DRAWINGS FOR

CITY OF BLOOMINGTON UTILITIES

BLOOMINGTON, INDIANA

MONROE WATER TREATMENT PLANT

RESIDUALS MANAGEMENT FACILITIES

CONSTRUCTION RECORD DRAWINGS
JULY, 2002

BLACK & VEATCH
Corporation
Cincinnati, Ohio

8/2/02
02-1260 AO
Monroe WTP (Residuals Mgmt.)
Asbuilt Drawings - Monroe
WTP Residuals Mgmt.

B&V P.N. 62409

2000

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOBINGER ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8903802

MSR0000002-H-NRN-01-1409

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GENERAL NOTES

1. THE LOCATION OF EXISTING UNDERGROUND UTILITIES AS INDICATED ON THE DRAWINGS IS SUBJECT TO FIELD VERIFICATION. OCCASIONAL ADJUSTMENTS TO THE NEW WORK AS A RESULT OF UNANTICIPATED LOCATION OF EXISTING UNDERGROUND UTILITIES ARE TO BE EXPECTED AND WILL BE CONSIDERED A SUBSIDIARY OBLIGATION OF THE CONTRACT. CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 4.3 OF THE GENERAL CONDITIONS FOR INFORMATION CONCERNING RESPONSIBILITY FOR LOCATING EXISTING UNDERGROUND INSTALLATIONS IN ADVANCE OF EXCAVATION OF TRENCHING.
2. WHERE NEW WATER LINES CROSS OVER OR UNDER EXISTING SANITARY SEWERS, A MINIMUM VERTICAL SEPARATION OF 18" SHALL BE PROVIDED BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. AT THE CROSSINGS, ONE FULL LENGTH OF WATER PIPE SHALL BE LOCATED SO BOTH JOINTS WILL BE EQUIDISTANT FROM THE SEWER. WHERE CROSSING GAS MAINS, A MINIMUM SEPARATION OF 18" SHALL BE PROVIDED, UNLESS OTHERWISE NOTED. WHERE NEW WATER LINES CROSS OVER OR UNDER OTHER EXISTING UNDERGROUND PIPING, A MINIMUM VERTICAL SEPARATION OF 6" BETWEEN THE OUTSIDE OF THE PIPES SHALL BE PROVIDED.
3. WHERE POWER AND/OR TELEPHONE POLES FALL ON OR NEAR WATER LINE, SANITARY SEWER, OR STORM SEWER ALIGNMENT, WATER LINE, SANITARY SEWER, OR STORM SEWER SHALL BE DEFLECTED AROUND POLES IN A MANNER SUITABLE TO THE OWNER.
4. ELEVATIONS ARE BASED ON USGS DATUM.
5. MINIMUM COVER SHALL BE 48" FOR ALL WATER PIPES.
6. MAXIMUM JOINT DEFLECTION FOR PIPE SHALL NOT EXCEED THE REQUIREMENTS IN THE SPECIFICATIONS.
7. "SCREENED" (LIGHT) DELINEATION INDICATED ON THE DRAWINGS DENOTE EXISTING FACILITIES. SCREENED INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS. IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED TO THE EXTENT NECESSARY FOR COMPLETING NEW WORK. "BOLD" (DARK) DELINEATION IS NEW WORK TO BE COMPLETED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
8. WALL AND SLAB THICKNESSES SHALL BE INCREASED AS NECESSARY TO INSTALL WALL CASTINGS. DIRECTION OF INCREASED THICKNESS SHALL BE ACCEPTABLE TO ENGINEER.
9. WHERE ABANDONED PIPES ARE REQUIRED TO BE PLUGGED WITH CONCRETE, THE PIPE SHALL BE FULLY ENCAPSULATED WITH CONCRETE, MIN 12" ALL AROUND FOR THE LAST 12" OF THE PIPE AND 12" OUT FROM THE END OF THE PIPE, UNLESS INDICATED OR SPECIFIED OTHERWISE.
10. TOPOGRAPHY WAS OBTAINED FROM THE CITY OF BLOOMINGTON UTILITIES (CBU) GEOGRAPHIC INFORMATION SYSTEM (GIS). TOPOGRAPHY IS NOT GUARANTEED AS TO THE COMPLETENESS AND ACCURACY. CONTRACTOR SHALL VERIFY PERTINANT DATA IN THE FIELD.
11. THE ADJUSTMENT OR RELOCATION OF ALL UTILITIES (UNDERGROUND, SURFACE, OR OVERHEAD) SHALL BE COORDINATED WITH THE OWNER OF EACH UTILITY AND ENGINEER PRIOR TO UNDERTAKING ANY CONSTRUCTION OPERATIONS.
12. SOIL BORING LOCATIONS SHOWN ON THE PLANS ARE AT APPROXIMATE LOCATIONS. THE GEOTECHNICAL REPORT IS AVAILABLE FOR CONTRACTOR'S REFERENCE BUT IS NOT PART OF THE CONTRACT DOCUMENTS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	A	FAW	AS	DHG

DESIGNED DPK,DHG
DETAILED DPK
CHECKED RED,JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

GENERAL
LIST OF DRAWINGS
& GENERAL NOTES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOMMOS ON 06-30-06, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENG 6063082

L1

SHEET 1 OF 73

CCD. DWG. NO: 62409-110-HRH-C-A0D00846

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MATERIALS LEGEND

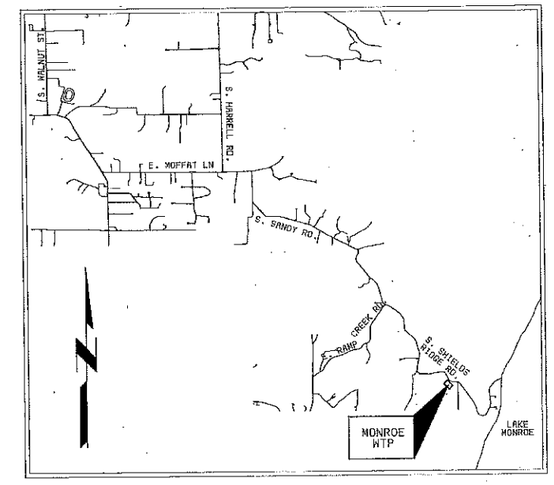
- CHECKERED PLATE
- INSULATION (RIGID)
- EARTH OR GRADE
- GRANULAR FILL (CRUSHED ROCK OR GRAVEL)
- NEW CONCRETE
- EXISTING CONCRETE, PRECAST OR PRESTRESSED CONCRETE
- CONCRETE MASONRY UNITS (CMU)
- COMPACTED CLAY FILL
- ENGINEERED FILL
- STRUCTURE BACKFILL
- ASPHALT OVERLAY
- COMPACTED BACKFILL
- ASPHALT PAVEMENT
- AGGREGATE SURFACING, GRAVEL

DEMOLITION LEGEND

- EXISTING STRUCTURES, PIPING, CONDUIT ETC TO BE REMOVED OR DEMOLISHED
- REMOVAL OF ASPHALT SURFACE COURSE
- REMOVAL OF EXISTING GRAVEL

GENERAL ABBREVIATIONS

AD	AIR DRYER
ALUM	ALUMINUM
ANP	ACID METERING PUMP
AR	AIR RECEIVER
ARCH	ARCHITECTURAL
AST	ACID STORAGE TANK
@	AT
BLDG	BUILDING
BBFV	BOILER BUTTERFLY VALVE
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BM	BENCH MARK
BW	BACKWASH WATER
BWC	BACKWASH CLARIFIER
BWCV	BACKWASH HOLDING BASIN CHECK VALVE
BW/F	BACKWASH WATER/FILTRATE
BWHB	BACKWASH HOLDING BASIN
BWX	BACKWASH HOLDING BASIN MIXER
BWPV	BACKWASH HOLDING BASIN PLUG VALVE
BWTP	BACKWASH HOLDING BASIN TRANSFER PUMP
BV	BALL VALVE
CBFV	CHILLED WATER BUTTERFLY VALVE
COU	CITY OF BLOOMINGTON UTILITIES
CD	CLARIFIER DISCHARGE
CEC	CLARIFIER EFFLUENT CHAMBER
CEF	CLARIFIER EFFLUENT
CHW	CHILLED WATER
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON
CIN	CLARIFIER INFLUENT
CISP	CAST IRON SOIL PIPE
℄	CENTERLINE
CLR	CLEARANCE
COMP	COMPRESSED
CONC	CONCRETE
COND	CONDUIT
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS, CONTINUATION
CR	CLARIFIER RETURN
CRCV	CLARIFIER RETURN CHECK VALVE
CRP	CLARIFIER RETURN PUMP
CRPV	CLARIFIER RETURN PLUG VALVE
CSP	CHEMICAL SUMP PUMP
CSPV	CLARIFIER SOLIDS PLUG VALVE
CTRS	CENTERS
CV	CHECK VALVE
CWPV	CORE WASH PLUG VALVE
D	DEEP
DI	DUCTILE IRON
DIA	DIAMETER
DIAP	DIAPHRAGM
ø	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWINGS
E	EAST
E	ELECTRIC, ELECTRICAL
EA	EACH
ECC	ECCENTRIC
EL	ELEVATION
ELEV	ELEVATION
EMBED	EMBEDMENT
EMH	ELECTRICAL MANHOLE
EQ	EQUAL
EQUIP	EQUIPMENT
E-RED	ECCENTRIC REDUCER
EWEF	EACH WAY EACH FACE
EWTB	EACH WAY TOP & BOTTOM
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR, EXTERNAL
F	FILTER, FILTRATE
FD	FLOOR DRAIN
FG	FLAP GATE
FH	FIRE HYDRANT
FIN	FINISH
FIG	FIGURE
FLC	FLANGE
FLR	FLOOR
FM	FLOWMETER
FM	FORCE MAIN
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET, FOOT
G	GAS
GAL	GALLONS
GALV	GALVANIZED
GIS	GEOGRAPHIC INFORMATION SYSTEM
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GR	GRADE
GRD	GRADE
GT	GRAVITY THICKENER
GTO	GRAVITY THICKENER OVERFLOW
GV	GATE VALVE
H	HORIZONTAL, HIGH
HBFV	HOT WATER BUTTERFLY VALVE
HORIZ	HORIZONTAL
HW	HOT WATER
HWL	HIGH WATER LEVEL
HR	HOUR
IA	INSTRUMENT AIR
ID	INSIDE DIAMETER
INV	INVERT
JT	JOINT
LB	POUNDS
LF	LINEAR FOOT, LINEAR FEET
LWCO	LOW WATER CUTOFF
LWL	LOW WATER LEVEL
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MG	MILLION GALLON
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
N	NORTH
NO	NUMBER
NTS	NOT TO SCALE
#	NUMBER
OC	ON CENTER
OD	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRICAL
P	PUMPER
%	PERCENT
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PE	PLAIN END
P/E	PERMANENT EASEMENT
PFB	POLYMER FEEDER BLENDER
PFP	PRESSURE FILTER PRESS
PL	PLATE
P/L	PROPERTY LINE
PLT	PLATE
PRV	PRESSURE RELIEF, REDUCING VALVE
PS	PIPE SUPPORT
PST	POLYMER STORAGE TANK
PT	POINT
PVC	POLYVINYL CHLORIDE
PVDF	POLYVINYLIDENE FLUORIDE
PWP	POWER POLE
R	RADIUS, RESIDUALS, RISER
RBM	RESIDUALS HOLDING BASIN MIXER
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RDC	RESIDUALS DISTRIBUTION CHAMBER
RED	REDUCER
REINF	REINFORCED
REQD	REQUIRED
RHB	RESIDUALS HOLDING BASIN
RHCV	RESIDUALS HOLDING BASIN CHECK VALVE
RHPV	RESIDUALS HOLDING BASIN PLUG VALVE
RTP	RESIDUALS TRANSFER PUMP
R/W	RIGHT OF WAY
S	SOUTH, SANITARY SEWER
SB	SEDIMENTATION BASIN
SBST	SODIUM BISULFITE STORAGE TANK
SE	SOUTHEAST
SECT	SECTION
SPEC	SPECIFICATION
SW	SOUTHWEST
SBMP	SODIUM BISULFITE METERING PUMP
SG	SLUICE GATE
SHT	SHEET
SIM	SIMILAR
SQ	SQUARE
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
T	TREAD, TON
T	TELEPHONE
TB	TEST BORING
TBM	TEMPORARY BENCH MARK
T&B	TOP & BOTTOM
T/E	TEMPORARY EASEMENT
TEL	TELEPHONE
TEO	TELEPHONE OVERHEAD
THK	THICKNESS
TOG	TOP OF GRADE, TOP OF GRATE
TOW	TOP OF WALL
TR	THICKENED RESIDUALS
TRCV	THICKENED RESIDUALS CHECK VALVE
TRP	THICKENED RESIDUALS PUMP
TRPV	THICKENED RESIDUALS PLUG VALVE
TYP	TYPICAL
UE	EXISTING UNDERGROUND ELECTRICAL DUCTBANK
UNO	UNLESS NOTED OTHERWISE
USGS	UNITED STATES GEOLOGICAL SURVEY
UT	UNDERGROUND TELEPHONE
V	VERTICAL
VBFV	VACUUM BUTTERFLY VALVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VS	VACUUM SKID
W	WEST, WIDE
W/	WITH
W/O	WITHOUT
WTP	WATER TREATMENT PLANT
WTR	WATER
WWF	WELDED WIRE FABRIC
YD	YARDS



LOCATION MAP

NO SCALE

GENERAL LEGEND

- SMALLER THAN 24" / 24" AND LARGER — EXISTING GENERAL LAYOUT YARD PIPING
- SIDEWALK OR WALKWAY
- EXISTING WATER LINE
- EXISTING SANITARY SEWER
- EXISTING NATURAL GAS LINE
- NEW UNDERGROUND ELECTRICAL DUCTBANK
- POWER OR TELEPHONE LINES
- OVERHEAD ELECTRICAL
- EXISTING UNDERGROUND DUCTBANK
- EXISTING TELEPHONE-FIBER OPTIC
- EXISTING FIRE HYDRANT
- YARD HYDRANT
- NON-CONNECTING PIPING
- WATER METER
- NATURAL GAS VALVE
- AREA DRAIN
- LIGHT STANDARD
- MANHOLE EXISTING
- MANHOLE PROPOSED
- TELEPHONE OR POWER POLE
- TRAFFIC SIGN
- STOP SIGN
- EXISTING GROUND CONTOUR
- FINISH GRADE CONTOUR
- SPOT ELEVATION
- TB-# TEST BORING & NUMBER
- F102 — ROOM NUMBER; AREA DESIGNATION
- HEDGE, BRUSH, SHRUBS
- TREE AND TRUNK DIAMETER
- MANHOLE THROUGH DEFLECTION ANGLE
- TREE REMOVAL
- BUILDINGS, STRUCTURES
- FENCE
- CENTERLINE
- BUILDING AND NUMBER
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- SURVEY LINE
- FENCE
- HEADWALL OF BOX CULVERT
- RETAINING WALL
- MARSH OR SWAMP
- ABBREVIATION DOOR, WINDOW AND LOUVER SCHEDULE REFERENCE
- SCHEDULE NUMBER
- EQUIPMENT OR VALVE IDENTIFICATION CODE
- EQUIPMENT NUMBER
- SECTION NUMBER OR DETAIL LETTER
- DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS, OR WHERE SECTION IS CUT OR DETAIL IS NOTED
- BENCHMARK

PIPING SYSTEMS

- NEW PIPING
- EXISTING PIPING
- CR — COMPRESSED AIR
- CHR — CHILLED WATER RETURN
- CHS — CHILLED WATER SUPPLY
- CW — WATER, COLD
- G — GAS, NATURAL
- HWR — HEATING SYSTEM WATER RETURN
- HWS — HEATING SYSTEM WATER SUPPLY
- HW — WATER, POTABLE HOT
- IA — INSTRUMENT AIR
- NPW — WATER, NON-POTABLE
- OF — OVERFLOW
- ST — STORM DRAIN
- SAN — SANITARY SEWER
- V — VENT

ACTUATOR LEGEND

- E — ELECTRIC
- S — SOLENOID
- P — PNEUMATIC

LANDSCAPING LEGEND

- PLANT
- PLANT

PIPING ACCESSORIES LEGEND

- BLIND FLANGE
- CAP OR PLUG
- CLEANOUT
- CROSS
- DIAPHRAGM SEAL
- ELBOW
- ELBOW DOWN
- ELBOW TURNING UP
- REDUCER
- TEE
- DRIP TRAP
- INLINE FILTER
- FLEXIBLE HOSE OR TUBING
- HOSE REEL
- PIPE DIFFUSER
- STRAINER
- CALIBRATING COLUMN
- TEE LINE DOWN
- TEE LINE UP
- TRAP
- UNION
- WALL SLEEVE
- WYE
- WYE STRAINER
- WYE STRAINER WITH BLOWOFF
- AUTOMATIC DRAIN TRAP
- DRAIN OR BELL-UP
- VENT - SCREENED
- VENT
- PRESSURE GAUGE W/SNUBBER
- SIGHT FLOW INDICATOR
- TEMPERATURE INDICATOR
- ELECTROMAGNETIC/ULTRASONIC FLOWMETER

VALVE LEGEND

- PLUG VALVE, ECCENTRIC
- PLUG VALVE, NON-ECCENTRIC
- BUTTERFLY VALVE
- GATE VALVE
- BALL VALVE
- PRESSURE REGULATING VALVE
- BACKFLOW PREVENTER
- SAFETY RELIEF VALVE
- GLOBE VALVE
- CHECK VALVE
- 3 WAY VALVE
- 4 WAY VALVE
- DIAPHRAGM VALVE

MISCELLANEOUS EQUIPMENT

- STATIC MIXER
- SUBMERSIBLE MIXER
- CENTRIFUGAL PUMP
- SLUICE GATE
- EXPANSION TANK
- PROGRESSING CAVITY PUMP
- DIFFUSER TANK

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DNG

DESIGNED MKR.DPK
DETAILED FRN.DPK
CHECKED REO.JEH
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES

GENERAL LEGEND, ABBREVIATIONS & LOCATION MAP

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 05-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 68030862

L2

SHEET 2 OF 73

CCD. DWG. NO: 62409-11D-KRH-C-N0D00000J

RESIDUALS MANAGEMENT FACILITIES

RESIDUALS HOLDING BASIN (RHB)

GRAVITY THICKENER (GT)

DEWATERING BUILDING (DWB)

BACKWASH HOLDING BASIN (BWHB)

BACKWASH CLARIFIER (BWC)

CHEMICAL BUILDING (CB)

DESIGN INFORMATION - YEAR 2020

GENERAL

PLANT FLOW	
AVERAGE	17 MGD
MAXIMUM	24 MGD
SOLIDS PRODUCTION	
AVERAGE	2,275 LB/DRY
MAXIMUM	3,500 LB/DRY
FILTER BACKWASH WATER	
AVERAGE	250,000 GAL
MAXIMUM	1,000,000 GAL
FILTRATE AND THICKENER OVERFLOW	
AVERAGE	60,000 GPD
MAXIMUM	91,000 GPD

RESIDUALS HOLDING BASIN

NOMINAL CAPACITY	255,000 GAL
BASIN INSIDE DIAMETER	65 FT
SIDE WALL DEPTH	19 FT
SIDE WATER DEPTH	11 FT
OVERFLOW ELEVATION	725.50
MAJOR EQUIPMENT	
SUBMERSIBLE MIXERS	3
SUBMERSIBLE PUMPS	3
RATED CAPACITY	65 GPM
RATED HEAD	49 FT

GRAVITY THICKENER

BASIN INSIDE DIAMETER	40 FT
SIDE WALL DEPTH	14 FT
SIDE WATER DEPTH	12 FT
OVERFLOW ELEVATION	754.00
SOLIDS LOADING RATE	0.2 LB/HR/SQ-FT
MAJOR EQUIPMENT	
RESIDUALS COLLECTION EQUIPMENT	

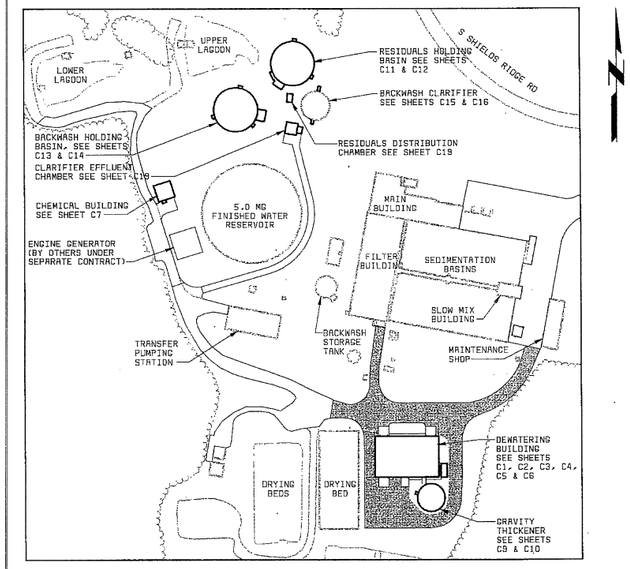
BACKWASH HOLDING BASIN

NOMINAL CAPACITY	500,000 GAL
BASIN INSIDE DIAMETER	65 FT
SIDE WALL DEPTH	22 FT
SIDE WATER DEPTH	21 FT
OVERFLOW ELEVATION	739.00
MAJOR EQUIPMENT	
SUBMERSIBLE MIXERS	3
SUBMERSIBLE PUMPS	3
RATED CAPACITY	800 GPM
RATED HEAD	25 FT

BACKWASH CLARIFIER

BASIN INSIDE DIAMETER	42 FT
SIDE WALL DEPTH	11.75 FT
SIDE WATER DEPTH	10.75 FT
OVERFLOW ELEVATION	738.50
MAXIMUM HYDRAULIC LOADING	2 GPM/SQ-FT
AVERAGE HYDRAULIC LOADING	1.4 GPM/SQ-FT
MAJOR EQUIPMENT	
CIRCULAR CLARIFYING EQUIPMENT	
SUBMERSIBLE PUMPS	2
RATED CAPACITY	2000 GPM
RATED HEAD	25 FT

KEY PLAN



100' 50' 0 100' 200'

1"=100'

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	RPP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DNG

DESIGNED JCD
DETAILED DPK
CHECKED RED, JEM
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

GENERAL
DESCRIPTION OF FACILITIES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0603882

L3

SHEET 3 OF 73

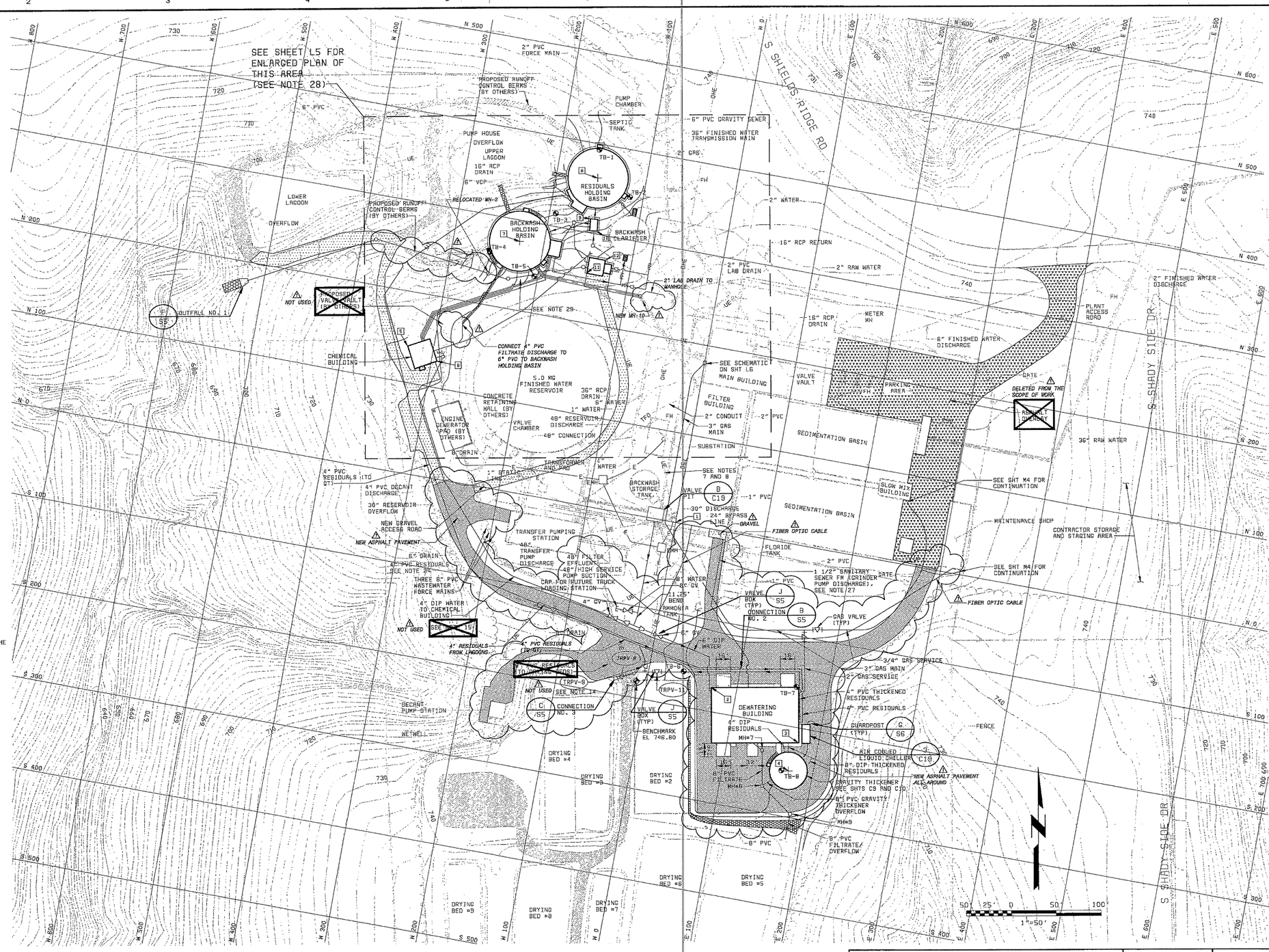
CCG. DWG. NO: 62409-110-WRH-C-A0001155

NOTES:

1. ALL EXISTING PIPE, DUCT BANKS, ETC SHALL BE SUPPORTED TO MAINTAIN INTEGRITY.
2. COORDINATE SYSTEM IS ESTABLISHED FOR THIS PROJECT. THE SOUTH WEST CORNER OF THE FILTER BUILDING IS N 0, W 0.
3. PROVIDE A MINIMUM OF 4 FEET OF COVER FOR ALL PIPING UNLESS OTHERWISE NOTED.
4. ALL BURIED VALVES SHALL BE INSTALLED WITH A CONCRETE VALVE BOX AND PAD AS SHOWN ON SHEET S5.
5. CONNECT TO EXISTING 4" STUB PROVIDED BY OTHERS. LOCATION TO BE COORDINATED WITH OWNER.
6. PROTECT AND SUPPORT EXISTING SEWER AS REQUIRED. AT CONTRACTOR'S OPTION, THE 6" GRAVITY SEWER MAY BE RE-ROUTED TO THE NORTH OF THE RESIDUALS HOLDING BASIN, ACCEPTABLE TO THE OWNER AND ENGINEER.
7. ABANDONED ELECTRICAL BY OTHERS.
8. SEE DEMO PLAN FOR ITEMS TO BE REMOVED OR ABANDONED IN PLACE.
9. SEE SHEET S1 FOR SITE GRADING AND ASPHALT AND GRAVEL ROADWAY PLANS.
10. GEOTECHNICAL BORINGS TB-1 THROUGH TB-8 LOCATIONS ARE APPROXIMATE.
11. WHERE ASPHALT IS REMOVED OR DAMAGED DURING CONSTRUCTION, ASPHALT SHALL BE REPLACED IN ACCORDANCE WITH DETAIL B ON SHEET S6 TYPICAL PAVEMENT DETAIL. ALL DAMAGED ASPHALT SHALL BE COMPLETELY REMOVED TO SOUND UNDISTURBED ASPHALT ACCEPTABLE TO ENGINEER.
12. REMOVE EXISTING 16" RCP TO EXTENT SHOWN ON SHEET L6. CONNECT 18" RCP TO EXISTING 18" RCP. CONTRACTOR TO PROVIDE ALL NECESSARY FITTINGS FOR A PROPER CONNECTION.
13. COORDINATE FINAL INVERT ELEVATION IN THE FIELD.
14. LOCATE VALVES AND VALVE BOXES OUTSIDE OF ROADWAYS AS ACCEPTABLE TO OWNER AND ENGINEER.
15. CONNECT TO EXISTING 5" PVC FORCE MAINS. COORDINATE LOCATION WITH OWNER AND ENGINEER.
16. IF FENCING OR GATES ARE REMOVED OR DAMAGED BY CONTRACTOR, THE CONTRACTOR SHALL REPLACE WITH NEW FENCING AS SPECIFIED AND ACCEPTABLE TO OWNER AND ENGINEER.
17. SEE SHEET S6 FOR RESTRAINED JOINT REQUIREMENTS.
18. MOWING STRIP REQUIRED AROUND ALL NEW STRUCTURES UNLESS NOTED OR INDICATED OTHERWISE.
19. SEE SITEWORK SHEETS.
20. SEE SHEET E2 FOR ELECTRICAL MODIFICATIONS AND IMPROVEMENTS.
21. SEE SHEET L5 FOR EXISTING PIPE CROSSINGS.
22. ALL PVC PIPING TO BE CONNECTED TO DIP AND HAVE DI FITTINGS SHALL BE RESTRAINED CSOD AND RESTRAINED IN ACCORDANCE WITH CBU SPECIFICATIONS AND SHALL BE RESTRAINED AT STRUCTURES PER CBU CONSTRUCTION SPECIFICATIONS.
23. CONNECT NEW 4" PVC TO EXISTING 4" PVC. PROVIDE ALL NECESSARY FITTINGS FOR PROPER CONNECTION. CONTRACTOR TO FIELD VERIFY LOCATION AND CONDITION OF EXISTING PIPE.
24. 4" PVC RESIDUALS TO REMAIN IN SERVICE DURING CONSTRUCTION. DEPENDING ON CONSTRUCTION SCHEDULE OF CHEMICAL BUILDING, CONTRACTOR SHALL RELOCATE 4" RESIDUALS TO WEST OF CHEMICAL BUILDING. IF THE 3-6" PVC WASTEWATER FORCE MAINS ARE IN SERVICE, 4" RESIDUALS WILL NOT REQUIRE RELOCATION, AND SHALL BE ABANDONED AND CAPPED.
25. NO PROFILE INCLUDED FOR CEF BY-PASS LINE. CONTRACTOR TO COORDINATE WITH NEW AND EXISTING PIPING. THE INVERT ELEVATION OUT OF THE CLARIFIER EFFLUENT CHAMBER IS 729.17 THE INVERT ELEVATION INTO MH-5 IS 728.50.
26. SEE SHEET L5 FOR EXISTING AND NEW PIPE CROSSING INFORMATION.
27. SEE SHEET C22 FOR PIPING LAYOUT INSIDE THE FILTER BUILDING.
28. SEE SHEET L5 FOR ALL NOTE CALL-OUTS ASSOCIATED WITH THE ENLARGED PLAN.
29. RELOCATE UT AS REQUIRED FOR CONSTRUCTION. COORDINATE WITH THE OWNING UTILITY.

LOCATION DATA

ID NO.	LOCATION	COORDINATE	
1	FILTER BLDG - SW COR	0.00	0.00
2	DWB - NW COR	S 173.08	E 71.76
3	DWB - SE COR	S 216.20	E 178.51
4	GT - CENTER	S 248.95	E 172.80
5	CHEMICAL BLDG - NW COR	N 139.81	W 329.01
6	CHEMICAL BLDG - SE COR	N 129.18	W 283.81
7	BWHB - CENTER	N 276.80	W 226.79
8	RHB - CENTER	N 361.87	W 153.88
9	RDC - NW COR	N 315.44	W 153.75
10	RDC - SE COR	N 303.42	W 143.92
11	CEF - SW COR	N 255.00	W 147.00
12	CEF - NE COR	N 273.00	W 129.00
	MH-1	N 261.00	W 152.03
	MH-2	N 233.23	W 232.00
1	MH-3	N 235.10	W 254.76
	MH-4	N 250.42	W 384.57
	MH-5	N 308.27	W 171.02
	MH-6	N 286.61	W 145.64
	MH-7	S 231.80	E 139.97
	MH-8	S 270.83	E 147.26
	MH-9	S 296.00	E 183.36
1	MH-10	N 237.71	W 81.84



07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DHG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED DHG, JCD, MHA, RS
DETAILED DPK
CHECKED REG. JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

GENERAL SITE PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8803882

L4

SHEET 4 OF 73

CCG. DWG. NO: 62409-110-WRH-C-A0000304

62409-110-WRH-C-Z0000CC5R
03009
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08/25/2000 13:59:09 ACD

PIPE CROSSING FOR 4" PVC RESIDUALS (TO GRAVITY THICKENER)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
16" RCP DRAIN	±722.5	
6" VCP SAN SEWER		DEMOLISH AS NECESSARY
3-6" PVC WW FORCE MAINS	±722.5	
UG TELEPHONE	±721.0	
30" RESERVIOR OVERFLOW	±732.3	
4" PVC DECANT	±726.0	
6" TRANSFER PUMPING STATION DRAIN		
4" PVC RESIDUALS	±734.0	
6" PVC WW FORCE MAIN	±734.0	
UG ELECTRICAL		REROUTE AS NECESSARY
6" PVC WW FORCE MAIN	±733.0	
8" BACKWASH STORAGE TANK DRAIN	±738.0	
UG ELECTRIC	±738.0	CONDUIT
UG ELECTRIC		REROUTE AS NECESSARY
UG ELECTRIC	±737.0	

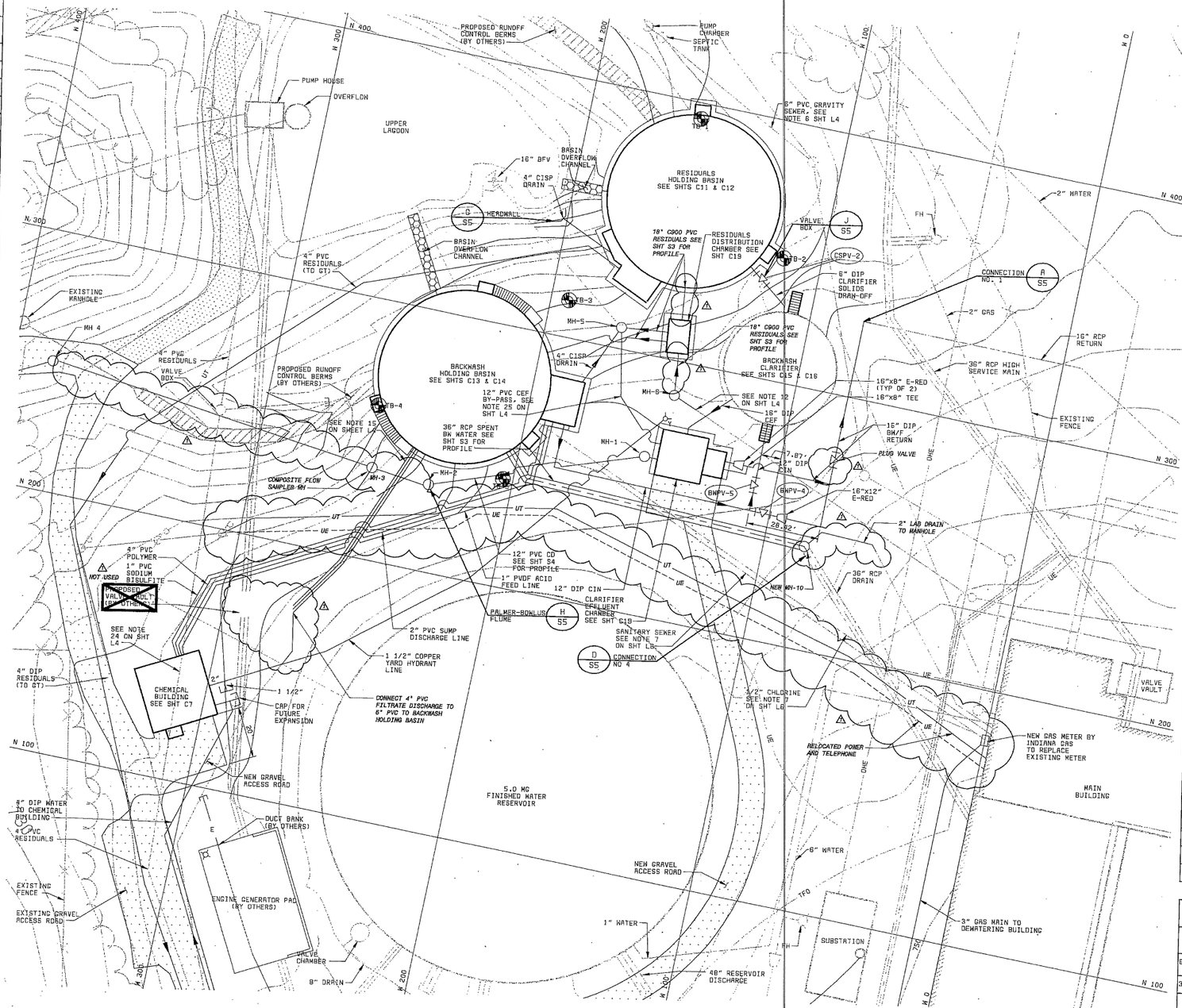
PIPE CROSSING FOR 4" PVC THICKENED RESIDUALS (TO DRYING BEDS)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
UG ELECTRICAL	±737.0	
UG ELECTRIC	±737.0	

PIPE CROSSING FOR 6" PVC FORCE MAIN (TO CONNECTION WITH 4" RESIDUALS)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
UG ELECTRIC	±738.0	REROUTE AS NECESSARY

PIPE CROSSING FOR 8" DIP WATER (TO TRUCK FILL STATION)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
UG ELECTRICAL	±744.3	
48" FILTER EFFLUENT	±732.0	
48" HIGH SERVICE SUCTION	±738.5	
UG ELECTRICAL	±744.3	DUCK BANK

PIPE CROSSING FOR 6" DIP WATER (TO DEWATERING BUILDING)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
UG ELECTRICAL	±738.0	REROUTE AS NECESSARY

PIPE CROSSING FOR 4" DIP WATER (TO CHEMICAL BUILDING)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
UG ELECTRICAL	±738.0	REROUTE AS NECESSARY
UG ELECTRICAL	±738.0	REROUTE AS NECESSARY
8" BACKWASH STORAGE TANK DRAIN	±733.0	
2-6" WW FORCE MAINS	±734.0	
UG ELECTRICAL		REROUTE AS NECESSARY
6" PVC WW FORCE MAIN	±735.0	
6" TRANSFER PUMPING STATION DRAIN		
30" RESERVIOR OVERFLOW	±732.25	
4" PVC DECANT	±726.00	



ENLARGED SITE PLAN
1" = 20'-0"

20' 10' 0 20' 40'
1"=20'

PIPE CROSSING FOR 2" PVC SUMP DISCHARGE (TO BACKWASH HOLDING BASIN)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
6" RESERVOIR FOUNDATION DRAIN	±733.0	
3-6" PVC FORCE MAINS	±733.0	
UG ELECTRICAL	±733.0	REROUTE AS NECESSARY
UG TELEPHONE	±732.5	REROUTE AS NECESSARY

PIPE CROSSING FOR 12" DIP CLARIFIER INFLUENT. (TO BACKWASH CLARIFIER)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
1/2" CHLORINE		DEMOLISH AS NECESSARY
6" VCP SANITARY SEWER		DEMOLISH AS NECESSARY
4" PVC DECANT		DEMOLISH AS NECESSARY
16" RCP RESIDUALS	±726.3	

PIPE CROSSING FOR 16" DIP BW/F (TO HEAD OF PLANT)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
16" RCP RESIDUALS	±726.3	
6" PVC SANITARY SEWER	±735.5	

PIPE CROSSING FOR 1-1/2" COPPER (TO YARD HYDRANT)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
3-6" PVC FORCE MAINS		
6" RESERVOIR FOUNDATION DRAIN		
4" PVC DECANT	±735.5	
UG ELECTRIC		REROUTE AS NECESSARY
UG TELEPHONE	±732.5	REROUTE AS NECESSARY
6" VCP SANITARY SEWER		DEMOLISH AS NECESSARY
1/2" CHLORINE		DEMOLISH AS NECESSARY

PIPE CROSSING FOR 2" PVC LAB DRAIN (TO BACKWASH HOLDING BASIN)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
1/2" CHLORINE		DEMOLISH AS NECESSARY
6" VCP SANITARY SEWER		DEMOLISH AS NECESSARY
4" PVC DECANT		DEMOLISH AS NECESSARY

PIPE CROSSING FOR 4" PVC POLYMER, 1" PVC SODIUM, AND 1" PVDF ACID FEED LINE (TO BACKWASH HOLDING BASIN VALVE VAULT)		
EXISTING PIPE OR DUCT BANK DESCRIPTION	ELEVATION OF CROSSING	COMMENTS
6" RESERVOIR FOUNDATION DRAIN	±733.0	
3-6" WW PVC FORCE MAINS	±733.0	
UG ELECTRIC	±733.0	REROUTE AS NECESSARY
UG TELEPHONE	±732.5	REROUTE AS NECESSARY
6" VCP SANITARY SEWER		DEMOLISH AS NECESSARY
1/2" CHLORINE		DEMOLISH AS NECESSARY

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DHG

DESIGNED DHG, MHA, JCD, AS
DETAILED DPK, FAM
CHECKED RED, JEW
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES

GENERAL
ENLARGED SITE PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0803882

L5

SHEET 5 OF 73

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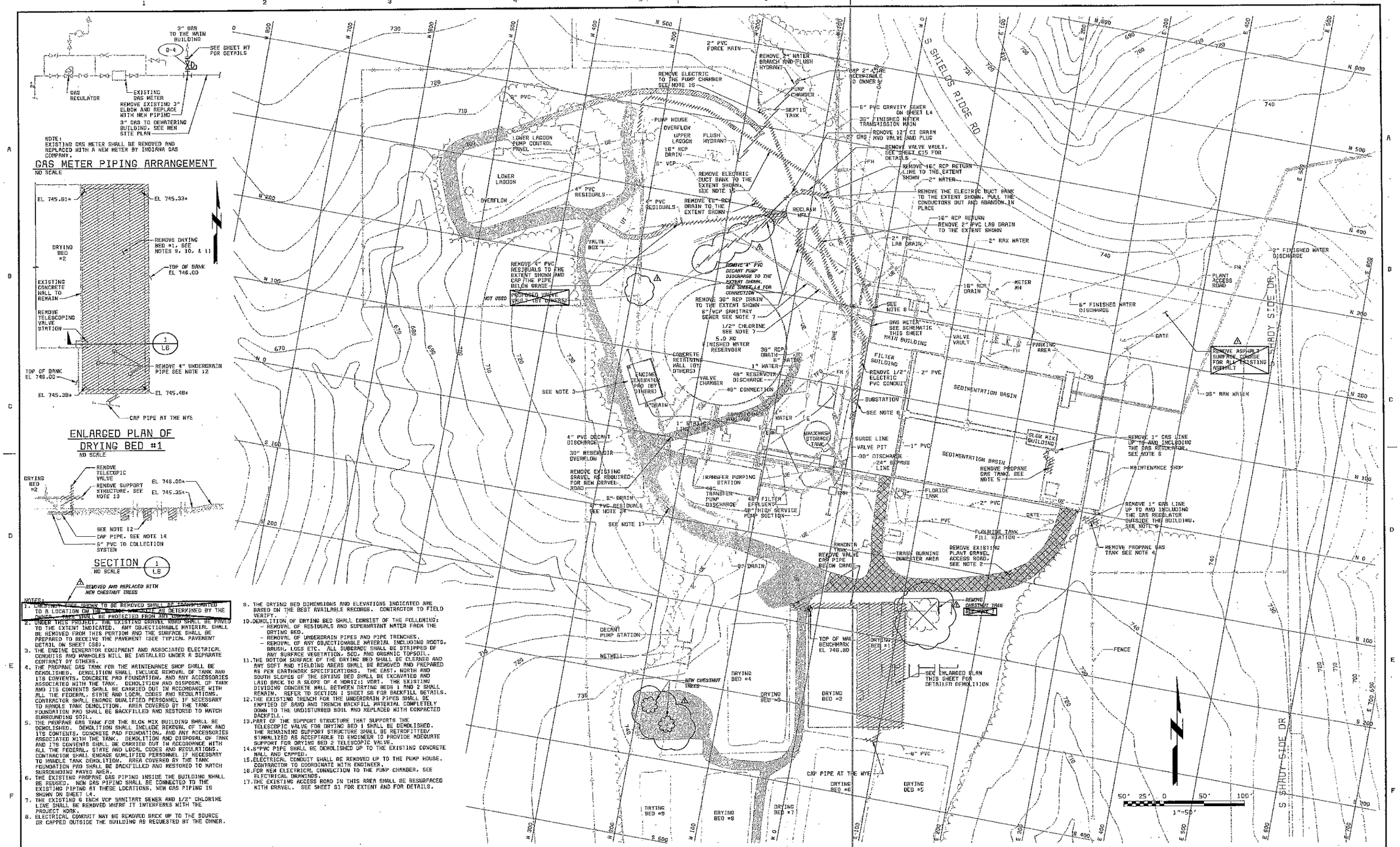
CCO. DWG. NO: 62409-110-WRH-C-A0001087



NOTES:

1. CHESTNUT TREE SHOWN TO BE REMOVED SHALL BE TRANSPLANTED TO A LOCATION ON THE NORTH WEST SIDE AS DETERMINED BY THE OWNER. TREE SHALL BE PROTECTED FROM ANY DAMAGE.
2. UNDER THIS PROJECT, THE EXISTING GRAVEL ROAD SHALL BE PAVED TO THE EXTENT INDICATED. ANY OBJECTIONABLE MATERIAL SHALL BE REMOVED FROM THIS PORTION AND THE SURFACE SHALL BE PREPARED TO RECEIVE THE PAVEMENT (SEE TYPICAL PAVEMENT DETAIL ON SHEET C56).
3. THE ENGINE GENERATOR EQUIPMENT AND ASSOCIATED ELECTRICAL CONDUITS AND MANHOLES WILL BE INSTALLED UNDER A SEPARATE CONTRACT BY OTHERS.
4. THE PROPANE GAS TANK FOR THE MAINTENANCE SHOP SHALL BE DEMOLISHED. DEMOLITION SHALL INCLUDE REMOVAL OF TANK AND ITS CONTENTS, CONCRETE PAD FOUNDATION, AND ANY ACCESSORIES ASSOCIATED WITH THE TANK. DEMOLITION AND DISPOSAL OF TANK AND ITS CONTENTS SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL THE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS. CONTRACTOR SHALL ENGAGE QUALIFIED PERSONNEL IF NECESSARY TO HANDLE TANK DEMOLITION. AREA COVERED BY THE TANK FOUNDATION PAD SHALL BE BACKFILLED AND RESTORED TO MATCH SURROUNDING SOIL.
5. THE PROPANE GAS TANK FOR THE SLOK MIX BUILDING SHALL BE DEMOLISHED. DEMOLITION SHALL INCLUDE REMOVAL OF TANK AND ITS CONTENTS, CONCRETE PAD FOUNDATION, AND ANY ACCESSORIES ASSOCIATED WITH THE TANK. DEMOLITION AND DISPOSAL OF TANK AND ITS CONTENTS SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL THE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS. CONTRACTOR SHALL ENGAGE QUALIFIED PERSONNEL IF NECESSARY TO HANDLE TANK DEMOLITION. AREA COVERED BY THE TANK FOUNDATION PAD SHALL BE BACKFILLED AND RESTORED TO MATCH SURROUNDING PAVED AREA.
6. THE EXISTING PROPANE GAS PIPING INSIDE THE BUILDING SHALL BE REUSED. NEW GAS PIPING SHALL BE CONNECTED TO THE EXISTING PIPING AT THESE LOCATIONS. NEW GAS PIPING IS SHOWN ON SHEET L4.
7. THE EXISTING 8 INCH VCP SANITARY SEWER AND 1/2" CHLORINE LINE SHALL BE REMOVED WHERE IT INTERFERES WITH THE PROJECT WORK.
8. ELECTRICAL CONDUIT MAY BE REMOVED BACK UP TO THE SOURCE OR CAPPED OUTSIDE THE BUILDING AS REQUESTED BY THE OWNER.
9. THE DRYING BED DIMENSIONS AND ELEVATIONS INDICATED ARE BASED ON THE BEST AVAILABLE RECORDS. CONTRACTOR TO FIELD VERIFY.
10. DEMOLITION OF DRYING BED SHALL CONSIST OF THE FOLLOWING:
    - REMOVAL OF RESIDUALS AND SUPERNATANT WATER FROM THE DRYING BED.
    - REMOVAL OF UNDERDRAIN PIPES AND PIPE TRENCHES.
    - REMOVAL OF ANY OBJECTIONABLE MATERIAL INCLUDING ROOTS, BRUSH, LOGS ETC. ALL SUBGRADE SHALL BE STRIPPED OF ANY SURFACE VEGETATION, SOD, AND ORGANIC TOPSOIL.
11. THE BOTTOM SURFACE OF THE DRYING BED SHALL BE CLEANED AND ANY SOFT AND YIELDING AREAS SHALL BE REMOVED AND PREPARED AS PER EARTHWORK SPECIFICATIONS. THE EAST, NORTH AND SOUTH SLOPES OF THE DRYING BED SHALL BE EXCAVATED AND LAID BACK TO A SLOPE OF 4 HORIZ:1 VERT. THE EXISTING DIVIDING CONCRETE WALL BETWEEN DRYING BEDS 1 AND 2 SHALL REMAIN. REFER TO SECTION 1 SHEET S6 FOR BACKFILL DETAILS.
12. THE EXISTING TRENCH FOR THE UNDERDRAIN PIPES SHALL BE EMPTIED OF SAND AND TRENCH BACKFILL MATERIAL COMPLETELY DOWN TO THE UNDISTURBED SOIL AND REPLACED WITH COMPACTED BACKFILL.
13. PART OF THE SUPPORT STRUCTURE THAT SUPPORTS THE TELESCOPIC VALVE FOR DRYING BED 1 SHALL BE DEMOLISHED. THE REMAINING SUPPORT STRUCTURE SHALL BE RETROFITTED/STABILIZED AS ACCEPTABLE TO ENGINEER TO PROVIDE ADEQUATE SUPPORT FOR DRYING BED 2 TELESCOPIC VALVE.
14. 6"PVC PIPE SHALL BE DEMOLISHED UP TO THE EXISTING CONCRETE WALL AND CAPPED.
15. ELECTRICAL CONDUIT SHALL BE REMOVED UP TO THE PUMP HOUSE. CONTRACTOR TO COORDINATE WITH ENGINEER.
16. FOR NEW ELECTRICAL CONNECTION TO THE PUMP CHAMBER, SEE ELECTRICAL DRAWINGS.
17. THE EXISTING ACCESS ROAD IN THIS AREA SHALL BE RESURFACED WITH GRAVEL. SEE SHEET S1 FOR EXTENT AND FOR DETAILS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	4	FAM	AS	DHG

DESIGNED DHG, JCD, RHA, AS
DETAILED DPK
CHECKED RED, JEH
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES

GENERAL DEMOLITION PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOADER ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8903882

L6

SHEET 6 OF 73

CCD. DWG. NO: 62409-110-MRH-C-R0000898

62409-110-MRH-C-R0000859
C2009
F2000000

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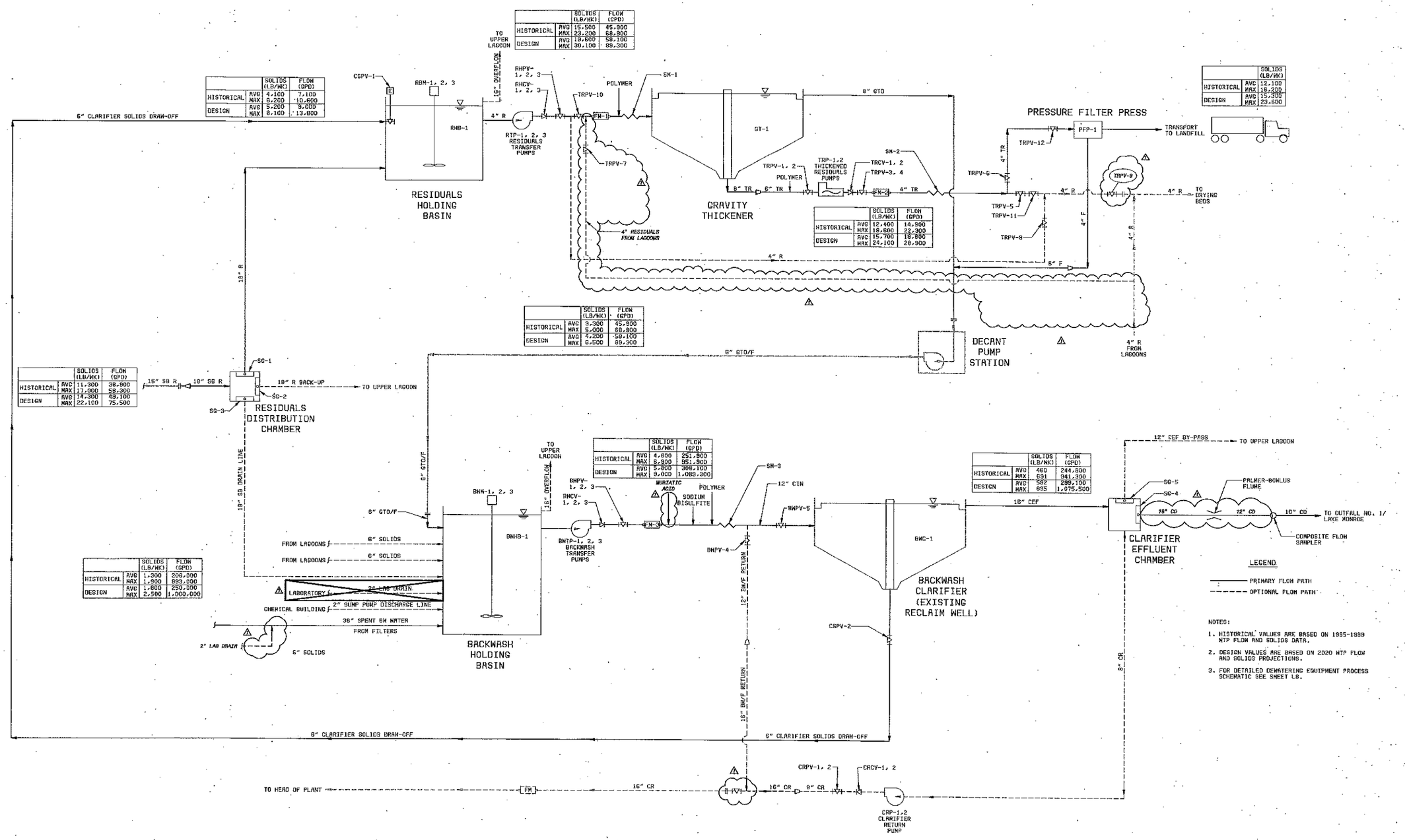


		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	4,100	7,100
	MAX	6,200	10,600
DESIGN	AVG	5,200	9,000
	MAX	8,100	13,800

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	15,500	45,900
	MAX	23,200	68,900
DESIGN	AVG	19,800	58,100
	MAX	30,100	89,300

		SOLIDS (LB/WK)
HISTORICAL	AVG	12,100
	MAX	18,200
DESIGN	AVG	15,300
	MAX	23,600

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	12,600	14,500
	MAX	18,600	22,300
DESIGN	AVG	15,700	18,800
	MAX	24,100	28,900

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	3,300	45,900
	MAX	5,000	68,800
DESIGN	AVG	4,200	59,100
	MAX	6,500	89,300

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	11,300	38,900
	MAX	17,000	58,300
DESIGN	AVG	14,300	49,100
	MAX	22,100	75,500

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	4,600	251,800
	MAX	6,900	951,900
DESIGN	AVG	5,800	308,100
	MAX	9,000	1,088,300

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	1,300	208,000
	MAX	1,900	883,000
DESIGN	AVG	1,800	250,000
	MAX	2,500	1,000,000

		SOLIDS (LB/WK)	FLOW (GPD)
HISTORICAL	AVG	460	244,800
	MAX	691	941,300
DESIGN	AVG	592	298,100
	MAX	895	1,075,500

NOTES:

1. HISTORICAL VALUES ARE BASED ON 1995-1999 WTP FLOW AND SOLIDS DATA.
2. DESIGN VALUES ARE BASED ON 2020 WTP FLOW AND SOLIDS PROJECTIONS.
3. FOR DETAILED DEWATERING EQUIPMENT PROCESS SCHEMATIC SEE SHEET L8.

PROCESS SCHEMATIC

NO SCALE

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02-	CONFORMED TO CONSTRUCTION RECORDS	FAM	AS	DMS

DESIGNED NMA, JCD, DMS
DETAILED DPK
CHECKED REO, JEW
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

GENERAL PROCESS SCHEMATIC

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 08-30-03, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE.8803682

L7

SHEET 7 OF 73

62409-(10-MRP-P-7000000CSF 06/27/2000 23:24:07 ACD

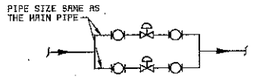
NOTE:

1. ALL VALVES, ACCESSORIES AND INTERCONNECTING PIPING INDICATED ON THIS SCHEMATIC SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ITEMS MARKED AS "W" WILL BE SHIPPED LOOSE BY EQUIPMENT SUPPLIER FOR INSTALLATION BY CONTRACTOR. ANY VALVES AND ACCESSORIES NOT INCLUDED ON THIS SCHEMATIC BUT REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT SHALL BE FURNISHED BY EQUIPMENT SUPPLIER AND INSTALLED BY THE CONTRACTOR.

2. CONNECTION POINTS SHOWN ON THIS SCHEMATIC ARE INDICATIVE ONLY AND DO NOT REPRESENT THE EXACT LOCATION ON THE EQUIPMENT. CONNECTION POINTS FOR ALL MAJOR PIPING (4 INCH AND LARGER) ARE INDICATED ON THE DRAWINGS. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER FOR ALL OTHER PIPING CONNECTIONS.

3. THE FOLLOWING PIPES AND ACCESSORIES SHALL BE SHIPPED LOOSE BY THE EQUIPMENT SUPPLIER TO BE INSTALLED IN THE FIELD BY THE CONTRACTOR. ALL HARDWARE, FASTENERS, ETC. REQUIRED TO ASSEMBLE THIS PIPING SHALL BE PROVIDED BY THE EQUIPMENT SUPPLIER.
   A) DOUBLE END SLURRY FEED PIPING AND HOSES.
   B) DOUBLE END VACUUM PIPING AND HOSES.
   C) FILTER CLOTHS.
   D) HOT WATER INLET AND OUTLET PIPING.

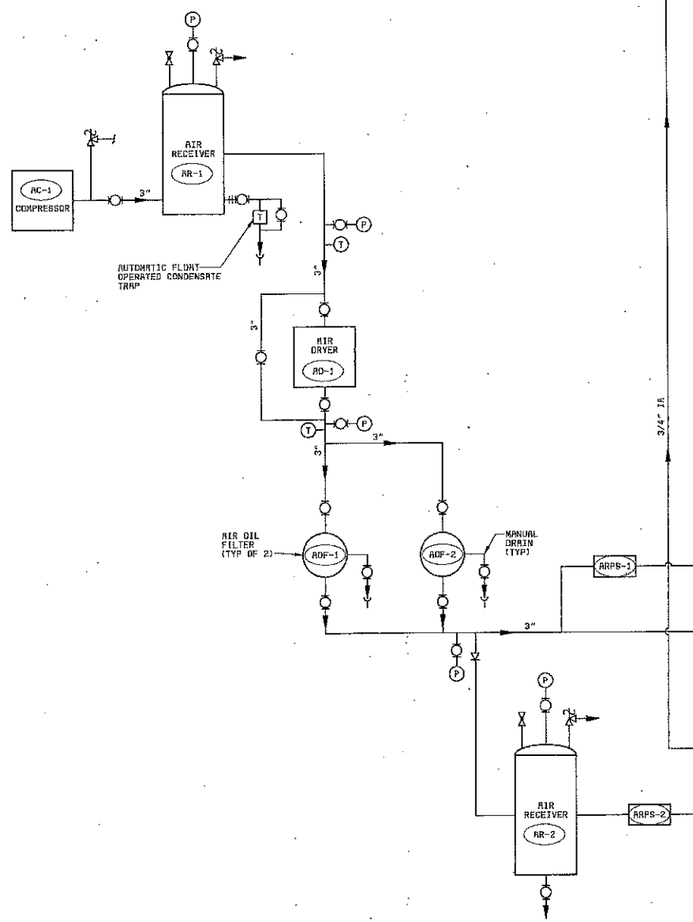
4. PROVIDE REDUCERS AT EACH SKID CONNECTION AS REQUIRED BY THE EQUIPMENT FURNISHED.

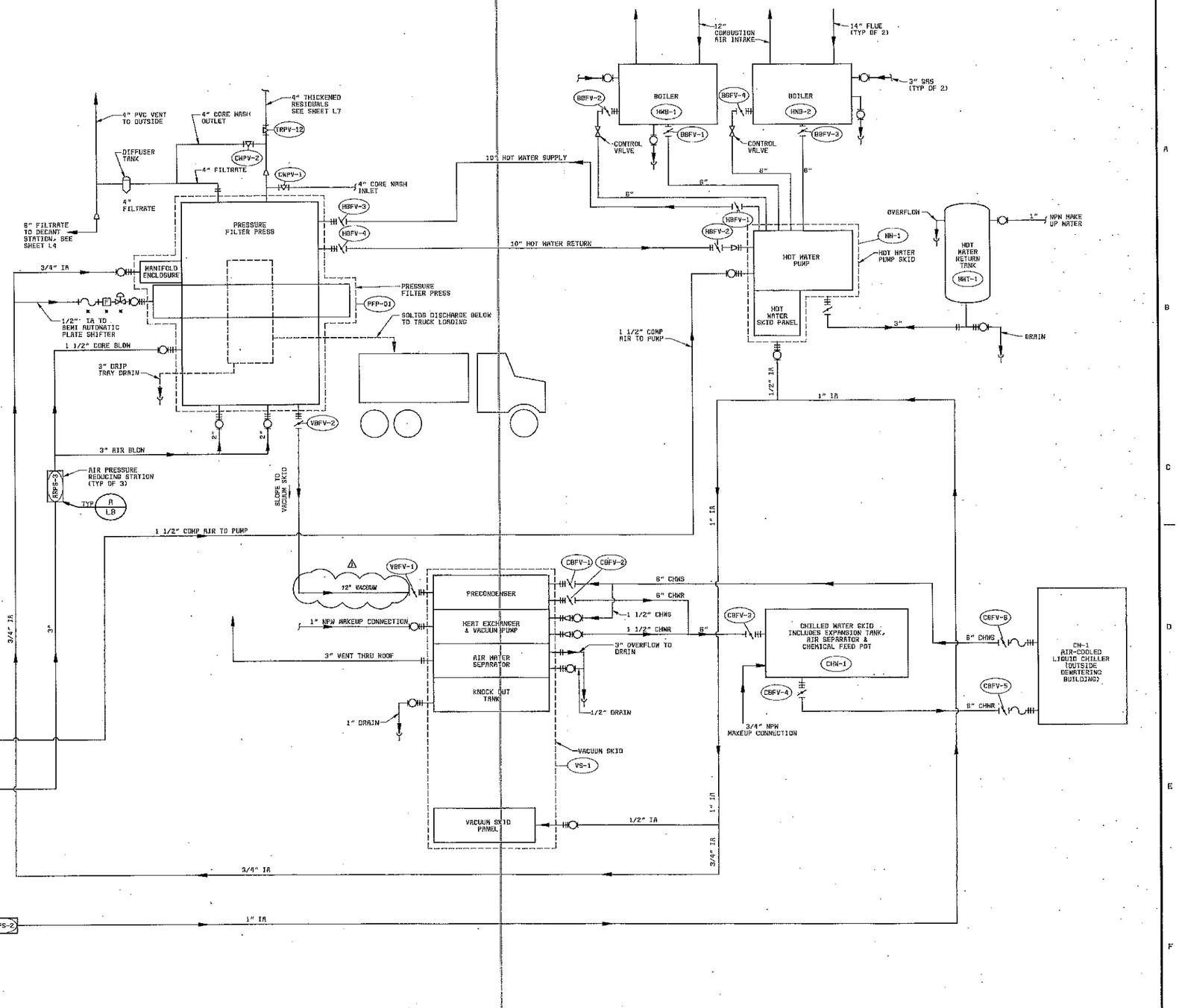


TYPICAL AIR PRESSURE REDUCING STATION

NOTE:
ALL PRESSURE REDUCING STATIONS SHALL BE LOCATED 3'-0" AFF. ALL PRESSURE REDUCING STATIONS SHALL BE WALL MOUNTED SO AS TO AVOID INTERFERENCE WITH OTHER EQUIPMENT IN LOCATIONS INDICATED ON THE DRAWINGS. ADEQUATE PIPE SUPPORTS SHALL BE PROVIDED TO MOUNT THE PRESSURE REDUCING STATION ASSEMBLY.

DETAIL A / L8
NO SCALE





07-02	CONFORMED TO CONSTRUCTION RECORDS		FAW	AS	DWG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED JVG, RS, DWG
DETAILED DPK
CHECKED REG, JEM
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

GENERAL
DEWATERING EQUIPMENT
PROCESS SCHEMATIC

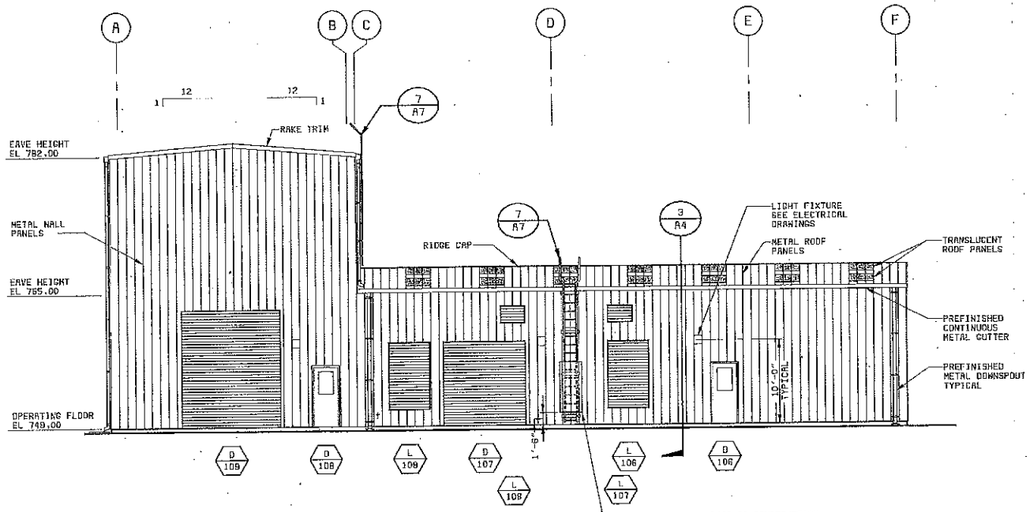
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 05-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6803882

L8

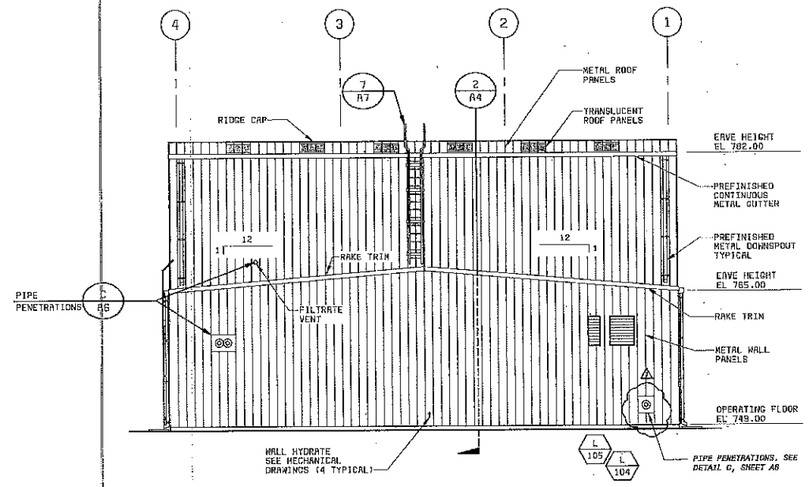
SHEET 8 OF 73

CCC. DWG. NO: 62409-110-NRH-C-N0000005H

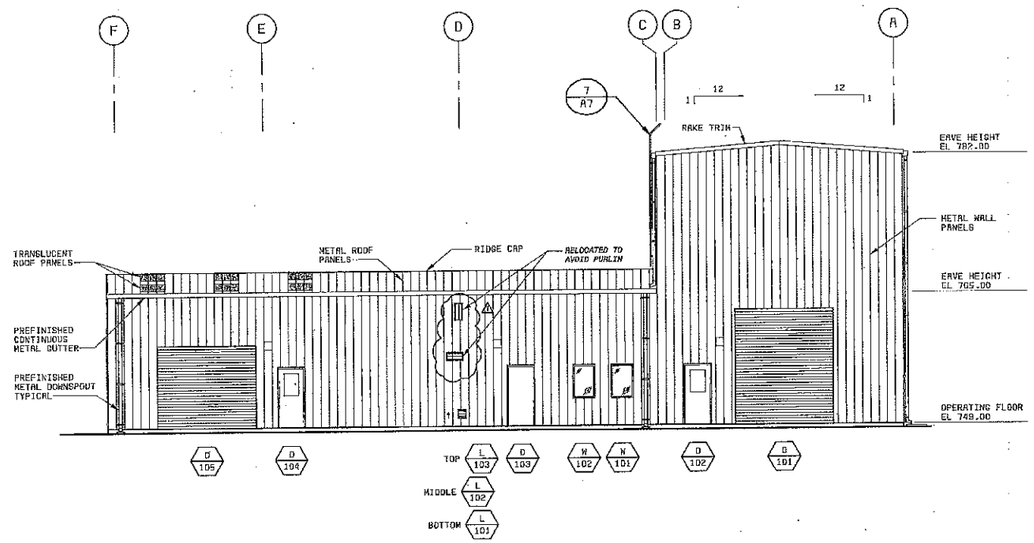
62409-110-NRH-C-N0000005H 06/27/2000 09:20:57 ACO



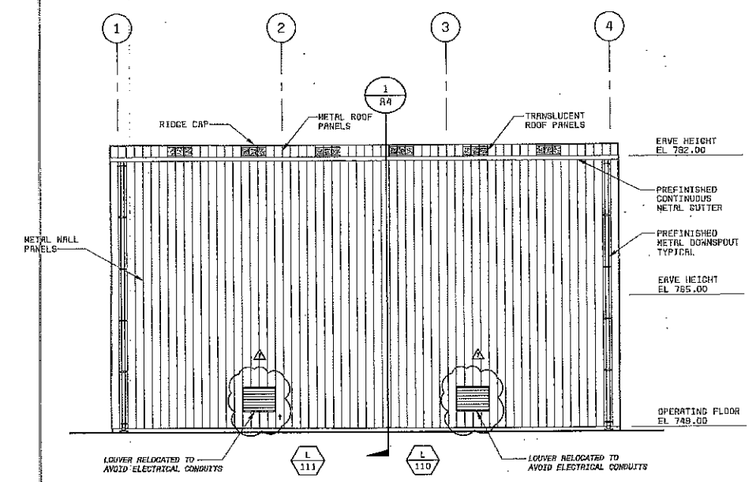
SOUTH ELEVATION
1/8" = 1'-0"



EAST ELEVATION
1/8" = 1'-0"



NORTH ELEVATION
1/8" = 1'-0"



WEST ELEVATION
1/8" = 1'-0"

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DRG

DESIGNED KJK
DETAILED MDE
CHECKED RRR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ARCHITECTURAL
DEWATERING BUILDING
ELEVATIONS

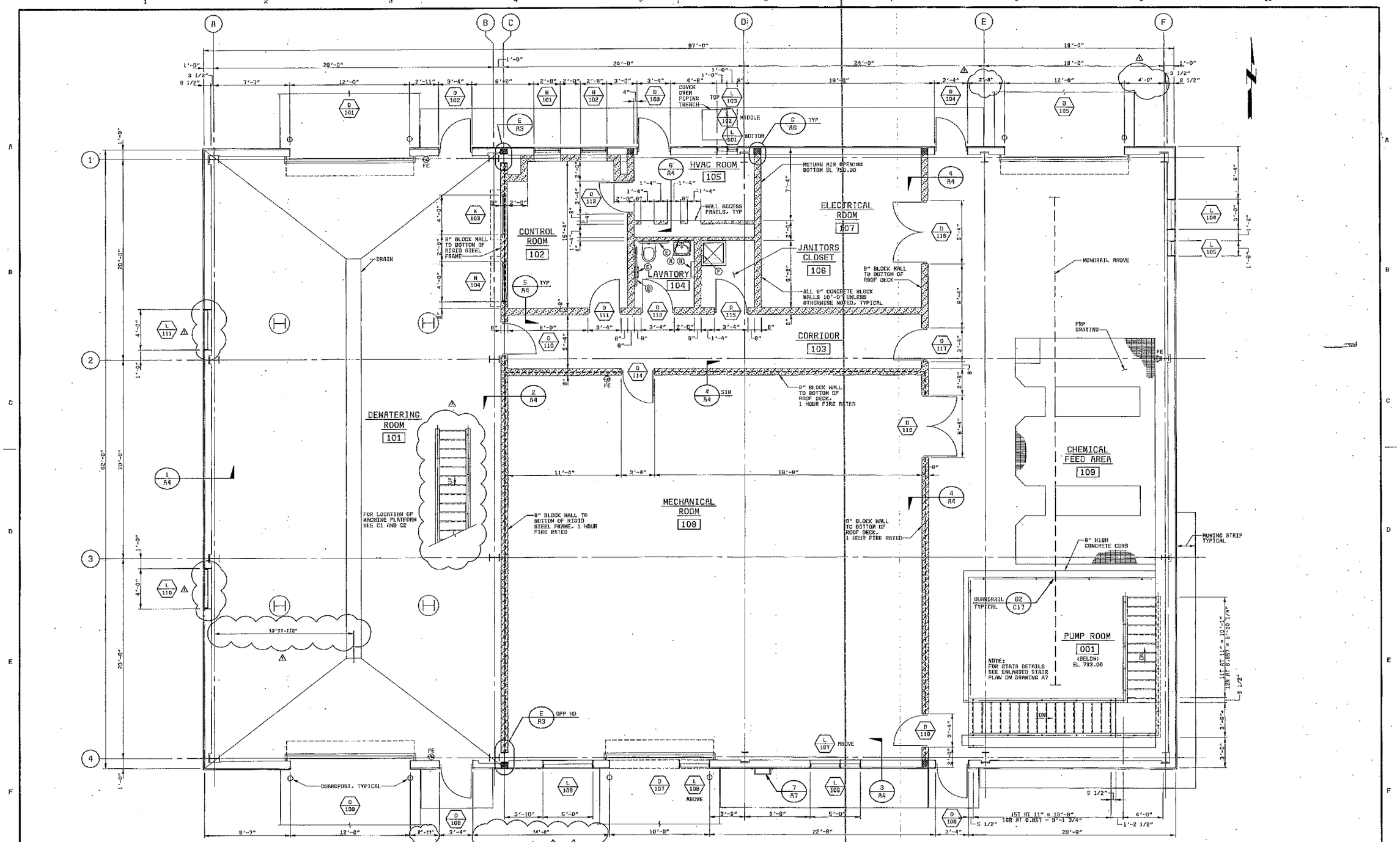
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 59003892

A1

SHEET 9 OF 73

G2009
F60000C

62409-112-WRH-A-Z000000CB8 06/29/00 09:38:25 RCD-14.01



DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DHG

DESIGNED XJK
DETAILED MDE
CHECKED RRR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

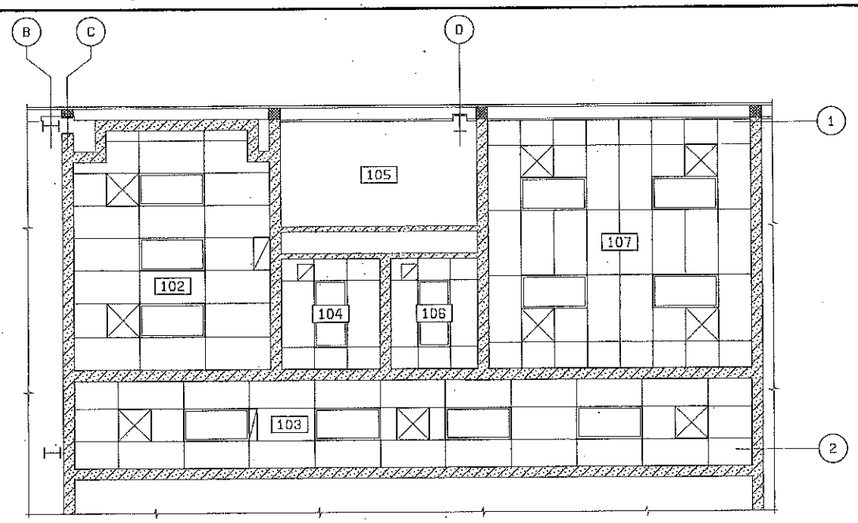
ARCHITECTURAL
DEWATERING BUILDING
OPERATING FLOOR PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONDONE ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6803682

A2

SHEET 10 OF 73

62409-112-WNSH-A-700000050 08/28/00 08:28:05 ACD-14.01



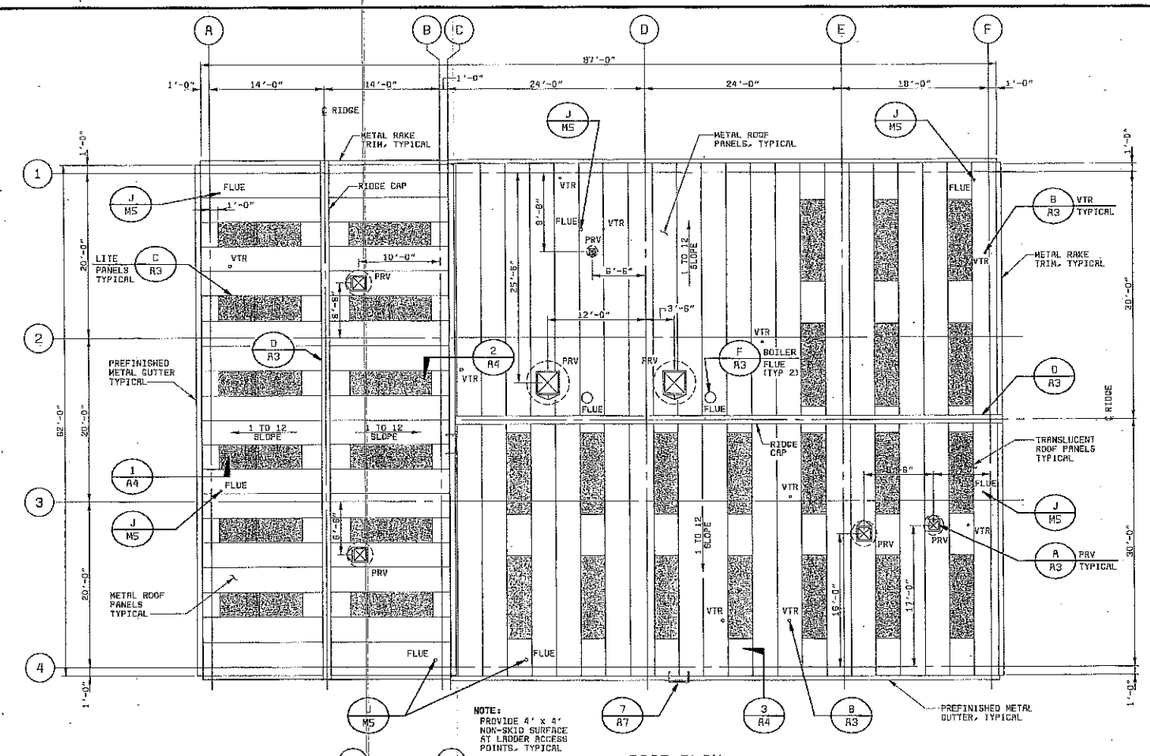
PARTIAL REFLECTED CEILING PLAN
1/4" = 1'-0"

LEGEND

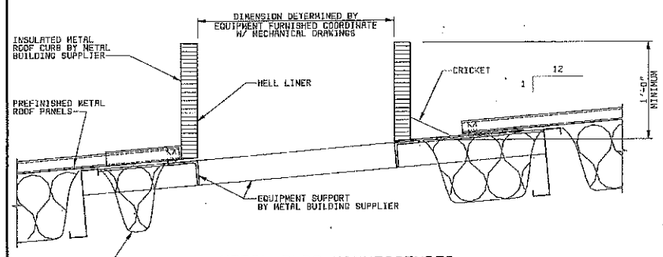
LIGHT FIXTURES

EXHAUST DIFFUSER / RETURN DIFFUSER

SUPPLY DIFFUSER

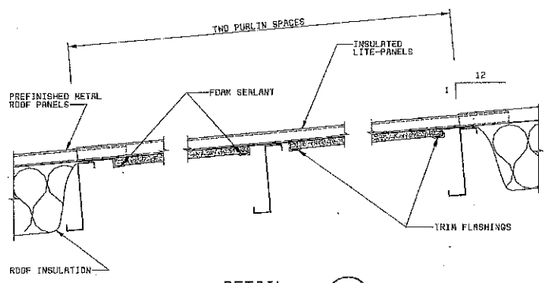


ROOF PLAN
1/8" = 1'-0"

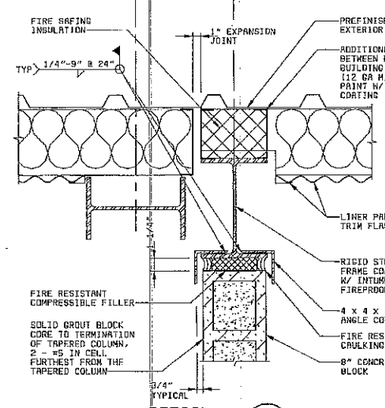


METAL BLDG MANUFACTURER
PRV OR DUCT ROOF PENETRATION

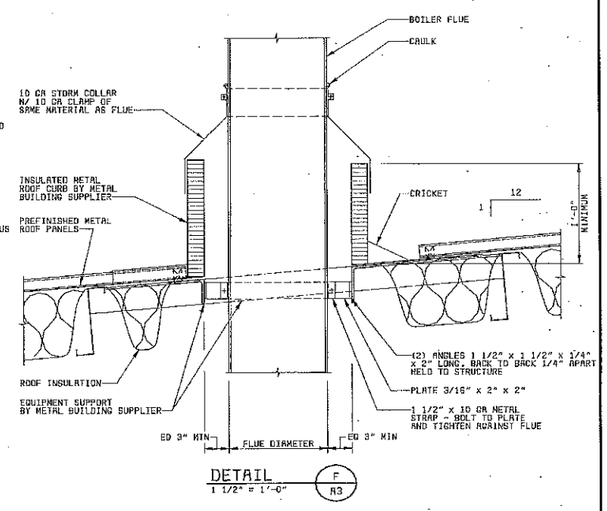
DETAIL A/A3
1 1/2" = 1'-0"



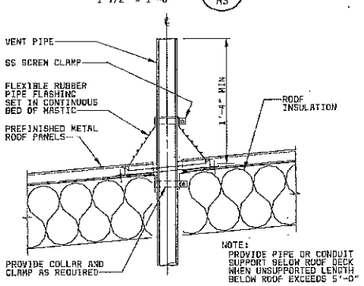
DETAIL C/A3
1 1/2" = 1'-0"



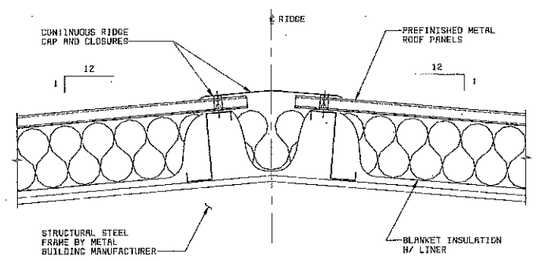
DETAIL E/A2
1/2" = 1'-0"



DETAIL F/A3
1 1/2" = 1'-0"



DETAIL B/A3
1 1/2" = 1'-0"



DETAIL D/A3
1 1/2" = 1'-0"

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORD	1	FAM	AS	DHS

DESIGNED KJK
DETAILED MDE
CHECKED RRR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

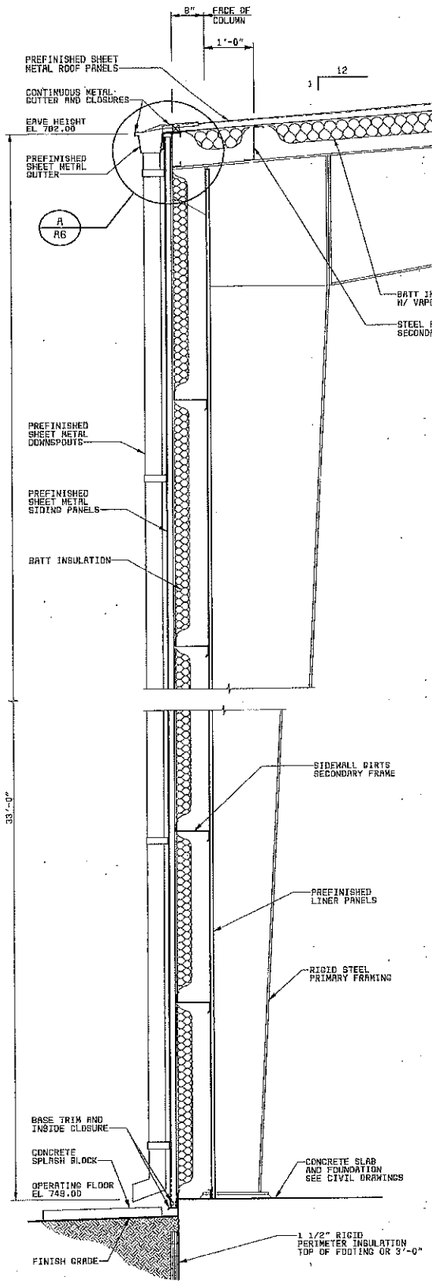
ARCHITECTURAL
DEWATERING BUILDING
ROOF & REFLECTED CLG PLANS & DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONGEE ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. EME 0602962

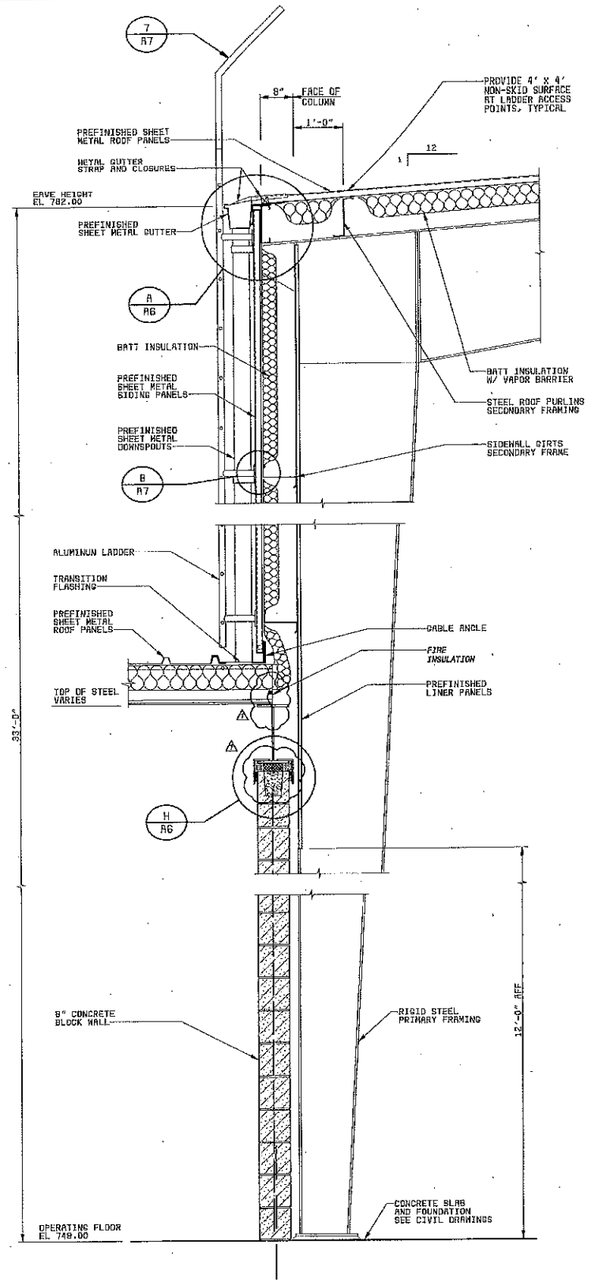
A3
SHEET 11 OF 73

G2009
F000000

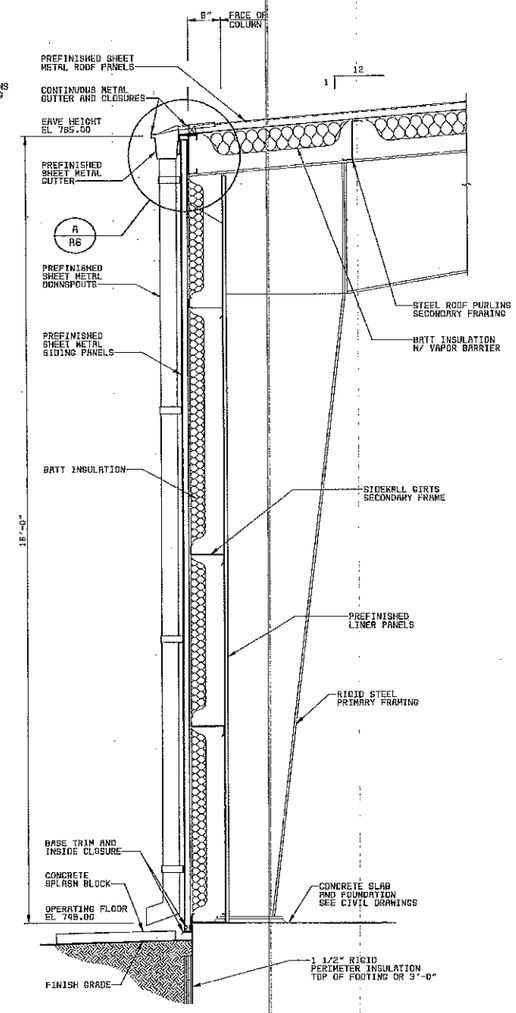
62409-112-WASH-A-700000050 06/29/00 08:47:25 ACD-14.01



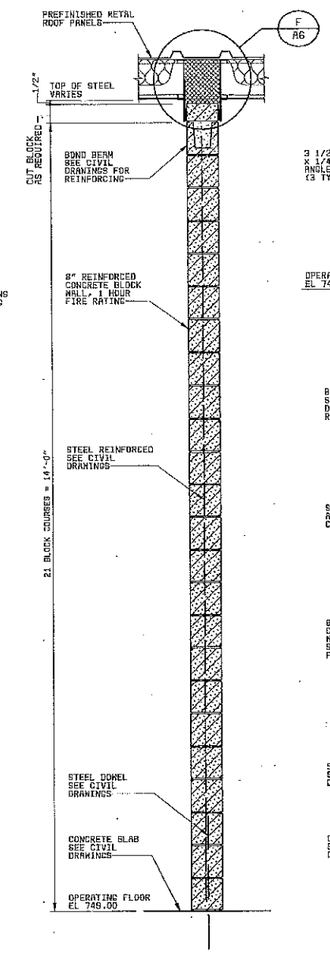
SECTION 1 (A1, A2, A3)
3/4" = 1'-0"



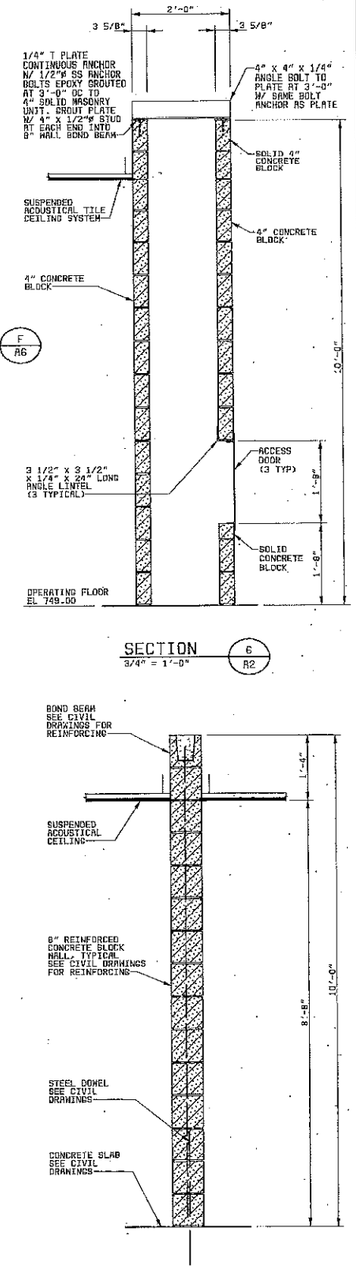
SECTION 2 (A1, A2, A3)
3/4" = 1'-0"



SECTION 3 (A1, A2, A3)
3/4" = 1'-0"



SECTION 4 (A2)
3/4" = 1'-0"



SECTION 6 (A2)
3/4" = 1'-0"

SECTION 5 (A2)
3/4" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DAG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED YJK
DETAILED WDE
CHECKED RRR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ARCHITECTURAL
DEWATERING BUILDING
WALL SECTIONS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOMBARD ON 06-20-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6803882

A4

SHEET 12 OF 73

62409-112-W04-A-700000C69 06/29/00 09:05:46 ACD-16.01

ROOM FINISH SCHEDULE

RM NO	ROOM NAME	FLOOR MATRL	FLOOR FINISH	WALLS NORTH MATRL	WALLS NORTH FINISH	WALLS NORTH BASE	WALLS SOUTH MATRL	WALLS SOUTH FINISH	WALLS SOUTH BASE	WALLS EAST MATRL	WALLS EAST FINISH	WALLS EAST BASE	WALLS WEST MATRL	WALLS WEST FINISH	WALLS WEST BASE	CEILING MATRL	CEILING FINISH	CEILING HEIGHT	REMARKS
	DEWATERING BUILDING																		
001	PUMP ROOM	CONC	FS	CONC	ND	ND	CONC	ND	ND	CONC	ND	ND	CONC	ND	ND	CONC	ND	13'-4"	
101	DEWATERING ROOM	CONC	FS	LP	FAC	ND	LP	FAC	ND	CB/LP	PT/FAC	ND	LP	FAC	ND	IS	FAC	VARIES	
102	CONTROL ROOM	CONC	VCT	CB	PT	V	CB	PT	V	CB	PT	V	CB	PT	V	ATC	FAC	8'-8"	
103	CORRIDOR	CONC	VCT	CB	PT	V	CB	PT	V	CB	PT	V	CB	PT	V	ATC	FAC	8'-8"	
104	LAVATORY	CONC	VCT	CB	PT	V	CB	PT	V	CB	PT	V	CB	PT	V	ATC	FAC	8'-8"	
105	HVAC ROOM	CONC	FS	LP	FAC	ND	CB	PT	ND	CB	PT	ND	CB	PT	ND	IS	FAC	VARIES	
106	JANITOR'S CLOSET	CONC	VCT	CB	PT	V	CB	PT	V	CB	PT	V	CB	PT	V	ATC	FAC	8'-8"	
107	ELECTRICAL ROOM	CONC	FS	LP	FAC	ND	CB	PT	ND	CB	PT	ND	CB	PT	ND	ATC	FAC	8'-8"	
108	MECHANICAL ROOM	CONC	FS	CB	PT	ND	LP	FAC	ND	CB	PT	ND	CB	PT	ND	IS	FAC	VARIES	
109	CHEMICAL FEED ROOM	CONC	FA/FG	LP	FAC	ND	LP	FAC	ND	LP	FAC	ND	CB	PT	ND	IS	FAC	VARIES	
	CHEMICAL FEED BUILDING																		
201	CHEMICAL FEED ROOM	CONC	FS/FG	LP	FAC	ND	LP	FAC	ND	LP	FAC	ND	CB	PT	ND	IS	FAC	VARIES	
202	ELECTRICAL ROOM	CONC	FG	LP	FAC	ND	CB	PT	ND	CB	PT	ND	LP	FAC	ND	ATC	FAC	8'-8"	

MATERIAL & FINISH LEGEND

AG - ALUMINUM GRATING
AL - ALUMINUM
ATC - ACOUSTICAL TILE CEILING
CB - CONCRETE BLOCK
CONC - CONCRETE
FAC - FACTORY FINISH
FG - FRP GRATING
FS - FLOOR SEALER
HM - HOLLOW METAL
IS - INSULATED SCRIM
LP - LINER PANEL
ND - NONE
RS - ROLLING STEEL
PT - PAINT
STL - STEEL
V - VINYL
VCT - VINYL COMPOSITION TILE

DOOR SCHEDULE

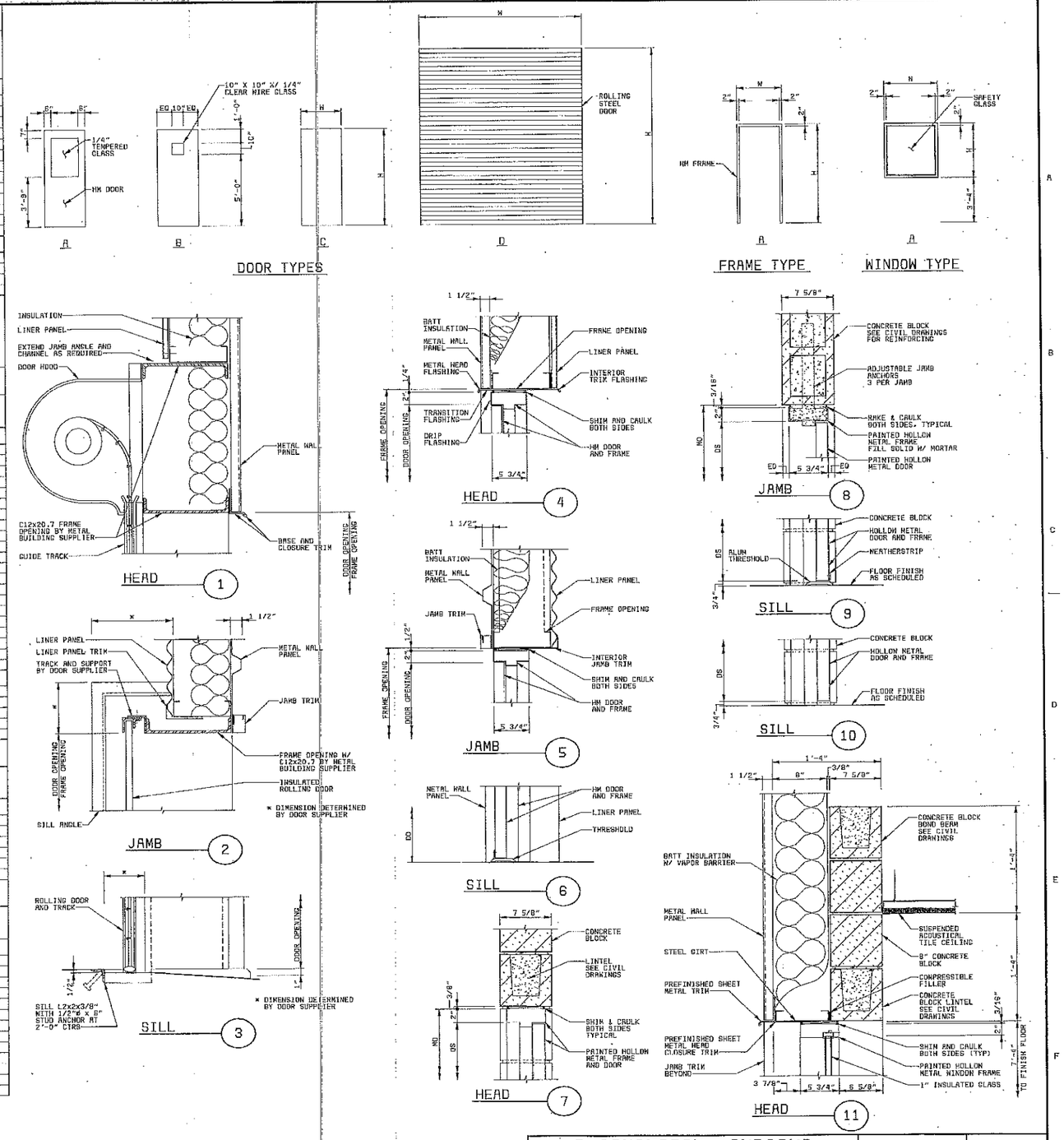
NO (D)	DOOR SIZE	DOOR TYPE	DOOR HEAD	DOOR JAMB	DOOR SILL	DOOR ELEV	FRAME TYPE	FRAME SIZE	LINTEL TYPE	LINTEL LENGTH	LABEL	REMARKS
	DEWATERING BUILDING											
101	12'-0" x 14'-0"	RS	1	2	3	D	STL	-	BY MTL BLDG MFR		-	
102	3'-0" x 7'-2"	HM	4	5	6	A	HM	5.75	BY MTL BLDG MFR		-	
103	3'-0" x 7'-2"	HM	4	5	6	C	HM	5.75	BY MTL BLDG MFR		-	
104	3'-0" x 7'-2"	HM	4	5	6	A	HM	5.75	BY MTL BLDG MFR		-	
105	12'-0" x 10'-0"	RS	1	2	3	D	STL	-	BY MTL BLDG MFR		-	
106	3'-0" x 7'-2"	HM	4	5	6	A	HM	5.75	BY MTL BLDG MFR		-	
107	10'-0" x 10'-0"	RS	1	2	3	D	STL	-	BY MTL BLDG MFR		-	
108	3'-0" x 7'-2"	HM	4	5	6	A	HM	5.75	BY MTL BLDG MFR		-	
109	12'-0" x 14'-0"	RS	1	2	3	D	STL	-	BY MTL BLDG MFR		-	
110	3'-0" x 7'-2"	HM	7	8	9	B	HM	5.75	SEE CIVIL DWGS		1 HR	
111	3'-0" x 7'-2"	HM	7	8	10	A	HM	5.75	SEE CIVIL DWGS		-	
112	3'-0" x 7'-2"	HM	7	8	9	C	HM	5.75	SEE CIVIL DWGS		-	
113	3'-0" x 7'-2"	HM	7	8	10	C	HM	5.75	SEE CIVIL DWGS		-	
114	3'-0" x 7'-2"	HM	7	8	9	B	HM	5.75	SEE CIVIL DWGS		1 HR	
115	3'-0" x 7'-2"	HM	7	8	10	C	HM	5.75	SEE CIVIL DWGS		-	
116	PR 3'-0" x 7'-2"	HM	7	8	10	C	HM	5.75	SEE CIVIL DWGS		-	
117	3'-0" x 7'-2"	HM	7	8	9	A	HM	5.75	SEE CIVIL DWGS		-	
118	3'-0" x 7'-2"	HM	7	8	10	B	HM	5.75	SEE CIVIL DWGS		1 HR	
119	3'-0" x 7'-2"	HM	7	8	10	C	HM	5.75	SEE CIVIL DWGS		1 HR	
	CHEMICAL FEED BUILDING - SEE SHEET C7											
201	10'-0" x 10'-0"	RS	1	2	3	D	STL	-	BY MTL BLDG MFR		-	
202	3'-0" x 7'-2"	HM	4	5	6	A	HM	5.75	BY MTL BLDG MFR		-	
203	3'-0" x 7'-2"	HM	7	8	9	C	HM	5.75	SEE CIVIL DRAWINGS		-	

WINDOW SCHEDULE

NO (W)	OPENING W X H	WINDOW TYPE	WINDOW HEAD	WINDOW JAMB	WINDOW SILL	WINDOW MULL	WINDOW ELEV	GLASS	LINTEL TYPE	LINTEL LENGTH	REMARKS
	DEWATERING BUILDING										
101	2'-8" x 4'-0"	HM	11	12	13	-	A	1" INSULATED	SEE CIVIL DWGS		
102	2'-8" x 4'-0"	HM	11	12	13	-	A	1" INSULATED	SEE CIVIL DWGS		
103	4'-0" x 4'-0"	HM	14	15	16	-	A	1/4" CLEAR GLASS	SEE CIVIL DWGS		FIRE SHUTTER
104	4'-0" x 4'-0"	HM	14	15	16	-	A	1/4" CLEAR GLASS	SEE CIVIL DWGS		FIRE SHUTTER

LOUVER SCHEDULE

NO (L)	OPENING W X H	LOUVER TYPE	LOUVER HEAD	LOUVER JAMB	LOUVER SILL	LOUVER TOP ELEV	LINTEL TYPE	LINTEL LENGTH	REMARKS
	DEWATERING BUILDING								
101	1'-0" x 1'-0"	AL	17	18	19	751.00	BY MTL BLDG MFR		
102	2'-0" x 1'-0"	AL	17	18	19	758.00	BY MTL BLDG MFR		
103	1'-0" x 1'-0"	AL	17	18	19	764.00	BY MTL BLDG MFR		
104	3'-0" x 3'-6"	AL	17	18	19	762.00	BY MTL BLDG MFR		
105	1'-6" x 3'-6"	AL	17	18	19	762.00	BY MTL BLDG MFR		
106	5'-0" x 8'-0"	AL	17	18	19	759.00	BY MTL BLDG MFR		
107	3'-0" x 2'-0"	AL	17	18	19	763.25	BY MTL BLDG MFR		NO DAMPER REQUIRED
108	3'-0" x 2'-0"	AL	17	18	19	763.25	BY MTL BLDG MFR		NO DAMPER REQUIRED
109	5'-0" x 8'-0"	AL	17	18	19	759.00	BY MTL BLDG MFR		
110	4'-0" x 3'-0"	AL	17	18	19	754.00	BY MTL BLDG MFR		
111	4'-0" x 3'-0"	AL	17	18	19	754.00	BY MTL BLDG MFR		



07-02	CONFORMED TO CONSTRUCTION RECORDS	FAW	AS	DMG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED KJK
DETAILED MDE
CHECKED RKR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

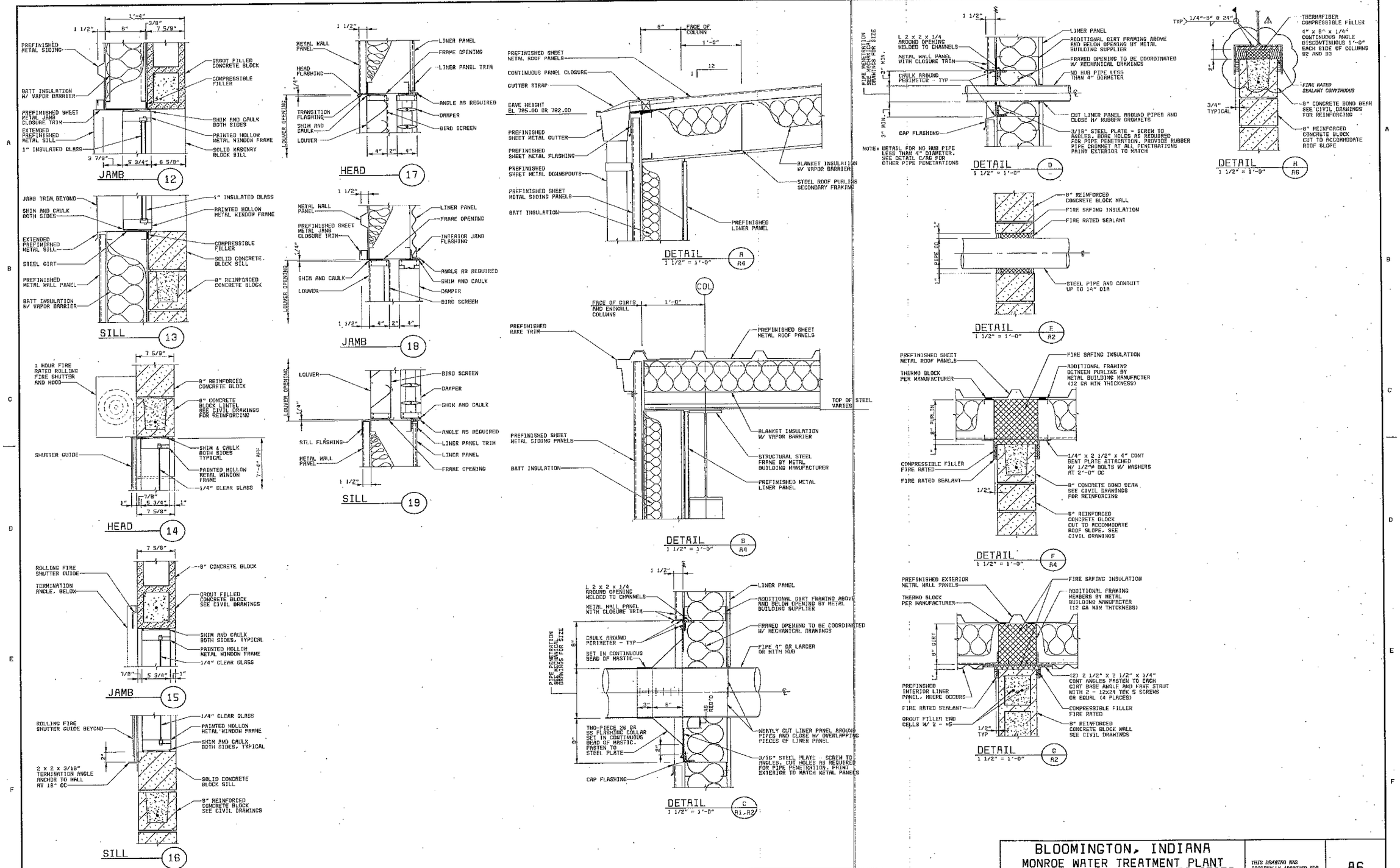
BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ARCHITECTURAL
DEWATERING BUILDING
SCHEDULES AND DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONNDES ON 05-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0003882

A5

SHEET 13 OF 73



07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DHG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED KJK
DETAILED MCE
CHECKED RRR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

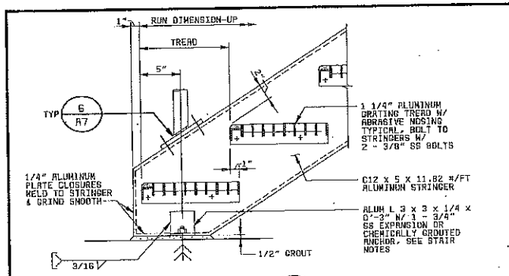
BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES

ARCHITECTURAL
DEWATERING BUILDING
MISCELLANEOUS DETAILS

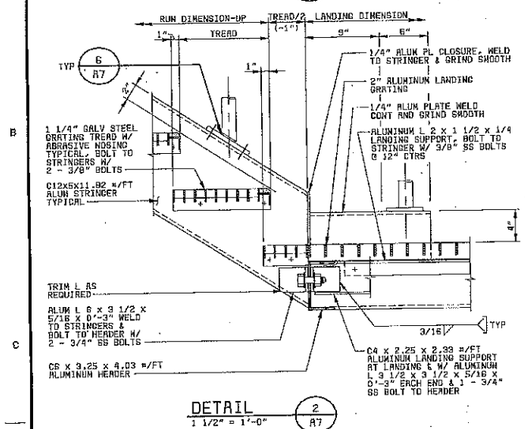
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWMAN ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 88038B2

A6

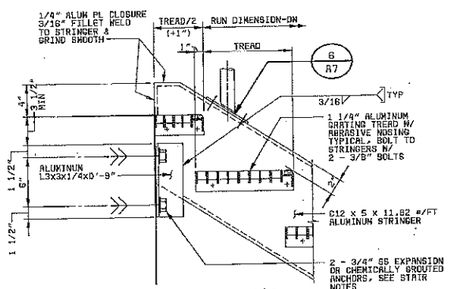
SHEET 14 OF 73



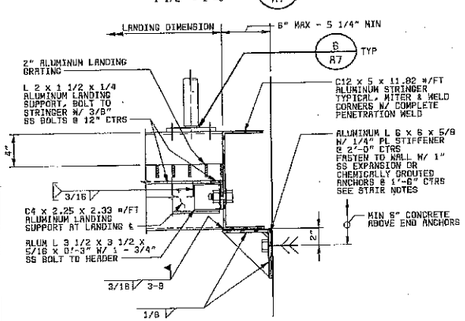
DETAIL 1 (1 A7)
1 1/2" = 1'-0"



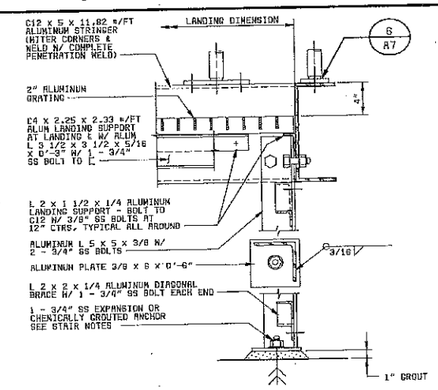
DETAIL 2 (2 A7)
1 1/2" = 1'-0"



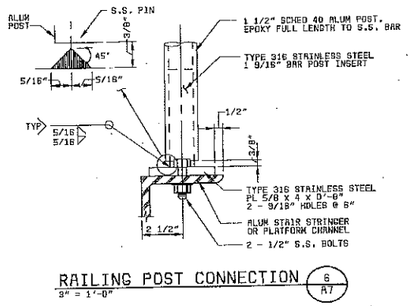
DETAIL 3 (3 A7)
1 1/2" = 1'-0"



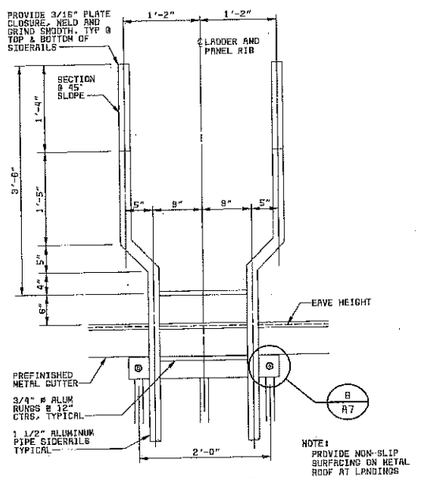
DETAIL 4 (4 A7)
1 1/2" = 1'-0"



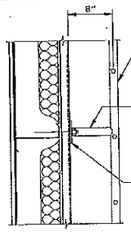
DETAIL 5 (5 A7)
1 1/2" = 1'-0"



RAILING POST CONNECTION 6 (6 A7)
3" = 1'-0"

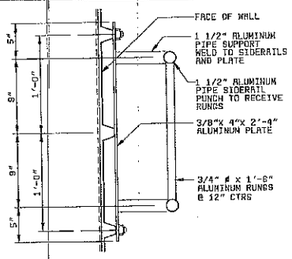


DETAIL 7 (7 A1,A2,A3,A4)
1" = 1'-0"



SECTION
1"=1'-0"

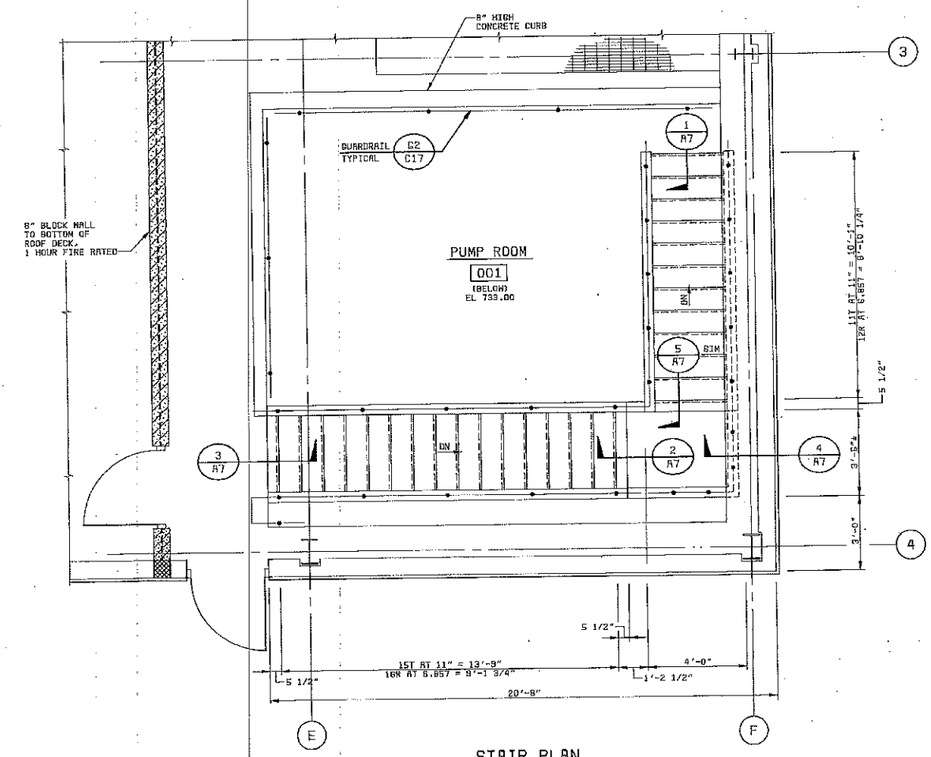
DETAIL 8 (8 A4,A7)
SCALE VARIES



PLAN
1 1/2"=1'-0"

ALUMINUM GRATING STAIR NOTES:

1. ALL MISCELLANEOUS ALUMINUM SHAPES ON THIS SHEET TO BE ROLLED TO ALUMINUM ASSOCIATION STANDARD STRUCTURAL SHAPES.
2. DESIGNATION LEGEND FOR ALUMINUM SHAPES:
   - C 12 X 5 X 11.022 #/FT
     - CHANNEL
     - DEPTH
     - FLANGE WIDTH
     - MEMBER HEIGHT
   - L 5 X 5 X 3/8
     - ANGLE
3. WELDS NOT DIMENSIONED ON THE DRAWINGS SHALL BE SIZED TO DELEVOP THE FULL STRENGTH OF THE LEAST STRENGTH COMPONENT OF THE CONNECTION.
4. ALTERNATIVE 3/8" ANCHORAGES INCLUDE:
   - (1) HILTI 3/8" SS KWIK BOLT II, 4 1/4" MIN EMBEDMENT; ICBO REPORT #4627
   - (2) 3/8" SS THREADED ROD, NUT AND BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 5 1/4" EMBEDMENT; ICBO REPORT #4016
   - (3) RAMSET 3/8" SS TRUBOLT, 4 1/2" MIN EMBEDMENT; ICBO REPORT #1372
   - (4) 3/8" SS THREADED ROD, NUT AND BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 4 1/2" EMBEDMENT; ICBO REPORT #4295
   - (5) 3/8" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER. ALL GALVANIZED. 9" MINIMUM EMBEDMENT, 4" HOOK.
5. ALTERNATIVE 1/2" ANCHORAGES INCLUDE:
   - (1) HILTI 1/2" SS KWIK BOLT II, 3 1/2" MIN EMBEDMENT; ICBO REPORT #4627
   - (2) 1/2" SS THREADED ROD, NUT AND BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 4 1/4" EMBEDMENT; ICBO REPORT #4016
   - (3) RAMSET 1/2" SS TRUBOLT, 4 1/4" MIN EMBEDMENT; ICBO REPORT #1372
   - (4) 1/2" SS THREADED ROD, NUT AND BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MIN 4 1/8" EMBEDMENT; ICBO REPORT #4295
   - (5) 1/2" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER. ALL GALVANIZED. 9" MINIMUM EMBEDMENT, 6" HOOK.
6. ALTERNATIVE 3/4" ANCHORAGES INCLUDE:
   - (1) HILTI 3/4" SS KWIK BOLT II, 4 3/4" MIN EMBEDMENT; ICBO REPORT #4627
   - (2) 3/4" SS THREADED ROD, NUT, BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 6 5/8" EMBEDMENT; ICBO REPORT #4016
   - (3) RAMSET 3/4" SS TRUBOLT, 6 2/8" MIN EMBEDMENT; ICBO REPORT #1372
   - (4) 3/4" SS THREADED ROD, NUT, BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 6 3/4" EMBEDMENT; ICBO REPORT #4295
   - (5) 3/4" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER. ALL GALVANIZED. 9" MINIMUM EMBEDMENT, 6" HOOK.
7. ALTERNATIVE 1" ANCHORAGES INCLUDE:
   - (1) HILTI 1" SS KWIK BOLT II, 6" MIN EMBEDMENT; ICBO REPORT #4627
   - (2) 1" SS THREADED ROD, NUT AND BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 8 1/4" EMBEDMENT; ICBO REPORT #4016
   - (3) RAMSET 1" SS TRUBOLT, 7 3/8" MIN EMBEDMENT; ICBO REPORT #1372
   - (4) 1" SS THREADED ROD, NUT AND BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 9" EMBEDMENT; ICBO REPORT #4295
   - (5) 1" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER. ALL GALVANIZED. 9" MINIMUM EMBEDMENT, 6" HOOK.



STAIR PLAN
3/8" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DNG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED KJK
DETAILED MDE
CHECKED RRR
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ARCHITECTURAL
DEWATERING BUILDING
STAIR AND MISCELLANEOUS DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONNGREN ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 5803892

A7

SHEET 15 OF 73

62409
F900000

6BANA-112-WR4-R-N00000021 08/28/00 08:20:28 RCD-14.01

NOTES:

1. REFER TO SHEET C6 FOR GENERAL NOTES APPLICABLE TO DEWATERING BUILDING AND SPECIFIC NOTES APPLICABLE TO THIS SHEET.

FLOOR PLAN EL 749.00

1/4" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS		FAM	AS	DMS
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED DMC, RS, JVC
DETAILED DPK
CHECKED RED, JEM, MDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
DEWATERING BUILDING
FOUNDATION & FLOOR PLANS

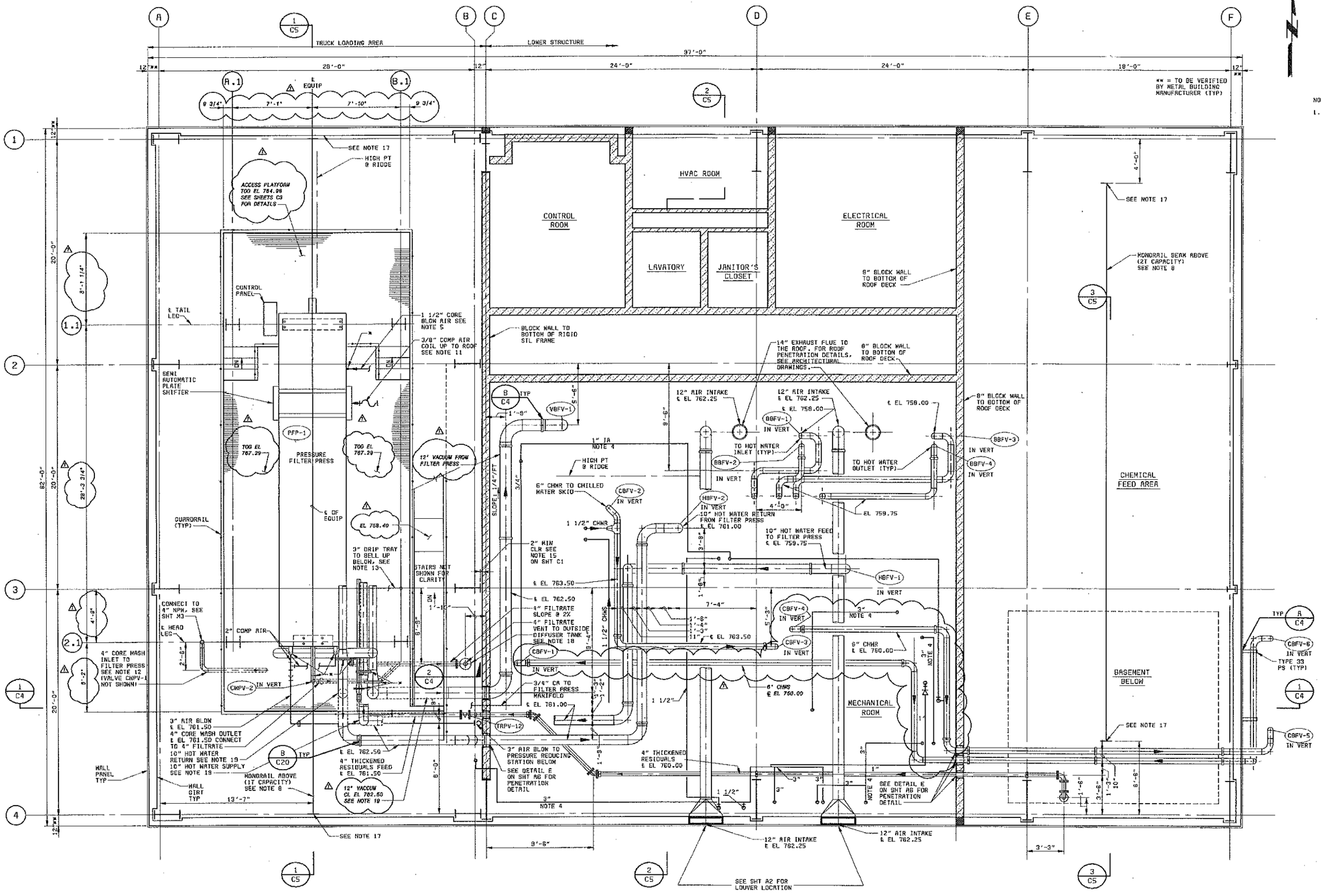
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8403882

C1

SHEET 16 OF 73

62409-110-WRH-C-Z000000C5H 06/26/2000 13:51:58 ACD

CCO. DWG. NO: 62409-110-WRH-C-R0000818



SECTIONAL PLAN

1/4" = 1'-0" (SEE NOTE 1)

NOTES:

1. REFER TO SHEET C8 FOR GENERAL NOTES APPLICABLE TO DEWATERING BUILDING AND SPECIFIC NOTES APPLICABLE TO THIS SHEET.

07-02	CONFORMED TO CONSTRUCTION RECORDS	FAM	AS	DHG
DATE	REVISIONS AND RECORD OF ISSUE	NO	BY	CK

DESIGNED JVG, AS, DHG
DETAILED DPK, ERS
CHECKED RED, JEW, WDB
APPROVED
DATE

BLACK & VEATCH Corporation

PROJECT NO. 62409

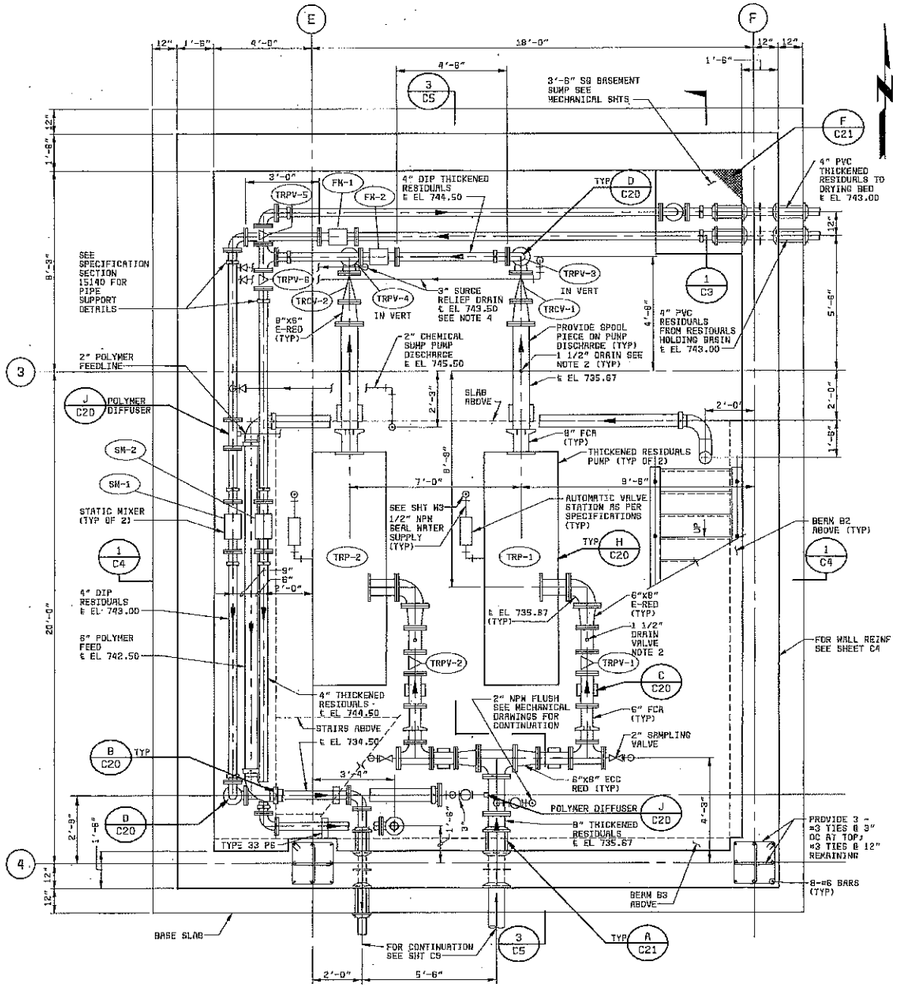
BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
DEWATERING BUILDING
SECTIONAL PLAN

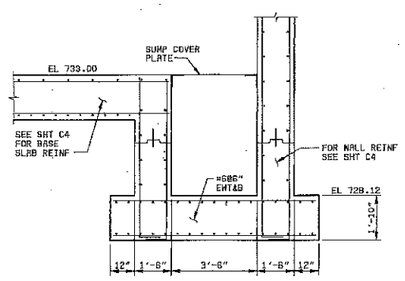
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8803082

C2

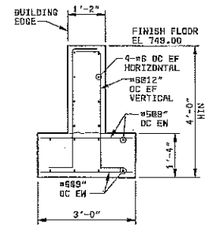
SHEET 17 OF 73



DEWATERING BUILDING BASEMENT PLAN @ EL 733.00
3/8" = 1'-0"

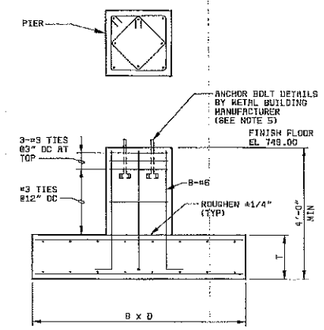


SECTION 1/C3
3/8" = 1'-0"



NOTE:
GRADE BEAM FOOTING SHALL BEAR AT THE SAME ELEVATION AS THE COLUMN FOOTINGS. ALL HORIZONTAL GRADE BEAM REINFORCEMENT SHALL BE DEVELOPED FULLY INTO THE COLUMN PIER AND FOUNDATION.

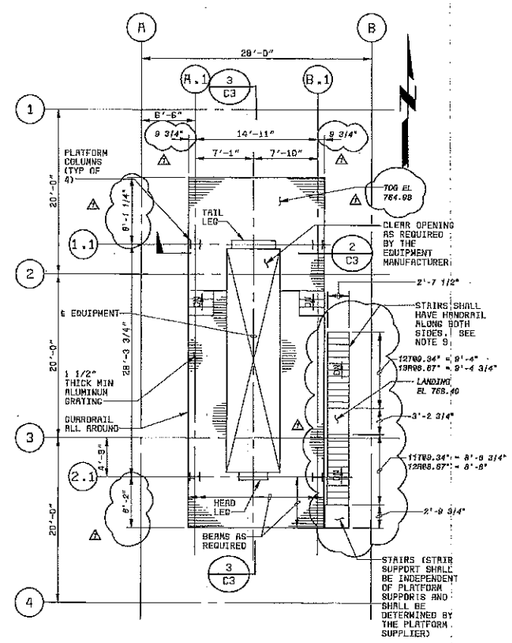
FOUNDATION REINFORCING DETAIL - TYPICAL BUILDING GRADE BEAM AND FOUNDATION
1/2" = 1'-0"



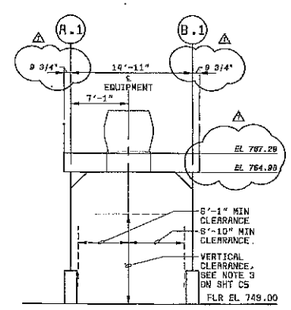
TYPICAL FOUNDATION DETAIL
1/2" = 1'-0"

FOUNDATION SCHEDULE							
COLUMN	PIER		TIES	FOUNDATION		FOUNDATION REINF	
	SIZE BW x NS (FT x FT)	REINF		SIZE EW x NS B x D (FT x FT)	THICKNESS T (FT x FT)	TOP	BOTTOM
A1, A4, F1	2 x 2	8 - #6	3-#3@3" AT TOP #3@12" REMAINING	5 x 5	1'-4"	8-#6 EW 8-#6 NS	8-#6 EW 8-#6 NS
A2, A3, B2, B3	2 x 2	8 - #6		6'-6" x 8'-0"	1'-4"	8-#6 EW 8-#6 NS	8-#6 EW 8-#6 NS
D1, D4, E1, E4	2 x 2	8 - #6		8'-0" x 8'-0"	1'-4"	8-#8 EW 8-#8 NS	8-#8 EW 8-#8 NS
B1, C1, B4, C4	2'-2" x 2'-0"	8 - #6		8'-6" x 5'-6"	1'-4"	8-#6 EW 8-#6 NS	8-#6 EW 8-#6 NS
EQUIPMENT SUPPORT COLUMN FOUNDATION	2 x 2	8 - #6		8'-4" x 8'-6"	1'-4"	8-#6 EW 8-#6 NS	8-#6 EW 8-#6 NS

NOTE:
COLUMNS B1, C1, AND B4, C4 ALL HAVE A COMMON FOUNDATION. SEE SHEET C1.



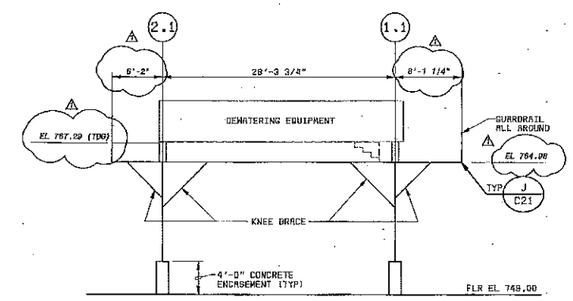
PLAN AT EL 767.29 (TOG)
1/8" = 1'-0"
SEE NOTE 8,12



SECTION 2/C3
1/8" = 1'-0"

NOTE:

1. REFER TO SHEET C6 FOR GENERAL NOTES APPLICABLE TO THE DEWATERING BUILDING AS WELL SPECIFIC NOTES APPLICABLE TO THIS SHEET.



SECTION 3/C3
1/8" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	FAW	AS	DMS
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED AS
DETAILED OPK
CHECKED REC, JEW, MDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
DEWATERING BUILDING
BASEMENT PLAN & DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOBNGES ON 09-10-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6803802

C3

SHEET 18 OF 73

NOTE:
SEE SHEET C6 FOR GENERAL NOTES APPLICABLE TO THE DEWATERING BUILDING AS WELL AS SPECIFIC NOTES APPLICABLE TO THIS SHEET.

TRUCK LOADING AREA
LOWER STRUCTURE
26'-0"
24'-0"
24'-0"
18'-0"
ROOF PANELS
EAVE EL 782.00
WALL PANELS
MONORAIL LIFTING CAPACITY = 1T
EL 778.33 MIN (HOOK IN HIGHEST POSITION)
1/2" COMPRESSED AIR
SEE NOTE 3 UNDER GENERAL NOTES ON SHT C6
3/8" COMPRESSED AIR HOSE (PROVIDED BY EQUIPMENT SUPPLIER TO PLATE SHIFTING DEVICE)
10" HOT WATER RETURN
4" CORE WASH OUTLET
4" FILTRATE
12" HOT WATER FEED
12" VACUUM
ADDITIONAL GIRT MEMBERS BY METAL BUILDING MANUFACTURER
PRESSURE FILTER PRESS
4" CORE WASH TO PRESSURE FILTER FEED, SEE NOTE 12 ON SHT C2
EL 767.41 (TOC)
DISCHARGE CHUTE SEE NOTE 3 ON SHT C5
3" AIR BLOW ℄ EL 761.50
10" MIN CLEAR SPACE
EQUIPMENT AND PLATFORM SUPPORT STRUCTURE
EAST JORDAN V-7309 TRENCH FRAME AND GRATE NO EXCEPTIONS
CONCRETE ENCASEMENT (TYP)
1 1/2" GROUT MIN UNDER COLUMN BASE PLATE
PERIMETER INSULATION ALL AROUND BUILDING
EL 749.00
PROVIDE 2 LAYERS OF 15 LB BUILDING FELT (TYP)
EXPANSION JOINT MATERIAL
SEE SECTION 1 ON SHT C6 FOR LIMITS OF BACKFILL IN THE DRYING BED AREA
DRIP TRAY SEE NOTE 9
DUMP TRUCK
#5@12" EWTAB
STAIRS NOT SHOWN FOR CLARITY
4" FILTRATE VENT
SEE ARCHITECTURAL DRAWINGS FOR CONNECTION DETAIL
10" HOT WATER FEED TO FILTER PRESS ℄ EL 761.00
6" CHWS TO VACUUM SKID ℄ EL 760.00
4" THICKENED RESIDUALS FEED ℄ EL 760.00
DRIP TRAY DRAIN SEE NOTE 9
DRIP TRAY DRAIN LAUNDER
4" FILTRATE
VACUUM SKID
10" THICK SLAB (SEE NOTE 2)
MECHANICAL ROOM
CHILLED WATER SKID
CONCRETE SLAB ON GRADE
10" THICK SLAB
4" MIN ENGINEERED FILL
SEE SHEET C3 FOR COLUMN, FOUNDATION AND GRADE BEAM FOUNDATION DETAILS
REMOVE ALL EXISTING FILL AND UNSUITABLE SOILS AND REPLACE WITH COMPACTED FILL (TYP UNDER THE ENTIRE BUILDING EXCEPT BASEMENT)
ADD 2 LAYERS OF 15LB BUILDING FELT BETWEEN COLUMN FOUNDATIONS (TYP)
EQUIPMENT SUPPORT COLUMN FOUNDATION
BUILDING FOUNDATION
6" CONCRETE ENCASED FILTRATE
BID BASIS FOR EXCAVATION IS 5 FT BELOW EXISTING GRADE. ACTUAL EXCAVATION MAY BE MORE OR LESS AS REQUIRED.
SLOPING ROOF 12H:1V
6" CHWR TO CHILLED WATER SKID ℄ EL 763.50
TO BOILER (TYP)
12" AIR ℄ EL 762.25
6" CHWS ℄ EL 760.00
6" CHWR ℄ EL 760.00
10" HOT WATER RETURN FROM FILTER PRESS ℄ EL 761.00
HOT WATER PUMP SKID
AIR COMPRESSOR SKID
AIR RECEIVER
HOT WATER RETURN TANK
TOP OF STACK EL 8'-0" ABOVE ROOF PEAK (TYP OF 2)
RAIN CAP
HIGH POINT @ RIDGE
(TYP OF 2)
SEE ARCHITECTURAL DRAWINGS FOR CONNECTION DETAIL
EXTERIOR FACE OF CONCRETE AND WALL GIRT (TYP ON ALL SIDES)
EL 760.25 MIN (HOOK IN HIGHEST POSITION)
MONORAIL LIFTING CAPACITY = 2T
CHEMICAL FEED AREA
TYPE 33 PS SEE NOTE 9
8" CHWS
8" FLANGED FLEXIBLE CONNECTION
AIR COOLED LIQUID CHILLER
GUARDPOST
ASPHALT PAVEMENT
#5 MASONRY DOWELS @ 48" OC #5@10", DEVELOP 18" MIN INTO WALL
8" HIGH WALL
4" THICKENED RESIDUALS TO DEWATERING EQUIPMENT ℄ EL 744.50
8" POLYMER FEED ℄ EL 742.50
℄ EL 741.00
#6 DOWELS @ 6" OC (TYP)
#6@12" EWEF
#6 DOWELS @ 12" OC (TYP)
#6@12" EW
BEAM B1
BEAM B2
BASEMENT
4" THICKENED RESIDUALS TO DRYING BEDS ℄ EL 743.00
3" SURGE RELIEF VALVE
4"X3" TEE
6"X4" RED
3" SCH 80 STEEL PIPE W/ FLANGE TO MATCH. ARSE ELBOW
STAIRS
FOR CONTINUATION SEE SHEET L4
#6@12" EWEF
2'-0" COMPACTED CLAY FILL (TYP)
FOR FOUNDATION DETAILS REFER TO SHEET C19
STRUCTURE BACKFILL AROUND BUILDING BASEMENT
MIN LIMITS OF REMOVAL OF EXISTING MATERIAL AND REPLACEMENT W/ STRUCTURE BACKFILL, SEE NOTE 5
ENGINEERED FILL UNDER STRUCTURE
REMOVE BEDROCK/FILL TO A DEPTH OF 12 INCHES BELOW THE BOTTOM SLAB AND REPLACE WITH COMPACTED BACKFILL
EL 733.00
21'-6"
#6 DOWELS @ 12" OC (TYP)
#6@6" EW (BOTTOM STEEL SHALL BE #6@8" ON ALL SIDES FOR UP TO 5.5 FT FROM WALL EDGE, BEYOND THAT POINT THE REINF SHALL BE REDUCED TO #6@12")

SECTION 1
1/4" = 1'-0"
C1,C2,C3

ADDITIONAL GIRT FRAMING PROVIDED BY METAL BUILDING MANUFACTURER
TYPE 33 PS
3/16"THK PLATE WELDED TO PS. CONNECT TO GIRT FRAMING BY 1/2" SS BOLTS

NOTE:
PIPE SUPPORT ON DETAIL SHALL BE DESIGNED BY THE METAL BUILDING MANUFACTURER TO BE WEATHERTIGHT.

PIPE SUPPORT VERTICAL
NO SCALE
B C4

ROOF PURLIN
6" LONG MIN ANGLE AS REQUIRED
HANGER ROD 3/4" MIN
MIN 1 - 1/2"Ø SS BOLT W/ SS WASHER
ADDITIONAL FRAMING MEMBERS BETWEEN PURLINS BY METAL BUILDING MANUFACTURER

NOTE:
PIPE SUPPORT DETAIL SHALL BE DESIGNED BY THE METAL BUILDING MANUFACTURER TO BE WEATHERTIGHT. (SEE NOTE 2 UNDER GENERAL NOTES ON SHT C6).

PIPE SUPPORT ROOF
NO SCALE
B C4

4" CORE WASH DISCHARGE
4" FILTRATE
4" FILTRATE VENT
SLOPE 1/8"/FT
℄ EL 781.50
CONNECT CORE WASH DISCHARGE TO 4" FILTRATE
2'-0" ℄ DIFFUSER TANK
PVC
1'-10"
PROVIDE 2-1/2"SS HEADED ANCHOR BOLTS FOR EACH SUPPORT
SEE SHEET C19 FOR TYPICAL MASONRY ANCHOR BOLT DETAIL

SECTION 2
1/4" = 1'-0"
C2

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAN	AS	DHG

DESIGNED AS, DHG
DETAILED DPK
CHECKED RED, JEN, NDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
DEWATERING BUILDING
SECTIONS AND DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0603002

C4
SHEET 19 OF 73

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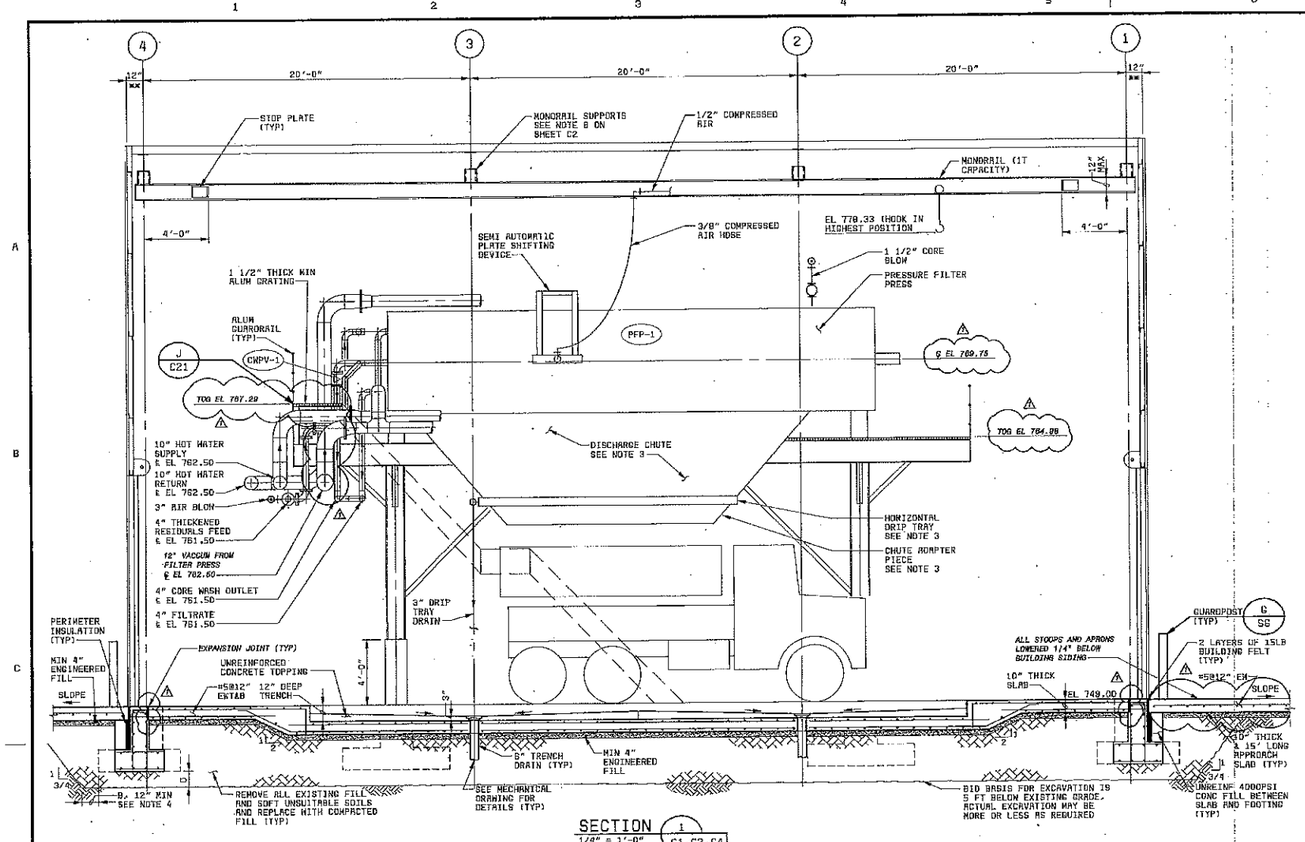
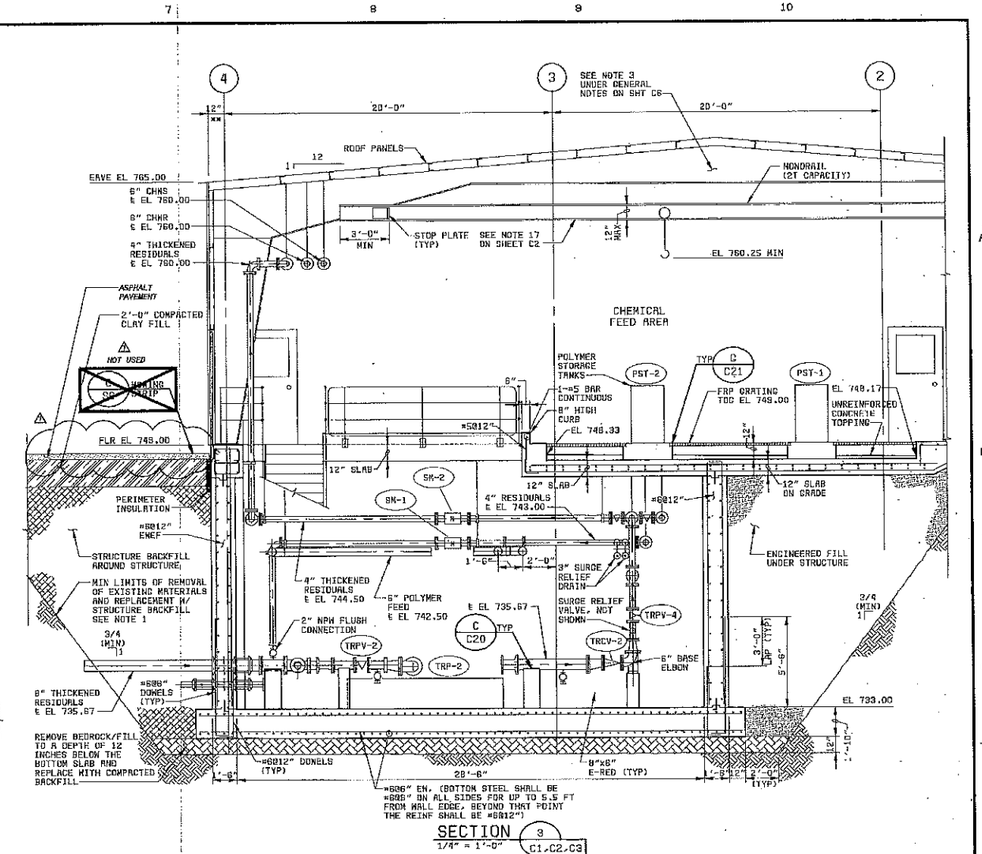
CDD. DWG. NO: 62409-110-WRH-C-R0000618



SECTION 1 (C1,C2,C4)
1/4" = 1'-0"



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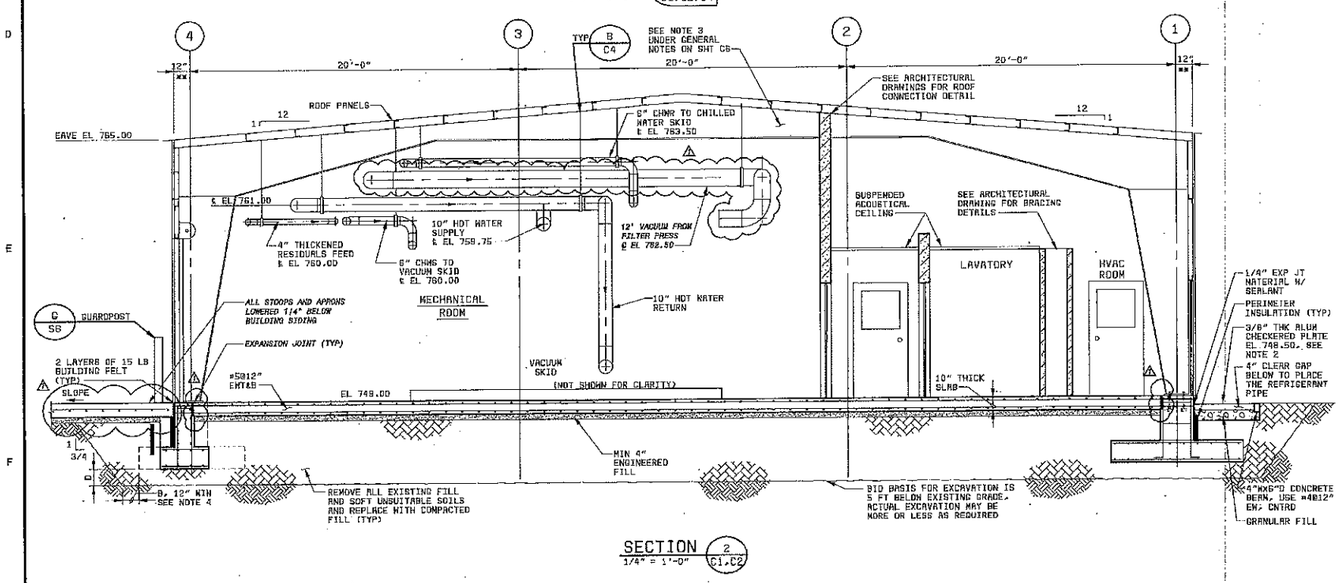

SECTION 2 (C1,C2)
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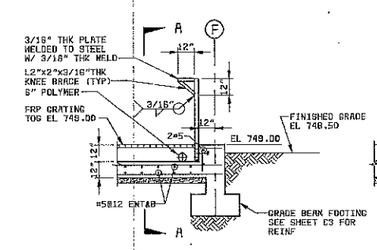

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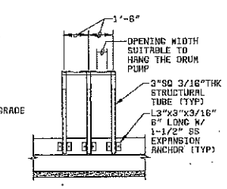
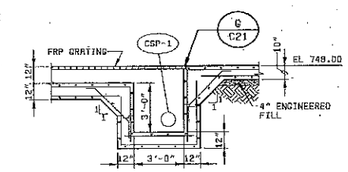


SECTION A-A



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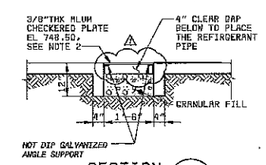

SECTION 6 (C1)
1/2" = 1'-0"

NOTES:

1. REFER TO SHT C6 FOR GENERAL NOTES APPLICABLE TO DEWATERING BUILDING AND SPECIFIC NOTES APPLICABLE TO THIS SHEET.

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DNS
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED AS, DHC
DETAILED DPK
CHECKED REO, JEH, WDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
DEWATERING BUILDING
SECTIONS & DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWDEN ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8807882

C5

SHEET 20 OF 73

CCD. DWG. NO: 62409-110-WRH-C-R0001219

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DEWATERING BUILDING NOTES

GENERAL NOTES

1. REFER TO MECHANICAL AND ELECTRICAL SHEETS FOR ADDITIONAL EQUIPMENT, DUCTWORK, PIPES, AND CONDUITS SUPPORTED FROM THE BUILDING SUPERSTRUCTURE. THE ROOF CURBS AND ADDITIONAL FRAMING REQUIRED FOR SUPPORTING THE EQUIPMENT SHALL BE DESIGNED, AND FURNISHED BY THE METAL BUILDING MANUFACTUERER AS PER THE SPECS. CONTRACTOR TO COORDINATE WITH THE METAL BUILDING MANUFACTURER AND RESPECTIVE EQUIPMENT SUPPLIER TO ENSURE PROPER INSTALLATION OF ALL EQUIPMENT. ALL FASTENERS, ANCHOR BOLTS, AND HARDWARE REQUIRED FOR EQUIPMENT SUPPORT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL HARDWARE AND FASTENERS REQUIRED FOR SUPPORTING THE DUCTWORK, PIPES AND CONDUITS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ANY ADDITIONAL FRAMING IN THE WALL OR ROOF AS REQUIRED TO PROPERLY INSTALL THESE SUPPORTS SHALL BE DESIGNED AND FURNISHED BY THE METAL BUILDING MANUFACTURER. CONTRACTOR TO COORDINATE WITH METAL BUILDING MANUFACTURER TO ENSURE THAT THE SUPPORT ARRANGEMENT IS ACCEPTABLE AND SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION. SEE SHEET C4 FOR SUGGESTED PIPE SUPPORT DETAIL.
2. THE LATERAL SWAY UNDER DESIGN LOADING FOR THE METAL BUILDING SHALL BE LIMITED TO BUILDING EAVE HEIGHT/175 WHERE BUILDING EAVE HEIGHT IS IN INCHES.
3. THE METAL BUILDING FRAME DIMENSIONS, WALL AND ROOF PANEL THICKNESS ARE BASED ON THE PRELIMINARY DIMENSIONS FURNISHED BY V.P. BUILDINGS INC. PRIOR TO FABRICATION, THE METAL BUILDING SUPPLIER SHALL SUBMIT ALL MEMBER SIZES AND CLEARANCES AVAILABLE TO THE ENGINEER FOR REVIEW AND APPROVAL. ALL CLEARANCES MARKED ON THE DRAWINGS MUST BE MET. CONTRACTOR TO COORDINATE WITH METAL BUILDING AND EQUIPMENT SUPPLIERS TO ENSURE THAT ALL EQUIPMENT AND SUPPORT STRUCTURES ARE INSTALLED TO MEET DIMENSIONS INDICATED IN THE DRAWINGS.
4. THE STANDARD HOOK HEIGHT FOR THE HOIST OF MONORAILS IN THE DEWATERING BUILDING IS 28 INCHES FROM INSIDE OF THE HOOK IN HIGHEST POSITION AND THE BOTTOM OF MONORAIL BEAM. CONTRACTOR TO SIZE THE MONORAIL MEMBER TO ALLOW SPECIFIED CLEARANCE ABOVE THE EQUIPMENT (SEE SECTION 11480). CONTRACTOR MAY PROVIDE LOW CLEARANCE HOIST AT NO ADDITIONAL COST IF REQUIRED.

SHEET C1

NOTES:

1. SEE SHEET C2 FOR DEWATERING EQUIPMENT AND PIPING LAYOUT.
2. FOR DETAILED EQUIPMENT LAYOUT IN THE BASEMENT, REFER TO SHEET C3.
3. NOT ALL PIPING AND VALVES REQUIRED FOR THE PRESSURE FILTER PRESS AUXILARY SYSTEMS ARE SHOWN. LAYOUT, PIPING, AND VALVING REQUIREMENTS WILL VARY DEPENDING ON THE SYSTEM SUPPLIER. SEE DEWATERING EQUIPMENT PROCESS SCHEMATIC FOR ITEMS TO BE FURNISHED BY THE CONTRACTOR AND SPECIFICATIONS FOR ITEMS TO BE FURNISHED BY THE EQUIPMENT SUPPLIER.
4. FOR PLUMBING LAYOUT, REFER TO MECHANICAL SHEETS.
5. REFER TO SHEET C3 FOR FOUNDATION SIZE AND REINFORCEMENT SCHEDULE.
6. CHEMICAL PIPING (3" AND SMALLER)NOT SHOWN. SEE CHEMICAL SCHEMATIC ON SHEET C8.
7. SLOPE THE TRENCH BOTTOM AT 1/4"/FT TOWARDS THE DRAINS USING CONCRETE FILL.
8. ALL DIMENSIONS INDICATED AS "*" SHALL BE VERIFIED BY THE EQUIPMENT SUPPLIER. DETAILED LAYOUT OF THE SUPPORT STRUCTURE INDICATING THE MEMBER LAYOUT AND SIZES SHALL BE SUBMITTED BY THE CONTRACTOR FOR ENGINEER'S REVIEW AND APPROVAL PRIOR TO FABRICATION. SEE SHEET C3 FOR PLATFORM LAYOUT.
9. SLOPE FLOOR TOWARDS THE CHEMICAL CONTAINMENT SUMP.
10. SEE ARCHITECTURAL SHEETS FOR MASONRY WALL LAYOUT AND DIMENSIONS.
11. WALL BRACING SHALL BE PROVIDED AS REQUIRED FOR BAYS A & B BETWEEN COLUMNS 2 & 3 BY THE METAL BUILDING MANUFACTURER. FOR LOWER STRUCTURE, WALL BRACING SHALL BE PROVIDED AS REQUIRED FOR BAYS 1 & 4 BETWEEN COLUMNS D & E. METAL BUILDING MANUFACTURER SHALL COORDINATE BRACING LOCATION WITH OPENINGS IN THE WALL TO AVOID INTERFERENCE. IF REQUIRED, PORTAL BRACE OR FRAMES SHALL BE USED FOR BRACING PURPOSES.
12. "**" DIMENSIONS TO BE VERIFIED BY THE METAL BUILDING MANUFACTURER.
13. DEWATERING EQUIPMENT ACCESS STAIR SUPPORT COLUMNS ARE NOT INDICATED AND SHALL BE LAID OUT BY THE EQUIPMENT SUPPLIER. SUPPORTS SHALL NOT INTERFERE WITH OTHER EQUIPMENT, PIPING OR STRUCTURE. SUPPORT LAYOUT SHALL BE SUBMITTED FOR REVIEW AND APPROVAL TO THE ENGINEER AS "*" SHALL BE VERIFIED BY THE SUPPLIER. SEE SHEET C3 FOR STAIR LAYOUT.
14. PROVIDE PIPE SUPPORTS FOR COMPRESSED AIR LINES ON EACH SIDE OF THE AIR FILTERS. SUITABLE SUPPORTS SHALL BE PROVIDED BY THE CONTRACTOR TO SUPPORT AIR OIL FILTERS INDEPENDENTLY IF REQUIRED BY THE ENGINEER IN THE FIELD.
15. A 2" MIN CLEAR GAP SHALL BE MAINTAINED BETWEEN THE COLUMN ROW B COLUMN EDGE AND THE CONCRETE BLOCK WALL ALONG COLUMN ROW C TO ACCOUNT FOR LATERAL SWAY. SEE NOTE 2 UNDER GENERAL NOTES.
16. THE FLOOR SLAB SHALL BE RECESSED BY 12 INCHES IN THE AREA COVERED BY FRP GRATING. THE RECESSED SLAB SHALL BE 12 INCHES THICK. SEE SECTION 3 ON SHEET C5.
17. THE SLAB ON GRADE SHALL BE 10" THICK EXCEPT IN THE FRP GRATING AREA WHERE THE SLAB WILL BE 12" THICK RECESSED.
18. PLAN INDICATES GENERAL ARRANGEMENT OF EQUIPMENT IN THE MECHANICAL ROOM. EQUIPMENT LOCATIONS MAY BE ADJUSTED AS REQUIRED TO MEET MINIMUM CLEARANCE REQUIREMENTS AROUND EACH EQUIPMENT. CONTRACTOR TO SUBMIT PROPOSED LAYOUT FOR REVIEW AND APPROVAL.
19. ALL AIR PRESSURE REDUCING STATIONS SHALL BE LOCATED 3'-0" ABOVE FINISHED FLOOR UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK; INCLUDING BOILER INSTALLATION, IN ACCORDANCE WITH LOCAL CODES, ORDINANCES, LAWS AND REGULATIONS. IN CASE OF A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND ANY STATE LAW OR MUNICIPAL ORDINANCE, THE LATTER SHALL GOVERN.

SHEET C2

NOTES:

1. *PLAN SHOWN AT EL 765.00, EXCEPT IN THE TRUCK LOADING AREA (BETWEEN COLUMN ROW A & C). TRUCK LOADING AREA PLAN IS SHOWN AT EL 767.29.* ⚠
2. PIPE SUPPORT LOCATIONS SHOWN ARE INDICATIVE ONLY. SEE SPECIFICATIONS FOR MAXIMUM ALLOWABLE SPACING.
3. NOT ALL PIPING AND VALVES REQUIRED FOR THE FILTER PRESS AUXILIARY SYSTEMS ARE SHOWN. LAYOUT, PIPING, AND VALVING REQUIREMENTS WILL VARY DEPENDING ON THE SYSTEM SUPPLIER. SEE DEWATERING EQUIPMENT PROCESS SCHEMATIC FOR ITEMS TO BE FURNISHED BY CONTRACTOR AND SPECIFICATIONS FOR ITEMS TO BE FURNISHED BY THE EQUIPMENT SUPPLIER.
4. ROUTE PIPING AT THE HIGHEST POSSIBLE ELEVATION.
5. 1 1/2" COMPRESSED CORE BLOW PIPE FROM THE AIR PRESSURE REDUCING STATION SHALL BE ROUTED TO THE 1 NPT AIR BLOW CONNECTION ON THE EQUIPMENT AS DIRECTED BY THE EQUIPMENT MANUFACTURER AND ACCEPTABLE TO THE ENGINEER. THE AIR BLOW PIPE SHALL HAVE A 3' LONG FLEXIBLE HOSE FOR CONNECTION TO THE MACHINE.
6. ROUTE ALL 3 INCH AND SMALLER PIPING UNDER THE ACCESS PLATFORM AT THE HIGHEST POSSIBLE ELEVATION.
7. ALL DIMENSIONS MARKED AS "***" SHALL BE VERIFIED BY THE EQUIPMENT SUPPLIER. DETAILED LAYOUT OF THE SUPPORT STRUCTURE INDICATING THE MEMBER LAYOUT AND SIZES SHALL BE SUBMITTED BY THE CONTRACTOR FOR ENGINEER'S REVIEW AND APPROVAL PRIOR TO FABRICATION. SEE SHEET C3 FOR PLATFORM LAYOUT.
8. MONORAILS SHALL BE DESIGNED, FURNISHED, AND INSTALLED BY THE BUILDING MANUFACTURER. ANY ADDITIONAL MEMBERS AND ACCESSORIES REQUIRED TO SUPPORT THE MONRAIL FROM THE BUILDING FRAME SHALL BE PROVIDED BY THE BUILDING MANUFACTURER. MONORAILS SHALL BE DESIGNED AS PER THE METAL BUILDING SPECIFICATIONS.
9. WALL BRACING SHALL BE PROVIDED AS REQUIRED FOR BAYS A & B BETWEEN COLUMNS 2 & 3 BY THE METAL BUILDING MANUFACTURER. FOR LOWER STRUCTURE, WALL BRACING SHALL BE PROVIDED AS REQUIRED FOR BAYS 1 & 4 BETWEEN COLUMNS D & E. METAL BUILDING MANUFACTURER SHALL COORDINATE BRACING LOCATION WITH OPENINGS IN THE WALL TO AVOID INTERFERENCE. IF REQUIRED, PORTAL BRACE OR FRAMES SHALL BE USED BRACING PURPOSES.
10. PLACES INDICATED AS "*" ARE THE CONNECTION POINTS OF VARIOUS PIPING TO THE DEWATERING EQUIPMENT. CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPING,VALVES, AND ACCESSORIES INCLUDING ITEMS PROVIDED BY THE EQUIPMENT SUPPLIER, UP TO THIS POINT. DIELECTRIC FITTINGS SHALL BE PROVIDED FOR CONNECTION BETWEEN PIPES OF DISSIMILAR METALS. ALL PIPING, VALVES, AND ACCESSORIES BEYOND THIS POINT ARE PREASSEMBLED ON THE EQUIPMENT AND SHALL BE PROVIDED BY THE EQUIPMENT SUPPLIER. SEE DEWATERING EQUIPMENT PROCESS SCHEMATIC FOR DETAILS.
11. 1/2" COMPRESSED AIR CONNECTION SHALL BE PROVIDED AT ROOF LEVEL OUTSIDE OF THE MONORAIL'S TRAVEL PATH BY THE CONTRACTOR. CONTRACTOR TO CONNECT TO THIS PIPING WITH THE 3/8" AIR COIL TUBE (PROVIDED BY EQUIPMENT MANUFACTURER) TO PROVIDE AIR SUPPLY TO THE PLATE SHIFTING DEVICE.
12. ROUTE 4" CORE WASH TO FILTER PRESS HEAD END AND CONNECT TO CORE WASH INLET CONNECTION (NOT SHOWN FOR CLARITY) SUPPLIED NEAR THE 6" SLURRY FEED PIPE CONNECTION AS DIRECTED BY THE EQUIPMENT MANUFACTURER AND ACCEPTABLE TO THE ENGINEER. INSTALL ISOLATION VALVE CWPV-1 IN LOCATION ACCEPTABLE TO THE ENGINEER.
13. DRIP TRAY DRAIN LAUNDER IS LOCATED UNDER THE PLATFORM AND IS SUPPLIED BY THE EQUIPMENT MANUFACTURER PRE ASSEMBLED WITH THE EQUIPMENT. CONTRACTOR TO CONNECT TO THE DRIP TRAY DRAIN LAUNDER AND ROUTE DRIP TRAY DRAIN TO THE BELLUP BELOW AS SHOWN ON SHEET C4.
14. ALL PIPING ROUTED UNDER PLATFORM SHALL BE SUPPORTED FROM THE PLATFORM IN LOCATIONS ACCEPTABLE TO THE ENGINEER AND PLATFORM SUPPLIER. ALL HARDWARE FASTENERS AND ADDITIONAL MEMBERS REQUIRED TO SUPPORT THE PIPING SHALL BE PROVIDED BY THE CONTRACTOR. PROPOSED ADDITIONAL FRAMING SHALL BE ACCEPTABLE TO THE PLATFORM SUPPLIER AND ENGINEER.
15. SEE ARCHITECTURAL SHEETS FOR MASONRY WALL LAYOUT AND DIMENSIONS.
16. "**" DIMENSIONS TO BE VERIFIED BY THE METAL BUILDING MANUFACTURER.

SHEET C2 (CONTD.)

17. ENDS OF MONORAIL SHALL BE SUPPORTED FROM THE BUILDING ROOF STRUCTURE. ADDITIONAL FRAMING AS REQUIRED TO SUPPORT THE MONORAIL SHALL BE DESIGNED AND FURNISHED BY THE METAL BUILDING MANUFACTURER.
18. A 2'-0" DIAMETER CAST IRON DIFFUSER TANK WITH FLANGED CONNECTIONS SHALL BE PROVIDED AT THE LOCATION INDICATED.
19. ISOLATION VALVES SHALL BE INSTALLED IN THE HOT WATER AND VACUUM PIPING NEAR FILTER PRESS AS AS INDICATED ON SHEET L8. THESE VALVES (VBFV-2, HBFV-3, AND HBFV-4) ARE NOT INDICATED ON PLANS FOR CLARITY. CONTRACTOR SHALL LOCATE THESE VALVES IN THE FIELD AS ACCEPTABLE TO THE ENGINEER AND EQUIPMENT SUPPLIER.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK; INCLUDING BOILER INSTALLATION, IN ACCORDANCE WITH LOCAL CODES, ORDINANCES, LAWS AND REGULATIONS. IN CASE OF A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND ANY STATE LAW OR MUNICIPAL ORDINANCE, THE LATTER SHALL GOVERN.

SHEET C3

NOTES:

1. THE PUMP AND PIPING LAYOUT IS BASED ON THE MOYNO SERIES 2000 PUMP WITH PIGGYBACK MOTOR AND BELT AND PULLEY ARRANGEMENT. ANY PIPING MODIFICATIONS REQUIRED AS A RESULT OF A DIFFERENT MANUFACTURER'S EQUIPMENT SUPPLIED SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL SUBMIT ALL SUCH MODIFICATIONS FOR REVIEW PRIOR TO FABRICATION.
2. CONTRACTOR SHALL PROVIDE 1-1/2" DRAIN IN THE THICKENED RESIDUALS PIPING AS SHOWN. THE DRAIN LINE SHALL BE EQUIPPED WITH A FULL PORT BALL VALVE AND THREADED CAP.
3. REFER TO MECHANICAL SHEETS FOR FLOOR DRAIN LAYOUT.
4. CONTRACTOR SHALL PROVIDE 3" SURGE RELIEF DRAIN PIPING FOR EACH PUMP TO CONNECT TO TO THE 4" RESIDUALS LINE GOING TO THE GRAVITY THICKENER.
5. INSTALL ANCHOR BARS PRIOR TO CONCRETE POUR FOR ALL FOUNDATIONS.
6. MINIMUM CLEARANCE AROUND EQUIPMENT = 3'-6".
7. STAIRS SHALL BE SUPPORTED INDEPEDENT OF THE PLATFORM.
8. REFER TO THE DEWATERING EQUIPMENT SPECIFICATIONS FOR MATERIAL OF CONSTRUCTION, LOADING AND DESIGN CRITERIA.
9. REFER TO SHEET C17 FOR GUARDRAIL DETAILS. GUARDRAILS MAY BE SIDEMOUNTED OR FLANGE MOUNTED AT THE SUPPLIERS OPTION.
10. *THE HEAD AND TAIL LEG OF EQUIPMENT SHALL BE SUPPORTED BY STEEL SUPPORT STRUCTURE AT EL 765.00. AN ELEVATED PLATFORM SHALL BE PROVIDED TO FACILITATE OPERATION AND MAINTENANCE AROUND THE EQUIPMENT AT EL 767.29 AS INDICATED.* ⚠
11. PLATFORM LAYOUT SHOWN IS INDICATIVE ONLY AND MAY CHANGE DEPENDING ON THE EQUIPMENT FURNISHED. PLATFORM DESIGN SHALL BE EQUIPMENT MANUFACTURERS RESPONSIBILITY AND SHALL PROVIDE ADEQUATE CLEARANCE AND EASY ACCESS TO ALL COMPONENTS OF THE EQUIPMENT AND VALVES AND ACCESSORIES.
12. *PLATFORM DIMENSIONS ARE REVISED BASED ON THE PLATFORM SUBMITTAL.* ⚠

SHEET C4

NOTE:

1. NOT ALL PIPING AND VALVES REQUIRED FOR THE PRESSURE FILTER PRESS AUXILIARY SYSTEMS ARE SHOWN, LAYOUT, PIPING, AND VALVING REQUIREMENTS WILL VARY DEPENDING ON THE SYSTEM SUPPLIER. SEE DEWATERING EQUIPMENT PROCESS SCHEMATIC FOR ITEMS TO BE FURNISHED BY THE CONTRACTOR AND SPECIFICATIONS FOR ITEMS TO BE FURNISHED BY THE EQUIPMENT SUPPLIER.
2. THE SLAB ON GRADE IN THE TRUCK LOADING AREA SHALL BE 10" THICK MINIMUM AT THE TRENCH DRAIN. THE SLAB SHALL SLOPE TOWARDS THE TRENCH DRAIN FROM ALL SIDES.
3. B=D WHERE D=THICKNESS OF SOIL REMOVED BENEATH THE FOOTING.
4. THE ACCESS PLATFORM AND EQUIPMENT SUPPORT STRUCTURE SHOWN HERE IS INDICATIVE ONLY. SEE SHEET C3 FOR MORE DETAILS.
5. AT LOCATION WHERE LIMITS OF EXCAVATION INTERFERE WITH ADJACENT STRUCTURES, COMBINE EXCAVATION AS NECESSARY AND ACCEPTABLE TO THE ENGINEER.
6. "**" DIMENSIONS TO BE VERIFIED BY THE METAL BUILDING MANUFACTURER.
7. WALL BRACING SHALL BE PROVIDED AS REQUIRED FOR BAYS A & B BETWEEN COLUMNS 2 & 3 BY THE METAL BUILDING MANUFACTURER. FOR LOWER STRUCTURE, WALL BRACING SHALL BE PROVIDED AS REQUIRED FOR BAYS 1 & 4 BETWEEN COLUMNS D & E. METAL BUILDING MANUFACTURER SHALL COORDINATE BRACE LOCATION WITH OPENINGS IN THE WALL TO AVOID INTERFERENCE. IF REQUIRED, PORTAL BRACE OR FRAMES SHALL BE USED FOR BRACING PURPOSES.
8. HORIZONTAL DRIP TRAY CONFIGURATION SHALL BE PROVIDED AT THE LOCATION INDICATED ALONG THE HEIGHT OF DISCHARGE CHUTE. DRIP TRAY ASSEMBLY SHALL BE SUPPORTED FROM THE PLATFORM MEMBERS ABOVE. DRIP TRAY SHALL OPEN TO THE LEFT WHEN VIEWED AT THE EQUIPMENT FROM THE SOUTH END OF THE BUILDING.
9. A STATIONARY DRIP TRAY LAUNDER SHALL BE PROVIDED BY THE EQUIPMENT SUPPLIER AS INDICATED. CONTRACTOR SHALL CONNECT THE DRIP TRAY DRAIN PIPE TO THE 3" NPT CONNECTION PROVIDED ON THE LAUNDER AND ROUTE THE DRAIN PIPING TO THE FLOOR BELLUP AS SHOWN ON SHEET C2. THE DRIP TRAY DRAIN PIPE SHALL SLOPE AWAY FROM THE LAUNDER AT A NOMINAL SLOPE TO FACILITATE DRAINAGE.
10. SEE BEAM SCHEDULE ON SHEET C17 FOR REINF AND SIZES.
11. SEE NOTE 19 ON SHEET C2.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK; INCLUDING BOILER INSTALLATION, IN ACCORDANCE WITH LOCAL CODES, ORDINANCES, LAWS AND REGULATIONS. IN CASE OF A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND ANY STATE LAW OR MUNICIPAL ORDINANCE, THE LATTER SHALL GOVERN.

SHEET C5

NOTE:

1. AT LOCATION WHERE LIMITS OF EXCAVATION INTERFERE WITH ADJACENT STRUCTURES. COMBINE EXCAVATION AS NECESSARY AND ACCEPTABLE TO ENGINEER.
2. ALUMINUM CHECKERED PLATE SHALL BE FASTENED TO CONCRETE AROUND THE TRENCH WITH SS FASTENERS AS PER DETAIL F ON SHEET C21. THE CHECKERED PLATE SHALL BE CONTINUOUSLY SUPPORTED ALONG ALL FOUR SIDES.
3. THE CAKE DISCHARGE CHUTE FOR THE FILTER PRESS SHALL BE OF THREE PART DESIGN CONSISTING OF THE FOLLOWING:
   A) TOP DISCHARGE CHUTE PIECE
   B) MIDDLE HORIZONTAL DRIP TRAY
   C) BOTTOM DISCHARGE CHUTE ADAPTER PIECE

   THIS SPECIAL DESIGN OF DISCHARGE CHUTE IS REQUIRED TO ALLOW THE DUMP TRUCKS OF DIFFERENT HEIGHTS TO DRIVE UNDERNEATH THE EQUIPMENT AND COLLECT SOLIDS DISCHARGE FROM ABOVE. THE BOTTOM ADAPTER PIECE SHALL BE REMOVABLE AND SHALL HAVE DIMENSIONS AS REQUIRED TO ALLOW DISCHARGE OF SOLIDS INTO A TRUCK WITH SMALLER BED DIMENSIONS. REMOVAL OF THIS PIECE SHALL FACILITATE SOLIDS DISCHARGE INTO A TALLER TRUCK WITH LARGER BED DIMENSIONS. PRIOR TO FABRICATING THE DISCHARGE CHUTE, THE EQUIPMENT SUPPLIER SHALL COORDINATE THE TRUCK AND CHUTE DIMENSION WITH THE OWNER AND ENGINEER. CHUTE DESIGN SHALL ALLOW FOR A MINIMUM CLEARANCE OF 10 INCHES BETWEEN THE FOLLOWING:
   - THE BOTTOM OF ADAPTER PIECE AND TALLEST COMPONENT OF THE TRUCK WITH SMALLER BED LENGTH (DUAL-AXLE TRUCK).
   - THE BOTTOM OF DRIP TRAY AND TALLEST COMPONENT AND THE TRUCK WITH LARGER BED LENGTH (TRI-AXLE TRUCK). THE BOTTOM DISCHARGE CHUTE ADAPTER PIECE SHALL BE SUPPORTED FROM THE CHUTE ABOVE. CHUTE DESIGN SHALL BE THE RESPONSIBILITY OF EQUIPMENT SUPPLIER.

   AFTER THE EQUIPMENT IS INSTALLED ON SITE AND THE CHUTE DESIGN AND INSTALLION IS COMPLETE, THE CONTRACTOR SHALL INSTALL STOP MARKERS THAT WILL ALLOW POSITIONING OF THE DUMP TRUCKS ACCURATELY BELOW THE DISCHARGE CHUTE. STOP MARKER LOCATION SHALL BE PROVIDED FOR BOTH DUAL AXLE TRUCK AND TRI-AXLE TRUCK. STOP MARKER SHALL BE CLEARLY VISIBLE TO THE TRUCK DRIVER AND SHALL BE LOCATED OUTSIDE OF THE TRAVEL PATH OF THE DUMP TRUCK. CONCRETE WHEELSTOPS OF ADEQUATE HEIGHT SHALL BE PROVIDED IN LINE WITH THE STOP MARKERS IF REQUIRED BY THE ENGINEER AND OWNER. STOP MARKER DESIGN AND LOCATION SHALL BE COORDINATED WITH THE OWNER AND ENGINEER. DESIGN SHALL ALLOW THE TRUCK DRIVER TO ACCURATELY POSITION THE TRUCK WITHOUT ANYBODY'S HELP OR DIRECTION.
4. B=D WHERE D=THICKNESS OF SOIL REMOVED BENEATH THE FOOTING.
5. 3 INCH AND SMALLER PIPING IS NOT SHOWN.
6. ISOLATION VALVES FOR AUXILIARY EQUIPMENT ARE NOT INDICATED. ISOLATION VALVES SHALL BE INSTALLED IN THE VERTICAL RUN OF PIPING AS INDICATED ON SHEET C2.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	*CONFORMED TO CONSTRUCTION RECORDS*	⚠	*FAW*	*AS*	*DHG*

DESIGNED DHG,AS
DETAILED DPK,FRM
CHECKED REO,JEW,GM
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
DEWATERING BUILIDING
NOTES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8803882

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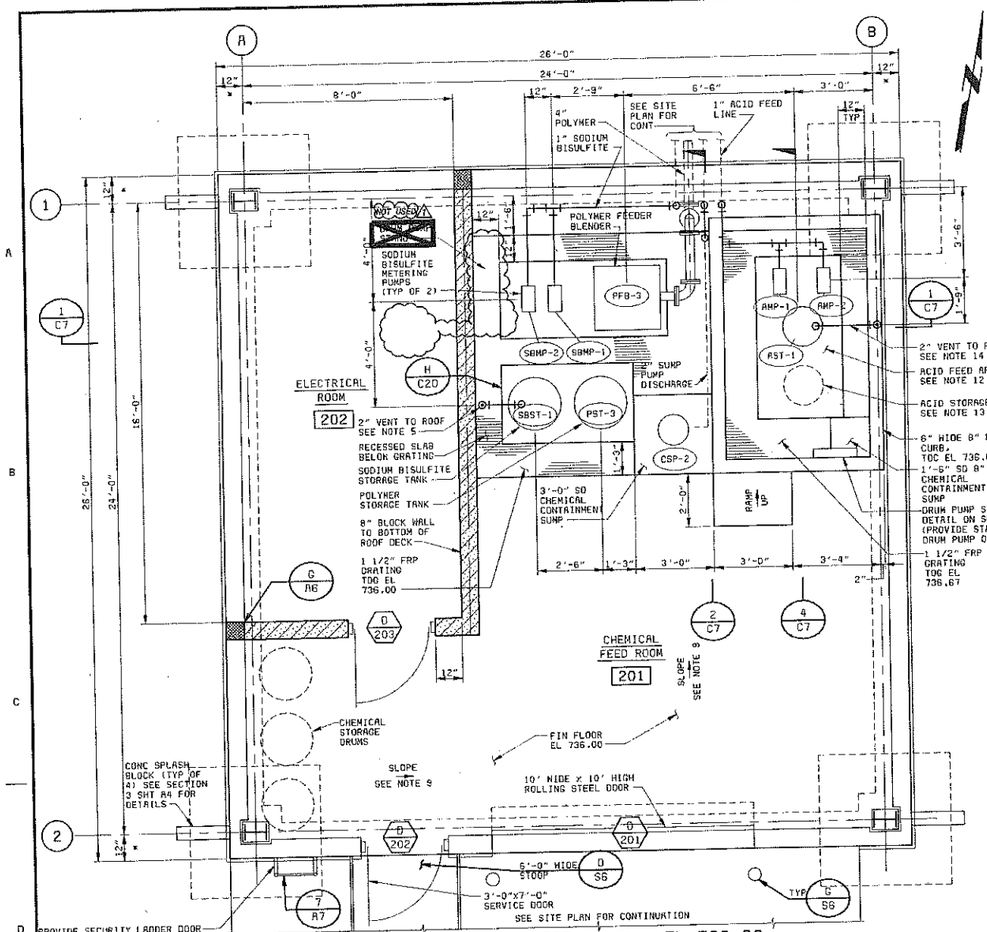
SHEET 21 OF 73

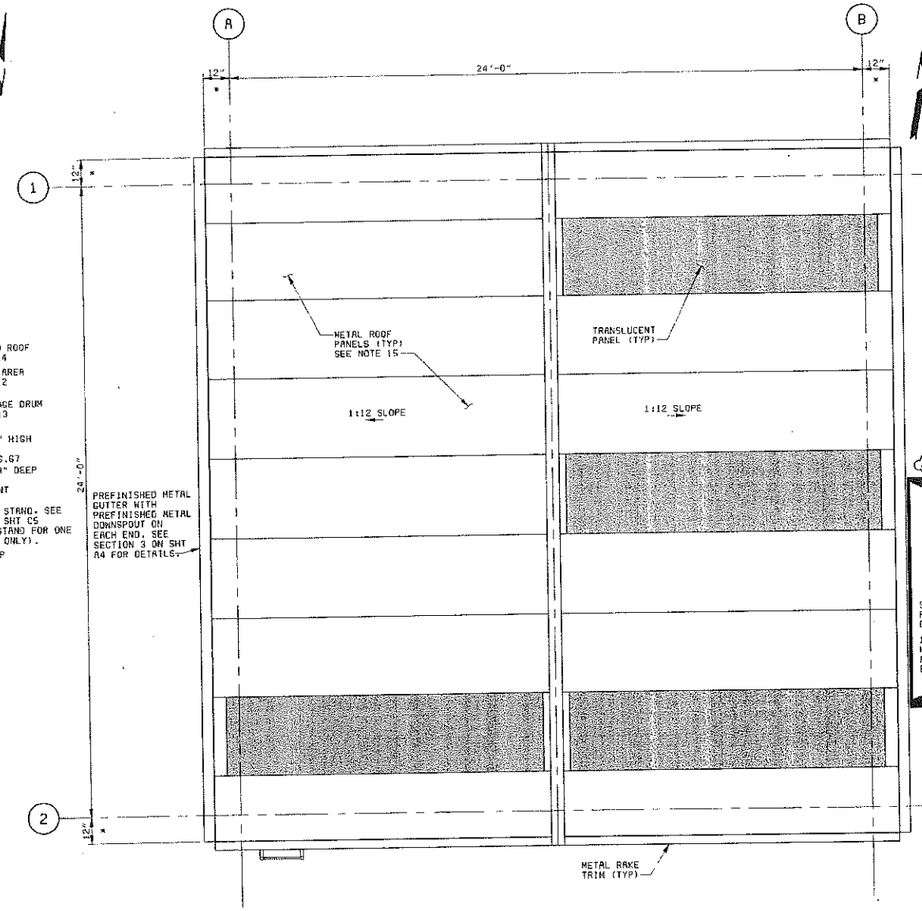
CCG. DWG. NO:

62409-110-WRH-C-Z00000C5L Date/Time

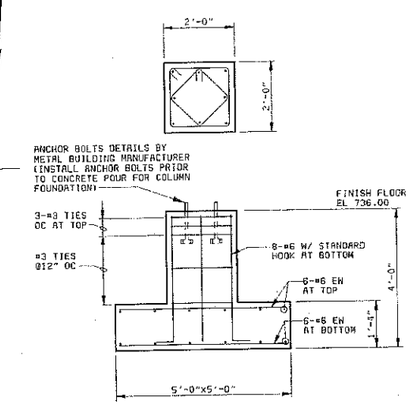
62409-110-WRH-C-AD000622
G3009 FGD0000



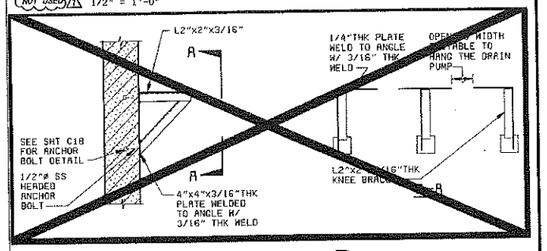
CHEMICAL BUILDING FLOOR PLAN - EL 736.00
3/8" = 1'-0"



CHEMICAL BUILDING ROOF PLAN
3/8" = 1'-0"



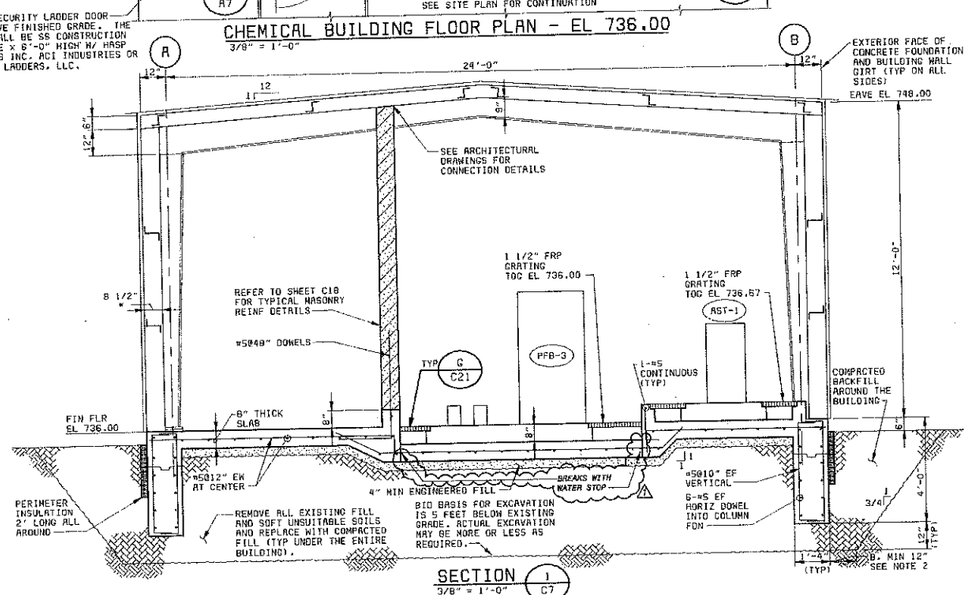
TYPICAL COLUMN FOUNDATION DETAIL
NOT USED 1/2" = 1'-0"



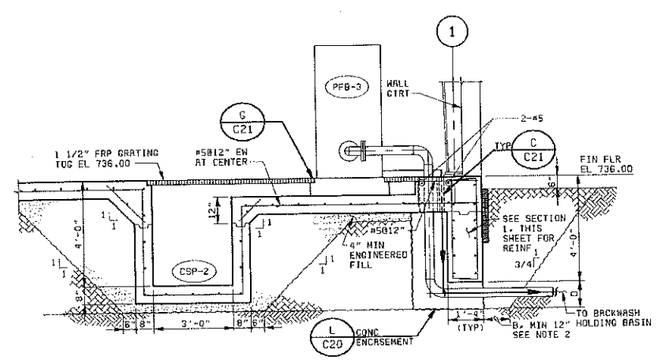
SECTION 3/C7
3/4" = 1'-0"

NOTES:

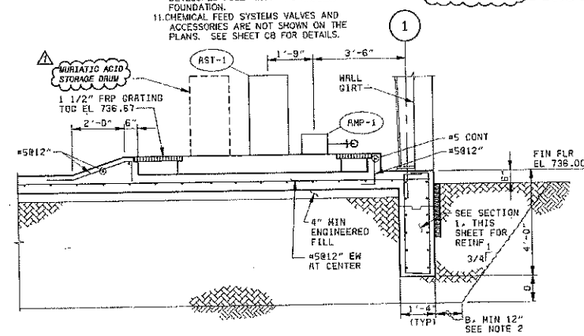
1. "A" DIMENSION TO BE VERIFIED BY METAL BUILDING MANUFACTURER.
2. B=D WHERE D=THICKNESS OF SOIL REMOVED BENEATH THE FOOTING.
3. FOR HVAC EQUIPMENT IN THE CHEMICAL BUILDING, REFER TO METAL BUILDING SPECIFICATIONS. HVAC EQUIPMENT SHALL BE LOCATED AS ACCEPTABLE TO OWNER AND ENGINEER.
4. SEE ARCHITECTURAL DRAWINGS FOR ROOM FINISH, DOORS, WINDOWS AND LOUVERS SCHEDULE, DOOR AND WINDOW DETAILS, PRV DUCT ROOF PENETRATION DETAIL, AND PIPE PENETRATION DETAILS.
5. ROUTE SODIUM BISULFITE STORAGE TANK VENT TO ROOF ALONG THE BLOCK WALL.
6. FOR PLUMBING LAYOUT, REFER TO MECHANICAL SHEETS.
7. SEE GENERAL NOTES ON SHT C6.
8. WALL BRACING SHALL BE PROVIDED AS REQUIRED ALONG BAYS A & B. METAL BUILDING MANUFACTURER SHALL COORDINATE BRACING LOCATION WITH OPENINGS IN THE WALL TO AVOID INTERFERENCE. X-TYPE BRACING OR PORTAL BRACING SHALL BE PROVIDED AS REQUIRED.
9. SLOPE FLOOR @ 1/8"/FT TOWARDS THE RECESSED SLAB AREA.
10. ALL GRADE BEAM HORIZ REINF SHALL BE DEVELOPED FULLY INTO THE COLUMN FOUNDATION.
11. CHEMICAL FEED SYSTEMS VALVES AND ACCESSORIES ARE NOT SHOWN ON THE PLANS. SEE SHEET C8 FOR DETAILS.
12. ALL CONCRETE SURFACES INSIDE THE MURIATIC ACID FEED AREA SHALL BE POLYMER LINED FOR CORROSION RESISTANCE. SEE SPECIFICATIONS FOR LINING.
13. THE ACID STORAGE DRUM SHALL BE STORED AT THE LOCATION SHOWN WITHIN THE SULFURIC ACID FEED AREA.
14. 2" ACID STORAGE TANK VENT SHALL BE ROUTED THRU THE ROOF TO A HEIGHT OF 10'-0" ABOVE THE ROOF. THE VENT PIPE SHALL BE SCREENED AND SUPPORTED AS NECESSARY FROM THE BUILDING ROOF. ALL ACCESSORIES AND LABOR ASSOCIATED WITH SUPPORTING THIS PIPE SHALL BE PROVIDED BY THE CONTRACTOR AS ACCEPTABLE TO THE METAL BUILDING MANUFACTURER AND ENGINEER.
15. VENT PIPE LOCATIONS THRU ROOF ARE NOT INDICATED ON THE ROOF PLAN. CONTRACTOR TO COORDINATE VENT PIPE LOCATIONS TO AVOID INTERFERENCE WITH THE TRANSLUCENT PANELS.
16. THE CHEMICAL DRUM PUMPS FOR POLYMER AND SODIUM BISULFITE ARE SUPPORTED OFF OF THE MANUFACTURER'S STANDARD STAND BOLTED TO THE WALL NEAR THE STORAGE TANKS.



SECTION 1/C7
3/8" = 1'-0"



SECTION 2/C7
3/8" = 1'-0"



SECTION 4/C7
3/8" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	SWH	AS	DHG
NO	REVISIONS AND RECORD OF ISSUE	BY	CK	APP

DESIGNED AS, DHG
DETAILED DPK
CHECKED REG, JEW, WDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

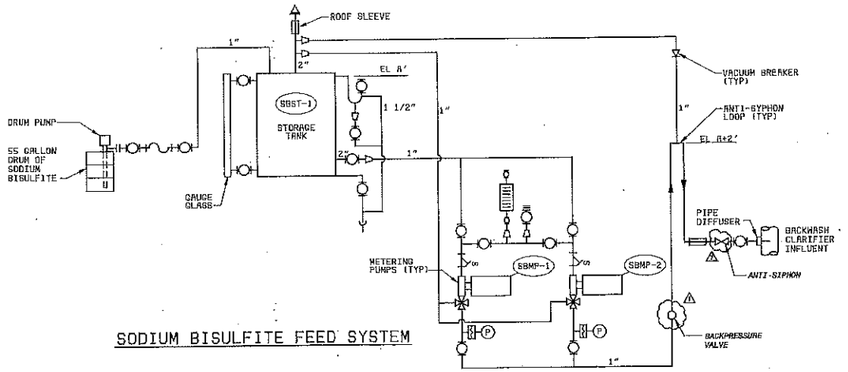
PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES
CIVIL
CHEMICAL BUILDING
PLANS, SECTIONS & DETAILS

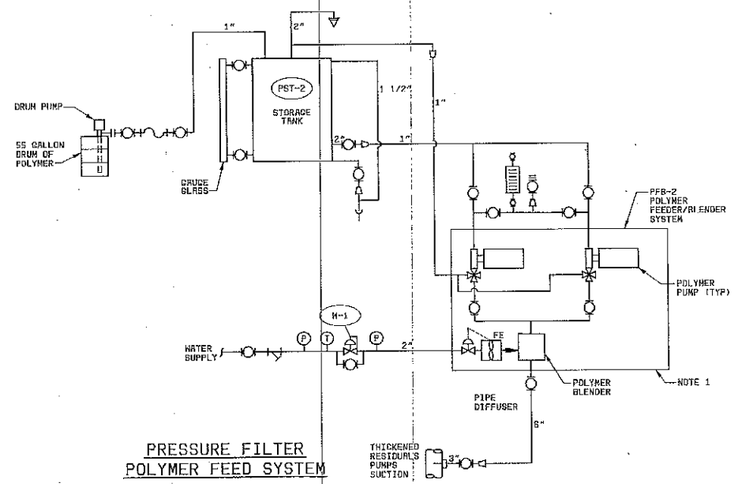
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 09-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 8803882

C7

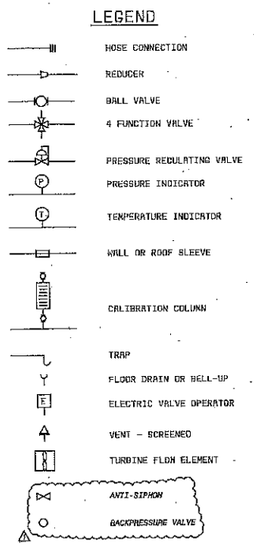
SHEET 22 OF 73

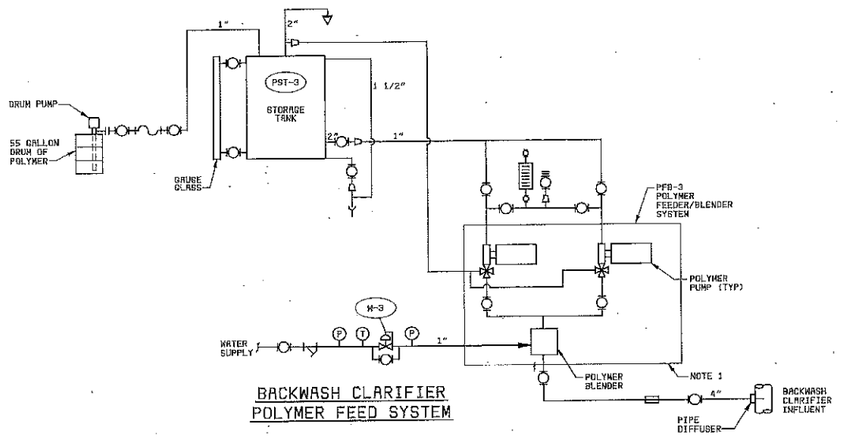


SODIUM BISULFITE FEED SYSTEM

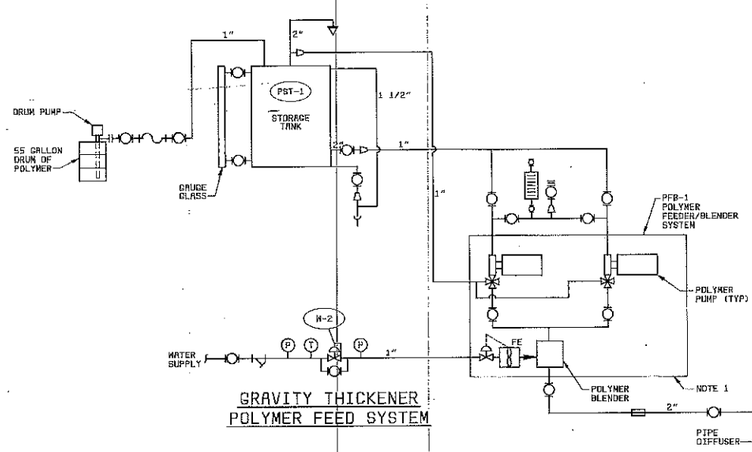


PRESSURE FILTER POLYMER FEED SYSTEM





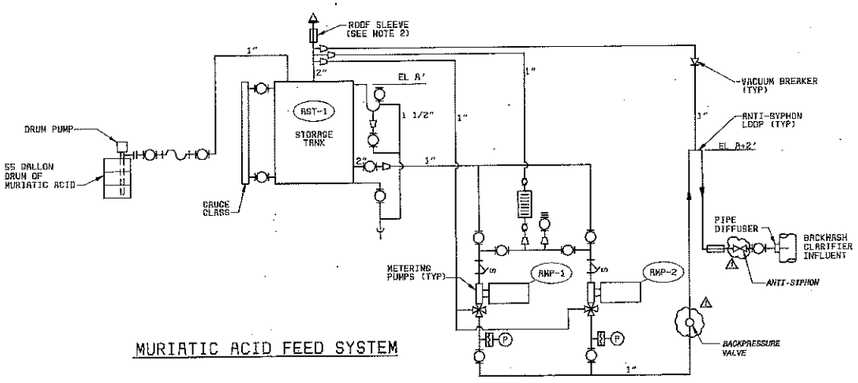
BACKWASH CLARIFIER POLYMER FEED SYSTEM



GRAVITY THICKENER POLYMER FEED SYSTEM

NOTES:

1. EQUIPMENT, PIPING, AND VALVES INSIDE POLYMER FEEDER/BLENDER PACKAGE BORDER TO BE INCLUDED IN POLYMER FEEDER/BLENDER SYSTEM.
2. VENT TO EXTEND A MINIMUM OF 10' ABOVE THE ROOF LEVEL



MURIATIC ACID FEED SYSTEM

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	RPF
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DHG

DESIGNED EDV
DETAILED JRC
CHECKED DCC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CHEMICAL FEED SCHEMATICS

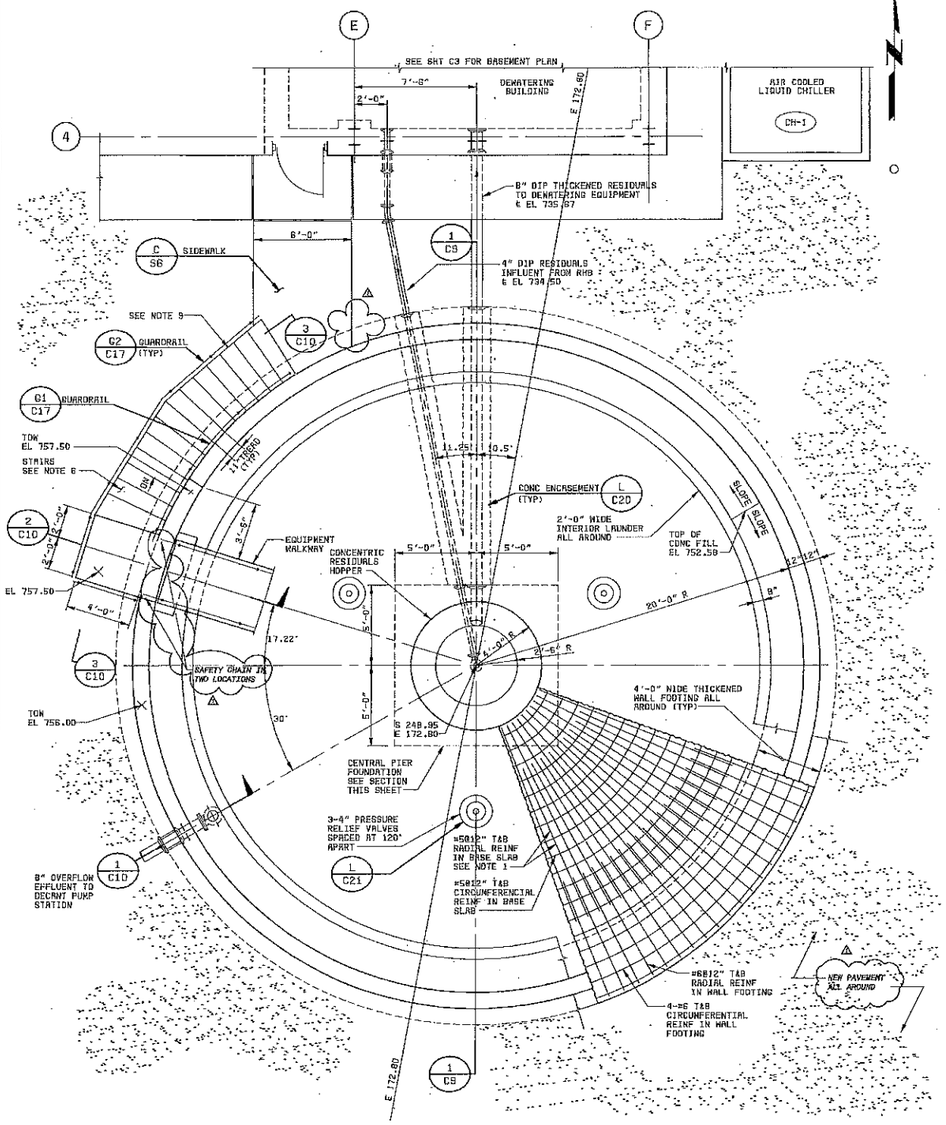
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 88038B

C8

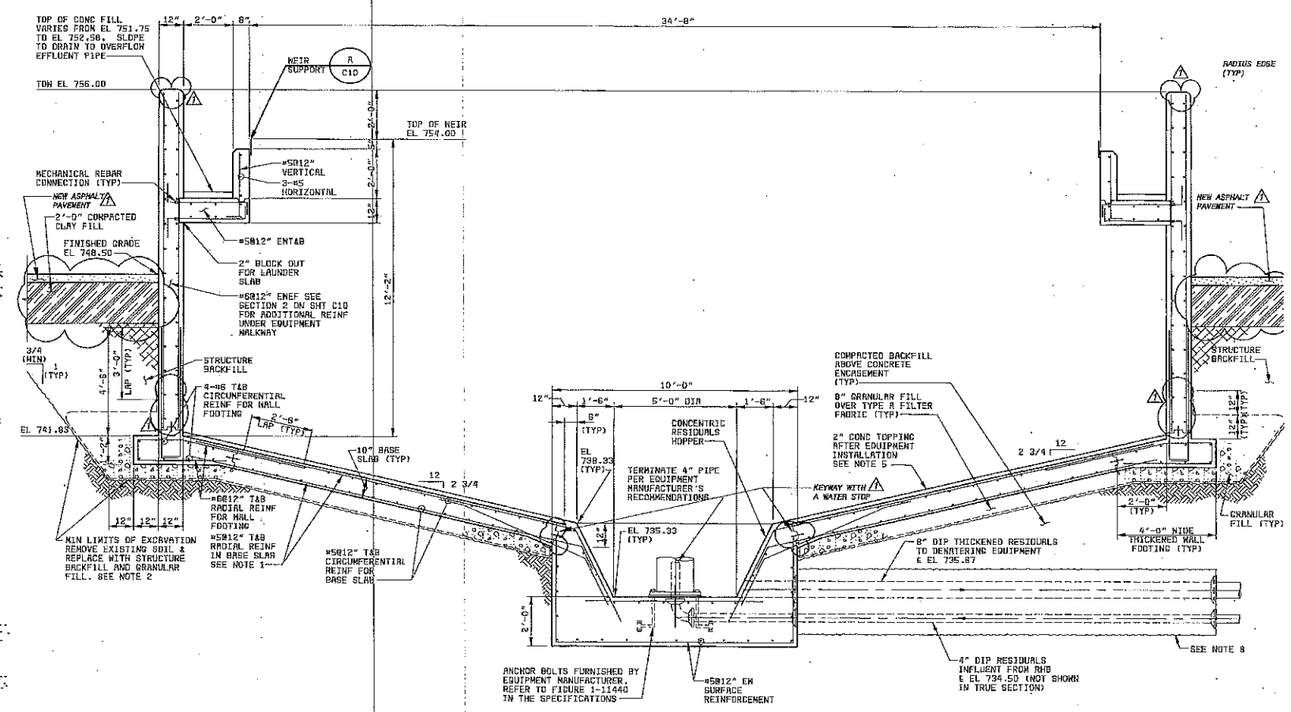
SHEET 23 OF 73

CCG. DWG. NO: 62409-115-MRH-PR-A0000979

03009
F000000



PLAN @ EL 757.50
1/4" = 1'-0"



SECTION 1/C9
3/8" = 1'-0"

NOTES:

1. CUT ALTERNATE BARS @ 7'-0" FROM CENTER OF BASIN.
2. AT LOCATIONS WHERE LIMITS OF EXCAVATION INTERFERE WITH ADJACENT STRUCTURES, COMBINE EXCAVATION AS NECESSARY, ACCEPTABLE TO THE ENGINEER.
3. THICKENING EQUIPMENT NOT SHOWN. SEE SPECIFICATIONS.
4. THICKENING EQUIPMENT MANUFACTURER SHALL VERIFY THAT THE RAKE ARM DESIGN AND PICKETS DO NOT INTERFERE WITH THE OVERFLOW PIPE.
5. THE 2 INCH CONCRETE TOPPING SHALL BE A PER GRAVEL MIX.
6. INSIDE EDGE OF ACCESS STAIRS SHALL MATCH THE CIRCULAR SHAPE OF THE CONCRETE WALL OF GRAVITY THICKENER BASIN. 2 LAYERS OF 15 LB BUILDING FELT SHALL BE PROVIDED BETWEEN THE BASIN WALL AND STAIR.
7. PRV DETAIL NOT SHOWN IN SECTION 1. SEE DETAIL L ON SHT C21.
8. CONCRETE ENCASEMENT TO THE EDGE OF BASIN FOOTING.
9. SEE SECTION 3 ON SHEET C10 FOR NUMBER OF RISERS AND TREADS.
10. THE MOWING STRIP AROUND THE PERIMETER OF THE GRAVITY THICKENER WAS DELETED FROM THE SCOPE OF THIS PROJECT.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMH	AS	DHG

DESIGNED JCD,DHG,AS
DETAILED DPK, KRP
CHECKED RED, JEH, WOB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
GRAVITY THICKENER
PLAN & SECTION

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOUNDES ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 8903882

C9

SHEET 24 OF 73

62409 F000000

62409-110-WRH-C-Z00000C5B 08/20/2000 13:46:04 RCD, Plotted : 6/26/2002 8:39:27 AK

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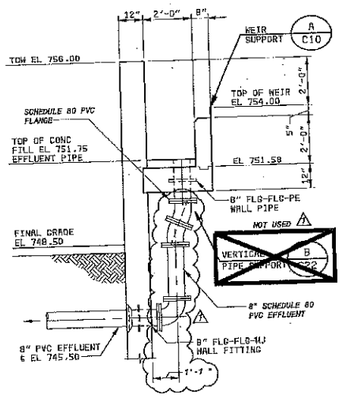
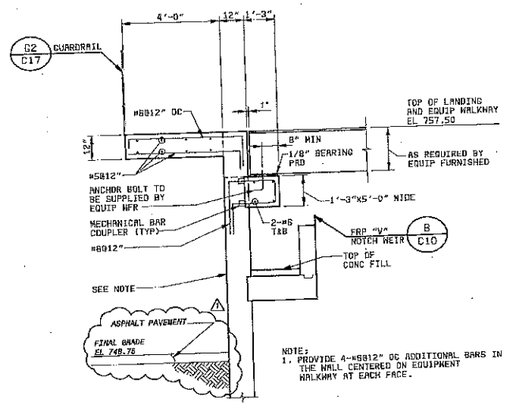
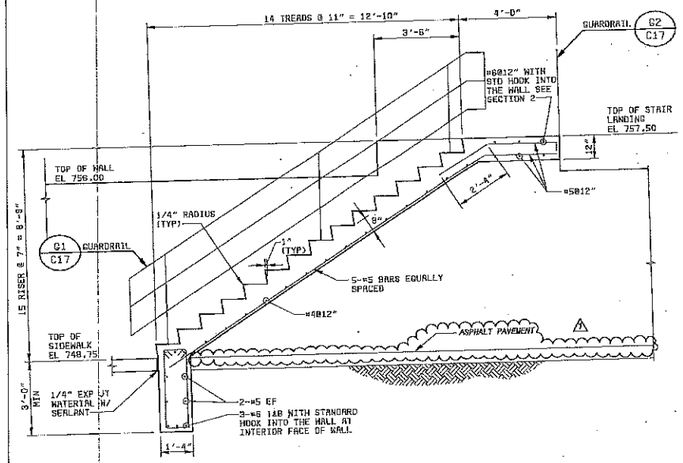


SECTION 1 / C9
3/8" = 1'-0"



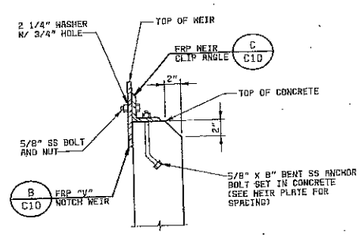
NOTE:
1. PROVIDE 4-#5@12" OC ADDITIONAL BARS IN THE WALL CENTERED ON EQUIPMENT WALKWAY AT EACH FACE.

SECTION 2 / C9
3/8" = 1'-0"

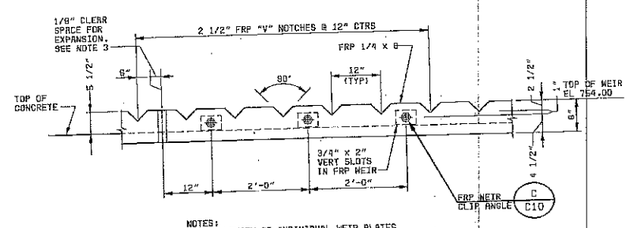


NOTES:
1. FOR TYPICAL CORNER REINFORCING DETAIL FOR STAIRS, REFER TO SHEET C14.
2. SEE NOTE 9 ON SHEET C13.

SECTION 3 / C9
3/8" = 1'-0"

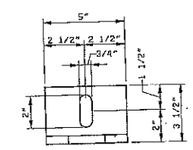


WEIR SUPPORT / A / C9,C10
1 1/2" = 1'-0"

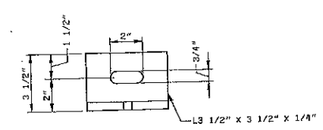


NOTES:
1. MAX LENGTH OF INDIVIDUAL WEIR PLATES SHALL BE 12'-0"
2. PLATES FOR CIRCULAR BASIN BENT TO RADIUS
3. EXPANSION REQUIREMENTS TO BE VERIFIED BY SUPPLIER

FRP "V" NOTCH WEIR / B / C10
3/4" = 1'-0"



PLAN



ELEVATION

NOTE:
1. CLIP ANGLE MAY BE FRP OR SS.

FRP WEIR CLIP ANGLE / C / C10
3" = 1'-0"

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
1	FAW	AS	DHG	07-02	CONFORMED TO CONSTRUCTION RECORDS

DESIGNED JCD, DNG, AS
DETAILED DPK, HRP
CHECKED RED, JEN, WDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
GRAVITY THICKENER
SECTIONS & DETAILS

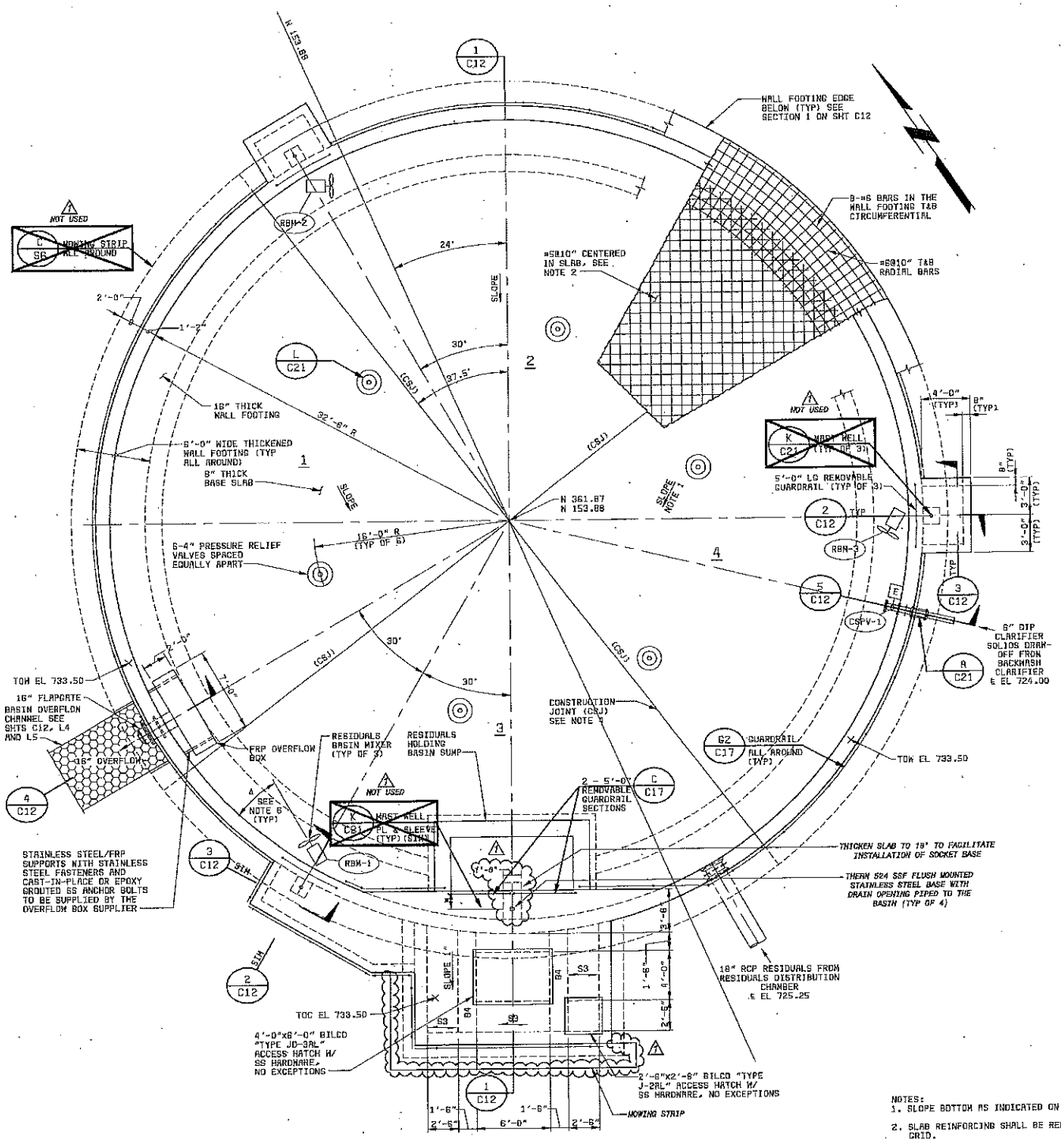
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOMMONS ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 8803802.

C10

SHEET 25 OF 73

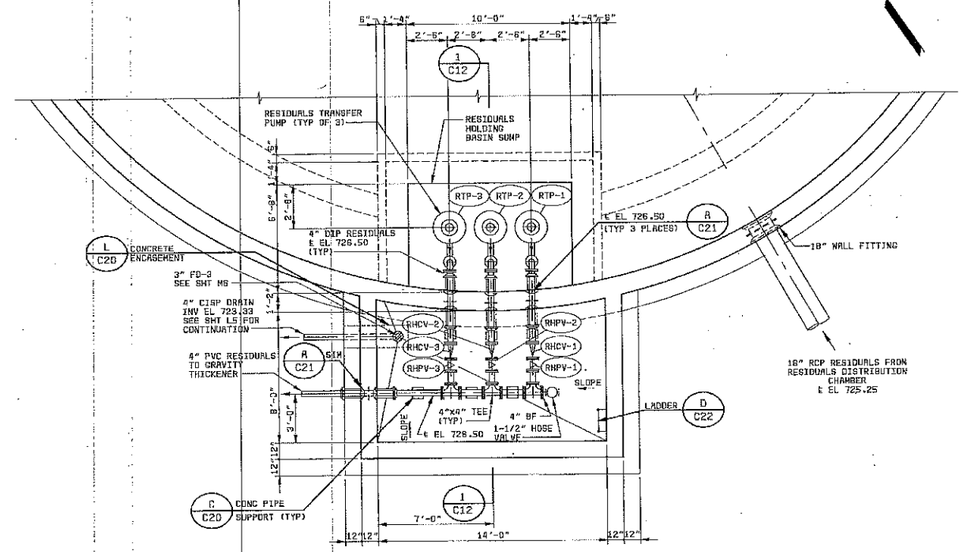
CCD. DWG. NO: 62409-110-WRH-C-A0000620

62409-110-WRH-C-Z00000C5K 06/20/2000 15:21:53 RCD



RESIDUALS HOLDING BASIN - PLAN @ EL 733.50

3/16" = 1'-0"



RESIDUALS HOLDING BASIN - SECTIONAL PLAN @ ℄ EL 726.50

1/4 = 1'-0"

NOTES:
1. SLOPE BOTTOM AS INDICATED ON SHEET C12.
2. SLAB REINFORCING SHALL BE RECTANGULAR GRID.
3. WALL FOOTING REINFORCING SHALL BE RADIAL AND CIRCUMFERENTIAL.
4. BASE SLAB CONSTRUCTION JOINTS SHALL BE AS PER SHEET C23. ALIGN VERTICAL WALL JOINTS WITH SLAB JOINTS. ALL JOINTS SHALL BE PROVIDED WITH WATERSTOPS.
5. 1 INDICATES SLAB POUR SEQUENCE.
6. "A" DENOTES ANGLE DETERMINED BY MIXER MANUFACTURER.
7. "*" DENOTES DIMENSION DETERMINED BY EQUIPMENT MANUFACTURER.
8. VERIFY ALL ELEVATIONS OF EXISTING PIPING REQUIRING REROUTING. SEE SHTS L5 & L6.
9. THE MOWING STRIP AROUND THE PERIMETER OF BASIN WAS DELETED FROM THE SCOPE OF THIS PROJECT.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SWH	AS	DMS

DESIGNED JCD,DHC,AS
DETAILED DPK
CHECKED REG. JEN. MOB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
RESIDUALS HOLDING BASIN
PLANS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONGES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 6800992

C11

SHEET 26 OF 73

CCP. DWG. NO: 62409-110-WRH-C-A0000789

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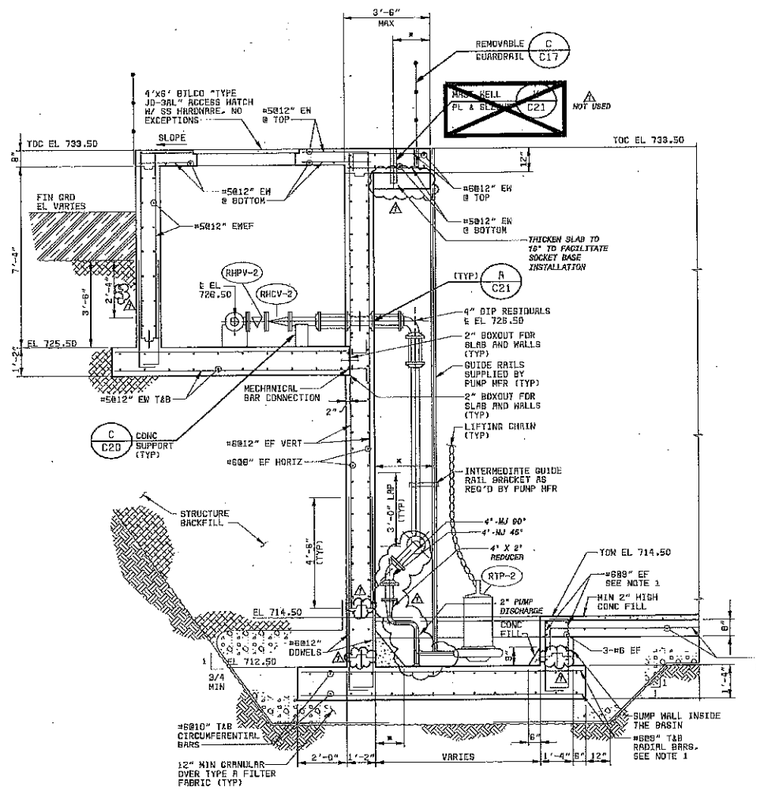
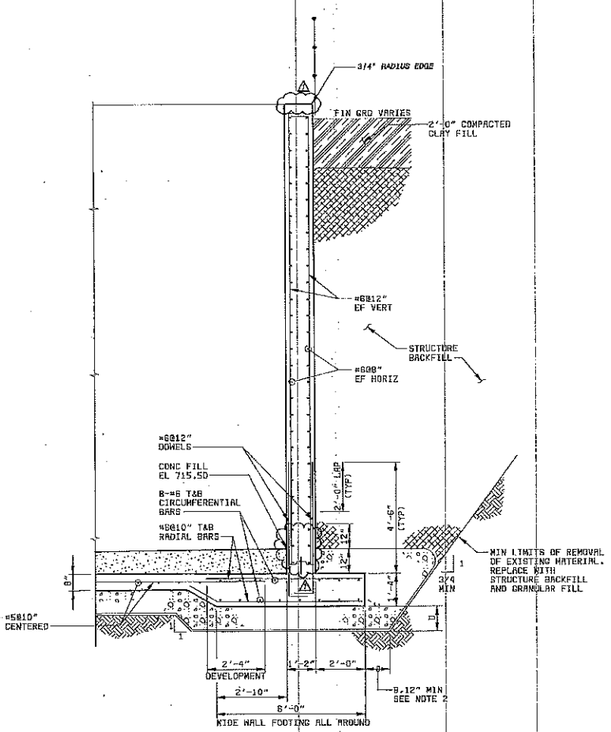
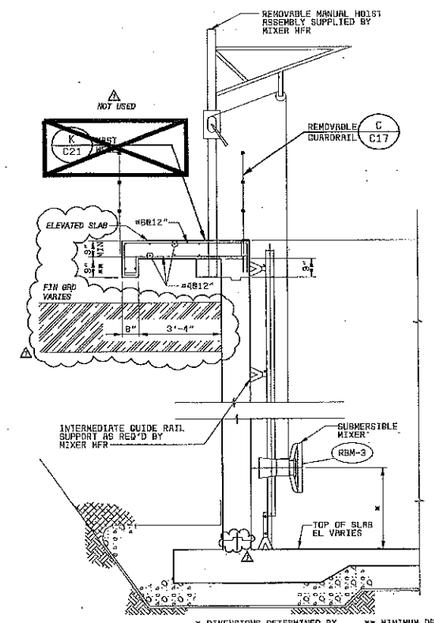


* DIMENSIONS DETERMINED BY PUMP MANUFACTURER

SECTION 1/C11
3/8" = 1'-0"

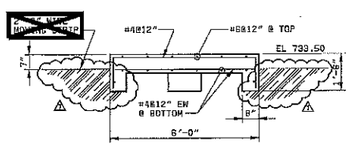




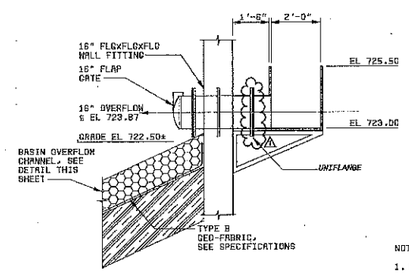
* DIMENSIONS DETERMINED BY MIXER MANUFACTURER

** MINIMUM DEPTH UNDER FINISHED GRADE SHALL BE 9 INCHES.

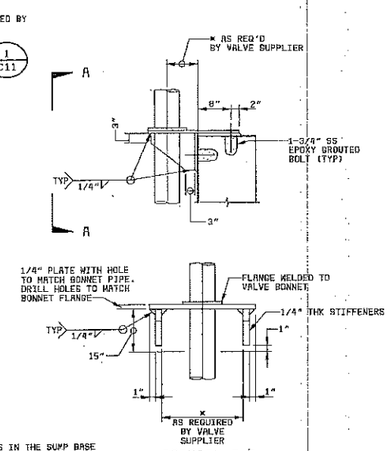
SECTION 2/C11
3/8" = 1'-0"



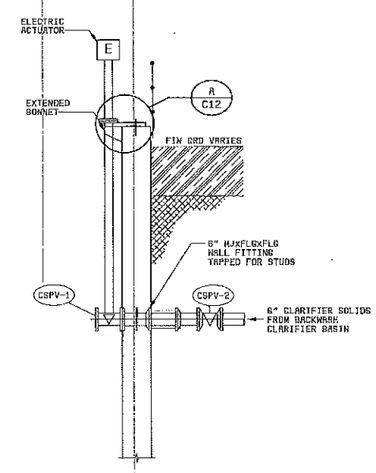
SECTION 3/C11,C13
3/8" = 1'-0"



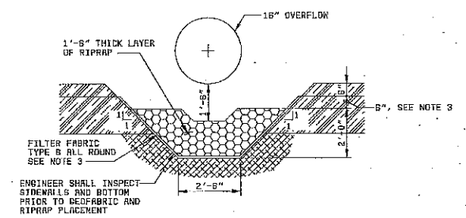
SECTION 4/C11
3/8" = 1'-0"



SECTION A-A
DETAIL A/C12
3/8" = 1'-0"



SECTION 5/C11
3/8" = 1'-0"



BASIN OVERFLOW CHANNEL DETAIL
NO SCALE

NOTES:

1. RADIAL BARS IN THE SUMP BASE SLAB AND VERTICAL BARS IN SUMP WALL SHALL BE #6 BARS @8" O.C. RADIAL BARS IN THE WALL FOOTING SHALL BE #6 BARS PLACED @ 10" O.C. AS INDICATED.
2. B=D WHERE D IS THE THICKNESS OF THE SOIL REMOVED FROM BENEATH THE BASE SLAB.
3. GEO-FABRIC SHALL BE ROLLED BACK A MINIMUM OF 6" ON ALL SIDES AT TOP AND COVERED WITH A MINIMUM OF 6" COMPACTED SOIL.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DHG

DESIGNED JCD, AS, DHG
DETAILED DPK, FAW
CHECKED REG, JEW, MDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
RESIDUALS HOLDING BASIN
SECTIONS & DETAILS

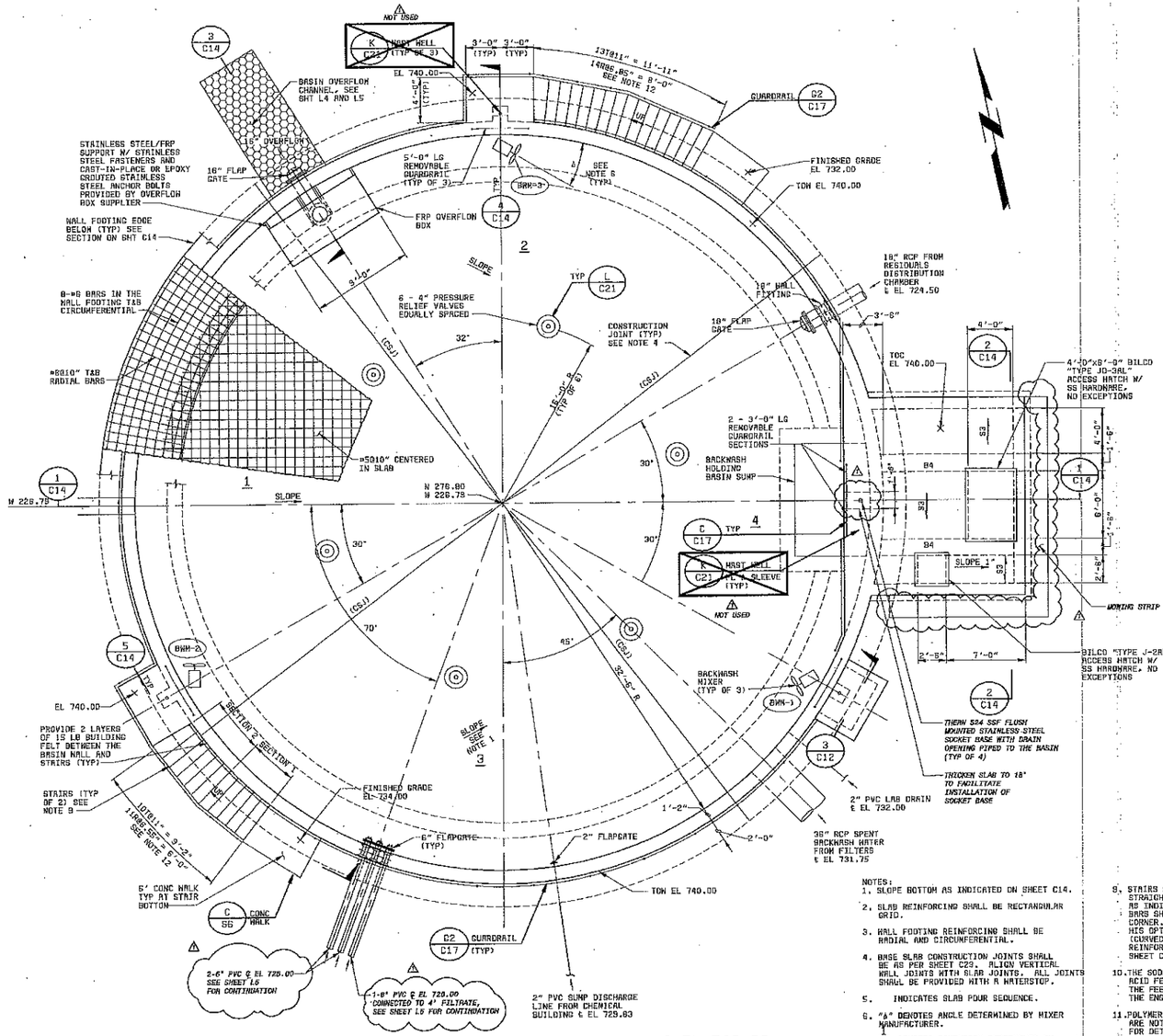
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LORENDES ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0003092

C12

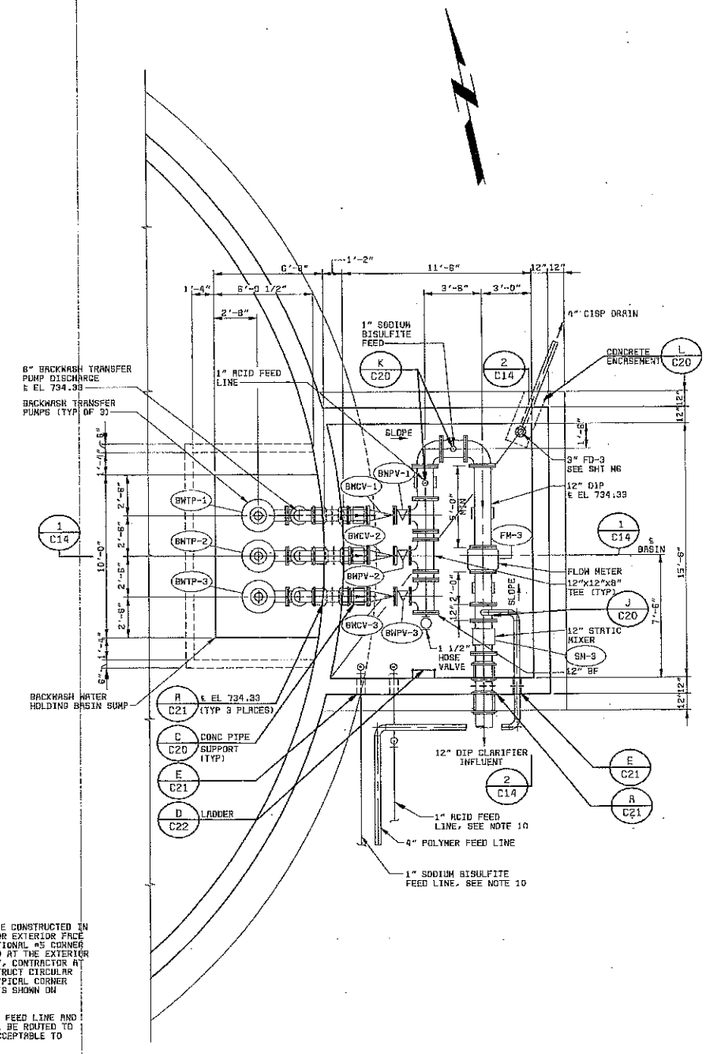
SHEET 27 OF 73

CCG. DRG. NO: 62409-110-NRH-C-R0001183

62409-110-NRH-C-Z0000DC62 08/08/2000 04:05:08 RCD



BACKWASH WATER HOLDING BASIN - PLAN @ EL 740.00
3/16" = 1'-0"



BACKWASH WATER HOLDING BASIN - SECTIONAL PLAN @ EL 734.33
1/4" = 1'-0"

NOTES:
1. SLOPE BOTTOM AS INDICATED ON SHEET C14.
2. SLAB REINFORCING SHALL BE RECTANGULAR GRID.
3. WALL FOOTING REINFORCING SHALL BE RADIAL AND CIRCUMFERENTIAL.
4. BASE SLAB CONSTRUCTION JOINTS SHALL BE AS PER SHEET C23. ALIGN VERTICAL WALL JOINTS WITH SLAB JOINTS. ALL JOINTS SHALL BE PROVIDED WITH A WATERSTOP.
5. INDICATES SLAB POUR SEQUENCE.
6. "A" DENOTES ANGLE DETERMINED BY MIXER MANUFACTURER.
7. "X" DENOTES DIMENSION DETERMINED BY EQUIPMENT MANUFACTURER.
8. VERIFY ELEVATIONS OF ALL EXISTING PIPING REQUIRING REROUTING. SEE SHT L4 FOR COORDINATION WITH NEW AND EXISTING PIPE.
9. STAIRS SHOWN SHALL BE CONSTRUCTED IN STRAIGHT SECTIONS FOR EXTERIOR FACE AS INDICATED. ADDITIONAL #5 CORNER BARS SHALL BE PLACED AT THE EXTERIOR CORNER. ALTERNATELY, CONTRACTOR AT HIS OPTION MAY CONSTRUCT CIRCULAR (CURVED) STAIRS. TYPICAL CORNER REINFORCING DETAIL IS SHOWN ON SHEET C14.
10. THE SODIUM BISULFITE FEED LINE AND ACID FEED LINE SHALL BE ROUTED TO THE FEED POINT AS ACCEPTABLE TO THE ENGINEER.
11. POLYMER SYSTEM VALVES AND ACCESSORIES ARE NOT SHOWN ON THE PLAN. SEE SHT C8 FOR DETAILS.
12. CONTRACTOR TO ADJUST THE NUMBER OF STAIR TREADS AND RISERS AS REQUIRED TO MATCH FINISHED GRADE.
13. SEE SPECIFICATIONS FOR PIPE INSULATION REQUIREMENTS.
14. THE MOUNTING STRIP AROUND THE PERIMETER OF BASIN WAS DELETED FROM THE SCOPE OF THIS PROJECT.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DHD

DESIGNED MHA, DHD, AS
DETAILED DPK
CHECKED RED, JEM, NDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
BACKWASH WATER HOLDING BASIN PLANS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOMBARDI ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6608662

C13

SHEET 28 OF 73

CCD. DWG. NO: 62409-110-MBH-C-R0000309

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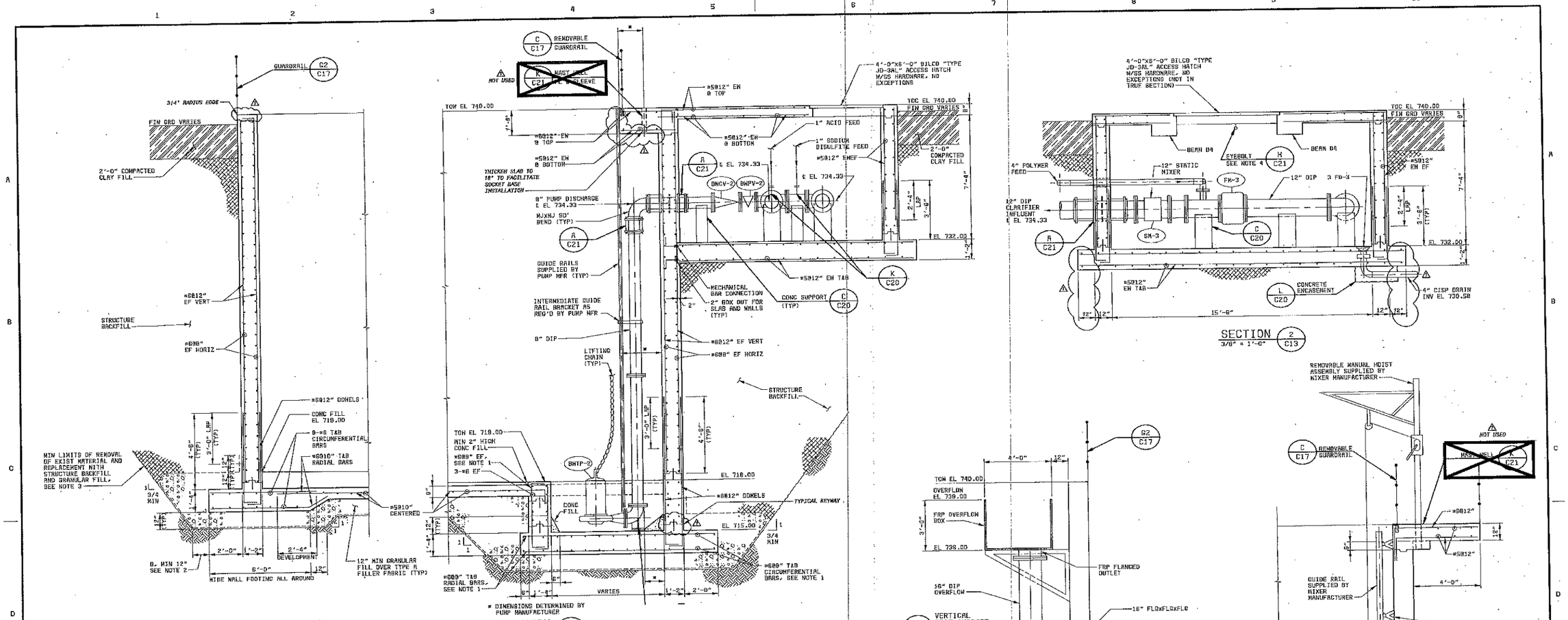


NOTES:

1. RADIAL BARS IN THE SUMP BASE SLAB AND VERTICAL BARS IN SUMP WALL SHALL BE #6@9" OC. RADIAL BARS IN THE WALL FOOTING SHALL BE PLACED AT #6@10" OC AS INDICATED.
2. B=D, WHERE D=THICKNESS OF SOIL REMOVED FROM BENEATH THE BASE SLAB.
3. AT LOCATIONS WHERE THE LIMITS OF EXCAVATION FOR THE BACKWASH HOLDING BASIN INTERFERE WITH THE NOJRDENT STRUCTURES, COMBINE EXCAVATION AS NECESSARY AND ACCEPTABLE TO THE ENGINEER.
4. LOCATION OF EYEBOLT SHALL BE DETERMINED IN THE FIELD AS ACCEPTABLE TO THE ENGINEER.
5. SEE SHEET C17 FOR BEAM AND SLAB SCHEDULE AND REINFORCEMENT.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DRB

DESIGNED WHR, DHD, AS
DETAILED DPK, WHR
CHECKED REO, JEW, WDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

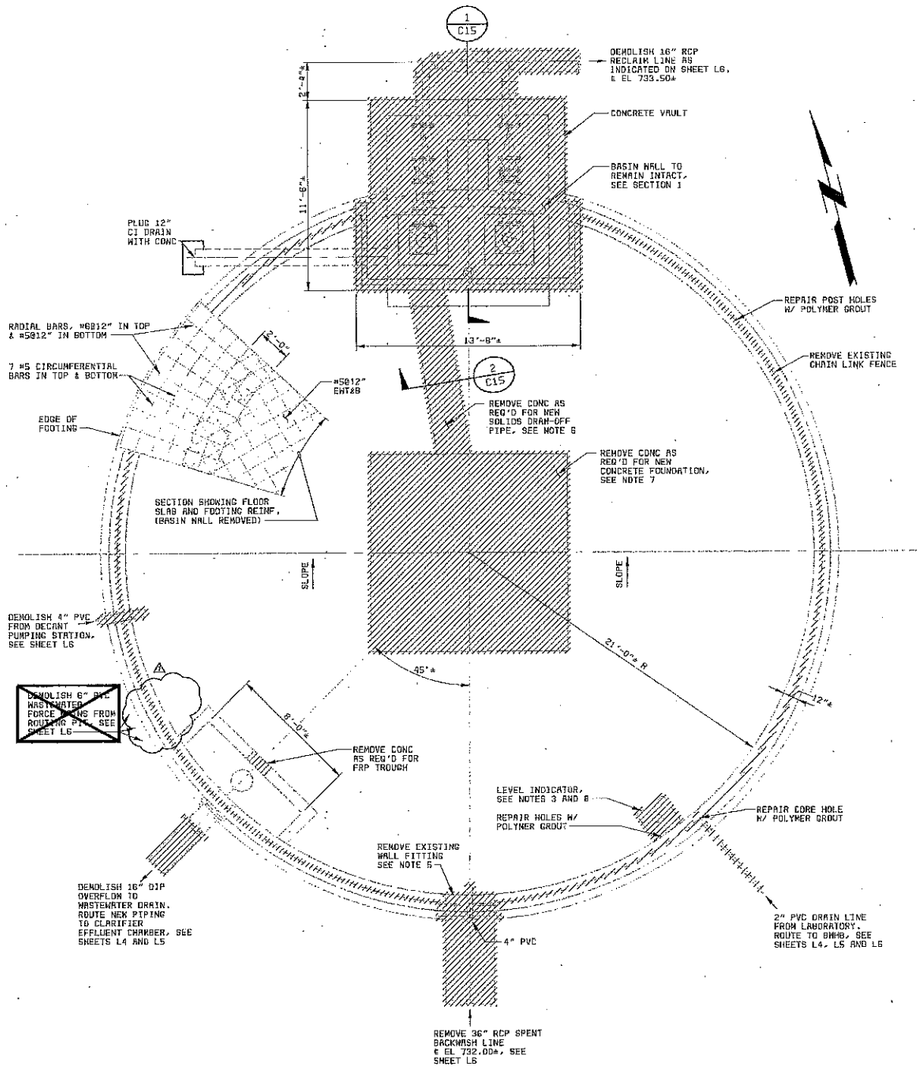
CIVIL
BACKWASH WATER HOLDING BASIN
SECTIONS & DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6803092

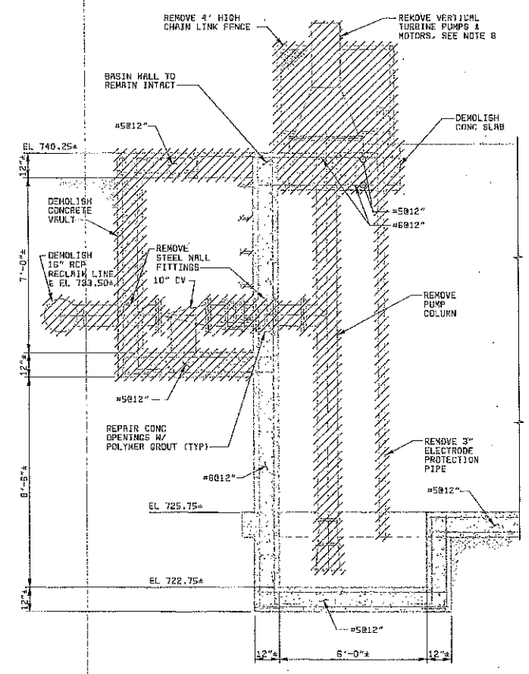
C14

SHEET 29 OF 73

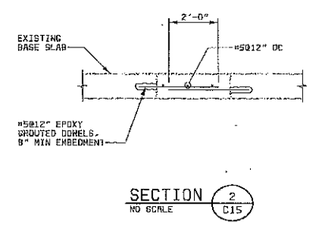
CCG. DWG. NO: 62409-110-WRH-C-R0000418



RECLAIM WELL DEMOLITION PLAN
1/4" = 1'-0"



SECTION 1/C15
3/8" = 1'-0"



SECTION 2/C15
NO SCALE

NOTES:

1. REFER TO CONCRETE REPAIR SPECIFICATION SECTION FOR CONCRETE REPAIR OF DEMOLISHED SURFACES, HOLES IN CONCRETE, AND AS REQUIRED OR INDICATED.
2. WHERE REINF BARS ARE EXPOSED AFTER DEMOLITION, GRIND BARS 1 1/2" BELOW CONCRETE SURFACE AND GROUT FLUSH W/ ADJACENT CONCRETE SURFACE.
3. REMOVE LEVEL INDICATOR AND ASSOCIATED SUPPORT STRUCTURE.
4. GROUT OR CONCRETE USED FOR REPAIRS SHALL BE SMOOTH W/ ADJACENT SURFACES.
5. REMOVE EXISTING 36" SPENT BACKWASH LINE WALL FITTING. SEE SHT C16 FOR REPAIR. COORDINATE LOCATION OF CLARIFIER INFLUENT FITTING.
6. EXISTING BASE SLAB SHALL BE CUT AS REQUIRED TO INSTALL NEW PIPE. CONTRACTOR AT HIS OPTION MAY MAINTAIN THE EXISTING SLAB REINFORCEMENT. IF SLAB REINFORCEMENT IS CUT, NEW #5@12" OC BARS SHALL BE DOWELED INTO THE SIDES #3 INDICATED.
7. THE SAW CUT EDGES OF OPENING IN BASE SLAB FOR NEW CONCRETE FOUNDATION SHALL BE ROUGHENED 1/4"± AND APPLIED WITH BONDING AGENT FOR BONDING WITH NEW CONCRETE.
8. FOR ELECTRICAL DEMOLITION ASSOCIATED WITH VERTICAL TURBINE PUMPS AND LEVEL INDICATOR, SEE SHEET L6.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	RPP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DNG

DESIGNED DHG/AS/MHR
DETAILED DPK
CHECKED REG/JEK
RPPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
RECLAIM WELL DEMOLITION
PLANS, SECTIONS & DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONGDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8803882

C15

SHEET 30 OF 73

23608
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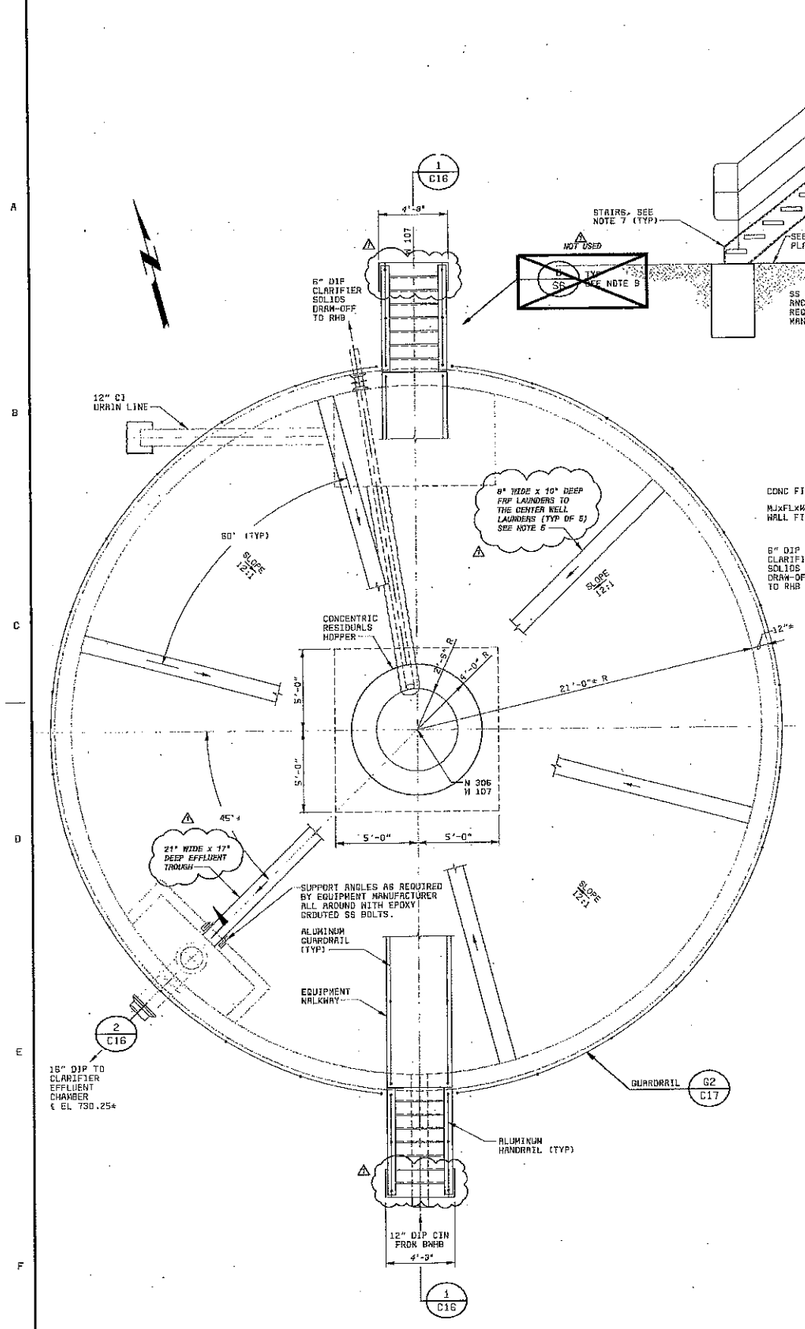
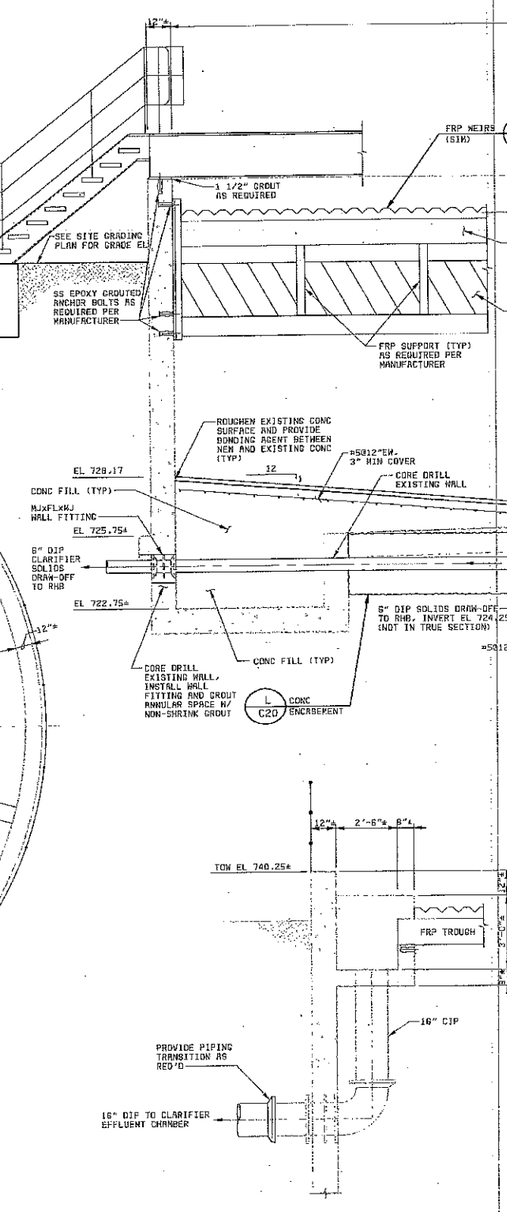
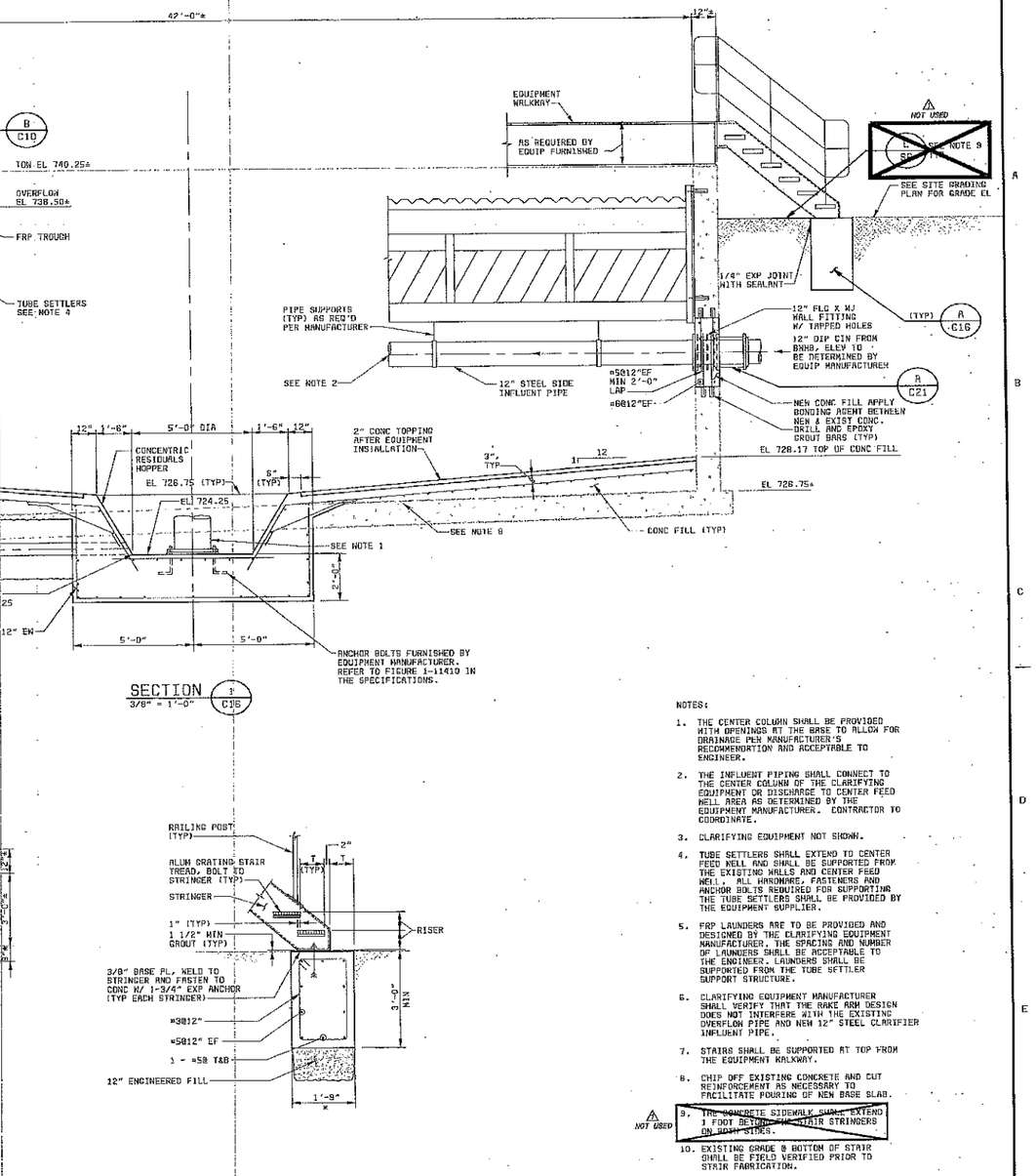


BACKWASH CLARIFIER PLAN
1/8" = 1'-0"





SECTION 1 C16
3/8" = 1'-0"

SECTION 2 C16
3/8" = 1'-0"

STAIR FOUNDATION A C16
1/2" = 1'-0"

NOTES:

1. THE CENTER COLUMN SHALL BE PROVIDED WITH OPENINGS AT THE BASE TO ALLOW FOR DRAINAGE PER MANUFACTURER'S RECOMMENDATION AND ACCEPTABLE TO ENGINEER.
2. THE INFLUENT PIPING SHALL CONNECT TO THE CENTER COLUMN OF THE CLARIFYING EQUIPMENT OR DISCHARGE TO CENTER FEED WELL AREA AS DETERMINED BY THE EQUIPMENT MANUFACTURER. CONTRACTOR TO COORDINATE.
3. CLARIFYING EQUIPMENT NOT SHOWN.
4. TUBE SETTLERS SHALL EXTEND TO CENTER FEED WELL AND SHALL BE SUPPORTED FROM THE EXISTING WALLS AND CENTER FEED WELL. ALL HARDWARE, FASTENERS AND ANCHOR BOLTS REQUIRED FOR SUPPORTING THE TUBE SETTLERS SHALL BE PROVIDED BY THE EQUIPMENT SUPPLIER.
5. FRP LAUNDERS ARE TO BE PROVIDED AND DESIGNED BY THE CLARIFYING EQUIPMENT MANUFACTURER. THE SPACING AND NUMBER OF LAUNDERS SHALL BE ACCEPTABLE TO THE ENGINEER. LAUNDERS SHALL BE SUPPORTED FROM THE TUBE SETTLER SUPPORT STRUCTURE.
6. CLARIFYING EQUIPMENT MANUFACTURER SHALL VERIFY THAT THE RAKE ARM DESIGN DOES NOT INTERFERE WITH THE EXISTING OVERFLOW PIPE AND NEW 12" STEEL CLARIFIER INFLUENT PIPE.
7. STAIRS SHALL BE SUPPORTED AT TOP FROM THE EQUIPMENT WALKWAY.
8. CHIP OFF EXISTING CONCRETE AND CUT REINFORCEMENT AS NECESSARY TO FACILITATE POURING OF NEW BASE SLAB.
9. ~~THE CONCRETE SIDEWALK SHALL EXTEND 1 FOOT BEYOND THE STAIR STRINGERS ON DOWN SIDES.~~ NOT USED
10. EXISTING GRADE @ BOTTOM OF STAIR SHALL BE FIELD VERIFIED PRIOR TO STAIR FABRICATION.
11. STAIR TREADS AND RISERS TO BE DETERMINED BY EQUIPMENT MANUFACTURER, AND SHALL BE IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.
12. PER THE SHOP DRAWING INFORMATION THE NORTH STAIR IS 4'-0 11/16" TALL AND SOUTH STAIR IS 3'-7 5/8" TALL.
13. THE WEIR PLATE IS 1/4"x9" IN DIMENSIONS WITH 3" V NOTCHES ON 6 1/8" CENTERS.

07-02	CONFORMED TO CONSTRUCTION RECORDS	FAM	AS	DHG	
DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP	

DESIGNED MHA,DHG,AS
DETAILED DPK
CHECKED RED, JEN, WDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
BACKWASH CLARIFIER
PLAN & SECTIONS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWDEN ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ERE 8803892

C16

SHEET 31 OF 73

CCD. DWG. NO: 62409-110-MRH-C-A0000311

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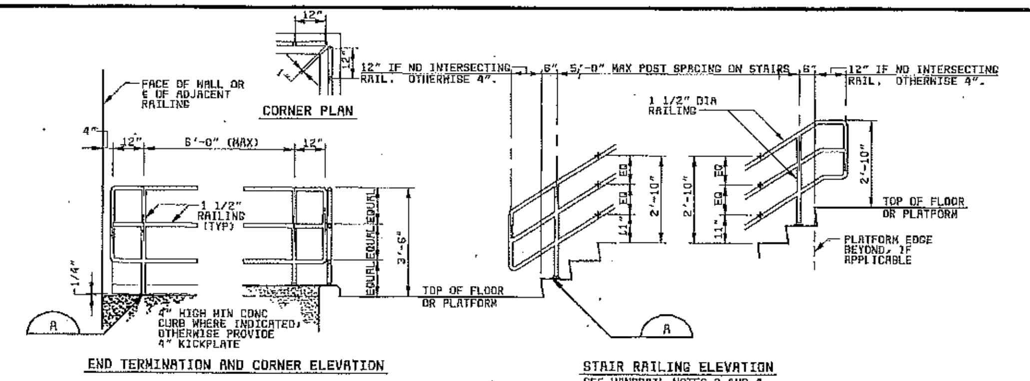
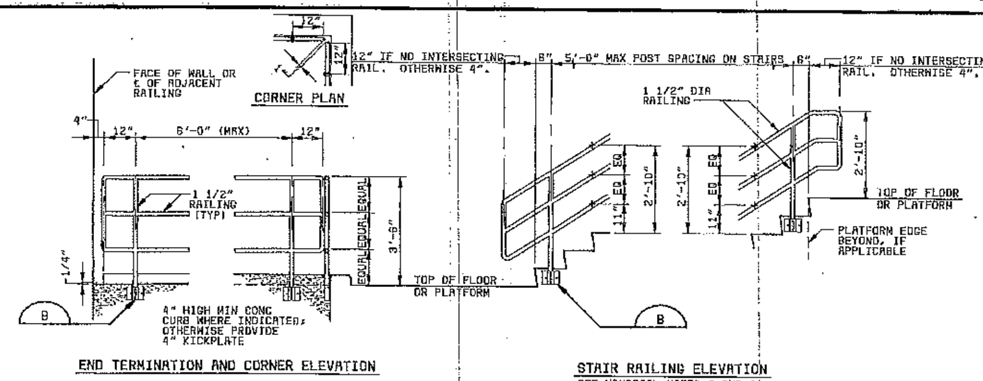


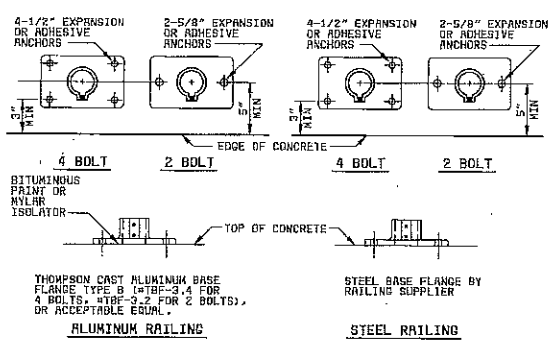
THREE RAIL GUARDRAIL (G1)
3/8" = 1'-0" FLANGE MOUNTED



THREE RAIL GUARDRAIL (G2)
3/8" = 1'-0" SIDE MOUNTED

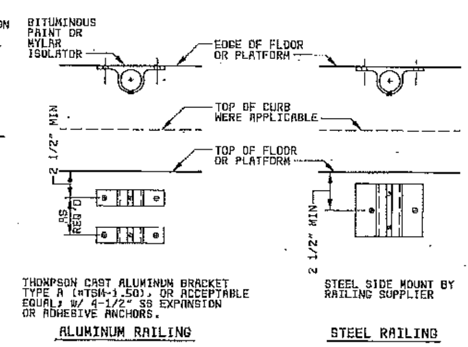
GUARDRAIL & HANDRAIL NOTES:

1. ALL RAILING SHALL BE THREE RAIL UNLESS INDICATED OTHERWISE ON THE DESIGN DRAWINGS.
2. GUARDRAILING AND HANDRAILING SHALL BE DESIGNED AND FABRICATED IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
3. GUARDRAIL MAY BE REPLACED WITH WALL MOUNTED HANDRAIL AT STAIR EDGES AND STRINGERS LOCATED ADJACENT TO WALLS. IF THE OUTSIDE EDGE OF THE STAIR STRINGER IS MORE THAN 3" FROM THE WALL FACE, GUARDRAIL SHALL BE USED.
4. THE INBOARD GUARDRAILING AT SWITCHBACK STAIR LANDINGS MUST BE CONTINUOUS FROM ONE STAIR RUN TO THE NEXT. ADJUST INDICATED DIMENSION AS REQUIRED TO ALIGN AND CONNECT RAILINGS OVER THE LANDING EDGE.
5. REMOVABLE RAILING-AT LOCATIONS SPECIFICALLY INDICATED AS REMOVABLE RAILING, GUARDRAILING AND MOUNTING DETAILS SHALL BE MODIFIED AS FOLLOWS:
   - RAILING SHALL BE DETAILED IN SHORT LENGTHS THAT CAN BE LIFTED BY ONE MAN. EACH PIECE SHALL INCLUDE AT LEAST 2, BUT NOT MORE THAN 3 POSTS. RAIL ENDS SHALL BE TERMINATED SIMILAR TO THE END TERMINATION DETAILS THIS SHEET.
   - MOUNTING DETAILS SHALL BE MODIFIED TO PERMIT RAILING PIECES TO BE REMOVED AND REINSTALLED WITHOUT USE OF TOOLS.



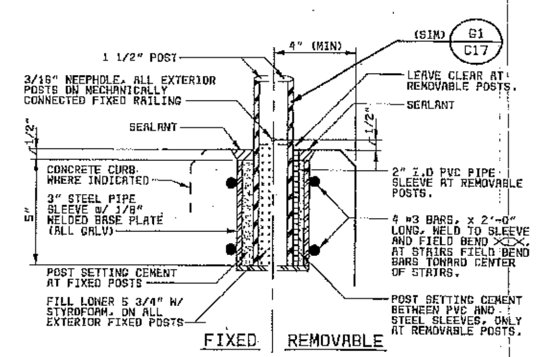
BASE FLANGE MOUNT (A)
1 1/2" = 1'-0" CONCRETE

NOTE:
BASE FLANGES SHALL BE SUITABLE FOR THE INDICATED LOADS AND APPLICABLE BUILDING CODE.



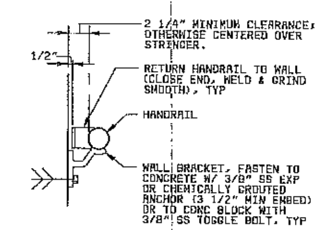
SIDE MOUNT (B)
1 1/2" = 1'-0" CONCRETE

NOTE:
SIDE MOUNTS SHALL BE SUITABLE FOR THE INDICATED LOADS AND APPLICABLE BUILDING CODE.



NOTES: 1. FIXED AND REMOVABLE DETAILS SIMILAR EXCEPT AS NOTED.
2. THE REMOVABLE SLEEVE MOUNT DETAIL SHALL NOT BE USED IN WET LOCATIONS SUBJECT TO FREEZING. SUBSTITUTE A REMOVABLE BASE FLANGE OR SIDE MOUNT DETAIL.

SLEEVE MOUNT (C)
3" = 1'-0" CONCRETE

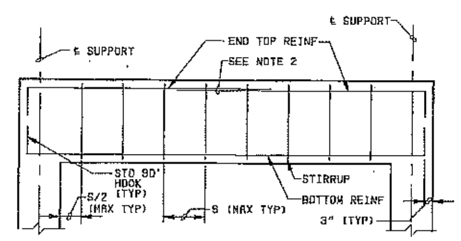


WALL MOUNTED HANDRAIL (D)
1 1/2" = 1'-0"

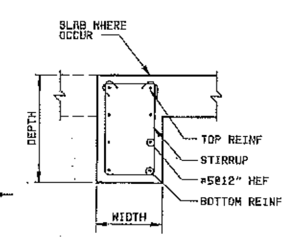
STRUCTURAL NOTES

1. THE APPLICABLE BUILDING CODE IS THE UNIFORM BUILDING CODE, 1997 WITH INDIANA AMENDMENTS.
2. STRUCTURES ARE DESIGNED WITH THE MINIMUM DESIGN CRITERIA LISTED BELOW. THE PRE-ENGINEERED METAL BUILDING SHALL BE DESIGNED BY THE METAL BUILDING MANUFACTURER TO MEET THESE DESIGN CRITERIA. SEE SPECIFIACTIONS FOR ADDITIONAL DESIGN INFORMATION.
   * DEAD LOAD AS CALCULATED
     EQUIPMENT LOAD ACTUAL
     ROOF COLLATERAL LOAD ACTUAL BUT NOT LESS THAN 15 PSF
     PIPE LOAD ALLOWANCE
     PIPE WEIGHT ACTUAL
     PIPE CONTENTS
     WATER-62.4 PCF
     SOLIDS-80 PCF
   * LIVE LOAD
     BASEMENT AND OPERATING FLOOR-150 PSF
     WALKWAYS AND PLATFORMS-100 PSF
     ELECTRICAL ROOMS-250 PSF
     MECHANICAL ROOMS-200 PSF
     STAIRS AND LANDINGS-100 PSF
     ALL OTHER FLOORS-100 PSF
     ROOF LIVE LOAD-20 PSF, UNREDUCED (NOT ADDITIVE WITH SNOW LOAD.)
   * SNOW LOAD
     MINIMUM GROUND SNOW LOAD-20 PSF
     SNOW EXPOSURE COEFFICIENT-0.7
     IMPORTANCE FACTOR-1.0
   * WIND LOAD
     BASIC WIND SPEED 70-MPH
     EXPOSURE-C
     IMPORTANCE FACTOR-1
     ROOFING, ROOF DECK, AND ROOF FRAMING SHALL BE DESIGNED FOR APPLICABLE WIND INDUCED UPLIFT LOADS. NOT MORE THAN 90 PERCENT OF THE ACTUAL ROOF DEAD LOAD EXCLUSIVE OF SUSPENDED CEILINGS, HVAC, PIPING, OR EQUIPMENT SHALL BE CONSIDERED AS EFFECTIVE IN RESISTING WIND UPLIFT.
   * SEISMIC LOAD.
     SEISMIC ZONE-1
     IMPORTANCE FACTOR-1
     SITE PROFILE-SC
     R = 2.85 FOR LIQUID CONTAINMENT STRUCTURES.
3. STRUCTURES ARE DESIGNED ON THE BASIS OF FOLLOWING MATERIAL PROPERTIES:
   CONCRETE STRENGTH-4000 PSI
   CONCRETE MASONRY-1500 PSI
   REINFORCING STEEL-60000 PSI
   STRUCTURAL STEEL:
   SHAPES AND PLATES-36000 PSI
   PIPE-35000 PSI
   TUBE-46000 PSI
4. FOLLOWING SOILS AND FOUNDATION INFORMATION IS APPLICABLE:
   FROST DEPTH-36 INCHES
   COEFF OF AT REST LATERAL EARTH PRESSURE-0.45
5. THE FOLLOWING WORK SHALL BE SUBJECT TO SPECIAL INSPECTION IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE:
   A. CONCRETE CONSTRUCTION:
      INSTALLATION OF REINFORCING
      FORMWORK
      CONCRETE OPERATIONS
      TESTING SPECIMENS

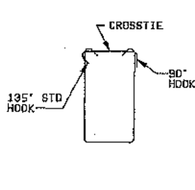
      SPECIAL INSPECTION SHALL BE PERFORMED DURING PLACEMENT OF REINFORCING STEEL. THE SPECIAL INSPECTOR NEED NOT BE PRESENT CONTINUOUSLY DURING THE PLACING OF REINFORCING STEEL, PROVIDED THE SPECIAL INSPECTOR HAS INSPECTED FOR CONFORMANCE WITH THE APPROVED PLANS PRIOR TO THE CLOSING OF FORMS OR THE DELIVERY OF CONCRETE TO THE JOBSITE.
      PAID FOR BY THE OWNER. INDIVIDUALS AND FIRMS HIRED FOR SPECIAL INSPECTION SHALL BE AUTHORIZED BY THE OWNER TO PERFORM THE TYPE OF INSPECTION REQUIRED AND SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
   B. MASONRY CONSTRUCTION (CONTINUOUS)



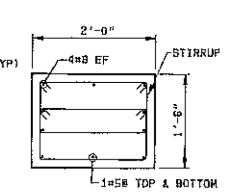
TYPE S-SINGLE SPAN



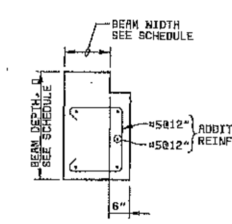
SECTION A



STIRRUP DETAIL



SECTION B

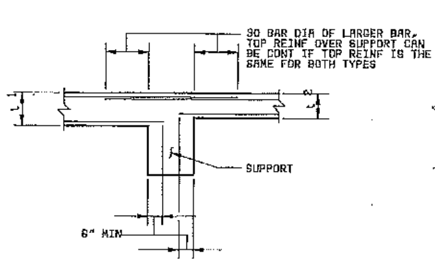


SECTION C

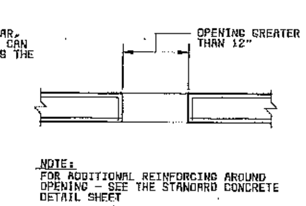
BEAM SCHEDULE								
MARK	BEAM SIZE		BOTTOM REINF	TOP REINF		STIRRUPS		REMARKS
	WIDTH	DEPTH		END	INT	SIZE	SPACE	
B1	18"	24"	4-#8	3#8	–	#4	10"	
B2	24"	18"	SEE SECTION B FOR REINF			#4	10"	
B3	24"	18"	SEE SECTION B FOR REINF			#4	10"	
B4	12"	16"	2#6	2#6	–	#3	10"	SEE SECTION C
B5	16"	18"	3#8	3#8	–	#3	7"	
B6	12"	16"	2#6	2#6	–	#3	10"	SEE SECTION C

BEAM NOTES:

1. AT THE CONTRACTOR'S OPTION, BOTTOM REINF MAY BE MADE CONTINUOUS, WITHOUT SPLICING, ACROSS THE SUPPORT IF BARS IN THE ADJECENT SPAN ARE EQUAL IN SIZE AND QUANTITY.
2. END AND INTERIOR TOP REINFORCING SHALL BE LAPPED AT MIDSPAN BETWEEN SUPPORTS USING 75% OF THE LAP SPLICE LENGTH INDICATED ON THE STANDARD CONCRETE DETAILS SHEET. USE THE LAP SPLICE REQUIREMENT OF THE SMALLER TOP BAR. IF THE BAR SIZES EACH SIDE OF MIDSPAN DIFFER. AT THE CONTRACTOR'S OPTION, TOP REINFORCING MAY BE MADE CONTINUOUS, WITHOUT SPLICING, IF THE TOP BARS EACH SIDE OF MIDSPAN ARE EQUAL IN SIZE AND QUANTITY.
3. UNLESS INDICATED OTHERWISE, CONSECUTIVE STIRRUP CROSSTIES SHALL HAVE THEIR 90° HOOK PLACED ON OPPOSITE SIDES. IN THE EVENT THAT A SLAB FRAMES INTO ONLY ONE SIDE OF A BEAM, THEN THE 90° HOOK SHALL BE PLACED ON THE SLAB SIDE CONSISTENTLY.

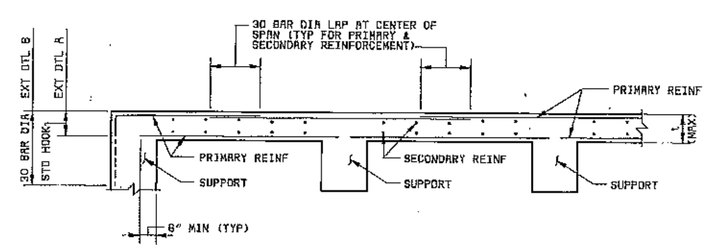


SLAB INTERACTION DETAIL



NOTE:
FOR ADDITIONAL REINFORCING AROUND OPENING - SEE THE STANDARD CONCRETE DETAIL SHEET

DETAIL AT OPENINGS



TYPICAL SUSPENDED SLAB DETAIL

SLAB SCHEDULE					
SLAB TYPE	t	PRIMARY REINF		SECONDARY REINF	
		TOP	BOTTOM	TOP	BOTTOM
S1	12"	#5@12"	#5@12"	#5@12"	#5@12"
S2	12"	#5@10"	#5@12"	#5@12"	#5@12"
S3	8"	#5@12"	#5@12"	#5@12"	#5@12"
S4	8"	#5@12"	CENTERED	#5@12"	CENTERED
S5	8"	#5@12"	CENTERED	#5@12"	CENTERED

SLAB NOTES:

1. THE SLAB CALL-OUTS —S-1— SHOWN ON THE PLANS INDICATE THE DIRECTION OF PLACEMENT OF THE PRIMARY REINFORCEMENT.
2. ALL SLAB DETAILS TYPICAL FOR BOTH PRIMARY AND SECONDARY REINFORCEMENT.
3. REINFORCING IN SLABS MAY BE CONTINUOUS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	△	FAW	AS	DHG

DESIGNED AS, DHG
DETAILED DPK
CHECKED RED, JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
STRUCTURAL DETAILS & NOTES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. EHE 6803862

C17

SHEET 32 OF 73

G3009
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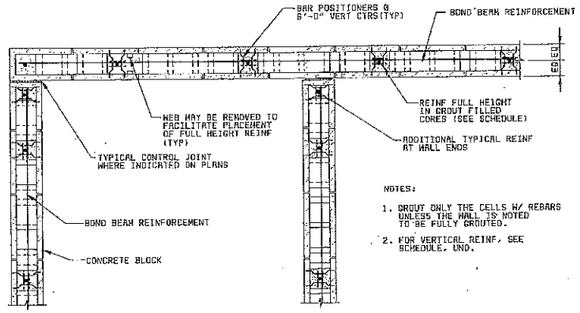
62409-110-WRH-C-Z00000C5S 06/28/2000 03:55:48 ACD

CCG. DWG. NO: 62409-110-WRH-C-A0000976

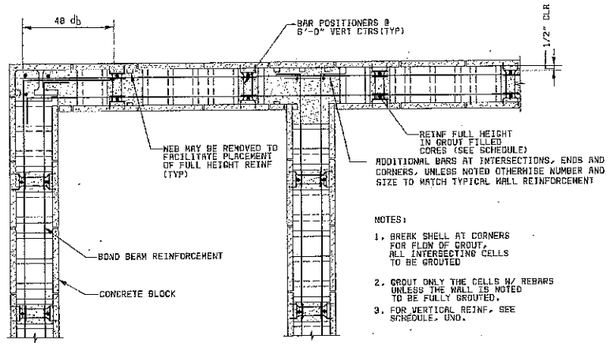


NOTES:

1. GROUT ONLY THE CELLS W/ REBARS UNLESS THE WALL IS NOTED TO BE FULLY GROUTED.
2. FOR VERTICAL REINF, SEE SCHEDULE, UND.

TYPICAL REINFORCING WITH CORNER CONTROL JOINTS

SINGLE CURTAIN REINFORCEMENT SHOWN. DOUBLE CURTAIN SIMILAR WITH 1/2" CLEAR FROM EACH WALL FACE.



NOTES:

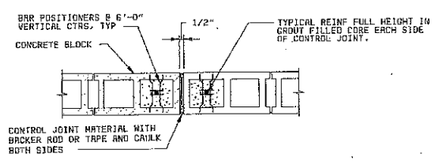
1. BREAK SHELL AT CORNERS FOR FLOW OF GROUT, ALL INTERSECTING CELLS TO BE GROUTED
2. GROUT ONLY THE CELLS W/ REBARS UNLESS THE WALL IS NOTED TO BE FULLY GROUTED.
3. FOR VERTICAL REINF, SEE SCHEDULE, UND.

TYPICAL REINFORCING WITHOUT CORNER CONTROL JOINTS.

DOUBLE CURTAIN REINFORCEMENT SHOWN. SINGLE CURTAIN SIMILAR EXCEPT CENTERED IN WALL.

TYPICAL MASONRY REINFORCING PLANS

3/4" = 1'-0"

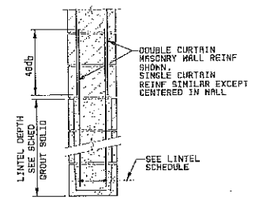


NOTES:

1. LADDER TYPE REINFORCEMENT IS DISCONTINUOUS AT JOINT. 50% OF BOND BEAM REINFORCEMENT IS DISCONTINUOUS AT JOINT.
2. CONTROL JOINT IS CONTINUOUS FULL WALL HEIGHT.
3. PLACE CONCRETE MASONRY CONTROL JOINTS AT ABOUT 35'-0" CENTERS AND WITHIN 16'-0" OF CORNERS UNLESS OTHERWISE NOTED. PLACE CONTROL JOINTS AT LEAST ONE HALF THE OPENING WIDTH AWAY FROM OPENINGS.
4. SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF VENEER CONTROL JOINTS.

TYPICAL CONCRETE MASONRY CONTROL JOINT

NO SCALE



LINTEL SCHEDULE			
WALL SIZE	OPENING WIDTH	LINTEL DEPTH	LONGITUDINAL REINFORCEMENT
8"	≤4'-0"	0'-8"	2-#5
	≤9'-0"	1'-4"	2-#5
	≤15'-0"	2'-0"	2-#6

NOTES:

1. BEAR ALL LINTELS A MINIMUM 2'-0" AT EACH END.
2. REINFORCE LINTELS AS INDICATED ABOVE UNLESS NOTED OTHERWISE ON THE DRAWINGS.

TYPICAL MASONRY LINTEL SECTION AND SCHEDULE

NO SCALE

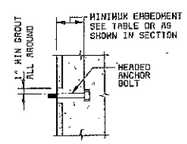
MINIMUM CMU WALL REINFORCING SCHEDULE (NOTE 4) (SPECIAL INSPECTION REQUIRED)			
WALL SIZE	WALL HEIGHT	VERTICAL REINFORCEMENT	HORIZONTAL REINFORCEMENT
8"	≤13'-0"	#5@48	LADDER TYPE JOINT REINFORCEMENT @ 16" CTRS
	≤16'-0"	#5@48	
	≤19'-0"	#5@40	
	≤22'-0"	#5@48	

NOTES:

1. WALL HEIGHT IS DISTANCE FROM BOTTOM OF MASONRY WALL TO THE LOCATION OF TOP LATERAL SUPPORT.
2. WHERE BARS ARE CALLED OUT EACH FACE (EF), BARS SHALL BE PLACED, IN A DOUBLE CURTAIN WITH ONE BAR TOWARD EACH FACE OF THE WALL. OTHERWISE BARS SHALL BE CENTERED IN THE WALL.
3. AT LOCATIONS WHERE WALLS CANTILEVER ABOVE THE TOP LATERAL SUPPORT, THE WALL HEIGHT FOR THE ABOVE SCHEDULE SHALL BE THE GREATER OF THE HEIGHT IN NOTE 1 OR DOUBLE THE DISTANCE FROM LATERAL SUPPORT TO THE TOP OF THE WALL.
4. IN ADDITION TO THE SCHEDULED REINFORCEMENT, WALLS SHALL HAVE A CONTINUOUS BOND BEAM WITH AT LEAST 2-#5 BARS AT OR NEAR THE TOP COURSE, SCHEDULED REINFORCEMENT AT OPENINGS, AND ALL OTHER HORIZONTAL AND VERTICAL REINFORCEMENT AS INDICATED ON THE CIVIL AND ARCHITECTURAL DRAWINGS.
5. SEE THE CIVIL DRAWINGS FOR SPECIAL REINFORCEMENT AND BOUNDARY ELEMENTS IN HIGH STRESS SHEAR WALLS. ALL WALLS SHALL BE REINFORCED WITH THE MINIMUMS ABOVE.

MINIMUM CMU WALL REINFORCING SCHEDULE

NO SCALE



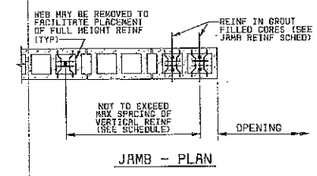
BOLT EMBEDMENT SCHEDULE (UND)	
BOLT SIZE	EMBED
1/2"	4"
5/8"	4"
3/4"	5"
7/8"	6"
1"	7"

NOTE:

MINIMUM BOLT SPACING SHALL BE 12 BOLT DIAMETERS WITH A MINIMUM EDGE DISTANCE OF 6 BOLT DIAMETERS AND WITH A MINIMUM OF 6" TO END OF WALL.

TYPICAL MASONRY ANCHOR BOLT DETAIL

NO SCALE



JAMB - PLAN

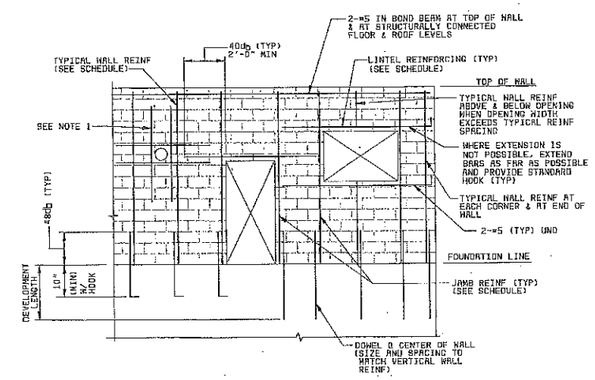
JAMB REINFORCING SCHEDULE				
WALL SIZE	WALL HEIGHT	OPENING WIDTH	EXTERIOR WALL REINFORCEMENT	INTERIOR WALL REINFORCEMENT
8"	≤13'-0"	≤4'-0"	1-#5 EF	1-#5 EF
		≤7'-0"	1-#8 EF	1-#5 EF
		≤12'-0"	3-#6 EF	1-#5 EF
	≤16'-0"	≤4'-0"	1-#6 EF	1-#6 EF
		≤7'-0"	2-#7 EF	1-#8 EF
	≤18'-0"	≤4'-0"	2-#5 EF	1-#8 EF

NOTES:

1. WALL HEIGHT IS DISTANCE FROM BOTTOM OF MASONRY WALL TO THE LOCATION OF TOP LATERAL SUPPORT.
2. THE SCHEDULED REINFORCING SHALL BE PLACED WITH ONE BAR AT EACH FACE OF THE WALL. ONLY ONE PAIR OF BARS SHALL BE PLACED IN EACH CELL.
3. REINFORCE JAMBS AS INDICATED UNLESS NOTED OTHERWISE ON THE DRAWINGS.

TYPICAL MASONRY JAMB PLAN AND SCHEDULE

NO SCALE



NOTE:

1. EXTEND JAMB BARS FLOOR TO ROOF WHERE OPENING WIDTH EXCEEDS 1'-4". OTHERWISE, EXTEND 40 BAR DIAMETERS OR 2'-0" MIN PAST OPENINGS.

TYPICAL MASONRY REINFORCING ELEVATION

NO SCALE

GENERAL NOTES:

1. THE DETAILS ON THIS SHEET ARE APPLICABLE TO ALL CONCRETE MASONRY CONSTRUCTION. SPECIAL NOTES, SECTIONS AND DETAILS SPECIFICALLY NOTED ON THE DESIGN DRAWINGS SHALL BE APPLICABLE INLIEU OF THESE TYPICAL DETAILS, EXCEPT THAT REINFORCEMENT SHALL NOT BE LESS THAN THE TYPICAL REINFORCEMENT REQUIRED.
2. FOR MISCELLANEOUS APPURTENANCES INCLUDING EMBEDMENTS, BRACING, STEEL OR PRECAST LINTELS, VENEER, FLASHING, WEEPS, INSULATION, SEALING, CAULKING AND EMBEDDED PIPE AND ELECTRICAL CONDUIT, SEE THE DESIGN DRAWINGS.
3. MASONRY SHALL BE CONSTRUCTED WITH SLEEVES AS REQUIRED TO ACCOMODATE PASSAGE OF PENETRATING PIPING, CONDUIT AND DUCT BANKS INDICATED ON THE CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS.
4. "db" DENOTES REINFORCING BAR DIAMETER. UND DENOTES "UNLESS NOTED OTHERWISE".
5. SPECIAL INSPECTION IS REQUIRED FOR ALL MASONRY.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	A	FAW	AS	DMG

DESIGNED AS, DMG
DETAILED DPK
CHECKED RED, JEW, MDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

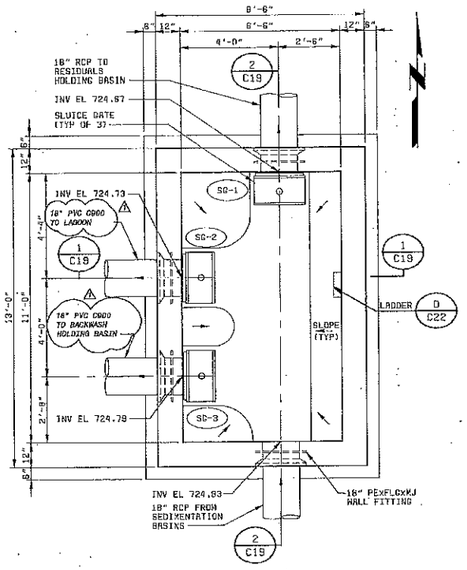
CIVIL
TYPICAL MASONRY DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT J. LOWRIES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENG 6803882

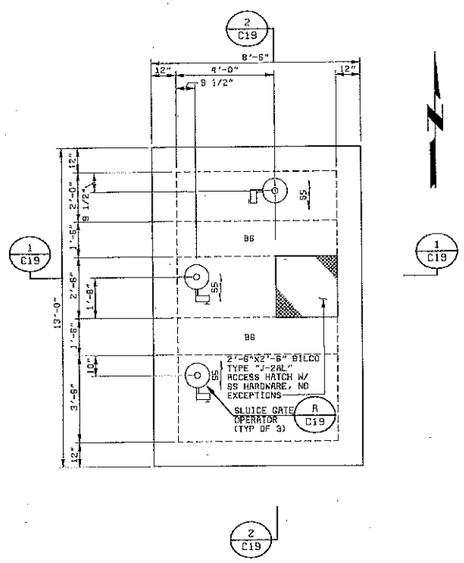
C18

SHEET 33 OF 73

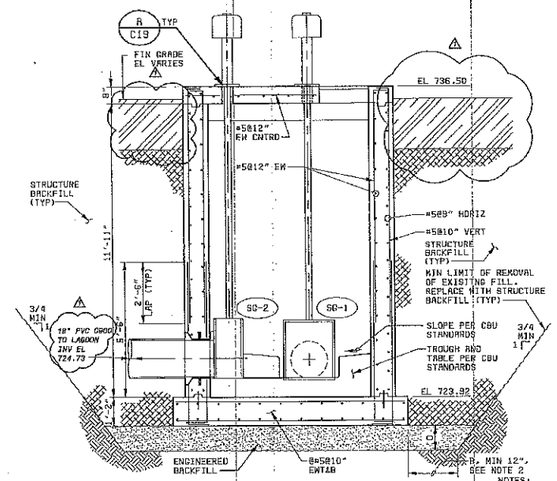
CCS. DWG. NO: 62409-110-WRH-C-R0001447



RESIDUALS DISTRIBUTION CHAMBER
SECTIONAL PLAN @ 724.79
3/8" = 1'-0"

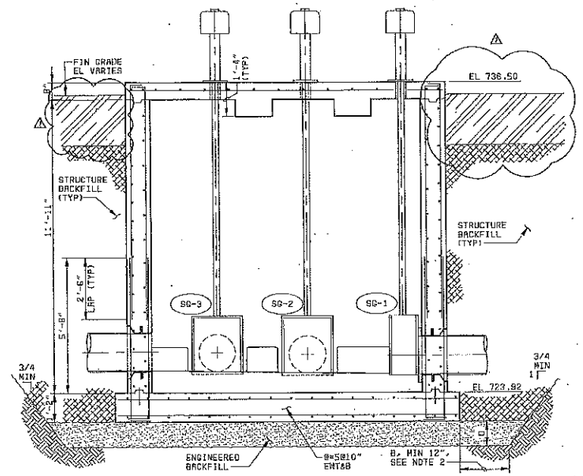


RESIDUALS DISTRIBUTION CHAMBER
PLAN AT EL 736.50
3/8" = 1'-0"

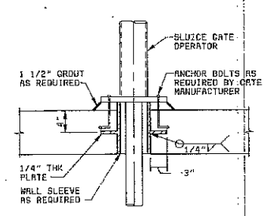


SECTION 1/C19
3/8" = 1'-0"

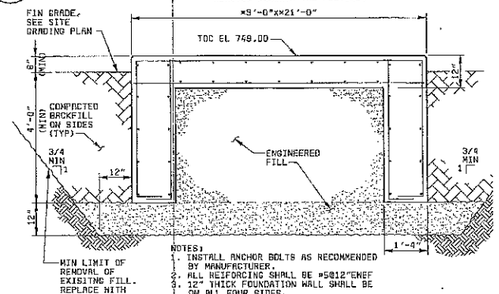
NOTES:
1. COORDINATE FLUSH MOUNTED SLUICE GATE WITH GROUT FILL.
2. B=D WHERE D IS THE THICKNESS OF SOIL REMOVED BENEATH THE FOOTING.



SECTION 2/C19
3/8" = 1'-0"

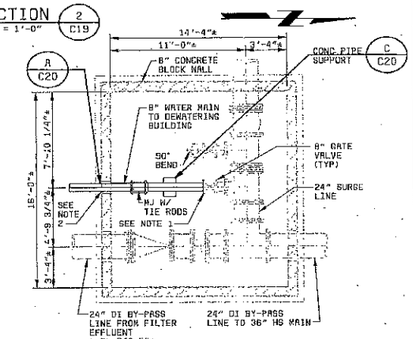


DETAIL A/C19
NO SCALE



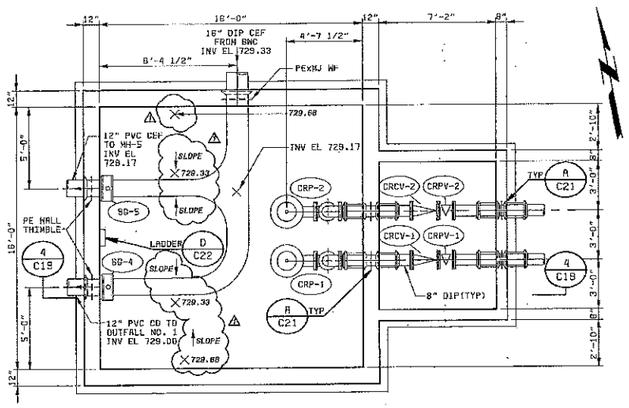
NOTES:
1. INSTALL ANCHOR BOLTS AS RECOMMENDED BY MANUFACTURER.
2. ALL REIFORCING SHALL BE #5@12"EWEF
3. 12" THICK FOUNDATION WALL SHALL BE ON ALL FOUR SIDES.
4. REFERENCE EQUIPMENT PAD DETAIL FOR ANCHOR BOLT AND GROUT INFORMATION.
* TO BE VERIFIED BY EQUIPMENT MANUFACTURER PER EQUIPMENT FURNISHED.

AIR COOLED LIQUID CHILLER FOUNDATION 3/L4
1/2" = 1'-0"

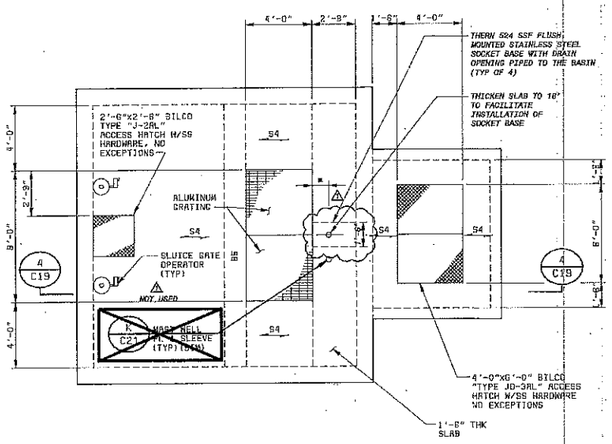


NOTES:
1. REMOVE EXISTING 90° BEND AND CONNECT NEW WATER MAIN.
2. CORE EXISTING MANSONRY WALL AS REQUIRED FOR 8" WATER MAIN. FILL BLOCK ANNULAR SPACE W/ NONSHRINK GROUT. PROVIDE CASING SEALS.

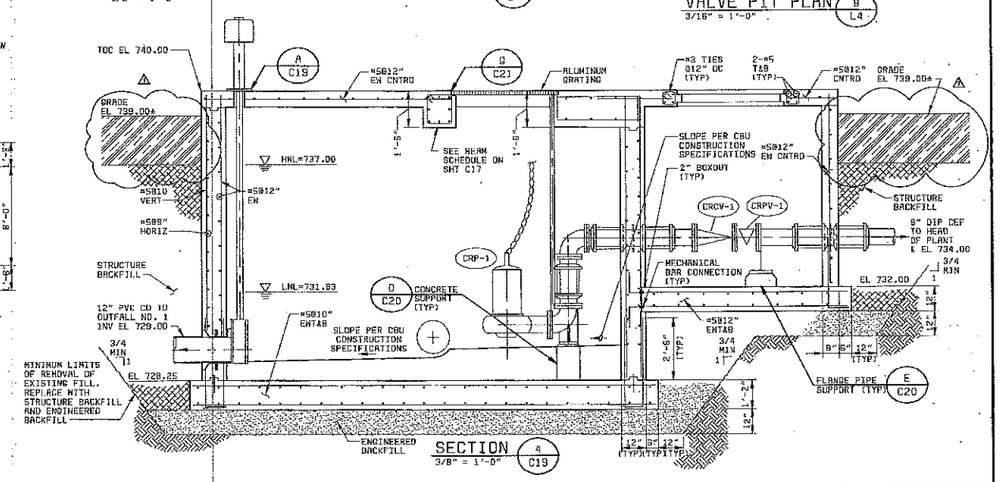
VALVE PIT PLAN 9/L4
3/16" = 1'-0"



CLARIFIER EFFLUENT CHAMBER
SECTIONAL PLAN @ EL 734.00
1/4" = 1'-0"



CLARIFIER EFFLUENT CHAMBER
TOP PLAN @ EL 740.00
1/4" = 1'-0"



SECTION 4/C19
3/8" = 1'-0"

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	FAM	AS	DHG

DESIGNED JCD, AS, MHR, DHG
DETAILED DPK
CHECKED RED, JEN, NDB
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

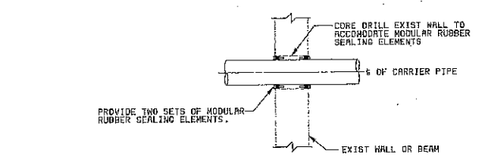
CIVIL
YARD STRUCTURES AND DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOMBARDI ON 05-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 69038B2

C19
SHEET 34 OF 73.

CCO. DWG. NO: 62409-110-WRH-C-A0001449

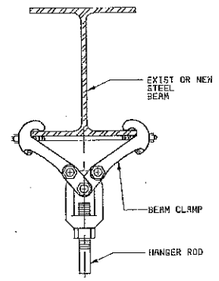
62409-110-WRH-C-200000C55 06/28/2000 03:25:57 ACD



REHAB CONSTRUCTION

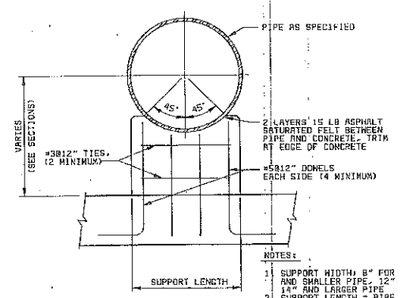
CONCRETE/MASONRY WALL SLEEVE (A)

NO SCALE



HANGER ROD SUPPORT (B)

NO SCALE

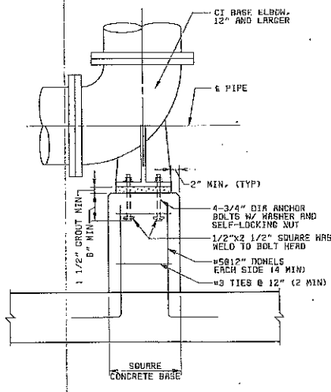


NOTES:

1. SUPPORT WIDTH: 8" FOR 12" AND SMALLER PIPE, 12" FOR 14" AND LARGER PIPE
2. SUPPORT LENGTH = PIPE OD + 6" FOR 12" AND SMALLER PIPE, PIPE OD FOR 14" AND LARGER PIPE
3. DRILL & EPOXY GROUT BARS INTO EXISTING SLAB A MIN OF 8" WHERE CONCRETE PIPE SUPPORT IS SHOWN ON AN EXISTING SLAB.

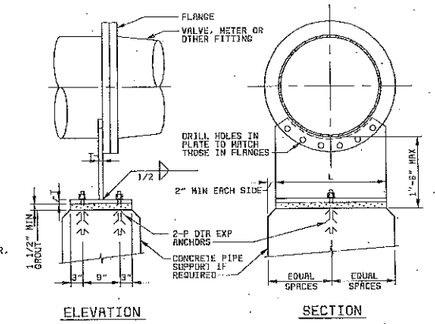
CONCRETE PIPE SUPPORT (C)

NO SCALE



CONCRETE SUPPORT FOR DUCTILE IRON BASE ELBOW (D)

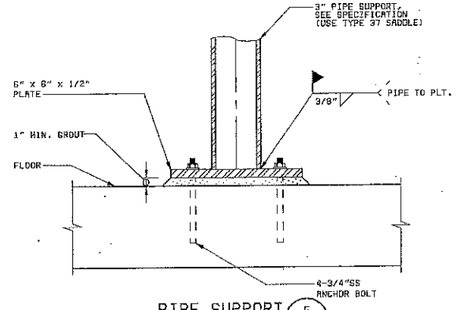
NO SCALE



PIPE SIZE	T	P	L
<20	5/8"	5/8"	PIPE OD
20	3/4"	3/4"	18"
24	3/4"	3/4"	21"
30	3/4"	3/4"	27"
36	3/4"	3/4"	33"
42	3/4"	3/4"	36"
48	3/4"	3/4"	42"
54	3/4"	3/4"	48"
60	3/4"	3/4"	50"

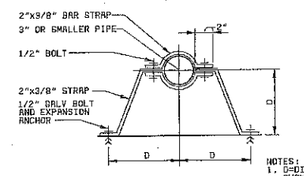
FLANGE PIPE SUPPORT (E)

NO SCALE



PIPE SUPPORT (F)

NO SCALE

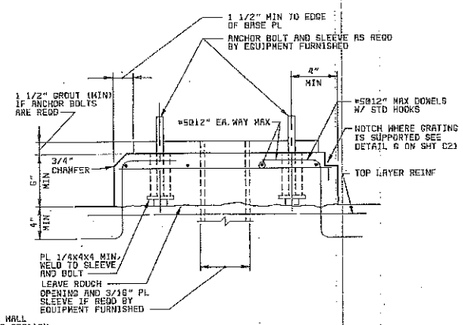


NOTES:

1. D=DISTANCE FROM WALL SHOWN ON PLAN OR SECTION.
2. HOT DIP GALVANIZE AFTER FABRICATION.

VERTICAL PIPE SUPPORT FOR 3" AND SMALLER PIPE (G)

NO SCALE



NOTE:
WILSON ANCHOR SLEEVES MAY BE SUBSTITUTED FOR STEEL PIPE SLEEVES

EQUIPMENT BASE (H) C1, C7

NO SCALE

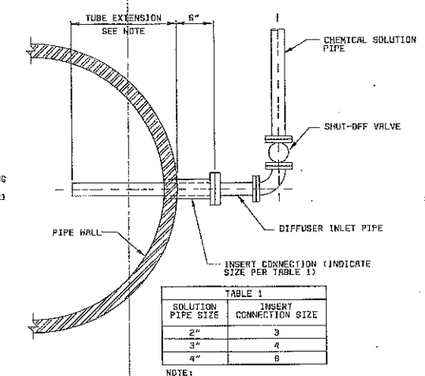
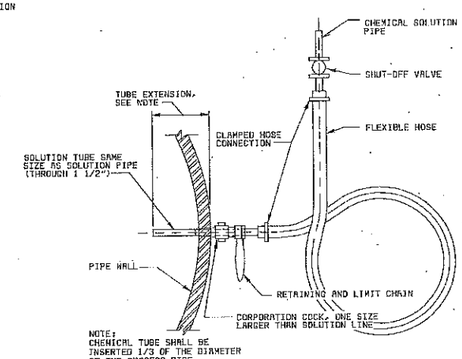


TABLE 1	
SOLUTION PIPE SIZE	INSERT CONNECTION SIZE
2"	3
3"	4
4"	6

NOTE:
CHEMICAL TUBE SHALL BE INSERTED 1/3 OF THE DIAMETER OF THE PROCESS PIPE.

PIPE DIFFUSER FOR SOLUTION PIPES 2 INCH AND LARGER (J)

NO SCALE

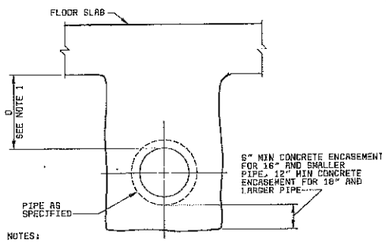


NOTE:
CHEMICAL TUBE SHALL BE INSERTED 1/3 OF THE DIAMETER OF THE PROCESS PIPE.

PIPE DIFFUSER FOR SOLUTION PIPES 1 INCH AND SMALLER (K)

NO SCALE

DIMENSIONS IN INCHES										
TIE BOLT DIA	T	R	Y	N	X	HB	E	HF	HOLE DIA
5/8	3/8	5	5	1 3/8	5	3 7/8	3	2	3/4
3/4	3/8	5	5	1 1/2	5	4 1/8	3 1/8	2	7/8
7/8	1/2	5 1/2	5	1 5/8	5	4 1/4	3 1/8	2	1
1	1/2	5 3/4	RING	1 3/4	RING	4 1/2	3 1/4	2	1 1/8
1 1/8	1/2	7	RING	1 7/8	RING	4 3/4	3 5/8	2 1/2	1 1/4
1 1/4	5/8	7 1/2	RING	2	RING	5	3 3/4	2 1/2	1 3/8
1 3/8	5/8	8 3/4	RING	2 1/8	RING	5 3/8	3 3/4	2 1/2	1 1/2
1 1/2	3/4	10	RING	2 1/4	RING	5 1/2	3 7/8	2 1/2	1 5/8
1 5/8	3/4	10 3/4	RING	2 3/8	RING	5 5/8	3 7/8	2 1/2	1 3/4
1 3/4	7/8	12	RING	2 1/2	RING	5 7/8	4	2 1/2	1 7/8
1 7/8	7/8	13	RING	2 5/8	RING	6	4	2 1/2	2
2	1	14	RING	2 3/4	RING	6 1/4	4 1/4	2 1/2	2 1/8
2 1/4	1	15 3/4	RING	3	RING	6 3/4	4 5/16	2 1/2	2 3/8

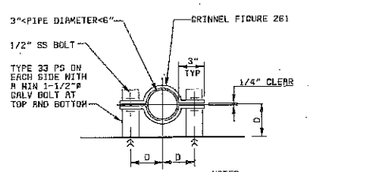


NOTES:

1. IF D IS LESS THAN 1'-6", PROVIDE ENCASEMENT CONTINUOUS TO SLAB. IF D IS GREATER THAN 1'-6", ENCASEMENT MAY BE SEPARATED FROM SLAB
2. PROVIDE A BELL JOINT AT END OF CONCRETE ENCASEMENT WHERE THE PIPELINE CHANGES FROM AN ENCASED PIPE TO A BURIED PIPE.

CONCRETE ENCASEMENT FOR PIPE UNDER SLABS (L)

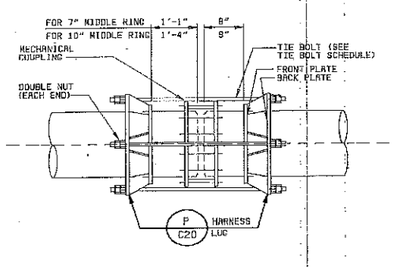
NO SCALE



NOTES:
1. D=DISTANCE FROM WALL SHOWN ON PLAN OR SECTION.

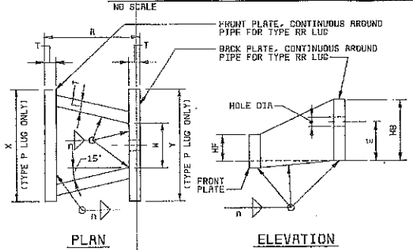
VERTICAL PIPE SUPPORT FOR 3" TO 6" PIPE (H)

NO SCALE



STEEL PIPE HARNESSED MECHANICAL COUPLING WITH TYPE RR LUGS (N)

NO SCALE



NOTES:
1. D = PIPE WALL THICKNESS
2. FOR HARNESS LUG TYPE(RR, THE GUSSET PLATES BETWEEN THE FRONT PLATE AND THE BACK PLATE MAY BE PERPENDICULAR TO THE FRONT AND BACK PLATES WITH A MINIMUM CLEAR DISTANCE BETWEEN EACH PAIR OF GUSSET PLATES OF DIMENSION H.

STEEL PIPE HARNESS LUG DETAIL (P) C20

NO SCALE

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DHG

DESIGNED JCO, WHA, AS, DHG
DETAILED DPK
CHECKED RED, JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES

CIVIL
MISCELLANEOUS DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8803882

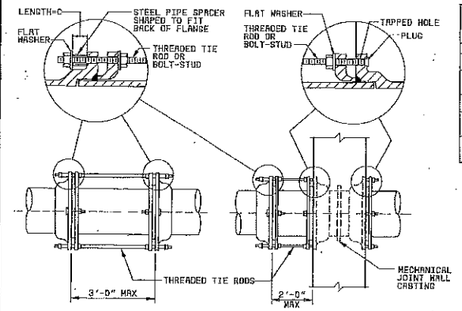
C20

SHEET 35 OF 73

CGS. DWG. NO: 62409-110-WRH-C-R0001114

G3009
F0000000

62409-110-WRH-C-Z0000005X 06/28/2000 03:03:55 ACD

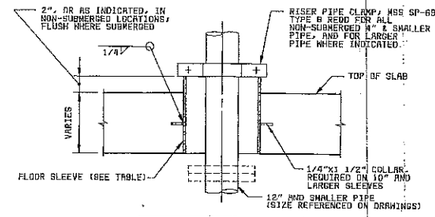


PIPE SIZE (IN)	MAXIMUM PRESSURE (PSI) (NOTE 1)	TIE RODS NO. OF RODS (NOTE 2)	TIE RODS DIA (IN)	PIPE SPACERS DIA (IN)	PIPE SPACERS LENGTH (IN)	PIPE SPACERS PIPE SCHEDULE
4	350 OR LESS	2	3/4	3/4	2 1/2	40
6	250 OR LESS	2	3/4	3/4	2 1/2	40
	350	4	3/4	3/4	2 1/2	40
8	150 OR LESS	2	3/4	3/4	2 1/2	40
	300	4	3/4	3/4	2 1/2	40
	350	6	3/4	3/4	2 1/2	40
10	200 OR LESS	2	3/4	1	2 1/2	80
	350	4	3/4	1	2 1/2	80
12	150 OR LESS	2	3/4	1	2 1/2	80
	300	4	3/4	1	2 1/2	80
	350	6	3/4	1	2 1/2	80
16	150 OR LESS	4	3/4	1	3 1/2	80
	250	6	3/4	1	3 1/2	80
	350	8	3/4	1	3 1/2	80

NOTES:

1. PRESSURE SHALL BE THE PRESSURE AT WHICH THE PIPE IS HYDROSTATICALLY TESTED, OR IF THERE IS NO HYDROSTATIC FIELD TEST, IT SHALL BE THE SPECIFIED SHOP TEST PRESSURE.
2. UNLESS OTHERWISE INDICATED, TIE RODS SHALL BE SPACED UNIFORMLY AROUND THE PIPE, BEGINNING WITH THE FIRST TWO AT THE HORIZONTAL CENTERLINE OF THE PIPE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON WALL CASTING AND TEE HEAD BOLTS IN OTHER LOCATIONS. ALL BOLT HOLES IN WALL CASTING SHALL BE TAPPED. WALL PIPES SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP (SIDE IN VERTICAL PIPING) CENTERLINE.

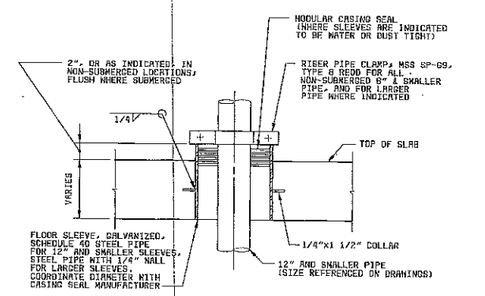
DIP MECHANICAL JOINTS WITH TIE RODS (A)
NO SCALE



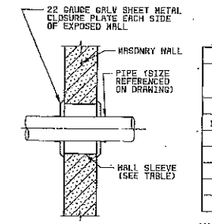
PIPE SIZE	SLEEVE SIZE (UNLESS INDICATED OTHERWISE)
1" & SMALLER	3" *
1 1/4" & 1 1/2"	3 1/2" *
2"	4" *
3"	8" *
4"	10" *
6"	12" *
8" TO 12"	FLANGE OD+2"**

* SCHEDULE 40 GALV STEEL PIPE
** STEEL PIPE, 1/4" WALL, GALVANIZED

FLOOR SLEEVE (B)
NO SCALE



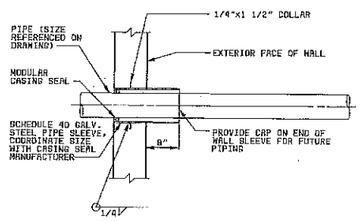
FLOOR SLEEVE WITH SEAL (C)
NO SCALE



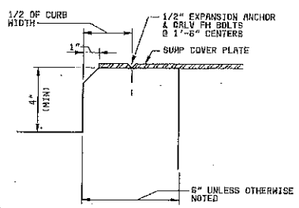
WALL SLEEVE TABLE	
PIPE SIZE	SLEEVE SIZE (UNLESS OTHERWISE INDICATED)
1"& SMALLER	3" (1)
1 1/4"&1 1/2"	3 1/2" (1)
2"	4" (1)
3"	6" (2)(4)
4"	8" (2)(4)
6"	8" (3)(4)
8"& LARGER	PIPE OD+2"± (3)(4)

(1) SCHEDULE 40 GALV STEEL PIPE
(2) SCHEDULE 20 GALV STEEL PIPE, MINIMUM
(3) 1/4" MINIMUM WALL THICKNESS
(4) IF PIPE IS FLANGED, USE SLEEVE LARGE ENOUGH FOR FLANGE TO PASS THROUGH

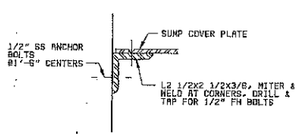
MASONRY WALL SLEEVE (D)
NO SCALE



EXTERIOR WALL SLEEVE FOR PLASTIC PIPE (E)
NO SCALE

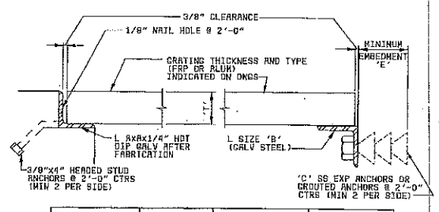


AT CURB OR FLOOR SLAB



AT WALL

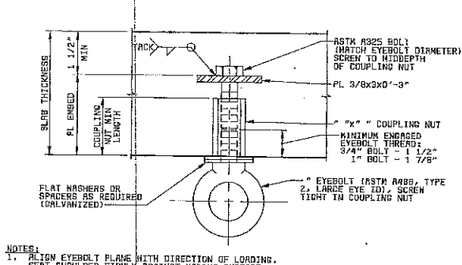
SUMP COVER PLATE SUPPORT (F)
NO SCALE



GRATING THICKNESS ('T')	L SIZE AxAx1/4	L SIZE 'B'	'C' EXP ANCHOR DIA	'C' EXP ANCHOR MIN 'E'
1	1 1/4x1 1/4	2 1/2x2 1/2x1/4	1/2"	4 1/8"
1 1/4	1 1/2x1 1/2	2 1/2x2 1/2x1/4	1/2"	4 1/8"
1 1/2	1 3/4x1 3/4	2 1/2x2 1/2x1/4	1/2"	4 1/8"
1 3/4	2x2	3x3x3/8	3/4"	6 3/8"
2	2 1/2x2 1/2*	3x3x3/8	3/4"	6 3/8"
2 1/4	2 1/2x2 1/2	3x3x3/8	3/4"	6 3/8"
2 1/2	2x3*	3x3x3/8	3/4"	6 3/8"

* TRIM AND BEVEL UPSTANDING LEG TO FIT

GRATING SUPPORT (G)
3" = 1'-0"
C1, C5, C7, C19



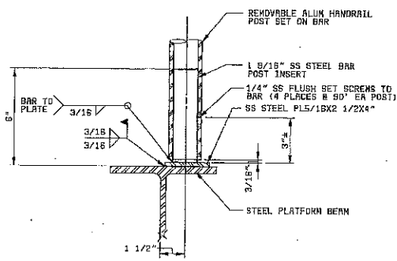
NOTES:

1. ALIGN EYEBOLT PLANE WITH DIRECTION OF LOADING. SEAT SHOULDER FIRMLY AGAINST MATING SURFACE; USE WASHERS OR SPACERS AS REQUIRED.
2. DO NOT PAINT OR GALVANIZE EYEBOLT.
3. TAG EYEBOLT AS INDICATED BELOW. TAG AND WIRE TO BE CORROSION RESISTANT METAL.

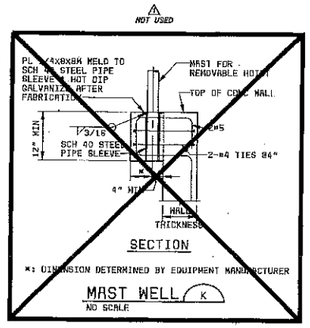
SAFE WORKING LOAD	XXXX LBS
SAFE WORKING LOAD AT 45 DEGREES (IN PLANE OF EYEBOLT)	XXXX LBS

SAFE VERTICAL WORKING LOAD (LBS)	SAFE WORKING LOAD AT 45° MAX (LBS)	MINIMUM SLAB THICKNESS (IN)	MINIMUM PLATE EMBED (IN)	COUPLING NUT SIZE DIA x MIN LENGTH (IN)	EYEBOLT SIZE (IN)
4000	1000	6	4	3/4 x 3 1/2	3/4
6000	1500	8	6	3/4 x 3 1/2	3/4
8000	2000	8	6	1 x 4	1

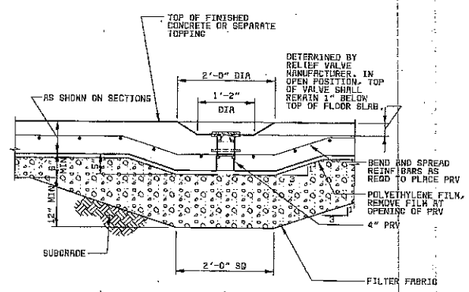
TYPICAL EYEBOLT (H)
NO SCALE



HANDRAIL POST CONNECTION (J)
3"=1'-0"



MAST WELL (K)
NO SCALE



PRESSURE RELIEF VALVE (L)
3/4" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	PAM	AS	DHB
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED MHA, JCD, AS, DHB
DETAILED DPK
CHECKED RED, JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
MISCELLANEOUS DETAILS

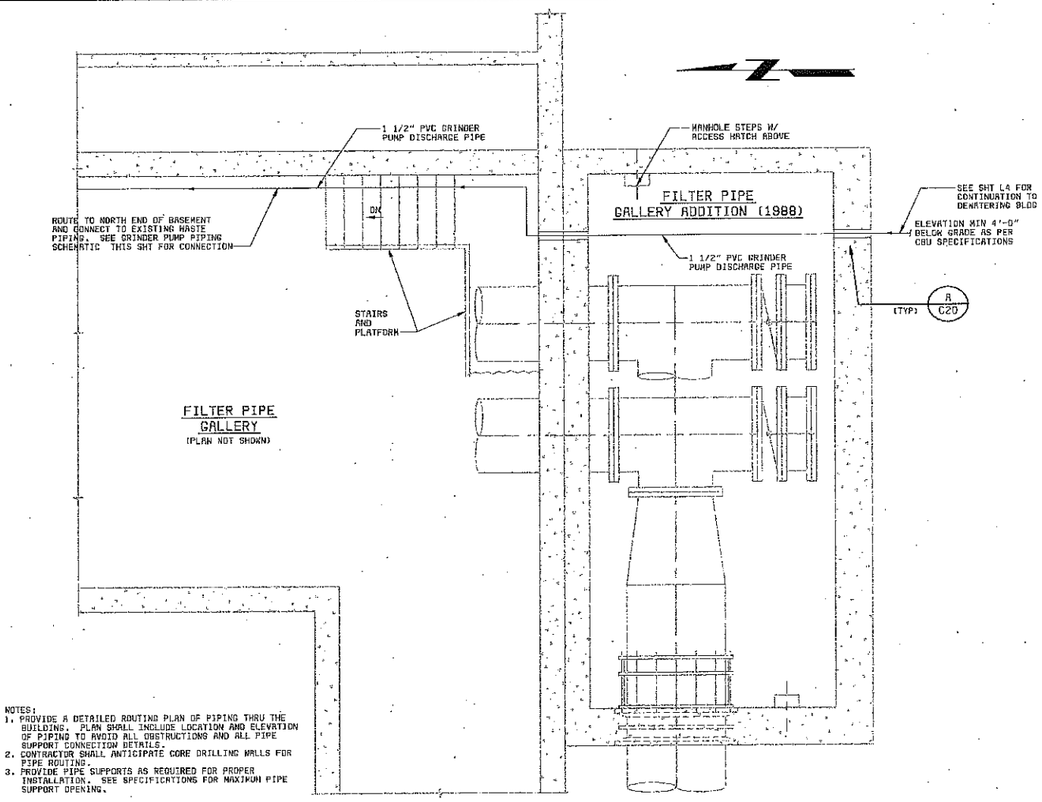
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWDER ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0053082

C21

SHEET 36 OF 73

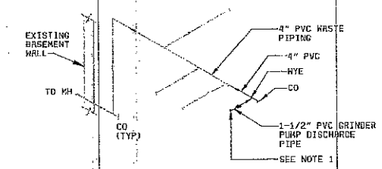
62409-110-MRH-C-Z0000005Y 06/28/2000 02:25:27 ACD

CCD. DWG. NO: 62409-110-KRH-C-AD001116



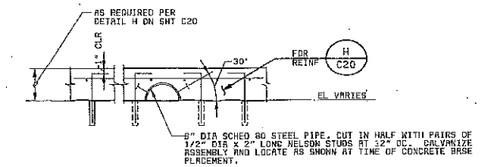
NOTES:
1. PROVIDE A DETAILED ROUTING PLAN OF PIPING THRU THE BUILDING. PLAN SHALL INCLUDE LOCATION AND ELEVATION OF PIPING TO AVOID ALL OBSTRUCTIONS AND ALL PIPE SUPPORT CONNECTION DETAILS.
2. CONTRACTOR SHALL ANTICIPATE CORE DRILLING WALLS FOR PIPE ROUTING.
3. PROVIDE PIPE SUPPORTS AS REQUIRED FOR PROPER INSTALLATION. SEE SPECIFICATIONS FOR MAXIMUM PIPE SUPPORT OPENING.

GRINDER PUMP PIPING DETAIL
INSIDE THE FILTER BUILDING
3/8" = 1'-0"

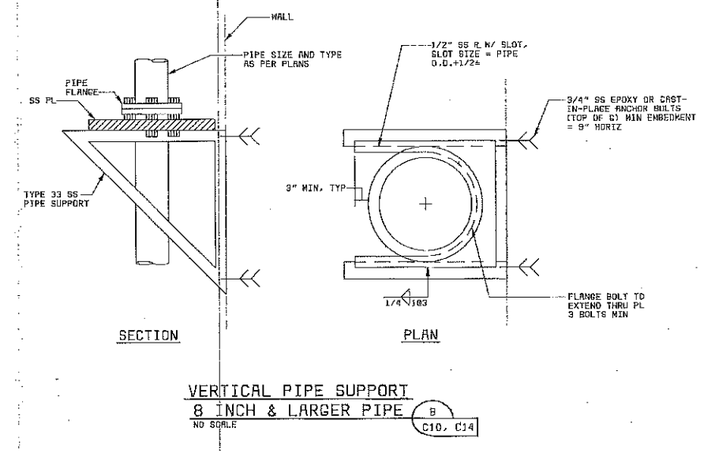


NOTES:
1. ROUTE GRINDER PUMP DISCHARGE PIPE THRU THE PIPE GALLERY TO THE SOUTH END OF THE FILTER BUILDING ALONG THE EAST WALL A MINIMUM OF 7'-6" AFF.

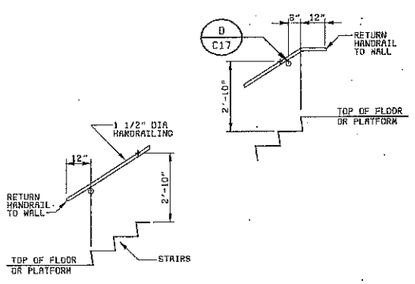
GRINDER PUMP PIPING SCHEMATIC
NO SCALE



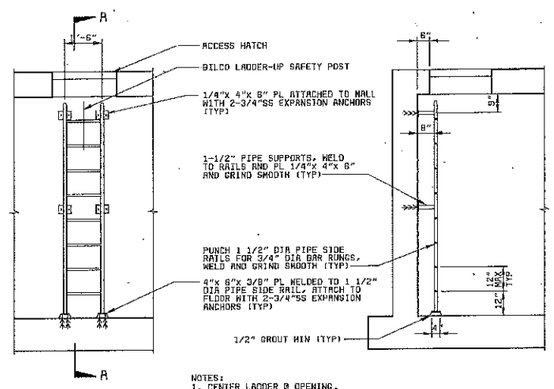
DETAIL A C1
1/2" = 1'-0"



VERTICAL PIPE SUPPORT
8 INCH & LARGER PIPE B C10, C14
NO SCALE



WALL MOUNTED HANDRAIL ELEV C
3/8" = 1'-0"



NOTES:
1. CENTER LADDER @ OPENING.
2. ACCESS OPENING WILL BE DETERMINED BY SIZE OF BILCO HATCH.

LADDER DETAIL D C11,C13,C19
3/8" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	4	FAM	AS	DHB
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED DHG, AS, MHR, JCD
DETAILED DPK, FAM
CHECKED RED, JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
MISCELLANEOUS
PLAN AND DETAILS

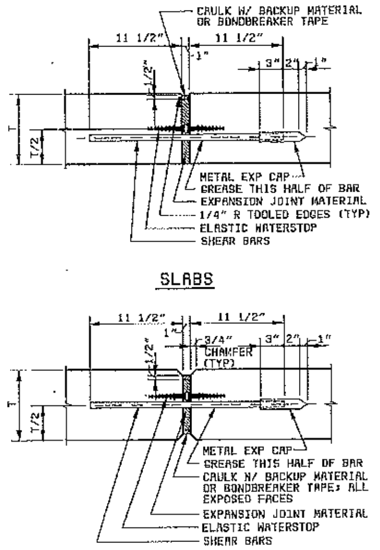
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWDER ON 09-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8800692

C22

SHEET 37 OF 73

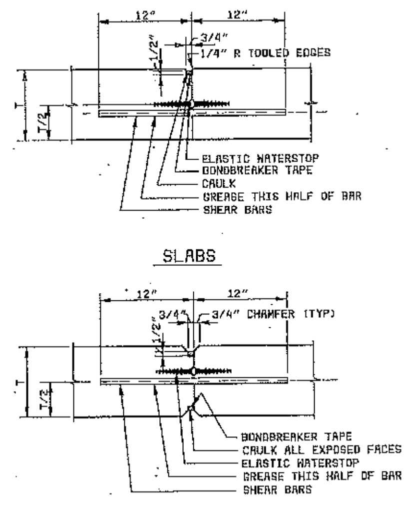
CCG. DWG. NO: 62409-110-WRH-C-R0001118

62409-110-WRH-C-Z00000C5Z 06/26/2000 01:53:13 RCD



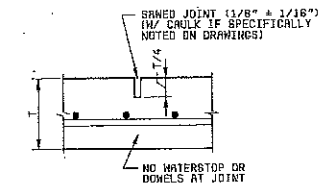
EXPANSION JOINTS

NOTE:
"EJ W/WS" – WITH ELASTIC WATERSTOP
"EJ" – WITHOUT ELASTIC WATERSTOP



CONTRACTION JOINTS

NOTE:
"CJ W/WS" – WITH ELASTIC WATERSTOP
"CJ" – WITHOUT ELASTIC WATERSTOP



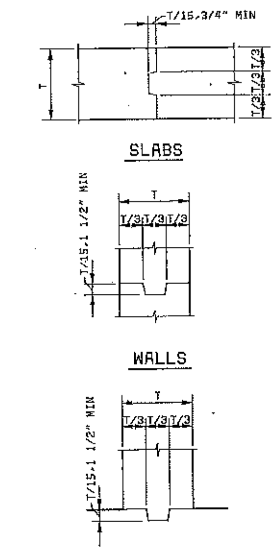
NOTE:
IF SINGLE LAYER REINFORCEMENT, EVERY OTHER BAR IS DISCONTINUOUS AT JOINT. IF 2 LAYER REINFORCEMENT, TOP LAYER IS COMPLETELY DISCONTINUOUS AT JOINT.

SAWED CONTRACTION JOINT
SLAB-ON-GRADE

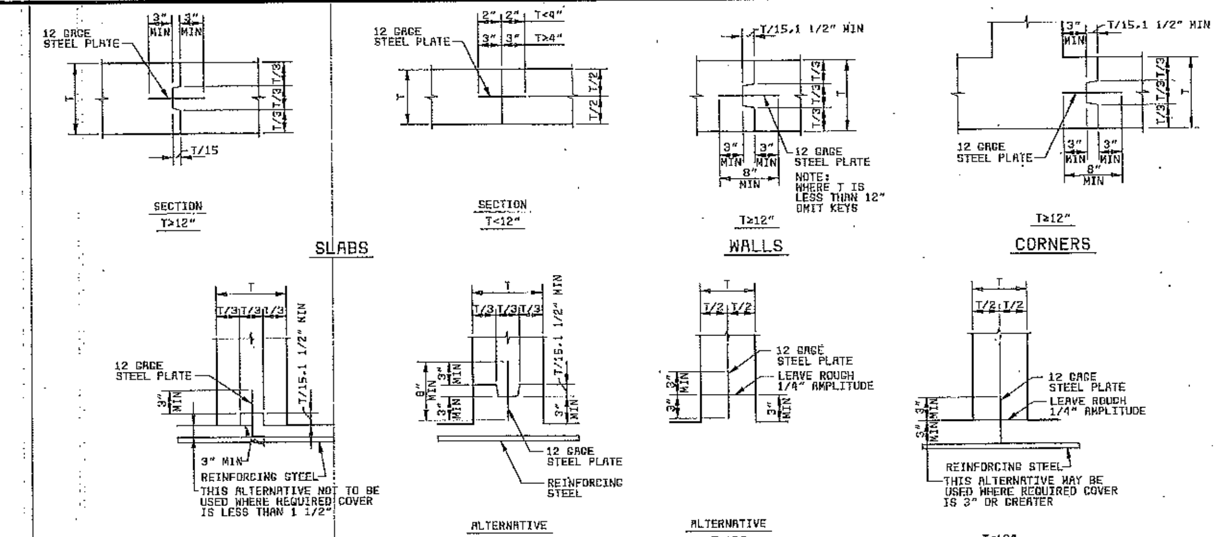
NOTES:
1. TYPICAL CONTROL JOINT NOTES 1 THRU 3 NOT APPLICABLE
2. "BJ" – NO WATERSTOP
3. JOINT FORMED WITH TOOL OR INSERT STRIP MAY BE SUBSTITUTED FOR SAWED TYPE ONLY WITH PRIOR ACCEPTANCE BY THE ENGINEER.

TYPICAL CONTROL JOINTS

NOTES:
1. PROVIDE 3/4" SHEAR BARS @ 1'-6" CTRS ACROSS JOINT UNLESS NOTED OTHERWISE
2. REINFORCING STEEL SHALL NOT BE EXTENDED ACROSS JOINT UNLESS NOTED OTHERWISE
3. SHEAR BARS SHALL BE SMOOTH, FREE FROM RUST OR SCALE, AND GREASED TO PREVENT BOND (ONE HALF OF BAR ONLY)



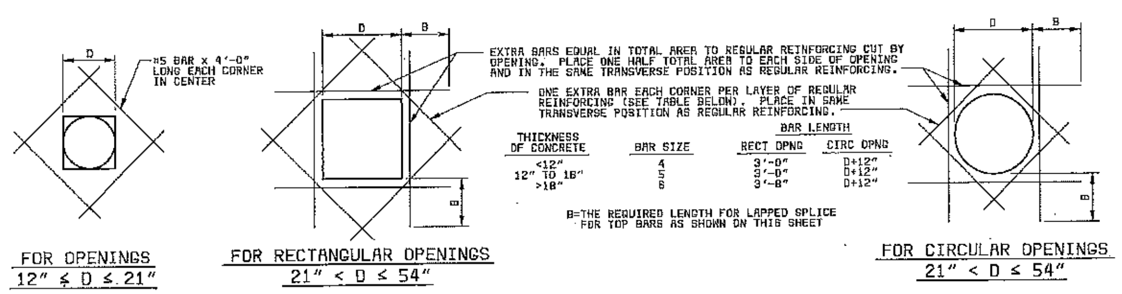
JOINTS WITHOUT WATERSTOPS



JOINTS WITH WATERSTOPS

TYPICAL CONSTRUCTION JOINTS

NOTE:
1. REINFORCING STEEL IS CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS
2. "CSJ W/WS" – WITH WATERSTOP
3. "CSJ" – WITHOUT WATERSTOP



EXTRA BARS EQUAL IN TOTAL AREA TO REGULAR REINFORCING CUT BY OPENING. PLACE ONE HALF TOTAL AREA TO EACH SIDE OF OPENING AND IN THE SAME TRANSVERSE POSITION AS REGULAR REINFORCING.

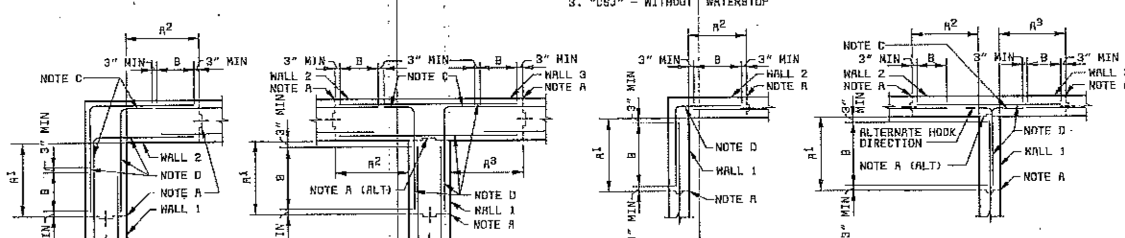
ONE EXTRA BAR EACH CORNER PER LAYER OF REGULAR REINFORCING (SEE TABLE BELOW). PLACE IN SAME TRANSVERSE POSITION AS REGULAR REINFORCING.

THICKNESS OF CONCRETE	BAR SIZE	BAR LENGTH RECT OPNG	BAR LENGTH CIRC OPNG
<12"	4	3'-0"	D+12"
12" TO 18"	5	3'-0"	D+12"
>18"	6	3'-8"	D+12"

B=THE REQUIRED LENGTH FOR LAPPED SPLICE FOR TOP BARS AS SHOWN ON THIS SHEET

TYPICAL EXTRA REINFORCING AT OPENINGS 12" TO ≤ 54"

(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)



A = VERTICAL CONSTRUCTION JOINT NEAREST TO WALL CORNER.

A(ALT) = ALTERNATE VERTICAL CONSTRUCTION JOINT NEAREST TO WALL CORNER IN T WALL JOINT WHICH DOES NOT REQUIRE WATERSTOP.

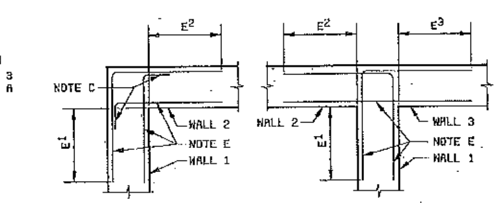
A^X = DISTANCE FROM INSIDE CORNER FACE TO NEAREST VERTICAL CONSTRUCTION JOINT IN SIMILARLY NUMBERED WALL. A^X SHALL NOT BE LESS THAN DIMENSIONS INDICATED BY THESE DETAILS; NOR GREATER THAN INDICATED ON PLAN DRAWINGS; BUT IN ANY CASE SHALL NOT EXCEED 30 FEET IN LIQUID CONTAINMENT STRUCTURES OR 40 FEET IN OTHER STRUCTURES. IN T WALL JOINTS WHICH DO NOT REQUIRE WATERSTOP, A^1 MAY BE ZERO.

B = OPTIONAL SPLICE LOCATION UNLESS SPECIFICALLY NOTED ON PLAN DRAWINGS. SPLICE LENGTH SHALL NOT BE LESS THAN THAT REQUIRED FOR TOP BARS AS SHOWN IN TABLE ON THIS SHEET. USE SPLICE LENGTH FOR THE SMALLER OF THE TWO BARS BEING SPLICED.

C = STANDARD HOOK

D = TYPICAL CORNER REINFORCEMENT. SIZE SHALL MATCH LARGEST ADJACENT WALL HORIZONTAL REINFORCEMENT; SPACING SHALL MATCH MINIMUM ADJACENT WALL HORIZONTAL REINFORCEMENT SPACING.

MAIN REINFORCEMENT FOR ALL STRUCTURES



E = WHERE SPECIFICALLY NOTED ON THE DRAWINGS, ADDITIONAL CORNER REINFORCEMENT SHALL BE PLACED IN BOTH FACES OF THE INDICATED CORNER OVER THE FULL HEIGHT. ADDITIONAL CORNER REINFORCEMENT SHALL BE OF THE SAME SIZE AND SPACING AS THE MAIN CORNER REINFORCEMENT. PLACE ADDITIONAL REINFORCEMENT ALTERNATELY WITH, AND EQUAL DISTANCE BETWEEN, MAIN CORNER REINFORCEMENT.

E^X = DISTANCE FROM INSIDE CORNER FACE TO TERMINATION OF ADDITIONAL CORNER REINFORCEMENT IN SIMILARLY NUMBERED WALL. E^X SHALL NOT BE LESS THAN 0.20 THE CLEAR SPAN DISTANCE MEASURED HORIZONTALLY BETWEEN THIS CORNER AND THE NEXT OR 0.40 THE CLEAR SPAN DISTANCE OR CANTILEVERED DISTANCE MEASURED VERTICALLY, WHICHEVER IS SMALLER, BUT NOT LESS THAN 3'-0".

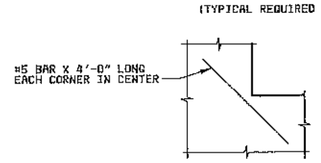
CONTRACTORS OPTION:
E BAR TAILS MAY BE SPLICED USING LAPPED SPLICE LENGTHS FOR TOP BARS. SPLICES SHALL NOT BE LOCATED IN THE CORNER AREA COMMON TO BOTH WALLS AND SHALL CLEAR HOOK ENDS BY 3" MIN.

ADDITIONAL REINFORCEMENT WHERE SPECIFICALLY NOTED ON THE DRAWINGS

DETAIL (A)
NO SCALE

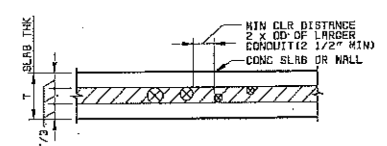
TYPICAL HORIZONTAL CORNER REINFORCING DETAILS

NOTES:
1. VERTICAL REINFORCING NOT SHOWN
2. THESE DETAILS SHALL BE APPLICABLE TO ALL WALL CORNERS UNLESS NOTED OTHERWISE ON THE DRAWINGS.



TYPICAL EXTRA REINFORCING AT ISOLATED RE-ENTRANT CORNERS

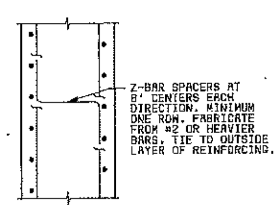
(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)



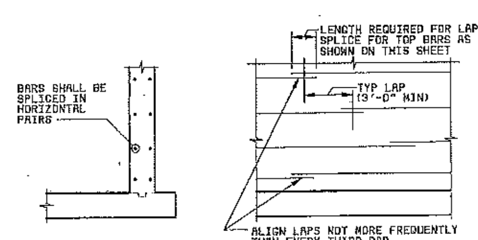
NOTES:
1. PLACE CONDUIT ONLY IN SHADED AREA
2. FOR CONDUIT REQUIREMENTS SEE THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.

CONDUIT PLACING DETAIL

NO SCALE



SPACERS FOR WALL REINFORCEMENT



TYPICAL RING WALL REINFORCING SPLICE DETAIL

SPLICE & DEVELOPMENT LENGTHS

(f'_c=4000 PSI)
(UNLESS NOTED OTHERWISE ON THE DRAWINGS)

BAR SIZE	BEAMS AND COLUMNS: LENGTH OF LAPPED SPLICES FOR REINF (INCHES) *TOP BARS	OTHERS	BEAMS AND COLUMNS: LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCEMENT (INCHES) *TOP BARS	OTHERS	HOOKED BARS	WALLS, SLABS AND FOOTINGS: LENGTH OF LAPPED SPLICES FOR REINF (INCHES) *TOP BARS	OTHERS	WALLS, SLABS AND FOOTINGS: LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCEMENT (INCHES) *TOP BARS	OTHERS	HOOKED BARS	BAR SIZE
3	19	16	14	12	6	19	16	14	12	6	3
4	24	19	19	15	7	24	19	19	15	7	4
5	31	24	24	18	9	31	24	24	18	9	5
6	40	31	28	22	10	36	28	28	22	10	6
7	54	42	33	25	12	54	42	42	32	12	7
8	71	55	39	30	14	102	78	55	42	14	8
9	90	70	50	38	15	129	99	69	53	15	9
10	115	88	63	49	17	163	126	88	68	17	10
11	141	109	77	60	19	201	154	154	119	19	11
14	---	---	105	81	33	---	---	210	162	33	14
18	---	---	155	119	43	---	---	309	238	43	18

* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS.

IN WALLS, SLABS AND FOOTINGS; LAPPED SPLICE LENGTH FOR BARS SIZE 8 THROUGH 11 AND STRAIGHT (NON-HOOKED) END ANCHORAGE DEVELOPMENT LENGTH FOR BAR SIZE 11 (IN TABLE ABOVE) PLACED WITH MORE THAN 2 BAR DIAMETER CLEAR SPACING MAY BE MULTIPLIED BY A FACTOR OF 0.7.

IN BEAMS, COLUMNS, WALLS, SLABS AND FOOTINGS; LAPPED SPLICE LENGTH AND STRAIGHT (NON-HOOKED) END ANCHORAGE DEVELOPMENT LENGTH FOR BARS SIZE 7 THROUGH 11 (IN THE TABLE ABOVE) PLACED WITH MORE THAN 5 BAR DIAMETER CLEAR SPACING MAY BE MULTIPLIED BY A FACTOR OF 0.8. THE MULTIPLICATION FACTORS OF 0.7 AND 0.8 MAY BE COMBINED ONLY FOR BARS COMMON TO THIS NOTE AND THE NOTE ABOVE.

LAPPED SPLICES SHALL NOT BE MADE AT POINTS OF MAXIMUM STRESS UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR AS DETERMINED BY THE ENGINEER.

CONCRETE COVER FOR REINFORCEMENT

LOCATION	MINIMUM COVER
UNFORMED SURFACES ADJACENT TO EXCAVATION	3"
FORMED OR TOP SURFACES EXPOSED TO WEATHER OR SATURATED AIR, SUBMERGED OR IN CONTACT WITH EARTH, INCLUDING STIRRUPS, TIES OR SPIRALS	2"
OTHER LOCATIONS	
BARS IN BEAMS OR GIRDERS, INCLUDING STIRRUPS AND COLUMN SPIRALS OR TIES	1 1/2"
SLABS, WALLS AND JOISTS #6 AND LARGER	1 1/2"
#5 AND SMALLER	3/4"

NOTE:
TOLERANCES FOR CONCRETE COVER AND THE FABRICATION AND PLACING OF REINFORCEMENT SHALL CONFORM TO ACI 117.

GENERAL NOTE:
DETAILS ON THIS SHEET APPLY TO ALL DRAWINGS UNLESS OTHERWISE NOTED

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	△	FAW	AS	DHG

DESIGNED: AS
DETAILED: DPK
CHECKED: RED, JEW
APPROVED:
DATE:

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

CIVIL
STANDARD CONCRETE DETAILS

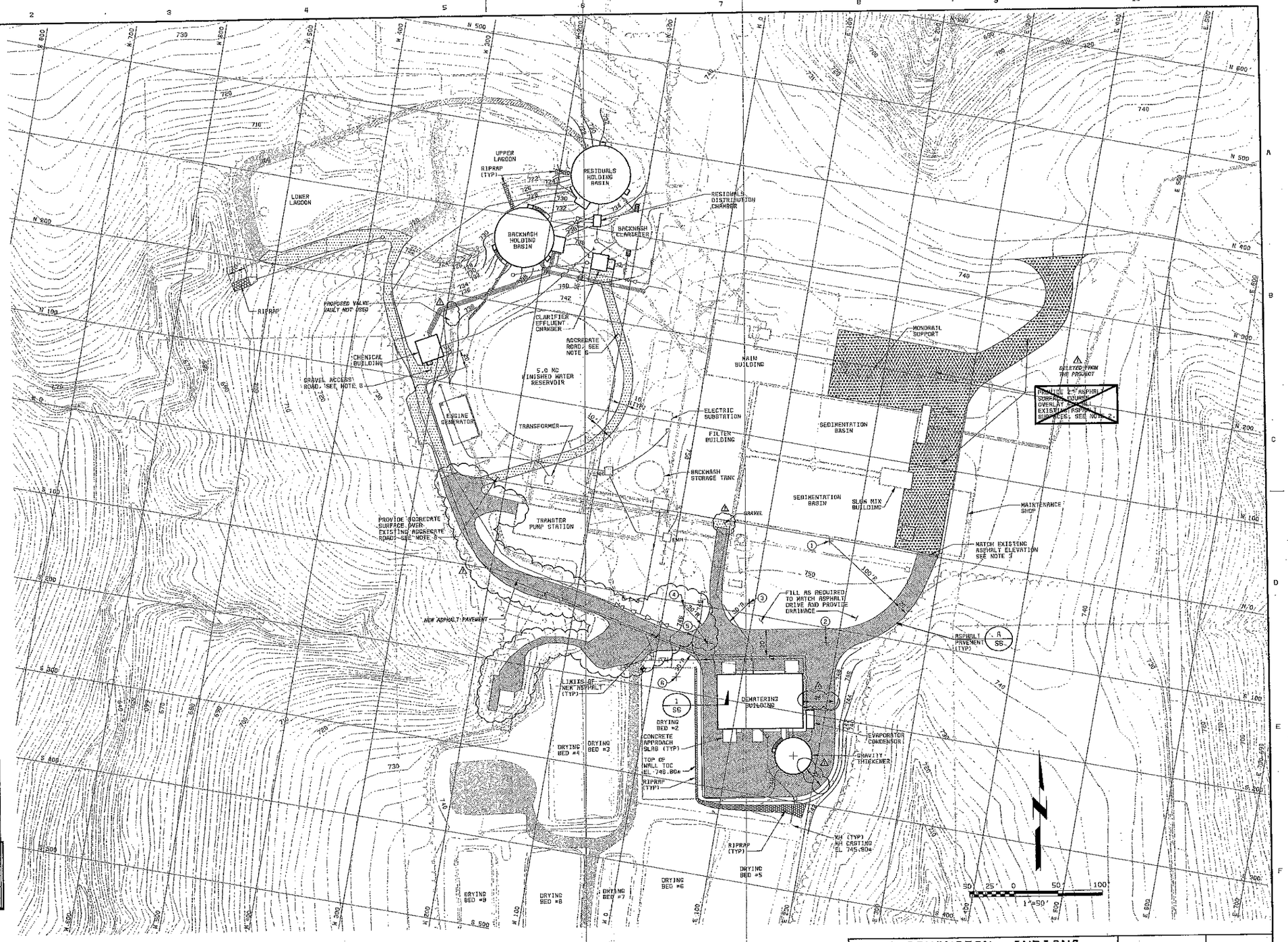
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 8803882

C23
SHEET 38 OF 73

CCG. DWG. NO: 62409-110-WRH-C-R0000949

NOTES:

1. AGGREGATE SURFACING SHALL BE PROVIDED THE FULL WIDTH OF THE EXISTING AGGREGATE DRIVES. SEE SPECIFICATIONS FOR CONSTRUCTION DETAILS.
2. SEE SHEET L6 FOR ASPHALT REMOVAL.
3. *PROVIDE SMOOTH TRANSITION BETWEEN NEW ASPHALT PAVEMENT AND EXISTING ASPHALT PAVEMENT.* △1
4. SLOPE AGGREGATE AND ASPHALT SURFACES TO DRAIN.
5. SEE SITE PLAN AND BUILDING DRAWINGS FOR CONCRETE APPROACH SLAB, SIDEWALK AND MOWING STRIPS.
6. SLOPE ROAD TO DRAIN. EDGE OF AGGREGATE SURFACING TO MATCH ADJACENT GRADE. SEE SPECIFICATIONS FOR CONSTRUCTION DETAILS.



ID NO	DESCRIPTION	COORDINATE	ELEVATION
1	RADIUS CENTER	S 2.88 E 171.34	–
2	INTERSECTION	S 115.98 E 187.20	748.00
3	RADIUS CENTER	S 87.80 E 84.01	–
4	RADIUS CENTER	S 103.40 E 21.19	–
5	INTERSECTION	S 140.57 E 55.51	748.20
6	RADIUS CENTER	S 183.64 E 28.94	–
~~7~~	~~RADIUS CENTER~~	~~S 146.08 E 242.71~~	–
~~8~~	~~RADIUS CENTER~~	~~S 145.12 E 139.73~~	–
~~9~~	~~RADIUS CENTER~~	~~S 153.62 E 95.06~~	–
~~10~~	~~RADIUS CENTER~~	~~S 248.95 E 172.80~~	–
~~11~~	~~RADIUS CENTER~~	~~S 159.82 E 170.85~~	–
~~12~~	~~RADIUS CENTER~~	~~S 248.93 E 148.49~~	–

NOT USED △1

NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUTION RECORDS	△1 FAM	AS DHG
DATE	REVISIONS AND RECORD OF ISSUE		

DESIGNED DHG
DETAILED DPK
CHECKED RED, JEH
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES
SITE WORK SITE GRADING & ROADWAY PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6800982

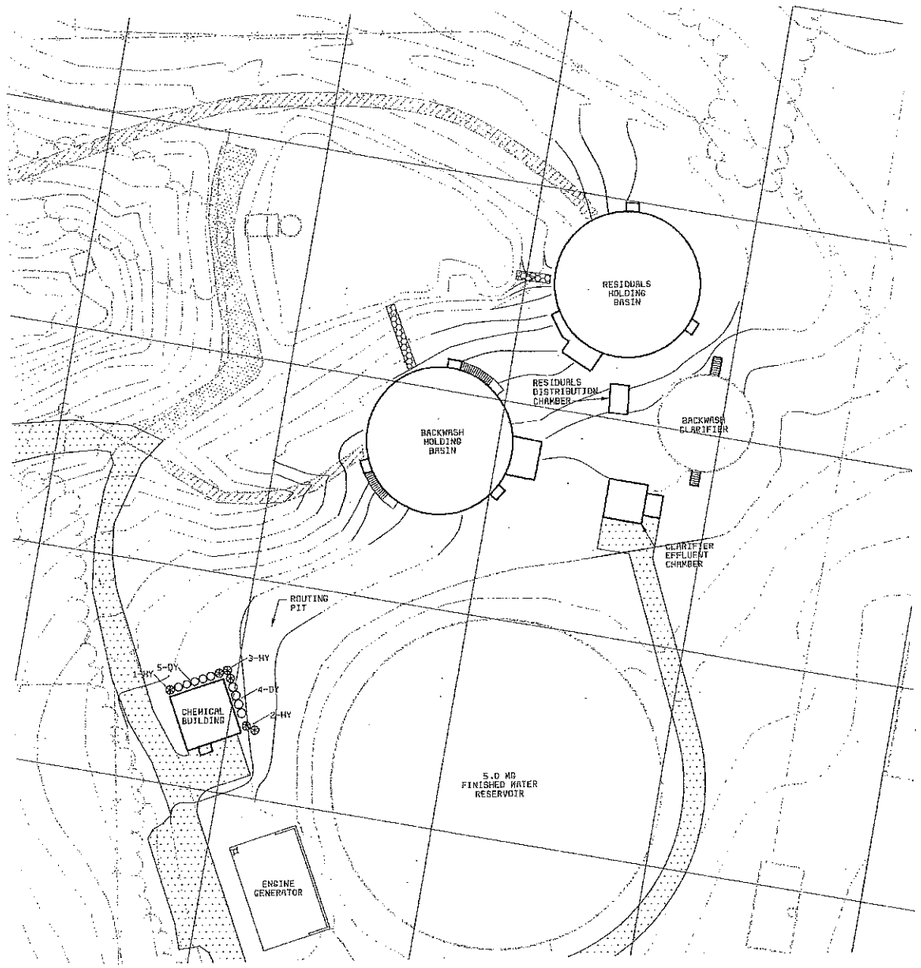
S1

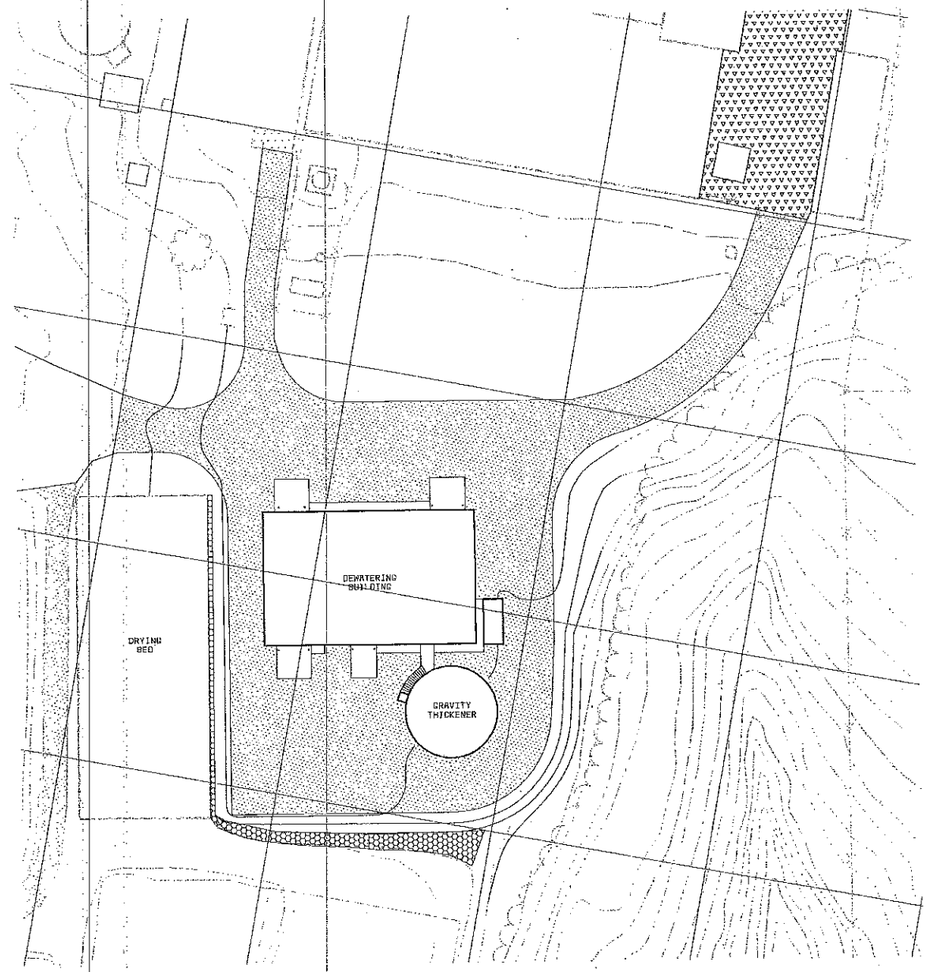
SHEET 39 OF 73

CCG. DWG. NO: 62409-110-WRH-C-A0001581

62409-110-WRH-C-A0001581

62409-110-WRH-C-70D000C60 06/27/2000 23:11:19 ACD





PLANT LIST

CODE	QUANT	NAME	SIZE
DY	29	DENSIFORMIS YEW	3' H
HY	8	HICKSI YEW	5' H

30' 20' 10' 0 30' 60'
1"=30'

NOTES:

1. LANDSCAPE PLAN FOR LANDSCAPING REQUIREMENTS ONLY.
2. FINAL LOCATION OF PLANTS SHALL BE ACCEPTABLE TO OWNER AND ENGINEER. COORDINATE FINAL LOCATION IN THE FIELD.
3. PLANT APPROXIMATELY 3' APART.
4. PLANTING INSTRUCTIONS PER SUPPLIER.
5. MAINTAIN MINIMUM 5' CLEARANCE AROUND ALL OUTDOOR MECHANICAL EQUIPMENT.

30' 20' 10' 0 30' 60'
1"=30'

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAW	AS	DWG

DESIGNED JCD
DETAILED DPK
CHECKED RED, JEN, KJK
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

SITE WORK
LANDSCAPING PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOWNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. EHE 8803882

S2

SHEET 40 OF 73

CCG. DWG. NO: 62409-110-WRH-C-R0001566

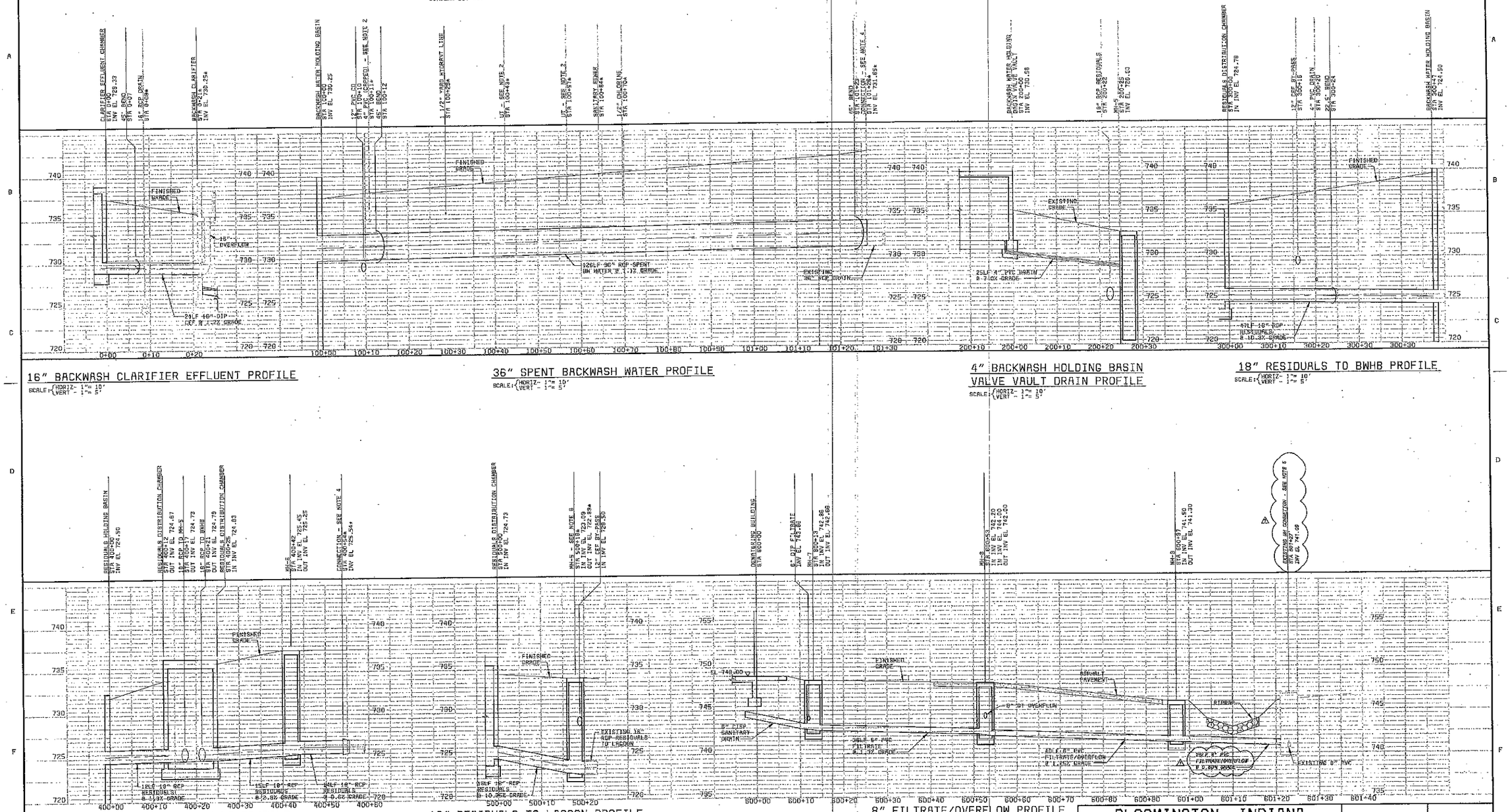
62409-110-WRH-C-Z00000067 08/27/2000 23:14:50 ACD

62409-110-WRH-C-R0000304

62409 F000000

NOTES:

1. STATION NUMBERS FOR SOME MANHOLES AND STRUCTURES MAY DIFFER BETWEEN PROFILES.
2. CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF CAPPED OR ABANDONED PIPING AND UTILITIES. CONTRACTOR SHALL COORDINATE DEMOLITION OR RELOCATION ACCEPTABLE TO ENGINEER.
3. TOP OF MANHOLE ELEVATIONS TO BE COORDINATED WITH SITE GRADING OR ASPHALT ELEVATIONS.
4. CONTRACTOR TO PROVIDE NECESSARY TRANSITION PIECES BETWEEN EXISTING AND NEW RCP PIPING.
5. CORE DRILL MANHOLE AND PROVIDE BOOT CONNECTION PER CBU CONSTRUCTION SPECIFICATIONS. SEE NOTES 6 AND 7.
6. COORDINATE FINAL INVERT ELEVATION IN THE FIELD.
7. FORM TABLE AND TROUGH FOR NEW SEWER LINE TO PROVIDE A SMOOTH TRANSITION OF FLOW TOWARDS DOWNSTREAM MANHOLE. SEE CONSTRUCTION SPECIFICATIONS FOR SIMILAR DETAILS.



16" BACKWASH CLARIFIER EFFLUENT PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

36" SPENT BACKWASH WATER PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

4" BACKWASH HOLDING BASIN VALVE VAULT DRAIN PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

18" RESIDUALS TO BWHB PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

18" RESIDUALS PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

18" RESIDUALS TO LAGOON PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

8" FILTRATE/OVERFLOW PROFILE
SCALE: HORIZ- 1"= 10' VERT - 1"= 5'

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	FAV	AS	DHO

DESIGNED MNR, JCD, DPK
DETAILED DPK
CHECKED RED, JEW
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT RESIDUALS MANAGEMENT FACILITIES

SITE WORK
PIPING PROFILES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONNGREN ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0803882

S3

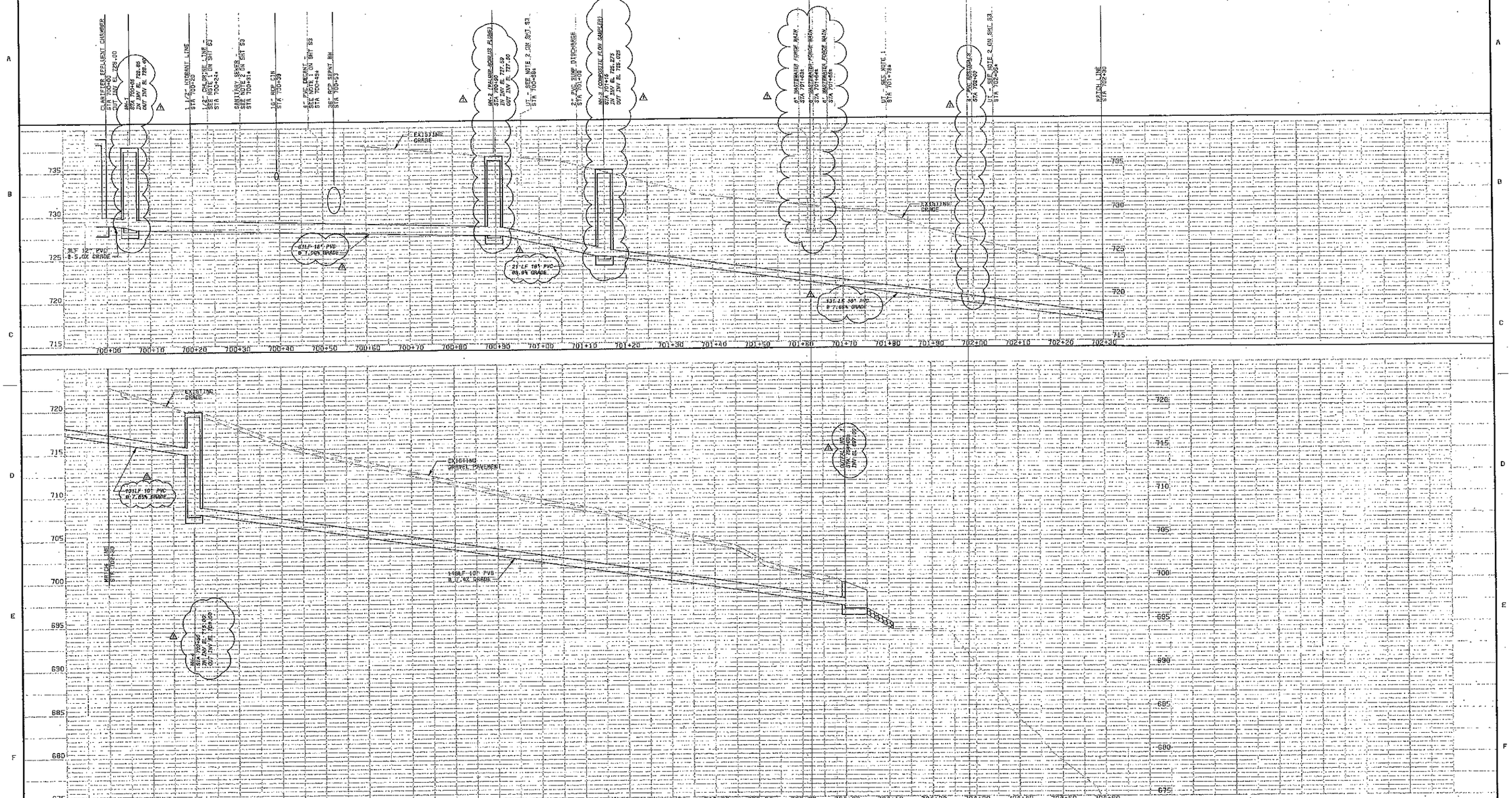
SHEET 41 OF 73

CCS. CWD. NO: 62409-110-WRH-C-N0000005J

62409-110-WRH-C-N0000005J 06/28/2000 00:58:18 RCD

NOTE:

1. FINISHED GRADE TO MATCH EXISTING.



BACKWASH CLARIFIER DISCHARGE PROFILE

SCALE: HORIZ- 1"= 10' VERT- 1"= 5'

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DMB
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED NHR, JCD, DPK
DETAILED DPK
CHECKED RED, JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

SITE WORK
PIPING PROFILES

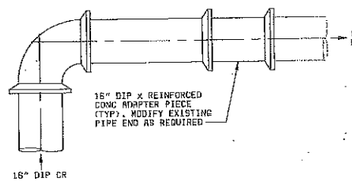
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LOUNDES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 6603882

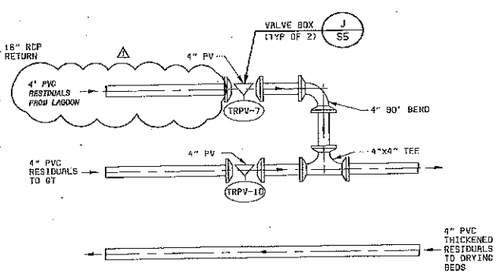
S4

SHEET 42 OF 73

CCG. DWG. NO: 62409-11D-WRH-C-N0000005L

62409-11D-WRH-C-N0000005L Date/Time

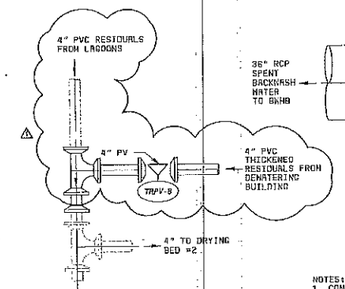




NOTES:
1. CONTRACTOR TO INSTALL RESTRAINED JOINT PIPING AS INDICATED ON SG.
2. FIELD VERIFY CONCRETE PIPING LOCATION, CONDITION AND ELEVATION PRIOR TO PREPARATION OF SHOP DRAWINGS FOR PIPING MODIFICATIONS.
3. PROVIDE THE NECESSARY FITTINGS AND PIPING REQUIRED FOR A COMPLETE INSTALLATION OF PIPING SYSTEM.

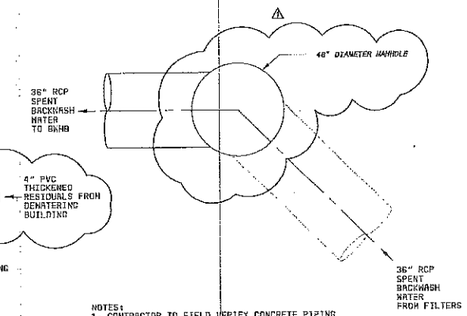
CONNECTION NO. 1 (B / L5)
1/2" = 1'-0"

CONNECTION NO. 2 (B / L4)
1/2" = 1'-0"



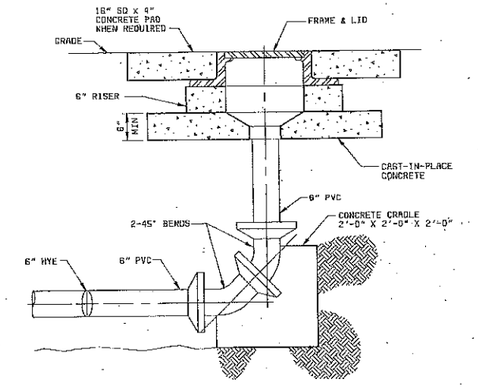
NOTES:
1. CONTRACTOR TO REMOVE 4" TEE TO EXISTING 4" PVC LINE TO DRYING BED #1. SEE SHT L6.
2. FIELD VERIFY LOCATION, CONDITION, AND ELEVATION PRIOR TO PREPARATION OF SHOP DRAWINGS.
3. PROVIDE NECESSARY FITTINGS REQUIRED FOR CONNECTION WITH EXISTING 4" SOLIDS.

CONNECTION NO. 3 (C / L4)
1/2" = 1'-0"

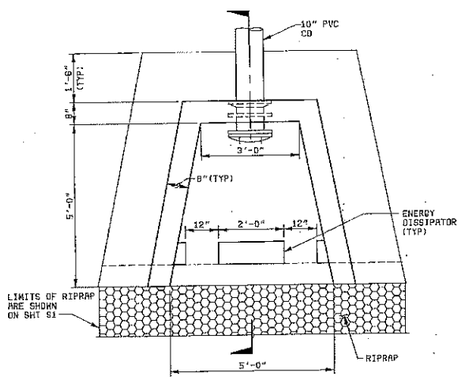


NOTES:
1. CONTRACTOR TO FIELD VERIFY CONCRETE PIPING LOCATION, CONDITION AND ELEVATION PRIOR TO PREPARATION OF SHOP DRAWINGS FOR PIPING MODIFICATIONS.
2. PROVIDE THE NECESSARY FITTINGS AND PIPING REQUIRED FOR A COMPLETE INSTALLATION OF PIPING SYSTEM.

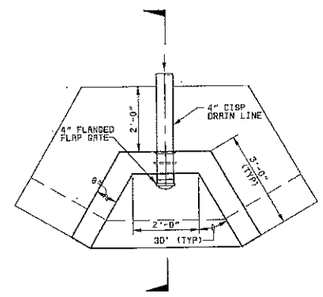
CONNECTION NO. 4 (D / L5)
3/8" = 1'-0"



CLEAN-OUT DETAIL (E)
NO SCALE



PLAN



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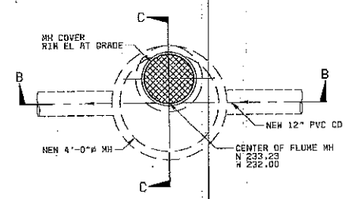

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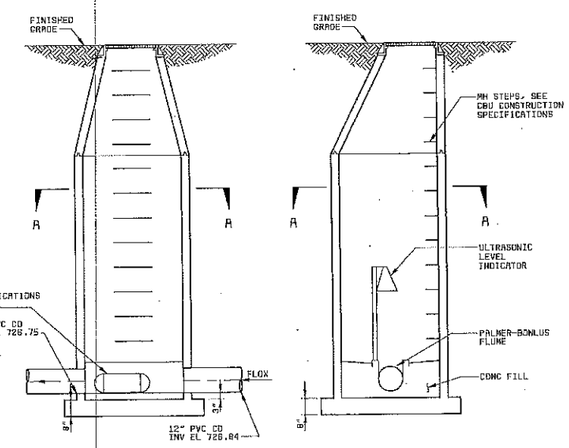
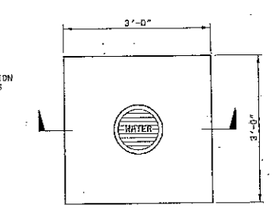
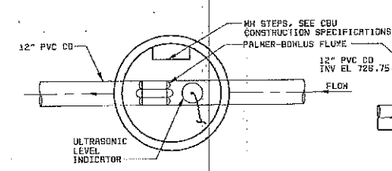




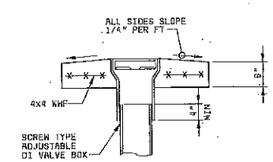
PLAN



SECTION A-A

SECTION B-B

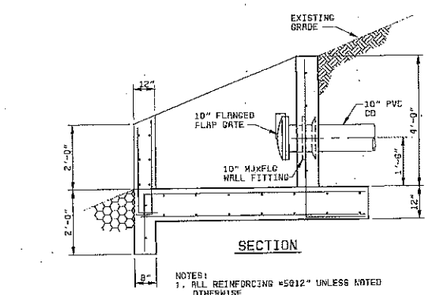
SECTION C-C



SECTION

VALVE BOX AND PAD (J)
3/4" = 1'-0"

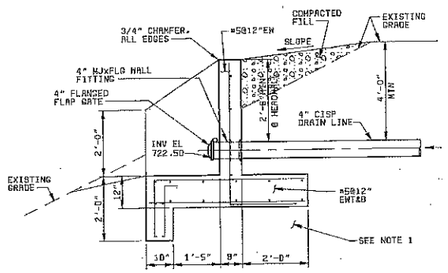
MH-2 PALMER-BOWLUS FLUME (H / L5)
3/8" = 1'-0"



SECTION

NOTES:
1. ALL REINFORCING #5@12" UNLESS NOTED OTHERWISE
2. GRADE AROUND HEADWALL AS REQUIRED TO ALLOW PROPER DRAINAGE.
3. REMOVE UNSUITABLE MATERIAL AS DETERMINED BY THE ENGINEER AND REPLACE W/ COMPACTED FILL.

OUTFALL NO. 1 (F / L4)
1/2" = 1'-0"



SECTION

NOTES:
1. REMOVE UNSUITABLE MATERIAL AS DETERMINED BY THE ENGINEER AND REPLACE W/ COMPACTED FILL.
2. GRADE AROUND HEADWALL AS REQUIRED TO ALLOW PROPER DRAINAGE.

HEADWALL DETAIL (G / L5)
3/8" = 1'-0"

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAN	AS	DNG

DESIGNED MHR, JCD, AS, DHG
DETAILED DPK, FAN
CHECKED RED, JEW
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

SITE WORK
MISCELLANEOUS SITE DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LONGDEN ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. ENE 0503882

S5
SHEET 43 OF 73

CCG. DWG. NO: 62409-110-WRH-C-A0001082

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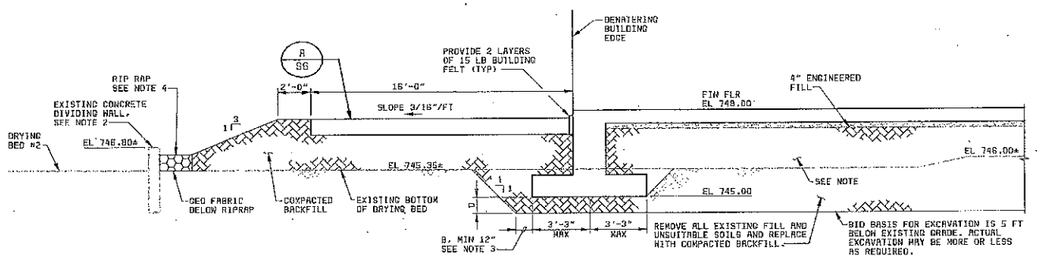
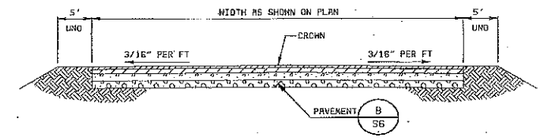
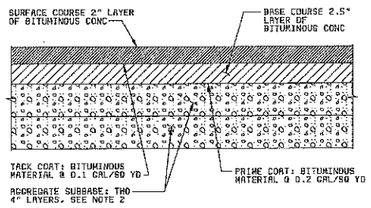


SECTION 1 S1
1/4" = 1'-0"

NOTES:
1. THE BOTTOM SURFACE OF THE DRYING BED SHALL BE CLEANED AND ANY SOFT AND YIELDING AREAS SHALL BE REMOVED. THE EAST, NORTH AND SOUTH SLOPES OF THE DRYING BED SHALL BE EXCAVATED AND LAID BACK TO A SLOPE OF 4 HORIZ : 1 VERT. THE PORTION OF THE DRYING BED UNDER THE DEWATERING BUILDING AS INDICATED ON DRAWING L4 SHALL BE FILLED WITH STRUCTURAL BACKFILL AS PER THE EARTHWORK SPECIFICATIONS. THE REMAINING PORTION SHALL BE BACKFILLED USING THE BACKFILL MATERIAL AS SPECIFIED IN THE EARTHWORK SPECIFICATIONS. ALL BACKFILL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPES. THE BACKFILL SHALL BE PLACED IN THE MAXIMUM LIFTS OF 8 INCHES.
2. THE EXISTING CONCRETE DIVIDING WALL BETWEEN DRYING BEDS 1 AND 2 SHALL REMAIN. CONTRACTOR TO ENSURE THAT THE EXISTING WALL IS NOT DAMAGED DURING DEMOLITION. WHILE BACKFILLING. LIGHT COMPACTION EQUIPMENT (AS DESCRIBED IN THE SPECIFICATIONS) SHALL BE USED IN THE AREA WITHIN 8 FEET OF THE EXISTING CONCRETE WALL.
3. B=D WHERE D IS THICKNESS OF SOIL REMOVED BENEATH THE FOOTING.
4. A 2 FOOT WIDE AND 8 INCHES DEEP MINIMUM SURFACE TRENCH SHALL BE PROVIDED NEAR THE EXISTING CONCRETE WALL FOR SURFACE DRAINAGE. THE TRENCH SHALL BE COVERED WITH A GEOFABRIC AND RIPRAP AS INDICATED. THE BOTTOM OF TRENCH SHALL BE SLOPED TOWARDS SOUTH A MINIMUM SLOPE OF 1/8"/FT TO FACILITATE DRAINAGE.

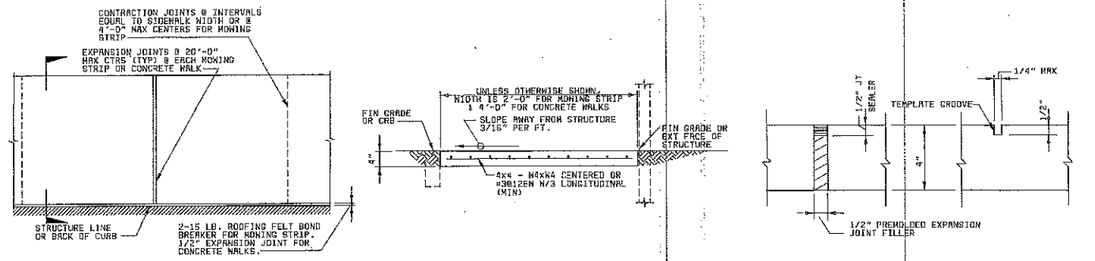


TYPICAL PAVEMENT CROSS SECTION A
NO SCALE

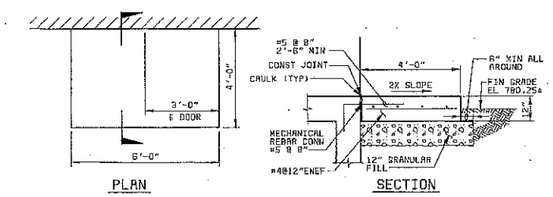


NOTES:
1. SEAL COAT REQUIRED ON EXISTING ASPHALT SURFACES WHERE NEW ASPHALT TIES INTO EXISTING SURFACES. A TACK COAT SHALL BE APPLIED ON ALL JOINTS BETWEEN NEW AND EXISTING PAVEMENT OR OTHER STRUCTURES TO PROVIDE A WATERTIGHT SEAL.
2. THE AGGREGATE SUBBASE SHALL BE CONSTRUCTED OF AN ACCEPTABLE INDOT ITEM WITH MAXIMUM PERMISSIBLE SIZE OF 1 INCH. THE MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT OF MAXIMUM DRY UNIT WEIGHT PER ASTM D698 AT OR NEAR OPTIMUM MOISTURE CONTENT.

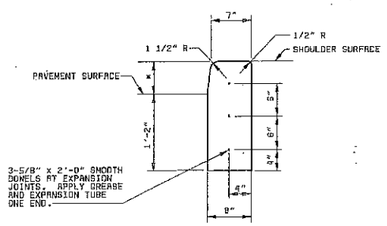
TYPICAL PAVEMENT DETAIL B S6
1 1/2" = 1'-0"



MOWING STRIP AND CONCRETE WALK DETAILS C
NO SCALE

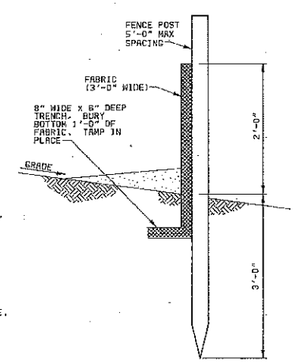


STOOP DETAIL D
3/8" = 1'-0"

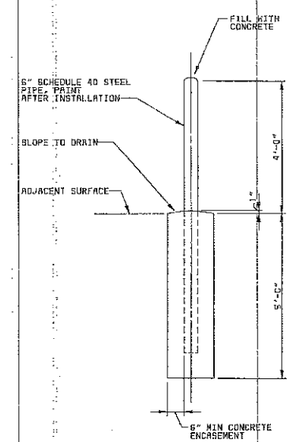


VERTICAL CONCRETE CURB E
1" = 1'-0"

NOTES:
1. SILT FENCE MAY BE FIELD CONSTRUCTED AND INSTALLED OR A PREMANUFACTURED FENCE MAY BE USED.
2. PREFABRICATED FENCE SHALL BE MIRAFI ENVIRO FENCE NUTEC SUPPLY ANN-R-S, OR APPROVED EQUAL.
3. FOR FIELD CONSTRUCTED FENCE:
   A. WIRE SHALL BE 32" (MIN) IN WIDTH AND HAVE 8 WIRES (MIN) WITH 12" STAY SPACING.
   B. FILTER FABRIC SHALL BE MIRA 100X, AMOCO CONSTRUCTION FABRIC SILT STOPPER OR APPROVED EQUAL.
   C. FILTER FABRIC SHALL BE 38" WIDE (MIN) AND SHALL BE ADEQUATELY FASTENED TO THE WIRE.
   D. STEEL POSTS SHALL BE 5'-0" (MIN) HEIGHT AND BE OF THE SELF-FASTENING ANGLE TYPE.
   E. WOOD POSTS SHALL BE 5'-0" (MIN) IN HEIGHT AND 3" (MIN) IN DIA. WIRE FABRIC SHALL BE FASTENED TO POSTS WITH #8 WIRE STAPLED (MIN) 1 1/2" LONG.
4. SILT FENCING SHALL BE INSTALLED ONLY FOR TEMPORARY EROSION AND SEDIMENT CONTROL AND SHALL BE REMOVED FOLLOWING PROJECT COMPLETION.
5. SILT FENCE SHALL BE INSTALLED THE ENTIRE PERIMETER OF THE CONSTRUCTION SITE AND SHALL BE MAINTAINED THROUGHOUT THE PROJECT ACCEPTABLE TO THE OWNER.
6. SILT FENCE SHALL NOT BE REMOVED UNTIL AN ACCEPTABLE STAND OF VEGETATION HAS BEEN PROVIDED OR SURFACE RESTORATION IS COMPLETE.



SILT FENCE F
NO SCALE



GUARDPOST G
NO SCALE

4" PVC RESIDUALS LINE	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
11.25°	2
22.5°	2
45°	2
90°	4
DEAD END	8

8" DIP WATER MAIN	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
11.25°	2
22.5°	6
45°	10
90°	22
DEAD END	40

4" DIP WATER MAIN	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
11.25°	2
22.5°	2
45°	4
90°	10
DEAD END	18

4" PVC THICKENED RESIDUALS LINE	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
11.25°	2
22.5°	2
45°	2
90°	4
DEAD END	6

8" DIP WATER MAIN	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
11.25°	2
22.5°	4
45°	8
90°	18
DEAD END	30

12" DIP CLARIFIER INFLUENT LINE	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
90°	12

16" DIP CLARIFIER RETURN LINE	
BEND	MINIMUM DISTANCE OF RESTRAINED JOINTS EACH SIDE, FEET
90°	18
DEAD END	30

RESTRAINED JOINT PIPE SCHEDULE

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	AS	DHG

DESIGNED MHA, JCD, AS, DHG
DETAILED DPK, FAK, MRP
CHECKED RED, JEN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

SITE WORK
MISCELLANEOUS SITE DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY ROBERT D. LORRIES ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO NO. EAE 0003828

S6
SHEET 44 OF 73

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62409-110-WRH-C-N0000000AF 05/26/2000 07:09:39 ACD

CCO. DWG. NO: 62409-110-WRH-C-N0000000AF

ABBREVIATIONS

A	ALARM, COMPRESSED AIR OUTLET
AC	AIR COMPRESSOR
AD	ACCESS DOOR, AIR DRYER
AE	AVERAGING ELEMENT
AF	AIR FLOW, AIRFOIL
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISH FLOOR
AFM	AIR FLOW MONITOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATE
AR	AIR RECEIVER
AS	AIR SEPARATOR
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
ATU	AIR TERMINAL UNIT
AUTO	AUTOMATIC
AVG	AVERAGE
AVS	AUTOMATIC VALVE STATION
B	BELT DRIVE, BLOW THROUGH
BDD	BACKDRAFT DAMPER
BF	BLIND FLANGE
BFF	BELOW FINISH FLOOR
BFP	BACKFLOW PREVENTER
BH	BASEBOARD HEATER
BI	BACKWARD INCLINED, BUILT-IN THERMOSTAT
BL	BOTTOM LEVEL
BLDG	BUILDING
BLR	BLOWER
BOD	BOTTOM OF DUCT
BOT	BOTTOM
BTUH	BRITISH THERMAL UNITS PER HOUR
BU	BELL-UP
C	CHANNEL, CONVECTOR, COOLING, COOLING (MAKE ON RISE)
CAU	CARBON ADSORPTION UNIT
CB	CENTRIFUGAL BLOWER
CBD	COUNTERBALANCE BACKDRAFT DAMPER
CC	COOLING COIL
CCU	CARBON CANNISTER UNIT
CD	CONTROL DAMPER
CDWP	CONDENSER WATER PUMP
CENTR	CENTRIFUGAL
CF	CABINET FAN
CFM	CUBIC FEET PER MINUTE
CH	CONVECTION HEATER
CO	CLEANOUT
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUATION
CP	CIRCULATING PUMP
CS	CUP SINK
CT	COOLING TOWER
CU	CONDENSING UNIT
CV	CHECK VALVE, CONTROL VALVE
CWP	CHILLED WATER PUMP
D	DIRECT DRIVE, DRAW-THRU
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEH	DEHUMIDIFIER
DF	DRINKING FOUNTAIN, DUCT FAN
DIA	DIAMETER
Ø	DIAMETER
DM	DUCT MOUNTED
DN	DOWN
DSN	DOWNSPOUT NOZZLE
DX	DIRECT EXPANSION
E	ELECTRIC, ELECTRIC OPERATOR, EXHAUST
EA	EACH, EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ECONOMIZER, EVAPORATIVE COOLER
ECH	ELECTRIC CABINET HEATER
EDH	ELECTRIC DUCT HEATER
EEW	EMERGENCY EYE WASH
EF	EXHAUST FAN
EFF	EFFICIENCY
EGS	EMERGENCY GAS SCRUBBER
EIH	ELECTRIC INFRARED HEATER
EL	ELEVATION
EQUIP	EQUIPMENT
ES	EMERGENCY SHOWER, EMERGENCY SWITCH
ES/EEW	EMERGENCY SHOWER AND EYEWASH
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EV	EXHAUST VALVE
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
F	DEGREES FAHRENHEIT
FA	FOUL AIR
FBD	FACE AND BYPASS DAMPER
FC	FORWARD CURVE
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FD	FIRE DAMPER, FLOOR DRAIN
FDB	DEGREES FAHRENHEIT DRY BULB
FEF	FUME EXHAUST FAN
FLEX	FLEXIBLE
FM	FLOW METER
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC PIPE
FS	FLOOR SINK, FLOW SWITCH
FSW	FILTER SURFACE WASH
FT	FEET, FIN TUBE HEATER, FLOW TUBE
FWB	DEGREES FAHRENHEIT WET BULB
G	GAS OUTLET
GA	GAUGE
GALV	GALVANIZED
GCO	GRADE CLEANOUT
GD	GARBAGE DISPOSER
GDF	GAS DUCT FURNACE
GF	GAS FURNACE
GIH	GAS INFRARED HEATER
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
GV	GATE VALVE
GW	GLASS WASHER
GWH	GAS WATER HEATER
H	HAND OPERATOR, HEATING, HEATING (MAKE ON FALL), HEIGHT, HORIZONTAL, HUMIDISTAT
HC	HEATING COIL
HCH	HEATING WATER CABINET HEATER
HE	HEAT EXCHANGER, HELIUM
HF	HOSE FAUCET
HO	HAND-OFF
HOA	HAND-OFF-AUTO
HP	HEAT PUMP, HORSEPOWER
HR	HEAT RECOVERY UNIT, HOUR, HOSE REEL
HUH	HEATING WATER UNIT HEATER
HUM	HUMIDIFIER
HV	HOSE VALVE
HWB	HEATING WATER BOILER
HWP	HEATING WATER PUMP
HZ	HERTZ
I	INTAKE
IBR	INSTITUTE OF BOILER AND RADIATOR MANUFACTURERS
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
JS	JANITOR'S SINK
KS	KITCHEN SINK
KW	KILOWATT
L	LINED DUCT, LOUVER
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LBS	POUNDS
LD	COMBINATION LOUVER/DAMPER
LI	LEVEL INDICATOR
LS	LABORATORY SINK, LEVEL SWITCH
LWT	LEAVING WATER TEMPERATURE
MAU	MAKE UP AIR UNIT
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPS
MOCP	MAXIMUM OVERCURRENT PROTECTION
MFR	MANUFACTURER
MIN	MINIMUM
MOD	MODULATING
MS	MOP SINK
NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NT	NEUTRALIZATION TANK
OA	OUTSIDE AIR
OC	ODOR CONTROL
OCD	ODOR CONTROL DAMPER
OCF	ODOR CONTROL FAN
OCFS	ODOR CONTROL FLOW SWITCH
OCLS	ODOR CONTROL LEVEL SWITCH
OCP	ODOR CONTROL PANEL
OCPS	ODOR CONTROL PRESSURE SWITCH
OCS	ODOR CONTROL SCRUBBER
OD	OUTSIDE DIAMETER
ORD	OVERFLOW ROOF DRAIN
ORP	OXIDATION REDUCTION POTENTIAL
P	PNEUMATIC
PD	PRESSURE DROP (INCHES OF WATER FOR AIR, FEET OF WATER FOR FLUIDS)
PAC	PACKAGED AIR CONDITIONING UNIT
PDI	PLUMBING AND DRAINAGE INSTITUTE
PDS	PRESSURE DIFFERENTIAL SWITCH
PF	PROPELLER FAN
PHP	PACKAGED HEAT PUMP
PL	PLATE
POS	POSITION
PPM	PARTS PER MILLION
PROP	PROPELLER
PRS	PRESSURE REDUCING STATION
PRV	POWER ROOF VENTILATOR, PRESSURE REDUCING VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
RA	REACTIVATION AIR, RETURN AIR
RAC	ROOM AIR CONDITIONER
RCS	REMOTE CONTROL STATION
RD	ROOF DRAIN
REQD	REQUIRED
RH	RELATIVE HUMIDITY, ROOF HOOD
SA	SUPPLY AIR
SCD	SMOKE CONTROL DAMPER
SCFM	STANDARD CUBIC FEET PER MINUTE
SCP	SCRUBBER CONTROL PANEL
SF	SQUARE FEET, SUPPLY FAN
SH	SHEET, SHOWER
SIM	SIMILAR
SMD	SMOKE DETECTOR
SP	STATIC PRESSURE (INCHES OF WATER)
SPS	STATIC PRESSURE SENSOR
SRP	SCRUBBER RECIRCULATION PUMP
SS	STAINLESS STEEL
SSK	SERVICE SINK
SSP	SUBMERSIBLE SUMP PUMP
STD	STANDARD
SV	SERVICE VALVE, SHUTOFF VALVE, SUPPLY VALVE, SOLENOID VALVE
T	THERMOSTAT
TCP	TEMPERATURE CONTROL PANEL
TCV	TEMPERATURE CONTROL VALVE
TD	TRENCH DRAIN
TE	TEMPERATURE ELEMENT
TEMP	TEMPERATURE
TI	TEMPERATURE INDICATOR
TL	TOP LEVEL
TS	TIP SPEED, TAMPER SWITCH
TYP	TYPICAL
UR	URINAL
V	VERTICAL
VAC	VACUUM OUTLET
VANE	VANEAXIAL
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VCD	VOLUME CONTROL DAMPER
VF	VANEAXIAL FAN
VP	VACUUM PUMP
VSP	VERTICAL COLUMN SUMP PUMP
VTR	VENT THRU ROOF
W	WIDE FLANGE, WIDTH
WB	WET BULB
WBP	WATER BOOSTER PUMP
WC	WATER CHILLER, WATER CLOSET, WATER COLUMN
WCO	WALL CLEANOUT
WF	WALL FAN
WG	WATER GAUGE
WH	WALL HEATER, WALL HYDRANT
WHA	WATER HAMMER ARRESTOR WITH PDI DESIGNATION
WM	WALL MOUNTED
WST	WATER STORAGE TANK
WT	WEIGHT
WV	WATER CONTROL VALVE
ZD	ZONE DAMPER

LEGEND

GENERAL

- PIPING ABOVE FLOOR OR GRADE
- PIPING BELOW FLOOR OR GRADE
- PIPE TURNING UP
- PIPE TURNING DOWN

FUEL GAS

- G — NATURAL GAS
- PG — PROPANE GAS

HVAC

- CWR — CHILLED WATER RETURN
- CWS — CHILLED WATER SUPPLY
- C — CONDENSATE DRAIN
- CDWR — CONDENSER WATER RETURN
- CDWS — CONDENSER WATER SUPPLY
- HWR — HEATING WATER RETURN
- HWS — HEATING WATER SUPPLY
- LPC — LOW PRESSURE CONDENSATE
- LPS — LOW PRESSURE STEAM (<15 PSIG)
- R — REFRIGERANT

SPECIAL

- ACET — ACETYLENE
- AR — ARGON
- A — COMPRESSED AIR
- HE — HELIUM
- H — HYDROGEN
- ME — METHANE
- N — NITROGEN
- NO — NITROUS OXIDE
- OX — OXYGEN
- VAC — VACUUM

WASTE

- CRW — CHEMICAL RESISTANT WASTE
- CRV — CHEMICAL RESISTANT VENT
- D — INDIRECT DRAIN
- SAN — SANITARY DRAIN
- ST — STORM DRAIN
- PD — SUMP PUMP DISCHARGE
- V — VENT

ODOR CONTROL

- SR — SCRUBBER RECIRCULATION
- FA — FOUL AIR

WATER

- NPW — COLD WATER - NONPOTABLE
- CW — COLD WATER - POTABLE
- DE — DEIONIZED WATER
- DW — DISTILLED WATER
- F — FIRE PROTECTION WATER
- HWC — HOT WATER CIRCULATING - POTABLE
- NPHW — HOT WATER - NONPOTABLE
- HW — HOT WATER - POTABLE
- PEW — PLANT EFFLUENT WATER
- SVW — SERVICE WATER
- SW — SOFTENED WATER
- TW — TEMPERED OR BLENDED WATER
- TNPW — TEMPERED NONPOTABLE WATER

PIPE FITTINGS

- BLIND FLANGE
- CAP
- DRAIN OR BELL-UP (SCHEMATIC)
- REDUCER
- SLEEVE
- TP — TEST PLUG
- UNION

PIPING SPECIALTIES

- AUTOMATIC VALVE STATION
- BASKET STRAINER
- COMBINATION PUMP DISCHARGE VALVE
- FLEXIBLE CONNECTION
- FLOW CONTROL VALVE
- FLOW SENSOR METER
- HF — HOSE FAUCET
- HF — HOSE FAUCET W/VACUUM BREAKER
- HOSE VALVE W/HOSE NIPPLE
- AIR VENT
- PRS — PRESSURE REDUCING STATION
- PRESSURE RELIEF VALVE
- PRESSURE/TEMPERATURE RELIEF VALVE
- Q — QUICK COUPLING
- ROTAMETER
- SIGHT FLOW INDICATOR
- SUCTION DIFFUSER (SCHEMATIC)
- WH — WALL HYDRANT
- WH — WALL HYDRANT W/VACUUM BREAKER
- METER
- WYE STRAINER
- WYE STRAINER W/BLOWOFF
- VACUUM BREAKER

FIRE PROTECTION

- ALARM CHECK VALVE - WET SYSTEM.
- DRY PIPE VALVE
- FIRE DEPARTMENT CONNECTION
- FS — FLOW SWITCH
- TS — SUPERVISORY (TAMPER) SWITCH

VALVES

- ANGLE VALVE
- BACKFLOW PREVENTER (2" & SMALLER)
- BACKFLOW PREVENTER
- BACKWATER VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- GATE VALVE
- GLOBE VALVE
- PLUG VALVE
- PRESSURE REDUCING VALVE
- THREE WAY VALVE

CONTROLS AND INSTRUMENTATION

- DIAL TYPE THERMOMETER
- DG — DRAFT GAUGE
- E_E — ELECTRIC OPERATOR (EXPLOSION PROOF)
- E_M — ELECTRIC OPERATOR (MODULATING)
- E — ELECTRIC OPERATOR (2 POSITION)
- FS — FLOW SWITCH
- GAUGE ACTIVATOR/ISOLATOR
- H_1 — HUMIDISTAT WITH NUMBER
- I — INSTRUMENT TEST OPENING
- LS — LEVEL SWITCH
- PDS_1 — PRESSURE DIFFERENTIAL SWITCH WITH NUMBER
- P — PRESSURE GAUGE W/SHUTOFF VALVE
- PS — PRESSURE SWITCH
- T_1 — REMOTE BULB THERMOSTAT WITH NUMBER
- SMD_1 — SMOKE DETECTOR WITH NUMBER
- S — SOLENOID OPERATOR
- STEM TYPE THERMOMETER
- TE — TEMPERATURE ELEMENT
- T_1 — THERMOSTAT WITH NUMBER
- V — VACUUM GAUGE W/SHUTOFF VALVE

HVAC

- CONTROL DAMPER
- DIFFUSER FOR FLEXIBLE DUCT
- DIRECTION OF AIR FLOW
- 30"X20"(L) — DUCTWORK DIMENSIONS, THE FIRST DIMENSION IS THE SIDE SEEN. (L) INDICATES INTERNALLY LINED DUCTWORK. (W) INDICATES EXTERNALLY WRAPPED DUCTWORK
- 30"x20" — DUCTWORK DIMENSIONS, THE FIRST DIMENSION IS THE SIDE THE LEADER LINE TOUCHES
- FD — FIRE DAMPER
- FLEXIBLE CONNECTION
- FLEXIBLE DUCTWORK
- DN — INCLINED DROP IN RESPECT TO DIRECTION OF AIRFLOW
- UP — INCLINED RISE IN RESPECT TO DIRECTION OF AIRFLOW
- NEGATIVE PRESSURE DUCT
- POSITIVE PRESSURE DUCT
- REGISTER, GRILLE OR DIFFUSER
- ROUND OR FLEXIBLE DUCT TAKEOFF
- ROUND TO SQUARE TRANSITION
- TURNING VANES
- VCD — VOLUME CONTROL DAMPER

PLUMBING

- BELL-UP DRAIN W/TRAP
- FCO — CLEANOUT (FLOOR)
- CO — CLEANOUT (PIPE)
- HW CW — BLENDING VALVE
- DOWNSPOUT NOZZLE
- EMERGENCY SHOWER/EYEWASH
- FLOOR DRAIN
- HOSE REEL
- P-TRAP
- ROOF DRAIN
- SHOWER
- SPLASHBLOCK
- A — WATER HAMMER ARRESTOR W/ PDI SIZE DESIGNATION

PLUMBING (SCHEMATIC)

- AIR-GAP FITTING
- BELL-UP DRAIN
- FLOOR CLEANOUT
- FLOOR DRAIN
- FLOOR DRAIN W/FUNNEL
- P-TRAP
- VENT THROUGH ROOF (VTR)

GENERAL MECHANICAL NOTES

1. THIS IS A GENERAL LEGEND AND ABBREVIATION SHEET FOR PLUMBING AND HVAC DRAWINGS. SOME ITEMS CONTAINED ON THIS SHEET MAY NOT BE USED ON THIS SPECIFIC PROJECT.
2. FOR ROOFTOP EQUIPMENT CURB, FLUES, AND FLASHING DETAILS, SEE ARCHITECTURAL DRAWINGS.
3. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL EQUIPMENT BASE DETAILS.
4. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR LOCATION OF AIR DISTRIBUTION DEVICES.
5. "SCREENED" DELINEATION DENOTES EXISTING AND NEW FACILITIES AND IS FOR REFERENCE ONLY. "LIGHT" LINE DELINEATION DENOTES EXISTING MECHANICAL EQUIPMENT AND SYSTEMS. EXISTING FACILITY AND MECHANICAL SYSTEMS INFORMATION WAS TAKEN FROM PREVIOUS DRAWINGS, CONSTRUCTION RECORDS, DATA, AND FIELD SURVEY INFORMATION. ACTUAL LOCATION, ARRANGEMENT, AND DIMENSIONS SHALL BE FIELD VERIFIED AND WORK INSTALLED TO MEET ACTUAL CONDITIONS AND LOCATIONS ENCOUNTERED. "BOLD" (DARK) DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
6. ALL MATERIALS, FITTINGS, COVERS, AND EQUIPMENT INSTALLED IN RETURN AIR PLENUMS SHALL BE NONCOMBUSTIBLE AND UL LISTED FOR USE IN RETURN AIR PLENUMS.
7. METAL ROOF DECKING SHALL NOT BE USED FOR THE SUPPORT OF EQUIPMENT, PIPING, OR DUCTWORK.
8. ALL HANGERS, BRACKETS, OR BRACES FOR DUCTWORK, EQUIPMENT, AND PIPING ARE NOT INDICATED ON THE DRAWINGS. REFER TO THE SPECIFICATIONS FOR SUPPORT REQUIREMENTS NOT SHOWN ON THE PLANS.
9. OUTSIDE AIR INLETS SHALL BE LOCATED A MINIMUM OF 10' AWAY FROM ANY EXHAUST AIR OR PLUMBING VENT OUTLET.
10. ALL EQUIPMENT, PIPING, AND DUCTWORK SHALL BE ROUTED TO AVOID INTERFERENCES WITH STRUCTURE, OTHER PIPING, EQUIPMENT, DUCTWORK, AND CONDUIT. UNLESS SPECIFICALLY DIMENSIONED, THE PIPE AND DUCTWORK ROUTING SHOWN IS INTENDED TO INDICATE GENERAL LOCATION ONLY.
11. ALL PIPING AND DUCTWORK SHALL BE ROUTED AS HIGH AS POSSIBLE WITH A MINIMUM HEIGHT OF 8'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED BY A CENTERLINE, INVERT, OR BOTTOM OF DUCT ELEVATION.
12. PIPING AND DUCTWORK INSTALLED ABOVE SUSPENDED CEILINGS SHALL BE INSTALLED TO ALLOW A MINIMUM 6 INCH CLEARANCE BETWEEN THE CEILING AND PIPING OR BOTTOM OF THE DUCT.
13. ALL HOSE FAUCETS AND HOSE VALVES SHALL BE INSTALLED 3'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. WALL HYDRANTS SHALL BE INSTALLED 1'-6" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
14. ALL HOSE FAUCETS AND WALL HYDRANTS SHALL BE NOMINAL 3/4" PIPE SIZE UNLESS OTHERWISE NOTED. ALL HOSE VALVES SHALL BE 1 1/2" NOMINAL PIPE SIZE UNLESS OTHERWISE NOTED.
15. ALL HOSE FAUCETS, WALL HYDRANTS, AND OTHER OUTLETS ON NONPOTABLE WATER LINES WHICH COULD BE USED FOR DRINKING OR DOMESTIC USE SHALL BE POSTED AS REQUIRED BY THE APPLICABLE CODES. IN ABSENCE OF A CODE REQUIREMENT, THE OUTLETS SHALL BE POSTED WITH A TAG IN THE SHAPE OF A 4" EQUILATERAL TRIANGLE BEARING THE LEGEND "DANGER: UNSAFE WATER" IN LETTERS NOT LESS THAN 1/2" IN HEIGHT. THIS TAG SHALL BE SECURELY ATTACHED IN A VISIBLE LOCATION DIRECTLY ABOVE OUTLET. THE TAG SHALL BE PAINTED ORANGE AND THE LETTERS BLACK.
16. DUCTWORK SHALL BE FABRICATED, REINFORCED, SUPPORTED AND SEALED FOR OPERATING PRESSURES INDICATED IN THE SCHEDULES FOR THE EQUIPMENT IT SERVES. ALL DUCTWORK SHALL HAVE A MINIMUM SMACNA PRESSURE CLASSIFICATION OF ONE INCH.
17. DUCT SIZES INDICATED ARE CLEAR DIMENSIONS INSIDE THE DUCT OR DUCT LINING. SHEET METAL SIZES ARE LARGER FOR INTERNALLY LINED DUCTWORK.
18. DUCT CONNECTIONS TO EQUIPMENT, PIPING SIZES TO EQUIPMENT, AND EQUIPMENT SUPPORTS SHALL BE VERIFIED AND ADJUSTED TO MATCH ACTUAL EQUIPMENT FURNISHED.
19. ALL RELIEF VALVES SHALL BE PIPED TO FLOOR OR BELLUP DRAINS.
20. THE LOCATION OF PIPING AND VALVES TO THE AIR HANDLING EQUIPMENT SHALL NOT INTERFERE WITH FILTER REMOVAL OR AIR HANDLING EQUIPMENT SERVICING.
21. ROOFTOP EQUIPMENT SHALL NOT BE LOCATED SUCH THAT ACCESS TO CONTROLS AND TO PERFORM SERVICE FOR EQUIPMENT IS LOCATED WITHIN 6 FEET OF THE BUILDING EDGE.

AIR INLET AND OUTLET IDENTIFICATION

24"x10"-10"
SR-1-760

- SIZE-WIDTH BY HEIGHT (INCHES)
- FLEXIBLE DUCT DIAMETER (INCHES, IF USED)
- CFM THRU DEVICE
- DEVICE DESIGNATION
- DEVICE GROUP: R-REGISTER, G-GRILLE, D-DIFFUSER
- DEVICE TYPE: S-SUPPLY, E-EXHAUST, R-RETURN

07-02	CONFORMED TO CONSTRUCTION RECORDS		SWH	AS	DWG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED GWP,HX,BCD
DETAILED BDL,LOW
CHECKED DWH,MLP
APPROVED
DATE

BLACK & VEATCH Corporation Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

HVAC AND PLUMBING
LEGEND, ABBREVIATIONS AND GENERAL NOTES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID W. NELSON ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19600503

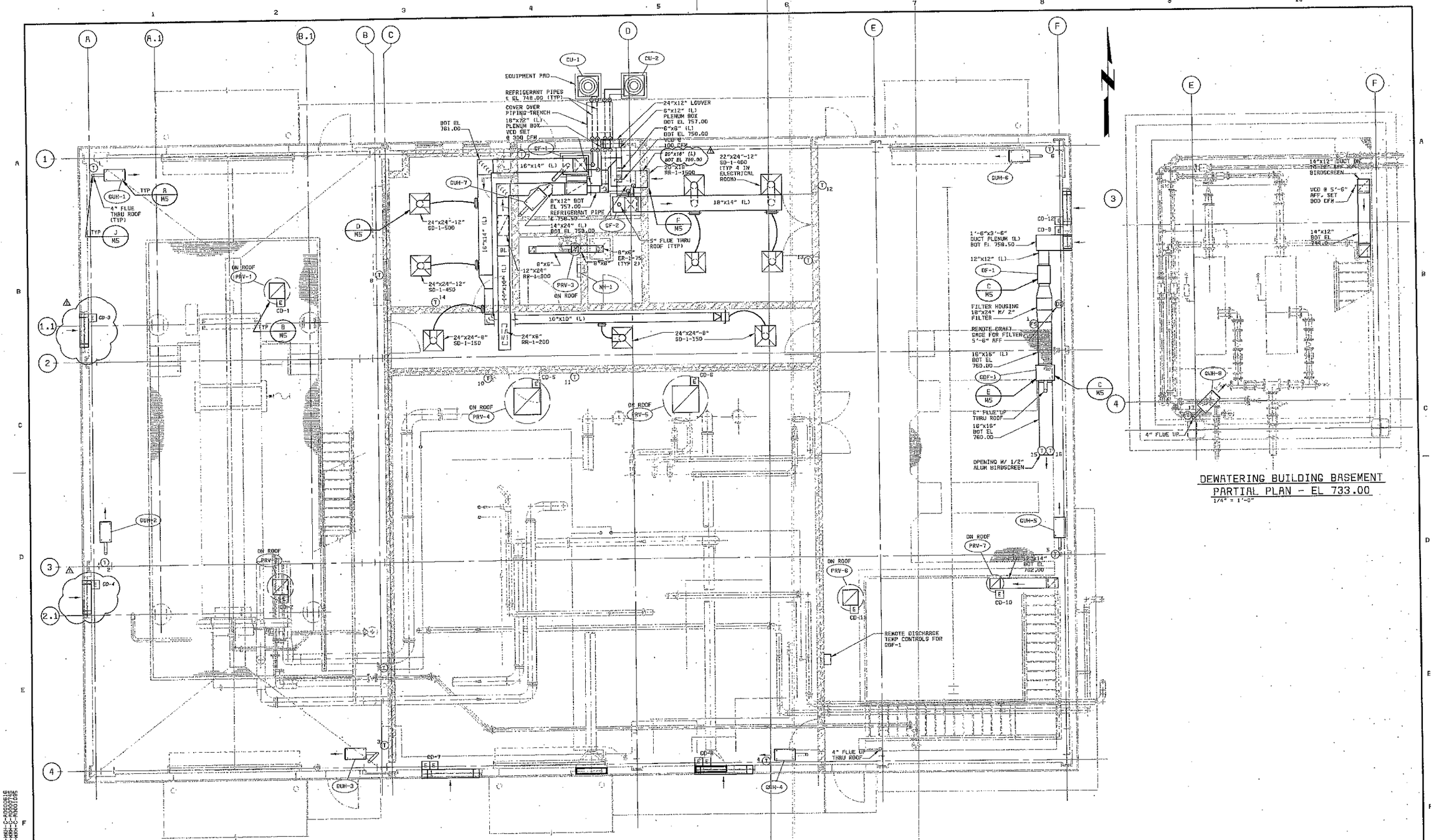
M1

SHEET 45 OF 73

CCG. DWG. NO: 62409-114-WRH-H-A0000B40

G3009 FC0000

62409-114-WRH-H-Z00000CBE 06/29/2000 15:13:50 ACD



DEWATERING BUILDING BASEMENT
PARTIAL PLAN - EL 733.00
1/4" = 1'-0"

FLOOR PLAN - EL 749.00
1/4" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	FAW	AS	DRG	
DATE:	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED CHP.RX
DETAILED BDL.LDH
CHECKED DNN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

HVAC
DEWATERING BUILDING
FLOOR PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID W. NELSON ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10600803

M2

SHEET 46 OF 73

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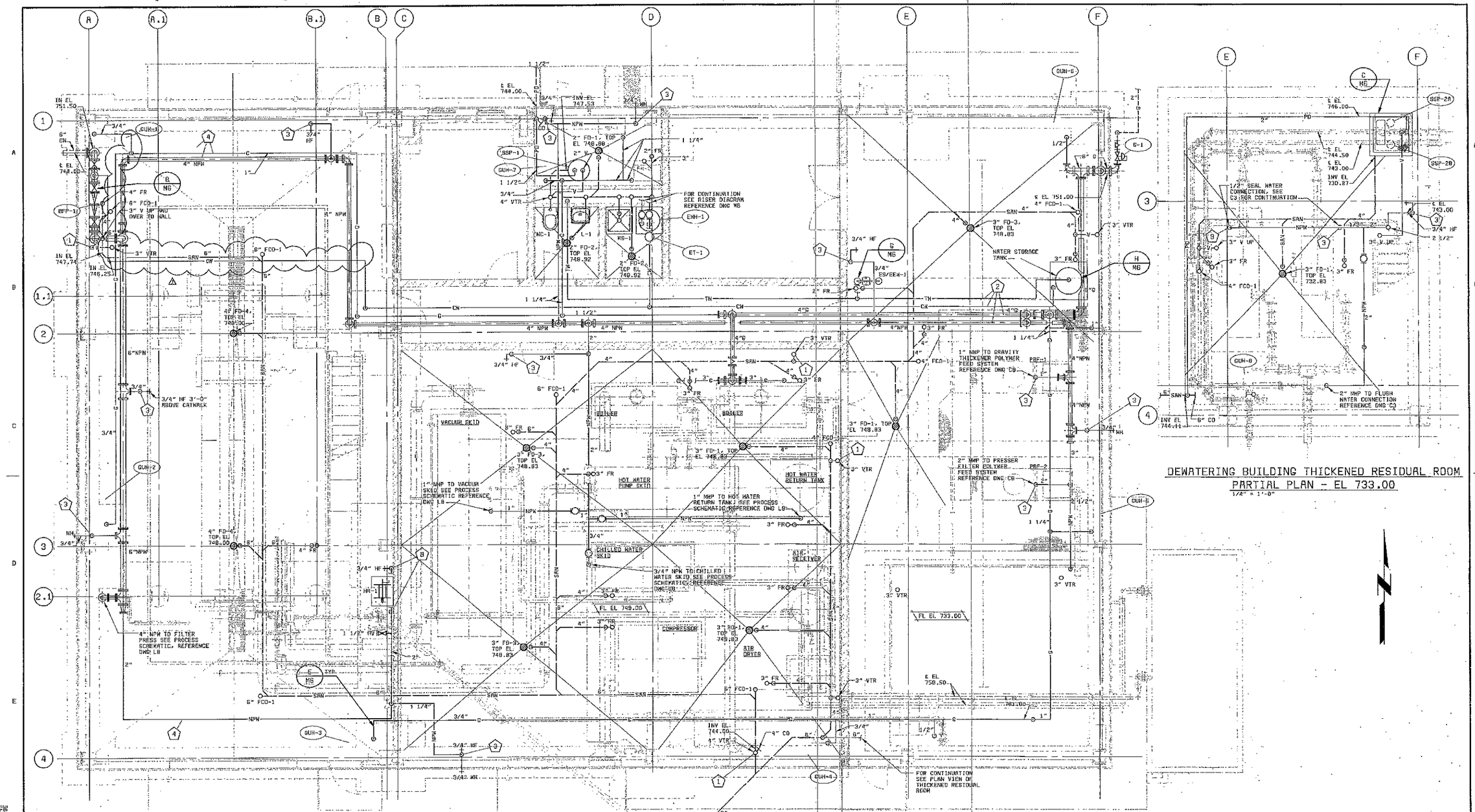

DEWATERING BUILDING THICKENED RESIDUAL ROOM
PARTIAL PLAN - EL 733.00
1/4" = 1'-0"

FLOOR PLAN - EL 749.00
1/4" = 1'-0"

PLAN NOTES:

1. OFFSET VENT TO WALL.
2. CONTRACTOR TO ROUTE PIPING ABOVE MONORAIL.
3. SHUT OFF VALVE IN RISER.
4. ROUTE PIPING OUTSIDE MONORAIL.

GENERAL NOTES:

1. LAYOUT SHOWN IS APPROXIMATE. PIPE SUPPORTS ARE NOT INDICATED. CONTRACTOR TO ROUTE AND SUPPORT THE PIPE AS SPECIFIED & ACCEPTABLE TO THE ENGINEER.

NO.	BY	CK	APP	DATE	REVISIONS AND RECORD OF ISSUE
07-02	FAN	AS	DHG		CONFORMED TO CONSTRUCTION RECORDS

DESIGNED BCD
DETAILED BDL/LDN
CHECKED MLP
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

PLUMBING
DEWATERING BUILDING
FLOOR PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID M. NELSON ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10900503

M3

SHEET 47 OF 73

CCC. DWG. NO: 62409-114-MRH-PB-A0000946

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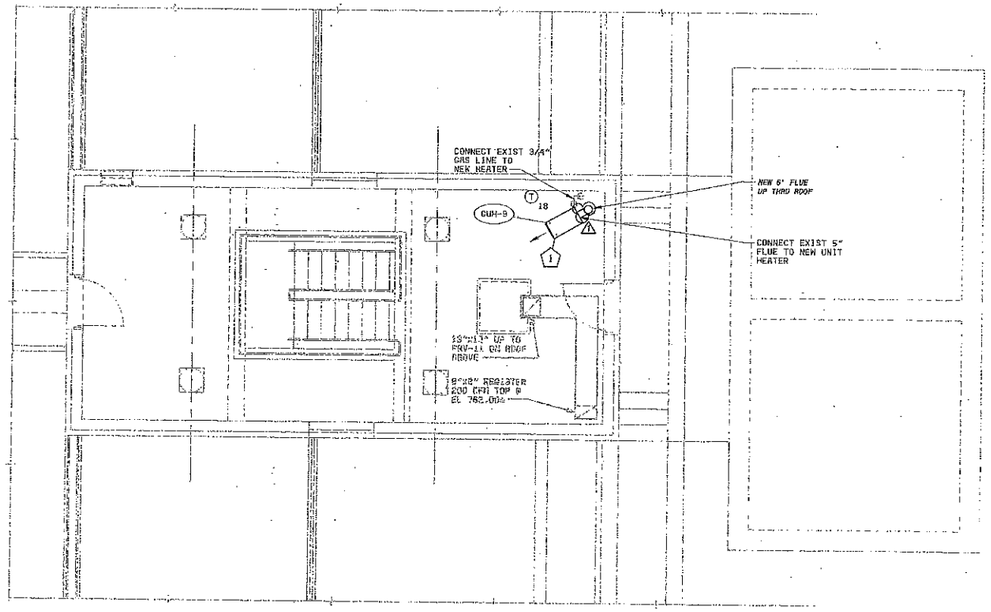
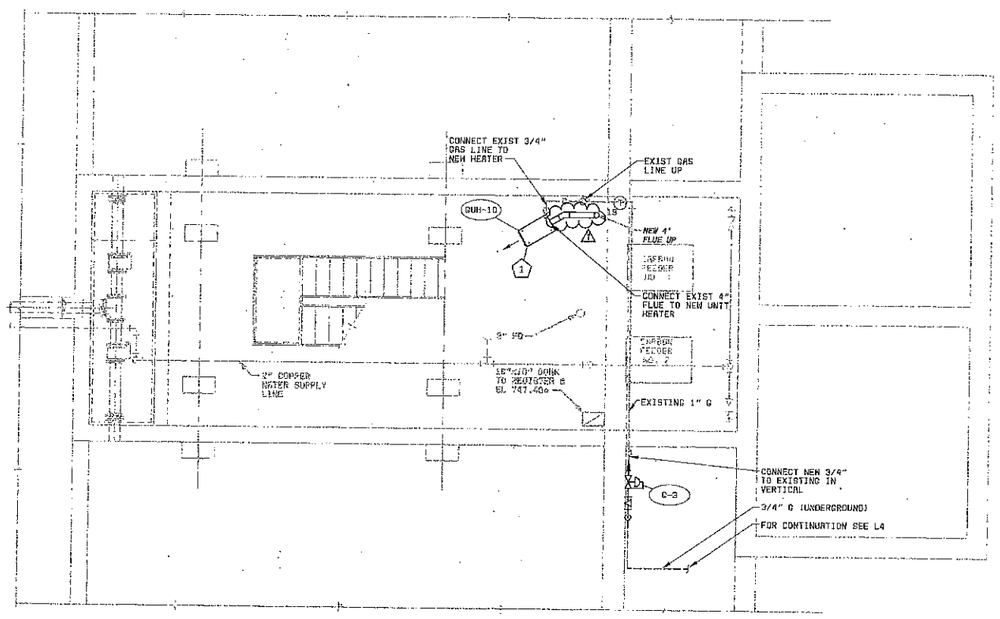
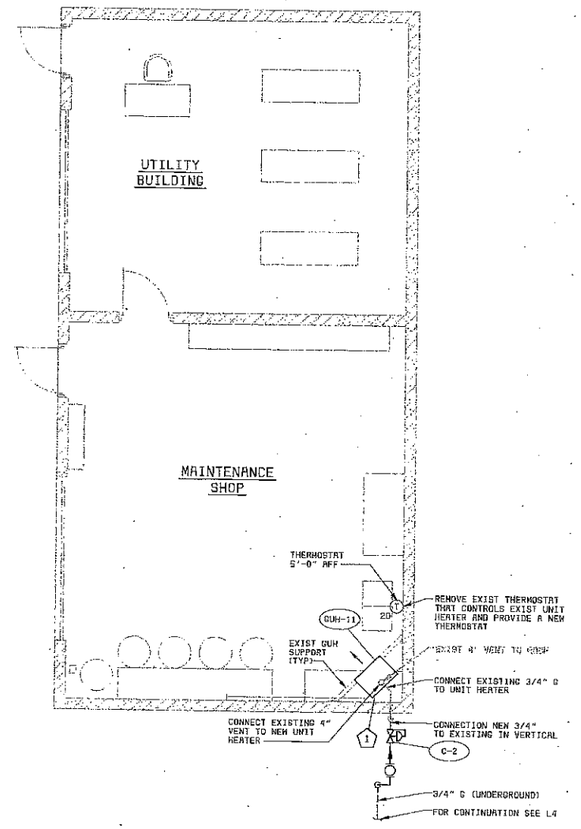


SLOW MIX BUILDING PLAN - EL 754.00±
1/8" = 1'-0"



SLOW MIX BUILDING PLAN - EL 739.00±
1/4" = 1'-0"



MAINTENANCE SHOP FLOOR PLAN - EL 753.00±
1/4" = 1'-0"

PLAN NOTES:

1. REMOVE EXISTING PROPANE GAS UNIT HEATER AND CONTROLS AND INSTALL A NEW GAS FIRED UNIT HEATER. MOUNT IN SAME LOCATION AND REUSE EXISTING SUPPORTS.
2. REMOVE EXISTING REGULATOR AND REPLACE WITH NEW. PROVIDE REDUCERS AS REQUIRED.

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMH	AS	DMG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED CMP.HX.BCD
DETAILED BDL.LDN
CHECKED DMN.MLP
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

HVAC AND PLUMBING
SLOW MIX BUILDING AND MAINTENANCE SHOP FLOOR PLANS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID W. NELSON ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10600000

M4

SHEET 48 OF 73

CCC. DWG. NO: 62409-114-WRH-H-A0001001

03109
F000000

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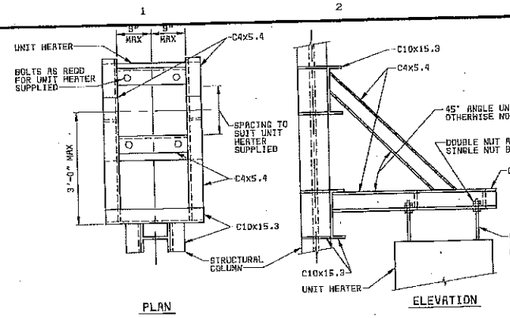
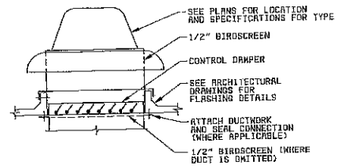
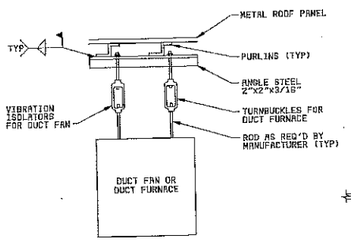


NOTE:
EACH CONNECTION FOR ALL UNIT HEATER HANGERS SHALL HAVE 3/16" FILLET WELD, 4" LONG (MIN).

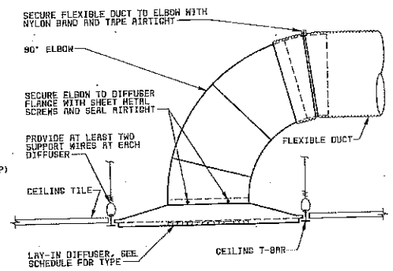
UNIT HEATER SUPPORT (TAG1)
NO SCALE



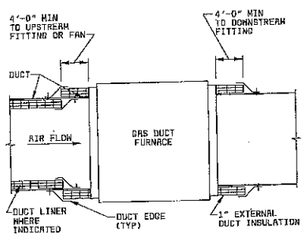
POWER ROOF VENTILATOR (B)
NO SCALE



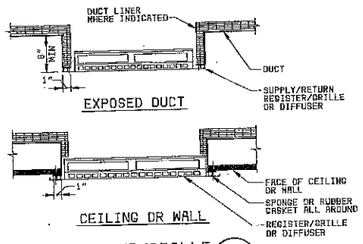
EQUIPMENT SUPPORT (C)
NO SCALE



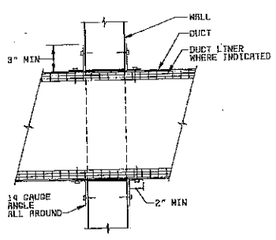
CEILING DIFFUSER (D)
NO SCALE



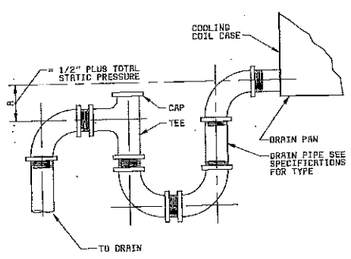
GAS DUCT FURNACE CONNECTION (E)
NO SCALE



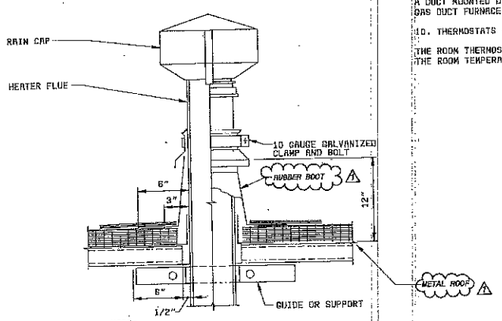
REGISTER/GRILLE (F)
NO SCALE



WALL PENETRATION (G)
NO SCALE



DRAIN PAN TRAP (H)
NO SCALE



NOTE:
CLEARANCE TO COMBUSTIBLES SHALL BE PROVIDED AS REQUIRED BY PRODUCT LISTING. ROOFING INSULATION AND FLASHING BY METAL BUILDING CONTRACTOR.

FLUE (J)
NO SCALE

HVAC - SEQUENCE OF OPERATIONS

EQUIPMENT TAG NUMBER	CONTROL SWITCH TYPE NOTE 1	CONTROL SWITCH LOCATION NOTE 2	AUTOMATIC CONTROL INTERLOCK NOTE 3	CONTROL DAMPER INTERLOCK NOTE 4	EMERGENCY VENTILATION SHUTOFF SWITCH INTERLOCK NOTE 5	GAS DETECTOR INTERLOCK NOTE 6	SMOKE DETECTOR INTERLOCK NOTE 7	HIGH FILTER LOSS NOTE 8	VENT FAN FAILURE NOTE 9	THERMOSTATS ROOM NOTE 10	THERMOSTATS LOW TEMP NOTE 11	THERMOSTATS SUPPLY NOTE 12	HUMIDI-STATS NOTE 13	REMARKS
CU-1,GF-1	UFT									T-14				
CU-2,GF-2	UFT									T-13				
PRV-1	O-O-A	MS		CD-1, CD-3						T-8				
PRV-2	O-O-A	MS		CD-2, CD-4						T-9				
PRV-3	O-O	NME												
PRV-4	O-O-A	MCC		CD-5, CD-7						T-10				
PRV-5	O-O-A	MCC		CD-6, CD-8								T-11		
PRV-6	O-O-A	MS		CD-11,CD-12								T-12		
PRV-7	O-O-A	MS	DF-1	CD-10										
DF-1	O-O	MCC		CD-9						FS-1				FS FURN W/UNIT
GUH-1										T-1				NOTE 20
GUH-2										T-2				NOTE 20
GUH-3										T-3				NOTE 20
GUH-4										T-4				NOTE 20
GUH-5										T-5				NOTE 20
GUH-6										T-6				NOTE 20
GUH-7										T-7				NOTE 20
GUH-8										T-17				
GUH-9										T-18				
GUH-10										T-19				
GUH-11										T-20				
GOF-1											T-15	T-16		T-16 FURN W/ UNIT
WH-1										BI				

HVAC SEQUENCE OF OPERATIONS NOTES:

1. CONTROL SWITCH TYPE

THE FOLLOWING CONTROL SWITCH TYPE ABBREVIATIONS SHALL APPLY TO THE SEQUENCE OF OPERATIONS:

O-O ON-OFF
O-O-A ON-OFF-AUTO
UFT UNIT FURNISHED THERMOSTAT

2. CONTROL SWITCH LOCATION

THE FOLLOWING CONTROL SWITCH LOCATION ABBREVIATIONS SHALL APPLY:

BI BUILT IN, PROVIDED WITH THE PIECE OF EQUIPMENT
MCC ON THE MOTOR STARTER AT THE MOTOR CONTROL CENTER
NME WALL MOUNTED INSIDE THE SPACE NEAR THE CONTROLLED EQUIPMENT
MS MOTOR STARTER

3. AUTOMATIC CONTROL

WHEN THE CONTROL SWITCH IS PLACED IN THE AUTO POSITION, THE EQUIPMENT SHALL BE INTERLOCKED WITH THE INDICATED EQUIPMENT OR CONTROLLED BY THE INDICATED CONTROL DEVICE. THE EQUIPMENT SHALL DE-ENERGIZE WHEN THE AUTOMATIC CONTROL INTERLOCK EQUIPMENT IS DE-ENERGIZED.

4. CONTROL DAMPER INTERLOCKS

UNLESS OTHERWISE INDICATED, THE CONTROL DAMPERS SHALL BE PROVEN OPEN BEFORE THE EQUIPMENT IS ALLOWED TO ENERGIZE AND CLOSE WHEN THE EQUIPMENT IS DE-ENERGIZED.

5. NOT USED

6. NOT USED

7. NOT USED

8. NOT USED

9. VENTILATION FAILURE

A DUCT MOUNTED DIFFERENTIAL PRESSURE SWITCH FS-1 SHALL DE-ENERGIZE THE GAS DUCT FURNACE GOF-1 WHEN THERE IS A LOSS OF VENTILATION AIRFLOW.

10. THERMOSTATS - ROOM

THE ROOM THERMOSTAT SHALL ENERGIZE THE PIECE OF EQUIPMENT TO MAINTAIN THE ROOM TEMPERATURE SETPOINT.

11. THERMOSTATS - LOW TEMPERATURE

IN THE EVENT THE DISCHARGE AIR FALLS BELOW THE LOW TEMPERATURE THERMOSTAT SETPOINT, THE EQUIPMENT SHALL DE-ENERGIZE. AN ADJUSTABLE 0 TO 60 SECOND TIME DELAY RELAY SHALL BE PROVIDED TO PREVENT NUISANCE SHUTDOWNS ON UNIT START UP DURING COLD WEATHER.

12. THERMOSTATS - SUPPLY

THE SUPPLY AIR THERMOSTAT LOCATED IN GOF-1 DISCHARGE DUCTWORK SHALL MODULATE GOF-1 OUTPUT CAPACITY TO MAINTAIN THE SUPPLY AIR SETPOINT.

13. NOT USED

14. NOT USED

15. NOT USED

16. NOT USED

17. NOT USED

18. NOT USED

19. NOT USED

20. HEATERS

UNIT HEATERS SHALL BE CONTROLLED BY THEIR RESPECTIVE THERMOSTATS. WALL HEATERS SHALL BE CONTROLLED BY THEIR BUILT-IN THERMOSTATS.

21. NOT USED

22. THERMOSTAT SETPOINTS

THERMOSTAT SETPOINTS SHALL BE AS FOLLOWS UNLESS INDICATED OTHERWISE.

LOW TEMPERATURE THERMOSTATS	- 40°F
HEATERS	- 60°F
MAKEUP AIR SUPPLY HEATING	- 60°F
VENTILATING EQUIPMENT	- 90°F
AIR CONDITIONED AREAS	
COOLING	- 78°F
HEATING	- 72°F

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMW	AS	DHN

DESIGNED GMP,HX
DETAILED BDL,LDH
CHECKED DHN
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

HVAC
DETAILS, AND
SEQUENCE OF OPERATIONS

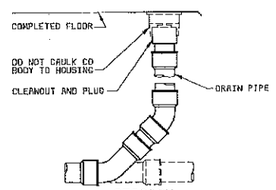
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID W. NELSON ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19906903

M5

SHEET 49 OF 73

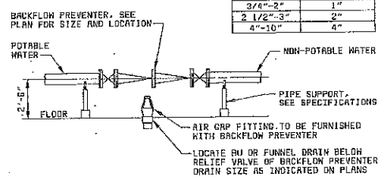
CCD. DWG. NO: 62409-114-WRH-H-RD0001222

62409-114-WRH-H-ZD0000C6H 08/29/2000 14:40:28 ACD

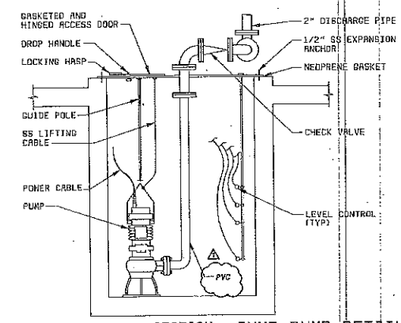


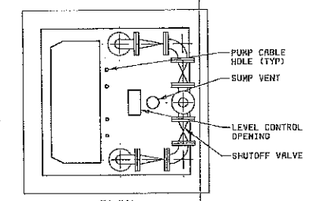
CLEANOUT DETAIL (A)
NO SCALE

BACKFLOW PREVENTER SIZE	MINIMUM AIR GAP DRAIN SIZE
1/2"	1/2"
3/4"-2"	1"
2 1/2"-3"	2"
4"-10"	4"

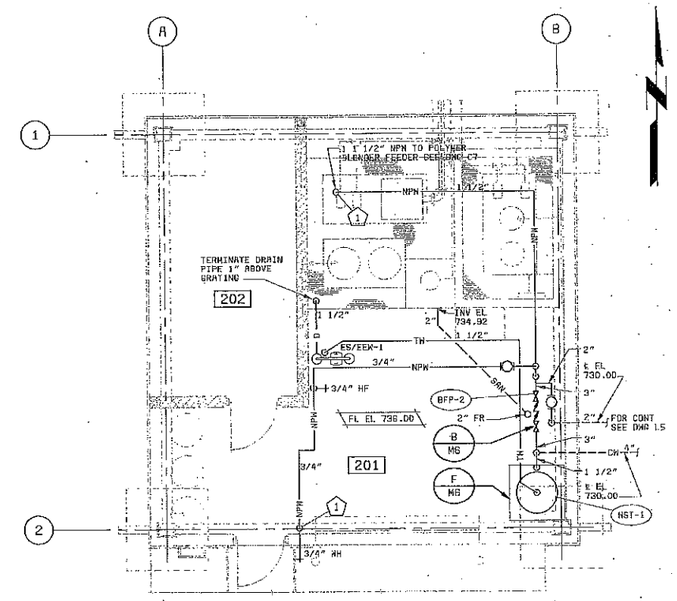


BACKFLOW PREVENTER DETAIL (B)
NO SCALE





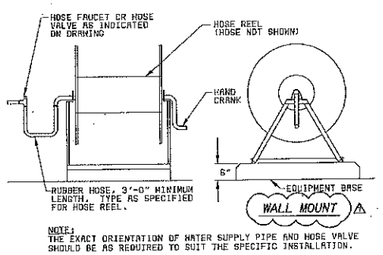
SUMP PUMP DETAIL (C)
NO SCALE



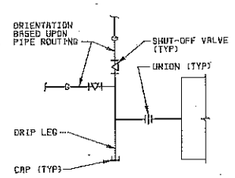
CHEMICAL FEED BUILDING PLAN
1/4" = 1'-0"

PLAN NOTES:

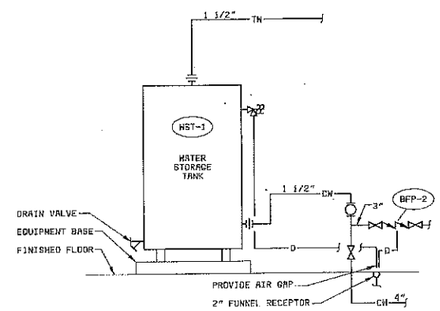
(1) SHUT OFF VALVE IN RISER.



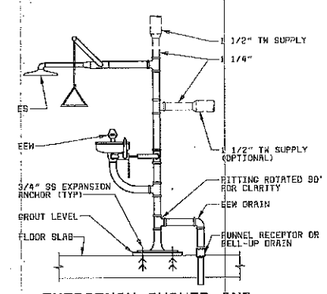
HOSE REEL DETAIL (D)
NO SCALE



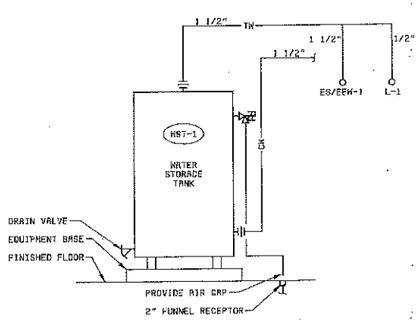
PIPING CONNECTION AT GAS EQUIPMENT (E)
NO SCALE



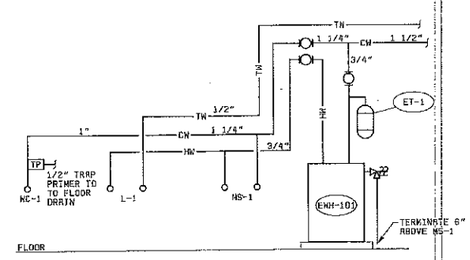
CHEMICAL BUILDING WATER PIPING SCHEMATIC (F)
NO SCALE



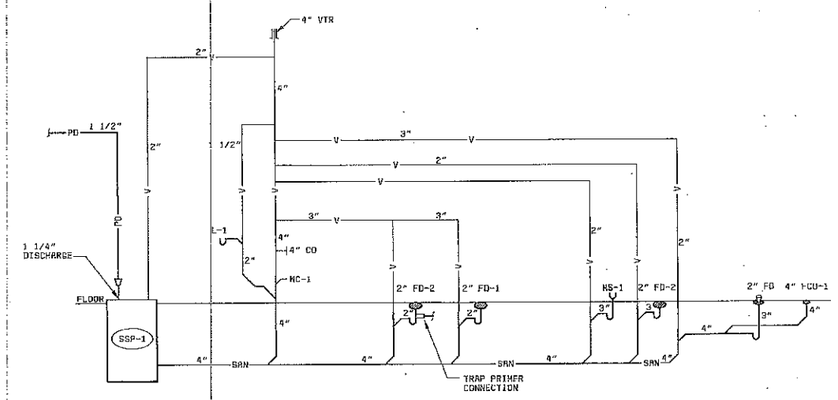
EMERGENCY SHOWER AND EYE WASH DETAIL (G)
NO SCALE



DEWATERING BUILDING WATER STORAGE TANK PIPING SCHEMATIC (H)
NO SCALE



LAVATORY / JANITOR'S CLOSET RISER DIAGRAM
NO SCALE



SANITARY DRAIN, WASTE AND VENT RISER DIAGRAM
NO SCALE

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAN	AS	DRG

DESIGNED BCD
DETAILED BDL-LDH
CHECKED MLP
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

PLUMBING
PARTIAL PLAN, DETAILS AND RISER DIAGRAMS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID L. NELSON ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10000003

M6

SHEET 50 OF 73

CCD. DWG. NO: 62409-114-WRH-PB-A0001151

62409-114-WRH-PB-Z0000DC8K 08/29/2000 16:10:09 RCD

R3009 FQ00000

62409-110-WRH-C-A0001153

BACKFLOW PREVENTER SCHEDULE

UNIT NO	SERVICE	BODY SIZE (IN)	MAXIMUM FLOW (GPM)	MAXIMUM PD (PSI)	MANUFACTURER MODEL	REMARKS
BFP-1	NONPOTABLE WATER SUPPLY TO THE DEWATERING BLDG	6	390	7	AMES - MODEL 4000SS	REDUCED PRESSURE ASSEMBLY
BPF-2	NONPOTABLE WATER SUPPLY TO THE CHEMICAL BLDG	3	90	12	AMES - MODEL 4000SS	REDUCED PRESSURE ASSEMBLY

NOTES:

PRESSURE REDUCING VALVE SCHEDULE

UNIT NO	SERVICE	TYPE*	FLOW RATE** MAX	FLOW RATE** ORD	FLOW RATE** MIN	REDUCED PRESSURE SETPOINT	INLET PRESSURE MAX	INLET PRESSURE MIN	MINIMUM PRESSURE AT MAX FLOW	REMARKS
G-1	NATURAL GAS SUPPLY TO DEWATERING BLDG	DA	5,000	4,600	4,100	11"WC	5 PSIG	4.5 PSIG	10"WC	
G-2	NATURAL GAS SUPPLY TO MAINTENACE BLDG	DA	100	70	0	9"WC	5 PSIG	4.5 PSIG	8"WC	
G-3	NATURAL GAS SUPPLY TO SLOW MIX BLDG	DA	200	140	0	9"WC	5" PSIG	4.5 PSIG	8"WC	
G-4	NATURAL GAS SUPPLY TO MAIN BLDG	DA	3000	2000	1000	9" CW	5" PSIG	4.5 PSIG	8"	CONTRACTOR SHALL CONFIRM THAT PRESSURE SET POINT AND FLOW RATE IS SUITABLE FOR SERVING EXITING GAS FIRED EQUIPMENT
W-1	NPW SUPPLY TO DEWATERING BLDG'S PRESSURE FILTER POLYMER FEED SYSTEM	DA	44	41.8	0	48 PSIG	53.6 PSIG	48.6 PSIG	43.5 PSIG	
W-2	NPW SUPPLY TO DEWATERING BLDG'S GRAVITY THICKENER POLYMER FEED SYSTEM	DA	5	5	0	48 PSIG	53.6 PSIG	48.6 PSIG	43.5 PSIG	
W-3	NPW SUPPLY TO CHEMICAL FEED BLDG'S BACKWASH CLARIFIER POLYMER FEED SYSTEM	DA	20	19	0	48 PSIG	57.9 PSIG	52.9 PSIG	47.5 PSIG	

*DA - DIRECT ACTING PO - PILOT OPERATED
**UNITS ARE SCFH FOR GAS, SCFM FOR AIR, AND GPM FOR WATER. "ORD" INDICATES ORDINARY FLOW RATE.

REMARKS:

SUMP AND SEWAGE PUMP SCHEDULE

UNIT NO	LOCATION	TYPE	CAPACITY (GPM)	TOTAL HEAD (FT)	MAX SPEED (RPM)	MOTOR HP	POWER SUPPLY VOLTS/PHASE	DISCHARGE SIZE (IN)	SUMP LEVELS (FT)* OFF	LEAD	LAG	HWA	MFR/MODEL	CONTROL TYPE	REMARKS
SSP-1	MECHANICAL ROOM OF THE DEWATERING BLDG	PACKAGED GRINDER PUMP SIMPLEX	13	27	1725	1	120/1	1 1/2"	14"	18"	NA	26"	E ONE SEWER SYSTEMS/ GP 2010-44	2S	1,5
SSP-2A	THICKENED RESIDUAL ROOM OF THE DEWATERING BLDG	MEDIUM DUTY SEWAGE PUMP DUPLEX	40	26	1750	1.5	120/1	2"	12"	27	30	333	WEIL/ 2426	4S	1,4,5
SSP-2B			40	26	1750	1.5									
CSP-1	CHEMICAL FEED BLDG	MEDIUM DUTY SUMP PUMP SIMPLEX	20	10	1750	1/3	120/1	2"	6"	NA	NA	24"	WEIL/ 1400	1S	1,4,5
CSP-2	DEWATERING BLDG	MEDIUM DUTY SUMP PUMP SIMPLEX	20	11	1750	1/3	120/1	2"	6"	NA	NA	24"	WEIL/ 1400	1S	1,4,5

*PUMPS OFF, LEAD PUMP START, LAG PUMP START AND HIGH WATER ELEVATIONS AS MEASURED FROM THE BOTTOM OF THE SUMP.

REMARKS
(1) HIGH WATER ALARM
(2) EXPLOSIONPROOF /DIVISION 1/DIVISION 2/ (PUMPING UNIT ONLY)
(3) GUIDERAIL MOUNTED
(4) PEDESTAL MOUNTED
(5) SUMP COVER REQUIRED
(6) LIFTING CHAIN REQUIRED
(7) CUTLESS RUBBER LOWER BEARING
(8) STUFFING BOX
(9)

PLUMBING FIXTURE AND EQUIPMENT SCHEDULE

LABEL	DESCRIPTION	MANUFACTURER MODEL	REMARKS
WC-1	WATER CLOSET, WALL MOUNT, FLUSH VALVE, 1.6 GAL/FLUSH MAX	KOHLER K-4330 KINGSTON	(1)
L-1	LAVATORY, WALL HUNG, 21 X 18 INCHES, WITH 1.5 GPM AERATED FAUCET AND POP-UP DRAIN	LAVATORY-KOHLER K-2005 KINGSTON FAUCET-KOHLER K-15503 CORALAIS	(1)
MS-1	MOP SINK, 32 X 32 INCHES, 12 INCHES DEEP, FLOOR MOUNTED, TWO SPLASH PANELS	SINK-WILLIAMS HL-1900-BP2 FAUCET-KOHLER K-8907	
ES/ EEW-1	EMERGENCY SHOWER/EYE/FACEWASH COMBINATION, PEDESTAL MOUNTED, 1-1/4 INCH IPS SUPPLY	HAWS-8346	
HR-1	HOSE REEL WITH 1 1/2 INCH SWIVEL WATER SUPPLY AND 50 FT TYPE 1 HOSE	HANNAY 3024-24-26	
EWH-1	ELECTRIC WATER HEATER, COMMERCIAL GRADE, 20 GALLONS STORAGE, 25 GPH RECOVERY AT 100 F RISE, 6 KW, 208 VOLT	STATE SB6-20-6-IFE-ASME-NSF	
ET-1	EXPANSION TANK, PIPELINE MOUNTED, 4.7 GALLON, PRECHARGE TO 80 PSIG	AMTROL ST-12	
FD-1	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, LOOSE SET CAST IRON GRATE	SMITH 2310 SERIES	
FD-2	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, SECURED NICKEL BRONZE ROUND GRATE, TRAP PRIMER CONNECTION	SMITH 2005-A-SERIES	
FD-3	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, TRACTOR GRATE	SMITH 2320 SERIES	
FD-4	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, DOME GRATE	SMITH 2310-D SERIES	
FCO-1	HEAVY DUTY FLOOR CLEANOUT, SECURED ROUND ADJUSTABLE NICKEL BRONZE TOP	SMITH 4100 SERIES	

REMARKS:
1. FIXTURE AND INSTALLATION SHALL BE ADA COMPLIANT.

AIR DEVICE SCHEDULE

SYMBOL	MODEL	FRAME/ BORDER	MATERIAL	FINISH	DAMPER TYPE	ACCESSORIES	REMARKS
SD-1	TDC	LAY-IN	ALUMINUM	WHITE	OPPOSED BLADE		
RR-1	50F	SURFACE	ALUMINUM	WHITE	OPPOSED BLADE		
ER-1	50F	SURFACE	ALUMINUM	WHITE	OPPOSED BLADE		

NOTES: 1. EQUIPMENT SCHEDULE MODEL NUMBERS BASED ON TITUS COMPANY
2. ALL DIFFUSER CORE STYLES ARE 4-WAY UNLESS OTHERWISE INDICATED ON THE PLANS

HEATER SCHEDULE

UNIT NO	LOCATION	AIRFLOW (CFM)	AIR PD (IN WG)	OUTPUT CAPACITY (BTUH)	OUTPUT CAPACITY (KW)	WATER FLOW (GPM)	WATER PD (FT)	MOTOR HP	POWER SUPPLY VOLTS/PHASE	APPROX WT (LBS)	REMARKS
WH-1	RESTROOM	65	-	-	0.75	-	-	-	120/1	-	
GUH-1	TRUCK LOADING	650	-	40000	-	-	-	1/35	120/1	80	
GUH-2	TRUCK LOADING	650	-	40000	-	-	-	1/35	120/1	80	
GUH-3	TRUCK LOADING	650	-	40000	-	-	-	1/35	120/1	80	
GUH-4	MECH ROOM	650	-	40000	-	-	-	1/35	120/1	80	
GUH-5	CHEMICAL FEED	380	-	20000	-	-	-	1/50	120/1	80	
GUH-6	CHEMICAL FEED	380	-	20000	-	-	-	1/50	120/1	80	
GUH-7	HVAC ROOM	650	-	40000	-	-	-	1/35	120/1	80	
GUH-8	PUMP AREA	380	-	20000	-	-	-	1/50	120/1	80	
GUH-9	SLOW MIX	980	-	60000	-	-	-	1/15	120/1	95	
GUH-10	SLOW MIX	650	-	40000	-	-	-	1/35	120/1	80	
GUH-11	MAINTENANCE	650	-	40000	-	-	-	1/35	120/1	80	
GDF-1	PUMP AREA	900	0.25	60000	-	-	-	-	120/1	190	

NOTES: 1. THE MAXIMUM OUTPUT CAPACITY FOR GDF-1 IS 78,000 BTUH.

CONDENSING UNIT SCHEDULE

UNIT NO	LOCATION	CAPACITY (BTUH)	EAT (F)	SUCTION TEMP (F) MIN	SUCTION TEMP (F) MAX	POWER SUPPLY VOLTS/PHASE	MINIMUM CIRCUIT AMPACITY	APPROX WT (LBS)	REMARKS
CU-1	HVAC ROOM	38000	95	45	50	208/1	26	190	
CU-2	HVAC ROOM	42000	95	48	53	208/1	32	230	

NOTES: 1. THE EQUIPMENT SHALL HAVE A MINIMUM EFFICIENCY AT THE ARI STANDARD RATING CONDITIONS OF EER 10.5

FAN SCHEDULE

UNIT NO	LOCATION	AIRFLOW (CFM)	ESP (IN WG)	MOTOR HP	POWER SUPPLY VOLTS/PHASE	MIN WHEEL DIA (IN)	DRIVE	APPROX WT (LBS)	REMARKS
PRV-1	TRUCK LOADING	3000	0.375	3/4	120/1	18	B	90	
PRV-2	TRUCK LOADING	3000	0.375	3/4	120/1	18	B	90	
PRV-3	RESTROOM	150	0.375	1/30	120/1	8	D	25	
PRV-4	MECH ROOM	12000	0.375	3	480/3	33	B	275	
PRV-5	MECH ROOM	12000	0.375	3	480/3	33	B	275	
PRV-6	CHEMICAL FEED	2400	0.375	1/2	120/1	16	B	90	
PRV-7	PUMP AREA	900	0.250	1/4	120/1	9	B	40	
DF-1	PUMP AREA	900	0.875	3/4	120/1	9	B	75	

DRIVE NOTES: D - DIRECT
B - BELT

FURNACE SCHEDULE

UNIT NO	LOCATION	COOLING COIL NO	AIRFLOW (CFM)	ESP (IN WG)	MOTOR HP	POWER SUPPLY VOLTS/PHASE	HEATING EAT (FDB)	HEATING OUTPUT CAPACITY (BTUH)	HEATING CAPACITY (KW)	APPROX WEIGHT (LBS)	REMARKS
GF-1	HVAC ROOM	CC-1	1400	0.750	1/2	120/1	57	33000	-	250	1,2
GF-2	HVAC ROOM	CC-2	1600	0.625	1/2	120/1	68	12000	-	250	1,2

NOTES: 1. THE MAXIMUM OUTPUT HEATING CAPACITIES FOR BOTH UNITS ARE 65,000 BTUH.
2. SEE COIL SCHEDULE FOR COOLING CAPACITY.
REMARKS: 1. PROVIDE FILTER AND FILTER RACK.
2. FILTER SP LOSS IS NOT INCLUDED IN ESP. COOLING COIL SP LOSS IS INCLUDED IN ESP.

COIL SCHEDULE

UNIT NO	SERVICE	AIRFLOW (CFM)	AIR PD (IN WG)	EAT (FDB)	EAT (FWB)	LAT (FDB)	CAPACITY (BTUH) SENSIBLE	CAPACITY (BTUH) TOTAL	EWT (F)	WATER FLOW (GPM)	WATER PD (FT)	REMARKS
CC-1	DX	1400	0.3	81	67	-	30900	38000	80.6	-	-	
CC-2	DX	1600	0.3	85.5	69.5	-	40000	42000	82.4	-	-	

PLUMBING FIXTURE CONNECTION SCHEDULE

SYMBOL	FIXTURE	WATER HOT	WATER COLD	SANITARY WASTE	SANITARY VENT
WC-1	WATER CLOSET	-	1"	4"	2"
L-1	LAVATORY	1/2"	1/2"	1 1/2"	1 1/2"
MS-1	MOP SINK	1/2"	1/2"	3"	1 1/2"
ES/EEW-1	COMBINATION EMERGENCY SHOWER AND EYEWASH	-	1 1/2"	-	-

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	SWH	AS	DNG

DESIGNED GWP.HX.BCD
DETAILED BDL.LDN
CHECKED DNN.WLP
APPROVED
DATE

BLACK & VEATCH Corporation

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

HVAC AND PLUMBING SCHEDULES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY DAVID W. NELSON ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19600003

M7

SHEET 51 OF 73

ONE-LINE DIAGRAM LEGEND

- 1500KVA 2.4KV∆-480Y/277 3φ, 60HZ — TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, AND KVA RATING AS NOTED
- 20 — 22: 3#8,#10G,2" — CIRCUIT NO.22 WITH #8 INSULATED CONDUCTORS, 1#10 BARE GROUND WIRE ALL IN 2" CONDUIT TO 20 HP MOTOR
- 15 — AUXILIARY ITEMS MAY NOT BE SHOWN COMPLETELY — ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A STEAM GENERATOR OR AN AIR HANDLING UNIT, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED
- INDICATES THAT ALL OR PART OF CIRCUIT MAY BE ROUTED IN DUCT BANK OR UNDERGROUND. CONDUIT SIZE SHOWN ON ONE-LINE IS ABOVE GROUND AND/OR INSIDE OF STRUCTURE. SEE DUCT BANK SCHEDULE AND SECTIONS FOR CONDUIT SIZE OF UNDERGROUND PORTION OF CIRCUIT.
- HIGH VOLTAGE DRAWOUT AIR OR VACUUM CIRCUIT BREAKER
- 3P-20 — LOW VOLTAGE AIR CIRCUIT BREAKER, 3 POLE, 20 AMPERE
- S4 — SIZE 4 COMBINATION MAGNETIC MOTOR STARTER
- LOW VOLTAGE DRAWOUT AIR CIRCUIT BREAKER
- HIGH VOLTAGE DRAWOUT CONTACTOR
- FUSE AND DISCONNECT SWITCH
- S2 — SIZE 2 COMBINATION MAGNETIC MOTOR STARTER, REVERSING OR 2 SPEED
- S1 — SIZE 1 COMBINATION REDUCED VOLTAGE STARTER
- POTENTIAL TRANSFORMER
- CURRENT TRANSFORMER

CONDUIT & WIRING INSTALLATION LEGEND

- CONDUIT EXPOSED
- CONDUIT CONCEALED
- CONDUIT TURNING UP. CONDUIT TURNING DOWN.
- CONDUIT PLUGGED FLUSH. CONDUIT CAPPED.
- L2-5 — TYPICAL FOR HOME RUN TO BE ROUTED TO LIGHTING PANEL L2 & CONNECTED TO CIRCUIT #5 (MINIMUM NO. 12 AWG CONDUCTORS AND 3/4" CONDUIT)
- A — LIGHTING FIXTURE, REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE
- 11 — FLUORESCENT FIXTURE. REFER TO NUMBER OR LETTER IN FIXTURE SCHEDULE.
- LP1-3 — RECEPTACLE POWERED FROM LIGHTING PANEL LP1, CIRCUIT 3
- A LP2-2 — LIGHTING FIXTURE POWERED FROM LIGHTING PANEL LP2, CIRCUIT 2 (NON-SWITCHED)
- LPA-4 A 11 — LIGHTING FIXTURE POWERED FROM LIGHTING PANEL LPA, CIRCUIT 4, VIA SWITCH A
- E — UNDERGROUND CONCRETE ENCASED ELECTRICAL DUCT BANK
- UNDERGROUND CONCRETE ENCASED ELECTRICAL BANK ROUTED BENEATH SLAB-ON-GRADE
- EE — DIRECT BURIED CONDUIT
- GROUND CONDUCTOR

SWITCH & OUTLET SYMBOLS

S	SINGLE POLE SWITCH		DUPLEX RECEPTACLE 120 VOLT
S_2	TWO POLE SWITCH		SIMPLEX RECEPTACLE
S_3	THREE-WAY SWITCH		RANGE RECEPTACLE
S_4	FOUR-WAY SWITCH		TWISTLOCK RECEPTACLE
S_M^{C1}	MOMENTARY SWITCH CONTROLLING CONTACTOR C1	30	240V, 1φ RECEPTACLE, TYPICAL AMPERE RATING NOTED
S_{WP}	WEATHERPROOF SWITCH	60	480V, 3φ WELDING RECEPTACLE, TYPICAL AMPERE RATING NOTED
S_{PL}	SWITCH WITH PILOT LIGHT		120 VOLT DUPLEX RECEPTACLE (UPS)
S_{KO}	KEY OPERATED SWITCH		DUPLEX FLOOR OUTLET
S_{XP}	EXPLOSION PROOF SWITCH		TELEPHONE OUTLET
S_{DM}	DIMMER SWITCH		TELEPHONE FLOOR OUTLET
S_{3A}	THREE-WAY SWITCH CONTROLLING LIGHTS WITH "A" DESIGNATION	CX	COAXIAL CABLE OUTLET

SCHEMATIC SYMBOLS

- WIRE CONNECTION POINT
- EXTERNAL CONNECTION POINT
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- STARTER, CONTACTOR OR RELAY COIL
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- MAINTAINED PUSH BUTTON
- NORMALLY CLOSED GEARED LIMIT SWITCH
- NORMALLY OPEN GEARED LIMIT SWITCH
- INDICATING LIGHT
- FUSE
- POTENTIOMETER
- CAPACITOR
- DIODE
- RESISTOR
- CONTROL POWER TRANSFORMER
- SWITCH
- MS — MANUAL STARTER
- OL — OVERLOAD
- ELECTRODE
- FLOAT SWITCH (CLOSING ON RISING LEVEL)
- FLOAT SWITCH (OPENING ON RISING LEVEL)
- PRESSURE SWITCH (CLOSING ON RISING PRESSURE)
- PRESSURE SWITCH (OPENING ON RISING PRESSURE)
- VACUUM SWITCH (CLOSING ON INCREASING VACUUM)
- VACUUM SWITCH OPENING ON INCREASING VACUUM)
- TEMPERATURE SWITCH (CLOSING ON RISING TEMPERATURE)
- TEMPERATURE SWITCH (OPENING ON RISING TEMPERATURE)
- FLOW ACTUATED SWITCH (CLOSING ON INCREASE IN FLOW)
- FLOW ACTUATED SWITCH (OPENING ON INCREASE IN FLOW)
- ON TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- ON TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS ENGERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY OPEN, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL OPEN AFTER A TIME DELAY)
- OFF TIME DELAY CONTACT (NORMALLY CLOSED, WHEN THE COIL IS DE-ENERGIZED THE CONTACT WILL CLOSE AFTER A TIME DELAY)
- TORQUE SWITCH (NORMALLY OPEN)
- TORQUE SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY OPEN)
- LIMIT SWITCH (NORMALLY OPEN, HELD CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED)
- LIMIT SWITCH (NORMALLY CLOSED, HELD OPEN)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY OPEN, CLOSING ON INCREASING DIFF.)
- DIFFERENTIAL PRESSURE SWITCH (NORMALLY CLOSED, OPENING ON INCREASING DIFF.)

COMMUNICATION SYMBOLS

- HORN SPEAKER
- DUAL HORN SPEAKER
- WALL MOUNTED CONE SPEAKER
- SK — CEILING MOUNTED CONE SPEAKER
- WS WP — WALL STATION
- DS — DESK TOP STATION
- RH WP — REMOTE HANDSET
- SA — SPEAKER AMPLIFIER
- LB — LINE BALANCE ASSEMBLY
- TG — TONE GENERATOR
- TI — TELEPHONE INTERFACE
- IA — INTERFACE AMPLIFIER
- IJB — INTERCOM JUNCTION BOX

NOTE: WP=WEATHERPROOF H=HAZARDOUS AREA

MISCELLANEOUS SYMBOLS

- BELL
- HORN
- T — THERMOSTAT
- J — JUNCTION BOX
- GROUND ROD
- GROUND CONNECTION
- DISCONNECT SWITCH
- COMBINATION STARTER
- POWER PANEL
- LIGHTING PANEL
- MISCELLANEOUS PANEL
- LIGHTING CONTACTOR
- CCTV CAMERA

ABBREVIATIONS

A	AMBER, AMPERE, ALARM
AC	ALTERNATING CURRENT
ACB	AIR CIRCUIT BREAKER
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AM	AMMETER
ANN	ANNUNCIATOR
AR	ALARM RELAY
AS	AMMETER SWITCH
AT	AMPERE TRIP
AWG	AMERICAN WIRE GAGE
BC	BATTERY CHARGER
BR	BRAKE
BT	BEARING TEMPERATURE
C	CLOSE, COUNTER OR CONTACTOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CB"A"	CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN OR TRIPPED CLOSED WHEN BREAKER IS CLOSED)
CB"B"	CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN OR TRIPPED OPEN WHEN BREAKER IS CLOSED)
CD	CONTROL DAMPER
CI	CELL INTERLOCK
CKT	CIRCUIT
CL2	CHLORINE
COS	CABLE OPERATED SWITCH
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CURRENT OR CONTROL RELAY
CS	CONTROL STATION
CT	CYCLE TIMER OR CURRENT TRANSFORMER
CTC	CYCLE TIMER CLUTCH
CTM	CYCLE TIMER MOTOR
2/C	2 CONDUCTOR
4"C	4" CONDUIT
DC	DIRECT CURRENT
DI	DOOR INTERLOCK
DM	DAMPER MOTOR OR DEMAND METER
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPR	DIFFERENTIAL PRESSURE REGULATOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DS	DISCONNECT SWITCH
DVLS	DISCHARGE VALVE LIMIT SWITCH
E	ELECTRIC OPERATOR FOR CONTROL DAMPER OR VALVE
EC	EMPTY CONDUIT
EL	ELEVATION OR EMERGENCY LIGHT
EMH	ELECTRICAL MANHOLE
ER	ELECTRODE RELAY
ES	END SWITCH
ETM	ELAPSED TIME METER
EX	EXISTING
F	FORWARD
FS	FLOW SWITCH
G	GREEN OR GROUND
GD	GROUND DETECTOR
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTER
GLS	GEARED LIMIT SWITCH
#8G	#8 GROUND WIRE
H	HIGH OR HUMIDISTAT
HC	HOT CIRCUIT
HH	HANDHOLE
HMT	HIGH MOTOR TEMPERATURE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
HWCO	HIGH WATER CUTOFF
HWA	HIGH WATER ALARM
HZ	HERTZ (CYCLE)
I/O	INPUT/OUTPUT
INST	INSTANTANEOUS
J	JUNCTION BOX
JB	JUNCTION BOX
K	KEY INTERLOCK
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR
KW	KILOWATT
KWH	KILOWATT HOUR
L	LOW, LEVEL
LA	LIGHTNING ARRESTER
LAN	LOCAL AREA NETWORK
LC	LIGHTING CONTACTOR
LOA	LOCAL-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LP	LIGHTING PANEL
LS	LIMIT OR LEVEL SWITCH
LWCO	LOW WATER CUTOFF
1-1PR#16S	ONE, SINGLE PAIR, TWISTED, SHIELDED #16 CABLE
3-7/C#14	THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES
M	MAGNETIC MOTOR STARTER
MA	MILLIAMPERE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCLU	MOTOR CONTROL LINEUP
MCM	THOUSAND CIRCULAR MIL
MD	MOISTURE DETECTOR
MFM	MAGNETIC FLOW METER
MFR	MANUFACTURER
MH	MANHOLE OR MOUNTING HEIGHT
MOV	MOTOR OPERATED VALVE
MPR	MOTOR PROTECTION RELAY
MS	MANUAL MOTOR STARTER
MSH	MOTOR SPACE HEATER
MV	MILLIVOLT
MVA	MEGA VOLT AMPERE
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER
O	OPEN
OCB	OIL CIRCUIT BREAKER
OL	OVERLOAD
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
P	PRIMARY
PCS	PLANT CONTROL SYSTEM
PB	PUSH BUTTON OR PULL BOX
PF	POWER FACTOR METER
PH	PHASE, CHEMICAL TERM
PLC	PROGRAMMABLE LOGIC CONTROLLER
PP	POWER PANEL
PRS	PROXIMITY SWITCH
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER, PROGRAM TIMER
2P	2 POLE
R	RED, RAISE, RELAY OR REVERSE
RECP	RECEPTACLE
RES	RESISTOR
RT	REPEATING TIMER
RTD	RESISTANCE TYPE TEMP DETECTOR
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE STARTER
S2	SIZE 2 STARTER
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SH	SPACE HEATER
SN	SOLID NEUTRAL
SO	SOLENOID OILER
SP	SINGLE POLE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SS	SELECTOR SWITCH
SSS	SOLID STATE STARTER
SUPV	SUPERVISORY CONTROL
SV	SOLENOID VALVE
SWB	SWITCHBOARD
SWGR	SWITCHGEAR
T	THERMOSTAT, TIMER, OR TOTALIZER
TACH	TACHOMETER
TB	TERMINAL BLOCK
TC	TIMER CLUTCH
TD	TIME DELAY RELAY
TEMP	TEMPERATURE
TM	TIMER MOTOR
TQ	TORQUE
TS	TEMPERATURE SWITCH
TTB	TELEPHONE TERMINAL BOX
UG	UNDERGROUND
UV	UNDER VOLTAGE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPERE
VAR	VARMETER
VLS	VALVE LIMIT SWITCH
VM	VOLTMETER
VPI	VALVE POSITION INDICATOR
VS	VOLTMETER SWITCH
W	WHITE OR WATTS
WH	WATTHOUR METER
WM	WATT METER
WP	WEATHERPROOF
X	AUXILIARY RELAY
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
Y	YELLOW
Z	AUXILIARY RELAY
ZS	POSITION SWITCH
ZSS	ZERO SPEED SWITCH

AREA DESIGNATIONS

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

AREA TYPE 1A	CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES, AND ACCESSORIES.
AREA TYPE 4	INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.
AREA TYPE 7A	CLASS I, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
AREA TYPE 7B	CLASS I, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
AREA TYPE 12	INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATIONS.
2. SPARE WIRES SHALL BE TAPED AND COILED.
3. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
5. LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12 AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
6. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC., NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

GENERAL NOTES

1. SOLID LINES (——) INDICATE NEW WORK OR EQUIPMENT.
2. SCREENED LINES (----) INDICATE EXISTING WORK OR EQUIPMENT.
3. DASHED LINES (----) INDICATE FUTURE WORK OR EQUIPMENT.
4. REFER TO THE FOLLOWING DRAWING(S) FOR INSTRUMENTATION LEGEND: I1
5. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
6. INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
   A. ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
   B. FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
   C. SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
   D. DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
	07-02	CONFORMED TO CONSTRUCTION RECORDS	SWH	WEM	DHG

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
LEGEND & ABBREVIATIONS

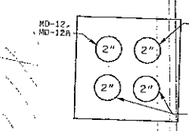
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER, IN THE STATE OF INDIANA NO. 19800311

E1
SHEET 52 OF 73

CCG. DWG. NO.: 62409-116-WRH-E-A0000951

G3009

SITE PLAN
1" = 40'-0"



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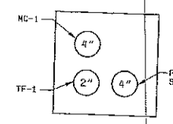

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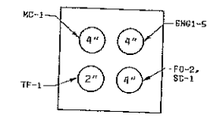

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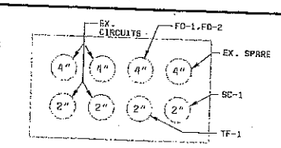

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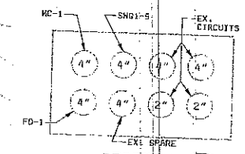

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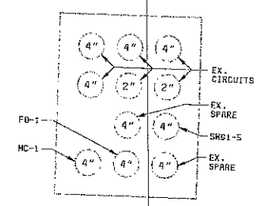

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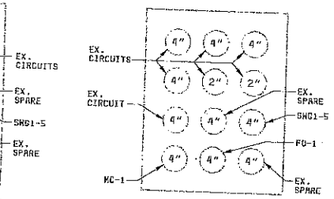

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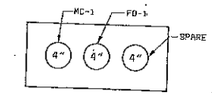

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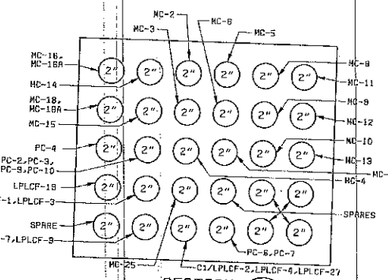

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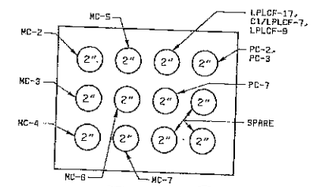

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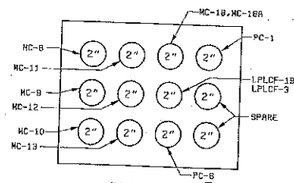

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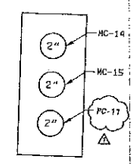

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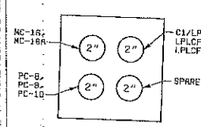

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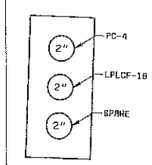

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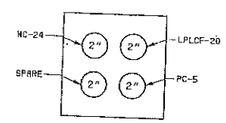

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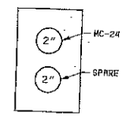

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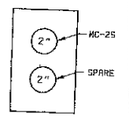
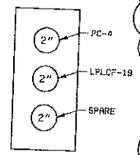
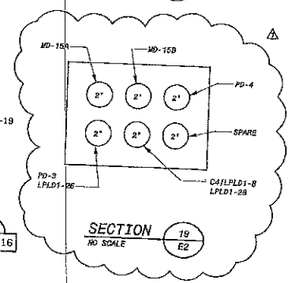


SECTION 17 (E2) NO SCALE



SECTION 18 (E2,E16) NO SCALE



SECTION 19 (E2) NO SCALE

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. UNDERGROUND CONDUITS SHALL NOT BE LESS THAN 2 INCH IN UNDERGROUND DUCT BANKS AND 1 INCH MINIMUM FOR DIRECT BURIED APPLICATIONS.
3. REFER TO INDIVIDUAL PLANS FOR ADDITIONAL DUCT BANK SECTION CUTS.
4. ROUTE CONDUITS FROM SECTION 4 EXPOSED OVERHEAD IN GALLERY BELOW FILTER BUILDING MAIN FLOOR TO BASEMENT OF MAIN BUILDING.
5. EXISTING CONDUIT IS STUBBED OUT AND CAPPED AT THE APPROX LOCATIONS INDICATED. CUT AND EXTEND EXISTING DUCTS WITH NEW CONDUITS AS INDICATED.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	RAM	AS	DHG

DESIGNED JTF
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

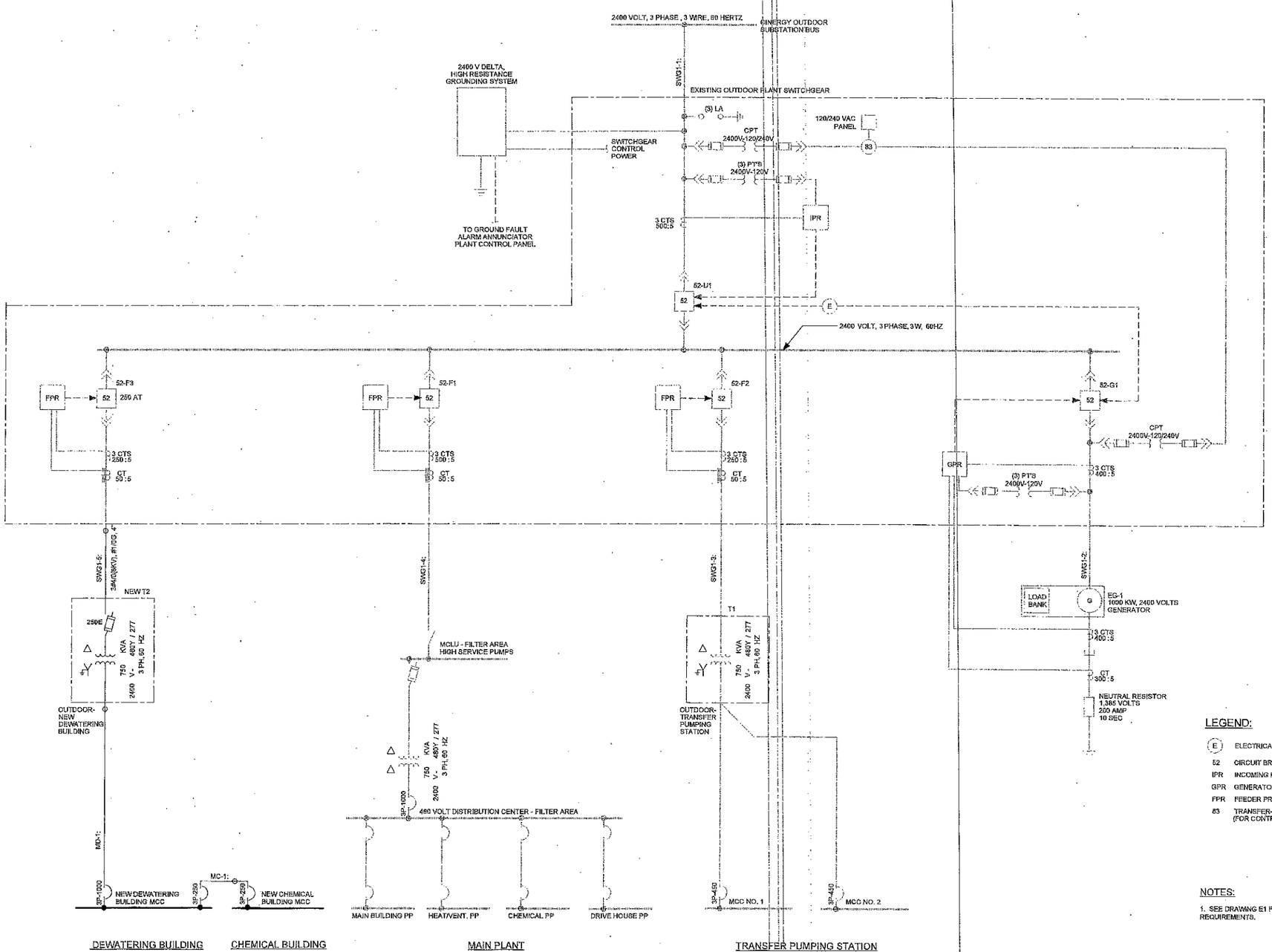
ELECTRICAL SITE PLAN

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. DUTTING ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10800311

E2

SHEET 53 OF 73

62409-116-WRH-E-Z000D0C70 06/29/2000 14:58:20 ACD



LEGEND:

(E)	ELECTRICAL INTERLOCK
52	CIRCUIT BREAKER
IPR	INCOMING POWER PROTECTION RELAY
GPR	GENERATOR PROTECTION RELAY
FPR	FEEDER PROTECTION RELAY
83	TRANSFER-AUTOMATIC (FOR CONTROL/ACCESORY POWER)

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SNB	MEH	DNG

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

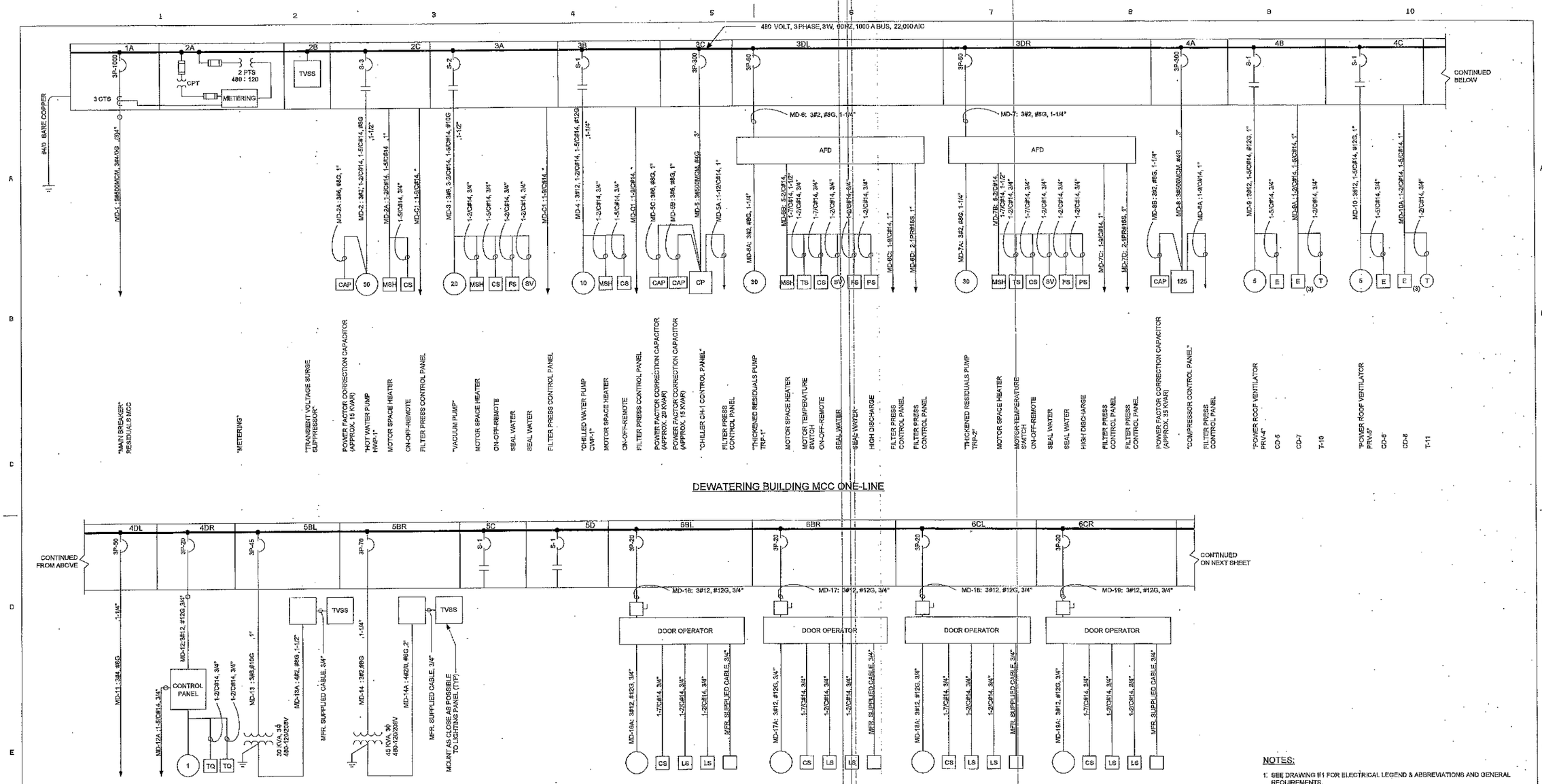
ELECTRICAL
POWER DISTRIBUTION
FUNCTIONAL DIAGRAM

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 05-30-05, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19930011

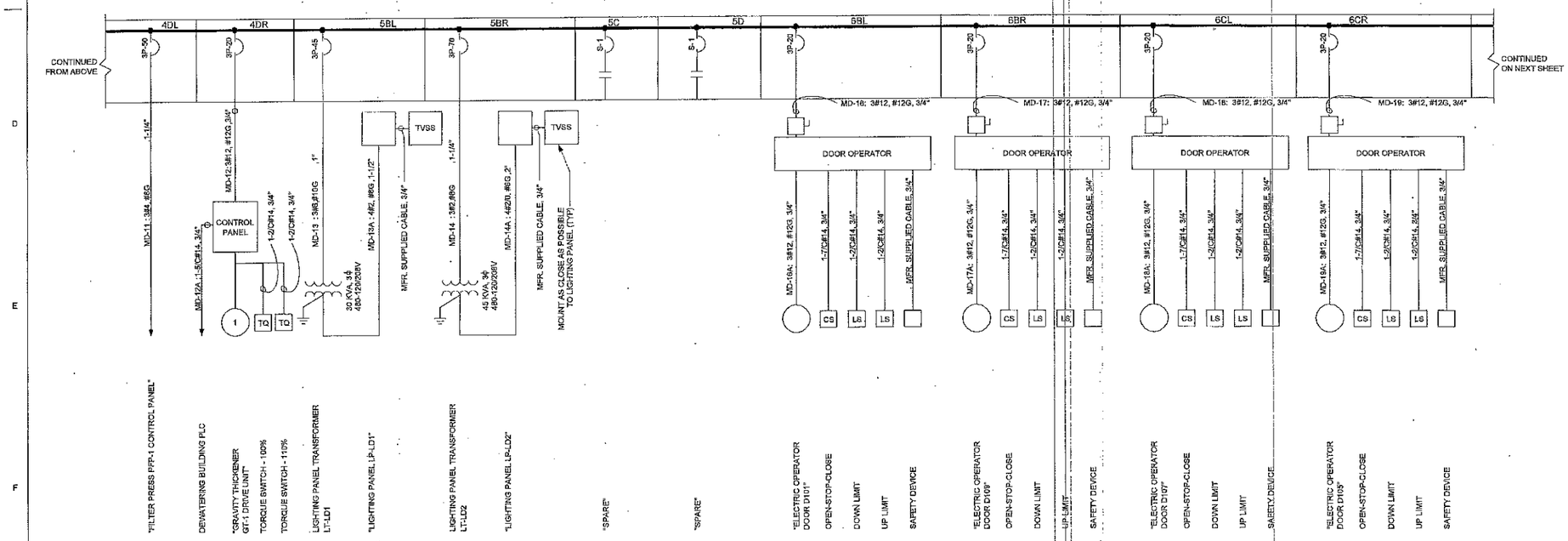
E3

SHEET 54 OF 73

CCG. DWG. NO.: 62409-116-WBH-E-A0000954



DEWATERING BUILDING MCC ONE-LINE



DEWATERING BUILDING MCC ONE-LINE (CONTINUED)

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. MCC NAMEPLATE WORKING IS SHOWN IN QUOTATION MARKS ("") ON THE ONE-LINE DIAGRAM.

* DENOTES INDIVIDUAL MULTI-CONDUCTOR CONTROL CABLES THAT ARE ROUTED IN A COMMON CONDUIT. THE TABLE BELOW DESCRIBES THE NUMBER AND SIZE OF CABLES AND CONDUIT, AND THE NUMBER OF SPARES.

MD-C1: 4-9/C#14, 2" (9 SPARE CONDUCTORS)

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	SHH	MSH	DSG

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
DEWATERING BUILDING
MCC ONE-LINE

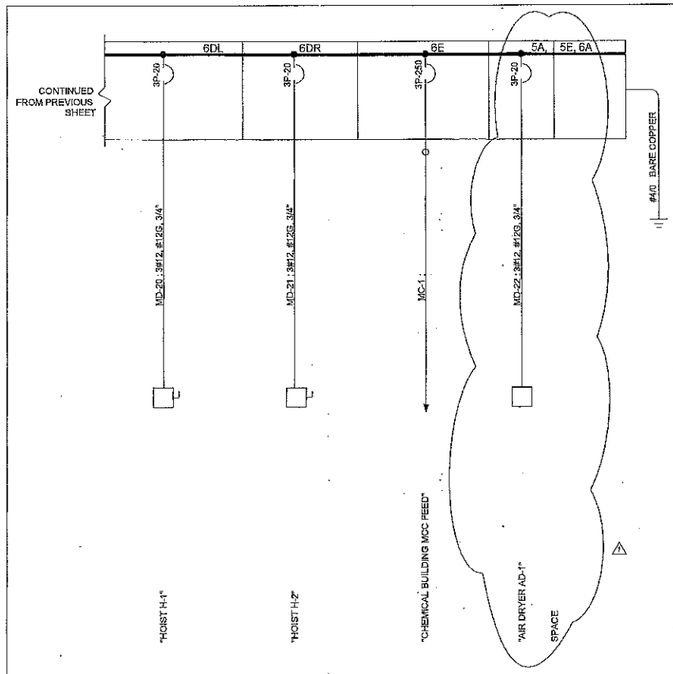
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. COTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19960311

E4

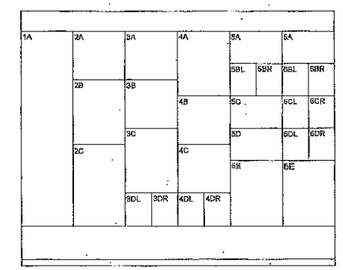
SHEET 55 OF 73

CCC. DWG. NO.: 62409-116-WRH-E-A0001556

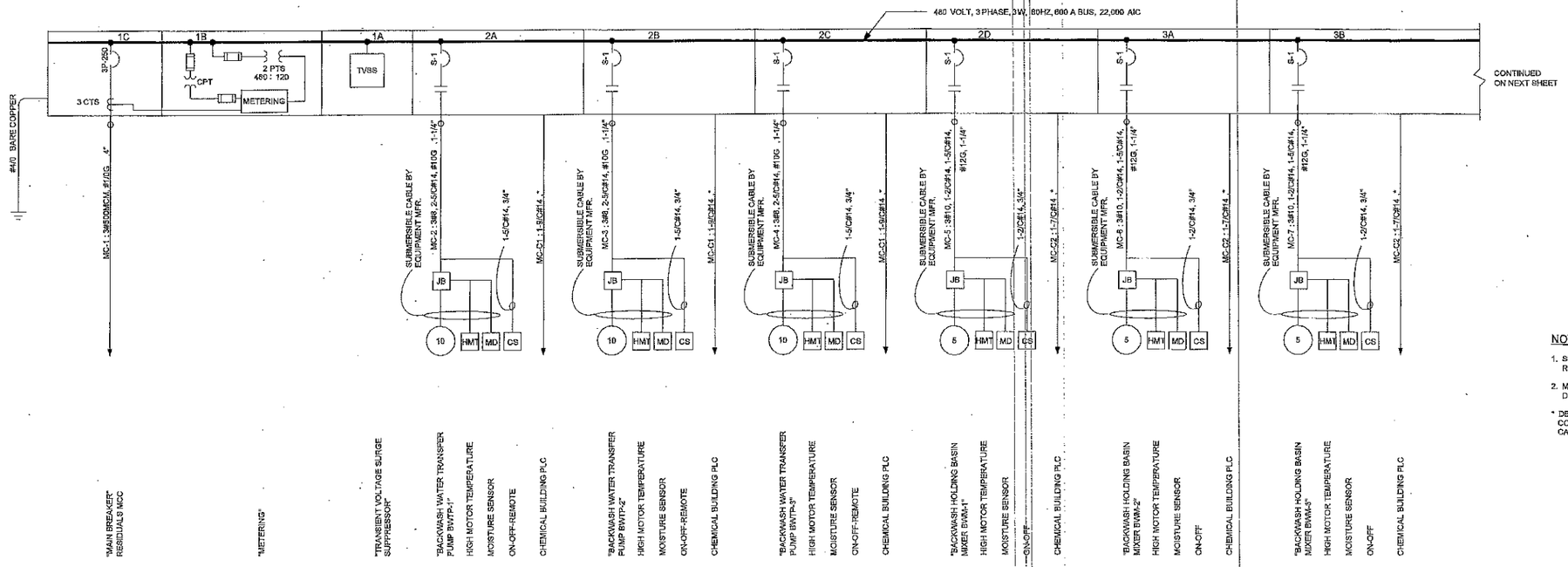
G3039



DEWATERING BUILDING MCC ONE-LINE (CONTINUED)



DEWATERING BUILDING MCC FRONT ELEVATION
NO SCALE



CHEMICAL BUILDING MCC ONE-LINE

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. MCC NAMEPLATE WORKING IS SHOWN IN QUOTATION MARKS (") ON THE ONE-LINE DIAGRAM.

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MC-C1: 4-9/C#14, 2" (9 SPARE CONDUCTORS)
MC-C2: 7-7/C#14, 2" (7 SPARE CONDUCTORS)
MC-C3: 4-9/C#14, 2" (9 SPARE CONDUCTORS)
MC-C4: 3-9/C#14, 2" (9 SPARE CONDUCTORS)

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	COMPARED TO CONSTRUCTION RECORDS	1	SWR	HEW	DHG

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

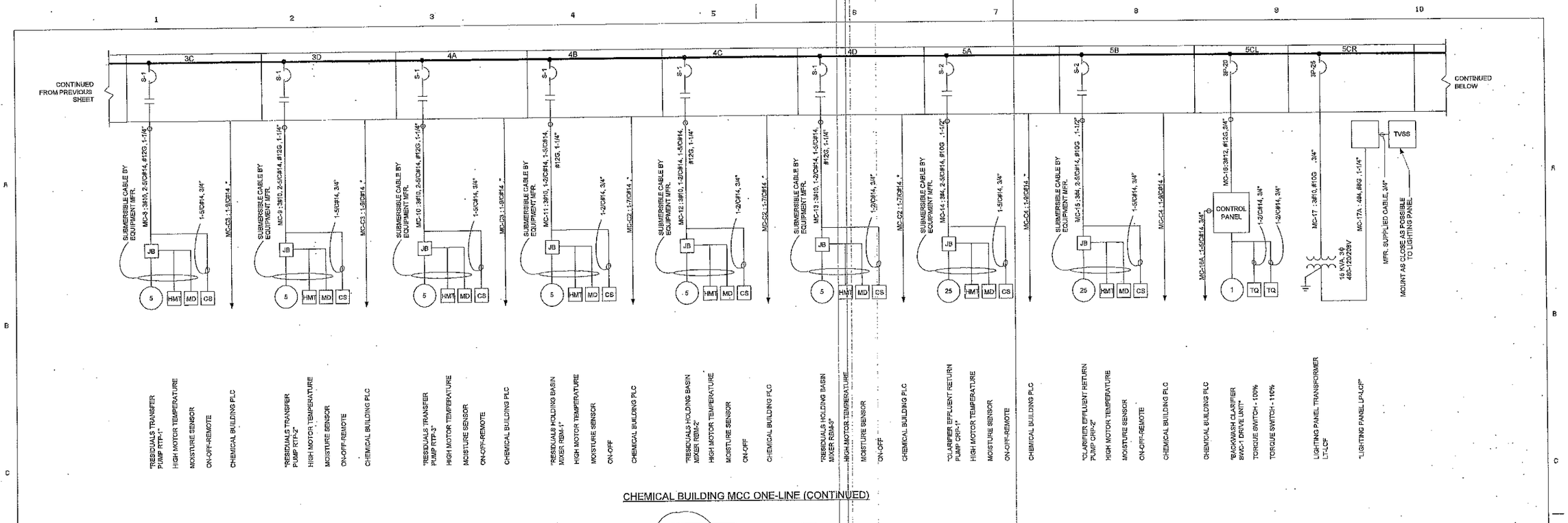
ELECTRICAL
CHEMICAL BUILDING
MCC ONE-LINE

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

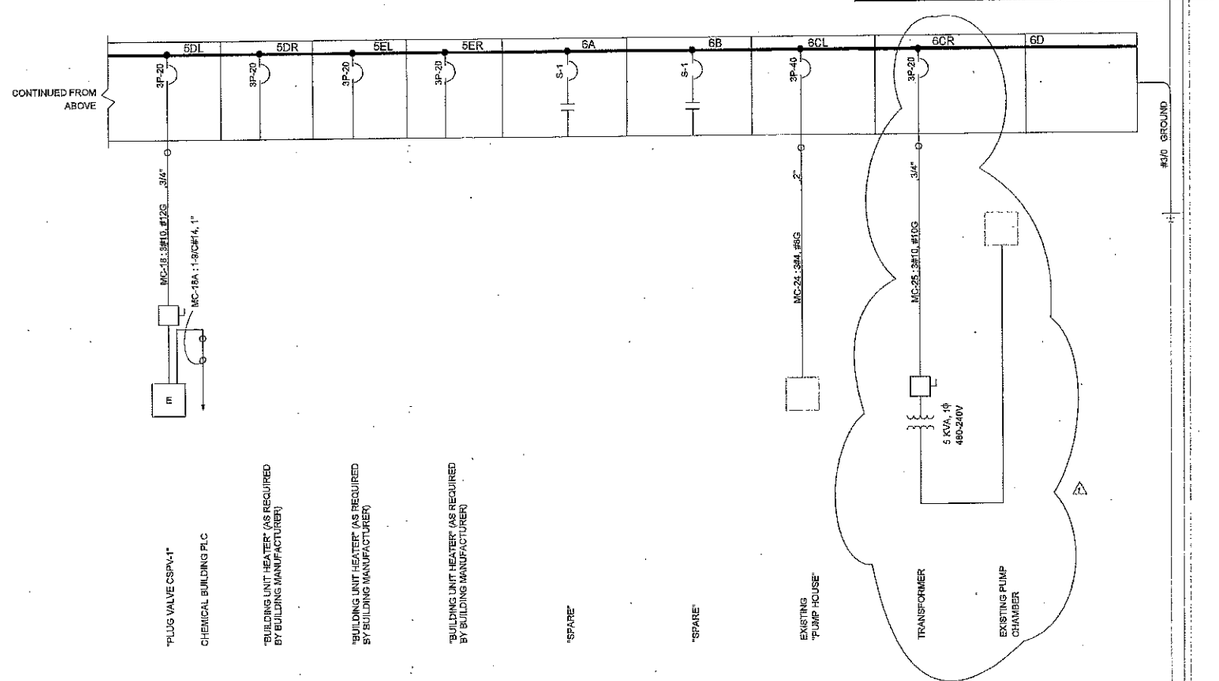
E5

SHEET 58 OF 73

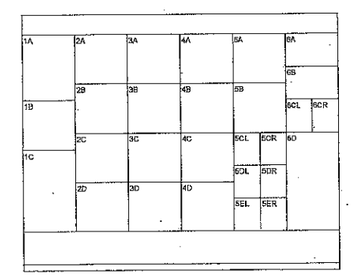
CODE DWG. NO.: 62409-116-WRH-E-00001509



CHEMICAL BUILDING MCC ONE-LINE (CONTINUED)



CHEMICAL BUILDING MCC ONE-LINE (CONTINUED)



CHEMICAL BUILDING MCC FRONT ELEVATION
NO SCALE

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. MCC NAMEPLATE WORKING IS SHOWN IN QUOTATION MARKS (") ON THE ONE-LINE DIAGRAM.

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MC-C1: 4-9/C#14, 2" (9 SPARE CONDUCTORS)
MC-C2: 7-7/C#14, 2" (7 SPARE CONDUCTORS)
MC-C3: 4-9/C#14, 2" (9 SPARE CONDUCTORS)
MC-C4: 3-9/C#14, 2" (9 SPARE CONDUCTORS)

NO.	BY	CK	APP	REVISIONS AND RECORD OF ISSUE
07-02	SWH	GEM	DNG	CONFORMED TO CONSTRUCTION RECORDS

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

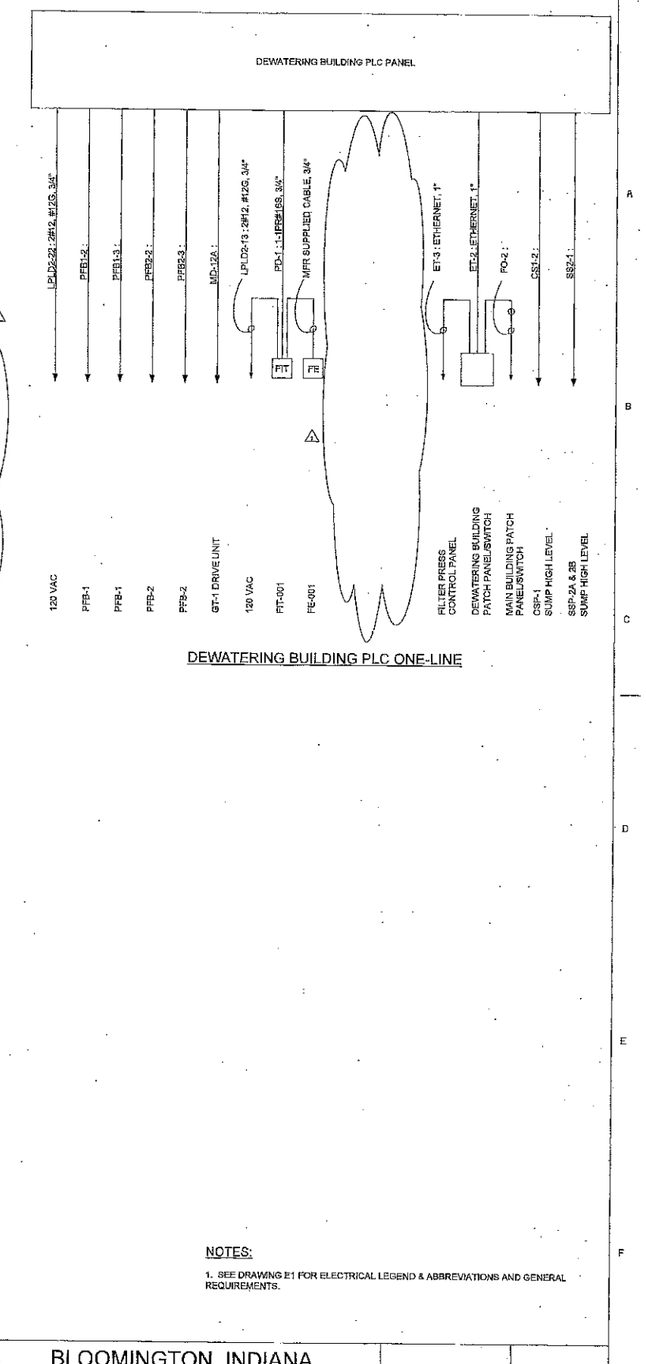
BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
CHEMICAL BUILDING
MCC ONE-LINE (CONTINUED)

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTLER ON 05-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19600311

E6
SHEET 57 OF 73

CCG DWG. NO.: 62409-116-WG1-E-A0001511



NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

NO.	BY	CK.	APP.	REVISIONS AND RECORD OF ISSUE
1	SHH	MEH	DHG	CONFORMED TO CONSTRUCTION RECORDS 07-02

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

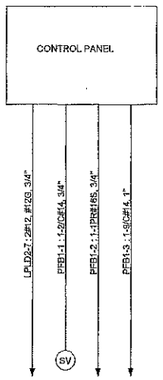
ELECTRICAL
CONTROL ONE-LINES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10800311

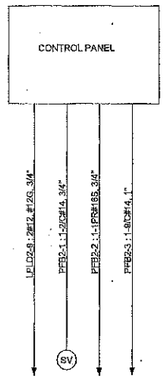
E7

SHEET 58 OF 73

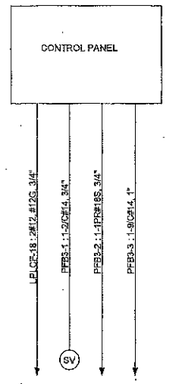
CCR. DWG. NO.: 62409-116-WRH-E-A0001575



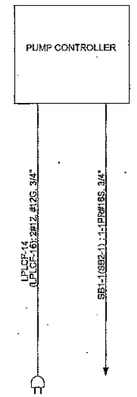
POLYMER FEEDER/BLENDER PFB-1



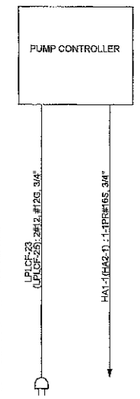
POLYMER FEEDER/BLENDER PFB-2



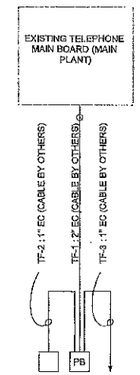
POLYMER FEEDER/BLENDER PFB-3



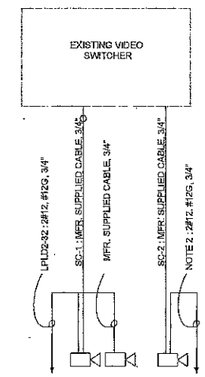
SODIUM BISULFITE METERING PUMP SBMP-1 (SBMP-2)



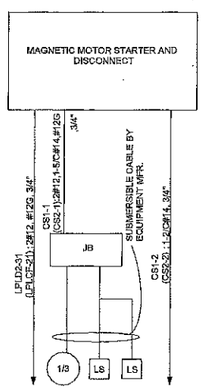
MURIATIC ACID METERING PUMP AMP-1 (AMP-2)



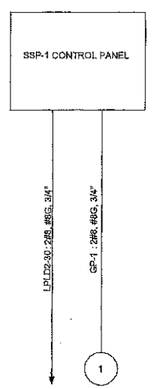
TELEPHONE SYSTEM MODIFICATION ONE-LINE



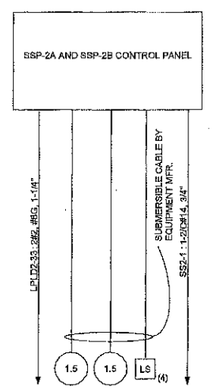
CCTV SYSTEM MODIFICATION ONE-LINE



CHEMICAL SUMP PUMP CSP-1(CSP-2)



GRINDER PUMP SSP-1



DUPLEX SUMP PUMPS SSP-2A AND 2B

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

2. CONNECT TO EXISTING SPARE BREAKER IN LIGHTING PANEL L1 OF THE FILTER BUILDING.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SRH	DEM	GNS

DESIGNED JTF
DETAILED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

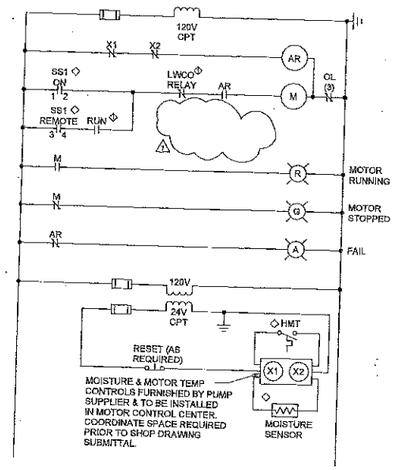
ELECTRICAL
MISCELLANEOUS
ONE-LINES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

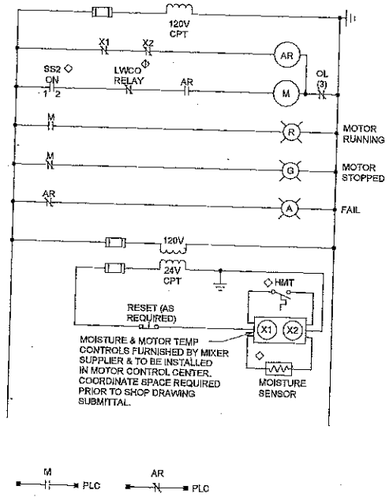
E8

SHEET 59 OF 73

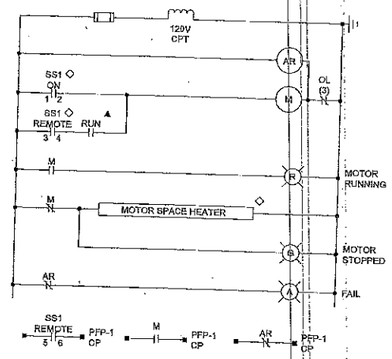
CCQ. DWG. NO. : 62409-116-WRH-E-A0001577



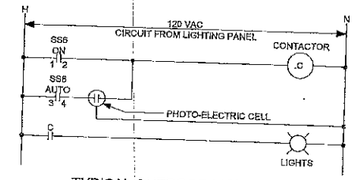
RESIDUALS TRANSFER PUMPS
RTP-1, 2 AND 3
BACKWASH WATER TRANSFER PUMPS
BWTP-1, 2 AND 3
CLARIFIER EFFLUENT RETURN PUMPS
CRP-1 AND 2



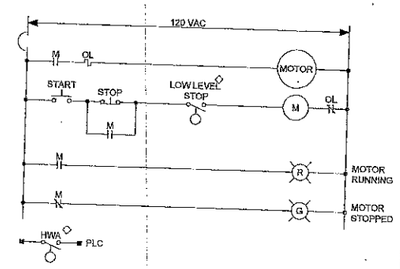
RESIDUALS HOLDING BASIN MIXERS
RBM-1, 2 AND 3
BACKWASH HOLDING BASIN MIXERS
BWM-1, 2 AND 3



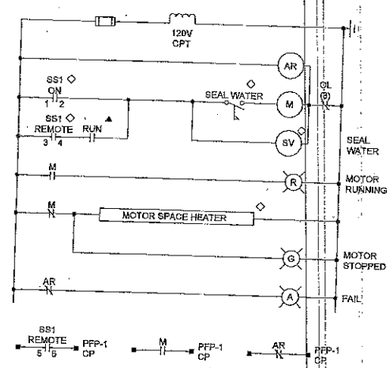
HOT WATER PUMP HWP-1
CHILLED WATER PUMP CWP-1



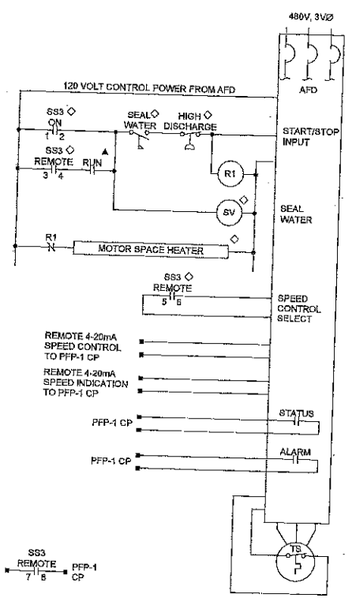
TYPICAL OUTDOOR LIGHTING CONTROL



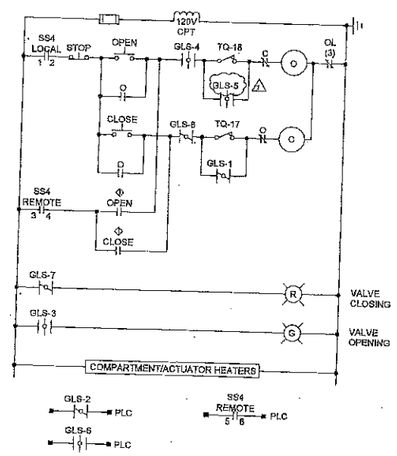
CHEMICAL SUMP PUMPS CSP-1 AND 2



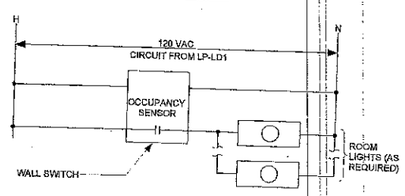
VACUUM PUMP



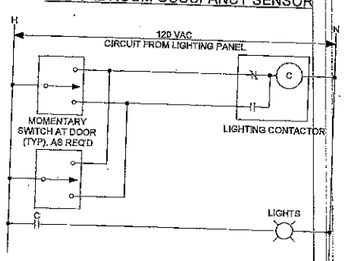
THICKENED RESIDUALS PUMPS TRP-1 AND 2



PLUG VALVE CSPV-1



TYPICAL ROOM OCCUPANCY SENSOR



TYPICAL LIGHTING CONTROL
LIGHTING CONTACTOR

VALVE GEARED LIMIT SWITCH DEVELOPMENT:

ROTOR	GLS CONTACT	ACTUATOR POSITION: FULL OPEN 0%	INTERMEDIATE POSITION (50%)	FULL CLOSED 100%
1	1			
	2			
	3			
	4			
2	5			
	6			
	7			
	8			
3	9			
	10			
	11			
	12			
4	13			
	14			
	15			
	16			

TQ/17 OPENS ON HIGH CLOSING TORQUE
TQ/18 OPENS ON HIGH OPENING TORQUE
=CONTACT CLOSED

SWITCH DEVELOPMENTS:

SS1

CONTACTS	POSITION: ON	OFF	REMOTE
1-2	X		
3-4			X
5-6			X

SS2

CONTACTS	POSITION: ON	OFF
1-2	X	

SS3

CONTACTS	POSITION: ON	OFF	REMOTE
1-2	X		
3-4			X
5-6			X
7-8			X

SS4

CONTACTS	POSITION: LOCAL	REMOTE
1-2	X	
3-4		X
5-6		X

SS6

CONTACTS	POSITION: ON	OFF	AUTO
1-2	X		
3-4			X

DEVICE LOCATION LEGEND:

- ◇ LOCATED AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ FROM CONTROL SYSTEM PLC
- ▲ FROM PRESSURE FILTER PRESS CONTROL PANEL (PFP-1 CP)

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS
2. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
3. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINE IN THE SCHEMATIC SYMBOL LEGEND.
4. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
5. CONTROL SETTINGS, ALARM LIMITS, AND SIMILAR ADJUSTABLE LIMITS ARE INTENDED TO BE FOR INITIAL STARTUP. ADJUSTABLE SETTINGS SHALL BE TESTED AND CHANGED BY THE CONTRACTOR, IF REQUIRED FOR PROPER SEQUENCING AND OPERATION.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMH	MEN	DHG

DESIGNED JTF
DETAILED JTF
CHECKED BLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

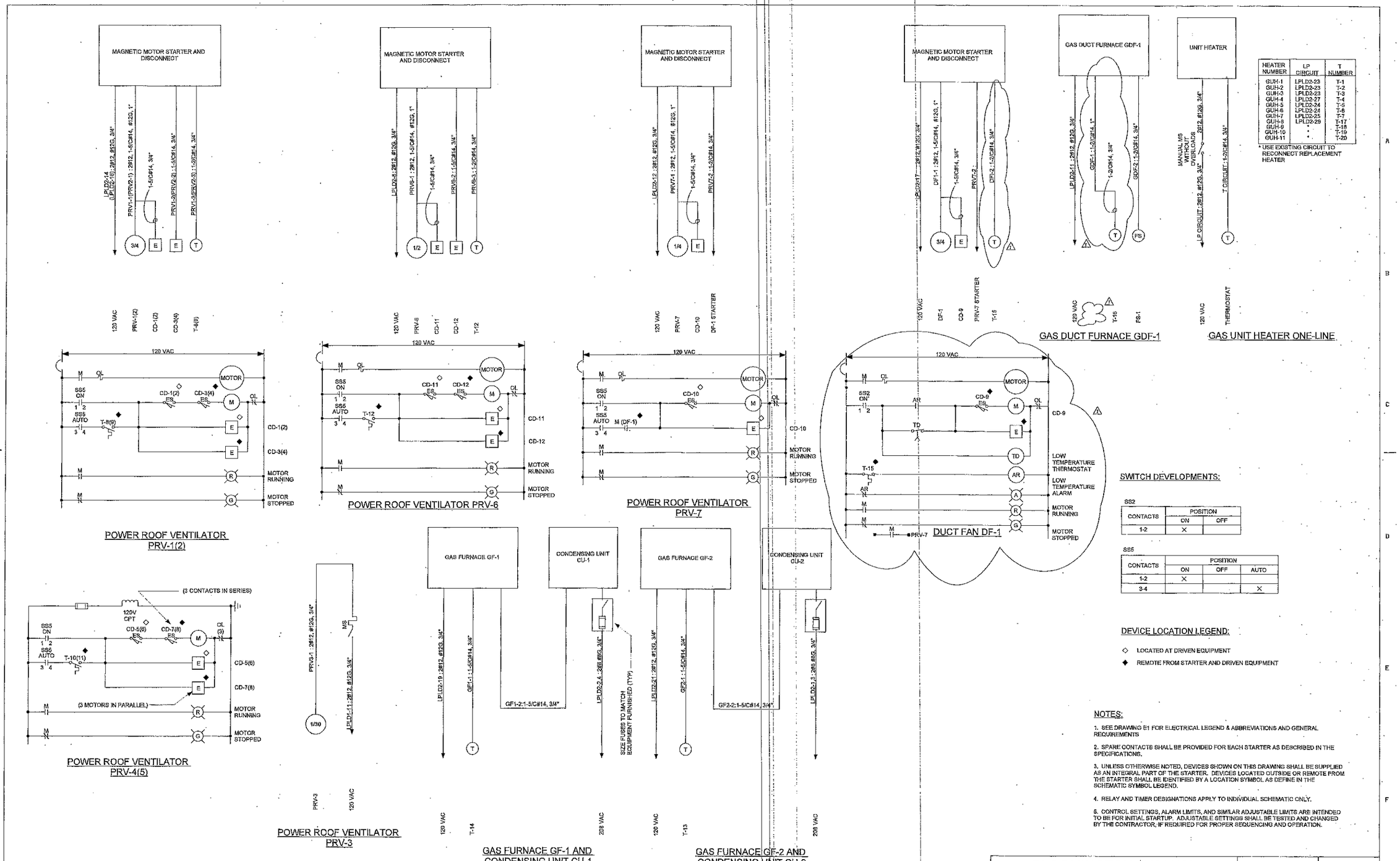
BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL SCHEMATICS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

E9

SHEET 60 OF 73



HEATER NUMBER	LP CIRCUIT	T NUMBER
GUH-1	LPLD2-23	T-1
GUH-2	LPLD2-23	T-2
GUH-3	LPLD2-23	T-3
GUH-4	LPLD2-27	T-4
GUH-5	LPLD2-24	T-5
GUH-6	LPLD2-24	T-6
GUH-7	LPLD2-25	T-7
GUH-8	LPLD2-29	T-17
GUH-9	*	T-18
GUH-10	*	T-19
GUH-11	*	T-20

* USE EXISTING CIRCUIT TO RECONNECT REPLACEMENT HEATER

SWITCH DEVELOPMENTS:

SS2

CONTACTS	POSITION	
	ON	OFF
1-2	X	

SS5

CONTACTS	POSITION		
	ON	OFF	AUTO
1-2	X		
3-4			X

DEVICE LOCATION LEGEND:

◇ LOCATED AT DRIVEN EQUIPMENT

◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS
2. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
3. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINE IN THE SCHEMATIC SYMBOL LEGEND.
4. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
5. CONTROL SETTINGS, ALARM LIMITS, AND SIMILAR ADJUSTABLE LIMITS ARE INTENDED TO BE FOR INITIAL STARTUP. ADJUSTABLE SETTINGS SHALL BE TESTED AND CHANGED BY THE CONTRACTOR, IF REQUIRED FOR PROPER SEQUENCING AND OPERATION.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMH	MEM	DMG

DESIGNED JTF
DRWA/LED JTF
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

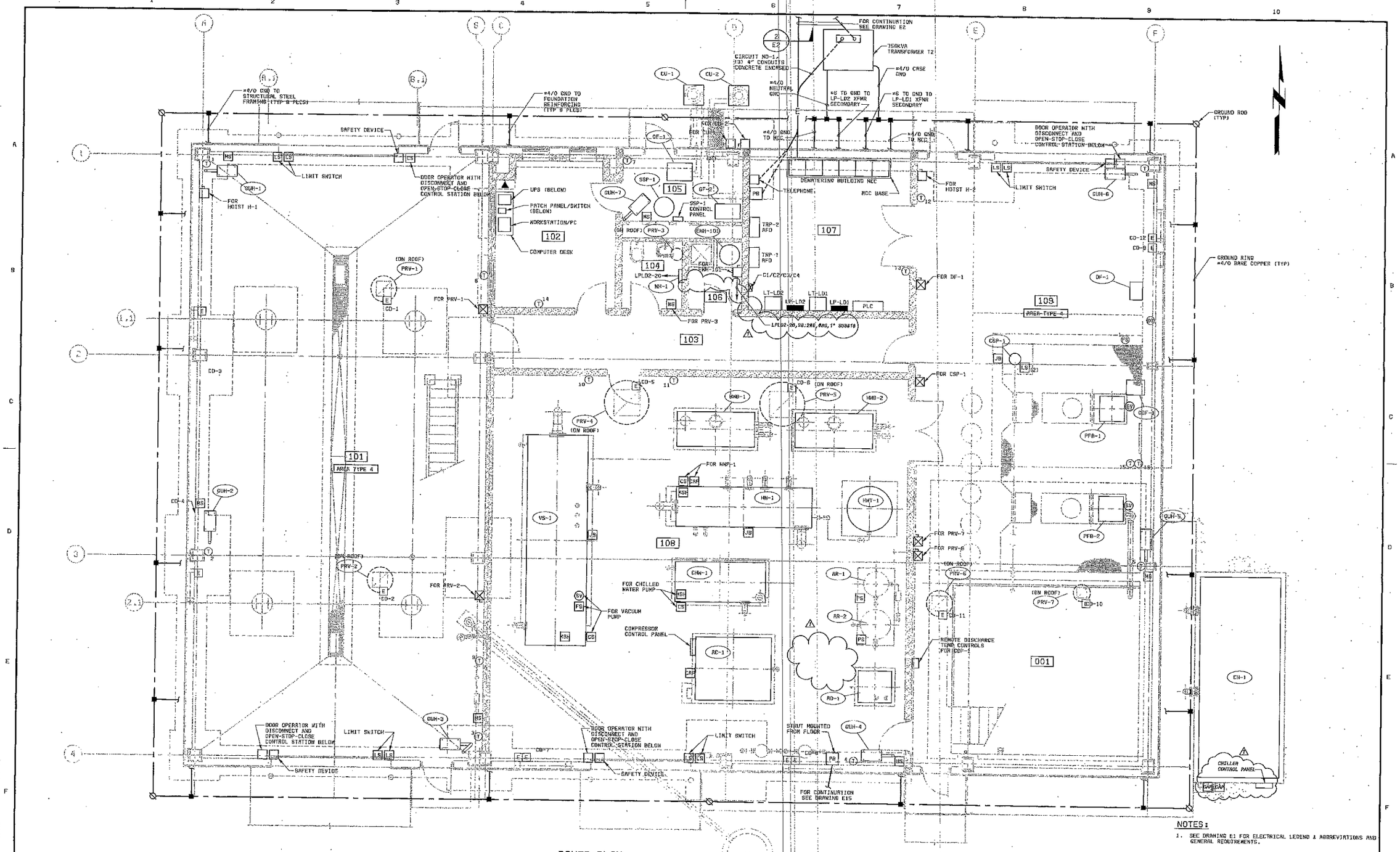
ELECTRICAL
HVAC SCHEMATICS AND
ONE-LINES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L CUTTING ON 09-30-09, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10900311

E10

SHEET 61 OF 73

CCG. DWG. NO.: 62409-116-WRH-E-M0031579



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

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SRM	MEM	DHG

DESIGNED JTF.DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
DEWATERING BUILDING
GROUND FLOOR POWER PLAN

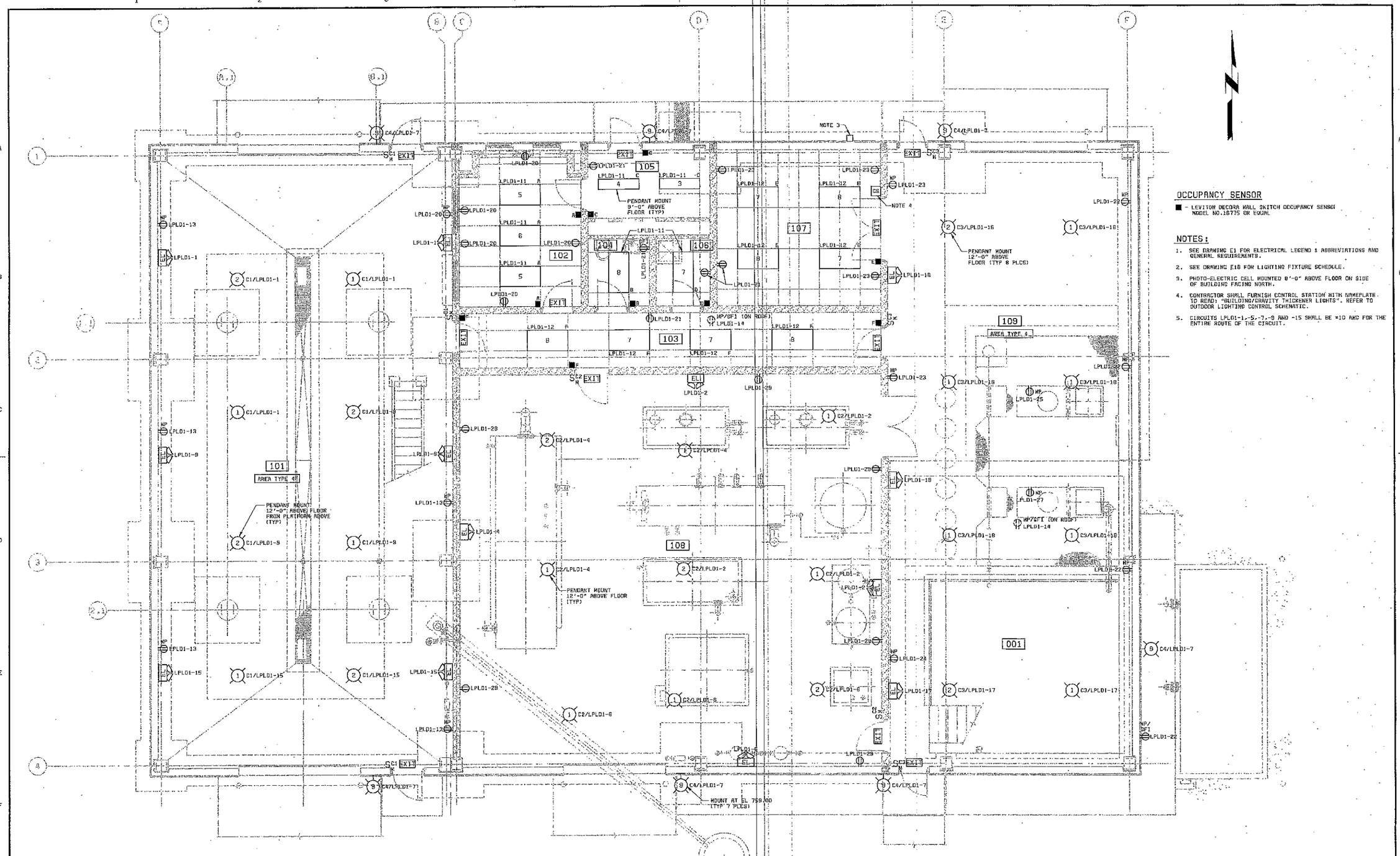
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 18002917

E11

SHEET 62 OF 73

CCO. DWG. NO: 62409-118-WRH-E-R0001235

62409-118-WRH-E-Z0D000CBD 06/28/2000 09:07:47 ACD



OCCUPANCY SENSOR

■ - LEVITON DECORA WALL SWITCH OCCUPANCY SENSOR MODEL NO.16775 OR EQUAL

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SEE DRAWING E16 FOR LIGHTING FIXTURE SCHEDULE.
3. PHOTO-ELECTRIC CELL MOUNTED 8'-0" ABOVE FLOOR ON SIDE OF BUILDING FACING NORTH.
4. CONTRACTOR SHALL FURNISH CONTROL STATION WITH NAMEPLATE TO READ: "BUILDING/GRAVITY THICKENER LIGHTS". REFER TO OUTDOOR LIGHTING CONTROL SCHEMATIC.
5. CIRCUITS LPLD1-1,-5,-7,-9 AND -15 SHALL BE #10 AWG FOR THE ENTIRE ROUTE OF THE CIRCUIT.

LIGHTING PLAN

1/4" = 1'-0"

07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SJH	NEW	DKG
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

DESIGNED JTF,DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
DEWATERING BUILDING
GROUND FLOOR LIGHTING PLAN

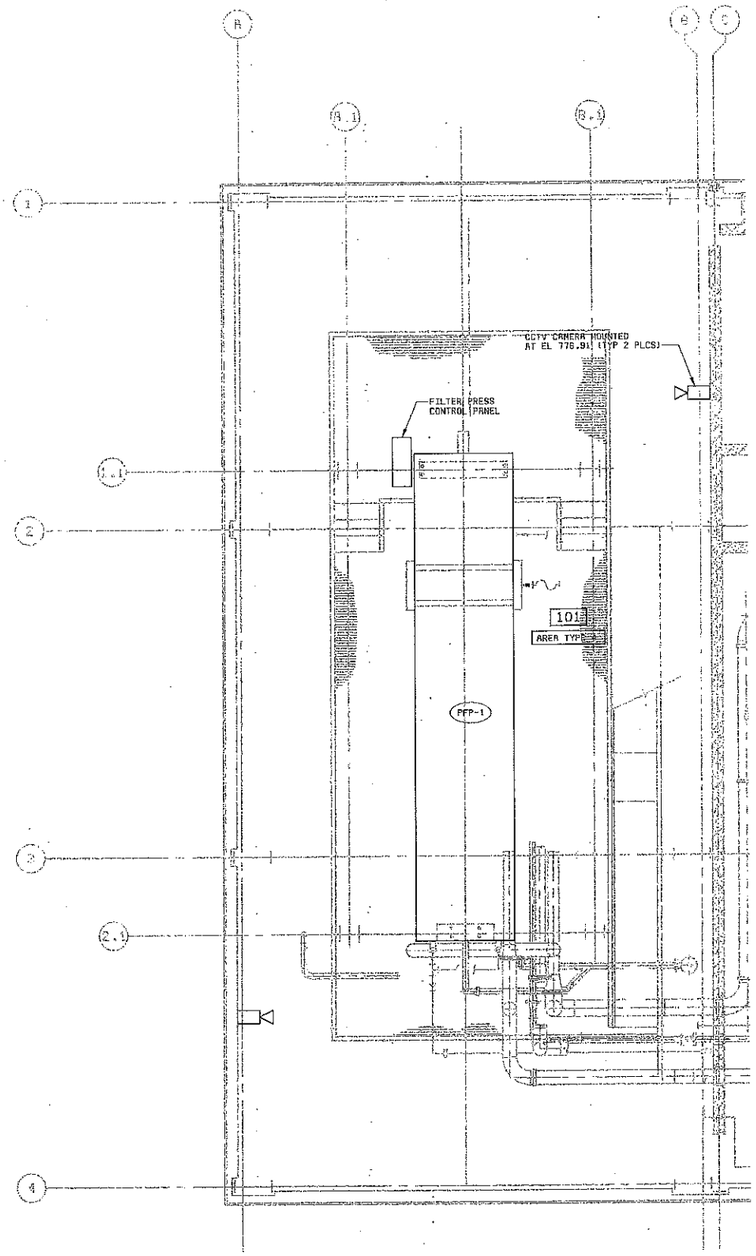
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800011

E12

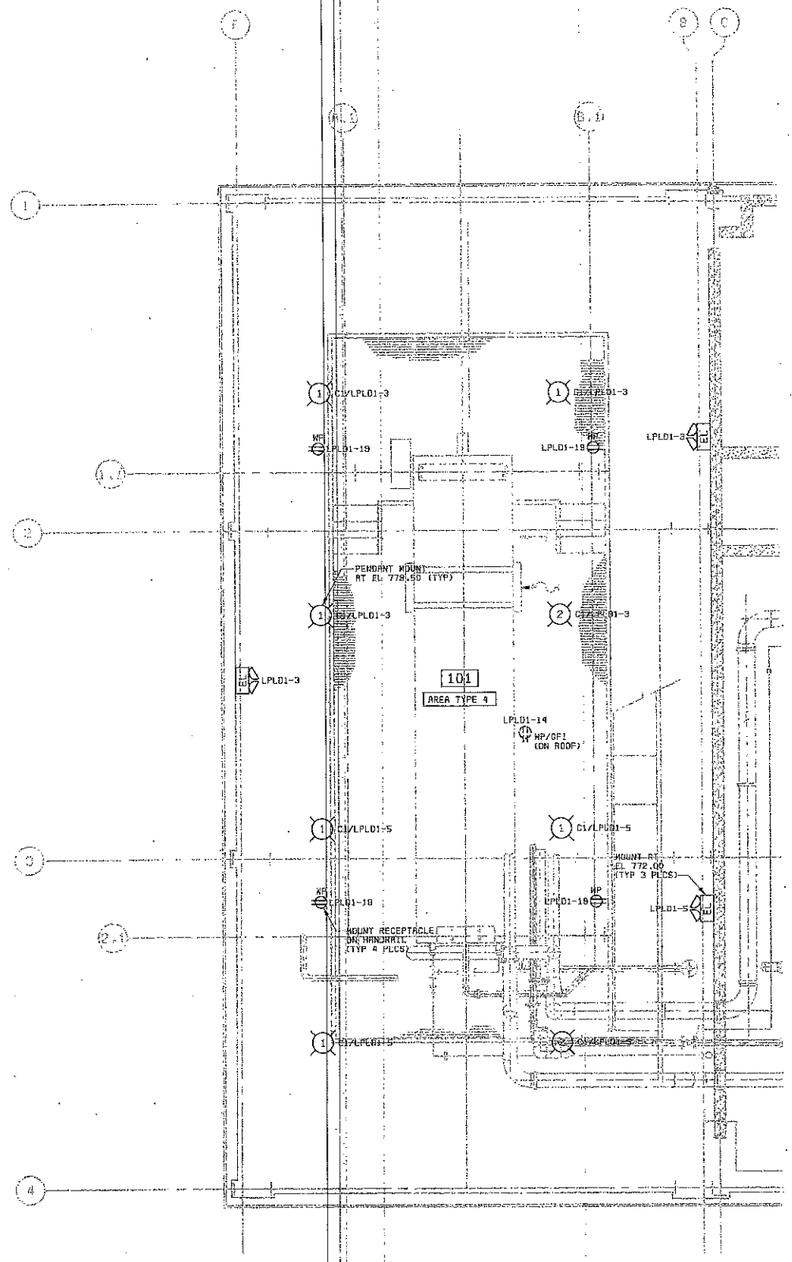
SHEET 63 OF 73

62409-116-WRH-E-Z0000068R 08/28/2000 09:11:39 RCD

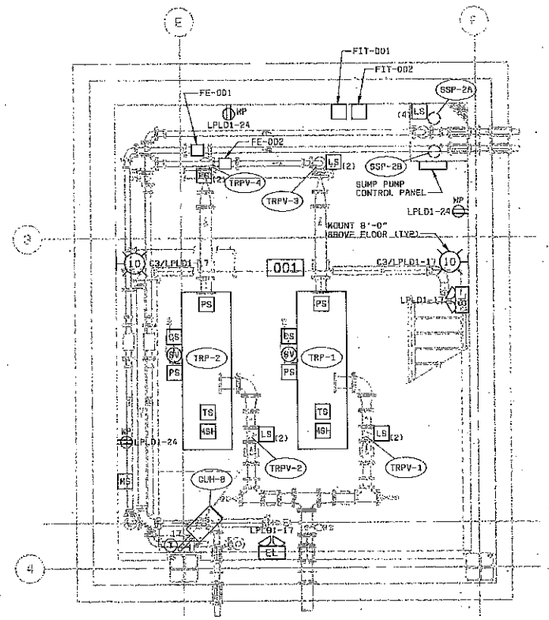
CCC. DWG. NO: 62409-116-WRH-E-R0001237



EQUIPMENT ROOM - PLATFORM
POWER PLAN
1/4" = 1'-0"



EQUIPMENT ROOM - PLATFORM
LIGHTING PLAN
1/4" = 1'-0"



BASEMENT - POWER AND LIGHTING PLAN
1/4" = 1'-0"

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SEE DRAWING E18 FOR LIGHTING FIXTURE SCHEDULE.
3. CIRCUITS LPLD1-3 & LPLD1-5 SHALL BE #10 AWG FOR THE ENTIRE ROUTE OF THE CIRCUIT.

07-02	COMPOSED TO CONSTRUCTION RECORDS	1	FAM	MEW	DHG	
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	

DESIGNED JTF/DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
DEWATERING BUILDING
MISCELLANEOUS
POWER AND LIGHTING PLANS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. GUTTING ON 05-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10900311

E13

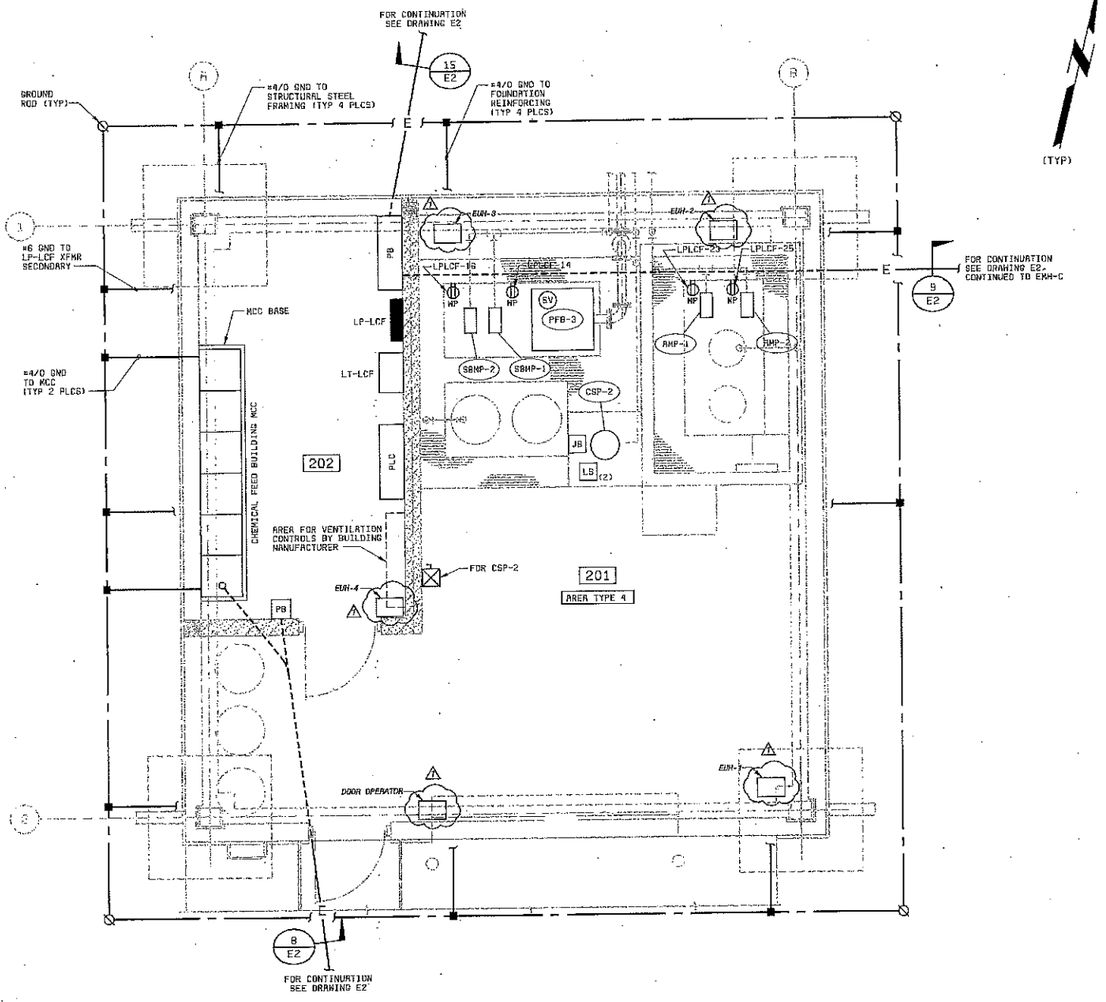
SHEET 64 OF 73

CCC. DWG. NO: 62408-116-WRH-E-A0001239

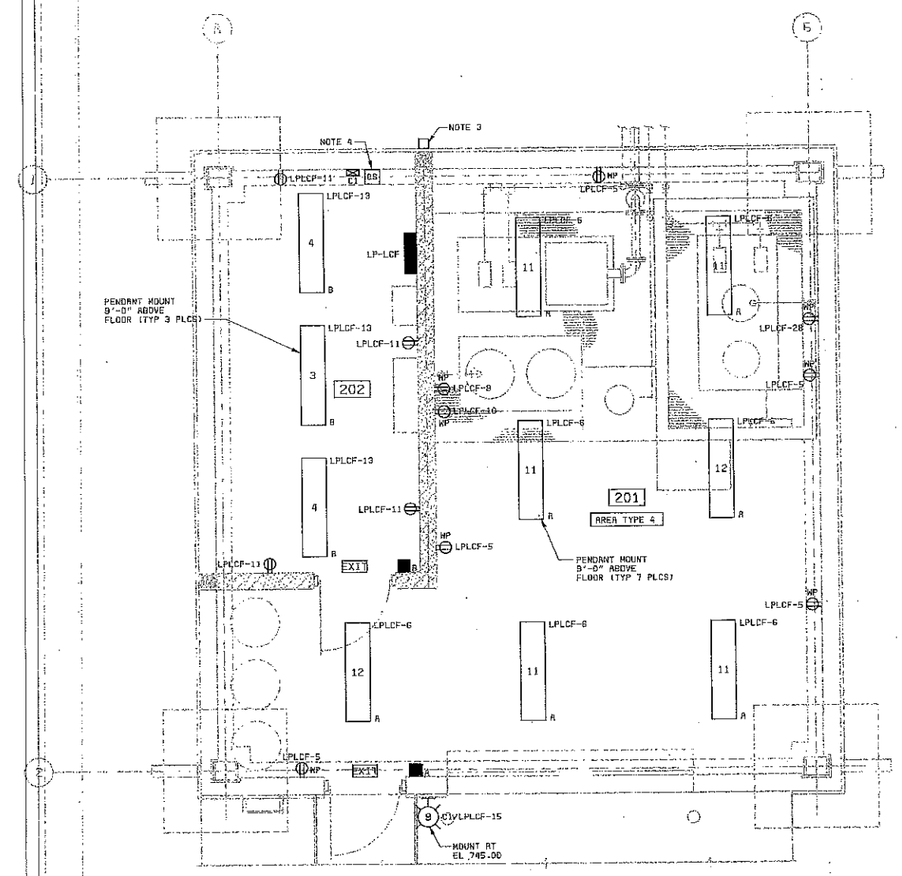
62408-110-WRH-C-R0000745
62408-110-WRH-C-R0001095

03008
FS00000

62408-116-WRH-E-Z00000C65 06/28/2000 10:20:46 RCD



POWER PLAN
3/8" = 1'-0"



LIGHTING PLAN
3/8" = 1'-0"

OCCUPANCY SENSOR

■ - LEVITON DECORA WALL SWITCH OCCUPANCY SENSOR MODEL NO.16775 OR EQUAL

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SEE DRAWING E18 FOR LIGHTING FIXTURE SCHEDULE.
3. PHOTO-ELECTRIC CELL MOUNTED 8'-0" ABOVE FLOOR ON SIDE OF BUILDING FACING NORTH.
4. CONTRACTOR SHALL FURNISH CONTROL STATION WITH NAMEPLATE TO READ: "BUILDING/BASIN LIGHTS". REFER TO OUTDOOR LIGHTING CONTROL SCHEMATIC.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	MEM	DND

DESIGNED JTF,DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
CHEMICAL BUILDING
POWER AND LIGHTING PLANS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10800317

E14

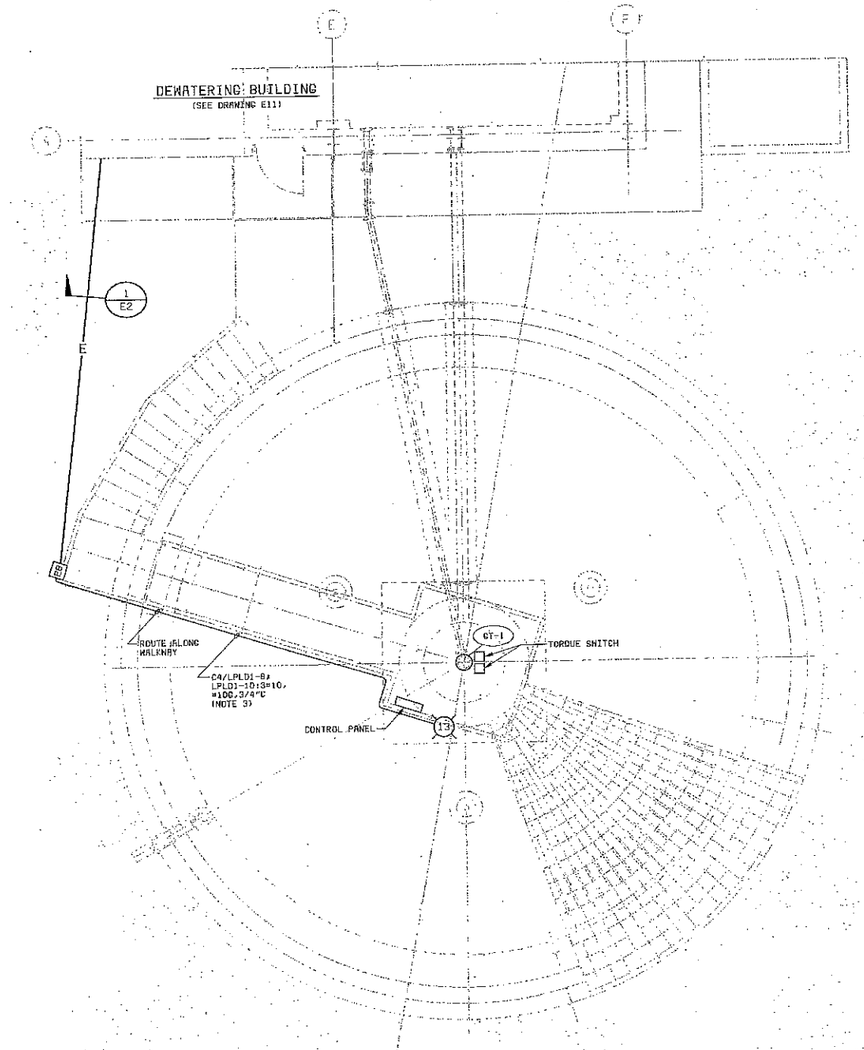
SHEET 65 OF 73

CCG. DWG. NO: 62409-116-NRH-E-AC001316

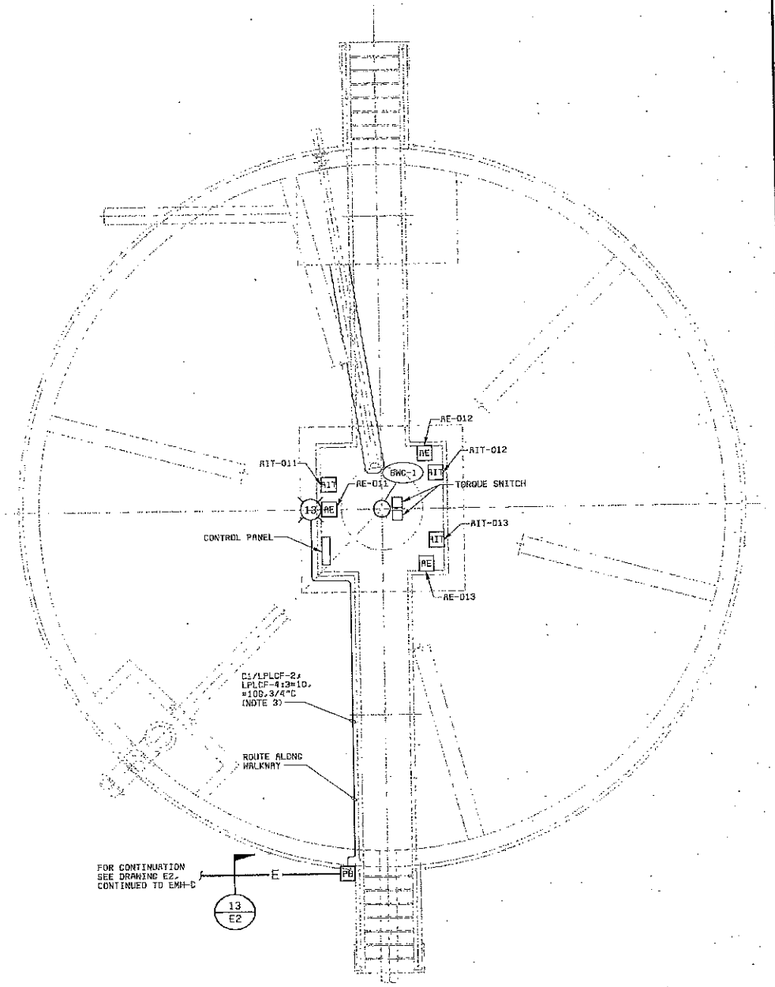
62409-116-NRH-E-Z0000CCGT 08/28/2000 16:25:52 RCD

62409-110-NRH-C-AC001153

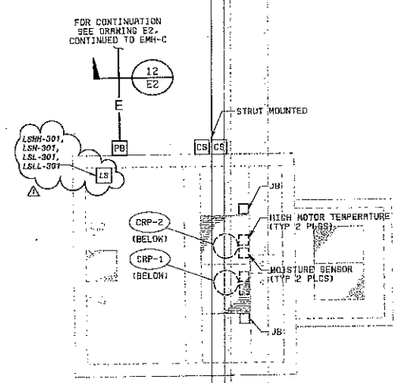
03009 F000000



GRAVITY THICKENER
POWER & LIGHTING PLAN
1/4" = 1'-0"



BACKWASH CLARIFIER
POWER & LIGHTING PLAN
1/4" = 1'-0"



CLARIFIER EFFLUENT CHAMBER
POWER PLAN
3/16" = 1'-0"

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SEE DRAWING E18 FOR LIGHTING FIXTURE SCHEDULE.
3. CIRCUITS C4/LPLD1-8 & C1/LPLCF-2 ARE FOR LIGHTS. CIRCUITS LPLD1-10 & LPLCF-4 ARE FOR RECEPTACLES.

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	FAW	MEM	DWO

DESIGNED JTF/DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES
ELECTRICAL
GRAVITY THICKENER, CLARIFIER EFFLUENT CHAMBER & BACKWASH CLARIFIER POWER AND LIGHTING PLANS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

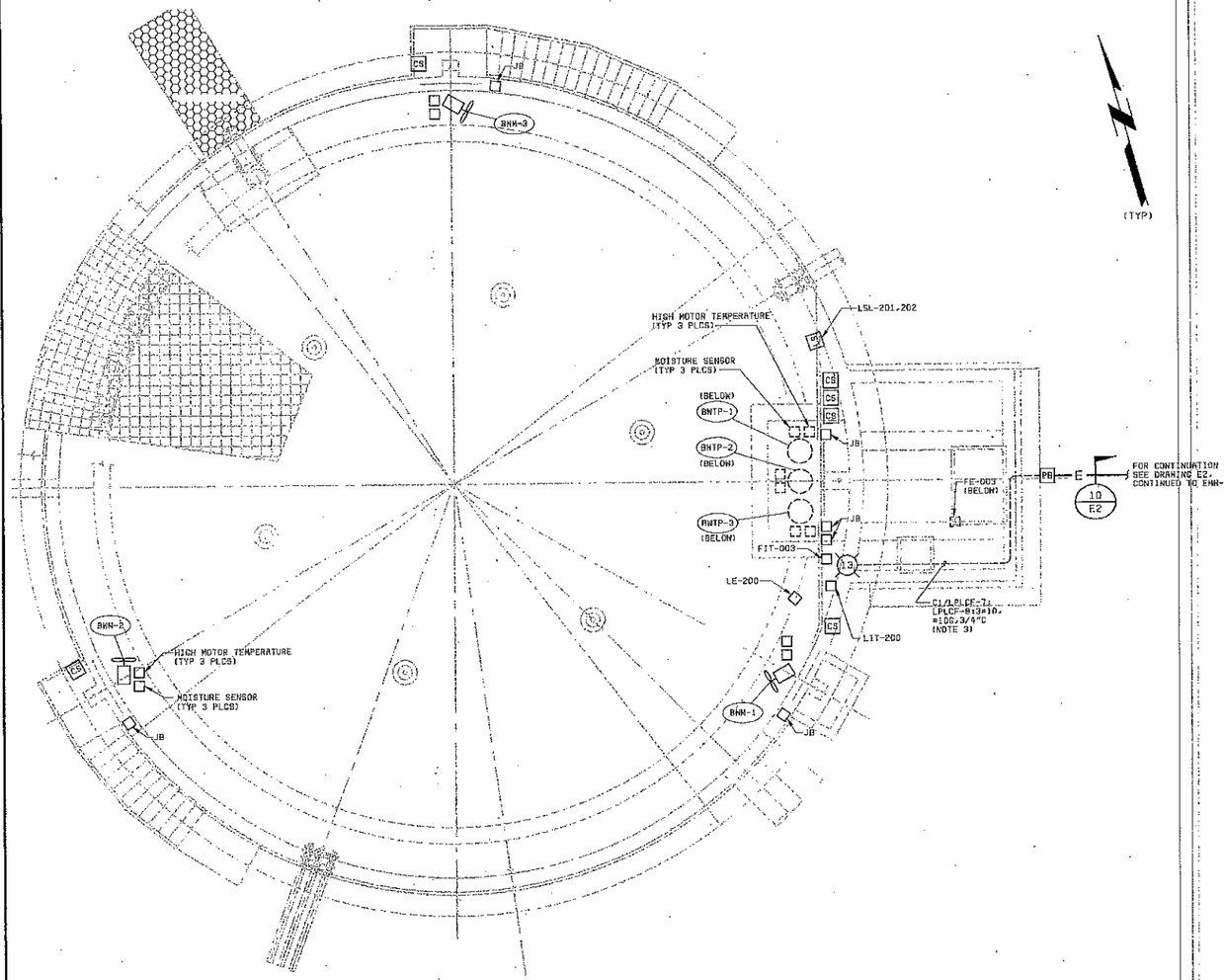
E15

SHEET 66 OF 73

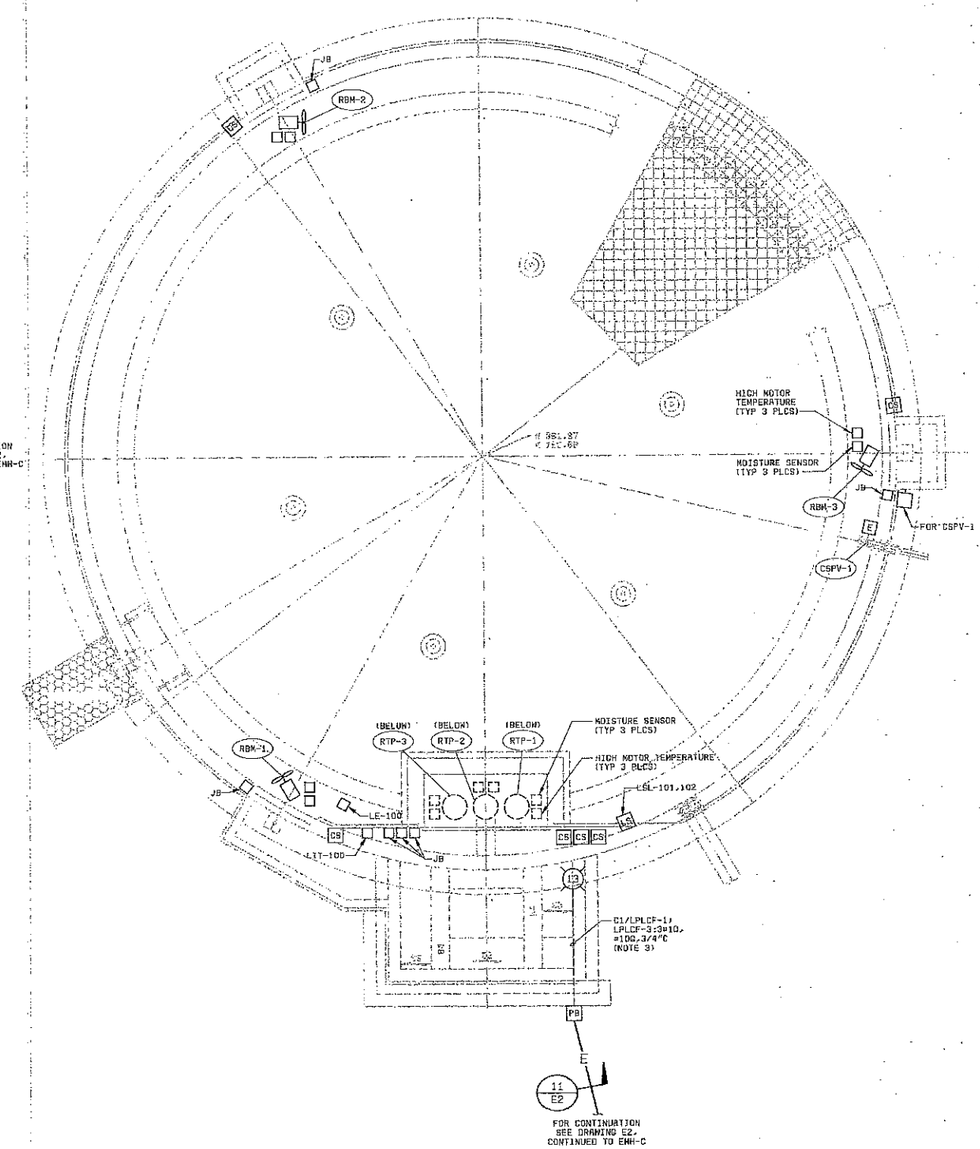
ECG. DWG. NO: 62409-116-WRH-E-R0001570

62409-110-WRH-C-R0000937
62409-110-WRH-C-R0000245
62409-110-WRH-C-R0000245
62409-116-WRH-E-R0000245

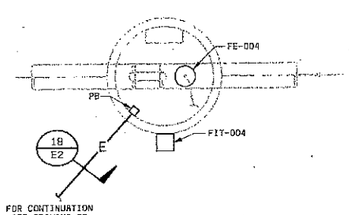
62409-118-WRH-E-Z0C000C71 08/28/2000 14:57:55 ACD



BACKWASH WATER HOLDING BASIN - POWER & LIGHTING PLAN
3/16" = 1'-0"



RESIDUALS HOLDING BASIN - POWER & LIGHTING PLAN
3/16" = 1'-0"



MANHOLE NO.2 - POWER PLAN
3/8" = 1'-0"

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SEE DRAWING E18 FOR LIGHTING FIXTURE SCHEDULE.
3. CIRCUITS C1/LPLCF-1 & C1/LPLCF-7 ARE FOR LIGHTS. CIRCUITS LPLCF-3 & LPLCF-8 ARE FOR RECEPTACLES.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAH	AS	DMS

DESIGNED JTF/DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
RESIDUALS & BACKWASH WATER HOLDING BASIN - POWER AND LIGHTING PLANS

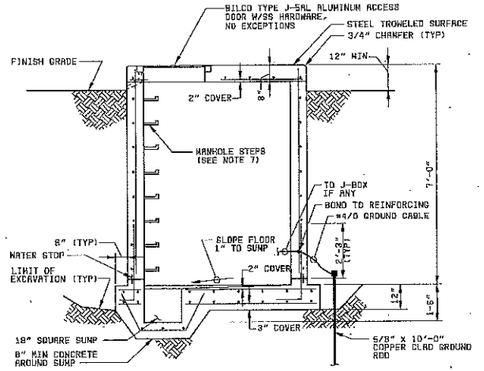
THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 08-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10800311

E16

SHEET 67 OF 73

CCG. DWG. NO: 62409-118-WRH-E-A0001572

62409-118-WRH-E-Z00000C72 08/28/2000 14:24:46 ACD

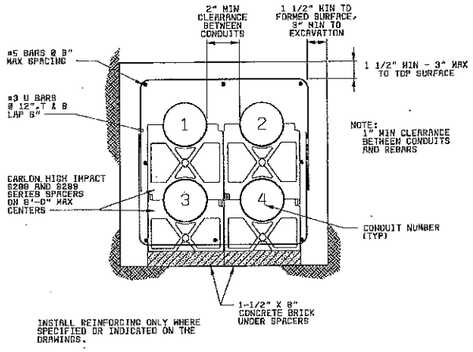


ELECTRICAL MANHOLE NOTES:

1. CABLE AND CONDUIT SUPPORTS SHALL BE SPACED AT 2'-0" HORIZONTAL CENTERS IN WALLS AND SHALL BEGIN 2'-0" FROM FLOOR.
2. SUPPORTS IN CEILINGS SHALL RUN FROM WALL TO WALL.
3. OPENING SHALL BE PROVIDED IN MANHOLE WALLS FOR CONDUIT BANK ENTRANCE AS REQUIRED.
4. ALL REINFORCING ON THIS DETAIL SHALL BE #5@12" UNLESS NOTED OTHERWISE. CENTER VERTICAL REINFORCING IN THE WALLS.
5. CONCRETE TO BE ROUGH AND CLEAN AT CONSTRUCTION JOINT FACES.
6. SEE DRAWING S1 FOR CORNER REINFORCING DETAILS.
7. MANHOLE STEPS SHALL BE POLYPROPYLENE COATED STEEL REINFORCED. COPOLYMER PROPYLENE SHALL MEET THE REQUIREMENTS OF ASTM D4101, REINFORCED WITH PREFORMED 3/8" MINIMUM DIAMETER REINFORCING STEEL CONFORMING TO ASTM A615, GRADE 60, NO EXCEPTIONS.

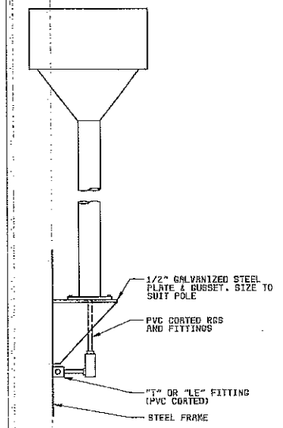
ELECTRICAL MANHOLE SECTION (1)

NO SCALE NOT SUITABLE FOR ROADWAY LOCATIONS



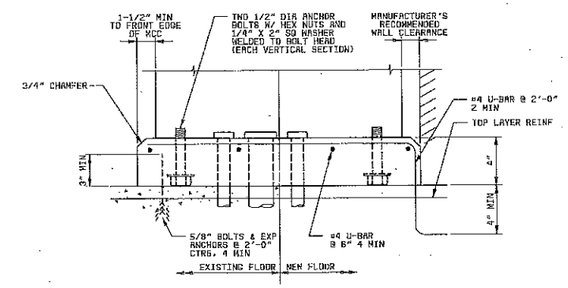
TYPICAL DUCT BANK SECTION

NO SCALE



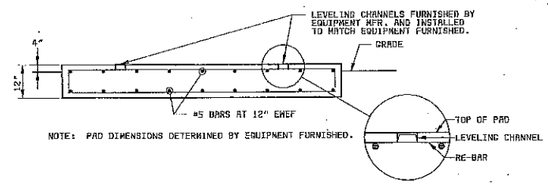
STEEL WALKWAY POLE MOUNTING DETAIL

NO SCALE



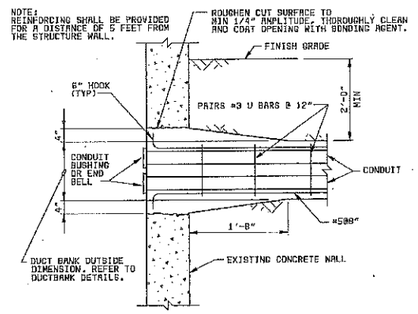
MOTOR CONTROL CENTER BASE

NO SCALE



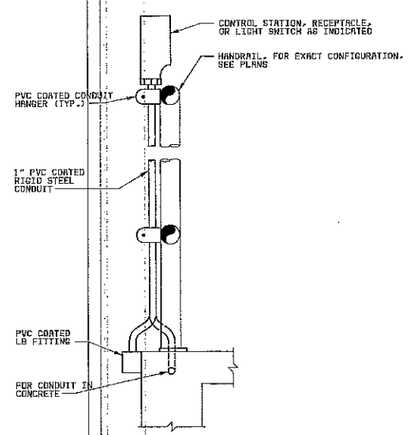
TRANSFORMER PAD DETAIL

NO SCALE



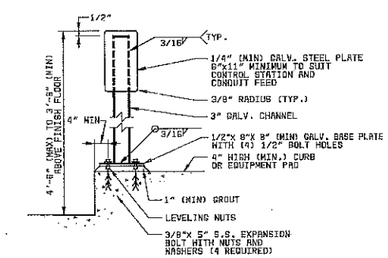
TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL

NO SCALE
NOTE: FOR EXISTING WALL



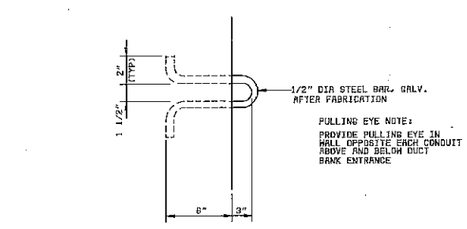
TYPICAL HANDRAIL MOUNTING DETAIL

NO SCALE



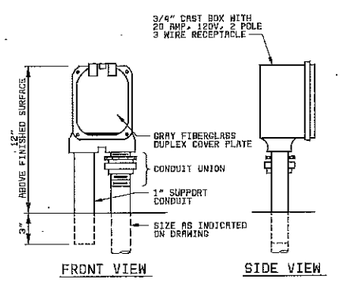
TYPICAL CONTROL STATION MOUNTING DETAIL

NO SCALE



PULLING EYE

NO SCALE



NOTE: ALL EXPOSED CONDUIT SHALL BE PVC COATED RIGID STEEL.

TYPICAL WEATHERPROOF RECEPTACLE MOUNTING DETAIL

NO SCALE

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMH	WEH	DHD

DESIGNED JTF,DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
MISCELLANEOUS DETAILS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-02, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19900311

E17

SHEET 68 OF 73

PANELBOARD: LP-LD1	BUS: COPPER	MAINS: 3P-100A MAIN BREAKER
SERVICE: 120/208V,3Ø,4W,S/N	RATING: 225A	LOCATION: DEWATERING BUILDING ELECTRICAL ROOM - RM 107
MOUNTING: SURFACE		

LOAD	P	BKR	CKT#		BKR	P	LOAD
LIGHTS - RM 101	1	20	1	2	20	1	LIGHTS - RM 108
LIGHTS - RM 101	1	20	3	4	20	1	LIGHTS - RM 108
LIGHTS - RM 101	1	20	5	6	20	1	LIGHTS - RM 108
LIGHTS - OUTDOOR	1	20	7	8	20	1	LIGHT - GRAVITY THICKENER
LIGHTS - RM 101	1	20	9	10	20	1	RECP - GRAVITY THICKENER
LIGHTS - RM 102,104,105,106 & PRV-3	1	20	11	12	20	1	LIGHTS - RM 103 & 107
RECP - RM 101	1	20	13	14	20	1	RECP - ROOFTOP
LIGHTS - RM 101	1	20	15	16	20	1	LIGHTS - RM 109
LIGHTS - RM 001 & 109	1	20	17	18	20	1	LIGHTS - RM 109
RECP - RM 101 (ON PLATFORM)	1	20	19	20	20	1	RECP - RM 101 & 102
RECP - RM 103,104,105,106 & 107	1	20	21	22	20	1	RECP - RM 109 & OUTDOOR
RECP - RM 107 & 109	1	20	23	24	20	1	RECP - RM 001 & 109
RECP - DRUM PUMP-RM 109	1	20	25	26	20	1	SPARE
RECP - DRUM PUMP-RM 109	1	20	27	28	20	1	SPARE
RECP - RM 108	1	20	29	30	20	1	SPARE
SPARE	1	20	31	32	20	1	SPARE
SPARE	1	20	33	34	20	1	SPARE
SPARE	1	20	35	36	20	1	SPARE
SPACE	1		37	38		1	SPACE
SPACE	1		39	40		1	SPACE
SPACE	1		41	42		1	SPACE

PANELBOARD: LP-LD2	BUS: COPPER	MAINS: 3P-150A MAIN BREAKER
SERVICE: 120/208V,3Ø,4W,S/N	RATING: 225A	LOCATION: DEWATERING BUILDING ELECTRICAL ROOM - RM 107
MOUNTING: SURFACE		

LOAD	P	BKR	CKT#		BKR	P	LOAD
CU-2	2	40	1	2	35	2	CU-1
--	--	--	3	4	--	--	"
VS-1 (FLOW METER)	1	20	5	6	20	1	PRV-6
PFB-1	1	20	7	8	20	1	HWB-1
PFB-2	1	20	9	10	20	1	HWB-2
GDF-1	1	20	11	12	20	1	PRV-7
FIT/FE-001	1	20	13	14	20	1	PRV-1
FIT/FE-002	1	20	15	16	20	1	PRV-2
DF-1	1	20	17	18	40	1	SPARE △1
OF-1	1	20	19	20	20	1	WH-1
CF-2	1	20	21	22	20	1	PLC
GUH-1,-2,-3	1	20	23	24	20	1	GUH-5,-6
GUH-7	1	20	25	26	40	2	EWH-101
GUH-4	1	20	27	28	--	--	△1
GUH-8	1	20	29	30	30	1	SSP-1
CSP-1	1	20	31	32	20	1	CCTV
SSP-2A,2B	1	60	33	34	20	1	SPARE
SPARE	1	20	35	36	20	1	SPARE
SPARE	1	20	37	38	20	1	SPARE
SPARE	1	20	39	40	20	1	SPARE
SPARE	1	20	41	42	20	1	SPARE

PANELBOARD: LP-LCF	BUS: COPPER	MAINS: 3P-50A MAIN BREAKER
SERVICE: 120/208V,3Ø,4W,S/N	RATING: 100A	LOCATION: CHEMICAL FEED BUILDING ELECTRICAL ROOM - RM 202
MOUNTING: SURFACE		

LOAD	P	BKR	CKT#		BKR	P	LOAD
LIGHT - RESIDUALS HOLDING BASIN	1	20	1	2	20	1	LIGHT - BACKWASH CLARIFIER
RECP - RESIDUALS HOLDING BASIN	1	20	3	4	20	1	RECP - BACKWASH CLARIFIER
RECP - CHEMICAL STORAGE ROOM	1	20	5	6	20	1	LIGHTS - CHEMICAL STORAGE ROOM
LIGHT - BACKWASH WATER HOLDING BASIN	1	20	7	8	20	1	RECP - DRUM PUMP
RECP - BACKWASH WATER HOLDING BASIN	1	20	9	10	20	1	RECP - DRUM PUMP
RECP - ELECTRICAL ROOM	1	20	11	12	20	1	PLC
LIGHTS - ELECTRICAL ROOM	1	20	13	14	20	1	SBMP-1
LIGHT - OUTDOOR	1	20	15	16	20	1	SBMP-2
FIT/FE-003, LIT/LE-200	1	20	17	18	20	1	PFB-3
LIT/LE-100, FIT/FE-004	1	20	19	20	20	1	COMPOSITE FLOW SAMPLER
CSP-2	1	20	21	22	20	1	BUILDING PRV (NOTE 2)
AMP-1	1	20	23	24	20	1	BUILDING PRV (NOTE 2)
AMP-2	1	20	25	26	20	1	BUILDING PRV (NOTE 2)
RIT-011,-012,-013	1	20	27	28	20	1	RECP - DRUM PUMP
SPARE	1	20	29	30	20	1	SPARE
SPARE	1	20	31	32	20	1	SPARE
SPARE	1	20	33	34	20	1	SPARE
SPARE	1	20	35	36	20	1	SPARE
SPACE	1		37	38		1	SPACE
SPACE	1		39	40		1	SPACE
SPACE	1		41	42		1	SPACE

LIGHTING FIXTURE SCHEDULE

SYMBOL	LAMP	MTG HGT	DESCRIPTION	MANUFACTURER
1	MVR175 14,000 LUMENS	AS NOTED ON PLANS	175 WATT METAL HALIDE LOW BAY FIXTURE, ENCLOSED & GASKETED ALUMINUM HOUSING, CORROSION-RESISTANT, DARK BRONZE FINISH, HIGH POWER FACTOR BALLAST, 120V	LITHONIA #TXL175MA20120SF-CR LCPP-PPH DDB
2	MVR175 14,000 LUMENS & 150W QUARTZ	AS NOTED ON PLANS	SAME AS FIXTURE NO.1, EXCEPT WITH HOT/COLD QUARTZ START OPTION & 150 WATT QUARTZ LAMP, 120V	LITHONIA #TXL175MA20120SF-QRSTO-CR LCPP-PPH DDB
3	F32T8/SP35/RS 2850 LUMENS	AS NOTED ON PLANS	2-LAMP OPEN INDUSTRIAL FLUORESCENT FIXTURE, 10% UP-LIGHT, WHITE PORCELAIN RE-FLECTOR, ELECTRONIC BALLAST, 120V	LITHONIA #AF102321200EBPO
4	F32T8/SP35/RS 2850 LUMENS	AS NOTED ON PLANS	SAME AS FIXTURE NO.3, EXCEPT WITH LITHONIA EMERGENCY BATTERY PACK PS1400-120V 50Hz, 120V	LITHONIA #AF102321200EBPO-EL14
5	F32T8/SP35/RS 2850 LUMENS	RECESSED IN CEILING	2'X4' 2-LAMP FLUORESCENT TROFFER, 3 ROWS BY 9 ROWS LOUVER CELLS, SILVER FINISH, FLUSH WHITE ALUMINUM FRAME DOOR, ELECTRONIC BALLAST, 120V	LITHONIA #2PMDG923227LS-120GEB
6	F32T8/SP35/RS 2850 LUMENS	RECESSED IN CEILING	SAME AS FIXTURE NO.5, EXCEPT WITH LITHONIA EMERGENCY BATTERY PACK PS1400-120V 50Hz, 120V	LITHONIA #2PMDG923227LS-120GEBEL14
7	F32T8/SP35/RS 2850 LUMENS	RECESSED IN CEILING	2'X4' 2-LAMP FLUORESCENT TROFFER, FLUSH WHITE ALUMINUM FRAME DOOR, ELECTRONIC BALLAST, 120V	LITHONIA #2SPG232FWA12125-120GEB
8	F32T8/SP35/RS 2850 LUMENS	RECESSED IN CEILING	SAME AS FIXTURE NO.7, EXCEPT WITH LITHONIA EMERGENCY BATTERY PACK PS1400-120V 50Hz, 120V	LITHONIA #2SPG232FWA12125-120GEBEL14
9	LU100 9500 LUMENS	AS NOTED ON PLANS	100 WATT HIGH PRESSURE SODIUM WALL MOUNTED FIXTURE, DARK BRONZE FINISH, HIGH POWER FACTOR BALLAST, 120V	HUBBELL #PVL-100S-521L
10	MVR100 8100 LUMENS	AS NOTED ON PLANS	100 WATT METAL HALIDE WALL MOUNTED FIXTURE, DARK BRONZE FINISH, HIGH POWER FACTOR BALLAST, 120V	HUBBELL #PVL-100H-120L
11	F32T8/SP35/RS 2850 LUMENS	AS NOTED ON PLANS	2-LAMP ENCLOSED & GASKETED FLUORESCENT FIXTURE, FIBERGLASS BODY, BROAD BEAM REFLECTOR, HIGH IMPACT ACRYLIC LENS, ELECTRONIC BALLAST, 120V	HOLOPHANE #ESSO4X88BNO42EP11
12	F32T8/SP35/RS 2850 LUMENS	AS NOTED ON PLANS	SAME AS FIXTURE NO.11, EXCEPT WITH BODINE EMERGENCY BATTERY PACK #850, 120V	HOLOPHANE #ESSO4X88BNO42EP11-BPAK50
13	LU100 9500 LUMENS	10'-0" ROUND ALUMINUM POLE	100 WATT HIGH PRESSURE SODIUM POST-TOP FIXTURE, TYPE 5 SQUARE DISTRIBUTION, DARK BRONZE FINISH, 120V WITH 20A WP/GFI DUPLEX RECEPTACLE EAGLE "647-2" OR HUBBELL "GF5352"	KIM #FM/VLP17W5/ 100HPS120/DB-P/ WITH #PRA10-34125/ FM/DB-P/DR-GFI POLE
EXIT	SELF-LUMINOUS	UNIVERSAL MOUNT	SELF-LUMINOUS UNIVERSAL MOUNTED EXIT SIGN, WHITE HOUSING, SINGLE FACE, RED FACEPLATE, 20 YEAR LUMINOUS LIFE	LITHONIA #DSW1R20
EL	2 HEADS FURNISHED W/ UNIT	7'-6" ABOVE FLOOR UNLESS NOTED OTHERWISE	EMERGENCY LIGHTING UNIT, WALL MOUNTED, SEALED & GASKETED, NEMA 4X ENCLOSURE, TIME DELAY, TWO 25W INCANDESCENT LAMPS, 120V	LITHONIA #ELU4XN-TD-N2512

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. FOR BUILDING PRV AS REQUIRED BY BUILDING MANUFACTURER.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	△1	FAM	MEM	DHG

DESIGNED JTF,DVH
DETAILED DVH
CHECKED SLC
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

ELECTRICAL
LIGHTING FIXTURE AND PANELBOARD SCHEDULES

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 10800511

E18

SHEET 69 OF 73

GENERAL INSTRUMENT SYMBOLS

- FIELD MOUNTED INSTRUMENT
- INSTRUMENT MOUNTED ON FACE OF PANEL
- INSTRUMENT MOUNTED BEHIND OR INSIDE OF PANEL
- INSTRUMENT MOUNTED ON FACE OF LOCAL PANEL
- INSTRUMENT MOUNTED BEHIND OR INSIDE OF LOCAL PANEL
- SINGLE INSTRUMENT HOUSING CONTAINING TWO (OR MORE) INSTRUMENTATION FUNCTIONS
- 1 — CONTROL INTERLOCK FUNCTION, SEE SCHEMATICS AND SYSTEM SPECIFICATIONS FOR SPECIFIC FUNCTION

TAG NUMBERS AND ADDITIONAL DESIGNATIONS

TRC 31-1

- FIRST LETTER
- SUCCEEDING LETTERS
- NUMBER AFTER DASH (-1, -2, ETC) DENOTES MULTIPLE DEVICES USED IN IDENTICAL DUPLICATE SYSTEMS. A LETTER AFTER THE LOOP NUMBER (31A, 31B, ETC) IS USED TO DISTINGUISH MULTIPLE SIMILAR DEVICES IN THE SAME INSTRUMENT LOOP.
- LOOP DESIGNATION NUMBER

pH 1

- pH — SEE INSTRUMENT FUNCTIONAL DESIGNATIONS AND ABBREVIATIONS.
- 1 — PANEL REFERENCE NUMBER AS FOLLOWS:
  1 = CHEMICAL BUILDING PLC PANEL

TAG NUMBERS
MEANINGS OF IDENTIFICATION LETTERS

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

DIGITAL SYSTEMS INTERFACE SYMBOLS

NOTE: REFER TO DETAILED SYSTEM SPECIFICATIONS FOR FUNCTIONAL DESCRIPTION. ALSO SEE THE PLC I/O LIST FOR COMPLETE INPUT AND OUTPUT LISTINGS.

pH AIT 100

- DIGITAL SYSTEM I/O INTERFACE DIRECTION OF ARROW DENOTES WHETHER INPUT OR OUTPUT. A FILLED ARROW DENOTES ANALOG I/O, AN UNFILLED ARROW DENOTES DISCRETE I/O.

2

- PLC REFERENCE NUMBERS, AS FOLLOWS:
  1 = CHEMICAL BUILDING PLC
  2 = DEWATERING BUILDING PLC
  3 = PRESSURE FILTER PRESS PLC (PROVIDED WITH EQUIPMENT BY SECTION 11480 SUPPLIER)

FUNCTION DESIGNATIONS AND ABBREVIATIONS

INSTRUMENT DESIGNATIONS

K	GAIN OR ATTENUATE (INPUT:OUTPUT)
-K	GAIN AND REVERSE
Σ	ADD OR SUM (ADD AND SUBTRACT)
Δ	SUBTRACT (DIFFERENCE)
√	EXTRACT SQUARE ROOT
÷	DIVIDE
F(X)	CHARACTERIZE SIGNAL
>	HIGH-SELECT
<	LOW-SELECT
×	MULTIPLY
∫	INTEGRATE (TIME INTEGRAL)
CH_4	METHANE
CL_2	CHLORINE RESIDUAL
CO_2	CARBON DIOXIDE
DO	DISSOLVED OXYGEN
LEL	LOWER EXPLOSIVE LIMIT
MCC	MOTOR CONTROL CENTER
MLSS	MIXED LIQUOR SUSPENDED SOLIDS
O_2	OXYGEN (PURITY)
pH	pH CELL
TURB	TURBIDITY

HAND SWITCH DESIGNATIONS

HOA	HAND-OFF-AUTO
LR	LOCAL REMOTE
OC	OPEN-CLOSE
OO	ON-OFF
LOR	LOCAL-OFF-REMOTE
OOA	ON-OFF-AUTO
OCR	OPEN-CLOSE-REMOTE
OOR	ON-OFF-REMOTE

TRANSDUCER & CONVERTER DESIGNATION

E	VOLTAGE
FSK	FREQUENCY SHIFT KEYING
H	HYDRAULIC
I	CURRENT
P	PNEUMATIC
PD	PULSE DURATION
PF	PULSE FREQUENCY
R	RESISTANCE (ELECTRICAL)

EXAMPLE: I/P = CURRENT TO PNEUMATIC TRANSDUCER

POWER SUPPLY ABBREVIATIONS

AS	AIR SUPPLY
ES	ELECTRIC SUPPLY
GS	GAS SUPPLY
HS	HYDRAULIC SUPPLY
NS	NITROGEN SUPPLY
SS	STEAM SUPPLY
WS	WATER SUPPLY

AS — POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION.

LINE SYMBOLS

- MAJOR PROCESS PIPING OR FLOW CHANNEL
- SECONDARY PROCESS PIPING
- OPTIONAL PIPING FLOW PATH
- SHADED OR LIGHT LINE WEIGHT DENOTES EXISTING PIPING AND EQUIPMENT
- ELECTRIC SIGNAL
- HYDRAULIC SIGNAL
- PNEUMATIC SIGNAL
- ELECTRICAL DIRECTION ARROW
- SIGNAL CONNECTION POINT
- A — SIGNAL LINE GOING TO ANOTHER SHEET
- A — SIGNAL LINE FROM ANOTHER SHEET (MATCH LETTERS)
- FLOW ARROW FOR PROCESS PIPING
- B I3 — PROCESS LINE GOING TO ANOTHER SHEET; MATCH SHEET NO. IDENTIFIER; MATCH LINE NO.
- B I2 — PROCESS LINE COMING FROM ANOTHER SHEET
- PROCESS LINES CROSSING (NOT CONNECTED)
- PROCESS LINES CROSSING (NOT CONNECTED)
- INTERNAL SYSTEM SIGNAL LINK (SOFTWARE OR DATA LINK)

PROCESS DEVICE SYMBOLS

- DIAPHRAGM SEAL
- ANNULAR TYPE DIAPHRAGM SEAL
- P — PURGE OR FLUSHING DEVICE
- POSITIVE DISPLACEMENT TYPE FLOWMETER
- PRIMARY FLOW ELEMENT: ORIFICE PLATE
- PRIMARY FLOW ELEMENT: VENTURI TUBE
- PRIMARY FLOW ELEMENT: FLUME
- PRIMARY FLOW ELEMENT: WEIR
- PRIMARY FLOW ELEMENT: TURBINE OR PROPELLER-TYPE
- PRIMARY FLOW ELEMENT: PITOT TUBE
- PRIMARY FLOW ELEMENT: ELECTROMAGNETIC OR TRANSIT-TIME ULTRASONIC
- DOPPLER TYPE ULTRASONIC FLOW SENSOR
- ULTRASONIC LEVEL SENSOR
- PRIMARY ELEMENT: ROTAMETER
- Y — DRAIN
- THERMAL DISPERSION TYPE FLOW ELEMENT

- FLOW CONTROL OR ISOLATION GATE
- VALVE: GLOBE, GATE, OR OTHER IN-LINE TYPE NOT OTHERWISE IDENTIFIED
- VALVE: EXISTING
- VALVE: THREE WAY
- VALVE: FOUR WAY
- VALVE: BUTTERFLY, DAMPER OR LOUVER
- VALVE: ROTARY BALL TYPE
- VALVE: CHECK
- VALVE: PLUG TYPE

THE FOLLOWING ADDITIONAL DESIGNATIONS MAY BE UTILIZED ADJACENT TO SOME VALVE OR GATE SYMBOLS.

NC	NORMALLY CLOSED
FC	FAILS CLOSED
FO	FAILS OPEN
FIP	FAILS IN LAST POSITION

- VS — PUMP; VS DENOTES: VARIABLE SPEED
- PUMP (EXISTING)
- SCREW (LIFT) PUMP
- COMPRESSOR OR BLOWER
- MIXER
- PROPORTIONING OR METERING PUMP
- M — MOTOR
- PROGRESSING CAVITY PUMP

VALVE AND GATE ACTUATOR SYMBOLS

- DIAPHRAGM
- DIAPHRAGM WITH POSITIONER
- PRESSURE-REDUCING VALVE, SELF-CONTAINED
- PRESSURE-SUSTAINING VALVE, SELF-CONTAINED
- DIAPHRAGM VALVE
- P — AIR CYLINDER
- S — SOLENOID
- P/O — AIR-OIL CYLINDER
- E — ELECTRIC MOTOR
- H — HYDRAULIC CYLINDER
- NO SYMBOL — MANUALLY (HAND) OPERATED

GENERAL NOTES

1. IN GENERAL, THE P & ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA STANDARD PRACTICES (SA-S5.1 (1986). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
2. ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P & ID DRAWINGS. SOME PROCESS ITEMS, SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS HAVE ALSO BEEN OMITTED.
3. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
4. PIPING AND EQUIPMENT LEGEND APPLIES TO P & ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.
5. REFER TO DRAWING L2 FOR THIS PROJECT'S GENERAL LEGEND.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	SMH	MEW	DMG

DESIGNED BLB
DETAILED BLB
CHECKED SAY
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

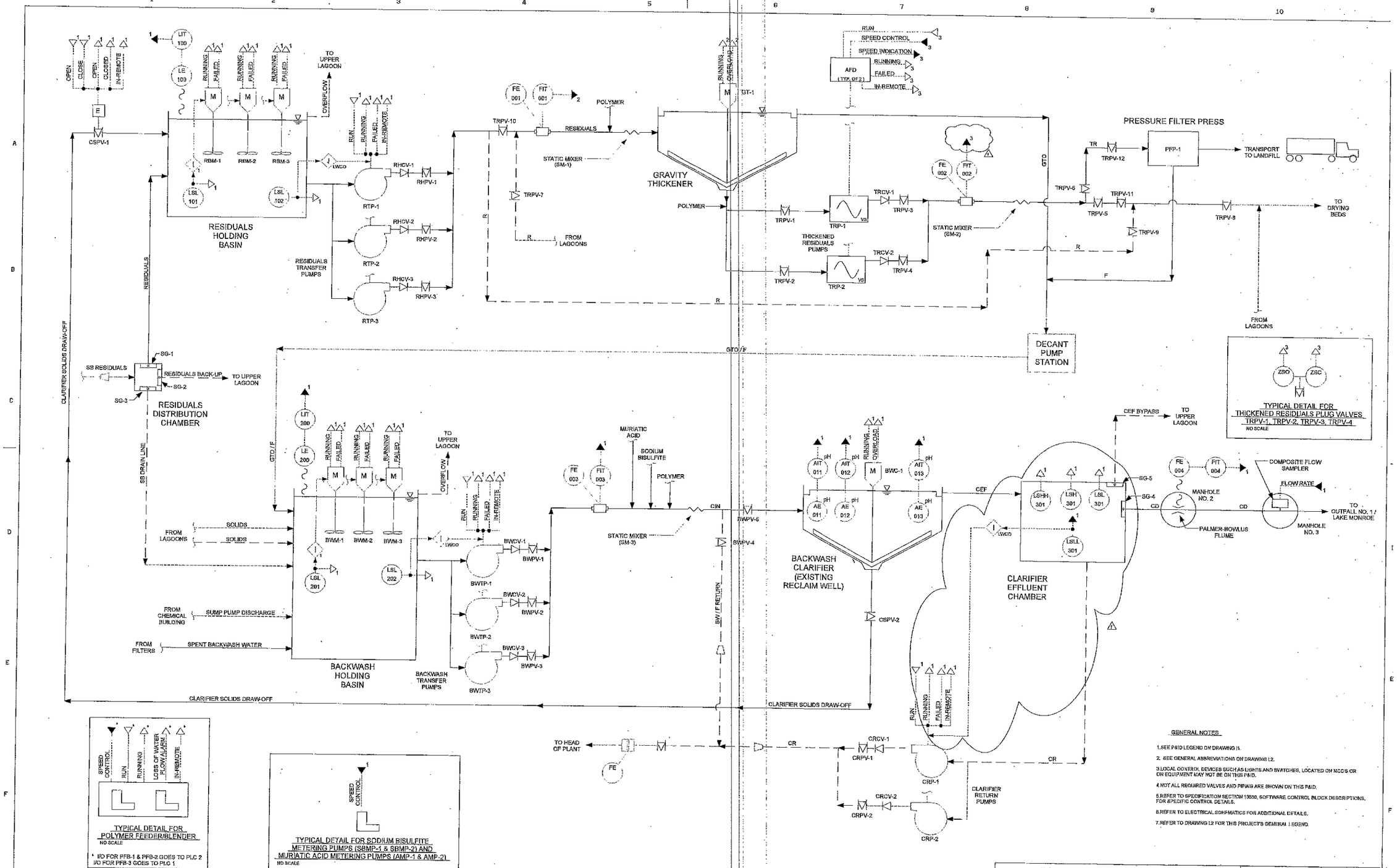
INSTRUMENTATION
P&ID LEGEND AND ABBREVIATION

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 6-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

I1

SHEET 70 OF 73

CCG. DWG. NO: 62409-117-WRH-I-A0000970



GENERAL NOTES

1. SEE P&ID LEGEND ON DRAWING I1.
2. SEE GENERAL ABBREVIATIONS ON DRAWING L2.
3. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCC'S OR ON EQUIPMENT MAY NOT BE ON THIS P&ID.
4. NOT ALL REQUIRED VALVES AND PIPING ARE SHOWN ON THIS P&ID.
5. REFER TO SPECIFICATION SECTION 13630, SOFTWARE CONTROL BLOCK DESCRIPTIONS, FOR SPECIFIC CONTROL DETAILS.
6. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
7. REFER TO DRAWING L2 FOR THIS PROJECT'S GENERAL LEGEND.

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
07-02	CONFORMED TO CONSTRUCTION RECORDS	1	FAM	WFM	DHS

DESIGNED BLB
DETAILED BLB
CHECKED BAY
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

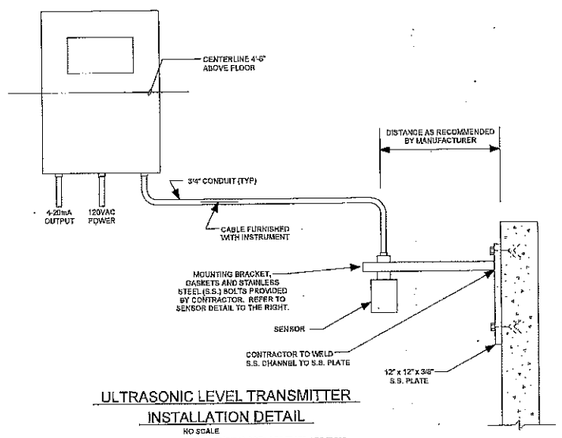
INSTRUMENTATION P&ID

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-06, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

I2

SHEET 71 OF 73

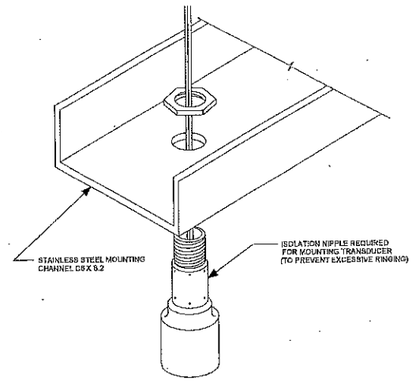
CCC. DWG. NO: 62409-117-WRH4-AD000072



ULTRASONIC LEVEL TRANSMITTER INSTALLATION DETAIL

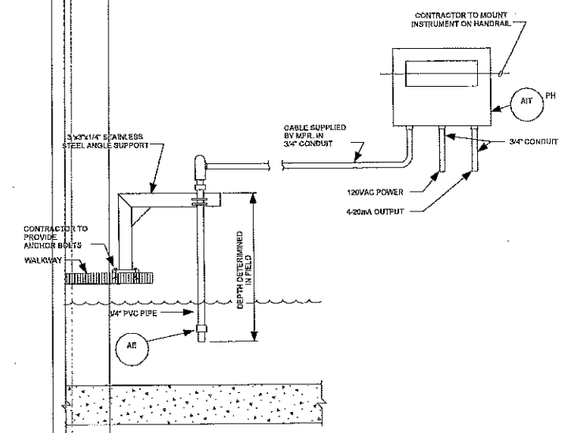
NO SCALE

TYPICAL FOR: LE/IT-100, LE/IT-200



ULTRASONIC SENSOR MOUNTING DETAIL

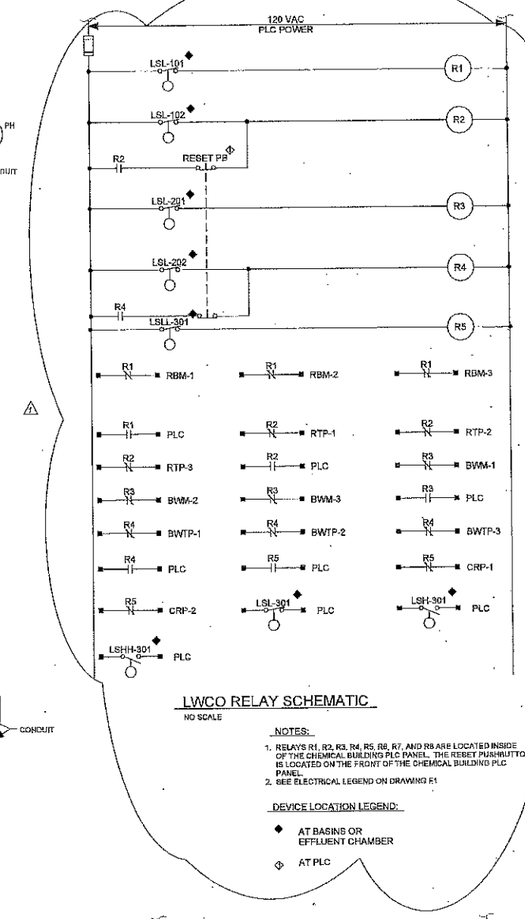
NO SCALE



pH TRANSMITTER

NO SCALE

TYPICAL FOR: AE/AIT-011, AE/AIT-012, AE/AIT-013



LWCO RELAY SCHEMATIC

NO SCALE

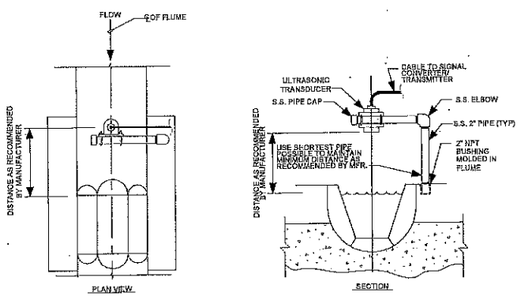
NOTES:

1. RELAYS R1, R2, R3, R4, R5, R6, R7, AND R8 ARE LOCATED INSIDE OF THE CHEMICAL BUILDING PLC PANEL. THE RESET PUSHBUTTON IS LOCATED ON THE FRONT OF THE CHEMICAL BUILDING PLC PANEL.
2. SEE ELECTRICAL LEGEND ON DRAWING E1

DEVICE LOCATION LEGEND:

◆ AT BASINS OR EFFLUENT CHAMBER

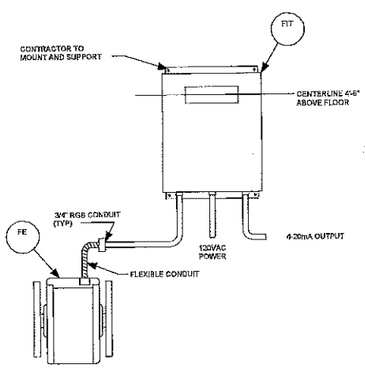
◇ AT PLC



PALMER-BOWLUS FLUME WITH ULTRASONIC FLOW SENSOR INSTALLATION DETAIL

NO SCALE

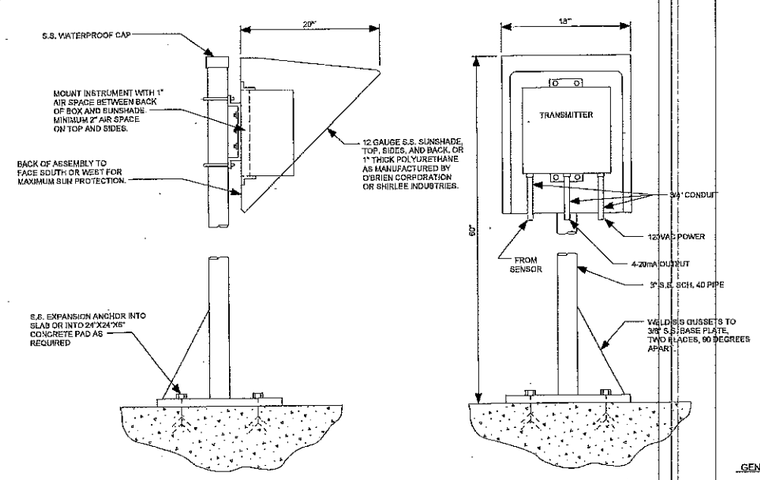
TYPICAL FOR: FF-004



MAGNETIC FLOWMETER INSTALLATION DETAIL

NO SCALE

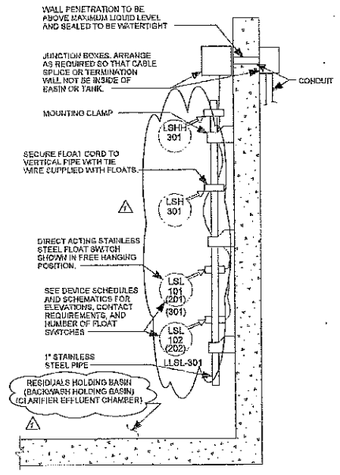
TYPICAL FOR: FE/FIT-001, FE/FIT-002, FE/FIT-003



OUTDOOR INSTRUMENT STAND MOUNTING DETAIL

NO SCALE

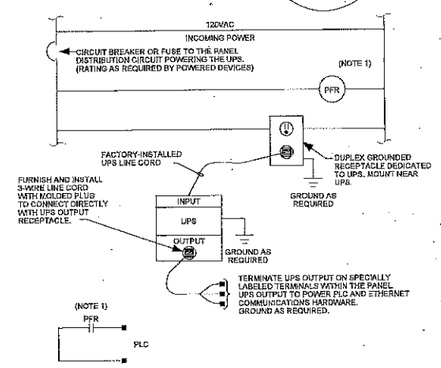
TYPICAL FOR: FIT-004



FIXED MOUNT FLOAT SWITCH INSTALLATION DETAIL

NO SCALE

TYPICAL FOR: LSL-101, LSL-102, LSL-201, LSL-202, LSHH-301, LSH-301, LSL-301, LLSL-301



PLC UPS - PARTIAL SCHEMATIC

NO SCALE

NOTES:

1. POWER FAILURE RELAY (PFR) AND PRF OUTPUT CONTACT MAY BE PROVIDED AS AN INTEGRAL FUNCTION OF THE UPS. IN THIS CASE AN EXTERNAL RELAY IS NOT REQUIRED.

GENERAL NOTES

1. SEE P&ID LEGEND ON DRAWING I1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCC'S OR ON EQUIPMENT MAY NOT BE ON THIS DRAWING.
3. NOT ALL REQUIRED VALVES AND PIPING ARE SHOWN ON THIS DRAWING.
4. REFER TO SPECIFICATION SECTION 13550, SOFTWARE CONTROL BLOCK DESCRIPTIONS, FOR SPECIFIC CONTROL DETAILS.
5. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
6. REFER TO DRAWING L2 FOR THIS PROJECT'S GENERAL LEGEND.

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	FAM	MEM	DHS

DESIGNED SLB
DETAILED SLB
CHECKED SAY
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

INSTRUMENTATION
INSTALLATION DETAILS AND PANEL SCHEMATICS

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 06-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19800311

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SHEET 72 OF 73

CCG. DWG. NO: 62409-117-WRH-I-A0001019

TO SOUTH TANK RADIO

EXISTING ANTENNA

EXISTING RADIO

EXISTING PLC (SLC 5/03)

DH485

EXISTING WORKSTATION PC (W/ MODEM & ETHERNET CARD)

LEASED LINE TO SERVICE CONTROL CENTER

10/100 BASE-T ETHERNET CATEGORY 5 UTP

16 PORT 10 / 100 BASE-T ETHERNET SWITCH

120 VAC POWER

UPS

FIBER OPTIC PATCH CORDS

FIBER OPTIC CABLE PATCH PANEL

FIBER OPTIC CABLE (12 PAIRS)

FIBER OPTIC CABLE PATCH PANEL

FIBER OPTIC PATCH CORD

MEDIA CONVERTER

10/100 BASE-T ETHERNET CATEGORY 5 UTP

CHEMICAL BLDG PLC (SLC 5/05)

120 VAC POWER

UPS

CHEMICAL BUILDING

EXISTING ANTENNA

EXISTING RADIO

10/100 BASE-T ETHERNET CATEGORY 5 UTP

GENERATOR PLC (SLC 5/05) (PROVIDED BY OTHERS UNDER A SEPARATE CONTRACT)

MAIN BUILDING

EXISTING ANTENNA

EXISTING RADIO

INTAKE STRUCTURE PLC (SLC 5/03) (PROVIDED BY OTHERS UNDER A SEPARATE CONTRACT)

INTAKE STRUCTURE

LAPTOP PC (W/ INTERNAL MODEM)

FIBER OPTIC CABLE (12 PAIRS)

DEWATERING ROOM (PFP ACCESS PLATFORM)

PRESSURE FILTER PRESS CONTROL PANEL (PROVIDED BY EQUIPMENT MANUFACTURER)

LOCAL OPERATOR INTERFACE TERMINAL (LOI) (PROVIDED BY EQUIPMENT MANUFACTURER)

10/100 BASE-T ETHERNET CATEGORY 5 UTP

PRESSURE FILTER PRESS PLC (SLC 5/05) (PROVIDED BY EQUIPMENT MANUFACTURER)

120 VAC POWER

UPS

(PROVIDED BY EQUIPMENT MANUFACTURER)

120 VAC POWER

UPS

WORKSTATION PC (W/ MODEM & ETHERNET CARD)

10/100 BASE-T ETHERNET CATEGORY 5 UTP

FIBER OPTIC CABLE PATCH PANEL

FIBER OPTIC PATCH CORD

16 PORT 10 / 100 BASE-T ETHERNET SWITCH

10/100 BASE-T ETHERNET CATEGORY 5 UTP

UPS

FUTURE WORKSTATION PC (W/ MODEM & ETHERNET CARD)

10/100 BASE-T ETHERNET CATEGORY 5 UTP

CONTROL ROOM

DEWATERING BUILDING

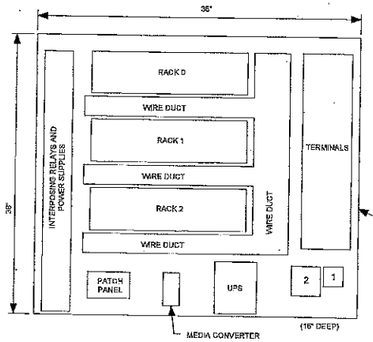
10/100 BASE-T ETHERNET CATEGORY 5 UTP

DEWATERING BUILDING PLC (SLC 5/05)

120 VAC POWER

UPS

ELECTRICAL ROOM



TYPICAL PLC INTERNAL LAYOUT DETAIL (PANEL VIEW)

NO SCALE

PLC PANEL LEGEND:

1 - GFI OUTLET

2 - SURGE SUPPRESSION

NOTES:

1. PANEL SIZE SHOWN IS RECOMMENDED. SYSTEM SUPPLIER SHALL PROVIDE A PANEL SIZED AS REQUIRED FOR ALL EQUIPMENT SPECIFIED AND WALL SPACE AVAILABLE AT MOUNTING LOCATION. PATCH PANELS AND MEDIA CONVERTERS MAY NOT BE REQUIRED.

NO.	DATE	REVISIONS AND RECORD OF ISSUE	BY	CK	APP
1	07-02	CONFORMED TO CONSTRUCTION RECORDS	SWH	DEM	DHG

DESIGNED BLB
DETAILED BLB
CHECKED SAY
APPROVED
DATE

BLACK & VEATCH Corporation
Cincinnati, Ohio

PROJECT NO. 62409

BLOOMINGTON, INDIANA
MONROE WATER TREATMENT PLANT
RESIDUALS MANAGEMENT FACILITIES

INSTRUMENTATION
SCADA SYSTEM ARCHITECTURE
AND PLC PANEL DETAIL

THIS DRAWING WAS ORIGINALLY APPROVED FOR CONSTRUCTION AND SEALED BY SCOTT L. CUTTING ON 6-30-00, A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF INDIANA NO. 19900311

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SHEET 73 OF 73

COG DWG. NO: 62409-117-WRH-I-AD0000974