ASHTABULA COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES

ASHCRAFT WWTP IMPROVEMENTS

KINGSVILLE TOWNSHIP

NOVEMBER 2026

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OHIO 811 UTILITY LIST:

OHIO UTILITY PROTECTION SERVICE:
106 WEST RYEN, ROOM 427
YOUNGSTOWN, 44051
(800) 362-2764

CLEVELAND ELECTRIC ILLUMINATING CO:
2210 SOUTH RIDGE ROAD
ASHTABULA, OHIO 44004

THE EAST OHIO GAS COMPANY:
1010 WEST 30TH STREET
ASHTABULA, OHIO 44004
(440) 992-5100

ALL-TEL:
360 HIGHLAND ROAD
MACEDONIA, OHIO 44067
(800) 782-6206

SPRINT:
PO BOX 3555
MANSFIELD, OHIO 44907
(800) 786-6272

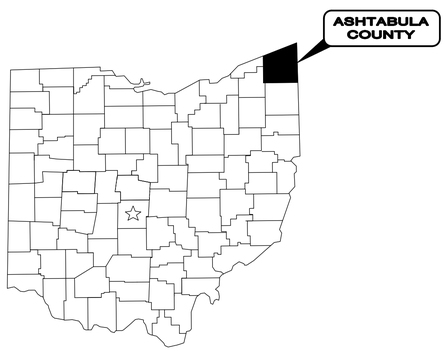
OHIO811.org Before You Dig

ENVIRONMENTAL SERVICES:
36 W. WALNUT STREET
JEFFERSON, OHIO 44047
(440) 576-3722 PHONE
(440) 576-3781 FAX

TCI:
2904 STATE ROAD
ASHTABULA, OHIO 44004
(440) 998-2148

1. UNDERGROUND BUILDING SERVICE UTILITY LINES ARE NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, MAINTAINING AND REPLACING AS NECESSARY TO ENSURE CONTINUAL SERVICE TO BUILDINGS.

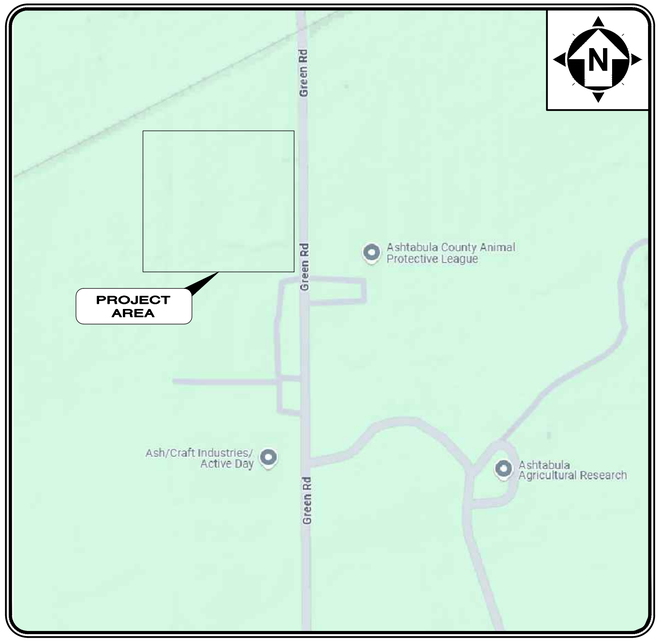
2. THE CONTRACTOR IS RESPONSIBLE TO CALL OHIO UTILITIES PROTECTION SERVICE @ 1-800-362-2764, THREE WORKING DAYS PRIOR TO CONSTRUCTION.



OHIO Utilities Protection SERVICE
Call Before You Dig
1-800-362-2764
CALL TWO WORKING DAYS BEFORE YOU DIG
(NON MEMBERS MUST BE CALLED DIRECTLY)

NOTE:

THE SURVEY SHOWN ON THESE PLANS WAS OBSERVED IN THE FIELD FOR CONSTRUCTION PURPOSES ONLY AND MAY NOT BE SUITABLE FOR PROPERTY LINE SURVEYS OR ANY OTHER PURPOSE.



LOCATION MAP
NOT TO SCALE

verdantas

ENGINEER'S PROJECT No. 34495

ASHTABULA COUNTY APPROVALS:

COUNTY COMMISIONER	KATHRYN L. WHITTINGTON	DATE
COUNTY COMMISIONER	CASEY R. KOZLOWSKI	DATE
COUNTY COMMISIONER	J.P. DUCRO IV	DATE
DIRECTOR, ACDES	RAYMOND J. NEVISON	DATE

ENGINEER/ARCHITECT:

VERDANTAS
8150 STERLING COURT
MENTOR, OH 44060
(440) 951-9000 PHONE
(440) 951-7487 FAX

STATE OF OHIO · RYAN S. SCHUSTER 72755 · REGISTERED PROFESSIONAL ENGINEER

RYAN SCHUSTER, P.E. — P.E. No. E-72755 — 10/27/26 DATE

verdantas
8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

NO	REVISION	DATE

SCALE: AS NOTED	DATE: 10/14/26	DESIGNED BY: MLB & TLC	DRAWN BY: JPB	CHECKED BY: RSS

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

GENERAL - 00 SERIES
COVER SHEET

PROJECT NO: 34495
DRAWING NAME: 00G-01
SHEET 1 OF 20

GENERAL:

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE PLANS AND TECHNICAL SPECIFICATIONS, VISIT THE PROJECT SITE, AND NOTIFY IN WRITING THE PROJECT ENGINEER OF ANY DISCREPANCIES IN THE PLANS OR SPECIFICATIONS PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION AND SUBMIT ANY NECESSARY MODIFICATIONS TO THE ENGINEER FOR APPROVAL.
3. ANY REVISIONS TO THE ACCEPTED CONSTRUCTION PLANS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION IN THE FIELD.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A CURRENT SET OF "AS BUILT" DRAWINGS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION LAYOUT AND SHALL NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
6. NO WORK MAY COMMENCE WITHOUT AN EXECUTED NOTICE TO PROCEED.
7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH OSHA AND ENGINEER SAFETY REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL VISITORS, EMPLOYEES AND WORKERS ON THE CONSTRUCTION SITE.
8. ANY DAMAGE TO UTILITIES DURING THIS WORK BY THE CONTRACTOR SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL CONSTRUCT THIS PROJECT IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL BUILDING CODES.
10. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SECURITY OF ALL STORED MATERIALS ON OWNER'S SITE.
11. THE CONTRACTOR SHALL COORDINATE WITH OWNER THE STORAGE OF STORED MATERIALS AND REMOVED EXISTING EQUIPMENT TO BE RETAINED.
12. ACCESS MUST BE MAINTAINED FOR EMERGENCY VEHICLES AT ALL TIMES.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN PEDESTRIAN, LOCAL ROADWAY, AND DRIVEWAY ACCESS AT ALL TIMES.
14. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE "UNIFORM MANUAL OF TRAFFIC CONTROL".
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION SIGNING AND TRAFFIC CONTROL AS DIRECTED BY THE LOCAL MUNICIPALITY. ALL SIGNS AND MATERIAL USED SHALL CONFORM TO THE SPECIFICATIONS SET FORTH IN THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
16. ACCESS TO ALL DRIVEWAYS WILL BE MAINTAINED AT ALL TIMES EXCEPT THE TIME WHEN UTILITY INSTALLATION AND PAVEMENT REPLACEMENT WILL NOT PERMIT.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING A SITE FOR DISPOSAL OF ALL EXCAVATED MATERIAL THAT IS UNSUITABLE FOR USE AS BACKFILL AND ALL OTHER EXCESS EXCAVATED MATERIALS. THE CONTRACTOR SHALL PROVIDE THE CITY WITH THE LOCATION OF THE DISPOSAL SITE AND WRITTEN PERMISSION FOR USE OF THE SITE FROM THE PROPERTY OWNER. CONTRACTOR MUST INFORM OEPA - DEFA TEAM MEMBER BRODY BETSCH OF THE DISPOSAL SITE ONCE SELECTED.
18. APPROVAL BY THE OWNER AND/OR THEIR REPRESENTATIVE CONSTITUTES NEITHER EXPRESSED NOR IMPLIED WARRANTS AS TO THE FITNESS, ACCURACY, OR SUFFICIENCY OF PLANS, DESIGNS, OR SPECIFICATIONS.
19. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY AND ALL EXISTING WORK DAMAGED DURING OR DUE TO THE EXECUTION OF THIS CONTRACT AT THEIR OWN EXPENSE. ALL SAID WORK TO BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER.
20. THE CONTRACTOR MUST COORDINATE THEIR WORK WITH THE OWNER. THE CONTRACTOR MUST MAINTAIN ADEQUATE ACCESS FOR ALL MAINTENANCE VEHICLES.
21. THE CONTRACTOR SHALL FURNISH ALL TEMPORARY FACILITIES AS REQUIRED TO MAINTAIN SANITARY FLOWS DURING THE COURSE OF THE WORK.
22. THE INFORMATION PROVIDED WITHIN THESE PLANS IS SPECIFIC TO THE ANTICIPATED WORK AREAS AND IS NOT INCLUSIVE OF ALL TOPOGRAPHIC AND UTILITY FEATURES OUTSIDE OF THE AREA.
23. CONTRACTOR SHALL CLEAR ALL DEBRIS, DIRT, VEHICLES, AND EQUIPMENT FROM WALKWAY AND TRAFFIC ROUTES AT THE CONCLUSION OF WORK EACH DAY.
24. OSHA PROHIBITS CRANE AND BACKHOE OPERATIONS WITHIN 10 FEET OF ENERGIZED PRIMARY CONDUCTORS. TEMPORARY RELOCATION OF ELECTRICAL UTILITIES, INCLUDING RESTRAINT OF POLES, RELOCATION OF POLES, AND RUBBER COVERING OF ENERGIZED CONDUCTOS MAY BE REQUIRED. THE COORDINATION AND COST OF THESE SERVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR MAY RESTRAIN POLES IF THE METHOD OF SUPPORT HAS BEEN SUBMITTED AND APPROVED BY THE UTILITY COMPANY.
25. ALL MATERIAL GENERATED DURING CONSTRUCTION (E.G., EXCESS AND UNSUITABLE FILL, HAZARDOUS MATERIALS, GENERAL REFUSE) AND REQUIRING DISPOSAL MUST BE DISPOSED OF IN ACCORDANCE WITH ANY APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS, AND ANY PERMITS NECESSARY FOR DISPOSAL MUST BE OBTAINED BEFOREHAND.
26. NOTIFY THE COUNTY WWTP SUPERINTENDENT TWENTY-FOUR (24) HOURS PRIOR TO STARTING CONSTRUCTION.
27. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO APPLY WHEN NECESSARY, WATER OR CALCIUM CHLORIDE FOR THE ALLEVIATION OR PREVENTION OF DUST NUISANCE ORIGINATING FROM CONSTRUCTION ACTIVITIES. CALCIUM CHLORIDE SHALL NOT BE UTILIZED ON OR BE ALLOWED TO TRACK INTO PAVED SURFACES. SUFFICIENT QUANTITIES OF CALCIUM CHLORIDE SHALL BE STORED ON THE JOB SITE AT ALL TIMES TO BE USED FOR DUST CONTROL. THE COST OF DUST CONTROL SHALL BE INCLUDED IN THE BID PRICES FOR GENERAL CONSTRUCTION.

NOISE CONTROL PRACTICES:

1. CONSTRUCTION EQUIPMENT WILL BE PROVIDED WITH INTAKE SILENCERS AND MUFFLERS AS REQUIRED BY SAFETY STANDARDS AND LOCAL NOISE ORDINANCE.
2. CONSTRUCTION ACTIVITIES WILL BE LIMITED TO 7:30 AM TO 7:30 PM UNLESS OTHERWISE DIRECTED BY THE OWNER.

PRESERVATION OF PROPERTY CORNERS AND SURVEY MARKERS:

1. THE CONTRACTOR SHALL CAREFULLY PRESERVE BENCH MARKS, PROPERTY CORNERS, REFERENCE POINTS AND STAKES AND IN CASE OF WILLFUL OR CARELESS DESTRUCTION, HE/SHE SHALL ENGAGE A REGISTERED SURVEYOR TO REPLACE THEM AT THEIR EXPENSE AND SHALL BE RESPONSIBLE FOR ANY MISTAKES THAT MAY BE CAUSED BY THEIR LOSS OR DISTURBANCE.

EXISTING UTILITIES:

1. EXISTING UTILITIES SHOWN ARE FROM BEST AVAILABLE RECORDS AND FIELD INVESTIGATIONS AND ARE NOT NECESSARILY COMPLETE OR EXACT. THE CONTRACTOR IS RESPONSIBLE FOR INVESTIGATION, LOCATION, SUPPORT, PROTECTION, AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES WHETHER SHOWN ON THESE PLANS OR NOT. THE CONTRACTOR SHALL EXPOSE BY PRE-EXCAVATING ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL EFFECT ON THE PROPOSED AND EXISTING UTILITIES. THE CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE UTILITY OWNER.
2. WHERE EXISTING POWER OR TELEPHONE POLES ARE IN CLOSE PROXIMITY TO WORK, THE CONTRACTOR SHALL COORDINATE THEIR WORK EFFORTS WITH THOSE OF THE UTILITY COMPANIES SUCH THAT THEIR EXISTING FACILITIES CAN BE MAINTAINED AND PROTECTED DURING THE TIME WORK IS GOING ON ADJACENT TO THE POLE. THE COST FOR ANY REQUIRED PROTECTION OR RELOCATION OF EXISTING POWER OR TELEPHONE POLES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NOT THAT OF THE CITY.
3. THE CONTRACTOR SHALL BE REQUIRED, AT THEIR EXPENSE, TO DO EVERYTHING NECESSARY TO PROTECT, SUPPORT AND SUSTAIN ALL SANITARY SEWERS, STORM DRAINS, WATER, PROCESS OR GAS PIPES, SERVICE PIPES, ELECTRIC LIGHTS, POWER AND TELEPHONE POLES, CONDUIT AND OTHER FIXTURES LAID ACROSS OR ALONG THE SITE OF THE WORK. THE ENGINEER AS WELL AS THE COMPANY OR CORPORATION OWNING SAID PIPES, POLES OR CONDUITS MUST BE NOTIFIED OF THE SAME BY THE CONTRACTOR, BEFORE ANY SUCH FIXTURES ARE REMOVED OR DISTURBED. IN CASE ANY OF THE SAID SEWER, DRAIN, GAS, PROCESS OR WATER PIPES, SERVICE PIPES, ELECTRIC LIGHT, POWER AND TELEPHONE POLES, CONDUITS OR OTHER FIXTURES ARE DAMAGED THEY SHALL BE REPAIRED BY THE AUTHORITIES HAVING CONTROL OF THE SAME AND THE EXPENSE OF SAID REPAIRS SHALL BE DEDUCTED FROM THE MONIES WHICH ARE DUE OR TO BECOME DUE THE CONTRACTOR UNDER THIS CONTRACT.
4. EXISTING UTILITY (GAS, ELECTRICAL, CABLE TELEVISION, TELEPHONE, WATER LINE, STORM OR SANITARY SEWER, WATER LINE OR STORM OR SANITARY SEWER APPURTENANCE, ETC.) IN OR OUTSIDE THE CONSTRUCTION LIMITS DAMAGED DURING THE CONSTRUCTION OF THE PROPOSED PROJECT, WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE. INDIVIDUAL SANITARY, STORM, GAS, WATER, ELECTRIC AND TELEPHONE AND CABLE SERVICE CONNECTIONS ARE NOT SHOWN. THE CONTRACTOR SHALL LOCATE AND PROTECT SERVICE CONNECTIONS THROUGHOUT THE COURSE OF THE WORK. IN THE EVENT SERVICE CONNECTIONS ARE BROKEN OR DISTURBED, THE CONTRACTOR SHALL REPAIR OR REPLACE THE SERVICE CONNECTION TO THE SATISFACTION OF THE OWNER AT NO ADDITION COST TO THE OWNER
5. SHOULD IT BECOME NECESSARY TO CHANGE THE POSITION OR TEMPORARILY REMOVE ANY STORM DRAIN, SANITARY SEWER, ELECTRIC CONDUITS, WATER PIPES, GAS PIPES, PROCESS OR OTHER PIPES OR WIRES IN ORDER TO PERMIT THE CONTRACTOR TO USE A PARTICULAR METHOD OF CONSTRUCTION OR IN ORDER TO CLEAR THE STRUCTURES BEING BUILT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE LOCATION AND CIRCUMSTANCES IMMEDIATELY
6. NO SURFACE, GROUND OR TRENCH WATER SHALL BE ALLOWED TO FLOW INTO EXISTING SANITARY SEWERS.

ARCHAEOLOGICAL/ HISTORIC RESOURCES:

1. CONTRACTORS AND SUBCONTRACTORS ARE REQUIRED UNDER OHIO REVISED CODE SECTION 149.53 TO NOTIFY THE OHIO HISTORICAL SOCIETY AND THE OHIO HISTORIC SITE PRESERVATION BOARD OF ARCHAEOLOGICAL DISCOVERIES LOCATED IN THE PROJECT AREA, AND TO COOPERATE WITH THOSE ENTITIES IN ARCHAEOLOGICAL AND HISTORIC SURVEYS AND SALVAGE EFFORTS IF SUCH DISCOVERIES ARE UNCOVERED WITHIN THE PROJECT AREA.

PROHIBITED CONSTRUCTION ACTIVITIES

1. DISPOSING OF EXCESS OR UNSUITABLE EXCAVATED MATERIAL IN WETLANDS OR FLOODPLAINS, EVEN WITH THE PERMISSION OF THE PROPERTY OWNER;
2. LOCATING STOCKPILE STORAGE AREAS IN ENVIRONMENTALLY SENSITIVE AREAS;
3. INDISCRIMINATE, ARBITRARY, OR CAPRICIOUS OPERATION OF EQUIPMENT IN ANY STREAM CORRIDORS, ANY WETLANDS, ANY SURFACE WATERS, OR OUTSIDE THE EASEMENT LIMITS;
4. PUMPING OF SEDIMENT-LADEN WATER FROM TRENCHES OR OTHER EXCAVATIONS DIRECTLY INTO ANY SURFACE WATERS, ANY STREAM CORRIDORS, ANY WETLANDS, OR STORM SEWERS; ALL SUCH WATER WILL BE PROPERLY FILTERED OR SETTLED TO REMOVE SILT PRIOR TO RELEASE;
5. DISCHARGING POLLUTANTS SUCH AS CHEMICALS, FUELS, LUBRICANTS, BITUMINOUS MATERIALS, RAW SEWAGE AND OTHER HARMFUL WASTE INTO OR ALONGSIDE OF RIVERS, STREAMS, IMPOUNDMENTS, OR INTO NATURAL OR MAN-MADE CHANNELS LEADING THERETO;
6. PERMANENT OR UNSPECIFIED ALTERATION OF THE FLOW LINE OF ANY STREAM;
7. DAMAGING VEGETATION OUTSIDE OF THE CONSTRUCTION AREA;
8. DISPOSAL OF TREES, BRUSH, AND OTHER DEBRIS IN ANY STREAM CORRIDORS, ANY WETLANDS, ANY SURFACE WATERS, OR AT UNSPECIFIED LOCATIONS;
9. OPEN BURNING OF PROJECT DEBRIS WITHOUT A PERMIT;
10. DISCHARGING INJURIOUS SILICA DUST CONCENTRATIONS INTO THE ATMOSPHERE RESULTING FROM BREAKING, CUTTING, CHIPPING, RILLING, BUFFING, GRINDING, POLISHING, SHAPING OR SURFACING CLOSER THAN 200 FEET TO PLACES OF RESIDENCES OR COMMERCIAL, PROFESSIONAL, QUASI-PUBLIC OR PUBLIC PLACES OF HUMAN OCCUPATION;
11. STORING CONSTRUCTION EQUIPMENT AND VEHICLES AND/OR STOCKPILING CONSTRUCTION MATERIALS ON PROPERTY, PUBLIC OR PRIVATE, NOT PREVIOUSLY SPECIFIED ON THE PLANS BY THE ENGINEER FOR SUCH PURPOSES;
12. RUNNING WELL POINT OR PUMP DISCHARGE LINES THROUGH PRIVATE PROPERTY OR PUBLIC PROPERTY AND RIGHTS-OF-WAY WITHOUT THE WRITTEN PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF THE ENGINEER;
13. OPERATIONS ENTAILING THE USE OF VIBRATORY HAMMERS OR COMPACTORS OUTSIDE THE HOURS OR 8:00 AM AND 5:00 P.M. OR OUTSIDE THE HOURS ALLOWED FOR CONSTRUCTION BY LOCAL ORDINANCES OR REGULATIONS; AND
14. CLOSING OFF CLEAR ACCESS TO ANY PUBLIC ALLEY, STREET, ROAD, AVENUE OR BOULEVARD WITHOUT THE PRIOR CONSENT OF MUNICIPAL OFFICIALS AND THE ENGINEER, AND CLOSING CLEAR ACCESS:
    - BY FIRE PROTECTION EQUIPMENT AND EMERGENCY VEHICLES;
    - BY THE PUBLIC TO ANY COMMERCIAL OR PROFESSIONAL PLACE OF BUSINESS, QUASI-PUBLIC OR PUBLIC ESTABLISHMENT, OR PLACE OF RESIDENCE; OR
    - BY VEHICLES TO DRIVEWAYS WITHOUT THE PROVISION OF ALTERNATIVE MEANS OF BUILDING INGRESS AND EGRESS.
15. SOIL AND FILL SHALL NOT BE STOCKPILED IN THE FLOODPLAIN.

EROSION/ SEDIMENT CONTROL:

1. SITE CLEARING AND GRUBBING SHALL NOT COMMENCE UNTIL SUCH TIME THAT THE CONTRACTOR IS PREPARED TO START CONSTRUCTION. REMOVE ONLY THOSE TREES, SHRUBS, AND GRASSES THAT MUST BE REMOVED FOR CONSTRUCTION OF ACTUAL FACILITIES; PROTECT THE REST TO PRESERVE THEIR AESTHETIC, HABITAT, AND EROSION CONTROL VALUES.
2. IMMEDIATELY FOLLOWING SITE AND ACCESS CLEARING, TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED. THEY WILL BE MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION UNTIL FINAL SEEDING AND SITE RESTORATION OCCURS.
3. AT THE WWTP CONSTRUCTION SITE, INSTALL SEDIMENT BASINS AND DIVERSION DIKES BEFORE DISTURBING THE LAND THAT DRAINS INTO THEM.
4. DIVERSION CHANNELS WILL BE CONSTRUCTED AROUND THE WWTP CONSTRUCTION SITE TO COLLECT RUNOFF AND PREVENT SILT AND OTHER ERODIBLE MATERIALS FROM ENTERING LOCAL DRAINAGE COURSES. DIVERSION CHANNELS WILL FLOW TO TEMPORARY SEDIMENT BASINS, AND ARE TO BE STABILIZED THROUGH SEEDING, RIP-RAPPING, OR LINING THEM WITH PLASTIC.
5. EXISTING TOPSOIL WILL BE STOCKPILED AND REPLACED UPON FINAL GRADING OF THE WWTP CONSTRUCTION SITE.
6. EXTENSIVE AREAS OF STOCKPILED TOPSOIL AT THE WWTP CONSTRUCTION SITE ARE TO BE PROTECTED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING OR COVERING SUCH AS WITH ANCHORED STRAW MULCH. SILT BARRIERS WILL BE INSTALLED DOWN GRADIENT OF THESE AREAS ON CONTOUR AND WITH THEIR ENDS UP SLOPE OF THE CONTOUR TO PREVENT SILT LADEN RUNOFF FROM ENTERING WATERWAYS OR STORM SEWERS. WITHIN 15 DAYS OF COMPLETION OF CONSTRUCTION, ANY REMAINING SOIL MUST EITHER BE REMOVED OR PERMANENTLY STABILIZED.
7. SILT FENCES SHOULD BE TRENCHED SIX TO TWELVE INCHES DEEP, THE FABRIC LAID IN THE TRENCH, AND THE SOIL PROPERLY BACKFILLED INTO THE TRENCH TO PREVENT UNDERCUTTING.
8. WHERE TRENCH EXCAVATION OCCURS PARALLEL TO ANY WATERWAY, A VEGETATED BARRIER SHOULD BE MAINTAINED BETWEEN THE STREAM AND THE CONSTRUCTION SITE. ALL TRENCH SPOILS WILL BE STOCKPILED ON THE SIDE OF THE TRENCH AWAY FROM THE WATERWAY, AND A LINE OF SILT BARRIERS WILL BE ESTABLISHED ALONG THE EDGE OF CONSTRUCTION ON THE CONTOUR BETWEEN THE TRENCH AND THE WATERWAY.
9. NO MORE THAN 200 FEET OF TRENCH SHALL BE OPEN AT ANY GIVEN TIME. TRENCH OPENING AND LAYING OF PIPE SHOULD OCCUR SO AS TO MINIMIZE THE AMOUNT OF DISTURBED AREA. ALL TRENCHES ARE TO BE BACKFILLED AND COMPACTED IMMEDIATELY AFTER PIPE INSTALLATION. IMMEDIATELY FOLLOWING THE BACKFILLING OF THE TRENCH, THE GROUND SURFACE WILL BE ROUGH GRADED TO THE EXISTING CONTOURS TO ALLOW FOR PROPER DRAINAGE, AND WILL BE SEEDED AND/OR MULCHED IN STAGES TO PREVENT EROSION.
10. ANY DISTURBED AREA THAT WILL NOT BE ACTIVELY UNDER CONSTRUCTION FOR A PERIOD OF 15 DAYS OR MORE WILL BE TEMPORARILY STABILIZED IMMEDIATELY BY SEEDING AND MULCHING OR BY ANCHORED STRAW MULCH.
11. AS CONSTRUCTION IS COMPLETED, PERMANENTLY STABILIZE EACH DISTURBED AREA IN STAGES WITH PERENNIAL VEGETATION INSTALLED ACCORDING TO OHIO EPA (OR EQUIVALENT) STANDARDS AND SPECIFICATIONS. AFTER FINAL SOIL SETTLING OVER THE SANITARY SEWER, OUTFALL SEWER, AND FORCE MAIN ALIGNMENTS, THE CONTRACTOR SHALL BRING THE TRENCH BACK TO GRADE IF NECESSARY, PLACE TOPSOIL, AND FINE GRADE, SEED, FERTILIZE, AND MULCH ALL AREAS DISTURBED BY ACTIVITIES ASSOCIATED WITH THE CONSTRUCTION OF THAT SECTION OF PIPE. FINAL GRADING WILL BE CONSISTENT WITH PRE-CONSTRUCTION TOPOGRAPHY FOR DRAINAGE AND AESTHETIC REASONS.
12. BORING PITS (FOR JACK AND BORE LOCATIONS) SHALL BE SURROUNDED WITH SILT BARRIERS TO PREVENT EROSION OF THE EXCAVATED PIT MATERIAL. STORM SEWER INLETS WILL BE SURROUNDED WITH SILT BARRIERS TO PREVENT SILTATION.
13. SLOPES EXCEEDING 15 PERCENT OR THAT TEND TO BE UNSTABLE REQUIRE SPECIAL TREATMENT SUCH AS WATER DIVERSION BERMS, SODDING, OR THE USE OF JUTE OR EXCELSIOR BLANKETS.
14. WHEN BORROW MATERIAL IS OBTAINED FROM OTHER THAN COMMERCIALLY OPERATED SOURCES, EROSION OF THE BORROW SITE WILL BE SO CONTROLLED BOTH DURING AND AFTER COMPLETION OF THE WORK THAT EROSION WILL BE MINIMIZED AND SEDIMENT WILL NOT ENTER STREAMS OR OTHER BODIES OF WATER. WASTE OR DISPOSAL AREAS AND CONSTRUCTION ROADS SHALL BE LOCATED AND CONSTRUCTED IN A MANNER THAT WILL KEEP SEDIMENT FROM ENTERING STREAMS. TEMPORARY EROSION CONTROL BARRIERS AND LIMITED SITE CLEARING WILL BE USED AS NEEDED.
15. IF WORK IS SUSPENDED FOR ANY REASON, THE CONTRACTOR SHALL MAINTAIN THE SOIL EROSION AND SEDIMENTATION CONTROLS IN GOOD OPERATING CONDITION DURING THE SUSPENSION OF THE WORK. ALSO, WHEN SEASONAL CONDITIONS PERMIT AND THE SUSPENSION OF WORK IS EXPECTED TO EXCEED A PERIOD OF ONE MONTH, THE CONTRACTOR SHALL SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS LEFT EXPOSED WHEN THE WORK IS STOPPED.
16. INSTALL THE ABOVE EROSION AND SEDIMENT CONTROL MEASURES, AS APPROPRIATE, REFERRING TO OHIO EPA, STORM WATER TECHNICAL ASSISTANCE, RAINWATER AND LAND DEVELOPMENT MANUAL STANDARDS AND SPECIFICATIONS (FORMERLY ODNR) OR EQUIVALENT FOR PARTICULAR TECHNIQUES. THESE MEASURES ARE TO BE MAINTAINED IN EFFECTIVE WORKING CONDITION DURING CONSTRUCTION AND UNTIL ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
    LINK:
    HTTP://EPA.OHIO.GOV/PORTALS/35/STORM/TECHNICALASSISTANCE
    /RLD11-6-14All.pdf

STATIONING AND LOCATIONS:

1. ALL LOCATIONS AND ITEMS CALLED OUT BY STATION ARE SUBJECT TO ADJUSTMENT IN THE FIELD AS APPROVED BY THE ENGINEER.

RESTORATION:

1. THE CONTRACTOR SHALL CLEAN UP ALL DEBRIS AND MATERIALS RESULTING FROM THEIR OPERATION AND RESTORE ALL SURFACES, STRUCTURES, DITCHES AND PROPERTY TO ITS ORIGINAL CONDITION TO THE SATISFACTION OF THE ENGINEER. RESTORATION SHALL INCLUDE SEEDING AND MULCHING DISTURBED AREAS, RESTORATION OF EXISTING DRIVES, AND FINAL CLEAN UP.
2. ALL EXISTING STORM AND SANITARY SEWER FACILITIES, INCLUDING TILE, DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED, REPLACED OR RECONNECTED TO THE EXISTING OR PROPOSED SYSTEM AS DIRECTED BY THE ENGINEER AT NO COST TO THE OWNER.

SHUTDOWNS AND BYPASSING

1. CONTRACTOR TO COORDINATE ALL PLANT SHUTDOWNS OR PROCESS BYPASSING WITH THE OWNER.
2. THE PLANT IS ABLE TO BE OFFLINE FOR 8-20 HOURS DEPENDING ON WET WEATHER EVENTS.
3. IF BYPASSING, THE CONTRACTOR SHALL WORK CLOSELY WITH THE OWNER TO ENSURE TEMPORARY PUMPING DOES NOT DISTURB THE CLARIFIER SLUDGE BLANKET.
4. THE CONTRACTOR SHALL MAINTAIN CONTINUOUS OPERATION OF THE WASTEWATER TREATMENT PLANT DURING CONSTRUCTION. PROVIDE TEMPORARY BYPASS PUMPING FROM THE EQ BASIN TRAIN TO THE EAST TREATMENT TRAIN AS REQUIRED TO DIVERT FLOW AND MAINTAIN TREATMENT OPERATIONS. THE BYPASS SYSTEM SHALL REMAIN IN SERVICE FOR THE DURATION OF WORK IMPACTING THE EAST TREATMENT TRAIN AND SHALL BE CAPABLE OF CONVEYING ALL ANTICIPATED FLOWS. SUBMIT A BYPASS PUMPING PLAN TO THE OWNER AND ENGINEER FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION. ALL EQUIPMENT, LABOR, MATERIALS, MONITORING, AND INCIDENTALS REQUIRED FOR BYPASS PUMPING SHALL BE INCLUDED IN THE CONTRACT PRICE.

STATE OF OHIO
RYAN S. SCHUSTER
72755
REGISTERED PROFESSIONAL ENGINEER

verdantas
8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

NO	REVISION	DATE

SCALE: N/A
DATE: 1/20/2026
DESIGNED BY: MLB & TLC
DRAWN BY: JPB
CHECKED BY: ---

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

GENERAL - 00 SERIES

GENERAL NOTES - 1

PROJECT NO: 34495
DRAWING NAME: 00G-02
SHEET: 2 OF: 20

PIPE SCHEDULE

SERVICE	MATERIAL	SIZE (IN.)	END TYPE	REMARKS
AIR - AERATION	304 STAINLESS STEEL	3	FL	
AIR - CLARIFIER	304 STAINLESS STEEL	1	FL	
FLOW SPLITTER	DIP	8	FL	CLASS 53
CLARIFIER EFFLUENT	DIP	12	FL	CLASS 53
EAST TANK SLUDGE EFFLUENT	DIP	3	MJ	BURIED, CLASS 53
WEST TANK SLUDGE EFFLUENT	DIP	UNKNOWN	MJ	BURIED, CLASS 53

VALVE SCHEDULE

TYPE	SIZE (IN.)	OPERATOR	QTY	SERVICE
PLUG	3	EXTENSION STEM	2	EAST SLUDGE HOLDING TANK EFFLUENT LINE
PLUG	UNKNOWN	EXTENSION STEM	1	WEST SLUDGE HOLDING TANK

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RYAN S. SCHUSTER
72755
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verdantas
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(440) 951-9000

NO	REVISION	DATE

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DATE: 10/14/26
DESIGNED BY: MLB & TLC
DRAWN BY: JPB
CHECKED BY: ---

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ASHTABULA COUNTY OHIO

GENERAL - 00 SERIES

PIPE & VALVE SCHEDULE

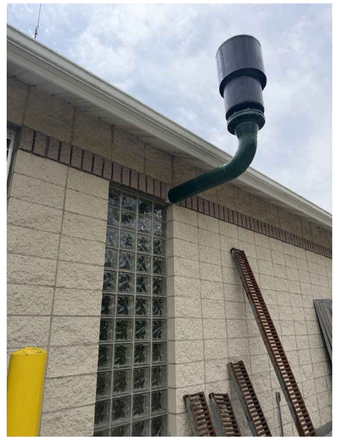
PROJECT NO: 34495
DRAWING NAME: 00G-03
SHEET 3 OF 20



AIR PIPING AT EAST TRAIN
- LOOKING SOUTH



AIR SUCTION INSIDE BUILDING



AIR SUCTION OUTSIDE BUILDING



WEST TRAIN EFFLUENT PIPING
- LOOKING SOUTHEAST



FLOW SPLITTER VIEW 1
- LOOKING NORTH



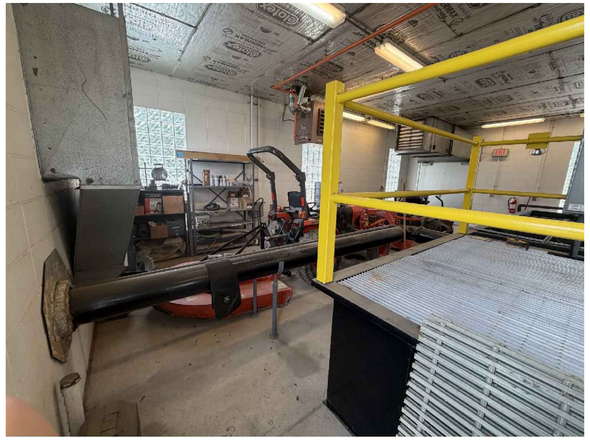
FLOW SPLITTER VIEW 2
- LOOKING NORTH



EFFLUENT PIPING AND STAIRS -
LOOKING SOUTHEAST



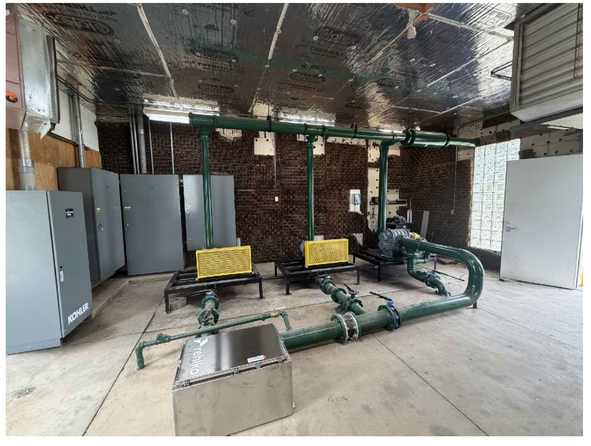
EFFLUENT PIPING AT BUILDING
- LOOKING EAST



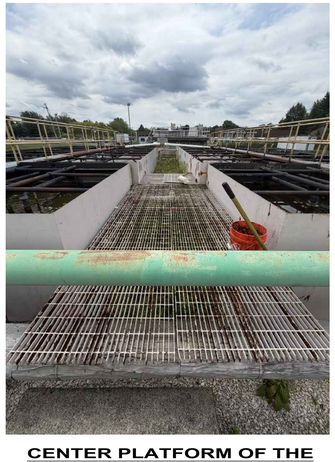
EFFLUENT PIPING INSIDE THE BUILDING



EFFLUENT PIPING CLOSE UP



BLOWER CONFIGURATION



CENTER PLATFORM OF THE
TRAINS - LOOKING SOUTH



MANHOLE USED FOR
ELEVATION REFERENCE



SLUDGE LINES - LOOKING EAST



TRAIN VIEW FROM EFFLUENT
PIPE - LOOKING SOUTHEAST



GENERATOR AND PAD - LOOKING EAST

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CIVIL - 10 SERIES

EXISITING CONDITIONS PHOTOS

PROJECT NO:
34495
DRAWING NAME
10C-01
SHEET 4 OF 20

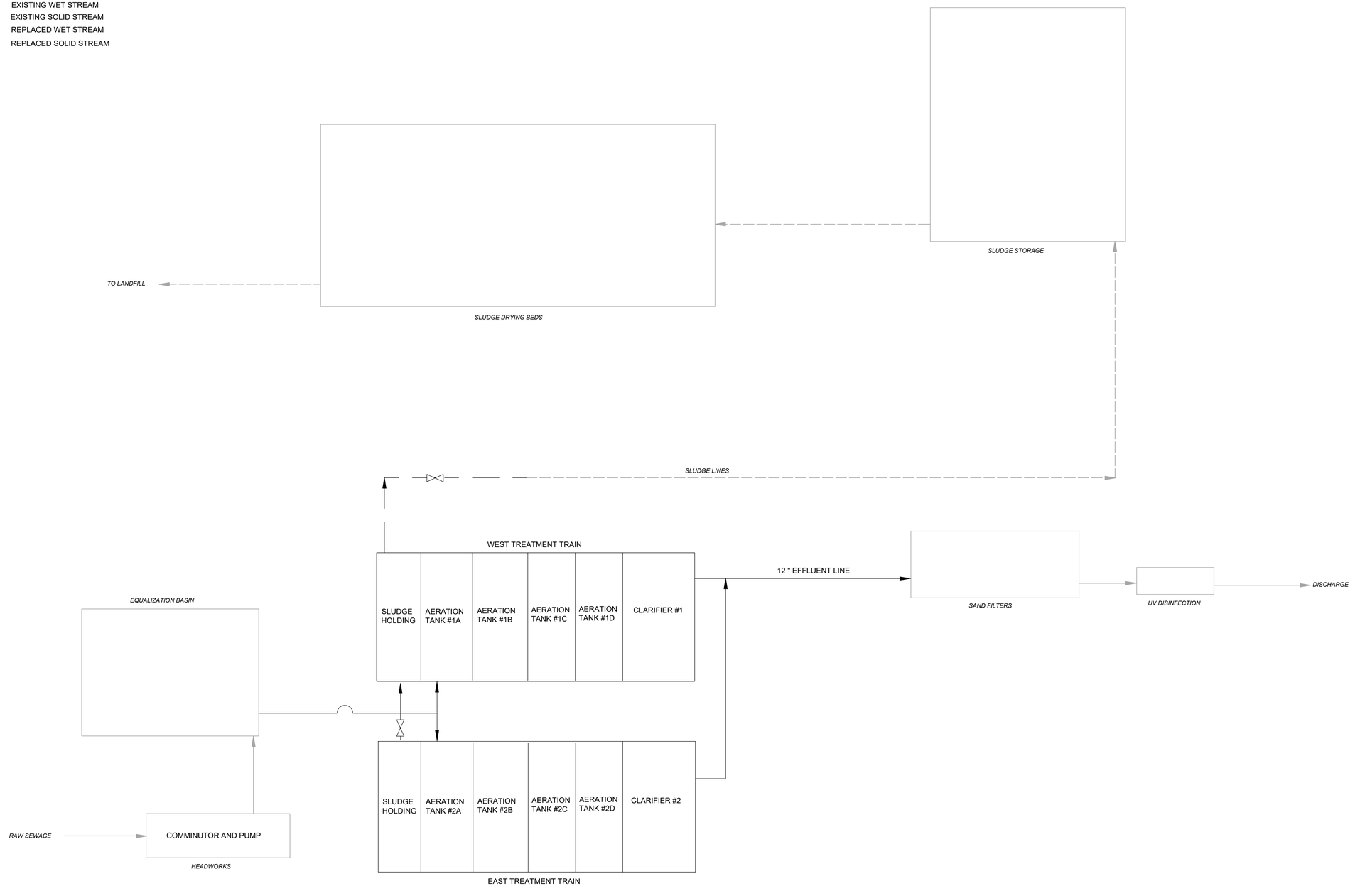
LINE SYMBOLOGY:

EXISTING WET STREAM
EXISTING SOLID STREAM
REPLACED WET STREAM
REPLACED SOLID STREAM

WWTP FLOW RATE:

AVERAGE DAILY FLOW: 0.01 MGD

DESIGN FLOW: 0.08 MGD



PROCESS FLOW DIAGRAM

STATE OF OHIO
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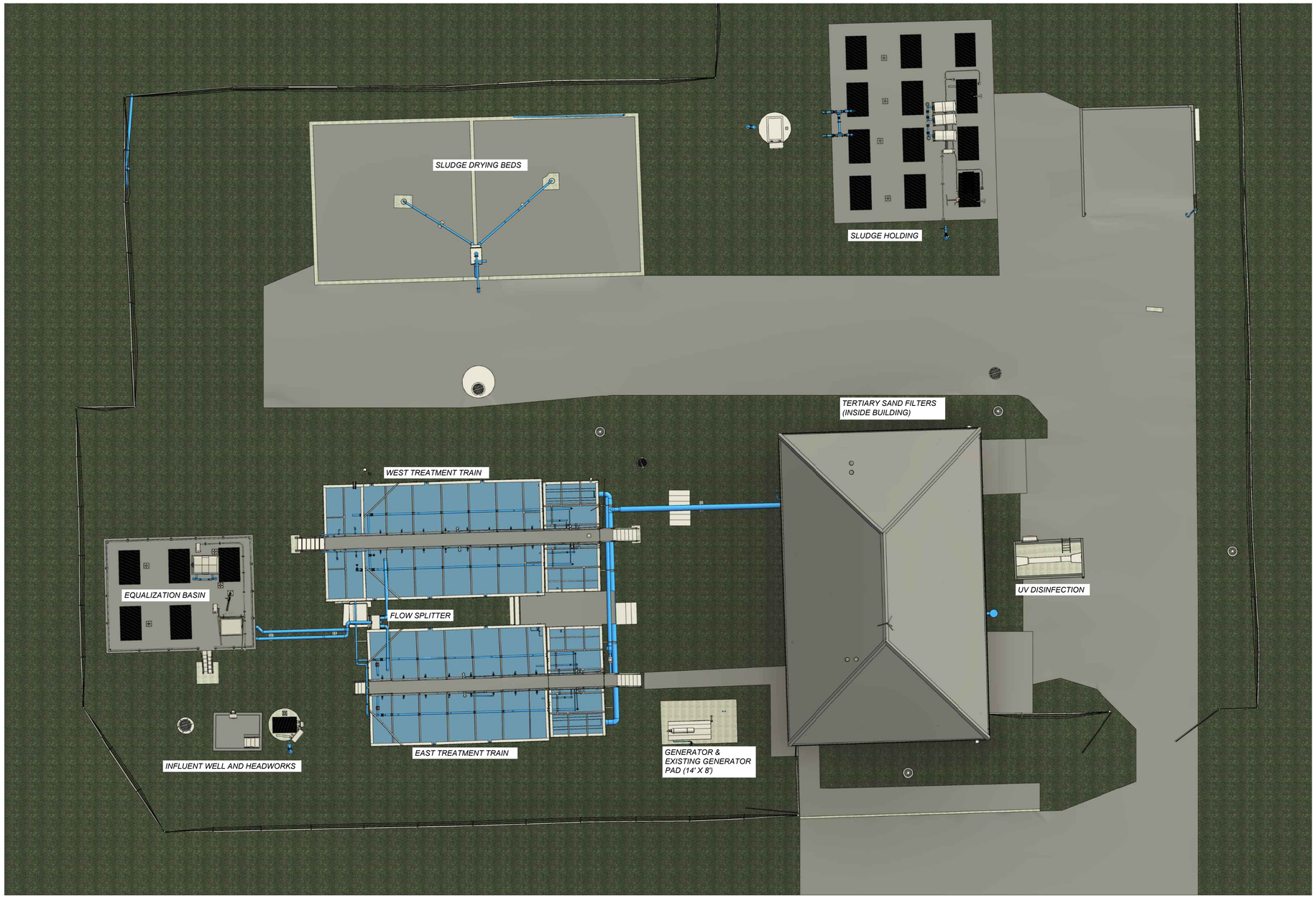
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CIVIL - 10 SERIES

PROCESS FLOW DIAGRAM

PROJECT NO:	
34495	
DRAWING NAME	
10C-02	
SHEET	OF
5	20

10 0' 10
SCALE: 1" = 10



EXISTING SITE PLAN

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CIVIL - 10 SERIES

EXISITING CONDITIONS PHOTOS

PROJECT NO: 34495
DRAWING NAME: 10C-03
SHEET 6 OF 20

N.T.S.

LINE SYMBOLOGY:

PROPOSED STAGING LIMITS

PROJECT AREA



EQUIPMENT/ MATERIAL STAGING PLAN

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CIVIL - 10 SERIES

SITE STAGING PLAN

PROJECT NO:	
34495	
DRAWING NAME	
10C-04	
SHEET	OF
7	20

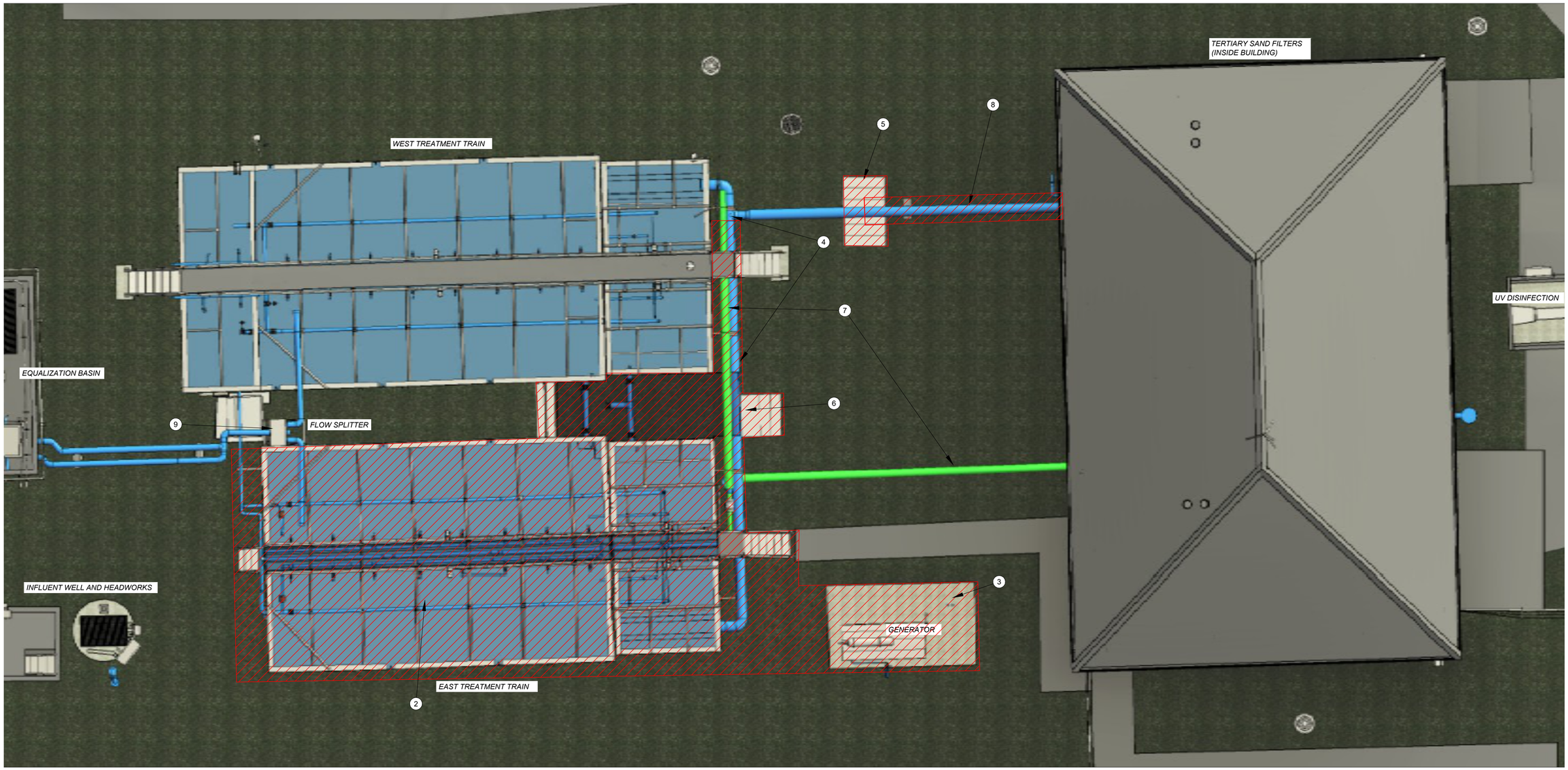
5' 0' 5'
SCALE: 1" = 5'

LEGEND

- EXISTING EXTERNAL AIR PIPING
- EXISTING PROCESS PIPING
- DEMOLITION LIMITS

PHASE ONE DEMOLITION NOTES:

1. CONTRACTOR SHALL REFER TO SPECIFICATIONS SECTION 011000 FOR SEQUENCING OF TREATMENT TRAIN DEMOLITION.
2. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL INTERNAL COMPONENTS OF EXISTING EAST TREATMENT TRAIN AS WELL AS EXISTING STEEL TANK STRUCTURES.
3. CONTRACTOR SHALL RELOCATE THE EXISTING GENERATOR WITH NEW GENERATOR EQUIPMENT PAD AS SHOWN ON SHEET 9. REMOVE AND DISPOSE OF EXISTING GENERATOR PAD. REFER TO DETAIL NO. 5 GENERATOR PAD ON SHEET 19. NEW EQUIPMENT PAD TO MATCH EXISTING SIZE.
4. CONTRACTOR SHALL REMOVE THE EFFLUENT PIPING UP TO THE TEE AND CAP TEE FOR THE DURATION OF PHASE 1. REFER TO DETAIL NO. 6 - PHASE 1 EFFLUENT EXISTING TEE DETAIL ON SHEET19.
5. CONTRACTOR SHALL DEMOLISH EXISTING STAIRS.
6. CONTRACTOR TO DEMOLISH PLATFORM, STAIRS AND INTERCONNECTING PIPING. CONTRACTOR TO CAP PIPING AT WEST TRAIN. DETAIL NO. 7 SHOWN ON SHEET 19. PLATFORM SHOWN AS TRANSPARENT FOR CLARIFICATION.
7. CONTRACTOR SHALL MODIFY EXISTING AIR PIPING TO ENSURE THE WEST TRAIN HAS CONTINUOUS AIR SUPPLY FOR THE DURATION OF PHASE 1. SECTION OF AIR PIPING SHOWN IN GRASS BETWEEN BUILDING AND TREATMENT TRAIN IS BURIED, SHOWN ABOVE GRADE FOR CLARITY. LOCATION IS APPROXIMATE, CONTRACTOR TO CONFIRM LOCATION OF BURIED AIR PIPING.
8. CONTRACTOR SHALL REMOVE THE EFFLUENT PIPING AS NOTED IN DETAIL NO. 1 - PHASE 1 EFFLUENT PIPING DETAIL, PART A ON SHEET 19. CONTRACTOR TO CONNECT EXISTING WEST TREATMENT TRAIN EFFLUENT TO NEW TEE, REFER TO DETAIL NO. 3 - PHASE 1 EFFLUENT PIPING CONNECTION DETAIL ON SHEET 19.
9. CONTRACTOR SHALL TEMPORARILY SUPPORT SPLITTER BOX DURING THE CONSTRUCTION OF THE EAST TREATMENT TRAIN.



PHASE ONE DEMOLITION PLAN

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CIVIL - 10 SERIES

PHASE ONE DEMOLITION PLAN

PROJECT NO:	
34495	
DRAWING NAME	
10C-05	
SHEET	OF
8	20

5' 0' 5'

SCALE: 1" = 5'

LEGEND:

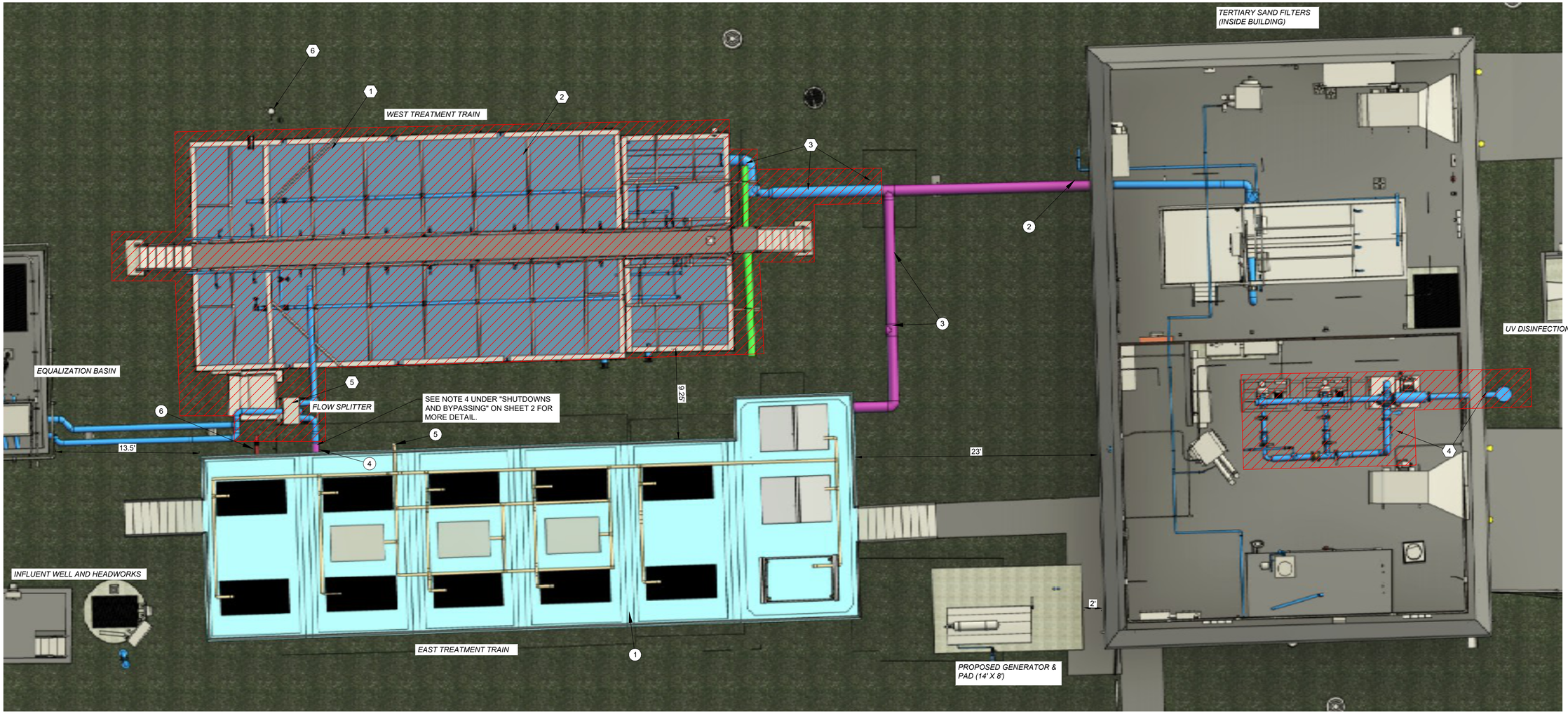
- EXISTING AIR PIPING
- PROPOSED AIR PIPING
- EXISTING PROCESS PIPING
- PROPOSED PROCESS PIPING
- PROPOSED STRUCTURE
- PROPOSED SLUDGE PIPING
- DEMOLITION LIMITS

PHASE ONE CONSTRUCTION NOTES:

1. CONTRACTOR SHALL INSTALL THE EAST TREATMENT TRAIN. CONTRACTOR SHALL REFER TO SPECIFICATION DIV 01 AND 46 FOR START UP OF EAST TRAIN.
2. CONTRACTOR SHALL COORDINATE SHUTDOWN/BYPASSING WITH OWNER DURING THE INSTALLATION OF THE NEW EFFLUENT PIPING.
3. CONTRACTOR SHALL INSTALL PROPOSED EFFLUENT PIPING. REFER TO DETAILS NO. 1 AND NO. 2 ON SHEET 19. CONTRACTOR SHALL CAP PROPOSED 12" TEE DURING PHASE 1 CONSTRUCTION.
4. CONTRACTOR SHALL INSTALL TEMPORARY PIPING TO EXISTING FLOW SPLITTER BOX FOR EAST TRAIN DURING PHASE ONE START UP.
5. CONTRACTOR SHALL CAP PROPOSED AIR LINE UNTIL CONNECTION OF WEST TRAIN IN PHASE 2.
6. CONTRACTOR SHALL INSTALL NEW SLUDGE PIPING FROM EAST TRAIN TO NEW VALVE. VALVE SHALL REMAIN SHUT AND FREE OF DEBRIS/EARTH UNTIL THE WEST TRAIN IS BROUGHT ONLINE. CONTRACTOR TO PUMP SLUDGE TO EXISTING STORAGE ONSITE FOR THE DURATION OF PHASE 2 DEMOLITION AND CONSTRUCTION.

PHASE TWO DEMOLITION NOTES:

1. PHASE TWO DEMOLITION SHALL NOT START UNTIL PHASE ONE HAS BEEN ONLINE FOR A MINIMUM OF 30 DAYS.
2. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL INTERNAL COMPONENTS OF EXISTING WEST TREATMENT TRAIN AS WELL AS EXISTING TANK STRUCTURES.
3. CONTRACTOR SHALL DEMOLISH THE REMAINING SEGMENT OF EXISTING 12" EFFLUENT PIPING AND AIR PIPING THAT WAS NOT REPLACED DURING PHASE ONE AND CAP THE TEE INSTALLED IN PHASE 1.
4. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL EXISTING BLOWERS, AIR PIPING, ELECTRICAL WIRING AND CONDUIT, AND ALL APPURTENANCES AS PART OF THE EXISTING BLOWER SYSTEM. CONTRACTOR TO FILL HOLE IN BUILDING WALL USING DETAIL NO. 8 ON SHEET 19.
5. CONTRACTOR SHALL DEMOLISH ALL COMPONENTS OF THE EXISTING FLOW SPLITTER. SEE 'SHUT DOWNS AND BYPASSING' ON SHEET 2.
6. CONTRACTOR SHALL FIELD LOCATE EXISTING SLUDGE CONNECTION AND PROTECT PIPING DURING THE DEMOLITION OF THE WEST TREATMENT TRAIN.



PHASE ONE PROPOSED SITE PLAN & PHASE TWO DEMOLITION PLAN

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CIVIL - 10 SERIES

PHASE ONE PR. SITE PLAN

PROJECT NO:	
34495	
DRAWING NAME	
10C-06	
SHEET	OF
9	20

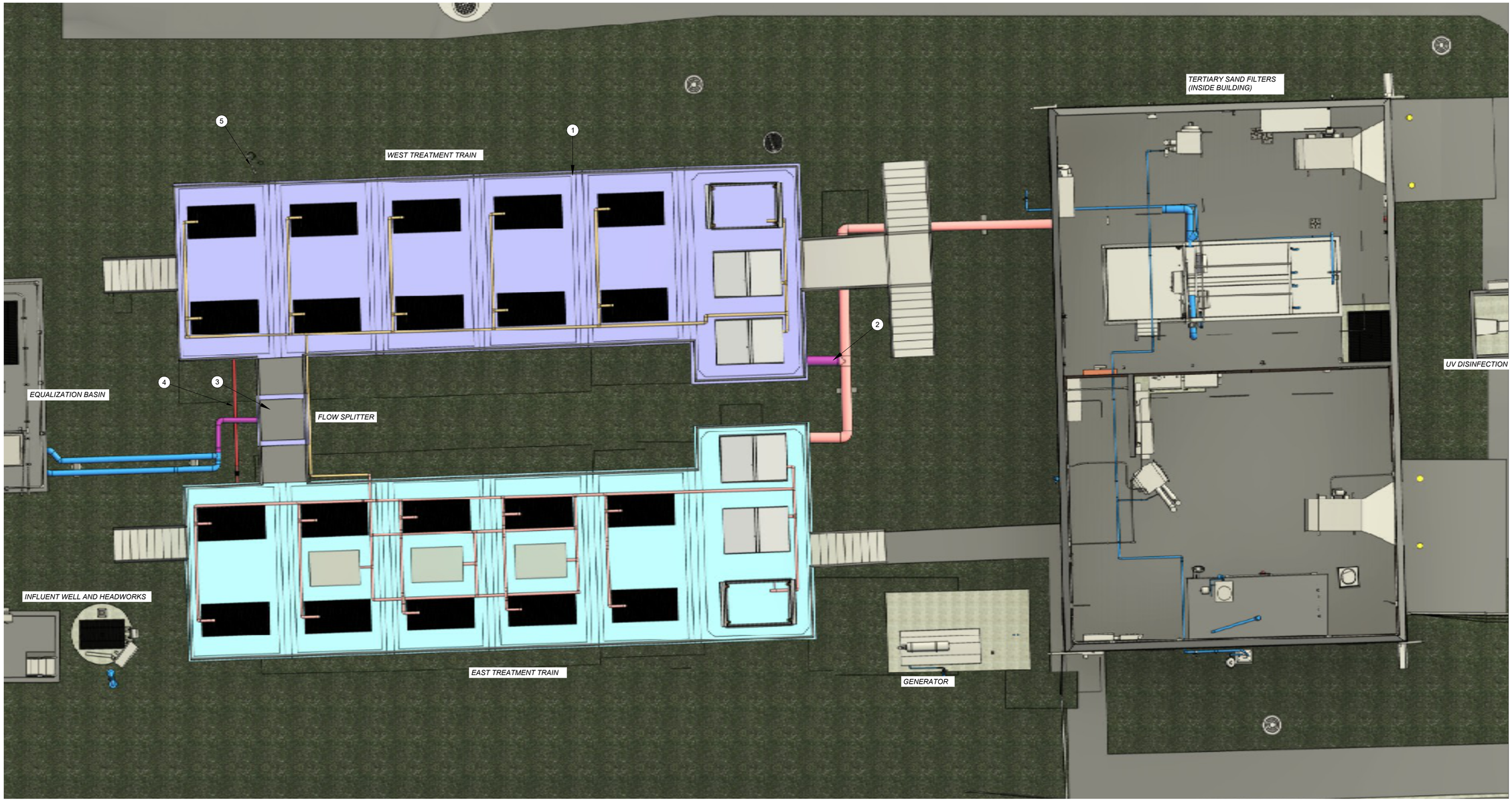
5' 0' 5'
SCALE: 1" = 5'

LEGEND:

- PROPOSED AIR PIPING
- ALL OTHER EXISTING PROCESS PIPING
- PROPOSED PROCESS PIPING
- PROPOSED STRUCTURE FROM PHASE 1
- PROPOSED PHASE 2 STRUCTURE
- PROPOSED PIPING FROM PHASE 1
- PROPOSED SLUDGE PIPING
- PROPOSED SLUDGE PIPING FROM PHASE 1

PHASE TWO CONSTRUCTION NOTES:

1. CONTRACTOR SHALL INSTALL THE WEST TREATMENT TRAIN.
2. CONTRACTOR SHALL COORDINATE SHUTDOWN/BYPASSING WITH OWNER TO CONNECT WEST TRAIN TO EXISTING EFFLUENT PIPING.
3. CONTRACTOR SHALL INSTALL THE NEW FLOW SPLITTER BOX AND COORDINATE SHUTDOWN/ BYPASSING WITH OWNER.
4. CONTRACTOR TO CONNECT THE EAST SLUDGE HOLDING TANK PIPING TO THE WEST SLUDGE HOLDING TANK.
5. CONTRACTOR SHALL CONNECT WEST SLUDGE HOLDING TANK PIPING TO THE EXISTING SITE PIPING USING A RESTRAINED COUPLING. THE EXISTING VALVE IS TO BE REPLACED. EXISTING PIPE MATERIAL, LOCATION, AND SIZE ARE UNKNOWN.



PHASE TWO
PROPOSED SITE PLAN

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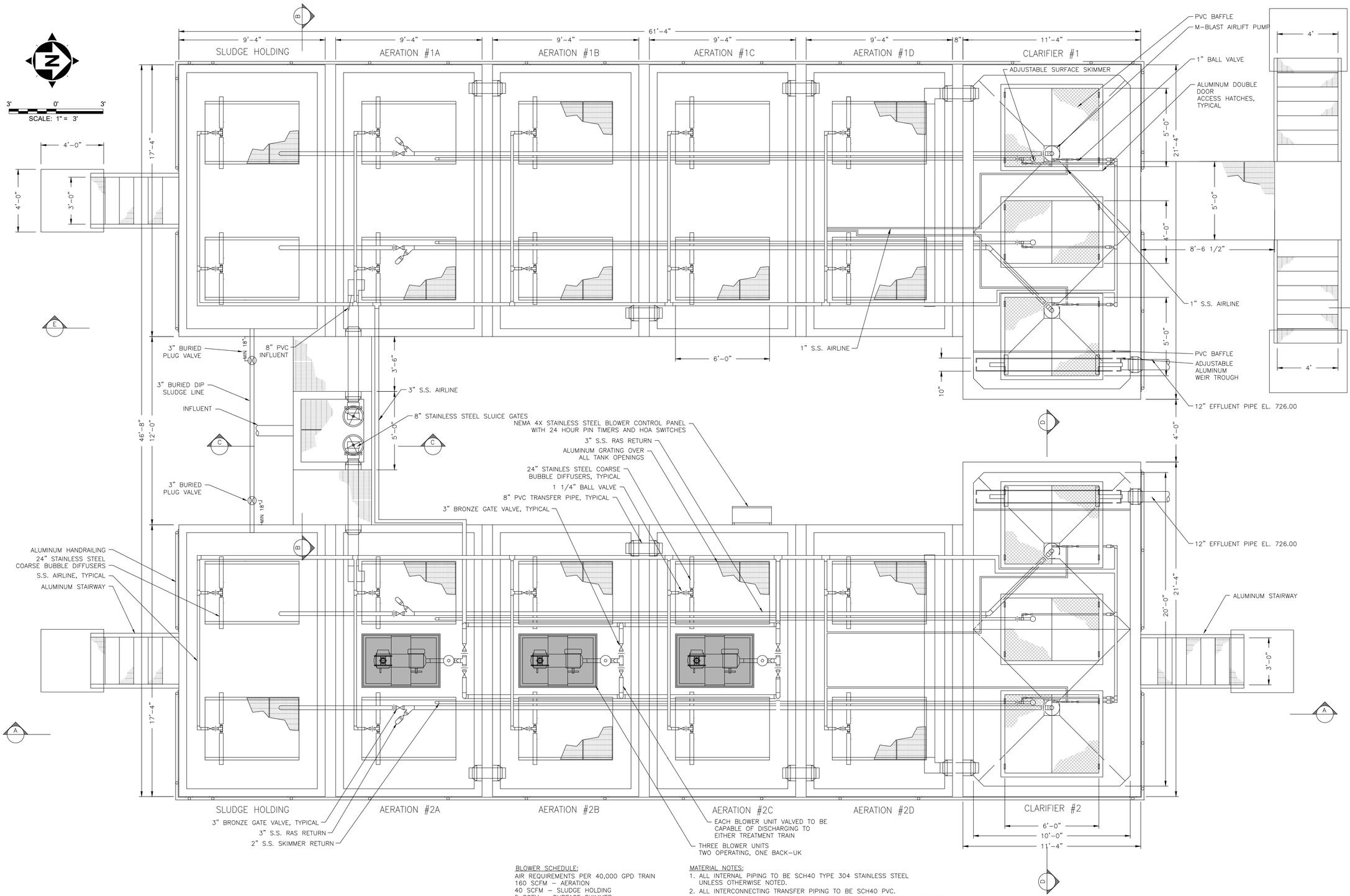
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CIVIL - 10 SERIES

PHASE TWO PR. SITE PLAN

PROJECT NO: 34495
DRAWING NAME: 10C-07
SHEET 10 OF 20



BLOWER SCHEDULE:
AIR REQUIREMENTS PER 40,000 GPD TRAIN
160 SCFM – AERATION
40 SCFM – SLUDGE HOLDING
5 SCFM – SURFACE SKIMMER
205 SCFM @ 6.0 PSI TOTAL
ROOTS URAI-47 & 10 HP MOTOR
THREE PLANT BLOWERS (ONE BACK-UP)

MATERIAL NOTES:
1. ALL INTERNAL PIPING TO BE SCH40 TYPE 304 STAINLESS STEEL UNLESS OTHERWISE NOTED.
2. ALL INTERCONNECTING TRANSFER PIPING TO BE SCH40 PVC.
3. ALL INTERNAL BRACING, FASTENERS AND SUPPORTS TO BE STAINLESS STEEL.
4. REINFORCED CONCRETE SHALL BE 5,000 PSI AT 28 DAYS
5. PRECAST CONCRETE SHALL INCLUDE WATERPROOFING ADMIX.
6. PRECAST CONCRETE TANKS ARE DESIGNED PER ACI 318 STANDARDS.
7. TANKS ARE NOT DESIGNED TO BE LEAK TESTED WITHOUT BACKFILL.

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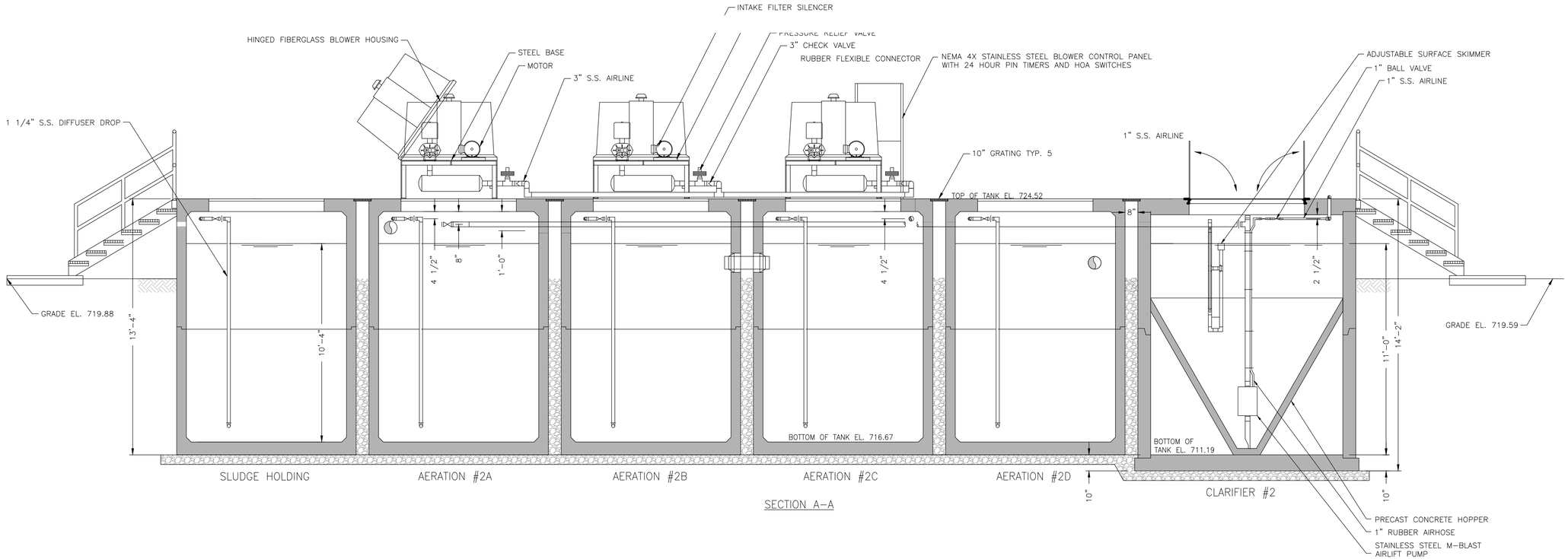
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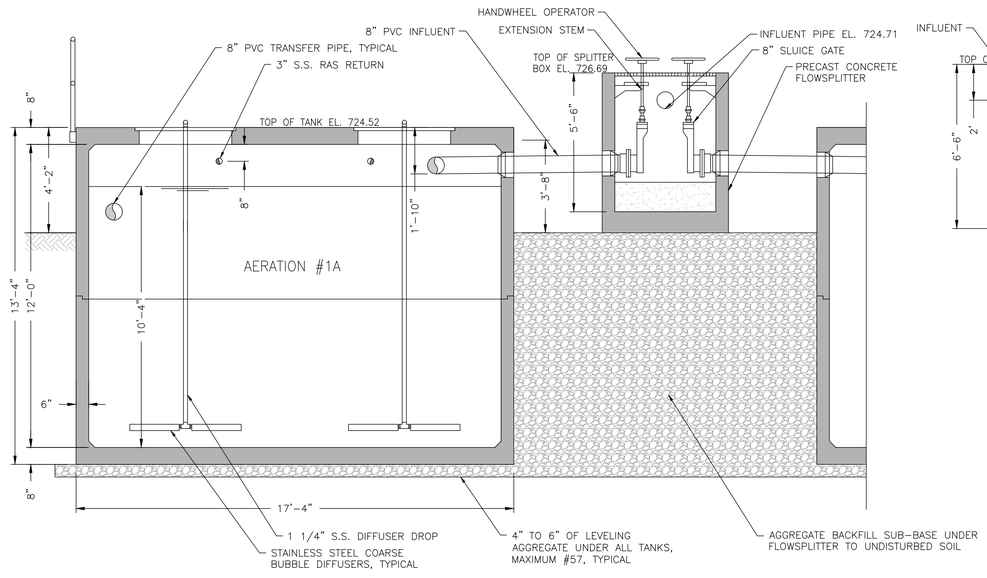
CIVIL - 10 SERIES

PROPOSED 2D PLAN (1 OF 3)

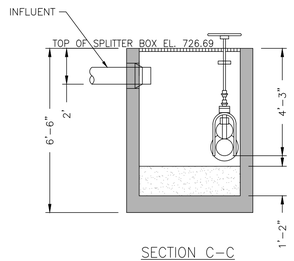
PROJECT NO:	
34495	
DRAWING NAME	
10C-08	
SHEET	OF
11	20



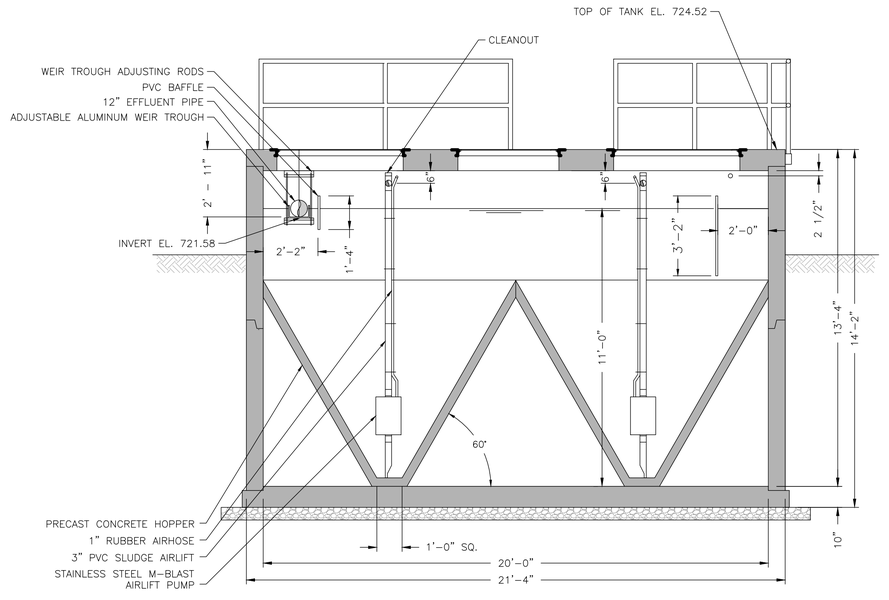
SECTION A–A



SECTION B–B



SECTION C–C



SECTION D–D

3' 0' 3'

SCALE: 1" = 3'

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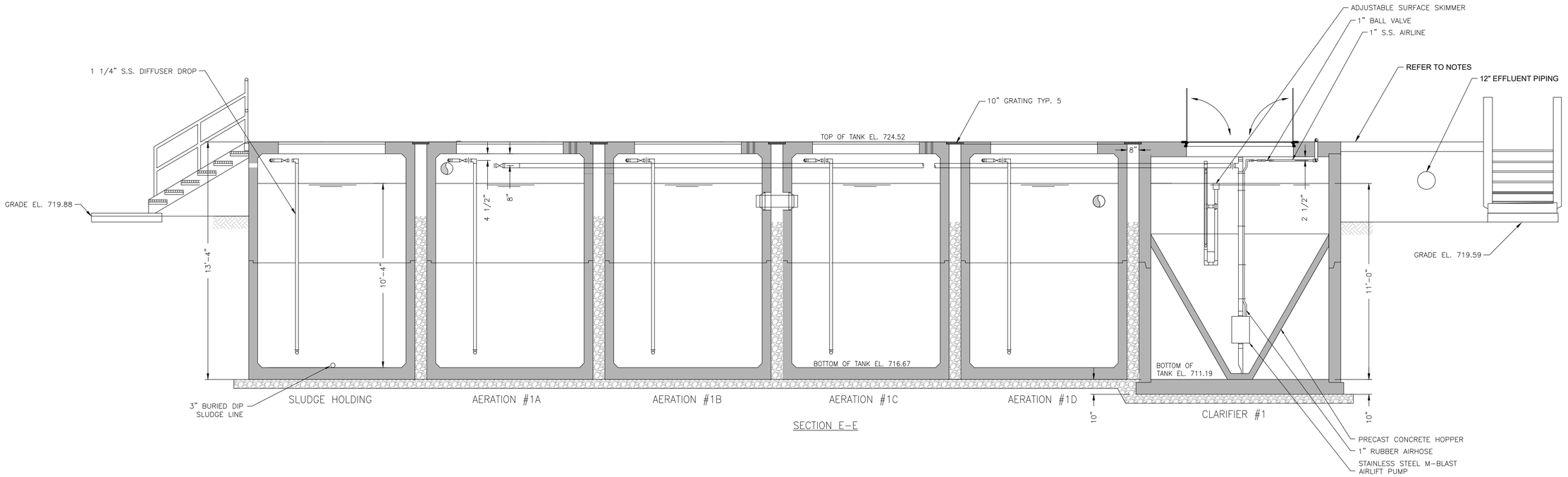
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CIVIL - 10 SERIES

PROPOSED 2D PLAN (2 OF 3)

PROJECT NO:	
34495	
DRAWING NAME	
10C-09	
SHEET	OF
12	20

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SECTION E-E

NOTES:

1. STRUCTURAL STEEL, GRATING, STAIR AND RAILING MUST CONSIST OF HOT DIPPING GALVANIZED STEEL.
2. LIVE LOAD: EQUIPMENT WEIGHT 100 PSF.
3. CONTRACTOR MUST HAVE A PLATFORM DESIGNED BY AN ENGINEER REGISTERED IN THE STATE OF OHIO AND PROVIDE SIGNED AND SEALED DRAWINGS TO VERDANTAS FOR REVIEW.

3' 0' 3'
SCALE: 1" = 3'

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CIVIL - 10 SERIES

PROPOSED 2D PLAN (3 OF 3)

PROJECT NO:	
34495	
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10C-10	
SHEET	OF
13	20

1. SCOPE OF WORK

1.1 THE WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THESE GENERAL NOTES, CONSTRUCTION DRAWINGS AND CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, SUPERVISION AND ANY OTHER MISCELLANEOUS ITEMS REQUIRED TO INSTALL THE EQUIPMENT AND/OR DEVICES AS SPECIFIED HEREIN AND SHOWN ON THE DRAWINGS, UNLESS SPECIFICALLY EXCLUDED. THE EQUIPMENT OR DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC, THE MFR'S INSTRUCTIONS AND ACCORDING TO PLANS AND DRAWINGS PROVIDED. WRITTEN APPROVAL FROM THE AUTHORIZED COMPANY REPRESENTATIVE SHALL BE OBTAINED PRIOR TO MAKING ANY DEVIATION FROM THE DRAWINGS OR ANY SUBSTITUTION OF MATERIALS. IF SUCH PRIOR APPROVAL HAS NOT BEEN OBTAINED, IT WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO CHANGE, WITHOUT ADDITIONAL COMPENSATION, ANY ITEMS SUBSEQUENTLY DISCOVERED TO BE UNACCEPTABLE.

1.2 THE CONTRACTOR SHALL PROVIDE THE INSTALLATION, INTERCONNECTION AND TESTING OF COMPLETE AND OPERABLE SYSTEMS.

1.3 INCLUDED IN THIS WORK IS THE FURNISHING, BY THE CONTRACTOR, OF OFFICE MATERIAL, EQUIPMENT STORAGE AND SHOP FACILITIES FOR THE CONSTRUCTION WORK DURING THE ENTIRE CONSTRUCTION PERIOD. CAPACITY, ARRANGEMENTS AND LOCATION OF THESE FACILITIES ARE SUBJECT TO APPROVAL BY THE CONSTRUCTION MANAGER AND SHALL COMPLY WITH APPLICABLE CODES AND REGULATIONS.

1.4 TO ENABLE ORDERLY REVIEW DURING PROGRESS OF THE WORK, AND TO PROVIDE FOR SYSTEMATIC DISCUSSION OF PROBLEMS, THE CONSTRUCTION MANAGER WILL CONDUCT PROJECT MEETINGS THROUGHOUT THE CONSTRUCTION PERIOD. THE CONTRACTOR WILL BE EXPECTED TO ATTEND THESE MEETINGS.

1.5 THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK ON THE PROJECT REQUIRED TO BE PERFORMED BY ELECTRICIANS, INCLUDING THAT DUE TO JURISDICTION AND/OR LOCAL PRACTICES.

1.6 THE CONTRACTOR SHALL EMPLOY QUALIFIED ELECTRICAL WORKERS, AND LABORERS TO PERFORM THE WORK TO BE DONE.

1.7 THE CONTRACTOR SHALL PROVIDE ALL TOOLS, CONSTRUCTION EQUIPMENT, TEST EQUIPMENT, AND TESTING FACILITIES AND SHALL MAKE TESTS AND KEEP RECORDS AS SPECIFIED HEREIN.

1.8 THE CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES, PERMANENT FACILITY PERSONNEL, AND THE CONSTRUCTION MANAGER. COORDINATION SHALL ALLOW WORK TO BE INSTALLED IN THE MOST DIRECT MANNER AND SO INTERFERENCE BETWEEN CONDUITS, PIPING, DUCTS, EQUIPMENT, AND STRUCTURAL FEATURES WILL BE AVOIDED.

1.9 CABLE TRAY AND RACEWAY ROUTING.

1.9.a EQUIPMENT, INSTRUMENTS, DEVICES, PANELS AND JUNCTION BOXES LOCATIONS ARE SHOWN ON THE ELECTRICAL LAYOUT DRAWINGS.

1.9.b ONLY THE GENERAL CABLE OR RACEWAY TRAY ROUTING PLANS ARE SHOWN ON THE ELECTRICAL LAYOUT DRAWINGS. THE ROUTING FROM INDIVIDUAL ITEMS IS NOT DEPICTED ON THE DRAWINGS.

1.9.c THE DIFFERENT WIRING CLASSES AND WIRE ASSIGNED TO THEM (MEDIUM VOLTAGE POWER, LOW VOLTAGE POWER, CONTROL, INSTRUMENTATION) ARE ALL INDICATED ON THE DRAWING OR IN THE CABLE, CONDUIT AND WIRE SCHEDULE.

1.9.d IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE BEST CABLE TRAY OR RACEWAY ROUTING FOR ALL WIRES NOT SPECIFICALLY ROUTED, WHILE MAINTAINING THE WIRE CLASS SEGREGATION REQUIREMENTS OF THE NEC.

1.9.e THE CONTRACTOR SHALL PRESENT THE ROUTING PLAN TO THE CONSTRUCTION MANAGER FOR APPROVAL BEFORE PROCEEDING.

1.10 RUNS FROM OUTLETS REFERRED TO AS "HOME RUNS" MAY BE USED ON CONTRACTOR'S CONSTRUCTION DRAWINGS. THEY ARE INDICATED BY POINTING IN THE GENERAL DIRECTION OF PANELS. CONTRACTOR SHALL BE RESPONSIBLE TO CONTINUE SUCH CIRCUITS TO THE PANELS AS THOUGH THE ROUTES WERE COMPLETELY INDICATED. HOME RUNS SHALL BE INSTALLED FROM OUTLETS AS SHOWN ON CONTRACTOR'S DRAWINGS.

1.11 THE CONTRACTOR SHALL BECOME FAMILIAR WITH ALL DETAILS OF THE WORK AND VERIFY ALL DIMENSIONS IN THE FIELD SO THAT THE OUTLETS AND EQUIPMENT WILL BE PROPERLY LOCATED AND READILY ACCESSIBLE. LIGHTING FIXTURES, OUTLETS, AND OTHER EQUIPMENT AND MATERIALS SHALL BE LOCATED TO AVOID INTERFERENCE WITH CABINETS, MECHANICAL OR STRUCTURAL FEATURES. DEVIATIONS FROM DRAWINGS REQUIRED TO MAKE WORK OF THIS CONTRACT CONFORM TO BUILDING AS CONSTRUCTED, OR AS TO WORK OF OTHER CONTRACTORS, SHALL BE MADE BY THE CONTRACTOR AT THEIR EXPENSE. THE ENGINEER RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF EQUIPMENT AND OUTLETS PRIOR TO INSTALLATION WITHOUT ADDITIONAL CHARGES.

2. CONTRACT DOCUMENTS

2.1 THE CONTRACT DOCUMENTS SHALL CONSIST OF DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS ISSUED BY THE ENGINEER. EACH DOCUMENT IS COMPLEMENTARY, AND THE REQUIREMENTS SHOWN, WRITTEN OR REASONABLY INFERABLE THERE FROM ONE DOCUMENT IS CONSIDERED AS WRITTEN, SHOWN OR IMPLIED IN ALL.

2.2 THE CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH ALL OF THE PLANS INCLUDING ARCHITECTURAL, LAYOUT, PIPING AND MECHANICAL PLANS. HE SHALL PERFORM ALL WORK AND PROVIDE ALL MATERIAL REQUIRED BY THE ELECTRICAL CONTRACTOR SHOWN UNDER THESE AND ALL OTHER SECTIONS OF THE PLANS AND SPECIFICATIONS.

2.3 THE CONTRACTOR SHALL MAINTAIN AN UP TO DATE SET OF AS-BUILT DRAWINGS NEATLY MARKED WITH ALL CHANGES (RED LINED) FROM THE ORIGINAL DESIGN. THESE DRAWINGS SHALL BE DELIVERED TO THE CONSTRUCTION MANAGER AT THE COMPLETION OF THE PROJECT PRIOR TO RECEIVING FINAL PAYMENT.

3. CODES AND STANDARDS

3.1 THE ELECTRICAL EQUIPMENT, MATERIALS AND INSTALLATION PROVIDED FOR THIS PROJECT SHALL CONFORM IN DESIGN, FABRICATION, TESTING AND PERFORMANCE, TO THE LATEST EDITION OF STANDARDS AND GUIDELINES PUBLISHED BY THE FOLLOWING ORGANIZATIONS WHERE APPLICABLE. THE LATEST EDITION OF THE STANDARDS, DOCUMENTS, AND PUBLICATIONS, REFERENCED HEREIN BY BASIC DESIGNATION SHALL BECOME PART OF THESE SPECIFICATIONS TO THE EXTENT REFERENCED.

ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
FM FACTORY MUTUAL FM STANDARDS
IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS
NFPA 70	NATIONAL ELECTRIC CODE
NFPA 70E	STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE
NFPA 72	NATIONAL FIRE ALARM CODE
NEMA	NATIONAL ELECTRICAL MFR'S ASSOCIATION
UL	UNDERWRITERS' LABORATORIES, INC.
ICEA	INSULATED CABLE ENGINEERS ASSOCIATION
IPCEA	INSULATED POWER CABLE ENGINEERS ASSOCIATION STANDARDS
ISA	INSTRUMENT SOCIETY OF AMERICA STANDARDS

3.2 ALL LOCAL, STATE AND FEDERAL CODES, STANDARDS AND REGULATIONS IN EFFECT HAVING JURISDICTION IN THE AREA WHERE THE EQUIPMENT WILL BE INSTALLED. ANY CONFLICT BETWEEN THE ABOVE MENTIONED DOCUMENTS AND THIS SPECIFICATION SHALL BE REFERRED TO THE ENGINEER FOR CLARIFICATION BEFORE PROCEEDING WITH THE FABRICATION OF THE AFFECTED PARTS.

4. CODES AND PERMITS

4.1 THE INSTALLATION AND MATERIALS SHALL COMPLY WITH ALL LAWS APPLYING TO ELECTRICAL INSTALLATION IN EFFECT, WITH THE REGULATIONS OF THE NEC WHERE SUCH REGULATIONS DO NOT CONFLICT WITH LAWS IN EFFECT, AND WITH THE REGULATIONS OF THE PUBLIC UTILITY COMPANY FURNISHING THE SERVICE.

5. GUARANTEE

5.1 THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS, WORKMANSHIP AND THE SUCCESSFUL OPERATION OF ALL EQUIPMENT AND APPARATUS UNDER THIS CONTRACT FOR A PERIOD OF (18) EIGHTEEN MONTHS FROM THE DATE OF FINAL ACCEPTANCE OF THE WHOLE WORK. CONTRACTOR SHALL GUARANTEE TO REPAIR OR REPLACE AT HIS OWN EXPENSE ANY PART OF THE APPARATUS WHICH MAY SHOW DEFECT DURING THAT TIME PROVIDED SUCH DEFECT IS DUE TO IMPROPER MATERIALS OR WORKMANSHIP AND NOT TO CARELESSNESS OR IMPROPER USE BY THE OWNER. BY DEFAULT, OWNER MAY HAVE SUCH WORK DONE AND CHARGED TO THE CONTRACTOR.

6. CONSTRUCTION, SHOP DRAWINGS AND MATERIALS

6.1 CONTRACTOR SHALL SUBMIT AN ELECTRONIC SET OF SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING ELECTRICAL CONSTRUCTION AND/OR PURCHASE OF EQUIPMENT INCLUDED THEREIN.

6.1.a THE FOLLOWING IS THE MINIMUM EXPECTATION OF SHOP DRAWINGS THAT WILL BE REQUIRED FOR THE PROJECT:

A. TRANSFORMERS
B. SWITCHGEAR, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROLLERS
C. DISCONNECT SWITCHES AND ASSOCIATED FUSES
D. RACEWAYS: CONDUIT, CABLE TRAY AND WIREWAY
E. WIRE, CABLE INCLUDING GROUND SYSTEM
F. LIGHTING FIXTURES
G. CONTROL PANELS
H. ALL PREFABRICATED CONCRETE: MANHOLES, VAULTS, POLE BASES

6.2 RECEIPT OR APPROVAL OF SHOP DRAWINGS BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF COMPLYING WITH CONTRACT DOCUMENTS.

6.3 ALL MATERIAL SHALL BE UL LISTED UNLESS OTHERWISE REQUIRED.

6.4 CONTRACTOR SHALL MAKE PROVISIONS FOR TIMELY AND SAFE DELIVERY AND SAFE STORAGE OF MATERIALS.

6.5 MFRS' NAMES ARE LISTED TO ESTABLISH FUNCTION AND QUALITY OF MATERIAL OR EQUIPMENT. MATERIALS SO LISTED SHALL BE BID AS SPECIFIED UNLESS WRITTEN APPROVAL IS OBTAINED TO SUBSTITUTE MATERIALS OF EQUAL QUALITY BY OTHER MFRS. LETTERS REQUESTING APPROVAL AND INCLUDING COMPLETE ENGINEERING INFORMATION DESCRIBING PERFORMANCE AND SHOWING DIMENSIONS SHALL BE SUBMITTED TO THE ENGINEER AT LEAST 5 WORKING DAYS PRIOR TO BID OPENING.

7. FIELD DEVICES & WIRING:

7.1 ALL MOTORS AND INSTRUMENTS SHALL BE HAVE AN EQUIPMENT IDENTIFYING TAG AS INDICTED HEREIN, ON PLANS OR IN SPECIFICATIONS SECTION 26.

7.2 TERMINAL BLOCKS SHALL BE LABELED AS INDICATED HEREIN, ON PLANS OR IN SPECIFICATIONS SECTION 26.

7.3 POWER CABLES ARE TO BE COLOR CODED BY PHASE AS INDICATED HEREIN.

8. EXCAVATION AND BACKFILLING:

8.1 THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, TRENCHING AND BACKFILLING WORK, AND REMOVE ALL DEBRIS IN CONNECTION WITH THIER WORK. BACKFILLING SHALL BE DONE WITH MATERIALS ACCEPTABLE TO THE CONSTRUCTION MANAGER AND THOROUGHLY COMPACTED. ALL DISTURBED SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AND PROPERLY INSTALLED TO ELIMINATE ANY SETTLEMENT.

9. WORKMANSHIP

9.1 THE CONTRACTOR SHALL BE HELD SOLELY RESPONSIBLE FOR THE PROPER INSTALLATION OF THEIR WORK. THEY SHALL ARRANGE WITH THE PROPER CONTRACTORS FOR THE BUILDING IN OF ANCHORS, ETC., AND FOR THE LEAVING OF REQUIRED CHASES, OPENINGS, ETC., AND SHALL DO ALL CUTTING AND PATCHING MADE NECESSARY BY THIER FAILURE OR NEGLECT TO MAKE SUCH ARRANGEMENTS WITH OTHERS. ANY CUTTING OR PATCHING DONE BY THIS CONTRACTOR SHALL BE SUBJECT TO THE DIRECTIONS OF THE CONSTRUCTION MANAGER AND SHALL NOT BE STARTED UNTIL APPROVAL HAS BEEN OBTAINED.

9.2 ALL CUTTING, WELDING OR DRILLING OF CONCRETE OR STRUCTURAL MEMBERS SHALL BE PROPERLY REINFORCED AND PATCHED TO MATCH AS NEARLY AS POSSIBLE THE SURROUNDING WORK. BEFORE CUTTING, WELDING OR DRILLING ANY CONCRETE OR STRUCTURAL MEMBER, THE CONTRACTOR SHALL SECURE THE APPROVAL OF THE CONSTRUCTION MANAGER.

9.3 THE CONTRACTOR SHALL ASSIGN PERSONS IN DIRECT CHARGE OF WORK WHO ARE THOROUGHLY EXPERIENCED IN THE CLASS OF CONSTRUCTION WORK SPECIFIED HEREIN. ALL LABOR SHALL BE PERFORMED IN A WORKMANLIKE MANNER BY SKILLED WORKERS UNDER THE SUPERVISION OF COMPETENT SUPERVISORS.

9.4 THE CONTRACTOR SHALL PERIODICALLY REMOVE ALL DEBRIS AND WASTE IN ORDER TO MAINTAIN SAFE WORKING AND OPERATING CONDITIONS, AND SHALL DISPOSE OF THE SAME IN AN APPROVED MANNER. AT THE COMPLETION OF WORK, THEY SHALL REMOVE ALL THEIR RUBBISH, TOOLS, SCAFFOLDS AND SURPLUS MATERIALS FROM AND ABOUT THE SITE, LEAVING THEIR WORK CLEAN AND THE AREAS READY FOR OCCUPANCY.

10. PERFORMANCE AND QUALITY ASSURANCE TESTING

10.1 UPON COMPLETION, THE COMPANY SHALL REVIEW AND APPROVE THE INSTALLATION TO ENSURE THAT THE WORK WAS DONE IN ACCORDANCE WITH THE DESIGN DRAWINGS AND CODE REQUIREMENTS, WITH ANY REQUIRED CORRECTIVE ACTIONS AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CERTIFICATES, PERMITS OR INSPECTIONS BY THE AUTHORITIES HAVING JURISDICTION.

10.2 THE INSTALLATION SHALL BE TESTED FREE FROM ALL GROUNDS AND SHORT CIRCUITS. ALL EQUIPMENT FURNISHED SHALL BE DEMONSTRATED TO OPERATE IN ACCORDANCE WITH THE REQUIREMENTS OF THESE SPECIFICATIONS AND PLANS. CONSULT WITH THE OWNER'S REPRESENTATIVE PRIOR TO TESTING AND ADJUSTING TO DETERMINE INTENDED FUNCTION. PERFORM SUCH TESTS AND MAKE NECESSARY ADJUSTMENTS TO ENSURE THAT DESIGN FUNCTION IS OBTAINED. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE CONSTRUCTION MANAGER OR THEIR AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL NOTIFY ALL THOSE WHO ARE REQUIRED TO BE PRESENT DURING THE TESTS (SUCH AS THE FIRE MARSHAL FOR THE TESTING OF THE FIRE ALARM SYSTEM AND EMERGENCY EXIT LIGHTING SYSTEM). NOTIFICATION OF A TEST SHALL BE MADE TO PERSONS THAT ARE TO ATTEND AS REQUIRED BY THEIR DEPARTMENT AT LEAST 7 DAYS IN ADVANCE.

10.3 NORMAL FEEDERS, CIRCUITS, AND SERVICE ENTRANCE CONDUCTORS WITH WIRE SIZE #2 AND LARGER SHALL BE TESTED FOR LEAKAGE PHASE-TO-GROUND AND PHASE-TO-PHASE PRIOR TO ENERGIZATION OF THE ELECTRICAL SYSTEM. THE CONTRACTOR SHALL SUBMIT A WRITTEN REPORT TO THE CONSTRUCTION MANAGER SHOWING METHODS AND READINGS TAKEN.

11. MATERIALS AND INSTALLATION

11.1 CONDUIT

11.1.a MATERIALS: EXTERIOR - ALL CONDUITS SHALL BE PVC (BELOW GRADE) AND RIGID STEEL ABOVE GRADE (UON ON PLANS). TRANSITION FROM PVC TO STEEL CONDUIT BELOW GRADE WITH PVC COATED RIGID SWEEPS. INTERIOR - ALL CONDUITS SHALL BE STEEL PER PLANS. ANY INTERIOR AREAS SUBJECT TO POTENTIAL IMPACT WITH CONDUIT (IE STORAGE AREAS, FORKLIFT PATHWAYS) SHALL BE PROTECTED.

11.1.b CONDUITS MUST USE EXPANSION JOINTS AS PER NEC.

11.1.c BEFORE INSTALLATION, THE INTERIOR AND EXTERIOR OF ALL CONDUIT AND FITTINGS SHALL BE INSPECTED AND CLEANED OF ALL DIRT, CUTTINGS AND OTHER FOREIGN MATERIALS.

11.1.d WHEN CONDUIT IS INSTALLED WHERE NO LOCATION DIMENSIONS ARE GIVEN ON THE DRAWINGS, APPROVAL OF THE LOCATIONS OF THESE

CONDUITS SHALL BE OBTAINED FROM THE COMPANY REPRESENTATIVE PRIOR TO INSTALLATION.

11.1.e CONDUITS SHALL NOT BE FASTENED TO REMOVABLE MEMBERS SUCH AS PIPING. CONDUIT HANGERS SHALL BE SUPPORTED FROM BUILDINGS AND STRUCTURES, NOT FROM EQUIPMENT.

11.1.f CONNECTIONS TO INTERIOR BOXES, PANELS, EQUIPMENT AND RELATED ITEMS SHALL BE MADE WITH DOUBLE LOCKNUTS, ONE INSIDE AND ONE OUTSIDE, WITH AN INSULATING BUSHING ON EACH END OF THE CONDUIT IN ADDITION TO LOCKNUTS. OUTDOOR CONNECTIONS SHALL BE MADE WITH "MYERS" HUBS OR APPROVED EQUAL.

11.1.g ALL CONDUITS SHALL HAVE THEIR ENDS PLUGGED BY CAPS, COUPLINGS W/ PLUGS OR OTHER APPROVED MEANS DURING CONSTRUCTION WORK.

11.1.h ALL CONDUIT SUPPORTS SHALL BE ALUMINUM. THE USE OF PERFORATED STRAP OR PLUMBERS STRAP IS NOT PERMITTED.

11.1.i IN CROSSING OF PIPING, THE CONDUIT SHOULD CLEAR THE PIPE BY A MINIMUM OF 6 INCHES.

11.1.j EXPOSED CONDUITS IN BUILDINGS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS, SHALL BE SUBJECT TO THE FOLLOWING REQUIREMENTS:

A. ALL CONDUITS SHOULD RUN PARALLEL OR PERPENDICULAR TO WALLS, CEILINGS, BEAMS AND COLUMNS.
B. ALL CONDUIT RUNS SHALL CLEAR ALL CRANE SYSTEMS, DOORS, WINDOWS, ACCESS WALLS AND OPENINGS.
C. PARALLEL RUNS SHOULD BE GROUPED IN NEATLY ALIGNED BANKS WHERE POSSIBLE WITH MINIMUM 1" CLEARANCE BETWEEN CONDUITS.
D. CONDUITS TERMINATING AT CABLE TRAYS SHALL ATTACH TO TRAY AND SHALL BE ELECTRICALLY BONDED TO EDGE OF TRAY OR TO THE GND WIRE IN CABLE TRAY.

11.1.k CONDUITS SHALL BE INSTALLED, WHEREVER POSSIBLE, IN SUCH MANNER AS TO AVOID THE COLLECTION OF CONDENSED MOISTURE IN THE CONDUIT. DRAINS SHALL BE INSTALLED AT LOW POINTS IN EXPOSED CONDUIT RUNS.

11.1.l PULL POINTS SHALL BE PROVIDED IN EACH CONDUIT RUN TO CONFORM WITH THE REQUIREMENTS OF THE NEC OR CABLE MFR'S RECOMMENDATION.

11.1.m CONDUIT RUNS SHALL BE IDENTIFIED AT TERMINATIONS AND PULL POINTS WITH STAMPED ALUMINUM BANDS.

11.1.n EACH CONDUIT SHALL BE CLEANED OF ALL OBSTRUCTION BY PULLING A MANDREL THROUGH THE ENTIRE LENGTH OF RUN PRIOR TO PULLING WIRE OR CABLE IN CONDUIT.

11.1.o CONDUIT SEALING AND DRAINING SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC. SEALING METHODS SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SEAL MFR.

11.1.p CONDUIT UNIONS SHALL BE INSTALLED IN ALL CONDUITS CONNECTED TO TAPPED EQUIPMENT SO THAT THE EQUIPMENT CAN BE REMOVED WITHOUT DISTURBING THE CONDUIT (OR SEAL).

11.1.q ALL BOLTS, NUTS & WASHERS SHALL BE CADMIUM PLATED.

11.1.r ALL CONDUITS ROUTED TO EXTERIOR CABLE TRAYS SHALL ENTER THROUGH THE BOTTOM OF THE CABLE TRAY UON.

11.2 CONDUIT BENDS

11.2.a ALL BENDS SHALL HAVE RADIUS NOT LESS THAN SHOWN IN THE NEC OR SHALL BE MADE UP OF SCREW-JOINTED CONDUIT FITTINGS. NOT MORE THAN THE EQUIVALENT OF FOUR (4) 90° BENDS SHALL BE USED IN ANY RUN BETWEEN TERMINALS AND CABINETS, OR BETWEEN OUTLETS AND JUNCTION OR PULL BOXES.

11.2.b A GROUP OF EXPOSED CONDUITS THAT CHANGE DIRECTION UTILIZING BENDS SHALL HAVE THE MINIMUM BENDING RADIUS OF THE LARGEST CONDUIT IN THE GROUP FOR VERTICAL CHANGES AND SHALL HAVE THE SAME BEND RADIUS POINT FOR A HORIZONTAL CHANGE.

11.2.c BENDS SHALL BE FREE FROM CRACKS, CRIMPS OR OTHER DAMAGE TO THE CONDUIT OR ITS COATING. THE CONDUIT AFTER BENDING SHALL BE TRUE AND ROUND WITH FULL INSIDE AREAS FOR THE LENGTH OF THE BEND. CONDUIT BENDS SHALL COMPLY WITH NEC.

11.3 CONDUIT JOINTS

11.3.a ALL JOINTS IN ALUMINUM SHALL BE THREADED OR ALUMINUM PUSH FITTINGS. ALL CUT THREADS AND ANY WRENCH MARKS SHALL BE COATED WITH COLD SEALING COMPOUND. ALL THREADED JOINTS SHALL BE MADE UP TIGHT WITH A MINIMUM OF FIVE (5) FULL THREADS.

11.4 CABLE TRAY

11.4.a MATERIALS: TRAYS SHALL BE THE BRAND/MODEL INDICATED ON PLANS OR AS DESCRIBED IF NO SPECIFIC BRAND/MODEL IS GIVEN. SUBSTITUTIONS MUST BE APPROVED BY ENGINEER.

11.4.b CABLE TRAY AND TRAY SUPPORT MATERIALS, WHEN ASSEMBLED AND MOUNTED SHALL SUPPORT THE FULL CABLE LOAD WITH A MAXIMUM OF 2" DEFLECTION WITHOUT PERMANENT DEFORMATION.

11.4.c TRAY FITTINGS, SUCH AS BRANCHES, REDUCERS, FLAT ELBOWS, TEES AND CROSSES, SHALL BE USED FOR CHANGES IN DIRECTION. THE DIMENSIONS OF TRAY FITTINGS SHALL PROVIDE AMPLE BENDING RADIUS FOR THE CABLES CONTAINED IN THE TRAY. THE TERMINATION SHALL BE PROVIDED WITH A PROTECTOR GUARD TO PREVENT DAMAGE TO THE CABLES. AS REQUIRED, PROVIDE ADDITIONAL SUPPORTS FOR INDIVIDUAL CABLES WHERE THE CABLE LEAVES THE CABLE TRAY FOR FINAL TERMINATION.

11.4.d TRAYS SHALL BE CAREFULLY ALIGNED, LEVELED AND PLUMBED. TRAY SECTIONS AND FITTINGS SHALL BE ASSEMBLED ON THEIR SUPPORTS AND JOINTED TOGETHER, USING MFR'S STANDARD CONNECTOR UNITS.

11.4.e POWDER COATED STEEL ANGLES, TRAPEZE HANGERS, CHANNELS, BOLTING, AND MISCELLANEOUS MATERIALS REQUIRED FOR THE SUPPORT OF TRAYS FROM THE BUILDING STRUCTURE, SHALL BE ALUMINUM AND SUPPLIED AND INSTALLED BY THE CONTRACTOR.

11.4.f ALL EXTERIOR CABLE TRAYS TO BE SUPPLIED WITH COVERS, INSTALLED BY THE CONTRACTOR AFTER ALL CABLES ARE INSTALLED.

11.5 JUNCTION AND PULL BOXES

11.5.a MATERIALS: BOXES SHALL BE THE BRAND/MODEL INDICATED ON PLANS OR AS DESCRIBED IF NO SPECIFIC BRAND/MODEL IS GIVEN. ALL BOXES SHALL BE UL/FM RATED FOR LOCATION. SUBSTITUTIONS MUST BE APPROVED BY ENGINEER.

11.5.b BOXES FOR INDOOR INSTALLATION SHALL CONFORM TO THE FOLLOWING:

A. BE HEAVY DUTY POWDER COATED METAL OR ALUMINUM, WITH ALUMINUM COVERS AND BRONZE OR CADMIUM PLATED SCREWS OR BOLTS UNLESS OTHERWISE PERMITTED OR SPECIFIED.
B. BE NEMA 12 IN NON-HAZARDOUS AREAS OR AS SHOWN ON DRAWINGS AND HAVE GASKETED COVERS ON BOXES CONTAINING TERMINAL BLOCKS.
C. HAVE PIANO HINGED COVER AND INTERIOR MOUNTING PANEL WHERE USED FOR ENCLOSING TERMINAL BLOCKS AND CONTROL RELAYS.

11.5.c BOXES FOR OUTDOOR INSTALLATION SHALL CONFORM TO THE FOLLOWING:

A. BE HEAVY DUTY STAINLESS STEEL WITH STAINLESS STEEL COVERS. SCREWS OR BOLTS UNLESS OTHERWISE NOTED.
B. HAVE THREADED CONDUIT ENTRANCES SUCH AS "MYERS" HUBS, OR APPROVED EQUAL AND HAVE RUBBER OR NEOPRENE COVER GASKETS.
C. BE NEMA 4 WATERTIGHT IN OUTDOOR NON-HAZARDOUS AREAS AND HAVE A DRIP LIP AND OTHER FEATURES REQUIRED FOR RAIN TIGHT CONSTRUCTION; UNLESS OTHERWISE NOTED.
D. HAVE PIANO HINGED COVER AND INTERIOR MOUNTING PANELS WHEN USED FOR ENCLOSING TERMINAL BLOCKS, CONTROL RELAYS, ETC AND HAVE A DRAIN FITTING INSTALLED IN THE BOTTOM OF THE BOX.

11.5.d IDENTIFICATION: NAMEPLATES, WITH TITLE AND TAG NO., FABRICATED FROM PLASTIC WITH BLACK LETTERS ON WHITE BACKGROUND SHALL BE PERMANENTLY AFFIXED TO ALL JUNCTION BOXES.

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PAUL S. MOSCHELL
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NO	REVISION	DATE

SCALE:	AS NOTED
DATE:	07/30/26
DESIGNED BY:	CJZ & PSM
DRAWN BY:	PSM
CHECKED BY:	CJZ

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

ELECTRICAL - E SERIES

ELECTRICAL SPECIFICATIONS 1

PROJECT NO: 34495
DRAWING NAME: E-001
SHEET 14 OF 20

11.6 WIRE AND CABLE

11.6.a MATERIALS: ALL WIRE / CABLE SHALL BE COPPER (UON) AND ACCORDING TO THE CABLE SCHEDULES AND/OR CONSTRUCTION DRAWINGS. ANY DEVIATION MUST BE APPROVED BY ENGINEER & OWNER'S REPRESENTATIVE.

11.6.b ALL WIRE AND CABLE WILL BE EITHER INSTALLED IN RACEWAY OR CABLE TRAY PROVIDED.

11.6.c CABLE ON REELS AND WIRE IN COILS SHALL BE PROTECTED DURING SHIPMENT, STORAGE AND HANDLING. THE ENDS OF CABLES SHALL BE TAPED WHILE ON REELS AND AFTER INSTALLATION. TAPE WILL BE REMOVED ONLY WHEN READY TO TERMINATE WIRE.

11.6.d CONDUCTORS SHALL BE CONTINUOUS FROM TERMINATION TO TERMINATION. CABLES SHALL NOT BE SPLICED TO MAKE USE OF SHORT LENGTHS AND SHALL NOT BE CUT FOR CONVENIENCE OF PULLING. MFR'S INSTRUCTIONS OR RECOMMENDATIONS FOR INSTALLATION, WIRING ACCESSORIES OR OTHER WIRING MATERIALS SHALL BE FOLLOWED.

11.6.e WHERE MULTI-CONDUCTOR CABLES ENTER CONTROL PANELS AND CABINETS, THE OUTER JACKET SHALL NOT BE STRIPPED BEYOND THE POINT WHERE THE FIRST CONDUCTOR LEAVES THE CABLE TO CONNECT TO THE TERMINAL STRIP. IF JACKET IS STRIPPED IN EXCESS OF THE ABOVE FROM ANY CABLE, THE CABLE SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

11.6.f THE PULLING OF WIRING INTO CONDUIT OR OTHER RACEWAYS SHALL BE DONE WITH ALL POSSIBLE CARE. THE CABLE REELS OR COILS SHALL BE SET UP IN SUCH A WAY THAT THE CONDUCTOR MAY BE TRAINED INTO THE RACEWAY AS DIRECTLY AS POSSIBLE WITH A MINIMUM NUMBER OF CHANGES OF DIRECTION AND BENDING. WHERE SEVERAL CABLES ARE CONTAINED IN ONE CONDUIT, ALL SUCH CABLES SHALL BE PULLED IN TOGETHER. PULLING COMPOUND OR POWDERED SOAPSTONE SHALL BE COMPATIBLE WITH THE CABLE INSULATION AND APPROVED FOR USE BY THE CABLE MFR. CABLE PULLING TENSIONS SHALL NOT EXCEED VALUES SPECIFIED BY THE CABLE MFR.

11.6.g ALL CONDUCTORS SHALL BE TERMINATED IN STRICT ACCORDANCE WITH THE MFRS' RECOMMENDED METHODS. PARTICULAR CARE AND COMPLIANCE WITH MFRS' INSTRUCTIONS SHALL BE UTILIZED IN CONNECTION WITH TERMINATING HIGH VOLTAGE CABLES. ALL CONDUCTORS SHALL BE CLEAN WHEN CONNECTIONS ARE MADE. WIRES, BUS BARS, AND POINTS OF CONTACT SHALL BE CLEANED WITH STEEL WOOL OR SAND PAPER TO REMOVE OXIDES AND DIRT.

11.6.h ALL CONNECTIONS SHALL BE MADE WITH PRESSURE TYPE CONNECTORS INSTALLED WITH THE TOOL RECOMMENDED BY THE MFR. ALL CONNECTORS SHALL BE RING TYPE. THE RING SHALL NOT BE CUT TO FACILITATE INSTALLATION. TAPED CONNECTIONS SHALL HAVE LAYERS OF INSULATING TAPE BUILT UP TO A THICKNESS NOT LESS THAN THE THICKNESS OF THE INSULATION ON THE CABLES BEING CONNECTED.

11.6.i LUGS SHALL BE USED FOR THE CONNECTION OF CABLES TO EQUIPMENT AND BUSES. PRESSED LUGS SHALL BE USED ON WIRES SIZED #8 AWG AND SMALLER, CAST LUGS SHALL BE USED ON WIRES LARGER THAN #8 AWG.

11.6.j POWER CABLE FOR ALL CIRCUITS 400 VOLTS AND ABOVE SHALL BE IDENTIFIED AT TERMINATIONS AND BOXES WITH HEAVY GAUGE STAMPED ALUMINUM BANDS. HEAT SHRINK WIRE MARKERS SHALL BE INSTALLED ON MOTOR, CONTROL AND INSTRUMENT LEADS AND THERMOCOUPLES AT ALL TERMINAL POINTS. IDENTIFICATION SHALL BE IN ACCORDANCE WITH THE DRAWINGS. COLORED WIRE MARKERS SHALL BE INSTALLED ON ALL FEEDERS AND INSULATED GROUNDLEADS AT ALL TERMINAL POINTS WHERE COLOR CODED WIRE IS NOT USED. COLOR CODE AS FOLLOWS:

	208/120VAC	480/277VAC	415/240VAC	
PHASE A	BLACK	BROWN		BROWN
PHASE B	RED	ORANGE		ORANGE
PHASE C	BLUE	YELLOW		YELLOW
NEUTRAL	WHITE	GREY	GREY	

11.6.k CONTROL WIRING COLOR CODES SHALL BE IN ACCORDANCE WITH SPECIFIC WIRING DRAWINGS.

11.6.l CONTROL WIRING IDENTIFICATION SHALL BE IN ACCORDANCE WITH SPECIFIC WIRING DIAGRAMS AND SCHEMATICS.

11.6.m AFTER INSTALLATION OF WIRING AND ASSOCIATED DEVICES HAS BEEN COMPLETED, ELECTRICAL CONDUCTORS SHALL BE TESTED TO ENSURE CONTINUITY, PROPER SPLICING AND FREEDOM FROM GROUND (EXCEPT "MADE GROUND" AND THOSE REQUIRED FOR PROTECTION). ALL 480VAC CIRCUITS AND ABOVE SHALL HAVE INSULATION RESISTANCE TEST COMPLETED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND UL REQUIREMENTS UTILIZING A MEGGER. DO NOT HI-POT THE CABLES AS THIS SHALL BE CONSIDERED DESTRUCTIVE.

11.7 ELECTRICAL EQUIPMENT AND DEVICES

11.7.a MATERIALS: EQUIPMENT/DEVICES SHALL BE THE BRAND/MODEL INDICATED ON PLANS OR AS DESCRIBED IF NO SPECIFIC BRAND/MODEL IS GIVEN. ALL EQUIPMENT/DEVICES SHALL BE UL/FM RATED FOR LOCATION. SUBSTITUTIONS MUST BE APPROVED BY ENGINEER.

11.7.b ALL EQUIPMENT SHALL BE COMPLETELY ASSEMBLED, INSTALLED AND CONNECTED AS SHOWN ON THE COMPANY OR MFR'S DRAWINGS AND SHALL BE FULLY PREPARED AND MADE READY FOR OPERATION AS NECESSARY BY THE CONTRACTOR. THE CONTRACTOR MAY HAVE THE USE OF ANY SPECIAL TOOLS FURNISHED WITH THE EQUIPMENT SPECIFICALLY FOR INSTALLATION PURPOSES. THE CONTRACTOR SHALL BECOME KNOWLEDGEABLE WITH AND FOLLOW SPECIAL INSTRUCTIONS OF THE MFR FOR THE HANDLING AND INSTALLATION OF THE EQUIPMENT.

11.7.c WHERE EQUIPMENT IS MOUNTED ON WALLS AND/OR COLUMNS CONTRACTOR SHALL PROVIDE STRUCTURAL STEEL SUPPORTS AND SUITABLE ANCHORS.

11.7.d AFTER INSTALLATION, ALL EQUIPMENT SHALL BE LEFT IN A CLEAN CONDITION. ALL INSULATORS, BUSHINGS, INSULATING MATERIALS AND OTHER PARTS WHICH ARE DEPENDED UPON FOR THEIR INSULATING QUALITIES SHALL BE THOROUGHLY CLEANED. NO OVERALL PAINTING OF EQUIPMENT WILL BE REQUIRED, BUT HOUSING SURFACES WHICH HAVE BEEN SOILED OR MARRED SHALL BE TOUCHED UP OR REFINISHED WITH PRIMER AND TOP COAT PAINT TO MATCH THE EQUIPMENT. DURING INSTALLATION, THE CONTRACTOR SHALL TAKE ALL POSSIBLE CARE TO KEEP THE DOORS OF SWITCHGEAR ASSEMBLIES, MOTOR CONTROL CENTERS AND PANELBOARDS CLOSED IN ORDER TO PREVENT THE ENTRANCE OF DUST AND OTHER FOREIGN MATTER.

11.7.e CONTRACTOR SHALL PROPERLY GROUND ALL EQUIPMENT, RACEWAYS, AND ANY SERVICE CONDUCTOR THAT IS TO BE GROUNDED IN ACCORDANCE WITH THE NEC AND ELECTRIC UTILITY COMPANY REQUIREMENTS.

11.7.f ANY POWERHOUSE, MOTOR CONTROL CENTER OR SWITCHGEAR SHALL BE SET AND SECURED ON ITS SUPPORTS. THE NECESSARY CONNECTIONS BETWEEN SECTIONS TO FORM A COMPLETELY ASSEMBLED AND INTERCONNECTED GROUP SHALL BE MADE INCLUDING INSTALLATION OF REMOVABLE CIRCUIT BREAKERS, POTENTIAL TRANSFORMERS, AND COMPLETING ALL EXTERNAL CONNECTIONS, THE RAILS ADJUSTED TO ENSURE SMOOTH BREAKER TRAVEL AND CONTACTS ON THE HOUSING SHALL BE INSPECTED AND TIGHTENED IF FOUND LOOSE.

11.7.g ARC FLASH HAZARD WARNINGS SHALL BE ATTACHED TO ALL APPLICABLE EQUIPMENT PER NEC 2014, SECTION 110.16.

11.7.h ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES, AND EQUIPMENT SHALL BE LABELED AND LISTED BY CERTIFIED TESTING LABORATORY OR AGENCY.

11.8.i ALL INTERIOR DISTRIBUTION EQUIPMENT WITH TERMINATIONS (IE PANELBOARDS, SWITCHBOARDS, DISCONNECT/STARTERS, CONTROL PANELS, TRANSFORMERS, VFDs, MCCs) SHALL BE NEMA TYPE 12 WITH RATING OF BEING DUST TIGHT.

11.8 CONDUIT

11.8.a MATERIALS: ALL CONDUITS SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE NOTED. ALL CONCRETE SHALL BE 3000PSI MINIMUM AND DYED RED THROUGHOUT.

11.8.b ALL UNDERGROUND UTILITY CONDUITS SHALL HAVE 3000PSI CONCRETE ENCASEMENT DYED RED ON THE TOP. 6" MINIMUM CONCRETE COVER AND 24" BELOW FINISHED GRADE WITH EXCEPTIONS AS ALLOWED BY THE NEC. CONDUIT SHALL BE FIRMLY FIXED IN PLACE BY BEING WIRED TO REINFORCING STEEL OR BY OTHER APPROVED MEANS TO AVOID BEING DISTURBED DURING BACKFILLING OR POURING OF CONCRETE. SEE DETAILS ON PLANS.

11.8.c INSTALL #2/0 HMWPE GROUND CABLE IN CONCRETE.

11.8.d CONTRACTOR TO USE SPACERS EVERY 60" MAXIMUM. (CARLON SNAP-N-STAC OR EQUAL)

11.9 GROUNDING

11.9.a MATERIALS:

A. GROUND RODS: COPPER-CLAD STEEL

B. GROUND BUS: RECTANGULAR BARS OF ANNEALED COPPER, 1/4 X 2 INCHES IN CROSS SECTION WITH INSULATORS

C. GROUNDING ELECTRODE CONDUCTORS: BARE COPPER

D. BONDING JUMPERS: BARE COPPER

E. EQUIPMENT GROUNDING CONDUCTORS: COPPER WITH GREEN-COLORED INSULATION

F. UNDERGROUND GROUNDING CONDUCTORS: SOFT DRAWN BARE COPPER

G. GROUNDING CONNECTORS: BRONZE SUITABLE FOR GROUNDING AND BONDING APPLICATIONS, IN CONFIGURATIONS REQUIRED FOR PARTICULAR INSTALLATION.

11.9.b GROUNDING SHALL BE IN ACCORDANCE WITH NFPA 70 AND DETAILS/NOTES HEREIN PLAN SET.

11.9.c. NON-CURRENT CARRYING PARTS OF ALL ELECTRICAL EQUIPMENT SHALL BE BONDED TO THE EQUIPMENT GROUND SERVING THIS EQUIPMENT.

11.9.d INSTALL SEPARATE EQUIPMENT GROUNDING CONDUCTOR IN CONDUITS WITH ALL BRANCH CIRCUITS AND FEEDERS. SIZE EQUIPMENT GROUNDING CONDUCTORS IN ACCORDANCE WITH NFPA 70. TERMINATE EACH END ON SUITABLE LUG, BUS, OR BUSHING.

11.9.e INSTALL SOLID CONDUCTORS FOR NO. 10 AWG AND SMALLER, AND STRANDED FOR NO. 8 AND LARGER.

11.9.e BURY UNDERGROUND GROUNDING CONDUCTORS AT LEAST 30 INCHES BELOW GRADE.

11.9.f ISOLATED GROUNDING CONDUCTORS: GREEN-COLORED WITH CONTINUOUS YELLOW STRIPE. ON FEEDERS WITH ISOLATED GROUND, IDENTIFY GROUNDING CONDUCTOR WHERE VISIBLE TO NORMAL INSPECTION, WITH ALTERNATING BANDS OF GREEN AND YELLOW TAPE, WITH AT LEAST THREE BANDS OF GREEN AND TWO BANDS OF YELLOW.

11.9.g ISOLATED GROUNDING RECEPTACLE CIRCUITS: INSTALL AN ISOLATED EQUIPMENT GROUNDING CONDUCTOR CONNECTED TO THE RECEPTACLE GROUNDING TERMINAL. ISOLATE CONDUCTOR FROM RACEWAY AND FROM PANELBOARD GROUNDING TERMINALS. TERMINATE AT EQUIPMENT GROUNDING TERMINAL OF THE APPLICABLE DERIVED SYSTEM OR SERVICE, UNLESS OTHERWISE INDICATED.

11.9.h PERFORM TESTS AND INSPECTIONS.

A. INSPECT PHYSICAL AND MECHANICAL CONDITION. VERIFY TIGHTNESS OF ALL BOLTED CONNECTIONS WITH CALIBRATED TORQUE WRENCH ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

B. TEST GROUND RESISTANCE AT SERVICE DISCONNECT ENCLOSURE GROUNDING TERMINAL, AT GROUND TEST WELLS, AND AT INDIVIDUAL GROUND RODS. MAXIMUM MEASURED GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS.

C. MEASURE GROUND RESISTANCE NO FEWER THAN TWO FULL DAYS AFTER LAST TRACE OF PRECIPITATION AND WITHOUT SOIL BEING MOISTENED BY ANY MEANS.

PREPARE AND SUBMIT TEST AND INSPECTION REPORTS. TURNOVER REPORTS TO COMMISSIONING AGENT.

11.10 LIGHTNING PROTECTION

11.10.a DESIGN & MATERIALS: THE DESIGN AND ALL MATERIALS SHALL CONFORM TO THE CODE REQUIREMENTS OF THE NFPA 780, LIGHTNING PROTECTION INSTITUTE 175 AND UL 96 AND 96A.

A. AIR TERMINALS SHALL BE UTILIZED.

B. COPPER MATERIALS SHALL BE USED FOR CONTACT WITH COPPER SURFACES, THE EARTH, ALKALINE-BASE PAINT, CONCRETE OR MASONRY, OR EXCESSIVE MOISTURE SUCH AS FLAT ROOFS; IN ACCORDANCE WITH NFPA 780 4.2, UL 96A 7, AND LPI 175 18--23.

C. ALUMINUM MATERIALS SHALL BE USED ON ALUMINUM, GALVANIZED STEEL, OR PAINTED METAL SURFACES; IN ACCORDANCE WITH NFPA 780 4.2, UL 96A 7, AND LPI 175 18--23.

D. ALL CONDUCTORS SHALL BE COPPER.

11.10.b ONLY APPROVED ADHESIVE SHALL BE USED ON MEMBRANE ROOF AREAS TO SECURE THE CABLES AND BASES IN POSITION. NO MECHANICAL FASTENERS SHALL BE DRIVEN INTO THE MEMBRANE ROOFING.

11.10.c. CABLE FASTENERS SHALL BE SPACED NO MORE THAN 36" ON CENTER USING SOLD COPPER OR ALUMINUM CLIPS WITH STAINLESS STEEL PINS ON MASONRY SURFACES AND STAINLESS STEEL NAILS ON NAILING SURFACES.

11.10.d. AIR TERMINALS SHALL BE APPLIED TO ALL BUILDINGS WITH SHEET METAL ROOFS OR BUILDINGS NOT OF STEEL MEMBER CONSTRUCTION. EXCEPTIONS TO THIS REQUIREMENT SHALL BE GIVEN TO BUILDINGS ADEQUATELY PROTECTED BY HIGHER LOCATED SYSTEMS, PER NFPA 780.

11.10.e. METAL BODIES WITHIN 72" OF LPS CONDUCTORS SHALL BE BONDED AS REQUIRED BY NFPA 780 4.19, UL 96A 11, AND LPI 175 110.

12. IDENTIFICATION NAMEPLATES AND LABELS

12.1 IDENTIFICATION NAMEPLATES:

12.1.a MATERIALS:

A. INDOOR CLEAN, DRY LOCATIONS: USE PLASTIC NAMEPLATES.

B. OUTDOOR LOCATIONS: USE PLASTIC SUITABLE FOR EXTERIOR USE.

C. MOTORS AND INSTRUMENT CONNECTION - STAINLESS STEEL IDENTIFICATION TAG.

12.1.b PLASTIC NAMEPLATES: TWO-LAYER OR THREE-LAYER LAMINATED ACRYLIC OR

ELECTRICALLY NON-CONDUCTIVE PHENOLIC WITH BEVELED EDGES; MINIMUM THICKNESS OF 1/16 INCH (1.6 MM); ENGRAVED TEXT.

12.1.c MOUNTING HOLES FOR MECHANICAL FASTENERS: TWO, CENTERED ON SIDES FOR SIZES UP TO 1 INCH (25 MM) HIGH; FOUR, LOCATED AT CORNERS FOR LARGER SIZES.

12.2. IDENTIFICATION LABELS:

12.2.a MATERIALS: USE SELF-ADHESIVE LAMINATED PLASTIC LABELS; UV, CHEMICAL, WATER, HEAT, AND ABRASION RESISTANT.

A. USE ONLY FOR INDOOR LOCATIONS ON ALL NON-EQUIPMENT UNLESS OTHERWISE NOTED.

12.2.b TEXT: USE FACTORY PRE-PRINTED OR MACHINE-PRINTED TEXT. DO NOT USE HANDWRITTEN TEXT UNLESS OTHERWISE INDICATED.

12.3 FORMAT FOR EQUIPMENT IDENTIFICATION:

12.3.a MINIMUM SIZE: 1 INCH (25 MM) BY 2.5 INCHES (64 MM).

12.3.b. LEGEND:

A. EQUIPMENT DESIGNATION OR OTHER APPROVED DESCRIPTION.

B. OTHER INFORMATION AS INDICATED.

12.3.c TEXT: ALL CAPITALIZED UNLESS OTHERWISE INDICATED.

12.3.d MINIMUM TEXT HEIGHT:

A. SYSTEM DESIGNATION: 1 INCH (25 MM).

B. EQUIPMENT DESIGNATION: 1/2 INCH (13 MM).

C. OTHER INFORMATION: 1/4 INCH (6 MM).

D. EXCEPTION: PROVIDE MINIMUM TEXT HEIGHT OF 1 INCH (25 MM) FOR EQUIPMENT

LOCATED MORE THAN 10 FEET (3.0 M) ABOVE FLOOR OR WORKING PLATFORM.

12.3.e COLOR:

A. NORMAL POWER SYSTEM: WHITE TEXT ON BLACK BACKGROUND.

12.4 FINAL CONNECTIONS TO ALL MOTORS AND INSTRUMENTS WILL BE SUPPLIED WITH A STAINLESS STEEL TAG IDENTIFYING THE EQUIPMENT (UON ON PLANS OR IN SPECIFICATIONS SECTION 26). THE IDENTIFICATION TAG WILL BE SUPPLIED ON THE CONNECTION POINT, NOT THE EQUIPMENT, TO FACILITATE FUTURE REPLACEMENT.

12.5 TERMINAL BLOCKS WILL BE CLEARLY LABELED AT EACH TERMINATION POINT. THE LABELING SYSTEM WILL BE TYPED, NOT WRITTEN AND WILL PROTECT THE LETTERING.

13. WIRE AND CABLE MARKERS

13.1 MARKERS FOR CONDUCTORS AND CABLES: USE WRAP-AROUND SELF-ADHESIVE VINYL

CLOTH, WRAP-AROUND SELF-ADHESIVE VINYL SELF-LAMINATING, HEAT-SHRINK SLEEVE, OR PLASTIC SLEEVE.

13.2 MARKERS FOR CONDUCTOR AND CABLE BUNDLES: USE PLASTIC MARKER TAGS SECURED

BY NYLON CABLE TIES.

13.3 LEGEND: POWER SOURCE AND CIRCUIT NUMBER OR OTHER DESIGNATION INDICATED.

13.4. TEXT: USE FACTORY PRE-PRINTED OR MACHINE-PRINTED TEXT, ALL CAPITALIZED UNLESS

OTHERWISE INDICATED.

13.4.a DO NOT USE HANDWRITTEN TEXT.

13.5 MINIMUM TEXT HEIGHT: 1/8 INCH (3 MM)

13.6 COLOR: BLACK TEXT ON WHITE BACKGROUND UNLESS OTHERWISE INDICATED.

14. GENERAL MOUNTING HEIGHTS

14.1 MOUNT DEVICES AT HEIGHTS INDICATED BELOW UNLESS OTHERWISE NOTED ON PLANS. HEIGHTS ARE TO CENTER OF DEVICE (UON). WHERE A DEVICE NOT LISTED BELOW IS BEING INSTALLED, MOUNTING HEIGHT SHALL FOLLOW ANY REGULATION REQUIREMENTS, TYPICAL INDUSTRY STANDARDS AND/OR MANUFACTURERS REQUIREMENTS.

LIGHT SWITCHES	48"
RECEPTACLE, GENERAL	18"
RECEPTACLE, COUNTER	6" ABOVE COUNTERTOP
SPECIAL PURPOSE OUTLET	AS NOTED OR APPROPRIATE FOR USE
TELEPHONE/DATA	18", 60" FOR STANDING LOCATIONS
THERMOSTAT	60"
PUSHBUTTONS	48"
INTERCOMS	54" INTERIOR, 48" EXTERIOR
CARD READERS	48"
FIRE ALARM HORN/STROBE	80"-96" WALL MOUNTED, 30' MAXIMUM CEILING MOUNTED
FIRE ALARM PULL STATION	48"
LIGHTING FIXTURES	AS INDICATED ON SCHEDULE
PANELBOARDS	TOP AT 78"
SAFETY SWITCHES	60" OR ADJACENT DEVICE SERVED AS ALLOWED PER CODE
HMI SCREENED DEVICE	60" AT SCREEN (WALL MOUNTED)

14.2 HEIGHTS ARE FOR REFERENCE AND ALL NATIONAL OR LOCAL CODES SHALL TAKE PRECEDENCE. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO CONFIRM HEIGHTS PRIOR TO ROUGH-IN.

GENERAL ABBREVIATIONS:

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AWG	AMERICAN WIRE GAUGE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BOD	BASIS OF DESIGN
CB	CIRCUIT BREAKER
CDP	CONTROLS DISTRIBUTION PANEL
C	CONDUIT
CLG	CEILING
CP	CAPPED / PLUGGED CONDUIT (SPARE)
CU Cu	COPPER
DS	DISCONNECT SWITCH
EC	ELECTRICAL CONTRACTOR
ETR	EXISTING TO REMAIN
FD	FIELD DETERMINE
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTING
GFI	GROUND FAULT INTERRUPTING
GND	GROUND
HC	HVAC CONTRACTOR
HP	HORSE POWER
HPS	HIGH PRESSURE SODIUM
HSS	HOLLOW STRUCTURAL STEEL
I/O	INPUT / OUTPUT
JB	JUNCTION BOX
KW kW	KILOWATT
KVA	KILO-VOLT AMPS
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MFR'S	MANUFACTURER'S
MLO	MAIN LUGS ONLY
PB	PULL BOX
QTY	QUANTITY
RGS	RIGID GALVANIZED STEEL
RPR	RESIDENT PROJECT REPRESENTATIVE
SCH	SCHEDULE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT
VAC	VOLT ALTERNATING CURRENT
VCR	VACUUM RECLOSER
VFD	VARIABLE FREQUENCY DRIVE
XFMR	TRANSFORMER

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NO	REVISION	DATE

SCALE: AS NOTED
DATE: 07/30/26
DESIGNED BY: CJZ & PSM
DRAWN BY: PSM
CHECKED BY: CJZ

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

ELECTRICAL - E SERIES

ELECTRICAL SPECIFICATIONS 2

PROJECT NO: 34495
DRAWING NAME: E-002
SHEET: 15 OF: 20

PLAN SYMBOLS

ABBREVIATIONS

27	UNDER VOLTAGE RELAY
2SFVNR	2 SPEED FULL VOLTAGE NONREVERSING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AWG	AMERICAN WIRE GAUGE
AMP	AMP FRAME
AM	AMMETER
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
CA	AC CONDUIT
CB	CIRCUIT BREAKER
CB	COMPRESSOR BUILDING
CD	DC AND COMMON CONDUIT
CDP	CONTROLS DISTRIBUTION PANEL
C	CONDUIT
CLG	CEILING
CT	CURRENT TRANSFORMER
CU, Cu	COPPER
EC	ELECTRICAL CONTRACTOR
ETR	EXISTING TO REMAIN
FD	FIELD DETERMINE
FLA	FULL LOAD AMPS
FM	FREQUENCY METER
FMC	FLEXIBLE METAL CONDUIT
FO	FIBER OPTIC
FVC	FULL VOLTAGE CONTACTOR
FVNR	FULL VOLTAGE NON REVERSING
GC	GENERAL CONTRACTOR
GFCI, GFI	GROUND FAULT CIRCUIT INTERRUPTING
GND	GROUND
HD	HEAVY DUTY RATED
HP	HORSE POWER
HSS	HOLLOW STRUCTURAL STEEL
I/O	INPUT / OUTPUT
J, JB	JUNCTION BOX
KAIC	KILO AMPERE INTERRUPT CAPACITY
KVA	KILO VOLT AMPERE
KW	KILOWATT
LFMC	LIQUID-TIGHT FLEXIBLE METAL CONDUIT
LRA	LOCKED ROTOR AMPS
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDP	MAIN DISTRIBUTION PANEL
MFR'S	MANUFACTURER'S
MLO	MAIN LUGS ONLY
MPF	MOTOR PROTECTION FILTER
MPR	MOTOR PROTECTIVE RELAY
MS	MOTOR STARTER
OL	OVERLOAD
PB	PULL BOX
PF	POWER FACTOR
PT	POTENTIAL TRANSFORMER
QTY	QUANTITY
RGS	RIGID GALVANIZED STEEL
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RTD	RESISTANCE TEMPERATURE DETECTOR
SCH	SCHEDULE
ST	SHUNT TRIP
TRNSFMR	TRANSFORMER
TYP	TYPICAL
UGE	UNDERGROUND ELECTRIC
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V, VAC	VOLT ALTERNATING CURRENT
VDC	VOLT DIRECT CURRENT
VAR	VOLT AMP REACTANCE
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLT METER
WHM	WATT HOUR METER
WM	WATT METER
XFMR	TRANSFORMER

COMMON EQUIPMENT TAG SUFFIX:

P	POWER
C	CONTROL
I	INSTRUMENTATION
COM	COMMUNICATION
FO	FIBER OPTIC
LSX	LIGHT SWITCH (X = SEQ. #)
RECX	RECEPTACLE (X = SEQ. #)
WP	WEATHERPROOF

(ST) SHUNT TRIP BREAKER

(GF) GROUND FAULT EQUIPMENT PROTECTION

DETAIL STANDARD NUMBER
DETAIL DRAWING SHEET NUMBER

SECTION CUT NUMBER
SECTION CUT DRAWING

(X) BILL OF MATERIAL ITEM NUMBER
X = NUMBER OF THE ITEM

AREA CLASSIFICATION

CLASS 1, DIVISION 1
GROUP C&D

CLASS 1, DIVISION 2
GROUP C&D

INTRUMENTATION/CONTROLS TRANSMITTERS

LS	POSITION - LIMIT SWITCH
HL	HIGH LEVEL SWITCH
LL	LOW LEVEL SWITCH
SS	SPEED SWITCH
DS	DIRECTIONAL CONTROL SOLENOID
SV	SOLENOID VALVE
LT	LEVEL TRANSMITTER
PT	PRESSURE TRANSMITTER
PC	PLUGGED CHUTE

CABLE ID TAG AND MATRIX

EXAMPLES:

DEVICE / EQUIPMENT / P&ID TAG - ABBREV. — POWER SOURCE ID, LOCATION OR INSTRUMENT NUMBER * — SEQUENCE #

CABLE/WIRE TYPE

P = 50 VAC - 600 VAC
U = UTILITY >600 VAC
N = NETWORK (CAT 6, FIBER, MODBUS, ETC.)
I = 4 - 20 mA
C = 24 VDC (CONTROL)

ILT = INTERIOR LIGHTS
EXL = EXTERIOR LIGHTS
EML = EMERGENCY LIGHTS
CVF = COMPRESSOR VENT. FAN
REC = RECEPTACLE
RIO = RIO PANEL
PIT = PRESSURE INDICATOR TRNSMTR
LSH = LIMIT SWITCH HIGH
(ETC...)

MDP = MAIN DISTRIBUTION PANEL
DP1 = DISTRIBUTION PANEL 1
DP2 = DISTRIBUTION PANEL 2
UPS = UNINTERRUPTIBLE POWER SUPPLY
(OR PANEL DESIGNATION AS INDICATED ON PLANS)

INSTRUMENT NUMBER
*AS INDICATED ON PLANS

AS PER PLAN

POWER

EQUIPMENT SHOWN WITH SCHEDULE SEQUENCE NUMBER AND/OR CIRCUIT NO.

MCC/3A — MOTOR (HP,VOLTAGE AS INDICATED)
SPECIAL PURPOSE RECEPTACLE
REC1 DP1/3 — INDUSTRIAL GRADE SINGLE RECEPTACLE 125V, 20A (UON), SEQUENCE NO. & CIRCUIT NO.
REC2 DP1/2 — INDUSTRIAL GRADE DUPLEX RECEPTACLE 125V, 20A, SEQUENCE NO. & CIRCUIT NO.
REC3 DP1/4 — EXPLOSION PROOF RECEPTACLE
HD DISCONNECT SWITHCH
HD STARTER
HD COMBINATION STARTER/DISCONNECT
$M — MOTOR RATED SWITCH
START-STOP EMERGENCY MUSHROOM HEAD PULL STATION
CONTROLLER - ON/OFF PUSHBUTTONS
VF — VENTILATION FAN

LIGHTING

FIXTURES SHOWN WITH SCHEDULE DESIGNATOR & SEQUENCE NUMBER.

A3 — LIGHT FIXTURE, WALL MOUNT
B3 — LIGHT FIXTURE, STANCHION MOUNT
D5 — LIGHT FIXTURE, SUSPENDED
E7 — LIGHT FIXTURE, WALL MOUNT, EMERGENCY
C5 — LIGHT FIXTURE, SUSPENDED, EMERGENCY
BATTERY BACK-UP EMERGENCY EGRESS LIGHT, TWO HEADED
EXIT SIGN, EMERGENCY EGRESS LIGHT COMBINATION W/BATTERY BACK-UP (UON)
EXIT SIGN W/BATTERY BACK-UP (UON) CEILING & WALL MOUNT
FLOODLIGHT FIXTURE, WALL MOUNT
POLE-MOUNTED TWIN HEADED FLOOD LIGHT
POLE-MOUNTED SINGLE HEADED FLOOD LIGHT
LINEAR LIGHT FIXTURE FLUSH, SURFACE OR SUSPENDED MOUNTING AS INDICATED (SIZE SCALED TO PLAN)
EMERGENCY LINEAR LIGHT FIXTURE FLUSH, SURFACE OR SUSPENDED MOUNTING AS INDICATED (SIZE SCALED TO PLAN)
LS1 $ — LIGHT SWITCH, SINGLE POLE
LS2 $3 — LIGHT SWITCH, 3-WAY
LS3 $4 — LIGHT SWITCH, 4-WAY
PHOTOCELL
VS — OCCUPANCY SENSOR / VACANCY SENSOR

CONDUIT & CABLE

EXPOSED CONDUIT OR CABLE RUN
BELOW GRADE OR SURFACE (UON)
CONDUIT OR CABLE HOME RUN
CONDUIT OR CABLE, TURNED DOWN
CONDUIT OR CABLE, TURNED UP
CONDUIT CAPPED
CONDUIT FITTING, 45° ELBOW
CONDUIT FITTING, TEE
CONDUIT FITTING, ELL
CONDUIT FITTING, TEE UP
CONDUIT FITTING, TEE DOWN
CONDUIT FITTING, ELL DOWN
CONDUIT FITTING, ELL UP
CONDUIT FITTING, UNION
CONDUIT FITTING, SEAL (EYS)
CONDUIT FITTING, SEAL (EYD)
MAIN GROUND LOOP, #2/0 AWG Cu, GREEN TYPE TW, 600V,GROUND WIRE, 30" MIN. BFG
EQUIPMENT GROUND TAP, 600V, Cu., GREEN TW INSULATION, #2 AWG MIN. (UON)
FLEXIBLE CONDUIT
CABLE/WIRE CROSSING NOT CONNECTED
CABLE/WIRE CONNECTED

GROUNDING & LIGHTNING PROTECTION

LIGHTNING DISSIPATOR
LIGHTNING ROD
GROUND ROD TEST WELL
GROUND ROD
EXOTHERMIC GROUND CONNECTION
MECHANICAL GROUND CONNECTION
BRANCH TAP GROUND BAR

HEAT TRACE

P — POWER CONNECTION BOX
T — POWER SPLICE (TEE) CONNECTION BOX
END SEAL KIT
HEAT TRACE

ANCILLARY SYSTEMS

U.V. FIRE DETECTOR SENSOR
GAS OR SMOKE DETECTOR SENSOR
SURVEILLANCE CAMERA
HORN OR SIREN
T — THERMOSTAT
ESD STATION

SINGLE LINE AND SCHEMATIC DIAGRAM SYMBOLS

SS / OL — SOLID STATE OVERLOAD RELAY
SPACE HEATER
SOLENOID
+ (–) — DIODE
INDUCTOR
CAPACITOR
VAR - VOLTAGE ADJUSTING RHEOSTAT
SAR - SPEED ADJUSTING RHEOSTAT
VENDOR WIRING (SCHEMATIC ONLY)
FIELD WIRING (SCHEMATIC ONLY)
HP — SINGLE Ø MSCALEOTOR WITH ESTIMATED HORSEPOWER AS INDICATED
MOTOR THERMAL OVERLOAD RELAY
OL — MOTOR OVERLOAD THERMAL CONTACTS
NORMALLY OPEN CONTACT
NORMALLY CLOSED CONTACT
15A — CIRCUIT BREAKER, SIZE AS INDICATED
SEPARABLE CONNECTOR (STAB-IN)
BUS TIE OR WIRING TERMINATION POINT
15A — FUSE, SIZE AS INDICATED

OPERATING COILS-RELAYS-TIMERS, ETC.
CR CONTROL RELAY
M MOTOR CONTACTOR
T TIME RELAY
C CONTACTOR - LIGHTING, HEATER, ETC.

START — MOMENTARY PUSHBUTTON - NORMALLY OPEN
STOP — MOMENTARY PUSHBUTTON - NORMALLY CLOSED
H O A — THREE POSITION MAINTAINED CONTACT SELECTOR SWITCH - "HAND-OFF-AUTO"
OFF ON — TWO POSITION MAINTAINED CONTACT SELECTOR SWITCH - "ON-OFF"

PILOT LIGHT
R - RED
G - GREEN
W - WHITE
B - BLUE
A - AMBER

GROUND, EARTH
GROUND, CHASSIS
N E L — AUTOMATIC TRANSFER SWITCH N-NORMAL, E-EMERGENCY, L-LOCKED
SCP — STATION CONTROL PANEL
ESD — EMERGENCY SHUT DOWN

TERMINAL	LOCATION
	MOTOR CONTROL CENTER
X	MOTOR STARTER TERMINAL
	PLC OUTPUT
	PLC INPUT
CR	INTERPOSING RELAY LOCATED IN STARTER ENCLOSURE
	DEVICE TERMINAL
	LIGHTING PHOTOCELL
	ENGINE CONTROL PANEL
	LOCAL CONTROL PANEL
	ENGINE JUNCTION BOX
	MARSHALLING CABINET
	TERMINAL IN PLC
	DCS TERMINAL
	MASTER PANEL JUNCTION BOX
	PNEUMATIC PANEL JUNCTION BOX
	TERMINAL JUNCTION BOX

LIMIT SWITCH, NORMALLY CLOSED
LIMIT SWITCH, NORMALLY CLOSED, HELD OPEN.
LIMIT SWITCH, NORMALLY OPEN
LIMIT SWITCH, NORMALLY OPEN, HELD CLOSED.
VIBRATION SWITCH, NORMALLY CLOSED
PRESSURE OR VACUUM ACTUATED SWITCH, OPENING ON RISING PRESSURE
PRESSURE OR VACUUM ACTUATED SWITCH CLOSING, ON RISING PRESSURE
LIQUID LEVEL ACTUATED SWITCH, OPENS ON RISING LEVEL
LIQUID LEVEL ACTUATED SWITCH, CLOSES ON RISING LEVEL
TEMPERATURE ACTUATED SWITCH, OPENS ON RISING TEMPERATURE
TEMPERATURE ACTUATED SWITCH, CLOSES ON RISING TEMPERATURE
FLOW SWITCH, OPENING ON INCREASE OF FLOW
FLOW SWITCH, CLOSING ON INCREASE OF FLOW

VFD
AMPS: X
VARIABLE FREQUENCY DRIVE
AMPS: X INDICATES CURRENT RATING

SHUNT TRIP (120VAC CONTROL)

STATE OF OHIO — CHRISTOPHER J. CUPP — PE.70758 — REGISTERED PROFESSIONAL ENGINEER

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NO	REVISION	DATE

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DATE: 07/30/26
DESIGNED BY: CJZ & PSM
DRAWN BY: PSM
CHECKED BY: CJZ

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

ELECTRICAL - E SERIES

ELECTRICAL SYMBOLS & LEGEND

PROJECT NO: 34495
DRAWING NAME: E-003
SHEET 16 OF 20

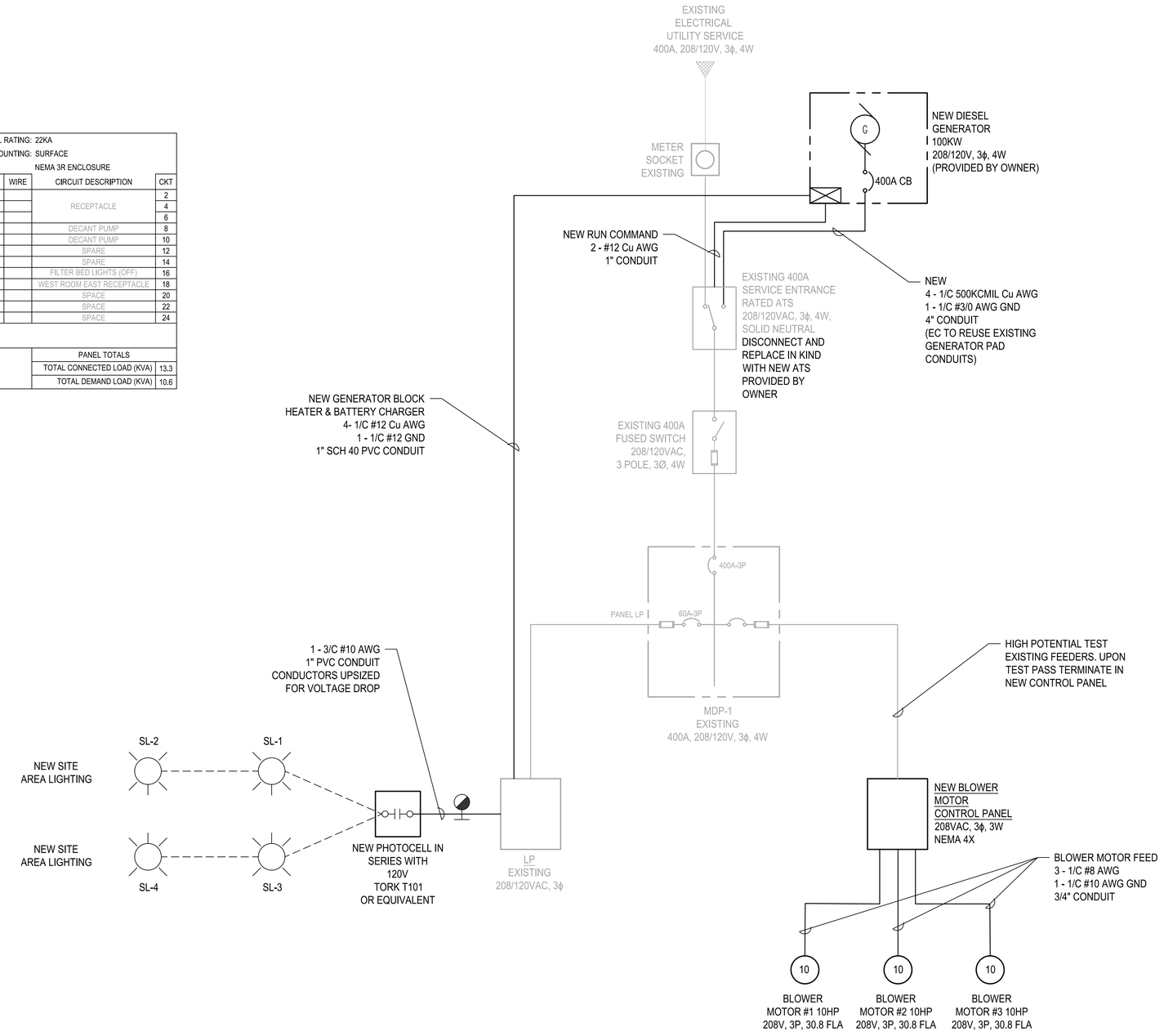
PANELBOARD: 'LP'

MCB RATING: MLO | VOLTS: 208/120 | A.I.C. RATING: 22KA
MAINS RATING: 100A | PHASE: 3 | MOUNTING: SURFACE
LOCATION: ELEC RACK | WIRES: 4 | NEMA 3R ENCLOSURE

CKT	CIRCUIT DESCRIPTION	WIRE	G.	C.	TRIP	POLE	A	B	C	POLE	TRIP	C.	G.	WIRE	CIRCUIT DESCRIPTION	CKT
1	WATER HEATER				20	1	0.2	1.0								2
3	SITE LIGHTING (SL1-4)	#10	10	1"	20	1		0.5	1.0	3	30				RECEPTACLE	4
5	GENERATOR BLOCK HEATER	#12	12	1"	20	1			1.2	1.0						6
7	GENERATOR BATTERY CHARGER	#12	12	1"	20	1	1.0	0.8		1	20				DECANT PUMP	8
9	EAST HEATER				20	1		1.0	0.8	1	20				DECANT PUMP	10
11	EAST BLOWER & LOUVER				20	1			1.0	0.0	1	20				SPARE	12
13	WEST BLOWER & LOUVER				20	1	1.0	0.0		1	20				SPARE	14
15	WEST HEATER				20	1		1.0	0.0	1	20				FILTER BED LIGHTS (OFF)	16
17	REST ROOM HEATER				20	1			1.0	0.8	1	20				WEST ROOM EAST RECEPTACLE	18
25	SPACE						0.0	0.0								SPACE	20
27	SPACE							0.0	0.0							SPACE	22
29	SPACE								0.0	0.0						SPACE	24
					TOTAL LOAD IN KVA		4.0 A	4.3 B	5.0 C							

REMARKS:

PANEL TOTALS	
TOTAL CONNECTED LOAD (KVA)	13.3
TOTAL DEMAND LOAD (KVA)	10.6



STATE OF OHIO
CORY J. CZIZ
PE.70758
REGISTERED PROFESSIONAL ENGINEER

verdantas
8150 STERLING COURT
MENTOR, OHIO 44060
(440) 951-9000

NO	REVISION	DATE

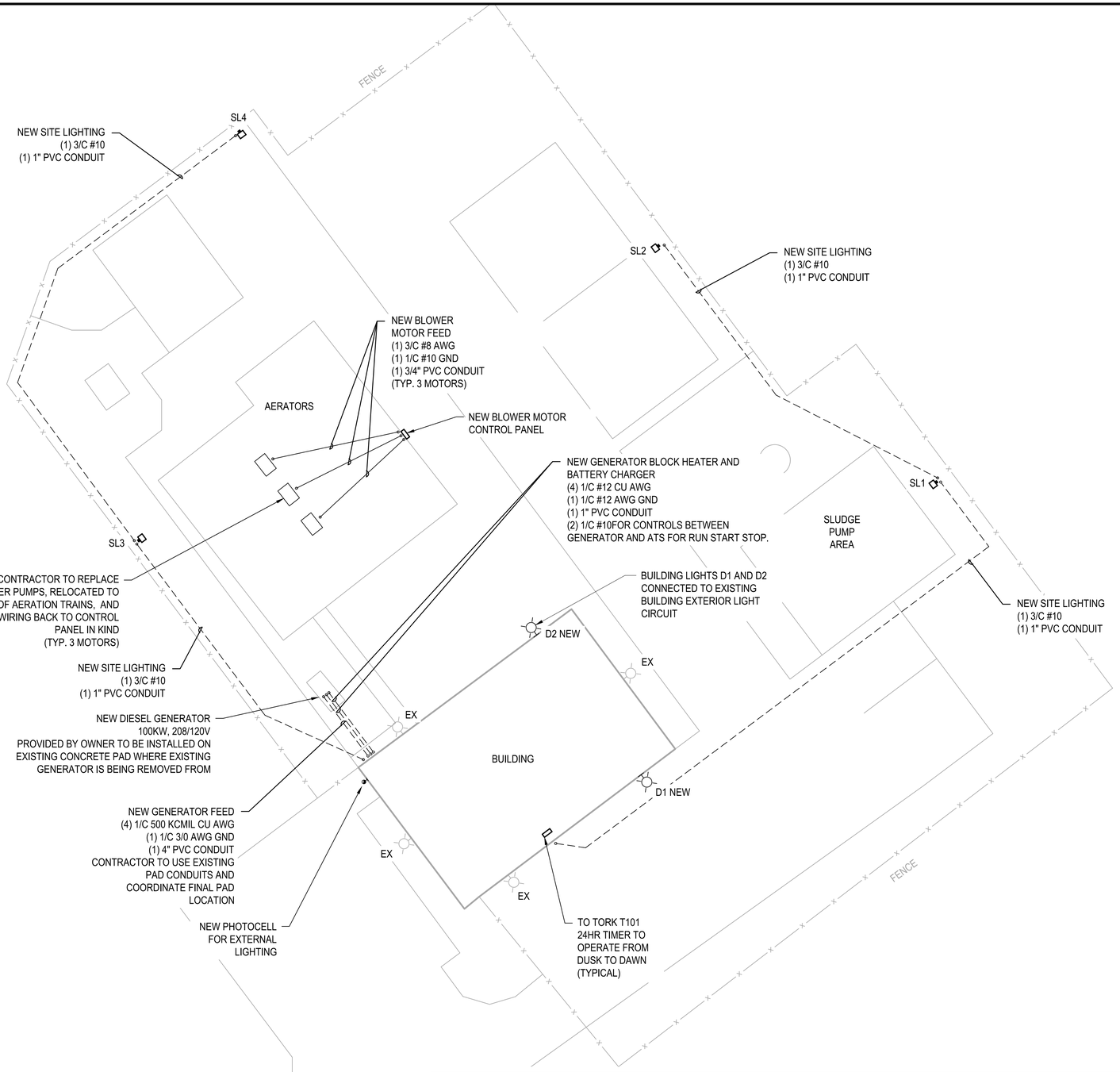
SCALE:	AS NOTED
DATE:	07/30/26
DESIGNED BY:	CJZ & PSM
DRAWN BY:	PSM
CHECKED BY:	CJZ

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

ELECTRICAL - E SERIES

ELECTRICAL SINGLE LINE

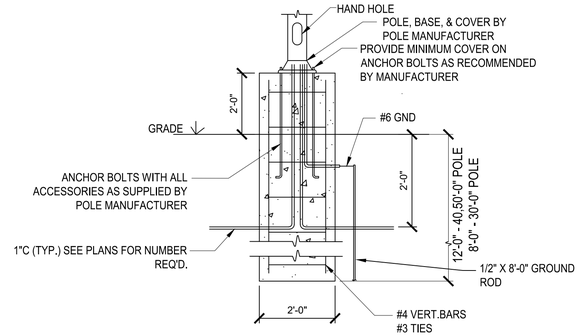
PROJECT NO:	
34495	
DRAWING NAME	
E-004	
SHEET	OF
17	20



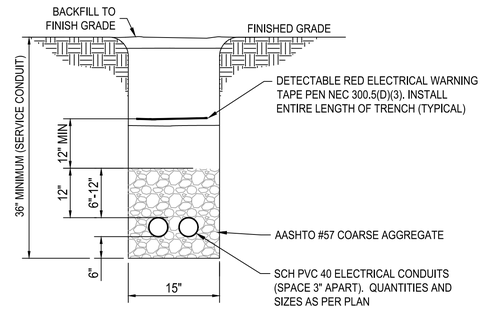
SITE POWER PLAN

SCALE: 1/16" = 1'-0"

0 4' 8' 16' 32' 48'



LIGHT POLE FOUNDATION DETAIL



DUCT BANK DETAIL

LIGHT FIXTURE SCHEDULE (BASIS OF DESIGN)

TYPE	DESCRIPTION	MOUNTING	LAMP					RATINGS	MT HGT	LUMINAIRE		REMARKS
			#	TYPE	WATTS	LUMENS	COLOR TEMP.	VOLTS		MANUFACTURER	MODEL NO.	
SL	LITHONIA LIGHTING D-SERIES SIZE 2 LED AREA LUMINAIRE. COMMERCIAL GRADE OUTDOOR AREA LIGHT, WITH EXTERNAL GLARE SHIELD	POLE	4	L.E.D.	134	10008	2700	120	30'–0"	LITHONIA LIGHTING	DSX2 LED P1 27K 80CRI TFTM EGS–F	OR EQUIVALENT
D/EX	ADJUSTABLE OUTDOOR LED WALL PACK. RUGGED CAST-ALUMINUM WITH BRONZE POLYESTER POWER PAINT. SEALED WITH A ONE-PIECE GASKET, OUTDOOR RATED	EXTERIOR WALL	2	L.E.D.	59	8400	3000	120	MATCH	LITHONIA LIGHTING	TWR1 LED ALO–HIGH 30K UVOLT	OR EQUIVALENT

NOTES:
1. LUMINARIES REQUIRE TRANSITION TO 1/2" HUB.
2. DIMMING FEATURE NOT USED. INSTALL FOR 100% LUMEN OUTPUT.
3. FOR NEW WALL PACKS MATCH MOUNTING HEIGHT WITH EXISTING FIXTURES.

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MENTOR, OHIO 44060
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STATE OF OHIO
CHRISTOPHER J. ZIMMERMAN
PE.70758
REGISTERED
PROFESSIONAL ENGINEER

NO	REVISION	DATE

SCALE:	AS NOTED
DATE:	07/30/26
DESIGNED BY:	CJZ & PSM
DRAWN BY:	PSM
CHECKED BY:	CJZ

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

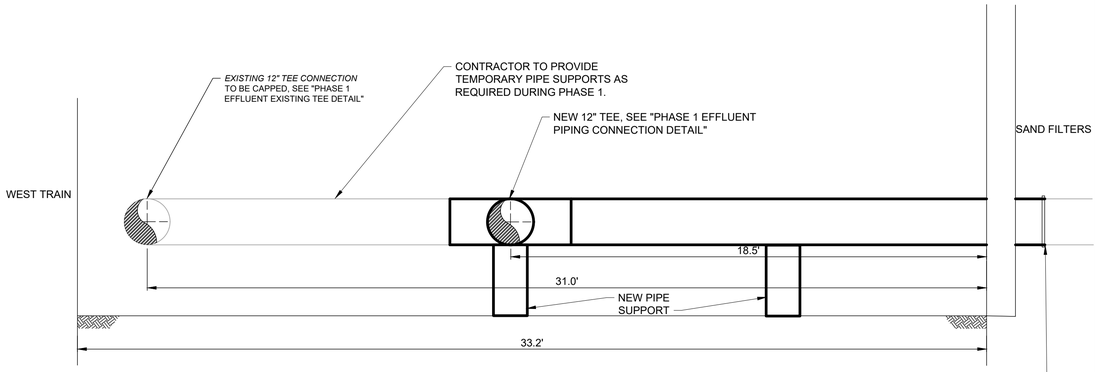
ELECTRICAL - E SERIES

ELECTRICAL SITE PLAN

PROJECT NO:	
34495	
DRAWING NAME	
E-005	
SHEET	OF
18	20

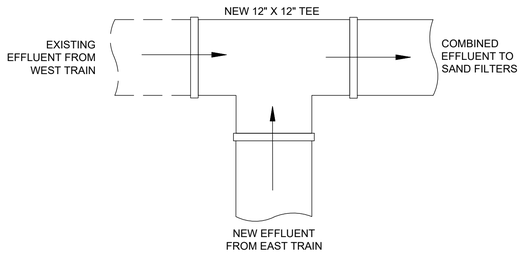
NOTES:

1. CONTRACTOR SHALL CONNECT EXISTING EFFLUENT FROM WEST TRAIN TO THE NEW EFFLUENT LINE.
2. CONTRACTOR SHALL CAP EXISTING TEE AT EAST END.
3. ALL NEW PIPING AND FITTINGS SHALL BE 12" DIP.
4. EXISTING PIPE SUPPORT TO BE REPLACED, SEE DETAIL.
5. SEE WALL PENETRATION DETAIL FOR EFFLUENT PIPING CONNECTION INSIDE THE BUILDING.
6. ALL EXTERIOR EFFLUENT PIPING SHALL BE INSULATED AND HEAT TRACED, REFER TO SPECIFICATION SECTION 404213 AND 404100.



NO. 1 - PHASE 1 EFFLUENT PIPING DETAIL, PART A

NOT TO SCALE



NOTES:

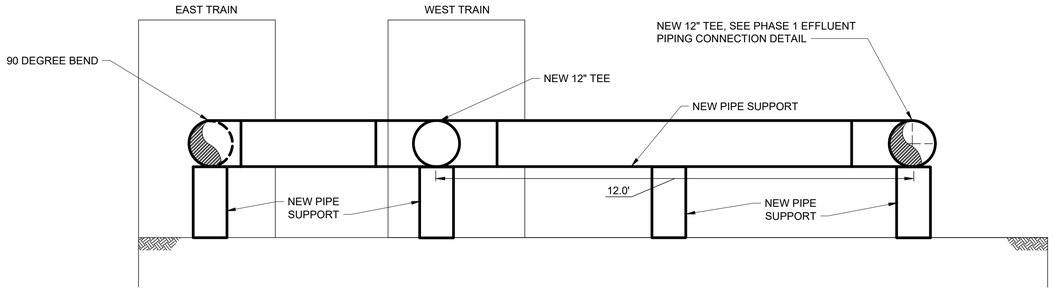
1. CONTRACTOR SHALL CONNECT EXISTING EFFLUENT FROM WEST TRAIN TO THE NEW EFFLUENT LINE USING A RESTRAINED COUPLING.
2. ALL NEW PIPING AND FITTINGS SHALL BE 12" DIP.

NO. 3 - PHASE 1 EFFLUENT CONNECTION DETAIL

NOT TO SCALE

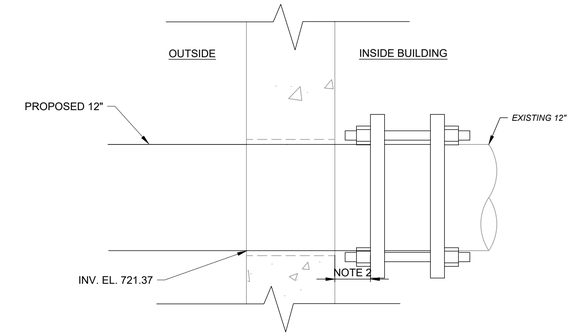
NOTES:

1. CONTRACTOR SHALL CONNECT PROPOSED EAST TRAIN EFFLUENT LINE TO THE NEW TEE IN PHASE 1 EFFLUENT PIPING DETAIL, PART A.
2. CONTRACTOR SHALL TEMPORARILY CAP 12" TEE FOR WEST TRAIN CONNECTION IN PHASE 2..
3. ALL NEW PIPING AND FITTINGS SHALL BE 12" DIP.
4. CONTRACTOR TO INSTALL NEW PIPE SUPPORTS, SEE DETAIL.
5. ALL EXTERIOR EFFLUENT PIPING SHALL BE INSULATED AND HEAT TRACED, REFER TO SPECIFICATION SECTION 404213 AND 404100.



NO. 2 - PHASE 1 EFFLUENT PIPING DETAIL, PART B

NOT TO SCALE

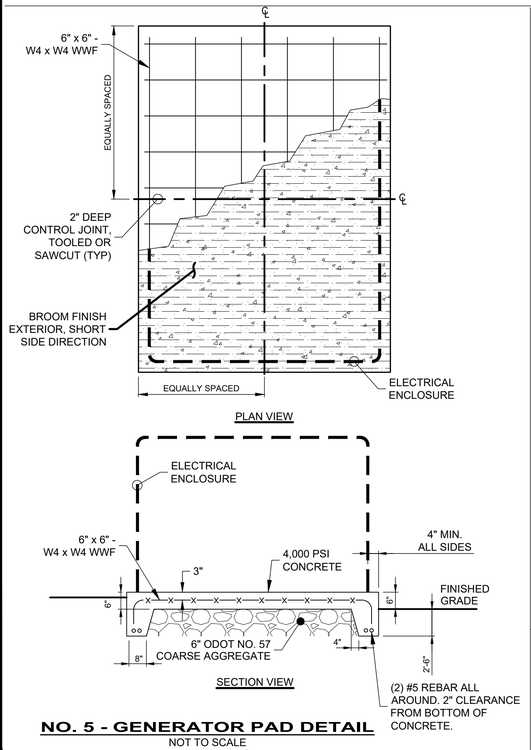


NO. 4 - WALL PENETRATION DETAIL

NOT TO SCALE

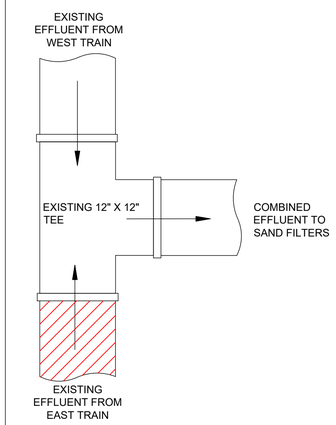
NOTES:

1. CONTRACTOR TO CONFIRM PIPE INVERT MATCHES EXISTING CONDITIONS.
2. CONTRACTOR SHALL CONFIRM WALL THICKNESS.
3. PROPOSED PIPE SHALL BE ONE CONTINUOUS PIPE AND EXTEND MINIMUM 6" INTO THE BUILDING.
4. SEAL ANNULAR SPACE BETWEEN WALL SLEEVE AND NEW 12" WITH A NON-SHRINK CEMENTITIOUS GROUT FLUSH TO FACE OF WALL.
5. PROPOSED AND EXISTING PIPE TO BE CONNECTED VIA RESTRAINED COUPLING.



NO. 5 - GENERATOR PAD DETAIL

NOT TO SCALE

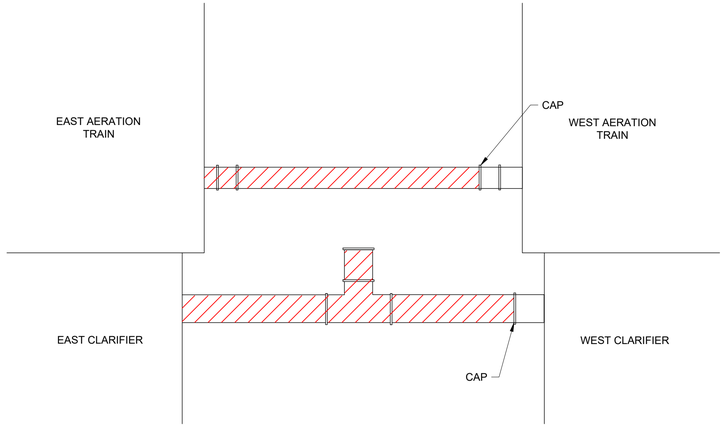


NOTES:

1. CONTRACTOR SHALL REMOVE EAST TRAIN SECTION OF PIPING AND CAP EXISTING TEE UNTIL DEMOLITION IN PHASE 2.

NO. 6 - PHASE 1 EFFLUENT EXISTING TEE DETAIL

NOT TO SCALE

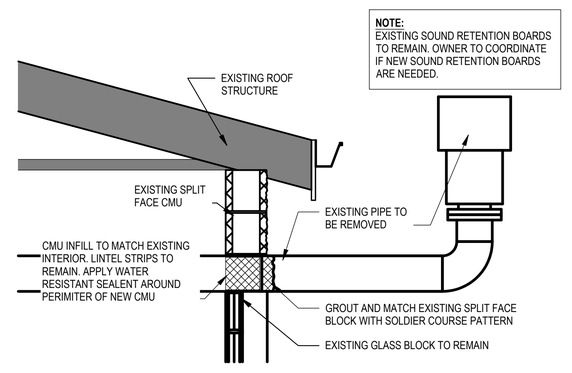


NOTES:

1. CONTRACTOR SHALL REMOVE EAST TRAIN SECTION OF PIPING AND CAP EXISTING UNTIL DEMOLITION IN PHASE 2.

NO. 7 - INTERCONNECTED PIPING DEMOLITION DETAIL

NOT TO SCALE



NO. 8 - WALL FILL DETAIL

NOT TO SCALE

NOTES:

1. CONTRACTOR TO CONFIRM WALL THICKNESS.

STATE OF OHIO
RYAN S. SCHUSTER
72755
REGISTERED PROFESSIONAL ENGINEER

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MENTOR, OHIO 44060
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NO	REVISION	DATE

SCALE:	DATE:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
AS NOTED	10/14/26	MLB & TLC	JPB	RSS

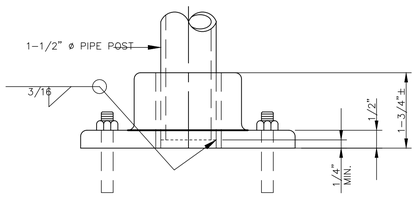
CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

STANDARD DETAILS - SD SERIES

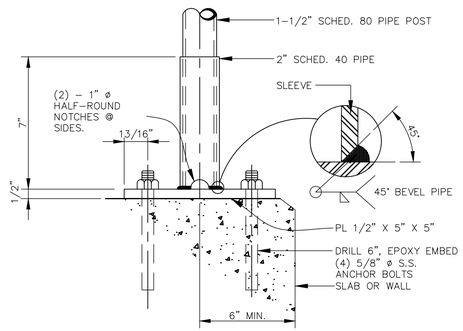
STANDARD DETAILS - 1

PROJECT NO:	
34495	
DRAWING NAME	
20SD-01	
SHEET	OF
19	20

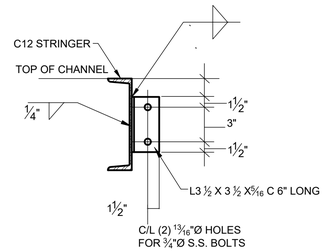
HEAVY DUTY FLOOR FLANGE:
ALUMINUM–6061–T6 (OR EQUAL STRENGTH WITH MIN. 5–3/8" O.D. AND 4" BOLT CIRCLE. DRILL 4" & EPOXY EMBED FOUR 3/8" ø S.S. ANCHORS. WELD POST AT BOTTOM OF BASE ONLY BY STERLING RAILING, ERIE, PA, OR MAULTRIE MFG. CO. MAULTRIE GA. OR APPROVED EQUAL.



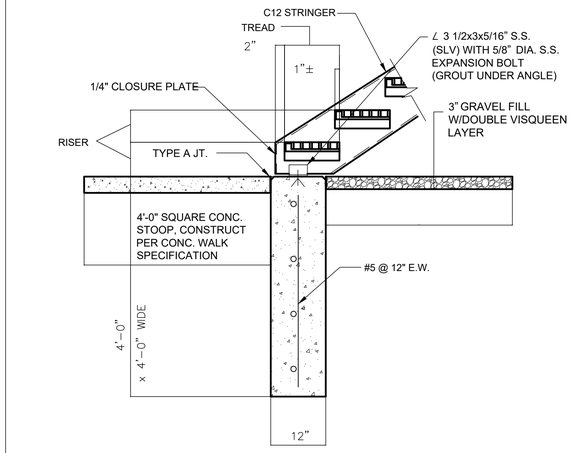
SURFACE MOUNTED PIPE RAILING DETAIL
NOT TO SCALE



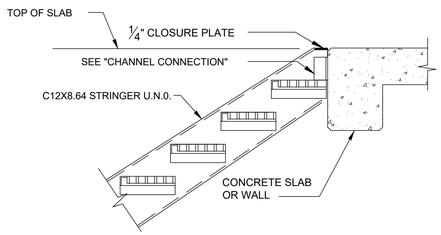
REMOVABLE RAILING DETAIL
NOT TO SCALE



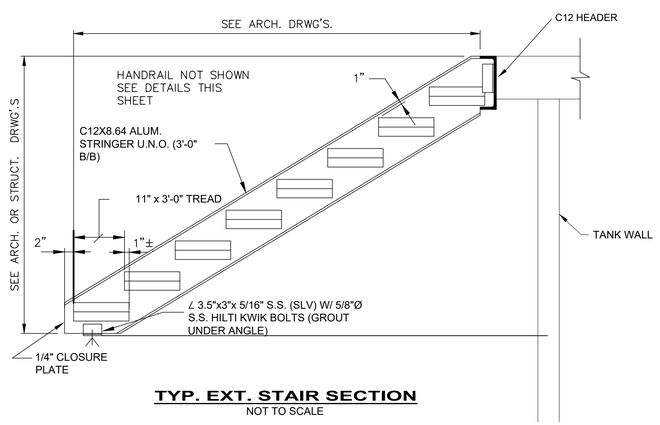
INTERCONNECTED PIPING DEMOLITION DETAIL
NOT TO SCALE



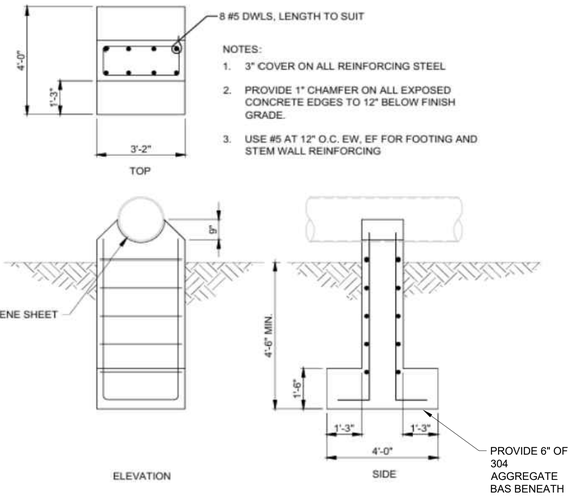
EXTERIOR STAIR SUPPORT DETAIL
NOT TO SCALE



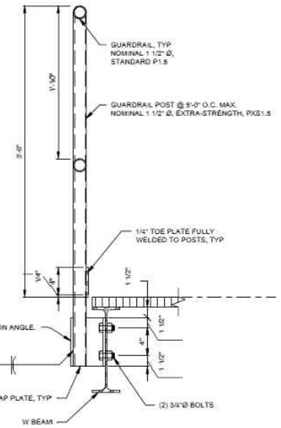
TYP. EXT. TOP OF STAIRS
NOT TO SCALE



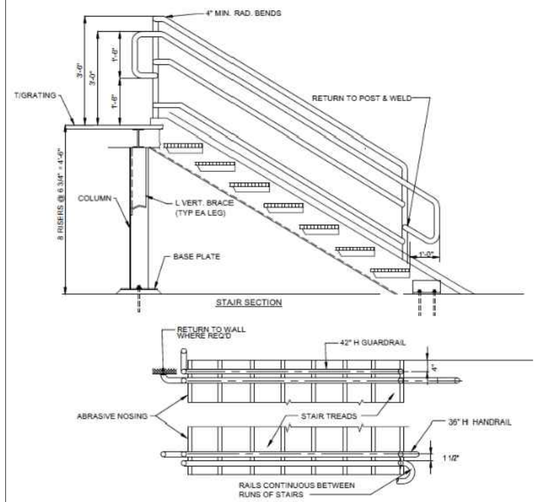
TYP. EXT. STAIR SECTION
NOT TO SCALE



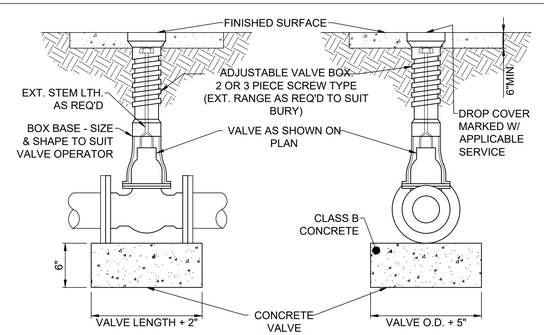
PIPE PIER DETAIL
NOT TO SCALE



TYP GUARDRAIL DETAIL
NOT TO SCALE



TYP STAIR/HANDRAIL DETAILS
NOT TO SCALE



TYPICAL VALVE AND VALVE BOX SETTING
NOT TO SCALE

RYAN S. SCHUSTER
72755
REGISTERED PROFESSIONAL ENGINEER
STATE OF OHIO

verdantas
8150 STERLING COURT
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(440) 951-9000

NO	REVISION	DATE

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CHECKED BY:	RSS

CITY OF KINGSVILLE, OHIO
ASHCRAFT WWTP IMPROVEMENTS
ASHTABULA COUNTY OHIO

STANDARD DETAILS - SD SERIES

STANDARD DETAILS - 2

PROJECT NO:	
34495	
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20SD-02	
SHEET	OF
20	20