

ADDENDUM ACKNOWLEDGMENT

ADDENDUM NO. 2
Opening Date: 06/14/23

Dated: 05/26/2023

NOTICE

It is the sole responsibility of the bidder to ensure that it has received any and all Addenda and the Philadelphia Redevelopment Authority may in their sole discretion reject any bid for which all Addenda have not been executed and returned.

RFP FOR

Project No.: 16450E-0101
Description: Francis J Myers Recreation Center Site and Building Improvements

IS AMENDED AS FOLLOWS:

1. Amendments will be posted in <https://phdcphila.org/rfps-rfqs-sales/construction-rfps/>. Each Bidder shall ascertain prior to submitting a proposal that Bidder has received all Amendments issued, and shall acknowledge their receipt in their proposal submission.
2. Remove the following sections and drawings from the original bid documents and replace with the attached sections and drawings:

000110	Table Of Contents
007343	Prevailing Wage Rates Schedule
084523	Insulated Translucent Fiberglass Sandwich Panel Wall System
099900	Painting And Coating
233113	Metal Ducts
284621.11	Addressable Fire Alarm Systems
C-100	Existing Conditions Plan
C-102	Demolition Plan
C-352	Site Details
C-400	Utility Plan
C-500	Grading Plan
C-600	PCSM Plan
C-656	PCSM Details
A801	Door & Hardware Schedule
M000	Mechanical Symbols, Notes & Abbreviations
M111B	Level 1 Addition – Mechanical Ductwork Plan
M500	Mechanical Schedules
E100	Electrical Site Plan
E400	Electrical Riser Diagram
E521	Lighting Control Schedules
E522	Lighting Control Schedules

3. Remove the following specification sections from the bid documents:

262923 Variable Frequency Motor Controllers

Bidder must acknowledge receipt of Addenda in their proposal submission.

Name of Firm: _____

Signature of Authorized Agent: _____

Date: _____

SECTION 000110 – TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

Division 00 Procurement and Contracting Requirements

00 0110	Table of Contents
00 0115	List of Drawings
00 2113	Instructions to Bidders
00 2114	Diesel Engine Emission Controls
00 2115	Notice to Sellers – Mayors Executive Order
00 4114	Construction Bid Proposal
00 4313	Bid Bond
00 7200	Standard Contract Requirements
00 7201	Supplemental State Conditions – RACP
00 7202	Supplemental State Conditions - DCED-Keystone
00 7203	Supplemental State Conditions – DCED-GTRP
00 7343	Prevailing Wage Rates Schedule

SPECIFICATIONS GROUP

GENERAL REQUIREMENTS SUBGROUP

Division 01 General Requirements

01 1100	Summary of Work
01 2100	Allowances
01 2200	Unit Prices
01 2300	Alternatives
01 2500	Substitution Procedures
01 2600	Contract Modification Procedures
01 2900	Payment Procedures
01 2973	Schedule of Values
01 3100	Project Management and Coordination
01 3200	Construction Process Documentation
01 3216	Construction Scheduling
01 3233	Construction Photographs
01 3300	Submittal Procedures
01 3513.18	PPRS Work Requirements
01 4000	Quality Requirements
01 4100	Codes, Regulations, and Standards
01 4200	References
014516.13	Contractor's Quality Control
01 5000	Temporary Facilities and Controls
01 5639	Temporary Tree and Plant Protection
01 5719	Environmental Controls
01 5800	Project ID Signs
01 6001	Product Requirements
01 7123	Field Engineering
01 7300	Execution
01 7329	Cut, Patch, Sleeves, and Inserts
01 7419	Construction Waste Management and Disposal
01 7423	Cleaning
01 7700	Closeout Procedures
01 7823	Operation and Maintenance Data

- 01 7836 Warranties
- 01 7839 Project Record Documents
- 01 8113 Sustainable Design Requirements
- 01 8119 Indoor Air Quality Requirements
- 01 9113 General Commissioning

FACILITY CONSTRUCTION SUBGROUP

Division 02 Existing Conditions

- 02 4116 Demolition

Division 03 Concrete

- 03 1000 Concrete Forming and Accessories
- 03 2000 Concrete Reinforcing
- 03 3000 Cast-In-Place Concrete
- 03 3543 Polished Concrete Finishing

Division 04 Masonry

- 04 0101 Repair and Cleaning of Existing Masonry
- 04 2200 Concrete Unit Masonry
- 04 4315 Anchored Stone Masonry Veneer
- 04 4316 Adhered Stone Masonry Veneer
- 04 7200 Cast Stone Masonry

Division 05 Metals

- 05 1200 Structural Steel Framing
- 05 3100 Steel Decking
- 05 4000 Cold Form Metal Framing
- 05 5000 Metal Fabrications
- 05 5113 Metal Pan Stairs
- 05 5213 Pipe and Tube Railings
- 05 5215 Exterior Handrails and Guardrails
- 05 7300 Decorative Metal Railings

Division 06 Wood, Plastics and Composites

- 06 1053 Miscellaneous Rough Carpentry
- 06 1600 Gypsum Sheathing
- 06 4100 Architectural Wood Casework

Division 07 Thermal and Moisture Protection

- 07 1326 Self-Adhering Sheet Waterproofing
- 07 1616 Crystalline Waterproofing
- 07 1900 Water Repellants
- 07 2100 Thermal Insulation
- 07 2727 Self Adhered Sheet Membrane Air Barriers
- 07 4113 Stone Coated Metal Roof Panels
- 07 4214 Formed Metal Wall Panels, Perforated
- 07 4216 Metal Composite Material Wall Panels
- 07 5216 SBS Modified Bituminous Membrane Roofing
- 07 6200 Sheet Metal Flashing and Trim
- 07 7200 Roof Accessories
- 07 8413 Penetration Firestopping
- 07 8443 Joint Firestopping
- 07 9200 Joint Sealants

Francis J Myers Rec Center | Building & Site Improvements

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08 1119 Stainless Steel Doors and Frames
08 3100 Access Doors and Panels
08 3313 Coiling Counter Doors
08 4113 Aluminum-Framed Entrances and Storefronts
08 4413 Glazed Aluminum Curtain Walls
08 4523 Insulated Translucent Fiberglass Panel Wall System
08 5113 Aluminum Windows
08 5658 Window Protection Screens
08 7111 Door Hardware
08 8000 Glazing
08 8300 Mirrors
08 8700 Glazing Surface Film
08 8853 Security Glazing
08 9113 Fixed Louvers

Division 09 Finishes

09 0164 Wood Floor Refurbishing
09 2118 Gypsum Shaft Wall Assemblies
09 2216 Non-Structural Metal Framing
09 2900 Gypsum Board
093013 Ceramic Tiling
09 6460 Wood Athletic Flooring
09 6513 Resilient Base and Accessories
09 6519 Resilient Tile Flooring
09 6750 Urethane Cement Composition Flooring
09 7213 Cork Wall Coverings
09 7720 Fiberglass Reinforced Wall Panels
09 8434 Sound-Absorbing Ceiling Units
09 9000 Painting and Coating

Division 10 Specialties

10 0610 Exterior Signage
10 1100 Visual Display Units
10 1200 Display Cases
10 1400 Site Signage
10 1419 Dimensional Character Signage
10 2113 Plastic Toilet Compartments
10 2213 Wire Mesh Partitions
10 2226 Operable Partitions
10 2800 Toilet Accessories
10 4313 Defibrillator Cabinets
10 4413 Fire Protection Cabinets
10 4416 Fire Extinguishers
10 5626 Storage Shelving

Division 11 Equipment

11 3013 Residential Appliances
11 6623 Gymnasium Equipment
11 6653 Gymnasium Dividers
11 6800 Play Equipment

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Division 12 Furnishings

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- 12 3600 Countertops
- 12 4816 Entrance Floor Grilles and Frames
- 12 6613 Telescoping Gym Seating
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Division 14 Conveying Equipment

- 14 2100 Electric Traction Passenger Elevators

FACILITY SERVICES SUBGROUP

Division 21 Fire Suppression

- 21 0500 Common Work Results for Fire Suppression
- 21 0513 Common Motor Requirements for Fire Suppression Equipment
- 21 1000 Water Based Fire Suppression System

Division 22 Plumbing

- 22 0500 Common Work Results for Plumbing
- 22 0519 Meters & Gages for Plumbing Piping
- 22 0523 General-Duty Valves for Plumbing Piping
- 22 0529 Hangers & Supports for Plumbing Piping & Equipment
- 22 0553 Identification for Plumbing Piping & Equipment
- 22 0700 Plumbing Insulation
- 22 0800 Commissioning of Plumbing Systems
- 22 1116 Domestic Water Piping
- 22 1119 Domestic Water Specialties
- 22 1316.02 Sanitary Waste & Vent Piping
- 22 1319 Sanitary Waste Piping Specialties
- 22 1323 Sanitary Waste Interceptors
- 22 1329 Sanitary Sewage Pumps
- 22 3300 Domestic Electric Water Heater
- 22 4000 Plumbing Fixtures
- 22 4700 Drinking Fountains & Water Coolers

Division 23 Heating, Ventilating, and Air Conditioning (HVAC)

- 23 0503 General Provisions for HVAC Work
- 23 0505 Basic HVAC Materials and Methods
- 23 0513 Common Motor Requirements for HVAC Equipment
- 23 0515 Motors – Variable Frequency Controllers
- 23 0519 Meters and Gages for HVAC Piping
- 23 0523 General-Duty Valves for HVAC Piping
- 23 0529 Hangers and Supports for HVAC Piping and Equipment
- 23 0548 Vibration Controls for HVAC
- 23 0553 Identification for HVAC Piping and Equipment
- 23 0593 Testing, Adjusting, and Balancing for HVAC
- 23 0700 HVAC Insulation
- 23 0800 Commissioning for HVAC
- 23 0920 BAS-General
- 23 0921 BAS-Basic Materials
- 23 0922 BAS-Field Panels
- 23 0923 BAS-Network Software Interface

- 23 0924 BAS-General Sequence
- 23 2300 Refrigerant Piping
- 23 3113 Metal Ducts
- 23 3300 Air Duct Accessories
- 23 3600 Air Terminal Units
- 23 3713 Diffusers, Registers, and Grilles
- 23 7414 Dedicated Outdoor Air Rooftop Units
- 23 7417 Packaged Rooftop HVAC Units
- 23 8126 Split System Air Conditioners
- 23 8217 Variable Refrigerant Flow Systems
- 23 8239.13 Cabinet Unit Heaters

Division 26 Electrical

- 26 0503 General Requirements for Electrical Systems
- 26 0505 Basic Electrical Materials and Methods
- 26 0506 Selective Demolition for Electrical
- 26 0507 Temporary Power and Communication Systems
- 26 0519 Low-Voltage Electrical Power Conductors and Cables
- 26 0526 Grounding and Bonding for Electrical Systems
- 26 0529 Hangers and Supports for Electrical Systems
- 26 0533.13 Conduit for Electrical Systems
- 26 0533.16 Boxes for Electrical Systems
- 26 0533.23 Surface Raceways for Electrical Systems
- 26 0534 Electric Heat Tracing for Piping
- 26 0543 Underground Ducts and Raceways for Electrical Systems
- 26 0553 Identification for Electrical Systems
- 26 0573 Power System Studies
- 26 0583 Wiring Connections
- 26 0800 Commissioning of Electrical Systems
- 26 0813 Testing of Electrical Systems
- 26 0919 Enclosed Contactors
- 26 0924 Lighting Control
- 26 2100 Low-Voltage Electrical Utility Service Entrance
- 26 2200 Low-Voltage Transformers
- 26 2413 Switchboards
- 26 2416 Panelboards
- 26 2713 Electricity Metering
- 26 2714 Electricity Sub-Metering
- 26 2716 Floor Boxes
- 26 2726 Wiring Devices
- 26 2813 Fuses
- 26 2816.13 Enclosed Circuit Breakers
- 26 2816.16 Enclosed Switches
- 26 2913 Enclosed Controllers
- 26 2923 Variable-Frequency Motor Controllers SECTION DELETED
- 26 4113 Lightning Protection for Structures
- 26 4300 Surge Protective Devices
- 26 5100 Interior Lighting - LED Only
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- 27 0800 Communication Commissioning
- 27 1116 Communication Cabinets Racks and Enclosures
- 27 1119 Communication Termination Blocks and Patch Panels
- 27 1123 Communication Cable Management and Runway
- 27 1313 Communication Copper Backbone Cabling
- 27 1323 Communication Optical Fiber Backbone Cabling
- 27 1333 Communication Coaxial Backbone Cabling
- 27 1334 Communication Coaxial Splicing and Termination
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- 27 1533 Communication Coaxial Horizontal Cabling
- 27 1543 Communication Faceplates and Connectors
- 27 1619 Communication Patch Cords

Division 28 Electronic Safety and Security

- 28 0500 Common Work Results for Electronic Safety and Security
- 28 0513 Conductors and Cables for Electronic Safety and Security
- 28 1300 Access Control System
- 28 2310 Digital Video Surveillance System and Components
- 28 2607 Emergency Call System
- 28 4621.11 Addressable Fire-Alarm Systems

SITE AND INFRASTRUCTURE SUBGROUP

Division 31 Earthwork

- 31 0000 General Earthwork Requirements
- 31 1000 Site Clearing
- 31 2000 Earth Moving
- 31 2319 Dewatering
- 31 5000 Excavation Support and Protection

Division 32 Exterior Improvements

- 32 1216 Asphalt Paving
- 32 1313 Plain Cement Concrete Paving
- 32 1316 Decorative Concrete Finishes
- 32 1400 Stone Masonry
- 32 1600 Curbs and Gutters
- 32 1816 Playground Protective Surfacing
- 32 3113 Chain-Link Fencing and Gates
- 32 3119 Decorative Metal Fences and Gate
- 32 3115 Wood Fences and Gates
- 32 3223 Concrete Retaining Wall
- 32 9100 Planting Preparation
- 32 9200 Lawn and Fine Grading
- 32 9300 Plants

Division 33 Utilities

- 33 0500 Common Work for Utilities
- 33 3300 Facility Sanitary Sewers
- 33 4100 Storm Utility Drainage Piping

APPENDICES

Appendix A: LEED v4.1 Project Checklist

Appendix B: Interior & Exterior Lighting Fixture Cut Sheets

Appendix C: Geotechnical Soils Investigation Report

Appendix D: Environmental Specifications

SPECIFICATION - Asbestos Abatement

SPECIFICATION - Hazardous, Universal, and Regulated Wastes

SPECIFICATION - Lead in Construction

SPECIFICATION - Soil Handling

Appendix E: Supplemental Environmental Reports

REPORT - Duffield Revised Report for Environmental Investigation (ACM & LBP) & Sampling dated January 21, 2021 (Revised on May, 2021)

REPORT - Synertech Phase I Environmental Site Assessment and Hazardous Materials Inventory dated January 2020 (Revised June 25, 2021; Updated Ph1 Report, Appendix J)

REPORT - Brightfields FJMyers Supplemental Asbestos Assessment dated February 15, 2023

NOTICE TO SELLERS

Contractors and their subcontractors are required to submit weekly certified payroll records to the Labor Standards Unit through an electronic system, LCP Tracker, or as directed by the Labor Standards Unit. Failure to pay Prevailing Wage, as applicable, or to submit certified payroll records is a substantial breach of Contract and may be subject to fines and penalties as prescribed by Section 17-107 of The Philadelphia Code which may include withholding from any sums due to the Contractor under the Contract so much as may be necessary to pay the employees the difference between the wages required to be paid hereunder and the wages actually paid to such employees, and the City may make such payments directly to the appropriate employees.

MEMORANDUM

TO: Municipal Operating Departments and Awarding Agencies

FROM: Perritti DiVirgilio, Director, Fair Labor Standards

DATE: Effective May 26, 2023

RE: Updated Prevailing Wage Schedule for the City of Philadelphia

The Philadelphia Labor Standards Unit has issued an updated prevailing wage rate schedule for construction projects done on behalf of the City of Philadelphia. Enclosed herein you will find the two (2) decisions, which comprise the updated prevailing wage schedule. They are as the follows:

- I. Building Construction**
- II. Heavy and Highway Construction**

Please direct any questions or concerns regarding the prevailing wage rate schedule to my attention:

**Philadelphia Labor Standards Unit
Municipal Services Bldg., 1st Floor Room 170C
1401 John F. Kennedy Blvd.
Philadelphia, PA 19102-1670
Telephone Numbers: (215) 686-2132
Fax Number: (215) 686-2116**

Thank you for your cooperation.

**PREVAILING WAGE RATE SCHEDULE
 FOR CONSTRUCTION WORK DONE ON BEHALF OF CITY OF PHILADELPHIA
 INCLUDING REPAIR, ALTERATION, AND REMODELING WORK**

I. BUILDING CONSTRUCTION

A. Job Classification and Wage Rates

	Basic Hourly Rate	Fringe Benefits
ASBESTOS WORKER		
Journeyman	57.84	43.46
Handler Level 1	32.01	23.80
Handler Level 2	46.47	23.80
BOILERMAKER	51.27	35.30
BRICKLAYER	47.50	31.61
CARPENTER	52.64	29.77
(as of 51/2024)	54.64	29.77
(as of 51/2025)	56.64	29.77
CEMENT MASON	44.20	32.96
DRY WALL FINISHER	41.80	31.76
ELECTRICIAN	65.76	43.48
(Telecommunication Senior Tech)	63.97	31.53
(Telecommunication Tech A)	60.13	29.64
ELEVATOR CONSTRUCTOR	63.52	37.485
FOOTNOTES FOR ELEVATOR MECHANICS:		

A. PAID VACATION: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% for 6 months to 5 years of service.

B. Eight Paid Holidays (provided employee has worked 5 consecutive days before and the working day after the holiday): New Year's Day; Memorial Day; Independence Day; Labor Day; Veteran's Day; Thanksgiving Day and the Friday after Thanksgiving Day, and Christmas Day.

GLAZIER	46.68	36.62
IRONWORKER		
Structural & Ornamental	47.70	39.16
Reinforcing (Rodsetter)	47.41	33.10
Rigger & Machinery Mover	43.72	32.47
LABORER		
Journeyman Class One	36.45	27.02
Journeyman Class Two	36.55	27.02
Journeyman Class Three	36.60	27.02
Journeyman Class Four	36.75	27.02
Journeyman Class Five	36.80	27.02
Journeyman Class Six	36.59	27.02
Journeyman Class Seven	37.70	27.02
Journeyman Class Eight	37.75	27.02
Journeyman Class Nine	37.85	27.02

Journeyman Class Ten	38.00	27.02
Journeyman Class Eleven	38.25	27.02
Journeyman Class Twelve	36.82	27.02
LABORER: ASBESTOS ABATEMENT, LEAD ABATEMENT, TOXIC WASTE HANDLING, HAZARDOUS WASTE HANDLING		
MASTER ABATEMENT TECHNICIAN	37.95	27.30
LANDSCAPE LABORER		
Class I	29.45	23.98
Class II	29.45	23.98
LATHER	52.64	29.46
LINE CONSTRUCTION		
Lineman	60.48	30.25
(as of 6/03/2024)	62.07	31.36
Winch Truck Operator	42.34	26.40
(as of 6/03/2024)	43.45	27.18
Ground hand	36.29	24.20
(as of 6/03/2024)	37.24	24.90
Watch/Flag Person	25.86	20.26
(as of 6/03/2024)	26.54	21.19
MARBLE SETTER	45.90	32.20
MARBLE FINISHER	39.52	29.30
MILLWRIGHT	51.60	35.81
(as of 51/2024)	54.67	35.81
(as of 51/2025)	57.39	35.81
(as of 51/2026)	60.20	35.81
PAINTER		
Brush & Roller	42.32	32.91
Spray, Steel, & Swing	43.57	32.91
Bridges	59.78	32.13
PILEDRIVERMAN	46.73	41.74
(as of 5/1/2024)	49.23	41.74
(as of 5/1/2025)	51.48	41.74
(as of 5/1/2026)	53.23	41.74
(Diver)	58.41	41.74
(as of 5/1/2024)	61.54	41.74
(as of 5/1/2025)	64.35	41.74
(as of 5/1/2026)	66.54	41.74
(Diver Tender)	46.73	41.74
(as of 5/1/2024)	49.23	41.74
(as of 5/1/2025)	51.48	41.74
(as of 5/1/2026)	53.23	41.74
PLASTERER	42.97	32.65
(as of 5/1/2024)	42.97	33.90
PLUMBER	64.73	37.61
POINTER, CAULKER, & CLEANER	48.80	30.70
POWER EQUIPMENT OPERATOR		
Group One	52.20	32.81
Group One A	55.20	33.70

Group Two	51.95	32.74
Group Two A	54.97	33.61
Group Three	47.87	31.53
Group Four	47.57	31.44
Group Five	45.85	30.93
Group Six	44.85	30.65

*****TOXIC/HAZARDOUS WASTE REMOVAL*****

Add 20 percent to basic hourly rate for all classifications

ROOFER	42.63	34.62
Shingle	32.85	22.10
Slate & Tile	35.85	22.10
SHEET METAL WORKER	57.31	48.97
(Sign Makers and Hangers)	25.03	21.41
SOFT FLOOR LAYER (Resilient Floor)	53.93	30.54
SPRINKLER FITTER	64.73	32.59
STEAM FITTER	67.37	41.99
STONE MASON	47.20	31.95
Surveying and Layout		
(Chief of Party)	60.54	29.27
(as of 5/1/2024)	62.83	29.27
(as of 5/1/2025)	65.14	29.27
(Instrument Person)	52.64	29.27
(as of 5/1/2024)	54.64	29.27
(as of 5/1/2025)	56.64	29.27
(Rodman)	26.32	20.87
(as of 5/1/2024)	27.32	20.87
(as of 5/1/2025)	28.32	20.87
TERRAZZO MECHANIC	50.26	29.56
TERRAZZO FINISHER (Grinder)	44.02	27.86
TERRAZZO FINISHER (Finisher)	43.75	27.86
TILE SETTER	50.26	29.10
TILE FINISHER	39.52	29.30
TRUCK DRIVER		
Journeyman Class I	36.24	21.555
Journeyman Class II	36.24	21.555
Journeyman Class III And Low Boy	36.24	21.555
WALL COVERER	44.41	32.91
WELDER - Rate for craft to which, welding work is incidental.		
WINDOW TINTER	24.97	12.38

B. Job Classification Definitions: Building Construction,

1. Laborer Classifications:

Class One: Strip concrete, dismantle concrete, load, unload, handle and/or transport reinforced steel and steel mesh, carry lumber, handle miscellaneous building materials operate jack hammers, use paving breakers and other pneumatic tools, build scaffolds, perform raking, handle asphalt, perform spading and concrete pit work, perform grading, perform form pinning or shorting, perform demolition work with exception of burners, lay conduits, lay ducts, perform sheating or lagging, lay non-metallic pipe, perform caulking.

Class Two: Power Buggies, Burners on Demolition.

Class Three: Wagon drill operator (single)

Class Four: Powderman, wagon drill operator (multiple), perform circular caissons excavations, caisson groundman, perform underpinning excavation, perform laborers' work at depth of eight (8) feet or below.

Class Five: Caisson bottom worker.

Class Six: Yard worker.

Class Seven: Trackmen, Brakemen, Groutmen, Bottom Shaft Men, All Other Men in Free Air Tunnels.

Class Eight: Caisson Foreman

Class Nine: Miner Helper, Form Setters.

Class Ten: Miners Bore Driver, Blasters, Drillers, Pneumatic Shield Operator.

Class Eleven: Welders & Burners.

Class Twelve: Mason Tenders

Landscape Laborers:

Class I: Landscape laborer

Class II: Farm tractor driver, hydro seeder, mulched nozzle worker, backhoe operator, bulldozer crawler type loader, tree crane operator.

Laborer - Lather and Plasterer: Wheel and/or hod carry any lather and plaster materials used by lathering and plastering contractors' build scaffolds; build runways; perform clean-up and removal of debris as covered by lathering and plastering contractor's contract; deliver any material used by lathering and plastering contractor, from curbside to building and back, unless motor vehicles are permitted to enter building with required materials; all mortar designated for use by plasterer shall be carried via wheel barrow or hod; all plastering and fire proofing machines, as well as guns and mixers requiring the assistance of a worker other than plasterer operator, shall be manned by helper (tender).

2. Truck driver classifications:

Class I: Helper, stake body truck operator (single axle, dumpster).

Class II: Dump truck operator, tandem truck operator, batch truck operator, semi-trailer truck operator, agitator-mixer truck operator, dump Crete type vehicle operator, asphalt distributor, farm tractor operator (when tractor used to transport materials), stake body truck (tandem) operator.

Class III: Euclid type; off highway equipment back truck operator; belly dump truck operator; double-hitched equipment trailer operator; straddle carrier (Ross) operator; low-bed trailer truck operator.

3. Power Equipment Operator Classifications – Building

Group One:

Handling steel and stone in connection with erection Cranes doing hook work

Any machines handling machinery

Helicopters

Concrete Pumps (building)

Machines similar to above, including remote control equipment

Group One A:

Handling steel and stone in connection with erection.

Cranes doing hook work

Any machines handling machinery

Concrete Pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

All equipment in this group which previously received the hour in lieu of an oiler will receive Wage Group I (A). Equipment in this Wage Group that does not require an oiler.

Machines similar to above, including remote control equipment

Group Two:

All types of cranes

All types of backhoes

Cableways

Draglines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trenching machines

Trench shovels

Cable spinning machine

Gradalls

Front- end Loaders

Boat Captain

Hoist with Two Towers

Building Hoists-double drum (unless used as a single drum)

Pippin type backhoes

Tandem scrapers

Tower type crane operation erecting dismantling jumping or jacking

Drills self-contained (Drillmaster type)

Fork lift (20ft. and over)

Motor Patrols (fine grade)

Batch Plant with Mixer

Carryalls, Scrapers, Tournapulls

Roller (High Grade Finishing)

Spreaders (Asphalt)

Bulldozers and Tractors

Mechanic-Welder

Conveyor Loaders (Euclid-Type Wheel)

Concrete Pumps (Heavy Highway)

Milling Machine

Bobcat

Side Boom

Directional Boring Machines

Vermeer Saw Type Machine (other than hand held)

Tractor Mounted Hydro Axe

Chipper with boom

Building Construction (cont'd)

All Autograde and concrete finishing machines

Bundle Pullers/Extractors (Tubular)

Machines similar to the above including remote control equipment

*Surcharge

Group Two (A):

Crawler backhoes and Crawler gradalls over one (1) cubic yard factory rating

Hydraulic backhoes over one (1) cubic yard factory rating

Single person operation truck cranes 15 ton and over factory rating

Cherry picker type machinery and equipment 15 ton and over factory rating, etc.

Cranes doing hook work will be paid Wage Group I (A).

All equipment in this Group which previously received the hour in lieu of an oiler will receive Wage Group II (A) including concrete pumps (Heavy/Highway).

Machines similar to the above including remote control equipment

*Surcharge

Group Three:

Asphalt Plant Engineers

Conveyors (except building conveyors)

Well Driller

Forklift Trucks of all types

Ditch Witch (small trenchers)

Motor Patrols

Fine Grade machines

Rollers

Concrete Breaking Machines (Guillotine Only)

Stump Grinder

High or Low Pressure Boilers

Building Hoist (single drum)

Elevator Operator (New Construction)

Machines similar to above including remote control equipment

Group Four:

Seamen Pulverizing Mixer

Form Line Graders

Farm Tractors

Road Finishing Machines

Concrete Spreaders (Heavy Highway)

Power Broom (self-contained)

Seed Spreader

Grease Truck

Machines similar to the above including remote control equipment

Group Five:

Compressors

Pumps

Well pint pumps

Conveyors (Building)

Welding Machines

Heaters

Tireman, Power Equipment

Maintenance Engineers (Power Boats)

Miscellaneous Equipment

Operator

Building Construction (cont'd)

Elevator Operator (Renovations)

House Car

Machines similar to above including remote control equipment

Group Six:

Fireman

Oilers and Deck Hands (Personnel Boats)/Grease Truck Helpers

*Surcharge

Group Seven (A):

Handling steel and stone in connection with erection

Cranes doing hook work

Any machines handling machinery

Cable spinning machine

Helicopters

Concrete pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

Machines similar to above, including remote control equipment

Group Seven B

All types of cranes

All types of backhoes

Cableways

Conveyor Loader (Euclid-Type Wheel)

Drag Lines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trench shovels

Trenching machines

Gradalls

Front-end Loaders

Boat Captain

Hoist with two towers

Concrete Pumps (Heavy, Highway)

Building Hoists-double drum (unless used as a single drum)

Milling Machine

Mucking Machines in Tunnel

Pippin type backhoes

Bobcat

Tandem scrapers

Side Boom

Tower type crane—operation, erecting, dismantling,

Jumping or jacking

Directional Boring Machines

Vermeer Saw Type Machine (other than hand held)

Drills self-contained (Drillmaster type)

Fork Lift (20 ft. & over)

Track or Mounted Hydro Axe

Motor Patrols (Fine Grade)

Chipper with boom
Batch Plant with Mixer
All autograde and concrete finishing machines
Carryalls, Scapers & Tournapulls
Rollers (High Grade Finishing)
Bundle Pullers/Extractors (Tubular)
Spreaders (Asphalt)
Bulldozers and Tractors
Mechanic – Welders
Production Switch Tamper
Ballast Regulators
Tie Replacer
Rail/Road Loader
Power Jack liner
Machines similar to above, including remote control equipment

II. HEAVY AND HIGHWAY CONSTRUCTION

A. JOB CLASSIFICATION AND WAGE RATES

	Basic Hourly Rate	Fringe Benefits
BOILERMAKER	51.27	35.30
CARPENTER	54.78	29.27
(as of 5/1/2024)	56.48	29.27
(as of 5/1/2025)	58.18	29.27
(as of 5/1/2026)	59.88	29.27
CEMENT MASON	43.20	32.91
(as of 5/1/2024)	44.25	33.41
(as of 5/1/2025)	45.80	33.41
(as of 5/1/2026)	47.40	33.41
ELECTRICIAN	65.76	43.48
IRONWORKERS		
Structural & Ornamental	47.70	39.16
Reinforcing (Rodsetter)	47.41	33.10
Rigger & Machinery Mover	43.72	32.47
LABORERS		
Group One	37.55	27.45
Group Two	37.75	27.45
Group Three	37.75	27.45
Group Four	32.25	27.45
Group Five	38.40	27.45
Group Six	38.45	27.45
Group Seven	38.30	27.45
Group Eight	38.05	27.45
Group Nine	37.90	27.45
Group Ten	38.05	27.45
Group Eleven	37.95	27.45
Group Twelve	39.65	27.45
Group Thirteen	41.68	27.45
Group Fourteen	38.25	27.45
LANDSCAPING LABORER		
Class I	29.03	23.80
Class II	27.73	23.80
LINE CONSTRUCTION		
Lineman	60.48	30.25
(as of 6/03/2024)	62.07	31.36
Winch Truck Operator	42.34	26.40
(as of 6/03/2024)	43.45	27.18
Ground hand	36.29	24.20
(as of 6/03/2024)	37.24	24.90
Watch/Flag Person	25.86	20.26
(as of 6/03/2024)	26.54	21.19

MILLWRIGHT	51.60	35.81
(as of 5/1/2024)	54.67	35.81
(as of 5/1/2025)	57.39	35.81
(as of 5/1/2026)	60.20	35.81
PAINTERS		
Brush & Roller	42.32	32.91
Spray, Steel, & Swing	43.57	32.91
Bridges	59.78	32.13
PILEDRIVERMAN	46.73	41.74
(as of 5/1/2024)	49.23	41.74
(as of 5/1/2025)	51.48	41.74
(as of 5/1/2026)	53.23	41.74
(Diver)	58.41	41.74
(as of 5/1/2024)	61.54	41.74
(as of 5/1/2025)	64.35	41.74
(as of 5/1/2026)	66.54	41.74
(Diver Tender)	46.73	41.74
(as of 5/1/2024)	49.23	41.74
(as of 5/1/2025)	51.48	41.74
(as of 5/1/2026)	53.23	41.74
POWER EQUIPMENT OPERATOR		
Group One	51.04	31.97
Group One A	54.05	32.85
Group Two	50.79	31.90
Group Two A	53.81	32.77
Group Three	46.71	30.69
Group Four	46.41	30.60
Group Five	44.69	30.09
Group Six	43.70	29.80

*****TOXIC/HAZARDOUS WASTE REMOVAL*****
 Add 20 percent to basic hourly rate for all classifications

POWER EQUIPMENT OPERATOR DREDGER		
Class A1	42.66	14.01
Class A2	38.02	13.73
Class B1	36.89	13.66
Class B2	34.73	13.53
Class C1	33.78	13.18
Class C2	32.69	13.11
Class D	27.16	12.58
STEAM FITTER	67.37	41.99
STONE MASON	44.90	30.75

Surveying and Layout

(Chief of Party)	63.00	29.27
(as of 5/1/2024)	64.95	29.27
(as of 5/1/2025)	66.91	29.27
(as of 5/1/2026)	68.86	29.27
(Instrument Person)	54.78	29.27
(as of 5/1/2024)	56.48	29.27
(as of 5/1/2025)	58.18	29.27
(as of 5/1/2026)	59.88	29.27
(Rodman)	43.82	22.62
(as of 5/1/2024)	45.18	22.62
(as of 5/1/2025)	46.54	22.62
(as of 5/1/2026)	47.90	22.62

TRUCK DRIVER

Class I	34.1075	20.1875
Class II	34.2075	20.1875
Class III	34.4575	20.1875

B. Job Classification Definitions: Heavy and Highway Construction

1. Laborer Classifications:

Group One: Yard workers: (laborer, scale mixerman, burnerman, dustman, feeder)

Group Two: General laborer; Asphalt Shovelers; Sheeting, Shoring & Lagging – Laborer; Stone, Granite & Artificial Stone Setting Laborer; Hod Carriers; Scaffold Building; Relief Joint & Approach Slabs; Assembling & Placing Gabions; Pneumatic Tool Laborers; Concrete Forms & Stripping Laborers; Concrete Lumber Material Laborers; Steel & Steel Mesh (carrying & handling); Form Pinners; Mortar Mixers; Pouring & Placing Concrete; Grade Men.

Group Three: Vibrator Laborers; Finish Surface Asphalt Rackers; Jackhammer Operators; Paving Breaker Operator; Pipelayer & Caulker (all joints up to within 5 feet of the Building Foundation Line); Conduit & Duct Layers

Group Four: Flagperson

Group Five: Miners

Group Six: Welders and Burners.

Group Seven: Miner Bore Driver; Blasters; Drillers Pneumatic Shield Operator

Group Eight: Form Setters

Group Nine: Trackmen; Brackmen; Groutmen; Bottom Shaft Men; All other Laborers in Free Air Tunnels; Underpinning (When an underpinning excavation for a pier hole of five feet square or less and eight feet or more deep is dug, the rate shall apply only after a depth of eight feet is reached, to the men working in the bottom)

Group Ten: Circular Caissons (Where an excavation for circular caissons are dug eight feet or more below the natural grade level adjacent to the starting point of the caisson hole, at ground level, for the men working in the bottom); Welders, Burners & Air Tuggers

Group Eleven: Powdermen; Multiple Wagon Drill Operator Laborer

Group Twelve: Caisson Laborer Foreman

Group Thirteen: Toxic/Hazardous waste Handler

Group Fourteen: Wagon Drill/Hydraulic Track Drill Operator Laborer

Landscape Laborers:

Class I: Landscape laborer

Class II: Farm tractor driver, hydroseeder, mulcher nozzle worker, backhoe operator, bulldozer crawler type loader, tree crane operator.

2. Power Equipment Operator Classifications - Heavy, & Highway

Group One:

Handling steel and stone in connection with erection Cranes doing hook work

Any machines handling machinery

Cable spinning machine

Helicopters

Concrete Pumps (building)

Machines similar to above including remote control equipment

Group One A:

Handling steel and stone in connection with erection.

Cranes doing hook work

Any machines handling machinery

Concrete Pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

All equipment in this group which previously received the hour in lieu of an oiler will receive Wage Group I (A). Equipment in this Wage Group that does not require an oiler.

Machines similar to above, including remote control equipment

Group Two:

All types of cranes

All types of backhoes

Draglines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trenching machines

Trench shovels

Gradalls

Front- end Loaders

Boat Captain

Hoist with Two Towers

Building Hoists-double drum (unless used as a single drum)

Pippin type backhoes

Tandem scrapers

Tower type crane operation erecting dismantling jumping or jacking

Drills self-contained (Drillmaster type)

Fork lift (20ft. and over)

Motor Patrols (fine grade)

Batch Plant with Mixer

Carryalls, Scrapers, Tournapulls

Roller (High Grade Finishing)

Bulldozers and Tractors

Mechanic-Welder
Conveyor Loaders (Euclid-Type Wheel)
Concrete Pumps (Heavy Highway)
Milling Machine
Bobcat
Side Boom
Directional Boring Machines
Vermeer Saw Type Machine (other than hand held)
Tractor Mounted Hydro Axe
Chipper with boom
All Autograde and concrete finishing machines
Bundle Pullers/Extractors (Tubular)

Machines similar to the above including remote control equipment

Group Two A:

Crawler backhoes and Crawler gradalls over one (1) cubic yard factory rating
Hydraulic backhoes over one (1) cubic yard factory rating
Single person operation truck cranes 15 ton and over factory rating
Cherry picker type machinery and equipment 15 ton and over factory rating, etc.
Cranes doing hook work will be paid Wage Group I (A).
All equipment in this Group which previously received the hour in lieu of an oiler will receive Wage Group II (A) including concrete pumps (Heavy/Highway).

Machines similar to the above including remote control equipment

Group Three:

Asphalt Plant Engineers
Conveyors (except building conveyors)
Well Drillers
Forklift Trucks of all types
Ditch Witch (small trenchers)
Motor Patrols
Fine Grade machines
Rollers
Concrete Breaking Machines (Guillotine Only)
Stump Grinder
High or Low Pressure Boilers
Building Hoist (single drum)
Elevator Operator (New Construction)

Machines similar to above including remote control equipment

Group Four:

Seamen Pulverizing Mixer
Form Line Graders
Farm Tractors
Road Finishing Machines
Concrete Spreaders (Heavy Highway)
Power Broom (self-contained)
Seed Spreader
Grease Truck

Machines similar to the above including remote control equipment

Group Five:

CompressorsPumps
Well pint pumps

Conveyors (Building)

Welding Machines

Heaters

Tireman, Power Equipment

Maintenance Engineers (Power Boats)

Miscellaneous Equipment Operator

Elevator Operator (Renovations)

House Car

Machines similar to above including remote control equipment

Group Six:

Fireman

Oilers and Deck Hands (Personnel Boats)

Grease Truck Helpers

Group Seven A:

Handling steel and stone in connection with erection

Cranes doing hook work

Any machines handling machinery

Cable spinning machinery

Helicopters

Concrete pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

Machines similar to above, including remote control equipment

Group Seven B:

All types of cranes

All types of backhoes

Cableways

Conveyor Loader (Euclid-Type Wheel)

Drag Lines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trench shovels

Trenching machines

Gradalls

Front-end Loaders

Boat Captain

Hoist with two towers

Concrete Pumps (Heavy, Highway)

Building Hoists-double drum (unless used as a single drum)

Milling Machine

Mucking Machines in Tunnel

Pippin type backhoes

Bobcat

Tandem scrapers

Side Boom

Tower type crane operation, erecting, dismantling,

Jumping or jacking

Directional Boring Machines

Vermeer Saw Type Machine (other than hand held)
Drills self-contained (Drillmaster type)
Fork Lift (20 ft & over)
Tractor Mounted Hydro Axe
Motor Patrols (Fine Grade)
Chipper with boom
Batch Plant with Mixer
All autograde and concrete finishing machines
Caryalls, Scapers & Tournapulls
Rollers (High Grade Finishing)
Bundle Pullers/Extractors (Tubular)
Spreaders (Asphalt)
Bulldozers and Tractors
Mechanic – Welders
Production Switch Tamper
Ballast Regulators
Tie Replacer
Rail/Road Loader
Power Jack liner
Machines similar to above, including remote control equipment
*Surcharge

Power Equipment Operator Dredger Classifications

Class A: Lead Dredgeman, Operator, Leverman, Licensed Tug Operator over 1000HP.

Class A1: Dozer Operator, Front-end Loader.

Class B1: Derrick Operator, Spider/Spill Barge Operator, Engineer, Electrician, Chief welder Chief Mate, Fill Placer, Operator 2, Maintenance Engineer, Licensed Boat Operator.

Class B2: Certified Welder.

Class C1: Mate, Drag Barge Operator, Steward, Assistant Fill Placer, Welder.

Class C2: Boat Operator.

Class D: Shoreman, Deckhand, Rodman, Scowman, Cook, Messman, Porter/Janitor, Oiler.

3. Truck Driver Classifications:

Class I: Helper, stake body truck operator (single axle, dumpster)

Class II: Dump truck operator, tandem truck operator, batch truck operator, semi-trailer truck operator, agitator-mixer truck operator, dumpcrete type vehicle operator, asphalt distributor, farm tractor operator (when used to transport materials), stake body truck (tandem) operator.

Class III: Euclid type, off highway equipment back truck operator, belly dump truck operator, double-hitched equipment trailer operator, straddle carrier (Ross) operator; lowbed trailer truck operator.

NOTE:

1. Contractors are advised to contact the Philadelphia Labor Standards Unit with any questions regarding job classification, prevailing wage rates, and fringe benefits.
2. Prior to employing apprentices on a public works project, the contractor is required to provide written evidence of employee's registration with a statewide training program recognized by the U.S. Bureau of Apprenticeship and Training (BAT). Contractors shall forward proper documentation for each bona fide apprentice to:

**Philadelphia Labor Standards Unit
Municipal Services Building
1401 John F. Kennedy Boulevard – 1st Floor, Room 170C
Philadelphia, PA 19102-1670
Telephone Number: (215) 686-2132
Fax Number: (215) 686-2116**

LOG OF CHANGES

DATE 5/30/2023
 PROJECT Francis J. Myers Recreation Center Site & Building Improvements
 PROJECT No. 16450E-0101 (Rebuild)

SUMMARY

This Addendum collects revisions to the ISSUED FOR BID documents dated 4/07/23. All documents issued with this Addendum are dated 5/26/23 in the Revisions List of the titleblock for sheets or in the page footer for specifications. Items noted “Delete” are no longer in use and should be removed from the contract documents.

Drawing/ Spec No.	Drawing/ Spec Title	Revision Description
TECHNICAL SPECIFICATIONS		
08 4523	INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL WALL SYSTEM	1. Paragraph 2.3A-4: Updated minimum U-Value (U-0.23) to correspond to balance of system performance requirements (VLT and SHGC).
09 9900	PAINTING AND COATING	1. Paragraph 1.1C: Added reference to Section 07 1900 Water Repellents for exterior graffiti control coatings on Masonry 2. Revised Exterior and Interior painting schedules to align with PPR standard product and paint systems
23 3113	METAL DUCTS	1. Modified note for duct liner.
26 2923	VARIABLE FREQUENCY MOTOR CONTROLLERS	1. VFDs are factory installed/ provided by mechanical per mechanical schedule on drawing M500 and Division 23 specifications. This Electrical section can be DELETED
28 4621.11	ADDRESSABLE FIRE ALARM SYSTEMS	1. Revised fire alarm specification per PPR standards.
CIVIL		
GENERAL		1. Limit of Disturbance line and tabulation table is revised on all plans to account for water service revisions.
C-100	EXISTING CONDITIONS PLAN	2. Existing electrical service along 58th street has been included onto the existing conditions background drawing.
C-102	DEMOLITION PLAN	1. Unknown utility has been rerouted to avoid proposed SW basin, trees, and other utilities (see C-400, Utility Plan). A note has been added for contractor to make test hole to identify structure (see C-102, Demo Plan). 2. The Electrical duct bank will be connecting to the PECO service within the LOD. Existing service along 58th street has been included onto the existing conditions background drawing. Pool Elec line updated to show demo/abandon.

		<ol style="list-style-type: none"> 3. Existing Telecom service to remain. Label included in Demo Plan. 4. Existing aerial electric service along 58th Street is shown to be removed in its entire length.
C-352	SITE DETAILS	<ol style="list-style-type: none"> 1. The spray ground vault detail has been updated to allow for proper drainage to the proposed stormwater system.
C-400	UTILITY PLAN	<ol style="list-style-type: none"> 1. 'Unknown Utility' has been rerouted to avoid proposed SW basin, trees, and other utilities (see C-400, Utility Plan). A note has been added for contractor to make test hole to identify structure (see C-102, Demo Plan). 2. Proposed water services have been updated to avoid tree roots and light poles. 3. Linework associated with existing utility structures to be abandoned or demolished have been removed from the Utility Plan. 4. All proposed water service utilities have been updated to avoid all trees, light poles, and other utilities with a minimum separation of 5 ft. Inverts at utility crossings have also been provided with a minimum separation of 12" between water lines and 18" between water and Storm lines. 5. Proposed water services have been updated to avoid tree roots. 6. Electrical duct bank will be connecting to the PECO service within the LOD. Existing service along 58th street has been included onto the existing conditions background drawing. 7. Hand hole relocated to be closer to the building connection and placed in the grassy area near the entrance. 8. 3/4" cold water to Ex. Drinking Fountain length update: Previous: 130 LF / Updated: 130 LF. 9. 1.5" Cold water to Ex. Swimming Pool length update: Previous: 90 LF/ Updated: 250 LF 10. 2" Cold water to Prop. Spray ground length update: Previous: 165 LF/ Updated: 165 LF 11. Telecom service length update: Previous: 150 LF/ Updated: 160 LF
C-500	GRADING PLAN	<ol style="list-style-type: none"> 1. Minor adjustments have been made around the spray ground vault to increase invert elevations for vault drainage.
C-600	PCSM PLAN	<ol style="list-style-type: none"> 1. SW Manhole 051, 052 and connecting laterals have been adjusted to avoid light pole foundations. 2. The spray ground vault inverts have been updated to allow for proper drainage to the proposed stormwater system.
C-656	PCSM DETAILS	<ol style="list-style-type: none"> 1. Pipe schedule updated to reflect SW system update.
ARCHITECTURE		
A801	DOOR & HARDWARE SCHEDULE	<ol style="list-style-type: none"> 1. Revised Door B02.1 panel type to chain link 2. Revised Doors B04 and B08 panel types to type HM (hollow metal)
MECHANICAL		

M000	MECHANICAL SYMBOLS, NOTES & ABBREVIATIONS	1. Revisions associated with Bid RFI-010. Added Note #17 to the General Mechanical Notes describing insulation requirements for all concealed cold temperature ductwork
M111B	LEVEL 1 ADDITION - MECHANICAL DUCTWORK PLAN	1. Revised Gymnasium return louver size. Added note to coordinate opening with Architectural louver specification and details
M500	MECHANICAL SCHEDULES	1. Changed manufacturer for ERW wheel and Branch Selector Box to TRANE and Mitsubishi.
ELECTRICAL		
E100	ELECTRICAL SITE PLAN	<ol style="list-style-type: none"> 1. Re-direct existing underground, medium-voltage, PECO service to new manhole at the east drive per PECO point of service drawing. 2. Moved temporary electric service to pool along the existing building wall to match civil site plan. 3. Re-routed underground utility paths to match civil site plan.
E400	ELECTRICAL RISER DIAGRAM	1. Re-direct existing underground, medium-voltage, PECO service to new manhole at the east drive per PECO point of service drawing.
E521	LIGHTING CONTROL SCHEDULES	1. Updated Lighting controls including removal of preset scenes.
E522	LIGHTING CONTROL SCHEDULES	1. Updated Lighting controls including removal of preset scenes.

SECTION 084523 - INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL WALL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes the insulated translucent sandwich panel system and accessories as shown and specified. Work includes providing and installing:
 - 1. 2-3/4" factory prefabricated structural insulated translucent sandwich panels
 - 2. Aluminum installation system
 - 3. Integrated Fixed Window Units
- B. Related Requirements:
 - 1. Section 076200 "Sheet Metal Flashings and Trim" for flashings and trim associated with translucent wall panel system
 - 2. Section 079200 "Joint Sealants" for installation of joint sealants installed with translucent panel wall system and for sealants to the extent not specified in this Section.
 - 3. Section 088853 "Security Glazing" for glazing within translucent wall system framing.
- C.

1.2 ACTION SUBMITTALS

- B. Sustainable Design Submittals: Provide Sustainable Design Submittals in Accordance with Section 018113.
 - 1. Building Product Disclosure Requirements: To encourage the use of building products that are working to minimize their environmental and health impacts, provide the following information when available:
 - a. Environmental Product Declaration: Submit with Product-specific Type III or Industry-wide Type III Environmental Product Declaration (EPD).
 - 2. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
 - 3. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles (160 km) of Project Site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.
- B. Submit manufacturer's product data. Include construction details, material descriptions, profiles and finishes of components.
- C. Submit shop drawings. Include elevations and details.
- D. Submit manufacturer's color charts showing the full range of colors available for factory-finished aluminum.
 - 1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
 - a. Sandwich panels: 14" x 28" units

- b. Factory finished aluminum: 5" long sections
- E. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.
- F. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications

1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope and location. At least three of the projects shall have been in successful use for ten years or longer.
2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an accredited agency.
3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with AC177 "Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems" as issued by the ICC-ES.

- B. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified panel systems for at least two consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

1.4 PERFORMANCE REQUIREMENTS

A. The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.

1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. Standard panel system shall have less than 0.01 cfm/ft² air leakage by ASTM E 283 at 6.24 PSF (50 mph) and no water penetration by ASTM E 331 at 15 PSF; and structural testing by ASTM E 330.
3. Structural Loads; Provide system capable of handling the following loads:
 - a. Positive Wind Load: See S-Series Drawings
 - b. Negative Wind Load: See S-Series Drawings

1.5 DELIVERY STORAGE AND HANDLING

- A. Deliver panel system, components and materials in manufacturer's standard protective packaging.
- B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.6 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work, which fails in materials or workmanship within one year of the date of delivery. Failure of materials or workmanship shall

include leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering, defects in accessories, insulated translucent sandwich panels and other components of the work.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The basis for this specification is for products manufactured by Kalwall Corporation. Other manufacturers may bid this project provided they comply with all of the performance requirements of this specification and submit evidence thereof. Listing other manufacturers' names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.

2.2 PANEL COMPONENTS

A. Face Sheets

1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
 - a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
 - b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
2. Interior face sheets:
 - a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 70 and smoke developed no greater than 250 when tested in accordance with UL 723.
 - b. Burn extent by ASTM D 635 shall be no greater than 1".
3. Exterior face sheets:
 - a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D 2244 after 5 years outdoor South Florida weathering at 5° facing south, determined by the average of at least three white samples with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
 - b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand-held pencil and repel an impact minimum of .070 ft. lbs. without fracture or tear when impacted by a 3-1/4" diameter, 5 lb. free-falling ball per UL 972.
4. Appearance:
 - a. Exterior face sheets: Smooth .070" thick and crystal in color.
 - b. Interior face sheets: Smooth .045" thick and white in color.
 - c. Face sheets shall not vary more than ± 10% in thickness and be uniform in color.

B. Grid Core

1. Thermally broken I-beam grid core shall be of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16".
2. I-beam Thermal break: Minimum 1", thermoset fiberglass composite.

C. Laminate Adhesive

1. Heat and pressure resin type adhesive engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Code Council "Acceptance Criteria for Sandwich Panel Adhesives".
2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to four separate conditions:
 - a. 50% Relative Humidity at 68° F: 540 PSI
 - b. 182° F: 100 PSI
 - c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI
 - d. Accelerated Aging by ASTM D 1037 at 182° F: 250 PSI

2.3 PANEL CONSTRUCTION

- A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
 1. Thickness: 2-3/4"
 2. Visible Light transmission (VLT): 26% .
 3. Solar heat gain coefficient (SHGC): .30
 4. Panel U-factor by NFRC certified laboratory (2-3/4" thermally broken grid) : ~~U-0.14~~ **U-0.23**
 5. Grid pattern: 8" x 20"; pattern shoji.
- B. Standard panels shall deflect no more than 1.9" at 30 PSF in 10' 0" span without a supporting frame by ASTM E 72.
- C. Standard panels shall withstand 1200° F fire for minimum one hour without collapse or exterior flaming.
- D. Thermally broken panels: Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.

2.4 BATTENS AND PERIMETER CLOSURE SYSTEM

- A. Closure system: Thermally broken extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
- B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.
- C. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.
- D. Finish:
 1. Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604
 2. Color: Aluminum #79

2.5 WINDOWS

- A. Windows shall be designed specifically for inclusion in the translucent panel unit wall system and factory unitized to panels.

1. Units shall be of the following type(s): Fixed lite
- C. Performance: Windows shall pass or exceed requirements of AAMA/WDMA/CSA-101/I.S.2/A440-05 (08).
1. HC-2000 Fixed widows: F-AW80; shall pass requirements at 120 psf uniform structural load with air infiltration $<.01$ CFM/FT² at 6.24 PSF and no water penetration at 12 PSF.
- D. Construction: All window frame members shall be of extruded 6063-T5 aluminum with a thermal break. Frame sections shall be coped and joined by stainless steel screws at each corner. All joints exposed to the weather shall be sealed with an elastic compound. All openings shall be double weather stripped using T-slot bulb gaskets to insure minimum air infiltration.
1. Fixed lites shall be inside glazed with an expanded EPDM closed cell sponge gasket to exterior, with aluminum glazing bead and a driven EPDM wedge gasket to the interior for rapid removal and replacement.
- E. Glazing:
1. Heavy commercial (HC2000) windows shall be glazed with 1" insulated glass.units
 2. Glazing Specification: Refer to Section 088000
- F. Finish is to be coordinated with closure system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall examine substrates, supporting structure and installation conditions.
- B. Do not proceed with panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection:
1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 2. Where aluminum will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

3.3 INSTALLATION

- A. Install the panel system in accordance with the manufacturer's suggested installation recommendations and approved shop drawings.
1. Anchor component parts securely in place by permanent mechanical attachment system.
 2. Accommodate thermal and mechanical movements.
 3. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.

- B. Install joint sealants at perimeter joints and within the panel system in accordance with manufacturer's installation instructions.

3.4 CLEANING

- A. Clean the panel system interior and exterior, immediately after installation.
- B. Refer to manufacturer's written recommendations.

END OF SECTION

SECTION 099000 - PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Surface preparation and the application of paint systems on exterior and interior substrates.
- B. Paint exposed exterior and interior substrates, except where schedules indicate that a surface or material is not to be painted or is to remain natural. If schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
 - 1. Do not paint prefinished items, integrally finished systems, finished metal surfaces, operating parts, and labels, unless otherwise indicated.
 - 2. Prefinished items include the following shop- or factory-finished components:
 - a. Elevator entrance doors and frames.
 - b. Finished mechanical and electrical equipment.
 - c. Lighting fixtures.
 - 3. Finished metal surfaces include the following:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze and brass.
- C. **Related Sections include the following:**
 - 1. **Section 07 1900 "Water Repellants" for graffiti control on Masonry**

1.2 DEFINITIONS

- A. Gloss Level 2 (Low Sheen): Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Sustainable Design Submittals: Provide Sustainable Design Submittals in Accordance with Section 018113.
 - 1. Building Product Disclosure Requirements: To encourage the use of building products that are working to minimize their environmental and health impacts, provide the following information when available:
 - a. Environmental Product Declaration: Submit with Product-specific Type III or Industry-wide Type III Environmental Product Declaration (EPD).
 - b. Material Ingredient Reporting: Submit Cradle to Cradle (C2C) certification (v2 Basic or v3 Bronze level), Health Product Declaration (HPD), or Declare product labels.
- B. Product Data: For each type of product. Include preparation requirements and application instructions.
- C. Samples for Initial Selection: For each type of topcoat product.
- D. Samples for Verification: For each type of paint system and each color and gloss of topcoat; cured not less than 7 days.
 - 1. Submit Samples on rigid backing, 12 inches (300 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- E. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 3. VOC content.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

- a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
- 2. Lighting: Do not apply mockups until a permanent level of lighting is provided on the surfaces to receive paint.
 - 3. Final approval of color selections will be based on mockups.
- a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
- 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Provide adequate ventilation, including mechanical ventilation, to remove paint odors and fumes from areas of the building where odors might migrate to occupied spaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. Sherwin-Williams Company (The).
 - 3. **Tnemec Company, Inc.**

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

- B. Material Quality: Unless otherwise indicated, provide manufacturer's best-quality paint material for each coating type.
- C. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- D. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Nonflat Paints and Coatings: 150 g/L.
 - 3. Dry-Fog Coatings: 400 g/L.
 - 4. Primers, Sealers, and Undercoaters: 200 g/L.
 - 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
 - 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
 - 7. Pretreatment Wash Primers: 420 g/L.
 - 8. Floor Coatings: 100 g/L.
- E. Colors: As selected by Architect from manufacturer's full range.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
 2. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 4. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
 2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel Substrates:

- 1. ~~Pigmented Polyurethane over Inorganic Zinc-Rich Primer and Epoxy System:~~
 - a. ~~Shop Applied Prime Coat: Primer, zinc rich, inorganic, MPI #19 or as recommended in writing by topcoat manufacturer.~~
 - b. ~~Intermediate Coat: Epoxy, for metal.~~
 - 1) ~~Sherwin-Williams; Macropoxy 646.~~
 - 2) ~~Tnemec, Inc.; L69.~~
 - c. ~~Topcoat: Polyurethane, pigmented, semi-gloss (Gloss Level 5).~~
 - 1) ~~Sherwin-Williams; Hi-Solid Polyurethane 100.~~
 - 2) ~~Tnemec, Inc.; 1071V.~~

B. Galvanized Metal Substrates:

- 1. ~~Latex System:~~
 - a. ~~Prime Coat: Primer, galvanized metal, as recommended in writing by topcoat manufacturer for exterior use on galvanized metal substrates with topcoat indicated.~~
 - b. ~~Intermediate Coat: Latex, exterior, matching topcoat.~~
 - c. ~~Topcoat: Latex, exterior semi-gloss (Gloss Level 5), MPI #11.~~

C. Ferrous Metal – Unprimed

- 1. **One Coat of primer: Tnemec 90-97 @ 2.5-3.5 mil dry thickness**
- 2. **First Finish coat: Tnemec 161 @ 3.0 - 5.0 mil dry thickness. Slightly tinted to another shade than the final finish coat.**
- 3. **Second finish coat: Tnemec 75 @ 2.0 - 3.0 mil dry thickness.**

D. Ferrous Metal – Shop primed

- 1. **First finish Coat: Tnemec 161 @ 3.0 - 5.0 mil dry thickness. Slightly tinted to another shade than the final finish coat.**

2. **Second finish coat: Tnemec 75 @ 2.0 - 3.0 mil dry thickness.**

E. Ferrous Metal – Galvanized

1. **First finish coat: Tnemec 161 @ 3.0 - 5.0 mil dry thickness. Slightly tinted to another shade than the final finish coat.**

2. **Second finish coat: Tnemec 75 @ 2.0 - 3.0 mil dry thickness.**

F. Non-Ferrous Metal – Unprimed (aluminum or copper)

1. **One Coat: Vinyl acid wash; #760 line or Galva-Prep Phosphoric acid wash.**

2. **One Coat: DTM Acrylic primer; #073-189.**

3. **Two coat: Alkyd gloss; #074. Slightly tinted to another shade than the final finish coat.**

4. **One Coat: GCP 1000. Color selected by the Architect.**

3.7 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC, (Gloss Level 2), MPI #144.

B. Steel Substrates - Unprimed:

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer, rust-inhibitive, water-based MPI #107. **Three Coats: Direct to Metal, M24 @ 2.0 mil dry thickness**

b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.

c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

C. Steel Substrates – Shop Primed

1. **Institutional Low-Odor/VOC System:**

a. **First finish coat: Direct to Metal, M24 @ 2.0 mil dry thickness.**

b. **Second finish coat: Direct to Metal, M24 @ 2.0 mil dry thickness.**

D. Galvanized-Metal Substrates: Including exposed metal ductwork.

1. Institutional Low-Odor/VOC Latex System:

a. Prime Coat: Primer, galvanized, water based, MPI #134. **M15@ 2.0 mil dry thickness.**

b. ~~Intermediate Coat~~ **Two finish Coat:** Latex, interior, institutional low odor/VOC, matching topcoat. **Direct to Metal, M29 @ 2.0 mil dry thickness**

c. Topcoat: Latex, interior, institutional low odor/VOC, flat (Gloss Level 1), MPI #143.

E. Non-Ferrous Metal – Unprimed (galvanized, aluminum, copper)

1. **One Coat: Vinyl acid wash; #760 line or Galva-Prep Phosphoric acid wash.**
2. **One Coat: DTM Acrylic Primer, #073-189.**
3. **Two Coats: Alkyd gloss enamel; #074.**

F. Wood Substrates for Painted Finish:

1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: ~~Primer, latex, for interior wood, MPI #39.~~ **Alkyd primer #037-172**
 - b. ~~Intermediate Coat~~ **Two Coats:** Latex, interior, institutional low odor/VOC, matching topcoat. **Alkyd gloss enamel; #074.**
 - c. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

G. Wood Substrates for Transparent Finish: Including plywood wall paneling and built-in plywood casework.

1. Polyurethane Varnish System:
 - a. First Coat: Polyurethane varnish matching topcoat.
 - b. Second Intermediate Coat: Polyurethane varnish matching topcoat.
 - c. Topcoat: Varnish, interior, polyurethane, oil-modified, satin (Gloss Level 4), MPI #57.

H. Gypsum Board Substrates – **Impact Resistant:**

1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149. **latex enamel underbody; #345.**
 - b. ~~Intermediate Coat~~ **Two Coats:** Latex, interior, institutional low odor/VOC, matching topcoat. **Latex semi-gloss finish; #310.**
 - c. Topcoat: Latex, interior, institutional low odor/VOC, eggshell (Gloss Level 3), MPI #145.

I. **Gypsum Board Substrates – Moisture Resistant**

1. **Institutional Low-Odor/ VOC Latex System**
 - a. **Prime Coat: Epoxy Primer**
 - b. **Two Coats: Epoxy Finish**

J. Concrete Masonry Unit Substrates:

1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Moorcraft Supercraft Latex Block Filler #285, or approved equal
 - b. Topcoat: Two coats Moorcraft Superspec Low lustre Latex Paint #185, or approved equal.

END OF SECTION

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

- A. Single-wall rectangular ducts and fittings.
- B. Single-wall round and flat-oval ducts and fittings.
- C. Sheet metal materials.
- D. **Duct liner (not used on this project).**
- E. Sealants and gaskets.
- F. Hangers and supports.

1.2 RELATED WORK

- A. Specified elsewhere:
 - 1. Section 23 05 93 "Testing, Adjusting and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
 - 2. Division 23 33 00 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.
- B. Materials Installed but furnished by others: NA
- C. Furnished, but installed by others: NA

1.3 SUMMARY

- A. Section includes metal ducts for supply, return, outside, and exhaust air-distribution systems in pressure classes from minus four (4)- inch wg to plus ten (10)-inch wg. Metal ducts include the following:
 - 1. Rectangular ducts and fittings.
 - 2. Single-wall, round, and flat-oval spiral-seam ducts and formed fittings.
 - 3. Duct liner.
 - 4. Duct Sealants and gaskets.
 - 5. Hangers and supports.

1.4 DEFINITIONS

- A. Sealing Requirements Definitions: For the purposes of duct systems sealing requirements specified in this Section, the following definitions apply:
 - 1. Seams: A seam is defined as joining of two longitudinally (in the direction of airflow) oriented edges of duct surface material occurring between two joints. All other duct surface connections made on the perimeter are deemed to be joints.
 - 2. Joints: Joints include girth joints; branch and sub-branch intersections; so-called duct collar tap-ins; fitting subsections; louver and air terminal connections to ducts; access door and access panel frames and jambs; duct, plenum, and casing abutments to building structures.

1.5 PERFORMANCE REQUIREMENTS

- A. Delegated Hanger and Support Design: Hangers and supports shall comply with SMACNA's "HVAC Duct Construction Standards – Metal and Flexible."

1.6 SUBMITTALS

- A. Shop Drawings: Drawn at a scale of not less than 1/4" = 1'-0". Show fabrication and installation details for metal ducts.
 - 1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
 - 2. Duct layout indicating sizes and pressure classes.
 - 3. Elevations of top and bottom of ducts.
 - 4. Dimensions of main duct runs from building grid lines.
 - 5. Fittings.
 - 6. Reinforcement and spacing.
 - 7. Seam and joint construction.
 - 8. Penetrations through fire-rated and other partitions.
 - 9. Equipment installation based on equipment being used on Project.
 - 10. Duct accessories, including access doors and panels.
 - 11. Hangers and supports, including methods for duct and building attachment and vibration isolation.
- B. Delegated-Design Submittal:
 - 1. Spacing of hangers and supports.
 - 2. Design calculations: Calculations, including analysis data, signed and sealed by the qualified professional engineer responsible for their preparation for selecting hangers and supports.
- C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Other systems installed in same space as ducts.
 - 3. Ceiling- and wall-mounting access doors and panels required to provide access to dampers and other operating devices.
 - 4. Ceiling-mounting items, including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- D. Field quality-control test reports.

1.7 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.
- B. NFPA Compliance:
 - 1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."
 - 2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- C. Comply with NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations," Ch. 3, "Duct System," for range hood ducts, unless otherwise indicated.

1.8 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be stored in a designated area and protected from inclement weather.
- B. All materials shall be secured so as not to be a hazard during the construction process.
- C. Store ductwork with tight-fitting seals on open ends to ensure ductwork is free of all dirt, debris and moisture during the installation process.

1.9 COMMISSIONING

- A. This section specifies a system, or a component of a system being commissioned as defined in section 01 9100 commissioning. Testing of these systems is required, in cooperation with the CDB and the commissioning authority. Refer to section 01 9100 commissioning for detailed commissioning requirements.

PART 2 - PRODUCTS

2.1 SHEET METAL MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Lock-forming quality; complying with ASTM A 653/A 653M and having G90 coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.
- C. PVC-Coated Galvanized Steel: Acceptable by authorities having jurisdiction for use in fabricating ducts with UL 181, Class 1 listing. Lock-forming-quality, galvanized sheet steel complying with ASTM A 653/A 653M and having G90 coating designation. Factory-applied PVC coatings shall be 4 mils thick on sheet metal surfaces of ducts and fittings exposed to corrosive conditions and 4 mils thick on opposite surfaces.
- D. Carbon-Steel Sheets: ASTM A 366/A 366M, cold-rolled sheets; commercial quality; with oiled, matte finish for exposed ducts.
- E. Stainless Steel: ASTM A 480/A 480M, Type 304 & 316.
- F. Aluminum Sheets: ASTM B 209, alloy 3003, temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.
- G. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts.
- H. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.
- I. Insulated Flexible Ducts: Flexible ducts wrapped with flexible glass fiber insulation, enclosed by seamless aluminum pigmented plastic vapor barrier jacket; maximum 0.23 K value at 75 degrees F.

2.2 SEALANT MATERIALS

- A. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature but includes combinations of open-weave fabric strips and mastics.
- B. Water-Based Joint and Seam Sealant: Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.
- C. Flanged Joint Mastic: One-part, acid-curing, silicone, elastomeric joint sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.
- D. Flange Gaskets: Butyl rubber or EPDM polymer with polyisobutylene plasticizer.

2.3 HANGERS AND SUPPORTS

- A. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 2. Exception: Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
- B. Hanger Materials: Galvanized sheet steel or threaded steel rod.
 - 1. Hangers Installed in Corrosive Atmospheres: All-thread rods used in pool areas, pool equipment rooms, and pool supporting spaces shall be aluminum if the ducts are aluminum and stainless steel if the ducts are stainless steel.
 - 2. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for steel sheet width and thickness and for steel rod diameters.
 - 3. Galvanized-steel straps attached to aluminum ducts shall have contact surfaces painted with zinc-chromate primer.
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.
 - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
 - 2. Supports for Stainless-Steel Ducts: Stainless-steel support materials.
 - 3. Supports for Aluminum Ducts: Aluminum support materials..

2.4 RECTANGULAR DUCT FABRICATION

- A. Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" and complying with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
 - 1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure class.
 - 2. Deflection: Duct systems shall not exceed deflection limits according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- B. Transverse Joints: Prefabricated slide-on joints and components constructed using manufacturer's guidelines for material thickness, reinforcement size and spacing, and joint reinforcement.

- C. Formed-On Flanges: Construct according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.
 - 1. Duct Size: Maximum 30 inches wide and up to 2-inch wg pressure class.
 - 2. Longitudinal Seams: Pittsburgh lock sealed with noncuring polymer sealant.
- D. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of nonbraced panel area unless ducts are lined.

2.5 ROUND AND FLAT-OVAL DUCT AND FITTING FABRICATION

- A. Manufacturers: applicable to factory-fabricated duct and fittings:
- B. Subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Ductmate Industries, Inc.
 - 2. Lindab.
 - 3. Lockformer.
 - 4. McGill Airflow.
 - 5. Nexus Inc.
 - 6. Semco, Inc.
 - 7. Ward Industries.
- C. Diameter as applied to flat-oval ducts in this Article is the diameter of a round duct with a circumference equal to the perimeter of a given size of flat-oval duct.
- D. Round, Longitudinal- and Spiral Lock-Seam Ducts: Fabricate supply ducts of galvanized steel according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- E. Flat-Oval, Spiral Lock-Seam Ducts: Fabricate supply ducts according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible. Fabricate ducts larger than 72 inches in diameter with butt-welded longitudinal seams.
- F. Duct Joints:
 - 1. Ducts up to 20 Inches in Diameter: Interior, center-beaded slip coupling, sealed before and after fastening, attached with sheet metal screws.
 - 2. Ducts 21 to 72 Inches in Diameter: Three-piece, gasketed, flanged joint consisting of two internal flanges with sealant and one external closure band with gasket.
 - 3. Ducts Larger Than 72 Inches in Diameter: Companion angle flanged joints per SMACNA "HVAC Duct Construction Standards--Metal and Flexible," Figure 3-2.
 - 4. Round Ducts: Prefabricated connection system consisting of double-lipped, EPDM rubber gasket. Manufacture ducts according to connection system manufacturer's tolerances.
 - 5. Flat-Oval Ducts: Prefabricated connection system consisting of two flanges and one synthetic rubber gasket.
- G. 90-Degree Tees and Laterals and Conical Tees: Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," with metal thicknesses specified for longitudinal-seam straight ducts.
- H. Diverging-Flow Fittings: Fabricate with reduced entrance to branch taps and with no excess material projecting from fitting onto branch tap entrance.

- I. Fabricate elbows using die-formed, gored, pleated, or mitered construction. Bend radius of die-formed, gored, and pleated elbows shall be 1-1/2 times duct diameter. Unless elbow construction type is indicated, fabricate elbows as follows:
 1. Mitered-Elbow Radius and Number of Pieces: Welded construction complying with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," unless otherwise indicated.
 2. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from minus 2- to plus 2-inch wg:
 - a. Ducts 3 to 36 Inches in Diameter: 0.034 inch.
 - b. Ducts 37 to 50 Inches in Diameter: 0.040 inch.
 - c. Ducts 52 to 60 Inches in Diameter: 0.052 inch.
 3. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from 2- to 10-inch wg:
 - a. Ducts 3 to 26 Inches in Diameter: 0.034 inch.
 - b. Ducts 27 to 50 Inches in Diameter: 0.040 inch.
 4. Flat-Oval Mitered Elbows: Welded construction with same metal thickness as longitudinal-seam flat-oval duct.
 5. 90-Degree, 2-Piece, Mitered Elbows: Use only for supply systems or for material-handling Class A or B exhaust systems and only where space restrictions do not permit using radius elbows. Fabricate with single-thickness turning vanes.
 6. Round Elbows 8 Inches and Less in Diameter: Fabricate die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Fabricate nonstandard bend-angle configurations or nonstandard diameter elbows with gored construction.
 7. Round Elbows 9 through 14 Inches in Diameter: Fabricate gored or pleated elbows for 30, 45, 60, and 90 degrees unless space restrictions require mitered elbows. Fabricate nonstandard bend-angle configurations or nonstandard diameter elbows with gored construction.
 8. Round Elbows Larger Than 14 Inches in Diameter and All Flat-Oval Elbows: Fabricate gored elbows unless space restrictions require mitered elbows.
 9. Die-Formed Elbows for Sizes through 8 Inches in Diameter and All Pressures 0.040 inch thick with 2-piece welded construction.
 10. Flat-Oval Elbow Metal Thickness: Same as longitudinal-seam flat-oval duct specified above.
 11. Pleated Elbows for Sizes through 14 Inches in Diameter and Pressures through 10-Inch wg: 0.022 inch.

2.6 DUCTWORK LINING

- A. Ductwork liner shall be Johns Manville, Knauf, Owens-Corning or Certain-Teed. The product name is to be imprinted on the air stream surface.
- B. Ductwork Liner shall be installed in accordance with the Sheet Metal and Air Conditioning Contractor's National Association Duct Liner Application Standard, Second Edition, shall meet ASTM C1071 standards and liner facing must meet EPA registration requirements for antimicrobial protection.
- C. Transfer air ductwork shall be provided with a minimum of 1 duct lining with reinforced air side coating.
 1. Liner to be 1-1/2 pcf density, shall have a minimum sound NRC of 0.55 based on a Type "A" mounting, and a "K" factor not exceeding 0.46 at 75° F mean temperature.
- D. Rectangular ductwork indicated to be lined shall be provided with a minimum of 1 ½" duct lining with reinforced air side coating and anti-microbial protection.

1. 1 1/2" thick liner to be 1-1/2 pcf density, shall have a minimum sound NRC of 0.85 based on a Type "A" mounting, and a "K" factor not exceeding 0.16 at 75° F mean temperature.
- E. Unless otherwise indicated, the duct dimensions given on the drawings are to be clear inside dimensions after lining is applied.
- F. Round ductwork indicated to be lined shall be lined with 1 1/2" thick from "Permacote Spiracoustic Plus" insulation manufactured by Johns Manville or CertainTeed Toughgard Ultrasound or Owens Corning Quietr. Liner shall be installed per manufacturer's recommendations and requirements.

PART 3 - EXECUTION

3.1 DUCT APPLICATIONS

- A. Static-Pressure Classes: Unless otherwise indicated, construct ducts according to the following:
1. Supply Ducts (constant volume units): +2".
 2. Supply Ducts (before Air Terminal Units): +4".
 3. Supply Ducts (after Air Terminal Units): +2".
 4. Supply Ducts (between fan and first system fire damper): +8".
 5. Return Ducts (Negative Pressure): -2".
 6. Return Ducts (between nearest fire damper and return fan inlet): -4".
 7. Return Ducts (return fan discharge and AHU intake / exhaust damper): -4".
 8. Exhaust Ducts (Negative Pressure): Listed Fan negative static.
- B. All ducts shall be galvanized steel except as follows:
- a. Range Hood Exhaust Ducts: Comply with NFPA 96
 - Concealed: 16 Gauge carbon-steel sheet or 18 gauge, Type 304 stainless steel.
 - Exposed: 18 gauge, Type 304, stainless steel with finish to match kitchen equipment and range hood.
 - Welded seams and joints.
 2. Dishwasher Hood Exhaust Ducts:
 - a. Aluminum or type 304, stainless steel with finish to match dishwasher equipment and hood. Welded/flanged seams and joints.
 3. Fab Lab Laser Cutter Ductwork:
 - a. Type 316, stainless-steel sheet. Welded seams and joints.
 4. Dark Room Exhaust Ducts:
 - a. Poly Vinyl Coated (PCD) spiral round ductwork with hot dipped G=90 galvanized steel coated on two sides.
 5. Exposed Supply Ducts In Occupied Spaces
 - a. Spiral round/oval galvanized sheet steel with paint grip finish.

3.2 DUCT INSTALLATION

- A. Construct and install ducts according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," unless otherwise indicated.
- B. Install round and flat-oval ducts in lengths not less than 12 feet unless interrupted by fittings.
- C. Install ducts with fewest possible joints.
- D. Install fabricated fittings for changes in directions, size, and shape and for connections.
- E. Install couplings tight to duct wall surface with a minimum of projections into duct. Secure couplings with sheet metal screws. Install screws at intervals of 12 inches, with a minimum of 3 screws in each coupling.
- F. Install ducts, unless otherwise indicated, vertically and horizontally and parallel and perpendicular to building lines; avoid diagonal runs.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions unless specifically indicated.
- J. Coordinate layout with suspended ceiling, fire- and control dampers, lighting layouts, and similar finished work.
- K. Seal all joints and seams. Apply sealant to male end connectors before insertion, and afterward to cover entire joint and sheet metal screws.
- L. Electrical Equipment Spaces: Route ducts to avoid passing through transformer vaults and electrical equipment spaces and enclosures.
- M. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls and are exposed to view, conceal spaces between construction openings and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts. Overlap openings on 4 sides by at least 1-1/2 inches.
- N. Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, install appropriately rated fire dampers, sleeves, and firestopping sealant. Fire and smoke dampers are specified in Division 23 Section "Air Duct Accessories." Firestopping materials and installation methods are specified in Division 07.
- O. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."
- P. Protect duct openings from damage and prevent entrance of foreign materials.
- Q. PVC-COATED DUCT, SPECIAL INSTALLATION REQUIREMENTS
 - 1. Repair damage to PVC coating with manufacturer's recommended materials.

R. RANGE HOOD EXHAUST DUCTS, SPECIAL INSTALLATION REQUIREMENTS

1. Install ducts to allow for thermal expansion through 2000 deg F temperature range.
2. Install ducts without dips or traps that may collect residues unless traps have continuous or automatic residue removal.
3. Install access panels at each change in direction and at intervals defined by NFPA 96; locate on sides of duct a minimum of 1-1/2 inches from bottom; and fit with grease-tight covers of same material as duct.
4. Do not penetrate fire-rated assemblies except as permitted by applicable building codes.

3.3 SEAM AND JOINT SEALING

- A. Seal all duct seams and joints to the most severe requirement between the latest Chicago Building Code and SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for duct pressure class indicated.
- B. Utilize sealant designed for outdoor use with ductwork exposed to the outdoors.
- C. Seal ducts before external insulation is applied.

3.4 HANGING AND SUPPORTING

- A. Support horizontal ducts within 24 inches of each elbow and within 48 inches of each branch intersection.
- B. Support vertical ducts at maximum intervals of 16 feet and at each floor.
- C. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

3.5 CONNECTIONS

- A. Make connections to equipment with flexible connectors according to Division 23 Section "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.6 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections according to SMACNA's "HVAC Air Duct Leakage Test Manual" and prepare test reports:
 1. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
 2. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If pressure classes are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure. Give seven days' advance notice for testing.
 3. Maximum Allowable Leakage: Comply with requirements for Leakage Class 3 for round and flat-oval ducts, Leakage Class 12 for rectangular ducts in pressure classes lower than and equal to 2-inch wg (both positive and negative pressures), and Leakage Class 6 for pressure classes from 2- to 10-inch wg.
 4. Remake leaking joints and retest until leakage is equal to or less than maximum allowable.

- B. Major equipment and system startup and operational tests shall be scheduled and documented in accordance with Section 01 9100 Commissioning.

3.7 DUCT LINER:

- A. Liner shall be applied to the following rectangular and square ductwork ductwork.
 - 1. All Exposed Outside Air and Fresh Air ductwork.
 - 2. Transfer Air Ductwork
 - 3. Exhaust ductwork within 10'-0" of fan.
- B. Duct liner shall be cut to assure overlapped and compressed longitudinal corner joints. Cut edges shall be properly sealed with mastic to assure no erosion of insulation.
- C. Fasteners shall start within 3" of the upstream transverse edges of the duct liner and 3" from the longitudinal joints and shall be spaced at a maximum of 12" o.c. except that they shall be placed not more than 6" from a longitudinal joint of the liner nor 12" from a corner break.
- D. Duct liner shall be adhered to the sheet metal (with 100% coverage) and edges coated with one (1) of the adhesives conforming to the Standard for Adhesives for Duct Liner, ASC-A-7001C -1972 of the Adhesive and Sealant Council, Inc.
- E. Duct liner shall be further secured with fasteners conforming to the Mechanical Fastener Standard, MF-1-1975 on Page 22 of the Duct Liner Application Standard, Second Edition, of the Sheet Metal and Air Conditioning Contractor's National Association.
- F. Duct liner in medium pressure ductwork shall be installed per manufacturer's recommendations for velocities above 2,000 fpm.
- G. The leading edge of duct liner joints (in direction of air flow) shall be provided with metal nosing or a hardening mastic to prevent lining from coming loose.

END OF SECTION

SECTION 284621.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section includes the design and provision of a new, complete, multiplex/addressable fire alarm system as described herein and on the Contract Drawings. The system shall include all wiring, raceways, pull boxes, terminal cabinets, outlet and mounting boxes, control equipment, alarm, and supervisory signal initiating devices, alarm notification appliances, and all other accessories and miscellaneous items required for a complete operating system even though each item is not specifically mentioned or described. The system layout on the drawings is generic. A single fire alarm control panel is indicated.

The Fire Alarm System shall include a D1.3igital Communicator Transmitter that uses a dialer transmission format that is able to be read by the Digital Alarm Communicator Receiver in the Keltron DR703Le Fire Alarm Receiver Equipment (feeding the Keltron LS7000 Graphical Automation System) in the City of Philadelphia's Central Radio Room via two dedicated telephone lines and can transmit alarm signals via radio signal to cellular telephone network to a remote central station fire alarm receiving equipment at a PPR approved fire alarm monitoring service.

B. Extent of the Work: The system shall be installed in accordance with the drawings, specifications and referenced publications.

C. Existing Fire Alarm Equipment: Existing fire alarm equipment shall be maintained fully operational until the new equipment has been tested and accepted by the Owner. As new equipment is installed, it shall be labeled "NOT IN SERVICE" until the new equipment is accepted. Once the new system is completed, tested, and accepted by the Owner it shall be placed in service and connected to a UL listed central station service. All new equipment shall have tags removed and the existing equipment shall be tagged "NOT IN SERVICE" until removed from the building.

D. Equipment Removal: After acceptance of the new system by the Owner, all existing equipment not connected to the new system shall be removed and all damaged surfaces shall be restored. The material shall be removed from the site and disposed of by the Contractor.

E. Repair Service/Replacement Parts: Repair services and replacement parts for the system shall be furnished under this contract and be available for a period of 10 years after the date of final

acceptance of this work by the Owner. On-site service during the guarantee period shall be provided within 24 hours after notification. All repairs shall be completed within 48 hours after notification.

F. Section Includes:

1. Fire-alarm control unit
2. Manual fire-alarm boxes
4. Heat detectors
5. Notification appliances
6. Remote annunciator
7. Addressable interface device
8. Digital alarm communicator transmitter

1.3 REFERENCES AND REQUIREMENTS OF REGULATORY AGENCIES AND STANDARDS

A. Codes and Standards: The fire alarm equipment and installation shall conform to the requirements of all applicable codes, rules, regulations and standards being enforced by agencies having jurisdiction. Codes, rules, regulations, and standards shall be latest version to date or version being enforced by the local approving agencies or code official(s), including, but not limited to, the following:

1. International Code Council (ICC)
 - a. International Building Code
 - b. International Fire Code
 - c. International Mechanical Code
2. National Fire Protection Association (NFPA)
 - a. NFPA 13 – Standard for the Installation of Sprinkler Systems
 - b. NFPA 70 – National Electrical Code
 - c. NFPA 72 – National Fire Alarm Code
 - d. NFPA 90A – Standard for the Installation of Air-Conditioning and Ventilating Systems
3. FM Global/Factory Mutual (FM)
 - a. Factory Mutual Approval Guide
4. Underwriters Laboratories (UL)

- a. UL 38 – Standard for Manual Signaling Boxes for Fire Alarm Systems
- b. UL 268 – Smoke Detectors for Fire Alarm Systems
- c. UL268A – Standard for Smoke Detectors for Duct Application
- d. UL 464 – Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
- e. UL 486A/B – Wire Connectors
- f. UL 521 – Standard for Heat Detectors for Fire Protective Signaling Systems
- g. UL 864 – Standard for Control Units and Accessories for Fire Alarm Systems
- h. UL 1449 – Standard for Surge Protective Devices
- i. UL 1971 – Standard for Signaling Devices for the Hearing Impaired
- j. UL 2075 – Standard for Gas and Vapor Detectors and Sensors
- k. UL Electrical Construction Equipment Directory
- l. UL Fire Protection Equipment Directory

5. IEEE Standards Association (IEEE)

- a. IEEE C62.41.1 – Guide on the Surge Environment in Low-Voltage (1000 V and less) AC Power Circuits
- b. IEEE C62.41.2 – Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits
- c. IEEE 1100 - IEEE Recommended Practice for Powering and Grounding Electronic Equipment

6. National Electrical Manufacturers Association (NEMA)

- a. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum)

7. American National Standards Institute (ANSI)

- a. ANSI S1.4: Specifications for Sound Level Meters

8. United States Department of Justice

- a. Americans with Disabilities Act (ADA)
- b. Americans with Disabilities Act Accessibility Guidelines (ADAAG)

9. National Institute for Certification in Engineering Technologies (NICET)

- a. Fire Alarm Systems Certification

b. Inspection & Testing of Fire Alarm Systems

1.4 DEFINITIONS

- A. Alarm Signal: A signal which indicates a state of emergency requiring immediate notification of the fire department and of the building occupants. These are signals such as the operation of a manual pull station or the activation of a smoke detector with alarm-verification feature.
- B. Class B Wiring: A circuit that is monitored for integrity such that a single break, a single wire-to-wire short, or a single loss of carrier condition will be indicated by a trouble signal on the FACP no matter where the break, short or loss of carrier condition occurs, but which would prohibit devices beyond the fault, short or carrier loss from remaining operational. In accordance with NFPA 72, this would be Style 4, Class B wiring for signaling line circuits and Class B wiring for, initiating device circuits and notification appliance circuits.
- C. Fire Alarm Control Panel (FACP): A master control panel having the features of a fire alarm control unit and to which all fire alarm control units are interconnected. The panel has central processing, memory, input and output terminals, and video display units (VDUs).
- D. Initiating Device: A system component that originates transmission of a change of state condition, which initiates an appropriate response via the fire alarm system.
- E. Initiating Device Circuit: A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated.
- F. Interface Device: An addressable device which interconnects hard wired systems or devices to a multiplex system.
- G. Install: To set in position and connect or adjust for use.
- H. LED: Light-emitting diode.
- I. Manual Pull Station: A fire alarm box as indicated in NFPA 72.
- J. Monitor/Control Modules: Addressable fire alarm devices installed to provide supervised monitoring or control of accessory equipment.
- K. NICET: National Institute for Certification in Engineering Technologies.
- L. Notification Appliance Circuit: A circuit to which notification appliances are connected to visually and audibly indicates an alarm signal.
- M. NRTL: Nationally Recognized Testing Laboratory.
- N. Pathway Survivability: Pathway survivability Level 1 shall consist of pathways in buildings that are fully protected by an automatic sprinkler system in accordance with NFPA 13,

Standard for the Installation of Sprinkler Systems, with any interconnecting conductors, cables, or other physical pathways installed in metal raceways.

- O. PPR: Philadelphia Department of Parks and Recreation
- P. Provide: To furnish and install the stated equipment or materials.
- Q. Remote Fire Alarm Control Unit: A control panel, remote from the fire alarm control panel, that receives inputs from automatic and manual fire alarm devices; may supply power to detection devices and interface devices; may provide transfer of power to the notification appliances; may provide transfer of condition to relays or devices connected to the control unit; and reports to and receives signals from the fire alarm control panel.
- R. Signaling Line Circuit: A circuit to which any combination of circuit interfaces, control units, or transmitters are connected and over which multiple system input signals or output signals, or both, are carried.
- S. Supervisory Signal: A signal which indicates the impairment of a fire protection system which may prevent its normal use. These are signals from switches, such as a tamper switch, a fire pump phase reversal switch, or a fire pump loss of phase switch.
- T. Tamper Switch: A valve monitor switch as indicated in NFPA 72.
- U. Terminal Cabinet: A steel cabinet with locking, hinge-mounted door in which terminal strips are securely mounted. Minimum size is 200 mm x 200 mm (8 inch x 8 inch).
- V. Trouble Signal: A signal which indicates that a fault, such as an open circuit or ground, has occurred in the fire alarm system or in a separate subsystem, whose control panel is monitored by the fire alarm system.

1.5 SYSTEM DESCRIPTION

- A. General: System shall be a complete, supervised, noncoded, addressable system fire alarm system with multiplexed signal transmission dedicated to fire alarm service only. System shall conform to NFPA 72. System shall have automatic sensitivity control of certain smoke detectors. The system shall have Style 4 Class B circuits for each floor. The system shall operate in the alarm mode upon actuation of any alarm initiating device. The system shall remain in the alarm mode until all initiating device(s) are reset and the fire alarm control panel is manually reset and restored to normal. The system shall provide the following functions and operating features:
 - 1. The FACP and fire alarm control units shall provide power, annunciation, supervision and control for the system.
 - 2. Provide Class B initiating device circuits.
 - 3. Provide Style 4 Class B signaling line circuits for each floor.
 - 4. Provide Class B notification appliance circuits.

5. Provide electrical supervision of the primary power (AC) supply, presence of the battery, battery voltage, and placement of system modules within the control panel.
6. Provide an audible and visual trouble signal to activate upon a single break or open condition, or ground fault which prevents the required operation of the system. The trouble signal shall also operate upon loss of primary power (AC) supply, absence of a battery supply, low battery voltage, or removal of alarm or supervisory panel modules. Provide a trouble alarm silence feature which will silence the audible trouble signal, without affecting the visual indicator. After the system returns to normal operating conditions, the trouble signal shall again sound until the trouble is acknowledged. A smoke detector in the process of being verified for the actual presence of smoke shall not initiate a trouble condition.
7. Provide a notification appliance silencing switch which, when activated, will cause the notification appliances to cease operating, but not affect the liquid crystal display or the automatic notification of the Fire Alarm receiver equipment in the City's Radio Room. This switch shall be overridden upon activation of a subsequent alarm.
8. Provide alarm verification capability for area smoke detectors.
9. Provide program capability via switches in a locked portion of the FACP to bypass the automatic notification appliance circuits, air handler shutdown, door release, features. The operation of this programming shall indicate this action on the FACP display and printer output.
10. All alarm, supervisory, or trouble signals shall be automatically transmitted to a UL listed central station.
11. Alarm functions shall override trouble or supervisory functions. Supervisory functions shall override trouble functions.
12. The system shall be capable of being programmed in the field. All programmed information shall be stored in nonvolatile memory.
13. The system shall be capable of operating, supervising, and/or monitoring both addressable and nonaddressable alarm and supervisory devices.
14. There shall be no limit, other than maximum system capacity, as to the number of addressable devices which may be in alarm simultaneously.
15. Where the fire alarm system is responsible for initiating an action in another emergency control device or system, such as an HVAC system, the addressable fire alarm relay shall be within 3 feet of the emergency control device.

16. An alarm signal shall automatically initiate the following functions:
 - a. Transmission of an alarm signal to fire alarm receiving equipment in the City's Central Radio Room.
 - b. Transmission of an alarm signal to remote central station fire alarm receiving equipment at a PPR approved fire alarm monitoring service via radio transmission over cellular telephone network.
 - c. Visual indication of the device operated on the fire alarm control panel (FACP). Indication on the graphic annunciator shall be by floor, zone or circuit, and type of device.
 - d. Continuous actuation of all alarm notification appliances.
 - e. Release of doors held open by electromagnetic devices.
 - f. Operation of a duct smoke detector shall shut down the appropriate air handler and/or smoke damper(s) in accordance with the International Mechanical Code and NFPA 90A
17. A supervisory signal shall automatically initiate the following functions:
 - a. Transmission of a supervisory signal to fire alarm receiving equipment in the City's Central Radio Room.
 - b. Transmission of a supervisory signal to remote central station fire alarm receiving equipment at a PPR approved fire alarm monitoring service via radio transmission over cellular telephone network.
 - c. Visual indication of the device operated on the fire alarm control panel (FACP),
18. A trouble condition shall automatically initiate the following functions:
 - a. Transmission of a trouble signal to fire alarm receiver equipment in the City's Central Radio Room.
 - b. Transmission of a trouble signal to remote central station fire alarm receiving equipment at a PPR approved fire alarm monitoring service via radio transmission over cellular telephone network.
 - c. Visual indication of the system trouble on the FACP.
19. The maximum permissible elapsed time between the actuation of an initiating device and its indication at the FACP shall be fifteen seconds.
20. The maximum elapsed time between the occurrence of the trouble condition and its indication at the FACP shall not exceed 200 seconds.

1.6 SUBMITTALS

- A. General Submittal Requirements:
1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
 2. The fire alarm equipment distributor shall submit, in accordance with Division 1 requirements, documentation as specified in the Quality Assurance portion of this Section. When the distributor intends to utilize the services of a manufacture-affiliated company in the system design, the distributor shall submit a letter of intent to do so, addressed to the Architect, which includes the name of the manufacturer-affiliated company, the names and qualifications of the NICET-certified employees of the company, and which describes the delegation of fire alarm system design responsibilities.
 3. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified fire-alarm technician, Level III minimum.
 - c. Licensed or certified by authorities having jurisdiction.
 - d. Drawings and Calculations to be sealed by a registered Professional Engineer in Pennsylvania.
- B. Product Data: For each type of product indicated.
- C. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.
1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
 2. Provide point-to-point wiring diagrams showing the points of connection and terminals used for all electrical field connections in the system, including all interconnections between the equipment or systems which are supervised or controlled by the system. Diagrams shall show all connections from field devices to the FACP and remote fire alarm control units, initiating circuits, switches, relays and terminals. Provide isometric drawing showing device locations, terminal cabinet locations, and all circuit layouts for all floors. Submit shop drawings not smaller than 30 inches by 42 inches. Shop drawings shall be prepared on a Computer Aided Drafting (CAD) system.
 3. Provide a complete description of the system's operation.
 4. Provide a complete list of devices, device addresses, and corresponding messages.

5. Include voltage drop calculations for notification appliance circuits.
6. Include battery-size calculations.
7. Include performance parameters and installation details for each detector, verifying that each detector is listed for the complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
8. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
9. Include annotated catalog data showing manufacturer's name, model, voltage, and catalog numbers for all equipment and components. Where multiple configurations of equipment or options are available, indicate specific configuration being submitted.
10. Provide complete battery calculations for both the alarm and supervisory power requirements. Ampere hour requirements for each system component shall be submitted with the calculations.
11. Provide complete riser diagrams indicating the wiring sequence of all devices and their connections to the control equipment. Provide a color code schedule for the wiring.
12. Provide floor plans showing the location of all devices and equipment. Show locations for all conduit and for all junction boxes used for T-taps. Indicate conduit fill percentages on the plans.
13. Provide data on each circuit to indicate that there is at least 25% spare capacity for notification appliances, 25% spare capacity for initiating devices. Provide circuit numbers for audible devices and load calculations for each circuit.
14. Provide a schedule of initiating device addresses and indicating device zones and subzones.
15. Include submittal data for all wire, terminal cabinets, and raceways.
16. Include floor plans to indicate final outlet locations showing the address of each addressable device. Show size and route of cable and conduits.
17. Working drawings shall indicate 24 VDC power circuits necessary for system functionality. System vendor shall verify the functionality and capacity of circuits.

- D. Qualification Data: For qualified Design, Installer.
- E. Field quality-control reports.
- F. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals. Provide bound copies of an operation and maintenance manual. The manual shall include an index, copies of all approved shop drawings and submittal materials updated to "As Built", and a complete parts list of all components. The manual shall also include a list of recommended spare parts. The spare parts list shall include, for each item, the manufacturer's name, the serial number of the part, an ordering number, if appropriate, and a physical and electrical description of the part. In addition to items specified in Division 01 "Operation and Maintenance Manuals," include the following:
 - 1. Prepare and submit detailed CAD-based "As-Built" drawings. The drawings shall include complete plan view wiring diagrams showing connections between all devices and equipment, both factory and field wired, including, but not limited to, locations for all conduit and for all junction boxes used for T-taps. Indicate conduit fill percentages on the plans. All equipment in panels shall be shown in the as-built orientation. Include a riser diagram and drawings showing the as-built location and address or circuit number of all devices and equipment.
 - 2. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
 - 3. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
 - 4. Record copy of site-specific software.
 - 5. Matrix of Operations including all system inputs and outputs.
 - 6. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:
 - a. Frequency of testing of installed components
 - b. Frequency of inspection of installed components
 - c. Requirements and recommendations related to results of maintenance
 - d. Manufacturer's user training manuals
 - 7. Manufacturer's required maintenance related to system warranty requirements.

8. Abbreviated operating instructions for mounting at fire-alarm control unit.
 9. Include an electronic copy of the programming on CD for use by the Owner.
- G. Software and Firmware Operational Documentation:
1. Software operating and upgrade manuals.
 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
 3. Device address list.

1.7 QUALITY ASSURANCE

- A. Designer Qualifications:
1. The Fire Alarm System Designer shall be capable of field surveying, design, and preparation of submittals required as part of this specification and certified as a Registered Professional Engineer in the Commonwealth of Pennsylvania who is experienced in fire protection systems or an individual who is certified as a Level III or IV Technician by NICET in Fire Alarm Systems.
 2. The Fire Alarm System Designer shall have a minimum of 5 years of experience in the preparation of fire alarm system design including shop drawings, battery and voltage drop calculations, field surveying, and shall be regularly engaged in the design of the type and complexity if system required or specified in the contract documents.
- B. Installer Qualifications:
1. Installation shall be accomplished by a Contractor with a minimum of five years' experience in the installation of fire alarm systems. Contractor shall show evidence of certification of at least one employee directly responsible for the work by the National Institute for Certification in Engineering Technologies (NICET) at Level II, III, or IV in the Fire Alarm Systems subfield of Fire Protection Engineering Technology. Any proposed installer who cannot show evidence of such qualifications may be rejected. The services of a technician provided and certified by the control equipment manufacturer shall be provided to supervise installation adjustments and tests of the system. Personnel shall be trained and certified by the manufacturer for installation of units required for this Project.
- C. Distributor Qualifications:

1. The manufacturer's equipment distributor shall show evidence of certification by the manufacturer in the technical support of the system installed under this contract.
2. The distributor shall show evidence of certification of at least one employee by the National Institute for Certification in Engineering Technologies (NICET) at Level III or IV in the Fire Alarm Systems subfield of Fire Protection Engineering Technology. At a minimum, training and experience shall consist of five years of progressive experience in the installation and design of fire alarm systems of similar size and complexity to that specified herein.

D. Manufacturer Qualifications:

1. Testing Services or Laboratories: Construct all fire alarm and fire detection equipment in accordance with the latest edition of the following publications from Underwriters Laboratories (UL) and Factory Mutual Engineering Corporation (FM):
 - a. UL Fire Protection Equipment Directory.
 - b. UL Electrical Construction Materials Directory.
 - c. UL 464 - Audible Signal Appliances.
 - d. UL 864 - Control Units for Fire Protective Signaling Systems.
 - e. UL 1971 - Signaling Devices for the Hearing Impaired.
 - f. Factory Mutual Approval Guide.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
1. Notify Owner no fewer than 3 days in advance of proposed interruption of fire-alarm service.
 2. Do not proceed with interruption of fire-alarm service without Owner's written permission.

1.9 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into

service and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.

- B. Equipment Removal: After acceptance of the new fire-alarm system, remove existing disconnected fire-alarm Equipment and wiring.

1.10 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- C. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from the date of Substantial Completion. Upgrading software shall include the operating system. Upgrade shall include new or revised licenses for use of software.
 - 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.11 APPROVALS

- A. Any deviations from this specification shall be approved in writing by the Philadelphia Department of Parks and Recreation prior to design, bidding, or installation, whichever occurs first.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Silent Knight Alarm System by Honeywell, Models 6820 (Larger Installations) or 6808 (Smaller Installations), or comparable non-proprietary product approved by the design professional and by PPR by one of the following:
 - 1. Silent Knight Alarms (non-proprietary); a Honeywell company
 - 2. Fire Lite Alarms (non-proprietary); a Honeywell company

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices:
 - 1. Manual stations
 - 2. Heat detectors

3. Smoke detectors
 5. Verified automatic alarm operation of smoke detectors (alarm verification feature)
- B. Fire-alarm signal shall initiate the following actions:
1. Continuously operate alarm notification appliances.
 2. Identify alarm at fire-alarm control unit and remote annunciators.
 3. Transmit an alarm signal to the remote alarm receiving station.
 4. Close smoke dampers in air ducts of designated air-conditioning duct systems.
 5. Recall elevators to primary or alternate recall floors.
 6. Activate emergency lighting control.
 7. Record events in the system memory.
- C. Supervisory signal initiation shall be by one or more of the following devices and actions:
- D. System trouble signal initiation shall be by one or more of the following devices and actions:
1. Open circuits, shorts, and grounds in designated circuits.
 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
 3. Loss of primary power at fire-alarm control unit.
 4. Ground or a single break in fire-alarm control unit internal circuits.
 5. Abnormal ac voltage at fire-alarm control unit.
 6. Break in standby battery circuitry.
 7. Failure of battery charging.
 8. Abnormal position of any switch at fire-alarm control unit or annunciator.
 9. Loss of communication of any panel.
- E. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit and remote annunciators. Record the event on system printer.

2.3 FIRE-ALARM CONTROL UNIT

- A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864 and listed and labeled by a Nationally Recognized Testing Laboratory (NRTL).
 2. Addressable initiation devices that communicate device identity and status.
 - a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at fire-alarm control unit.
 - b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.
 3. Addressable control circuits for operation of mechanical equipment.
- B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
1. Annunciator and Display: Liquid-crystal type, 4 lines of 20 characters, minimum.
 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.
- C. Circuits:
1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class B.
 - a. Initiating Device Circuits: Class B
 - b. Notification Appliance Circuits : Class B
 - c. Signaling Line Circuits: Style 4 Class B
 - d. Each circuit shall be provided with 20% spare capacity
 - D. Smoke-Alarm Verification:
 1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
 2. Activate an NRTL-listed and -approved "alarm-verification" sequence at fire-alarm control unit and detector.
 3. Record events by the system printer.
 4. Sound general alarm if the alarm is verified.

5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.
- E. Notification Appliance Circuit: Fire Alarm Signal Operation shall sound as follows:
 1. The alarm signal shall be a square wave or provide equivalent awakening ability.
 2. The wave shall have a fundamental frequency of 520Hz + 10 percent.
 - F. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.
 - G. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.
 - H. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals digital alarm communicator transmitters shall be powered by 24-V dc source. Provide and install a dedicated fused safety switch for power service connection to new fire alarm system. Switch box to be red and labeled "FIRE ALARM CIRCUIT CONTROL."
 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
 - I. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch. Provide the battery powered secondary power system with sufficient capacity to operate the complete alarm system in normal or supervisory (nonalarm) mode for a period of 24 72 hours. Following this period of operation on battery power, the batteries shall have sufficient capacity to operate the system during a fire or other emergency condition for a period of 5 minutes.
 1. Batteries: Sealed, valve-regulated, recombinant lead acid.
 - J. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.4 MANUAL FIRE-ALARM BOXES

- A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color;

shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key- or wrench-operated switch.
3. Stations shall be supplied with screw terminals for making connections.

2.5 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be two-wire type.
3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
5. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.
6. Detectors shall have alarm verification capability and environmental compensation feature.
7. Smoke detectors shall be listed for use with the fire alarm control panel.
8. Provide self-restoring type detectors which do not require any readjustment after actuation to restore it to normal operation.
9. All detectors shall have an insect screen and, as required, one set of auxiliary contacts, one each normally open and normally closed (Form "C").
10. Base to include integral audible sounding device capable of Temporal 4 code and 520 Hz square Fire Alarm "waking" compliant square wave.
11. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.
 - a. Rate-of-rise temperature characteristic shall be selectable at fire-alarm control unit for 15 deg F per minute.

- b. Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 deg F (57 deg C) for general building spaces and 194 deg F (90 deg C) for boiler rooms.
 - c. Provide multiple levels of detection sensitivity for each sensor.
- B. Photoelectric Smoke Detectors:
- 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting. Detector sensitivity to be between 2.5 and 3.5 percent/foot smoke obscuration when tested according to UL 268A.
 - 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status
 - b. Device type
 - c. Present average value
 - d. Present sensitivity selected
 - e. Sensor range (normal, dirty, etc.)

2.6 HEAT DETECTORS

- A. General Requirements for Heat Detectors: Comply with UL 521.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) for general building spaces or 194 deg F (90 deg C) for boiler rooms or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.7 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Connected to notification appliance signal circuits, zoned as indicated, equipped for mounting as indicated and with screw terminals for system connections.
 - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.

- B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound- pressure level of 90 dBA, measured 10 feet from the horn, using:
 - 1. The alarm signal shall be a square wave or provide equivalent awakening ability.
 - 2. The wave shall have a fundamental frequency of 520 Hz +10 percent.
- C. Visible Notification Appliances: Xenon strobe lights comply with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch high letters on the lens.
 - 1. Rated Light Output: field selectable to 15/30/75/110 cd, Set as shown on drawings.
 - 2. Mounting: ceiling mounted unless otherwise indicated.
 - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 - 4. Flashing shall be in a temporal pattern, synchronized with other units.
 - 5. Strobe Leads: Factory connected to screw terminals.
 - 6. Mounting Faceplate: Factory finished, red.
 - 7. Field selectable wattage taps from ¼ to 2 watts. Setting determined by contractor's final certification / test.
 - 8. Mounting: Flush
 - 9. Matching Transformers: Tap range matched to acoustical environment of speaker location.

2.8 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
 - 1. Mounting: Surface cabinet, NEMA 250, Type 1.
- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.9 ADDRESSABLE INTERFACE DEVICE

- A. Monitor Module Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts. Addressable monitor module shall provide an individual address for each device below using a supervised Class B circuit:
 - 1. Each nonaddressable initiating device
- B. Control Module Description: Addressable control module shall provide normally-open, normally-closed Form C contacts for auxiliary control purposes. Integral Relay: Capable of providing a direct signal to circuit-breaker shunt trip for power shutdown. All activation and power circuits required shall be provided from the fire alarm system for the following:

2.10 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632 and be listed and labeled by an NRTL.
- B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station at the City's Central Radio Room. Unit shall also receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically transmit radio signals via cellular telephone network for a remote central station at a PPR approved fire alarm monitoring service. When contact is made with central station(s), signals shall be transmitted. If service on either line or radio signal is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line or radio signal to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines or radio signal, transmitter shall initiate the local trouble signal.
- C. Local functions and display at the digital alarm communicator transmitter shall include the following:
 - 1. Verification that both telephone lines are available.
 - 2. Programming device.
 - 3. LED display.
 - 4. Manual test report function and manual transmission clear indication.
 - 5. Communications failure with the central station or fire-alarm control unit.
- D. Digital data transmission shall include the following:
 - 1. Address of the alarm-initiating device.

2. Address of the supervisory signal.
 3. Address of the trouble-initiating device.
 4. Loss of ac supply or loss of power.
 5. Low battery.
 6. Abnormal test signal.
 7. Communication bus failure.
- E. Secondary Power: Integral rechargeable battery and automatic charger.
- F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.
- G. A ¾ inch conduit with the required conductors shall be extended from the dialer to the nearest telephone terminal board. The telephone company shall provide and install interface terminal block. Electrical Contractor shall terminate conductors on one side of this terminal block as directed by the telephone company. The Owner shall contract with the telephone company for a private line for the dialer.

2.1 SURGE SUPPRESSION

- A. Provide line voltage and low voltage surge suppression devices to suppress all voltage transients which might damage the control panel and transmitter components. Mount suppressors in separate enclosure(s) adjacent to control panel and transmitter unless suppressors are specifically UL listed or FM approved for mounting inside the control panel and transmitter provided and approved for such use by the control panel and transmitter manufacturer[s].
1. Line Voltage Surge Suppressor shall be UL 1449 listed with a maximum 330 volt clamping level and a maximum response time of 5 nanoseconds. Suppressor shall also meet IEEE C62.41.1 and IEEE C62.41.2 category B tests for surge capacity. Suppressor shall be a multi-stage construction which includes inductors and silicon avalanche zener diodes. Suppressor shall have a long-life indicating lamp (light emitting diode or neon lamp) which extinguishes upon failure of protection components. Fuses shall be externally accessible. Wire in series with the incoming power source to the protected equipment using screw terminations.
 2. Low Voltage Surge Suppressor shall be provided for all circuits which leave the building shell and as shown on the contract drawings. When circuits interconnect two or more buildings, provide an arrestor at the circuit entrance to each building. Suppressor shall be UL 497B listed with a maximum 30 volt clamping level and a maximum response time of 5 nanoseconds. Suppressor

shall have multi-stage construction and both differential/common mode protection.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, the plan drawings, specifications, manufacturer's recommendations, and all applicable codes for installation of fire-alarm equipment. All wiring shall be installed in compliance with NFPA 70, National Electrical Code®.
- B. Smoke- or Heat-Detector Spacing:
 - 1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing.
 - 2. Comply with NFPA 72, "Heat-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for heat-detector spacing.
 - 3. Smooth ceiling spacing shall not exceed 30 feet.
 - 4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A or Appendix B in NFPA 72.
 - 5. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.
 - 6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture.
 - 7. Detectors located on the ceiling shall be installed not less than 4 inches from a side wall to the near edge.
- C. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.
- D. Remote Status and Alarm Indicators: Install near each smoke detector that is not readily visible from normal viewing position.
- E. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.
- F. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling.
- G. Device Location-Indicating Lights: Locate in public space near the device they monitor.

- I. Fire-Alarm Control Unit: Surface mounted, with tops of cabinets not more than 72 inches above the finished floor.
- J. Manual Pull Stations: Locate manual pull stations where shown on the drawings. Provide recessed back boxes in which the station operating mechanisms shall be mounted. Manual pull stations shall be comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- K. Annunciator: Install with top of panel not more than 72 inches above the finished floor.

3.2 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Alarm-initiating connection to activate emergency lighting control.
 - 2. Supervisory connections at valve supervisory switches.

3.3 FIELD WIRING

- A. Wire Nuts are not permitted. Multiple wires on a single terminal are prohibited.
- B. Signaling Line circuits, initiating device circuits, and notification appliance circuits shall be supervised in accordance with the requirements of NFPA 72.
- C. Provide wiring within cabinets installed parallel with or at right angles to the sides and back of the enclosure. All conductors which are terminated, spliced, or otherwise interrupted in any enclosure associated with the fire alarm system shall be connected to terminal blocks. Mark each terminal in accordance with the wiring diagrams of the system. Make all connections with either crimp-on terminal spade lugs or with pressure type terminal blocks.
- D. Provide a terminal cabinet where any circuit tap is made.
- E. For alarm and supervisory initiating device circuit and alarm indicating circuit wiring for the low voltage portion of the fire alarm system, provide all wiring as recommended by the equipment manufacturer. Provide wiring operating at 120 VAC as minimum No. 12 AWG solid copper having similar insulation.
- F. Conductors shall be run in conduit or EMT as a minimum.

- G. Signaling Line Circuits, Initiating Device Circuits and Notification Appliance Circuits:
1. Power-Limited Circuits: For interior wiring (in raceways) use power-limited insulated multiconductor cable types except where a 2-hour fire rated cable assembly is required.
 - a. Number of conductors and conductor size as recommended by the Company producing the system, except that conductor size shall not be less than No. 18 AWG for signaling line circuits and not less than No. 16 AWG for initiating device circuits and notification appliance circuits.
 - b. Using Non-power-Limited Wiring On Power-Limited Circuits: Wiring size and types specified for NONPOWER-limited circuits may be used for power-limited circuits if power-limited circuits are reclassified and the power-limited markings are eliminated. Refer to NEC Article 760-52(a) Exception No. 3.
 2. Nonpower-Limited Circuits: For interior wiring (in raceways) use nonpower-limited insulated single conductors or multiconductor cable types .
 - a. Number of conductors and conductor size as recommended by the Company producing the system, except that conductor size shall not be less than No. 18 AWG for signaling line circuits, not less than No. 16 AWG for initiating device circuits, and not less than No. 14 AWG for notification appliance circuits.
 - H. Distinctively color code all wiring differently from the normal building wiring. Audible alarm indicating devices shall be color coded differently from alarm initiating circuits. Use different colors for visual alarm indicating devices.
 - I. Where the fire alarm system is responsible for initiating an action in another emergency control device or system, such as an HVAC system or elevator system, the addressable fire alarm interface module shall be within 10 feet of the emergency control device.
 - J. Provide a terminal cabinet where any circuit tap is made.
 - K. Provide wiring within cabinets installed parallel with or at right angles to the sides and back of the enclosure. All conductors which are terminated, spliced, or otherwise interrupted in any enclosure associated with the fire alarm system shall be connected to terminal blocks. Mark each terminal in accordance with the wiring diagrams of

the system. Make all connections with either crimp-on terminal spade lugs or with pressure type terminal blocks.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 "Electrical (CCTV)".
- B. All junction boxes and conduits shall be sprayed red and labeled "Fire Alarm". Wiring color code shall be maintained throughout the installation.
- C. Install framed instructions in a location visible from fire-alarm control unit.
- D. Provide fire alarm circuit conductors with color coded insulation, or use color coded tape at each conductor termination and in each junction box and interface panel.
- E. Distinctively color code all wiring differently from the normal building wiring. Audible alarm notification appliance circuits shall be colored differently from signaling line circuits. Use different colors for visual alarm notification appliance circuits.

3.5 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.6 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by The Owner.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- D. Tests and Inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.

- b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
- 2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
- 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
- 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
- 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
- 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72. After final testing is complete provide a letter certifying that the installation is complete and fully operable. The letter shall include the names and titles of the witnesses to the preliminary tests. An authorized representative from each supplier of equipment shall be in attendance at the preliminary testing to make necessary adjustments.
- 7. Audibility tests shall be performed to verify compliance with the requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG). If the system does not meet the intended performance of the ADAAG, the fire alarm system distributor shall provide additional speakers and system expansion parts to accommodate them, as required to meet the required audibility levels.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

- I. annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.7 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.
- B. Provide training session at all site(s) or facility(s) as part of the project.
- C. Training sessions shall cover all aspects of system performance, including system architecture, signaling line circuit configurations, sensor and other initiating device types, locations, and addresses, fire alarm control panel function key operation, and other functions as designated by the Owner.
- D. Comprehensive system troubleshooting training shall be provided for a single individual designated by the Owner. This session shall be separate and distinct from the above described sessions.
- E. All training sessions shall be conducted following final system certification.
- F. All training sessions shall be conducted by an authorized fire alarm system distributor representative.

3.8 SERVICE/MONITORING/INSPECTION/CERTIFICATION AGREEMENT

- A. Included in the bid price shall be a 3 year service and central station monitoring contract, effective upon final system acceptance, to provide all service required beyond the capability of the facility personnel. Contract shall include all service and repairs required and annual system testing and inspection in accordance with NFPA 72. Central station monitoring shall be 24 hours per day, 365 days per year. Contract shall also include annual inspections and preparation and filing of City of Philadelphia Department of Licenses + Inspections Annual Certification for Fire Alarm Systems (see attached form).

3.9 WARRANTY

- A. The contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from the date of the completed and certified test or from the date of first beneficial use.

END OF SECTION

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1515 Arch Street
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Philadelphia, PA 19104

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CITY OF PHILADELPHIA
Department of Parks and Recreation
1515 Arch Street, 10th Floor
Philadelphia, PA 19102

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dbHMS
1500 Walnut St
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v 297.217.1812

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COST ESTIMATING
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www.brightfields.com

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DataBase+
303 W Erie Street, Suite 510
Chicago, IL 60654
v 312.315.0557
www.databasplus.com

PROFESSIONAL ENGINEER
EXPIRES 09-30-2023
SIGNATURE
05/30/2023
DATE

DATE	DESCRIPTION
5/30/23	BID ADDENDUM #2

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

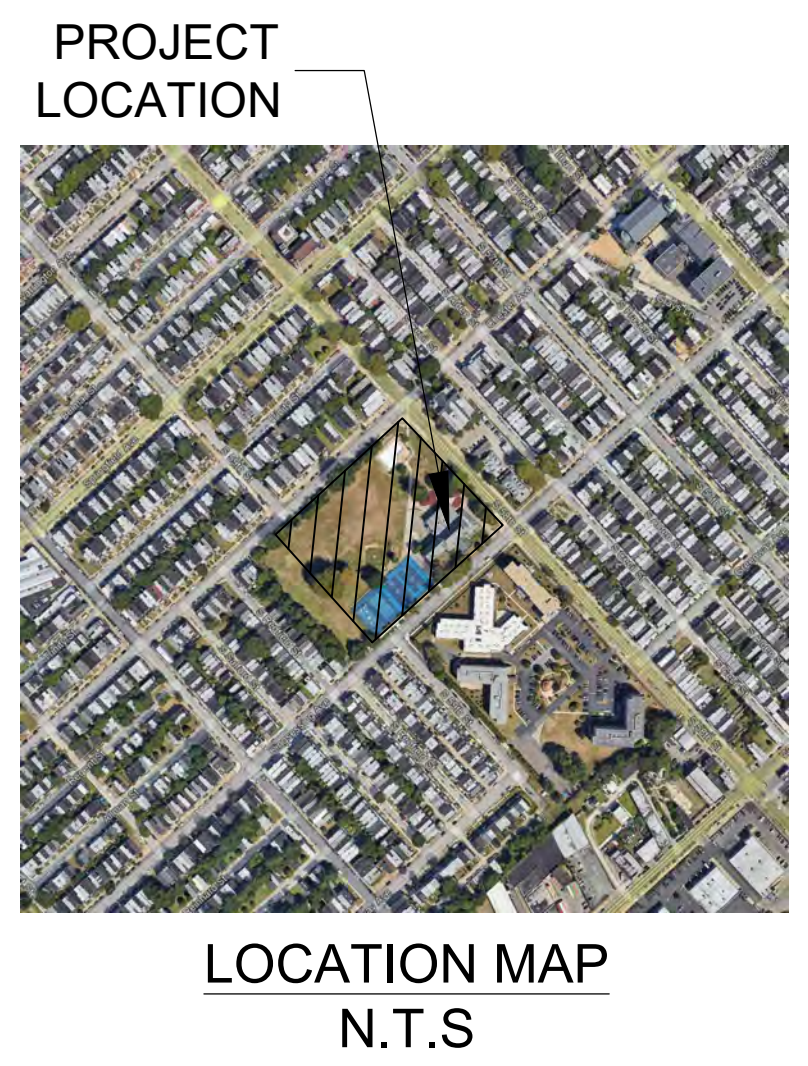
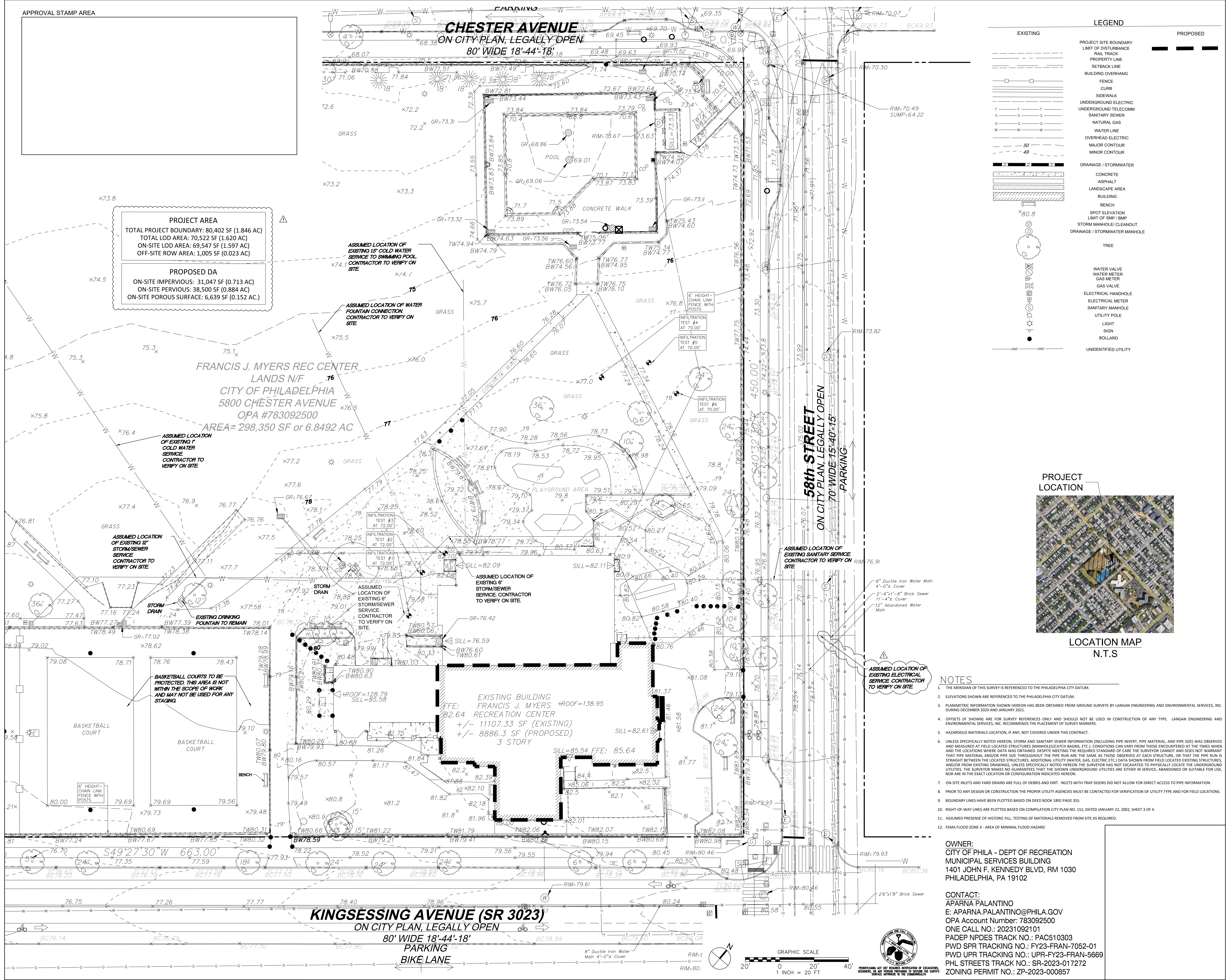
5800 Chester Ave., Philadelphia, PA 19143

PROJECT #:	2020297-00
SCALE:	1" = 20'
FORMAT:	30" X 42"
DRAWN:	JVL
CHECKED:	JG
DATE:	04/07/2023

SHEET NAME:
EXISTING CONDITION INFILTRATION TEST LOCATION PLAN

SHEET NUMBER:
C-100

PROJECT PHASE:
CONSTRUCTION DOCUMENTS



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PROFESSIONAL ENGINEER
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5/30/23	BID ADDENDUM #2

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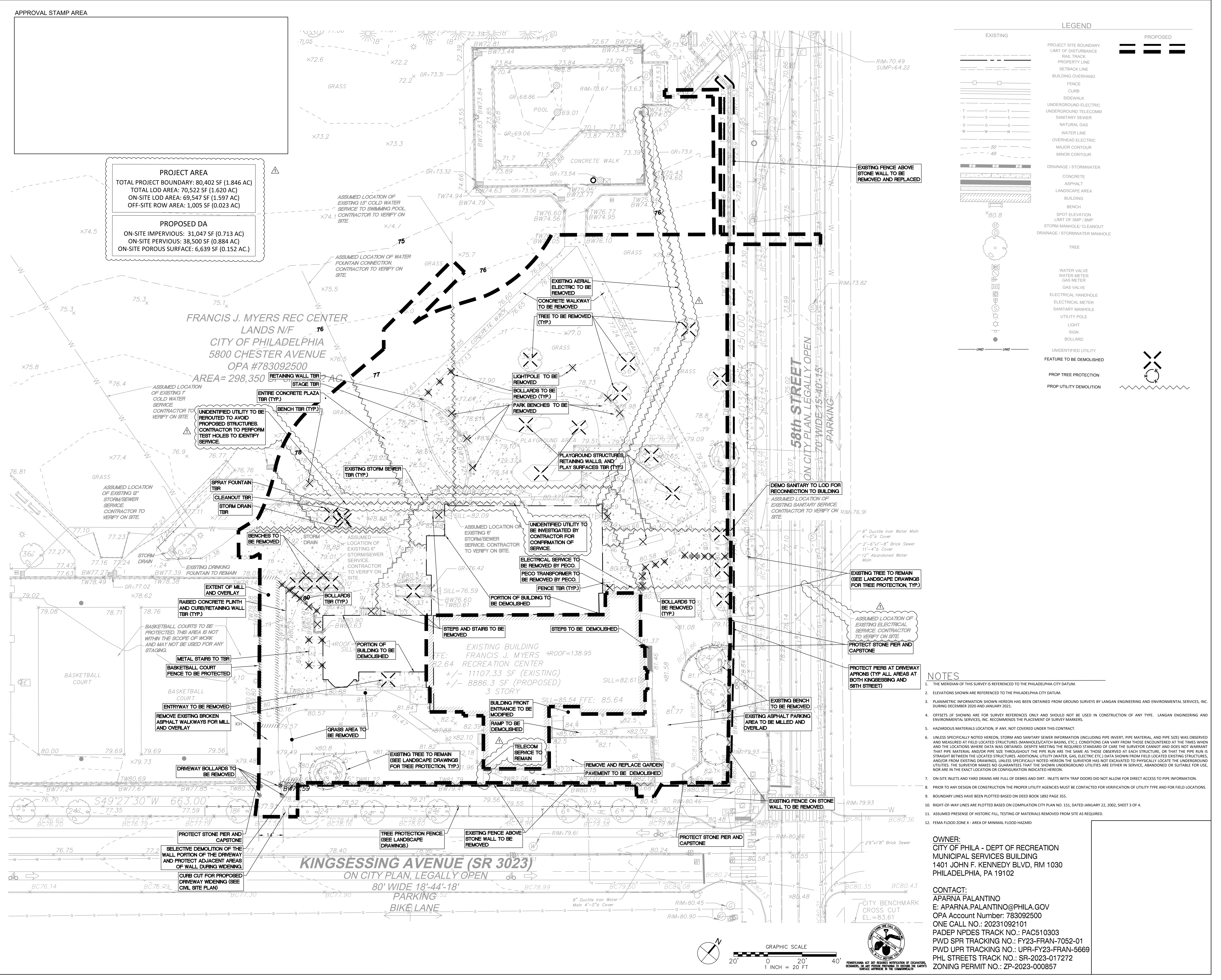
5800 Chester Ave.
 Philadelphia, PA 19143

PROJECT #:	2020297-00
SCALE:	1" = 20'
FORMAT:	30" X 42"
DRAWN:	JVL
CHECKED:	JG
DATE:	04/07/2023

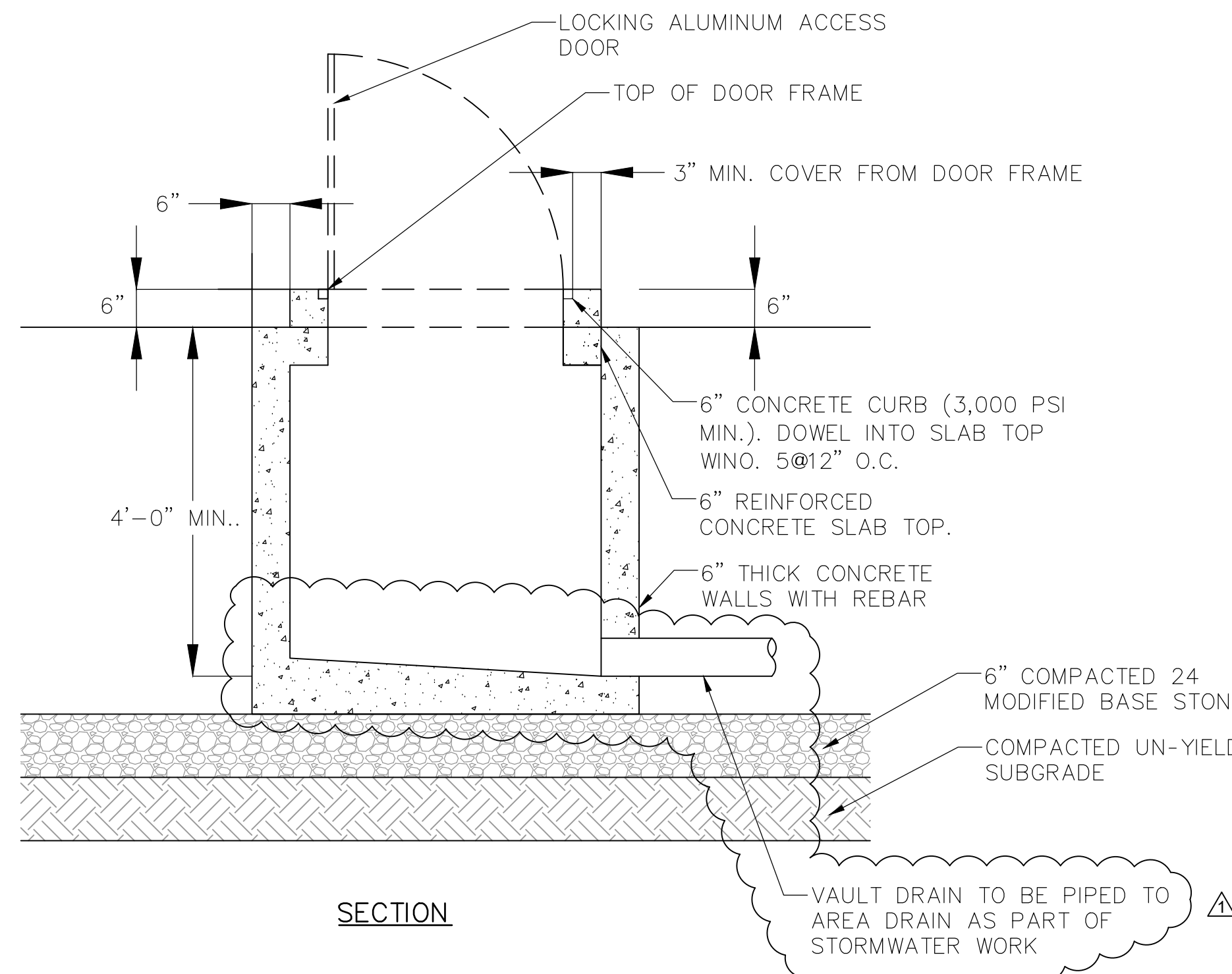
SHEET NAME:
DEMOLITION PLAN

SHEET NUMBER:
C-102

PROJECT PHASE:
CONSTRUCTION DOCUMENTS



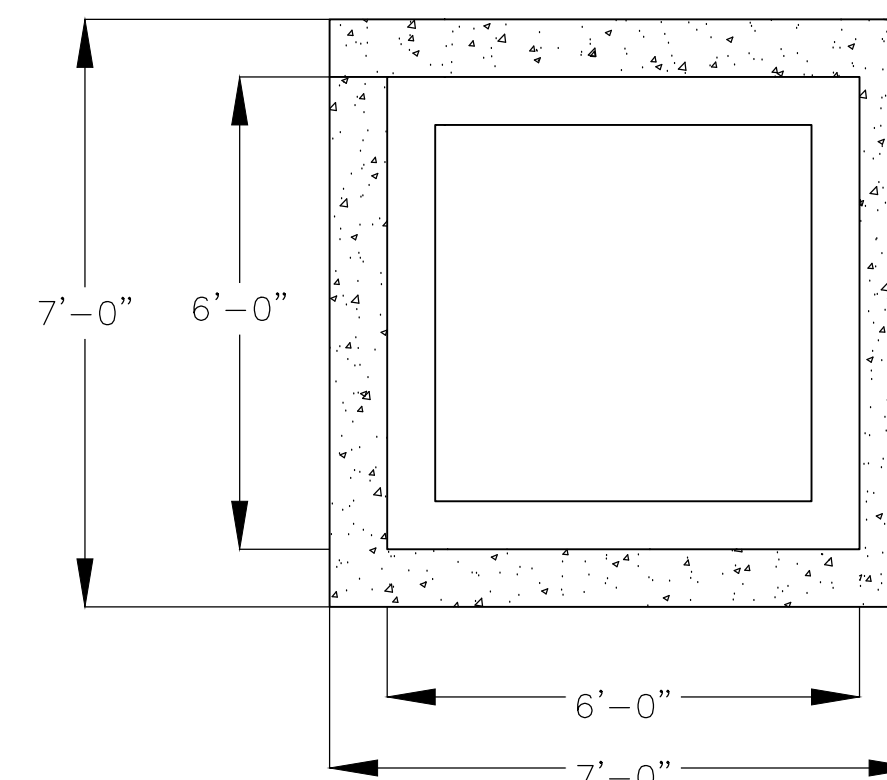
APPROVAL STAMP AREA



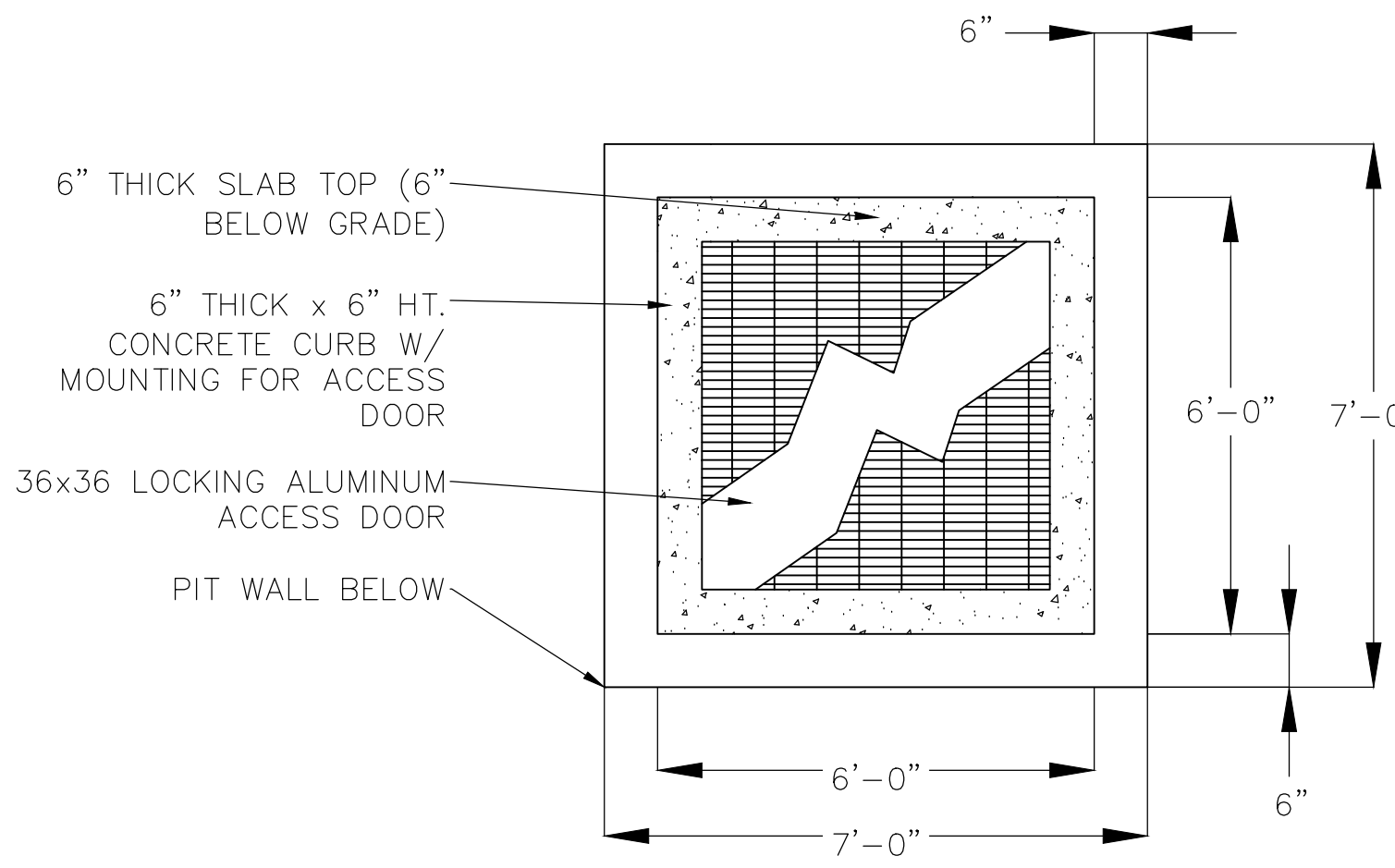
NOTES:

1. EXPECTED FLOW: 21 GPM
2. FOR INFORMATION ONLY. SEE PLUMBING DRAWINGS FOR ADDITIONAL DETAILS AND CALCULATIONS FOR SPRAY GROUND WATER SERVICE.

1 SPRAYGROUND VAULT (FOR INFORMATION ONLY)
C352 SCALE: NOT TO SCALE



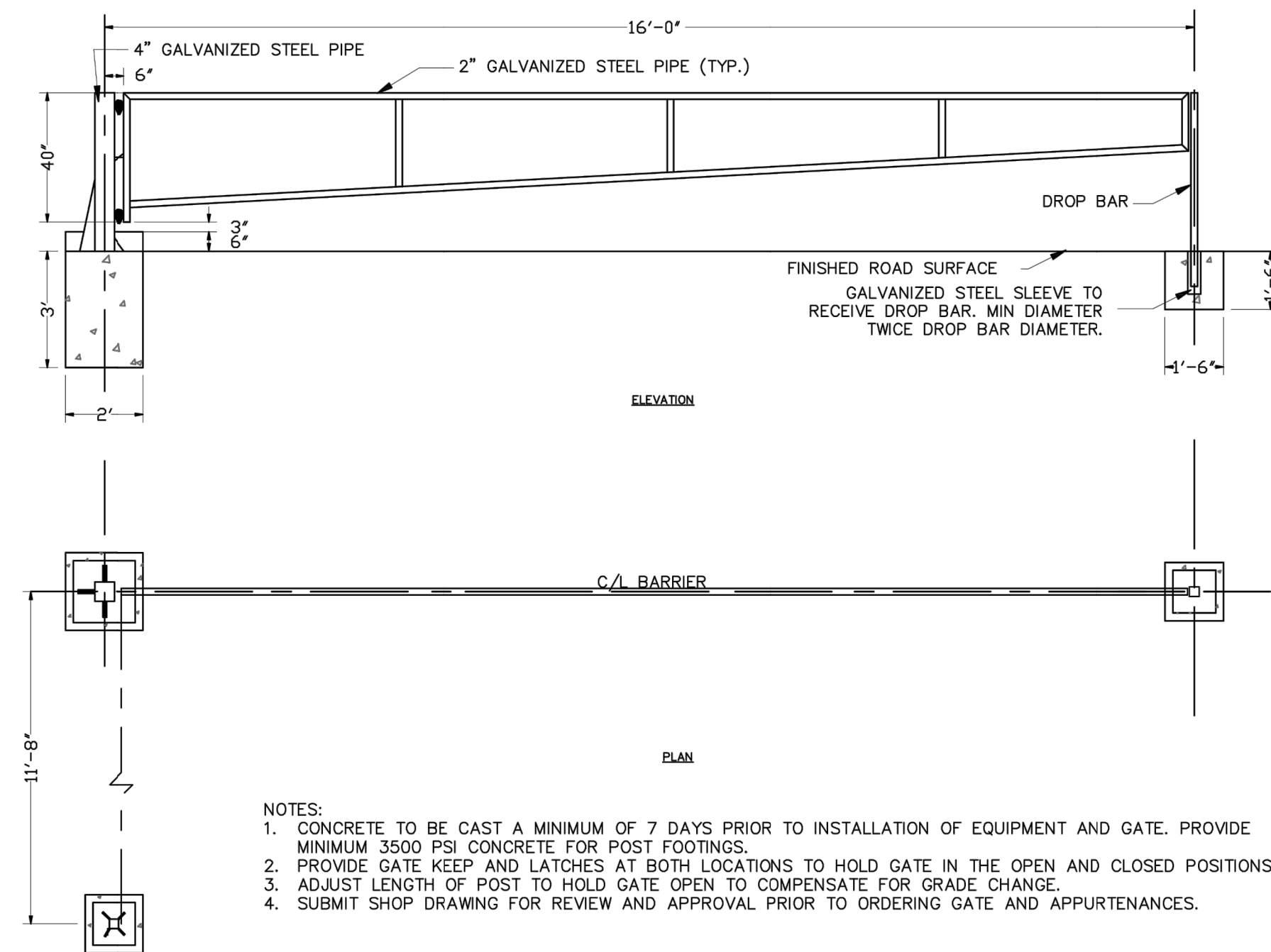
PIT PLAN



SLAB TOP AND DOOR PLAN

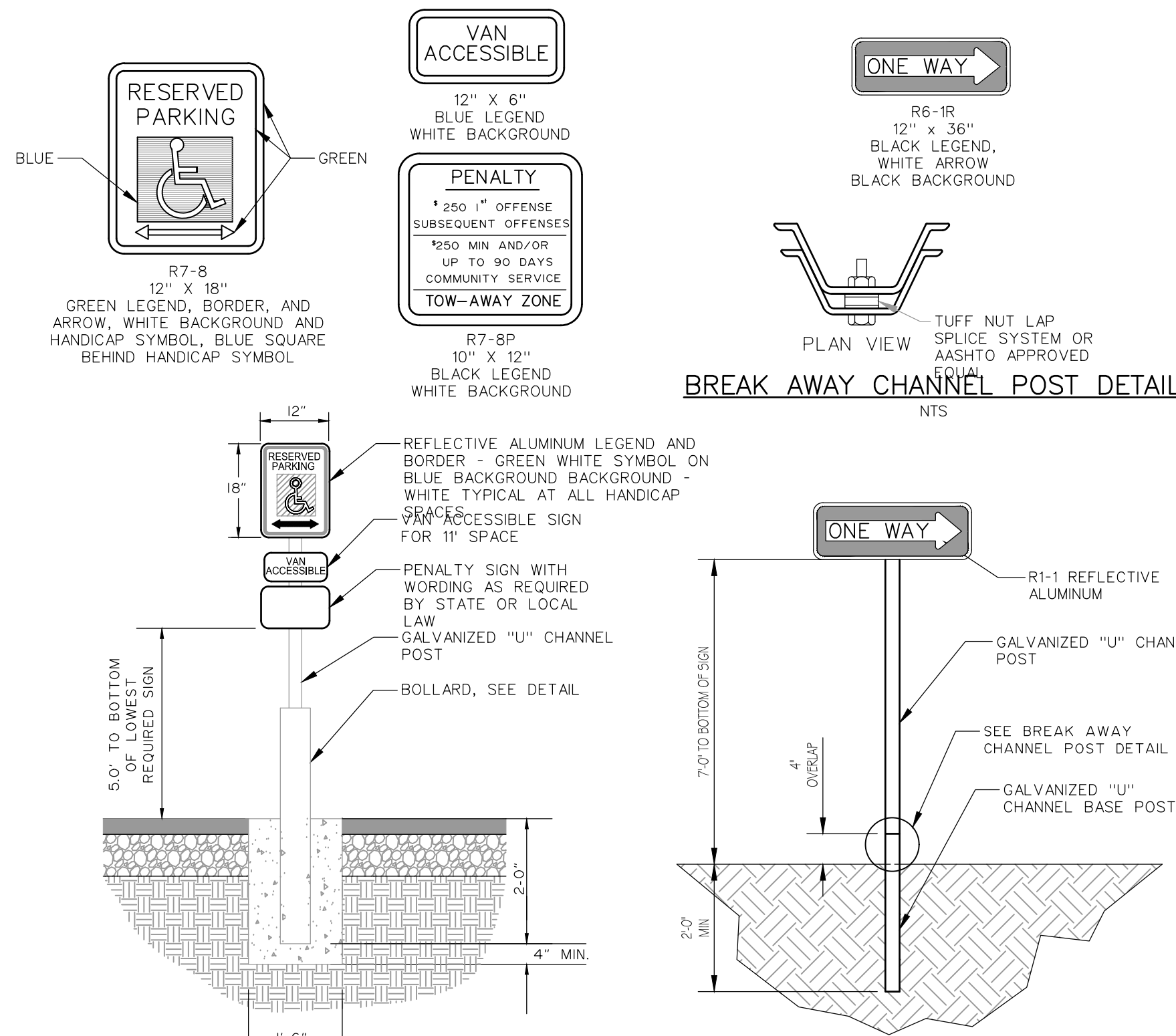
NOTES:

1. CONCRETE VAULT SHALL BE MANUFACTURED BY ALTOMORE PRECAST CONCRETE.
2. CONTRACTOR TO CONFIRM REQUIRED INTERIOR DIMENSIONS OF CONCRETE VAULT PRIOR TO FABRICATION; COORDINATE WITH SPRAYGROUND EQUIPMENT SUPPLIER.
3. SPRAYGROUND MANIFOLD VAULT LID TO BE PAINTED WITH WHITE CERAMIC PAINT.



- NOTES:
1. CONCRETE TO BE CAST A MINIMUM OF 7 DAYS PRIOR TO INSTALLATION OF EQUIPMENT AND GATE. PROVIDE MINIMUM 3500 PSI CONCRETE FOR POST FOOTINGS.
 2. PROVIDE GATE KEEP AND LATCHES AT BOTH LOCATIONS TO HOLD GATE IN THE OPEN AND CLOSED POSITIONS.
 3. ADJUST LENGTH OF POST TO HOLD GATE OPEN TO COMPENSATE FOR GRADE CHANGE.
 4. SUBMIT SHOP DRAWING FOR REVIEW AND APPROVAL PRIOR TO ORDERING GATE AND APPURTENANCES.

2 16 FT VEHICULAR ACCESS GATE
C352 SCALE: NOT TO SCALE



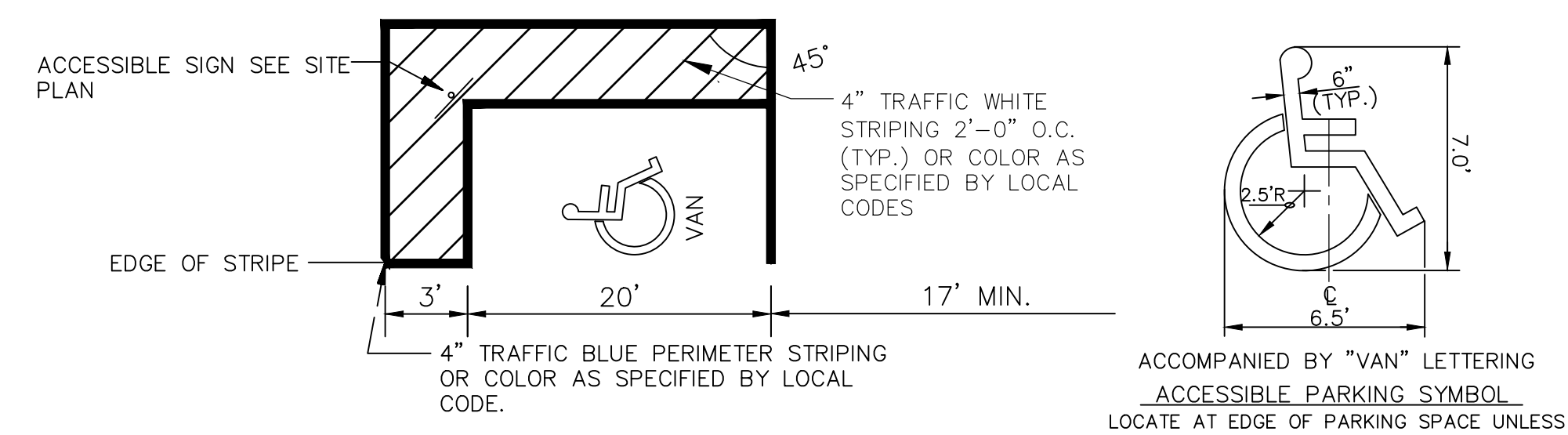
BREAK AWAY CHANNEL POST DETAIL

- NOTE:
1. REVISE TO MEET JOB AND LOCAL JURISDICTION REQUIREMENTS AND GEOTECHNICAL REPORT REQUIREMENTS. THE MINIMUM REQUIRED THICKNESS ARE SHOWN IN THE DETAIL. USE LOCAL DOT PAVEMENT MIX DESIGN FOR WEARING AND BINDING COURSES.
 2. PROOF ROLL PREPARED SUBBASE SURFACE TO CHECK FOR UNSTABLE AREAS AND AREAS REQUIRING ADDITIONAL COMPACTION. NOTIFY ENGINEER OF UNSATISFACTORY CONDITIONS. DO NOT BEGIN PAVING WORK UNTIL DEFICIENT SUBBASE AREAS HAVE BEEN CORRECTED AND ARE READY TO RECEIVE PAVING.
 3. VERIFY WITH GEOTECHNICAL ENGINEER FOR PAVEMENT THICKNESS.

4 ASPHALT PAVEMENT DETAIL
C352 SCALE: NOT TO SCALE

- NOTES:
1. SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
 2. SIGNS ATTACHED WITH ACORN NUT TYPE FASTENERS.
 3. THE DATE OF MANUFACTURER SHOULD BE PERMANENTLY AFFIXED TO THE REAR OF ALL SIGNS.
 4. ALL SIGNS SHALL MEET THE CURRENT RETRO REFLECTIVITY REQUIREMENTS OF THE MUTCD AND NJDOT.

3 SITE SIGNAGE DETAIL
C352 SCALE: NOT TO SCALE



5 ADA PARKING STALL DETAIL
C352 SCALE: NOT TO SCALE

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PROFESSIONAL ENGINEER
EXPRES 09-30-2023
SIGNATURE
05/30/2023
DATE

5/30/23	BID ADDENDUM #2
DATE:	DESCRIPTION:

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

5800 Chester Ave.
Philadelphia, PA 19143

PROJECT #:	20202097-00
SCALE:	1" = 20'
FORMAT:	30" X 42"
DRAWN:	JYL
CHECKED:	JG
DATE:	04/07/2023

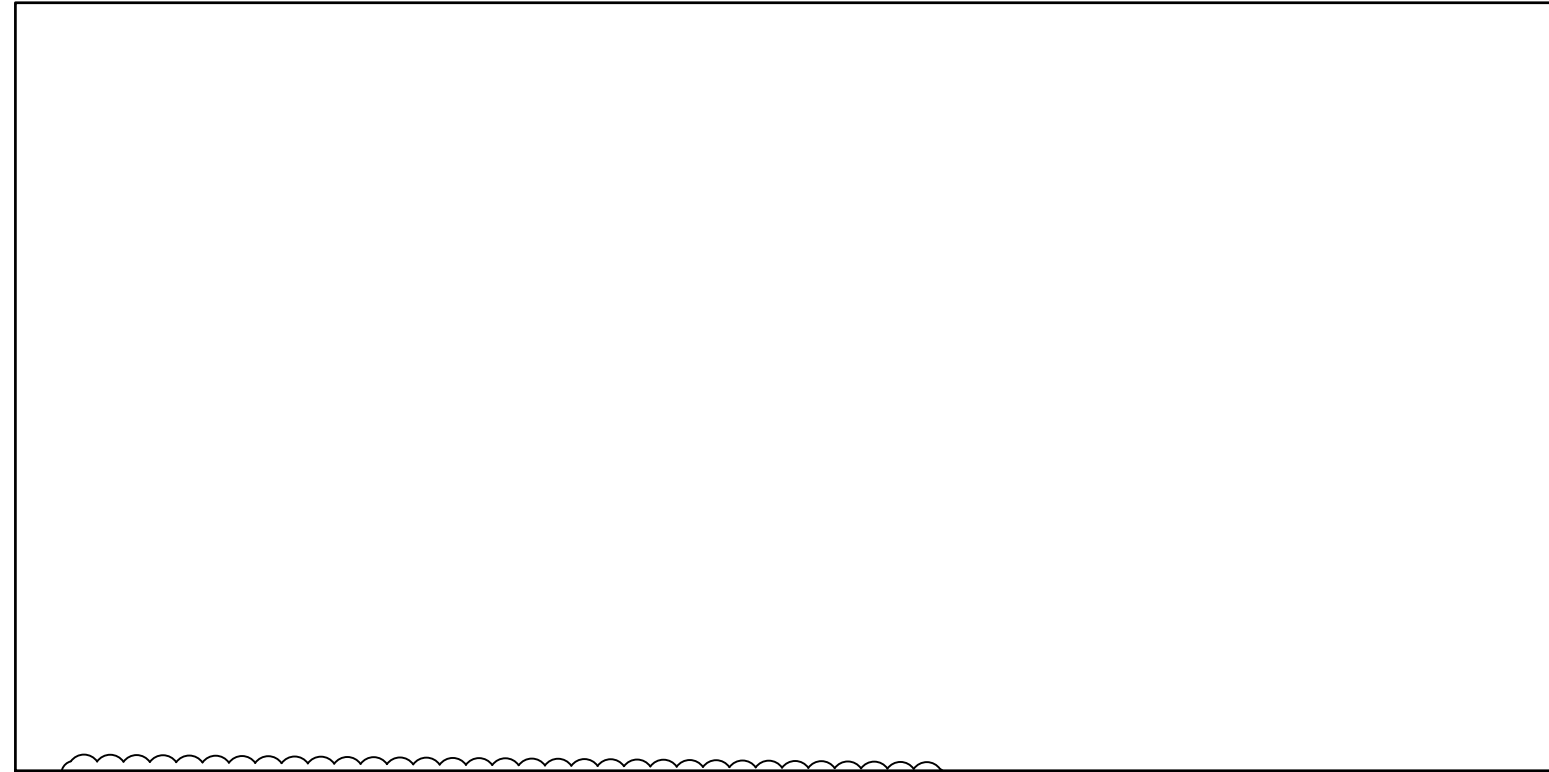
**SHEET NAME:
SITE DETAILS 2**

SHEET NUMBER:

C-352

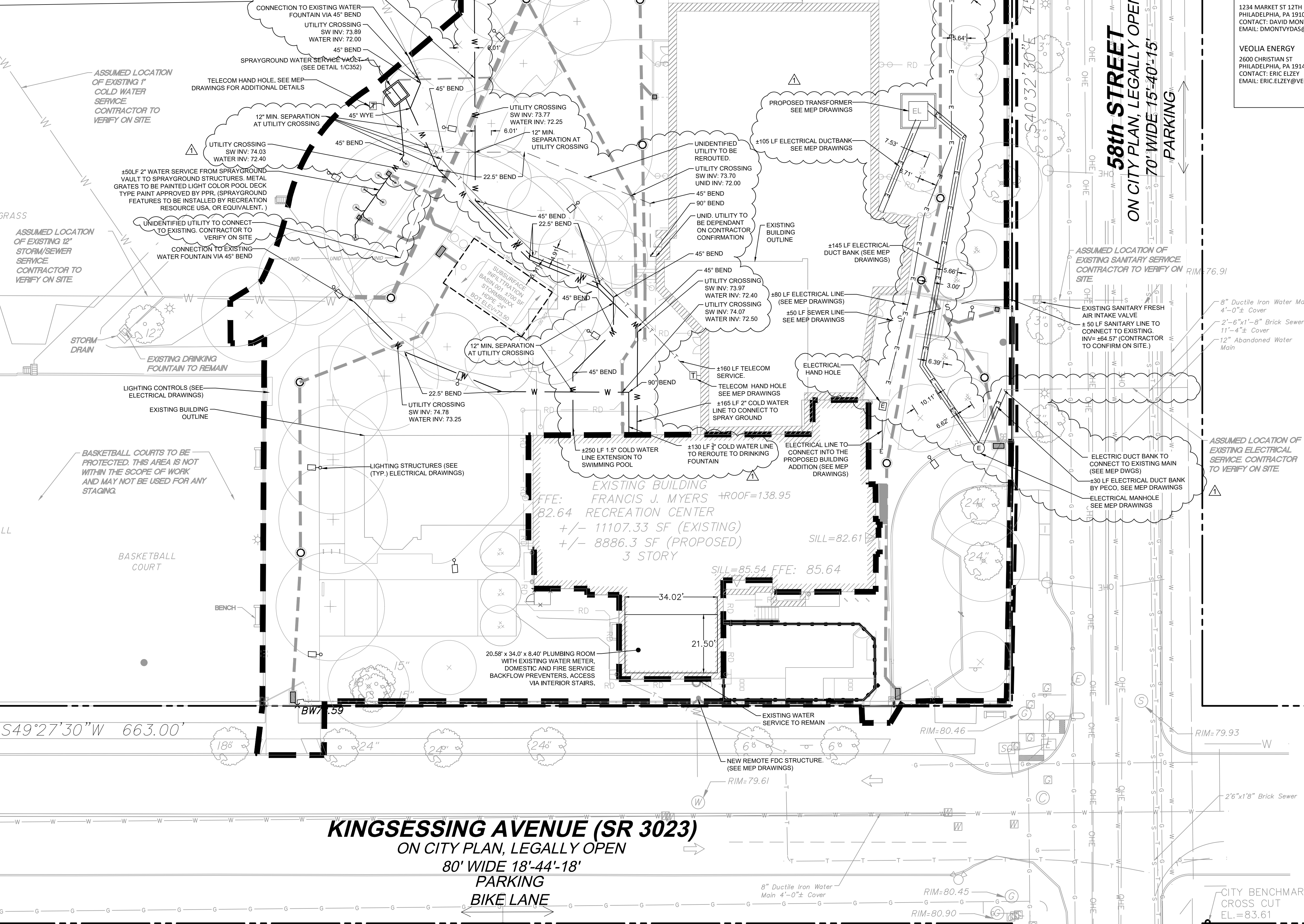
PROJECT PHASE:
CONSTRUCTION DOCUMENTS

APPROVAL STAMP AREA

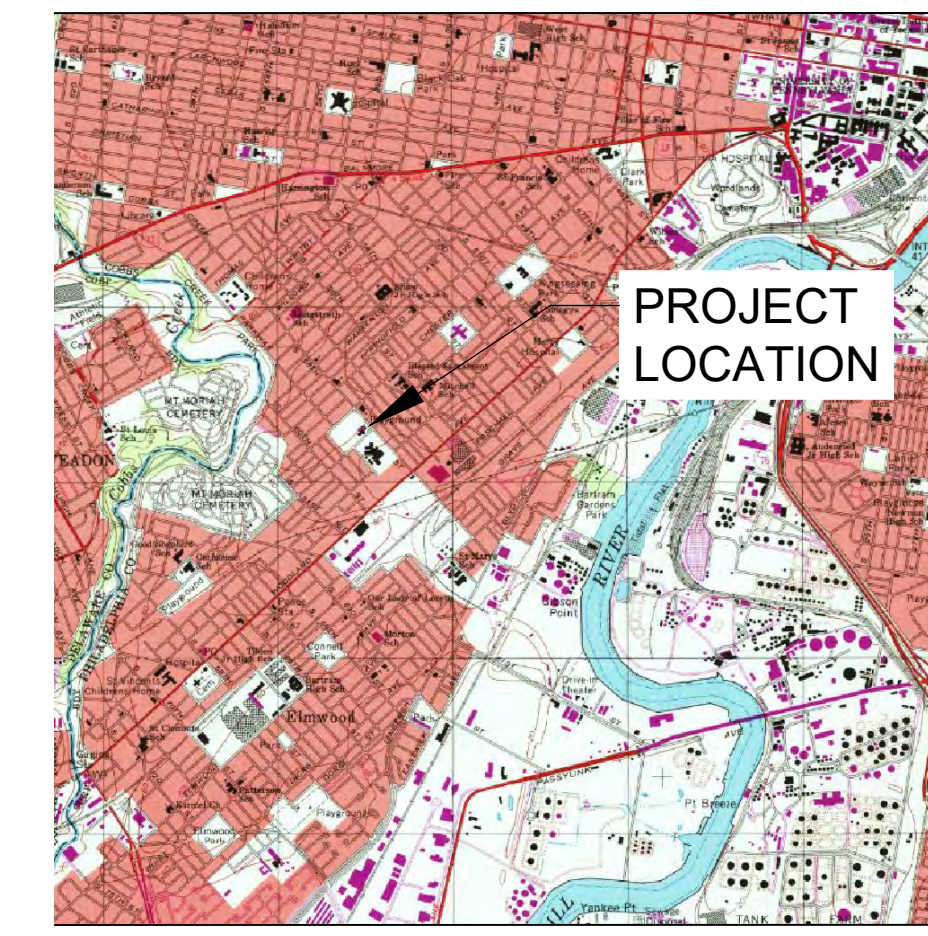


PROJECT AREA
TOTAL PROJECT BOUNDARY: 80,402 SF (1.846 AC)
TOTAL LOD AREA: 70,522 SF (1.620 AC)
ON-SITE LOD AREA: 69,547 SF (1.597 AC)
OFF-SITE PVIOUS AREA: 1,005 SF (0.023 AC)
PROPOSED DA
ON-SITE IMPERVIOUS: 31,047 SF (0.713 AC)
ON-SITE PVIOUS: 38,500 SF (0.884 AC)
ON-SITE POROUS SURFACE: 6,639 SF (0.152 AC.)

FRANCIS J. MYERS REC CENTER
LANDS N/F
CITY OF PHILADELPHIA
5800 CHESTER AVENUE
OPA #783092500
AREA= 298,350 SF or 6.8492 AC



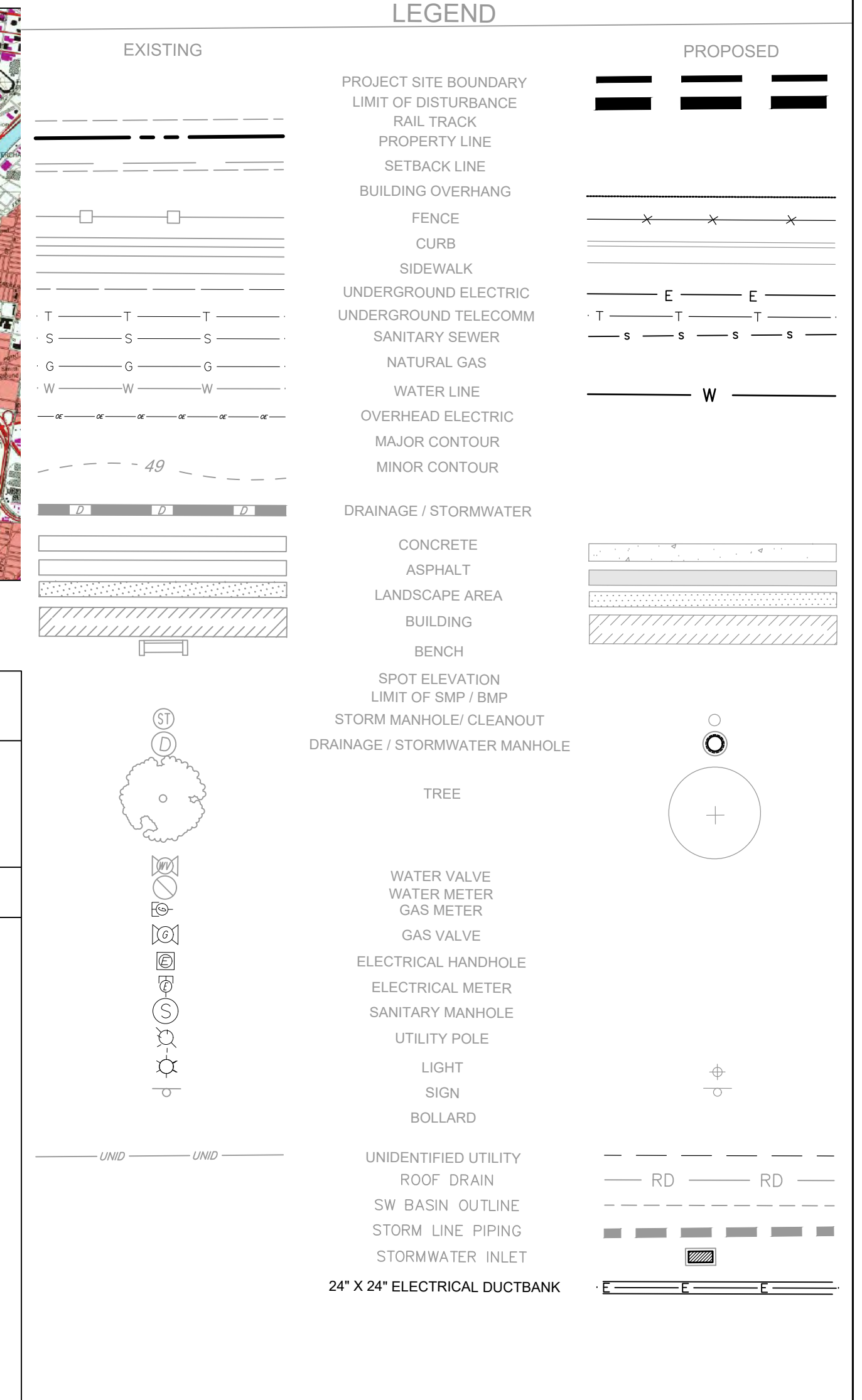
UTILITY NOTES:
1. THERE ARE NO PROPOSED EASEMENTS.
2. THE PROPERTY IS OWNER MANAGED.
3. NO CRANE LOCATION IS PROPOSED.
4. DEVELOPER/ OWNER WILL COMPLY WITH ALL PHILADELPHIA REGULATIONS PERTAINING TO PROPER ABANDONMENT AND/OR REUSE OF WATER SERVICE LINES AND SEWER LATERALS. PROOF OF ABANDONMENT AND/OR WATER DISCONTINUANCE MUST BE PROVIDED UPON REQUEST.



USGS LOCATION MAP
SCALE: N.T.S

UTILITY USER LIST
ACT NUMBER 287 OF 1974 AS AMENDED

IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE PENNSYLVANIA ACT 287 (AS AMENDED) AND TO CONTACT THE 'ONE CALL SYSTEM' THREE (3) WORKING DAYS (UNLESS OTHERWISE NOTED) PRIOR TO THE START OF CONSTRUCTION.
PHILADELPHIA CITY WATER DEPARTMENT
PECO ENERGY C/O USIC
VEOLIA ENERGY
VERIZON PENNSYLVANIA LLC



CONSTRUCTION OF:
NEW 1 STORY BUILDING GYM ADDITION
REDESIGN TO PLAYGROUND ON REAR SIDE OF PROPERTY
DEMOLITION OF EXISTING STRUCTURES IS PROPOSED.

Table with 7 columns: ID, TYPE, SIZE (INCHES), MATERIAL, CONNECTION METHOD, MAX. FLOW RATE. Rows include Sanitary, Storm, Domestic Cold Water, Fire, Electric, and Telecom connections.

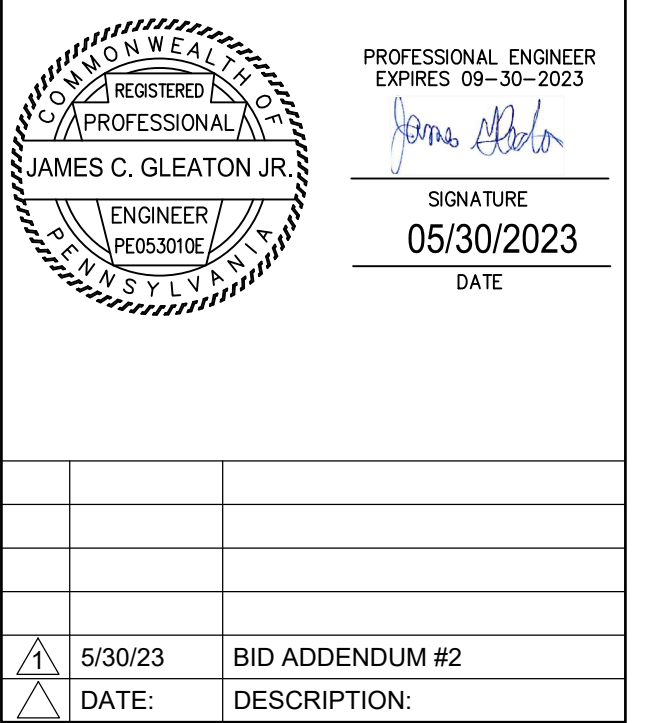
- NOTES
1. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO THE PHILADELPHIA CITY DATUM.
2. ELEVATIONS SHOWN ARE REFERENCED TO THE PHILADELPHIA CITY DATUM.
3. PLANIMETRIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC. DURING DECEMBER 2020 AND JANUARY 2021.
4. OFFSETS (IF SHOWN) ARE FOR SURVEY REFERENCES ONLY AND SHOULD NOT BE USED IN CONSTRUCTION OF ANY TYPE. LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES, INC. RECOMMENDS THE PLACEMENT OF SURVEY MARKERS.
5. HAZARDOUS MATERIALS LOCATION, IF ANY, NOT COVERED UNDER THIS CONTRACT.
6. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC.). CONDITIONS CAN VARY FROM THOSE INDICATED AT THE TIMES WHEN AND THE LOCATIONS WHERE DATA WAS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE THE SURVEYOR CANNOT AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES. ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA SHOWN FROM FIELD LOCATED EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS, UNLESS SPECIFICALLY NOTED HEREON THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.
7. ON-SITE INLETS AND YARD DRAINS ARE FULL OF DEBRIS AND DIRT. INLETS WITH TRAP DOORS DID NOT ALLOW FOR DIRECT ACCESS TO PIPE INFORMATION.
8. PRIOR TO ANY DESIGN OR CONSTRUCTION THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.
9. BOUNDARY LINES HAVE BEEN PLOTTED BASED ON DEED BOOK 1892 PAGE 355.
10. RIGHT-OF-WAY LINES ARE PLOTTED BASED ON COMPLETION CITY PLAN NO. 151, DATED JANUARY 22, 2002, SHEET 3 OF 4.
11. ASSUMED PRESENCE OF HISTORIC FILL. TESTING OF MATERIALS REMOVED FROM SITE AS REQUIRED.
12. FEMA FLOOD ZONE X - AREA OF MINIMAL FLOOD HAZARD

OWNER:
CITY OF PHILA - DEPT OF RECREATION
MUNICIPAL SERVICES BUILDING
1401 JOHN F. KENNEDY BLVD, RM 1030
PHILADELPHIA, PA 19102

CONTACT:
APARNA PALANTINO
E: APARNA.PALANTINO@PHILA.GOV
OPA Account Number: 783092500
ONE CALL NO.: 20231092101
PADEP NPDES TRACK NO.: PAC510303
PWD SPR TRACKING NO.: FY23-FRAN-7052-01
PWD UPR TRACKING NO.: UPR-FY23-FRAN-5669
PHL STREETS TRACK NO.: SR-2023-017272
ZONING PERMIT NO.: ZP-2023-000857

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FRANCIS J. MYERS RECREATION CENTER
SITE AND BUILDING IMPROVEMENTS

5800 Chester Ave.
Philadelphia, PA 19143

PROJECT #: 2022097-00
SCALE: 1" = 20'
FORMAT: 30" X 42"
DRAWN: JYL
CHECKED: JG
DATE: 04/07/2023

SHEET NAME:
UTILITY PLAN

SHEET NUMBER:
C-400

PROJECT PHASE:
CONSTRUCTION DOCUMENTS

CLIENT
REBUILD
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PROFESSIONAL ENGINEER
 EXPRES 09-30-2023
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FRANCIS J. MYERS RECREATION CENTER
SITE AND BUILDING IMPROVEMENTS

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PROJECT #: 2020297-00
SCALE: 1" = 20'
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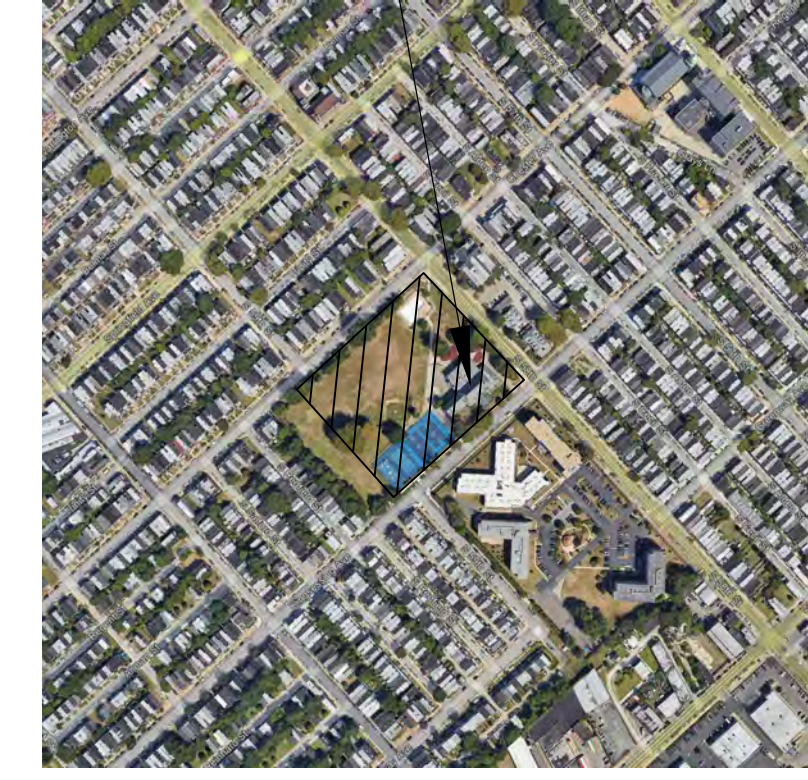
SHEET NAME:
GRADING PLAN

SHEET NUMBER:
C-500

PROJECT PHASE:
CONSTRUCTION DOCUMENTS

EXISTING	LEGEND	PROPOSED
[Symbol]	PROJECT SITE BOUNDARY	[Symbol]
[Symbol]	LIMIT OF DISTURBANCE	[Symbol]
[Symbol]	RAIL TRACK	[Symbol]
[Symbol]	PROPERTY LINE	[Symbol]
[Symbol]	SETBACK LINE	[Symbol]
[Symbol]	BUILDING OVERHANG	[Symbol]
[Symbol]	FENCE	[Symbol]
[Symbol]	CURB	[Symbol]
[Symbol]	SIDEWALK	[Symbol]
[Symbol]	UNDERGROUND ELECTRIC	[Symbol]
[Symbol]	UNDERGROUND TELECOMM	[Symbol]
[Symbol]	SANITARY SEWER	[Symbol]
[Symbol]	NATURAL GAS	[Symbol]
[Symbol]	WATER LINE	[Symbol]
[Symbol]	OVERHEAD ELECTRIC	[Symbol]
[Symbol]	MAJOR CONTOUR	[Symbol]
[Symbol]	MINOR CONTOUR	[Symbol]
[Symbol]	DRAINAGE / STORMWATER	[Symbol]
[Symbol]	CONCRETE	[Symbol]
[Symbol]	ASPHALT	[Symbol]
[Symbol]	LANDSCAPE AREA	[Symbol]
[Symbol]	BUILDING	[Symbol]
[Symbol]	BENCH	[Symbol]
[Symbol]	SPOT ELEVATION	[Symbol]
[Symbol]	LIMIT OF SMP / BMP	[Symbol]
[Symbol]	STORM MANHOLE / CLEANOUT	[Symbol]
[Symbol]	DRAINAGE / STORMWATER MANHOLE	[Symbol]
[Symbol]	TREE	[Symbol]
[Symbol]	WATER VALVE	[Symbol]
[Symbol]	WATER METER	[Symbol]
[Symbol]	GAS METER	[Symbol]
[Symbol]	GAS VALVE	[Symbol]
[Symbol]	ELECTRICAL HANDHOLE	[Symbol]
[Symbol]	ELECTRICAL METER	[Symbol]
[Symbol]	SANITARY MANHOLE	[Symbol]
[Symbol]	UTILITY POLE	[Symbol]
[Symbol]	LIGHT	[Symbol]
[Symbol]	SIGN	[Symbol]
[Symbol]	BOLLARD	[Symbol]
[Symbol]	UNIDENTIFIED UTILITY	[Symbol]
[Symbol]	ROOF DRAIN	[Symbol]
[Symbol]	SW BASIN OUTLINE	[Symbol]
[Symbol]	STORM LINE PIPING	[Symbol]
[Symbol]	STORMWATER INLET	[Symbol]

PROJECT LOCATION



LOCATION MAP N.T.S

NOTES

- THE MERIDIAN OF THIS SURVEY IS REFERENCED TO THE PHILADELPHIA CITY DATUM.
- ELEVATIONS SHOWN ARE REFERENCED TO THE PHILADELPHIA CITY DATUM.
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- BOUNDARY LINES HAVE BEEN PLOTTED BASED ON DEED BOOK 1892 PAGE 355.
- RIGHT-OF-WAY LINES ARE PLOTTED BASED ON COMPLETION CITY PLAN NO. 151, DATED JANUARY 22, 2002, SHEET 3 OF 4.
- ASSUMED PRESENCE OF HISTORIC FILL. TESTING OF MATERIALS REMOVED FROM SITE AS REQUIRED.
- FEMA FLOOD ZONE X - AREA OF MINIMAL FLOOD HAZARD

OWNER:
 CITY OF PHILA - DEPT OF RECREATION
 MUNICIPAL SERVICES BUILDING
 1401 JOHN F. KENNEDY BLVD, RM 1030
 PHILADELPHIA, PA 19102

CONTACT:
 APARNA PALANTINO
 E: APARNA.PALANTINO@PHILA.GOV
 OPA Account Number: 783092500
 ONE CALL NO.: 20231092101
 PADEP NPDES TRACK NO.: PAC510303
 PWD SPR TRACKING NO.: FY23-FRAN-7052-01
 PWD UPR TRACKING NO.: UPR-FY23-FRAN-5669
 PHL STREETS TRACK NO.: SR-2023-017272
 ZONING PERMIT NO.: ZP-2023-000857

APPROVAL STAMP AREA

PROJECT AREA
 TOTAL PROJECT BOUNDARY: 80,402 SF (1.846 AC)
 TOTAL LOD AREA: 70,522 SF (1.620 AC)
 ON-SITE PERVIOUS: 69,547 SF (1.597 AC)
 OFF-SITE ROW AREA: 1,005 SF (0.023 AC)

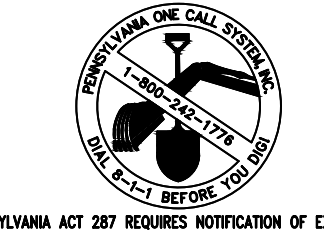
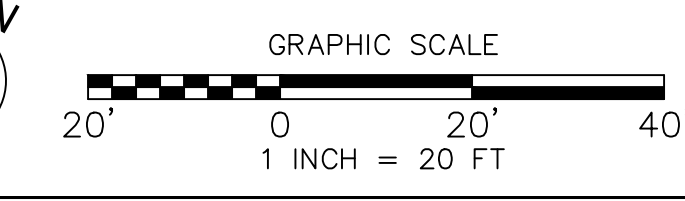
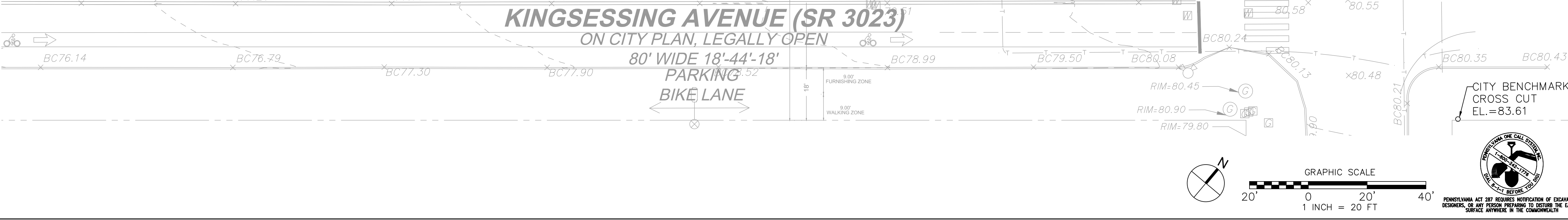
PROPOSED DA
 ON-SITE IMPERVIOUS: 31,047 SF (0.713 AC)
 ON-SITE PERVIOUS: 38,500 SF (0.884 AC)
 ON-SITE POROUS SURFACE: 6,639 SF (0.152 AC.)

FRANCIS J. MYERS REC CENTER
LANDS N/F
CITY OF PHILADELPHIA
5800 CHESTER AVENUE
OPA #783092500
AREA= 298,350 SF or 6.8492 AC

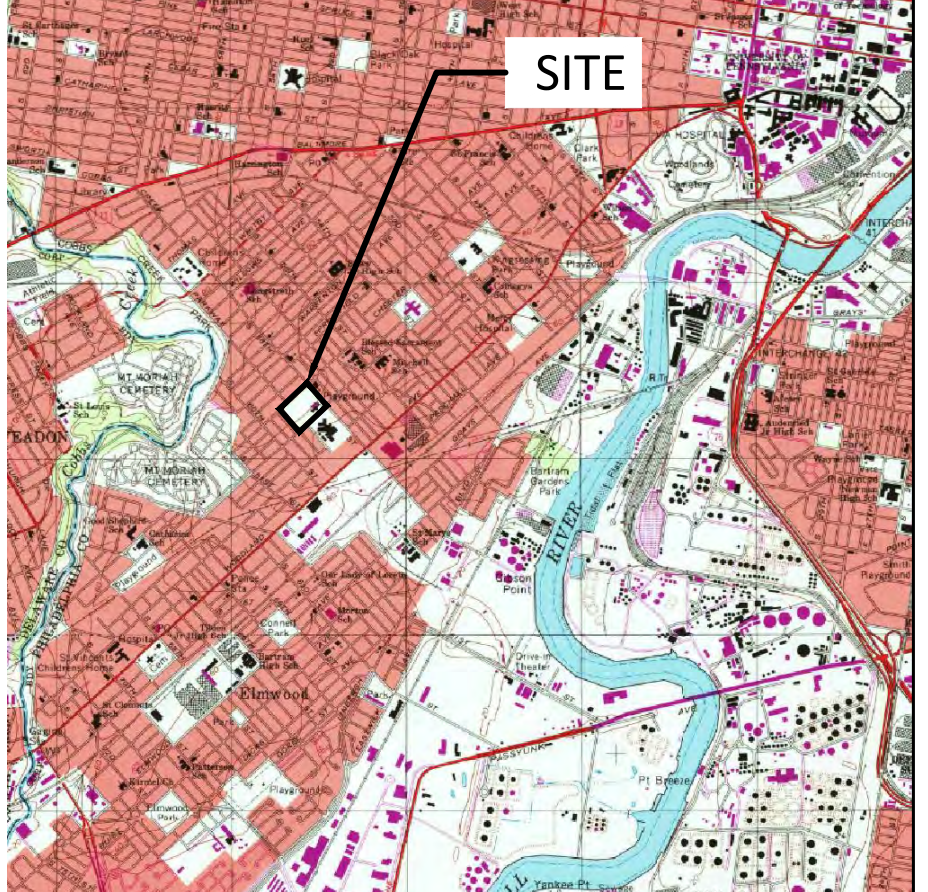
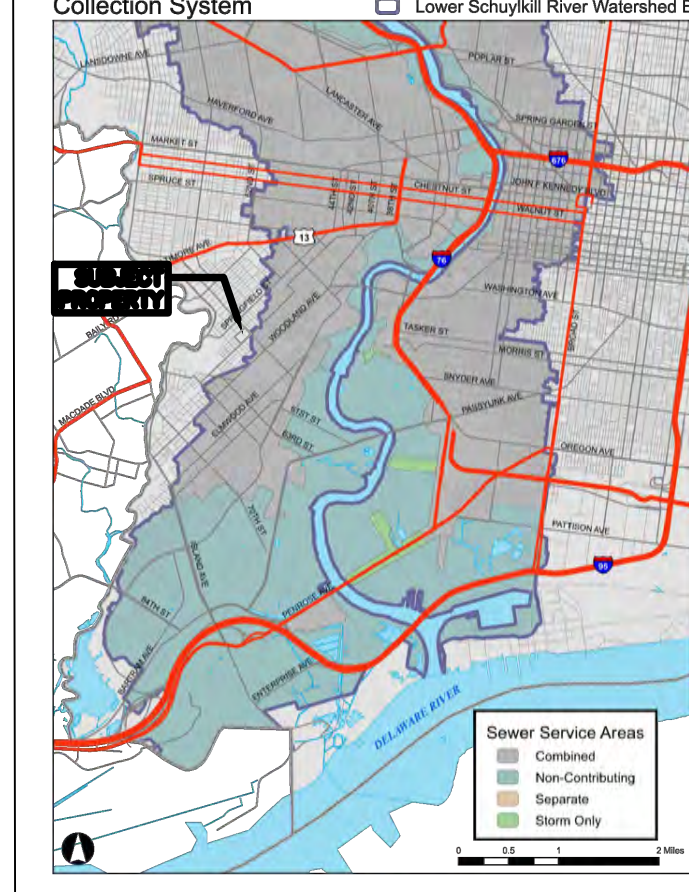
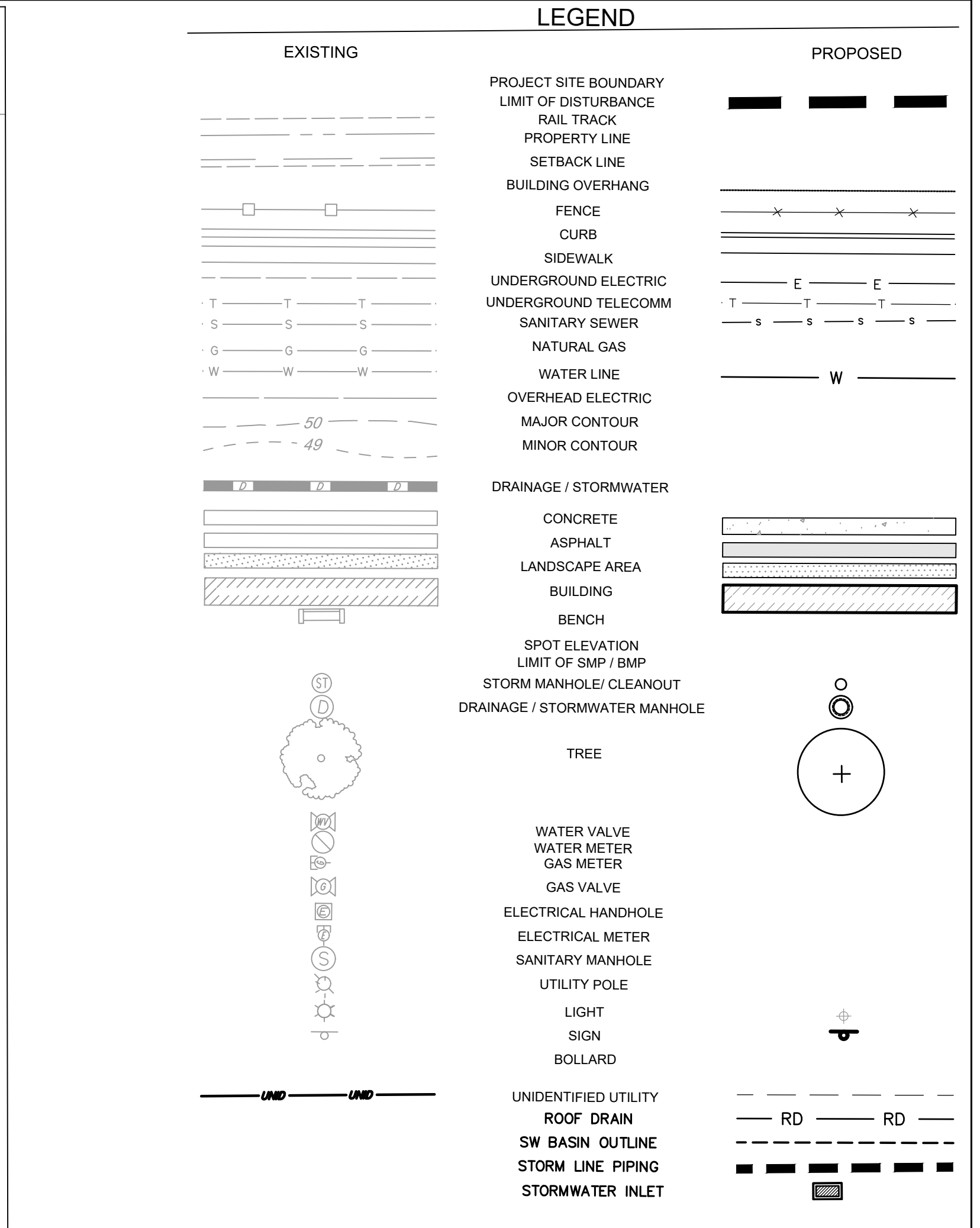
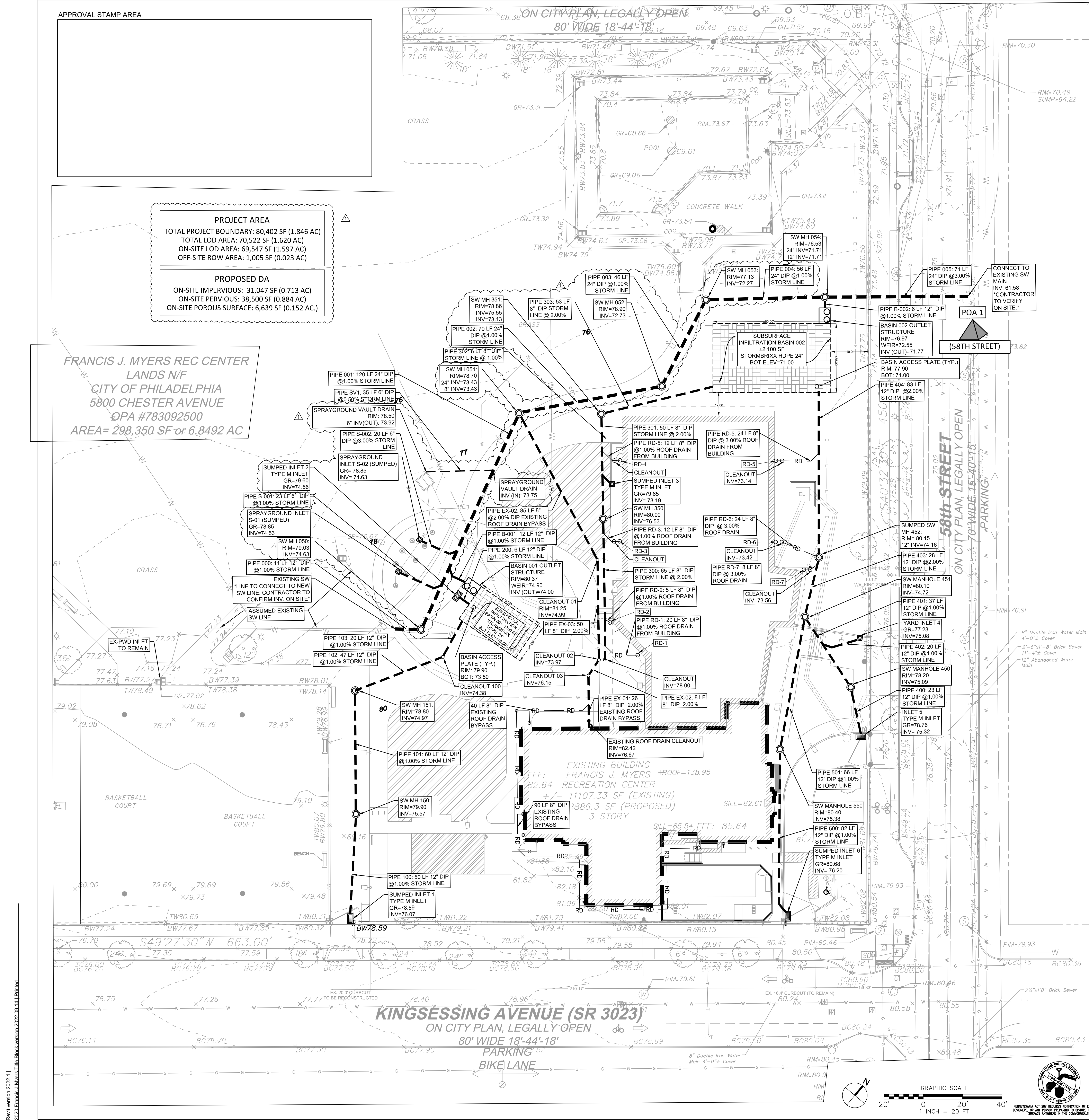
EXISTING BUILDING
FRANCIS J. MYERS RECREATION CENTER
11107.33 SF (EXISTING)
8886.3 SF (PROPOSED)
3 STORY

58th STREET
 ON CITY PLAN, LEGALLY OPEN
 70' WIDE-15'-40'-15'-
 PARKING

KINGESSING AVENUE (SR 3023)
 ON CITY PLAN, LEGALLY OPEN
 80' WIDE 18'-44'-18'
 PARKING BIKE LANE



PROFESSIONAL ACT OF SURVEY OR ENGINEERING DESIGN, OR ANY PERSON PREPARING TO OBTAIN THE EMPLOYER'S SURFACE APPROVAL TO THE CONSTRUCTION



NOTES

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ZONING PERMIT NO.: ZP-2023-000857

LEGEND:

EXISTING	PROPOSED
PROJECT SITE BOUNDARY	---
RAIL TRACK	---
PROPERTY LINE	---
SETBACK LINE	---
BUILDING OVERHANG	---
FENCE	---
CURB	---
SIDEWALK	---
UNDERGROUND ELECTRIC	---
UNDERGROUND TELECOMM	---
SANITARY SEWER	---
NATURAL GAS	---
WATER LINE	---
OVERHEAD ELECTRIC	---
MAJOR CONTOUR	---
MINOR CONTOUR	---
CONCRETE	---
ASPHALT	---
LANDSCAPE AREA	---
BUILDING	---
BENCH	---
SPOT ELEVATION	---
LIMIT OF SMP / BMP	---
STORM MANHOLE / CLEANOUT	---
DRAINAGE / STORMWATER MANHOLE	---
TREE	---
WATER VALVE	---
GAS METER	---
GAS VALVE	---
ELECTRICAL HANDHOLE	---
ELECTRICAL METER	---
SANITARY MANHOLE	---
UTILITY POLE	---
LIGHT	---
SIGN	---
BOLLARD	---
UNIDENTIFIED UTILITY	---
ROOF DRAIN	---
SW BASIN OUTLINE	---
STORM LINE PIPING	---
STORMWATER INLET	---

APPROVAL STAMP AREA:

PROJECT AREA:
TOTAL PROJECT BOUNDARY: 80,402 SF (1.846 AC)
TOTAL LOD AREA: 70,522 SF (1.620 AC)
ON-SITE LOD AREA: 69,547 SF (1.597 AC)
OFF-SITE ROW AREA: 1,005 SF (0.023 AC)

PROPOSED DA:
ON-SITE PERVIOUS: 38,500 SF (0.884 AC)
ON-SITE POROUS SURFACE: 6,639 SF (0.152 AC)

FRANCIS J. MYERS REC CENTER LANDS N/F CITY OF PHILADELPHIA 5800 CHESTER AVENUE OPA #783092500 AREA = 298,350 SF or 6.8492 AC

LEGEND:

WATERSHED LOCATION MAP: SCALE: N.T.S.

USGS LOCATION MAP: SCALE: N.T.S.

NOTES:

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DIGSAU

CLIENT:
REBUILD
1515 Arch Street
Mazzanine Level
Philadelphia, PA 19104

OWNER:
CITY OF PHILADELPHIA
Department of Parks and Recreation
1515 Arch Street, 10th Floor
Philadelphia, PA 19102

ARCHITECT:
DIGSAU
340 North 12th Street, Suite 421
Philadelphia, PA 19107
v 215.627.0808
www.digsau.com

CIVIL ENGINEER:
David Mason & Associates
123 S. Broad St
Suite 1130
Philadelphia, PA 19109
www.davidmason.com
v 215.375.6059

STRUCTURAL ENGINEER:
David Mason & Associates
123 S. Broad St
Suite 1130
Philadelphia, PA 19109
www.davidmason.com
v 215.375.6059

LANDSCAPE ARCHITECT:
Ground Reconsidered
230 South Broad Street
Suite 604
Philadelphia, PA 19102
v 215.790.0727
www.groundreconsidered.com

MEP/FP ENGINEER:
dbms
1500 Walnut St
Suite 1910
Philadelphia, PA 19102
v 297.217.1812

LIGHTING DESIGN:
The Lighting Practice
600 Chestnut Street
Suite 772
Philadelphia, PA 19106
v 215.238.1644

COST ESTIMATING:
Dharam Consulting
1719 Chestnut Street
Suite 300
Philadelphia, PA 19103
v 610.554.6560

ENVIRONMENTAL CONSULTANT:
Brightfields, Inc.
801 Industrial Street
Wilmington, DE 19801
v 302.656.9600
www.brightfields.com

LEED CONSULTANT:
DataBase+
303 W Erie Street, Suite 510
Chicago, IL 60654
v 312.915.0557
www.databaselpdplus.com

PROFESSIONAL ENGINEER:
EXPIRES 09-30-2023
JAMES C. GLEATON JR.
ENGINEER
PENNSYLVANIA
SIGNATURE: [Signature]
DATE: 05/30/2023

PROJECT #: 2020297-00
SCALE: 1" = 20'
FORMAT: 30" X 42"
DRAWN: JYL
CHECKED: JG
DATE: 04/07/2023

SHEET NAME:
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-600

PROJECT PHASE:
CONSTRUCTION DOCUMENTS



1 STORMWATER PIPE NETWORK SCHEDULE SCALE: NOT TO SCALE

CLIENT REBUILD 1515 Arch Street Mezzanine Level Philadelphia, PA 19104

ARCHITECT DIGSAU 340 North 12th Street, Suite 421 Philadelphia, PA 19107

CIVIL ENGINEER David Mason & Associates 123 S. Broad St Suite 1130 Philadelphia, PA 19109

STRUCTURAL ENGINEER David Mason & Associates 123 S. Broad St Suite 1130 Philadelphia, PA 19109

LANDSCAPE ARCHITECT Ground Reconsidered 230 South Broad Street Suite 604 Philadelphia, PA 19102

MEP/FP ENGINEER dbHMS 1500 Walnut St Suite 1910 Philadelphia, PA 19102

LIGHTING DESIGN The Lighting Practice 600 Chestnut Street Suite 772 Philadelphia, PA 19106

COST ESTIMATING Dham Consulting 1719 Chestnut Street Suite 300 Philadelphia, PA 19103

ENVIRONMENTAL CONSULTANT Brightfields, Inc. 801 Industrial Street Wilmington, DE 19801

LEED CONSULTANT DataBase+ 303 W Erie Street, Suite 510 Chicago, IL 60654

PROFESSIONAL ENGINEER JAMES C. GLEATON JR. REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF PENNSYLVANIA

5/30/23 BID ADDENDUM #2 DATE: DESCRIPTION:

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

5800 Chester Ave. Philadelphia, PA 19143

PROJECT #: 2020297-00 SCALE: 1" = 20' FORMAT: 30" X 42" DRAWN: JYL CHECKED: JG DATE: 04/07/2023

SHEET NAME: POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS 4

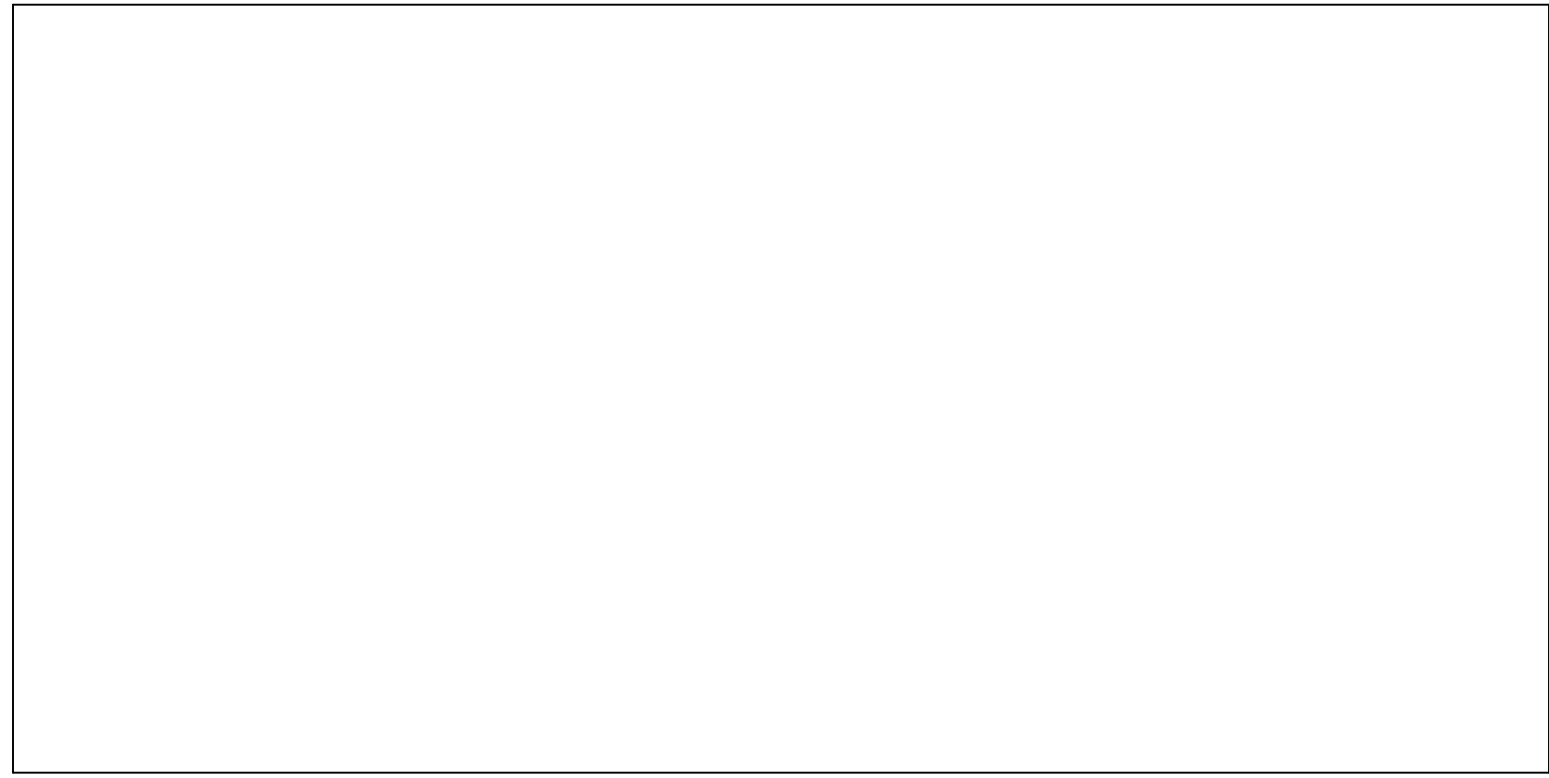
SHEET NUMBER: C-656

PROJECT PHASE: CONSTRUCTION DOCUMENTS

Project Summary Table: Project: Francis J. Myers Recreation Center - Redevelopment, Job #: 2020297-00, System: Stormwater Network Pipe Schedule, Design Storm = 10 Year, Design Storm Intensity = 6.96

Main Stormwater Pipe Network Schedule Table with columns: Pipe ID No., Inlet / MH From, Grate/Rim Elevation OUT (ft.), Invert Elevation OUT (ft.), Inlet / MH To, Grate/Rim Elevation IN (ft.), Invert Elevation IN (ft.), Area (acres), Total Area (acres), Time Conc. (min), Runoff "C", Intensity "I" (in/hr), Q10 (cfs), Mannings "n", Material, Length (ft.), Size (in.), Grade (ft./ft.), Full Flow Velocity (fps), Full Flow Capacity (cfs)

APPROVAL STAMP AREA



VENTILATION SYMBOLS		MECHANICAL SYMBOLS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	NEW DUCTWORK		PRESSURE GAGE & COCK
	DUCT SECTION - SUPPLY UP		STRAINER
	DUCT SECTION - SUPPLY DOWN		STRAINER WITH BLOW OFF VALVE
	DUCT SECTION - RETURN UP		THERMOMETER
	DUCT SECTION - RETURN DOWN		PRESSURE/TEMPERATURE SENSOR
	DUCT SECTION - EXHAUST UP		CAP
	DUCT SECTION - EXHAUST DOWN		UNION
	DUCT SECTION - OUTSIDE AIR UP		ANCHOR W/ ALIGNMENT GUIDES
	DUCT SECTION - OUTSIDE AIR DOWN		EXPANSION JOINT
	EXISTING DUCT		FLEXIBLE CONNECTION
	DUCT/EXISTING WORK TO BE REMOVED		PRESSURE REDUCING VALVE
	INCLINED RISE WITH RESPECT TO AIRFLOW		RELIEF VALVE
	INCLINED DROP WITH RESPECT TO AIRFLOW		TRIPLE DUTY VALVE
	FLEXIBLE CONNECTION TO EQUIPMENT		CHECK VALVE
	LOUVER & SCREEN W/D GROSS OPENING		BALANCING VALVE
	FLEXIBLE DUCT		GLOBE VALVE
	VOLUME DAMPER WITH QUADRANT LOCKING		GATE VALVE
	MOTORIZED DAMPER		BUTTERFLY WHEN VALVE IS 4' OR MORE BALL VALVE WHEN VALVE IS 3' OR LESS
	SPLITTER DAMPER		VALVE WITH MEMORY STOP
	BACKDRAFT DAMPER (GRAVITY)		GAS COCK
	FIRE DAMPER, SLEEVE & ACCESS DOOR		CONTROL VALVE 2 WAY
	AIR EXTRACTING VANES		CONTROL VALVE 3 WAY
	TURNING VANES, DOUBLE THICKNESS ARFOIL TYPE		PRESSURE/TEMPERATURE TAP
	RISER MARK		CIRCUIT SETTER
	THERMOSTAT (G) W/ GUARD		CODE BACKFLOW PREVENTER
	SENSOR		UNIT HEATER VERTICAL
	HUMIDISTAT		UNIT HEATER HORIZONTAL
	CONNECTION TO EXISTING PIPING, DUCTWORK, ETC.		PIPE DOWN
	EXHAUST OR RETURN AIR REGISTER		PIPE UP
	RECTANGULAR CEILING SUPPLY DIFFUSER		EXISTING PIPE TO BE REMOVED
	ROUND CEILING SUPPLY DIFFUSER		EXISTING PIPE TO REMAIN
	SIDE WALL, SUPPLY REGISTER W/ VOLUME DAMPER		NEW PIPING
	DOOR GRILLE W/ BUILT-IN FIRE DAMPER IF LOCATED ON A FIRE DOOR		PIPING ASSEMBLY (SEE DETAIL)
	LINEAR DIFFUSER W/ BOOT, NO VOLUME DAMPER IN BOOT		AIR VENT
	AIR VALVE		FLOW CONTROL FITTING
	TERMINAL UNIT, VARIABLE VOLUME INTEGRAL DIFFUSER		FLOW INDICATOR
	DOOR UNDERCUT MINIMUM 1"		FLOW SWITCH
	ROOF MOUNTED POWER OR GRAVITY VENTILATOR		PRESSURE SWITCH
	ROOF MOUNTED AIR INTAKE		BASE MOUNTED PUMP (SEE DETAIL)
	ELECTRIC DUCT HEATER		INLINE PUMP (SEE DETAIL)
	DIFFUSER / REGISTER TAG		EQUIPMENT (SPECIFIED BY TAG BELOW)
	DIFFUSER / REGISTER TAG		EQUIPMENT TAG
			SMOKE DETECTOR
			FIRE / SMOKE DETECTOR

SYSTEMS ABBREVIATIONS			
DUCTWORK		MECHANICAL PIPING	
ABBREVIATION	SYSTEM NAME	ABBREVIATION	SYSTEM NAME
GE	EXHAUST AIR	CD	CONDENSATE DRAIN
KE	KITCHEN EXHAUST	NGMP	NATURAL GAS MEDIUM PRESSURE
OA	OUTSIDE AIR		
RA	RETURN AIR		
SA	SUPPLY AIR		
TE	TOILET EXHAUST		

MECHANICAL ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
AC	AIR CONDITIONER
A/C	AIR CHANGES PER HOUR
ADS	AIR DIRT SEPARATOR
AF	ABOVE FINISH FLOOR
AFG	ABOVE FINISHED GRADE
AFMS	AIR FLOW MONITORING STATION
AFU	ANNUAL FUEL EFFICIENCY RATIO
AHU	AIR HANDLER
AMP	AMPERAGE
APD	AIR PRESSURE DROP
AS	AIR SEPARATOR
ATU	AIR TERMINAL UNIT
AUX.	AUXILIARY
B	BOLLER
BAS	BUILDING AUTOMATION SYSTEM
BLDG	BUILDING
BTU	BRITISH THERMAL UNITS
BTUH	BRITISH THERMAL UNITS PER HOUR
CAI	COMBUSTION AIR INTAKE
CAP.	CAPACITY
CAV	CONSTANT AIR VOLUME
CAV	CABINET UNIT HEATER
CC	COOKING COIL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFM	GALUGE
CHW/P	CHILLED WATER PUMP
CLG	CEILING
CO2	CARBON DIOXIDE
CONN	CONNECTION
COP	COEFFICIENT OF PERFORMANCE
CP	STEAM CONDENSATE PUMP
CRAC	COMPUTER ROOM AIR CONDITIONER
CT	COOLING TOWER
CUH	CABINET UNIT HEATERS
CWP	CONDENSER WATER PUMP
DB	DRY-BULB TEMPERATURE
DE	DRYER EXHAUST
DEF	DRYER EXHAUST FAN
DIA, Ø	DIAMETER
DN	DOWN
DOA	DEDICATED OUTSIDE AIR
EAD	EXHAUST AIR DAMPER
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATERS
EWI	ENTERING WATER TEMPERATURE
EX	EXISTING
EXH	EXHAUST
F	FAHRENHEIT
F.S.P.	FAN STATIC PRESSURE
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLA	FULL LOAD AMPERAGE
FPB	FAN POWERED BOX
FPF	FINS PER INCH
FFM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FIN-TUBE
FT/MIN	FEET PER MINUTE
GE	GALLONS
GPM	GALLONS PER MINUTE
GPR	GEODEXCHANGE PIPE RETURN
GPS	GEODEXCHANGE PIPE SUPPLY
GWP	ETHYLENE GLYCOL WATER PUMP
H	HUMIDISTAT
HC	HEATING COIL
HCP	HEATING COIL PUMP
HOA	HANDS-OFF-AUTO
HP	HORSE POWER
HP	HEAT PUMP
HPS	HIGH PRESSURE SUPPLY
HWP	HOT WATER PUMP
HWV	HOT WATER VALVE
HX	HEAT EXCHANGER
HZ	HERTZ
IH	INTAKE AIR HOOD
IHD	INTAKE HOOD DAMPER
INW/C	INCHES WATER COLUMN
INW/G	INCHES WATER GAUGE
KEF	KITCHEN EXHAUST FAN
KFD	KITCHEN EXHAUST CONTROL DAMPER
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LBHR	POUNDS PER HOUR
LBS	POUNDS
LEF	LAUNDRY EXHAUST FAN
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS
MCA	MAXIMUM CURRENT AMPERAGE
MD	MANUAL DAMPER
MERV	MINIMUM EFFICIENCY RATING VALUE
MFG	MANUFACTURER
MIN.	MINIMUM
MOCOP	MAXIMUM OVER-CURRENT PROTECTION
MPS	MEDIUM PRESSURE SUPPLY
MTD	MOUNTED
O.B.D	OPPOSED BLADE DAMPER
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OAI	OUTSIDE AIR INTAKE
P	PUMP
P.D.	PRESSURE DROP
P/T	PRESSURE TESTING
PH	ELECTRICAL PHASE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PWP	PROCESS WATER PUMP
RA	RETURN AIR
RAD	RETURN AIR DAMPER
RBD	ROUND BACKDRAFT DAMPER
RCR	RECIRCULATION AIR
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RH	RELIEF AIR HOOD
RHV	REHEAT WATER VALVE
RPM	REVOLUTIONS PER MINUTE
RTU	ROOFTOP UNIT
RV	RELIEF VALVE
S	SENSOR
SA	SUPPLY AIR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SF	SUPPLY FAN
SQ. FT.	SQUARE FEET
STV	STEAM VALVE
T	THERMOSTAT
TE	TOILET EXHAUST
TEF	TOILET EXHAUST FAN
TFD	TOILET EXHAUST CONTROL DAMPER
TG	TRANSFER GRILLE
TRE	TRASH EXHAUST
TSP	TOTAL STATIC PRESSURE
TRP	TYPICAL
UH	UNIT HEATERS
V	VOLTAGE
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
WB	WET-BULB TEMPERATURE
WC	INCHES IN WATER COLUMN

GENERAL MECHANICAL NOTES

NOTES APPLY TO ALL MECHANICAL DRAWINGS

1. EACH TRADE CONTRACTOR SHALL VISIT CONSTRUCTION SITE PRIOR TO BIDDING, EXAMINE SCOPE AND CONDITIONS OF OTHER CONTRACT WORK, EXAMINE EXISTING CONDITIONS AND ALL INTERFERENCES AND REQUIRED COORDINATION IN ORDER TO INCLUDE EFFECT OF SAID CONDITIONS IN THEIR BID. BID DRAWINGS ARE DIAGRAMATIC AND DO NOT INDICATE ALL REQUIRED LOCATIONS, OFFSETS, CHANGE IN ASPECT RATIOS, OR ROUTING CHANGES REQUIRED TO INTEGRATE WORK WITH ALL OTHER CONDITIONS OR TRADES. WORK INSTALLED BEFORE COORDINATING SO AS TO CAUSE INTERFERENCES WITH OTHER TRADES SHALL BE REMOVED AND REWORKED WITHOUT COST TO OWNER. COST OF PROVIDING SUCH RELOCATIONS, OFFSETS, SIZE, CHANGES, REROUTING, ETC. SHALL BE INCLUDED IN BID. CODE CONFORMING SCALED (1/4") COORDINATED DRAWINGS SHALL BE PREPARED BY EACH TRADE TO FACILITATE AND VERIFY FIT AND CONGRUENCE OF THEIR INSTALLATION WITH OTHER TRADES.

2. WHERE ADDITIONAL DETAILS, DIAGRAMS, EQUIPMENT DATA, AND ISOMETRICS ARE REQUIRED BY BUILDING DEPARTMENT OR CODE AUTHORITIES FOR PERMIT OR APPROVAL, CONTRACTOR SHALL PROVIDE SAME AT NO ADDITIONAL COST.

3. BUILDING PLANS SHOWN ARE COMPILED FROM SOURCES BELIEVED TO BE ACCURATE. HOWEVER, THE INFORMATION SHOWN ON THESE PLANS IS SCHEMATIC AND CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PROPER DIMENSIONS, SIZES, SYSTEM VOLTAGES, QUANTITIES AND EXTENT OF WORK.

4. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL, STRUCTURAL, PLUMBING, FIRE PROTECTION, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR COORDINATION AND EXTENT OF THE WORK OF THE VARIOUS TRADES AND IMPACT ON THEIR WORK.

5. WITH THE APPROVAL OF THE ARCHITECT AND WITHOUT ADDITIONAL COST TO THE OWNER, MAKE MODIFICATIONS IN THE WORK, INCLUDING REROUTING AS REQUIRED BY INTERFERENCE WITH STRUCTURAL, GENERAL AND WORK OF OTHER TRADES FOR PROPER EXECUTION OF THE WORK.

6. REFER TO THE ARCHITECTURAL DRAWINGS, FIELD CONDITIONS AND DETAILS FOR EXACT LOCATION OF PARTITIONS, RCP, DIMENSIONED ELEMENTS.

7. CUTTING AND PATCHING FOR THEIR WORK SHALL BE PERFORMED BY EACH TRADE CONTRACTOR UNLESS NOTED OTHERWISE.

8. REFER TO ELECTRICAL DIAGRAM AND SPECIFICATIONS FOR VFD DRIVE TYPE, MODEL REQUIREMENTS.

9. ALL WORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH BUILDING STANDARDS AND ALL APPLICABLE CODES.

10. MEDIUM/LOW PRESSURE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. SUPPLY DUCTWORK, MEDIUM PRESSURE SHALL NOT EXCEED 2000 FPM VELOCITY OR 0.2 N/100 FT. PRESSURE DROP. LOW PRESSURE DUCTWORK SHALL NOT EXCEED 1500 FPM OR 0.08 N/100 FT. PRESSURE DROP. EXHAUST DUCTWORK SHALL NOT EXCEED 1500 FPM OR 0.08 N/100 FT. PRESSURE DROP.

11. PROVIDE MANUAL DAMPER ON ALL LOW PRESSURE SUPPLY BRANCH TAKE-OFF OF DUCTWORK.

12. ALL DUCT SIZES SHOWN SHALL BE CLEAR INSIDE DIMENSIONS.

13. DIFFUSERS, REGISTERS ARE AS SCHEDULED IN THE DRAWING. CONTRACTOR TO VERIFY AND COORDINATE WITH ARCHITECT TYPE OF CEILING TO DETERMINE FRAME TYPE.

14. BLANK-OFF WITH BLACK PAINTED PANEL WHERE SHOWN, DO NOT PAINT EXPOSED DUCTS OR REGISTERS.

15. PROVIDE UL APPROVED FIRE DAMPERS IN ALL DUCT PENETRATIONS THRU FIRE RATED ASSEMBLIES (WHETHER INDICATED OR NOT).

16. FLEXIBLE DUCTWORK: FINAL CONNECTIONS TO ALL BOOT ASSEMBLIES, DIFFUSERS AND REGISTERS SHALL BE MADE WITH CODE APPROVED INSULATED FLEXIBLE DUCT. THE RIMFLEX TYPE MAKE OR AS MANUFACTURED BY FLEX MASTER OR GENFLEX. FLEXIBLE DUCTWORK SHALL NOT BE USED IN DUCTWORK AS AN ELBOW. FLEXIBLE DUCTWORK SHALL BE STRAIGHT WITH ONLY MINOR OFFSETS NECESSARY FOR FIELD CONDITIONS. FLEXIBLE DUCTWORK SHALL NOT EXCEED 6'-0" IN LENGTH IN EITHER MEDIUM OR LOW VELOCITY SYSTEMS. SHALL BE PROPERLY SUPPORTED TO PREVENT KINKS OR SAGS, AND SHALL NOT BE USED AS AN ELBOW. CONNECTIONS SHALL BE SECURED WITH WRAP LOCK CLAMPS AND SEALED WITH DUCT SEALER. INSTALLATION SHALL BE IN ACCORDANCE WITH LOCAL AND STATE ADOPTED CODES.

17. CONCEALED COLD TEMPERATURE DUCTWORK, INCLUDING SUPPLY DUCTS, SHALL BE INSULATED AS REQUIRED OR PER BUILDING STANDARDS TO PREVENT CONDENSATION. ALL NEW CONCEALED DUCTWORK (UPSTREAM OF VAV TERMINAL UNITS) SHALL BE INSULATED. REFER INSULATION AND METAL DUCT SPECIFICATIONS FOR LINING REQUIREMENTS.

18. SUPPLY PIPING AND CONTROL CONDENSATE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH IFGC, CHAPTER 4 (WITH MODIFICATIONS AS NOTED IN ARTICLE 401, (18-28-1400)).

19. GAS PIPING MUST BE SIZED IN ACCORDANCE WITH IFGC TABLES 402.1(1) THROUGH 402.3 (34). [IFGC 402.3]

20. THE MAXIMUM DESIGN OPERATING PRESSURE FOR GAS PIPING SYSTEMS LOCATED INSIDE BUILDINGS SHALL NOT EXCEED 5 PSIG (SOME EXCEPTIONS ARE NOTED). [IFGC 402.3]

21. GAS PIPING MATERIALS MUST CONFORM TO THE GAS PIPING AND TUBING MATERIAL MATRIX (LFGC 403 REQUIREMENTS). [IFGC 402.3]

22. PIPING IN CONCEALED LOCATIONS MUST CONFORM TO THIS IFGC 404.3. [IFGC 404.3]

23. GAS PIPES MUST BE SLOPED AT 1/4 INCH IN EVERY 15 FEET. [IFGC 408.1]

24. ALL FITTINGS AND CONNECTIONS FOR ALL CHILLED WATER, COOLING WATER, HEATING HOT WATER SYSTEMS INSIDE BUILDING, EXCEPT INSIDE THE EQUIPMENT ROOM SHALL BE WELDED OR BRAZED.

25. PROVIDE FLEXIBLE DUCTS RATED FOR 10 INCH WG PRESSURE RATING. PROVIDE STRAP FOR INSIDE AND OUTSIDE LINING AT EACH CONNECTION POINT. MINIMUM HYDRONIC PIPING SIZE SHALL BE 3/4".

26. SMOKE DETECTOR SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THEIR LOCATION BASED ON THE ACTUAL DUCT ROUTING. INSTALLATION TO BE LEAK FREE AND SHALL PASS THE DUCT PRESSURE TEST.

27. LINE THE FOLLOWING DUCTWORK, REGARDLESS OF WHETHER SYSTEMS ARE EXPOSED OR CONCEALED, WITH 1" LINING.
 A. ALL NEW DUCTWORK WITHIN 25' OF FANS
 B. NEW TRANSFER AIR DUCTS
 C. NEW DUCTWORK FOR AT LEAST 15' DOWNSTREAM OF VAV TERMINAL DUCTS

GENERAL NOTE: NOT ALL SYMBOLS, NOTES AND ABBREVIATIONS ARE APPLICABLE TO THIS PROJECT

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1	5/28/23	BID ADDENDUM #2
△	DATE:	DESCRIPTION:

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

5800 Chester Ave
Philadelphia, PA 19143

PROJECT #:	2020
SCALE:	1/2" = 1'-0"
FORMAT:	30" X 42"
DRAWN:	EHA/J
CHECKED:	SA/DS/SSA
DATE:	4/7/2023

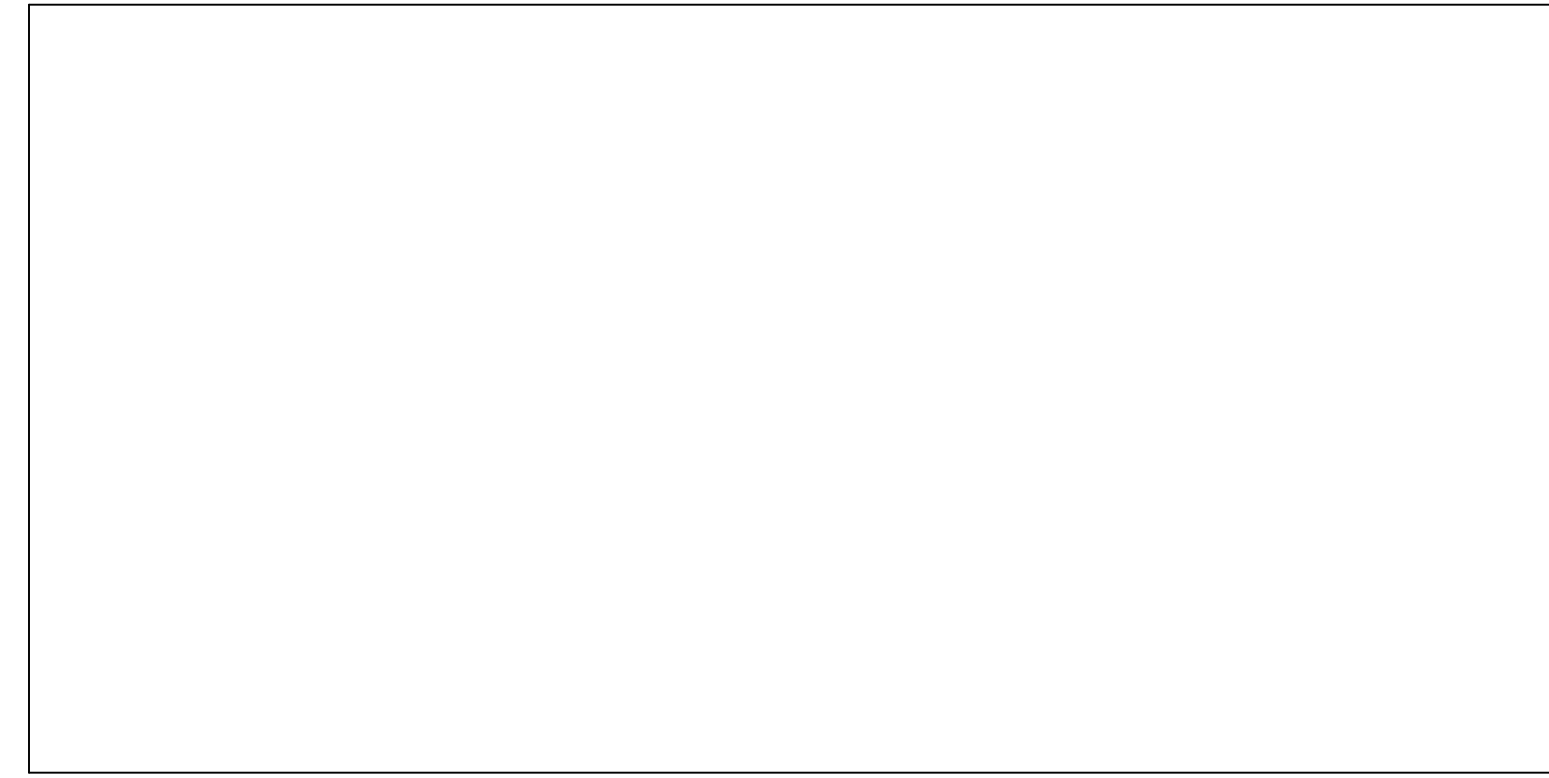
SHEET NAME: MECHANICAL SYMBOLS, NOTES & ABBREVIATIONS

SHEET NUMBER:

MOOO

PROJECT PHASE:
CONSTRUCTION DOCUMENTS

APPROVAL STAMP AREA



MECHANICAL SHEET NOTES
 1 WRAP FAN COIL UNITS WITH MASS LOADED VYVIL (2 PSF DENSITY, STC 31), PROVIDE OPENING FOR ACCESS DOORS AND COMPONENTS.

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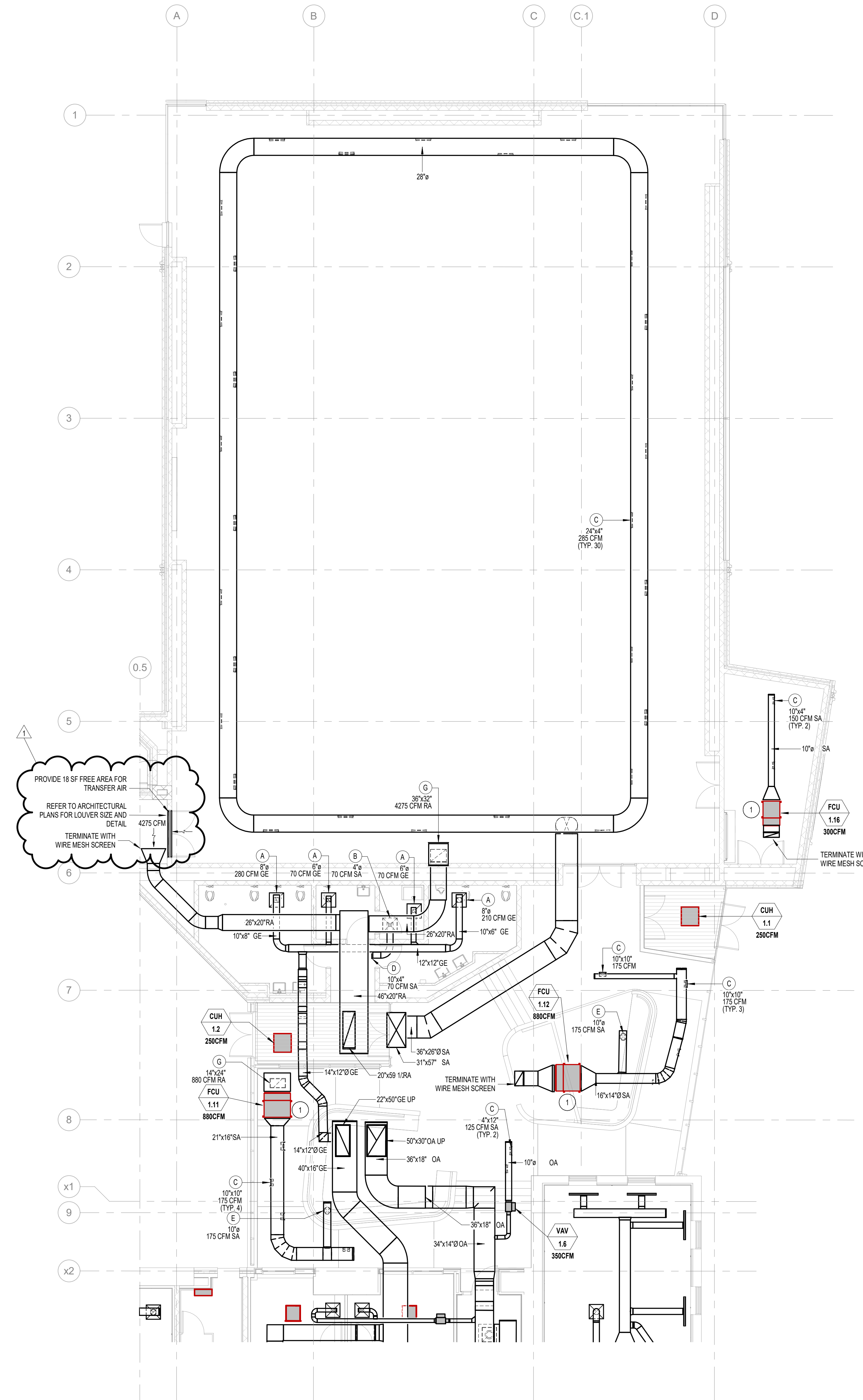
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1	5/28/23	BID ADDENDUM #2
△	DATE:	DESCRIPTION:

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

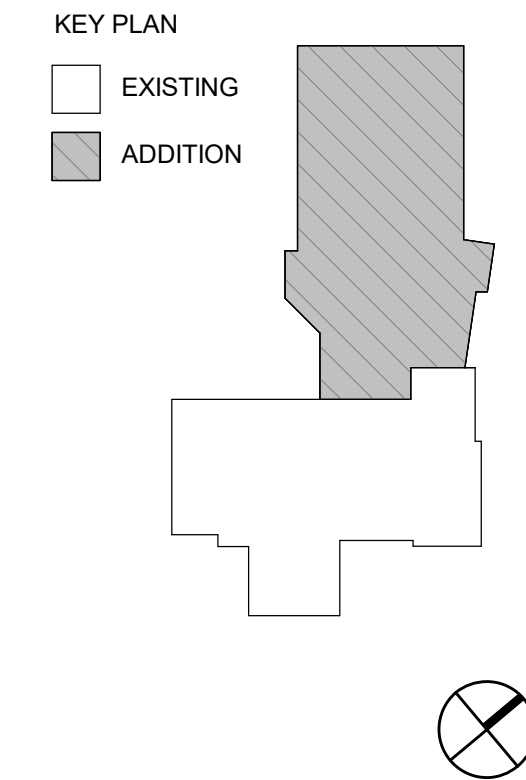
5800 Chester Ave
 Philadelphia, PA 19143

PROJECT #:	2020
SCALE:	1/8" = 1'-0"
FORMAT:	30" X 42"
DRAWN:	Author
CHECKED:	Checker
DATE:	4/7/2023

SHEET NAME:
LEVEL 1 ADDITION - MECHANICAL DUCTWORK PLAN

SHEET NUMBER:
M111 B

PROJECT PHASE:
CONSTRUCTION DOCUMENTS



1 LEVEL 1 ADDITION - HVAC PLAN
 1/8" = 1'-0"

APPROVAL STAMP AREA



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 2020 Francis J. Myers Title Block version: 2022.09.14 | Printed: 5/28/2023 11:28:43 AM



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FRANCIS J. MYERS
RECREATION CENTER
SITE AND BUILDING
IMPROVEMENTS

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 Philadelphia, PA 19143

PROJECT #: 2020
 SCALE: 3/8" = 1'-0"
 FORMAT: 30" x 42"
 DRAWN: EHAJ
 CHECKED: SA/DS/SSA
 DATE: 4/7/2023

SHEET NAME:
MECHANICAL
SCHEDULES

SHEET NUMBER:
M500

PROJECT PHASE:
CONSTRUCTION DOCUMENTS

VRF CONDENSING UNIT																									
TAG	ABBR.	#	LOCATION	# OF MODULES	EQUIPMENT TYPE		COOLING		HEATING		# OF COMPRESSORS		ELECTRICAL DATA		UNIT WEIGHT (LBS)	MANUFACTURER	MODEL	REMARKS							
					HEAT PUMP	HEAT RECOVERY	CAPACITY (MBH)	EER	AMBIENT TEMP (°F)	AMBIENT TEMP (°F)	CAPACITY (MBH)	COP	MCA	MOC					MCC	MCP	PH	WxHxD			
	CU	1.1	ROOF	2		Yes	210	18.9/18.9	0	15	3.36/3.56	R410A	1	21	35	21	35	480 V	3	(71'-5/8" X 49'-1/4" X 29'-3/8") X 2	1394	Mitsubishi Electric	TURVH2404BNA0AN	1-9	
	CU	1.2	ROOF	2		Yes	95	176.4	18.9/25.6	0	210	3.63/8.88	R410A	1	20	30	20	30	480 V	3	(71'-5/8" X 49'-1/4" X 29'-3/8") X 2	1394	Mitsubishi Electric	TURVH1924BNA0AN	1-9
	CU	2.1	ROOF	2		Yes	95	139.1	10.9/12.2	0	157.3	3.45/3.82	R410A	1	17	25	17	25	480 V	3	(71'-5/8" X 49'-1/4" X 29'-3/8") X 2	1288	Mitsubishi Electric	TURVH1444BNA0AN	1-9

- 1 PROVIDE UNIT WITH LOW AMBIENT OPERATION DOWN TO 0 F
- 2 MANUFACTURER TO ENSURE NO LOSS OF CAPACITY UNDER ALL OUTDOOR CONDITIONS DURING DEFROST CYCLE
- 3 PRESSURE RELIEF VALVE ON HIGH SIDE OF SYSTEM
- 4 ISOLATION VALVES AT EACH MODULE
- 5 MOUNT ON EQUIPMENT RAILS
- 6 PROVIDE TOUCH SCREEN PANEL w/BACNET INTERFACE
- 7 PROVIDE FAN HEATERS
- 8 SNOW / WIND HOOD KITS
- 9 HAIL GUARD KIT
- 10 PROVIDE TWINNING KITS

VARIABLE AIR VOLUME TERMINAL UNIT																					
TAG	ABBR.	#	LOCATION	RM. NUMBER	DUCT SIZE		CFM		STATIC PRESSURE (IN. WC)		MAX NC		MANUFACTURER	MODEL	REMARKS						
					INLET UNIT	OUTLET UNIT	MAX. (CFM)	MIN. (CFM)	DISCHARGE	RADIATED											
	VAV	1.1	CLASSROOM 2	121	6	8" x 12"	375	110	0.25	0.11	25	23	TITUS	DESV							
	VAV	1.2	STAFF LOUNGE	810	4	8" x 12"	100	30	0.25	0.02	27	14	TITUS	DESV							
	VAV	1.3	CLASSROOM 1	122	6	8" x 12"	375	85	0.25	0.11	25	23	TITUS	DESV							
	VAV	1.4	DIRECTOR'S OFFICE	112	4	8" x 12"	100	20	0.25	0.02	27	14	TITUS	DESV							
	VAV	1.5	AFTER SCHOOL PROGRAM RM	113	6	8" x 12"	375	110	0.25	0.11	25	23	TITUS	DESV							
	VAV	1.6	LOBBY-1	100-1	6	8" x 12"	350	100	0.25	0.1	24	22	TITUS	DESV							
	VAV	1.7	CLO	103	5	8" x 12"	250	50	0.25	0.05	24	17	TITUS	DESV							
	VAV	1.8	COMPUTER LAB	115	4	8" x 12"	150	50	0.25	0.02	18	11	TITUS	DESV							
	VAV	1.9	ADMIN	108	4	8" x 12"	100	20	0.25	0.02	27	14	TITUS	DESV							
	VAV	1.10	CORRIDOR-1	107A-1	5	8" x 12"	150	75	0.25	0.02	18	11	TITUS	DESV							
	VAV	2.1	CLASSROOM 4	201	8	8" x 12"	475	120	0.25	0.01	28	20	TITUS	DESV							
	VAV	2.2	CLO	202B	8	10" x 12"	475	100	0.25	0.01	28	20	TITUS	DESV							
	VAV	2.3	MULTIPURPOSE ROOM 2	203	5	10" x 12"	325	65	0.25	0.09	24	21	TITUS	DESV							
	VAV	2.4	CORRIDOR	200	6	8" x 12"	100	50	0.25	0.01	13		TITUS	DESV							
	VAV	2.5	CORRIDOR	200	6	8" x 12"	375	115	0.25	0.11	25	23	TITUS	DESV							
	VAV	B.1	CORRIDOR-1	107A-1	5	8" x 12"	300	125	0.25	0.07	23	20	TITUS	DESV							

ROOFTOP & DOAS UNITS (AIR SOURCE HEAT PUMP)																																																		
TAG	ABBR.	#	LOCATION	AREA SERVED	OA AIRFLOW (CFM)	UNIT AIRFLOW (CFM)	MIN. UNIT AIRFLOW (CFM)	SUPPLY FAN			EXHAUST FAN			COIL (COOLING MODE)				COIL (HEATING MODE)				ELECTRIC COIL (HEATING MODE)		ELECTRICAL DATA			FILTER RATING	ENERGY RECOVERY WHEEL TAG	UNIT WEIGHT (LBS)	MANUFACTURER	MODEL	REMARKS																		
								TOTAL SP	FAN SPEED (RPM)	# OF FANS	HP EACH	CFM	ESP (IN)	TOTAL SP (IN)	FAN SPEED (RPM)	# OF FANS	HP EACH	CAP TOTAL (MBH)	CAP SENS. (MBH)	EAT DB/WB(F)	LAT DB/WB(F)	AIR P.D. (IN. WG)	EER	CAP TOTAL (MBH)	EAT(F)	LAT(F)							P.D. (IN. WG)	COP	EAT (DB)	LAT (DB)	CAP. MBH	KW	TEMP RISE (F)	MODULATION	MCA	MOC	MCC	MCP	PH					
	DOAS	1	ROOF	1ST TO 3RD FLOOR	5000	5000	1900	2	3.8	1803	1	5	5000	1.5	2.68	1640	1	5	215	154	79.5/65.9	51/651.5	0.21	14.9	127	54.4	75.7	0.05	2.3	0.05	2.3	0.05	2.3	0.05	2.3	0.05	2.3	61.1	SCR	110.9	125	480 V	3	MERV 14	ERW-1	4857	TRANE	HORIZON OAK K240	1-16	
	RTU	1	ROOF	GYM	3500	8500	2500	2	4.26	2297	1	10	3500	1.5	1.52	1192	1	3	290	228	177.1/64.1	52.8/52.5	0.29	10.4	193	63.9	82.2	0.05	2.3	0.05	2.3	0.05	2.3	0.05	2.3	0.05	2.3	80	54	SCR	146.5	150	480 V	3	MERV 14	ERW-2	4651	TRANE	HORIZON OAK K360	1-16

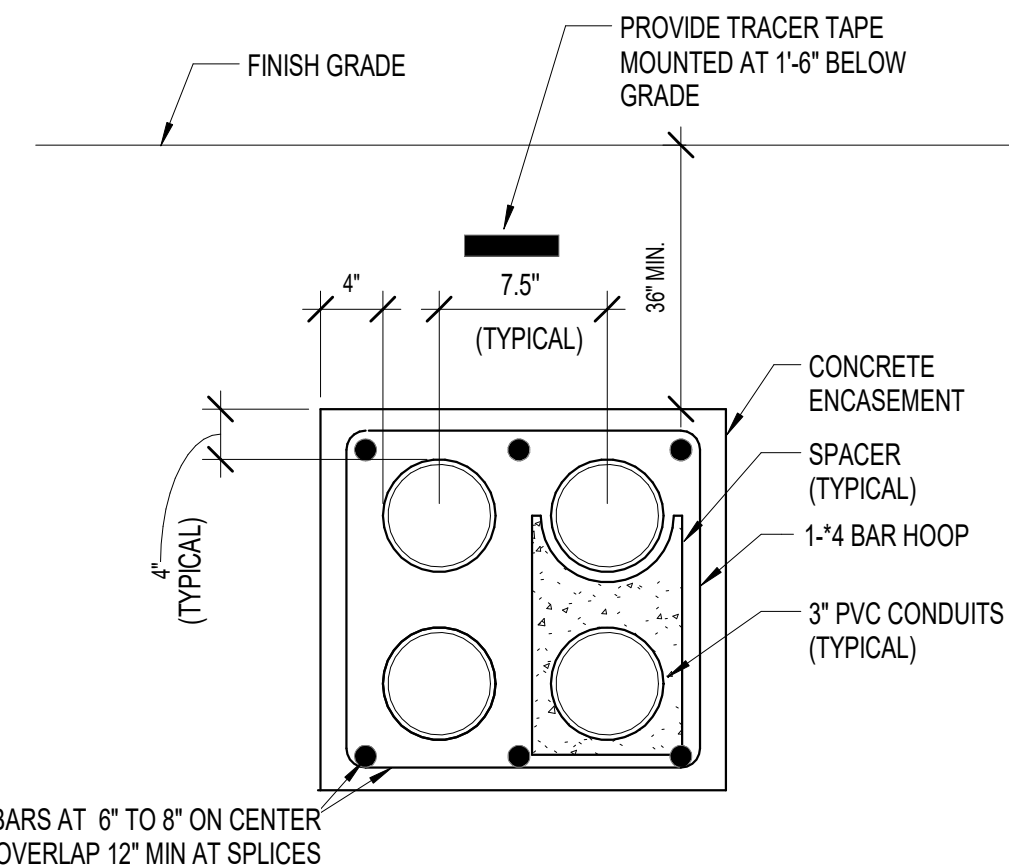
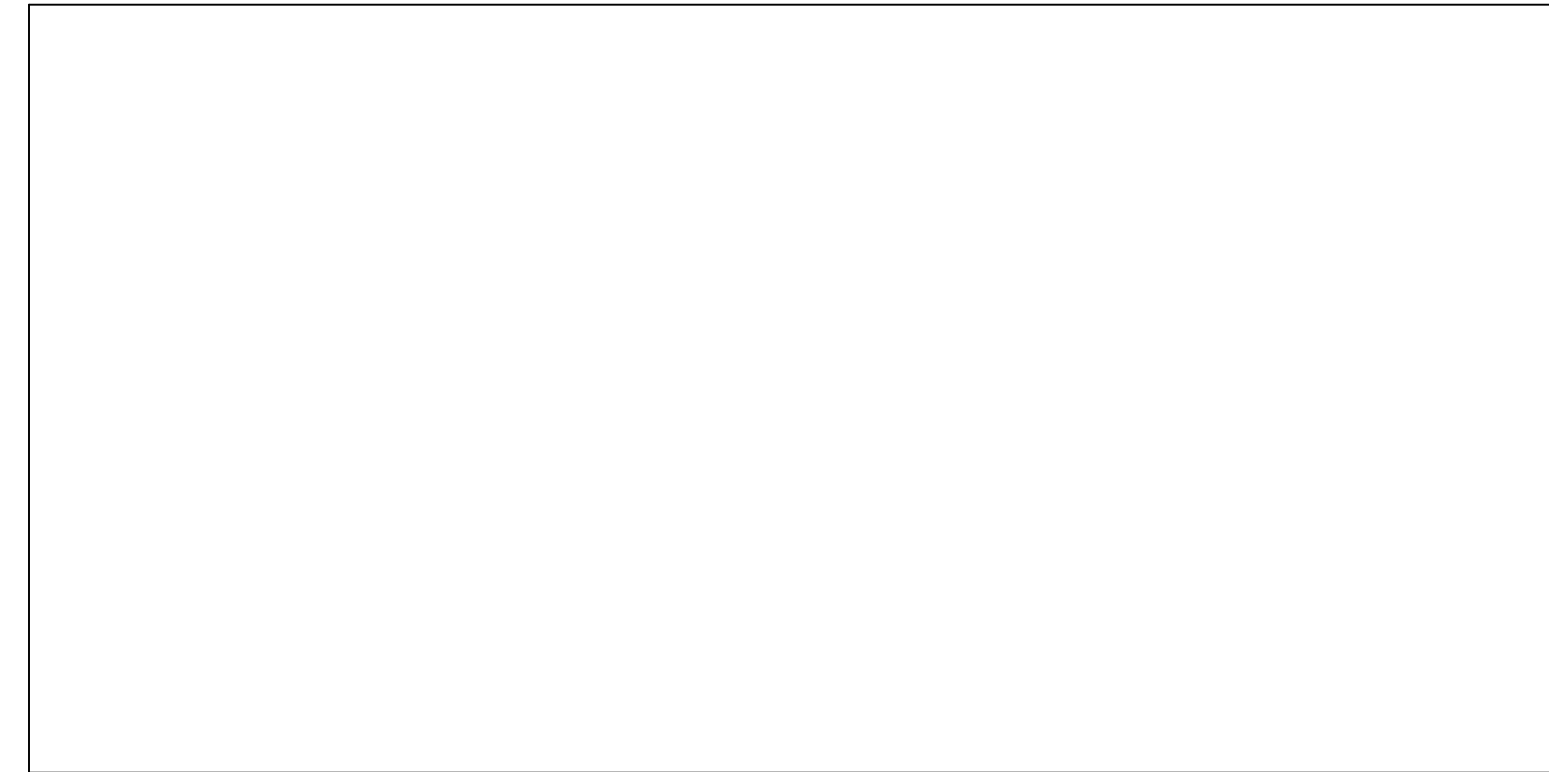
- 1 DOUBLE WALL CONSTRUCTION WITH GALVANIZED STEEL PANELS AND A MINIMUM R-4 INSULATION.
- 2 PROVIDE FULL PERIMETER INSULATED VIBRO CURB. 24" FOR DOAS-1 AND RTU-1
- 3 INCLUDE SS DRAIN PAN AT DX COOLING COIL SECTION.
- 4 PROVIDE WITH MERV 13 FILTERS
- 5 PROVIDE WITH CONVENIENCE OUTLET AT UNIT.
- 6 PROVIDE WITH NEMA 3R ELECTRICAL DISCONNECT SWITCH
- 7 DOAS -1 AND RTU-1 IS PROVIDED WITH AN INTEGRAL ELECTRIC HEATING COIL WITH SCR MODULATION CONTROL TO OPERATE DURING FROST CONDITIONS.
- 8 SUPPLY AND EXHAUST FAN SHALL BE DIRECT DRIVE TYPE WITH FACTORY INSTALLED VFD IN OUTDOOR RATED ENCLOSURE.
- 9 PROVIDE FLOOR MEASURING STATION FOR SUPPLY AND EXHAUST FANS.
- 10 PROVIDE PACKAGED CONTROLS WITH BACNET INTEGRATION AND VAV CONTROL CONFIGURATION AND CONTROL FOR ALL HEATING STAGES.
- 11 PROVIDE MERV 8 PRE FILTER
- 12 PROVIDE SINGLE POINT POWER CONNECTION.
- 13 RTU-1 AND DOAS-1 TO BE PROVIDED WITH BOTTOM SUPPLY/RETURN CONFIGURATION.
- 14 FAN AND UNIT TO MODULATE DOWN TO MINIMUM CFM.
- 15 OA AMBIENT CONDITIONS : SUMMER DB/WB 95F/75F ; WINTER OF
- 16 HEATING CAPACITY LISTED IS AT OF AMBIENT CONDITIONS.

ENERGY RECOVERY WHEEL																																		
TAG	ABBR.	#	LOCATION	UNIT SERVED	CFM	OA CFM	SUMMER CONDITION - OA				SUMMER RA CFM	SUMMER CONDITION - RA				WINTER CONDITION - OA		WINTER CONDITION - RA				WHEEL MOTOR (HP)	WHEEL SPEED (RPM)	VOLTS	PH	F.L. AMPS (FLA)	HZ	MANUFACTURER	REMARKS					
							ENTERING DEG. F. (DB)	LEAVING DEG. F. (WB)	ENTERING DEG. F. (DB)	LEAVING DEG. F. (WB)		ENTERING DEG. F. (DB)	LEAVING DEG. F. (WB)	WINTER APP IN/WG	WINTER APP IN/WG	WINTER APP IN/WG	WINTER APP IN/WG	WINTER APP IN/WG	WINTER APP IN/WG															
	ERW	1	DOAS-1	DOAS-1	5000	5000	95	75	79.5	65.8	5000	75	62.5	90.2	72.2	0.87	0	0	54.4	45.3	5000	72	55.8	18.2	18.1	0.87	1075	0.5	460 V	1	1.5	60	TRANE	
	ERW	2	RTU-1	RTU-1	3500	3500	95	75	80.1	66.3	3500	75	62.5	89.5	71.8	1.02	0	0	52.3	43.9	3500	72	55.8	20.3	20.1	1.02	1075	0.5	460 V	1	0.44	60	TRANE	

BRANCH SELECTOR BOX					
TAG	NUMBER OF PORTS	MANUFACTURER	MODEL	REMARKS	
BSB 1.1	12	mitsubishi electric	TCMBM1012JA11N4		
BSB 1.2	8	mitsubishi electric	TCMBM1008JA11N4		
BSB 1.1	8	mitsubishi electric	TCMBM1008KB11N4		
BSB 2.1	8	mitsubishi electric	TCMBM1008JA11N4		

VRF FAN COIL UNIT																											
TAG	ABBR.	#	AREA SERVED	INDOOR UNIT TYPE	OUTDOOR UNIT	ZONE SELECTOR	CONDENSATE PUMP	INTEGRAL FILTER	SOUND PRESSURE LEVEL (dBA)	FAN MAX AIR FLOW (CFM)	COOLING MODE		HEATING MODE		DIMENSIONS			ELECTRICAL DATA			UNIT WEIGHT (LBS)	MANUFACTURER	MODEL	REMARKS			
											EAT (°F)	WB (°F)	EAT (°F)	WB (°F)	HEIGHT	WIDTH	DEPTH	MCA	VOLTS	PH							
	FCU	1.1	CLASSROOM 2	HORIZONTAL DUCTED	CU-1.2	BSS-1.3	NO	MERV 13	39	1270	0.6	75	62	33.449	28.936	70	39.981	7.7/8"	4'-11 1/8"	2'-1 3/8"	2.88	208 V	1	84	Mitsubishi Electric	TPEFPY036MA144A	1-5
	FCU	1.2	CLASSROOM 1	HORIZONTAL DUCTED	CU-1.2	BSS-1.3	NO	MERV 13	35	880	0.6	75	62	22.299	19.581	70	26.987	7.7/8"	3'-11 1/4"	2'-1 3/8"	2.88	208 V	1	67	Mitsubishi Electric	TPEFPY024MA144A	1-5
	FCU	1.3	PREP KITCHEN	HORIZONTAL DUCTED	CU-1.2	BSS-1.3	YES	MERV 13	35	880	0.6	75	62	27.814	22.924	70	33.984	7.7/8"	3'-11 1/4"	2'-1 3/8"	2.88	208 V	1	67	Mitsubishi Electric	TPEFPY030MA144A	1-5
	FCU	1.4	ARTS & CRAFTS	HORIZONTAL DUCTED	CU-1.2	BSS-1.2	NO	MERV 13	35	880	0.6	75	62	22.299	19.581	70	26.987	7.7/8"	3'-11 1/4"	2'-1 3/8"	2.88	208 V	1	67	Mitsubishi Electric	TPEFPY024MA144A	1-5
	FCU	1.5	LOUNGE	HORIZONTAL DUCTED	CU-1.2	BSS-1.2	NO	MERV 13	31	490	0.6	75	62	13.937	11.587	70	16.992	7.7/8"	3'-3 3/8"	2'-1 3/8"	2.88	208 V	1	58	Mitsubishi Electric	TPEFPY015MA144A	1-5
	FCU	1.6	ADMIN	HORIZONTAL DUCTED	CU-1.1	BSS-1.1	YES	MERV 13	28	300	0.6	75	62	5.575	5.575	70	6.420	7.7/8"	2'-7 1/2"	2'-1 3/8"	1.75	208 V	1	47	Mitsubishi Electric	TPEFPY006MA144A	1-5
	FCU	1.7	OFFICE	4-WAY CEILING CASSETTE	CU-1.1	BSS-1.1	YES	MERV 13	28	280	0.6	75	62	4.646	4.643	70	5.366	9.5/8"	2'-0 5/8"	2'-0 5/8"	0.24	208 V	1	29	Mitsubishi Electric	TPFLY0005PM140A	1-4
	FCU	1.8	OFFICE	4-WAY CEILING CASSETTE	CU-1.1	BSS-1.1	YES	MERV 13	28	280	0.6	75	62	4.646	4.643	70	5.366	9.5/8"	2'-0 5/8"	2'-0 5/8"	0.24	208 V	1	29	Mitsubishi Electric	TPFLY0005PM140A	1-4
	FCU	1.9	COMPUTER LAB	HORIZONTAL DUCTED	CU-1.2	BSS-1.2	NO	MERV 13	40	1300	0.6	75	62	44.598	34.269	70	53.974	7.7/8"	4'-11 1/8"	2'-1 3/8"	4.38	208 V	1	86	Mitsubishi Electric	TPEFPY048MA144A	1-5
	FCU	1.10	AFTER SCHOOL PROGRAM	HORIZONTAL																							

APPROVAL STAMP AREA



NOTES:
CONDUIT SHALL BE PVC SCHEDULE 40 U.O.N. REFER TO ELECTRICAL RISER DIAGRAM ON SHEET E-400 FOR ADDITIONAL INFORMATION AND FEEDER SIZE.

2 NEW ELECTRICAL SERVICE DUCT BANK

GENERAL ELECTRICAL LIGHTING NOTES:

- ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE ALL LIGHTING FIXTURE LOCATIONS, HANDHOLES LOCATIONS, CONDUIT ROUTING LAYOUT AND IDENTIFICATION OF LIGHT FIXTURES, LIGHTING CONTROLS AND LUMINAIRE TYPE WITH ARCHITECTURAL, LANDSCAPE AND "LT" SERIES DRAWINGS PRIOR TO ROUGH-IN.
- ALL EXTERIOR LIGHTING FIXTURES PLAN NORTHWEST SHALL BE FED FROM PANEL P1-PH-1, UNLESS NOTED OTHERWISE. ALL EXTERIOR LIGHTING FIXTURES PLAN SOUTHEAST SHALL BE FED FROM PANEL P1-PH-2, UNLESS NOTED OTHERWISE.
- ELECTRICAL CONTRACTOR SHALL REFER LIGHTING FIXTURE SCHEDULE ON SHEET E520 FOR LIGHTING FIXTURE TYPES AND POWER REQUIREMENTS.
- ELECTRICAL CONTRACTOR SHALL REFERENCE THE ARCHITECTURAL AND LIGHTING CONSULTANT DRAWINGS, VERIFY AND COORDINATE WITH OWNERSHIP FOR ALL LIGHTING FIXTURE TYPES, LIGHTING CONTROLS, QUANTITIES AND LOCATIONS. ELECTRICAL CONTRACTOR SHALL CIRCUIT ALL LIGHTING FIXTURES TO RESPECTIVE BRANCH CIRCUIT LIGHTING PANELBOARDS AND ASSOCIATED CONTROLS WHETHER A CIRCUIT NUMBER DESIGNATION AND PANEL SOURCE IS SHOWN OR NOT ON THE ELECTRICAL DRAWINGS.

GENERAL ELECTRICAL POWER NOTES:

- ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE ALL NEW EQUIPMENT LOCATIONS, INCLUDING PULLBOXES, NEW UNDERGROUND CONDUIT FEEDER ROUTING WITH ALL EXISTING AND NEW UNDERGROUND UTILITY INFRASTRUCTURE WITH THE UTILITY COMPANIES, CIVIL ENGINEER, STRUCTURAL ENGINEER, ARCHITECT AND OWNERSHIP PRIOR TO ROUGH-IN.
- ALL NEW UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 80 BURIED 36" BELOW FINISHED GRADE. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SAW-CUTTING, TRENCHING, EXCAVATION AND BACKFILLING FOR ALL UNDERGROUND CONDUITS. ALL CONDUITS INSTALLED UNDER VEHICULAR PATHWAYS SHALL BE RIGID GALVANIZED STEEL HEAVY WALL WITH A 3" CONCRETE ENVELOPE FOR PROTECTION. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 24" SEPARATION BETWEEN UNDERGROUND CONDUITS AND ALL OTHER UNDERGROUND UTILITIES AND ALL OTHER TRADES PRIOR TO ROUGH-IN.
- ALL UNDERGROUND CONDUITS SHALL BE IN 3" CONCRETE ENCASUREMENT. ELECTRICAL CONTRACTOR SHALL PROVIDE NYLON PULL WIRE IN ALL EMPTY SPARE CONDUITS.
- PROVIDE A CERTIFIED MASTER LABELED LIGHTNING PROTECTION SYSTEM FOR EXISTING AND NEW BUILDING STRUCTURE PER SPECIFICATION 26 41 13.

DIGSAU

CLIENT
REBUILD
1515 Arch Street
Mezzanine Level
Philadelphia, PA 19104

OWNER
CITY OF PHILADELPHIA
Department of Parks and Recreation
1515 Arch Street, 10th Floor
Philadelphia, PA 19102

ARCHITECT
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Philadelphia, PA 19107
v 215.627.0808
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CIVIL ENGINEER
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STRUCTURAL ENGINEER
David Mason & Associates
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Philadelphia, PA 19109
www.davidmason.com
v 215.375.6059

LANDSCAPE ARCHITECT
Ground Reconsidered
230 South Broad Street
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Philadelphia, PA 19102
v 215.790.0727
www.groundreconsidered.com

MEP/FP ENGINEER
dbHMS
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Suite 1910
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v 267.217.1612

LIGHTING DESIGN
The Lighting Practice
600 Chestnut Street
Suite 772
Philadelphia, PA 19106
v 215.238.1644

COST ESTIMATING
Dharam Consulting
1719 Chestnut Street
Suite 300
Philadelphia, PA 19103
v 610.554.6560

ENVIRONMENTAL CONSULTANT
Brightfields, Inc.
801 Industrial Street
Wilmington, DE 19801
v 302.656.9600
www.brightfields.com

LEED CONSULTANT
DataBased+
303 W Erie Street, Suite 510
Chicago, IL 60654
v 312.915.0557
www.databasedplus.com

NO.	DATE	DESCRIPTION
1	5/28/23	BID ADDENDUM #2

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

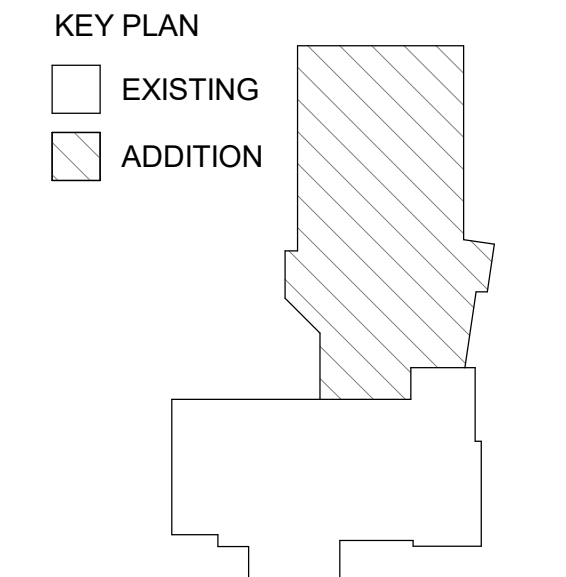
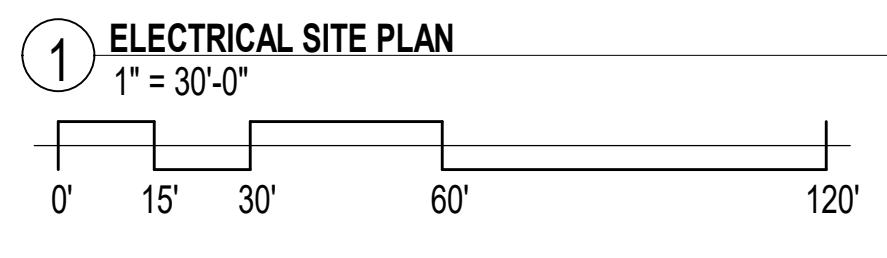
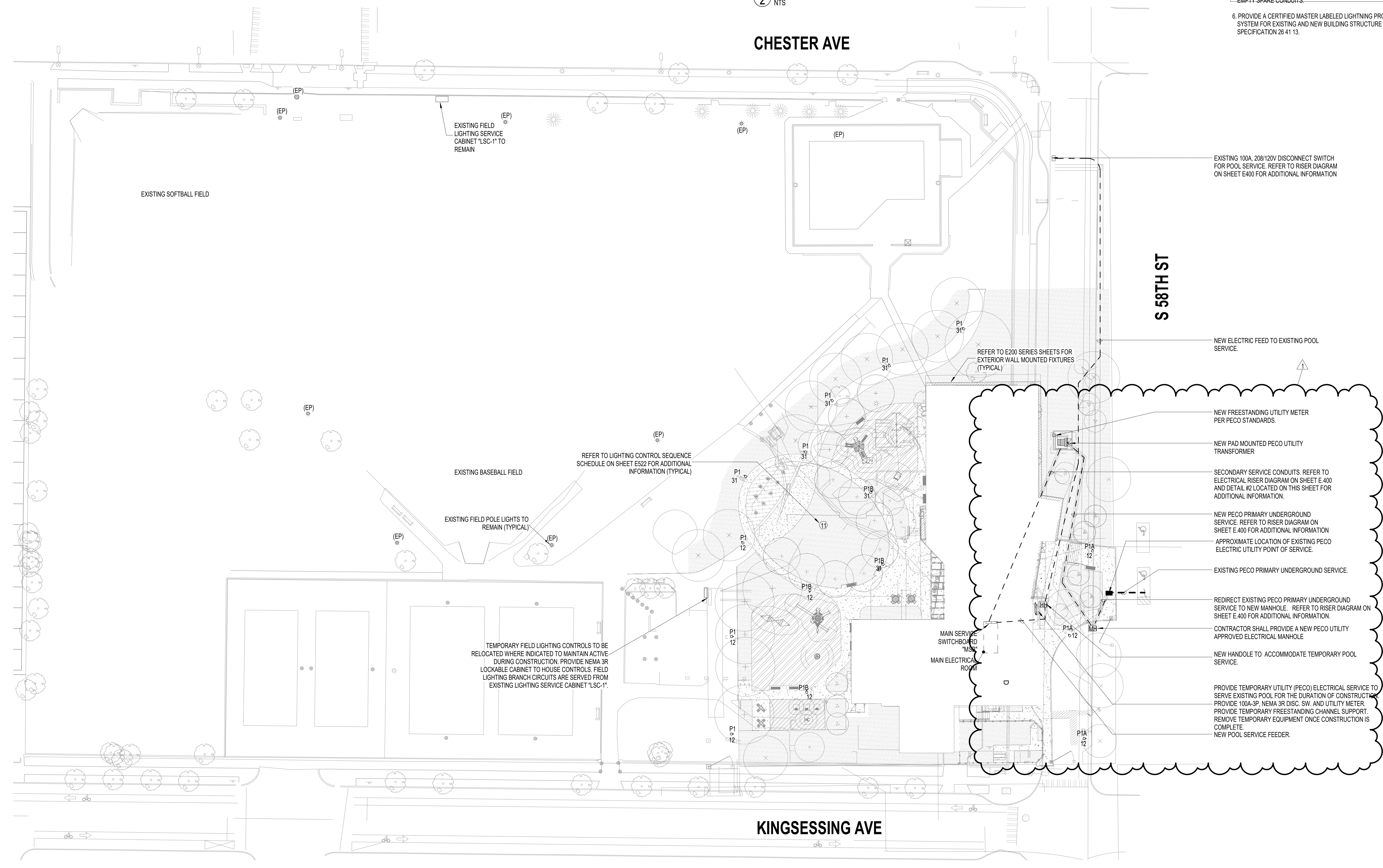
5800 Chester Ave
Philadelphia, PA 19143

PROJECT #:	2020
SCALE:	As indicated
FORMAT:	30" X 42"
DRAWN:	LL
CHECKED:	JC
DATE:	4/7/2023

SHEET NAME:
ELECTRICAL SITE PLAN

SHEET NUMBER:
E100

PROJECT PHASE:
CONSTRUCTION DOCUMENTS



APPROVAL STAMP AREA



1Ø 120V - 277V BRANCH CIRCUIT SCHEDULES

TABLE G: BRANCH CIRCUITS 1Ø WITH GC 'NEUTRAL' & WITH GRD EGC					TABLE H: BRANCH CIRCUITS 1Ø GC 'NEUTRAL' & ISO GRD IG & GRD EGC					
CKT	PWR	STR	COND	PWR	STR	COND	CKT	PWR	STR	COND
AMPS	TAG	Cu THWN-2 AWG - Kcmil	SIZE	TAG	Cu THWN-2 AWG - Kcmil	SIZE				
20	1G	2 #12 & 1 #12 EGC	3/4"	1H	2 #12 & 2 #12 IG & EGC	3/4"				
30	2G	2 #10 & 1 #10 EGC	3/4"	2H	2 #10 & 2 #10 IG & EGC	3/4"				
40	3G	2 #8 & 1 #10 EGC	1"	3H	2 #8 & 2 #8 IG & EGC	1"				
55	4G	2 #6 & 1 #10 EGC	1"	4H	2 #6 & 2 #6 IG & EGC	1"				
70	5G	2 #4 & 1 #8 EGC	1"	5H	2 #4 & 2 #4 IG & EGC	1"				
85	6G	2 #3 & #8 EGC	1.5"	6H	2 #3 & 2 #3 IG & EGC	1.5"				
95	7G	2 #2 & 1 #8 EGC	1.5"	7H	2 #2 & 2 #2 IG & EGC	1.5"				
130	8G	2 #1 & 1 #8 EGC	1.5"	8H	2 #1 & 2 #1 IG & EGC	1.5"				
150	9G	2 #1/0 & 1 #8 EGC	2"	9H	2 #1/0 & 2 #1/0 IG & EGC	2"				
175	10G	2 #2/0 & 1 #8 EGC	2"	10H	2 #2/0 & 2 #2/0 IG & EGC	2"				
200	11G	2 #3/0 & 1 #8 EGC	2"	11H	2 #3/0 & 2 #3/0 IG & EGC	2"				
230	12G	4 #4/0 & 1 #4 EGC	2.5"	12H						
255	13G	4 #250 & 1 #4 EGC	2.5"	13H						
310	14G	4 #350 & 1 #4 EGC	3"	14H						
335	15G	4 #400 & 1 #4 EGC	3"	15H						
380	16G	4 #500 & 1 #3 EGC	4"	16H						

THREE PHASE (Ø) AND SINGLE PHASE (Ø) POWER FEEDERS - BRANCH CIRCUITS - SERVICE ENTRANCE SCHEDULE UP TO 1,200A

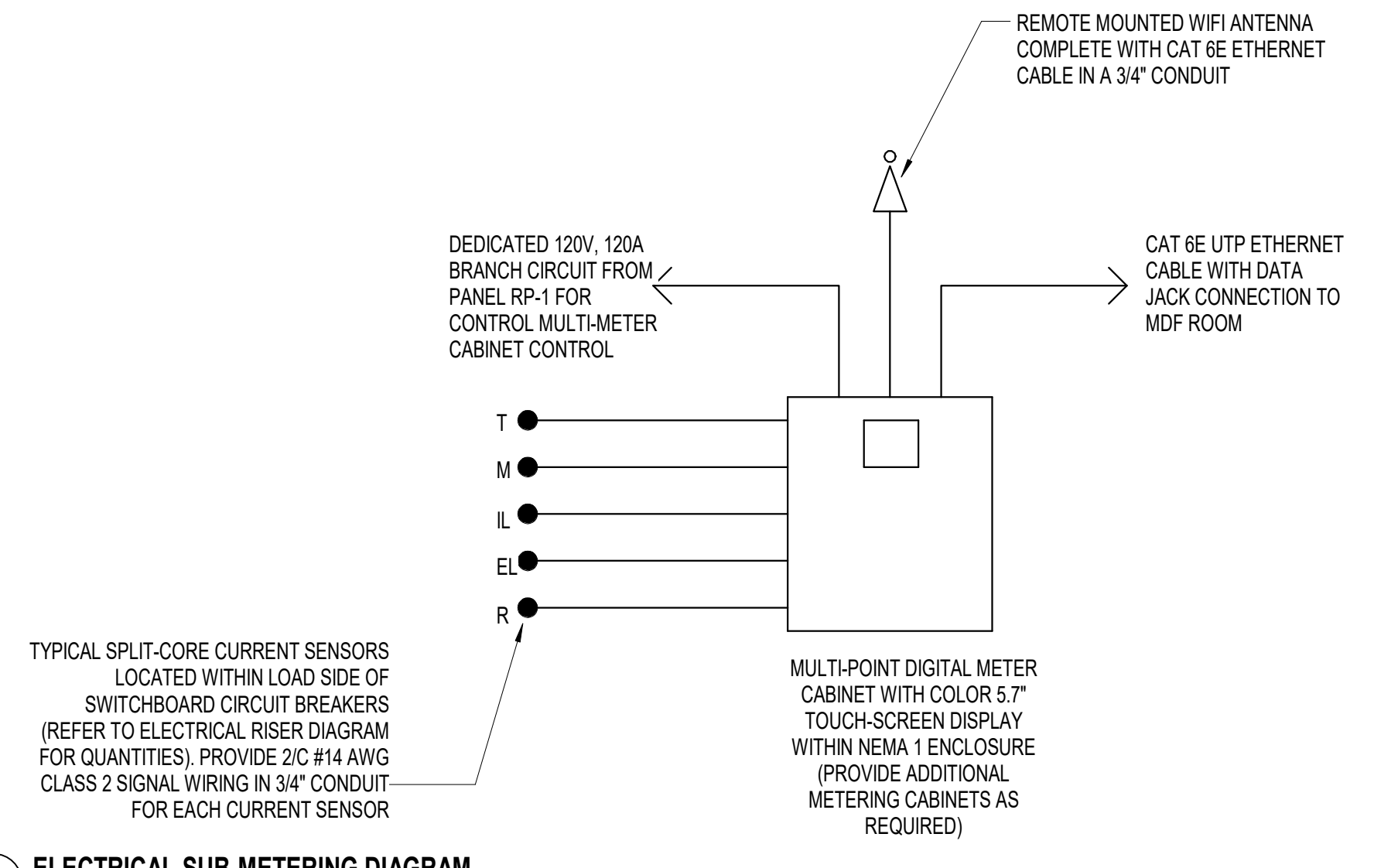
TABLE A: FEEDER-BRANCH CIRCUITS 3Ø 3W NO GC 'NEUTRAL' AND WITH 'GROUND' EGC								TABLE B: FEEDER-BRANCH CIRCUITS 3Ø 4W WITH GC 'NEUTRAL' & 'GROUND' EGC			TABLE C: FEEDER-BRANCH CIRCUITS 1Ø 2W NO GC 'NEUTRAL' AND WITH GRD EGC			TABLE D: FEEDER-BRANCH CIRCUITS 3Ø 3W WITH GC 'NEUTRAL' AND WITH GRD EGC			TABLE N: SERVICE ENTRANCE 3Ø 4W WITH GC 'NEUTRAL'						
CKT	PWR	TAG	STR	COND	PWR	TAG	COND	PWR	TAG	COND	PWR	TAG	COND	PWR	TAG	COND	PWR	TAG	COND	PWR	TAG	COND	
AMPS			XHHW-2 AWG - Kcmil	SIZE					XHHW-2 AWG - Kcmil	SIZE		XHHW-2 AWG - Kcmil	SIZE	XHHW-2 AWG - Kcmil	SIZE	XHHW-2 AWG - Kcmil	SIZE	XHHW-2 AWG - Kcmil	SIZE	XHHW-2 AWG - Kcmil	SIZE	XHHW-2 AWG - Kcmil	SIZE
20	1A		3 #12 & 1 #12 EGC	3/4"	1B		4 #12 & 1 #12 EGC	3/4"	1C		2 #12 & 1 #12 EGC	3/4"	1D		3 #12 & 1 #12 EGC	3/4"	1N		NA		NA		NA
30	2A		3 #10 & 1 #10 EGC	3/4"	2B		4 #10 & 1 #10 EGC	3/4"	2C		2 #10 & 1 #10 EGC	3/4"	2D		3 #10 & 1 #10 EGC	3/4"	2N		NA		NA		NA
40	3A		3 #8 & 1 #8 EGC	3/4"	3B		4 #8 & 1 #8 EGC	3/4"	3C		2 #8 & 1 #8 EGC	3/4"	3D		3 #8 & 1 #8 EGC	3/4"	3N		NA		NA		NA
55	4A		3 #6 & 1 #8 EGC	3/4"	4B		4 #6 & 1 #8 EGC	3/4"	4C		2 #6 & 1 #8 EGC	3/4"	4D		3 #6 & 1 #8 EGC	3/4"	4N		NA		NA		NA
70	5A		3 #4 & 1 #8 EGC	3/4"	5B		4 #4 & 1 #8 EGC	3/4"	5C		2 #4 & 1 #8 EGC	3/4"	5D		3 #4 & 1 #8 EGC	3/4"	5N		NA		NA		NA
85	6A		3 #3 & 1 #8 EGC	3/4"	6B		4 #3 & 1 #8 EGC	3/4"	6C		2 #3 & 1 #8 EGC	3/4"	6D		3 #3 & 1 #8 EGC	3/4"	6N		4 #3		4 #3		1.5"
95	7A		3 #2 & 1 #8 EGC	3/4"	7B		4 #2 & 1 #8 EGC	3/4"	7C		2 #2 & 1 #8 EGC	3/4"	7D		3 #2 & 1 #8 EGC	3/4"	7N		4 #2		4 #2		1.5"
130	8A		3 #1 & 1 #8 EGC	3/4"	8B		4 #1 & 1 #8 EGC	3/4"	8C		2 #1 & 1 #8 EGC	3/4"	8D		3 #1 & 1 #8 EGC	3/4"	8N		4 #1		4 #1		1.5"
150	9A		3 #1/0 & 1 #8 EGC	3/4"	9B		4 #1/0 & 1 #8 EGC	3/4"	9C		2 #1/0 & 1 #8 EGC	3/4"	9D		3 #1/0 & 1 #8 EGC	3/4"	9N		4 #1/0		4 #1/0		2"
175	10A		3 #2/0 & 1 #8 EGC	3/4"	10B		4 #2/0 & 1 #8 EGC	3/4"	10C		2 #2/0 & 1 #8 EGC	3/4"	10D		3 #2/0 & 1 #8 EGC	3/4"	10N		4 #2/0		4 #2/0		2"
200	11A		3 #3/0 & 1 #8 EGC	3/4"	11B		4 #3/0 & 1 #8 EGC	3/4"	11C		2 #3/0 & 1 #8 EGC	3/4"	11D		3 #3/0 & 1 #8 EGC	3/4"	11N		4 #3/0		4 #3/0		2"
230	12A		3 #4/0 & 1 #4 EGC	2"	12B		4 #4/0 & 1 #4 EGC	2"	12C		2 #4/0 & 1 #4 EGC	2"	12D		3 #4/0 & 1 #4 EGC	2"	12N		4 #4/0		4 #4/0		2.5"
255	13A		3 #250 & 1 #4 EGC	2"	13B		4 #250 & 1 #4 EGC	2"	13C		2 #250 & 1 #4 EGC	2"	13D		3 #250 & 1 #4 EGC	2"	13N		4 #250		4 #250		2.5"
310	14A		3 #350 & 1 #4 EGC	2"	14B		4 #350 & 1 #4 EGC	2"	14C		2 #350 & 1 #4 EGC	2"	14D		3 #350 & 1 #4 EGC	2"	14N		4 #350		4 #350		3"
335	15A		3 #400 & 1 #3 EGC	3"	15B		4 #400 & 1 #3 EGC	3"	15C		2 #400 & 1 #3 EGC	3"	15D		3 #400 & 1 #3 EGC	3"	15N		4 #400		4 #400		3"
380	16A		3 #500 & 1 #3 EGC	3"	16B		4 #500 & 1 #3 EGC	3"	16C		2 #500 & 1 #3 EGC	3"	16D		3 #500 & 1 #3 EGC	3"	16N		4 #500		4 #500		3.5"
420	17A		3 #600 & 1 #3 EGC	4"	17B		4 #600 & 1 #3 EGC	4"	17C		2 #600 & 1 #3 EGC	4"	17D		3 #600 & 1 #3 EGC	4"	17N		4 #600		4 #600		4"
460	18A		2 Sets 3 #4/0 & 1 #2 EGC	2" EA	18B		2 Sets 4 #4/0 & 1 #2 EGC	2.5" EA	18C		2 Sets 2 #4/0 & 1 #2 EGC	2" EA	18D		2 Sets 3 #4/0 & 1 #2 EGC	2" EA	18N		2 Sets 4 #4/0		2 Sets 4 #4/0		2.5" EA
510	19A		2 Sets 3 #250 & 1 #2 EGC	2.5" EA	19B		2 Sets 4 #250 & 1 #2 EGC	2.5" EA	19C		2 Sets 2 #250 & 1 #2 EGC	2" EA	19D		2 Sets 3 #250 & 1 #2 EGC	2.5" EA	19N		2 Sets 4 #250		2 Sets 4 #250		2.5" EA
620	20A		2 Sets 3 #350 & 1 #1 EGC	3" EA	20B		2 Sets 4 #350 & 1 #1 EGC	3" EA	20C		2 Sets 2 #350 & 1 #1 EGC	2.5" EA	20D		2 Sets 3 #350 & 1 #1 EGC	2.5" EA	20N		2 Sets 4 #350		2 Sets 4 #350		3" EA
670	21A		2 Sets 3 #400 & 1 #1/0 EGC	3" EA	21B		2 Sets 4 #400 & 1 #1/0 EGC	3" EA	21C		2 Sets 2 #400 & 1 #1/0 EGC	3" EA	21D		2 Sets 3 #400 & 1 #1/0 EGC	3" EA	21N		2 Sets 4 #400		2 Sets 4 #400		3" EA
690	22A		3 Sets 3 #400 & 1 #1/0 EGC	3" EA	22B		3 Sets 4 #400 & 1 #1/0 EGC	2.5" EA	22C		3 Sets 2 #400 & 1 #1/0 EGC	2" EA	22D		3 Sets 3 #400 & 1 #1/0 EGC	2" EA	22N		3 Sets 4 #400		3 Sets 4 #400		2.5" EA
840	23A		2 Sets 3 #600 & 1 #1/0 EGC	3.5" EA	23B		2 Sets 4 #600 & 1 #1/0 EGC	3" EA	23C		2 Sets 2 #600 & 1 #1/0 EGC	3.5" EA	23D		2 Sets 3 #600 & 1 #1/0 EGC	3.5" EA	23N		2 Sets 4 #600		2 Sets 4 #600		4" EA
1005	24A		3 Sets 3 #400 & 1 #2/0 EGC	3" EA	24B		3 Sets 4 #400 & 1 #2/0 EGC	3" EA	24C		3 Sets 2 #400 & 1 #2/0 EGC	3" EA	24D		3 Sets 3 #400 & 1 #2/0 EGC	3" EA	24N		3 Sets 4 #400		3 Sets 4 #400		3" EA
1020	25A		4 Sets 3 #400 & 1 #2/0 EGC	3" EA	25B		4 Sets 4 #250 & 1 #2/0 EGC	2.5" EA	25C		4 Sets 2 #250 & 1 #2/0 EGC	2" EA	25D		4 Sets 3 #250 & 1 #2/0 EGC	2.5" EA	25N		4 Sets 4 #250		4 Sets 4 #250		2.5" EA
1140	26A		3 Sets 3 #500 & 1 #3/0 EGC	3" EA	26B		3 Sets 4 #500 & 1 #3/0 EGC	3.5" EA	26C		3 Sets 2 #500 & 1 #3/0 EGC	3" EA	26D		3 Sets 3 #500 & 1 #3/0 EGC	3.5" EA	26N		3 Sets 4 #500		3 Sets 4 #500		3.5" EA
1240	27A		4 Sets 3 #500 & 1 #3/0 EGC	3" EA	27B		4 Sets 4 #350 & 1 #3/0 EGC	3" EA	27C		4 Sets 2 #350 & 1 #3/0 EGC	2.5" EA	27D		4 Sets 3 #350 & 1 #3/0 EGC	2.5" EA	27N		4 Sets 4 #350		4 Sets 4 #350		3" EA

ASHRAE 90.1 REQUIRES METERS IN COMMERCIAL BUILDINGS TO MONITOR THE FOLLOWING SEPARATELY:

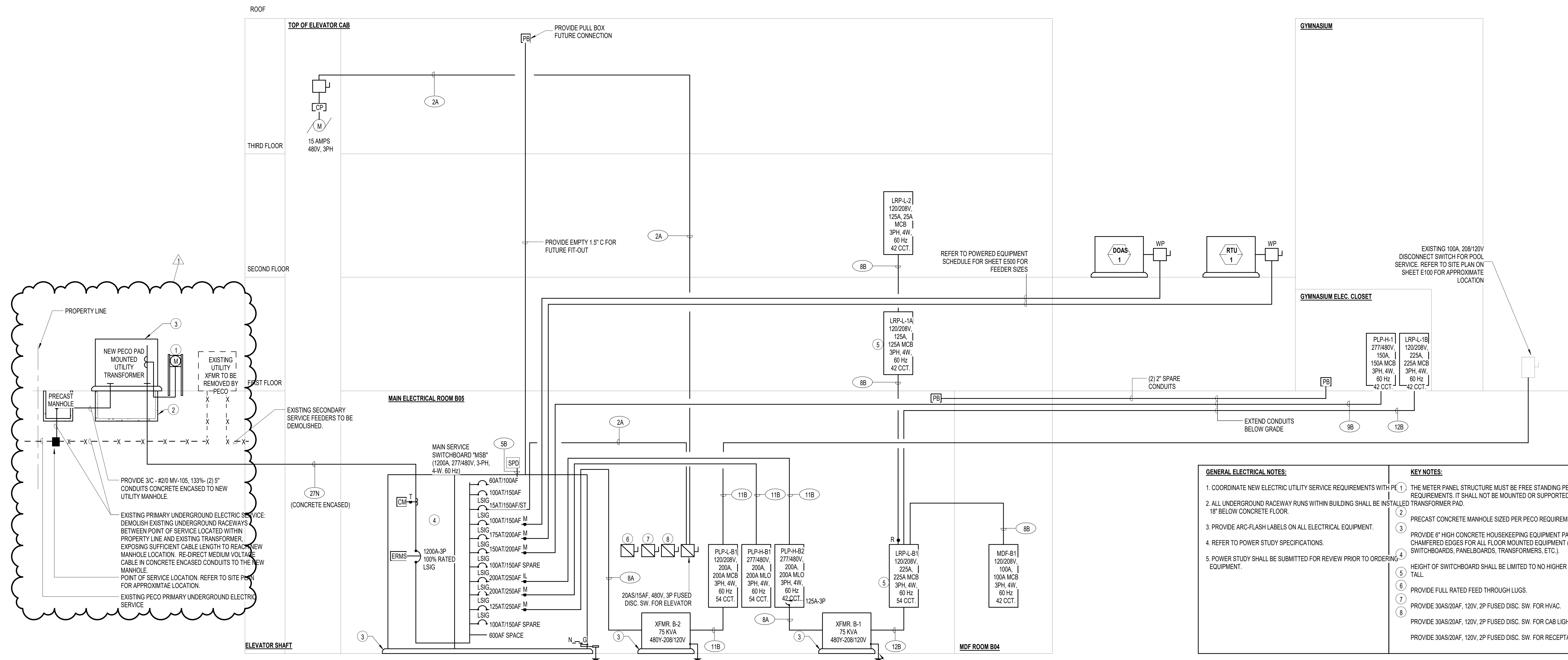
- TOTAL ELECTRICAL ENERGY
- HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEMS
- INTERIOR LIGHTING
- EXTERIOR LIGHTING
- RECEPTACLE CIRCUITS

THE ELECTRICAL CONTRACTOR SHALL PROVIDE ELECTRICITY METERING SYSTEM COMPLETE WITH DIGITAL METERS, METERING EQUIPMENT, COMMUNICATIONS BOARDS, HARDWARE, SOFTWARE, FUSE KIT AND BONDING KITS, ANTENNAS, COMMUNICATION PROTOCOL, INTERFACE MODULES/CARDS, INCLUDING BUT NOT LIMITED TO ALL SIGNAL AND COMMUNICATION WIRING AND RACEWAYS, CONNECTIONS, CTS, PTS, AND RELATED EQUIPMENT REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL TURN-KEY ENERGY MONITORING SYSTEM. PROVIDE ALL PROGRAMMING, TESTING AND ON-SITE TRAINING OF USING AGENCY PERSONNEL. REFER TO SPECIFICATION SECTION 26.27.14-ELECTRICITY SUB-METERING FOR ADDITIONAL INFORMATION

- T ● CURRENT SENSOR FOR TOTAL BUILDING ENERGY
- M ● CURRENT SENSOR FOR HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEMS ENERGY
- IL ● CURRENT SENSOR FOR INTERIOR LIGHTING ENERGY
- EL ● CURRENT SENSOR FOR EXTERIOR LIGHTING ENERGY
- R ● CURRENT SENSOR FOR RECEPTACLE ENERGY



2 ELECTRICAL SUB-METERING DIAGRAM
NTS



- | | |
|--|---|
| GENERAL ELECTRICAL NOTES: <ol style="list-style-type: none"> COORDINATE NEW ELECTRIC UTILITY SERVICE REQUIREMENTS WITH PE 1 ALL UNDERGROUND RACEWAY RUNS WITHIN BUILDING SHALL BE INSTALLED TRANSFORMER PAD. PROVIDE ARC-FLASH LABELS ON ALL ELECTRICAL EQUIPMENT. REFER TO POWER STUDY SPECIFICATIONS. POWER STUDY SHALL BE SUBMITTED FOR REVIEW PRIOR TO ORDERING EQUIPMENT. | KEY NOTES: <ol style="list-style-type: none"> THE METER PANEL STRUCTURE MUST BE FREE STANDING PER PECO REQUIREMENTS. IT SHALL NOT BE MOUNTED OR SUPPORTED BY 18" BELOW CONCRETE FLOOR. PRECAST CONCRETE MANHOLE SIZED PER PECO REQUIREMENTS. PROVIDE 6" HIGH CONCRETE HOUSEKEEPING EQUIPMENT PAD WITH CHAMFERED EDGES FOR ALL FLOOR MOUNTED EQUIPMENT (I.E., SWITCHBOARDS, PANELBOARDS, TRANSFORMERS, ETC.). HEIGHT OF SWITCHBOARD SHALL BE LIMITED TO NO HIGHER THAN 75" TALL. PROVIDE FULL RATED FEED THROUGH LUGS. PROVIDE 30AS/20AF, 120V, 2P FUSED DISC. SW. FOR HVAC. PROVIDE 30AS/20AF, 120V, 2P FUSED DISC. SW. FOR CAB LIGHTING. PROVIDE 30AS/20AF, 120V, 2P FUSED DISC. SW. FOR RECEPTACLE |
|--|---|

1 ELECTRICAL RISER
NTS

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2020 Francis J. Myers Title Block version 2022.09.14 FRM\RMR 6:56:56 PM



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1	5/26/23	BID ADDENDUM #2
DATE:	DESCRIPTION:	

FRANCIS J. MYERS RECREATION CENTER
SITE AND BUILDING IMPROVEMENTS
5800 Chester Ave
Philadelphia, PA 19143

PROJECT #: 2020
SCALE: 1/2" = 1'-0"
FORMAT: 30" X 42"
DRAWN: LL
CHECKED: JC
DATE: 4/7/2023

SHEET NAME:
ELECTRICAL RISER DIAGRAMS

SHEET NUMBER:
E400

PROJECT PHASE:
CONSTRUCTION DOCUMENTS

APPROVAL STAMP AREA

CLIENT
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1	5/28/23	BID ADDENDUM #2
△	DATE:	DESCRIPTION:

FRANCIS J. MYERS RECREATION CENTER SITE AND BUILDING IMPROVEMENTS

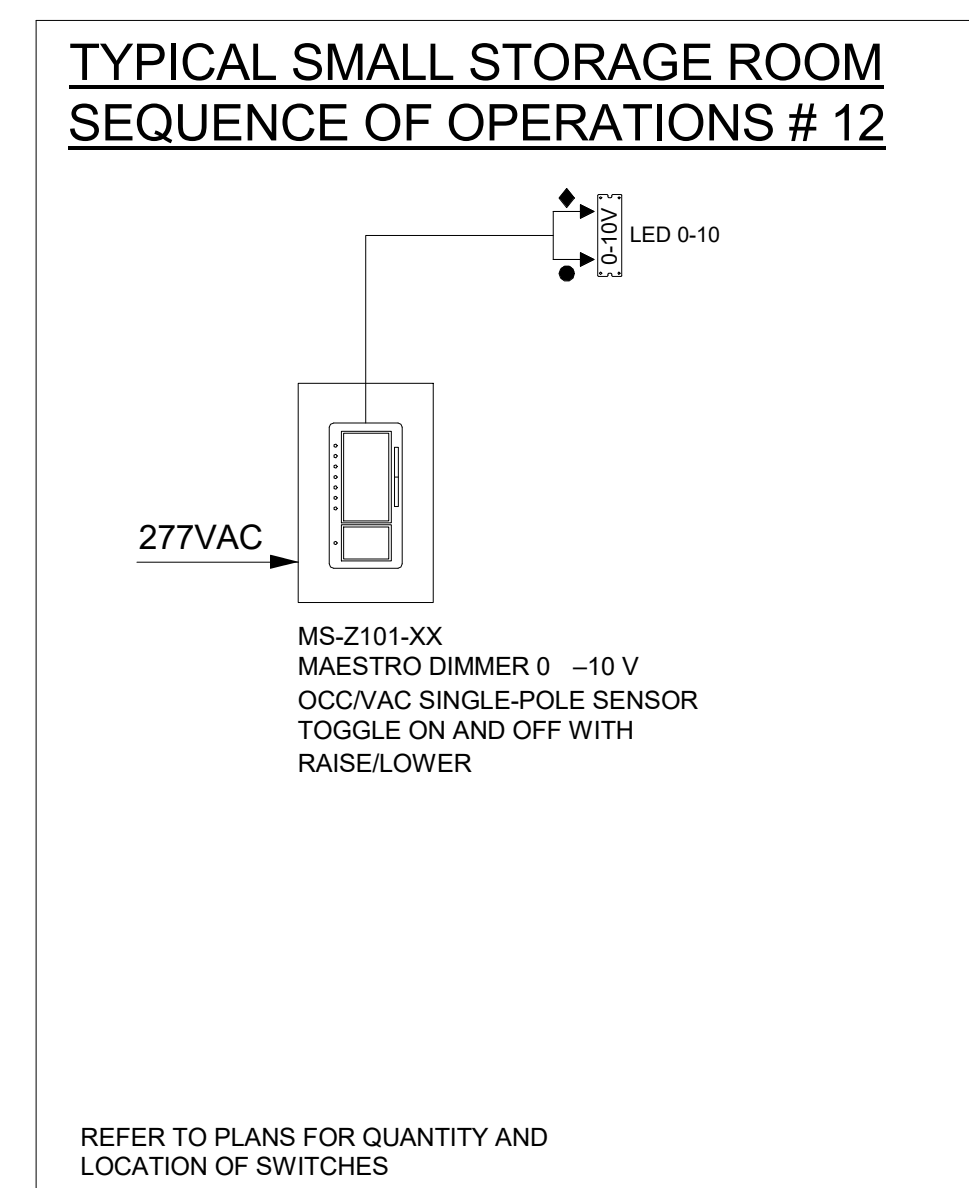
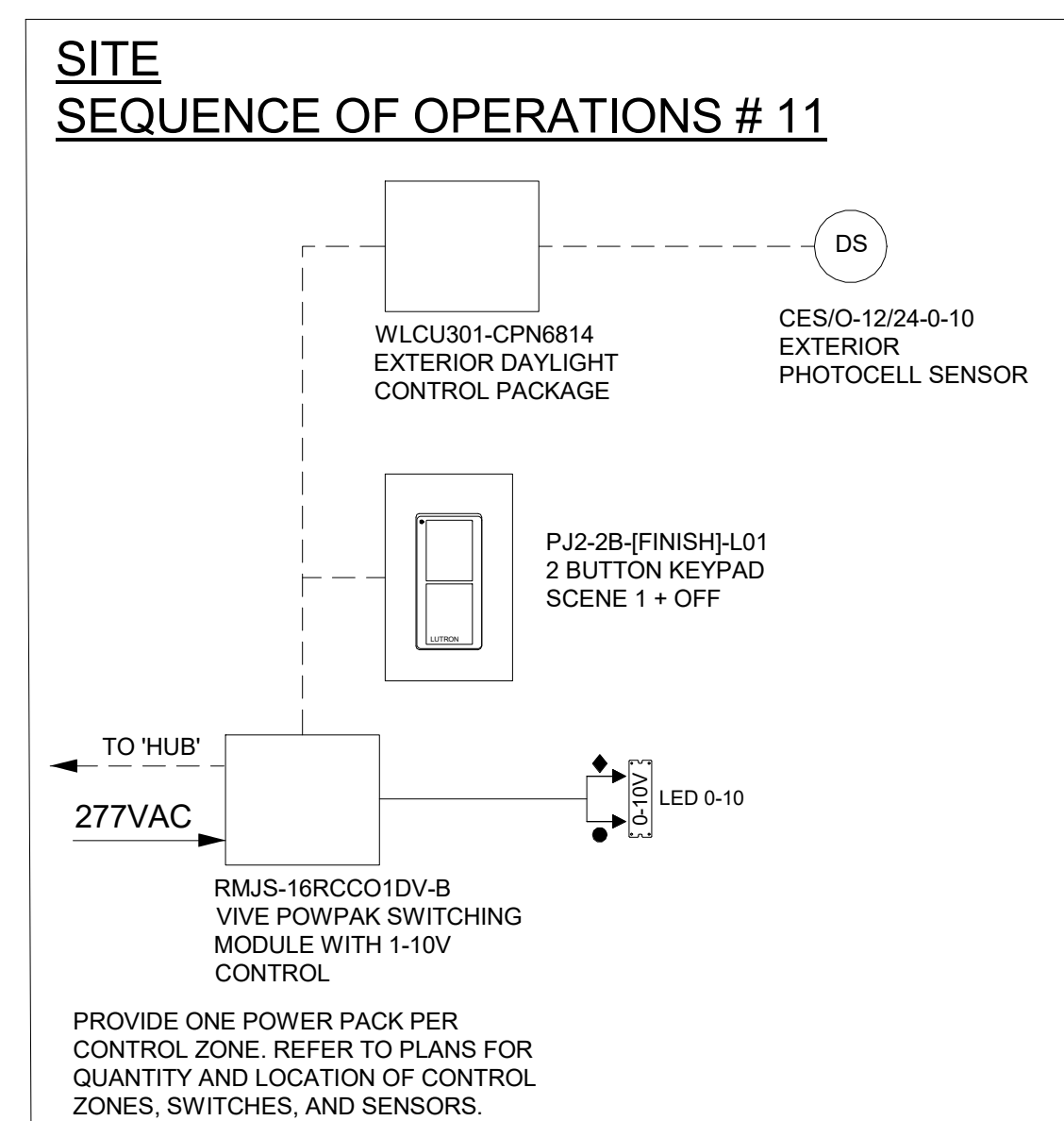
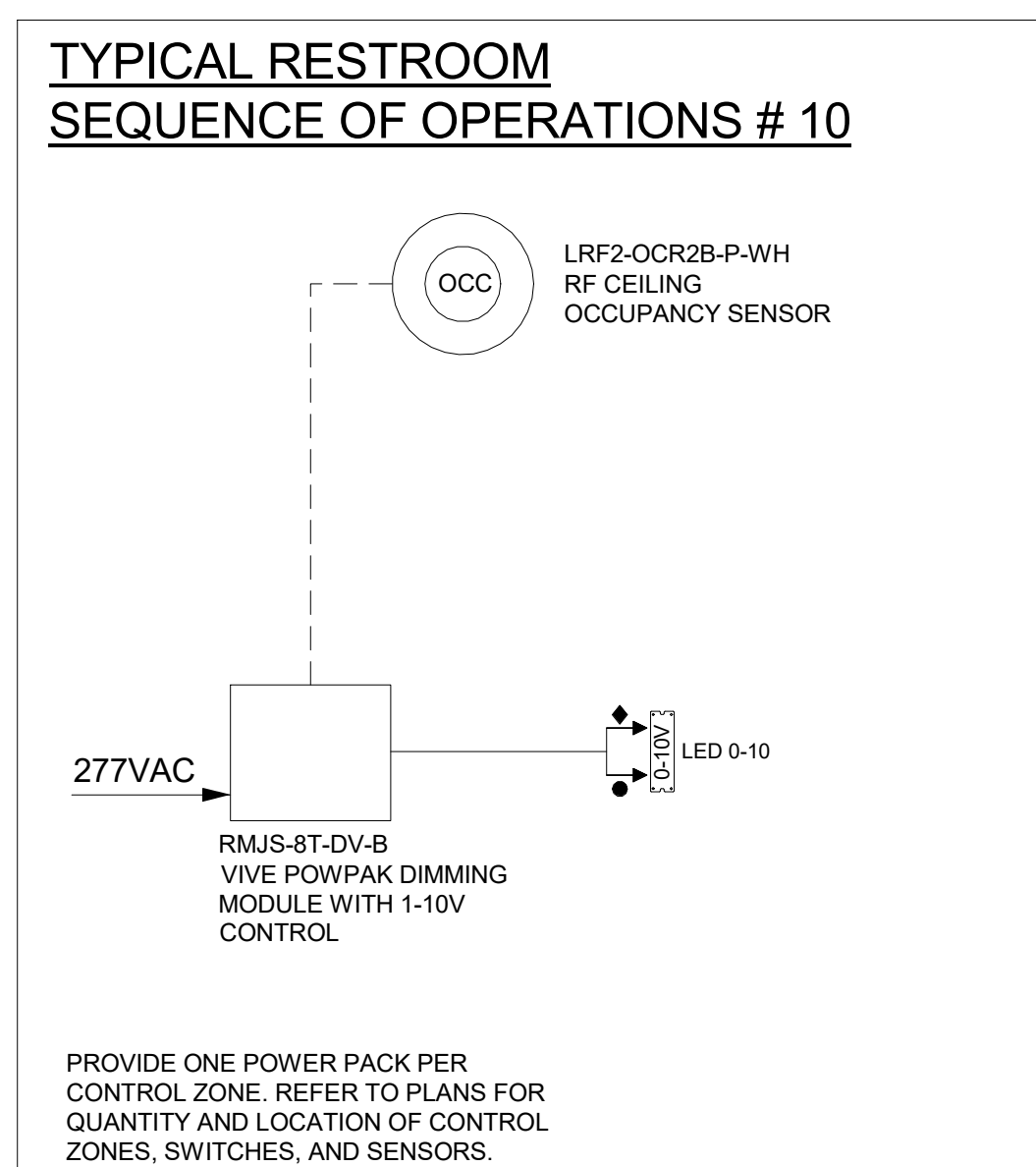
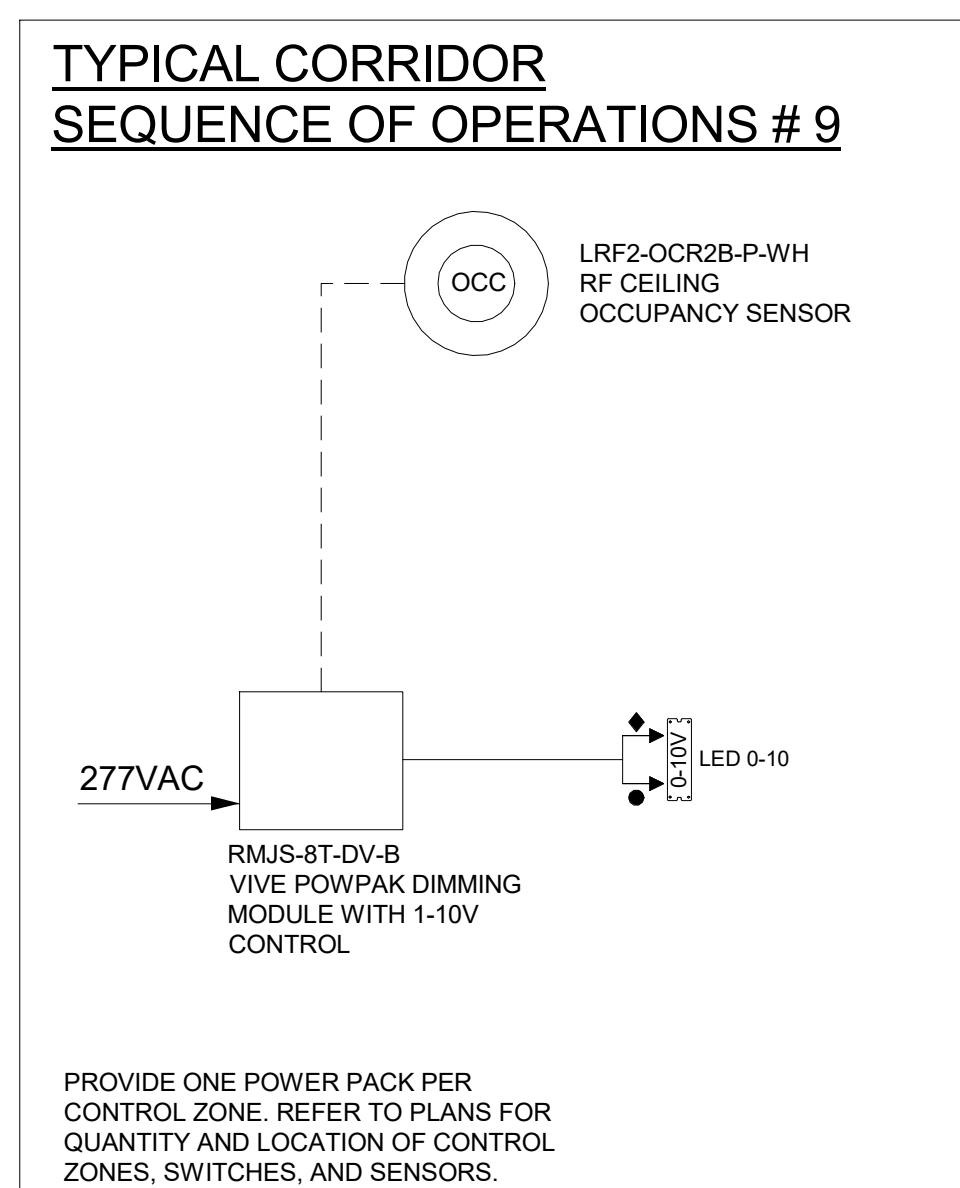
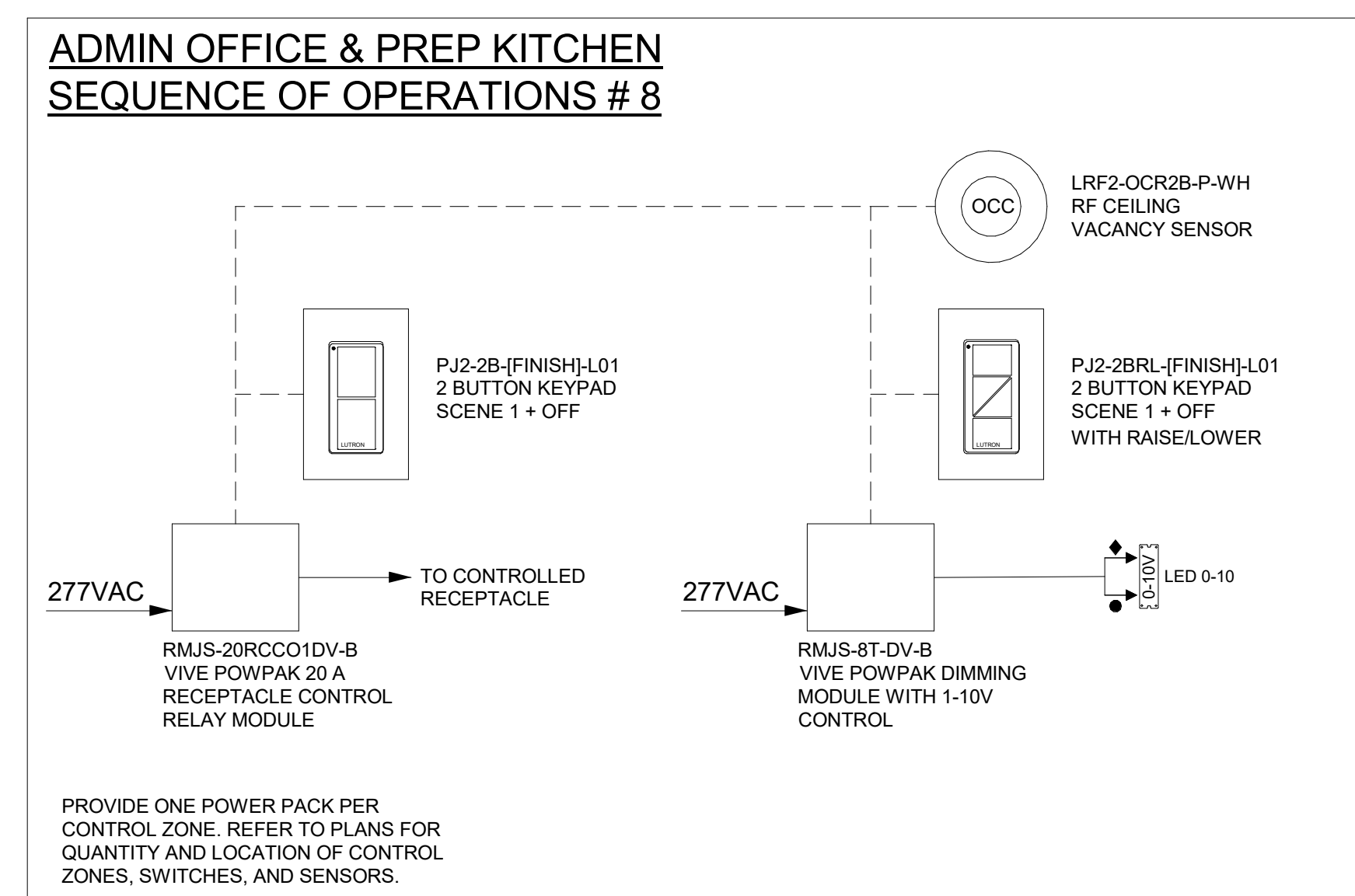
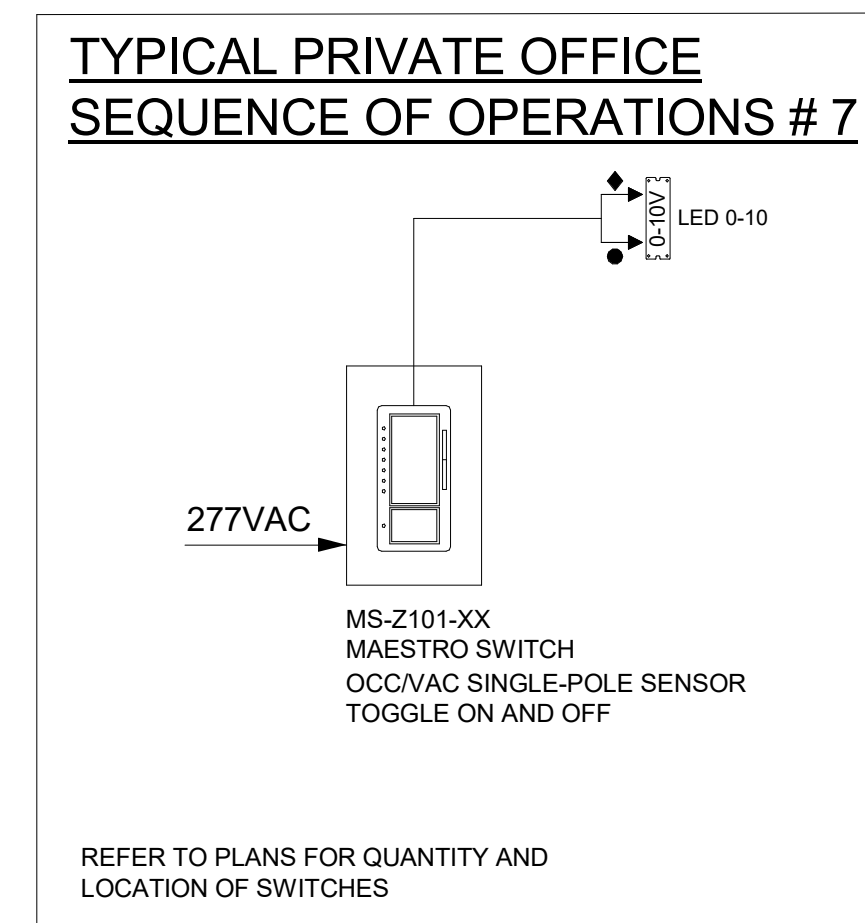
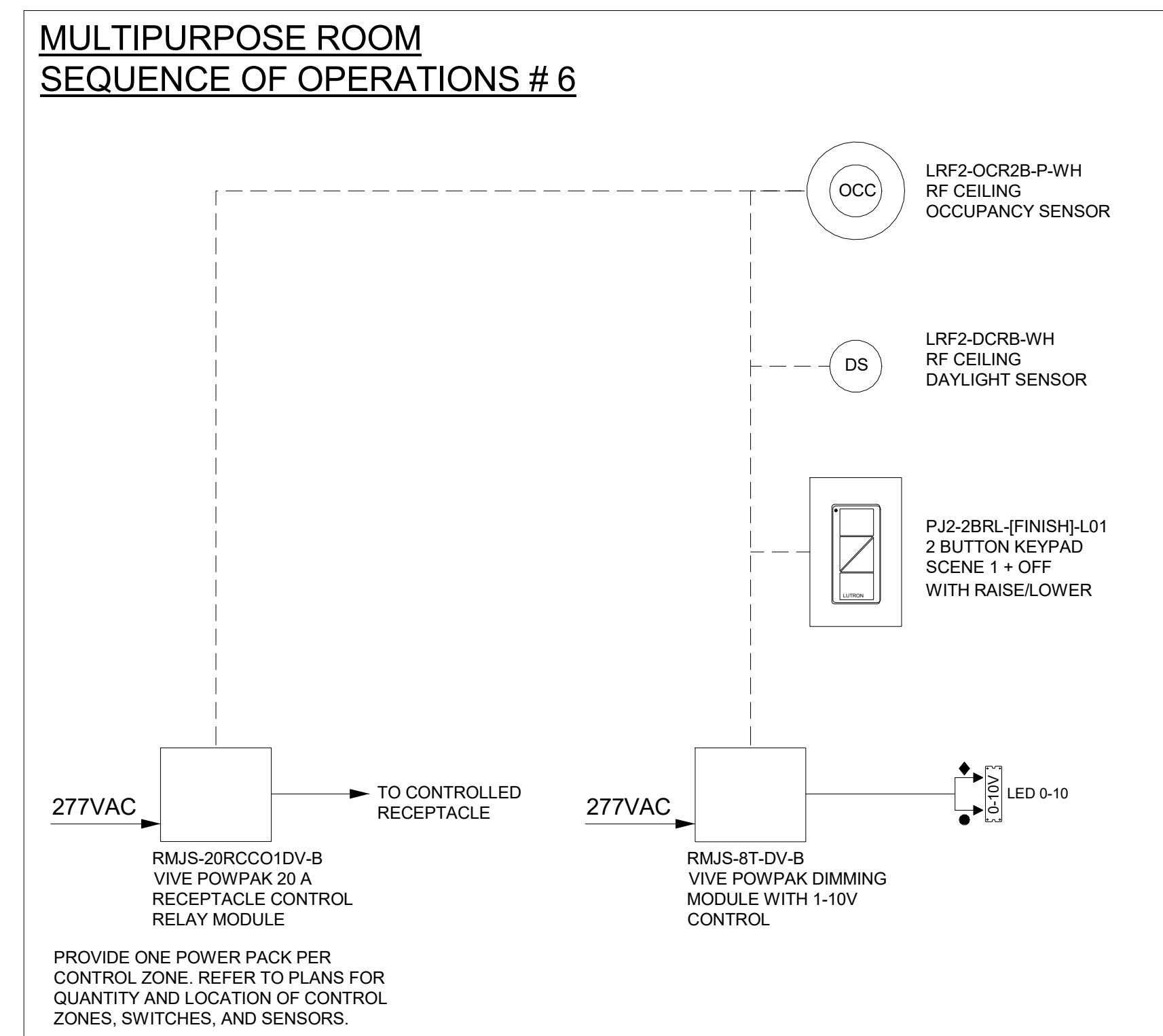
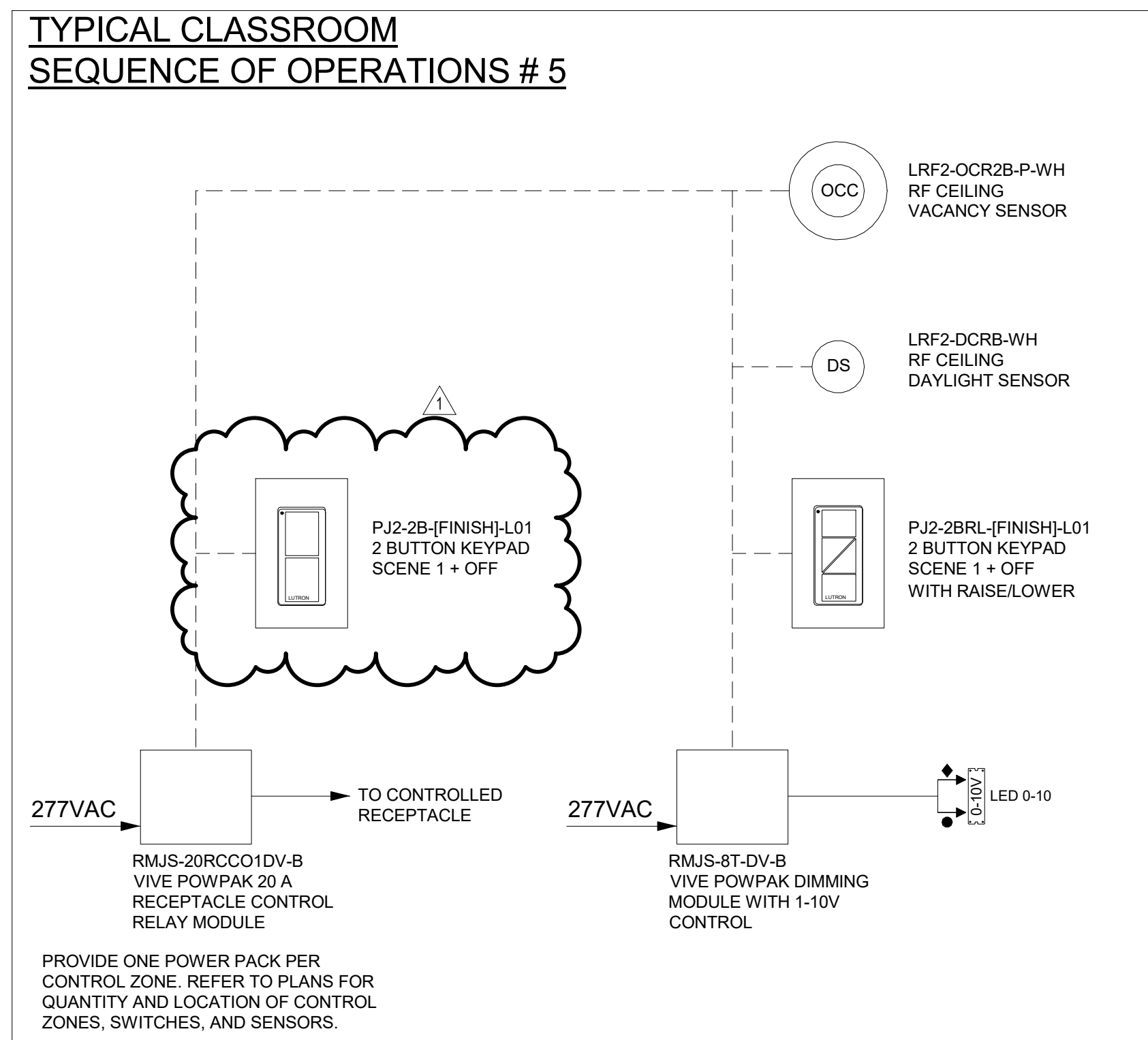
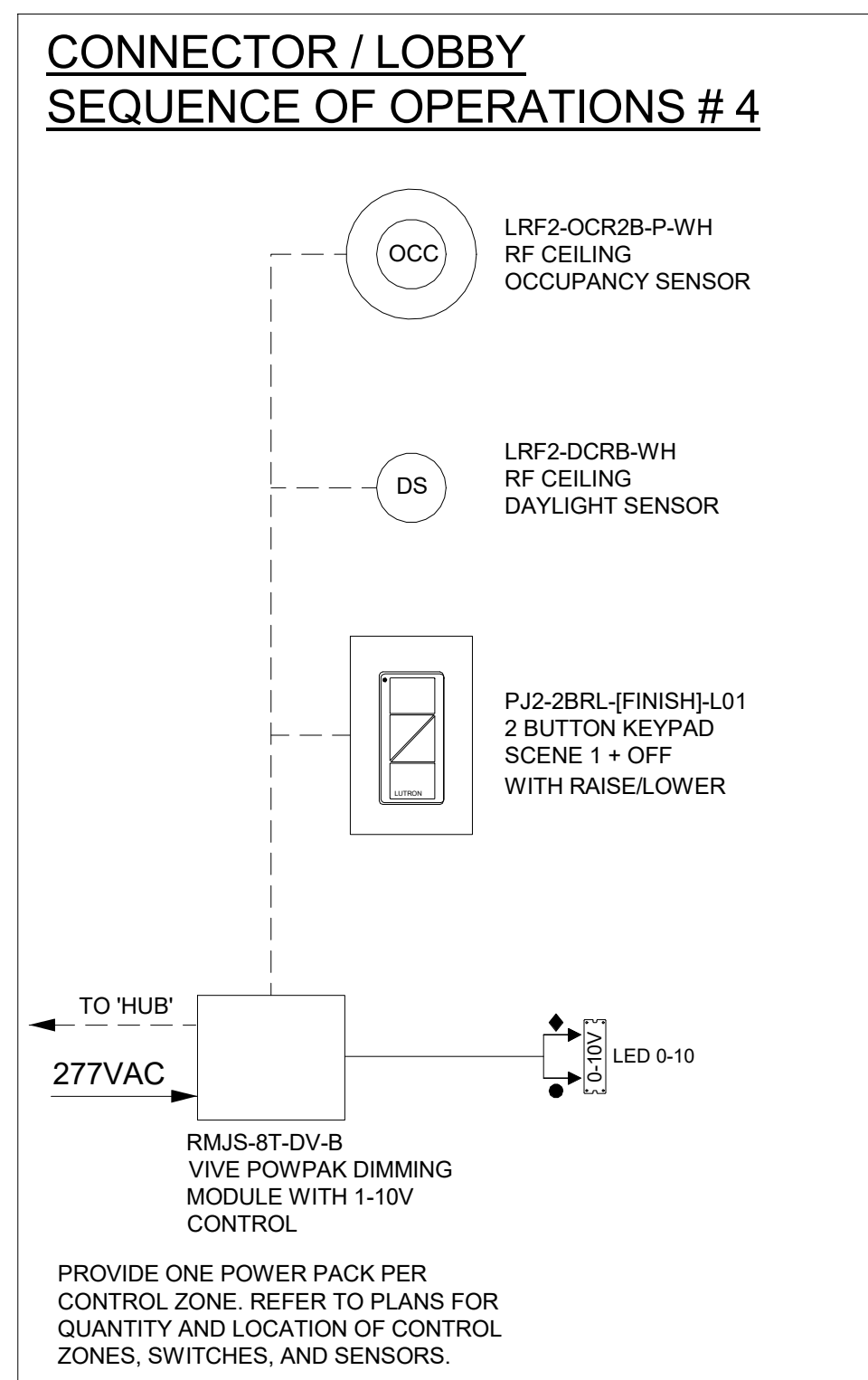
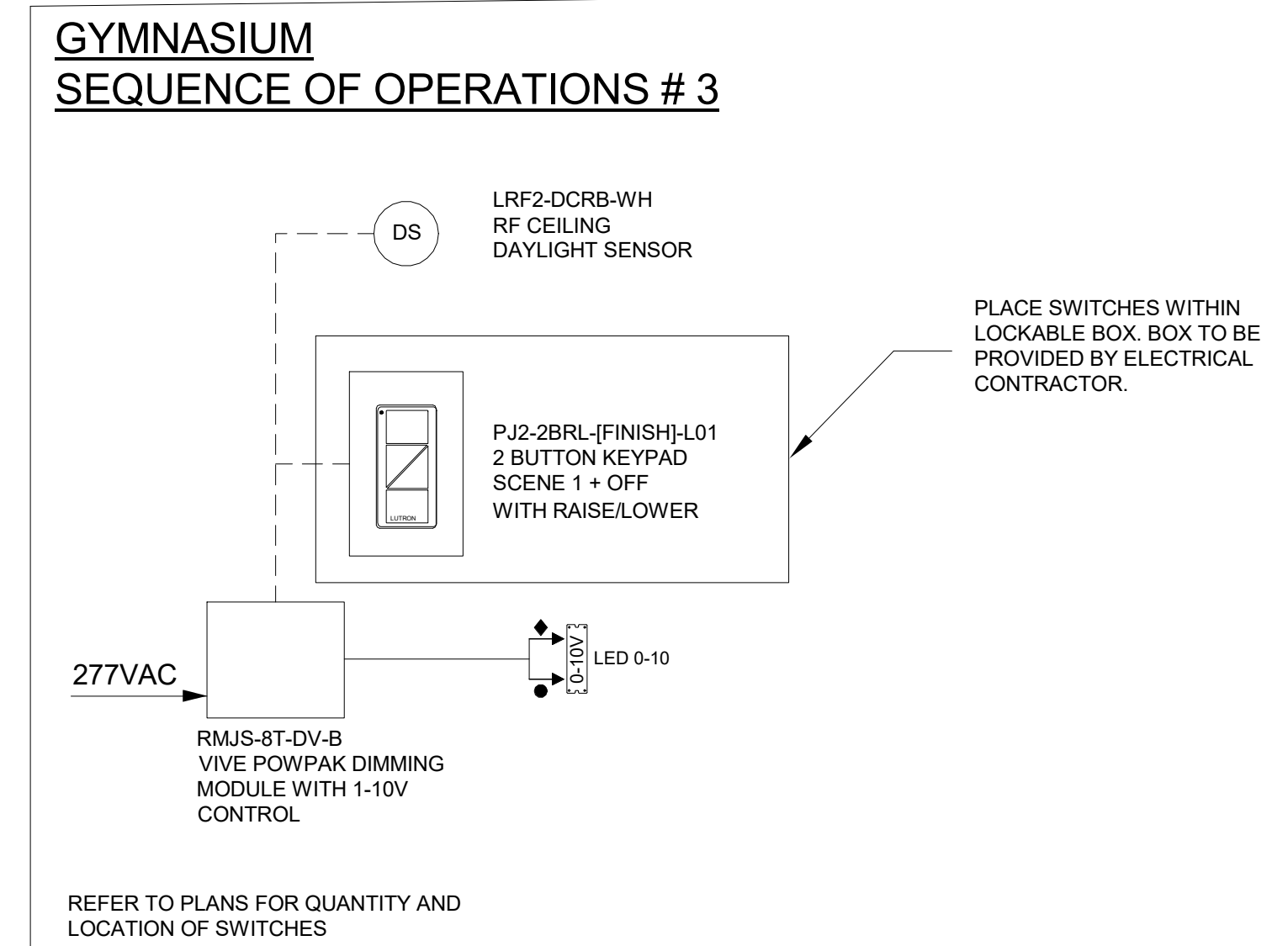
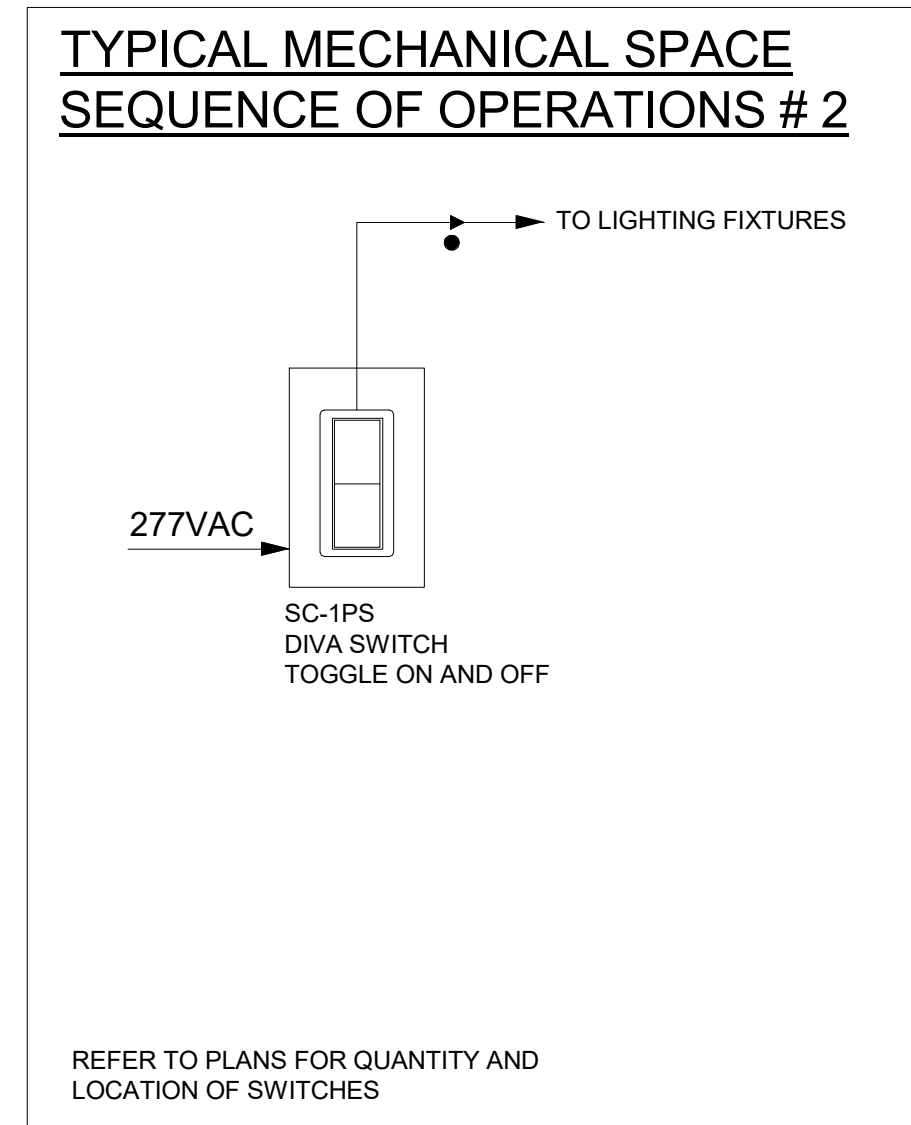
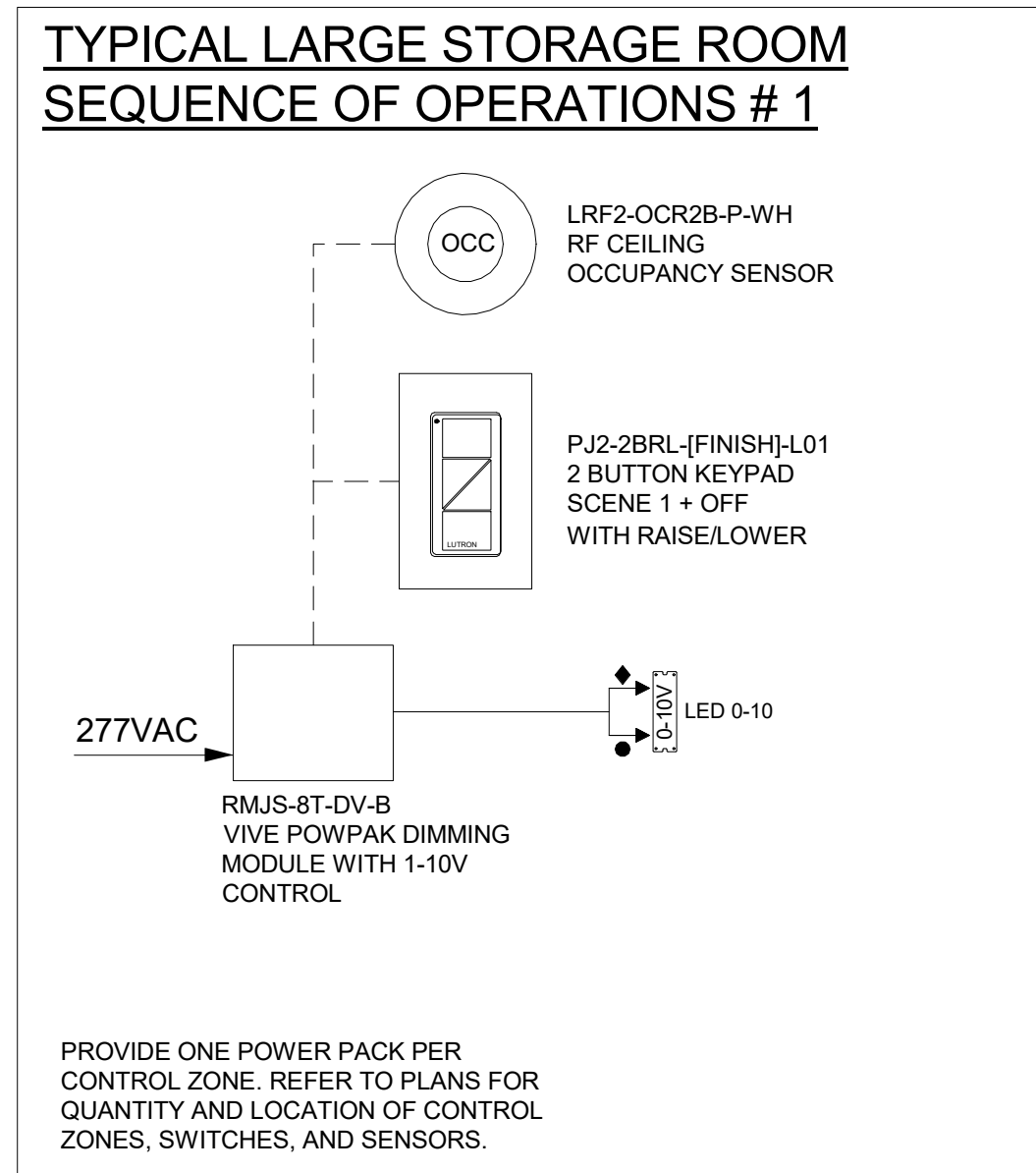
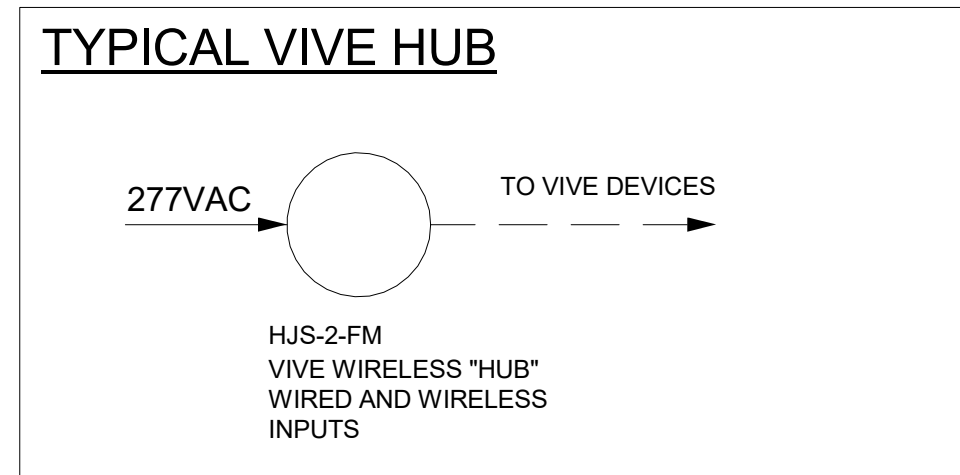
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DATE:	4/7/2023

SHEET NAME:
LIGHTING CONTROL SCHEDULES

SHEET NUMBER:
E521

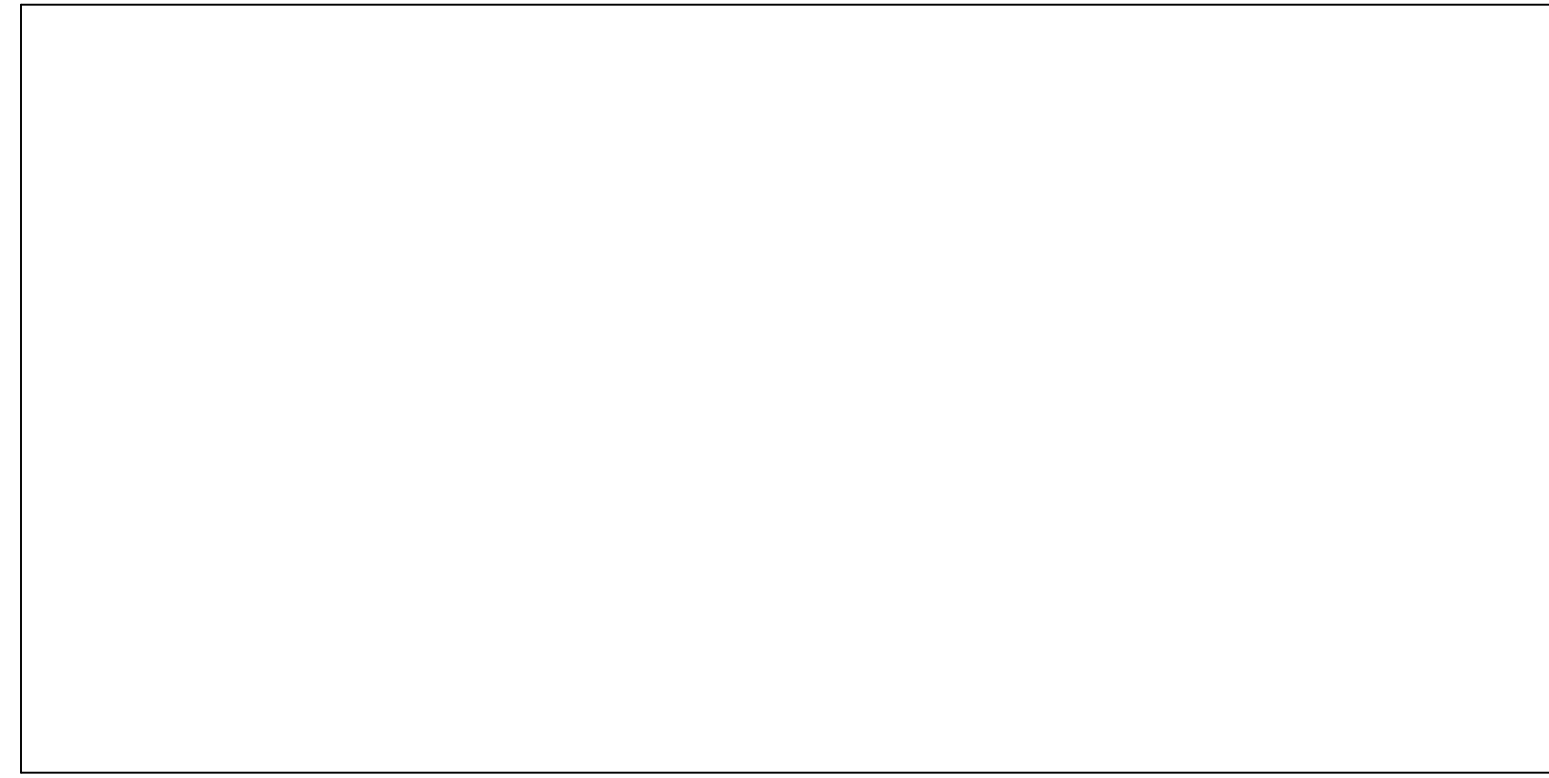
PROJECT PHASE:
CONSTRUCTION DOCUMENTS



WIRE LEGEND

- NORMAL INPUT POWER 2 #12 AWG (4 SQ MM) + GROUND
- NORMAL EMERGENCY INPUT POWER 2 #12 AWG (4 SQ MM) + GROUND
- 2 #12 AWG (4 SQ MM) + GROUND
- ◆ 0-10 V SIGNAL 2#18AWG (1.0 SQ MM)
- RF CONNECTION
- WIRED CONNECTION

APPROVAL STAMP AREA



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FRANCIS MYERS RECREATION CENTER PHILADELPHIA, PA			TLP PROJECT NUMBER 2014	TLP ISSUE DATE 03/31/2023		
LIGHTING CONTROL SEQUENCE OF OPERATIONS						
SOOF#	AREAS CONTROLLED	FUNCTIONALITY DURING PEAK HOURS	FUNCTIONALITY DURING OFF-PEAK HOURS	PRIMARY DEVICES	COMMISSIONING	NOTES
1	LARGE STORAGE	- OCCUPIED - AUTO ON TO 50% - MANUAL ADJUSTMENT TO 100% - UNOCCUPIED - AUTO OFF	- SAME AS PEAK HOURS	- DIMMING SWITCHES - CEILING OCCUPANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 5 MINUTES	1, 2
2	MEP, IT, UTILITY SPACES	- MANUAL ON - MANUAL OFF	- SAME AS PEAK HOURS	- ON/OFF SWITCH	- N/A	2
3	GYMNASIUM	- MANUAL ON TO HIGH END TRIM - MANUAL OFF - DAYLIGHT RESPONSIVE DIMMING	- SAME AS PEAK HOURS	- DIMMING SWITCHES WITH LOCKABLE BOX - CEILING DAYLIGHT SENSOR	- HIGH END TRIM: 50FC AVERAGE WITHIN PLAYING AREA - DAYLIGHT RESPONSIVE DIMMING AVERAGE LEVEL: 80FC WITHIN PLAYING AREA - UNOCCUPIED TIMEOUT DELAY: 20 MINUTES	2, 3
4	CONNECTOR/Lobby	- OCCUPIED - AUTO ON TO 80% - UNOCCUPIED - AUTO DIM TO 30% - MANUAL OFF - DAYLIGHT RESPONSIVE DIMMING	- SAME AS PEAK HOURS	- DIMMING SWITCHES - CEILING OCCUPANCY SENSOR - CEILING DAYLIGHT SENSOR	- LUMINAIRES TO REMAIN ON AT 30% WHEN UNOCCUPIED - DAYLIGHT RESPONSIVE DIMMING AMBIENT LEVEL: 30FC	1, 2, 3
5	CLASSROOMS	- OCCUPIED - MANUAL ON - UNOCCUPIED - AUTO OFF - DAYLIGHT RESPONSIVE DIMMING	- SAME AS PEAK HOURS	- DIMMING SWITCHES - CEILING VACANCY SENSOR - CEILING DAYLIGHT SENSOR - SENSOR & SWITCH CONTROLLED RECEPTACLES	- UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2
6	MULTIPURPOSE ROOM	- OCCUPIED - AUTO ON - UNOCCUPIED - AUTO OFF - DAYLIGHT RESPONSIVE DIMMING	- SAME AS PEAK HOURS	- DIMMING SWITCHES - CEILING OCCUPANCY SENSOR - CEILING DAYLIGHT SENSOR - SENSOR CONTROLLED RECEPTACLES	- DAYLIGHT RESPONSIVE DIMMING AVERAGE LEVEL: 40FC - UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2, 3
7	PRIVATE OFFICES	- OCCUPIED - MANUAL ON - UNOCCUPIED - AUTO OFF	- SAME AS PEAK HOURS	- DIMMING SWITCHES - CEILING VACANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2
8	ADMIN & PREP KITCHEN	- OCCUPIED - MANUAL ON - UNOCCUPIED - AUTO OFF	- SAME AS PEAK HOURS	- DIMMING SWITCHES - CEILING VACANCY SENSOR - SENSOR & SWITCH CONTROLLED RECEPTACLES	- UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2
9	CORRIDORS	- OCCUPIED - AUTO ON TO 80% - UNOCCUPIED - AUTO DIM TO 30%	- SAME AS PEAK HOURS	- CEILING OCCUPANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2
10	RESTROOMS	- OCCUPIED - AUTO ON - UNOCCUPIED - AUTO OFF	- SAME AS PEAK HOURS	- CEILING OCCUPANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 20 MINUTES	1, 2
11	EXTERIOR/ SITE	- TIMELOCK ON/OFF - PHOTOCELL ON WHEN LIGHT LEVELS ARE LOW ENOUGH	- SAME AS PEAK HOURS	- ON/OFF SWITCH - EXTERIOR PHOTOCELL	- TIMELOCK ON 30-MINUTES BEFORE SUNSET - TIMELOCK OFF 30-MINUTES AFTER SUNRISE - PHOTOCELL ON WHEN LIGHT LEVELS ARE 10FC OR LESS	NA
12	SMALL STORAGE	- MANUAL ON TO 100% - UNOCCUPIED - AUTO OFF	- SAME AS PEAK HOURS	- DIMMING SWITCH WITH INTEGRAL VACANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 5 MINUTES	1, 2
13	STAIRS	- OCCUPIED - AUTO ON TO 80% - UNOCCUPIED - AUTO DIM TO 30%	- SAME AS PEAK HOURS	- FIXTURE ONBOARD OCCUPANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2
14	CLOSETS	- OCCUPIED - AUTO ON TO 80% - UNOCCUPIED - AUTO OFF	- SAME AS PEAK HOURS	- FIXTURE ONBOARD OCCUPANCY SENSOR	- UNOCCUPIED TIMEOUT DELAY: 15 MINUTES	1, 2

- NOTES:
- CEILING SENSOR SHALL PROVIDE OVERALL CONTROL FOR ALL ZONES WITHIN AREA.
 - EMERGENCY LIGHTING LOCATED WITHIN DIMMING ZONES SHALL HAVE THE CAPABILITY TO DIM.
 - ALL DAYLIGHT RESPONSIVE DIMMING AMBIENT LEVELS TO BE REVIEWED WITH OWNER DURING COMMISSIONING FOR FINAL APPROVAL.

OPERATING HOURS:
PEAK HOURS
Monday - Friday, 8:00AM TO 7:00PM

OFF-PEAK HOURS
Monday - Friday, 7:00PM TO 11:00PM
Saturday - Sunday, 7:00PM TO 11:00PM

2 LIGHTING CONTROL SEQUENCE
NTS

CONTROL SYSTEM NOTES:

- CONTROL SYSTEM TO BE PRODUCTS BY LUTRON ELECTRONICS. AT A MINIMUM, SYSTEMS SHALL HAVE THE FOLLOWING CAPABILITIES:
 - PROVIDE AUTOMATED ASTRONOMIC AND REALTIME TIMELOCK PRESET LIGHTING CONTROL.
 - PROVIDE DIMMING RANGE FOR EACH FIXTURE TYPE AS INDICATED IN LIGHTING FIXTURE SCHEDULE.
 - DIMMING OF LIGHTING FIXTURES DESIGNATED TO BE CONTROLLED BY EMERGENCY LIGHTING SYSTEM SHALL BE PROGRAMMED TO OPERATE ON THE SAME CONTROL ZONE AS NORMAL LIGHTING FIXTURES. LIGHTING FIXTURES DESIGNATED TO BE CONTROLLED BY EMERGENCY LIGHTING SYSTEM SHALL BE DIMMABLE FOR THE FULL RANGE AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE, BUT IN CASE OF EMERGENCY WILL DEFAULT TO FULL-ON CONDITION.
- LOCATION OF ALL CONTROL AND INTERFACE DEVICES TO BE COORDINATED WITH PROJECT ELECTRICAL ENGINEER, DESIGN PROFESSIONAL, AND THE OWNER.
- FINISHES TO BE COORDINATED WITH DESIGN PROFESSIONAL PRIOR TO RELEASE OF ORDER.
- ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL ALL NECESSARY MOUNTING FASTENERS AND EQUIPMENT FOR COMPLETE AND CODE-COMPLIANT INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL CAT-6 ETHERNET CABLE, LOW VOLTAGE WIRING, MISCELLANEOUS WIRING, AND HARDWARE AS RECOMMENDED BY MANUFACTURER FOR FULLY OPERATIONAL LIGHTING SYSTEM.
- INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS.
- PC FOR PROGRAMMING OF LIGHTING CONTROL SYSTEM SHALL MEET MINIMUM SYSTEM REQUIREMENTS AS SPECIFIED BY CONTROL SYSTEM MANUFACTURER. PC TO BE PROVIDED BY CONTRACTOR, PROGRAMMING SOFTWARE PROVIDED BY CONTROL MANUFACTURER.
- ELECTRICAL CONTRACTOR TO PROVIDE SUBMITTALS FOR REVIEW BY DESIGN PROFESSIONAL. SUBMITTALS TO INCLUDE DATA SHEETS FOR ALL SYSTEM COMPONENTS WITH CATALOG NUMBERS ANNOTATED, CONTROL SINGLE-LINE INDICATING LOCATION OF ALL DEVICES, TYPE AND QUANTITY, TYPE AND SIZE OF WIRING FOR DEVICE INTERCONNECTIONS, DIMENSIONS OF ALL CONTROL DEVICES, CONTROL DEVICE TYPE AS INDICATED ON ELECTRICAL DRAWINGS, LOAD SCHEDULE WITH ROOM/AREA, CONTROL ZONE, FIXTURE TYPE AND QUANTITY, LOAD TYPE, WATTAGE, VOLTAGE, AND CIRCUITING INDICATED; LOAD SCHEDULE INFORMATION TO BE COMPLETED BASED ON APPROVED LIGHTING FIXTURE SUBMITTALS; SEQUENCE OF OPERATIONS; AND A COMPLETE BILL OF MATERIALS FOR REVIEW BY DESIGN PROFESSIONAL PRIOR TO RELEASE OF ORDER.
- ELECTRICAL CONTRACTOR SHALL PARTICIPATE IN AT LEAST ONE (1) COORDINATION MEETING WITH A REPRESENTATIVE OF THE SELECTED LIGHTING CONTROL SYSTEM MANUFACTURER AND DESIGN TEAM TO REVIEW ITEMS SUCH AS, BUT NOT LIMITED TO, LOCATION AND QUANTITY OF POWER/DATA DEVICES, CABLE RUN LENGTHS AND TYPES, LAYOUTS, AND FASTENERS.
- ACCEPTABLE ALTERNATE MANUFACTURERS:
 - WATTSTOPPER CONTROLS
 - ACUITY CONTROLS

LOAD TYPE
0-10V, 0-10 VOLT DIMMING LOAD TYPE (4-WIRE)

1 LIGHTING CONTROL NOTES
NTS

ACCEPTANCE TESTING & PROGRAMMING:

- UPON COMPLETION OF INSTALLATION AND INITIAL TESTS, ACCEPTANCE TESTING SHALL BE WITNESSED BY THE DESIGN PROFESSIONAL AND/OR OWNER'S REPRESENTATIVE.
- ACCEPTANCE TESTING WILL INCLUDE OPERATION OF EACH MAJOR SYSTEM AND ANY OTHER COMPONENTS DEEMED NECESSARY. ELECTRICAL CONTRACTOR WILL ASSIST IN THIS TESTING AND PROVIDE ANY TEST EQUIPMENT REQUIRED. ELECTRICAL CONTRACTOR SHALL PROVIDE AT LEAST ONE (1) TECHNICIAN AVAILABLE FOR THE ENTIRE TESTING AND PROGRAMMING PERIOD (DAY AND NIGHT), TO ASSIST THE CONTROL SYSTEM VENDOR'S TECHNICIAN WITH TESTS, ADJUSTMENTS, AND FINAL MODIFICATIONS. TOOLS AND MATERIAL REQUIRED TO MAKE ANY NECESSARY REPAIRS, CORRECTIONS, OR ADJUSTMENTS SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR. TESTING PROCESS IS ESTIMATED TO TAKE A MINIMUM OF THREE (3) DAYS.
- THE FOLLOWING PROCEDURES WILL BE PERFORMED ON EACH SYSTEM:
 - CONTROL FUNCTIONS SHALL BE CHECKED FOR PROPER OPERATION, FROM CONTROLLING DEVICES TO CONTROLLED DEVICES.
 - ADJUST, BALANCE, AND ALIGN EQUIPMENT FOR OPTIMUM QUALITY AND TO MEET THE MANUFACTURER'S PUBLISHED SPECIFICATIONS AND RECORD THESE SETTINGS, IN THE SYSTEM OPERATION AND MAINTENANCE MANUAL.
 - IN THE EVENT THE NEED FOR FURTHER ADJUSTMENT OR WORK BECOMES EVIDENT DURING ACCEPTANCE TESTING, THE ELECTRICAL CONTRACTOR WILL CONTINUE TO WORK UNTIL THE SYSTEM IS ACCEPTABLE AT NO ADDITION TO THE CONTRACT PRICE. IF APPROVAL IS DELAYED BECAUSE OF DEFECTIVE EQUIPMENT, OR FAILURE OF EQUIPMENT OR INSTALLATION TO MEET THE REQUIREMENTS OF THESE SPECIFICATIONS, THE INSTALLER WILL PAY FOR ADDITIONAL TIME AND EXPENSES OF THE DESIGN PROFESSIONAL OR OWNER'S REPRESENTATIVE.
 - PROVIDE ON-SITE VISITS BY CONTROL SYSTEM VENDOR'S APPLICATION ENGINEER AND SYSTEMS PROGRAMMER TO INSPECT, START-UP, COMMISSION, AND PROGRAM THE LIGHTING SYSTEM IN ORDER TO PROVIDE A COMPLETE, FULLY-FUNCTIONING LIGHTING SYSTEM. ON-SITE VISIT TO INCLUDE REVIEW OF DESIGN INTENT, FINE-TUNING OF SCENE LEVEL, PROGRAMMING AND NECESSARY ADJUSTMENTS TO TIMELOCKS. COMMISSIONING ACTIVITIES WILL INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:
 - INSTRUCT THE OWNER'S PERSONNEL ON THE USE, OPERATION, PROGRAMMING, AND MAINTENANCE OF THE SYSTEM. REFER TO DEMONSTRATION NOTES FOR DETAILS.
 - UPON SUCCESSFUL COMPLETE OF STEP "A" ABOVE, PROVIDE OWNER A WRITTEN CERTIFICATION THAT THE SYSTEM HAS BEEN COMMISSIONED PER THE METHOD DESCRIBED ABOVE AND THAT IT IS FULLY OPERATIONAL.

DEMONSTRATION & TRAINING:

- PROVIDE EIGHT (8) HOURS INSTRUCTION TO THE OWNER'S REPRESENTATIVE DESIGNATED STAFF ON THE USE, OPERATION AND MAINTENANCE OF THE SYSTEM, SCHEDULED AS A MINIMUM OF TWO (2) SEPARATE SESSIONS, BY AN INSTRUCTOR FULLY KNOWLEDGEABLE AND QUALIFIED IN SYSTEM OPERATION. THE SYSTEM REFERENCE MANUALS SHOULD BE COMPLETE AND AVAILABLE DURING THESE DEMONSTRATIONS/INSTRUCTION.
- TRAINING SCHEDULES:
 - TRAINING SHOULD BE ASSUMED TO TAKE PLACE ON THE PROJECT SITE.
 - TRAINING SHOULD BE SCHEDULED TO BE NON-OVERLAPPING, UNLESS AGREED TO BY THE OWNER.
 - ACTUAL TRAINING SCHEDULE SHALL BE BY AGREEMENT WITH OWNER. DO NOT ASSUME THAT TRAINING WILL OCCUR OVER EIGHT (8) HOUR DAYS. IT IS MORE LIKELY THAT TRAINING WILL BE SCHEDULED IN 4 HOUR INCREMENTS; PERHAPS OVER A PERIOD OF WEEKS OR EVEN MONTHS.
 - IN THE EVENT THAT A PORTION OF THE TRAINING TIME IS OCCUPIED IN TROUBLESHOOTING THE EQUIPMENT INSTALLATION, THEN THE TRAINING TIME SHALL BE EXTENDED AN EQUAL AMOUNT OF TIME AT A TIME MUTUALLY AGREED TO WITH OWNER.
 - THE FOLLOWING IS A GENERAL IDEA OF THE TRAINING "CURRICULUM":
 - GENERAL FAMILIARIZATION OF EACH MAJOR DEVICE.
 - AN EXPLANATION OF HOW THE DEVICE INTERFACES TO THE REST OF THE SYSTEM (INCLUDING REMOTE CONTROLS, DATA CONNECTIONS, TIMING REQUIREMENTS AND THE LIKE).
 - GENERAL TRAINING ON OPERATING THE SYSTEM.
 - SPECIFIC TRAINING ON DEVICE OPERATION.
 - SAVING INFORMATION; BACKING INFORMATION UP (INCLUDING A REVIEW OF THE PROPER PROCEDURES FOR BACKING UP).
 - BASIC TROUBLESHOOTING.
 - HOW TO UPGRADE SOFTWARE; PRECAUTIONS TAKEN WHILE DOING (E.G. BACKING-UP EXISTING SOFTWARE, DON'T BE THE FIRST ONE TO TRY THE NEW SOFTWARE ON GAME DAY).

1	5/26/23	BID ADDENDUM #2
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RECREATION CENTER
SITE AND BUILDING
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DATE:	4/7/2023

SHEET NAME:
**LIGHTING CONTROL
SCHEDULES**

SHEET NUMBER:
E522

PROJECT PHASE:
CONSTRUCTION DOCUMENTS