LIVONIA PUBLIC SCHOOLS

CHURCHILL HIGH SCHOOL POOL FILTRATION PROJECT

LIVONIA, MICHIGAN

PROJECT NO. 2025-042.1

12/10/2025 BIDS

FRENCH

LIST OF DRAWINGS

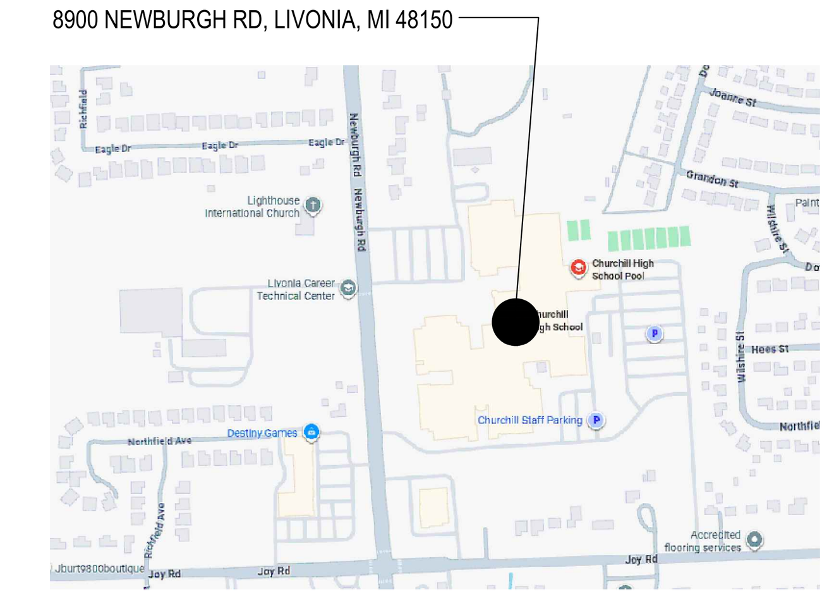
ARCHITECTURAL

POOL

ELECTRICAL

REFERENCE LOCATION MAP

8900 NEWBURGH RD, LIVONIA, MI 48150



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2025-042.1 LPS CHURCHILL HIGH SCHOOL - POOL FILTRATION PROJECT

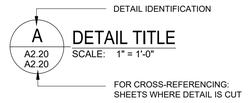
MATERIAL LEGEND

- SOIL
- ASPHALT AGGREGATE
- GRANULAR FILL
- STONE/GRAVEL
- CONCRETE
- CONCRETE MASONRY UNIT
- BRICK
- GLAZED HOLLOW CMU
- STRUCTURAL GLAZED TILE
- LIMESTONE
- MARBLE
- FINISH WOOD
- COMPOSITION/PLYWOOD
- CONTINUOUS WOOD BLOCKING
- BLOCKING OR SHIMS
- BATT INSULATION
- RIGID INSULATION
- PREMOLDED EXPANSION JOINT/ COMPRESSIBLE FILLER STRIP
- PLASTER OR GYPSUM BOARD
- CERAMIC OR QUARRY TILE
- TERRAZZO
- ACOUSTICAL PANEL OR ACOUSTICAL TILE
- EXISTING MATERIAL (IN SECTION)
- EXISTING MATERIAL (IN PLAN)
- DEMOLITION - TO BE REMOVED

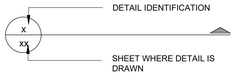
ABBREVIATIONS

AC	AIR CONDITIONING
ACOUST	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGG	AGGREGATE
ALT	ALTERNATE
AL/ALUM	ALUMINUM
ANOD	ANODIZED
APC	ARCHITECTURAL PRECAST LINTEL
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ASPH	ASPHALT
AV	AUDIO/VISUAL
L	ANGLE
B CMU	BURNISHED CMU
BIT	BITUMINOUS
BD	BOARD
BF	BARRIER FREE
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BENCH MARK/BEAM
BOT	BOTTOM
BRG	BEARING
BUR	BUILT-UP ROOF
CAB	CABINET
CUH	CABINET UNIT HEATER
CB	CHALKBOARD/CATCH BASIN
CEM	CEMENT
CER	CERAMIC
CFM	CUBIC FEET PER MINUTE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMP	COMPACTED
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS/CONTINUE
CONTR	CONTRACTOR
CORR	CORRUGATED
CPL	CEMENT PLASTER
CPT	CARPET
CT	CERAMIC TILE
CU	CONDENSING UNIT
CUSP	CUSPIDOR
CWF	CURTAINWALL FRAMING
D	DEPTH/DEEP
°	DEGREE
DC	DISPLAY CASE
DEMO	DEMOLISH/DEMOLITION
DTL	DETAIL
DF	DRINKING FOUNTAIN
DIA/Ø	DIAMETER
DIM	DIMENSION
DIV	DIVISION
DS	DOWNSPOUT
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC(AL)
ELEV	ELEVATOR
EQ	EQUAL
EQUIP	EQUIPMENT
EIFS	EXTERIOR INSULATION FINISH
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EX/EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FD	FLOOR DRAIN
FEC	FIRE EXTINGUISHER CABINET
FF	FORCED FLOW CABINET HEATER
FHC	FIRE HOSE CABINET
FIN	FINISH
FIN FL	FINISH FLOOR
FLR	FLOOR
FOUND	FOUNDATION
FT/'	FEET
FTG	FOOTING
FRP	FIBERGLASS REINFORCED POLYESTER
GA	GAUGE
GALV	GALVANIZE(D)
GB	GRAB BARS
GHT	GLAZED HOLLOW TILE
GL	GLASS
GLCMU	GLAZED CMU
GLZD	GLAZED
GYP	GYPSUM
H/HGT	HEIGHT
HB	HOSE BIB
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HVAC	HEATING/VENTILATING/AIR CONDITIONING
ID	INSIDE DIAMETER
IN/"	INCH
INCL	INCLUDE(D),(ING)
INSUL	INSULATION/INSULATE(D)
INT	INTERIOR
JST	JOIST
JT	JOINT
KIT	KITCHEN
L	LENGTH
LAM	LAMINATE(D)
LAV	LAVATORY
LB/#	POUND
LGF	LIGHT GAUGE FRAMING
LIN	LINOLEUM
LKR	LOCKER
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LMC	LINEAR METAL CEILING
LOC	LOCATION(S)
LP	LOW POINT
MANUF	MANUFACTURER
MAR	MARBLE THRESHOLD
MB	MARKER BOARD
MAS	MASONRY
MAT	MATERIAL/MAT
MAU	MAKE UP AIR UNIT
MAZ	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MIN	MINIMUM/MINUTE
MISC	MISCELLANEOUS
ML	MASONRY LINTEL
MP	METAL PANEL
MWP	METAL WALL PANEL
MO	MASONRY OPENING
MET/MTL	METAL
MSF	METAL STUD FRAMING
MT	METAL THRESHOLD
NIC	NOT IN CONTRACT
NO/#	NUMBER
NOM	NOMINAL
NSF	NON-SLIP FINISH
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHD	OVERHEAD DOOR
OPNG	OPENING
OPP	OPPOSITE
OS	OVERFLOW SUMP
PART	PARTICLE
PART'N	MOVABLE PARTITION
PC	PRECAST CONCRETE
PL	PLATE/PROPERTY LINE
PLAS	PLASTER
PLAM	PLASTIC LAMINATE
PLYWD	PLYWOOD
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
R	RISER/RADIUM
RB	RESILIENT WALL BASE/RUBBER BASE
RBF	RUBBER FLOORING
RC	RAIN CONDUCTOR
RES	RESILIENT
RS	ROOF SUMP
REF	REFERENCE
REFR	REFRIGERATOR
REINF	REINFORCING
REQ'D	REQUIRED
REV	REVISION(S)
RF	ROOF EXHAUST FAN
RM	REMOVABLE MULLION/ROOM
RO	ROUGH OPENING
RWO	RIGHT OF WAY
RTU	ROOF TOP UNIT
RV	ROOF VENT
S	SINK
SAAC	SPRAY APPLIED ACOUSTICAL COATING
SCHED	SCHEDULE
SEAL	CONCRETE SEALER
SEC	SECTION
SFF	STOREFRONT FRAMING
SHT	SHEET
SIM	SIMILAR
SPEC(S)	SPECIFICATIONS
SP CMU	SPLIT FACE CMU
SPI	SPORTS IMPACT FLOORING
SPKR	SPEAKER
SQ	SQUARE
SS	SERVICE SINK/STAINLESS STEEL
SSM	SOLID SURFACE MATERIAL
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SVT	SOLID VINYL TILE
SV	SHEET VINYL
T	TREAD
T&B	TOP AND BOTTOM
TB	TACK BOARD
TC	TOP OF CURB
TEMP	TEMPERED
TER	TERRAZZO
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TS	TUBE STEEL
TV	TELEVISION
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATOR
VCT	VINYL COMPOSITION TILE
VCG	VINYL COVERED GYPSUM BOARD
VERT	VERTICAL
VIF	VERIFY IN FIELD
VUV	VERTICAL UNIT VENTILATOR
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
WDSC	WOOD SOUND CONTROL
WH	WATER HEATER
WP	WORKING POINT / WATERPROOF
WWF	WELDED WIRE FABRIC

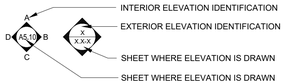
SYMBOL LEGEND



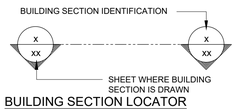
DRAWING SYMBOL



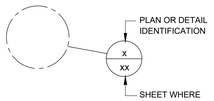
DETAIL LOCATOR



ELEVATION SYMBOL



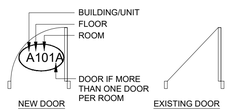
BUILDING SECTION LOCATOR



PLAN OR DETAIL BLOW-UP

COLUMN GRID

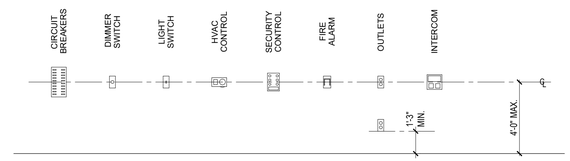
ROOM NAME AND NUMBER



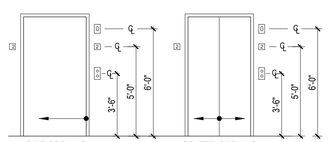
DOOR NUMBER AND SYMBOLS

MISCELLANEOUS SYMBOLS

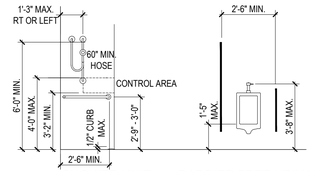
MOUNTING HEIGHTS



CONVENIENCE CONTROLS AND OUTLETS

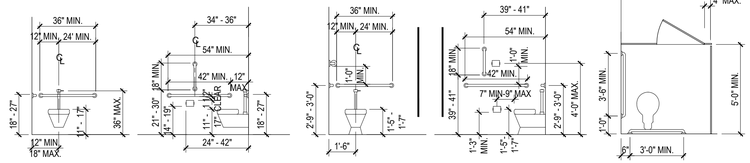


ELEVATORS



SHOWER UNIT

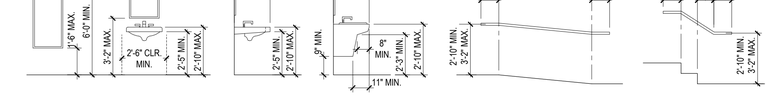
BARRIER FREE URINAL



BARRIER FREE WATER CLOSET MOUNTING HEIGHTS FOR CHILDREN

BARRIER FREE WATER CLOSET

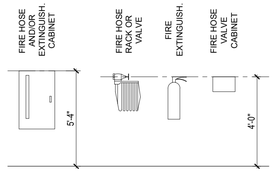
STALL LAYOUT



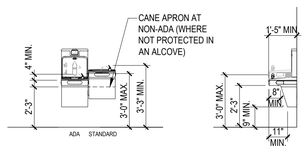
BARRIER FREE LAVATORIES AND MIRRORS

RAMP HANDRAIL

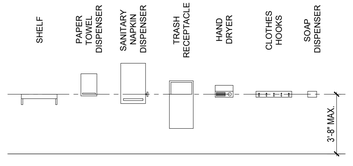
STAIR HANDRAIL



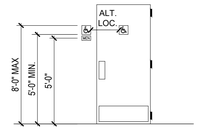
FIRE EXTINGUISHER EQUIPMENT



DRINKING FOUNTAINS/ ELECTRIC WATER COOLER WITH OPTIONAL BOTTLE FILLER

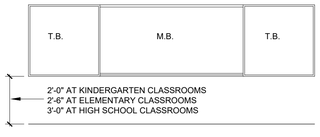


TOILET ROOM ACCESSORIES

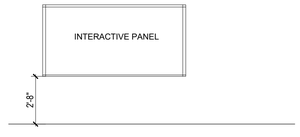


TOILET ROOM SIGNAGE

NOTE: HEIGHT ABOVE FLOOR TO BASELINE OF CHARACTER TO COMPLY WITH ICC/ANSI ICC A117.1-2017 TABLE 703.2.4



TACK BOARDS AND MARKER BOARDS



INTERACTIVE PANEL MOUNTING

KEY PLAN

ISSUE DATE	ISSUED FOR
12/10/2025	BIDS
-	-

DRAWN

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APPROVED

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2851 High Meadow Circle | Suite 100
Auburn Hills | MI 48326
248.656.1377

PROJECT

Livonia Public Schools
Churchill High School
Pool Filtration Project

Livonia,
Michigan

SHEET

ARCHITECTURAL REFERENCE SHEET

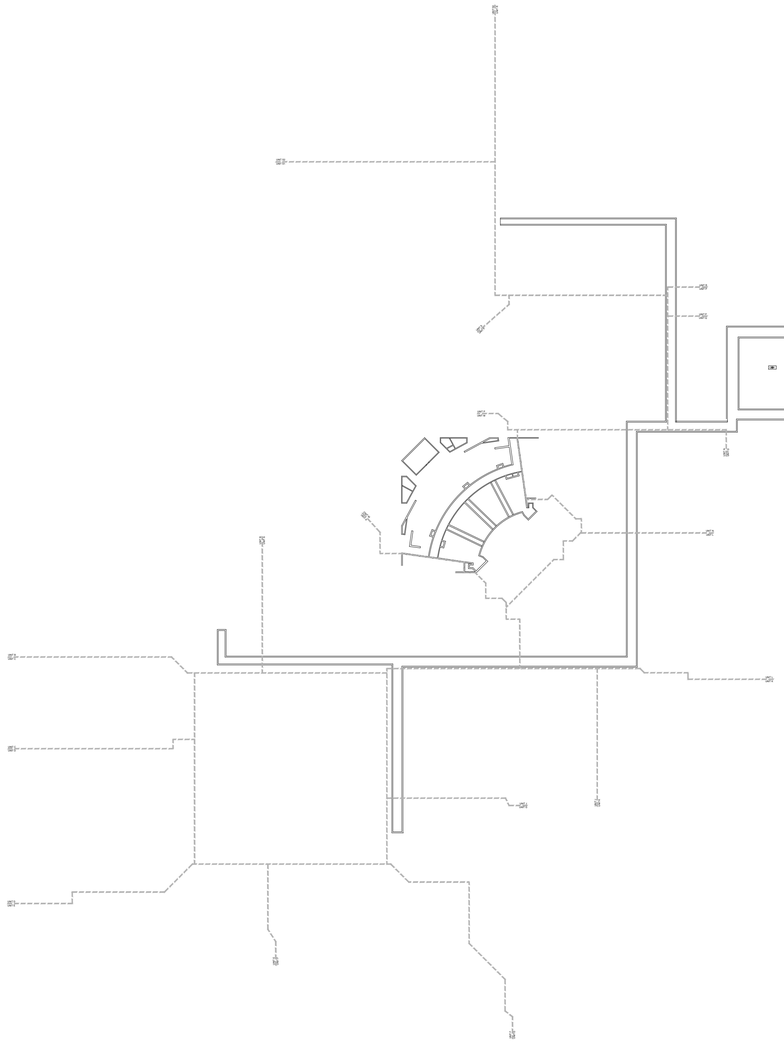
PROJECT NUMBER

2025-042.1

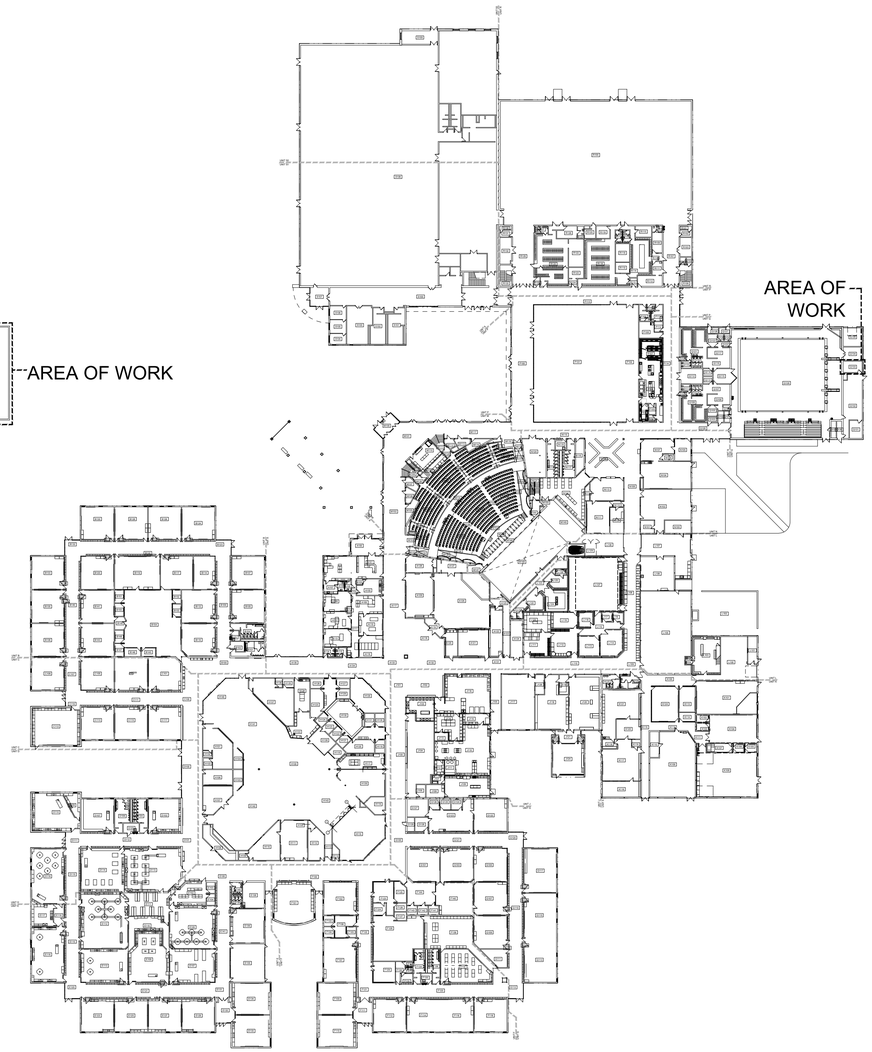
SHEET NUMBER

A0.01

2025-042.1 LPS Churchill HS - Pool Filtration Project



COMPOSITE TUNNEL CODE PLAN
SCALE: 1/16"=1'-0"



COMPOSITE FIRST FLOOR CODE PLAN
SCALE: 1/16"=1'-0"

CODE PLAN INFORMATION

1) Design Codes
 a)2021 MICHIGAN REHABILITATION CODE (EXISTING BUILDING)
 b)2016 SCHOOL FIRE SAFETY RULES
 c)NFPA 101 LIFE SAFETY CODE 2012 EDITION
 d)2021 MICHIGAN PLUMBING CODE
 e)2021 MICHIGAN MECHANICAL CODE
 f) 2021 MICHIGAN UNIFORM ENERGY CODE
 g)2023 MICHIGAN ELECTRICAL CODE RULES, PART 8
 h)2023 NATIONAL ELECTRICAL CODE (NFPA 70)
 i) 2017 ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES

2) DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (106.6)
 a)A REPRESENTATIVE OF FRENCH ASSOCIATES WILL BE THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.

3) EXISTING BUILDING INFORMATION
 a)TOTAL BUILDING = 358,385 SQUARE FEET (NO CHANGE)
 b)THE BUILDING IS PARTIALLY SPRINKLED - PERFORMING ARTS STAGE ONLY.
 c)TYPE OF CONSTRUCTION IS IIB (II-000 FROM SCHOOL FIRE SAFETY RULES)
 d)USE GROUP IS OCCUPANCY E (EDUCATION)

4) COMPLIANCE METHOD (CHAPTER 3)
 a)WORK AREA COMPLIANCE METHOD (301.1.2) - THE WORK SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF CHAPTERS 5 THROUGH 11.

5) CLASSIFICATION OF WORK (CHAPTER 5)
 a)AS DEFINED BY THE MICHIGAN REHABILITATION CODE, THE WORK INCLUDES LEVEL 1 ALTERATIONS AND LEVEL 2 ALTERATIONS. THE WORK AREA DOES NOT EXCEEDS 50% OF THE BUILDING AREA.
 b)THERE IS NO CHANGE OF OCCUPANCY.
 c)THERE IS NO ADDITION.
 d)UNDER THE SCHOOL FIRE SAFETY RULES, THE SCOPE OF WORK IN THE LEVEL 1 ALTERATIONS IS THE REPLACEMENT OF EXISTING POOL AND RELATED ELECTRICAL SYSTEMS. AS A RESULT, THE LEVEL 1 ALTERATION AREAS DO NOT QUALIFY AS REMODELING.

6) CHAPTER 7- ALTERATIONS- LEVEL 1
 a)SECTION 702.1- NEW INTERIOR FINISHES WILL COMPLY WITH CHAPTER 8 OF THE MICHIGAN BUILDING CODE.
 i) FROM TABLE 803.9- CORRIDORS ARE CLASS B FINISHES, ROOMS ARE CLASS C FINISHES
 b)INTERIOR FLOOR FINISHES SHALL COMPLY WITH SECTION 804 OF MBC.

BUILDING INFORMATION

EXISTING BUILDING AREA: 358,385 SQUARE FEET

STUDENT POPULATION IS NOT CHANGING

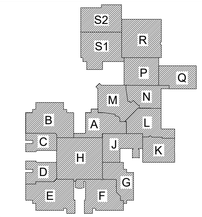
WORK AREA COMPLIANCE METHOD: LEVEL 1 ALTERATIONS

NO CHANGE OF USE

EXISTING BUILDING IS NOT SPRINKLED (EXCEPT PERFORMING ARTS AREA).

ALTERATION LEVEL 1 DESCRIPTION:
- REPLACEMENT AND UPGRADING OF EXISTING POOL EQUIPMENT SYSTEMS (INCLUDING RELATED ELECTRICAL).

KEY PLAN



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PROJECT
Livonia Public Schools
Churchill High School
Pool Filtration Project

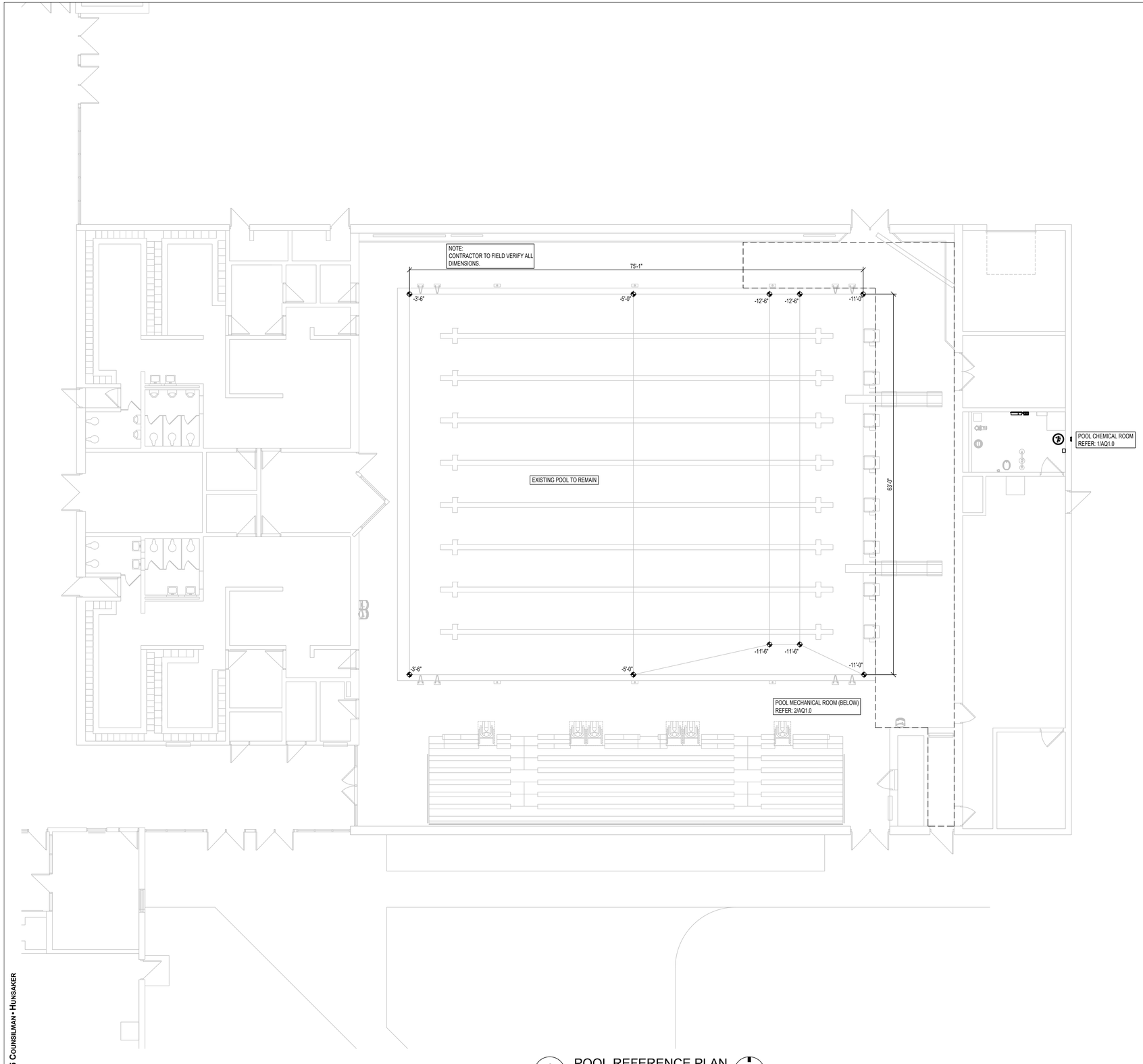
Livonia,
Michigan

SHEET
COMPOSITE
CODE PLAN

PROJECT NUMBER
2025-042.1

SHEET NUMBER
A0.02

2025-042.1 LPS Churchill HS - Pool Filtration Project



1 AQ0.0 POOL REFERENCE PLAN

1/8" = 1'-0"

N

DESIGN DATA

	UNITS	EXISTING POOL
LENGTH	FT.	75'-1"
WIDTH	FT.	63'-0"
WATER SURFACE AREA	SQ. FT.	4,736
PERIMETER	FT.	276'-2"
VOLUME	GALLONS	265,320
RECIRCULATION SYSTEM		
POOL TURNOVER RATE	HOURS	6.0
RECIRCULATION RATE	GPM	737
SURGE CAPACITY	GALLONS	EXISTING TO REMAIN
SEWER CAPACITY	GPM	REFER TO PLUMBING
BATHER LOAD	PERSONS	320

GENERAL POOL NOTES

1. ✥DENOTES WATER DEPTH FROM WATER LEVEL.
2. (ALTERNATE #1) POOL FINISH TO RECEIVE ACID WASHING AND REGROUT. REFER TO SPECIFICATION 131100.
3. ALL PROPRIETARY NAMES MENTIONED ARE TO DESIGNATE PERFORMANCE STANDARDS. EQUIVALENT PRODUCTS MUST BE SUBMITTED FOR APPROVAL.
4. ALL POOL REINFORCING STEEL, METAL FITTINGS, EQUIPMENT WITHIN 5'-0" OF POOL EDGE, AND ANY METAL PARTS OF POOL MECHANICAL EQUIPMENT IN CONTACT WITH THE POOL RECIRCULATION SYSTEM MUST BE BONDED PER NEC 680. REFER: 1/AQ1.2

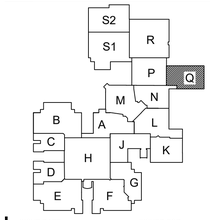
CONTRACTOR SUPPLIED POOL CHEMICALS

DESCRIPTION	AMOUNT
CO2	FULL BULK TANK(S) : 750 LBS

DRAWING INDEX

POOL ALTERNATES

ALTERNATE #1 - ACID WASH THE INTERIOR POOL TILE AND RE-GROUT WITH MATERIAL COMPATIBLE WITH EXISTING FINISHES.



ISSUE DATE	ISSUED FOR
12/10/2025	BIDS

STATE OF MICHIGAN
CARL P. NYLANDER
ENGINEER
NO. 6201056291
LICENSED PROFESSIONAL ENGINEER

DRAWN	ZRW
CHECKED	MJM
APPROVED	CPN

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PROJECT

Livonia Public Schools
Churchill High School
Pool Filtration Project

Livonia,
Michigan

SHEET

Unit Q
POOL REFERENCE PLAN

COUNSILMAN•HUNSAKER
AQUATICS FOR LIFE
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PROJECT NUMBER

2025-042.1

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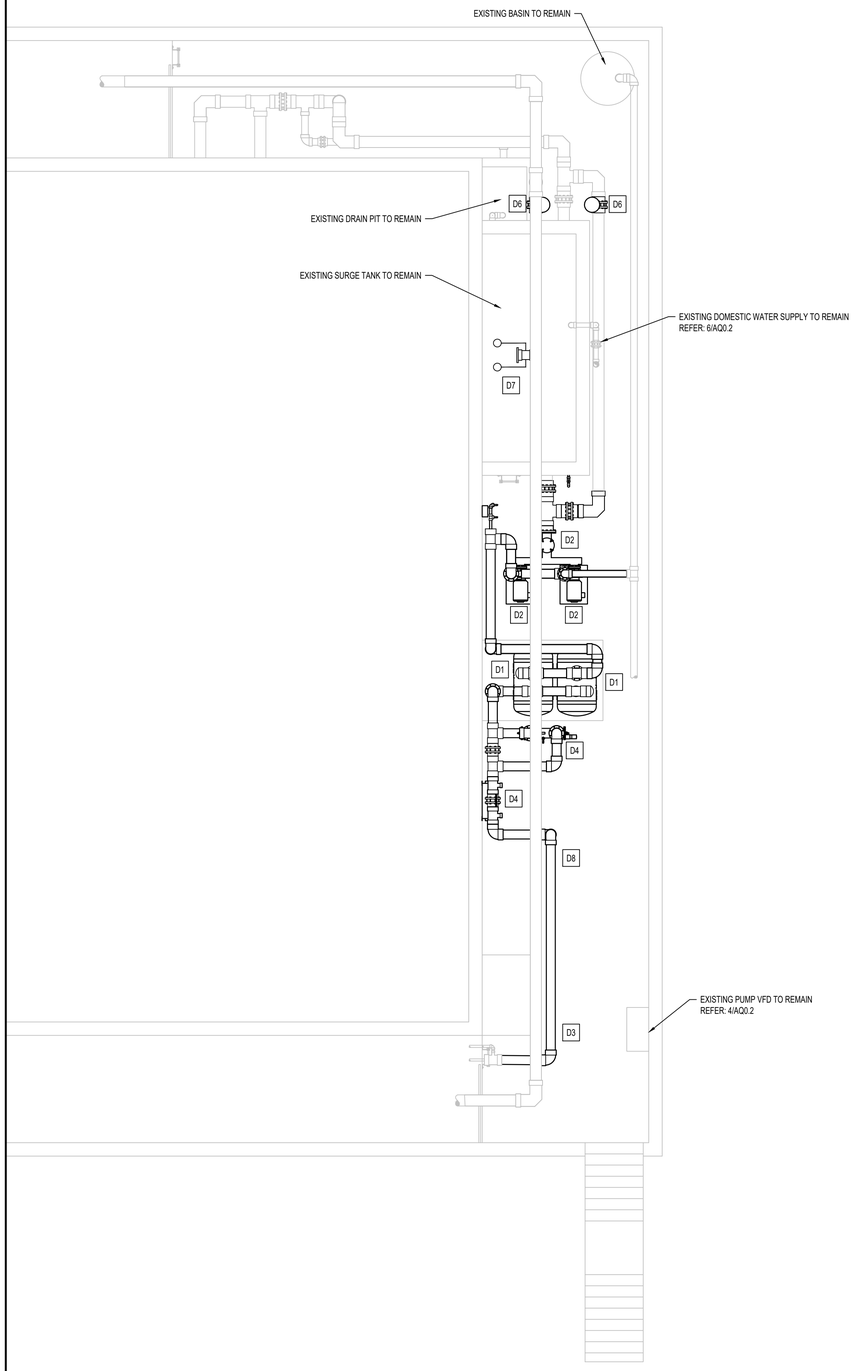
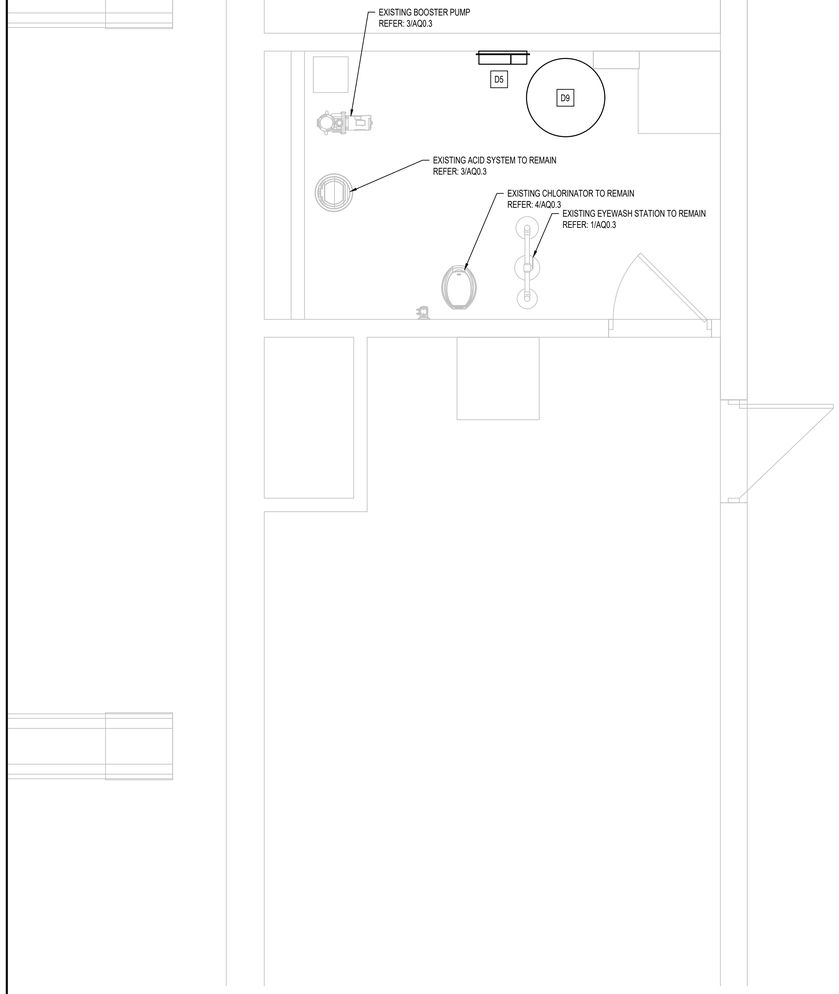
AQ0.0

2025-042.1 LPS Churchill HS - Pool Filtration Project



2 AQ0.1 POOL MECHANICAL ROOM DEMOLITION PLAN (LEVEL BELOW)

3/16" = 1'-0"



1 AQ0.1 POOL CHEMICAL ROOM DEMOLITION PLAN (MAIN FLOOR)

3/8" = 1'-0"

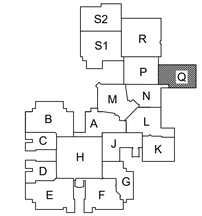
GENERAL POOL DEMOLITION AND RENOVATION NOTES

1. COORDINATE ALL DEMOLITION PLANS AND WORK WITH ARCHITECT AND CONSTRUCTION DOCUMENTS PRIOR TO THE START OF DEMOLITION.
2. REVIEW RECORD DOCUMENTS OF EXISTING CONSTRUCTION PROVIDED BY THE OWNER. NEITHER THE OWNER NOR ENGINEER MAKES ANY GUARANTEE THAT THE EXISTING CONDITIONS REFLECT THOSE INDICATED IN THE RECORD DOCUMENTS. CONTRACTOR TO PROVIDE NOTIFICATION OF ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH DEMOLITION.
3. CONTRACTOR TO SURVEY EXISTING CONDITIONS AND CORRELATE WITH REQUIREMENTS INDICATED IN THE CONTRACT DOCUMENTS TO DETERMINE THE EXTENT OF DEMOLITION REQUIRED. CONTRACTOR TO RECORD EXISTING CONDITIONS WITH DETAILED PRECONSTRUCTION PHOTOGRAPHS.
4. UNLESS OTHERWISE INDICATED, DEMOLITION WASTE BECOMES PROPERTY OF THE CONTRACTOR.
5. EXCEPT FOR ITEMS OR MATERIALS INDICATED TO BE RECYCLED, REUSED, SALVAGED, REINSTALLED, OR OTHERWISE INDICATED TO REMAIN OWNER'S PROPERTY, REMOVE DEMOLISHED MATERIALS FROM PROJECT SITE AND LEGALLY DISPOSE OF THEM. OWNER HAS THE FIRST RIGHT OF REFUSAL ON ALL DEMOLITION MATERIALS.
6. IF HAZARDOUS MATERIALS ARE ENCOUNTERED, DO NOT DISTURB. IMMEDIATELY NOTIFY THE OWNER AND ENGINEER.
7. INDICATE RECEIPT AND ACCEPTANCE OF ANY HAZARDOUS WASTES BY A LANDFILL FACILITY LICENSED TO ACCEPT SUCH HAZARDOUS WASTES.
8. MAINTAIN EXISTING UTILITIES TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. REFER TO OTHER TRADES FOR COORDINATION.
9. ELECTRICIAN MUST VERIFY EXISTING BOND GRID. ALL NEW EMBEDS AND MECHANICAL EQUIPMENT MUST BE BONDED AND TIED TO EXISTING GRID PER NEC ARTICLE 680.
10. PROTECT ALL EXISTING POOL FINISHES, GUTTERS, MAIN DRAINS, AND ANY OTHER POOL RELATED APPURTENANCES DURING CONSTRUCTION.
11. THE CONTRACTOR MUST BE RESPONSIBLE FOR CONTINUOUSLY MONITORING GROUNDWATER LEVELS ON THE SITE DURING ANY AND ALL PERIODS WHEN THE SWIMMING POOL IS NOT FULL OF WATER. PROTECTION OF THE EXISTING POOL STRUCTURE FROM DAMAGE DUE TO HYDROSTATIC PRESSURE IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
12. CONTRACTOR TO PROVIDE AND EXECUTE APPROVED DUST CONTROL PLAN.
13. ALL AREAS OF WORK MUST HAVE DOUBLE CONTAINMENT AND DEDICATED EXHAUST INDEPENDENT OF HVAC.
14. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF DUST, DIRT, AND DEBRIS FOLLOWING DEMOLITION OPERATIONS. CONTRACTOR TO RETURN ADJACENT AREAS TO CONDITION EXISTING BEFORE THE START OF DEMOLITION OPERATIONS.

POOL DEMOLITION KEYNOTES

COORDINATE ALL DEMOLITION PLANS WITH ARCHITECT AND CONSTRUCTION DOCUMENTS PRIOR TO DEMOLITION

D1	REMOVE EXISTING SAND FILTERS AND FACE PIPING. REFER: 3/AQ0.2
D2	REMOVE EXISTING RECIRCULATION PUMPS, HOUSEKEEPING PADS, VALVES AND STRAINER. REFER: 2/AQ0.2
D3	REMOVE EXISTING FLOW METER SENSOR
D4	REMOVE EXISTING UV CHAMBER, CABINET AND HOUSEKEEPING PAD. REFER: 7/AQ0.2
D5	REMOVE EXISTING CHEMICAL CONTROLLER. REFER: 2/AQ0.3
D6	REMOVE TWO EXISTING FISHER VALVES. REFER: 8 & 9/AQ0.2
D7	REMOVE EXISTING FLOAT VALVE IN SURGE TANK.
D8	REMOVE MECHANICAL ROOM POOL RECIRCULATION PIPING, VALVES, HANGERS AND SUPPORTS. REFER: 1/AQ0.2
D9	REMOVE ABANDONED MURIATIC ACID BULK TANK AND DISPOSE REMAINING ACID. REFER: 1/AQ0.3



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CARL P. NYLANDER
ENGINEER
NO. 6201056291
LICENSED PROFESSIONAL ENGINEER

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PROJECT

Livonia Public Schools
Churchill High School
Pool Filtration Project

Livonia,
Michigan

SHEET

Unit Q
POOL MECHANICAL ROOMS DEMOLITION PLANS

PROJECT NUMBER

2025-042.1

SHEET NUMBER

AQ0.1

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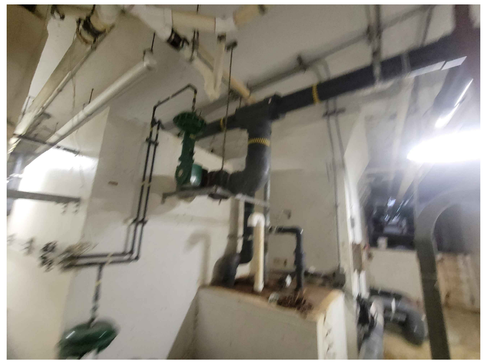
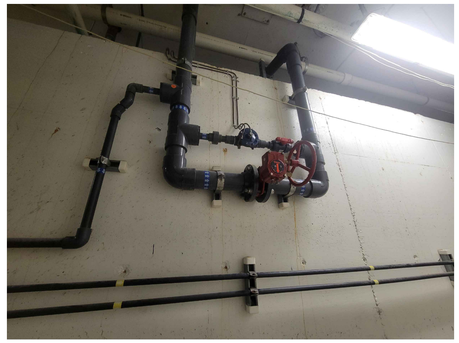


9 AQ0.2 EXISTING GUTTER FISHER VALVE
NTS

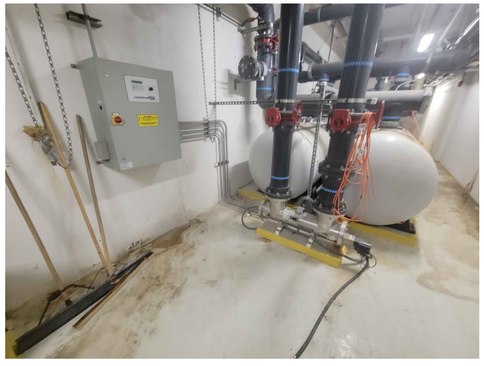


6 AQ0.2 EXISTING DOMESTIC WATER SUPPLY
NTS

3 AQ0.2 EXISTING SAND FILTERS
NTS

1 AQ0.2 OVERALL MECHANICAL ROOM (LEVEL BELOW)
NTS

10 AQ0.2 EXISTING CHEMICAL INJECTIONS
NTS



7 AQ0.2 EXISTING UV CHAMBER & CABINET
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4 AQ0.2 EXISTING PUMP MOTOR STARTER TO REMAIN
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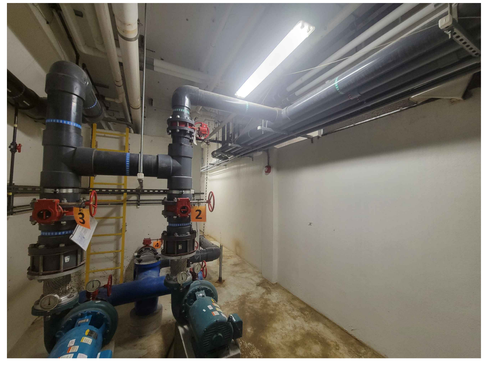
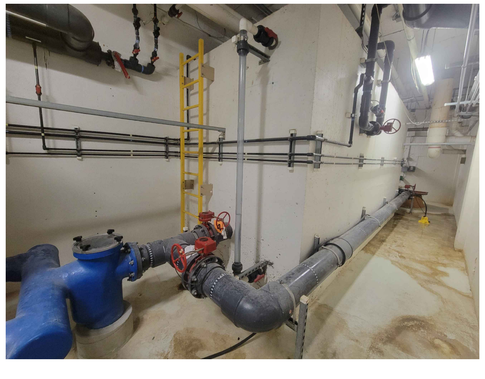
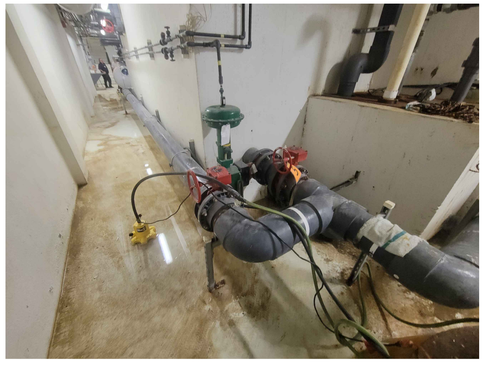


2 AQ0.2 EXISTING RECIRCULATION PUMPS & STRAINER
NTS



11 AQ0.2 EXISTING WATER LEVEL PIPE FOR NEW SENSORS
NTS



8 AQ0.2 EXISTING MAIN DRAIN FISHER VALVE
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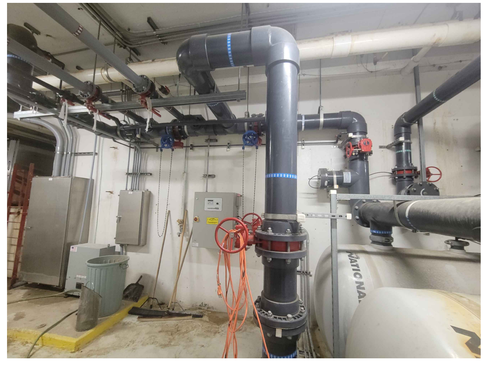
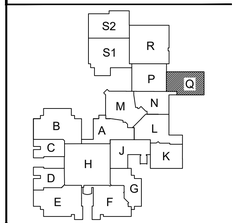


5 AQ0.2 EXISTING HEATER & UV TEES
NTS



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PROJECT
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Churchill High School
Pool Filtration Project

Livonia,
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SHEET
Unit Q
POOL MECHANICAL ROOM EXISTING CONDITIONS

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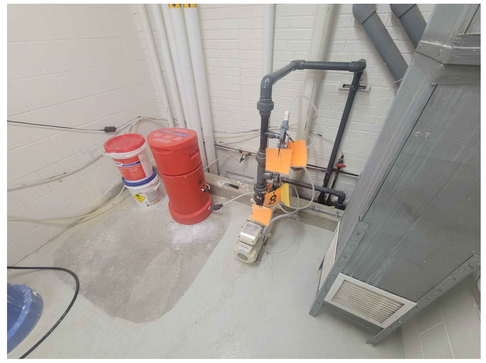
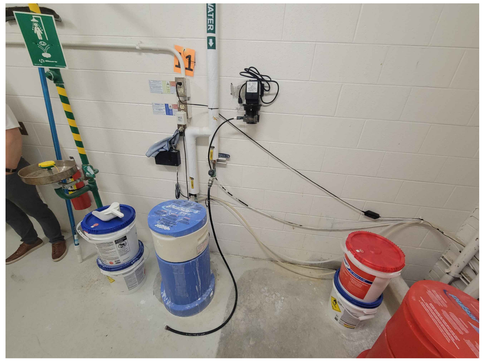


3 AQ0.3 EXISTING ACID SYSTEM TO REMAIN

NTS

1 AQ0.3 OVERALL CHEMICAL ROOM (MAIN LEVEL)

NTS

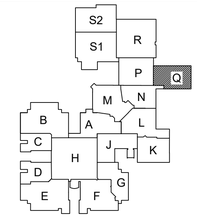


4 AQ0.3 EXISTING CHLORINATION SYSTEM TO REMAIN

NTS

2 AQ0.3 EXISTING CHEMICAL CONTROLLER

NTS



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Pool Filtration Project

Livonia,
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SHEET

Unit Q
POOL CHEMICAL
ROOM EXISTING
CONDITIONS

PROJECT NUMBER

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AQ0.3

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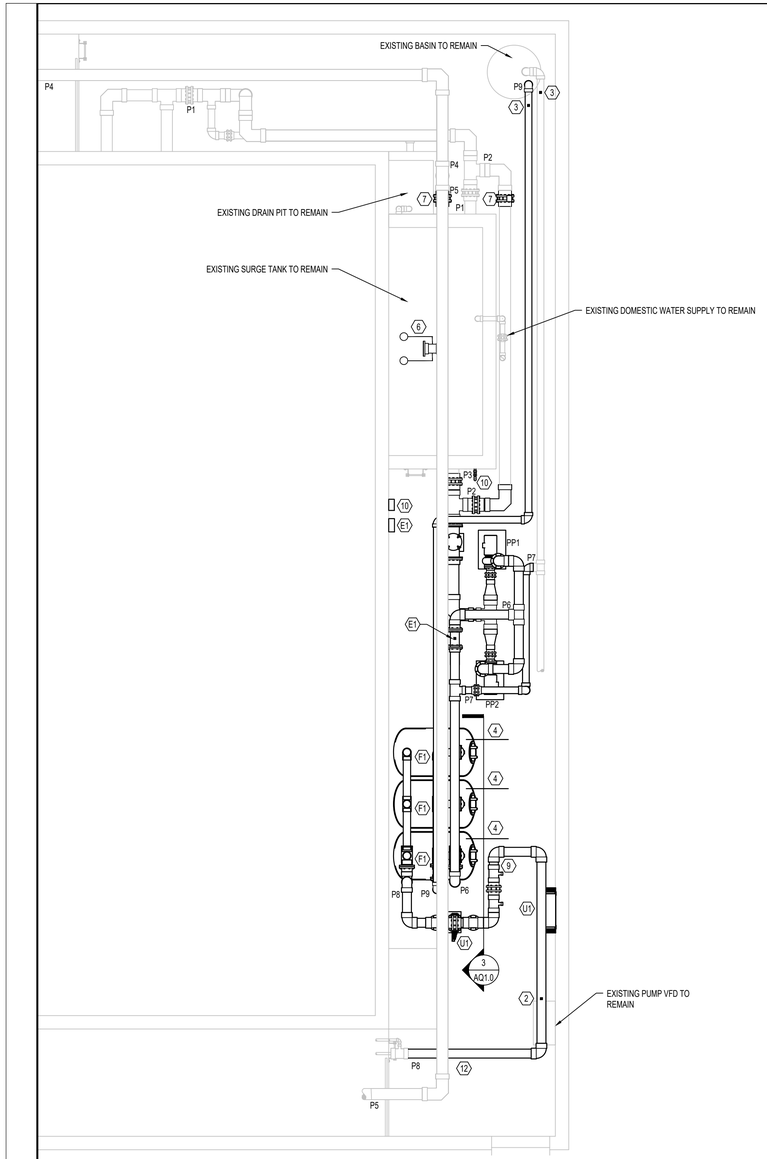
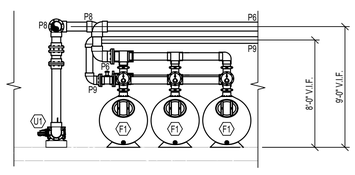


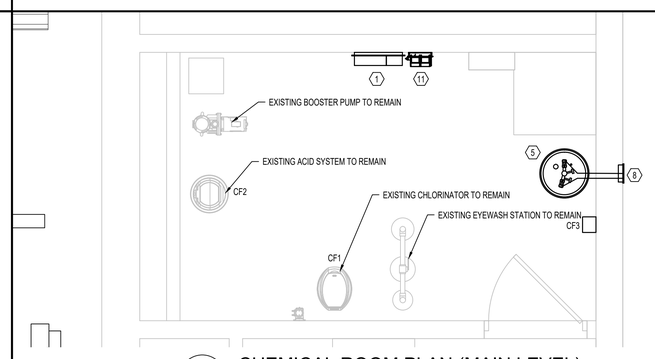
2 AQ1.0 — POOL MECHANICAL ROOM PLAN (LEVEL BELOW)

3/16" = 1'-0"



3 AQ1.0 — POOL MECHANICAL ROOM SECTION (LEVEL BELOW)

3/16" = 1'-0"



1 AQ1.0 — CHEMICAL ROOM PLAN (MAIN LEVEL)

3/8" = 1'-0"

CHEMICAL FEED SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	HP	FLOW	NOTES
CF1	EXISTING POOL CHLORINATION BOOSTER PUMP TO REMAIN	PULSAR	PULSAR 3	1	120 LBS/DAY	4
CF2	EXISTING POOL ACID FEED PUMP TO REMAIN	PULSAR	ACID PLUS	N/A	60 LBS/DAY	4
CF3	EXISTING POOL CO2 FEED REFER: 3/AQ1.1	PROMINENT	CO2-200	N/A	20-200 SCFH	1-3

NOTE:
1. THE MANUFACTURER INDICATED IS BASIS OF DESIGN. ALTERNATE MANUFACTURER: PROMINENT, BECS, EKO3 OR APPROVED EQUAL.
2. PROVIDE WITH 120 VOLT, SINGLE PHASE, ADJUSTABLE FEED.
3. INTERLOCK WITH POOL RECIRCULATION PUMP.
4. PROVIDE WITH AN ADDITIONAL 1 HP WHISPERFLO FEED PUMP TO MATCH EXISTING FOR ATTIC STOCK.

UV TREATMENT SYSTEMS SCHEDULE

ID	POOL	MODEL NUMBER	CALCULATED 60 MJ/CM2 (GPM)	LAMPS	POWER (KW)	VOLTAGE (V) WITH BREAKER SIZE (50 OR 60 HZ)
U1	COMPETITION	WF-215-8-N	1,012	2 @ 1.5KW	3.0	240 V (1Φ)-30A

NOTE:
1. THE BASIS OF DESIGN MANUFACTURER IS EVOQUA TECHNOLOGIES LTD. ALTERNATE MANUFACTURER: PROMINENT, AQUIONICS OR APPROVED EQUAL.
2. INTERLOCK UV SYSTEM WITH CHEMICAL CONTROLLER OR RECIRCULATION PUMP.
3. REFER: 6/AQ1.1

EQUIPMENT SCHEDULE

ID	ITEM	ID	ITEM
1	CHEMICAL CONTROLLER REFER: 2/AQ1.1	7	ELECTRICALLY ACTUATED VALVE REFER: 8/AQ1.2
2	FLOW METER SENSOR REFER: 8/AQ1.1	8	C02 FILLBOX REFER: 5/AQ1.1
3	IMPACT FLOW METER REFER: 9/AQ1.1	9	HEATER TEES REFER: 9/AQ1.2
4	HARD PIPE TO DRAIN	10	WATER LEVEL CONTROLLER REFER: 11/AQ1.1
5	CO2 TANK REFER: 3/AQ1.1	11	TOTAL ALKALINITY PANEL REFER: 10/AQ1.2
6	10" FLOAT VALVE REFER: 12/AQ1.2	12	CHEMICAL INJECTION REFER: 7/AQ1.1

GENERAL POOL MECHANICAL ROOM NOTES

1. THE FOLLOWING INFORMATION SHALL BE LAMINATED AND POSTED IN THE POOL MECHANICAL ROOM: BACKWASH PROCEDURE, POOL FILLING & DRAINING, VALVE REFERENCE CHART, POOL MECHANICAL ROOM PLAN, POOL PIPING SCHEMATICS & POOL SYSTEMS SCHEMATICS.

PIPING

1. MINIMUM 7'-0" CLEARANCE BENEATH ALL OVERHEAD PIPING.
2. PROVIDE AND SUPPORT OVERHEAD AND VERTICAL PIPING PER SPECIFICATION REQUIREMENTS.
3. LABEL AND IDENTIFY ALL PIPING IN COMPLIANCE WITH THE SPECIFICATIONS.
4. ALL FLOW METERS SHALL BE SIZED TO MATCH THE PIPE ON WHICH IT IS INSTALLED. PROVIDE PRESSURE GAUGES ON INFLUENT AND EFFLUENT SIDE OF EACH FILTRATION SYSTEM AND A FULL LINE SIZE FLOW METER ON FILTER RETURN.
5. HYDROSTATICALLY TEST ALL PIPING AT 50 PSI FOR TWO HOURS AND MAINTAIN A PRESSURE OF 20 PSI IN ALL PIPING THROUGHOUT CONSTRUCTION. SECURE ALL FIXTURES PER SPECIFICATION REQUIREMENTS BEFORE HYDROSTATIC TEST.
6. REFER TO DETAILS 2-7/AQ1.2 FOR INSTALLATION OF PIPE SUPPORTS.
7. ALL VALVE HARDWARE MUST BE 316L STAINLESS STEEL AND MEET ANSI HARDWARE INSTALLATION GUIDELINES. REFER: 10/AQ1.1

CHEMICAL TREATMENT

1. CHEMICAL FEED REQUIREMENTS - REFER TO THE POOL SYSTEMS SCHEMATIC(S) ON AQ2.0.
2. INTERLOCK POOL RECIRCULATION PUMP(S) WITH ITS CORRESPONDING WATER CHEMISTRY CONTROLLER, CHEMICAL FEED PUMP(S), AND HEATER(S).
3. PROVIDE SIGNAGE ON CHEMICAL ROOM DOORS IN COMPLIANCE WITH THE STATE FIRE CODE. REFER: 11/AQ1.2
4. SECURE CHEMICAL METERING PUMP FEED LINES TO WALL AND/OR OVERHEAD WITH CLIPS OR DEVICES THAT DO NOT CRIMP, DISTORT OR ALLOW HIGH AND LOW AREAS IN TUBING RUNS. PROVIDE CHECK VALVE AND SHUT-OFF VALVE BEFORE LINES ENTER POOL RETURN PIPING.
5. WATER CHEMISTRY CONTROLLERS SHALL CONTROL THE SANITIZING SYSTEM AND PH CONTROL SYSTEM AND SHUT THEM DOWN UPON LOSS OF SAMPLE STREAM FLOW.
6. THE CHEMICAL CONTROL SYSTEM BYPASS LINE SHALL SAMPLE WATER AFTER THE FILTERS AND BEFORE THE HEATER BYPASS LINE.
7. VERIFY REMOTE ACCESS CAPABILITY TO ALL CHEMICAL CONTROLLERS. REFER TO ELECTRICAL.
8. INSTALL SANITIZER INJECTION POINT DOWNSTREAM OF PH BUFFER INJECTION POINT ON FILTERED WATER RETURN PIPE. CHEMICAL INJECTION POINTS SHALL BE LOCATED DOWNSTREAM OF ALL OTHER EQUIPMENT/SYSTEMS IN THE POOL MECHANICAL ROOM AT A MAXIMUM HEIGHT OF 7'-0" ABOVE FINISHED FLOOR. REFER: 7/AQ1.1

ELECTRICAL

1. GFCI'S PROVIDED AT OUTLETS. REFER TO ELECTRICAL.
2. POOL EQUIPMENT ROOM AND CHEMICAL STORAGE AREAS SHALL BE PROVIDED WITH ARTIFICIAL LIGHTING SUFFICIENT TO ILLUMINATE ALL EQUIPMENT AND SUPPLIES. REFER TO ELECTRICAL.
3. CONDUIT SHALL BE ROUTED OVERHEAD OR BELOW GRADE.

FILTER SCHEDULE

ID	POOL	MANUFACTURER	FILTER MODEL	QTY.	FILTRATION TYPE	MAXIMUM FILTRATION RATE (GPM/SQ. FT)	REQUIRED FILTRATION AREA (SQ. FT.)	DESIGN FILTRATION RATE (GPM/SQ.FT.)	DESIGN FILTRATION AREA (SQ. FT.)	FILTER BACKWASH RATE (GPM/SQ. FT.)	BACKWASH FLOW RATE PER FILTER (GPM)
F1	EXISTING POOL	STARK	S1-72	3	HIGH RATE PRESSURE	13.5	54.6	12.3	60.0	16.0	246

NOTE:
1. BACKWASH METHOD MUST BE MANUAL.
2. ALL FILTER SUPPORTS MUST BE SEISMICALLY RATED FOR THE SEISMIC ZONE IN WHICH IT IS INSTALLED IN ACCORDANCE WITH LOCAL AND/OR STATE REQUIREMENTS.
3. FILTER MANUFACTURER MUST CERTIFY FILTER MEDIA.
4. VALVES MUST BE PROVIDED TO BACKWASH EACH FILTER VESSEL INDEPENDENTLY.
5. THE BACKWASH PIPING MUST TERMINATE NO CLOSER THAN 6" ABOVE THE FLOOD RIM OF THE BACKWASH CATCH BASIN OR TWICE THE PIPE DIAMETER, WHICHEVER IS GREATER.
6. FILTER TANK ASSEMBLIES MUST BEAR THE NATIONAL SANITATION FOUNDATION SEAL OF APPROVAL FOR A MAXIMUM FLOW RATE 20 GPM PER SQUARE FOOT OF FILTER MEDIA.
7. THE BACKWASH THROTTLING VALVE(S) HANDLE MUST BE REMOVED AND TURNED OVER TO THE OWNER ONCE THE BACKWASH FLOW RATE(S) HAVE BEEN TESTED, ADJUSTED AND BALANCED.
8. PROVIDE 1" DIAMETER, SCHEDULE 80 PIPE FROM THE AUTOMATIC AIR VENT ON EACH OF THE FILTER VESSEL TO THE NEAREST FLOOR DRAIN OR BACKWASH CATCH BASIN. THE VENT PIPE MUST BE SLOPED TO THE DRAIN.
9. VESSEL MUST BE BACKWASHED AT NO LESS THAN 15.0 GPM/SF.

PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	SIZE	GPM	TDH	HP	NPSHR	HAIR & LINT		NOTES
									MAKE	SIZE	
PP1	EXISTING POOL RECIRCULATION PUMP 1 REFER: 1/AQ1.1	AURORA	3801	4"X5"X9.5	737	75	20	10.1	MER-MADE	10"X10"	1-6
PP2	EXISTING POOL RECIRCULATION PUMP 2 REFER: 1/AQ1.1	AURORA	3801	4"X5"X9.5	737	75	20	10.1			1-6

NOTE:
1. THE MANUFACTURER INDICATED IS BASIS OF DESIGN. PUMP MANUFACTURERS: GRISWOLD, HERBORNER OR PACO MUST BE CONSIDERED EQUAL PROVIDED THEY MEET SPECIFICATIONS AS INDICATED IN BID DOCUMENTS.
2. POOL PUMPS AND STRAINERS MUST BE INSTALLED ON HOUSEKEEPING PADS.
3. PROVIDE INFLUENT AND EFFLUENT GAUGES FOR EACH PUMP. PRESSURE GAUGES HAVE A RANGE OF 0-60 PSI. COMPOUND GAUGES HAVE A RANGE OF 0-30 HG / 0-60 PSI.
4. PROVIDE WITH 460 VOLT, 3 PHASE, 60HZ, 1750 RPM MOTOR.
5. PROVIDE WITH CHECK VALVE.
6. EXISTING VARIABLE FREQUENCY DRIVE TO REMAIN AND CONNECT TO NEW RECIRCULATION PUMP.

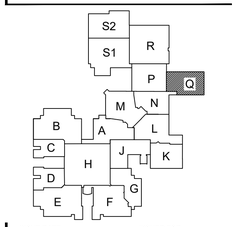
ELECTRONIC FLOCCULATION SYSTEM SCHEDULE

ID	POOL	MANUFACTURER	MODEL	PIPE SIZE (NOMINAL)	INPUT VOLTAGE	POWER RATING (W)	POWER CABLE LENGTH (FT)	SIGNAL CABLE LENGTH (FT)
E1	EXISTING POOL	CLEAR-FLOW	CF-800C	8"	100-240 VAC	5.4	15	33

NOTE:
REFER: 1/AQ1.3

PIPE SCHEDULE

ID	DESCRIPTION
P1	10" FROM EXISTING POOL MAIN DRAINS TO SURGE TANK
P2	10" FROM P1 TO PP1 & PP2
P3	10" FROM EXISTING POOL SURGE TANK TO PP1 & PP2
P4	10" FROM EXISTING POOL GUTTER DROPOUTS TO SURGE TANK
P5	10" FROM EXISTING POOL GUTTER DROPOUTS TO SURGE TANK
P6	8" FROM PP1 & PP2 TO F1
P7	6" FROM P5 TO EXISTING POOL DRAIN PIPING
P8	8" FROM F1 TO EXISTING POOL INLETS
P9	8" FROM F1 TO BASIN



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Livonia,
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SHEET

Unit Q
POOL MECHANICAL & CHEMICAL ROOM PLANS & SECTION

PROJECT NUMBER

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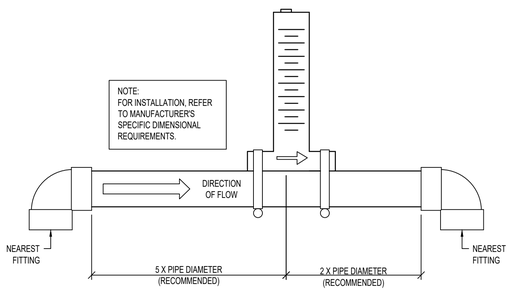
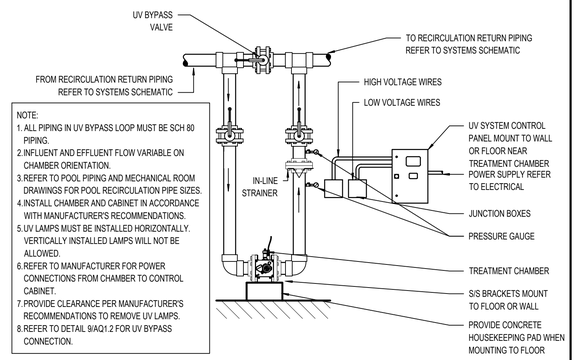
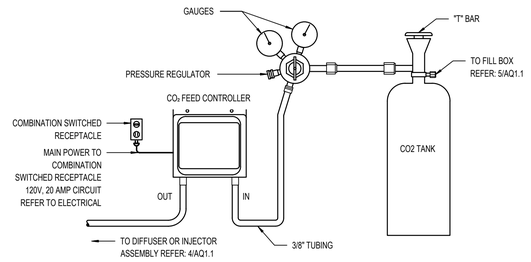


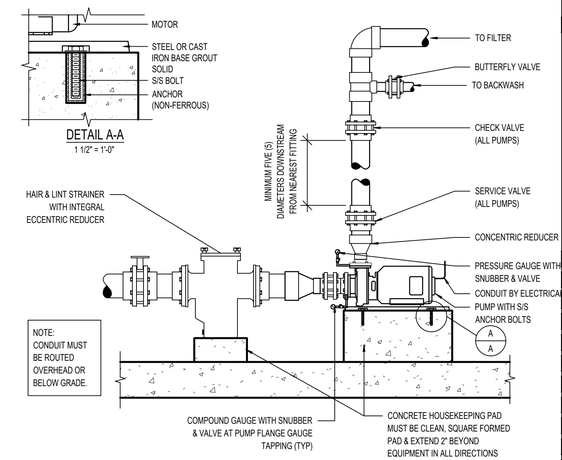
9 AQ1.1 IMPACT FLOW METER
3/4" = 1'-0"



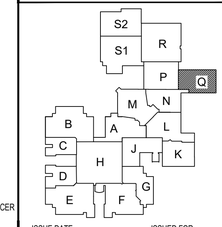
6 AQ1.1 UV TREATMENT SYSTEM
1/2" = 1'-0"



3 AQ1.1 CO2 STORAGE REGULATION
1/2" = 1'-0"



1 AQ1.1 TYPICAL PUMP DETAIL
1/2" = 1'-0"



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10 AQ1.1 VALVE
1/2" = 1'-0"

7 AQ1.1 CHEMICAL INJECTION
1/2" = 1'-0"

4 AQ1.1 CO2 DIFFUSER
3" = 1'-0"

2 AQ1.1 CHEMICAL CONTROLLER
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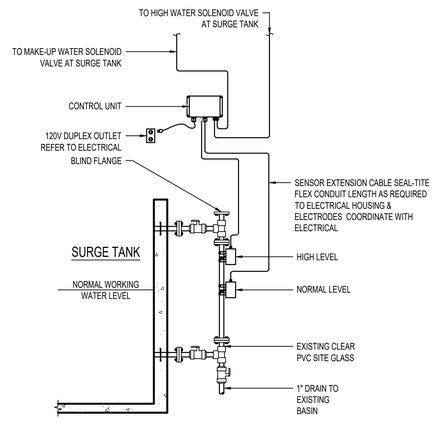
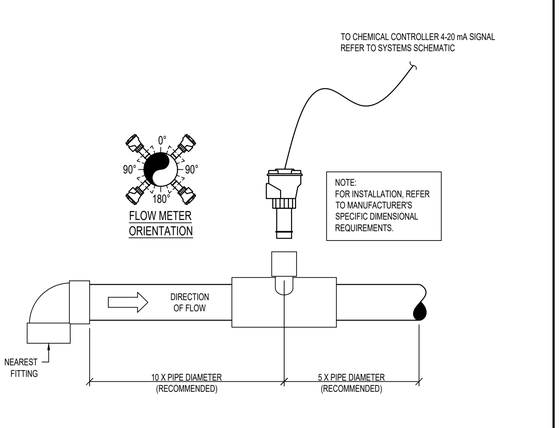
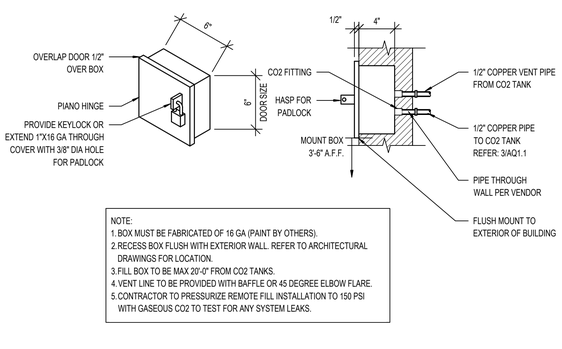


11 AQ1.1 WATER LEVEL CONTROLLER
3/4" = 1'-0"



8 AQ1.1 FLOW METER SENSOR
NTS



5 AQ1.1 CO2 FILLBOX
1 1/2" = 1'-0"

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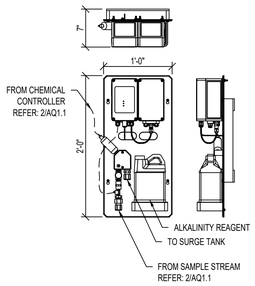
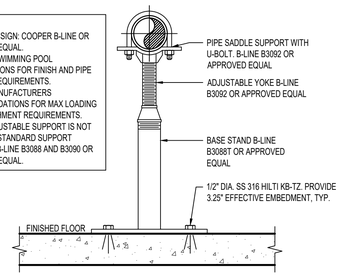


10 AQ1.2 TOTAL ALKALINITY PANEL

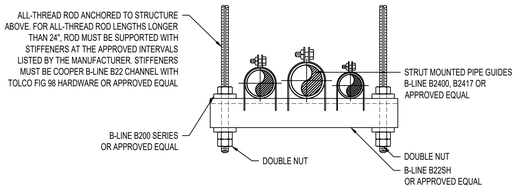
NTS

NOTE:
1. BASIS OF DESIGN: COOPER B-LINE OR APPROVED EQUAL.
2. REFER TO SWIMMING POOL SPECIFICATIONS FOR FINISH AND PIPE SUPPORT REQUIREMENTS.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.
4. WHERE ADJUSTABLE SUPPORT IS NOT REQUIRED, STANDARD SUPPORT ASSEMBLY B-LINE B3088 AND B3090 OR APPROVED EQUAL.



7 AQ1.2 FLOOR MOUNTED PIPE SUPPORT

3" = 1'-0"

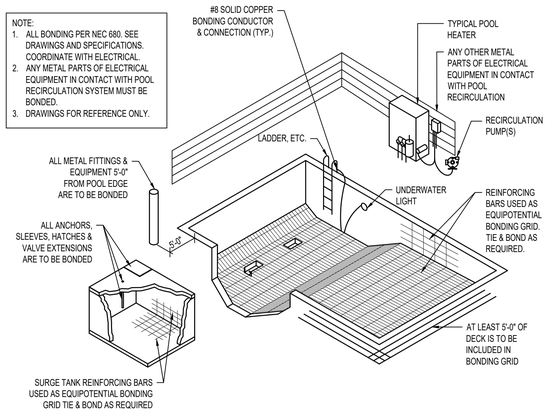


NOTE:
1. BASIS OF DESIGN: COOPER B-LINE. ALTERNATE MANUFACTURERS UNISTRUT OR APPROVED EQUAL.
2. REFER TO SWIMMING POOL SPECIFICATIONS FOR FINISH AND PIPE SUPPORT REQUIREMENTS.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.

4 AQ1.2 TRAPEZE HANGER

3" = 1'-0"

NOTE:
1. ALL BONDING PER NEC 680. SEE DRAWINGS AND SPECIFICATIONS. COORDINATE WITH ELECTRICAL.
2. ANY METAL PARTS OF ELECTRICAL EQUIPMENT IN CONTACT WITH POOL RECIRCULATION SYSTEM MUST BE BONDED.
3. DRAWINGS FOR REFERENCE ONLY.



1 AQ1.2 TYPICAL POOL BONDING DETAIL

NTS

CALCIUM HYPOCHLORITE

SODIUM BISULFATE

CARBON DIOXIDE

RATING EXPLANATION GUIDE

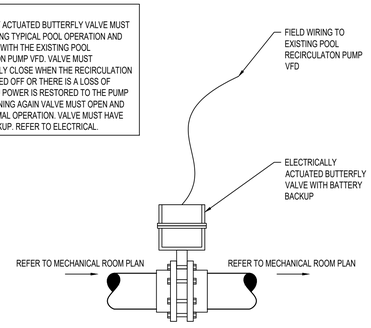
RATING	HEALTH HAZARD	FLAMMABILITY HAZARD	INSTABILITY HAZARD
4	CAN BE LETHAL	BELOW 73 DEGREES F	MAY EXPLODE AT NORMAL TEMPERATURES & PRESSURES
3	CAN CAUSE SERIOUS OR PERMANENT INJURY	ABOVE 73 DEGREES, BELOW 100 DEGREES F	MAY EXPLODE AT HIGH TEMPERATURE OR SHOCK
2	CAN CAUSE TEMPORARY INCAPACITATION OR RESIDUAL INJURY	ABOVE 100 DEGREES F, BELOW 200 DEGREES F	VIOLENT CHEMICAL CHANGE AT HIGH TEMPERATURES OR PRESSURES
1	CAN CAUSE SIGNIFICANT IRRITATION	ABOVE 200 DEGREES F	NORMALLY STABLE. HIGH TEMPERATURES MAKE UNSTABLE
0	NO HAZARD	WILL NOT BURN	STABLE

CONFIRM SIGNAGE WITH LOCAL FIRE MARSHAL AND/OR BUILDING CODES PRIOR TO INSTALLATION.

11 AQ1.2 HAZARD SIGNAGE

NTS

NOTE:
ELECTRICALLY ACTUATED BUTTERFLY VALVE MUST BE OPEN DURING TYPICAL POOL OPERATION AND INTERLOCKED WITH THE EXISTING POOL RECIRCULATION PUMP VFD. VALVE MUST AUTOMATICALLY CLOSE WHEN THE RECIRCULATION PUMP IS TURNED OFF OR THERE IS A LOSS OF POWER. WHEN POWER IS RESTORED TO THE PUMP AND IT IS RUNNING AGAIN VALVE MUST OPEN AND RESUME NORMAL OPERATION. VALVE MUST HAVE BATTERY BACKUP. REFER TO ELECTRICAL.



8 AQ1.2 ELECTRICALLY ACTUATED VALVE

1" = 1'-0"

NOTE:
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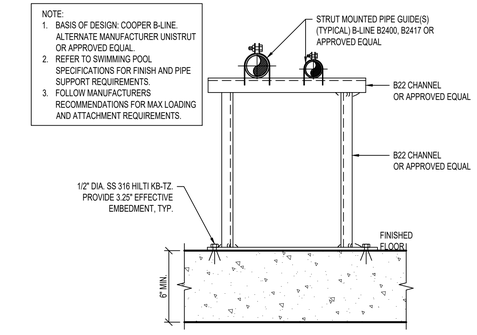
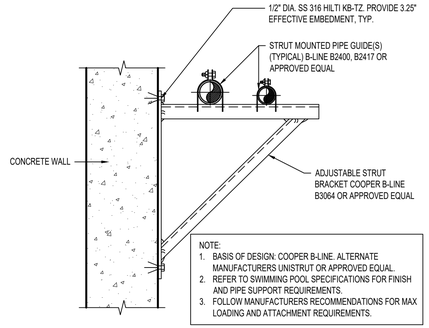
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.



5 AQ1.2 FLOOR MOUNTED ADJUSTABLE STRUT BRACKET

3" = 1'-0"



NOTE:
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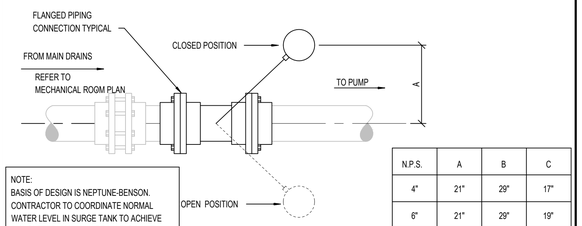
2. REFER TO SWIMMING POOL SPECIFICATIONS FOR FINISH AND PIPE SUPPORT REQUIREMENTS.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.

2 AQ1.2 ADJUSTABLE STRUT BRACKET

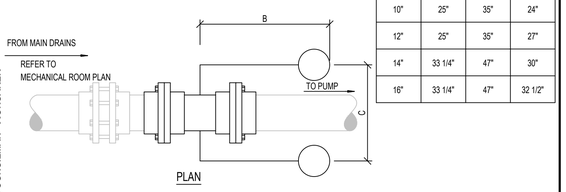
3" = 1'-0"



ELEVATION

NOTE:
BASIS OF DESIGN IS NEPTUNE-BENSON. CONTRACTOR TO COORDINATE NORMAL WATER LEVEL IN SURGE TANK TO ACHIEVE 80% GUTTER/ 20% MAIN DRAIN FLOW WITH ALTERNATE FLOAT VALVE MANUFACTURER.

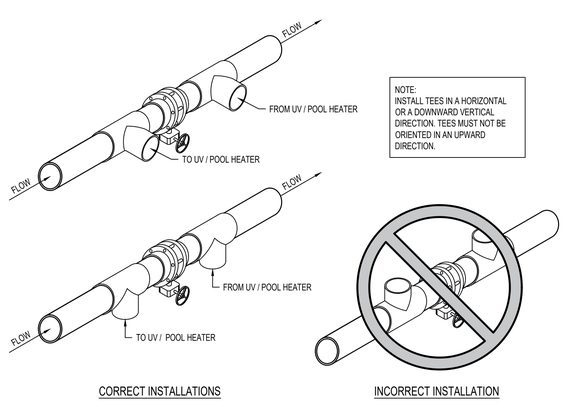
N.P.S.	A	B	C
4"	21"	29"	17"
6"	21"	29"	19"
8"	21"	29"	21 1/2"
10"	25"	35"	24"
12"	25"	35"	27"
14"	33 1/4"	47"	30"
16"	33 1/4"	47"	32 1/2"



PLAN

12 AQ1.2 MODULATING FLOAT VALVE

NTS



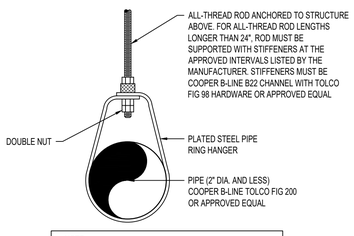
NOTE:
INSTALL TEES IN A HORIZONTAL OR A DOWNWARD VERTICAL DIRECTION. TEES MUST NOT BE ORIENTED IN AN UPWARD DIRECTION.

CORRECT INSTALLATIONS

INCORRECT INSTALLATION

9 AQ1.2 PIPING BYPASS

1/2" = 1'-0"



NOTE:
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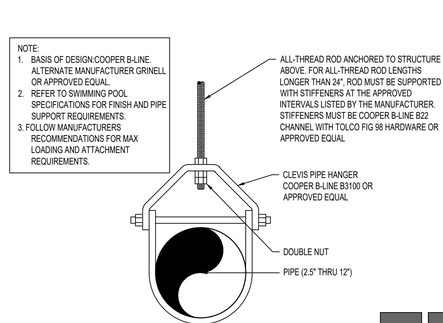
2. REFER TO SWIMMING POOL SPECIFICATIONS FOR FINISH AND PIPE SUPPORT REQUIREMENTS.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.

6 AQ1.2 SWIVEL RING PIPE HANGER

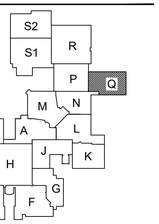
1 1/2" = 1'-0"

NOTE:
1. BASIS OF DESIGN:COOPER B-LINE. ALTERNATE MANUFACTURER GRINELL OR APPROVED EQUAL.
2. REFER TO SWIMMING POOL SPECIFICATIONS FOR FINISH AND PIPE SUPPORT REQUIREMENTS.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.



3 AQ1.2 CLEVIS PIPE HANGER

1 1/2" = 1'-0"



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Churchill High School
Pool Filtration Project

Livonia,
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SHEET

Unit Q
POOL MECHANICAL DETAILS

PROJECT NUMBER

2025-042.1

SHEET NUMBER

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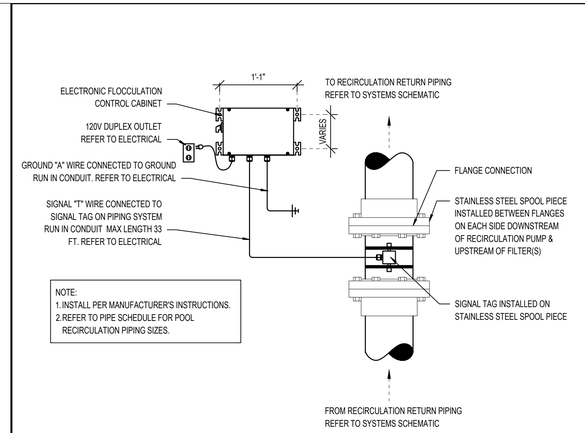
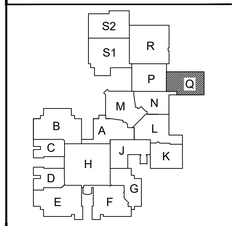


NOTE:
1. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
2 REFER TO PIPE SCHEDULE FOR POOL RECIRCULATION PIPING SIZES.

1 / AQ1.3 ELECTRONIC FLOCCULATION SYSTEM

1" = 1'-0"



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STATE OF MICHIGAN
CARL P. NYLANDER
ENGINEER
NO. 6201056291
LICENSED PROFESSIONAL ENGINEER

DRAWN	ZRW
CHECKED	MJM
APPROVED	CPN

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Unit Q
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PROJECT NUMBER

2025-042.1

SHEET NUMBER

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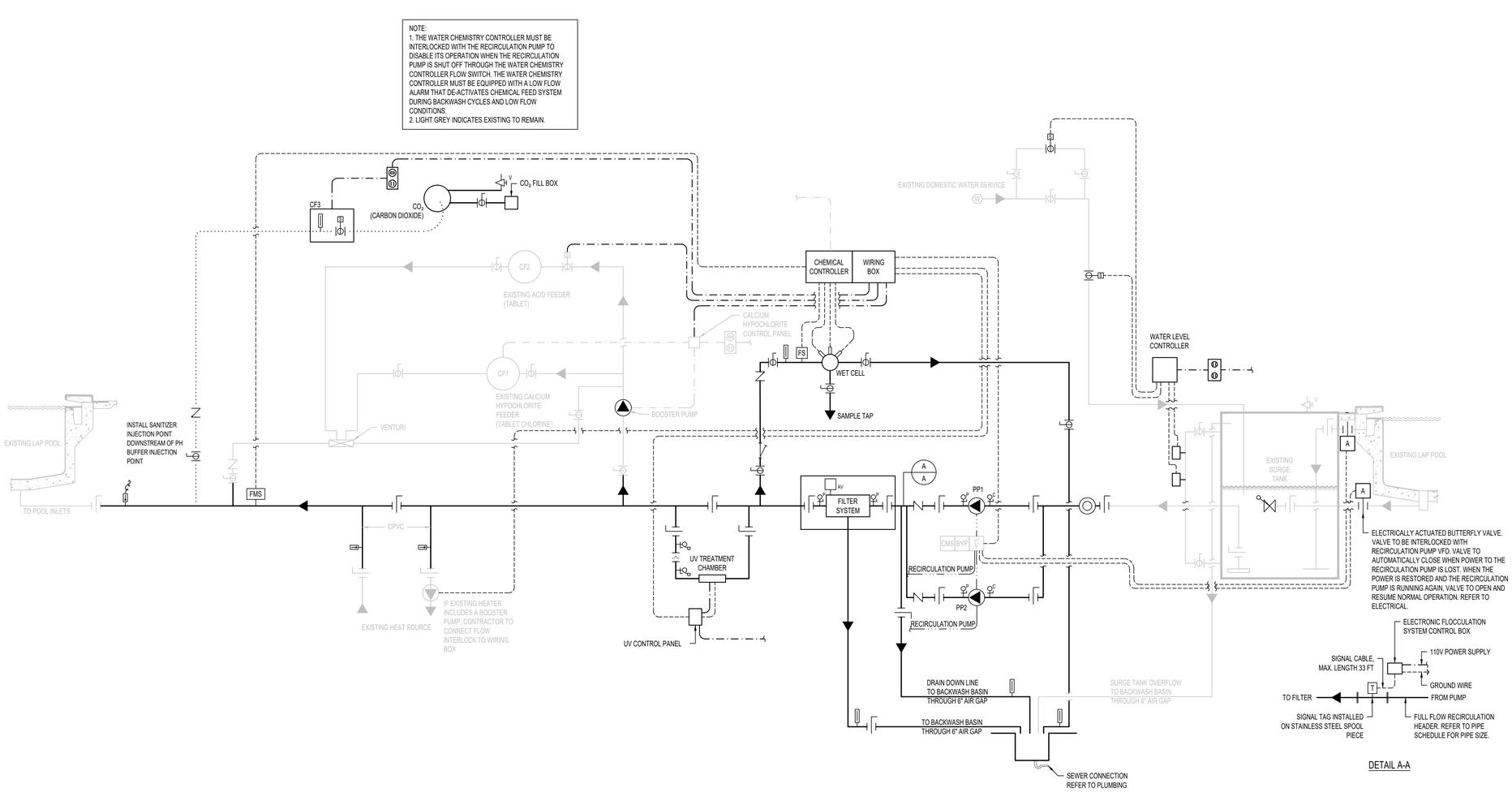
NOTE:
1. THE WATER CHEMISTRY CONTROLLER MUST BE INTERLOCKED WITH THE RECIRCULATION PUMP TO DISABLE ITS OPERATION WHEN THE RECIRCULATION PUMP IS SHUT OFF THROUGH THE WATER CHEMISTRY CONTROLLER FLOW SWITCH. THE WATER CHEMISTRY CONTROLLER MUST BE EQUIPPED WITH A LOW FLOW ALARM THAT DE-ACTIVATES CHEMICAL FEED SYSTEM DURING BACKWASH CYCLES AND LOW FLOW CONDITIONS.
2. LIGHT GREY INDICATES EXISTING TO REMAIN.

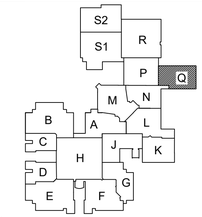


DETAIL A-A

1 AQ2.0 POOL SYSTEMS SCHEMATIC
NTS

SCHEMATIC LEGEND

LEGEND	ITEM
	FLOW DIRECTION
	BUTTERFLY VALVE
	BALL VALVE
	MODULATING FLOAT VALVE
	SOLENOID VALVE
	CHECK VALVE
	THREE WAY VALVE
	PUMP
	HAIR AND LINT STRAINER
	"Y" STRAINER
FMS	FLOW METER SENSOR
FS	FLOW SWITCH
	IMPACT FLOW METER
	VENTURI FLOW METER
W	WATER METER
AV	AUTOMATIC AIR VENT
V	AIR VENT
I	AIR INLET
P	PRESSURE GAUGE AND PETCOCK
C	COMPOUND GAUGE AND PETCOCK
	DIGITAL TEMP SENSOR
	THERMOMETER
A	PNEUMATIC ACTUATOR
	FLOW CONTROL VALVE
	COMBINATION SWITCH/RECEPTACLE
	DUPLEX OUTLET
APSO	AUTOMATIC PUMP SHUT-OFF DEVICE
V	VARIABLE FREQUENCY DRIVE
R	REMOTE START/STOP
E	EMERGENCY STOP
BYP	VARIABLE FREQUENCY DRIVE BYPASS
CMS	CONTACT MOTOR SELECTOR
T	ELECTRONIC FLOCCULATION SIGNAL TAG
T	15 MINUTE TIMER SWITCH
	LOW VOLTAGE CONTROL
	WATER LINE
	1 PHASE POWER
	3 PHASE POWER
	CO_2 LINE
N	NETWORK LINE BY ELECTRICAL
G	GAS LINE



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POWER SYMBOL LIST

SYMBOL	DESCRIPTION
●	CONDUIT DOWN
○	CONDUIT UP
C	CONTACTOR
	DISCONNECT SWITCH - NON FUSED
	DISCONNECT SWITCH - FUSED
	DISCONNECT SWITCH - COMB. MOTOR STARTER
	ELECTRICAL PANEL - 208/240 VOLTS
	ELECTRICAL PANEL - 480 VOLTS
	GROUNDING ROD
	GROUND
	GROUNDING BAR
J	JUNCTION BOX
J	JUNCTION BOX WITH HARDWIRED CONNECTION
M	METER
	MOTOR - SINGLE PHASE
	MOTOR - THREE PHASE
$M	MOTOR RATED SWITCH
	POWER RECEPTACLE - SIMPLEX TYPE
	POWER RECEPTACLE - DUPLEX TYPE
	POWER RECEPTACLE - DUPLEX 6" ABOVE COUNTER
USB	POWER RECEPTACLE - USB/DUPLEX COMBO. DEVICE
	POWER RECEPTACLE - QUADRUPLEX TYPE
	POWER RECEPTACLE - RECESSED FLOOR TYPE
	POWER RECEPTACLE - SPECIALTY TYPE
SPD	SURGE PROTECTION DEVICE
TC	TIME CLOCK
T	TRANSFORMER (REFER TO SCHEDULES FOR INFO)
VSD	VARIABLE SPEED DRIVE

NOTES:
1. ALL DEVICE RATINGS/SIZES SHALL BE COORDINATED WITH PLANS AND SCHEDULES.

AUXILIARY SYST. SYMBOL LIST

SYMBOL	DESCRIPTION
	CAMERA
CR	CARD READER
	COMMUNICATIONS DEVICE - 6" ABOVE COUNTER
	COMMUNICATIONS DEVICE - FLOOR
	COMMUNICATIONS DEVICE - WALL
DH	MAGNETIC DOOR HOLDER
	PUSH BUTTON
S	SPEAKER
	WALL CLOCK - SINGLE FACE
	WALL CLOCK - DOUBLE FACE
S	WALL CLOCK AND SPEAKER UNIT

NOTES:
1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR BOX AND CONDUIT FOR ALL DEVICES INDICATED.
2. LOW VOLTAGE CONTRACTOR SHALL PROVIDE EXACT SPECIFICATIONS AND LOCATIONS OF ALL DEVICES.

FIRE ALARM SYMBOL LIST

SYMBOL	DESCRIPTION
S	DETECTION DEVICE
S	DETECTION DEVICE - DUCT MOUNTED
FS	DETECTION DEVICE - FLOW SWITCH
TS	DETECTION DEVICE - TAMPER SWITCH
FAA	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FD	FIRE DEPARTMENT COMMUNICATION OUTLET
F	MANUAL DEVICE - PULL STATION
F	NOTIFICATION DEVICE - WALL MOUNTED
F	NOTIFICATION DEVICE - CEILING MOUNTED
F	VISUAL NOTIFICATION DEVICE - WALL MOUNTED
F	COMBINATION NOTIFICATION DEVICE - CEILING MOUNTED

NOTES:
1. DRAWINGS INDICATE DESIGN INTENT ONLY, FINAL LOCATIONS AND DEVICE SPECIFICATIONS SHALL BE PROVIDED BY FIRE ALARM MANUFACTURER. REFER TO PROJECT SPECIFICATIONS FOR APPROVED MANUFACTURERS.

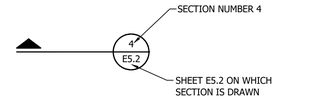
ELECTRICAL ABBREVIATIONS

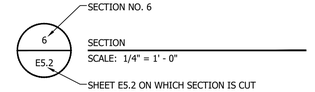
ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
A	AMPERE
AF	AMPERE FUSE/AMPERE FRAME
AWG	AMERICAN WIRE GAUGE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
C	CONDUIT OR CEILING MOUNTED
CB	CIRCUIT BREAKER
CU	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
EMT	ELECTRICAL METALLIC TUBING
EWC	ELECTRIC WATER COOLER
EPO	EMERGENCY POWER OFF
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F	FUSE
G/GRD	GROUND
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
IG	ISOLATED GROUND
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LP	LIGHTING PANEL
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MAX	MAXIMUM
MIN	MINIMUM
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N/NEU	NEUTRAL
NF	NON-FUSIBLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NIC	NOT IN CONTRACT
OF/CI	OWNER FURNISHED / CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED / OWNER INSTALLED
PH. OR Ø	PHASE
P	POLE
PF	POWER FACTOR
PVC	POLYVINYL CHOLRIDE (PLASTIC)
(R)	RELOCATED EXISTING ELECTRICAL EQUIPMENT
(RR)	REMOVE AND REINSTALL
RMC	RIGID METALLIC CONDUIT
RP	RECEPTACLE PANEL
SPEC/SPECS	SPECIFICATIONS
TBB	TELEPHONE BACKBOARD
TYP.	TYPICAL
UC	UNDER COUNTER
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
V	VOLT
VA	VOLT AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

DRAWING INDEX

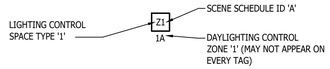
DRAWING NOTATION

SYMBOL	DESCRIPTION
LA	LIGHTING FIXTURE TAG
1	CONSTRUCTION KEY NOTE NUMBER 1
1	DEMOLITION KEY NOTE NUMBER 1
1	FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE ON THIS SHEET)
EF-1	EQUIPMENT DESIGNATION, (I.E. EXHAUST FAN NUMBER 1)
	EXISTING DEVICES OR EQUIPMENT
	NEW OR MODIFIED DEVICES OR EQUIPMENT
	NEW OR MODIFIED UNDERGROUND WIRING
	EXISTING SYSTEM COMPONENT TO BE REMOVED





LIGHTING CONTROL TAG



APPLICABLE CODES AND REGULATIONS

YEAR	CODE
2021	MICHIGAN BUILDING CODE
2019	MICHIGAN ENERGY CODE
2023	MICHIGAN ELECTRICAL CODE RULES, PART 8
2023	NATIONAL ELECTRICAL CODE (NFPA 70)
2013	NATIONAL FIRE ALARM AND SIGNALING CODE, NFPA 72
2012	LIFE SAFETY CODE, NFPA 101
2013	STANDARD FOR EMERGENCY AND STANDBY POWER SYSTEMS, NFPA 110
2009	ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES

ISSUE DATE	ISSUED FOR
12/10/2025	BIDS

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UNIFIED BUILDING SYSTEMS ENGINEERING
69 S. GRATIOT AVE.
MT. CLEMENS, MI 48043
UBS PROJECT 029.25.12

PROJECT

Livonia Public Schools Churchill High School Pool Filtration Project

Livonia,
Michigan

SHEET

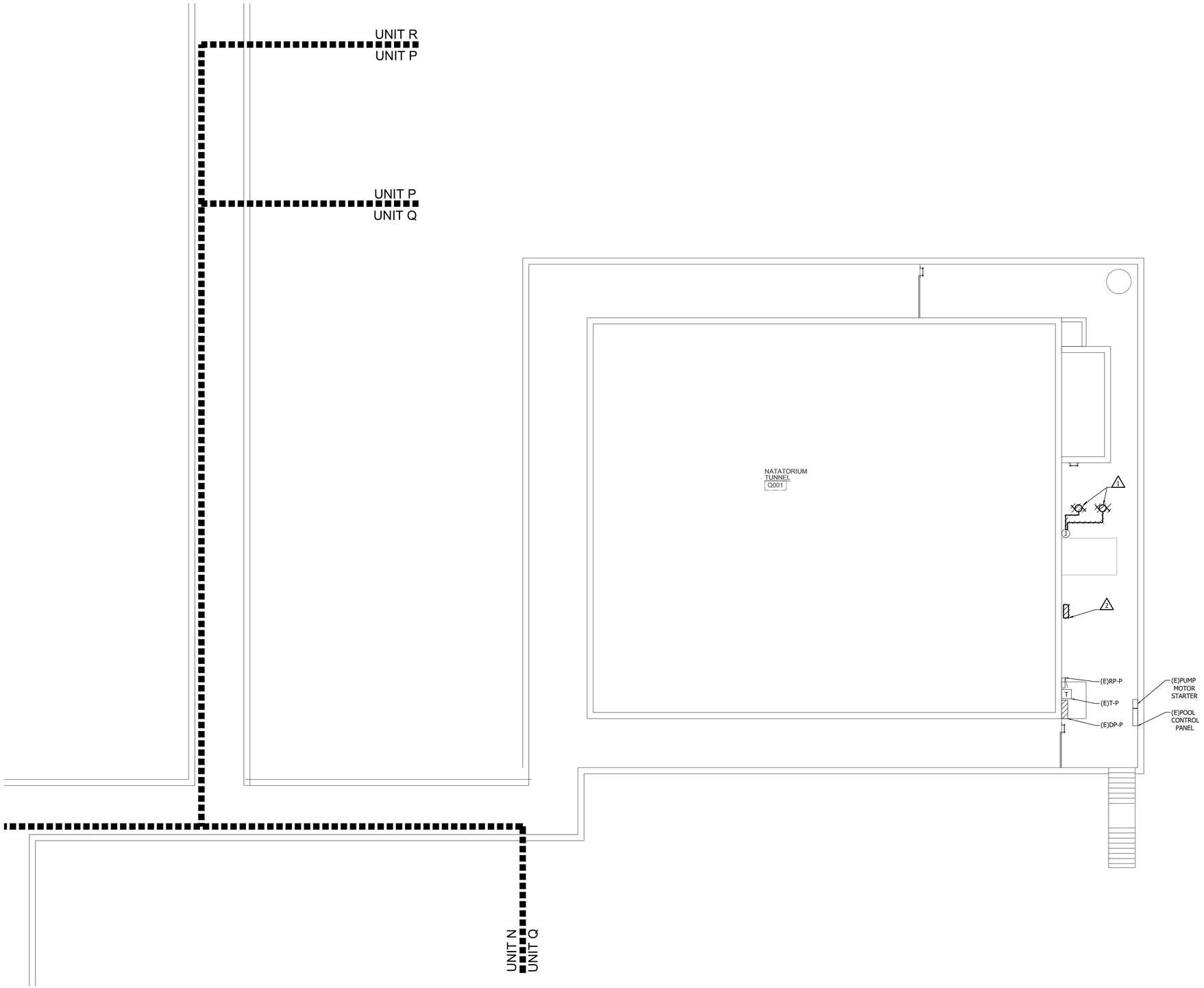
ELECTRICAL GENERAL INFORMATION

PROJECT NUMBER

2025-042.1

SHEET NUMBER

E0.00



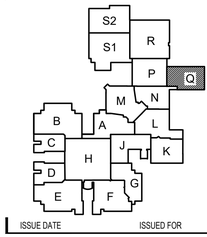
ELECTRICAL POWER DEMOLITION TUNNEL PLAN - UNIT Q
SCALE: 1/8" = 1'-0"

GENERAL DEMOLITION NOTES

A	THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE DETERMINED BY THE NEW WORK.
B	ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
C	PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY DESIGN PROFESSIONAL OF ANY INTERFERENCES OR DISCREPANCIES.
D	ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETELY WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN-ENDED PIPES AND DUCTS.
E	THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER-PROVIDED EQUIPMENT.
F	VERIFY DEPTH, SIZE, LOCATIONS, AND CONDITIONS OF EXISTING UTILITIES IN THE FIELD. INCLUDING POINTS OF CONNECTION PRIOR TO STARTING WORK.
G	ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
H	ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WHERE DUCT WORK PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.

DEMOLITION KEYED NOTES

1	POOL CIRCULATION PUMPS REMOVED BY OTHERS. EC TO DISCONNECT AND MAKE SAFE. TAKE CONDUIT AND WIRING BACK TO SOURCE AND PREP CIRCUIT FOR RECONNECTION TO NEW EQUIPMENT. REFER TO NEW WORK PLANS.
2	UV CHAMBER AND CABINET REMOVED BY OTHERS. EC TO DISCONNECT AND MAKE SAFE. TAKE CONDUIT AND WIRING BACK TO SOURCE.



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Churchill High School
Pool Filtration Project

Livonia,
Michigan

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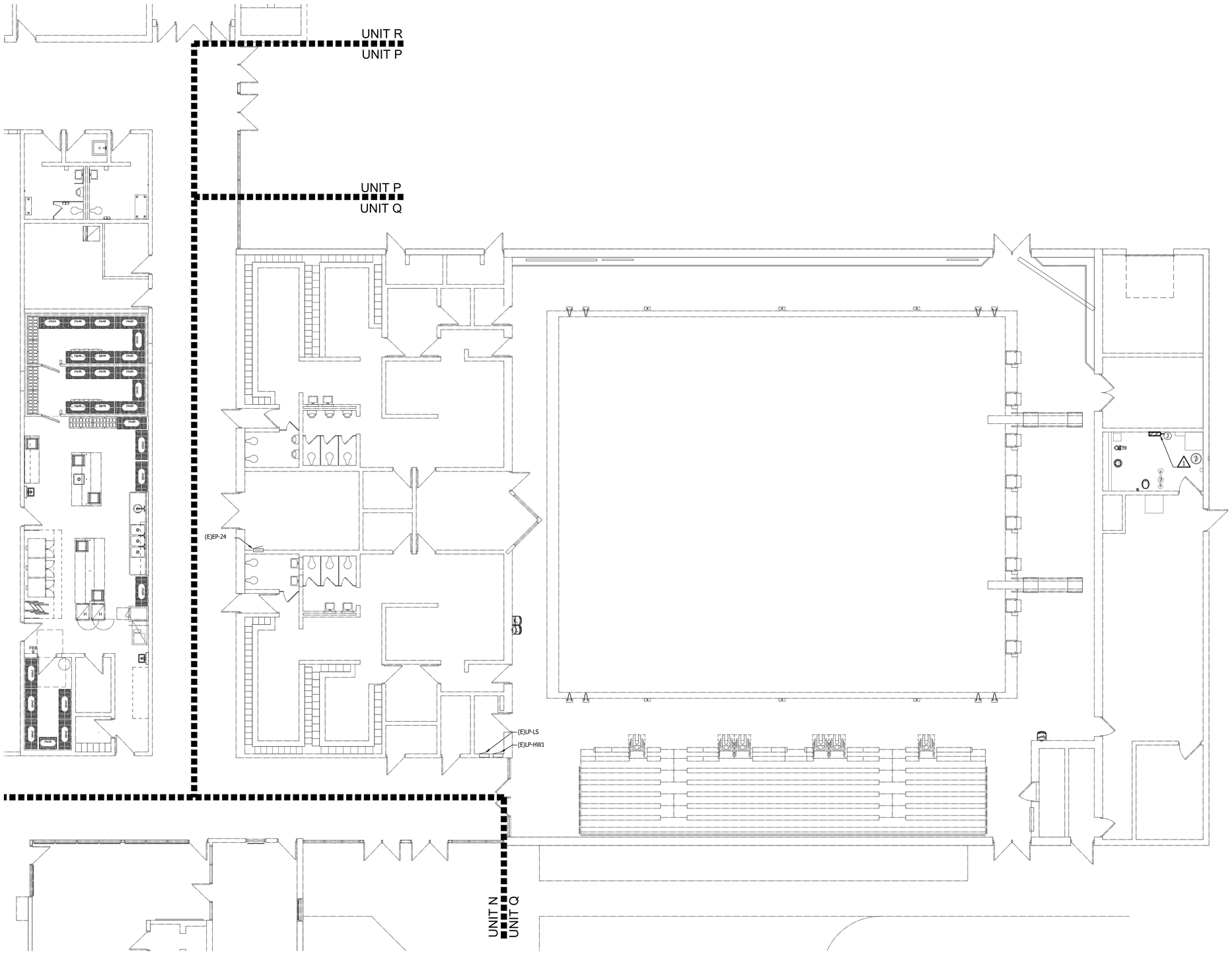
ELECTRICAL POWER
DEMOLITION TUNNEL
PLAN - UNIT Q

PROJECT NUMBER

2025-042.1

SHEET NUMBER

EPD2.00Q



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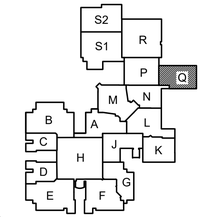
⚠ DEMOLITION KEYED NOTES

1	CHEMICAL CONTROLLER TO BE REMOVED BY OTHERS. EC TO DISCONNECT AND MAKE SAFE. TAKE CONDUIT AND WIRING BACK TO SOURCE AND PREP CIRCUIT FOR RECONNECTION TO NEW EQUIPMENT. REFER TO NEW WORK PLANS.

ELECTRICAL POWER DEMOLITION FIRST FLOOR PLAN - UNIT Q
SCALE: 1/8" = 1'-0"



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UBS PROJECT 029.25.12

PROJECT
Livonia Public Schools
Churchill High School
Pool Filtration Project

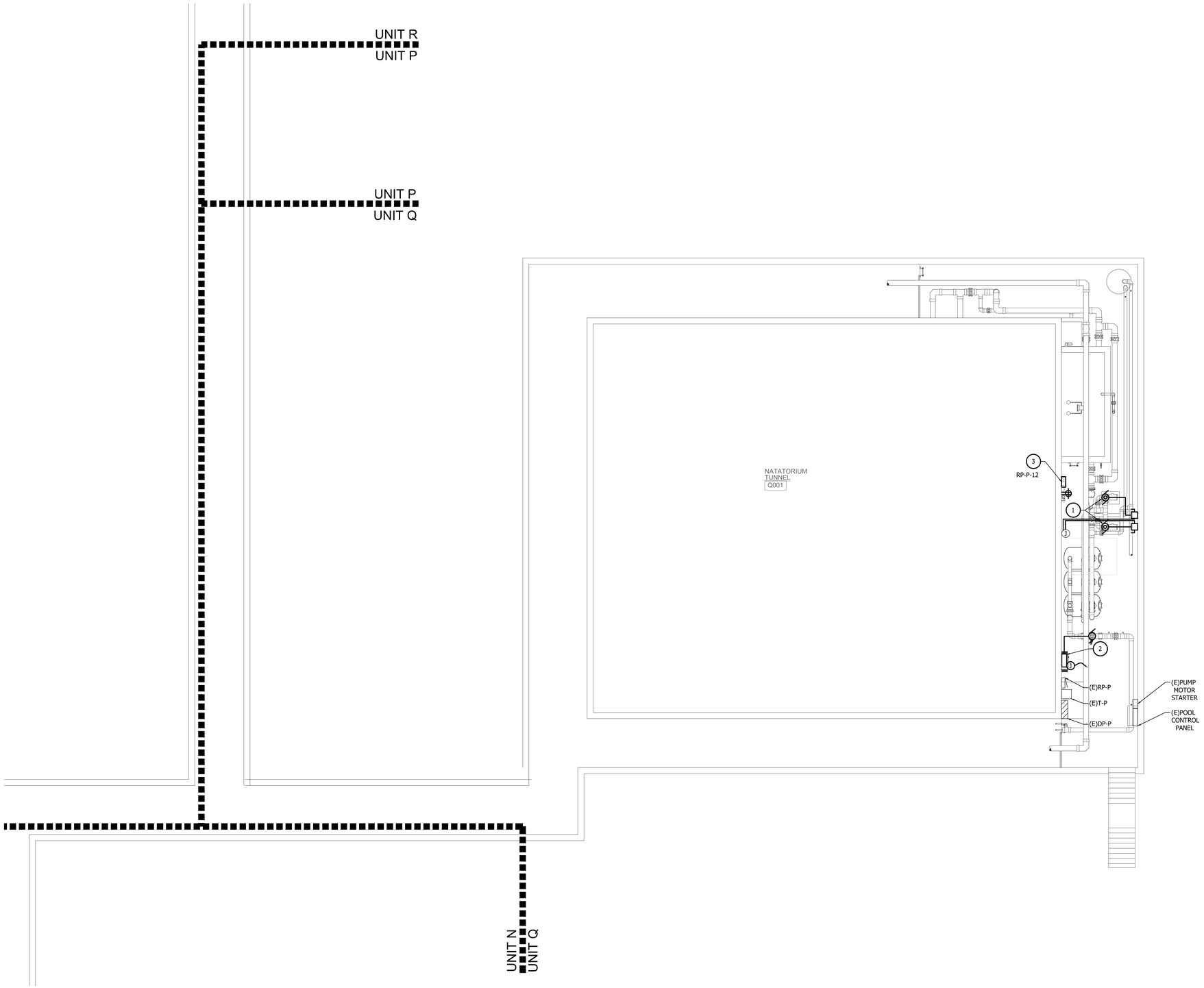
Livonia,
Michigan

SHEET
ELECTRICAL POWER DEMOLITION FIRST FLOOR PLAN - UNIT Q

PROJECT NUMBER
2025-042.1

SHEET NUMBER
EPD2.10Q

2025-042.1 LPS Churchill HS - Pool Filtration Project



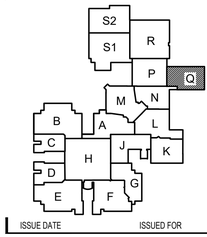
ELECTRICAL POWER NEW WORK TUNNEL PLAN - UNIT Q
SCALE: 1/8" = 1'-0"

POWER GENERAL NOTES

A	THESE DRAWINGS ARE DIAGRAMMAITC AND REPRESENT THE GENERAL EXTENT OF THE WORK TO BE PERFORMED. PROVIDE AND EXECUTE ALL HVAC SYSTEMS PER ENGINEER'S SPECIFICATION, AND LOCAL APPLICABLE CODES INCLUDING AMENDMENTS, BULLETINS, ETC. AS WELL AS THE STANDARDS OF INSTALLATION AND EQUIPMENT ESTABLISHED FOR THE BUILDINGS, AND REQUIREMENTS OF THE OWNER.
B	EXCEPT FOR CHANGES AS MAY BE SPECIFICALLY APPROVED BY THE ENGINEER OF RECORD. IN ACCORDANCE WITH ALTERNATES OF OPTIONS AS STATED HEREINAFTER, ALL WORK MUST BE IN FULL ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS. SYSTEMS ARE TO BE COMPLETE, EFFICIENT, AND SATISFACTORY OPERATION WHEN PROJECT IS DELIVERED TO THE OWNER.
D	CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVAL FROM GOVERNING AUTHORITIES AND FILE NECESSARY FORMS, PAY ALL INSPECTION FEES.
E	ELECTRICAL CONTRACTOR SHALL COMPLY WITH THE LATEST NATIONAL ELECTRICAL CODE, LIFE SAFETY CODE AND APPLICABLE STATE AND LOCAL CODES AND ORDINANCES.
F	ELECTRICAL EQUIPMENT AND WIRING SHALL BE NEW AND SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED.
G	WIRING SHALL BE IN CONDUIT. CONDUIT SHALL BE 3/4" CONDUIT MINIMUM. CONDUITS IN FINISHED AREAS SHALL BE CONCEALED
H	NEW WIRES SHALL BE TYPE THHN. MINIMUM SIZE SHALL BE #12 AWG, UNLESS OTHERWISE NOTED. FINAL CONNECTIONS TO EQUIPMENT, FURNISHED AND INSTALLED BY OTHERS, SHALL BE PROVIDED BY THIS CONTRACTOR.

(X) NEW WORK KEYED NOTES

1	NEW CIRC PUMPS PROVIDED BY OTHERS. EC TO PROVIDE NEW NEMA 4 60A 3P 480V DISCONNECT SWITCH AND CONNECT TO EXISTING CIRCUIT KEPT SAFE DURING DEMOLITION. EXTEND #8 AWG WIRING AND CONDUIT AS REQUIRED.
2	NEW UV TREATMENT SYSTEM PROVIDED BY OTHERS. EC TO CONNECT TO EXISTING PUMP CONTROLLER. ALL WIRING AND CONDUIT SHALL BE NEW.
3	ELECTRONIC FLOCCULATION SYSTEM PROVIDED BY OTHERS. EC TO INSTALL NEW GFCI RECEPTACLE FROM SPARE 120V 20A BREAKER AS SHOWN.



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UBS PROJECT 029.25.12

PROJECT

Livonia Public Schools
Churchill High School
Pool Filtration Project

Livonia,
Michigan

SHEET

ELECTRICAL POWER
NEW WORK TUNNEL
PLAN - UNIT Q

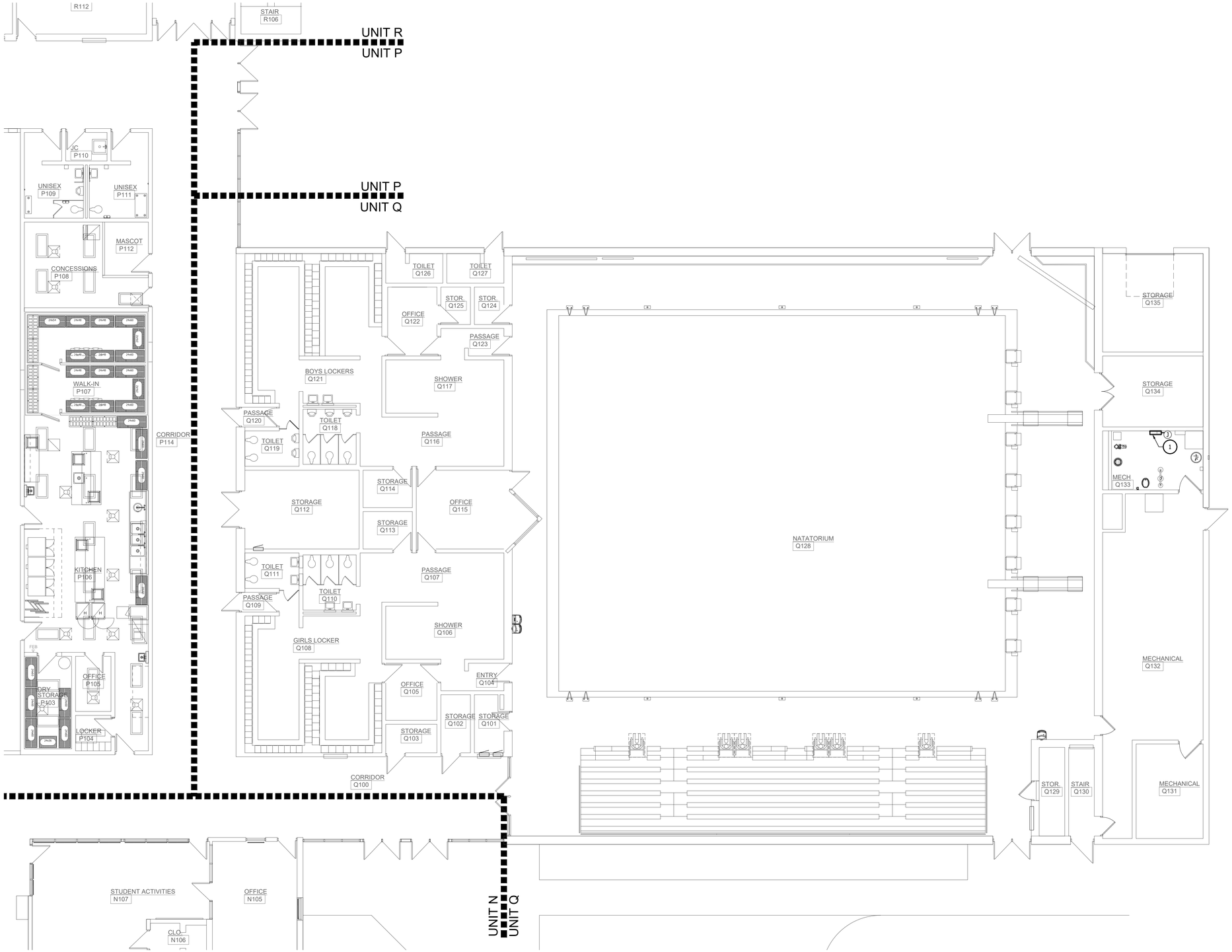
PROJECT NUMBER

2025-042.1

SHEET NUMBER

EP2.00Q

2025-042.1 LPS Churchill HS - Pool Filtration Project



ELECTRICAL POWER NEW WORK FIRST FLOOR PLAN - UNIT Q

SCALE: 1/8" = 1'-0"

POWER GENERAL NOTES

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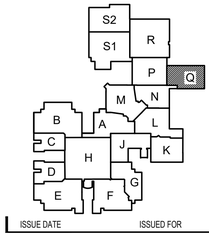
H	NEW WIRES SHALL BE TYPE THHN. MINIMUM SIZE SHALL BE #12 AWG, UNLESS OTHERWISE NOTED. FINAL CONNECTIONS TO EQUIPMENT, FURNISHED AND INSTALLED BY OTHERS, SHALL BE PROVIDED BY THIS CONTRACTOR.

(X) NEW WORK KEYED NOTES

1	CHEMICAL CONTROLLER PROVIDED BY OTHERS. PROVIDE ALL FINAL CONNECTIONS. CONNECT TO EXISTING CIRCUIT KEPT SAFE DURING DEMOLITION.



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UBS PROJECT 029.25.12

PROJECT

Livonia Public Schools
Churchill High School
Pool Filtration Project

Livonia,
Michigan

SHEET

ELECTRICAL POWER
NEW WORK FIRST
FLOOR PLAN - UNIT Q

PROJECT NUMBER

2025-042.1

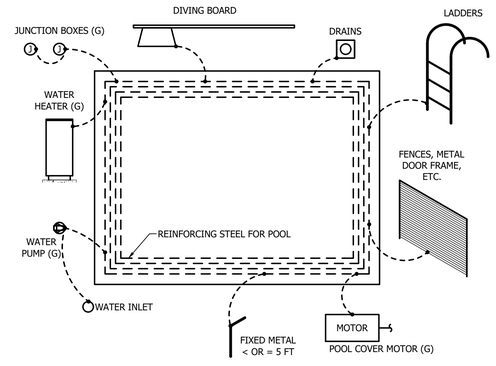
SHEET NUMBER

EP2.10Q

2025-042.1 LIVS Churchill HS - Pool Filtration Project

NOTES:
"G" = ALSO REQUIRED TO BE GROUNDED

PARTS SPECIFIED IN 680(B)(1) - (B)(7)
TO BE BONDED TOGETHER USING:
SOLID COPPER CONDUCTORS, INSULATED COVERED, OR BARE, NOT SMALLER THAN 8 AWG
RIGID METAL CONDUIT OF BRASS OR OTHER IDENTIFIED CORROSION-RESISTANT METAL



POOL BONDING DETAIL

NO SCALE

Panel Designation: (E)RP-P — **Main:** 100A — **P-P Voltage:** 208
Panel Location: POOL TUNNEL — **Bussing:** 100 — **P-N Voltage:** 120
Fed From: EXISTING — **Ground Bus:** STANDARD — **Phase:** 3
Feeder Size: EXISTING — **Mounting:** SURFACE — **Wire:** 4
Neutral: 100% — **Min SC Interrupting Rating:** EXISTING

Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prot	CKT	Ø A	Ø B	Ø C	CKT	OC Prot	nonC Load	Cont Load	Recept Load	Light Load	Remarks
(E)UH-1 RM 101-102-104			1920		20	1	X			2	20		1000			(E)SCOREBOARD
(E)EF-1 RM 103			1000		20	3		X		4	20		1000			(E)SCOREBOARD
(E)TRAP TRIMMERS RM101-103			1920		20	5			X	6	20		1000			(E)SCOREBOARD
(E)PLUGS RM 101,03,04,05 ROOF		720			20	7	X			8	20		1000			(E)SCOREBOARD
(E)PLUGS RM 101,02 EXTERIOR		720			20	9		X		10	20	555				(E)CONTACT & SWITCH
(E)SUMP PUMP CONTROL PANEL		1000			20	11			X	12	20	**540**				**FLOCCULATION SYSTEM**
(E) SUMP PUMP #3				1248	15	13	X			14	20					(E)SPARE
				1248		15		X		16	20					(E)SPARE
(E)SPARE					20	17			X	18	20					(E)SPARE
(E)SPARE					20	19	X			20	20					(E)SPARE
(E)FIRE NAC PANEL			555		20	21		X		22	20					(E)SPARE
(E) SPARE					20	23			X	24	20					(E)SPARE
(E) SPARE					20	25	X			26	20					(E)SPARE
(E) SPARE					20	27		X		28	20					(E)SPARE
(E) SPARE					20	29			X	30	20					(E)SPARE
(E) SPARE					20	31	X			32	20					(E)SPARE
(E) SPARE					20	33		X		34	20					(E)SPARE
(E) SPARE					20	35			X	36	20					(E)SPARE
(E) SPARE					20	37	X			38	20					(E)SPARE
(E) SPARE					20	39		X		40	20					(E)SPARE
(E) SPARE					20	41			X	42	20					(E)SPARE

Load Description	Connected Load ØA	ØB	ØC	Total	Demand Factor	Demand Load ØA	ØB	ØC	Total	
Lighting or Continous Load (Volt-Amps)	0	0	0	0	1.00	0	0	0	0	
180VA Receptacle Load (Volt-Amps)	720	720	1000	2440	1.00 (First 10kVA)	720	720	1000	2440	**Receptacle Demand Factor per Article 220.44 of the National Electrical Code.**
	Amount over 10kVA			0	0.50 (> 10kVA)	0	0	0	0	
Continuous Load (Volt-Amps)	3920	2555	2920	9395	1.25	4900	3194	3650	11744	
Non-Continuous Load (Volt-Amps)	1248	1803	540	3591	0.80	998	1442	432	2873	
Total Load (kVA)	5.89	5.08	4.46	15.43	**125% of Light/Cont and Recept**	6.62	5.36	5.08	17.06	
Total Ampacity (Amps)	49.1	42.3	37.2	42.9	**(<10kVA) load plus other load**	55.2	44.6	42.4	47.4	
Minimum Feeder Sizing (Amps)	50.6	43.8	39.3	44.5	**<---- per NEC Article 215.2 ---->**	56.7	46.1	44.4	49.1	

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Livonia,
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SHEET

ELECTRICAL DETAILS AND PANEL SCHEDULES

PROJECT NUMBER

2025-042.2

SHEET NUMBER

E5.00