Cedar Hills Regional Landfill Pilot-Scale Micro-Electrolysis

Contract KC001738

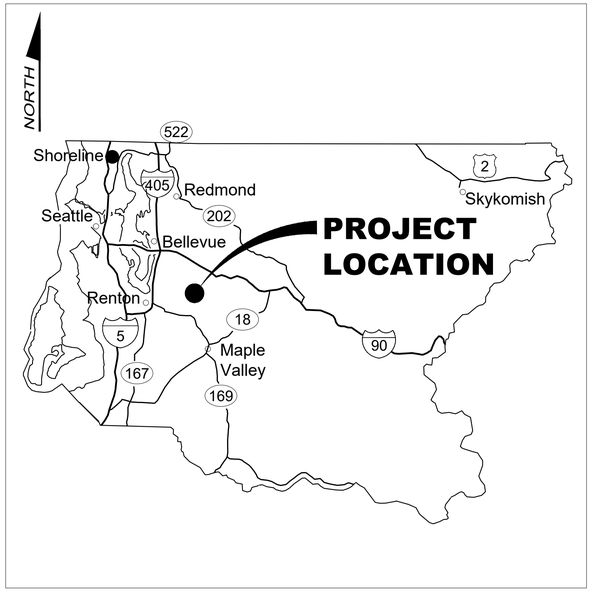
Volume 3 of 3

Contract Drawings

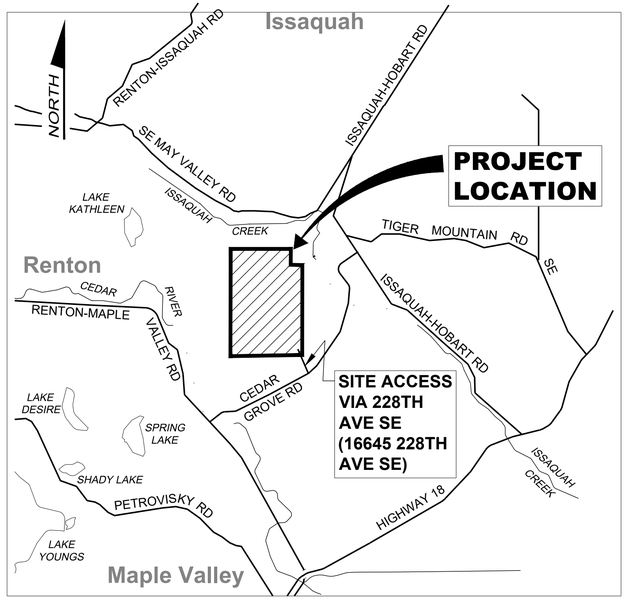
October 2026

King County

Department of Natural Resources and Parks
Solid Waste Division



PROJECT VICINITY MAP



PROJECT SITE MAP

KING COUNTY

DEPARTMENT OF NATURAL RESOURCES & PARKS

MO MCBROOM
DIRECTOR

CONTRACT DRAWINGS FOR:

CEDAR HILLS REGIONAL LANDFILL
PILOT-SCALE MICRO-ELECTROLYSIS

PROJECT NO.
SWD-1133921

PROJECT STATUS:
ISSUED FOR CONSTRUCTION

CONTRACT NO.
KC001738

FACILITY NO.
SW-PR-0021088

PROJECT MANAGER
SAID SEDDIKI, PE, PMP

KING COUNTY DIVISION DIRECTOR
REBECCA SINGER

CONSULTING ENGINEERS

JOHN HUNT

FINAL

ISSUE DATE: 09/2026 CONTRACT NO.: KC001738

DESIGNED:	DPD	09/2026
CHECKED:	KMB	09/2026
DRAWN:	DPD	09/2026
RECOMMENDED:		
APPROVED:	CAB	09/2026

SCALE: NONE

NUM.	REVISION	BY	DATE
1	TITLE BLOCK UPDATES	CAB	09/2026
0	ISSUED FOR CONSTRUCTION	CAB	09/2026

CHRISTOPHER ALLEN HACK — STATE OF WASHINGTON — 19580 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

KING COUNTY DEPT. OF NATURAL RESOURCES AND PARKS
SOLID WASTE DIVISION
CEDAR HILLS REGIONAL LANDFILL
PILOT-SCALE MICRO-ELECTROLYSIS
COVER SHEET

King County

SHEET 1 OF 27 SHEETS

G0.01

DWG. NO.	DRAWING TITLE
G0.01	COVER SHEET
G0.02	SHEET INDEX
C1.01	SITE VICINITY
C1.02	FACILITY LAYOUT
C1.03	MICRO-ELECTROLYSIS PILOT-SCALE LAYOUT AND TRAFFIC PATTERN
M1.01	EQUIPMENT LAYOUT
M1.02	EQUIPMENT LAYOUT DETAIL
M1.03	MECHANICAL EQUIPMENT GENERAL ARRANGEMENT
M1.04	MECHANICAL PIPING PLAN
S0.01	STRUCTURAL GENERAL NOTES
S1.01	EQUIPMENT SUPPORTING CONCRETE PAD PLAN & SECTIONS
D6.01	PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS & ABBREVIATIONS SH 1
D6.02	PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS & ABBREVIATIONS SH 2
D6.03	PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS & ABBREVIATIONS SH 3
D6.04	PIPING AND INSTRUMENTATION DIAGRAM INFLUENT / CO2 / WATER SYSTEMS
D6.05	PIPING AND INSTRUMENTATION DIAGRAM ME REACTOR
D6.06	PIPING AND INSTRUMENTATION DIAGRAM EFFLUENT / CHEMICAL SYSTEMS
D6.07	PIPING AND INSTRUMENTATION DIAGRAM MEDIA DOSING / AIR / SCRUBBING SYSTEMS
D6.08	PIPING AND INSTRUMENTATION DIAGRAM SOLIDS DEWATERING
D6.09	PIPING SPECIFICATIONS 1
D6.10	PIPING SPECIFICATIONS 2
E0.01	ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS
E2.01	POWER PLAN, SECTIONS AND ELEVATIONS
E6.01	ELECTRICAL SCHEDULES
E6.02	ELECTRICAL ONE-LINE DIAGRAM, ELEVATION, AND SECTIONS
E6.03	NETWORK DIAGRAM PLC SYSTEM
E6.04	I/O POINTS LIST SCHEDULES

FINAL

ISSUE DATE: 09/2026 CONTRACT NO.: KC001738

DESIGNED:	DPD	09/2026
CHECKED:	KMB	09/2026
DRAWN:	DPD	09/2026
RECOMMENDED:	.	.
APPROVED:	CAB	09/2026

SCALE: NONE

NUM.	REVISION	BY	DATE
1	TITLE BLOCK UPDATES	CAB	09/2026
0	ISSUED FOR CONSTRUCTION	CAB	09/2026

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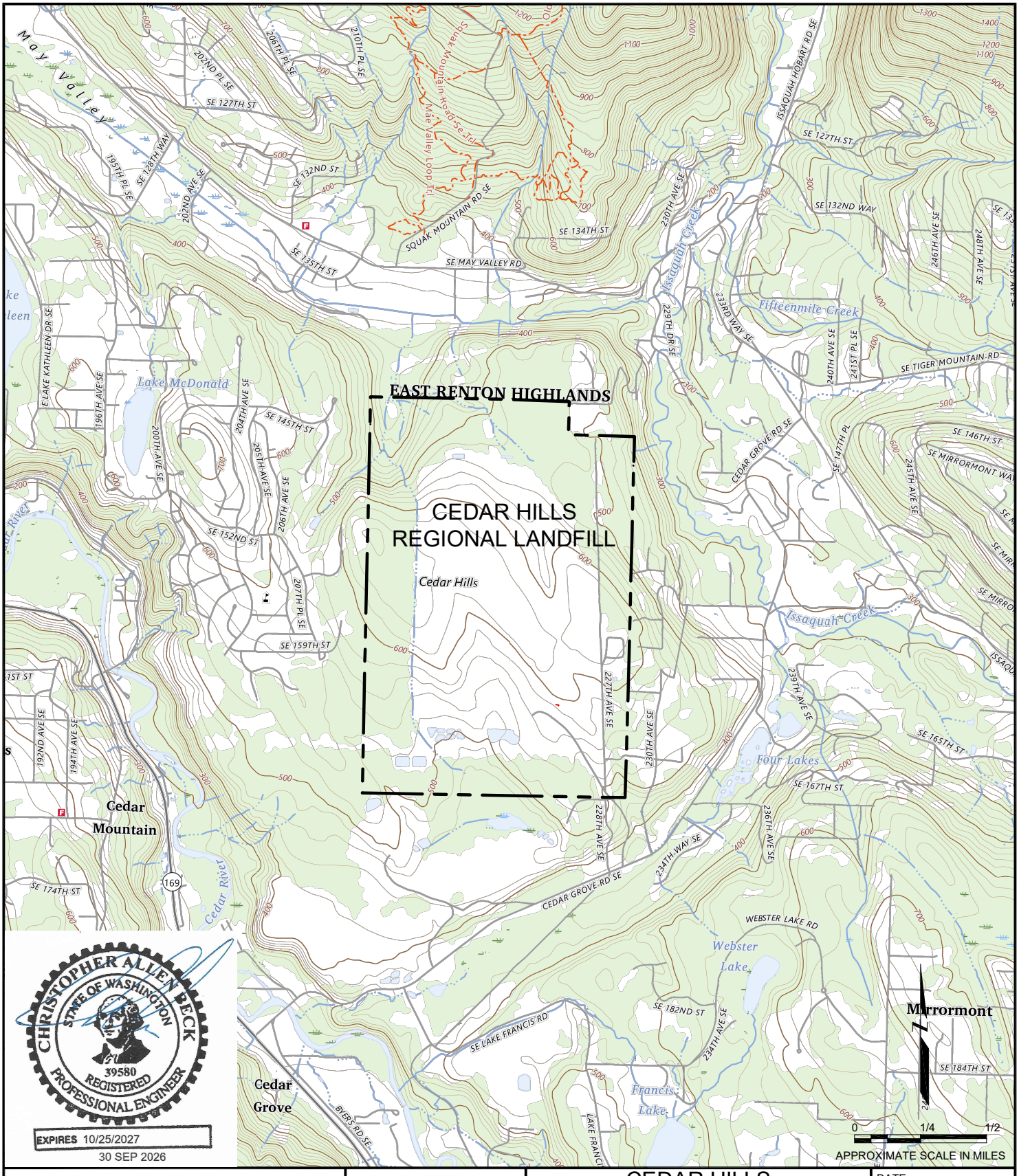
CHRISTOPHER ALLAN PEAK STATE OF WASHINGTON 39580 REGISTERED PROFESSIONAL ENGINEER EXPIRES 10/25/2027 30 SEP 2026

KING COUNTY DEPT. OF NATURAL RESOURCES AND PARKS
SOLID WASTE DIVISION
CEDAR HILLS REGIONAL LANDFILL
PILOT-SCALE MICRO-ELECTROLYSIS
SHEET INDEX

King County

SHEET 2 OF 27 SHEETS

G0.02



CHRISTOPHER ALLEN BECK
STATE OF WASHINGTON
39580
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 10/25/2027

30 SEP 2026

King County

Department of Natural Resources and Parks
Solid Waste Division

WSP USA Inc.

18300 Redmond Way, Suite 200
Redmond, Washington 98052

CEDAR HILLS REGIONAL LANDFILL

PILOT-SCALE MICRO-ELECTROLYSIS

SITE VICINITY

DATE
SEPTEMBER 2026

SHEET NO: OF
3 OF 27

PROJECT NO:
SWD-1133921

DRAWING NO:
C1.01

DRAWN BY: APS CHECKED BY: GM

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PROPERTY LINE

WEST PROPERTY LINE

WEST PERIMETER ROAD

EASTPROPERTY LINE

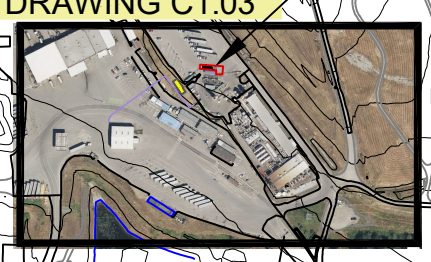
EAST PERIMETER ROAD

SOUTH PERIMETER ROAD

SOUTH PROPERTY LINE

PROPOSED PILOT-SCALE MICRO-ELECTROLYSIS LOCATION

DRAWING C1.03



CONTAMINATED STORMWATER LAGOON

ENTRANCE

228TH AVE SE

LEACHATE LAGOONS

690
650
610
600
590
580

CHRISTOPHER ALLEN BECK
STATE OF WASHINGTON
39580
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 10/25/2027

30 SEP 2026

SPRING 2018 TOPOGRAPHY SHOWN.

0 300 600

APPROXIMATE SCALE IN FEET

King County

Department of Natural Resources and Parks
Solid Waste Division

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

CEDAR HILLS REGIONAL LANDFILL

PILOT-SCALE MICRO-ELECTROLYSIS

FACILITY LAYOUT

DATE
SEPTEMBER 2026

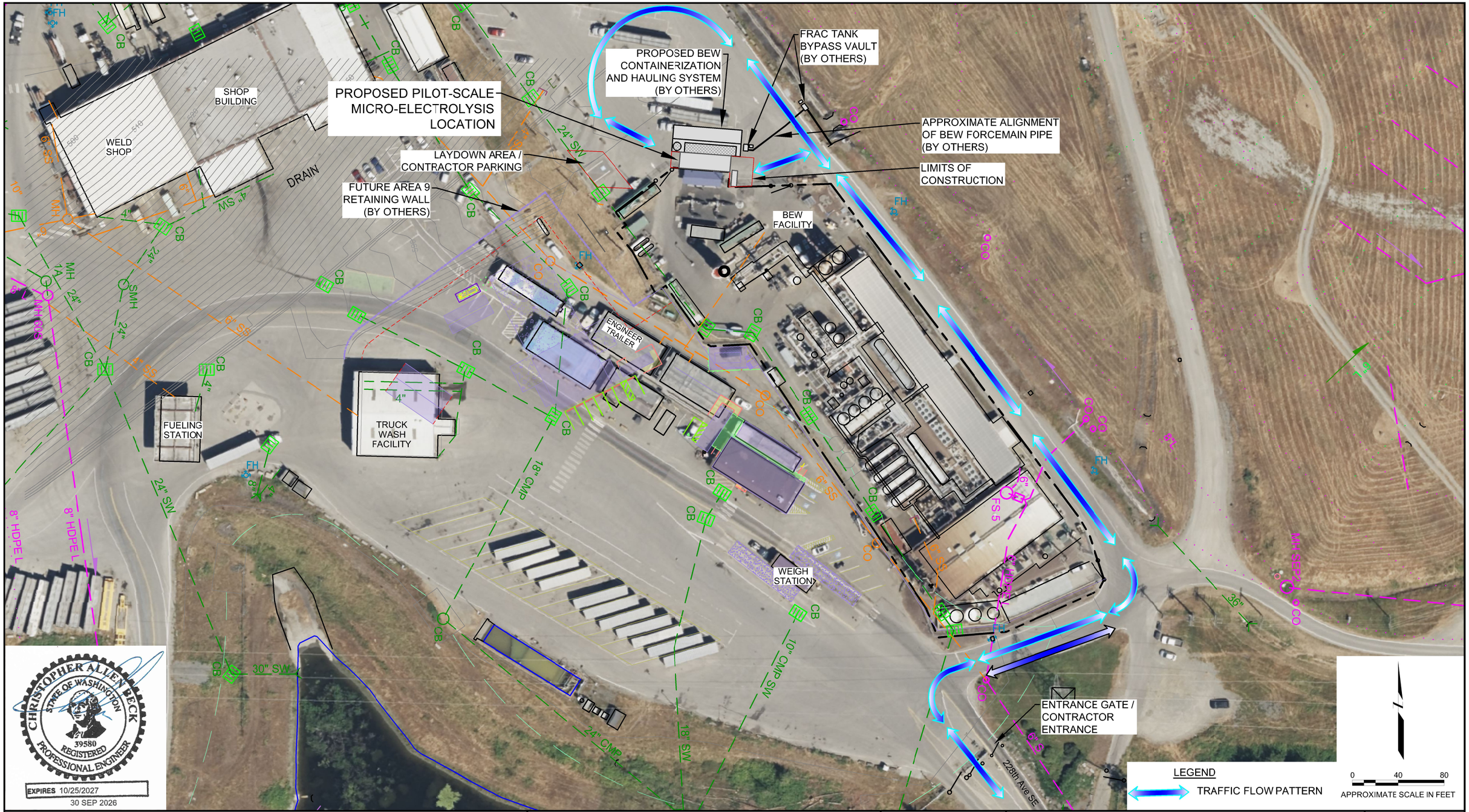
SHEET NO: OF
4 OF 27

PROJECT NO:
SWD-1133921

DRAWING NO:
C1.02

DRAWN BY: APS CHECKED BY: TR

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CHRISTOPHER ALLEN BECK
STATE OF WASHINGTON
39580
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 10/25/2027
30 SEP 2026

ABBREVIATIONS:
HDPE = High Density Polyethylene
LEAC = Leachate-conveying Pipe
CMP = Corrugated Metal Pipe
MH = Manhole
CB = Catch Basin
CO = Clean Out
PS = Pump Station
SW = Stormwater Pipe
SS = Sanitary Sewer Pipe

LEGEND
PS-3 LEACHATE FROM UNLINED SOUTHEAST PIT
PS-4 LEACHATE FROM UNLINED SE PIT, S MAIN HILL, SSWA
STORMWATER PIPE
SANITARY SEWER PIPE

King County
Department of Natural Resources and Parks
Solid Waste Division

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

CEDAR HILLS REGIONAL LANDFILL

PILOT-SCALE MICRO-ELECTROLYSIS

LAYOUT AND TRAFFIC PATTERN

DATE: SEPTEMBER 2026
SHEET NO: OF: 5 OF 27
PROJECT NO: SWD-1133921
DRAWING NO: C1.03

DRAWN BY: APS CHECKED BY: WY

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CHRISTOPHER ALLEN PECK
STATE OF WASHINGTON
39580
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 10/25/2027

30 SEP 2026

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APPROXIMATE SCALE IN FEET

King County

Department of Natural Resources and Parks
Solid Waste Division

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

CEDAR HILLS REGIONAL LANDFILL

PILOT-SCALE MICRO-ELECTROLYSIS

EQUIPMENT LAYOUT

DATE
SEPTEMBER 2026

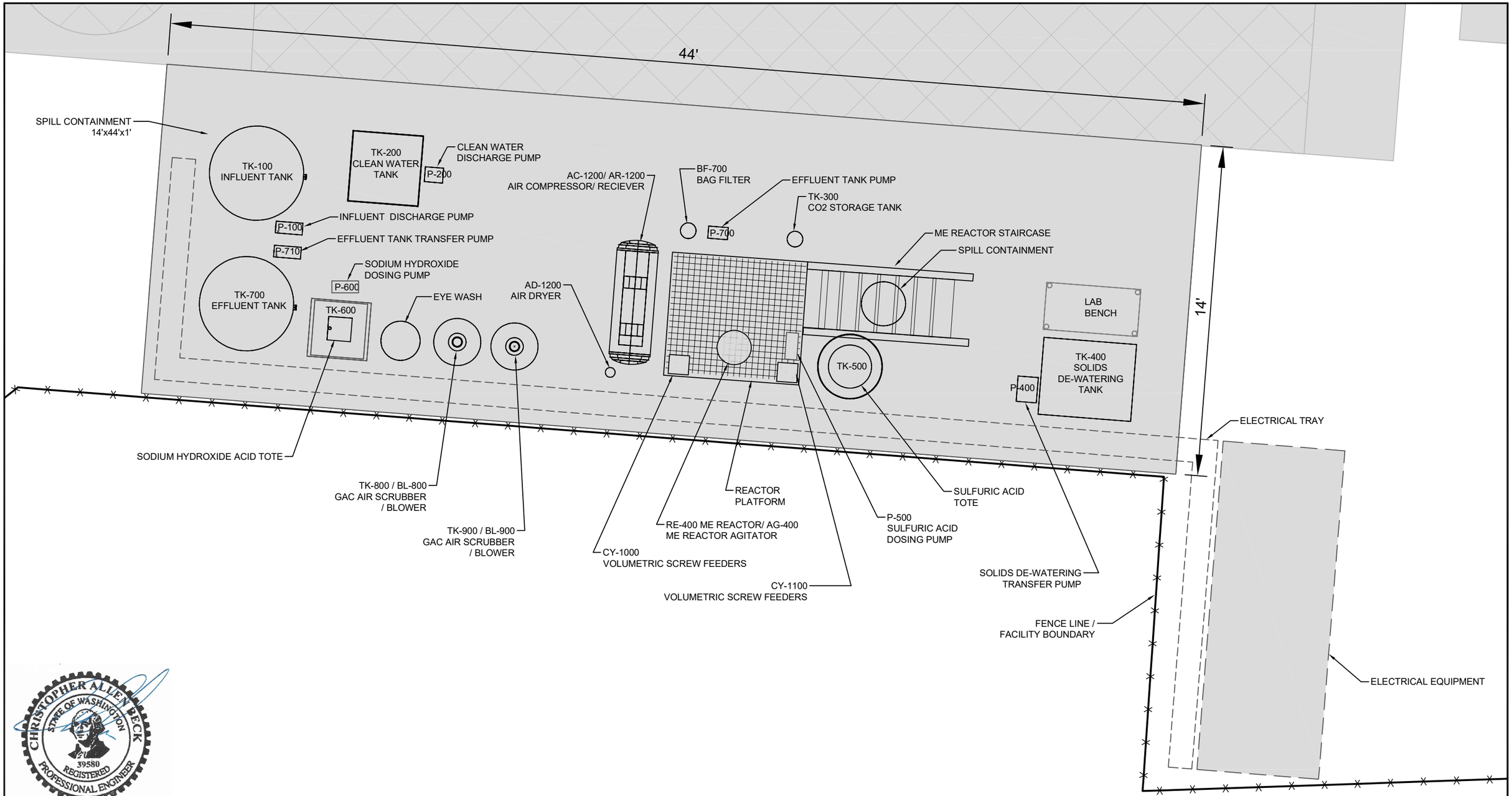
SHEET NO: OF
6 OF 27

PROJECT NO:
SWD-1133921

DRAWING NO:
M1.01

DRAWN BY: APS CHECKED BY: WY

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CHRISTOPHER ALLEN BECK
STATE OF WASHINGTON
39580
REGISTERED
PROFESSIONAL ENGINEER

EXPIRES 10/25/2027

30 SEP 2026

ABBREVIATIONS:

CO2 = Carbon Dioxide
GAC = Granular Activated Carbon
ME = Micro-Electrolysis
ZVI = Zero Valence Iron

N

0 2 4

APPROXIMATE SCALE IN FEET

King County

King County
Department of Natural Resources and Parks
Solid Waste Division

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

CEDAR HILLS REGIONAL LANDFILL

PILOT-SCALE MICRO-ELECTROLYSIS

EQUIPMENT LAYOUT DETAIL

DATE
SEPTEMBER 2026

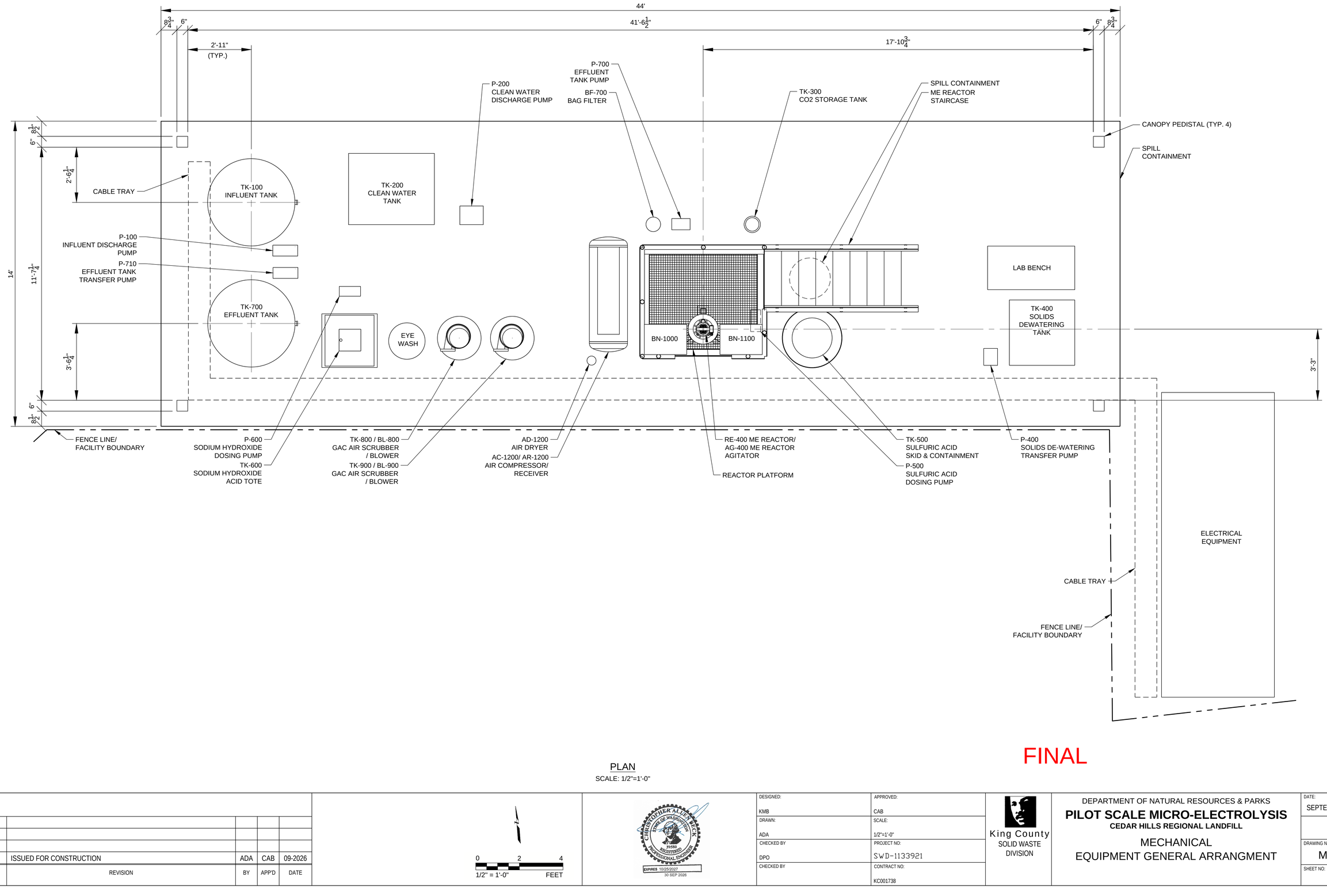
SHEET NO: OF
7 OF 27

PROJECT NO:
SWD-1133921

DRAWING NO:
M1.02

DRAWN BY: APS CHECKED BY: WY

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PLAN

SCALE: 1/2"=1'-0"

FINAL

No.	REVISION	BY	APP'D	DATE
0	ISSUED FOR CONSTRUCTION	ADA	CAB	09-2026

0 2 4

1/2" = 1'-0" FEET

CHRISTOPHER ALLEN BECK
STATE OF WASHINGTON
39580
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 10/25/2027
30 SEP 2026

DESIGNED: KMB	APPROVED: CAB
DRAWN: ADA	SCALE: 1/2"=1'-0"
CHECKED BY DPO	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE
DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

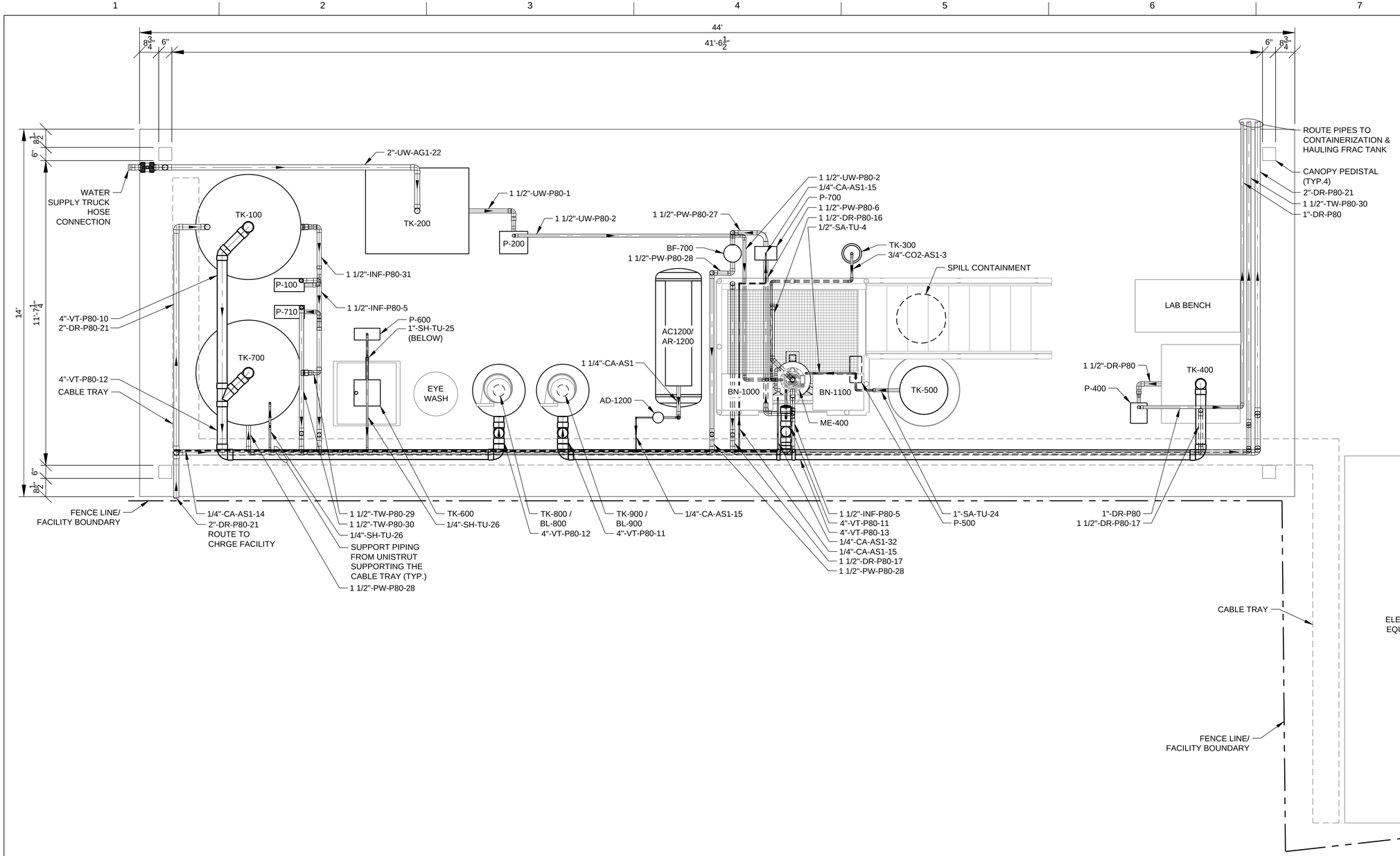
MECHANICAL
EQUIPMENT GENERAL ARRANGMENT

DATE: SEPTEMBER 2026

DRAWING NO: M1.03

SHEET NO: 8 OF 27

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IMAGES:



NOTES:

1) CONTRACTOR TO INSTALL PIPING, SUPPORTS, AND EQUIPMENT PER APPLICABLE CODES AND STANDARDS.
2) PIPE ROUTINGS ARE DIAGRAMMATIC AND NOT INTENDED TO BE ALL INCLUSIVE AND SHOW EVERY FITTING OR DETAIL. CONTRACTOR TO FIELD ROUTE AND SUPPORT. PROVIDE ALL REQUIRED FITTINGS AND COMPONENTS FOR A COMPLETE SYSTEM AS OUTLINED ON THE P&IDS.
3) PIPING AND TEMPERATURE SENSITIVE CHEMICALS MAY NEED TO BE HEAT TRACED AND INSULATED AS PART OF THE CONSTRUCTION PROCESS.

PLAN

SCALE: 1/2"=1'-0"

FINAL

No.	REVISION	BY	APP'D	DATE
0	ISSUED FOR CONSTRUCTION	ADA	CAB	09-2026

0 2 4
1/2" = 1'-0" FEET

CHRISTOPHER ALLEN BECK, STATE OF WASHINGTON, 39580, REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/25/2027
30 SEP 2026

DESIGNED: KMB	APPROVED: CAB
DRAWN: ADA	SCALE: 1/2"=1'-0"
CHECKED BY DPO	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

MECHANICAL
PIPING PLAN

DATE: SEPTEMBER 2026

DRAWING NO: M1.04

SHEET NO. OF 9 OF 27

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STRUCTURAL GENERAL NOTES:

1. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS AND ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND SITE DRAWINGS. CONSULT THESE DRAWINGS FOR LOCATIONS AND DIMENSIONS OF OPENINGS, CHASES, INSERTS, REGLETS, SLEEVES, DEPRESSIONS, AND OTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.
2. THE CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON THE DRAWINGS. IN ANY CASE OF CONFLICT BETWEEN THE NOTES, DRAWINGS, DETAILS AND SPECIFICATIONS, THE MOST RIGID (MOST COSTLY) REQUIREMENTS SHALL BE ASSUMED FOR BIDDING PURPOSES BUT ANY CONFLICTS MUST BE RESOLVED IN WRITING BY THE CONTRACTING OFFICER BEFORE THE WORK IS IMPLEMENTED.
3. THE CONTRACTORS SHALL VERIFY ALL RELEVANT EXISTING CONDITIONS PRIOR TO COMMENCING ANY OTHER WORK. ANY DISCREPANCIES BETWEEN THE NOTES, PLANS, DETAILS, SPECIFICATIONS AND EXISTING CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ENGINEER'S ATTENTION BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.
4. THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE ONLY AFTER THE STRUCTURAL WORK CONTAINED IN THE DRAWINGS IS COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS. SUCH MATERIAL SHALL REMAIN AT THE PROPERTY OF THE CONTRACTOR AFTER COMPLETION OF THE PROJECT.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SAFETY, CONSTRUCTION PROCEDURES, COORDINATION OF THEIR WORK WITH OTHER TRADES AND ON-SITE SECURITY.
6. THE CONTRACTOR SHALL COORDINATE WORK WITH THE OWNER TO MINIMIZE DISRUPTION TO THE OWNER'S OPERATIONS.
7. THE CONTRACTOR SHALL CONTACT ALL INVOLVED UTILITY COMPANIES AND LOCATE ALL UNDERGROUND UTILITIES IN THE VICINITY OF THE WORK BEFORE PROCEEDING WITH ANY EXCAVATION WORK.
8. THE CONTRACTOR SHALL PROTECT EXISTING FACILITIES, STRUCTURES AND UTILITIES FROM DAMAGE.
9. SHOP DRAWINGS FOR ALL MATERIALS ARE TO BE SUBMITTED AND REVIEWED PRIOR TO THE START OF FABRICATION.
10. THE CONTRACTOR SHALL MAKE NO DEVIATION FROM THE DOCUMENTS WITHOUT WRITTEN DIRECTION FROM THE CONTRACTING OFFICER.
11. THE CONTRACTING OFFICER SHALL HAVE FREE ACCESS TO ANY FABRICATION, ERECTION AND PAINTING WORK ON ANY COMPONENT OF THIS PROJECT WHICH THEY WISH TO INSPECT DURING AND/OR UPON COMPLETION OF SUCH WORK.

STRUCTURAL DESIGN CRITERIA:

1. STRUCTURAL DESIGN AND CONSTRUCTION SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE FOLLOWING BUILDING CODE(S):
   - 2021 WASHINGTON STATE BUILDING CODE
   - 2021 INTERNATIONAL BUILDING CODE, 2nd PRINTING
   - ASCE 7-22
   - ACI 318-19
2. BUILDING RISK CATEGORY: II
3. LIVE LOADS:
   a. LIVE: 100 PSF
4. SEISMIC LOADS

a.	SHORT PERIOD SPECTRAL RESPONSE (Ss)	1.46g
b.	1 SEC PERIOD SPECTRAL RESPONSE (S1)	0.45g
c.	IMPORTANCE FACTOR (Ie)	1.0
d.	SITE CLASSIFICATION	D (ASSUMED)
e.	DESIGN SHORT PERIOD RESPONSE (Sds)	1.09g
f.	DESIGN 1 SEC PERIOD RESPONSE (Sd1)	0.63g
g.	SEISMIC DESIGN CATEGORY	D

STRUCTURAL STANDARD ABBREVIATIONS:

B.S.	=	BOTH SIDES
℄	=	CENTERLINE
C.C.	=	CENTER TO CENTER
C.F.	=	CUBIC FOOT
CLR.	=	CLEAR
C.J	=	CONSTRUCTION JOINT
Ø, DIA.	=	DIAMETER
DIM.	=	DIMENSION
DWG.	=	DRAWING
EA	=	EACH
E.B.	=	EACH WAY
EXP	=	EXPANSION
Fy	=	YIELD STRESS
NTS	=	NOT TO SCALE
O.C.	=	ON CENTER
REV.	=	REVISION
REQ'D	=	REQUIRED
SIM.	=	SIMILAR
SOG	=	SLAB ON GRADE
SP.	=	SPACES
SPEC.	=	SPECIFICATION
STD	=	STANDARD
STL.	=	STEEL
STRUCT	=	STRUCTURAL
STM.	=	STANDARD
SYM.	=	SYMMETRY
T.O.	=	TOP OF
T.O.S.	=	TOP OF STEEL
T.O.C.	=	TOP OF CONCRETE
T.O.G.	=	TOP OF GRATING
T&B	=	TOP & BOTTOM
TYP.	=	TYPICAL
U.N.O.	=	UNLESS NOTED OTHERWISE
U.N.S.	=	UNLESS OTHERWISE SHOWN

FOUNDATION NOTES:

1. FOUNDATIONS HAVE BEEN DESIGNED BASED ON IBC 2021 DEFAULT VALUES AS FOLLOWS:
   a. ALLOWABLE BEARING CAPACITY 1,500 PSF
   b. SOIL DENSITY 110 PCF
   c. ALLOWABLE SOIL FRICTION FACTOR 0.3
2. SLAB ON GRAD FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH "DESIGN OF SLAB-ON-GROUND FOUNDATIONS" PUBLISHED BY THE WIRE REINFORCEMENT INSTITUTE USING AN ASSUMED EFFECTIVE PLASTICITY INDEX OF 30, AND A SOIL/CLIMATIC RATING FACTOR (1-C) OF 0.16.
3. PROTECT ADJACENT STRUCTURES AND FOUNDATIONS FROM DAMAGE DURING CONSTRUCTION OF NEW FOUNDATIONS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION OF ALL EXCAVATION SLOPES. WHERE NECESSARY, SHEETING AND SHORING OF EXCAVATIONS (DESIGNED BY PROFESSIONAL ENGINEER HIRED BY CONTRACTOR) SHALL BE PROVIDED WITH ALL TIE-BACKS AND BRACING.
5. SOILS EXPOSED AT THE BASE OF ALL SATISFACTORY FOUNDATION EXCAVATIONS SHOULD BE PROTECTED AGAINST ANY DETRIMENTAL CHANGE IN CONDITION, SUCH AS DISTURBANCE FROM RAIN. SURFACE RUNOFF SHOULD BE DRAINED AWAY FROM THE EXCAVATIONS AND NOT BE ALLOWED TO POND. FOUNDATION EXCAVATIONS SHOULD BE ADEQUATELY PROTECTED FROM RAINFALL.
6. ALL SUBGRADE PREPARATION AND FILL PLACEMENT SHALL BE CONDUCTED UNDER THE OBSERVATION AND INSPECTION OF THE CONTRACTOR'S GEOTECHNICAL ENGINEER. NO FILL FOR BUILDING SUPPORT SHALL BE PLACED UNTIL SUBGRADES HAVE BEEN OBSERVED AND APPROVED BY THE CONTRACTING OFFICER.
7. PREPARE SOIL UNDER BUILDINGS AND EQUIPMENT PADS AS FOLLOWS:
   a. OVEREXCAVATION WILL BE REQUIRED TO RECONDITION THE SOIL UNDER THE BUILDING AND EQUIPMENT PADS. OVEREXCAVATION SHALL ENTEND A MINIMUM OF 2 FEET BELOW EXISTING GRADED, AND A MINIMUM OF 1 FEET BEYOND THE EDGE OF THE BUILDING AND EQUIPMENT PADS.
   b. EXPOSED SUBGRADE SHALL BE PROOF ROLLED WITH EQUIPMENT WEIGHING AT LEAST 20 TONS. SOILS THAT ARE OBSERVED TO RUT OR DEFLECT EXCESSIVELY SHALL BE REMOVED AND REPLACED WITH PROPERLY COMPACTED SELECT FILL MATERIALS.
   c. AFTER PROOF ROLLING, EXPOSED SUBGRADE SHALL BE SCARIFIED, MOISTURE CONDITIONS, AND COMPACTED TO A DENSITY BETWEEN 94% TO 98% OF MAXIMUM IN ACCORDANCE WITH ASTM D698.
   d. RAISE SUBGRADE TO FOUNDATION BEARING ELEVATIONS WITH SELECT FILL COMPACTED TO A DENSITY OF AT LEAST 95% OF MAXIMUM IN ACCORDANCE WITH ASTM D698
8. GENERAL FILL SHALL BE CLEAN MATERIAL FREE OF ROOTS, DEBRIS AND OTHER DELETERIOUS MATERIAL WITH A MAXIMUM PARTICLE SIZE OF 4 INCHES AND SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95% OF MAXIMUM IN ACCORDANCE WITH ASTM D698.
9. SELECT FILL SHALL BE PIT RUN MATERIAL MEETING THE FOLLOWING REQUIREMENTS:
   a. FREE OF ORGANICS, TRASH, OR OTHER DELETERIOUS MATERIAL
   b. LIQUID LIMIT (LL) LESS THAN 40%
   c. PLASTICITY INDEX (PI) BETWEEN 7 AND 20
   d. MAXIMUM PARTICAL SIZE LESS THAN 3 INCHES
   e. AT LEAST 35% OF MATERIAL PASSING A NUMBER 200 SIEVE
10. ALL FILL SHALL BE PLACED IN LOOSE LIFTS NO GREATER THAN 8 INCHES.

CONCRETE NOTES:

1. CONCRETE WORK SHALL CONFORM TO "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318)," AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301)." GENERAL CONTRACTOR, CONSTRUCTION MANAGER AND/OR OWNER'S CLERK OF THE WORKS SHALL HAVE AVAILABLE ON SITE AT ALL TIMES A COPY OF ACI "FIELD REFERENCE MANUAL SP-15".
2. CONCRETE MUST COMPLY WITH THE REQUIREMENTS OF ASTM C94, AND AS SPECIFIED HEREIN. PROVIDE BATCH TICKET FOR EACH BATCH DISCHARGED AND USED IN WORK, INDICATING PROJECT NAME, MIX TYPE, MIX TIME, BATCH QUANTITY, AND PROPORTIONS OF INGREDIENTS.
3. PORTLAND CEMENT SHALL CONFORM TO ASTM C150 TYPE I OR II. BLENDED HYDRAULIC CEMENT SHALL CONFORM TO ASTM C595 TYPE IP OR IS. AGGREGATES SHALL CONFORM TO ASTM C33 CLASS 3M.
4. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI WITH A MAXIMUM WATER CEMENT (W/C) RATIO OF 0.50.
5. GROUT SHALL BE NON-METALLIC AND NONSHRINK CONFORMING TO ASTM C1107 AND SHALL HAVE A COMPRESSIVE STRENGTH AT 28 DAYS OF 5,000 PSI IN ACCORDANCE WITH ASTM C827.
6. SUBMIT CONCRETE MIX DESIGNS FOR REVIEW. NO CONCRETE SHALL BE PLACED WITHOUT THE DESIGN MIX BEING APPROVED BY THE CONTRACTING OFFICER.
7. ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE "ACI DETAILING MANUAL" (ACI 315).
8. REINFORCING BARS SHALL BE DEFORMED AND PLAIN CARBON STEEL CONFORMING TO ASTM A615 GRADE 60.
9. COMPLETE SHOP DRAWINGS AND SCHEDULES OF ALL REINFORCING STEEL SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED FOR REVIEW. PROVIDE NECESSARY ACCESSORIES TO HOLD REINFORCEMENT SECURELY IN POSITION.
10. MINIMUM CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
    a. SURFACES CAST AGAINST AND PERMANENTLY IN CONTACT WITH EARTH: 3 INCHES
    b. FORMED SURFACES IN CONTACT WITH EARTH OR EXPOSED TO WEATHER: 2 INCHES
    c. SURFACES NOT IN CONTACT WITH EARTH OR EXPOSED TO WEATHER: 1.5 INCHES
11. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE LAPPED BARS AT SPLICES OR HOOKED BARS AT DISCONTINUOUS ENDS. PROVIDE TENSION LAP SPLICES PER THE SCHEDULE FOR ALL REINFORCING UNLESS OTHERWISE SHOWN ON PLAN.
12. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT FINISHED SURFACES. PROVIDE ADEQUATE PROTECTION AGAINST OVEREXPOSURE TO SUN, WIND, OR RAIN.
13. WATER SHALL NOT BE ADDED TO THE CONCRETE AT THE JOBSITE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE REQUIREMENTS OF THE CONCRETE SUPPLIER TO ENSURE PUMPABLE AND WORKABLE MIXES WITHOUT THE ADDITION OF WATER AT THE JOBSITE, THE USE OF CONCRETE ADDITIVES SHALL BE AT THE OPTION OF THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ENGINEER. ALL MANUFACTURER'S RECOMMENDATIONS FOR THE USE OF ADDITIVES SHALL BE FOLLOWED. THE USE OF CALCIUM CHLORIDE OR OTHER CHLORIDE BEARING SALTS ARE NOT PERMITTED.
14. PLACE CONCRETE IN A MANNER SO AS TO PREVENT SEGREGATION OF THE MIX. DELAY FLOATING AND TROWELING UNTIL THE CONCRETE HAS LOST SURFACE WATER SHEEN. FINISHING OF SLAB SURFACES SHALL COMPLY WITH ACI RECOMMENDATIONS ACI 302 AND 304.
15. CONCRETE SHALL NOT BE PLACED IN WATER. CONCRETE SHALL BE PLACED WITHOUT HORIZONTAL CONSTRUCTION JOINTS EXCEPT WHERE SHOWN OR NOTED. VERTICAL CONSTRUCTION JOINTS AND STOPS IN CONCRETE WORK SHALL BE MADE AT MIDSPAN OR AT POINTS OF MINIMUM SHEAR.
16. ALL ADJOINING SURFACES NOT CAST MONOLITHICALLY SHALL BE ROUGHENED TO ¼ INCH AMPLITUDE FOR THE ENTIRE JOINED SURFACE PER ACI RECOMMENDATIONS. COAT SURFACES TO BE JOINED WITH APPROVED BONDING AGENT.
17. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4 INCH (UNO).
18. PROVIDE PVC SLEEVES WHERE PIPES PASS THROUGH EXTERIOR CONCRETE, OR SLABS, UNLESS SHOWN OTHERWISE
19. HOT WEATHER CONCRETING SHALL CONFORM TO ACI 305.
20. CONCRETE SHALL BE PLACED IN THE PRESENCE OF A REPRESENTATIVE OF AN APPROVED TESTING AGENCY.
21. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED (UNO).
22. PROVIDE 7 DAY CURING IMMEDIATELY AFTER FINISHING USING APPROVED CURING METHOD.
23. THE TOP OF ALL FOUNDATIONS SHALL BE TROWEL FINISHED AND SMOOTH.

SPECIAL INSPECTIONS AND QUALITY ASSURANCE PLAN

1. SPECIAL INSPECTIONS AND TESTING ARE TO BE PROVIDED AS REQUIRED BY IBC SECTION 1704 AND 1705 AND OTHER APPLICABLE SECTIONS OF THE IBC. THE TYPE AND FREQUENCY OF TESTING AND SPECIAL INSPECTIONS MUST BE AS NOTED IN THE SPECIAL INSPECTION TABLES, PROJECT SPECIFICATIONS, AND IN ACCORDANCE WITH IBC CHAPTER 1, SECTION 110 AND CHAPTER 17. CONTRACTOR MUST COORDINATE AND COOPERATE WITH REQUIRED INSPECTIONS.
2. THE DESIGNATED SEISMIC/WIND SYSTEMS AND SEISMIC/WIND-FORCE-RESISTING SYSTEMS ARE SUBJECT TO SPECIAL INSPECTIONS IN ACCORDANCE WITH IBC SECTIONS 1705.11, 1705.12, AND 1705.13, REQUIRED SPECIAL INSPECTION ARE IDENTIFIED IN THE SPECIAL INSPECTION TABLES ON THIS SHEET.
3. TESTING AND SPECIAL INSPECTIONS MUST BE PERFORMED BY A QUALIFIED INDEPENDENT SPECIAL INSPECTION AGENCY. REPORTS OF FINDINGS OR DISCREPANCIES MUST BE NOTED AND FORWARDED TO THE CONTRACTOR, ARCHITECT, PROJECT MANAGER. DISCREPANCIES NOT CORRECTED MUST BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR, ARCHITECT, AND STRUCTURAL ENGINEER.
4. THE INDIVIDUAL EMPLOYED BY THE TESTING AGENCY, RESPONSIBLE FOR OVERSEEING TESTING AND INSPECTION OF SOILS AND FOUNDATIONS, MUST BE A PROFESSIONAL ENGINEER PRACTICING THE DISCIPLINE OF GEOTECHNICAL ENGINEERING, REFERRED TO AS THE GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER IS RESPONSIBLE FOR TESTING AND INSPECTIONS OF SOILS, EARTHWORK, AND FOUNDATIONS FOR CONFORMANCE TO THE FOUNDATION DESIGN.
5. STRUCTURAL LOAD BEARING MEMBERS AND ASSEMBLIES WHICH ARE FABRICATED IN A SHOP MUST BE FABRICATED IN AN AISC REGISTERED AND APPROVED FABRICATOR'S SHOP OR MUST BE SPECIAL INSPECTED.
   A. APPROVED FABRICATORS MUST SUBMIT A CERTIFICATE OF COMPLIANCE AT THE CONCLUSION OF THEIR FABRICATION.
6. INSPECTIONS PERFORMED BY THE LOCAL JURISDICTION OR OWNER ARE NOT A SUBSTITUTE FOR SPECIAL INSPECTIONS.
7. IN ACCORDANCE WITH IBC 1704.4, THE CONTRACTOR MUST SUBMIT A WRITTEN CONTRACTOR'S STATEMENT OF RESPONSIBILITY TO THE CONTRACTING OFFICER AND PROJECT MANAGER. THE STATEMENT MUST BE SUBMITTED PRIOR TO THE CONSTRUCTION OF ANY SEISMIC/WIND-FORCE-RESISTING SYSTEM OR COMPONENT. THE STATEMENT OF RESPONSIBILITY MUST CONTAIN THE FOLLOWING:
   A. IDENTIFICATION AND QUALIFICATIONS OF PERSONS RESPONSIBLE FOR SPECIAL INSPECTIONS AND THEIR POSITION IN THE ORGANIZATION.
   B. ACKNOWLEDGEMENT OF AWARENESS OF THE REQUIREMENTS CONTAINED IN THE SPECIAL INSPECTION TABLES. ACKNOWLEDGEMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS AND SPECIAL INSPECTION REQUIREMENTS.
   C. PROCEDURES FOR EXERCISING CONTROL WITHIN THE SUB-CONTRACTOR'S ORGANIZATION, INCLUDING THE METHOD AND FREQUENCY OF REPORTING AND DISTRIBUTION OF THE REPORTS.
8. CONTRACTOR SHALL PROVIDE COPIES OF THE INSPECTION REPORTS AND TESTING RESULTS AS REQUIRED.
9. CONTRACTOR SHALL CORRECT WORK FOUND TO BE DEFICIENT AND COORDINATE RETESTING OF CORRECTION.
10. CONTRACTOR SHALL COORDINATE THE REQUIRED INSPECTIONS, TESTING, AND/OR STRUCTURAL OBSERVATIONS OF THE QUALITY ASSURANCE PLAN.
11. CONTRACTOR SHALL NOT PROCEED WITH SUBSEQUENT WORK UNTIL THE REQUIRED INSPECTIONS, TESTING, AND/OR STRUCTURAL OBSERVATIONS HAVE BEEN PROVIDED.

SOILS AND FOUNDATIONS SPECIAL INSPECTIONS (BASED ON 2021 IBC, TABLE 1705.6)	SPECIAL INSTRUCTIONS	
	CONTINUOUS	PERIODIC
MATERIALS BELOW FOOTINGS ARE ADEQUATE		X
EXCAVATIONS EXTEND TO PROPER DEPTH AND REACH PROPER MATERIAL		X
CLASSIFICATION AND TESTING OF FILL MATERIALS		X
INSPECT SUBGRADE AND VERIFY PROPER PREPARATION	X	
SOIL PARAMETERS MUST BE IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT REFERENCED IN THE DESIGN CRITERIA TABLE.		X

CONCRETE SPECIAL INSPECTIONS (BASED ON 2021 IBC, TABLE 1705.3)	SPECIAL INSTRUCTIONS	
	CONTINUOUS	PERIODIC
REINFORCEMENT)INCLUDING PRESTRESSING TENDONS), AND VERIFY PLACEMENT		X
REINFORCEMENT BAR WELDING[A]	X	X
ANCHORS CAST IN CONCRETE		X
POST-INSTALLED ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS[b]		X
POST-INSTALLED ANCHORS OTHER THAN INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS[b]		X
VERIFY USE OF REQUIRED DESIGN MIX		X
CONCRETE PLACEMENT AND SAMPLING[a]	X	
CONCRETE AND SHORTCRETE PLACEMENT TECHNIQUES	X	
CURING TEMPERATURES AND TECHNIQUES		X
PRESTRESSED CONCRETE • APPLICATION OF PRESTRESS FORCES • GROUTING OF BONDED PRESTRESSING TENDONS	X	
ERECTION OF PRECAST MEMBERS		X
VERIFICATION OF IN-SITU CONCRETE STRENGTH • PRIOR TO STRESSING OF POST-TENSIONED TENDONS • PRIOR TO REMOVALOF BEAM, STRUCTURAL SLAB, AND MAT FOUNDATION SHORES AND FORMS		X
INSPECT FORMWORK FOR SHAPE , LOCATION AND DIMENSIONS OF THE CONCRETE MEMEBER BEING FORMED		X

a. PERIODIC SPECIAL INSTRUCTIONS ARE ACCEPTABLE FOR VERIFYING WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706 AND FOR INSPECTION OF SINGLE-PASS FILLET WELDS LESS THAN OR EQUAL TO 5/16". CONTINUOUS SPECIAL INSPECTIONS ARE REQUIRED FOR OTHER WELDING OF REINFORCING.
b. POST-INSTALLED ANCHORS ARE NOT A SUBSTITUTE FOR CAST IN PLACE ANCHORS. THE CONTRACTOR MUST OBTAIN WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER PRIOR TO USING POST-INSTALLED ANCHORS FOR MISSING OR MISPLACED CAST IN PLACE ANCHORS.
c. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.



No.	REVISION	BY	APP'D	DATE
3				
2	TITLE BLOCK REVISED	SAA	SAK	09-2026
1	ISSUED FOR CONSTRUCTION	SAA	SAK	05-2026
0	ISSUED FOR CONSTRUCTION	SAA	SAK	10-2025

ISSUED FOR CONSTRUCTION

DESIGNED: SAA	APPROVED: SAK
DRAWN: SAA	SCALE: NONE
CHECKED BY GA	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS
PILOT SCALE MICRO-ELECTROLYSIS
CEDAR HILLS REGIONAL LANDFILL

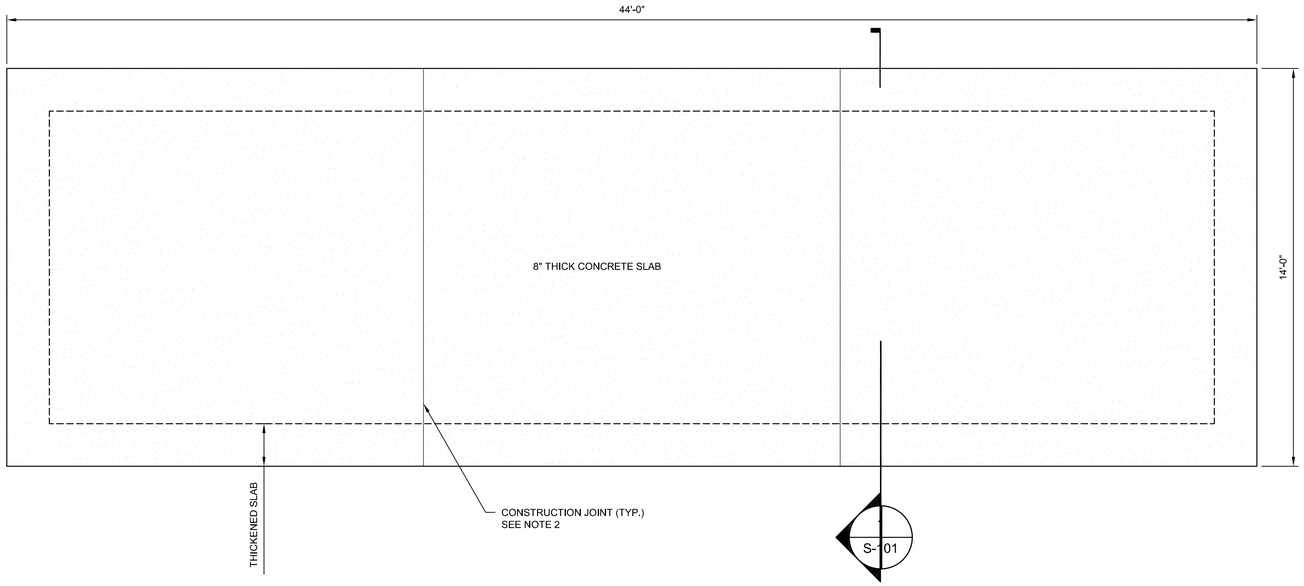
STRUCTURAL GENERAL NOTES

DATE: SEPTEMBER 2026
DRAWING NO: S0.01
SHEET NO: OF 10 OF 27

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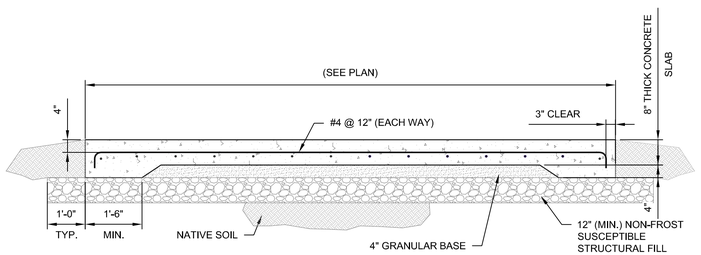
NOTES:

1. FOR STRUCTURAL GENERAL NOTES AND DESIGN CRITERIA SEE DRAWING S-001.
2. CONSTRUCTION JOINT OPTIONAL FOR CONTRACTOR WITH MINIMUM SPACING 20 FT IF REQUIRED.



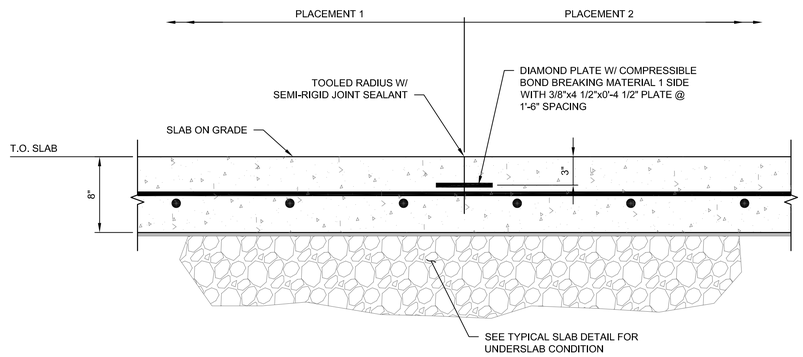
A CONCRETE SUPPORT PAD

SCALE: 3/8" = 1' - 0"



1 SECTION

REF: S-101 SCALE: 1/2" = 1'- 0"



B TYPICAL CONSTRUCTION JOINT

SCALE: 1 1/2" = 1'- 0"



No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK REVISED	SAA	SAK	09-2026
0	ISSUED FOR CONSTRUCTION	SAA	SAK	09-2026

ISSUED FOR CONSTRUCTION

DESIGNED: SAA	APPROVED: SAK
DRAWN: SAA	SCALE: A
CHECKED BY GA	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

EQUIPMENT SUPPORTING CONCRETE PAD PLAN & SECTIONS

DATE: SEPTEMBER 2026

DRAWING NO: S1.01

SHEET NO: OF 11 OF 27

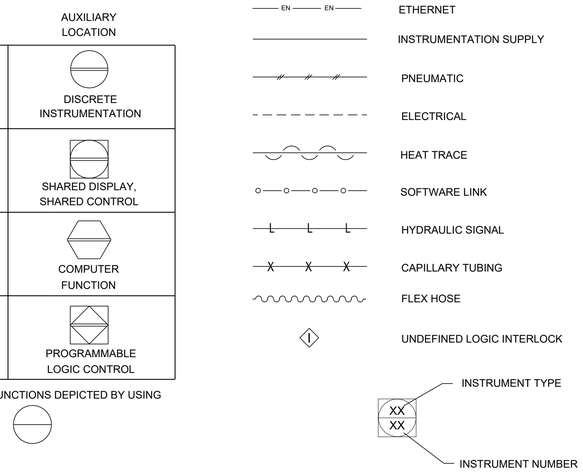
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INSTRUMENTATION SYMBOLS

NORMALLY ACCESSIBLE TO OPERATOR *

FIELD MOUNTED	PRIMARY LOCATION	AUXILIARY LOCATION
DISCRETE INSTRUMENTATION	DISCRETE INSTRUMENTATION	DISCRETE INSTRUMENTATION
SHARED DISPLAY, SHARED CONTROL	SHARED DISPLAY, SHARED CONTROL	SHARED DISPLAY, SHARED CONTROL
COMPUTER FUNCTION	COMPUTER FUNCTION	COMPUTER FUNCTION
PROGRAMMABLE LOGIC CONTROL	PROGRAMMABLE LOGIC CONTROL	PROGRAMMABLE LOGIC CONTROL

* INACCESSIBLE OR BEHIND THE PANEL DEVICES OR FUNCTIONS DEPICTED BY USING SAME SYMBOLS BUT WITH DASHED HORIZONTAL BAR



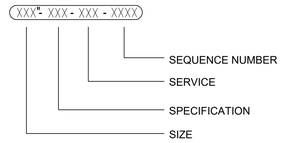
IDENTIFICATION LETTERS

	FIRST-LETTER		SUCCEEDING-LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)	GLASS, VIEWING DEVICE	RATIO (FRACTION)	
G	USER'S CHOICE				
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME, RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR UNCLASSIFIED FINAL CONTROL ELEMENT	

NOTES:

1. SYMBOLS SHOWN ON THIS DRAWING ARE PER AMERICAN NATIONAL STANDARD INSTRUMENTATION SYMBOLS AND IDENTIFICATION (ANSI/ISA-S5.1-2022).
2. ALL SYMBOLS SHOWN MAY NOT BE INCORPORATED IN THIS PROJECT.

LINE NUMBER IDENTIFIER



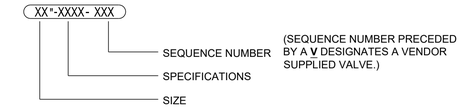
PIPE SERVICE ABBREVIATIONS

ABBV.	SERVICE	ABBV.	SERVICE
AF	ANTI FOAM	LS	LOW PRESSURE STEAM
AG	ALGEACIDE	ME	METHANOL
AL	ALUM	MO	MOLASSES
AS	ANTISCALANT	NG	NATURAL GAS
BA	BARIUM	NIT	NITROGEN
BD	BLOWDOWN	NP	NITROGEN PHOSPHATE
BFW	BOILER FEED WATER	OF	OVERFLOW
BRR	BRINE RETURN	OG	OFF GAS
BRS	BRINE SUPPLY	OIL	OIL
CA	COMPRESSED AIR	OX	OXYGEN
CC	CLEANING CHEMICAL	PA	PROCESS AIR
CO2	CARBON DIOXIDE	PC	PROCESS CONDENSATE
CL	CALCIUM CHLORIDE	PER	PERMEATE
COA	COAGULANT	PH	PHOSPHORIC ACID
CWR	COOLING TOWER RETURN	PLW	PLANT WATER (TREATED)
CWS	COOLING TOWER SUPPLY	POL	POLYMER
DE	DIATOMACEOUS EARTH	POT	POTABLE WATER
DEC	DECANT	PW	PROCESS WATER
DMW	DEMINERALIZED WATER	PWW	PROCESS WASTE WATER
DR	DRAIN	RCW	RECYCLE WATER
DS	DILUTION STREAM	REG	REGENERATE
DW	DRINKING WATER	RV	RELIEF VENT
EFF	EFFLUENT	RW	RAW WATER
FF	FLUSHING FLUID	SA	SULFURIC ACID
FG	FLUE GAS	SAH	SODA ASH
FIL	FILTRATE	SB	SODIUM BISULFITE
FL	FLARE	SC	STEAM CONDENSATE
FO	FUEL OIL	SD	STORM DRAIN
FW	FIRE WATER	SEW	SEWER
GAC	GRANULAR ACTIVATED CARBON	SH	SODIUM HYDROXIDE
GLR	GLYCOL RETURN	SHP	SODIUM HYDROCHLORIDE
GLS	GLYCOL SUPPLY	SL	SLUDGE
HCL	HYDROCHLORIC ACID	SO	SEAL OIL
HS	HIGH PRESSURE STREAM	SS	SANITARY SEWER
HWR	HOT WATER RETURN	STM	STEAM
HWS	HOT WATER SUPPLY	STS	STORM SEWER
HYD	HYDROGEN	SU	SLUICE
IA	INSTRUMENT AIR	SW	SEAL WATER
INF	INFLUENT	UR	UREA
LE	LEACHATE	VT	VENT
LO	LUBE OIL	WW	WELL WATER
LPG	LIQUIFIED PETROLEUM GAS	ZVI	ZERO VALENT IRON

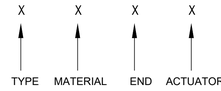
PIPE SPECIFICATION DESIGNATION

ABS	ABS	IT	INSTRUMENT TUBING
C40	CPVC - SCH.40	P40	PVC - SCH. 40
C80	CPVC - SCH. 80	P80	PVC - SCH. 80
CO	COPPER	PE	POLYETHYLENE
AC1	CARBON STEEL - STD	AS1	304L STAINLESS STEEL - SCH. 10S
AC2	CARBON STEEL - SCH. 80	AS2	304L STAINLESS STEEL - SCH. 40S
AC4	CARBON STEEL - SCH. 10	AS10	316L STAINLESS STEEL - SCH. 10S
AG1	GALV CARBON STEEL - SCH. 40	AS20	316L STAINLESS STEEL - SCH. 40S
XP4	DOUBLE CONTAIN - PVC 80	TU	TUBING
HDPE	HIGH DENSITY POLYETHYLENE		

VALVE NUMBER IDENTIFIER



VALVE SPECIFICATION DESIGNATION



VALVE TYPE:		MATERIAL:		ENDS:		ACTUATOR:	
1.	BALL	1.	PVC	1.	SOCKET	1.	HANDWHEEL
2.	BUTTERFLY	2.	STEEL	2.	THREADED	2.	LEVER
3.	GATE	3.	BRONZE	3.	FLANGE - FLAT FACE	3.	GEAR
4.	KNIFE GATE	4.	STAINLESS STEEL	4.	FLANGE - RAISED FACE	4.	CHAIN
5.	GLOBE	5.	POLYETHYLENE	5.	WAFER	5.	PNEUMATIC
6.	BALL CHECK	6.	POLYPROPYLENE	6.	LUG	6.	ELECTRIC
7.	SWING CHECK	7.	PVDF	7.	COMPRESSION	7.	OPERATING NUT
8.	SOLENOID	8.	CPVC	8.	FERRULE	8.	SPRING RETURN
9.	SPECIAL	9.	SPECIAL	9.	SW / THD	9.	EXTENDED STEM
0.	WAFER CHECK			0.	SPECIAL	0.	NOT APPLICABLE

GENERAL ABBREVIATIONS

ABBV.		ABBV.	
AC	AIR CLOSES	NC	NORMALLY CLOSED
AO	AIR OPEN	NO	NORMALLY OPEN
AT	AIR TRAP	P/S	PURGE WATER SUPPLY
A/S	AIR SUPPLY	RT	RESIN TRAP
CL	SCALE INHIBITOR	RTD	RESISTANCE TEMPERATURE DETECTOR
CO	CHAIN OPERATED	SP	SAMPLE PORT
DC	DOUBLE CONTAINED	ST	STEAM TRAP
DT	DRAIN TRAP	S/T	STEAM TRACE
DW	DEAREATOR WATER	SV	SAMPLE VALVE (1/2" UNLESS OTHERWISE NOTED)
FC	FAIL CLOSE	TC	THERMOCOUPLE
FD	FLOOR DRAIN	TDS	TOTAL DISSOLVED SOLIDS
FO	FAIL OPEN	TP	TEST PORT
H/T	HEAT TRACE	TS	TOTAL SOLIDS
MCP	MAIN CONTROL PANEL	TSS	TOTAL SUSPENDED SOLIDS
		W/S	WATER SUPPLY

EQUIPMENT ABBREVIATIONS

ABBV.		ABBV.	
AC	AIR COMPRESSOR	IX	ION EXCHANGER
AD	AIR DRYER	M	MOTOR
AG	AGITATOR	MMF	MULTIMEDIA FILTER
B	BIN	MV	MOTOR VALVE
BD	BUBBLE DIFFUSER	MX	MIXER
BH	BAG HOUSE	P	PUMP
BL	BLOWER	PCV	PRESSURE CONTROL VALVE
CC	CYCLONE SEPARATOR	PRV	PRESSURE RELIEF VALVE
CL	CLARIFIER/THICKENER	PS	PIPE SUPPORT
CP	CONTROL PANEL	R	RAKE
CT	COOLING TOWER	RO	REVERSE OSMOSIS
CY	CONVEYOR	S	SILO
DAF	DISSOLVED AIR FLOTATION SYSTEM	SB	STEAM BOILER
ES	EYEWASH/SAFETY SHOWER	SK	SKIMMER
EV	EVAPORATOR	SP	SAMPLE POINT
FL	FILTER	SS	SAFETY SHOWER
FP	FILTER PRESS	STR	STRAINER
GEN	GENERATOR	SYS	SYSTEM
HP	HOPPER	TK	TANK
HTR	HEATER	US	UTILITY STATION
HX	HEAT EXCHANGER	V	VALVE
ICB	IMMOBILIZED CELL BIOREACTOR	VP	VENDOR PACKAGE

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BECK — 39580 — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON
EXPIRES 10/25/2027
30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS
PILOT SCALE MICRO-ELECTROLYSIS
CEDAR HILLS REGIONAL LANDFILL
PIPING AND INSTRUMENTATION DIAGRAM
SYMBOLS & ABBREVIATIONS SH 1

DATE: SEPTEMBER 2026
DRAWING NO: D6.01
SHEET NO: OF 12 OF 27

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METERS AND RELATED EQUIPMENT

METERS

- PADDLE
- TURBINE
- ORIFICE
- MAGNETIC
- VORTEX SHEDDING
- STRAIGHTENING VANE
- ROTOMETER WITH VALVE
- ROTOMETER WITHOUT VALVE
- PITOT TUBE
- FLOW METER

FILTERS

- CARTRIDGE
- BAG
- LIQUID FILTER
- PLATE & FRAME FILTER
- VACUUM FILTER
- OIL SKIMMER

ACTUATORS

- BACKPRESSURE REGULATOR W/ EXTERNAL PRESSURE TAP
- DIAPHRAGM ACTUATOR
- DIAPHRAGM ACTUATOR WITH AIR SUPPLY
- DIAPHRAGM SPRING
- DIFFERENTIAL PRESSURE REDUCING REGULATOR
- DIGITAL
- ELECTRO/HYDRAULIC
- FILTER/REGULATOR/ LUBRICATOR
- HANDWHEEL/MANUAL ACTUATOR
- MOTOR OPERATED
- PISTON OPERATED
- PNEUMATIC CONTROLLER
- PRESSURE BALANCED DIAPHRAGM ACTUATOR
- PRESSURE REDUCING REGULATOR
- PRESSURE REDUCING REGULATOR WITH EXTERNAL TAP
- PRESSURE REDUCING REGULATOR WITH INTEGRAL OUTLET
- SOLENOID
- ROTARY MOTOR
- SOLENOID MANUAL RESET
- SOLENOID PNEUMATIC
- SOLENOID REMOTE RESET
- SPRING
- THROTTLING ACTUATOR
- CONSUMER

PIPING SYMBOLS

VALVES

- NC BALL
- NC BUTTERFLY
- NC GATE
- KNIFE GATE
- NC GLOBE
- NC PLUG
- NC NEEDLE
- PINCH
- SWING CHECK
- LIFT CHECK
- DIAPHRAGM
- PILOT OPERATED RELIEF VALVE
- PRESSURE AND VACUUM RELIEF
- ANGLE
- 3-WAY
- 4-WAY
- V-PORT BALL VALVE
- BACKFLOW PREVENTER GATE VALVE
- BACKFLOW PREVENTER BALL VALVE - RPZD
- FOOT CHECK VALVE
- REGULATOR
- HPV H.P.V. (HIGH POINT VENT)
- LPD L.P.D. (LOW POINT DRAIN)
- SAFETY VALVE
- RUPTURE DISC

VALVE END TYPES

- FLANGED
- SOCKET WELD
- THREADED / UNSPECIFIED
- WELDED

PIPING SYMBOLS

LINE TYPES

- MAIN PROCESS FLOW MAJOR FLOW ARROW
- SECONDARY FLOW SECONDARY FLOW ARROW
- ELECTRIC SIGNAL
- SOFTWARE SIGNAL
- HYDRAULIC SIGNAL
- CAPILLARY TUBE
- PNEUMATIC SIGNAL
- MECHANICAL LINK
- WIRELESS LINK
- WIRELESS SIGNAL
- PROCESS AIR
- VENDOR PACKAGE
- EXPANSION LOOP (HOSE ONLY)
- TANK VENT TO ATMOSPHERE
- ROOF VENT TO ATMOSPHERE
- DOUBLE CONTAINED
- SAMPLE PORT
- TIE-IN POINT

TRAPS
- AT = AIR TRAP
- DT = DRAIN TRAP
- ST = STEAM TRAP (Shown)
- RT = RESIN TRAP

- HEAT TRACE

2"-PPET — INSULATION THICKNESS, TYPE & TRACE TYPE

TRACE TYPE
- ET ELECTRIC TRACE
- GT GLYCOL TRACE
- ST STEAM TRACE

1/8"-PP — INSULATION THICKNESS & TYPE

INSULATION ABBREVIATIONS

IC -INSULATE AGAINST COLD
IH -INSULATE TO RETAIN HEAT
PP -PERSONNEL PROTECTION
IS - SAFETY INSULATION
AU - ACOUSTIC INSULATION
AS - ANTI-SWEAT INSULATION

- SITE GLASS
- BLEED RING
- PILOT LIGHT
- DRAIN

OPEN DRAIN NO PID | CLOSED DRAIN NO PID | OPEN DRAIN | CLOSED DRAIN

PIPING SYMBOLS

- THREADED TANK CONNECTION W/UNION
- FLANGE
- LINE BLIND
- UNION
- ORIFICE UNION
- CONICAL SCREEN BETWEEN FLANGES
- FLAT SCREEN BETWEEN FLANGES
- BLIND FLANGE
- HOSE CONNECTION
- PIPE CAP - THREADED
- PIPE CAP - WELDED
- PLUG
- PIPE BREAK
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- SEAL WATER
- SIMPLEX STRAINER
- DUPLEX STRAINER
- "Y" STRAINER
- "Y" STRAINER W/BLOWDOWN
- FLEXIBLE HOSE
- EXPANSION JOINT
- BP BACK PULSE COLUMN
- HORN
- PRESSURE INDICATORS
- TEMPERATURE INDICATOR
- RESET FOR LATCH-TYPE ACTUATOR
- PANEL MOUNTED PATCHBOARD
- PURGE PURGE OR FLUSHING DEVICE
- UNDEFINED INTERLOCK LOGIC

MISCELLANEOUS SYMBOLS

- TO/FROM ON-OFF PAGE CONNECTOR. (PROCESS LINES)
- TO/FROM ON-OFF PAGE CONNECTOR (INSTRUMENT SIGNALS)
- 4"-PW-AS1-XXX LINE NUMBER TAG (EXAMPLE)
- 4"-1112-XXX VALVE NUMBER TAG (EXAMPLE)
- SPEC BREAK
- SEGMENT BREAK-ONE LINE
- SEGMENT BREAK-TWO LINE
- RISE / RUN SLOPE/GRAVITY FLOW
- MARK GRADE
- TUBING ADAPTER
- FLUME
- DIAPHRAGM SEAL
- CALIBRATION COLUMN
- CAM-LOK CONNECTION
- ULTRASONIC LEVEL
- LEVEL FLOAT
- VIBRATING FORK
- SAFETY SHOWER WITH EYEWASH
- UTILITY CONNECTOR
- X MASS BALANCE TAG
- XX NOTE REFERENCE
- NORTH ARROW

NOTES:

1. SYMBOLS SHOWN ON THIS DRAWING ARE PER AMERICAN NATIONAL STANDARD INSTRUMENTATION SYMBOLS AND IDENTIFICATION (ANSI/ISA-S5.1-2022).
2. ALL SYMBOLS SHOWN MAY NOT BE INCORPORATED IN THIS PROJECT.

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BECK — STATE OF WASHINGTON — 39580 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING AND INSTRUMENTATION DIAGRAM SYMBOLS & ABBREVIATIONS SH 2

DATE: SEPTEMBER 2026

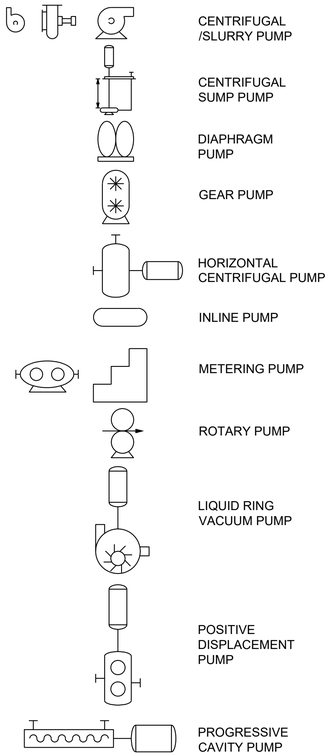
DRAWING NO: D6.02

SHEET NO: OF 13 OF 27

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PLOTTED: Sep 25, 2026 - 08:23:01am By USDOT075868
XREFS: _Golder_Logo.dwg
IMAGES:

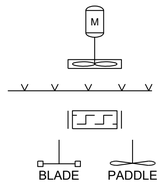
EQUIPMENT

PUMPS

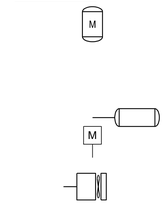


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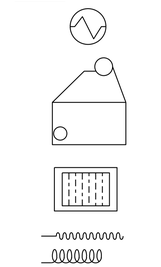
MIXERS



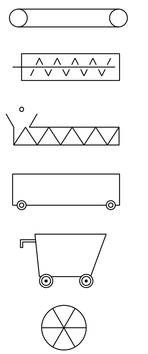
MOTORS



HEAT

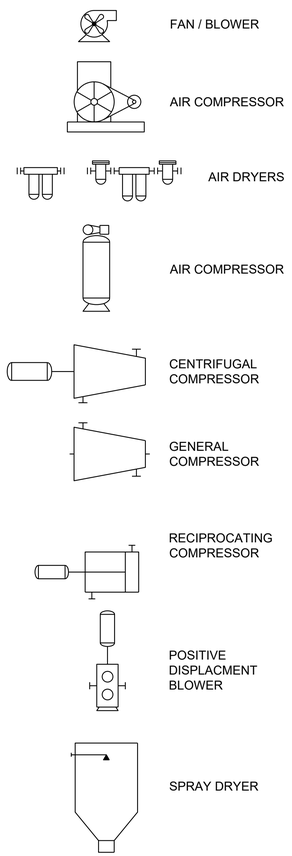


MATERIAL HANDLING

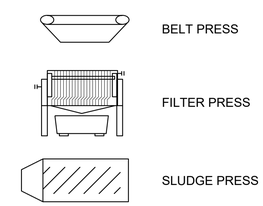


EQUIPMENT

COMPRESSORS/DRYERS

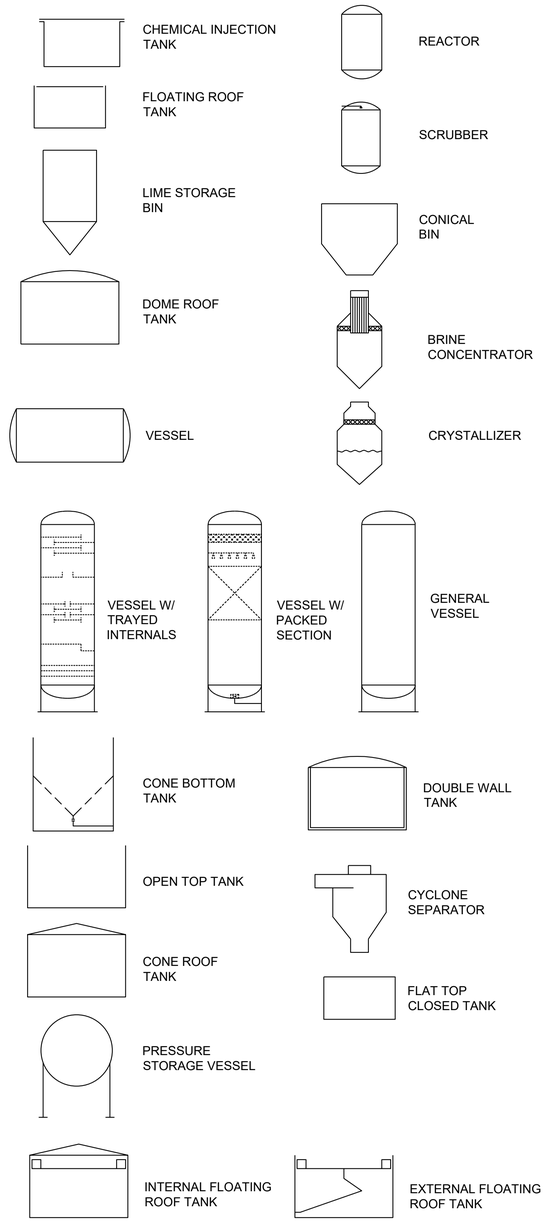


PRESSES



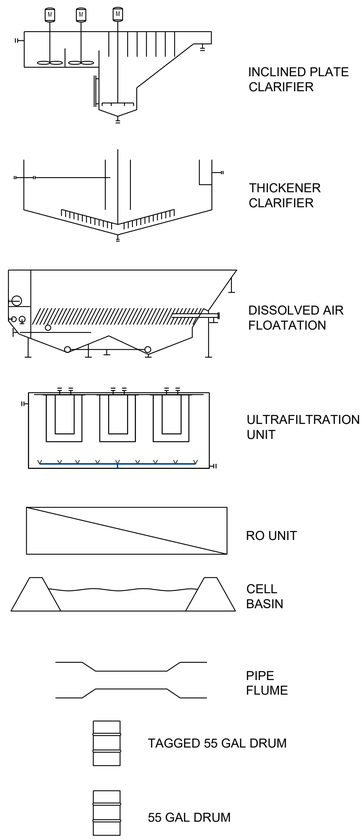
EQUIPMENT

TANKS & VESSELS



EQUIPMENT

MISCELLANEOUS SYMBOLS



NOTES:

1. SYMBOLS SHOWN ON THIS DRAWING ARE PER AMERICAN NATIONAL STANDARD INSTRUMENTATION SYMBOLS AND IDENTIFICATION (ANSI/ISA-S5.1-2022).
2. ALL SYMBOLS SHOWN MAY NOT BE INCORPORATED IN THIS PROJECT.
3. ALL SYMBOLS SHOWN ARE SCALABLE TO FIT THE APPLICATION.

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BLACK — STATE OF WASHINGTON — 31580 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING AND INSTRUMENTATION DIAGRAM
SYMBOLS & ABBREVIATIONS SH 3

DATE: SEPTEMBER 2026

DRAWING NO: D6.03

SHEET NO: OF 14 OF 27

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PLOTTED: Sep 25, 2026 @ 8:24:58am By USDO7075688
XREFS: Golder_Logo.dwg
IMAGES:

TK-100 INFLUENT TANK
TK-200 CLEAN WATER TANK
TK-300 CO_2 STORAGE TANK
AG-100 INFLUENT TANK AGITATOR
P-200 CLEAN WATER DISCHARGE PUMP
P-100 INFLUENT DISCHARGE PUMP

FROM D6.05 A
LSH-400A

YI 101 | YA 101
KQI 101 | HS 101A

HS 101

SV 100

I

LIC 100 LAH LAL

FROM
2"-P80-DR-21
CHRGE FACILITY

S

2"-1112-100

LIT 100

M

AI 100 pH

AE 100 | AIT 100 pH

4"-P80-VT-10

TO D6.07 1
TK-800
GAC AIR SCRUBBER

KQI 100 | HS 100A
YI 100 | YA 100

HS 100

AG-100

TSL 102 | TSH 102 | YI 102
LOCAL THERMOSTAT

TK-100

2" x 1 1/2"

1 1/2"-1122-101

1 1/2"-P80-INF-31

1 1/2"-1112-102

1 1/2" x 1 1/4"

P-100

1" x 1 1/2"

1 1/2"-7110-103

1 1/2"-1112-104

1 1/2"-P80-INF-5

1"-1112-105

SP 1

TO D6.05 3
RE-400
ME REACTOR

FROM D6.07 13
AR-1200
AIR RECEIVER

S

SV 110

2"-P80-DR-21

TO
CONTAINERIZATION AND HAULING FRAC TANK

YI 200 | YA 200
KQI 200 | HS 200A

HS 200

SC 200

PI 200

1/2"-1422-206

1/2"-1422-205

FROM
2"-AG1-UW-22
CLEAN WATER

2"-1222-200

TSL 201 | TSH 201 | YI 201

TK-200

1 1/2"-1122-201

1 1/2"-P80-UW-1

1 1/2"-1122-202

1 1/2" x 1 1/4"

P-200

1" x 1 1/2"

1 1/2"-7110-203

1 1/2"-1112-204

1 1/2"-P80-UW-2

TO D6.05 4
RE-400
ME REACTOR

PRV 300 SET AT 12 PSI OR LOWER

3/4"-1222-300

3/4"-AS2-CO2-3

TO D6.05 5
RE-400
ME REACTOR

TK-300

FINAL

No.	REVISION	BY	APP'D	DATE
2				
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BECK — STATE OF WASHINGTON — 39580 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

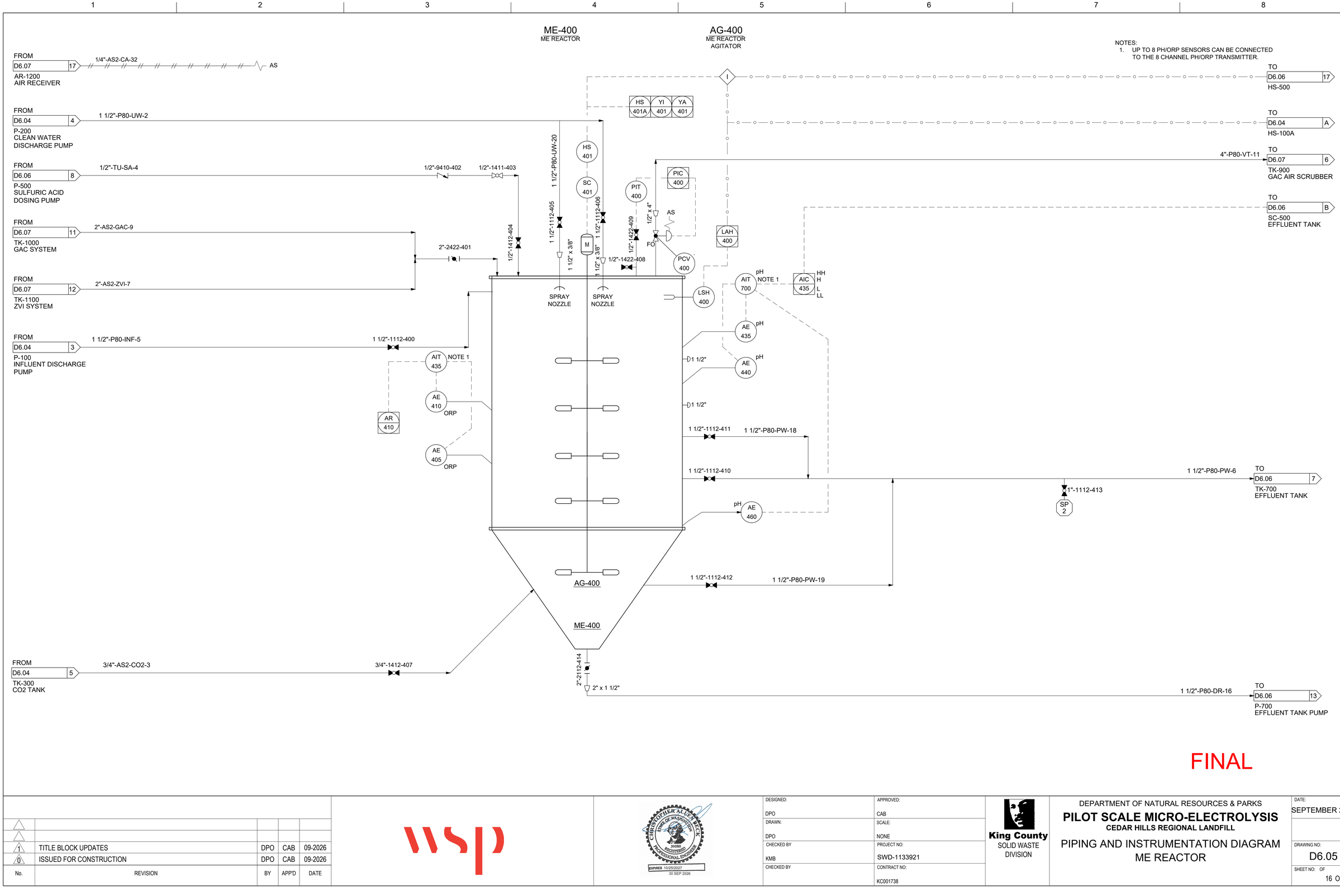
PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING AND INSTRUMENTATION DIAGRAM
INFLUENT / CO2 / WATER SYSTEMS

DATE: SEPTEMBER 2026
DRAWING NO: D6.04
SHEET NO: 15 OF 27

\\corp.pbwan.net\US\Central\Data\USLK100\ACAD\King County\3140681?\KCMEP\DP\D WG\3140681?-003-405-D6.04.dwg | Layout: PID INFLUENT_CO2_WATER
PLOTTED: Sep 25, 2026 - 08:26:42am By USDO707588
XREFS: Golder_Logo.dwg
IMAGES: KCLogo.png;



FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BECK — STATE OF WASHINGTON — 39580 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS
CEDAR HILLS REGIONAL LANDFILL

PIPING AND INSTRUMENTATION DIAGRAM
ME REACTOR

DATE: SEPTEMBER 2026
DRAWING NO: D6.05
SHEET NO: 16 OF 27

\\corp.pbwan.net\US\Central\Data\USLIK10\ACAD\King County\314058\7\KCMEP\DP\D 0\VG\314058170-003-405-D6.05.dwg | Layout: PID ME REACTOR
PLOTTED: Sep 25, 2026-08:28:45am By USDO7075838
XREFS: _Golder_Logo.dwg
IMAGES:

TK-500	TK-600	P-500	P-600	BF-700	TK-700	AG-700	P-700	P-710
SULFURIC ACID TOTE	SODIUM HYDROXIDE TOTE	SULFURIC ACID DOSING PUMP	SODIUM HYDROXIDE DOSING PUMP	BAG FILTER	EFFLUENT TANK	EFFLUENT TANK AGITATOR	EFFLUENT TANK PUMP	EFFLUENT TANK TRANSFER PUMP

NOTES:
1. UP TO 8 PH/ORP SENSORS CAN BE CONNECTED TO THE 8 CHANNEL PH/ORP TRANSMITTER.

FROM D6.05 17 LSH-400A

FROM D6.05 14 AIC-435

SC 500 | HS 500 | HS 500A | YI 500 | YA 500

1/2"-7410-502 | 1/2"-1422-503 | 1/2"-TU-SA-4 | TO D6.05 8 RE-400 ME REACTOR

1"-1422-500 | 1"-TU-SA-24 | 1/2"-1422-501 | 1" x 1/2" | TK-500 | P-500

1/2"-1422-504 | DRAIN

SC 600 | HS 600 | HS 600A | YI 600 | YA 600

AIC 700 | AAH 700 | AAHH 700 | AAL 700 | AALL 700

1/4"-7422-602 | 1/4"-1422-603 | 1/4"-TU-SH-26

1"-1422-600 | 1"-TU-SH-25 | 1/2"-1422-601 | 1" x 1/2" | TK-600 | P-600

1/4"-1422-604 | DRAIN

HS 701A | YI 701 | YA 701

4"-P80-VT-12 | TO D6.07 9 TK-800 GAC AIR SCRUBBER

NOTE 1

AIT 700 | HS 701 | LIC 700 | H

AE 700 | M | LIT 700

1/2"-9410-605

FROM D6.07 14 AR-1200 AIR RECEIVER

1/4"-AS2-CA-15 | 1/4"-1412-1205

PI 700 | 1/2"-1422-701 | 1/2"-1422-700 | PI 705 | 1/2"-1422-706 | 1/2"-1422-705

FROM D6.05 7 RE-400 ME REACTOR

1 1/2"-P80-PW-6 | P-700 | 1 1/2"-P80-PW-27 | 1 1/2"-1122-702 | BF-700 | 1 1/2"-1122-704 | THD | 1"-1422-703 | DRAIN

1 1/2"-P80-PW-28 | 1 1/2"-1132-707

KQI 700 | YI 700 | YA 700 | HS 700 | HS 700A

HS 700

FROM D6.05 13 RE-400 ME REACTOR

1 1/2"-P80-DR-16

TSL 702 | TSH 702 | YI 702

AG-700 | TK-700

1 1/2"-1132-708 | 1 1/2"-P80-TW-29 | 1"-1112-709 | SP 3 | 1 1/2"-1112-710 | 1 1/2" x 1 1/4" | P-710

1" x 1 1/2" | 1 1/2"-6110-711 | 1 1/2"-1112-712 | 1 1/2"-1112-713 | DRAIN | 1 1/2"-1112-714 | 1 1/2"-P80-TW-30 | TO CONTAINERIZATION AND HAULING FRAC TANK (BY OTHERS)

1 1/2"-P80-DR-17 | TO D6.08 15 TK-400 SOLIDS DE-WATERING TANK

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BLACK · STATE OF WASHINGTON · 39584 · REGISTERED PROFESSIONAL ENGINEER · EXPIRES 10/25/2027 · 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING AND INSTRUMENTATION DIAGRAM EFFLUENT / CHEMICAL SYSTEMS

DATE: SEPTEMBER 2026

DRAWING NO: D6.06

SHEET NO: 17 OF 27

\\corp.pbwan.net\US\Central\Data\USLIK100\ACAD\King County\314068117KCMEP\D\PID DWG\314068117-003-405-D6.06.dwg | Layout: PID EFFLUENT_CHEMICALS
PLOTTED: Sep 25, 2026 08:30:08am By USD\D7075B8
XREFS: _Golder_Logo.dwg; _Golder_Logo.dwg
IMAGES:

BN-1000	CY-1000	BN-1100	CY-1100	AC-1200	AR-1200	AD-1200	TK-800	BL-800	TK-900	BL-900
GAC BIN	SCREW FEEDER	ZVI BIN	SCREW FEEDER	AIR COMPRESSOR	AIR RECIEVER	AIR DRYER	GAC AIR SCRUBBER	BLOWER	GAC AIR SCRUBBER	BLOWER

FROM D6.04 1 — 4"-VT-P80-10
TK-100
INFLUENT TANK

FROM D6.06 9 — 4"-P80-VT-12
TK-700
EFFLUENT TANK

FROM D6.05 6 — 4"-P80-VT-11
RE-400
ME REACTOR

FROM D6.08 16 — 4"-P80-VT-13
TK-400
SOLIDS DE-WATERING
TANK

4"-P80-VT-12

TK-800

4"-1112-801

HS 900

BL-800

TO ATMOS

LAH 800

LS 800

1"-1222-800

4"-P80-VT-11

TK-900

4"-1112-901

HS 900

BL-900

TO ATMOS

LAH 900

LS 900

1"-1222-900

KY 1000

HS 1000A

HS 1000

BN-1000

LSL 1000

LAL 1000

M

CY-1000

2"-AS2-GAC-9 — TO D6.05 11
RE-400
ME REACTOR

KY 1100

HS 1100A

HS 1100

BN-1100

LSL 1100

LAL 1100

M

CY-1100

2"-AS2-ZVI-7 — TO D6.05 12
RE-400
ME REACTOR

PRV 1200

PI 1200

1/2"-1212-1201

HS 1200

AC-1200

1 1/4"-1412-1202

1 1/4" x 1/2"

AR-1200

1/2" x 1/4"

AD-1200

SET TO 35 PSI OR LOWER

PRV 1200

1/4"-1412-1203 — 1/4"-AS2-CA-14 — TO D6.04 13
SV-100/110
SOLENOID VALVES

1/4"-1412-1204 — 1/4"-AS2-CA-15 — TO D6.06 14
P-700
EFFLUENT TANK PUMP

1/4"-1412-1206 — 1/4"-AS2-CA-32 — TO D6.05 17
PCV-400
PRESSURE CONTROL
VALVE

1"-1222-1200

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN MACK — STATE OF WASHINGTON — 19580 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/25/2027
30 SEP 2026

DESIGNED:	APPROVED:
DPO	CAB
DRAWN:	SCALE:
DPO	NONE
CHECKED BY	PROJECT NO:
KMB	SWD-1133921
CHECKED BY	CONTRACT NO:
	KC001738

King County
SOLID WASTE
DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

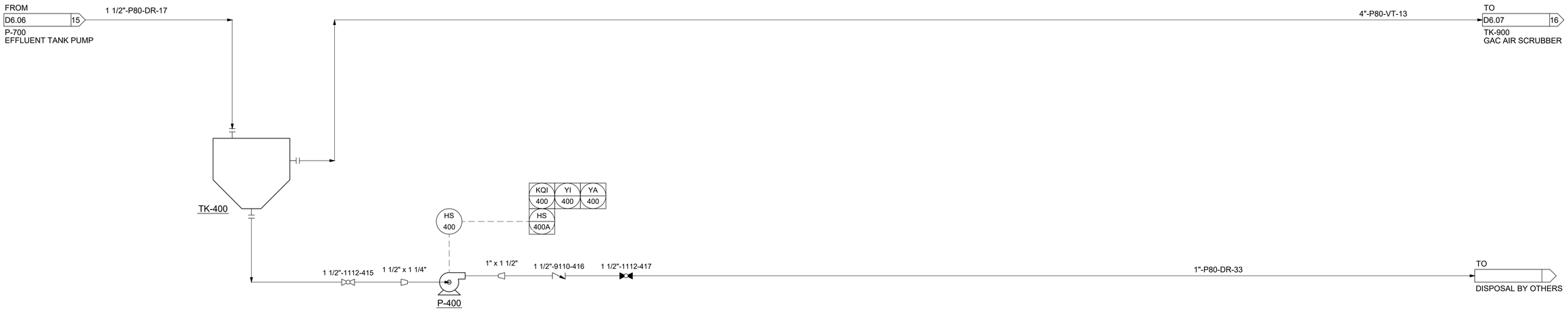
PIPING AND INSTRUMENTATION DIAGRAM
MEDIA DOSING / AIR / SCRUBBING SYSTEMS

DATE: SEPTEMBER 2026
DRAWING NO: D6.07
SHEET NO: 18 OF 27

| \\corp.pbwan.net\US\Central\Data\USLIK100\ACAD\King County\314406817\KCMEPID\PID DWG\314406817.003.405-D6.07.dwg | Layout: P&ID MEDIA DOSING_AIR_SCRUBBING SYSTEMS
PLOTTED: Sep 25, 2026 - 8:31:26am By USDOT075388
XREFS: _Golder_Logo.dwg; _Golder_Logo.dwg
IMAGES:

TK-400
SOLIDS DE-WATERING TANK

P-400
SOLIDS DE-WATERING TRANSFER PUMP



FINAL

No.	REVISION	BY	APP'D	DATE
2				
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

wsp

CHRISTOPHER ALLEN BECK — STATE OF WASHINGTON — 39580 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/25/2027
30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING AND INSTRUMENTATION DIAGRAM
SOLIDS DEWATERING

DATE: SEPTEMBER 2026
DRAWING NO: D6.08
SHEET NO: 19 OF 27

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PIPING MATERIAL CLASSES

CLASS **AG1** | REV **0**

Sheet 1 of 2

Commodity	Abrv.	Nominal Operating Pressure, psig	Nominal Operating Temperature, °F
Water	UW	100	70

Design Code: ASME B31.3

Corr Allow: 0.06250 in.

Design Pressure, psig

150

Maximum operating temperature limited to 250°F based on valve limits.

Nominal Pipe Size, in.	½	¾	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24
CONSTRUCTION	Threaded joints - pipe, fittings, and valves. Flanged and threaded specialty items, control valves, and in-line elements.					Butt weld joints - pipe and fittings. Flanged valves and specialty items.											
PIPE	C.S. ASTM A53 Gr. B, Seamless or ERW, Galvanized					C.S. ASTM A53 Gr. B, ERW											
	Sch. 40, T & C					Std. Wt., B.E.											
NIPPLE	Use Pipe																
FITTINGS	ASME B16.3 Class 150, Threaded, Malleable Iron, Galvanized, ASTM A197					Butt welding fittings, ASME B16.9, C.S. ASTM A234 Gr. WPB, (Sch. same as pipe), B.E.											
UNION	ASME B16.3 Class 150, Threaded, Malleable Iron, Galvanized, ASTM A197					Use Flanges											
	Dielectric union - Screwed FPT Galvanized iron body, solder joint copper tail piece, dielectric insulating sleeve. (Used at copper piping interface)																
BRANCH CONNECTION	Use straight or reducing tees, Galvanized					Use straight tees for full size branches; Use thredolets/weldolets for reduced branches											
THREDOLET ELBOLET THD. LATROLET THD.	ASME B16.11 Class 3000 C.S. ASTM A105, Sch 80, Galvanized																
WELDOLET ELBOLET B.W.						C.S. ASTM A105, Std. Wt. x (Branch pipe Sch.) Bore											
FLANGES (Note 2)	Blind Flange, ASME B16.5 Class 150 R.F. C.S. ASTM A105																
	Threaded, ASME B16.5 Class 150 R.F. C.S. ASTM A105, Galvanized					Slip-on, ASME B16.5 Class 150 R.F. or F.F. (Note 3) C.S. ASTM A105											
						Weld neck, ASME B16.5 Class 150 R.F. or F.F. (Note 3) C.S. ASTM A105, (Class 300 R.F. for Orifice Flanges), (Sch. same as Pipe) bore											
BOLTING	Alloy stud bolts ASTM A193 Gr. B7 with heavy hex nuts and washers ASTM A194 Gr. 2H																
GASKETS	1/16 in. thick Non-Asbestos Composition, GARLOCK BLUE-GARD Style 3000 Class 150 or approved equal.																
INSULATING FLANGE KIT	1/8 in. thick phenolic core neoprene faced gasket, 1/32" wall plastic bolt sleeves, 1/8" thick insulating washer, and plated steel washer																
BALL VALVE	12XX																
BUTTERFLY VALVE						B-13			B-13-GO								
CHECK VALVE	C-1					C-13			C-13A								
GLOBE VALVE	E-2					E-11											
PLUG VALVE						U-4			U-4-GO								
Nominal Pipe Size, in.	½	¾	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24

Continuation Sheet — Sheet 2 of 2

Nominal Pipe Size, in.	½	¾	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24
Y-STRAINER	SPY-10						SPY-11				SPY-13						
DOUBLE BASKET STRAINER	SPY-21						SPY-23										
SPECTACLE BLIND	C.S. ASTM A515 Gr. 70, Class 150 ASME B16.5, ASME B31.3 (0.0625") C.A.																
TRAPS	SPT-4																
AIR VENTS	SPV-1		SPV-5A														
	SPV-12																
FLANGE ISOLATION KIT	SPZ-10																
Nominal Pipe Size, in.	½	¾	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24

Notes:
1. Pressure ratings shown on the pressure and temperature ratings are limited by:
 a) C.I. Valves per ANSI B16.1 and Steel Valves per ANSI B16.34.
 b) Flanges per ANSI B16.5.
 c) Temperature limitations based on soft seated valve trims (butterfly valves). Maximum temperature for EPDM seats is 250°F.

2. Weld neck flanges are preferred. Use slip on flanges only when space is a constraint. Use weld neck flanges when adjacent to welding fittings.

3. Flat face flanges shall be used to mate to C.I. valve or equipment.

AG1 - CONTINUED

BALL VALVE	Ball Valve, 800 # screwed ends, forged steel body, chrome plated steel ball, TFE seats and seals.	A-3
1/2" to 2"	Lever Operated, Apollo 73-100 Series or Approved Equal	
CHECK VALVE	Swing Check Valve, Class 125, screwed ends, bronze body and trim, screwed cap, Y-pattern.	C-1
1/2" to 2"	Walworth No. W406 / Nibco T-413-B / or Approved Equal	
GLOBE VALVE	Globe Valve, Class 200, screwed ends, bronze body, union bonnet, rising stem, renewable full port plug disc, 316 S.S. disc and seat ring, 500 BHN.	E-2
1/2" to 2"	Walworth Fig. No. W245P / Nibco T-256-AP or Approved Equal	

PIPING MATERIAL CLASSES

CLASS **P80** | REV **0**

Sheet 1 of 1

Commodity	Abrv.	Nominal Operating Pressure, psig	Nominal Operating Temperature, °F
Non-Pressurized Vent and Overflow Lines Only for the Following Commodities:			
Drain	DR	Atm	60
Tempered Water	TW		
Influent	INF		
Vent	VT		

Design Code: ASME B31.3

Corr Allow: 0.00000 in.

Design Pressure, psig

0 to 140 (atmospheric to max. 140 psi at 110°F)

Maximum operating temperature limited to 110°F based on limits of CPVC flanges/unions at 140 psi.

Nominal Pipe Size, in.	1/2	3/4	1	1½	2	3	4	6	8	10	12
CONSTRUCTION	Socket Cement joints, except flanged at valves, specialty items, control valves, and in-line elements. Socket joints shall be primed with PVC primer and cemented with solvent cement.										
PIPE	Polyvinyl Chloride (PVC) ASTM D1785 Class 12454, Sch 80.										
NIPPLE	Use Pipe										
FITTINGS	Polyvinyl Chloride (PVC) ASTM D1785 Class 12454 & ASTM D2467, Sch. 80 Socket Ends										
UNION	PVC, ASTM D1785 Class 12454 & ASTM D2467, Sch. 80, Socket Ends, Viton "O"-Ring Seals					Use Flanges					
BRANCH CONNECTION	Use tee and reducer tee fittings & reducer bushings for reduced branch size										
FLANGES	Socket-Type, Class 150 PVC, ASTM D1785 Class 12454 & ASTM D2467, Sch. 80										
	Blind Flange, Class 150 PVC, ASTM D1785 Class 12454 & ASTM D2467, Sch. 80										
BOLTING	Stainless Steel Type 316 stud bolts, ASTM A193 Gr. B8M with S.S. Type 316 heavy hex nuts ASTM A194 Gr. 8M, with 316 S.S. bolt washers installed with silicone thread lubricant.										
GASKETS	1/8 in thick GARLOCK Stress Saver 100% pure PTFE bonded to EPDM elastomer or approved equal, ASME B16.5 Class 150 full face										
BALL VALVE	11XX					11XX					
BUTTERFLY VALVE						21XX		B-27-GO			
BALANCING DAMPER											
Nominal Pipe Size, in.	1/2	3/4	1	1½	2	3	4	6	8	10	12

Notes:

BALL VALVE	Ball Valve, 150#, socket ends, PVC double union body, TFE seats, Viton seals	
1/2" to 6"	Lever Actuated, Chemtrol Model TU or Approved Equal	A-12
BUTTERFLY VALVE	Butterfly Valve, #150, Socket/Threaded Ends, PVC Body, PVC Disk, EPDM Seats, 410 Stainless Steel Stem.	
1/2" - 2"	Lever Operated Hayward or Approved Equal	B-27

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

CHRISTOPHER ALLEN BECK — STATE OF WASHINGTON — 39580 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING SPECIFICATIONS 1

DATE: SEPTEMBER 2026

DRAWING NO: D6.09

SHEET NO: 20 OF 27

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PIPING MATERIAL CLASSES

CLASS **AS2** | REV **0**

Sheet 1 of 2

Commodity	Abrv.	Nominal Operating Pressure, psig	Nominal Operating Temperature, °F

Design Code: ASME B31.3

Corr Allow: 0.03130 in.

Design Pressure, psig

150

Maximum operating temperature limited to 300°F based on valve limits.

Nominal Pipe Size, in.	1/2	3/4	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24
CONSTRUCTION	Socket weld joints - pipe, fittings and valves. Flanged and threaded specialty items, control valves, and in-line elements.					Butt weld joints - pipe and fittings. Flanged valves and specialty items.											
PIPE	Stainless Steel, ASTM A312 Gr.TP304L/TP304 dual certified, EFW, Double Butt Seam Welded																
	Sch. 40S					Sch 10S, B.E.											
NIPPLE	Use Pipe																
FITTINGS	ASME B16.11 Class 3000, socket weld, S.S. ASTM A182 F304L					Butt welding fittings, ASME B16.9, S.S. ASTM A403 Gr. WP304L, Sch. same as pipe), B.E.											
UNION	MSS-SP-83 Class 3000, socket weld, S.S. ASTM A182 F304L, steel to steel seats					Use Flanges											
BRANCH CONNECTION	Use Fittings					Use straight tees for full size branches, use sockolets / weldolets for reduced size branches											
SOCKOLET ELBOLET S.W. LATROLET S.W.	ASME B16.11 Class 3000, S.S. ASTM 182 Gr. F304L Sch. 40S Bore																
WELDOLET ELBOLET B.W.						ASTM A182 F304L, Sch 10S x Sch 10S Bore, ASME B36.19											
FLANGES (Notes 1 & 4)	Blind Flange, ASME B16.5 Class 150 R.F. ASTM A182 F304L																
	Socket Weld, ASME B16.5 Class 150 R.F. ASTM A182 F304L					Weld Neck, ASME B16.5 Class 150 R.F. ASTM A182 F304L (Class 300 R.F. for Orifice Flanges) (Sch. same as Pipe) bore											
						Slip-on, ASME B16.5 Class 150 R.F. ASTM A182 F304L											
						Lap Joint, Class 150, ASME B16.5 Class 150 R.F. ASTM A182 F304L											
Nominal Pipe Size, in.	1/2	3/4	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24

Continuation Sheet — Sheet 2 of 2

Nominal Pipe Size, in.	1/2	3/4	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24
STUB END						S.S. ASTM A403 WP304L, ANSI B16.9, Short Pattern, Wall to match pipe											
BOLTING	Stainless Steel Type 316 stud bolts, ASTM A193 Gr. B8M with S.S. Type 316 heavy hex nuts and washers per ASTM A194 Gr. 8M installed with silicone thread lubricant.																
GASKETS	1/16 in. thick Non-Asbestos Composition, GARLOCK Fawn Gylon style 3500. Pressure Class to suit flange rating and facing.																
BALL VALVE (Notes 2 & 5)	14XX																
	A-15									A-15-GO							
BUTTERFLY VALVE						B-27				B-27-GO							
CHECK VALVE	C-10					C-23				C-23A							
GLOBE VALVE (Note 2, 4)	E-6					E-18				E-18-GO							
PLUG VALVE						U-8				U-8-GO							
HOSES	SPH-20																
		SPH-55															
TRAPS	SPT-7																
	SPT-8																
Y-STRAINER		SPY-36															
EXPANSION JOINT		SPJ-1H															
Nominal Pipe Size, in.	1/2	3/4	1	1 ½	2	2 ½	3	4	6	8	10	12	14	16	18	20	24

AS2 - CONTINUED

Notes:

1. Weld neck flanges are preferred. Use slip on flanges only when space is a constraint. Use lap joint flanges only when necessary.
2. For throttling valve services, globe valves are preferred.
3. For shutoff service, butterfly valves 14" and larger cannot be used for differential pressures in excess of 150 psig.
4. Provide flange shields at all flanged joints and at valve bonnets for all hazardous services, especially reagents listed above like Sodium Hydrosulfide, Spdium Ferrocyanide, and Sodium Hydroxide.
5. A-15 valve in sizes smaller than 2½" shall be used for instrument root valves only.

BALL VALVE	Ball Valve, 1500#, socket weld ends, 3 piece construction, 304L SS -body per ASTM A351 Gr. CF3, Std. port, 304 S.S. ball and stem,, RPTFE seats and seals. 1/4 turn actuation with lockable level handle.	A-6
1/2" to 2"	Lever Operated, Apollo 86A series or equal	
1/2" to 6"	Ball Valve, ANSI Class 150, R.F. flanged ends, Type 316 S.S. body per ASTM A351 Gr. CF8M, Std. port, 316 S.S. ball and stem, reinforced TFE seat and stem packing.	A-15
	Floating ball, lever operated, Jamesbury Fig. No. 5150-11-3600-MT-1 or Approved Equal	
CHECK VALVE	Swing check valve, Class 150, socket weld ends, 304L stainless steel body and 304L stainless steel trim per ASTM A351 Gr. CF3, bolted cover, integral seat.	C-10
1/2" to 2"	Aloyco Fig. No. 374 / Kitz AW150UOM or Approved Equal	
GLOBE VALVE	Globe Valve, Class 150, socket weld ends, 304L stainless steel body, 304L stainless steel trim per ASTM A351 Gr. CF3, OS&Y bolted bonnet, plug type disc, integral seat, teflon packing.	E-6
1/2" to 2"	Crane-Aloyco Fig. No. 314 / Kitz AW150UPM or Approved Equal	

PIPING MATERIAL CLASSES

CLASS **TU** | REV **0**

Sheet 1 of 1

Commodity	Abrv.	Nominal Operating Pressure, psig	Nominal Operating Temperature, °F
Sulfuric Acid	SA	150 to 2000	70
Sodium Hydroxide	SH	150 to 2000	70

Design Code: ASME B31.3

Corr Allow: 0.00 in.

Design Pressure, psig

2000

Maximum operating temperature limited to 250°F based on valve limits.

Nominal Pipe Size, in.	¼	?	½	¾	1	1¼	1½	2
CONSTRUCTION	Tubing and tube compression fittings - valves, control valves, and in-line elements, Swagelok or Equal							
TUBING MAT'L	Type 316 S.S. Tubing, ASTM A269 Gr. TP316 Seamless							
TUBING WALL (in.)	0.035		0.049		0.083		0.109	
NIPPLE	Use Tubing							
FITTINGS	Use Tube Fittings, Type 316 Stainless Steel, Swagelok or Equal							
BRANCH CONNECTION	Use Tube fittings, Type 316 Stainless Steel, Swagelok or Equal							
BALL VALVE (Note 1)	14XX				A-84			
CHECK VALVE	74XX OR 94XX					C-5		
GLOBE VALVE								
GATE VALVE								
NEEDLE VALVE								
Nominal Pipe Size, in.	¼	?	½	¾	1	1¼	1½	2

Notes:

1. Use ball valve for quick opening services as required. Otherwise, gate valves are preferred.

BALL VALVE	Ball valve, Class 2500, Compression x compression tube ends, 316 stainless steel, one piece body, standard port, lever acuated handle, PFA seat and PTFE seal materials. Parker or equivalent	A-86
1/4" to 1/2"		

FINAL

No.	REVISION	BY	APP'D	DATE
1	TITLE BLOCK UPDATES	DPO	CAB	09-2026
0	ISSUED FOR CONSTRUCTION	DPO	CAB	09-2026

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CHRISTOPHER ALLEN KEELEY — STATE OF WASHINGTON — 29330 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/25/2027 — 30 SEP 2026

DESIGNED: DPO	APPROVED: CAB
DRAWN: DPO	SCALE: NONE
CHECKED BY KMB	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS

PILOT SCALE MICRO-ELECTROLYSIS

CEDAR HILLS REGIONAL LANDFILL

PIPING SPECIFICATIONS 2

DATE: SEPTEMBER 2026

DRAWING NO: D6.10

SHEET NO: OF 21 OF 27

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ELECTRICAL NOTES

General

1. All work to conform to all locally adopted codes including the International Building Codes, National Electric Codes, all City, County and State Codes including locally adopted amendments to the National Codes and the Washington State Energy Code.
2. The Contractor shall visit the site prior to submitting a bid and note all conditions affecting his work. No extras will be allowed for coordination or relocation of existing conditions not shown on the drawings. Bids shall serve as evidence of knowledge of existing conditions.
3. Secure and pay for all required permits, fees and inspection certificates.
4. Electrical service point of panel connection point to be coordinated at time of bid.
5. Furnish all labor, materials, equipment and tools to perform electrical work shown, noted or scheduled for a complete and finished installation.
   a. All materials and equipment shall be commercial grade and shall carry a U.L. label.
   b. Materials, products and equipment, including all components thereof, shall be new and such as appear on the Underwriters Laboratories List of Approved Items and shall meet requirements of ASTM, IEEE, IPCEA, NEC, NEMA, RLM, CEM and other recognized standards and shall be sized in conformity with requirements of the National Electrical Code and other applicable codes, whichever are more stringent
6. It is the intent that this work shall be complete in every respect and that any material or work not specifically mentioned or shown on the drawings, but necessary to fully complete the work shall be furnished by this Contractor without extra charge.
7. Use sufficient journeymen, workmen, and competent supervisors in the execution of this work to ensure proper and adequate installation manpower to meet the construction schedule.
8. The word "provide" as used herein means to furnish and install complete.
9. Submit material lists, product data and shop drawings for equipment to the Engineer for approval. Submittals shall include all data, information and dimensioned drawings required by the Engineer to determine the correct product is being provided for the project. Data sheets that include products not part of the project shall have required products highlighted to make it obvious of the product being provided. Substitutions shall be clearly listed on a cover letter stating the reason for the substitution (product no longer made, product has a longer ship time than the duration of the project from project start date to project completion date, no other substitutions are acceptable). Provide an electronic submittal in .pdf format. All submittals shall be stamped by the Contractor
10. Cutting and Patching:
    a. Do all cutting and patching required to install materials and systems specified and shown on the
    b. Cutting shall be done in a neat and workman like manner limiting scope to only that which is necessary to accomplish the new work. Remove all cut material from site. Patch to match existing.
    c. Do no cutting or drilling of structural members or slabs without permission of the Owner.
    d. Take precautions to protect building, contents and occupants and repair or replace all damage to building and its contents.
    e. Sleeves shall extend at least 2" above finished floor.
    f. All sleeves, openings, etc., through fire rated walls and floors shall be sealed to retain their fire rating.
11. Guarantee:
    a. Materials, equipment and installation shall be guaranteed for a period of one (1) year from date of acceptance. Defects which appear during that period shall be corrected at this Contractor's expense.
    b. For the same period, Electrical Contractor shall be responsible for any damage to premises caused by defects in workmanship or in the work or equipment furnished and/or installed by him.
12. The drawings and devices shown are generally diagrammatic. Complete details of the building which affect the installation are not shown. Contractor to provide complete systems as shown on the drawings. The exact location of all work is to be verified in the field. Bring conflicts to the Engineers attention for resolution prior to rough-in. Relocations required due to conflicts shall be done without
13. Protection:
    a. Use all means necessary to protect materials, before, during and after installation and to protect the installed work of other trades
    b. Contractor shall be responsible for damages caused by their work to the work of other trades, and shall make, or pay for, all necessary repairs to restore damage to new condition at no cost to the
    c. In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the Owner and at no additional cost to the Owner.
14. Provide final as-built drawings and maintenance manuals.

Products

1. Wiring Devices:
   a. Color of wiring devices shall be selected by the Contractor.
   b. Receptacles shall be 20A-125V - 3-wire grounding type equal to Leviton 5362 and of type required (GFI, Tamperproof, Isolated Ground, TVSS, Single Outlet, Duplex, Quad, etc.) for application and
   c. Switches shall be Specification Grade rated 20A at 120 volt Leviton 1221 and of type required (3-way, 4-way, pilot light, etc.) for application and nomenclature.
   d. Special devices shall be Heavy Duty Industrial and Federal Specification grade.
   e. Provide weather-proof in use cover plates for all devices.
2. Electrical Panels and Switchboards shall be copper bus, fully rated and have bolt on circuit breakers. Panels shall be manufactured by Square D, EATON OR ABB.
3. Provide safety and disconnect switches; fused or non-fused as called for on drawings and as required by Code. Switches shall be heavy duty, load and horsepower rated as manufactured by Square D,
4. Three phase starters shall be provided with overload device in each phase. Magnetic motor starters shall be used for integral horsepower motors. Starter shall have HOA switch and run light. Starter shall be ABB, Furnace, Allen Bradley or Square D.
5. Labeling: All panels, disconnects, starters, and controllers shall be labeled. Black Lamicore tags w/

Execution

1. The location of outlets and equipment shown on the drawings is approximate and the Engineer shall have the right to relocate any outlets or fixtures before they are installed without additional cost.
2. All electric work shall be installed so as to be readily accessible for operating, servicing, maintaining and repairing. Hangers shall include all miscellaneous steel, such as channels, rods, etc., necessary for the installation of work and shall be fastened to steel, concrete or masonry, but not to piping. Conduits and cable tray shall be in straight lines parallel with or at right lines wherever they run alongside or across such lines. Conductors shall be in conduit, wireways, or approved raceways.
3. Grounding shall be less than 5 Ohms to Ground. Provide testing results and method used for testing from a qualified electrical testing company. Grounding shall meet all local, state and NEC requirements.
4. Prior to any work or fabrication, carefully inspect the surrounding conditions and verify that all such conditions are compatible to the point where this installation may commence.
5. Record drawings shall be kept on site and updated daily. Provide measurement to all underground and concealed work.

End of Electrical Notes.

CONTROL SYSTEM NOTES

The controls contractor shall be an Allen Bradley certified industrial controls contractor with the capacity to provide design build services for the controls system for this project.

The Design shall be based on an Allen Bradley PLC based controls system (ControlLogix 5580 with 1756-L8 series controllers and PanelView 5310 HMI graphic displays) and shall include all points listed on the points list and 20% additional spare points. Additionally, PID drawings shall be closely reviewed and all related controls work included.

Shop drawings shall include the following:

- Drawing for each graphics page for Human Machine Interface (HMI). This shall match PID drawings, it shall include additional pages (windows) for detailed equipment information if that detailed information clutters the main PID drawing.
- Include P.I.D. contract drawing layout and information.
- For HMI the colors Red for in operation and Green in stand-by (or safe) shall be used.
- Detailed wiring connection diagrams for each piece of equipment, this will need to be coordinated with the actual selected equipment. Verification of control point types will need to be validated with this equipment prior to submitting shop drawings.
- Details of air-conditioned equipment enclosure.
- Details of operator station.

Provide product information cutsheets and company qualifications with submittals.

HMI shall operate with both touch screen and mounted track ball

The entire controls system shall be commissioned. The contractor shall coordinate with the commission agent to provide a full functional test plan for all control points and sequences. After this plan is approved by Owner, Engineer and Commissioning Agent it shall be used for the verification of the system operation. The controls system shall be tested/demonstrated by the controls contractor in the presence of owner, engineer, and commissioning agent. For any areas of failure, the testing/commissioning shall be repeated until all items pass.

The contractor shall include in their scope of work, as a separate price, an independent commissioning agent for the controls system.

All Controls cabling shall be TC tray rated cable per the specification or outdoor rated cable installed in schedule 40 PVC conduit.

End of Control System Notes

ABBREVIATIONS

Ø	PHASE
A	AMPERE
AC	ALTERNATING CURRENT
AIC	AMPS INTERRUPTING CAPACITY
AMP	AMPS
BLDG	BUILDING
C or COND	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CO	CONDUIT ONLY
DC	DIRECT CURRENT
DWG	DRAWING
(E) or EXIST	EXISTING
EA	EACH
ELEC	ELECTRICAL
FLA	FULL LOAD AMPS
G or GND or GRD	GROUND
GEN	GENERAL or GENERATOR
GFI	GROUND FAULT INTERRUPTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HP	HORSEPOWER
I/O	INPUT/OUTPUT
KAIC	THOUSAND AMPS INTERRUPTING CAPACITY
KCMIL	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATT
KWH	KILOWATT HOURS
MCA	MINIMUM CURRENT AMPACITY
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MLO	MAIN LUGS ONLY
MOP	MAXIMUM OVERCURRENT PROTECTION or METHOD OF PROCEDURE
MOT or MTR	MOTOR
N	NEUTRAL
(N)	NEW
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE (NFPA-70)
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NW	NO WORK (IN PROJECT)
P	POLE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PH	PHASE
PNL	PANEL
PRIM.	PRIMARY
RECEPT	RECEPTACLE
RLA	RUNNING LOAD AMPS
SCH or SCHED	SCHEDULE
SHT	SHEET
SWBD	SWITCHBOARD
SYS	SYSTEM
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG or U/G	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLT
VA	VOLT AMPERES
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH
W	WATTS
WP	WEATHER PROOF
XFMR	TRANSFORMER

CONDUIT

CONDUIT

FLEXIBLE CONDUIT

CONDUIT RUN BELOW FLOOR OR BELOW GRADE.

A-1,3,5

DENOTES HOME RUN TO PANEL "A" - NUMERALS DENOTE CIRCUIT BREAKER #. SLASH MARKS INDICATE # OF WIRES. #12 HOT & NEUTRAL, #12 GND., 3/4" C. UNLESS OTHERWISE NOTED. CURVED SLASH INDICATES INSULATED GROUND. IF NO SLASH MARKS ARE SHOWN, PROVIDE WIRES AS REQUIRED.

CONDUIT STUB UP.

CONDUIT STUB DOWN

DEVICE (GENERAL)

DUPLEX RECEPTACLE
RECEPTACLE NOTATION:
+48 - MOUNTING HEIGHT ABOVE FINISH FLOOR OR FINISH GRADE IF NOT MOUNTED ABOVE FLOOR
GFI - GROUND FAULT INTERRUPTER
TR - TAMPER RESISTANT
U - (2) USB CONNECTIONS
WP - WEATHERPROOF (HUBBELL WP26 COVER)
WPIU - WEATHERPROOF, IN-USE COVER (RED-DOT CODEKEEPER #CKMUV COVER)

SPECIAL RECEPTACLE

EQUIPMENT CONNECTION

LIGHT SWITCH

NON-FUSED DISCONNECT

FUSED DISCONNECT

PULL BOX OR JUNCTION BOX (SIZE PER NEC)

SURGE SUPPRESSOR

GROUND CONNECTION

$_m$ MANUAL MOTOR STARTER

DEVICE (ONE-LINE DIAGRAM)

TRANSFORMER

STARTER

POWER PANEL

LSIG CIRCUIT BREAKER WITH TRIP MODULES AS INDICATED:
- L: LONG
- S: SHORT
- I: INSTANTANEOUS
- G: GROUND

TRANSFORMER

MISCELLANEOUS

LIGHT LINE INDICATES EXISTING WORK

SLASH MARK INDICATES WORK TO BE REMOVED

SHEET LIST

E0.01	ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS
E2.01	POWER PLAN, SECTIONS AND ELEVATIONS
E6.01	ELECTRICAL SCHEDULES
E6.02	ELECTRICAL ONE-LINE DIAGRAM, ELEVATION, AND SECTIONS
E6.03	NETWORK DIAGRAM - PLC SYSTEM
E6.04	PLC I/O POINTS LIST SCHEDULES

No.	REVISION	BY	APP'D	DATE
2	TITLE BLOCK UPDATES	DEH	JDH	09/2026
1	FINAL	DEH	JDH	09/2025

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JOHN DEAN HUNT 31885 STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER
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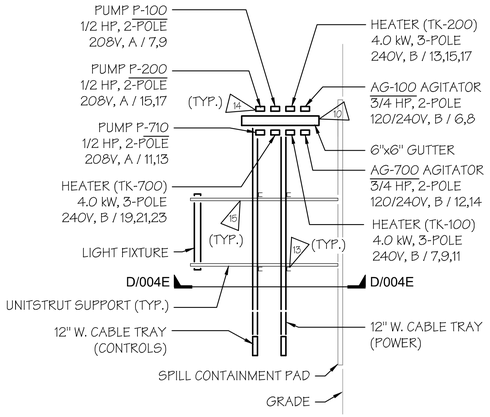
DESIGNED: JOHN HUNT	APPROVED: JOHN HUNT
DRAWN: DAVID HEYLEN	SCALE: NONE
CHECKED BY	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS
CEDAR HILLS REGIONAL LANDFILL
PILOT SCALE MICRO-ELECTROLYSIS
ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS

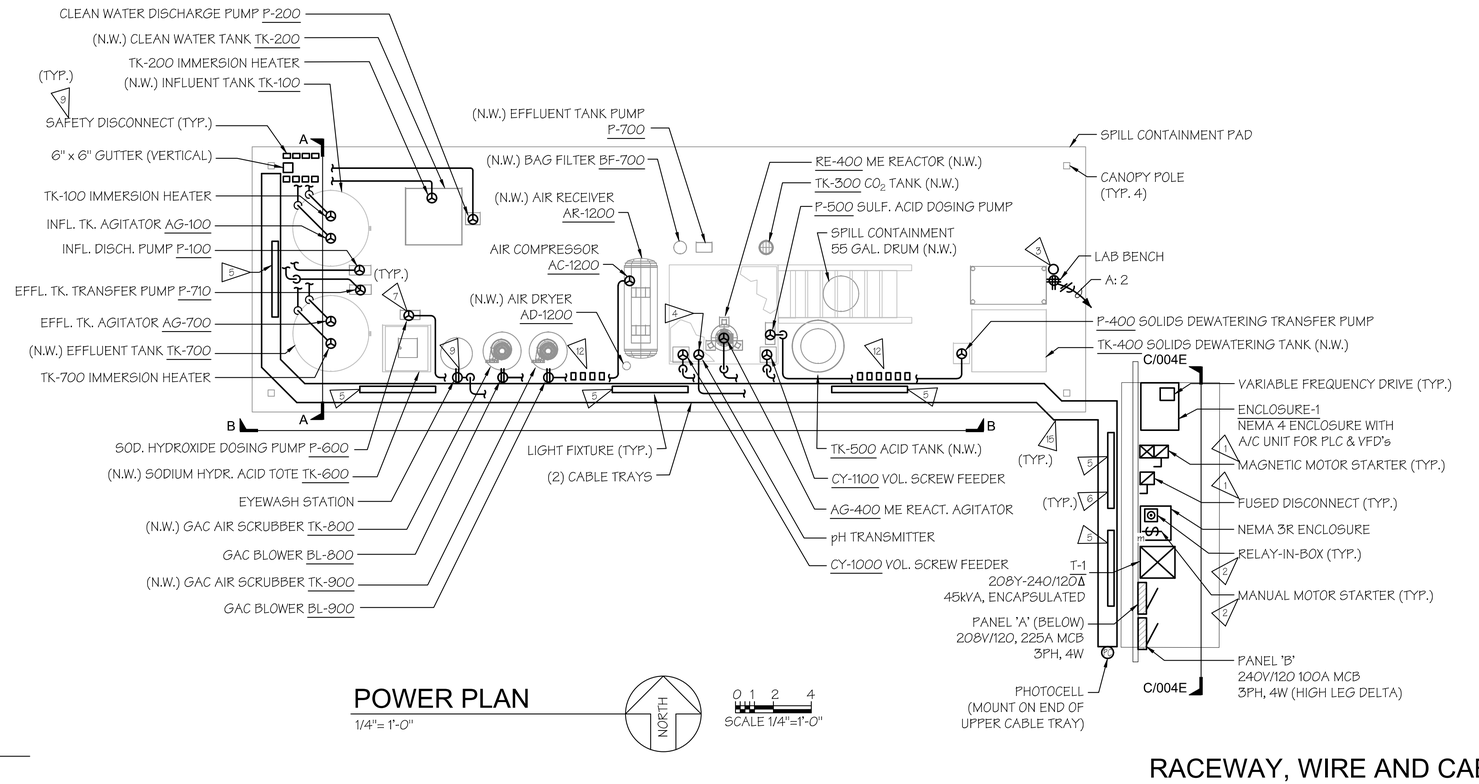
DATE: SEPTEMBER 2026
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SHEET NO: OF 22 OF 27

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A-A WEST CABLE TRAY ELEVATION
SCALE: 1/4"=1'-0"

0 1 2 4
SCALE 1/4"=1'-0"



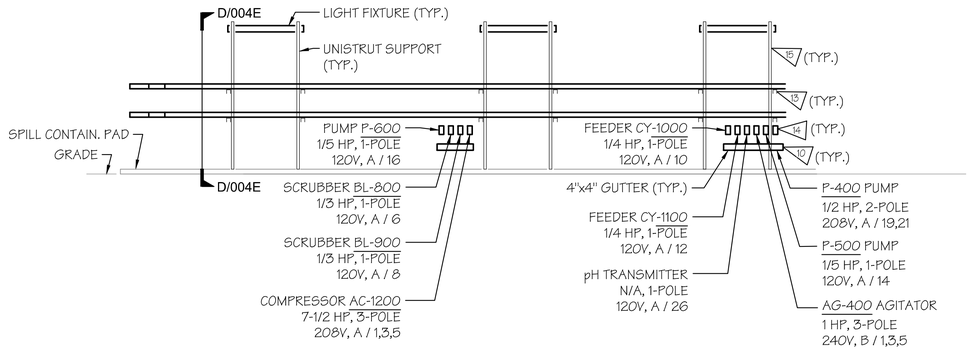
POWER PLAN
1/4"= 1'-0"

NORTH

0 1 2 4
SCALE 1/4"=1'-0"

CONSTRUCTION NOTES

1. FUSED DISCONNECTS AND MAGNETIC MOTOR STARTERS NOT MOUNTED INSIDE ENCLOSURES SHALL BE NEMA 3R. (TYP.)
2. MANUAL MOTOR STARTERS, RELAY-IN-BOXES, VARIABLE FREQUENCY DRIVES AND ASSOCIATED FUSED DISCONNECTS SHALL BE MOUNTED IN NEMA 3R ENCLOSURES. (TYP.)
3. PROVIDE STANCHION FOR RECEPTACLE MOUNTING.
4. MOUNT pH &ORP TRANSMITTER ON REACTOR PLATFORM. VERIFY FINAL. LOCATION
5. LED VAPOR TIGHT / WEATHER-PROOF WASHDOWN STRIP LIGHT, MOUNTED ON UNISTRUT SUPPORT UNDER CONTROL WIRING CABLE TRAY. CONTROL LIGHTS VIA SWITCH AND PHOTOCELL. KORLITE KVT SERIES, 48" L, 50W, 5000K, 120V, MOTION SENSOR, EMERGENCY BATTERY BACKUP.
6. CIRCUITING FOR LIGHTING NOT SHOWN FOR CLARITY. ALL LIGHT FIXTURES AND PHOTOCELL ARE ROUTED TO CIRCUIT A: 18.
7. SEE MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE, DWG. 003E FOR CIRCUIT NUMBERS AND WIRE SIZES. (TYPICAL ALL EQUIPMENT.)
8. SEE ENCLOSURE-1 CONTROL CABINET DETAIL, DWG. 005E,
9. PROVIDE MANUAL MOTOR SWITCH AS INDICATED ON PLAN AND ELEVATIONS. (SWITCHES ARE FOR SAFETY DISCONNECT ONLY) (TYP.)
10. PROVIDE MINIMUM 12" CLEARANCE BETWEEN BOTTOM OF GUTTER AND TOP OF SPILL CONTAINMENT PAD.
11. ROUTE EYEWASH STATION RECEPTACLE WIRING DIRECT TO PANEL A: 4 (NO SAFETY DISCONNECT).
12. PROVIDE 4"x4" GUTTER BELOW SAFETY DISCONNECTS. SEE ELEVATION B-B, THIS DWG. FOR LOCATION.
13. CABLE TRAYS ARE MOUNTED ON UNISTRUT SUPPORTS (SEE SECTION D-D, DWG. 004E FOR ADDITIONAL INFORMATION AND REQUIREMENTS). MAXIMUM 8' SPACING BETWEEN SUPPORTS AND MAXIMUM 12" FROM CABLE TRAY OFFSETS. PROVIDE STAMPED CABLE TRAY SUPPORT SHOP DRAWINGS FOR APPROVAL PRIOR TO COMMENCING ANY WORK.
14. PROVIDE UNISTRUT SUPPORT STANDS FOR SAFETY DISCONNECTS AND ASSOCIATED GUTTER. (TYP.)
15. CABLE TRAY AND ASSOCIATED UNISTRUT SUPPORT LAYOUT IS CONCEPTUAL ONLY. COORDINATE FINAL LAYOUT WITH EXISTING CONDITIONS AND STRUCTURAL & MECHANICAL WORK PRIOR TO COMMENCING ANY WORK. MODIFY CABLE TRAY/UNISTRUT DESIGN AS REQUIRED.



B-B SOUTH CABLE TRAY ELEVATION
SCALE: 1/4"=1'-0"

0 1 2 4
SCALE 1/4"=1'-0"

RACEWAY, WIRE AND CABLE SCHEDULE

BRANCH CIRCUITS

TRAY RATED CABLE, FREP INSULATION, NO SHIELD, CPE JACKET, UL TYPE TC-ER, 600V, WET OR DRY LOCATION, PROVIDE DEDICATED GROUNDING CONDUCTOR. ROUTE IN CABLE TRAY OR SCHEDULE 40 PVC CONDUIT.

FEEDER CIRCUITS

ROUTE WIRE IN SCHEDULE 80 PVC CONDUIT.

CONDUIT CONNECTIONS

PROVIDE CONDUIT SEAL-OFF FOR ALL UNDERGROUND CONDUITS.

GENERAL NOTES

1. SEE MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE, DWG. 003E FOR CONDUCTOR SIZES AND QUANTITIES.
2. ALL CONDUCTORS SHALL BE OUTDOOR, CABLE TRAY RATED.
3. ALL EQUIPMENT INDICATED WITH (N.W.) HAS NO ELECTRICAL WORK IN THIS PROJECT (FOR REFERENCE ONLY)
4. PROVIDE STAMPED & SIGNED STRUCTURAL EQUIPMENT DRAWINGS FOR UNISTRUT SUPPORT SYSTEM.
5. CABLE TRAY AND ASSOCIATED UNISTRUT SUPPORT LAYOUT IS CONCEPTUAL ONLY. COORDINATE FINAL LAYOUT AND REVISE AS REQUIRED. SEE CONSTRUCTION NOTE 15, THIS DWG.

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DRAWN: DAVID HEYLEN	SCALE: 1/4"=1'-0" U.O.N.
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King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS
CEDAR HILLS REGIONAL LANDFILL
PILOT SCALE MICRO-ELECTROLYSIS
POWER PLAN, SECTIONS AND ELEVATIONS

DATE: SEPTEMBER 2026
DRAWING NO: E2.01
SHEET NO: OF 23 OF 27

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NORMAL POWER PANEL A SCHEDULE (NEW)

FED FROM: | 225 AMPS | MAINS: MCB | LOCATION: | 208/120 VOLTS | 3 PH | 4 WIRE | AIC | SURF MOUNT

code	NO	Breaker Pole	DESCRIPTION	LOAD IN VOLT-AMPS A	B	C	DESCRIPTION	Breaker Pole	NO	code
M	1	50 / 3	AC-1200 AIR COMPRESSOR	3,002 / 360			LAB BENCH	20 / 1	2	R
M	3	XX / X	(7-1/2 HP)		3,002		EYEWASH STATION	20 / 1	4	M1
M	5	XX / X	(INFLUENT)		396	3,002 / 828	BL-800 GAC SCRUBBER BLOWER (1/3 HP)	20 / 1	6	M
M	7	15 / 2	P-100 INFLUENT TK. TRANSFER PUMP	648 / 828			BL-900 GAC SCRUBBER BLOWER (1/3 HP)	20 / 1	8	M
M	9	XX / X	(1/2 HP)		648 / 1,354		CY-1000 VOL. SOLIDS FEEDER (1/4 HP x2)	15 / 1	10	M
M	11	15 / 2	P-710 EFFLUENT TK. TRANSFER PUMP			648 / 1,354	CY-1100 VOL. SOLIDS FEEDER (1/4 HP x2)	15 / 1	12	M
M	13	XX / X	(1/2 HP)	648 / 670			P-500 SULF. ACID DOSING PUMP (1/5 HP)	15 / 1	14	M
M	15	15 / 2	P-200 CLEAN WATER DISCHARGE PUMP		648 / 670		P-600 SOD. HYDR. DOSING PUMP (1/5 HP)	15 / 1	16	M
M	17	XX / X	(1/2 HP)			648 / 300	LIGHTING	20 / 1	18	L
M	19	15 / 2	P-400 SOLIDS DEWATERING TRANS. PUMP	648 / 6,064			240/120 Panel B	200 / 3	20	M1
M	21	XX / X	(1/2 HP)		648 / 4,476		(VIA 45kVA XFMR T-1)	XX / X	22	M1
	23	20 / 1	SPARE			6,064	---	XX / X	24	M1
	25	20 / 1	SPARE	180			pH & ORP TRANSMITTER	20 / 1	26	M1
	27	20 / 1	SPARE				SPARE	20 / 1	28	
	29	20 / 1	SPARE				SPARE	20 / 1	30	
	31	XX / X	SPACE				SPACE	XX / X	32	
	33	XX / X	SPACE				SPACE	XX / X	34	
	35	XX / X	SPACE				SPACE	XX / X	36	
	37	XX / X	SPACE	-			SURGE SUPRESSOR	60 / 3	38	M1
	39	XX / X	SPACE		-		(200 kA)	XX / X	40	M1
	41	XX / X	SPACE			-	--	XX / X	42	M1
			PHASE TOTALS - VA	13,048	11,842	12,844	TOTAL VA 37,734	**Demand**	40,061	
			PHASE TOTALS - AMPS	109	99	107	TOTAL AMPS 105	**Demand**	111	

PANEL A NOTES:

1. PROVIDE GFI BREAKERS AS REQUIRED BY CODE.

NORMAL POWER PANEL B SCHEDULE (NEW)

FED FROM: A | 150 AMPS | MAINS: MCB | LOCATION: | 240/120 VOLTS | 3 PH | 4 WIRE | AIC | SURF MOUNT | (HIGH LEG DELTA PANEL)

code	NO	Breaker Pole	DESCRIPTION	LOAD IN VOLT-AMPS A	B	C	DESCRIPTION	Breaker Pole	NO	code
M	1	15 / 3	AG-400 ME REACTOR AGITATOR	477			SPACE	XX / X	2	
M	3	XX / X	(1 HP)		477		SPACE (HIGH LEG)	XX / X	4	
M	5	XX / X	--			477 / 794	AG-100 INFLUENT TANK AGITATOR	20 / 2	6	M
H	7	15 / 3	IMMERSION HEATER	1,333 / 794			(3/4 HP)	XX / X	8	M
H	9	XX / X	(FOR TK-100 INFLUENT TANK)		1,333		SPACE (HIGH LEG)	XX / X	10	
H	11	XX / X	(4.0 kW)			1,333 / 794	AG-700 EFFLUENT TANK AGITATOR	20 / 2	12	M
H	13	15 / 3	IMMERSION HEATER	1,333 / 794			(3/4 HP)	XX / X	14	M
H	15	XX / X	(FOR TK-200 CLEAN WATER TANK)		1,333		SPACE (HIGH LEG)	XX / X	16	
H	17	XX / X	(4.0 kW)			1,333	SPACE	20 / 1	18	
H	19	15 / 3	IMMERSION HEATER	1,333			SPACE	20 / 1	20	
H	21	XX / X	(FOR TK-700 EFFLUENT TANK)		1,333		SPACE (HIGH LEG)	XX / X	22	
H	23	XX / X	(4.0 kW)			1,333	SPARE	XX / X	24	
	25	XX / X	SPACE				SPARE	XX / X	26	
	27	XX / X	SPACE (HIGH LEG)				SPACE (HIGH LEG)	XX / X	28	
AC	29	20 / 1	A/C UNIT (ENCLOSURE-1)				SPACE	XX / X	30	
	31	XX / X	SPACE				SPACE	XX / X	32	
	33	XX / X	SPACE (HIGH LEG)				SPACE (HIGH LEG)	XX / X	34	
	35	20 / 1	PLC & HMI UNIT (ENCLOSURE-1)				SPACE	XX / X	36	
	37	20 / 1	ROUTER (ENCLOSURE-1)				SPACE	XX / X	38	
	39	XX / X	SPACE (HIGH LEG)				SPACE (HIGH LEG)	XX / X	40	
	41	XX / X	SPACE				SPACE	XX / X	42	
			PHASE TOTALS - VA	6,064	4,476	6,064	TOTAL VA 16,604	**Demand**	17,001	
			PHASE TOTALS - AMPS	57	32	57	TOTAL AMPS 40	**Demand**	41	

PANEL B NOTES:

1. PROVIDE PLACARD: "HIGH LEG DELTA" AS REQUIRED BY THE NEC.
2. CONTACT THE ENGINEER AFTER POINT OF SYSTEM CONNECTION IS DETERMINED FOR PANEL AIC RATINGS AND ARC FLASH CALCULATIONS.
3. PROVIDE GFI BREAKERS AS REQUIRED BY CODE.

Mechanical Equipment Electrical Connection Schedule [B]

Mark	Description	Voltage	Phase	Amps	HP	kW	Controller	Local Disconnect [C]	Disconnect	Conductors [A]	Panel / Ckt	Notes
AC-1200	Air Compressor	208	3	25.3	7-1/2 HP	--	Mag St, 1	MS	FS	(3) #6, #10 G.	A / 1,3,5	2
AG-100	Influent Tank Agitator	120/240	1	--	3/4 HP	--	Mag St, 0	MS	FS	(3) #12, #12 G.	B / 6,8	2
AG-400	ME Reactor Agitator	240	3	--	1 hp	--	VFD	MS	FS	(3) #12, #12 G.	B / 1,3,5	1
AG-700	Effluent Tank Agitator	120/240	1	--	3/4 HP	--	Mag St, 0	MS	FS	(3) #12, #12 G.	B / 12,14	2
BL-800	GAC Air Scrubber Blower	120	1	--	1/3 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 6	6, 8, 9, 10
BL-900	GAC Air Scrubber Blower	120	1	--	1/3 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 8	6, 8, 9, 10
CY-1000	Volumetric Solids Feeder	120 (Note 3)	1	--	1/4 HP (Note 4)	--	N/A	MS	FS	(2) #12, #12 G.	A / 10	3, 4
CY-1100	Volumetric Solids Feeder	120 (Note 3)	1	--	1/4 HP (Note 4)	--	N/A	MS	FS	(2) #12, #12 G.	A / 12	3, 4
P-100	Influent Tank Transfer Pump	208	1	--	1/2 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 7,9	
P-200	Clean Water Discharge Pump	208	1	--	1/2 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 15,17	
P-400	Solids Dewatering Transfer Pump	208	1	--	1/2 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 19,21	
P-500	Sulfuric Acid Dosing Pump	120	1	--	1/5 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 14	7
P-600	Sodium Hydroxide Dosing Pump	120	1	--	1/5 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 16	7
P-710	Effluent transfer pump	208	1	--	1/2 HP	--	RIB	MS	MS	(2) #12, #12 G.	A / 11,13	
--	A/C Unit (for Control Cabinet Enclosure-1)	120	1							(2) #12, #12 G.	A / 29	
--	Eyewash Station	120	1	3.3	--	--	N/A	MS	MS	(2) #12, #12 G.	A / 4	8
--	Immersion Heater (Influent Tank TK-100)	240	3	--	--	4.0	N/A	MS	FS	(3) #12, #12 G.	B / 7,9,11	11
--	Immersion Heater (Clean Water Tank TK-200)	240	3	--	--	4.0	N/A	MS	FS	(3) #12, #12 G.	B / 13,15,17	11
--	Immersion Heater (Effluent Tank TK-700)	240	3	--	--	4.0	N/A	MS	FS	(3) #12, #12 G.	B / 19,21,23	11
--	pH & ORP Transmitter	120	1	--	--	--	N/A	MS	N/A	(2) #12, #12 G.	A / 26	12

General Notes

[A] All conductors are cable tray rated, outdoor rated

[B] All equipment is NEMA 3R or located in NEMA 3R separate enclosure, except VFD's located in ENCLOSURE-1 (See Control Cabinet Detail, Dwg. 005E)

[C] Unless other wise noted, provide separate manual starter (complete with lockout), for local disconnect. Note that local disconnect near equipment is in addition to disconnect near controllers at panels.

Notes

1 All VFD controled motors to be AC, 3 phase
2 Starters shall have run/stop lights, and Hand/off/Auto switch
3 Integral factory 90V DC converter
4 Feeder has (2) motors. Provide connection for each motor
5 Not used
6 Cord and Plug connection
7 Dosing pump has integral controller
8 Cord and GFCI plug field connection
9 Connect control input direct to unit controller supplied with equipment
10 Provide 120V connection to low level probe
11 Provide additional 120V connection for controls as required
12 Provide local disconnect for pH transmitter per plan. Route wiring from local disconnect direct to panel.

Disconnect Abbreviations

FS Fused KS-1 type Disconnect Switch
DS KS-1 type Disconnect Switch
MS Manual Motor Starter with thermal overloads and pad lock ears on cover

Controller Abbreviations

Mag St,x Magnetic Starter with overloads on all phases, run/stop lights, hand off auto switch. (x = starter size)
RIB Relay In Box, by functional control, provide with indicator light
VFD Variable Frequency Drive

EQUIPMENT SCHEDULE

MARK	DESCRIPTION	NOTES
T-1	208V Y 3Ø - 240/120 Δ 3Ø 45 kVA ENCAPSULATED TRANSFORMER, ALUMINUM WINDINGS, 150°C. SQUARE D OR APPROVED EQUAL.	

NOTES:

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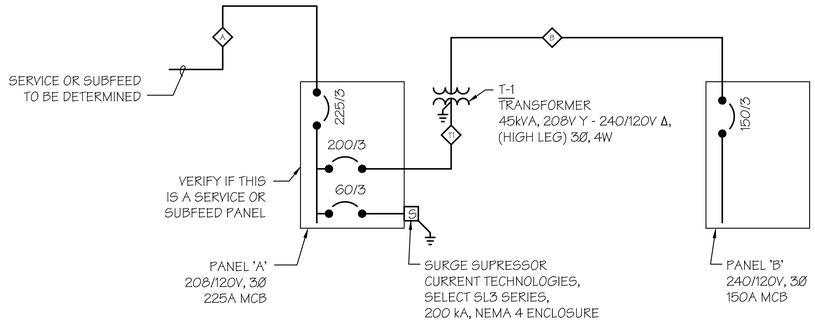
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ELECTRICAL SCHEDULES

DATE: SEPTEMBER 2026
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SHEET NO: OF 24 OF 27

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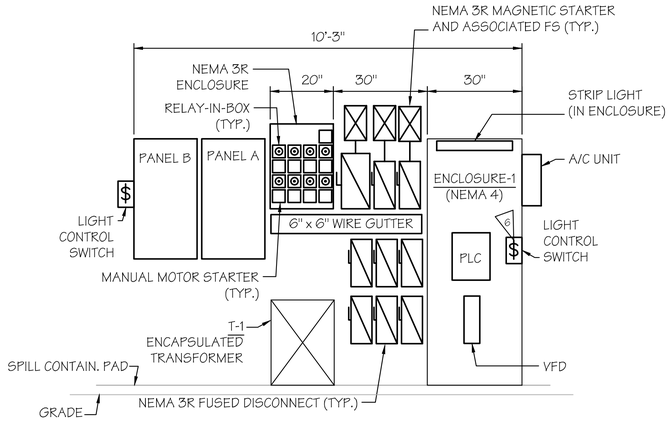
FEEDER SCHEDULE				
TAG	AMPS	FEEDER SIZE (NOTE 1)	COND. SIZE	NOTES
A	225	(4) 4/0, #4 GND.	2-1/2"	2
T1	200	(3) 3/0, #6 GND.	2"	
B	150	(4) 1/0, #6 GND.	1-1/2"	

NOTES:

1. ALL COPPER CONDUCTORS.
2. SERVICE OR SUB-FEED DETAILS TO BE DETERMINED.

ONE-LINE DIAGRAM

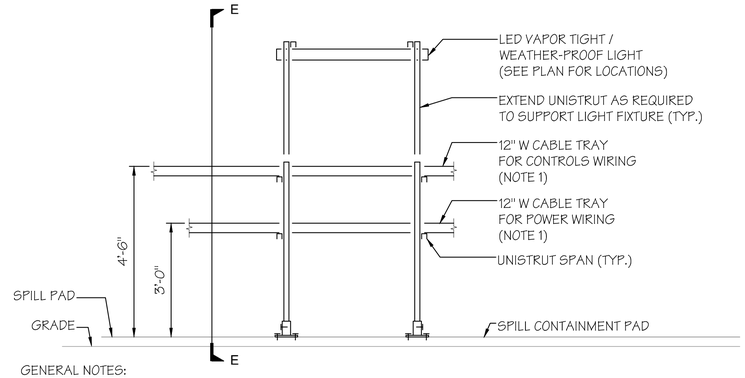
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C-C ELECTRICAL RACK ELEVATION

SCALE: 1/2"=1'-0"

0 6" 1 2
SCALE 1/2"=1'-0"



GENERAL NOTES:

[A] CABLE TRAY AND ASSOCIATED UNISTRUT SUPPORT LAYOUT IS CONCEPTUAL ONLY. SEE DWG. 002E FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

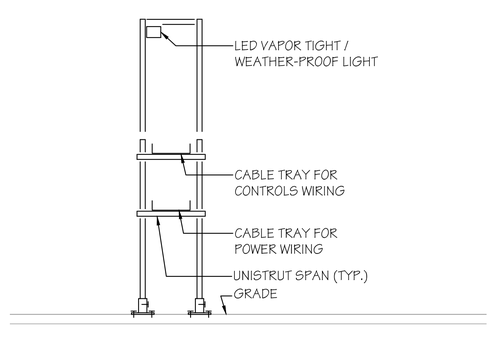
NOTES:

1. PROVIDE 12" W NEMA 20A CABLE TRAY.

D-D TYPICAL ELECTRICAL RACK SECTION

SCALE: 1/2"=1'-0"

0 6" 1 2
SCALE 1/2"=1'-0"



E-E TYPICAL ELECTRICAL RACK SECTION

SCALE: 1/2"=1'-0"

0 6" 1 2
SCALE 1/2"=1'-0"

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JOHN DEAN HUNT — STATE OF WASHINGTON — 31885 — REGISTERED PROFESSIONAL ENGINEER
09-29-2026

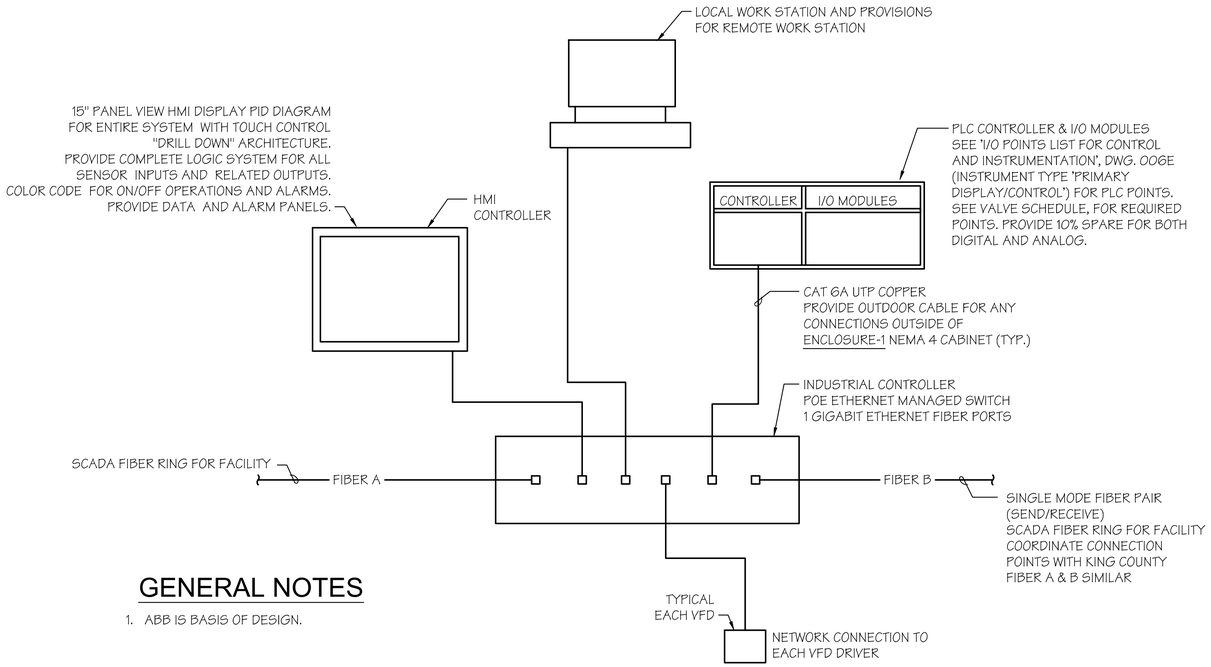
DESIGNED: JOHN HUNT	APPROVED: JOHN HUNT
DRAWN: DAVID HEYLEN	SCALE: NONE
CHECKED BY	PROJECT NO: SWD-1133921
CHECKED BY	CONTRACT NO: KC001738

King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS
CEDAR HILLS REGIONAL LANDFILL
PILOT SCALE MICRO-ELECTROLYSIS
ELECTRICAL ONE-LINE DIAGRAM, ELECATION, AND SECTIONS

DATE: SEPTEMBER 2026
DRAWING NO: E6.02
SHEET NO: OF 25 OF 27

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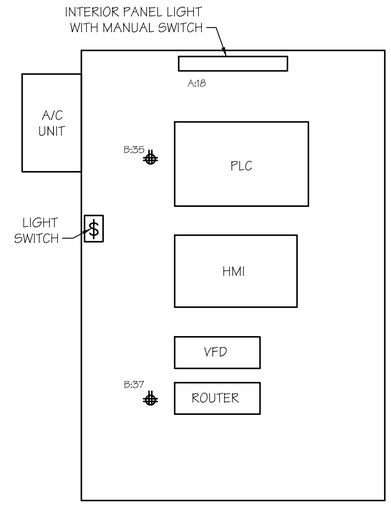


GENERAL NOTES

1. ABB IS BASIS OF DESIGN.

NETWORK DIAGRAM - PLC SYSTEM

SCALE: NONE



ENCLOSURE-1
CONTROL CABINET DETAIL

SCALE: NONE

No.	REVISION	BY	APP'D	DATE
3				
2				
2	TITLE BLOCK UPDATES	DEH	JDH	09/2026
1	FINAL	DEH	JDH	09/2025

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09-29-2026

DESIGNED: JOHN HUNT	APPROVED: JOHN HUNT
DRAWN: DAVID HEYLEN	SCALE: 1/4"=1'-0" U.O.N.
CHECKED BY	PROJECT NO: SWD-1133921
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King County
SOLID WASTE DIVISION

DEPARTMENT OF NATURAL RESOURCES & PARKS
CEDAR HILLS REGIONAL LANDFILL
PILOT SCALE MICRO-ELECTROLYSIS
NETWORK DIAGRAM
PLC SYSTEM

DATE: SEPTEMBER 2026
DRAWING NO: E6.03
SHEET NO: 26 OF 27

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I/O Points List for Control and Instrumentation

A= analog D= digital

Instrument Type	Instr. No.	Equipment ID	Description	Device	Inputs A	Inputs D	Outputs A	Outputs D	Alarms A	Alarms D	Remarks
Field Mount	100	LIT	Level Indicator transmitter	LIT 100			LIT100				
Field Mount	101	HS	Hand Switch to AG 100 motor (HOA on starter)	HS 101			x	x			Current transformers for amps and run verfication
Primary Display/Control	101A	HS	Hand Switch to AG 100 motor (HMI)	HS101A			HS 101	AG 100			HMI function
Primary Display/Control	101	KQI	Totalizer	KQI 101							Run time by event and total;HMI
Primary Display/Control	101	YI	Event Indicator	YI 101	AG 100						run verification AG 100;HMI
Primary Display/Control	101	YA	Event Alarm	YA 101						H,L	High;Low amp alarm AG 100;HMI
Field Mount	100	AE	Analysis Sensor	AE 100							
Field Mount	100	AIT	Analysis indicator and transmitter (PH)	AIT 100	AE 100		AI 100				
Primary Display/Control	100	AI	Analysis Indicator (PH)	AI 100	AIT 100					H,L	Alarm on High; Low PH; HMI
Primary Display/Control	700	YI	Event Indicator	YI 700							run verification
Field Mount	100	HS	Hand Switch to Pump 100 (HOA on starter)	HS 100				x			Current transformers for amps and run verfication
Primary Display/Control	100A	HS	Hand Switch to P 100 pump (HMI)	HS 100A				P 100			HMI function
Primary Display/Control	100	KQI	Totalizer	KQI 100							Run time by event and total;HMI
Primary Display/Control	100	YI	Event Indicator	YI 100	P 100						run verification P 100;HMI
Primary Display/Control	100	YA	Event Alarm	YA 100						H,L	High;Low amp alarm P 100;HMI
Field Mount	100	TSH	Local Thermostat for TK-100	TSH 100							Local Instument, no points
Field Mount	200	HS	Hand Switch to Pump 200 (HOA on VFD)	HS 200		x		x			
Field Mount	200	SC	Speed Control pump 200	SC 200	x		x	x	x	x	VFD (variable frequency drive)
Primary Display/Control	200A	HS	Hand Switch to P 100 pump (HMI)	HS 200A				P 200			HMI function
Primary Display/Control	200	KQI	Totalizer	KQI 200							Run time by event and total;HMI
Primary Display/Control	200	YI	Event Indicator	YI 200	P 200						VFD data and run verification
Primary Display/Control	200	YA	Event Alarm	YA 200						H,L	VFD Alarms and fail to run alarm
Field Mount	200	PI	Pressure Indicator	PI 200							Pressure Gauge
Field Mount	200	TSH	Local Thermostat for TK-200	TSH 200							Local Instument, no points
Field Mount	405	AE	Analysis Sensor ORP	AE 405			x				Connected to 8-channel transmitter AIT 435
Field Mount	410	AE	Analysis Sensor	AE 410			x				Connected to 8-channel transmitter AIT 435
Primary Display/Control	410	AR	Analysis Recorder; HMI	AR 410							provide graphing and trending with user definable options for
Field Mount	401	SC	Speed Control AG 400 motor	SC 401	x		x	x	x	x	VFD
Field Mount	401	HS	Hand Switch AG 400 motor (HOA on SC 401)	HS 401		x		x			
Primary Display/Control	401A	HS	Hand Switch AG 400 motor (HMI)	HS 401A			HS 401	HS 401			
Primary Display/Control	401	YI	Event Indicator for AG 400 Motor; HMI	YI 401							VFD data and run verification
Primary Display/Control	401	YA	Event Alarm for AG 400 Motor; HMI	YA 401						x	VFD Alarms and fail to run alarm
Field Mount	400	LSH	Level Sensor High	LSH 400				x			
Primary Display/Control	400A	LSH	Level Sensor High; HMI	LSH 400A						x	
Primary Display/Control	400	PIC	Pressure Indicating Controller	PIC 400	x			x			
Field Mount	400	PIT	Pressure Indicating Transmitter	PIT 400	x		x				
Field Mount	435	AE	Analysis Sensor PH	AE 435			x				Connected to 8-channel transmitter AIT 435
Field Mount	435	AIT	Analysis Indicator and Transmitter (PH)	AIT 435	x (8)		x				Connected to sensors AE 405, AE 410, AE 435, AE 440, AE 460, AE 700
Primary Display/Control	435	AIC	Analysis indicator and controller;HMI	AIC 435	AIT 435		x	x		x	L, LL alarms; H, HH alarms; pump 500 SC control
Field Mount	440	AE	Analysis Sensor PH	AE 440			x				Connected to 8-channel transmitter AIT 435
Field Mount	460	AE	Analysis Sensor PH	AE 460			x				Connected to 8-channel transmitter AIT 435
Field Mount	400	HS	Hand Switch (pump P 400) HOA on SC 400	HS 400		x			x		
Primary Display/Control	400A	HS	Hand Switch (pump p 400); HMI	HS 400A			HS 401	HS401			
Primary Display/Control	400	KQI	Totalizer (pump 400 A)	KQI 400							
Primary Display/Control	400	YI	Event Indicator for Pump 400 A	YI 400							VFD data and run verification
Primary Display/Control	400	YA	Event Alarm for Pump 400 A	YA 400						x	VFD Alarms and fail to run alarm
Field Mount	500	SC	Speed Control Pump 500; VFD	SC 500	x		x	x	x	x	
Field Mount	500	HS	Hand Switch Pump 500 (HOA on SC 500)	HS 500		x		x			
Primary Display/Control	500A	HS	Hand Switch Pump 500 (HMI)	HS 500A			HS 500	HS 500			
Primary Display/Control	500	YI	Event Indicator for Pump 500; HMI	YI 500							VFD data and run verification
Primary Display/Control	500	YA	Event Alarm for Pump 500; HMI	YA 500						x	VFD Alarms and fail to run alarm
Field Mount	600	SC	Speed Control Pump 600; VFD	SC 600	x		x	x	x	x	
Field Mount	600	HS	Hand Switch Pump 600 (HOA on SC 600)	HS 600		x		x			
Primary Display/Control	600A	HS	Hand Switch Pump 600 (HMI)	HS 600A			HS 600	HS 600			
Primary Display/Control	100	LIC	Level alarm high and low; fill control SV 100 and 110 (interlocked); Control HS 100 (interlocked)	LIC 100	LIT100			PSV100 PSV200		H,L	HMI Display
Primary Display/Control	600	YI	Event Indicator for Pump 600; HMI	YI 600							VFD data and run verification
Primary Display/Control	600	YA	Event Alarm for Pump 600; HMI	YA 600						x	VFD Alarms and fail to run alarm
Field Mount	700	PI	Pressure Indicator	PI 700							Pressure Gauge
Field Mount	705	PI	Pressure Indicator	PI 705							Pressure Gauge
Field Mount	700	AE	Analysis Sensor (PE)	AE 700			x				Connected to 8-channel transmitter AIT 435
Field Mount	700	AIT	Analysis Indicator Transmitter	AIT 700	AE 700		AIC 700				Verify connections with shop drawing
Primary Display/Control	700	AIC	Analysis indicator and controller;HMI	AIC 700	AIT 700		x	x		x	L, LL alarms; H, HH alarms; pump 600 start/stop
Primary Display/Control	700	AAH	Analysis Alarm High	AAH 700						x	H Alarm
Primary Display/Control	700	AAHH	Analysis Alarm High High	AAHH 700						x	HH Alarm
Primary Display/Control	700	AAL	Analysis Alarm Low	AAL 700						x	L Alarm
Primary Display/Control	700	AALL	Analysis Alarm Low Low	AALL 700						x	LL Alarm
Field Mount	701	HS	Hand Switch (AG 700 motor); HOA	HS 701		x		x			current transformers for current monitoring
Primary Display/Control	701A	HS	Hand Switch (AG 700 motor); HMI	HS 701A				x			
Primary Display/Control	701	YI	Event Indicator (AG 700 motor); HMI	YI 701							
Primary Display/Control	701	YA	Event Alarm (AG 700 Motor); HMI	YA 701						x	Run verification
Field Mount	700	LIT	Level Indicator transmitter	LIT 700	x		x				
Primary Display/Control	700	LIC	Level Indicator and controller	LIC 700	x			x		x	(high level pump 710 on auger AG 700 off)
Field Mount	700	HS	Hand Switch to pump 710 (HOA)	HS 700				x			current transformer for current monitoring
Primary Display/Control	700 A	HS	Hand Switch (pump 710), HMI	HS 700A		x		x			
Primary Display/Control	700	KQI	Totalizer (pump 710)	KQI 700							controlled by LIC 700)
Primary Display/Control	700	YA	Event Alarm	YA 700						x	Alarm on fail to run
Field Mount	700	TSH	Local Thermostat for TK-700	TSH 700							Local Instument, no points
Field Mount	1000	HS	Hand switch (screw feeder 1000); HOA	HS 1000		x					current transformers

A= analog D= digital

Instrument Type	Instr. No.	Equipment ID	Description	Device	Inputs A	Inputs D	Outputs A	Outputs D	Alarms A	Alarms D	Remarks
Primary Display/Control	1000A	HS	Hand Switch (screw feeder 1000); HMI	HS 1000A				x			
Primary Display/Control	1000	KY	Timed Relay (screw feeder 1000) ; HMI	KY 1000				x			provide count down and data point, user input run time
Field Mount	1000	LSL	Level Switch (Bin 1000)	LSL 1000			x				
Primary Display/Control	1000	LAL	Level Alarm Low (Bin 1000)	LAL 1000						x	
Field Mount	1100	HS	Hand switch (screw feeder 1100); HOA	HS 1100		x					
Primary Display/Control	1100A	HS	Hand Switch (screw feeder 1100); HMI	HS 1100A				x			
Primary Display/Control	1100	KY	Timed Relay (screw feeder 1100) ; HMI	KY 1100				x			provide count down and data point, user input run time
Field Mount	1100	LSL	Level Switch (Bin 1100)	LSL 1100			x				
Primary Display/Control	1100	LAL	Level Alarm Low (Bin 1100)	LAL 1100						x	
Field Mount	1200	HS	Hand Switch (Air Compressor 1200)	HS 1200							
Field Mount	1200	PI	Pressure Indicator	PI 1200							Pressure Gauge
Field Mount	800	LS	Level Switch	LS 800				x			
Field Mount	800	LAH	Level Alarm High	LAH 800							
Field Mount	800	HS	Hand Switch	HS 800							
Field Mount	900	LS	Level Switch	LS 900				x			
Field Mount	900	LAH	Level Alarm High	LAH 900		x				x	
Field Mount	900	HS	Hand Switch (Blower 900)	HS 900							

General Notes:

1. Primary display / control listed under 'Instrument Type' is the PLC I/O point.
2. Field mount points are devices that are separate from PLC.
3. Contractor shall provide shop drawings showing wiring details for all devices and PLC I/O points in this schedule.
4. HMI interface shall mimic Piping and Instrumentation Drawings (PID) presented elsewhere in this drawing set.
   Red color is RUNNING, green is STANDBY, "selecting" equipment shall provide additional information on the specific device with trends as relative. Review 'Remarks' column for additional requirements.

I/O Points List for Valve Schedule

Valves Type	No.	Equip ID	Description	Device	PLC inputs A	PLC inputs D	Remarks
Solenoid	SV	100	BEW line to Tank AG 100		-	x	pneumatic air input, end switch
Solenoid	SV	110	BEW line flow Direct to Frac Tank		-	x	pneumatic air input, end switch
Pressure Regulating	PRV	300	Pressure regulator outflow of TK 300 CO2				
spring	PCV	400	Pressure regulator outflow of ME-400				
Pressure Regulating	PRV	1200	Pressure regulator from compressed air reciever AR-1200				
Spring	PRV	1200	Spring operated pressure relief valve				

GENERAL NOTES

1. PROVIDE 20% ADDITIONAL I/O POINTS FOR FUTURE EXPANSION.

No.	REVISION	BY	APP'D	DATE
2	TITLE BLOCK UPDATES	DEH	JDH	09/2026
1	FINAL	DEH	JDH	09/2025

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CEDAR HILLS REGIONAL LANDFILL
PILOT SCALE MICRO-ELECTROLYSIS
I/O POINTS LIST SCHEDULES

DATE: SEPTEMBER 2026
DRAWING NO: E6.04
SHEET NO: OF 27 OF 27

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