ADDENDUM NO. 1

December 2, 2021

Cadillac High School Addition & Renovations

Cadillac High School
400 Linden Street
Cadillac, MI, 49601

TO: ALL BIDDERS OF RECORD

****BIDS DUE DATE CHANGED TO DECEMBER 22, 2021****

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and the Drawings dated November 3, 2021, by TowerPinkster. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages ADD 1-1 through ADD 1-3, dated December 2, 2021, and TowerPinkster Addendum No. 1, dated November 29, 2021, consisting of 11 pages, Issued Specification Sections: 09 5423, 12 3216, Reissued Specification Sections: 08 7100, 31 1000, 31 2000, 31 2319, 33 4100, and Reissued Drawings: G 001.2, G 100.2B, CD 101.2, C 101.2, C 102.2, C 201.2, C 203.2, C 501.2, L 003.2, AD 101.2D, AD 101.2G, AD 101.2H, AD 101.2J, AD 103.2, A 101.2D, A 101.2F, A 101.2G, A 101.2H, A 101.2J, A 103.2, A 201.2J, A 320.2, A 356.2, A 601.2J, A 602.2D, A 602.2J, A 610, A 622.2, A 632.2, A 633.2, A 634.2, A 635.2, A 651.2, A 652.2, A 653.2, A 654.2, P 000.2D, P 000.2J, P 101.2A, P 101.2D, P 101.2J, P 101.2K, P 301.2, P 302.2, P 501.2, M 101.2K, M 102.2K, M 301.2, M 502.2, M 503.2, M 505.2, M 601.2, M 602.2, M 603.2, M 604.2, M 605.2, M 606.2, M 607.2, ED 010.2, ES 010.2, E 101.2G, E 101.2J, E 101.2K, E 105.2, E 201.2J, E 201.2K, E 404.2, E 412.2, E 441.2, E 442.2, E 443.2, E 444.2, E 445.2, E 451.2, E 452.2, E 453.2, E 454.2, E 461.2, L 503.3, L 506.3, L 507.3, L 510.

A. SPECIFICATION SECTION 00 00 10 – TITLE PAGE

1. All references to the **Bids Received Date** are to change from December 16, 2021, to **December 22, 2021**. Bids remain due at 2:00 PM (EST), and will be publicly read aloud immediately following the deadline.

B. SPECIFICATION SECTION 00 00 20 – TABLE OF CONTENTS

1. Add the following Specification Sections:

   09 54 33 - Linear Metal Ceilings
   12 32 16 - Manufactured Plastic-Laminate-Clad Casework

C. SPECIFICATION SECTION 00 02 00 – NOTICE TO BIDDERS

1. All references to the **Bids Received Date** are to change from December 16, 2021, to **December 22, 2021**. Bids remain due at 2:00 PM (EST), and will be publicly read aloud immediately following the deadline.

D. SPECIFICATION SECTION 00 10 00 – INSTRUCTIONS TO BIDDERS

1. 1.18 Time of Commencement and Completion

   Revise the following:

   1. It is anticipated that construction will start within **40** calendar days after receipt of bids.

E. SPECIFICATION SECTION 00 20 00 – INFORMATION AVAILABLE TO BIDDERS

Add the following:

1. Triterra Environmental Construction Management Plan

F. SPECIFICATION SECTION 01 12 00 - MULTIPLE CONTRACT SUMMARY

1. Paragraph 1.16 Time of Commencement and Completion

   Revise the following:

   1. It is anticipated that construction will start within **40** calendar days after receipt of bids.

2. Paragraph 3.03 Bid Categories

I. BID CATEGORY NO. 9 – METAL STUDS, DRYWALL, & ACOUSTICAL CEILINGS

1. Add the following Specification Section:

   09 54 33 – Linear Metal Ceilings

N. BID CATEGORY NO. 14 – MANUFACTURED CASEWORK

1. Add the following Specification Section:

   12 32 16 – Manufactured Plastic-Laminate-Clad Casework

G. SPECIFICATION SECTION 01 32 00 SCHEDULES AND REPORTS (ISSUED)

1. Issued section 01 32 00b – Building Phasing Plan, dated November 29, 2021.
2. Issued section 01 32 00c – Guideline Schedule, dated November 29, 2021.
3. Issued section 01 32 00d – Site Phasing Plan, dated November 29, 2021.
4. Issued section 01 32 00e – Site Logistics Plan, dated November 29, 2021.

End of Addendum

ENVIRONMENTAL CONSTRUCTION MANAGEMENT PLAN



400 Linden Street

Cadillac, Michigan 49601

November 19, 2021

PREPARED FOR:

Cadillac Area Public Schools
Attn: Mrs. Jennifer Brown
421 S. Mitchell Street
Cadillac, Michigan 49601

PREPARED BY:

Triterra
1375 S. Washington Avenue, Suite 300
Lansing, Michigan 48910
517.702.0470

Project No. 21-2787

TRI TERRA

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ATTACHMENTS

Attachment 1: Contractor Disclosure Statement of Brownfield Conditions

1.0 INTRODUCTION

Triterra has prepared this Environmental Construction Management Plan (ECMP) for the proposed Renovations to the Cadillac Public Schools project (the Project) located at 400 Linden Street in the City of Cadillac, Wexford County, Michigan (the Property). The Property Location and proposed construction activities are shown on the Package 2 High School Renovations and Additions drawing set, dated November 3, 201.

The Property on which the work will be completed, contains documented environmental contamination in the fill used during initial construction. The contamination exceeds the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 Generic Residential Cleanup Criteria (GRCC). Therefore, the Property meets the definition of a *facility*, under Section 20101 of the Natural Resources and Environmental Protection Act (NREPA) 451 of 1994, as amended.

The contaminated fill was identified in the Geotechnical borings as black fine to coarse sandy material with lenses of gravel, silt and fly ash. The contaminated fill was found from six inches to two feet below grade and ranging in thickness from six inches to seven feet. The contaminated fill is easily distinguishable from native soil in the area by the distinct dark gray to black color and the presence of fly ash. The native soils to the area are light brown to brown, fine to medium grain sands with trace silt and gravel. The full extent and nature of the fill identified in soil borings can be found in the **REPORT OF GEOTECHNICAL INVESTIGATION FOR CADILLAC AREA PUBLIC SCHOOLS – HIGH SCHOOL ADDITIONS AND RENOVATIONS, DATED MAY 5, 2021.**

The ECMP provides guidance during the Project construction activities to all contractors for the management of documented onsite soil contamination. The soil management will be performed in a manner which conforms to Federal, State, and local regulations; protects workers and the environment; and exercise due care requirements.

Prior to commencing work, all Contractors conducting subsurface activities on the Property are required to sign a copy of the Contractor Disclosure Statement of Brownfield Conditions included as **Attachment 1**.

1.1 Management Summary

No remediation or offsite disposal of soil are planned for the site. Excavated soil will be re-used in the excavations or relocated and repurposed on the Property. Should excavated soils exceed the available reusable tonnage, the contaminated soil would be transported to a Type II landfill for appropriate disposal. Management of the soil will be limited to preventing runoff as well as strategic relocation of characterized soil: metals in soils exceeds the state background levels, drinking water protection criteria, groundwater surface water interface protection criteria, and direct contact.

Groundwater is not expected to be encountered during the Project construction activities. If groundwater is encountered during construction activities the water will be sampled and depending on the results, the Contractor may seek approval for a discharge permit from the City of Cadillac for groundwater discharge into the municipal storm sewer system if additional groundwater characterization sampling is completed and if results meet the City requirements for discharge.

2.0 SCOPE OF WORK

The Project redevelopment activities include soil excavation and management, various subsurface and grade activities (i.e. utilities, thoroughfares, and paved parking lots), and general due care management.

The intent of this ECMP is to require that all soil and groundwater generated from construction activities on the Property be managed either via: onsite re-purposing/relocation as appropriate for construction and in compliance with Part 201; removal from the Property to an appropriately licensed, Owner-approved disposal facility; or treated and discharged in accordance with all applicable permitting requirements.

Management of soil, groundwater, debris, and all other construction residual materials shall be performed concurrently with other aspects of Property development. All activities outlined in the ECMP shall be carefully coordinated with other Project activities, the Owner, and Owner appointed representatives.

2.1 Project Activities

Soil is expected to be generated on the Property during the activities listed below.

- Excess soils/fill materials generated from the following activities:
  - Installation of subgrade building foundation elements for construction of new buildings;
  - Installation of subgrade utilities, including electrical power systems, storm sewers, sanitary sewers, water lines, and related subgrade structures;
  - Rough grading and general earthwork at the Property; and
  - Excavation as may be required to provide a structurally stable sub-base for construction of the building and related site features (e.g., parking lots).
- Belowground debris generated from the above-described activities, potentially including construction debris, roots, stumps, and vegetative materials.
- Residuals from decontamination of personnel and equipment:
  - Used Level D personal protective equipment (PPE);
  - Solids derived from decontamination of personnel and equipment; and
  - Liquid wastes derived from decontamination of personnel and equipment.
- Other residuals from the Property, potentially including the following:
  - Used silt fencing and related erosion control materials used to mitigate soil erosion in the course of construction; and
  - Subgrade utilities and related structures to be removed to facilitate construction (e.g., sewer piping).

Construction activities to be performed in response to management of soil and groundwater at the Property include a range of tasks to be performed by Contractors and subcontractors. Work tasks to be completed under the ECMP include, but are not limited to:

- Stockpiling and onsite transportation of soil as necessary and based on characterization results of soils and fill materials derived from construction;
- Stockpiling, transportation and onsite recycling and use or offsite disposal of construction debris and other materials derived from construction activities based on characterization results;

- Containment, onsite storage, treatment (if deemed necessary), and/or discharge of aqueous wastes derived from construction, if necessary, including water derived from decontamination of personnel and equipment; and,
- Containment, and disposal (on-site or offsite as deemed necessary) of other residuals generated from the site development process, if necessary, subsequent to characterization and in compliance with applicable Federal, State and local rules and regulations.

The Owner will retain a Qualified Environmental Professional to assist with the implementation of this ECMP. The Qualified Environmental Professional's responsibilities shall include general oversight of the Project construction activities to assess and verify consistency of the construction activities with the Owner's due care obligations under Section 20107a of Part 201. This will include the following tasks:

- Oversight, as necessary, of the Contractor's invasive construction activities and field screening of excavated soils that result therefrom;
- Providing direction, as necessary, to the Contactor regarding materials and methods for stockpiling of impacted soils, fill materials and other residuals that must be temporarily stored on the property during construction;
- Coordination and monitoring, in association with the Owner's representative, of redistribution of soils/fill materials on the Property;
- Visual monitoring of ambient air, as necessary, to verify that particulate emissions from the Property are appropriately minimized through dust suppression techniques implemented by the Contractor; and,
- Visual monitoring, as necessary, of the effectiveness of soil erosion and sedimentation control (SESC) measures and vehicle track-out measures to prevent public nuisance.

Environmental Best Management Practices (BMPs) will be used on this Project where applicable and appropriate, unless otherwise determined by the Qualified Environmental Professional.

3.0 HEALTH AND SAFETY

Appropriate health and safety procedures and soil and groundwater management procedures are outlined herein and will be followed during invasive Project activities. These procedures apply to the Contractors and subcontractors, and any other entity conducting invasive onsite work.

3.1 Health and Safety Plan

Due to the presence of environmental contamination, Contractors conducting invasive onsite work activities will take all necessary precautions as required by laws, regulations, and the contract documents for protection of the Contractor's personnel. Regulations may include but are not limited to the following:

- Federal Occupational Health and Safety Act (OSHA) including OSHA HAZWOPER standard (29 CFR 1910.120),
- Michigan Occupation Health and Safety Ace (MIOSHA), as amended, and
- Michigan Worker Right-to-Know Act.

It will be the Contractor's responsibility to develop a site-specific health and safety plan (HASP) for all Contractor personal. This HASP will be specific to the Property and address the potential hazards associated with the Contractor's scope of work. The contractor will take all necessary precautions to assure that Contractor's personal and Subcontractor's personal under the Contractor's jurisdiction observe and abide by all applicable safety regulations while performing the work.

3.2 Response Procedures

The Contractor is responsible for emergency response notification in the event that an emergency occurs during construction. Emergencies may include injury to personnel, fire, explosion, or an environmental material spill or release. It is recommended that the Contractor have an emergency response plan developed for the construction Project.

As appropriate, the fire department and other emergency response groups will be notified immediately by telephone of the emergency. A list of emergency contact telephone numbers should be posted prominently at the Property (e.g., construction office trailer) and made readily available to all personnel at all times. This should include a description of: Procedures for spills and releases; Evacuation plans; and Amendments to the contingency plan. Additional, post-incident response assistance may also be obtained from other sources, as directed by the Owner and Construction Manager.

4.0 ENGINEERING AND INSTITUTIONAL CONTROLS

The engineering and institutional controls for soil/groundwater management at the Property are required to protect human health and the environment and to prevent exacerbation of the documented contamination.

4.1. Cover

Direct contact exposure to remaining contamination in soil/fill at the Property is a health and safety concern. Therefore, the Property will be covered with at least one foot of clean soil or six inches of clean topsoil underlain by geotextile fabric. Further, other cover (i.e. buildings, pavement, landscaping) will be placed over the Property's surface will assist with preventing exacerbation of contaminant conditions that underlie the Property.

4.2 Stormwater Management

Precautionary measures will be utilized to eliminate the risk of erosion, runoff, and infiltration during construction and post-construction activities to prevent the exacerbation of contamination in groundwater. During construction controls, such as site grading to control runoff, stormwater controls, and erosion protection will be installed to prevent contaminant migration through sedimentation, precipitation runoff, erosion, and infiltration.

To the extent practicable, open excavation and soil will be limited during construction to prevent surface water infiltration. Any surface water entering an open excavation area will be managed primarily with the dewatering equipment in place to dewater the groundwater. This dewatering operation will be operated as necessary during demolition and excavation for the new foundation installation and utility construction.

Erosion controls (e.g., silt fencing or other barriers) will be utilized: around the perimeter of the Property; and around any areas where excavated soil is stockpiled or mounded. Additionally, stockpiled and mounded soil will be minimized and/or covered at the Property.

4.3 Excavation Work Plan

The Property will continue to be utilized as a public education facility following the completion of the construction activities. Any future intrusive work that will penetrate the soil cover or cap materials (e.g., pavement or topsoil), or potentially encounter or disturb contaminated media will be performed in compliance with the Excavation Work Plan (EWP) that is provided in Section 5.0. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a site-specific HASP to be prepared by the Contractor conducting the invasive work. Any intrusive construction activities or utility maintenance and repair will be performed in compliance with the EWP and site-specific HASP.

The Owner, Developer, Contractors, subcontractors, and associated parties performing this work are responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation dewater, control of runoff from open excavations into remaining contamination,

4.4 Post-Construction Documentation of Due Care Compliance

To manage the long term environmental due care responsibilities at the Property, a post-construction Section 7a Documentation of Due Care Compliance (DDCC) will be prepared for the Property by Triterra on behalf of the Owner. This post-development DDCC will describe due care requirements for the Property in its redeveloped form. The post-construction DDCC will be prepared at the completion of Project activities.

4.5 Due Care

Due care management responsibilities are also required to prevent potential future exposure to remaining contamination by controlling disturbances of the subsurface contamination. The proposed due care control mechanisms are: Prohibit any future activities that disturb remaining, potentially contaminated material in accordance with the ECMP or a post development DDCC.

5.0 EXCAVATION WORK PLAN

Excavated soils on the Property will be reused onsite. The generated soils will be managed in accordance with the following guidance.

Areas of contaminated soils will be stockpiled on and reused on site and covered with at least one foot of clean soil or six inches of clean topsoil underlain by geotextile fabric or other covers (i.e. buildings, pavement, landscaping) will be placed over the Property's surface to prevent contact with contaminated soils.

5.1 Soil Stockpile Method

Residual soil will only be stockpiled at locations on the Property approved in advance by the Construction Manager. Stockpiled soil will not be mixed with other residual materials, such as construction materials or debris. Any contaminated soil that is blended will be managed as contaminated soil. Contaminated soil stockpiles will be continuously encircled with a berm and/or silt fence.

Precipitation shall not be permitted to accumulate within stockpiled soil. Silt fence shall be provided at the perimeter of stockpiled materials, if necessary, to prevent erosion of stockpiled soils. Sedimentation control materials and/or devices will be used as needed near catch basins, surface waters and other discharge points. Stockpiles will be routinely inspected, and damaged SESC controls will be promptly repaired or replaced.

5.2 Backfill from Offsite Sources

All imported materials proposed for the Property will be approved by the Owner in advance. The Contractor will be required to provide the known sources and/or certification through laboratory analysis that imported materials are clean for each material brought to the Property. Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Property. Solid waste will not be imported onto the Property. Trucks entering the Property with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated stockpiled materials and covered to prevent dust and run-off sediment releases.

5.3 Groundwater Management

In the event that groundwater is encountered during subsurface excavation or construction activities and needs to be removed, the Contractor will properly manage groundwater according to all applicable federal, state, and local regulations. The Contractor will follow the following general procedures:

- Contact the Owner,
- Estimate the volume of water requiring proper management,
- Determine the proper removal method,
- Determined the proper disposal method, including if on-site pretreatment is necessary,
- Obtain all required permits for disposal,
- Characterize the water,
- Containerize material or direct discharge.

No groundwater will be discharged to a storm sewer, sanitary sewer or in a manner that results in flow off the Property without obtaining a proper permit.

5.4 Stormwater Pollution Prevention

Appropriate controls and precautionary measures will be utilized to eliminate the risk of erosion, runoff, infiltration, or exacerbation of contamination into groundwater during construction activities. The Contractor will obtain a Soil Erosion and Sedimentation and Control (SESC) permit. All work will be performed in compliance with the SESC permit and with all applicable rules and regulations as established by the State of Michigan and the local regulating agency in conjunction with the SESC Act (Act 347 P.A. of

1972) and the Stormwater Permit-By-Rule for Construction Activities (R 323.2190 of Act 245 of 1929 as amended) and Act 203 of 1993. The Contractor will be responsible for obtaining the SESC permit from the local agency with jurisdiction for regulating soil erosion and sedimentation. A copy of the SESC permit will be submitted to the Owner prior to initiation of the Contractor's work.

All SESC controls will be installed, and activities performed according to the practices outlined in the Guidebook of Best Management Practices for Michigan Watersheds, Michigan Department of Natural Resources, Surface Water Quality Division. The Contractor will provide and maintain temporary soil erosion and sedimentation control measures as required by permit. Controls will be maintained during working and non-working hours as required by weather. Silt or solids retention at control structures will be removed following construction and managed consistent with the other soils at the Property.

5.5 Dust Control

The Contractor will be responsible for suppressing the generation of dust during invasive on-site work activities including but not limited to ground resurfacing, removal or relocation of fill material and debris, and excavation activities. Dust control during invasive onsite work shall include:

- Visual monitoring of the potential presence of dust emissions;
- Dust suppression as necessary through the use of a dedicated on-site water truck for road and surface wetting. The truck shall be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles;
- Reducing free-fall drop distance from equipment during stockpiling of residuals;
- Gravel may be necessary on roadways where pavement is not present to provide a clean and dust-free road surface;
- Onsite roads will be limited in total area to minimize the area required for water truck sprinkling; and
- Limiting the speed of all vehicles on the property to $\leq$ 10 miles per hour.

The Contractor will apply water and/or dust palliatives as required to eliminate visible dust emissions from the site. Application of water will be the preferred dust palliative for the site. In the event that application of water proves ineffective, dust palliatives will be approved by the Owner. Appropriate dust palliatives may include: Calcium chloride, in accordance with MDOT 9.22.08A; or Organic, nonpetroleum products (e.g., lignin derivatives, vegetable oils, and sugar beet extract) and synthetic polymer derivatives.

6.0 ENVIRONMENTAL PROFESSIONAL SIGNATURES

This ECMP was prepared by Brannon Roach and reviewed by Garnet Johnson on behalf of Triterra.

Additional soil and groundwater/water management strategies may be recommended as additional characterization sampling is completed or conditions are encountered and evaluated.

Please direct any questions to Triterra at (517) 702-0477.

Mr. Brannon Roach
Environmental Scientist

Mr. Garnet R. Johnson
Director | Remediation Activities
Senior Consultant

November 19, 2021
Date

TRI TERRA

ATTACHMENT 1:

CONTRACTOR DISCLOSURE STATEMENT OF BROWNFIELD CONDITIONS

1305 S. Washington Avenue, Suite 102
Lansing, Michigan 48910
517-702-0470
Fax 517-702-0477
www.triterra.us

CONTRACTOR DISCLOSURE
STATEMENT OF BROWNFIELD CONDITIONS

400 Linden Street, Cadillac, Michigan 49601

Triterra Project Number: 21-2787

November 19, 2021

The Property on which the work will be completed, contains documented environmental contamination in the fill used during initial construction. The contamination exceeds the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 Generic Residential Cleanup Criteria (GRCC). Therefore, the Property meets the definition of a *facility*, under Section 20101 of the Natural Resources and Environmental Protection Act (NREPA) 451 of 1994, as amended.

Complete delineation of all on-site impacts has not been conducted. As part of the due care obligations under Section 20107a of Part 201, the following measures shall be followed during site construction activities.

Precautions should be taken to ensure that impacted soil and groundwater are separated from the public. A fence surrounding the Property and excavations will be constructed to prevent unauthorized access to work area(s). Should subsurface soil become exposed through excavation, grading, etc., appropriate action will be taken to prevent an unacceptable risk to the public health. Including: (1) promptly returning impacted soil to the excavation, (2) removing the impacted soil to a proper disposal facility, and backfilling with clean fill material, (3) covering exposed impacted soil with clean fill material, (4) properly managing soil through the use of erosion controls, etc. to prevent contaminated runoff, and/or (5) implement precautions to prevent track-off of soils to public right of ways and roadways.

Promptly fill excavations, below grade areas or voids from construction activities to ensure water does not collect within the area(s). In the event that groundwater is encountered during subsurface excavation or construction activities and needs to be removed, the Contractor will properly manage groundwater according to all applicable federal, state, and local regulations. No groundwater will be discharged to a storm sewer, sanitary sewer or in a manner that results in flow off the Property without obtaining a proper permit.

Residual soil will only be stockpiled at locations on the property approved in advance by the Construction Manager. Stockpiled soil will not be mixed with other residual materials, such as construction materials or debris. Soil stockpiles will be continuously encircled with a berm and/or silt fence.

Precipitation shall not be permitted to accumulate within stockpiled soil. Silt fence shall be provided at the perimeter of stockpiled materials, if necessary, to prevent erosion of stockpiled soils. Sedimentation control materials and/or devices will be used as needed near catch basins, surface waters and other discharge points. Stockpiles will be routinely inspected, and damaged SESC controls will be promptly repaired or replaced.

Importation of fill material other than clean backfill from a gravel/sand yard is prohibited. Importation of fill material from another property is prohibited until the known source(s) of the fill materials have been identified and/or certified as appropriate for use at the site through laboratory characterization. Documentation that fill is clean must be provided to the Owner prior to importation to the Property.

All onsite soil is to be reused or otherwise repurposed on the Property beneath future buildings, landscaped areas, and/or pavement as noted within the Environmental Construction Management Plan (ECMP). Any soil to be transported off-site should be stockpiled in a manner that separates the contaminated material from potential export material in compliance with all local, state, and federal regulations. The Contractor is responsible for obtaining authorization to dispose.

At specific locations on the Property exposure to contaminants in shallow soil through direct contact is a potential exposure, however, fencing and signage will be utilized to restrict access to the Property during construction work except by authorized personnel. Appropriate worker protection will be necessary for work conducted in the areas where contaminant levels exceed direct contact.

Excavation activities shall be conducted under a Health and Safety Plan (HASP). Any contractors working with materials containing potentially hazardous substances will prepare a site-specific HASP, which will include, at a minimum, emergency contact numbers, hospital locations, Level D personal protective equipment (PPE) (i.e., gloves, boots, coveralls, etc.), and decontamination procedures. HASPs prepared for this work will be read and signed by all contractor and subcontractor workers assigned to the Project. The Property Owner or representative will review the contractors' HASP to determine if adequate understanding and protective measures will be implemented throughout the work, to protect workers and the public from accidental exposure to contamination.

Excavation on the Property should be restricted except for the purpose of construction, landscaping, or utility installation/repair by persons authorized by the Property Owner. All excavation work should be approved by the Property Owner prior to initiating work.

Hazardous substances and petroleum products will not be stored on the Property in quantities considered significant. This includes petroleum fuel above ground storage tanks (ASTs) for equipment being utilized on the Property, unless otherwise approved and proper containment devices are used.

Any buried containers (i.e., underground storage tanks (USTs), drums, pipelines, etc.) that are discovered during construction will be appropriately characterized and removed. Any abandoned containers that are discovered will not be disturbed. Any construction activities that could result in damage to buried containers will be immediately ceased. Activities in the vicinity of the abandoned container will not resume until the abandoned container(s) is properly removed.

Precautions to prevent the reasonably foreseeable acts or omissions of a third party will be implemented. Contractors will be required to post "no trespassing" signs and/or fencing to prohibit the public from entering the Property. Open excavations will be fenced to prevent access by unauthorized personnel. Subcontractors will not be brought onto the Property without authorization of the Property

Owner and completion of this disclosure statement. It is the Contractor's responsibility to maintain the construction fencing until the completion of the Project.

I have read and understand this Disclosure Statement.

_____
Signature

_____
Company

_____
Date

Phase 1
February 2022 - December 2023

Phase 2
March 2022 - August 2022

Phase 3
October 14, 2022 - September 2023
Stadium Restroom Completion - August 2023

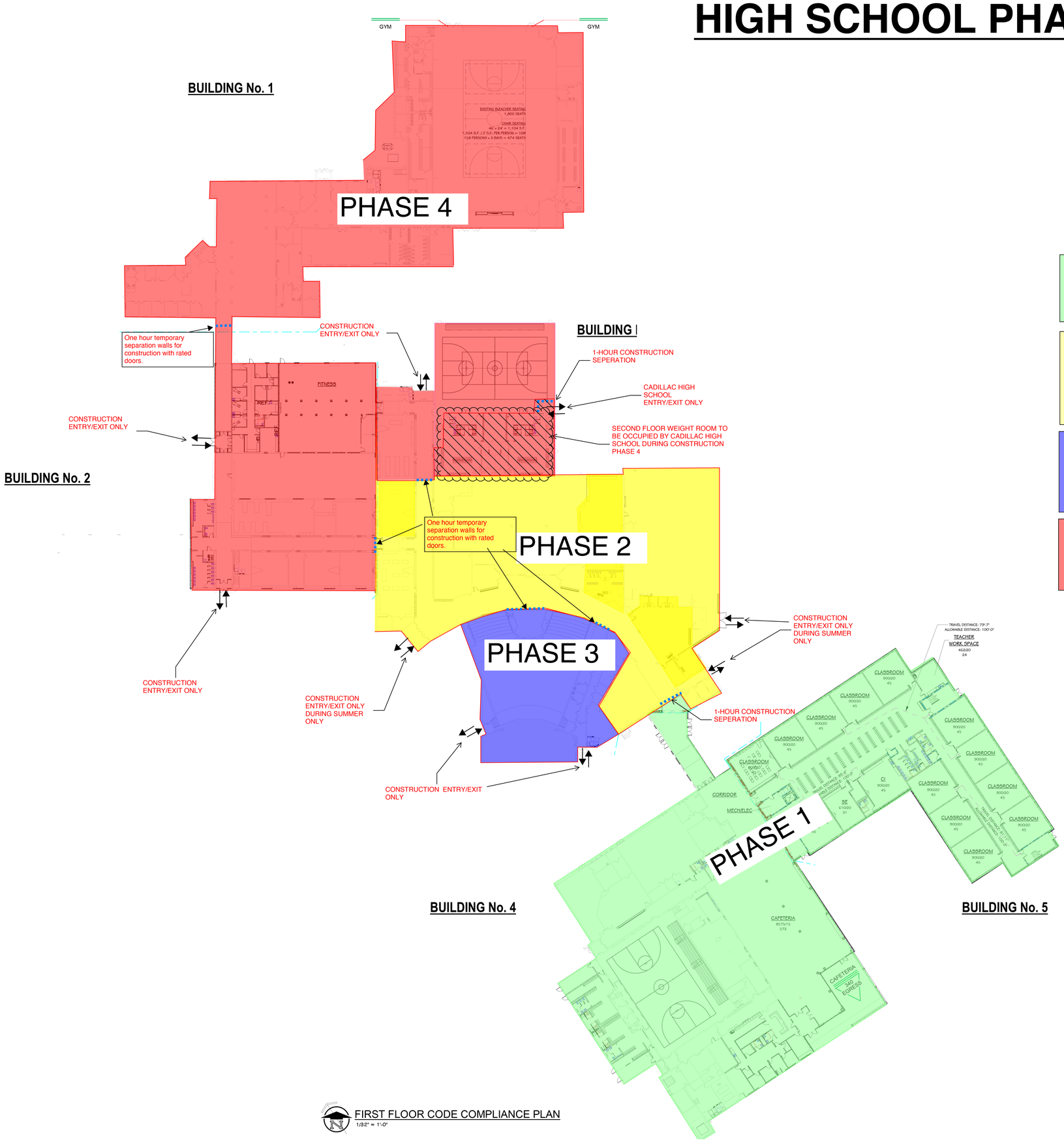
Phase 4
January 2024 - August 2024

CADILLAC HIGH SCHOOL ADDITIONS AND RENOVATIONS

SITE PHASING PLAN - 11.29.2021

HIGH SCHOOL PHASING PLAN (Building)

November 29, 2021



Phase 1
February 2022 - November 2023

Phase 2
June - August (2022, 2023 & 2024)

Phase 3
January 2023 - August 2023

Phase 4
January 2024 - August 2024

FIRST FLOOR CODE COMPLIANCE PLAN
1/32" = 1'-0"

SCALE: NO SCALE

SHE
FI

SHE
G

17-175.60

Activity Name	Original Duration	Start	Finish
Cadillac High School Additions and Renovations	899	20-Nov-20 A	23-Aug-24
Project Administration	899	20-Nov-20 A	23-Aug-24
Phase 1 Construction	486	01-Feb-22	22-Dec-23
Phase 2 Construction (Summer 2022, 2023 & 2024)	0	20-Jun-22	
Phase 3 Construction	164	09-Jan-23	25-Aug-23
Phase 3 Owner Occupancy (Phase 3 Substantial Completion	0		25-Aug-23
Phase 1 Owner Occupancy (Phase 1 Substantial Completion	0		22-Dec-23
Phase 4 Construction	165	08-Jan-24	23-Aug-24
Phase 2 Owner Occupancy (Phase 2 Substantial Completion	0		19-Aug-24
Phase 4 Owner Occupancy (Phase 4 Substantial Completion	0		23-Aug-24
Final Project Substantial Completion	0		23-Aug-24
Schematic Design	66	20-Nov-20 A	26-Mar-21
Design Development	69	30-Mar-21 A	21-Jul-21 A
Construction Documents	34	04-Nov-21 A	17-Nov-21
Bid Phase	55	05-Nov-21 A	26-Jan-22
TP/Skillman Prepare CD Package for Bidding	0	05-Nov-21 A	
Advertisement & NTB & SOM Posting	0		08-Nov-21
CAPS HS Bid Package Released for Bidding	0	17-Nov-21 A	
Addendum No. 1 Release & Posted	0	01-Dec-21	
Pre-Bid Meeting @ CAPS	0		02-Dec-21
Final Addenda Release & Posted	0	13-Dec-21	
Bids Due	0		22-Dec-21
Tabulate & Post Bid Tab	1	23-Dec-21	23-Dec-21
Pre-Award Conferences	8	28-Dec-21	07-Jan-22
LOR to Award Contracts	0		07-Jan-22
BOE Meeting/Reccommendation to Award Contracts	0		10-Jan-22
Notice to Proceed	0		11-Jan-22
Pre-Construction Meeting	0		26-Jan-22
Construction	705	22-Nov-21 A	23-Aug-24
Phase 1	540	22-Nov-21 A	05-Jan-24
Units H and K	540	22-Nov-21 A	05-Jan-24
Owner Move-Out	5	22-Nov-21 A	26-Nov-21
Abatement	20	17-Dec-21	17-Jan-22
Procure Permits, and Notice	10	18-Jan-22	31-Jan-22
Temporary Construction Seperation, Shoring and Enclosures	0	01-Feb-22	
Discconects MEP, FA and Comm.	5	01-Feb-22	07-Feb-22
Fire Alarm, Communication Disconnects (Connecting Corrid	3	08-Feb-22	10-Feb-22
Disconnect Underground Utilities (Storm-Sewer)	10	08-Feb-22	21-Feb-22
Building Demolition	30	15-Feb-22	28-Mar-22
Cafeteria Floor Demolition	5	29-Mar-22	04-Apr-22
Backfill to Bottom of New Footings	5	05-Apr-22	11-Apr-22



Primary Baseline
Actual Work
Remaining Work
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Cadillac High School Additions and Renovations

Guideline Schedule 29-Nov-21

SKILLMAN

Activity Name	Original Duration	Start	Finish
Footings and Foundations	15	12-Apr-22	02-May-22
Underground MEP, FP, and Utilities Rough-in	15	03-May-22	23-May-22
Below Grade Masonry	10	03-May-22	16-May-22
Backfill Footings and Foundations	5	17-May-22	23-May-22
Underground Inspections	0	24-May-22	
Form and Pour Slab on Grade (SOG)	10	24-May-22	07-Jun-22
First Floor Masonry	50	08-Jun-22	17-Aug-22
Unit H Steel Framing, Joists and Decking	10	29-Jun-22	13-Jul-22
Hollow Core Planks	10	18-Aug-22	31-Aug-22
Second Floor Masonry	50	01-Sep-22	10-Nov-22
Temporary Doors and Enclosures	5	01-Sep-22	08-Sep-22
Hollwcore Plank Topping and Equipment Pads	5	09-Sep-22	15-Sep-22
First Floor Overhead MEP, FP and Comm Rough-ins	15	16-Sep-22	06-Oct-22
Install RTU's	5	16-Sep-22	22-Sep-22
Temporary Heating and Ventilation	125	04-Nov-22	03-May-23
Unit K Steel Framing, Joists and Decking	15	11-Nov-22	05-Dec-22
Brick Veneer	50	11-Nov-22	25-Jan-23
Roofing	15	06-Dec-22	27-Dec-22
Second Floor Overhead MEP, FP and Comm Rough-ins	40	28-Dec-22	22-Feb-23
Aluminum Windows	20	26-Jan-23	22-Feb-23
50% BCC and BFS Inspections	0		22-Feb-23
Painting and Ceiling Grid	30	23-Feb-23	05-Apr-23
MEP, FP and Comm Finishes	30	06-Apr-23	17-May-23
Overhead Inspections	0		17-May-23
Tiling and Carpet Flooring	40	18-May-23	13-Jul-23
Casework	15	14-Jul-23	03-Aug-23
Ceiling Tile	25	04-Aug-23	07-Sep-23
Doors, Hardware, Markerboards, and Toilet Accessories	50	08-Sep-23	16-Nov-23
Architectural Finishes	10	08-Sep-23	21-Sep-23
Polished Concrete Flooring	17	17-Nov-23	11-Dec-23
CAPS Technology (Intercom-Paging, Data, and Security)	10	12-Dec-23	25-Dec-23
Owner Move-In	13	20-Dec-23	05-Jan-24
Unit J	321	02-Dec-21	08-Mar-23
Abatement	20	02-Dec-21*	30-Dec-21
Procure Permits, and Notice	21	03-Jan-22	31-Jan-22
MEP, FA, and Comm Demolition	10	01-Feb-22	14-Feb-22
Temporary Shoring, Doors and Enclosures	10	15-Feb-22	28-Feb-22
Temporary Power, Heating and Ventilation	60	15-Feb-22	09-May-22
Architectural Demolition	15	22-Feb-22	14-Mar-22
Slab Removal	10	15-Mar-22	28-Mar-22
Kitchen Demolition	5	15-Mar-22	21-Mar-22



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Cadillac High School Additions and Renovations

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SKILLMAN

Activity Name	Original Duration	Start	Finish
Underground MEP Rough-in	20	22-Mar-22	18-Apr-22
Underground Inspections	0		18-Apr-22
New Walls (Masonry and Metal Studs)	40	19-Apr-22	14-Jun-22
In-wall and Overhead MEP, FP, and Comm Rough-ins	30	03-May-22	14-Jun-22
Structural Steel Joists and Decking	15	01-Jun-22	21-Jun-22
Roofing	15	22-Jun-22	13-Jul-22
Painting and Ceiling Grid	20	14-Jul-22	10-Aug-22
Gypsum Ceiling and Painting	15	11-Aug-22	31-Aug-22
Aluminum Windows	15	11-Aug-22	31-Aug-22
Flooring, Tiling, Metal Wall Panels	40	01-Sep-22	27-Oct-22
Food Service Equipment (FSE)	10	28-Oct-22	10-Nov-22
Special Inspection before ISO	0		10-Nov-22
MEP, FP, and Comm Finishes	25	11-Nov-22	19-Dec-22
Final MEP, FP and Communications Inspections	0		19-Dec-22
FSE Inspections	0		19-Dec-22
Doors, Entrances and Hardware	20	20-Dec-22	18-Jan-23
Casework, Lockers, and Visual Display Boards	15	20-Dec-22	11-Jan-23
Access Control, Technology, Paging, etc.	15	20-Dec-22	11-Jan-23
Final Inspections for Temp. Occupancy	0		18-Jan-23
Gymnasium Flooring	20	19-Jan-23	15-Feb-23
Polished Concrete	15	16-Feb-23	08-Mar-23
Bleachers	10	16-Feb-23	01-Mar-23
Phase 2 (Units F & G)	563	20-Jun-22	23-Aug-24
Phase 2 - Summer 2022	49	20-Jun-22	26-Aug-22
Ceiling Demolition	10	20-Jun-22*	01-Jul-22
Overhead Rough-in Fire Alarm, MEP and Communications	20	05-Jul-22	01-Aug-22
FIre Protection	22	05-Jul-22	03-Aug-22
Ceiling Install	3	04-Aug-22	08-Aug-22
Temporary Lighitng and Security	14	09-Aug-22	26-Aug-22
FInal Inspections	0		26-Aug-22
Phase 2 - Summer 2023	56	12-Jun-23	29-Aug-23
Architectural Demoliton (Restrooms and Corridors)	5	12-Jun-23*	16-Jun-23
MEP Demolition (Restrooms and Corridors)	5	14-Jun-23	20-Jun-23
Slab Removal	4	14-Jun-23	19-Jun-23
Underground Plumbing Rough-in	5	21-Jun-23	27-Jun-23
Underground Inspections	0		27-Jun-23
Pour Slab on Grade	2	28-Jun-23	29-Jun-23
Masonry Walls	10	30-Jun-23	14-Jul-23
MEP, FP and Comm Rough-in	7	17-Jul-23	25-Jul-23
Restroom Flooring and Tiling	10	26-Jul-23	08-Aug-23
Plumbing Fixtures, Toilet Partitions and Accessories	5	09-Aug-23	15-Aug-23



Primary Baseline
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Cadillac High School Additions and Renovations

Guideline Schedule 29-Nov-21

SKILLMAN

Activity Name	Original Duration	Start	Finish
Ceiling	5	16-Aug-23	22-Aug-23
MEP, Fire Alarm, FP and Comm Finishes (Restroom and Cor	3	23-Aug-23	25-Aug-23
Doors, Frames and Hardware	2	28-Aug-23	29-Aug-23
Final Inspections	0		29-Aug-23
Phase 2 - Summer 2024	50	17-Jun-24	23-Aug-24
Architectural, MEP and Communications Demolition	10	17-Jun-24*	28-Jun-24
New MEP Finishes	15	01-Jul-24	19-Jul-24
Painting, Flooring and Architectural Finishes	20	22-Jul-24	16-Aug-24
Owner Move-In	5	19-Aug-24	23-Aug-24
Phase 3	162	09-Jan-23	23-Aug-23
Demolition	5	09-Jan-23*	13-Jan-23
MEP, and Comm Demolition	10	16-Jan-23	27-Jan-23
MEP, FP and Comm Rough-In	20	30-Jan-23	24-Feb-23
Fire Alarm	20	27-Feb-23	24-Mar-23
FIre Protection	22	27-Mar-23	25-Apr-23
Stage Lighting	10	26-Apr-23	09-May-23
New Light Fixtures	15	10-May-23	30-May-23
Painting	10	31-May-23	13-Jun-23
Ceiling	10	14-Jun-23	27-Jun-23
New Auditorium Seating	15	28-Jun-23	19-Jul-23
Flooring	15	20-Jul-23	09-Aug-23
Stage Curtains	10	10-Aug-23	23-Aug-23
FInal Inspections	0		23-Aug-23
Phase 4	165	08-Jan-24	23-Aug-24
Unit C	83	08-Jan-24	01-May-24
Temporary Construction Seperation	3	08-Jan-24*	10-Jan-24
Discconects MEP, FA and Comm.	10	11-Jan-24	24-Jan-24
Temporary Shoring	10	25-Jan-24	07-Feb-24
Abatement	10	08-Feb-24	21-Feb-24
Building Demolition	20	22-Feb-24	20-Mar-24
Backfill	10	21-Mar-24	03-Apr-24
Form and Pour Footings	10	04-Apr-24	17-Apr-24
Patch Existing Roofing	10	18-Apr-24	01-May-24
Units A, B, D & E	165	08-Jan-24	23-Aug-24
Abatement	5	08-Jan-24*	12-Jan-24
Temporary Power, Heating and Ventilation	2	15-Jan-24	16-Jan-24
Temporary Shoring, Doors and Enclosures	5	17-Jan-24	23-Jan-24
Architectural Demolition	20	24-Jan-24	20-Feb-24
Slab Removal	5	21-Feb-24	27-Feb-24
MEP, FA, and Comm Demolition	15	28-Feb-24	19-Mar-24
Underground MEP Rough-in	10	20-Mar-24	02-Apr-24



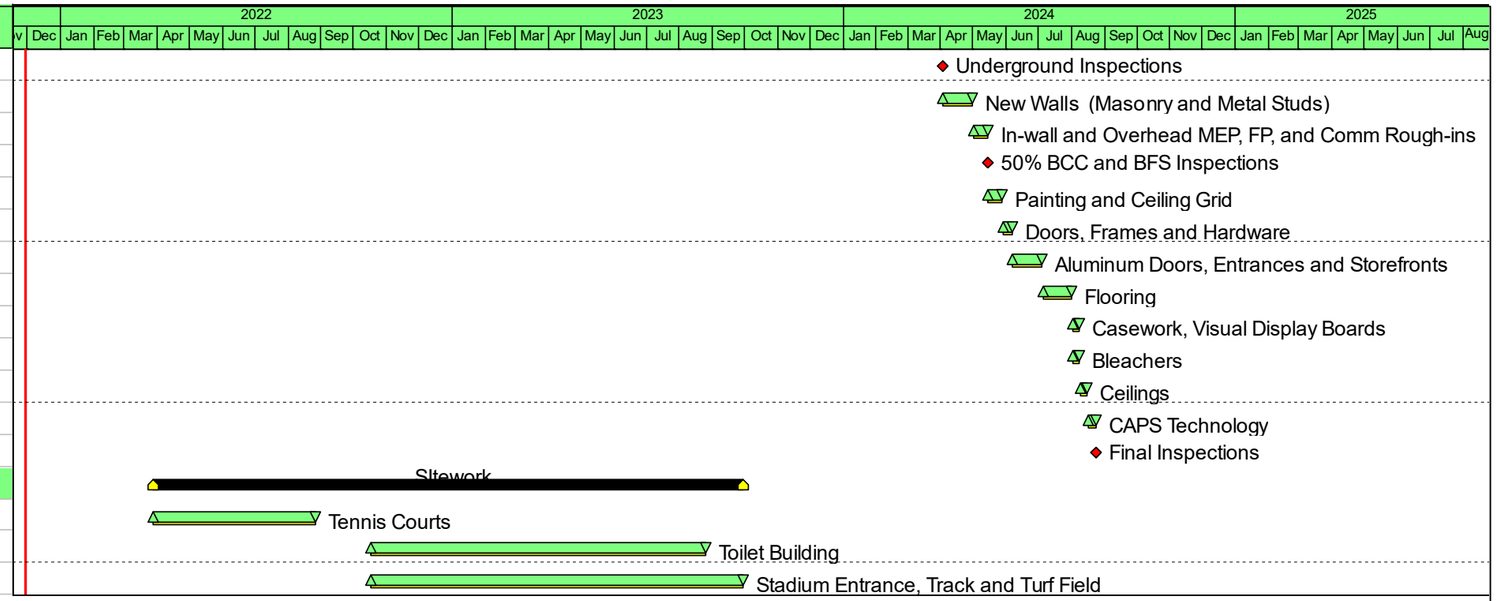
Primary Baseline
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Cadillac High School Additions and Renovations

Guideline Schedule 29-Nov-21

SKILLMAN

Activity Name	Original Duration	Start	Finish
Underground Inspections	0		02-Apr-24
New Walls (Masonry and Metal Studs)	20	03-Apr-24	30-Apr-24
In-wall and Overhead MEP, FP, and Comm Rough-ins	10	01-May-24	14-May-24
50% BCC and BFS Inspections	0		14-May-24
Painting and Ceiling Grid	10	15-May-24	28-May-24
Doors, Frames and Hardware	7	29-May-24	06-Jun-24
Aluminum Doors, Entrances and Storefronts	20	07-Jun-24	04-Jul-24
Flooring	20	05-Jul-24	01-Aug-24
Casework, Visual Display Boards	5	02-Aug-24	08-Aug-24
Bleachers	5	02-Aug-24	08-Aug-24
Ceilings	5	09-Aug-24	15-Aug-24
CAPS Technology	6	16-Aug-24	23-Aug-24
Final Inspections	0		23-Aug-24
SItework	387	28-Mar-22	29-Sep-23
Tennis Courts	108	28-Mar-22*	26-Aug-22
Toilet Building	220	17-Oct-22*	25-Aug-23
Stadium Entrance, Track and Turf Field	245	17-Oct-22*	29-Sep-23



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ADDENDUM NO. 1

DATE OF ISSUANCE:	**November 29, 2021**
PROJECT:	**Cadillac High School** **400 Linden Street** **Cadillac, MI 49601**
OWNER:	**Cadillac Area Public Schools**
ARCHITECT'S PROJECT NO.:	**17-175.70**
ORIGINAL BID ISSUE DATE:	**November 3, 2021**

SCOPE OF WORK

This Addendum includes changes to, or clarifications of, the original Bidding Documents and any previously issued addenda, and shall be included in the Bid. All of these Addendum items form a part of the Contract Documents. The Bidder shall acknowledge receipt of this Addendum in the appropriate space provided on the Bid Form. Failure to do so may result in disqualification of the Bid.

DOCUMENTS INCLUDED IN THIS ADDENDUM

This Addendum includes **eleven** pages of text and the following documents:

- Bidding Documents: **none**
- Contract Conditions: **none**
- Specification Sections: **08 7100, 09 5423, 12 3216, 31 1000, 31 2000, 31 2319, 33 4100**
- Drawings: **G 001.2, G 100.2B, CD 101.2, C 101.2, C 102.2, C 201.2, C 203.2, C 501.2, L 003.2, AD 101.2D, AD 101.2G, AD 101.2H, AD 101.2J, AD 103.2, A 101.2D, A 101.2F, A 101.2G, A 101.2H, A 101.2J, A 103.2, A 201.2J, A 320.2, A 356.2, A 601.2J, A 602.2D, A 602.2J, A 610, A 622.2, A 632.2, A 633.2, A 634.2, A 635.2, A 651.2, A 652.2, A 653.2, A 654.2, P 000.2D, P 000.2J, P 101.2A, P 101.2D, P 101.2J, P 101.2K, P 301.2, P 302.2, P 501.2, M 101.2K, M 102.2K, M 301.2, M 502.2, M 503.2, M 505.2, M 601.2, M 602.2, M 603.2, M 604.2, M 605.2, M 606.2, M 607.2, ED 010.2, ES 010.2, E 101.2G, E 101.2J, E 101.2K, E 105.2, E 201.2J, E 201.2K, E 404.2, E 412.2, E 441.2, E 442.2, E 443.2, E 444.2, E 445.2, E 451.2, E 452.2, E 453.2, E 454.2, E 461.2, L 503.3, L 506.3, L 507.3, L 510.3**

CHANGES TO PREVIOULSY ISSUED ADDENDA

None.

CHANGES TO BIDDING REQUIREMENTS

None.

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CHANGES TO CONTRACT CONDITIONS

None.

CHANGES TO SPECIFICATIONS

ADD-1 Item No. S-1 - Alternate No. 1 Clarification

Refer to Specification Section: 01 2300 - Alternates

A. Alternate No. 1: Existing roof replacement, (refer to sheet A 103.2).

1. Base Bid: No roof work in areas listed in alternates areas below.

2. Alternate: Remove existing ballasted roof down to existing roof deck and install a new single-ply membrane over high density coverboard, 5 inches rigid insulation and tapered rigid insulation as required to provide positive drainage. Provide added blocking as required for tapered insulation and prefinished fascia and fascia extenders as required.

a. Areas to be considered for Re-Roofing are identified by Area No. as listed below:
1] Alternate 1A: Area No. 1 (30,970 sf ±).
2] Alternate 1B: Area No. 2 (9,446 sf ±).
3] Alternate 1C: Area No. 3 (9,610 sf ±).
4] Alternate 1D: Area No. 4 (11,756 sf ±).
5] Alternate 1E: Area No. 5 (16,482 sf ±).
6] Alternate 1F: Area No. 6 (10,682 sf ±).

ADD-1 Item No. S-2 - Alternate No. 9.

Refer to Specification Section: 01 2300 – Alternates

I. Alternate No. 1: Existing roof replacement, (refer to sheet A 103.2).

1. Base Bid: No work.

2. Alternate: Provide a ¾-inch water service extension to the future tennis court pavilion and related additional removal and replacement of existing improvements necessary for this water service extension.

ADD-1 Item No. S-3 - Environmental Data

Refer to Specification Section: 00 3100 – Available Project information

Refer to added Environmental Management Construction Plan report.

ADD-1 Item No. S-4 - Additional Products

Refer to Specification Section 08 7100 – Door Hardware

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The following products have been added under Part 2 – Products:

2.2, A - Hinges. Ives

2.2, B - Continuous Geared Hinges. Ives

2.3, A – Electrified Quick Connect Transfer Hinges. Ives – CON Option

2.3, C – Electric Door Wire Harness. Schlage – CON Series

2.10, A – Standard Electric Strikes. Von Duprin 6400 Series

2.10, B – Surface Mounted Rim Electric Strikes. Von Duprin 6300 Series

2.17, C – Overhead Door Stops and Holders. Glynn Johnson

2.18, F – Architectural Seals. Zero International

ADD-1 Item No. S-5 - Plumbing Fixtures

Refer to Specification Section: 22 4000 – Plumbing Fixtures

Refer to Section 2.8 Showers and change to read the following;

A. SH-1 Shower System (Non Barrier Free): Built in showers with concealed supplies, shower components; Equa Flo HD pressure balancing valve with stops in supply for valves, standard 1.5 GPM (S15) vandal resistant showerhead with allen key volume control and back plate and recessed soap dish. All exposed materials are stainless steel or chrome plated brass. Bradley Model 1C or equivalent.

B. SH-1/BF Shower System (Barrier-Free): Built in showers with concealed supplies, shower components; Equa Flo HD pressure balancing valve with stops in supply for valves (ADA compliant), standard 1.5 GPM (S15) vandal resistant showerhead with allen key volume control and back plate, diverter valve, hand spray with 60" flexible hose and 30" slide bar, in line vacuum breaker and recessed soap dish. All exposed materials are stainless steel or chrome plated brass. Bradley Model 1C or equivalent.

ADD-1 Item No. S-6 - Added Specification Sections

Refer to Specification Section: 09 5423 – Linear Metal Ceilings

Refer to Specification Section: 12 3216 – Manufactured Plastic-Laminate-Clad Casework

ADD-1 Item No. S-7 - Additional information

Refer to Specification Section 31 1000 – Site Clearing

Add 1.1, B to specification section.

Add 1.8, C to specification section, and update lettering for subsequent items in section.

Add 3.11, A to specification section, and update lettering for subsequent items in section.

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ADD-1 Item No. S-8 - Additional Information

Refer to Specification Section 31 2000 – Earth Moving

Add 1.1, D to specification section.

Add 1.6, A to specification section, and update lettering for subsequent items in section.

Add 3.2, A to specification section, and update lettering for subsequent items in section.

Add 3.4, C to specification section, and update lettering for subsequent items in section.

Add 3.14, C to specification section.

ADD-1 Item No. S-9 - Additional Information

Refer to Specification Section 31 2319 – Dewatering

Add 1.1, D to specification section, and update lettering for subsequent items in section.

Add 1.6, B to specification section.

Add 3.1, G to specification section.

ADD-1 Item No. S-10 - Additional Information

Refer to Specification Section 33 4100 – Storm Utility Drainage Piping

Add 1.1, B to specification section, and update lettering for subsequent items in section.

Add 1.6, B to specification section, and update lettering for subsequent items in section.

Add 3.10, D to specification section, and update lettering for subsequent items in section.

ADD-1 Item No. S-11 - Added Specification Sections

Refer to Specification Section: 09 5423 – Linear Metal Ceilings

Refer to Specification Section: 12 3216 – Manufactured Plastic-Laminate-Clad Casework

CHANGES TO DRAWINGS

ADD-1 Item No. D-1 - Alternates Revisions

Refer to Sheet(s): G 001.2

Revised list of alternates.

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ADD-1 Item No. D-2 - BCC and BFS Numbers

Refer to Sheet(s): G 100.2B

Addition of Bureau of Construction Codes (BCC) and Bureau of Fire Services (BFS) numbers. As shown clouded.

ADD-1 Item No. D-3 - Slab-on-Grade Removal and Replacement

Refer to Sheet(s): AD 101.2H, AD 101.2J, A 101.2H and A 101.2J

Remove additional portion of existing slab-on-grade for removal and replacement of underground Plumbing piping (refer to Plumbing drawings), and installation of new polished concrete slab-on-grade. As shown clouded.

ADD-1 Item No. D-4 - Serving (K4) Openings and Wall Furring

Refer to Sheet(s): AD 101.2J, A 101.2J and A 601.2J

Adjustment of new sawcut opening locations and the addition of a tile finished wall furring at Serving (K4). As shown clouded.

ADD-1 Item No. D-5 - New Roof and Overflow Drain – Unit D

Refer to Sheet(s): A 103.2

Provide a new combination roof and overflow drain over Corridor (COR2). Coordinate storm piping and overflow outlet with Plumbing drawings. As shown clouded.

ADD-1 Item No. D-6 - Ceiling Bulkhead in Corridor (COR10)

Refer to Sheet(s): A 201.2J

Provide a gypsum bulkhead in Corridor (COR10) to conceal overhead piping. Adjust ceiling mounted lighting as required. As shown clouded.

ADD-1 Item No. D-7 - Slab-on-Grade Removal and Replacement

Refer to Sheet(s): AD 101.2D and A 101.2D

Remove additional portion of existing slab-on-grade for removal and replacement of underground storm piping (refer to Plumbing drawings), and installation of new concrete slab-on-grade. As shown clouded.

ADD-1 Item No. D-8 - Existing Tennis Courts Removal, Existing Utilities Removal and Relocation, Pavement Removal, and Civil Demolition Notes

Refer to Sheet(s): CD 102.2

The existing tennis court removal was clarified to include the base and subbase sections of the removal.

The Demo Legend was modified to clarify the extent of removal for the pavement section.

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Some existing utilities currently located beneath the tennis courts are called out to be removed and relocated.

Additional concrete sidewalk is called to be removed and replaced as part of Alternate No. 9.

Note #15 was added to the Civil Demolition Notes to address the onsite soils contamination.

ADD-1 Item No. D-9 - Curb, Sidewalk, and Pavement Revisions and Layout & Utility Notes Addition

Refer to Sheet(s): C 101.2

A reference to a specific curb type was updated.

A reference to the detail for heavy-duty pavement was updated.

Replacement of integral curb & walk was added as part of Alternate No. 9.

Note #17 was added to the Layout & Utility Notes to address the onsite soils contamination.

ADD-1 Item No. D-10 - Future Tennis Court Pavilion Services, Watermain, Relocated Utilities, and Layout & Utility Notes Addition

Refer to Sheet(s): C 102.2 & P 101.2A

Extension of a ¾-inch water service from the existing building to the future tennis court pavilion was added as part of Alternate No. 9. Refer to sheet P 101.2A for connection of new ¾" CW line inside Boiler Room 614 to existing 4" CW main. Install new RPZ valve in new ¾" CW line inside building.

Extension of an electrical service from the existing building to the future tennis court pavilion was added with a reference to the Electrical Plans.

Approximate locations of the utilities relocation were added alongside the proposed tennis courts.

Watermain and water services notes were updated to add sleeves and clarification.

Note #17 was added to the Layout & Utility Notes to address the onsite soils contamination.

ADD-1 Item No. D-11 - SESC Modifications, Storm Structure Corrections, and Grading & Storm Sewer Notes Addition

Refer to Sheet(s): C 201.2

Silt fencing was added near the proposed restroom building.

Corrections were made to a couple storm structure call-outs.

Note #11 was added to the Grading & Storm Sewer Notes to address the onsite soils contamination.

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ADD-1 Item No. D-12 - Grading Revisions

Refer to Sheet(s): C 203.2

Grading was revised within a grass area to provide a minimum of 1% slope to catch basin.

ADD-1 Item No. D-13 - Additional Civil Detail

Refer to Sheet(s): C 501.2

A 24" Curb & Gutter (Pitch Out) Detail was added to the sheet.

ADD-1 Item No. D-14 - Tennis Court Plan

Refer to Sheet(s): L 003.2

Refer to Enlarged Tennis Court Plan for detail clarifications.

ADD-1 Item No. D-15 - Slab-on-Grade Removal and Replacement

Refer to Sheet(s): AD 101.2G, A 101.2G

Sawcut and remove portion of existing slab-on-grade in Auditorium (305) for installation of electrical conduit and junction boxes for aisle lighting.

ADD-1 Item No. D-16 - Markerboard Adjustment

Refer to Sheet(s): A101.2F and A633.2.

Adjusted markerboard sizes and locations.

ADD-1 Item No. D-17 - Exterior Monument Sign Detailing

Refer to Sheet(s): A 320.2 and A 356.2

Added detailing, dimensions and cast stone profiles for exterior Monument Sign.

ADD-1 Item No. D-18 - Finish plan and Material Selection Schedule updates

Refer to reissued sheets A601.2J, A602.2D, A602.2J, and A610. See clouded updated finish plans, along with updated finish key and notes on all sheets. Finish adjustments and additional notes have been added to sheets and clouded.

ADD-1 Item No. D-19 - Elevation and Millwork Updates

Refer to reissued sheets A622.2, A632.2, A633.2, A634.2, A635.2, A651.2, A652.2, A652.2, A654.2. See clouded notes for adjusted items with include finish and dimension updates, casework details, and additional notes for clarification.

ADD-1 Item No. D-20 - Sheet Titles

Refer to Sheet(s): A634.2, A653.2, and A654.2

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Changed sheet titles.

ADD-1 Item No. D-21 - (4) Existing Sinks in Existing Wellness Center to be Relocated

Refer to Sheet PD 101.2K. Sheet is not reissued.

Note on the demolition drawings for Unit K that the (3) existing sinks and faucets for the (3) existing Exam Rooms and (1) sink and faucet with eyewash station for the existing Lab Room shall be saved and reinstalled in the new Wellness Center located in Unit D.

ADD-1 Item No. D-22 - New Storm Piping for New and Existing Roof Drains in Unit D

Refer to Sheet(s): P 000.2D & P 101.2D

Install new combination roof drain and overflow roof drain in Corridor COR2. Reconnect (3) existing roof drains to new storm piping as shown.

ADD-1 Item No. D-23 - Plumbing Kitchen Plans for Kitchen K1

Refer to Sheet(s): P 000.2J & P 302.2

Refer to the above sheets for plumbing piping for Kitchen K1 in Unit D.

ADD-1 Item No. D-24 - Plumbing Changes for First Floor Unit K

Refer to Sheet: P 101.2K

Refer to above sheet for plumbing changes in (5) locations. Shifting of piping and pipe size changes.

ADD-1 Item No. D-25 - Heat Trace for Outdoor Storm and Storm Overflow Piping

Refer to Sheet: P 101.2J

Install Heat Trace for storm and storm overflow piping where shown.

ADD-1 Item No. D-26 - Unit K First Floor and Second Floor Enlarged Toilet Rooms

Refer to Sheet: P 301.2

Refer to above sheet for changes to pipe sizing for the Enlarged Plumbing Plans.

ADD-1 Item No. D-27 - Add Bottle Filling Station to Enlarged Plumbing Plan Unit H

Refer to Sheet: P 301.2

Refer to First Floor Toilet Room Area Enlarged Plumbing Plan – Unit H and add BFS-1 / BF.

ADD-1 Item No. D-28 - Plumbing Details

Refer to Sheet: P 501.2

Add plumbing details: Gas Service Piping Detail, Gas Vent Detail and Three Compartment Sink Waste Piping Detail.

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ADD-1 Item No. D-29 - First Floor Sheet Metal Plan – Unit K, Terminal Units & Kitchen Hood

Refer to Sheet: M 101.2K

Refer to the (6) clouded terminal units for updated CFM. Refer to Classroom 026 for the new non ducted kitchen hood.

ADD-1 Item No. D-30 - Terminal Unit TU-121

Refer to Sheet: M 102.2K

Terminal Unit labeled TU-002 serving Corridor 121 shall change tag number to TU-121.

ADD-1 Item No. D-31 - Stadium Toilet Building & Stadium Ticket Booth Mechanical Plans

Refer to Sheet: M 301.2

Refer to the Plans for changes to the mechanical.

ADD-1 Item No. D-32 - Changes to Expansion Tanks for Boiler Room 614 & Snowmelt System

Refer to Sheet M 401.2. Sheet not reissued.

Refer to the Heating Hot Water System Schematic (Boiler Room 614) and change size of expansion tank ET-2 to a model B-800 versus B-500. Refer to Snowmelt Heating Hot Water System Schematic and change size of expansion tank ET-3 to a model B-200 versus B-300.

ADD-1 Item No. D-33 - Sheet M 502.2 Mechanical Schedules & Details

Refer to Sheet: M 502.2

Refer to Louver Schedule and add L-5 & L-6. Refer to the Pump Schedule and change P-5 as shown. Refer to the Terminal Unit Schedule: TU-100B shall read 2 row coil. TU-101 shall read 2 row coil. Change TU-002 to the updated information in the schedule. Add TU-121 to the schedule

ADD-1 Item No. D-34 - Sheet M 503.2 Mechanical Schedules & Details

Refer to Sheet: M 503.2

Add Grilles & Diffuser Schedule, add Silencer Schedule & add Base Mounted Pump Piping Detail.

ADD-1 Item No. D-35 - Sheet M 505.2 Mechanical Schedules & Details

Refer to Sheet: M 505.2

Add Electric Cabinet Heaters Schedule & add (5) snowmelt details as shown.

ADD-1 Item No. D-36 - Temperature Control Drawings

Refer to Sheet(s): M 601.2, M 602.2, M 603.2, M 604.2, M 605.2, M 606.2 & M 607.2

Refer to sheets for updated control sequence of operations for all equipment.

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ADD-1 Item No. D-37 - Electric Utility Revisions

Refer to Sheet(s): ED 010.2, ES 010.2, E 105.2, E 404.2, E 412.2, E 461.2

Revise utility connection information and routing for the new toilet building main panelboard MDP-S as shown clouded. See also electrical site demolition keyed note #5 and electrical site keyed note #9.

ADD-1 Item No. D-38 - Electrical Site Revisions

Refer to Sheet(s): ES 010.2

Add underground conduit to future shelter at tennis courts as shown clouded. Add notation for conduit internal to stadium sports lighting poles and hand holes behind each pole location. See also electrical site keyed notes #12 and #13.

ADD-1 Item No. D-39 - Auditorium Aisleway Lighting

Refer to Sheet(s): E 101.2G, E 445.2

Add aisleway lighting in auditorium as shown clouded. See also new power keyed notes #11 - #13.

ADD-1 Item No. D-40 - Unit J Canopy Heat Tracing

Refer to Sheet(s): E 101.2J, E 452.2

Add circuit for heat tracing in Unit J canopy as shown clouded. Coordinate final connection location with mechanical contractor.

ADD-1 Item No. D-41 - Unit J Receptacle Location Revisions

Refer to Sheet(s): E 101.2J

Add and/or adjust receptacle locations and heights in cafeteria area. Adjust location of televisions on West wall of Cafeteria to be centered in associated wall.

ADD-1 Item No. D-42 - Classroom 026 Range Hood

Refer to Sheet(s): E 101.2K, E 453.2

Add circuit for range hood in Classroom 026 as shown clouded.

ADD-1 Item No. D-43 - Stadium Toilet Building Revisions

Refer to Sheet(s): E 105.2

Update electrical connections to HVAC equipment as shown clouded.

ADD-1 Item No. D-44 - Lighting Revisions

Refer to Sheet(s): E 201.2J, E 201.2K

Revise lighting in Corridor COR10 (South of Kitchen, Unit J) as shown clouded. Add/revise lighting fixtures in stairwells Stair S001, Stair S002 and Stair S003 as shown clouded.

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ADD-1 Item No. D-45 - Electrical Panelboard IC Rating Updates

Refer to Sheet(s): E 441.2, E 442.2, E 443.2, E 444.2, E 445.2, E 451.2, E 452.2, E 453.2, E 454.2, E 461.2

Revise switchboard and panelboard IC ratings as shown clouded on associated panelboard load schedules. IC ratings of switchboards and panelboards shall have a minimum IC rating equal to rating indicated on panelboard load schedules plus 20%. Refer also to specification sections 26 2413 and 26 2416 (not re-issued).

ADD-1 Item No. D-46 - Chain Link Fence Detail

Refer to Sheet(s): L 503.3

Added detail key callouts referencing chain link fence Detail 3/L 003.2.

ADD-1 Item No. D-47 - Track Stormwater Management Design

Refer to Sheet(s): L 507.3

Revised track and synthetic turf stormwater management design to coordinate with proposed site stormwater management design provided by Civil Engineer.

ADD-1 Item No. D-48 - New Turf Field Utility Clarification

Refer to Sheet(s): L 507.3

Added empty electrical conduit routing from goal posts to centerfield sideline. Added a note referencing size and intent of new utility box at the centerfield sideline. Added note referencing quick coupler valve service line and new pipe detail.

ADD-1 Item No. D-49 - Chain Link Fence Detail

Refer to Sheet(s): L 510.3

Added detail key callout on Detail #13 – Track Section. Callout references chain link fence to Detail 3/L 003.2.

END OF ADDENDUM.

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SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

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E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

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C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.
    c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and

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electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

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1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties 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 made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.

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3. Twenty five years for manual overhead door closer bodies.
4. Five years for motorized electric latch retraction exit devices.
5. Two years for electromechanical door hardware.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

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a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

a. Hager Companies (HA).
b.
c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
d. Stanley Hardware (ST).
e. Ives (IV).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

a. Hager Companies (HA).
b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
c. Ives (IV).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. Hager Companies (HA) - ETW-QC (# wires) Option.

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b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC (# wires) Option.
c. Stanley Hardware (ST) - C Option.
d. Ives (IV) - -CON Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) - EL-CEPT Series.
b. Securitron (SU) - EL-CEPT Series.
c. Von Duprin (VD) - EPT-10 Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

a. Hager Companies (HA) - Quick Connect.
b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - QC-C Series.
c. Stanley Hardware (ST) - WH Series.
d. Schlage (SC) –CON Series.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.

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2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.

1. Manufacturers:

    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:

    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Key Registration List (Bitting List):

1. Furnish a list of opening numbers with locking devices, showing cylinder types and quantities required when cylinders or cores are to be owner furnished.

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2.6 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.7 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.

2. Manufacturers:

a. Corbin Russwin Hardware (RU) - ML2000 Series.
b. dormakaba Best (BE) - 45H Series.
c. Sargent Manufacturing (SA) - 8200 Series.
d. Schlage (SC) - L9000 Series.

2.8 AUXILIARY LOCKS

A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

1. Manufacturers:

a. dormakaba Best (BE) - 48H Series.
b. Corbin Russwin Hardware (RU) - DL4000 Series.
c. Sargent Manufacturing (SA) - 4870 Series.
d. Schlage (SC) - L460 Series.

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2.9 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.10 ELECTRIC STRIKES

A. Standard Electric Strikes: Electric strikes tested to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire rated openings. Strikes shall be of stainless steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of 1 million operating cycles. Provide strikes with 12 or 24 VDC capability, fail-secure unless otherwise specified. Where specified provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

1. Manufacturers:

    a. HES (HS) - 1500/1600 Series.
    b. Von Duprin (VD) – 6400 Series.

B. Surface Mounted Rim Electric Strikes: Surface mounted rim exit device electric strikes tested to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide tamper resistance. Strikes tested for a minimum of 500,000 operating cycles. Provide strikes with 12 or 24 VDC capability supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation.

1. Manufacturers:

    a. HES (HS) - 9400/9500/9600/9700/9800 Series.
    b. Von Duprin (VD) – 6300 Series.

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C. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.11 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

9. Rail Sizing: Provide exit device rails factory sized for proper door width application.

10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions

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specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
    b. Sargent Manufacturing (SA) - 80 Series.
    c. dormakaba Precision (PR) - Apex 2000 Series.
    d. Von Duprin (VD) - 35A/98 XP Series.

2.12 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

1. Energy Efficient Design: Provide devices which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

2. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.

3. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

4. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED5000 Series.
    b. dormakaba Precision (PR) - Apex 2000 Series.
    c. Sargent Manufacturing (SA) - 80 Series.
    d. Von Duprin (VD) - 35A/98 XP Series.

2.13 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use.

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Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:

a. LCN Closers (LC) - 4040 Series.
b. Norton Door Controls (NO) - 7500 Series.
c. Sargent Manufacturing (SA) - 351 Series.

2.14 ELECTROHYDRAULIC DOOR OPERATORS

A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.

1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.

B. Standard: Certified ANSI/BHMA A156.19.

C. Performance Requirements:

1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.

D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.

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E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.

F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.

G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.

H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.

I. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. LCN Closers (LC) - 4640 Series.
2. Norton Door Controls (NO) - 6000 Series.

2.15 SURFACE MOUNTED CLOSER HOLDERS

A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.

1. Manufacturers:

a. LCN Door Closers (LC) - SEM7800 Series.
b. Rixson (RF) - 980/990 Series.
c. Sargent Manufacturing (SA) - 1560 Series.

2.16 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

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3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

2.17 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Rixson Door Controls (RF).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Sargent Manufacturing (SA).
    d. Glynn Johnson (GJ).

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2.18 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
3. Zero International (ZE).

2.19 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.20 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

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C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9

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Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

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3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Refer to Section 080671, Door Hardware Sets, for hardware sets.

END OF SECTION 087100

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SECTION 09 5423 - LINEAR METAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes strip, linear metal pans and suspension systems for ceilings.

1.2 COORDINATION

A. Coordinate layout and installation of linear metal pans and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below:

1. Linear Metal Pan: Set of 12-inch- (300-mm-) long Samples of each type and color and a 12-inch- (300-mm-) long spliced section.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Linear Metal Ceiling Components: Quantity of each pan, carrier, accessory, and exposed molding and trim equal to 2 percent of quantity installed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver linear metal pans, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected

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against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Handle linear metal pans, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install linear metal ceilings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 50 or less.

2.2 LINEAR METAL CEILING PANS

A. Acoustical Metal Pan Standard: Provide manufacturer's standard linear metal pans of configuration indicated that comply with ASTM E 1264.

1. Mounting Method for Measuring NRC: Type E-400.

B. Sheet Metal Characteristics: For metal components exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, roughness, stains, or discolorations.

1. Aluminum Sheet: Roll-formed aluminum sheet, complying with ASTM B 209 (ASTM B 209M); alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

    a. Painted Finishes: Electrolytic zinc-coated steel complying with ASTM A 879/A 879M, 04Z (12G) coating; surface treatment as recommended by finish manufacturer for type of use and finish indicated.

C. Pan Fabrication: Manufacturer's standard units of size, profile, and edge treatment indicated, formed from metal indicated to snap on and be securely retained on carriers without separate fasteners, and finished to comply with requirements indicated.

D. Pan Splices: Construction same as pans, in lengths 8 to 12 inches (200 to 300 mm); with manufacturer's standard finish.

E. End Caps: Metal matching pans; fabricated to fit and conceal exposed ends of pans.

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F. Moldings and Trim: Provide manufacturer's standard moldings and trim for exposed members, and as indicated or required, for edges and penetrations of ceiling, around fixtures, at changes in ceiling height, and for other conditions; of same metal and finish as linear metal ceiling pans.

G. Sound-Absorbent Pads: Provide width and length to completely fill between carriers, joined at center of panel, with surface-burning characteristics for flame-spread index of 25 or less and smoke-developed index of 50 or less, as determined by testing per ASTM E 84, and to comply with the following requirements:

1. Plastic Sheet-Wrapped Mineral-Fiber Insulation: Pads consisting of nonrigid, PVC plastic sheet encapsulating unfaced mineral-fiber insulation complying with ASTM C 553, Type I, II, or III, and as follows:

   a. Mineral-Fiber Type and Thickness: Glass fiber; 1 inch (25 mm).
   b. Mineral-Fiber Density: 1-1/2 lb/cu. ft. (24 kg/cu. m).
   c. Plastic Sheet Thickness and Color: Not less than 0.003 inch (0.076 mm); flat black.

2.3 METAL SUSPENSION SYSTEMS

A. Metal Suspension Systems Standard: Provide ceiling manufacturer's standard metal suspension systems of types and finishes indicated that comply with applicable ASTM C 635/C 635M requirements.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, Direct Hung, unless otherwise indicated.

1. Postinstalled Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

   a. Type: Postinstalled expansion or postinstalled bonded anchors.
   b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC service condition (mild).

2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.

C. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C 635/C 635M, Table 1, Direct Hung is less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

D. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Carriers: Factory finished with matte-black baked finish.

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F. Carrier Splices: Same metal, profile, and finish as for carriers.

G. Stabilizer Channels, Tees, and Bars: Manufacturer's standard components for stabilizing main carriers at regular intervals and spaced as standard with manufacturer for use indicated; and factory finished with matte-black baked finish.

H. Edge Moldings and Trim: Provide exposed members as indicated or required to comply with seismic requirements of authorities having jurisdiction, to conceal edges of penetrations through ceiling, to conceal ends of pans and carriers, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching linear metal pans or extruded plastic unless otherwise indicated.

2.4 PANS AND SUSPENSION SYSTEM FOR LINEAR METAL CEILING

A. Aluminum Pans and Suspension System (LMC-1):

1. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Ceilings; METALWORKS Blades - Classics, or comparable product by one of the following:

   a. Ceilings Plus.
   b. Hunter Douglas Architectural Products, Inc.

2. Perforations: Unperforated.

3. Linear Beam Size: 2 inches (51 mm) wide by 12 inches (305 mm) high by length indicated on Drawings.
4. Linear Beam Finish: Powder coat faux wood finish to match Armstrong Ceilings; Effects Subtle – Cinnamon.
5. End Cap, Finish of Exposed Portions: To match beam.
6. Suspension System: Ceiling manufacturer’s 15/16-inch (2-mm) "T" grid with black finish.

2.5 FINISHES

A. General: Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
2. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

B. Aluminum Finishes:

1. Color-Coated Finish: Manufacturer's faux wood powder-coat baked paint.

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PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with ASTM C 636/C 636M and seismic requirement indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required, install trapezes or equivalent devices.
4. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
6. Do not attach hangers to steel deck tabs or to steel roof deck.

C. Install suspension system carriers so they are aligned and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

D. Cut linear metal pans for accurate fit at borders and at interruptions and penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.

E. Install linear metal pans in coordination with suspension system and exposed moldings and trim.

1. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated.
2. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.
3. Install pans with butt joints using internal pan splices
4. Where metal pan ends are visible, install end caps unless trim is indicated.
5. Install sound-absorbent pads at right angle to perforated metal pans so pads do not hang unsupported.

END OF SECTION 09 5423

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SECTION 12 3216 - MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes plastic-laminate-clad cabinets of stock design.

B. Related Requirements:

1. Section 06 1000 "Rough Carpentry" for wood blocking for anchoring casework.
2. Section 09 6513 "Resilient Base and Accessories" for resilient base applied to plastic-laminate-clad casework.
3. Section 12 3661.16 “Solid Surfacing Countertops.”

1.2 DEFINITIONS

A. Definitions in the AWI/AWMAC/WI's "Architectural Woodwork Standards" apply to the Work of this Section.

B. MDF: Medium-density fiberboard.

C. Hardwood Plywood: A panel product composed of layers or piles of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive, and faced both front and back with hardboard veneers.

1.3 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For plastic-laminate-clad casework.

1. Include plans, elevations, sections, and attachments to other work including blocking and reinforcements required for installation.
2. Indicate types and sizes of casework.
3. Indicate manufacturer's catalog numbers for casework.
4. Show fabrication details, including types and locations of hardware.
5. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and equipment.

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1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer for installation of units required for this Project.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver casework only after painting, utility roughing-in, and similar operations that could damage, soil, or deteriorate casework have been completed in installation areas. If casework must be stored in areas other than installation areas, store only in areas where environmental conditions meet requirements specified in “Project Conditions” Article.

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

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during remainder of construction period.

B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

C. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Delamination of components or other failures of glue bond.
b. Warping of components.
c. Failure of operating hardware.

2. Warranty Period: Five years from date of Substantial Completion.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Case Systems Inc.
2. Stevens Industries, Inc.
3. TMI Systems Design Corporation.

B. Source Limitations: Obtain plastic-laminate-clad casework from single source from single manufacturer.

2.2 CASEWORK, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the AWI/AWMAC/WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.

1. Grade: Premium.

2. Provide inspections of casework fabrication and installation together with labels and certificates from AWI certification program indicating that casework complies with requirements of grades specified.

2.3 PLASTIC-LAMINATED-FACED CABINETS

A. Design: Frameless cabinet construction with the following door and drawer-front style:
1. Flush overlay.

B. Exposed Materials:

1. Plastic-Laminate Grade: VGS.
2. Unless otherwise indicated, provide specified edgebanding on all semiexposed edges.

C. Semiexposed Materials:
1. Thermoset Decorative Panels: Provide thermoset decorative panels for semiexposed surfaces unless otherwise indicated.
a. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

2. Unless otherwise indicated, provide specified edgebanding on all semiexposed edges.

D. Concealed Materials:

1. Solid Wood: With no defects affecting strength or utility.
2. Plywood: Hardwood plywood.

3. Plastic Laminate: Grade BKL.
4. Particleboard.
5. MDF.

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2.4 MATERIALS

A. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.

B. Softwood Plywood: DOC PS 1.

C. Particleboard: ANSI A208.1, Grade M-2, minimum 47 lb/cu.ft.(0.75 g/cc) density.

D. MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.

E. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

F. PVC Edgebanding for Doors and Drawer Fronts: Rigid PVC extrusions, through color with satin finish, 0.12 inch (3 mm) thick.

G. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

1. Edgebanding for Thermoset Decorative Panels: PVC or polyester edgebanding matching thermoset decorative panels.

2.5 COLOR AND FINISHES

A. Thermoset Decorative Panel Colors, Patterns, and Finishes: As selected by Architect from casework manufacturer's full range.

B. Plastic-Laminate Colors, Patterns, and Finishes: As indicated by manufacturer's designations.

C. PVC Edgebanding Color: As indicated by manufacturer's designations.

2.6 FABRICATION

A. General: Shop-cut openings for hardware, appliances, plumbing fixtures, and similar items to greatest extent possible. Locate openings accurately using templates or rough in diagrams. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating. Thickness indicated are for core material and do not include laminate in thickness.

1. Construction: Join members together with glue-and-dowel construction or Mod-Eez mechanical fasteners.

B. Plastic-Laminate-Clad Cabinet Construction: As required by referenced quality standard, but not less than the following:

1. Bottoms and Ends of Cabinets, and Tops of Tall Cabinets: 3/4-inch (19-mm) particleboard.
2. Bottoms and Tops of Wall Cabinets: 1-inch(25-mm) particleboard, plastic-laminate faced on exposed surfaces, thermoset decorative panels on semiexposed surfaces.

3. Shelves: 3/4-inch- (19-mm-) thick particleboard. Comply with deflection standards of the National Particleboard Association.

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4. Concealed Backs of Casework: 1/2-inch- (13-mm-) thick particleboard, dadoed into sides, bottoms, and tops.
5. Exposed Backs of Cabinets: 3/4-inch- (19-mm-) thick particleboard.
6. Base Cabinet Subtops: 3/4-inch(19-mm) melamine-faced particleboard. Spreaders are not acceptable.
7. Structural Cabinet Support: Separate and continuous 4-inch(102-mm) high exterior grade plywood ladder-type platform design leveled and floor-mounted prior to cabinet body placement. Provide 2-1/2-inch(64-mm) recess at front of cabinet and 3/8-inch(9.5-mm) recess at exposed sides. No cabinet sides exposed to floor acceptable.
8. Interior Structure: For Cabinets 36 inches(914 mm) wide and wider, provide one of the following:

    a. Mechanically fastened and removable vertical divider to reduce horizontal shelf deflection.
    b. Fixed Intermediate Support: All shelves, tops, and bottoms, shall be 1-inch(25-mm) thick with fixed intermediate support.

9. Wall cabinets shall have minimum clear inside depth of 12 inches(305 mm) unless indicated otherwise.
10. Door and Drawer Front Rail: Minimum 3/4-by-6-inch(19-by-152-mm) by full horizontal width of cabinet body rails immediately behind joints between any combination of doors or drawers.
11. Drawer Fronts: 3/4-inch (19-mm) particleboard.
12. Drawer Sides and Backs: 1/2-inch- (13-mm-) thick particleboard or MDF, with glued dovetail or multiple-dowel joints.
13. Drawer Bottoms: One of the following:

    a. 1/2-inch(13-mm) thermoset decorative panels glued and dadoed into front, back, and sides of drawers.
    b. 1/2-inch(13-mm) thermoset decorative panels fastened to drawer box and supported by "L" shaped bottom corner-mount drawer slides. Fasten slides to drawer with 1-1/4-inch(32-mm) long screws through drawer bottoms and into sides.

14. Doors: 3/4 inch (19 mm) thick, with particleboard or MDF cores.

C. Filler Strips: Provide as needed to close spaces between casework and walls, ceilings, and equipment. Fabricate from same material and with same finish as casework.

2.7 CASEWORK HARDWARE AND ACCESSORIES

A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.
1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.

B. Butt Hinges: Stainless-steel or chrome-plated brass, semiconcealed, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two hinges for doors less than 48 inches (1220 mm) high, and provide three hinges for doors more than 48 inches (1220 mm) high.

C. Wire Pulls: Solid stainless-steel or chrome-plated brass wire pulls, fastened from back with two screws.
1. For sliding doors, provide recessed stainless-steel or chrome-plated flush pulls.
2. Provide two pulls for drawers more than 24 inches (600 mm) wide.

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D. Door Catches: Powder-coated, nylon-roller spring catch or dual, self-aligning, permanent magnet catch. Provide two catches on doors more than 48 inches (1220 mm) high.

E. Drawer Slides: BHMA A156.9, Type B05091.

1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted.

a. Extension Type: Full.
b. Material: Epoxy-coated steel with polymer rollers.

2. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated, steel ball-bearing slides.

3. Box Drawer Slides: Grade 1HD-100, for drawers not more than 6 inches (150 mm) high and 24 inches (600 mm) wide.
4. File Drawer Slides: Grade 1HD-200, for drawers more than 6 inches (150 mm) high or 24 inches (600 mm) wide.
5. Pencil Drawer Slides: Grade 1, for drawers not more than 3 inches (75 mm) high and 24 inches (600 mm) wide.
6. Keyboard Slides: Grade 1HD-100, for computer keyboard shelves.
7. Trash Bin Slides: Grade 1HD-200, for trash bins not more than 20 inches (500 mm) high and 16 inches (400 mm) wide.
8. Paper Storage Drawers: 3-part progressive opening slide, Grade 1HD-100.

F. Drawer and Hinged-Door Locks: Cylindrical (cam) type, five-pin tumbler, brass with chrome-plated finish, and complying with BHMA A156.11, Grade 1.
1. Provide a minimum of two keys per room and six master keys.
2. Provide locks on every door and drawer.
3. Key all locks within a room alike and each room differently.

G. Sliding-Door Hardware Sets: Manufacturer's standard, to suit type and size of sliding-door unit.

H. Adjustable Shelf Supports: Two-pin-locking plastic shelf rests complying with BHMA A156.9, Type B04013.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CASEWORK INSTALLATION

A. Grade: Install casework to comply with same quality standard grade as item to be installed.

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B. Install casework level, plumb, and true in line; shim as required using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

C. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm). Bolt adjacent cabinets together with joints flush, tight, and uniform.

D. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to hanging strips, masonry, framing, wood blocking, or reinforcements in walls and partitions. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).

E. Fasten casework to adjacent units and to masonry, framing, wood blocking, or reinforcements in walls and partitions to comply with the AWI/AWMAC/WI's "Architectural Woodwork Standards."

F. Install hardware uniformly and precisely. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.

G. Adjust operating hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 CLEANING

A. Repair or remove and replace defective work as directed on completion of installation.

B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 12 3216

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SECTION 31 1000 – SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Site work shall comply with Environmental Management Construction Plan completed by TriTerra dated November 19, 2021.

C. City of Cadillac Standards and Specifications.

D. City of Cadillac Soil Erosion and Sedimentation Control Ordinance and Permitting Requirements.

E. Standards and requirements of any other agencies having jurisdiction.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected site elements.
2. Salvage of existing items to be reused or recycled.
3. Protecting existing trees, shrubs, groundcovers, plants, and grass to remain.
4. Removing existing trees, shrubs, groundcovers, plants, and grass.
5. Clearing and grubbing.
6. Stripping and stockpiling topsoil.
7. Removing above and below grade site improvements.
8. Temporary erosion and sedimentation control measures.

B. Related Requirements:

1. Division 02 Section "Selective Structure Demolition" for partial demolition of buildings or structures undergoing alterations.
2. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and coordinate with Architect and Owner to determine requirements for storage and reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

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D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

F. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials, or other non-soil materials.

G. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

C. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for dust control and for noise control, as applicable. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities; Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager and facilities manager on-site operations are uninterrupted and/or scheduled if interruption is necessary.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 01 3233 "Photographic Documentation." Submit before Work begins.

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D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

E. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

1.6 PRODUCT DATA SUBMITTALS

A. Submit Product Data for:

1. Mulch Blankets
2. Inlet Filters
3. Geotextiles
4. Temporary Plastic Sheets
5. Seeding

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during demolition and construction.

G. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

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2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

H. Do not commence site clearing operations until temporary erosion and sedimentation control and plant protection measures are in place.

I. Tree and Plant Protection Zones: Protect according to requirements in Section 01 5639 "Temporary Tree and Plant Protection."

J. Weather Limitations: Proceed with installation of soil erosion and sedimentation control measures only when existing and forecasted weather conditions permit the work to be performed according to manufacturers' written instructions and warranty requirements.

K. It is the Contractor's responsibility to acquire the Soil Erosion and Sedimentation Control permit from The City of Cadillac.

L. It is the Contractor's responsibility to acquire the NDPES Notice of Coverage and submittal from the Michigan Department of Environment, Great Lakes, and Energy (EGLE), if required.

M. Internal courtyard improvements shall be constructed per landscape requirements.

1.9 QUALITY ASSURANCE

A. Perform Soil Erosion and Sedimentation Control practices in accordance with the City of Cadillac Soil Erosion and Sedimentation Control Ordinance and Michigan Department of Environment, Great Lakes, and Energy (EGLE) requirements.

B. The storm water management facilities within the development rely on infiltration for disposal of storm water. All necessary steps are to be taken by the Contactor to prevent sediment from entering the storm water conveyance system. Additional controls may be required if the Contractor's efforts are not successful.

C. The Contractor shall complete Storm Water Operator Inspections as required per the Soil Erosion and Sedimentation Control requirements and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) standards and requirements.

1.10 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be stored and handled per manufacturer's recommendations.

B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.11 COORDINATION

A. Contractor shall coordinate the work with sub-contractors prior to commencement of work.

B. Contractor shall notify the Engineer a minimum of 48 hours prior to the placement of any soil erosion control device so that proper inspection and documentation can be performed at the time of installation.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with regulations of authorities having jurisdiction.

2.2 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 2000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

2.3 MULCH BLANKETS

A. Available Manufacturers:

1. North American Green.
2. Or approved manufacturers.

B. Available Products:

1. North American Green: Soil Erosion Control Blankets as specified on the Drawings.
2. Or approved equal.

2.4 SILT FENCE

A. Available Manufacturers:

1. American Excelsior Co. Inc.
2. CSI / Geo Turf, Inc.
3. Or approved manufacturers.

2.5 FILTER SOCK

A. Available Manufacturers:

1. Filtrexx.
2. Or approved manufacturers.

B. Available Products:

1. SiltSoxx 12-inch – Perimeter Control.
2. Or approved equal.

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2.6 FILTER BAG

A. Available Products:

1. Price and Company: Ecolobag.
2. Or approved equal.

2.7 FILTRATION SACKS / BASIN INLET PROTECTION

A. Available Products:

1. Price and Company: Catch All
2. ACF Environmental: SiltSack
3. Or approved equal.

2.8 TEMPORARY SEEDING

A. As specified by the Landscape Architect.

B. Seed Mixture proportioned by weight as follows, unless otherwise specified by the Landscape Architect:

1. 50% Perennial Rye Grass
2. 50% Spring Oats

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey of Existing Conditions: Review survey information for accuracy prior to construction. Record existing conditions by use of preconstruction photographs or video.

1. Comply with requirements specified in Section 01 3233 "Photographic Documentation."

C. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

D. Examine soil erosion and sedimentation control measures and areas, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

3.2 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

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B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 01 5639 "Temporary Tree and Plant Protection."

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

D. Prepare soil erosion and sedimentation control materials to be used in accordance with manufacturer's recommendations.

3.3 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the requirements of the City of Cadillac, Wexford County, EGLE, and as shown on the soil erosion and sediment control Drawings.

B. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

D. There shall not be any disturbance to the soil prior to obtaining the soil erosion and sedimentation control permit from agencies having jurisdiction.

3.4 MULCH BLANKET

A. Prepare the ground to receive the blanket per grading tolerances outline in Section 31 2000 "Earth Moving".

B. Place and anchor blankets according to manufacturer's directions.

C. Installed erosion control blankets on slopes 1:4 or steeper.

3.5 SILT FENCE

A. Install silt fence per manufacturer's recommendation, only if they are more restrictive than those listed below.

B. Bottom of silt fence shall be toed in a minimum of 6-inches.

C. Trenches shall not be excavated wider and deeper than necessary for proper installation of the temporary linear sediment barriers.

D. Excavation of trenches shall be performed immediately before installation of the temporary linear sediment barriers.

E. Stakes shall be spaced at a maximum of 6 feet and shall be positioned on downstream side of fence.

F. Stakes shall be driven a minimum of 12-inches below existing ground surface.

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G. Joining of two sections of silt fence shall have the end stakes overlap and fabric shall be folded around both stakes one full turn. Stakes shall be driven tightly together to prevent potential slow-through of sediment at joint. The top of the stakes shall be secured with wire.

H. Construct silt fence with a set-back of at least 3 feet for the toe of a slope. Where a silt fence is determined to be not practical due to site specific conditions, the silt fence may be constructed at the toe of the slope but shall be constructed as far from the toe of the slope as practical.

I. Maintain silt fence to provide for an adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches one-third (1/3) of the barrier height.

J. Silt fences that are damaged and become unsuitable for the intended purpose, as determined by the Engineer, shall be removed for the site of work, and disposed of off-site according to local governing agency regulations.

3.6 FILTER SOCK

A. Install filter sock per manufacturer's recommendation, only if they are more restrictive than those listed below.

B. Bottom of the filter sock must be in complete contact with ground beneath.

C. Stakes shall be spaced at a maximum of 10 feet centers and staked through the center of the sock with 2" x 2" wood stakes.

D. Stakes shall be driven a minimum of 12-inches below existing ground surface in sandy loam soils and 8-inches below in clay soil.

E. Placement of filter sock on pavement surfaces can be secured by placing sandbags over top.

F. Loose compost may be backfilled along the upslope side of the Sediment control, filling the seam between the soil surface and the device, improving filtration and sediment retention.

G. In areas where downstream flooding may occur, filter sock is to be securely tied down at stakes to prevent floatation of filter sock.

H. Maintain filter sock to provide for an adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches one-half (1/2) of the barrier height.

I. Filter socks that are damaged and become unsuitable for the intended purpose, as determined by the Engineer, shall be removed for the site of work, and disposed of off-site according to local governing agency regulations.

3.7 INLET FILTRATION SACKS

A. Install filtration sacks per manufacture's recommendation, only if they are more restrictive than those listed below.

B. Installed new silt sacks at the locations shown on the plans for this project.

C. Silt sacks to be sized appropriate to the specific inlet casting being protected.

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3.8 TRENCH DRAIN INLET PROTECTION

A. Until site is stabilized, contractor to maintain temporary protection within trench drain.

B. Filter fabric placed beneath the casting will not suffice for adequate protection.

C. Throughout construction, securely situate a filter wrapped underdrain pipe within the base of the trench drain.

D. Connect underdrain pipe to outlet end of trench drain with watertight fitting.

E. Upon sediment build up reaching one-half (1/2) the height of the underdrain, contractor to remove sediment of trench drain base and re-install underdrain filter.

3.9 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 5000 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

D. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.
3. Maintain fenced area free of weeds and trash.

E. Do not excavate within tree protection zones, unless otherwise indicated.

F. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.

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2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
4. Backfill with soil as soon as possible.

G. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Landscape Architect.

3.10 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
4. Use only hand methods for grubbing within tree protection zone.
5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.11 TOPSOIL STRIPPING

A. Handle contaminated onsite soils in accordance with with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

B. Remove sod and grass before stripping topsoil.

C. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

D. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Do not stockpile topsoil within tree protection zones.
2. Dispose of excess topsoil as specified for waste material disposal.
3. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

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3.12 UTILITY SERVICES

A. Existing Services to Remain: Maintain services indicated to remain and protect them against damage.

B. Existing Services to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Contractor shall coordinate the shut off of indicated services with the Owner.
2. Arrange to shut off utilities with utility companies.
3. If services are required to be removed, relocated, or abandoned, provide temporary services that bypass area of selective demolition and that maintain continuity of services to other parts of building.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

3.13 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering, and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Coordinate with Architect and Owner on handling of salvaged items.

D. Removed and Reinstalled Items:

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1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage during storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.14 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.15 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in accordance with agencies having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

3.16 TEMPORARY SEEDING

A. Place temporary seed only for erosion control or temporary stabilization. Do not temporarily seed slopes 1:3 or steeper after topsoil placement; permanently seed these slopes.

B. Secure the Landscape Architect's approval for all temporary seeding.

C. Temporary seed shall be placed on all spoil piles, and stockpiles that will be left on-site for more than 2 months.

D. Slopes and ditches within 150 feet of a lake, stream, or wetland shall be seeded within 24 hours after final grading or final earth change.

E. Temporary seeding shall be placed on disturbed areas, regardless of the status of the work, if no work has been performed on the area in the last 3 days.

3.17 SITE STABILIZATION

A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.

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B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.

C. Stockpile and waste pile heights shall not exceed 16-feet. Slope stockpile sides at 2:1 or flatter. Stabilize stockpiles with temporary seeding, mulch, or plastic sheeting.

D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 20 days.

E. During non-germinating periods, apply mulch at recommended rates.

F. Stabilize disturbed areas which are not at finished grade and which will be disturbed within one year.

G. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with permanent seeding specifications.

H. Stabilize diversion channels, sediment traps, and stockpiles immediately.

3.18 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.19 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

3.20 FIELD QUALITY CONTROL

A. During Construction: Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.

B. After Construction and until site is stabilized: At least once a week and after any precipitation event, the Contractor shall inspect and maintain all soil erosion control measures.

C. The minimum soil erosion and sedimentation control measures are shown on the Drawings. Contractor shall install additional measures as necessary to maintain site stabilization.

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3.21 CLEANING

A. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove, and dispose of sediment.

B. During the period between initial groundbreaking or site preparation and the stabilization of the soil surface resulting from final grading, all soil erosion and sedimentation control measures shall be maintained by the Contractor or Owner.

C. Do not damage structure or device during cleaning operations.

D. Do not permit sediment to erode into construction or site areas or natural waterways.

E. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 31 1000

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SECTION 31 2000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Geotechnical Evaluation Report completed by Soils & Structures, Inc. for the Project dated May 5, 2021, recommendations apply.

C. Geotechnical Evaluation Report completed by Soils & Structures, Inc. for the Pavement Evaluation Investigation for the Cadillac High School Running Track portion of the Project dated November 7, 2019, recommendations apply.

D. Site work shall comply with Environmental Management Construction Plan completed by TriTerra dated November 19, 2021.

E. City of Cadillac Standards and Specifications.

F. MDOT Standard Specifications for Construction, most current version.

G. Standards and Requirements of any agencies having jurisdiction.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns and grasses, and exterior plants.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Subbase and base course for asphalt paving.
6. Subsurface drainage backfills for walls and trenches.
7. Excavating and backfilling for utility trenches.
8. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:

1. Division 01 Section "Photographic Documentation" for recording pre-excavation and earthwork progress.
2. Division 01 Section "Temporary Tree and Plant Protection" for protecting and trimming trees to remain.
3. Division 03 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
4. Divisions 21, 22, 23, 26, 27, and 28 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

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5. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
6. Division 32 Section "Turf and Grasses" for finish grading, including preparing and placing topsoil and planting soil for lawns.
7. Division 32 Section "Plants" for planting bed establishment and tree and shrub pit excavation and planting.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength 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: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

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

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work upon written request by Contractor prior to excavation.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by an independent geotechnical testing agency, according to ASTM D 1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

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

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

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

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1.4 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.
2. Geotextile.
3. Controlled low-strength material, including design mixture.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.

C. Pre-excavation Photographs: 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.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

B. Codes and standards. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.

1.6 FIELD CONDITIONS

A. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify Engineer not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Engineer's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

C. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

D. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

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E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

H. Internal courtyard improvements shall be constructed per landscape requirements.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture as indicated below:

1. Beneath buried piping, conduit, and exterior concrete walks. Six inches of clean, well-graded, thoroughly compacted sand which meets MDOT Class II Granular Material Specifications or ASTM D-2487 Soil Classification Groups SW or SP.
2. Beneath bituminous pavement and concrete curbs and gutters. Eight inches of stabilized processed road gravel meeting MDOT 22A Dense Graded Aggregate Specifications or equivalent unless specifically detailed within the plans.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve and meeting MDOT 22A Dense Graded Aggregate Specifications.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve and meeting MDOT Class 2 Sand Specifications.

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2.2 GEOTEXTILES

A. Geotextiles shall be as specified on the Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.

D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

A. Reference Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021 for any dewatering requirements associated with the contaminated soils onsite.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. If necessary, providing pumps to efficiently remove ground water from excavation area. Contractor to provide dewater plan illustrating discharge points to Engineer prior to commencing. Dewatering operations are considered incidental to the excavations costs unless otherwise noted. If necessary, discharge pumped water through filter bags to remove sediment from discharge. Appropriately dispose of filter bags.

D. All dewatering activities shall be completed in accordance with the City of Cadillac, Wexford County, and EGLE standards and requirements.

E. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

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3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches outside of concrete forms other than at footings.
b. 12 inches outside of concrete forms at footings.
c. 6 inches outside of minimum required dimensions of concrete cast against grade.
d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs on grade.
f. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide; or as required by utility owner.

B. Classified Excavation: Excavate per the recommendations outlined in the Geotechnical Report for the Project.

C. Excavation of Contaminated Soils: Excavate and handle soils in accordance with Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches in accordance with the applicable sections for each type of utility as set forth in this document.

3.7 SUBGRADE INSPECTION

A. Notify Geotechnical Engineer as necessary to inspect excavations prior to backfill and compaction.

B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll of subgrade in accordance with the recommendations outlined in the Geotechnical Report for the Project.
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

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D. Refer to Geotechnical reports issued for additional requirements of proof roll operation.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

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

3.9 BACKFILL

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

1. Construction below finish grade including, where applicable, sub-drainage, damp-proofing, waterproofing, and perimeter insulation.
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.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

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

3.10 UTILITY TRENCH BACKFILL

A. Excavate trenches in accordance with the applicable sections for each type of utility as set forth in this document.

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

C. Place and compact bedding course 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.

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact initial backfills under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

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

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3.11 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use engineered fill.

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

3.12 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 9 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight in accordance with Modified Proctor Test, ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.

3.14 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

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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.

C. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

3.15 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

3.16 FIELD QUALITY CONTROL

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

B. Materials Testing shall be completed in accordance with municipalities and agencies having jurisdiction.

C. 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.

D. 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 at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
2. Under Lawn and Unpaved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 5000-sq. ft. or less of unpaved area.

E. 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. Retesting compaction after areas after initial failed test may be charged to the Contractor.

3.17 PROTECTION

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

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

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C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 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 Owner's property.

END OF SECTION 31 2000

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SECTION 31 2319 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Geotechnical Evaluation Report completed by Soils & Structures, Inc. for the Project dated May 5, 2021, recommendations apply.

C. Geotechnical Evaluation Report completed by Soils & Structures, Inc. for the Pavement Evaluation Investigation for the Cadillac High School Running Track portion of the Project dated November 7, 2019, recommendations apply.

D. Site work and dewatering shall comply with Environmental Management Construction Plan completed by TriTerra dated November 19, 2021.

E. City of Cadillac Soil Erosion and Sedimentation Control Ordinance and Permitting Requirements.

F. Standard and Requirements of the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

G. Standards and requirements of agencies having jurisdiction.

1.2 SUMMARY

A. Section includes construction dewatering.

B. Related Sections:

1. Section 31 2000 "Earth Moving" for excavating, backfilling, site grading, and for site utilities.
2. Section 31 5000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
3. Section 33 4600 "Subdrainage" for permanent foundation wall, underfloor, and footing drainage.

1.3 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

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1.4 ACTION SUBMITTALS

A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, discharge lines, piezometers, and flow-measuring devices; and means of discharge, control of sediment, and disposal of water.

B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with EGLE regulations and local agencies having jurisdiction regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.6 PROJECT CONDITIONS

A. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

B. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Monitor dewatering systems continuously.

E. Promptly repair damages to adjacent facilities caused by dewatering.

F. Protect and maintain temporary erosion and sedimentation controls, which are specified in Section 31 1000 "Site Clearing" during dewatering operations.

G. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of 24 inches below surface of excavation.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

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1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

END OF SECTION 31 2319

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SECTION 33 4100 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Site work and stormwater management construction shall comply with Environmental Management Construction Plan completed by TriTerra dated November 19, 2021.

C. The City of Cadillac Storm Water Standards and Requirements.

D. Standards and requirements of agencies having jurisdiction.

1.2 SUMMARY

A. Section Includes:

1. Storm sewer.
2. Cleanouts.
3. Manholes.
4. Channel drainage systems.
5. Catch basins.
6. Pipe outlets.

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. PE: Polyethylene plastic.

C. PVC: Polyvinyl chloride plastic.

D. RCP: Reinforced concrete pipe.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Storm sewer: Provide perforated pipe and solid wall pipe information.
2. Manholes: Include plans, elevations, sections, details, frames, and covers.
3. Catch basins: Include plans, elevations, sections, details, frames, covers, and grates.

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4. Channel drainage systems: Include plans, sections, details, grates, drop-out, grates, and other system components.

C. Field quality-control reports.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

D. Handle catch basins according to manufacturer's written rigging instructions.

E. Handle channel drain systems in accordance with manufacturer’s requirements.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Engineer and any agencies having jurisdiction no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Engineer’s and Owner’s written permission.

B. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

1.7 COORDINATION

A. Coordinate with Engineer for onsite construction observation of the proposed storm water management system.

B. Coordinate with Materials Testing firm to complete compaction testing as required per the City of Cadillac standards and requirements.

C. Work in rights-of-way shall be completed in accordance with the City of Cadillac Standards and Requirements.

PART 2 - PRODUCTS

2.1 ABS PIPE AND FITTINGS

A. ABS Sewer Pipe and Fittings: ASTM D 2751, with bell-and-spigot ends for gasketed joints.

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1. NPS 8 to NPS 12: SDR 35.

B. Gaskets: ASTM F 477, elastomeric seals.

2.2 HDPE PIPE

A. Corrugated HDPE Pipe with smooth waterway for coupling joints.

1. Sewer Pipe and Fittings: ASTM F 2648, with bell-and-spigot ends for gasketed joints.
2. Pipe Sizes: 12-inch to 60-inch, as specified.
3. Gaskets: ASTM F 477, elastomeric seals.
4. Fittings: ASTM F 2306, bell and spigot connections shall utilize a spun-on or welded bell and a valley or saddle gasket meeting the soil-tight joint performance requirements of ASTM F 2306.
5. Perforations: Provide perforations for piping as specified on Drawings.

B. Corrugated HDPE Pipe, single wall with perforations to allow storm water to percolate into the soil.

1. Sewer Pipe and Fittings: AASHTO M294, with bell-and-spigot ends for gasketed joints.
2. Pipe Size: 4-inch for subdrainage only.
3. Gaskets: ASTM D1056 Grade 2A2.
4. Fittings: AASHTO M294.

2.3 PE PIPE AND FITTINGS

A. Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth waterway for coupling joints.

1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
2. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.

B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints.

1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
2. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

2.4 PVC PIPE AND FITTINGS

A. PVC Type PSM Sewer Piping:

1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

B. PVC Water-Service Piping:

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1. Pipe: ASTM D 1785, Schedule 40 PVC, with plain ends for solvent-cemented joints.
2. Fittings: ASTM D 2466, Schedule 40 PVC, socket type.

2.5 CONCRETE PIPE AND FITTINGS

A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.

1. Bell-and-spigot ends and gasketed joints with ASTM C 443, rubber gaskets.
2. Class III.
3. Class IV.
4. Class V.

2.6 NONPRESSURE TRANSITION COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Concrete Pipes: ASTM C 443, rubber.
2. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
3. For Dissimilar Pipes: ASTM D 5926, PVC, or other material compatible with pipe materials being joined.

2.7 CLEANOUTS

A. General: Cleanouts shall be provided as detailed on Drawings.

B. Cast-Iron Cleanouts:

1. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
2. Top-Loading Classification(s): Heavy Duty.
3. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

C. Plastic Cleanouts:

1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.8 MINI TRENCH DRAIN SYSTEM

A. Mini-Trench Drain System: Provide mini-trench drain system along snowmelt system in concrete pavement as detailed in Drawings.

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B. Mini-Trench Drain Product:

1. Zurn Z886-HPD, ACO Drain KS100, or approved equal.
2. Trench drain encased in concrete, per detail on Drawings, with the following requirements:
   a. Meets HS-20 Loading Requirements
   b. Frost Proof.
   c. Salt Proof.
   d. Nominal Clear Opening: 4-inches minimum.
   e. Neutral Channel, or per manufacturer's recommendations.
   f. Stainless Steel Edge Rail.
   g. Includes Grate Lock Down Integral to Frame.
   h. End Cap: Per manufacturer's requirements.
   i. Knockout: Per manufacturer's requirements.
   j. Access Ports: Per manufacturer's requirements.
   k. Accessories: Per manufacturer's requirements.

C. Grates: Heel Proof Ductile Iron ADA Compliant Grate, HS-20 Traffic Loading Requirements.

2.9 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: As indicated on Drawings, 48 inches minimum unless otherwise noted.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen, or butyl rubber.
8. Steps: Individual FRP steps or FRP ladder, wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at intervals shown on plans.
9. Adjusting Rings: Interlocking HDPE rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.

B. Manhole Frames and Covers:

1. Provide manhole frames and covers as specified on Drawings.

2.10 CATCH BASINS AND LEACH BASINS

A. Standard Precast Concrete Catch Basins and Leach Basins:

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1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: Provide diameter as specified on Drawings.
3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
4. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
5. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
6. Joint Sealant: ASTM C 990, bitumen, or butyl rubber.
7. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
8. Steps: Individual FRP steps or FRP ladder, wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at intervals shown on plans.
9. Perforations: Provide perforations for leach basins as indicated on Drawings.

B. Catch Basin and Leach Basin Frames and Grates:

1. Provide manhole frames and covers as specified on Drawings.

2.11 PIPE OUTLETS

A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.

B. Flared End Sections:

1. Standard Precast Concrete; Class III, IV, V.
2. Description: ASTM C76, precast, reinforced concrete, with provision for sealant joints.
3. Size: As specified on drawings.
4. Rubber Gasket Joint: ASTM C443.
5. Steel Grates: Per MDOT Standard Detail R-92-C.

C. Riprap Basins: Broken, irregularly sized, and shaped, graded stone according to NSSGA's "Quarried Stone for Erosion and Sediment Control."

1. Average Size: NSSGA No. R-5, screen opening 5 inches.

D. Filter Stone: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. FS-2, No. 4 screen opening, average-size graded stone.

E. Energy Dissipaters: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. A-1, 3-ton average weight armor stone, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 31 2000 "Earth Moving."

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3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Engineer shall be contacted for review and approval if layout is deviated from plans.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream.

C. Install manholes for changes in direction unless fittings are indicated.

D. Install gravity-flow, non-pressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at the slope indicated on the plans.
2. Install piping at the elevations specified on the plans.
3. Install type of pipe specified on the plans for each run.
4. Install ABS sewer piping according to ASTM D 2321 and ASTM F 1668.
5. Install PE corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
6. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
7. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

E. Install perforated pipe and underdrain pipe section per detail shown on Drawings.

3.3 PIPE JOINT CONSTRUCTION

A. Basic pipe joint construction is specified in Division 33 Section "Common Work Results for Utilities." Where specific joint construction is not indicated, follow piping manufacturer's written instructions.

B. Join gravity-flow, non-pressure drainage piping according to the following:

1. Join BS sewer piping according to ASTM D 2321 and ASTM D 2751 for elastomeric-seal joints.
2. Join corrugated PE piping according to CPPA 100 and the following:
   a. Use silttight couplings for Type 2, silttight joints.
3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.
4. Join PVC profile gravity sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.
5. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.

3.4 CLEANOUT INSTALLATION

A. General: Install cleanouts at locations specified on Drawings.

B. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

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1. Use Medium-Duty, top-loading classification cleanouts in paved or unpaved foot-traffic areas.
2. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.

3.5 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with sealants according to ASTM C 891.

C. Set tops of frames and covers flush with finished surface.

3.6 CATCH BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

3.7 LEACH BASIN INSTALLATION

A. Construct leach basins to sizes and shapes indicated.

B. Install per precast concrete sections in accordance to ASTM C891 and per detail shown on Drawings.

C. Set frames and grates to elevations indicated on Drawings.

3.8 STORMWATER OUTLET INSTALLATION

A. Construct riprap of broken stone, as indicated.

B. Install outlets that spill onto grade, anchored with concrete, where indicated.

C. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

D. Construct energy dissipaters at outlets, as indicated.

3.9 MINI TRENCH DRAINAGE SYSTEM INSTALLATION

A. Install trench drain system in locations indicated on Drawings.

B. Install trench drain system per manufacturer’s standards and requirements.

C. Install with top surfaces of components, except piping, flush with finished surface.

D. Assemble channel sections to form slope down toward drain outlets.

E. Fasten grates to channel sections per manufacturer’s requirements.

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3.10 FIELD QUALITY CONTROL

A. Conduct field quality control testing as required per City of Cadillac and any other agencies having jurisdiction.

B. Contact Engineer at least 72 hours prior to the need for construction observation of the installation of the storm water management system.

C. Coordinate with Materials Testing firm to complete testing as required by the City of Cadillac standards and requirements.

D. Contaminated Soils: There are contaminated soils onsite. Contractor shall handle contaminated soils in accordance with the Environmental Management Construction Plan report completed by TriTerra dated November 19, 2021.

E. Contractor shall provide as-built mark-up of installed storm water management system with measurements and any changes documented. This mark-up shall be provided to the Engineer for preparation of the storm sewer as-built drawings.

F. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:
   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Crushed, broken, cracked, or otherwise damaged piping.
3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

G. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction.

H. Leaks and loss in test pressure constitute defects that must be repaired.

I. Replace leaking piping using new materials and repeat testing until leakage is within allowances specified.

J. Storm sewer sections showing signs of settlement or poor alignment as determined by the Engineer, must be taken up and relaid. The cost of this corrective action is the responsibility of the Contractor. For more information, see installation tolerances below.

K. Storm Sewer: The installation tolerances for storm sewer shall be as noted below:

1. Storm sewer shall not be backsloped.

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2. Storm sewer inverts shall be installed to a vertical installation tolerance within 0.1-feet +/- to the invert elevations stated on the Drawings, however, in no case shall the storm sewer be placed with a backslope.

L. Storm Structures: The installation tolerances for storm sewer structures shall be as noted below:

1. Storm structure rim elevations shall be installed to an installation tolerance within 0.1-feet +/- to the rim elevations stated on the Drawings, however, the concept of the drainage on the Drawings shall still apply.
2. The out letting storm sewer invert shall not be placed higher than the inletting storm sewer invert.

M. If it is determined that the installation tolerances mentioned above are not met, the Contractor will be required to remove the storm sewer and/or storm structure and relay it in accordance with the project Drawings at no additional cost to the Owner.

3.11 CLEANING

A. Clean interior of piping of dirt and superfluous materials.

B. Remove sediment from all manholes, catch basins, leach basins, and storm sewer system at final completion of Construction.

END OF SECTION 33 4100

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PACKAGE 2 - HIGH SCHOOL ADDITION & RENOVATIONS

CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan
CONSTRUCTION DOCUMENTS

DESIGN TEAM

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Architecture · Engineering · Interiors
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220 HOOVER BLVD.
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FOOD SERVICE CONSULTANT
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TECHNOLOGY CONSULTANT
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STADIUM DESIGN CONSULTANT
FORESITE design
3269 COOLIDGE HIGHWAY
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CONSTRUCTION MANAGER

SKILLMAN
8120 MOORSBRIDGE ROAD
SUITE 101
PORTAGE, MICHIGAN 49024
PHONE: 269.350.5757
www.skillman.com

CLIENT ADDRESS

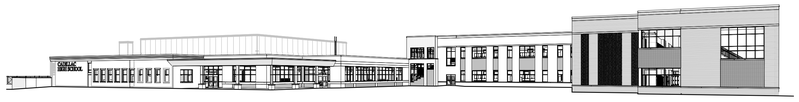
CADILLAC AREA PUBLIC SCHOOLS
421 S. MITCHELL STREET
CADILLAC, MI 49601

SITE ADDRESS

400 LINDEN ST.
CADILLAC, MI 49601

REFERENCED CODES

BUILDING:	2015 MICHIGAN BUILDING CODE AND 2012 NFPA 101 LIFE SAFETY CODE
ENERGY:	2015 MICHIGAN ENERGY CODE
PLUMBING:	2015 MICHIGAN PLUMBING CODE
MECHANICAL:	2015 MICHIGAN MECHANICAL CODE
FUEL GAS:	(IFGC) 2015 INTERNATIONAL FUEL GAS CODE
ELECTRICAL:	2017 NATIONAL ELECTRICAL CODE WITH MICHIGAN AMENDMENTS
BARRIER-FREE:	2015 MICHIGAN BUILDING CODE AND 2009 ICC & C A117.1
USE GROUP:	EDUCATION
CONSTRUCTION TYPE:	IIB
AUTOMATIC SPRINKLERS:	PARTIAL



PROJECT AREA

EXISTING BUILDING:	261,320 SQ. FT
AREA TO BE DEMOLISHED:	(89,880) SQ. FT
AREA TO BE RENOVATED:	123,702 SQ. FT
FIRST FLOOR ADDITION:	41,136 SQ. FT
SECOND FLOOR ADDITION:	27,966 SQ. FT
TOTAL FINISHED PROJECT:	241,198 SQ. FT

FIRE SUPPRESSION

NON-SPRINKLERED - BUILDING AREA 1 (SEE SHEET G 101.2):	42,098 SQ. FT
SPRINKLERED - BUILDING AREAS 2-5 (SEE SHEET G 101.2):	199,100 SQ. FT
TOTAL FINISHED PROJECT:	241,198 SQ. FT

ALTERNATES

ALTERNATE #1: EXISTING BUILDING RE-ROOFING (SEE SHEET A 103.2)
- AREA #1: 30,970 SQ. FT ±
- AREA #2: 9,446 SQ. FT ±
- AREA #3: 9,610 SQ. FT ±
- AREA #4: 11,756 SQ. FT ±
- AREA #5: 16,482 SQ. FT ±
- AREA #6: 10,682 SQ. FT ± A1

ALTERNATE #2: SNOWMELT AT BUILDING ENTRANCES

ALTERNATE #3: WATERMAIN REMOVAL AND REPLACEMENT

ALTERNATE #4: POST-TENSIONED CONCRETE TENNIS COURTS

ALTERNATE #5: CORRIDOR (COR6) CEILING REPLACEMENT

ALTERNATE #6: PAINTING AT COMPETITION GYM

ALTERNATE #7: TURF FIELD AT FOOTBALL STADIUM

ALTERNATE #8: PERFORMANCE SHOCK PAD

ALTERNATE #9: WATER SERVICE EXTENSION TO TENNIS COURTS A1

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ADDENDUM 1 NOVEMBER 29, 2021
ISSUED FOR DATE

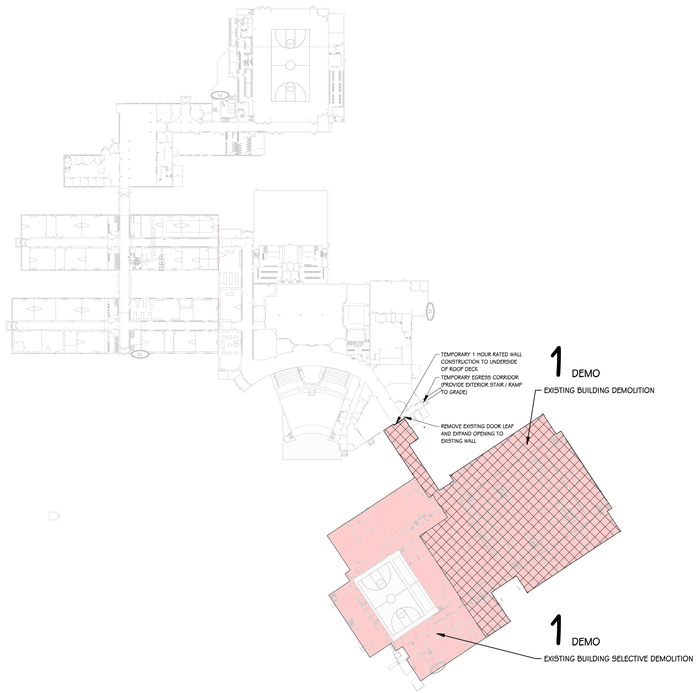
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

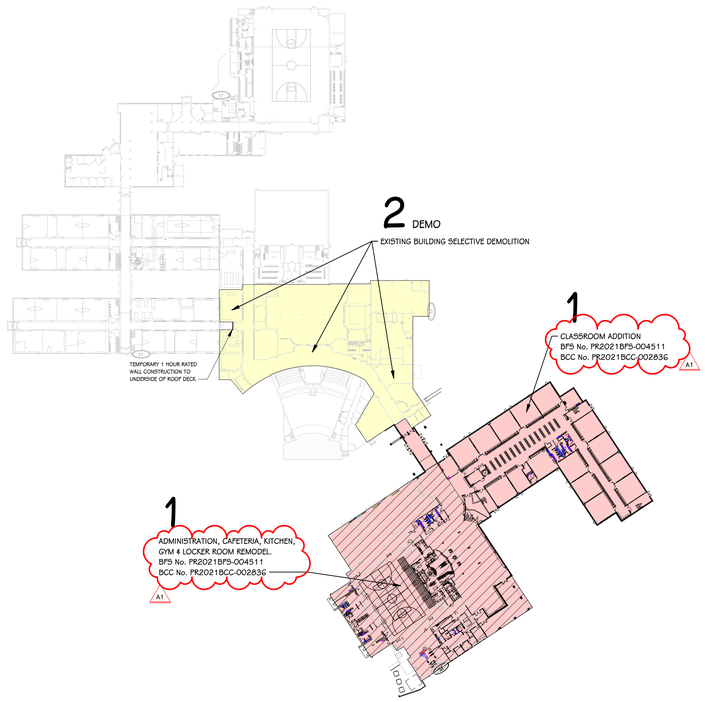
SHEET TITLE
COVER SHEET - VOLUME 1

DATE
NOVEMBER 3, 2021

SHEET NUMBER
G 001.2
17-175.70



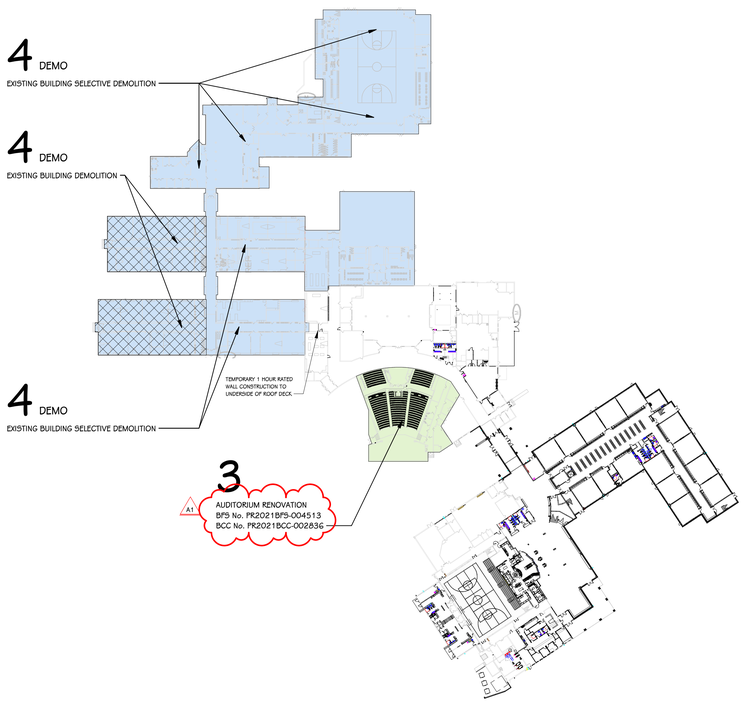
2 / G100.2B — FIRST FLOOR CONSTRUCTION PHASING PLAN - PHASE 1 DEMOLITION
1" = 80'-0"



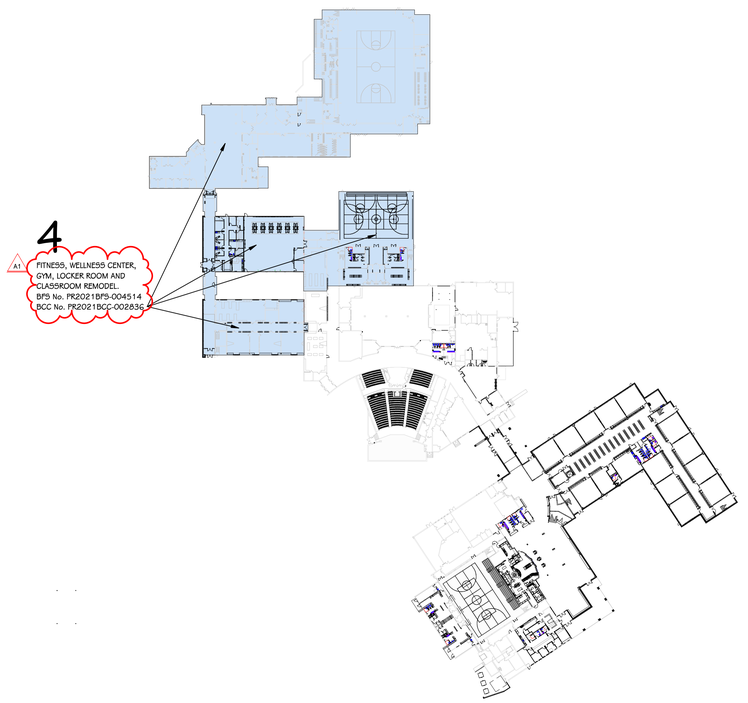
3 / G100.2B — FIRST FLOOR CONSTRUCTION PHASING PLAN - PHASE 1 & PHASE 2 DEMOLITION
1" = 80'-0"



4 / G100.2B — FIRST FLOOR CONSTRUCTION PHASING PLAN - PHASE 2 & PHASE 3 DEMOLITION
1" = 80'-0"



8 / G100.2B — FIRST FLOOR CONSTRUCTION PHASING PLAN - PHASE 3 & PHASE 4 DEMOLITION
1" = 80'-0"



5 / G100.2B — FIRST FLOOR CONSTRUCTION PHASING PLAN - PHASE 4
1" = 80'-0"

NOTE: REFER TO CONSTRUCTION MANAGER, SKILLMAN CORPORATION, FOR FINAL CONSTRUCTION PHASING AND CONSTRUCTION SCHEDULE

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ADDENDUM 1 — NOVEMBER 29, 2021
ISSUED FOR — DATE

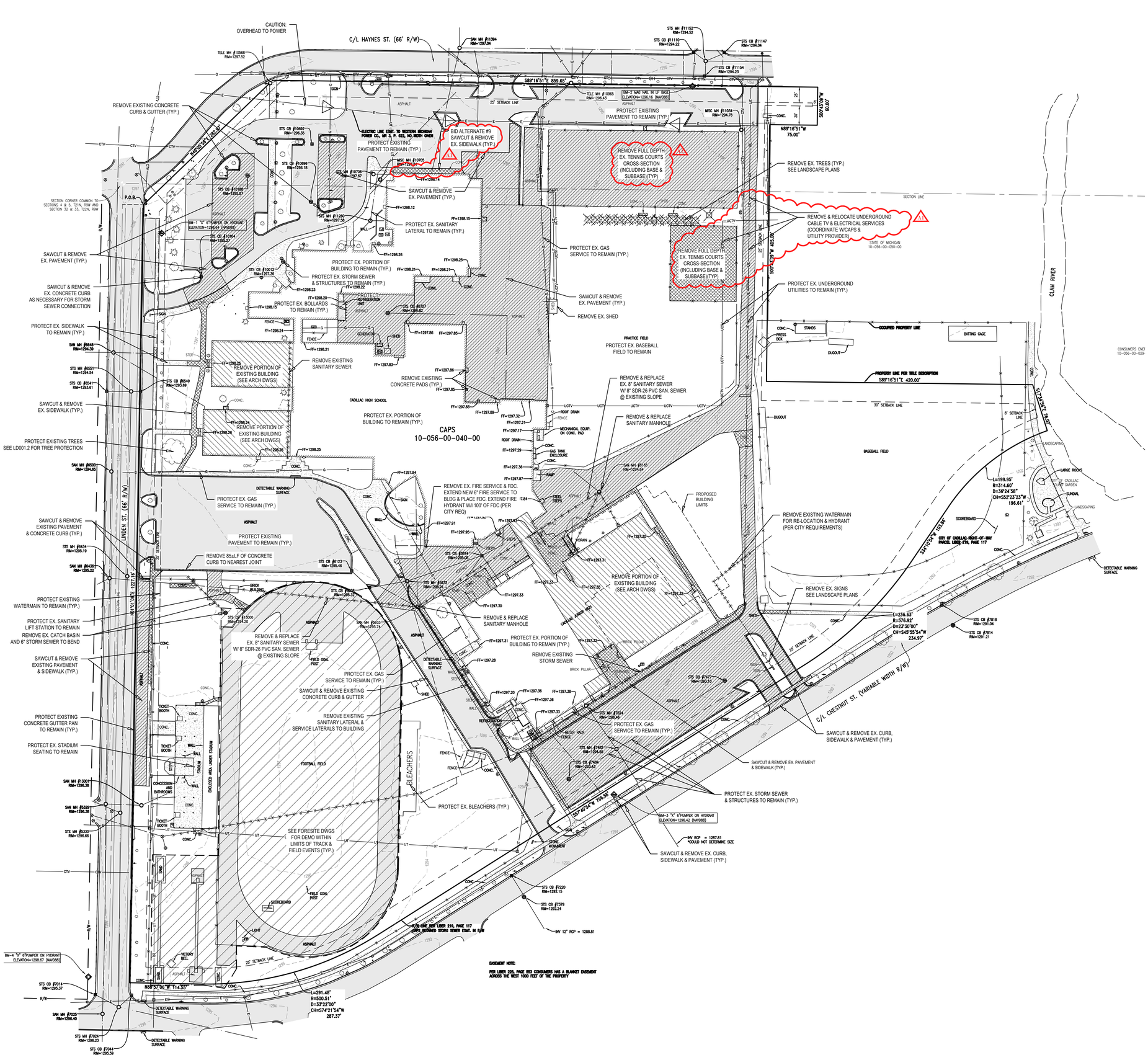
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
BUILDING CONSTRUCTION PHASING PLANS

DATE
NOVEMBER 3, 2021

SHEET NUMBER
G100.2B
17-175.70



CIVIL DEMOLITION NOTES:

1. THE BOUNDARY AND TOPOGRAPHIC SURVEY WAS COMPLETED BY ANOTHER FIRM AND PROVIDED TO HEI BY THE CLIENT. HEI IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY INFORMATION OR ANY DESIGN DISCREPANCIES RESULTING FROM THE PROVIDED SURVEY INFORMATION.
2. SEE BOUNDARY AND TOPOGRAPHIC SURVEY SHEET FOR PROPERTY, EASEMENT, BENCHMARK, ETC. INFORMATION.
3. LOCATION OF UNDERGROUND UTILITIES HAVE BEEN SHOWN BASED ON SURFACE EVIDENCE AND RECORD INFORMATION AVAILABLE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
4. DURING CONSTRUCTION, CONTRACTOR SHALL PROTECT ALL EXISTING AND NEW CONSTRUCTION FROM DAMAGE. SHOULD ANY DAMAGE OCCUR, CONTRACTOR SHALL MAKE ALL NECESSARY REPAIRS AT NO COST TO THE OWNER. THE PAVED ROADWAY SHALL BE SWEPT CLEAN AS NEEDED, BUT AT LEAST ONCE A WEEK.
5. CONTRACTOR SHALL PROVIDE BARRIERS, AS NECESSARY, TO PREVENT PEDESTRIAN AND VEHICULAR TRAFFIC FROM ENTERING THE CONSTRUCTION SITE.
6. CALL MISS DIG AT LEAST THREE (3) WORKING DAYS PRIOR TO STARTING ANY EXCAVATION.
7. REMOVAL ITEMS ARE SHOWN BASED ON BEST AVAILABLE INFORMATION AND ARE SHOWN SCHEMATICALLY. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO VERIFY THE EXTENT OF WORK REQUIRED.
8. REMOVE ALL STRUCTURES, CONCRETE CURB, CONCRETE PAVING, ASPHALT PAVING, TREES, STUMPS, UTILITIES, AND OTHER EXISTING SITE FEATURES WITHIN THE LIMITS OF DEMOLITION. ALL DEMOLITION MATERIALS SHALL BE REMOVED FROM THE SITE UNLESS OTHERWISE NOTED AND DISPOSED OF IN A MANNER ACCEPTABLE TO THE LOCAL AUTHORITY HAVING JURISDICTION.
9. ALL UTILITY LINES SHOWN "X" OUT SHALL BE PHYSICALLY REMOVED ALONG WITH STRUCTURES AND APPURTENANCES. CONTRACTOR SHALL CONFIRM UTILITY LINES REMOVED WILL NOT IMPACT UTILITIES TO REMAIN.
10. ALL REMOVALS OF PAVEMENT, CONCRETE, CURB AND GUTTER, ETC. SHALL BE PERFORMED TO THE NEXT JOINT BEYOND THE LIMITS OF REMOVAL. ALL REMOVALS SHALL BE PERFORMED BY SAWCUTTING.
11. PROTECT ALL TREES AND SHRUBS NOT SCHEDULED FOR REMOVAL. DO NOT OPERATE EQUIPMENT, STORE, STOCKPILE, OR PARK WITHIN DRIP LINE. HOLD NECESSARY DISTURBANCE TO A MINIMUM.
12. ALL TREE STUMPS SHALL BE REMOVED TO BELOW GRADE BY EITHER GRINDING OR COMPLETE REMOVAL IN ALL CASES NO WOODCHIPS AND/OR STUMPS SHALL BE LEFT IN PLACE.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL UTILITIES REMOVALS WITH PROPERTY OWNER AND UTILITY PROVIDER.
14. ALL WORK IN ROAD RIGHTS OF WAY SHALL BE COMPLETED IN ACCORDANCE WITH MDOT, LOCAL AGENCY AND CONSUMERS ENERGY STANDARDS.
15. THERE ARE EXISTING CONTAMINATED SOILS ONSITE. CONTRACTOR SHALL REFER TO ENVIRONMENTAL CONSTRUCTION MANAGEMENT PLAN COMPLETED BY TRITERRA DATED NOVEMBER 10,2021.
16. SEE OTHER SHEETS IN PLAN SET FOR MORE INFORMATION.

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ADDENDUM 1	NOVEMBER 29,2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

Project Manager	REBECCA K. PAGE, P.E.
Drawn by	STEVE A. MORRIS
HEI Project Number	21-01-064

CADILLAC PUBLIC SCHOOL
HIGH SCHOOL
400 LINDEN STREET
CADILLAC, MICHIGAN 49601
PT. OF THE NW 1/4 , SECT 4, T21N, R9W
CITY OF CADILLAC , WEXFORD CO., MI.

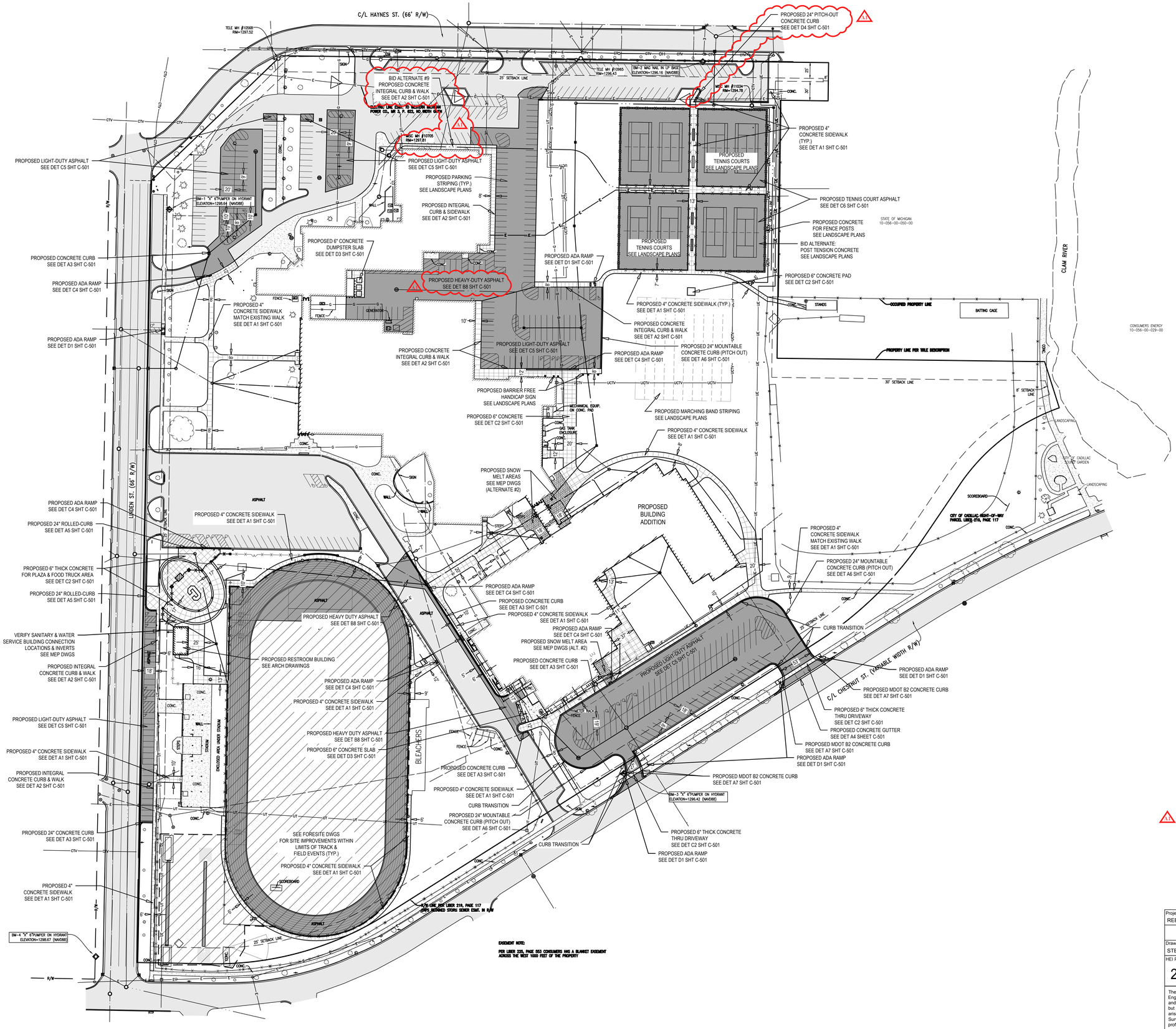
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SHEET TITLE
CIVIL DEMOLITION PLAN

DATE
NOVEMBER 03, 2021

SHEET NUMBER
CD 101.2
17-175.70



LAYOUT & UTILITY NOTES:

1. THE BOUNDARY AND TOPOGRAPHIC SURVEY WAS COMPLETED BY ANOTHER FIRM AND PROVIDED TO HEI BY THE CLIENT. HEI IS NOT RESPONSIBLE FOR THE ACCURACY OF THE SURVEY INFORMATION OR ANY DESIGN DISCREPANCIES RESULTING FROM THE PROVIDED SURVEY INFORMATION.
2. SITE DESIGN WAS DEVELOPED IN ACCORDANCE WITH THE INFORMATION CONTAINED IN THE GEOTECHNICAL REPORT AND SOIL BORINGS COMPLETED FOR THE PROJECT. CONTRACTOR SHALL ACQUIRE A COPY OF THE GEOTECHNICAL REPORT AND SOIL BORING INFORMATION. SOIL CONDITIONS MAY VARY FROM THE GEOTECHNICAL INFORMATION, WHICH MAY AFFECT THE SITE DESIGN, EARTHWORK QUANTITIES, USABLE SOILS, AND SOIL EROSION AND SEDIMENTATION CONTROL PRACTICES. CONTRACTOR SHALL NOTIFY DESIGN ENGINEER AND GEOTECHNICAL ENGINEER IF SITE CONDITIONS VARY FROM SOILS INFORMATION CONTAINED IN THE GEOTECHNICAL INFORMATION.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT ALL NECESSARY PERMITS AND APPROVALS HAVE BEEN ACQUIRED PRIOR TO CONSTRUCTION.
4. CALL MISS DIG AT LEAST THREE (3) WORKING DAYS PRIOR TO STARTING ANY EXCAVATION.
5. CONTRACTOR SHALL CONTACT ENGINEER IF ANY DISCREPANCIES ARE DETERMINED BETWEEN SITE LAYOUT DIMENSIONS AND ACTUAL SITE CONDITIONS.
6. COORDINATE ALL UTILITY CONSTRUCTION WITH UTILITY PROVIDER, AS REQUIRED.
7. CONTRACTOR SHALL VERIFY THAT THERE ARE NO UTILITY CONFLICTS PRIOR TO CONSTRUCTION.
8. ALL SANITARY SEWER WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE CITY OF CADILLAC STANDARDS & SPECIFICATIONS.
9. ALL WATERMAIN, WATER SERVICES, AND FIRE PROTECTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT EDITION OF THE CITY OF CADILLAC STANDARDS & SPECIFICATIONS.
10. ALL WORK WITHIN THE PUBLIC ROAD RIGHT-OF-WAY WILL REQUIRE A PERMIT AND OR APPROVAL FROM THE CITY AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF THEIR STANDARDS & SPECIFICATIONS.
11. COORDINATE ALL SIGNAGE REMOVAL AND RELOCATION WITHIN THE RIGHT-OF-WAY WITH THE CITY OF CADILLAC.
12. SITE CONTRACTOR RESPONSIBLE TO CONNECT EXISTING AND PROPOSED BUILDING TO WATER SERVICE AND SANITARY SEWER LATERAL. REFER TO PLUMBING PLANS FOR CONNECTION LOCATION AND DETAILS.
13. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS. BUILDING SHALL BE STAKED BASED ON FOUNDATION PLAN. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE ARE DISCREPANCIES BETWEEN THE BUILDING AND SITE DRAWINGS.
14. ONSITE LIGHTING SHALL DIRECTED DOWNWARD AND AWAY FROM ADJACENT PROPERTIES AS REQUIRED PER THE CITY OF CADILLAC ZONING ORDINANCE.
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16. CONTRACTOR SHALL BE RESPONSIBLE TO MEETING THE STANDARDS AND REQUIREMENTS OF THE LOCAL NOISE ORDINANCE FOR ALL CONSTRUCTION ACTIVITY.
17. THERE ARE EXISTING CONTAMINATED SOILS ONSITE. CONTRACTOR SHALL REFER TO ENVIRONMENTAL CONSTRUCTION MANAGEMENT PLAN COMPLETED BY TRITERRA DATED NOVEMBER 19, 2021
18. SEE OTHER SHEETS IN PLAN SET FOR MORE INFORMATION.

Project Manager	CADILLAC PUBLIC SCHOOL HIGH SCHOOL
REBECCA K. PAGE, P.E.	
Drawn by	400 LINDEN STREET
STEVE A. MORRIS	CADILLAC, MICHIGAN 49601
HEI Project Number	PT. OF THE NW 1/4 , SECT 4, T21N, R9W
21-01-064	CITY OF CADILLAC , WEXFORD CO., MI.

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ADDENDUM 1	NOVEMBER 29,2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

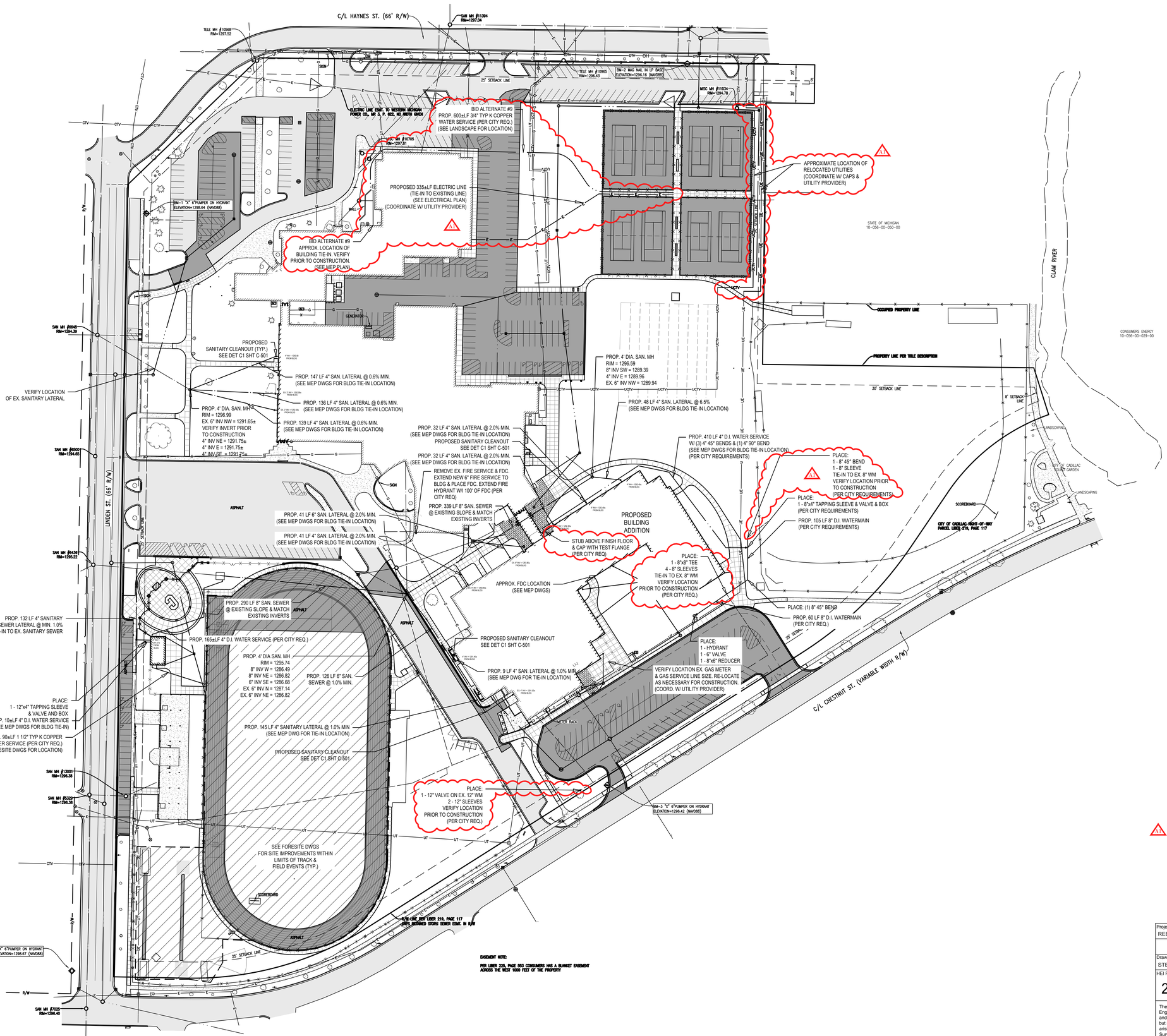
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
CIVIL SITE PLAN

DATE
NOVEMBER 03, 2021

SHEET NUMBER
C 101.2
17-175.70



N

0' 30' 60' 120'

SCALE 1" = 60'

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CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

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Project Manager	REBECCA K. PAGE, P.E.
Drawn by	STEVE A. MORRIS
HEI Project Number	21-01-064

CADILLAC PUBLIC SCHOOL HIGH SCHOOL

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CADILLAC, MICHIGAN 49601

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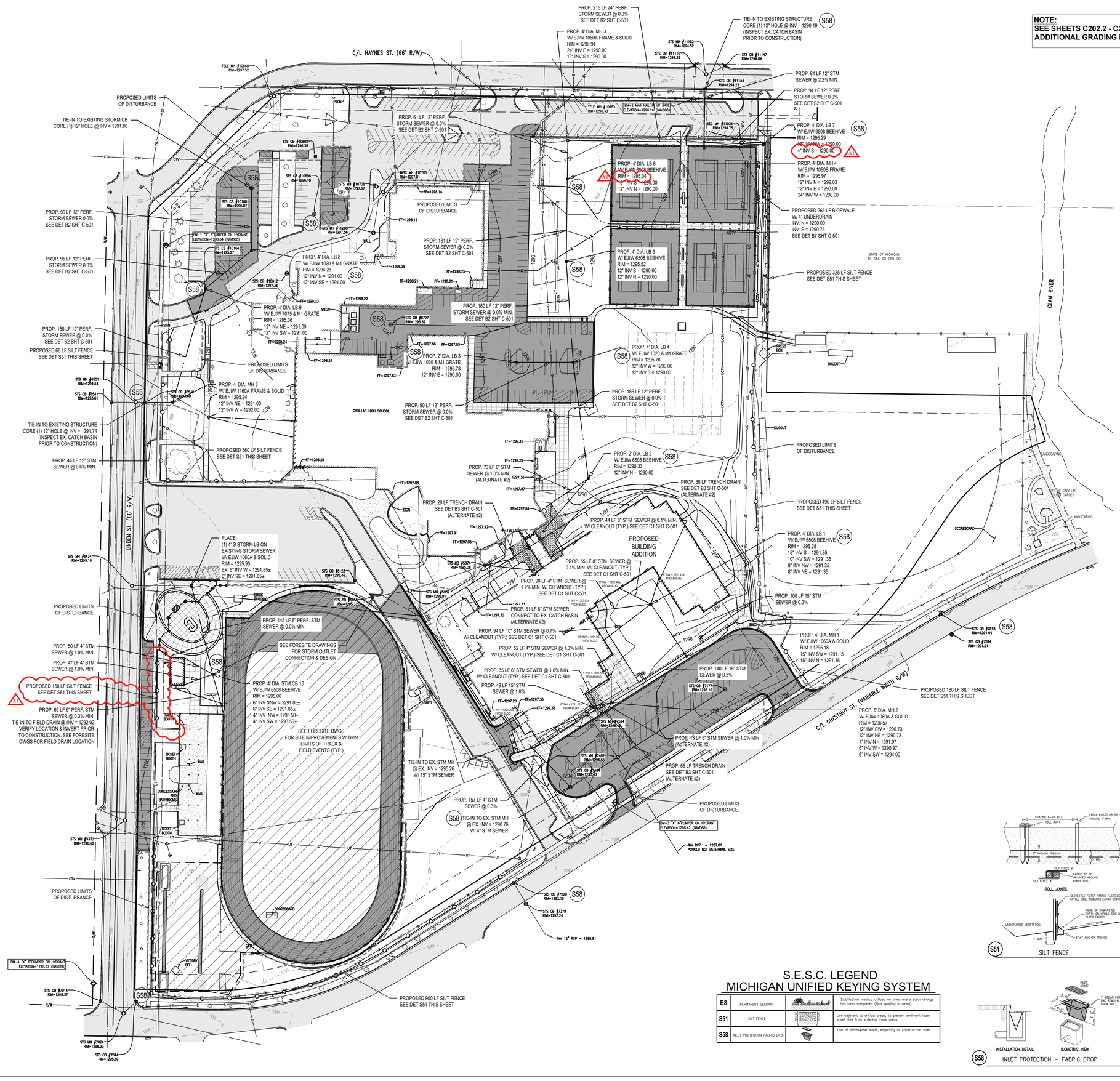
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SHEET TITLE
UTILITY SITE PLAN

DATE
NOVEMBER 03, 2021

SHEET NUMBER
C 102.2
17-175.70


C/L HAYNES ST. (66' R/W)
LINDEN ST. (66' R/W)
C/L CHESTNUT ST. (VARIABLE WIDTH R/W)
CLAM RIVER
CADILLAC HIGH SCHOOL
PROPOSED BUILDING ADDITION
PROPOSED LIMITS OF DISTURBANCE
TIE-IN TO EXISTING STRUCTURE CORE (1) 12" HOLE @ INV = 1290.19 (INSPECT EX. CATCH BASIN PRIOR TO CONSTRUCTION)
PROP. 216 LF 24" PERF. STORM SEWER @ 0.0% SEE DET B2 SHT C-501
PROP. 4' DIA. MH 3 W/ EJIW 1060A FRAME & SOLID RIM = 1296.94 24" INV E = 1290.00 12" INV S = 1290.00
PROP. 84 LF 12" STM SEWER @ 2.2% MIN.
PROP. 94 LF 12" PERF. STORM SEWER 0.0% SEE DET B2 SHT C-501
PROP. 4' DIA. LB 7 W/ EJIW 6508 BEEHIVE RIM = 1295.29 12" INV NW = 1290.00 4" INV S = 1290.00
PROP. 4' DIA. MH 4 W/ EJIW 1060B FRAME RIM = 1295.97 12" INV N = 1292.03 12" INV E = 1290.00 24" INV W = 1290.00
PROPOSED 255 LF BIOSWALE W/ 4" UNDERDRAIN INV. N = 1290.00 INV. S = 1290.75 SEE DET B7 SHT C-501
PROP. 4' DIA. LB 6 W/ EJIW 6508 BEEHIVE RIM = 1295.04 12" INV S = 1290.00 12" INV N = 1290.00
PROP. 4' DIA. LB 5 W/ EJIW 6508 BEEHIVE RIM = 1295.52 12" INV S = 1290.00 12" INV N = 1290.00
PROPOSED 325 LF SILT FENCE SEE DET SS1 THIS SHEET
PROP. 4' DIA. LB 4 W/ EJIW 1020 & M1 GRATE RIM = 1295.78 12" INV W = 1290.00 12" INV S = 1290.00
PROP. 186 LF 12" PERF. STORM SEWER @ 0.0% SEE DET B2 SHT C-501
PROP. 2' DIA. LB 3 W/ EJIW 1020 & M1 GRATE RIM = 1295.78 12" INV E = 1290.00
PROP. 90 LF 12" PERF. STORM SEWER @ 0.0% SEE DET B2 SHT C-501
PROP. 2' DIA. LB 2 W/ EJIW 6508 BEEHIVE RIM = 1295.33 12" INV N = 1290.00
PROP. 38 LF TRENCH DRAIN SEE DET B3 SHT C-501 (ALTERNATE #2)
PROPOSED 490 LF SILT FENCE SEE DET SS1 THIS SHEET
PROP. 4' DIA. LB 1 W/ EJIW 6508 BEEHIVE RIM = 1296.28 15" INV S = 1291.35 10" INV SW = 1291.35 8" INV NW = 1291.35 8" INV NE = 1291.35
PROP. 100 LF 15" STM SEWER @ 0.2%
PROP. 4' DIA. MH 1 W/ EJIW 1060A & SOLID RIM = 1295.18 15" INV SW = 1291.15 15" INV N = 1291.15
PROP. 5' DIA. MH 2 W/ EJIW 1060A & SOLID RIM = 1296.57 12" INV SW = 1290.73 12" INV NE = 1290.73 4" INV N = 1291.97 6" INV W = 1290.97 6" INV SW = 1294.00
PROPOSED 180 LF SILT FENCE SEE DET SS1 THIS SHEET
PROP. 140 LF 15" STM SEWER @ 0.3%
PROP. 44 LF 8" STM SEWER @ 0.1% MIN. W/ CLEANOUT (TYP.) SEE DET C1 SHT C-501
PROP. 55 LF 8" STM SEWER @ 0.1% MIN. W/ CLEANOUT (TYP.) SEE DET C1 SHT C-501
PROP. 98 LF 4" STM SEWER @ 1.2% MIN. W/ CLEANOUT (TYP.) SEE DET C1 SHT C-501
PROP. 51 LF 6" STM SEWER CONNECT TO EX. CATCH BASIN (ALTERNATE #2)
PROP. 94 LF 10" STM SEWER @ 0.7% W/ CLEANOUT (TYP.) SEE DET C1 SHT C-501
PROP. 52 LF 4" STM SEWER @ 1.0% MIN. W/ CLEANOUT (TYP.) SEE DET C1 SHT C-501
PROP. 35 LF 6" STM SEWER @ 1.0% MIN. W/ CLEANOUT (TYP.) SEE DET C1 SHT C-501
PROP. 42 LF 15" STM SEWER @ 1.0%
PROP. 73 LF 6" STM SEWER @ 1.0% MIN. (ALTERNATE #2)
PROP. 20 LF TRENCH DRAIN SEE DET B3 SHT C-501 (ALTERNATE #2)
PROP. 61 LF 12" PERF. STORM SEWER @ 0.0% SEE DET B2 SHT C-501
PROP. 131 LF 12" PERF. STORM SEWER @ 0.0% SEE DET B2 SHT C-501
PROP. 160 LF 12" PERF. STORM SEWER @ 0.0% MIN. SEE DET B2 SHT C-501
PROP. 4' DIA. LB 8 W/ EJIW 1020 & M1 GRATE RIM = 1296.28 12" INV N = 1291.00 12" INV SE = 1291.00
PROP. 4' DIA. LB 9 W/ EJIW 7075 & M1 GRATE RIM = 1295.36 12" INV NE = 1291.00 12" INV SW = 1291.00
PROP. 4' DIA. MH 5 W/ EJIW 1160A FRAME & SOLID RIM = 1295.94 12" INV NE = 1291.00 12" INV W = 1292.00
PROP. 99 LF 12" PERF. STORM SEWER 0.0% SEE DET B2 SHT C-501
PROP. 95 LF 12" PERF. STORM SEWER 0.0% SEE DET B2 SHT C-501
PROP. 188 LF 12" PERF. STORM SEWER @ 0.0% SEE DET B2 SHT C-501
PROPOSED 68 LF SILT FENCE SEE DET SS1 THIS SHEET
PROPOSED 360 LF SILT FENCE SEE DET SS1 THIS SHEET
PROP. 44 LF 12" STM SEWER @ 0.6% MIN.
TIE-IN TO EXISTING STRUCTURE CORE (1) 12" HOLE @ INV = 1291.74 (INSPECT EX. CATCH BASIN PRIOR TO CONSTRUCTION)
TIE-IN TO EXISTING STORM CB CORE (1) 12" HOLE @ INV = 1291.00
PLACE: (1) 4' Ø STORM LB ON EXISTING STORM SEWER W/ EJIW 1060A & SOLID RIM = 1295.95 EX. 6" INV W = 1291.85± 6" INV SE = 1291.85±
PROP. 145 LF 6" PERF. STM SEWER @ 0.0% MIN.
SEE FORESITE DRAWINGS FOR STORM OUTLET CONNECTION & DESIGN
PROP. 50 LF 4" STM SEWER @ 1.0% MIN.
PROP. 47 LF 4" STM SEWER @ 1.0% MIN.
PROPOSED 158 LF SILT FENCE SEE DET SS1 THIS SHEET
PROP. 65 LF 6" PERF. STM SEWER @ 0.3% MIN.
TIE-IN TO FIELD DRAIN @ INV = 1292.02
VERIFY LOCATION & INVERT PRIOR TO CONSTRUCTION. SEE FORESITE DWGS FOR FIELD DRAIN LOCATION
PROP. 4' DIA. STM CB 10 W/ EJIW 6508 BEEHIVE RIM = 1295.00 6" INV NNW = 1291.85± 6" INV SE = 1291.85± 4" INV NW = 1293.50± 4" INV SW = 1293.50±
SEE FORESITE DWGS FOR SITE IMPROVEMENTS WITHIN LIMITS OF TRACK & FIELD EVENTS (TYP.)
TIE-IN TO EX. STM MH @ EX. INV = 1290.26 W/ 15" STM SEWER
PROP. 157 LF 4" STM SEWER @ 0.3%
TIE-IN TO EX. STM MH @ EX. INV = 1290.76 W/ 4" STM SEWER
PROPOSED 900 LF SILT FENCE SEE DET SS1 THIS SHEET
PROPOSED LIMITS OF DISTURBANCE
INV 12" RCP = 1289.81
INV RCP = 1287.81 *COULD NOT DETERMINE SIZE
RIM=1' "X" 6"PUMPER ON HYDRANT ELEVATION=1298.67 (NAVD88)
RIM=1' "X" 6"PUMPER ON HYDRANT ELEVATION=1296.42 (NAVD88)
RIM=1' "X" 6"PUMPER ON HYDRANT ELEVATION=1295.64 (NAVD88)
RIM=2' MAC MAL "A" D" BASE ELEVATION=1296.16 (NAVD88)
STATE OF MICHIGAN 10-056-00-050-00
DUGOUT
SCOREBOARD
LANDSCAPING
CITY OF CADILLAC SCULPTURE GARDEN
BRICK BUILDING
CONCESSION AND BATHROOMS
TICKET BOOTH
BALL
WALL
SHED
HISTORY WALL
STS MH #10566 RIM=1297.52
STS CB #10692 RIM=1298.39
STS CB #10696 RIM=1298.18
STS MH #10705 RIM=1297.81
STS MH #10706 RIM=1297.67
STS CB #10188 RIM=1295.87
STS MH #11260 RIM=1297.58
STS CB #10164 RIM=1295.27
STS CB #10012 RIM=1297.38
STS MH #8551 RIM=1294.54
STS CB #8549 RIM=1294.45
STS CB #8541 RIM=1293.61
STS MH #8434 RIM=1295.19
STS CB #8123 RIM=1295.46
STS CB #8056 RIM=1295.33
STS MH #8032 RIM=1295.91
STS MH #7024 RIM=1296.23
STS CB #7044 RIM=1295.59
STS CB #7014 RIM=1295.37
STS MH #5330 RIM=1296.66
STS CB #7220 RIM=1292.15
STS CB #7379 RIM=1292.24
STS MH #7482 RIM=1294.55
STS CB #7484 RIM=1293.43
STS MH #8524 RIM=1294.06
STS CB #7477 RIM=1293.19
STS MH #11152 RIM=1294.52
STS CB #11150 RIM=1294.22
STS CB #11147 RIM=1294.04
STS CB #11154 RIM=1294.23
TELE MH #10965 RIM=1296.43
MISC MH #11024 RIM=1294.76
STS CB #7018 RIM=1291.04
STS CB #7014 RIM=1291.21
STS CB #7027 RIM=1296.82
STS CB #7074 RIM=1295.08
FF=1298.14
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FF=1298.26
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FF=1298.23
FF=1298.22
FF=1298.24
FF=1298.21
FF=1297.86
FF=1297.85
FF=1297.83
FF=1297.17
FF=1297.29
FF=1297.36
FF=1297.87
FF=1297.84
FF=1297.92
FF=1297.91
FF=1297.95
FF=1297.33
FF=1297.30
FF=1297.20
FF=1297.36
FF=1298.25
FF=1297.84
INV = 1291.47± FROM BLDG
4" INV = 1292.52± FROM BLDG
10" INV = 1291.95± FROM BLDG
6" INV = 1291.62± FROM BLDG
6" INV = 1291.22± FROM BLDG
INV = 1292.40± FROM BLDG
INV = 1292.00± FROM BLDG
INV = 1292.00± FROM BLDG
INV = 1291.00± FROM BLDG
INV = 1291.00± FROM BLDG
INV = 1291

N

0' 10' 20' 40'

SCALE 1" = 20'

30'

FF=1298.25

FF=1298.21

FF=1298.21

FF=1298.22

FF=1297.86

FF=1297.85

FF=1297.83

SHED

PRESS BOX

FF=1297.17

FF=1297.29

SPOT GRADE LEGEND

XXX.XXT TOP ELEVATION
XXX.XXB BOTTOM ELEVATION
XXX.XX SURFACE SPOT GRADE

Project Manager REBECCA K. PAGE, P.E.	CADILLAC PUBLIC SCHOOL HIGH SCHOOL
Drawn by STEVEN A. MORRIS	400 LINDEN STREET CADILLAC, MICHIGAN 49601
HEI Project Number 21-01-064	PT. OF THE NW 1/4 , SECT 4, T21N, R9W CITY OF CADILLAC , WEXFORD CO., MI.

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ADDENDUM 1 NOVEMBER 29,2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

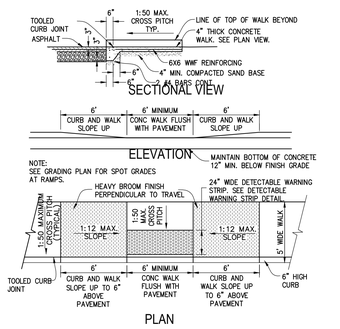
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

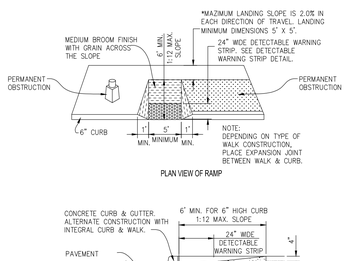
SHEET TITLE
GRADING PLAN - NORTHEAST

DATE
NOVEMBER 03, 2021

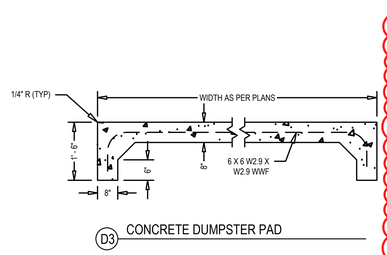
SHEET NUMBER
C 203.2
17-175.70

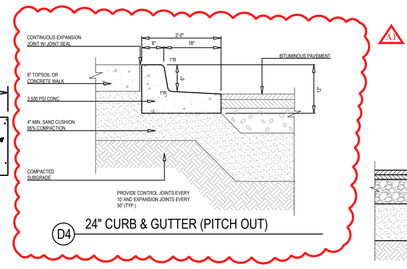


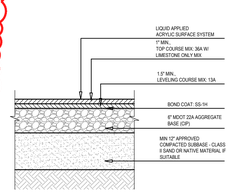
D1 TYPE 2 BARRIER FREE SIDEWALK RAMP

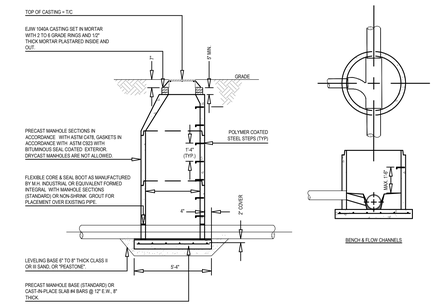


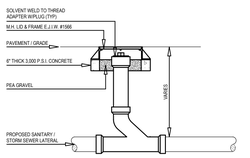
D2 TYPE R BARRIER FREE SIDEWALK RAMP

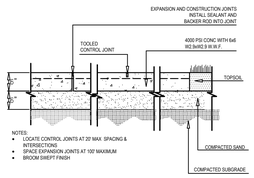


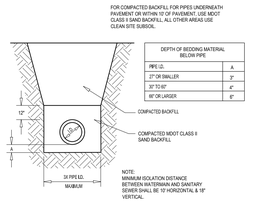


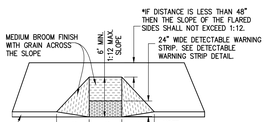




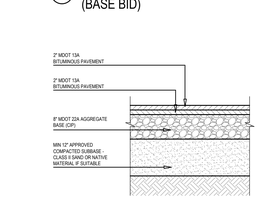


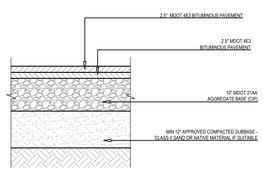


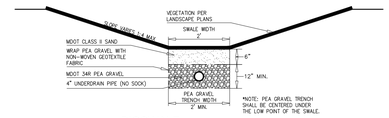


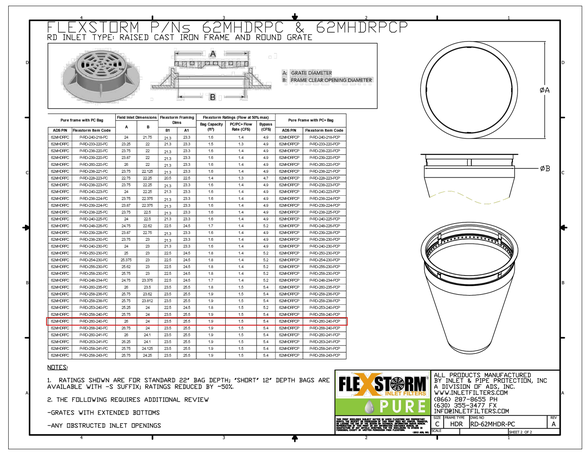


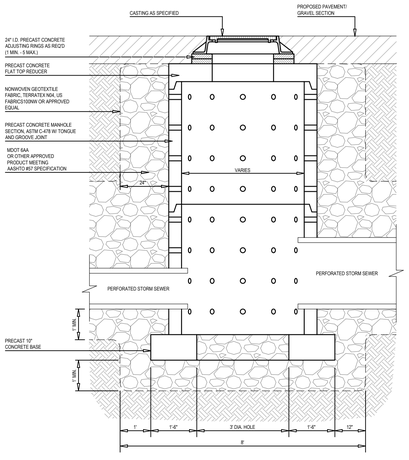
C4 TYPE 1 BARRIER FREE SIDEWALK RAMP

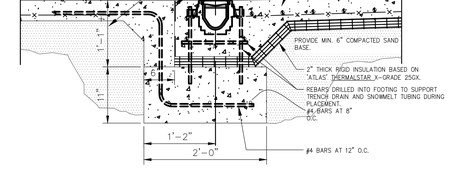


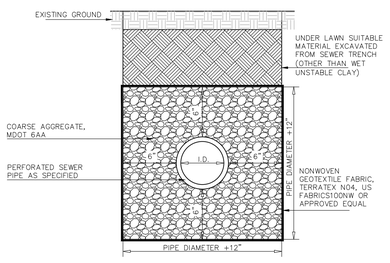


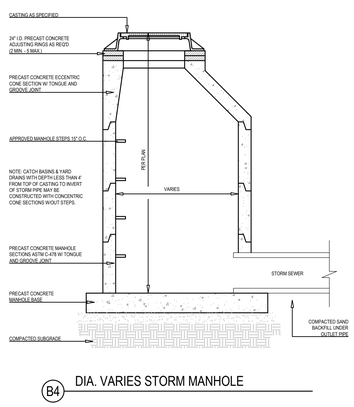


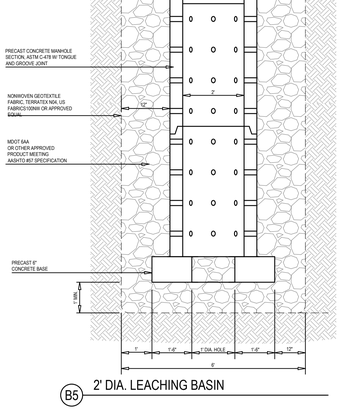


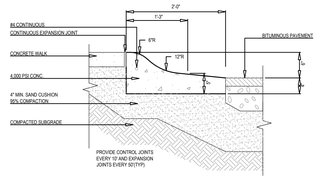


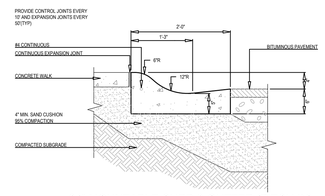


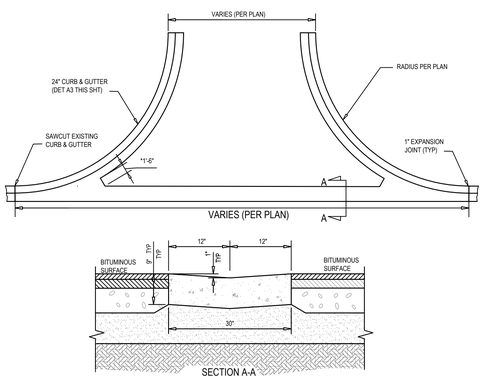


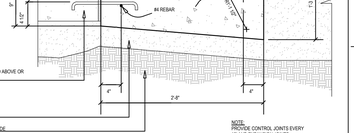


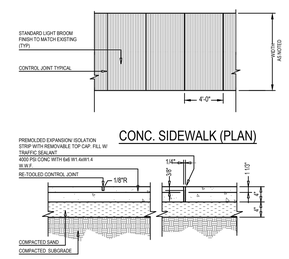


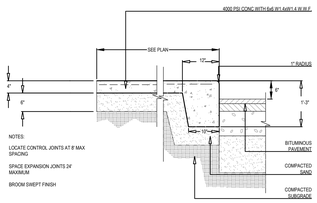


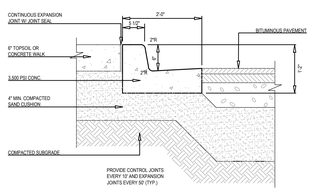












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ADDENDUM 1	NOVEMBER 29,2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

DATE
NOVEMBER 03, 2021

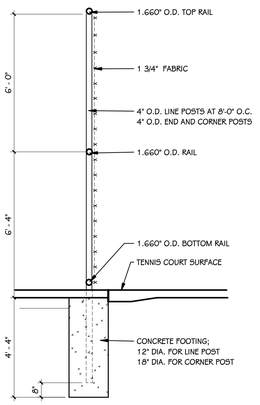
SHEET TITLE
CIVIL GENERAL DETAILS

SHEET NUMBER
C 501.2
17-175.70

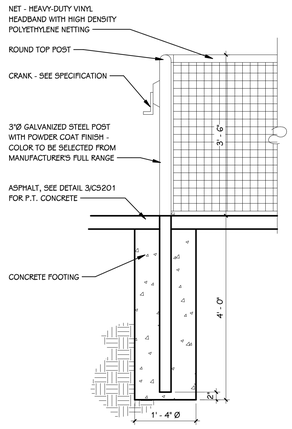
REBECCA K. PAGE, P.E.	CADILLAC PUBLIC SCHOOL HIGH SCHOOL
Drawn by STEVEN A. MORRIS	400 LINDEN STREET CADILLAC, MICHIGAN 49601
HEI Project Number 21-01-064	PT. OF THE NW 1/4 , SECT 4, T21N, R9W CITY OF CADILLAC , WEXFORD CO., MI.

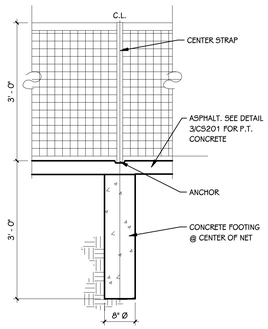
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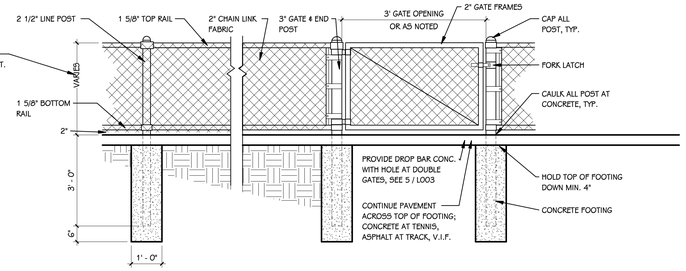


1 L 003.2 **12 FT. C.L. TENNIS FENCE**
3/8" = 1'-0"

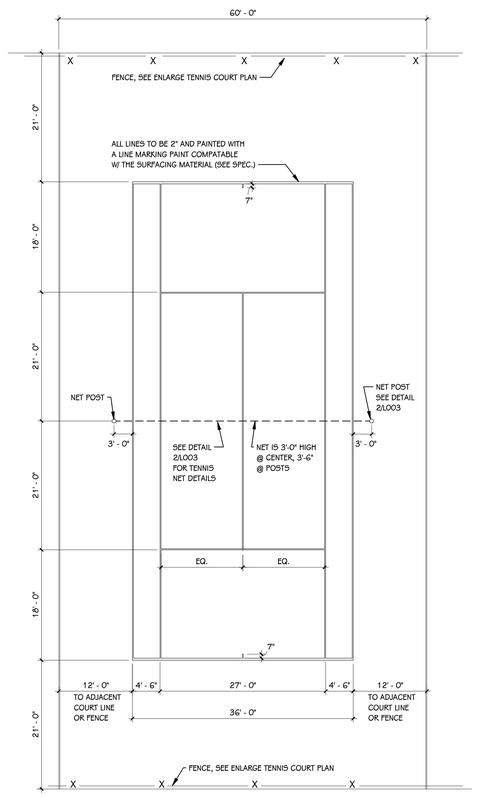




2 L 003.2 **TENNIS NET DETAIL**
3/4" = 1'-0"

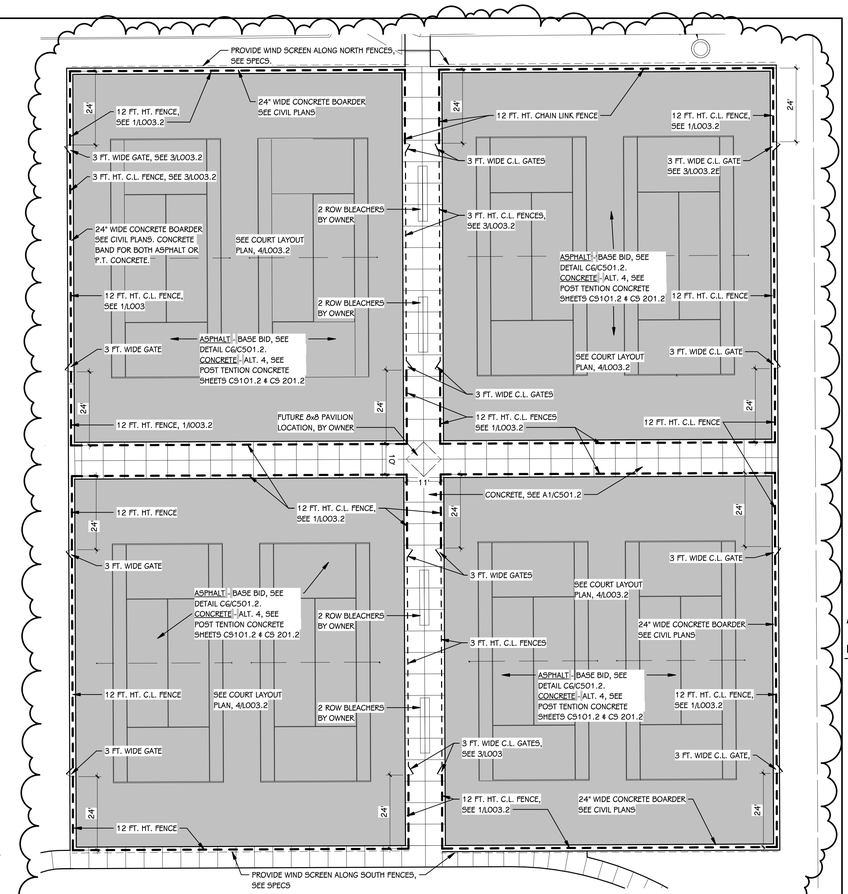


3 L 003.2 **CHAIN LINK FENCE DETAIL**
1/2" = 1'-0"

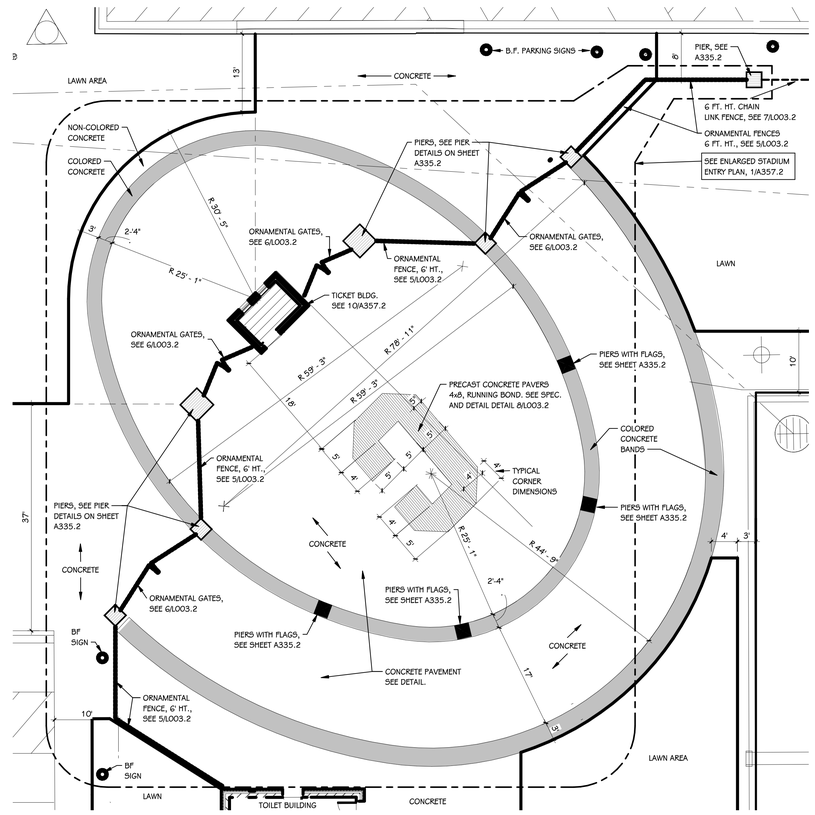


NOTES:
1. DIMENSIONS ARE GIVEN TO ALL OUTSIDE EDGES OF LINES EXCEPT THE CENTER LINE. ALL LINES 2" WIDE EXCEPT THE BASE LINE WHICH IS 4" WIDE.

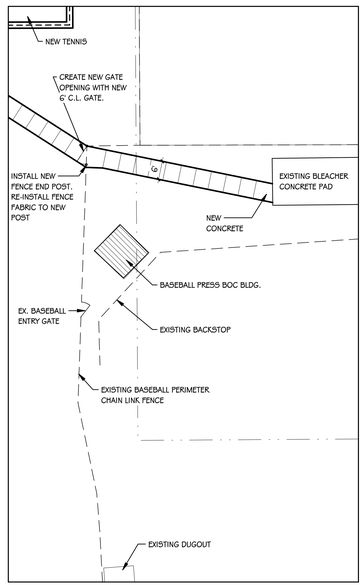
4 L 003.2 **TENNIS COURT LAYOUT PLAN DETAIL**
1" = 10'-0"



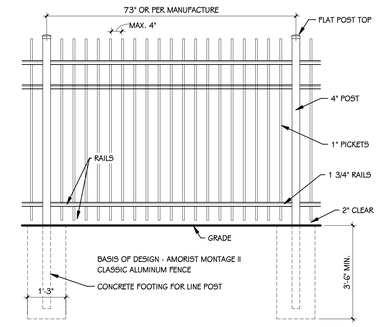
ENLARGED TENNIS COURT PLAN
1" = 20'-0"



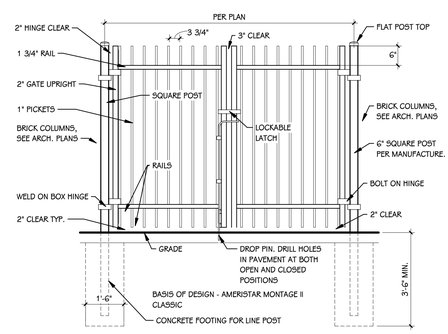
ENLARGED STADIUM ENTRY PLAN
1" = 10'-0"



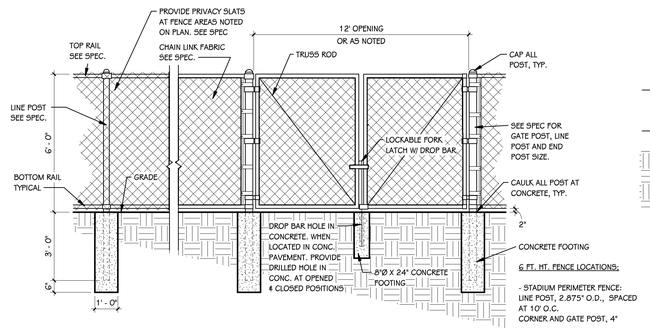
BASEBALL GATE MODIFICATION
1" = 20'-0"



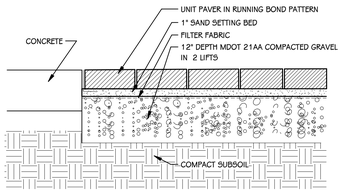
5 L 003.2 **ORNAMENTAL FENCING DETAIL**
1/2" = 1'-0"



6 L 003.2 **ORNAMENTAL GATE**
1/2" = 1'-0"



7 L 003.2 **6 FT. CHAIN LINK FENCE & GATE DETAIL**
3/8" = 1'-0"



8 L 003.2 **UNIT PAVER DETAIL**
1/8" = 1'-0"

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
ENLARGED DETAILS

DATE
NOVEMBER 3, 2021

SHEET NUMBER
L 003.2
17-175.70

KEYED NOTES - DEMOLITION

1 REMOVE EXISTING CONCRETE SLAB ON GRADE, FOUNDATIONS AND FOOTINGS IN ITS ENTIRETY (SHOWN AS A DIAGONAL CROSSHATCH). SHORE EXISTING STRUCTURE TO REMAIN AS REQUIRED. COORDINATE WITH NEW WORK AND STRUCTURAL.
2 REMOVE EXISTING CONCRETE SLAB ON GRADE (SHOWN AS A DIAGONAL DOWN HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
3 REMOVE EXISTING CONCRETE SLAB ON GRADE RAMP (SHOWN AS A DIAGONAL DOWN HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
4 REMOVE EXISTING DEPRESSED CONCRETE SLAB ON GRADE (SHOWN AS A DIAGONAL UP HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
5 SAWCUT & REMOVE SUPPORTED CONCRETE SLAB. COORDINATE EXTENTS WITH NEW WORK AND STRUCTURAL.
6 REMOVE EXISTING CONCRETE TOPPING SLAB (SHOWN AS A PLUS HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
7 REMOVE EXISTING CONCRETE LOCKER BASE. COORDINATE WITH NEW WORK.
8 REMOVE EXISTING FLOORING, WALL BASE, AND ASSOCIATED ADHESIVES. PREP FOR NEW WORK.
9 REMOVE EXISTING PLATFORM FRAMING IN ITS ENTIRETY.
10 SAWCUT & REMOVE CONCRETE RISERS IN ITS ENTIRETY. SLAB ON GRADE TO REMAIN. COORDINATE WITH NEW WORK AND STRUCTURAL.
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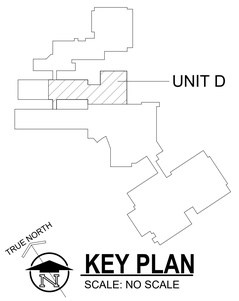
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NEW CARPET TILE TO TRANSITION TO EXISTING TILE (CLEAN/SALVAGE EDGE DURING DEMO)

CORRIDOR COR2 · BOYS TOILET 508M · MAINTENANCE 506C · CLASSROOM 506 · CLASSROOM 504 · CLASSROOM 502 · CLASSROOM 500 · OFFICE 500A · GYM AGO · ELECTRICAL 317 · VESTIBULE ENT 5 · STOR 507S · GIRLS TOILET 507W · BOYS TOILET 505M · STORAGE 505S · GIRLS TOILET 505W · TOILET 505R · CORRIDOR COR3 · CLASSROOM 505 · CLASSROOM 503 · SPECIAL EDUCATION 501 · STORAGE 315B · STORAGE 315A · OFFICE 5015 · OFFICE 315C · SCIENCE 315 · SCIENCE 313 · REMOVE CONC. STEP · REMOVE CONC. STEP · CORRIDOR COR5 · AUDIO VISUAL 314 · MEDIA CENTER LIB · GIRLS TOILET AG7 · GIRLS SHOWER AG6 · STORAGE AG5 · BOYS SHOWER AB4 · BOYS TOILET AB5 · STAIR WS-1 · STAIR WS-2 · SHOWER AG8 · TOWEL J1 · LAUNDRY AG4 · TOWEL J2 · GIRLS LOCKER AG1 · OFFICE AG3 · OFFICE AB3 · BOYS LOCKER AB1 · JC AG1A · TOILET AG2 · TOILET AB2 · JC AB1A · UNIT B · UNIT C · UNIT D · UNIT E · UNIT F

FIRST FLOOR DEMOLITION PLAN - UNIT D
1/8" = 1'-0"

CADILLAC JR-SR HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021
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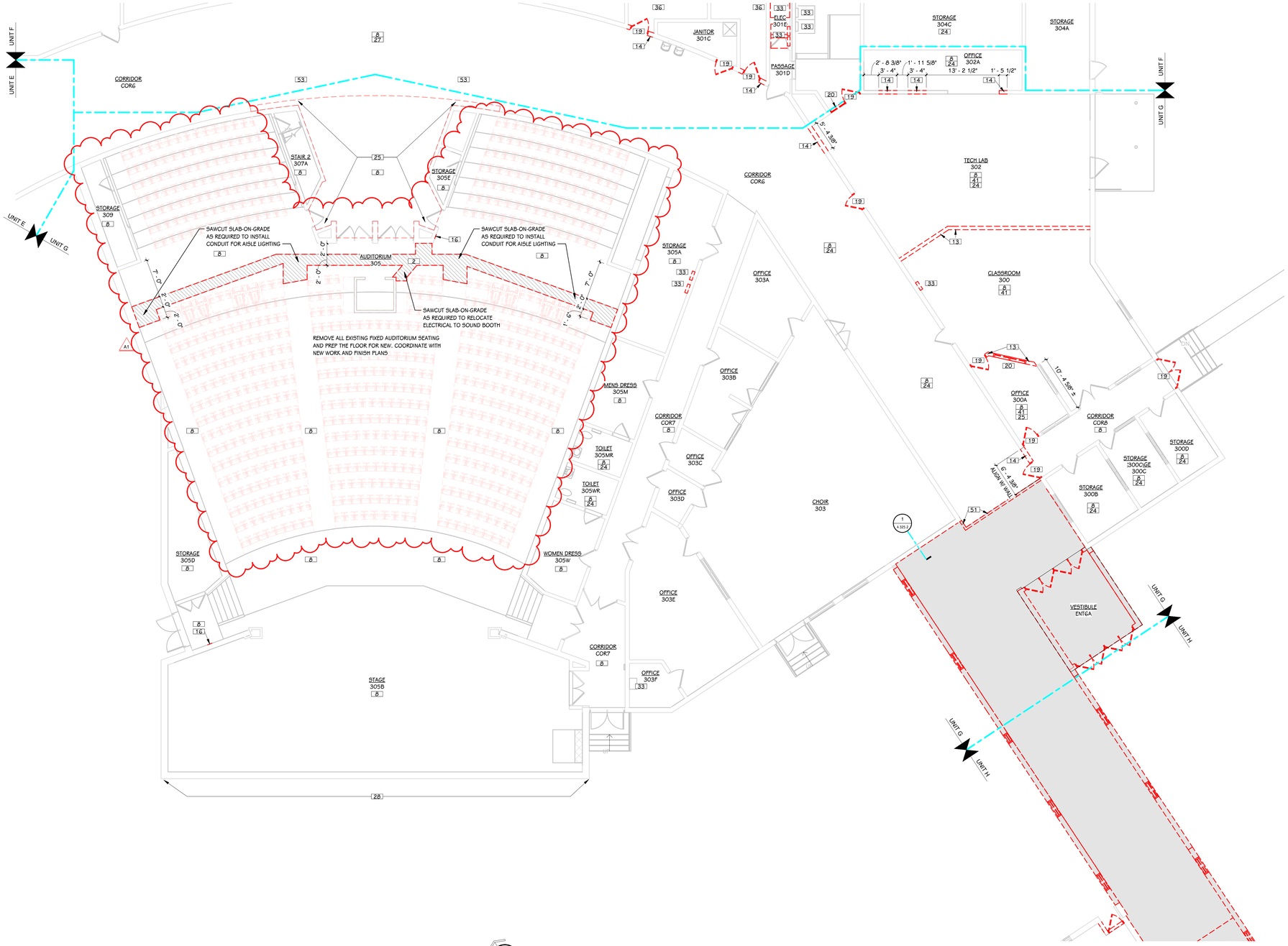
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
FIRST FLOOR DEMOLITION PLAN - UNIT D

DATE
NOVEMBER 3, 2021

SHEET NUMBER
AD 101.2D
17-175.70



FIRST FLOOR DEMOLITION PLAN - UNIT G

1/8" = 1'-0"

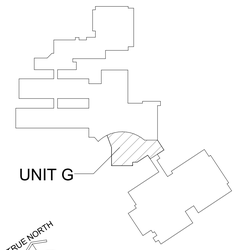
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CADILLAC JR-SR HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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Grand Rapids, Michigan 49503
616.458.8944 Phone 616.458.8938 FAX

ADDENDUM 1 NOVEMBER 29, 2021
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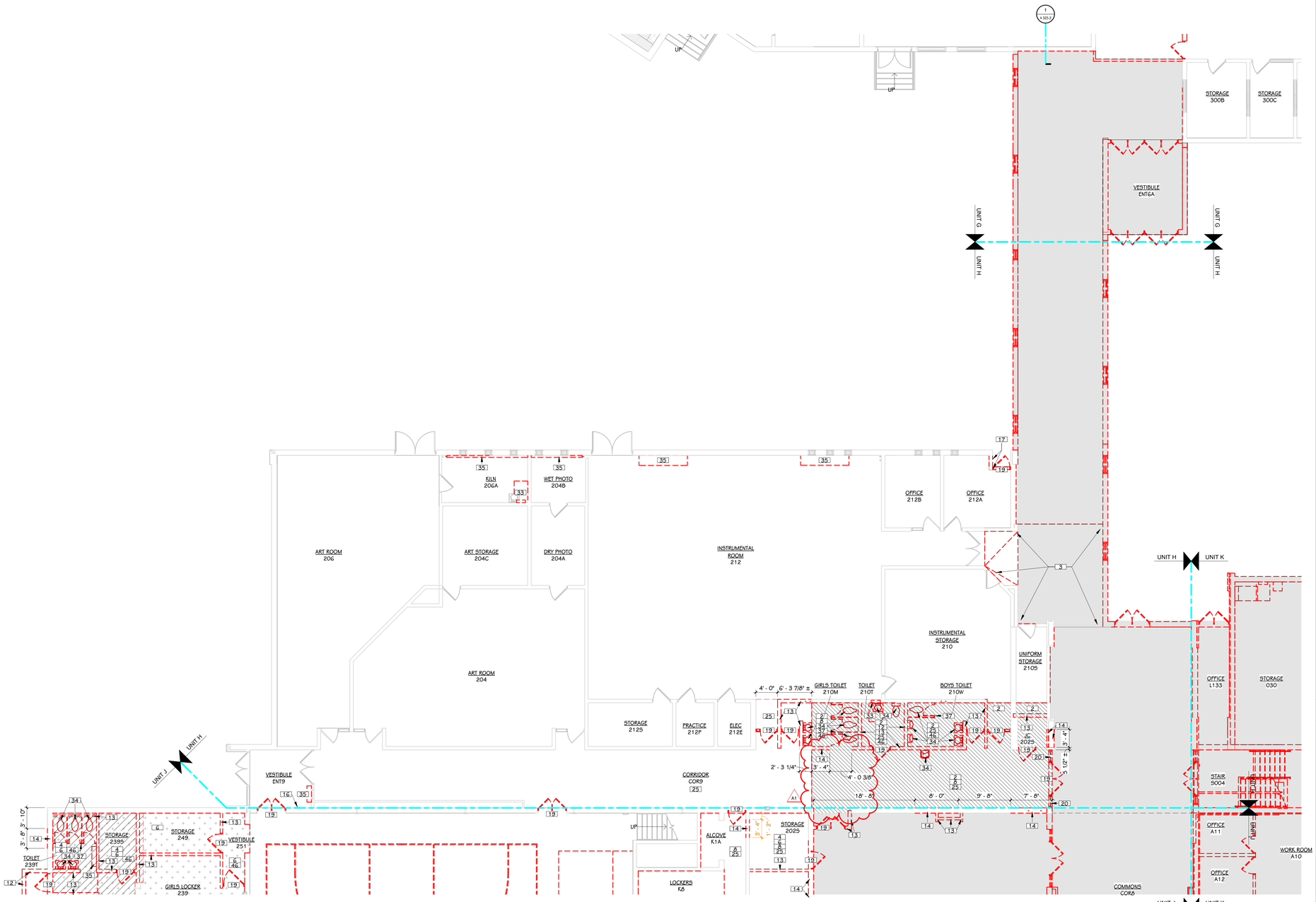
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
FIRST FLOOR DEMOLITION PLAN - UNIT G

DATE
NOVEMBER 3, 2021

SHEET NUMBER
AD 101.2G
17-175.70



FIRST FLOOR DEMOLITION PLAN - UNIT H

1/8" = 1'-0"

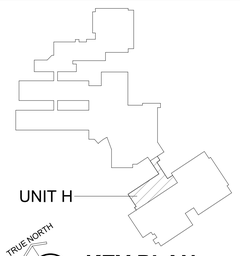
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CADILLAC JR-SR HIGH SCHOOL



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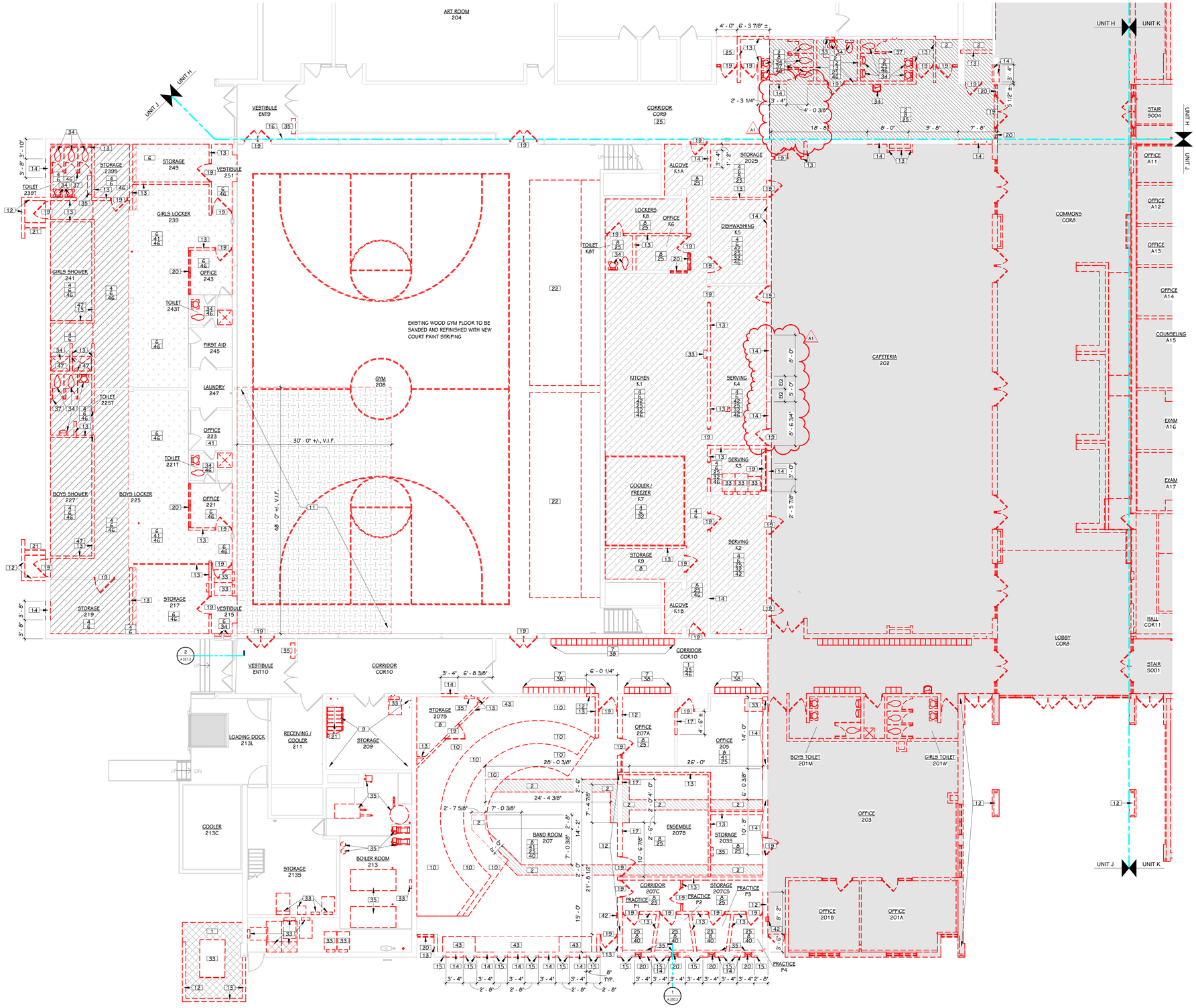
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FIRST FLOOR DEMOLITION PLAN - UNIT H

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FIRST FLOOR DEMOLITION PLAN - UNIT J

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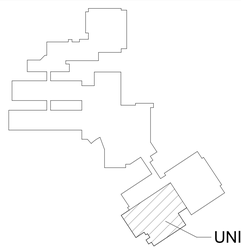
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10 SAWCUT & REMOVE CONCRETE RISERS IN ITS ENTIRETY. SLAB ON GRADE TO REMAIN. COORDINATE WITH NEW WORK AND STRUCTURAL.
11 REMOVE DAMAGED WOOD ATHLETIC FLOORING AS REQUIRED DOWN TO DEPRESSED CONCRETE SLAB (SHOWN AS CHECKER PLATE HATCH). COORDINATE EXTENTS WITH NEW WORK AND FIELD CONDITIONS.
12 REMOVE EXISTING BEARING WALL, FOUNDATION AND FOOTING IN ITS ENTIRETY. SHORE EXISTING ROOF FRAMING AS REQUIRED. COORDINATE WITH NEW WORK AND STRUCTURAL.
13 REMOVE EXISTING MASONRY WALL.
14 REMOVE PORTION OF EXISTING WALL FOR NEW OPENING. COORDINATE WITH NEW WORK AND STRUCTURAL.
15 REMOVE PORTION OF EXISTING FACE BRICK AS REQUIRED. COORDINATE WITH NEW WORK.
16 REMOVE PORTION OF EXISTING WALL FOR WALL MOUNTED EQUIPMENT. COORDINATE WITH NEW WORK.
17 REMOVE PORTION OF EXISTING MASONRY WALL. COORDINATE EXTENTS WITH NEW WORK.
18 REMOVE EXISTING STUD WALL.
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21 REMOVE EXISTING STAIR ASSOCIATED RAILINGS AND SUPPORTS. COORDINATE WITH NEW WORK.
22 REMOVE EXISTING BLEACHER SYSTEM. PREP FOR NEW WORK.
23 USE CARE NOT TO DISTURB HARD LID ABOVE ACP CEILING SYSTEM, SEE DETAIL (4/A 322.2).
24 REMOVE EXISTING CEILING SYSTEM AND RELATED BULKHEADS IN ITS ENTIRETY.
25 REMOVE EXISTING GYPSUM CEILING SYSTEM AND RELATED BULKHEADS IN ITS ENTIRETY.
26 REMOVE & REINSTALL CEILING PADS AS REQUIRED FOR FIRE PROTECTION INSTALLATION.
27 ALTERNATE #5: REMOVE EXISTING LINEAR METAL CEILING AND ADJACENT BULKHEADS IN THEIR ENTIRETY.
28 REMOVE EXISTING EXTERIOR SIGNAGE. PATCH & REPAIR WALL AS REQUIRED.
29 REMOVE EXISTING FASCIA AND SOFFIT. PREP FOR NEW WORK.
30 REMOVE EXISTING ROOFING SYSTEM AND STRUCTURE FOR NEW 2 HOUR RATED PORTAL FRAME. COORDINATE WITH STRUCTURAL AND NEW WORK.
31 REMOVE EXISTING ROOF SYSTEM IN ITS ENTIRETY.
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33 REMOVE EXISTING ELECTRICAL. REFER TO ELECTRICAL DRAWINGS.
34 REMOVE EXISTING PLUMBING FIXTURE, SEAL AND CAP SERVICES AS REQUIRED. SEE PLUMBING DRAWINGS. PATCH AND REPAIR WALL AND/OR FLOOR AS REQUIRED. COORDINATE WITH NEW WORK.
35 REMOVE EXISTING MECHANICAL. REFER TO MECHANICAL DRAWINGS.
36 REMOVE EXISTING TOILET ROOM ACCESSORIES. COORDINATE WITH NEW WORK.
37 REMOVE EXISTING TOILET PARTITION. COORDINATE WITH NEW WORK.
38 REMOVE EXISTING METAL LOCKERS. COORDINATE WITH NEW WORK.
39 REMOVE EXISTING OVERHEAD PROJECTOR. COORDINATE WITH NEW WORK.
40 REMOVE EXISTING SOUND ABSORPTION PANELS IN ITS ENTIRETY. PREP EXISTING WALL FOR NEW WORK. COORDINATE WITH NEW WORK AND FINISH PLANS.
41 REMOVE EXISTING MARKERBOARDS/TACKBOARDS/SMARTBOARD/TACKSTRIP.
42 REMOVE EXISTING EQUIPMENT. COORDINATE WITH NEW WORK.
43 REMOVE EXISTING CASEWORK. COORDINATE WITH NEW WORK.
44 DEMO LOWER CASEWORK AND PREP WALL + FLOOR FOR NEW CASEWORK.
45 DEMO UPPER + LOWER CASEWORK AND PREP WALL AND FLOOR FOR NEW CASEWORK.
46 REMOVE EXISTING FLOOR TILE AND WALL BASE. PREP FOR NEW WORK. COORDINATE WITH FINISH PLANS.
47 REMOVE EXISTING WALL TILE AND WALL BASE. PREP FOR NEW WORK. COORDINATE WITH FINISH PLANS.
48 REMOVE EXISTING WALL SYSTEM AROUND WINDOW. REFER TO DETAIL (7/A 323.2).
49 REMOVE EXISTING LOUVER. REFER TO DETAIL (7/A 323.2).
50 PATCH AND REPAIR SURROUNDING WALLS, CEILINGS, AND FLOORS AS REQUIRED TO MATCH ADJACENT CONDITIONS AT LOCATIONS OF EXISTING OPENING REPLACEMENT
51 REMOVE TEMPORARY WALL. COORDINATE WITH CONSTRUCTION PHASING IN FIELD.
52 REMOVE WALL MOUNTED FURNITURE
53 REMOVE TACK STRIP
54 REMOVE RUBBER BASE
55 REMOVE EXISTING ROOF SYSTEM DOWN TO EXISTING ROOF DECK, PREP FOR NEW ROOF.
56 REMOVE EXISTING ROOF SYSTEM IN ITS ENTIRETY. USE CARE NOT TO DAMAGE ADJACENT FOOR TO REMAIN.

CADILLAC JR-SR HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021
ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

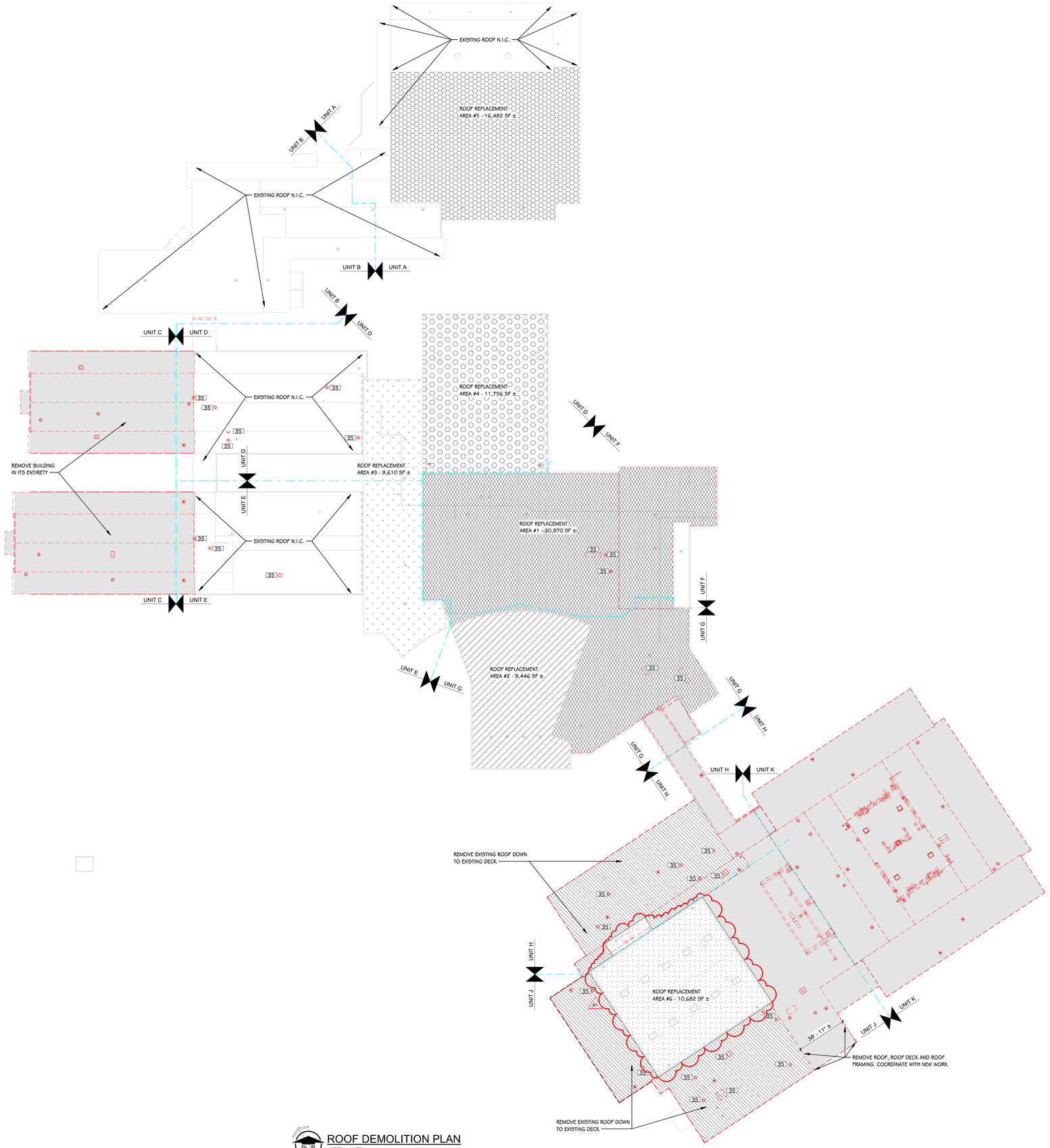
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR DEMOLITION PLAN - UNIT J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
AD 101.2J
17-175.70



ROOF DEMOLITION PLAN
1/32" = 1'-0"

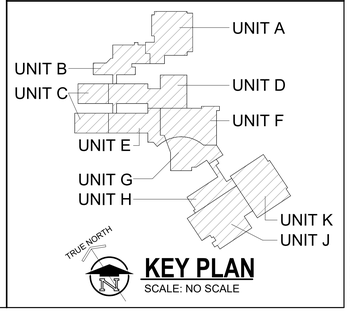
DEMOLITION ROOF PLAN KEY

- DEMOLISH BUILDING AREA IN ITS ENTIRETY
- AREA OF BALLASTED ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK
- AREA #1 - AREA OF BALLASTED ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK
- AREA #2 - AREA OF BALLASTED ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK
- AREA #3 - AREA OF BALLASTED ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK
- AREA #4 - AREA OF BALLASTED ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK
- AREA #5 - AREA OF BALLASTED ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK
- AREA #6 - AREA OF ROOF TO BE REMOVED DOWN TO EXISTING ROOF DECK

KEYED NOTES - DEMOLITION

1 REMOVE EXISTING CONCRETE SLAB ON GRADE, FOUNDATIONS AND FOOTINGS IN ITS ENTIRETY (SHOWN AS A DIAGONAL CROSSHATCH). SHORE EXISTING STRUCTURE TO REMAIN AS REQUIRED. COORDINATE WITH NEW WORK AND STRUCTURAL.
2 REMOVE EXISTING CONCRETE SLAB ON GRADE (SHOWN AS A DIAGONAL DOWN HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
3 REMOVE EXISTING CONCRETE SLAB ON GRADE RAMP (SHOWN AS A DIAGONAL DOWN HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
4 REMOVE EXISTING DEPRESSED CONCRETE SLAB ON GRADE (SHOWN AS A DIAGONAL UP HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
5 SAWCUT & REMOVE SUPPORTED CONCRETE SLAB. COORDINATE EXTENTS WITH NEW WORK AND STRUCTURAL.
6 REMOVE EXISTING CONCRETE TOPPING SLAB (SHOWN AS A PLUS HATCH). COORDINATE WITH NEW WORK AND STRUCTURAL.
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CADILLAC JR-SR HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ROOF DEMOLITION PLAN

DATE
NOVEMBER 3, 2021

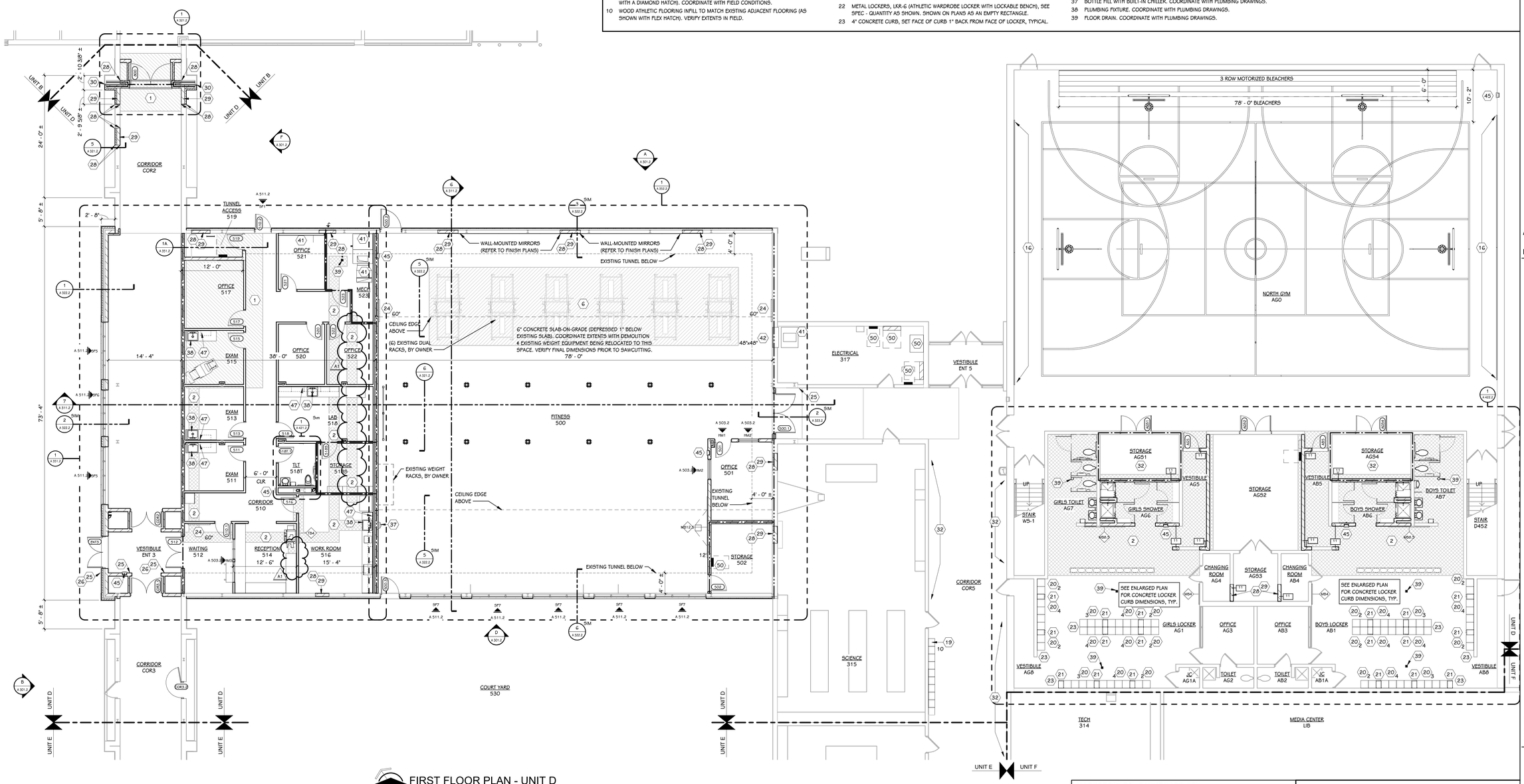
SHEET NUMBER
AD 103.2
17-175.70

GENERAL NOTES

1. REFER TO CODE COMPLIANCE PLAN FOR WALL RATING LINES.
2. REFER TO FLOOR FINISH PLANS FOR INTERIOR ELEVATION CALLOUTS.
3. REFER TO SHEET A 501 FOR WALL AND CEILING ACCESS PANEL INFORMATION.

KEYED NOTES - NEW CONSTRUCTION

1. NEW SUPPORTED CONCRETE SLAB ON METAL DECK INFILL (AS SHOWN WITH DIAGONAL DOWN HATCH). COORDINATE EXTENTS WITH EXISTING CONDITIONS.
2. NEW CONCRETE SLAB ON GRADE (AS SHOWN WITH DIAGONAL CROSSHATCH). COORDINATE EXTENTS WITH EXISTING CONDITIONS, NEW WORK, FINISH PLANS, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
3. NEW POLISHED CONCRETE SLAB ON GRADE (AS SHOWN SOLID GREY). COORDINATE EXTENTS WITH EXISTING CONDITIONS, NEW WORK, FINISH PLANS, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
4. NEW CONCRETE TOPPING SLAB OVER EXISTING SLAB TO ALIGN WITH ADJACENT FINISH FLOOR ELEVATION (AS SHOWN WITH HONEYCOMB HATCH). COORDINATE EXTENTS WITH EXISTING CONDITIONS AND NEW WORK.
5. NEW CONCRETE RAMP ON GRADE (1:20 SLOPE).
6. DEPRESSED CONCRETE SLAB ON GRADE (AS SHOWN WITH DIAGONAL UP HATCH). COORDINATE EXTENTS & DEPTH WITH EXISTING CONDITIONS, NEW WORK, FINISH PLANS, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
7. MUD BED SET TILE ON RECESSED CONCRETE SLAB (AS SHOWN WITH A PLUS HATCH). COORDINATE EXTENTS WITH NEW WORK, FINISH PLANS, STRUCTURAL AND PLUMBING.
8. DEPRESSED SLAB 10" FOR INSULATED COOLER-FREEZER AREA (SHOWN WITH A HEXAGON HATCH).
9. FEATHER CONCRETE TOPPING TO CREATE A 1:20 RAMP TO CORRIDOR (AS SHOWN WITH A DIAMOND HATCH). COORDINATE WITH FIELD CONDITIONS.
10. WOOD ATHLETIC FLOORING INFILL TO MATCH EXISTING ADJACENT FLOORING (AS SHOWN WITH FLEX HATCH). VERIFY EXTENTS IN FIELD.
11. STRIP, SAND, REFINISH AND PAINT GAME LINES ON EXISTING WOOD ATHLETIC FLOORING (SHOWN WITH A VERTICAL LINE HATCH).
12. PROVIDE NEW CONCRETE SLAB ON GRADE THROUGHOUT AREA. COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
13. PROVIDE NEW CONCRETE PLANK FLOOR SYSTEM WITH CONCRETE TOPPING SLAB. COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
14. KITCHEN EQUIPMENT, MECHANICAL, PLUMBING AND ELECTRICAL DESIGN BY FOOD SERVICE CONSULTANT. REFER TO FSE DRAWINGS.
15. OVERHEAD COILING GRILL. REFER TO DOOR SCHEDULE AND SPECIFICATIONS.
16. WALL PADS PER SPECIFICATION SECTION 11 6623.
17. METAL LOCKERS, LKR-1 (SINGLE TIER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
18. METAL LOCKERS, LKR-2 (SINGLE TIER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
19. METAL LOCKERS, LKR-3 (SINGLE TIER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
20. METAL LOCKERS, LKR-4 (SINGLE TIER ATHLETIC LOCKER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
21. METAL LOCKERS, LKR-5 (FOUR TIER ATHLETIC LOCKER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
22. METAL LOCKERS, LKR-6 (ATHLETIC WARDROBE LOCKER WITH LOCKABLE BENCH), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
23. 4" CONCRETE CURB, SET FACE OF CURB 1" BACK FROM FACE OF LOCKER, TYPICAL.
24. NEW WALL MOUNTED FLAT PANEL MONITOR - REFER TO INTERIOR ELEVATIONS, COMMUNICATIONS AND ELECTRICAL DRAWINGS.
25. CARD READER. REFER TO SECURITY PLANS.
26. BARRIER-FREE DOOR ACTUATOR BUTTON (WALL MOUNTED).
27. KNOX BOX.
28. PATCH AND REPAIR WALL AT AREA OF DEMOLITION AS REQUIRED TO MATCH ADJACENT. MASONRY TO BE TOOTHED-IN UNLESS NOTED OTHERWISE.
29. INFILL EXISTING OPENING WITH CMU OR BRICK TO MATCH EXISTING ADJACENT CONDITIONS - MATCH THICKNESS AS REQUIRED TO BE FLUSH ON BOTH SIDES. MEET RATING REQUIREMENTS AS INDICATED ON PLANS. TOOTH-IN MASONRY AT JAMBS.
30. PROVIDE 2" WIDE MASONRY EXPANSION JOINT FILLER BASED ON EMSEAL COLORSEAL
31. ALIGN NEW WALL PARTITION FLUSH WITH EXISTING CONSTRUCTION.
32. REFINISH EXISTING TERRAZZO FLOOR WHERE EXISTING CONCRETE LOCKER CURBS WERE REMOVED. COORDINATE WITH DEMOLITION.
33. EXTEND WALL UP TO DECK AND PATCH AS REQUIRED TO BE SMOKE RESISTIVE.
34. PREP EXISTING GLAZED BLOCK FOR NEW WALL FINISH - REFER TO A 600 SHEETS
35. OPERABLE WINDOW INSET IN STOREFRONT SYSTEM
36. BI-LEVEL ELECTRIC WATER COOLER WITH INTEGRAL BOTTLE FILLER. COORDINATE WITH PLUMBING DRAWINGS.
37. BOTTLE FILL WITH BUILT-IN CHILLER. COORDINATE WITH PLUMBING DRAWINGS.
38. PLUMBING FIXTURE. COORDINATE WITH PLUMBING DRAWINGS.
39. FLOOR DRAIN. COORDINATE WITH PLUMBING DRAWINGS.
40. FLOOR SINK - REFER TO PLUMBING DRAWINGS.
41. MECHANICAL EQUIPMENT, REFER TO MECHANICAL DRAWINGS. COORDINATE WORK WITH DEMOLITION, NEW WORK AND STRUCTURAL.
42. MECHANICAL RETURN GRILL, INSTALL 8" AFF - SIZE AS SHOWN. COORDINATE WITH MECHANICAL.
43. MECHANICAL LOUVER - SIZE AS SHOWN (ALSO SEE FRAME ELEVATION FOR LOCATION IN RELATION TO STOREFRONT WINDOW). COORDINATE WITH MECHANICAL.
44. ACCESS PANEL, 24" x 24" TYPICAL (COORDINATE WITH MECHANICAL).
45. RECESSED FIRE EXTINGUISHER CABINET
46. AUTOMATED EXTERNAL DEFIBRILLATOR (AED) - SEE CODE COMPLIANCE PLANS.
47. PROVIDE PAPER TOWEL DISPENSER AND SOAP DISPENSER
48. FRP PANEL ON 3-5/8" METAL STUD @ 16" O.C. SET 4" OFF OF EXISTING WALL.
49. PROVIDE TEMPORARY STUD WALL WITH GYPSUM BOARD ON BOTH SIDES TO MEET ONE-HOUR FIRE RATING. WALL SHALL RUN FROM FLOOR TO UNDERSIDE OF DECK ABOVE OR RATED ASSEMBLY.
50. ELECTRICAL EQUIPMENT, REFER TO ELECTRICAL DRAWINGS.
51. ELECTRIC WATER COOLER & BOTTLE FILL. COORDINATE WITH PLUMBING DRAWINGS.



FIRST FLOOR PLAN - UNIT D
1/8" = 1'-0"

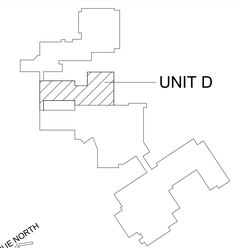
NEW CONSTRUCTION PLAN LEGEND

- CONCRETE SLAB ON GRADE
- POLISHED CONCRETE SLAB ON GRADE
- SUPPORTED CONCRETE SLAB ON METAL DECK
- CONCRETE TOPPING SLAB OVER EXISTING SLAB TO ALIGN WITH ADJACENT FINISHED FLOOR ELEVATION
- DEPRESSED CONCRETE SLAB ON GRADE
- MUD BED SET TILE ON RECESSED CONCRETE SLAB
- WOOD ATHLETIC FLOORING INFILL TO MATCH EXISTING
- INSULATED COOLER / FREEZER SLAB
- FEATHERED CONCRETE TOPPING RAMP

MARKERBOARD / TACKBOARD KEY

- TB3 — TACKBOARD 3: 3' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- TB4 — TACKBOARD 4: 4' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- TB8 — TACKBOARD 8: 8' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB4 — MARKERBOARD 4: 4' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB5 — MARKERBOARD 5: 5' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB8.4 — MARKERBOARD 8.4 - PLACE ON CENTER OF WALL U.N.O.: 8' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB8.5 — MARKERBOARD 8.5 - PLACE ON CENTER OF WALL U.N.O.: 8' WIDE X 5' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB12.4 — MARKERBOARD 12.4 - PLACE ON CENTER OF WALL U.N.O.: 12' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB12.5 — MARKERBOARD 12.5 - PLACE ON CENTER OF WALL U.N.O.: 12' WIDE X 5' HIGH - MOUNTED AT 2'-10" A.F.F.
- MB16 — MARKERBOARD 16 - PLACE ON CENTER OF WALL U.N.O.: 16' WIDE X 5' HIGH - MOUNTED AT 2'-10" A.F.F.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

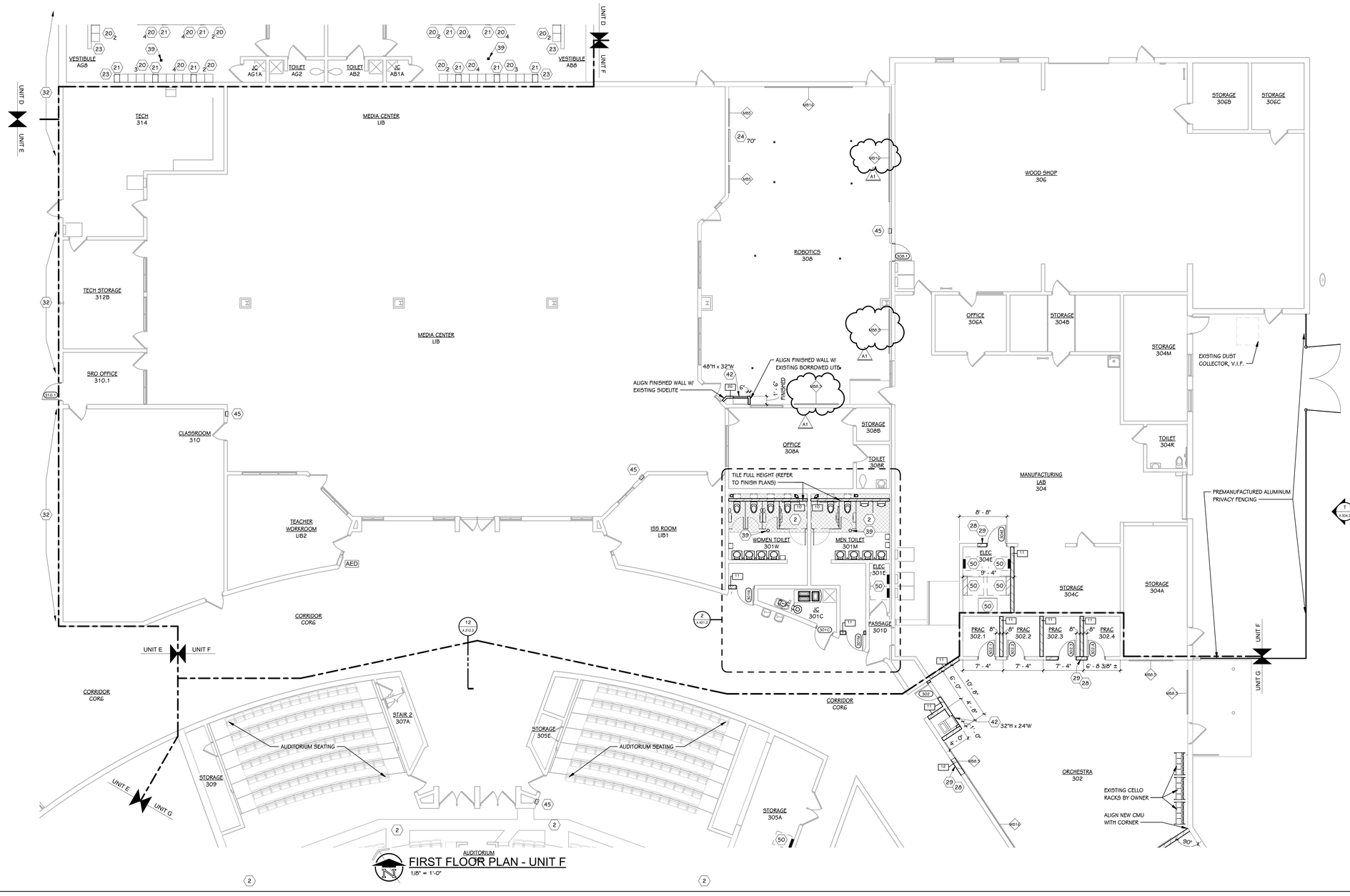
SHEET TITLE
FIRST FLOOR PLAN - UNIT D

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 101.2D
17-175.70

NEW CONSTRUCTION PLAN LEGEND

- CONCRETE SLAB ON GRADE
- POLISHED CONCRETE SLAB ON GRADE
- SUPPORTED CONCRETE SLAB ON METAL DECK
- CONCRETE TOPPING SLAB OVER EXISTING SLAB TO ALIGN WITH ADJACENT FINISHED FLOOR ELEVATION
- DEPRESSED CONCRETE SLAB ON GRADE
- MUD BED SET TILE ON RECESSED CONCRETE SLAB
- WOOD ATHLETIC FLOORING INFILL TO MATCH EXISTING
- INSULATED COOLER / FREEZER SLAB
- FEATHERED CONCRETE TOPPING RAMP



FIRST FLOOR PLAN - UNIT F

1/8" = 1'-0"

GENERAL NOTES

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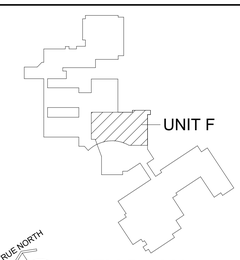
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CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

OWNER CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

PROJECT TITLE PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

SHEET TITLE FIRST FLOOR PLAN - UNIT F

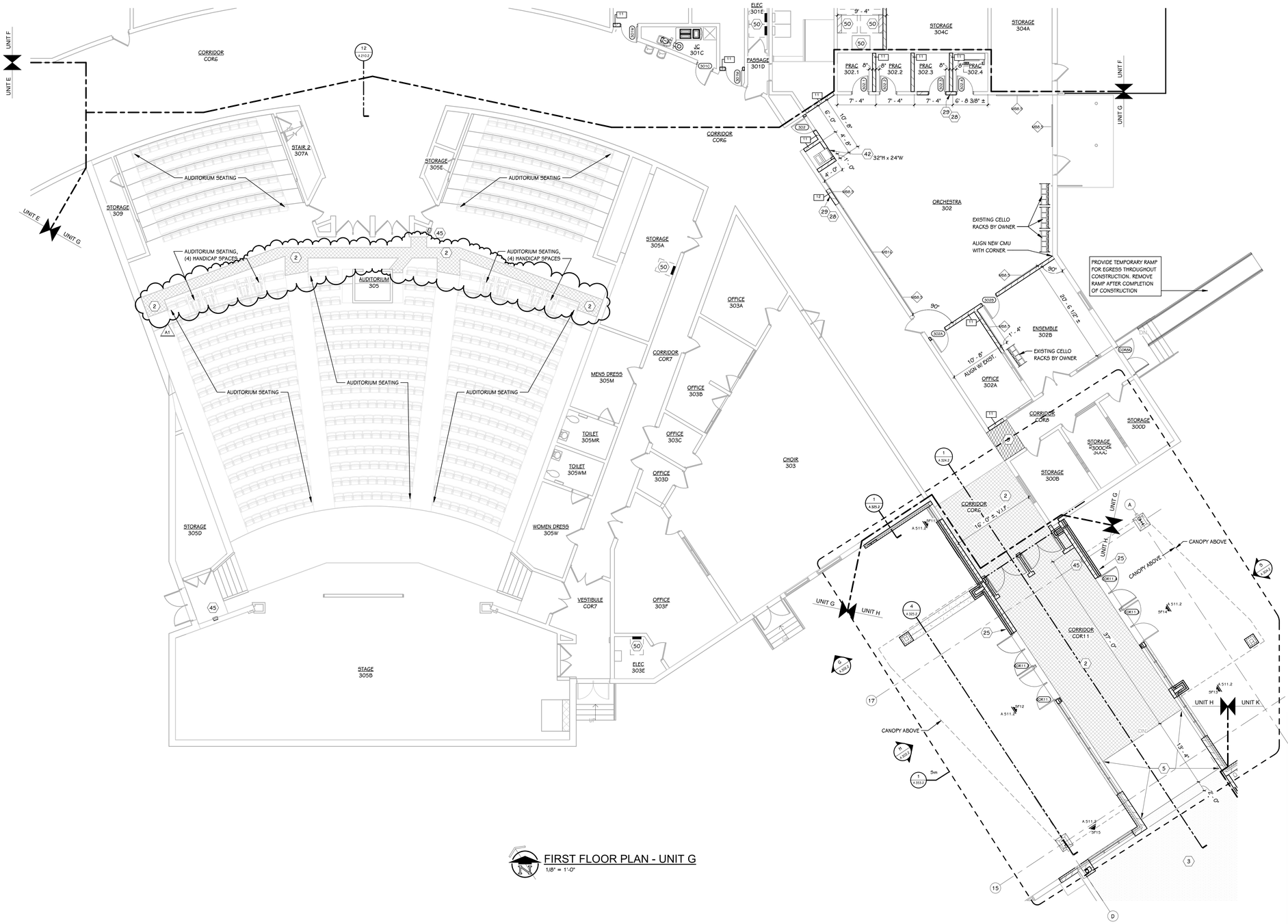
DATE NOVEMBER 3, 2021

SHEET NUMBER A 101.2F

17-175.70

NEW CONSTRUCTION PLAN LEGEND

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- MUD BED SET TILE ON RECESSED CONCRETE SLAB
- FEATHERED CONCRETE TOPPING RAMP



FIRST FLOOR PLAN - UNIT G
1/8" = 1'-0"

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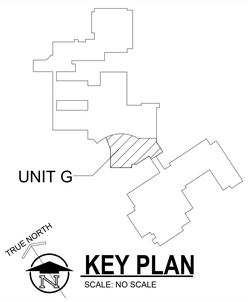
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CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR PLAN - UNIT G

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 101.2G
17-175.70

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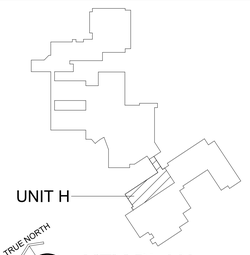
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43. MECHANICAL LOUVER - SIZE AS SHOWN (ALSO SEE FRAME ELEVATION FOR LOCATION IN RELATION TO STOREFRONT WINDOW). COORDINATE WITH MECHANICAL.
44. ACCESS PANEL, 24" x 24" TYPICAL (COORDINATE WITH MECHANICAL).
45. RECESSED FIRE EXTINGUISHER CABINET
46. AUTOMATED EXTERNAL DEFIBRILLATOR (AED) - SEE CODE COMPLIANCE PLANS.
47. PROVIDE PAPER TOWEL DISPENSER AND SOAP DISPENSER
48. PRF PANEL ON 3-5/8" METAL STUD @ 16" O.C. SET 4" OFF OF EXISTING WALL.
49. PROVIDE TEMPORARY STUD WALL WITH GYPSUM BOARD ON BOTH SIDES TO MEET ONE-HOUR FIRE RATING. WALL SHALL RUN FROM FLOOR TO UNDERSIDE OF DECK ABOVE OR RATED ASSEMBLY.
50. ELECTRICAL EQUIPMENT, REFER TO ELECTRICAL DRAWINGS.
51. ELECTRIC WATER COOLER & BOTTLE FILL. COORDINATE WITH PLUMBING DRAWINGS.

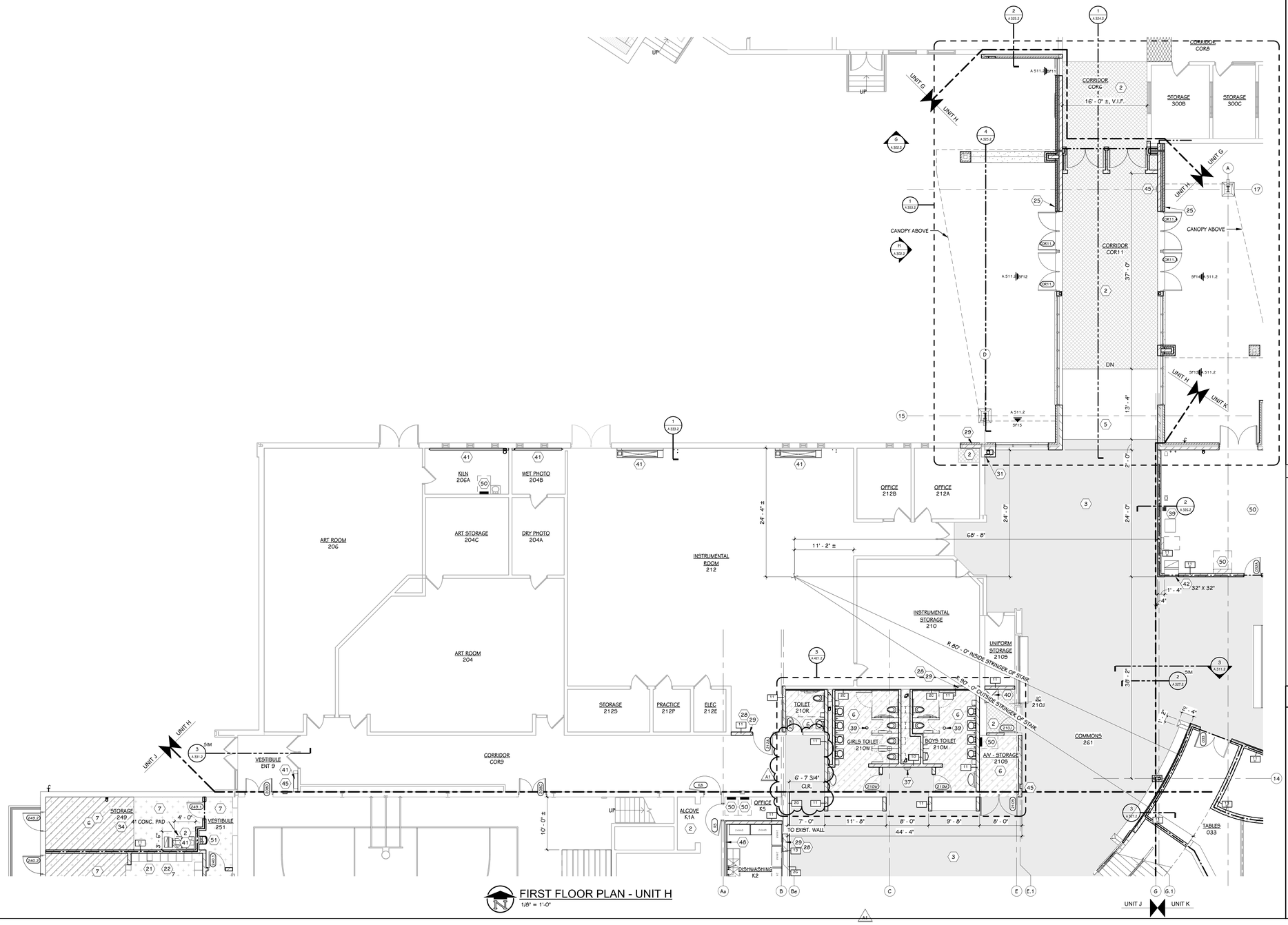
MARKERBOARD / TACKBOARD KEY

- TB3 — TACKBOARD 3: 3' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
- TB4 — TACKBOARD 4: 4' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
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- MB4 — MARKERBOARD 4: 4' WIDE X 4' HIGH - MOUNTED AT 2'-10" A.F.F.
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- MB16 — MARKERBOARD 16 - PLACE ON CENTER OF WALL U.N.O.: 16' WIDE X 5' HIGH - MOUNTED AT 2'-10" A.F.F.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE



FIRST FLOOR PLAN - UNIT H
1/8" = 1'-0"

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR PLAN - UNIT H

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 101.2H
17-175.70

NEW CONSTRUCTION PLAN LEGEND

- CONCRETE SLAB ON GRADE
- POLISHED CONCRETE SLAB ON GRADE
- SUPPORTED CONCRETE SLAB ON METAL DECK
- CONCRETE TOPPING SLAB OVER EXISTING SLAB TO ALIGN WITH ADJACENT FINISHED FLOOR ELEVATION
- DEPRESSED CONCRETE SLAB ON GRADE
- MUD BED SET TILE ON RECESSED CONCRETE SLAB
- WOOD ATHLETIC FLOORING INFILL TO MATCH EXISTING
- INSULATED COOLER / FREEZER SLAB
- FEATHERED CONCRETE TOPPING RAMP

GENERAL NOTES

1. REFER TO CODE COMPLIANCE PLAN FOR WALL RATING LINES.
2. REFER TO FLOOR FINISH PLANS FOR INTERIOR ELEVATION CALLOUTS.
3. REFER TO SHEET A 501 FOR WALL AND CEILING ACCESS PANEL INFORMATION.

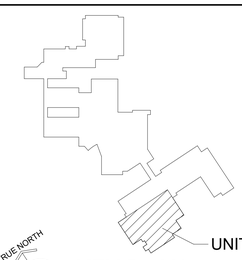
KEYED NOTES - NEW CONSTRUCTION

1 NEW SUPPORTED CONCRETE SLAB ON METAL DECK INFILL (AS SHOWN WITH DIAGONAL DOWN HATCH). COORDINATE EXTENTS WITH EXISTING CONDITIONS.
2 NEW CONCRETE SLAB ON GRADE (AS SHOWN WITH DIAGONAL CROSSHATCH). COORDINATE EXTENTS WITH EXISTING CONDITIONS, NEW WORK, FINISH PLANS, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
3 NEW POLISHED CONCRETE SLAB ON GRADE (AS SHOWN SOLID GREY). COORDINATE EXTENTS WITH EXISTING CONDITIONS, NEW WORK, FINISH PLANS, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
4 NEW CONCRETE TOPPING SLAB OVER EXISTING SLAB TO ALIGN WITH ADJACENT FINISH FLOOR ELEVATION (AS SHOWN WITH HONEYCOMB HATCH). COORDINATE EXTENTS WITH EXISTING CONDITIONS AND NEW WORK.
5 NEW CONCRETE RAMP ON GRADE (1:20 SLOPE).
6 DEPRESSED CONCRETE SLAB ON GRADE (AS SHOWN WITH DIAGONAL UP HATCH). COORDINATE EXTENTS & DEPTH WITH EXISTING CONDITIONS, NEW WORK, FINISH PLANS, STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
7 MUD BED SET TILE ON RECESSED CONCRETE SLAB (AS SHOWN WITH A PLUS HATCH). COORDINATE EXTENTS WITH NEW WORK, FINISH PLANS, STRUCTURAL AND PLUMBING.
8 DEPRESSED SLAB 10" FOR INSULATED COOLER-FREEZER AREA (SHOWN WITH A HEXAGON HATCH).
9 FEATHER CONCRETE TOPPING TO CREATE A 1:20 RAMP TO CORRIDOR (AS SHOWN WITH A DIAMOND HATCH). COORDINATE WITH FIELD CONDITIONS.
10 WOOD ATHLETIC FLOORING INFILL TO MATCH EXISTING ADJACENT FLOORING (AS SHOWN WITH FLEX HATCH). VERIFY EXTENTS IN FIELD.
11 STRIP, SAND, REFINISH AND PAINT GAME LINES ON EXISTING WOOD ATHLETIC FLOORING (SHOWN WITH A VERTICAL LINE HATCH).
12 PROVIDE NEW CONCRETE SLAB ON GRADE THROUGHOUT AREA. COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
13 PROVIDE NEW CONCRETE PLANK FLOOR SYSTEM WITH CONCRETE TOPPING SLAB. COORDINATE WITH STRUCTURAL, MECHANICAL, PLUMBING AND ELECTRICAL.
14 KITCHEN EQUIPMENT, MECHANICAL, PLUMBING AND ELECTRICAL DESIGN BY FOOD SERVICE CONSULTANT. REFER TO FSE DRAWINGS.
15 OVERHEAD COILING GRILL. REFER TO DOOR SCHEDULE AND SPECIFICATIONS.
16 WALL PADS PER SPECIFICATION SECTION 11 6623.
17 METAL LOCKERS, LKR-1 (SINGLE TIER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
18 METAL LOCKERS, LKR-2 (SINGLE TIER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
19 METAL LOCKERS, LKR-3 (SINGLE TIER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
20 METAL LOCKERS, LKR-4 (SINGLE TIER ATHLETIC LOCKER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
21 METAL LOCKERS, LKR-5 (FOUR TIER ATHLETIC LOCKER), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
22 METAL LOCKERS, LKR-6 (ATHLETIC WARDROBE LOCKER WITH LOCKABLE BENCH), SEE SPEC - QUANTITY AS SHOWN. SHOWN ON PLANS AS AN EMPTY RECTANGLE.
23 4" CONCRETE CURB, SET FACE OF CURB 1" BACK FROM FACE OF LOCKER, TYPICAL.
24 NEW WALL MOUNTED FLAT PANEL MONITOR - REFER TO INTERIOR ELEVATIONS, COMMUNICATIONS AND ELECTRICAL DRAWINGS.
25 CARD READER. REFER TO SECURITY PLANS.
26 BARRIER-FREE DOOR ACTUATOR BUTTON (WALL MOUNTED).
27 KNOX BOX.
28 PATCH AND REPAIR WALL AT AREA OF DEMOLITION AS REQUIRED TO MATCH ADJACENT. MASONRY TO BE TOOTHED-IN UNLESS NOTED OTHERWISE.
29 INFILL EXISTING OPENING WITH CMU OR BRICK TO MATCH EXISTING ADJACENT CONDITIONS - MATCH THICKNESS AS REQUIRED TO BE FLUSH ON BOTH SIDES. MEET RATING REQUIREMENTS AS INDICATED ON PLANS. TOOTH-IN MASONRY AT JAMBS.
30 PROVIDE 2" WIDE MASONRY EXPANSION JOINT FILLER BASED ON EMSEAL COLORSEAL
31 ALIGN NEW WALL PARTITION FLUSH WITH EXISTING CONSTRUCTION.
32 REFINISH EXISTING TERRAZZO FLOOR WHERE EXISTING CONCRETE LOCKER CURBS WERE REMOVED. COORDINATE WITH DEMOLITION.
33 EXTEND WALL UP TO DECK AND PATCH AS REQUIRED TO BE SMOKE RESISTIVE.
34 PREP EXISTING GLAZED BLOCK FOR NEW WALL FINISH - REFER TO A 600 SHEETS
35 OPERABLE WINDOW INSET IN STOREFRONT SYSTEM
36 BI-LEVEL ELECTRIC WATER COOLER WITH INTEGRAL BOTTLE FILLER. COORDINATE WITH PLUMBING DRAWINGS.
37 BOTTLE FILL WITH BUILT-IN CHILLER. COORDINATE WITH PLUMBING DRAWINGS.
38 PLUMBING FIXTURE. COORDINATE WITH PLUMBING DRAWINGS.
39 FLOOR DRAIN. COORDINATE WITH PLUMBING DRAWINGS.
40 FLOOR SINK - REFER TO PLUMBING DRAWINGS.
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CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

FIRST FLOOR PLAN - UNIT J
1/8" = 1'-0"

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ADDENDUM 1 — NOVEMBER 29, 2021

ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR PLAN - UNIT J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 101.2J
17-175.70

SHEET TITLE
ROOF PLAN

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

SHEET NUMBER
A 103.2

DATE
NOVEMBER 3, 2021

17-175.70

ROOF PLAN KEY

TAPERED INSULATION

- AREA #1 - SINGLE-PLY MEMBRANE ON 1/2" COVERBOARD, TAPERED RIGID INSULATION AS REQUIRED AND 5" RIGID INSULATION ON 1-1/2" METAL DECK.
- AREA #2 - SINGLE-PLY MEMBRANE ON 1/2" COVERBOARD, TAPERED RIGID INSULATION AS REQUIRED AND 5" RIGID INSULATION ON EXISTING ROOF DECK.
- AREA #3 - SINGLE-PLY MEMBRANE ON 1/2" COVERBOARD, TAPERED RIGID INSULATION AS REQUIRED AND 5" RIGID INSULATION ON EXISTING ROOF DECK.
- AREA #4 - SINGLE-PLY MEMBRANE ON 1/2" COVERBOARD, TAPERED RIGID INSULATION AS REQUIRED AND 5" RIGID INSULATION ON EXISTING ROOF DECK.
- AREA #5 - SINGLE-PLY MEMBRANE ON 1/2" COVERBOARD, TAPERED RIGID INSULATION AS REQUIRED AND 5" RIGID INSULATION ON EXISTING ROOF DECK.
- AREA #6 - SINGLE-PLY MEMBRANE ON 1/2" COVERBOARD, TAPERED RIGID INSULATION AS REQUIRED AND 5" RIGID INSULATION ON EXISTING ROOF DECK.

E.R.D. EXISTING ROOF DRAIN - SEE PLUMBING DRAWINGS

R.D. ROOF DRAIN - SEE PLUMBING DRAWINGS

O.D. OVERFLOW DRAIN - SEE PLUMBING DRAWINGS

ROOF SLOPE DUE TO TAPERED INSULATION OR SLOPED STRUCTURE - REFER TO STRUCTURAL DRAWINGS

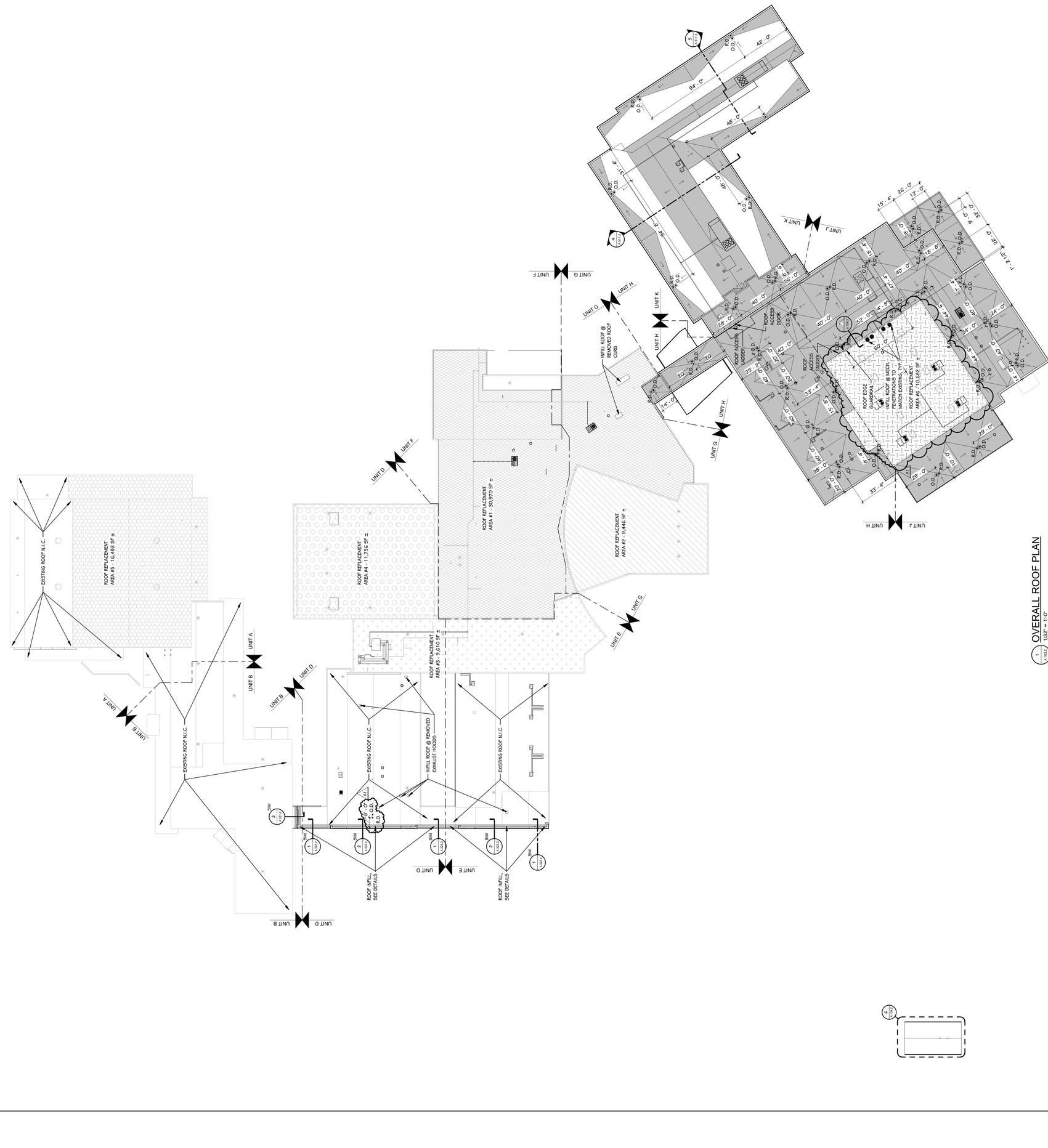
ARU OR RTU ROOF TOP UNIT - SEE MECHANICAL DRAWINGS

ACCU CONDENSING UNIT - SEE MECHANICAL DRAWINGS

E.F. EXHAUST FAN / HOOD - SEE MECHANICAL DRAWINGS

NOTES

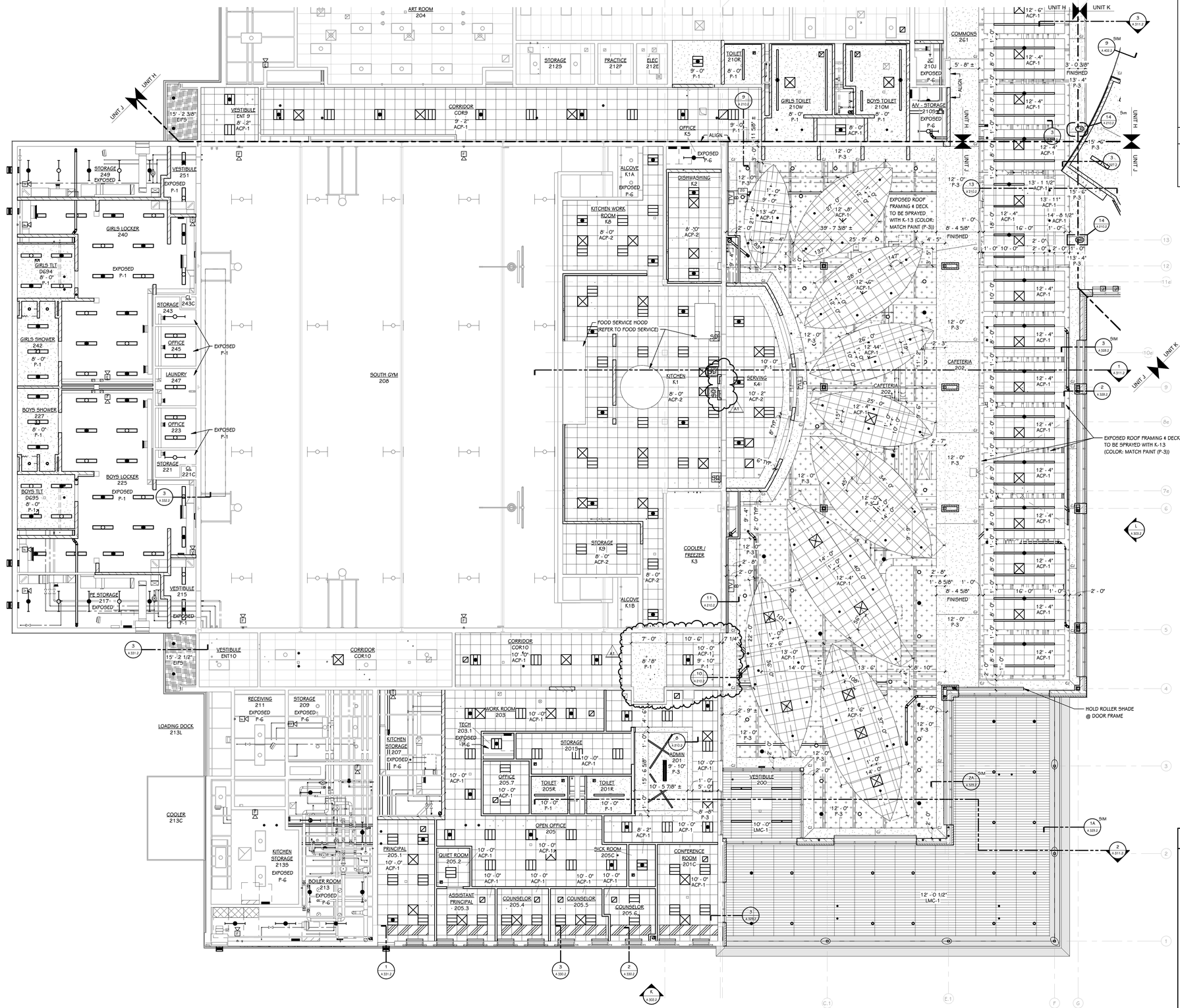
1. TYPICAL ROOF SLOPE 1/4" / 1'-0" UNLESS NOTED OTHERWISE.
2. PROVIDE ROOFING MANUFACTURERS STANDARD ROOFING TERMINATION DETAILS AT ALL PARAPETS, PRE-MANUFACTURED ROOF EDGE SYSTEMS, CURBS, PIPE PENETRATIONS, ETC.
3. PROVIDE CRICKETS AS REQUIRED AT ALL MECHANICAL UNITS, VENTS, ETC. TO MAINTAIN POSITIVE SLOPE OF 1/4":1'-0" MINIMUM.



1 OVERALL ROOF PLAN
1/32" = 1'-0"

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FIRST FLOOR REFLECTED CEILING PLAN - UNIT J

1/8" = 1'-0"

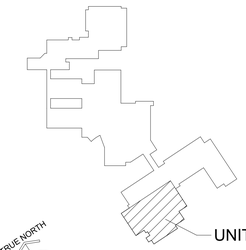
REFLECTED CEILING KEY

- GYPSUM BOARD
- LAY-IN ACOUSTICAL TILE GRID
- EIFS
- LINEAR METAL CEILING (LMC)
- "K-13" SPRAY APPLIED INSULATION
- LIGHTING - REFER TO ELECTRICAL LIGHTING PLAN OR MECHANICAL - REFER TO MECHANICAL SHEET METAL PLAN

REFLECTED CEILING GENERAL NOTES

1. WHERE CEILING TILE IS LESS THAN 3" AT PERIMETER OF ROOM PROVIDE A CUT 2x4 TILE IN LIEU OF FULL 2x2 TILE AND SMALL PIECE OF TILE OR DOUBLE GRID - MATCH 2x2 FOR STYLE AND COLOR.
2. REFER TO PLAN DETAIL 1/A 210 FOR TYPICAL BULKHEAD AT CMU WALL.

CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

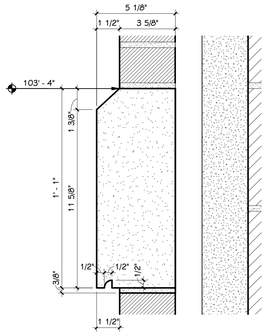
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

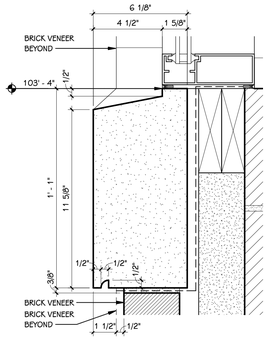
SHEET TITLE
FIRST FLOOR REFLECTED CEILING
PLAN - UNIT J

DATE
NOVEMBER 3, 2021

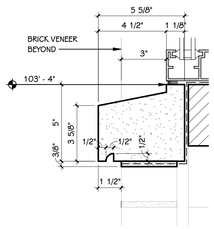
SHEET NUMBER
A 201.2J
17-175.70



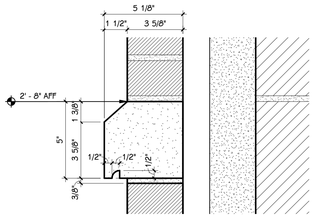
CS1 A.320.2 — CAST STONE BAND @ CAFETERIA - UNIT J
3" = 1'-0"



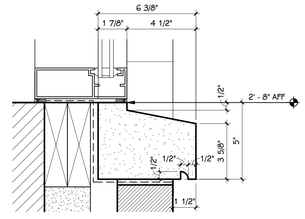
CS2 A.320.2 — CAST STONE SILL @ CAFETERIA - UNIT J
3" = 1'-0"



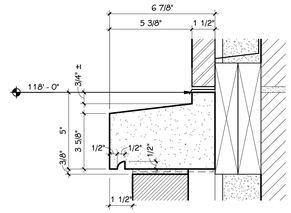
CS3 A.320.2 — CAST STONE SILL @ EXISTING WALL
3" = 1'-0"



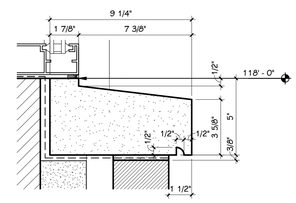
CS4 A.320.2 — TYPICAL CAST STONE BAND
3" = 1'-0"



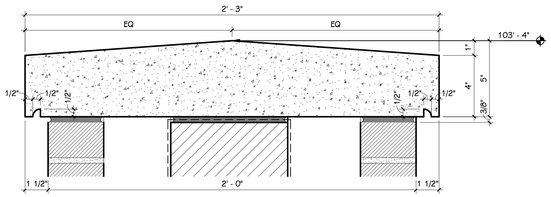
CS5 A.320.2 — TYPICAL CAST STONE SILL
3" = 1'-0"



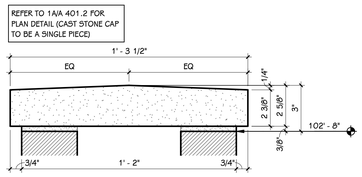
CS6 A.320.2 — CAST STONE BAND @ METAL PANEL & BRICK TRANSITION
3" = 1'-0"



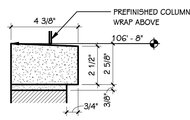
CS7 A.320.2 — CAST STONE SILL @ METAL PANEL & BRICK TRANSITION
3" = 1'-0"



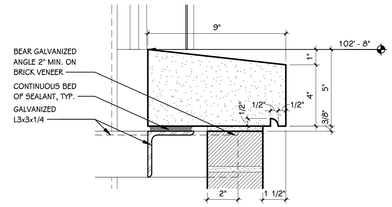
CS8 A.320.2 — CAST STONE CAP - UNIT H ENTRY
3" = 1'-0"



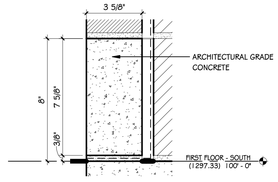
CS9 A.320.2 — CAST STONE CAP - MONUMENTAL STAIR BENCH
3" = 1'-0"



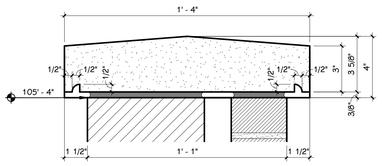
CS10 A.320.2 — CAST STONE CAP - INTERIOR COLUMN WRAP MASONRY CAP
3" = 1'-0"



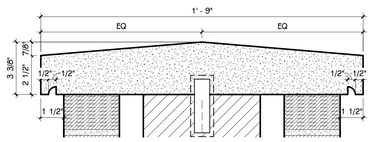
CS11 A.320.2 — CAST STONE CAP - ENTRY CANOPY PIERS - UNIT J
3" = 1'-0"



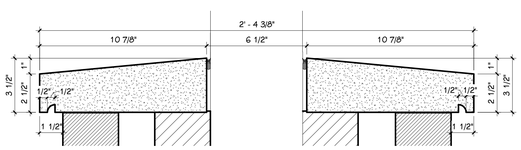
CS12 A.320.2 — CONCRETE BASE - WALL INFILL
3" = 1'-0"



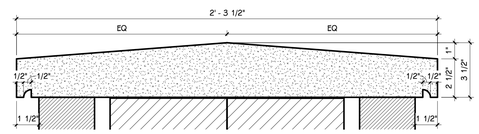
CS13 A.320.2 — CAST STONE CAP - TYPICAL SCREEN WALL
3" = 1'-0"



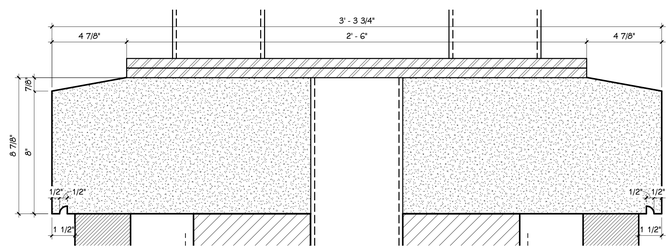
CS15 A.320.2 — SECTION DETAIL - CAST STONE @ HONOR WALL
3" = 1'-0"



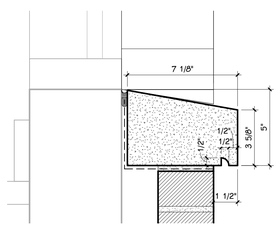
CS16 A.320.2 — SECTION DETAIL - CAST STONE CAP @ FLAG PIER
3" = 1'-0"



CS17 A.320.2 — SECTION DETAIL - CAST STONE CAP @ TYPICAL PIER
3" = 1'-0"

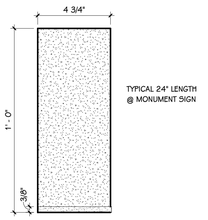


CS18 A.320.2 — SECTION DETAIL - CAST STONE @ ENTRY PIER
3" = 1'-0"

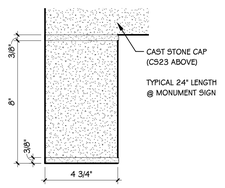


CS19 A.320.3 — SECTION DETAIL - CAST STONE @ TICKET BOOTH
3" = 1'-0"

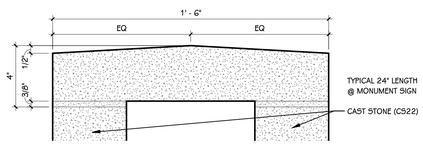
A1



CS21 A.320.2 — SECTION DETAIL - TYPICAL CAST STONE @ MONUMENT SIGN
3" = 1'-0"



CS22 A.320.2 — SECTION DETAIL - 8" HIGH CAST STONE @ MONUMENT SIGN
3" = 1'-0"



CS23 A.320.2 — SECTION DETAIL - CAST STONE CAP @ MONUMENT SIGN
3" = 1'-0"

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

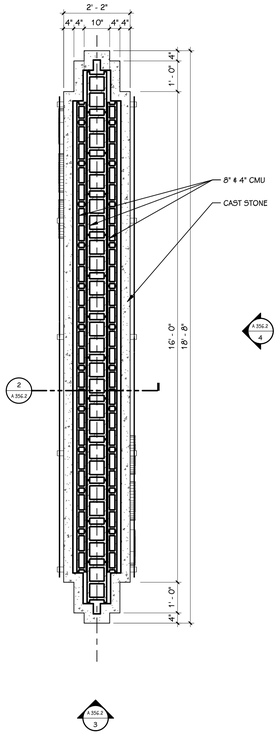
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

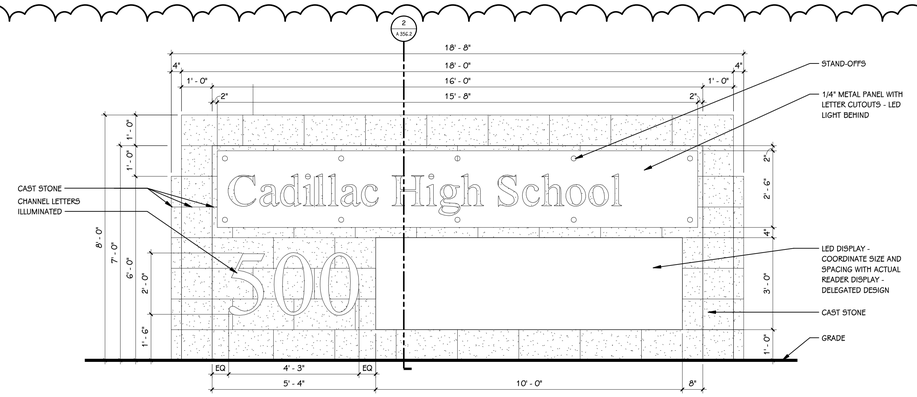
SHEET TITLE
CUSTOM MASONRY PROFILES

DATE
NOVEMBER 3, 2021

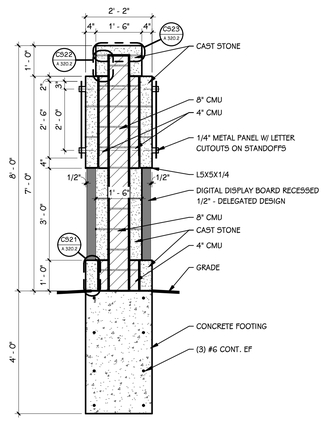
SHEET NUMBER
A 320.2
17-175.70



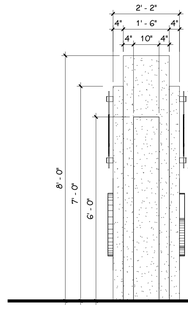
6 A 356.2 ENLARGED PLAN - MONUMENT SIGN
1/2" = 1'-0"



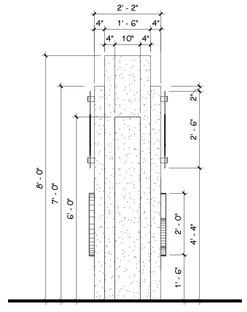
4 A 356.2 MONUMENT SIGN - WEST
1/2" = 1'-0"



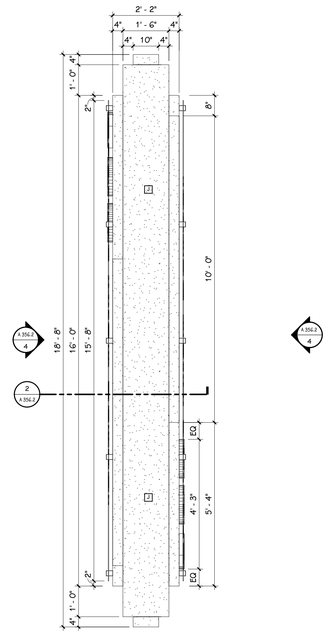
2 A 356.2 MONUMENT SIGN SECTION
1/2" = 1'-0"



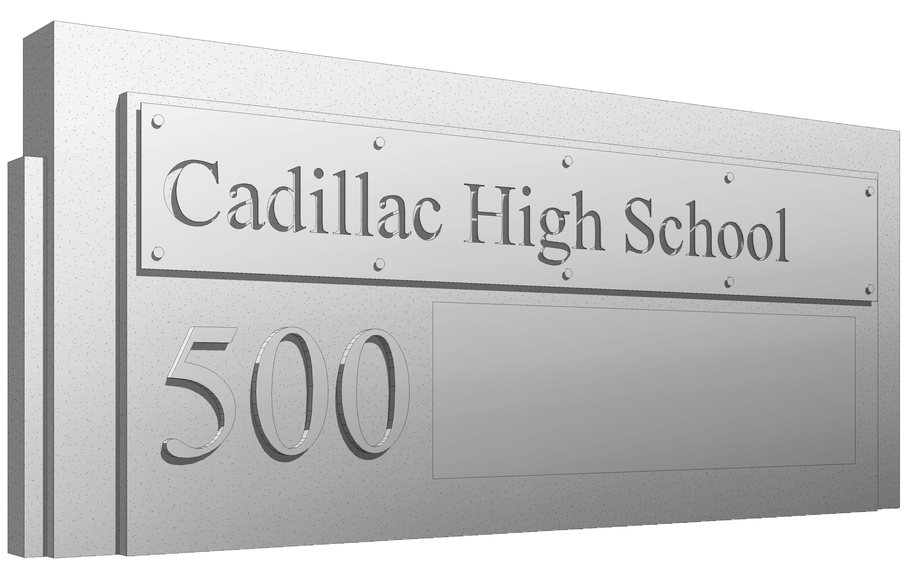
3 A 356.2 MONUMENT SIGN - NORTH
1/2" = 1'-0"



5 A 356.2 MONUMENT SIGN - SOUTH
1/2" = 1'-0"



7 A 356.2 ENLARGED PLAN - MONUMENT SIGN - CAST STONE
1/2" = 1'-0"



1 A 356.2 MONUMENTAL SIGN

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ADDENDUM 1 NOVEMBER 29, 2021

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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

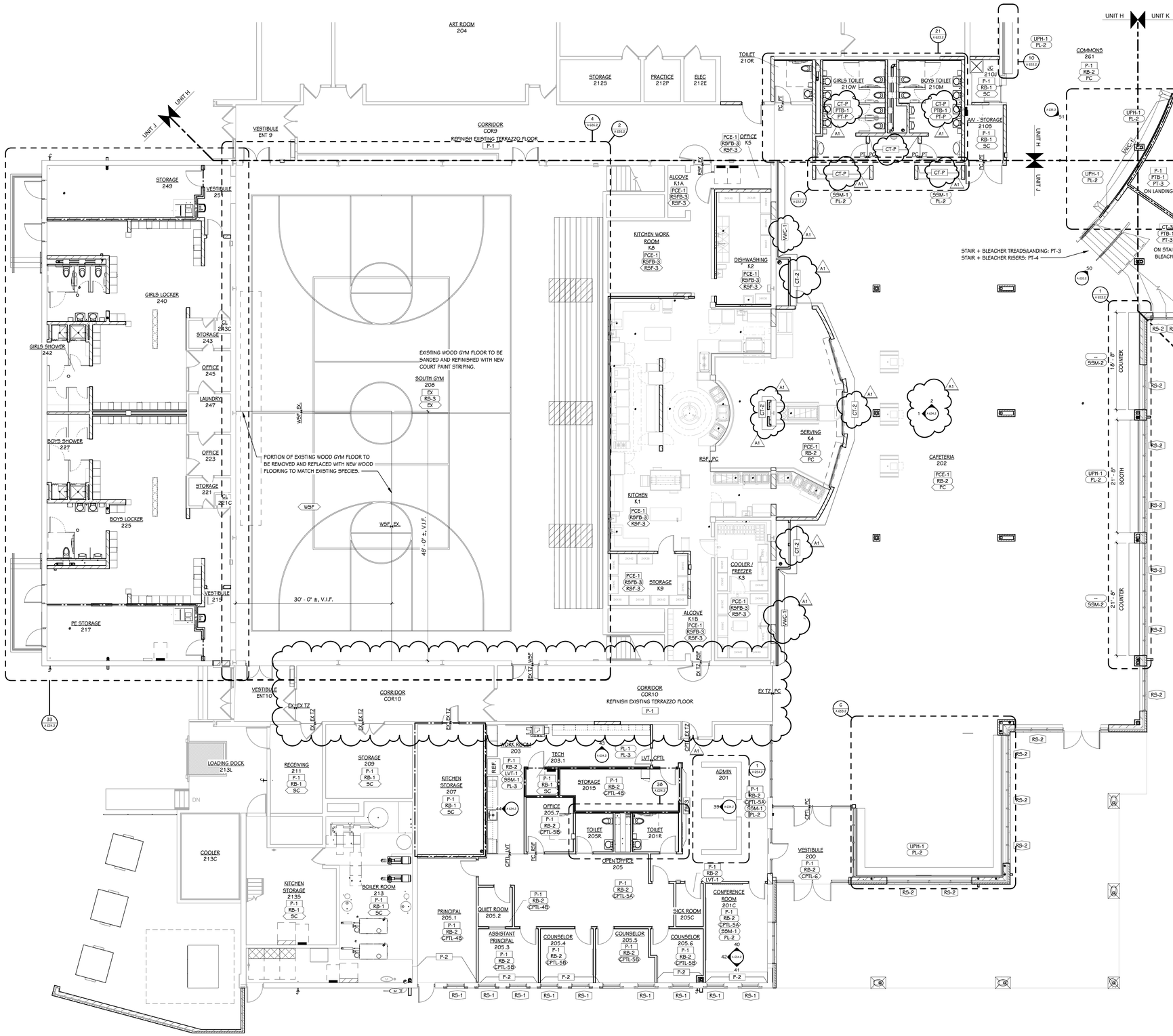
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ENLARGED MONUMENT SIGN PLANS,
SECTIONS & DETAILS

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 356.2
17-175.70



FIRST FLOOR FINISH PLAN - UNIT J

1/8" = 1'-0"

FINISH KEY

- P-# / RB-# / CPT-# — WALL FINISH / FLOOR BASE / FLOOR FINISH
- REFER TO MATERIAL SELECTION SCHEDULE FOR FINISH INFORMATION
- PL-# / PL-# — COUNTER FINISH / CABINET FINISH (BASE AND UPPER)
- P-# — INDICATES EXTENT OF ATYPICAL FINISH
- VCT / CPT — INDICATES FLOOR MATERIAL TRANSITION. NOTE - REFER TO MATERIAL SELECTION SCHEDULE REMARKS FOR FLOOR TRANSITION TYPE
- MULTI — INDICATES MULTIPLE MATERIAL TYPES ON A SURFACE. REFER TO DETAIL OR ELEVATIONS.
- - P — INDICATES MATERIAL PATTERN. REFER TO DETAILS

FINISH PLAN GENERAL NOTES

1. REFER TO ARCHITECTURAL FLOOR PLANS AND SPECIFICATION FOR ADDITIONAL INFORMATION ON CONSTRUCTION MATERIALS.
2. REFER TO REFLECTED CEILING PLANS FOR CEILING FINISH AND HEIGHTS.
3. AT AREAS OF EXPOSED CEILING WHERE THE DUCT WORK AND DIFFUSERS ARE TO BE PAINTED, COORDINATE WITH MECHANICAL SPECIFICATIONS AND REFER TO THE REFLECTED CEILING PLANS FOR PAINT COLORS.
4. REFER TO DOOR SCHEDULE FOR FINISH ON DOORS AND FRAMES.
5. WALL MOUNTED DIFFUSERS, GRILLES, ACCESS PANELS, ELECTRICAL PANELS, ETC. ARE TO BE PAINTED WITH AN OIL-BASED PAINT TO MATCH THE ADJACENT WALL FINISH.
6. CEILING ACCESS PANELS ARE TO BE PAINTED TO MATCH ADJACENT CEILING FINISH.
7. REFER TO ARCHITECTURAL FLOOR PLANS FOR LOCKER LOCATIONS, FINISHES AND QUANTITIES.
8. FINISH TAGS APPLY TO LIKE MATERIALS IN ENTIRE ROOM. I.E. CASEWORK TAG MAY ONLY CALLOUT ONE RUN OF CASEWORK, BUT ALL CASEWORK IN ROOM RECEIVE THE SAME FINISHES, UNLESS TAGGED DIFFERENTLY.
9. CASEWORK FINISH TAGS DO NOT APPLY TO CUSTOM MILLWORK PIECES. REFER TO THEIR SECTIONS AND/OR ELEVATIONS FOR FINISH MATERIALS.
10. REFER TO ENLARGED STAIR PLANS AND SECTIONS FOR FINISH COLORS OF STRINGERS AND GUARDRAILS.
11. PUBLIC TOILET ROOM PARTITIONS ARE TO BE TYPE-X, LOCKER ROOM PARTITION ARE TO BE TYPE-Y.
12. ALL EXPOSED COLUMNS TO BE PAINTED P-X.
13. SPACES WITHOUT FINISH TAGS: EXISTING FINISHES TO REMAIN.

WINDOW TREATMENT KEY

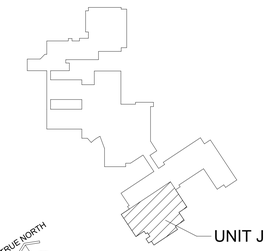
- R5-1 — MANUAL SINGLE ROLLER SHADE, BASIS OF DESIGN: MERMET E SCREEN, FABRIC: PEARL/LINEN, 5% OPEN
- R5-2 — REMOTE CONTROLLED DUAL ROLLER SHADE, BASIS OF DESIGN: MERMET E SCREEN, FABRIC: PEARL/LINEN, 5% OPEN

1. REFER TO SPECIFICATION FOR MORE INFORMATION.
2. WINDOW TREATMENT TAGS SHOWN ON PLAN REPRESENTS A SINGLE SHADE, UNLESS NOTED OTHERWISE.
3. REFER TO FLOOR PLANS, EXTERIOR ELEVATIONS AND FRAME TYPES FOR HEIGHT AND WIDTH OF OPENINGS.
4. WINDOW TREATMENTS ARE TO BE MOUNTED INSIDE OF THE WINDOW OPENING FROM HEAD TO SILL AND JAMB TO JAMB, UNLESS NOTED OTHERWISE.
5. VERIFY ALL DIMENSIONS IN FIELD PRIOR TO FABRICATION.

FINISH PLAN KEY: CARPET TILE

- CPTL-1, INSTALL ASHLAR.
- CPTL-2A, INSTALL ASHLAR.
- CPTL-2B, INSTALL ASHLAR.
- CPTL-3A, INSTALL ASHLAR.
- CPTL-3B, INSTALL ASHLAR.
- COMPRISED EQUAL MIX OF CPTL-7 AND CPTL-8, INSTALL STAGGERED.

CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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ADDENDUM 1	NOVEMBER 29, 2021

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

PROJECT TITLE
CADILLAC HIGH SCHOOL
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

SHEET TITLE
FIRST FLOOR FINISH PLAN - UNIT J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 601.2J
17-175.70

FINISH PLAN KEY: CARPET TILE

- CPTL-1, INSTALL ASHLAR.
- CPTL-2A, INSTALL ASHLAR.
- CPTL-2B, INSTALL ASHLAR.
- CPTL-3A, INSTALL ASHLAR.
- CPTL-3B, INSTALL ASHLAR.
- COMPRISED EQUAL MIX OF CPTL-7 AND CPTL-8, INSTALL STAGGERED.

FINISH KEY

P-# — WALL FINISH
RB-# — FLOOR BASE
CPT-# — FLOOR FINISH

REFER TO MATERIAL SELECTION SCHEDULE FOR FINISH INFORMATION

PL-# — COUNTER FINISH
PL-# — CABINET FINISH (BASE AND UPPER)

P-# — INDICATES EXTENT OF ATYPICAL FINISH

VCT / CPT — INDICATES FLOOR MATERIAL TRANSITION
NOTE - REFER TO MATERIAL SELECTION SCHEDULE REMARKS FOR FLOOR TRANSITION TYPE

MULTI — INDICATES MULTIPLE MATERIAL TYPES ON A SURFACE. REFER TO DETAIL OR ELEVATIONS.

- P - — INDICATES MATERIAL PATTERN. REFER TO DETAILS

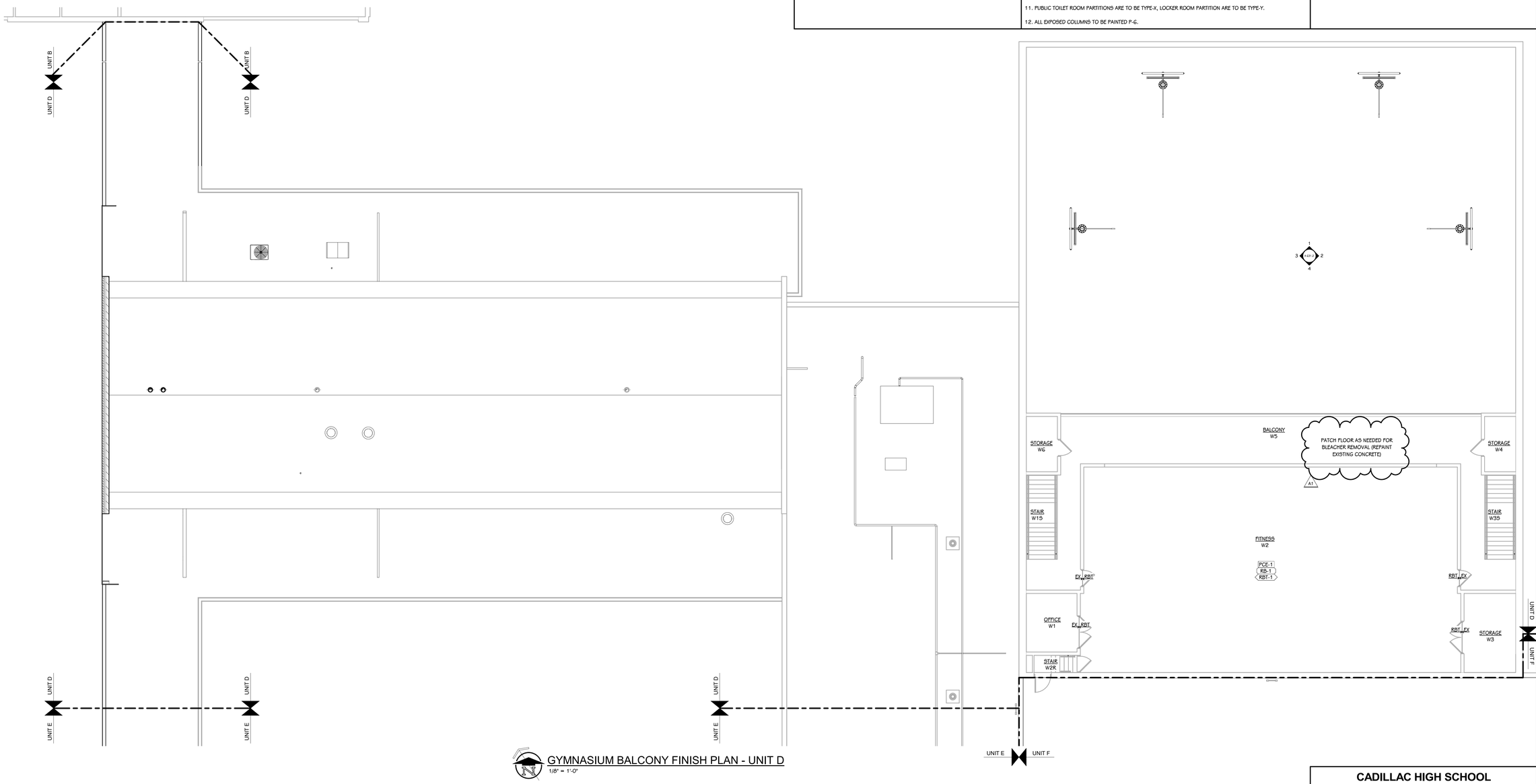
FINISH PLAN GENERAL NOTES

1. REFER TO ARCHITECTURAL FLOOR PLANS AND SPECIFICATION FOR ADDITIONAL INFORMATION ON CONSTRUCTION MATERIALS.
2. REFER TO REFLECTED CEILING PLANS FOR CEILING FINISH AND HEIGHTS.
3. AT AREAS OF EXPOSED CEILING WHERE THE DUCT WORK AND DIFFUSERS ARE TO BE PAINTED, COORDINATE WITH MECHANICAL SPECIFICATIONS AND REFER TO THE REFLECTED CEILING PLANS FOR PAINT COLORS.
4. REFER TO DOOR SCHEDULE FOR FINISH ON DOORS AND FRAMES.
5. WALL MOUNTED DIFFUSERS, GRILLES, ACCESS PANELS, ELECTRICAL PANELS, ETC. ARE TO BE PAINTED WITH AN OIL-BASED PAINT TO MATCH THE ADJACENT WALL FINISH.
6. CEILING ACCESS PANELS ARE TO BE PAINTED TO MATCH ADJACENT CEILING FINISH.
7. REFER TO ARCHITECTURAL FLOOR PLANS FOR LOCKER LOCATIONS, FINISHES AND QUANTITIES.
8. FINISH TAGS APPLY TO LIKE MATERIALS IN ENTIRE ROOM. I.E. CASEWORK TAG MAY ONLY CALLOUT ONE RUN OF CASEWORK, BUT ALL CASEWORK IN ROOM RECEIVE THE SAME FINISHES, UNLESS TAGGED DIFFERENTLY.
9. CASEWORK FINISH TAGS DO NOT APPLY TO CUSTOM MILLWORK PIECES. REFER TO THEIR SECTIONS AND/OR ELEVATIONS FOR FINISH MATERIALS.
10. REFER TO ENLARGED STAIR PLANS AND SECTIONS FOR FINISH COLORS OF STRINGERS AND GUARDRAILS.
11. PUBLIC TOILET ROOM PARTITIONS ARE TO BE TYPE-X, LOCKER ROOM PARTITION ARE TO BE TYPE-Y.
12. ALL EXPOSED COLUMNS TO BE PAINTED P-6.

WINDOW TREATMENT KEY

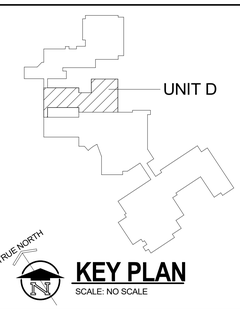
- RS-1 — MANUAL ROLLER SHADE, BASIS OF DESIGN: MERMET E SCREEN, FABRIC: PEARL/LINEN, 5% OPEN
- RS-2 — MOTORIZED DUAL-ROLLER SHADE, BASIS OF DESIGN: MERMET AVILA TWILIGHT,FABRIC: WHITE, 0% OPEN BASIS OF DESIGN: MERMET E SCREEN, FABRIC: PEARL/LINEN, 5% OPEN

1. REFER TO SPECIFICATION FOR MORE INFORMATION.
2. WINDOW TREATMENT TAGS SHOWN ON PLAN REPRESENTS A SINGLE SHADE.
3. REFER TO FLOOR PLANS, EXTERIOR ELEVATIONS AND FRAME TYPES FOR HEIGHT AND WIDTH OF OPENINGS.
4. WINDOW TREATMENTS ARE TO BE MOUNTED INSIDE OF THE WINDOW OPENING FROM HEAD TO SILL AND JAMB TO JAMB, UNLESS NOTED OTHERWISE.
5. VERIFY ALL DIMENSIONS IN FIELD PRIOR TO FABRICATION.



GYMNASIUM BALCONY FINISH PLAN - UNIT D
1/8" = 1'-0"

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 — NOVEMBER 29, 2021
ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

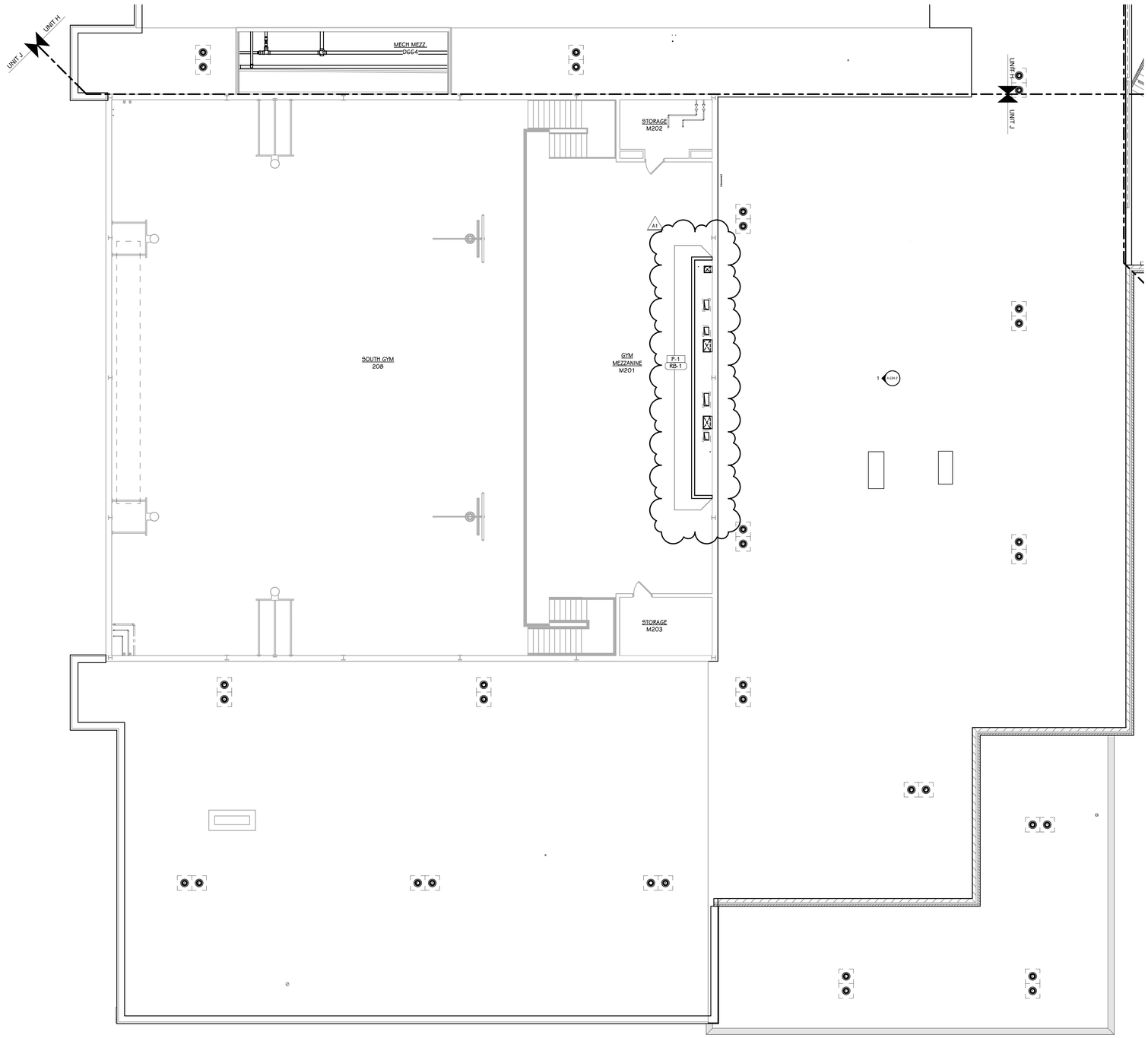
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
SECOND FLOOR FINISH PLAN - UNIT D

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 602.2D
17-175.70



GYMNASIUM BALCONY & MEZZANNINE FINISH PLAN - UNIT J
1/8" = 1'-0"

FINISH KEY

P-#, RD-#, CPT-# — WALL FINISH, FLOOR BASE, FLOOR FINISH
REFER TO MATERIAL SELECTION SCHEDULE FOR FINISH INFORMATION
PL-#, PL-# — COUNTER FINISH, CABINET FINISH (BASE AND UPPER)
P-# — INDICATES EXTENT OF ATYPICAL FINISH
VCT / CPT — INDICATES FLOOR MATERIAL TRANSITION. NOTE - REFER TO MATERIAL SELECTION SCHEDULE REMARKS FOR FLOOR TRANSITION TYPE
MULTI — INDICATES MULTIPLE MATERIAL TYPES ON A SURFACE. REFER TO DETAIL OR ELEVATIONS.
- P — INDICATES MATERIAL PATTERN. REFER TO DETAILS

FINISH PLAN GENERAL NOTES

1. REFER TO ARCHITECTURAL FLOOR PLANS AND SPECIFICATION FOR ADDITIONAL INFORMATION ON CONSTRUCTION MATERIALS.
2. REFER TO REFLECTED CEILING PLANS FOR CEILING FINISH AND HEIGHTS.
3. AT AREAS OF EXPOSED CEILING WHERE THE DUCT WORK AND DIFFUSERS ARE TO BE PAINTED, COORDINATE WITH MECHANICAL SPECIFICATIONS AND REFER TO THE REFLECTED CEILING PLANS FOR PAINT COLORS.
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5. WALL MOUNTED DIFFUSERS, GRILLES, ACCESS PANELS, ELECTRICAL PANELS, ETC. ARE TO BE PAINTED WITH AN OIL-BASED PAINT TO MATCH THE ADJACENT WALL FINISH.
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10. REFER TO ENLARGED STAIR PLANS AND SECTIONS FOR FINISH COLORS OF STRINGERS AND GUARDRAILS.
11. PUBLIC TOILET ROOM PARTITIONS ARE TO BE TYPE-X, LOCKER ROOM PARTITION ARE TO BE TYPE-Y.
12. ALL EXPOSED COLUMNS TO BE PAINTED P-X.
13. SPACES WITHOUT FINISH TAGS: EXISTING FINISHES TO REMAIN.

WINDOW TREATMENT KEY

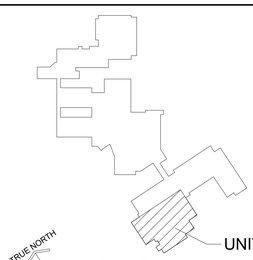
RS-1 — MANUAL SINGLE ROLLER SHADE, BASIS OF DESIGN: MERMET E SCREEN, FABRIC: PEARL/LINEN, 5% OPEN
RS-2 — REMOTE CONTROLLED DUAL ROLLER SHADE, BASIS OF DESIGN: MERMET E SCREEN, FABRIC: PEARL/LINEN, 5% OPEN

1. REFER TO SPECIFICATION FOR MORE INFORMATION.
2. WINDOW TREATMENT TAGS SHOWN ON PLAN REPRESENTS A SINGLE SHADE, UNLESS NOTED OTHERWISE.
3. REFER TO FLOOR PLANS, EXTERIOR ELEVATIONS AND FRAME TYPES FOR HEIGHT AND WIDTH OF OPENINGS.
4. WINDOW TREATMENTS ARE TO BE MOUNTED INSIDE OF THE WINDOW OPENING FROM HEAD TO SILL AND JAMB TO JAMB, UNLESS NOTED OTHERWISE.
5. VERIFY ALL DIMENSIONS IN FIELD PRIOR TO FABRICATION.

FINISH PLAN KEY: CARPET TILE

- CPTL-1, INSTALL ASHLAR.
- CPTL-2A, INSTALL ASHLAR.
- CPTL-2B, INSTALL ASHLAR.
- CPTL-3A, INSTALL ASHLAR.
- CPTL-3B, INSTALL ASHLAR.
- COMPRISED EQUAL MIX OF CPTL-7 AND CPTL-8, INSTALL STAGGERED.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 — NOVEMBER 29, 2021
ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
SECOND FLOOR FINISH PLAN - UNIT J

DATE
NOVEMBER 3, 2021

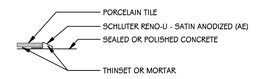
SHEET NUMBER
A 602.2J
17-175.70

MATERIAL SELECTION SCHEDULE

ABBREV	ITEM	MANUFACTURER	PATTERN	COLOR	PRODUCT NO.	SIZE	REMARKS
ACP-1	ACOUSTIC CEILING PANEL	ARMSTRONG	ULTIMA	WHITE	1900	24'X24'X3/4"	15/16" SQUARE LAY IN, 4" AXIOM TRIM AT EXPOSED EDGES
ACP-2	ACOUSTIC CEILING PANEL	ARMSTRONG	KITCHEN ZONE	WHITE	673	24'X24'X5/8"	15/16" SQUARE LAY IN.
AWP-1	ACOUSTIC WALL PANEL	KIREI	ECHOLINE 45 (4.0 STRIPE WIDTH)	124	--		
AWP-2	ACOUSTIC WALL PANEL	KIREI	ECHOLINE 45 (1.0 STRIPE WIDTH)	444	--		
AWP-3	ACOUSTIC WALL PANEL	KINETICS	HARDSIDE 2"	UPHOLSTERY: MAHARAM - MESSENGER (LUMINE)	--	2" THICKNESS. REFER TO ELEVATIONS FOR ADDITIONAL DIMENSIONS.	
AWP-4	ACOUSTIC WALL PANEL	KINETICS	HARDSIDE 4"	UPHOLSTERY: MAHARAM - MESSENGER (LUMINE)	--	4" THICKNESS. REFER TO ELEVATIONS FOR ADDITIONAL DIMENSIONS.	
AWP-5	IMPACT RESISTANT WALL PANEL	KINETICS	SPORTS BOARD ELITE	UPHOLSTERY: MAHARAM - MERIT (IMMERSED)	--	2" THICKNESS. REFER TO ELEVATIONS FOR ADDITIONAL DIMENSIONS.	
AWP-6	IMPACT RESISTANT WALL PANEL	KINETICS	SPORTS BOARD ELITE	UPHOLSTERY: MAHARAM - MERIT (OVERCAST)	--	2" THICKNESS. REFER TO ELEVATIONS FOR ADDITIONAL DIMENSIONS.	
BBC-1	BULLETIN BOARD CORK	FORBO	BULLETIN BOARD	NUTMEG SPICE	2166		
CPTL-1	CARPET TILE	INTERFACE	SOURCE MATERIAL	NICKEL	1632904K00	19.69"X19.69"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-2A	CARPET TILE	INTERFACE	VIVA COLORES (GOLD)	AMARILLO	1465004K0V	9.845"X39.38"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-2B	CARPET TILE	INTERFACE	VIVA COLORES (BLUE)	ZAFIRO	146500250H	9.845"X39.38"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-3A	CARPET TILE	INTERFACE	UPLOAD (GOLD)	CUSTOM (NUMBER TO BE ASSIGNED)	1611604K00	9.845"X39.38"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-3B	CARPET TILE	INTERFACE	UPLOAD (BLUE)	CUSTOM (NUMBER TO BE ASSIGNED)	1611604K00	9.845"X39.38"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-4A	CARPET TILE	INTERFACE	BITRATE (GOLD)	CUSTOM (NUMBER TO BE ASSIGNED)	1611604K00	9.845"X39.38"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-4B	CARPET TILE	INTERFACE	BITRATE (BLUE)	CUSTOM (NUMBER TO BE ASSIGNED)	1611604K00	9.845"X39.38"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-5A	CARPET TILE (ADMIN)	INTERFACE	DETOURS AHEAD (GOLD)	CUSTOM (NUMBER TO BE ASSIGNED)	1466602500	19.69"X19.69"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-5B	CARPET TILE (ADMIN)	INTERFACE	DETOURS AHEAD (BLUE)	CUSTOM (NUMBER TO BE ASSIGNED)	1466602500	19.69"X19.69"	ASHLAR INSTALL. REFER TO PLANS FOR ADDITIONAL INSTALLATION PATTERN INFORMAITON.
CPTL-6	CARPET TILE (WALK OFF)	SHAW CONTRACT	ENTREE	CHARCOAL	5T033	24'X24"	QUARTER TURN
CPTL-7	CARPET TILE (WELLNESS CENTER)	SHAW CONTRACT	SUSPEND	CALM	5T391	9"X36"	HERRINGBONE
CPTL-8	CARPET TILE (WELLNESS CENTER)	SHAW CONTRACT	HABITAT	CALM	5T390	9"X36"	HERRINGBONE
CPTL-9	CARPET TILE (ROBOTICS)	INTERFACE	MONOCHROME	SEAL	138570250H	19.69 in x 19.69 in	MONOLITHIC INSTALL.
CT-1	CERAMIC TILE	MARAZZI	COSTA CLARA	CLOUD	CC20	3X12	REFER TO ELEVATIONS
CT-2	CERAMIC TILE	MARAZZI	COSTA CLARA	OCEAN DRIVE	CC25	3X12	REFER TO ELEVATIONS
CT-3	CERAMIC TILE	MARAZZI	ZELLIGE	CHINA	ZL06	4X4	REFER TO ELEVATIONS
CT-4	CERAMIC TILE	WOW TILE	STRIPES - LISO XL	ICE WHITE GLOSS	--	3X12	
CT-5	CERAMIC TILE	WOW TILE	STRIPES TRANSITION	ICE WHITE GLOSS	--	3X12	
CT-6	CERAMIC TILE	WOW TILE	STRIPES	ICE WHITE GLOSS	--	3X12	
ER-1	EPOXY RESIN	TNEMEC		REFER TO REMARKS	--	--	COMPRISED OF CHIP COLORS TO MATCH P-1 (32%), P-2 (32%), P-3 (28%), AND P-4 (8%)
ERB-1	EPOXY RESIN FLASH COVE BASE	TNECMEC		REFER TO REMARKS			COMPRISED OF CHIP COLORS TO MATCH P-1 (32%), P-2 (32%), P-3 (28%), AND P-4 (8%)
EX	EXISTING	--	--	--	--	--	--
FW-1	FEATURE WALL						COMPRISED OF HANGING ART RAIL, FRAMED ARTWORK, FULL SIZE VINYL WALL GRAPHIC
FW-2	FEATURE WALL						COMPRISED OF HANGING ART RAIL, FRAMED ARTWORK, FULL SIZE VINYL WALL GRAPHIC
FW-3	FEATURE WALL						COMPRISED OF 3D EXTRUDED LOGO/BRANDING FEATURE INSTALLED ON TOP OF VWC-1
G-1	EPOXY GROUT	TEC ACCUCOLOR	--	TBD	--	--	
G-2	EPOXY GROUT	TEC ACCUCOLOR	--	TBD	--	--	
LMC-1	LINEAR METAL CEILING	ARMSTRONG	METALWORKS BLADES	SUBTLE - CINNAMON			
LVT-1	LUXURY VINYL TILE	SHAW CONTRACT	ENVELOP	SWATHE 07211	--	7"X48"X4MM	
P-1	PAINT	SHERWIN WILLIAMS	--	NATURAL CHOICE	SW 7011	--	--
P-2	PAINT	SHERWIN WILLIAMS	--	CLASSIC FRENCH GRAY	SW 0077	--	--
P-3	PAINT	SHERWIN WILLIAMS	--	COMMODORE	SW 6524	--	--
P-4	PAINT	SHERWIN WILLIAMS	--	GLITZY GOLD	SW 6691	--	--
P-5	PAINT	SHERWIN WILLIAMS	--	REFUGE	SW 6228	--	--
P-6	PAINT	SHERWIN WILLIAMS	--	IRON ORE	SW 7069	--	--
P-7	PAINT	SHERWIN WILLIAMS	--	TRICORN BLACK	SW 6258		
PC	POLISHED CONCRETE	CONSUMERS ARTEVIA	ROCKFORD 1 (CPAA CLASS D FINISH)	NATURAL DEEP GRIND	--	--	--
PCE-1	PRE-CATALYZED EPOXY PAINT	SHERWIN WILLIAMS	--	NATURAL CHOICE	SW 7011		
PCE-2	PRE-CATALYZED EPOXY PAINT	SHERWIN WILLIAMS	--	GLITZY GOLD	SW 6691		
PL-1	PLASTIC LAMINATE	PIONITE	LOVE LETTERS	--	AW30050		
PL-2	PLASTIC LAMINATE	WILSONART	HARVEST MAPLE	--	7953		
PL-3	PLASTIC LAMINATE	NEVAMAR	CALM DISTINCTION	--	VAG001T		
PL-4	PLASTIC LAMINATE	TO MATCH EXISTING					
PL-5	PLASTIC LAMINATE	TO MATCH EXISTING					
PSF-1	POLYMER SHEET FLOORING	POLYONYX+	--	BLACK	--	3/4" THICKNESS. 4'X8' SHEETS	
PT-1	PORCELAIN TILE	FLORIM	FAROE	MIST	--	12"X24"	1/3 BOND. USE G-1, 3/16 GROUT JOINT.
PT-2	PORCELAIN TILE	FLORIM	FAROE	SEASHELL	--	12"X24"	1/3 BOND. USE G-1, 3/16 GROUT JOINT.
PT-3	PORCELAIN TILE	CAESAR CERAMICS	LIFE	OAK	--	12"X48"	1/3 BOND. USE G-2, 3/16" GROUT JOINT.
PT-4	PORCELAIN TILE PANEL	CROSSVILLE	BIANCO ASSOLUTO	MATTE	L7956.1M3M	1M X 3M PANEL 5.6MM THICK	CUT TO SIZE OF STAIR RISER + BLEACHER RISER.
PTB-1	PORCELAIN TILE BASE	FLORIM	FAROE	MIST	--	12"X24"	CUT TILE BASE (4"H). USE G-1, 3/16 GROUT JOINT.
PTB-2	PORCELAIN TILE BASE	CAESAR CERAMICS	LIFE	OAK		12"X48"	CUT TILE BASE (4"H). USE G-2, 3/16 GROUT JOINT.
RB-1	RESILIENT BASE	JOHNSONITE	4"H TRADITIONAL WALL BASE	GATEWAY		4"H	--
RB-2	RESILIENT BASE	JOHNSONITE	4"H MILLWORK WALL BASE	GATEWAY		4"H	MITER ALL CORNERS
RB-3	RESILIENT BASE	JOHNSONITE	VENT COVE BASE	BLACK	VCO 40	4"H	MITER INSIDE CORNER CUTS. VENTED COVE CORNER BASE REQUIRED AT OUTSIDE CORNERS.
RBST-1	RUBBER STAIR TREAD WITH INTEGRATED RISER	TARKETT	MESTO CONFIGURATIONS INTEGRAL TREAD/RISER WITH SILVER GREY CONTRAST INSERT.	MAIDEN VOYAGE LIGHT	P55L	--	--
RBT-1	RUBBER TILE	TARKETT	MESTO CONFIGURATIONS	MAIDEN VOYAGE LIGHT	P55L	12"X24"	--
REFIN	SAND & REFINISH EXISTING WOOD FLOOR	--	TO MATCH EXISTING	TO MATCH EXISTING	--	--	--
RSF-1	RESILIENT SPORTS FLOOR	ACTION FLOOR SYSTEMS	ACTION REFLEX SPIN	STONE GREY	--	11.5MM THICK	APPLY EVEN MIXTURE OF PAINT CHIP COLORS: RAL 9010, RAL 1012, RAL 5000. REFER TO FINISH PLANS FOR INSTALLATION PATTERN. SEE DETAILS FOR TRIM APPLICATION.
RSF-2	RESILIENT SPORTS FLOOR	ACTION FLOOR SYSTEMS	ACTION REFLEX SPIN	GRAPHITE GREY		11.5MM THICK	APPLY EVEN MIXTURE OF PAINT CHIP COLORS: RAL 9010, RAL 1012, RAL 5000. REFER TO FINISH PLANS FOR INSTALLATION PATTERN. SEE DETAILS FOR TRIM APPLICATION.
RSF-3	RESILIENT SHEET FLOORING	PROTECT-ALL FLOORING	--	NORTHERN LIGHTS	--	5' X 8' X 1/4"	PROVIDE 4" FLASH COVE BASE AT ALL RSF-3
SC	SEALED CONCRETE	--	--	--	--	--	--
SSM-1	SOLID SURFACE MATERIAL	CORIAN	ANTARTICA	--	--	--	--
UPH-1	UPHOLSTERY	KNOLL	TIGHTROPE	HARVEST	K1798/3	--	
VWC-1	VINYL WALL COVERING	MAHARAM	BURST	KASHA	300053-002		
WSF-1	WOOD SPORTS FLOOR	MATCH EXISTING	MATCH EXISTING	MATCH EXISTING	--	--	--

A1

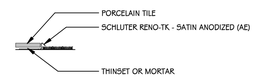
PORCELAIN TILE TO SEALED OR POLISHED CONCRETE



PORCELAIN TILE TO WOOD SPORTS FLOOR
POLISHED CONCRETE TO WOOD SPORTS FLOOR



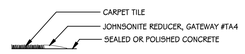
PORCELAIN TILE TO CARPET TILE



CARPET TILE TO LVT



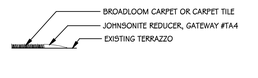
CARPET TILE TO SEALED OR POLISHED CONCRETE



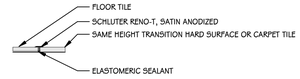
CARPET TILE TO RUBBER TILE



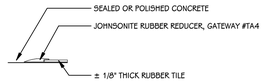
BROADLOOM CARPET + CARPET TILE TO EXISTING TERRAZZO



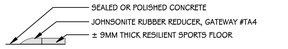
EXISTING TERRAZZO TO EXISTING TILE
CARPET TILE TO EXISTING TILE
CARPET TILE TO EXISTING BROADLOOM CARPET



POLISHED CONCRETE TO RUBBER TILE (RBT-1)

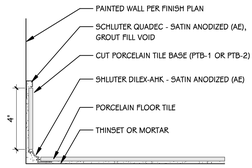


POLISHED CONCRETE OR SEALED CONCRETE TO RESILIENT SPORTS FLOOR (RSF-1)

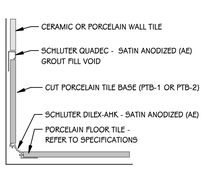


1 / A610.2 TYPICAL FLOOR TRANSITION DETAILS
3" = 1'-0"

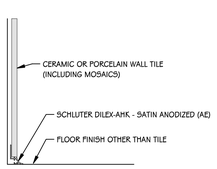
PORCELAIN TILE WALL BASE (PTB-1)



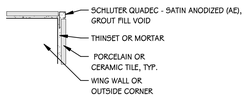
PORCELAIN TILE WALL BASE AT TILED WALLS



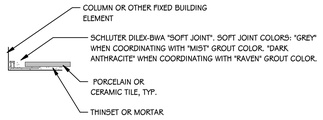
TILED WALLS WITHOUT TILE BASE



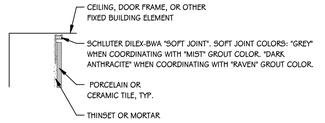
WALL TILE OUTSIDE CORNER



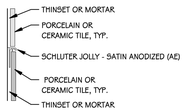
FLOOR TILE SOFT JOINT



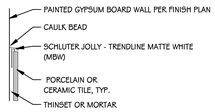
WALL TILE SOFT JOINT



WALL TILE TRANSITION (VERTICAL)



WALL TILE TERMINATION (VERTICAL)



2 / A610.2 TYPICAL TILE TRIM DETAILS
3" = 1'-0"

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

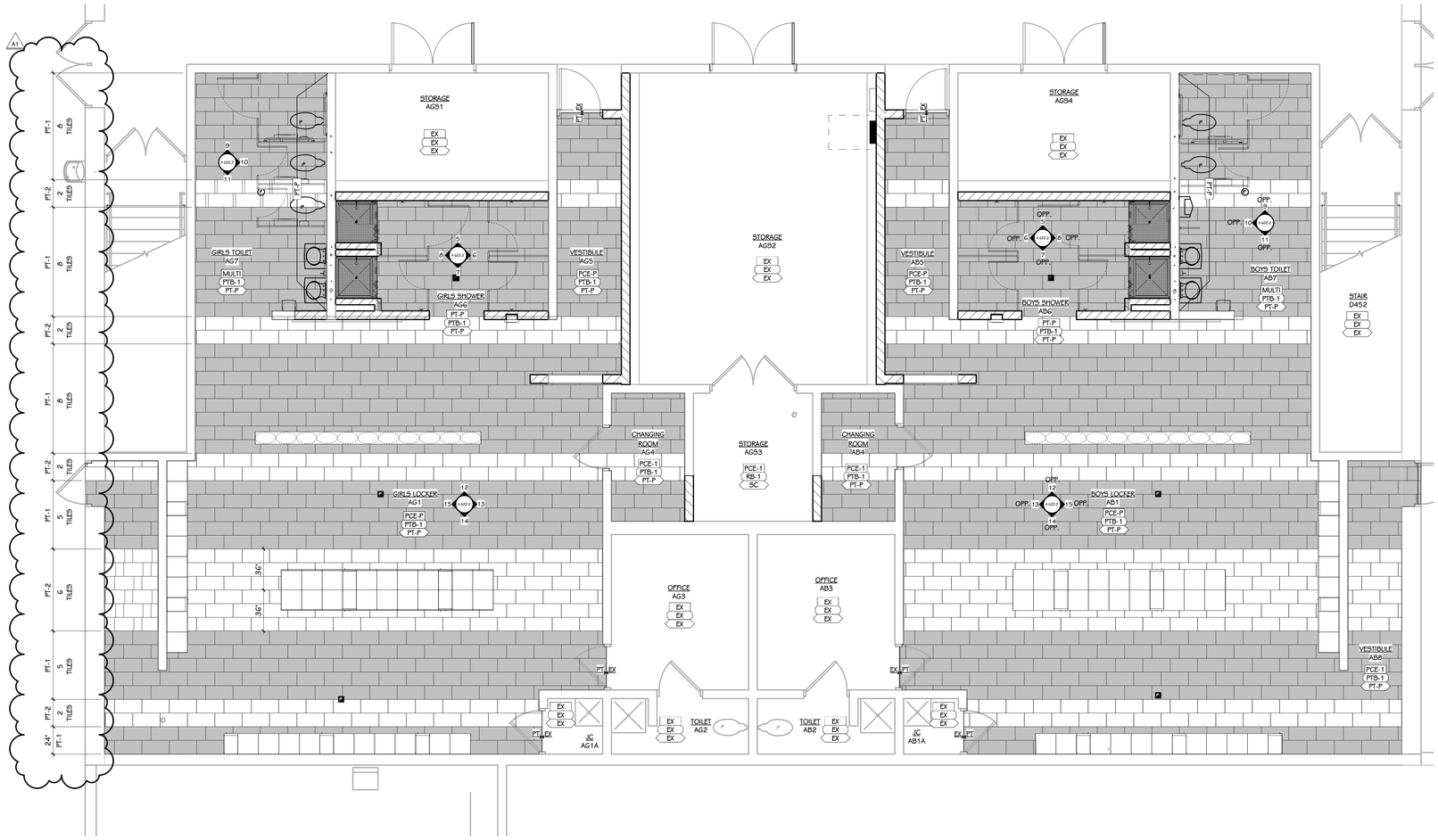
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

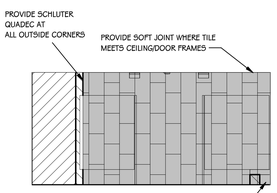
SHEET TITLE
MATERIAL SELECTION SCHEDULE &
TYPICAL DETAILS

DATE
NOVEMBER 3, 2021

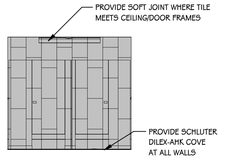
SHEET NUMBER
A 610.2
17-175.70



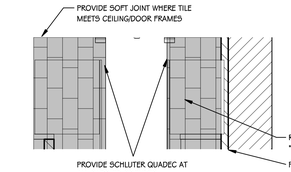
4 UNIT D LOCKER ROOMS - ENLARGED PLAN
1/4" = 1'-0"



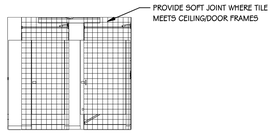
5 GIRLS SHOWER - NORTH
1/4" = 1'-0"



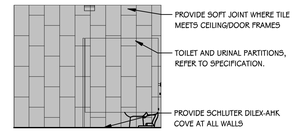
6 GIRLS SHOWER - EAST
1/4" = 1'-0"



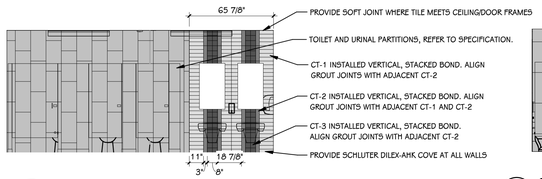
7 GIRLS SHOWER - SOUTH
1/4" = 1'-0"



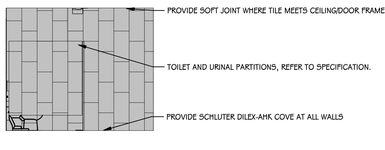
8 GIRLS SHOWER - WEST
1/4" = 1'-0"



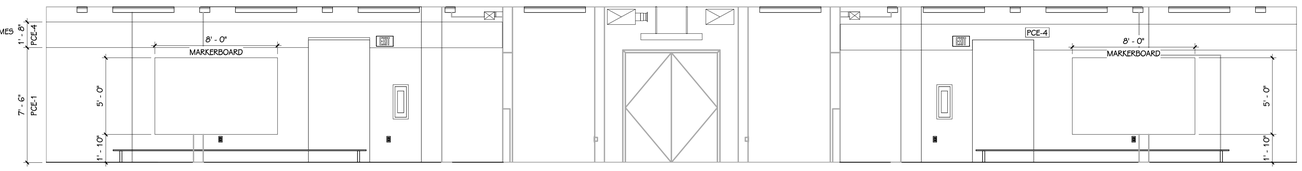
9 GIRLS TOILET AG7 - NORTH
1/4" = 1'-0"



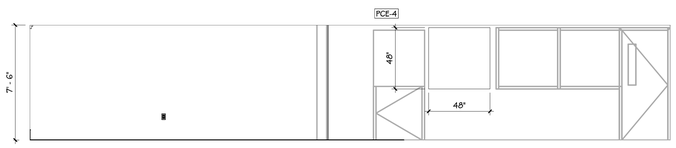
10 GIRLS TOILET AG7 - EAST
1/4" = 1'-0"



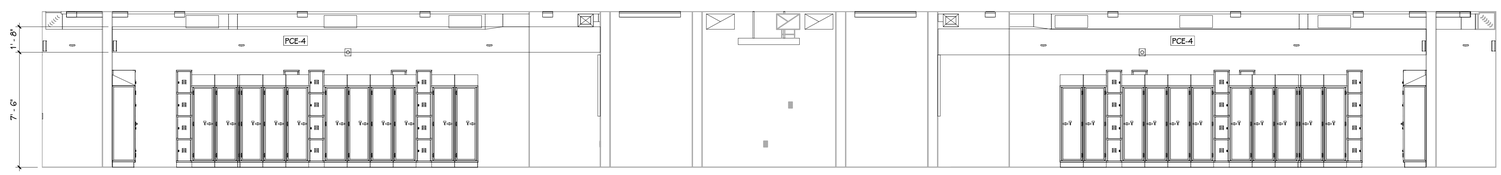
11 GIRLS TOILET AG7 - SOUTH
1/4" = 1'-0"



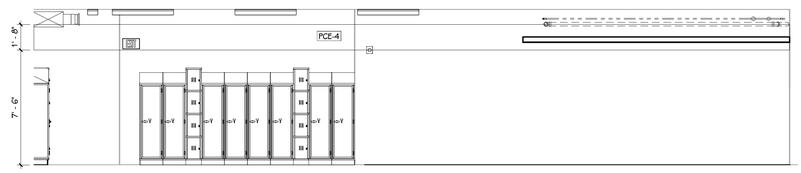
12 NORTH LOCKER ROOM - NORTH - AG1 & AB1
1/4" = 1'-0"



13 NORTH LOCKER ROOM - EAST - AG1
1/4" = 1'-0"



14 NORTH LOCKER ROOM - SOUTH - AG1
1/4" = 1'-0"



15 NORTH LOCKER ROOM - WEST - AG1
1/4" = 1'-0"

GENERAL CASEWORK/MILLWORK NOTES

1. VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO FABRICATION.
2. FILLER PANELS SHALL BE NO LESS THAN 2" WIDE, UNLESS NOTED OTHERWISE.
3. REFER TO FLOOR FINISH PLANS FOR CASEWORK AND COUNTERTOP FINISHES BY ROOM.
4. FINISH ANY EXPOSED END PANELS, UNDERSIDE OF CABINETS OR OPEN CABINETS, WITH PLASTIC LAMINATE SPECIFIED FOR FRONTS IN THAT ROOM.
5. ALL VERTICAL AND HORIZONTAL EXPOSED AND SEMI-EXPOSED SURFACES TO BE FINISHED WITH BODY PLASTIC LAMINATE.
6. SUPPORT BRACKETS ARE REQUIRED EVERY 36" O.C. AT AREAS WHERE COUNTERTOP IS OPEN UNDERNEATH. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING BRACKETS APPROPRIATELY SIZED BASED ON DEPTH OF COUNTER.
7. PATTERN OR GRAIN DIRECTION TO BE VERTICAL ON DOORS AND HORIZONTAL ON DRAWERS - PER AWI STANDARDS, UNLESS NOTED OTHERWISE.
8. LOCKS: ALL UNITS TO BE KEYED ALIKE PER ROOM. ALL ROOMS KEYED DIFFERENTLY.
9. GROMMET LOCATIONS SHALL BE VERIFIED IN THE FIELD WITH THE OWNER PRIOR TO INSTALLATION - COORDINATE WITH POWER & DATA LOCATIONS FOR ANY ADDITIONAL WIRE MANAGEMENT REQUIREMENTS
10. 'SLABSMITHING' WILL BE REQUIRED IN INSTANCES WHERE A PATTERNED QUARTZ, NATURAL STONE, OR SOLID SURFACE IS SPECIFIED.

STANDARD ABBREVIATIONS FOR CASEWORK/MILLWORK

ADJ	ADJUSTABLE	BF	BARRIER FREE
FP	FILLER PANEL	LFE	LEFT FINISHED END
RP	REMOVABLE PANEL	RFE	RIGHT FINISHED END

CASEWORK HARDWARE AND ACCESSORY SELECTIONS

PULL SELECTION: WIRE PULLS, SATIN NICKEL

COUNTERTOP EDGE: 3MM PVC EDGE, STANDARD SQUARE

FINISH ANY EXPOSED END PANELS, UNDERSIDE OF CABINETS OR OPEN CABINETS, WITH PLASTIC LAMINATE SPECIFIED FOR FRONTS IN THAT ROOM.

CABINET INTERIOR: STANDARD WHITE.

GROMMETS TYPE # FINISH, WHERE INDICATED.

FINISH PLAN KEY: TILE

- PT-1, 1/3 OFFSET.
- PT-2, 1/3 OFFSET.
- PT-3, STAGGERED.
- CT-?, STACKED
- CT-1, STACKED VERTICAL
- CT-1, STACKED HORIZONTAL
- CT-2, STACKED VERTICAL
- CT-3, STACKED

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

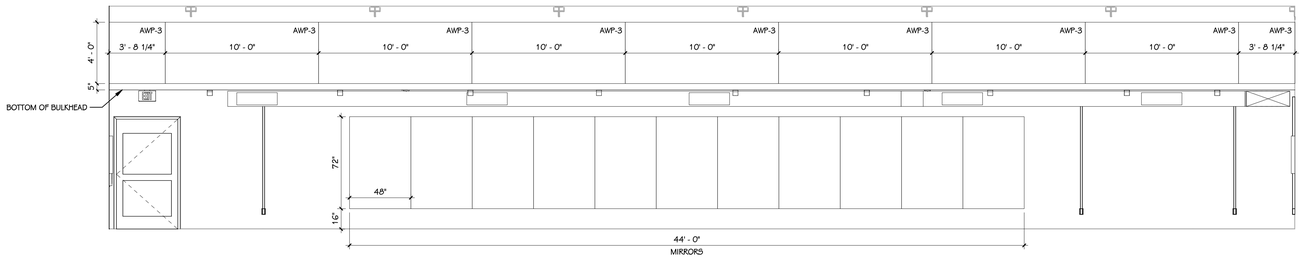
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

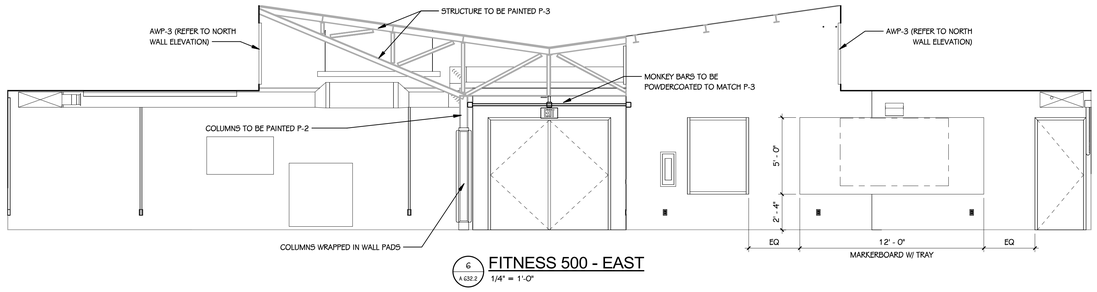
DATE
NOVEMBER 3, 2021

SHEET TITLE
ENLARGED FINISH PLANS - UNIT D

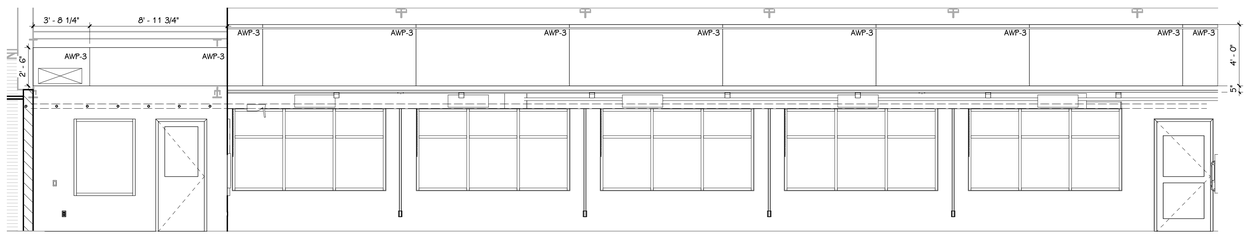
SHEET NUMBER
A 622.2
17-175.70



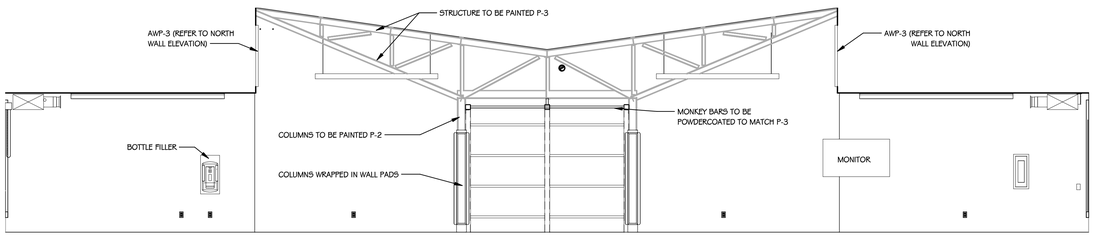
5 / A 632.2 FITNESS 500 - NORTH
1/4" = 1'-0"



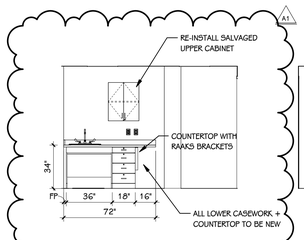
6 / A 632.2 FITNESS 500 - EAST
1/4" = 1'-0"



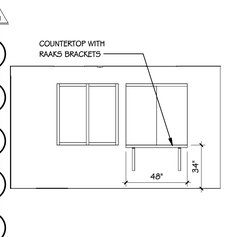
7 / A 632.2 FITNESS 500 - SOUTH
1/4" = 1'-0"



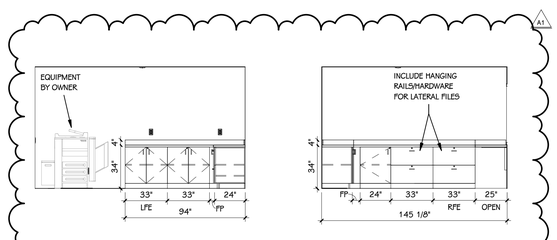
8 / A 632.2 FITNESS 500 - WEST
1/4" = 1'-0"



9 / A 632.2 EXAM 511 - NORTH
1/4" = 1'-0"

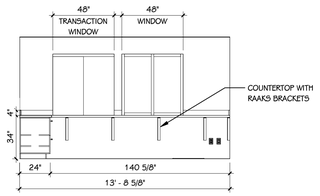


10 / A 632.2 WAITING 512 - EAST
1/4" = 1'-0"

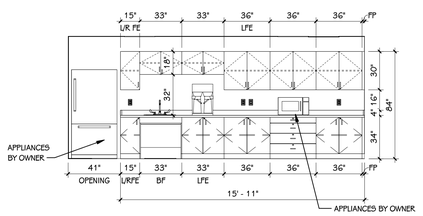


11 / A 632.2 RECEPTION 514 - EAST
1/4" = 1'-0"

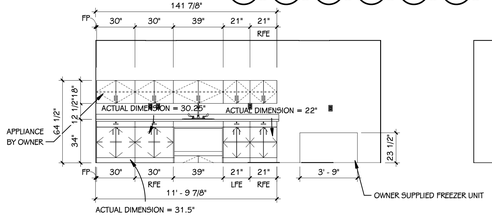
12 / A 632.2 RECEPTION 514 - SOUTH
1/4" = 1'-0"



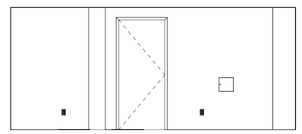
13 / A 632.2 RECEPTION 514 - WEST
1/4" = 1'-0"



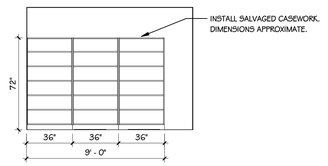
14 / A 632.2 WORK ROOM 516 - EAST
1/4" = 1'-0"



15 / A 632.2 LAB 518 - NORTH
1/4" = 1'-0"



16 / A 632.2 LAB 518 - SOUTH
1/4" = 1'-0"



17 / A 632.2 STORAGE 518S - SOUTH
1/4" = 1'-0"

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CABINET INTERIOR: STANDARD WHITE.

GROMMETS TYPE 4 FINISH, WHERE INDICATED.

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- PT-2, 1/3 OFFSET.
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- CT-?, STACKED
- CT-1, STACKED VERTICAL
- CT-1, STACKED HORIZONTAL
- CT-2, STACKED VERTICAL
- CT-3, STACKED

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

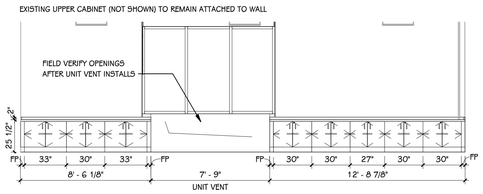
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
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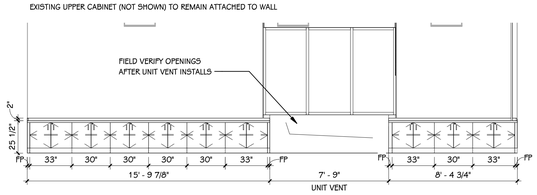
SHEET TITLE
INTERIOR ELEVATIONS - UNIT D

DATE
NOVEMBER 3, 2021

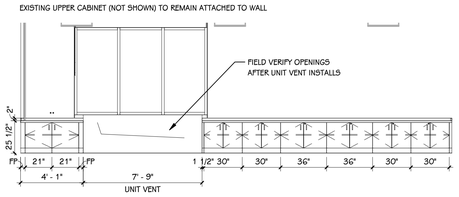
SHEET NUMBER
A 632.2
17-175.70



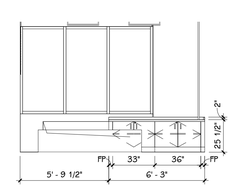
18 A 633.2 CLASSROOM 401 - SOUTH
1/4" = 1'-0"



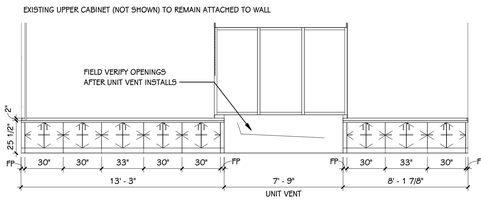
19 A 633.2 CLASSROOM 402 - NORTH
1/4" = 1'-0"



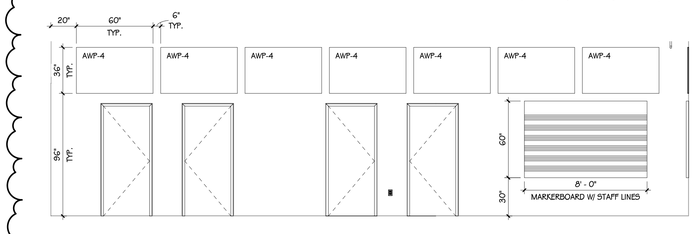
20 A 633.2 CLASSROOM 403 - SOUTH
1/4" = 1'-0"



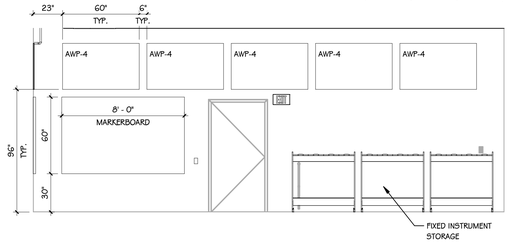
21 A 633.2 CLASSROOM SUPPORT 405 - SOUTH
1/4" = 1'-0"



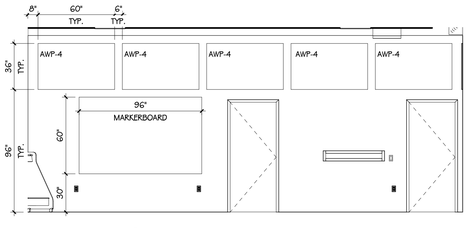
22 A 633.2 CLASSROOM 407 - SOUTH
1/4" = 1'-0"



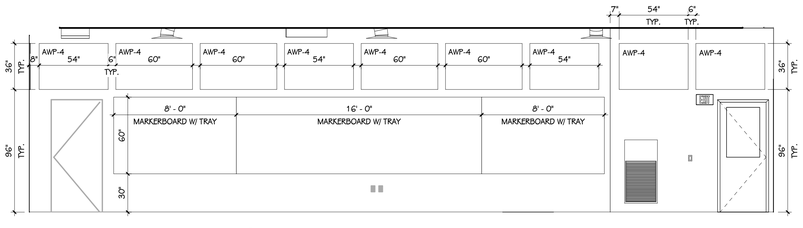
23 A 633.2 ORCHESTRA 302 - NORTH
1/4" = 1'-0"



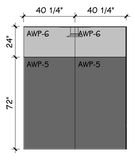
24 A 633.2 ORCHESTRA 302 - EAST
1/4" = 1'-0"



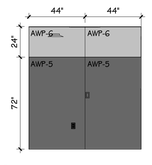
25 A 633.2 ORCHESTRA 302 - SOUTH
1/4" = 1'-0"



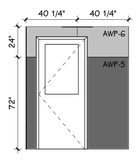
26 A 633.2 ORCHESTRA 302 - WEST
1/4" = 1'-0"



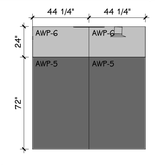
27 A 633.2 PRAC 302.1 - NORTH
1/4" = 1'-0"



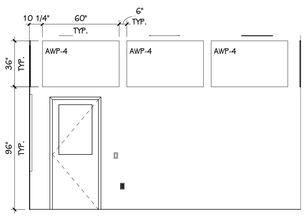
28 A 633.2 PRAC 302.1 - EAST
1/4" = 1'-0"



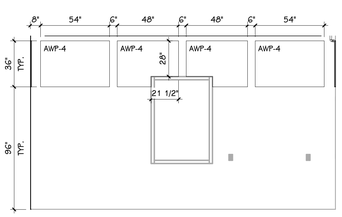
29 A 633.2 PRAC 302.1 - SOUTH
1/4" = 1'-0"



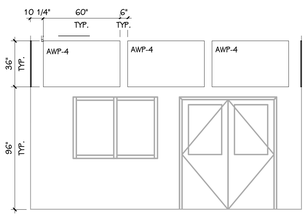
30 A 633.2 PRAC 302.1 - WEST
1/4" = 1'-0"



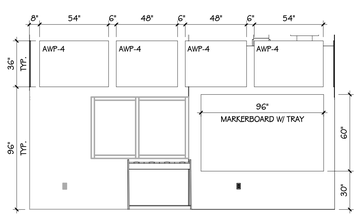
31 A 633.2 ENSEMBLE 302B - NORTH
1/4" = 1'-0"



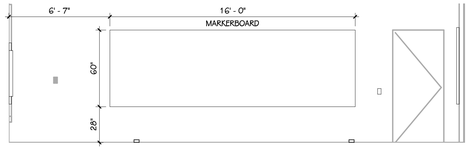
32 A 633.2 ENSEMBLE 302B - EAST
1/4" = 1'-0"



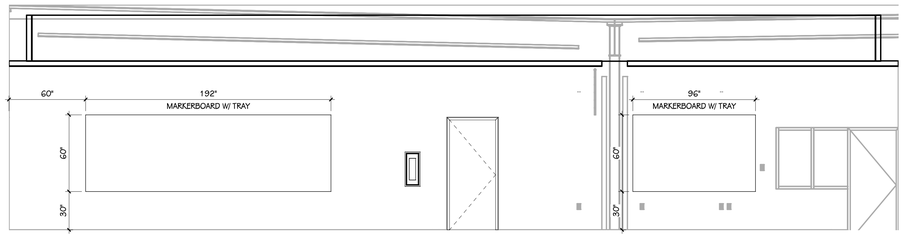
33 A 633.2 ENSEMBLE 302B - SOUTH
1/4" = 1'-0"



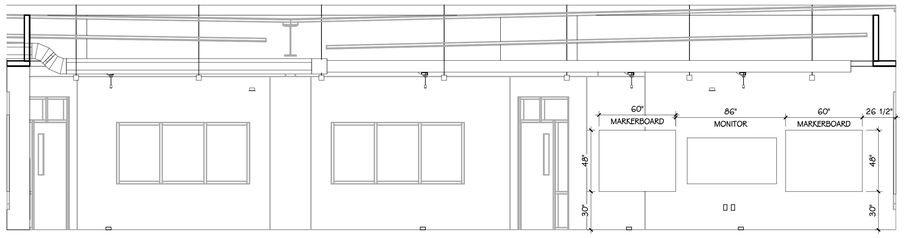
34 A 633.2 ENSEMBLE 302B - WEST
1/4" = 1'-0"



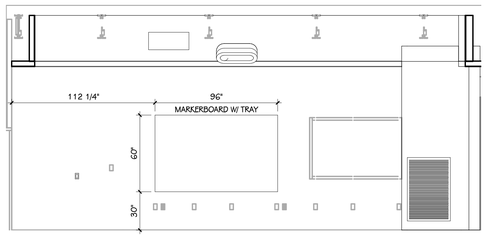
35 A 633.2 ROBOTICS 308 - NORTH
1/4" = 1'-0"



1 A 633.2 A 634.2 - ROBOTICS 308 - EAST
1/4" = 1'-0"



36 A 633.2 ROBOTICS 308 - WEST
1/4" = 1'-0"



2 A 633.2 ROBOTICS 308 - SOUTH
1/4" = 1'-0"

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ADJ	ADJUSTABLE	BF	BARRIER FREE
FP	FILLER PANEL	LFE	LEFT FINISHED END
RP	REMOVABLE PANEL	RFE	RIGHT FINISHED END

CASEWORK HARDWARE AND ACCESSORY SELECTIONS

PULL SELECTION: WIRE PULLS, SATIN NICKEL

COUNTERTOP EDGE: 3MM PVC EDGE, STANDARD SQUARE

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CABINET INTERIOR: STANDARD WHITE.

GROMMETS TYPE 4 FINISH, WHERE INDICATED.

FINISH PLAN KEY: TILE

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- CT-?, STACKED
- CT-1, STACKED VERTICAL
- CT-1, STACKED HORIZONTAL
- CT-2, STACKED VERTICAL
- CT-3, STACKED

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ADDENDUM 1	NOVEMBER 29, 2021

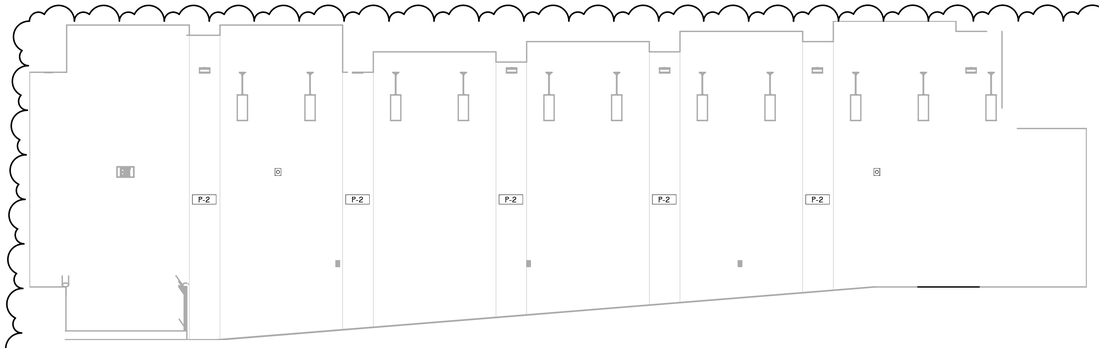
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
INTERIOR ELEVATIONS - UNIT E/F/G

DATE
NOVEMBER 3, 2021

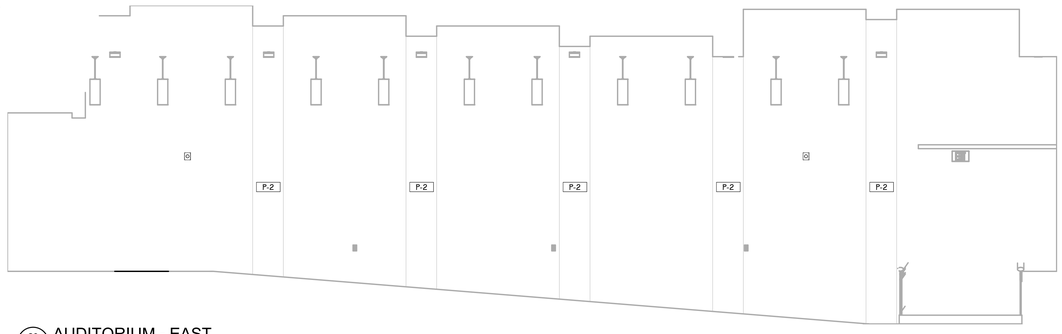
SHEET NUMBER
A 633.2
17-175.70



37 A 634.2 AUDITORIUM - WEST
1/4" = 1'-0"

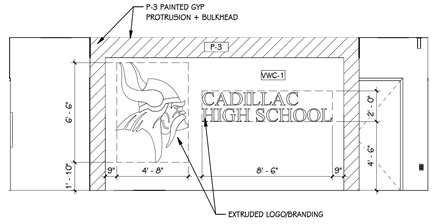


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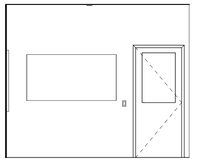


38 A 634.2 AUDITORIUM - EAST
1/4" = 1'-0"

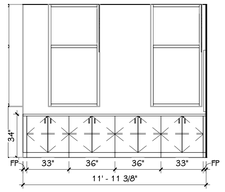
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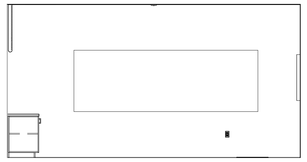
39 A 634.2 ADMIN 201 - WEST
1/4" = 1'-0"



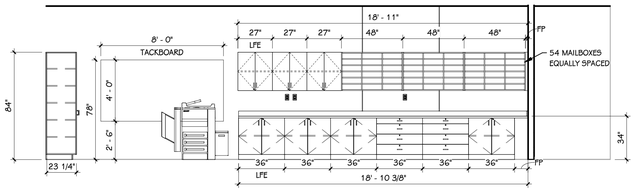
40 A 634.2 CONFERENCE ROOM 201C - NORTH
1/4" = 1'-0"



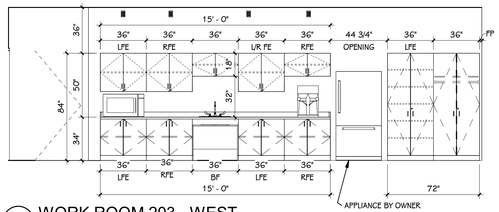
41 A 634.2 CONFERENCE ROOM 201C - SOUTH
1/4" = 1'-0"



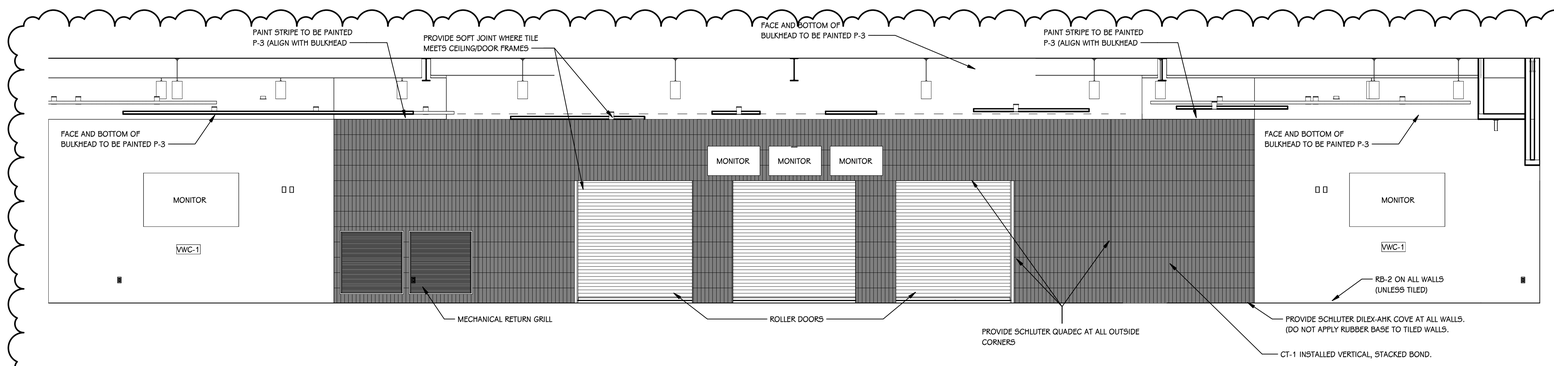
42 A 634.2 CONFERENCE ROOM 201C - WEST
1/4" = 1'-0"



43 A 634.2 WORK ROOM 203 - NORTH
1/4" = 1'-0"



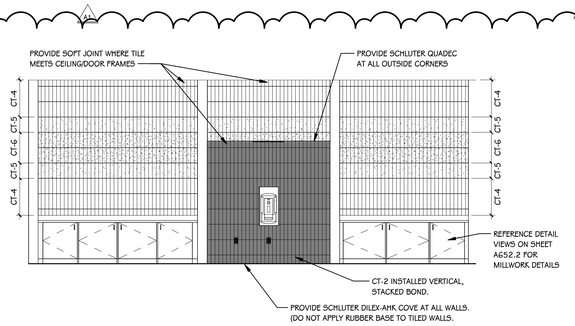
44 A 634.2 WORK ROOM 203 - WEST
1/4" = 1'-0"



1 A 634.2 CAFETERIA 202 - WEST SERVERY WALL
1/4" = 1'-0"

A1

A1



2 A 634.2 CAFETERIA 202 - NORTH
1/4" = 1'-0"

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- CT-3, STACKED

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

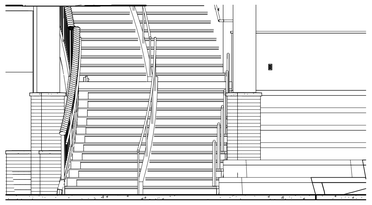
PROJECT TITLE
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OWNER
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Cadillac, Michigan

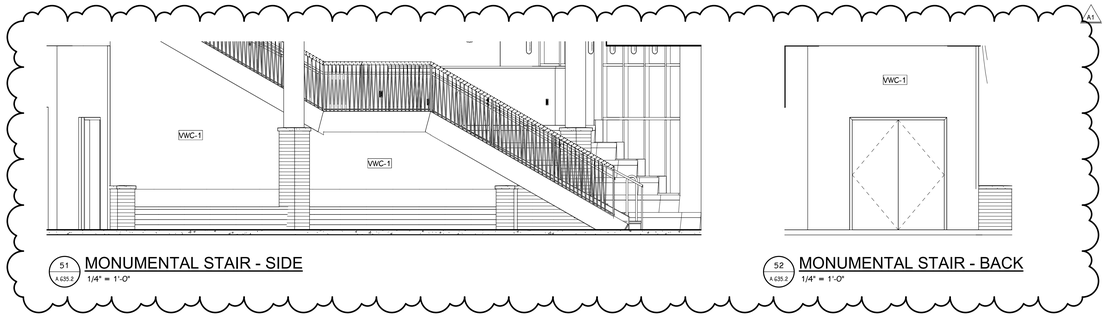
SHEET TITLE
INTERIOR ELEVATIONS - UNIT G/J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 634.2
17-175.70

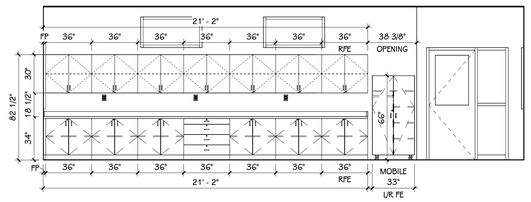


50 A 635.2 MONUMENTAL STAIR - FRONT
1/4" = 1'-0"

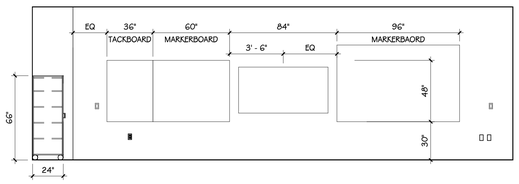


51 A 635.2 MONUMENTAL STAIR - SIDE
1/4" = 1'-0"

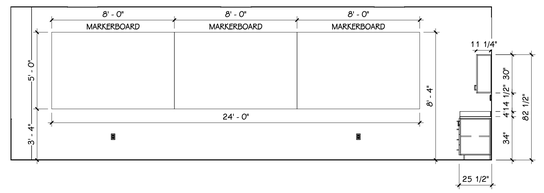
52 A 635.2 MONUMENTAL STAIR - BACK
1/4" = 1'-0"



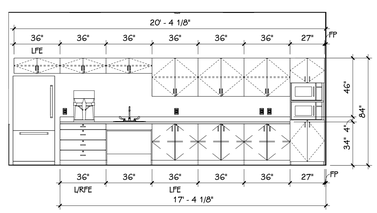
53 A 635.2 CLASSROOM CASEWORK WALL - TYPICAL
1/4" = 1'-0"



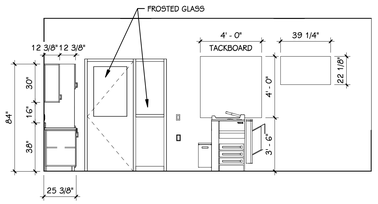
54 A 635.2 CLASSROOM TEACHING WALL - TYPICAL
1/4" = 1'-0"



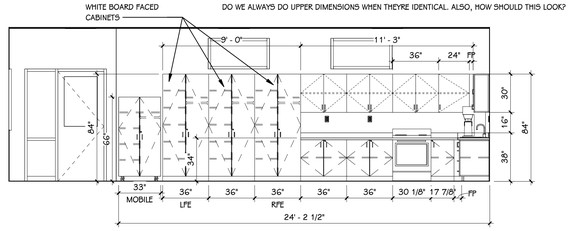
55 A 635.2 CLASSROOM REAR WALL - TYPICAL
1/4" = 1'-0"



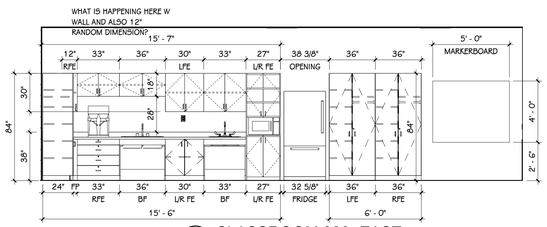
56 A 635.2 TEACHER WORK SPACE 011 - SOUTH
1/4" = 1'-0"



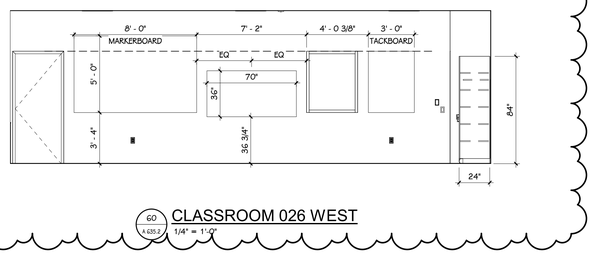
57 A 635.2 TEACHER WORK SPACE 011 - WEST
1/4" = 1'-0"



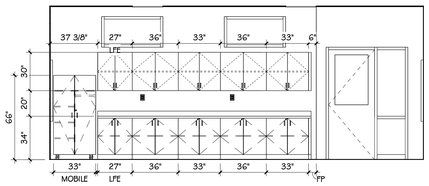
58 A 635.2 CLASSROOM 026 - NORTH
1/4" = 1'-0"



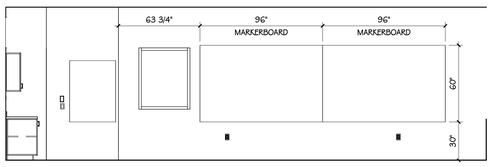
59 A 635.2 CLASSROOM 026 -EAST
1/4" = 1'-0"



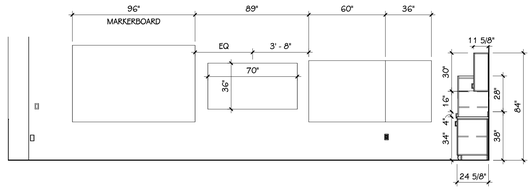
60 A 635.2 CLASSROOM 026 WEST
1/4" = 1'-0"



61 A 635.2 SE K104 - NORTH
1/4" = 1'-0"



62 A 635.2 SE K104 - EAST
1/4" = 1'-0"



63 A 635.2 SE 028 - WEST
1/4" = 1'-0"

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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

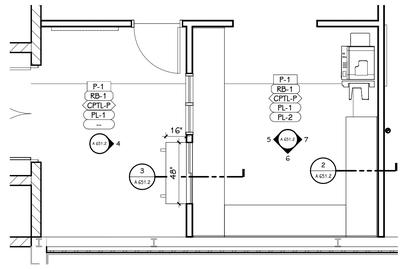
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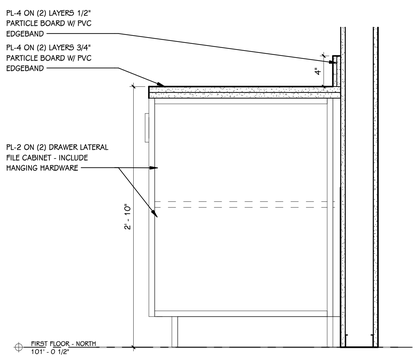
SHEET TITLE
INTERIOR ELEVATIONS - UNIT K

DATE
NOVEMBER 3, 2021

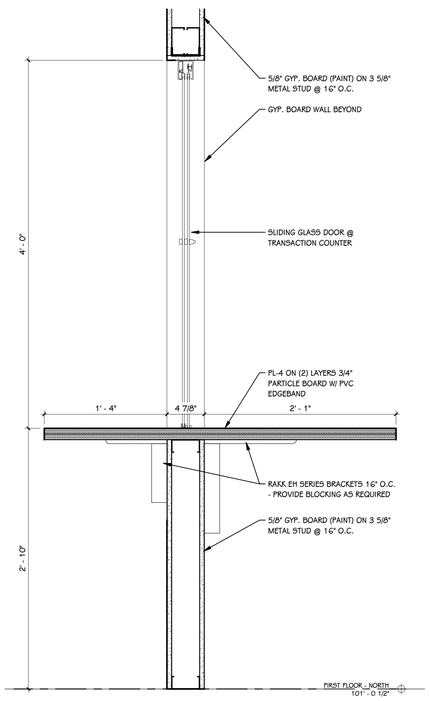
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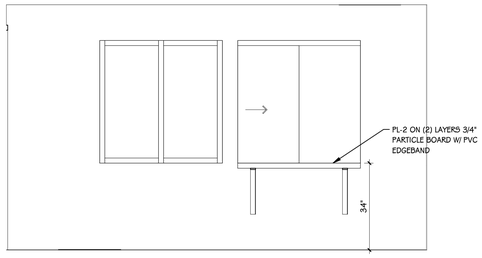
1 / A 651.2 FIRST FLOOR FINISH PLAN - UNIT D
1/4" = 1'-0"



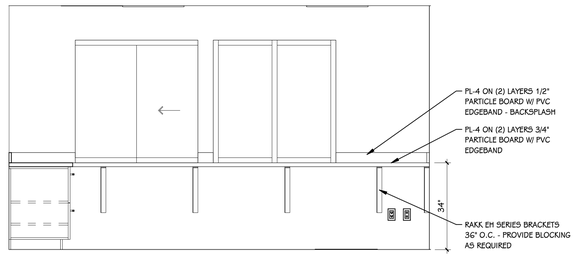
2 / A 651.2 RECEPTION DESK - MILLWORK DETAIL 2
1 1/2" = 1'-0"



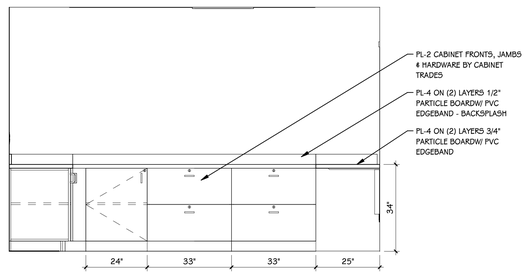
3 / A 651.2 RECEPTION DESK - MILLWORK DETAIL 1
1 1/2" = 1'-0"



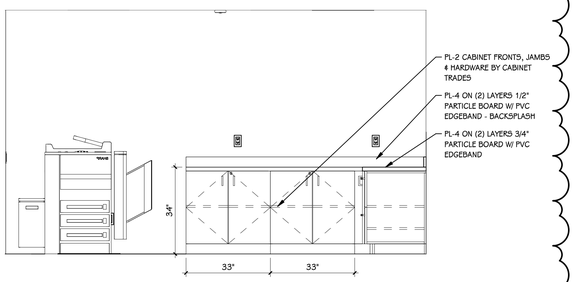
4 / A 651.2 RECEPTION - WINDOW FRONT
1/2" = 1'-0"



5 / A 651.2 RECEPTION - WINDOW BACK
1/2" = 1'-0"



6 / A 651.2 RECEPTION - SIDE
1/2" = 1'-0"



7 / A 651.2 RECEPTION - BACK
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STANDARD ABBREVIATIONS FOR CASEWORK/MILLWORK

ADJ	ADJUSTABLE	BF	BARRIER FREE
FP	FILLER PANEL	LFE	LEFT FINISHED END
RP	REMOVABLE PANEL	RFE	RIGHT FINISHED END

CASEWORK HARDWARE AND ACCESSORY SELECTIONS

PULL SELECTION: WIRE PULLS, SATIN NICKEL

COUNTERTOP EDGE: 3MM PVC EDGE, STANDARD SQUARE

FINISH ANY EXPOSED END PANELS, UNDERSIDE OF CABINETS OR OPEN CABINETS, WITH PLASTIC LAMINATE SPECIFIED FOR FRONTS IN THAT ROOM.

CABINET INTERIOR: STANDARD WHITE.

GROMMETS TYPE 4 FINISH, WHERE INDICATED.

FINISH PLAN KEY: TILE

- PT-1, 1/3 OFFSET.
- PT-2, 1/3 OFFSET.
- PT-3, STAGGERED.
- CT-?, STACKED
- CT-1, STACKED VERTICAL
- CT-1, STACKED HORIZONTAL
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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

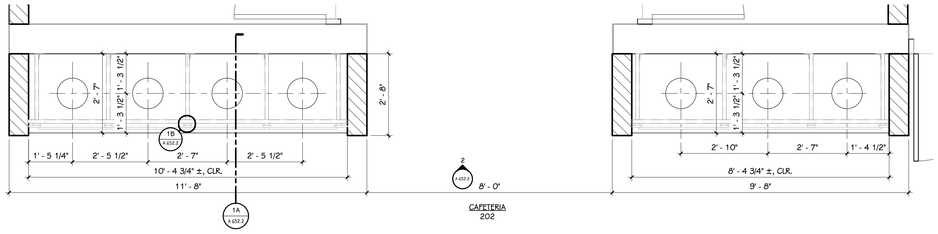
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
MILLWORK DETAILS - UNIT D

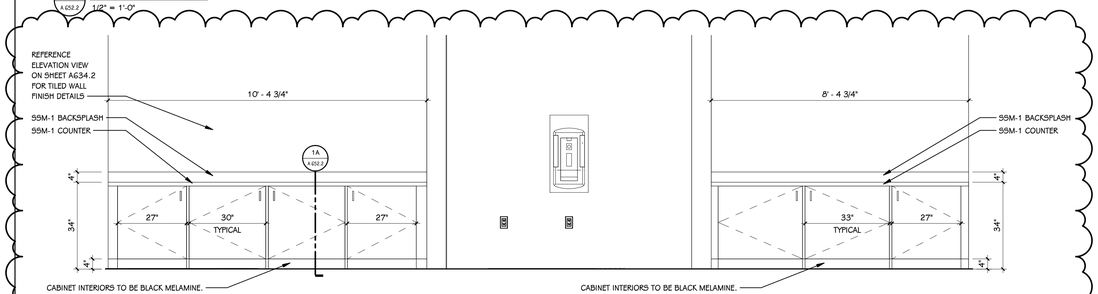
DATE
NOVEMBER 3, 2021

SHEET NUMBER
A 651.2
17-175.70



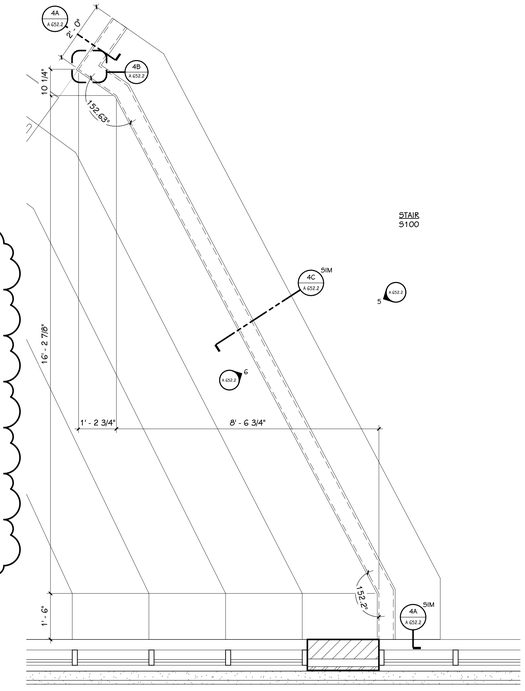
ENLARGED FINISH PLAN - CAFETERIA TRASH RECEPTACLES

1 A 652.2 — 1/2" = 1'-0"



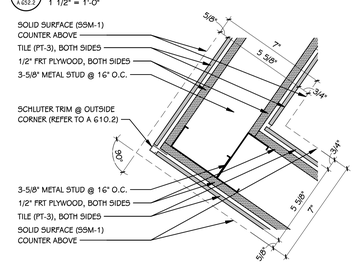
CAFETERIA - TRASH RECEPTACLE ELEVATION

2 A 652.2 — 1/2" = 1'-0"



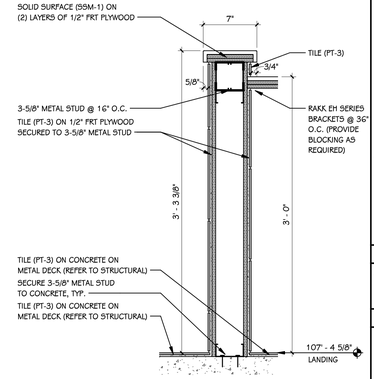
STAIR COUNTER - MILLWORK DETAIL 2

4A A 652.2 — 1 1/2" = 1'-0"



STAIR COUNTER - MILLWORK DETAIL 3

4B A 652.2 — 3" = 1'-0"



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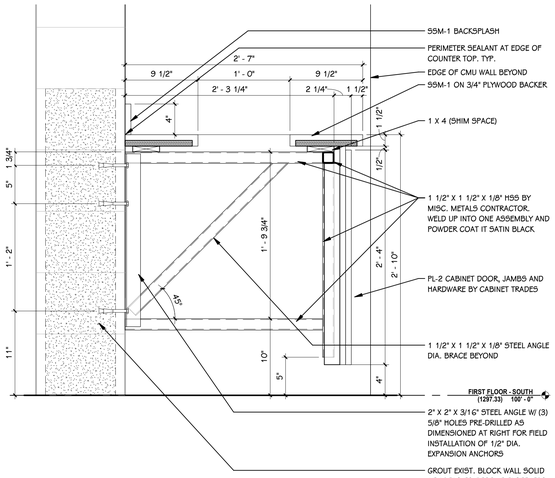
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GROMMETS TYPE 4 FINISH, WHERE INDICATED.

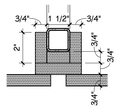
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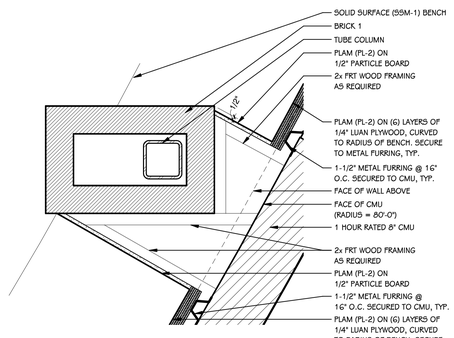
TRASH RECEPTACLE - MILLWORK DETAIL

1A A 652.2 — 1 1/2" = 1'-0"



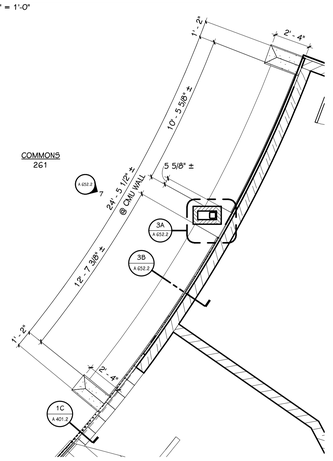
ENLARGED DETAIL - TRASH RECEPTABLE DETAIL

1B A 652.2 — 3" = 1'-0"



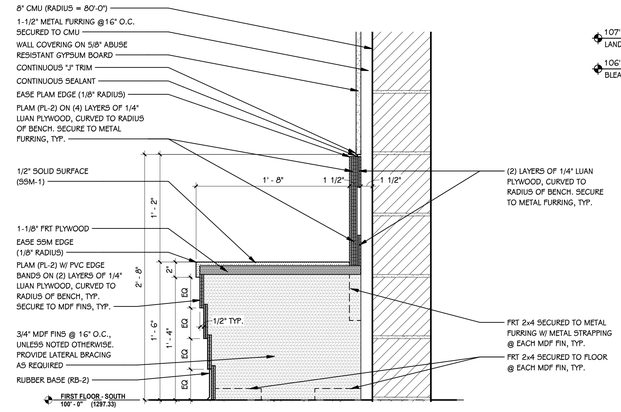
ENLARGED DETAIL - BENCH DETAIL

3A A 652.2 — 1 1/2" = 1'-0"



ENLARGED FINISH PLAN - COMMONS BENCH

3 A 652.2 — 1/4" = 1'-0"



COMMONS BENCH - MILLWORK DETAIL

3B A 652.2 — 1 1/2" = 1'-0"

ENLARGED FINISH PLAN - COUNTER @ LANDING

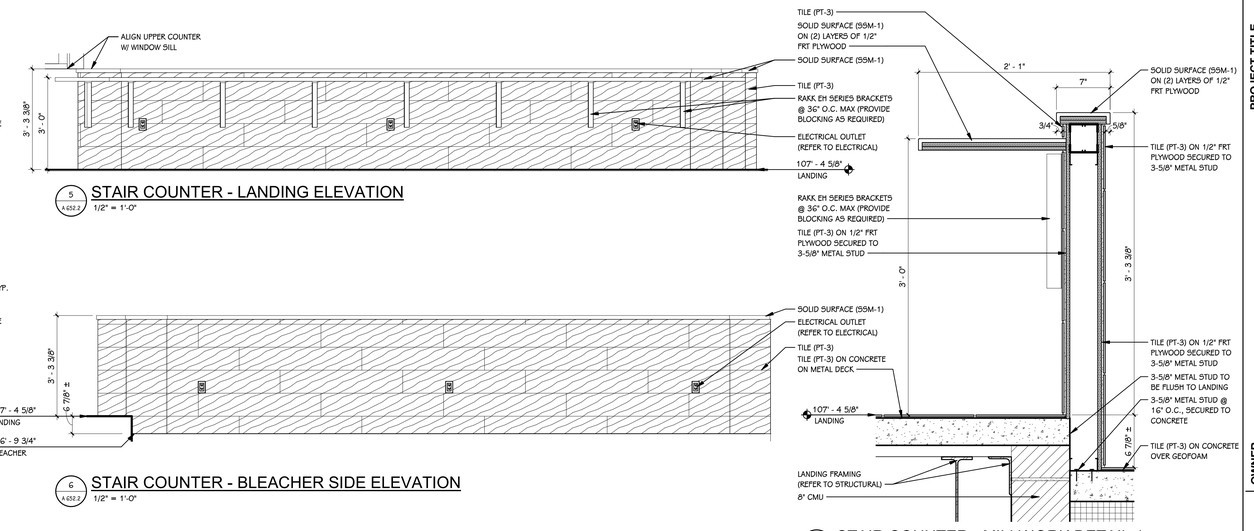
4 A 652.2 — 1/2" = 1'-0"

STAIR COUNTER - LANDING ELEVATION

5 A 652.2 — 1/2" = 1'-0"

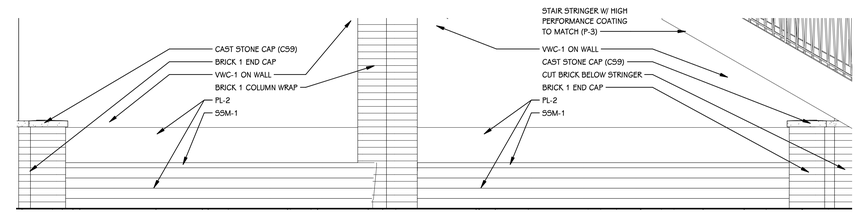
STAIR COUNTER - BLEACHER SIDE ELEVATION

6 A 652.2 — 1/2" = 1'-0"



STAIR COUNTER - MILLWORK DETAIL 1

4C A 652.2 — 1 1/2" = 1'-0"



COMMONS BENCH - FRONT ELEVATION

7 A 652.2 — 1/2" = 1'-0"

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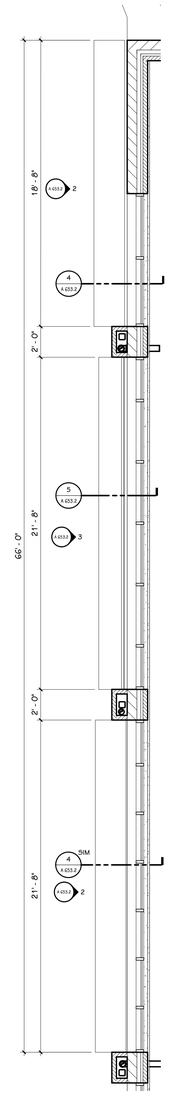
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

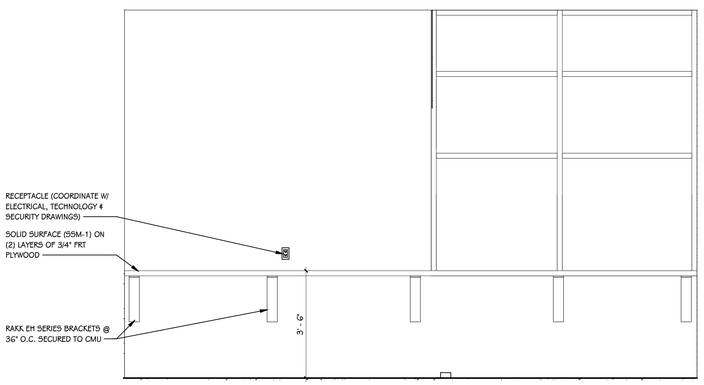
DATE
NOVEMBER 3, 2021

SHEET TITLE
MILLWORK DETAILS - UNIT J

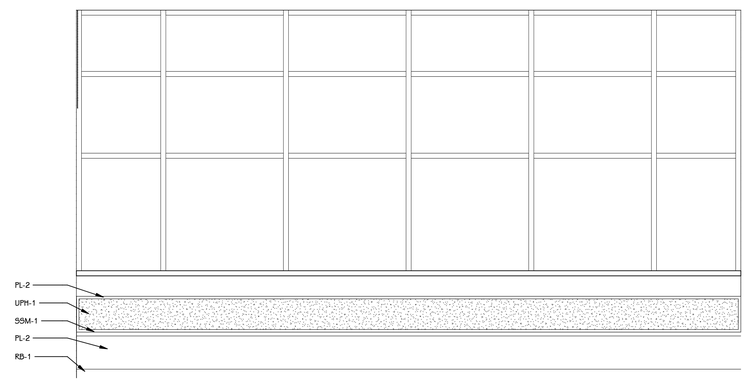
SHEET NUMBER
A 652.2
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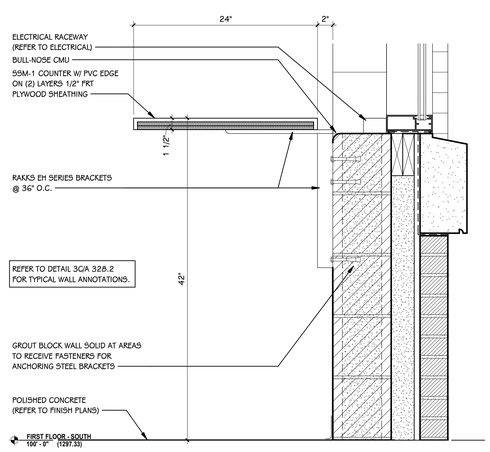
1 A 653.2 ENLARGED FINISH PLAN - CAFETERIA COUNTER
1/4" = 1'-0"



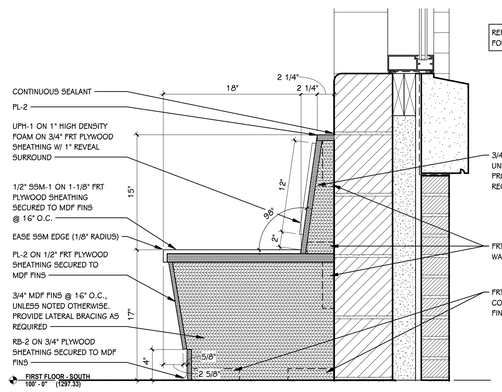
2 A 653.2 CAFETERIA COUNTER - FRONT
1/2" = 1'-0"



3 A 653.2 CAFETERIA BENCH 1 - FRONT
1/2" = 1'-0"

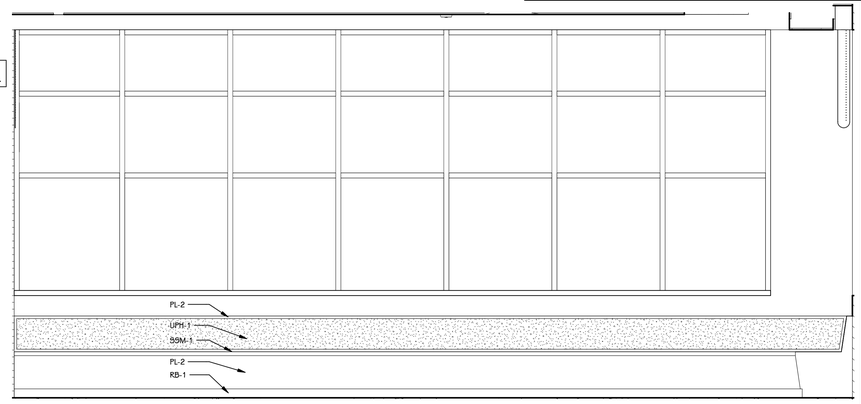


4 A 653.2 CAFETERIA COUNTER - MILLWORK DETAIL
1 1/2" = 1'-0"

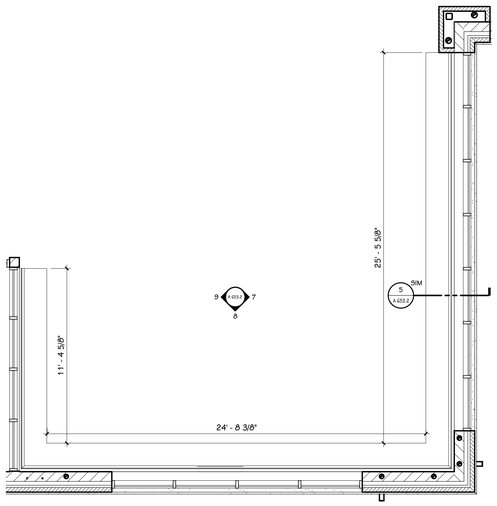


5 A 653.2 CAFETERIA BENCH - MILLWORK DETAIL
1 1/2" = 1'-0"

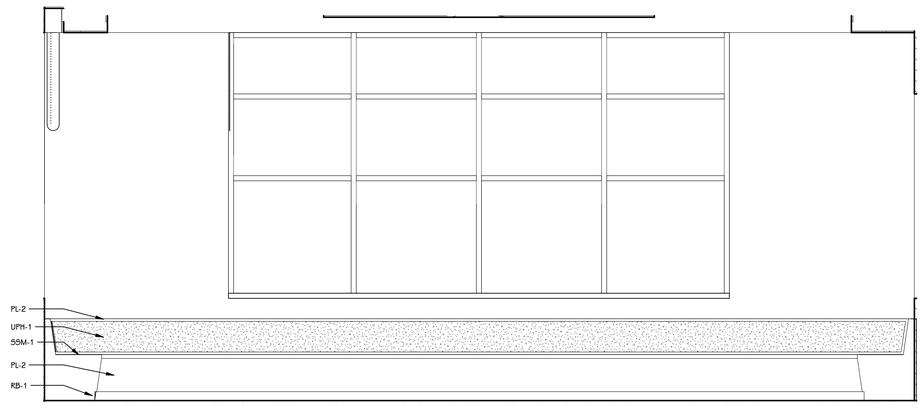
REFER TO DETAIL 3C/A 328.2 FOR TYPICAL WALL ANNOTATIONS.



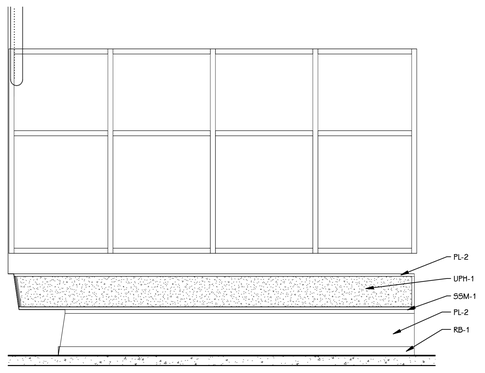
7 A 653.2 CAFETERIA BENCH 2 - EAST ELEVATION
1/2" = 1'-0"



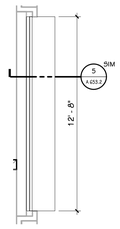
6 A 653.2 ENLARGED FINISH PLAN - CAFETERIA BENCH 2
1/4" = 1'-0"



8 A 653.2 CAFETERIA BENCH 2 - SOUTH ELEVATION
1/2" = 1'-0"



9 A 653.2 CAFETERIA BENCH 2 - WEST ELEVATION
1/2" = 1'-0"



10 A 653.2 ENLARGED FINISH PLAN - CAFETERIA BENCH 3
1/4" = 1'-0"

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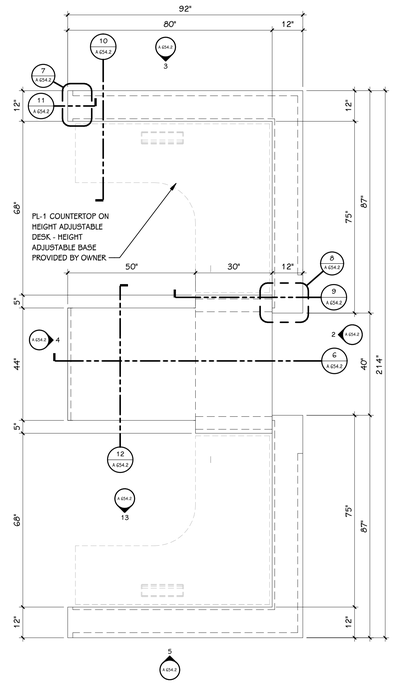
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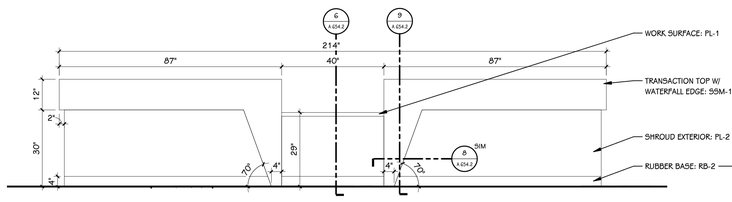
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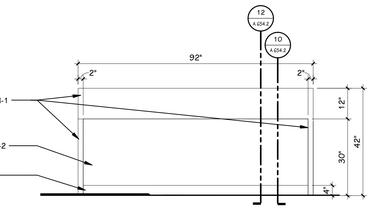
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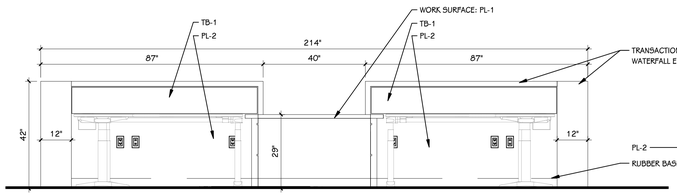
1 A 654.2 ENLARGED FINISH PLAN - RECEPTION DESK
1/2" = 1'-0"



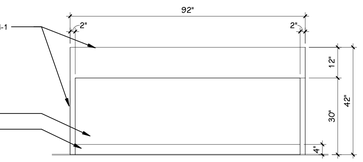
2 A 654.2 RECEPTION DESK - EAST ELEVATION
1/2" = 1'-0"



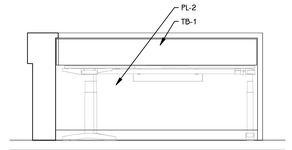
3 A 654.2 RECEPTION DESK - NORTH ELEVATION
1/2" = 1'-0"



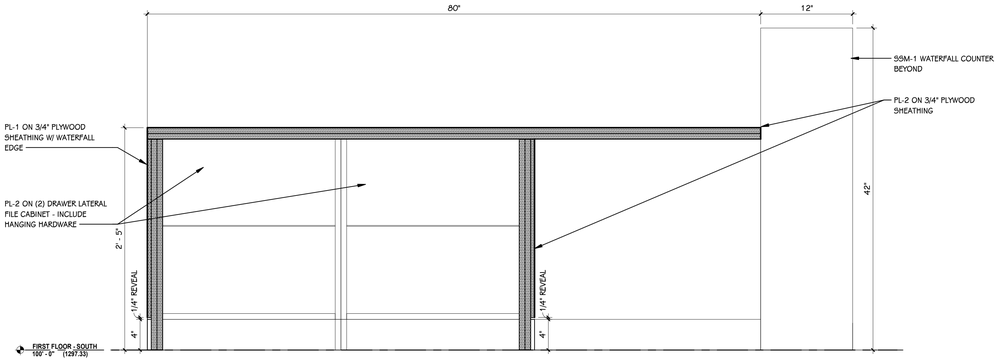
4 A 654.2 RECEPTION DESK - WEST ELEVATION
1/2" = 1'-0"



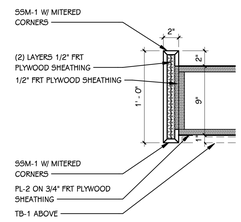
5 A 654.2 RECEPTION DESK - SOUTH ELEVATION
1/2" = 1'-0"



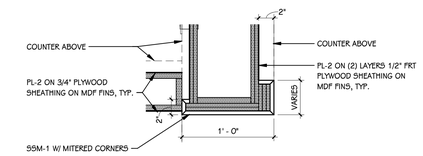
13 A 654.2 RECEPTION DESK - INSIDE
1/2" = 1'-0"



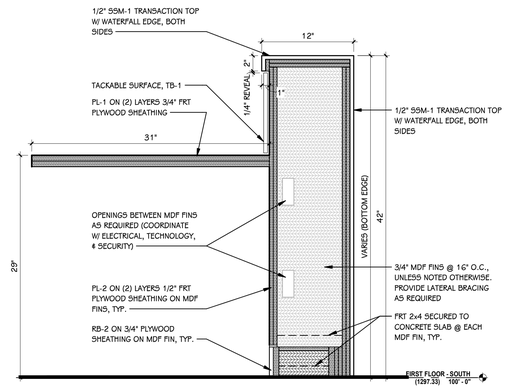
6 A 654.2 MILLWORK SECTION - RECEPTION DESK SECTION 5
1 1/2" = 1'-0"



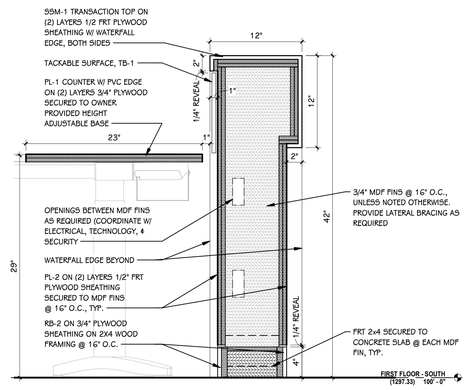
7 A 654.2 PLAN DETAIL - SOLID SURFACE WATERFALL
1 1/2" = 1'-0"



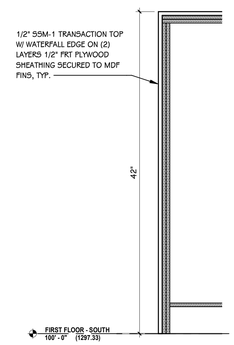
8 A 654.2 PLAN DETAIL - SOLID SURFACE/ PLAM TRANSITION
1 1/2" = 1'-0"



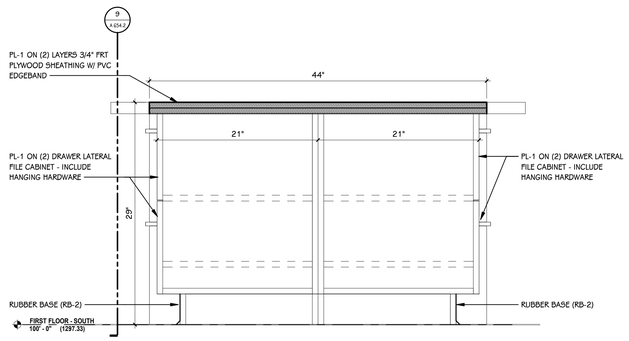
9 A 654.2 MILLWORK SECTION - RECEPTION DESK SECTION 1
1 1/2" = 1'-0"



10 A 654.2 MILLWORK SECTION - RECEPTION DESK SECTION 2
1 1/2" = 1'-0"



11 A 654.2 MILLWORK SECTION - RECEPTION DESK SECTION 3
1 1/2" = 1'-0"



12 A 654.2 MILLWORK SECTION - RECEPTION DESK SECTION 4
1 1/2" = 1'-0"

GENERAL CASEWORK/MILLWORK NOTES

1. VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO FABRICATION.
2. FILLER PANELS SHALL BE NO LESS THAN 2" WIDE, UNLESS NOTED OTHERWISE.
3. REFER TO FLOOR FINISH PLANS FOR CASEWORK AND COUNTERTOP FINISHES BY ROOM.
4. FINISH ANY EXPOSED END PANELS, UNDERSIDE OF CABINETS OR OPEN CABINETS, WITH PLASTIC LAMINATE SPECIFIED FOR FRONTS IN THAT ROOM.
5. ALL VERTICAL AND HORIZONTAL EXPOSED AND SEMI-EXPOSED SURFACES TO BE FINISHED WITH BODY PLASTIC LAMINATE.
6. SUPPORT BRACKETS ARE REQUIRED EVERY 36" O.C. AT AREAS WHERE COUNTERTOP IS OPEN UNDERNEATH. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING BRACKETS APPROPRIATELY SIZED BASED ON DEPTH OF COUNTER.
7. PATTERN OR GRAIN DIRECTION TO BE VERTICAL ON DOORS AND HORIZONTAL ON DRAWERS - PER AWI STANDARDS, UNLESS NOTED OTHERWISE.
8. LOCKS: ALL UNITS TO BE KEYED ALIKE PER ROOM. ALL ROOMS KEYED DIFFERENTLY.
9. GROMMET LOCATIONS SHALL BE VERIFIED IN THE FIELD WITH THE OWNER PRIOR TO INSTALLATION - COORDINATE WITH POWER & DATA LOCATIONS FOR ANY ADDITIONAL WIRE MANAGEMENT REQUIREMENTS
10. 'SLABSMITHING' WILL BE REQUIRED IN INSTANCES WHERE A PATTERNED QUARTZ, NATURAL STONE, OR SOLID SURFACE IS SPECIFIED.

STANDARD ABBREVIATIONS FOR CASEWORK/MILLWORK

ADJ	ADJUSTABLE	BF	BARRIER FREE
FP	FILLER PANEL	LFE	LEFT FINISHED END
RP	REMOVABLE PANEL	RFE	RIGHT FINISHED END

CASEWORK HARDWARE AND ACCESSORY SELECTIONS

PULL SELECTION: WIRE PULLS, SATIN NICKEL

COUNTERTOP EDGE: 3MM PVC EDGE, STANDARD SQUARE

FINISH ANY EXPOSED END PANELS, UNDERSIDE OF CABINETS OR OPEN CABINETS, WITH PLASTIC LAMINATE SPECIFIED FOR FRONTS IN THAT ROOM.

CABINET INTERIOR: STANDARD WHITE.

GROMMETS TYPE 4 FINISH, WHERE INDICATED.

FINISH PLAN KEY: TILE

- PT-1, 1/3 OFFSET.
- PT-2, 1/3 OFFSET.
- PT-3, STAGGERED.
- CT-?, STACKED
- CT-1, STACKED VERTICAL
- CT-1, STACKED HORIZONTAL
- CT-2, STACKED VERTICAL
- CT-3, STACKED

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ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

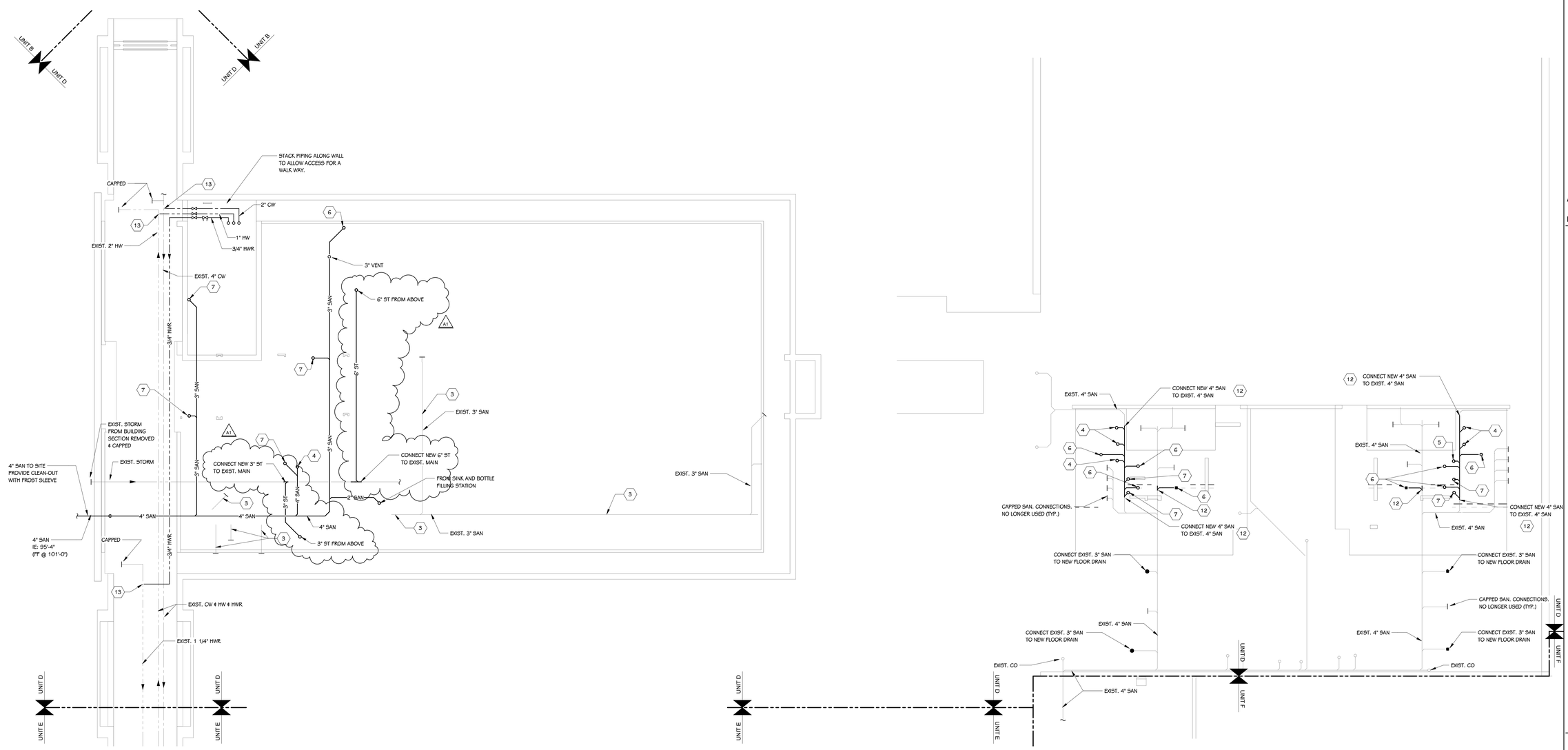
Cadillac, Michigan

SHEET TITLE
MILLWORK DETAILS - UNIT J

A1

DATE
NOVEMBER 3, 2021

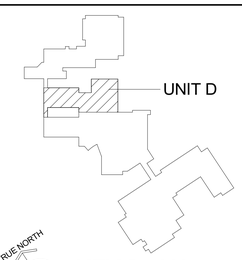
SHEET NUMBER
A 654.2
17-175.70



FOUNDATION PLUMBING PLAN - UNIT D

1/8" = 1'-0"

CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

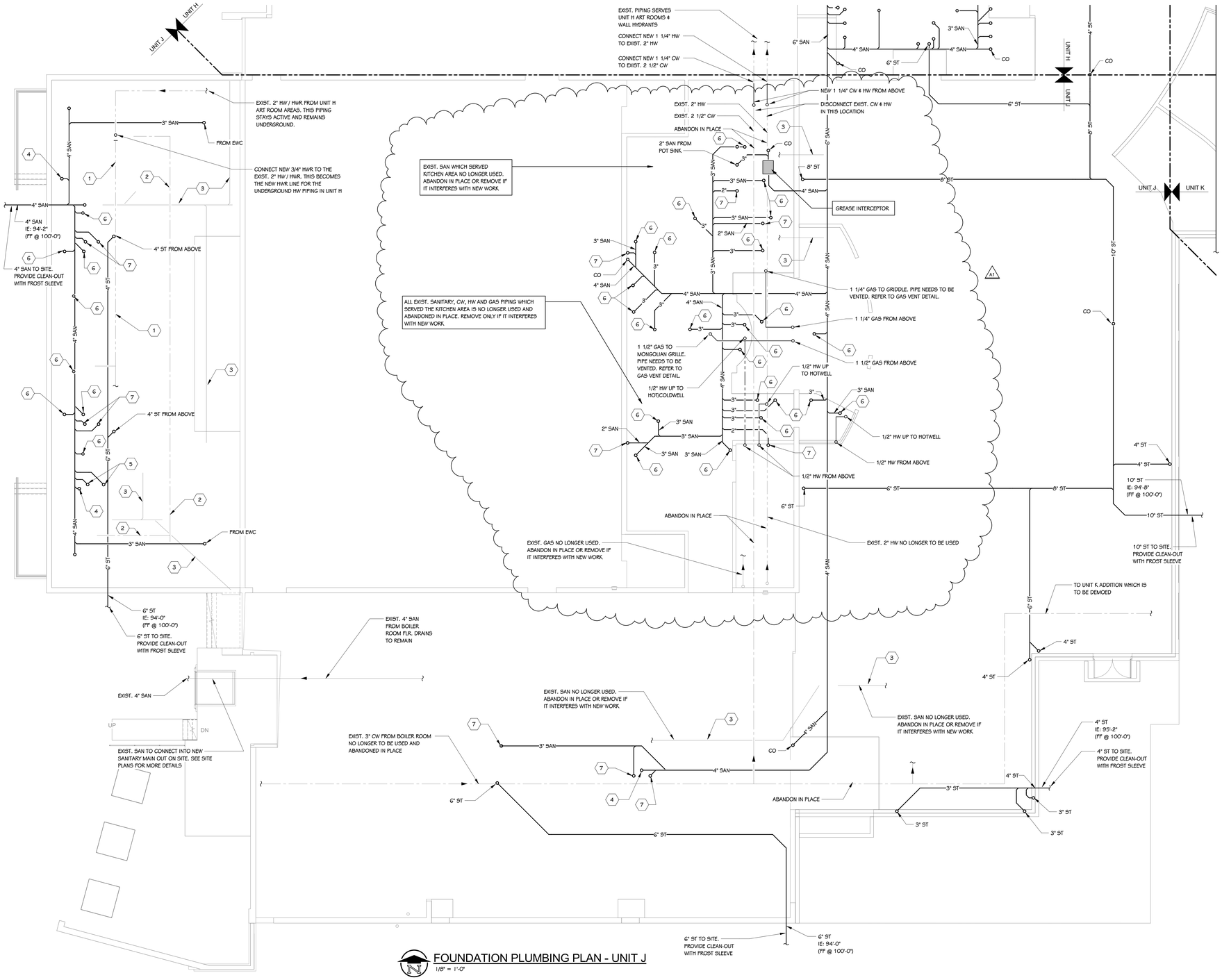
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FOUNDATION PLUMBING PLAN - UNIT D

DATE
NOVEMBER 03, 2021

SHEET NUMBER
P 000.2D
17-175.70



FOUNDATION PLUMBING PLAN - UNIT J

1/8" = 1'-0"

GENERAL PLUMBING NOTES

1 DETAILS SHOWN ILLUSTRATE DESIGN INTENT, NOT ALL POSSIBLE CONDITIONS. DRAWINGS ARE NOT TO BE CONSIDERED FABRICATION DRAWINGS.

2 IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT OTHER THAN BASIS OF DESIGN, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.

3 COORDINATE ALL NEW CONSTRUCTION WORK OR ACTIVITY WITH THAT WHICH IS REQUIRED BY OTHER TRADES OR INSTALLERS IN ORDER TO PROVIDE A COMPLETE SYSTEM INCLUDING ALL NECESSARY COMPONENTS, FITTINGS, AND OFFSETS.

4 INSTALLER SHALL VERIFY ALL EXISTING JOBSITE CONDITIONS AND DIMENSIONS AND BE RESPONSIBLE FOR THE SAME. NOTIFY THE ENGINEER OF DISCREPANCIES PRIOR TO COMMENCING WORK.

5 FIRE SEAL ALL PENETRATIONS, SUCH AS PIPES, DUCTS, CONDUIT, ETC. THROUGH FIRE AND/OR SMOKE RATED ASSEMBLIES.

6 CONTRACTOR IS RESPONSIBLE UNLESS NOTED OTHERWISE BY ASSIGNED WORK SCOPE FOR PATCHING OF WALLS, CEILINGS, ROOF AND FLOORS WHERE PIPING, DUCTWORK, EQUIPMENT AND RELATED ACCESSORIES HAVE BEEN REMOVED, RELOCATED, OR NEWLY INSTALLED.

7 ALL PIPING SHALL AVOID LOCATIONS DIRECTLY ABOVE ALL ELECTRICAL EQUIPMENT. COORDINATE WITH ELECTRICAL.

8 CONTRACTOR TO INSTALL ALL EQUIPMENT AND MATERIALS PER THE MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL REQUIRED SERVICE CLEARANCES FOR EQUIPMENT INSTALLATION.

9 ALL LOW VOLTAGE CABLING SHALL BE RUN IN CONDUIT BETWEEN DEVICE AND CABLE TRAY OR TECHNOLOGY RACK. NO CABLING SHALL BE VISIBLE IN EXPOSED CEILING SPACES. EXPOSED CONDUIT SHALL BE PAINTED TO MATCH SURFACE IT IS SUPPORTED FROM. WIRING ROUTED IN ACCESSIBLE CEILING SPACES SHALL BE INDEPENDENTLY SUPPORTED WITH COMM HOOKS OR RINGS.

10 DASHED LINES INDICATE 1" DOUBLE WALL OR 1" ACOUSTICAL LINED DUCT TO BE INSTALLED. REFER TO PLANS FOR LISTED TYPE.

11 CONTRACTOR SHALL CAREFULLY COORDINATE ROUTING OF DUCTWORK, HVAC PIPING, PLUMBING PIPING, FIRE PROTECTION AND ELECTRICAL BETWEEN ONE ANOTHER.

13 ALL EXPOSED PIPING ROUTED ABOVE FINISHED AREAS SHALL HAVE A PAINTABLE PROTECTIVE JACKET INSTALLED OVER INSULATION.

14 ALL EQUIPMENT WITH A HOT WATER HEATING COIL SHALL BE SUPPLIED WITH 2-WAY CONTROL VALVE UNLESS NOTED BY KEYNOTE ON PLANS TO BE PROVIDED WITH 3-WAY.

KEYED NOTES - PLUMBING

1 EXISTING UNDERGROUND HW PIPING NO LONGER USED AND ABANDON IN PLACE.

2 EXISTING UNDERGROUND CW PIPING NO LONGER USED AND ABANDON IN PLACE.

3 EXISTING SANITARY PIPING NO LONGER USED AND ABANDON IN PLACE.

4 4" SANITARY FROM WATER CLOSET OR WATER CLOSETS.

5 2" SANITARY FROM URINAL.

6 3" SANITARY FROM FLOOR DRAIN, FLOOR SINK, SHOWER DRAIN OR MOP SINK.

7 2" SANITARY FROM LAV OR SINK.

8 1" CW TO WATER CLOSET.

9 3/4" CW TO URINAL.

10 1/2" CW & HW TO LAV OR SHOWER FROM OVERHEAD PIPE MAINS.

11 2 1/2" CW DOWN IN CHASE TO SERVE (3) WCs. ROUTE 1" CW TO EACH WC.

12 CONNECT NEW SANITARY TO EXISTING IN THIS LOCATION.

13 CONNECT NEW PIPING TO EXISTING.

14 2" CW DOWN IN CHASE TO SERVE (1) WC & (2) URs. ROUTE 1" CW TO WC AND 3/4" CW TO EACH UR.

15 1 1/2" VENT FROM (2) LAVS. 1 1/4" VENT FOR EACH LAV.

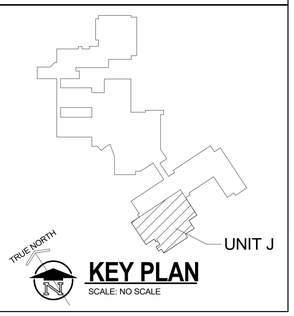
16 3" VTR. CONNECTS TO 2" VENT FROM WC AND (2) 1 1/2" VENTS FROM URs IN CHASE.

17 3" VTR. CONNECTS TO (3) 2" VENTS FROM WCs IN CHASE.

18 INSTALL PAINTABLE PVC JACKET OVER PIPE INSULATION IN EXPOSED OCCUPIED LOCATIONS WHERE SHOWN.

31 ALL STORM AND STORM (OF) PIPING LOCATED OUTSIDE THE BUILDING SHALL REQUIRE HEAT TRACE INSTALLED. HEAT TRACE SHALL BE APPLIED FROM THE ROOF DRAIN BODY TO THE LOCATION WHERE THE PIPE ENTERS INSIDE THE WALL.

CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

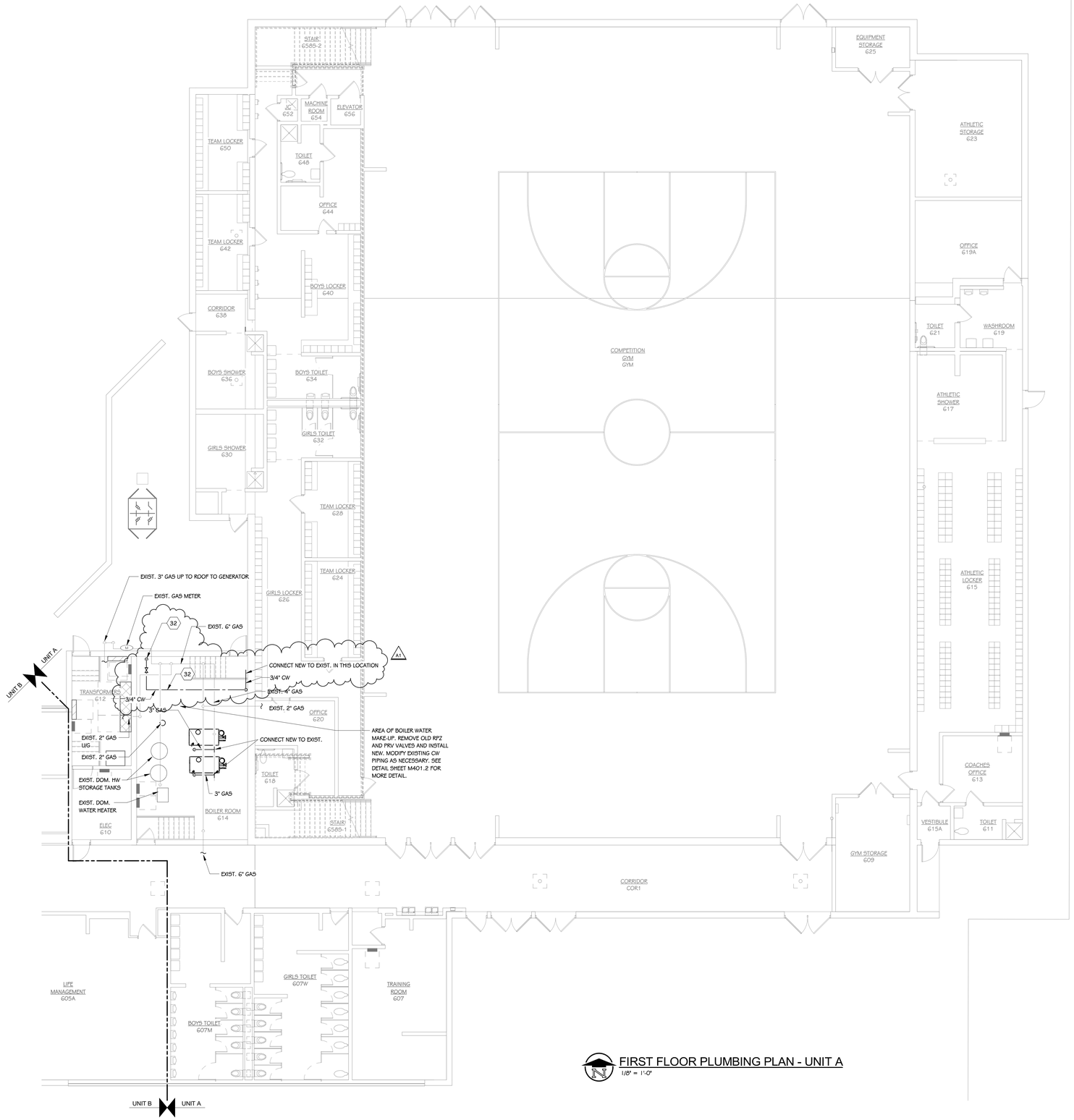
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FOUNDATION PLUMBING PLAN - UNIT J

DATE
NOVEMBER 03, 2021

SHEET NUMBER
P000.2J
17-175.70



FIRST FLOOR PLUMBING PLAN - UNIT A
1/8" = 1'-0"

GENERAL PLUMBING NOTES

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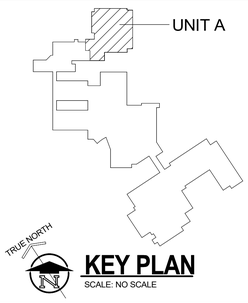
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32 PER ALTERNATE # 9, CONNECT NEW 3/4" CW TO EXISTING CW MAIN. 3/4" CW TO OUTSIDE BUILDING. REFER TO SITE PLANS FOR CONT. INSTALL NEW RPZ VALVE IN 3/4" CW LINE. NEW 3/4" CW TO TENNIS COURTS.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021

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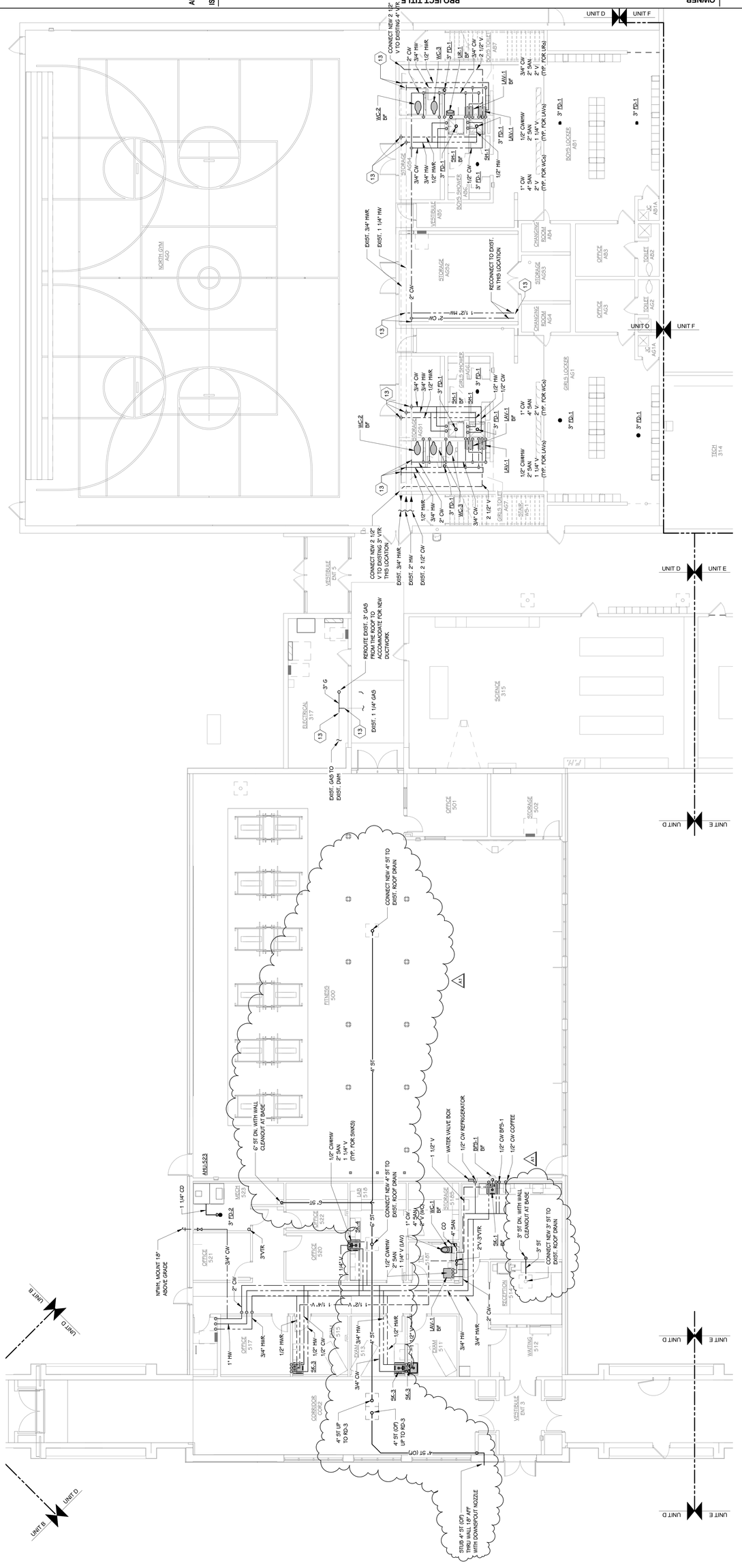
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

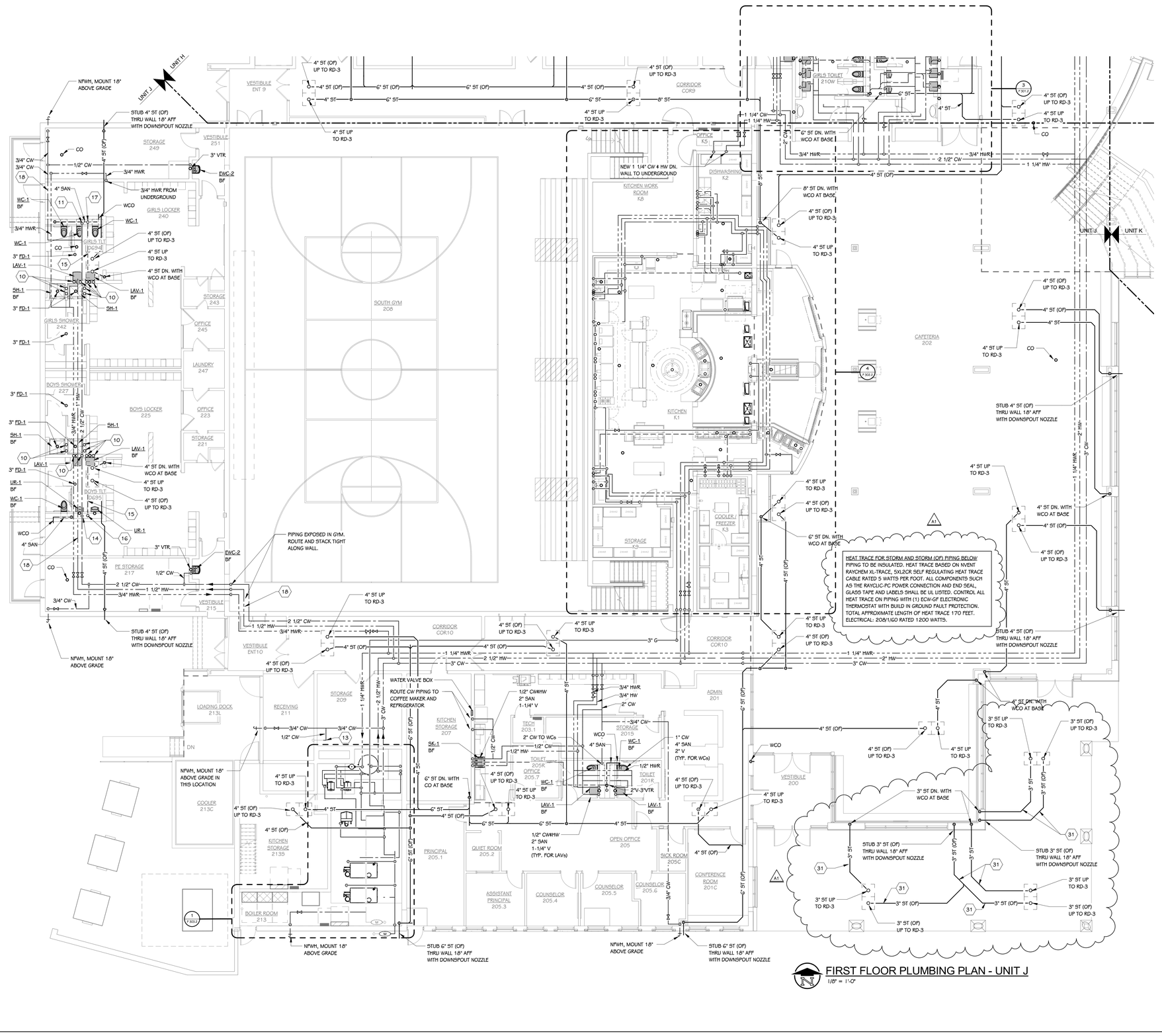
OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
FIRST FLOOR PLUMBING PLAN - UNIT A

DATE
NOVEMBER 03, 2021

SHEET NUMBER
P101.2A
17-175.70


UNIT D
UNIT F
UNIT E
UNIT B
NORTH GYM
A50
MECH
502
AHU-502
OFFICE
521
OFFICE
520
OFFICE
522
LAB
510
OFFICE
517
ELECTRICAL
317
SCIENCE
315
SCIENCE
314
OFFICE
501
STORAGE
502
FITNESS
500
CORRIDOR
512
VESTIBULE
ENT 3
WAITING
516
RECEPTION
514
STORAGE
515
OFFICE
511
ROOM
513
ROOM
515
VESTIBULE
ENT 5
STORAGE
AG54
VESTIBULE
A55
BOYS SHOWER
A56
BOYS LOCKERS
A57
STORAGE
AG52
CHANGING
ROOM
AB4
STORAGE
AG53
OFFICE
AB3
TOILET
AB2
JC
AB1A
CHANGING
ROOM
AG4
OFFICE
AG3
TOILET
AG2
JC
AG1A
GIRLS LOCKER
AG1
GIRLS SHOWER
AG4A
GIRLS TOILET
A47
STORAGE
AG51
CONNECT NEW 2 1/2" V TO EXISTING 4" VTR.
CONNECT NEW 2 1/2" V TO EXISTING 3" VTR. THIS LOCATION
EXIST. 3/4" HWR
EXIST. 2" HW
EXIST. 2 1/2" CW
EXIST. 3/4" HW
EXIST. 1 1/4" HWR
EXIST. 2" CW
RECONNECT TO EXIST. IN THIS LOCATION
EXIST. 3/4" HWR
EXIST. 1 1/4" HW
EXIST. GAS TO EXIST. DWH
REROUTE EXIST. 3" GAS FROM THE ROOF TO ACCOMMODATE FOR NEW DUCTWORK
EXIST. 1 1/4" GAS
3" G
CONNECT NEW 4" ST TO EXIST. ROOF DRAIN
6" ST DN. WITH WALL CLEANOUT AT BASE
4" ST
4" ST (OP) UP TO RD-3
STUB 4" ST. (OP) THRU WALL 1'-8" AFF WITH DOWNSPOUT NOZZLE
1/2" CW/HW
2" SAN
1" V
(TYP. FOR SINKS)
1/2" CW/HW
1" SAN
1 1/4" V
(TYP. FOR LAVs)
1/2" CW/HW
1" SAN
1 1/4" V
(TYP. FOR WCs)
1/2" CW/HW
2" SAN
1 1/4" V (LAV)
1" CW
4" SAN
1 1/2" V
WATER VALVE BOX
1/2" CW REFRIGERATOR
1/2" CW BFS-1
1/2" CW COFFEE
3" ST DN. WITH WALL CLEANOUT AT BASE
CONNECT NEW 3" ST TO EXIST. ROOF DRAIN
MWH, MOUNT 18" ABOVE GRADE
1 1/4" CD
3" FD-2
3"VTR
2"-3"VTR
1 1/4" V
1 1/2" V
1 1/4" V
1" HW
1/2" HWR
1/2" HW
1/2" CW
3/4" CW
3/4" HW
3/4" HWR
2" CW
1 1/2" V
1 1/4" V
2" CW
3/4" CW
3/4" HW
1/2" HWR
3/4" HW
3/4" HWR
2" CW
1 1/2" V
1 1/4" V
2" CW
3/4" CW
3/4" HW
1/2" HWR
3/4" CW
3/4" HW
1/2" HWR
2" CW
1 1/2" V



FIRST FLOOR PLUMBING PLAN - UNIT J
1/8" = 1'-0"

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CADILLAC HIGH SCHOOL

KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1	NOVEMBER 29, 2021
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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

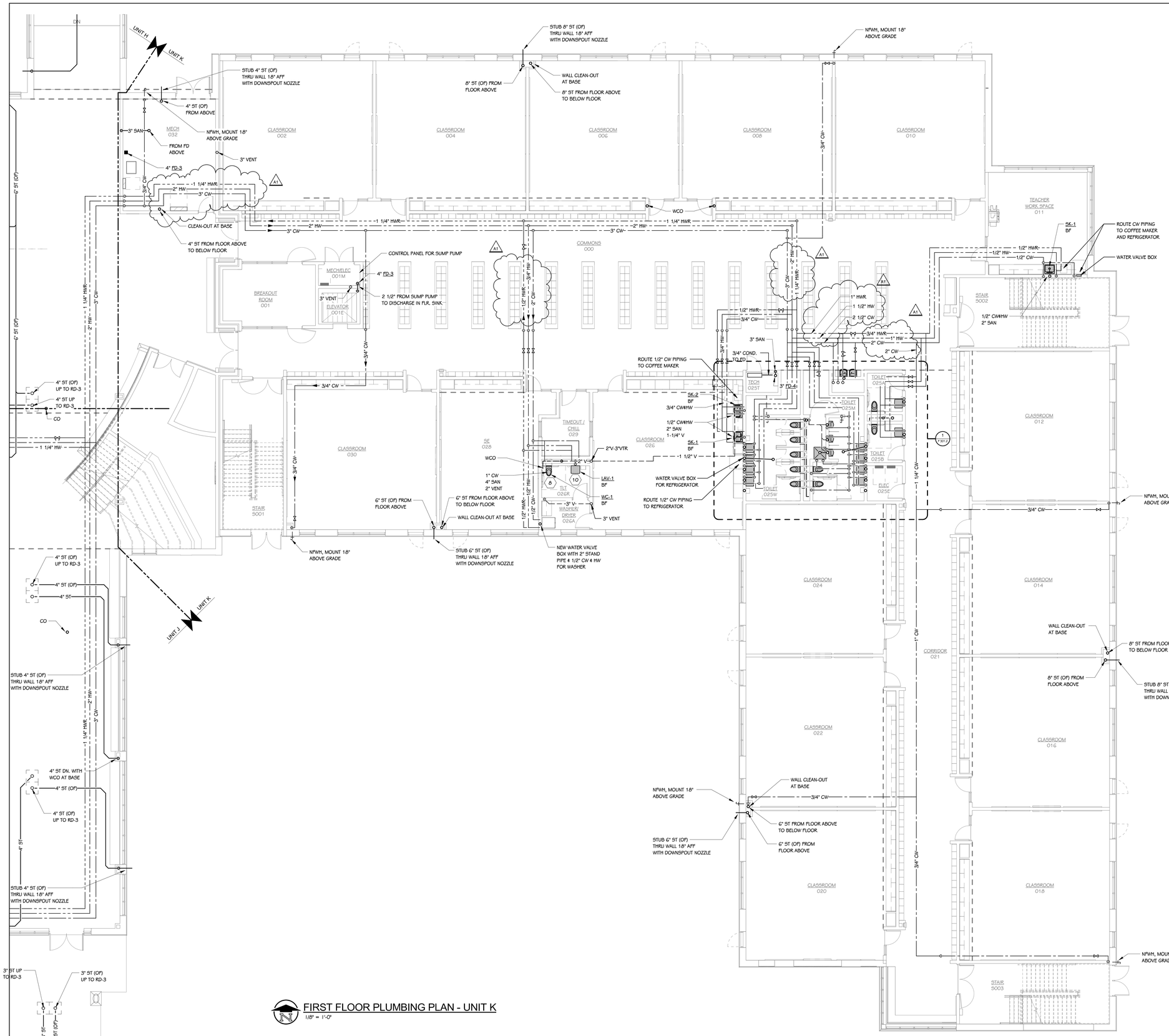
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR PLUMBING PLAN - UNIT J

DATE
NOVEMBER 03, 2021

SHEET NUMBER
P 101.2J
17-175.70



FIRST FLOOR PLUMBING PLAN - UNIT K
1/8" = 1'-0"

GENERAL PLUMBING NOTES

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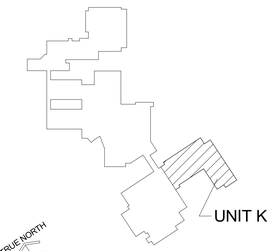
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CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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RENOVATION & ADDITIONS

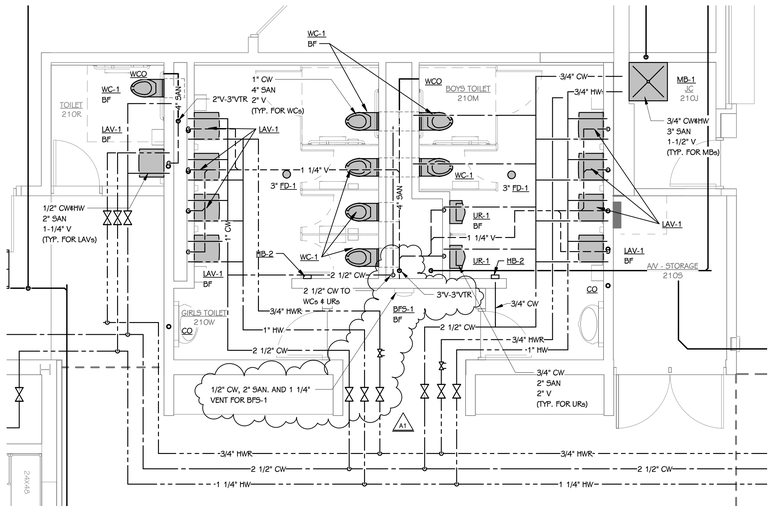
OWNER
CADILLAC AREA PUBLIC SCHOOLS

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SHEET TITLE
FIRST FLOOR PLUMBING PLAN - UNIT K

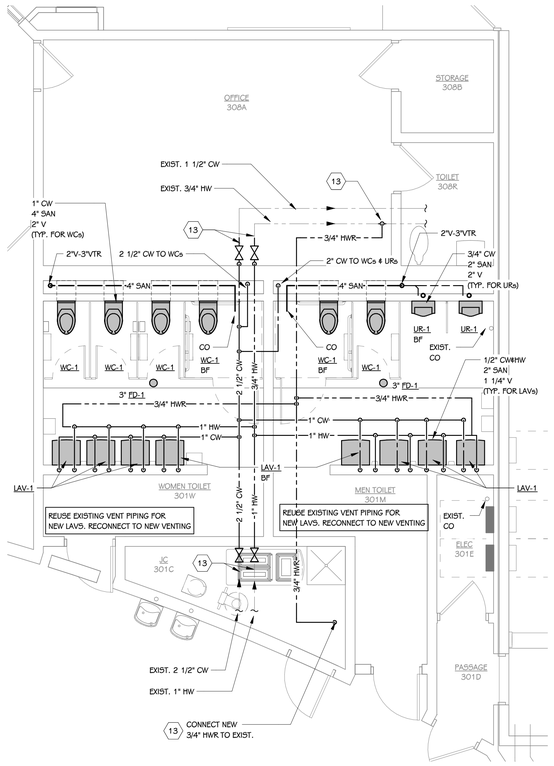
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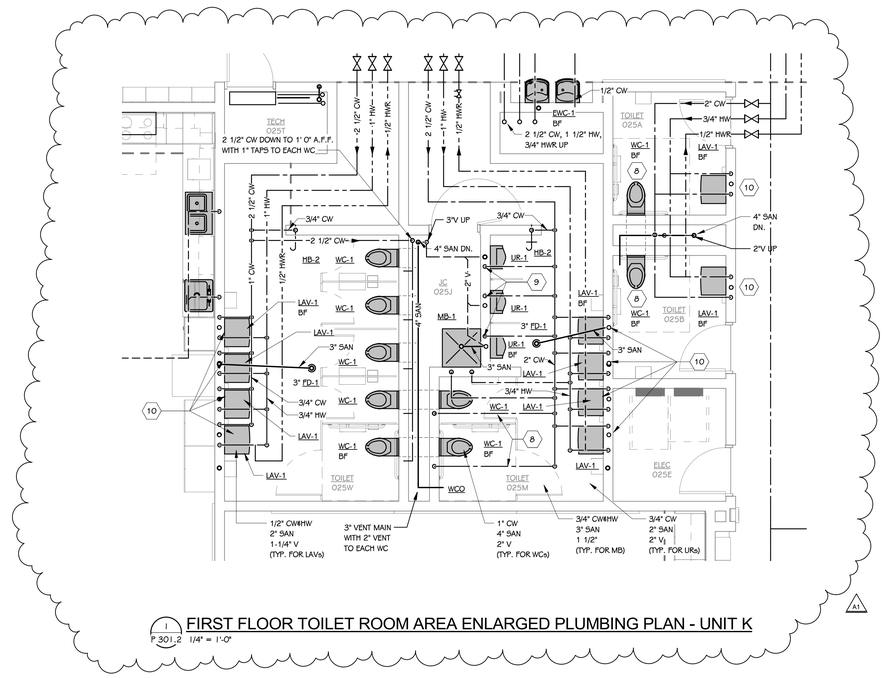
3 P 301.2 FIRST FLOOR TOILET ROOM AREA ENLARGED PLUMBING PLAN - UNIT H

1/4" = 1'-0"



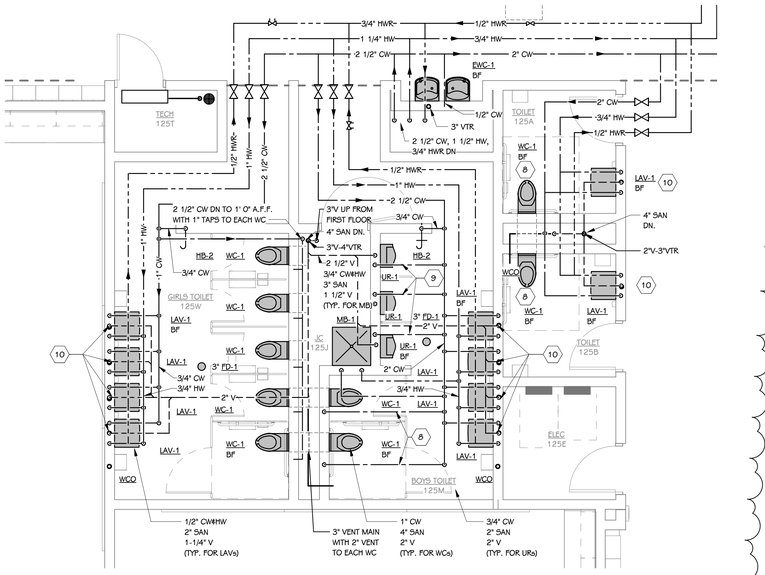
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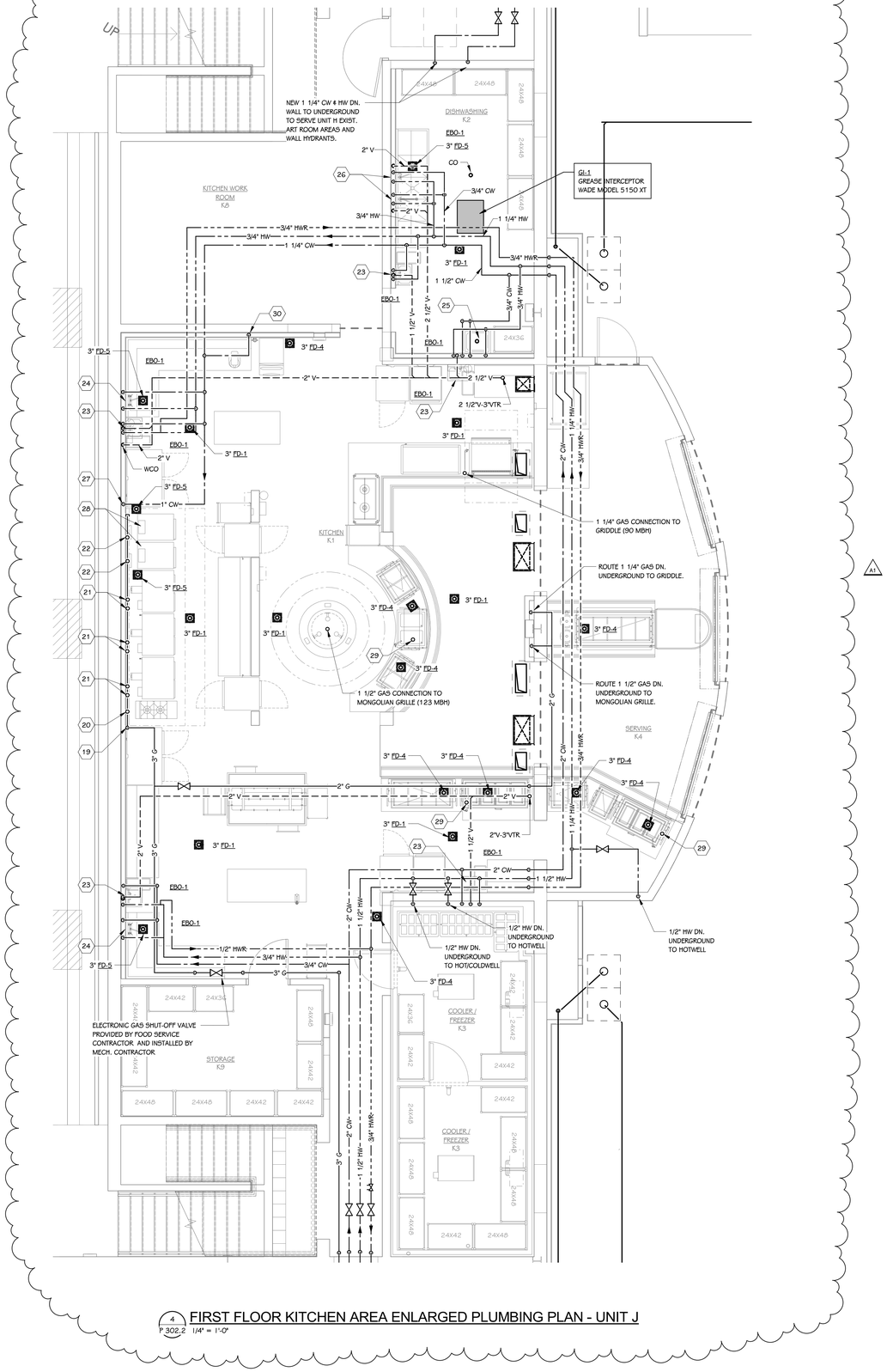
PROJECT TITLE
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RENOVATION & ADDITIONS

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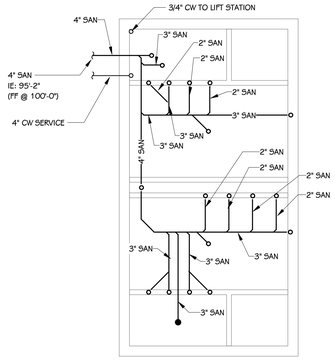
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ENLARGED PLUMBING PLANS

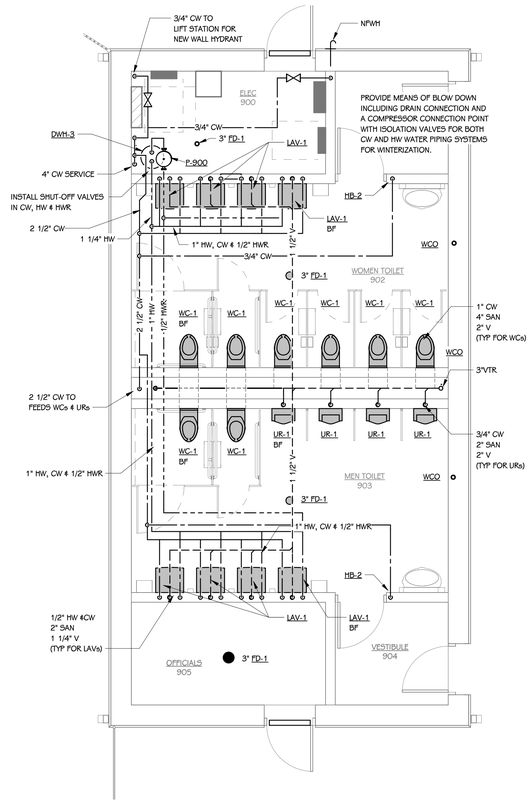
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4 FIRST FLOOR KITCHEN AREA ENLARGED PLUMBING PLAN - UNIT J
P 302.2 1/4" = 1'-0"



STADIUM TOILET BUILDING FOUNDATION PLUMBING PLAN
1/8" = 1'-0"



STADIUM TOILET BUILDING PLUMBING PLAN
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19 ROUTE 3" GAS FROM CEILING DOWN TO 6" A.F.F., SECURE HEADER TO WALL. ROUTE GAS PIPE HEADER FULL SIZE w/ NO REDUCTIONS.

20 1 1/4" GAS FOR RANGE, 90 MBH. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

21 (2) 1 1/4" GAS CONNECTIONS FOR CONVECTION OVEN. EACH CONNECTION 90 MBH FOR A TOTAL OF 180 MBH PER OVEN. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

22 1 1/2" GAS FOR STEAMER, 125 MBH. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

23 1/2" HW & CW TO HAND SINK. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

24 1/2" HW & CW TO PREP TABLE. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

25 1/2" HW & CW FOR MOP SINK. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

26 (2) 1/2" HW & CW FOR POT SINK. REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

27 1" CW HEADER DOWN IN WALL TO SUPPLY WATER CONNECTIONS FOR STEAMERS.

28 FOR EACH STEAMER: 1/2" CW TO FILTER AND THEN TO STEAMER, 1/2" CW CONNECTION NON FILTERED TO STEAMER AND 1/2" CW TO DRAIN WATER TEMPERING KIT SERVING THE STEAMER.

29 1/2" HW FROM UNDERGROUND TO SERVE HOTWELL OR HOT/COLD WELL. TERMINATE ABOVE FLOOR WITH SHUT-OFF VALVE.

30 1/2" CW TO ICE MAKER FILTER SYSTEM AND THEN PIPED FROM FILTER TO ICE MAKER.

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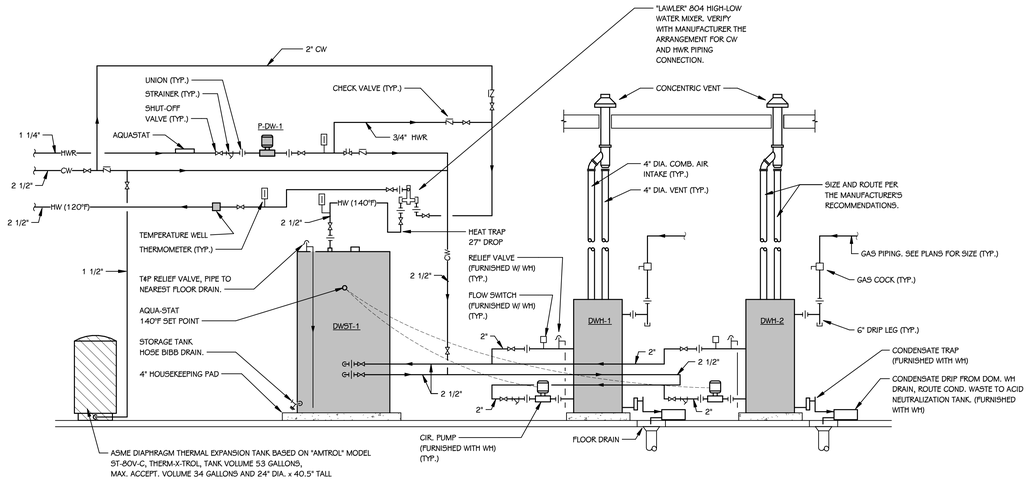
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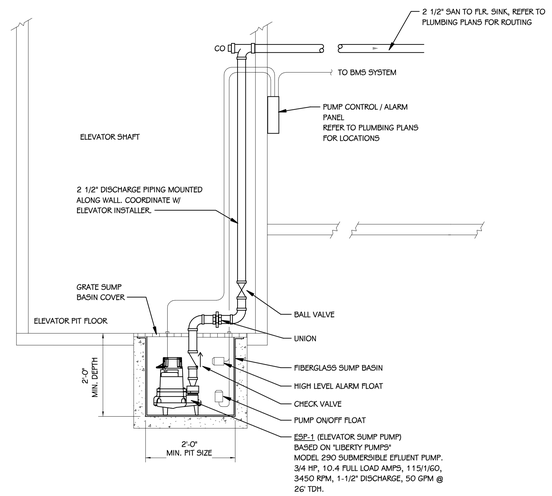


P-DW-1 DOMESTIC WATER RE-CIRC PUMP
REFER TO PUMP EQUIPMENT SCHEDULE

DWST-1 DOMESTIC HOT WATER STORAGE TANK
BASED ON "LOCHINVAR" MODEL RGA0432, LOCK TEMP, 432 GALLON, ASME, GLASS LINED, ROUND JACKETED, INSULATED VERTICAL STORAGE TANK. PROVIDE WITH INTERNAL TANK BAFFLE, MAGNESIUM ANODES AND SIZE 46" DIA. x 80" H.

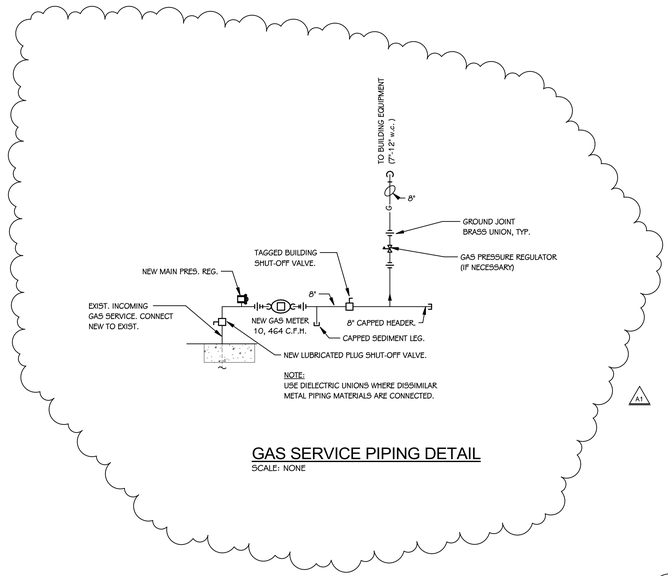
DWH-1 & DWH-2 GAS FIRED DOMESTIC WATER HEATERS
BASED ON "LOCHINVAR" ARMOR MODEL AWN286PM, 96% THERMAL EFFICIENCY CONDENSING WATER HEATER, 5:1 TURN DOWN, 285 MBH INPUT, 332 GPH @ 100°F TEMPERATURE RISE, 4" DIA. VENT & COMB. AIR FOR DIRECT VENT VERTICAL VENTING APPLICATION, 2" WATER CONNECTIONS, 3/4" GAS CONNECTION, SMART TOUCH CONTROL SYSTEM AND PROVIDED WITH ALL BRONZE CIRCULATING PUMP.

DOMESTIC WATER HEATER DETAIL
SCALE: NONE



ESP-1 (ELEVATOR SUMP PUMP)
BASED ON "LIBERTY PUMPS" MODEL 290 SUBMERSIBLE EFFLUENT PUMP. 3/4 HP, 10.4 FULL LOAD AMPS, 115/1/60, 3450 RPM, 1-1/2" DISCHARGE, 50 GPM @ 26' TDH.

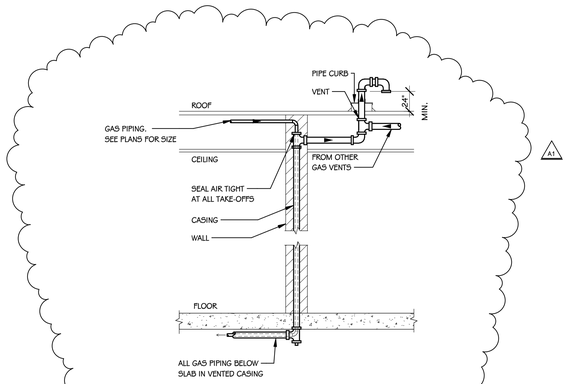
ELEVATOR SUMP PUMP DETAIL (ESP-1)
SCALE: NONE



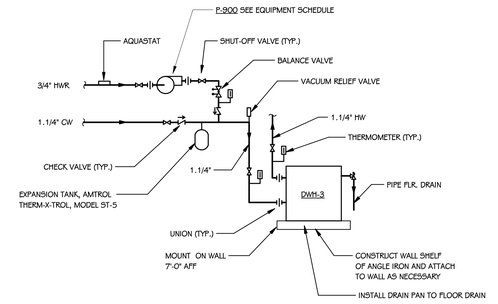
NOTE:
USE DIELECTRIC UNIONS WHERE DISSIMILAR METAL PIPING MATERIALS ARE CONNECTED.

GAS SERVICE PIPING DETAIL
SCALE: NONE

NATURAL GAS LOAD SCHEDULE - NEW METER (LOCATION UNIT J)		
EQUIPMENT	LOAD (CFH)	PRESSURE (IN WC)
B-1	2500	4" - 14"
B-2	2500	4" - 14"
DWH-1	285	4" - 14"
DWH-2	285	4" - 14"
B-5	750	4" - 14"
RTU-3J	250	4" - 14"
RTU-4J	250	4" - 14"
RTU-5J	250	4" - 14"
RTU-6J	250	4" - 14"
RTU-1J	500	7" - 14"
RTU-1K	500	7" - 14"
RTU-2K	500	7" - 14"
MAU (KITCHEN)	551	7" - 14"
RANGE (KITCHEN)	90	7" - 12"
CONVECTION OVENS (KITCHEN)	540	7" - 12"
STEAMERS (KITCHEN)	250	4" - 14"
MONGOLIAN GRILLE (KITCHEN)	123	7" - 12"
GRIDDLE (KITCHEN)	90	7" - 12"
10464		

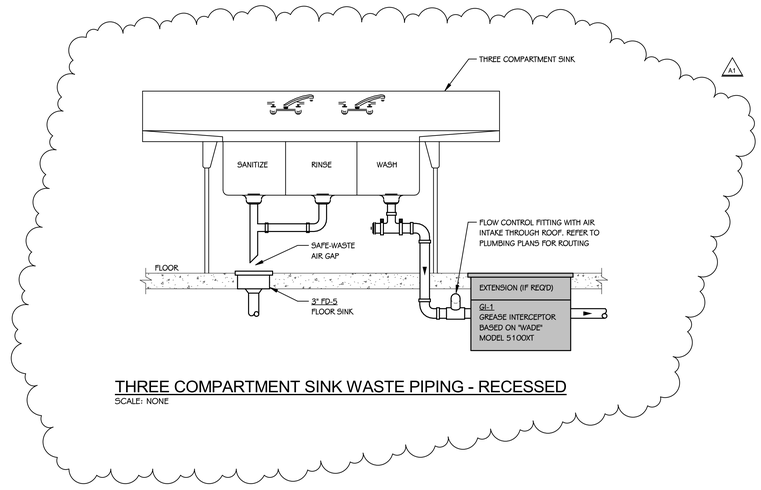


GAS VENT DETAIL
SCALE: NONE



DW1-3
BASED ON LOCHINVAR JUNIOR ELECTRIC HEAT MODEL, JRC020FS, 20 GALLONS, 2500 WATTS @ 120 VOLTS

ELECTRIC WATER HEATER DETAIL (STADIUM TOILET BUILDING)
SCALE: NONE



THREE COMPARTMENT SINK WASTE PIPING - RECESSED
SCALE: NONE

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

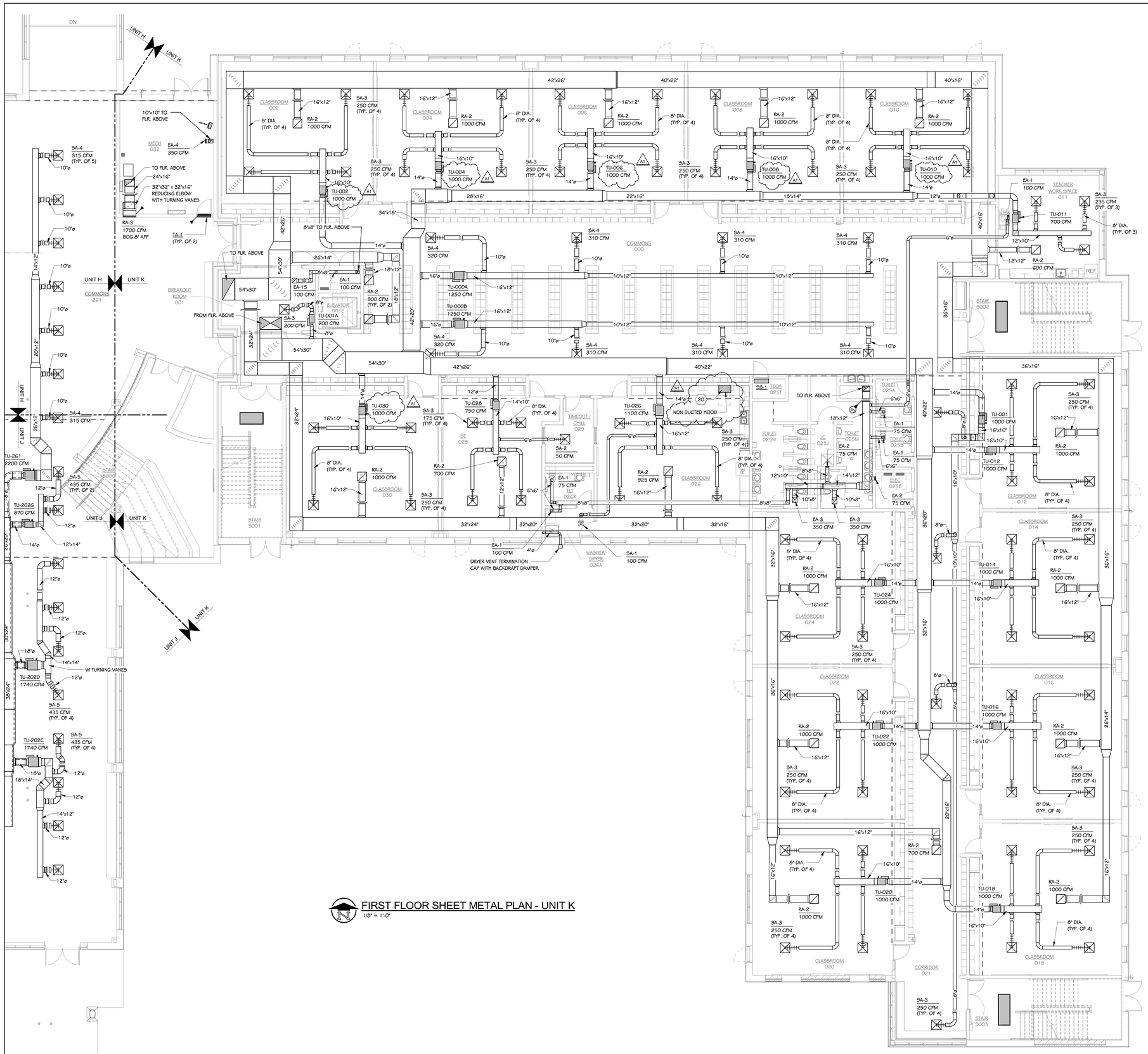
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
PLUMBING SCHEDULES AND DETAILS

DATE
NOVEMBER 03, 2021

SHEET NUMBER
P 501.2
17-175.70



FIRST FLOOR SHEET METAL PLAN - UNIT K

1/8" = 1'-0"

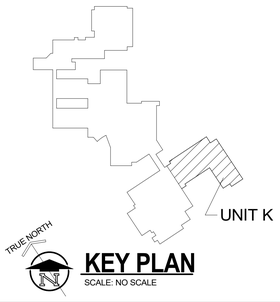
GENERAL MECHANICAL NOTES

1. DETAILS SHOWN ILLUSTRATE DESIGN INTENT, NOT ALL POSSIBLE CONDITIONS. DRAWINGS ARE NOT TO BE CONSIDERED FABRICATION DRAWINGS.
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3. COORDINATE ALL NEW CONSTRUCTION WORK OR ACTIVITY WITH THAT WHICH IS REQUIRED BY OTHER TRADES OR INSTALLERS IN ORDER TO PROVIDE A COMPLETE SYSTEM INCLUDING ALL NECESSARY COMPONENTS, FITTINGS, AND OFFSETS.
4. INSTALLER SHALL VERIFY ALL EXISTING JOBSITE CONDITIONS AND DIMENSIONS AND BE RESPONSIBLE FOR THE SAME. NOTIFY THE ENGINEER OF DISCREPANCIES PRIOR TO COMMENCING WORK.
5. FIRE SEAL ALL PENETRATIONS, SUCH AS PIPES, DUCTS, CONDUIT, ETC. THROUGH FIRE AND/OR SMOKE RATED ASSEMBLIES.
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9. ALL LOW VOLTAGE CABLING SHALL BE RUN IN CONDUIT BETWEEN DEVICE AND CABLE TRAY OR TECHNOLOGY RACK. NO CABLING SHALL BE VISIBLE IN EXPOSED CEILING SPACES. EXPOSED CONDUIT SHALL BE PAINTED TO MATCH SURFACE IT IS SUPPORTED FROM. WIRING ROUTED IN ACCESSIBLE CEILING SPACES SHALL BE INDEPENDENTLY SUPPORTED WITH COMM HOOKS OR RINGS.
10. DASHED LINES INDICATE 1" DOUBLE WALL OR 1" ACOUSTICAL LINED DUCT TO BE INSTALLED. REFER TO PLANS FOR LISTED TYPE.
11. CONTRACTOR SHALL CAREFULLY COORDINATE ROUTING OF DUCTWORK, HVAC PIPING, PLUMBING PIPING, FIRE PROTECTION AND ELECTRICAL BETWEEN ONE ANOTHER.
13. ALL EXPOSED PIPING ROUTED ABOVE FINISHED AREAS SHALL HAVE A PAINTABLE PROTECTIVE JACKET INSTALLED OVER INSULATION.
14. ALL EQUIPMENT WITH A HOT WATER HEATING COIL SHALL BE SUPPLIED WITH 2-WAY CONTROL VALVE UNLESS NOTED BY KEYNOTE ON PLANS TO BE PROVIDED WITH 3-WAY.

KEYED NOTES - MECHANICAL

1. UP TO EXHAUST FAN ON ROOF.
2. FROM INTAKE HOOD ON ROOF.
3. CONNECT NEW DUCT TO EXISTING DUCT.
4. NEW UNIT TO CONNECT INTO THE EXISTING DUCT SYSTEM. MODIFY THE SUPPLY AIR, RETURN AIR AND OR OUTSIDE AIR CONNECTIONS AS NECESSARY TO CONNECT TO NEW UNIT.
5. NO FLEX DUCT ALLOWED IN THIS AREA ABOVE FLOATING CEILING.
6. CONSTRUCT PLENUM TO MATCH LOUVER SIZE. SLOPE BOTTOM TOWARDS LOUVER FOR DRAINAGE.
7. 1" DOUBLE WALL DUCTWORK FROM UNIT DISCHARGE TO HEATING COIL.
8. 1" ACOUSTICAL LINED DUCTWORK. (DASHED LINES).
9. ROOF CURB SHALL HAVE DRYWALL AND INSULATION INSTALLED INSIDE. SEE AHU ROOF CURB INSULATION DETAIL FOR MORE INFORMATION.
10. FLEX DUCT MAY BE USED IN THIS LOCATION ABOVE FLOATING CEILING. USE A SHORT LENGTH THAT WILL NOT BE SEEN FROM THE FLOOR LEVEL.
11. REBALANCE TO CFM AS INDICATED.
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13. EXISTING OA DUCT FROM EXISTING INTAKE HOOD ON ROOF.
14. EXISTING EA DUCT TO NEW EXHAUST FAN ON ROOF.
15. INSTALL NEW FAN ON EXISTING ROOF CURB. PROVIDE ADAPTOR CURB. CONSTRUCT OUT OF 16 GAUGE GALVANIZED STEEL.
16. ROUTE 10" EXHAUST VENT AND 10" COMBUSTION AIR INTAKE VENT FOR EACH BOILER. PRIOR TO ROUTING REFER TO THE MANUFACTURER FOR SIZING, ACCESSORIES AND ALL VENTING REQUIREMENTS. EXHAUST SHALL BE AL29-4C.
17. ROUTE 6" EXHAUST VENT AND 6" COMBUSTION AIR INTAKE VENT FOR BOILER. PRIOR TO ROUTING REFER TO THE MANUFACTURER FOR SIZING, ACCESSORIES AND ALL VENTING REQUIREMENTS. EXHAUST SHALL BE AL29-4C.
18. ROUTE 4" EXHAUST VENT AND COMBUSTION AIR VENT AND COMBINE AT ROOF DECK WITH CONCENTRIC VENT. PRIOR TO ROUTING REFER TO THE MANUFACTURER FOR ALL VENTING REQUIREMENTS, SIZING AND ACCESSORIES.
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20. BROAN MODEL BUEZ130WW, 30", WHITE, 120/1/60, 2.0 AMPS. WITH 2-SPEED ROCKER, 75 WATT LIGHT AND NON DUCT FILTER.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1	NOVEMBER 29, 2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

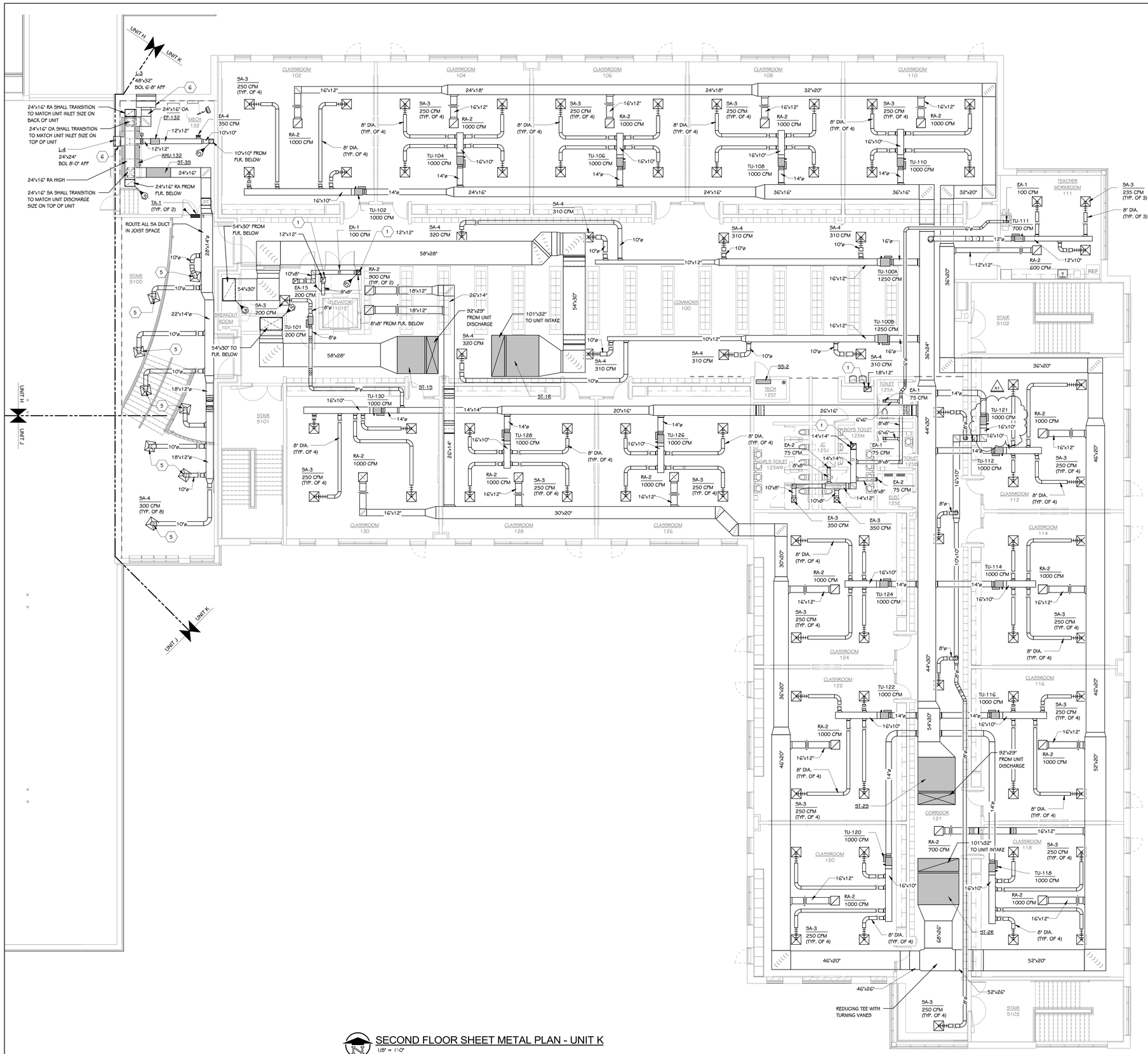
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR SHEET METAL PLAN - UNIT K

DATE
NOVEMBER 03, 2021

SHEET NUMBER
M 101.2K
17-175.70



SECOND FLOOR SHEET METAL PLAN - UNIT K
1/8" = 1'-0"

GENERAL MECHANICAL NOTES

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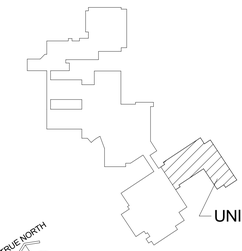
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20 BROAN MODEL BUEZ130WW, 30", WHITE, 120/1/60, 2.0 AMPS. WITH 2-SPEED ROCKER, 75 WATT LIGHT AND NON DUCT FILTER.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

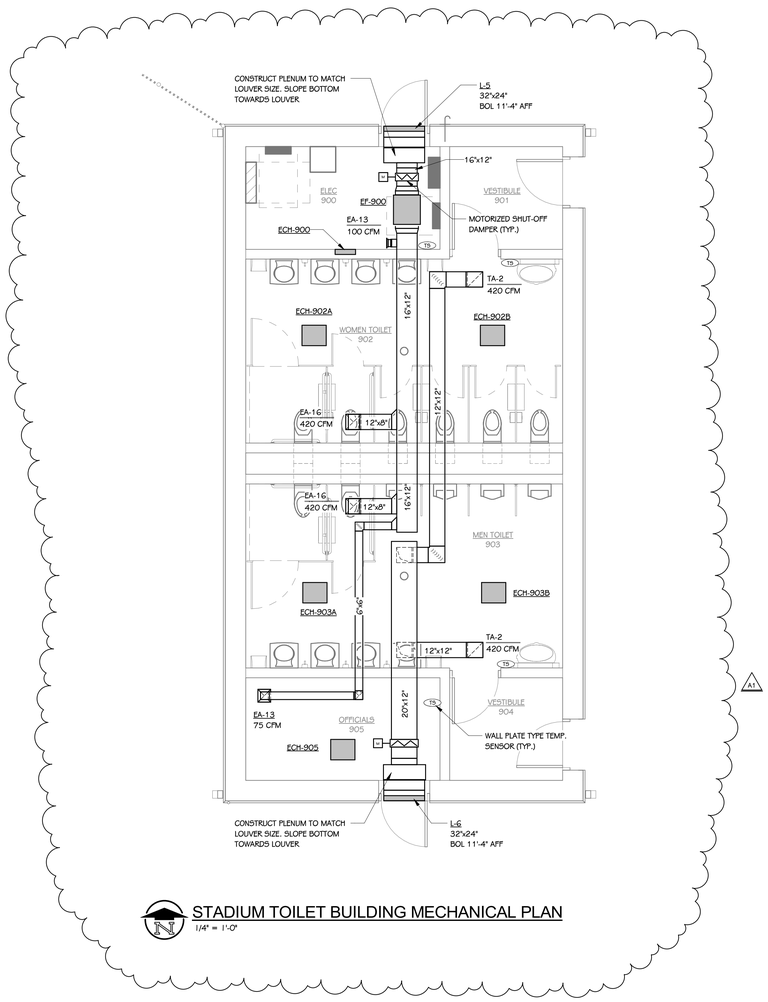
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

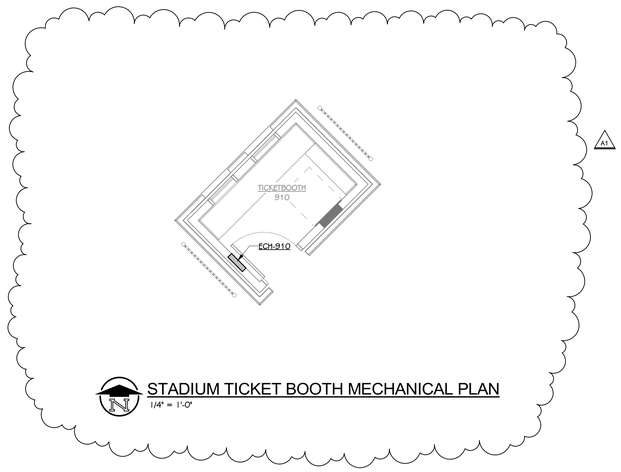
SHEET TITLE
SECOND FLOOR SHEET METAL PLAN - UNIT K

DATE
NOVEMBER 03, 2021

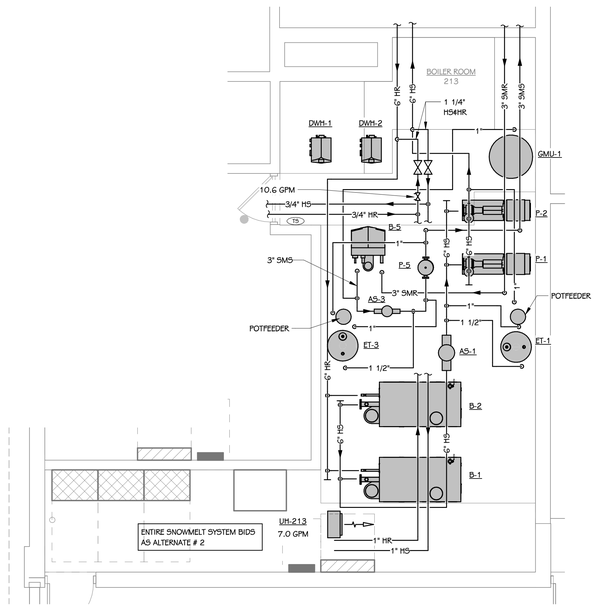
SHEET NUMBER
M102.2K
17-175.70



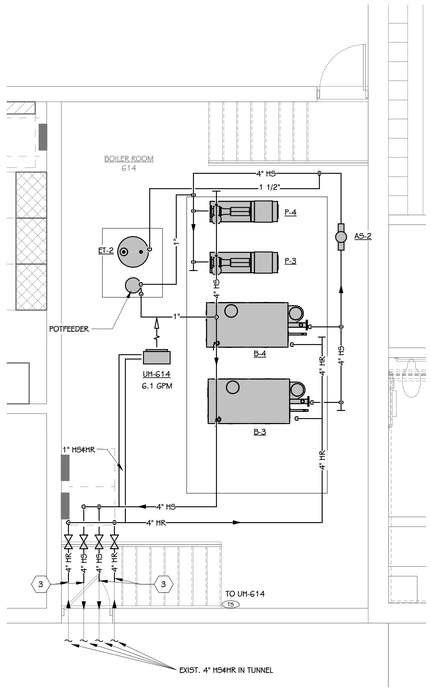
STADIUM TOILET BUILDING MECHANICAL PLAN
1/4" = 1'-0"



STADIUM TICKET BOOTH MECHANICAL PLAN
1/4" = 1'-0"



M 301.2 ENLARGED BOILER ROOM 213
SCALE: NONE



M 301.2 ENLARGED BOILER ROOM 614
SCALE: NONE

GENERAL MECHANICAL NOTES

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KEYED NOTES - HVAC PIPING

1 CAP EXISTING PIPING IN THIS LOCATION.

2 EXISTING PIPING DEMOED FROM TUNNEL OF EXISTING BUILDING SECTION (UNIT C) WHICH WAS DEMOLISHED.

3 CONNECT NEW PIPING TO EXISTING.

4 CONNECT NEW CABINET HEATER TO EXISTING PIPING IN WALL. MODIFY AS NECESSARY. REFER TO THE CABINET HEATER PIPING DETAIL FOR ALL NEW VALVING DETAILS.

5 CONNECT NEW 3/4" H54HR TO UNIT FROM TUNNEL BELOW. CONNECT TO EXISTING PIPING MAINS IN TUNNEL. MODIFY AS NECESSARY.

6 ROUTE REFRIGERANT PIPING TO CONDENSER UNIT LOCATED ON THE ROOF. ROUTE, SIZE, INSTALL AND PROVIDE ALL ACCESSORIES PER THE MANUFACTURER'S RECOMMENDATIONS.

7 CONNECT NEW EQUIPMENT TO EXISTING H54HR PIPING. MODIFY PIPING AS NECESSARY. REFER TO EQUIPMENT PIPING DETAIL FOR PIPING OF NEW UNIT.

8 ROUTE REFRIGERANT PIPING IN CORNER UP ALONG WALL TO ROOF. CONSTRUCT 16 GAUGE GALAVANIZED STEEL PIPE ENCLOSURE TO CONCEAL PIPING. PRIME AND PAINT TO MATCH WALL COLOR.

9 ROUTE AND CONCEAL REFRIGERANT PIPING BEHIND CASEWORK.

10 REBALANCE TO GPM AS INDICATED.

11 SNOWMELT PIPING MANIFOLD TO BE LOCATED WITHIN POLYMER CONCRETE UTILITY BOX LABELED "SNOWMELT". COORDINATE LOCATION OF BOX WITH LANDSCAPING AND OTHER EXTERIOR COMPONENTS. ALL UNDERGROUND SNOWMELT PIPING BETWEEN BUILDING AND HEATED SLAB SHALL BE PREINSULATED PEX TUBING BASED ON "UPONOR" ECOFLEX PIPING.

12 PROVIDE 3-WAY CONTROL VALVE.

13 CONNECT NEW 1" H54HR TO UNIT FROM TUNNEL BELOW. CONNECT TO EXISTING PIPING MAINS IN TUNNEL. MODIFY AS NECESSARY.

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ADDENDUM 1	NOVEMBER 29, 2021

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
ENLARGED MECHANICAL PLANS

DATE
NOVEMBER 03, 2021

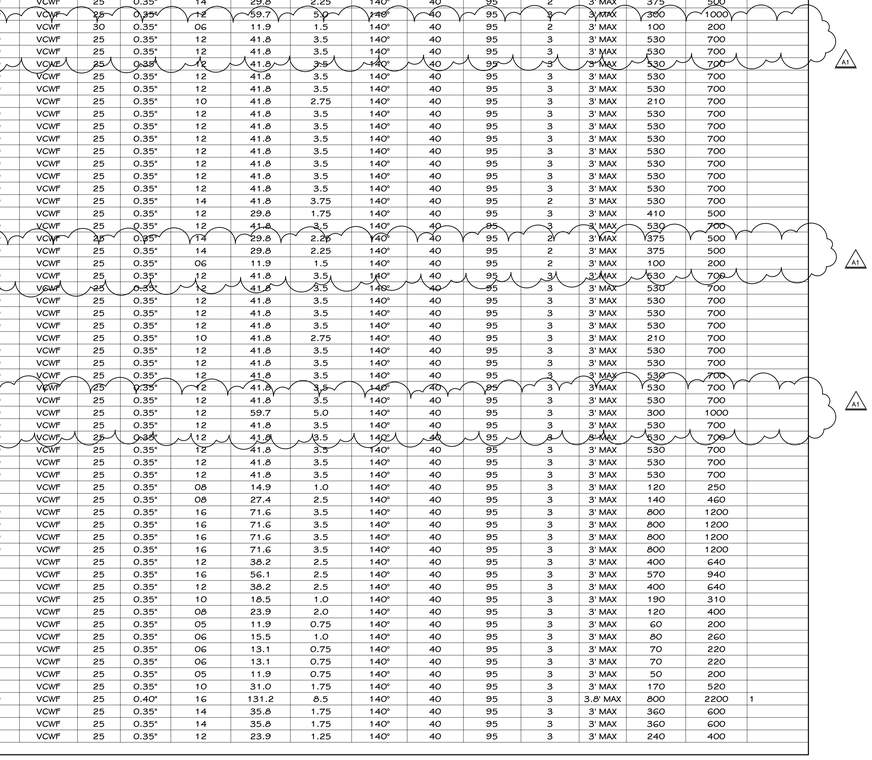
SHEET NUMBER
M 301.2
17-175.70

TERMINAL UNITS — BASED ON TRANE

MARK	MAX CFM	TYPE	NC (MAX)	SP DROP (MAX)	INLET SIZE	HEATING COIL MBH	GPM	EWT	EAT	LAT	ROWS	W.P.D.	MIN CFM CLG	MIN CFM HTG	NOTES
TU-000A	1250	VCWF	25	0.35"	14	29.8	2.25	140°	40	95	2	3' MAX	375	500	
TU-000B	1250	VCWF	25	0.35"	14	29.8	2.25	140°	40	95	2	3' MAX	375	500	
TU-001	1000	VCWF	25	0.35"	12	59.7	5.0	140°	40	95	3	3' MAX	300	1000	
TU-001A	200	VCWF	30	0.35"	06	11.9	1.5	140°	40	95	2	3' MAX	100	200	
TU-002	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-004	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-006	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-008	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-010	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-011	700	VCWF	25	0.35"	10	41.8	2.75	140°	40	95	3	3' MAX	210	700	
TU-012	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-014	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-016	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-018	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-020	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-022	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-024	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-026	1100	VCWF	25	0.35"	14	41.8	3.75	140°	40	95	2	3' MAX	530	700	
TU-028	750	VCWF	25	0.35"	12	29.8	1.75	140°	40	95	3	3' MAX	410	500	
TU-030	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-100A	1250	VCWF	25	0.35"	14	29.8	2.25	140°	40	95	2	3' MAX	375	500	
TU-100B	1250	VCWF	25	0.35"	14	29.8	2.25	140°	40	95	2	3' MAX	375	500	
TU-101	200	VCWF	25	0.35"	06	11.9	1.5	140°	40	95	2	3' MAX	100	200	
TU-102	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-104	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-106	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-108	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-110	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-111	700	VCWF	25	0.35"	10	41.8	2.75	140°	40	95	3	3' MAX	210	700	
TU-112	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-114	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-116	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-118	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-120	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-121	1000	VCWF	25	0.35"	12	59.7	5.0	140°	40	95	3	3' MAX	300	1000	
TU-122	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-124	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-126	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-128	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-130	1000	VCWF	25	0.35"	12	41.8	3.5	140°	40	95	3	3' MAX	530	700	
TU-201	400	VCWF	25	0.35"	08	14.9	1.0	140°	40	95	3	3' MAX	120	250	
TU-201C	460	VCWF	25	0.35"	08	27.4	2.5	140°	40	95	3	3' MAX	140	460	
TU-202A	1740	VCWF	25	0.35"	16	71.6	3.5	140°	40	95	3	3' MAX	800	1200	
TU-202B	1740	VCWF	25	0.35"	16	71.6	3.5	140°	40	95	3	3' MAX	800	1200	
TU-202C	1740	VCWF	25	0.35"	16	71.6	3.5	140°	40	95	3	3' MAX	800	1200	
TU-202D	1740	VCWF	25	0.35"	16	71.6	3.5	140°	40	95	3	3' MAX	800	1200	
TU-202E	870	VCWF	25	0.35"	12	38.2	2.5	140°	40	95	3	3' MAX	400	640	
TU-202F	1305	VCWF	25	0.35"	16	56.1	2.5	140°	40	95	3	3' MAX	570	940	
TU-202G	870	VCWF	25	0.35"	12	38.2	2.5	140°	40	95	3	3' MAX	400	640	
TU-203	620	VCWF	25	0.35"	10	18.5	1.0	140°	40	95	3	3' MAX	190	310	
TU-205.1	400	VCWF	25	0.35"	08	23.9	2.0	140°	40	95	3	3' MAX	120	400	
TU-205.3	200	VCWF	25	0.35"	05	11.9	0.75	140°	40	95	3	3' MAX	60	200	
TU-205.4	260	VCWF	25	0.35"	06	15.5	1.0	140°	40	95	3	3' MAX	80	260	
TU-205.5	220	VCWF	25	0.35"	06	13.1	0.75	140°	40	95	3	3' MAX	70	220	
TU-205.6	220	VCWF	25	0.35"	06	13.1	0.75	140°	40	95	3	3' MAX	70	220	
TU-205.7	200	VCWF	25	0.35"	05	11.9	0.75	140°	40	95	3	3' MAX	50	200	
TU-207	520	VCWF	25	0.35"	10	31.0	1.75	140°	40	95	3	3' MAX	170	520	
TU-261	2200	VCWF	25	0.40"	16	131.2	8.5	140°	40	95	3	3.8' MAX	800	2200	1
TU-K1A	1175	VCWF	25	0.35"	14	35.8	1.75	140°	40	95	3	3' MAX	360	600	
TU-K1B	1175	VCWF	25	0.35"	14	35.8	1.75	140°	40	95	3	3' MAX	360	600	
TU-K4	800	VCWF	25	0.35"	12	23.9	1.25	140°	40	95	3	3' MAX	240	400	

Grand total: 61

NOTES:
1 TU PRIMARY INLET SIZE 24"x16"



BASED ON MITSUBISHI WALL MOUNTED

SPLIT SYSTEM UNIT PIPING DETAIL

SCALE: NONE

SPLIT SYSTEM COOLING — MITSUBISHI

MARK	DESCRIPTION
SS-1	MITSUBISHI NOMINAL 1.0 TON WALL MOUNTED UNIT. SEE MITSUBISHI SPLIT SYSTEM UNIT PIPING DETAIL FOR MORE INFORMATION.
SS-2	MITSUBISHI NOMINAL 1.0 TON WALL MOUNTED UNIT. SEE MITSUBISHI SPLIT SYSTEM UNIT PIPING DETAIL FOR MORE INFORMATION.

RADIANT CEILING PANEL - HOT WATER — BASED ON AERO-TECH

MARK	MODEL	LENGTH	WIDTH	GPM	BTU/FT	BTUH	EWT	MWT	TYPE	PANEL SURFACE	REMARKS
RCP-026A	AXO	10' - 0"	24"	0.5	225	2250	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-201C	AXO	12' - 0"	24"	0.8	225	2700	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-205.1	AXO	8' - 0"	24"	0.5	225	1800	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-205.3	AXO	8' - 0"	24"	0.5	225	1800	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-205.4	AXO	8' - 0"	24"	0.5	225	1800	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-205.5	AXO	10' - 0"	24"	0.5	225	2250	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-205.6	AXO	8' - 0"	24"	0.5	225	1800	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-302B	AXO	18' - 0"	24"	1.0	225	4050	140°	135°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-512	AXO	9' - 5"	24"	0.6	300	2850	160°	155°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-514	AXO	8' - 0"	24"	0.5	300	2400	160°	155°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2
RCP-516	AXO	12' - 0"	24"	0.8	300	3600	160°	155°	LINEAR EXTRUDED	WHITE FLUTED ALUMINUM	1,2

NOTES:
1 PROVIDE ALL ACCESSORIES FOR A COMPLETE INSTALLATION. PROVIDE PLASTER FRAME FOR INSTALLATION IN A DRYWALL CEILING AND REQUIRED FRAME TYPE FOR A LAY-IN CEILING
2 INSTALLED IN LAY-IN CEILING SYSTEM

EXHAUST FANS — BASED ON COOK

MARK	MODEL	TYPE	CFM	SP (IN)	HP	VOLTAGE	RPM	SONES	CURB HEIGHT	REMARKS
EF-025M	ACED 150C17D (VF)	DIRECT DRIVE DOWNBLAST	1275	0.75	1/3	115/1/60	1071	8.9	2' - 0"	1,2,3,4,5
EF-101	ACED EC 101C17DEC	DIRECT DRIVE DOWNBLAST	500	0.5	1/4	115/1/60	1385	7.5	2' - 0"	1,2,3,4,5
EF-101E	ACED EC 100C17DEC	DIRECT DRIVE DOWNBLAST	250	0.375	1/4	115/1/60	1151	5.0	2' - 0"	1,2,3,4,5
EF-125M	ACED 135C17D (VF)	DIRECT DRIVE DOWNBLAST	1100	0.5	1/4	115/1/60	1056	7.2	2' - 0"	1,2,3,4,5
EF-132	SQND EC 100SQN17DEC	DIRECT DRIVE SQUARE INLINE	700	0.5	1/4	115/1/60	1709	6.9		2,3,6,7
EF-203.1	ACED EC 70C17DEC	DIRECT DRIVE DOWNBLAST	100	0.375	1/6	115/1/60	1639	4.0	2' - 0"	1,2,3,5,6
EF-204	ACED EC 90C17DEC	DIRECT DRIVE DOWNBLAST	300	0.375	1/6	115/1/60	1340	5.1	2' - 0"	1,2,3,4,5
EF-204C	ACED EC 90C17DEC	DIRECT DRIVE DOWNBLAST	400	0.5	1/6	115/1/60	1617	6.5		2,3,4,5,9
EF-206	ACED 120C17D (VF)	DIRECT DRIVE DOWNBLAST	700	0.375	1/4	115/1/60	988	4.7		2,3,4,5,9
EF-207	ACED 120C17D (VF)	DIRECT DRIVE DOWNBLAST	680	0.5	1/4	115/1/60	1096	5.9	2' - 0"	1,2,3,4,5
EF-208	ACED 210C17D (VF)	DIRECT DRIVE DOWNBLAST	3800	0.25	3/4	460/3/60	737	10.0	2' - 0"	1,3,5,6,8
EF-209	ACED EC 100C17DEC	DIRECT DRIVE DOWNBLAST	150	0.375	1/4	115/1/60	1090	4.3	0' - 0"	2,3,4,5,9
EF-210	ACED 120C17D (VF)	DIRECT DRIVE DOWNBLAST	580	0.375	1/4	115/1/60	947	4.2		2,3,5,6,9
EF-210J	ACED EC 100C17DEC	DIRECT DRIVE DOWNBLAST	225	0.375	1/4	115/1/60	1135	4.8		2,3,4,5,9
EF-210M	ACED 120C17D (VF)	DIRECT DRIVE DOWNBLAST	635	0.375	1/4	115/1/60	963	4.4	2' - 0"	1,2,3,4,5
EF-212	ACED 165C17D (VF)	DIRECT DRIVE DOWNBLAST	1800	0.25	1/4	115/1/60	778	6.5		3,5,6,8,9
EF-212E	ACED EC 90C17DEC	DIRECT DRIVE DOWNBLAST	300	0.375	1/6	115/1/60	1340	5.1		2,3,4,5,9
EF-213	ACED 135C17D (VF)	DIRECT DRIVE DOWNBLAST	1000	0.25	1/4	115/1/60	854	4.9		2,3,5,6,9
EF-217	ACED 150C17D (VF)	DIRECT DRIVE DOWNBLAST	1150	0.75	1/3	115/1/60	1059	8.7	2' - 0"	1,2,3,4,5
EF-249	ACED 150C17D (VF)	DIRECT DRIVE DOWNBLAST	1100	0.75	1/3	115/1/60	1055	8.6	2' - 0"	1,2,3,4,5
EF-301M	ACED 120C17D (VF)	DIRECT DRIVE DOWNBLAST	805	0.4	1/4	115/1/60	1062	5.7		2,3,4,5,9
EF-302	ACED EC 101C17DEC	DIRECT DRIVE DOWNBLAST	580	0.5	1/4	115/1/60	1465	7.0	2' - 0"	1,3,5,6,8
EF-308	ACED 135C17D (VF)	DIRECT DRIVE DOWNBLAST	1000	0.375	1/4	115/1/60	935	5.6		3,5,6,8,9
EF-502	ACED EC 90C17DEC	DIRECT DRIVE DOWNBLAST	200	0.375	1/4	115/1/60	1120	4.7	2' - 0"	1,2,3,4,5
EF-5185	ACED EC 101C17DEC	DIRECT DRIVE DOWNBLAST	500	0.45	1/4	115/1/60	1338	7.1	2' - 0"	1,2,3,4,5
EF-523	ACED 180C17D (VF)	DIRECT DRIVE DOWNBLAST	2000	0.70	1/2	115/1/60	866	7.8	2' - 0"	1,3,5,6,8
EF-900	135SQN17D (VF)	DIRECT DRIVE SQUARE INLINE	1015	0.5	1/4	115/1/60	1057	5.9		2,3,6,7
EF-K1	ACED 210C17D (VF2)	DIRECT DRIVE DOWNBLAST	3150	0.70	1.5	460/3/60	785	9.3	2' - 0"	1,3,5,6,8

NOTES:
1 PROVIDE INSULATED ROOF CURB TO MATCH ROOF SLOPE. IN AREAS OF TAPERED INSULATION: PRIOR TO ORDERING COORDINATE REQUIRED HEIGHT TO ACCOMMODATE TAPERED INSULATION THICKNESS AND MAINTAIN SIDEWALL HEIGHT TO ACHEIVE ROOFING WARRANTY.
2 EC MOTOR WITH SPEED CONTROL
3 PROVIDE WITH DISCONNECT SWITCH
4 PROVIDE WITH BACKDRAFT DAMPER
5 STANDARD LORENIZED COLOR. SUBMIT COLOR CHART WITH SHOP DRAWINGS
6 PROVIDE WITH MOTORIZED DAMPER BY CONTROLS CONTRACTOR
7 PROVIDE WITH RUBBER IN SHEAR ISOLATORS
8 PROVIDE EC MOTOR WITH SPEED CONTROL. CONTROLLED BY SPACE DIFFERENTIAL PRESSURE.
9 INSTALL ON EXISTING ROOF CURB.

HOT WATER HEATING COILS — BASED ON TRANE

MARK	COIL TYPE	FIN TYPE	FIN SPACING (FPF)	NOMINAL SIZE	CFM	EAT (°F)	EWT (°F)	GPM	MBH	W.P.D	COIL APD	COIL VEL (FPM)	ROWS	REMARKS
HC-2J	5W	PRIMA-FLO E	80	38"x30"	3400	54.6	140	3.7	55.9	0.41'	0.05"	429	1	

INTAKE HOODS — BASED ON COOK

MARK	MODEL	THROAT SIZE	HOOD SIZE	CFM	MAX S.P.	CURB HEIGHT	REMARKS
IH-523	24x24 GI	24"x24"	51"x39"	2505	0.04	24"	1,2,3
IH-COR3	16x16 GI	16"x16"	31"x39"	1200	0.02	24"	1,2,3

NOTES:
1 PROVIDE INSULATED ROOF CURB TO MATCH ROOF SLOPE. IN AREAS OF TAPERED INSULATION: PRIOR TO ORDERING COORDINATE REQUIRED HEIGHT TO ACCOMMODATE TAPERED INSULATION THICKNESS AND MAINTAIN SIDEWALL HEIGHT TO ACHEIVE ROOFING WARRANTY.
2 ALUMINUM CONSTRUCTION, ALUMINUM BIRDSCREEN, ANTI-CONDENSATE COATING AND MOTORIZED DAMPER BY CONTROLS CONTRACTOR.
3 STANDARD LORENIZED COLOR. SUBMIT COLOR CHART WITH SHOP DRAWINGS.

PUMPS — BASED ON BELL & GOSSETT

MARK	MODEL	GPM	HEAD (FT)	HP	BHP	RPM	VOLTAGE	SERVICE	LOCATION	REMARKS
P-1	E-1510 3EB	300	110	20	11.3	1800	460/3/60	B-1 & B-2	BOILER ROOM 213	VFD BY TCC
P-2	E-1510 3EB	300	110	20	11.3	1800	460/3/60	B-1 & B-2	BOILER ROOM 213	VFD BY TCC
P-3	E-1510 2EB	180	100	10	6.3	1800	460/3/60	B-3 & B-4	BOILER ROOM 614	VFD BY TCC
P-4	E-1510 2EB	180	100	10	6.3	1800	460/3/60	B-3 & B-4	BOILER ROOM 614	VFD BY TCC
P-5	E-80 2x2x9.5C	60	75	5	2.3	1800	460/3/60	B-5	BOILER ROOM 213	VFD BY TCC (ALTERNATE # 2)
P-217	NRF-45	6.3	20	270 WATTS	0	3300	115/1/60	AHU-217	PE STORAGE 217	3 SPEED PUMP
P-249	NRF-45	6.3	20	270 WATTS	0	3300	115/1/60	AHU-249	PE STORAGE 249	3 SPEED PUMP
P-900	ECOCIRC 20-18	3	10	0.0418	0	3664	115/1/60	DOMESTIC HOT WATER RETURN TOILET BUILDING	ELEC 900	STAINLESS STEEL FOR DOMESTIC
P-AHU-132	NRF-45	7.5	20	270 WATTS	0	3300	115/1/60	AHU-132	MECH 132	3 SPEED PUMP
P-AHU-523	NRF-45	11.7	15	270 WATTS	0	3300	115/1/60	AHU-523	MECH 523	3 SPEED PUMP
P-DW-1	ECOCIRC XL 36-45	10	20	0.166	0	3377	115/1/60	DOMESTIC HOT WATER RETURN	BOILER ROOM 213	STAINLESS STEEL FOR DOMESTIC
P-HC-2J	NRF-25	3.7	15	125 WATTS	0	2950	115/1/60	HC-2J	STORAGE 2015	3 SPEED PUMP

AIR COOLED CONDENSING UNITS — TRANE

MARK	DESCRIPTION
ACCU-1	MODEL MITSUBISHI: SERVES SS-1, MITSUBISHI NOMINAL 1.0 TON ROOF MOUNTED CONDENSER UNIT. SEE MITSUBISHI SPLIT SYSTEM UNIT PIPING DETAIL FOR MORE INFORMATION.
ACCU-2	MODEL MITSUBISHI: SERVES SS-2, MITSUBISHI NOMINAL 1.0 TON ROOF MOUNTED CONDENSER UNIT. SEE MITSUBISHI SPLIT SYSTEM UNIT PIPING DETAIL FOR MORE INFORMATION.
ACCU-132	SERVES AHU-132, MODEL TTA090044DAA, NOMINAL 7.5 TONS, DUAL COMPRESSORS FOR 2 STAGE COOLING, SCROLL COMPRESSORS, R-410A, 460/3/60, 15.0 MCA & 20.0 MOP.
ACCU-204	SERVES AHU-204, MODEL 4TTA7048A3000A, NOMINAL 4.0 TONS, SEER 17, 208/3/60, 18.0 MCA, 30.0 MAX AMPS, R410A AND 2 STAGE SCROLL COMPRESSOR.
ACCU-206A	SERVES HUV-206A, MODEL 4TTR7024A1, NOMINAL 2.0 TONS, SEER 17, 208/1/60, 15.0 MCA, 25.0 MAX AMPS, R410A AND 2 STAGE SCROLL COMPRESSOR.
ACCU-206B	SERVES HUV-206B, SAME AS ACCU-206A.
ACCU-210	SERVES AHU-210, MODEL 4TTR6018J1000A, NOMINAL 1.5 TONS, SEER 16, 208/1/60, 12.0 MCA, 20.0 MAX AMPS, R410A AND SINGLE STAGE.
ACCU-212A	SERVES VUV-212A, MODEL 4TTA7048A3000A, NOMINAL 4.0 TONS, SEER 17, 208/3/60, 18.0 MCA, 30.0 MAX AMPS, R410A AND 2 STAGE SCROLL COMPRESSOR.
ACCU-212B	SERVES VUV-212B, SAME AS ACCU-212A.
ACCU-401	SERVES VUV-401, MODEL 4TTA7036A3000A, NOMINAL 3.0 TONS, SEER 17, 208/3/60, 15.0 MCA, 25.0 MAX AMPS, R410A AND 2 STAGE SCROLL COMPRESSOR.
ACCU-402	SERVES VUV-402, SAME AS ACCU-401.
ACCU-403	SERVES VUV-403, SAME AS ACCU-401.
ACCU-405	SERVES VUV-405, MODEL 4TTR7024A1, NOMINAL 2.0 TONS, SEER 17, 208/1/60, 15.0 MCA, 25.0 MAX AMPS, R410A AND 2 STAGE SCROLL COMPRESSOR.
ACCU-407	SERVES VUV-407, SAME AS ACCU-401.
ACCU-523	SERVES AHU-523, MODEL TTA072044DAA, NOMINAL 6.0 TONS, DUAL COMPRESSORS FOR 2 STAGE COOLING, SCROLL COMPRESSORS, R-410A, 460/3/60, 14.0 MCA & 15.0 MOP.
ACCU-COR3	SERVES AHU-COR3, MODEL 4TTA7036A3000A, NOMINAL 3.0 TONS, SEER 17, 208/3/60, 15.0 MCA, 25.0 MAX AMPS, R410A AND 2 STAGE SCROLL COMPRESSOR.

LOUVERS — BASED ON RUSKIN

MARK	DESCRIPTION
L-1	OUTSIDE AIR LOUVER, MODEL ELF6375DX, EXTRUDED ALUMINUM DRAINABLE BLADE, SIZE 32" LONG x 24" TALL x 6" DEEP, BIRD SCREEN, STANDARD CONSTRUCTION WITH EXTENDED SILL AND CUSTOM KYNAR FINISH TO BE SELECTED BY ARCHITECT. PROVIDE COLOR CHART WHEN SUBMITTING SHOP DRAWINGS.
L-2	OUTSIDE AIR LOUVER, MODEL ELF6375DX, EXTRUDED ALUMINUM DRAINABLE BLADE, SIZE 32" LONG x 24" TALL x 6" DEEP, BIRD SCREEN, STANDARD CONSTRUCTION WITH EXTENDED SILL AND CUSTOM KYNAR FINISH TO BE SELECTED BY ARCHITECT. PROVIDE COLOR CHART WHEN SUBMITTING SHOP DRAWINGS.
L-3	OUTSIDE AIR LOUVER, MODEL ELF6375DX, EXTRUDED ALUMINUM DRAINABLE BLADE, SIZE 48" LONG x 32" TALL x 6" DEEP, BIRD SCREEN, STANDARD CONSTRUCTION WITH EXTENDED SILL AND CUSTOM KYNAR FINISH TO BE SELECTED BY ARCHITECT. PROVIDE COLOR CHART WHEN SUBMITTING SHOP DRAWINGS.
L-4	EXHAUST AIR LOUVER, MODEL ELF6375DX, EXTRUDED ALUMINUM DRAINABLE BLADE, SIZE 24" LONG x 24" TALL x 6" DEEP, BIRD SCREEN, STANDARD CONSTRUCTION WITH EXTENDED SILL AND CUSTOM KYNAR FINISH TO BE SELECTED BY ARCHITECT. PROVIDE COLOR CHART WHEN SUBMITTING SHOP DRAWINGS.
L-5	EXHAUST AIR LOUVER, MODEL ELF6375DX, EXTRUDED ALUMINUM DRAINABLE BLADE, SIZE 32" LONG x 24" TALL x 6" DEEP, BIRD SCREEN, STANDARD CONSTRUCTION WITH EXTENDED SILL AND CUSTOM KYNAR FINISH TO BE SELECTED BY ARCHITECT.
L-6	OUTSIDE AIR LOUVER, MODEL ELF6375DX, EXTRUDED ALUMINUM DRAINABLE BLADE, SIZE 32" LONG x 24" TALL x 6" DEEP, BIRD SCREEN, STANDARD CONSTRUCTION WITH EXTENDED SILL AND CUSTOM KYNAR FINISH TO BE SELECTED BY ARCHITECT.

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ADDENDUM 1 — NOVEMBER 29, 2021

ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

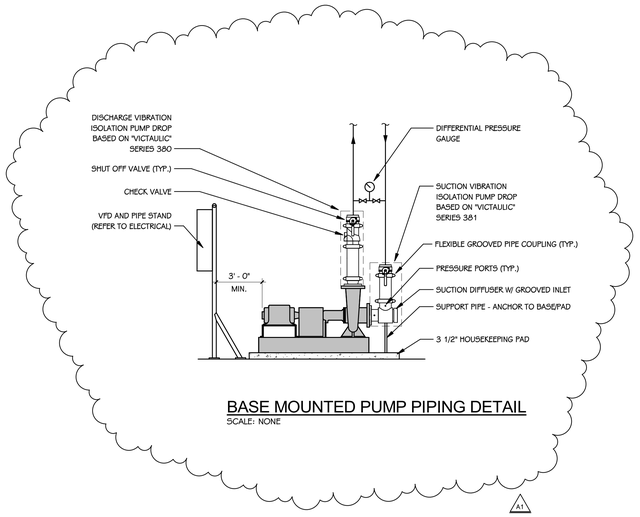
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
MECHANICAL SCHEDULES AND DETAILS

DATE
NOVEMBER 03, 2021

SHEET NUMBER
M 502.2
17-175.70



BASE MOUNTED PUMP PIPING DETAIL

SCALE: NONE

A1

SELF CONTAINED VERTICAL UNIT VENTILATORS — BASED ON CHANGE AIR

MARK	MODEL	CABINET	TYPE	FILTER SIZE	SUPPLY FAN O.A. CFM	SUPPLY FAN CFM	SUPPLY FAN HP	RELIEF / CONDENSER FAN FLA	VOLTAGE	MCA	MOP	HOT WATER COIL MBH	HOT WATER COIL GPM	HOT WATER COIL EAT	HOT WATER COIL MAX WPD	NOM. COOLING (TONS)	CLG. COIL TMBH	REMARKS
SCVUV-406A	SOPHOMORE HPA IQ	O	PACKAGED AC	2"	400	1000	0.5	1.6	460/3/60	10.7	15.0	60.25	5.0	40°	1.1'	3 TONS	32.8	1,2,3,4,5,6,7,8,9,10,11,13,14,15,16,17,18
SCVUV-406B	SOPHOMORE HPA IQ	P	PACKAGED AC	2"	500	1350	0.75	1.6	460/3/60	12.4	15.0	77	8.0	41.5°	2.7'	4 TONS	43.8	1,2,3,4,5,6,7,8,9,10,11,12,13,14,16,17,18

NOTES:
1. BASED ON 160° EWT AND 2 ROW HEATING COIL
2. SELF CONTAINED R410A COOLING SYSTEM WITH 2 STAGE SCROLL COMPRESSOR
3. PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH
4. UNIT CAPABLE OF 100% ECONOMIZER AND 100% RELIEF
5. PROVIDE TOP DISCHARGE AIR PLENUM WITH DOUBLE DEFLECTION SUPPLY DIFFUSERS. APPROX. SIZE 16" TALL. VERIFY SIZE PRIOR TO ORDERING. SUPPLY DIFFUSERS BY UNIT MANUFACTURER
6. PROVIDE WALL SLEEVE WITH DIVIDER PLATE. VERIFY OVERALL LENGTH PRIOR TO ORDERING
7. ECM SUPPLY FANS AND CONDENSING/RELIEF FAN
8. PROVIDE 1" ANGLE TRIM PIECES TO MATCH UNIT COLOR
9. PROVIDE 10" REAR INSULATED PLENUM
10. FACTORY INSTALLED HEATING COIL PIPING PACKAGE WHICH INCLUDES SHUT OFF VALVES, STRAINER, BALANCE VALVE, DRAIN VALVE, PT PORTS AND CONTROL VALVE. SEE PIPING DETAILS ON DETAIL SHEETS.
11. CONDENSATE SHALL BE PLUMBED INTERNALLY AT FACTORY WHICH WILL ALLOW CONTRACTOR TO CONNECT AND DISCHARGE BELOW LOUVER
12. PROVIDE 46"x46" LOUVER. ANODIZED ALUMINUM
13. UNIT WITH SOUND PACKAGE, STANDARD SOUND REDUCTION FEATURES
14. UNIT COLOR TO BE SELECTED BY ARCHITECT. SUBMIT COLOR CHARTS WHEN ISSUING SHOP DRAWINGS
15. PROVIDE 42"x46" LOUVER. ANODIZED ALUMINUM
16. PROVIDE WITH 5" SIDE PIPE CHASE
17. MERV 13 FILTERS
18. BIPOLAR IONIZATION PROVIDED BY THE UNIT MANUFACTURER AND COMPLYING WITH UL 2998 AND POWERED BY THE UNIT CONTROL BOARD

VERTICAL UNIT VENTILATORS — BASED ON TRANE

MARK	MODEL	TYPE	FILTER SIZE	OA CFM	CFM	ELECTRICAL HP	ELECTRICAL VOLTAGE	ELECTRICAL MCA	ELECTRICAL MAX FUSE SIZE	HOT WATER COIL MBH	HOT WATER COIL GPM	HOT WATER COIL EWT	HOT WATER COIL EAT	HOT WATER COIL WPD	DX COOLING COIL EAT	DX COOLING COIL NOM. COOLING (TONS)	DX COOLING COIL CLG. TMBH	REMARKS
VUV-212A	VUVE1500	VERTICAL	1"	450	1200	327 WATTS	115/1/60	9.0	15.0	62.0	6	140°	40°	17.0'	79.6° DB / 66.9° WB	4.0	47.1	1,2,3,6,7
VUV-212B	VUVE1500	VERTICAL	1"	450	1200	327 WATTS	115/1/60	9.0	15.0	62.0	6	140°	40°	17.0'	79.6° DB / 66.9° WB	4.0	47.1	1,2,3,6,7
VUV-401	VUVE1250	VERTICAL	1"	390	950	276 WATTS	115/1/60	9.0	15.0	68.0	3.3	160°	39°	1.64'	79.2° DB / 66.6° WB	3.0	36.2	1,2,3,4,5,7
VUV-402	VUVE1250	VERTICAL	1"	390	950	276 WATTS	115/1/60	9.0	15.0	68.0	3.3	160°	39°	1.64'	79.2° DB / 66.6° WB	3.0	36.2	1,2,3,4,5,7
VUV-403	VUVE1250	VERTICAL	1"	390	950	276 WATTS	115/1/60	9.0	15.0	68.0	3.3	160°	39°	1.64'	79.2° DB / 66.6° WB	3.0	36.2	1,2,3,4,5,7
VUV-405	VUVE1000	VERTICAL	1"	160	760	235 WATTS	115/1/60	4.5	15.0	34.0	1.5	160°	50°	0.09'	78.4° DB / 65.8	2.0	26.1	1,2,3,4,5,7
VUV-407	VUVE1250	VERTICAL	1"	390	950	276 WATTS	115/1/60	9.0	15.0	68.0	3.3	160°	39°	1.64'	79.2° DB / 66.6° WB	3.0	36.2	1,2,3,4,5,7

NOTES:
1. RETURN AIR FRONT, FRESH AIR BACK AND TOP DOUBLE DEFLECTION DISCHARGE GRILLE
2. UNIT PROVIDED WITH FALSEBACK, BACKSIDE PIPE CHASE, COOLING COIL DRAIN PAN, ECM MOTOR, DISCONNECT SWITCH AND END PANELS
3. DX COOLING COIL WITH R410A
4. MERV 13 FILTER
5. PROVIDE NEW OUTSIDE AIR LOUVER NON FLANGE TYPE. ANODIZED ALUMINUM.
6. PROVIDE WITH DYNAMIC AIR CLEANER. SHALL BE POWERED FROM UNIT INTERNAL POWER SUPPLY.
7. BIPOLAR IONIZATION PROVIDED BY THE UNIT MANUFACTURER AND COMPLYING WITH UL 2998 AND POWERED BY THE UNIT CONTROL BOARD

HORIZONTAL UNIT VENTILATORS — BASED ON TRANE

MARK	MODEL	TYPE	FILTER SIZE	OA CFM	CFM	ESP	ELECTRICAL HP	ELECTRICAL VOLTAGE	ELECTRICAL MCA	HOT WATER COIL MBH	HOT WATER COIL GPM	HOT WATER COIL EWT	HOT WATER COIL EAT	HOT WATER COIL WPD	DX COOLING COIL EAT	DX COOLING COIL NOM. COOLING (TONS)	DX COOLING COIL CLG. TMBH	REMARKS
HUV-206A	HUVC1001	HORIZONTAL	1"	300	925	0.20"	1.0	115/1/60	15.0	54.7	4.0	140°	45.4°	1.3'	79.0° DB / 66.4° WB	2.0 TONS	26.1	1,2,3,4,5
HUV-206B	HUVC1001	HORIZONTAL	1"	300	925	0.20"	1.0	115/1/60	15.0	54.7	4.0	140°	45.4°	1.3'	79.0° DB / 66.4° WB	2.0 TONS	26.1	1,2,3,4,5

NOTES:
1. UNIT PROVIDED WITH COOLING COIL DRAIN PAN, ECM MOTOR AND DISCONNECT SWITCH
2. DX COOLING COIL WITH R410A
3. FA DUCT BACK, RETURN GRILLE BOTTOM & DOUBLE DEFLECTION DISCHARGE GRILLE FRONT
4. MERV 13 FILTER
5. BIPOLAR IONIZATION PROVIDED BY THE UNIT MANUFACTURER AND COMPLYING WITH UL 2998 AND POWERED BY THE UNIT CONTROL BOARD

GRILLES, REGISTERS, & DIFFUSERS — BASED ON TITUS

MARK	FACE SIZE	NECK SIZE	MODEL	VCD	MATERIAL	FINISH	INSTALLATION	REMARKS
SA-1	12"x12"	6" Ø	TMSA	NO	STEEL	WHITE	SURFACE MOUNT	
SA-2	24"x24"	6" Ø	TMSA	NO	STEEL	WHITE	LAY-IN	
SA-3	24"x24"	8" Ø	TMSA	NO	STEEL	WHITE	LAY-IN	
SA-4	24"x24"	10" Ø	TMSA	NO	STEEL	WHITE	LAY-IN	
SA-5	24"x24"	12" Ø	TMSA	NO	STEEL	WHITE	LAY-IN	
SA-6		12"x6"	300RS	YES	STEEL	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-7		18"x6"	300RS	YES	STEEL	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-8		8"x8"	300RS	YES	STEEL	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-9	(4) - 1" SLOTS	6" Ø	ML-39	NO	ALUMINUM	WHITE	SURFACE MOUNT	4' LONG, BORDER TYPE 2A, INSULATED PLENUM
SA-10		30"x6"	300FS	YES	ALUMINUM	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-11		16"x6"	300FS	YES	ALUMINUM	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-12		18"x16"	300RS	YES	STEEL	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-13		32"x16"	300RS	YES	STEEL	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-14		30"x8"	300RS	YES	STEEL	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-15		24"x8"	300FS	YES	ALUMINUM	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-16		8"x6"	300FS	YES	ALUMINUM	WHITE	SURFACE MOUNT	DOUBLE DEFLECTION
SA-17	24"x24"	6" Ø	TMSA	YES	STEEL	WHITE	SURFACE MOUNT	
RA-1	24"x24"	12"x12"	50F	NO	ALUMINUM	WHITE	LAY-IN	
RA-2	24"x24"	22"x22"	50F	NO	ALUMINUM	WHITE	LAY-IN	
RA-3		32"x32"	33RS	NO	STEEL	WHITE	SURFACE MOUNT	HEAVY DUTY
RA-4		48"x48"	33RS	YES	STEEL	WHITE	SURFACE MOUNT	HEAVY DUTY
RA-5	24"x24"	20"x20"	50FF	NO	ALUMINUM	WHITE	LAY-IN	WITH 1" FILTER FRAME
RA-6		32"x8"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
RA-7		44"x44"	33RL	YES	STEEL	WHITE	SURFACE MOUNT	HEAVY DUTY
RA-8		24"x48"	33RS	NO	STEEL	WHITE	SURFACE MOUNT	HEAVY DUTY
RA-9		32"x48"	33RS	NO	STEEL	WHITE	SURFACE MOUNT	HEAVY DUTY
EA-1		6"x6"	350RL	YES	STEEL	WHITE	SURFACE MOUNT	
EA-2		8"x8"	350RL	YES	STEEL	WHITE	SURFACE MOUNT	
EA-3	24"x24"	12"x12"	50F	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-4		10"x10"	350RL	YES	STEEL	WHITE	SURFACE MOUNT	
EA-5	24"x24"	20"x20"	50FF	YES	ALUMINUM	WHITE	LAY-IN	WITH 1" FILTER FRAME
EA-6		8"x4"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-7		10"x10"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-8		30"x6"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-9		8"x6"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-10		12"x6"	350RL	YES	STEEL	WHITE	SURFACE MOUNT	
EA-11	24"x24"	22"x22"	50F	NO	ALUMINUM	WHITE	LAY-IN	
EA-12		14"x14"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-13		6"x6"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
EA-14		30"x12"	350RL	NO	STEEL	WHITE	SURFACE MOUNT	
EA-15	24"x24"	12"x12"	50F	NO	ALUMINUM	WHITE	LAY-IN	
EA-16		12"x12"	350FL	YES	ALUMINUM	WHITE	SURFACE MOUNT	
TA-1		32"x8"	350RL	NO	STEEL	WHITE	SURFACE MOUNT	
TA-2		12"x12"	350FL	NO	ALUMINUM	WHITE	SURFACE MOUNT	

A1

FINNED TUBE - HOT WATER — BASED ON VULCAN

MARK	SERIES	CATALOG DESIGNATION	ELEMENT TIERS	ELEMENT TUBE SIZE	ELEMENT FIN SIZE	ELEMENT LENGTH	ELEMENT EWT	ELEMENT BTU/FT	ELEMENT BTUH	ELEMENT GPM	ENCLOSURE STYLE	ENCLOSURE HEIGHT	ENCLOSURE MOUNTING HEIGHT	ENCLOSURE LENGTH	REMARKS
FT-204B	LINOVECTOR II LT	VC3/4-435	1	3/4"	4-1/4"x3-5/8"	8'-0"	140°	485	3900	1.0	LV4-S SLOPE TOP	14"	1'-6"	10'-0"	1,2
FT-206A	LINOVECTOR II LT	VC3/4-435	1	3/4"	4-1/4"x3-5/8"	13'-0"	140°	485	6300	1.3	LV4-S SLOPE TOP	14"	1'-6"	16'-0"	1,2
FT-521	LINOVECTOR II LT	VC3/4-435	1	3/4"	4-1/4"x3-5/8"	5'-0"	160°	520	2600	0.6	LV4-S SLOPE TOP	14"	1'-6"	9'-1"	1,2

NOTES:
1. PROVIDE END CAPS, ALL HANGERS AND ALL ACCESSORIES FOR A COMPLETE INSTALLED SYSTEM. PRIOR TO ORDERING ENCLOSURES FIELD VERIFY LENGTHS.
2. FOR ALL ENCLOSURES COLOR TO BE SELECTED BY ARCHITECT. SUBMIT COLOR CHARTS WHEN ISSUING SHOP DRAWINGS.

UNIT HEATERS — BASED ON TRANE

MARK	UH MODEL	TYPE	CFM	MBH	GPM	EWT	WPD	HP	RPM	VOLTAGE	MCA	MOP	REMARKS
UH-032	S-18	HORIZONTAL	350	6.7	1.3	140°	0.005	16 WATTS	1350	115/1/60	1.0	1.8	1,2
UH-132	S-A18	HORIZONTAL	420	8.9	1.9	140°	2.2	16 WATTS	1350	115/1/60	1.0	1.8	1,2
UH-211	S-A25	HORIZONTAL	460	12.1	2.5	140°	2.2	25 WATTS	1350	115/1/60	1.5	2.7	1,2
UH-213	S-96	HORIZONTAL	1400	39.8	7.0	140°	0.29	1/12	1000	115/1/60	2.8	5.0	1,2
UH-2135	S-A36	HORIZONTAL	850	20.5	3.6	140°	3.0	1/20	1000	115/1/60	1.8	3.2	1,2
UH-217	S-A36	HORIZONTAL	750	18.4	3.6	140°	3.0	1/20	900	115/1/60	1.8	3.2	1,2
UH-249	S-A36	HORIZONTAL	750	18.4	3.6	140°	3.0	1/20	900	115/1/60	1.8	3.2	1,2
UH-519	S-A08	HORIZONTAL	245	5.7	0.80	160°	0.8	16 WATTS	1550	115/1/60	1.0	1.8	1,2
UH-523	S-A08	HORIZONTAL	245	5.7	0.80	160°	0.8	16 WATTS	1550	115/1/60	1.0	1.8	1,2
UH-614	S-84	HORIZONTAL	1400	43.6	6.1	160°	0.24	1/12	1000	115/1/60	2.8	5.0	1,2

NOTES:
1. 60° EAT & 20° WTD
2. DISCONNECT SWITCH AND LOUVER FIN DIFFUSER

SILENCERS — BASED ON VIBRO-ACOUSTICS

MARK	MODEL	DUCT SERVICE	DIMENSIONS WIDTH	DIMENSIONS HEIGHT	DIMENSIONS CL LENGTH	CFM	VELOCITY	MAX APD IN WG	NC	CASING GAUGE	ATTENUATION 63 OCT	125 OCT	250 OCT	500 OCT	1K OCT	2K OCT	4K OCT	8K OCT	REMARKS
ST-1R	RED-MV-AY27928	RTU-1K	2' - 8"	8' - 5"	8' - 0"	17,725	806	0.24	30	10	9	15	21	31	32	31	23	21	1,2,3,4,6
ST-1S	RED-MV-AY27928	RTU-1K	2' - 5"	7' - 8"	10' - 0"	19,250	1039	0.22	30	10	10	21	26	38	46	35	26	25	1,2,3,4,5
ST-2R	RED-MV-AY27928	RTU-2K	2' - 8"	8' - 5"	8' - 0"	17,725	806	0.24	30	10	9	15	21	31	32	31	23	21	1,2,3,4,6
ST-2S	RED-MV-AY27928	RTU-2K	2' - 5"	7' - 8"	10' - 0"	19,500	1039	0.22	30	10	10	21	26	38	46	35	26	25	1,2,3,4,5
ST-3S	RED-MHV-AY27928	AHU-132	1' - 4"	2' - 0"	5' - 0"	2400	900	0.2	35	14	7	11	15	26	23	23	19	15	1,2,3,4
ST-4R	RED-MV-AY27928	RTU-1J	2' - 8"	6' - 4"	7' - 0"	14,350	850	0.15	38	14	9	12	18	30	28	29	21	19	1,2,3,4,7
ST-4S	RED-UHV-AY27928	RTU-1J	2' - 5"	5' - 8"	7' - 0"	15,350	1161	0.26	38	14	8	11	15	26	30	31	24	20	1,2,3,4,8

NOTES:
1. SUBMIT CALCULATIONS TO DEMONSTRATE THE PRESSURE DROP INCLUDING SYSTEM EFFECTS AS SCHEDULED.
2. SUBMIT CALCULATIONS TO DEMONSTRATE THE AIRBORNE/BREAKOUT NOISE SHALL NOT EXCEED THE NC LISTED IN THE SCHEDULE.
3. FOR NON BASIS OF DESIGN PRODUCTS SUPPLIED, CONTRACTOR IS FINANCIALLY RESPONSIBLE TO ENSURE THE REQUIRED NOISE CONTROL SOLUTION IS DELIVERED TO MEET DESIRED NC CRITERIA.
4. REFER TO ABOVE SCHEDULE FOR GAUGE OF HTL CASING TO CONTROL BREAKOUT NOISE.
5. TRANSITIONAL ELBOW SILENCER, INLET 92"x29" WITH VERTICAL CL LENGTH 4', OUTLET: 92"x26" WITH HORIZONTAL CL LENGTH 6'.
6. TRANSITIONAL ELBOW SILENCER, INLET 101"x26" WITH HORIZONTAL CL LENGTH 4', OUTLET: 101"x32" WITH VERTICAL CL LENGTH 4'.
7. TRANSITIONAL ELBOW SILENCER, INLET 76"x24" WITH HORIZONTAL CL LENGTH 4', OUTLET: 76"x32" WITH VERTICAL CL LENGTH 3'.
8. TRANSITIONAL ELBOW SILENCER, INLET 68"x29" WITH VERTICAL CL LENGTH 3', OUTLET: 68"x24" WITH HORIZONTAL CL LENGTH 4'.

A1

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ADDENDUM 1 — NOVEMBER 29, 2021

ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

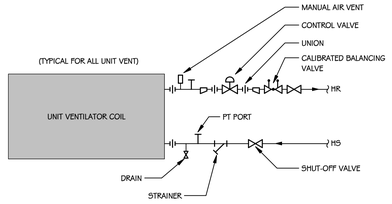
OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
MECHANICAL SCHEDULES AND DETAILS

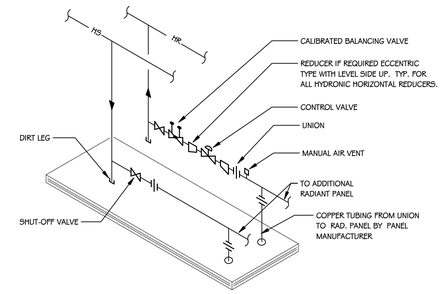
DATE
NOVEMBER 03, 2021

SHEET NUMBER
M 503.2
17-175.70

ELECTRIC CABINET HEATERS		BERKO
MARK	**DESCRIPTION**	
ECH-900	ARCHITECTURAL HEAVY DUTY WALL HEATER, MODEL FRC1812F, 1800 WATTS, 6142 BTUH, 120/1/60, 15.0 AMPS, SURFACE MOUNT FRAME, DISCONNECT SWITCH, CONCEALED TAMPER RESISTANT THERMOSTAT AND WHITE. PROVIDE WITH RELAY FOR CONNECTION INTO BMS SYSTEM.	
ECH-902A	CEILING MOUNTED HEAVY DUTY FAN FORCED HEATER, MODEL QFF4004, 3000 WATTS, 10,239 BTUH, 208/1/60, 14.4 AMPS, SURFACE MOUNTING FRAME, DISCONNECT SWITCH AND CONCEALED TAMPER RESISTANT THERMOSTAT. PROVIDE WITH RELAY FOR CONNECTION INTO BMS SYSTEM.	
ECH-902B	SAME AS ECH-902A. 3000 WATTS.	
ECH-903A	SAME AS ECH-902A. 3000 WATTS.	
ECH-903B	SAME AS ECH-902A. 3000 WATTS.	
ECH-905	CEILING MOUNTED HEAVY DUTY FAN FORCED HEATER, MODEL QFF1500, 1500 WATTS, 5120 BTUH, 120/1/60, 12.5 AMPS, SURFACE MOUNTING FRAME, DISCONNECT SWITCH AND WALL MOUNTED THERMOSTAT. PROVIDE WITH RELAY FOR CONNECTION INTO BMS SYSTEM.	
ECH-910	SAME AS ECH-900.	

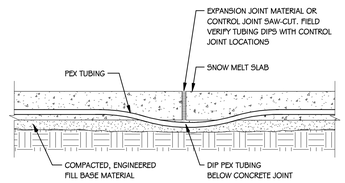


UNIT VENTILATOR HEATING COIL PIPING DETAIL (2-WAY)
SCALE: NONE

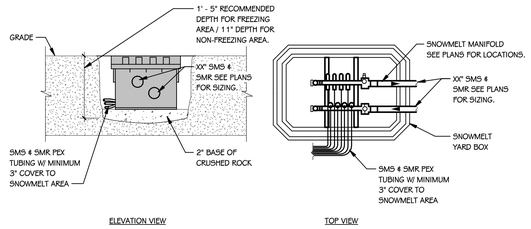


SAME DETAIL FOR RADIANT PANEL

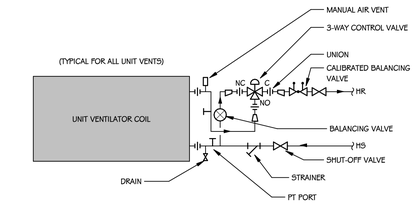
RADIANT CEILING PANEL PIPING DETAIL
SCALE: NONE



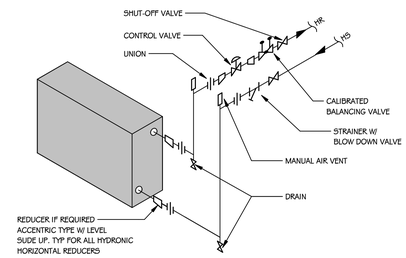
SNOWMELT EXPANSION JOINT DETAIL (ALTERNATE # 2)
SCALE: NONE



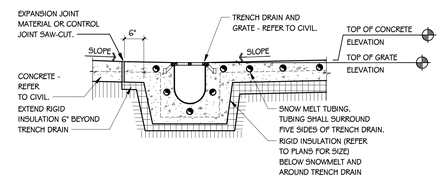
SNOWMELT MANIFOLD YARD BOX INSTALLATION DETAIL (ALTERNATE # 2)
SCALE: NONE



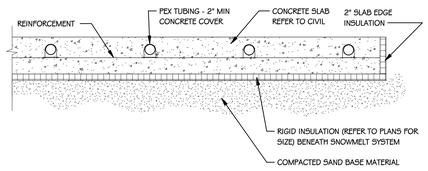
UNIT VENTILATOR HEATING COIL PIPING DETAIL (3-WAY)
SCALE: NONE



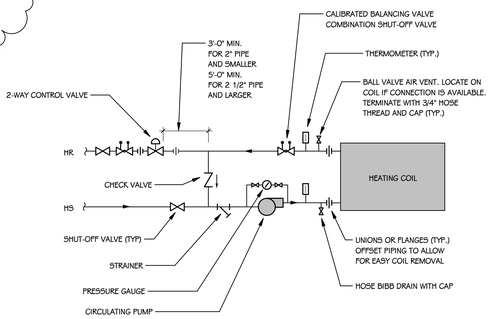
CABINET HEATER PIPING DETAIL
SCALE: NONE



SNOWMELT TRENCH DRAIN DETAIL (ALTERNATE # 2)
SCALE: NONE

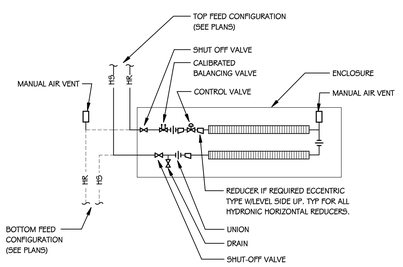


SNOWMELT SLAB DETAIL (ALTERNATE # 2)
SCALE: NONE



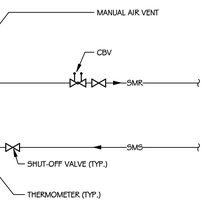
NOTE: CONTRACTOR TO VERIFY NUMBER AND SIZE OF COIL CONNECTIONS

PUMPED HEATING COIL PIPING DETAIL (2-WAY)
SCALE: NONE

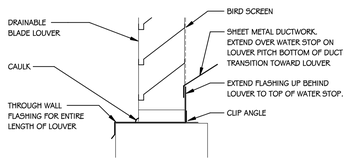


REFER TO EQUIPMENT SCHEDULE FOR NUMBER OF TIERS. DETAIL TYPICAL FOR SINGLE AND THREE TIER ELEMENTS. TWO TIER ELEMENT SHOWN ABOVE.

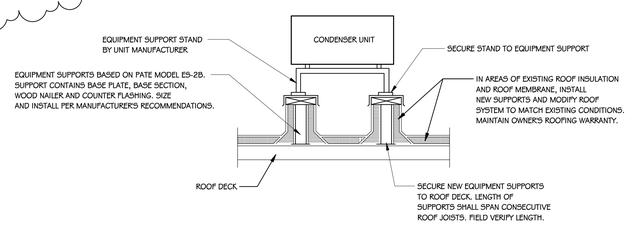
FINNED TUBE PIPING DETAIL
SCALE: NONE



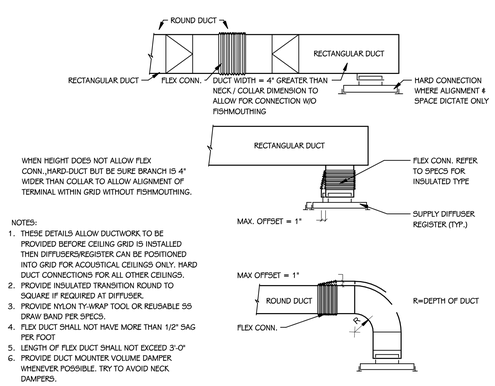
SNOWMELT MANIFOLD DETAIL (ALTERNATE # 2)
SCALE: NONE



LOUVER INSTALLATION DETAIL
SCALE: NONE

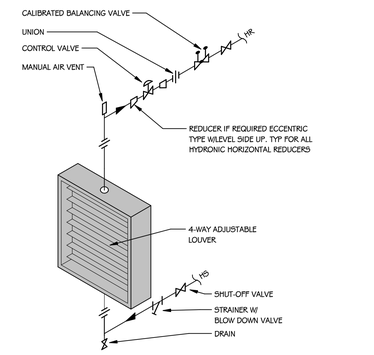


MITSUBISHI CONDENSER UNIT SUPPORT DETAIL
SCALE: NONE



NOTES:
1. THESE DETAILS ALLOW DUCTWORK TO BE PROVIDED BEFORE CEILING GRID IS INSTALLED THEN DIFFUSERS/REGISTER CAN BE POSITIONED INTO GRID FOR ACOUSTICAL CEILINGS ONLY. HARD DUCT CONNECTIONS FOR ALL OTHER CEILINGS.
2. PROVIDE INSULATED TRANSITION ROUND TO SQUARE IF REQUIRED AT DIFFUSER.
3. PROVIDE NYLON TY-WRAP TOOL OR REUSABLE SS DRAW BAND PER SPECS.
4. FLEX DUCT SHALL NOT HAVE MORE THAN 1/2" SAG PER FOOT
5. LENGTH OF FLEX DUCT SHALL NOT EXCEED 3'-0"
6. PROVIDE DUCT MOUNTER VOLUME DAMPER WHENEVER POSSIBLE. TRY TO AVOID NECK DAMPERS.

SUPPLY DIFFUSER / REGISTER DUCTWORK AND CONNECTION DETAIL - TYPICAL
SCALE: NONE



UNIT HEATER PIPING DETAIL - HORIZONTAL
SCALE: NONE

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ISSUED FOR	DATE
ADDENDUM 1	NOVEMBER 29, 2021

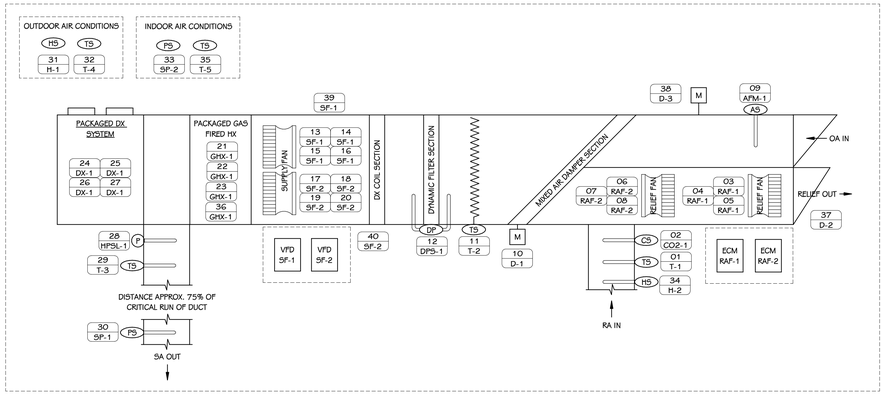
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
MECHANICAL SCHEDULES AND DETAILS

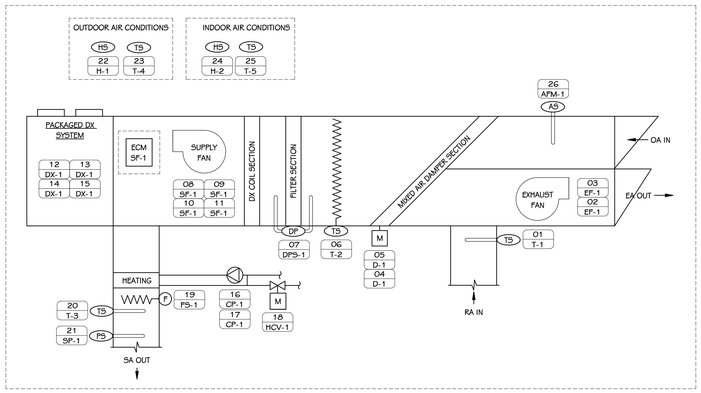
DATE
NOVEMBER 03, 2021

SHEET NUMBER
M505.2
17-175.70



RTU-1K, RTU-2K & RTU-1J CONTROLS DIAGRAM

SCALE: NONE

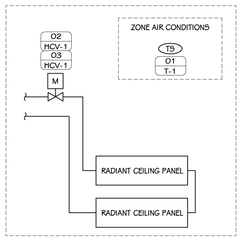


RTU-2J CONTROLS DIAGRAM

SCALE: NONE

CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
RTU-1K, RTU-2K & RTU-1J						
01	T-1	RETURN AIR TEMPERATURE		▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
02	CO2-1	RETURN AIR CARBON DIOXIDE	▮	▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC, ALARM AT 1200 PPM
03	RAF-1	SPEED CONTROL		▮	▮	ECM FAN MOTOR
04	RAF-1	ENABLE/DISABLE		▮	▮	
05	RAF-1	STATUS	▮	▮	▮	
06	RAF-2	SPEED CONTROL		▮	▮	ECM FAN MOTOR
07	RAF-2	ENABLE/DISABLE		▮	▮	
08	RAF-2	STATUS	▮	▮	▮	
09	AFM-1	OUTDOOR AIR FLOW		▮	▮	TRAQ DAMPER
10	D-1	MIXED AIR DAMPER OUTPUT		▮	▮	
11	T-2	MIXED AIR TEMPERATURE	▮	▮	▮	ALARM AT 45°F ADJ.
12	DPS-1	FILTER STATUS	▮	▮	▮	BASED ON DYNAMIC ELECTRONIC V-BANK FILTER, ALARM AT 0.75" ADJ.
13	5F-1	FAN AIR FLOW		▮	▮	
14	5F-1	SPEED CONTROL		▮	▮	VFD PROVIDED BY MANUFACTURER
15	5F-1	ENABLE/DISABLE		▮	▮	
16	5F-1	STATUS	▮	▮	▮	
17	5F-2	FAN AIR FLOW		▮	▮	
18	5F-2	SPEED CONTROL		▮	▮	VFD PROVIDED BY MANUFACTURER
19	5F-2	ENABLE/DISABLE		▮	▮	
20	5F-2	STATUS	▮	▮	▮	
21	GHX-1	GAS FIRED HX ENABLE/DISABLE		▮	▮	
22	GHX-1	GAS FIRED HX RUN STATUS		▮	▮	
23	GHX-1	GAS FIRED HX ALARM STATUS	▮		▮	
24	DX-1	COOLING SYSTEM ALARM STATUS	▮		▮	
25	DX-1	COOLING SYSTEM RUN STATUS		▮	▮	
26	DX-1	COOLING SYSTEM ENABLE/DISABLE		▮	▮	
27	DX-1	COOLING SYSTEM STAGING		▮	▮	VARIABLE SPEED COMPRESSORS
28	HPSL-1	HIGH PRESSURE STATIC LIMIT	▮		▮	PROVIDED/INSTALLED BY MANUFACTURER HARD WIRED SAFETY - MANUAL RESET
29	T-3	DISCHARGE AIR TEMPERATURE		▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
30	5P-1	SUPPLY AIR STATIC PRESSURE		▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
31	H-1	OUTDOOR AIR HUMIDITY		▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
32	T-4	OUTDOOR AIR TEMPERATURE		▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
33	5P-2	ROOM STATIC PRESSURE		▮	▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
34	H-2	INDOOR AIR HUMIDITY SENSOR			▮	PROVIDED BY MANUFACTURER, INSTALLED BY TCC
35	T-5	INDOOR AIR TEMPERATURE			▮	TCC AVERAGE OF ASSOCIATED TERMINAL AIR UNITS
36	GHX-1	GAS FIRED HX SYSTEM STAGING			▮	MODULATING GAS HEAT
37	D-2	RELIEF DAMPER OUTPUT		▮	▮	
38	D-3	OUTDOOR AIR DAMPER OUTPUT		▮	▮	TRAQ DAMPER
39	5F-1	VFD FAULT STATUS	▮		▮	
40	5F-2	VFD FAULT STATUS	▮		▮	
RTU-2J						
01	T-1	RETURN AIR TEMPERATURE		▮		DISPLAY ENTHALPY BASED ON T4H READINGS
02	EF-1	ENABLE/DISABLE		▮		
03	EF-1	STATUS	▮	▮		
04	D-1	MIXED AIR DAMPER POSITION		▮		
05	D-1	MIXED AIR DAMPER OUTPUT		▮		
06	T-2	MIXED AIR TEMPERATURE	▮	▮		ALARM AT 45°F ADJ.
07	DPS-1	FILTER STATUS	▮	▮		ALARM AT 0.75" ADJ.
08	5F-1	FAN AIR FLOW		▮		
09	5F-1	SPEED CONTROL		▮		ECM MOTOR
10	5F-1	ENABLE/DISABLE		▮		
11	5F-1	STATUS	▮	▮		
12	DX-1	COOLING SYSTEM ALARM STATUS	▮	▮		
13	DX-1	COOLING SYSTEM RUN STATUS	▮	▮		
14	DX-1	COOLING SYSTEM ENABLE/DISABLE		▮		
15	DX-1	COOLING SYSTEM STAGING		▮		VARIABLE SPEED COMPRESSOR
16	CP-1	PUMP ENABLE/DISABLE		▮		
17	CP-1	PUMP STATUS	▮	▮		
18	HCV-1	HEATING CONTROL VALVE OUTPUT		▮		
19	FS-1	FREEZE STAT ALARM STATUS	▮			HARD WIRED SAFETY - MANUAL RESET
20	T-3	DISCHARGE AIR TEMPERATURE	▮	▮		DISPLAY ENTHALPY BASED ON T4H READINGS
21	5P-1	SUPPLY AIR STATIC PRESSURE		▮		
22	H-1	OUTDOOR AIR HUMIDITY		▮		DISPLAY ENTHALPY BASED ON T4H READINGS (SHARED POINT)
23	T-4	OUTDOOR AIR TEMPERATURE		▮		DISPLAY ENTHALPY BASED ON T4H READINGS (SHARED POINT)
24	H-2	INDOOR AIR HUMIDITY SENSOR		▮		AVERAGE OF ASSOCIATED TERMINAL AIR UNITS
25	T-5	INDOOR AIR TEMPERATURE		▮		AVERAGE OF ASSOCIATED TERMINAL AIR UNITS
26	AFM-1	OUTDOOR AIRFLOW		▮		
CABINET UNIT HEATER						
01	T-1	ZONE AIR TEMPERATURE	▮	▮		
02	5F-1	HEATING CONTROL VALVE OUTPUT		▮		
03	5F-1	ENABLE/DISABLE		▮		
04	5F-1	STATUS	▮	▮		
UNIT HEATER						
01	T-1	ZONE AIR TEMPERATURE	▮	▮		
02	HCV-1	HEATING CONTROL VALVE OUTPUT		▮		
03	5F-1	ENABLE/DISABLE		▮		
04	5F-1	STATUS	▮	▮		
RADIANT CEILING PANEL						
01	T-1	ZONE AIR TEMPERATURE	▮	▮		
02	HCV-1	HEATING CONTROL VALVE POSITION		▮		
03	HCV-1	HEATING CONTROL VALVE OUTPUT		▮		

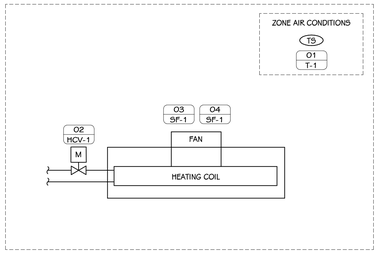


RADIANT CEILING PANEL CONTROLS DIAGRAM

SCALE: NONE

RADIANT CEILING PANEL CONTROLS

1. UNIT IS A COMBINATION OF A HEATING ELEMENT, CONTROL VALVE (CV) AND ACTUATOR AND AIR TEMPERATURE SENSOR.
2. REFER TO ASSOCIATED TERMINAL AIR UNIT CONTROL ARTICLES FOR STAGED HEATING CONTROL.
   A. OPERATION BASED ON 1ST STAGE HEATING WITH ASSOCIATED TERMINAL AIR UNIT. REFER TO ASSOCIATED TERMINAL AIR UNIT CONTROL ARTICLE FOR STAGE HEATING CONTROL.
3. IN AREAS WITHOUT TERMINAL UNITS THE CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SPACE TEMPERATURE SET POINT.

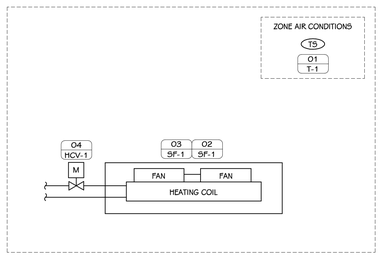


UNIT HEATER (UH) CONTROLS DIAGRAM

SCALE: NONE

UNIT HEATER (UH) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR UNIT HEATER OPERATION. UNIT HEATER IS A COMBINATION OF A FAN, HEATING COIL, CONTROL VALVE (CV) AND ACTUATOR AND AIR TEMPERATURE SENSOR.
2. UNIT HEATER ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. SCHEDULED 24/7 OCCUPIED.
3. UNIT HEATER ADJUSTABLE SETPOINTS:
   A. OCCUPIED 68°F HEATING
4. OPERATION SHALL BE BASED ON THE FOLLOWING:
   A. OPERATION BASED ON WALL MOUNTED SENSOR THAT WILL ENABLE UNIT WHENEVER SPACE TEMPERATURE FALLS BELOW HEATING SETPOINT.
5. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP, CONTROLLED DEVICES SHALL RESPOND AS NOTED:
      a. DISABLE FAN.
      b. HEATING CV 100% CLOSED.
   B. WHEN INDEXED TO START, CONTROLLED DEVICES SHALL RESPOND AS NOTED:
      a. HEATING CV 100% OPENED.
      b. ENABLE FAN.
6. MONITORING AND ALARMING OF THE FOLLOWING:
   A. FAN MOTOR STATUS.
      a. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
   B. SPACE AIR TEMPERATURE.



CABINET UNIT HEATER (CUH) CONTROLS DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

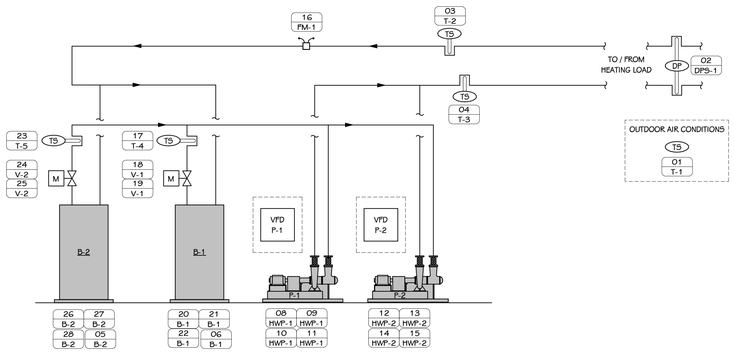
ROOFTOP UNIT (RTU-1K, RTU-2K & RTU-1J) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR BASE BID TRANE INTELLIPAK ROOFTOP SYSTEM OPERATION. UNITS ARE A COMBINATION OF AN OUTDOOR VARIABLE VOLUME UNIT, PACKAGE GAS FIRED HX, SUPPLY AND RELIEF FANS, VARIABLE FREQUENCY CONTROLLERS, PACKAGED DX SYSTEM, DYNAMIC ELECTRONIC FILTERS, BIPOLAR IONIZATION, OUTDOOR - RELIEF - RETURN AIR DAMPERS AND ACTUATORS AND AIR TEMPERATURE/AIRFLOW/HUMIDITY SENSORS. UNIT IS EQUIPPED WITH A SYMBIO 800 CONTROLLER WITH BACNET COMMUNICATION PROTOCOL FOR BUILDING MANAGEMENT SYSTEM (BMS) CONTROL. ALL INTERFACE, SCHEDULING, ALARMING AND SETPOINT ADJUSTMENTS OCCUR THROUGH (BMS).
2. COORDINATE ALL POINTS SHOWN WITH EQUIPMENT MANUFACTURER FOR A COMPLETE OPERATING SYSTEM.
3. REFER TO VARIABLE AIR VOLUME (VAV) TERMINAL UNIT CONTROL ARTICLES FOR VAV TERMINAL UNIT OPERATION.
4. ROOFTOP UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
5. ROOFTOP UNIT ADJUSTABLE SETPOINTS:
   A. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
6. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP BY BMS: UNIT CONTROLLER WILL DISABLE SUPPLY AND RELIEF FANS SIMULTANEOUSLY, DISABLE COOLING AND HEATING, OUTDOOR AND RELIEF AIR DAMPERS WILL BE 100% CLOSED AND RETURN AIR DAMPER 100% OPENED.
   B. WHEN INDEXED TO START BY BMS: UNIT CONTROLLER WILL ENABLE SUPPLY FANS WITH TEMPERATURE CONTROL OF SYSTEM TO RESUME AFTER START-UP DELAY.
7. SUPPLY FAN CONTROL – SYSTEM CONTROLLER SHALL MODULATE SUPPLY FAN MOTOR VARIABLE FREQUENCY CONTROLLERS TO MAINTAIN AN ADJUSTABLE DUCT STATIC PRESSURE SETPOINT MEASURED BY A DUCT STATIC PRESSURE CONTROLLER LOCATED 75% OF MAXIMUM MAIN DUCT DISTANCE DOWNSTREAM OF SYSTEM (FINAL POSITION TO BE APPROVED BY ENGINEER). RESET STATIC PRESSURE DIFFERENTIAL SETPOINT BASED ON THE FOLLOWING:
   A. SETPOINT WILL BE FROM BMS AS AN INPUT TO UNIT CONTROLLER VIA BACNET.
   B. STATIC PRESSURE SETPOINT SHALL BE RESET USING "TRIM AND RESPOND" LOGIC WITHIN THE RANGE OF 0.25" W.C. TO 1.75" W.C. (ADJ.). WHEN THE SYSTEM IS OFF, THE SETPOINT SHALL BE 0.25" W.C. (ADJ.). WHEN SYSTEM IS ON, EVERY TEN (10) MINUTES, TRIM THE SETPOINT BY 0.05" W.C. IF THERE ARE TWO (2) OR FEWER ZONE PRESSURE REQUESTS. IF THERE ARE MORE THAN TWO (2) ZONE PRESSURE REQUESTS, RESPOND BY INCREASING THE SETPOINT BY 0.10" W.C..
      a. A REQUEST IS GENERATED WHENEVER TERMINAL UNIT DAMPER IS GREATER THAN 95% (ADJ.) OPEN UNTIL IT DROPS TO 80% (ADJ.) OPEN.
      b. EXCLUDE ANY TERMINAL UNITS SET-UP AS CONSTANT VOLUME FROM "TRIM AND RESPOND" LOGIC.
      c. PROVIDE THE ABILITY TO OMIT OTHER VAV TERMINAL UNITS FROM "TRIM AND RESPOND" LOGIC.
      d. TEST AND BALANCE CONTRACTOR SHALL PROVIDE MINIMUM AND MAXIMUM STATIC SETPOINTS, WHICH WILL BE DETERMINED DURING THE BALANCING PROCESS.
   C. DISCHARGE PRESSURE HIGH LIMIT WILL CONTROL STATIC PRESSURE AT UNIT FROM EXCEEDING 3.0" W.C. (ADJ.) WITH OVERRIDE CONTROL OF SUPPLY FAN(S) VARIABLE FREQUENCY DRIVES.
8. RELIEF FAN CONTROL – SYSTEM CONTROLLER SHALL MODULATE RELIEF FAN MOTORS BASED ON THE FOLLOWING:
   A. THE MODULATING RELIEF DISCHARGE DAMPERS AND ECM SHALL BE MODULATED IN RESPONSE TO BUILDING PRESSURE. A DIFFERENTIAL PRESSURE CONTROL SYSTEM, SHALL USE A DIFFERENTIAL PRESSURE TRANSDUCER TO COMPARE INDOOR BUILDING PRESSURE TO OUTDOOR ATMOSPHERIC PRESSURE. THE RELIEF FAN SHALL BE TURN ON WHEN REQUIRED TO LOWER BUILDING STATIC PRESSURE SETPOINT. THE SYSTEM SHALL THEN MODULATE THE DISCHARGE DAMPERS AND ECM TO CONTROL THE BUILDING PRESSURE TO WITHIN THE ADJUSTABLE, SPECIFIED DEAD BAND THAT SHALL BE ADJUSTABLE AT THE USER INTERFACE PANEL.
9. FAN INITIAL START-UP CONTROL - WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE FANS BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, BMS SHALL INDICATE A CRITICAL ALARM.
      a. IF ANY FAN (SUPPLY OR RELIEF) STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
10. DISCHARGE AIR TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL MODULATE/CYCLE HEATING AND COOLING SOURCES AND MIXED AIR DAMPERS TO MAINTAIN AN ADJUSTABLE DISCHARGE AIR TEMPERATURE SETPOINT MEASURED BY A DUCT TEMPERATURE SENSOR LOCATED DOWNSTREAM OF UNIT. RESET DISCHARGE AIR TEMPERATURE SETPOINT BASED ON THE FOLLOWING:
   A. SETPOINT WILL BE FROM BMS AS AN INPUT TO UNIT CONTROLLER VIA BACNET.
   B. ALL TERMINAL AIR UNIT ZONE SPACE TEMPERATURES FOR THE SERVING UNIT SHALL BE AVERAGED. A REVERSE ACTING PI (PROPORTIONAL, INTEGRAL) LOOP SHALL BE CONFIGURED SUCH THAT ITS INPUT SHALL BE THE AVERAGE ZONE SPACE TEMPERATURE AND ITS SETPOINT SHALL BE HALF WAY BETWEEN THE GLOBAL REHEAT AND COOLING SETPOINTS. FOR EXAMPLE, IF THE ZONE SPACE TEMPERATURE REHEAT SETPOINT IS 70°F AND THE ZONE SPACE TEMPERATURE COOLING SETPOINT IS 75°F, THE RESULTING AVERAGE SPACE TEMP SETPOINT WOULD BE 72.5°F.
      a. THE PI LOOP OUTPUT SHALL BE USED AS THE AHU DISCHARGE TEMPERATURE SETPOINT AND SHALL BE LIMITED BETWEEN 55°F AND 69°F (ADJ.).
      b. DISCHARGE AIR TEMPERATURE CONTROL SEQUENCE IS DESIGNED TO MAINTAIN MOST SPACES IN THE AHU SERVED ZONE AT OR CLOSE TO THE AVERAGE SPACE TEMPERATURE SETPOINT WHICH SHOULD POSITION MOST TERMINAL AIR UNITS AT MINIMUM CFM WITH NO REHEAT REQUIRED.
11. ECONOMIZER CONTROL – SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET UNIT DISCHARGE AIR TEMPERATURE SETPOINT WHEN OUTDOOR AIR TEMPERATURE AND HUMIDITY IS BELOW SETPOINT.
   A. SETPOINT WILL BE FROM BMS AS AN INPUT TO UNIT CONTROLLER VIA BACNET.
12. MINIMUM OUTDOOR AIR CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MAINTAIN MINIMUM CFM SETPOINT MEASURED BY AN OUTDOOR AIR FLOW MEASURING STATION. LIMIT THE CLOSING OF THE OUTDOOR AIR DAMPER TO PROVIDE ABSOLUTE MINIMUM OUTDOOR AIR FLOW.
   A. OUTDOOR – RELIEF – RETURN MODULATING WITH ONE SIGNAL FROM CONTROLLER.
   B. FOR RTU-1K & 2K: 2000 CFM ABSOLUTE MINIMUM OUTDOOR AIRFLOW CFM SETPOINT AND 6100 CFM MAXIMUM MINIMUM OUTDOOR AIRFLOW CFM SETPOINT. FOR RTU-1J: 1540 CFM ABSOLUTE MINIMUM OUTDOOR AIRFLOW CFM SETPOINT AND 4730 CFM MAXIMUM MINIMUM OUTDOOR AIRFLOW CFM SETPOINT
   C. MINIMUM CFM SETPOINT WILL BE FROM BMS AS AN INPUT TO UNIT CONTROLLER VIA BACNET.
13. CO2 CONTROL - SYSTEM CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING RETURN DUCT MOUNTED SENSOR(S) TO INCREASE OUTDOOR ABSOLUTE MINIMUM CFM TO A MAXIMUM MINIMUM CFM (RANGE 2000 CFM THRU 6100 CFM FOR RTU-1K & 2K AND RANGE 1540 CFM THRU 4730 CFM FOR RTU-1J). INCLUDE CORRESPONDING CLOSING RETURN AIR DAMPER AND OPENING OF RELIEF/EXHAUST AIR DAMPERS.
   A. UPON RETURN DUCT CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS (OUTDOOR AIR DAMPER OPENING) IN GRADUAL INCREMENTS UNTIL CO2 SENSOR SETPOINT IS SATISFIED.
      a. MODULATE MIXED AIR DAMPERS DOWN TO ITS ABSOLUTE MINIMUM POSITION UPON SATISFYING SENSOR SETPOINT.
   B. SETPOINTS WILL BE FROM BMS AS AN INPUT TO UNIT CONTROLLER VIA BACNET.
14. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP AND POWER TO FILTER CONTROLLER.
15. UNOCCUPIED CONTROL - SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. SYSTEM CONTROLLER SHALL CYCLE SYSTEM ON WHEN A CALL FOR HEAT OR COOL IS INITIATED BY BMS VIA SPACE TEMPERATURE SENSOR(S) DURING UNOCCUPIED MODE AND SYSTEM SHALL RESPOND BASED ON THE FOLLOWING:
      a. ENABLE FANS AND SYSTEM SHALL FUNCTION AS DESCRIBED IN TEMPERATURE CONTROL OPERATION TO PROVIDE HEATING/COOLING TO ZONE WITH THE EXCEPTION TO THE FOLLOWING:
         - MIXED AIR DAMPERS SHALL REMAIN CLOSED WITH RETURN DAMPER 100% OPENED AND OUTDOOR AND RELIEF 100% CLOSED.
         - RELIEF FANS SHALL BE DISABLED.
      b. SYSTEM DISABLED UPON SATISFYING THE CALL FOR HEAT/COOL.
16. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNIT PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNIT BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
   A. UNIT SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSORS TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AND RELIEF AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNIT SHALL SWITCH TO OCCUPIED MODE.
17. TIMED OVERRIDE CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNIT WHEN ASSOCIATED TERMINAL UNIT TIMED OVERRIDE (2 HOURS (ADJ)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.
18. SAFETY SHUTDOWNS:
   A. PROVIDE A HIGH STATIC PRESSURE SENSOR IN THE SUPPLY DISCHARGE PLENUM TO DE-ENERGIZE THE UNIT UPON SENSING A HIGH STATIC PRESSURE OF 4.0" W.C (ADJ) PROVIDE MANUAL RESET.
   B. DUCT MOUNTED IONIZATION SMOKE DETECTOR(S) PROVIDED BY DIVISION 28 SHALL DE-ENERGIZE THE UNIT WHENEVER PRODUCTS OF COMBUSTION ARE SENSED.

SEQUENCE OF OPERATIONS (CONT'D)

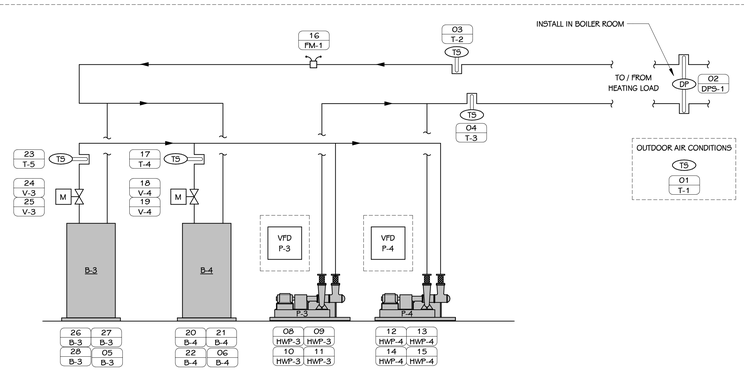
ROOFTOP UNIT (RTU-2J) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR SYSTEM OPERATION. UNIT OPERATES AS A VARIABLE VOLUME UNIT. UNIT CONTAINS SUPPLY FAN, ELECTRONICALLY COMMUTATED MOTOR, DX COOLING COIL WITH VARIABLE SPEED COMPRESSOR, DUCT MOUNTED HEATING HOT WATER COIL, CONTROL VALVE (CV) AND ACTUATOR WITH CIRCULATING PUMP, MERV 13 FILTERS, BIPOLAR IONIZATION, OUTDOOR – EXHAUST - RETURN AIR DAMPERS AND ACTUATORS, CONSTANT VOLUME EXHAUST FAN AND AIR TEMPERATURE / HUMIDITY SENSORS. UNIT IS EQUIPPED WITH PACKAGED CONTROLLER WITH BACNET COMMUNICATION AND TERMINAL STRIP FOR BUILDING MANAGEMENT SYSTEM (BMS) INTEGRATION, CONTROL AND MONITORING. ALL INTERFACE, SCHEDULING, ALARMING AND SETPOINT ADJUSTMENTS OCCUR THROUGH (BMS).
2. COORDINATE ALL POINTS SHOWN WITH EQUIPMENT MANUFACTURER FOR A COMPLETE OPERATING SYSTEM.
3. UNIT SHALL HAVE ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE.
4. REFER TO VARIABLE AIR VOLUME (VAV) TERMINAL UNIT CONTROL ARTICLES FOR VAV TERMINAL UNIT OPERATION.
5. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE COOLING AND HEATING SOURCES AND AFTER TIME DELAY DISABLE SUPPLY AND EXHAUST FANS, OUTDOOR AND EXHAUST AIR DAMPERS 100% CLOSED, RETURN AIR DAMPER 100% OPENED.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, OPERATION OF SYSTEM TO RESUME AFTER START-UP DELAY.
6. THE BMS SHALL SEND THE UNIT CONTROLLER THE FOLLOWING MODES BASED ON SPACE NEEDS: OPTIMAL MORNING WARM-UP / PRE-COOL, OCCUPIED HEAT/COOL AND UNOCCUPIED HEAT/COOL MODES.
   A. IF BMS COMMUNICATION IS LOST WITH UNIT CONTROLLER, THE UNIT CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.
7. OCCUPIED MODE CONTROL - UNIT CONTROLLER SHALL MODULATE SUPPLY FAN MOTOR TO MAINTAIN DUCT STATIC PRESSURE AT SETPOINT AND MODULATE OR CYCLE HEATING AND COOLING SOURCES AND MIXED AIR DAMPERS TO MAINTAIN AN ADJUSTABLE DISCHARGE AIR TEMPERATURE SETPOINT MEASURED BY A DISCHARGE AIR TEMPERATURE SENSOR.
   A. SUPPLY FAN CONTROL - UNIT CONTROLLER SHALL MODULATE SUPPLY FAN ECM TO MAINTAIN AN ADJUSTABLE DUCT STATIC PRESSURE SETPOINT MEASURED BY A DUCT STATIC PRESSURE CONTROLLER LOCATED 75% OF MAXIMUM MAIN DUCT DISTANCE DOWNSTREAM OF SYSTEM (FINAL POSITION TO BE APPROVED BY ENGINEER). RESET STATIC PRESSURE DIFFERENTIAL SETPOINT BASED ON THE FOLLOWING:
      a. STATIC PRESSURE SETPOINT SHALL BE RESET USING "TRIM AND RESPOND" LOGIC. UNIT CONTROLLER SHALL MONITOR ALL TERMINAL AIR UNIT DAMPER POSITIONS AND RESET THE RTU'S DUCT STATIC PRESSURE SETPOINT BASED ON THE POSITION OF THE FURTHEST-OPEN DAMPER.
         - RANGE OF 0.25" W.C. TO 1.2" W.C. (ADJ.). WHEN THE SYSTEM IS OFF, THE SETPOINT SHALL BE 0.5" W.C. (ADJ.).
   B. DISCHARGE AIR TEMPERATURE CONTROL - UNIT CONTROLLER SHALL MODULATE OR CYCLE HEATING AND COOLING SOURCES AND MIXED AIR DAMPERS TO MAINTAIN AN ADJUSTABLE DISCHARGE AIR TEMPERATURE SETPOINT MEASURED BY A DUCT TEMPERATURE SENSOR LOCATED DOWNSTREAM OF UNIT. RESET DISCHARGE AIR TEMPERATURE SETPOINT AS FOLLOWS BASED ON THE CURRENT OUTDOOR AIR TEMPERATURE OR ZONE COOLING AND HEATING DEMAND:
      a. AT 0°F OUTDOOR AIR TEMPERATURE, SET DISCHARGE AIR TEMPERATURE AT 65°F (ADJ.).
      b. AT 65°F OUTDOOR AIR TEMPERATURE, SET DISCHARGE AIR TEMPERATURE AT 55°F (ADJ.).
   C. COIL PUMP CONTROL BASED ON THE FOLLOWING:
      a. HEATING HOT WATER COIL PUMP SHALL RUN WHEN THE SYSTEM IS IN HEATING MODE.
      b. PUMP SHALL RUN CONTINUOUSLY WHENEVER THE OUTDOOR AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).
   D. ECONOMIZER CONTROL - UNIT CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET UNIT DISCHARGE AIR TEMPERATURE SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY.
   E. MINIMUM OUTDOOR AIR CONTROL - SYSTEM CONTROLLER SHALL MODULATE MINIMUM DAMPER TO MAINTAIN MINIMUM PERCENT DAMPER POSITION SETPOINT. INCLUDE CORRESPONDING CLOSING RETURN AIR DAMPER.
      a. TEST AND BALANCE CONTRACTOR SHALL PROVIDE MINIMUM DAMPER PERCENTAGE SETPOINT, WHICH WILL BE DETERMINED DURING THE BALANCING PROCESS.
   F. EXHAUST FAN CONTROL - UNIT CONTROLLER SHALL ENABLE EXHAUST FAN ON WHEN UNIT IS IN ECONOMIZER MODE.
      a. THE ENABLE DAMPER POSITION SETPOINT OF 40% (ADJ.) SHALL BE A SETPOINT THAT CONTROLS TO A SLIGHTLY POSITIVE PRESSURE.
8. FANS INITIAL START-UP CONTROL – WHEN INDEXED TO START, UNIT CONTROLLER SHALL ENABLE FANS BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF ANY FAN (SUPPLY OR EXHAUST) STATUS IS NOT SENSED, THE UNIT SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZES OF RUN HOURS FOR FAN WILL BE ACTIVE.
9. UNOCCUPIED MODE CONTROL - UNIT CONTROLLER SHALL CYCLE HEATING AND COOLING SOURCES TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. UNIT CONTROLLER SHALL CYCLE SYSTEM ON (DURING UNOCCUPIED MODE) WHEN A CALL IS INITIATED.
      a. ENABLE UNIT AND SYSTEM SHALL FUNCTION AS DESCRIBED IN OCCUPIED TEMPERATURE CONTROL OPERATION WITH THE EXCEPTION TO THE FOLLOWING:
         - OUTSIDE AIR DAMPER SHALL REMAIN CLOSED WITH RETURN DAMPER 100% OPENED, UNLESS ECONO



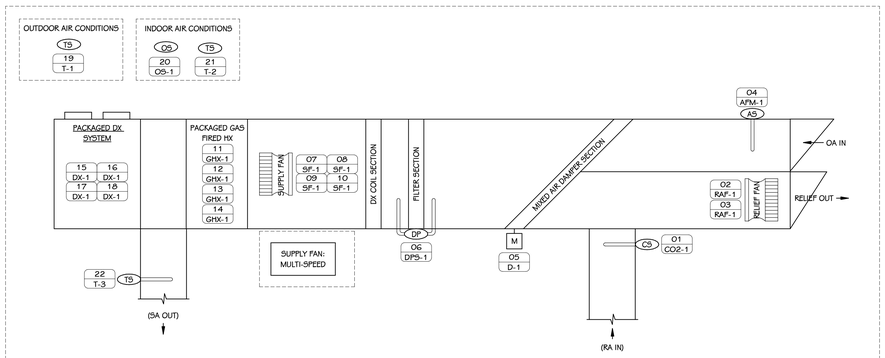
HEATING HOT WATER SYSTEM CONTROLS DIAGRAM (BOILER ROOM 213)

SCALE: NONE



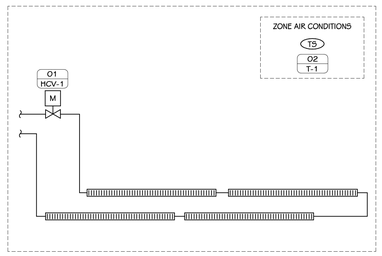
HEATING HOT WATER SYSTEM CONTROLS DIAGRAM (BOILER ROOM 614)

SCALE: NONE



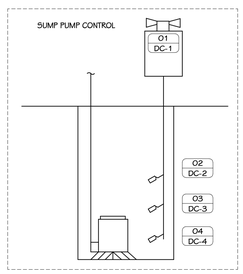
RTU-3J, 4J, 5J & 6J CONTROLS DIAGRAM

SCALE: NONE



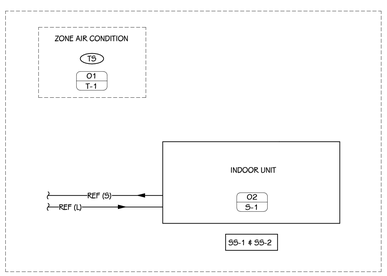
FINNED TUBE (FT) CONTROLS DIAGRAM

SCALE: NONE



DOMESTIC (SUMP PUMP) CONTROLS DIAGRAM

SCALE: NONE



MINI-SPLIT CONTROLS DIAGRAM

SCALE: NONE

CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
HEATING HOT WATER SYSTEM (BOILER ROOM 213)						
01	T-1	OUTDOOR AIR TEMPERATURE		▮		GLOBAL
02	DPS-1	HEATING LOOP DIFFERENTIAL PRESSURE		▮		TWO SENSORS WITH CONTROL TO LOWEST READING TO SETPOINT
03	T-2	HEATING WATER RETURN TEMPERATURE	▮	▮		
04	T-3	HEATING SUPPLY WATER TEMPERATURE	▮	▮		
05	B-2	SETPOINT ADJUSTMENT	▮			SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
06	B-1	SETPOINT ADJUSTMENT	▮			SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
08	HWP-1	ENABLE/DISABLE		▮		
09	HWP-1	STATUS	▮	▮		
10	HWP-1	SPEED CONTROL		▮		
11	HWP-1	VFD FAULT STATUS	▮			
12	HWP-2	ENABLE/DISABLE		▮		
13	HWP-2	STATUS	▮	▮		
14	HWP-2	SPEED CONTROL		▮		
15	HWP-2	VFD FAULT STATUS	▮			
16	FM-1	LOOP FLOW (GPM)		▮		
17	T-4	LEAVING WATER TEMPERATURE		▮		
18	V-1	ISOLATION VALVE OPEN/CLOSE		▮		CONTROLLED BY BOILER CONTROLLER
19	V-1	ISOLATION VALVE POSITION	▮	▮		CONTROLLED BY BOILER CONTROLLER
20	B-1	ENABLE/DISABLE		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
21	B-1	STATUS		▮		MODBUS/BACNET DATA (FIRE RATE/HOURS...)
22	B-1	ALARM STATUS	▮			
23	T-5	LEAVING WATER TEMPERATURE		▮		
24	V-2	ISOLATION VALVE OPEN/CLOSE		▮		CONTROLLED BY BOILER CONTROLLER
25	V-2	ISOLATION VALVE POSITION	▮	▮		CONTROLLED BY BOILER CONTROLLER
26	B-2	ENABLE/DISABLE		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
27	B-2	STATUS		▮		MODBUS/BACNET DATA (FIRE RATE/HOURS...)
28	B-2	ALARM STATUS	▮			
HEATING HOT WATER SYSTEM (BOILER ROOM 614)						
01	T-1	OUTDOOR AIR TEMPERATURE		▮		GLOBAL
02	DPS-1	HEATING LOOP DIFFERENTIAL PRESSURE		▮		ONE SENSOR TO BE INSTALLED IN THE BOILER ROOM
03	T-2	HEATING WATER RETURN TEMPERATURE	▮	▮		
04	T-3	HEATING SUPPLY WATER TEMPERATURE	▮	▮		
05	B-3	SETPOINT ADJUSTMENT		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
06	B-4	SETPOINT ADJUSTMENT		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
08	HWP-3	ENABLE/DISABLE		▮		
09	HWP-3	STATUS	▮	▮		
10	HWP-3	SPEED CONTROL		▮		
11	HWP-3	VFD FAULT STATUS	▮			
12	HWP-4	ENABLE/DISABLE		▮		
13	HWP-4	STATUS	▮	▮		
14	HWP-4	SPEED CONTROL		▮		
15	HWP-4	VFD FAULT STATUS	▮			
16	FM-1	LOOP FLOW (GPM)		▮		
17	T-4	LEAVING WATER TEMPERATURE		▮		
18	V-4	ISOLATION VALVE OPEN/CLOSE		▮		CONTROLLED BY BOILER CONTROLLER
19	V-4	ISOLATION VALVE POSITION	▮	▮		CONTROLLED BY BOILER CONTROLLER
20	B-4	ENABLE/DISABLE		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
21	B-4	STATUS		▮		MODBUS/BACNET DATA (FIRE RATE/HOURS...)
22	B-4	ALARM STATUS	▮			
23	T-5	LEAVING WATER TEMPERATURE		▮		
24	V-3	ISOLATION VALVE OPEN/CLOSE		▮		CONTROLLED BY BOILER CONTROLLER
25	V-3	ISOLATION VALVE POSITION	▮	▮		CONTROLLED BY BOILER CONTROLLER
26	B-3	ENABLE/DISABLE		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
27	B-3	STATUS		▮		MODBUS/BACNET DATA (FIRE RATE/HOURS...)
28	B-3	ALARM STATUS	▮			
RTU-3J, 4J, 5J & 6J						
01	CO2-1	RETURN AIR CARBON DIOXIDE		▮		ALARM AT 1200 PPM ADJ.
02	RAF-1	ENABLE/DISABLE		▮		
03	RAF-1	STATUS	▮			
04	AFM-1	OUTDOOR AIR FLOW		▮		
05	D-1	MIXED AIR DAMPER OUTPUT		▮		
06	DPS-1	FILTER STATUS	▮	▮		BASED ON DYNAMIC ELECTRONIC V-BANK FILTER, ALARM AT 0.75" ADJ
07	SF-1	FAN AIR FLOW		▮		
08	SF-1	SPEED CONTROL		▮		2-SPEED
09	SF-1	ENABLE/DISABLE		▮		
10	SF-1	STATUS	▮	▮		
11	GHX-1	GAS FIRED HX ENABLE/DISABLE		▮		
12	GHX-1	GAS FIRED HX RUN STATUS		▮		
13	GHX-1	GAS FIRED HX ALARM STATUS	▮			
14	GHX-1	GAS FIRED HX STAGING		▮		2 STAGE HEATING
15	DX-1	COOLING SYSTEM ALARM STATUS	▮			
16	DX-1	COOLING SYSTEM RUN STATUS		▮		
17	DX-1	COOLING SYSTEM ENABLE/DISABLE		▮		
18	DX-1	COOLING SYSTEM STAGING		▮		2 STAGE COOLING
19	T-1	OUTDOOR AIR TEMPERATURE		▮		GLOBAL SHARED POINT
20	OS-1	OCCUPANCY SENSOR		▮		
21	T-2	INDOOR AIR TEMPERATURE		▮		
22	T-3	DISCHARGE AIR TEMPERATURE	▮	▮		ALARM IF OUT OF RANGE
AC SYSTEM (MINI-SPLIT)						
01	T-1	SPACE TEMPERATURE	▮	▮		
02	S-1	UNIT STATUS	▮			
DOMESTIC (SUMP PUMP)						
01	DC-1	DRY CONTACT ALARM	▮			LOSS OF POWER
02	DC-2	DRY CONTACT ALARM	▮			HIGH WATER ALARM FLOAT
03	DC-3	DRY CONTACT ALARM	▮			PUMP ON
04	DC-4	DRY CONTACT ALARM	▮			PUMP OFF
FINNED TUBE						
01	HCV-1	HEATING CONTROL VALVE OUTPUT		▮		
02	T-1	ZONE AIR TEMPERATURE		▮		

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

HEATING HOT WATER SYSTEM SEQUENCE OF OPERATION (BOILER ROOM 213):

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR HEATING HOT WATER SYSTEM OPERATION. SYSTEM IS A COMBINATION OF VARIABLE VOLUME BASE MOUNTED CENTRIFUGAL PUMPS, VARIABLE FREQUENCY CONTROLLERS, MODULAR HOT WATER CONDENSING BOILERS WITH MANUFACTURER MULTIPLE BOILER CASCADING CONTROLLER, ISOLATION CONTROL VALVES (CV) AND ACTUATORS AND WATER TEMPERATURE/AIR TEMPERATURE/FLOW SENSORS.
2. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. UPON A CALL FOR HEAT BY ANY PIECE OF HEATING EQUIPMENT.
      a. INCLUDE CAPABILITY TO OMIT ANY INDIVIDUAL PIECE OF HEATING EQUIPMENT.
   B. AT AN ADJUSTABLE 55°F OUTDOOR AIR TEMPERATURE.
   C. BY OPERATOR COMMAND.
3. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE BOILER CONTROLLER, AFTER DELAY OF TEN (10) MINUTE HOLD TO EQUALIZE SYSTEM, DISABLE LEAD PUMP, LEAD BOILER ISOLATION VALVE SHALL CLOSE AFTER PUMP IS OFF.
   B. WHEN INDEXED TO START: LEAD BOILER ISOLATION VALVE (CONTROLLED BY BOILER CONTROLLER) 100% OPEN, ENABLE LEAD PUMP, AFTER DELAY OF TEN (10) MINUTE HOLD TO ESTABLISH FLOW IN SYSTEM, ENABLE BOILER CONTROLLER.
4. INITIAL START-UP CONTROL – WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE LEAD PUMP BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM, START LAG PUMP SHOULD LEAD PUMP FAIL.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR UNIT WILL BE ACTIVE.
   C. ALTERNATE OF LEAD AND LAG PUMPS (15 DAYS ADJUSTABLE) TO EVEN OUT OPERATING TIME OF EACH PUMP.
      a. UTILIZE CALENDAR DAY(S) AND TOTALIZE HOURS TO DETERMINE LEAD PUMP FOR DURATION.
5. PUMP PRESSURE CONTROL – SYSTEM CONTROLLER SHALL MODULATE SYSTEM PUMP MOTOR VARIABLE FREQUENCY CONTROLLER TO MAINTAIN A FIXED PRESSURE DIFFERENTIAL (PSID) SETPOINT MEASURED BY TWO PRESSURE DIFFERENTIAL CONTROLLERS LOCATED 75% OF MAXIMUM MAIN PIPE DISTANCE DOWNSTREAM OF SYSTEM. PRESSURE DIFFERENTIAL SETPOINT BASED ON THE FOLLOWING:
   A. SETPOINT TO BE DETERMINED BY TEST AND BALANCE CONTRACTOR.
   B. LOCATION OF (2) DIFFERENTIAL PRESSURE SENSORS: FIRST LOCATION UNIT K FIRST FLOOR IN CLASSROOM 024 AND SECOND LOCATION UNIT K SECOND FLOOR CLASSROOM 124.
6. PUMP VARIABLE FREQUENCY CONTROLLER SHALL BE MONITORED BASED ON THE FOLLOWING:
   A. VIA BACNET/MODBUS CONNECTION: POWER USAGE / SPEED % AND HZ / HOURS / FAULT / ALARM.
7. TEMPERATURE CONTROL – SYSTEM CONTROLLER SHALL SEND TO MULTIPLE BOILER CASCADING CONTROLLER AN ADJUSTABLE HEATING HOT WATER TEMPERATURE SETPOINT MEASURED BY MAIN SUPPLY WATER TEMPERATURE SENSOR LOCATED DOWNSTREAM OF HEATING SYSTEM. RESET HOT WATER SUPPLY TEMPERATURE SETPOINT BASED ON THE FOLLOWING:
   A. INITIAL STARTUP SET SUPPLY WATER TEMPERATURE SETPOINT AT 110°F (ADJ.)
   B. MAIN SUPPLY WATER TEMPERATURE SETPOINT SHALL BE RESET BASED ON THE FOLLOWING:
      a. AT 0°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 140°F (ADJ.).
      b. AT 55°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 110°F (ADJ.).
8. SYSTEM CONTROLLER SHALL MONITOR HEATING HOT WATER SYSTEM GALLONS PER MINUTE (GPM).
   A. COORDINATE MINIMUM FLOW RATE WITH ACTUAL PUMPS INSTALLED.
9. SYSTEM SAFETY SHUTDOWNS – WHEN EMERGENCY BUTTON(S) LOCATED OUTSIDE OF BOILER ROOM IS ACTIVE, SYSTEM CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
   A. SYSTEM SHALL BE DISABLED WHEN EMERGENCY BUTTON(S) IS ACTIVE.
   B. DE-ENERGIZED BOILERS, PUMPS DISABLED AND ALARM GENERATED.
      a. PUMPS SHALL REMAIN ON FOR A PERIOD OF TIME PRIOR TO BE DISABLED.

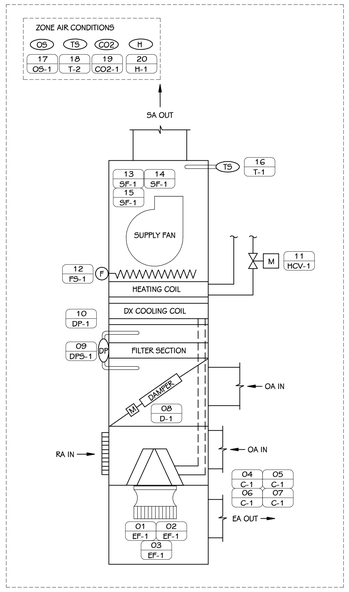
HEATING HOT WATER SYSTEM SEQUENCE OF OPERATION (BOILER ROOM 614):

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR HEATING HOT WATER SYSTEM OPERATION. SYSTEM IS A COMBINATION OF VARIABLE VOLUME BASE MOUNTED CENTRIFUGAL PUMPS, VARIABLE FREQUENCY CONTROLLERS, MODULAR HOT WATER CONDENSING BOILERS WITH MANUFACTURER MULTIPLE BOILER CASCADING CONTROLLER, ISOLATION CONTROL VALVES (CV) AND ACTUATORS AND WATER TEMPERATURE/AIR TEMPERATURE/FLOW SENSORS.
   A. NEW BOILER SYSTEM SHALL SERVE NEW EQUIPMENT TO BE INSTALLED AND SERVE EXISTING EQUIPMENT WHICH SHALL REMAIN AS IS. THE EXISTING EQUIPMENT OPERATES AT 180° EWT ON A 0° DAY. WITH THE EXISTING EQUIPMENT THERE IS A LARGE NUMBER OF 3-WAY CONTROL VALVES INSTALLED. FOR EXISTING CABINET HEATERS AND UNIT HEATERS THERE ARE NO CONTROL VALVES INSTALLED ALLOWING CONSISTENT FLOW. THERE ARE SOME 2-WAY CONTROL VALVES INSTALLED BUT THE LARGER EQUIPMENT IS 3-WAY. THE NEW EQUIPMENT IS PRIMARILY 2-WAY CONTROL VALVES WITH SOME 3-WAY CONTROL VALVES TO ALLOW BYPASS. FOR CONSTRUCTION AS THE SYSTEM CURRENTLY STANDS THE PUMP DIFFERENTIAL PRESSURE SENSOR SHALL BE INSTALLED IN THE BOILER ROOM. THE PUMP SPEED AND FLOW SHALL BE MODULATED FOR THE SYSTEM BUT IT WILL BE LIMITED BASED UPON THE NUMBER OF EXISTING 3-WAY CONTROL VALVES AND BYPASS CURRENTLY IN THE EXISTING SYSTEM.
2. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. UPON A CALL FOR HEAT BY ANY PIECE OF HEATING EQUIPMENT.
      a. INCLUDE CAPABILITY TO OMIT ANY INDIVIDUAL PIECE OF HEATING EQUIPMENT.
   B. AT AN ADJUSTABLE 55°F OUTDOOR AIR TEMPERATURE.
   C. BY OPERATOR COMMAND.
3. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE BOILER CONTROLLER, AFTER DELAY OF TEN (10) MINUTE HOLD TO EQUALIZE SYSTEM, DISABLE LEAD PUMP, LEAD BOILER ISOLATION VALVE SHALL CLOSE AFTER PUMP IS OFF.
   B. WHEN INDEXED TO START: LEAD BOILER ISOLATION VALVE (CONTROLLED BY BOILER CONTROLLER) 100% OPEN, ENABLE LEAD PUMP, AFTER DELAY OF TEN (10) MINUTE HOLD TO ESTABLISH FLOW IN SYSTEM, ENABLE BOILER CONTROLLER.
4. INITIAL START-UP CONTROL – WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE LEAD PUMP BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM, START LAG PUMP SHOULD LEAD PUMP FAIL.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR UNIT WILL BE ACTIVE.
   C. ALTERNATE OF LEAD AND LAG PUMPS (15 DAYS ADJUSTABLE) TO EVEN OUT OPERATING TIME OF EACH PUMP.
      a. UTILIZE CALENDAR DAY(S) AND TOTALIZE HOURS TO DETERMINE LEAD PUMP FOR DURATION.
5. PUMP PRESSURE CONTROL – SYSTEM CONTROLLER SHALL MODULATE SYSTEM PUMP MOTOR VARIABLE FREQUENCY CONTROLLER TO MAINTAIN A FIXED PRESSURE DIFFERENTIAL (PSID) SETPOINT MEASURED BY A PRESSURE DIFFERENTIAL CONTROLLER LOCATED IN THE BOILER ROOM. PRESSURE DIFFERENTIAL SETPOINT BASED ON THE FOLLOWING:
   A. SETPOINT TO BE DETERMINED BY TEST AND BALANCE CONTRACTOR.
6. PUMP VARIABLE FREQUENCY CONTROLLER SHALL BE MONITORED BASED ON THE FOLLOWING:
   A. VIA BACNET/MODBUS CONNECTION: POWER USAGE / SPEED % AND HZ / HOURS / FAULT / ALARM.
7. TEMPERATURE CONTROL – SYSTEM CONTROLLER SHALL SEND TO MULTIPLE BOILER CASCADING CONTROLLER AN ADJUSTABLE HEATING HOT WATER TEMPERATURE SETPOINT MEASURED BY MAIN SUPPLY WATER TEMPERATURE SENSOR LOCATED DOWNSTREAM OF HEATING SYSTEM. RESET HOT WATER SUPPLY TEMPERATURE SETPOINT BASED ON THE FOLLOWING:
   A. INITIAL STARTUP SET SUPPLY WATER TEMPERATURE SETPOINT AT 110°F (ADJ.)
   B. MAIN SUPPLY WATER TEMPERATURE SETPOINT SHALL BE RESET BASED ON THE FOLLOWING:
      a. AT 0°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 180°F (ADJ.).
      b. AT 55°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 110°F (ADJ.).
8. SYSTEM CONTROLLER SHALL MONITOR HEATING HOT WATER SYSTEM GALLONS PER MINUTE (GPM).
   A. COORDINATE MINIMUM FLOW RATE WITH ACTUAL PUMPS INSTALLED.
9. SYSTEM SAFETY SHUTDOWNS – WHEN EMERGENCY BUTTON(S) LOCATED OUTSIDE OF BOILER ROOM IS ACTIVE, SYSTEM CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
   A. SYSTEM SHALL BE DISABLED WHEN EMERGENCY BUTTON(S) IS ACTIVE.
   B. DE-ENERGIZED BOILERS, PUMPS DISABLED AND ALARM GENERATED.
      a. PUMPS SHALL REMAIN ON FOR A PERIOD OF TIME PRIOR TO BE DISABLED.

SEQUENCE OF OPERATIONS (CONT'D)

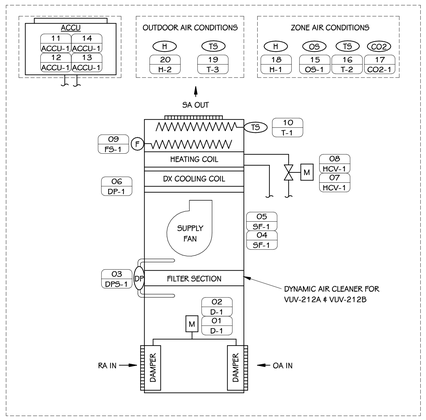
ROOFTOP UNITS (RTU-3J, 4J, 5J & 6J) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR PACKAGE ROOFTOP SYSTEM OPERATION. UNIT CONSISTS OF CONTROLLER SUPPLIED BY MANUFACTURER, MULTISPEED SUPPLY FAN, POWER EXHAUST FAN, (2) STAGE NATURAL GAS HEATER SECTION, DYNAMIC AIR CLEANER, BIPOLAR IONIZATION, OUTDOOR – RETURN AIR DAMPERS AND ACTUATOR AND (2) STAGE DX COOLING SYSTEM.
2. ALL INTERFACE, SCHEDULING, ALARMING AND SETPOINT ADJUSTMENTS OCCUR THROUGH (BMS). COORDINATE ALL POINTS SHOWN WITH EQUIPMENT MANUFACTURER FOR A COMPLETE OPERATING SYSTEM BASED ON THIS SEQUENCE AND POINT LIST.
3. SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
   E. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
4. ROOFTOP UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
5. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY AND EXHAUST FANS SIMULTANEOUSLY OUTDOOR AND RELIEF AIR DAMPERS 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY.
6. OCCUPIED TEMPERATURE CONTROL – SYSTEM CONTROLLER SHALL ADJUST SPEED OF SUPPLY FAN, STAGE GAS HEATER SYSTEM, STAGE DX COOLING SYSTEM AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. THE GYM WILL BE DIVIDED INTO (2) TEMPERATURE ZONES: RTU-3J & RTU-4J SHALL WORK IN CONJUNCTION TO SERVE AS (1) ZONE SERVED BY (1) SPACE TEMPERATURE SENSOR AND RTU-5J AND RTU-6J SHALL WORK IN THE SAME MANNER FOR THE OTHER TEMPERATURE ZONE.
   B. HEATING PER TEMPERATURE ZONE – UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, BOTH ROOFTOP UNITS SHALL BE OPERATING AT LOW FAN SPEED WHICH IS APPROX. 60% OF TOTAL FLOW. THE FIRST STAGE OF HEATING SHALL BE ENABLED IN ONE OF THE UNITS AND THE OTHER SHALL BE ENABLED IF NECESSARY. AS HEATING DEMAND INCREASES BEYOND THE FIRST STAGE OF BOTH UNITS THEN THE FAN SPEEDS SHALL BE ADJUSTED TO 100% AND ADDITIONAL STAGING PER UNIT SHALL BE ENABLED TO MAINTAIN SPACE SET POINT TEMPERATURE. FAN SPEEDS AND STAGING SHALL BE COORDINATED BY THE MANUFACTURER TO OPERATE WITHIN THEIR EQUIPMENT GUIDELINES FOR UNIT PROTECTION.
      a. HEATING STAGING SHALL HAVE EQUALIZED RUN TIMES BETWEEN THE UNITS.
      b. ALARM IF FAILURE WITH THE GAS HEATER SYSTEMS.
   C. COOLING PER TEMPERATURE ZONE – UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, BOTH ROOFTOP UNITS SHALL BE OPERATING AT LOW FAN SPEED WHICH IS APPROX. 60% OF TOTAL FLOW. THE FIRST STAGE OF COOLING SHALL BE ENABLED IN ONE OF THE UNITS AND THE OTHER SHALL BE ENABLED IF NECESSARY. AS COOLING DEMAND INCREASES BEYOND THE FIRST STAGE OF BOTH UNITS THEN THE FAN SPEEDS SHALL BE ADJUSTED TO 100% AND ADDITIONAL STAGING PER UNIT SHALL BE ENABLED TO MAINTAIN SPACE SET POINT TEMPERATURE. FAN SPEEDS AND STAGING SHALL BE COORDINATED BY THE MANUFACTURER TO OPERATE WITHIN THEIR EQUIPMENT GUIDELINES FOR UNIT PROTECTION.
      a. COOLING STAGING SHALL HAVE EQUALIZED RUN TIMES BETWEEN UNITS.
      b. WHEN OUTDOOR AIR TEMPERATURE IS ACCEPTABLE 8°F (ADJ.) BELOW SPACE TEMERATURE SET POINT AND THERE IS A DEMAND FOR COOLING THEN ECONOMIZER SHALL BE UTILIZED.
      c. ALARM IF FAILURE WITH THE DX COOLING SYSTEMS.
7. EXHAUST FAN CONTROL – ON DURING ECONOMIZER MODE ONLY.
8. FAN INITIAL START-UP CONTROL – WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE FANS BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
      b. IF EXHAUST FAN STATUS IS NOT SENSED THEN ALARM AND DISABLE ECONOMIZER.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
9. ECONOMIZER CONTROL – SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SPACE TEMPERATURE SET POINT WHEN OUTDOOR AIR TEMPERATURE IS 8°F (ADJ.) BELOW THE SPACE SET POINT TEMPERATURE WITH A DEMAND FOR COOLING.
10. CO2 CONTROL – SYSTEM CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING RETURN DUCT MOUNTED OR SPACE CO2 SENSOR(S) TO INCREASE OUTDOOR ABSOLUTE MINIMUM CFM TO A MAXIMUM MIMIMUM CFM. MAXIMUM MIMIMUM SHALL NOT EXCEED 950 CFM PER UNIT.
   A. UPON RETURN DUCT/SPACE CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS (OUTDOOR AIR DAMPER OPENING) IN GRADUAL INCREMENTS UNTIL CO2 SENSOR SETPOINT IS SATISFIED.
      a. MODULATE MIXED AIR DAMPERS DOWN TO ITS ABSOLUTE MINIMUM POSITION 400 CFM PER UNIT UPON SATISFYING SENSOR SETPOINT.
   B. ALARM HIGH CO2, 1,200 PPM (ADJ.)
11. FILTER MONITORING – SYSTEM CONTROLLER SHALL MONITOR AND ALARM DYNAMIC FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
   A. FILTERS
      a. MONITORING OF PSID
      b. ALARM SETPOINT 0.75" W.C. (ADJ.)
      c. MONITOR POWER TO DYNAMIC FILTER SYSTEM (ALARM)
12. UNOCCUPIED CONTROL – SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. HEATING - ROOFTOP UNITS PER ZONE SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100%, EXHAUST FAN OFF AND HEATER STAGING AS NECESSARY. IF REQUIRED THE SECOND UNIT SHALL OPERATE IN THE SAME MANNER. BOTH UNITS PER ZONE SHALL HAVE EQUALIZED RUN TIMES.
   B. COOLING - ROOFTOP UNITS PER ZONE SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100%, EXHAUST FAN OFF (UNLESS ECONOMIZER IS ENABLED) AND DX STAGING OR ECONOMIZER AS NECESSARY. IF REQUIRED THE SECOND UNIT SHALL OPERATE IN THE SAME MANNER. BOTH UNITS PER ZONE SHALL HAVE EQUALIZED RUN TIMES. PROVIDE SEQUENCE FOR THE OWNER TO DISABLE COOLING DURING THIS TIME IF PREFERRED.
13. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
14. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
   A. UNITS SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSORS TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS EC



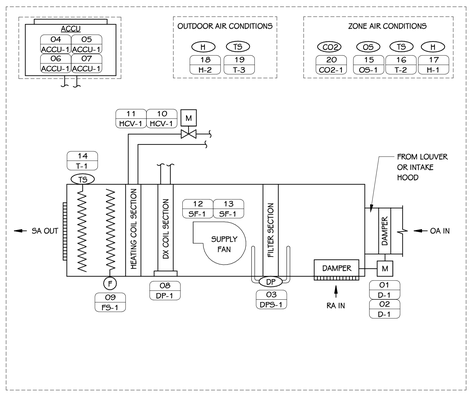
SELF CONTAINED VERTICAL UNIT VENTILATOR (VUV) CONTROLS DIAGRAM

SCALE: NONE



VERTICAL UNIT VENTILATOR (VUV) CONTROLS DIAGRAM

SCALE: NONE

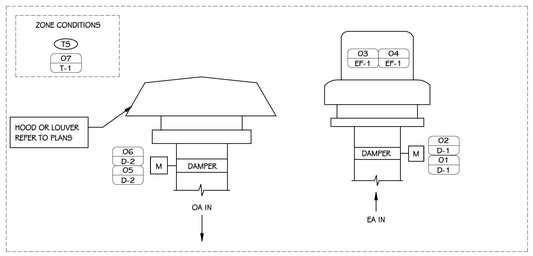


HORIZONTAL UNIT VENTILATOR (HUV) CONTROLS DIAGRAM

SCALE: NONE

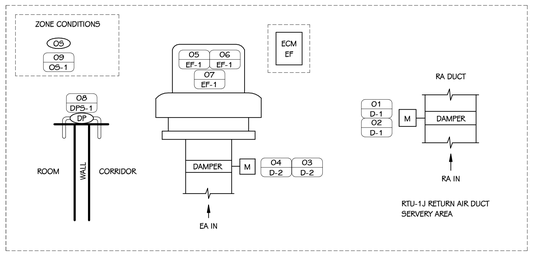
CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
SELF CONTAINED VERTICAL UNIT VENTILATOR						
01	EF-1	ENABLE/DISABLE		■		
02	EF-1	STATUS	■	■		
03	EF-1	SPEED CONTROL		■		ECM 0-10 VDC
04	C-1	COMPRESSOR ALARM STATUS	■			
05	C-1	COMPRESSOR RUN STATUS		■		
06	C-1	COMPRESSOR OUTPUT	■			2 STAGE COOLING
07	C-1	COMPRESSOR ENABLE/DISABLE		■		
08	D-1	MIXED AIR DAMPER OUTPUT		■		
09	DPS-1	FILTER STATUS	■	■		
10	DP-1	DRAIN PAN ALARM	■			
11	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
12	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
13	SF-1	ENABLE/DISABLE		■		
14	SF-1	SPEED CONTROL		■		ECM 0-10 VDC
15	SF-1	STATUS	■	■		
16	T-1	DISCHARGE AIR TEMPERATURE	■	■		ALARM IF OUT OF RANGE
17	OS-1	OCCUPANCY SENSOR		■		
18	T-2	ZONE AIR TEMPERATURE	■	■		
19	CO2-1	CARBON DIOXIDE	■	■		ALARM AT 1200 PPM ADJ.
20	H-1	INDOOR AIR HUMIDITY SENSOR		■		
VERTICAL UNIT VENTILATOR						
01	D-1	MIXED AIR DAMPER POSITION		■		
02	D-1	MIXED AIR DAMPER OUTPUT		■		
03	DPS-1	FILTER STATUS	■	■		
04	SF-1	STATUS	■	■		
05	SF-1	ENABLE/DISABLE		■		
06	DP-1	DRAIN PAN ALARM	■	■		
07	HCV-1	HEATING CONTROL VALVE POSITION		■		
08	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
09	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
10	T-1	DISCHARGE AIR TEMPERATURE	■	■		
11	ACCU-1	COOLING SYSTEM ALARM STATUS	■	■		
12	ACCU-1	COOLING SYSTEM ENABLE/DISABLE		■		
13	ACCU-1	COOLING SYSTEM STAGING		■		
14	ACCU-1	COOLING SYSTEM RUN STATUS	■	■		
15	OS-1	OCCUPANCY SENSOR		■		
16	T-2	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T+H READINGS
17	CO2-1	CARBON DIOXIDE		■		
18	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T+H READINGS
19	T-3	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T+H READINGS (SHARED POINT)
20	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T+H READINGS (SHARED POINT)
HORIZONTAL UNIT VENTILATOR						
01	D-1	MIXED AIR DAMPER OUTPUT		■		
02	D-1	MIXED AIR DAMPER POSITION		■		
03	DPS-1	FILTER STATUS	■	■		
04	ACCU-1	COOLING SYSTEM ALARM STATUS	■	■		
05	ACCU-1	COOLING SYSTEM RUN STATUS	■	■		
06	ACCU-1	COOLING SYSTEM ENABLE/DISABLE		■		
07	ACCU-1	COOLING SYSTEM STAGING		■		
08	DP-1	DRAIN PAN ALARM	■	■		
09	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
10	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
11	HCV-1	HEATING CONTROL VALVE POSITION		■		
12	SF-1	ENABLE/DISABLE		■		
13	SF-1	STATUS	■	■		
14	T-1	DISCHARGE AIR TEMPERATURE	■	■		
15	OS-1	OCCUPANCY SENSOR		■		
16	T-2	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T+H READINGS
17	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T+H READINGS
18	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T+H READINGS (SHARED POINT)
19	T-3	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T+H READINGS (SHARED POINT)
20	CO2-1	CARBON DIOXIDE		■		
EXHAUST FANS (EF-213)						
01	D-1	EXHAUST AIR DAMPER POSITION	■	■		OPEN/CLOSE
02	D-1	EXHAUST AIR DAMPER OUTPUT		■		OPEN/CLOSE
03	EF-1	STATUS	■	■		
04	EF-1	ENABLE/DISABLE		■		
05	D-2	OUTDOOR AIR DAMPER POSITION	■	■		OPEN/CLOSE
06	D-2	OUTDOOR AIR DAMPER OUTPUT		■		OPEN/CLOSE
07	T-1	ZONE AIR TEMPERATURE	■	■		
EF-K1						
01	D-1	RETURN AIR DAMPER OUTPUT		■		OPEN/CLOSE
02	D-1	RETURN AIR DAMPER POSITION	■	■		OPEN/CLOSE
03	D-2	EXHAUST AIR DAMPER POSITION	■	■		OPEN/CLOSE
04	D-2	EXHAUST AIR DAMPER OUTPUT		■		OPEN/CLOSE
05	EF-1	SPEED CONTROL		■		
06	EF-1	ENABLE/DISABLE		■		
07	EF-1	STATUS	■	■		
08	DPS-1	ROOM DIFFERENTIAL PRESSURE SENSOR		■		
09	OS-1	OCCUPANCY SENSOR		■		



EXHAUST FANS (EF-213) CONTROLS DIAGRAM

SCALE: NONE



EXHAUST FAN (EF-K1) CONTROLS DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

SELF CONTAINED VERTICAL UNIT VENTILATOR (VUV/S) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR UNIT VENTILATOR OPERATION. UNIT IS A COMBINATION OF A VARIABLE VOLUME SUPPLY AND RELIEF FANS, ECM MOTORS, HEATING HOT WATER COIL, CONTROL VALVE (CV) AND ACTUATOR, PACKAGED DX COOLING SYSTEM, MERV 13 FILTERS, BIPOLAR IONIZATION, OUTDOOR / RELIEF/ RETURN AIR DAMPERS AND ACTUATORS AND SPACE TEMPERATURE/CO2/OCCUPANCY SENSORS.
2. UNIT VENTILATOR ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. BASED ON TIME OF DAY SCHEDULE.
3. UNIT VENTILATOR ADJUSTABLE SETPOINTS:
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE DX COOLING, HEATING CV MODULATES TO MAINTAIN DISCHARGE AIR TEMPERATURE SENSOR AT 80°F (ADJ.), WHEN OUTDOOR AIR TEMPERATURE IS BELOW 38°F (ADJ.), OUTDOOR AND RELIEF/EXHAUST AIR DAMPER 100% CLOSED AND RETURN AIR DAMPER 100% OPENED.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE AND AFTER DELAY OF FIVE (5) MINUTE HOLD, ENABLE OCCUPIED CONTROL.
5. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL MODULATE HEATING AND COOLING SOURCES AND MIXED AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. COOLING (DX COOLING) - UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. 1ST STAGE COOLING TO SATISFY SPACE TEMPERATURE SETPOINT. LOW FAN SPEED OR SPEED DIRECTED BY UNIT MANUFACTURER.
      b. IF 1ST STAGE CANNOT MAINTAIN SPACE TEMPERATURE SETPOINT THEN ACTIVATE THE 2ND STAGE COOLING. HIGH FAN SPEED OR SPEED DIRECTED BY UNIT MANUFACTURER.
      c. MIXED AIR DAMPERS AT MINIMUM AIRFLOW SETPOINT FOR BOTH STAGES UNLESS ECONOMIZER CYCLE IS ACTIVATED.
   B. HEATING CONTROL - UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. MODULATE HEATING COIL CV TO MAINTAIN SPACE TEMPERATURE SETPOINT.
      b. FAN SPEED AS DIRECTED BY UNIT MANUFACTURER.
      c. MIX AIR DAMPERS AT MINIMUM AIRFLOW SETPOINT.
6. RELIEF/EXHAUST FAN CONTROL - SYSTEM CONTROLLER SHALL ENABLED AND MODULATE FAN MOTOR TO MAINTAIN SPACE PRESSURE SETPOINT.
   A. FAN WILL BE ENABLED WHENEVER THE COOLING IS ENABLED FOR UNIT, AND ADJUST SPEED AS NEEDED TO KEEP LEAVING CONDENSER AIR TEMPERATURE RISING ABOVE SETPOINT.
   B. FAN WILL BE AT FULL SPEED DURING 100% ECONOMIZER MODE.
7. ECONOMIZER CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET UNIT DISCHARGE AIR TEMPERATURE SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY BUT ABOVE ECONOMIZING SETPOINT.
8. MINIMUM OUTDOOR AIR CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MAINTAIN MINIMUM CFM SETPOINT MEASURED BY AN OUTDOOR AIR FLOW MEASURING STATION. LIMIT THE CLOSING OF THE OUTDOOR AIR DAMPER TO PROVIDE ABSOLUTE MINIMUM OUTDOOR AIR FLOW.
   A. OUTDOOR – RELIEF/EXHAUST – RETURN MODULATING WITH ONE SIGNAL FROM CONTROLLER.
   B. REFER TO UNIT SCHEDULE FOR THE ABSOLUTE MINIMUM OUTDOOR AIRFLOW CFM SETPOINT.
9. CO2 CONTROL - SYSTEM CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING SPACE CO2 SENSOR TO INCREASE OUTDOOR MINIMUM CFM TO A MAXIMUM CFM. INCLUDE CORRESPONDING CLOSING RETURN AIR DAMPER AND OPENING OF RELIEF/EXHAUST AIR DAMPERS.
   A. UPON SPACE CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS (OUTDOOR AIR DAMPER OPENING) IN GRADUAL INCREMENTS UNTIL CO2 SENSOR SETPOINT IS SATISFIED.
      a. MODULATE MIXED AIR DAMPERS DOWN TO ITS ABSOLUTE MINIMUM POSITION UPON SATISFYING SENSOR SETPOINT.
10. REFER TO UNIT SCHEDULE FOR THE MAXIMUM OUTDOOR AIRFLOW CFM SETPOINT.
11. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP.
12. UNOCCUPIED CONTROL
   A. HEATING CONTROL - SYSTEM CONTROLLER SHALL CYCLE UNIT ON (UNOCCUPIED HEATING MODE) WHEN A CALL FOR HEAT IS INITIATED BY SPACE TEMPERATURE SENSOR DURING UNOCCUPIED MODE AND HEATING SYSTEM IS OR CAN BE ENABLED.
      a. ENABLE FAN, OUTDOOR AND RELIEF AIR DAMPERS 100% CLOSED, RETURN AIR DAMPER 100% OPENED, HEATING CV MODULATES AS NECESSARY TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE SETPOINT.
   B. COOLING CONTROL – SYSTEM CONTROLLER SHALL CYCLE UNIT ON (UNOCCUPIED COOLING MODE) WHEN A CALL FOR COOL IS INITIATED BY SPACE TEMPERATURE SENSOR DURING UNOCCUPIED MODE AND COOLING SYSTEM IS OR CAN BE ENABLED.
      a. ENABLE FAN, OUTDOOR AIR DAMPER 100% CLOSED, RETURN AIR DAMPER 100% OPENED (UNLESS ECONOMIZER IS ENABLED) AND DX COOLING SYSTEM STAGED TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE SETPOINT.
      b. SYSTEM DISABLED UPON SATISFYING THE CALL FOR COOL.
13. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
14. INITIAL START-UP (OPTIMAL START) CONTROL – SYSTEM CONTROLLER SHALL ENABLE UNIT PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR SYSTEM.
   A. BASED ON SPACE TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
   B. SYSTEM SHALL BE ENABLED AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT.
      a. ENABLE FAN, OUTDOOR AIR DAMPER 100% CLOSED, RETURN AIR DAMPER 100% OPENED (UNLESS ECONOMIZER IS ENABLED), SYSTEM SHALL SWITCH TO OCCUPIED MODE.
15. TIMED OVERRIDE CONTROL – SYSTEM CONTROLLER SHALL ENABLE SYSTEM WHEN ASSOCIATED SPACE TIMED OVERRIDE (2 HOURS (ADJ.)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.
16. SAFETY SHUTDOWN:
   A. PROVIDE A LOW-TEMPERATURE PROTECTION THERMOSTAT(S) ON THE LEAVING SIDE OF HEATING HOT WATER COIL WHICH WILL DE-ENERGIZE UNIT, CLOSE MIXED AIR DAMPERS (CLOSING OUTDOOR/RELIEF/EXHAUST AIR DAMPER(S)), CLOSE CHILLED WATER COIL CONTROL VALVE AND THE HEATING HOT WATER COIL CONTROL VALVE SHALL BE FULLY OPENED AND COIL PUMP ENERGIZED. PROVIDE MANUAL RESET.

EXHAUST FAN (EF-K1) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR EXHAUST SYSTEM OPERATION. SYSTEM IS A COMBINATION OF ROOF MOUNTED VARIABLE VOLUME EXHAUST FAN, EXHAUST AND RETURN AIR DAMPERS AND ACTUATORS, ECM SPEED CONTROL AND SPACE DIFFERENTIAL PRESSURE AND OCCUPANCY SENSOR.
2. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. BASED ON TIME OF DAY (TOD) SCHEDULE:
      a. WHENEVER ASSOCIATED HVAC SYSTEM IS INDEXED OCCUPIED AND SPACE SENSOR IS ACTIVE
         • BOTH STATUSES MUST BE ACTIVE FOR FAN TO BE ENABLED.
         • OCCUPANCY SENSOR (PROVIDED BY DIVISION 26).
3. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, EXHAUST AIR DAMPER 100% CLOSED AND RETURN AIR DAMPER 100% OPENED.
   B. WHEN INDEXED TO START: ENABLE EXHAUST FAN, EXHAUST AIR DAMPER 100% OPENED AND RETURN AIR DAMPER 100% CLOSED.
4. OCCUPANCY CONTROL - CONTROLLER SHALL DISABLE PRESSURE CONTROL DURING OCCUPIED TOD. (SHALL BE IN CONJUNCTION WITH RTU-1J OCCUPANCY STATUS).
   A. WHEN INDEXED OCCUPIED AND OCCUPANCY SENSOR IS ACTIVE: PRESSURE CONTROL WILL BE ENABLED AND CONTROL AS NOTED IN PRESSURE CONTROL.
   B. WHEN INDEXED OCCUPIED AND OCCUPANCY SENSOR IS INACTIVE: PRESSURE CONTROL WILL BE DISABLED AND WILL CONTROL AS NOTED IN SYSTEM STOP.
5. SPACE PRESSURE CONTROL - CONTROLLER SHALL MODULATE EXHAUST FAN MOTOR RPM TO MAINTAIN SPACE PRESSURE SETPOINT MEASURED BY A SPACE PRESSURE CONTROLLER LOCATED IN SPACE SERVED.
   A. SPACE PRESSURE SETPOINT OF 0.03"W.C. (ADJ.).
   B. ENABLED WHEN SPACE PRESSURE RISES ABOVE SETPOINT BY 0.03"W.C. (ADJ.).
   C. DISABLED WHEN SPACE PRESSURE FALLS BELOW SETPOINT BY 0.05"W.C. (ADJ).
6. SYSTEM DDC MONITORING AND ALARMING OF THE FOLLOWING:
   A. EXHAUST FAN MOTOR STATUS.
      a. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
      b. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR EXHAUST FAN WILL BE ACTIVE.
   B. EXHAUST AIR DAMPER POSITION (100% OPEN/CLOSED).
   C. RETURN AIR DAMPER POSITION (100% OPEN/CLOSED).
   D. SPACE OCCUPANCY.
   E. SPACE DIFFERENTIAL PRESSURE.

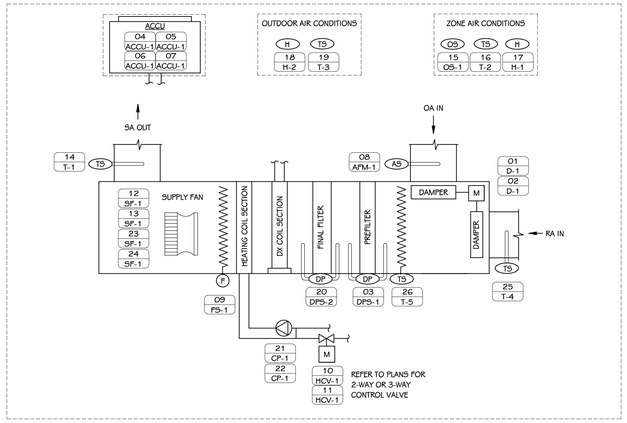
SEQUENCE OF OPERATIONS (CONT'D)

UNIT VENTILATORS (VUV & HUV) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR UNIT VENTILATOR OPERATION. HORIZONTAL AND VERTICAL UNIT VENTILATORS ARE A COMBINATION OF A CONSTANT VOLUME FAN, DX COOLING COIL WITH REMOTE 2 STAGE CONDENSER UNIT, HEATING HOT WATER COIL WITH CONTROL VALVE (CV) AND ACTUATOR, MERV 13 FILTERS OR DYNAMIC AIR CLEANER, BIPOLAR IONIZATION, OUTDOOR / RETURN AIR DAMPERS AND ACTUATOR AND AIR TEMPERATURE, HUMIDITY AND CO2 SENSORS. SPACE TEMPERATURE SENSORS WITH SETPOINT ADJUSTMENT AND OVERRIDE BUTTON .
2. UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. BASED ON TIME OF DAY SCHEDULE.
3. UNIT ADJUSTABLE SETPOINTS:
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE DX COOLING AND AFTER DELAY DISABLE FAN, HEATING CV MODULATES TO MAINTAIN DISCHARGE AIR TEMPERATURE SENSOR AT 60° F (ADJ.) WHEN OUTDOOR AIR TEMPERATURE IS BELOW 40°F (ADJ.), OUTDOOR DAMPER 100% CLOSED, RETURN AIR DAMPER 100% OPENED.
   B. WHEN INDEXED TO START: ENABLE FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE, AFTER DELAY OF FIVE (5) MINUTE HOLD, ENABLE OCCUPIED CONTROL.
5. OCCUPIED TEMPERATURE CONTROL – SYSTEM CONTROLLER SHALL MODULATE HEATING AND COOLING SOURCES AND MIXED AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. COOLING – UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. STAGE ONE UTILIZES 1ST STAGE COMPRESSOR CAPACITY.
      b. STAGE TWO UTILIZES 2ND STAGE COMPRESSOR CAPACITY.
      c. MIXED AIR DAMPERS AT MINIMUM SETPOINT FOR ALL STAGES UNLESS ECONOMIZER MODE IS ENABLED.
   B. HEATING CONTROL - UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. MODULATE HEATING COIL CV TO MAINTAIN SPACE TEMPERATURE SETPOINT.
      b. FAN ON NORMAL SPEED.
      c. MIX AIR DAMPERS AT MINIMUM SETPOINT.
   C. ECONOMIZER CONTROL - UNIT CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET UNIT DISCHARGE AIR TEMPERATURE SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY.
      a. ALLOW OWNER OVERRIDE TO DISABLE ECONOMIZER IF SPACE PRESSURE BECOMES AN ISSUE. IN SOME ROOMS THERE IS NO MEANS OF RELIEF AVAILABLE FOR THE SYSTEM.
   D. MINIMUM OUTDOOR AIR CONTROL - SYSTEM CONTROLLER SHALL MODULATE MINIMUM DAMPER TO MAINTAIN MINIMUM PERCENT DAMPER POSITION SETPOINT. INCLUDE CORRESPONDING CLOSING RETURN AIR DAMPER.
      a. TEST AND BALANCE CONTRACTOR SHALL PROVIDE MINIMUM DAMPER PERCENTAGE SETPOINT, WHICH WILL BE DETERMINED DURING THE BALANCING PROCESS.
6. FAN INITIAL START-UP CONTROL – WHEN INDEXED TO START, UNIT CONTROLLER SHALL ENABLE FANS BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF ANY FAN (SUPPLY) STATUS IS NOT SENSED, THE UNIT SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZES OF RUN HOURS FOR FAN WILL BE ACTIVE.
7. FILTER MONITORING - UNIT CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP FOR THE FOLLOWING:
   A. PRE-FILTERS WITH MONITORING PRESSURE DROP FROM BMS AND ALARM SETPOINT 0.5"W.C. (ADJ.).
8. UNOCCUPIED CONTROL
   A. HEATING CONTROL – SYSTEM CONTROLLER SHALL ENABLE UNIT ON (UNOCCUPIED HEATING MODE) WHEN A CALL FOR HEAT IS INITIATED BY SPACE TEMPERATURE SENSOR DURING UNOCCUPIED MODE.
      a. ENABLE FAN, OUTDOOR DAMPER 100% CLOSED, RETURN AIR DAMPER 100% OPENED, HEATING CV TO MODULATE TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE SETPOINT.
   B. COOLING CONTROL – SYSTEM CONTROLLER SHALL ENABLE UNIT ON (UNOCCUPIED COOLING MODE) WHEN A CALL FOR COOL IS INITIATED BY SPACE TEMPERATURE SENSOR DURING UNOCCUPIED MODE.
      a. ENABLE FAN, OUTDOOR AIR DAMPER 100% CLOSED, RETURN AIR DAMPER 100% OPENED (UNLESS ECONOMIZER IS ENABLED) AND DX COOLING SYSTEM STAGED TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE SETPOINT.
      b. SYSTEM SHALL SWITCH TO OCCUPIED MODE.
9. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
10. INITIAL START-UP (OPTIMAL START) CONTROL – SYSTEM CONTROLLER SHALL ENABLE UNIT PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR SYSTEM.
   A. BASED ON SPACE TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
   B. SYSTEM SHALL BE ENABLED AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT.
      a. ENABLE FAN, OUTDOOR AIR DAMPER 100% CLOSED, RETURN AIR DAMPER 100% OPENED (UNLESS ECONOMIZER IS ENABLED).
      b. SYSTEM SHALL SWITCH TO OCCUPIED MODE.
11. TIMED OVERRIDE CONTROL – SYSTEM CONTROLLER SHALL ENABLE SYSTEM WHEN ASSOCIATED SPACE TIMED OVERRIDE (2 HOURS (ADJ.)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.
12. SAFETY SHUTDOWN:
   A. PROVIDE A LOW-TEMPERATURE PROTECTION THERMOSTAT(S) ON THE LEAVING SIDE OF HEATING HOT WATER COIL WHICH WILL DE-ENERGIZE UNIT, CLOSE MIXED AIR DAMPERS (CLOSING OUTDOOR 100% AND OPENING RETURN 100%), THE HEATING HOT WATER COIL CONTROL VALVE SHALL BE FULLY OPENED. PROVIDE MANUAL RESET.
13. CO2 CONTROL - UNIT CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING SPACE MOUNTED CO2 SENSOR TO INCREASE OUTDOOR MINIMUM CFM TO A MAXIMUM CFM. INCLUDE CORRESPONDING CLOSING OF RETURN AIR DAMPER AND ACTIVATING EXHAUST FAN BASED ON SPACE PRESSURE SETPOINT.
   a. UPON CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS IN GRADUAL INCREMENTS, UP TO THE MAXIMUM CFM AS INDICATED IN EQUIPMENT SCHEDULE, UNTIL CO2 SENSOR SETPOINT IS SATISFIED. ONCE SATISFIED MIXED AIR DAMPERS SHALL MODULATE DOWN TO ITS ABSOLUTE MINIMUM POSITION.
   b. CO2 800 PPM MINIMUM AND 1000 PPM MAXIMUM. BOTH (ADJUSTABLE)
   c. REFER TO UNIT SCHEDULE FOR THE MAXIMUM OUTDOOR AIRFLOW CFM SETPOINT.

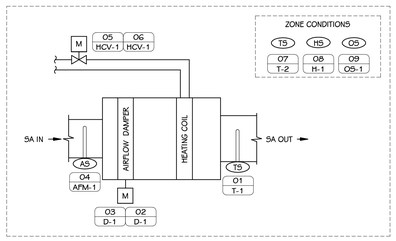
EXHAUST FAN (EF-213) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR EXHAUST SYSTEM OPERATION. SYSTEM IS A COMBINATION OF ROOF MOUNTED CONSTANT VOLUME EXHAUST FAN, INLET ISOLATION AND INTAKE AIR DAMPERS AND ACTUATORS AND TEMPERATURE SENSOR.
2. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. OPERATION BASED ON WALL MOUNTED ROOM AIR TEMPERATURE SENSOR, ENABLE SYSTEM WHENEVER SPACE TEMPERATURE RISES ABOVE COOLING SETPOINT OF 78°F (ADJ.).
3. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, EXHAUST AIR DAMPER 100% CLOSED, OUTSIDE AIR INTAKE HOOD OR LOUVER AIR DAMPER 100% CL



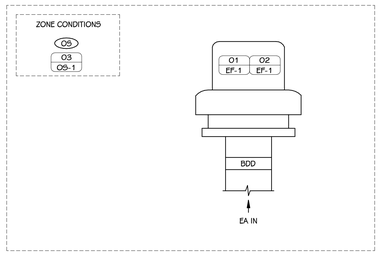
AHU-132 CONTROLS DIAGRAM

SCALE: NONE



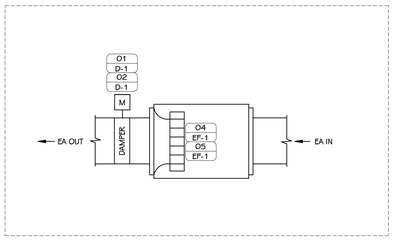
TERMINAL AIR UNITS (VAV) CONTROLS DIAGRAM

SCALE: NONE



EXHAUST FAN (EF) CONTROLS DIAGRAM

SCALE: NONE

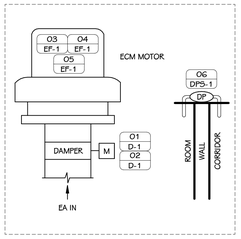


EXHAUST FAN (EF-132) CONTROLS DIAGRAM

SCALE: NONE

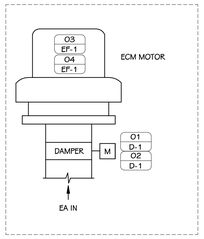
CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
AHU-132						
01	D-1	MIXED AIR DAMPER OUTPUT		■		
02	D-1	MIXED AIR DAMPER POSITION		■		
03	DPS-1	PREFILTER STATUS	■	■		ALARM AT 0.75" ADJ.
04	ACCU-1	COOLING SYSTEM ALARM STATUS	■	■		
05	ACCU-1	COOLING SYSTEM RUN STATUS		■		
06	ACCU-1	COOLING SYSTEM ENABLE/DISABLE		■		
07	ACCU-1	COOLING SYSTEM STAGING		■		2 STAGE COOLING
08	AFM-1	OUTDOOR AIR FLOW		■		
09	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
10	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
11	HCV-1	HEATING CONTROL VALVE POSITION		■		
12	SF-1	ENABLE/DISABLE		■		
13	SF-1	STATUS	■	■		
14	T-1	DISCHARGE AIR TEMPERATURE	■	■		ALARM IF OUT OF RANGE
15	OS-1	OCCUPANCY SENSOR		■		
16	T-2	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T4H READINGS
17	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T4H READINGS
18	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T4H READINGS
19	T-3	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T4H READINGS
20	DPS-2	FINAL FILTER STATUS	■	■		ALARM AT 0.75" ADJ.
21	CP-1	PUMP ENABLE/DISABLE		■		
22	CP-1	PUMP STATUS	■	■		
23	SF-1	FAN AIR FLOW		■		
24	SF-1	SPEED CONTROL		■		ECM FAN MOTOR
25	T-4	RETURN AIR TEMPERATURE		■		
26	T-5	MIXED AIR TEMPERATURE	■	■		ALARM AT 45°F ADJ.
TERMINAL AIR UNITS						
01	T-1	DISCHARGE AIR TEMPERATURE	■	■		
02	D-1	AIR DAMPER OUTPUT		■		
03	D-1	AIR DAMPER POSITION		■		
04	AFM-1	SUPPLY AIR FLOW		■		
05	HCV-1	REHEAT CONTROL VALVE OUTPUT		■		
06	HCV-1	REHEAT CONTROL VALVE POSITION		■		
07	T-2	ZONE AIR TEMPERATURE	■	■		
08	H-1	ZONE HUMIDITY		■		
09	OS-1	ZONE OCCUPANCY SENSOR		■		
(EF)						
01	EF-1	STATUS	■	■		
02	EF-1	ENABLE/DISABLE		■		
03	OS-1	OCCUPANCY SENSOR		■		
EF-132						
01	D-1	EXHAUST AIR DAMPER POSITION	■	■		OPEN/CLOSE
02	D-1	EXHAUST AIR DAMPER OUTPUT		■		OPEN/CLOSE
04	EF-1	ENABLE/DISABLE		■		
05	EF-1	STATUS	■	■		
EF-SPACE PRESSURE						
01	D-1	EXHAUST AIR DAMPER OUTPUT		■		OPEN/CLOSE
02	D-1	EXHAUST AIR DAMPER POSITION	■	■		OPEN/CLOSE
03	EF-1	SPEED CONTROL		■		
04	EF-1	ENABLE/DISABLE		■		
05	EF-1	STATUS	■	■		
06	DPS-1	ROOM DIFFERENTIAL PRESSURE SENSOR		■		
EF-ECONOMIZER MODE						
01	D-1	EXHAUST AIR DAMPER OUTPUT		■		OPEN/CLOSE
02	D-1	EXHAUST AIR DAMPER POSITION	■	■		OPEN/CLOSE
03	EF-1	ENABLE/DISABLE		■		
04	EF-1	STATUS	■	■		



EXHAUST FAN (EF- SPACE PRESSURE) CONTROLS DIAGRAM

SCALE: NONE



EXHAUST FAN (EF- ECONOMIZER MODE) CONTROLS DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

TERMINAL AIR UNIT (VAV) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR EACH TERMINAL AIR UNIT OPERATION. UNIT(S) ARE A COMBINATION OF VARIABLE VOLUME UNITS, INDEPENDENT CONTROLLER, AIRFLOW DAMPER AND ACTUATOR, REHEAT COIL, CONTROL VALVE (CV) AND ACTUATOR, AND SPACE TEMPERATURE/HUMIDITY SENSORS.
   A. SPACE SENSORS SHALL HAVE LIMITED ADJUSTMENT SETPOINT AND AN OVERRIDE BUTTON FUNCTIONALITY.
2. TERMINAL AIR UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. SCHEDULED WITH ASSOCIATED ZONE HVAC SYSTEM.
3. TERMINAL AIR UNIT ADJUSTABLE SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
4. OCCUPIED TEMPERATURE CONTROL - CONTROLLER SHALL MODULATE AIRFLOW DAMPER AND REHEAT COIL CV TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. COOLING - UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. MODULATE AIRFLOW DAMPER BETWEEN THE MINIMUM AND MAXIMUM COOLING AIRFLOW CFM SETPOINTS TO MAINTAIN SPACE TEMPERATURE SETPOINT.
   B. HEATING - UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. MODULATE AIRFLOW DAMPER (FIRST STAGE HEATING) TO MINIMUM AIRFLOW CFM SETPOINT AND MODULATE REHEAT CV TO MAINTAIN SPACE TEMPERATURE SETPOINT.
      b. MODULATE AIRFLOW DAMPER (SECOND STAGE HEATING) BETWEEN THE MINIMUM AND MAXIMUM HEATING AIRFLOW CFM SETPOINTS TO MAINTAIN SPACE TEMPERATURE SETPOINT.
      c. PROVIDE STAGED HEATING WITH SPACES THAT HAVE ASSOCIATED RADIANT CEILING PANELS OR FINNED TUBE.
         - RADIANT OR PT 1ST STAGE, REHEAT COIL 2ND STAGE, INCREASED AIRFLOW 3RD STAGE.
      d. LIMIT DISCHARGE AIR TEMPERATURE TO BE NO GREATER THAN 95° LAT (ADJ.).
   C. VENTILATION- UPON SPACE TEMPERATURE SET POINT BEING SATISFIED, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. AIRFLOW DAMPER TO MINIMUM COOLING AIRFLOW CFM SETPOINT.
      b. REHEAT CV 100% CLOSED.
   D. STANDBY - UPON SPACE OCCUPANCY SENSOR INDICATING UNOCCUPIED AND AFTER TIME DELAY, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. SPACE TEMPERATURE IS SETBACK TO STANDBY SETPOINTS.
5. UNOCCUPIED TEMPERATURE CONTROL - CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. COOLING - UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. REQUEST THE ASSOCIATED ZONE HVAC SYSTEM TO BE ENABLED, (UNOCCUPIED COOLING MODE) WHEN A CALL FOR COOL IS INITIATED BY SPACE TEMPERATURE SENSOR DURING UNOCCUPIED MODE.
      b. ONCE ZONE HVAC SYSTEM IS ENABLED, MODULATE AIRFLOW DAMPER TO MAXIMUM COOLING AIRFLOW CFM SETPOINT.
      c. ZONE HVAC SYSTEM ENABLE POINT SHALL BE BASED ON QUANTITY OF REQUESTS FOR COOLING.
      d. WHEN SPACE TEMPERATURE READING DECREASES BELOW UNOCCUPIED SPACE TEMPERATURE SETPOINT, RELEASE AIRFLOW DAMPER OVERRIDE AND ZONE HVAC SYSTEM REQUEST.
   B. HEATING - UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
      a. REQUEST THE ASSOCIATED ZONE HVAC SYSTEM TO BE ENABLED. (UNOCCUPIED HEATING MODE) WHEN A CALL FOR HEAT IS INITIATED BY SPACE TEMPERATURE SENSOR DURING UNOCCUPIED MODE.
      b. ONCE ZONE HVAC SYSTEM IS ENABLED, MODULATE AIRFLOW DAMPER TO MAXIMUM HEATING AIRFLOW CFM SETPOINT
         - REHEAT CV 100% OPENED.
      c. ZONE HVAC SYSTEM ENABLE POINT SHALL BE BASED ON QUANTITY OF REQUESTS FOR HEATING.
      d. WHEN SPACE TEMPERATURE READING INCREASES ABOVE UNOCCUPIED SPACE TEMPERATURE SETPOINT, RELEASE AIRFLOW DAMPER AND REHEAT CV OVERRIDE AND ZONE HVAC SYSTEM REQUEST.
   C. THE FOLLOWING SHALL BE DISABLED DURING UNOCCUPIED TEMPERATURE CONTROL:
      a. SPACE OCCUPANCY SENSOR.
6. TIMED OVERRIDE CONTROL - PROVIDE LIMITED TIME OVERRIDE OF UNOCCUPIED MODE.
7. INITIAL STARTUP CONTROL - PRIOR TO ZONE HVAC SYSTEM STARTING, ALL ASSOCIATED TERMINAL UNIT CONTROLLERS SHALL DRIVE AIRFLOW DAMPERS OPEN TO THEIR MINIMUM COOLING AIRFLOW POSITIONS AS A STARTING POINT.

EXHAUST FAN (EF) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR EXHAUST SYSTEM OPERATION. SYSTEM IS A COMBINATION OF ROOF MOUNTED CONSTANT VOLUME EXHAUST FAN AND INLET BACKDRAFT DAMPER (BDD).
2. FOR EF-209, 207, 217, 249, 204, 206, 204C, 210M, 101, 101E, 025M, 125M, 301M, 502, 518S, 210J AND 203.1.
3. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. OPERATION BASED ON TIME OF DAY (TOD) SCHEDULE:
      a. ENABLED WHENEVER ASSOCIATED HVAC SYSTEM IS INDEXED OCCUPIED.
      b. OPERATES IN CONJUNTION WITH OCCUPANCY SENSOR OF ASSOCIATED HVAC SYSTEM.
      c. EXCEPTION: EF-203.1 SHALL OPERATE CONTINUOUSLY.
4. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, BDD (BAROMETRICALLY WEIGHTED) CLOSED.
   B. WHEN INDEXED TO START: ENABLE EXHAUST FAN, BDD (BAROMETRICALLY WEIGHTED) OPENED.
5. SYSTEM DDC MONITORING AND ALARMING OF THE FOLLOWING:
   A. EXHAUST FAN MOTOR STATUS.
      a. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
      b. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR EXHAUST FAN WILL BE ACTIVE.

EXHAUST FAN (EF-132) CONTROLS

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR UNIT OPERATION. SYSTEM IS A COMBINATION OF CONSTANT VOLUME EXHAUST FAN, ISOLATION OUTLET AIR DAMPER AND ACTUATOR.
   A. OPERATION SHALL BE BASED ON TIME OF DAY (TOD) SCHEDULE.
   B. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
      a. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, ISOLATION AIR DAMPER 100% CLOSED.
      b. WHEN INDEXED TO START: ENABLE EXHAUST FAN, ISOLATION AIR DAMPER 100% OPENED.
   C. SYSTEM DDC MONITORING AND ALARMING OF THE FOLLOWING:
      a. EXHAUST FAN MOTOR STATUS.
         - WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
         - WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZES OF RUN HOURS FOR EXHAUST FAN WILL BE ACTIVE.
      b. ISOLATION AIR DAMPER POSITION (100% OPEN/CLOSED).

SEQUENCE OF OPERATIONS (CONT'D)

AHU-132 SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR AIR HANDLING SYSTEM. UNIT OPERATES AS A SINGLE ZONE VAV SYSTEM. UNIT CONTAINS ECM SUPPLY FAN, DX COOLING COIL WITH REMOTE 2 STAGE AIR COOLED CONDENSER UNIT, HEATING HOT WATER COIL CONTROL VALVE (CV) AND ACTUATOR WITH CIRCULATING PUMP, MERV 13 FILTERS, MERV 8 PREFILTERS, BIPOLAR IONIZATION, OUTDOOR / RETURN AIR DAMPERS AND ACTUATORS AND AIR TEMPERATURE / HUMIDITY SENSORS.
2. SETPOINTS BASED ON THE FOLLOWING:
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
3. UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY FAN, OUTDOOR AIR DAMPER 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY.
5. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL ADJUST OUTPUT OF SUPPLY FAN, MODULATE HEATING COIL CONTROL VALVE, STAGE DX COOLING SYSTEM AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. HEATING: UPON A FALL IN SPACE TEMPERATURE BELOW THE SPACE TEMPERATURE SETPOINT, THE SUPPLY FAN CFM OUTPUT SHALL BE ADJUSTED UPWARD AND THE HEATING COIL CONTROL VALVE SHALL MODULATE OPEN UNTIL THE SPACE TEMPERATURE IS SATISFIED. FAN OUTPUT CFM SHALL BE NO LOWER THAN 60% OF TOTAL AIRFLOW.
   B. HEATING COIL PUMP CONTROL BASED ON THE FOLLOWING:
      a. HEATING HOT WATER COIL PUMP SHALL RUN WHEN THE SYSTEM IS IN HEATING MODE.
      b. PUMP SHALL RUN CONTINUOUSLY WHENEVER THE OUTDOOR AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).
   C. COOLING: UPON A RISE IN SPACE TEMPERATURE ABOVE THE SPACE TEMPERATURE SETPOINT, THE SUPPLY FAN SPEED SHALL BE ADJUSTED UPWARD INCREASING THE CFM OUTPUT AND THE DX COOLING SYSTEM OUTPUT SHALL BE STAGED UPWARD UNTIL THE SPACE TEMPERATURE IS SATISFIED. THE FAN OUTPUT CFM SHALL BE NO LOWER THAN 60% OF TOTAL AIRFLOW. THE MINIMUM FAN CFM OUTPUT SHALL BE COORDINATED WITH THE UNIT MANUFACTURER TO ASSURE IT OPERATES IN THE SAFETY RANGE OF THE FIRST STAGE COOLING OF THE DX COOLING SYSTEM.
      a. WHEN OUTDOOR AIR TEMPERATURE AND HUMIDITY CONDITIONS ARE ACCEPTABLE AND BELOW SET POINT AND THERE IS A DEMAND FOR COOLING THEN ECONOMIZER SHALL BE UTILIZED.
      b. ALARM IF FAILURE WITH THE DX COOLING SYSTEM.
6. FAN INITIAL START-UP CONTROL - WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE SUPPLY FAN BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
7. ECONOMIZER CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY AND THE SYSTEM IS CALLING FOR COOLING.
   A. ALLOW OWNER OVERRIDE TO DISABLE ECONOMIZER IF DESIRED.
8. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
   A. FILTERS
      a. MONITORING OF PSID
      b. ALARM SETPOINT 0.75"W.C. (ADJ.)
9. UNOCCUPIED CONTROL - SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. HEATING - UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND THE HEATING COIL CONTROL VALVE MODULATED OPEN AS NECESSARY TO MAINTAIN SET POINT TEMPERATURE.
   B. COOLING - UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND DX COOLING SYSTEM STAGGED OR ECONOMIZER MODE ACTIVATED AS NECESSARY TO MAINTAIN SET POINT TEMPERATURE. PROVIDE SEQUENCE FOR THE OWNER TO DISABLE COOLING DURING THIS TIME IF PREFERRED.
10. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
11. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
    A. UNITS SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNITS SHALL SWITCH TO OCCUPIED MODE.
12. BIPOLAR IONIZATION: PROVIDED BY UNIT MANUFACTURER BUT A LOW VOLTAGE CIRCUIT IS REQUIRED BY THE CONTROLS CONTRACTOR.
13. SAFETY SHUTDOWNS:
    A. DUCT MOUNTED IONIZATION SMOKE DETECTOR(S) PROVIDED BY DIVISION 28 SHALL DE-ENERGIZE THE UNIT WHENEVER PRODUCTS OF COMBUSTION ARE SENSED.
    B. PROVIDE A LOW-TEMPERATURE PROTECTION THERMOSTAT(S) ON THE LEAVING SIDE OF HEATING HOT WATER COIL WHICH WILL DE-ENERGIZE UNIT, CLOSING OUTDOOR AIR DAMPER 100%, OPEN RETURN AIR DAMPER 100%, THE HEATING HOT WATER COIL CONTROL VALVE SHALL BE FULLY OPENED AND COIL PUMP ENERGIZED. PROVIDE MANUAL RESET.

EXHAUST FAN (EF-SPACE PRESSURE) CONTROLS

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR UNIT OPERATION. SYSTEM IS A COMBINATION OF VARIABLE VOLUME EXHAUST FAN, ISOLATION INLET DAMPER AND ACTUATOR, ELECTRONICALLY COMMUNICATED MOTOR (ECM) AND CONTROLLER, AND SPACE DIFFERENTIAL PRESSURE SENSOR. FOR EF-206, 212, 302, 306 AND 523.
   A. OPERATION SHALL BE BASED ON SPACE PRESSURE SETPOINT:
      a. ENABLED WHENEVER ASSOCIATED HVAC SYSTEMS ARE INDEXED OCCUPIED (ALSO CORRESPONDS WITH THE OCCUPANCY SENSOR OF ASSOCIATED HVAC SYSTEM) AND SPACE PRESSURE EXCEEDS SPACE PRESSURE SETPOINT.
   B. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
      a. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, ISOLATION AIR DAMPER 100% CLOSED.
      b. WHEN INDEXED TO START: ENABLE EXHAUST FAN, ISOLATION AIR DAMPER 100% OPENED.
      c. FAN MOTOR MODULATES TO MAINTAIN ROOM PRESSURE SETPOINT OF 0.01"W.C. (ADJ.).
         - ENABLE AT 0.05"W.C.
         - DISABLE AT -0.01"W.C. (DELAY WITH FAN AT MINIMUM SPEED)
   C. SYSTEM DDC MONITORING AND ALARMING OF THE FOLLOWING:
      a. EXHAUST FAN MOTOR STATUS.
         - WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
         - WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZES OF RUN HOURS FOR EXHAUST FAN WILL BE ACTIVE.
      b. ISOLATION AIR DAMPER POSITION (100% OPEN/CLOSED).
      c. SPACE PRESSURE.

EXHAUST FAN (EF-ECONOMIZER MODE) CONTROLS

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR UNIT OPERATION. SYSTEM IS A COMBINATION OF A CONSTANT VOLUME EXHAUST FAN, ISOLATION INLET DAMPER AND ACTUATOR, ELECTRONICALLY COMMUNICATED MOTOR (ECM) AND CONTROLLER. FOR EF-210 AND 212E.
   A. ENABLED WHENEVER ASSOCIATED HVAC SYSTEMS ARE IN THE ECONOMIZER MODE.
   B. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
      a. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, ISOLATION AIR DAMPER 100% CLOSED.
      b. WHEN INDEXED TO START: ENABLE EXHAUST FAN, ISOLATION AIR DAMPER 100% OPENED.
   C. SYSTEM DDC MONITORING AND ALARMING OF THE FOLLOWING:
      a. EXHAUST FAN MOTOR STATUS.
         - WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
         - WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZES OF RUN HOURS FOR EXHAUST FAN WILL BE ACTIVE.
      b. ISOLATION AIR DAMPER POSITION (100% OPEN/CLOSED).

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ADDENDUM 1	NOVEMBER 29, 2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

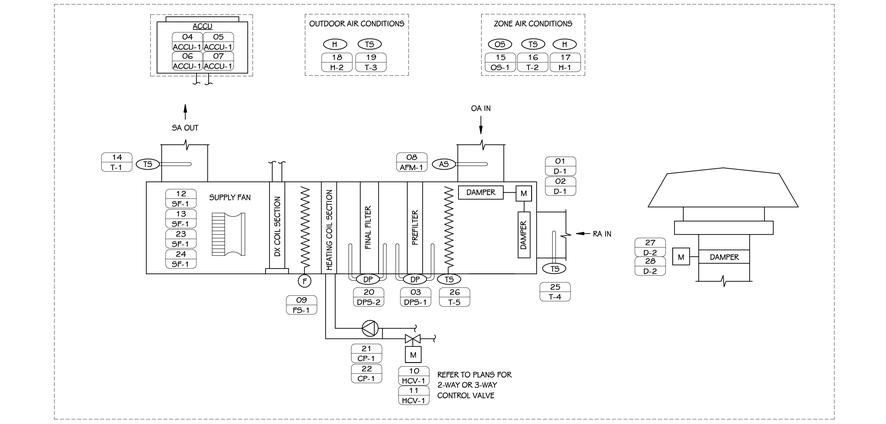
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
TEMPERATURE CONTROLS

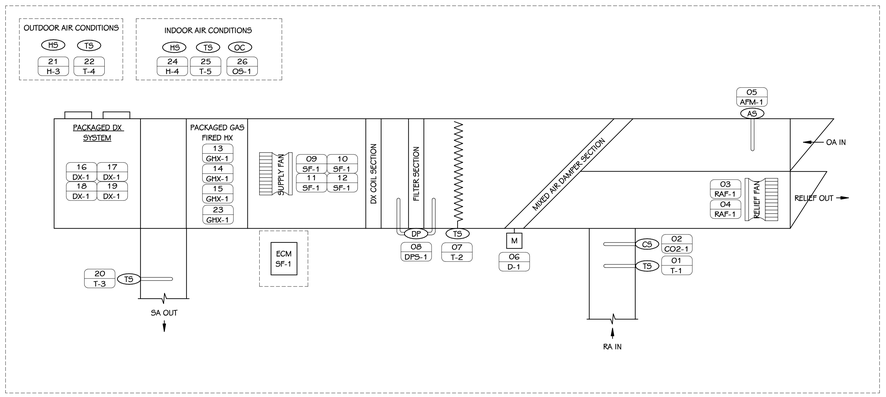
DATE
NOVEMBER 03, 2021

SHEET NUMBER
M 604.2
17-175.70



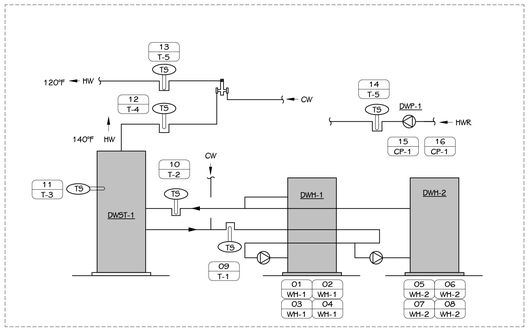
AHU-523 CONTROLS DIAGRAM

SCALE: NONE



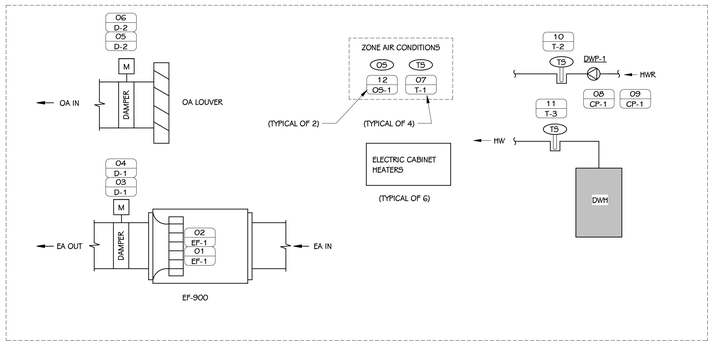
RTU-1F & RTU-1G CONTROLS DIAGRAM

SCALE: NONE



DOMESTIC HOT WATER HEATER CONTROL DIAGRAM

SCALE: NONE



STADIUM TOILET BUILDING CONTROLS DIAGRAM

SCALE: NONE

CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
AHU-523						
01	D-1	MIXED AIR DAMPER OUTPUT		▮		
02	D-1	MIXED AIR DAMPER POSITION		▮		
03	DPS-1	PREFILTER STATUS	▮	▮		ALARM AT 0.75" ADJ.
04	ACCU-1	COOLING SYSTEM ALARM STATUS	▮	▮		
05	ACCU-1	COOLING SYSTEM RUN STATUS		▮		
06	ACCU-1	COOLING SYSTEM ENABLE/DISABLE		▮		
07	ACCU-1	COOLING SYSTEM STAGING		▮		2 STAGE COOLING
08	AFM-1	OUTDOOR AIR FLOW		▮		
09	FS-1	FREEZE STAT ALARM STATUS	▮			HARD WIRED SAFETY - MANUAL RESET
10	HCV-1	HEATING CONTROL VALVE OUTPUT		▮		
11	HCV-1	HEATING CONTROL VALVE POSITION		▮		
12	SF-1	ENABLED/DISABLE		▮		
13	SF-1	STATUS	▮	▮		
14	T-1	DISCHARGE AIR TEMPERATURE	▮	▮		ALARM IF OUT OF RANGE
15	OS-1	OCCUPANCY SENSOR		▮		
16	T-2	ZONE AIR TEMPERATURE	▮	▮		BASED ON AVERAGE SPACE TEMP. SEE PLANS FOR NUMBER OF SENSORS USED
17	H-1	INDOOR AIR HUMIDITY SENSOR		▮		DISPLAY ENTHALPY BASED ON T&H READINGS
18	H-2	OUTDOOR AIR HUMIDITY		▮		DISPLAY ENTHALPY BASED ON T&H READINGS
19	T-3	OUTDOOR AIR TEMPERATURE		▮		DISPLAY ENTHALPY BASED ON T&H READINGS
20	DPS-2	FINAL FILTER STATUS	▮	▮		ALARM AT 0.75" ADJ.
21	CP-1	PUMP ENABLE/DISABLE		▮		
22	CP-1	PUMP STATUS	▮	▮		
23	SF-1	FAN AIR FLOW		▮		
24	SF-1	SPEED CONTROL		▮		ECM FAN MOTOR
25	T-4	RETURN AIR TEMPERATURE		▮		
26	T-5	MIXED AIR TEMPERATURE	▮	▮		ALARM AT 45°F ADJ.
27	D-2	OUTDOOR AIR DAMPER OUTPUT		▮		OPEN/CLOSE
28	D-2	OUTDOOR AIR DAMPER POSITION	▮	▮		OPEN/CLOSE, PROVE OPEN
RTU-1F & RTU-1G						
01	T-1	RETURN AIR TEMPERATURE		▮		
02	CO2-1	RETURN AIR CARBON DIOXIDE	▮	▮		ALARM AT 1200 PPM ADJ.
03	RAF-1	ENABLE/DISABLE		▮		
04	RAF-1	STATUS	▮	▮		
05	AFM-1	OUTDOOR AIR FLOW		▮		
06	D-1	MIXED AIR DAMPER OUTPUT		▮		
07	T-2	MIXED AIR TEMPERATURE	▮	▮		ALARM AT 45°F ADJ.
08	DPS-1	FILTER STATUS	▮	▮		ALARM AT 0.75" ADJ.
09	SF-1	FAN AIR FLOW		▮		
10	SF-1	SPEED CONTROL		▮		ECM
11	SF-1	ENABLE/DISABLE		▮		
12	SF-1	STATUS	▮	▮		
13	GHX-1	GAS FIRED HX ENABLE/DISABLE		▮		
14	GHX-1	GAS FIRED HX RUN STATUS		▮		
15	GHX-1	GAS FIRED HX ALARM STATUS	▮			
16	DX-1	COOLING SYSTEM ALARM STATUS	▮			
17	DX-1	COOLING SYSTEM RUN STATUS		▮		
18	DX-1	COOLING SYSTEM ENABLE/DISABLE		▮		
19	DX-1	COOLING SYSTEM STAGING		▮		VARIABLE SPEED COMPRESSOR
20	T-3	DISCHARGE AIR TEMPERATURE	▮	▮		ALARM IF OUT OF RANGE
21	H-3	OUTDOOR AIR HUMIDITY		▮		
22	T-4	OUTDOOR AIR TEMPERATURE		▮		
23	GHX-1	GAS FIRED HX STAGING		▮		MODULATING GAS HEAT
24	H-4	INDOOR AIR HUMIDITY SENSOR		▮		
25	T-5	INDOOR AIR TEMPERATURE		▮		BASED ON AVERAGE SPACE TEMP. SEE PLANS FOR NUMBER OF SENSORS USED
26	OS-1	OCCUPANCY SENSOR		▮		
DOMESTIC HOT WATER HEATER						
01	WH-1	ENABLE/DISABLE		▮		
02	WH-1	RUN STATUS		▮		
03	WH-1	ALARM STATUS	▮			
04	WH-1	UNIT PUMP STATUS	▮			
05	WH-2	ENABLE/DISABLE		▮		
06	WH-2	RUN STATUS		▮		
07	WH-2	ALARM STATUS	▮			
08	WH-2	UNIT PUMP STATUS	▮			
09	T-1	WATER HEATER INCOMING TEMPERATURE		▮		
10	T-2	STORAGE TANK INCOMING TEMPERATURE		▮		
11	T-3	STORAGE TANK TEMPERATURE		▮		
12	T-4	DOMESTIC SUPPLY WATER TEMPERATURE	▮			
13	T-5	TEMPERED SUPPLY WATER TEMPERATURE	▮			
14	T-5	DOMESTIC RETURN WATER TEMPERATURE	▮	▮		
15	CP-1	ENABLE/DISABLE		▮		
16	CP-1	STATUS	▮			
STADIUM TOILET BUILDING						
01	EF-1	STATUS	▮			
02	EF-1	ENABLE/DISABLE		▮		
03	D-1	EXHAUST AIR DAMPER OUTPUT		▮		OPEN/CLOSE
04	D-1	EXHAUST AIR DAMPER POSITION	▮			OPEN/CLOSE
05	D-2	OUTDOOR AIR DAMPER OUTPUT		▮		OPEN/CLOSE
06	D-2	OUTDOOR AIR DAMPER POSITION	▮			OPEN/CLOSE
07	T-1	ZONE AIR TEMPERATURE	▮	▮		
08	CP-1	ENABLE/DISABLE		▮		
09	CP-1	STATUS	▮			
10	T-2	DOMESTIC RETURN WATER TEMPERATURE	▮	▮		
11	T-3	DOMESTIC HOT WATER TEMPERATURE	▮	▮		
12	OS-1	OCCUPANCY SENSOR		▮		

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

AHU-523 SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR AIR HANDLING SYSTEM. UNIT OPERATES AS A CONSTANT VOLUME SYSTEM. UNIT CONTAINS ECM SUPPLY FAN, DX COOLING COIL WITH REMOTE 2 STAGE AIR COOLED CONDENSER UNIT, HEATING HOT WATER COIL, CONTROL VALVE (CV) AND ACTUATOR WITH CIRCULATING PUMP, MERV 13 FILTERS, MERV 8 PREFILTERS, BIPOLAR IONIZATION, OUTDOOR / RETURN AIR DAMPERS AND ACTUATORS AND AIR TEMPERATURE / HUMIDITY SENSORS.
2. SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
3. UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING;
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY FAN, OUTDOOR AIR DAMPER 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY.
5. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL MODULATE HEATING COIL CONTROL VALVE, STAGE DX COOLING SYSTEM AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY AVERAGING SPACE TEMPERATURE SENSORS. SPACE TEMPERATURE SENSORS SHALL BE LOCATED IN NUMEROUS LOCATIONS. USE AVERAGE SPACE TEMPERATURE INPUT.
   A. HEATING: UPON A FALL IN SPACE TEMPERATURE BELOW THE AVERAGE SPACE TEMPERATURE SETPOINT, THE HEATING COIL CONTROL VALVE SHALL MODULATE OPEN UNTIL THE AVERAGE SPACE TEMPERATURE IS SATISFIED. FAN OUTPUT CFM REMAINS CONSTANT.
   B. HEATING COIL PUMP CONTROL BASED ON THE FOLLOWING:
      a. HEATING HOT WATER COIL PUMP SHALL RUN WHEN THE SYSTEM IS IN HEATING MODE.
      b. PUMP SHALL RUN CONTINUOUSLY WHENEVER THE OUTDOOR AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).
   C. COOLING: UPON A RISE IN SPACE TEMPERATURE ABOVE THE AVERAGE SPACE TEMPERATURE SETPOINT, THE DX COOLING SYSTEM OUTPUT SHALL BE STAGED UPWARD UNTIL THE AVERAGE SPACE TEMPERATURE IS SATISFIED. THE FAN OUTPUT CFM REMAINS CONSTANT.
      a. WHEN OUTDOOR AIR TEMPERATURE AND HUMIDITY CONDITIONS ARE ACCEPTABLE AND BELOW SET POINT AND THERE IS A DEMAND FOR COOLING THEN ECONOMIZER SHALL BE UTILIZED.
      b. ALARM IF FAILURE WITH THE DX COOLING SYSTEM.
6. FAN INITIAL START-UP CONTROL - WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE SUPPLY FAN BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
7. ECONOMIZER CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY AND THE SYSTEM IS CALLING FOR COOLING.
   A. ALLOW OWNER OVERRIDE TO DISABLE ECONOMIZER IF DESIRED.
8. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
   A. FILTERS
      a. MONITORING OF PSID
      b. ALARM SETPOINT 0.75"W.C. (ADJ.)
9. UNOCCUPIED CONTROL - SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. HEATING - UNIT SHALL CYCLE TO MAINTAIN AVERAGE SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND THE HEATING COIL CONTROL VALVE MODULATED OPEN AS NECESSARY TO MAINTAIN AVERAGE SET POINT TEMPERATURE.
   B. COOLING - UNIT SHALL CYCLE TO MAINTAIN AVERAGE SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND DX COOLING SYSTEM STAGGED OR ECONOMIZER MODE ACTIVATED AS NECESSARY TO MAINTAIN AVERAGE SET POINT TEMPERATURE. PROVIDE SEQUENCE FOR THE OWNER TO DISABLE COOLING DURING THIS TIME IF PREFERRED.
10. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
11. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
   A. UNITS SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNITS SHALL SWITCH TO OCCUPIED MODE.
12. BIPOLAR IONIZATION: PROVIDED BY UNIT MANUFACTURER BUT A LOW VOLTAGE CIRCUIT IS REQUIRED BY THE CONTROLS CONTRACTOR.
13. PURGE CYCLE:
   A. WINTER: WHEN OUTSIDE AIR TEMPERATURE IS NO LOWER THAN 15° F (ADJ.) PROVIDE SEQUENCE TO BRING 100% OUTSIDE AIR INTO THE SPACE FOR A PERIOD OF 1 HOUR (ADJ.). THE ASSOCIATED DUCT MOUNTED EXHAUST FAN SHALL BE ON DURING THIS PERIOD.
   B. SUMMER: WHEN OUTDOOR AIR CONDITIONS ALLOW AND OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY PROVIDE SEQUENCE TO BRING 100% OUTSIDE AIR INTO THE SPACE FOR A PERIOD OF 2 HOURS (ADJ.). THE ASSOCIATED DUCT MOUNTED EXHAUST FAN SHALL BE ON DURING THIS PERIOD.
14. TIMED OVERRIDE CONTROL - SYSTEM CONTROLLER SHALL ENABLE SYSTEM WHEN ASSOCIATED SPACE TIMED OVERRIDE (2 HOURS (ADJ.)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.
15. SAFETY SHUTDOWNS:
   A. DUCT MOUNTED IONIZATION SMOKE DETECTOR(S) PROVIDED BY DIVISION 28 SHALL DE-ENERGIZE THE UNIT WHENEVER PRODUCTS OF COMBUSTION ARE SENSED.
   B. PROVIDE A LOW-TEMPERATURE PROTECTION THERMOSTAT(S) ON THE LEAVING SIDE OF HEATING HOT WATER COIL WHICH WILL DE-ENERGIZE UNIT, CLOSING OUTDOOR AIR DAMPER 100%, OPEN RETURN AIR DAMPER 100%, THE HEATING HOT WATER COIL CONTROL VALVE SHALL BE FULLY OPENED AND COIL PUMP ENERGIZED. PROVIDE MANUAL RESET.

STADIUM TOILET BUILDING CONTROLS

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR EQUIPMENT OPERATION. EQUIPMENT INCLUDES INLINE EXHAUST FAN WITH MOTORIZED SHUT-OFF DAMPERS AT THE EXHAUST AND OUTSIDE AIR LOUVERS, ELECTRIC WALL MOUNTED AND CEILING MOUNTED CABINET HEATERS AND DOMESTIC HOT WATER RETURN PUMP.
   A. EQUIPMENT OPERATION SHALL BE BASED ON TIME OF DAY (TOD) SCHEDULE OR BY OWNER COMMAND.
   B. EXHAUST FAN OPERATION: START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
      a. WHEN INDEXED TO STOP: DISABLE EXHAUST FAN, EXHAUST AND OUTSIDE AIR DAMPERS 100% CLOSED.
      b. WHEN INDEXED TO START: ENABLE EXHAUST FAN, EXHAUST AND OUTSIDE AIR DAMPERS 100% OPENED.
      c. LIGHTING OCCUPANCY SENSORS INSTALLED IN BOTH TOILET ROOMS SHALL BE USED TO STOP AND START EXHAUST FAN DURING SCHEDULED OCCUPIED PERIODS WHEN NO OCCUPANTS ARE WITHIN THE SPACE FOR A DETERMINED TIME PERIOD.
   C. ELECTRIC CABINET HEATER OPERATION: HEATERS SHALL BE CONTROLLED BY THEIR INDEPENDENT THERMOSTAT. THE ENABLE AND DISABLE SHALL BE CONTROLLED BY THE BMS SYSTEM.
   D. DOMESTIC HOT WATER RETURN PUMP: ON AT 105° (ADJ.) AND OFF AT 120° (ADJ.)
   E. SYSTEM DDC MONITORING AND ALARMING OF THE FOLLOWING:
      a. EXHAUST FAN MOTOR STATUS.
         - WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, THE DDC SHALL INDICATE A GENERAL ALARM.
         - WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZES OF RUN HOURS FOR EXHAUST FAN WILL BE ACTIVE.
      b. EXHAUST AND OUTSIDE AIR DAMPERS POSITION (100% OPEN/CLOSED). DAMPERS MUST PROVE OPEN PRIOR TO STARTING EXHAUST FAN.
      c. SPACE TEMPERATURE OF ALL ROOMS SHALL BE MONITORED BY THE BMS SYSTEM. ALARM IF TEMPERATURE FALLS OUT OF RANGE.
      d. DOMESTIC HOT WATER RETURN PUMP: WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A GENERAL ALARM.
      e. MONITOR HOT WATER RETURN TEMPERATURE.
      f. MONITOR HOT WATER SUPPLY TEMPERATURE.

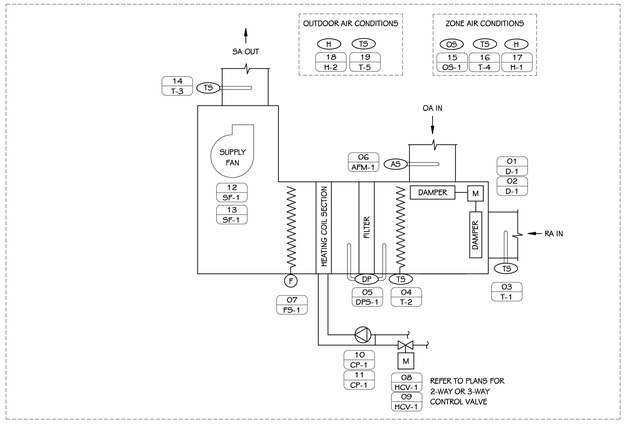
SEQUENCE OF OPERATIONS (CONT'D)

ROOFTOP UNIT (RTU-1F & RTU-1G) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR PACKAGED ROOFTOP UNIT. UNIT OPERATES AS A SINGLE-ZONE VARIABLE VOLUME UNIT AND CONTAINS A MODULATING GAS FIRED HEATING SYSTEM, ECM SUPPLY FAN, RELIEF FAN, DX COOLING SYSTEM WITH VARIABLE SPEED COMPRESSOR, MERV 13 FILTERS, BIPOLAR IONIZATION, OUTDOOR – RELIEF - RETURN AIR DAMPERS AND ACTUATORS AND AIR TEMPERATURE/AIRFLOW/HUMIDITY SENSORS.
2. ALL INTERFACE, SCHEDULING, ALARMING AND SETPOINT ADJUSTMENTS OCCUR THROUGH (BMS). COORDINATE ALL POINTS SHOWN WITH EQUIPMENT MANUFACTURER FOR A COMPLETE OPERATING SYSTEM BASED ON THIS SEQUENCE AND POINT LIST.
3. SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
   E. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
4. ROOFTOP UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
5. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY AND EXHAUST FANS SIMULTANEOUSLY OUTDOOR AND RELIEF AIR DAMPERS 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY.
6. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL ADJUST OUTPUT OF SUPPLY FAN, MODULATE GAS HEATER SYSTEM, MODULATE DX COOLING SYSTEM AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY AVERAGING SPACE TEMPERATURE SENSORS. SPACE TEMPERATURE SENSORS SHALL BE LOCATED IN NUMEROUS LOCATIONS FOR EACH UNIT. USE AVERAGE SPACE TEMPERATURE INPUT.
   A. HEATING: UPON A FALL IN SPACE TEMPERATURE BELOW THE AVERAGE SPACE TEMPERATURE SETPOINT, THE SUPPLY FAN SPEED AND MODULATING GAS HEATER SYSTEM SHALL BE ADJUSTED UPWARD UNTIL THE AVERAGE SPACE TEMPERATURE IS SATISFIED. FAN SPEED CFM OUTPUT AND MODULATING GAS HEATER SYSTEM OUTPUT SHALL BE COORDINATED BY THE MANUFACTURER TO OPERATE WITHIN THEIR EQUIPMENT GUIDELINES FOR UNIT PROTECTION.
      a. ALARM IF FAILURE WITH THE GAS HEATER SYSTEMS.
   B. COOLING: UPON A RISE IN SPACE TEMPERATURE ABOVE THE AVERAGE SPACE TEMPERATURE SETPOINT, THE SUPPLY FAN SPEED SHALL BE ADJUSTED UPWARD INCREASING THE CFM OUTPUT AND THE DX COOLING SYSTEM OUTPUT SHALL BE ADJUSTED UNTIL THE AVERAGE SPACE TEMPERATURE IS SATISFIED. FAN SPEED CFM OUTPUT AND THE MODULATING DX COOLING SYSTEM OUTPUT SHALL BE COORDINATED BY THE MANUFACTURER TO OPERATE WITHIN THEIR EQUIPMENT GUIDELINES FOR UNIT PROTECTION.
      a. WHEN OUTDOOR AIR TEMPERATURE AND HUMIDITY CONDITIONS ARE ACCEPTABLE AND BELOW SET POINT AND THERE IS A DEMAND FOR COOLING THEN ECONOMIZER SHALL BE UTILIZED.
      b. ALARM IF FAILURE WITH THE DX COOLING SYSTEMS.
7. EXHAUST FAN CONTROL – ON DURING ECONOMIZER MODE ONLY.
8. FAN INITIAL START-UP CONTROL – WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE FANS BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
      b. IF EXHAUST FAN STATUS IS NOT SENSED THEN ALARM AND DISABLE ECONOMIZER.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
9. ECONOMIZER CONTROL – SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY AND THE SYSTEM IS CALLING FOR COOLING.
10. CO2 CONTROL - SYSTEM CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING RETURN DUCT MOUNTED OR SPACE CO2 SENSOR(S) TO INCREASE OUTDOOR ABSOLUTE MINIMUM CFM TO A MAXIMUM MINIMUM CFM. MAXIMUM MINIMUM SHALL NOT EXCEED 845 CFM FOR RTU-1G & 1000 CFM FOR RTU-1F.
   A. UPON RETURN DUCT/SPACE CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS (OUTDOOR AIR DAMPER OPENING) IN GRADUAL INCREMENTS UNTIL CO2 SENSOR SETPOINT IS SATISFIED.
      a. MODULATE MIXED AIR DAMPERS DOWN TO ITS ABSOLUTE MINIMUM POSITION 320 CFM PER UNIT UPON SATISFYING SENSOR SETPOINT.
   B. ALARM HIGH CO2, 1,200 PPM (ADJ.)
11. FILTER MONITORING – SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
   A. FILTERS
      a. MONITORING OF PSID
      b. ALARM SETPOINT 0.75"W.C. (ADJ.)
12. UNOCCUPIED CONTROL – SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. HEATING - ROOFTOP UNITS SHALL CYCLE TO MAINTAIN AVERAGE SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100%, EXHAUST FAN OFF AND HEATER STAGING AS NECESSARY TO MAINTAIN AVERAGE SET POINT TEMPERATURE.
   B. COOLING - ROOFTOP UNITS SHALL CYCLE TO MAINTAIN AVERAGE SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100%, EXHAUST FAN OFF (UNLESS ECONOMIZER IS ENABLED) AND DX STAGING OR ECONOMIZER AS NECESSARY TO MAINTAIN AVERAGE SET POINT TEMPERATURE. PROVIDE SEQUENCE FOR THE OWNER TO DISABLE COOLING DURING THIS TIME IF PREFERRED.
13. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
14. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
   A. UNITS SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSORS TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNITS SHALL SWITCH TO OCCUPIED MODE.
15. TIMED OVERRIDE CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS WHEN ASSOCIATED SPACE TIMED OVERRIDE (2 HOURS (ADJ)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.
16. SAFETY SHUTDOWNS:
   A. DUCT MOUNTED IONIZATION SMOKE DETECTOR(S) PROVIDED BY DIVISION 28 SHALL DE-ENERGIZE THE UNIT WHENEVER PRODUCTS OF COMBUSTION ARE SENSED.

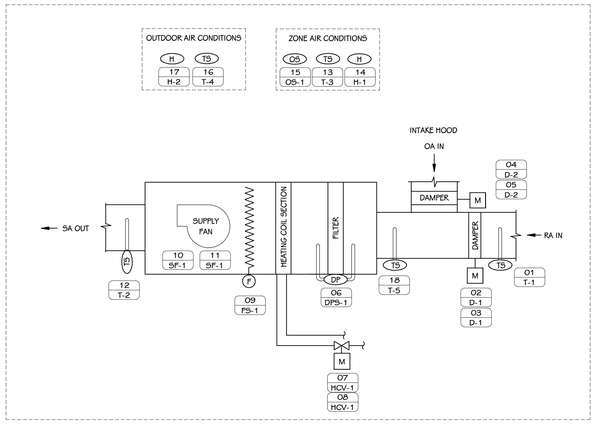
DOMESTIC HOT WATER HEATER SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR DOMESTIC HOT WATER SYSTEM OPERATION. SYSTEM IS A COMBINATION OF CONSTANT VOLUME INLINE BUILDING HOT WATER RETURN PUMP, CONDENSING HOT WATER HEATER WITH MANUFACTURER CONTROLLER, TEMPERING VALVE AND TEMPERATURE SENSORS.
2. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. BUILDING TIME OF DAY SCHEDULE.
      a. ENABLED CONTINUOUSLY (24/7).
   B. BY OPERATOR COMMAND.
3. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE HOT WATER HEATER MANUFACTURER CONTROLLER, DISABLE BUILDING HOT WATER RETURN PUMP.
   B. WHEN INDEXED TO START: ENABLE BUILDING HO



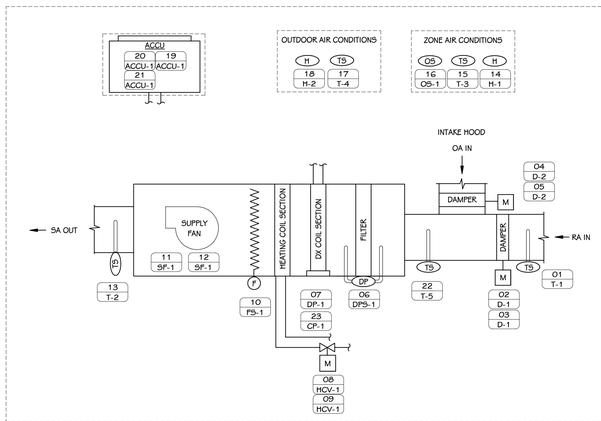
AHU-217 & 249 CONTROLS DIAGRAM

SCALE: NONE



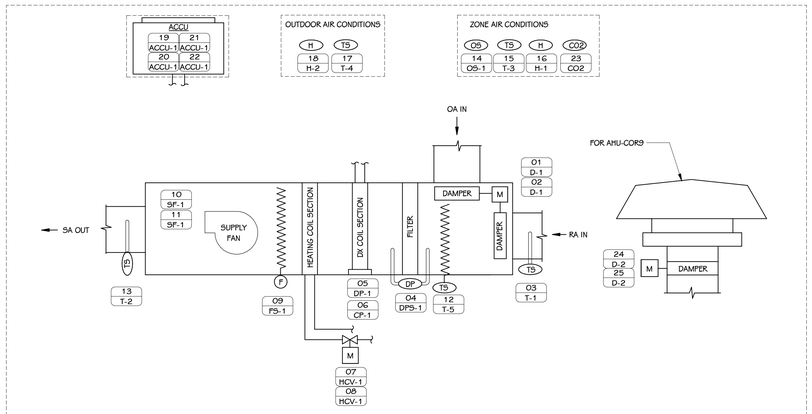
AHU-212S CONTROLS DIAGRAM

SCALE: NONE



AHU-210 CONTROLS DIAGRAM

SCALE: NONE



AHU-204 & AHU-COR9 CONTROLS DIAGRAM

SCALE: NONE

CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
AHU-217 & AHU-249						
01	D-1	MIXED AIR DAMPER OUTPUT		■		
02	D-1	MIXED AIR DAMPER POSITION		■		
03	T-1	RETURN AIR TEMPERATURE		■		
04	T-2	MIXED AIR TEMPERATURE	■	■		ALARM AT 45°F ADJ.
05	DPS-1	FILTER STATUS	■	■		ALARM AT 0.75" ADJ.
06	AFM-1	OUTDOOR AIR FLOW		■		
07	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
08	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
09	HCV-1	HEATING CONTROL VALVE POSITION		■		
10	CP-1	PUMP ENABLE/DISABLE		■		
11	CP-1	PUMP STATUS	■	■		
12	SF-1	ENABLE/DISABLE		■		
13	SF-1	STATUS	■	■		
14	T-3	DISCHARGE AIR TEMPERATURE	■	■		ALARM IF OUT OF RANGE
15	OS-1	OCCUPANCY SENSOR		■		
16	T-4	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T4H READINGS
17	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T4H READINGS
18	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T4H READINGS
19	T-5	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T4H READINGS
AHU-2125						
01	T-1	RETURN AIR TEMPERATURE		■		
02	D-1	RETURN AIR DAMPER OUTPUT		■		
03	D-1	RETURN AIR DAMPER POSITION		■		
04	D-2	OUTSIDE AIR DAMPER OUTPUT		■		
05	D-2	OUTSIDE AIR DAMPER POSITION		■		
06	DPS-1	FILTER STATUS	■	■		ALARM AT 0.75" ADJ.
07	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
08	HCV-1	HEATING CONTROL VALVE POSITION		■		
09	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
10	SF-1	STATUS	■	■		
11	SF-1	ENABLE/DISABLE		■		
12	T-2	DISCHARGE AIR TEMPERATURE	■	■		ALARM IF OUT OF RANGE
13	T-3	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T4H READINGS
14	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T4H READINGS
15	OS-1	OCCUPANCY SENSOR		■		
16	T-4	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T4H READINGS
17	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T4H READINGS
18	T-5	MIXED AIR TEMPERATURE	■	■		
AHU-210						
01	T-1	RETURN AIR TEMPERATURE		■		
02	D-1	RETURN AIR DAMPER OUTPUT		■		
03	D-1	RETURN AIR DAMPER POSITION		■		
04	D-2	OUTSIDE AIR DAMPER OUTPUT		■		
05	D-2	OUTSIDE AIR DAMPER POSITION		■		
06	DPS-1	FILTER STATUS	■	■		ALARM AT 0.75" ADJ.
07	DP-1	DRAIN PAN ALARM	■	■		
08	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
09	HCV-1	HEATING CONTROL VALVE POSITION		■		
10	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
11	SF-1	STATUS	■	■		
12	SF-1	ENABLE/DISABLE		■		
13	T-2	DISCHARGE AIR TEMPERATURE	■	■		ALARM IF OUT OF RANGE
14	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T4H READINGS
15	T-3	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T4H READINGS
16	OS-1	OCCUPANCY SENSOR		■		
17	T-4	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T4H READINGS
18	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T4H READINGS
19	ACCU-1	COOLING SYSTEM ALARM STATUS	■	■		
20	ACCU-1	COOLING SYSTEM ENABLE/DISABLE		■		
21	ACCU-1	COOLING SYSTEM RUN STATUS		■		
22	ACCU-1	COOLING SYSTEM STAGING		■		2 STAGE COOLING
23	CP-1	CONDENSATE PUMP STATUS	■	■		ALARM
AHU-204 & AHU-COR9						
01	D-1	MIXED AIR DAMPER OUTPUT		■		
02	D-1	MIXED AIR DAMPER POSITION		■		
03	T-1	RETURN AIR TEMPERATURE		■		
04	DPS-1	FILTER STATUS	■	■		ALARM AT 0.75" ADJ.
05	DP-1	DRAIN PAN ALARM	■	■		
06	CP-1	CONDENSATE PUMP STATUS	■	■		ALARM
07	HCV-1	HEATING CONTROL VALVE OUTPUT		■		
08	HCV-1	HEATING CONTROL VALVE POSITION		■		
09	FS-1	FREEZE STAT ALARM STATUS	■			HARD WIRED SAFETY - MANUAL RESET
10	SF-1	ENABLE/DISABLE		■		
11	SF-1	STATUS	■	■		
12	T-5	MIXED AIR TEMPERATURE	■	■		
13	T-2	DISCHARGE AIR TEMPERATURE	■	■		ALARM IF OUT OF RANGE
14	OS-1	OCCUPANCY SENSOR		■		
15	T-3	ZONE AIR TEMPERATURE	■	■		DISPLAY ENTHALPY BASED ON T4H READINGS
16	H-1	INDOOR AIR HUMIDITY SENSOR		■		DISPLAY ENTHALPY BASED ON T4H READINGS
17	T-4	OUTDOOR AIR TEMPERATURE		■		DISPLAY ENTHALPY BASED ON T4H READINGS
18	H-2	OUTDOOR AIR HUMIDITY		■		DISPLAY ENTHALPY BASED ON T4H READINGS
19	ACCU-1	COOLING SYSTEM ALARM STATUS	■	■		
20	ACCU-1	COOLING SYSTEM ENABLE/DISABLE		■		
21	ACCU-1	COOLING SYSTEM RUN STATUS		■		
22	ACCU-1	COOLING SYSTEM STAGING		■		2 STAGE COOLING
23	CO2	CARBON DIOXIDE		■		AHU-204 ONLY
24	D-2	OUTDOOR AIR DAMPER OUTPUT		■		OPEN/CLOSE
25	D-2	OUTDOOR AIR DAMPER POSITION	■	■		OPEN/CLOSE, PROVE OPEN

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

AHU-204, AHU-210 & AHU-COR9 SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR BLOWER COIL AIR HANDLING SYSTEM. UNIT OPERATES AS A CONSTANT VOLUME SYSTEM. UNIT CONTAINS ECM SUPPLY FAN, DX COOLING COIL WITH REMOTE 2 STAGE AIR COOLED CONDENSER UNIT (CONDENSER UNIT FOR AHU-210 IS SINGLE STAGE), HEATING HOT WATER COIL WITH CONTROL VALVE (CV) AND ACTUATOR, MERV 13 FILTERS, BIPOLAR IONIZATION, OUTDOOR / RETURN AIR DAMPERS AND ACTUATORS AND AIR TEMPERATURE / HUMIDITY SENSORS.
2. SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
   E. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
3. UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY FAN, OUTDOOR AIR DAMPER 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY.
5. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL MODULATE HEATING COIL CONTROL VALVE, STAGE DX COOLING SYSTEM AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. HEATING: UPON A FALL IN SPACE TEMPERATURE BELOW THE SPACE TEMPERATURE SETPOINT, THE HEATING COIL CONTROL VALVE SHALL MODULATE OPEN UNTIL THE SPACE TEMPERATURE IS SATISFIED.
   B. COOLING: UPON A RISE IN SPACE TEMPERATURE ABOVE THE SPACE TEMPERATURE SETPOINT, THE DX COOLING SYSTEM OUTPUT SHALL BE STAGED UPWARD UNTIL THE SPACE TEMPERATURE IS SATISFIED.
      a. WHEN OUTDOOR AIR TEMPERATURE AND HUMIDITY CONDITIONS ARE ACCEPTABLE AND BELOW SET POINT AND THERE IS A DEMAND FOR COOLING THEN ECONOMIZER SHALL BE UTILIZED.
      b. ALARM IF FAILURE WITH THE DX COOLING SYSTEM.
6. FAN INITIAL START-UP CONTROL - WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE SUPPLY FAN BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
7. ECONOMIZER CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY AND THE SYSTEM IS CALLING FOR COOLING.
   A. ALLOW OWNER OVERRIDE TO DISABLE ECONOMIZER IF DESIRED.
8. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
   A. FILTERS
      a. MONITORING OF PSID
      b. ALARM SETPOINT 0.75"W.C. (ADJ.)
9. UNOCCUPIED CONTROL - SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. HEATING - UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND THE HEATING COIL CONTROL VALVE MODULATED OPEN AS NECESSARY TO MAINTAIN SET POINT TEMPERATURE.
   B. COOLING - UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND DX COOLING SYSTEM STAGGED OR ECONOMIZER MODE ACTIVATED AS NECESSARY TO MAINTAIN SET POINT TEMPERATURE. PROVIDE SEQUENCE FOR THE OWNER TO DISABLE COOLING DURING THIS TIME IF PREFERRED.
10. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
11. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
    A. UNITS SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNITS SHALL SWITCH TO OCCUPIED MODE.
12. BIPOLAR IONIZATION: PROVIDED BY UNIT MANUFACTURER BUT A LOW VOLTAGE CIRCUIT IS REQUIRED BY THE CONTROLS CONTRACTOR.
13. CO2 CONTROL (AHU-204 ONLY) - SYSTEM CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING SPACE CO2 SENSOR TO INCREASE OUTDOOR MINIMUM CFM TO A MAXIMUM CFM. INCLUDE CORRESPONDING CLOSING RETURN AIR DAMPER AND OPENING OF RELIEF/EXHAUST AIR DAMPERS.
    A. UPON SPACE CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS (OUTDOOR AIR DAMPER OPENING) IN GRADUAL INCREMENTS UNTIL CO2 SENSOR SETPOINT IS SATISFIED.
       a. MODULATE MIXED AIR DAMPERS DOWN TO ITS ABSOLUTE MINIMUM POSITION UPON SATISFYING SENSOR SETPOINT.
14. SAFETY SHUTDOWNS:
    A. PROVIDE A LOW-TEMPERATURE PROTECTION THERMOSTAT(S) ON THE LEAVING SIDE OF HEATING HOT WATER COIL WHICH WILL DE-ENERGIZE UNIT, CLOSING OUTDOOR AIR DAMPER 100%, OPEN RETURN AIR DAMPER 100%, THE HEATING HOT WATER COIL CONTROL VALVE SHALL BE FULLY OPENED AND COIL PUMP ENERGIZED. PROVIDE MANUAL RESET.
    B. IF CONDENSATE SWITCH IN DRAIN PAN IS ACTIVATED THE UNIT SHALL SHUT DOWN AND SEND ALARM TO BMS.

SEQUENCE OF OPERATIONS (CONT'D)

AHU-217, 249 & 2125 SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR BLOWER COIL AIR HANDLING SYSTEM. UNIT OPERATES AS A CONSTANT VOLUME SYSTEM. UNIT CONTAINS ECM SUPPLY FAN, HEATING HOT WATER COIL, CONTROL VALVE (CV) AND ACTUATOR WITH CIRCULATING PUMP, MERV 13 FILTERS, BIPOLAR IONIZATION, OUTDOOR / RETURN AIR DAMPERS AND ACTUATORS AND AIR TEMPERATURE / HUMIDITY SENSORS.
2. SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75° COOLING / 70°F HEATING
   B. STANDBY 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 65°F HEATING
   D. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
3. UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY FAN, OUTDOOR AIR DAMPER 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY.
5. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL MODULATE HEATING COIL CONTROL VALVE AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. HEATING: UPON A FALL IN SPACE TEMPERATURE BELOW THE SPACE TEMPERATURE SETPOINT, THE HEATING COIL CONTROL VALVE SHALL MODULATE OPEN UNTIL THE SPACE TEMPERATURE IS SATISFIED.
   B. HEATING COIL PUMP CONTROL BASED ON THE FOLLOWING:
      a. HEATING HOT WATER COIL PUMP SHALL RUN WHEN THE SYSTEM IS IN HEATING MODE.
      b. PUMP SHALL RUN CONTINUOUSLY WHENEVER THE OUTDOOR AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).
      c. AHU-2125 HAS NO PUMP.
   C. COOLING: THIS SYSTEM IS NOT SUPPLIED WITH MECHANICAL COOLING. IF THERE IS A COOLING DEMAND AND IF THE OUTSIDE AIR CONDITIONS ALLOW THE ECONOMIZER MODE SHALL BE UTILIZED.
      a. WHEN OUTDOOR AIR TEMPERATURE AND HUMIDITY CONDITIONS ARE ACCEPTABLE AND BELOW SET POINT AND THERE IS A DEMAND FOR COOLING THEN ECONOMIZER SHALL BE UTILIZED.
6. FAN INITIAL START-UP CONTROL - WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE SUPPLY FAN BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
7. ECONOMIZER CONTROL - SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SETPOINT WHEN OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY AND THE SYSTEM IS CALLING FOR COOLING.
   A. ALLOW OWNER OVERRIDE TO DISABLE ECONOMIZER IF DESIRED.
8. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
   A. FILTERS
      a. MONITORING OF PSID
      b. ALARM SETPOINT 0.75"W.C. (ADJ.)
9. UNOCCUPIED CONTROL - SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
   A. HEATING - UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100% AND THE HEATING COIL CONTROL VALVE MODULATED OPEN AS NECESSARY TO MAINTAIN SET POINT TEMPERATURE.
   B. COOLING - ECONOMIZER MODE ONLY IF OUTSIDE AIR CONDITIONS ALLOW.
10. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
11. INITIAL STARTUP CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
    A. UNIT SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSOR TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNITS SHALL SWITCH TO OCCUPIED MODE.
12. PURGE CYCLE: SUMMER: WHEN OUTDOOR AIR CONDITIONS ALLOW AND OUTDOOR AIR ENTHALPY IS BELOW THE RETURN AIR ENTHALPY PROVIDE SEQUENCE TO BRING 100% OUTSIDE AIR INTO THE SPACE FOR A PERIOD OF 2 HOURS (ADJ.). THE ASSOCIATED SYSTEM EXHAUST FAN SHALL BE ON DURING THIS PERIOD.
13. BIPOLAR IONIZATION: PROVIDED BY UNIT MANUFACTURER BUT A LOW VOLTAGE CIRCUIT IS REQUIRED BY THE CONTROLS CONTRACTOR.
14. SAFETY SHUTDOWNS:
    A. PROVIDE A LOW-TEMPERATURE PROTECTION THERMOSTAT(S) ON THE LEAVING SIDE OF HEATING HOT WATER COIL WHICH WILL DE-ENERGIZE UNIT, CLOSING OUTDOOR AIR DAMPER 100%, OPEN RETURN AIR DAMPER 100%, THE HEATING HOT WATER COIL CONTROL VALVE SHALL BE FULLY OPENED AND COIL PUMP ENERGIZED. PROVIDE MANUAL RESET.

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ADDENDUM 1	NOVEMBER 29, 2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

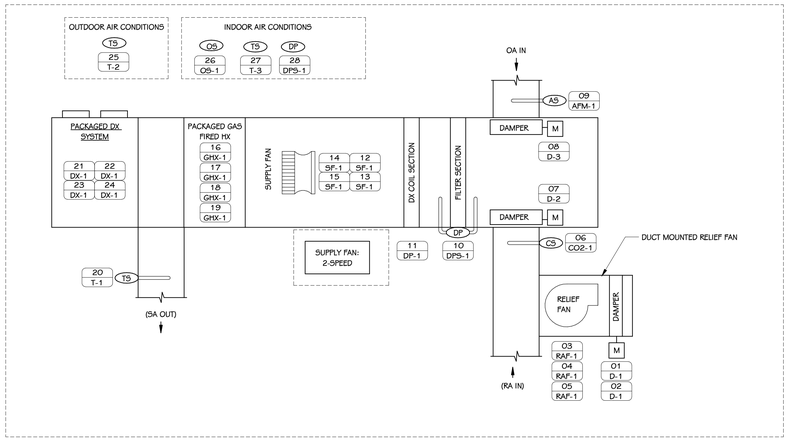
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
TEMPERATURE CONTROLS

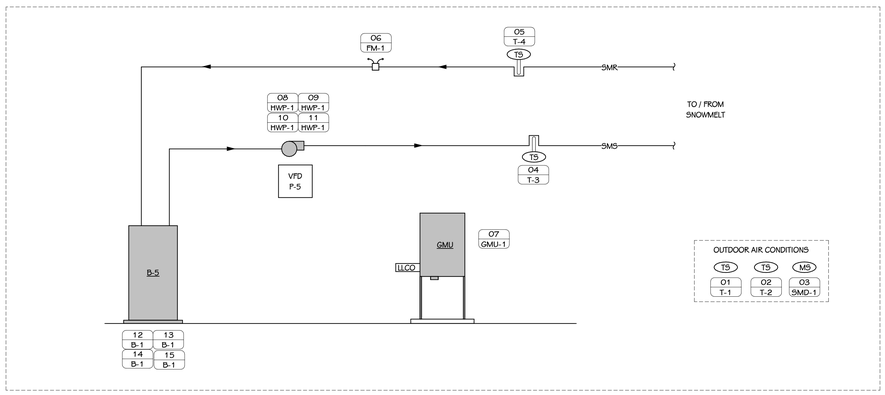
DATE
NOVEMBER 03, 2021

SHEET NUMBER
M606.2
17-175.70



RTU-1D CONTROLS DIAGRAM

SCALE: NONE



SNOWMELT HEATING HOT WATER SYSTEM CONTROLS DIAGRAM (ALTERNATE # 2)

SCALE: NONE

CONTROL POINTS

NUMBER	TAG	DESCRIPTION	ALARM	TREND	BACNET	REMARKS
RTU-1D						
01	D-1	EXHAUST AIR DAMPER OUTPUT		▮		
02	D-1	EXHAUST AIR DAMPER POSITION	▮			
03	RAF-1	STATUS	▮	▮		
04	RAF-1	ENABLE/DISABLE		▮		
05	RAF-1	SPEED CONTROL		▮		
06	CO2-1	RETURN AIR CARBON DIOXIDE		▮		BY UNIT MANUFACTURER
07	D-2	RETURN AIR DAMPER OUTPUT		▮		BY UNIT MANUFACTURER
08	D-3	OUTDOOR AIR DAMPER OUTPUT		▮		BY UNIT MANUFACTURER
09	AFM-1	OUTDOOR AIR FLOW		▮		
10	DPS-1	FILTER STATUS	▮	▮		
11	DP-1	DRAIN PAN ALARM	▮	▮		
12	SF-1	SPEED CONTROL		▮		2-SPEED, BY UNIT MANUFACTURER
13	SF-1	STATUS	▮	▮		
14	SF-1	FAN AIR FLOW		▮		
15	SF-1	ENABLE/DISABLE		▮		BY UNIT MANUFACTURER
16	GHX-1	GAS FIRED HX ENABLE/DISABLE		▮		BY UNIT MANUFACTURER
17	GHX-1	GAS FIRED HX RUN STATUS		▮		
18	GHX-1	GAS FIRED HX ALARM STATUS	▮			
19	GHX-1	GAS FIRED HX STAGING		▮		2 STAGE HEATING BY UNIT MANUFACTURER
20	T-1	DISCHARGE AIR TEMPERATURE	▮	▮		ALARM IF OUT OF RANGE
21	DX-1	COOLING SYSTEM ALARM STATUS	▮			
22	DX-1	COOLING SYSTEM RUN STATUS		▮		
23	DX-1	COOLING SYSTEM ENABLE/DISABLE		▮		BY UNIT MANUFACTURER
24	DX-1	COOLING SYSTEM STAGING		▮		2 STAGE COOLING, BY UNIT MANUFACTURER
25	T-2	OUTDOOR AIR TEMPERATURE		▮		BY UNIT MANUFACTURER
26	OS-1	OCCUPANCY SENSOR		▮		
27	T-3	INDOOR AIR TEMPERATURE		▮		BY UNIT MANUFACTURER
28	DPS-1	SPACE DIFFERENTIAL PRESSURE SENSOR		▮		
SNOWMELT HEATING HOT WATER SYSTEM						
01	T-1	OUTDOOR AIR TEMPERATURE		▮		GLOBAL
02	T-2	SLAB TEMPERATURE	▮			ALARM: SLAB TEMPERATURE HIGH. (3) POINTS TOTAL
03	SMD-1	SLAB MOISTURE DETECTION		▮		
04	T-3	SNOWMELT SUPPLY WATER TEMPERATURE	▮	▮		ALARM: SUPPLY WATER HIGH
05	T-4	SNOWMELT RETURN WATER TEMPERATURE	▮	▮		ALARM: RETURN WATER LOW
06	FM-1	LOOP FLOW (GPM)		▮		
07	GMU-1	TANK LEVEL ALARM	▮	▮		DRY CONTACT
08	HWP-1	ENABLE/DISABLE		▮		
09	HWP-1	STATUS	▮	▮		
10	HWP-1	SPEED CONTROL		▮		VFD FOR BALANCING ONLY. CONSTANT SPEED
11	HWP-1	VFD FAULT STATUS	▮			
12	B-1	ENABLE/DISABLE		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER
13	B-1	STATUS		▮		MODBUS/BACNET DATA (FIRE RATE/HOURS...)
14	B-1	ALARM STATUS	▮			
15	B-1	SETPOINT ADJUSTMENT		▮		SENT FROM BMS (SYSTEM) TO BOILER CONTROLLER

SEQUENCE OF OPERATIONS

NOTE: ALL LABOR, MATERIAL, EQUIPMENT AND SOFTWARE NOT SPECIFICALLY INDICATED WITHIN CONTROLS DRAWINGS THAT IS REQUIRED TO MEET THE FUNCTIONAL INTENT OF THE SEQUENCE OF OPERATIONS SHALL BE PROVIDED WITHOUT ADDITIONAL COST. POINT LISTS SHALL BE A GUIDE TO THE POINTS REQUIRED FOR CONTROL SYSTEM. FINAL POINTS SHALL BE DETERMINED BY SEQUENCE OF OPERATIONS. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS. ALL POINTS SHALL BE TRENDABLE.

SNOWMELT HEATING HOT WATER SYSTEM SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR SNOWMELT HEATING HOT WATER SYSTEM OPERATION. SYSTEM IS A COMBINATION OF A CONSTANT VOLUME INLINE PUMP, VARIABLE FREQUENCY CONTROLLER, HOT WATER CONDENSING BOILER WITH MANUFACTURER SUPPLIED CONTROLLER, SLAB MOISTURE DETECTION SENSOR AND WATER TEMPERATURE, SLAB TEMPERATURE AND FLOW SENSORS.
2. SYSTEM ENABLED/DISABLED BASED ON THE FOLLOWING:
   A. ON AT 40°F (ADJ.) OUTDOOR AIR TEMPERATURE AND OFF WHEN OUTDOOR AIR TEMEPRATURE RISES ABOVE 40° F (ADJ.).
   B. ON AND OFF ALSO BY OPERATOR COMMAND.
3. SYSTEM START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE BOILER CONTROLLER, AFTER DELAY OF TEN (10) MINUTE HOLD TO EQUALIZE SYSTEM, DISABLE PUMP.
   B. WHEN INDEXED TO START: ENABLE PUMP, AFTER DELAY OF TEN (10) MINUTE HOLD TO ESTABLISH FLOW IN SYSTEM, ENABLE BOILER CONTROLLER.
4. INITIAL START-UP CONTROL – WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE PUMP BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM FOR PUMP FAILURE.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR UNIT WILL BE ACTIVE.
5. PUMP CONTROL – PUMP OPERATES AS CONSTANT VOLUME.
6. PUMP VARIABLE FREQUENCY CONTROLLER SHALL BE MONITORED BASED ON THE FOLLOWING:
   A. VIA BACNET/MODBUS CONNECTION: POWER USAGE / SPEED % AND HZ / HOURS / FAULT / ALARM.
   B. VFD FOR BALANCING ONLY.
7. TEMPERATURE CONTROL – UPON OUTDOOR AIR TEMPERATURE FALLING BELOW 40° F (ADJ.), SYSTEM CONTROLLER SHALL SEND TO BOILER CONTROLLER AN ADJUSTABLE SNOWMELT HEATING HOT WATER TEMPERATURE SETPOINT MEASURED BY THE MAIN SUPPLY WATER TEMPERATURE SENSOR. IF NO MOISTURE IS DETECTED BY THE SLAB MOISTURE DETECTION SENSOR THE SYSTEM SHALL OPERATE IN AN IDLE MODE. IDLE MODE: SYSTEM PUMP ON AND THE SUPPLY WATER TEMPERATURE SETPOINT AT 90° F (ADJ.).
   A. UPON DETECTION OF MOISTURE RESET THE SUPPLY WATER TEMPERATURE SETPOINT ON THE FOLLOWING:
      a. AT 0°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 120°F (ADJ.).
      b. AT 15°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 115°F (ADJ.).
      c. AT 25°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 105°F (ADJ.).
      d. AT 40°F (ADJ.) OUTDOOR AIR TEMPERATURE, SET SUPPLY WATER TEMPERATURE AT 90°F (ADJ.).
8. SYSTEM CONTROLLER SHALL MONITOR SNOWMELT HEATING HOT WATER SYSTEM GALLONS PER MINUTE (GPM).
9. SYSTEM SAFETY SHUTDOWNS – WHEN EMERGENCY BUTTON(S) LOCATED OUTSIDE OF BOILER ROOM IS ACTIVE, SYSTEM CONTROLLER SHALL RESPOND BASED ON THE FOLLOWING:
   A. SYSTEM SHALL BE DISABLED WHEN EMERGENCY BUTTON(S) IS ACTIVE.
   B. DE-ENERGIZED BOILER, PUMP DISABLED AND ALARM GENERATED.
      a. PUMP SHALL REMAIN ON FOR A PERIOD OF TIME PRIOR TO BE DISABLED.
10. MONITOR AND ALARM GLYCOL MAKE-UP UNIT LOW LEVEL ALARM.

SEQUENCE OF OPERATIONS (CONT'D)

ROOFTOP UNIT (RTU-1D) SEQUENCE OF OPERATION:

1. PROVIDE DIRECT DIGITAL CONTROLS FOR PACKAGE ROOFTOP SYSTEM OPERATION. A MAJORITY OF THE CONTROLS WILL BE PROVIDED BY THE UNIT MANUFACTURER. THE SEQUENCE OF OPERATIONS WILL BE IMPLEMENTED BY THE MANUFACTURER PER THEIR RECOMMENDED OPERATION. THE ATTACHED SEQUENCE ACTS AS SUGGESTED SEQUENCE. THERE WILL BE ADDITIONAL POINTS NOT COVERED BY THE MANUFACTURER THAT NEED TO BE COVERED BY THE CONTROLS CONTRACTOR. COORDINATE ALL POINTS SHOWN WITH EQUIPMENT MANUFACTURER FOR A COMPLETE OPERATING SYSTEM. THE SYSTEM SHALL BE PROVIDED WITH A BACNET THERMOSTAT FOR COMMUNICATION WITH THE BMS SYSTEM. THERMOSTAT SHALL ALLOW SCHEDULING, AND COOLING AND HEATING SET POINT ADJUSTMENT THROUGH THE BMS. UNIT CONSISTS OF A MULTI-SPEED SUPPLY FAN, DUCT MOUNTED POWER EXHAUST FAN, (2) STAGE NATURAL GAS HEATER SECTION, BIPOLAR IONIZATION, MERV 13 FILTERS, OUTDOOR / RETURN AIR DAMPERS AND ACTUATOR AND (2) STAGE DX COOLING SYSTEM.
2. SETPOINTS BASED ON THE FOLLOWING;
   A. OCCUPIED 75°F COOLING / 70°F HEATING
   B. STANDBY 77°F COOLING / 68°F HEATING (BASED ON LIGHTING OCCUPANCY SENSOR(S))
   C. UNOCCUPIED 80°F COOLING / 65°F HEATING
   D. CO2 800 PPM MINIMUM / 1,000 PPM MAXIMUM
   E. ALL ABOVE SETPOINTS ARE ADJUSTABLE.
3. ROOFTOP UNIT ADJUSTABLE SCHEDULE BASED ON THE FOLLOWING:
   A. TIME OF DAY (TOD) SCHEDULE, TO BE DETERMINED BY OWNER (CONSULT WITH OWNER).
4. START/STOP, CONTROLLED DEVICES SHALL RESPOND AS FOLLOWS:
   A. WHEN INDEXED TO STOP: DISABLE SUPPLY AND RELIEF FAN SIMULTANEOUSLY OUTDOOR AND RELIEF AIR DAMPERS 100% CLOSED AND RETURN AIR DAMPER 100% OPEN.
   B. WHEN INDEXED TO START: ENABLE SUPPLY FAN, RUNS CONTINUOUSLY IN OCCUPIED MODE WITH OPERATION OF SYSTEM TO ENGAGE AFTER START-UP DELAY. RELIEF FAN SHALL ALSO START AND FAN SPEED SHALL BE CONTROLLED BY SPACE DIFFERENTIAL PRESSURE TO MAINTAIN A SLIGHTLY POSITIVE PRESSURE.
5. OCCUPIED TEMPERATURE CONTROL - SYSTEM CONTROLLER SHALL ADJUST SPEED OF SUPPLY FAN, STAGE GAS HEATER SYSTEM, STAGE DX COOLING SYSTEM AND MODULATE RETURN AND OUTDOOR AIR DAMPERS TO MAINTAIN AN ADJUSTABLE SPACE TEMPERATURE SETPOINT MEASURED BY A SPACE TEMPERATURE SENSOR.
   A. HEATING: UPON A FALL IN SPACE TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, UNIT SHALL OPERATE AT LOW FAN SPEED. THE FIRST STAGE OF HEATING SHALL BE ENABLED AND THE SECOND STAGE SHALL BE ENABLED AS NECESSARY. AS HEATING DEMAND INCREASES BEYOND THE FIRST STAGE THE FAN SPEED SHALL BE ADJUSTED TO 100% AND THE SECOND STAGE HEATING SHALL BE ENABLED TO MAINTAIN THE SPACE SET POINT TEMPERATURE.
      a. ALARM IF FAILURE WITH THE GAS HEATER SYSTEMS.
   B. COOLING: UPON A RISE IN SPACE TEMPERATURE ABOVE SPACE TEMPERATURE SETPOINT, UNIT SHALL OPERATE AT LOW FAN SPEED. THE FIRST STAGE OF COOLING SHALL BE ENABLED AND THE SECOND STAGE SHALL BE ENABLED AS NECESSARY. AS COOLING DEMAND INCREASES BEYOND THE FIRST STAGE THE FAN SPEED SHALL BE ADJUSTED TO 100% AND THE SECOND STAGE COOLING SHALL BE ENABLED TO MAINTAIN SPACE SET POINT TEMPERATURE.
      a. WHEN OUTDOOR AIR TEMPERATURE IS ACCEPTABLE 8°F (ADJ.) BELOW SPACE TEMERATURE SET POINT AND THERE IS A DEMAND FOR COOLING THEN DRY BULB ECONOMIZER SHALL BE UTILIZED.
      b. ALARM IF FAILURE WITH THE DX COOLING SYSTEMS.
6. RELIEF FAN CONTROL – ON DURING OCCUPIED MODE OR ANYTIME UNIT IS IN THE ECONOMIZER MODE. FAN SPEED SHALL BE CONTROLLED BY SPACE DIFFERENTIAL PRESSURE TO MAINTAIN A SLIGHTLY POSITIVE PRESSURE. CORRESPONDING RELIEF AIR DAMPER SHALL OPEN 100% AND CLOSE WHEN FAN IS OFF.
7. FAN INITIAL START-UP CONTROL – WHEN INDEXED TO START, SYSTEM CONTROLLER SHALL ENABLE FANS BASED ON THE FOLLOWING:
   A. WHEN ENABLED, AND AFTER A DELAY OF TWO (2) MINUTES (ADJ.) WITH NO STATUS SENSED, DDC SHALL INDICATE A CRITICAL ALARM.
      a. IF SUPPLY FAN STATUS IS NOT SENSED, THE SYSTEM SHALL BE DISABLED.
      b. IF RELIEF FAN STATUS IS NOT SENSED THEN ALARM AND DISABLE ECONOMIZER.
   B. WHEN ENABLED AND STATUS IS SENSED BY THE CURRENT SENSOR, A TOTALIZE OF RUN HOURS FOR FAN WILL BE ACTIVE.
8. ECONOMIZER CONTROL – SYSTEM CONTROLLER SHALL MODULATE MIXED AIR DAMPERS TO MEET SPACE TEMPERATURE SET POINT WHEN OUTDOOR AIR TEMPERATURE IS 8°F (ADJ.) BELOW THE SPACE SET POINT TEMERATURE WITH A DEMAND FOR COOLING.
9. CO2 CONTROL – SYSTEM CONTROLLER SHALL OVERRIDE MIXED AIR DAMPER CONTROLS IN NON-ECONOMIZING MODE USING RETURN DUCT MOUNTED OR SPACE CO2 SENSOR(S) TO INCREASE OUTDOOR ABSOLUTE MINIMUM CFM TO A MAXIMUM MIMIMUM CFM. MAXIMUM MIMIMUM SHALL NOT EXCEED 950 CFM PER UNIT.
   A. UPON RETURN DUCT/SPACE CO2 SENSOR EXCEEDING SETPOINT (800 PPM ADJ.), START TO MODULATE MIXED AIR DAMPERS (OUTDOOR AIR DAMPER OPENING) IN GRADUAL INCREMENTS UNTIL CO2 SENSOR SETPOINT IS SATISFIED.
      a. MODULATE MIXED AIR DAMPERS DOWN TO ITS ABSOLUTE MINIMUM POSITION 400 CFM PER UNIT UPON SATISFYING SENSOR SETPOINT.
   B. ALARM HIGH CO2, 1,200 PPM (ADJ.)
10. FILTER MONITORING - SYSTEM CONTROLLER SHALL MONITOR AND ALARM DYNAMIC FILTER PRESSURE DIFFERENTIAL PRESSURE DROP(S) FOR THE FOLLOWING:
    A. FILTERS
       a. MONITORING OF PSID
       b. ALARM SETPOINT 0.75"W.C. (ADJ.)
11. UNOCCUPIED CONTROL – SYSTEM CONTROLLER SHALL INITIATE THE FOLLOWING BASED ON A FALL OR RISE IN SPACE TEMPERATURE:
    A. HEATING: ROOFTOP UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100%, RELIEF FAN OFF AND HEATER STAGING AS NECESSARY.
    B. COOLING: ROOFTOP UNIT SHALL CYCLE TO MAINTAIN SPACE UN-OCCUPIED SET POINT TEMPERATURE. THE SUPPLY FAN SHALL BE AT 100% SPEED, OUTSIDE AIR DAMPER CLOSED 100%, RETURN AIR DAMPER OPENED 100%, RELIEF FAN OFF (UNLESS ECONOMIZER IS ENABLED) AND DX STAGING OR ECONOMIZER AS NECESSARY. PROVIDE SEQUENCE FOR THE OWNER TO DISABLE COOLING DURING THIS TIME IF PREFERRED.
12. STANDBY MODE - WITH USE OF THE LIGHTING OCCUPANCY SENSOR, IN THE OCCUPIED MODE, IF NO OCCUPANTS ARE WITHIN THE SPACE THE UNITS SHALL OPERATE THE SAME AS THE UNOCCUPIED MODE BUT MAINTAINING THE STANDBY TEMPERATURE SETPOINTS. AN ADJUSTABLE DELAY OF 15 MINUTES SHALL BE INCORPORATED WHEN NO OCCUPANTS ARE DETECTED AND UNITS SWITCH TO THE STANDBY MODE.
13. INITIAL STARTUP CONTROL – SYSTEM CONTROLLER SHALL ENABLE UNITS PRIOR TO SCHEDULED OCCUPANCY UTILIZING OPTIMUM START LOGIC TO ADJUST STARTUP TIME FOR UNITS BASED ON OUTDOOR AIR TEMPERATURE, BUILDING TEMPERATURE AND HISTORIC ELAPSE TIME TO REACH SETPOINT.
    A. UNITS SHALL ENERGIZE AND PROVIDE HEATING AND COOLING BASED ON THE SPACE TEMPERATURE SENSORS TO BRING SPACE TO OCCUPIED SETPOINT. THE OUTDOOR AIR DAMPERS SHALL BE CLOSED UNLESS ECONOMIZER IS ENABLED. ONCE OCCUPIED SETPOINT HAS BEEN REACHED, THE UNITS SHALL SWITCH TO OCCUPIED MODE.
14. TIMED OVERRIDE CONTROL - SYSTEM CONTROLLER SHALL ENABLE UNITS WHEN ASSOCIATED SPACE TIMED OVERRIDE (2 HOURS (ADJ)) IS ENABLED, SYSTEM SHALL BE ENABLE AND FUNCTION AS IN OCCUPIED MODE.
15. SAFETY SHUTDOWNS:
    A. DUCT MOUNTED IONIZATION SMOKE DETECTOR(S) PROVIDED BY DIVISION 28 SHALL DE-ENERGIZE THE UNIT WHENEVER PRODUCTS OF COMBUSTION ARE SENSED.

LIGHTING CONTROLS SYSTEM:
THE NEW LIGHTING CONTROLS SYSTEM SHALL BE INTEGRATED WITH THE BUILDING MANAGEMENT SYSTEM (BMS). ALL NEW LIGHTING SHALL BE CONTROLLED (SCHEDULING) AND MONITORED BY THE BMS. PROVIDE COMMUNICATIONS GATEWAY AND ALL NECESSARY COMPONENTS FOR INTERFACE BETWEEN THE TWO SYSTEMS.

FREEZER AND COOLER MONITORING FOR KITCHEN:
1. PROVIDE DIRECT DIGITAL CONTROLS (DDC) FOR FREEZER/COOLER MONITORING BASED ON THE FOLLOWING:
   A. SYSTEM SHALL BE MONITORED BY (DDC) BASED ON MONITORING, TRENDING AND ALARMING OF TEMPERATURES.

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ADDENDUM 1 NOVEMBER 29, 2021

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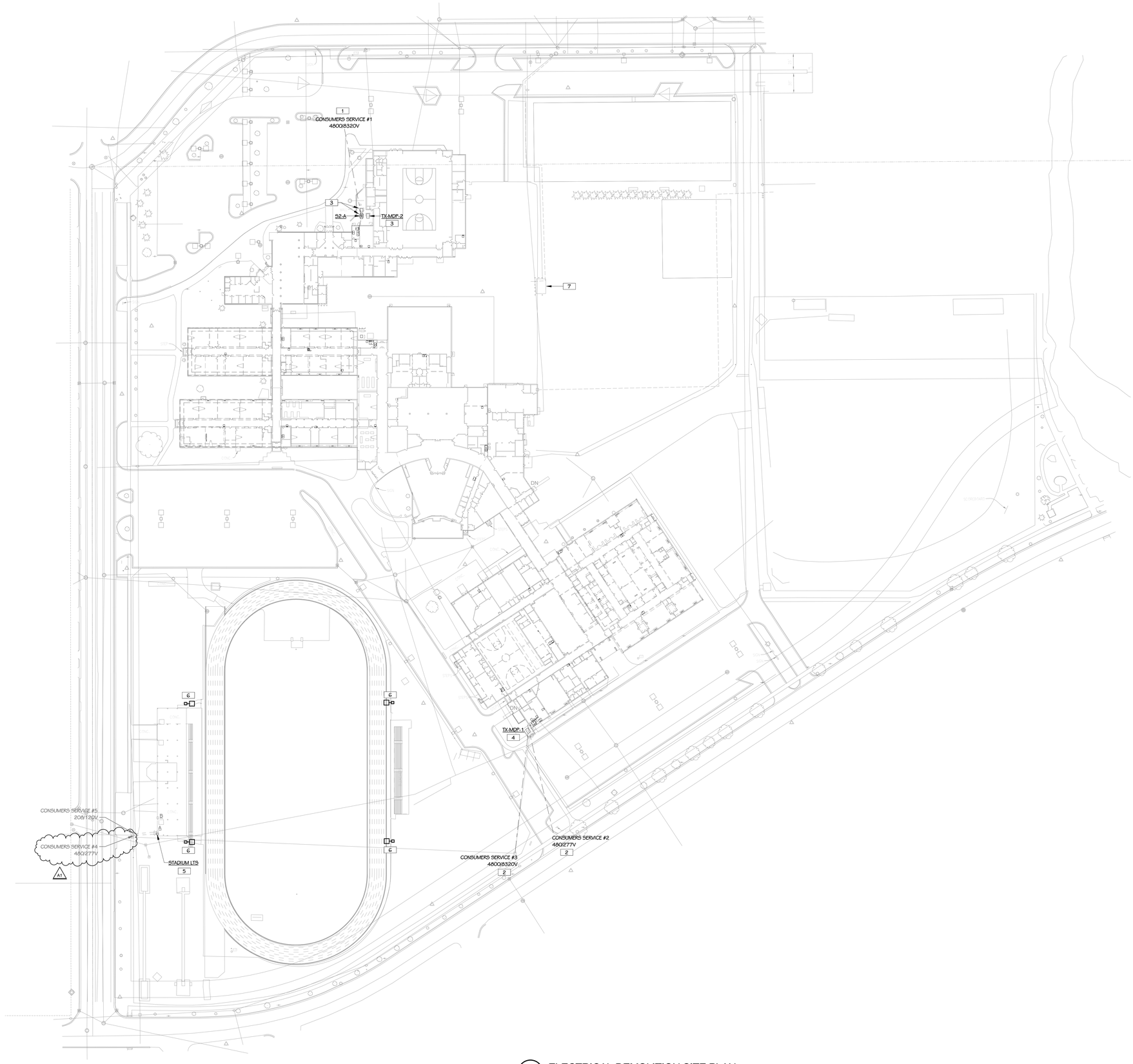
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
TEMPERATURE CONTROLS

DATE
NOVEMBER 03, 2021

SHEET NUMBER
M 607.2
17-175.70



ELECTRICAL DEMOLITION SITE PLAN
1" = 60'-0"

ELECTRICAL DEMOLITION KEYED NOTES

1. EXISTING UNDERGROUND UTILITY SERVICE TO BE DISCONNECTED TO FACILITATE DEMOLITION OF PRIMARY ELECTRICAL EQUIPMENT. UTILITY SERVICE TO REMAIN AND BE RECONNECTED IN NEW CONSTRUCTION. COORDINATE WORK WITH CONSUMERS ENERGY.
2. EXISTING UNDERGROUND UTILITY SERVICE TO BE DISCONNECTED AND REMOVED. COORDINATE WORK WITH CONSUMERS ENERGY.
3. REMOVE EXISTING UTILITY PAD-MOUNT METER CABINET, PRIMARY SWITCH AND TRANSFORMER. REMOVE CABLING AND CONDUIT BACK TO SOURCE. COORDINATE UTILITY DEMOLITION WORK WITH CONSUMERS ENERGY.
4. REMOVE EXISTING UTILITY PAD-MOUNT TRANSFORMER. REMOVE CABLING AND CONDUIT BACK TO SOURCE. COORDINATE UTILITY DEMOLITION WORK WITH CONSUMERS ENERGY.
5. REMOVE EXISTING STADIUM LIGHTING PANELBOARD AND ASSOCIATED CABLING AND CONDUIT BACK TO UTILITY METER. COORDINATE UTILITY DEMOLITION WORK WITH CONSUMERS ENERGY. (A1)
6. DISCONNECT AND REMOVE EXISTING ATHLETIC FIELD LIGHTING AND ASSOCIATED POLE, WIRING AND CONDUIT BACK TO SOURCE.
7. DISCONNECT AND REMOVE ELECTRICAL FROM SHED TO BE DEMOLISHED. REMOVE ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.

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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

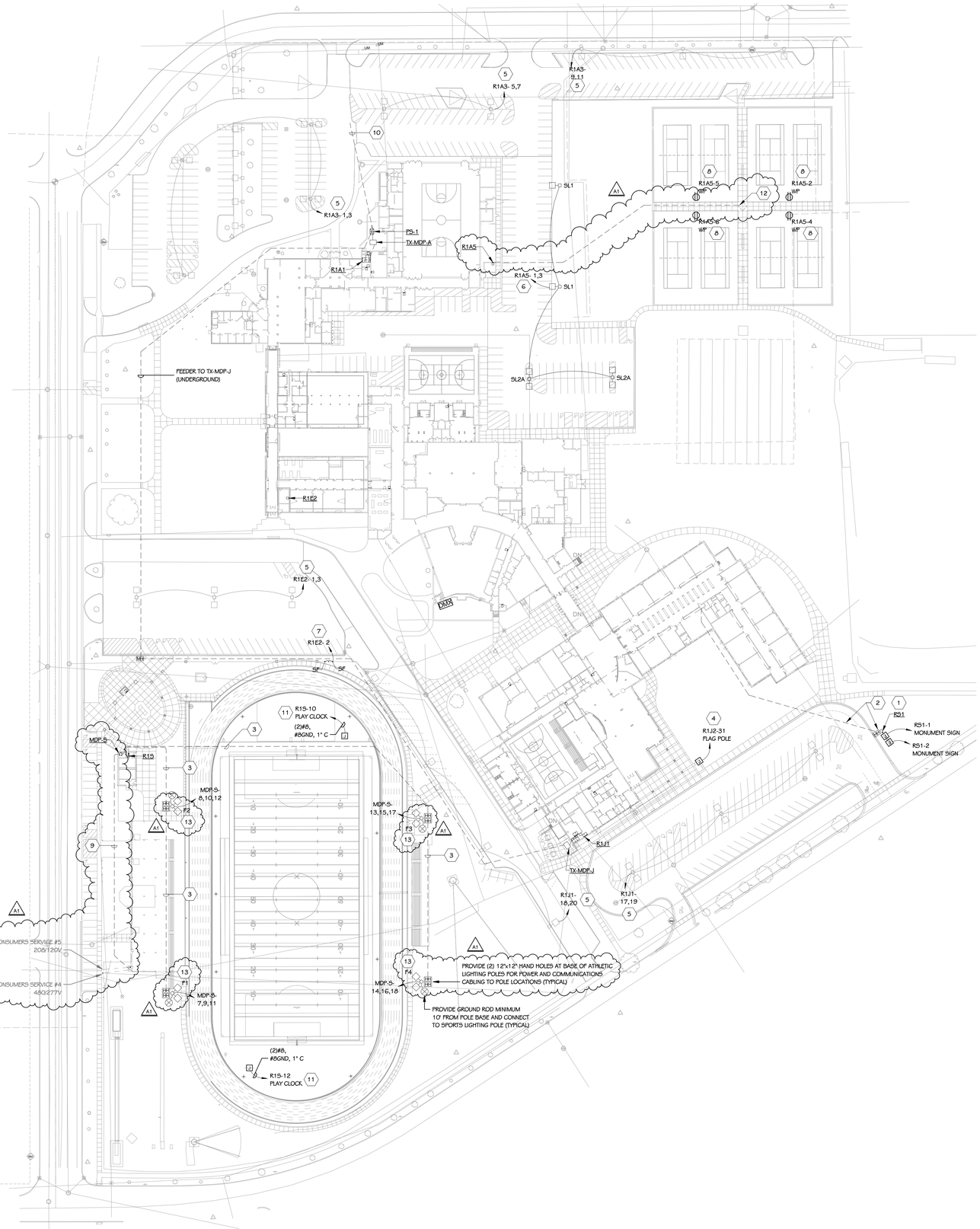
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

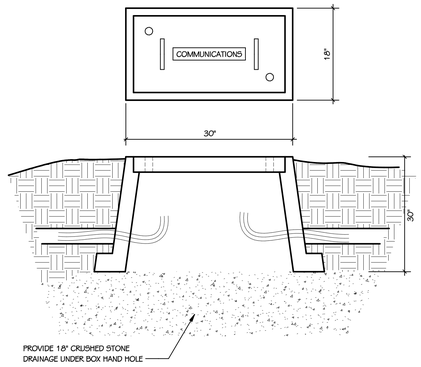
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ELECTRICAL DEMOLITION SITE PLAN

DATE
NOVEMBER 3, 2021

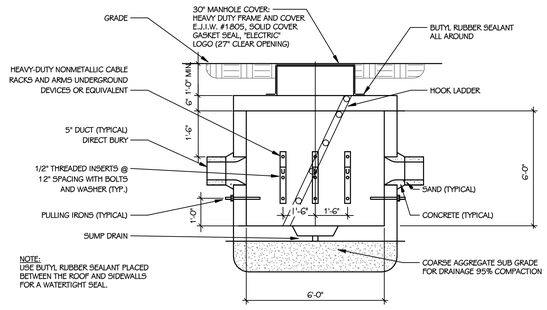
SHEET NUMBER
ED 010.2
17-175.70



ELECTRICAL SITE PLAN
1" = 60'-0"



HAND HOLE DETAILS
SCALE: NONE



MANHOLE DETAIL
SCALE: NONE

ELECTRICAL KEYED NOTES

1 PROVIDE SQUARE D #MPZB7S40F MINI POWER-ZONE TO FEED MONUMENT SIGN POWER CIRCUITS.

2 INSTALL (1) 2" CONDUIT FROM TECH 025T UNDERGROUND TO NEW 12"x12" HAND HOLE FOR COMMUNICATIONS CABLING TO NEW MONUMENT SIGN.

3 PROVIDE (2) 1-1/2" CONDUITS TO SPORTS LIGHTING POLE(S) FOR POWER AND COMMUNICATIONS CABLING.

4 CONNECT FLAG POLE LIGHTING CIRCUIT TO LIGHTING CONTROL SYSTEM FOR REMOTE CONTROL AND MONITORING.

5 INTERECPT EXISTING SITE LIGHTING BRANCH CIRCUIT AND REFEED FROM INDICATED PANELBOARD.

6 ROUTE BRANCH CIRCUIT TO SITE LIGHTING WITH (3)#10, #10GND, 3/4" CONDUIT FROM INDICATED PANELBOARD.

7 GROUND MOUNT SPOT LIGHTING FIXTURE(S) MINIMUM 5' FROM FLAG POLE AND AIM FIXTURE(S) AT FLAG AND CONNECT TO INDICATED CIRCUIT. ROUTE (2)#10, #10GND, 3/4" CONDUIT FROM ASSOCIATED PANELBOARD. COORDINATE FINAL LOCATION IN FIELD WITH LANDSCAPE DRAWINGS. SEE ALSO GROUND MOUNTED LIGHTING BASE DETAIL, SHEET E422.2.

8 PROVIDE GFI RECEPTACLE WITH WEATHER PROOF COVER IN POST IN LOCATION INDICATED. SEE ALSO TENNIS BALL MACHINE CONNECTION DETAIL, SHEET E422.2.

A1 9 NEW SECONDARY FEEDER FROM EXISTING UTILITY OWNED METER TO NEW PANELBOARD MDP-S. COORDINATE WORK WITH CONSUMERS ENERGY.

10 RECONNECT EXISTING UTILITY FEED MADE AVAILABLE THROUGH DEMOLITION AND CONNECT TO PRIMARY SWITCH PS-1. COORDINATE WORK WITH CONSUMERS ENERGY.

11 DIRECTIONALLY BORE CONDUIT FROM INDICATED PANELBOARD TO POST FOR NEW PLAY CLOCK. COORDINATE FINAL LOCATION IN FIELD WITH EQUIPMENT INSTALLER.

12 DIRECTIONALLY BORE 1" CONDUIT FROM PANELBOARD R1A5 TO FUTURE PAVILION LOCATION. PROVIDE PULL STRING FOR FUTURE CABLING AND CAP CONDUIT AT PAVILION LOCATION.

A1 13 STADIUM PA SPEAKERS TO BE MOUNTED TO ATHLETIC LIGHTING POLE. COMMUNICATIONS CABLING TO BE ROUTED INTERNAL TO POLE IN (1) 3/4" CONDUIT FROM IN-GRADE HAND HOLE AT BASE OF POLE.

ELECTRICAL SPORTS LIGHTING FEEDER SCHEDULE - PACKAGE 2

DESCRIPTION	FED FROM PANEL	FED FROM CIRCUIT	CURRENT (FLA)	BREAKER / POLES	FEEDER # OF SETS	FEEDER WIRE	FEEDER GROUND
480 V							
LIGHTING - FIELD - POLE F1	MDP-S	7,9,11	21 A	30 A / 3	1 SET	4 #8	#8 GND.
LIGHTING - FIELD - POLE F2	MDP-S	8,10,12	21 A	30 A / 3	1 SET	4 #10	#10 GND.
LIGHTING - FIELD - POLE F3	MDP-S	13,15,17	21 A	30 A / 3	1 SET	4 #8	#8 GND.
LIGHTING - FIELD - POLE F4	MDP-S	14,16,18	21 A	30 A / 3	1 SET	4 #6	#6 GND.

SITE LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	MOUNTING	WATTS	MANUFACTURER	NOTES
F1	ATHLETIC PERFORMANCE LIGHT	80' POLE	17625 VA	MUSCO: (8) #TLC-LED-1500, (1) #TLC-LED-1200, (2) #TLC-BT-575, (1) #TLC-LED-400	1, 2, 3
F2	ATHLETIC PERFORMANCE LIGHT	80' POLE	17625 VA	MUSCO: (8) #TLC-LED-1500, (1) #TLC-LED-1200, (2) #TLC-BT-575, (1) #TLC-LED-400	1, 2, 3
F3	ATHLETIC PERFORMANCE LIGHT	80' POLE	17625 VA	MUSCO: (8) #TLC-LED-1500, (1) #TLC-LED-1200, (2) #TLC-BT-575	1, 2, 3
F4	ATHLETIC PERFORMANCE LIGHT	80' POLE	17625 VA	MUSCO: (8) #TLC-LED-1500, (1) #TLC-LED-1200, (2) #TLC-BT-575	1, 2, 3

1 ALL LED FIXTURES TO HAVE WARRANTY TO MEET OR EXCEED WARRANTY INCLUDED IN BASIS OF DESIGN. FIXTURES LISTED AS EQUALS SHALL MEET DELIVERED LUMENS, CRI, EFFICACY AND OPTIONS OF THAT SPECIFIED. REFER TO SPECIFICATIONS 265668 FOR ADDITIONAL REQUIREMENTS.

2 THE MOUNTING DESCRIPTION IS GENERAL. REFER TO SHOP DRAWINGS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR SPECIFIC MOUNTING DETAILS.

A1 3 PROVIDE SINGLE GANG ROUGH-IN AT 15' ABOVE FINISHED GRADE ON FIELD SIDE OF POLE WITH (1) 3/4" CONDUIT ROUTED INTERNAL TO POLE STRUCTURE. PROVIDE HAND HOLE(S) IN POLE AS REQUIRED TO PULL COMMUNCATIONS CABLING TO POLE MOUNTED PA DEVICES. SEE ELECTRICAL SITE PLAN, THIS SHEET FOR MORE INFORMATION.

SITE LIGHT FIXTURE SCHEDULE

TYPE	DESCRIPTION	MOUNTING	WATTS	MANUFACTURER	NOTES
5F	SITE FLAGPOLE LIGHT	KNUCKLE	20 VA	HUBBELL: #LBUL-20-4K	1, 2
SL1	SINGLE HEAD SITE LIGHT	30' POLE	104 VA	CREE: #OSQ-M-B-16L-40K7-3M-UL-BZ-PML, #OSQ-ML-B-DA-BZ POLE: CREE #PS4530RTBZ	1, 2
SL2A	DUAL HEAD SITE LIGHT	30' POLE	208 VA	HEAD 1: CREE #OSQ-M-B-16L-40K7-3M-UL-BZ-PML, #OSQ-ML-B-DA-BZ HEAD 2: CREE #OSQ-M-B-16L-40K7-3M-UL-BZ-PML, #OSQ-ML-B-DA-BZ POLE: CREE #PS4530RTBZ	1, 2
SL2B	DUAL HEAD SITE LIGHT	30' POLE	208 VA	HEAD 1: CREE #OSQ-M-B-16L-40K7-4M-UL-BZ-PML, #OSQ-ML-B-DA-BZ HEAD 2: CREE #OSQ-M-B-16L-40K7-4M-UL-BZ-PML, #OSQ-ML-B-DA-BZ POLE: CREE #PS4530RTBZ	1, 2

1 ALL LED FIXTURES TO HAVE WARRANTY TO MEET OR EXCEED WARRANTY INCLUDED IN BASIS OF DESIGN. FIXTURES LISTED AS EQUALS SHALL MEET DELIVERED LUMENS, CRI, EFFICACY AND OPTIONS OF THAT SPECIFIED. REFER TO SPECIFICATIONS 265100 AND 265600 FOR ADDITIONAL REQUIREMENTS.

2 THE MOUNTING DESCRIPTION IS GENERAL. REFER TO SHOP DRAWINGS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR SPECIFIC MOUNTING DETAILS.

3 REFER TO BUILDING ELEVATIONS FOR FIXTURE PLACEMENT, CENTER OVER DOORS, ALIGN SIMILAR FIXTURES.

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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
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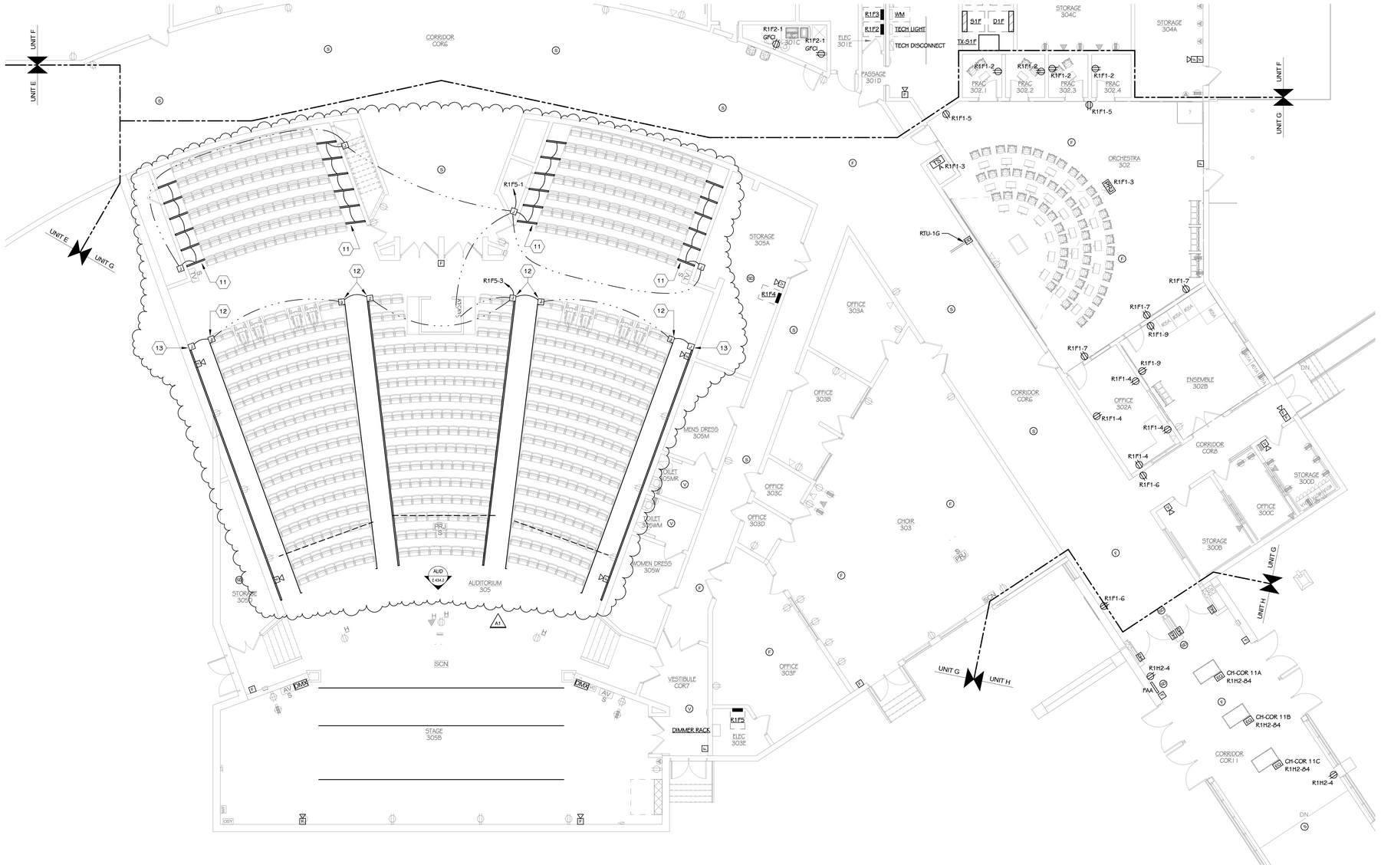
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL SITE PLAN

DATE
NOVEMBER 3, 2021

SHEET NUMBER
ES010.2
17-175.70



FIRST FLOOR POWER PLAN - UNIT G

1/8" = 1'-0"

ELECTRICAL KEYED NOTES

1 PROVIDE (2) 3" SLEEVES BETWEEN FIRST AND SECOND FLOOR TECH CLOSETS.

2 ROUTE CONDUIT FOR DATA AND A/V CABLING UP TO ACCESSIBLE CEILING SPACE THROUGH NEAREST WALL.

3 CONNECT RECEPTACLE TO LOAD SIDE OF ADJACENT GFI RECEPTACLE.

4 COORDINATE NUMBER OF WATER FLOW AND TAMPER DEVICES WITH FIRE PROTECTION AND PRE-ACTION SHOP DRAWINGS.

5 PROVIDE WIREMOLD #AL3300 SURFACE RACEWAY WITH NEMA 5-20R DUPLEX RECEPTACLES MOUNTED ON TOP OF BRICK LEDGE ADJACENT TO ALUMINUM CURTAINWALL (RECEPTACLE FACE UP). PROVIDE ALL END FITTINGS, DIVIDERS AND EQUIPMENT FOR A COMPLETE INSTALLATION. DEVICES MOUNTED IN RACEWAY TO BE GRAY IN COLOR (TYPICAL ALONG EXTERIOR WALL).

6 ROUTE (1) 2" CONDUIT ABOVE ACCESSIBLE CEILING SPACE FROM MDF IN TECH 314 TO IDF IN STORAGE 5185 FOR DATA CABLING.

7 ROUTE (3)#3, #8GND, 1-1/4" CONDUIT FROM PANELBOARD R1S TO PANELBOARD IN PREFABRICATED TICKET BOOTH. PROVIDE ALSO (1) 1" CONDUIT FROM ELEC 900 AND STUB UP INTO TICKET BOOTH IT RACK FOR DATA CABLING.

8 ROUTE (1) 1" CONDUIT UNDERGROUND FROM ELEC 900 TO 24" ABOVE FINISHED GRADE ON NORTH FACE OF BLEACHER SUPPORT COLUMN. PROVIDE PULL STRING IN CONDUIT AND CAP CONDUIT AT COLUMN.

9 PROVIDE NEW RECESSED PANELBOARD. RECONNECT ALL EXISTING FEEDERS AND BRANCH CIRCUITS TO REMAIN. FIELD VERIFY EXISTING BRANCH CIRCUIT QUANTITIES AND SIZES. PROVIDE UPDATED PANELBOARD DIRECTORY. COORDINATE CIRCUIT BREAKER SIZES WITH EXISTING CIRCUIT SIZES.

10 CONNECT EXISTING KITCHEN HOOD FIRE PROTECTION SYSTEM TO NEW BUILDING FIRE ALARM SYSTEM.

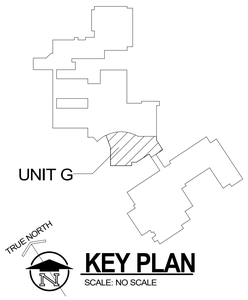
11 PROVIDE CALI #STL6150-6'-10V-1%-3.0K-SLC-3'4" STEP LIGHT (TYPICAL FOR STEPS) AND CONNECT TO INDICATED CIRCUIT. CONNECT TO CONTROL SWITCH AT CONTROL BOOTH IN AUDITORIUM. PROVIDE ALL REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

12 PROVIDE CALI #AIL1800-6'-10V-1%-3.0K-SLC-45'3" AISLE LIGHT AND CONNECT TO INDICATED CIRCUIT. CONNECT TO CONTROL SWITCH AT CONTROL BOOTH IN AUDITORIUM. PROVIDE ALL REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

13 PROVIDE CALI #AIL1700-6'-10V-1%-3.0K-SLC-45'3" AISLE LIGHT AND CONNECT TO INDICATED CIRCUIT. CONNECT TO CONTROL SWITCH AT CONTROL BOOTH IN AUDITORIUM. PROVIDE ALL REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

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CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
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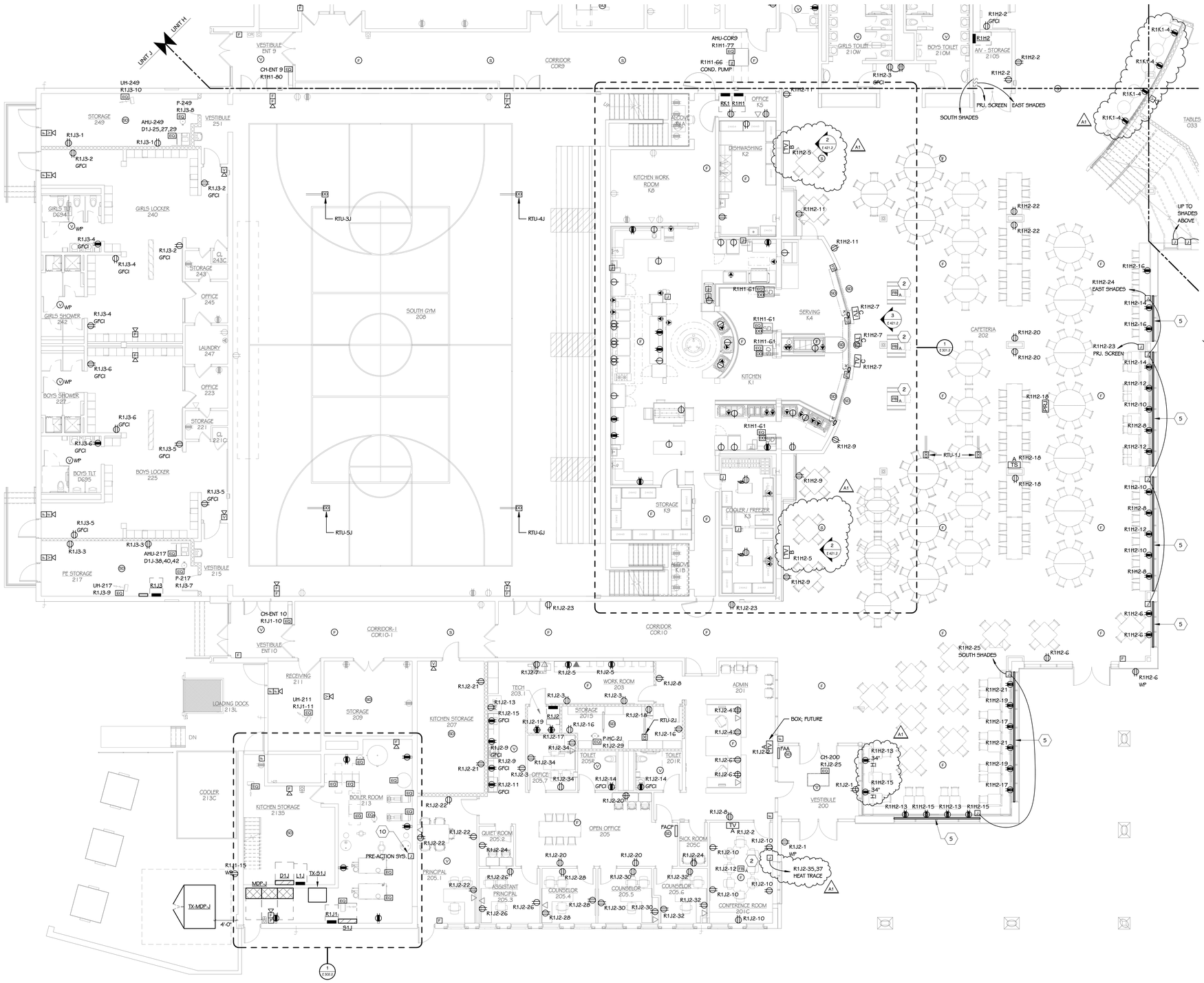
Cadillac, Michigan

SHEET TITLE
FIRST FLOOR POWER PLAN - UNIT G

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 101.2G

17-175.70



FIRST FLOOR POWER PLAN - UNIT J

1/8" = 1'-0"

ELECTRICAL KEYED NOTES

1 PROVIDE (2) 3" SLEEVES BETWEEN FIRST AND SECOND FLOOR TECH CLOSETS.

2 ROUTE CONDUIT FOR DATA AND A/V CABLING UP TO ACCESSIBLE CEILING SPACE THROUGH NEAREST WALL.

3 CONNECT RECEPTACLE TO LOAD SIDE OF ADJACENT GFI RECEPTACLE.

4 COORDINATE NUMBER OF WATER FLOW AND TAMPER DEVICES WITH FIRE PROTECTION AND PRE-ACTION SHOP DRAWINGS.

5 PROVIDE WIREMOLD #AL3300 SURFACE RACEWAY WITH NEMA 5-20R DUPLEX RECEPTACLES MOUNTED ON TOP OF BRICK LEDGE ADJACENT TO ALUMINUM CURTAINWALL (RECEPTACLE FACE UP). PROVIDE ALL END FITTINGS, DIVIDERS AND EQUIPMENT FOR A COMPLETE INSTALLATION. DEVICES MOUNTED IN RACEWAY TO BE GRAY IN COLOR (TYPICAL ALONG EXTERIOR WALL).

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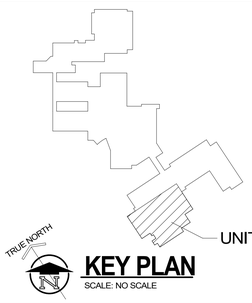
10 CONNECT EXISTING KITCHEN HOOD FIRE PROTECTION SYSTEM TO NEW BUILDING FIRE ALARM SYSTEM.

11 PROVIDE CALI #STL6150-6"-10V-1%-3.0K-SLC-3'4" STEP LIGHT (TYPICAL FOR STEPS) AND CONNECT TO INDICATED CIRCUIT. CONNECT TO CONTROL SWITCH AT CONTROL BOOTH IN AUDITORIUM. PROVIDE ALL REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

12 PROVIDE CALI #AIL1800-6"-10V-1%-3.0K-SLC-45'3" AISLE LIGHT AND CONNECT TO INDICATED CIRCUIT. CONNECT TO CONTROL SWITCH AT CONTROL BOOTH IN AUDITORIUM. PROVIDE ALL REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

13 PROVIDE CALI #AIL1700-6"-10V-1%-3.0K-SLC-45'3" AISLE LIGHT AND CONNECT TO INDICATED CIRCUIT. CONNECT TO CONTROL SWITCH AT CONTROL BOOTH IN AUDITORIUM. PROVIDE ALL REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

CADILLAC HIGH SCHOOL



KEY PLAN

SCALE: NO SCALE

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

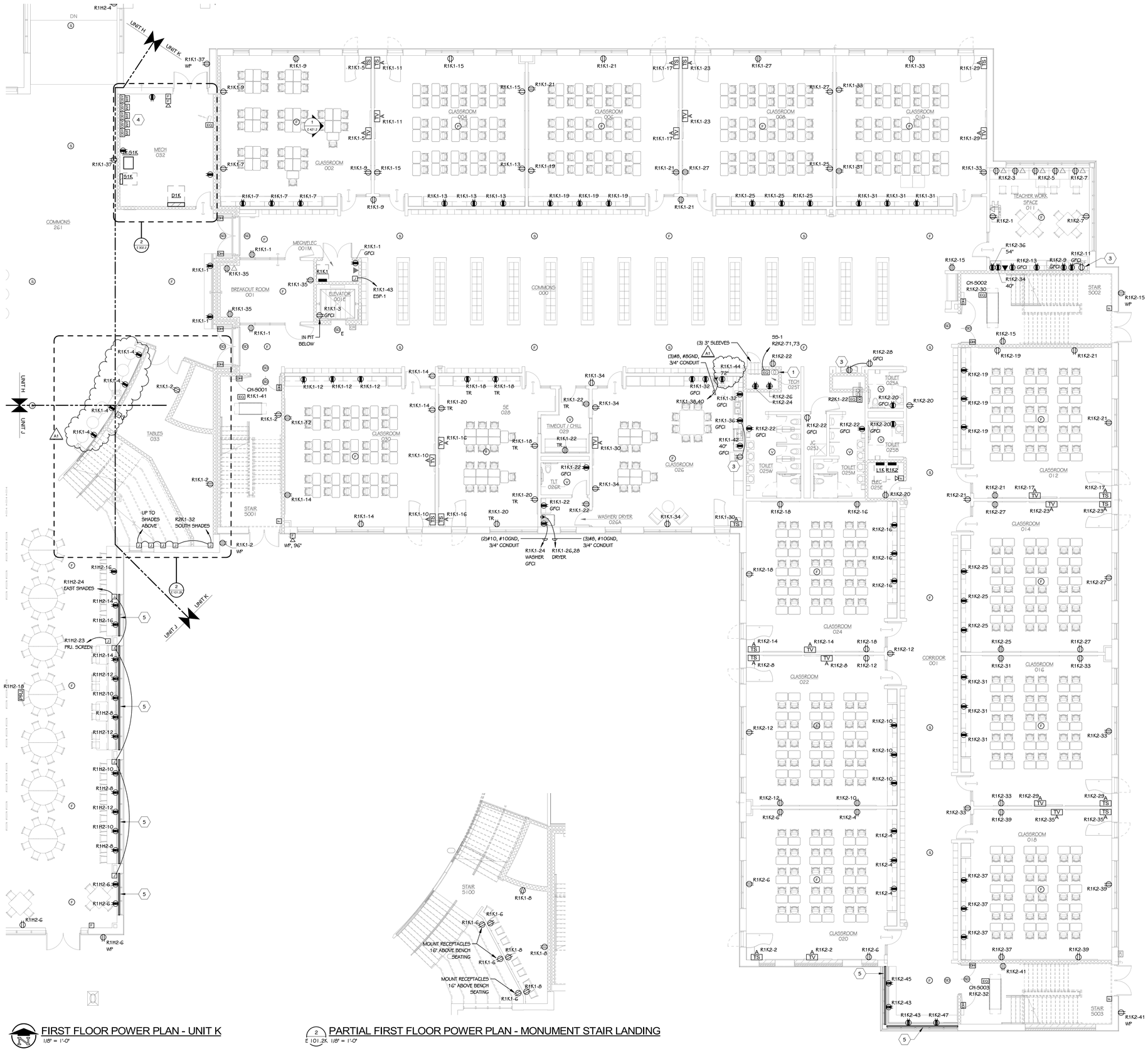
OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
FIRST FLOOR POWER PLAN - UNIT J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E101.2J
17-175.70



FIRST FLOOR POWER PLAN - UNIT K
1/8" = 1'-0"

2 E101.2K PARTIAL FIRST FLOOR POWER PLAN - MONUMENT STAIR LANDING
1/8" = 1'-0"

ELECTRICAL KEYED NOTES

1 PROVIDE (2) 3" SLEEVES BETWEEN FIRST AND SECOND FLOOR TECH CLOSETS.

2 ROUTE CONDUIT FOR DATA AND A/V CABLING UP TO ACCESSIBLE CEILING SPACE THROUGH NEAREST WALL.

3 CONNECT RECEPTACLE TO LOAD SIDE OF ADJACENT GFI RECEPTACLE.

4 COORDINATE NUMBER OF WATER FLOW AND TAMPER DEVICES WITH FIRE PROTECTION AND PRE-ACTION SHOP DRAWINGS.

5 PROVIDE WIREMOLD #AL3300 SURFACE RACEWAY WITH NEMA 5-20R DUPLEX RECEPTACLES MOUNTED ON TOP OF BRICK LEDGE ADJACENT TO ALUMINUM CURTAINWALL (RECEPTACLE FACE UP). PROVIDE ALL END FITTINGS, DIVIDERS AND EQUIPMENT FOR A COMPLETE INSTALLATION. DEVICES MOUNTED IN RACEWAY TO BE GRAY IN COLOR (TYPICAL ALONG EXTERIOR WALL).

6 ROUTE (1) 2" CONDUIT ABOVE ACCESSIBLE CEILING SPACE FROM MDF IN TECH 314 TO IDF IN STORAGE 5185 FOR DATA CABLING.

7 ROUTE (3)#3, #8GND, 1-1/4" CONDUIT FROM PANELBOARD R1S TO PANELBOARD IN PREFABRICATED TICKET BOOTH. PROVIDE ALSO (1) 1" CONDUIT FROM ELEC 900 AND STUB UP INTO TICKET BOOTH IT RACK FOR DATA CABLING.

8 ROUTE (1) 1" CONDUIT UNDERGROUND FROM ELEC 900 TO 24" ABOVE FINISHED GRADE ON NORTH FACE OF BLEACHER SUPPORT COLUMN. PROVIDE PULL STRING IN CONDUIT AND CAP CONDUIT AT COLUMN.

9 PROVIDE NEW RECESSED PANELBOARD. RECONNECT ALL EXISTING FEEDERS AND BRANCH CIRCUITS TO REMAIN. FIELD VERIFY EXISTING BRANCH CIRCUIT QUANTITIES AND SIZES. PROVIDE UPDATED PANELBOARD DIRECTORY. COORDINATE CIRCUIT BREAKER SIZES WITH EXISTING CIRCUIT SIZES.

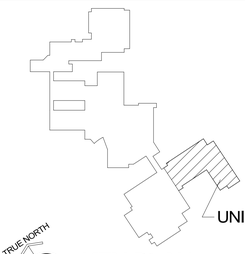
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CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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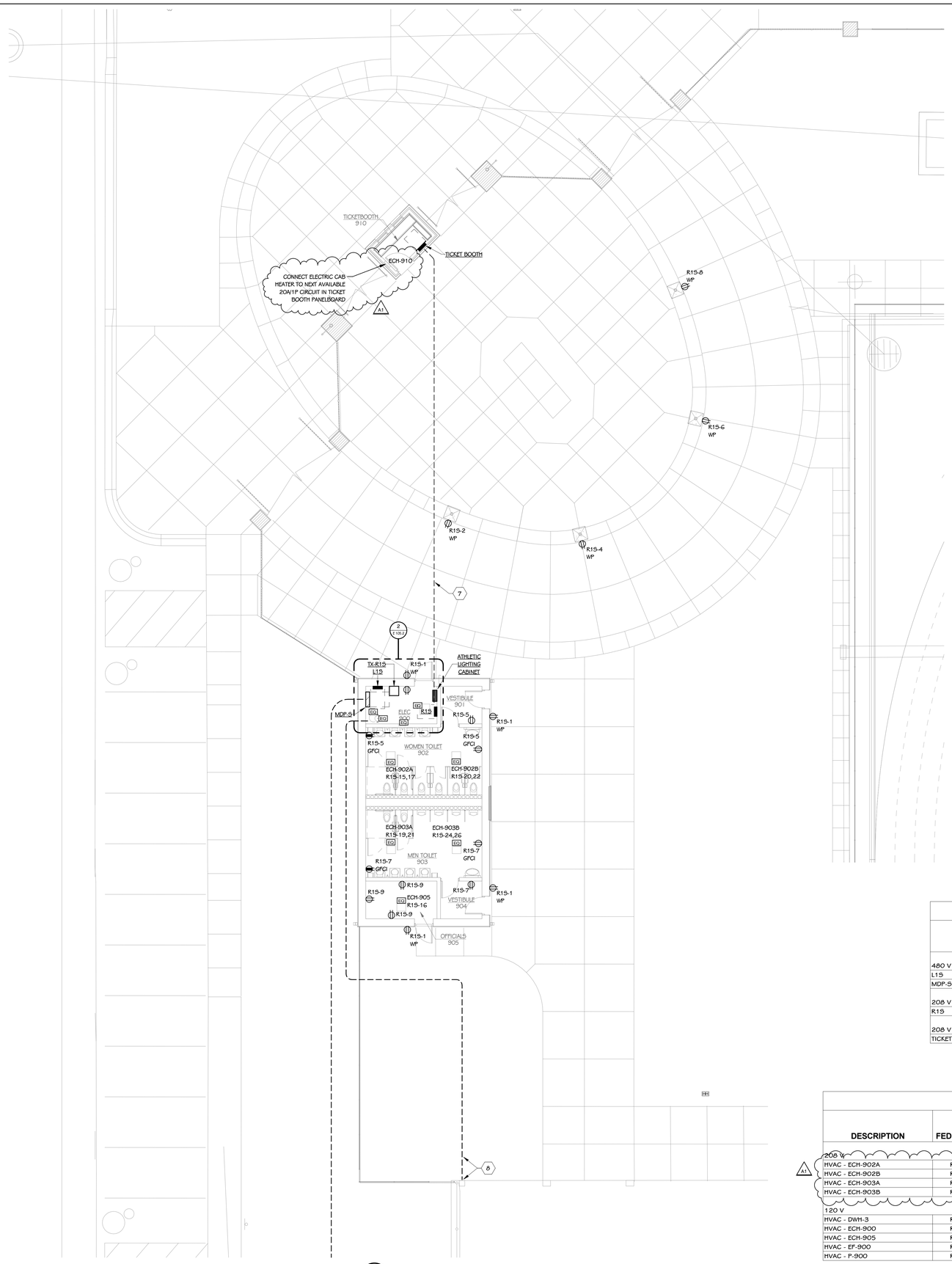
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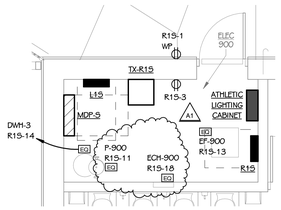
SHEET TITLE
FIRST FLOOR POWER PLAN - UNIT K

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E101.2K
17-175.70



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



2 E105.2 ENLARGED POWER PLAN - ELEC 900 - STADIUM
1/4" = 1'-0"

ELECTRICAL KEYED NOTES

1 PROVIDE (2) 3" SLEEVES BETWEEN FIRST AND SECOND FLOOR TECH CLOSETS.

2 ROUTE CONDUIT FOR DATA AND A/V CABLING UP TO ACCESSIBLE CEILING SPACE THROUGH NEAREST WALL.

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7 ROUTE (3)#3, #8GND, 1-1/4" CONDUIT FROM PANELBOARD R15 TO PANELBOARD IN PREFABRICATED TICKET BOOTH. PROVIDE ALSO (1) 1" CONDUIT FROM ELEC 900 AND STUB UP INTO TICKET BOOTH IT RACK FOR DATA CABLING.

8 ROUTE (1) 1" CONDUIT UNDERGROUND FROM ELEC 900 TO 24" ABOVE FINISHED GRADE ON NORTH FACE OF BLEACHER SUPPORT COLUMN. PROVIDE PULL STRING IN CONDUIT AND CAP CONDUIT AT COLUMN.

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ELECTRICAL PANEL FEEDER SCHEDULE - STADIUM

DESCRIPTION	FED FROM	CURRENT (FLA)	DEMAND (FLA)	FEEDER BREAKER / POLES	FEEDER # OF SETS	FEEDER WIRE	FEEDER GROUND	FEEDER EMT	FEED VOLT DROP %	NOTES
480 V										
L15	MDP-5	1 A	1 A	100 A / 3	1 SET	4 #3	#8 GND.	1 1/4"	0.00%	
MDP-5	TX-2	113 A	113 A	400 A / 3	1 SET	4 #600 KCMIL	#3 GND.	4"	0.26%	
208 V										
R15	TX-R15	62 A	62 A	225 A / 3	1 SET	4 #4/0	#4 GND.	2 1/2"	0.20%	
208 V										
TICKET BOOTH	R15	0 A	0 A	100 A / 2	1 SET	3 #3	#8 GND.	1 1/4"	0.00%	

ELECTRICAL HVAC FEEDER SCHEDULE - PACKAGE 2 STADIUM

DESCRIPTION	FED FROM	DISCONNECT MEANS	CURRENT (FLA)	DEMAND (FLA)	FEEDER BREAKER / POLES	FEEDER # OF SETS	FEEDER WIRE	FEEDER GROUND	FEEDER EMT	FEED VOLT DROP %	NOTES
208 V											
HVAC - ECH-902A	R15	30A NON-FUSED DISCONNECT	14 A	14 A	20 A / 2	1 SET	3 #12	#12 GND.	3/4"	1.39%	
HVAC - ECH-902B	R15	30A NON-FUSED DISCONNECT	14 A	14 A	20 A / 2	1 SET	3 #12	#12 GND.	3/4"	1.25%	
HVAC - ECH-903A	R15	30A NON-FUSED DISCONNECT	14 A	14 A	20 A / 2	1 SET	3 #12	#12 GND.	3/4"	1.84%	
HVAC - ECH-903B	R15	30A NON-FUSED DISCONNECT	14 A	14 A	20 A / 2	1 SET	3 #12	#12 GND.	3/4"	1.65%	
120 V											
HVAC - DWH-3	R15	30A FUSED DISCONNECT, LOCKABLE	21 A	21 A	30 A / 1	1 SET	2 #10	#10 GND.	3/4"	1.95%	
HVAC - ECH-900	R15	MANUAL MOTOR STARTER	15 A	15 A	20 A / 1	1 SET	2 #12	#12 GND.	3/4"	2.00%	
HVAC - ECH-905	R15	MANUAL MOTOR STARTER	13 A	13 A	20 A / 1	1 SET	2 #10	#10 GND.	3/4"	2.02%	
HVAC - EF-900	R15	MANUAL MOTOR STARTER	6 A	6 A	20 A / 1	1 SET	2 #12	#12 GND.	3/4"	0.71%	
HVAC - P-900	R15	MANUAL MOTOR STARTER	2 A	2 A	20 A / 1	1 SET	2 #12	#12 GND.	3/4"	0.29%	

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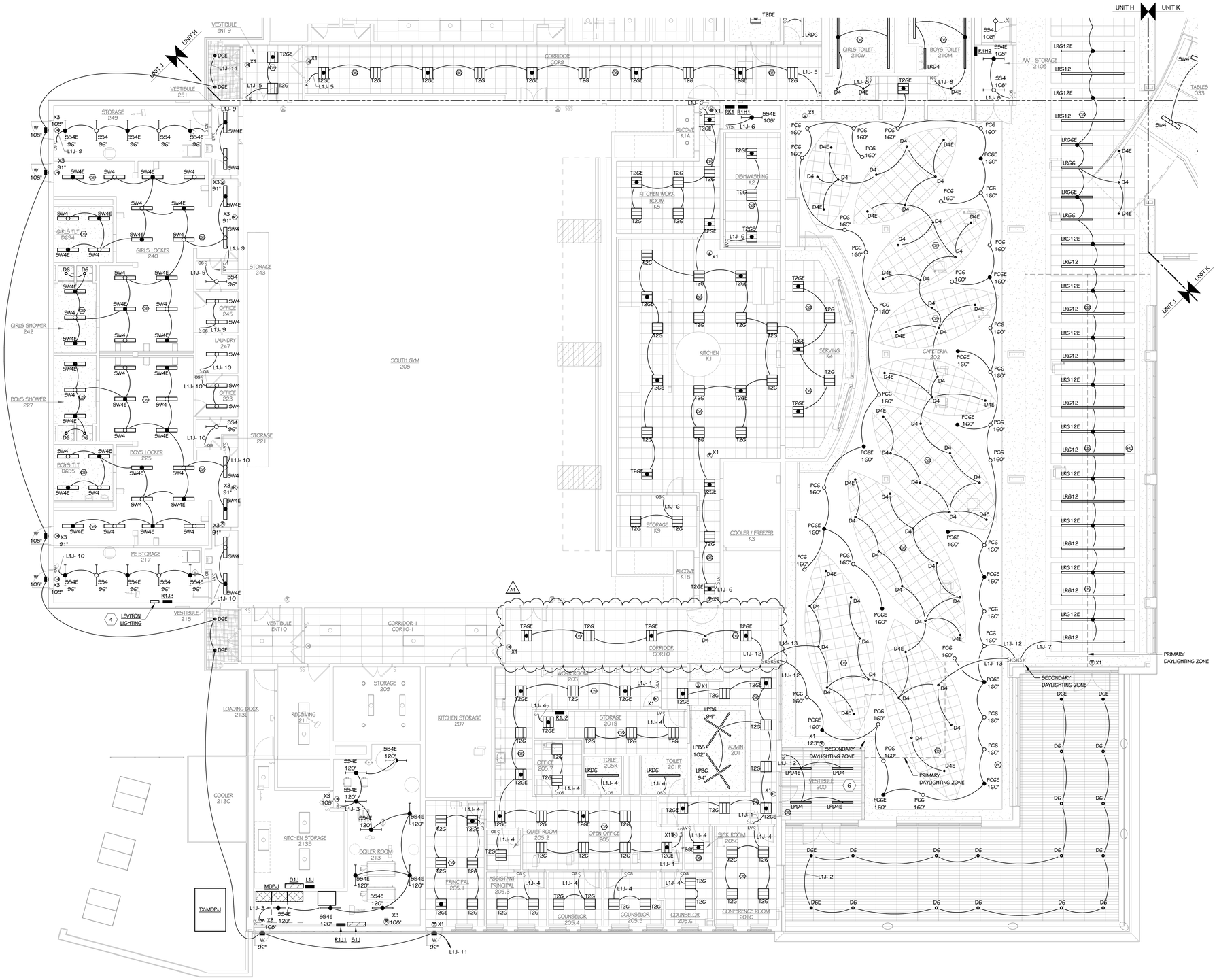
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
FIRST FLOOR POWER PLAN - STADIUM

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E105.2
17-175.70



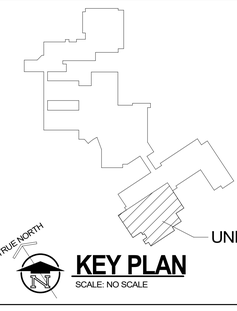
FIRST FLOOR LIGHTING PLAN - UNIT J

1/8" = 1'-0"

ELECTRICAL KEYED NOTES

1. ALTERNATE #5: EXTEND LIGHTING CIRCUIT AND CONNECT TO NEW LIGHTING FIXTURES AS INDICATED.
2. REUSE EXISTING POWER DISTRIBUTION/MOUNTING RAILS AND HARDWARE FOR NEW STAGE LIGHTING FIXTURES.
3. EXTEND EXISTING CIRCUIT CONDUCTORS AND CONNECT NEW LIGHTING FIXTURE TO OPERATE WITH LIGHTING WITHIN THE SPACE.
4. REINSTALL GYMNASIUM LIGHTING CONTROL PANEL MADE AVAILABLE THROUGH DEMOLITION IN NEW LOCATION. EXTEND EXISTING WIRING AND CONDUIT AS REQUIRED TO RECONNECT ASSOCIATED LIGHTING CIRCUITS.
5. SUSPEND PENDANT CYLINDER FIXTURES IN THE SPACE EVEN WITH BOTTOM SURFACE OF ADJACENT CEILING CLOUDS.
6. SUSPEND LIGHTING FIXTURE(S) WITHIN THE SPACE FROM STRUCTURE ABOVE SO THAT BOTTOM OF FIXTURE IS EVEN WITH ADJACENT METAL PANEL CEILING.
7. EXTEND LIGHTING CIRCUIT AND CONNECT TO NEW LIGHTING FIXTURES AS INDICATED. NEW LIGHTING SHALL OPERATE AND BE CONTROLLED IN SAME MANNER AS PRIOR TO DEMOLITION OF EXISTING LIGHTING FIXTURES.

CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

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PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

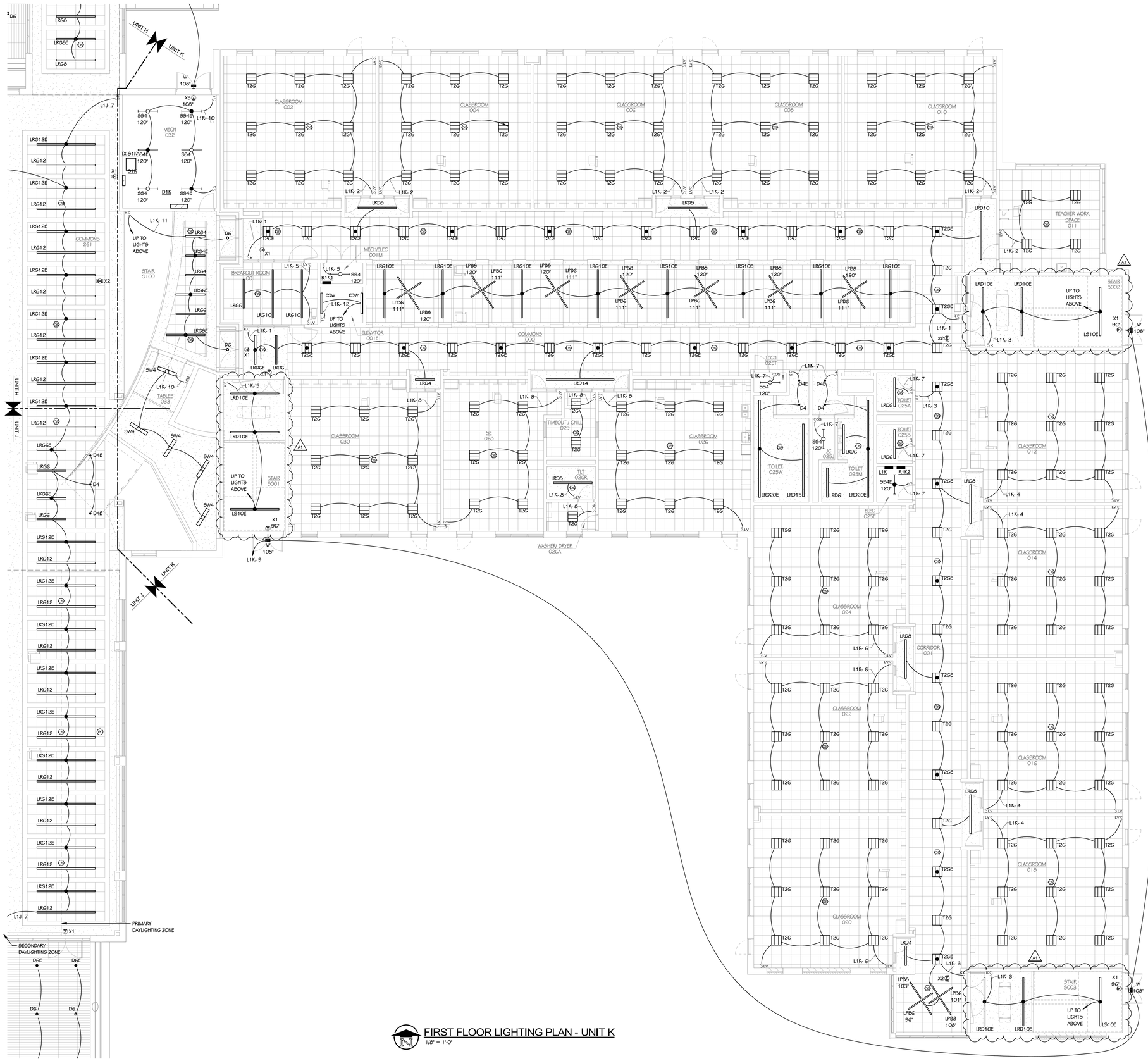
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Cadillac, Michigan

SHEET TITLE
FIRST FLOOR LIGHTING PLAN - UNIT J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 201.2J
17-175.70



FIRST FLOOR LIGHTING PLAN - UNIT K
1/8" = 1'-0"

ELECTRICAL KEYED NOTES

1 ALTERNATE #5: EXTEND LIGHTING CIRCUIT AND CONNECT TO NEW LIGHTING FIXTURES AS INDICATED.

2 REUSE EXISTING POWER DISTRIBUTION/MOUNTING RAILS AND HARDWARE FOR NEW STAGE LIGHTING FIXTURES.

3 EXTEND EXISTING CIRCUIT CONDUCTORS AND CONNECT NEW LIGHTING FIXTURE TO OPERATE WITH LIGHTING WITHIN THE SPACE.

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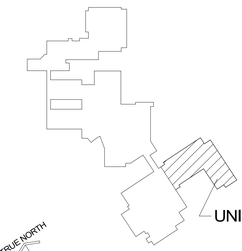
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CADILLAC HIGH SCHOOL



KEY PLAN
SCALE: NO SCALE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
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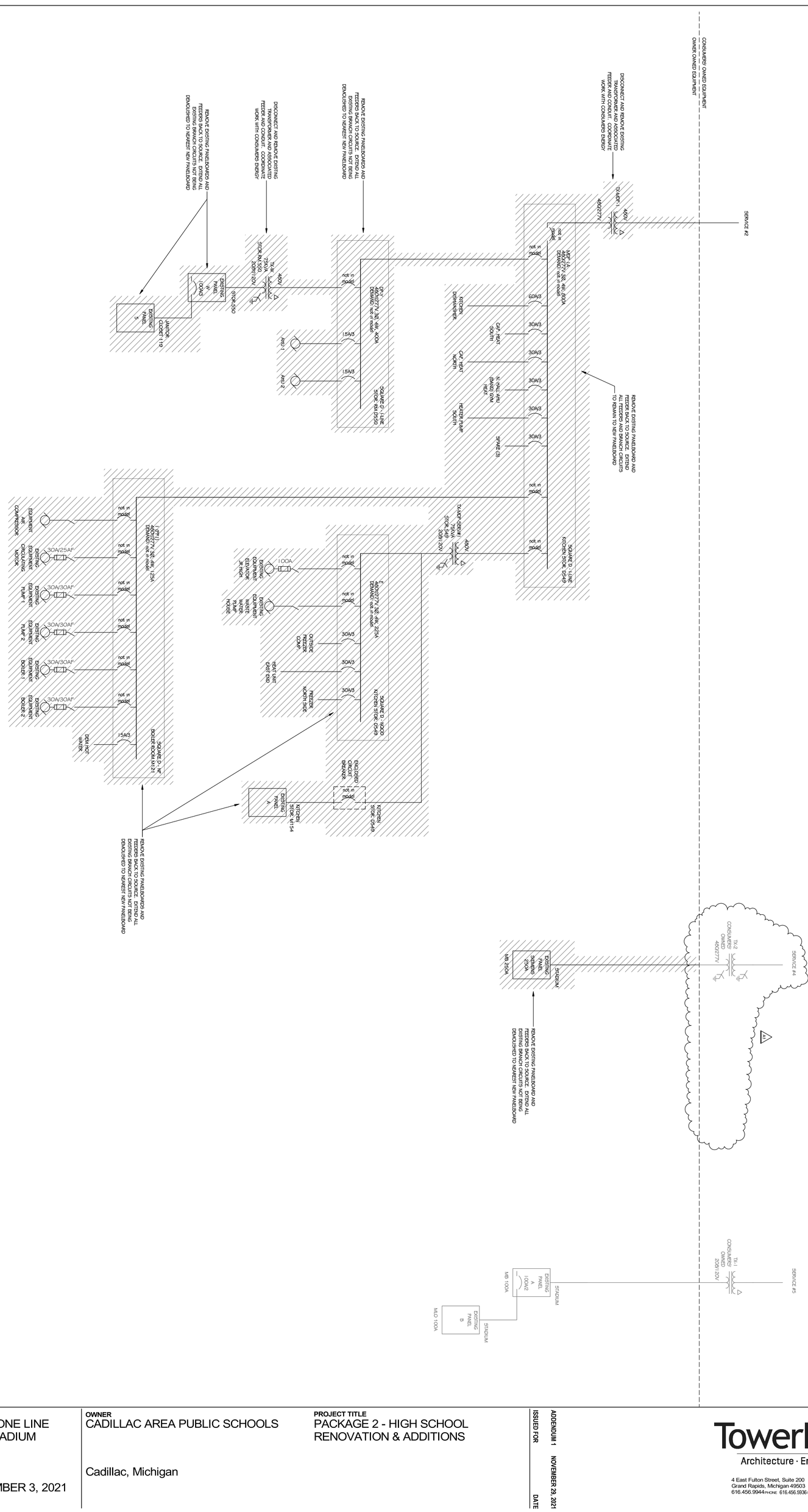
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Cadillac, Michigan

SHEET TITLE
FIRST FLOOR LIGHTING PLAN - UNIT K

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 201.2K
17-175.70



ELECTRICAL DEMOLITION ONE LINE DIAGRAM - MDP 1A AND STADIUM
SCALE: NONE

SHEET TITLE
ELECTRICAL DEMOLITION ONE LINE DIAGRAM - MDP 1A AND STADIUM

SHEET NUMBER
E 404.2
17-175.70

DATE
NOVEMBER 3, 2021

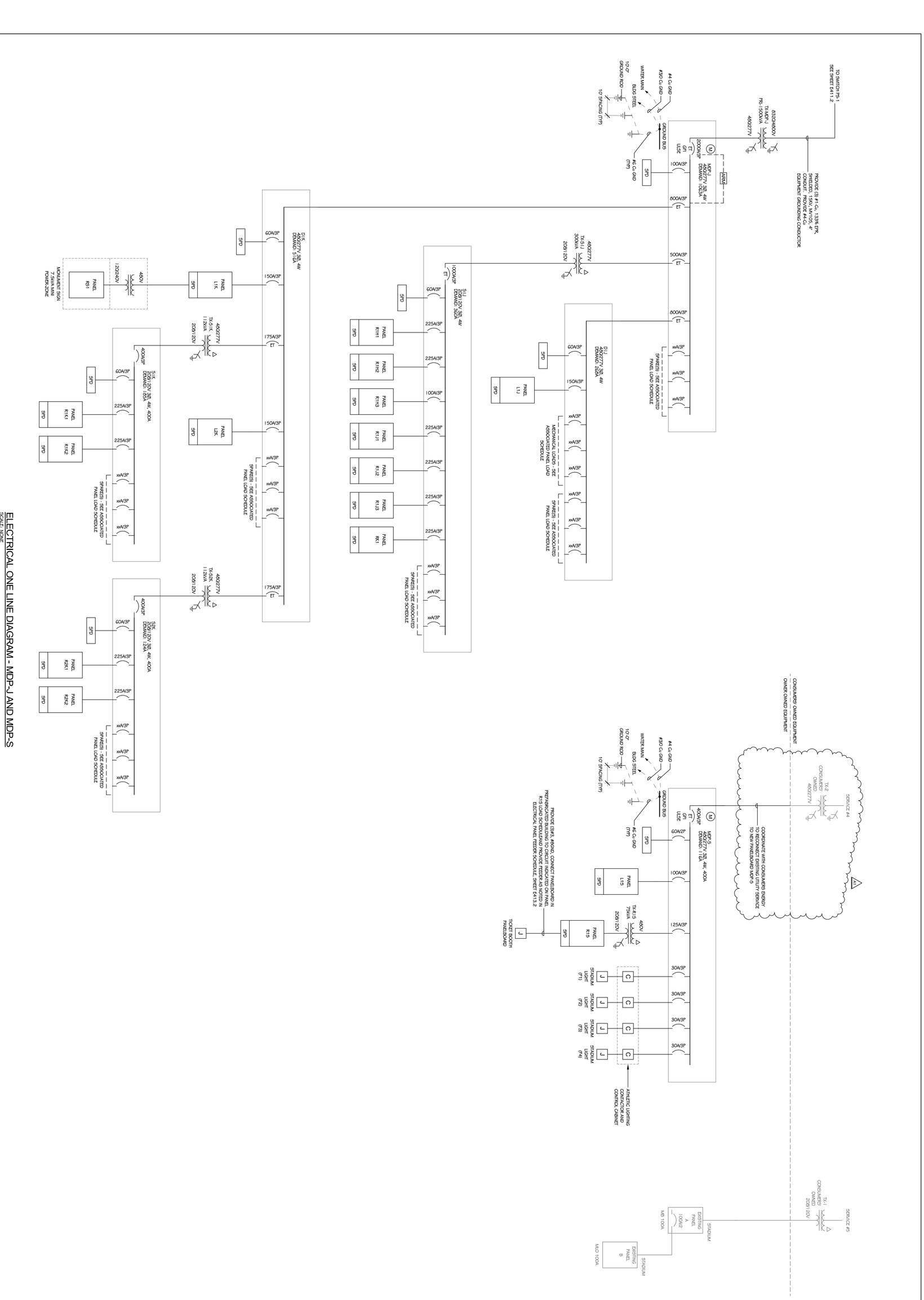
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Cadillac, Michigan

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

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SHEET TITLE
ELECTRICAL ONE-LINE DIAGRAM - MDP-J AND MDP-S

SHEET NUMBER
E 412.2
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DISTRIBUTION PANEL " MDP-A" LOAD SCHEDULE

SWITCHBOARD: MDP-A
LOCATION: TRANSFORMERS...
OPTIONS: SPD

VOLTAGE: 480/277V
FED FROM: TX-MDP-A
MAINS RATING: 2500 A
I.C. RATING: 44902 A1

CIRCUIT NUMBER	LOAD NAME	RATING	NUMBER OF POLES	APPARENT CURRENT
1	TX-S1A	500 A	3	327 A
2	TX-S1D	500 A	3	224 A
3	D1A	800 A	3	28 A
4	D1D	800 A	3	70 A
5	D1E	400 A	3	77 A
6	D1F	800 A	3	369 A
7	SPARE	600 A	3	--
8	SPARE	400 A	3	--
9	SPARE	400 A	3	--
10	SPARE	250 A	3	--
11	SPARE	250 A	3	--
12	SPARE	250 A	3	--
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

TOTAL CONNECTED VA:	910505 VA
TOTAL CONNECTED AMPS:	1095 A
TOTAL DEMAND VA:	901915 VA
TOTAL DEMAND AMPS:	1085 A

PANELBOARD " D1A" LOAD SCHEDULE

PANEL: D1A
LOCATION: TRANSFORMERS 612 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 800 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-A
I.C. RATING: 37583 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	L1A	150	3	618	3733					3	20	HVAC - P-3	2
3	--	--	--			0	3733			--	--	--	4
5	--	--	--					0	3733	--	--	--	6
7	HVAC - P-4	20	3	3733	0					3	60	SPARE	8
9	--	--	--			3733	0			--	--	--	10
11	--	--	--					3733	0	--	--	--	12
13	SPARE	60	3	0	0					3	60	SPARE	14
15	--	--	--			0	0			--	--	--	16
17	--	--	--					0	0	--	--	--	18
19	SPARE	30	3	0	0					3	30	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	20	3	0	0					3	20	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
	TOTAL LOAD:			8085 VA		7467 VA		7467 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			29 A		27 A		27 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	22400 VA	100.00%	22400 VA		
LIGHTING -	618 VA	100.00%	618 VA	**TOTAL CONNECTED LOAD:**	23018 VA
				TOTAL ESTIMATED DEMAND:	23018 VA
				TOTAL CONNECTED LOAD (A):	28 A
				TOTAL ESTIMATED DEMAND...	28 A

NOTES:

PANELBOARD " D1D" LOAD SCHEDULE

PANEL: D1D
LOCATION: ELECTRICAL 317 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 800 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-A
I.C. RATING: 23565 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	L1D	150	3	4808	1472					3	20	HVAC - AHU-523	2
3	--	--	--			1619	1472			--	--	--	4
5	--	--	--					1733	1472	--	--	--	6
7	HVAC - RTU-1D	50	3	9699	3333					3	20	HVAC - ACCU-523	8
9	--	--	--			9699	3333			--	--	--	10
11	--	--	--					9699	3333	--	--	--	12
13	HVAC - RTU-1D PR	20	3	2245	0					3	100	SPARE	14
15	--	--	--			2245	0			--	--	--	16
17	--	--	--					2245	0	--	--	--	18
19	SPARE	60	3	0	0					3	60	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	20	3	0	0					3	20	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
	TOTAL LOAD:			21557 VA		18368 VA		18482 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			78 A		66 A		67 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	50247 VA	100.00%	50247 VA		
LIGHTING -	8161 VA	100.00%	8161 VA	**TOTAL CONNECTED LOAD:**	58408 VA
				TOTAL ESTIMATED DEMAND:	58408 VA
				TOTAL CONNECTED LOAD (A):	70 A
				TOTAL ESTIMATED DEMAND...	70 A

NOTES:

PANELBOARD " D1E" LOAD SCHEDULE

PANEL: D1E
LOCATION: STORAGE 407S / FIRST FLOOR -...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 600 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-A
I.C. RATING: 9676 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	L1E	150	3	697	13511					3	225	TX-S1E	2
3	--	--	--			0	16411			--	--	--	4
5	--	--	--					0	14249	--	--	--	6
7	HVAC - SCVUV-406A	20	3	2965	3436					3	20	HVAC - SCVUV-406B	8
9	--	--	--			2965	3436			--	--	--	10
11	--	--	--					2965	3436	--	--	--	12
13	SPARE	60	3	0	0					3	60	SPARE	14
15	--	--	--			0	0			--	--	--	16
17	--	--	--					0	0	--	--	--	18
19	SPARE	20	3	0	0					3	20	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	20	3	0	0					3	20	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
	TOTAL LOAD:			20610 VA		22812 VA		20650 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			74 A		82 A		75 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	51775 VA	100.00%	51775 VA		
LIGHTING -	1946 VA	100.00%	1946 VA	**TOTAL CONNECTED LOAD:**	64072 VA
RECEPTACLE -	1620 VA	100.00%	1620 VA	**TOTAL ESTIMATED DEMAND:**	64072 VA
Spare	8732 VA	100.00%	8732 VA	**TOTAL CONNECTED LOAD (A):**	77 A
				TOTAL ESTIMATED DEMAND...	77 A

NOTES:

PANELBOARD " D1F" LOAD SCHEDULE

PANEL: D1F
LOCATION: ELEC 304E / FIRST FLOOR - CENTER
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 800 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-A
I.C. RATING: 13390 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	TX-S1F	500	3	88873	3160					3	150	L1F	2
3	--	--	--			84040	1399			--	--	--	4
5	--	--	--					77311	745	--	--	--	6
7	HVAC - RTU-1G	45	3	8591	8591					3	45	HVAC - RTU-1F	8
9	--	--	--			8591	8591			--	--	--	10
11	--	--	--					8591	8591	--	--	--	12
13	SPARE	100	3	0	0					3	100	SPARE	14
15	--	--	--			0	0			--	--	--	16
17	--	--	--					0	0	--	--	--	18
19	SPARE	60	3	0	0					3	60	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	20	3	0	0					3	20	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
	TOTAL LOAD:			109215 VA		102621 VA		95238 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			398 A		375 A		344 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	53802 VA	100.00%	53802 VA		
LIGHTING -	5527 VA	100.00%	5527 VA	**TOTAL CONNECTED LOAD:**	307075 VA
POWER -	50797 VA	100.00%	50797 VA	**TOTAL ESTIMATED DEMAND:**	307075 VA
RECEPTACLE -	6480 VA	100.00%	6480 VA	**TOTAL CONNECTED LOAD (A):**	369 A
Spare	189749 VA	100.00%	189749 VA	**TOTAL ESTIMATED DEMAND...**	369 A
TECHNOLOGY -	720 VA	100.00%	720 VA		

NOTES:

PANELBOARD " S1A" LOAD SCHEDULE

PANEL: S1A
LOCATION: TRANSFORMERS 612 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 1000 A MB
FEED-THRU LUGS...

VOLTAGE: 208/120V, 3PH, 4W
FED FROM: TX-S1A
I.C. RATING: 11744 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R1A1	225	3	16932	18121					3	225	R1A2	2
3	--	--	--			13330	16261			--	--	--	4
5	--	--	--					0	15877	--	--	--	6
7	R1A3	150	3	12108	4702					3	100	R1A4	8
9	--	--	--			11258	4342			--	--	--	10
11	--	--	--					7982	5938	--	--	--	12
13	R1A5	60	3	3181	9960					3	225	R1A6	14
15	--	--	--			3541	10820			--	--	--	16
17	--	--	--					1801	3740	--	--	--	18
19	KP2	225	3	0	0					3	225	KP	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	(EXIST.) AHU-10 (ROOF)	225	3	18013	0					3	225	OP	26
27	--	--	--			18013	0			--	--	--	28
29	--	--	--					18013	0	--	--	--	30
31	(EXIST.) AHU-1 (GYM)	60	3	4804	4804					3	60	(EXIST.) AHU-3 (GYM)	32
33	--	--	--			4804	4804			--	--	--	34
35	--	--	--					4804	4804	--	--	--	36
37	(EXIST.) AHU-6 (GYM)	30	3	2402	4804					3	60	(EXIST.) AHU-4 (GYM)	38
39	--	--	--			2402	4804			--	--	--	40
41	--	--	--					2402	4804	--	--	--	42
43	SPARE	20	3	0	2402					3	30	(EXIST.) BARRIER FREE LIFT	44
45	--	--	--			0	2402			--	--	--	46
47	--	--	--					0	2402	--	--	--	48
49	SPARE	20	3	0	0					3	20	SPARE	50
51	--	--	--			0	0			--	--	--	52
53	--	--	--					0	0	--	--	--	54
	TOTAL LOAD:			102233 VA		96781 VA		72567 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			883 A		838 A		605 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	4496 VA	100.00%	4496 VA		
LIGHTING -	3848 VA	100.00%	3848 VA	**TOTAL CONNECTED LOAD:**	271581 VA
RECEPTACLE -	720 VA	100.00%	720 VA	**TOTAL ESTIMATED DEMAND:**	271581 VA
Spare	262517 VA	100.00%	262517 VA	**TOTAL CONNECTED LOAD (A):**	754 A
				TOTAL ESTIMATED DEMAND...	754 A

NOTES:

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL PANEL SCHEDULES - MDP-A

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 441.2
17-175.70

PANELBOARD " S1D" LOAD SCHEDULE

PANEL: S1D **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELECTRICAL 317 / FIRST FLOOR -... **AMPS:** 1000 A MB **FED FROM:** ~~T-S1D~~ **I.C. RATING:** 10853 A1
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...**

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R1D1	225	3	5196	1260					3	225	R1D2	2
3	--	--	--			5260	1440			--	--	--	4
5	--	--	--					5060	930	--	--	--	6
7	R1D3	225	3	4440	16804					3	225	R1D4	8
9	--	--	--			5456	13084			--	--	--	10
11	--	--	--					5166	13684	--	--	--	12
13	N/C	150	3	5060	180					3	100	MDF 4	14
15	--	--	--			3840	2220			--	--	--	16
17	--	--	--					0	720	--	--	--	18
19	HVAC - RTU-1	110	3	11048	11048					3	110	HVAC - RTU-2	20
21	--	--	--			11048	11048			--	--	--	22
23	--	--	--					11048	11048	--	--	--	24
25	(EXIST.) RT3	20	3	1441	1441					3	20	(EXIST.) RT4	26
27	--	--	--			1441	1441			--	--	--	28
29	--	--	--					1441	1441	--	--	--	30
31	(EXIST.) SW MAU GIRLS	20	3	1441	1441					3	20	(EXIST.) SE MAU BOYS	32
33	--	--	--			1441	1441			--	--	--	34
35	--	--	--					1441	1441	--	--	--	36
37	(EXIST.) WRESTLING MAT HOIST	20	3	1441	1441					3	20	(EXIST.) RT8	38
39	--	--	--			1441	1441			--	--	--	40
41	--	--	--					1441	1441	--	--	--	42
43	SPARE	20	3	0	1441					3	20	(EXIST.) RT10	44
45	--	--	--			0	1441			--	--	--	46
47	--	--	--					0	1441	--	--	--	48
49	SPARE	20	3	0	0					3	20	SPARE	50
51	--	--	--			0	0			--	--	--	52
53	--	--	--					0	0	--	--	--	54
55	SPARE	20	3	0	0					3	20	SPARE	56
57	--	--	--			0	0			--	--	--	58
59	--	--	--					0	0	--	--	--	60
	TOTAL LOAD:			65124 VA		63484 VA		57744 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			550 A		536 A		481 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	69958 VA	100.00%	69958 VA		
POWER -	1180 VA	100.00%	1180 VA	**TOTAL CONNECTED LOAD:**	186351 VA
RECEPTACLE -	18360 VA	77.23%	14180 VA	**TOTAL ESTIMATED DEMAND:**	182171 VA
Spare	96493 VA	100.00%	96493 VA	**TOTAL CONNECTED LOAD (A):**	517 A
TECHNOLOGY -	360 VA	100.00%	360 VA	**TOTAL ESTIMATED DEMAND...**	506 A

NOTES:

PANELBOARD " S1E" LOAD SCHEDULE

PANEL: S1E **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: STORAGE 407S / FIRST FLOOR -... **AMPS:** 500 A MB **FED FROM:** ~~T-S1E~~ **I.C. RATING:** 5378 A1
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...**

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R1E1	225	3	10247	0					3	225	R1E3	2
3	--	--	--			10687	0			--	--	--	4
5	--	--	--					10337	0	--	--	--	6
7	R1E2	225	3	3264	0					3	100	SPARE	8
9	--	--	--			5724	0			--	--	--	10
11	--	--	--					3912	0	--	--	--	12
13	SPARE	60	3	0	0					3	60	SPARE	14
15	--	--	--			0	0			--	--	--	16
17	--	--	--					0	0	--	--	--	18
19	SPARE	20	3	0	0					3	20	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	20	3	0	0					3	20	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
	TOTAL LOAD:			13511 VA		16411 VA		14249 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			113 A		138 A		120 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	32570 VA	100.00%	32570 VA		
LIGHTING -	1249 VA	100.00%	1249 VA	**TOTAL CONNECTED LOAD:**	44170 VA
RECEPTACLE -	1620 VA	100.00%	1620 VA	**TOTAL ESTIMATED DEMAND:**	44170 VA
Spare	8732 VA	100.00%	8732 VA	**TOTAL CONNECTED LOAD (A):**	123 A
				TOTAL ESTIMATED DEMAND...	123 A

NOTES:

PANELBOARD " S1F" LOAD SCHEDULE

PANEL: S1F **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 304E / FIRST FLOOR - CENTER **AMPS:** 1000 A MB **FED FROM:** ~~T-S1F~~ **I.C. RATING:** 9432 A1
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...**

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R1F1	225	3	3036	9841					3	225	R1F2	2
3	--	--	--			3240	10065			--	--	--	4
5	--	--	--					2136	9061	--	--	--	6
7	R1F3	225	3	10320	20002					3	225	R1F4	8
9	--	--	--			6660	18262			--	--	--	10
11	--	--	--					6960	13522	--	--	--	12
13	R1F5	100	3	42	0					3	400	DIMMER RACK	14
15	--	--	--			181	0			--	--	--	16
17	--	--	--					0	0	--	--	--	18
19	TECH DISCONNECT	200	3	16812	4804					3	60	(EXIST.) WATER HEATER RM A-129	20
21	--	--	--			16812	4804			--	--	--	22
23	--	--	--					16812	4804	--	--	--	24
25	(EXIST.) RTU-13	150	3	12008	12008					3	150	(EXIST.) RTU-14	26
27	--	--	--			12008	12008			--	--	--	28
29	--	--	--					12008	12008	--	--	--	30
31	SPARE	60	3	0	0					3	60	SPARE	32
33	--	--	--			0	0			--	--	--	34
35	--	--	--					0	0	--	--	--	36
37	SPARE	30	3	0	0					3	30	SPARE	38
39	--	--	--			0	0			--	--	--	40
41	--	--	--					0	0	--	--	--	42
43	SPARE	20	3	0	0					3	20	SPARE	44
45	--	--	--			0	0			--	--	--	46
47	--	--	--					0	0	--	--	--	48
	TOTAL LOAD:			88873 VA		84040 VA		77311 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			749 A		709 A		644 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	2256 VA	100.00%	2256 VA		
LIGHTING -	223 VA	100.00%	223 VA	**TOTAL CONNECTED LOAD:**	250225 VA
POWER -	50797 VA	100.00%	50797 VA	**TOTAL ESTIMATED DEMAND:**	250225 VA
RECEPTACLE -	6480 VA	100.00%	6480 VA	**TOTAL CONNECTED LOAD (A):**	695 A
Spare	189749 VA	100.00%	189749 VA	**TOTAL ESTIMATED DEMAND...**	695 A
TECHNOLOGY -	720 VA	100.00%	720 VA		

NOTES:

PANELBOARD " L1A" LOAD SCHEDULE

PANEL: L1A **MOUNTING:** SURFACE **VOLTAGE:** 480/277V, 3PH, 4W
LOCATION: TRANSFORMERS 612 / FIRST FLOOR -... **AMPS:** 250 A MLO **FED FROM:** ~~D1F~~ **I.C. RATING:** 26919 A1
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...**

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - RMS 614, 612, 610	20	1	516	102					1	20	LIGHTING - EXTERIOR - UNIT A	2
3	SPARE	20	1			0	0			1	20	SPARE	4
5	SPARE	20	1					0	0	1	20	SPARE	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			618 VA		0 VA		0 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			2 A		0 A		0 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	618 VA	100.00%	618 VA		
				TOTAL CONNECTED LOAD:	618 VA
				TOTAL ESTIMATED DEMAND:	618 VA
				TOTAL CONNECTED LOAD (A):	1 A
				TOTAL ESTIMATED DEMAND...	1 A

NOTES:

PANELBOARD " L1D" LOAD SCHEDULE

PANEL: L1D **MOUNTING:** SURFACE **VOLTAGE:** 480/277V, 3PH, 4W
LOCATION: ELECTRICAL 317 / FIRST FLOOR -... **AMPS:** 150 A MLO **FED FROM:** ~~D1F~~ **I.C. RATING:** 18838 A1
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...**

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - FITNESS ROOMS	20	1	2071	606					1	20	LIGHTING - RMS 510, 512, 514, 519, 523	2
3	LIGHTING - WELLNESS CTR - EXAM/LAB ROOMS	20	1			624	653			1	20	LIGHTING - WELLNESS CTR - OFFICES/STOR/TLT	4
5	LIGHTING - UNIT D/E - WEST CORRIDOR	20	1					516	1217	1	20	LIGHTING - UNIT D LOCKERS - WEST	6
7	LIGHTING - UNIT D LOCKERS - CENTER	20	1	863	1268					1	20	LIGHTING - UNIT D LOCKERS - EAST	8
9	LIGHTING - EXTERIOR - UNIT D	20	1			170	172			1	20	LIGHTING - ELECTRICAL 317	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			4808 VA		1619 VA		1733 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			17 A		6 A		6 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	8161 VA	100.00%	8161 VA		
				TOTAL CONNECTED LOAD:	8161 VA
				TOTAL ESTIMATED DEMAND:	8161 VA
				TOTAL CONNECTED LOAD (A):	10 A
				TOTAL ESTIMATED DEMAND...	10 A

NOTES:

PANELBOARD " L1E" LOAD SCHEDULE

PANEL: L1E **MOUNTING:** SURFACE **VOLTAGE:** 480/277V, 3PH, 4W
LOCATION: STORAGE 407S / FIRST FLOOR -... **AMPS:** 150 A MLO **FED FROM:** ~~D1F~~ **I.C. RATING:** 8268 A1
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...**

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - COR3, ENT4	20	1	594	103					1	20	LIGHTING - STORAGE 407S	2
3	SPARE	20	1			0	0			1	20	SPARE	4
5	SPARE	20	1					0	0	1	20	SPARE	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			697 VA		0 VA		0 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			3 A		0 A		0 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	697 VA	100.00%	697 VA		
				TOTAL CONNECTED LOAD:	697 VA
				TOTAL ESTIMATED DEMAND:	697 VA
				TOTAL CONNECTED LOAD (A):	1 A
				TOTAL ESTIMATED DEMAND...	1 A

NOTES:

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL PANEL SCHEDULES - MDP-A

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 442.2
17-175.70

PANELBOARD " L1F" LOAD SCHEDULE

PANEL: L1F
LOCATION: ELEC 304E / FIRST FLOOR - CENTER
ADDED ACCESSORIES: SPD
MOUNTING: SURFACE
AMPS: 150 A MLO
FEED-THRU LUGS...
VOLTAGE: 480/277V, 3PH, 4W
FED FROM: ~~S1F~~
I.C. RATING: 11676 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - ROBOTICS 308	20	1	1280	285					1	20	LIGHTING - TOILETS 301M, 301W	2
3	LIGHTING - ELEC 304E	20	1			69	1330			1	20	LIGHTING - ORCHESTRA, ENSEMBLE, OFFICE	4
5	LIGHTING - CORRIDOR COR11	20	1					388	357	1	20	LIGHTING - EXTERIOR - UNIT H	6
7	LIGHTING - CORR. COR6 - AUD. ENTRY	20	1	1595	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			3160 VA		1399 VA		745 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			12 A		5 A		3 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	5304 VA	100.00%	5304 VA		
				TOTAL CONNECTED LOAD:	5304 VA
				TOTAL ESTIMATED DEMAND:	5304 VA
				TOTAL CONNECTED LOAD (A):	6 A
				TOTAL ESTIMATED DEMAND...	6 A

NOTES:

PANELBOARD " R1A1" LOAD SCHEDULE

PANEL: R1A1
LOCATION: TRANSFORMERS 612 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD
MOUNTING: SURFACE
AMPS: 225 A MLO
FEED-THRU LUGS...
VOLTAGE: 208/120V, 3PH, 4W
FED FROM: ~~S1F~~
I.C. RATING: 9936 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	(EXIST.) COOK TOP	30	2	2402	3242					2	40	(EXIST.) DOUBLE OVEN	2
3	--	--	--			0	3242			--	--	--	4
5	SHUNT TRIP SPACE	--	--					0	0	--	--	SHUNT TRIP SPACE	6
7	(EXIST.) COOK TOP	30	2	2402	0					2	40	SPARE	8
9	--	--	--			2402	0			--	--	--	10
11	SHUNT TRIP SPACE	--	--					0	0	--	--	SHUNT TRIP SPACE	12
13	(EXIST.) COOK TOP	20	2	1441	2402					2	30	(EXIST.) COOK TOP	14
15	--	--	--			1441	2402			--	--	--	16
17	SHUNT TRIP SPACE	--	--					0	0	--	--	SHUNT TRIP SPACE	18
19	(EXIST.) COOK TOP	30	2	2402	1441					2	20	(EXIST.) COOK TOP	20
21	--	--	--			2402	1441			--	--	--	22
23	SHUNT TRIP SPACE	--	--					0	0	--	--	SHUNT TRIP SPACE	24
25	(EXIST.) EF-13, AHU-8	20	3	0	0					1	20	(EXIST.) P-2	26
27	--	--	--			0	0			1	20	SPARE	28
29	--	--	--					0	0	1	20	(EXIST.) RECEPTACLE 206	30
31	(EXIST.) COND-2	20	3	1200	0					1	20	(EXIST.) RECEPTACLE 206	32
33	--	--	--			0	0			1	20	(EXIST.) RECEPTACLE 206	34
35	--	--	--					0	0	1	20	(EXIST.) RECEPTACLE 206	36
37	(EXIST.) COND-1	20	3	0	0					1	20	(EXIST.) RECEPTACLE 206	38
39	--	--	--			0	0			1	20	(EXIST.) RECEPTACLE 206	40
41	--	--	--					0	0	1	20	(EXIST.) RECEPTACLE 206	42
43	(EXIST.) WIREMOLD ON COUNTERS	20	1	0	0					1	20	(EXIST.) RECEPTACLE 206	44
45	(EXIST.) WIREMOLD ON COUNTERS	20	1			0	0			1	20	(EXIST.) RECEPTACLE 206	46
47	(EXIST.) RECEPTACLE 206	30	2					0	0	1	20	(EXIST.) RECEPTACLE 206	48
49	--	--	--	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
	TOTAL LOAD:			16932 VA		13330 VA		0 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			158 A		128 A		0 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Spare	30262 VA	100.00%	30262 VA		
				TOTAL CONNECTED LOAD:	30262 VA
				TOTAL ESTIMATED DEMAND:	30262 VA
				TOTAL CONNECTED LOAD (A):	84 A
				TOTAL ESTIMATED DEMAND...	84 A

NOTES:

PANELBOARD " R1A2" LOAD SCHEDULE

PANEL: R1A2
LOCATION: BOILER ROOM 614 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD
MOUNTING: SURFACE
AMPS: 225 A MLO
FEED-THRU LUGS...
VOLTAGE: 208/120V, 3PH, 4W
FED FROM: S1A
I.C. RATING: 8693 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	HVAC - B-3	20	2	1040	1040					2	20	HVAC - B-4	2
3	--	--	--			1040	1040			--	--	--	4
5	HVAC - UH-614	20	1					336	1501	3	20	(EXIST.) AIR COMPRESSOR	6
7	(EXIST.) SPRINKLER SYSTEM	20	1	1200	1501					--	--	--	8
9	SPARE	20	1			0	1501			--	--	--	10
11	(EXIST.) BLEACHERS	20	3					600	240	1	20	(EXIST.) EXT. LIFT LIGHT, RECEPT	12
13	--	--	--	600	240					1	20	(EXIST.) B.F. LIFT LIGHT, RECEPT	14
15	--	--	--			600	540			1	20	(EXIST.) RECEPTACLE 120, 122	16
17	(EXIST.) EF-2, EF-3	20	3					1200	2400	1	30	(EXIST.) HAIR DRYER 122	18
19	--	--	--	1200	2400					1	30	(EXIST.) HAIR DRYER 122	20
21	--	--	--			1200	2400			1	30	(EXIST.) HAIR DRYER 122	22
23	(EXIST.) EF-4, EF-5	20	3					960	2400	1	30	(EXIST.) HAIR DRYER 133	24
25	--	--	--	960	2400					1	30	(EXIST.) HAIR DRYER 133	26
27	--	--	--			960	2400			1	30	(EXIST.) HAIR DRYER 133	28
29	(EXIST.) EF-1	20	3					960	540	1	20	(EXIST.) RECEPTACLE 122, 128	30
31	--	--	--	960	540					1	20	(EXIST.) RECEPTACLE 133, 136	32
33	--	--	--			960	180			1	20	(EXIST.) RECEPTACLE EXT. GFI	34
35	(EXIST.) RECEPTACLE SOUND SYSTEM	20	1					180	600	1	20	(EXIST.) LIGHTS GYM	36
37	(EXIST.) RECEPTACLE SCOREBOARD	20	1	180	600					1	20	(EXIST.) LIGHTS GYM	38
39	SPARE	20	1			0	180			1	20	(EXIST.) RECEPTACLE 112	40
41	(EXIST.) RECEPTACLE TV CAMERA	20	1					180	2400	1	30	(EXIST.) HAIR DRYER 122	42
43	(EXIST.) RECEPTACLE EXIT 101	20	1	180	2400					1	30	(EXIST.) HAIR DRYER 133	44
45	(EXIST.) RECEPTACLE EF-6	20	1			180	2400			1	30	(EXIST.) HAIR DRYER 133	46
47	(EXIST.) EF-7, CH-3, CH-4	20	1					1200	180	1	20	(EXIST.) RECEPTACLE BACKBOARD	48
49	(EXIST.) GREEN MAX PANEL	20	1	500	180					1	20	(EXIST.) RECEPTACLE BACKBOARD	50
51	(EXIST.) GREEN MAX PANEL	20	1			500	180			1	20	(EXIST.) RECEPTACLE BACKBOARD	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61													62
63													64
65													66
67													68
69													70
71													72
73													74
75													76
77													78
79													80
81													82
83													84
	TOTAL LOAD:			18121 VA		16261 VA		15877 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			152 A		136 A		132 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	4496 VA	100.00%	4496 VA		
Spare	45763 VA	100.00%	45763 VA		
				TOTAL CONNECTED LOAD:	50259 VA
				TOTAL ESTIMATED DEMAND:	50259 VA
				TOTAL CONNECTED LOAD (A):	140 A
				TOTAL ESTIMATED DEMAND...	140 A

NOTES:

PANELBOARD " R1A3" LOAD SCHEDULE

PANEL: R1A3
LOCATION: ELEC 610 / FIRST FLOOR - NORTH
ADDED ACCESSORIES: SPD
MOUNTING: SURFACE
AMPS: 150 A MLO
FEED-THRU LUGS...
VOLTAGE: 208/120V, 3PH, 4W
FED FROM: ~~S1F~~
I.C. RATING: 8291 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - SITE LTG - NW LOT	20	2	832	500					1	20	(EXIST.) HIGHBAY GYM LTS	2
3	--	--	--			832	500			1	20	(EXIST.) HIGHBAY GYM LTS	4
5	LIGHTING - SITE LTG - NORTH LOT	20	2					416	500	1	20	(EXIST.) HIGHBAY GYM LTS	6
7	--	--	--	416	500					1	20	(EXIST.) HIGHBAY GYM LTS	8
9	LIGHTING - SITE LTG - NE LOT	20	2			156	500			1	20	(EXIST.) HIGHBAY GYM LTS	10
11	--	--	--					156	500	1	20	(EXIST.) HIGHBAY GYM LTS	12
13	(EXIST.) EXTERIOR LTG CONTACTOR	20	1	1200	500					1	20	(EXIST.) HIGHBAY GYM LTS	14
15	(EXIST.) LIGHTS BALLARDS	20	1			250	500			1	20	(EXIST.) HIGHBAY GYM LTS	16
17	(EXIST.) LIGHTS BALLARDS	20	1					250	900	1	20	(EXIST.) LIGHTS CORRIDOR 112, 210	18
19	(EXIST.) HIGH SCHOOL SIGN	20	1	1200	900					1	20	(EXIST.) LIGHTS GYM STAIR N, EXITS	20
21	(EXIST.) LIGHTS 202, 203, 204	20	1			720	900			1	20	(EXIST.) LIGHTS GYM BALCONY	22
23	(EXIST.) LIGHTS ENTRY NITE LTS	20	1					360	480	1	20	(EXIST.) LIGHTS TRAINING 138, WOMENS 139	24
25	(EXIST.) LIGHTS CAFETERIA	20	1	1000	900					1	20	(EXIST.) LIGHTS MEN 140	26
27	(EXIST.) LIGHTS CAFETERIA	20	1			1000	1000			1	20	(EXIST.) LIGHTS BOYS LOCKER	28
29	(EXIST.) LIGHTS CAFETERIA	20	1					1000	360	1	20	(EXIST.) LIGHTS COACHES OFFICES 120, 134	30
31	(EXIST.) LIGHTS CAFETERIA	20	1	1000	1000					1	20	(EXIST.) LIGHTS GIRLS LOCKER	32
33	(EXIST.) LIGHTS CAFETERIA	20	1			1000	900			1	20	(EXIST.) LIGHTS LIFE MANAGEMENT 206	34
35	(EXIST.) LIGHTS CORRIDOR 211	20	1					900	900	1	20	(EXIST.) LIGHTS LIFE MANAGEMENT 206	36
37	(EXIST.) LIGHTS SERVING TRACK	20	1	1200	480					1	20	(EXIST.) LIGHTS LME 206, JAN 205	38
39	(EXIST.) LIGHTS SERVING TRACK	20	1			1200	900			1	20	(EXIST.) LIGHTS CORRIDOR 201	40
41	(EXIST.) LIGHTS CONCESSION 212	20	1					360	900	1	20	(EXIST.) LIGHTS 209, 210	42
43	(EXIST.) LIGHTS KITCHEN LTS	20	1	480	0					1	20	SPARE	44
45	(EXIST.) LIGHTS 217, 218	20	1			900	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
	TOTAL LOAD:			12108 VA		11258 VA		7982 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			105 A		98 A		67 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	2808 VA	100.00%	2808 VA		
Spare	28540 VA	100.00%	28540 VA		
				TOTAL CONNECTED LOAD:	31348 VA
				TOTAL ESTIMATED DEMAND:	31348 VA
				TOTAL CONNECTED LOAD (A):	87 A
				TOTAL ESTIMATED DEMAND...	87 A

NOTES:

PANELBOARD " R1A4" LOAD SCHEDULE

PANEL: R1A4
LOCATION: TRAINING ROOM 607 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD
MOUNTING: SURFACE
AMPS: 100 A MLO
FEED-THRU LUGS...
VOLTAGE: 208/120V, 3PH, 4W
FED FROM: ~~S1F~~
I.C. RATING: 3142 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	(EXIST.) AHU-7	30	3	2402	180					1	20	(EXIST.) RECEPTALCE EWC 112	2
3	--	--	--			2402	180			1	20	(EXIST.) RECEPTALCE EWC 112	4
5	--	--	--					2402	700	1	20	(EXIST.) HAND DRYER 139	6
7	SPARE	20	1	0	700					1	20	(EXIST.) HAND DRYER 139	8
9	SPARE	20	1			0	700			1	20	(EXIST.) HAND DRYER 139	10
11	(EXIST.) P-1	20	1					696	700	1	20	(EXIST.) HAND DRYER 140	12
13	(EXIST.) RECEPTACLE 138	20	1	360	700					1	20	(EXIST.) HAND DRYER 140	14
15	(EXIST.) RECEPTALCE 138	20	1			360	700			1	20	(EXIST.) HAND DRYER 140	16
17	(EXIST.) RECEPTALCE 138	20	1					360	1080	1	20	(EXIST.) RECEPTACLE 139, 140	18
19	SPARE	20	1	0	360					1	20	(EXIST.) RECEPTACLE 138	20
21	SPARE	20	1			0	0			2	30	SPARE	22
23	SPARE	20	1					0	0	--	--	--	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			4702 VA		4342 VA		5938 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			40 A		36 A		50 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
Spare	14982 VA	100.00%	14982 VA		
				TOTAL CONNECTED LOAD:	14982 VA
				TOTAL ESTIMATED DEMAND:	14982 VA
				TOTAL CONNECTED LOAD (A):	42 A
				TOTAL ESTIMATED DEMAND...	42 A

NOTES:

PANELBOARD " R1A5" LOAD SCHEDULE

PANEL: R1A5
LOCATION: COACHES OFFICE 613 / FIRST FLOOR...
ADDED ACCESSORIES: SPD
MOUNTING: FLUSH
AMPS: 60 A MLO
FEED-THRU LUGS...
VOLTAGE: 208/120V, 3PH, 4W
FED FROM: S1A
I.C. RATING: 1106 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - SITE LTG - EAST LOT	20	2	520	180					1	20	RECEPTACLE - NE TENNIS COURT	2
3	--	--	--			520	180			1	20	RECEPTACLE - SE TENNIS COURT	4
5	RECEPTACLE - NW TENNIS COURT	20	1					180	180	1	20	RECEPTACLE - SW TENNIS COURT	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	(EXIST.) RECEPTACLE RTU LOCKER RM	20	1			180	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	(EXIST.) RTU #5	20	3			1441	180			1	20	(EXIST.) RECEPTACLE PRESS BOX	16
17	--	--	--					1441	0	1	20	SPARE	18
19	--	--	--	1441	1040					2	20	(EXIST.) HEATER N STORAGE RM	20
21	SPARE	20	1			0	1040			--	--	--	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			3181 VA		3541 VA		1801 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			28 A		31 A		15 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	1040 VA	100.00%	1040 VA		
RECEPTACLE -	720 VA	100.00%	720 VA	**TOTAL CONNECTED LOAD:**	8523 VA
Spare	6763 VA	100.00%	6763 VA	**TOTAL ESTIMATED DEMAND:**	8523 VA
				TOTAL CONNECTED LOAD (A):	24 A
				TOTAL ESTIMATED DEMAND...	24 A

NOTES:

PANELBOARD " R1A6" LOAD SCHEDULE

PANEL: R1A6
LOCATION: BOILER ROOM 614 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD
MOUNTING: SURFACE
AMPS: 225 A MLO
FEED-THRU LUGS...
VOLTAGE: 208/120V, 3PH, 4W
FED FROM: S1A
I.C. RATING: 8655

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	(EXIST.) RECEPTACLE 203	20	1	360	360					1	20	(EXIST.) RECEPTACLE SOUND RACK	2
3	(EXIST.) RECEPTACLE 204	20	1			360	360			1	20	(EXIST.) RECEPTACLE IDF ROOM	4
5	(EXIST.) RECEPTACLE 204	20	1					360	0	--	--	SHUNT TRIP SPACE	6
7	(EXIST.) RECEPTACLE 201, 202	20	1	540	0					2	50	SPARE	8
9	(EXIST.) RECEPTACLE 207, 209	20	1			540	0			--	--	--	10
11	SPARE	20	1					0	0	--	--	SHUNT TRIP SPACE	12
13	(EXIST.) COPIER	20	2	1200	0					2	50	SPARE	14
15	--	--	--			1200	0			--	--	--	16
17	(EXIST.) RECEPTACLE 209	20	1					360	900	1	20	(EXIST.) EF-11, EF-12	18
19	(EXIST.) RECEPTACLE 209	20	1	360	180					1	20	(EXIST.) CH-1, EXT. RECEPT	20
21	(EXIST.) RECEPTACLE 209	20	1			360	1040			2	20	(EXIST.) AHU-11, AHU-12	22
23	(EXIST.) RECEPTACLE 209	20	1					360	1040	--	--	--	24
25	(EXIST.) RECEPTACLE 210	20	1	360	360					1	20	(EXIST.) RECEPTACLE 210	26
27	(EXIST.) RECEPTACLE 210	20	1			360	360			1	20	(EXIST.) RECEPTACLE 210	28
29	(EXIST.) RECEPTACLE 210	20	1					360	360	1	30	(EXIST.) RECEPTACLE 210	30
31	(EXIST.) RANGE	50	2	3120	0					1	20	SPARE	32
33	--	--	--			3120	0			1	20	SPARE	34
35	SHUNT TRIP SPACE	--	--					0	0	1	20	SPARE	36
37	(EXIST.) RANGE	50	2	3120	0					1	20	SPARE	38
39	--	--	--			3120	0			1	20	SPARE	40
41	SHUNT TRIP SPACE	--	--					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
	TOTAL LOAD:			9960 VA		10820 VA		3740 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	**

PANELBOARD " R1D1" LOAD SCHEDULE

PANEL: R1D1 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELECTRICAL 317 / FIRST FLOOR -... **AMPS:** 225 A MLO ~~FED FROM: S1D~~
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** I.C. RATING: 9168 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	POWER - RTU-500 CONV. RECEPT.	20	1	180	696					1	20	HVAC - EF-502	2
3	POWER - UNIT D - 1ST FLR SMOKE DAMPERS	20	1			80	360			1	20	(EXIST.) RECEPTACLE 502	4
5	(EXIST.) RECEPTACLE 315	20	1					360	360	1	20	(EXIST.) RECEPTACLE 504	6
7	(EXIST.) RECEPTACLE 301	20	1	360	360					1	20	(EXIST.) RECEPTACLE 504	8
9	(EXIST.) RECEPTACLE 301	20	1			360	360			1	20	(EXIST.) RECEPTACLE 504	10
11	(EXIST.) RECEPTACLE 301	20	1					360	360	1	20	(EXIST.) RECEPTACLE 506	12
13	(EXIST.) RECEPTACLE 301	20	1	360	360					1	20	(EXIST.) RECEPTACLE 508	14
15	(EXIST.) RECEPTACLE 301	20	1			360	360			1	20	(EXIST.) RECEPTACLE 503B	16
17	(EXIST.) RECEPTACLE 301	20	1					360	0	1	20	SPARE	18
19	(EXIST.) RECEPTACLE 301	20	1	360	360					1	20	(EXIST.) RECEPTACLE 402	20
21	(EXIST.) RECEPTACLE 301	20	1			360	360			1	20	(EXIST.) RECEPTACLE 404	22
23	(EXIST.) RECEPTACLE 301	20	1					360	360	1	20	(EXIST.) RECEPTACLE 305	24
25	(EXIST.) RECEPTACLE 301	20	1	360	360					1	20	(EXIST.) RECEPTACLE 306	26
27	(EXIST.) RECEPTACLE 301	20	1			360	360			1	20	(EXIST.) RECEPTACLE 306	28
29	(EXIST.) RECEPTACLE 407	20	1					360	360	1	20	(EXIST.) RECEPTACLE 306	30
31	(EXIST.) RECEPTACLE 403	20	1	360	360					1	20	(EXIST.) RECEPTACLE 306	32
33	(EXIST.) FIRE PANEL	20	1			180	360			1	20	(EXIST.) RECEPTACLE 306	34
35	(EXIST.) EX. FAN RM 305	20	1					240	360	1	20	(EXIST.) RECEPTACLE 306	36
37	(EXIST.) RECEPTACLE 502	20	1	360	360					1	20	(EXIST.) RECEPTACLE 306	38
39	(EXIST.) RT7	20	2			1040	360			1	20	(EXIST.) RECEPTACLE 306	40
41	--	--	--					1040	180	1	20	(EXIST.) RECEPTACLE ELEC RM	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	SPARE	20	1	0	0					1	20	SPARE	62
63	SPARE	20	1			0	0			1	20	SPARE	64
65	SPARE	20	1					0	0	1	20	SPARE	66
67	SPARE	20	1	0	0					1	20	SPARE	68
69	SPARE	20	1			0	0			1	20	SPARE	70
71	SPARE	20	1					0	0	1	20	SPARE	72
73	SPARE	20	1	0	0					1	20	SPARE	74
75	SPARE	20	1			0	0			1	20	SPARE	76
77	SPARE	20	1					0	0	1	20	SPARE	78
79	SPARE	20	1	0	0					1	20	SPARE	80
81	SPARE	20	1			0	0			1	20	SPARE	82
83	SPARE	20	1					0	0	1	20	SPARE	84
	TOTAL LOAD:			5196 VA		5260 VA		5060 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			43 A		44 A		42 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	776 VA	100.00%	776 VA		
POWER -	180 VA	100.00%	180 VA	**TOTAL CONNECTED LOAD:**	15516 VA
Spare	14560 VA	100.00%	14560 VA	**TOTAL ESTIMATED DEMAND:**	15516 VA
				TOTAL CONNECTED LOAD (A):	43 A
				TOTAL ESTIMATED DEMAND...	43 A

NOTES:

PANELBOARD " R1D2" LOAD SCHEDULE

PANEL: R1D2 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: STORAGE 502 / FIRST FLOOR - CENTER **AMPS:** 225 A MLO ~~FED FROM: S1D~~
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** I.C. RATING: 6511 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - FITNESS 500	20	1	360	180					1	20	RECEPTACLE - STORAGE 502	2
3	RECEPTACLE - FITNESS 500	20	1			360	720			1	20	RECEPTACLE - OFFICE 501	4
5	RECEPTACLE - FITNESS 500	20	1					360	0	1	20	SPARE	6
7	RECEPTACLE - FITNESS 500	20	1	360	0					1	20	SPARE	8
9	RECEPTACLE - FITNESS 500	20	1			360	0			1	20	SPARE	10
11	RECEPTACLE - FITNESS 500	20	1					360	0	1	20	SPARE	12
13	TECHNOLOGY - FITNESS 500	20	1	360	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	210	1	20	HVAC - CH-502	60
	TOTAL LOAD:			1260 VA		1440 VA		930 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			11 A		12 A		8 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	210 VA	100.00%	210 VA		
RECEPTACLE -	3060 VA	100.00%	3060 VA	**TOTAL CONNECTED LOAD:**	3630 VA
TECHNOLOGY -	360 VA	100.00%	360 VA	**TOTAL ESTIMATED DEMAND:**	3630 VA
				TOTAL CONNECTED LOAD (A):	10 A
				TOTAL ESTIMATED DEMAND...	10 A

NOTES:

PANELBOARD " R1D3" LOAD SCHEDULE

PANEL: R1D3 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: TUNNEL ACCESS 519 / FIRST FLOOR -... **AMPS:** 225 A MLO ~~FED FROM: S1D~~
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** I.C. RATING: 4841 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - RMS COR2, ENT 3	20	1	900	720					1	20	RECEPTACLE - RECEPTION 514	2
3	RECEPTACLE - RMS 510, 512	20	1			1080	180			1	20	RECEPTACLE - RECEPTION 514 - COPIER	4
5	RECEPTACLE - WORK ROOM 516	20	1					540	540	1	20	RECEPTACLE - EXAM 511	6
7	RECEPTACLE - WORK ROOM 516	20	1	360	540					1	20	RECEPTACLE - EXAM 513	8
9	RECEPTACLE - WK RM 516 - MICROWAVE	20	1			180	540			1	20	RECEPTACLE - EXAM 515	10
11	RECEPTACLE - WK RM 516 - COFFEE	20	1					180	540	1	20	RECEPTACLE - OFFICE 517	12
13	RECEPTACLE - WK RM 516 - REFRIGERATOR	20	1	360	540					1	20	RECEPTACLE - OFFICE 521	14
15	RECEPTACLE - RMS 518S, 518T	20	1			360	540			1	20	RECEPTACLE - OFFICE 520	16
17	RECEPTACLE - LAB 518	20	1					540	540	1	20	RECEPTACLE - OFFICE 522	18
19	RECEPTACLE - LAB 518	20	1	180	120					1	20	HVAC - UH-519 / 523	20
21	RECEPTACLE - LAB 518	20	1			360	270			1	20	HVAC - P-AHU-523	22
23	RECEPTACLE - RMS 519, 523	20	1					360	0	1	20	SPARE	24
25	RECEPTACLE - UNIT D EXTERIOR	20	1	540	0					1	20	SPARE	26
27	RECEPTACLE - FITNESS 500	20	1			540	0			1	20	SPARE	28
29	RECEPTACLE - FITNESS 500	20	1					540	0	1	20	SPARE	30
31	RECEPTACLE - ROOF CONV. RECEPT.	20	1	180	0					1	20	SPARE	32
33	POWER - AHU-523 LIGHTS	20	1			500	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	HVAC - EF-518S	20	1			696	210			1	20	HVAC - CH-ENT3	58
59	HVAC - EF-523	20	1					1176	210	1	20	HVAC - CH-COR2	60
	TOTAL LOAD:			4440 VA		5456 VA		5166 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			37 A		46 A		44 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	2682 VA	100.00%	2682 VA		
POWER -	500 VA	100.00%	500 VA	**TOTAL CONNECTED LOAD:**	15062 VA
RECEPTACLE -	11880 VA	92.09%	10940 VA	**TOTAL ESTIMATED DEMAND:**	14122 VA
				TOTAL CONNECTED LOAD (A):	42 A
				TOTAL ESTIMATED DEMAND...	39 A

NOTES:

PANELBOARD " R1D4" LOAD SCHEDULE

PANEL: R1D4 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: STORAGE AGS2 / FIRST FLOOR -... **AMPS:** 225 A MLO ~~FED FROM: S1D~~
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** I.C. RATING: 6209 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - RMS AG1, AG7	20	1	720	900					1	20	RECEPTACLE - RMS AB1, AB7	2
3	RECEPTACLE - STORAGE AGS1, AGS2	20	1			720	720			1	20	RECEPTACLE - STORAGE AGS2, AGS4	4
5	RECEPTACLE - OFFICES AB3, AG3	20	1					360	500	1	20	POWER - STORAGE AGS2 - PRE-ACTION SYS.	6
7	(EXIST.) LIGHTS SPORTS ROW 1 EAST	20	1	700	700					1	20	(EXIST.) LIGHTS SPORTS CONTACT ROW	8
9	(EXIST.) LIGHTS SPORTS ROW 2 EAST	20	1			700	700			1	20	(EXIST.) LIGHTS SPORTS ROW 3 WEST	10
11	(EXIST.) LIGHTS SPORTS ROW 3 EAST	20	1					700	700	1	20	(EXIST.) LIGHTS SPORTS ROW 2 WEST	12
13	(EXIST.) LIGHTS SPORTS ROW 1 WEST	20	1	700	700					1	20	(EXIST.) LIGHTS GYM CENTER ROW	14
15	(EXIST.) LIGHTS GYM ROW 1 WEST	20	1			700	700			1	20	(EXIST.) LIGHTS GYM ROW 2 EAST	16
17	(EXIST.) LIGHTS GYM ROW 2 WEST	20	1					700	700	1	20	(EXIST.) LIGHTS GYM ROW 1 EAST	18
19	(EXIST.) RECEPTACLE GYM SOUTH WALL/WEST...	20	1	540	720					1	20	(EXIST.) RECEPTACLE WEST WALL	20
21	(EXIST.) RECEPTACLE GYM NORTH WALL	20	1			540	360			1	20	(EXIST.) RECEPTACLE NORTH WALL	22
23	(EXIST.) RECEPTACLE EAST WALL	20	1					540	2080	2	30	(EXIST.) RECEPTACLE CLOTHES DRYER	24
25	(EXIST.) EM LIGHTS	20	1	900	2080					--	--	--	26
27	(EXIST.) RECEPTACLE ALARM TX	20	1			180	180			1	20	(EXIST.) RECEPTACLE WALL TOILET	28
29	(EXIST.) RECEPTACLE SCOREBOARD	20	1					180	1441	3	20	(EXIST.) FANS XF-5, XF-6	30
31	(EXIST.) FAN - LAUNDRY	20	1	240	1441					--	--	--	32
33	(EXIST.) RECEPTACLE NORTH / EAST WALL	20	1			720	1441			--	--	--	34
35	(EXIST.) RECEPTACLE STORAGE WEST	20	1					720	0	1	20	SPARE	36
37	(EXIST.) FAN XF4	20	1	540	0					1	20	SPARE	38
39	(EXIST.) FAN XF4	20	1			540	0			1	20	SPARE	40
41	(EXIST.) FAN TIME CLOCK	20	1					180	0	1	20	SPARE	42
43	(EXIST.) CV6 WEST STAIRWELL GYM	20	2	1040	0					1	20	SPARE	44
45	--	--	--			1040	0			1	20	SPARE	46
47	(EXIST.) CV7 WEST HALL	20	2					1040	0	1	20	SPARE	48
49	--	--	--	1040	0					1	20	SPARE	50
51	(EXIST.) FANS XF-1, XF-2	20	3			1441	0			1	20	SPARE	52
53	--	--	--					1441	0	1	20	SPARE	54
55	--	--	--	1441	0					1	20	SPARE	56
57	(EXIST.) RECEPTACLE WASHER	30	3			2402	0			1	20	SPARE	58
59	--	--	--					2402	0	1	20	SPARE	60
61	--	--	--	2402	0					1	20	SPARE	62
63	SPARE	20	1			0	0			1	20	SPARE	64
65	SPARE	20	1					0	0	1	20	SPARE	66
67	SPARE	20	1	0	0					1	20	SPARE	68
69	SPARE	20	1			0	0			1	20	SPARE	70
71	SPARE	20	1					0	0	1	20	SPARE	72
73	SPARE	20	1	0	0					1	20	SPARE	74
75	SPARE	20	1			0	0			1	20	SPARE	76
77	SPARE	20	1					0	0	1	20	SPARE	78
79	SPARE	20	1	0	0					1	20	SPARE	80
81	SPARE	20	1			0	0			1	20	SPARE	82
83	SPARE	20	1					0	0	1	20	SPARE	84
	TOTAL LOAD:			16804 VA		13084 VA		13684 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			141 A		109 A		115 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
POWER -	500 VA	100.00%	500 VA		
RECEPTACLE -	3420 VA	100.00%	3420 VA	**TOTAL CONNECTED LOAD:**	43572 VA
Spare	39652 VA	100.00%	39652 VA	**TOTAL ESTIMATED DEMAND:**	43572 VA
				TOTAL CONNECTED LOAD (A):	121 A
				TOTAL ESTIMATED DEMAND...	121 A

NOTES:

PANELBOARD " R1E1" LOAD SCHEDULE

PANEL: R1E1 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: STORAGE 407S / FIRST FLOOR -... **AMPS:** 225 A MLO ~~FED FROM: S1E~~
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** I.C. RATING: 4928 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - RMS COR3, ENT4	20	1	540	180					1	20	RECEPTACLE - STORAGE 407S	2
3	(EXIST.) RECEPTACLE SUMP PUMPS	20	1			1200	500			1	20	(EXIST.) RECEPTACLE CLOCKS	4
5	(EXIST.) DWH CIRC PUMP	20	1					240	0	1	20	SPARE	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	HVAC - CH-ENT4	20	1					210	0	1	20	SPARE	42
43	HVAC - ACCU-401	25	3	1992	0					1	20	SPARE	44
45	--	--	--			1992	480			1	20	HVAC - CH-COR3A-B	46
47	--	--	--					1992	1992	3	25	HVAC - ACCU-402	48
49	HVAC - ACCU-403	25	3	1992	1992					--	--	--	50
51	--	--	--			1992	1992			--	--	--	52
53	--	--	--					1992	1560	2	25	HVAC - ACCU-405	54
55	HVAC - ACCU-407	25	3	1992	1560					--	--	--	56
57	--	--	--			1992	540			1	20	RECEPTACLE - ROOF CONV. RECEPT.	58
59	--	--	--					1992	360	1	20	RECEPTACLE - ROOF CONV. RECEPT.	60
	TOTAL LOAD:			10247 VA		10687 VA		10337 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			85 A		89 A		86 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	27710 VA	100.00%	27710 VA		
RECEPTACLE -	1620 VA	100.00%	1620 VA	**TOTAL CONNECTED LOAD:**	31270 VA
Spare	1940 VA	100.00%	1940 VA	**TOTAL ESTIMATED DEMAND:**	31270 VA
				TOTAL CONNECTED LOAD (A):	87 A
				TOTAL ESTIMATED DEMAND...	87 A

NOTES:

PANELBOARD " R1E2" LOAD SCHEDULE

PANEL: R1E2 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: STORAGE 407S / FIRST FLOOR -... **AMPS:** 225 A MLO ~~FED FROM: S1E~~
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** I.C. RATING: 4891 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - SITE LTG - STADIUM LOT	20	2	624	40					1	20	LIGHTING - STADIUM FLAGPOLE LIGHTS	2
3	--	--	--			624	720			1	20	(EXIST.) LIGHTS BOILER RM/GIRLS BATHROOM	4
5	(EXIST.) LIGHTS SUPPLY ROOM	20	1					500	600	1	20	(EXIST.) LIGHTS BOYS BATHROOM	6
7	(EXIST.) NIGHT LIGHTS	20	1	600	360					1	20	(EXIST.) NIGHT LIGHTS CORRIDOR	8
9	(EXIST.) LIGHTS DISPLAY CASE	20	1			1500	720			1	20	(EXIST.) RECEPTACLE NORTH/SOUTH HALL	10
11	(EXIST.) EXHAUST GIRLS BATHROOM	20	1					596	596	1	20	(EXIST.) VENTS ATTIC	12
13	SPARE	20	1	0	600					1	20	(EXIST.) LIGHTS GIRLS BATHROOM	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	HVAC - VUV-401	20	1	1080	0					1	20	SPARE	56
57	HVAC - VUV-402	20	1			1080	1080			1	20	HVAC - VUV-403	58
59	HVAC - VUV-405	20	1					540	1080	1	20	HVAC - VUV-407	60
	TOTAL LOAD:			3264 VA		5724 VA		3912 VA					
	**ADDITIONAL FEED THRU LUGS LOAD (IF AP

PANELBOARD " R1E3" LOAD SCHEDULE

PANEL: R1E3 **MOUNTING:** FLUSH **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: CORRIDOR COR5 / FIRST FLOOR -... **AMPS:** 225 A MLO **FED FROM:** SJF
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 3548 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	2
3	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	4
5	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	6
7	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	8
9	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	10
11	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	12
13	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	14
15	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	16
17	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	18
19	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	20
21	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	22
23	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	24
25	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	26
27	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	28
29	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	30
31	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	32
33	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	34
35	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	36
37	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	38
39	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	40
41	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	42
43	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	44
45	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	46
47	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	48
49	SPARE FOR EXISTING LOAD	20	1	0	0					1	20	SPARE FOR EXISTING LOAD	50
51	SPARE FOR EXISTING LOAD	20	1			0	0			1	20	SPARE FOR EXISTING LOAD	52
53	SPARE FOR EXISTING LOAD	20	1					0	0	1	20	SPARE FOR EXISTING LOAD	54
	TOTAL LOAD:			0 VA		0 VA		0 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			0 A		0 A		0 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
				TOTAL CONNECTED LOAD: 0 VA
				TOTAL ESTIMATED DEMAND: 0 VA
				TOTAL CONNECTED LOAD (A): 0 A
				TOTAL ESTIMATED DEMAND... 0 A

NOTES:

PANELBOARD " R1F1" LOAD SCHEDULE

PANEL: R1F1 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 304E / FIRST FLOOR - CENTER **AMPS:** 225 A MLO **FED FROM:** SJF
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 8178 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - ELEC 304E	20	1	180	720					1	20	RECEPTACLE - PRACTICE ROOMS 302.1-302.4	2
3	TECHNOLOGY - ORCHESTRA 302	20	1			720	720			1	20	RECEPTACLE - OFFICE 302A	4
5	RECEPTACLE - ORCHESTRA 302	20	1					360	360	1	20	RECEPTACLE - CORRIDOR COR8	6
7	RECEPTACLE - ORCHESTRA 302	20	1	540	180					1	20	POWER - RTU-1F CONV. RECEPT.	8
9	RECEPTACLE - ENSEMBLE 302B	20	1			360	720			1	20	RECEPTACLE - ROBOTICS 308 - PLUG REEL	10
11	HVAC - EF-301M	20	1					696	720	1	20	RECEPTACLE - ROBOTICS 308 - PLUG REEL	12
13	HVAC - EF-308	20	1	696	720					1	20	RECEPTACLE - ROBOTICS 308 - PLUG REEL	14
15	SPARE	20	1			0	720			1	20	RECEPTACLE - ROBOTICS 308 - PLUG REEL	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
	TOTAL LOAD:			3036 VA		3240 VA		2136 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			26 A		28 A		18 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC -	1392 VA	100.00%	1392 VA	
POWER -	180 VA	100.00%	180 VA	**TOTAL CONNECTED LOAD:** 8412 VA
RECEPTACLE -	6120 VA	100.00%	6120 VA	**TOTAL ESTIMATED DEMAND:** 8412 VA
TECHNOLOGY -	720 VA	100.00%	720 VA	**TOTAL CONNECTED LOAD (A):** 23 A
				TOTAL ESTIMATED DEMAND... 23 A

NOTES:

PANELBOARD " R1F2" LOAD SCHEDULE

PANEL: R1F2 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 301E / FIRST FLOOR - CENTER **AMPS:** 225 A MLO **FED FROM:** SJF
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 7799 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - JC 301C	20	1	360	180					1	20	POWER - RTU-1G CONV. RECEPT.	2
3	(EXIST.) LIGHTS LIBRARY	20	1			600	864			1	20	HVAC - EF-302	4
5	(EXIST.) LIGHTS LIBRARY	20	1					600	600	1	20	(EXIST.) LIGHTS LIBRARY	6
7	(EXIST.) LIGHTS LIBRARY	20	1	600	600					1	20	(EXIST.) LIGHTS LIBRARY	8
9	(EXIST.) LIGHTS LIBRARY	20	1			600	600			1	20	(EXIST.) LIGHTS LIBRARY	10
11	(EXIST.) LIGHTS LIBRARY	20	1					600	600	1	20	(EXIST.) LIGHTS LIBRARY	12
13	(EXIST.) LIGHTS A117	20	1	500	600					1	20	(EXIST.) LIGHTS LIBRARY	14
15	(EXIST.) LIGHTS A121	20	1			600	540			1	20	(EXIST.) LIGHTS LIBRARY COUNTER	16
17	(EXIST.) LIGHTS CONF. ROOM	20	1					720	900	1	20	(EXIST.) LIGHTS LIBRARY SPOTS	18
19	(EXIST.) LIGHTS A118, A119, A120	20	1	720	900					1	20	(EXIST.) LIGHTS LIBRARY SPOTS	20
21	(EXIST.) LIGHTS TECH CENTER	20	1			600	900			1	20	(EXIST.) LIGHTS LIBRARY SPOTS	22
23	(EXIST.) LIGHTS ELEC RM, TOILETS, A132	20	1					600	720	1	20	(EXIST.) LIGHTS LIBRARY	24
25	(EXIST.) LIGHTS TOILET MEDIA A124	20	1	900	600					1	20	(EXIST.) LIGHTS EAST LIBRARY	26
27	(EXIST.) LIGHTS PROF. 308A	20	1			600	600			1	20	(EXIST.) LIGHTS EAST LIBRARY	28
29	(EXIST.) LIGHTS RM 123	20	1					500	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	(EXIST.) RECEPTACLE TOILET RMS	20	1			720	0			1	20	SPARE	34
35	(EXIST.) HONEYWELL CONTROLS	20	1					500	240	1	20	(EXIST.) CIRC PUMP	36
37	(EXIST.) CV-2	20	2	1040	360					1	20	(EXIST.) RECEPTACLE EWC	38
39	--	--	--			1040	360			1	20	(EXIST.) RECEPTACLE A133 SHOWCASE	40
41	(EXIST.) TIME CLOCK OUTSIDE LIGHTS	20	2					1040	1441	3	20	(EXIST.) EXHAUST FAN 7 / 11	42
43	--	--	--	1040	1441					--	--	--	44
45	SPARE	20	1			0	1441			--	--	--	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
	TOTAL LOAD:			9841 VA		10065 VA		9061 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			83 A		85 A		76 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC -	864 VA	100.00%	864 VA	
POWER -	180 VA	100.00%	180 VA	**TOTAL CONNECTED LOAD:** 28967 VA
RECEPTACLE -	360 VA	100.00%	360 VA	**TOTAL ESTIMATED DEMAND:** 28967 VA
Spare	27563 VA	100.00%	27563 VA	**TOTAL CONNECTED LOAD (A):** 80 A
				TOTAL ESTIMATED DEMAND... 80 A

NOTES:

PANELBOARD " R1F3" LOAD SCHEDULE

PANEL: R1F3 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 301E / FIRST FLOOR - CENTER **AMPS:** 225 A MLO **FED FROM:** SJF
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 7769 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	(EXIST.) RECEPTACLE A124, A125	20	1	720	720					1	20	(EXIST.) RECEPTACLE A123	2
3	(EXIST.) RECEPTACLE MED 124 EAST WALL	20	1			720	720			1	20	(EXIST.) RECEPTACLE A123	4
5	(EXIST.) RECEPTACLE A132 NORTH WALL	20	1					900	360	1	20	(EXIST.) RECEPTACLE LIBRARY COLUMN	6
7	(EXIST.) RECEPTACLE A132 WEST/SOUTH WALLS	20	1	900	540					1	20	(EXIST.) RECEPTACLE LIBRARY NORTH WALL	8
9	(EXIST.) RECEPTACLE TECH CENTER	20	1			720	360			1	20	(EXIST.) RECEPTACLE LIBRARY COLUMN	10
11	(EXIST.) RECEPTACLE TECH CENTER	20	1					720	360	1	20	(EXIST.) RECEPTACLE LIBRARY COLUMN	12
13	(EXIST.) LIGHTS DISPLAY CASE	20	1	900	360					1	20	(EXIST.) RECEPTACLE LIBRARY COLUMN	14
15	(EXIST.) RECEPTACLE C100 DEPRESSED READ.	20	1			540	720			1	20	(EXIST.) RECEPTACLE LIBRARY	16
17	(EXIST.) RECEPTACLE LIBRARY SOUTH WALL	20	1					720	720	1	20	(EXIST.) RECEPTACLE LIBRARY	18
19	(EXIST.) RECEPTACLE A121	20	1	540	720					1	20	(EXIST.) RECEPTACLE LIBRARY	20
21	(EXIST.) RECEPTACLE A120	20	1			540	540			1	20	(EXIST.) LIGHTS W. OFFICE	22
23	(EXIST.) RECEPTACLE A118	20	1					540	360	1	20	(EXIST.) RECEPTACLE LIBRARY COLUMN	24
25	(EXIST.) RECEPTACLE COMPUTER ROOM	20	1	900	720					1	20	(EXIST.) RECEPTACLE A117 EAST WALL	26
27	(EXIST.) RECEPTACLE COMPUTER ROOM	20	1			900	720			1	20	(EXIST.) RECEPTACLE A117 NORTH WALL	28
29	(EXIST.) LIGHTS 302	20	1					540	360	1	20	(EXIST.) RECEPTACLE A117	30
31	(EXIST.) LIGHTS WOOD SHOP	20	1	1200	900					1	20	(EXIST.) LIGHTS 302	32
33	(EXIST.) LIGHTS 302	20	1			0	0			2	30	(EXIST.) RECEPTACLE COPY MACHINE	34
35	(EXIST.) LIGHTS WOOD SHOP	20	1					1200	0	--	--	--	36
37	(EXIST.) LIGHTS WOOD SHOP	20	1	1200	0					3	20	(EXIST.) XF-8	38
39	(EXIST.) RECEPTACLE LIBRARY BACK DOOR	20	1			180	0			--	--	--	40
41	(EXIST.) RECEPTACLE LIBRARY FRONT DOOR	20	1					180	0	--	--	--	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
	TOTAL LOAD:			10320 VA		6660 VA		6960 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			86 A		56 A		58 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
Spare	23940 VA	100.00%	23940 VA	
				TOTAL CONNECTED LOAD: 23940 VA
				TOTAL ESTIMATED DEMAND: 23940 VA
				TOTAL CONNECTED LOAD (A): 66 A
				TOTAL ESTIMATED DEMAND... 66 A

NOTES:

PANELBOARD " R1F4" LOAD SCHEDULE

PANEL: R1F4 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: STORAGE 305A / FIRST FLOOR -... **AMPS:** 225 A MLO **FED FROM:** SJF
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 6015 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	(EXIST.) LIGHTS CORR C-100	20	1	900	900					1	20	(EXIST.) LIGHTS C-102, C-103	2
3	(EXIST.) LIGHTS CORR C-100	20	1			900	900			1	20	(EXIST.) LIGHTS OVERFLOW WESTSIDE	4
5	(EXIST.) LIGHTS CORR C-100	20	1					900	900	1	20	(EXIST.) LIGHTS PROJECTION ROOM	6
7	(EXIST.) LIGHTS CORR C-100 SPOTS	20	1	720	900					1	20	(EXIST.) LIGHTS OVERFLOW EASTSIDE	8
9	(EXIST.) LIGHTS CORR C-100 SPOTS	20	1			720	540			1	20	(EXIST.) LIGHTS ELEC RM, TOILET ROOMS	10
11	(EXIST.) LIGHTS CORR C-100 SPOTS	20	1					720	900	1	20	(EXIST.) LIGHTS CORR C-114	12
13	(EXIST.) LIGHTS CORR C-100 SPOTS	20	1	720	720					1	20	(EXIST.) RECEPTACLE MENS DRESSING	14
15	(EXIST.) LIGHTS CORR C-100 SPOTS	20	1			720	900			1	20	(EXIST.) RECEPTACLE C-111, C-112	16
17	(EXIST.) LIGHTS CORR C-100 SPOTS	20	1					720	540	1	20	(EXIST.) RECEPTACLE AUD. EAST, C-113	18
19	SPARE	20	2	0	720					1	20	(EXIST.) RECEPTACLE STAGE FRONT	20
21	--	--	--			0	720			1	20	(EXIST.) RECEPTACLE C-104, C-111	22
23	(EXIST.) RECEPTACLE AUD. WEST/CENTER	20	1					720	240	1	20	(EXIST.) RECEPTACLE AUD. PROJ. SCREEN	24
25	(EXIST.) RECEPTACLE STAGE CENTER C-104	20	1	720	720					1	20	(EXIST.) RECEPTACLE STAGE C-104	26
27	(EXIST.) RECEPTACLE STAIRWAY C-106	20	1			360	720			1	20	(EXIST.) RECEPTACLE STAGE C-104	28
29	(EXIST.) RECEPTACLE STORAGE C-107	20	1					360	180	1	20	(EXIST.) F/A FLOW SWITCH	30
31	(EXIST.) RECEPTACLE PROJECTION RM	20	1	720	0					1	20	SPARE	32
33	(EXIST.) RECEPTACLE PROJECTION RM	20	1			720	0			1	20	SPARE	34
35	(EXIST.) RECEPTACLE AUD. BY SEATS	20	1					360	500	1	20	(EXIST.) LOUVER CONTROL STAGE HONEYWELL	36
37	(EXIST.) RECEPTACLE AUD. BY SEATS	20	1	360	360					1	20	(EXIST.) RECEPTACLE SOUND CABINET	38
39	(EXIST.) RECEPTACLE AUD. BY SEATS	20	1			360	0			1	20	SPARE	40
41	(EXIST.) RECEPTACLE AUD. BY SEATS	20	1					360	0	1	20	SPARE	42
43	(EXIST.) LIGHTS D-107	20	1	900	720					1	20	(EXIST.) RECEPTACLE D-105 - D-107	44
45	(EXIST.) LIGHTS D-115	20	1			900	360			1	20	(EXIST.) RECEPTACLE D-104	46
47	(EXIST.) LIGHTS D-106	20	1					900	720	1	20	(EXIST.) RECEPTACLE D-102, D-103	48
49	(EXIST.) LIGHTS D-106	20	1	900	720					1	20	(EXIST.) RECEPTACLE D-101, D-102	50
51	(EXIST.) LIGHTS D-106	20	1			900	720			1	20	(EXIST.) RECEPTACLE D-106, D-107	52
53	(EXIST.) LIGHTS D-100	20	1					900	720	1	20	(EXIST.) RECEPTACLE D-114, D-115	54
55	(EXIST.) LIGHTS D-101 - D-105	20	1	720	540					1	20	(EXIST.) RECEPTACLE MUSIC OFFICE	56
57	(EXIST.) EXHAUST FAN D-100	20	1			240	540			1	20	(EXIST.) RECEPTACLE MUSIC OFFICE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	SPARE	20	1	0	1441					3	20	(EXIST.) RT-16 CORR D107	62
63	SPARE	20	1			0	1441			--	--	--	64
65	SPARE	20	1					0	1441	--	--	--	66
67	RT-17 D-100	20	3	1441	4160					2	60	(EXIST.) ROOFTOP UNIT	68
69	--	--	--			1441	4160			--	--	--	70
71	--	--	--					1441	0	1	20	SPARE	72
73	SPARE	20	1	0	0					1	20	SPARE	74
75	SPARE	20	1			0	0			1	20	SPARE	76
77	SPARE	20	1					0	0	1	20	SPARE	78
79	SPARE	20	1	0	0					1	20	SPARE	80
81	SPARE	20	1			0	0			1	20	SPARE	82
83	SPARE	20	1					0	0	1	20	SPARE	84
	TOTAL LOAD:			20002 VA		18262 VA		13522 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			173 A		158 A		113 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
Spare	51786 VA	100.00%	51786 VA	
				TOTAL CONNECTED LOAD: 51786 VA
				TOTAL ESTIMATED DEMAND: 51786 VA
				TOTAL CONNECTED LOAD (A): 144 A
				TOTAL ESTIMATED DEMAND... 144 A

NOTES:

PANELBOARD " R1F5" LOAD SCHEDULE

PANEL: R1F5 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 303E / FIRST FLOOR - CENTER **AMPS:** 100 A MLO **FED FROM:** SJF
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 3020 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - AUDITORIUM 305 - STEP LIGHTS	20	1	42	0					1	20	SPARE	2
3	LIGHTING - AUDITORIUM 305 - AISLE LIGHTS	20	1			181	0			1	20	SPARE	4
5	SPARE	20	1					0	0	1	20	SPARE	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			42 VA		181 VA		0 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			0 A		2 A		0 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LIGHTING -	223 VA	100.00%	223 VA	
POWER -	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:** 223 VA
				TOTAL ESTIMATED DEMAND: 223 VA
				TOTAL CONNECTED LOAD (A): 1 A
				TOTAL ESTIMATED DEMAND... 1 A

DISTRIBUTION PANEL " MDP-J" LOAD SCHEDULE

SWITCHBOARD: MDP-J
LOCATION: BOILER ROOM 213
OPTIONS: SPD

VOLTAGE: 480/277V
FED FROM: TX-MDP-J
MAINS RATING: 2000 A
I.C. RATING: 43065 (A1)

CIRCUIT NUMBER	LOAD NAME	RATING	NUMBER OF POLES	APPARENT CURRENT
1	TX-S1J	500 A	3	200 A
2	D1J	800 A	3	271 A
3	D1K	800 A	3	558 A
4	HVAC - RTU-1J	175 A	3	130 A
5	SPARE	400 A	3	--
6	SPARE	250 A	3	--
7	SPARE	250 A	3	--
8	SPARE	100 A	3	--
9	SPARE	60 A	3	--
10	SPARE	20 A	3	--
11	SPARE	20 A	3	--
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

TOTAL CONNECTED VA:	963450 VA
TOTAL CONNECTED AMPS:	1159 A
TOTAL DEMAND VA:	888131 VA
TOTAL DEMAND AMPS:	1068 A

PANELBOARD " D1J" LOAD SCHEDULE

PANEL: D1J
LOCATION: KITCHEN STORAGE 213S / FIRST...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 600 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-J
I.C. RATING: 35365 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	L1J	150	3	4534	433					3	20	HVAC - EF-208	2
3	--	--	--			4372	433			--	--	--	4
5	--	--	--					3314	433	--	--	--	6
7	HVAC - RTU-2J	45	3	8591	8037					3	40	HVAC - RTU-3J	8
9	--	--	--			8591	8037			--	--	--	10
11	--	--	--					8591	8037	--	--	--	12
13	HVAC - RTU-4J	40	3	8037	8037					3	40	HVAC - RTU-5J	14
15	--	--	--			8037	8037			--	--	--	16
17	--	--	--					8037	8037	--	--	--	18
19	HVAC - RTU-6J	40	3	8037	5543					3	30	HVAC - B-1	20
21	--	--	--			8037	5543			--	--	--	22
23	--	--	--					8037	5543	--	--	--	24
25	HVAC - AHU-249	20	3	867	5543					3	30	HVAC - B-2	26
27	--	--	--			867	5543			--	--	--	28
29	--	--	--					867	5543	--	--	--	30
31	HVAC - P-1	40	3	7167	7167					3	40	HVAC - P-2	32
33	--	--	--			7167	7167			--	--	--	34
35	--	--	--					7167	7167	--	--	--	36
37	HVAC - P-5	20	3	2033	867					3	20	HVAC - AHU-217	38
39	--	--	--			2033	867			--	--	--	40
41	--	--	--					2033	867	--	--	--	42
43	HVAC - EF-K1	20	3	800	0					3	150	SPARE	44
45	--	--	--			800	0			--	--	--	46
47	--	--	--					800	0	--	--	--	48
49	SPARE	60	3	0	0					3	60	SPARE	50
51	--	--	--			0	0			--	--	--	52
53	--	--	--					0	0	--	--	--	54
55	SPARE	20	3	0	0					3	20	SPARE	56
57	--	--	--			0	0			--	--	--	58
59	--	--	--					0	0	--	--	--	60
61	SPARE	20	3	0	0					3	20	SPARE	62
63	--	--	--			0	0			--	--	--	64
65	--	--	--					0	0	--	--	--	66
	TOTAL LOAD:			75692 VA		75530 VA		74472 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			274 A		273 A		269 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	213473 VA	100.00%	213473 VA		
LIGHTING -	12220 VA	100.00%	12220 VA	**TOTAL CONNECTED LOAD:**	225693 VA
				TOTAL ESTIMATED DEMAND:	225693 VA
				TOTAL CONNECTED LOAD (A):	271 A
				TOTAL ESTIMATED DEMAND...	271 A

NOTES:

PANELBOARD " D1K" LOAD SCHEDULE

PANEL: D1K
LOCATION: MECH 032 / FIRST FLOOR - SOUTH
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 800 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-J
I.C. RATING: 17495 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	TX-S1K	175	3	32273	6521					3	150	L1K	2
3	--	--	--			29365	5404			--	--	--	4
5	--	--	--					22829	2430	--	--	--	6
7	TX-S2K	175	3	19622	6466					3	150	L2K	8
9	--	--	--			18684	2230			--	--	--	10
11	--	--	--					17996	1469	--	--	--	12
13	HVAC - RTU-1K	225	3	47112	47112					3	225	HVAC - RTU-2K	14
15	--	--	--			47112	47112			--	--	--	16
17	--	--	--					47112	47112	--	--	--	18
19	HVAC - AHU-132	20	3	1380	3880					3	20	HVAC - ACCU-132	20
21	--	--	--			1380	3880			--	--	--	22
23	--	--	--					1380	3880	--	--	--	24
25	SPARE	150	3	0	0					3	100	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
31	SPARE	60	3	0	0					3	60	SPARE	32
33	--	--	--			0	0			--	--	--	34
35	--	--	--					0	0	--	--	--	36
37	SPARE	20	3	0	0					3	20	SPARE	38
39	--	--	--			0	0			--	--	--	40
41	--	--	--					0	0	--	--	--	42
43	SPARE	20	3	0	0					3	20	SPARE	44
45	--	--	--			0	0			--	--	--	46
47	--	--	--					0	0	--	--	--	48
	TOTAL LOAD:			164364 VA		155167 VA		144207 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			599 A		566 A		521 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	329325 VA	100.00%	329325 VA		
KITCHEN EQUIPMENT -	5824 VA	100.00%	5824 VA	**TOTAL CONNECTED LOAD:**	463737 VA
LIGHTING -	22720 VA	100.00%	22720 VA	**TOTAL ESTIMATED DEMAND:**	430037 VA
POWER -	6868 VA	100.00%	6868 VA	**TOTAL CONNECTED LOAD (A):**	558 A
RECEPTACLE -	77400 VA	56.46%	43700 VA	**TOTAL ESTIMATED DEMAND...**	517 A
TECHNOLOGY -	21600 VA	100.00%	21600 VA		

NOTES:

PANELBOARD " S1J" LOAD SCHEDULE

PANEL: S1J
LOCATION: BOILER ROOM 213 / FIRST FLOOR -...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 1000 A MB
FEED-THRU LUGS...

VOLTAGE: 208/120V, 3PH, 4W
FED FROM: TX-S1J
I.C. RATING: 11928 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R1H1	225	3	7068	2488					3	225	R1J1	2
3	--	--	--			10358	3176			--	--	--	4
5	--	--	--					8342	3424	--	--	--	6
7	R1H2	225	3	10540	4920					3	225	R1J2	8
9	--	--	--			8486	6084			--	--	--	10
11	--	--	--					7522	3750	--	--	--	12
13	R1H3	100	3	7396	1440					3	225	R1J3	14
15	--	--	--			3996	1140			--	--	--	16
17	--	--	--					5920	2472	--	--	--	18
19	RK1	225	3	20494	0					3	150	SPARE	20
21	--	--	--			24503	0			--	--	--	22
23	--	--	--					22421	0	--	--	--	24
25	SPARE	100	3	0	0					3	100	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
31	SPARE	60	3	0	0					3	60	SPARE	32
33	--	--	--			0	0			--	--	--	34
35	--	--	--					0	0	--	--	--	36
37	SPARE	20	3	0	0					3	20	SPARE	38
39	--	--	--			0	0			--	--	--	40
41	--	--	--					0	0	--	--	--	42
43	SPARE	20	3	0	0					3	20	SPARE	44
45	--	--	--			0	0			--	--	--	46
47	--	--	--					0	0	--	--	--	48
	TOTAL LOAD:			54346 VA		57743 VA		53851 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			454 A		482 A		449 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	38255 VA	100.00%	38255 VA		
KITCHEN EQUIPMENT -	65259 VA	65.00%	42418 VA	**TOTAL CONNECTED LOAD:**	165940 VA
LIGHTING -	1664 VA	100.00%	1664 VA	**TOTAL ESTIMATED DEMAND:**	131359 VA
POWER -	6730 VA	100.00%	6730 VA	**TOTAL CONNECTED LOAD (A):**	461 A
RECEPTACLE -	33480 VA	64.93%	21740 VA	**TOTAL ESTIMATED DEMAND...**	365 A
Spare	17312 VA	100.00%	17312 VA		
TECHNOLOGY -	3240 VA	100.00%	3240 VA		

NOTES:

PANELBOARD " L1J" LOAD SCHEDULE

PANEL: L1J
LOCATION: KITCHEN STORAGE 213S / FIRST...
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 150 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: D1J
I.C. RATING: 24284 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - ADMIN 201, 203, 205	20	1	1003	306					1	20	LIGHTING - ENTRY CANOPY	2
3	LIGHTING - BOILER ROOM 213	20	1			344	1072			1	20	LIGHTING - OFFICES 205, RMS 201	4
5	LIGHTING - ENT 9, COR9	20	1					468	1438	1	20	LIGHTING - KITCHEN K1	6
7	LIGHTING - CAFETERIA 202 - LINEARS	20	1	2103	394					1	20	LIGHTING - Room 210R, 210M, 210W, 210S, 210J	8
9	LIGHTING - UNIT J LOCKERS - NORTH	20	1			1455	1500			1	20	LIGHTING - UNIT J LOCKERS - SOUTH	10
11	LIGHTING - EXTERIOR - UNIT J	20	1					374	1034	1	20	LIGHTING - CORR. COR10, CAFETERIA 202	12
13	LIGHTING - CAFETERIA 202	20	1	728	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			4534 VA		4372 VA		3314 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			17 A		16 A		12 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	12220 VA	100.00%	12220 VA	**TOTAL CONNECTED LOAD:**	12220 VA
				TOTAL ESTIMATED DEMAND:	12220 VA
				TOTAL CONNECTED LOAD (A):	15 A
				TOTAL ESTIMATED DEMAND...	15 A

NOTES:

PANELBOARD " R1H1" LOAD SCHEDULE

PANEL: R1H1
LOCATION: OFFICE K5 / FIRST FLOOR - SOUTH
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 225 A MLO
FEED-THRU LUGS...

VOLTAGE: 208/120V, 3PH, 4W
FED FROM: S1J
I.C. RATING: 4315 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	POWER - SERVING K4 - KITCHEN FIRE SHUTTERS	20	1	150	600					1	20	POWER - SERVING K4 - OVERHEAD DOOR	2
3	POWER - SERVING K4 - OVERHEAD DOOR	20	1			600	600			1	20	POWER - SERVING K4 - OVERHEAD DOOR	4
5	SPARE	20	1					0	0	1	20	SPARE	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	POWER - UNIT J - 1ST FLR SMOKE DAMPERS	20	1	160	0					1	20	SPARE	62
63	HVAC - AHU-204	25	1			1992	1440			1	20	HVAC - HUV-206A	64
65	HVAC - ACCU-204	30	3					2162	180	1	20	POWER - AHU-204, COR9, 210 COND. PUMP	66
67	--	--	--	2162	1440					1	20	HVAC - HUV-206B	68
69	--	--	--			2162	526			1	20	HVAC - EF-204	70
71	HVAC - ACCU-206A	25	2					1560	528	1	20	HVAC - EF-204C	72
73	--	--	--	1560	696					1	20	HVAC - EF-206	74
75	HVAC - AHU-212S	20	1			1118	1560			2	25	HVAC - ACCU-206B	76
77	HVAC - AHU-COR9	25	1					1992	1560	--	--	--	78
79	POWER - RTU-3J CONV. RECEPT.	20	1	180	120					1	20	HVAC - CH-ENT 9	80
81	POWER - RTU-1J CONV. RECEPT.	20	1			180	180			1	20	POWER - RTU-4J CONV. RECEPT.	82
83	POWER - RTU-1J DYN. FILTER	20	1					180	180	1	20	POWER - RTU-2J CONV. RECEPT.	84
	TOTAL LOAD:			7068 VA		10358 VA		8342 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			59 A		88 A		71 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	22737 VA	100.00%	22737 VA		
POWER -	3030 VA	100.00%	3030 VA	**TOTAL CONNECTED LOAD:**	25767 VA
				TOTAL ESTIMATED DEMAND:	25767 VA
				TOTAL CONNECTED LOAD (A):	72 A
				TOTAL ESTIMATED DEMAND...	72 A

NOTES:

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ADDENDUM 1	NOVEMBER 29, 2021
ISSUED FOR	DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL PANEL SCHEDULES - MDP-J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 451.2
17-175.70

PANELBOARD " R1H2" LOAD SCHEDULE

PANEL: R1H2 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: A/V - STORAGE 210S / FIRST FLOOR -... **AMPS:** 225 A MLO **FED FROM:** S31
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 4531 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A	B	C	POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - TOILETS 210R, 210W, 210M	20	1	720 540			1	20	TECHNOLOGY - RMS 210J, 210S, 261	2
3	RECEPTACLE - CAFETERIA 202 - BOTTLE FILL	20	1		360 540		1	20	RECEPTACLE - CORRIDOR COR11, COMMONS 261	4
5	TECHNOLOGY - CAFETERIA 202 - TV'S	20	1			720 720	1	20	RECEPTACLE - CAFETERIA 202 - E WINDOW	6
7	TECHNOLOGY - CAFETERIA 202 - MENU'S	20	1	1080 540			1	20	RECEPTACLE - CAFETERIA 202 - E WINDOW	8
9	RECEPTACLE - CAFETERIA 202	20	1		540 540		1	20	RECEPTACLE - CAFETERIA 202 - E WINDOW	10
11	RECEPTACLE - CAFETERIA 202	20	1			540 540	1	20	RECEPTACLE - CAFETERIA 202 - E WINDOW	12
13	RECEPTACLE - CAFETERIA 202 - S WINDOW	20	1	1656 360			1	20	RECEPTACLE - CAFETERIA 202 - E WINDOW	14
15	RECEPTACLE - CAFETERIA 202 - S WINDOW	20	1		1656 360		1	20	RECEPTACLE - CAFETERIA 202 - E WINDOW	16
17	RECEPTACLE - CAFETERIA 202 - SE WINDOW	20	1			1476 900	1	20	TECHNOLOGY - CAFETERIA 202 - S COLUMN	18
19	RECEPTACLE - CAFETERIA 202 - SE WINDOW	20	1	1476 360			1	20	RECEPTACLE - CAFETERIA 202 - CENTER...	20
21	RECEPTACLE - CAFETERIA 202 - SE WINDOW	20	1		1476 360		1	20	RECEPTACLE - CAFETERIA 202 - NORTH COLUMN	22
23	POWER - CAFETERIA - PRJ. SCREEN	20	1			200 800	1	20	POWER - CAFETERIA 202 - EAST SHADES	24
25	POWER - CAFETERIA 202 - SOUTH SHADES	20	1	400 0			1	20	SPARE	26
27	SPARE	20	1		0 0		1	20	SPARE	28
29	SPARE	20	1			0 0	1	20	SPARE	30
31	SPARE	20	1	0 0			1	20	SPARE	32
33	SPARE	20	1		0 0		1	20	SPARE	34
35	SPARE	20	1			0 0	1	20	SPARE	36
37	SPARE	20	1	0 0			1	20	SPARE	38
39	SPARE	20	1		0 0		1	20	SPARE	40
41	SPARE	20	1			0 0	1	20	SPARE	42
43	SPARE	20	1	0 0			1	20	SPARE	44
45	SPARE	20	1		0 0		1	20	SPARE	46
47	SPARE	20	1			0 0	1	20	SPARE	48
49	SPARE	20	1	0 0			1	20	SPARE	50
51	SPARE	20	1		0 0		1	20	SPARE	52
53	SPARE	20	1			0 0	1	20	SPARE	54
55	SPARE	20	1	0 0			1	20	SPARE	56
57	SPARE	20	1		0 0		1	20	SPARE	58
59	SPARE	20	1			0 0	1	20	SPARE	60
61	SPARE	20	1	0 0			1	20	SPARE	62
63	SPARE	20	1		0 0		1	20	SPARE	64
65	SPARE	20	1			0 0	1	20	SPARE	66
67	SPARE	20	1	0 0			1	20	SPARE	68
69	SPARE	20	1		0 0		1	20	SPARE	70
71	SPARE	20	1			0 0	1	20	SPARE	72
73	HVAC - VUV-212A	20	1	1080 1080			1	20	HVAC - VUV-212B	74
75	HVAC - EF-210	20	1		300 696		1	20	HVAC - EF-210J	76
77	HVAC - EF-210M	20	1			300 696	1	20	HVAC - EF-212	78
79	HVAC - EF-212E	20	1	528 720			1	20	RECEPTACLE - ROOF CONV. RECEPT.	80
81	HVAC - AHU-210	20	1		1118 540		1	20	RECEPTACLE - ROOF CONV. RECEPT.	82
83						630	1	20	HVAC - CH-COR 11A-C	84

TOTAL LOAD: 10540 VA 8486 VA 7522 VA
ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE): 0 VA 0 VA 0 A
TOTAL AMPS: 89 A 72 A 63 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC -	6428 VA	100.00%	6428 VA	
POWER -	1400 VA	100.00%	1400 VA	**TOTAL CONNECTED LOAD:** 26548 VA
RECEPTACLE -	16200 VA	80.86%	13100 VA	**TOTAL ESTIMATED DEMAND:** 23448 VA
TECHNOLOGY -	2520 VA	100.00%	2520 VA	**TOTAL CONNECTED LOAD (A):** 74 A
				TOTAL ESTIMATED DEMAND... 65 A

NOTES:

PANELBOARD " R1H3" LOAD SCHEDULE

PANEL: R1H3 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: KILN 206A / FIRST FLOOR - SOUTH **AMPS:** 100 A MLO **FED FROM:** S31
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 1985 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A	B	C	POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	(EXIST.) RECEPTACLE KILN RM	20	1	360 900			1	20	(EXIST.) LTS/RECEPTS RMS 512, 513	2
3	(EXIST.) RECEPTACLE POTTERY TABLES	20	1		1200 900		1	20	(EXIST.) LIGHTS 2D ART ROOM	4
5	(EXIST.) LTS/RECEPTS RM 515	20	1			720 720	1	20	(EXIST.) RECEPTACLE 2D ART ROOM	6
7	(EXIST.) LIGHTS 3D ART ROOM	20	1	900 360			1	20	(EXIST.) LIGHTS KILN ROOM	8
9	(EXIST.) RECEPTACLE EAST 3D ART ROOM	20	1		540 696		1	20	(EXIST.) EX. FAN 22, EX. FAN 23	10
11	(EXIST.) RECEPTACLE MEZZANINE	20	1			360 3640	2	50	(EXIST.) RECEPTACLE KILN	12
13	(EXIST.) LIGHTS MEZZANINE	20	1	540 3640			--	--	--	14
15	(EXIST.) LIGHTS TIME CLOCK	20	2		480 0		1	20	SPARE	16
17	--	--	--			480 0	1	20	SPARE	18
19	(EXIST.) EX. FAN 24	20	1	696 0			1	20	SPARE	20
21	(EXIST.) RECEPTACLE KILN EX. FAN	20	1		180 0		1	20	SPARE	22
23	SPARE	20	1			0 0	1	20	SPARE	24
25	SPARE	20	1	0 0			1	20	SPARE	26
27	SPARE	20	1		0 0		1	20	SPARE	28
29	SPARE	20	1			0 0	1	20	SPARE	30
31	SPARE	20	1	0 0			1	20	SPARE	32
33	SPARE	20	1		0 0		1	20	SPARE	34
35	SPARE	20	1			0 0	1	20	SPARE	36
37	SPARE	20	1	0 0			1	20	SPARE	38
39	SPARE	20	1		0 0		1	20	SPARE	40
41	SPARE	20	1			0 0	1	20	SPARE	42

TOTAL LOAD: 7396 VA 3996 VA 5920 VA
ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE): 0 VA 0 VA 0 A
TOTAL AMPS: 64 A 33 A 52 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
Spare	17312 VA	100.00%	17312 VA	
				TOTAL CONNECTED LOAD: 17312 VA
				TOTAL ESTIMATED DEMAND: 17312 VA
				TOTAL CONNECTED LOAD (A): 48 A
				TOTAL ESTIMATED DEMAND... 48 A

NOTES:

PANELBOARD " R1J1" LOAD SCHEDULE

PANEL: R1J1 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: BOILER ROOM 213 / FIRST FLOOR -... **AMPS:** 225 A MLO **FED FROM:** S31
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 9241 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A	B	C	POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	POWER - RTU-5J CONV. RECEPT.	20	1	180 180			1	20	POWER - RTU-6J CONV. RECEPT.	2
3	POWER - BOILER RM 214 - PRE-ACTION SYS.	20	1		500 696		1	20	HVAC - EF-209	4
5	HVAC - B-5	20	1			600 1176	1	20	HVAC - GMU-1	6
7	HVAC - UH-213	20	1	336 600			1	20	HVAC - DWH-1	8
9	HVAC - DWH-2	20	1		600 120		1	20	HVAC - CH-ENT 10	10
11	HVAC - UH-211	20	1			120 696	1	20	HVAC - EF-213	12
13	HVAC - P-DW-1	20	1	240 120			1	20	HVAC - UH-213S	14
15	RECEPTACLE - BOILER ROOM 213	20	1		540 720		1	20	RECEPTACLE - BOILER ROOM 213	16
17	LIGHTING - SITE LTG - SE LOT	20	2			624 208	2	20	LIGHTING - SITE LTG - WEST DRIVE	18
19	--	--	--	624 208			--	--	--	20
21	SPARE	20	1		0 0		1	20	SPARE	22
23	SPARE	20	1			0 0	1	20	SPARE	24
25	SPARE	20	1	0 0			1	20	SPARE	26
27	SPARE	20	1		0 0		1	20	SPARE	28
29	SPARE	20	1			0 0	1	20	SPARE	30
31	SPARE	20	1	0 0			1	20	SPARE	32
33	SPARE	20	1		0 0		1	20	SPARE	34
35	SPARE	20	1			0 0	1	20	SPARE	36
37	SPARE	20	1	0 0			1	20	SPARE	38
39	SPARE	20	1		0 0		1	20	SPARE	40
41	SPARE	20	1			0 0	1	20	SPARE	42
43	SPARE	20	1	0 0			1	20	SPARE	44
45	SPARE	20	1		0 0		1	20	SPARE	46
47	SPARE	20	1			0 0	1	20	SPARE	48
49	SPARE	20	1	0 0			1	20	SPARE	50
51	SPARE	20	1		0 0		1	20	SPARE	52
53	SPARE	20	1			0 0	1	20	SPARE	54
55	SPARE	20	1	0 0			1	20	SPARE	56
57	SPARE	20	1		0 0		1	20	SPARE	58
59	SPARE	20	1			0 0	1	20	SPARE	60
61	SPARE	20	1	0 0			1	20	SPARE	62
63	SPARE	20	1		0 0		1	20	SPARE	64
65	SPARE	20	1			0 0	1	20	SPARE	66
67	SPARE	20	1	0 0			1	20	SPARE	68
69	SPARE	20	1		0 0		1	20	SPARE	70
71	SPARE	20	1			0 0	1	20	SPARE	72
73	SPARE	20	1	0 0			1	20	SPARE	74
75	SPARE	20	1		0 0		1	20	SPARE	76
77	SPARE	20	1			0 0	1	20	SPARE	78
79	SPARE	20	1	0 0			1	20	SPARE	80
81	SPARE	20	1		0 0		1	20	SPARE	82
83	SPARE	20	1			0 0	1	20	SPARE	84

TOTAL LOAD: 2488 VA 3176 VA 3424 VA
ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE): 0 VA 0 VA 0 A
TOTAL AMPS: 21 A 27 A 29 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC -	5304 VA	100.00%	5304 VA	
LIGHTING -	1664 VA	100.00%	1664 VA	**TOTAL CONNECTED LOAD:** 9088 VA
POWER -	860 VA	100.00%	860 VA	**TOTAL ESTIMATED DEMAND:** 9088 VA
RECEPTACLE -	1260 VA	100.00%	1260 VA	**TOTAL CONNECTED LOAD (A):** 25 A
				TOTAL ESTIMATED DEMAND... 25 A

NOTES:

PANELBOARD " R1J2" LOAD SCHEDULE

PANEL: R1J2 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: TECH 203.1 / FIRST FLOOR - SOUTH **AMPS:** 225 A MLO **FED FROM:** S31
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 7775 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A	B	C	POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - VESTIBULE 200	20	1	360 720			1	20	TECHNOLOGY - RMS 201, 201C - TV'S	2
3	RECEPTACLE - WORK ROOM 203	20	1		540 360		1	20	RECEPTACLE - ADMIN 201 - DESK	4
5	RECEPTACLE - WORK ROOM 203	20	1			360 360	1	20	RECEPTACLE - ADMIN 201 - DESK	6
7	RECEPTACLE - WORK ROOM 203 - COPIER	20	1	180 360			1	20	RECEPTACLE - ADMIN 201	8
9	RECEPTACLE - WORK ROOM 203	20	1		360 900		1	20	RECEPTACLE - CONFERENCE ROOM 201C	10
11	RECEPTACLE - WORK ROOM 203 - MIRCOWAVE	20	1			180 360	1	20	RECEPTACLE - CONFERENCE ROOM 201C	12
13	RECEPTACLE - WORK ROOM 203 -...	20	1	180 360			1	20	RECEPTACLE - TOILETS 201R, 205R	14
15	RECEPTACLE - WORK ROOM 203 - COFFEE	20	1		180 360		1	20	RECEPTACLE - STORAGE 201S	16
17	RECEPTACLE - TECH 203.1 - IDF	20	1			180 180	1	20	RECEPTACLE - STORAGE 201S - REFRIGERATOR	18
19	RECEPTACLE - TECH 203.1 - IDF	20	1	180 540			1	20	RECEPTACLE - CORRIDOR 205	20
21	RECEPTACLE - KITCHEN STORAGE 207	20	1		360 720		1	20	RECEPTACLE - PRINCIPAL 205.1	22
23	RECEPTACLE - CORRIDOR-2 COR10-2	20	1			360 360	1	20	RECEPTACLE - RMS 205.2, 205C	24
25	HVAC - CH-200	20	1	120 540			1	20	RECEPTACLE - ASSISTANT PRINCIPAL 205.3	26
27	HVAC - EF-207	20	1		696 540		1	20	RECEPTACLE - COUNSELOR 205.4	28
29	HVAC - P-HC-2J	20	1			270 540	1	20	RECEPTACLE - COUNSELOR 205.5	30
31	POWER - FLAG POLE LIGHT - ENTRY	20	1	240 540			1	20	RECEPTACLE - COUNSELOR 205.6	32
33	HVAC - EF-203.1	20	1		528 540		1	20	RECEPTACLE - OFFICE 205.7	34
35	POWER - UNIT J CANOPY HEAT TRACE	20	2			600 0	1	20	SPARE	36
37	--	--	--	600 0			1	20	SPARE	38
39	SPARE	20	1		0 0		1	20	SPARE	40
41	SPARE	20	1			0 0	1	20	SPARE	42
43	SPARE	20	1	0 0			1	20	SPARE	44
45	SPARE	20	1		0 0		1	20	SPARE	46
47	SPARE	20	1			0 0	1	20	SPARE	48
49	SPARE	20	1	0 0			1	20	SPARE	50
51	SPARE	20	1		0 0		1	20	SPARE	52
53	SPARE	20	1			0 0	1	20	SPARE	54
55	SPARE	20	1	0 0			1	20	SPARE	56
57	SPARE	20	1		0 0		1	20	SPARE	58
59	SPARE	20	1			0 0	1	20	SPARE	60

TOTAL LOAD: 4920 VA 6084 VA 3750 VA
ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE): 0 VA 0 VA 0 A
TOTAL AMPS: 43 A 52 A 31 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC -	1614 VA	100.00%	1614 VA	
POWER -	1440 VA	100.00%	1440 VA	**TOTAL CONNECTED LOAD:** 14754 VA
RECEPTACLE -	10980 VA	95.54%	10490 VA	**TOTAL ESTIMATED DEMAND:** 14264 VA
TECHNOLOGY -	720 VA	100.00%	720 VA	**TOTAL CONNECTED LOAD (A):** 41 A
				TOTAL ESTIMATED DEMAND... 40 A

NOTES:

PANELBOARD " R1J3" LOAD SCHEDULE

PANEL: R1J3 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: PE STORAGE 217 / FIRST FLOOR -... **AMPS:** 225 A MLO **FED FROM:** S31
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 6408 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A	B	C	POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - STORAGE 249	20	1	360 540			1	20	RECEPTACLE - GIRLS LOCKER 240	2
3	RECEPTACLE - PE STORAGE 217	20	1		360 540		1	20	RECEPTACLE - LOCKER 240, TLT D694	4
5	RECEPTACLE - BOYS LOCKER 225	20	1			540 540	1	20	RECEPTACLE - LOCKER 225, TLT D695	6
7	HVAC - P-217	20	1	270 270			1	20	HVAC - P-249	8
9	HVAC - UH-217	20	1		120 120		1	20	HVAC - UH-249	10
11	HVAC - EF-217	20	1			696 696	1	20	HVAC - EF-249	12
13	SPARE	20	1	0 0			1	20	SPARE	14
15	SPARE	20	1		0 0		1	20	SPARE	16
17	SPARE	20	1			0 0	1	20	SPARE	18
19	SPARE	20	1	0 0			1	20	SPARE	20
21	SPARE	20	1		0 0		1	20	SPARE	22
23	SPARE	20	1			0 0	1	20	SPARE	24
25	SPARE	20	1	0 0			1	20	SPARE	26
27	SPARE	20	1		0 0		1	20	SPARE	28
29	SPARE	20	1			0 0	1	20	SPARE	30
31	SPARE	20	1	0 0			1	20	SPARE	32
33	SPARE	20	1		0 0		1	20	SPARE	34
35	SPARE	20	1			0 0	1	20	SPARE	36
37	SPARE	20	1	0 0			1	20	SPARE	38
39	SPARE	20	1		0 0		1	20	SPARE	40
41	SPARE	20	1			0 0	1	20	SPARE	42
43	SPARE	20	1	0 0			1	20	SPARE	44
45	SPARE	20	1		0 0		1	20	SPARE	46
47	SPARE	20	1			0 0	1	20	SPARE	48
49	SPARE	20	1	0 0			1	20	SPARE	50
51	SPARE	20	1		0 0		1	20	SPARE	52
53	SPARE	20	1			0 0	1	20	SPARE	54
55	SPARE	20	1	0 0			1	20	SPARE	56
57	SPARE	20	1		0 0		1	20	SPARE	58
59	SPARE	20	1			0 0	1	20	SPARE	60

TOTAL LOAD: 1440 VA 1140 VA 2472 VA
ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE): 0 VA 0 VA 0 A
TOTAL AMPS: 12 A 10 A 21 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC -	2172 VA	100.00%	2172 VA	
RECEPTACLE -	2880 VA	100.00%	2880 VA	**TOTAL CONNECTED LOAD:** 5052 VA
				TOTAL ESTIMATED DEMAND: 5052 VA
				TOTAL CONNECTED LOAD (A): 14 A
				TOTAL ESTIMATED DEMAND... 14 A

NOTES:

PANELBOARD " RK1" LOAD SCHEDULE

PANEL: RK1 **MOUNTING:** SURFACE **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: OFFICE K5 / FIRST FLOOR - SOUTH **AMPS:** 225 A MLO **FED FROM:** S31
ADDED ACCESSORIES: SPD **FEED-THRU LUGS...** **I.C. RATING:** 5631 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A	B	C	POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	KITCHEN EQ - COOLER	20	1	960 960			1	20	KITCHEN EQ - FREEZER	2
3	KITCHEN EQ - FIRE PROTECTION SYSTEM	20	1		1200 1200		1	20	KITCHEN EQ - FIRE PROTECTION SYSTEM	4
5	KITCHEN EQ - FIRE PROTECTION SYSTEM	20	1			1200 614	2	20	KITCHEN EQ - ICE MAKER	6
7	KITCHEN EQ - MIXER	20	1	348 614			--	--	--	8
9	KITCHEN EQ - HOT FOOD CABINET	20	1		1440 1440		1	20	KITCHEN EQ - HOT FOOD CABINET	10
11	KITCHEN EQ - HOOD	20	1			1200 1068	1	20	KITCHEN EQ - CONVECTION OVEN	12
13	KITCHEN EQ - CONVECTION OVEN	20	1	1068 1068			1	20	KITCHEN EQ - CONVECTION OVEN	14
15	KITCHEN EQ - STEAMERS	20	1		480 1200		1	20	KITCHEN EQ - HOOD	16
17	KITCHEN EQ - REFRIGERATOR	20	1			588 888	1	20	KITCHEN EQ - REFRIGERATOR	18
19	KITCHEN EQ - REFRIGERATOR	20	1	888 588			1	20	KITCHEN EQ - REFRIGERATOR	20
21	KITCHEN EQ - HOOD	20	1		1200 2080		2	30	KITCHEN EQ - DROP-IN HOT WELLS	22
23	KITCHEN EQ - SNEEZE GUARD	20	2			1269 2080	--	--	--	24
25	--	--	--	1269 492			1	20	KITCHEN EQ - COLD WELL / SNEEZE GUARD	26
27	KITCHEN EQ - COLD WELL / SNEEZE GUARD	20	1		360 564		1	20	KITCHEN EQ - SALAD BAR	28
29	KITCHEN EQ - POINT OF SALE	20	1			360 360	1	20	KITCHEN EQ - POINT OF SALE	30
31	KITCHEN EQ - POINT OF SALE	20	1	360 780			1	20	KITCHEN EQ - DROP-IN HEATED SURFACE	32
33	KITCHEN EQ - REFRIG. PASS THRU	20	1		864 811		2	20	KITCHEN EQ - HEATED PASS THRU	34
35	KITCHEN EQ - COLD WELL / SNEEZE GUARD	20	1			360 811	--	--	--	36
37	KITCHEN EQ - COLD WELL / SNEEZE GUARD	20	1	360 360			1	20	KITCHEN EQ - COLD WELL / SNEEZE GUARD	38
39	KITCHEN EQ - AIR CURTAIN REFRIG.	25	2		1643 1872		1	25	KITCHEN EQ - AIR CURTAIN REFRIG.	40
41	--	--	--			1643 1560	2	25	KITCHEN EQ - DROP-IN HOT WELLS	42
43	KITCHEN EQ - SNEEZE GUARD	20	2	967 1560			--	--	--	44
45	--	--	--		967 480		1	20	KITCHEN EQ - DECOR. HEAT LAMPS	46
47	KITCHEN EQ - DROP-IN SOUP WELLS	20	1			912 1467	2	20	KITCHEN EQ - HEATED SAND. SLIDE	48
49	KITCHEN EQ - DROP-IN HOT/COLD WELLS	20	1	1524 1467			--	--	--	50
51	KITCHEN EQ - SNEEZE GUARD	20	2		520 540		1	20	KITCHEN EQ - GEN PURPOSE - CEILING	52
53	--	--	--			520 360	1	20	KITCHEN EQ - GEN PURPOSE	54
55	KITCHEN EQ - GEN PURPOSE	20	1	360 540			1	20	KITCHEN EQ - GEN PURPOSE	56
57	KITCHEN EQ - GEN PURPOSE	20	1		360 1560		2	20	KITCHEN EQ - FREEZER COIL	58
59	KITCHEN EQ - COOLER COIL	20	1			600 1560	--	--	--	60
61	KITCHEN EQ - COOLER COMPRESSOR	20	3	1201 1801			3	20	KITCHEN EQ - FREEZER COMPRESSOR	62
63	--	--	--		1201 1801		--	--	--	64
65	--	--	--			1201 1801	--	--	--	66
67	RECEPTACLE - COMP. CONV. RECEPT.	20	1	360 600			1	20	KITCHEN EQ - FREEZER COIL HEAT TAPE	68
69	RECEPTACLE - RMS K5, K2	20	1		720 0		1	20	SPARE	70
71	SPARE	20	1			0 0	1	20	SPARE	72
73	SPARE	20	1	0 0			1	20	SPARE	74
75	SPARE	20	1		0 0		1	20	SPARE	76
77	SPARE	20	1			0 0	1	20	SPARE	78
79	SPARE	20	1	0 0			1	20	SPARE	80
81	SPARE	20	1		0 0		1	20	SPARE	82
83	SPARE	20	1			0 0	1	20	SPARE	84

TOTAL LOAD: 20494 VA 24503 VA 22421 VA
ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE): 0 VA 0 VA 0 A
TOTAL AMPS: 171 A 207 A 189 A

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
KITCHEN EQUIPMENT -	65259 VA	65.00%	42418 VA	
RECEPTACLE -	2160 VA	100.00%	2160 VA	**TOTAL CONNECTED LOAD:** 67419 VA
				TOTAL ESTIMATED DEMAND: 44578 VA
				TOTAL CONNECTED LOAD (A): 187 A
				TOTAL ESTIMATED DEMAND... 124 A

NOTES:

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| ISSUED FO

PANELBOARD " L1K" LOAD SCHEDULE

PANEL: L1K | **MOUNTING:** SURFACE | **VOLTAGE:** 480/277V, 3PH, 4W
LOCATION: ELEC 025E / FIRST FLOOR - NORTH | **AMPS:** 150 A MLO | ~~FED FROM: DJK~~
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 7427 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - COMMONS 000	20	1	2511	2379					1	20	LIGHTING - CLASSROOMS 002-010, T WKRM 011	2
3	LIGHTING - CORRIDOR 001, STAIRS S002, S003	20	1			1616	1404			1	20	LIGHTING - CLASSROOMS 012-018	4
5	LIGHTING - MECH/ELEC 001, STAIR S001	20	1					555	1053	1	20	LIGHTING - CLASSROOMS 020-024	6
7	LIGHTING - RMS 025A, B, E, J, M, T, W	20	1	538	1092					1	20	LIGHTING - CLASSROOMS 026-030, RMS 026A-029	8
9	LIGHTING - EXTERIOR LIGHTING - UNIT K	20	1			153	431			1	20	LIGHTING - MECH 032, TABLES 033	10
11	LIGHTING - STAIR S100	20	1					649	172	1	20	LIGHTING - ELEVATOR 001E	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	1800			2	15	TX-RS1	40
41	SPARE	20	1					0	0	--	--	--	42
	TOTAL LOAD:			6521 VA		5404 VA		2430 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			25 A		21 A		9 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	12555 VA	100.00%	12555 VA		
POWER -	1800 VA	100.00%	1800 VA	**TOTAL CONNECTED LOAD:**	14355 VA
				TOTAL ESTIMATED DEMAND:	14355 VA
				TOTAL CONNECTED LOAD (A):	17 A
				TOTAL ESTIMATED DEMAND...	17 A

NOTES:

PANELBOARD " L2K" LOAD SCHEDULE

PANEL: L2K | **MOUNTING:** SURFACE | **VOLTAGE:** 480/277V, 3PH, 4W
LOCATION: ELEC 125E / SECOND FLOOR | **AMPS:** 150 A MLO | ~~FED FROM: DJK~~
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 6861 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - COMMONS 100	20	1	2495	2379					1	20	LIGHTING - CLASSROOMS 102-110, T WKRM 111	2
3	LIGHTING - CORRIDOR 002	20	1			826	1404			1	20	LIGHTING - CLASSROOMS 112-118	4
5	LIGHTING - MECH/ELEC 101, MECH 132	20	1					416	1053	1	20	LIGHTING - CLASSROOMS 120-124	6
7	LIGHTING - RMS 125A, B, E, J, M, T, W	20	1	538	1053					1	20	LIGHTING - CLASSROOMS 126-130	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			6466 VA		2230 VA		1469 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			24 A		8 A		5 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	10166 VA	100.00%	10166 VA		
				TOTAL CONNECTED LOAD:	10166 VA
				TOTAL ESTIMATED DEMAND:	10166 VA
				TOTAL CONNECTED LOAD (A):	12 A
				TOTAL ESTIMATED DEMAND...	12 A

NOTES:

PANELBOARD " S1K" LOAD SCHEDULE

PANEL: S1K | **MOUNTING:** SURFACE | **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: MECH 032 / FIRST FLOOR - SOUTH | **AMPS:** 400 A MB | ~~FED FROM: TX-S1K~~
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 6672 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R1K1	225	3	16160	8740					3	225	R1K2	2
3	--	--	--			13352	8640			--	--	--	4
5	--	--	--					8700	8004	--	--	--	6
7	HVAC - ACCU-COR9	25	3	1801	1248					2	20	HVAC - ACCU-210	8
9	--	--	--			1801	1248			--	--	--	10
11	--	--	--					1801		--	--	--	12
13	HVAC - ACCU-212A	30	3	2162	2162					3	30	HVAC - ACCU-212B	14
15	--	--	--			2162	2162			--	--	--	16
17	--	--	--					2162	2162	--	--	--	18
19	SPARE	100	3	0	0					3	100	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	30	3	0	0					3	30	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
31	SPARE	20	3	0	0					3	20	SPARE	32
33	--	--	--			0	0			--	--	--	34
35	--	--	--					0	0	--	--	--	36
37	SPARE	20	3	0	0					3	20	SPARE	38
39	--	--	--			0	0			--	--	--	40
41	--	--	--					0	0	--	--	--	42
	TOTAL LOAD:			32273 VA		29365 VA		22829 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			277 A		253 A		190 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	21774 VA	100.00%	21774 VA		
KITCHEN EQUIPMENT -	5824 VA	100.00%	5824 VA	**TOTAL CONNECTED LOAD:**	84466 VA
POWER -	1248 VA	100.00%	1248 VA	**TOTAL ESTIMATED DEMAND:**	67056 VA
RECEPTACLE -	44820 VA	61.16%	27410 VA	**TOTAL CONNECTED LOAD (A):**	234 A
TECHNOLOGY -	10800 VA	100.00%	10800 VA	**TOTAL ESTIMATED DEMAND...**	186 A

NOTES:

PANELBOARD " R1K1" LOAD SCHEDULE

PANEL: R1K1 | **MOUNTING:** SURFACE | **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: MECH/ELEC 001M / FIRST FLOOR -... | **AMPS:** 225 A MLO | ~~FED FROM: SJK~~
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 5975 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - RMS 000, 001, 261	20	1	900	720					1	20	RECEPTACLE - STAIR S001	2
3	RECEPTACLE - ELEVATOR 001E	20	1			360	720			1	20	RECEPTACLE - COMMONS 261	4
5	TECHNOLOGY - CLASSROOM 002	20	1					720	720	1	20	RECEPTACLE - STAIR S100	6
7	RECEPTACLE - CLASSROOM 002	20	1	720	720					1	20	RECEPTACLE - STAIR S100	8
9	RECEPTACLE - CLASSROOM 002, COMMONS 000	20	1			720	720			1	20	TECHNOLOGY - CLASSROOM 030	10
11	TECHNOLOGY - CLASSROOM 004	20	1					720	720	1	20	RECEPTACLE - CLASSROOM 030	12
13	RECEPTACLE - CLASSROOM 004	20	1	720	720					1	20	RECEPTACLE - CLASSROOM 030, COMMONS 000	14
15	RECEPTACLE - CLASSROOM 004	20	1			540	720			1	20	TECHNOLOGY - SE 028	16
17	TECHNOLOGY - CLASSROOM 006	20	1					720	540	1	20	RECEPTACLE - SE 028	18
19	RECEPTACLE - CLASSROOM 006	20	1	720	540					1	20	RECEPTACLE - SE 028	20
21	RECEPTACLE - CLASSROOM 006, COMMONS 000	20	1			720	900			1	20	RECEPTACLE - RMS 026A, 026R, 029	22
23	TECHNOLOGY - CLASSROOM 008	20	1					720	1080	1	20	RECEPTACLE - RM 026A - WASHER	24
25	RECEPTACLE - CLASSROOM 008	20	1	720	3120					2	40	RECEPTACLE - RM 026A - DRYER	26
27	RECEPTACLE - CLASSROOM 008	20	1			540	3120			--	--	--	28
29	TECHNOLOGY - CLASSROOM 010	20	1					720	720	1	20	TECHNOLOGY - CI 026	30
31	RECEPTACLE - CLASSROOM 010	20	1	720	540					1	20	RECEPTACLE - Room 026	32
33	RECEPTACLE - CLASSROOM 010	20	1			540	720			1	20	RECEPTACLE - CI 026, COMMONS 000	34
35	RECEPTACLE - BREAKOUT ROOM 001	20	1					540	360	1	20	RECEPTACLE - CI 026 - REFRIGERATOR	36
37	RECEPTACLE - MECH 032	20	1	900	2912					2	40	KITCHEN EQUIP - CI 026 - RANGE	38
39	HVAC - UH-032	20	1			120	2912			--	--	--	40
41	HVAC - CH-S001	20	1					240	180	1	20	RECEPTACLE - CLASSROOM 026 - MICROWAVE	42
43	POWER - RM 001M - ESP-1 CONTROL PANEL	20	1	1248	240					1	20	RECEPTACLE - RM 026 - RANGE HOOD	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	SPARE	20	1	0	0					1	20	SPARE	62
63	SPARE	20	1			0	0			1	20	SPARE	64
65	SPARE	20	1					0	0	1	20	SPARE	66
67	SPARE	20	1	0	0					1	20	SPARE	68
69	SPARE	20	1			0	0			1	20	SPARE	70
71	SPARE	20	1					0	0	1	20	SPARE	72
73	SPARE	20	1	0	0					1	20	SPARE	74
75	SPARE	20	1			0	0			1	20	SPARE	76
77	SPARE	20	1					0	0	1	20	SPARE	78
79	RESERVED SPARE FOR TERMINAL UNITS	20	1	0	0					1	20	RESERVED SPARE FOR TERMINAL UNITS	80
81	RESERVED SPARE FOR TERMINAL UNITS	20	1			0	0			1	20	RESERVED SPARE FOR TERMINAL UNITS	82
83	RESERVED SPARE FOR TERMINAL UNITS	20	1					0	0	1	20	RESERVED SPARE FOR TERMINAL UNITS	84
	TOTAL LOAD:			16160 VA		13352 VA		8700 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			141 A		117 A		73 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	360 VA	100.00%	360 VA		
KITCHEN EQUIPMENT -	5824 VA	100.00%	5824 VA	**TOTAL CONNECTED LOAD:**	38212 VA
POWER -	1248 VA	100.00%	1248 VA	**TOTAL ESTIMATED DEMAND:**	30702 VA
RECEPTACLE -	25020 VA	69.98%	17510 VA	**TOTAL CONNECTED LOAD (A):**	106 A
TECHNOLOGY -	5760 VA	100.00%	5760 VA	**TOTAL ESTIMATED DEMAND...**	85 A

NOTES:

PANELBOARD " R1K2" LOAD SCHEDULE

PANEL: R1K2 | **MOUNTING:** SURFACE | **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 025E / FIRST FLOOR - SOUTH | **AMPS:** 225 A MLO | ~~FED FROM: SJK~~
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 3893 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - TEACH WRK SP 011 - COPIER	20	1	180	720					1	20	TECHNOLOGY - CLASSROOM 020	2
3	RECEPTACLE - TEACHER WORK SPACE 011	20	1			360	720			1	20	RECEPTACLE - CLASSROOM 020	4
5	RECEPTACLE - TEACHER WORK SPACE 011	20	1					360	540	1	20	RECEPTACLE - CLASSROOM 020	6
7	RECEPTACLE - TEACHER WORK SPACE 011	20	1	360	720					1	20	TECHNOLOGY - CLASSROOM 022	8
9	RECEPTACLE - TEACHER WORK SPACE 011	20	1			180	720			1	20	RECEPTACLE - CLASSROOM 022	10
11	RECEPTACLE - TEACH WRK SP 011 - REFRIG.	20	1					360	720	1	20	RECEPTACLE - CLASSROOM 022, CORRIDOR 001	12
13	RECEPTACLE - TEACHER WORK SPACE 011	20	1	360	720					1	20	TECHNOLOGY - CLASSROOM 024	14
15	RECEPTACLE - RMS S002, 000, 001	20	1			540	720			1	20	RECEPTACLE - CLASSROOM 024	16
17	TECHNOLOGY - CLASSROOM 012	20	1					720	540	1	20	RECEPTACLE - CLASSROOM 024	18
19	RECEPTACLE - CLASSROOM 012	20	1	720	720					1	20	RECEPTACLE - RMS 025E, 025A, 025B, 001	20
21	RECEPTACLE - CLASSROOM 012, CORRIDOR 001	20	1			720	720			1	20	RECEPTACLE - RMS 000, 025J, 025W, 025M	22
23	TECHNOLOGY - CLASSROOM 014	20	1					720	180	1	20	RECEPTACLE - TECH 025T	24
25	RECEPTACLE - CLASSROOM 014	20	1	720	180					2	20	RECEPTACLE - TECH 025T	26
27	RECEPTACLE - CLASSROOM 014	20	1			540	360			1	20	RECEPTACLE - COMMONS 000 - DRNK FOUNT.	28
29	TECHNOLOGY - CLASSROOM 016	20	1					720	264	1	20	HVAC - CH-S002	30
31	RECEPTACLE - CLASSROOM 016	20	1	720	280					1	20	HVAC - CH-S003	32
33	RECEPTACLE - CLASSROOM 016, CORRIDOR 001	20	1			720	180			1	20	RECEPTACLE - RM 011 - MICROWAVE	34
35	TECHNOLOGY - CLASSROOM 018	20	1					720	180	1	20	RECEPTACLE - RM 011 - MICROWAVE	36
37	RECEPTACLE - CLASSROOM 018	20	1	720	0					1	20	SPARE	38
39	RECEPTACLE - CLASSROOM 018	20	1			540	0			1	20	SPARE	40
41	RECEPTACLE - STAIR S003, CORRIDOR 001	20	1					360	0	1	20	SPARE	42
43	RECEPTACLE - CORRIDOR 001	20	1	1620	0					1	20	SPARE	44
45	RECEPTACLE - CORRIDOR 001	20	1			1620	0			1	20	SPARE	46
47	RECEPTACLE - CORRIDOR 001	20	1					1620	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	SPARE	20	1	0	0					1	20	SPARE	62
63	SPARE	20	1			0	0			1	20	SPARE	64
65	SPARE	20	1					0	0	1	20	SPARE	66
67	SPARE	20	1	0	0					1	20	SPARE	68
69	SPARE	20	1			0	0			1	20	SPARE	70
71	SPARE	20	1					0	0	1	20	SPARE	72
73	SPARE	20	1	0	0					1	20	SPARE	74
75	SPARE	20	1			0	0			1	20	SPARE	76
77	SPARE	20	1					0	0	1	20	SPARE	78
79	RESERVED SPARE FOR TERMINAL UNITS	20	1	0	0					1	20	RESERVED SPARE FOR TERMINAL UNITS	80
81	RESERVED SPARE FOR TERMINAL UNITS	20	1			0	0			1	20	RESERVED SPARE FOR TERMINAL UNITS	82
83	RESERVED SPARE FOR TERMINAL UNITS	20	1					0	0	1	20	RESERVED SPARE FOR TERMINAL UNITS	84
	TOTAL LOAD:			8740 VA		8640 VA		8004 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			74 A		73 A		67 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	544 VA	100.00%	544 VA		
RECEPTACLE -	19800 VA	75.25%	14900 VA	**TOTAL CONNECTED LOAD:**	25384 VA
TECHNOLOGY -	5040 VA	100.00%	5040 VA	**TOTAL ESTIMATED DEMAND:**	20484 VA
				TOTAL CONNECTED LOAD (A):	70 A
				TOTAL ESTIMATED DEMAND...	57 A

NOTES:

PANELBOARD " S2K" LOAD SCHEDULE

PANEL: S2K | **MOUNTING:** SURFACE | **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: MECH 132 / SECOND FLOOR | **AMPS:** 400 A MB | ~~FED FROM: TX-S2K~~
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 6638 A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	R2K1	225	3	8858	10764					3	225	R2K2	2
3	--	--	--			8112	10572			--	--	--	4
5	--	--	--					7760	10236	--	--	--	6
7	SPARE	100	3	0	0					3	100	SPARE	8
9	--	--	--			0	0			--	--	--	10
11	--	--	--					0	0	--	--	--	12
13	SPARE	60	3	0	0					3	60	SPARE	14
15	--	--	--			0	0			--	--	--	16
17	--	--	--					0	0	--	--	--	18
19	SPARE	60	3	0	0					3	60	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	20	3	0	0					3	20	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
31	SPARE	20	3	0	0					3	20	SPARE	32
33	--	--	--			0	0			--	--	--	34
35	--	--	--					0	0	--	--	--	36
37	SPARE	20	3	0	0					3	20	SPARE	38
39	--	--	--			0	0			--	--	--	40
41	--	--	--					0	0	--	--	--	42
	TOTAL LOAD:			19622 VA		18684 VA		17996 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			164 A		157 A		150 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	9102 VA	100.00%	9102 VA		
POWER -	3820 VA	100.00%	3820 VA	**TOTAL CONNECTED LOAD:**	56302 VA
RECEPTACLE -	32580 VA	65.35%	21290 VA	**TOTAL ESTIMATED DEMAND:**	45012 VA
TECHNOLOGY -	10800 VA	100.00%	10800 VA	**TOTAL CONNECTED LOAD (A):**	156 A
				TOTAL ESTIMATED DEMAND...	125 A

NOTES:

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL PANEL SCHEDULES - MDP-J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 453.2
17-175.70

PANELBOARD " R2K1" LOAD SCHEDULE

PANEL: R2K1 | **MOUNTING:** SURFACE | **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: MECH/ELEC 101M / SECOND FLOOR | **AMPS:** 225 A MLO | **FED FROM:** S2K
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 5764 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - RMS 100, 101	20	1	900	720					1	20	TECHNOLOGY - CLASSROOM 130	2
3	TECHNOLOGY - CLASSROOM 102	20	1			720	720			1	20	RECEPTACLE - CLASSROOM 130	4
5	RECEPTACLE - CLASSROOM 102	20	1					720	720	1	20	RECEPTACLE - CLASSROOM 130, COMMONS 100	6
7	RECEPTACLE - CLASSROOM 102, COMMONS 100	20	1	720	720					1	20	TECHNOLOGY - CLASSROOM 128	8
9	TECHNOLOGY - CLASSROOM 104	20	1			720	720			1	20	RECEPTACLE - CLASSROOM 128	10
11	RECEPTACLE - CLASSROOM 104	20	1					720	720	1	20	RECEPTACLE - CLASSROOM 128, COMMONS 100	12
13	RECEPTACLE - CLASSROOM 104	20	1	540	720					1	20	TECHNOLOGY - CLASSROOM 126	14
15	TECHNOLOGY - CLASSROOM 106	20	1			720	720			1	20	RECEPTACLE - CLASSROOM 126	16
17	RECEPTACLE - CLASSROOM 106	20	1					720	540	1	20	RECEPTACLE - CLASSROOM 126	18
19	RECEPTACLE - CLASSROOM 106, COMMONS 100	20	1	720	540					1	20	RECEPTACLE - MECH 132	20
21	TECHNOLOGY - CLASSROOM 108	20	1			720	240			1	20	POWER - UNIT K - 1ST FLR SMOKE DAMPERS	22
23	RECEPTACLE - CLASSROOM 108	20	1					720	500	1	20	POWER - AHU-132 LIGHTS	24
25	RECEPTACLE - CLASSROOM 108	20	1	540	270					1	20	HVAC - P-AHU-132	26
27	TECHNOLOGY - CLASSROOM 110	20	1			720	696			1	20	HVAC - EF-132	28
29	RECEPTACLE - CLASSROOM 110	20	1					720	180	1	20	RECEPTACLE - ROOF CONV. RECEPT.	30
31	RECEPTACLE - CLASSROOM 110	20	1	540	1400					1	20	POWER - STAIR S100 - SOUTH SHADES	32
33	RECEPTACLE - BREAKOUT ROOM 101	20	1			540	0			1	20	SPARE	34
35	POWER - STAIR S100 - WEST SHADES	20	1					1200	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	SPARE	20	1	0	0					1	20	SPARE	62
63	SPARE	20	1			0	0			1	20	SPARE	64
65	SPARE	20	1					0	0	1	20	SPARE	66
67	SPARE	20	1	0	0					1	20	SPARE	68
69	SPARE	20	1			0	0			1	20	SPARE	70
71	SPARE	20	1					0	0	1	20	SPARE	72
73	HVAC - EF-101E	20	1	528	0					1	20	SPARE	74
75	HVAC - EF-101	20	1			696	180			1	20	POWER - RTU-1K CONV. RECEPT.	76
77	HVAC - UH-132	20	1					120	180	1	20	POWER - RTU-1K DYN. FILTER	78
79	RESERVED SPARE FOR TERMINAL UNITS	20	1	0	0					1	20	RESERVED SPARE FOR TERMINAL UNITS	80
81	RESERVED SPARE FOR TERMINAL UNITS	20	1			0	0			1	20	RESERVED SPARE FOR TERMINAL UNITS	82
83	RESERVED SPARE FOR TERMINAL UNITS	20	1					0	0	1	20	RESERVED SPARE FOR TERMINAL UNITS	84
				TOTAL LOAD:	8858 VA	8112 VA		7760 VA					
				ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):	0 VA	0 VA		0 A					
				TOTAL AMPS:	74 A	68 A		65 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	2550 VA	100.00%	2550 VA		
POWER -	3460 VA	100.00%	3460 VA	**TOTAL CONNECTED LOAD:**	24730 VA
RECEPTACLE -	12960 VA	88.58%	11480 VA	**TOTAL ESTIMATED DEMAND:**	23250 VA
TECHNOLOGY -	5760 VA	100.00%	5760 VA	**TOTAL CONNECTED LOAD (A):**	69 A
				TOTAL ESTIMATED DEMAND...	65 A

NOTES:

PANELBOARD " R2K2" LOAD SCHEDULE

PANEL: R2K2 | **MOUNTING:** SURFACE | **VOLTAGE:** 208/120V, 3PH, 4W
LOCATION: ELEC 125E / SECOND FLOOR | **AMPS:** 225 A MLO | **FED FROM:** S2K
ADDED ACCESSORIES: SPD | **FEED-THRU LUGS...** | **I.C. RATING:** 3621 (A1)

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - TEACH WRKRM 111 - COPIER	20	1	180	720					1	20	TECHNOLOGY - CLASSROOM 120	2
3	RECEPTACLE - TEACHER WORKROOM 111	20	1			360	720			1	20	RECEPTACLE - CLASSROOM 120	4
5	RECEPTACLE - TEACHER WORKROOM 111	20	1					360	540	1	20	RECEPTACLE - CLASSROOM 120	6
7	RECEPTACLE - TEACHER WORKROOM 111	20	1	360	720					1	20	TECHNOLOGY - CLASSROOM 122	8
9	RECEPTACLE - TEACHER WORKROOM 111	20	1			180	720			1	20	RECEPTACLE - CLASSROOM 122	10
11	RECEPTACLE - TEACH WRKRM 111 - REFRIG.	20	1					360	720	1	20	RECEPTACLE - CLASSROOM 122, CORRIDOR 002	12
13	RECEPTACLE - TEACHER WORKROOM 111	20	1	360	720					1	20	TECHNOLOGY - CLASSROOM 124	14
15	RECEPTACLE - COMMONS 100, STAIR S002	20	1			360	720			1	20	RECEPTACLE - CLASSROOM 124	16
17	TECHNOLOGY - CLASSROOM 112	20	1					720	540	1	20	RECEPTACLE - CLASSROOM 124	18
19	RECEPTACLE - CLASSROOM 112	20	1	720	720					1	20	RECEPTACLE - RMS 002, 125E, 125A, 125B	20
21	RECEPTACLE - CLASSROOM 112, CORRIDOR 002	20	1			720	720			1	20	RECEPTACLE - RMS 125J, 125W, 125M, 100	22
23	TECHNOLOGY - CLASSROOM 114	20	1					720	180	1	20	RECEPTACLE - TECH 125T	24
25	RECEPTACLE - CLASSROOM 114	20	1	720	180					1	20	RECEPTACLE - TECH 125T	26
27	RECEPTACLE - CLASSROOM 114	20	1			540	360			1	20	RECEPTACLE - COMMONS 100 - DRNK FOUNT.	28
29	TECHNOLOGY - CLASSROOM 116	20	1					720	180	1	20	RECEPTACLE - RM 111 - MICROWAVE	30
31	RECEPTACLE - CLASSROOM 116	20	1	720	180					1	20	RECEPTACLE - RM 111 - MICROWAVE	32
33	RECEPTACLE - CLASSROOM 116, CORRIDOR 002	20	1			720	0			1	20	SPARE	34
35	TECHNOLOGY - CLASSROOM 118	20	1					720	0	1	20	SPARE	36
37	RECEPTACLE - CLASSROOM 118	20	1	900	0					1	20	SPARE	38
39	RECEPTACLE - CLASSROOM 118	20	1			540	0			1	20	SPARE	40
41	RECEPTACLE - CORRIDOR 002, STAIR S003	20	1					1620	0	1	20	SPARE	42
43	RECEPTACLE - CORRIDOR 002	20	1	1620	0					1	20	SPARE	44
45	RECEPTACLE - CORRIDOR 002	20	1			1620	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
55	SPARE	20	1	0	0					1	20	SPARE	56
57	SPARE	20	1			0	0			1	20	SPARE	58
59	SPARE	20	1					0	0	1	20	SPARE	60
61	SPARE	20	1	0	0					1	20	SPARE	62
63	SPARE	20	1			0	0			1	20	SPARE	64
65	SPARE	20	1					0	0	1	20	SPARE	66
67	SPARE	20	1	0	0					1	20	SPARE	68
69	SPARE	20	1			0	1248			2	20	HVAC - ACCU-2 / SS-2	70
71	HVAC - ACCU-1 / SS-1	20	2					1248	1248	--	--	--	72
73	--	--	--	1248	696					1	20	HVAC - EF-125M	74
75	HVAC - EF-025M	20	1			864	180			1	20	POWER - RTU-2K CONV. RECEPT.	76
77	RECEPTACLE - ROOF CONV. RECEPT.	20	1					180	180	1	20	POWER - RTU-2K DYN. FILTER	78
79	RESERVED SPARE FOR TERMINAL UNITS	20	1	0	0					1	20	RESERVED SPARE FOR TERMINAL UNITS	80
81	RESERVED SPARE FOR TERMINAL UNITS	20	1			0	0			1	20	RESERVED SPARE FOR TERMINAL UNITS	82
83	RESERVED SPARE FOR TERMINAL UNITS	20	1					0	0	1	20	RESERVED SPARE FOR TERMINAL UNITS	84
				TOTAL LOAD:	10764 VA	10572 VA		10236 VA					
				ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):	0 VA	0 VA		0 A					
				TOTAL AMPS:	90 A	89 A		85 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	6552 VA	100.00%	6552 VA		
POWER -	360 VA	100.00%	360 VA	**TOTAL CONNECTED LOAD:**	31572 VA
RECEPTACLE -	19620 VA	75.48%	14810 VA	**TOTAL ESTIMATED DEMAND:**	26762 VA
TECHNOLOGY -	5040 VA	100.00%	5040 VA	**TOTAL CONNECTED LOAD (A):**	88 A
				TOTAL ESTIMATED DEMAND...	74 A

NOTES:

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ADDENDUM 1 — NOVEMBER 29, 2021
ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL PANEL SCHEDULES - MDF-J

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 454.2
17-175.70

PANELBOARD " MDP-S" LOAD SCHEDULE

PANEL: MDP-S
LOCATION: ELEC 900 / FIRST FLOOR - SOUTH
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 400 A MB , ULSE RATED
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: TX-2
I.C. RATING: 2934
A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	L1S	100	3	789	9316					3	125	TX-R1S	2
3	--	--	--			0	7140			--	--	--	4
5	--	--	--					0	6000	--	--	--	6
7	LIGHTING - FIELD - POLE F1	30	3	5875	5875					3	30	LIGHTING - FIELD - POLE F2	8
9	--	--	--			5875	5875			--	--	--	10
11	--	--	--					5875	5875	--	--	--	12
13	LIGHTING - FIELD - POLE F3	30	3	5875	5875					3	30	LIGHTING - FIELD - POLE F4	14
15	--	--	--			5875	5875			--	--	--	16
17	--	--	--					5875	5875	--	--	--	18
19	SPARE	60	3	0	0					3	60	SPARE	20
21	--	--	--			0	0			--	--	--	22
23	--	--	--					0	0	--	--	--	24
25	SPARE	30	3	0	0					3	30	SPARE	26
27	--	--	--			0	0			--	--	--	28
29	--	--	--					0	0	--	--	--	30
31	SPARE	20	3	0	0					3	20	SPARE	32
33	--	--	--			0	0			--	--	--	34
35	--	--	--					0	0	--	--	--	36
37	SPARE	20	3	0	0					3	20	SPARE	38
39	--	--	--			0	0			--	--	--	40
41	--	--	--					0	0	--	--	--	42
	TOTAL LOAD:			33605 VA		30640 VA		29500 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			122 A		111 A		106 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	18736 VA	100.00%	18736 VA		
LIGHTING -	71289 VA	100.00%	71289 VA	**TOTAL CONNECTED LOAD:**	93745 VA
POWER -	480 VA	100.00%	480 VA	**TOTAL ESTIMATED DEMAND:**	93745 VA
RECEPTACLE -	3240 VA	100.00%	3240 VA	**TOTAL CONNECTED LOAD (A):**	113 A
				TOTAL ESTIMATED DEMAND...	113 A

NOTES:

PANELBOARD " R1S" LOAD SCHEDULE

PANEL: R1S
LOCATION: ELEC 900 / FIRST FLOOR - SOUTH
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 225 A MB
FEED-THRU LUGS...

VOLTAGE: 208/120V, 3PH, 4W
FED FROM: TX-R1S
I.C. RATING: 2173
A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	RECEPTACLE - TLT BLDG - EXTERIOR	20	1	720	180					1	20	RECEPTACLE - EXT. PIER	2
3	RECEPTACLE - ELEC 900	20	1			180	180			1	20	RECEPTACLE - EXT. PIER	4
5	RECEPTACLE - VEST. 901, TLT 902	20	1					540	180	1	20	RECEPTACLE - EXT. PIER	6
7	RECEPTACLE - TLT 903, VEST. 904	20	1	540	180					1	20	RECEPTACLE - EXT. PIER	8
9	RECEPTACLE - OFFICIALS 905	20	1			540	240			1	20	POWER - NORTH PLAY CLOCK	10
11	HVAC - P-900	20	1					240	240	1	20	POWER - SOUTH PLAY CLOCK	12
13	HVAC - EF-900	20	1	696	2500					1	30	HVAC - DWH-3	14
15	HVAC - ECH-902A	20	2			1500	1500			1	20	HVAC - ECH-905	16
17	--	--	--					1500	1800	1	20	HVAC - ECH-900	18
19	HVAC - ECH-903A	20	2	1500	1500					2	20	HVAC - ECH-902B	20
21	--	--	--			1500	1500			--	--	--	22
23	TICKET BOOTH	100	2					0	1500	2	20	HVAC - ECH-903B	24
25	--	--	--	0	1500					--	--	--	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
43	SPARE	20	1	0	0					1	20	SPARE	44
45	SPARE	20	1			0	0			1	20	SPARE	46
47	SPARE	20	1					0	0	1	20	SPARE	48
49	SPARE	20	1	0	0					1	20	SPARE	50
51	SPARE	20	1			0	0			1	20	SPARE	52
53	SPARE	20	1					0	0	1	20	SPARE	54
	TOTAL LOAD:			9316 VA		7140 VA		6000 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			79 A		61 A		50 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
HVAC -	18736 VA	100.00%	18736 VA		
POWER -	480 VA	100.00%	480 VA	**TOTAL CONNECTED LOAD:**	22456 VA
RECEPTACLE -	3240 VA	100.00%	3240 VA	**TOTAL ESTIMATED DEMAND:**	22456 VA
				TOTAL CONNECTED LOAD (A):	62 A
				TOTAL ESTIMATED DEMAND...	62 A

NOTES:

PANELBOARD " L1S" LOAD SCHEDULE

PANEL: L1S
LOCATION: ELEC 900 / FIRST FLOOR - SOUTH
ADDED ACCESSORIES: SPD

MOUNTING: SURFACE
AMPS: 100 A MLO
FEED-THRU LUGS...

VOLTAGE: 480/277V, 3PH, 4W
FED FROM: MDP-S
I.C. RATING: 2798
A1

	CIRCUIT DESCRIPTION	TRIP (A)	POLES	A		B		C		POLES	TRIP (A)	CIRCUIT DESCRIPTION	
1	LIGHTING - RMS 900, 901, 902	20	1	384	405					1	20	LIGHTING - RMS 903, 904, 905	2
3	SPARE	20	1			0	0			1	20	SPARE	4
5	SPARE	20	1					0	0	1	20	SPARE	6
7	SPARE	20	1	0	0					1	20	SPARE	8
9	SPARE	20	1			0	0			1	20	SPARE	10
11	SPARE	20	1					0	0	1	20	SPARE	12
13	SPARE	20	1	0	0					1	20	SPARE	14
15	SPARE	20	1			0	0			1	20	SPARE	16
17	SPARE	20	1					0	0	1	20	SPARE	18
19	SPARE	20	1	0	0					1	20	SPARE	20
21	SPARE	20	1			0	0			1	20	SPARE	22
23	SPARE	20	1					0	0	1	20	SPARE	24
25	SPARE	20	1	0	0					1	20	SPARE	26
27	SPARE	20	1			0	0			1	20	SPARE	28
29	SPARE	20	1					0	0	1	20	SPARE	30
31	SPARE	20	1	0	0					1	20	SPARE	32
33	SPARE	20	1			0	0			1	20	SPARE	34
35	SPARE	20	1					0	0	1	20	SPARE	36
37	SPARE	20	1	0	0					1	20	SPARE	38
39	SPARE	20	1			0	0			1	20	SPARE	40
41	SPARE	20	1					0	0	1	20	SPARE	42
	TOTAL LOAD:			789 VA		0 VA		0 VA					
	ADDITIONAL FEED THRU LUGS LOAD (IF APPLICABLE):			0 VA		0 VA		0 A					
	TOTAL AMPS:			3 A		0 A		0 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING -	789 VA	100.00%	789 VA		
				TOTAL CONNECTED LOAD:	789 VA
				TOTAL ESTIMATED DEMAND:	789 VA
				TOTAL CONNECTED LOAD (A):	1 A
				TOTAL ESTIMATED DEMAND...	1 A

NOTES:

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ADDENDUM 1 NOVEMBER 29, 2021

ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
ELECTRICAL PANEL SCHEDULES - MDP-S

DATE
NOVEMBER 3, 2021

SHEET NUMBER
E 461.2
17-175.70

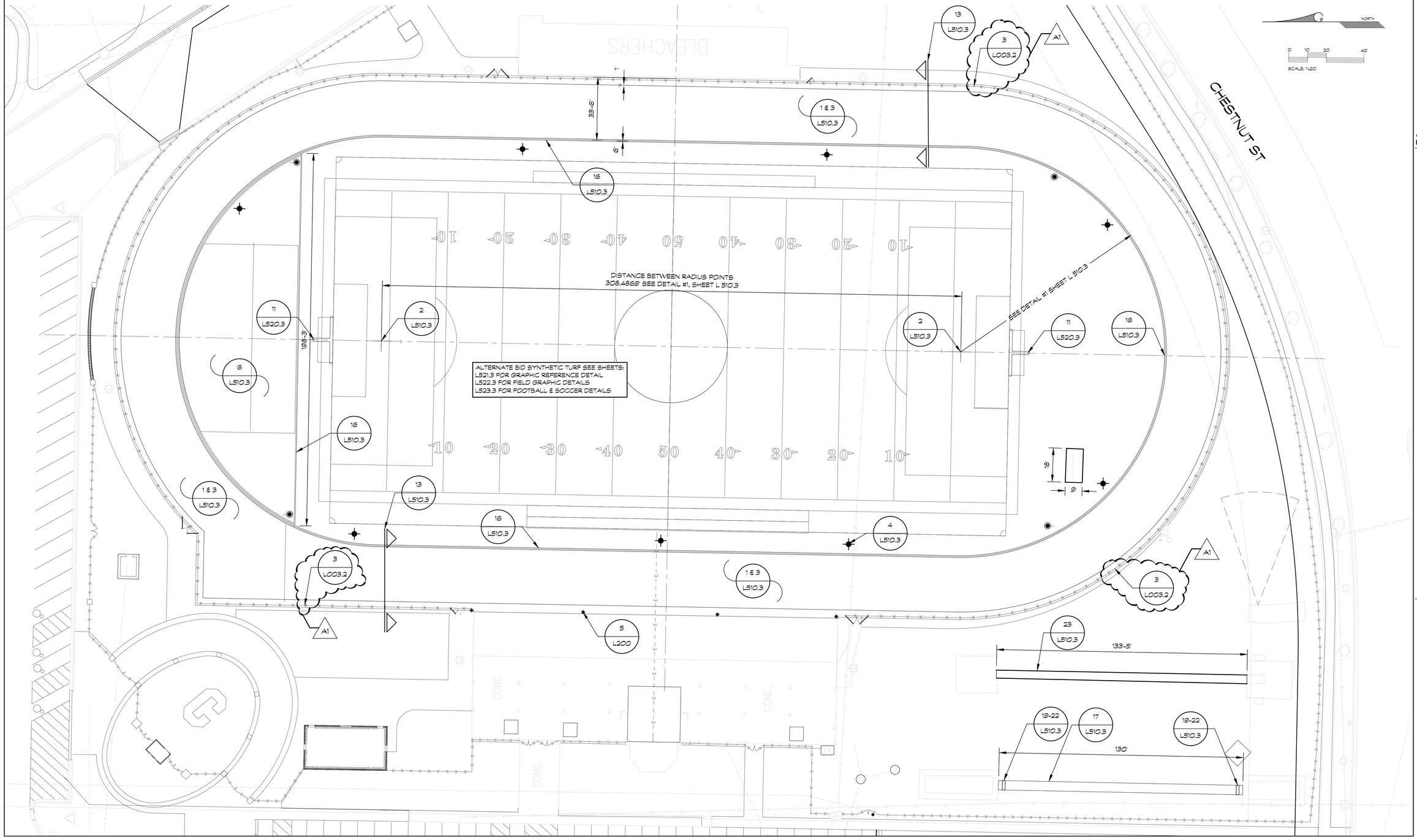
LEGEND

EXISTING	PROPOSED
SPOT ELEVATION	SPOT GRADE
FENCE	TOP OF TRENCH ELEVATION
DRAINAGE STRUCTURE	TOP OF CURB ELEVATION
STORM DRAIN	TOP OF WALL ELEVATION
LIGHT POLE	DRAINAGE SWALE
ELECTRICAL	FENCE - SEE PLANS FOR HT.
WATER	DRAINAGE STRUCTURE
TELEPHONE	STORM DRAIN
IRRIGATION	4" PERFORATED DRAINTILE
PROPERTY	6" PERFORATED DRAINTILE
SANITARY	8" PERFORATED DRAINTILE
GAS	LIGHT POLE
	ELECTRICAL
	WATER
	TELEPHONE
	IRRIGATION
	LIMITS OF CONSTRUCTION
	1/2" ALL-WEATHER SURFACE OVER 4" ASPHALT (2 LIFTS) OVER 8" CRUSHED LIMESTONE BASE
	1/2" ALL-WEATHER SURFACE OVER 4" CONCRETE OVER 4" COMPACTED SAND BASE
	4" ASPHALT (2 LIFTS) OVER 8" CRUSHED LIMESTONE BASE
	DEMOLITION
	SOD
	TOPSOIL AND SEED
	CRUSHER DUST
	MASON SAND

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NOTES

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4. ALL CONTOURS AND SPOT GRADES REFER TO FINISH GRADE OF LAWN, ASPHALT, OR CONCRETE. THEY DO NOT FACTOR IN THE ALL-WEATHER SURFACE OR ACRYLIC COATINGS.



ADDENDUM 1 NOVEMBER 29, 2021
ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
TRACK DIMENSION PLAN

DATE
NOVEMBER 3, 2021

SHEET NUMBER
L 503.3
17-175.70

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Precipitation Storage Calculations — Prein&Newhof

Inputs

$d := 3.36in$ Rainfall depth for 10 year, 24 hr event (from NOAA)

$A_{track} := 42359sft + 5836sft + 3014sft + 600sft = 51809 \cdot sft$ Measured from Provided CAD files

$A_{seating} := 13312sft$ Measured from Provided CAD files

$A_{field} := 94741sft$ Measured from Provided CAD files

$L_{dt} := 1227ft + 246ft = 1473 \cdot ft$ Length of Drain Tile Measured from CAD files

$d_{peastone} := 18in$ $w_{trench} := 24in$ Depth, width of Peastone

$VR_{peastone} := 0.4$ Void Ratio of Peastone

$dia_{dt} := 8in$ Diameter of Drain Tile

$R_{infiltration} := 5\frac{in}{hr}$ Percolation Rate of Soil (assumed, needs to be field verified via ASTM D3385 prior to construction)

Total Storm Volume Calculation

$A_{imp} := A_{track} + 0.5A_{field} + A_{seating} = 1.125 \times 10^5 \cdot sft$

$V_{STORM} := d \cdot A_{imp} = 31497.62 \cdot cft$ Assumed 1.0 for runoff coefficient for impervious; Assumed 0.5 for runoff coefficient for field

Volume Held in Drain Tile and Stone

$A_{tile} := \frac{\pi \cdot dia_{dt}^2}{4} = 0.349 \cdot sft$

$A_{peastone} := d_{peastone} \cdot w_{trench} \cdot VR_{peastone} = 1.2 \cdot sft$

$A_{storage} := A_{tile} + A_{peastone} = 1.549 \cdot sft$ Cross Sectional Area of Storage for Tile

$V_{storage} := A_{storage} \cdot L_{dt} = 2281.754 \cdot cft$

Volume Percolated in 24 hours

$V_{perc} := L_{dt} \cdot w_{trench} \cdot R_{infiltration} \cdot 24hr = 29460 \cdot cft$

Storage Volume Calculations

$BALANCE := V_{STORM} - V_{perc} - V_{storage} = -244.154 \cdot cft$

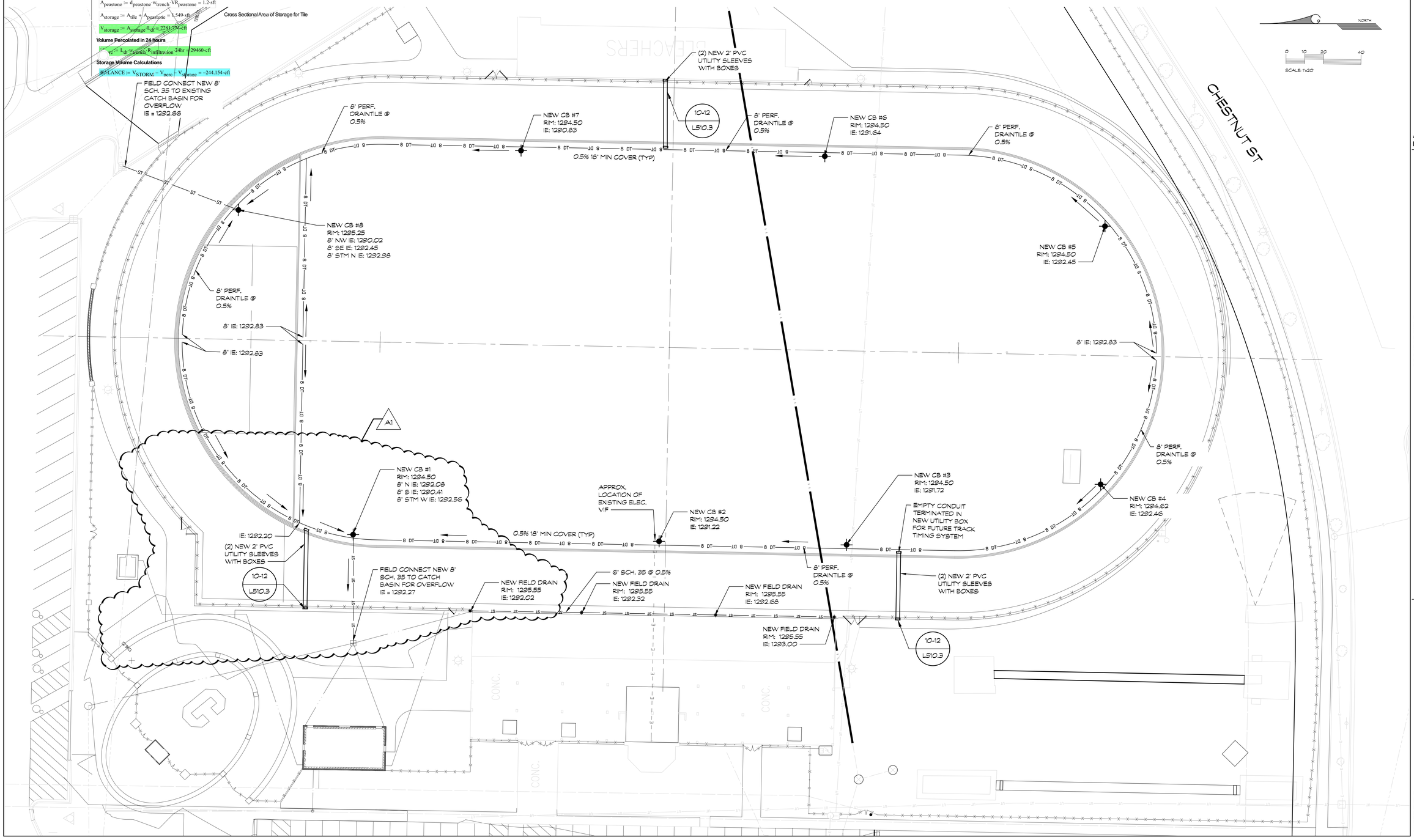
LEGEND

EXISTING	PROPOSED
SPOT ELEVATION	100.00 SPOT GRADE
FENCE	T/TA(XXXX) TOP OF TRENCH ELEVATION
DRAINAGE STRUCTURE	T/CA(XXXX) TOP OF CURB ELEVATION
STORM DRAIN	T/WA(XXXX) TOP OF WALL ELEVATION
LIGHT POLE	DRAINAGE SWALE
ELECTRICAL	FENCE - SEE PLANS FOR HT.
WATER	DRAINAGE STRUCTURE
TELEPHONE	STORM DRAIN
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	WATER
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	DEMOLITION
	SOD
	TOPSOIL AND SEED
	CRUSHER DUST
	MASON SAND

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ADDENDUM 1 — NOVEMBER 29, 2021
ISSUED FOR — DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS

Cadillac, Michigan

SHEET TITLE
TRACK DRAINAGE AND UTILITY PLAN

DATE
NOVEMBER 3, 2021

SHEET NUMBER
L 506.3
17-175.70

3/18/2020, 5:23 PM
Checked by: KLM, 3-18-2020

Precipitation Storage Calculations

Prein&Newhof

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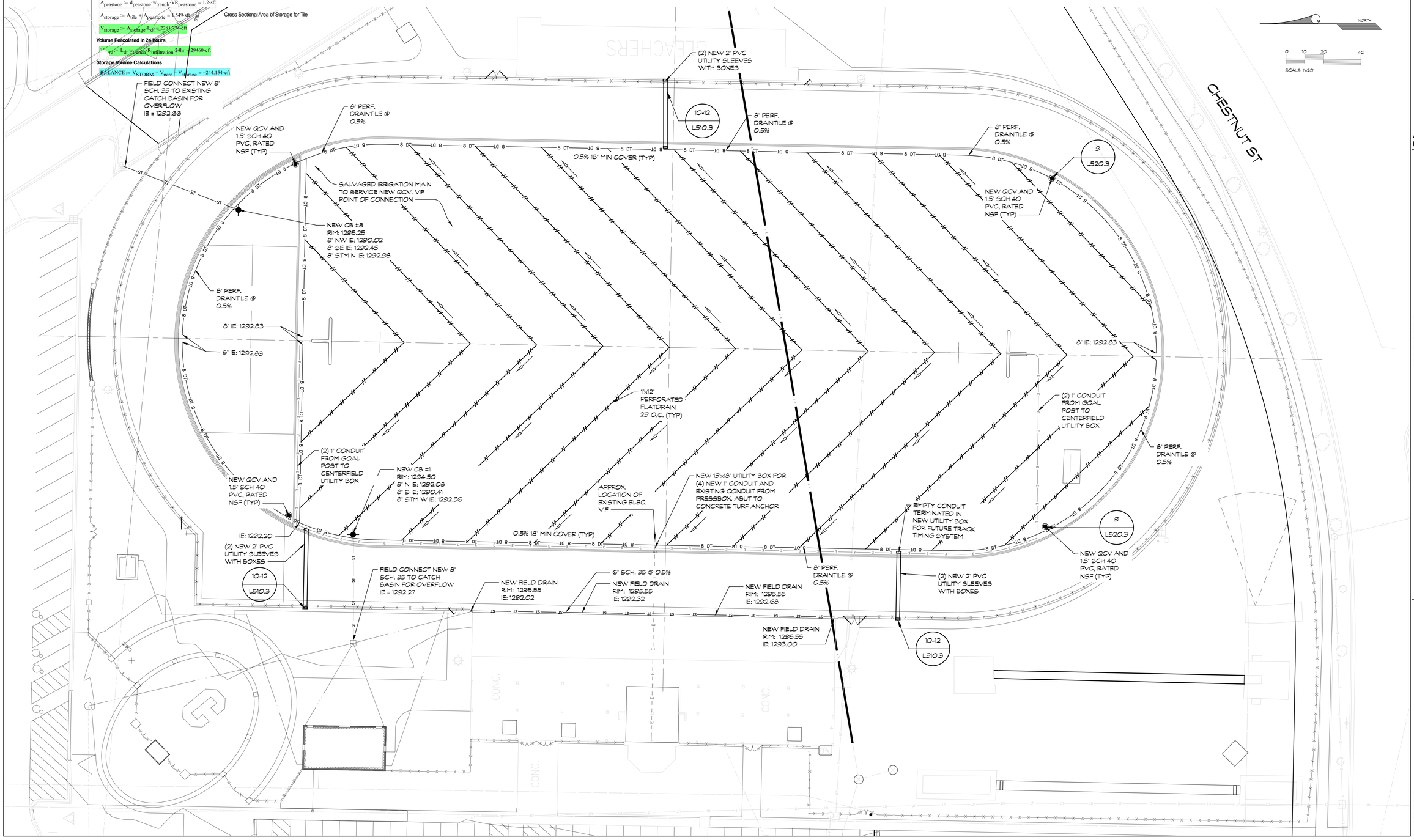
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ELECTRICAL	FENCE - SEE PLANS FOR HT.
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	CRUSHER DUST
	MASON SAND

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ADDENDUM 1 NOVEMBER 29, 2021
ISSUED FOR DATE

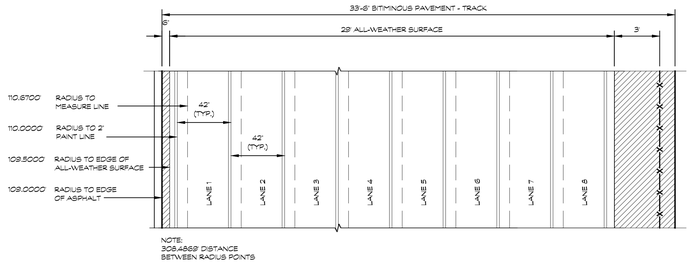
PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

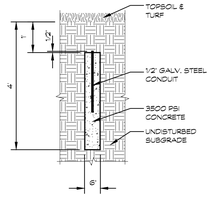
SHEET TITLE
TRACK & FIELD DRAINAGE AND UTILITY PLAN - ALTERNATE BID

DATE
NOVEMBER 3, 2021

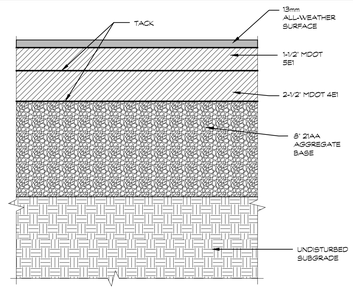
SHEET NUMBER
L 507.3
17-175.70
A1



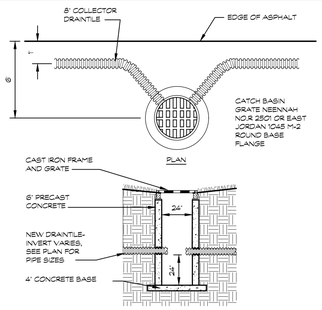
1 TRACK DIMENSION
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2 RADIUS POINT MONUMENT
SCALE 1/2"x1'-0"

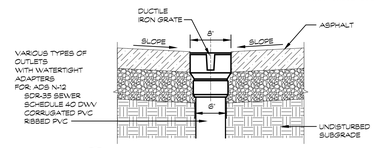


3 BITUMINOUS PAVEMENT
REFER TO GEOTECHNICAL INVESTIGATION REPORT
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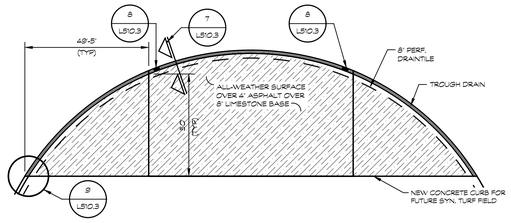


4 CATCH BASIN DETAIL
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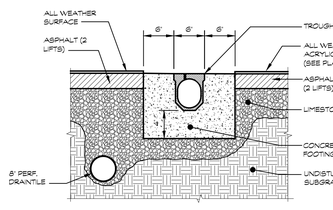
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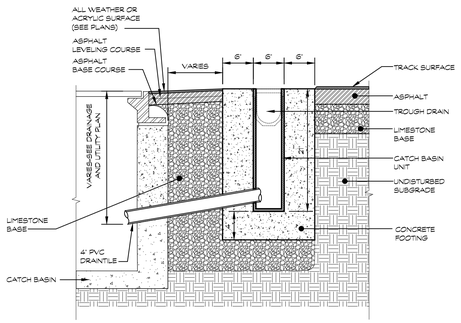
5 NYLOPLAST CATCH BASIN
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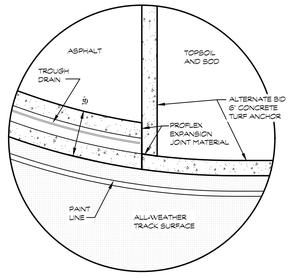
6 HIGH JUMP DETAIL
SCALE 1"x30'-0"



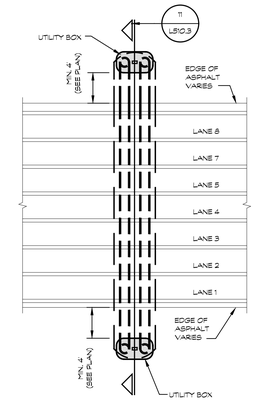
7 TROUGH DRAIN
SCALE 1"x1'-0"



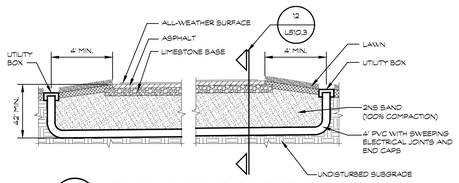
8 TROUGH DRAIN CATCH BASIN DETAIL
SCALE 1"x1'-0"



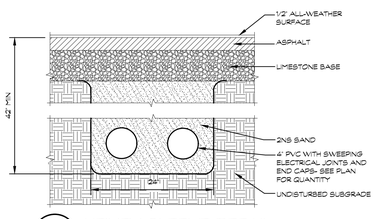
9 TROUGH DRAIN/TURF ANCHOR
1/8"x1'-0"



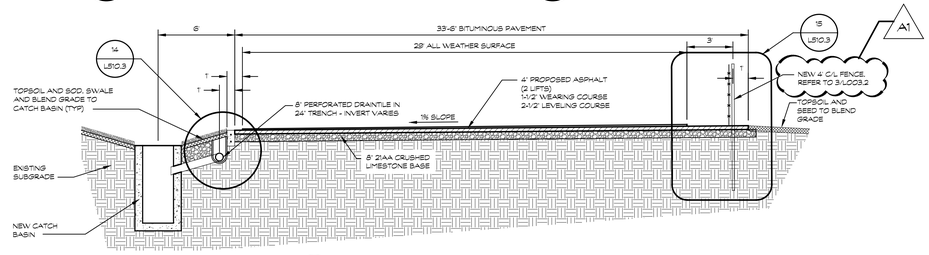
10 UTILITY SLEEVE LAYOUT
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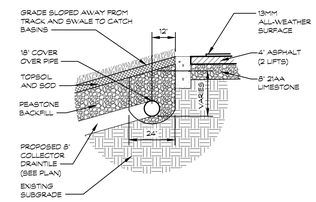
11 UTILITY SLEEVE SECTION
SCALE 1/4"x1'-0"



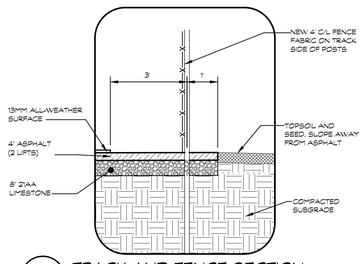
12 UTILITY SLEEVE DETAIL
SCALE 1"x1'-0"



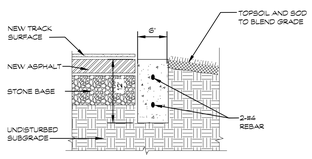
13 TRACK SECTION
SCALE 1/4"x1'-0"



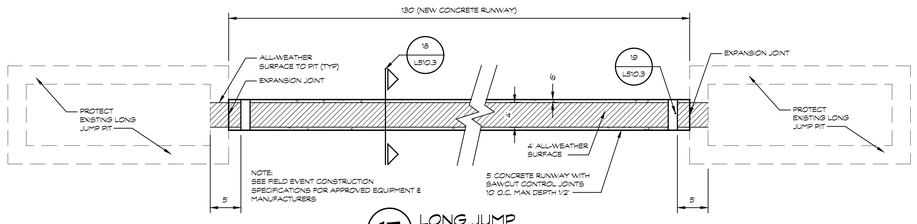
14 FIELD DRAIN SECTION
SCALE 1"x1'-0"



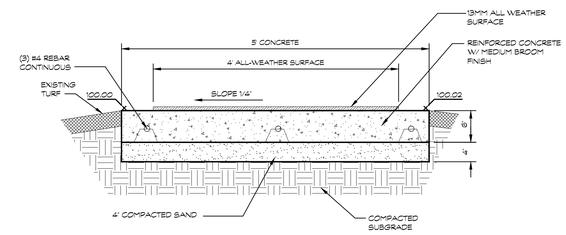
15 TRACK AND FENCE SECTION
SCALE 1"x1'-0"



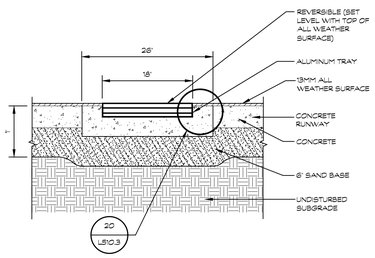
16 CONCRETE TURF ANCHOR
SCALE 1"x1'-0"



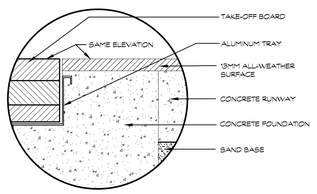
17 LONG JUMP
SCALE 1"x10'-0"



18 CONCRETE RUNWAY SECTION
SCALE 1"x1'-0"

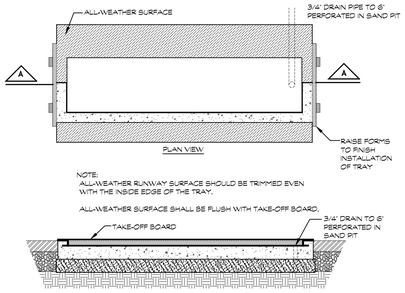


19 TAKE-OFF BOARD SECTION
SCALE 1"x1'-0"

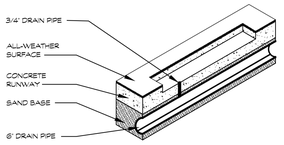


NOTE:
1. TAKE-OFF BOARD AND TRAY MUST BE INSTALLED PRIOR TO INSTALLATION OF THE ALL-WEATHER SURFACE. SEE MFR. CUT SHEET FOR TRAY INSTALLATION.
2. ARTFICIAL RUNWAY SURFACE SHOULD BE TRIMMED EVEN WITH THE INSIDE EDGE OF THE TRAY.
3. THE TOP OF THE TAKE-OFF BOARD SHALL BE LEVEL WITH TOP OF ALL-WEATHER SURFACE. ADJUST AS REQUIRED FOR DIFFERENT SURFACE THICKNESS.

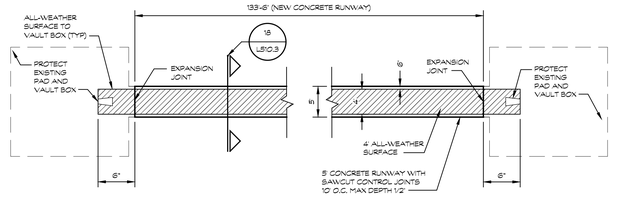
20 TAKE-OFF BOARD SECTION
NTS



21 TAKE-OFF BOARD INSTALLATION
NTS



22 LONG JUMP TAKE OFF DRAINAGE
N.T.S.



NOTE: * CONCRETE PAD NOT TO EXCEED CUSHION SIZE. VERIFY WITH OWNER, THE MANUFACTURER AND SIZE OF CUSHION PRIOR TO WORK.

* SEE FIELD EVENT CONSTRUCTION SPECIFICATIONS FOR APPROVED MANUFACTURER

23 POLE VAULT DETAIL
SCALE 1"x10'-0"

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ADDENDUM 1 NOVEMBER 29, 2021
ISSUED FOR DATE

PROJECT TITLE
PACKAGE 2 - HIGH SCHOOL
RENOVATION & ADDITIONS

OWNER
CADILLAC AREA PUBLIC SCHOOLS
Cadillac, Michigan

SHEET TITLE
TRACK SITE DETAILS

DATE
NOVEMBER 3, 2021

SHEET NUMBER
L 510.3
17-175.70