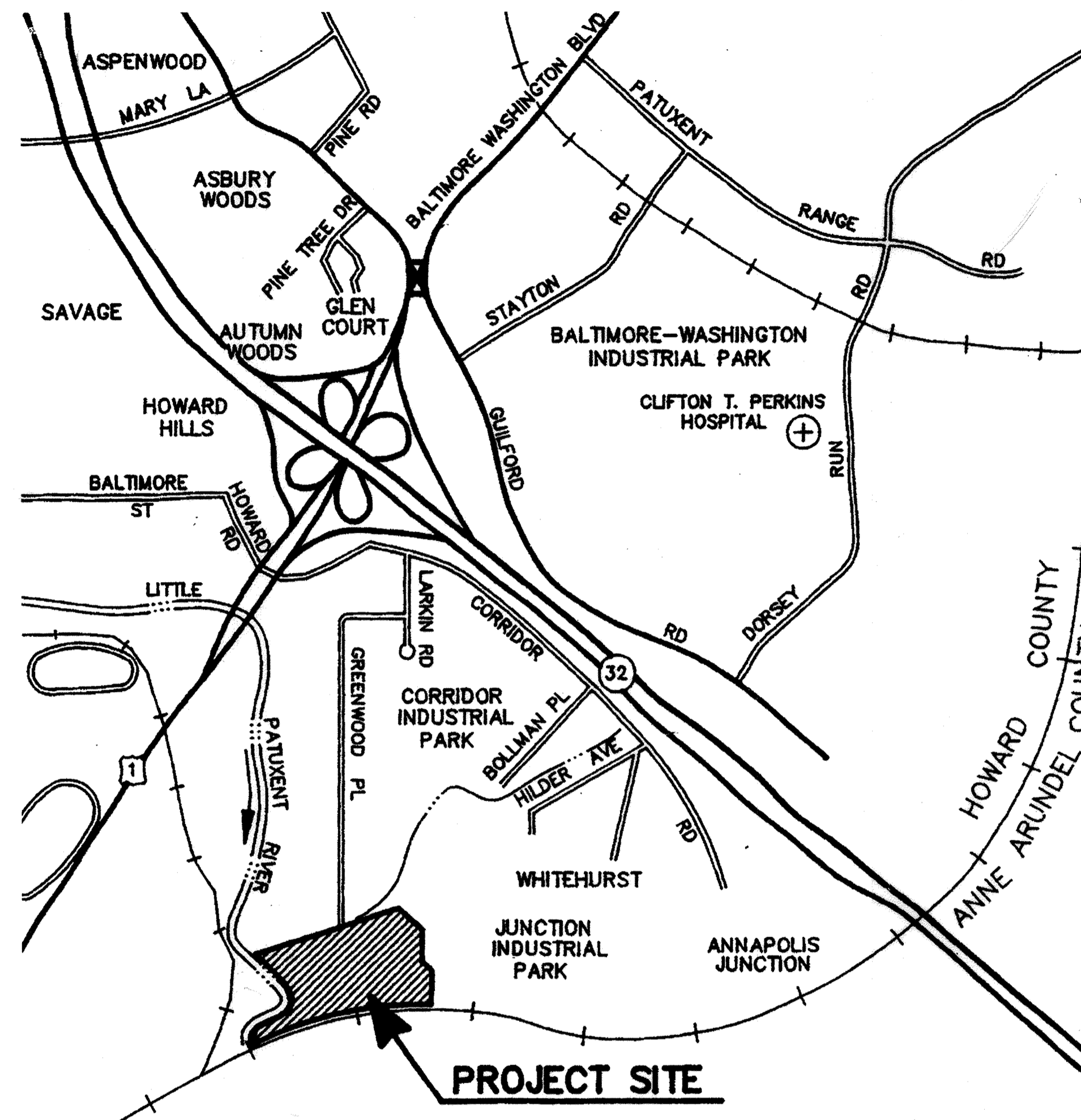


# HOWARD COUNTY, MARYLAND

## LITTLE PATUXENT WATER RECLAMATION PLANT



### CAPACITY EXPANSION AND BNR IMPROVEMENTS ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT NO. S-6205  
CONTRACT NO. 20-3752

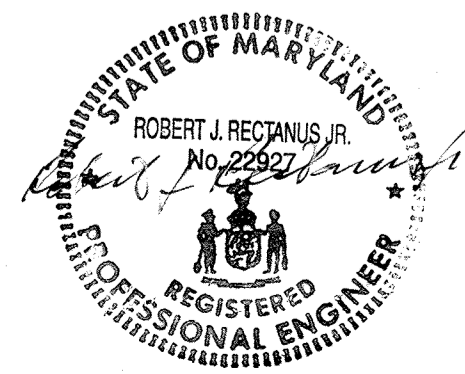
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Beaman* 6/29/00  
DIRECTOR OF PUBLIC WORKS DATE

*Robert J. Restanius, Jr.* 6/30/00  
CHIEF, BUREAU OF ENGINEERING DATE

*Robert M. Beaman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

*Robert M. Beaman* 6-30-00  
CHIEF, WATER & SEWER DIVISION DATE



#### ASSOCIATE DESIGN FIRMS

**STANTEC CONSULTING, LTD.**  
Surrin, British Columbia

**BRYANT, BRYANT, & WILLIAMS**  
Washington, D. C.

**A. MORTON THOMAS & ASSO., INC.**  
Rockville, Maryland


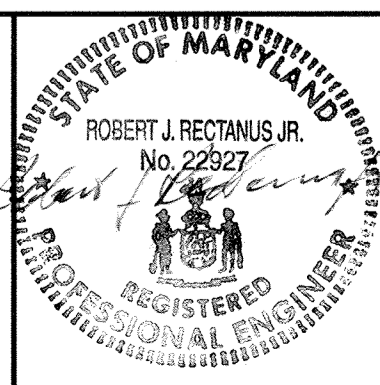
**LACH ELECTRIC CORPORATION**  
Baltimore, Maryland

SHEET  
1 OF 161

L1

**LIST OF DRAWINGS**


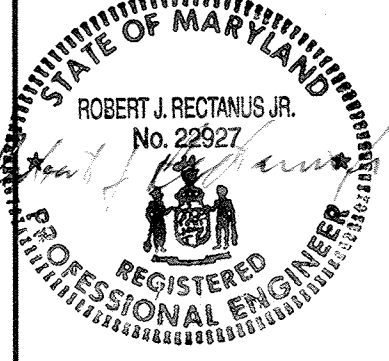
SHEET NO.	DRAWING NO.	DRAWING TITLE	SHEET NO.	DRAWING NO.	DRAWING TITLE	SHEET NO.	DRAWING NO.	DRAWING TITLE
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24	Y5	YARD PIPING PROFILES - SHEET 1 OF 4	67	M1	NORTH BLOWER BUILDING - BASEMENT PLAN	136	E26	NORTH GALLERY - POWER AND LIGHTING PLANS - EL 134.00
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28	Y9	FERMENTER SPLITTER BOX - PLANS & SECTIONS	71	M5	NORTH BLOWER BUILDING - SECTIONS	140	E30	NORTH GALLERY - DEMOLITION PLAN
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34	Y15	MISCELLANEOUS YARDWORK DETAILS	77	M11	NORTH PROCESS REACTORS - SECTIONS AND DETAILS	146	E36	MISCELLANEOUS PLANS
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36	A2	NORTH BLOWER BUILDING - NORTH AND SOUTH ELEVATIONS	80	M14	FC 10 & 11 - SECTIONS	149	E39	LIGHTING FIXTURES AND PANELBOARD SCHEDULES
37	A3	NORTH BLOWER BUILDING - OPERATING FLOOR PLAN EL 144.00'	81	M15	FC 10 & 11 - SECTIONS	<u>INSTRUMENTATION AND CONTROLS</u>		
38	A4	NORTH BLOWER BUILDING - ROOF PLAN	82	M16	FC 12 - PLAN AND SECTIONS	150	I1	P&ID - LEGEND AND ABBREVIATIONS
39	A5	NORTH BLOWER BUILDING - SECTIONS	83	M17	FERMENTERS - DEMOLITION PLAN & SECTION	151	I2	P&ID - PROCESS REACTOR 5
40	A6	NORTH BLOWER BUILDING - DETAILS	84	M18	FERMENTERS - TOP AND LOWER PLAN	152	I3	P&ID - PROCESS REACTOR 6
41	A7	NORTH BLOWER BUILDING - SCHEDULES AND DETAILS	85	M19	FERMENTERS - SECTIONS AND DETAILS	153	I4	P&ID - PROCESS REACTOR 7
42	A8	NORTH BLOWER BUILDING - DETAILS	86	M20	NORTH GALLERY - DEMOLITION PLANS	154	I5	P&ID - FINAL CLARIFIERS 10,11, & 12
			87	M21	NORTH GALLERY - LOWER FLOOR PLANS AND SECTIONS	155	I6	P&ID - WEST GALLERY
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			92	M26	WEST GALLERY - PLAN	160	I11	INSTALLATION DETAILS
			93	M27	WEST GALLERY - ENLARGED PLAN AND SECTIONS	161	I12	INSTALLATION DETAILS
			94	M28	EAST GALLERY - PLANS			
			95	M29	MISCELLANEOUS DETAILS			
			96	M30	MISCELLANEOUS DETAILS			
			97	M31	MISCELLANEOUS DETAILS			
			98	M32	MISCELLANEOUS DETAILS			
			99	M33	ODOR CONTROL AIR PIPING - PLANS			
					ODOR CONTROL AIR PIPING - SECTIONS			
			<u>HVAC/PLUMBING</u>					
			100	H1	HVAC/PLUMBING - LEGEND, ABBREVIATIONS AND GENERAL NOTES			
			101	H2	HVAC - NORTH BLOWER BUILDING - BASEMENT PLAN			
			102	H3	HVAC - NORTH BLOWER BUILDING - OPERATING FLOOR PLAN			
			103	H4	HVAC - NORTH GALLERY BUILDING - LOWER AND UPPER LEVEL FLOOR PLANS			
			104	H5	HVAC - NORTH GALLERY BUILDING - OPERATING LEVEL			
			105	H6	HVAC - DETAILS, SECTIONS AND SCHEDULES			
			106	H7	HVAC - SEQUENCE OF OPERATION			
			107	P1	PLUMBING - NORTH BLOWER BUILDING - BASEMENT PLAN			
			108	P2	PLUMBING - NORTH BLOWER BUILDING - OPERATING FLOOR PLAN			
			109	P3	PLUMBING - NORTH GALLERY - LOWER AND UPPER LEVEL FLOOR PLANS			
			110	P4	HVAC/PLUMBING - SCHEMATICS, DETAILS & SCHEDULES			

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> LLP Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> REG. PROF. ENGR. DATE: 6/24/00	 DES: FKA DRN: RLC CHK: WLK DATE: 6/23/00	LAYOUT/OVERVIEW CIVIL  LIST OF DRAWINGS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
				SHEET 2 OF 161
CHIEF, BUREAU OF UTILITIES DATE: 6/29/00			L2	



ABBREVIATIONS

A	ACID, AMBER INDICATING LIGHT, AMPERE	CTR(S)	CENTER(S)	GM	GAS METER	SKL	SKYLIGHT
AB	ANCHOR BOLT	CU	CUBIC	GPM	GALLONS PER MINUTE	SLG	SLIDE GATE
ABS	ACID BATH SINK	CU YD	CUBIC YARD	GR	GRADE	SM	SHEET METAL
AC	ALTERNATING CURRENT	CV	CHECK VALVE	GRV	GATE VALVE	SP	SUMP PUMP
A/C	AIR CONDITIONER, (ING)	CW	COLD WATER	GWB	GYPSPUM WALLBOARD	SPA	SPACING, SPACES
ACP	ASBESTOS CEMENT PIPE	CWR	COLD WATER RETURN	GYP	GYPSPUM	SPEC(S)	SPECIFICATION(S)
ACST	ACOUSTIC, (AL)	CWS	COLD WATER SUPPLY	H	HIGH, HOUR, HYDROGEN	SPLY	SUPPLY
AD	ACCESS DOOR, AREA DRAIN, AIR DAMPER, ANODE	D	DOOR, DRAIN	HB	HOSE BIBB	SQ	SQUARE
ADA	AMERICAN DISABILITY ACT	DBL	DOUBLE	HDR	HOLLOW CORE	SR	SUPPLY REGISTER
ADD	ADDITIONAL	DC	DIRECT CURRENT	HV	HOLLOW CORE	SS	STAINLESS STEEL
ADH	ADHESIVE	DEG	DEGREE	HDR	HEADER	SS	SANITARY SEWER
ADJ	ADJUSTABLE, ADJACENT	DEPT	DEPARTMENT	HDWR	HARDWARE	SSK	SERVICE SINK
ADMIN	ADMINISTRATION	DET	DETAIL	HE	HEAT EXCHANGER	ST	SEL TAPPING
AF	AIR FLOW	DF	DRINKING FOUNTAIN	HEX	HEXAGONAL	ST SWR	STORM SEWER
AFF	ABOVE FINISH FLOOR	DH	DOOR HEIGHT	HF	HOSE FAUCET	STA	STATION
AH	AHEAD	DI	DROP INLET, DUCTILE IRON	HGT	HEIGHT	STD	STANDARD
AHU	AIR HANDLING UNIT	DIA	DIAMETER	HL	HIGH LEVEL SWITCH	STL	STEEL
AL	ACTIVE LEAF	DIFF	DIFFUSER	HLS	HIGH LEVEL SWITCH	STR	STORAGE
ALT	ALTERNATE, (IVE)	DIM	DIMENSION	HMC	HARNESSED MECHANICAL COUPLING	STR	STRUCTURAL
ALUM	ALUMINUM	DIP	DUCTILE IRON PIPE	HMD	HOLLOW METAL DOOR	SUP	SUPPLY
AM	AMMETER	DISCH	DISCHARGE	HMJ	HARNESSED MECHANICAL JOINT	SUSP	SUSPENDED
AMP	AMPERE	DISP	DISPENSER	HORIZ	HORIZONTAL	SV	SHUTOFF VALVE
AN	ANAEROBIC	DIST	DISTRIBUTION	HP	HIGH POINT, HORSEPOWER	SW	SWITCH
ANOD	ANODIZED	DLV	DEAD LOAD	HR	HOUR, HANDRAIL	SWBD	SWITCHBOARD
AP	ACCESS PANEL	DM	DAMPEN MOTOR	HS	HIGH STRENGTH	SWCR	SWITCHGEAR
APPR	APPROXIMATE, (LY)	DMJ	DOUBLE MECHANICAL JOINT	HV	HOSE VALVE	SWS	SEAL WATER SOLENOID
APPROX	APPROXIMATE, (LY)	DN	DOWN	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	SYM	SYMMETRICAL
AR	ALARM RELAY	DO	DOOR OPENING, DISSOLVED OXYGEN	HW	HOT WATER	SYS	SYSTEM
ARCH	ARCHITECTURAL	DPDT	DOUBLE POLE DOUBLE THROW	HWY	HIGHWAY	T	THERMOSTAT, TREAD, TOTALIZER
AS	AMMETER SWITCH	DR	DRAIN	ID	INDICATOR	TAN	TRANSFORMER, TELEPHONE, TOP
ASSY	ASSEMBLY	DS	DOWNSPOUT	ID	INSIDE DIAMETER	TAN	TANGENT
AUTO	AUTOMATIC	DT	DISTRIBUTION TRANSFORMER	IF	INSIDE FACE	TB	TERMINAL BOX
AUX	AUXILIARY	DV	DRAIN VALVE	I/I	CURRENT TO CURRENT BOOSTER	T&B	TOP AND BOTTOM
AVS	AUTOMATIC VALVE STATION	DWG(S)	DRAWING(S)	IN	INCHES	TBE	THREAD BOTH ENDS
AWG	AMERICAN WIRE GAGE	DWL(S)	DOWEL(S)	INC	INCORPORATED	TBM	TEMPORARY BENCHMARK
AX	AXONIC	E	EAST, ELECTRICAL	INCL	INCLUDING	TC	TOWEL CABINET, TOP OF CURB
B	BEAM	EA	EACH	INCR	INCREASE	TC	TERMINAL CABINET
B TO B	BACK TO BACK	EAT	ENTERING AIR TEMPERATURE	INST	INSTRUMENT, (ATION)	TEL	TELESCOPING
BA	BEARING AREA	ECC	ECCENTRIC	INSUL	INSULATE, (ED), (ING)	TEMP	TEMPERATURE, TEMPORARY
BAL	BALANCE	ECC RED	ECCENTRIC REDUCER	INT	INTERIOR, INTERNAL	TERM	TERMINAL
BAT	BATTERY	EEM	EMERGENCY EYEWASH	INV	INVERT	T&G	TONGUE & GROOVE
BC	BEGIN CURVE	EF	EACH FACE	IPS	IRON PIPE SIZE	TH	TEST HOLE
BD	BOARD	EFF	EFFLUENT	IR	INTERNAL RECYCLE	THK	THICK, THICKNESS
BEJ	BRICK EXPANSION JOINT	EJ	EXPANSION JOINT	JAN	JANITOR	THR	THRESHOLD
BF	BLIND FLANGE	EL	ELEVATION	JB	JUNCTION BOX	TI	TOTALIZING INDICATOR, TEMPERATURE INDICATOR
BFV	BUTTERFLY VALVE	ELB	ELBOW	JF	JOINT FILLER	TIR	TOTALIZING INDICATING RECORDER
BHP	BRAKE HORSEPOWER	ELEC	ELECTRIC, (AL)	JT	JOINT	TOP	TOP OF FOOTING
BITUM	BITUMINOUS	ELEV	ELEVATOR	K	KIPS	TOM	TOP OF MASONRY
BKR	BREAKER	EMER	EMERGENCY	KIT	KITCHEN	TOS	TOP OF STEEL
BLDG	BUILDING	ENC	ENCASEMENT	KO	KNOCK OUT	TP	TWISTED PAIR COUPLE, TOWEL PIN
BLK	BLOCK	ENCL	ENCLOSURE	KS	KITCHEN SINK	TPD	TONS PER DAY
BM	BENCHMARK	ENT	ENTRANCE	KV	KILOVOLT	TRANS	TRANSFORMER, TRANSMITTER, TRANSFER
BOF	BOTTOM OF FOOTING	EOL	END OF LINE	KWA	KILOWATT AMPERE	TS	TEMPERATURE SWITCH
BOF	BOTTOM OF FOOTING	EPV	ECCENTRIC PLUG VALVE	KW	KILOWATT	TV	TELEVISION
BOT	BOTTOM	EQ	EQUAL	KWH	KILOWATT HOUR	TYP	TYPICAL
BP	BACK PRESSURE	EQUIP	EQUIPMENT	L	LOUVER, ANGLE	TW	TILTING WEIR
BPMK NO	BASEPLATE MARK NUMBER	EW	EMERGENCY EYEWASH	LAB	LABORATORY	UJM	ULTRASONIC DENSITY METER
BRC	BEARING	EWF	EACH WAY EACH FACE	LAM	LAMINATE(D)	UGND	UNDERGROUND
BRK	BRICK	EXCH	EXCHANGER	LAT	LEAVING AIR TEMPERATURE	UH	UNIT HEATER
BS	BOTH SIDES	EXH	EXHAUST	LAT	LATERAL	UNIF	UNIFORM
B&S	BELL AND SPIGOT	EX, EXIST	EXISTING	LAV	LAVATORY	UNO	UNLESS NOTED OTHERWISE
BSMT	BASEMENT	EXP	EXPANSION, EXPOSED	LB(S)	POUNDS	UR	URINAL
BTU	BRITISH THERMAL UNIT	EXP JT	EXPANSION JOINT	LG	LENGTH, LONG	USGS	UNITED STATES GEOLOGICAL SURVEY
BTUH	BRITISH THERMAL UNIT-HOUR	EXT	EXTENSION, EXTERIOR, EXTERNAL	LH	LEFT HAND	V	VALVE, VOLT, VENT
BU	BELL-UP	F	FAN, FIBERGLASS	LIN	LINEAL, LINEAR	VAC	VACUUM
BUR	BUILT UP ROOFING	F TO F	FACE TO FACE	LL	LIVE LOAD	VAT	VINYL ASBESTOS TILE
BV	BALL VALVE	FB	FACE BRICK, FILTER BASIN	LLH	LONG LEG HORIZONTAL	VB	VACUUM BREAKER
BVC	BEGIN VERTICAL CURVE	FC	FLEXIBLE CONNECTION, FLOW CONTROL, FINAL CLARIFIER	LLV	LONG LEG VERTICAL	VC	VERTICAL CURVE, VICTAULIC COUPLING
C	COUNTER	FCD	FLANGED COUPLING ADAPTER	LO	LOUVER OPENING	VCD	VERTICAL CONTROL DAMPER
C TO C	CENTER TO CENTER	FDN	FOUNDATION	LS	LABORATORY SINK, LEVEL SWITCH, LIMIT SWITCH	VCP	VITRIFIED CLAY PIPE
CB	CATCH BASIN	FDR	FIRE DAMPER	LT	LEFT, LAB TABLE	VCT	VINYL COMPOSITION TILE
CBU	CEMENTITIOUS BACKER UNIT	FE	FIRE EXTINGUISHER, FLOW ELEMENT	MA	MILLIAMPERE	VF	VACUUM FILTER
CD	CEILING DIFFUSER	FEC	FIRE EXTINGUISHER CABINET	MACH	MACHINE	VIB	VIBRATION
C/EJ	CONTRACTION/EXPANSION JOINT	FF	FACTORY FINISH	MAINT	MAINTENANCE	VM	VOLT METER
CFM	CUBIC FEET PER MINUTE	FH	FLAT HEAD, FIRE HYDRANT	MAN	MANUAL	VNR	VENEER
CFM	CUBIC FEET PER MINUTE	FHMS	FLAT HEAD MACHINE SCREW	MAS	MASONRY	VV	VENT VALVE
C&S	CURB AND GUTTER	FIG	FIGURE	MATL	MATERIAL	W	WEST, WIDE, WIDTH, WINDOW, WATT, WATER
CHKD	CHECKERED	FIN	FINISH	MAX	MAXIMUM	W/	WITH
CI	CAST IRON	FIN GR	FINISH GRADE	MB	MACHINE BOLT	WAS	WASTE ACTIVATED SLUDGE
CIMH	CAST IRON MANHOLE	FL	FLOOR, FLOW LINE	MC	MECHANICAL COUPLING	WB	WALLBOARD
CIMHS	CAST IRON MANHOLE STEPS	FLEX	FLEXIBLE	MCC	MOTOR CONTROL CENTER	WC	WATER CLOSET
CIP	CAST IRON PIPE	FLG	FLANGE, FLASHING	MECH	MECHANICAL	WD	WOOD, WIDTH
CISP	CAST IRON SOIL PIPE	FM	FORCE MAIN	MED	MEDIUM	WF	WALL FITTING, WALL FABRIC
CJT	CONTROL JOINT	FOD	FUEL OIL	MEZ	MEZZANINE	WH	WALL HYDRANT
CKT	CIRCUIT	FOB	FLAT ON BOTTOM	MFM	MAGNETIC FLOWMETER	WL	WATER LEVEL
CL	CLASS, CENTERLINE	FOS	FACE OF STUDS	MFR(S)	MANUFACTURER(S)	WM	WATER METER, WATTMETER
CLG	CEILING	FOT	FLAT ON TOP	MG	MILLION GALLONS	WO	WINDOW OPENING
CLO	CLOSET	FPM	FEET PER MINUTE	MG/L	MILLIGRAMS PER LITER	W/O	WITHOUT
CLR	CLEAR, (ANCE)	FRP	FIBERGLASS REINFORCED PLASTIC	MH	MANHOLE	WOM	WOMEN
CMP	CORRUGATED METAL PIPE	FS	FAR SIDE, FLOOR SLEEVE, FLOAT SWITCH, FLOOR SEALER	MIN	MINIMUM, MINUTE	WP	WATERPROOF, WORKING POINT
CMU	CONCRETE MASONRY UNIT	FT	FOOT	MISC	MISCELLANEOUS	WR	WASTE RECEPTACLE
CO	CLEAN OUT, COMPANY	FTC	FOOTING	MJ	MECHANICAL JOINT	WS	WEIGHT, CERAMIC WALL TILE
COD	CHEMICAL OXYGEN DEMAND	FURN	FURNISH, FURNISHED	MJR	MECHANICAL JOINT RETAINER GLAND	WT	WETWELL
COL	COLUMN	FV	FLAP VALVE	MJTR	MECHANICAL JOINT WITH TIE ROD	WMF	WELDED WIRE FABRIC
COMB	COMBINATION	FWD	FORWARD	MO	MASONRY OPENING, MOTOR OPERATED	X	BY, TIMES
COMB SWR	COMBINED SEWER	G	GAS	MOD	MODIFIED	YH	YARD HYDRANT
COMP	COMPRESSOR, (ED)	GA	GUAGE	MRO	METAL ROOF DECK	&	AND
CONC	CONCRETE	GAL	GALLON	MS	MACHINE SCREW	@	AT
CONN	CONNECTION	GALV	GALVANIZED	MT	MEAN SEA LEVEL	e	CENTERLINE
CONST	CONSTRUCTION	GB	GRIT BASIN	MTL	MOUNTED	<	DEFLECTION ANGLE
CONT	CONTINUOUS, CONTINUATION, CONTROL	GC/MS	GAS CHROMATOGRAPH/MASS SPECTROMETER	MTR	MOTOR	#	NUMBER
CONTR	CONTRACTOR	GEN	GENERAL, GENERATOR	MV	MUD VALVE	%	PERCENT
COR	CORNER	GLV	GLOBE VALVE				
CORR	CORRIDOR, CORRUGATED						
CP	CONTROL PANEL, CARPET						
CPLC	COUPLING						
CPT	CONTROL POWER TRANSFORMER						
CRS	COURSES, (ING)						
CS	CONTROL SWITCH, CONTROL STATION, CUP SINK						
CSK	COUNTERSUNK, (INK)						
CT	CERAMIC TILE, CARPET TILE, CYCLE TIMER, CURRENT TRANSFORMER						

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   REG. PROF. ENGR. DATE	DES: FKA DRN: RLC CHK: WLK DATE: 6/23/00	LAYOUT/OVERVIEW CIVIL  ABBREVIATIONS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 4 OF 161  L4
	DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP			

EXISTING LEGEND

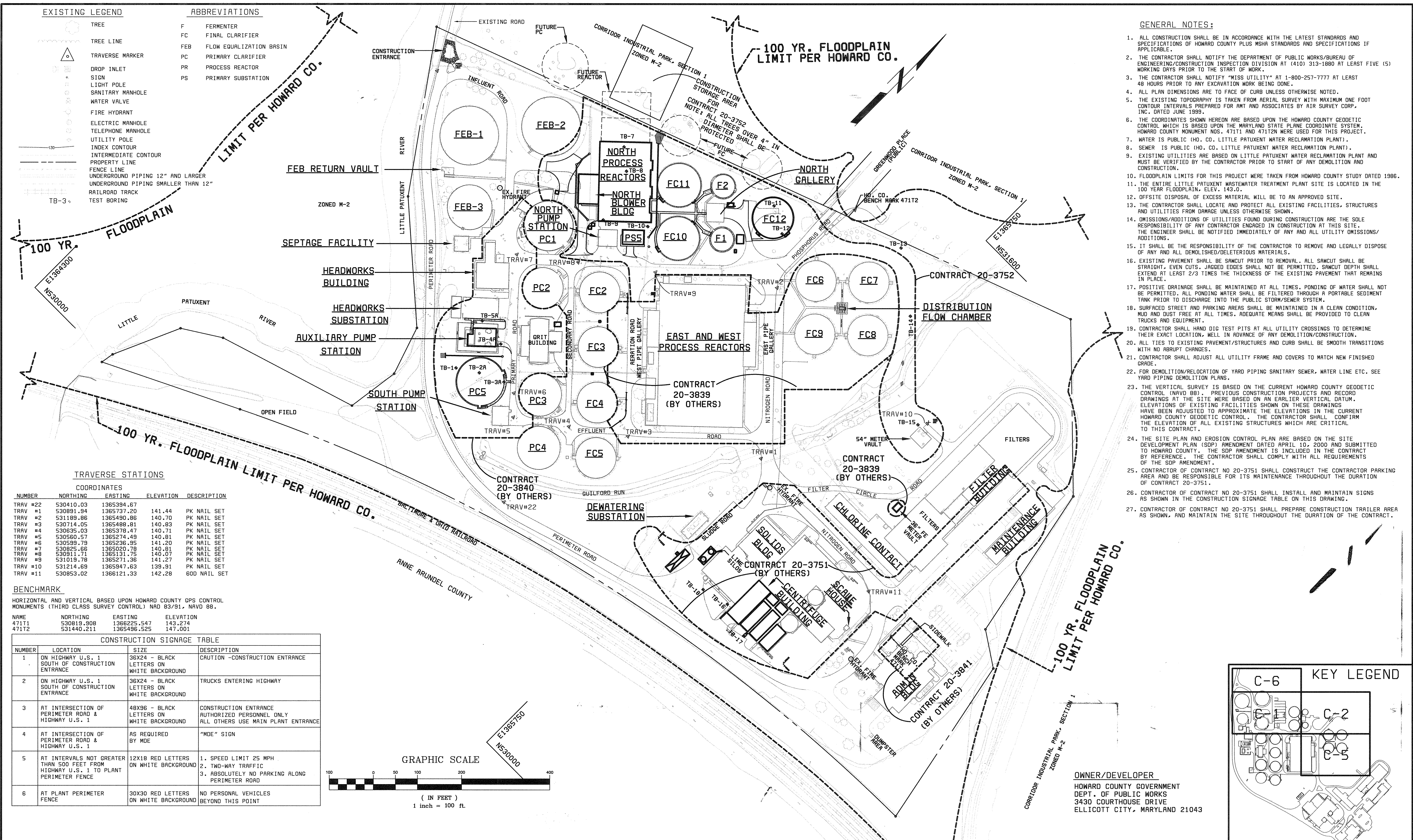
- TREE
- TREE LINE
- TRAVERSE MARKER
- DROP INLET
- SIGN
- LIGHT POLE
- SANITARY MANHOLE
- WATER VALVE
- FIRE HYDRANT
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- UTILITY POLE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- PROPERTY LINE
- FENCE LINE
- UNDERGROUND PIPING 12" AND LARGER
- UNDERGROUND PIPING SMALLER THAN 12"
- RAILROAD TRACK
- TEST BORING

ABBREVIATIONS

- F FERMENTER
- FC FINAL CLARIFIER
- FEB FLOW EQUALIZATION BASIN
- PC PRIMARY CLARIFIER
- PR PROCESS REACTOR
- PS PRIMARY SUBSTATION

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
3. THE CONTRACTOR SHALL NOTIFY "WISD UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
4. ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
5. THE EXISTING TOPOGRAPHY IS TAKEN FROM AERIAL SURVEY WITH MAXIMUM ONE FOOT CONTOUR INTERVALS PREPARED FOR AMT AND ASSOCIATES BY AIR SURVEY CORP., INC. DATED JUNE 1999.
6. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE COORDINATE SYSTEM, HOWARD COUNTY MONUMENT NOS. 4711 AND 4712N WERE USED FOR THIS PROJECT.
7. WATER IS PUBLIC (HO. CO. LITTLE PATUXENT WATER RECLAMATION PLANT).
8. SEWER IS PUBLIC (HO. CO. LITTLE PATUXENT WATER RECLAMATION PLANT).
9. EXISTING UTILITIES ARE BASED ON LITTLE PATUXENT WATER RECLAMATION PLANT AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO START OF ANY DEMOLITION AND CONSTRUCTION.
10. FLOODPLAIN LIMITS FOR THIS PROJECT WERE TAKEN FROM HOWARD COUNTY STUDY DATED 1986.
11. THE ENTIRE LITTLE PATUXENT WASTEWATER TREATMENT PLANT SITE IS LOCATED IN THE 100 YEAR FLOODPLAIN, ELEV. 143.0.
12. OFFSITE DISPOSAL OF EXCESS MATERIAL WILL BE TO AN APPROVED SITE.
13. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING FACILITIES, STRUCTURES AND UTILITIES FROM DAMAGE UNLESS OTHERWISE SHOWN.
14. OMISSIONS/ADDITIONS OF UTILITIES FOUND DURING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF ANY CONTRACTOR ENGAGED IN CONSTRUCTION AT THIS SITE. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY AND ALL UTILITY OMISSIONS/ADDITIONS.
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND LEGALLY DISPOSE OF ANY AND ALL DEMOLISHED/DELETERIOUS MATERIALS.
16. EXISTING PAVEMENT SHALL BE SAWCUT PRIOR TO REMOVAL. ALL SAWCUT SHALL BE STRAIGHT, EVEN CUTS. JAGGED EDGES SHALL NOT BE PERMITTED. SAWCUT DEPTH SHALL EXTEND AT LEAST 2/3 TIMES THE THICKNESS OF THE EXISTING PAVEMENT THAT REMAINS IN PLACE.
17. POSITIVE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES. PONDING OF WATER SHALL NOT BE PERMITTED. ALL PONDING WATER SHALL BE FILTERED THROUGH A PORTABLE SEDIMENT TANK PRIOR TO DISCHARGE INTO THE PUBLIC STORM/SEWER SYSTEM.
18. SURFACED STREET AND PARKING AREAS SHALL BE MAINTAINED IN A CLEAN CONDITION, MUD AND DUST FREE AT ALL TIMES. ADEQUATE MEANS SHALL BE PROVIDED TO CLEAN TRUCKS AND EQUIPMENT.
19. CONTRACTOR SHALL HAND DIG TEST PITS AT ALL UTILITY CROSSINGS TO DETERMINE THEIR EXACT LOCATION, WELL IN ADVANCE OF ANY DEMOLITION/CONSTRUCTION.
20. ALL TIES TO EXISTING PAVEMENT/STRUCTURES AND CURB SHALL BE SMOOTH TRANSITIONS WITH NO ABRUPT CHANGES.
21. CONTRACTOR SHALL ADJUST ALL UTILITY FRAME AND COVERS TO MATCH NEW FINISHED GRADE.
22. FOR DEMOLITION/RELOCATION OF YARD PIPING SANITARY SEWER, WATER LINE ETC. SEE YARD PIPING DEMOLITION PLANS.
23. THE VERTICAL SURVEY IS BASED ON THE CURRENT HOWARD COUNTY GEODETIC CONTROL (NAVD 88). PREVIOUS CONSTRUCTION PROJECTS AND RECORD DRAWINGS AT THE SITE WERE BASED ON AN EARLIER VERTICAL DATUM. ELEVATIONS OF EXISTING FACILITIES SHOWN ON THESE DRAWINGS HAVE BEEN ADJUSTED TO APPROXIMATE THE ELEVATIONS IN THE CURRENT HOWARD COUNTY GEODETIC CONTROL. THE CONTRACTOR SHALL CONFIRM THE ELEVATION OF ALL EXISTING STRUCTURES WHICH ARE CRITICAL TO THIS CONTRACT.
24. THE SITE PLAN AND EROSION CONTROL PLAN ARE BASED ON THE SITE DEVELOPMENT PLAN (SDP) AMENDMENT DATED APRIL 10, 2000 AND SUBMITTED TO HOWARD COUNTY. THE SDP AMENDMENT IS INCLUDED IN THE CONTRACT BY REFERENCE. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE SDP AMENDMENT.
25. CONTRACTOR OF CONTRACT NO 20-3751 SHALL CONSTRUCT THE CONTRACTOR PARKING AREA AND BE RESPONSIBLE FOR ITS MAINTENANCE THROUGHOUT THE DURATION OF CONTRACT 20-3751.
26. CONTRACTOR OF CONTRACT NO 20-3751 SHALL INSTALL AND MAINTAIN SIGNS AS SHOWN IN THE CONSTRUCTION SIGNAGE TABLE ON THIS DRAWING.
27. CONTRACTOR OF CONTRACT NO 20-3751 SHALL PREPARE CONSTRUCTION TRAILER AREA AS SHOWN, AND MAINTAIN THE SITE THROUGHOUT THE DURATION OF THE CONTRACT.



TRAVERSE STATIONS

NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
TRAV #22	530410.03	1365394.67		
TRAV #1	530891.94	1365737.20	141.44	PK NAIL SET
TRAV #2	531189.86	1365490.86	140.70	PK NAIL SET
TRAV #3	530714.05	1365488.81	140.93	PK NAIL SET
TRAV #4	530635.03	1365378.47	140.71	PK NAIL SET
TRAV #5	530560.57	1365274.49	140.81	PK NAIL SET
TRAV #6	530589.79	1365236.95	141.20	PK NAIL SET
TRAV #7	530825.66	1365020.78	140.81	PK NAIL SET
TRAV #8	530911.71	1365131.75	140.07	PK NAIL SET
TRAV #9	531019.78	1365271.36	141.27	PK NAIL SET
TRAV #10	531214.69	1365947.63	139.91	PK NAIL SET
TRAV #11	530853.02	1366121.33	142.28	60D NAIL SET

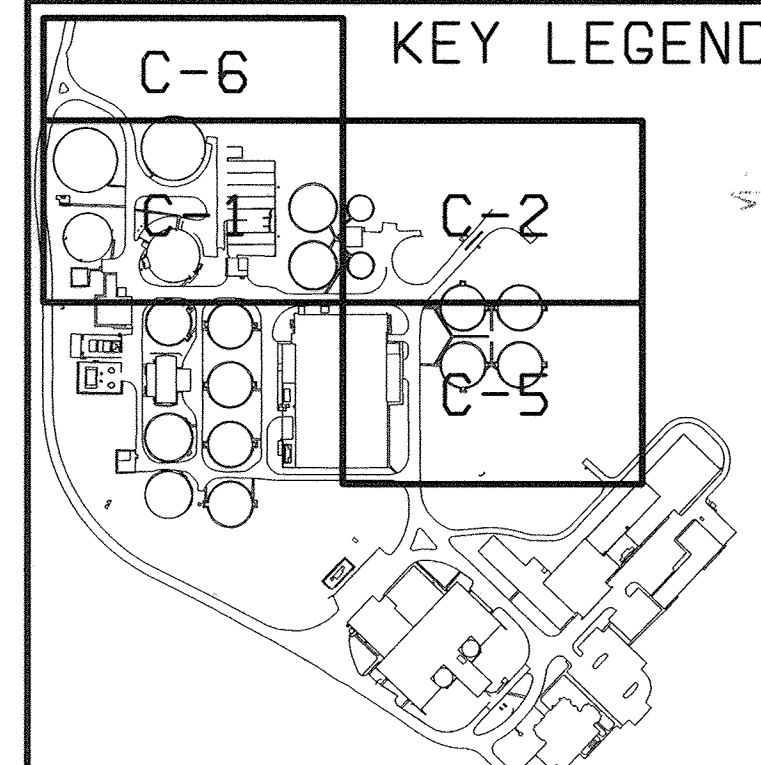
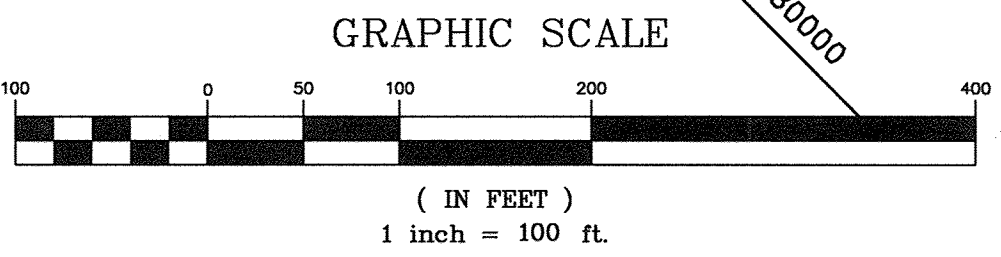
BENCHMARK

HORIZONTAL AND VERTICAL BASED UPON HOWARD COUNTY GPS CONTROL MONUMENTS (THIRD CLASS SURVEY CONTROL) NAD 83/91, NAVD 88.

NAME	NORTHING	EASTING	ELEVATION
4711T	530819.908	1366225.547	143.274
4717Z	531440.211	1365496.525	147.001

CONSTRUCTION SIGNAGE TABLE

NUMBER	LOCATION	SIZE	DESCRIPTION
1	ON HIGHWAY U.S. 1 SOUTH OF CONSTRUCTION ENTRANCE	36X24 - BLACK LETTERS ON WHITE BACKGROUND	CAUTION - CONSTRUCTION ENTRANCE
2	ON HIGHWAY U.S. 1 SOUTH OF CONSTRUCTION ENTRANCE	36X24 - BLACK LETTERS ON WHITE BACKGROUND	TRUCKS ENTERING HIGHWAY
3	AT INTERSECTION OF PERIMETER ROAD & HIGHWAY U.S. 1	48X96 - BLACK LETTERS ON WHITE BACKGROUND	CONSTRUCTION ENTRANCE AUTHORIZED PERSONNEL ONLY ALL OTHERS USE MAIN PLANT ENTRANCE
4	AT INTERSECTION OF PERIMETER ROAD & HIGHWAY U.S. 1	AS REQUIRED BY MDE	"MDE" SIGN
5	AT INTERVALS NOT GREATER THAN 500 FEET FROM HIGHWAY U.S. 1 TO PLANT PERIMETER FENCE	12X18 RED LETTERS ON WHITE BACKGROUND	1. SPEED LIMIT 25 MPH 2. TWO-WAY TRAFFIC 3. ABSOLUTELY NO PARKING ALONG PERIMETER ROAD
6	AT PLANT PERIMETER FENCE	30X30 RED LETTERS ON WHITE BACKGROUND	NO PERSONAL VEHICLES BEYOND THIS POINT



OWNER/DEVELOPER  
 HOWARD COUNTY GOVERNMENT  
 DEPT. OF PUBLIC WORKS  
 3430 COURTHOUSE DRIVE  
 ELLICOTT CITY, MARYLAND 21043

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  A. MORFON THOMAS AND ASSOCIATES, INC. CONSULTING ENGINEERS 12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE MD 20852 TEL (301) 881-2545 FAX (301) 881-0814 E-MAIL JBYRNE@AMTEENGINEERING.COM AMT FILE # 98-154	BLACK & VEATCH, L.P. Gaithersburg, Maryland  REG. PROF. ENGR. DATE 6/22/00	DES: A.R. DRN: R.E.A. CHK: J.B. DATE: 06/23/00	CIVIL  OVERALL SITE PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 5 OF 161 L5
		DATE: 06/23/00 DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP	CIVIL  OVERALL SITE PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 5 OF 161 L5

DESIGN WASTEWATER CHARACTERISTICS

Table with columns: AVERAGE, MAX. MO., MAX DAY. Rows include RAW WASTEWATER (FLOW, BOD5, TSS, TKN, TP), INTERNAL RECYCLE LOADS, TOTAL PLANT LOADS, PRIMARY EFFLUENT CHARACTERISTICS, and EFFLUENT DISCHARGE LIMITATIONS.

RAW WASTEWATER SCREENING

Table with columns: NO. OF SCREENS, SCREEN WIDTH, TYPE OF SCREENS, NOMINAL BAR SPACING, CLEAN SCREEN CAPACITY.

RAW WASTEWATER PUMPING

Table with columns: HEADWORKS PUMPS (NO. OF EXISTING, RATED CAPACITY), NO. OF NEW PUMPS, RATED CAPACITY, AUXILIARY PUMP STATION.

GRIT REMOVAL BASINS

Table with columns: NO. OF BASINS, TYPE OF BASINS, DIMENSIONS, RATED CAPACITY, 90% REMOVAL MESH.

FLOW EQUALIZATION

Table with columns: NO. OF BASINS, TOTAL VOLUME.

PRIMARY CLARIFIERS

Table with columns: DIAMETER EXISTING BASINS, PC NO., SIDE WATER DEPTH, TOTAL SURFACE AREA, TOTAL WEIR LENGTH, SURFACE OVERFLOW RATES, WEIR OVERFLOW RATE.

PRIMARY SLUDGE PUMPING

Table with columns: SOUTH PUMP STATION (EXISTING/NEW PUMPS), NORTH PUMP STATION (EXISTING/NEW PUMPS).

BIOLOGICAL PROCESS REACTORS

Table with columns: NORTH PROCESS REACTORS (NO. OF REACTOR BASINS, CELL VOLUMES, CELL 1-10), REACTOR ZONE VOLUMES, TOTAL.

PROCESS LOADING

Table with columns: FLOW, BOD5, TSS, TKN, TP, TEMP, RETENTION TIME BY ZONE, WASTE ACTIVATED SLUDGE, RETURN ACTIVATED SLUDGE, RAS FLOW, SOLIDS CONCENTRATION, INTERNAL RECYCLE FLOW, OXYGEN TRANSFER REQ., AIR REQUIRED.

EXISTING PROCESS REACTORS

Table with columns: NO. OF REACTOR BASINS, CELL VOLUMES, CELL 1-10, REACTOR ZONE VOLUMES, TOTAL.

PROCESS LOADING

Table with columns: FLOW, BOD5, TSS, TKN, TP, TEMP, RETENTION TIME BY ZONE, WASTE ACTIVATED SLUDGE, RETURN ACTIVATED SLUDGE, RAS FLOW, SOLIDS CONCENTRATION, INTERNAL RECYCLE FLOW, OXYGEN TRANSFER REQ., AIR REQUIRED.

ANAEROBIC FERMENTER

Table with columns: NO. FERMENTER BASINS, BASIN DIAMETER, BASIN SIDE WATER DEPTH, BASIN VOLUME, PRIMARY SLUDGE FLOW, SOLIDS FEED, ELUTRIATION WATER, HYDRAULIC RETENTION TIME, SOLIDS RETENTION TIME, FERMENTATE PRODUCTION.

FINAL CLARIFIERS

Table with columns: NORTH FINAL CLARIFIERS (NO. OF CLARIFIERS, DIAMETER, SIDE WATER DEPTH, SURFACE AREA, WEIR LENGTH, SURFACE OVERFLOW RATES), WEIR OVERFLOW RATES, SOLIDS LOADING RATES, EAST & WEST FINAL CLARIFIERS.

EFFLUENT FILTERS

Table with columns: NO. OF FILTER BASINS, FILTER AREA, TOTAL FILTER AREA, HYDRAULIC LOADING, AVERAGE, MAX MONTH, MAX DAY.

FILTER EFFLUENT PUMP STATION

Table with columns: NO. OF PUMPS, RATED CAPACITY, TOTAL CAPACITY, FIRM CAPACITY.

CHLORINATION/DECHLORINATION/REAERATION

Table with columns: FLOCCULATION/1ST STAGE CHLORINE CONTACT BASINS, POST CHLORINATION BASIN, DECHLORINATION BASIN, REAERATION BASIN.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. Chief, Bureau of Utilities Date: 6/29/00.

BLACK & VEATCH LLP, Gaithersburg, Maryland. Robert J. Rectanus Jr., No. 22927, Registered Professional Engineer.

Table with columns: DES: RJR, DRN: SLF, CHK: WLK, DATE: 6/23/00, REVISIONS AND RECORD OF ISSUE.

LAYOUT/OVERVIEW CIVIL. PROCESS DESIGN CRITERIA.

LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION. CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752. HOWARD COUNTY, MARYLAND.

SCALE AS SHOWN. SHEET 6 OF 161. L6.

058472 F058472A

INFLUENT SEWER  
 BOD5 37,253 ppd  
 TSS 37,084 ppd  
 TKN 6,110 ppd  
 TP 1,025 ppd  
 FLOW 25 mgd

PLANT INFLUENT  
 BOD5 38,333 ppd  
 TSS 40,845 ppd  
 TKN 6,500 ppd  
 TP 1,222 ppd  
 FLOW 26.14 mgd

HEADWORKS

GRIT REMOVAL

PRIMARY CLARIFIER

PRIMARY EFFL  
 BOD5 23,600 ppd  
 TSS 12,600 ppd  
 TKN 5,200 ppd  
 TP 1,100 ppd  
 FLOW 26.00 mgd

AX AN AX OX

FINAL CLARIFIER

SECONDARY EFFL  
 BOD5 2,148 ppd  
 TSS 2,148 ppd  
 TKN 645 ppd  
 TP 215 ppd  
 FLOW 25.76 mgd

EFLUENT FILTERS

FILTERED EFFLUENT  
 BOD5 1,039 ppd  
 TSS 1,039 ppd  
 TKN 418 ppd  
 TP 104 ppd  
 FLOW 24.91 mgd

FILTER BACKWASH  
 BOD5 1,110 ppd  
 TSS 1,110 ppd  
 TKN 229 ppd  
 TP 111 ppd  
 FLOW 0.56 ppd

SOLIDS PROCESSING RETURN  
 BOD5 971 ppd  
 TSS 2,452 ppd  
 TKN 161 ppd  
 TP 84 ppd  
 FLOW 0.58 mgd

SCREENINGS

GRIT

ELUTRIATION WATER  
 BOD5 784 ppd  
 TSS 419 ppd  
 TKN 173 ppd  
 TP 37 ppd  
 FLOW 0.86 mgd

FERMENTATE  
 BOD5 5035 ppd  
 TSS 1520 ppd  
 TKN 433 ppd  
 TP 1200 ppd  
 FLOW 0.91 mgd

PRIMARY SLUDGE  
 BOD5 15,733 ppd  
 TSS 28,045 ppd  
 TKN 1,300 ppd  
 TP 122 ppd  
 FLOW 0.13 mgd

PRIMARY SLUDGE  
 BOD5 7,867 ppd  
 TSS 14,023 ppd  
 TKN 850 ppd  
 TP 61 ppd  
 FLOW 0.07 mgd

ANAEROBIC FERMENTER

MAS SLUDGE  
 BOD5 4,844 ppd  
 TSS 21,800 ppd  
 TKN 1,744 ppd  
 TP 855 ppd  
 FLOW 0.29 mgd

PRIMARY SLUDGE  
 BOD5 7,867 ppd  
 TSS 14,023 ppd  
 TKN 850 ppd  
 TP 61 ppd  
 FLOW 0.07 mgd

FERMENTED SLUDGE  
 BOD5 4,720 ppd  
 TSS 8,414 ppd  
 TKN 507 ppd  
 TP 85 ppd  
 FLOW 0.02 mgd

DAF SUPERNATANT  
 BOD5 52 ppd  
 TSS 280 ppd  
 TKN 5 ppd  
 TP 35 ppd  
 FLOW 0.21 mgd

DAF THICKENER

THICKENER OVERFLOW  
 BOD5 91 ppd  
 TSS 91 ppd  
 TKN 18 ppd  
 TP 3 ppd  
 FLOW 0.04 mgd

GRAVITY THICKENER

MISC. WASH WATER  
 FLOW 0.18 mgd

THICKENED SLUDGE  
 BOD5 11,957 ppd  
 TSS 21,314 ppd  
 TKN 1,099 ppd  
 TP 81 ppd  
 FLOW 0.05 mgd

THICKENED MAS  
 BOD5 4,602 ppd  
 TSS 20,710 ppd  
 TKN 1,657 ppd  
 TP 841 ppd  
 FLOW 0.08 mgd

LIME  
 TSS 24,752 ppd

THICKENED SLUDGE  
 BOD5 16,560 ppd  
 TSS 42,024 ppd  
 TKN 2,758 ppd  
 TP 380 ppd  
 FLOW 0.13 mgd


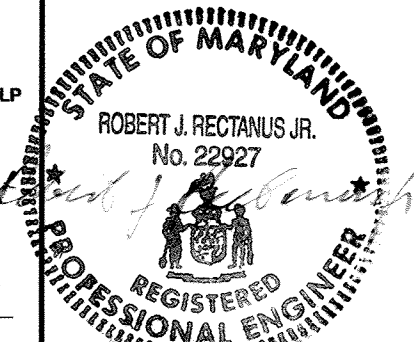
CENTRIFUGE

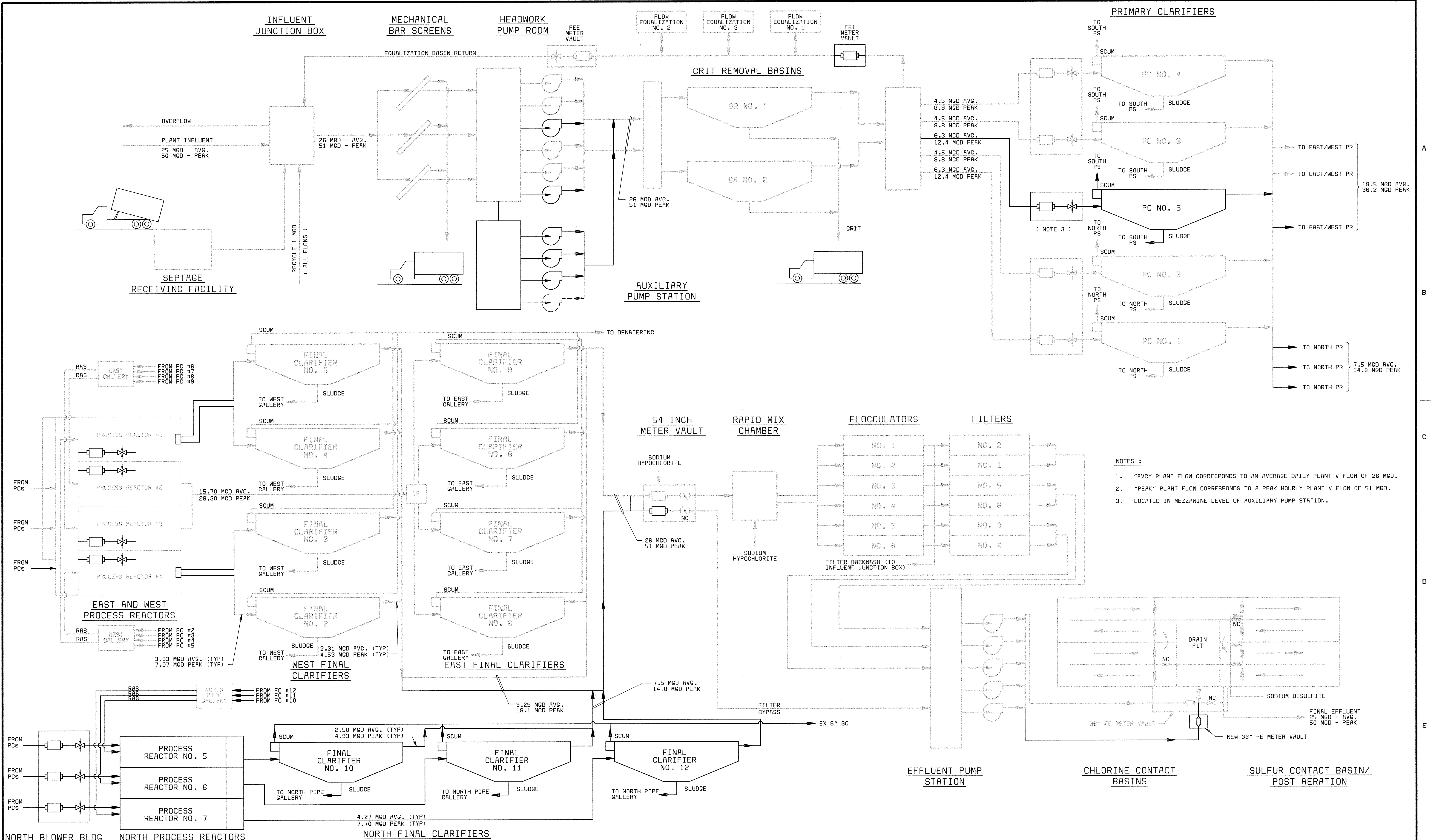
DEWATERED SLUDGE  
 TSS 39,823 ppd  
 TKN 2,618 ppd  
 TP 931 ppd  
 FLOW 19,100 ppd

SLUDGE STABILIZATION

STABILIZED SLUDGE  
 TSS 84,675 ppd  
 FLOW 19,400 ppd

CENTRATE  
 BOD5 828 ppd  
 TSS 2,101 ppd  
 TKN 138 ppd  
 TP 49 ppd  
 FLOW 0.11 mgd

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER STATE OF MARYLAND REG. PROF. ENGR. DATE	DES: RJR	LAYOUT/OVERVIEW CIVIL  PROCESS MASS BALANCE DIAGRAM	SCALE AS SHOWN
	DRN: SLF		LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND
Robert M. Bennett (6-21-00) CHIEF, BUREAU OF UTILITIES DATE	CHK: WLK	REVISIONS AND RECORD OF ISSUE NO. BY CK APP	L7
58472-101-GEN-C-A0001299 06/12/2000 16:23:08 ACD	DATE: 6/23/00		



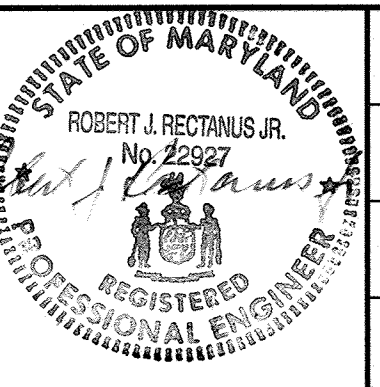
- NOTES :**
1. "AVG" PLANT FLOW CORRESPONDS TO AN AVERAGE DAILY PLANT V FLOW OF 26 MGD.
  2. "PEAK" PLANT FLOW CORRESPONDS TO A PEAK HOURLY PLANT V FLOW OF 51 MGD.
  3. LOCATED IN MEZZANINE LEVEL OF AUXILIARY PUMP STATION.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Robert J. Rectanus Jr.  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gallithersburg, Maryland

Robert J. Rectanus Jr.  
REG. PROF. ENGR. DATE 6/26/00



DES: FKA					
DRN: GRH					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

LAYOUT/OVERVIEW  
CIVIL

LIQUID SCHEMATIC

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

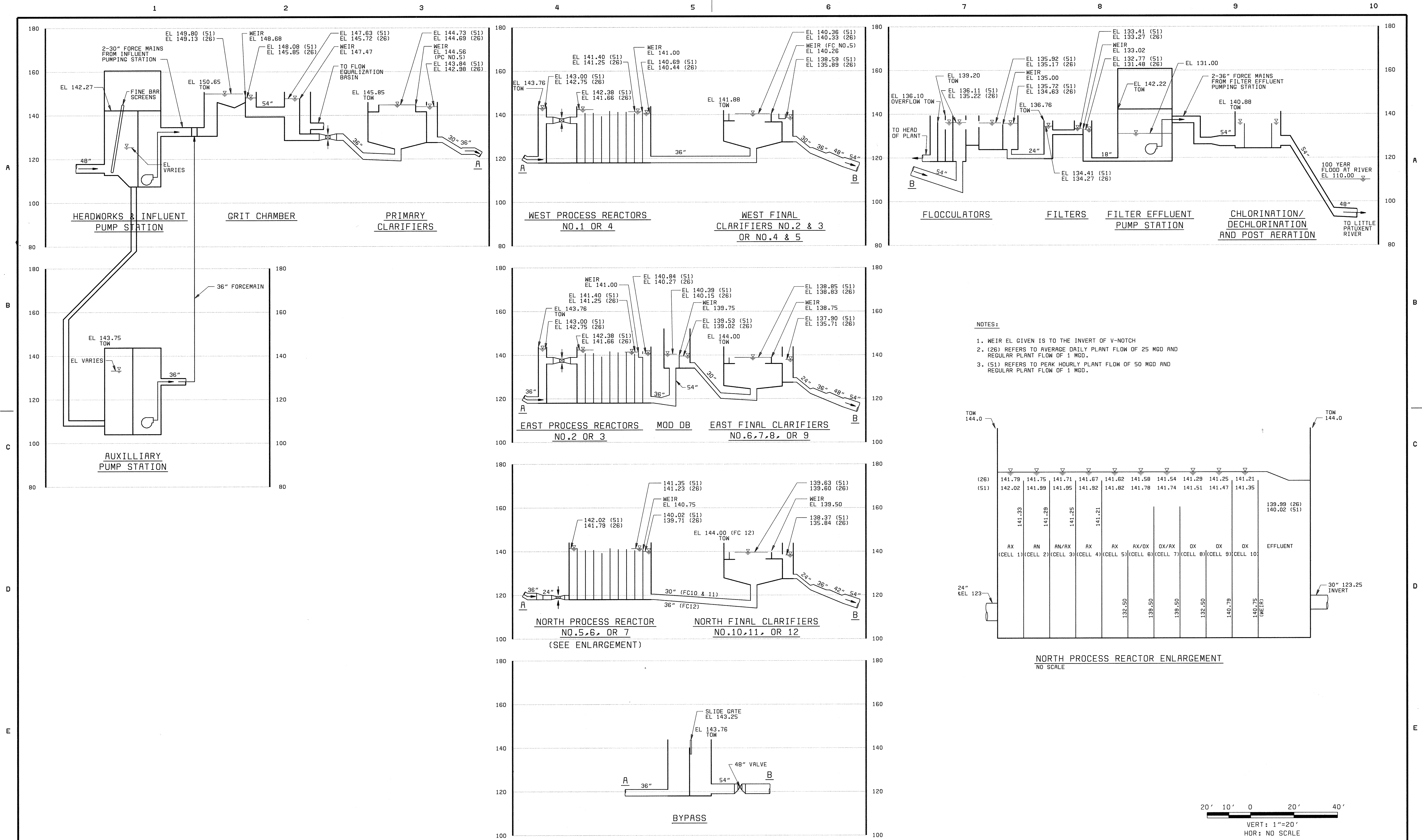
HOWARD COUNTY, MARYLAND

SCALE  
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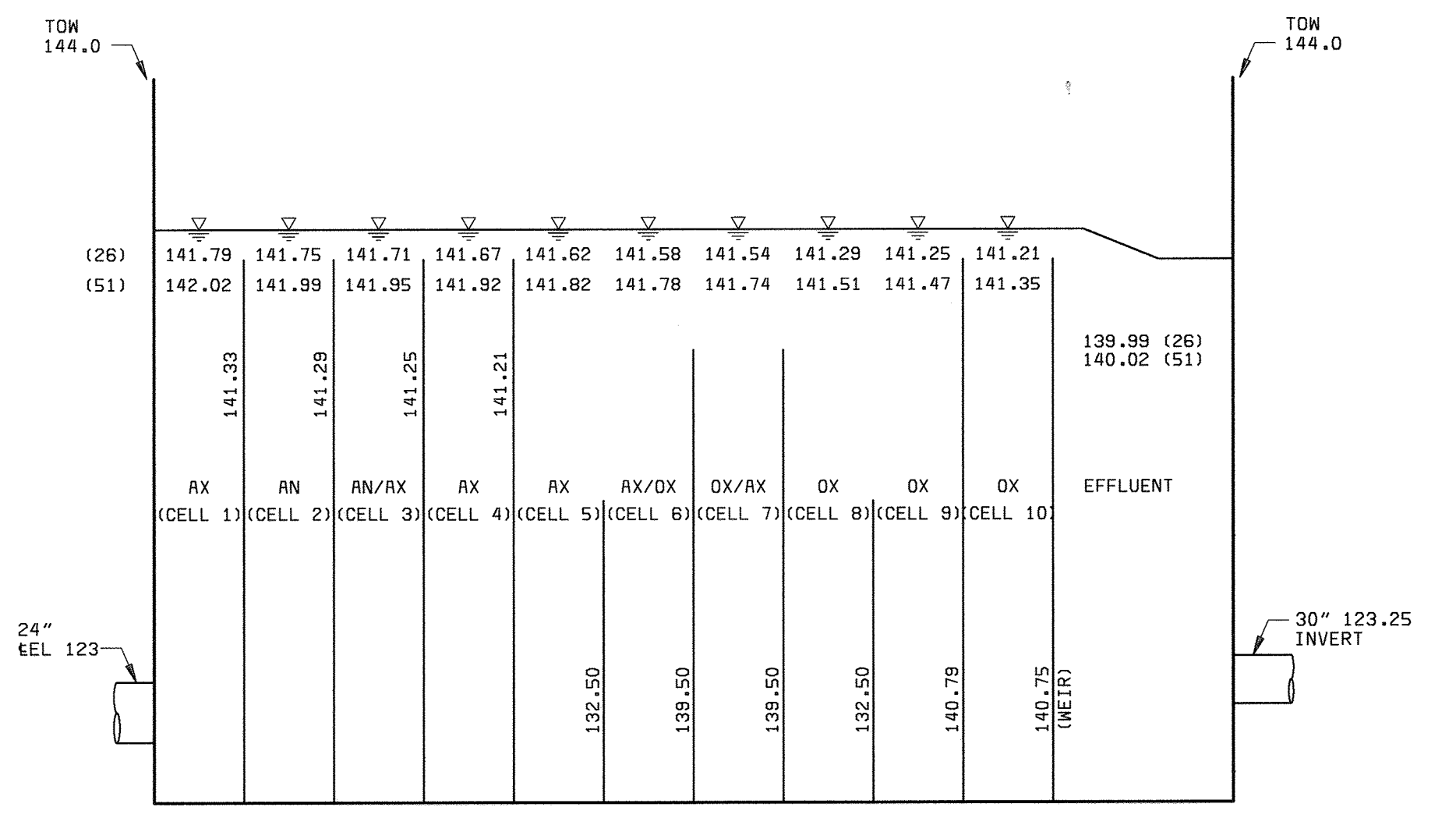
SHEET  
8 OF 161

L8

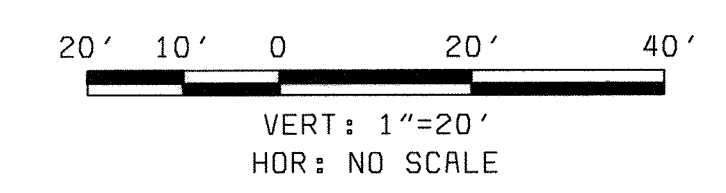




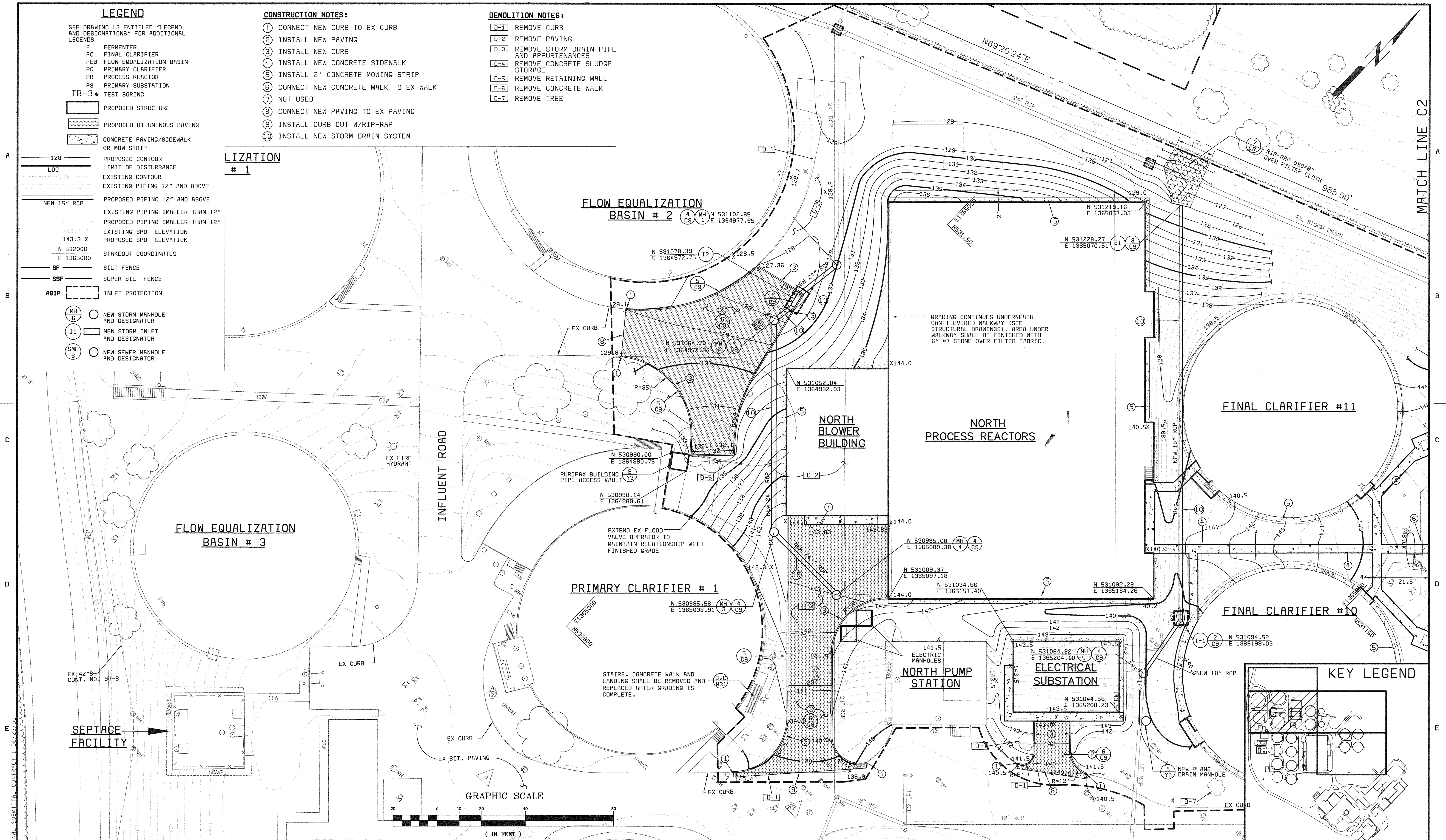
- NOTES:**
- WEIR EL GIVEN IS TO THE INVERT OF V-NOTCH
  - (26) REFERS TO AVERAGE DAILY PLANT FLOW OF 25 MGD AND REGULAR PLANT FLOW OF 1 MGD.
  - (51) REFERS TO PEAK HOURLY PLANT FLOW OF 50 MGD AND REGULAR PLANT FLOW OF 1 MGD.



**NORTH PROCESS REACTOR ENLARGEMENT**  
NO SCALE



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert M. Reilly CHIEF, BUREAU OF UTILITIES DATE: 6-29-00	 <b>BLACK &amp; VEATCH</b> LP Gaithersburg, Maryland  Robert J. Rectanus, Jr. REG. PROF. ENGR. DATE: 6/26/00	 REGISTERED PROFESSIONAL ENGINEER	DES: FKA							LAYOUT/OVERVIEW CIVIL  HYDRAULIC PROFILE	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: GRH	CHK: WLK	DATE: 6/23/00							



**LEGEND**

- SEE DRAWING L3 ENTITLED "LEGEND AND DESIGNATIONS" FOR ADDITIONAL LEGENDS
- F FERMENTER
  - FC FINAL CLARIFIER
  - FEB FLOW EQUALIZATION BASIN
  - PC PRIMARY CLARIFIER
  - PR PROCESS REACTOR
  - PS PRIMARY SUBSTATION
  - TB-3 TEST BORING
- PROPOSED STRUCTURE  
 PROPOSED BITUMINOUS PAVING  
 CONCRETE PAVING/SIDEWALK OR MOW STRIP

**CONSTRUCTION NOTES:**

- 1 CONNECT NEW CURB TO EX CURB
- 2 INSTALL NEW PAVING
- 3 INSTALL NEW CURB
- 4 INSTALL NEW CONCRETE SIDEWALK
- 5 INSTALL 2' CONCRETE MOWING STRIP
- 6 CONNECT NEW CONCRETE WALK TO EX WALK
- 7 NOT USED
- 8 CONNECT NEW PAVING TO EX PAVING
- 9 INSTALL CURB CUT W/RIP-RAP
- 10 INSTALL NEW STORM DRAIN SYSTEM

**DEMOLITION NOTES:**

- D-1 REMOVE CURB
- D-2 REMOVE PAVING
- D-3 REMOVE STORM DRAIN PIPE AND APPURTENANCES
- D-4 REMOVE CONCRETE SLUDGE STORAGE
- D-5 REMOVE RETAINING WALL
- D-6 REMOVE CONCRETE WALK
- D-7 REMOVE TREE

**UTILIZATION # 1**

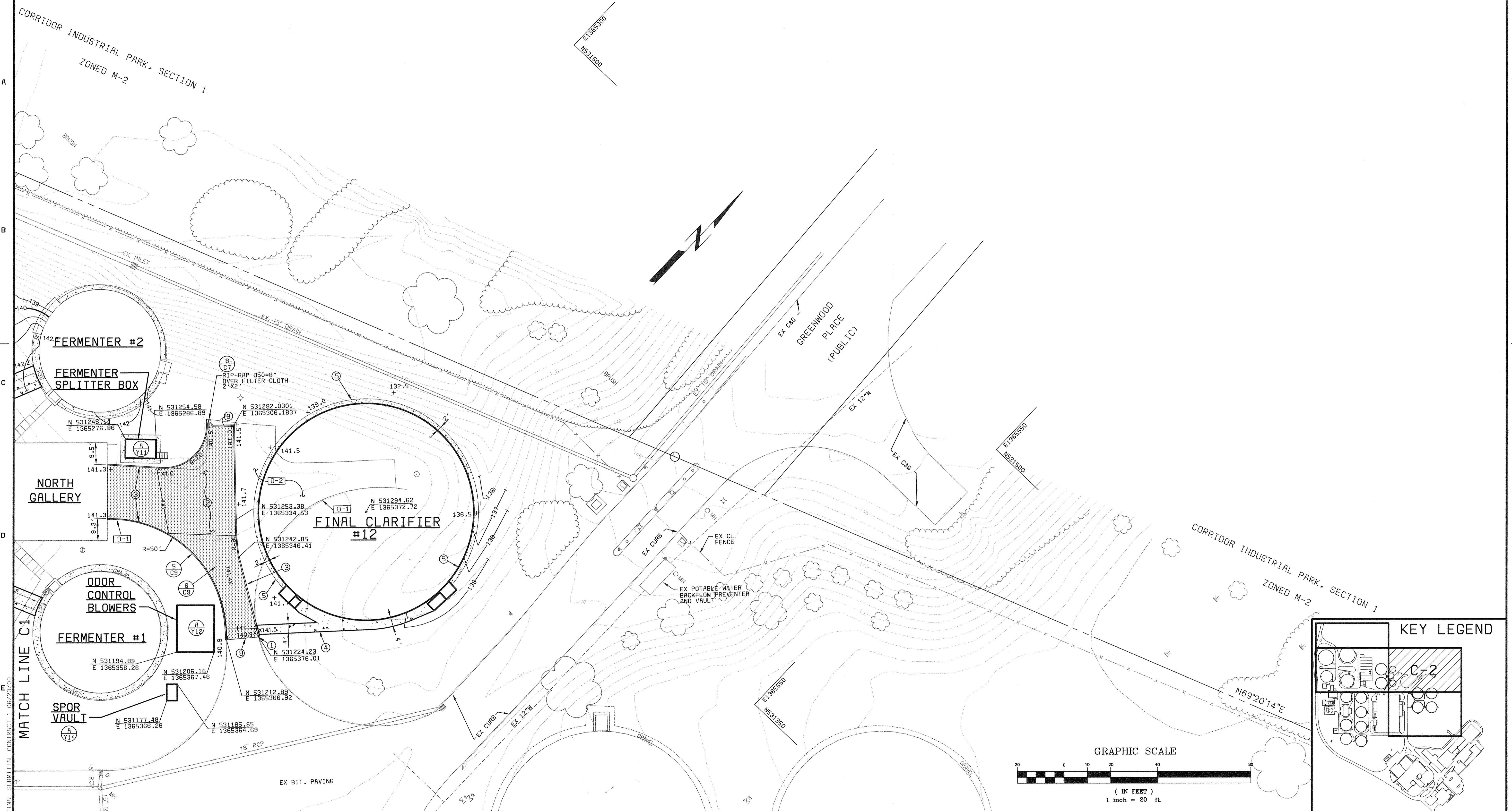
- 128 PROPOSED CONTOUR
- LOD LIMIT OF DISTURBANCE
- 129 EXISTING CONTOUR
- EXISTING PIPING 12" AND ABOVE
- NEW 15" RCP PROPOSED PIPING 12" AND ABOVE
- EXISTING PIPING SMALLER THAN 12"
- PROPOSED PIPING SMALLER THAN 12"
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- 143.3 X STAKEOUT COORDINATES
- N 532000 E 1365000
- SF SILT FENCE
- SSF SUPER SILT FENCE
- ACIP INLET PROTECTION
- MH 6 NEW STORM MANHOLE AND DESIGNATOR
- I1 NEW STORM INLET AND DESIGNATOR
- SMH 6 NEW SEWER MANHOLE AND DESIGNATOR

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	 <b>AMT</b> A. MORTON THOMAS AND ASSOCIATES, INC. CONSULTING ENGINEERS 12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE MD 20852 TEL (301) 881-2545 FAX (301) 881-8814 E-MAIL JBYRNE@AMTEENGINEERING.COM AMT FILE # 98-154	 <b>BLACK &amp; VEATCH</b> LP Gaithersburg, Maryland REG. PROF. ENGR. <i>[Signature]</i> DATE 6/22/00	 PROFESSIONAL ENGINEER 24174 DATE 6/22/00	DES: A.R. DRN: R.E.A. CHK: J.B. DATE: 06/23/00	CIVIL SITE GRADING AND STAKING PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 10 OF 161 <b>C1</b>
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*[Signature]* 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE

CORRIDOR INDUSTRIAL PARK, SECTION 1  
ZONED M-2



FINAL SUBMITTAL CONTRACT 1.06/23/00

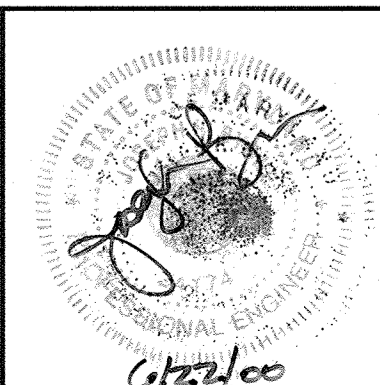
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Ruth B...*  
CHIEF, BUREAU OF UTILITIES DATE

**AMT**  
A. MORTON THOMAS AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE MD 20852  
TEL: (301) 881-2545 FAX: (301) 881-6814  
E-MAIL: JBYRNE@AMTENGINEERING.COM  
AMT FILE # 98-154

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*...*  
REG. PROF. ENGR. DATE



DES: A.R.					
DRN: R.E.A.					
CHK: J.B.					
DATE: 06/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

CIVIL

**SITE GRADING AND STAKING PLAN**

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
NORTH BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 11 OF 161

**C2**

DB8472  
FD58472A

MATCH LINE C6

FLOW EQUALIZATION  
BASIN # 1

FLOW EQUALIZATION  
BASIN # 2

STOCKPILE  
AREA

FINAL CLARIFIER #11

FLOW EQUALIZATION  
BASIN # 3

PRIMARY CLARIFIER # 1

NORTH  
BLOWER  
BUILDING

NORTH  
PROCESS REACTORS

FINAL CLARIFIER #10

SEPTAGE  
FACILITY

ELECTRICAL  
SUBSTATION

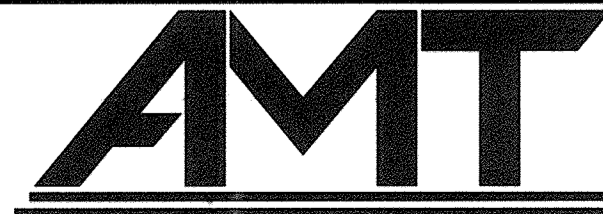
NORTH PUMP  
STATION

KEY LEGEND

GRAPHIC SCALE



DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND



A. MORTON THOMAS AND ASSOCIATES, INC.  
CONSULTING ENGINEERS  
12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE MD 20852  
TEL (301) 881-2545 FAX (301) 881-8814  
E-MAIL: JBYRNE@AMTEngineering.com  
AMT FILE # 98-154



BLACK & VEATCH, L.P.  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE 6/22/00



DES: A.R.

DRN: R.E.A.

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DATE: 06/23/00

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CIVIL

EROSION AND SEDIMENT CONTROL PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
NORTH BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

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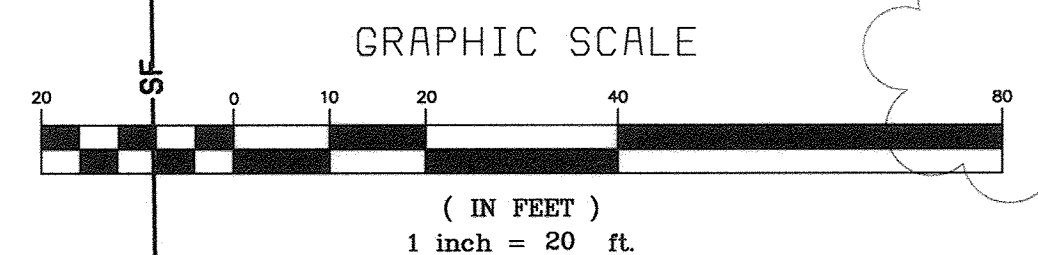
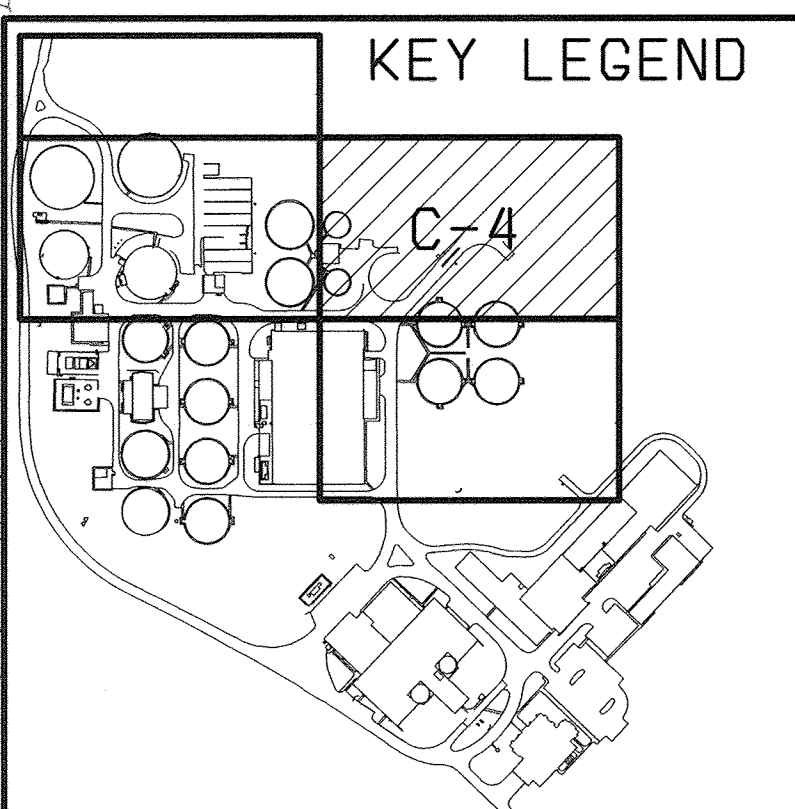
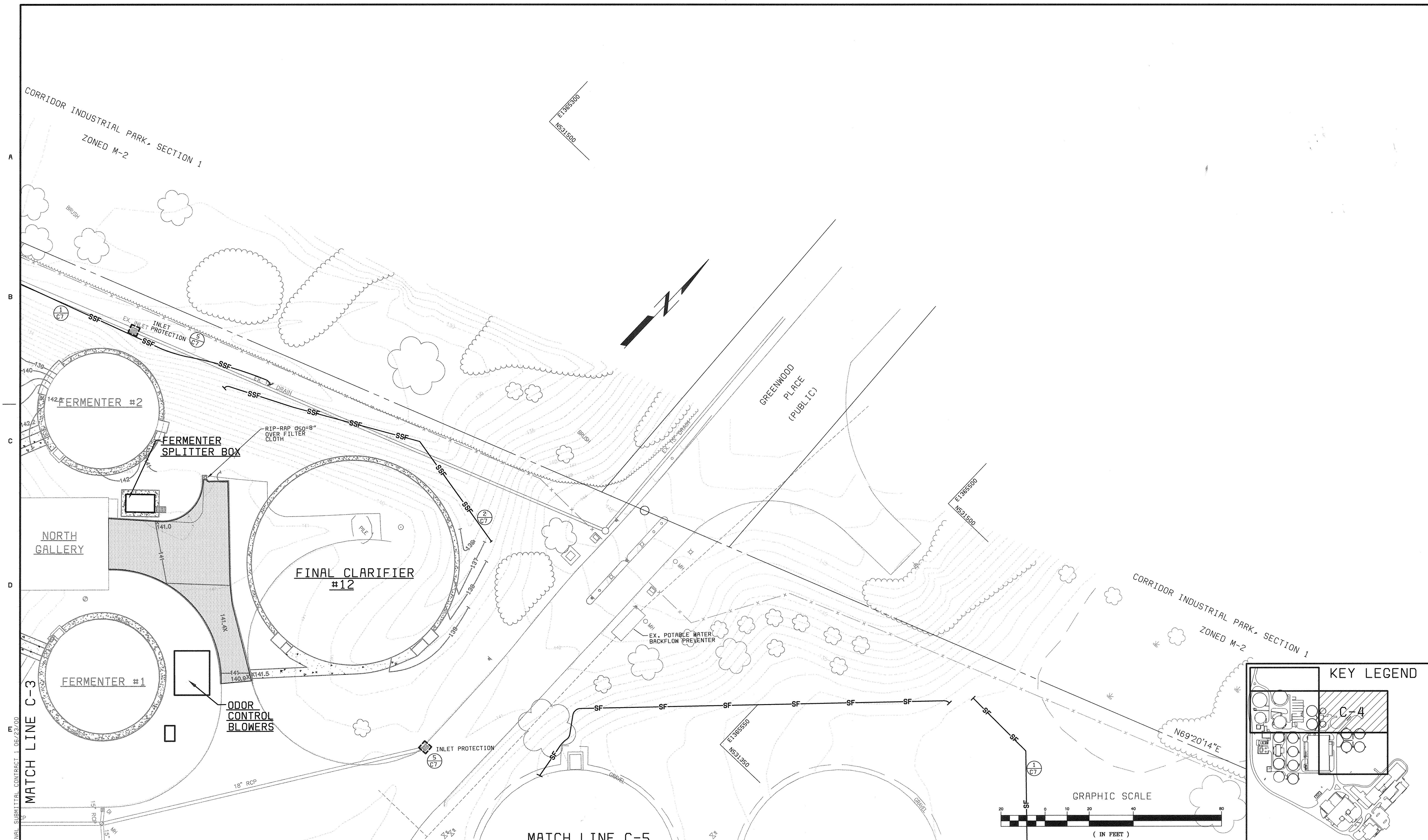
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12 OF 161

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FINAL SUBMITTAL CONTRACT 1.06/23/00

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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 MATCH LINE C-3  
 MATCH LINE C-5  
 FINAL SUBMITTAL CONTRACT 1.06/23/00  
 058472  
 F058472A

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Chief, Bureau of Utilities DATE

**AMT**  
 A. MORTON THOMAS AND ASSOCIATES, INC.  
 CONSULTING ENGINEERS  
 12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE MD 20852  
 TEL: (301) 881-2545 FAX: (301) 881-0814  
 E-MAIL: JBYRNE@AMTENGINEERING.COM  
 AMT FILE # 98-154

**BLACK & VEATCH** LLP  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE 6/22/00

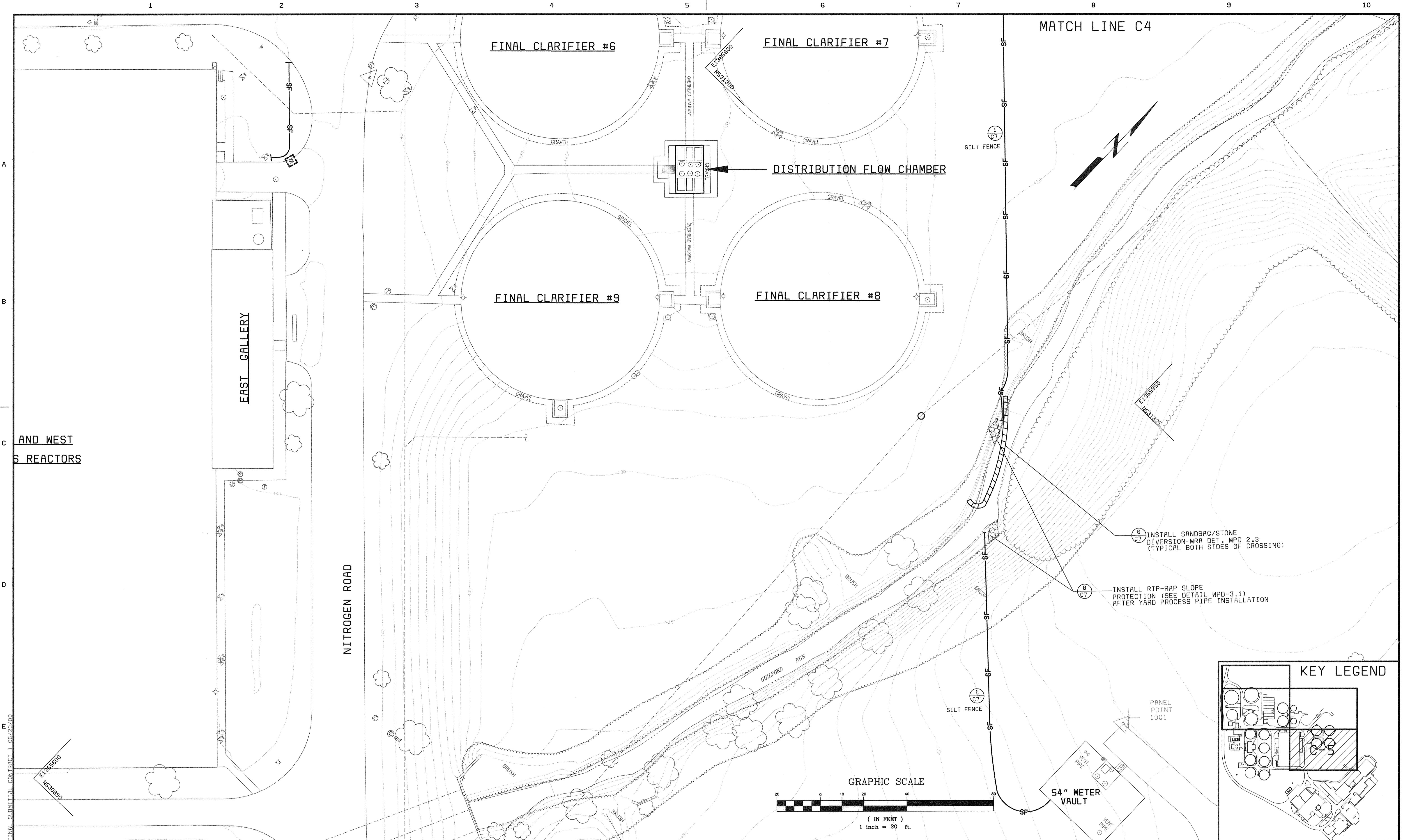


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DATE: 06/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

CIVIL  
 EROSION AND SEDIMENT CONTROL PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 NORTH BNR TREATMENT CAPACITY EXPANSION  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 13 OF 161  
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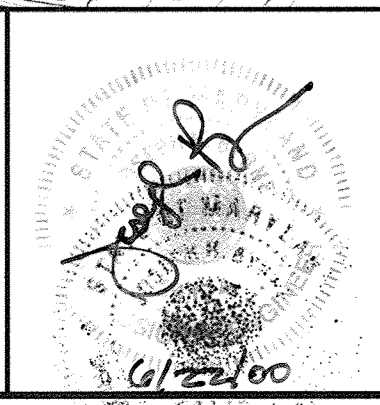


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 DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
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 HOWARD COUNTY, MARYLAND  
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 TEL (301) 881-2545 FAX (301) 881-0814  
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**BLACK & VEATCH**  
 Gaithersburg, Maryland  
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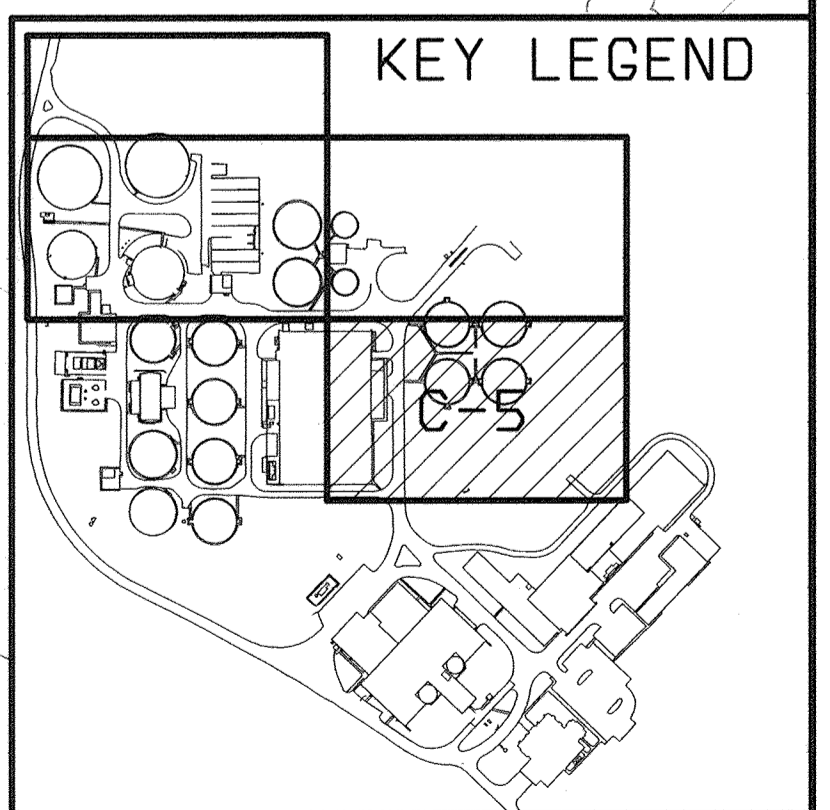
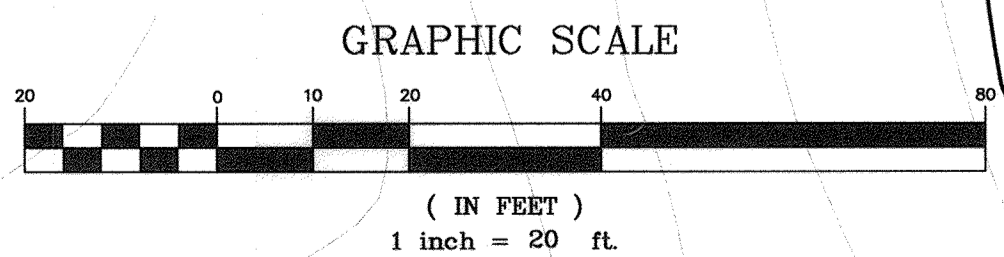


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CIVIL  
**EROSION AND SEDIMENT CONTROL PLAN**

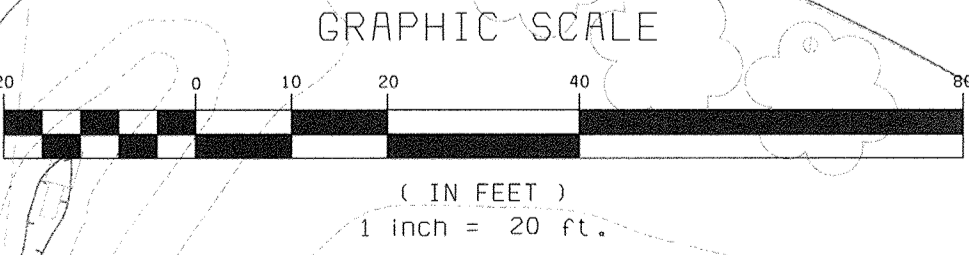
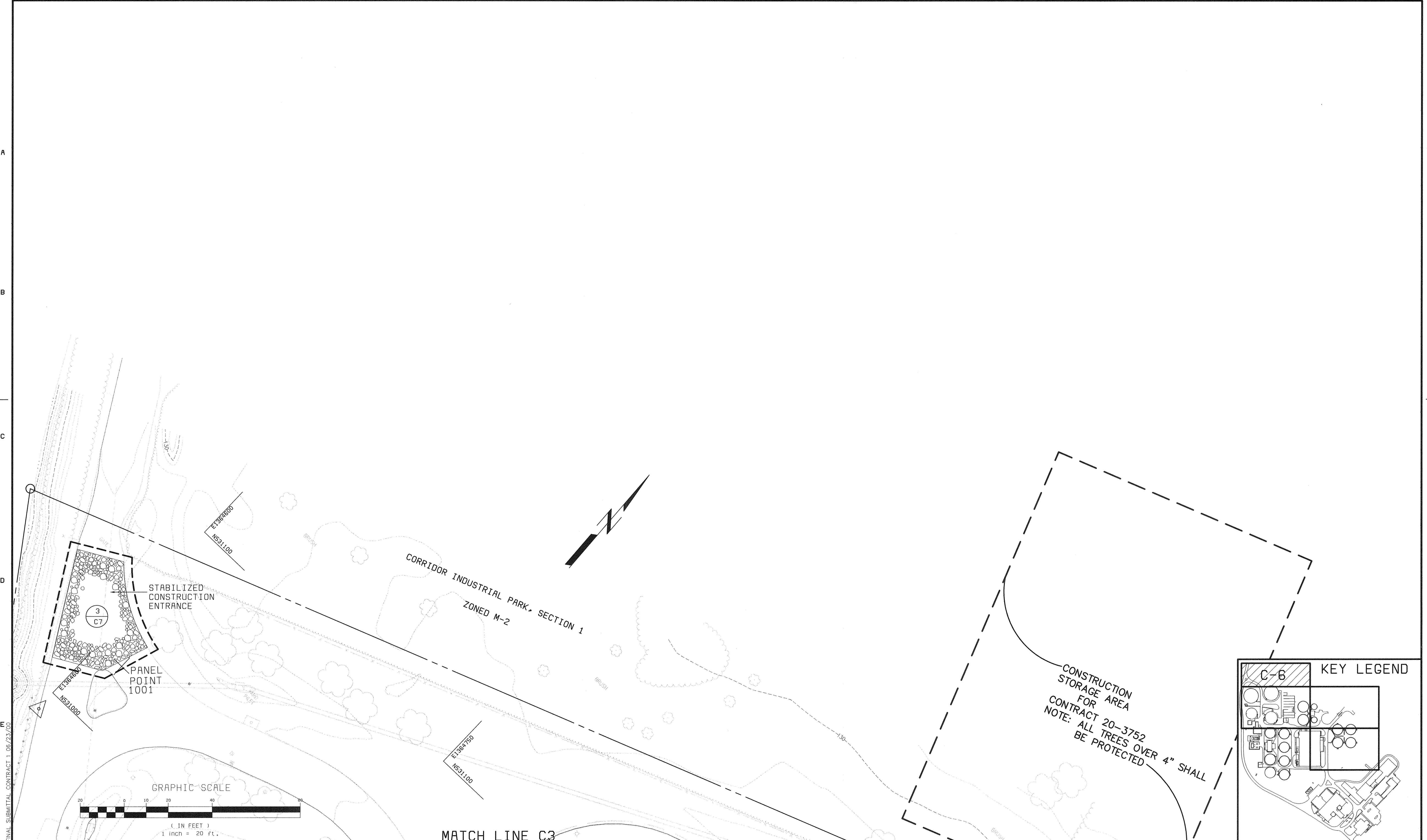
LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 NORTH BNR TREATMENT CAPACITY EXPANSION  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 14 OF 161  
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FINAL SUBMITTAL CONTRACT 1.06/23/00

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Ruth Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

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TEL (301) 881-2545 FAX (301) 881-0814  
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AMT TEL: # 98-154

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*[Signature]* 6/22/00  
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**EROSION AND SEDIMENT CONTROL PLAN**

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
NORTH BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 15 of 161

**C6**

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### DETAIL 22 - SILT FENCE

**CONSTRUCTION SPECIFICATIONS**

- FENCE POSTS SHALL BE A MINIMUM OF 36" LONG DRIVEN 16" MINIMUM INTO THE GROUND. WOOD POSTS SHALL BE 1 1/2" x 1 1/2" SQUARE (MINIMUM) CUT, OR 1 3/4" DIAMETER (MINIMUM) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD "T" OR "U" SECTION WEIGHING NOT LESS THAN 1.00 POUND PER LINEAR FOOT.
- GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:
 

TENSILE STRENGTH	50 LBS/IN (MIN.)	TEST: MSMT 509
TENSILE MODULUS	20 LBS/IN (MIN.)	TEST: MSMT 509
FLOW RATE	0.3 GAL. FT <sup>2</sup> /MINUTE (MAX.)	TEST: MSMT 322
FILTERING EFFICIENCY	75% (MIN.)	TEST: MSMT 322
- WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
- SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHED 50% OF THE FABRIC HEIGHT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-15-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### DETAIL 33 - SUPER SILT FENCE

**CONSTRUCTION SPECIFICATIONS**

- The poles do not need to be set in concrete.
- Chain link fence shall be fastened securely to the fence posts with wire ties, or staples.
- Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
- Filter cloth shall be embedded a minimum of 8" into the ground.
- When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
- Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE H-26-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

**CONSTRUCTION SPECIFICATION**

- LENGTH - MINIMUM OF 50' (\*30' FOR SINGLE RESIDENCE LOT).
- WIDTH - 10' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
- GEOTEXTILE FABRIC (FILTER CLOTH) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE. \*\*THE PLAN APPROVAL AUTHORITY MAY NOT REQUIRE SINGLE FAMILY RESIDENCES TO USE GEOTEXTILE.
- STONE - CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE. EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.
- SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCE SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 2:1 SLOPES AND A MINIMUM OF 8" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM WILL BE REQUIRED.
- LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE F-17-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### DETAIL 23C - CURB INLET PROTECTION

**CONSTRUCTION SPECIFICATIONS**

- Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4") to the 2" x 4" weir (measuring throat length plus 2") as shown on the standard drawing.
- Place a continuous piece of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.
- Securely nail the 2" x 4" weir to a 9" long vertical spacer to be located between the weir and the inlet face (max. 4' apart).
- Place the assembly against the inlet throat and nail (minimum 2" lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
- The assembly shall be placed so that the end spacers are a minimum 1' beyond both ends of the throat opening.
- Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" x 1 1/2" stone over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.
- This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
- Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.

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### DETAIL 23B - AT GRADE INLET PROTECTION

**CONSTRUCTION SPECIFICATIONS**

- LIFT GRATE AND WRAP WITH GEOTEXTILE CLASS E TO COMPLETELY COVER ALL OPENINGS THEN SET GRATE BACK IN PLACE.
- PLACE 3/4" TO 1 1/2" STONE, 4"-6" THICK ON THE GRATE TO SECURE THE FABRIC AND PROVIDE ADDITIONAL FILTRATION.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-16-5A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### Sandbag/Stone Diversion

**CONSTRUCTION SPECIFICATIONS**

- Description**  
The work shall consist of installing flow diversions for the purpose of erosion control when construction activities take place within the stream channel such as bank stabilization or bridge abutment construction.
- Material Specifications**
  - Sandbags: Sandbags shall consist of materials which are resistant to ultraviolet radiation, tearing and puncture and woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
  - Stone: Stone shall be washed and have a minimum diameter of 6 inches.
  - Sheeting: Sheeting shall consist of polyethylene or other material which is impervious and resistant to puncture and tearing.
- Construction Requirements**
  - All erosion and sediment control devices shall be installed as the first order of work.
  - The diversion structure shall be installed from upstream to downstream.
  - The height of the diversion structure shall be one half the distance from stream bed to stream bank plus one foot, as indicated on the cross-section view.
  - All excavated materials shall be disposed of in a SCD approved disposal area outside the 100-year floodplain unless otherwise approved on the plans by the MA.
  - All diverting of the construction area shall be pumped to a dewatering basin prior to re-entering the stream.
  - Sheeting shall be overlapped such that the upstream portion covers the downstream portion with at least an 18-inch overlap.
  - Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-15-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### In-Stream Stone Dike

**CONSTRUCTION SPECIFICATIONS**

- Description**  
The work encompasses the installation of an in-stream stone dike to be used as a sediment filtering device for streams that generally carry wet weather flow.
- Material Specifications**
  - Small Riprap - 3-12 inch washed stone and gravel shall be used.
  - Filter Fabric - The filter cloth shall be a woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydrocarbons, oil, and is resistant. A one foot layer of 2" washed stone may be used instead of filter fabric.
  - Gabion Baskets - Class I gabion baskets shall meet the requirements listed in WPD-2.
- Construction Requirements**
  - Structure to be installed in-stream as first order of business to trap sediment generated during construction activities.
  - The top width of the dike is to be from 2-4 feet.
  - The distance between the dike and the disturbance is to be determined by flow rate of the streamway.
  - Gabion baskets may be used in lieu of small riprap as indicated by alternative section.
  - Structure is to remain in place until all disturbed areas have been stabilized in accordance with an approved sediment and erosion control plan.
  - Entrapped sediment is to be excavated periodically and disposed of in a SCD approved disposal area outside the 100-year floodplain unless otherwise approved on the plans by the MA.
  - Structure can be removed once approved by inspecting authority.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE H-26-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### Riprap

**CONSTRUCTION SPECIFICATIONS**

- Description**  
This work shall consist of protecting slopes and channels from erosion with coverings of stone in accordance with the plans and specifications shown on this drawing.
- Material Specifications**
  - Bedding:
 

Stone Size	U.S. Standard Layer Size
18" - 24"	12" - 18"
12" - 18"	8" - 12"
6" - 12"	4" - 8"
3" - 6"	2" - 4"
  - Geotextile Filter Fabric: shall meet the following requirements:
 

Tensile Strength	200 lbs.
Break Strength	200 lbs.
Puncture Strength	20 lbs.
Dimensional Change	0.5%
Temperature at Failure	115
Minimum Lap Length	24 in.
- Construction Requirements**
  - The appearance shall result in a sediment and erosion control device of a first order of business.
  - Protecting shall be made to provide a layer of the riprap and shall be done prior to any other construction. The riprap shall be placed with sufficient overlap to prevent water from passing through the joints. The riprap shall be placed with sufficient overlap to prevent water from passing through the joints. The riprap shall be placed with sufficient overlap to prevent water from passing through the joints.
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U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE F-17-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### DETAIL 20B - SUMP PIT

**CONSTRUCTION SPECIFICATIONS**

- Pit dimensions are variable, with the minimum diameter being 2 times the standpipe diameter.
- The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. Then wrapping with 1/2" hardware cloth and Geotextile Class E. The perforations shall be 1/2" x 6" slots or 1" diameter holes.
- A base of filter material consisting of clean gravel or #57 stone should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with the same filter material.
- The standpipe should extend 12" to 18" above the lip of the pit or the riser crest elevation (basin dewatering only) and the filter material should extend 3" minimum above the anticipated standing water elevation.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE D-15-2 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



1 2 3 4 5 6 7 8 9 10

HOWARD SOIL CONSERVATION DISTRICT  
PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION-- LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

1. PREFERRED -- APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ. FT.) AND 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS/ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ. FT.)

2. ACCEPTABLE -- APPLY 2 TONS/ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ. FT.) AND 1000 LBS/ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ. FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING-- FOR THE PERIODS MARCH 1 -- APRIL 30, AND AUGUST 1 -- OCTOBER 15, SEED WITH 60 LBS/ACRE (1.4 LBS/1000 SQ. FT.) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 -- JULY 31, SEED WITH 60 LBS KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS/ACRE (.05 LBS/1000 SQ. FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 -- FEBRUARY 28, PROTECT SITE BY:

OPTION 1-- TWO TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING.

OPTION 2-- USE SOD.

OPTION 3-- SEED WITH 60 LBS/ACRE KENTUCKY 30 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING -- APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ. FT.) FOR ANCHORING.

MAINTENANCE -- INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE RE-DISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: -- LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: -- APPLY 600 LBS/ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ. FT.).

SEEDING: -- FOR PERIODS MARCH 1 -- APRIL 30 AND FROM AUGUST 15 -- OCTOBER 15, SEED WITH 2-1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ. FT.). FOR THE PERIOD MAY 1 -- AUGUST 14, SEED WITH 3 LBS/ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ. FT.). FOR THE PERIOD NOVEMBER 16 -- FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS/ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING -- APPLY 1-1/2 TO 2 TONS/ACRE (70 TO 90 LBS/1000 SQ. FT.) OF UNROTTED WEED-FREE, SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL. PER ACRE (5 GAL/1000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FT. OR HIGHER, USE 348 GAL. PER ACRE (8 GAL/1000 SQ. FT.) FOR ANCHORING.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR ADDITIONAL RATES AND METHODS NOT COVERED.

HOWARD SOIL CONSERVATION DISTRICT  
STANDARD SEDIMENT CONTROL NOTES

- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
- FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
  - 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1,
  - 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12 OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. 51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE ANALYSIS:
 

TOTAL AREA OF SITE	38.01 ACRES
AREA DISTURBED	5.00 ACRES
AREA TO BE ROOFED OR PAVED	3.35 ACRES
AREA TO BE VEGETATIVELY STABILIZED	1.65 ACRES
TOTAL CUT	6000 CU. YDS.
TOTAL FILL	3500 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	2500 CU. YDS.
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORK DAY, WHICHEVER IS SHORTER.

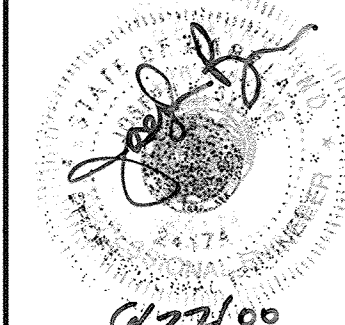
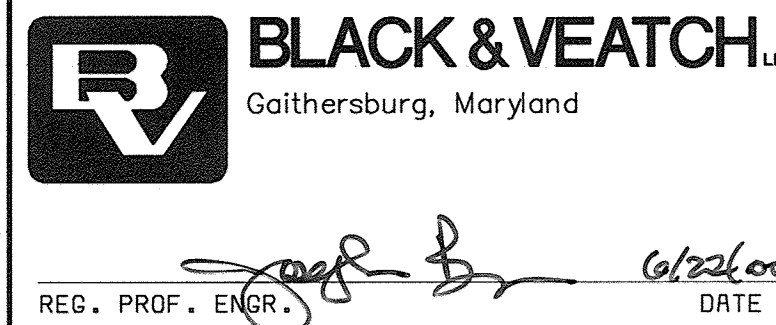
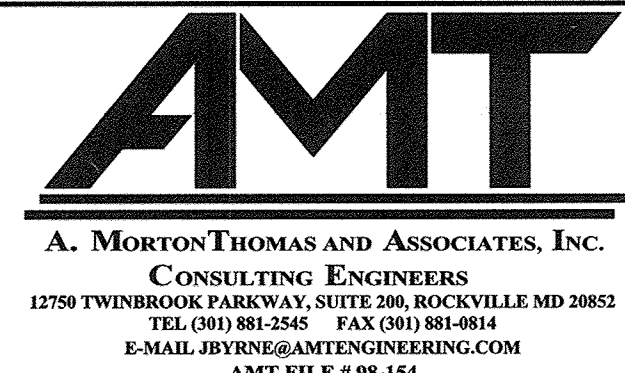
SEQUENCE OF CONSTRUCTION ACTIVITIES

- OBTAIN GRADING PERMIT.
- INSTALL NECESSARY SEDIMENT CONTROL MEASURES AND DEVICES.
- START DEMOLITION WORK AND STABILIZE AREAS TO BE VEGETATED WITH TEMPORARY SEED AND MULCH.
- INSTALL SUMP PIT AND PROVIDE PORTABLE SEDIMENT TANK. (IN LIEU OF A PORTABLE SEDIMENT TANK, FC11 MAY BE USED AS A SEDIMENT TANK.) THE CONTRACTOR MUST DEVISE SUITABLE METHODS TO DIVERT OVERFLOW FROM THE TANK INTO THE STORM DRAINAGE SYSTEM AND TO INSURE THAT NO STORMWATER OR SILT GETS INTO THE WASTEWATER TREATMENT SYSTEM. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL SILT AND CLEANING OF FC11 PRIOR TO RENOVATION OF THE TANK.
- EXCAVATE AND BUILD PROCESS REACTOR FOUNDATION, SLAB AND PERIMETER WALL. ONCE REACTOR BASIN HAS BEEN CONSTRUCTED REMAINING DRAINAGE MAY BE DIRECTED THROUGH SUPER SILT FENCE.
- START INSTALLATION OF UTILITY PIPES, STORM DRAIN AND PROCESS PIPING. INSTALL INLET PROTECTION TO NEW INLETS.
- CONSTRUCT AND RENOVATE FACILITIES.
- FINAL GRADING AND INSTALL CURB AND GUTTER, PAVING, WALK, ETC..
- STABILIZE AREAS TO BE VEGETATED WITH PERMANENT SEED AND MULCH. IF, AT THE TIME OF SUBSTANTIAL COMPLETION, CERTAIN EROSION AND SEDIMENT CONTROL MEASURES ARE STILL REQUIRED BY OTHER CONTRACTS, THE RESPONSIBILITY FOR MAINTENANCE AND REMOVAL OF THOSE FACILITIES WILL BE ASSUMED BY OTHERS. ALL OTHER EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE PROPERLY REMOVED PRIOR TO FINAL STABILIZATION.
- REMOVE ALL SEDIMENT CONTROL MEASURES AND DEVICES. RESTABILIZE DISTURBED AREAS WITH SEED AND MULCH.
- FINAL STABILIZATION OF SITE.

058472  
FDSB472A  
FINAL SUBMITTAL CONTRACT # 06/23/00

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*John J. ...*  
CHIEF, BUREAU OF UTILITIES DATE



DES: A.R.									
DRN: R.E.A.									
CHK: J.B.									
DATE: 06/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

CIVIL

EROSION AND SEDIMENT CONTROL  
NOTES

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
NORTH BNR TREATMENT CAPACITY EXPANSION

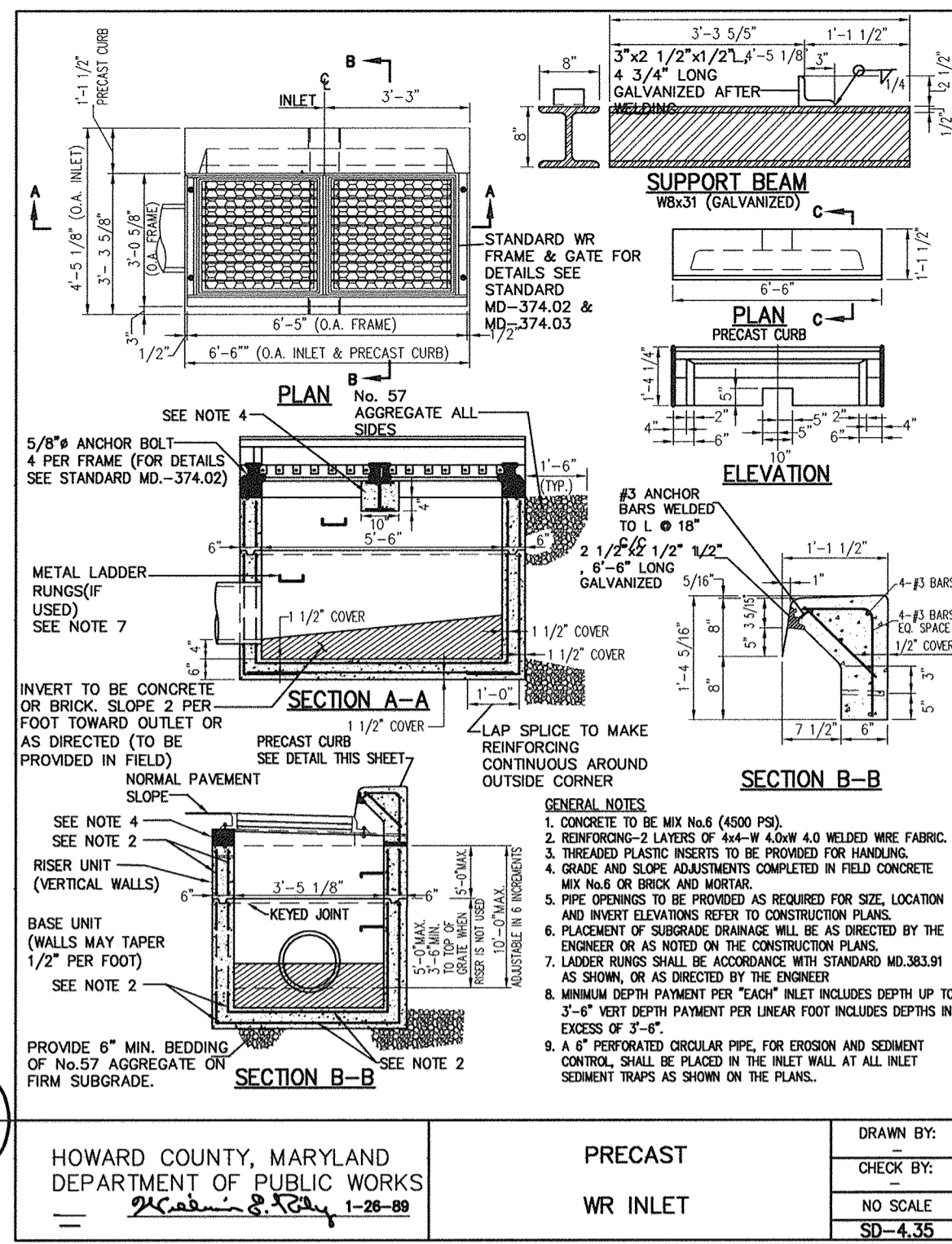
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 17 OF 161

C8

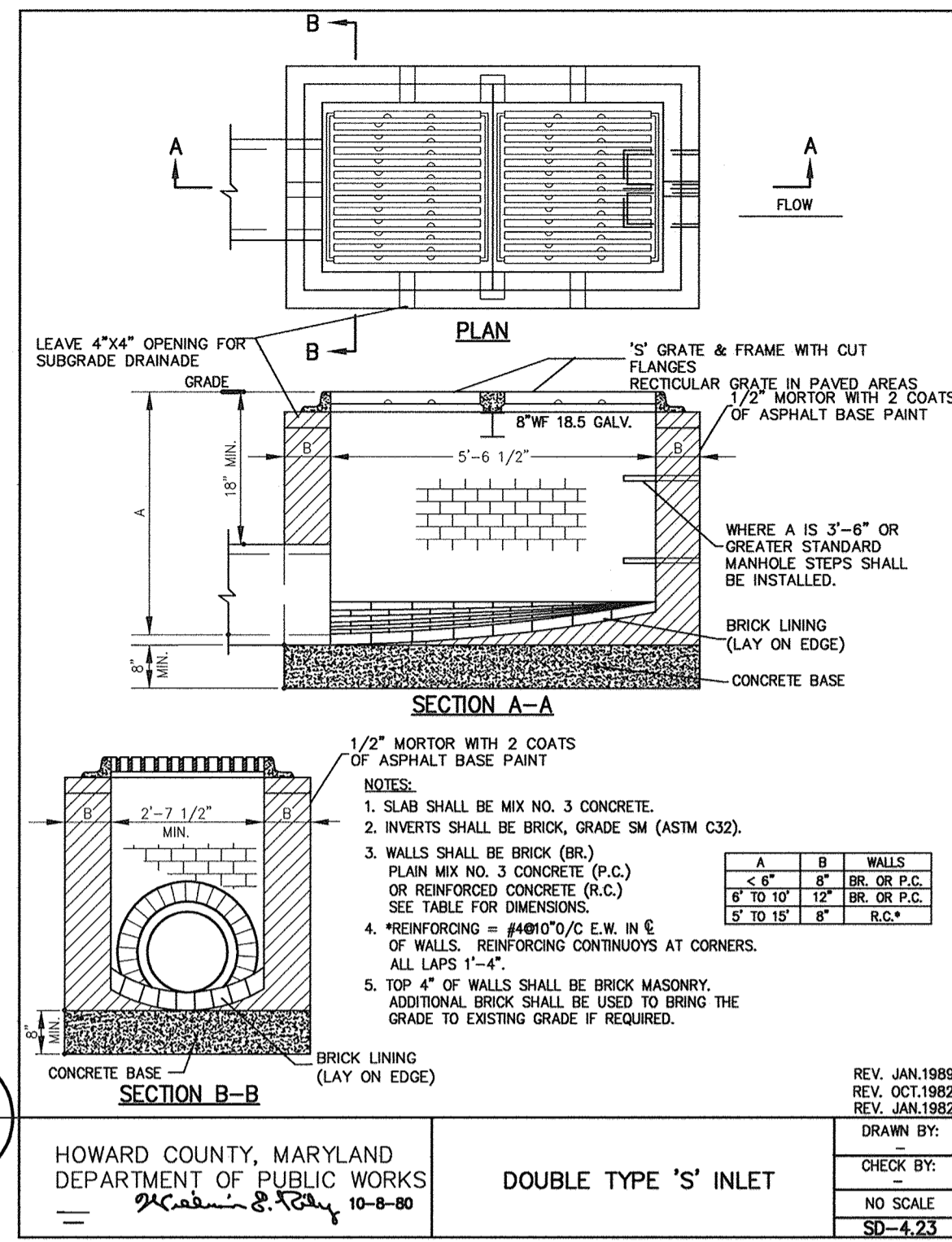


1  
C9

HOWARD COUNTY, MARYLAND  
 DEPARTMENT OF PUBLIC WORKS  
 2/28/89

PRECAST  
 WR INLET

DRAWN BY:  
 CHECK BY:  
 NO SCALE  
 SD-4.35

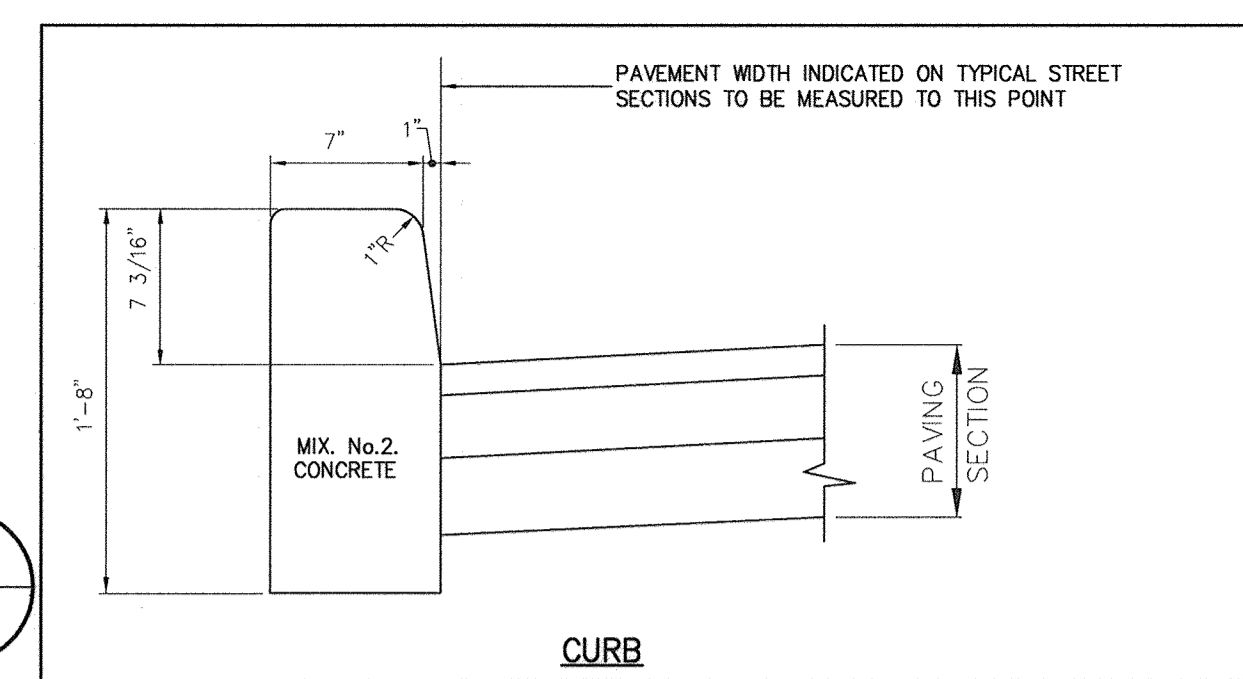


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HOWARD COUNTY, MARYLAND  
 DEPARTMENT OF PUBLIC WORKS  
 10-8-80

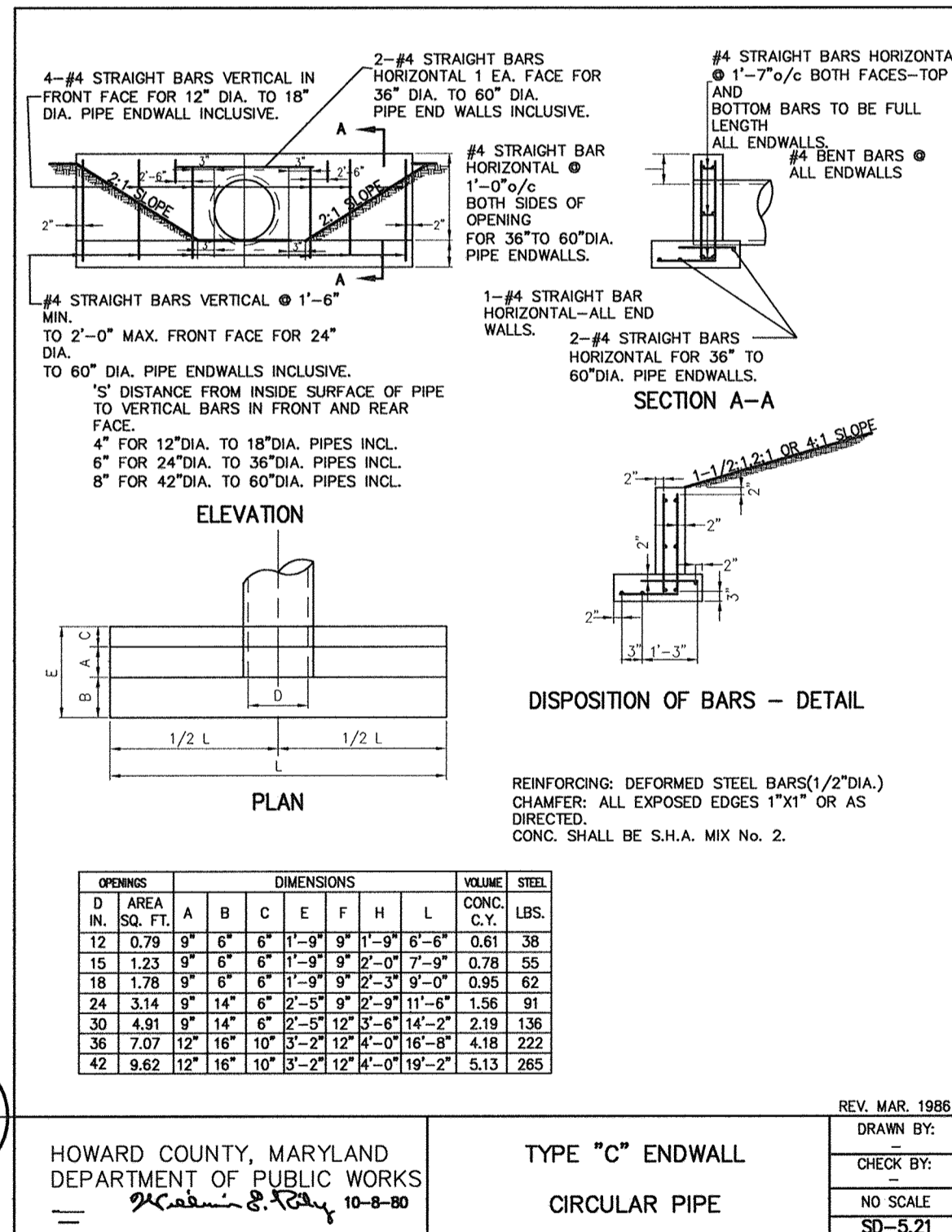
DOUBLE TYPE 'S' INLET

DRAWN BY:  
 CHECK BY:  
 NO SCALE  
 SD-4.23



6  
C9

PAVING SECTION  
 (NOT TO SCALE)

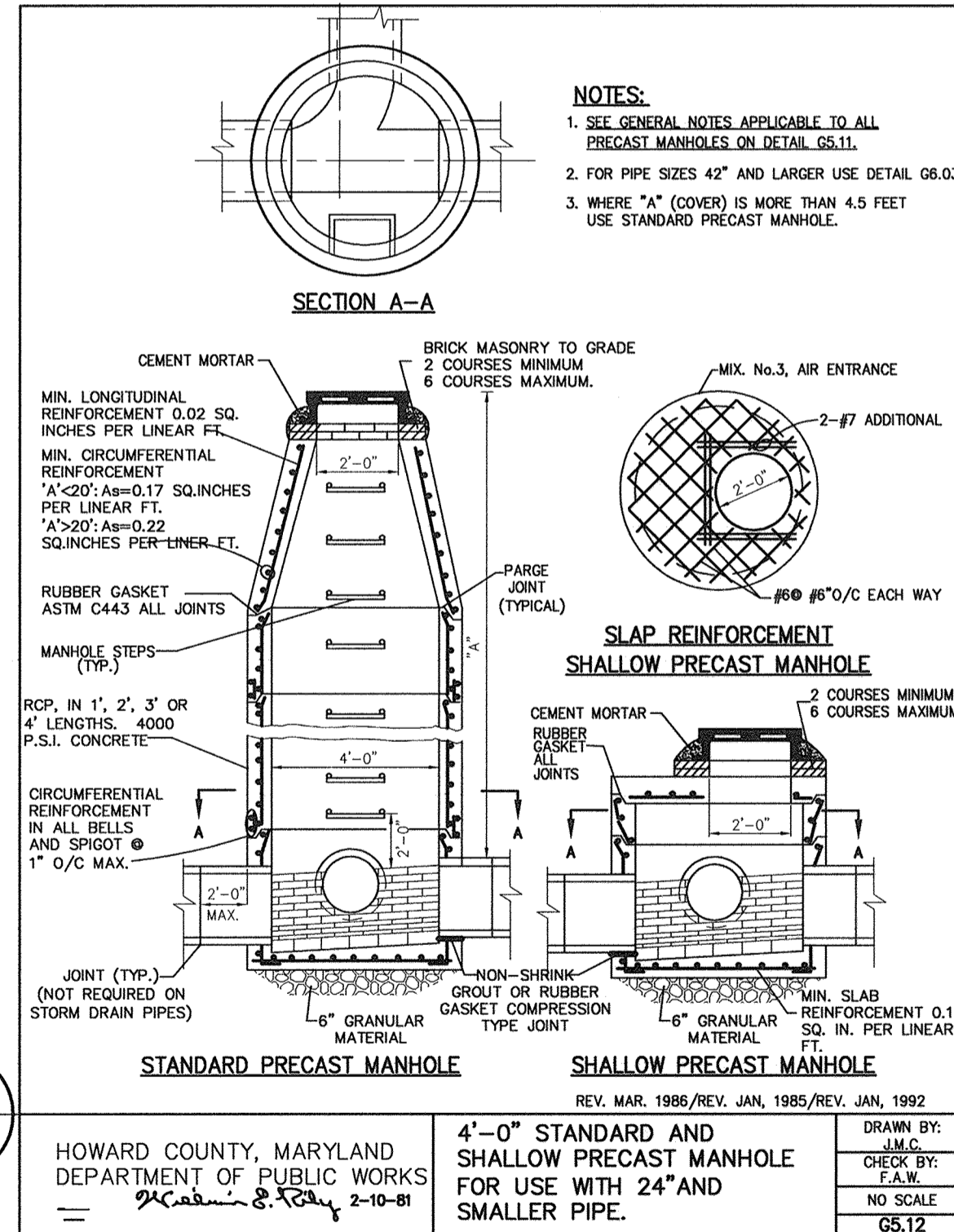


3  
C9

HOWARD COUNTY, MARYLAND  
 DEPARTMENT OF PUBLIC WORKS  
 10-8-80

TYPE "C" ENDWALL  
 CIRCULAR PIPE

DRAWN BY:  
 CHECK BY:  
 NO SCALE  
 SD-5.21

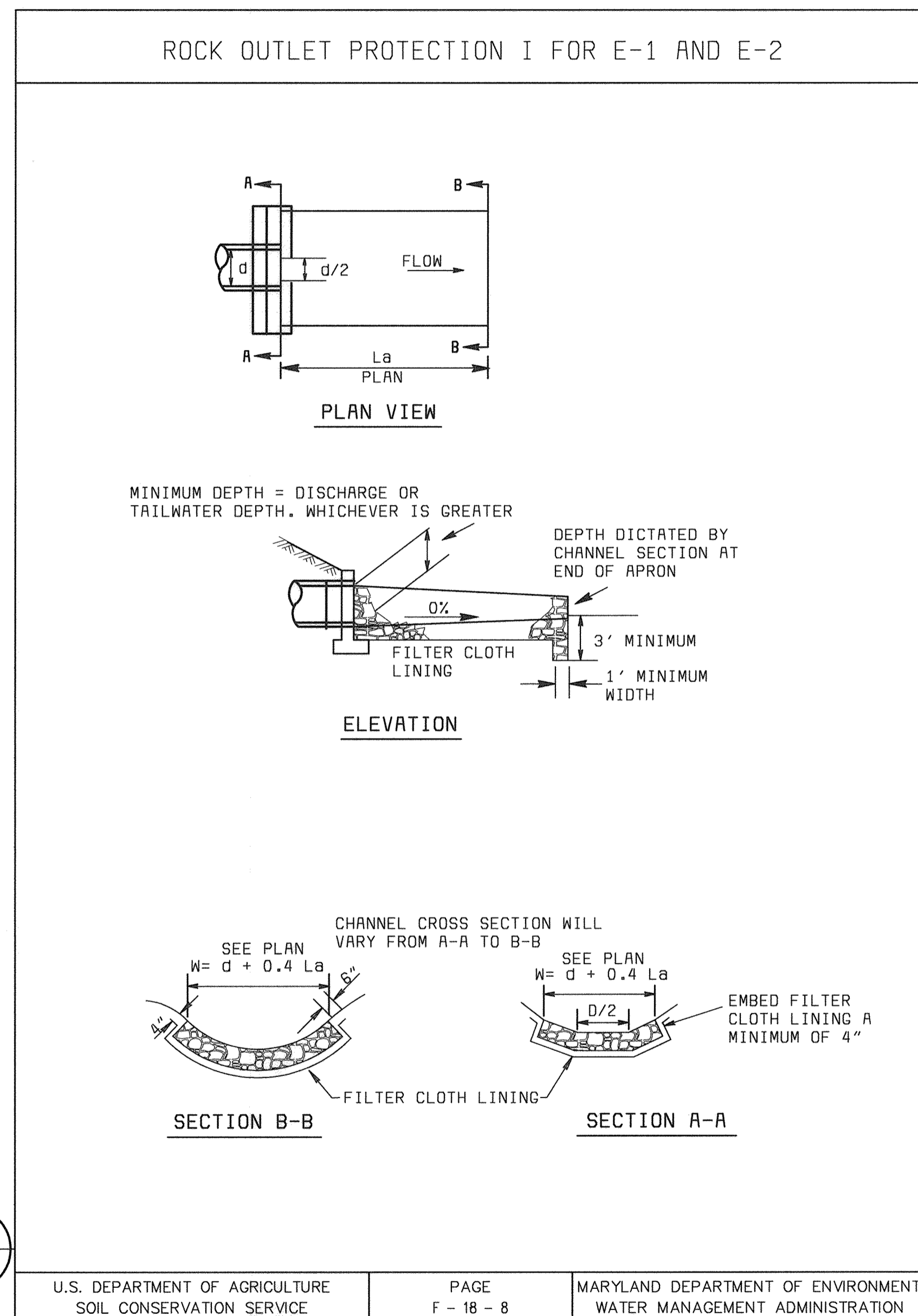


4  
C9

HOWARD COUNTY, MARYLAND  
 DEPARTMENT OF PUBLIC WORKS  
 2-10-81

4'-0" STANDARD AND SHALLOW PRECAST MANHOLE FOR USE WITH 24" AND SMALLER PIPE.

DRAWN BY:  
 CHECK BY:  
 NO SCALE  
 GS.12



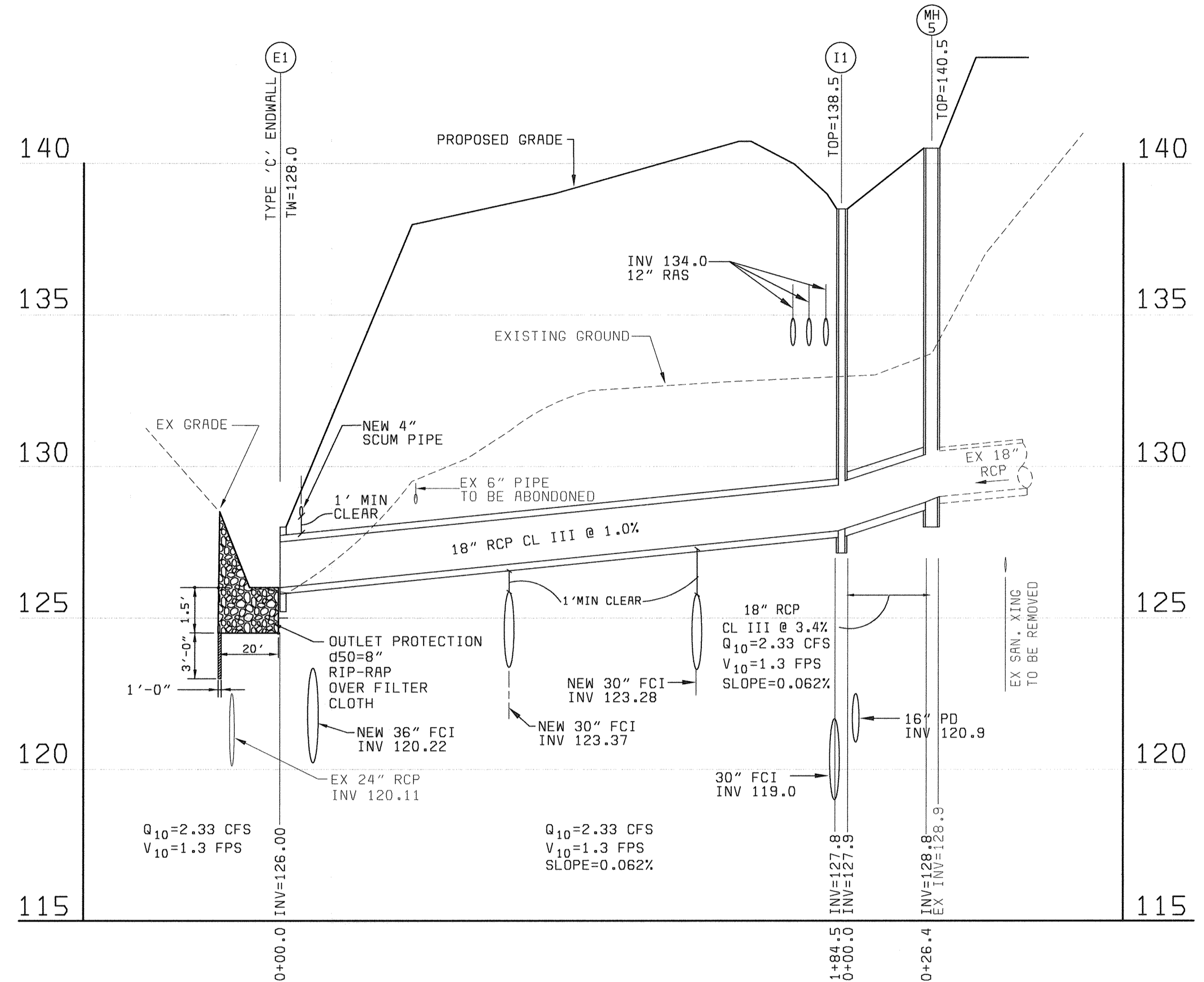
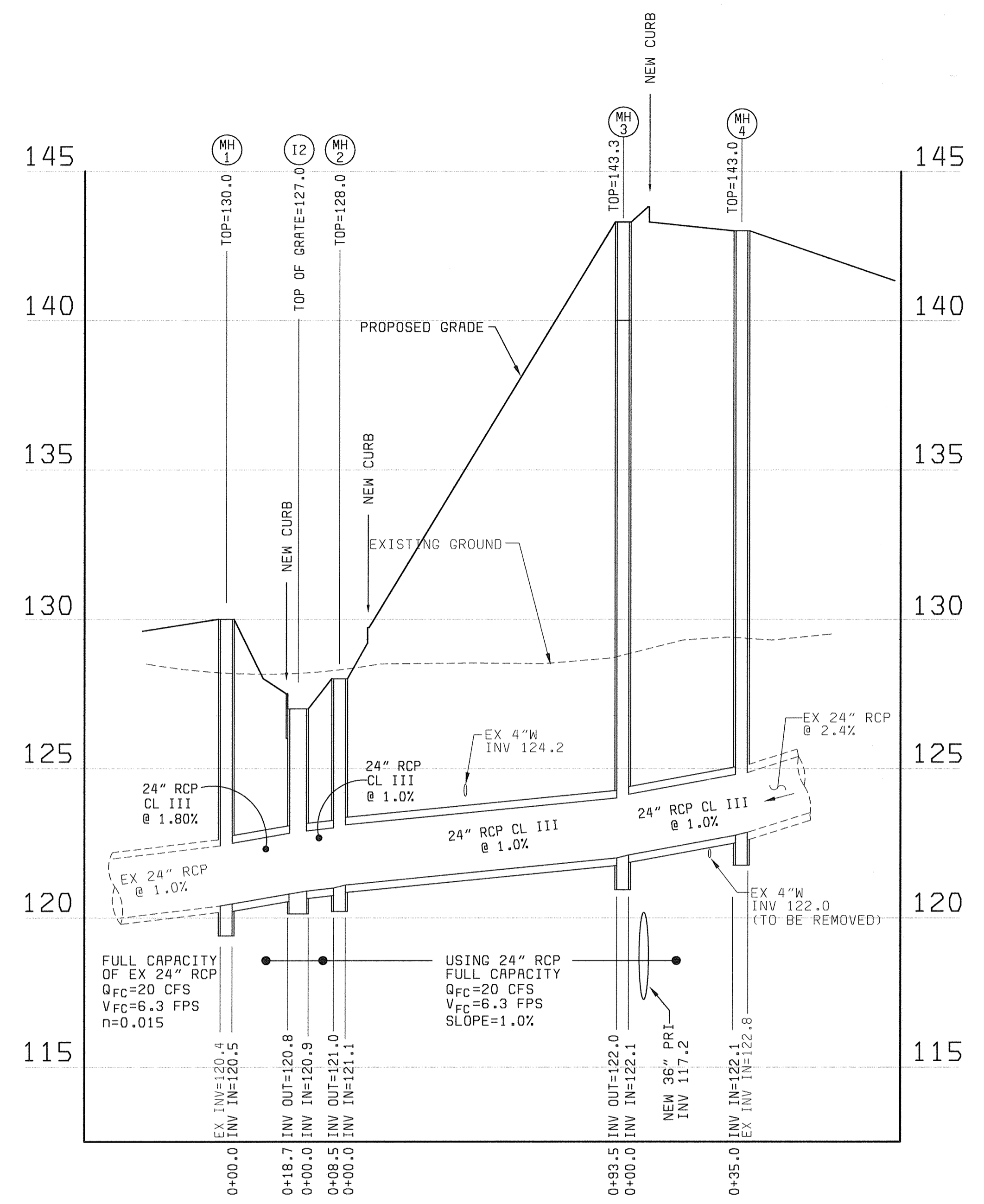
7  
C9

U.S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE

PAGE  
 F - 18 - 8

MARYLAND DEPARTMENT OF ENVIRONMENT  
 WATER MANAGEMENT ADMINISTRATION

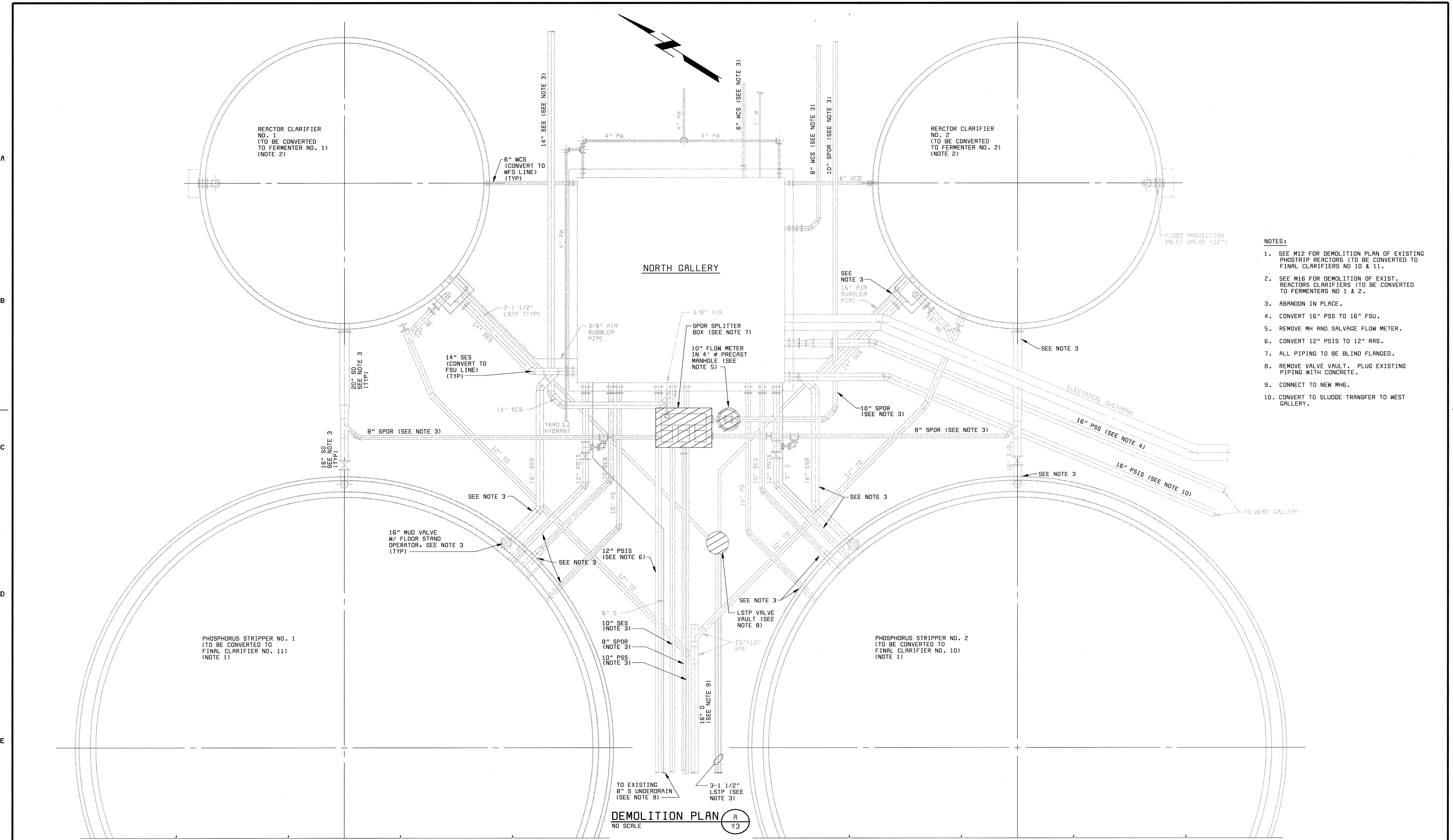
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  AMT A. MORTON THOMAS AND ASSOCIATES, INC. CONSULTING ENGINEERS 12750 TWINBROOK PARKWAY, SUITE 200, ROCKYVILLE MD 20852 TEL. (301) 881-2545 FAX (301) 881-0814 E-MAIL: JHV@AMTENGINEERING.COM AMT FILE # 98-154	BLACK & VEATCH LLP Gaithersburg, Maryland   REG. PROF. ENGR. DATE 6/22/00	DES: A.R. DRN: R.E.A. CHK: J.B. DATE: 06/23/00	CIVIL  SITE DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 18 OF 161 C9



STRUCTURE SCHEDULE					
No.	STRUCTURE	INVERT IN	INVERT OUT	TOP ELEV.	REMARKS
I1	INLET (NR FRAME GRATE)	127.9	127.8	138.5	Ho. Co. SD-4.23
I2	INLET	120.9	120.8	127.00	Ho. Co. SD-4.35
MH1	MANHOLE	120.5	120.4	131.0	Ho. Co. 65.12
MH2	MANHOLE	121.1	121.0	129.0	Ho. Co. 65.12
MH3	MANHOLE	122.1	122.0	140.00	Ho. Co. 65.12
MH4	MANHOLE	122.8	122.7	142.40	Ho. Co. 65.12
MH5	MANHOLE	128.9	128.8	140.50	Ho. Co. 65.12
E-1	ENDWALL	-	126.0	128.0	Ho. Co. SD-5.21

PIPE SCHEDULE		
MANHOLE	PIPE	LENGTH
MH5 TO I1	18" RCP CL III	26.4 LF
I1 TO E-1	18" RCP CL III	184.5 LF
MH4 TO MH3	24" RCP CL III	38 LF
MH3 TO MH2	24" RCP CL III	93.5 LF
MH2 TO I2	24" RCP CL III	8.5 LF
I2 TO MH1	24" RCP CL III	18.7 LF

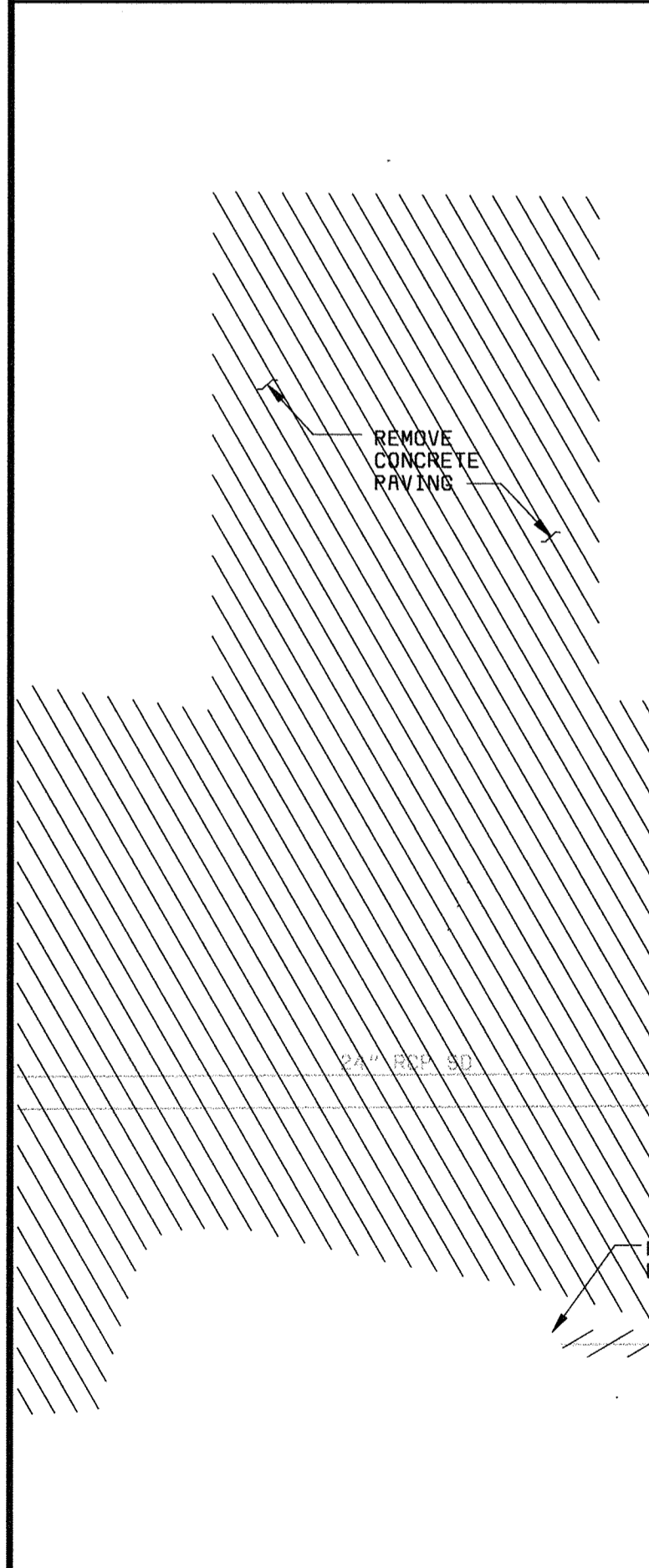
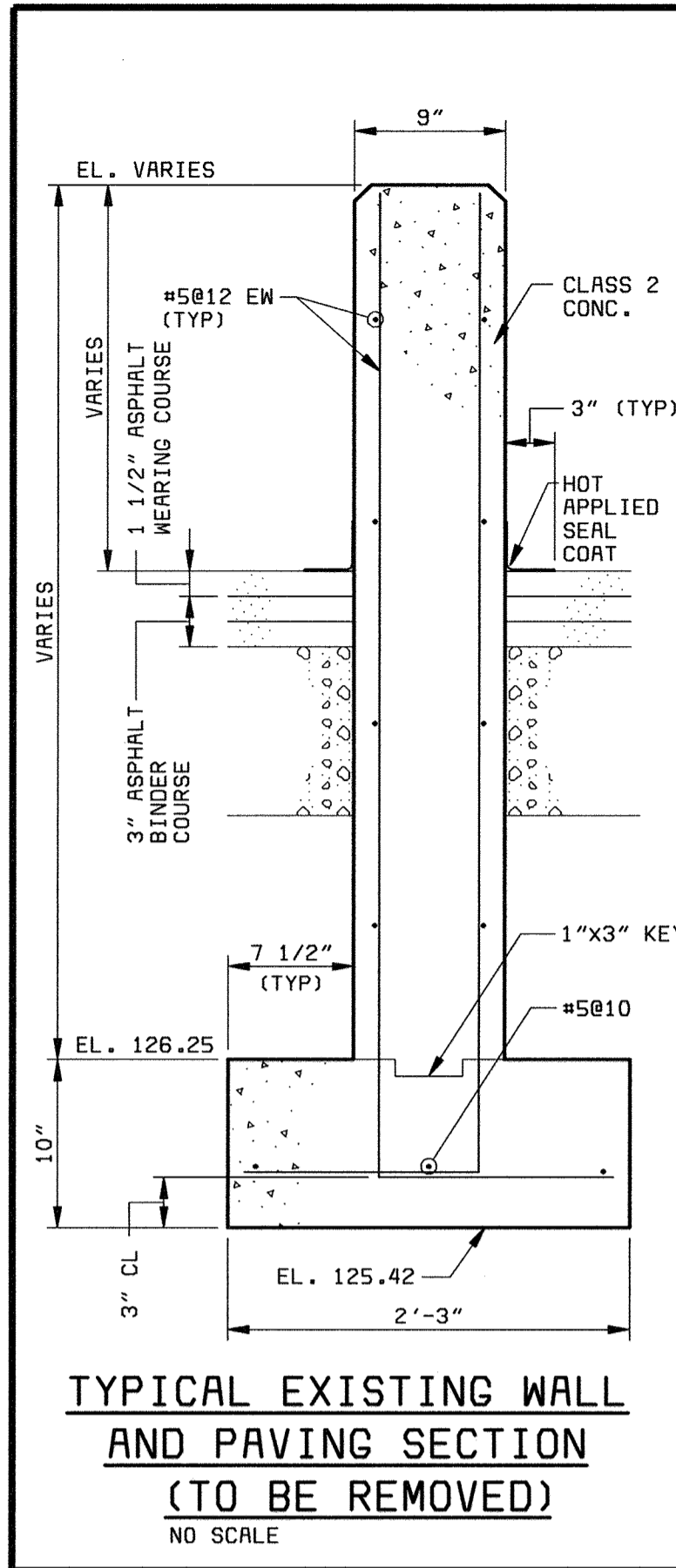
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <b>AMT</b> A. MORTON THOMAS AND ASSOCIATES, INC. CONSULTING ENGINEERS 12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE, MD 20852 TEL (301) 881-2545 FAX (301) 881-0814 E-MAIL: JHV@AMTENGINEERING.COM AMT FILE # 96-154	<b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  REG. PROF. ENGR. <i>[Signature]</i> DATE 6/22/00	DES: A.R. DRN: R.E.A. CHK: J.B. DATE: 06/23/00	CIVIL  STORM SEWER PROFILES	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
					SHEET 19 OF 161 <b>C10</b>



- NOTES:**
1. SEE M12 FOR DEMOLITION PLAN OF EXISTING PHOSTRIP REACTORS (TO BE CONVERTED TO FINAL CLARIFIERS NO 10 & 11).
  2. SEE M16 FOR DEMOLITION OF EXIST. REACTORS CLARIFIERS (TO BE CONVERTED TO FERMENTERS NO 1 & 2).
  3. ABANDON IN PLACE.
  4. CONVERT 16" PSS TO 16" FSU.
  5. REMOVE MH AND SALVAGE FLOW METER.
  6. CONVERT 12" PSIS TO 12" RAS.
  7. ALL PIPING TO BE BLIND FLANGED.
  8. REMOVE VALVE VAULT, PLUG EXISTING PIPING WITH CONCRETE.
  9. CONNECT TO NEW MH6.
  10. CONVERT TO SLUDGE TRANSFER TO WEST GALLERY.

**DEMOLITION PLAN**  
NO SCALE

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert J. Rectanus Jr. CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> L.P. Gaithersburg, Maryland  Robert J. Rectanus Jr. REG. PROF. ENGR. DATE	 ROBERT J. RECTANUS JR. No. 22327 REGISTERED PROFESSIONAL ENGINEER	DES: FKA							YARDWORK YARD PIPING  <b>DEMOLITION PLAN</b>	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: SLF	CHK: WLK	DATE: 6/23/00							



DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus Jr.*  
6/23/00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE

STATE OF MARYLAND  
ROBERT J. RECTANUS JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: KMH					
DRN: RLC					
CHK: WLK					
DATE: 6/23/00					

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

EXISTING SLUDGE DRYING BEDS  
YARDWORK

DEMOLITION PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

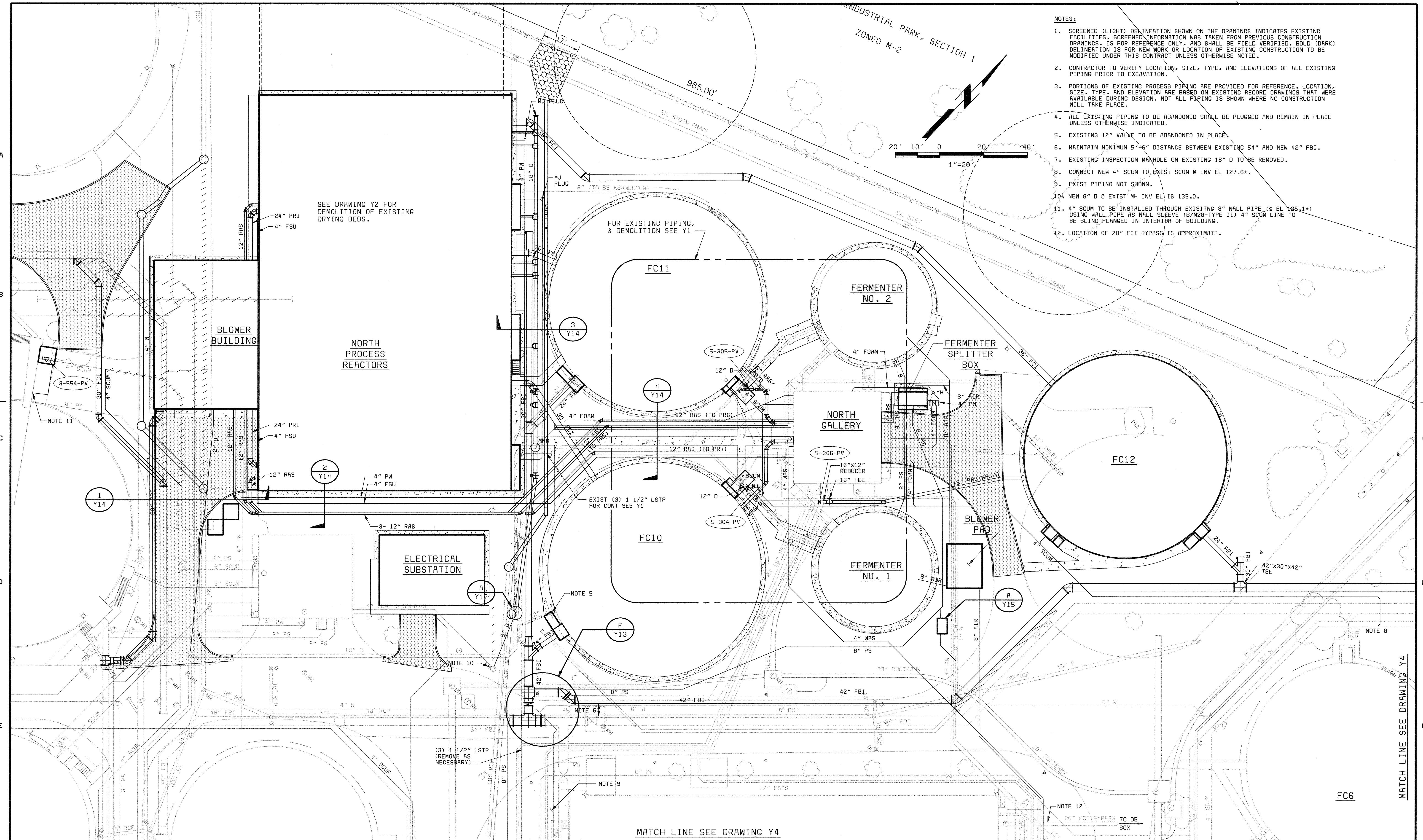
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

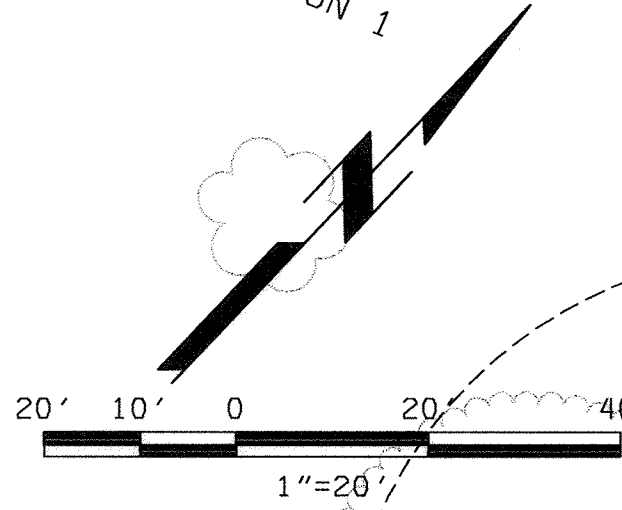
SHEET 21 OF 161

Y2

LP ALL 58472-101-YARD-C-R0000294  
 D58472 F058472A




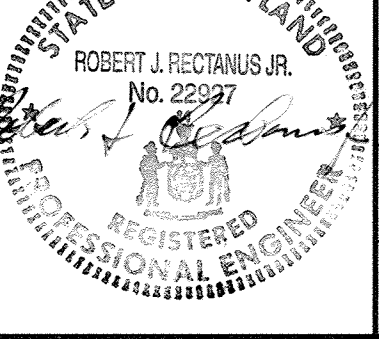
- NOTES:**
- SCREENED (LIGHT) DELINEATION SHOWN ON THE DRAWINGS INDICATES EXISTING FACILITIES. SCREENED INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS, IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED. BOLD (DARK) DELINEATION IS FOR NEW WORK OR LOCATION OF EXISTING CONSTRUCTION TO BE MODIFIED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
  - CONTRACTOR TO VERIFY LOCATION, SIZE, TYPE, AND ELEVATIONS OF ALL EXISTING PIPING PRIOR TO EXCAVATION.
  - PORTIONS OF EXISTING PROCESS PIPING ARE PROVIDED FOR REFERENCE. LOCATION, SIZE, TYPE, AND ELEVATION ARE BASED ON EXISTING RECORD DRAWINGS THAT WERE AVAILABLE DURING DESIGN. NOT ALL PIPING IS SHOWN WHERE NO CONSTRUCTION WILL TAKE PLACE.
  - ALL EXISTING PIPING TO BE ABANDONED SHALL BE PLUGGED AND REMAIN IN PLACE UNLESS OTHERWISE INDICATED.
  - EXISTING 12" VALVE TO BE ABANDONED IN PLACE.
  - MAINTAIN MINIMUM 5'-6" DISTANCE BETWEEN EXISTING 54" AND NEW 42" FBI.
  - EXISTING INSPECTION MANHOLE ON EXISTING 18" D TO BE REMOVED.
  - CONNECT NEW 4" SCUM TO EXIST SCUM @ INV EL 127.64.
  - EXIST PIPING NOT SHOWN.
  - NEW 8" D @ EXIST MH INV EL IS 135.0.
  - 4" SCUM TO BE INSTALLED THROUGH EXISTING 8" WALL PIPE (E EL 125.14) USING WALL PIPE AS WALL SLEEVE (B/M28-TYPE II) 4" SCUM LINE TO BE BLIND FLANGED IN INTERIOR OF BUILDING.
  - LOCATION OF 20" FCI BYPASS IS APPROXIMATE.



LPALL  
 58472-101-YARD-C-R000294  
 58472-101-YARD-C-R000292

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
  
*Robert J. Baird* 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE


**BLACK & VEATCH** LP  
 Gaithersburg, Maryland  
  
*Robert J. Rectanus, Jr.*  
 REG. PROF. ENGR. DATE

STATE OF MARYLAND  
 ROBERT J. RECTANUS, JR.  
 No. 22397  

 REGISTERED PROFESSIONAL ENGINEER

DES: FKA					
DRN: RLC					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

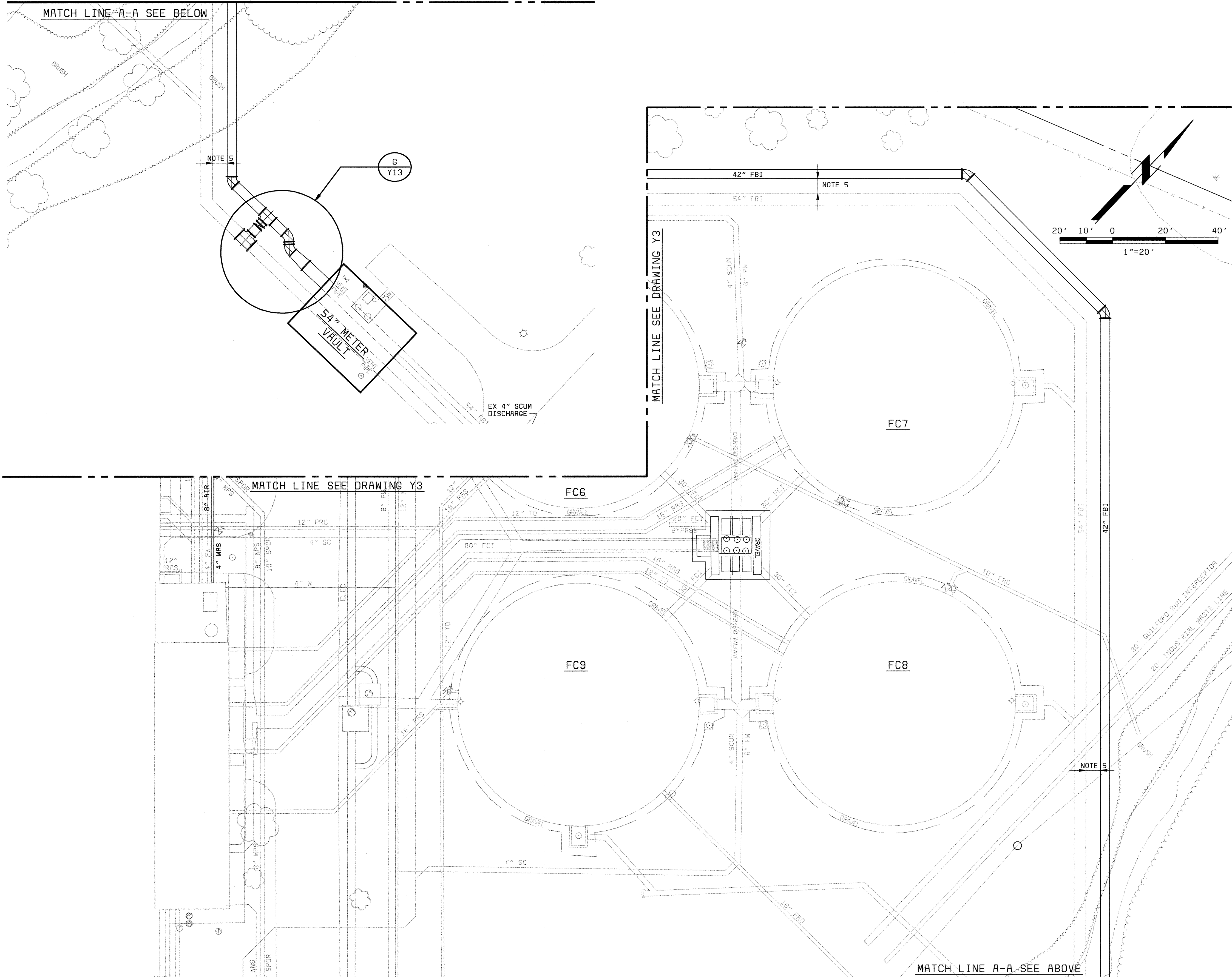
YARDWORK  
 CIVIL  
  
 YARD PIPING  
 1 OF 2

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION  
  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE  
 AS  
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 SHEET  
 22 OF 161  
  
**Y3**

A  
B  
C  
D  
E  
F

- NOTES:**
1. SCREENED (LIGHT) DELINEATION SHOWN ON THE DRAWINGS INDICATES EXISTING FACILITIES. SCREENED INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS. IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED. BOLD (DARK) DELINEATION IS FOR NEW WORK OR LOCATION OF EXISTING CONSTRUCTION TO BE MODIFIED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
  2. CONTRACTOR TO VERIFY LOCATION, SIZE, TYPE, AND ELEVATIONS OF ALL EXISTING PIPING PRIOR TO EXCAVATION.
  3. PORTION OF EXISTING PROCESS PIPING ARE PROVIDED FOR REFERENCE. LOCATION, SIZE, TYPE, AND ELEVATION ARE BASED ON EXISTING RECORD DRAWINGS THAT WERE AVAILABLE DURING DESIGN. NOT ALL PIPING IS SHOWN WHERE NO CONSTRUCTION WILL TAKE PLACE.
  4. ALL EXISTING PIPING TO BE ABANDONED SHALL BE PLUGGED IF NECESSARY AND REMAIN IN PLACE UNLESS OTHERWISE INDICATED.
  5. MAINTAIN MINIMUM 6'-6" BETWEEN EXISTING 54" AND NEW 42" FBI.



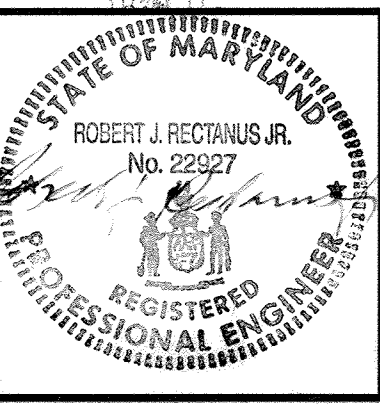
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 58472-101-YARD-C-A0000292  
 058472  
 F058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus, Jr.*  
6/23/00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus, Jr.*  
REG. PROF. ENGR. DATE: 6/23/00



DES: FKA	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RLC						
CHK: WLK						
DATE: 6/23/00						

**YARDWORK**  
CIVIL

**YARD PIPING**  
2 OF 2

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

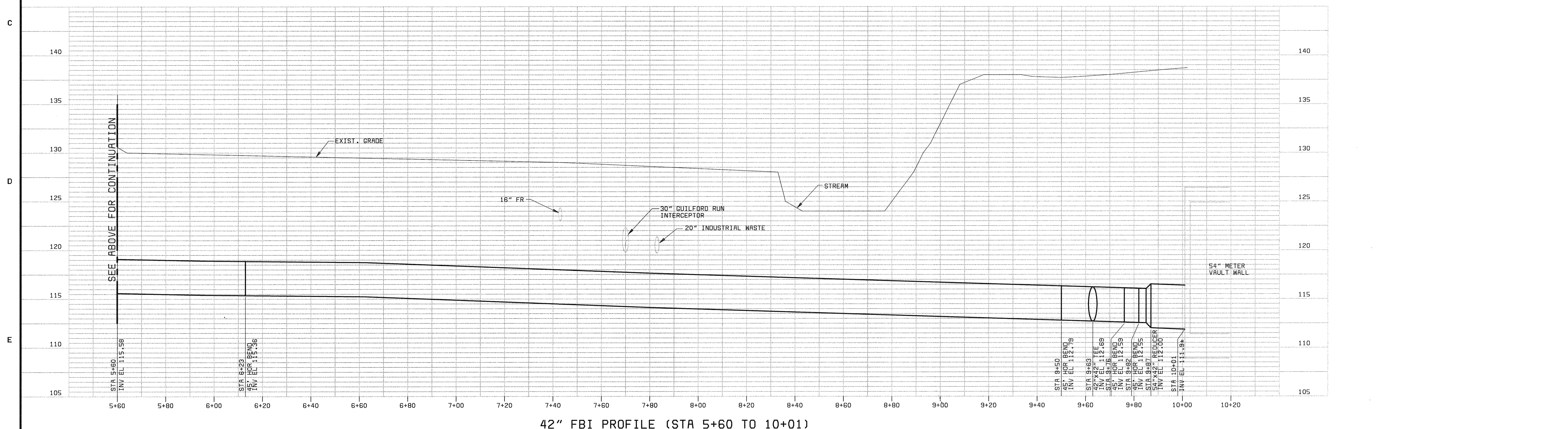
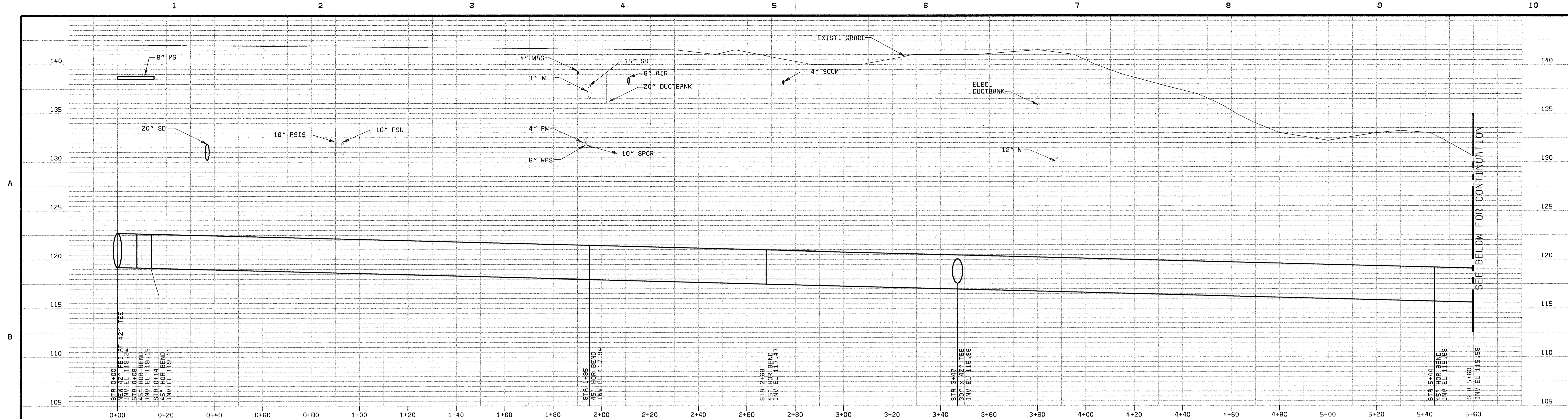
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
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SHEET  
23 OF 161

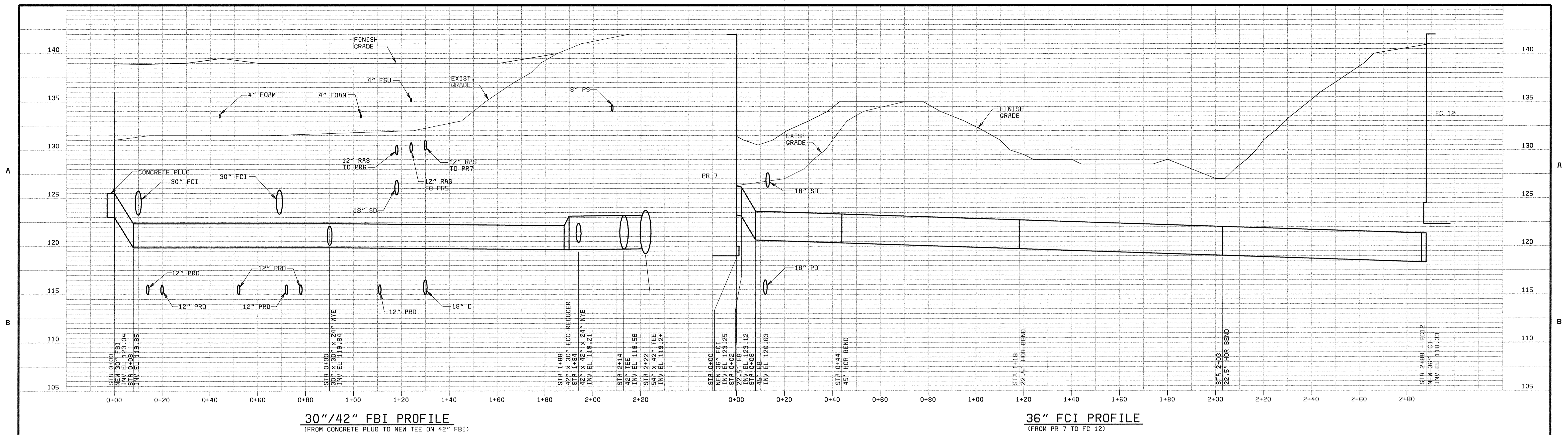
**Y4**



SCALE: HORIZ: 1" = 20'-0"  
 VERT: 1" = 5'-0"

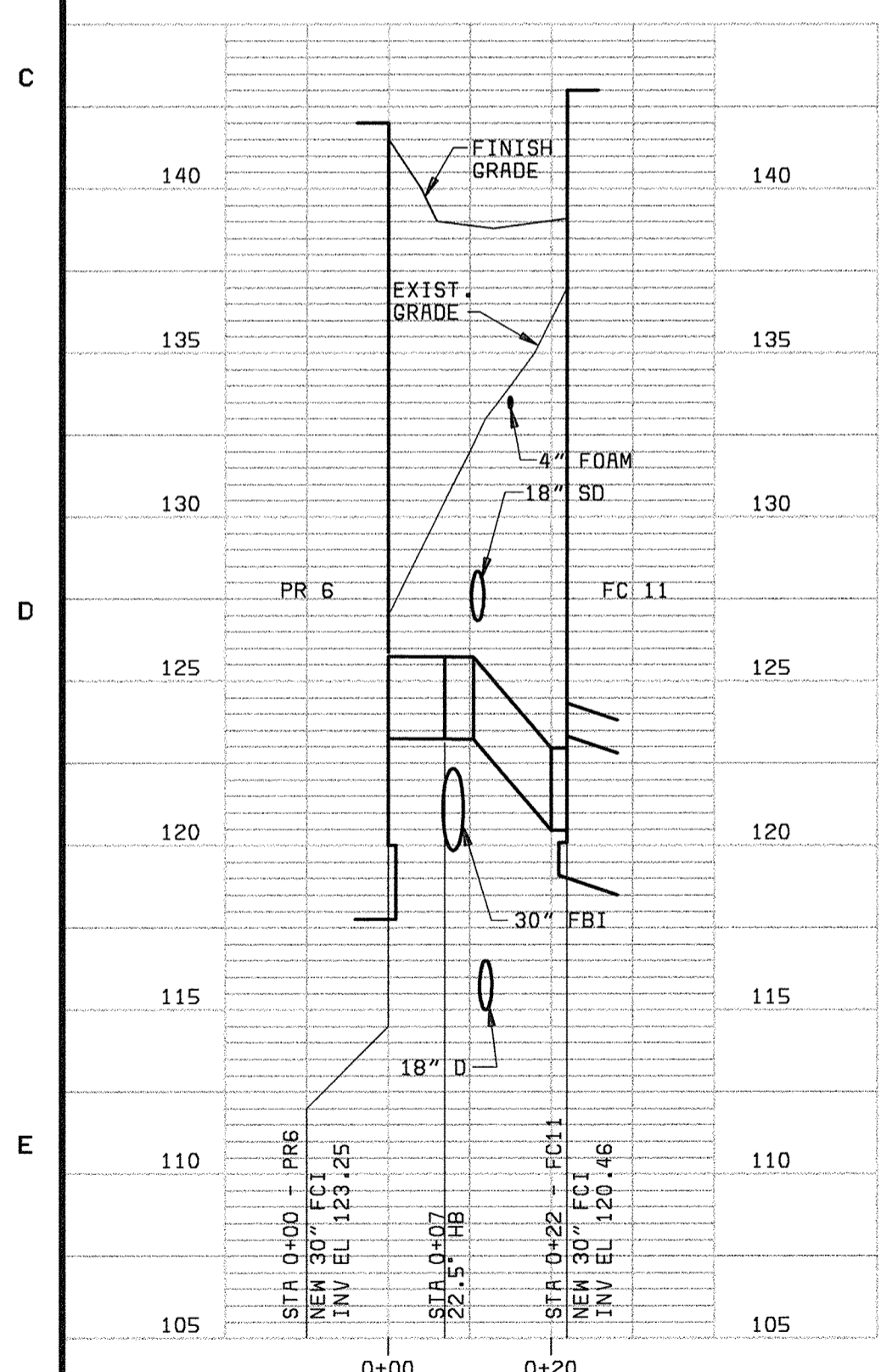
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Rectanus Jr.</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: FKA					<b>YARDWORK</b> <b>CIVIL</b>  <b>YARD PIPING PROFILES</b> <b>SHEET 1 OF 4</b>	<b>LITTLE PATUXENT WATER RECLAMATION PLANT</b> <b>ADDITION NO. 6</b> <b>BNR TREATMENT CAPACITY EXPANSION</b>  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: RM	CHK: WLK	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE			NO.



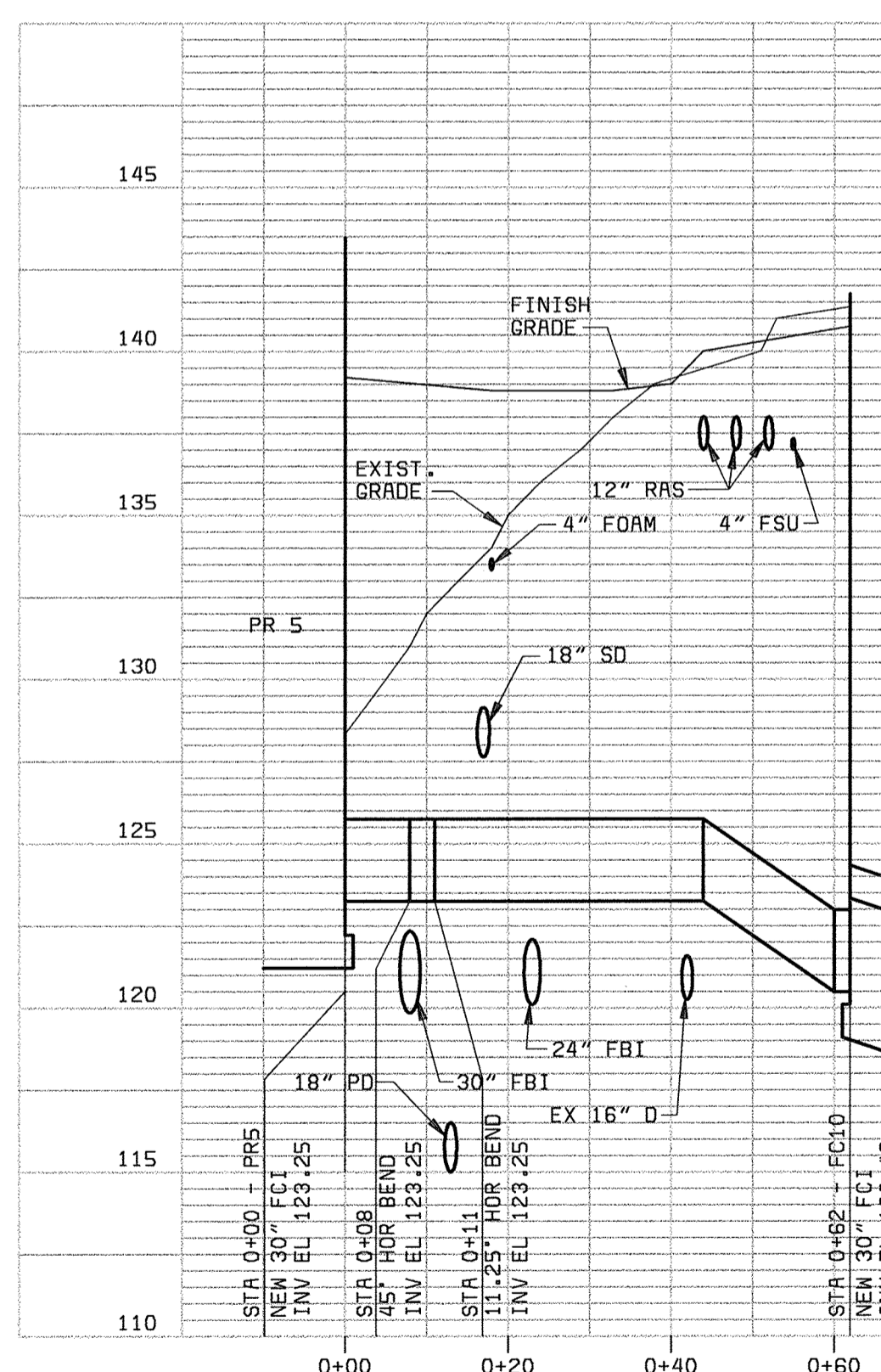


**30"/42" FBI PROFILE**  
 (FROM CONCRETE PLUG TO NEW TEE ON 42" FBI)

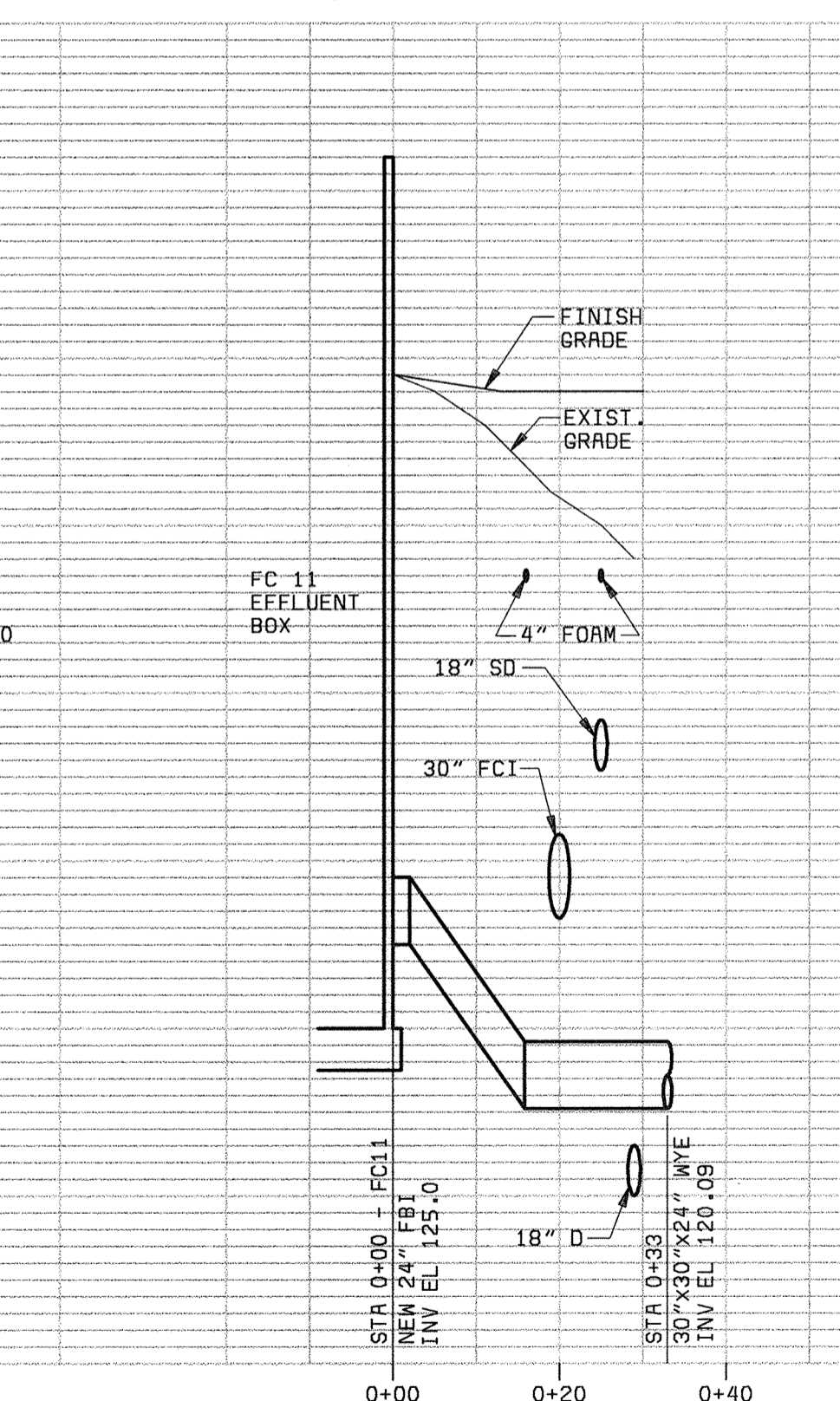
**36" FCI PROFILE**  
 (FROM PR 7 TO FC 12)



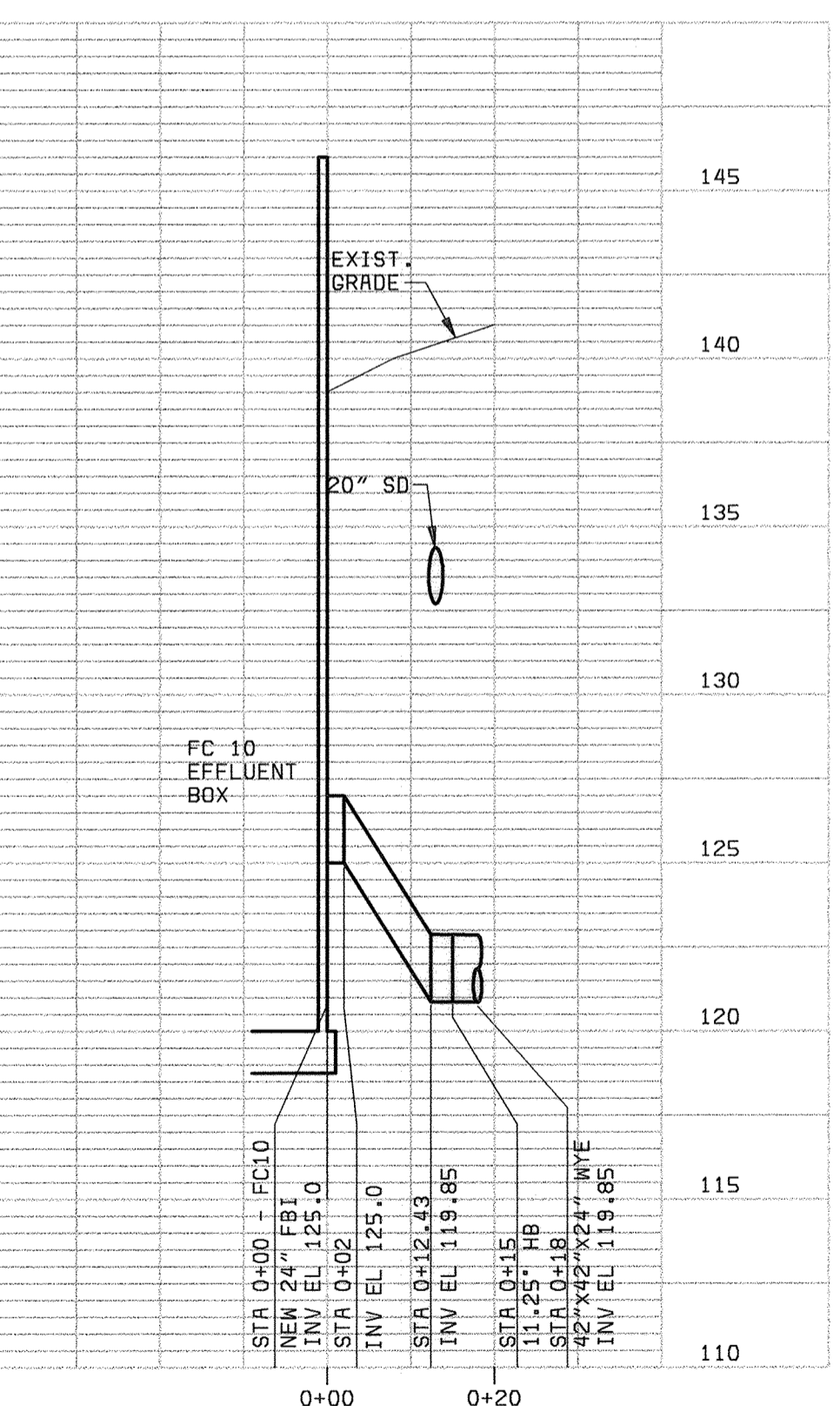
**30" FCI PROFILE**  
 (FROM PR 6 TO FC 11)



**30" FCI PROFILE**  
 (FROM PR 5 TO FC 10)



**24" FBI PROFILE**  
 (FROM FC 11 EFFLUENT BOX TO 30"/42" FBI)

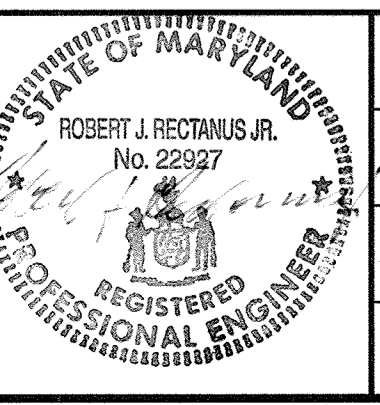


**24" FBI PROFILE**  
 (FROM FC 10 EFFLUENT BOX TO 30"/42" FBI)

SCALE: HORIZ: 1" = 20'-0"  
 VERT: 1" = 5'-0"

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
  
*Robert Benjamin* 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
 Gaithersburg, Maryland  
  
*Robert J. Rectanus, Jr.*  
 REG. PROF. ENGR. DATE

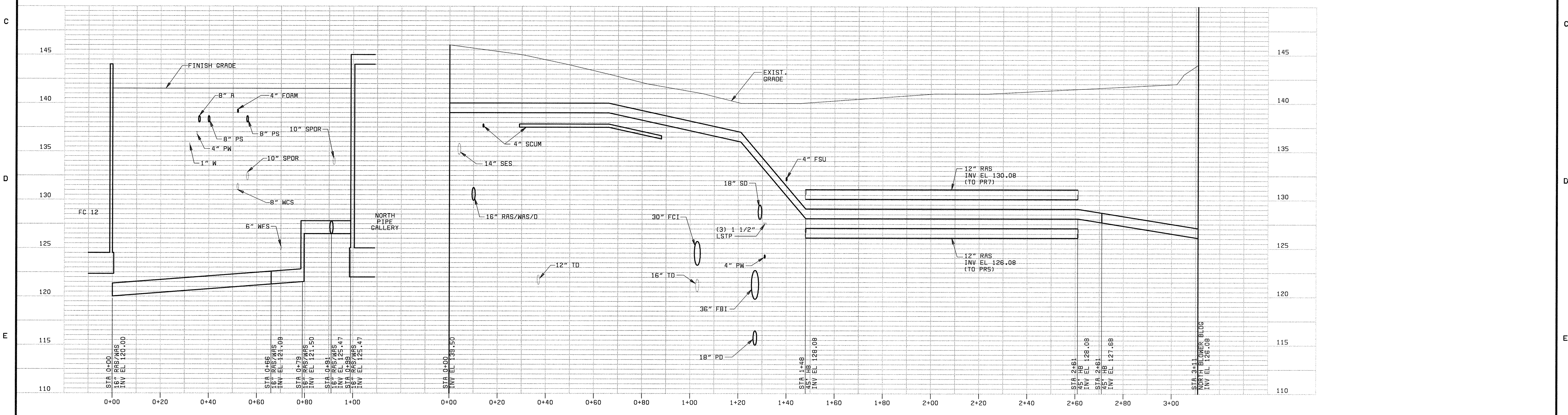
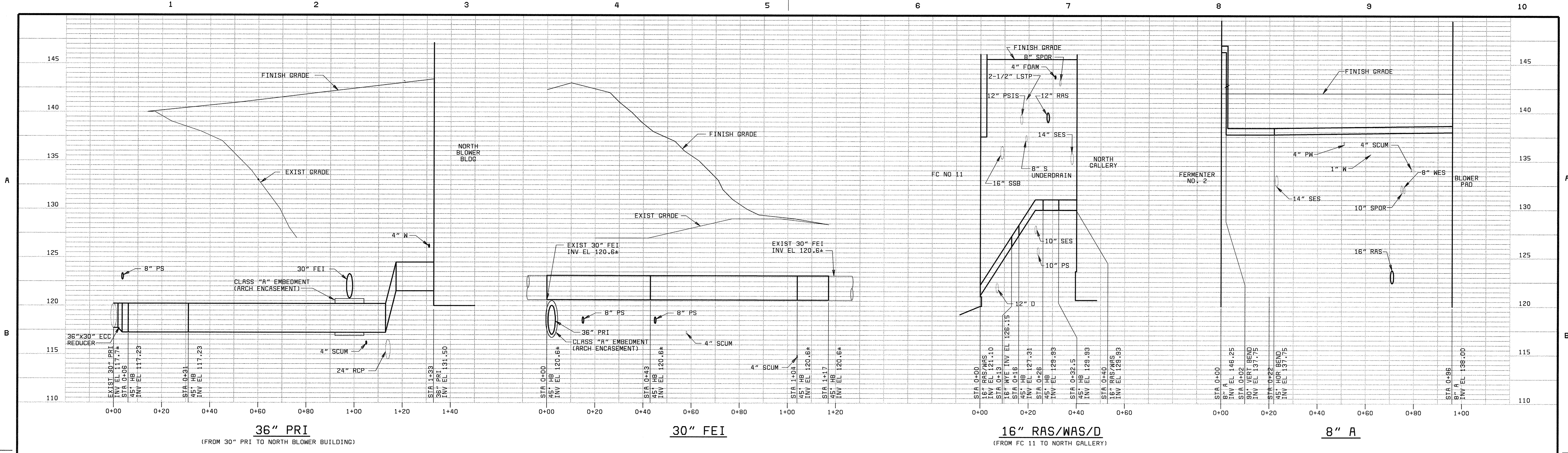


DES: MBH,FKA	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RM						
CHK: WLK						

**YARDWORK CIVIL**  
  
**YARD PIPING PROFILES**  
 2 OF 4

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 25 OF 161  
**Y6**



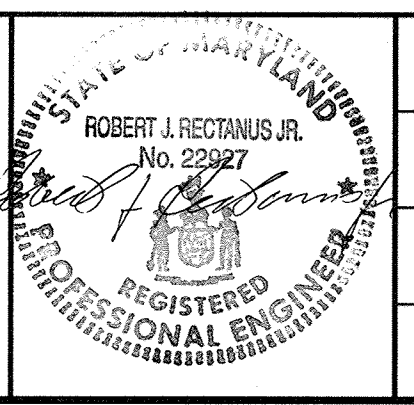
SCALE: HORIZ: 1" = 20'-0"  
VERT: 1" = 5'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
CHIEF, BUREAU OF UTILITIES DATE 6-29-00

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE 6/26/00



DES: FKA					
DRN: RM					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**YARDWORK**  
**CIVIL**

**YARD PIPING PROFILES**  
**SHEET 3 OF 4**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

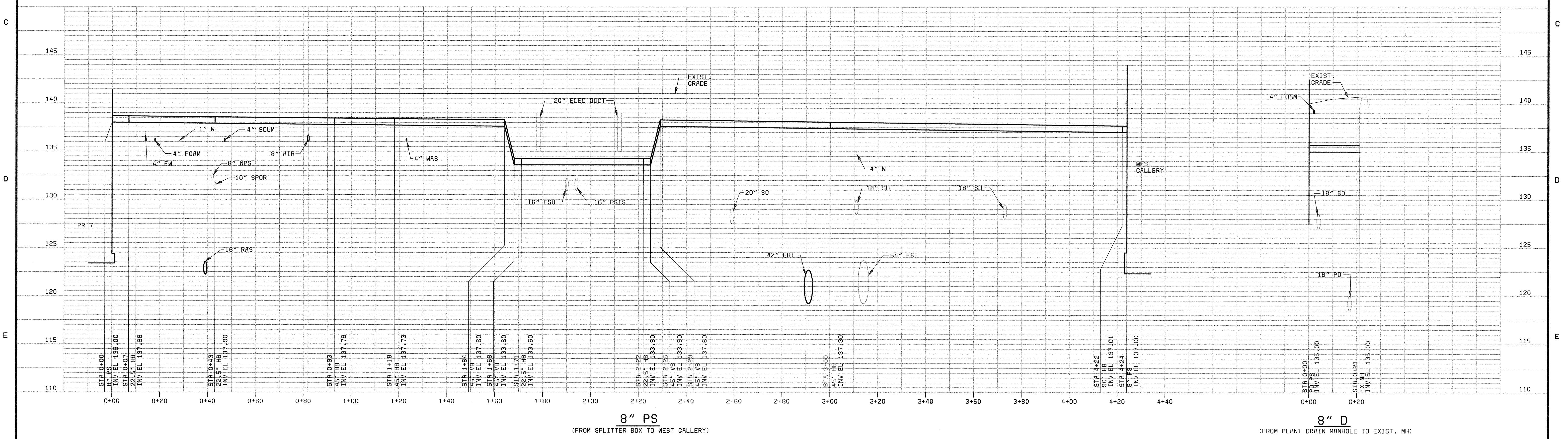
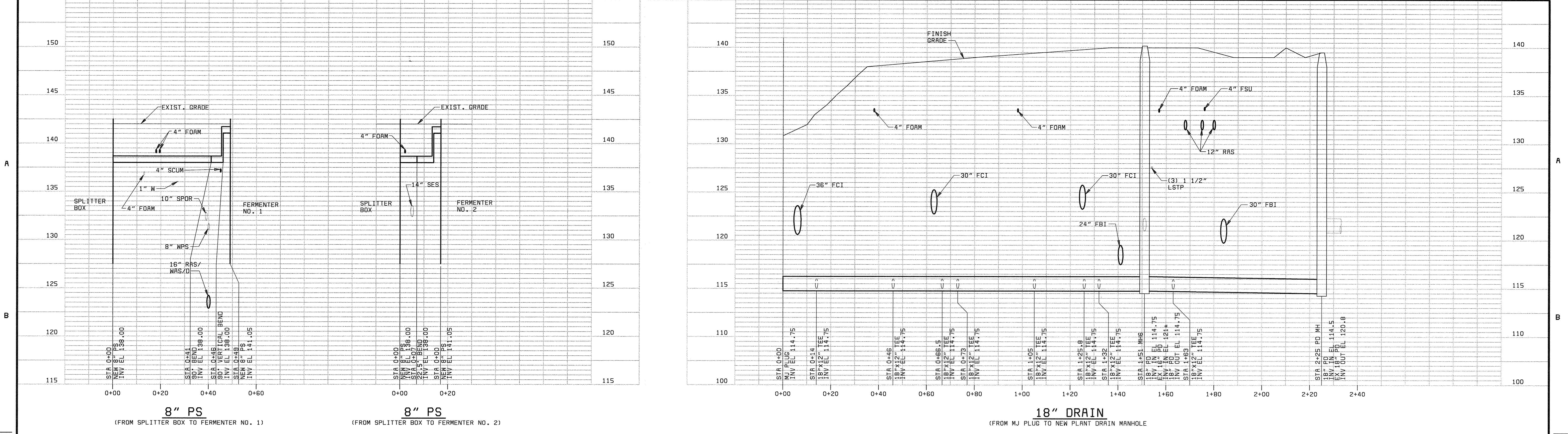
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

**HOWARD COUNTY, MARYLAND**

SCALE AS SHOWN

SHEET 26 OF 161

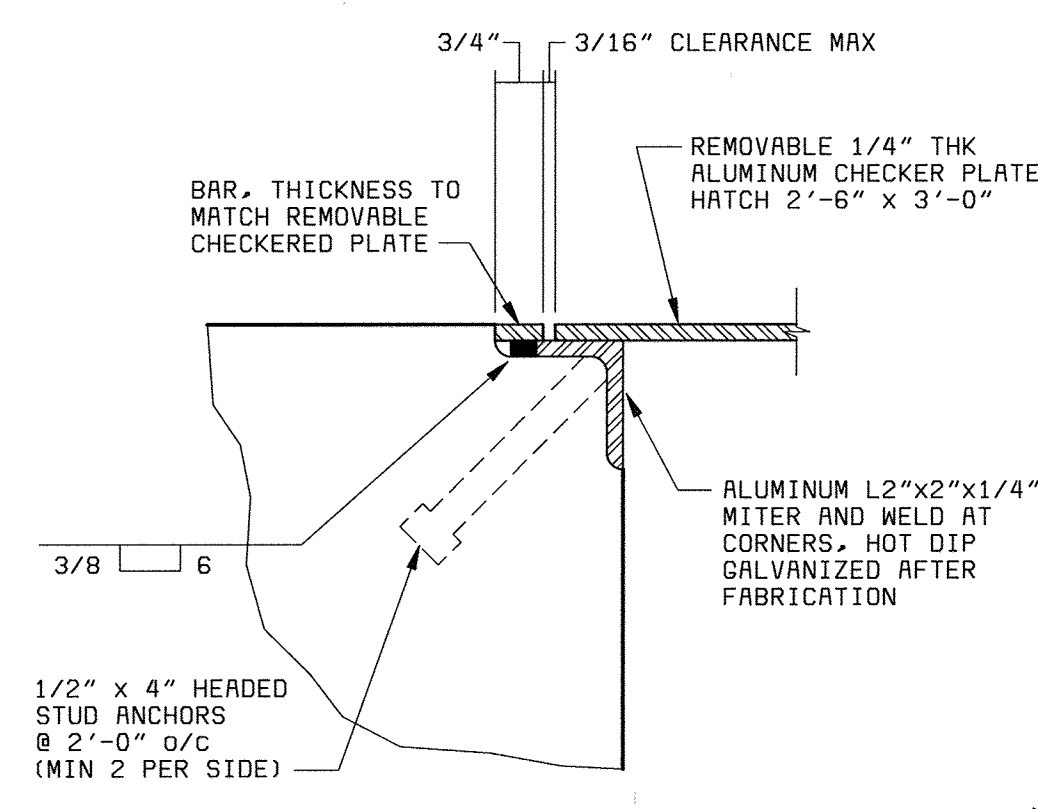
**Y7**



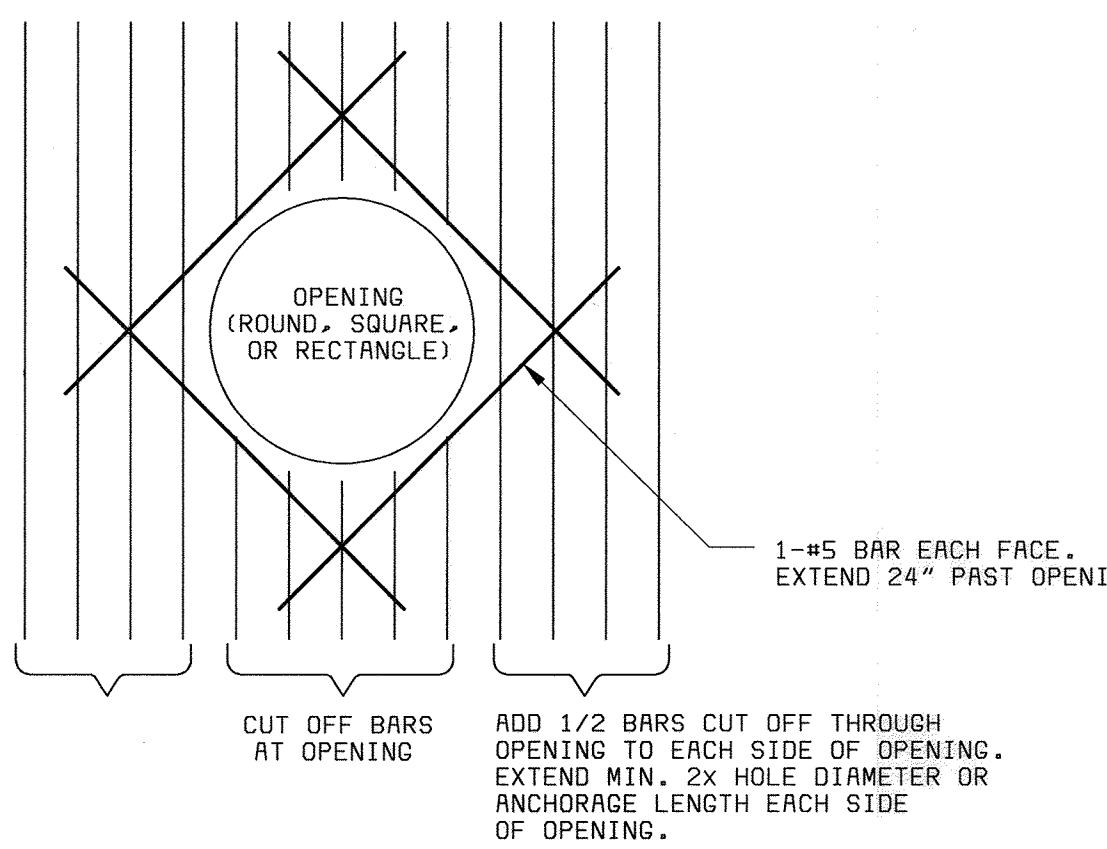
SCALE: HORIZ: 1" = 20'-0"  
VERT: 1" = 5'-0"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Rectanus Jr.</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LLP Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> REG. PROF. ENGR. DATE 8/15/00	 REGISTERED PROFESSIONAL ENGINEER	DES: MBH.FKA	YARDWORK CIVIL	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: RM			SHEET 27 OF 161
			CHK: WLK	YARD PIPING PROFILES 4 OF 4		Y8
			DATE: 6/23/00			

**NOTE:**  
 -ALL WALLS & ROOF 8" THICK C/W #5 @12" EW/EF.  
 -BASE SLAB 12" THICK #5 @12" EW/EF.  
 -PROVIDE DOWELS FROM BASE SLAB TO MATCH VERTICAL REBAR IN WALL.

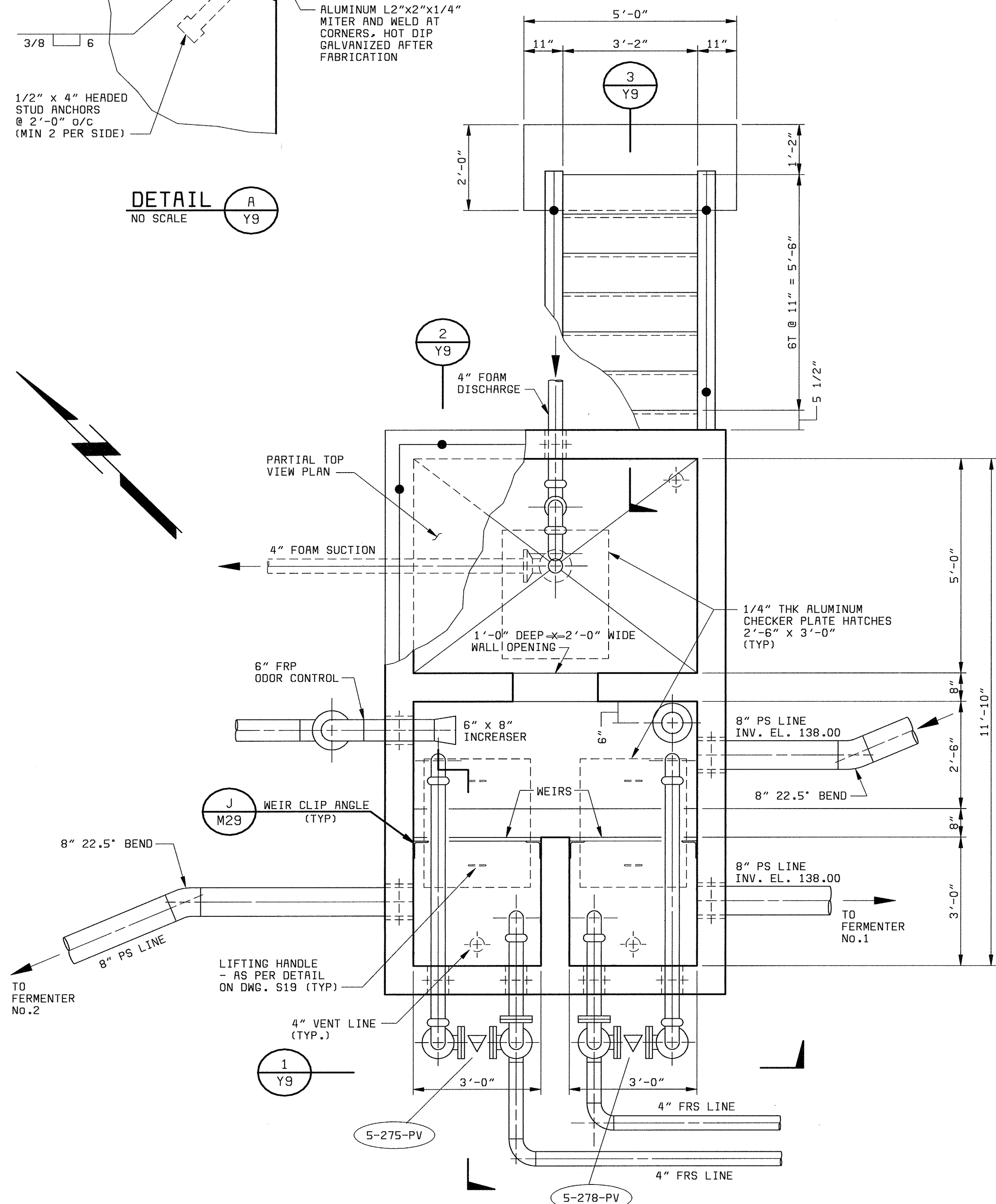


**DETAIL A**  
 NO SCALE  
 Y9

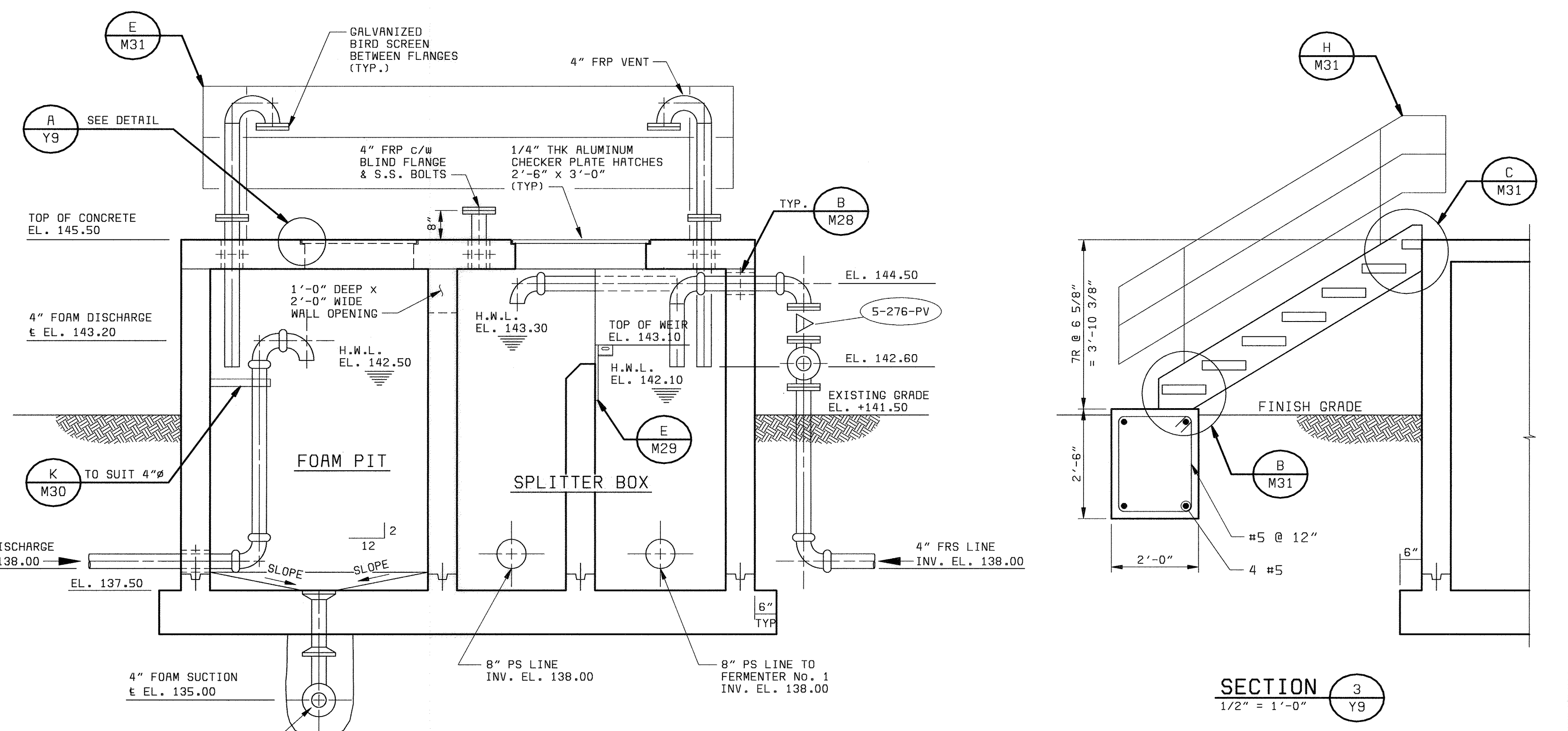


NOTE: -NO ADDITIONAL REINFORCING REQUIRED FOR OPENINGS 6" OR LESS.  
 -REINFORCING TYP. BOTH DIRECTIONS.

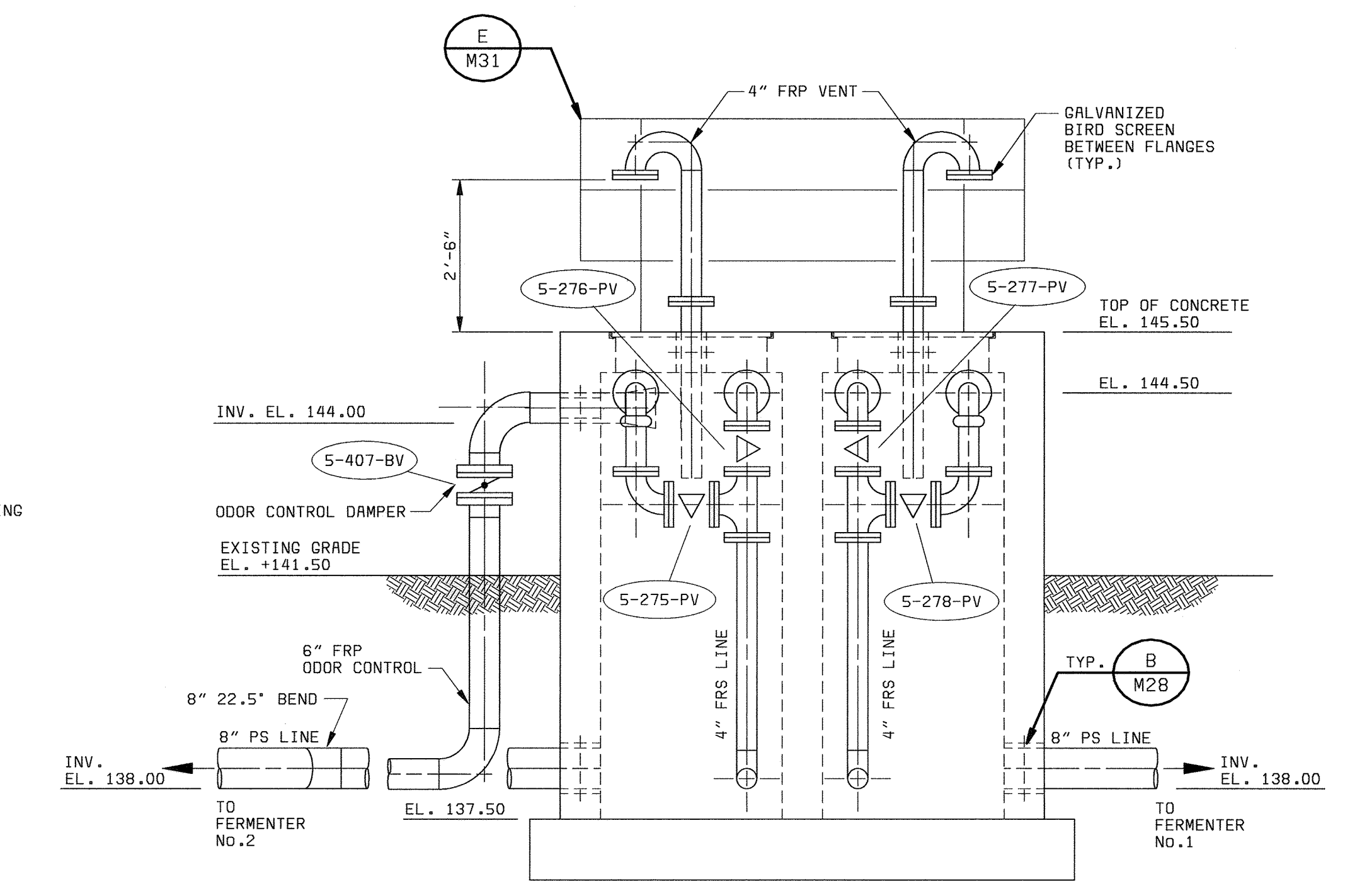
**REINFORCEMENT OF OPENINGS IN WALLS & SLABS**  
 NO SCALE



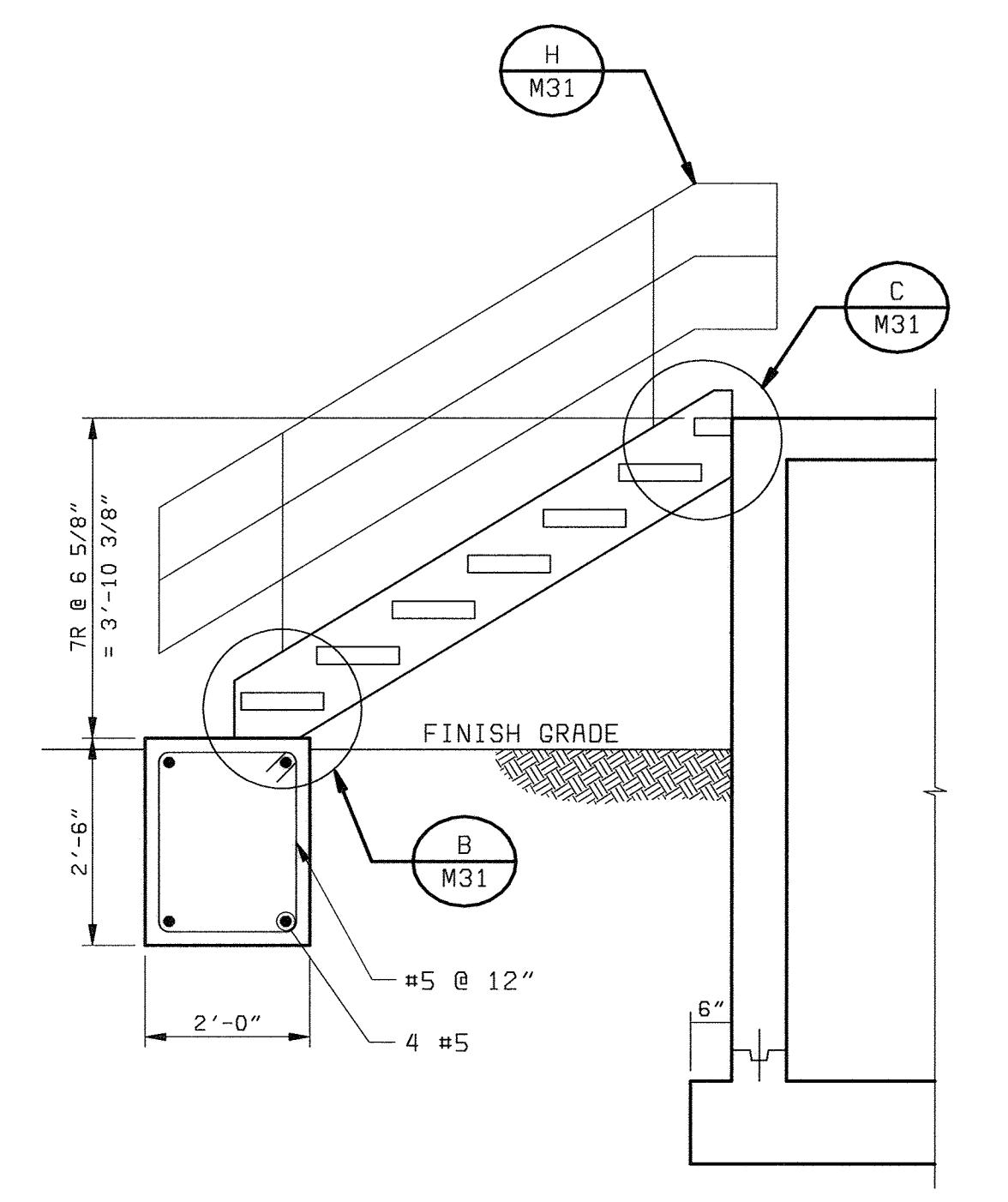
**PLAN**  
 1/2" = 1'-0"



**SECTION 2**  
 1/2" = 1'-0"

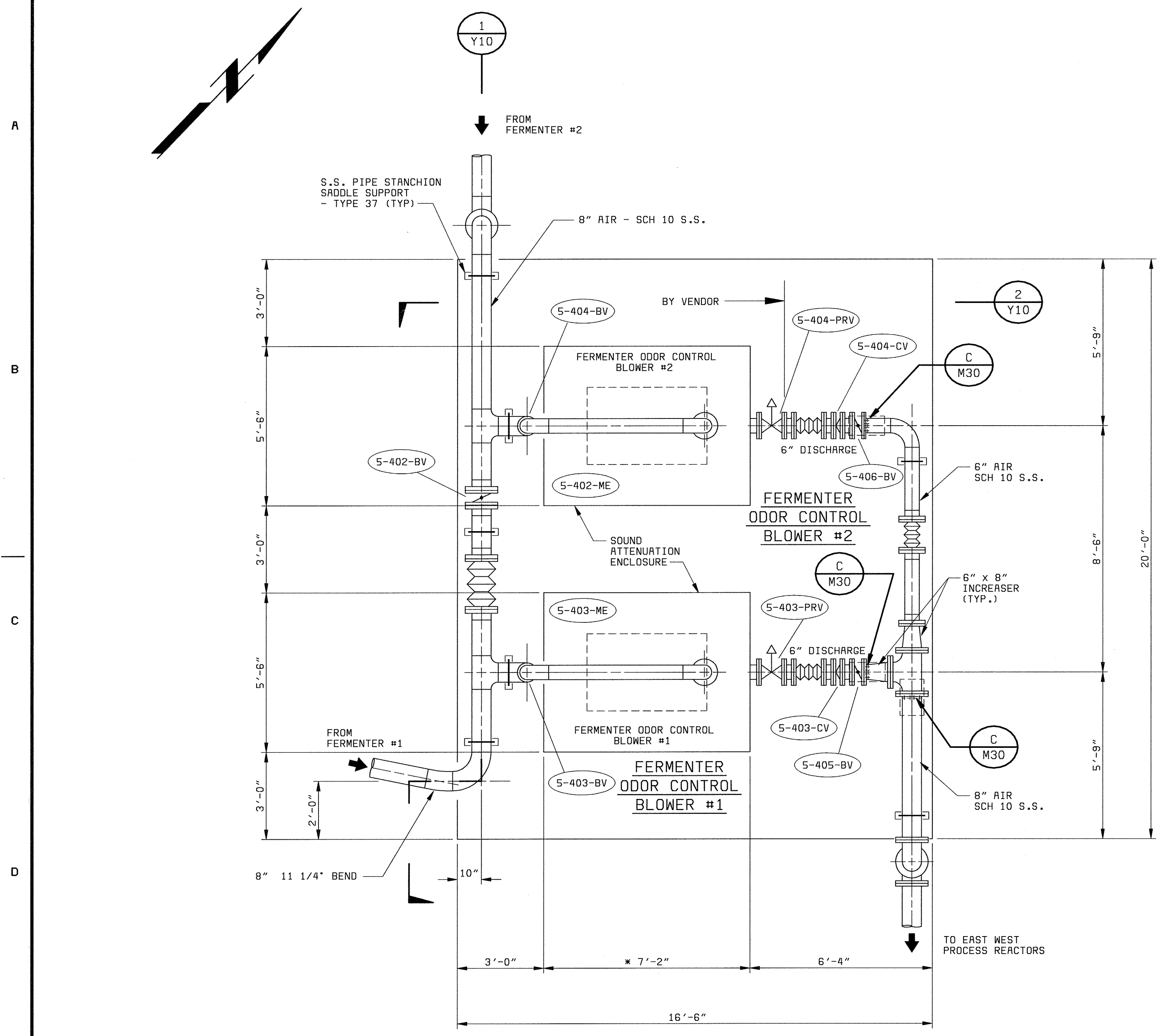


**SECTION 1**  
 1/2" = 1'-0"

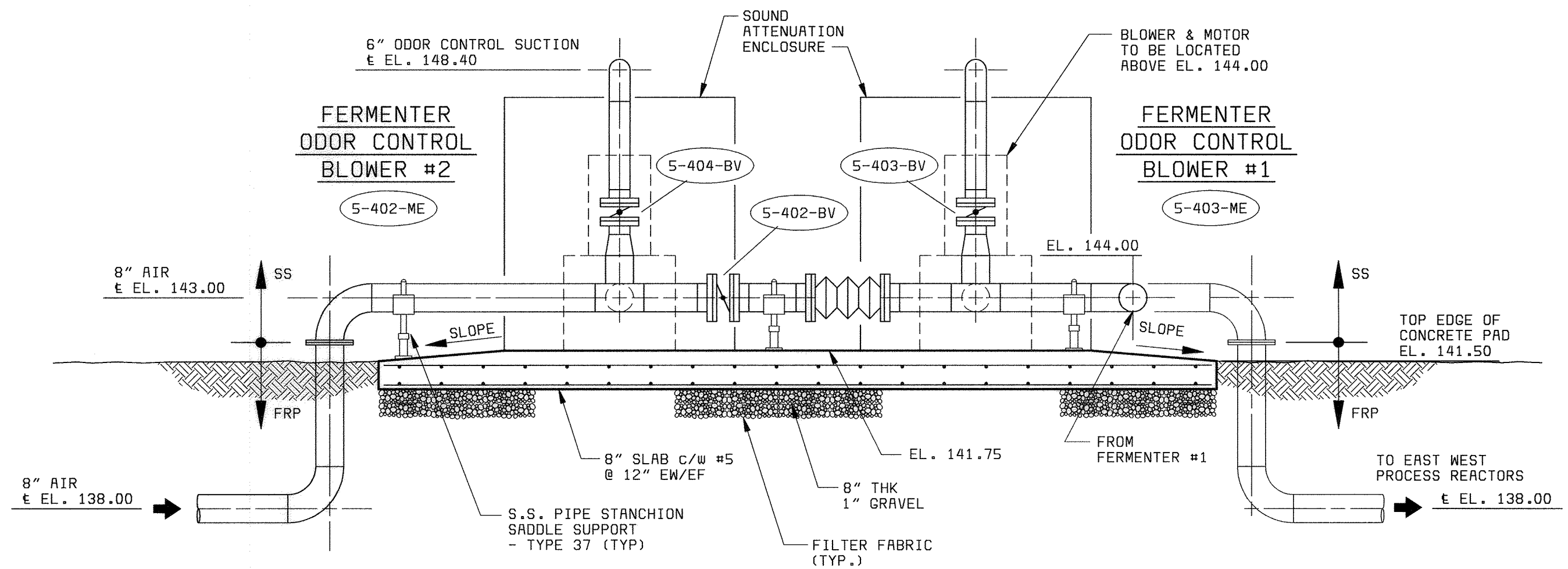


**SECTION 3**  
 1/2" = 1'-0"

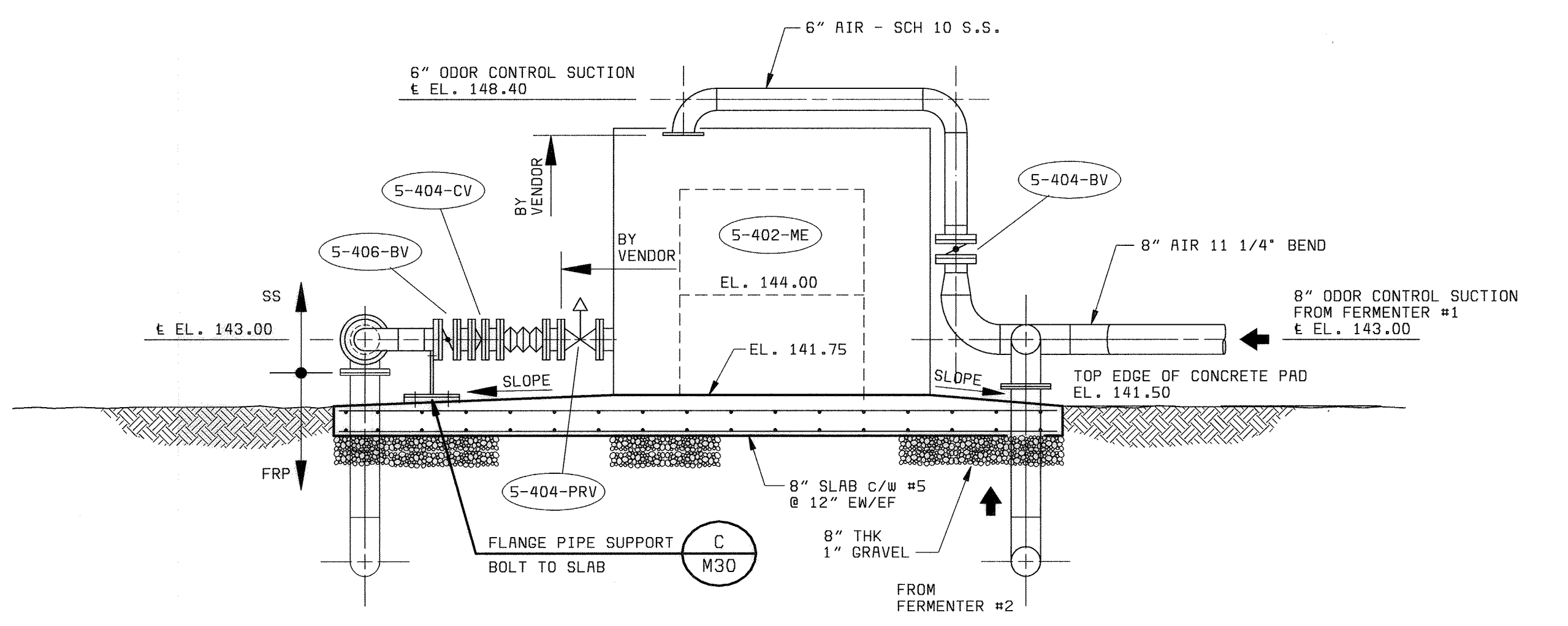
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>Stantec</b> Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com  Robert H. Baerwin 7-19-07 CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  Lawrence R. Tobey July 17, 2000 REG. PROF. ENGR. DATE	Structural Only  License # 25128 July 17, 2000	DES: RVJ	YARDWORK STRUCTURAL/MECHANICAL  FERMENTER SPLITTER BOX PLAN & SECTIONS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR PROCESS TRAIN  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN	
			DRN: RCF			SHEET 28 OF 161	
CHK: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP



\* SUBJECT TO VARIATION PENDING SELECTION OF VENDOR.  
**PLAN**  
 3/8" = 1'-0"



**SECTION 1**  
 3/8" = 1'-0" Y10



**SECTION 2**  
 3/8" = 1'-0" Y10

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 7-19-00  
 CHIEF, BUREAU OF UTILITIES DATE

**Stantec**  
 Stantec Consulting Ltd.  
 Suite 1007, 7445-132 St.  
 Surrey, BC  
 V3W 1J8  
 Ph. (604) 597-0422  
 Fax (604) 591-1856  
 Email: surrey@stantec.com

**BLACK & VEATCH**  
 Gaithersburg, Maryland  
 Lawrence R. Tobey July 17, 2000  
 REG. PROF. ENGR. DATE

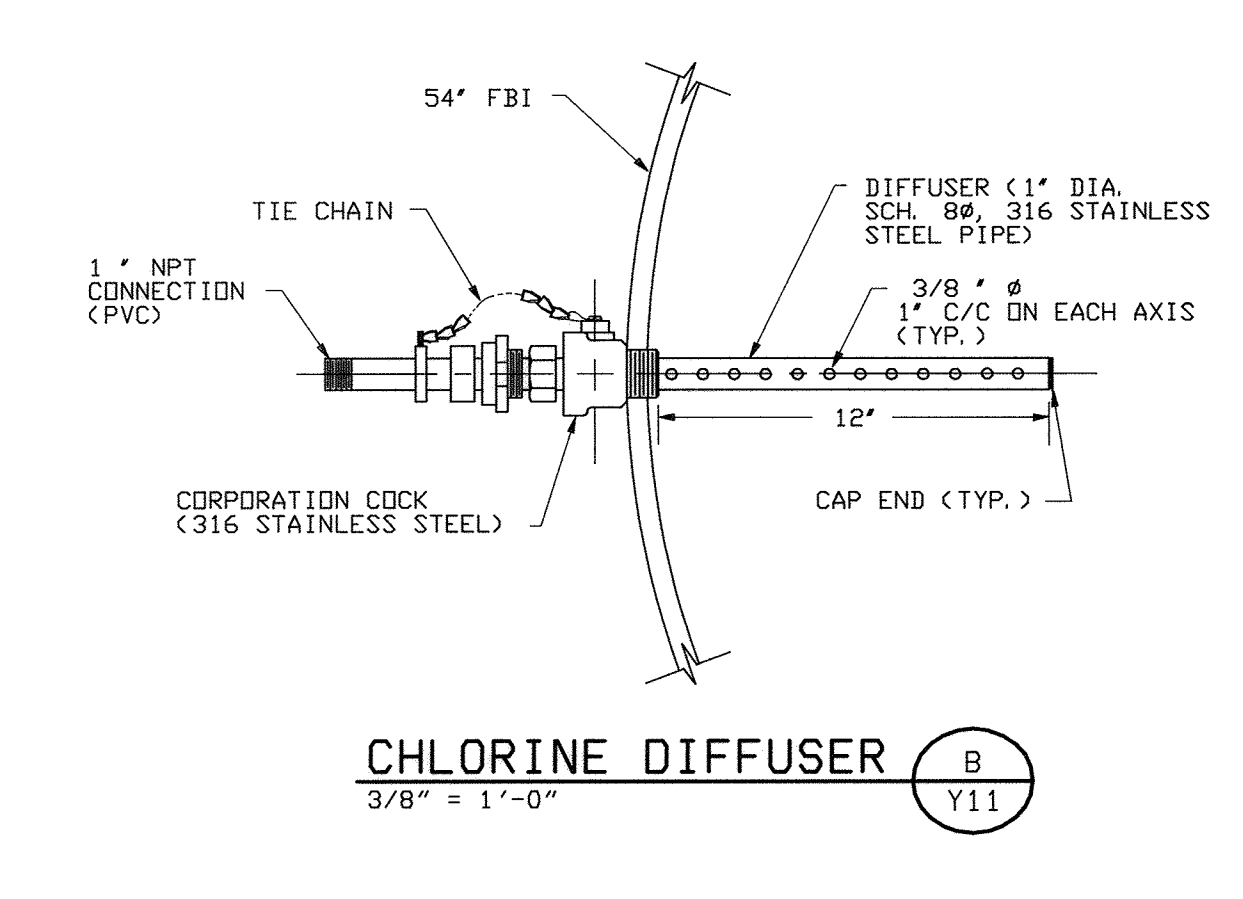
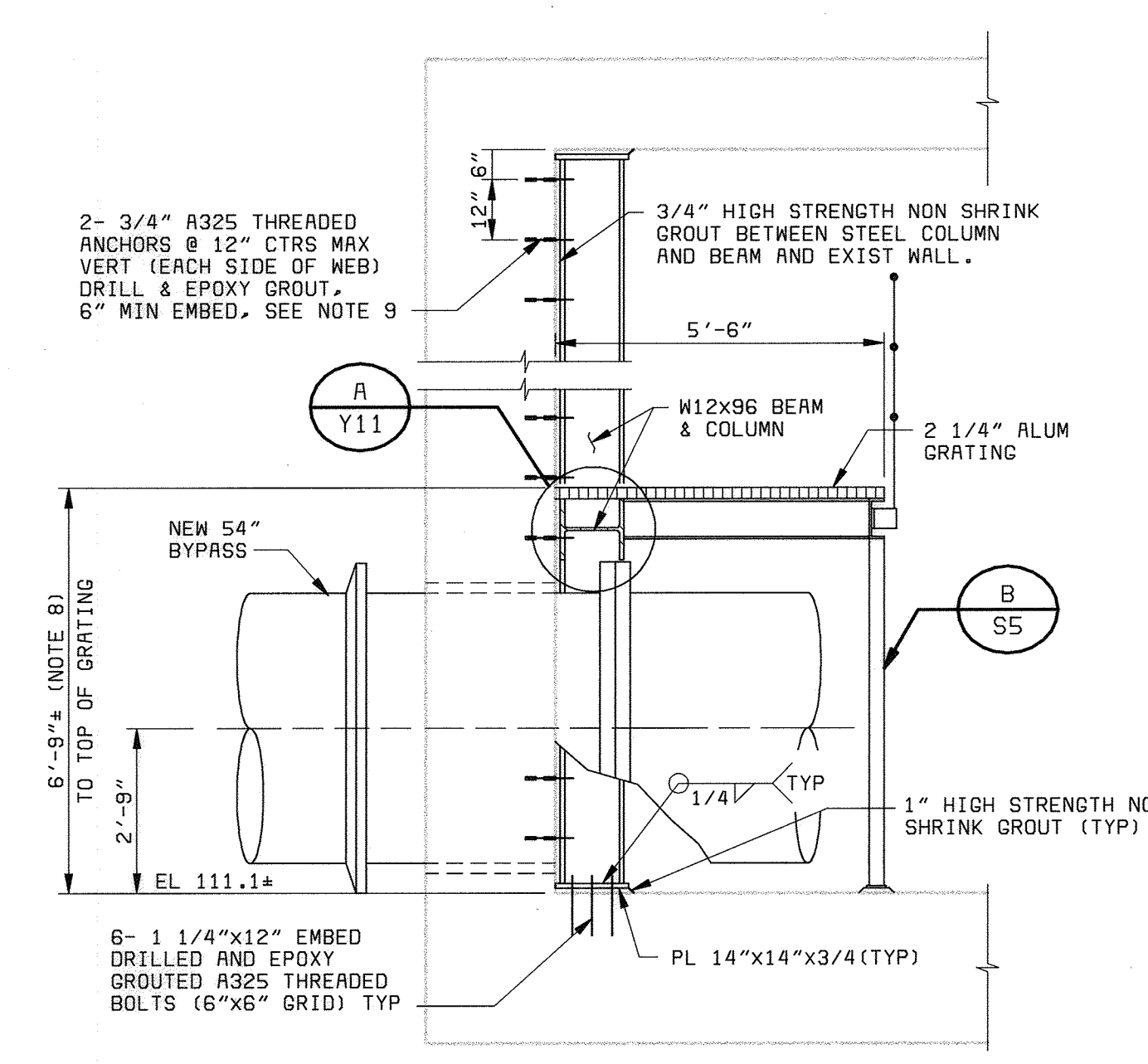
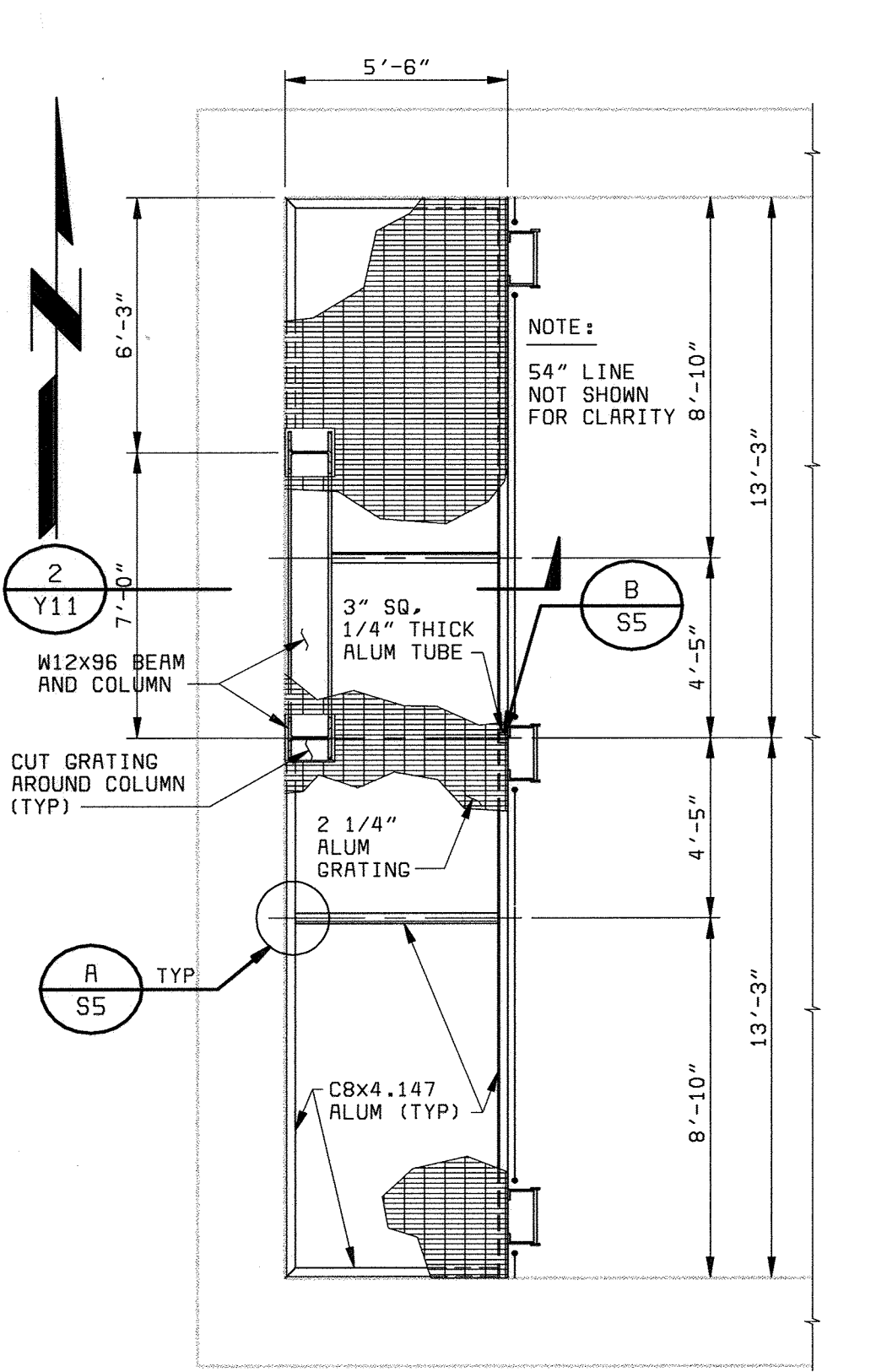
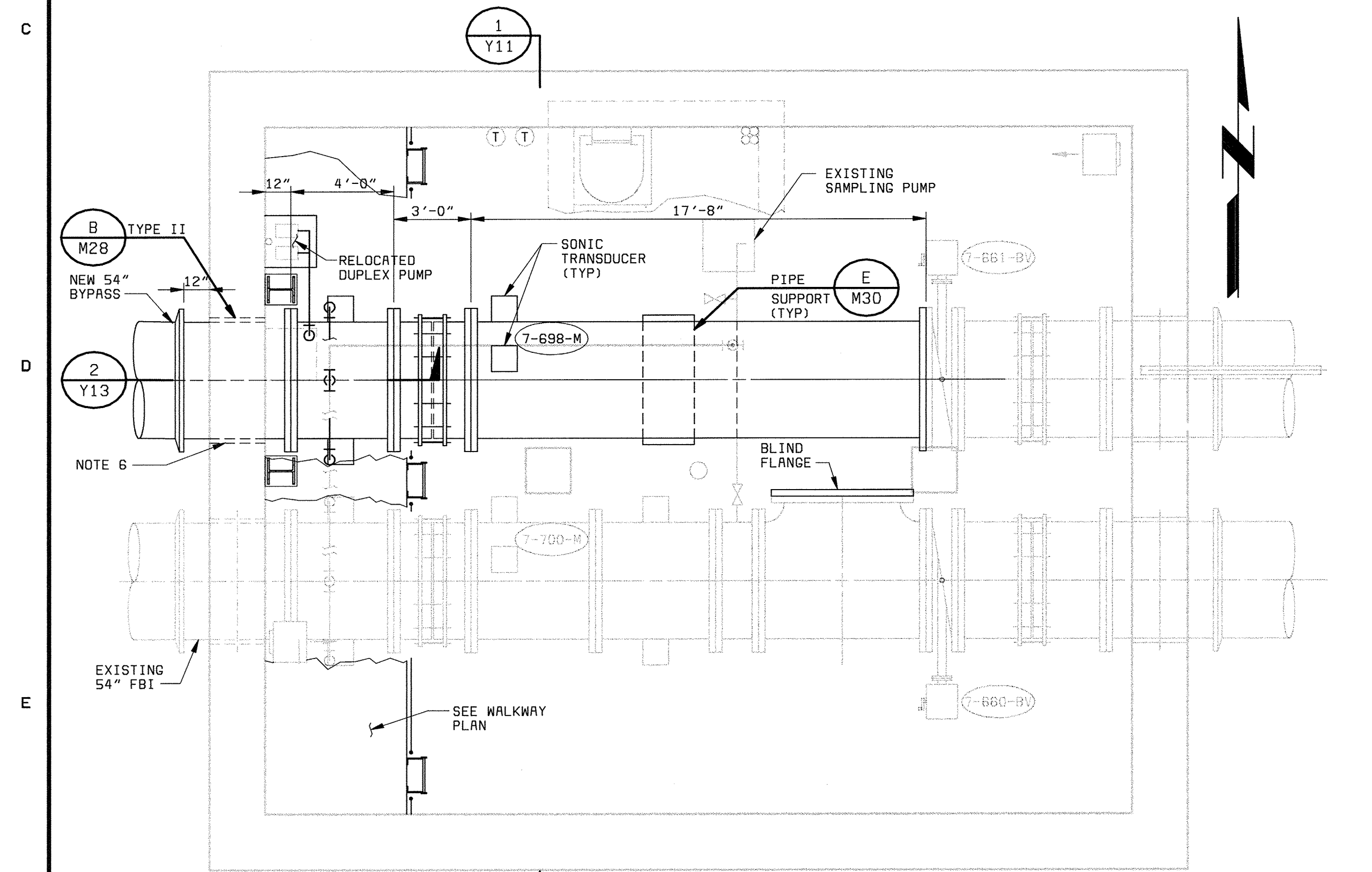
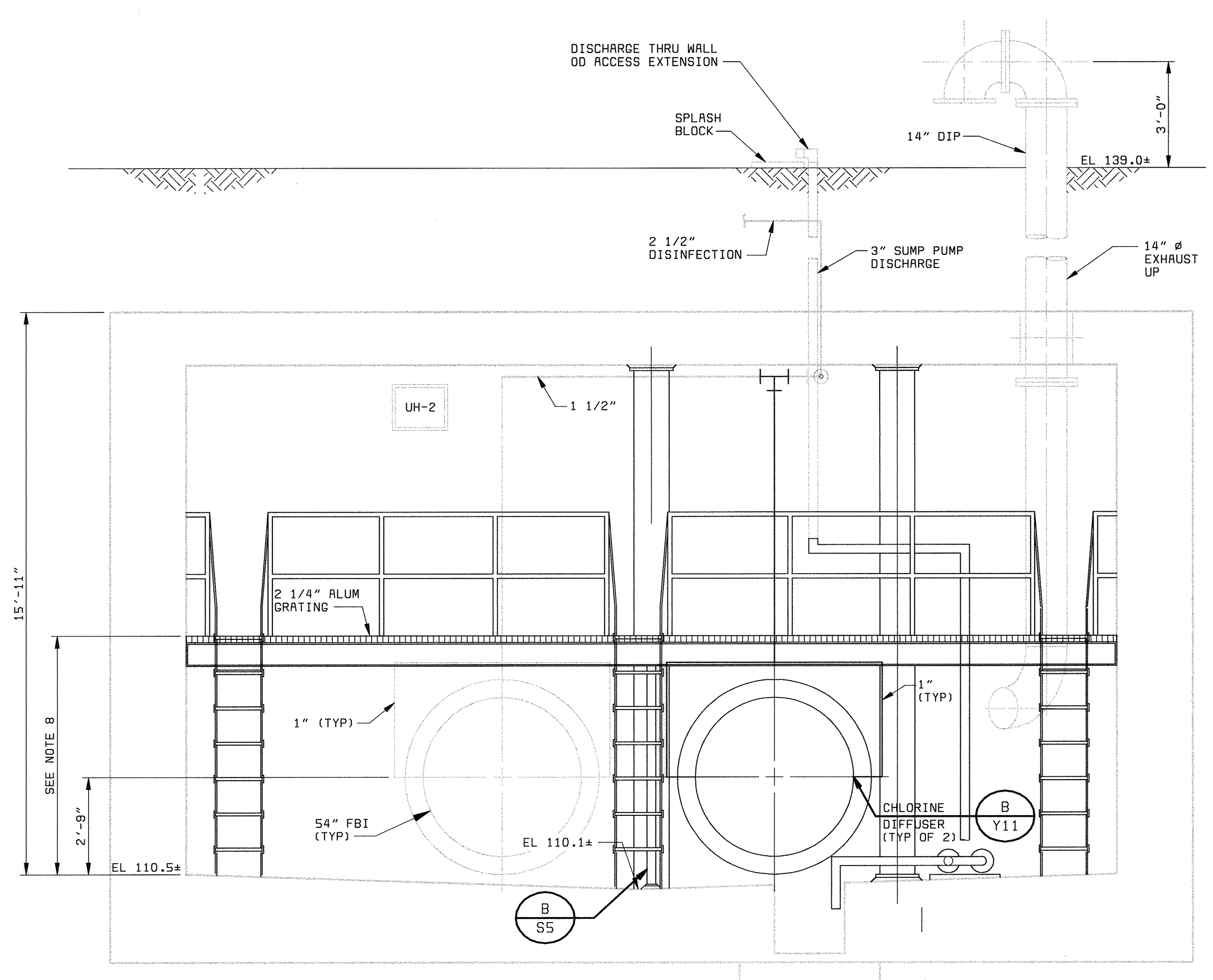
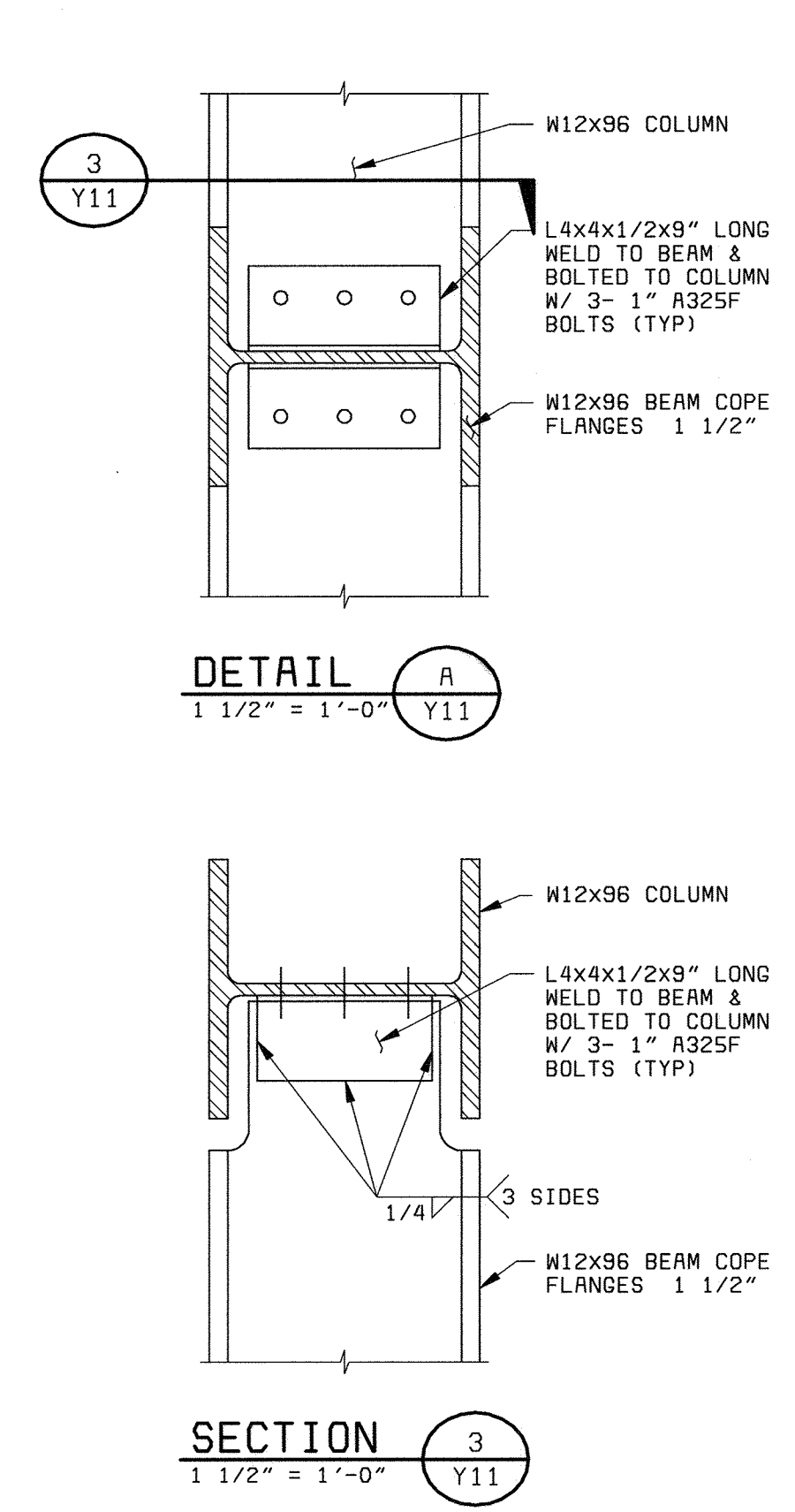
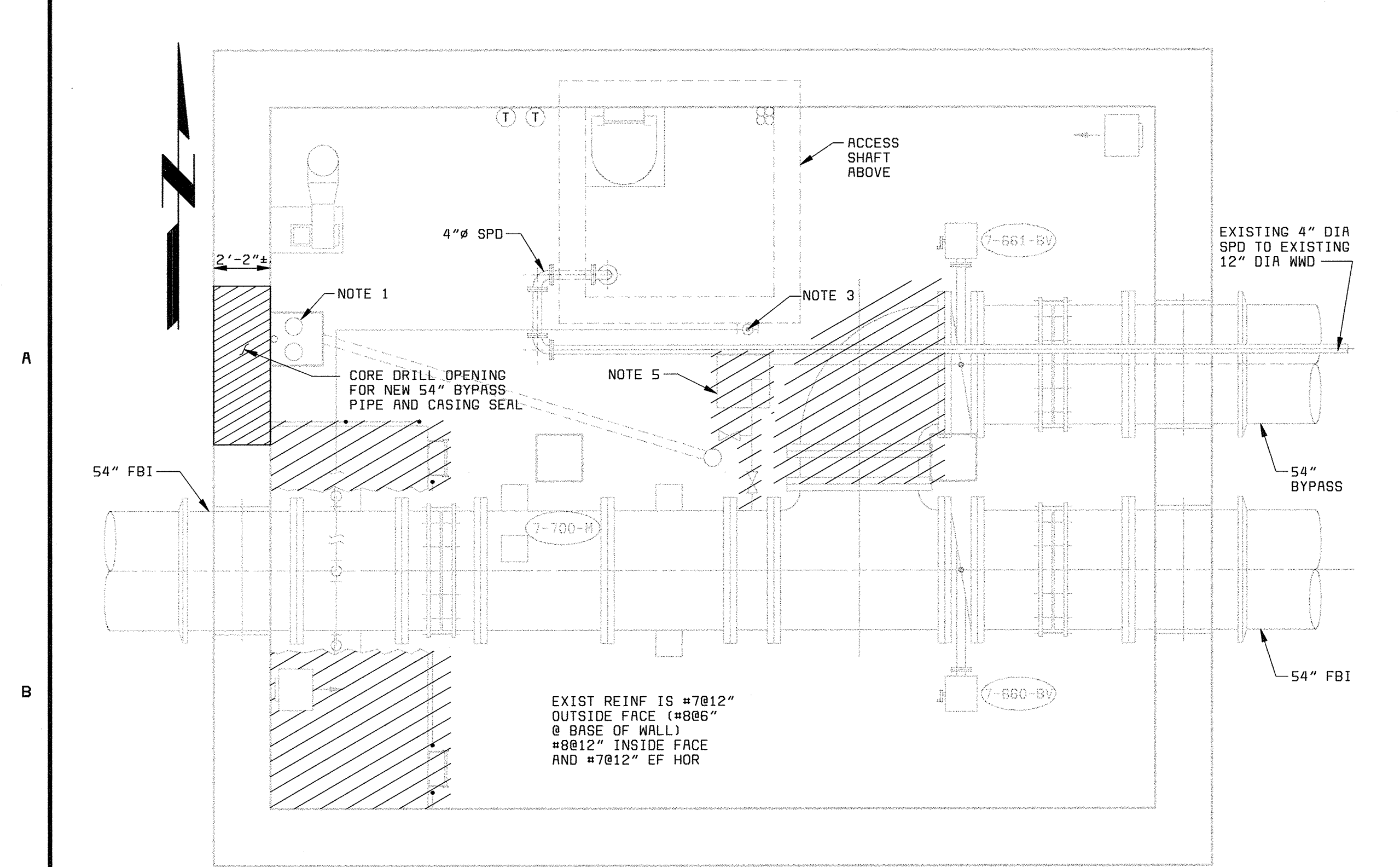
Structural Only  
 PROFESSIONAL ENGINEER  
 LAWRENCE R. TOBEY  
 # 25188  
 July 17, 2000

DES: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RCF							
CHK: RVJ							

**YARDWORK**  
 STRUCTURAL/MECHANICAL  
**ODOR CONTROL**  
 FERMENTER BLOWERS  
 PLAN & SECTIONS

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
 ADDITION NO. 6  
 NORTH BNR PROCESS TRAIN  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE  
 AS  
 SHOWN  
 SHEET  
 29 OF 161  
**Y10**



- NOTES:**
1. DUPLEX PUMPS TO BE RELOCATED NEXT TO NEW 54" LINE.
  2. PUMP CONTROL PANEL TO BE RELOCATED.
  3. EXISTING 2 1/2" TEE WITH CAP.
  4. EXISTING VENT BLOWER TO BE RELOCATED AS NEEDED.
  5. EXISTING SAMPLING PUMPS TO BE RELOCATED NEXT TO NEW 54" LINE AND KEPT IN SERVICE DURING CONSTRUCTION.
  6. EXTRA REINFORCEMENT TO BE PROVIDED PER STRUCTURAL DETAILS AROUND PIPE OPENING.
  7. ELEVATIONS ARE BASED ON EXISTING DRAWINGS. CONTRACTOR TO VERIFY PRIOR TO CONNECTION.
  8. HEIGHT SHALL BE DETERMINED BASED ON W12X96 BEAM LOCATION, 6" 12" ABOVE EDGE OF CONC OPENING.
  9. TIGHTEN NUTS AFTER WALL GROUT HAS HARDENED FOR 72 HRS AND BEFORE REPLACING BACKFILL.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus Jr.*  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE

STATE OF MARYLAND  
ROBERT J. RECTANUS JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: FKA	DATE: 6/23/00
DRN: AJM	REVISIONS AND RECORD OF ISSUE
CHK: WLK	NO. BY CK APP

**54" METER VAULT  
YARDWORK**

**PLANS, SECTIONS, AND DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

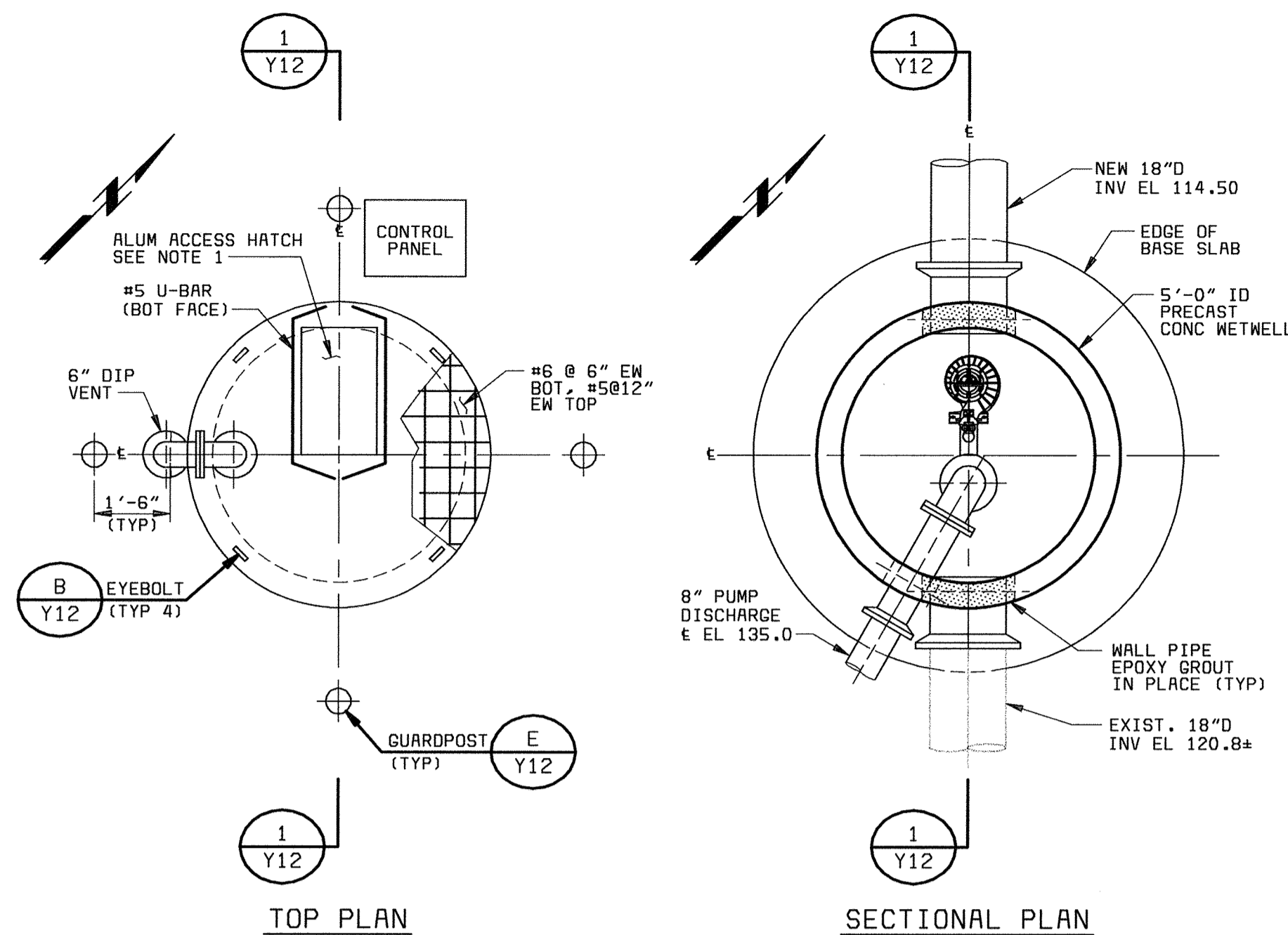
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

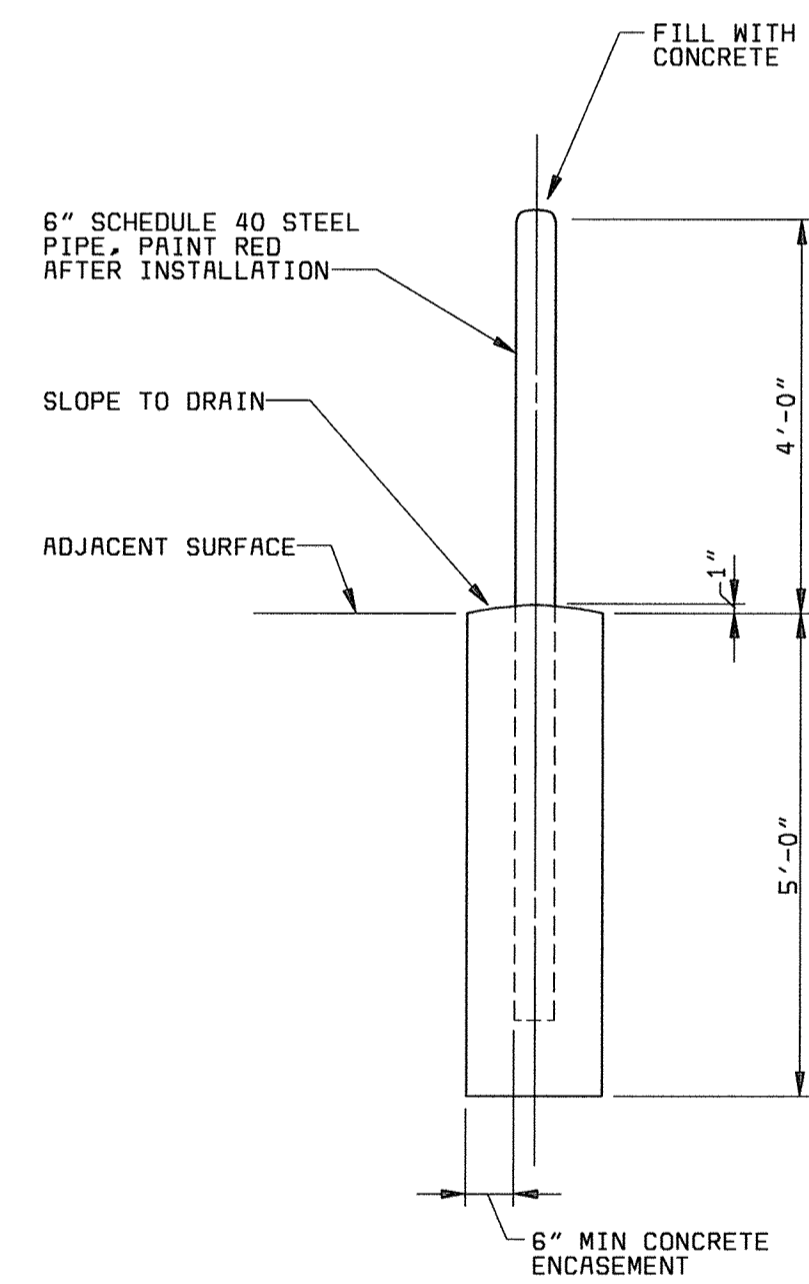
SCALE AS SHOWN

SHEET 30 OF 161

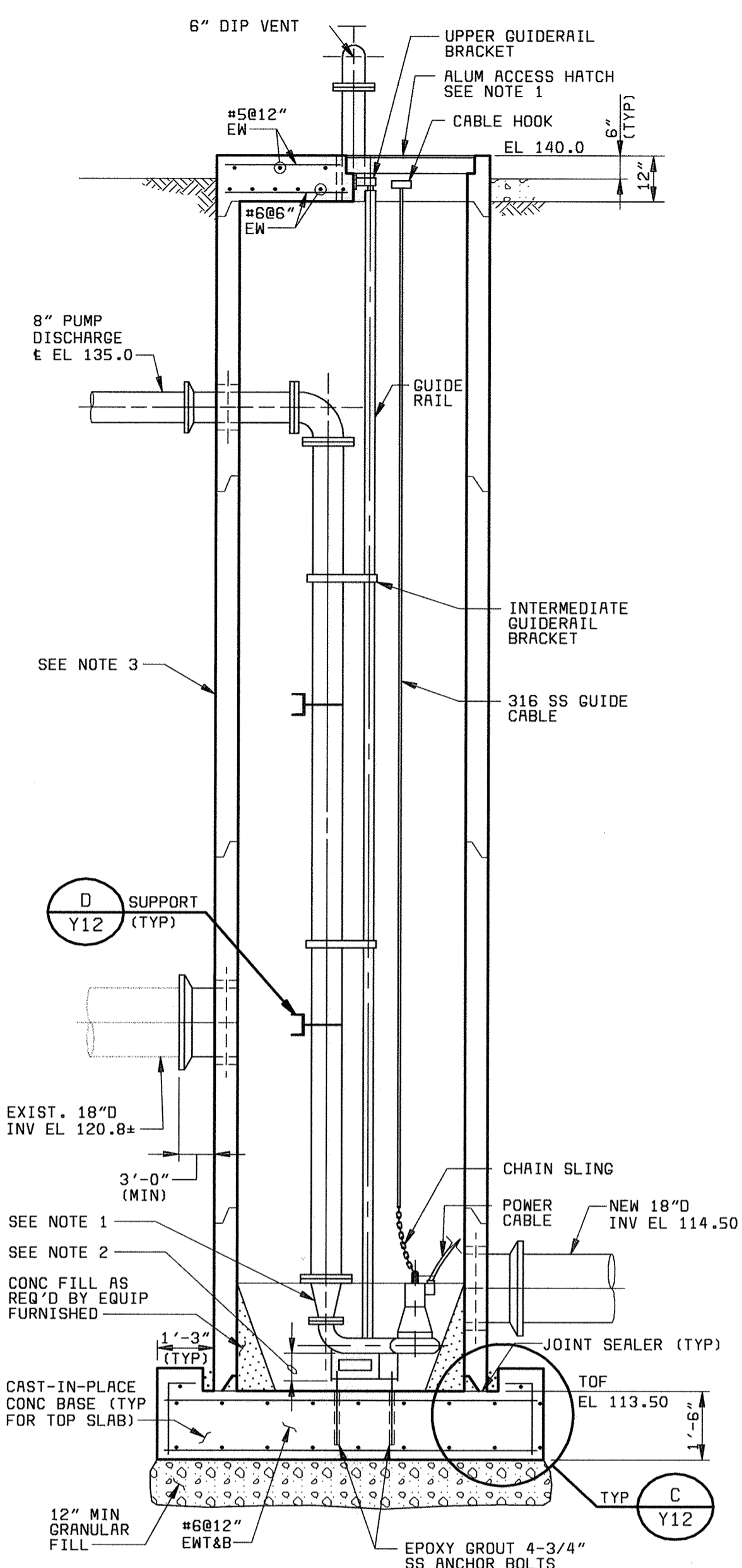
**Y11**



**PLANT DRAIN MANHOLE**  
3/8" = 1'-0"

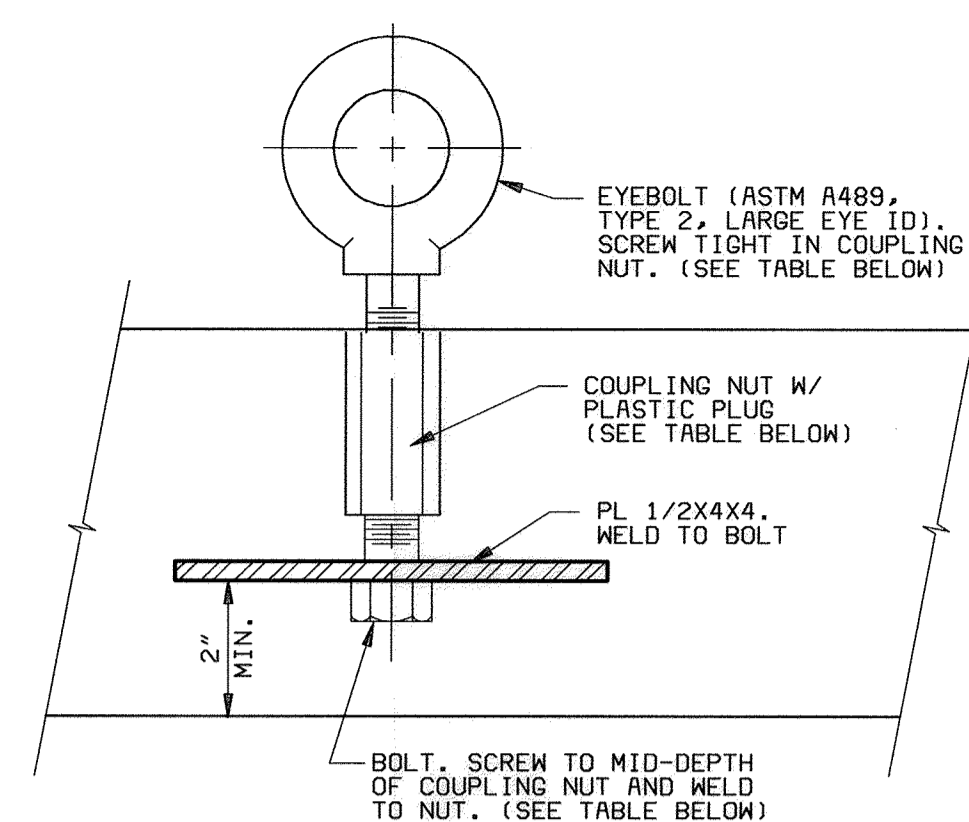


**GUARDPOST**  
NO SCALE



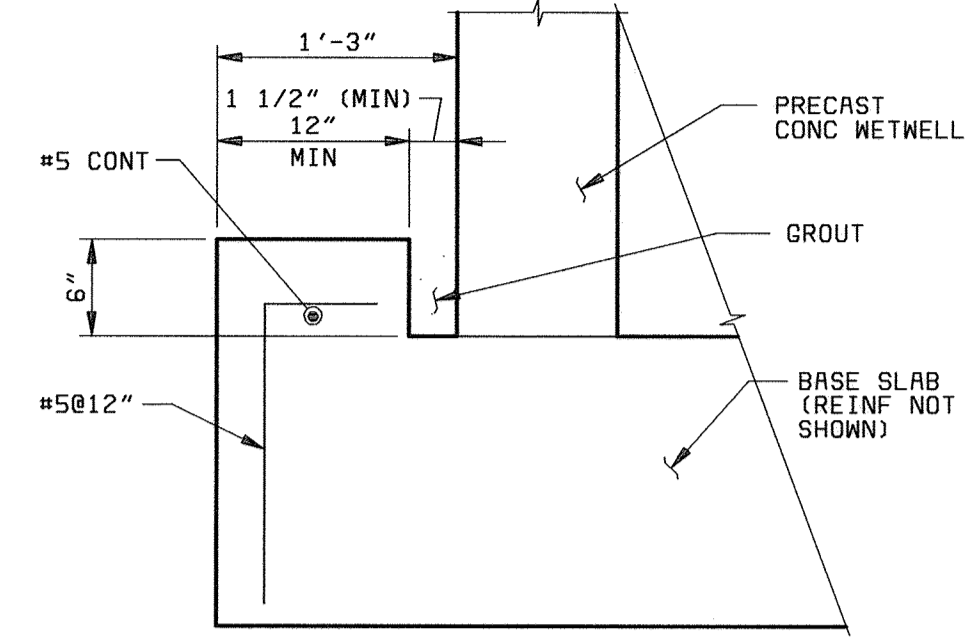
**SECTION 1**  
3/8" = 1'-0"

- NOTES:**
1. SIZE AND LOCATION AS REQUIRED BY EQUIPMENT FURNISHED.
  2. AS REQUIRED BY EQUIPMENT FURNISHED.
  3. JOINTS BETWEEN PRECAST SECTIONS SHALL BE DESIGNED/CONSTRUCTED TO RESIST UPLIFT FORCES DUE TO 100 YR FLOOD EL. OF 144.00.

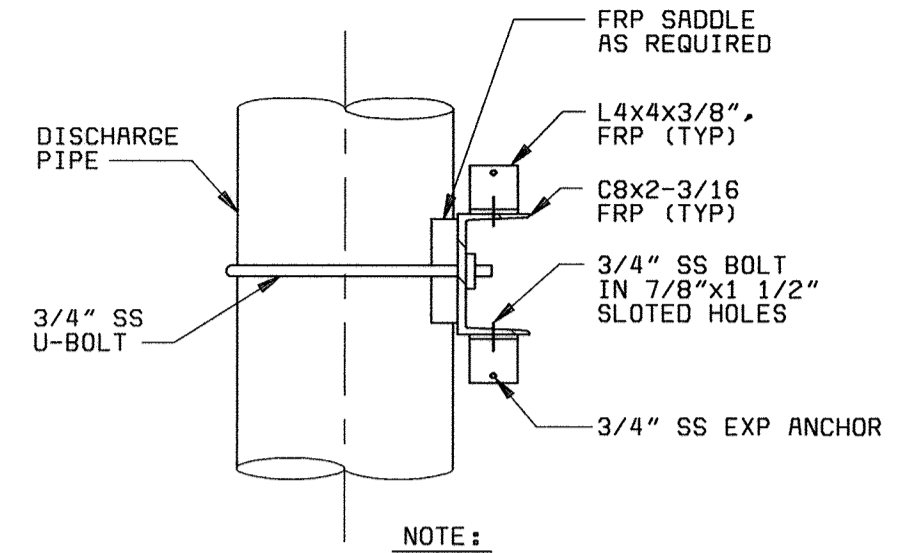


SAFE WORKING LOAD-POUNDS	BOLT SIZE DIA. x LENGTH (INCH)	PL EMBED. DEPTH (INCH) (MINIMUM)	COUPLING NUT SIZE DIA. x LENGTH (INCH)	EYEBOLT SIZE (INCH)
6000	3/4 x 5 1/4	6	3/4 x 2 1/4	3/4

**EYEBOLT B**  
NO SCALE

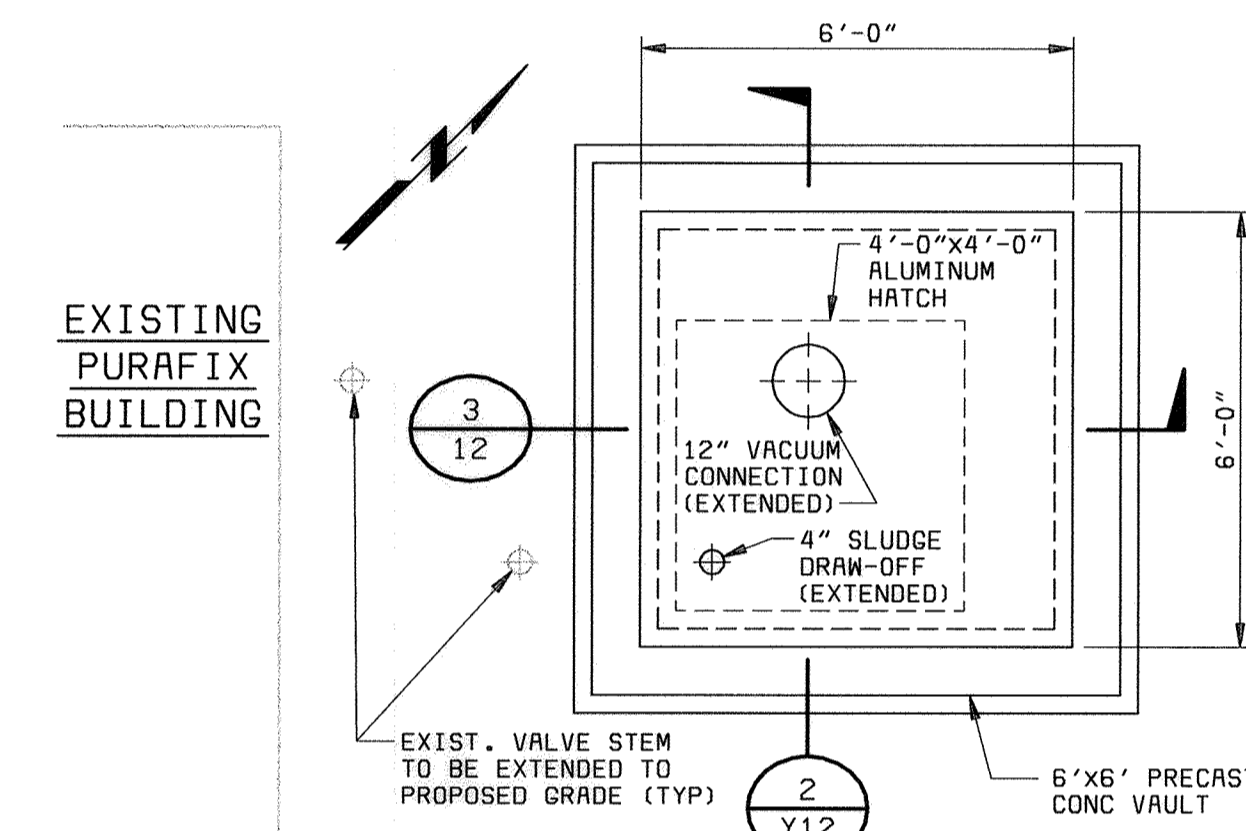


**DETAIL C**  
NO SCALE



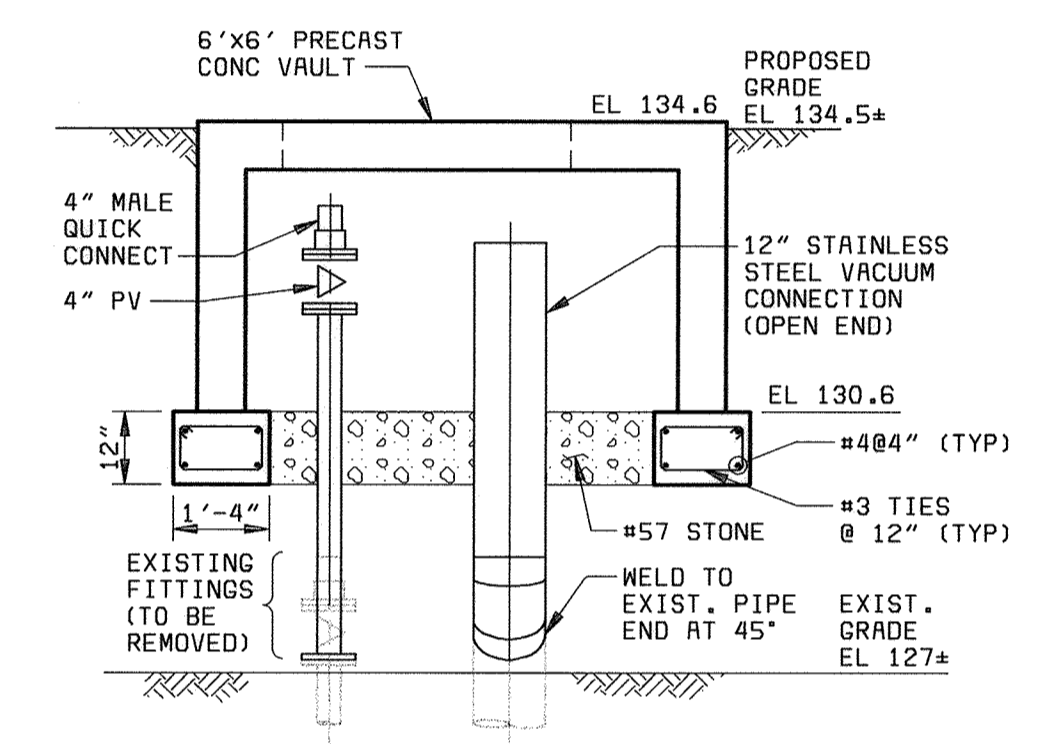
**SUPPORT D**  
NO SCALE

**NOTE:**  
PROVIDE 2 SUPPORTS FOR PUMP DISCHARGE PIPE: 1 AT EL 121.00 AND 1 AT EL 128.50.

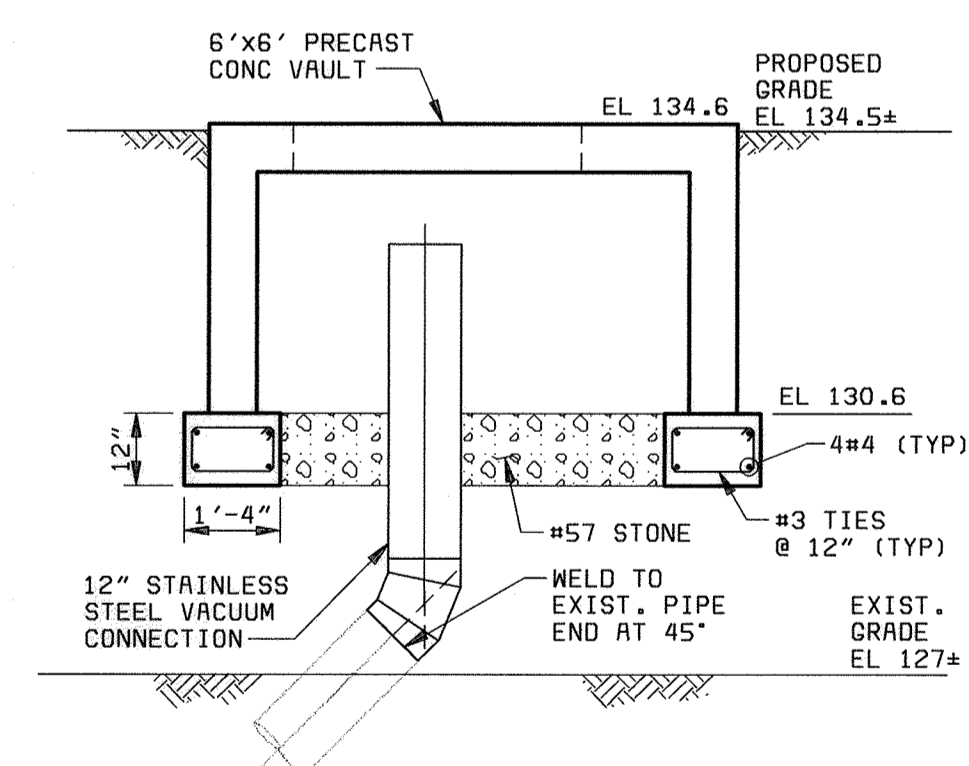


**EXISTING PURAFIX BUILDING**

**PURAFIX BUILDING PIPE ACCESS VAULT**  
3/8" = 1'-0"

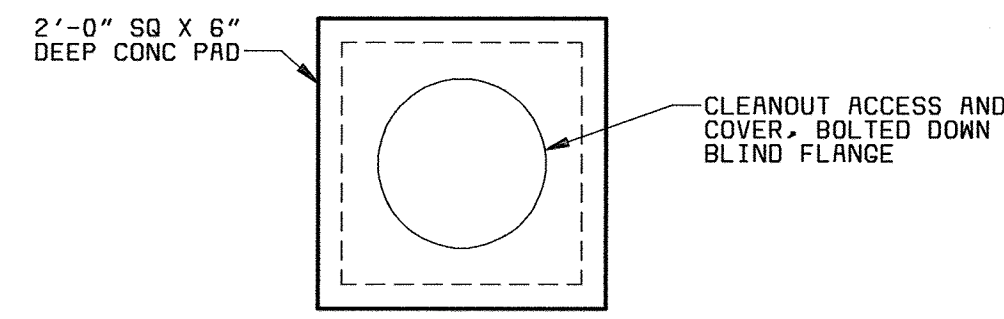


**SECTION 2**  
3/8" = 1'-0"

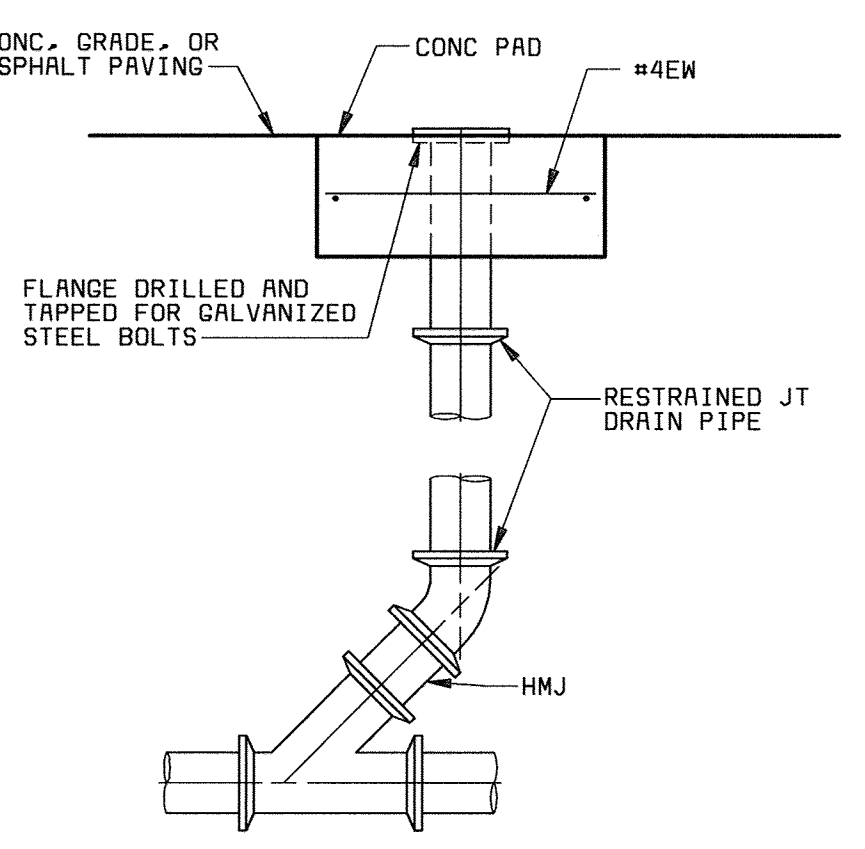


**SECTION 3**  
3/8" = 1'-0"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Rectanus Jr.</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LLP Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: FKA, KMH									<b>YARDWORK CIVIL</b>  <b>MISCELLANEOUS DETAILS</b>	<b>LITTLE PATUXENT WATER RECLAMATION PLANT</b> <b>ADDITION NO. 6</b> <b>BNR TREATMENT CAPACITY EXPANSION</b>  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  <b>HOWARD COUNTY, MARYLAND</b>	SCALE AS SHOWN
			DRN: RLC	CHK: WLK	DATE: 6/23/00									

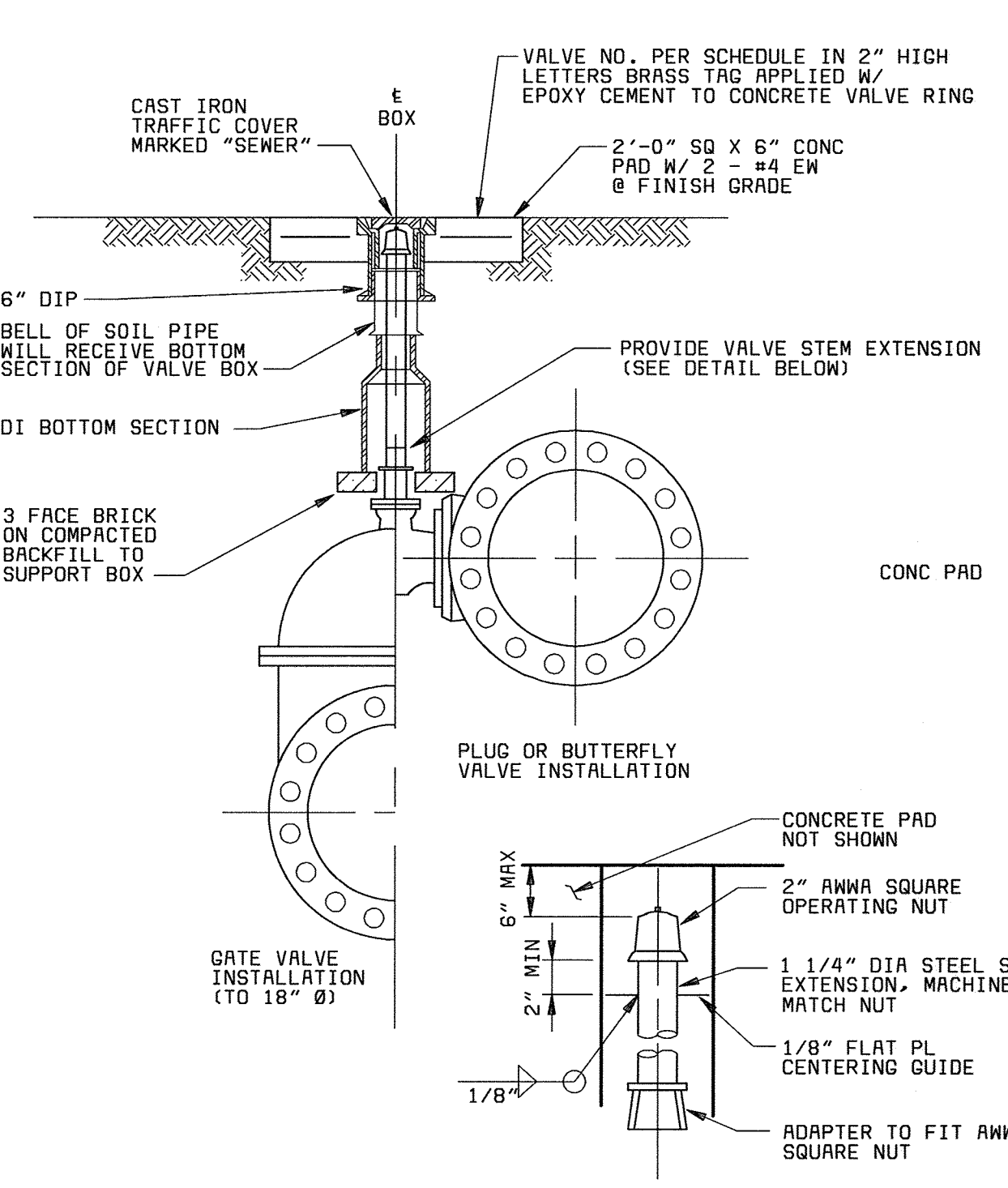


PLAN



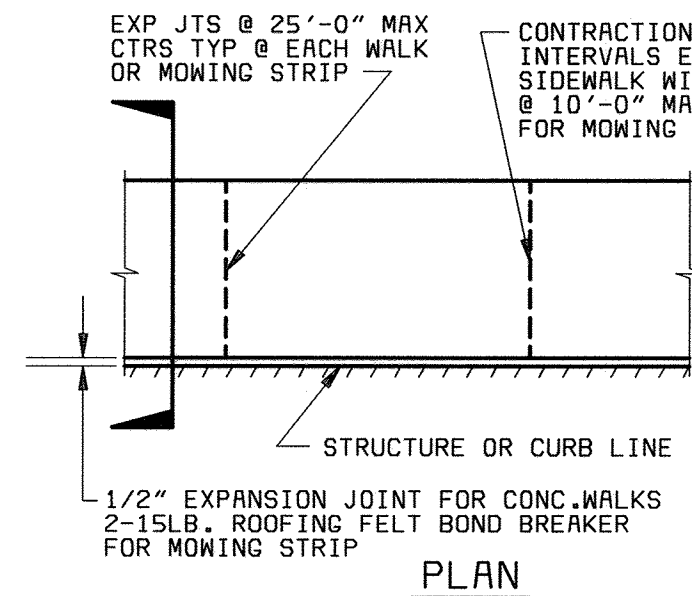
SECTION

CLEANOUT UP TO GRADE DETAIL (A)  
NO SCALE

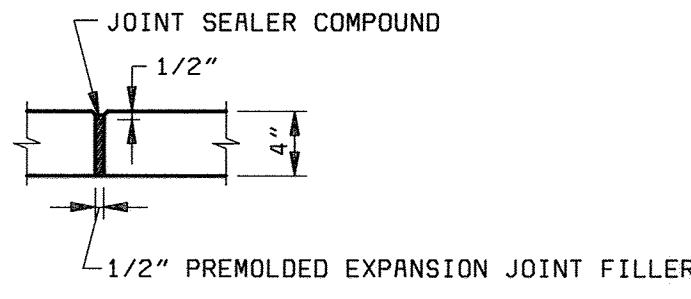


VALVE STEM EXTENSION DETAIL

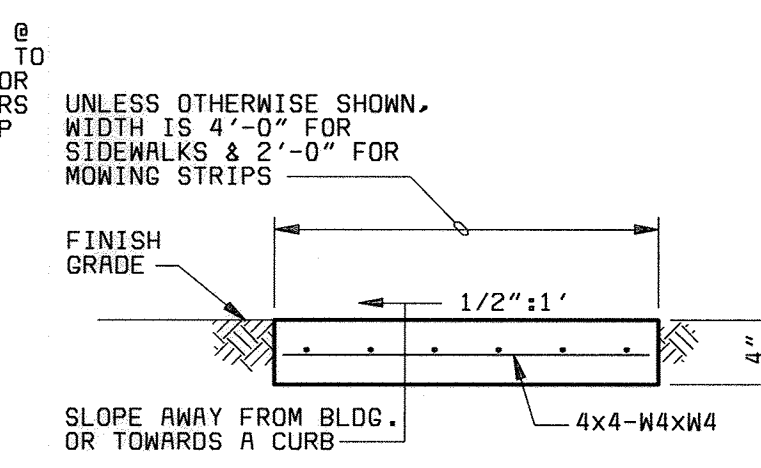
BURIED VALVE INSTALLATION (B)  
NO SCALE



PLAN

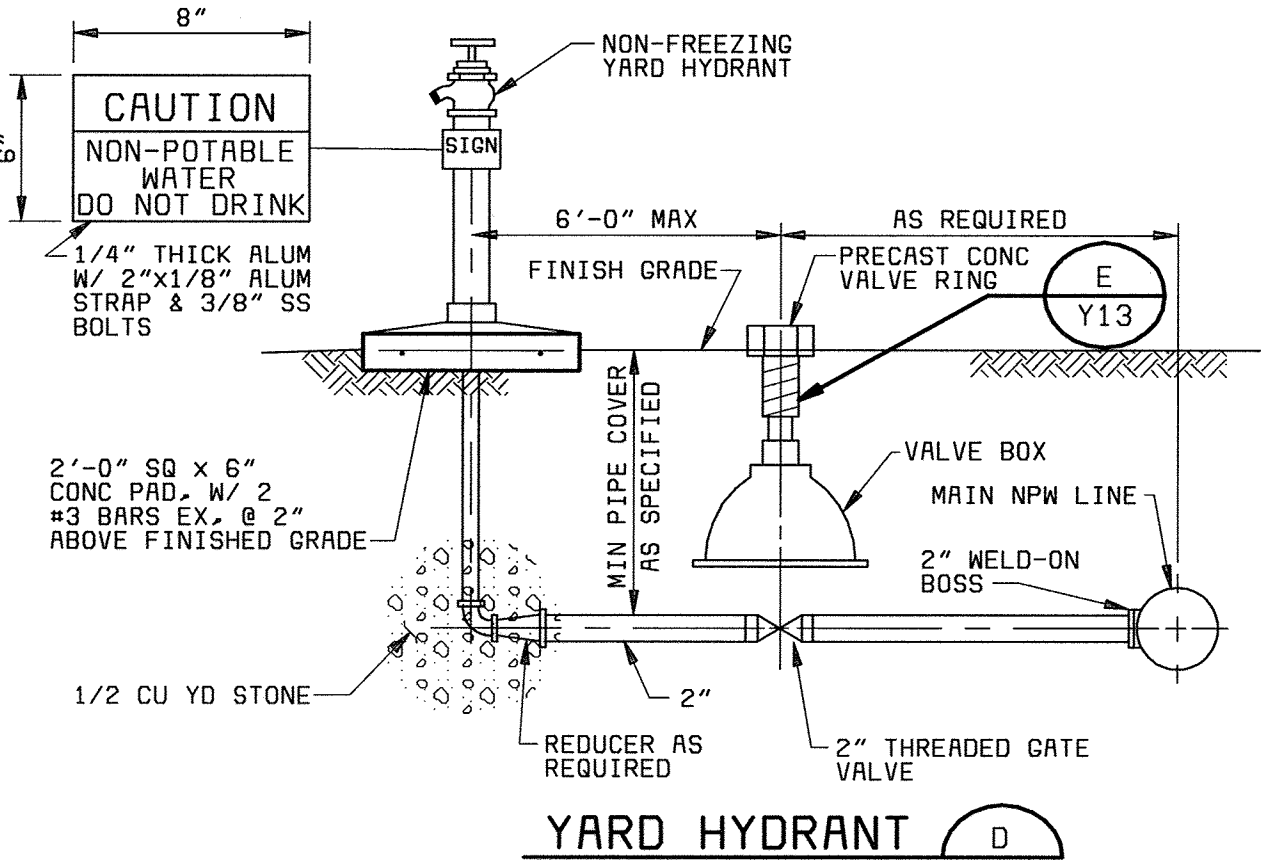


EXPANSION JOINT

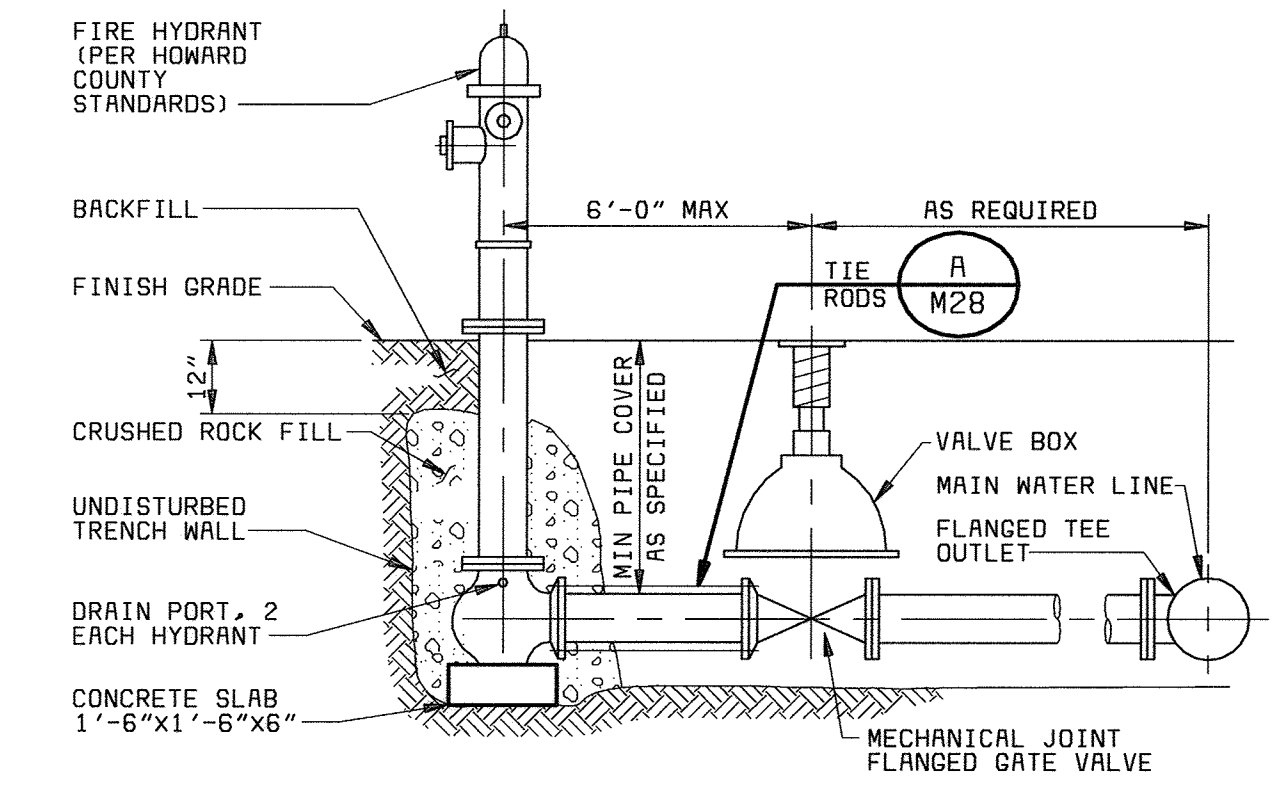


SECTION

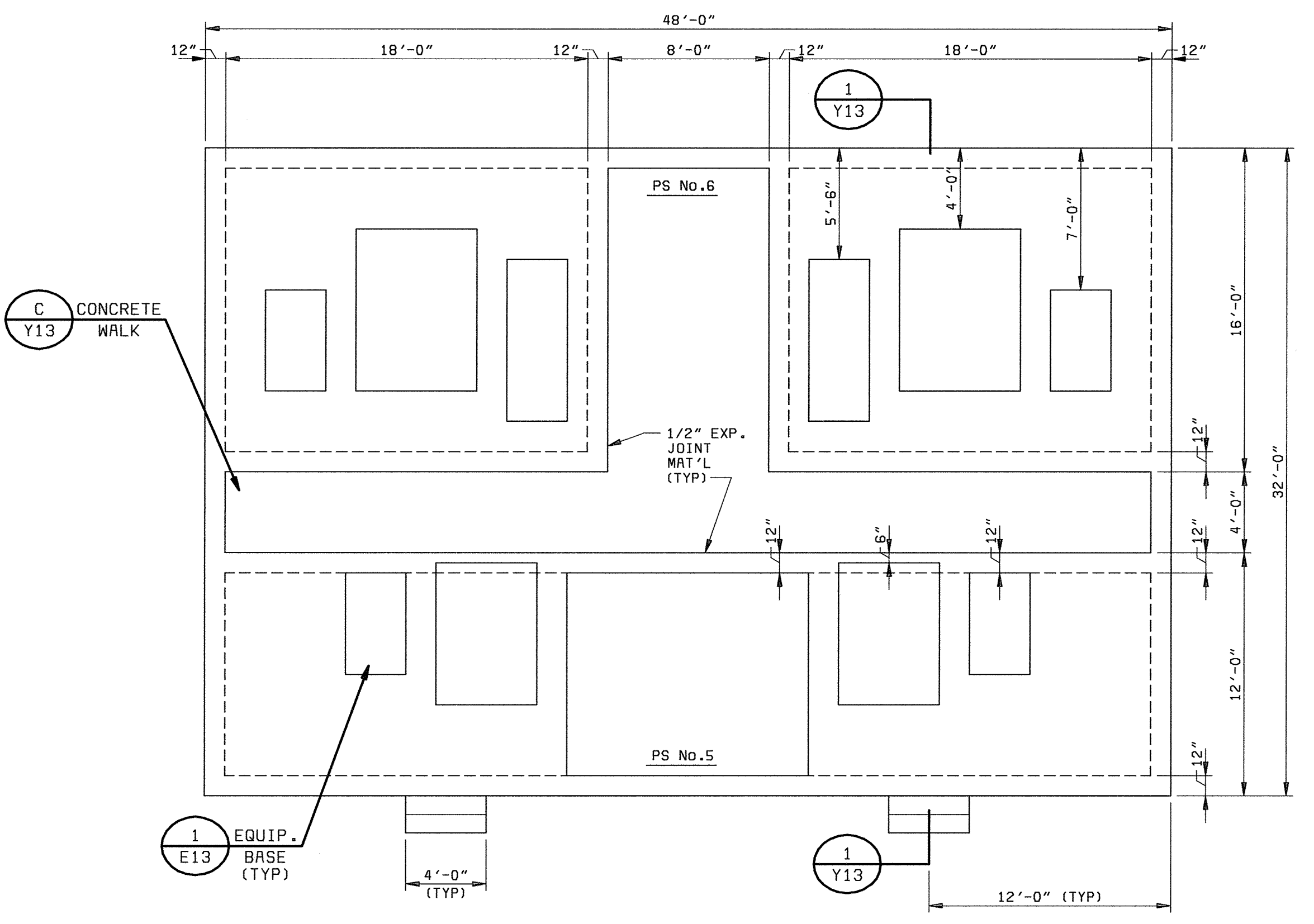
MOWING STRIP AND CONCRETE WALK DETAILS (C)  
NO SCALE



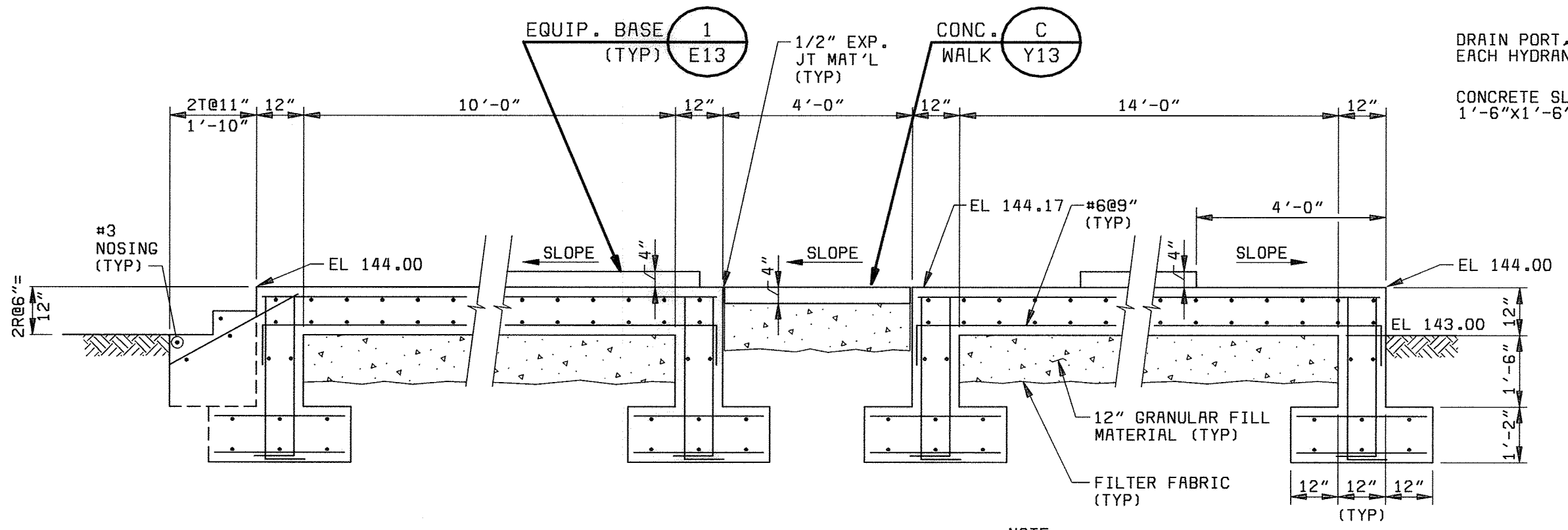
YARD HYDRANT (D)



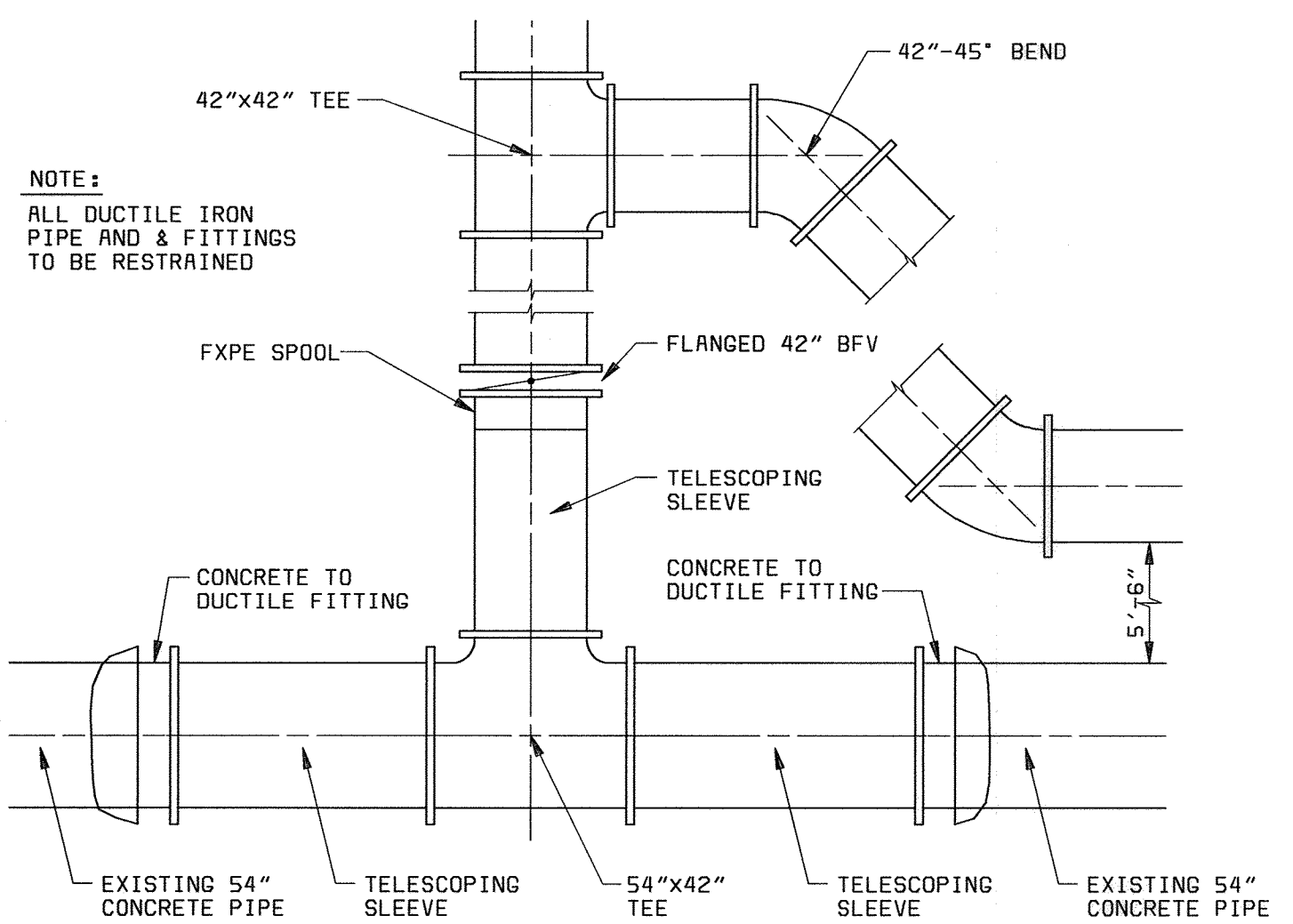
FIRE HYDRANT (E)  
NO SCALE



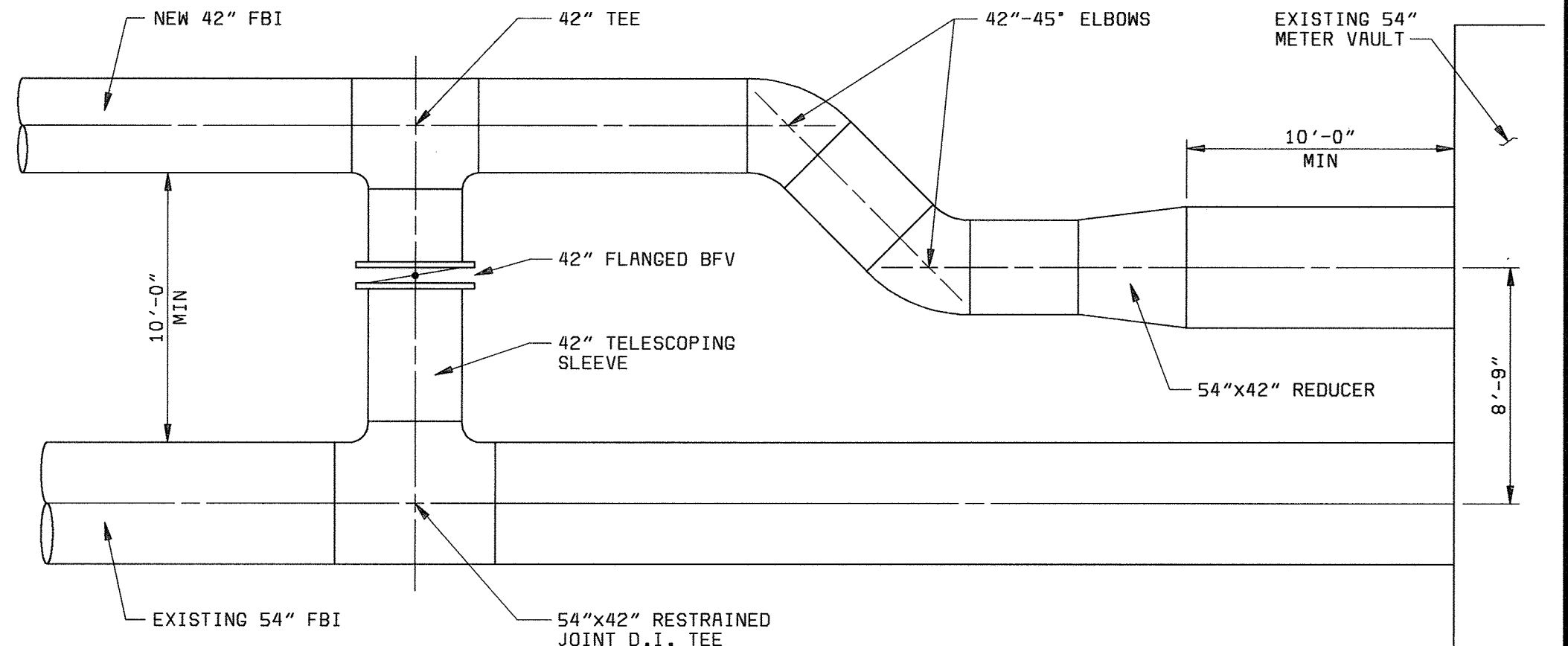
POWER SUBSTATION - No.5 AND No.6 PLAN  
3/16" = 1'-0"



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



DETAIL (F)  
3/16" = 1'-0"



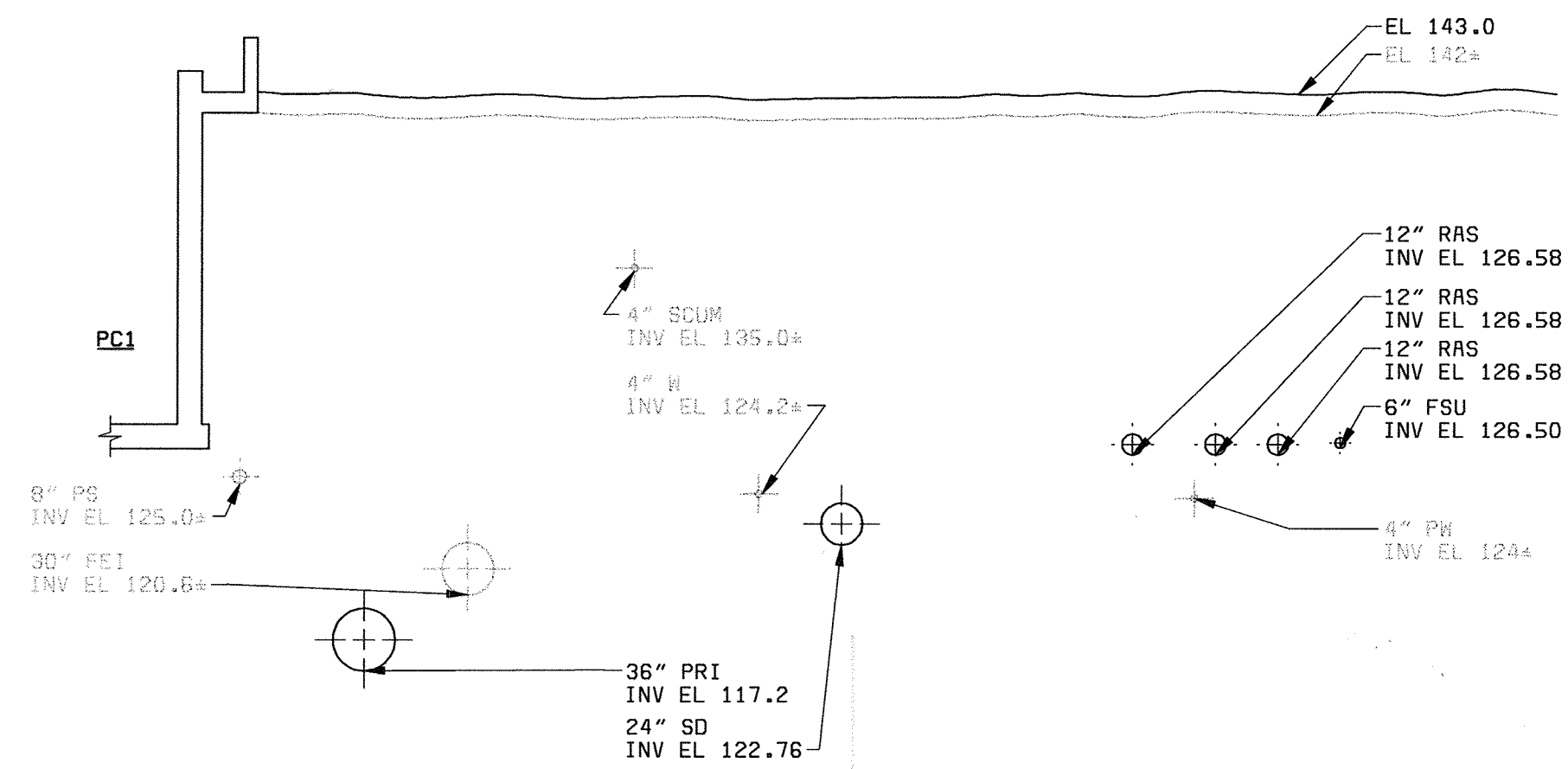
DETAIL (G)  
3/16" = 1'-0"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   <b>ROBERT J. RECTANUS JR.</b> No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: FKA DRN: RLC CHK: WLK DATE: 6/23/00	YARDWORK CIVIL  MISCELLANEOUS DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 32 OF 161  <b>Y13</b>
	REG. PROF. ENGR. DATE	REVISIONS AND RECORD OF ISSUE NO. BY CK APP		

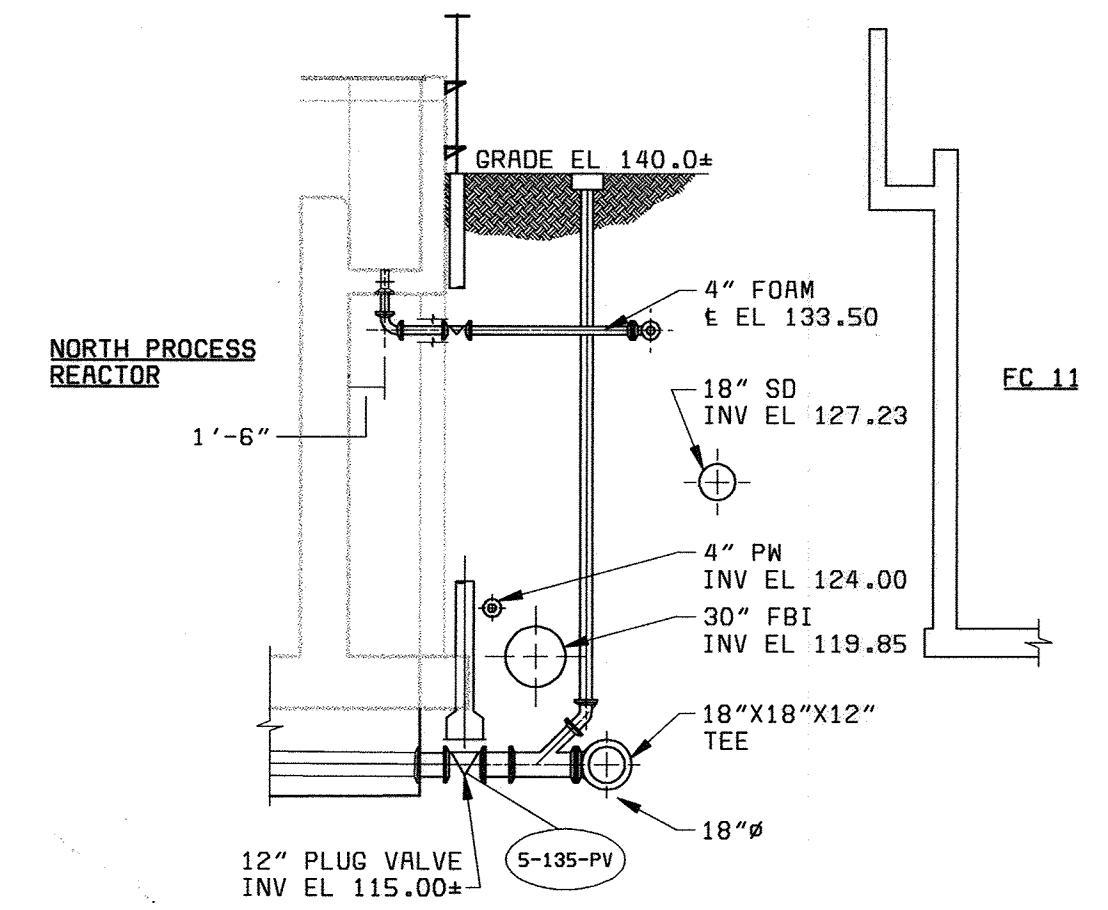


A  
B  
C  
D  
E  
F

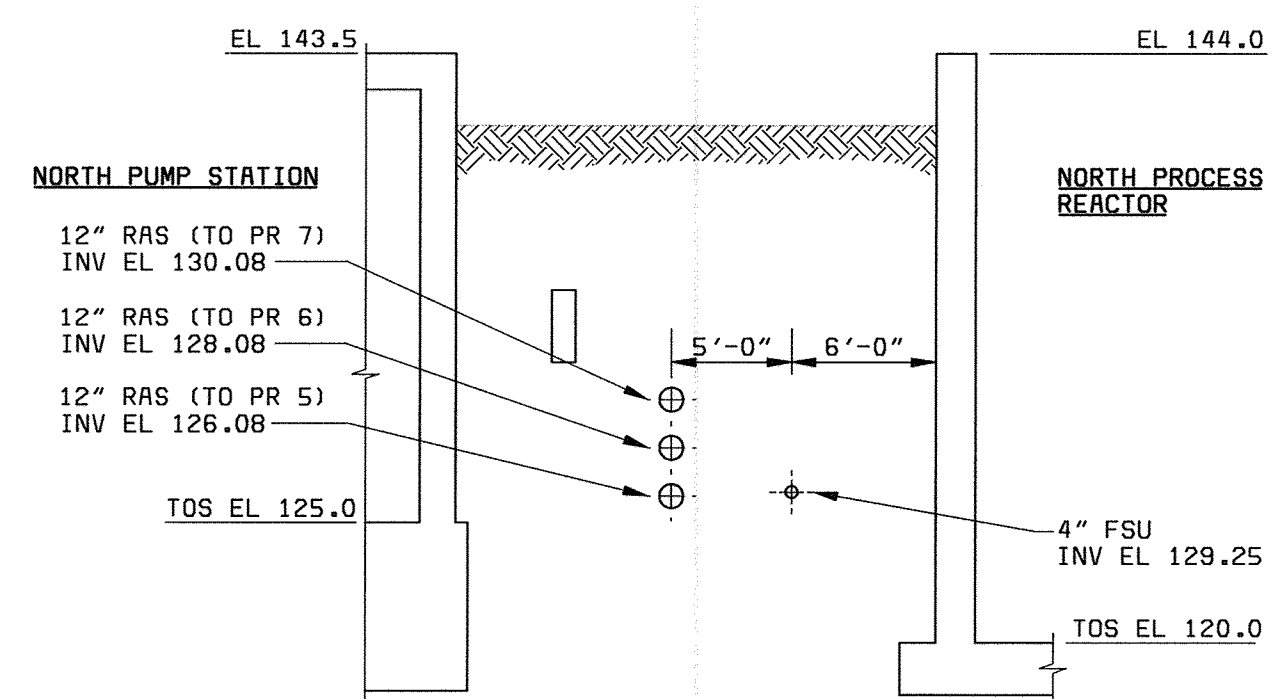
A  
B  
C  
D  
E  
F



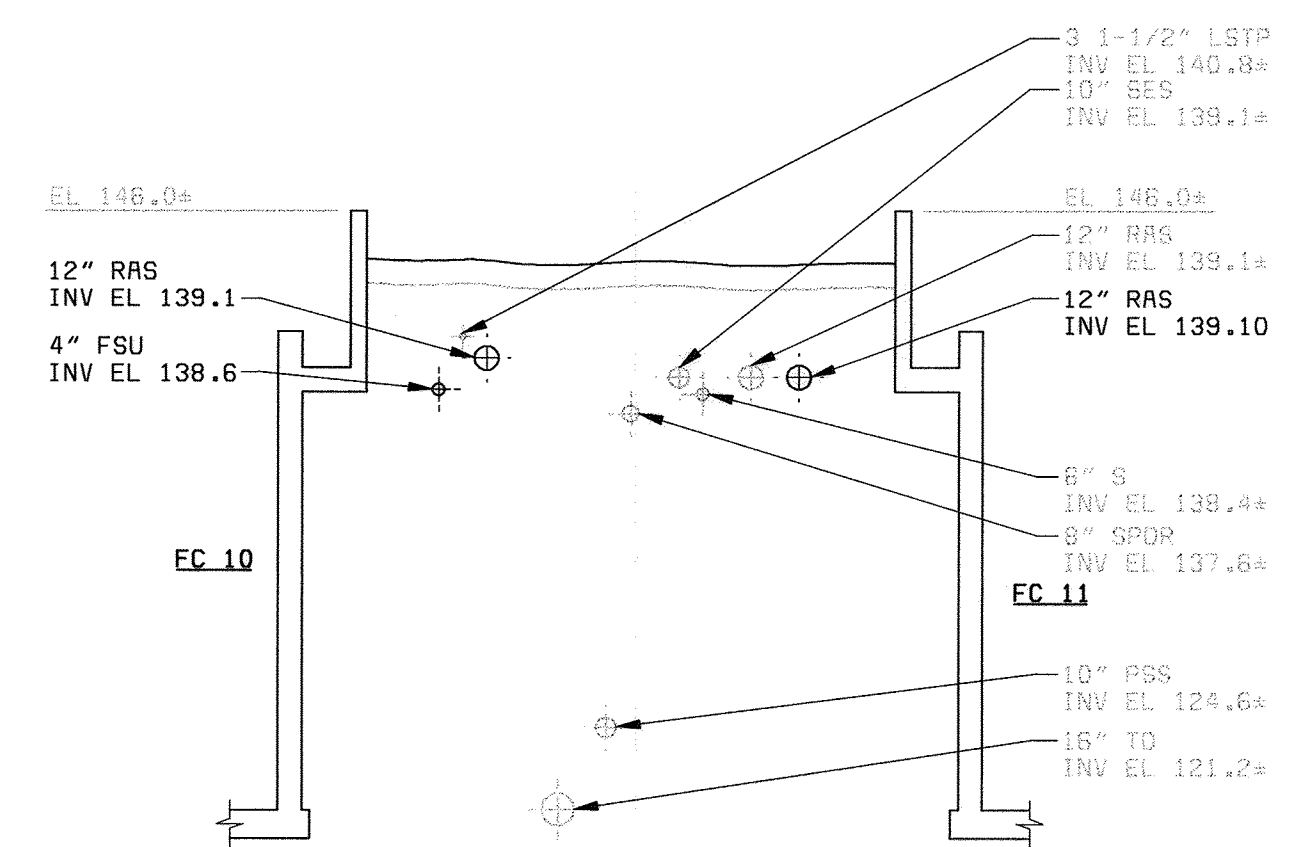
SECTION 1  
1/8" = 1'-0" Y14



SECTION 3  
1/8" = 1'-0" Y14



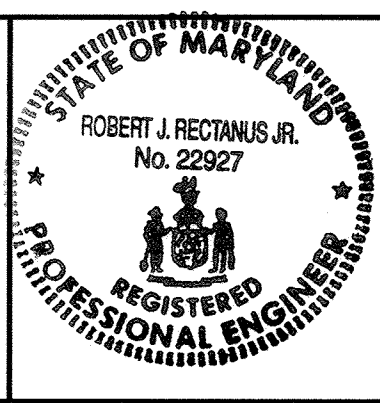
SECTION 2  
1/8" = 1'-0" Y14



SECTION 4  
1/8" = 1'-0" Y14

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
*Robert J. Rectanus Jr.* 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE

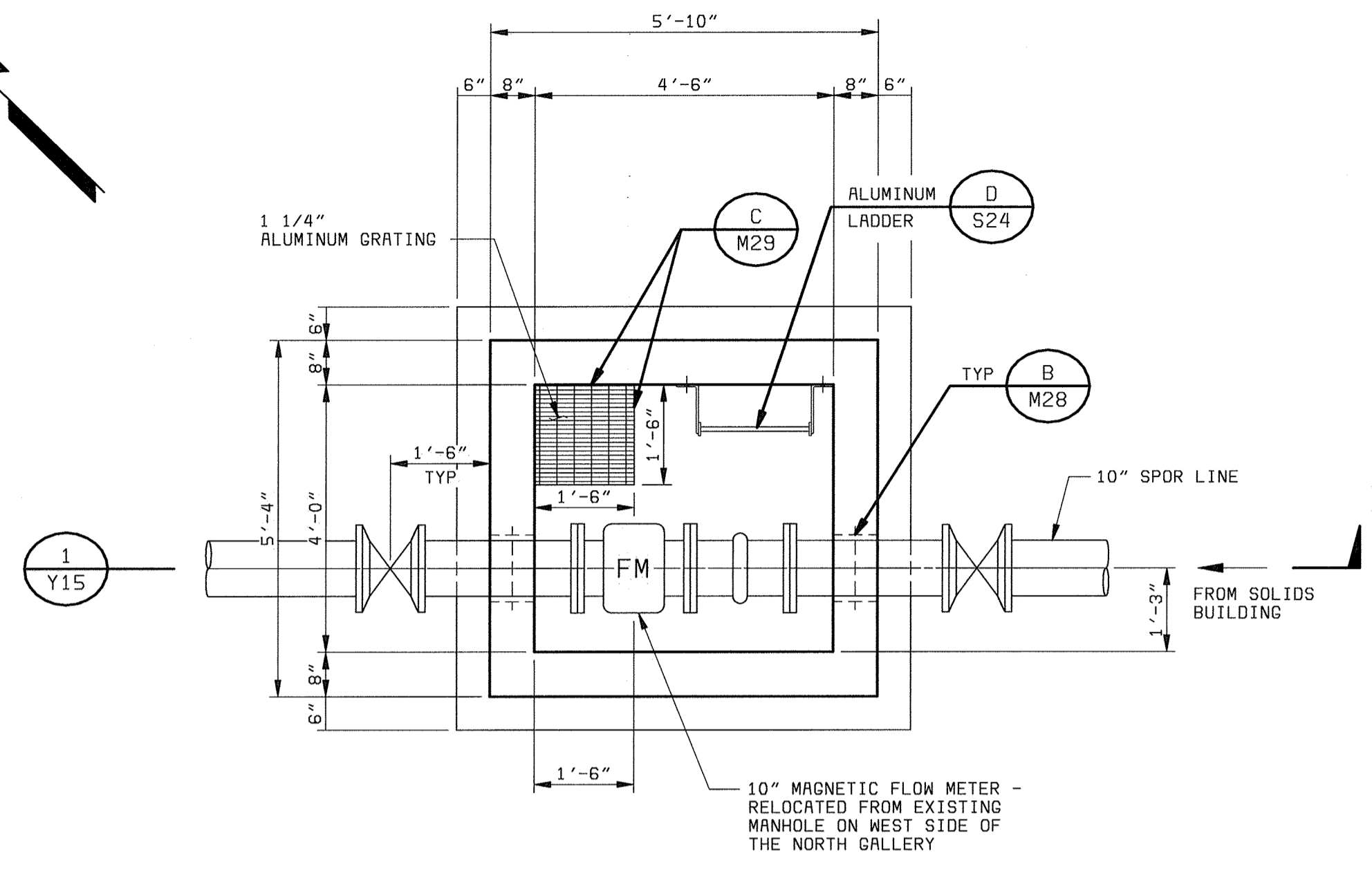


DES: BCK									
DRN: WHS.VVR									
CHK: WLK									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**YARDWORK**  
**CIVIL**  
**MISCELLANEOUS DETAILS**

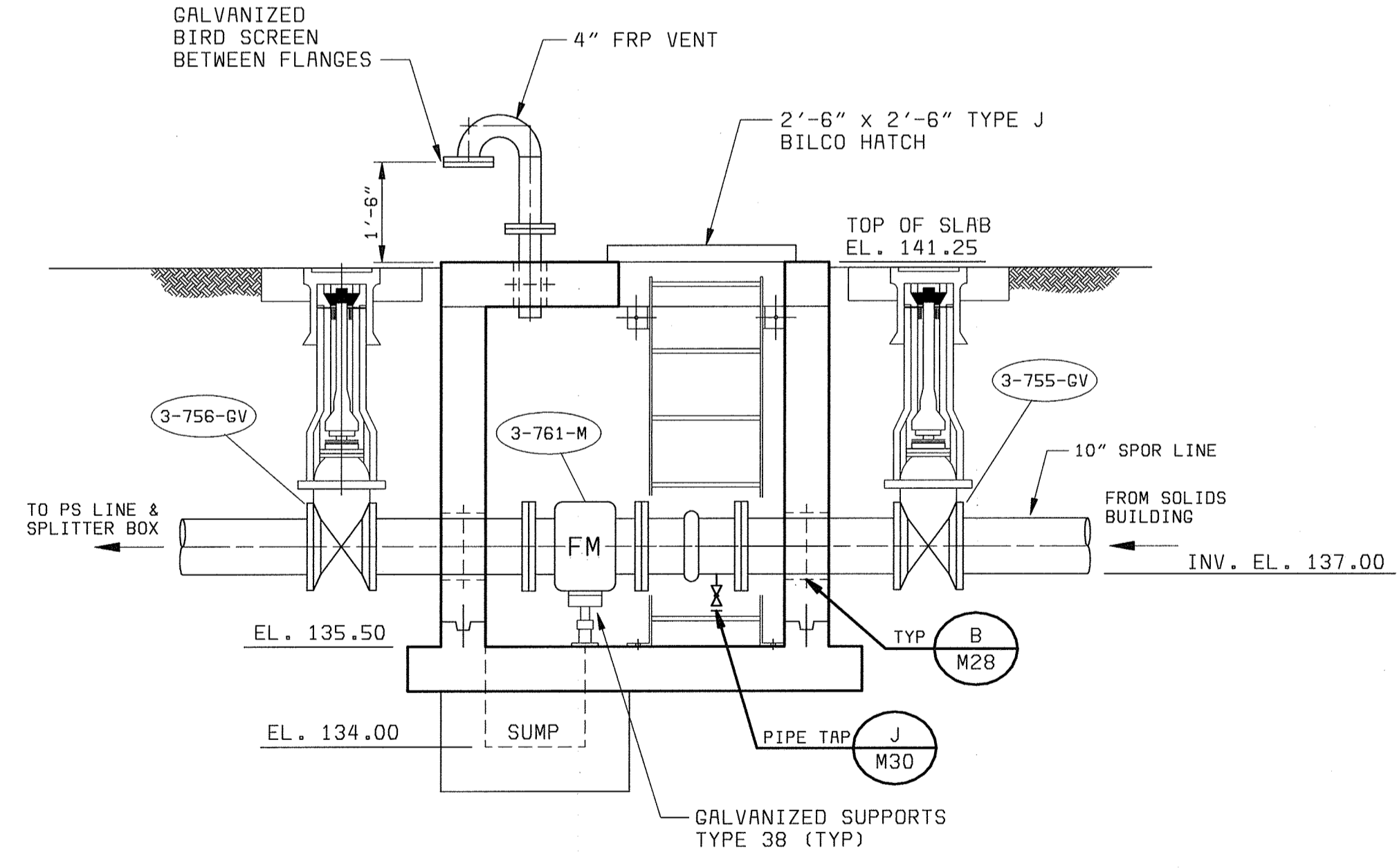
**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
**HOWARD COUNTY, MARYLAND**

SCALE AS SHOWN  
 SHEET 33 OF 161  
**Y14**



**PLAN**  
1/2" = 1'-0"  
**SPOR METER VAULT**

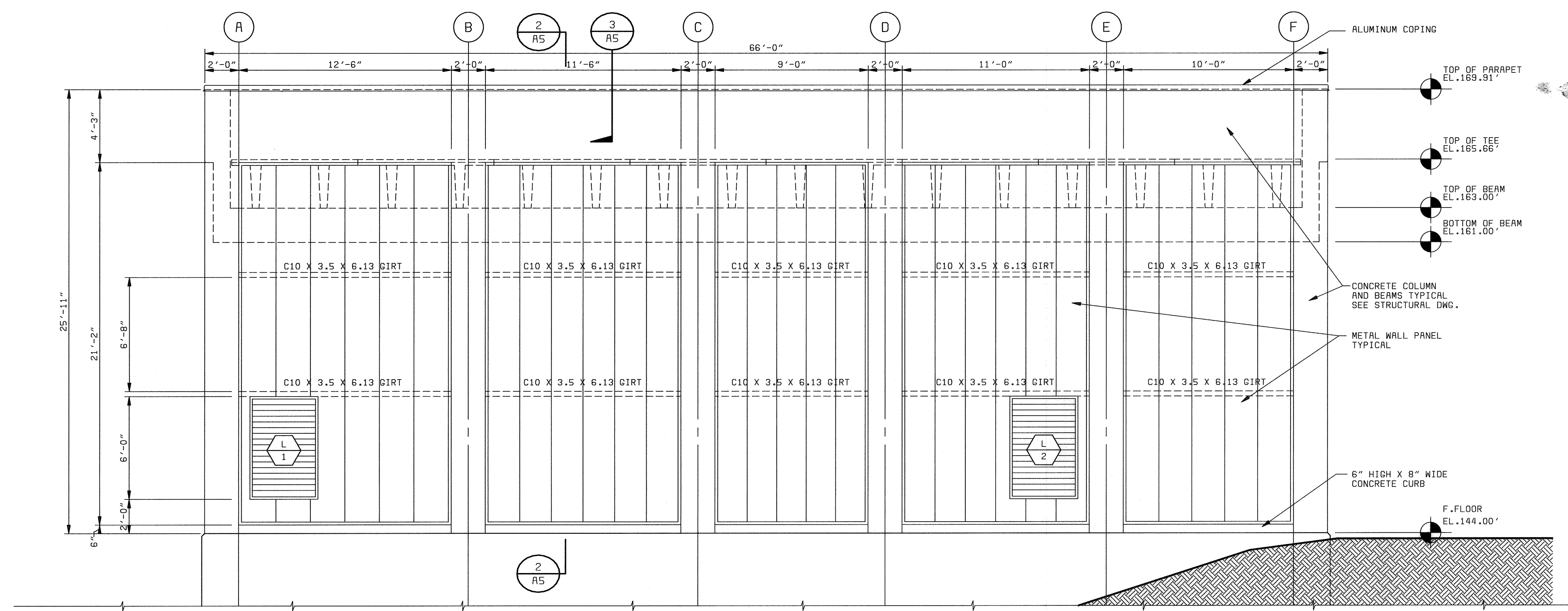
**NOTE:**  
-ALL WALLS & ROOF 8" THICK C/W #5 @12" EW/EF.  
-BASE SLAB 12" THICK #5 @12" EW/EF.  
-PROVIDE DOWELS FROM BASE SLAB TO MATCH VERTICAL REBAR IN WALL.



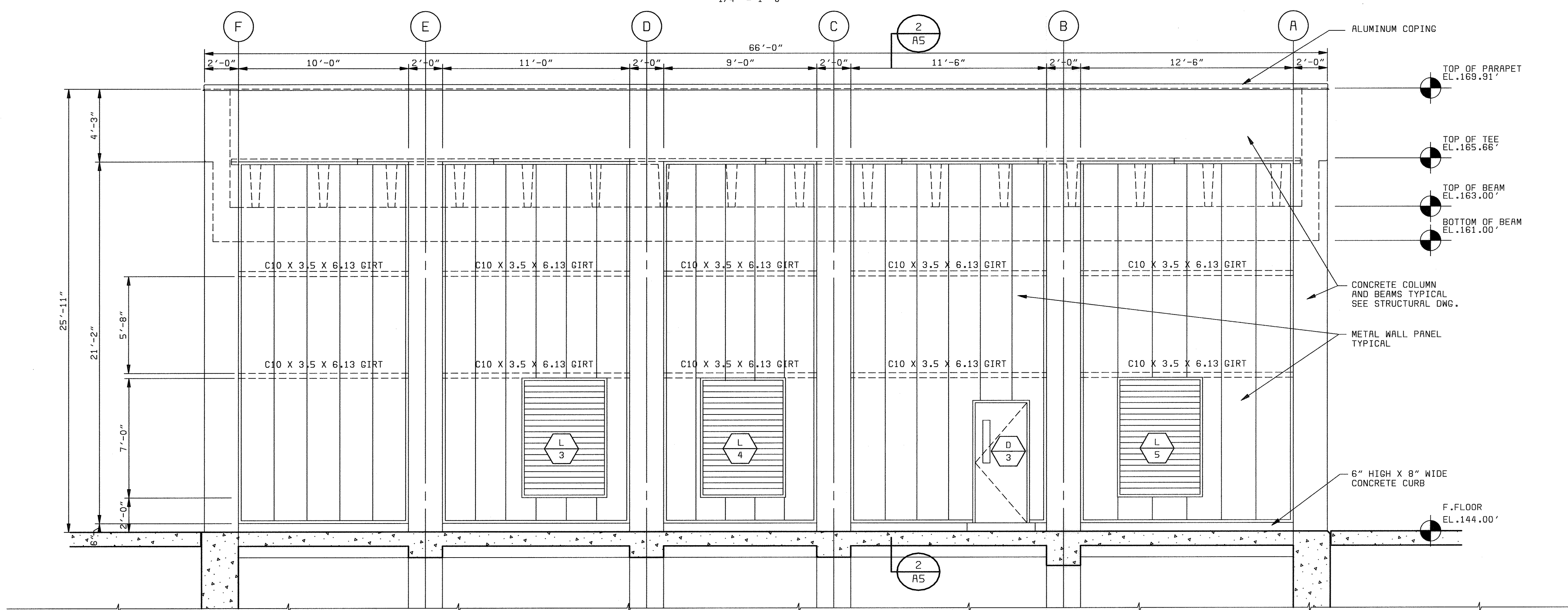
**SECTION 1**  
1/2" = 1'-0"  
Y15

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com	<b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland REG. PROF. ENGR.	DES: RVJ DRN: RCF CHK: RVJ DATE: 6/23/00	YARDWORK STRUCTURAL/MECHANICAL  MISCELLANEOUS YARDWORK DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 34 OF 161  Y15
		CHIEF, BUREAU OF UTILITIES DATE	DATE	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP

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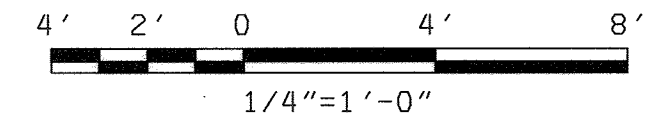


WEST ELEVATION  
1/4" = 1'-0"



EAST ELEVATION  
1/4" = 1'-0"

- GENERAL NOTES:**
1. FOR CONCRETE CONFIGURATION SEE STRUCTURAL DRAWINGS.
  2. FOR STAIR TYPICAL DETAILS SEE STRUCTURAL DRAWINGS.
  3. FOR TYPICAL METAL WALL PANEL DETAILS AND ACOUSTICAL TREATMENT PANELS SEE A6.
  4. FOR FINISH, DOOR AND WINDOW SCHEDULES SEE A7.
  5. ALL GIRTS ARE ALUMINUM.



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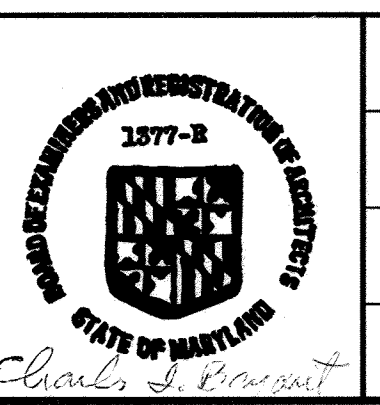
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert S. Sawyer* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**bbw** Architects • Designers • Planners  
Bryant Bryant Williams, P.C.  
4201 Connecticut Avenue N.W., Suite 500  
Washington, D.C. 20008 (202) 244-2100

**BLACK & VEATCH**  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



DES: CH/JS	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: JS						
CHK: CH						

**NORTH BLOWER BUILDING**  
ARCHITECTURAL

**WEST AND EAST ELEVATIONS**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

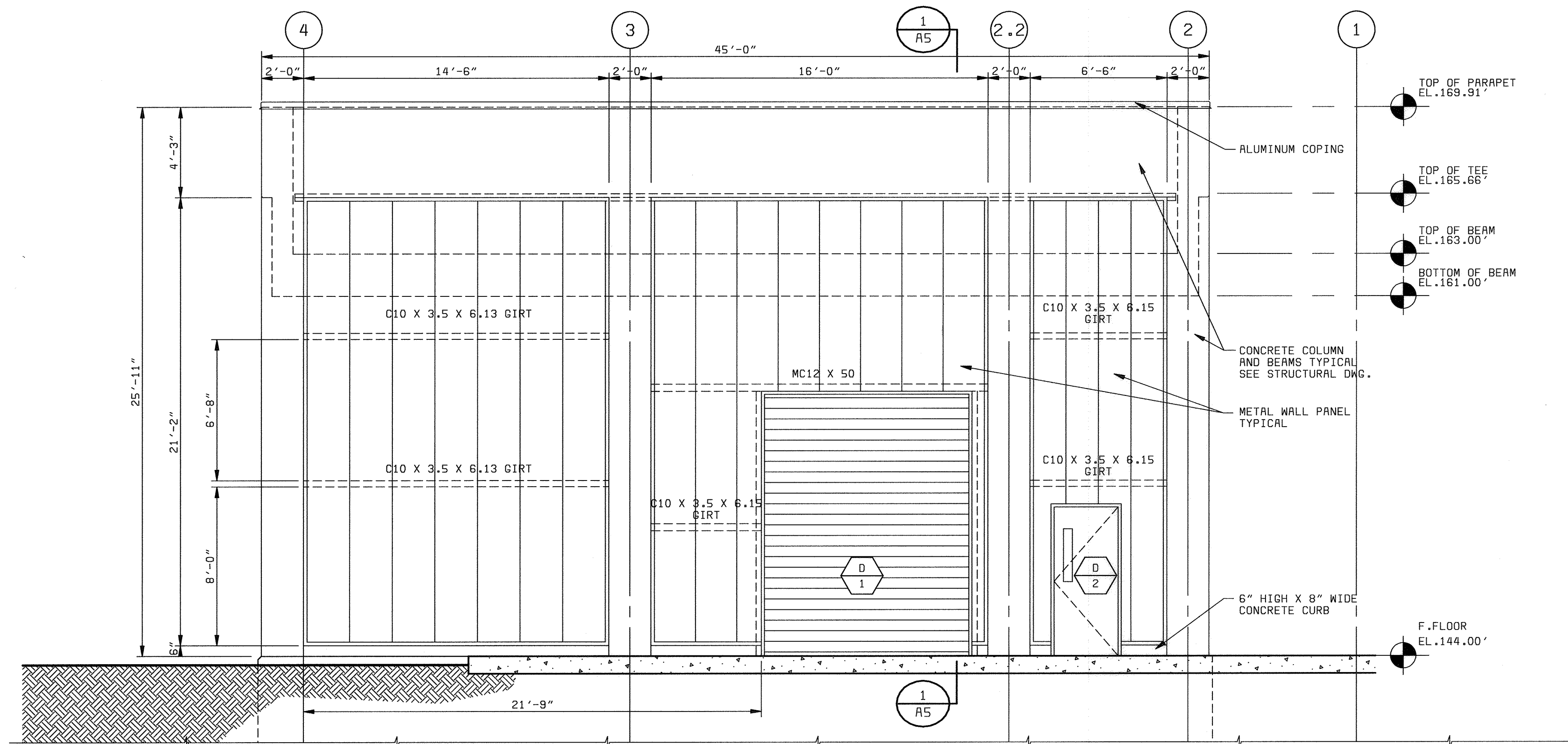
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

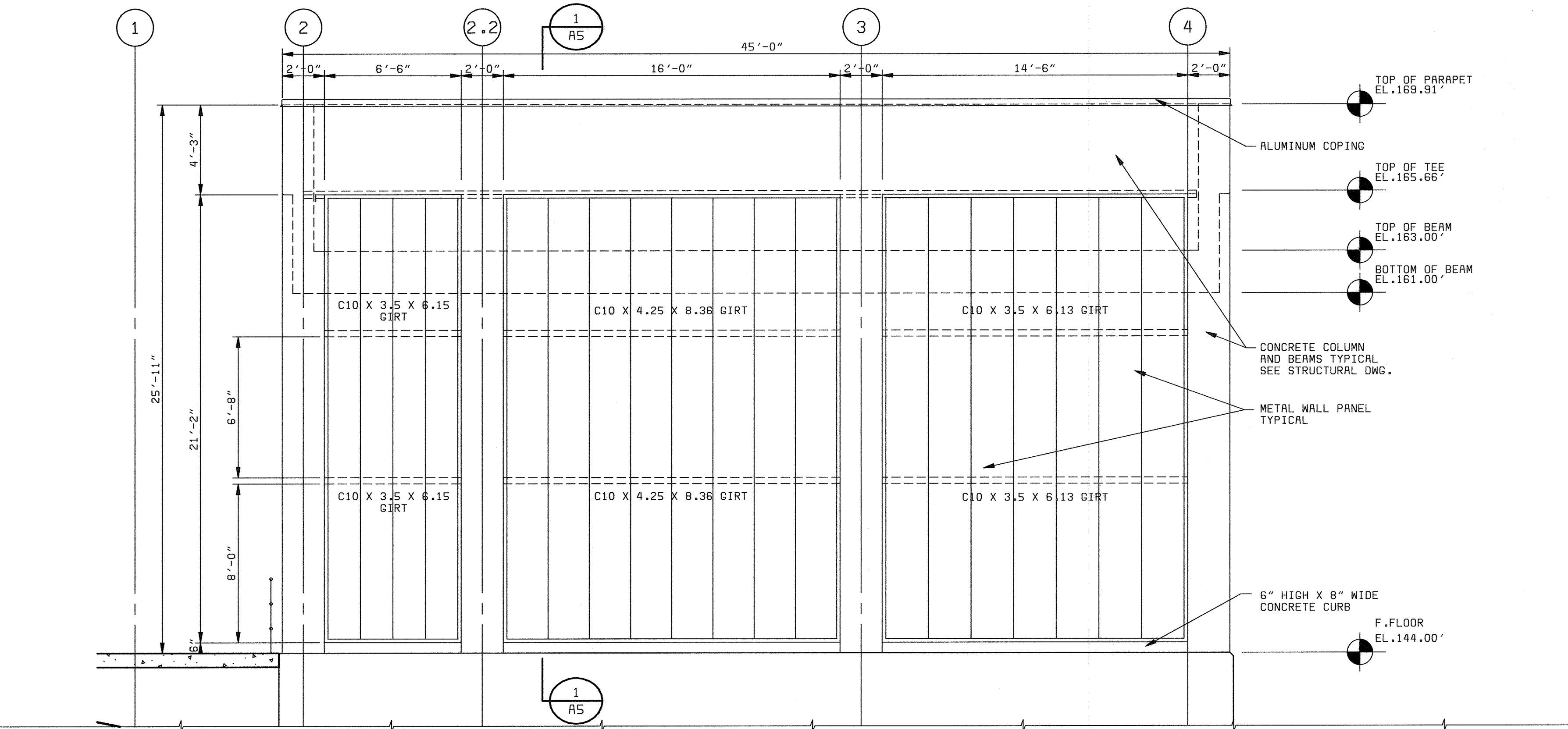
SCALE AS SHOWN

SHEET 35 OF 161

**A1**



**SOUTH ELEVATION**  
1/4" = 1'-0"



**NORTH ELEVATION**  
1/4" = 1'-0"

**GENERAL NOTES:**

1. FOR CONCRETE CONFIGURATION SEE STRUCTURAL DRAWINGS.
2. FOR STAIR TYPICAL DETAILS SEE STRUCTURAL DRAWINGS.
3. FOR TYPICAL METAL WALL PANEL DETAILS AND ACOUSTICAL TREATMENT PANELS SEE A6.
4. FOR FINISH, DOOR AND WINDOW SCHEDULES SEE A7.
5. ALL GIRTS ARE ALUMINUM.

4' 2' 0 4' 8'  
1/4"=1'-0"

X:\M\DCO\K\B\B\B100\DESIGN\PSB\B\A\Z\A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. Brown* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**bbw** Architects • Designers • Planners  
Bryant Bryant Williams, P.C.  
4200 Connecticut Avenue N.W., Suite 500  
Washington, D.C. 20008 (202) 344-2108

**BLACK & VEATCH**  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

1977-R  
STATE OF MARYLAND

*Charles S. Bryant*

DES: CH/JS					
DRN: JS					
CHK: CH					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH BLOWER BUILDING**  
ARCHITECTURAL

**SOUTH AND NORTH ELEVATIONS**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

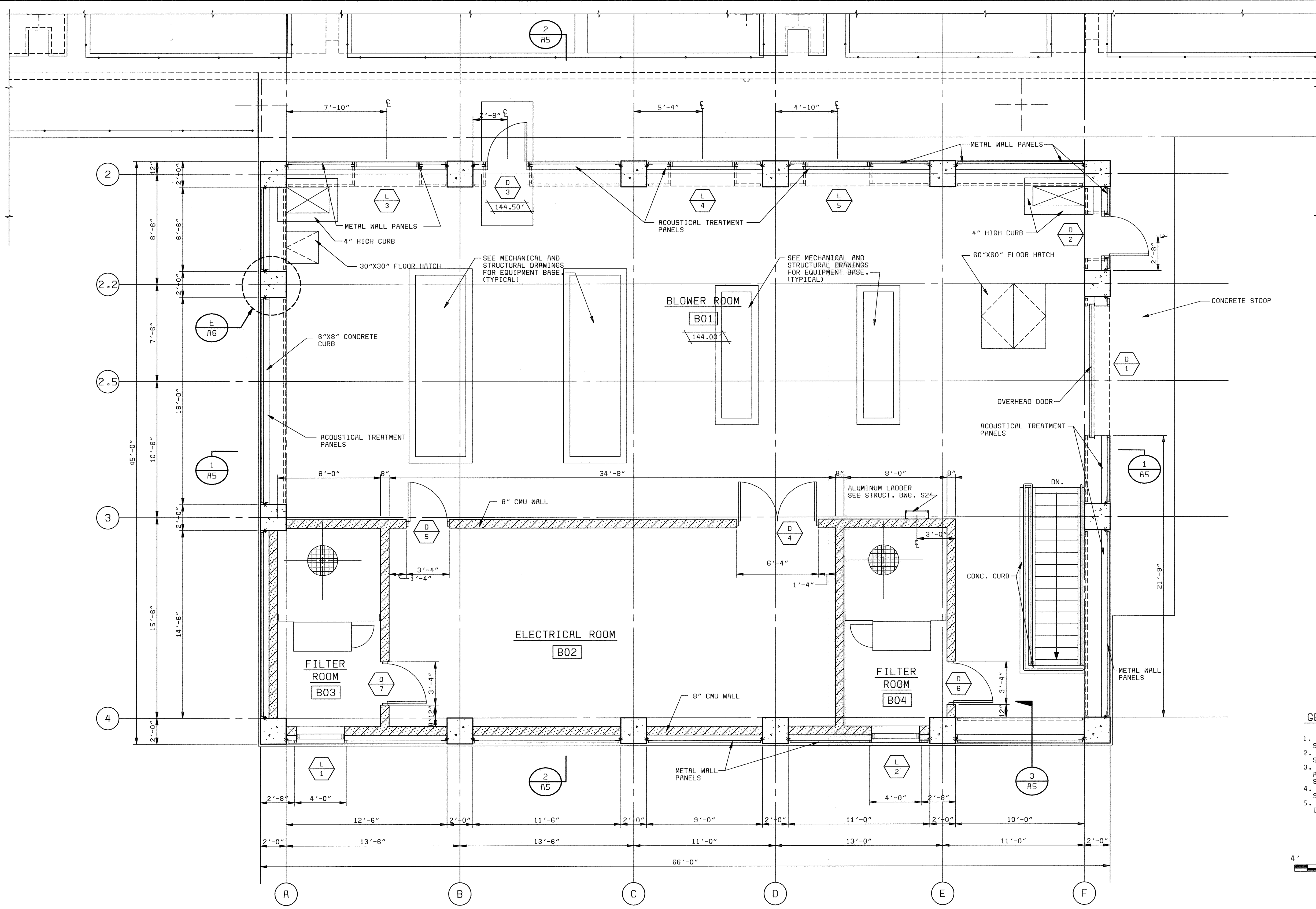
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

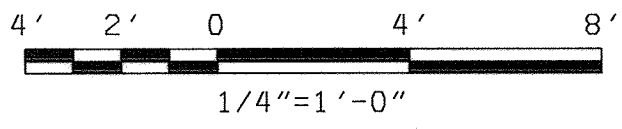
SCALE AS SHOWN

SHEET 36 OF 161

**A2**



- GENERAL NOTES:**
1. FOR CONCRETE CONFIGURATION SEE STRUCTURAL DRAWINGS.
  2. FOR STAIR TYPICAL DETAILS SEE STRUCTURAL DRAWINGS.
  3. FOR TYPICAL METAL WALL PANEL DETAILS AND ACOUSTICAL TREATMENT PANELS SEE A6.
  4. FOR FINISH, DOOR AND WINDOW SCHEDULES SEE A7.
  5. REFER TO H DRAWINGS FOR ADDITIONAL INFORMATION NOT SHOWN.



**OPERATING FLOOR PLAN**  
1/4" = 1'-0"

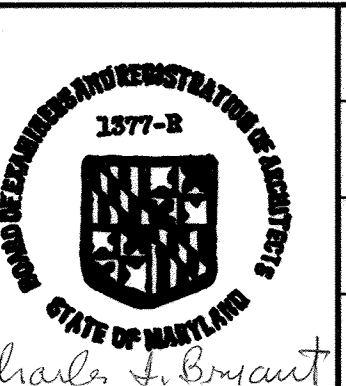
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Brown* 6-29-02  
CHIEF, BUREAU OF UTILITIES DATE

**bbw** Architects • Designers • Planners  
Bryant Bryant Williams, P.C.  
4001 Connecticut Avenue N.W., Suite 500  
Washington, D.C. 20008 (202) 244-1188

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



DES: CH/JS									
DRN: JS									
CHK: CH									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**NORTH BLOWER BUILDING**  
ARCHITECTURAL

**OPERATING FLOOR PLAN**  
ELEVATION 144.00'

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

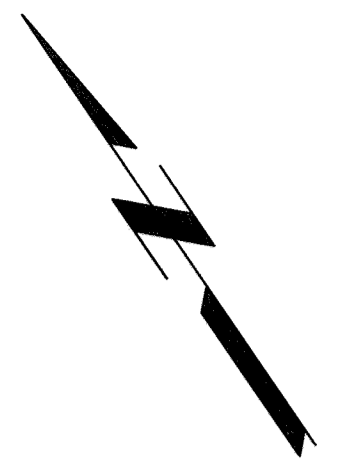
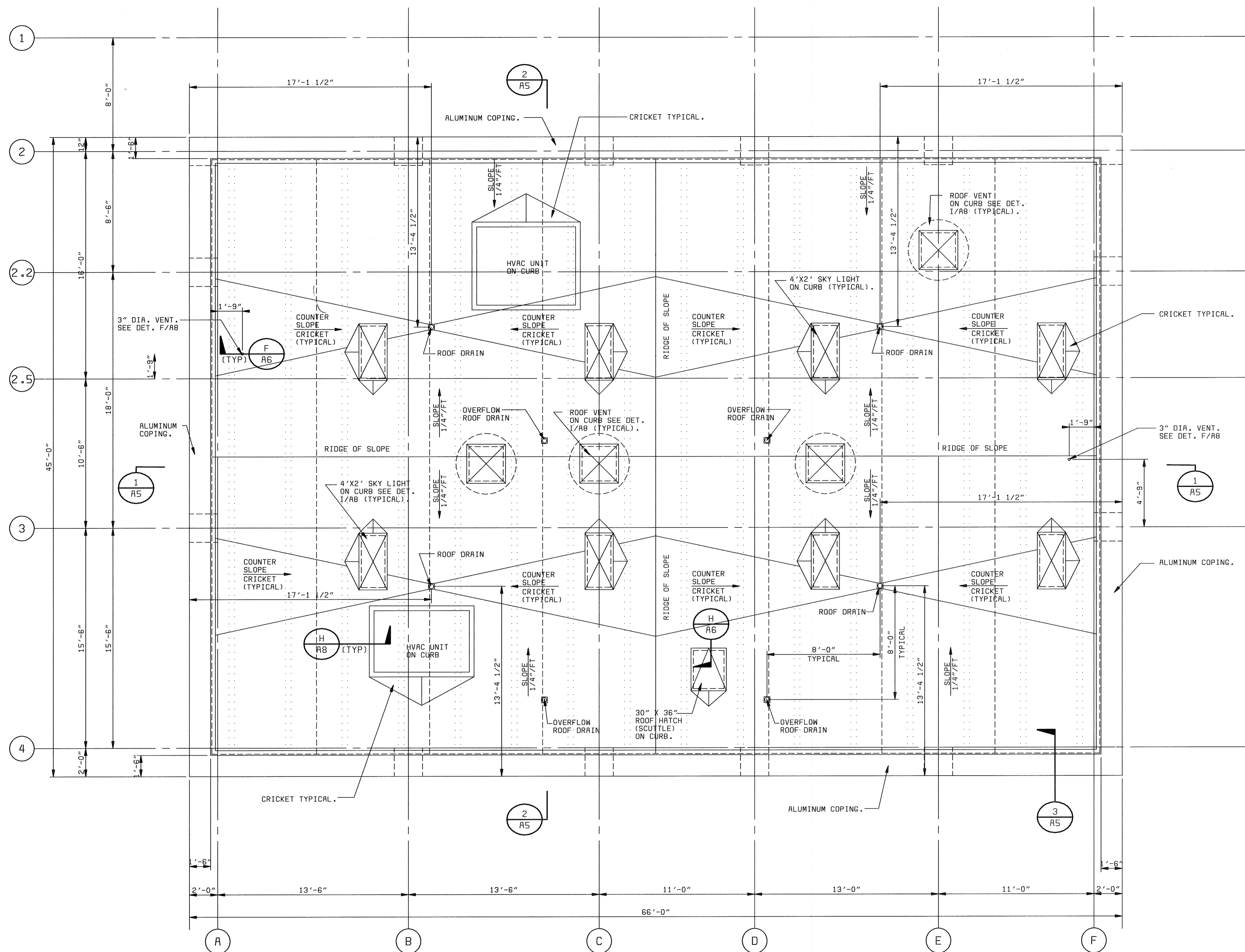
SCALE AS SHOWN

SHEET 37 OF 161

**A3**

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**GENERAL NOTES:**

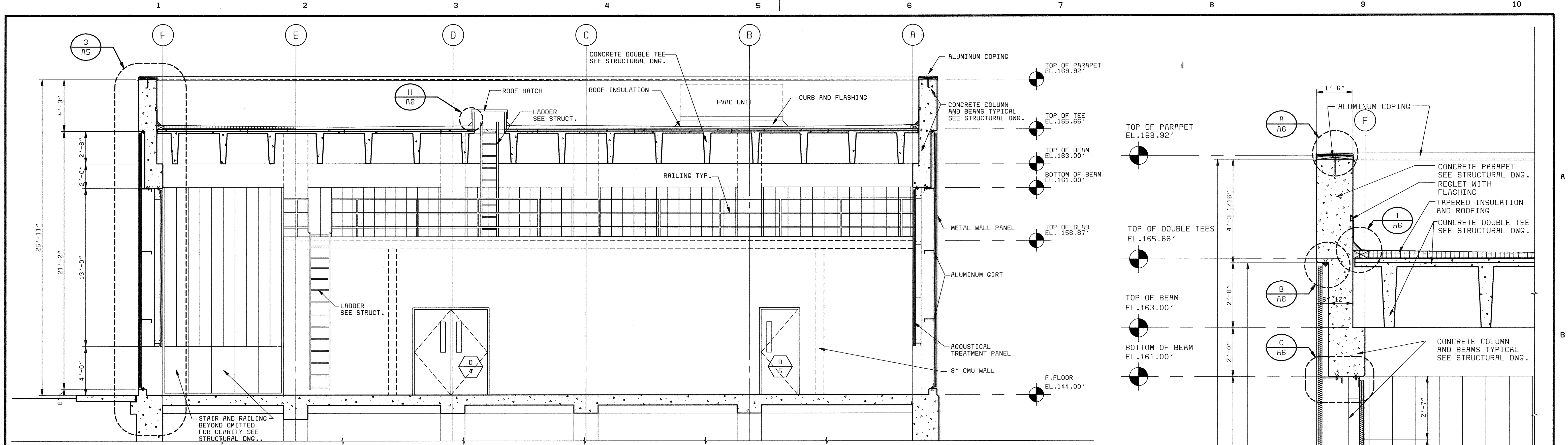
1. FOR CONCRETE CONFIGURATION SEE STRUCTURAL DRAWINGS.
2. FOR STAIR TYPICAL DETAILS SEE STRUCTURAL DRAWINGS.
3. FOR TYPICAL METAL WALL PANEL DETAILS AND ACOUSTICAL TREATMENT PANELS SEE A6.
4. FOR FINISH, DOOR AND WINDOW SCHEDULES SEE A7.
5. SEE MECHANICAL DRAWINGS FOR SIZE AND STRUCTURAL DRAWINGS FOR LOCATION OF MECHANICAL EQUIPMENT TO BE MOUNTED ON CURBS SHOWN HERE.
6. SEE HVAC AND PLUMBING DRAWINGS FOR ADDITIONAL PENETRATIONS.
7. SEE PLUMBING DRAWINGS ROOF DRAIN INSTALLATION.

4' 2' 0 4' 8'  
1/4" = 1'-0"

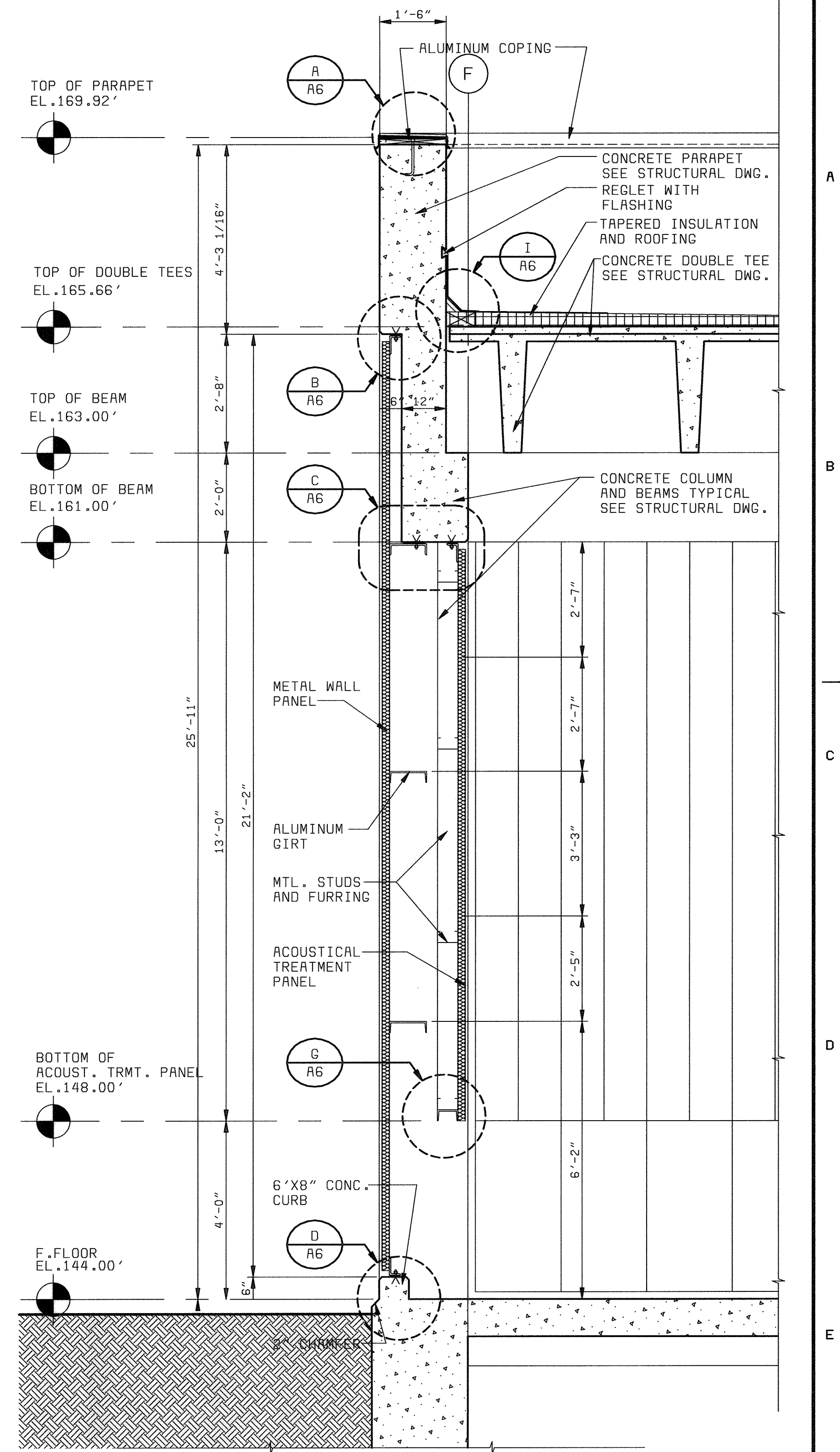
**ROOF PLAN**  
1/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <b>bbw</b> Architects • Designers • Planners Bryant Bryant Williams, P.C. 4011 Connecticut Avenue N.W., Suite 500 Washington, D.C. 20008 (202) 244-2100  <i>Ruth Benay</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LP Gaithersburg, Maryland  REG. PROF. ENGR. _____ DATE _____	 STATE OF MARYLAND CHARLES J. BRYANT	DES: CH/JS	NORTH BLOWER BUILDING ARCHITECTURAL  ROOF PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: JS			NO. BY CK APP
			CHK: CH			A4
			DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	

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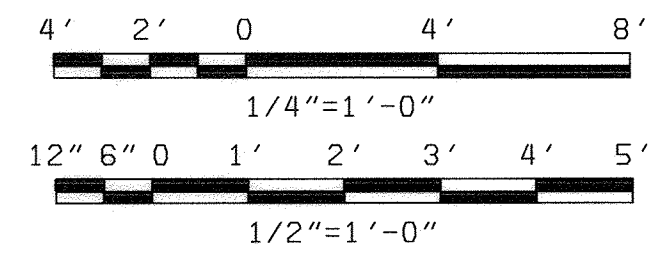
SECTION 1  
1/4" = 1'-0" A1, A2, A3 and A4



SECTION 3  
1/2" = 1'-0" A1, A2, A3 and A4

GENERAL NOTES:

1. FOR CONCRETE CONFIGURATION SEE STRUCTURAL DRAWINGS.
2. FOR STAIR TYPICAL DETAILS SEE STRUCTURAL DRAWINGS.
3. FOR TYPICAL WALL PANEL DETAILS SEE A6.
4. FIELDS VERIFY ALL DIMENSION FOR WALL PANELS.
5. FOR FINISH, DOOR AND WINDOW SCHEDULES SEE A7.



XWL000 XMBN100 058472 058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert D. ...*  
CHIEF, BUREAU OF UTILITIES DATE

**bbw** Architects • Designers • Planners  
Bryant Bryant Williams, P.C.  
4201 Connecticut Avenue N.W., Suite 500  
Washington, D.C. 20009 (202) 244-2100

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

1577-2  
STATE OF MARYLAND  
*Charles J. ...*

DES: CH/JS	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: JS						
CHK: CH						

NORTH BLOWER BUILDING  
ARCHITECTURAL

BUILDING SECTIONS AND  
WALL SECTION

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

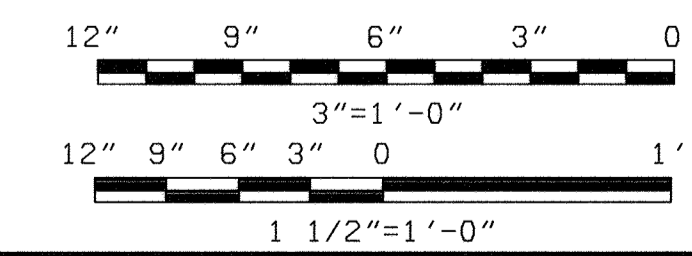
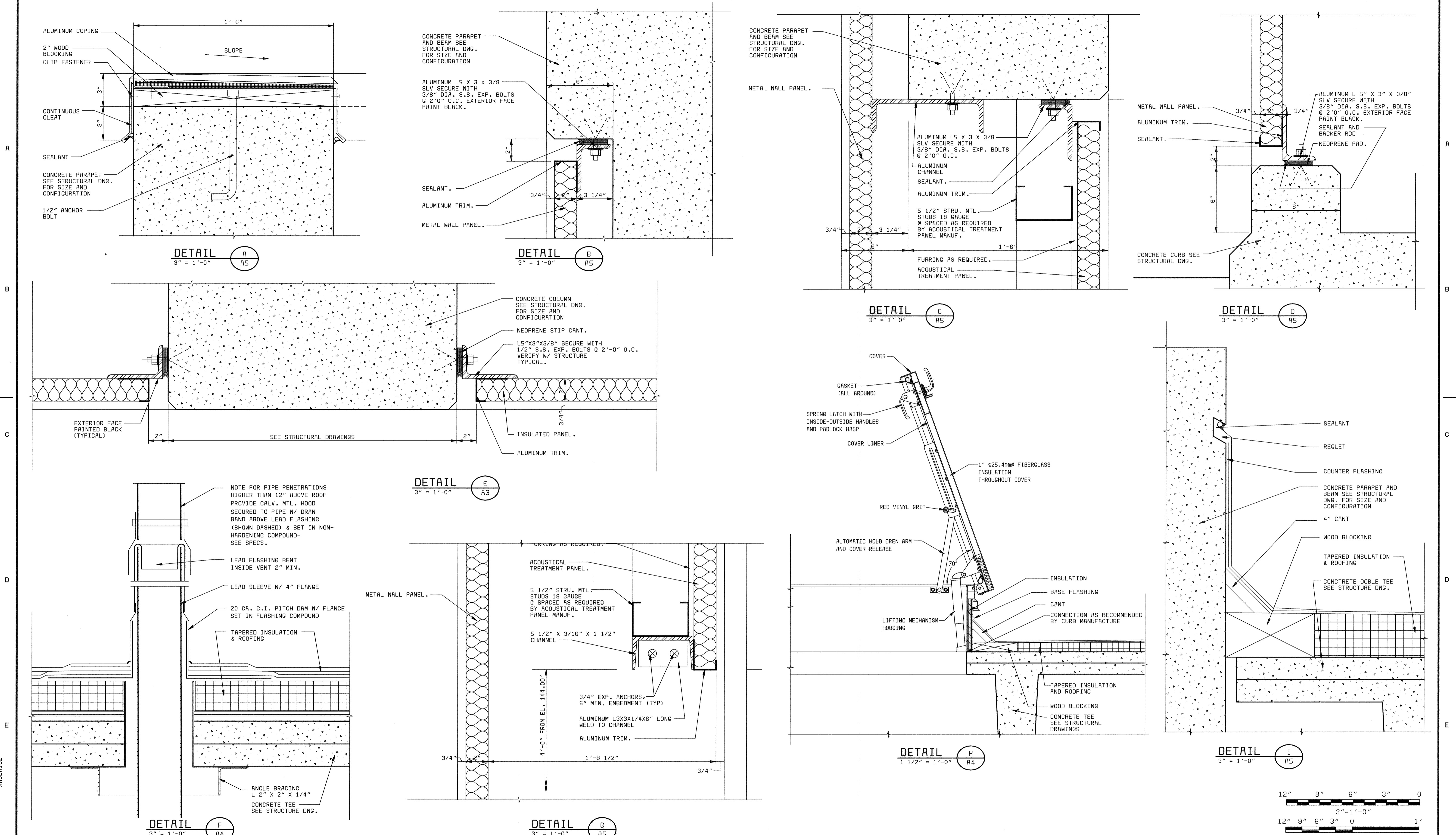
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
39 OF 161

**A5**



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <b>bbw</b> Architects • Designers • Planners Bryant Bryant Williams, P.C. 4201 Connecticut Avenue N.W., Suite 500 Washington, D.C. 20008 (202) 244-2100	<b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland	DES: CH/JS DRN: JS CHK: CH DATE: 6/23/00	NORTH BLOWER BUILDING ARCHITECTURAL	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION	SCALE AS SHOWN SHEET 40 OF 161 <b>A6</b>



### FINISH SCHEDULE

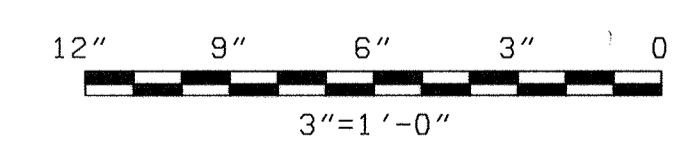
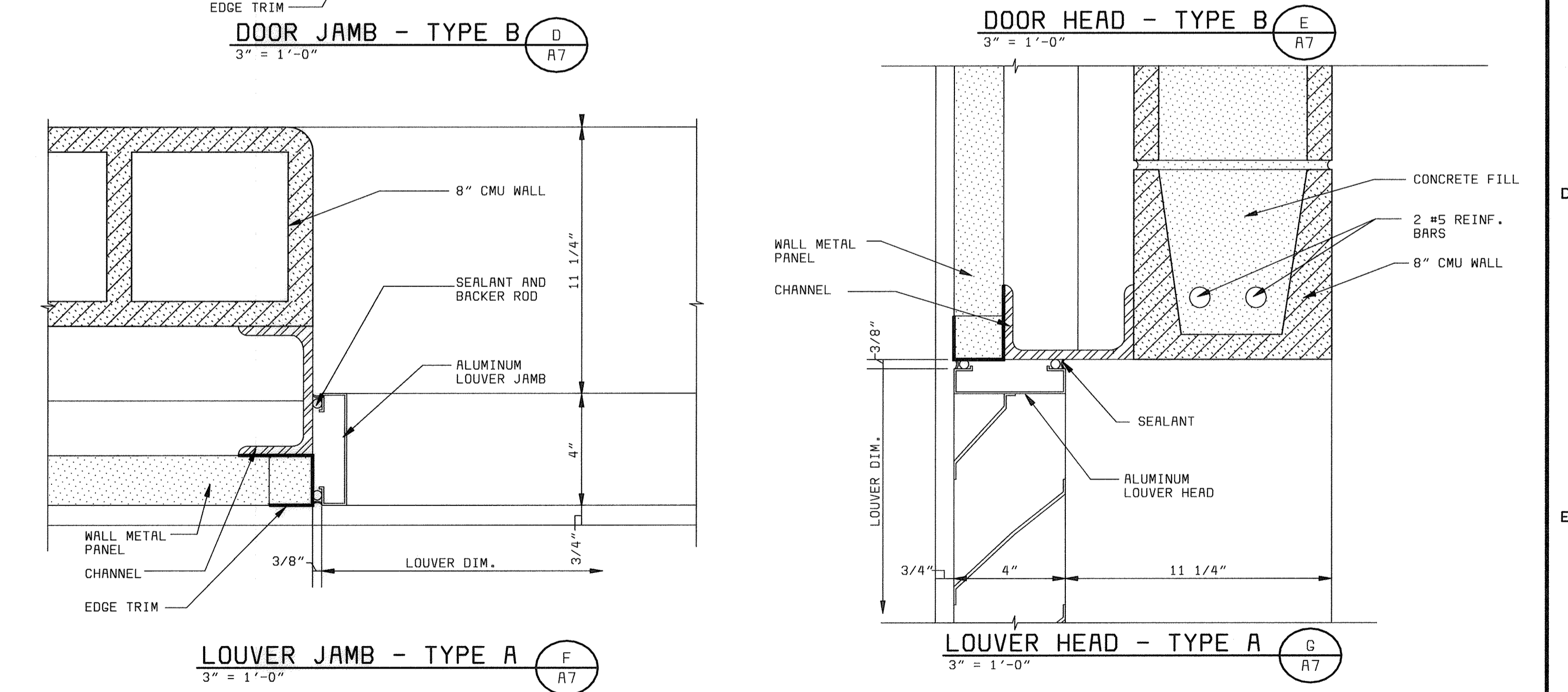
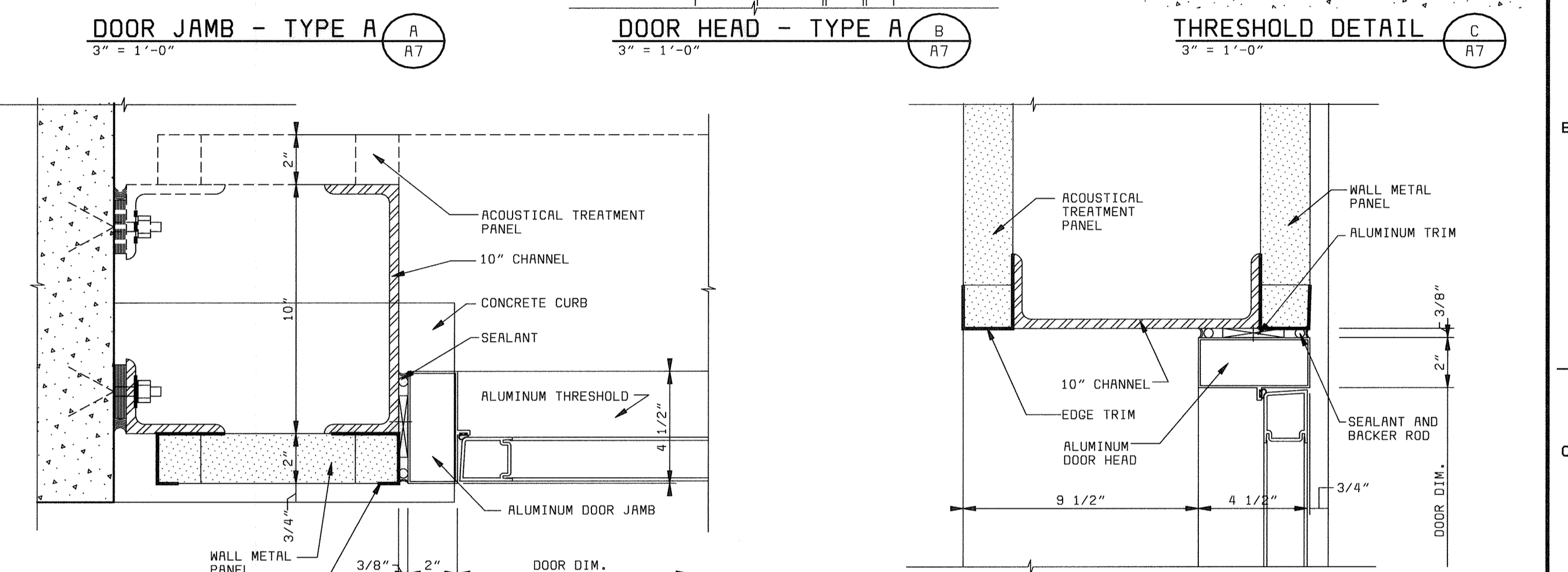
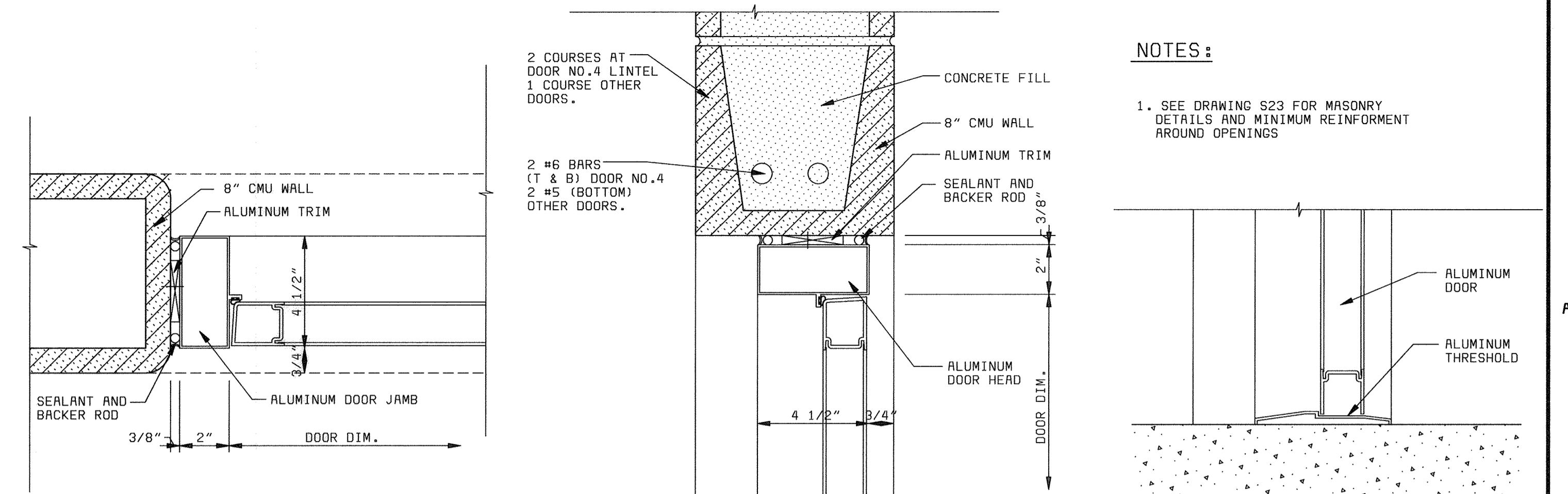
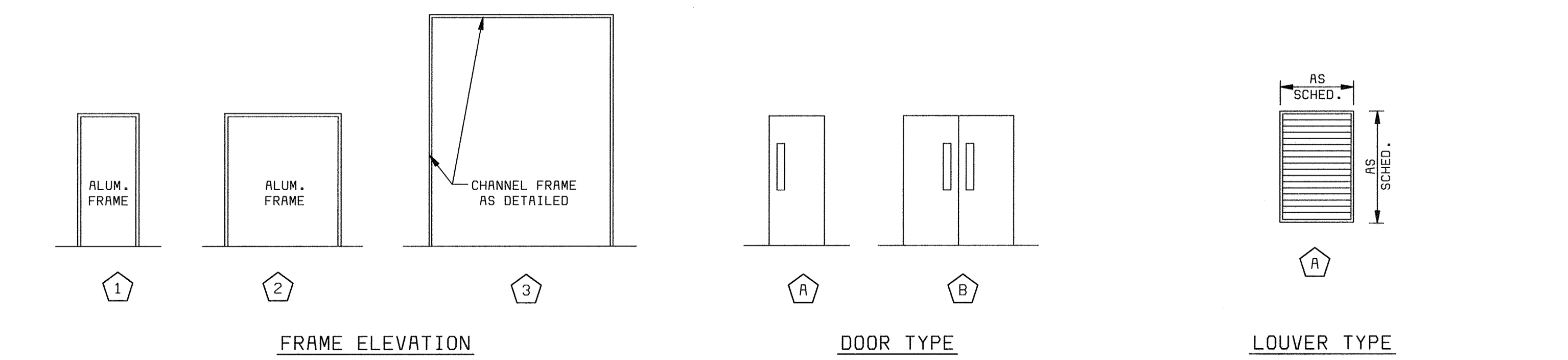
BUILDING	SPACE NUMBER	SPACE NAME	FLOOR	WALL	CEILING	REMARKS
BLOWER BUILDING	B01	BLOWER ROOM	CONCRETE W/ SEALER	MTL WALL PANEL/ ACST TREATMENT PANEL/CMU-PTD	EXPOSED CONC	-
	B02	ELECTRICAL ROOM	CONCRETE W/ SEALER	CMU-PTD	EXPOSED CONC	-
	B03	FILTER ROOM	CONCRETE W/ SEALER	CMU-PTD	EXPOSED CONC	-
	B04	FILTER ROOM	CONCRETE W/ SEALER	CMU-PTD	EXPOSED CONC	-
	-	-	-	-	-	-
	-	-	-	-	-	-

### DOOR SCHEDULE

BUILDING	DOOR NUMBER	DOOR SIZE			DOOR TYPE	MATERIAL	FRAME DETAILS			FRAME MATERIAL	FRAME ELEV.	REMARKS
		W	H	T			HEAD	JAMB	THRESH			
BLOWER BUILDING	1	10'-0"	12'-6"	-	OVERHEAD DOOR	ALUMINUM	A/A8	B/A8	G/A8	STL. CHANNEL W/ ALUM. CLADDING TRIM	3	INSTALL IN METAL WALL PANEL
	2	3'-0"	7'-2"	1 3/4"	A	ALUMINUM	E/A7	D/A7	C/A7	ALUMINUM	1	INSTALL IN METAL WALL PANEL
	3	3'-0"	7'-2"	1 3/4"	A	ALUMINUM	E/A7	D/A7	C/A7	ALUMINUM	1	INSTALL IN METAL WALL PANEL
	4	6'-0"	7'-2"	1 3/4"	B	ALUMINUM	B/A7	A/A7	-	ALUMINUM	2	-
	5	3'-0"	7'-2"	1 3/4"	A	ALUMINUM	B/A7	A/A7	-	ALUMINUM	1	-
	6	3'-0"	7'-2"	1 3/4"	A	ALUMINUM	B/A7	A/A7	-	ALUMINUM	1	-
	7	3'-0"	7'-2"	1 3/4"	A	ALUMINUM	B/A7	A/A7	-	ALUMINUM	1	-

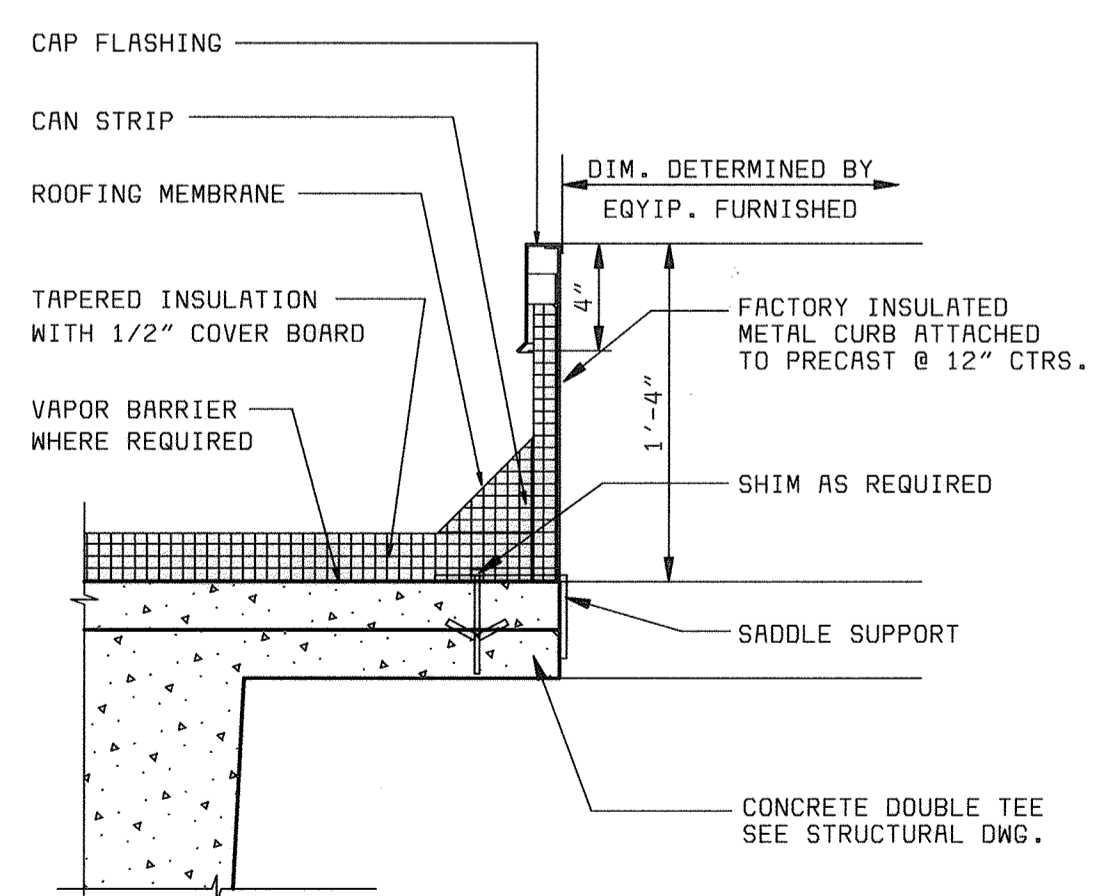
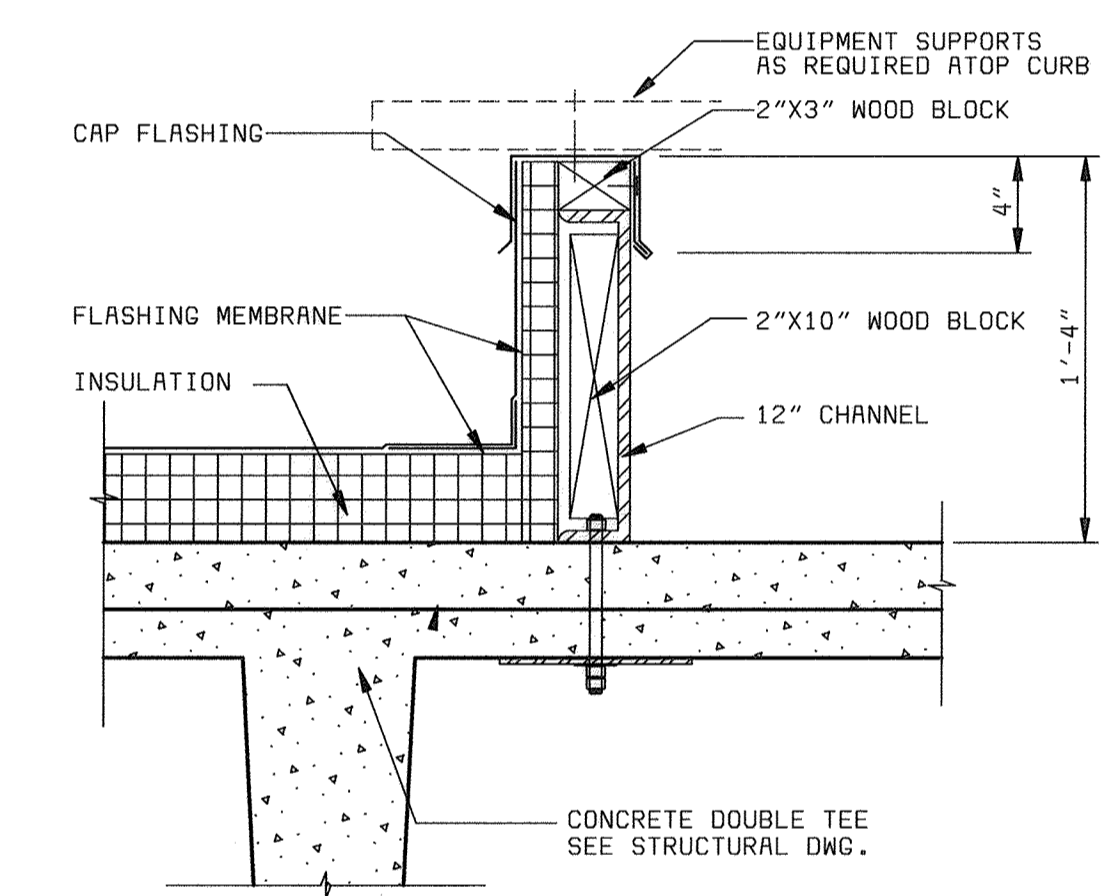
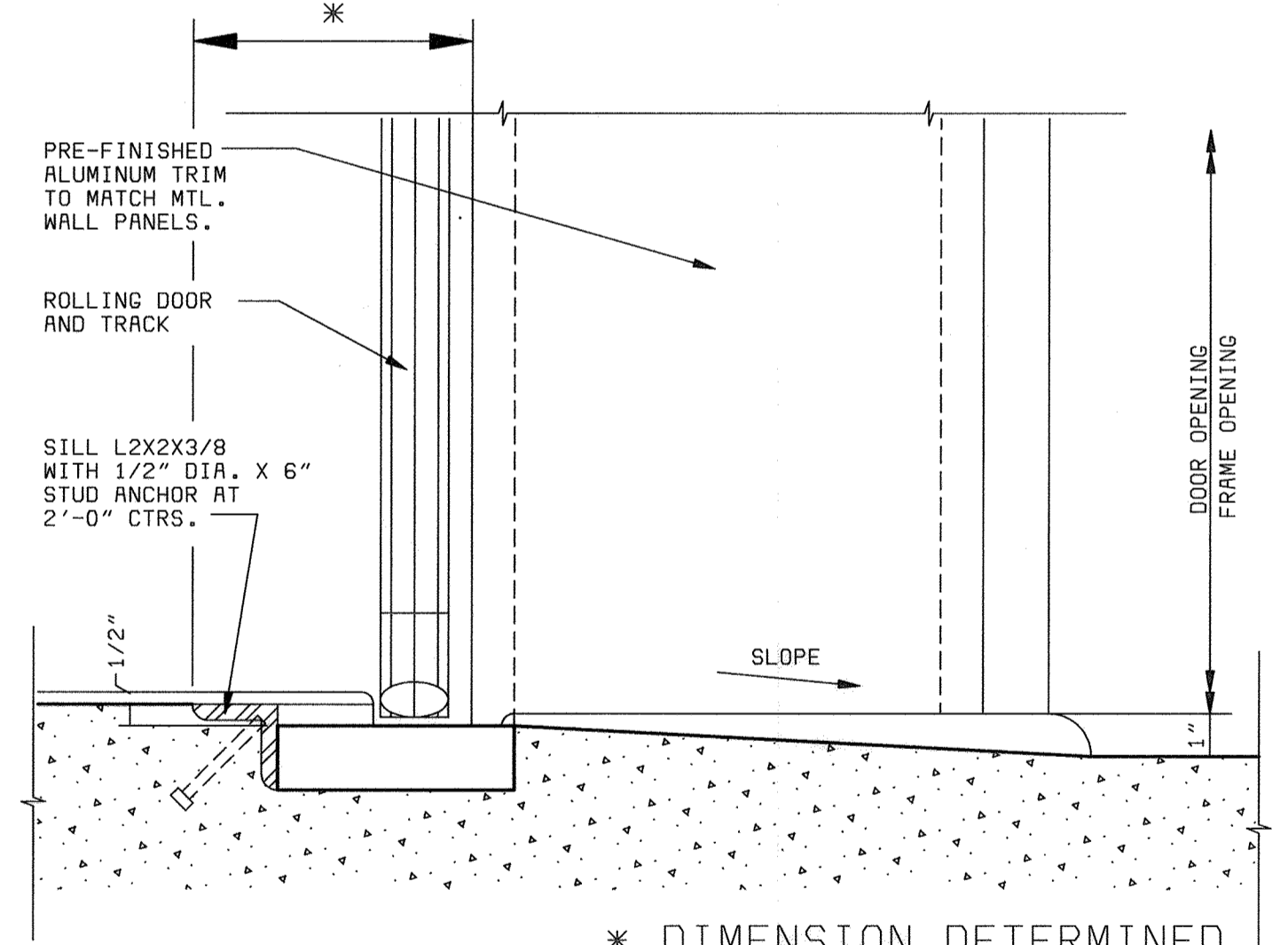
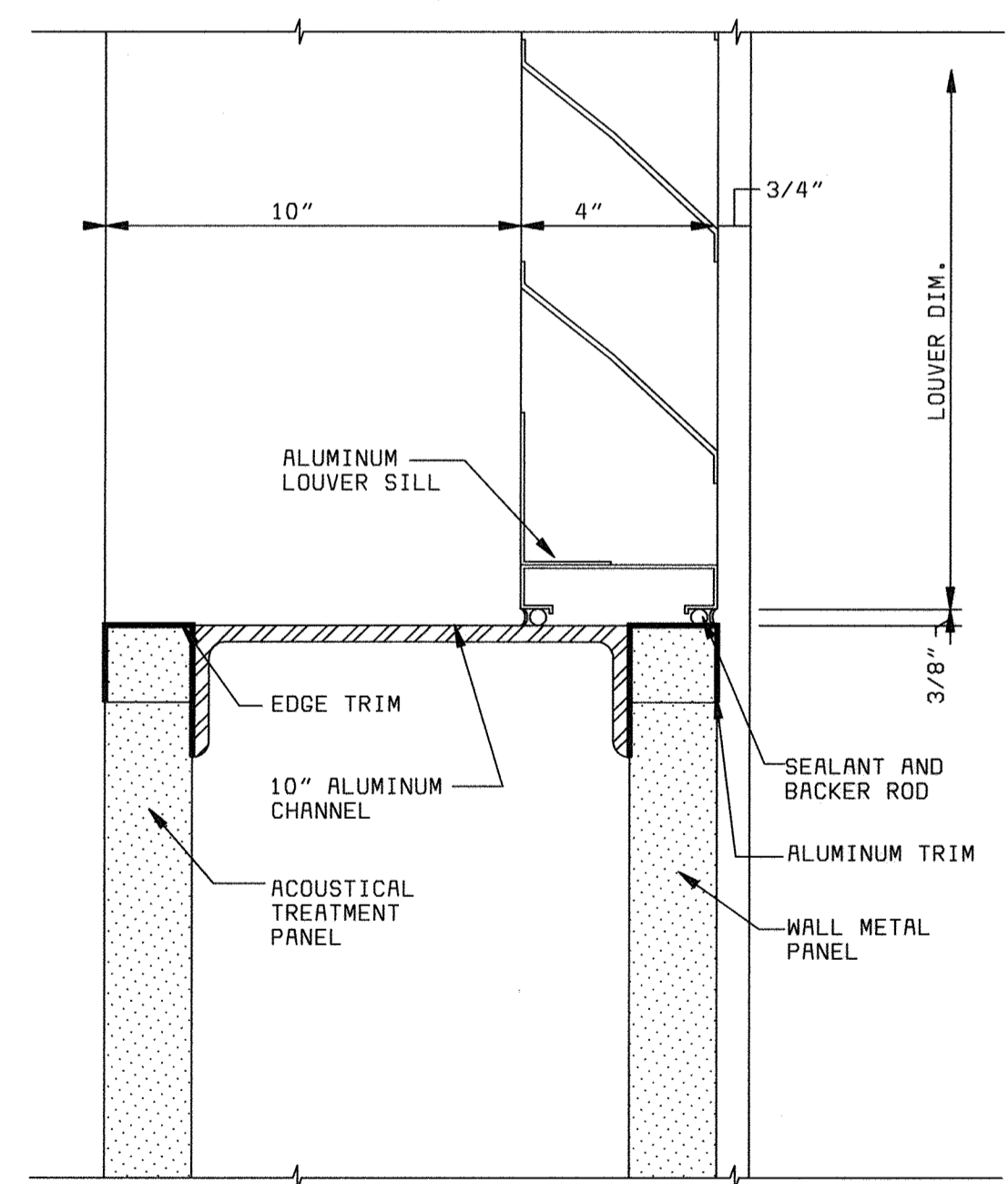
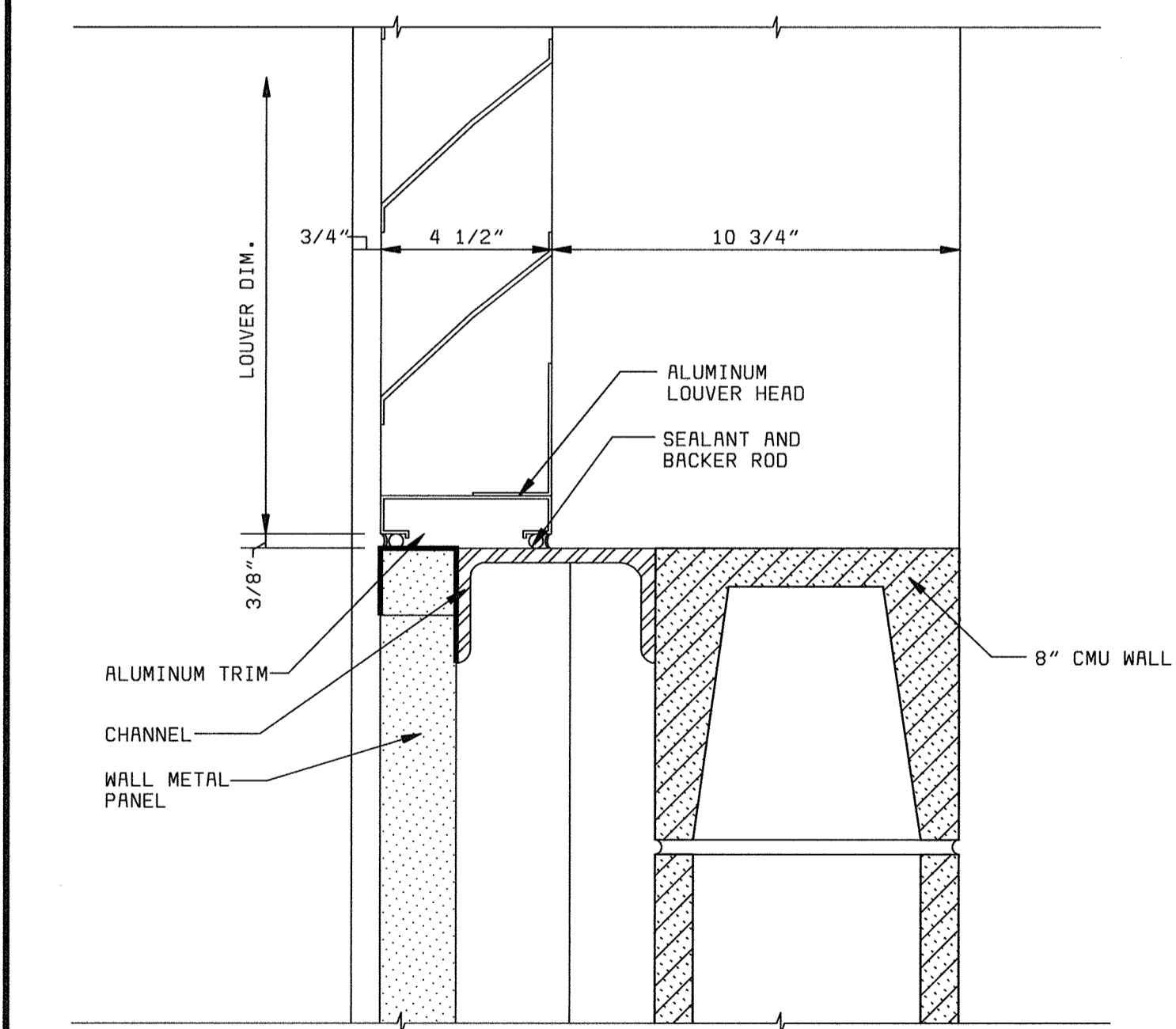
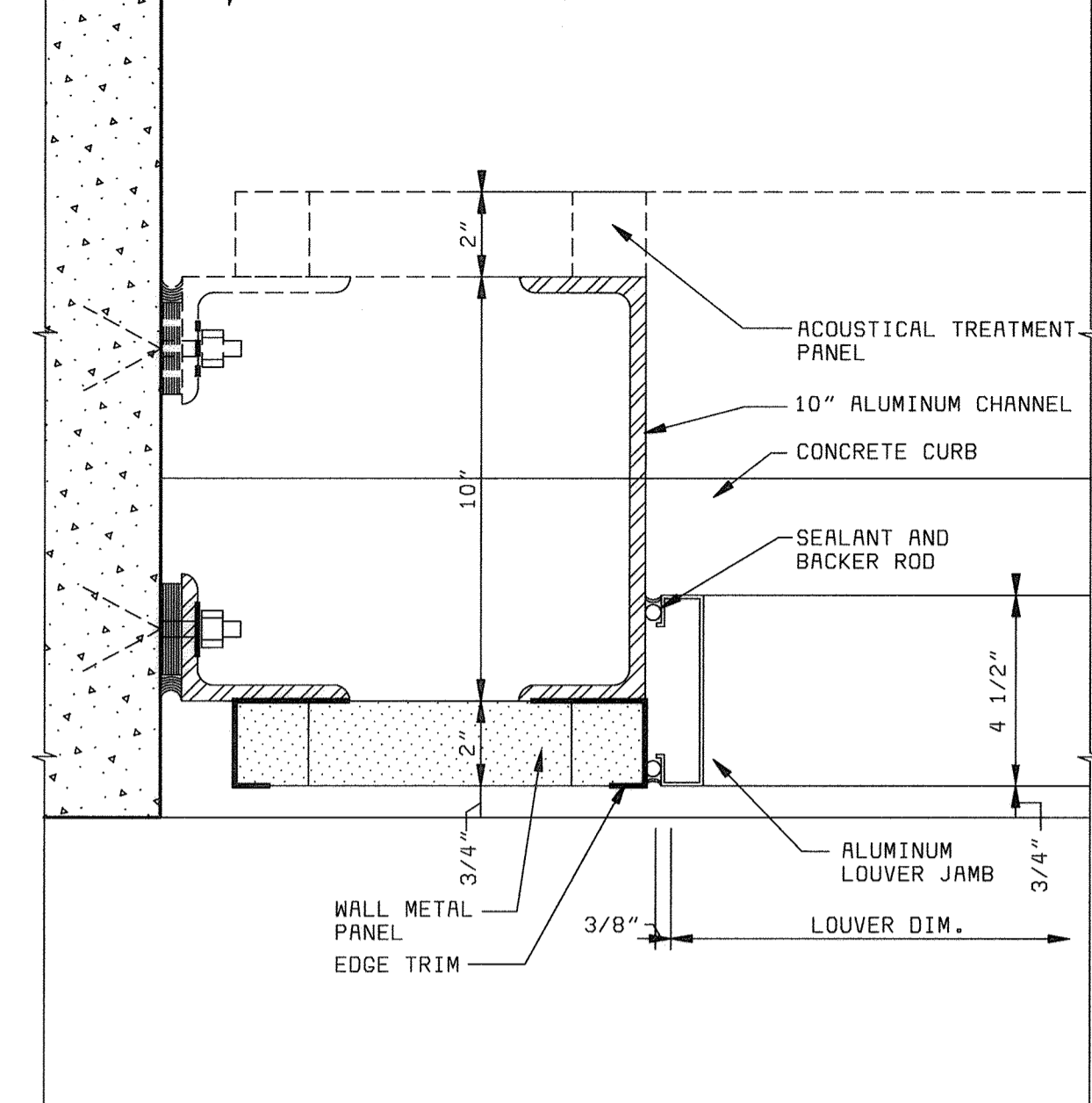
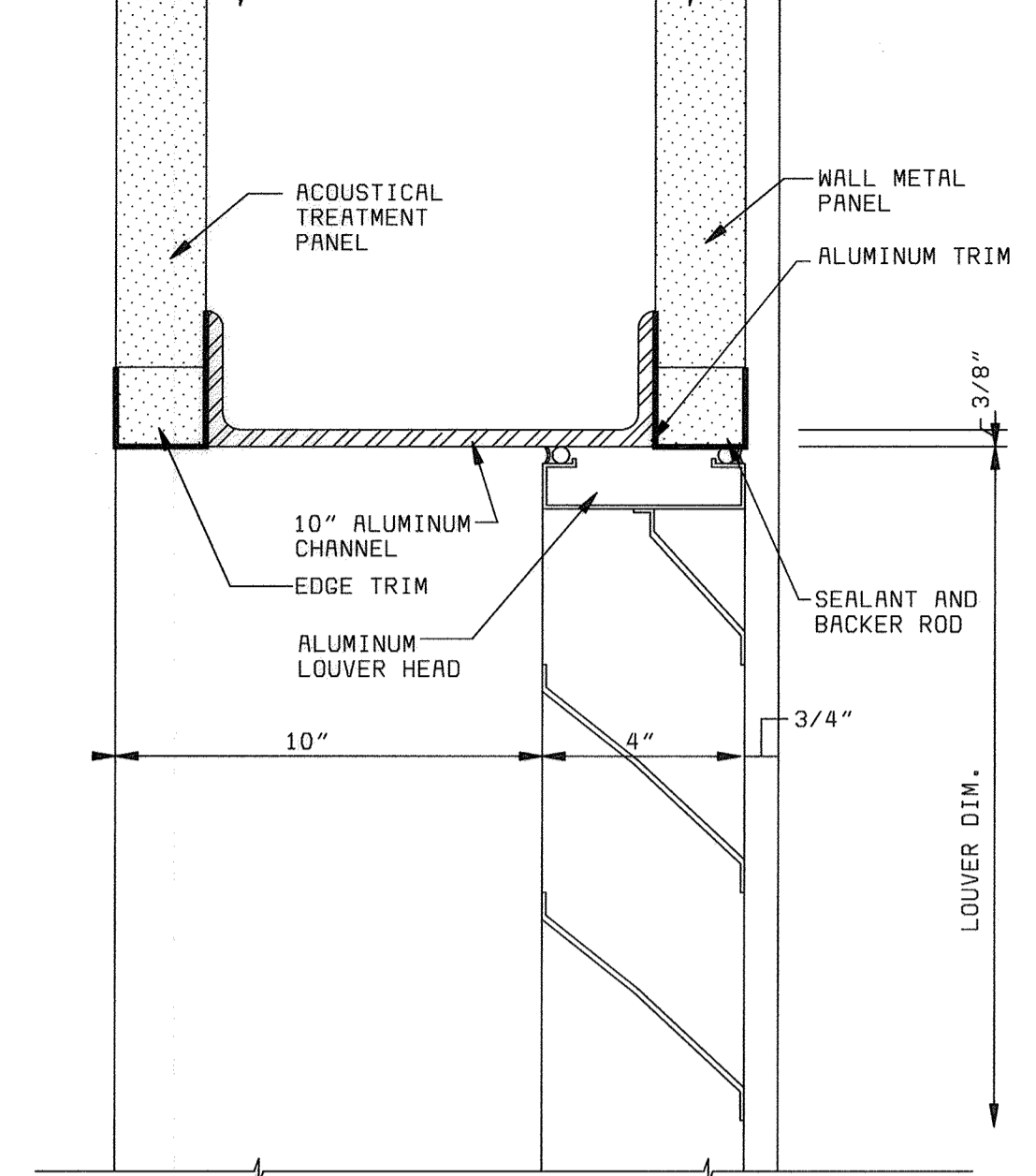
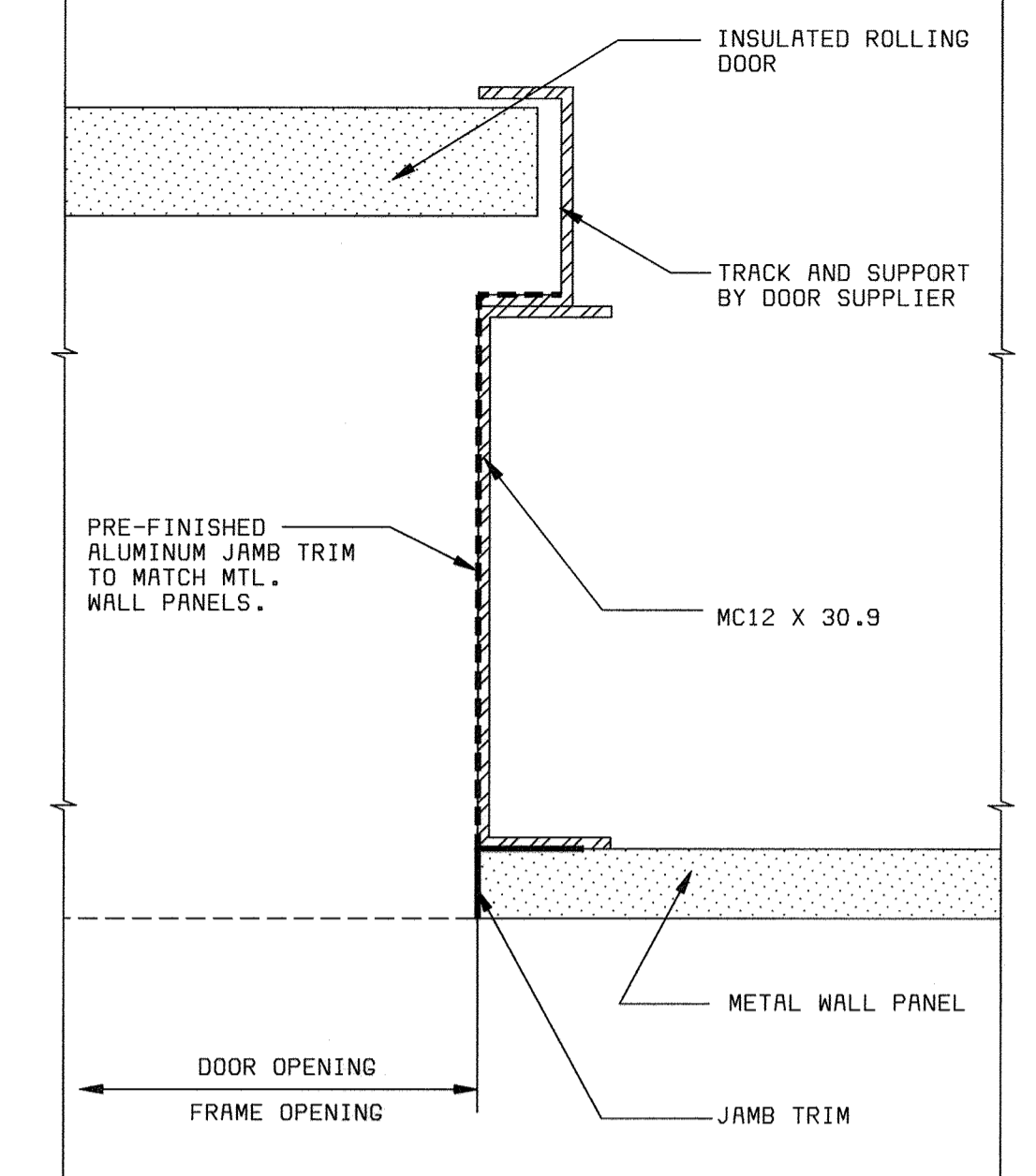
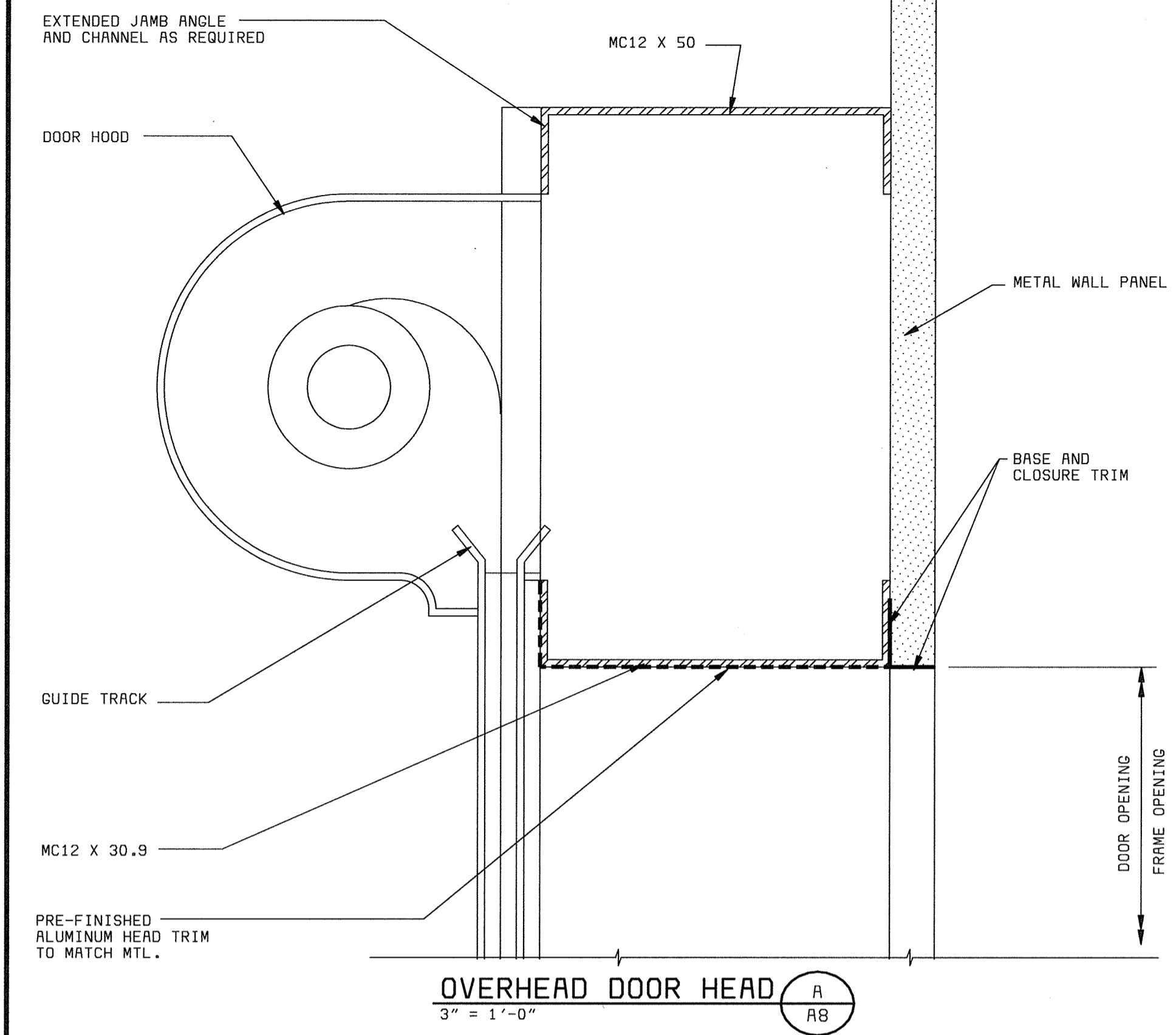
### LOUVER SCHEDULE

BUILDING	LOUVER NUMBER	LOUVER SIZE			TYPE	FRAME DETAILS			REMARKS
		W	H	T		HEAD	JAMB	SILL	
BLOWER BUILDING	1	4'-0"	6'-0"	4"	A	G/A7	F/A7	E/A8	INSTALL IN METAL WALL PANEL AND 8" CMU WALL
	2	4'-0"	6'-0"	4"	A	G/A7	F/A7	E/A8	INSTALL IN METAL WALL PANEL AND 8" CMU WALL
	3	5'-0"	7'-0"	4"	A	C/A8	D/A8	F/A8	INSTALL IN METAL WALL PANEL
	4	5'-0"	7'-0"	4"	A	C/A8	D/A8	F/A8	INSTALL IN METAL WALL PANEL
	5	5'-0"	7'-0"	4"	A	C/A8	D/A8	F/A8	INSTALL IN METAL WALL PANEL



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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Architects • Designers • Planners Bryant Bryant Williams, P.C. 4001 Connecticut Avenue N.W., Suite 500 Washington, D.C. 20008 (202) 344-2100	BLACK & VEATCH Gaithersburg, Maryland  REG. PROF. ENGR. _____ DATE _____ <i>Charles S. Bryant</i>	DES: CH/JS DRN: JS CHK: CH DATE: 6/23/00	NORTH BLOWER BUILDING ARCHITECTURAL  SCHEDULES AND DOOR AND LOUVER DETAILS	LITTLE PATUXENT WATER RECLAMATION ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 41 OF 161  A7
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**NOTES:**

- SEE DRAWING S23 FOR MASONRY DETAILS AND MINIMUM REINFORCEMENT AROUND OPENINGS

12" 9" 6" 3" 0 1'

1 1/2" = 1'-0"

12" 9" 6" 3" 0

3" = 1'-0"

XKLOGO XMBB101

058472 P058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Bryant* 6-24-00  
CHIEF, BUREAU OF UTILITIES DATE

**bbw** Architects • Designers • Planners  
Bryant Bryant Williams, P.C.  
4001 Connecticut Avenue N.W., Suite 500  
Washington, D.C. 20008 (202) 246-2100

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE *Charles J. Bryant*

DES: CH/JS  
DRN: JS  
CHK: CH  
DATE: 6/23/00

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

**NORTH BLOWER BUILDING**  
ARCHITECTURAL

**DOOR AND LOUVER DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

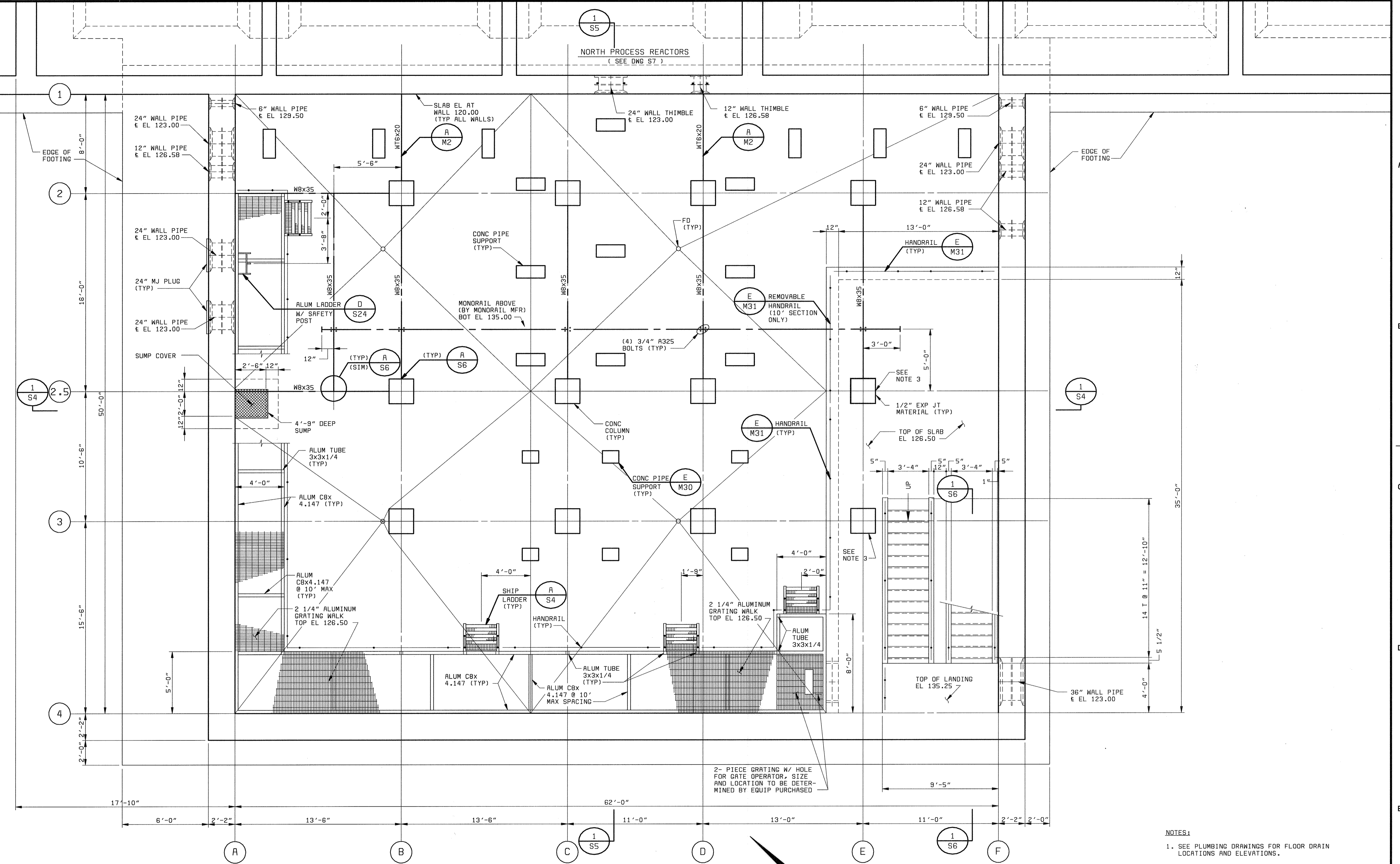
SCALE AS SHOWN

SHEET 42 OF 161

**A8**

1 2 3 4 5 6 7 8 9 10

A B C D E



**SECTIONAL PLAN**  
1/4" = 1'-0"

- NOTES:**
1. SEE PLUMBING DRAWINGS FOR FLOOR DRAIN LOCATIONS AND ELEVATIONS.
  2. SEE MECHANICAL DRAWINGS FOR PIPE SUPPORTS AND WALL PIPE LOCATIONS AND ELEVATIONS.
  3. PROVIDE EXTRA REINFORCING AT COLUMN/SLAB OPENING AS SHOWN ON DRAWING S21.

58472-101-PR-N-0000550  
06/27/2000  
06/27/2000

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Bauman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE

STATE OF MARYLAND  
ROBERT J. RECTANUS JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: IFH	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: SLF						
CHK: NGM						
DATE: 6/23/00						

**NORTH BLOWER BUILDING**  
STRUCTURAL

**SECTIONAL PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

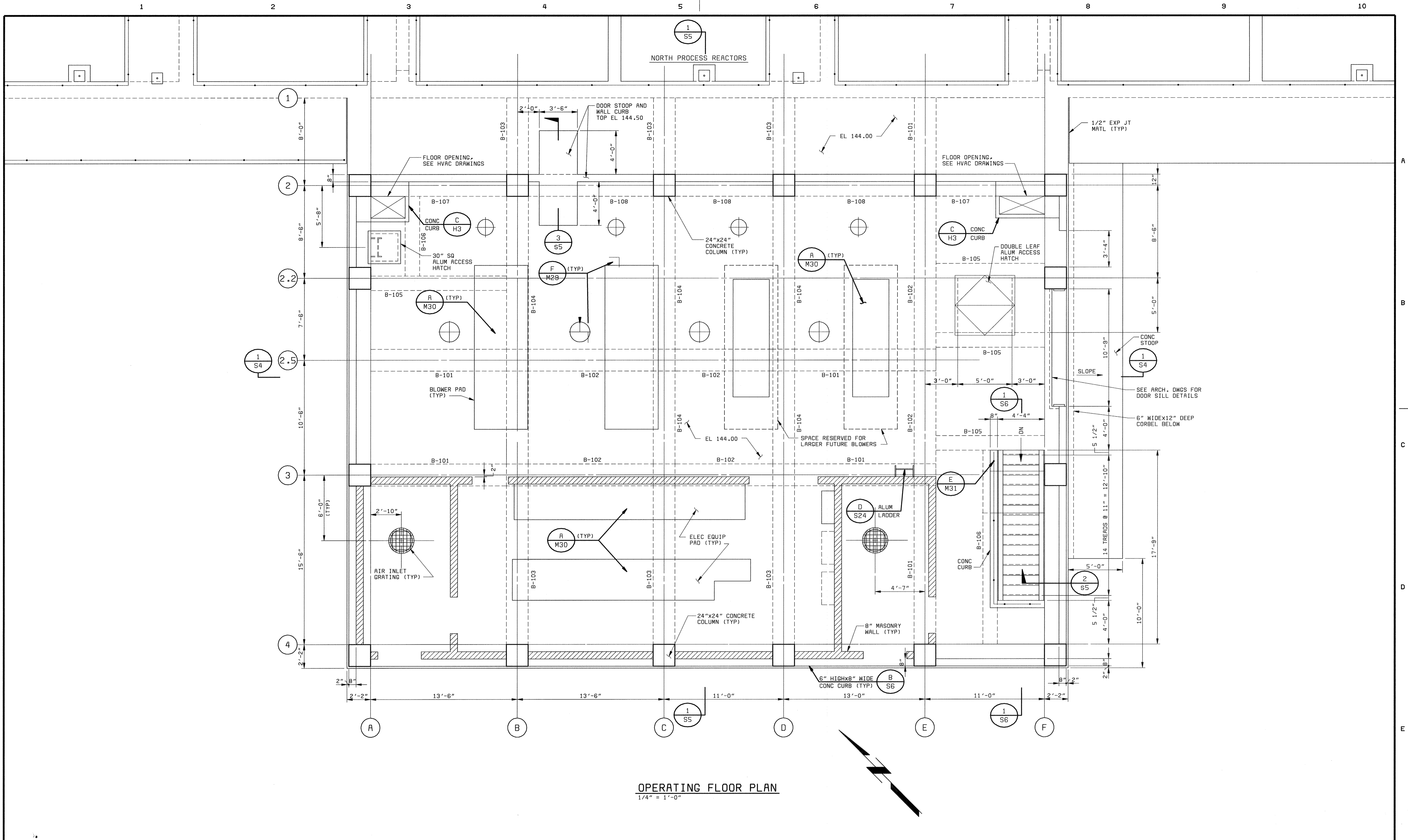
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 43 OF 161

**S1**



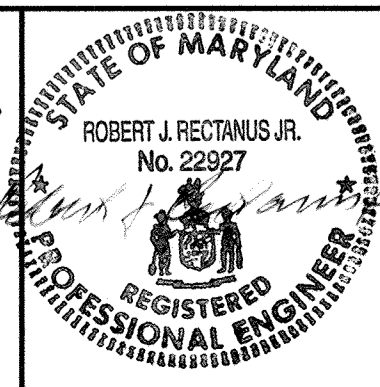
**OPERATING FLOOR PLAN**  
1/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.* 6/26/00  
REG. PROF. ENGR. DATE



DES: IFH  
DRN: SLF  
CHK: NGM  
DATE: 6/23/00

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

**NORTH BLOWER BUILDING  
STRUCTURAL**

**OPERATING FLOOR PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

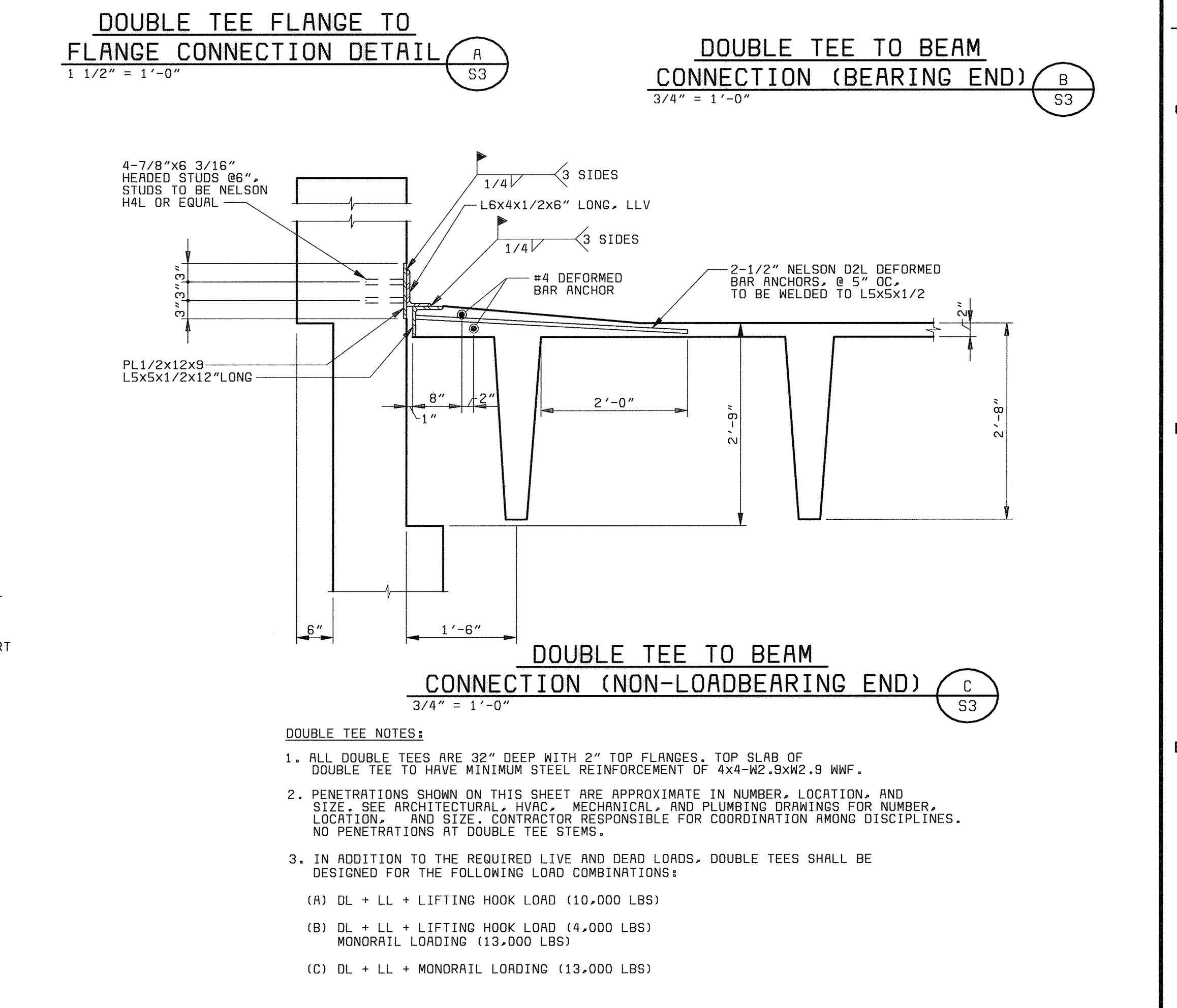
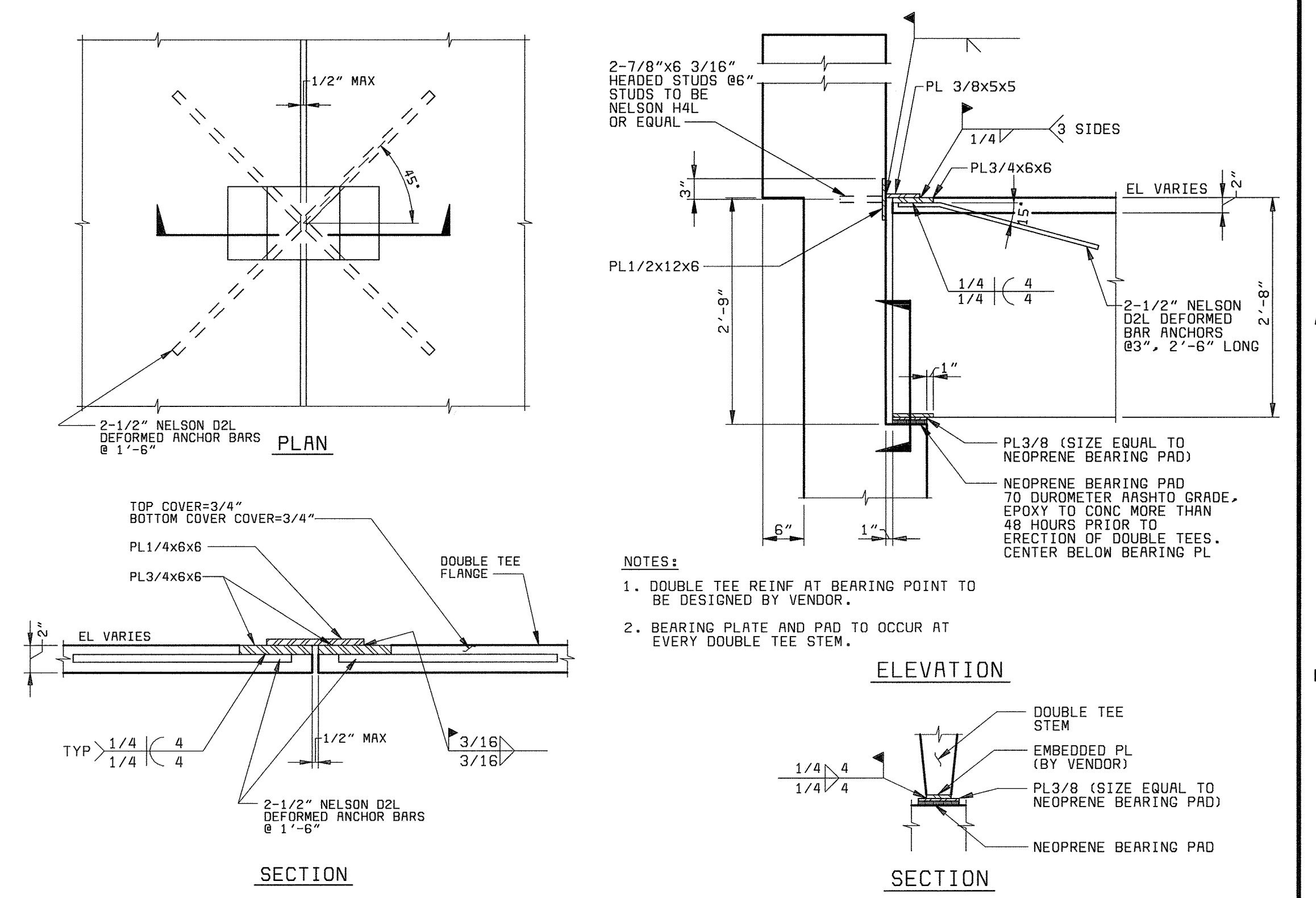
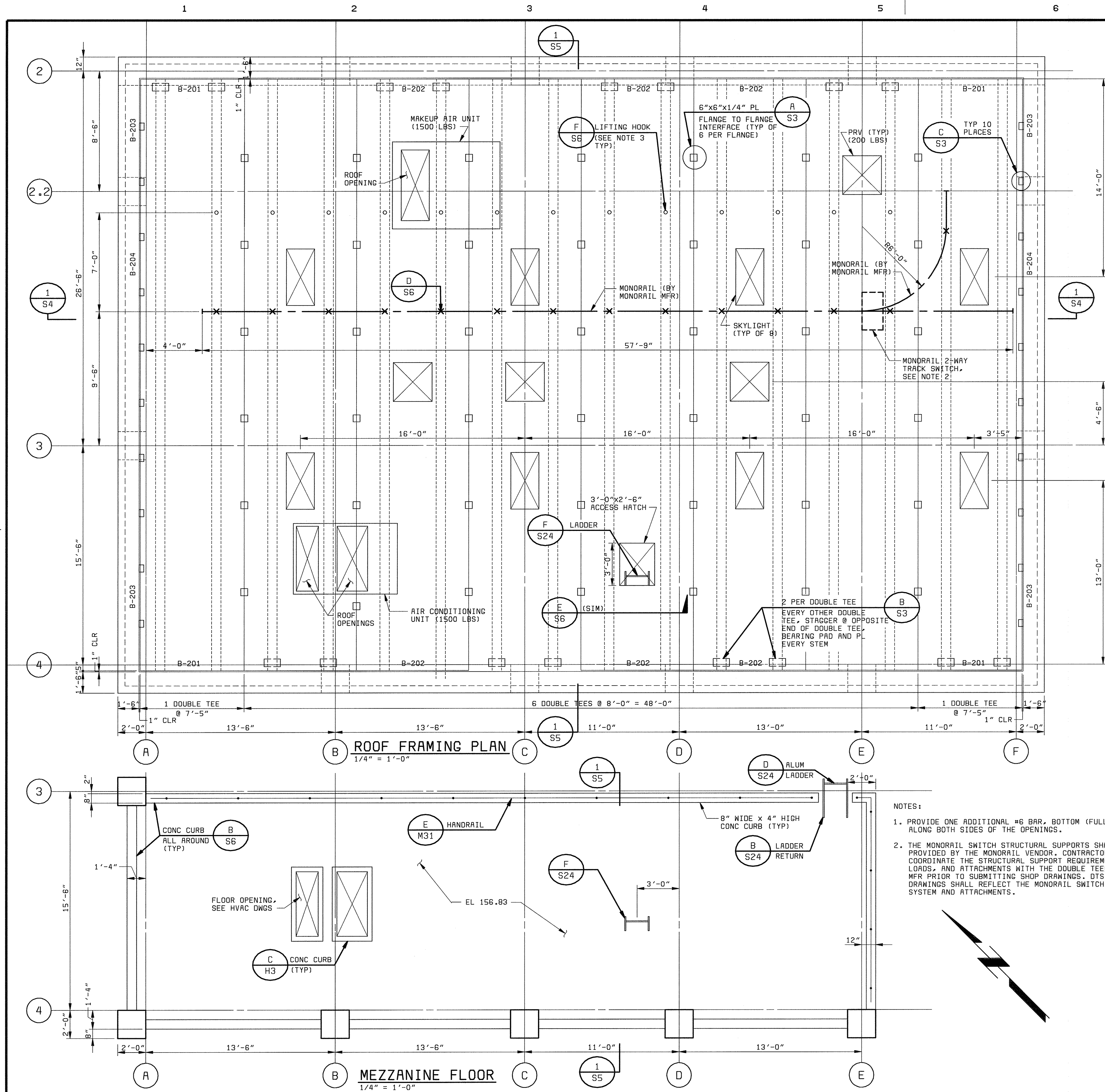
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

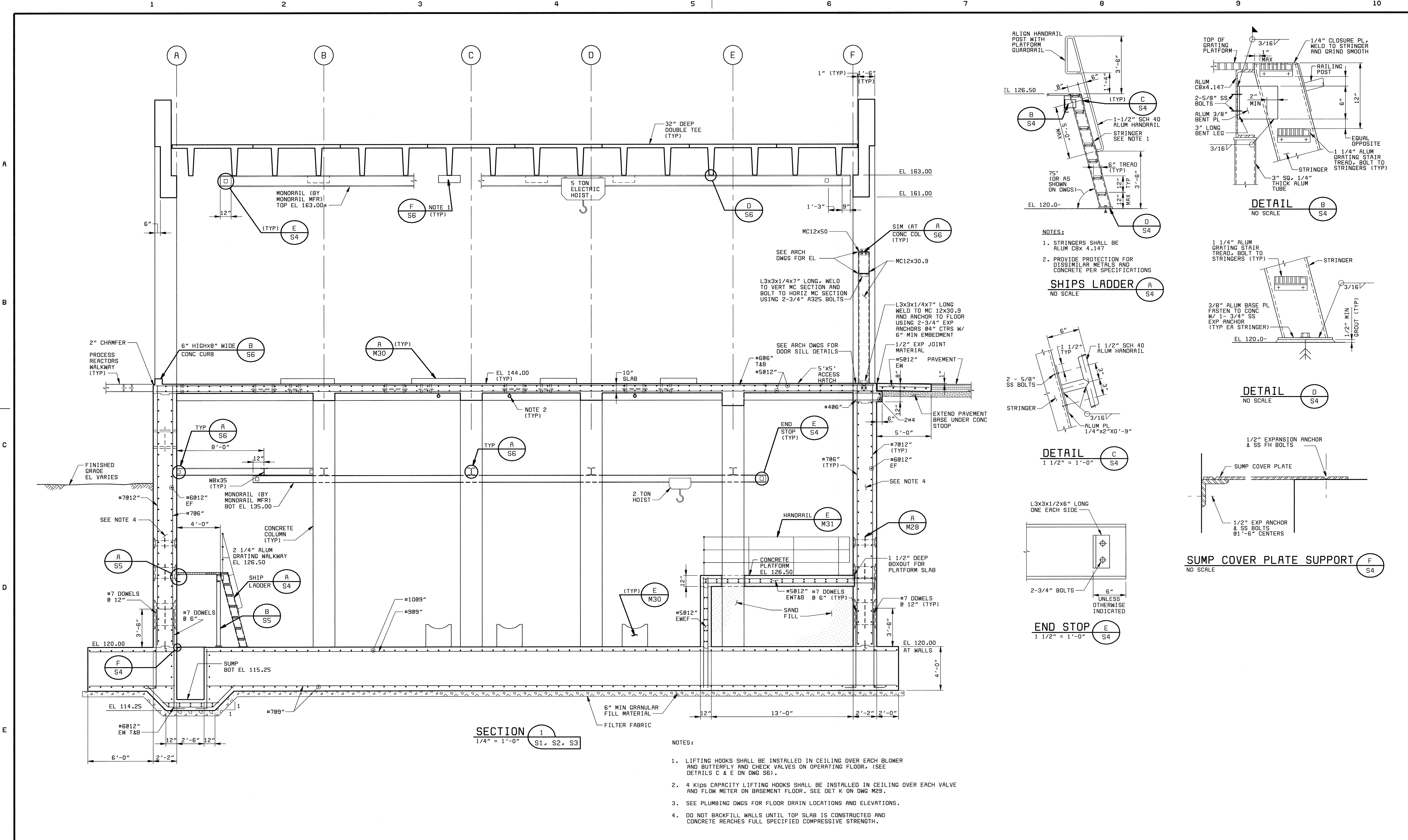
SCALE AS SHOWN

SHEET 44 OF 161

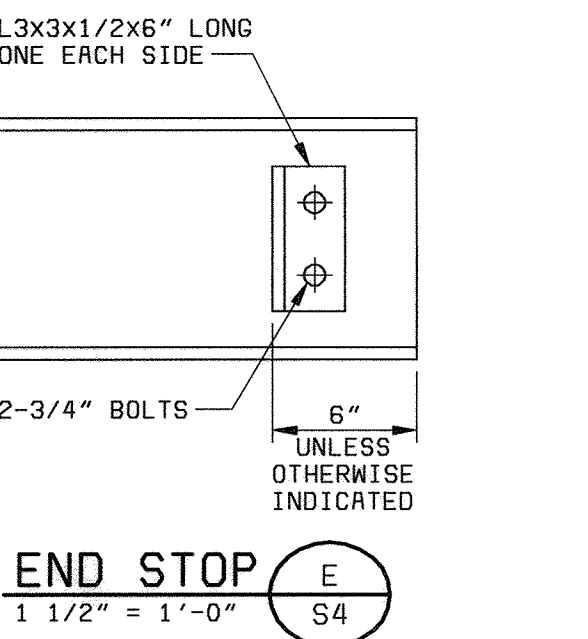
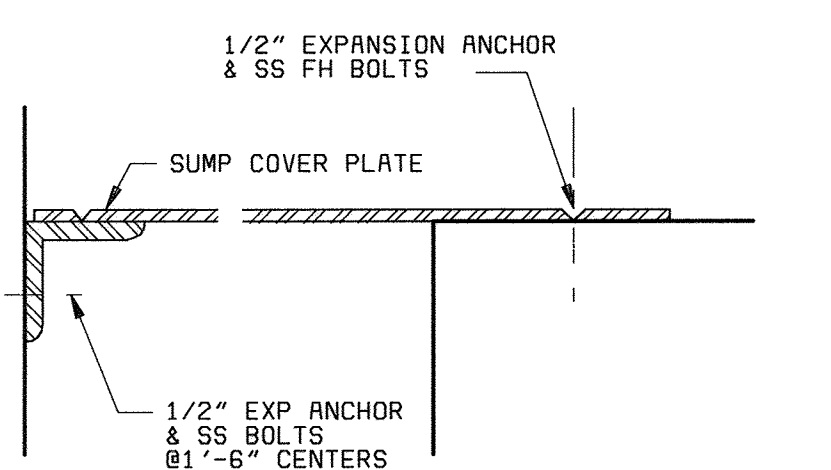
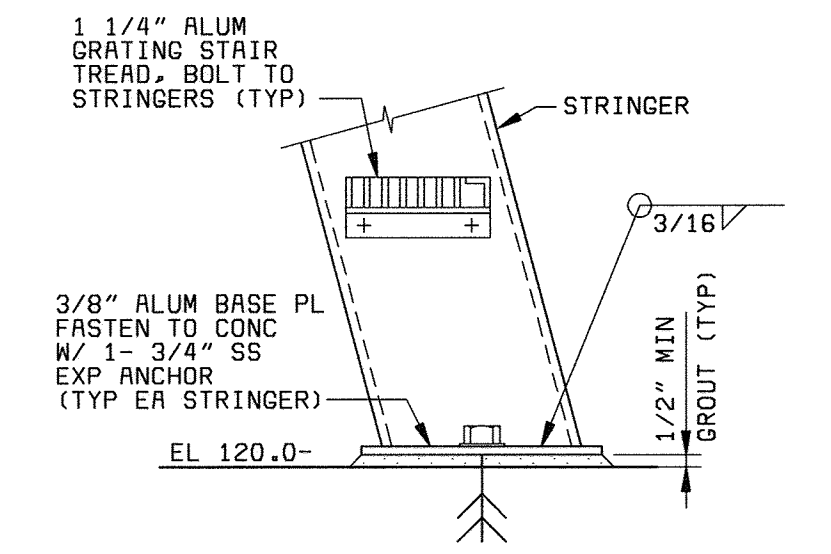
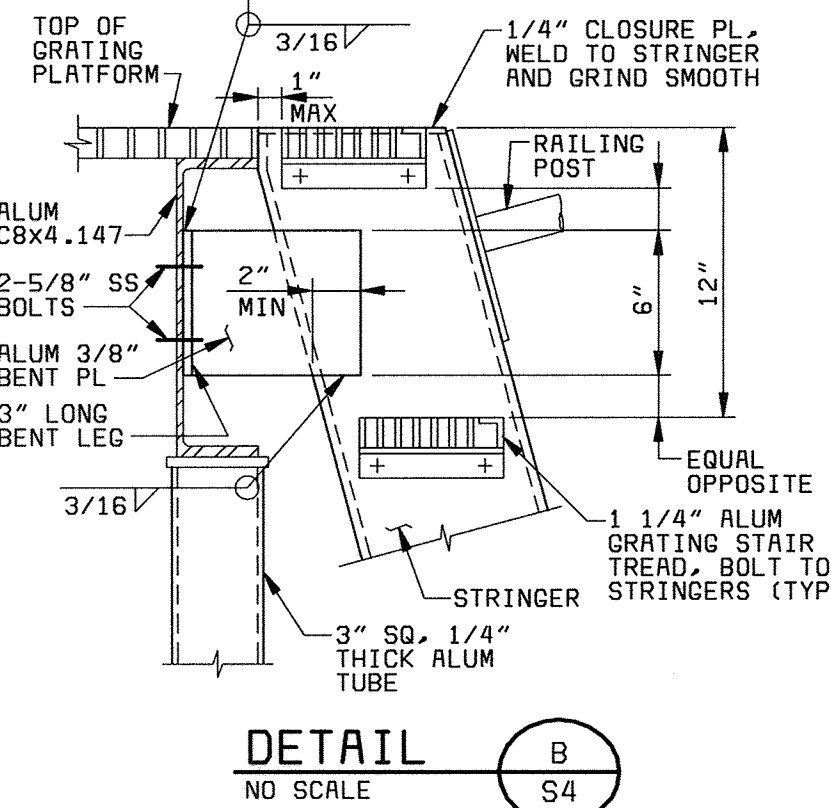
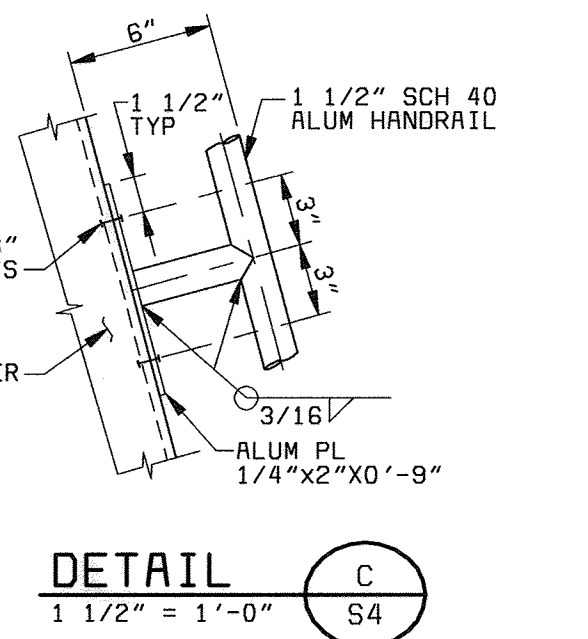
**S2**



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert M. Bainger 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LP Gaithersburg, Maryland  REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: IFH	NORTH BLOWER BUILDING STRUCTURAL	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION	SCALE AS SHOWN
			DRN: SLF			CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND
			CHK: NGM	<b>MEZZANINE FLOOR PLAN,          ROOF FRAMING PLAN, AND DETAILS</b>		<b>S3</b>
			DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE		



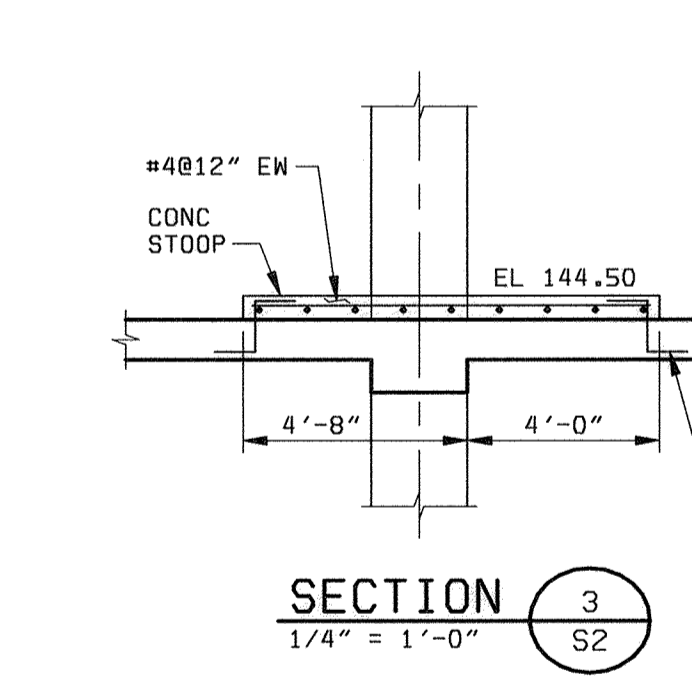
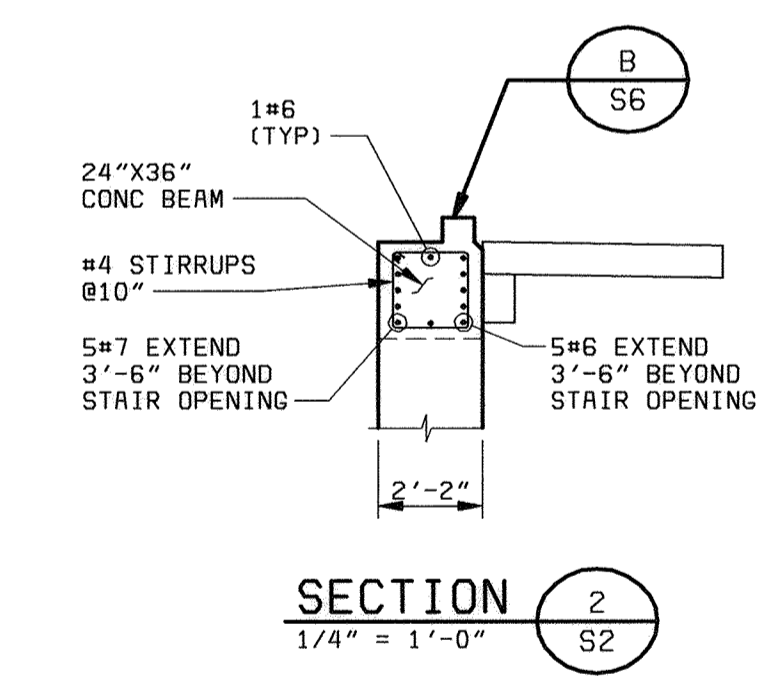
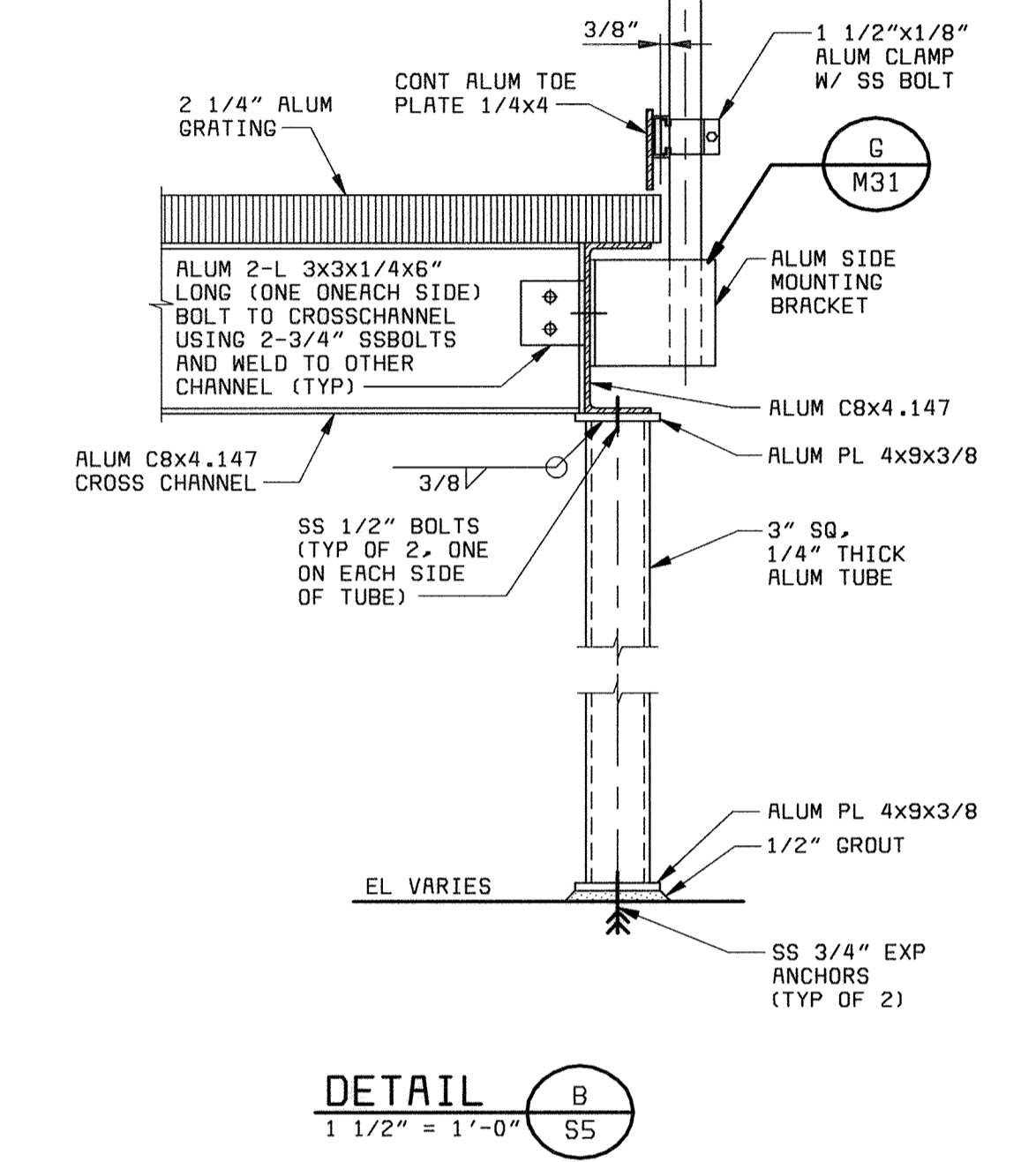
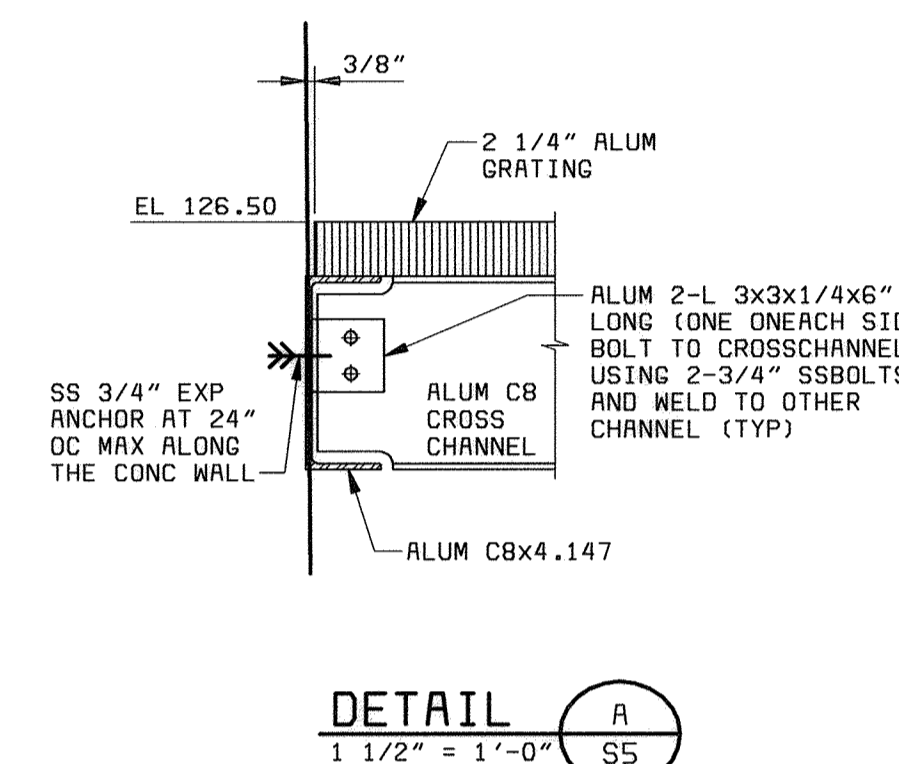
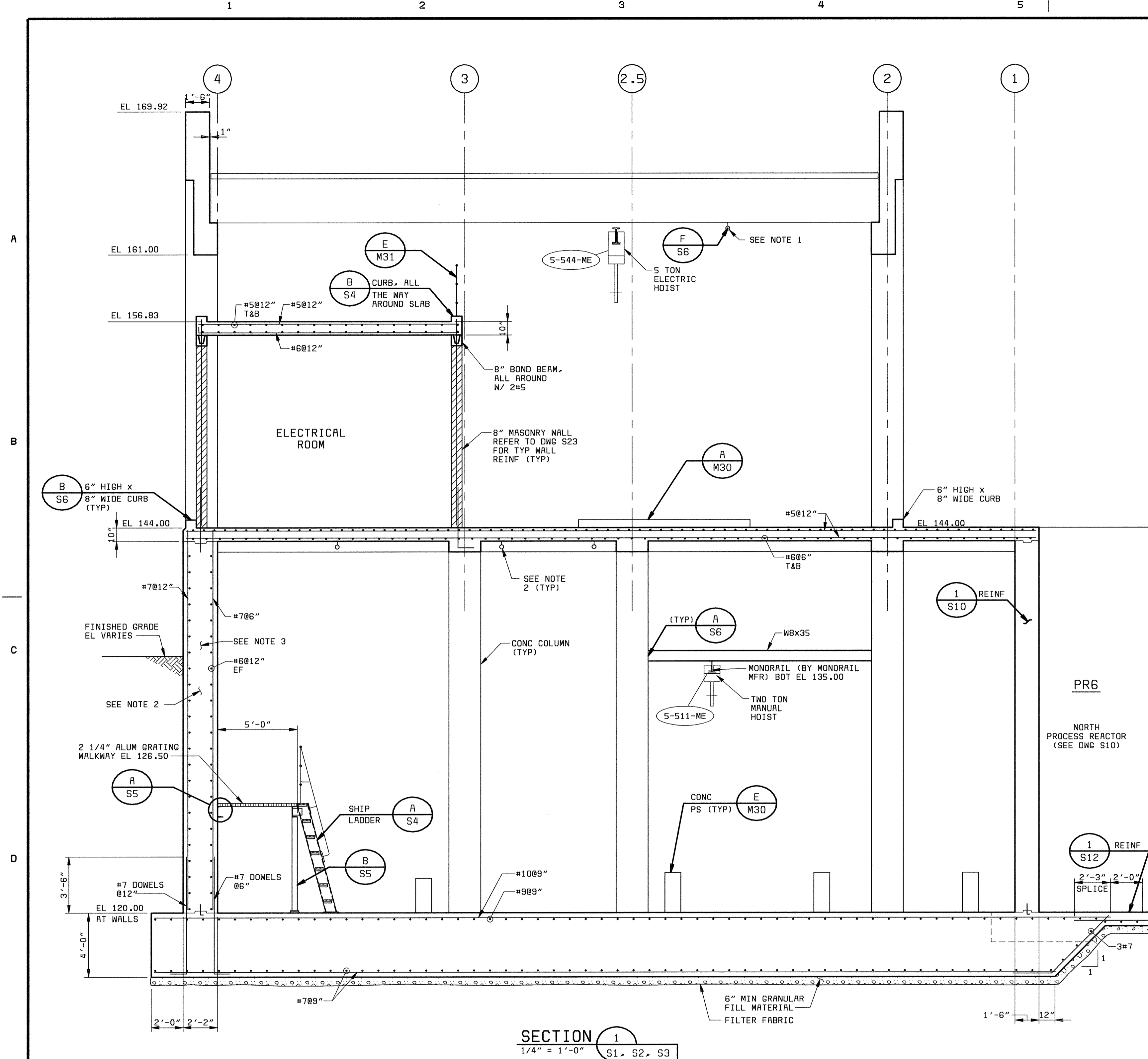
NOTES:  
 1. STRINGERS SHALL BE ALUM CBX 4.147  
 2. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS



SECTION 1  
 1/4" = 1'-0" S1, S2, S3

- NOTES:
1. LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH BLOWER AND BUTTERFLY AND CHECK VALVES ON OPERATING FLOOR. (SEE DETAILS C & E ON DWG S6).
  2. 4 KIPS CAPACITY LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH VALVE AND FLOW METER ON BASEMENT FLOOR. SEE DET K ON DWG M29.
  3. SEE PLUMBING DWGS FOR FLOOR DRAIN LOCATIONS AND ELEVATIONS.
  4. DO NOT BACKFILL WALLS UNTIL TOP SLAB IS CONSTRUCTED AND CONCRETE REACHES FULL SPECIFIED COMPRESSIVE STRENGTH.

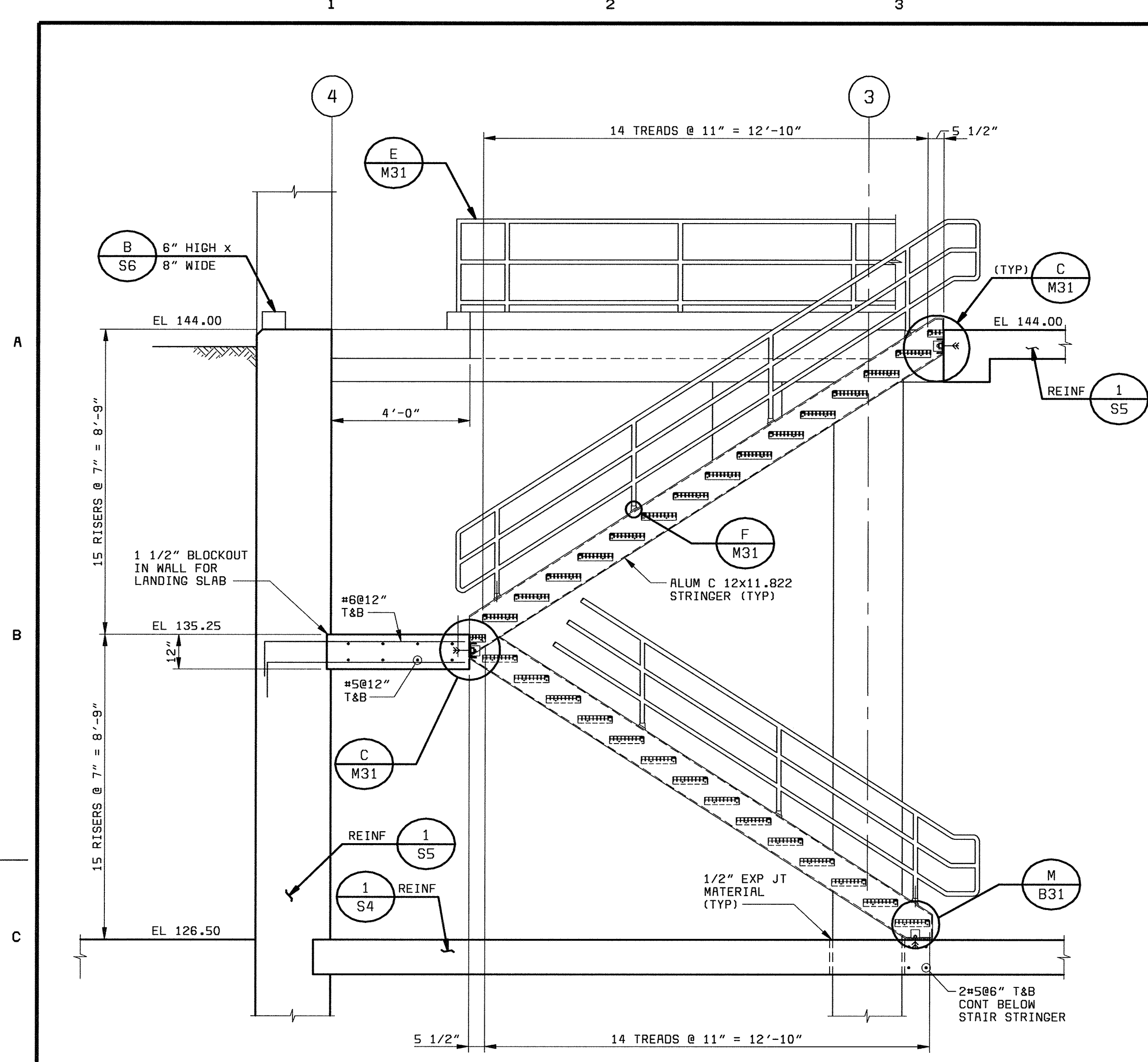
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Reitan</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	 Gaithersburg, Maryland  <i>Robert J. Reitan</i> 6/26/00 REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: IFH	NORTH BLOWER BUILDING STRUCTURAL	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION	SCALE AS SHOWN
			DRN: RLC			SECTION AND DETAILS
CHK: NGM	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP	HOWARD COUNTY, MARYLAND	S4	



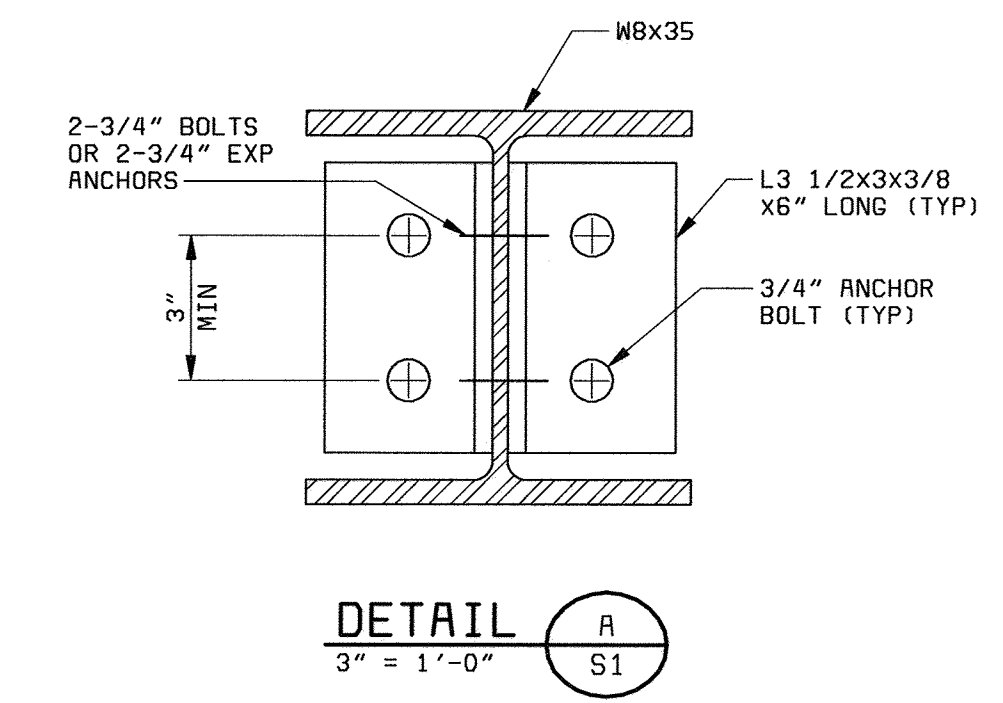
SECTION 1  
1/4" = 1'-0"  
S1, S2, S3

- NOTES:
- LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH BLOWER AND BUTTERFLY AND CHECK VALVES ON OPERATING FLOOR. (SEE DETAILS C & E ON DRAWING S6).
  - 4 KIPS CAPACITY LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH VALVE AND FLOW METER ON BASEMENT FLOOR. SEE DET K ON DWG M29.
  - SEE PLUMBING DWGS FOR FLOOR DRAIN LOCATIONS AND ELEVATIONS.
  - DO NOT BACKFILL WALLS UNTIL TOP SLAB IS CONSTRUCTED AND CONCRETE REACHES FULL SPECIFIED COMPRESSIVE STRENGTH.

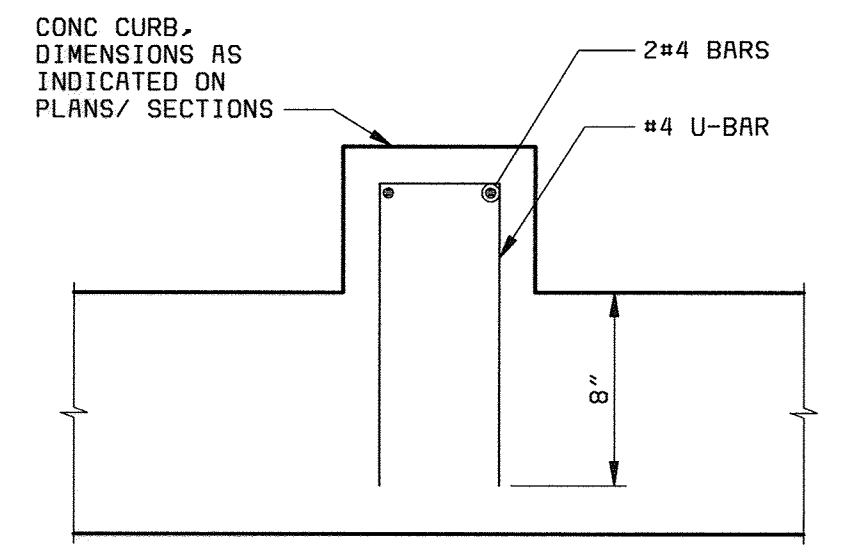
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert J. Rectanus Jr. CHIEF, BUREAU OF UTILITIES DATE	 Gaithersburg, Maryland  Robert J. Rectanus Jr. REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: IFH							NORTH BLOWER BUILDING STRUCTURAL  SECTIONS AND DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: RLC									
			CHK: NGM									S5
			DATE: 6/23/00									



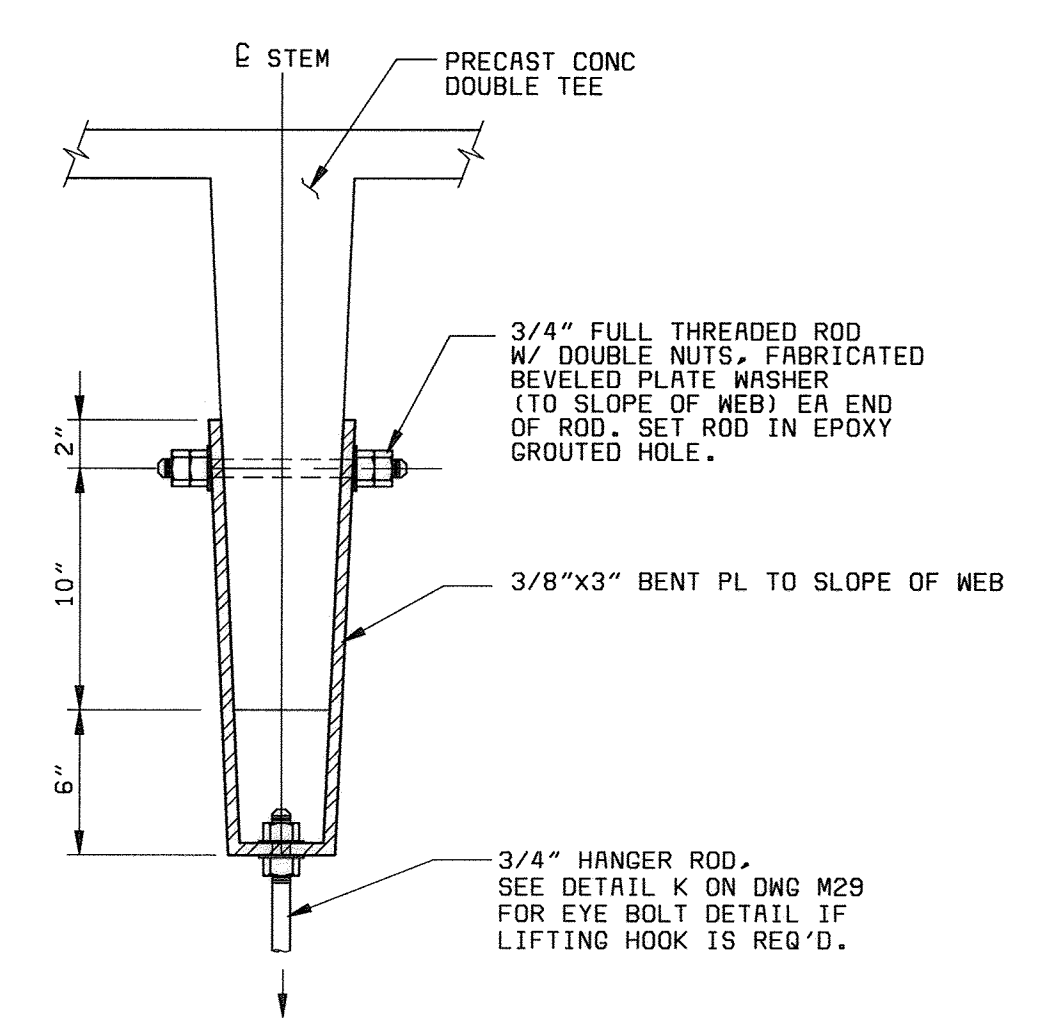
**SECTION 1**  
3/8" = 1'-0"



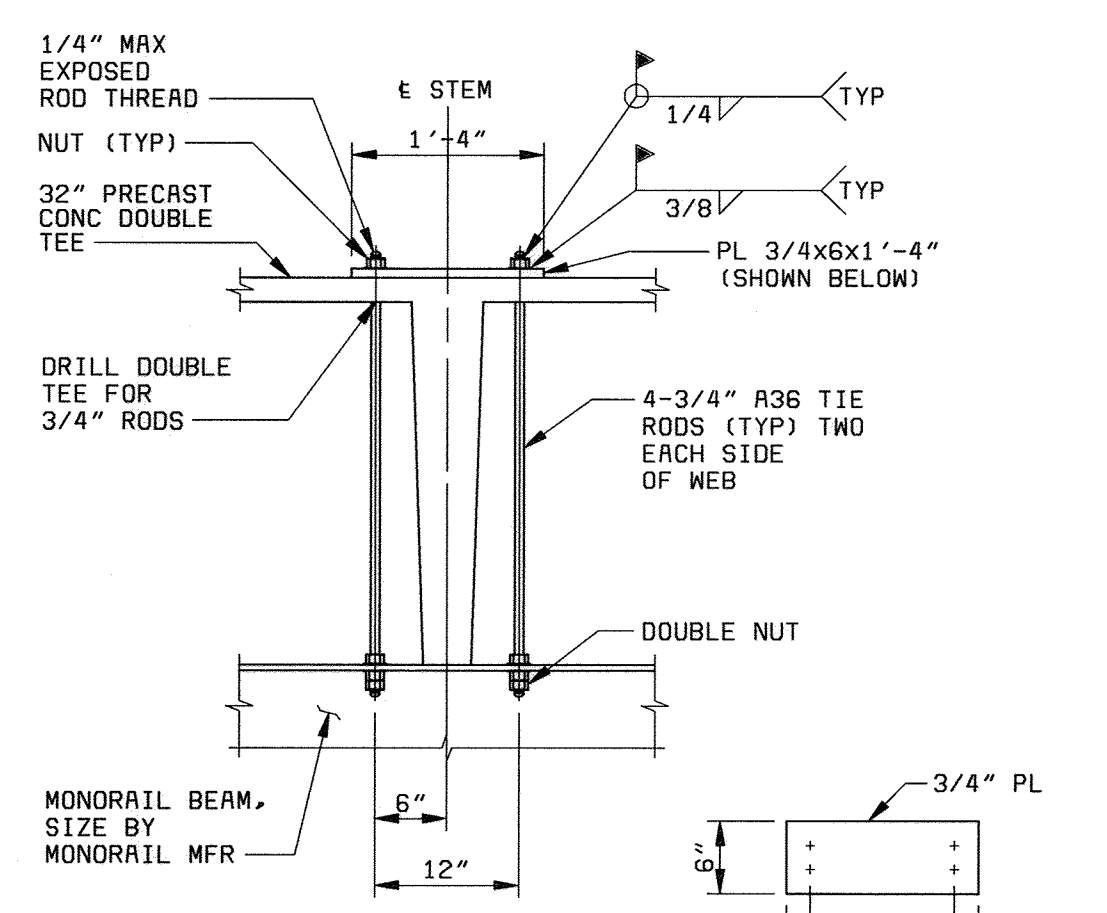
**DETAIL A**  
3" = 1'-0"



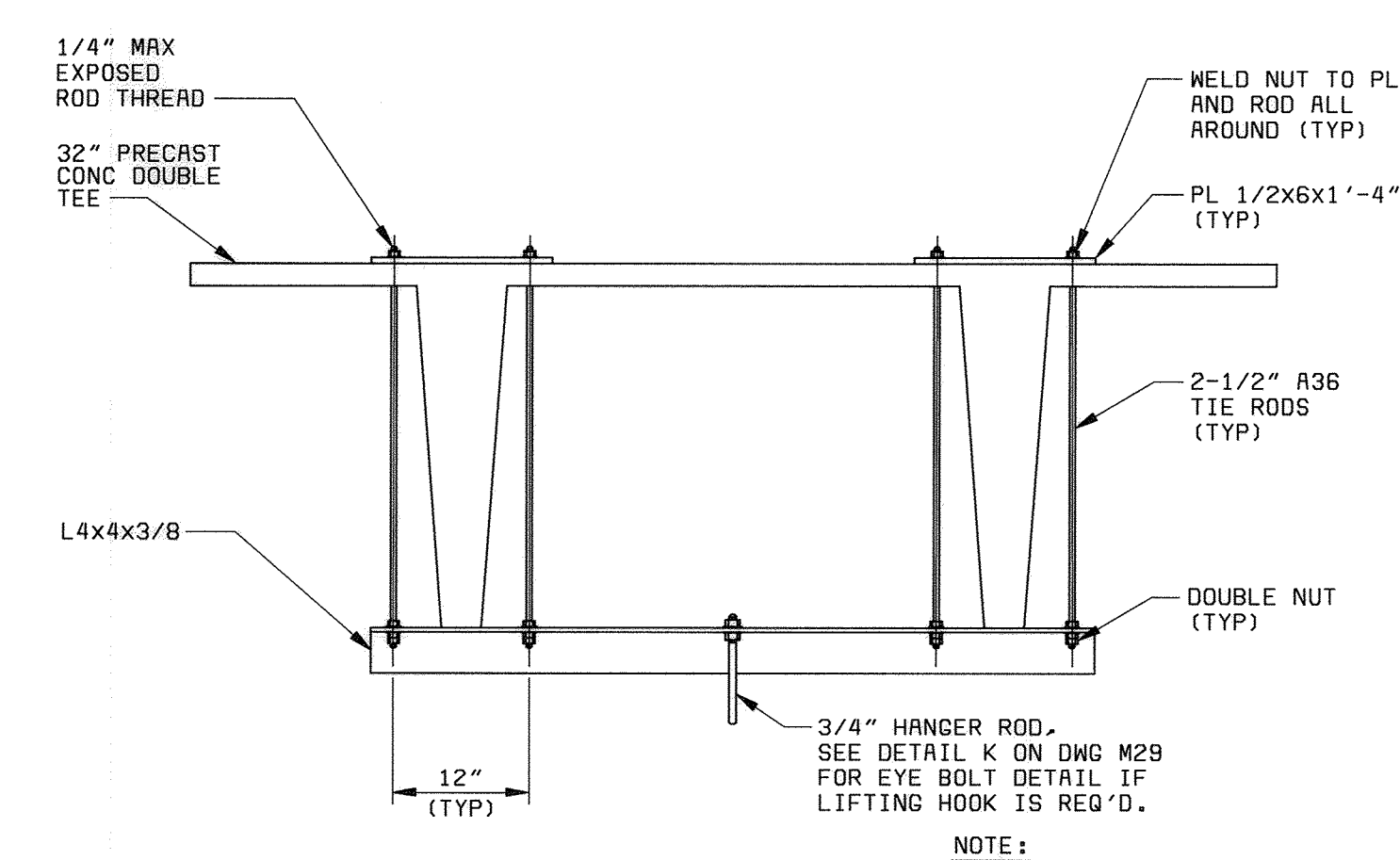
**DETAIL B**  
1 1/2" = 1'-0"



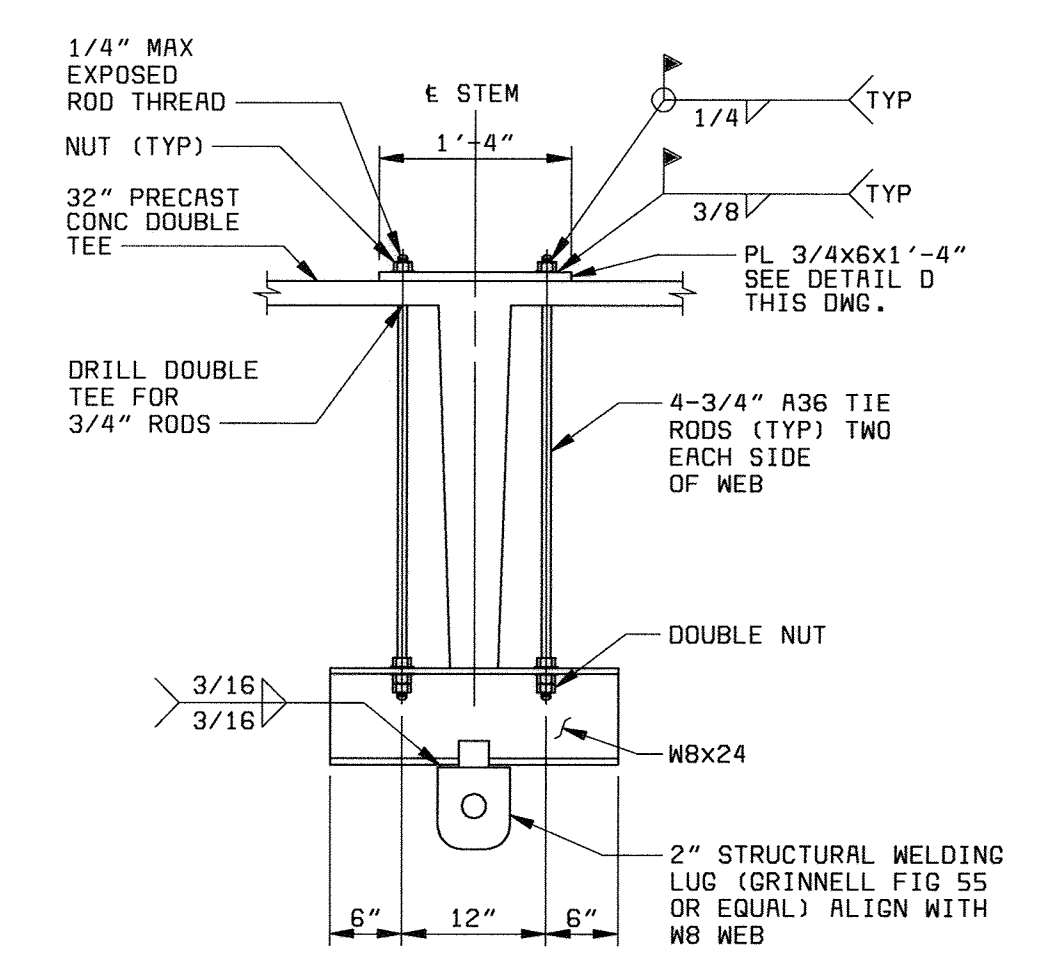
**DETAIL C**  
1 1/2" = 1'-0"



**DETAIL D**  
3/4" = 1'-0"



**DETAIL E**  
3/4" = 1'-0"



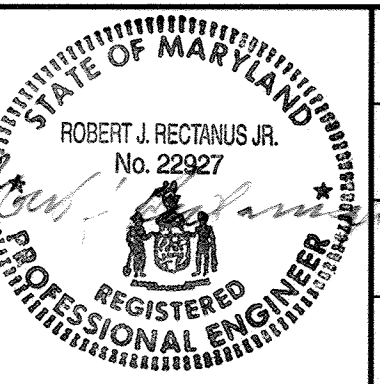
**DETAIL F**  
3/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus Jr.*  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE



DES: IFH	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: AJM						
CHK: NGM						

**NORTH BLOWER BUILDING  
STRUCTURAL**

**SECTIONS AND DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

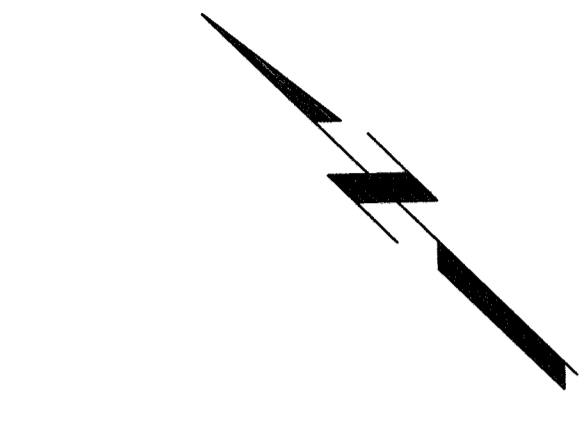
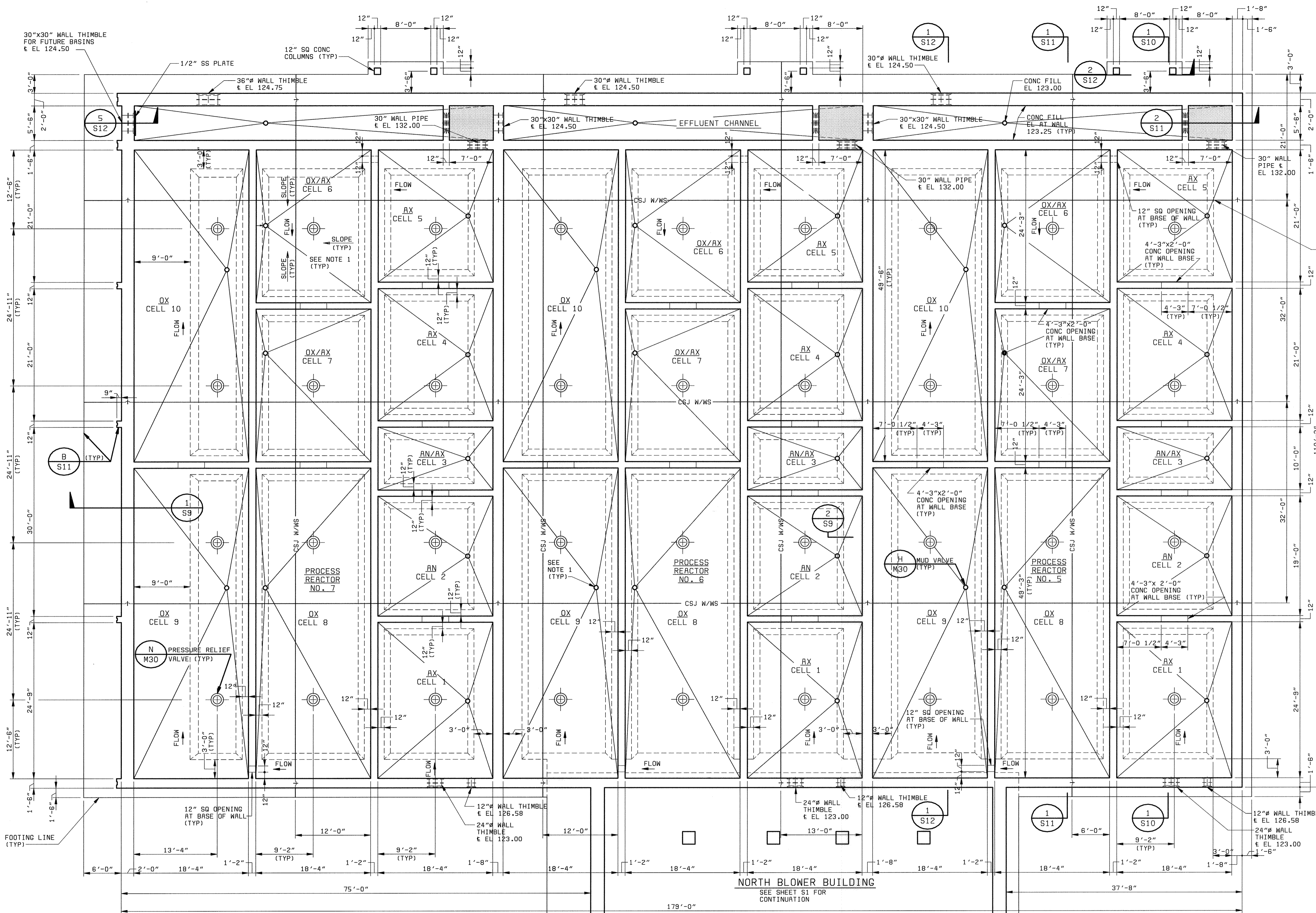
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 48 OF 161

**S6**





CONSTRUCTION JOINT (TYP)  
SEE NOTE 3

- NOTES**
1. BOTTOM SLAB EL AT ALL WALLS IS 120.00 AND SLAB EL AT MUD VALVE IS 119.83, UNLESS NOTED OTHERWISE.
  2. NOT ALL WALL PENETRATIONS/OPENINGS SHOWN. REFER TO PROCESS REACTORS MECHANICAL DRAWINGS FOR SIZE, EXACT LOCATIONS, AND ELEVATIONS.
  3. CONSTRUCTION JOINTS IN EXTERIOR WALLS, DIVIDER WALLS, AND SLAB ON GRADE SHALL HAVE WATERSTOPS, UNLESS SHOWN ON WALL SECTIONS. WATERSTOPS ARE NOT REQUIRED FOR CONSTRUCTION JOINTS IN BAFFLE WALLS AND TOP SLABS.
  4. ALL REACTORS ARE IDENTICAL UNLESS OTHERWISE INDICATED.

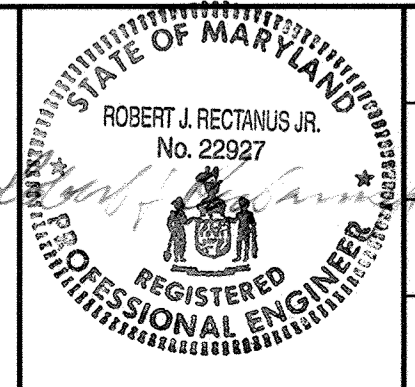
**SECTIONAL PLAN**  
1/8" = 1'-0"

**NORTH BLOWER BUILDING**  
SEE SHEET S1 FOR CONTINUATION

58472-101-PR-W-R0000550  
06/24/00  
P58472R

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
*Robert J. Rectanus Jr.*  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland  
*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE

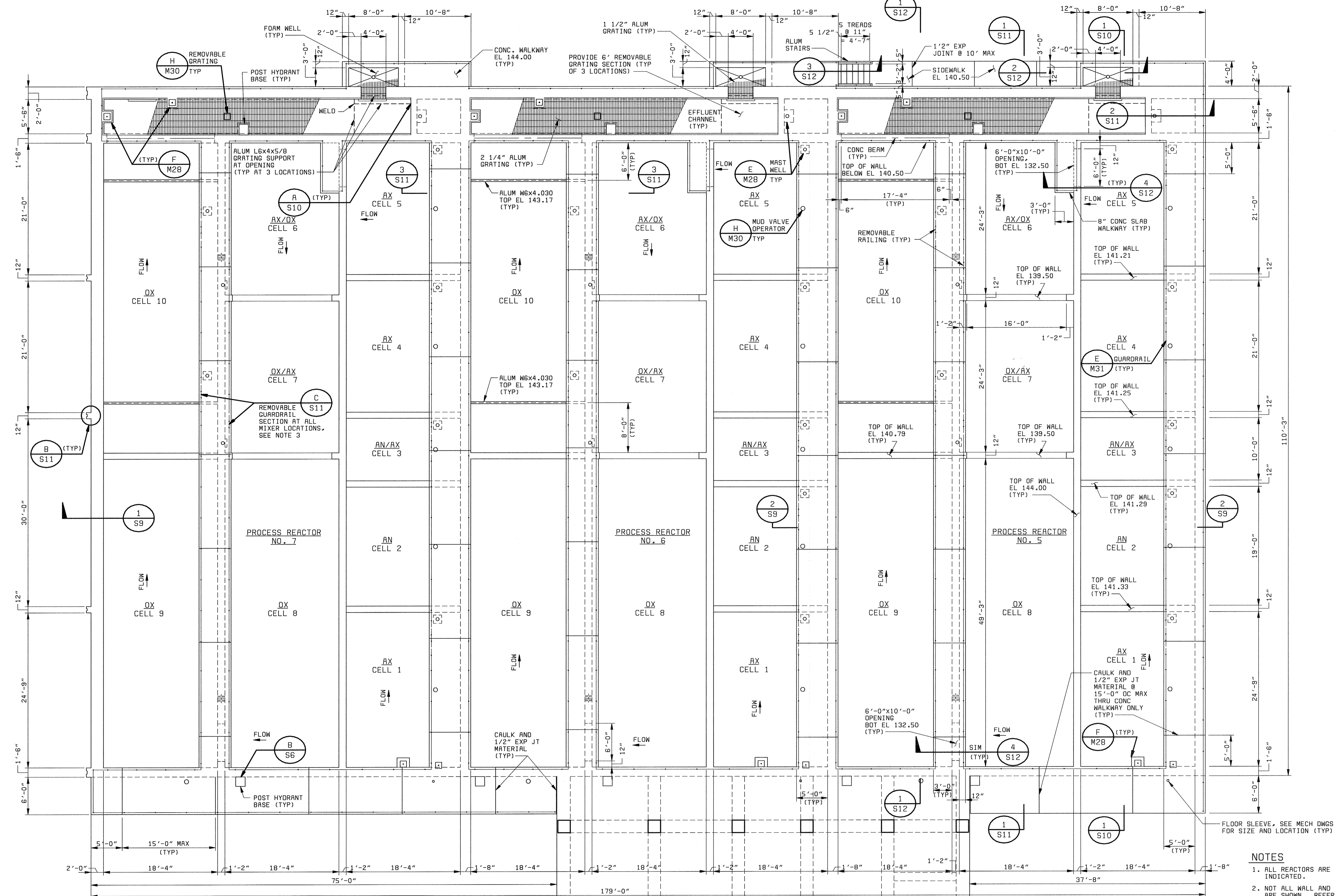


DES: IFH	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: SLF						
CHK: NGM						

**NORTH PROCESS REACTORS**  
**STRUCTURAL**  
**SECTIONAL PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 49 OF 161  
**S7**



**TOP PLAN**  
1/8" = 1'-0"

**NORTH BLOWER BUILDING**  
SEE SHEET S2 FOR CONTINUATION

- NOTES**
- ALL REACTORS ARE IDENTICAL UNLESS OTHERWISE INDICATED.
  - NOT ALL WALL AND SLAB PENETRATIONS/OPENINGS ARE SHOWN. REFER TO MECHANICAL DRAWINGS FOR SIZE, LOCATIONS, AND ELEVATIONS.
  - CONTRACTOR SHALL COORDINATE THE LOCATION OF THE REMOVABLE HANDRAIL WITH THE MIXER LOCATION, MAST WELL, AND HOIST SWING ANGLE.

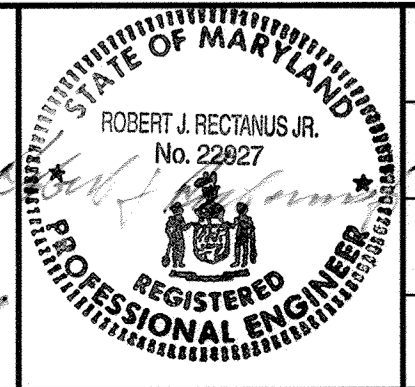
58472-101-PR-W-00000550  
05/24/20  
05/24/20

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus, Jr.*  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus, Jr.*  
REG. PROF. ENGR. DATE



DES: IFH	DATE: 6/23/00	NO.	BY	CK	APP
DRN: SLF, AJM					
CHK: NGM					
REVISIONS AND RECORD OF ISSUE					

**NORTH PROCESS REACTORS  
STRUCTURAL**

**TOP PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

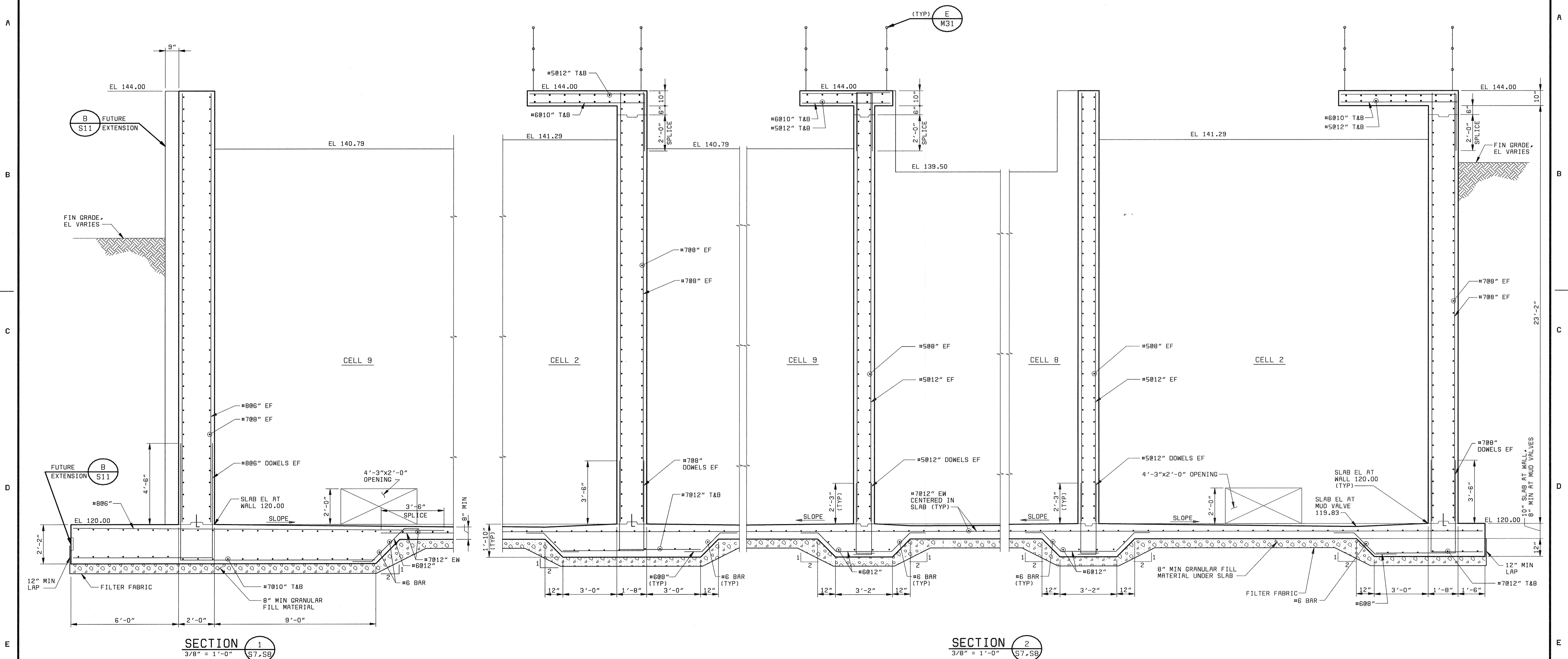
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 50 OF 161

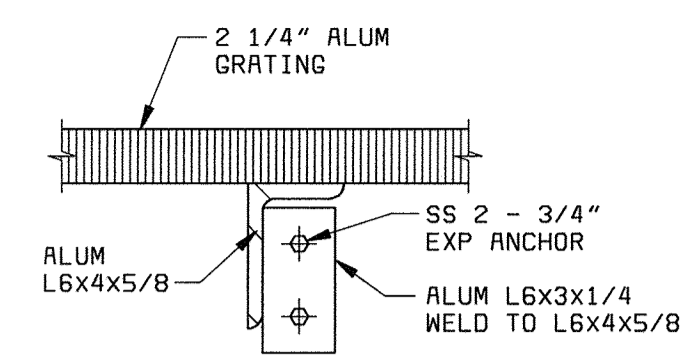
**S8**



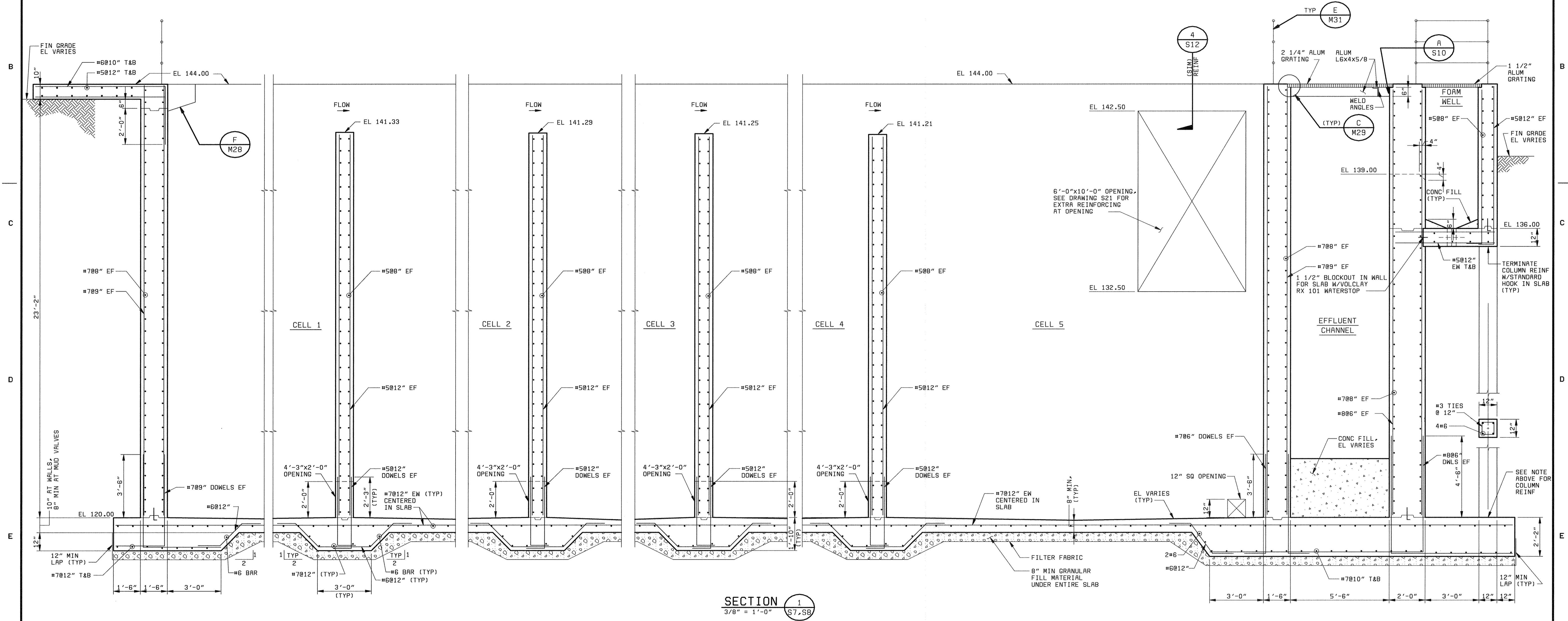
**SECTION 1**  
3/8" = 1'-0" (S7.S8)

**SECTION 2**  
3/8" = 1'-0" (S7.S8)

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Rectanus Jr.</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: IFH							<b>NORTH PROCESS REACTORS</b> <b>STRUCTURAL</b>  <b>SECTIONS</b>	<b>LITTLE PATUXENT WATER RECLAMATION PLANT</b> <b>ADDITION NO. 6</b> <b>BNR TREATMENT CAPACITY EXPANSION</b>  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: RM	CHK: NGM	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY			CK



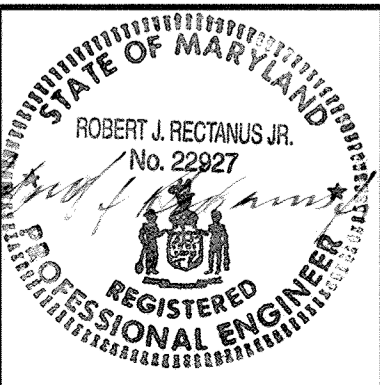
**DETAIL A**  
NO SCALE  
S8, S10, S11



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
Robert M. Beniger 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland  
  
REG. PROF. ENGR. DATE

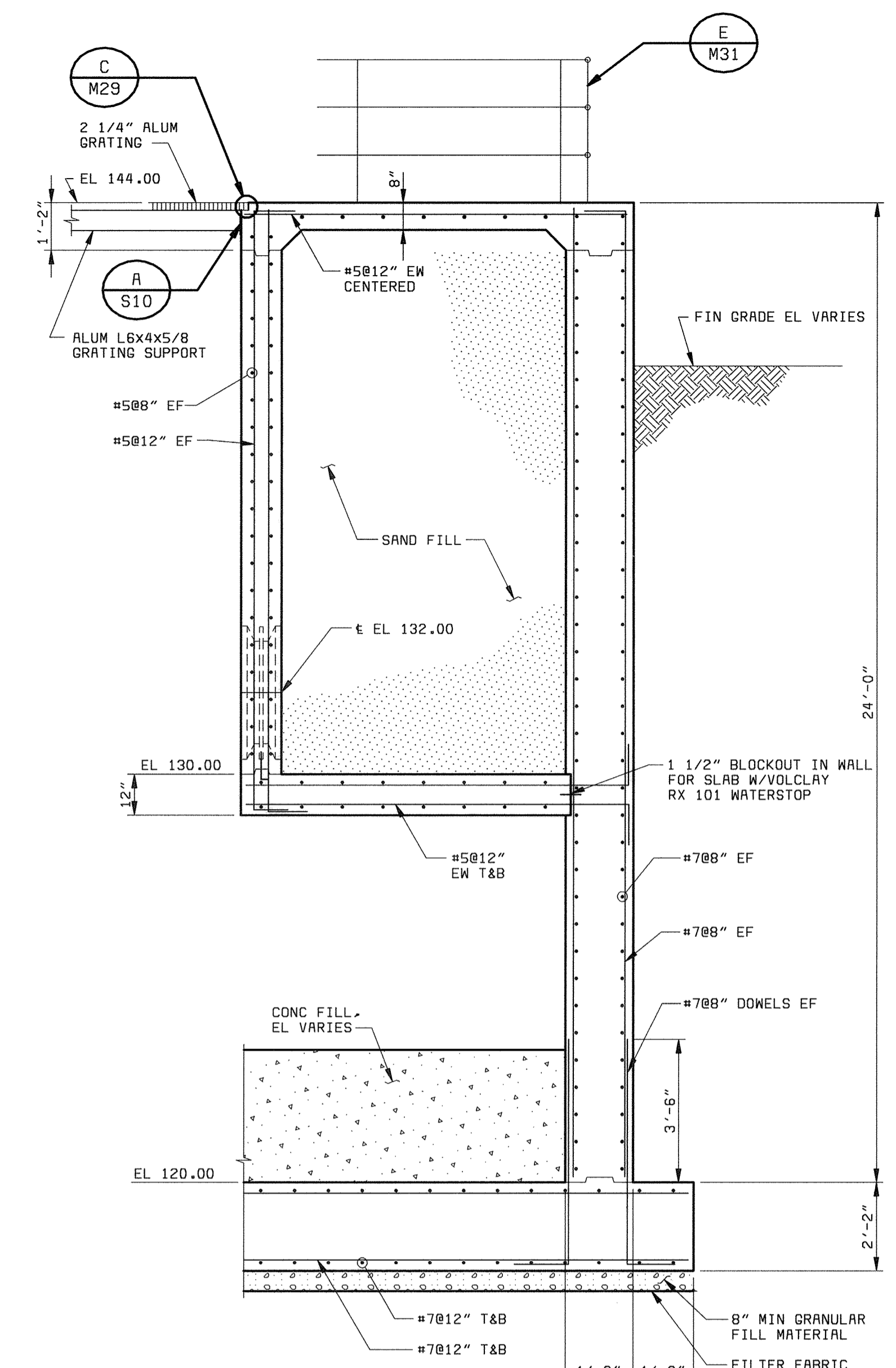
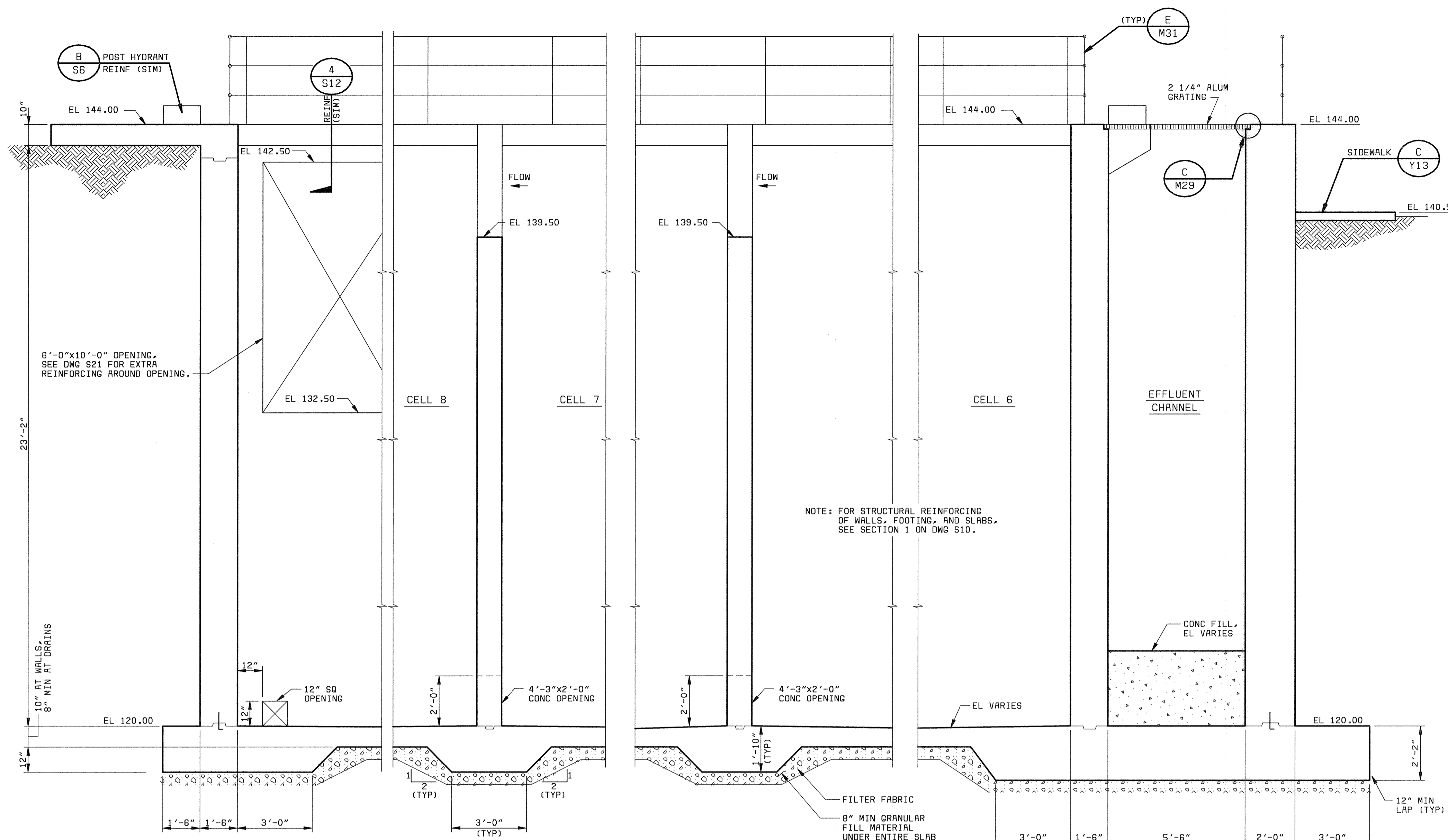


DES: IFH									
DRN: SLF, AJM									
CHK: NGM									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**NORTH PROCESS REACTORS  
STRUCTURAL**  
  
SECTION

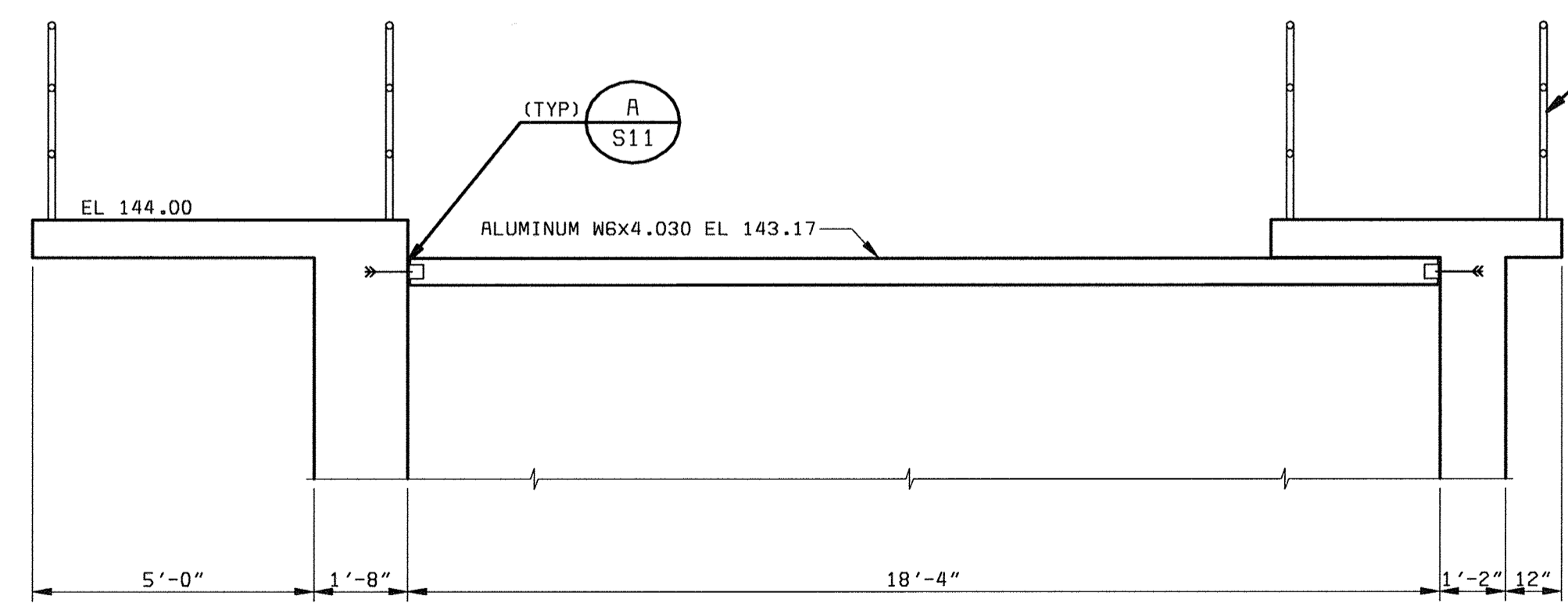
**LITTLE PATUXENT WATER RECLAMATION  
PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN  
  
SHEET  
52 OF 161  
  
**S10**

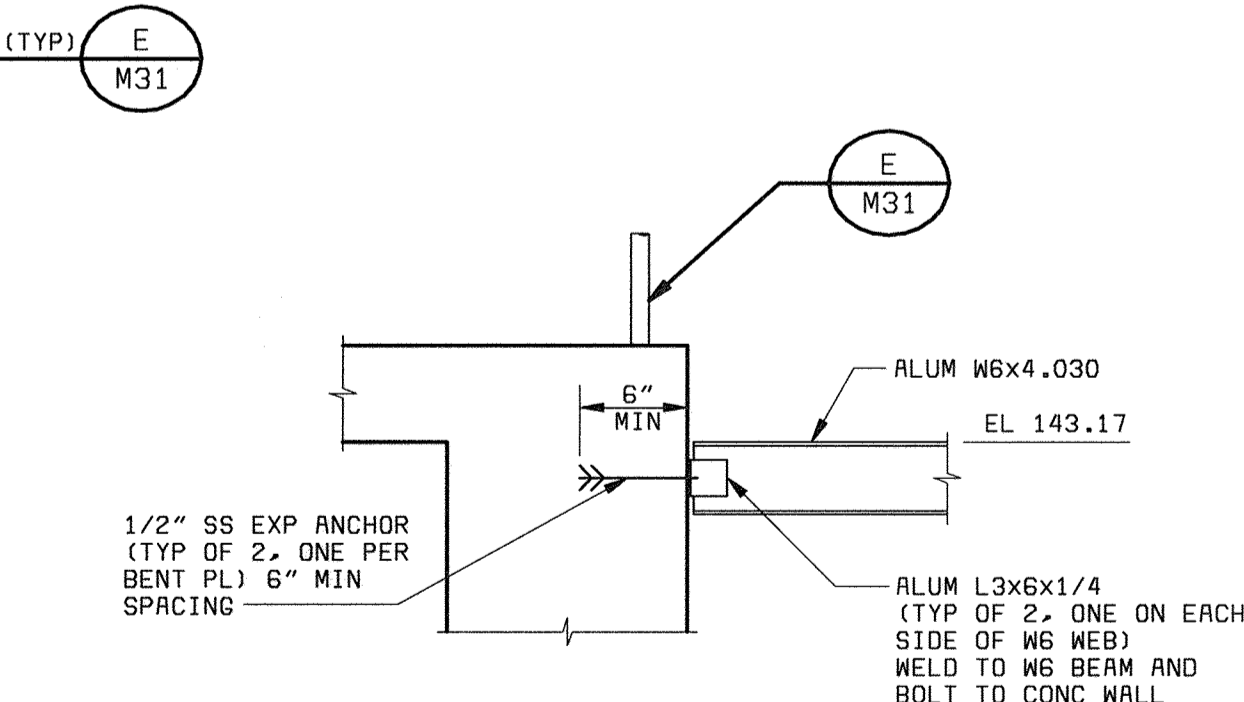


SECTION 1  
3/8" = 1'-0"

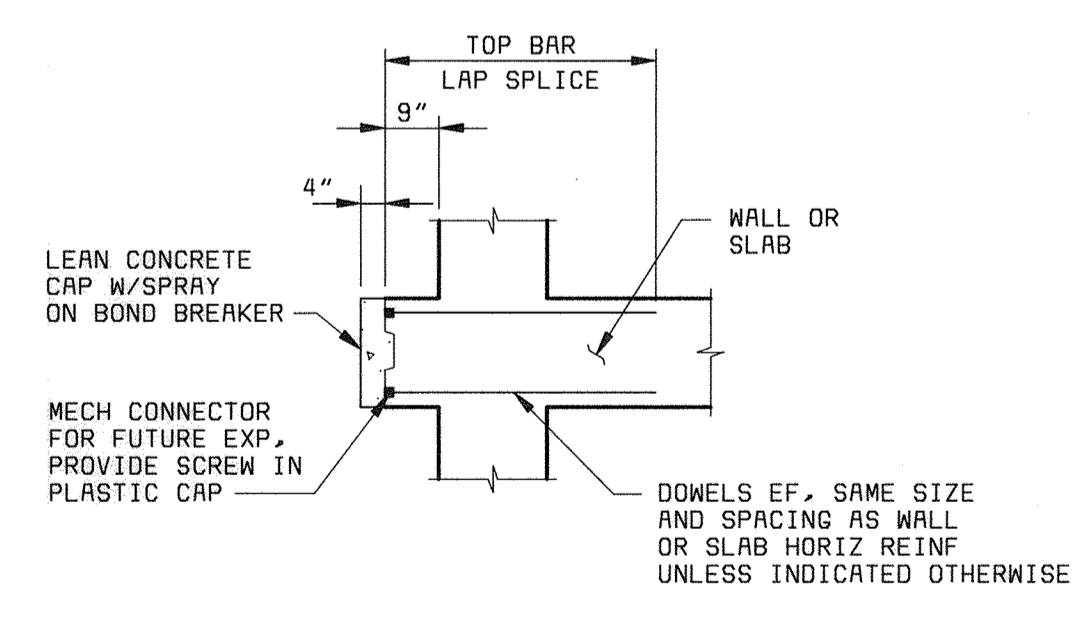
SECTION 2  
3/8" = 1'-0"



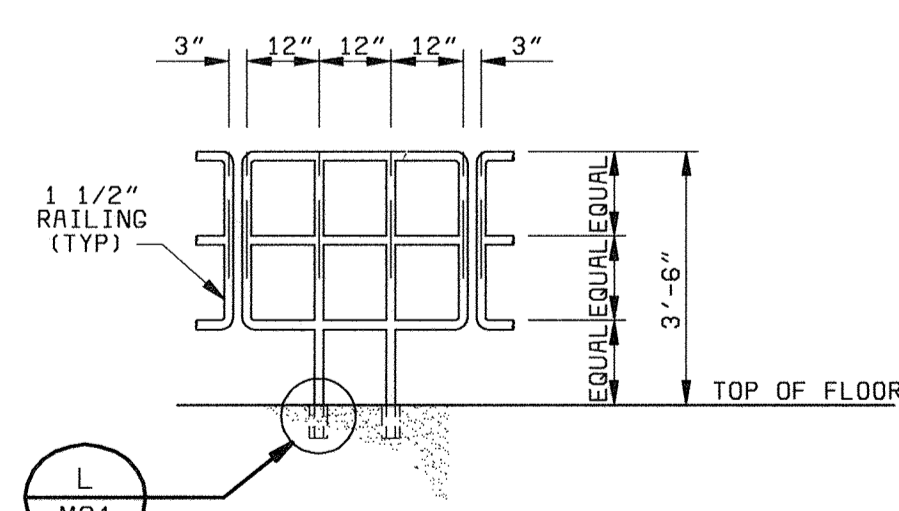
SECTION 3  
3/8" = 1'-0"



DETAIL A  
NO SCALE



FUTURE EXTENSION B  
NO SCALE



REMOVABLE GUARDRAIL C  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
Robert Benjamin 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland  
  
REG. PROF. ENGR. DATE

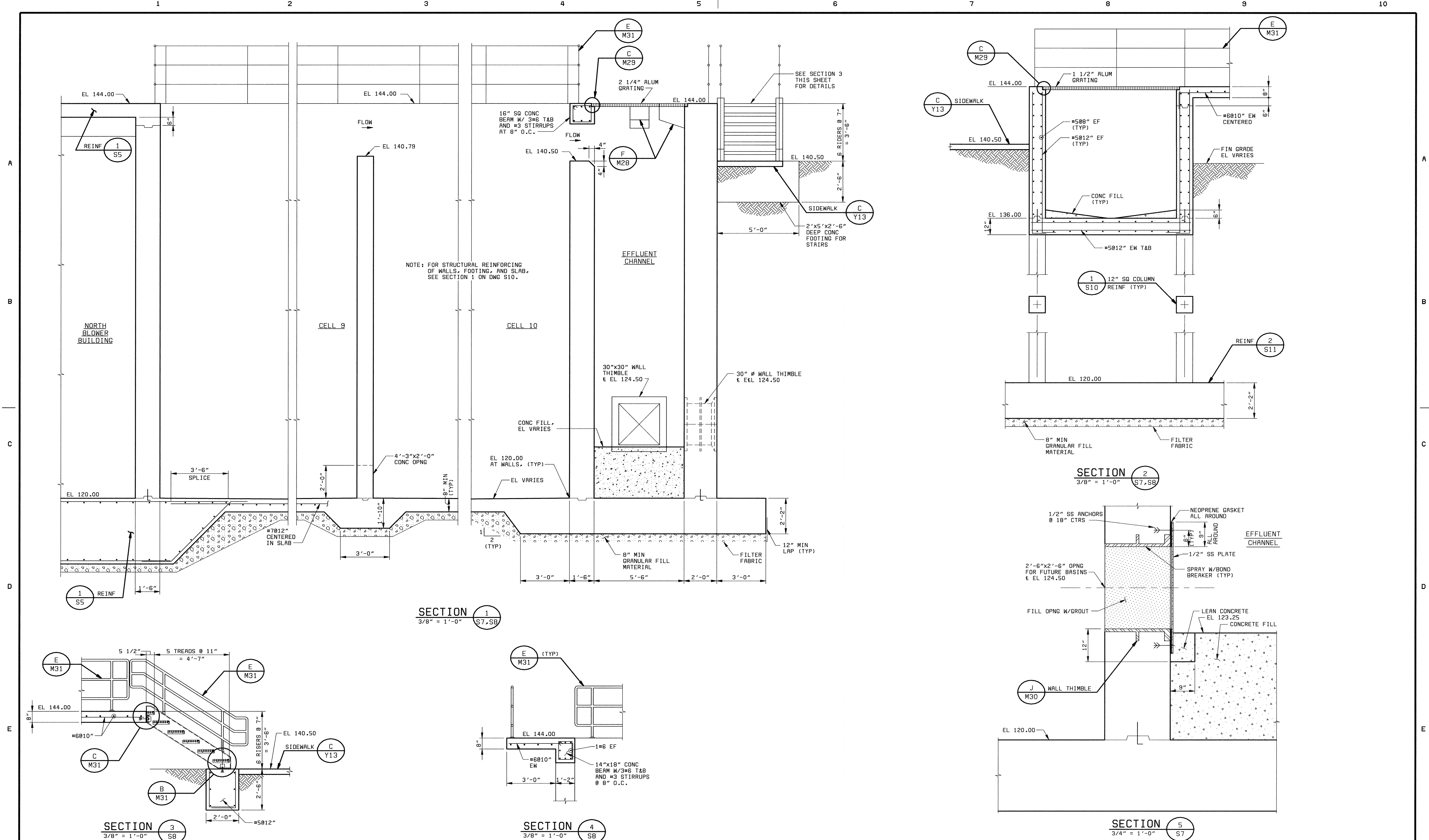
STATE OF MARYLAND  
ROBERT J. RECTANUS, JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: IPH					
DRN: SLF, RJM					
CHK: NGM					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

NORTH PROCESS REACTORS  
STRUCTURAL  
  
SECTIONS AND DETAILS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 53 OF 161  
S11

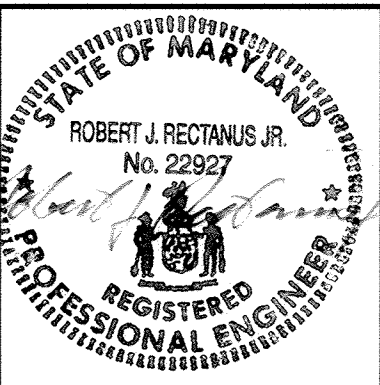


DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Reitanus Jr.*  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Reitanus Jr.*  
REG. PROF. ENGR. DATE



DES: IFH					
DRN: SLF, AJM					
CHK: NCM					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH PROCESS REACTORS  
STRUCTURAL**

**SECTIONS AND DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

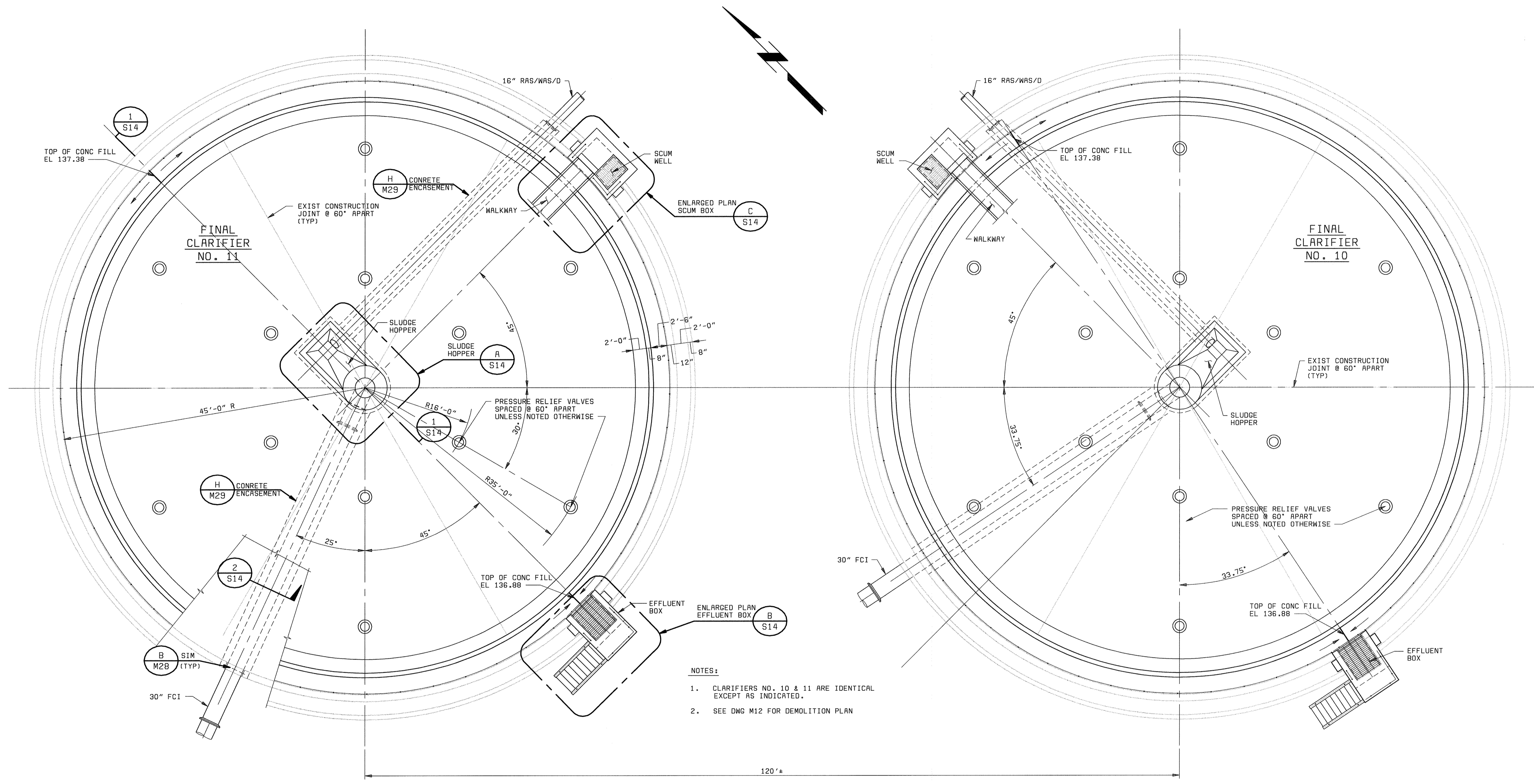
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 54 OF 161

**S12**



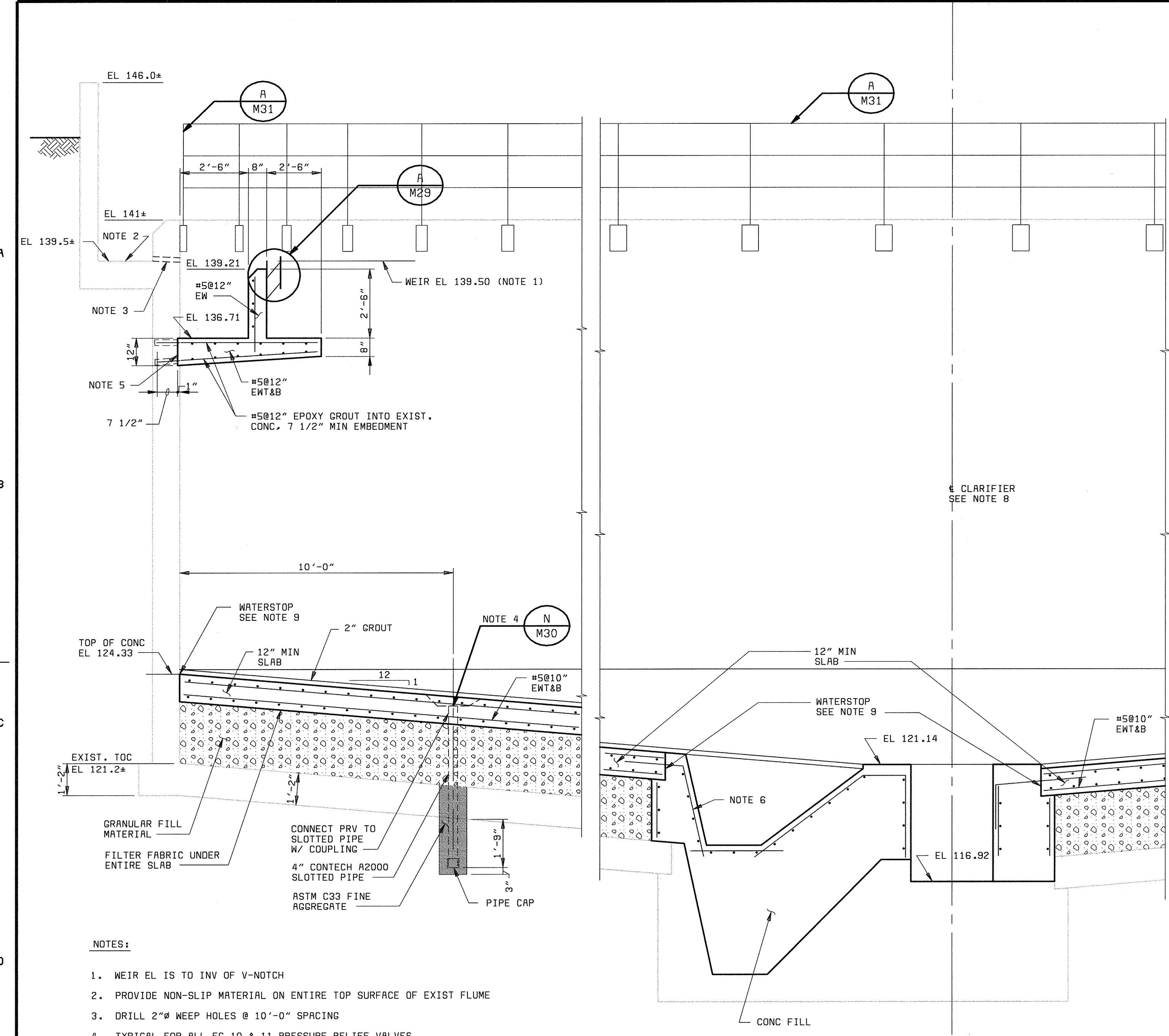
- NOTES:
1. CLARIFIERS NO. 10 & 11 ARE IDENTICAL EXCEPT AS INDICATED.
  2. SEE DWG M12 FOR DEMOLITION PLAN

PLAN  
1/8" = 1'-0"

56472-101-FC-S-R0000647 (XVFC11M)

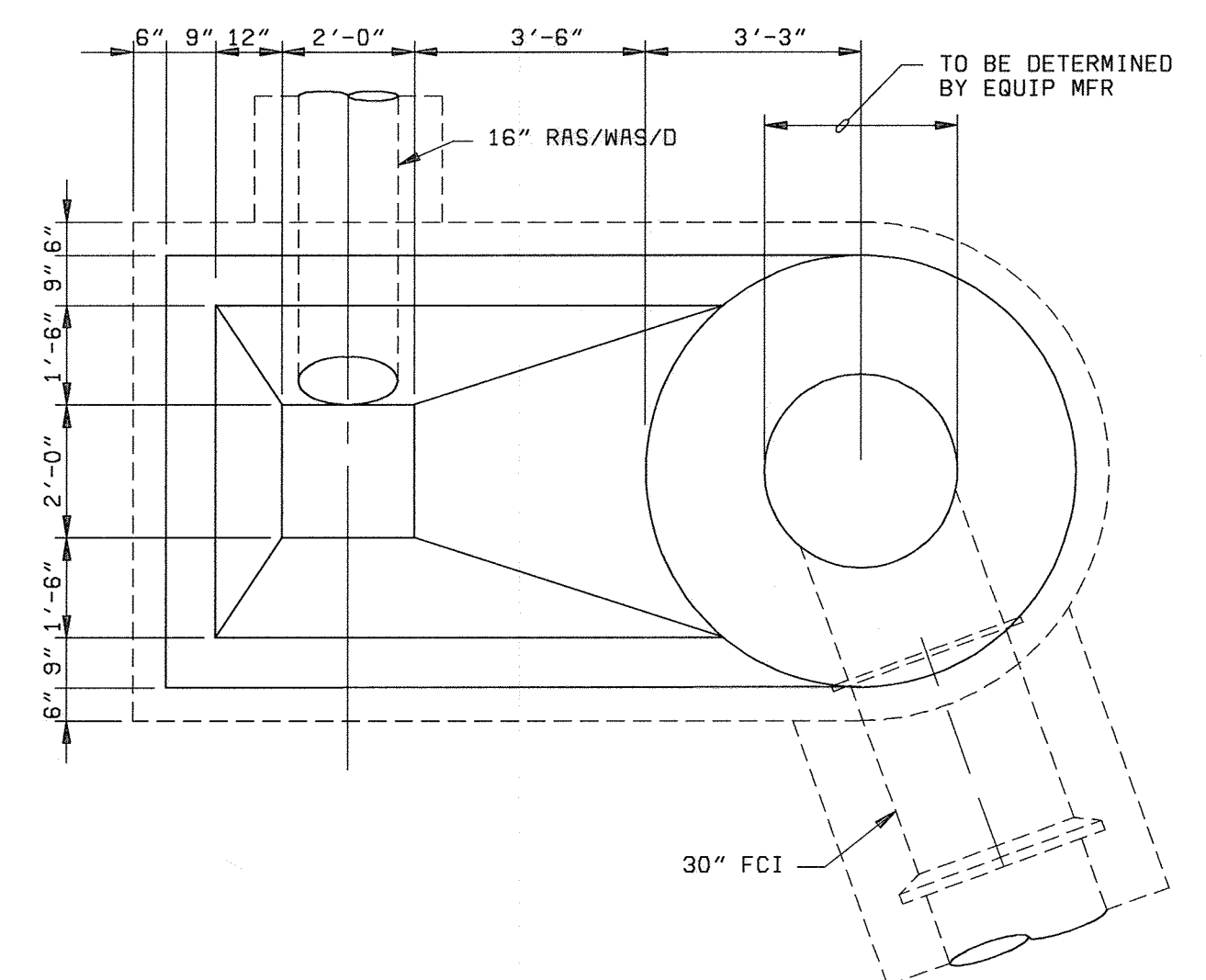
058472  
058472A

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Rectanus, Jr.</i> CHIEF, BUREAU OF UTILITIES DATE 6-29-00	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  <i>Robert J. Rectanus, Jr.</i> REG. PROF. ENGR. DATE	 ROBERT J. RECTANUS, JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: FKA							FC 10 & 11 STRUCTURAL  PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: RLC	CHK: NGM	DATE: 6/23/00							
											S13	

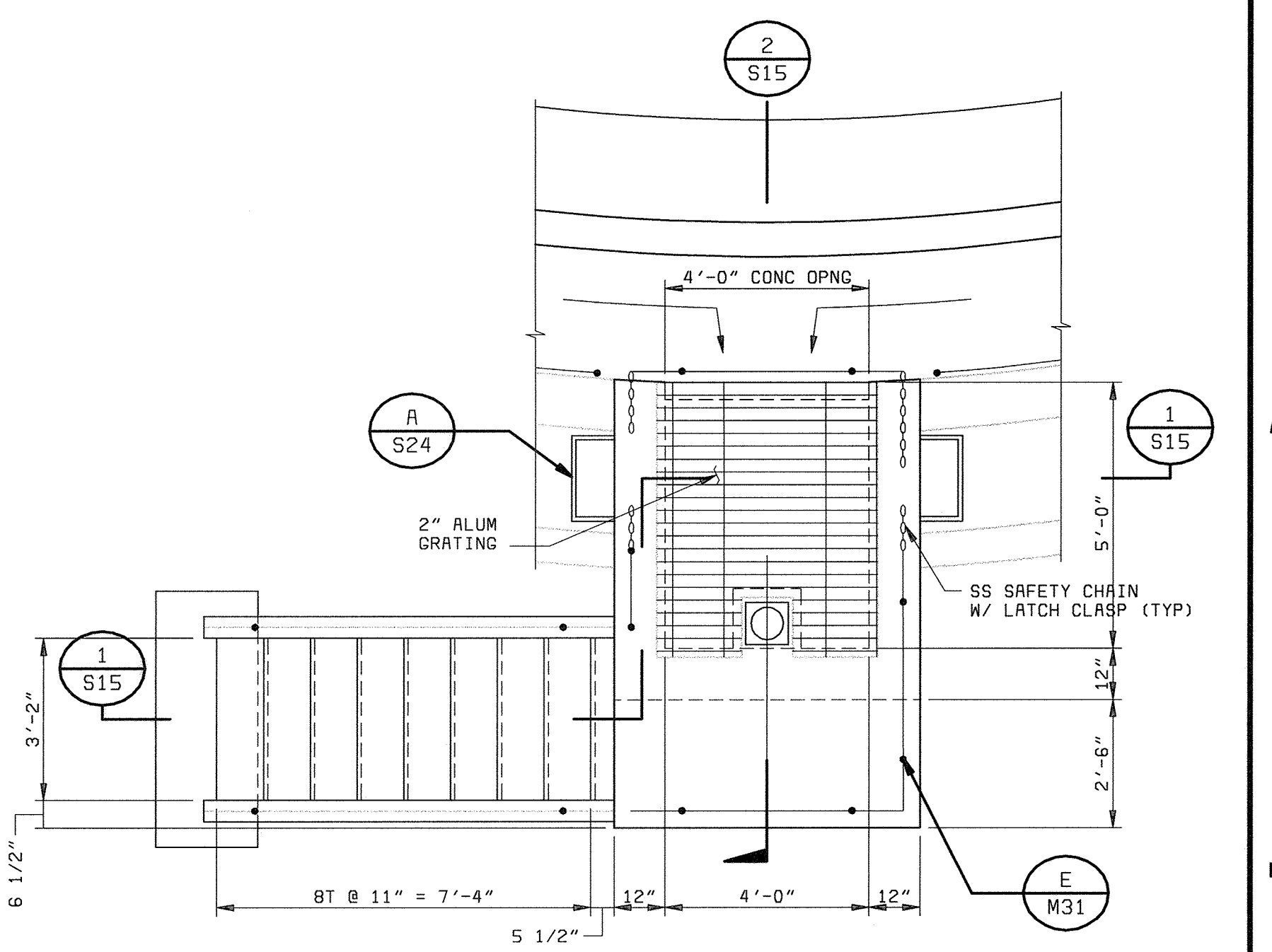


- NOTES:**
- WEIR EL IS TO INV OF V-NOTCH
  - PROVIDE NON-SLIP MATERIAL ON ENTIRE TOP SURFACE OF EXIST FLUME
  - DRILL 2"Ø WEEP HOLES @ 10'-0" SPACING
  - TYPICAL FOR ALL FC 10 & 11 PRESSURE RELIEF VALVES
  - ROUGHEN EXIST CONC 1/4" MIN DEPTH
  - ALL REINFORCEMENT SHALL BE #5@12" UNLESS NOTED OTHERWISE
  - MOUNT STRUCTURAL ANGLE, WEIR WALL BRACKET, AND ATTACHMENT HARDWARE BY LAUNDER MFR. ALL ATTACHMENT HARDWARE SHALL BE TYPE 316 SS. ANCHOR BOLTS SHALL BE 5/8" DIA MIN.
  - BASIN EQUIPMENT NOT SHOWN
  - GREENSTREAK HYDROHITE WATERSTOP TYPE CJ-0725-3K INSTALLED PER MFR REQUIREMENTS AROUND ALL BASINS.

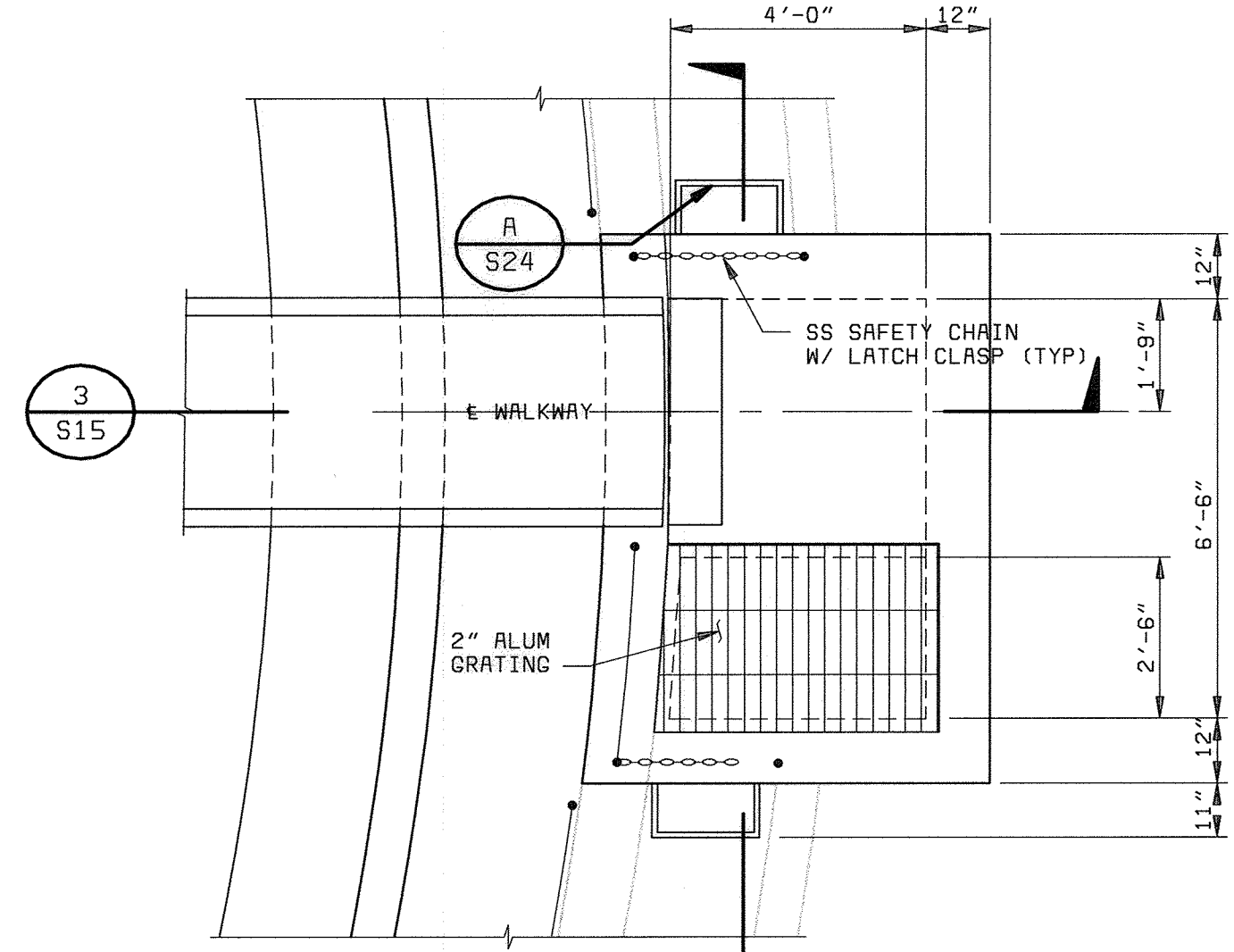
**SECTION 1**  
3/8" = 1'-0"



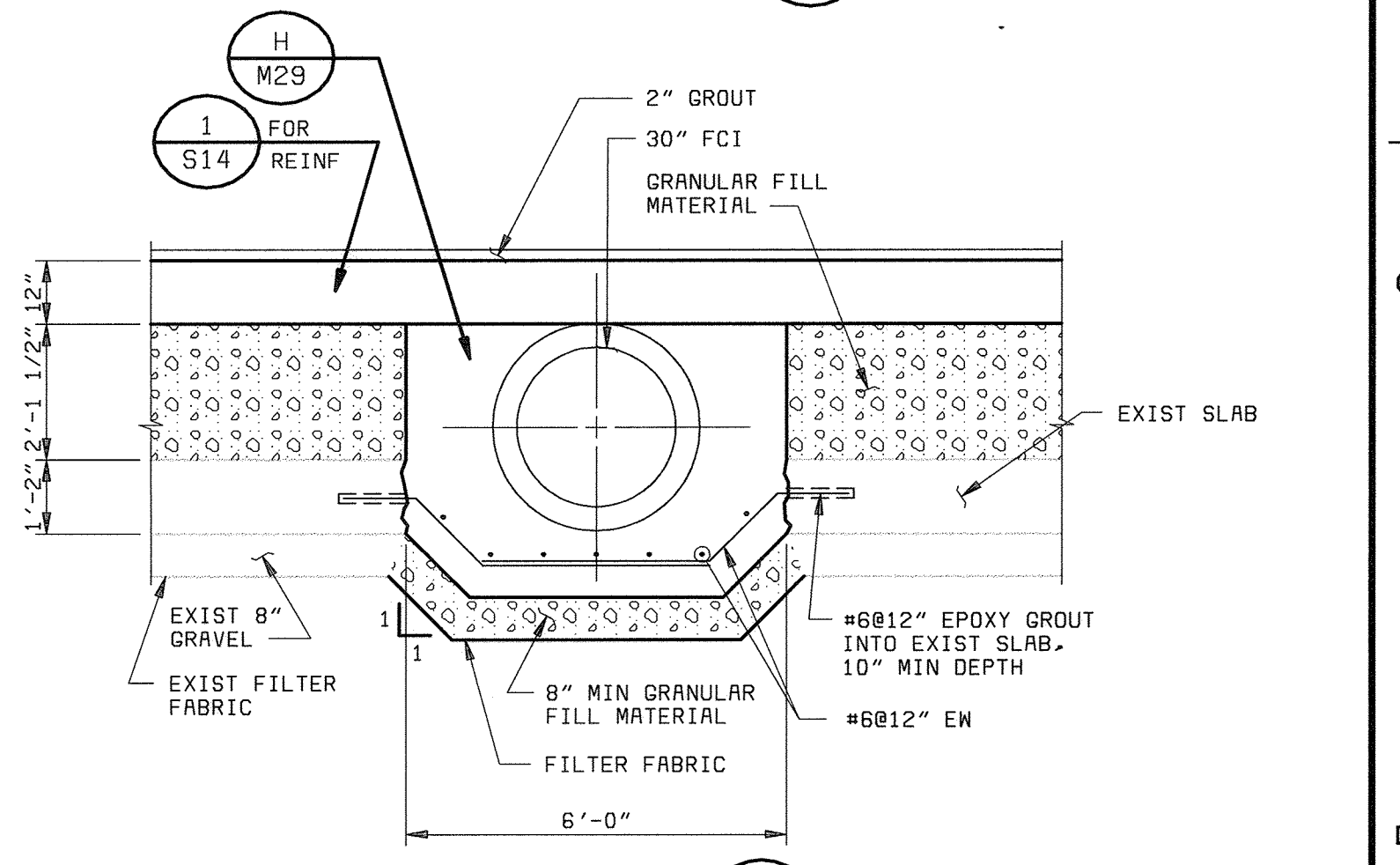
**ENLARGED PLAN SLUDGE HOPPER**  
3/8" = 1'-0"



**ENLARGED PLAN EFFLUENT BOX**  
3/8" = 1'-0"



**ENLARGED PLAN SCUM BOX**  
3/8" = 1'-0"



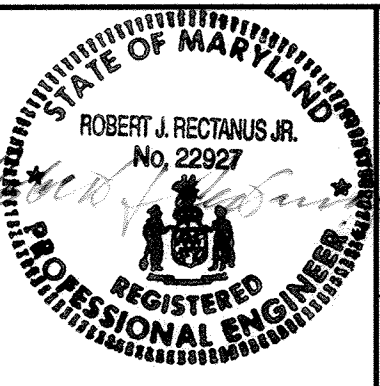
**SECTION 2**  
3/8" = 1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Dawson* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE



DES: FKA	DRN: RLC	CHK: NGM	DATE: 6/23/00
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY
		CK	APP

FC 10 & 11  
STRUCTURAL

SECTIONS AND DETAILS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

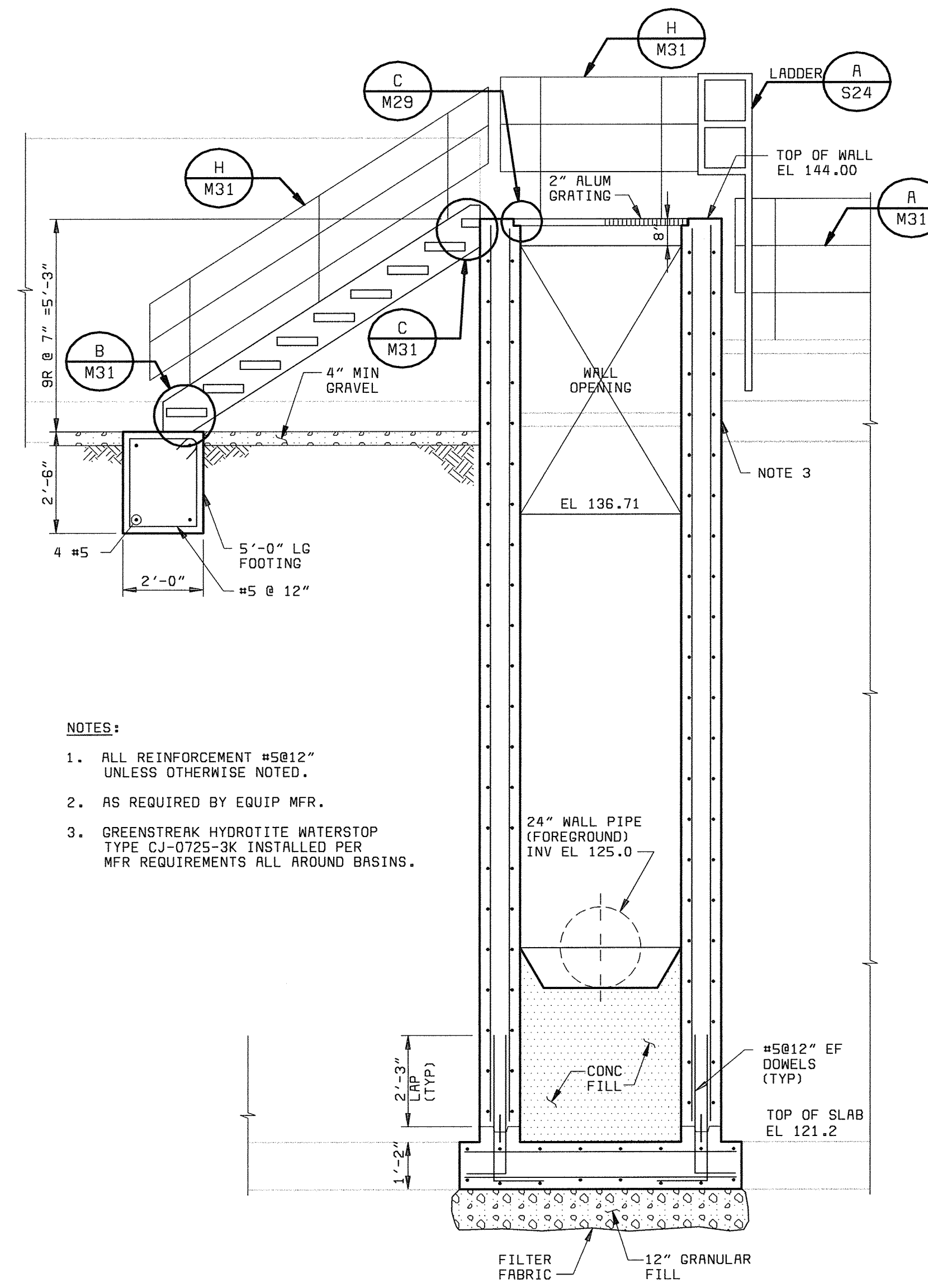
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

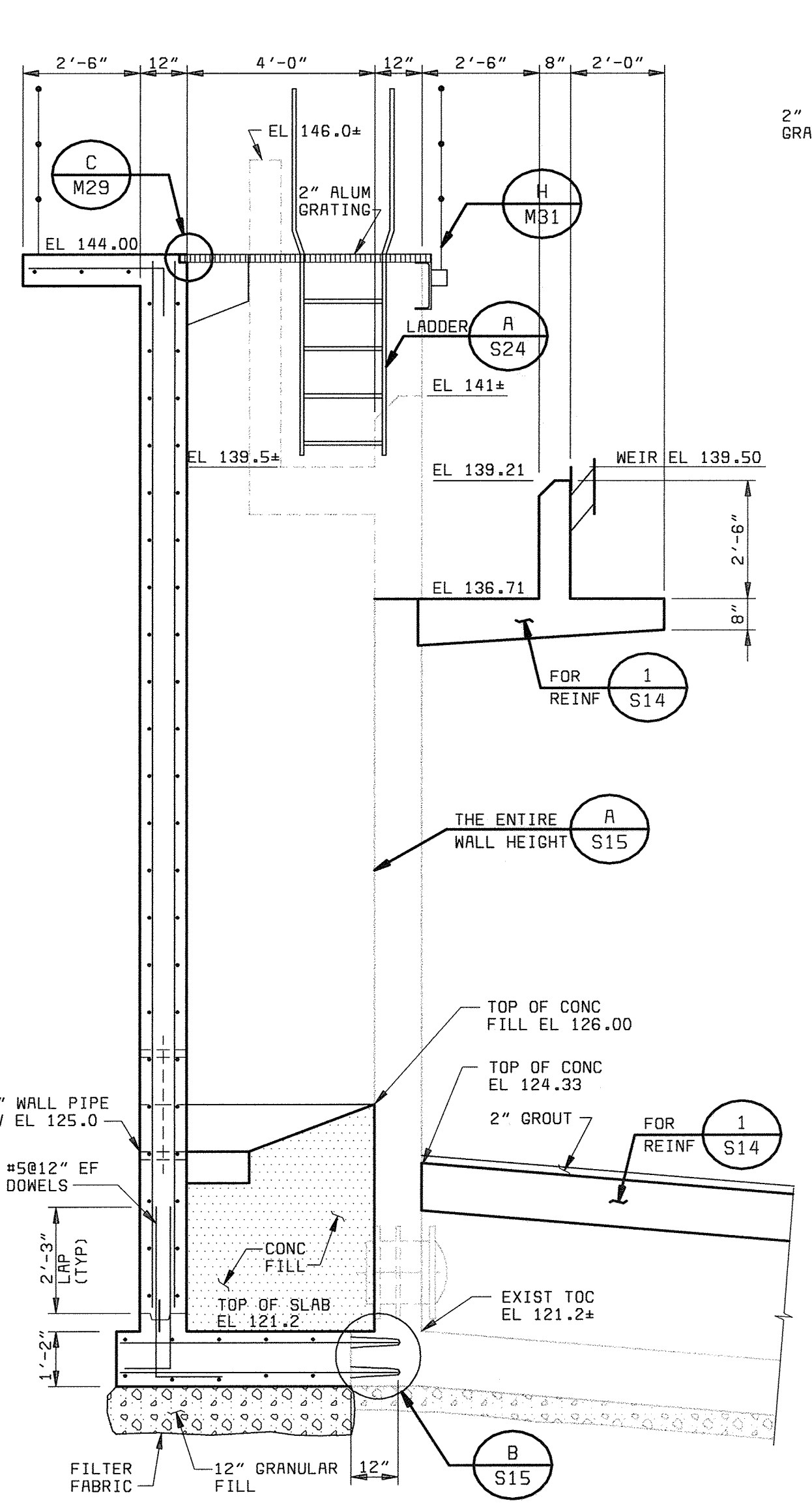
SHEET 56 OF 161

**S14**

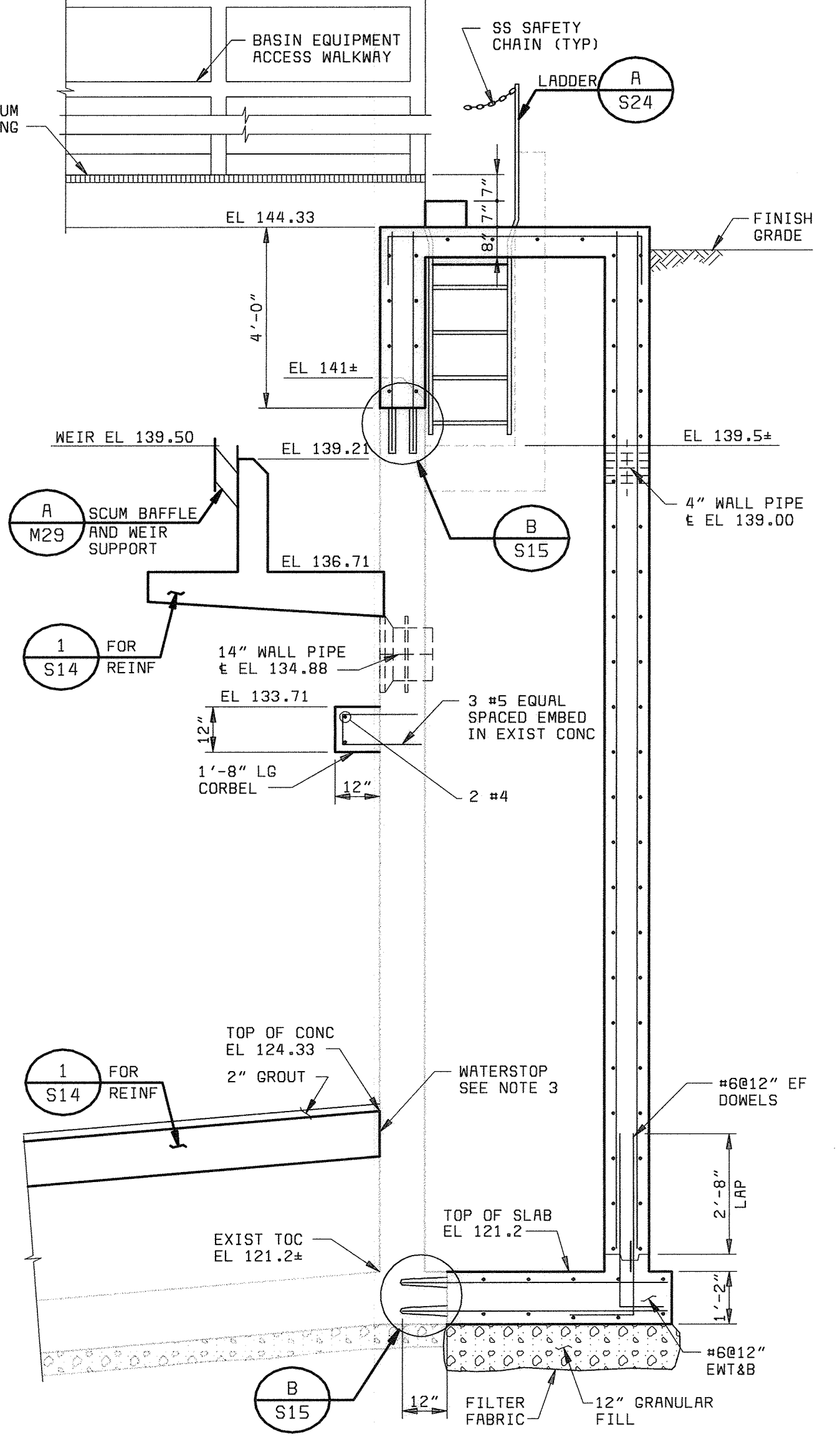




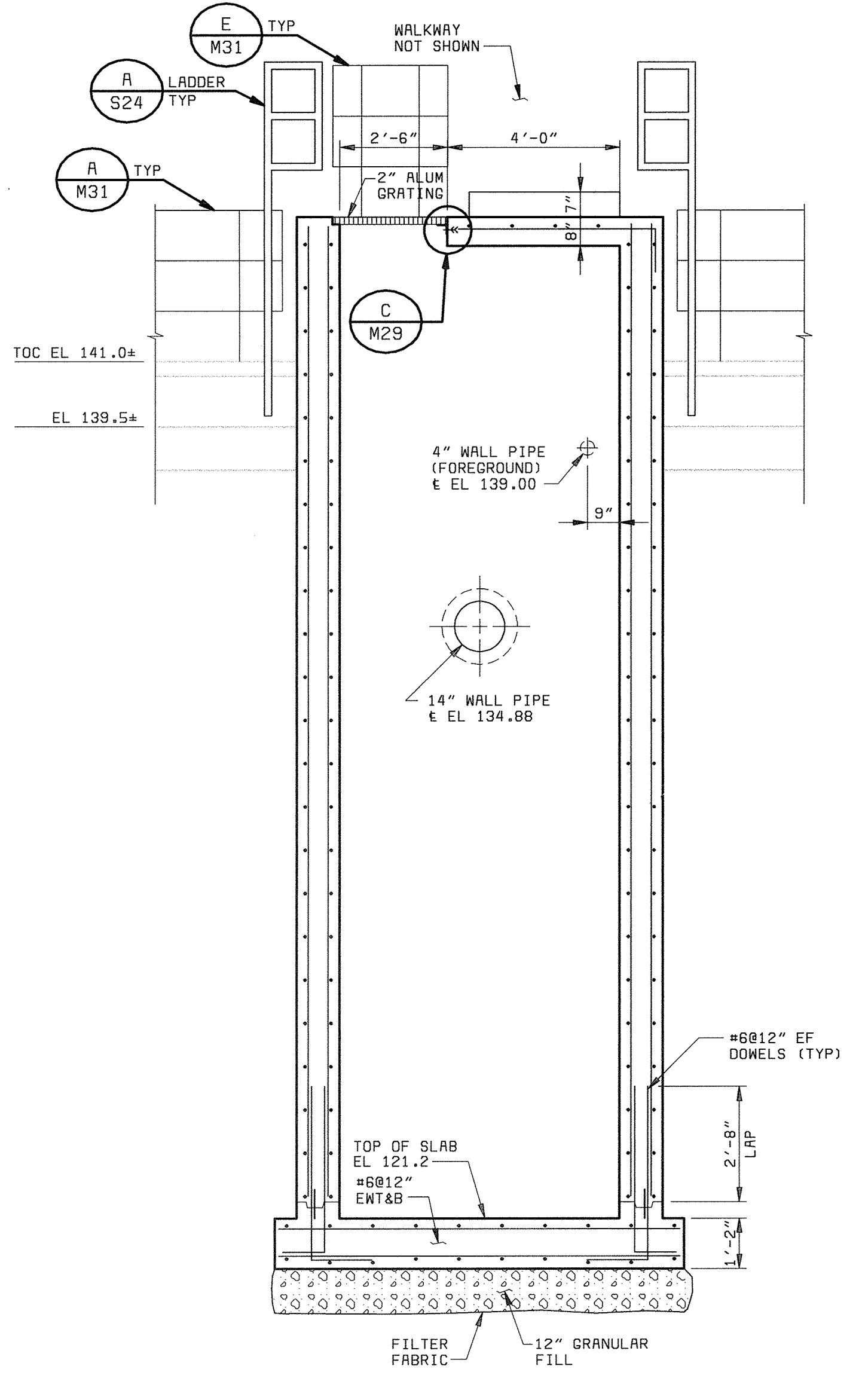
SECTION 1  
3/8" = 1'-0" S14



SECTION 2  
3/8" = 1'-0" S14

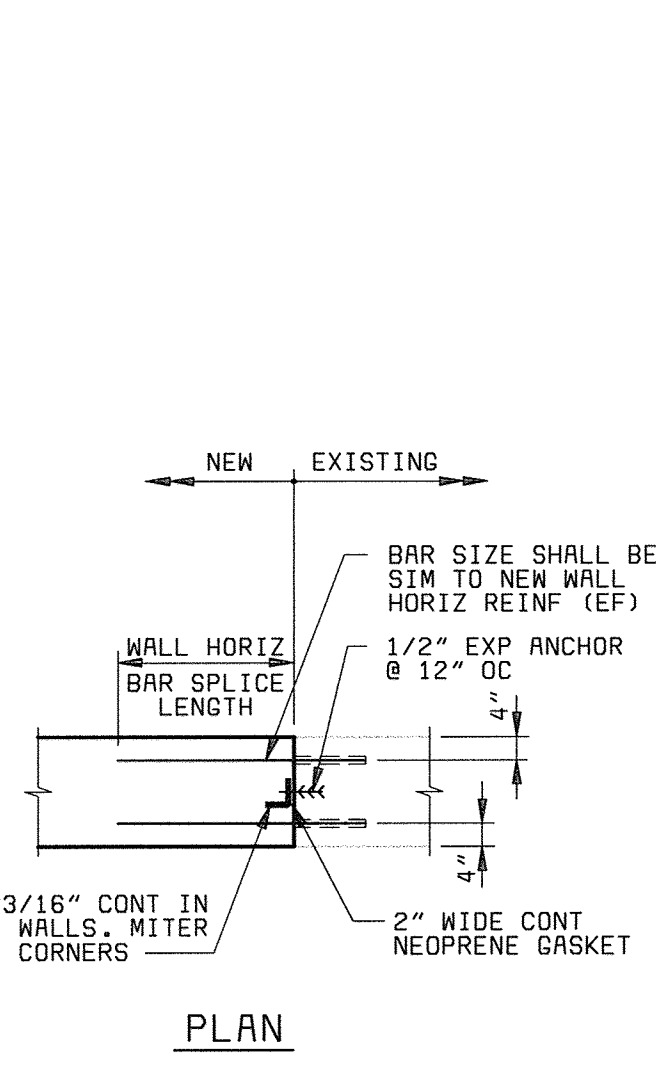


SECTION 3  
3/8" = 1'-0" S14

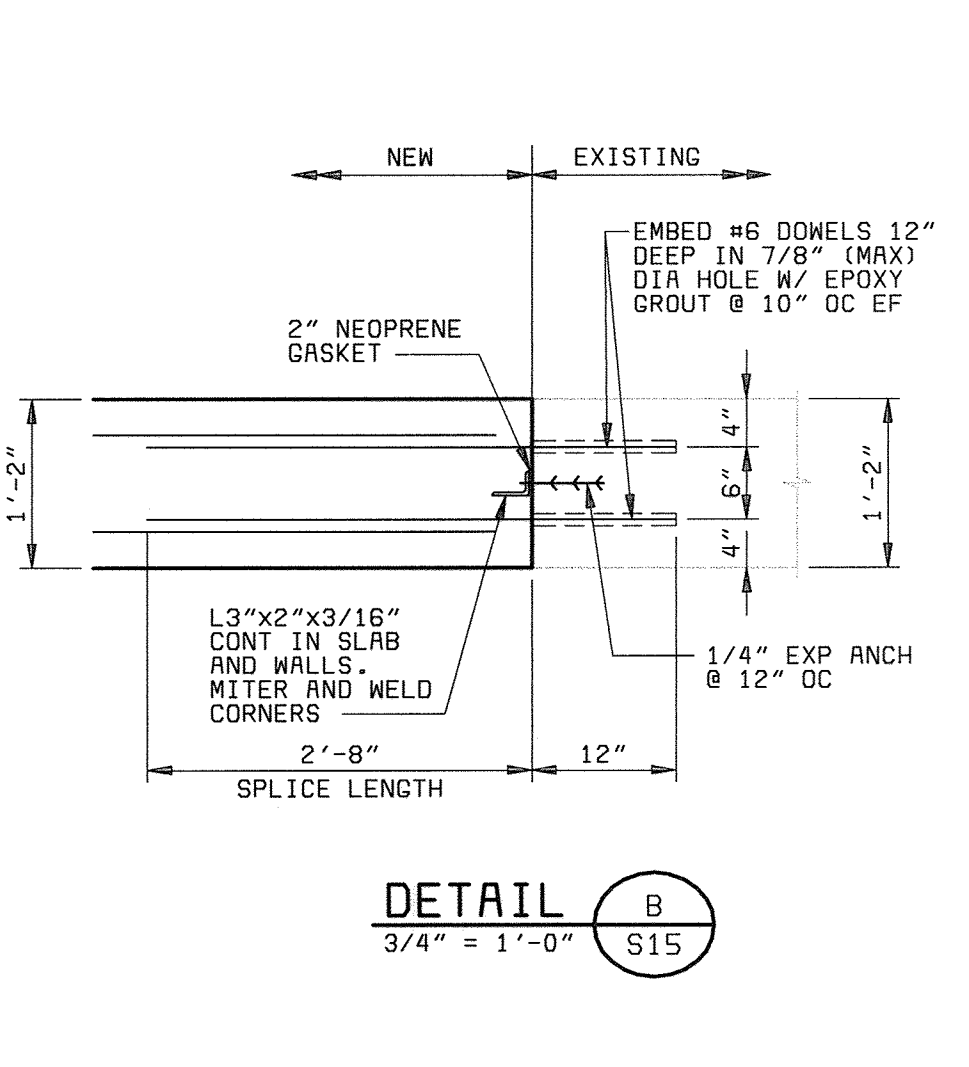
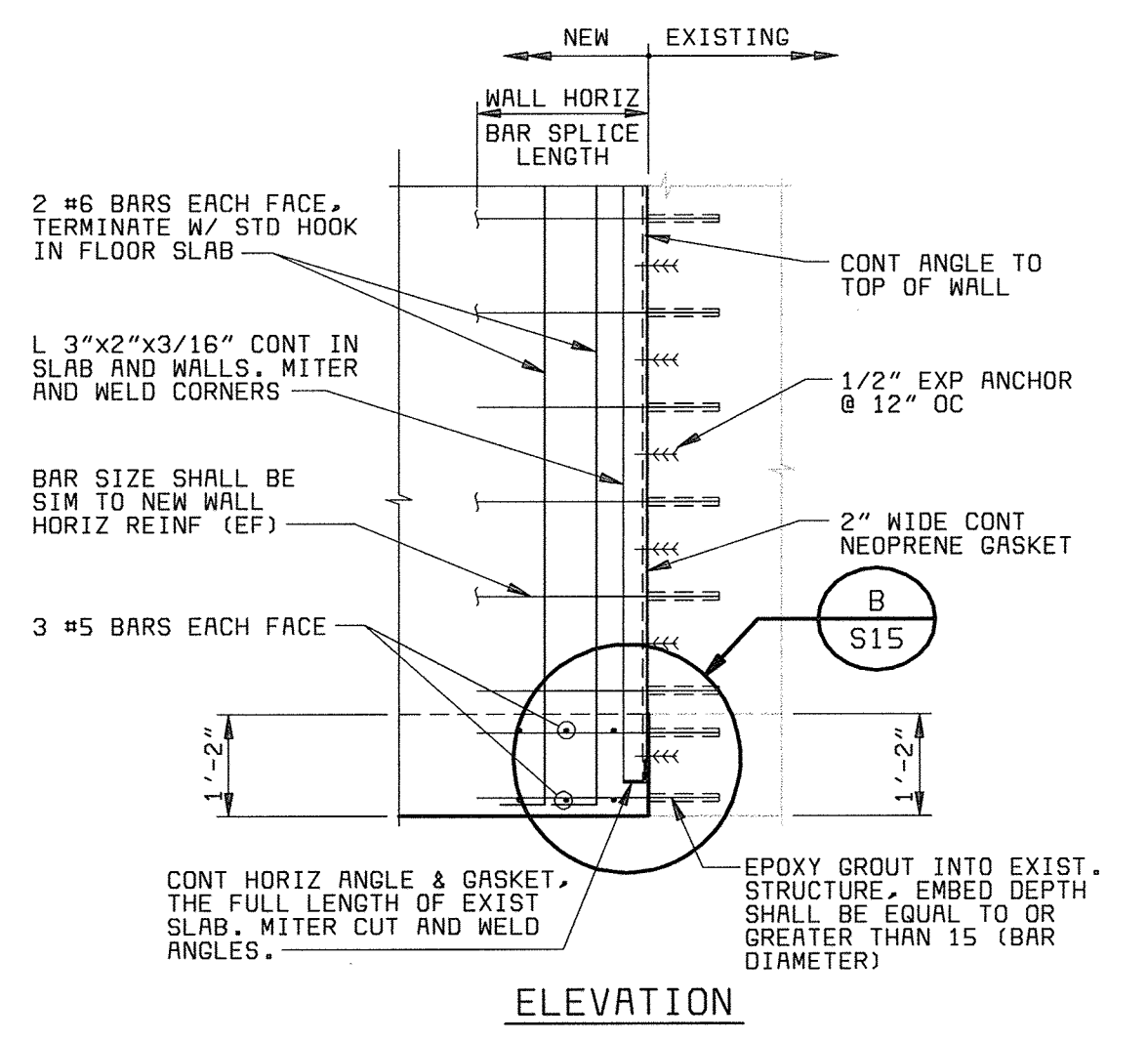


SECTION 4  
3/8" = 1'-0" S14

- NOTES:
1. ALL REINFORCEMENT #5@12" UNLESS OTHERWISE NOTED.
  2. AS REQUIRED BY EQUIP MFR.
  3. GREENSTREAK HYDROTITE WATERSTOP TYPE CJ-0725-3K INSTALLED PER MFR REQUIREMENTS ALL AROUND BASINS.



DETAIL A  
1/4" = 1'-0" S15



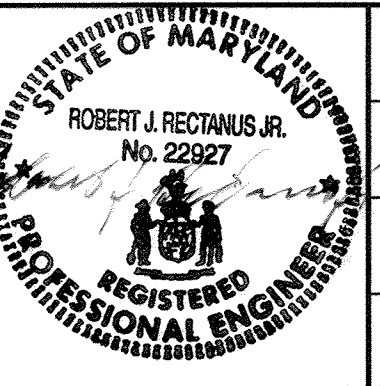
DETAIL B  
3/4" = 1'-0" S15

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

DESIGNED BY: *Robert J. Rectanus Jr.*  
CHIEF, BUREAU OF UTILITIES DATE: 6-29-00

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE: 6-29-00



DES: FKA					
DRN: RLC					
CHK: NGM					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

FC 10 & 11  
STRUCTURAL

SECTIONS AND DETAILS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

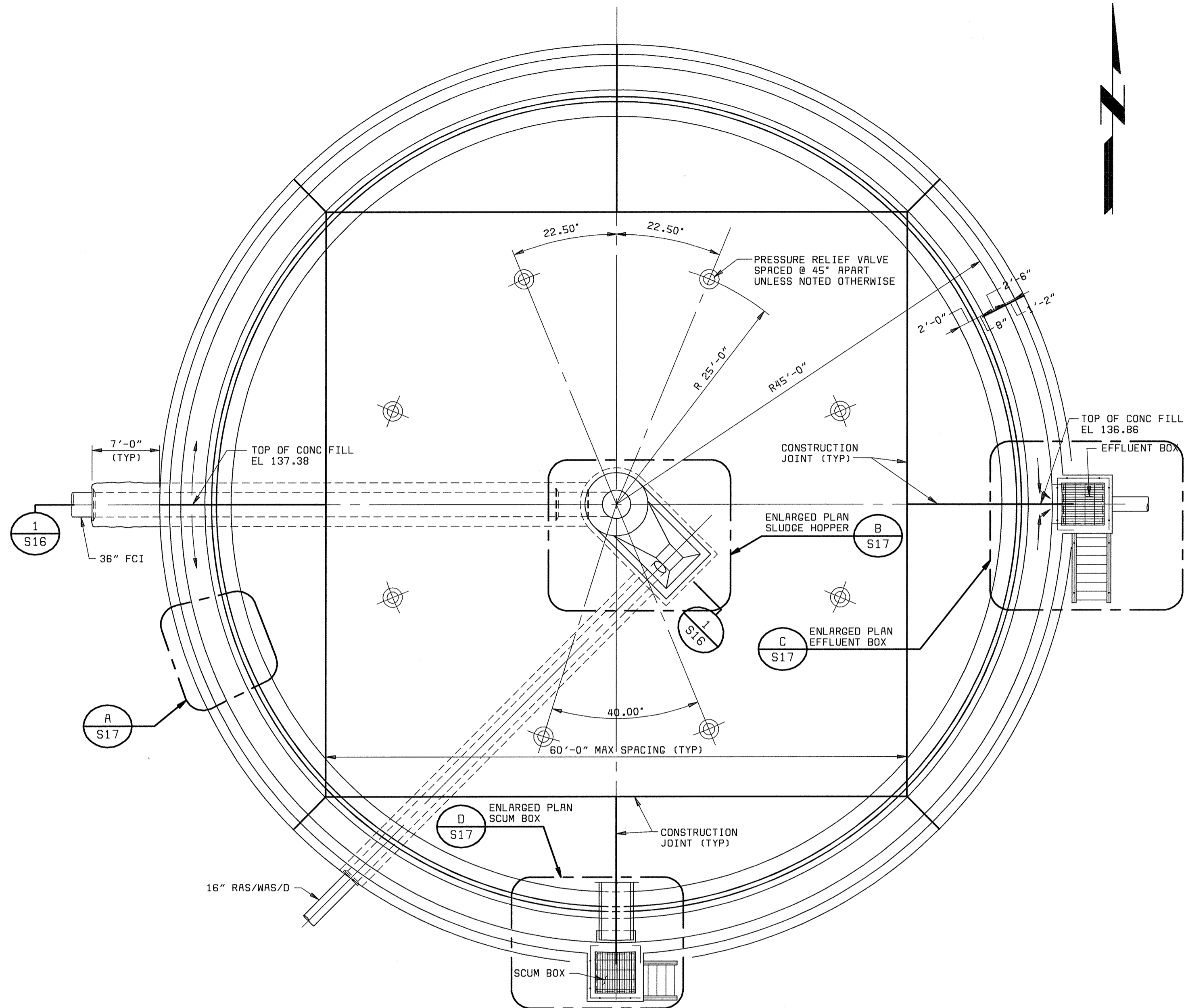
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

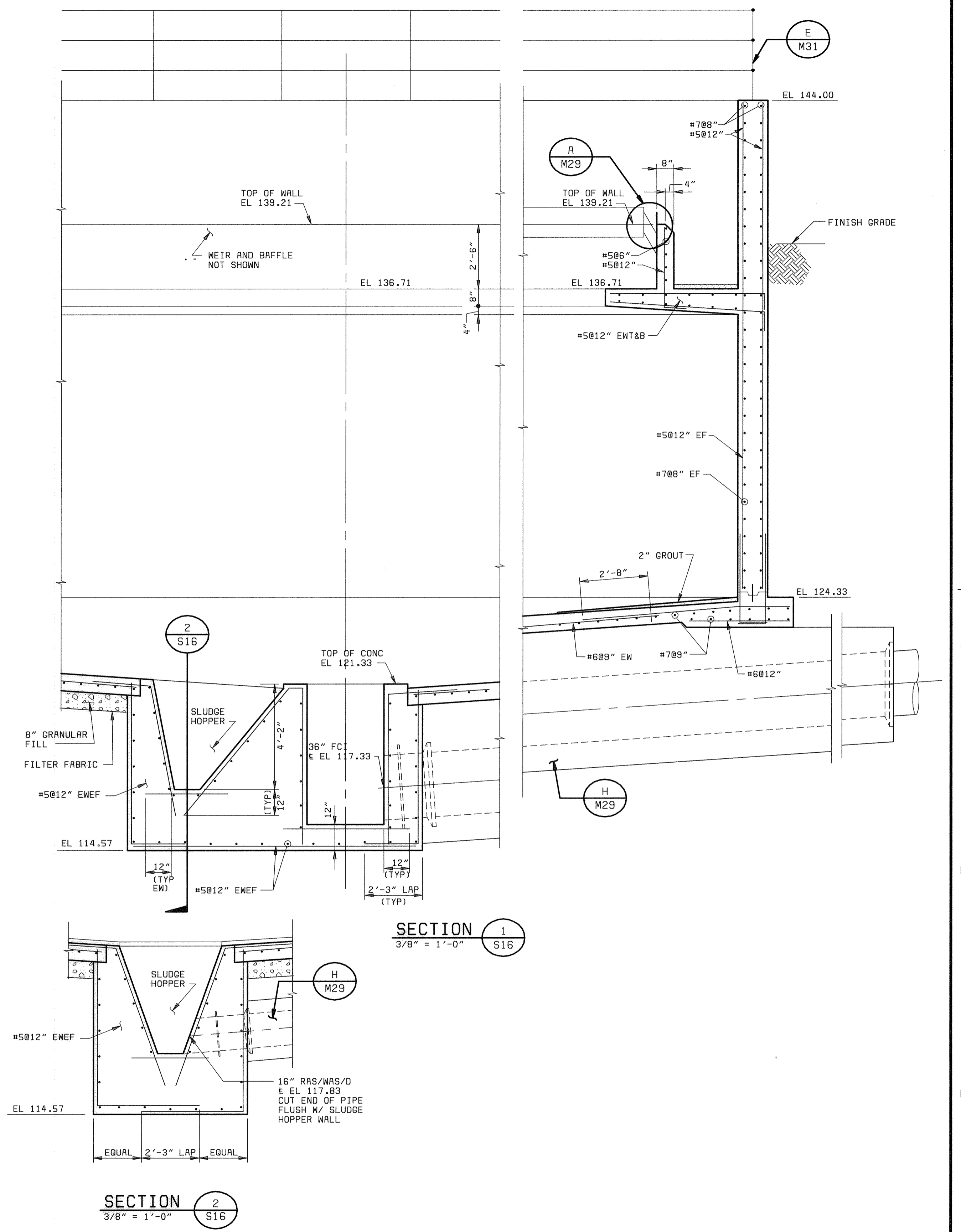
SHEET 57 OF 161

**S15**



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

- NOTES:**
1. THIS DRAWING DEPICTS FINAL CLARIFIER NO. 12. SEE YARD PIPING DRAWING FOR PIPE ORIENTATION.
  2. BASIN EQUIPMENT NOT SHOWN.
  3. PROVIDE 8" MIN GRANULAR FILL FOR ALL ELEVATIONS BELOW 117.50. OTHERWISE PROVIDE DIFFERENCE BETWEEN BOTTOM OF SLAB AND EL 117.50.



**SECTION 1**  
3/8" = 1'-0" S16

**SECTION 2**  
3/8" = 1'-0" S16

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.* 6/21/00  
REG. PROF. ENGR. DATE



DES: FKA					
DRN: ABW, SLF					
CHK: NGM					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**FC 12**  
**STRUCTURAL**

**PLAN AND SECTIONS**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

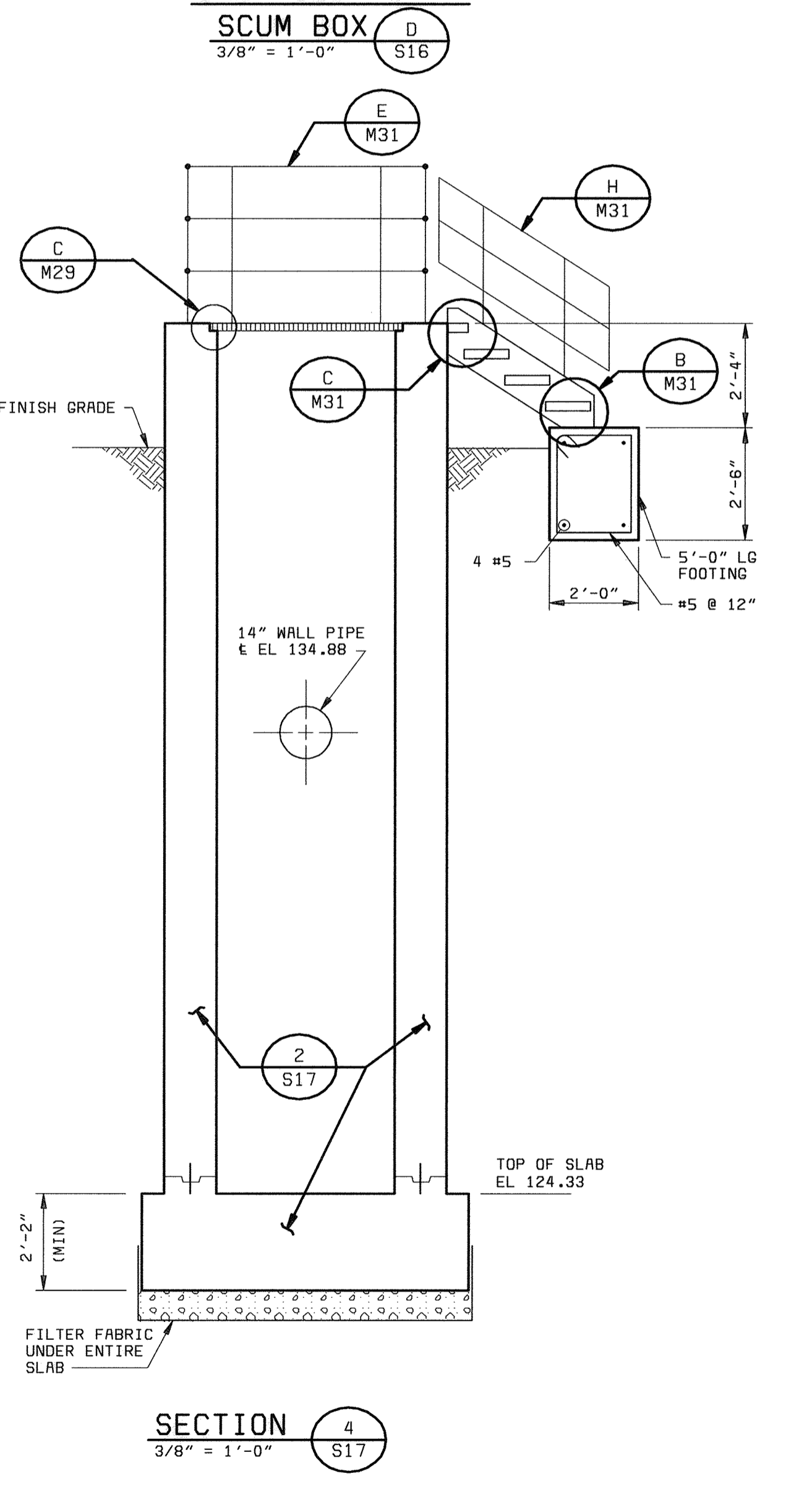
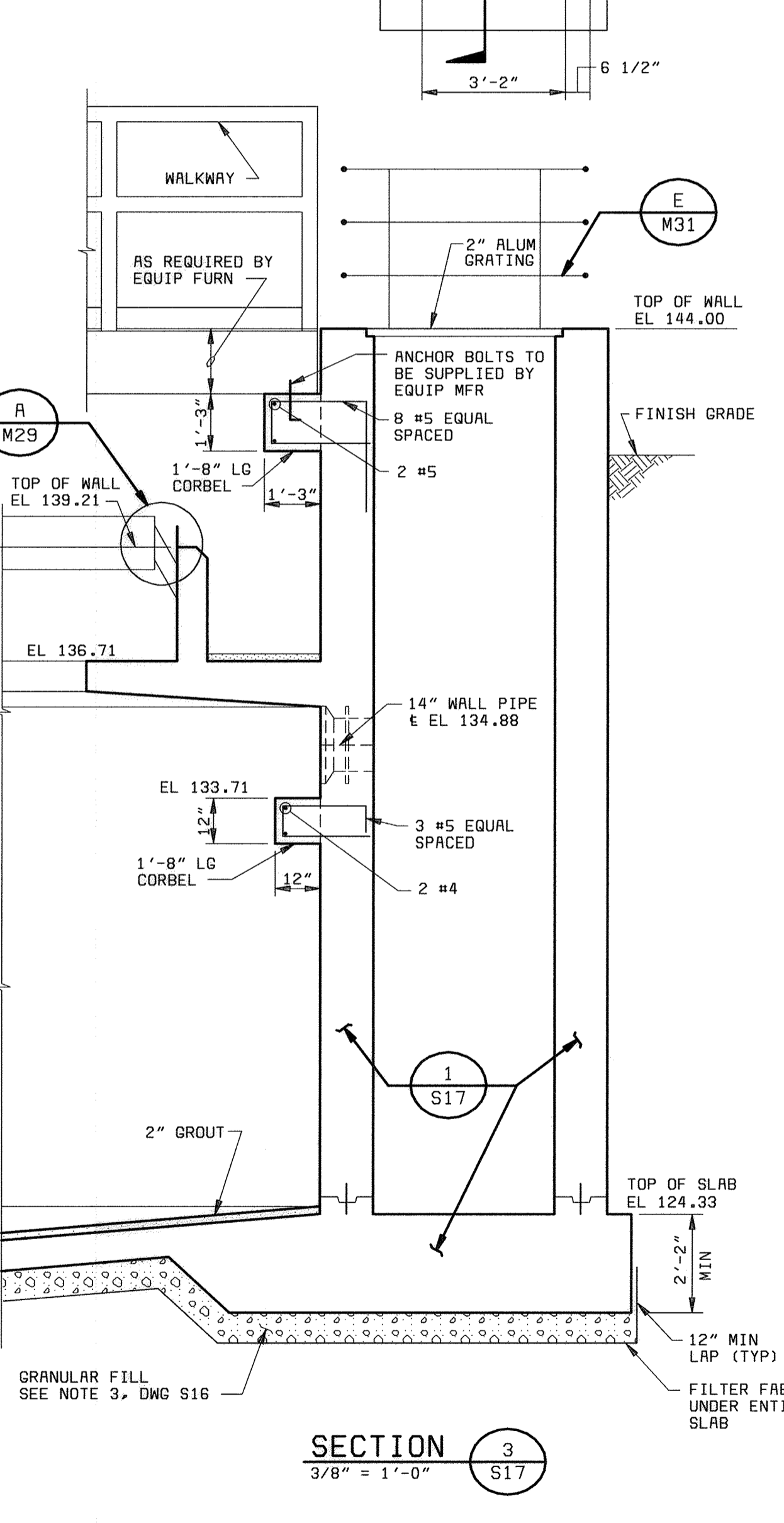
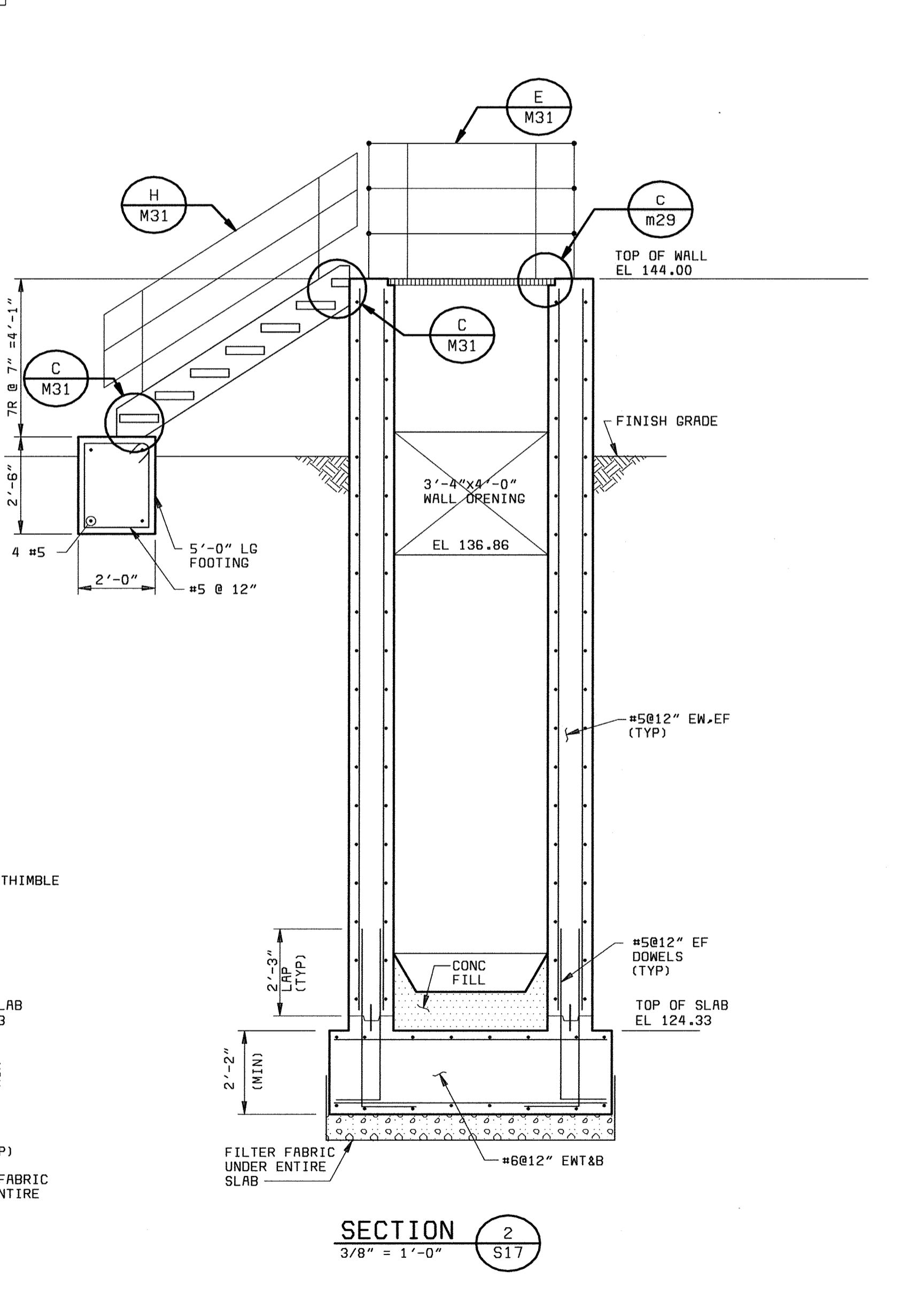
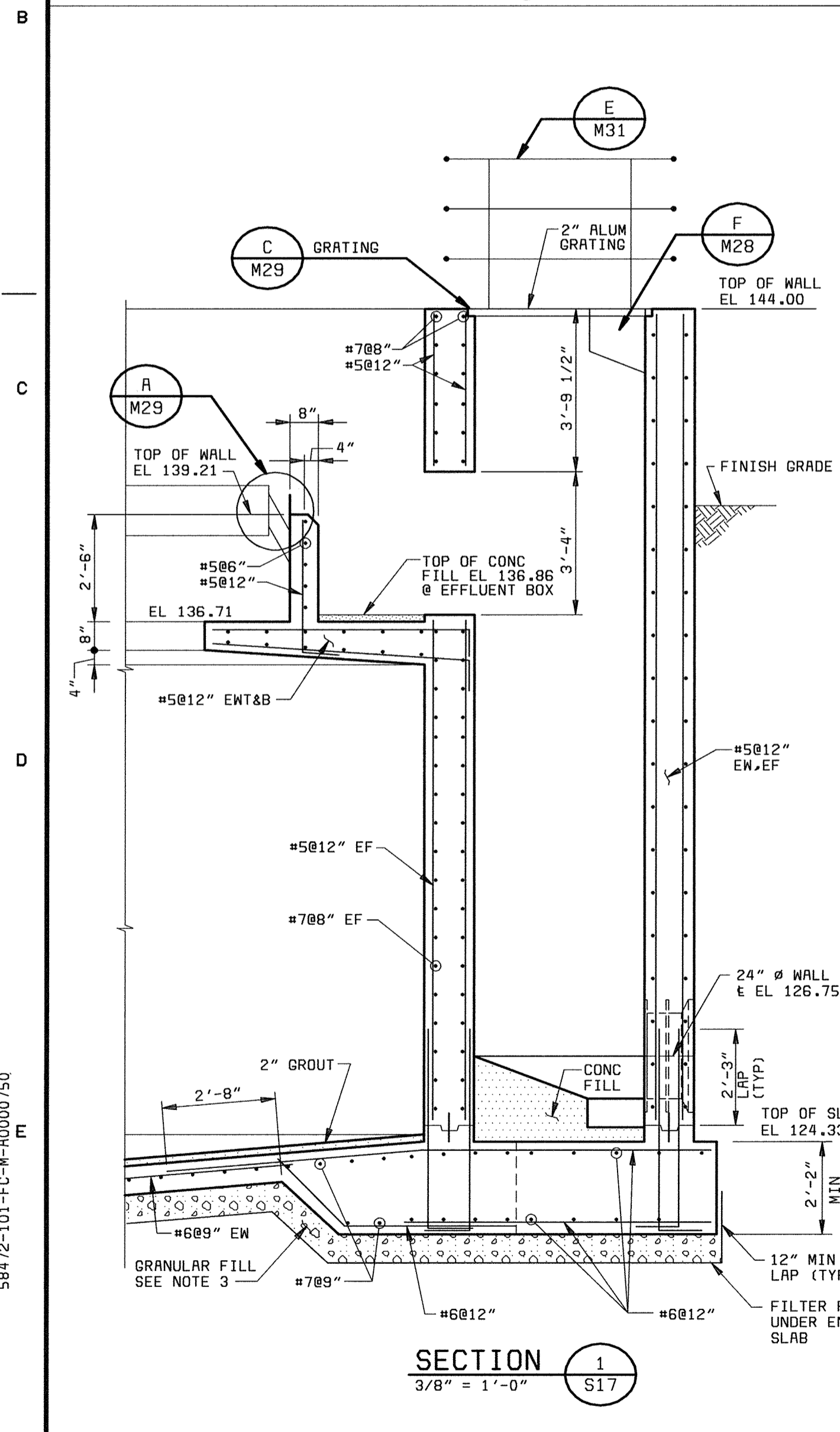
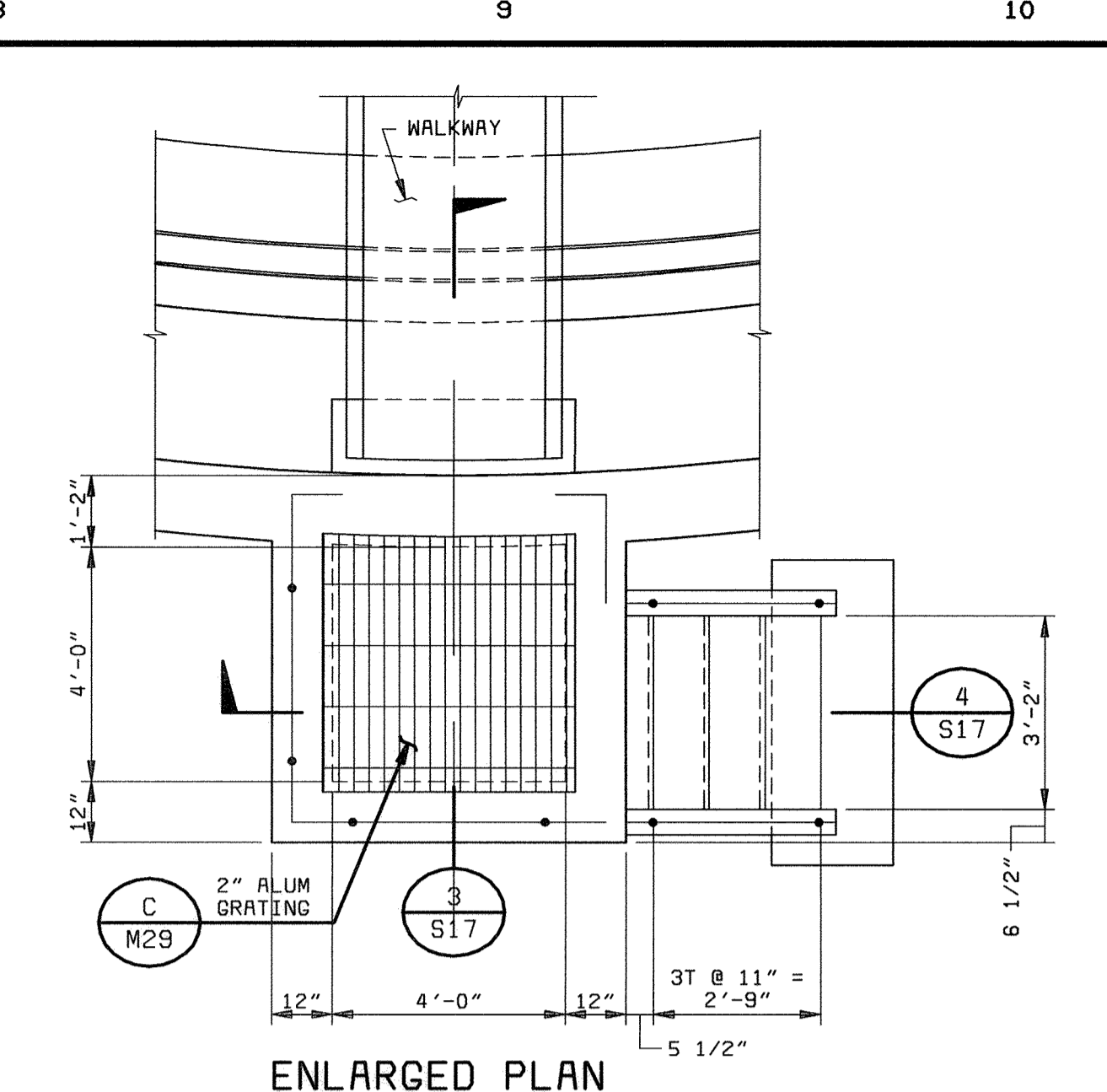
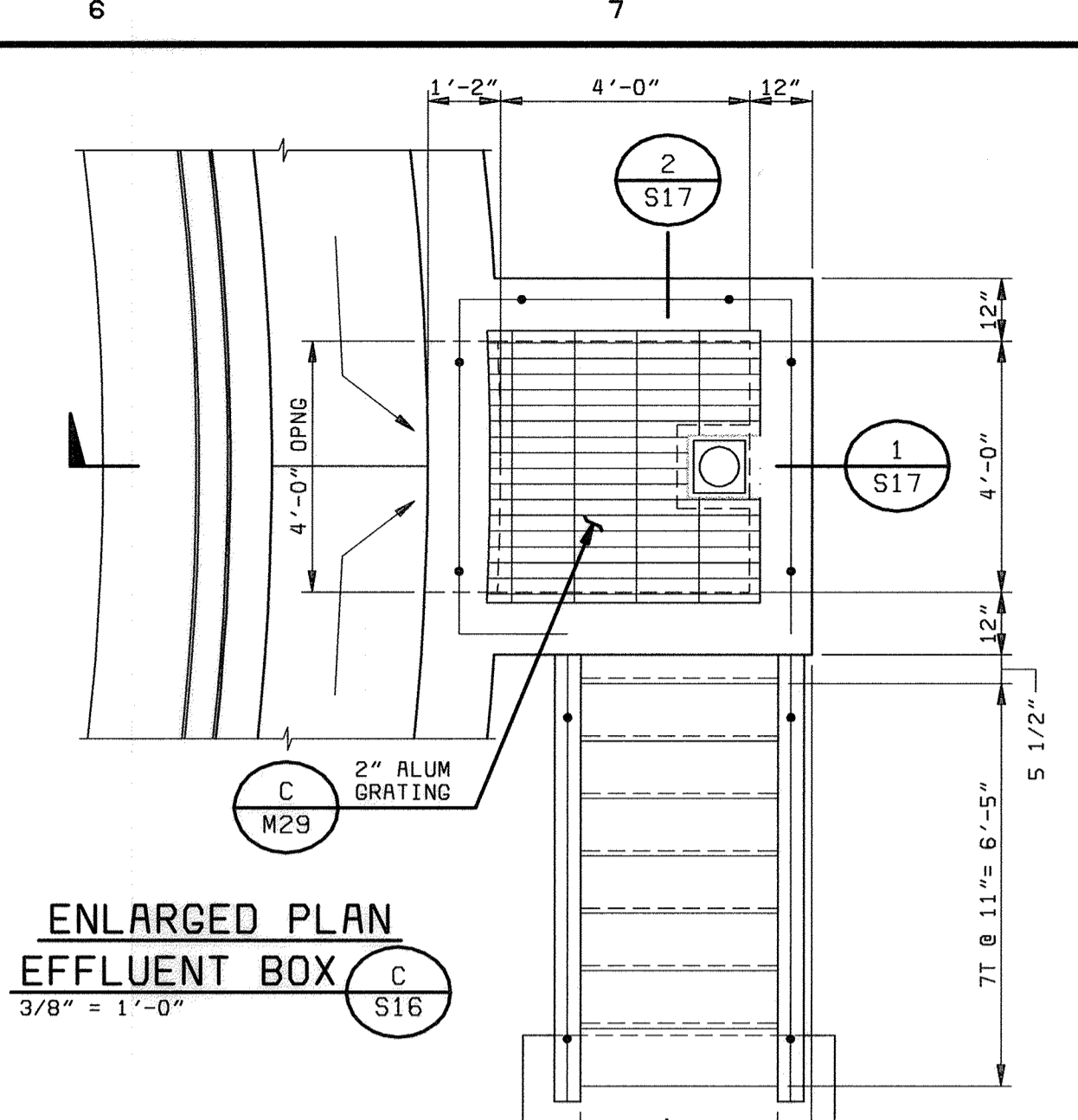
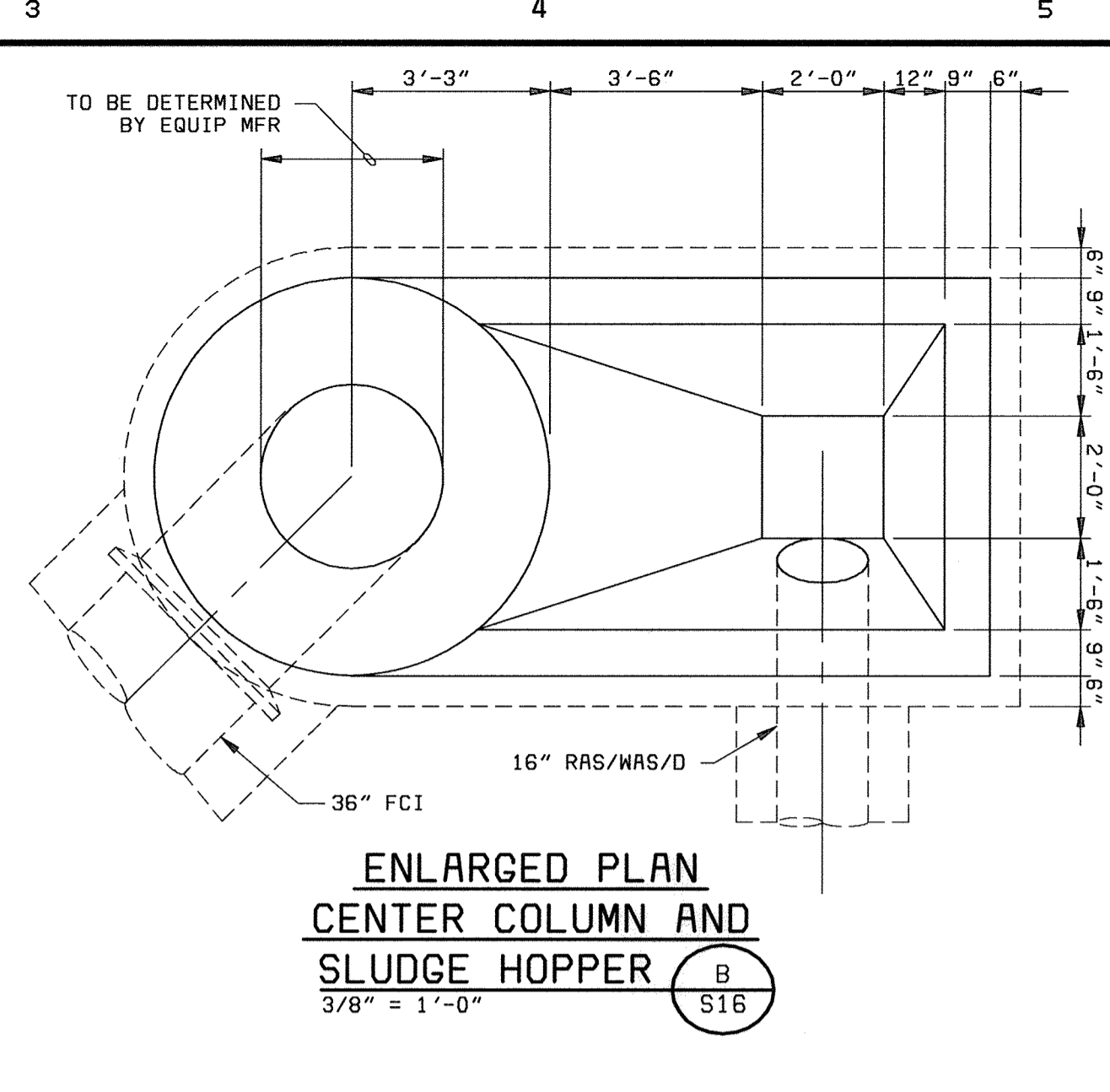
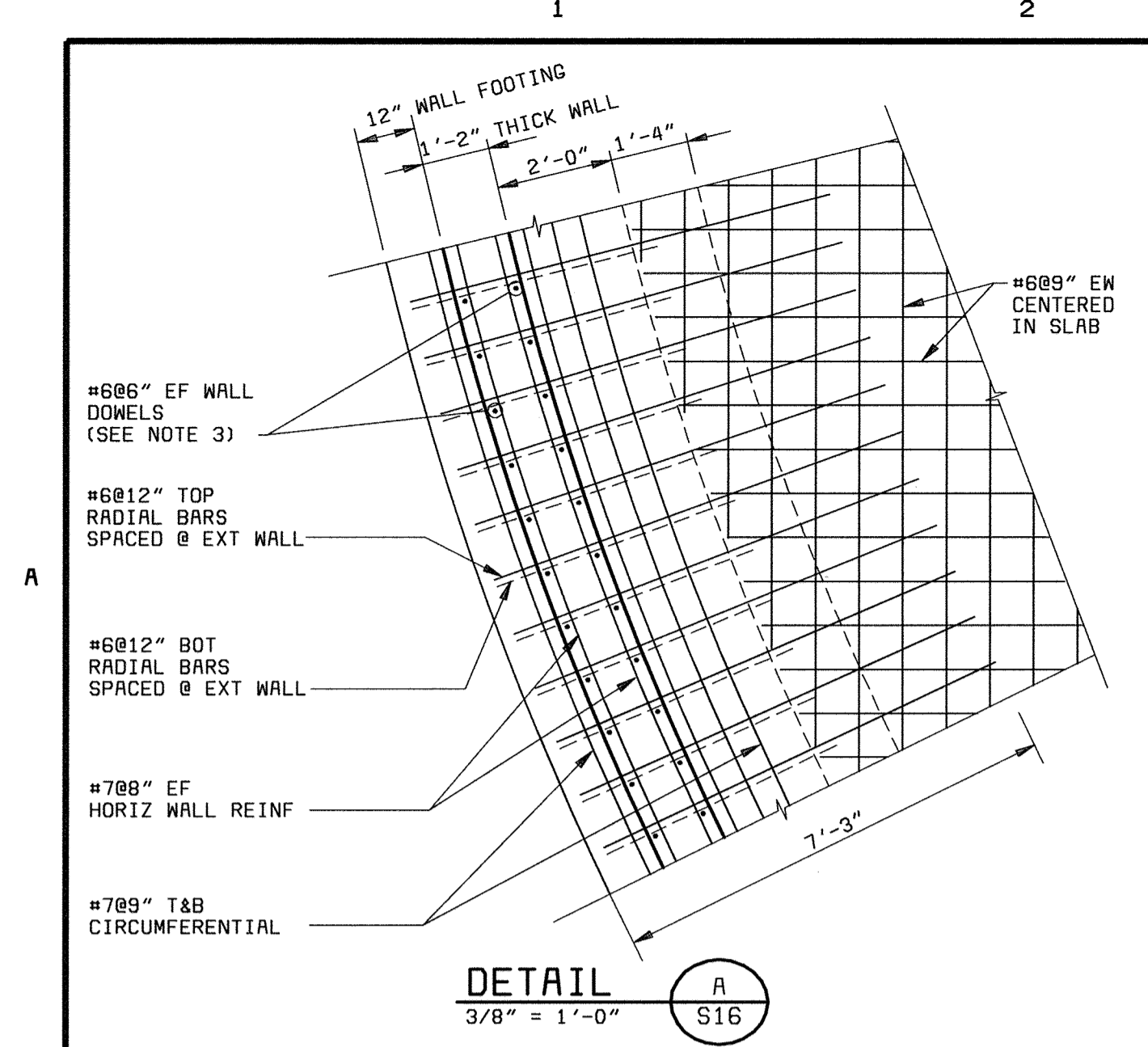
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

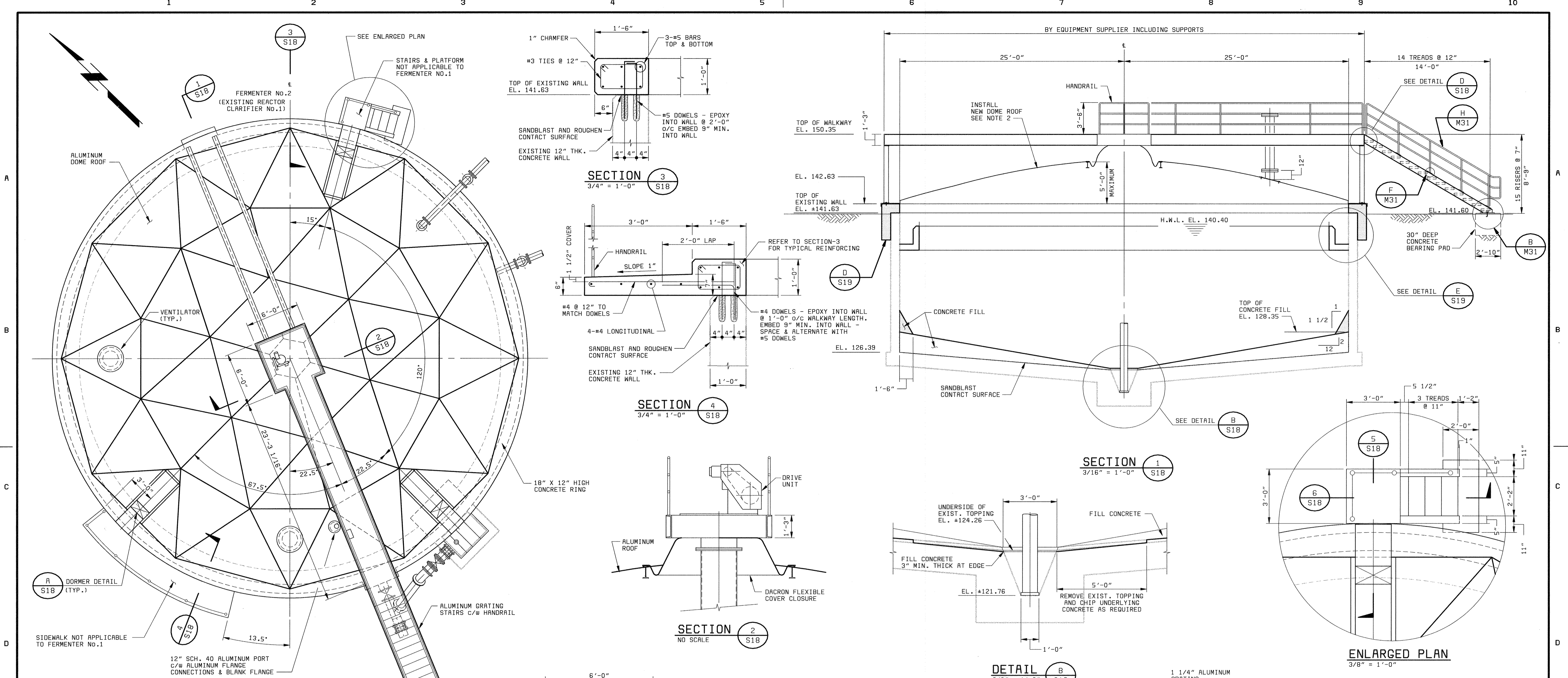
SCALE AS SHOWN

SHEET 58 OF 161

**S16**



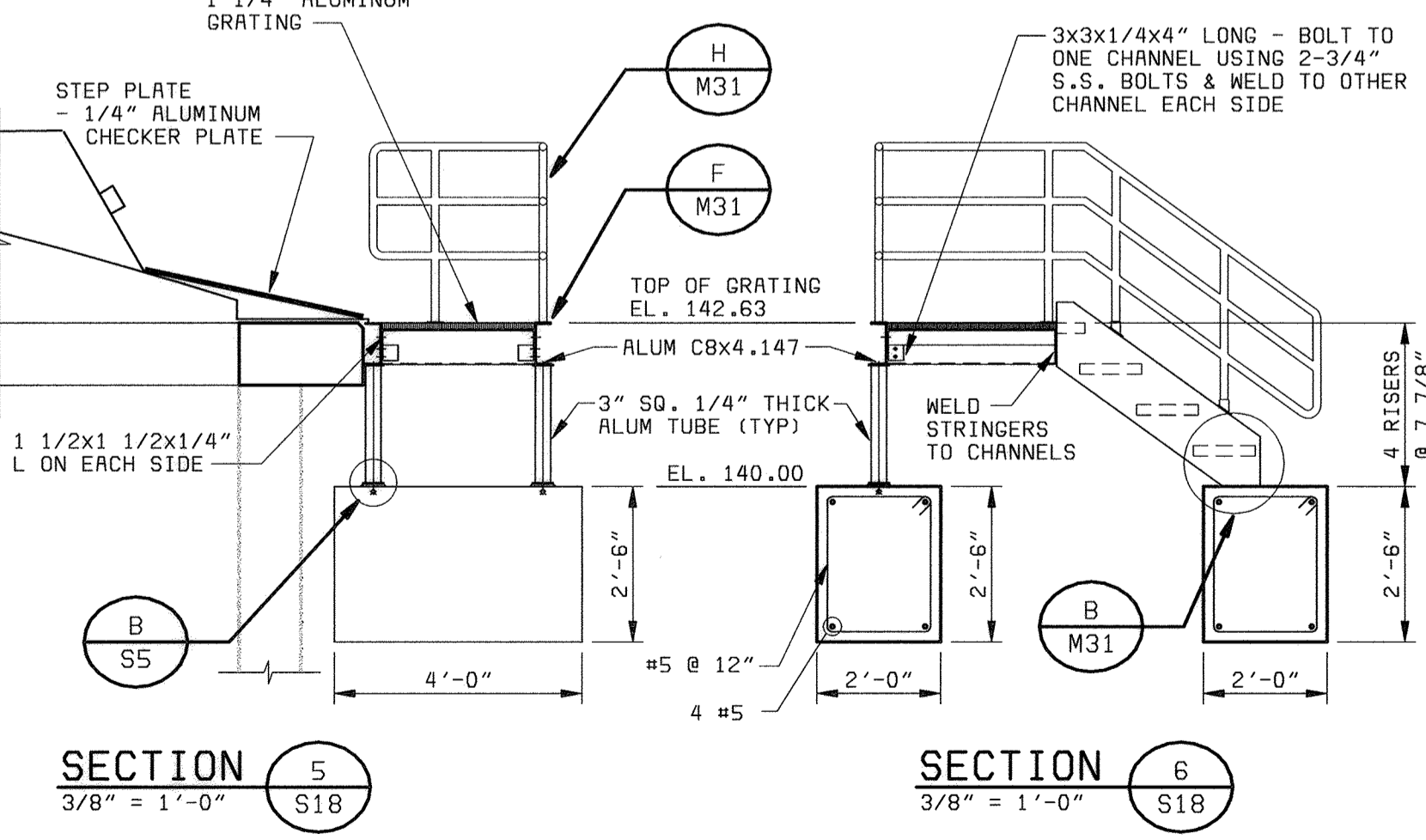
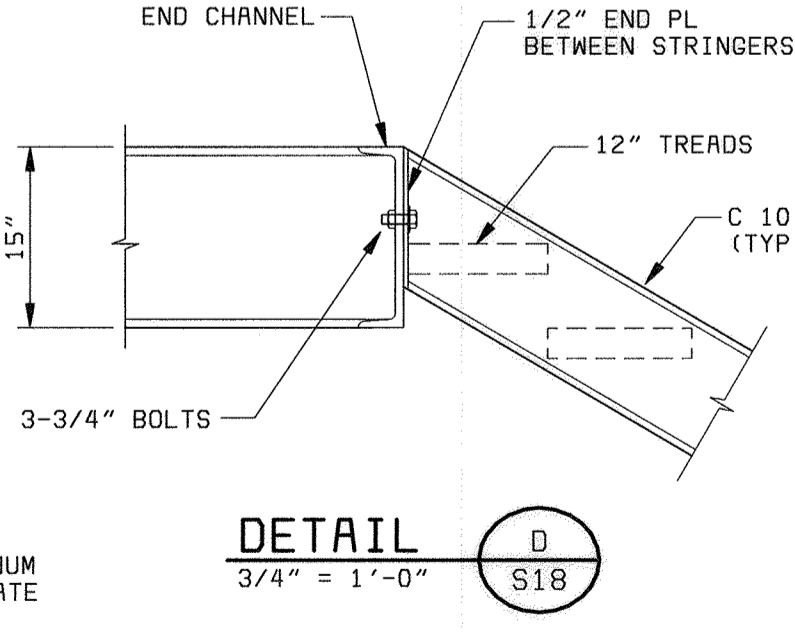
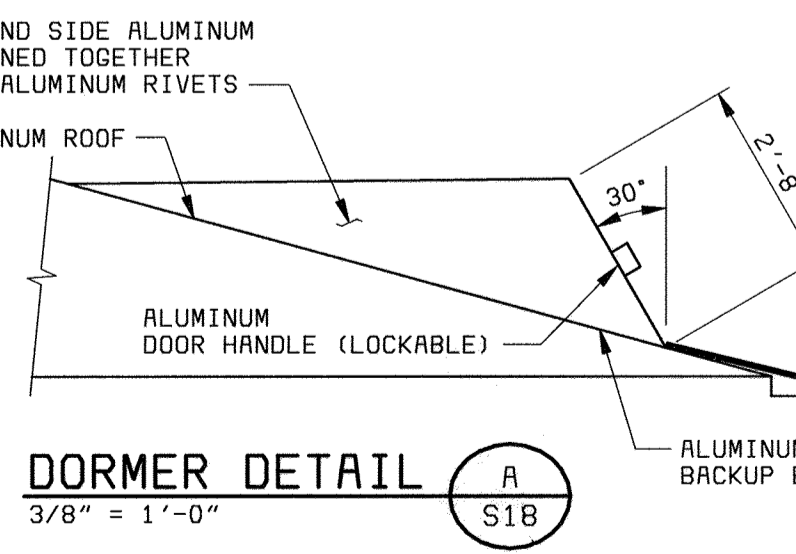
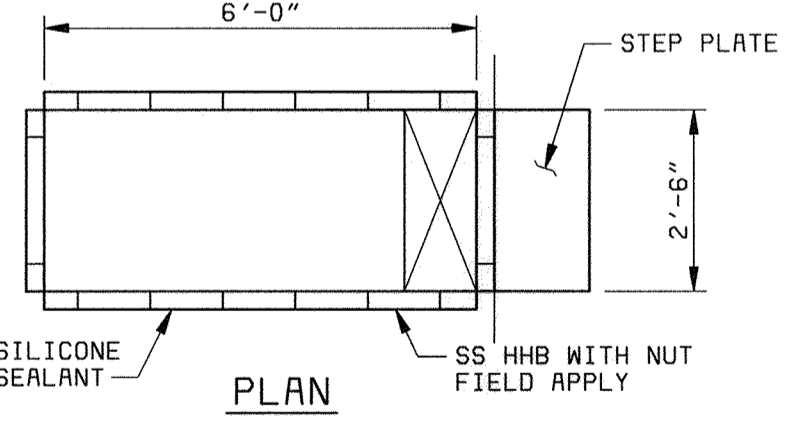
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert M. Benin 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH, L.P. Gaithersburg, Maryland  Robert J. Rectanus, Jr. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: FKA DRN: SLF CHK: NGM DATE: 6/23/00	FC 12 STRUCTURAL  PLANS AND SECTIONS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 59 OF 161  <b>S17</b>
		DATE: 6/23/00 DATE: _____ REVISIONS AND RECORD OF ISSUE NO. BY CK APP			



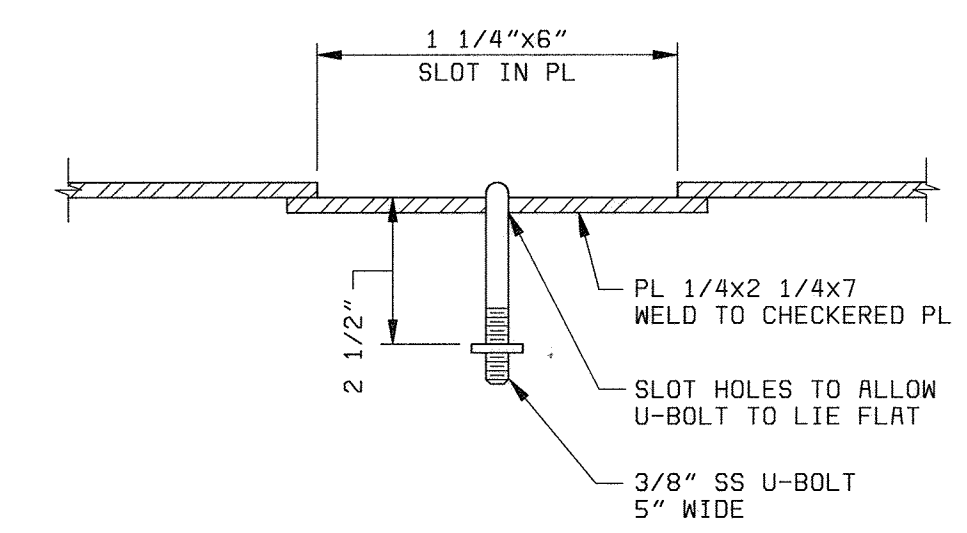
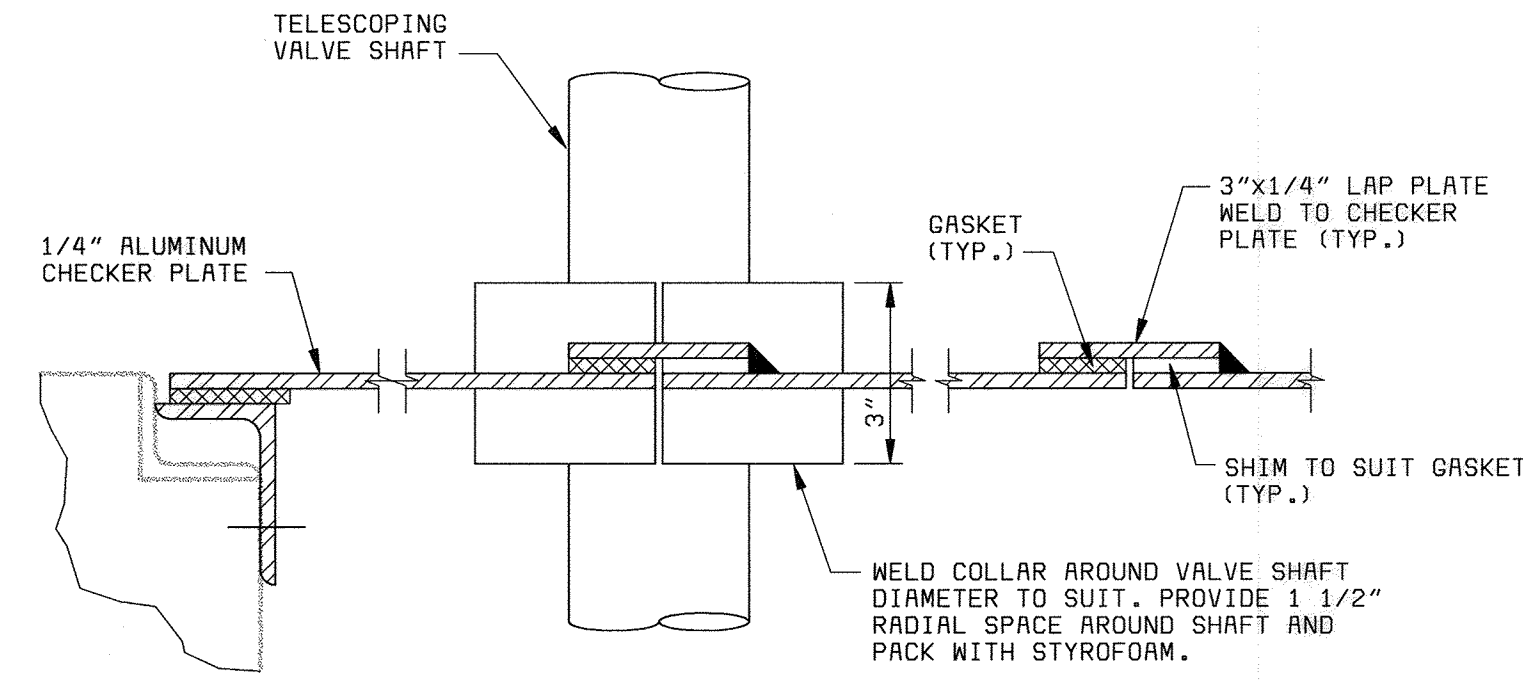
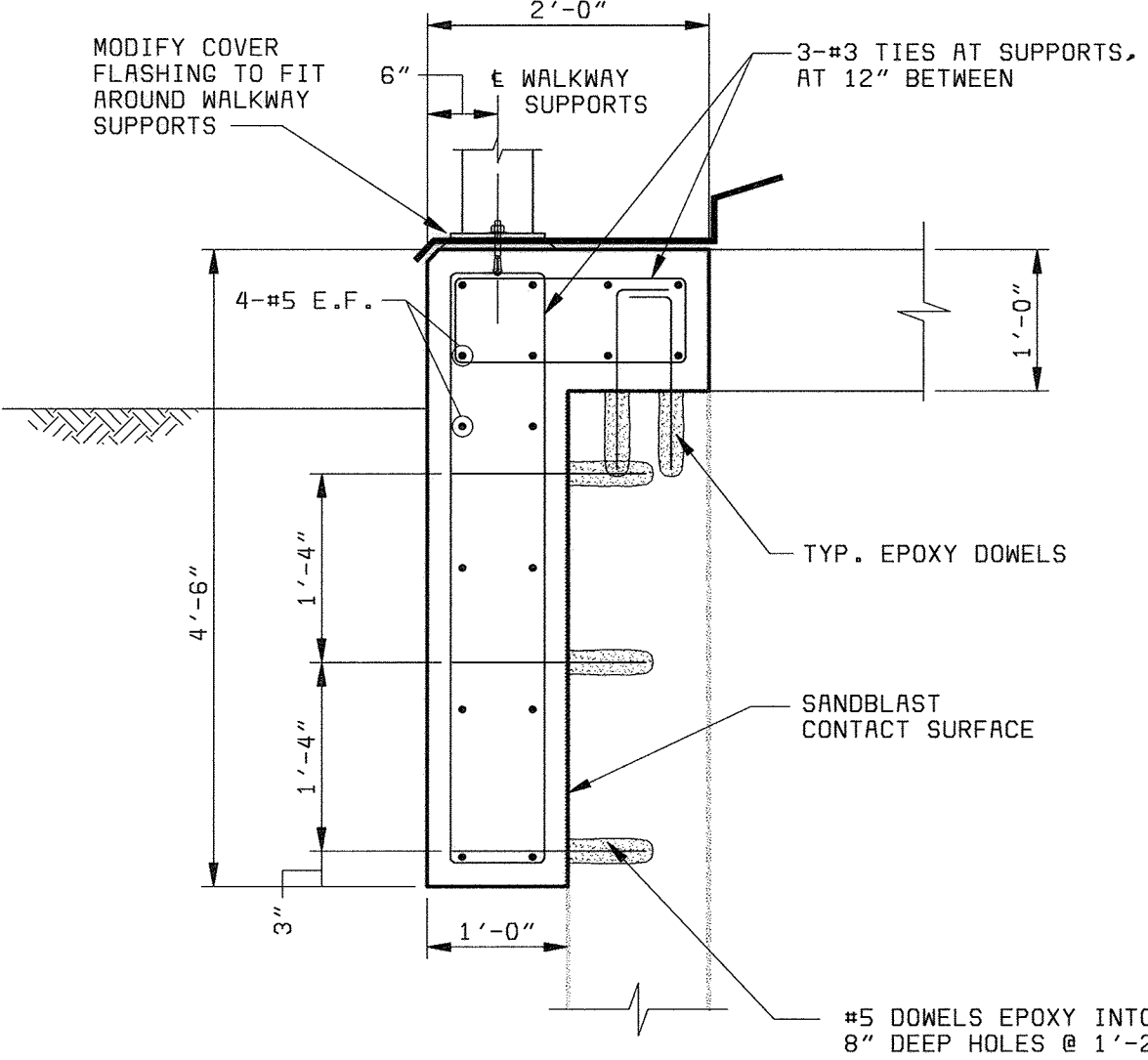
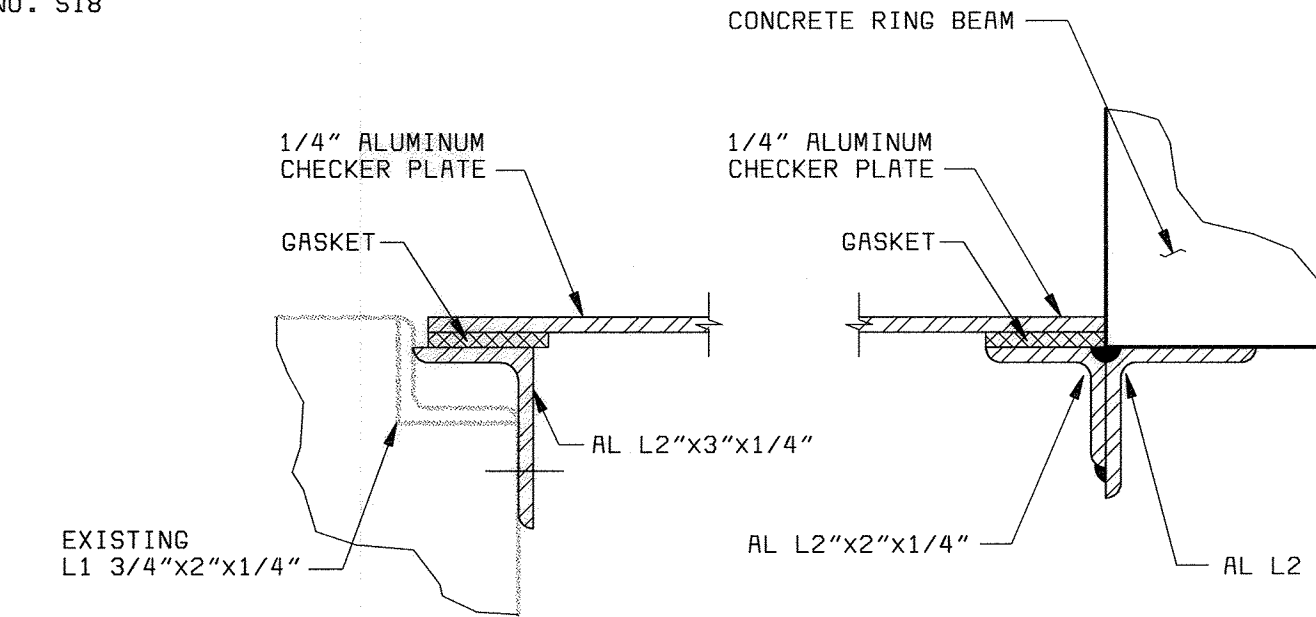
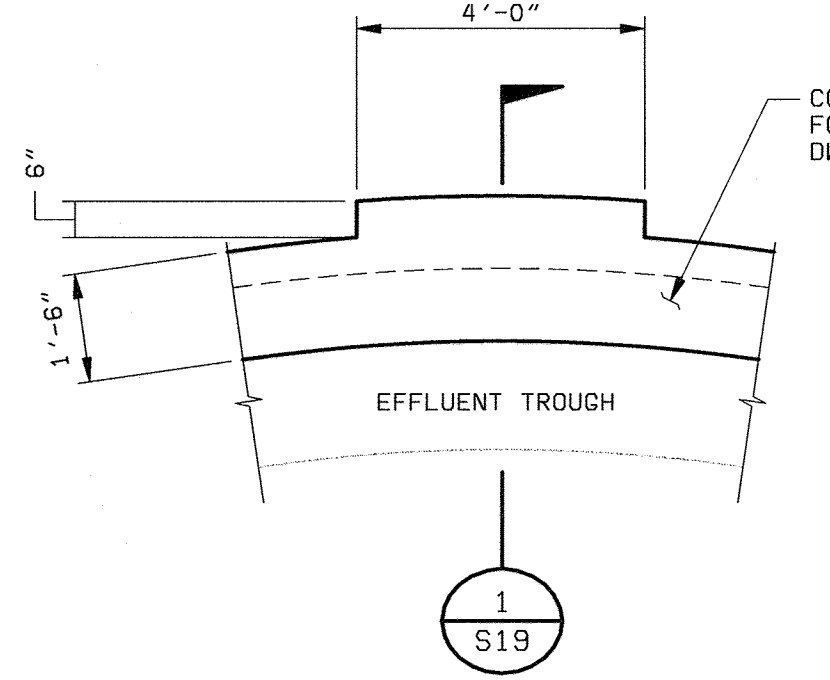
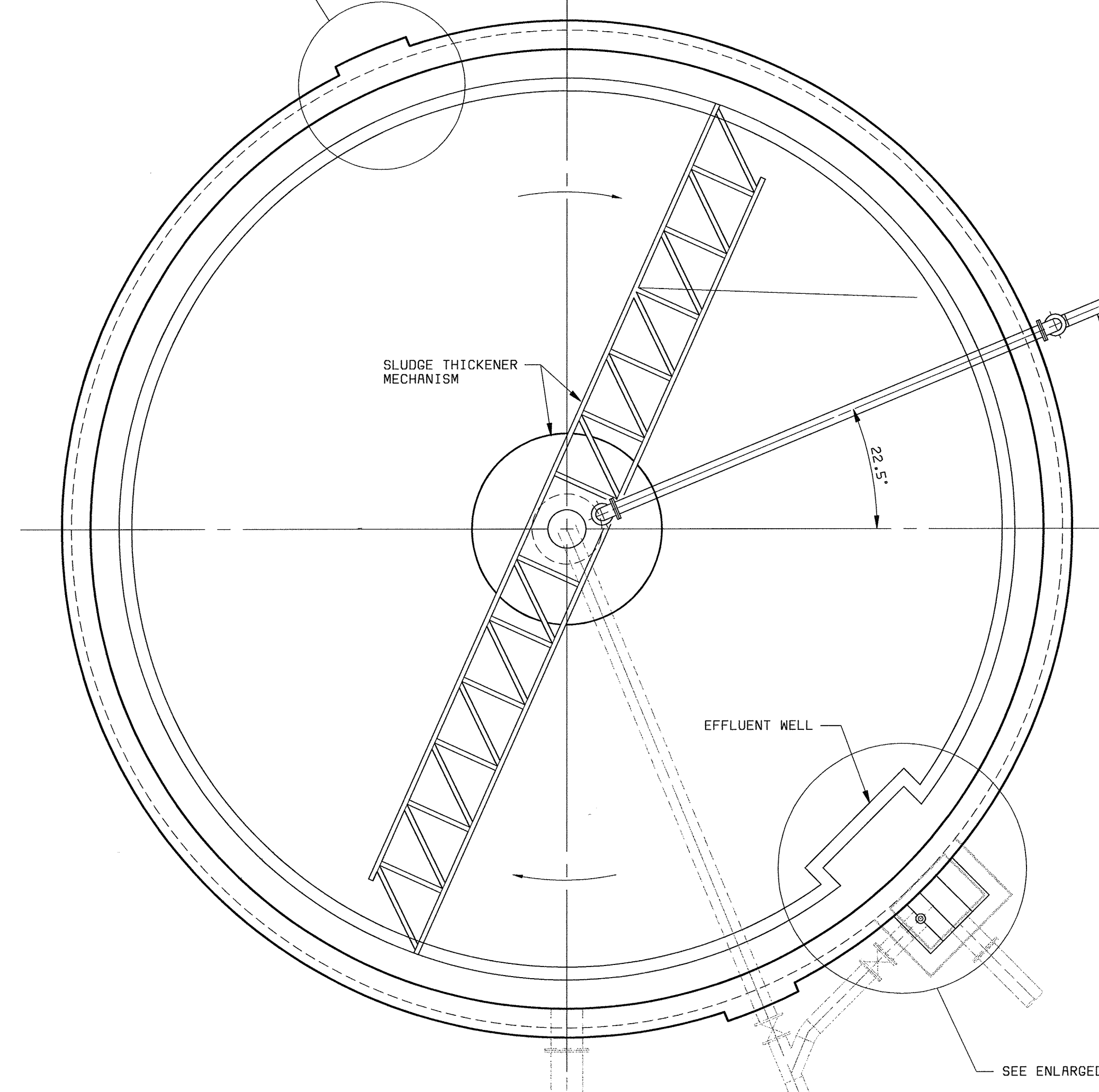
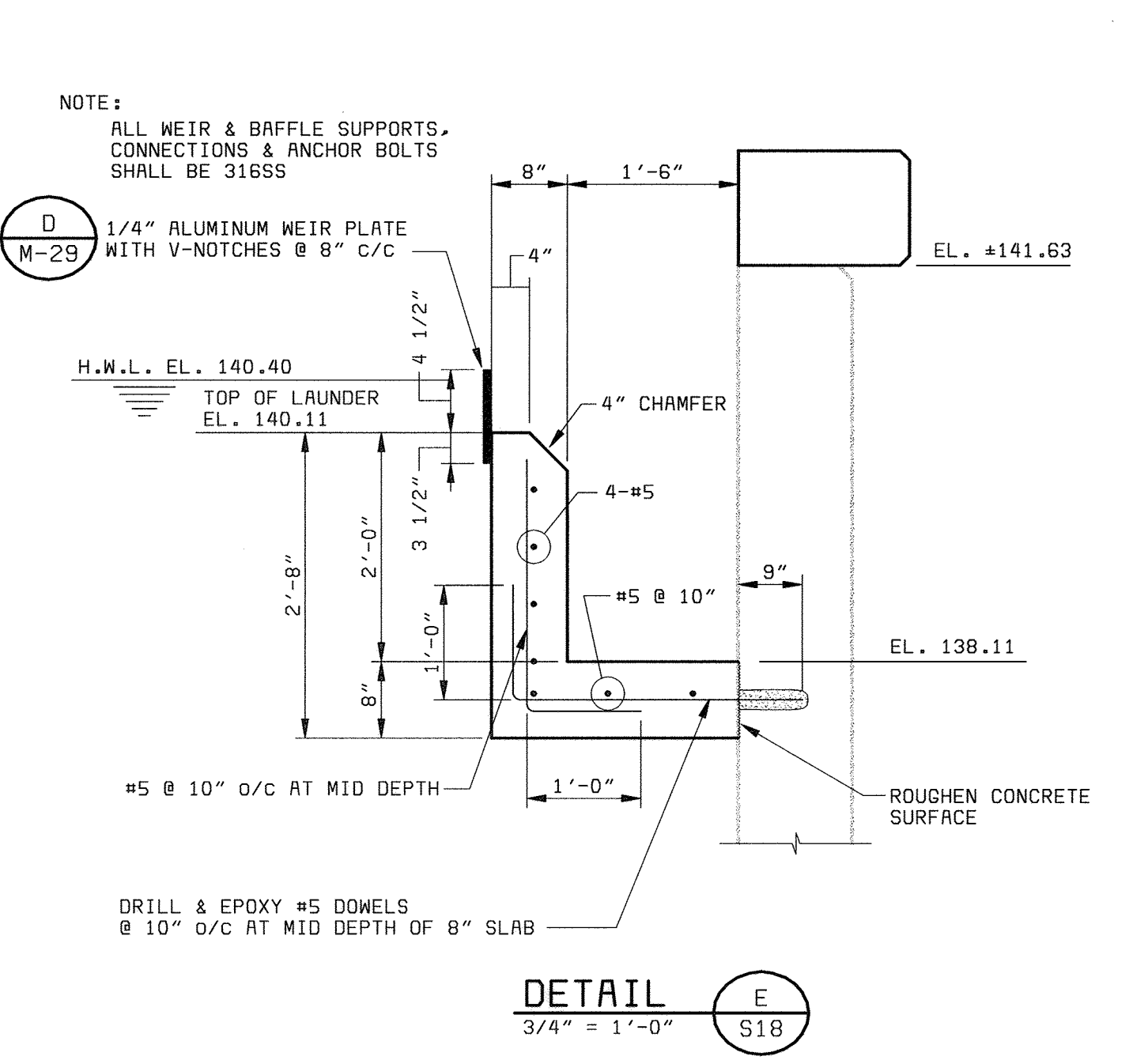
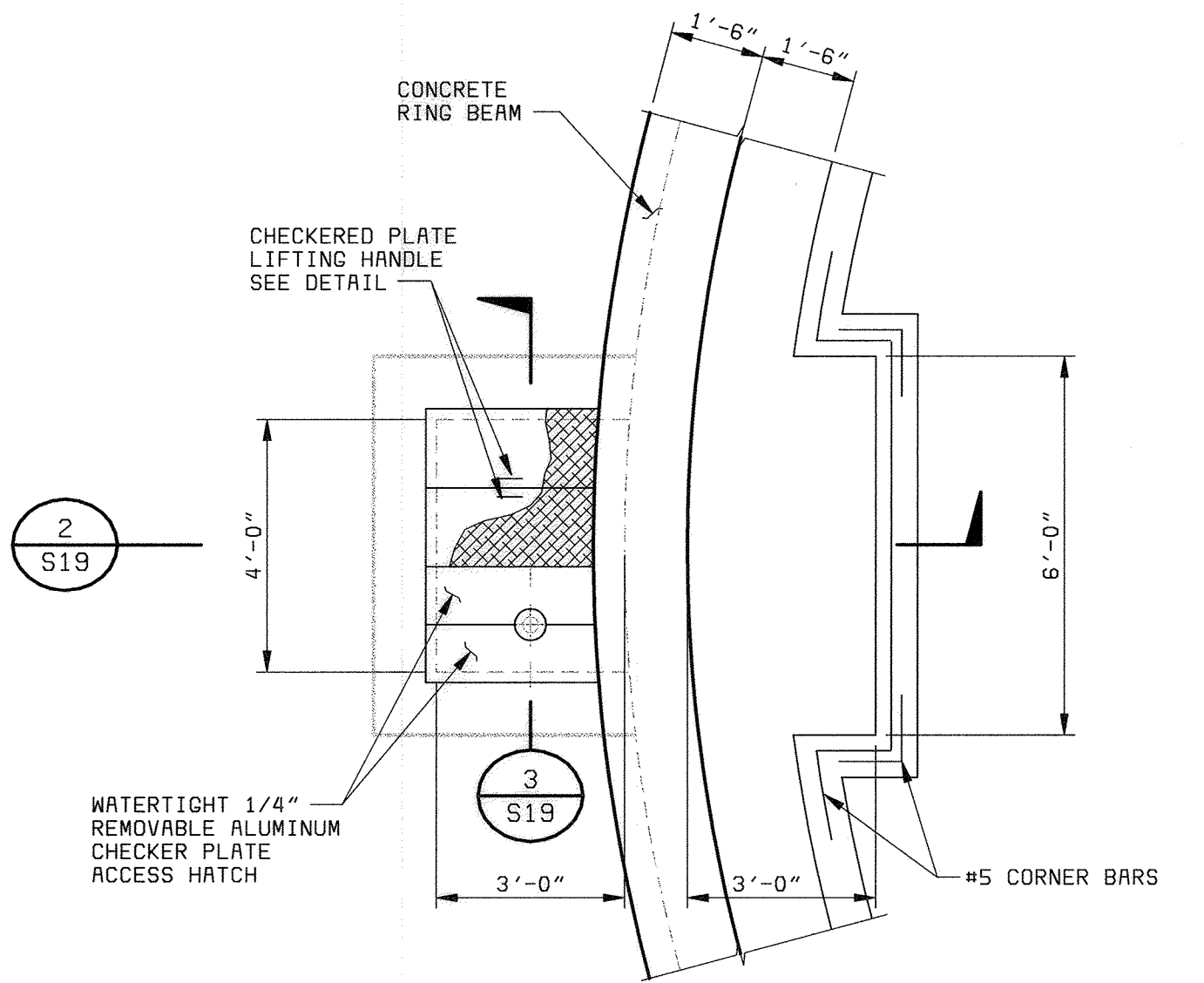
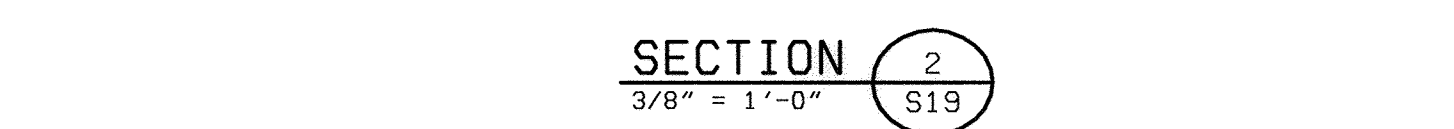
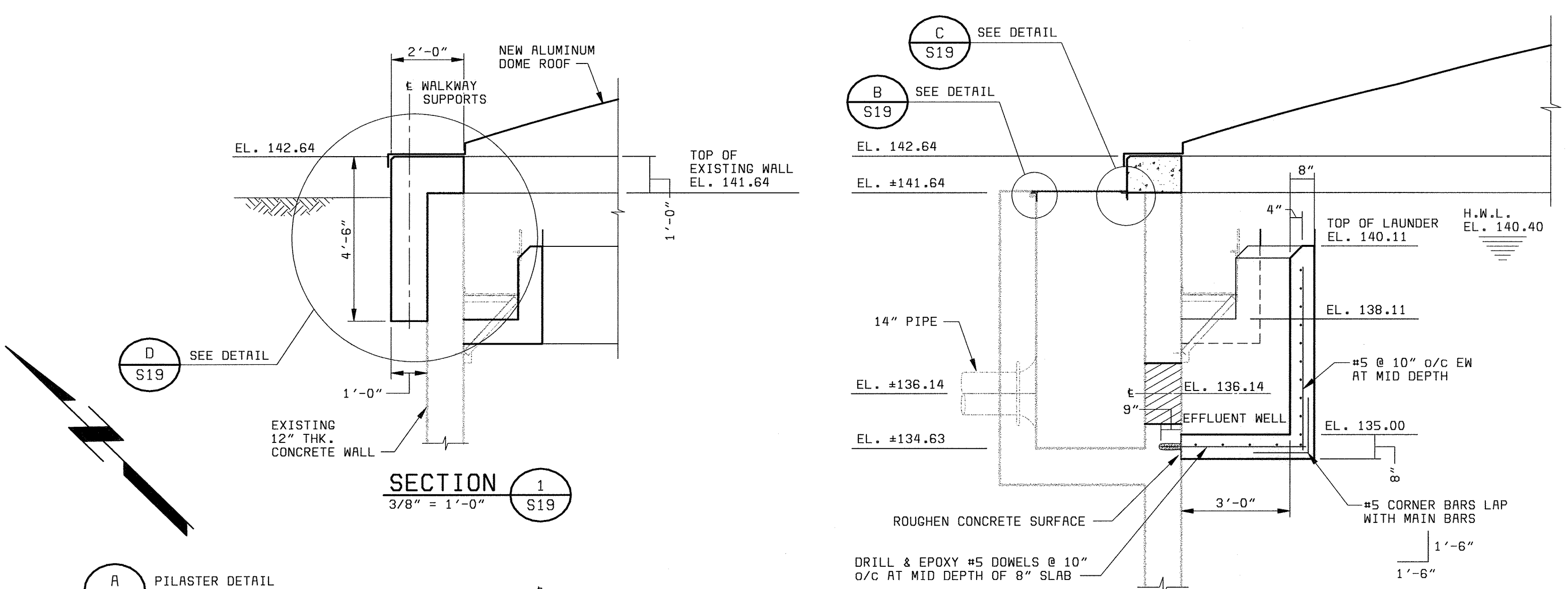
**FERMENTER No.2**  
**TOP PLAN**  
3/16" = 1'-0"

( FERMENTER No.1 SIMILAR  
REFER TO SITE & YARDWORK DRAWINGS FOR ORIENTATION )

- NOTE:
- ELEVATIONS SHOWN ARE FOR EXISTING REACTOR CLARIFIER No.1 (FERMENTER No.2). RECENT SURVEY DATA SHOWS THE FOLLOWING ELEVATIONS FOR REACTOR CLARIFIER No.2.  
TOP OF WALL = 141.63  
TOP OF WEIR = 140.64  
ALL EXISTING ELEVATIONS ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
  - HEIGHT OF DOME ROOF VARIES FROM 4'-0" TO 5'-0" PENDING SELECTION OF MANUFACTURER.
  - PLANS, SECTIONS, DETAILS ARE APPLICABLE TO BOTH FERMENTERS.



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrveys@stantec.com   <b>BLACK &amp; VEATCH</b> Galliersburg, Maryland   Terrence R. Tobey REG. PROF. ENGR. July 17, 2000 	DES: RVJ DRN: RCF CHK: RVJ DATE: 6/23/00	FERMENTER STRUCTURAL  <b>ROOF PLAN, SECTION &amp; DETAILS</b>	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR PROCESS TRAIN  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 60 OF 161  <b>S18</b>
	Robert M. Beaman 7-19-00 CHIEF, BUREAU OF UTILITIES DATE	DATE: 6/23/00 DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP		



( FERMENTER NO.1 SIMILAR REFER TO SITE & YARDWORK DRAWINGS FOR ORIENTATION )

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com Robert Brown 7-19-01 CHIEF, BUREAU OF UTILITIES DATE	BLACK & VEATCH Gaithersburg, Maryland June R. Tobey REG. PROF. ENGR. July 17, 2000 DATE	DES: RVJ DRN: RCF CHK: RVJ DATE: 6/23/00	FERMENTER STRUCTURAL PLAN, SECTIONS & DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR PROCESS TRAIN CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
					SHEET 61 OF 161

**STRUCTURAL NOTES**

**GENERAL**

- FOR LOCATIONS AND DIMENSIONS OF SLEEVES, CURB, OPENINGS AND DEPRESSIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS, REFER TO ARCHITECTURAL, CIVIL/MECHANICAL, YARDWORK, PLUMBING, HVAC AND ELECTRICAL DRAWINGS. CONTRACTOR SHALL VERIFY AND COORDINATE REQUIREMENT FOR AND LOCATION OF ABOVE ITEMS WHETHER SHOWN ON THE STRUCTURAL DRAWING OR NOT.
- EMBEDDED ITEMS, SUCH AS PIPE SLEEVES, CONDUITS AND INSERTS SHALL BE IN PLACE BEFORE CONCRETE IS POURED. REFER TO ARCHITECTURAL, CIVIL/MECHANICAL, YARDWORK, PLUMBING, HVAC AND ELECTRICAL DRAWINGS FOR ITEMS REQUIRING SLEEVES AND EMBEDMENTS IN CONCRETE WHICH ARE NOT SHOWN IN THE STRUCTURAL DRAWINGS.

**CONCRETE**

- ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c) OF 4000 PSI, UNLESS OTHERWISE SPECIFIED. CEMENT SHALL BE ASTM C150, TYPE II LOW ALKALI FOR ALL STRUCTURES.
- ALL CONCRETE CONSTRUCTION SHALL CONFORM TO THE ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" INCLUDING BAR BENDS AND HOOKS, UNLESS DETAILED OTHERWISE.
- THE LOCATION OF ALL CONSTRUCTION JOINTS AND OTHER TYPES OF JOINTS, OTHER THAN SPECIFIED OR SHOWN ON THE PLANS, SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING CONCRETE.
- ALL OPENINGS, PIPE SLEEVES, CONDUITS, INSERTS AND OTHER EMBEDDED ITEMS SHALL BE IN PLACE BEFORE CONCRETE IS PLACED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ARCHITECTURAL, CIVIL/MECHANICAL, PLUMBING, HVAC, ELECTRICAL PLANS FOR ITEMS REQUIRING SLEEVES AND EMBEDMENTS IN CONCRETE WHICH ARE NOT INDICATED IN SECTIONS OR FLOOR PLANS. NO PIPES OR SLEEVES SHALL PASS THROUGH STRUCTURAL MEMBERS, UNLESS SHOWN ON STRUCTURAL DRAWINGS OR APPROVED BY THE ENGINEER.
- ALL EXPOSED EDGES AND CORNERS SHALL BE CHAMFERED 3/4" EXCEPT THE TOP EDGES OF WALLS AND SLABS WHICH ARE TO BE TOOLED.
- ALL CONSTRUCTION JOINTS SHALL BE ROUGHENED TO 1/4" AMPLITUDE MINIMUM.

**REINFORCING STEEL**

- ALL REINFORCING BAR SHALL BE GRADE 60.
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR ASTM A497.
- DIMENSIONS TO REINFORCING BARS ARE TO BAR CENTERLINES, UNLESS NOTED OTHERWISE. BAR COVER IS CLEAR DISTANCE BETWEEN BAR AND THE CONCRETE SURFACE. BAR COVERS AS SHOWN ON THE "STANDARD CONCRETE DETAILS" SHEET SHALL BE PROVIDED UNLESS NOTED OTHERWISE.
- SPLICING OF REINFORCEMENT FOR WALLS, FOOTINGS AND SLABS SHALL BE AS SHOWN ON THE "STANDARD CONCRETE DETAILS" SHEET, UNLESS NOTED OTHERWISE. WHEN BARS OF DIFFERENT SIZE LAP TO EACH OTHER, SPLICE LENGTH FOR THE SMALLER BAR MAY BE USED.
- UNLESS INDICATED OTHERWISE, ALL DOWELS SHALL HAVE THE SAME SIZE AND SPACING AS THAT OF THE REINFORCING STEEL TO WHICH THEY ARE SPLICED.
- NO WELDING OF REINFORCING BARS SHALL BE PERMITTED, UNLESS NOTED OTHERWISE.

**STRUCTURAL STEEL**

- UNLESS NOTED OTHERWISE, STRUCTURAL STEEL SHALL CONFORM TO ASTM A36, STRUCTURAL PIPES TO ASTM A53, TYPE E, GRADE B OR ASTM A500, GRADES B, C OR D, OR ASTM A501, STRUCTURAL TUBING TO ASTM A500, GRADE B OR C. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE LATEST AISC SPECIFICATIONS PARTS 1 THRU 4 AND THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
- WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS AND AISC WELDING PROCEDURES AND CODES AS OUTLINED IN THE SPECIFICATIONS.
- ALL STRUCTURAL STEEL WELDING SHALL BE PERFORMED WITH FILLER METAL HAVING A MINIMUM TENSILE STRENGTH OF 70 KSI.

**STAINLESS STEEL**

- STAINLESS STEEL BOLTS SHALL CONFORM TO ASTM F593. ALLOY GROUP 1 OR 2, UNLESS NOTED OTHERWISE.
- STAINLESS STEEL PLATES, BARS AND RODS SHALL CONFORM TO ASTM A240, TYPE 304L.
- STAINLESS STEEL STRUCTURES SHAPES AND STUDS SHALL CONFORM TO ASTM A276, TYPE 304.

**ALUMINUM**

- UNLESS NOTED OTHERWISE, ALUMINUM ALLOY IN ALL ALUMINUM STRUCTURAL MATERIALS SHALL BE 6061-T6.
- ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE OR DISSIMILAR METALS SHALL BE COATED OR COVERED WITH A HEAVY COAT OF EPOXY ENAMEL TO PREVENT ALUMINUM-CONCRETE REACTION OR ELECTROLYTIC ACTION.
- ALL ALUMINUM WELDING SHALL CONFORM TO THE PROVISIONS OF THE LATEST STRUCTURAL WELDING CODE (AWS 01.2).
- A CERTIFIED FABRICATOR IS REQUIRED FOR ALL ALUMINUM PANELS AND FRAMES.

**MASONRY**

- CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90. THE TOTAL MASONRY ASSEMBLAGE SHALL HAVE A COMPRESSIVE STRENGTH EQUAL TO 1500 PSI AT 28 DAYS.
- MASONRY MORTAR SHALL CONFORM TO ASTM C270, TYPE S.
- ANY MASONRY IN CONTACT WITH EARTH SHALL BE GROUTED FULL AND BACK PARGED AS REQUIRED.
- ALL BOND BEAMS AND ANY BLOCK CELLS CONTAINING EMBEDMENTS, REINFORCING STEEL, ANCHORS, ETC., SHALL BE FILLED MINIMUM 2,000 PSI CONCRETE FILL. PROVIDE BOND BEAMS W/ MIN 2-#5 HORIZONTAL AT OPENING SILL (EXTENDED 2'-0" MIN BEYOND OPENING AT EACH END), WHERE INDICATED ON ARCH DRAWINGS AND TOP OF WALL UNLESS DETAILED OTHERWISE. BOND BEAM REINF TO BE CONTINUOUS AT CORNERS AND INTERSECTIONS.
- ALL CONCRETE MASONRY OPERATIONS SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE BOCA NATIONAL BUILDING CODE / 1996.
- REFER TO ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS FOR EMBEDDED ITEMS NOT SHOWN HEREIN AND TO VERIFY SIZE AND LOCATION OF ALL OPENINGS. BEFORE EXECUTING ANYTHING HEREIN SHOWN, THE CONTRACTOR SHALL EXAMINE ACTUAL JOB CONDITIONS AND REPORT TO THE ENGINEER ANY ERROR OMISSION OR DISCREPANCY AFFECTING THE WORK.
- ALL REINFORCING TO BE CONTINUOUS WITH LAP SPLICES EQUAL TO 48 BAR DIAMETERS MINIMUM.

**SOIL AND FOUNDATIONS**


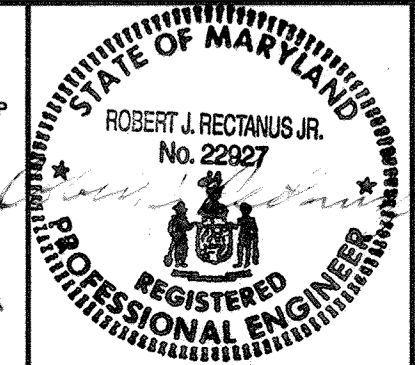
- ALL EARTHWORK AND FOUNDATION CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL REPORT. IN CASE OF A CONFLICT THE REQUIREMENTS OF THE SPECIFICATIONS SHALL COVER.
- TO FACILITATE SCHEDULING, AT LEAST 48 HOURS ADVANCE NOTICE SHOULD BE GIVEN TO THE INSPECTION ENGINEER PRIOR TO THE REQUIRED INSPECTIONS.
- UNLESS NOTED OTHERWISE, BACKFILL SHALL NOT BE PLACED AGAINST THE WALLS UNTIL THE TOP SLAB HAS BEEN PLACED IN ITS ENTIRETY AND ALL CONCRETE HAS REACHED ITS DESIGN STRENGTH.

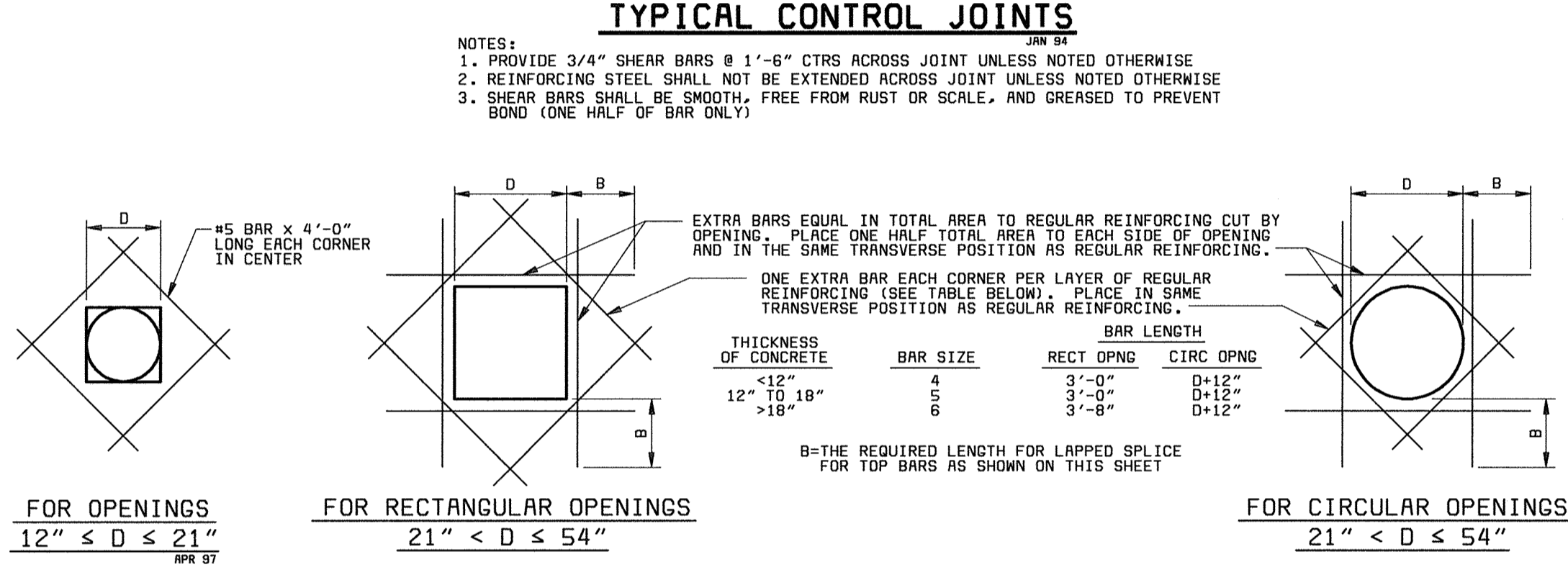
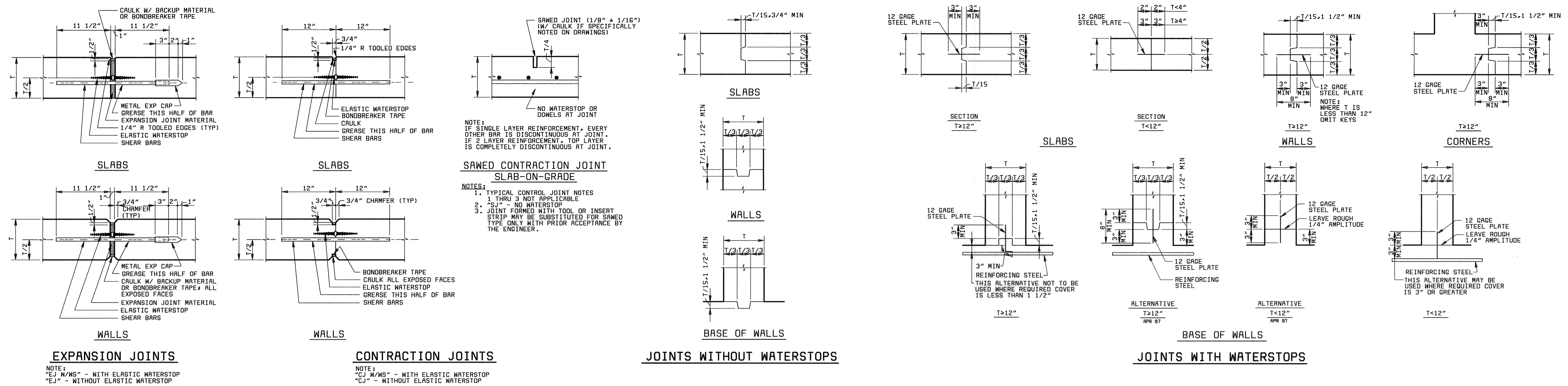
**LOADING CRITERIA**

- DEAD LOAD .....CALCULATED
- LIVE LOADS:
  - OPERATION AND PROCESS FLOORS..... 150 PSF
  - EQUIPMENT..... ACTUAL
  - STAIRS/SERVICE PLATFORMS..... 100 PSF
  - GRATING AREAS..... 100 PSF
  - ALL FLOORS NOT INDICATED..... 100 PSF
  - ROOF (MIN)..... 20 PSF
  - CLEARWELL ROOF..... 100 PSF
  - GROUND SNOW LOAD..... 30 PSF
  - IMPORTANCE FACTOR..... 1.0
- LATERAL EARTH PRESSURE AS PER GEOTECHNICAL REPORT FROST DEPTH 24 INCHES MINIMUM
- LATERAL SURCHARGE ..... EQUIVALENT OF 2 FT OF SOIL WHERE ADJACENT TO ROADWAY
- HYDROSTATIC FLUID PRESSURE ..... 63 PSF/FT
- WIND LOAD:
  - BASIC WIND SPEED..... 80 MPH
  - EXPOSURE..... C
  - IMPORTANCE FACTOR..... 1.0
- SEISMIC LOAD:
  - AV..... .05
  - RB..... .05
  - HAZARD EXPOSURE GROUP..... 1
  - PERFORMANCE CATEGORY..... 8
  - SEISMIC SITE COEFFICIENT (S)..... 1.0

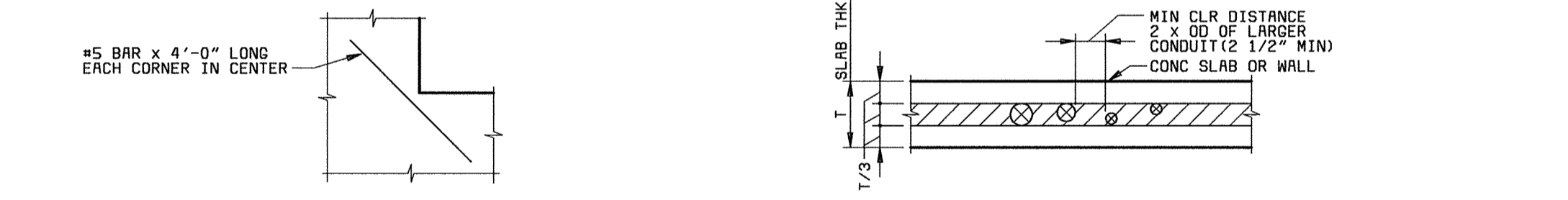
A  
B  
C  
D  
E  
F

A  
B  
C  
D  
E  
F

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert M. Berger</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LLP Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> REG. PROF. ENGR. DATE	 ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: JD							GENERAL STRUCTURAL  STRUCTURAL NOTES	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: ET									
			CHK: NGM									S20
			DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

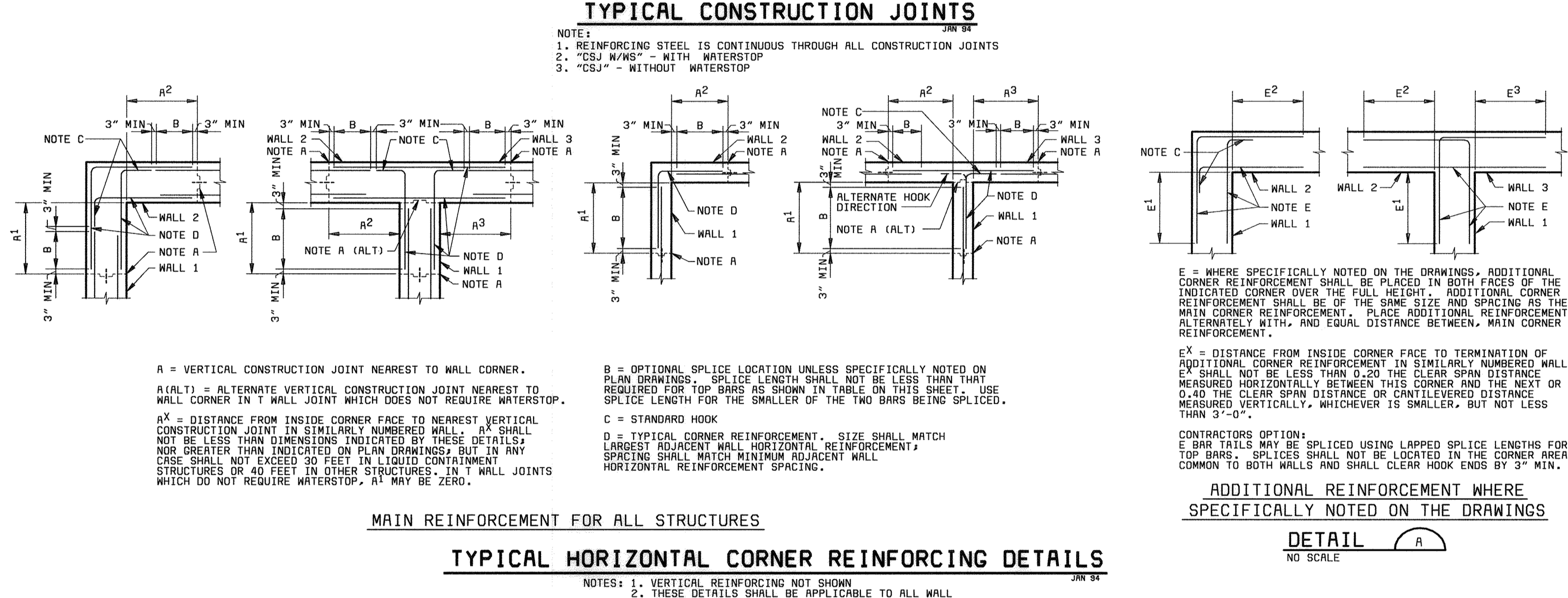


**TYPICAL EXTRA REINFORCING AT OPENINGS 12" TO ≤ 54"**  
 (TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS) JAN 94



**TYPICAL RING WALL REINFORCING SPLICE DETAIL**  
 JUN 94

**CONDUIT PLACING DETAIL**  
 NO SCALE APR 97



(f'c=4000 PSI) **SPLICE & DEVELOPMENT LENGTHS** (UNLESS NOTED OTHERWISE ON THE DRAWINGS) JAN 94

BAR SIZE	BEAMS AND COLUMNS					WALLS, SLABS AND FOOTINGS					BAR SIZE
	LENGTH OF LAPPED SPLICES FOR REIN (INCHES)		LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCEMENT (INCHES)			LENGTH OF LAPPED SPLICES FOR REIN (INCHES)		LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCEMENT (INCHES)			
	*TOP BARS	OTHERS	*TOP BARS	OTHERS	HOKED BARS	*TOP BARS	OTHERS	*TOP BARS	OTHERS	HOKED BARS	
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	40	31	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	108	77	60	19	201	154	119	89	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.

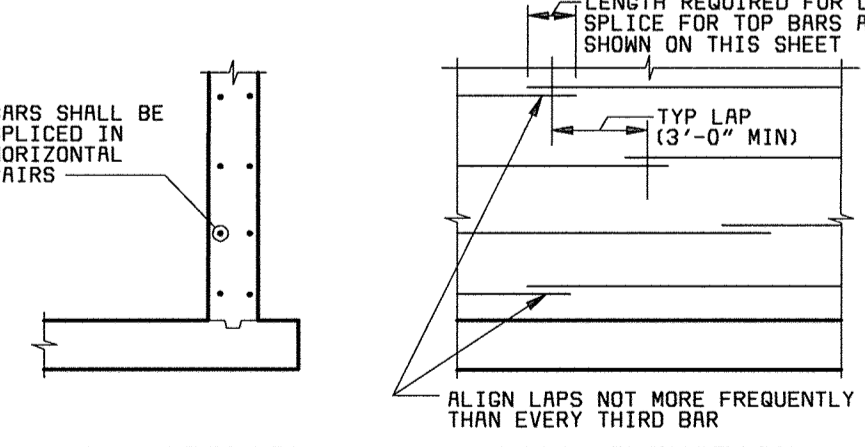
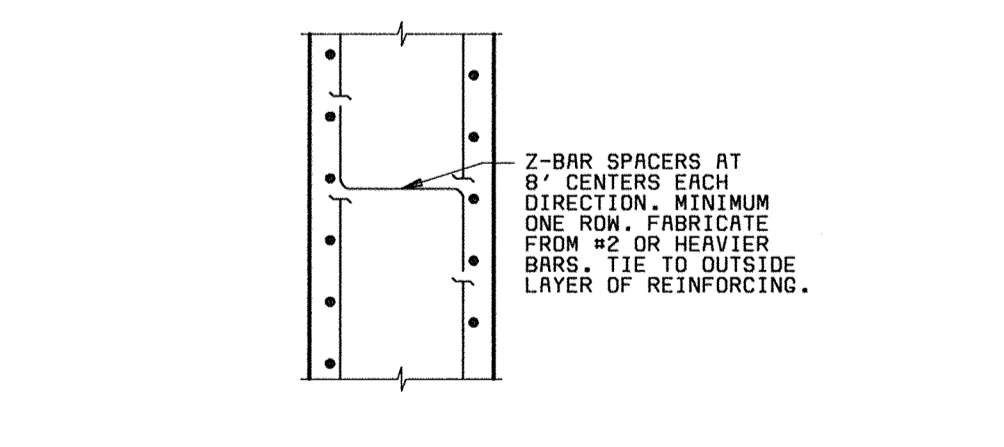
**CONCRETE COVER FOR REINFORCEMENT**

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 GIRDETS, 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.

**SPACERS FOR WALL REINFORCEMENT**  
 JUN 94

**CONCRETE COVER FOR REINFORCEMENT**



**GENERAL STRUCTURAL**

**LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION**

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

Robert M. Beaman 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
 Gaithersburg, Maryland

REG. PROF. ENGR. DATE

STATE OF MARYLAND  
 ROBERT J. RECTANUS JR.  
 No. 22927  
 REGISTERED PROFESSIONAL ENGINEER

DES: STD  
 DRN: RLC  
 CHK: NGM  
 DATE: 5/5/00

DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP

**GENERAL STRUCTURAL**

**STANDARD CONCRETE DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

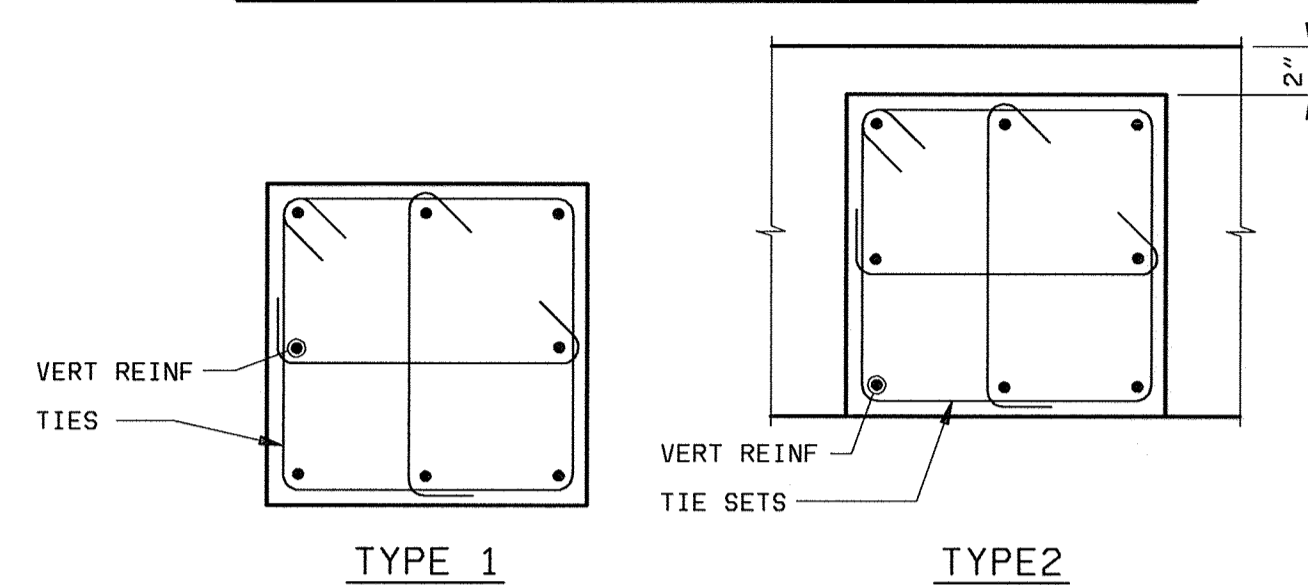
SCALE AS SHOWN  
 SHEET 63 OF 161  
 S21

COLUMN REINFORCING SCHEDULE			
ELEVATION TYPE	I	II	III
BLOWER BUILDING			
TOP OF BEAM/COLUMN	163.00	163.00	
SECTION TYPE	2	1	
SIZE	24"x24"	24"x24"	
VERTICAL REINF	8-#8	8-#8	
TIES	#3@12"	#3@12"	
LAP L <sup>2</sup>	5'-4"	5'-4"	
TOP OF SLAB EL		144.00	144.00
SECTION TYPE		1	1
SIZE		24"x24"	24"x24"
VERTICAL REINF		8-#8	
TIES		#3@12"	#3@12"
LAP L <sup>1</sup>		5'-4"	5'-4"
TOP OF FDN EL		VARIES	VARIES
DOWELS	8-#8	8-#8	8-#8
COMMENTS		NOTE 1	NOTE 1

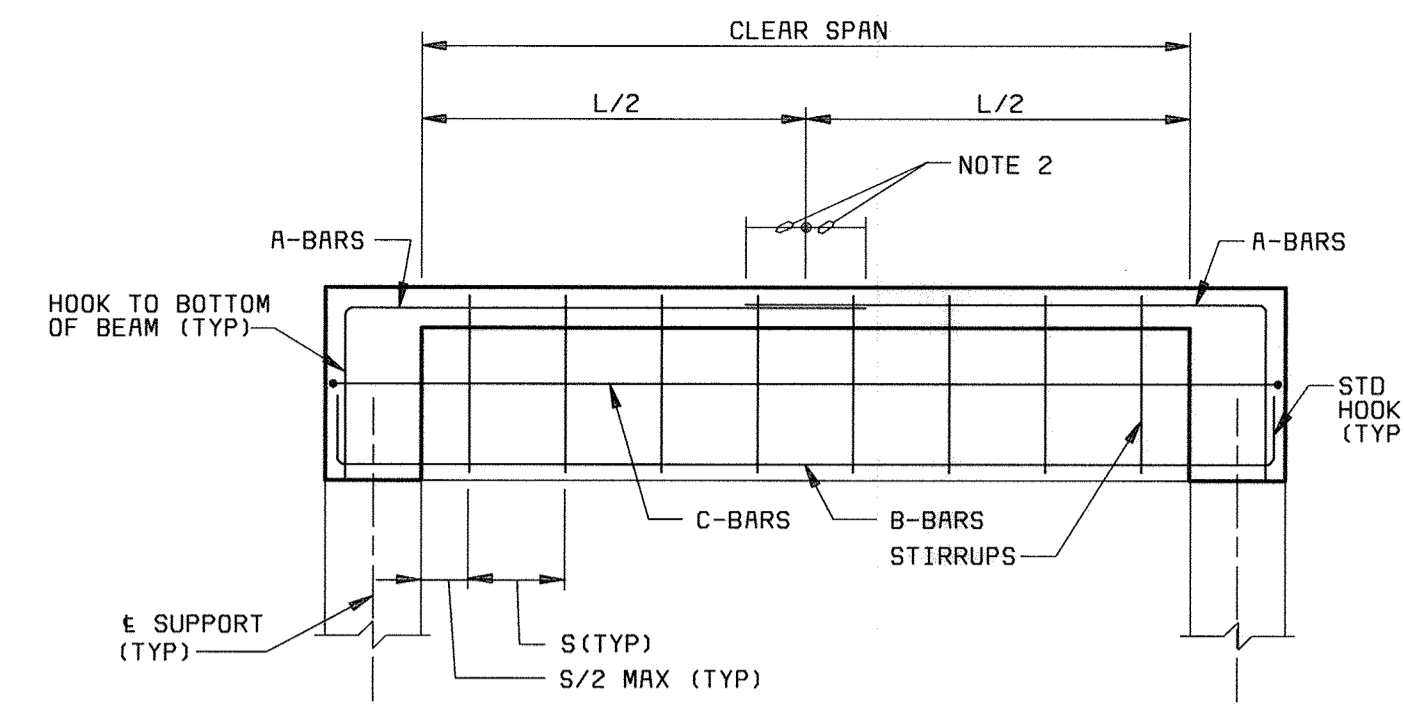
NOTE:

1. FOR TOP OF FDN, SEE PLAN.

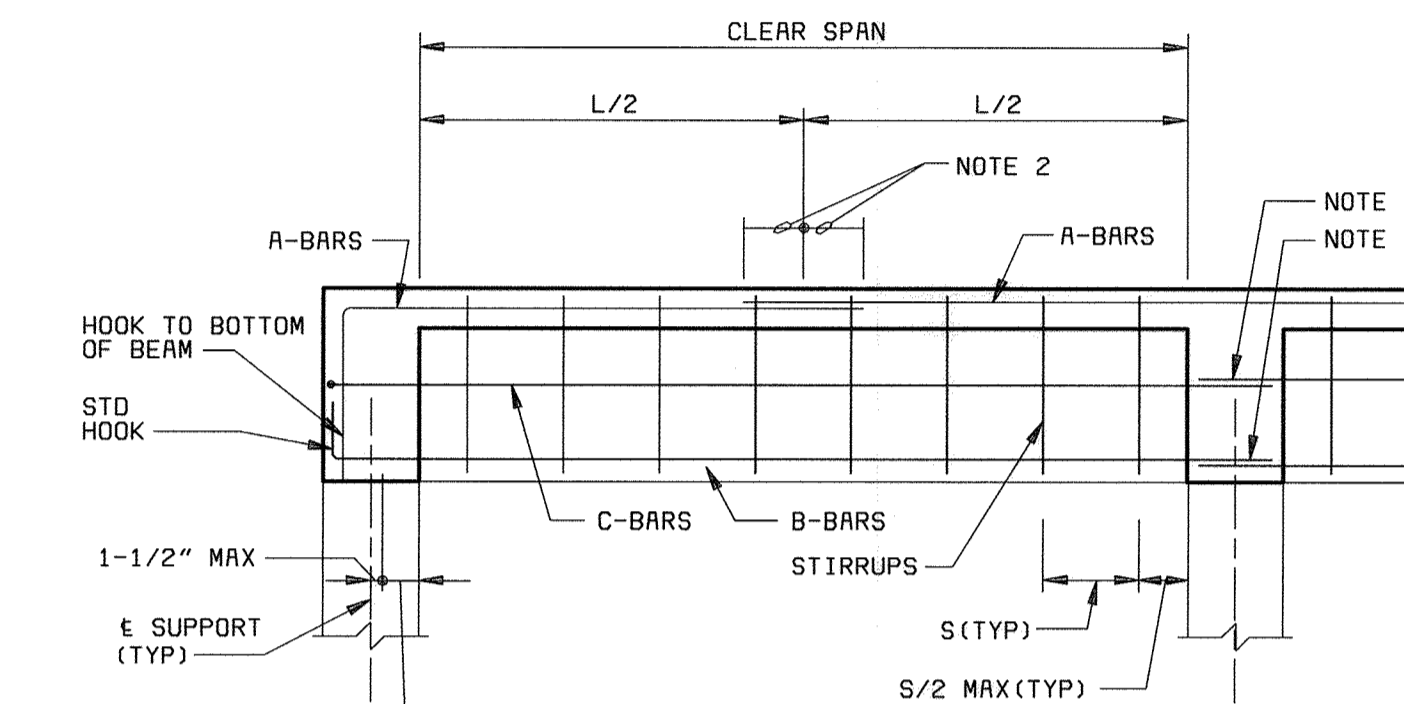
COLUMN SCHEDULE						
COLUMN ROW	A	B	C	D	E	F
BLOWER BUILDING						
2	I	II	II	II	II	I
2.2	I					
2.5		III	III	III	III	
2.7	I					I
3		III	III	III	III	
4	I	I	I	I	I	I



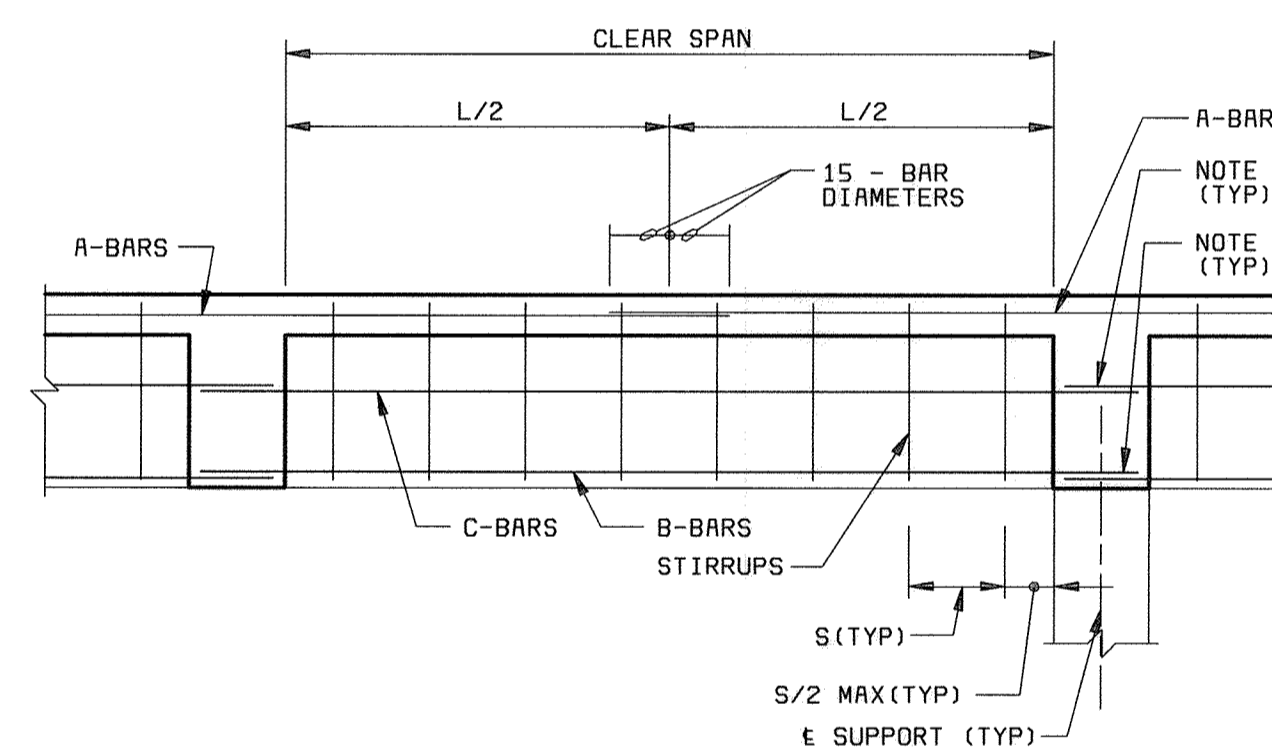
COLUMN SECTION TYPES



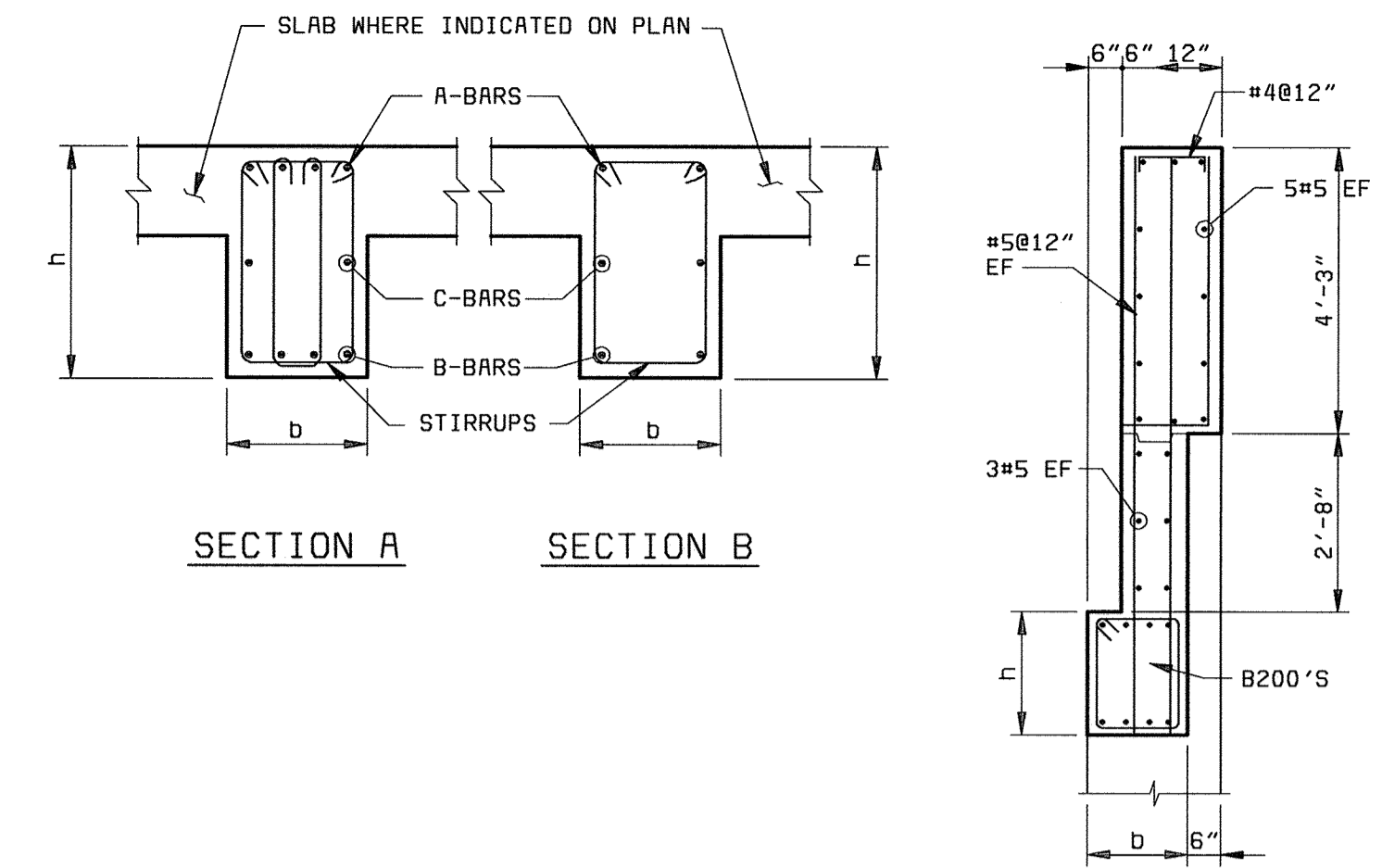
TYPE I



TYPE II



TYPE III



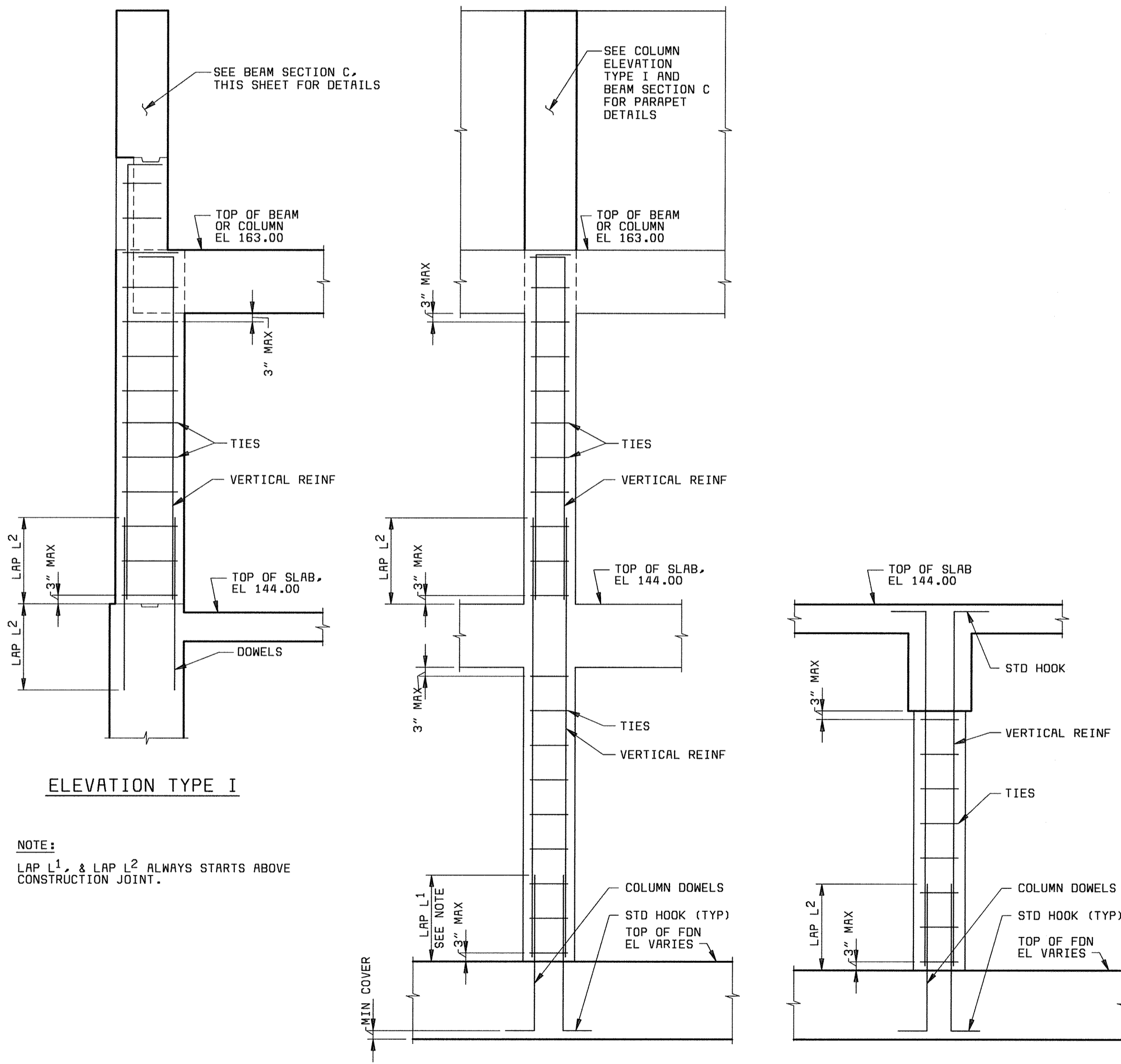
BEAM SECTIONS

BEAM SCHEDULE									
BEAM NO.	BEAM TYPE	BEAM SECTION	b (IN)	h (IN)	A BARS	B BARS	C BARS	STIRRUPS SIZE @ S	COMMENTS
BLOWER BUILDING									
B-101	II	A	24	24	5#8	5#8	-	#4@8"	
B-102	III	A	24	24	5#8	5#8	-	#4@8"	
B-103	II	A	24	18	5#8	5#7	-	#4@8"	
B-104	III	A	24	18	5#8	5#7	-	#4@8"	
B-105	I	B	16	18	3#7	3#9	-	#3@6"	
B-106	I	B	16	18	3#6	3#6	-	#3@6"	
B-107	II	A	24	18	5#7	5#6	-	#3@8"	
B-108	III	A	24	18	5#7	5#6	-	#3@8"	
B-201	II	C	18	24	4#7	4#6	-	#4@10"	
B-202	III	C	18	24	4#7	4#6	-	#4@10"	
B-203	II	C	18	24	4#7	4#6	-	#3@10"	
B-204	III	C	18	24	4#7	4#6	-	#3@10"	

BEAM NOTES:

- UNLESS INDICATED OTHERWISE IN BEAM SCHEDULE, CONTINUOUS BOTTOM REINF SHALL HAVE LAP SPLICES CENTERED ON THE CENTERLINE OF THE SUPPORT USING 75% OF THE LAP SPLICE LENGTH INDICATED ON THE STANDARD CONCRETE DETAILS SHEET D-1. USE THE LAP SPLICE REQUIREMENT OF THE SMALLER BOTTOM BAR IF BAR SIZES IN ADJACENT SPANS DIFFER. AT THE CONTRACTORS OPTION, BOTTOM REINF MAY BE CONTINUOUS, WITHOUT SPLICING, ACROSS THE SUPPORT IF BARS IN THE ADJACENT SPAN ARE EQUAL IN SIZE AND QUANTITY.
- CONTINUOUS END AND INTERIOR TOP REINF 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 BARS, IF THE BAR SIZES EACH SIDE OF MIDSPAN DIFFER. AT THE CONTRACTORS OPTION, TOP REINF MAY BE MADE CONTINUOUS, WITHOUT SPLICING, IF THE TOP BARS EACH SIDE OF MIDSPAN ARE EQUAL IN SIZE AND QUANTITY.
- CONTINUOUS TOP AND BOTTOM BARS SHALL BE PLACED IN THE BEAM SECTION SUCH THAT ONE OF THE CONTINUOUS BARS IS LOCATED IN EACH CORNER OF THE BEAM STIRRUPS.
- ALL TOP AND BOTTOM BARS SHALL BE PLACED IN ONE LAYER UNLESS INDICATED OTHERWISE. WHERE MORE THAN ONE LAYER IS NOTED, PROVIDE GREATER OF 2.5 INCHES OR 3 BAR DIAMETER CLEAR BETWEEN LAYERS.
- SIDE FACE REINF SHALL BE CONTINUOUS WITH LAP SPLICES CENTERED AT THE CENTERLINE OF THE SUPPORT. A 90 DEGREE STANDARD HOOK SHALL BE PROVIDED AT THE EXTERIOR ENDS OF END SPANS. SCHEDULED SIDE FACE REINF SHALL BE SPACED EQUALLY ON EACH SIDE.

BEAM DETAILS  
NO SCALE

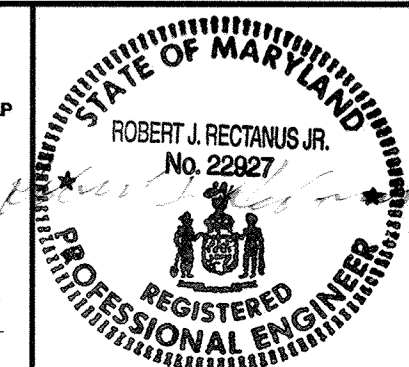


COLUMN REINFORCEMENT ELEVATIONS  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND



REG. PROF. ENGR. DATE



DES: IFH

DRN: RLC

CHK: NGM

DATE: 6/23/00

GENERAL  
STRUCTURAL

COLUMN AND BEAM SCHEDULES

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
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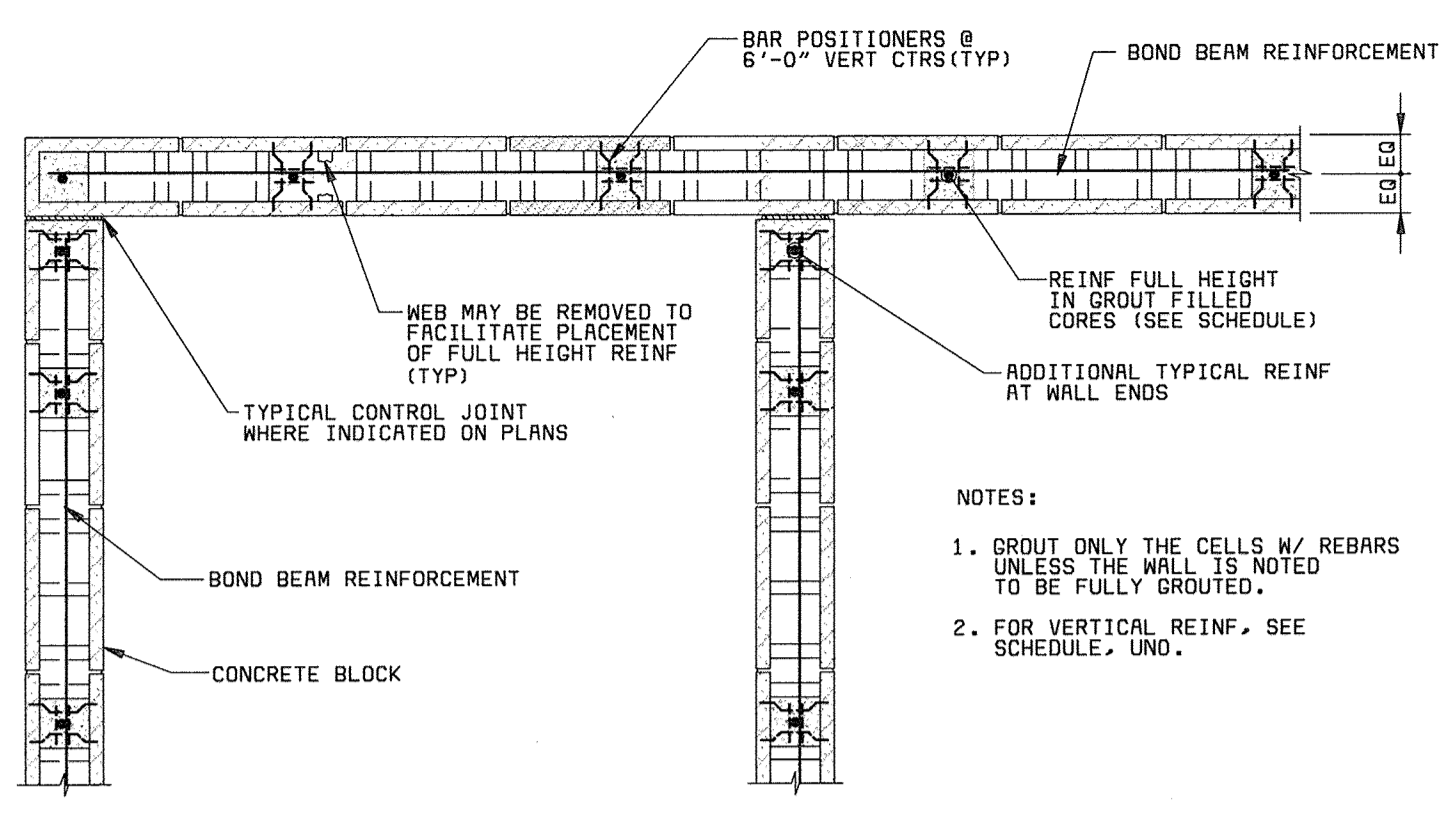
SHEET  
64 OF 161

S22

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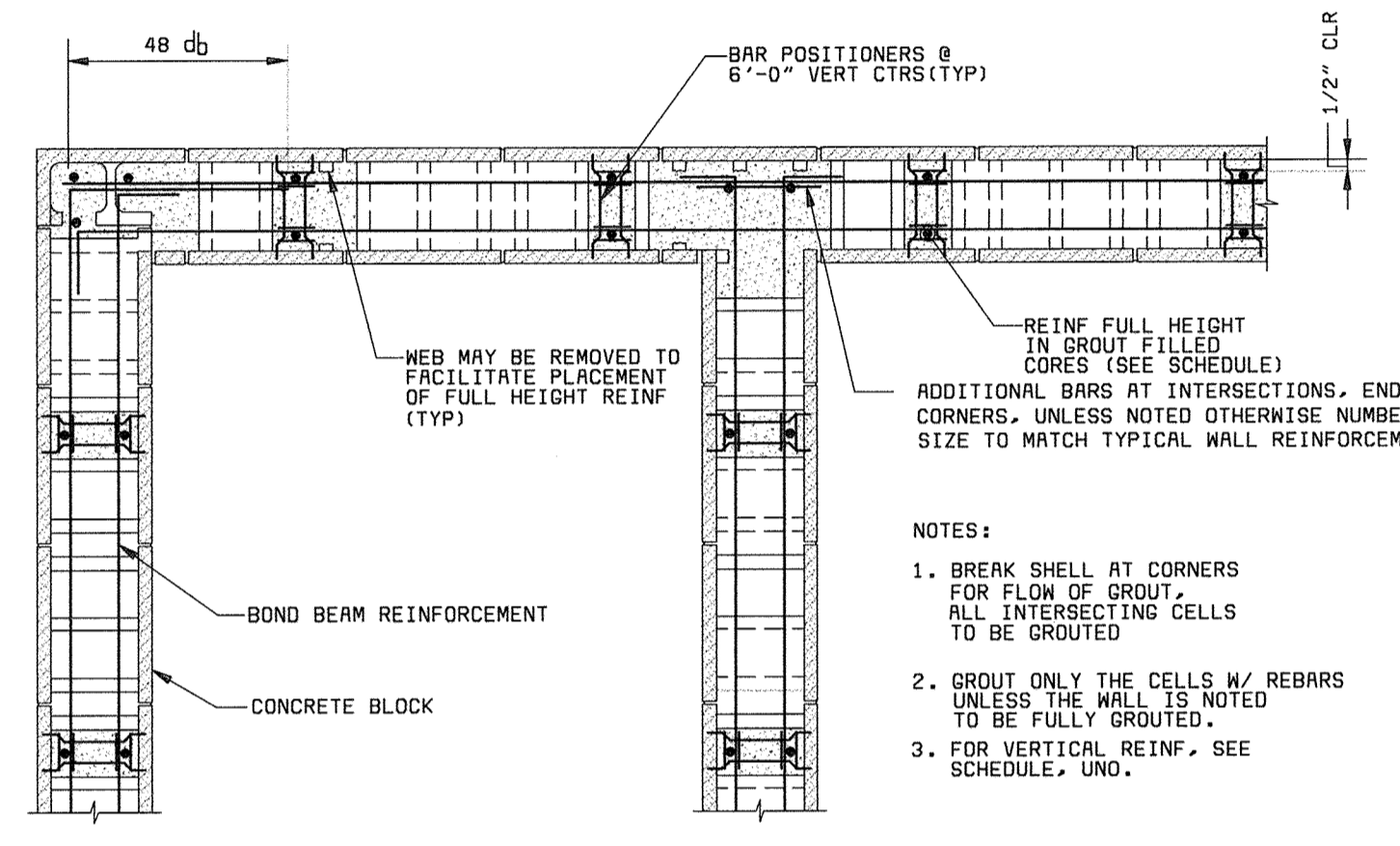
Robert M. Baizer 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE





TYPICAL REINFORCING WITH CORNER CONTROL JOINTS

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



TYPICAL REINFORCING WITHOUT CORNER CONTROL JOINTS

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

TYPICAL MASONRY REINFORCING PLANS

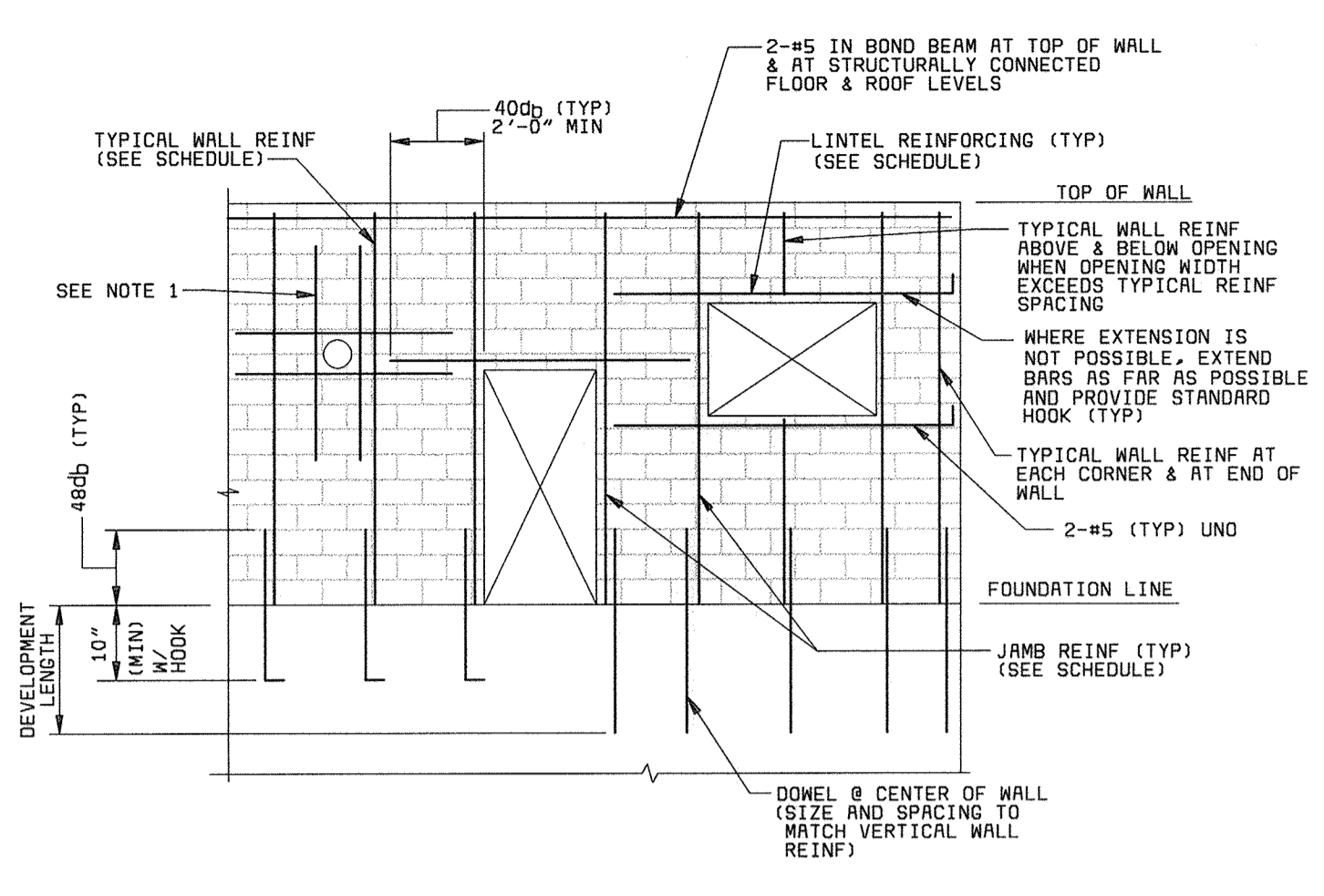
3/4" = 1'-0"

MINIMUM CMU WALL REINFORCING SCHEDULE (NOTE 5) (SPECIAL INSPECTION REQUIRED)					
WALL SIZE	WALL HEIGHT	VERTICAL REINFORCEMENT		HORIZONTAL REINFORCEMENT	
		EXTERIOR WALL	INTERIOR WALL	EXTERIOR WALL	INTERIOR WALL
12"	≤16'-0"	#5@48	#5@48	CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#6 HORIZONTAL	CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#6 HORIZONTAL
	≤20'-0"	#6@48	#5@48		
	≤22'-0"	#5@48 EF	#5@48		
	≤24'-0"	#5@32 EF	#5@48		
8"	≤13'-0"	#5@48	#5@48	CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#5 HORIZONTAL	CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#5 HORIZONTAL
	≤16'-0"	#5@32	#5@48		
	≤18'-0"	#5@32 EF	#5@48		
	≤22'-0"	#6@32 EF	#5@48		

- NOTES:
- WALL HEIGHT IS DISTANCE FROM BOTTOM OF MASONRY WALL TO THE LOCATION OF TOP LATERAL SUPPORT.
  - 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.
  - AN INTERIOR WALL IS A WALL IN WHICH NO PORTION OF THE WALL IS EXPOSED TO THE EXTERIOR.
  - 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.
  - 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 STRUCTURAL AND ARCHITECTURAL DRAWINGS.
  - SEE THE STRUCTURAL DRAWINGS FOR SPECIAL REINFORCEMENT AND BOUNDARY ELEMENTS IN HIGH STRESS SHEAR WALLS. ALL WALLS SHALL BE REINFORCED WITH THE MINIMUMS ABOVE.

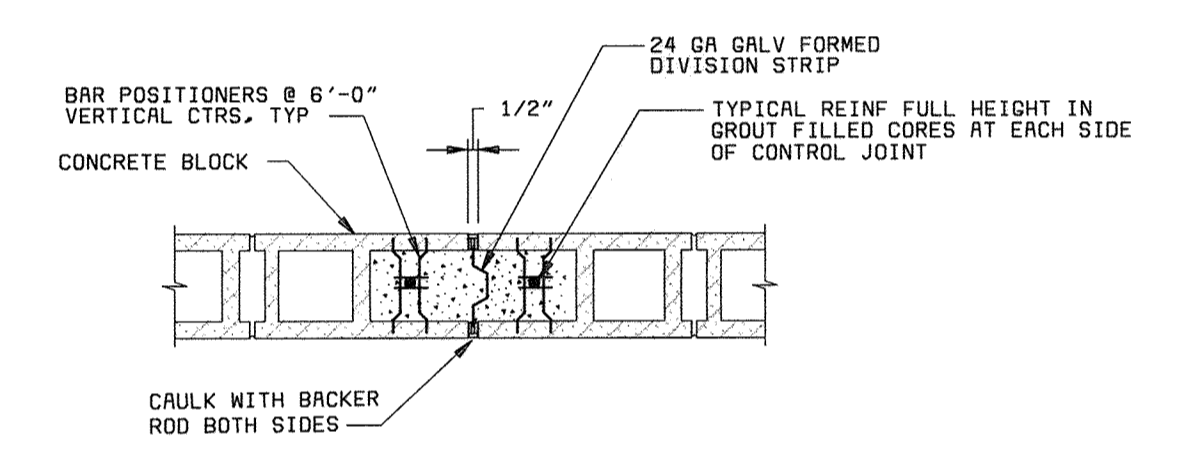
MINIMUM CMU WALL REINFORCING SCHEDULE

NO SCALE



TYPICAL MASONRY REINFORCING ELEVATION

NO SCALE

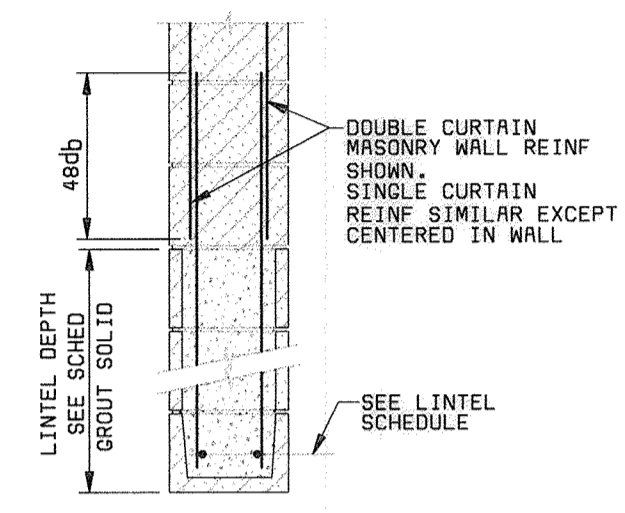


TYPICAL CONCRETE MASONRY CONTROL JOINT

NO SCALE

LINTEL SCHEDULE			
WALL SIZE	OPENING WIDTH	LINTEL DEPTH	LONGITUDINAL REINFORCEMENT
12"	≤4'-0"	0'-8"	2-#5
	≤8'-0"	1'-4"	2-#5
	≤12'-0"	2'-0"	2-#5
	≤16'-0"	2'-0"	2-#6
	≤20'-0"	2'-8"	2-#7
8"	≤4'-0"	0'-8"	2-#5
	≤8'-0"	1'-4"	2-#5
	≤15'-0"	2'-0"	2-#5

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

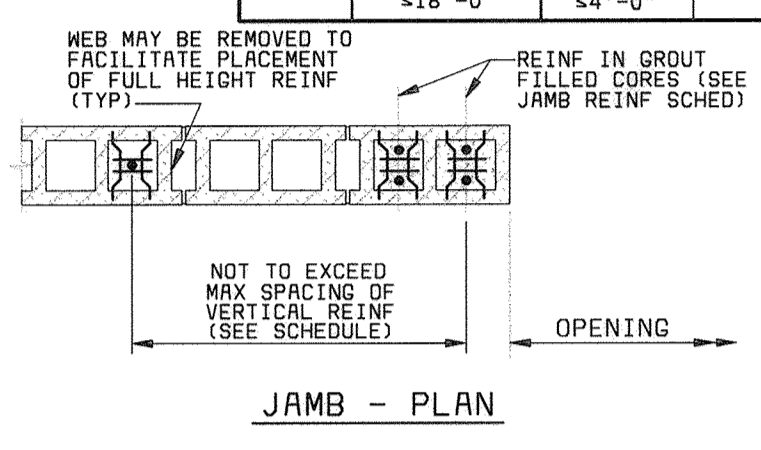


TYPICAL MASONRY LINTEL SECTION AND SCHEDULE

NO SCALE

JAMB REINFORCING SCHEDULE				
WALL SIZE	WALL HEIGHT	OPENING WIDTH	EXTERIOR WALL REINFORCEMENT	INTERIOR WALL REINFORCEMENT
12"	≤16'-0"	≤7'-0"	1-#5 EF	1-#5 EF
		≤12'-0"	2-#5 EF	1-#5 EF
		≤4'-0"	1-#6 EF	1-#5 EF
	≤20'-0"	≤7'-0"	1-#6 EF	1-#5 EF
		≤12'-0"	3-#6 EF	1-#5 EF
		≤4'-0"	1-#6 EF	1-#5 EF
8"	≤22'-0"	≤7'-0"	2-#6 EF	1-#5 EF
		≤12'-0"	3-#6 EF	2-#5 EF
		≤4'-0"	2-#6 EF	1-#5 EF
	≤24'-0"	≤7'-0"	2-#7 EF	1-#5 EF
		≤12'-0"	3-#6 EF	1-#5 EF
		≤4'-0"	1-#5 EF	1-#5 EF
≤13'-0"	≤7'-0"	1-#6 EF	1-#5 EF	
	≤12'-0"	3-#6 EF	1-#5 EF	
	≤4'-0"	1-#6 EF	1-#5 EF	
≤16'-0"	≤4'-0"	1-#6 EF	1-#5 EF	
	≤7'-0"	2-#7 EF	1-#5 EF	
	≤18'-0"	2-#5 EF	1-#5 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. AN INTERIOR WALL IS A WALL IN WHICH NO PORTION OF THE WALL IS EXPOSED TO THE EXTERIOR.  
4. AT LOCATIONS WHERE WALLS CANTILEVER ABOVE THE TOP LATERAL SUPPORT, THE WALL HEIGHT FOR 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.  
5. REINFORCE JAMBS AS INDICATED UNLESS NOTED OTHERWISE ON THE DRAWINGS.



TYPICAL MASONRY JAMB PLAN AND SCHEDULE

NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
Robert D. Berger 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland  
REG. PROF. ENGR.  
DATE

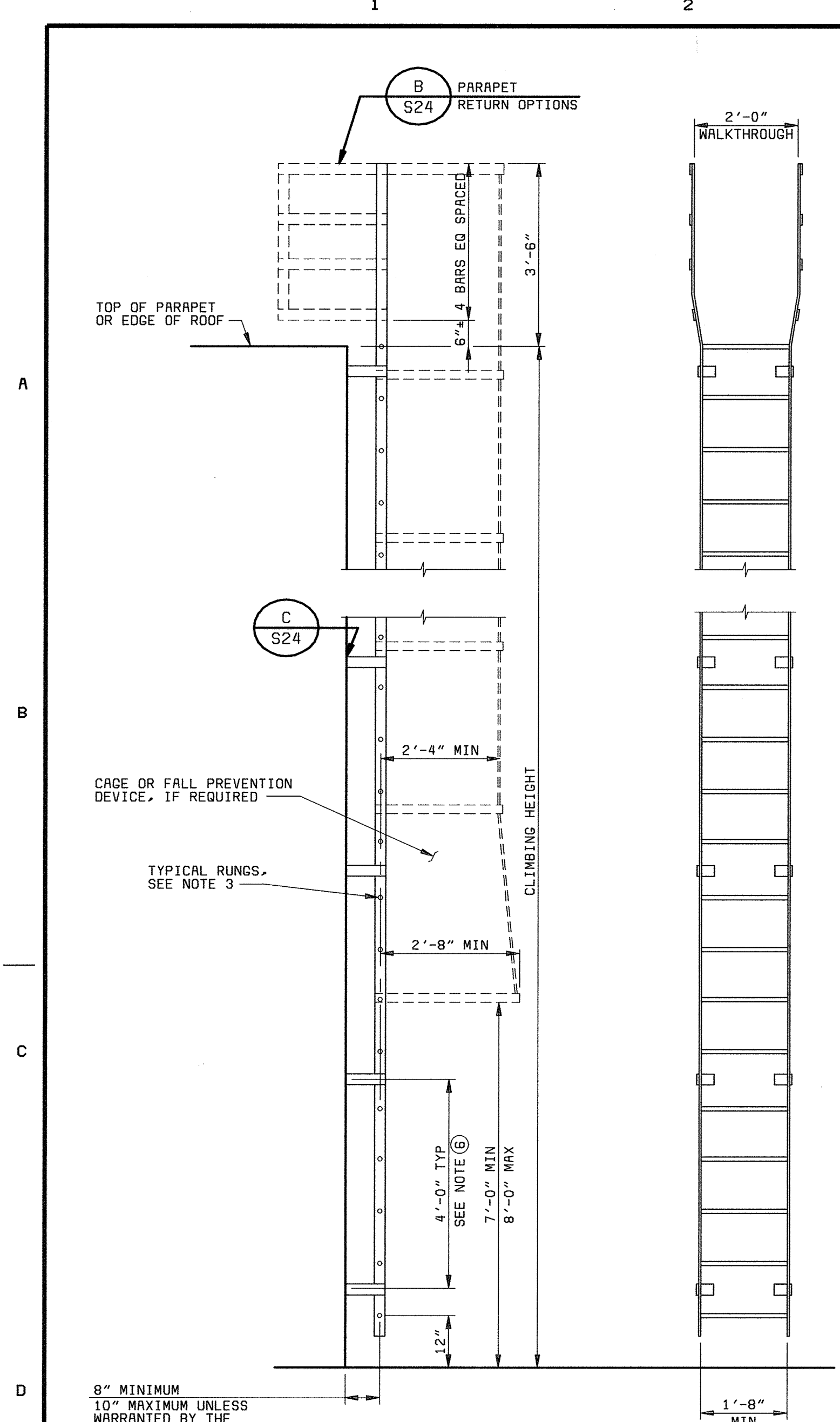
STATE OF MARYLAND  
ROBERT J. RECTANUS JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: STD									
DRN: B&V									
CHK: NGM									
DATE: 6/23/00									
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP				

GENERAL STRUCTURAL  
STANDARD MASONRY DETAILS

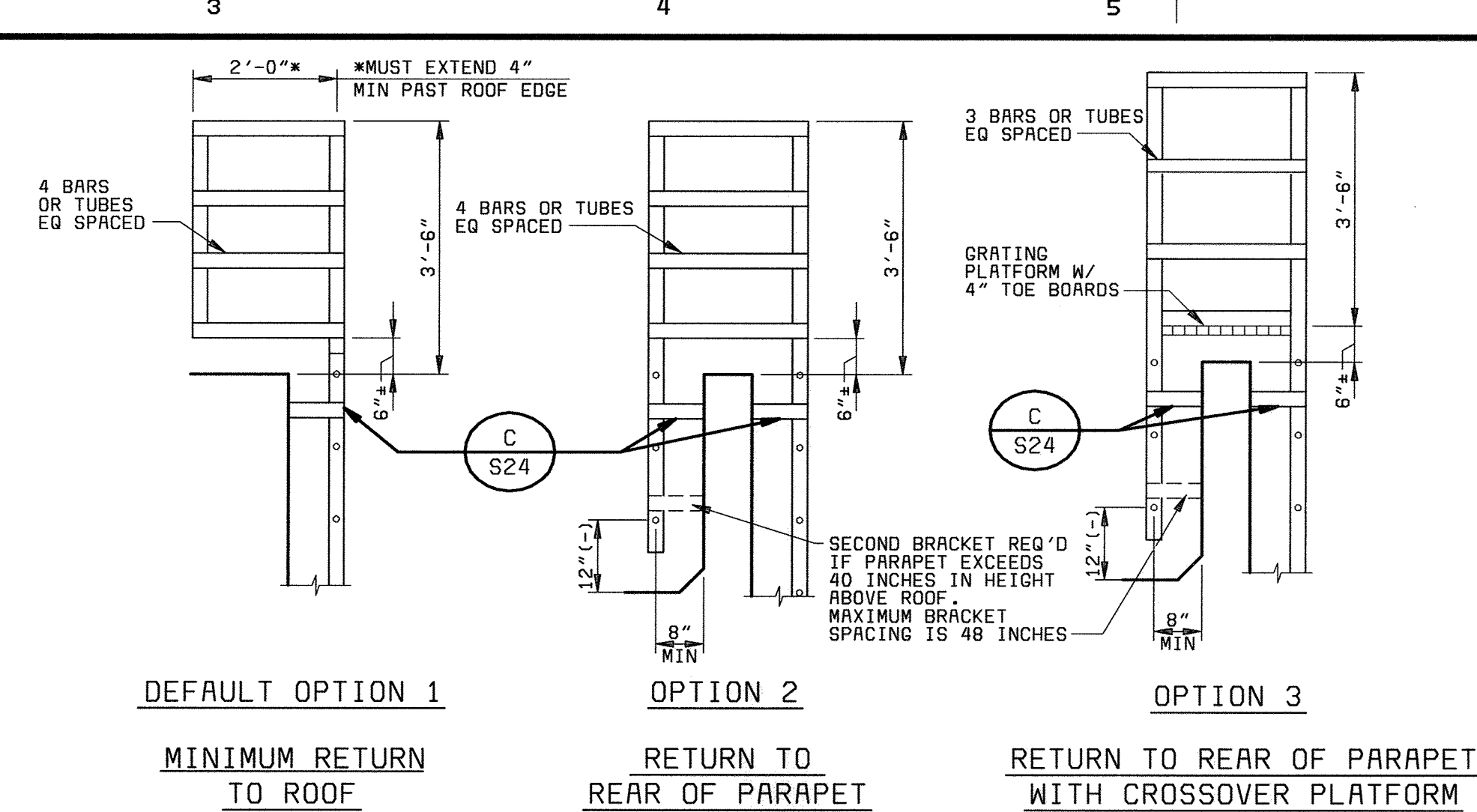
LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 65 OF 161  
S23

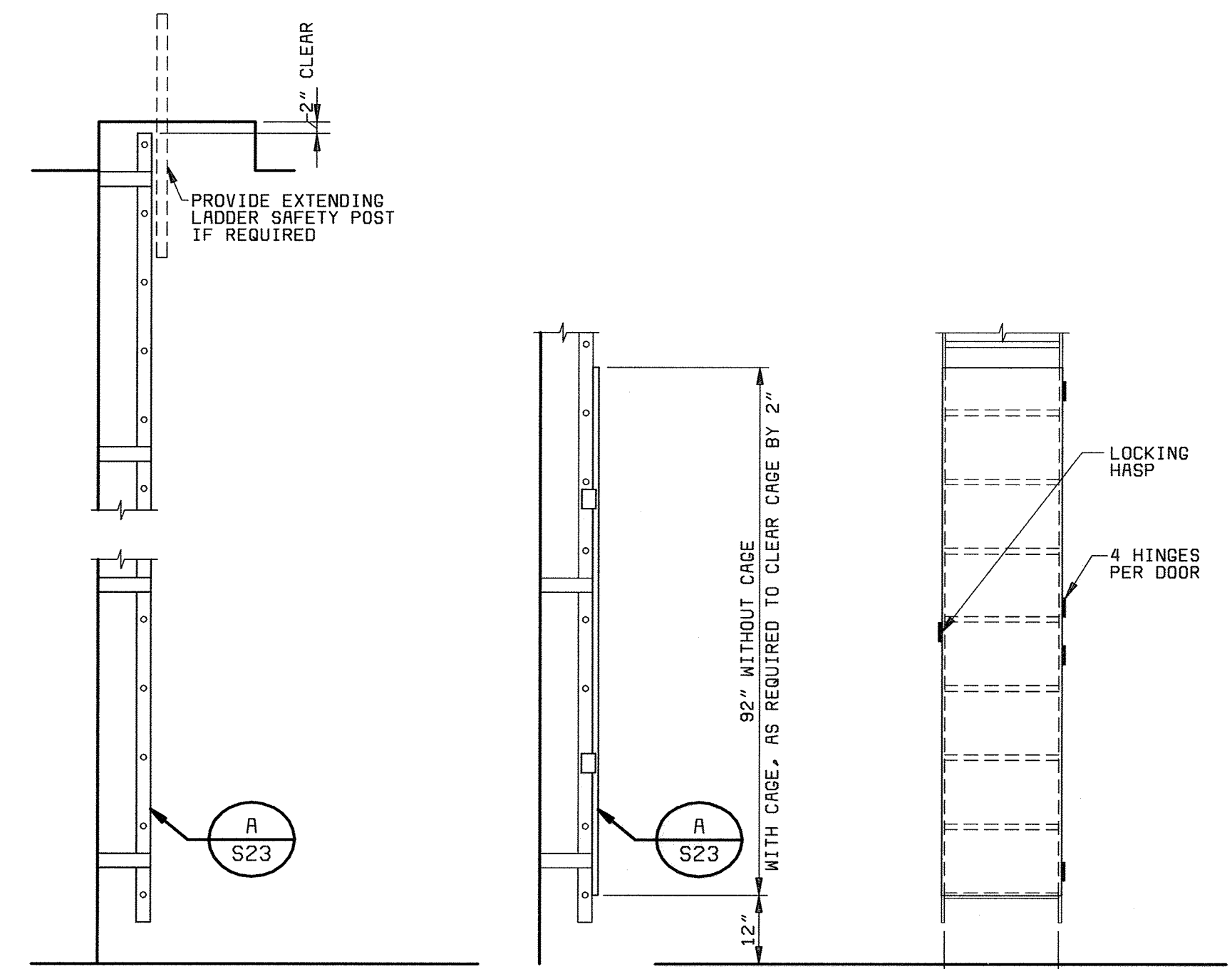


NOTE: A CAGE OR FALL PREVENTION DEVICE, AS REQUIRED, SHALL BE FURNISHED FOR ALL CLIMBING HEIGHTS GREATER THAN 20'-0" FOR CLIMBING HEIGHTS GREATER THAN 30'-0". REST PLATFORMS SHALL BE FURNISHED AS REQUIRED TO LIMIT STRAIGHT CLIMBS TO 30'-0".

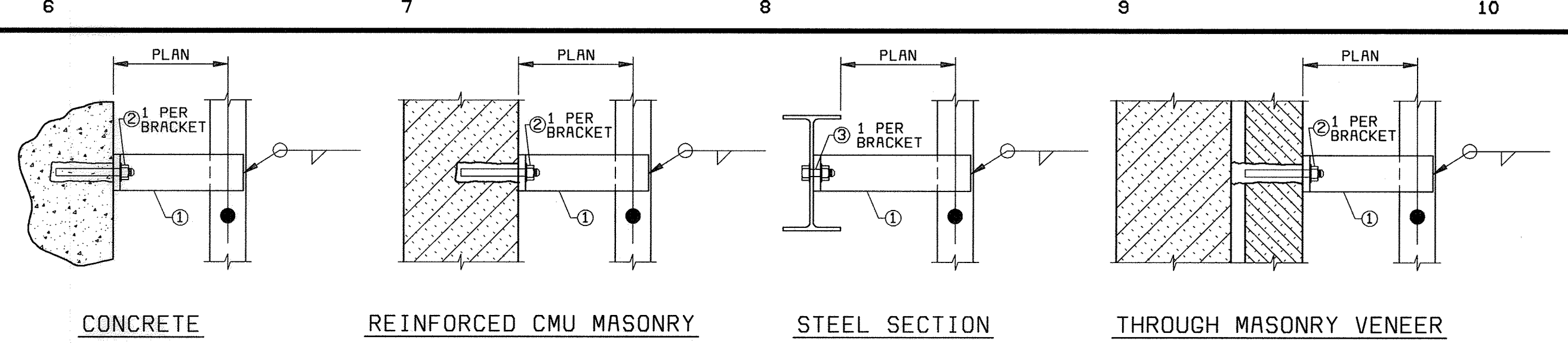
**TYPICAL LADDER (A)**  
1/2" = 1'-0"



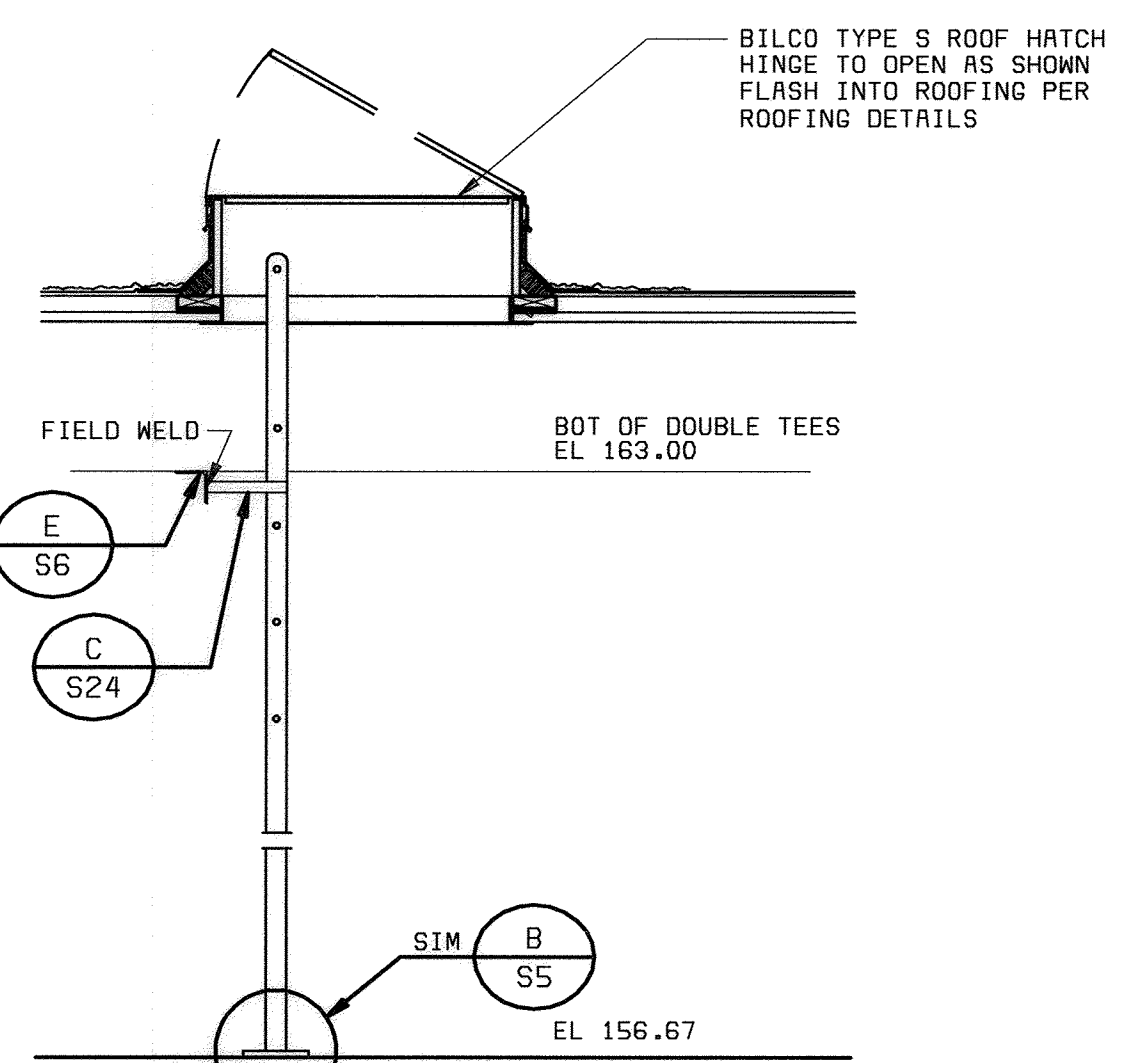
**PARAPET RETURN OPTIONS (B)**  
1/2" = 1'-0"  
USE OPTION 1 IF NONE INDICATED.



**UNDER HATCH (D)** 1/2" = 1'-0"  
**SECURITY DOOR (E)** 1/2" = 1'-0"



**TYPICAL LADDER BRACKET CONNECTIONS (C)**  
NO SCALE



**ROOF HATCH (F)**  
1/2" = 1'-0"

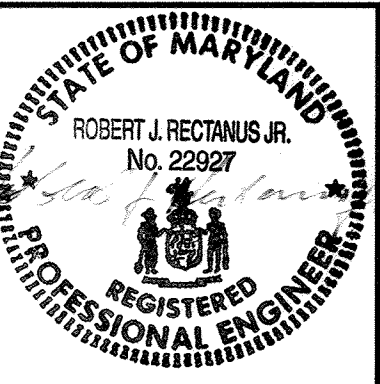
- NOTES:**
- ALL LADDERS, CAGES AND REST PLATFORMS, COMPLETE WITH GUARDRAILING AND GRATING AS REQUIRED, SHALL BE DESIGNED AND FABRICATED BY THE LADDER SUPPLIER IN CONFORMANCE WITH THE LATEST ISSUE OF OSHA/ANST A14.3, APPLICABLE BUILDING CODE STANDARDS FOR FIXED WALL LADDERS, AND THE REQUIREMENTS OF THE CONTRACT DRAWINGS AND SPECIFICATIONS. GENERAL CONFIGURATION AND DETAILS SHALL CONFORM WITH THIS DRAWING. ALL REST PLATFORMS SHALL BE GUARDED WITH STANDARD 3-RAIL RAILING WITH STANDARD TOE BOARD.
  - LADDER AND ALL APPURTENANCES TO BE MATERIAL AS NOTED ON DRAWINGS. COORDINATE MATERIALS AND FABRICATION WITH THE SPECIFICATIONS FOR MISCELLANEOUS METALS, GUARDRAILING, GRATING AND FIBERGLASS, IF APPLICABLE.  
STEEL (PAINTED) - ASTM A36, SHOP PRIME PAINTED  
STEEL (GALVANIZED) - ASTM A36, ZINC COATED IN ACCORDANCE WITH ASTM A123.  
ALUMINUM - ALUMINUM ASTM A6061-T6 ALLOY WITH MILL FINISH UNLESS NOTED OTHERWISE.  
STAINLESS STEEL - ASTM TYPE 316L  
FIBERGLASS - FIBERGLASS REINFORCED PULTRUDED TUBE, UV PROTECTED.  
GRATING - 1" THICK MIN; PAINTED, GALVANIZED OR STAINLESS STEEL, ALUMINUM OR FIBERGLASS TO MATCH LADDER MATERIAL  
HANDRAIL - 1 1/2" OR 1 3/4" ROUND OR SQUARE, 3 HORIZONTAL RAILS WITH MINIMUM 4" KICK PLATE.
  - LADDER RUNGS TO BE 1" DIA BARS OR PREFABRICATED FLAT TOP LADDER TREADS W/ MINIMUM 1" WIDE SLIP RESISTANT SURFACES. SPACE RUNGS AT 12". LADDER SIDE RAILS TO BE PIPE, TUBE OR FLAT STOCK.
  - FURNISH LADDERS IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
  - IF REQUIRED BY THE ENGINEER, CALCULATIONS OR TEST REPORTS VERIFYING THE LADDERS COMPLIANCE WITH APPLICABLE STANDARDS SHALL BE SUBMITTED. THESE SUBMITTALS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT.
  - IF A LADDER CONFIGURATION INDICATED ON THE DRAWINGS REQUIRES THAT THE LADDER SPAN A GREATER DISTANCE BETWEEN SUPPORTS THAN INDICATED ON THE TYPICAL DETAILS, THE LADDER SUPPLIER SHALL DESIGN THE LADDER, THE LADDER BRACKET, AND THE LADDER BRACKET CONNECTIONS FOR THE INDICATED SPAN IN ACCORDANCE WITH NOTE 1 ABOVE. THE BRACKET CONNECTIONS SHALL BE AT LEAST EQUAL TO THE TYPICAL CONNECTIONS INDICATED.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Robert W. Benner 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



DES: STD					
DRN: RLC					
CHK: NCM					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**GENERAL STRUCTURAL**

**LADDER DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

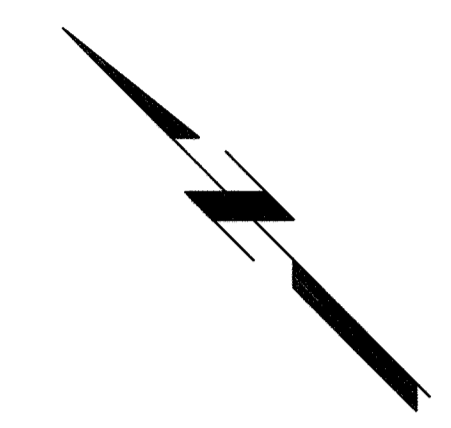
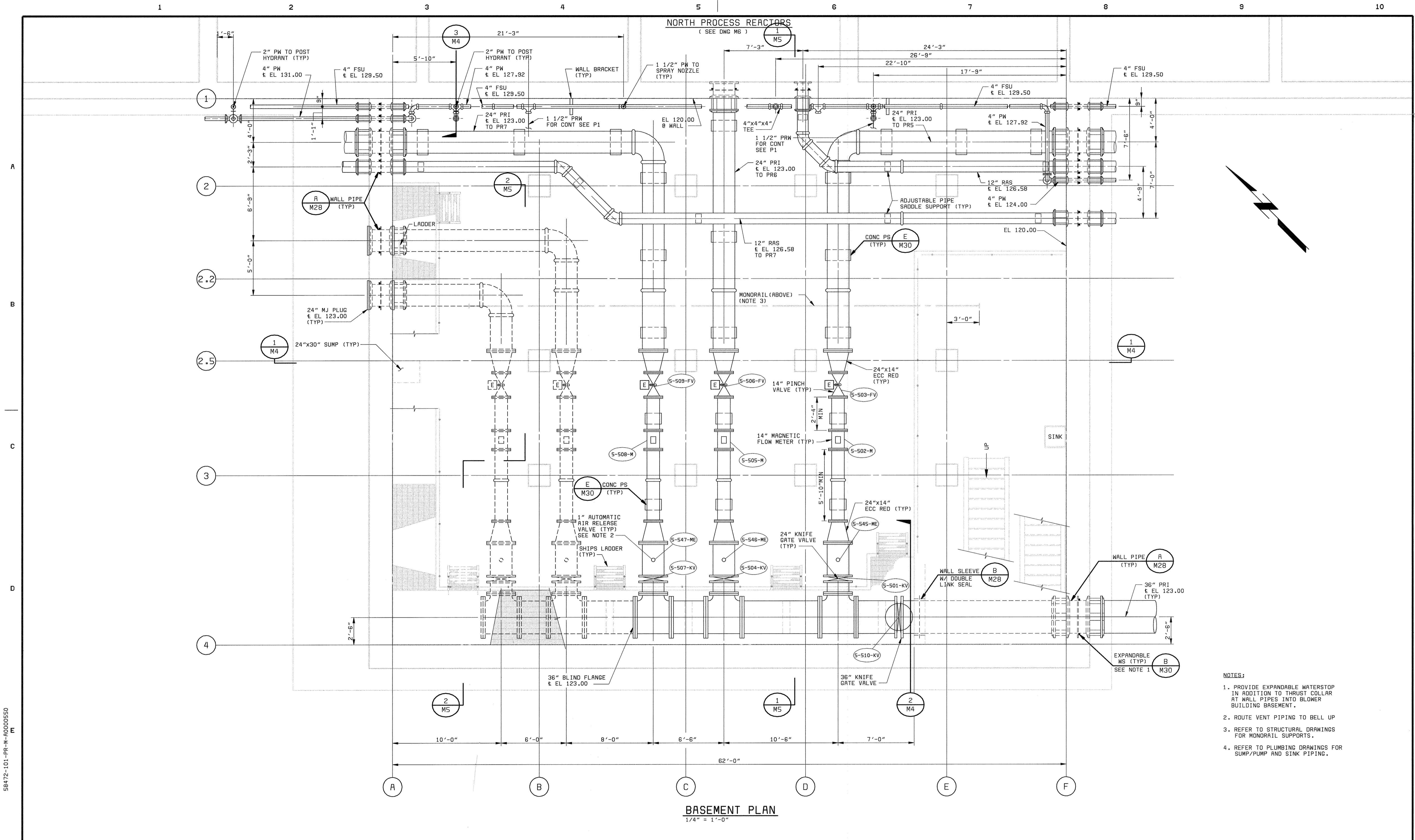
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 66 OF 161

**S24**



- NOTES:**
1. PROVIDE EXPANDABLE WATERSTOP IN ADDITION TO THRUST COLLAR AT WALL PIPES INTO BLOWER BUILDING BASEMENT.
  2. ROUTE VENT PIPING TO BELL UP
  3. REFER TO STRUCTURAL DRAWINGS FOR MONORAIL SUPPORTS.
  4. REFER TO PLUMBING DRAWINGS FOR SUMP/PUMP AND SINK PIPING.

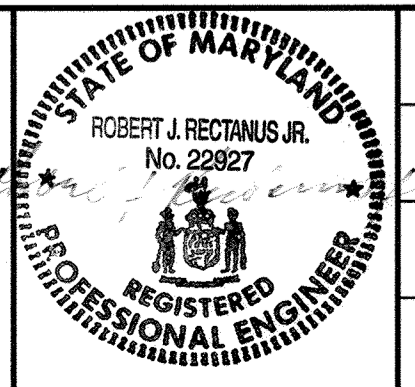
**BASEMENT PLAN**  
1/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Berman* 6-29-00  
REG. PROF. ENGR. DATE



DES: DWL.BCK	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: JRC.VVR							
CHK: WLK							

**NORTH BLOWER BUILDING**  
**MECHANICAL**

**BASEMENT PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

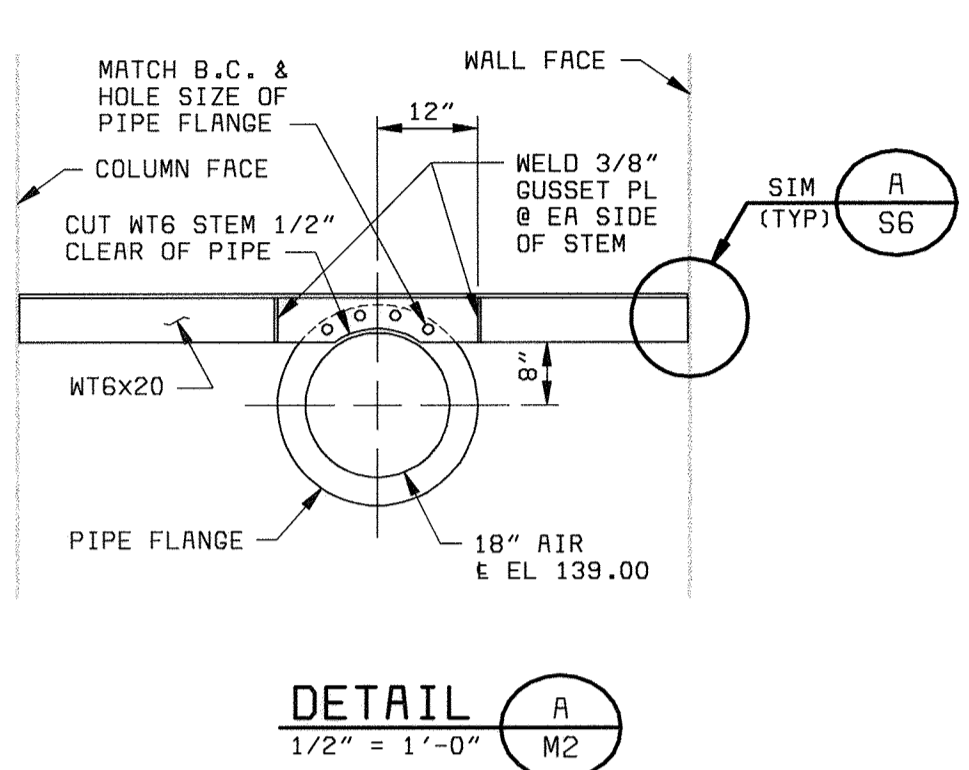
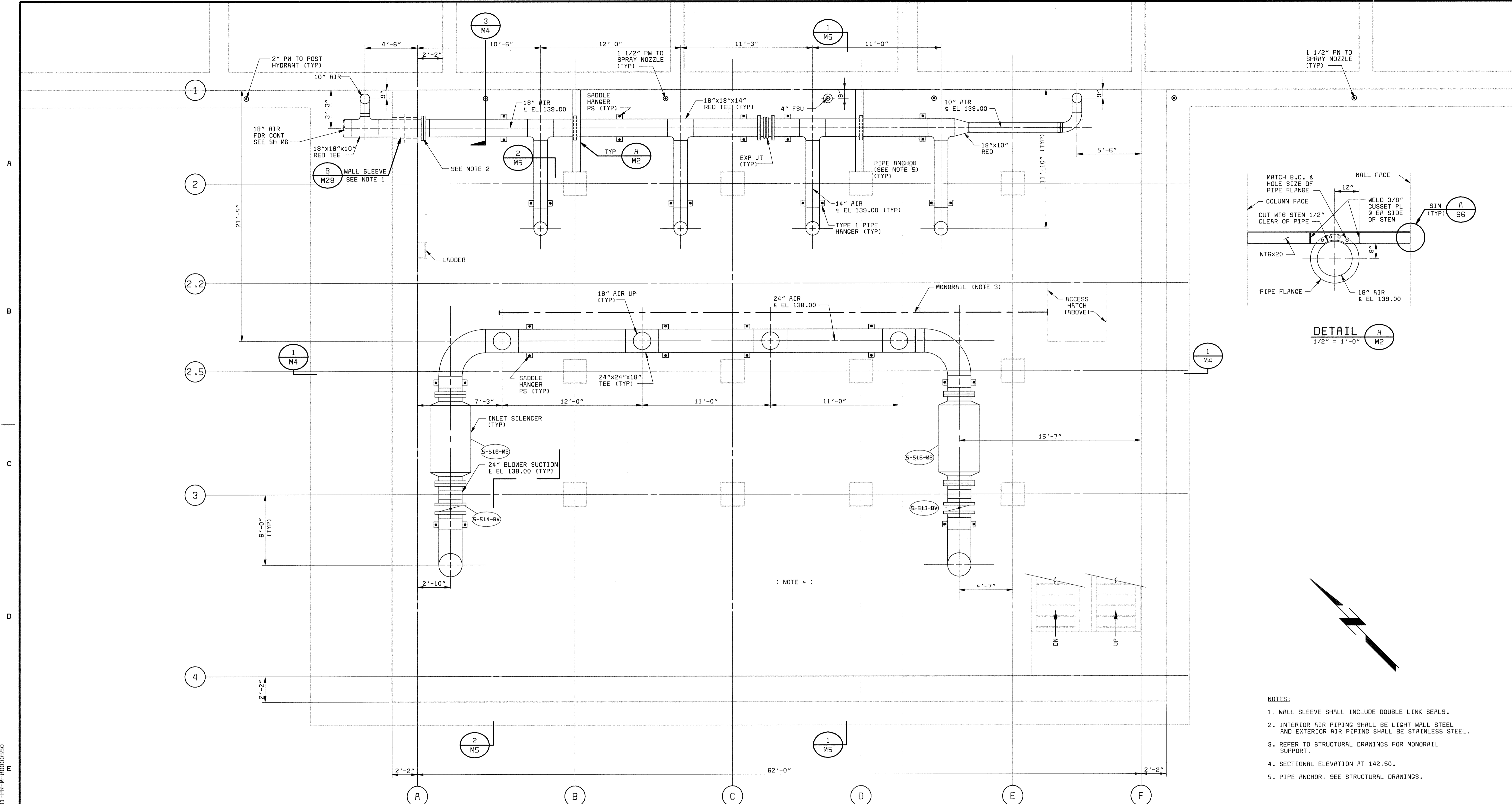
SCALE AS SHOWN

SHEET 67 OF 161

**M1**

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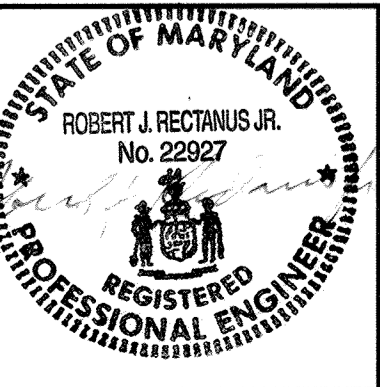
- NOTES:**
1. WALL SLEEVE SHALL INCLUDE DOUBLE LINK SEALS.
  2. INTERIOR AIR PIPING SHALL BE LIGHT WALL STEEL AND EXTERIOR AIR PIPING SHALL BE STAINLESS STEEL.
  3. REFER TO STRUCTURAL DRAWINGS FOR MONORAIL SUPPORT.
  4. SECTIONAL ELEVATION AT 142.50.
  5. PIPE ANCHOR. SEE STRUCTURAL DRAWINGS.

**SECTIONAL PLAN**  
1/4" = 1'-0"

56472-101-PR-M-0000550  
M  
F  
56472-205-BB-PR-A0000560

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
*Robert M. Beniger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland  
*Robert J. Rectanus Jr.* 6-26-00  
REG. PROF. ENGR. DATE



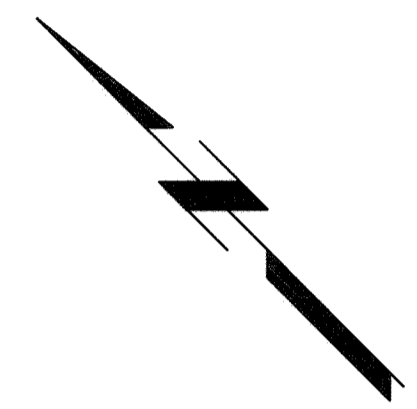
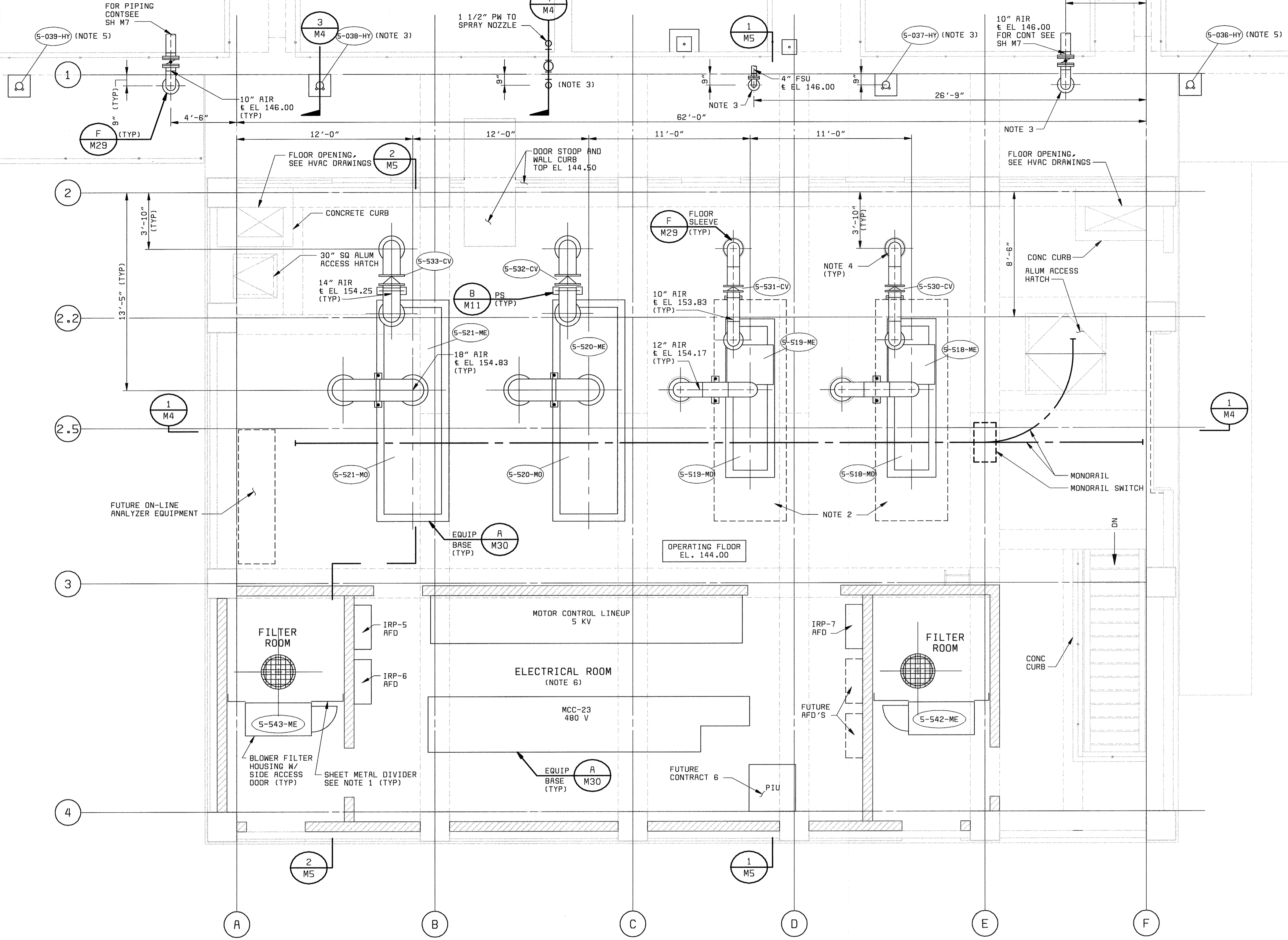
DES: DWL, BCK									
DRN: JRC, VVR									
CHK: WLK									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**NORTH BLOWER BUILDING**  
**MECHANICAL**  
**SECTIONAL PLAN AND DETAIL**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 68 OF 161  
**M2**

NORTH PROCESS REACTORS  
(SEE DWG M7)



- NOTES:**
1. CLOSE OPNG BETWEEN FILTER HOUSING & WALL/CEILING/DOOR WITH REINFORCED GALV SH METAL, MIN 12 GA. SEAL CONNECTIONS AIR TIGHT W/ GASKETS & CAULK.
  2. SPACE RESERVED FOR LARGER FUTURE BLOWER.
  3. FLOOR SLEEVE SHALL INCLUDE DOUBLE SEALS AT LOCATIONS NOTED, & @ 1 1/2" PW PENETRATION THROUGH BLOWER BLDG SLABS
  4. FLOOR SLEEVES ARE SIZED FOR FUTURE AIR PIPE DIAMETER REQUIREMENTS.
  5. HYDRANTS MOUNTED ON SIDEWALK SHALL BE SIMILAR TO THAT SHOWN ON SECTION 3 ON DWG M4
  6. CONTRACTOR SHALL COORDINATE EQUIPMENT BASE DIMENSIONS WITH ELECTRICAL EQUIP SUPPLIED.
  7. REFER TO STRUCTURAL DWGS FOR MONORAIL SUPPORTS.

**OPERATING FLOOR PLAN**  
1/4" = 1'-0"

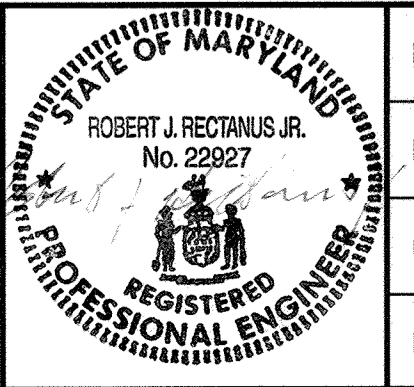
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Reitan* 6/29/00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Reitan* 6/29/00  
REG. PROF. ENGR. DATE



DES: DWL, BCK					
DRN: JRC, VVR					
CHK: WLK					
DATE: 6/23/00					
	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH BLOWER BUILDING  
MECHANICAL**

**OPERATING FLOOR PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

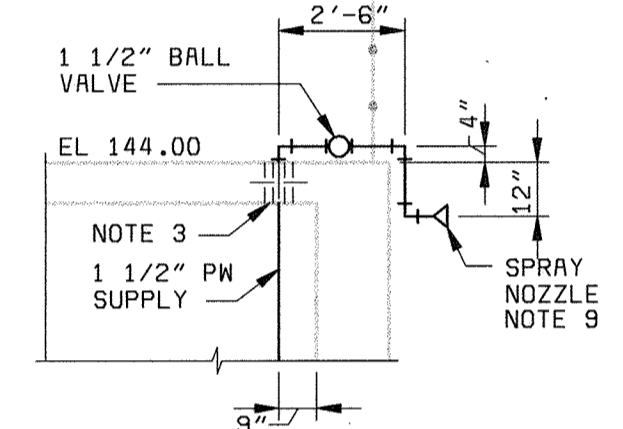
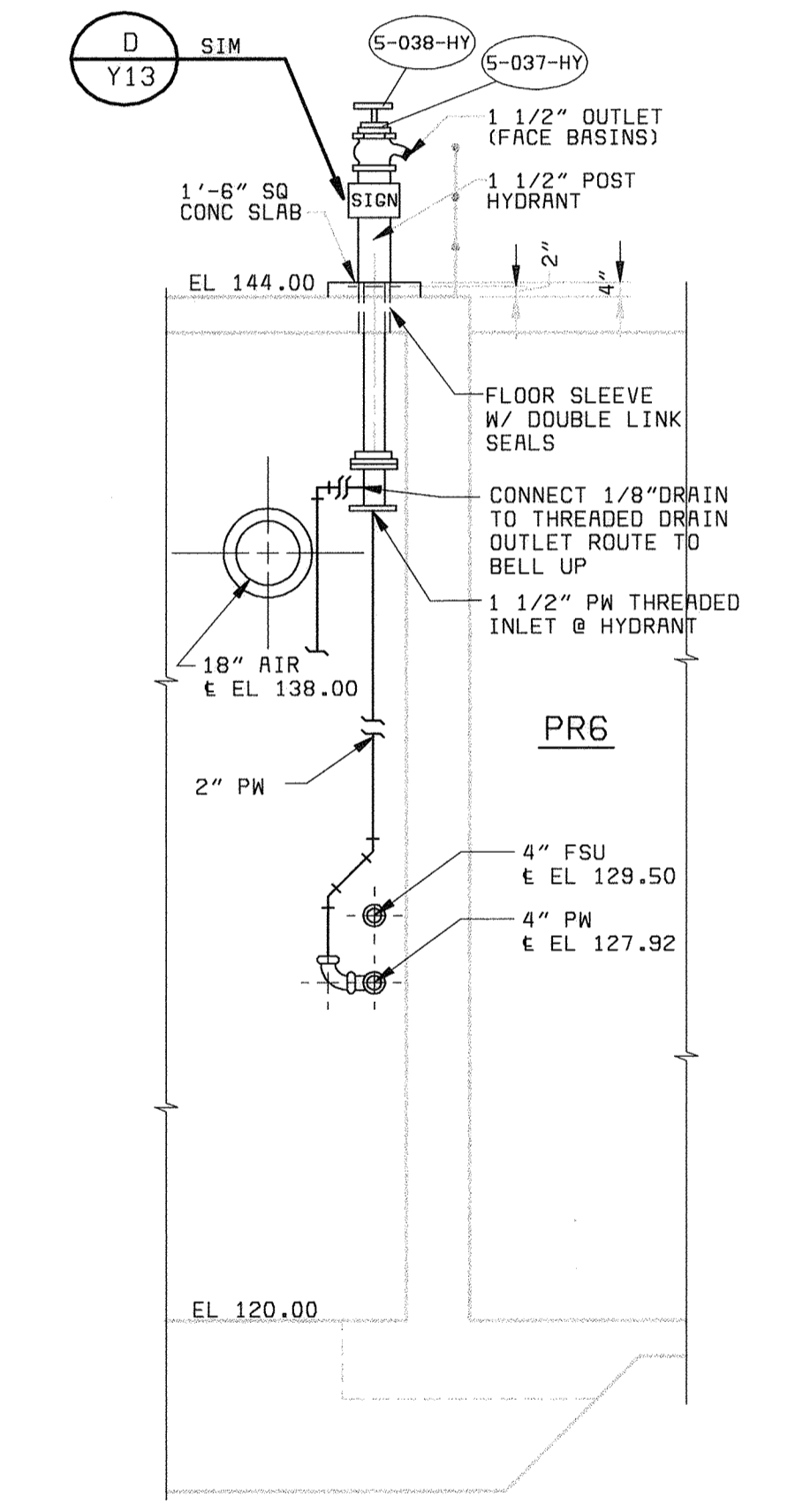
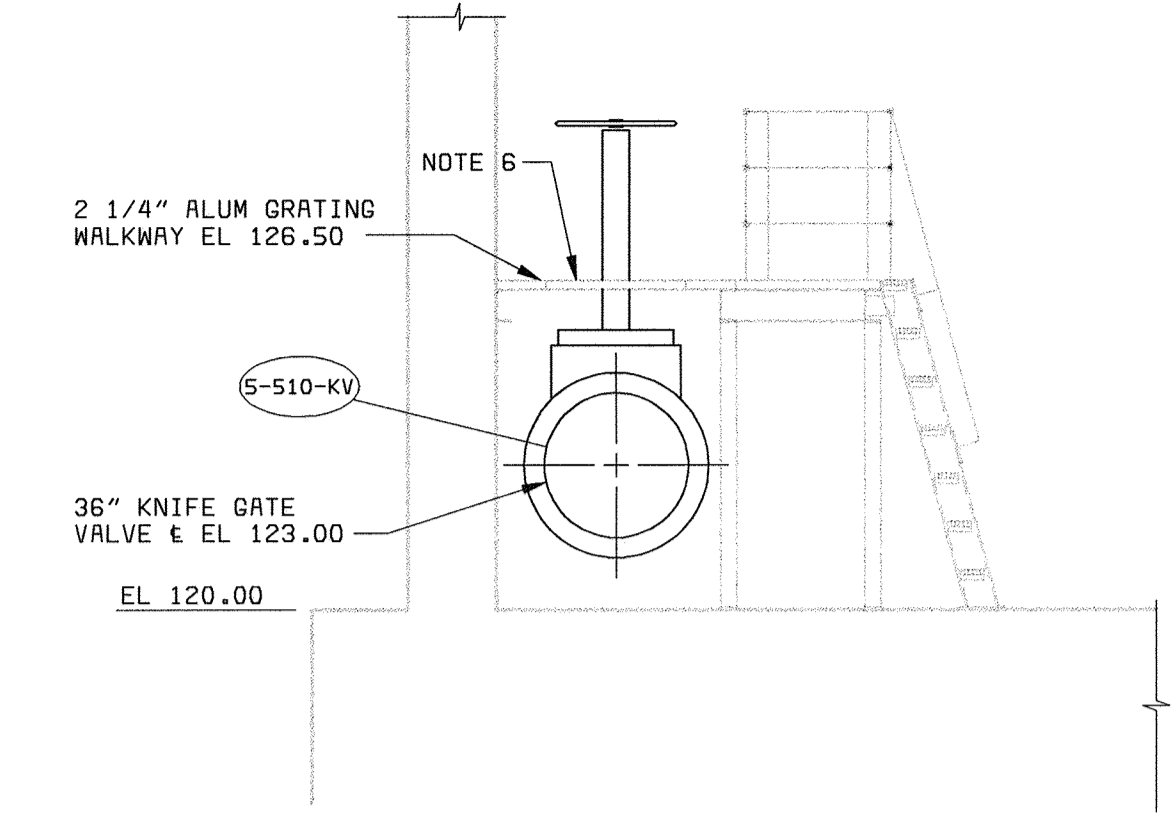
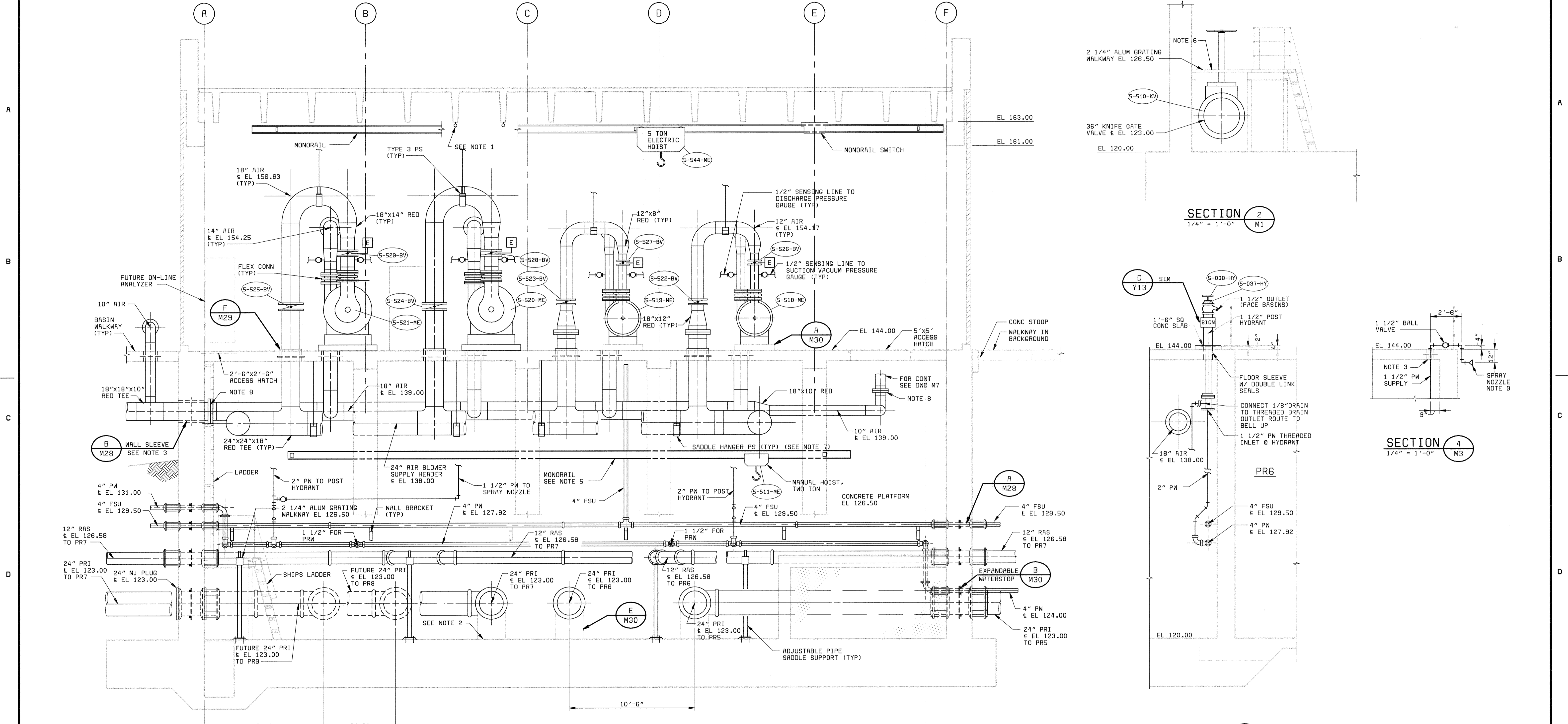
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 69 OF 161

**M3**

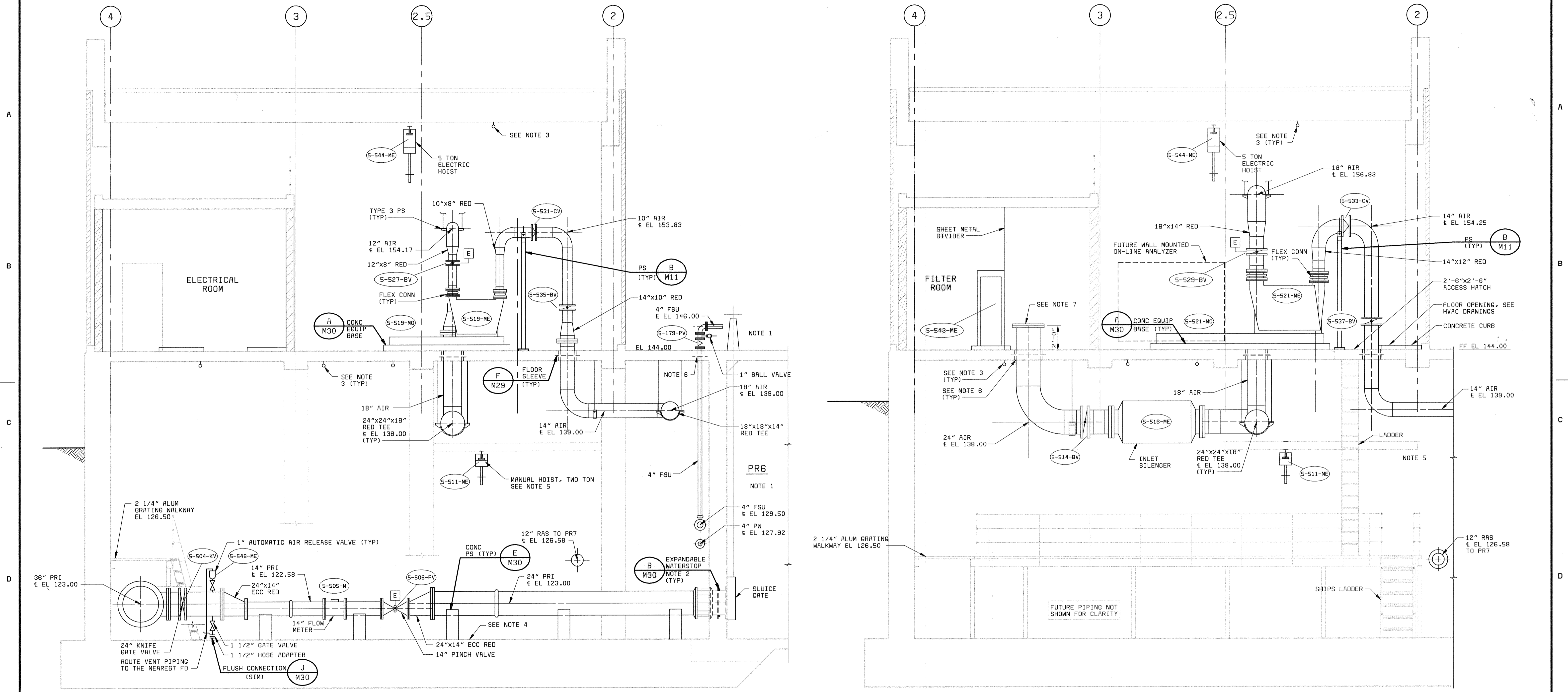


SECTION 1  
1/4" = 1'-0" M1, M2, M3

SECTION 3  
1/4" = 1'-0" M1, M2, M3

- NOTES:**
- LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH BUTTERFLY AND CHECK VALVES ON OPERATING FLOOR (SEE DET C & E ON S6) AND OVER EACH SILENCER, VALVE, AND FLOW METER ON BASEMENT FLOOR (SEE DETAIL K ON M29).
  - SEE PLUMBING DWGS FOR FLOOR DRAIN LOCATIONS AND ELEVATIONS.
  - WALL SLEEVE SHALL INCLUDE DOUBLE LINK SEALS.
  - PROVIDE EXPANDABLE WATERSTOP IN ADDITION TO THRUST COLLAR AT WALL PIPES INTO BLOWER BUILDING BASEMENT.
  - REFER TO STRUCTURAL DRAWINGS FOR MONORAIL SUPPORTS.
  - PROVIDE OPENING FOR VALVE GATE AND OPERATOR. OPENING SIZE SHALL BE COORDINATED WITH VALVE SUPPLIED. BAND OPENING EDGES.
  - SEE SPECIFICATIONS FOR SADDLE HANGER PIPE SUPPORT DETAIL.
  - INTERIOR AIR PIPING SHALL BE LIGHT WALL STEEL AND EXTERIOR AIR PIPING SHALL BE STAINLESS STEEL.
  - SPRAY NOZZLE SHALL BE INSTALLED TO DIRECT FOAM OUT OF THE CELL CORNER.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert J. Rectanus Jr. CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH Gaithersburg, Maryland  Robert J. Rectanus Jr. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: DWL, BCK	NORTH BLOWER BUILDING			LITTLE PATUXENT WATER RECLAMATION PLANT		SCALE AS SHOWN
		DRN: JRC, VVR	MECHANICAL			ADDITION NO. 6		
CHK: WLK	SECTIONS			BNR TREATMENT CAPACITY EXPANSION		CAPITAL PROJECT S-6205		
DATE: 6/23/00						CONTRACT NO. 20-3752		M4
	REVISIONS AND RECORD OF ISSUE					HOWARD COUNTY, MARYLAND		

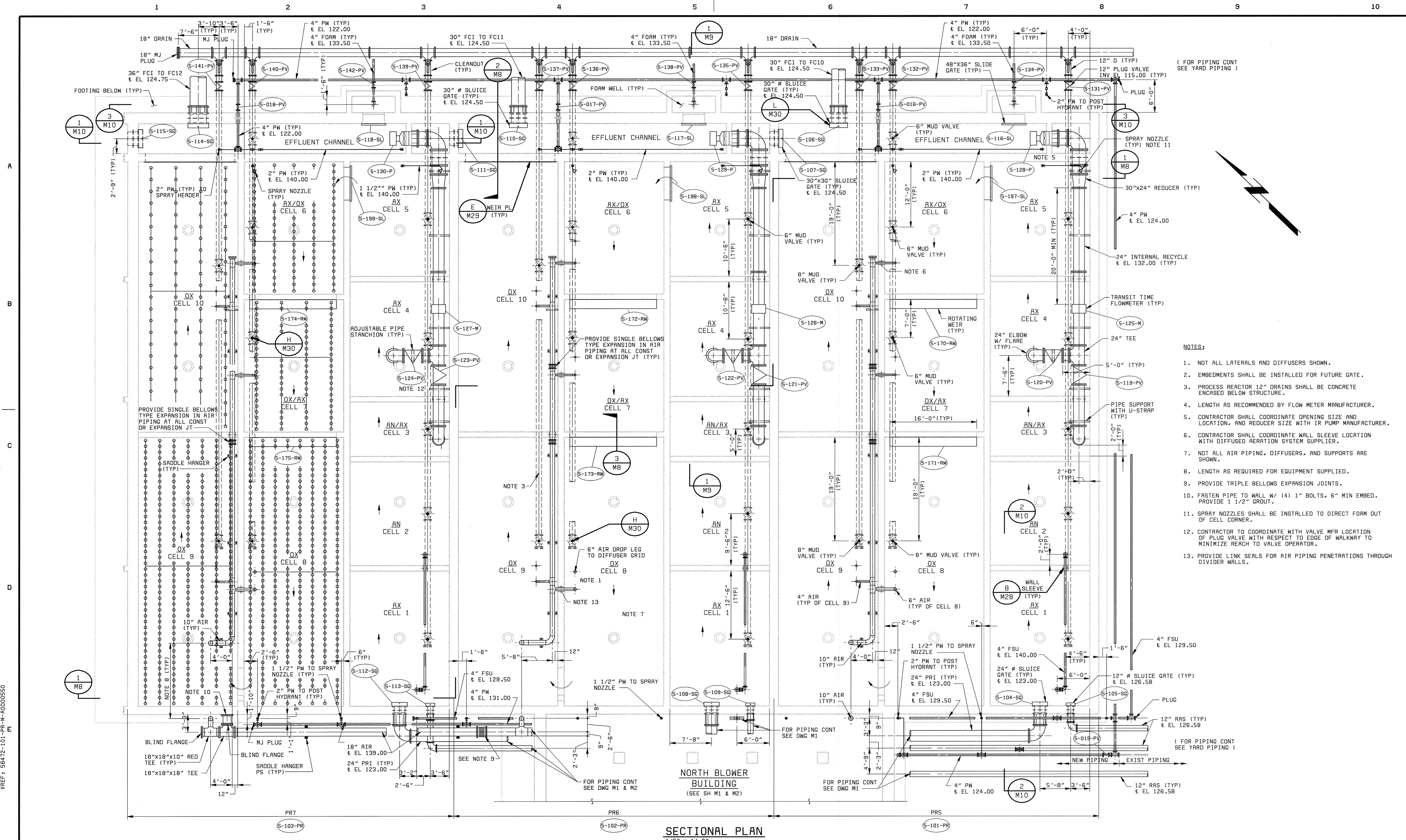


**SECTION 1**  
1/4" = 1'-0" M1, M2, M3

**SECTION 2**  
1/4" = 1'-0" M1, M2, M3

- NOTES:**
- FOR PIPING AND BASIN CONTINUATION SEE DRAWING M6 & M7.
  - PROVIDE EXPANDABLE WATERSTOP IN ADDITION TO THRUST COLLAR AT WALL PIPES INTO BLOWER BUILDING BASEMENT.
  - LIFTING HOOKS SHALL BE INSTALLED IN THE CEILING OVER EACH BUTTERFLY AND CHECK VALVES ON OPERATING FLOOR (SEE DET C&E ON S6), AND OVER EACH SILENCER, VALVE, AND FLOW METER ON BASEMENT FLOOR (SEE DETAIL K ON M29).
  - SEE PLUMBING DWGS FOR FLOOR DRAIN LOCATIONS AND ELEVATIONS.
  - REFER TO STRUCTURAL DRAWINGS FOR MONORAIL SUPPORTS.
  - EXTERIOR FLOOR SLEEVES AND FILTER ROOM FLOOR SLEEVES SHALL INCLUDE DOUBLE MODULAR RUBBER SEALING ELEMENTS. CAULK UPPER PORTION OF SLEEVE IN FILTER ROOM. BLOWER PIPING FLOOR SLEEVES SHALL NOT BE PROVIDED WITH MODULAR RUBBER SEALING ELEMENTS.
  - ATTACH 1/2" BIRD SCREEN AND FLANGE TO FLANGE END PIPE.

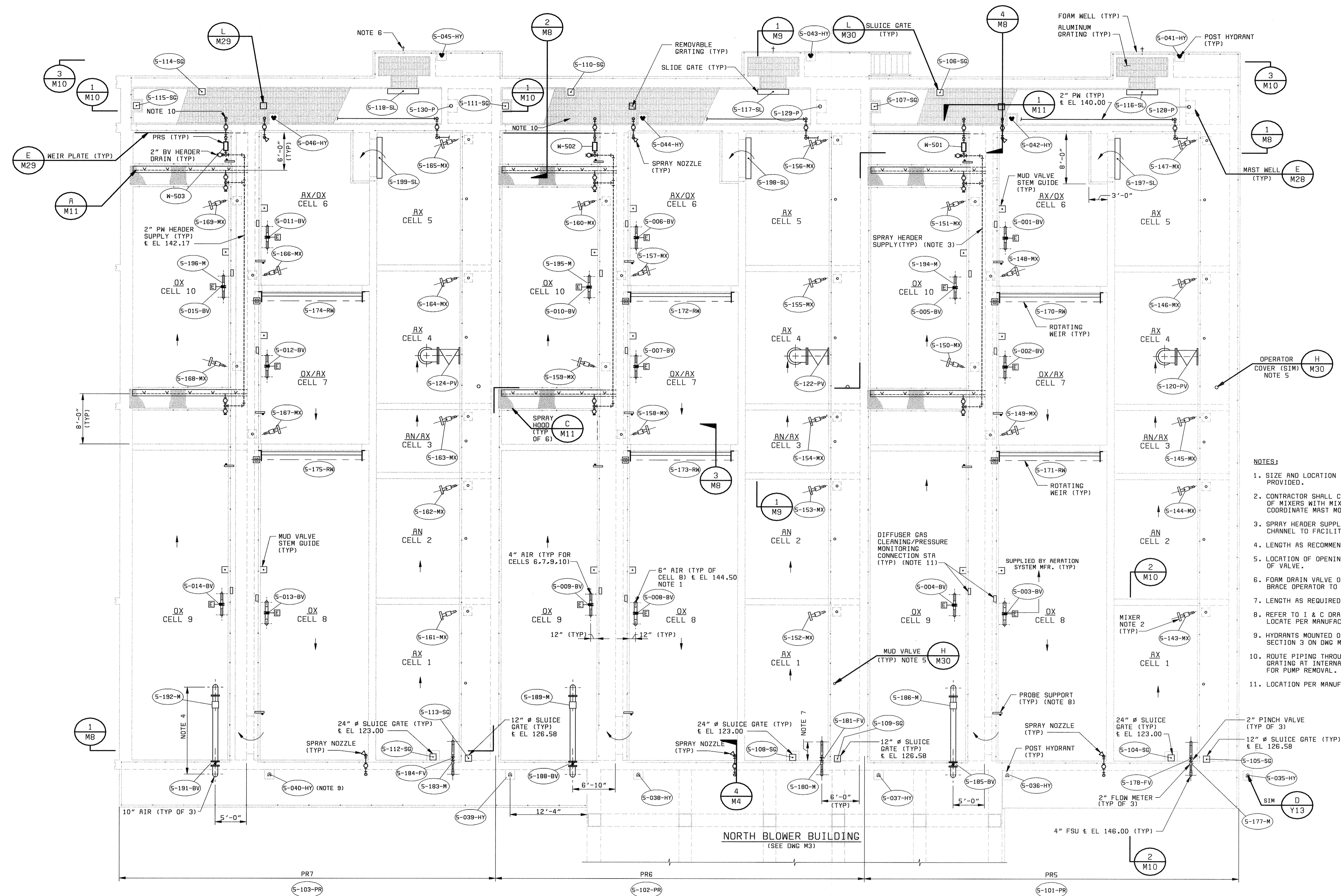
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Chief, Bureau of Utilities DATE	<b>BLACK &amp; VEATCH</b> LLP Gaithersburg, Maryland REG. PROF. ENGR. DATE	ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: DWL/BCK		NORTH BLOWER BUILDING MECHANICAL  SECTIONS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: JRC/VVR				SHEET 71 of 161 <b>M5</b>
			CHK: WLK				
			DATE: 6/23/00				
				DATE	REVISIONS AND RECORD OF ISSUE		
					NO. BY CK APP		



**SECTIONAL PLAN**  
1/8" = 1'-0"

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert Benjamin</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: DMP, BCK	DRN: SLF, VVR	CHK: WLK	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
			<b>NORTH PROCESS REACTORS MECHANICAL</b>  <b>SECTIONAL PLAN</b>			<b>LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6</b> <b>BNR TREATMENT CAPACITY EXPANSION</b>  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND			SCALE AS SHOWN	SHEET 72 OF 161	<b>M6</b>	





- NOTES:**
1. SIZE AND LOCATION TO BE DETERMINED BY EQUIPMENT PROVIDED.
  2. CONTRACTOR SHALL COORDINATE LOCATION AND ORIENTATION OF MIXERS WITH MIXER MANUFACTURER. CONTRACTOR SHALL COORDINATE MAST MOUNTING WITH MIXER MANUFACTURER.
  3. SPRAY HEADER SUPPLY SHALL SLOPE TOWARD EFFLUENT CHANNEL TO FACILITATE DRAINING HEADER.
  4. LENGTH AS RECOMMENDED BY FLOW METER MANUFACTURER.
  5. LOCATION OF OPENING SHALL BE COORDINATED WITH LOCATION OF VALVE.
  6. FOAM DRAIN VALVE OPERATOR SHALL EXTEND TO GUARDRAIL. BRACE OPERATOR TO FOAM WELL.
  7. LENGTH AS REQUIRED FOR EQUIPMENT SUPPLIED.
  8. REFER TO I & C DRAWINGS FOR INSTALLATION DETAILS. LOCATE PER MANUFACTURERS' RECOMMENDATION
  9. HYDRANTS MOUNTED ON WALKWAY SHALL BE SIMILAR TO SECTION 3 ON DWG M4
  10. ROUTE PIPING THROUGH GRATING. BAND EDGES OF OPENING GRATING AT INTERNAL RECYCLE PUMPS SHALL BE REMOVABLE FOR PUMP REMOVAL.
  11. LOCATION PER MANUFACTURES RECOMMENDATIONS.

**TOP PLAN**  
1/8" = 1'-0"

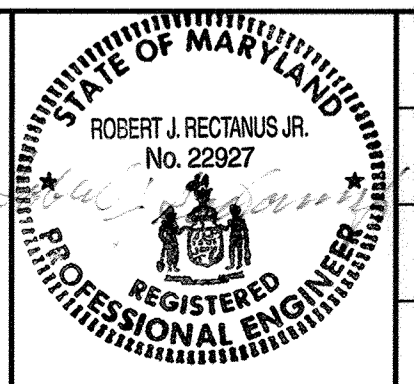
XREF: 58472-101-PR-M-R0000550

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. ...*  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE



DES: DMP, BCK					
DRN: SLF, VVR					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH PROCESS REACTORS  
MECHANICAL**

**TOP PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

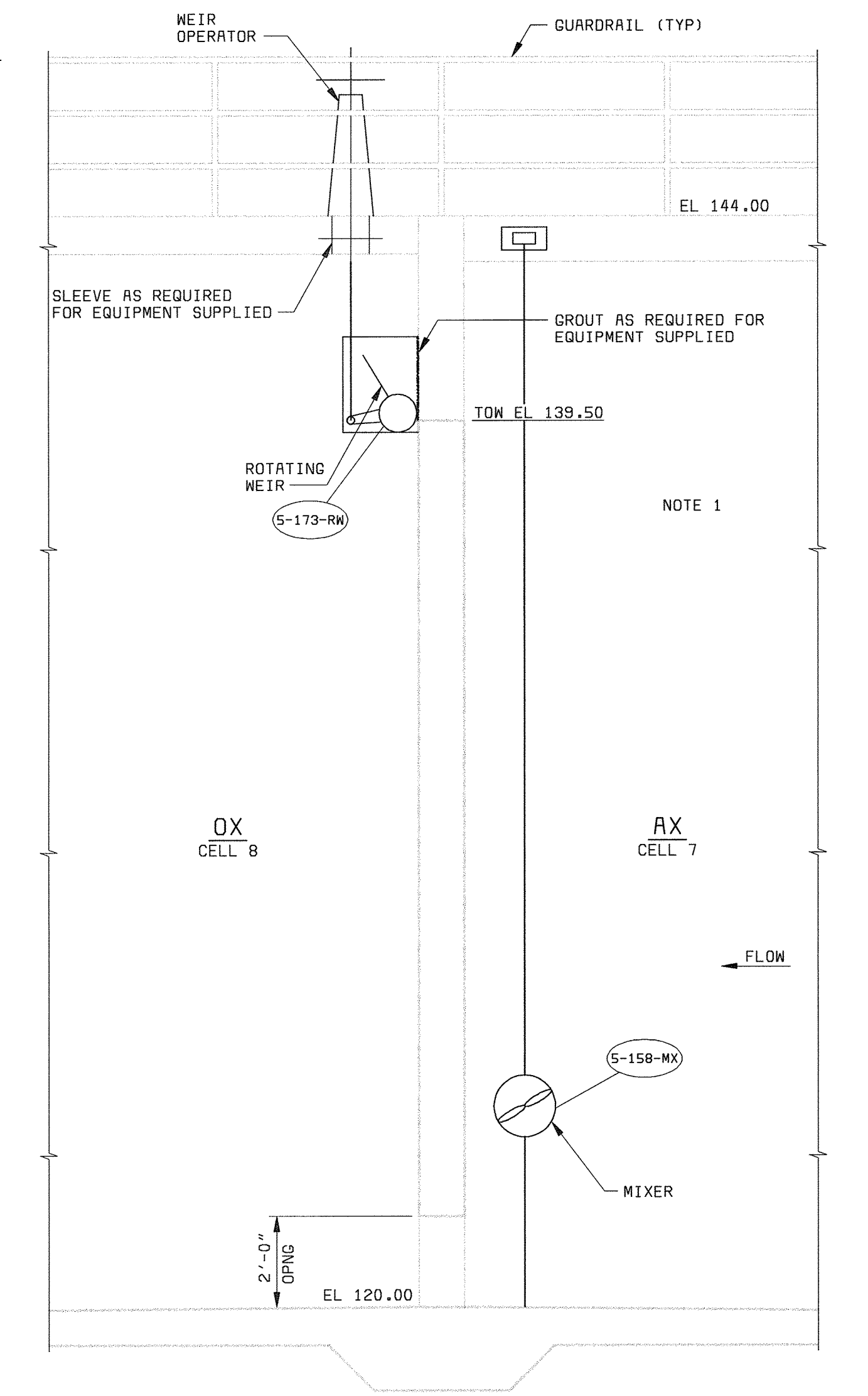
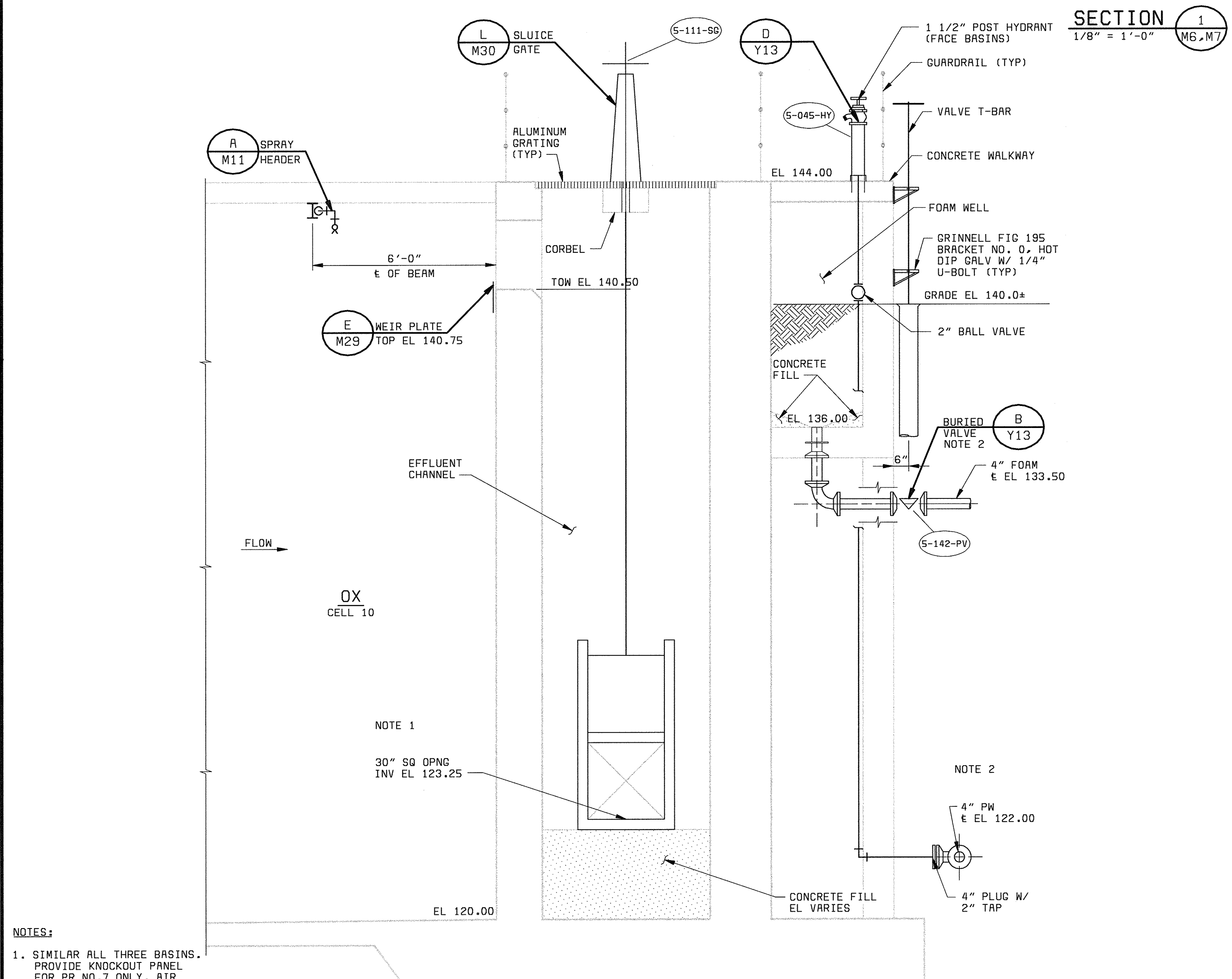
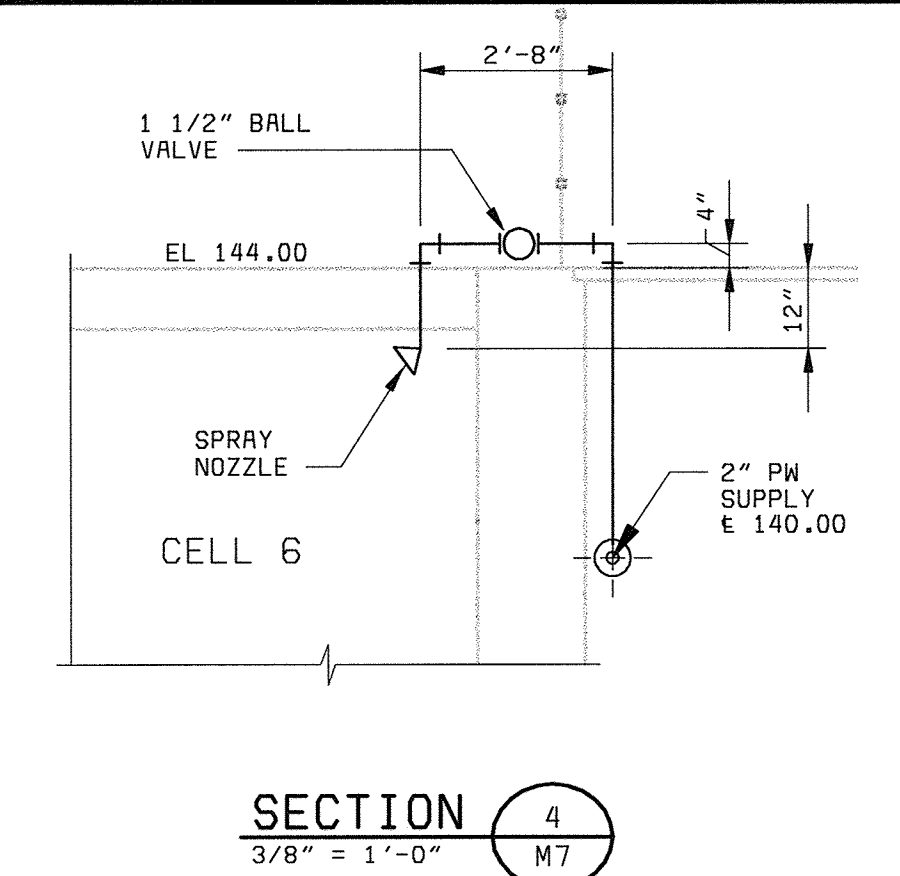
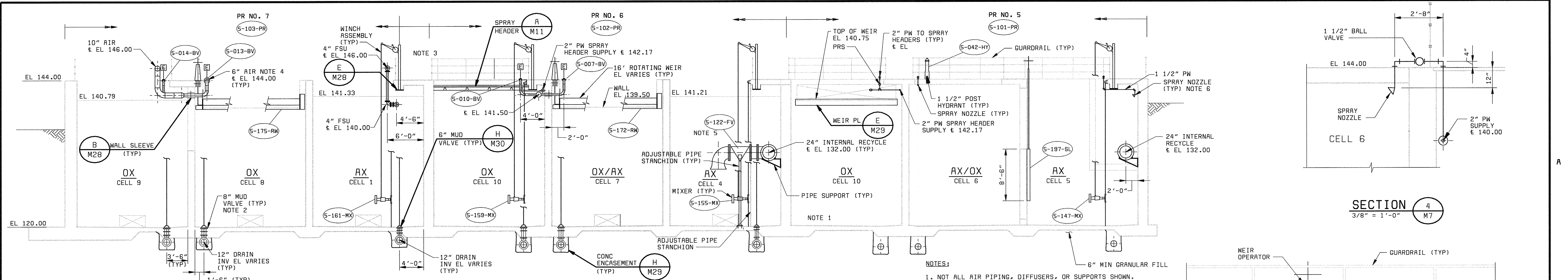
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 73 OF 161

**M7**

DS8472 F058472A



**NOTES:**  
 1. SIMILAR ALL THREE BASINS. PROVIDE KNOCKOUT PANEL FOR PR NO. 7 ONLY. AIR PIPING, DIFFUSERS, AND SUPPORTS NOT SHOWN.  
 2. NOT ALL PIPING SHOWN. REFER TO Y SHEETS.

**NOTES:**  
 1. NOT ALL AIR PIPING, DIFFUSERS, OR SUPPORTS SHOWN.  
 2. MUD VALVE INVERT = 119.83 UNLESS OTHERWISE INDICATED.  
 3. DAVIT ARM SHALL CLEAR UPPER GUARDRAIL. CONTRACTOR TO COORDINATE MIXER AND HOIST MOUNTING W/ EQUIP MANUFACTURER.  
 4. AIR PIPING DOWNSTREAM OF MODULATING BUTTERFLY VALVE SHALL BE SUPPLIED BY AERATION SYSTEM SUPPLIER.  
 5. CONTRACTOR TO COORDINATE WITH VALVE MFR LOCATION OF PLUG VALVE WITH RESPECT TO EDGE OF WALKWAY TO MINIMIZE REACH TO VALVE OPERATOR.  
 6. SPRAY NOZZLE SHALL BE INSTALLED TO DIRECT FLOW OUT OF CELL CORNER.

**NOTE:**  
 1. SIMILAR FOR ALL ROTATING WEIRS IN NORTH PROCESS REACTOR BASINS. AIR PIPING, DIFFUSERS, AND SUPPORTS NOT SHOWN.

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Robert Bainger 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE

STATE OF MARYLAND  
 ROBERT J. RECTANUS JR.  
 No. 22927  
 REGISTERED PROFESSIONAL ENGINEER

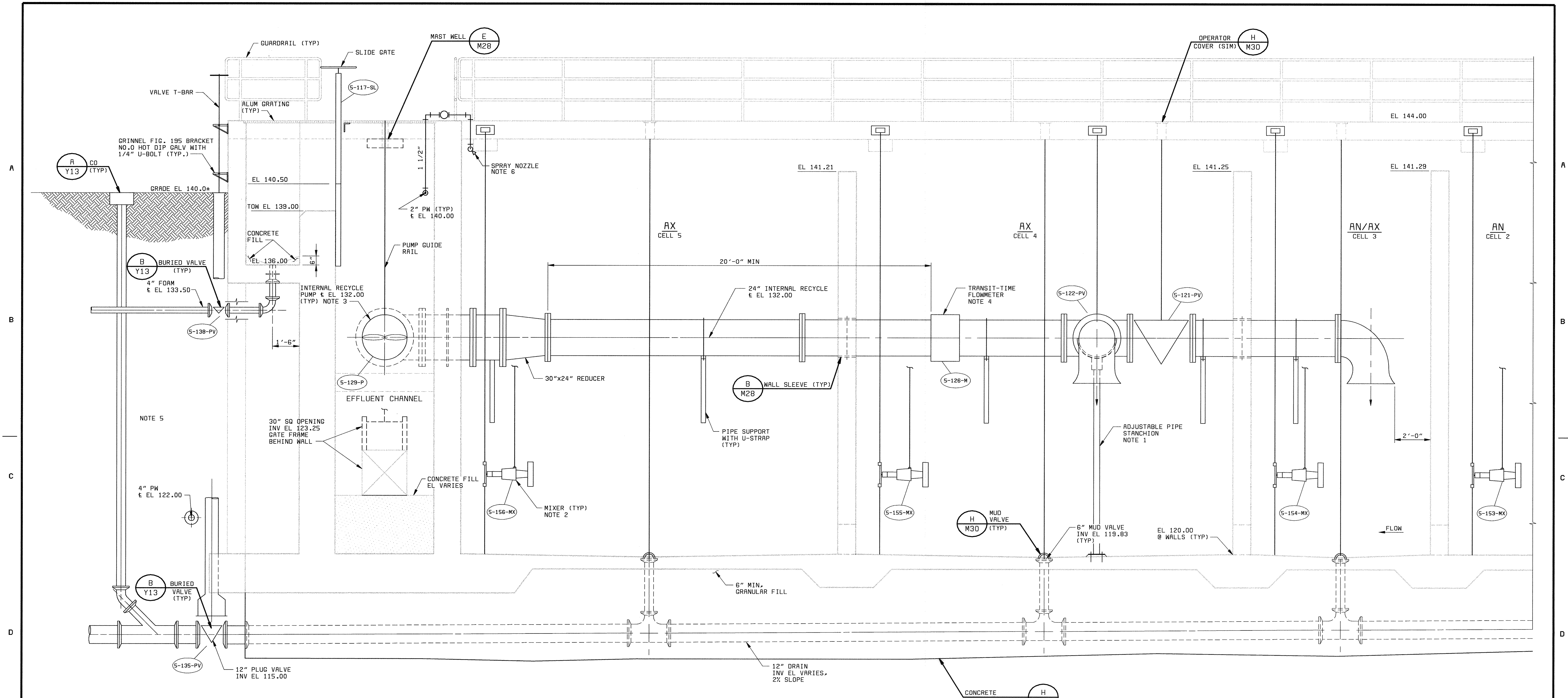
DES: BCK					
DRN: WHS-VVR					
CHK: WLK					
DATE: 6/23/00					
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

**NORTH PROCESS REACTORS  
 MECHANICAL**  
 SECTIONS

**LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION**  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 74 OF 161  
**M8**

058472  
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SECTION 1  
3/8" = 1'-0" M28, M29

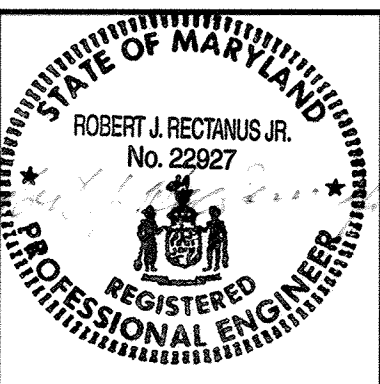
- NOTES:
1. SIMILAR FOR BASINS PR5, PR6, AND PR7.
  2. CONTRACTOR SHALL COORDINATE LOCATION AND ORIENTATION OF MIXERS WITH MIXER MANUFACTURER. CONTRACTOR SHALL COORDINATE MIXER MOUNTING W/ MIXER MANUFACTURER.
  3. CONTRACTOR SHALL COORDINATE LOCATION AND SIZE OF OPENING WITH INTERNAL RECYCLE PUMP MANUFACTURER.
  4. CONTRACTOR SHALL COORDINATE LOCATION OF FLOW METER WITH INSTRUMENT MANUFACTURER.
  5. NOT ALL PIPING SHOWN. REFER TO Y DWGS FOR PIPES AND LOCATIONS.
  6. SPRAY NOZZLES SHALL BE INSTALLED TO DIRECT FLOW OUT OF CELL CORNER.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Beniger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus, Jr.*  
REG. PROF. ENGR. DATE



DES: BCK	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: WHS-VVR						
CHK: WLK						
DATE: 6/23/00						

NORTH PROCESS REACTORS  
MECHANICAL

SECTION

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

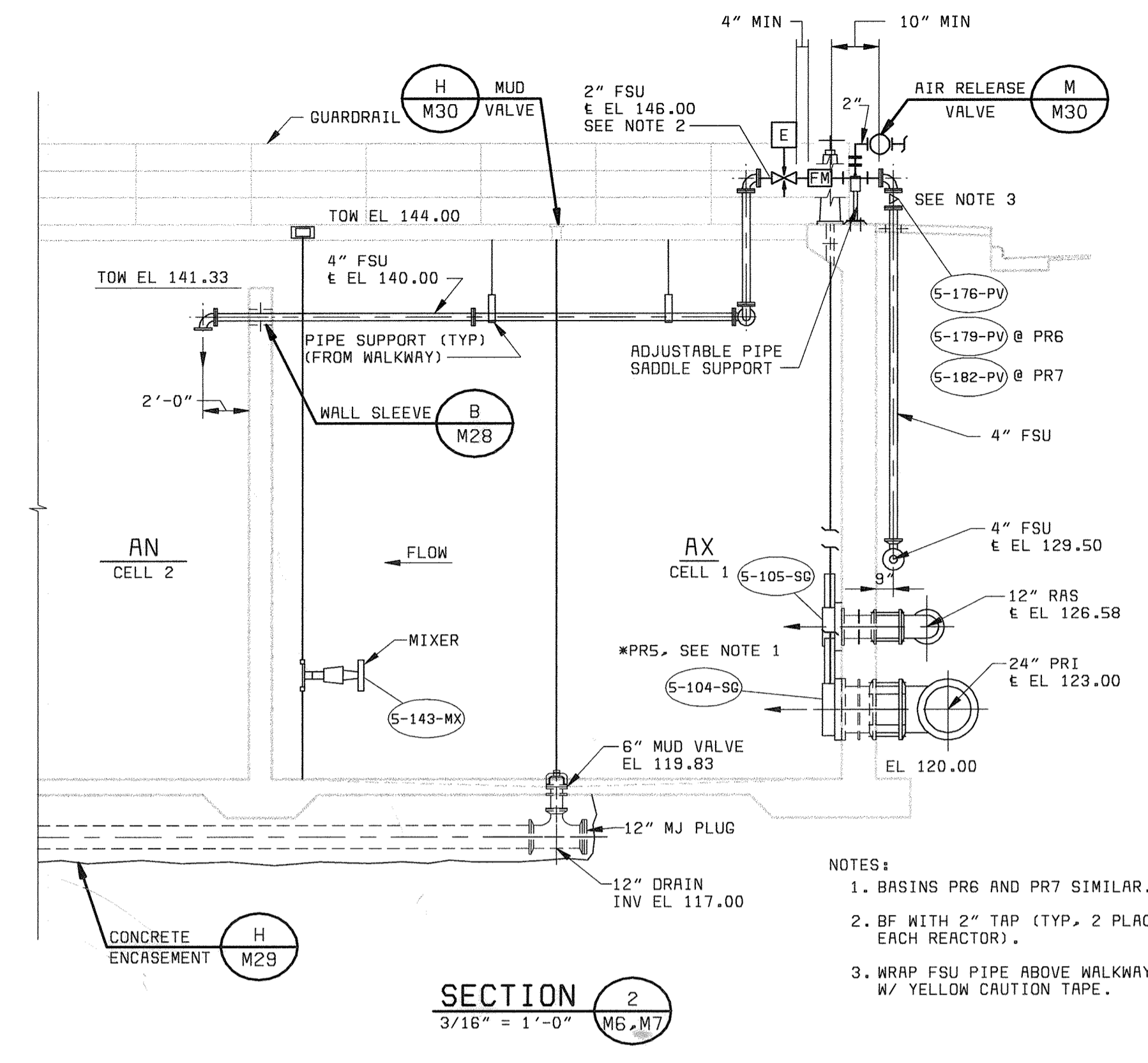
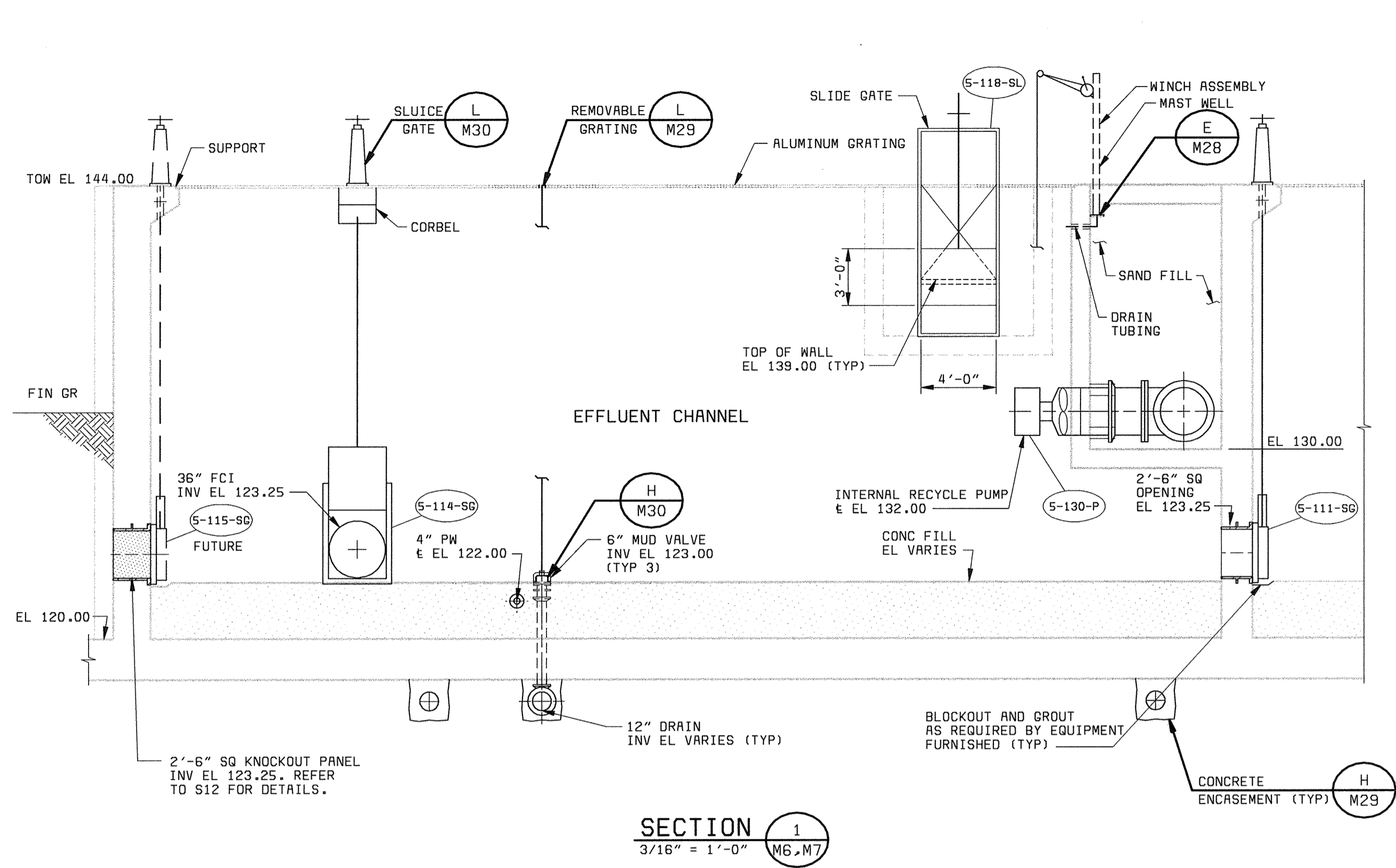
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

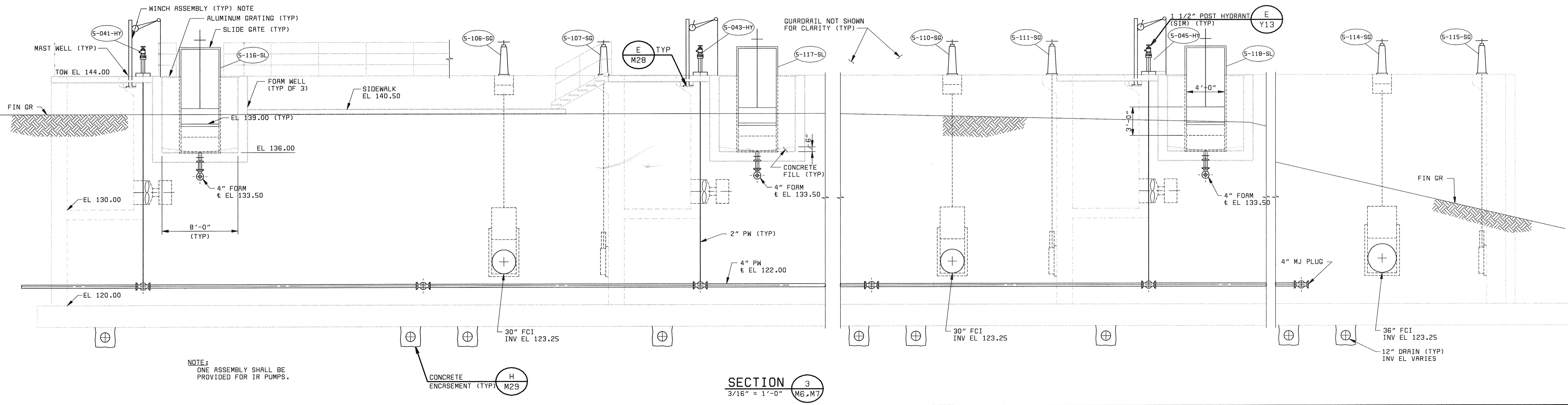
SCALE AS SHOWN

SHEET 75 OF 161

**M9**



- NOTES:
1. BASINS PR6 AND PR7 SIMILAR.
  2. BF WITH 2" TAP (TYP, 2 PLACES EACH REACTOR).
  3. WRAP FSU PIPE ABOVE WALKWAY W/ YELLOW CAUTION TAPE.



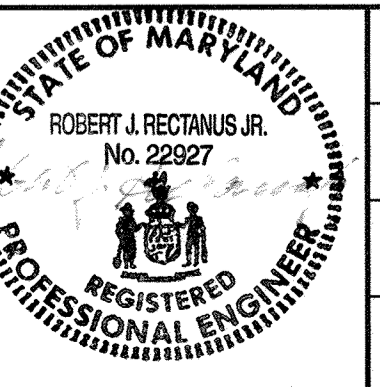
NOTE: ONE ASSEMBLY SHALL BE PROVIDED FOR IR PUMPS.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE



DES: BCK	DRN: ABW-VVR	CHK: WLK	DATE: 6/23/00
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY
		CK	APP

NORTH PROCESS REACTORS  
MECHANICAL

SECTIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

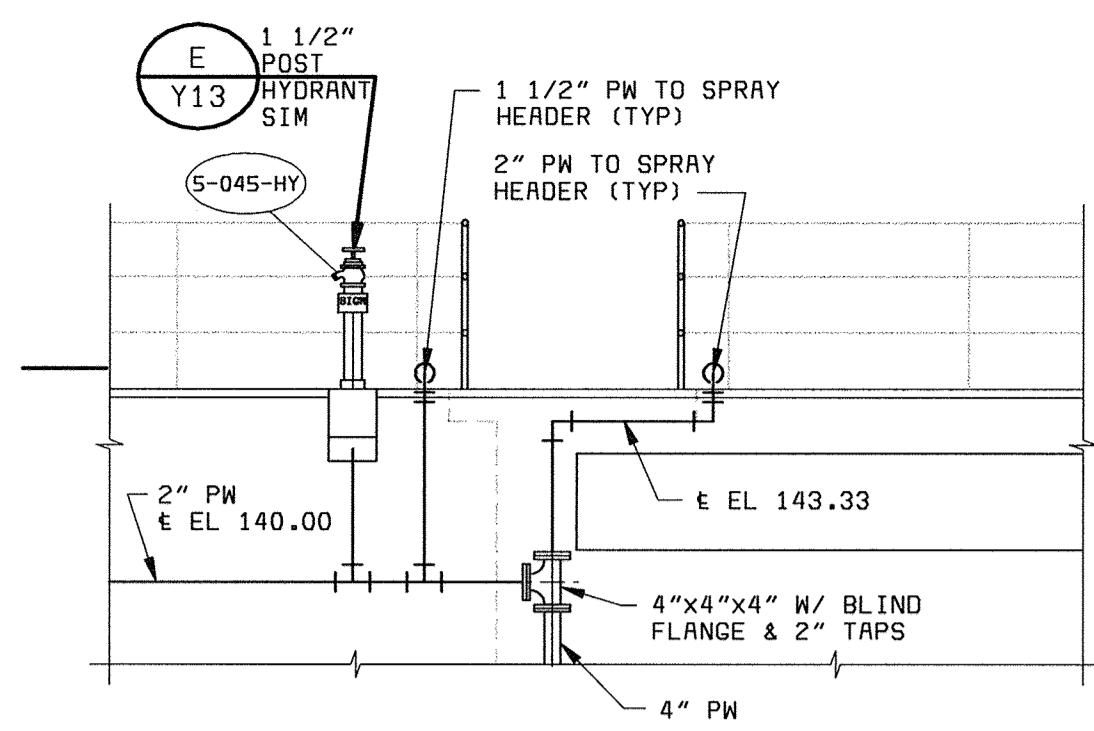
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

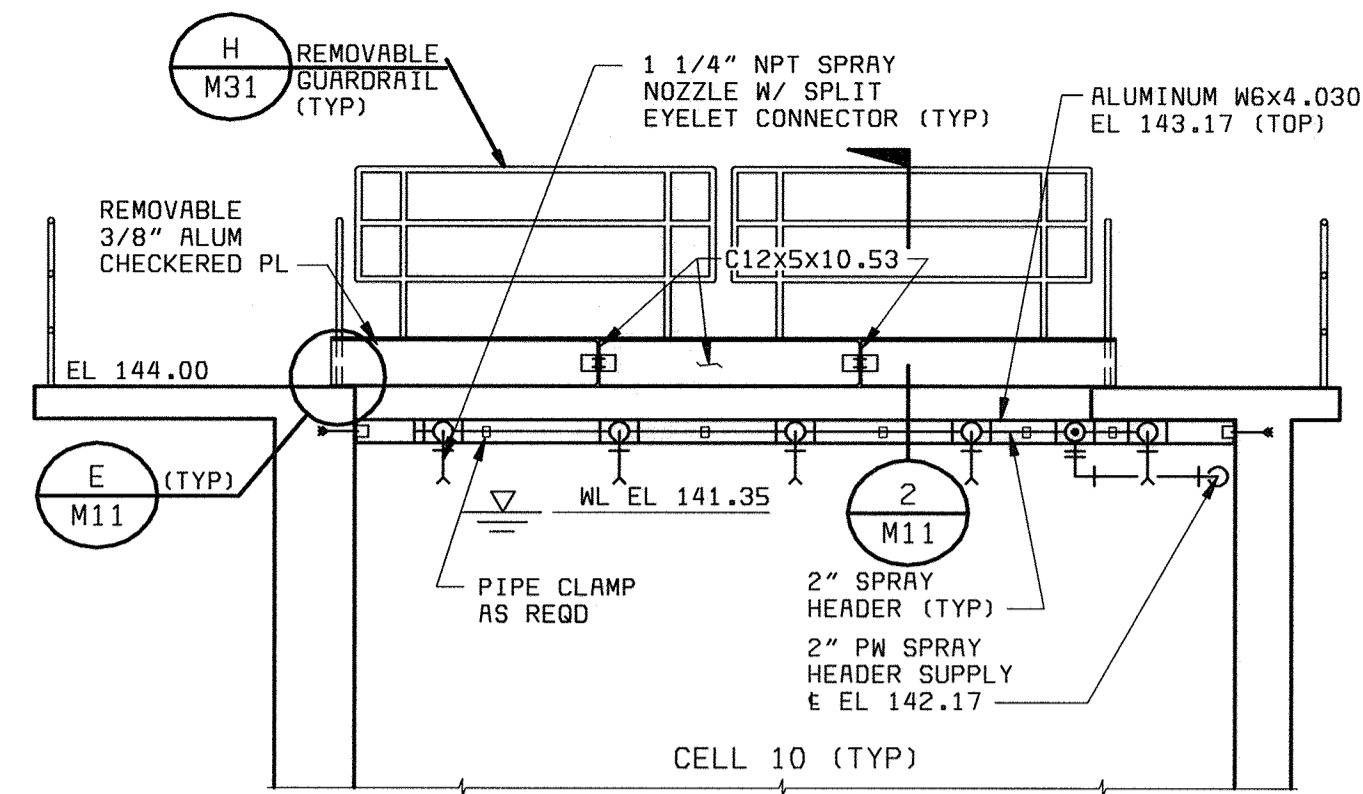
SCALE AS SHOWN

SHEET 76 OF 161

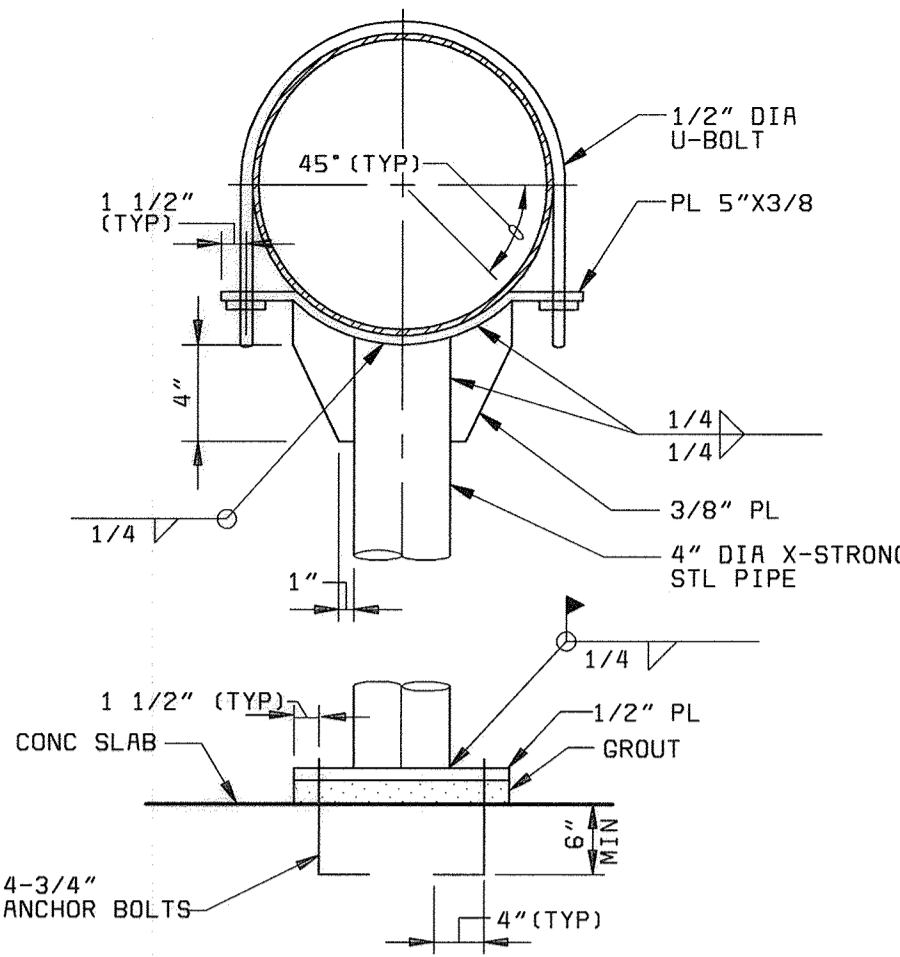
M10



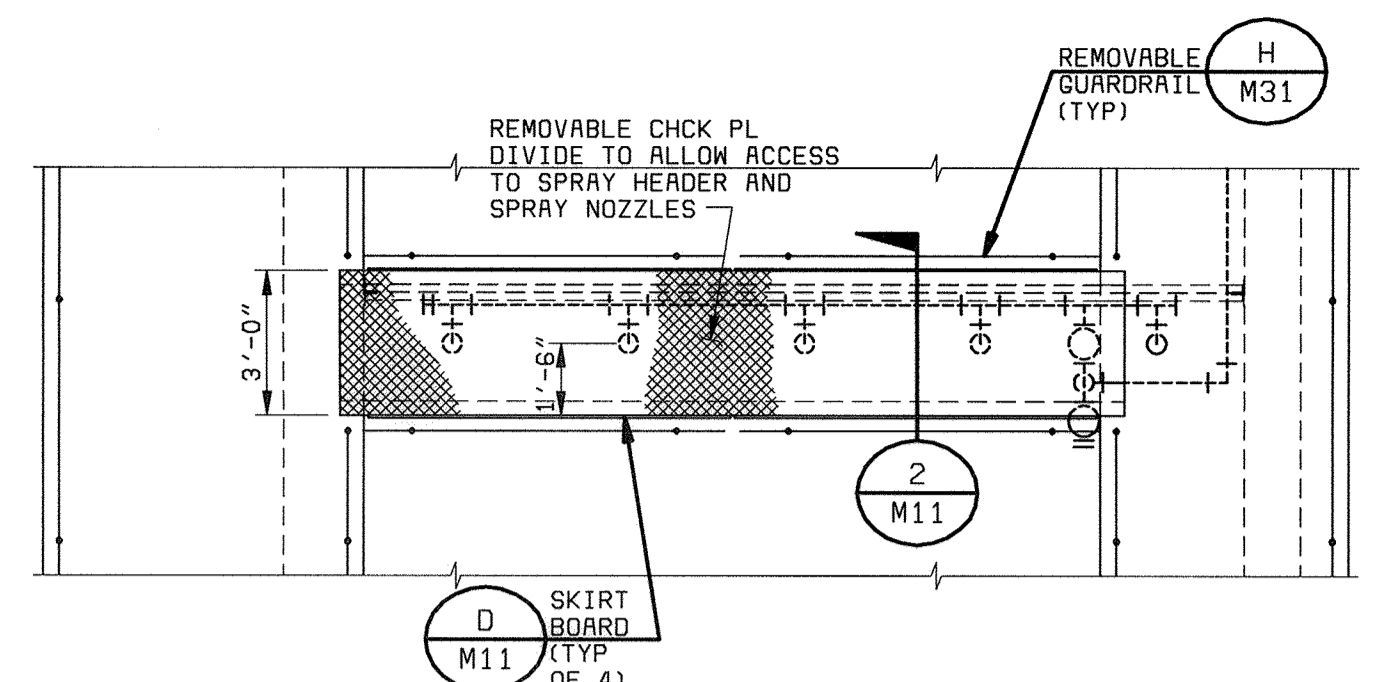
**SECTION 1**  
1/4" = 1'-0" M7



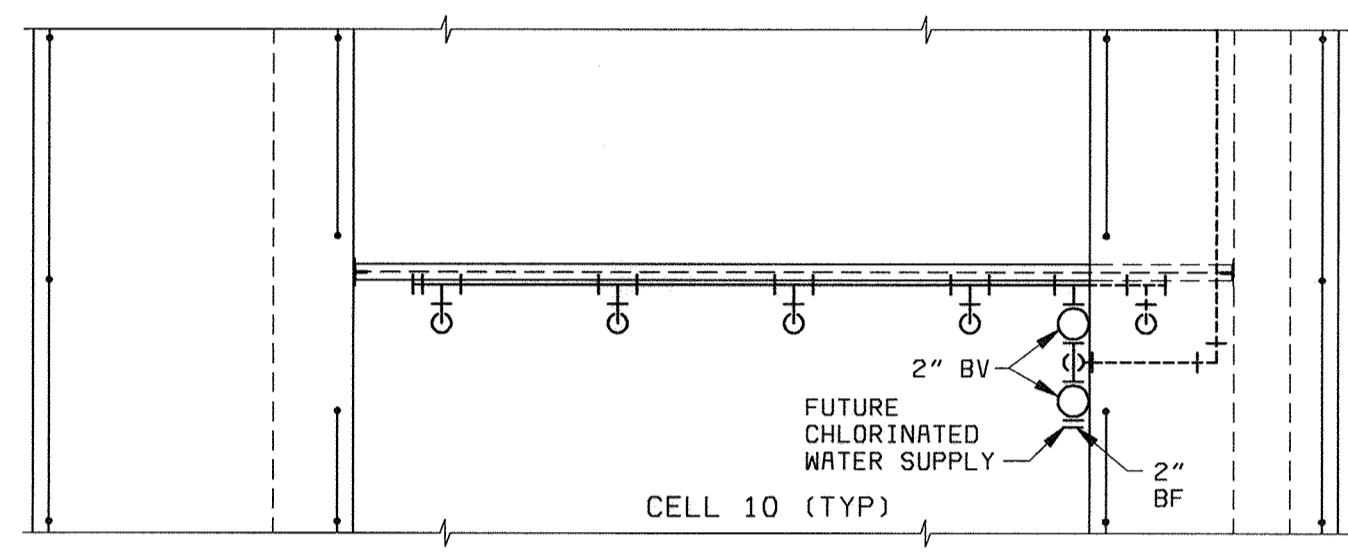
**ELEVATION**



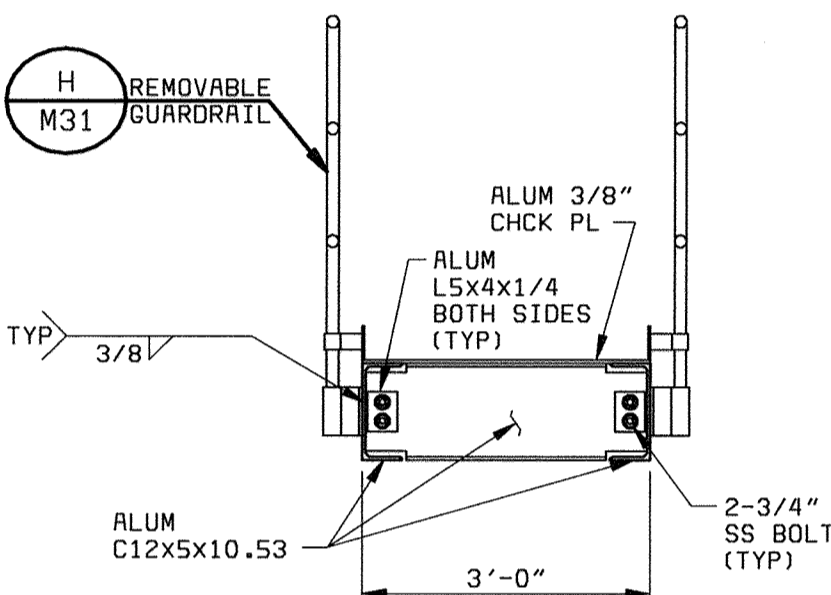
**PIPE SUPPORT DETAIL B**  
NO SCALE



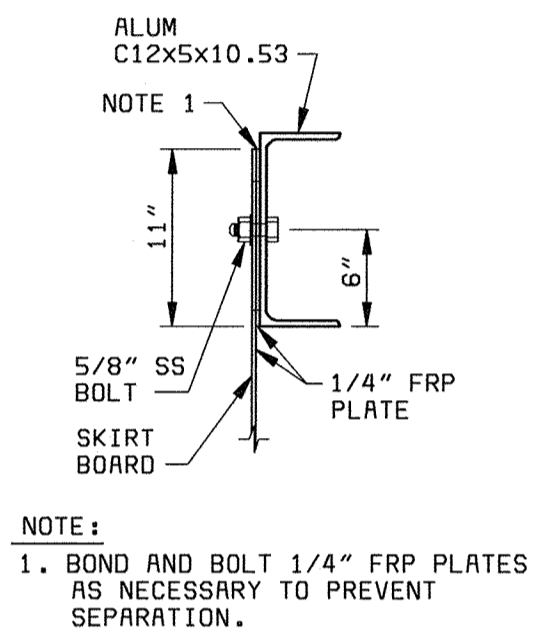
**SPRAY HOOD - PLAN C**  
1/4" = 1'-0" M7



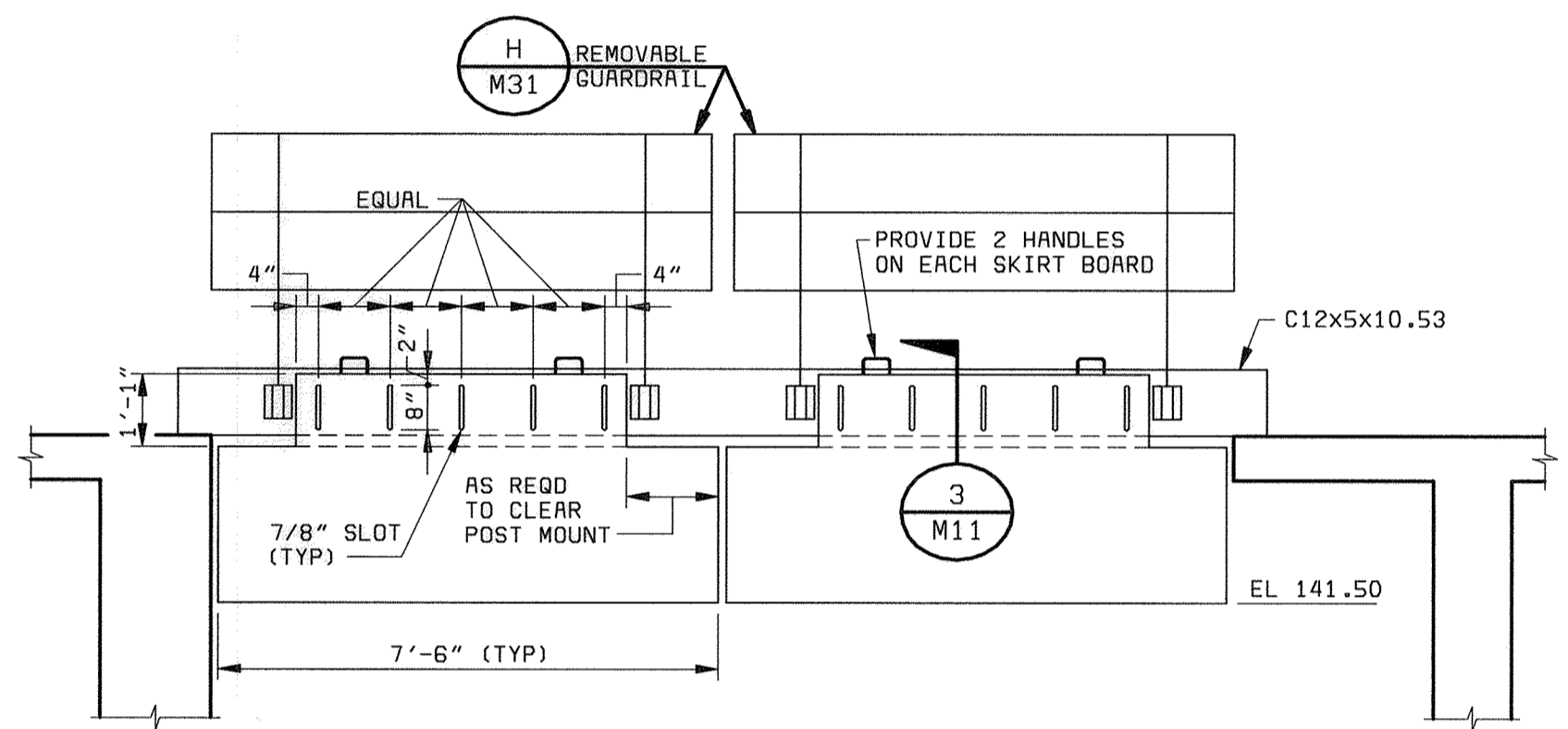
**SPRAY HEADER DETAIL A**  
1/4" = 1'-0" M7, M8



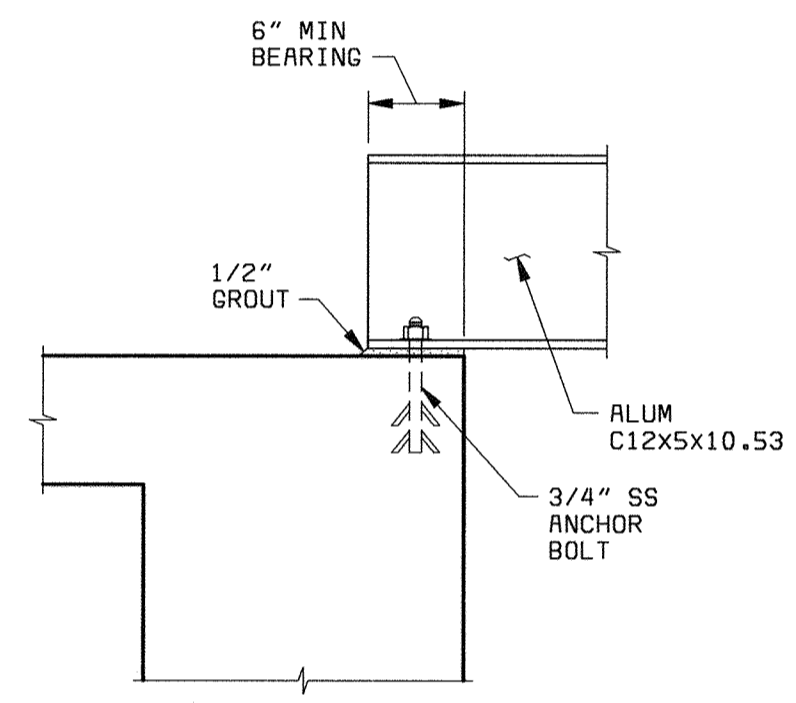
**SECTION 2**  
1/2" = 1'-0" M11



**SECTION 3**  
1" = 1'-0" M11



**SKIRT BOARD D**  
3/8" = 1'-0" M11



**DETAIL E**  
1" = 1'-0" M11

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Robert M. Bennett, C-29,00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH, L.P.**  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

STATE OF MARYLAND  
ROBERT J. RECTANUS, JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: BCK					
DRN: VVR, MDD					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH PROCESS REACTOR  
MECHANICAL**

**SECTIONS AND DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

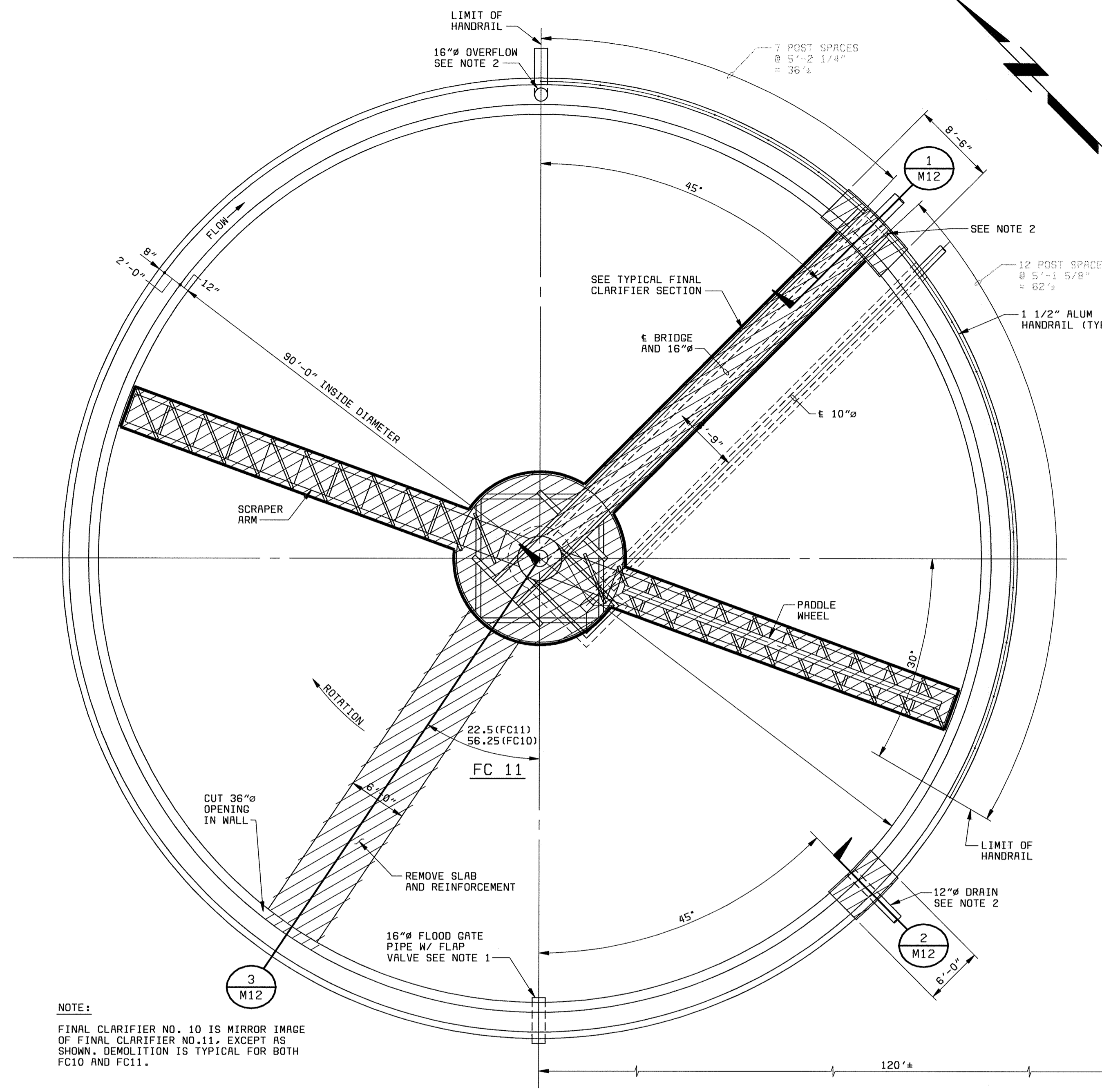
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

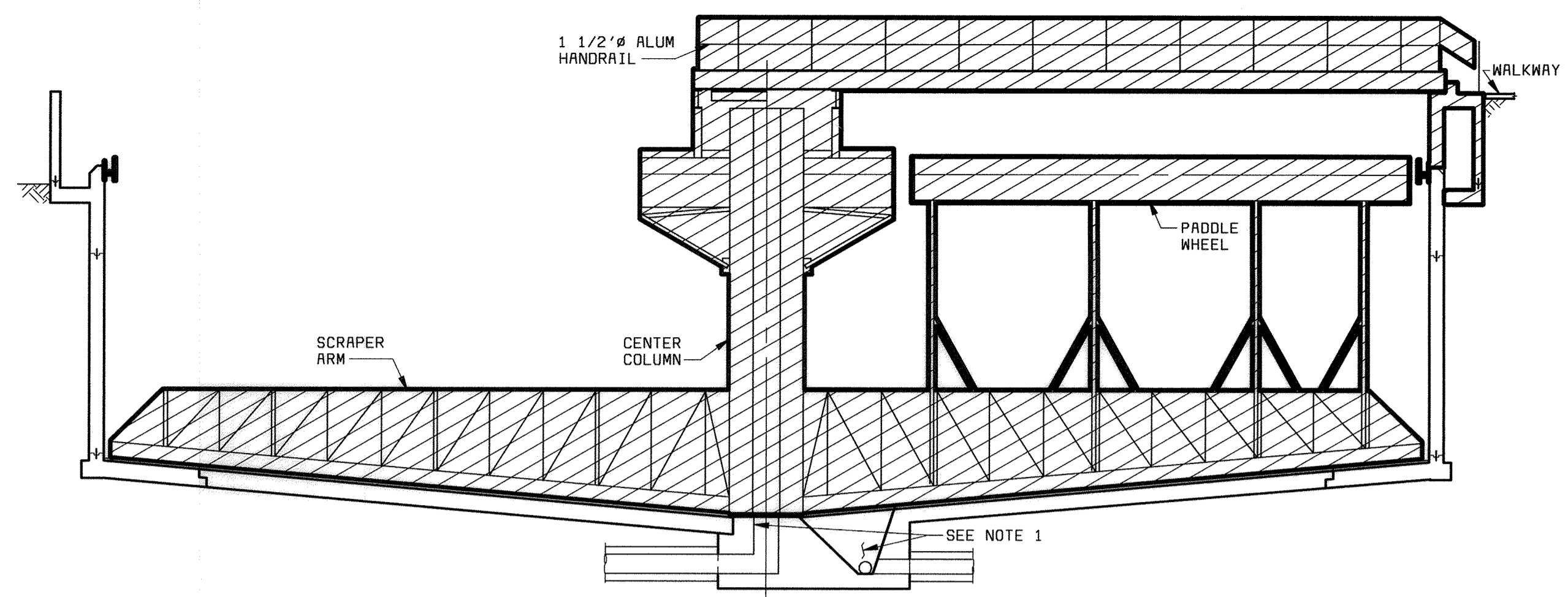
SCALE AS SHOWN

SHEET 77 OF 161

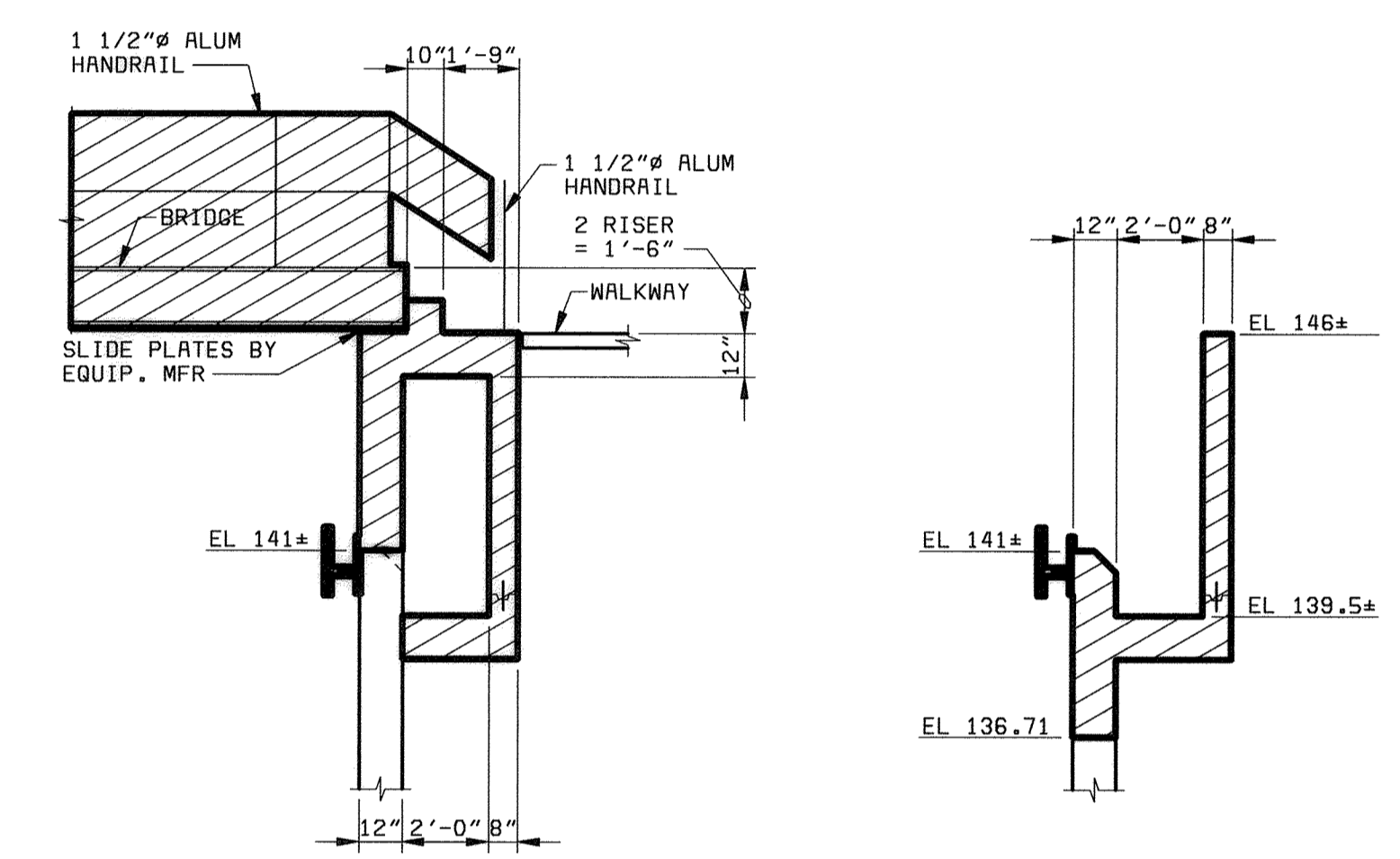
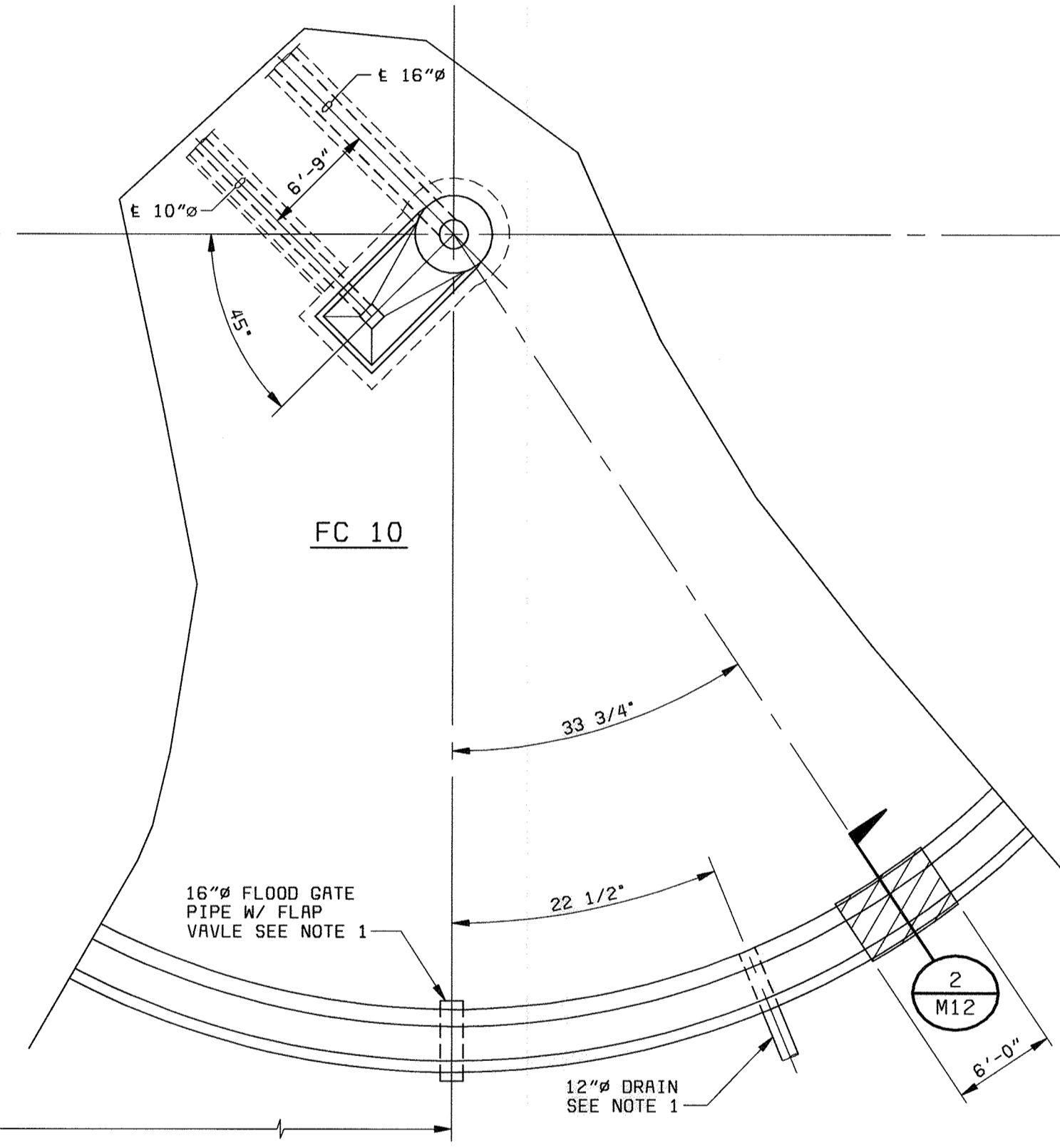
**M11**



**FINAL CLARIFIERS  
NO. 10 AND NO. 11 PLAN**  
1/8" = 1'-0"

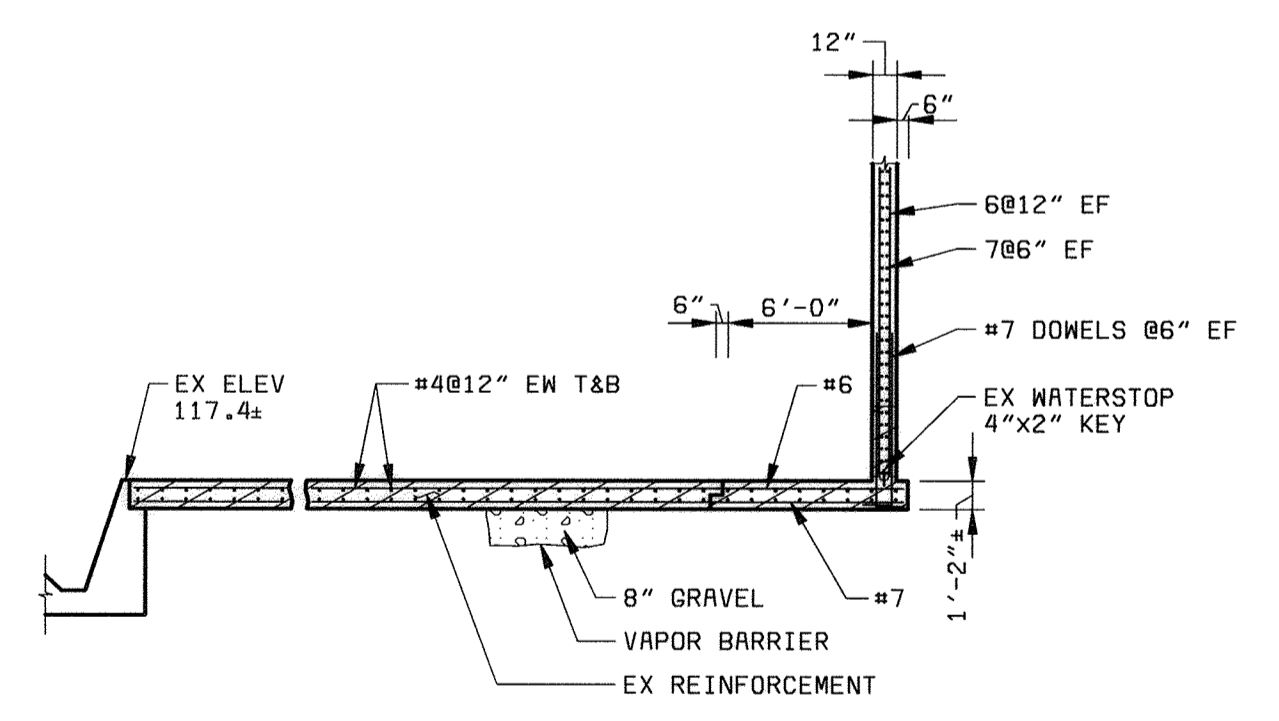


**TYPICAL FINAL CLARIFIER SECTION**  
1/16" = 1'-0"



**SECTION 1**  
1/4" = 1'-0" M12

**SECTION 2**  
1/4" = 1'-0" M12



**SECTION 3**  
1/8" = 1'-0" M12

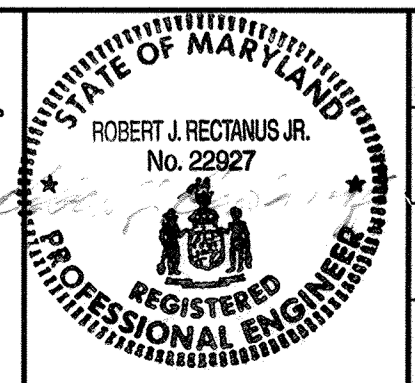
- NOTES:**
1. PLUG WITH CONCRETE AND ABANDON IN PLACE.
  2. EXISTING HANDRAIL TO BE REINSTALLED FOLLOWING CONSTRUCTION OF SCUM BOX.
  3. ALL ELECTRICAL CONDUITS TO BE REMOVED.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Beaman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus, Jr.*  
REG. PROF. ENGR. DATE



DES: FKA					
DRN: RLC					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**FC 10 & 11  
MECHANICAL**

**DEMOLITION PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

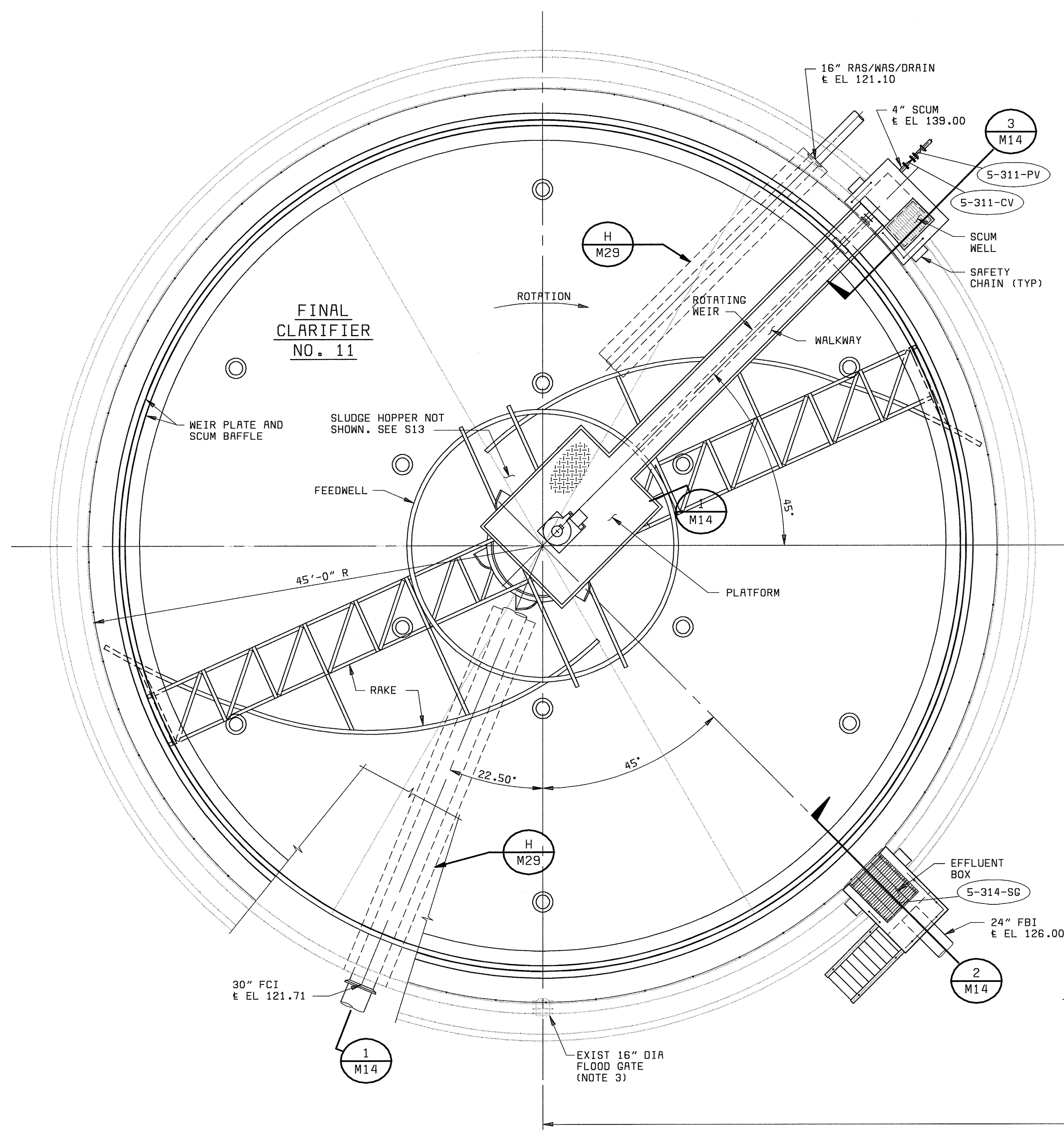
**HOWARD COUNTY, MARYLAND**

SCALE  
AS  
SHOWN

SHEET  
78 OF 161

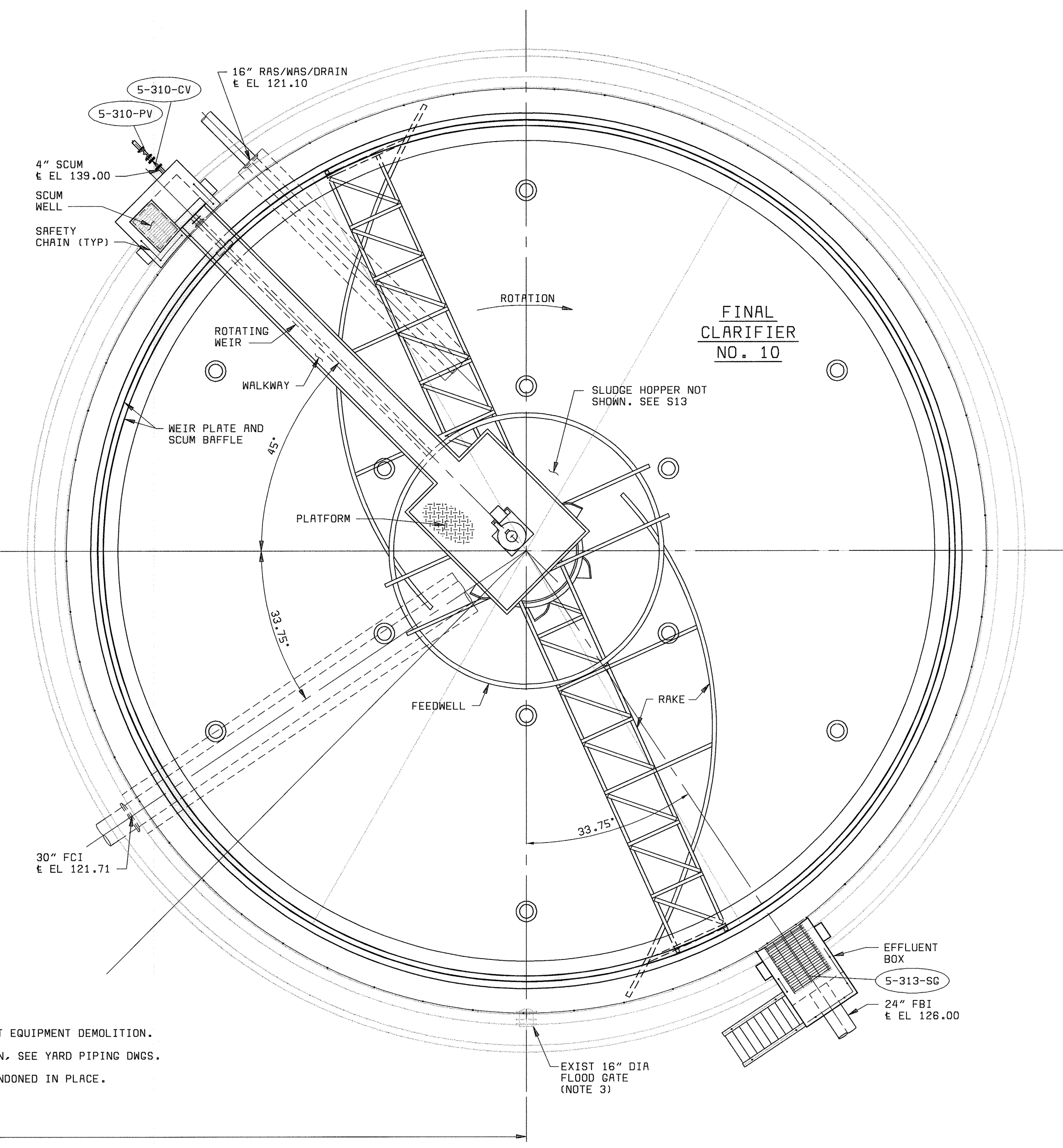
**M12**

A  
B  
C  
D  
E



- NOTES:
1. SEE DWG M12 FOR EXIST EQUIPMENT DEMOLITION.
  2. FOR PIPE CONTINUATION, SEE YARD PIPING DWGS.
  3. FLOOD GATE TO BE ABANDONED IN PLACE.

PLAN  
1/8" = 1'-0"

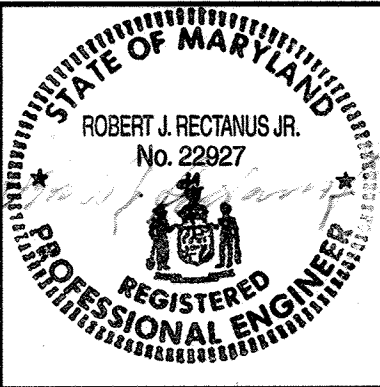


A  
B  
C  
D  
E

59472-101-FC-M-A0000647 (XVFC11M)  
M  
D59472  
F059472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
Robert H. Berger 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** L.P.  
Gaithersburg, Maryland  
  
*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE

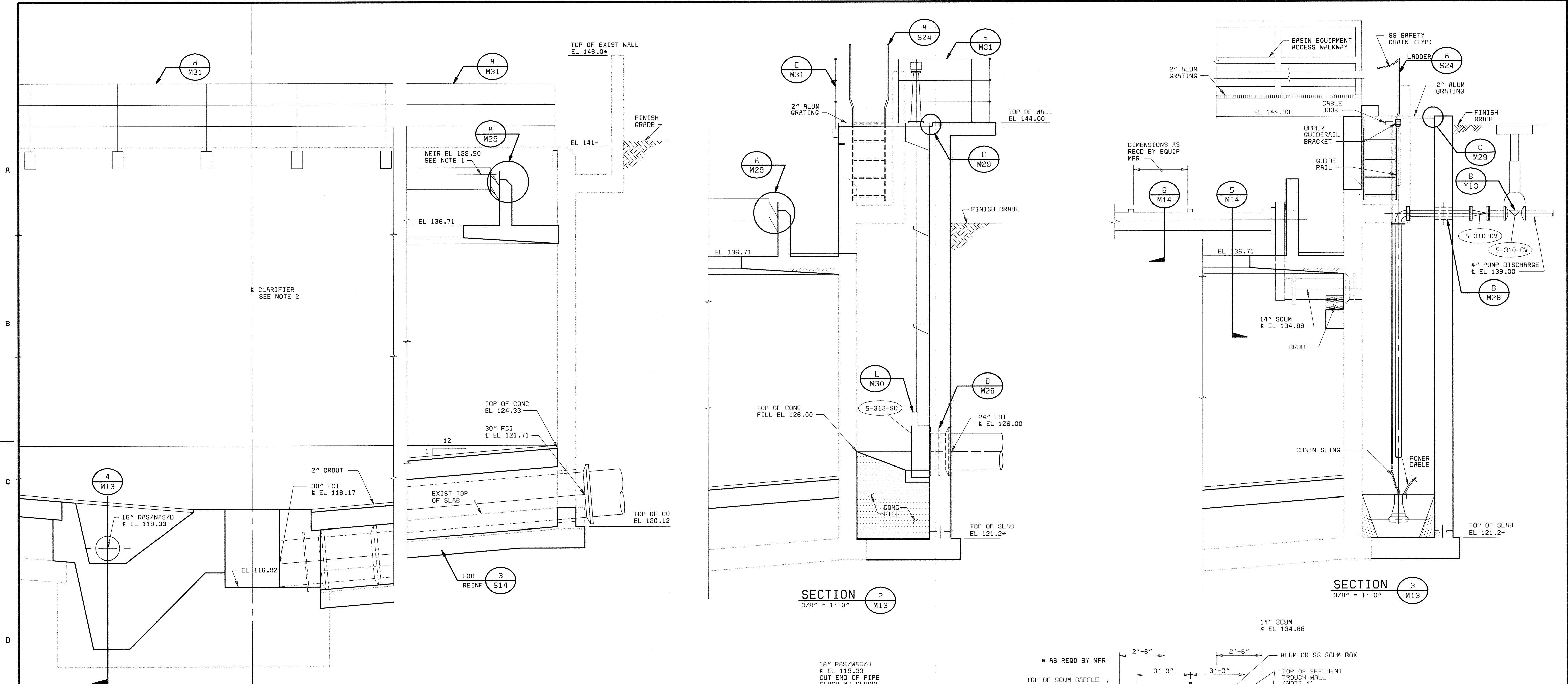


DES: FKA									
DRN: RLC									
CHK: WLK									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

FC 10 & 11  
MECHANICAL  
  
PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

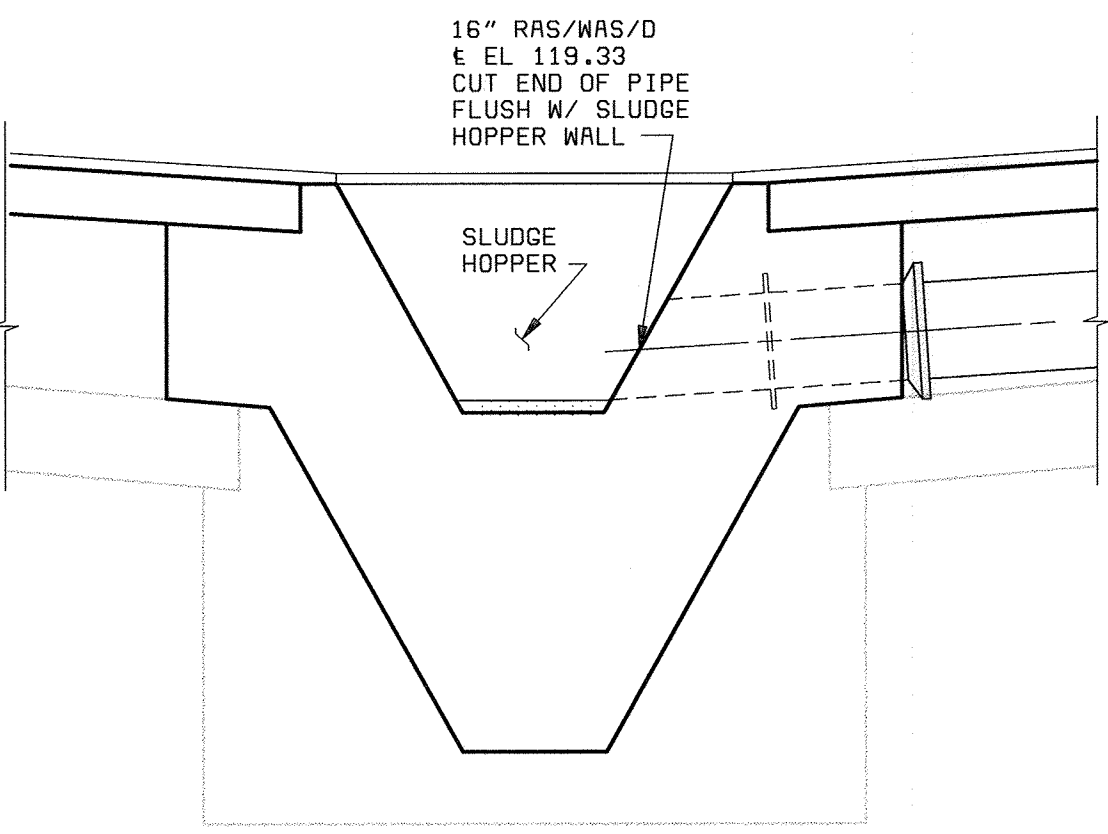
SCALE  
AS  
SHOWN  
  
SHEET  
79 OF 161  
  
M13



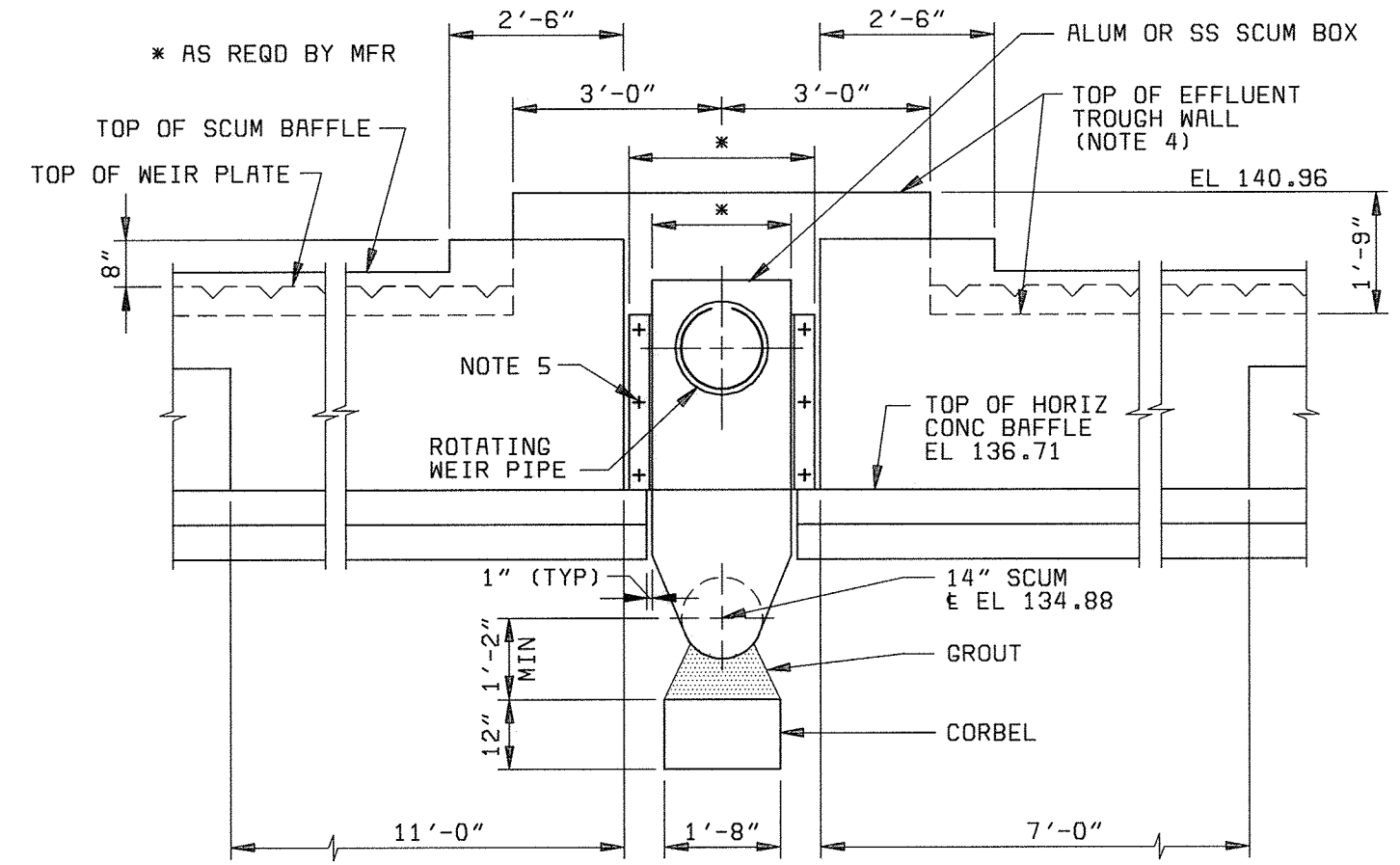
SECTION 1  
3/8" = 1'-0" M13

SECTION 2  
3/8" = 1'-0" M13

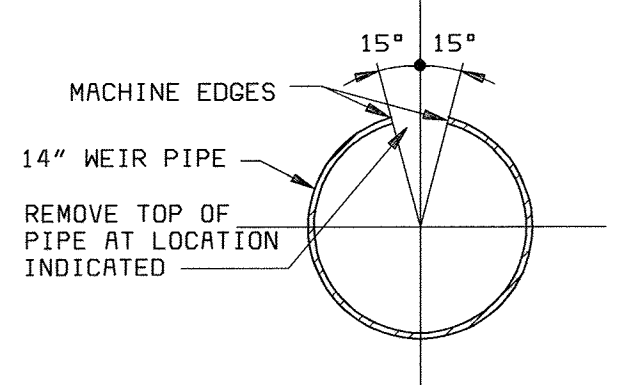
SECTION 3  
3/8" = 1'-0" M13



SECTION 4  
1/4" = 1'-0" M14



SECTION 5  
3/8" = 1'-0" M14



SECTION 6  
1" = 1'-0" M14

- NOTES:
- WEIR ELEVATION IS TO THE INVRET OF V-NOTCH.
  - EQUIPMENT NOT SHOWN.
  - PROVIDE SUPPORT AS REQUIRED BY EQUIPMENT MFR.
  - TOP OF EFFLUENT TROUGH WALL IS HIGHER AT SCUM BOX. SEE SPECIFICATION 11435 FOR REQUIREMENTS.
  - ATTACHMENT HARDWARE SHALL BE 1/2" DIA MINIMUM, TYPE 316 SS ADHESIVE ANCHORS, 3 PER SIDE MIN.

58472-101-FC-M-R0000647 (X)FC11M

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

REG. PROF. ENGR. DATE

DES: FKA  
DRN: RLC  
CHK: WLK  
DATE: 6/23/00

DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP

FC 10 & 11  
MECHANICAL

SECTIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

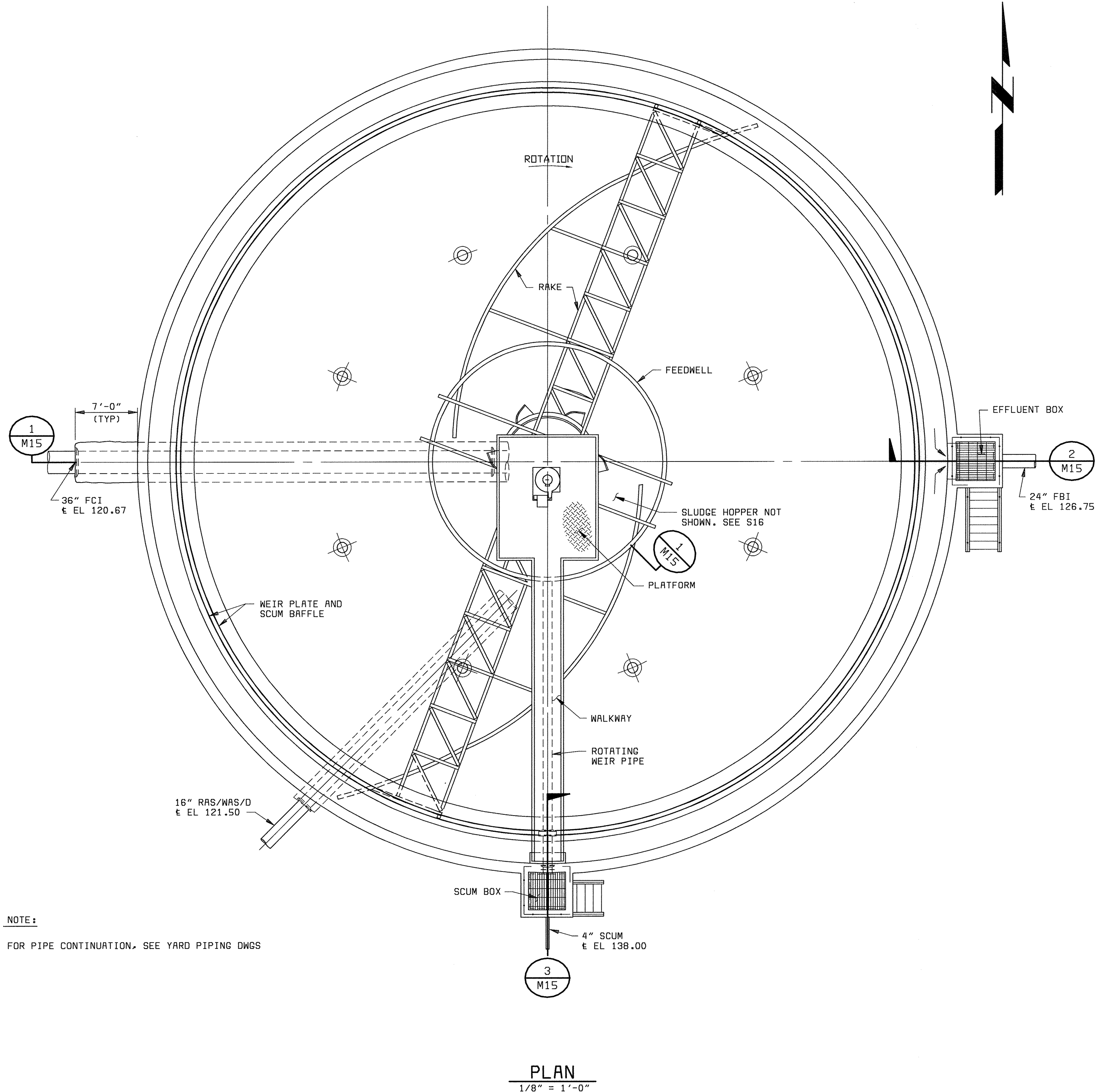
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

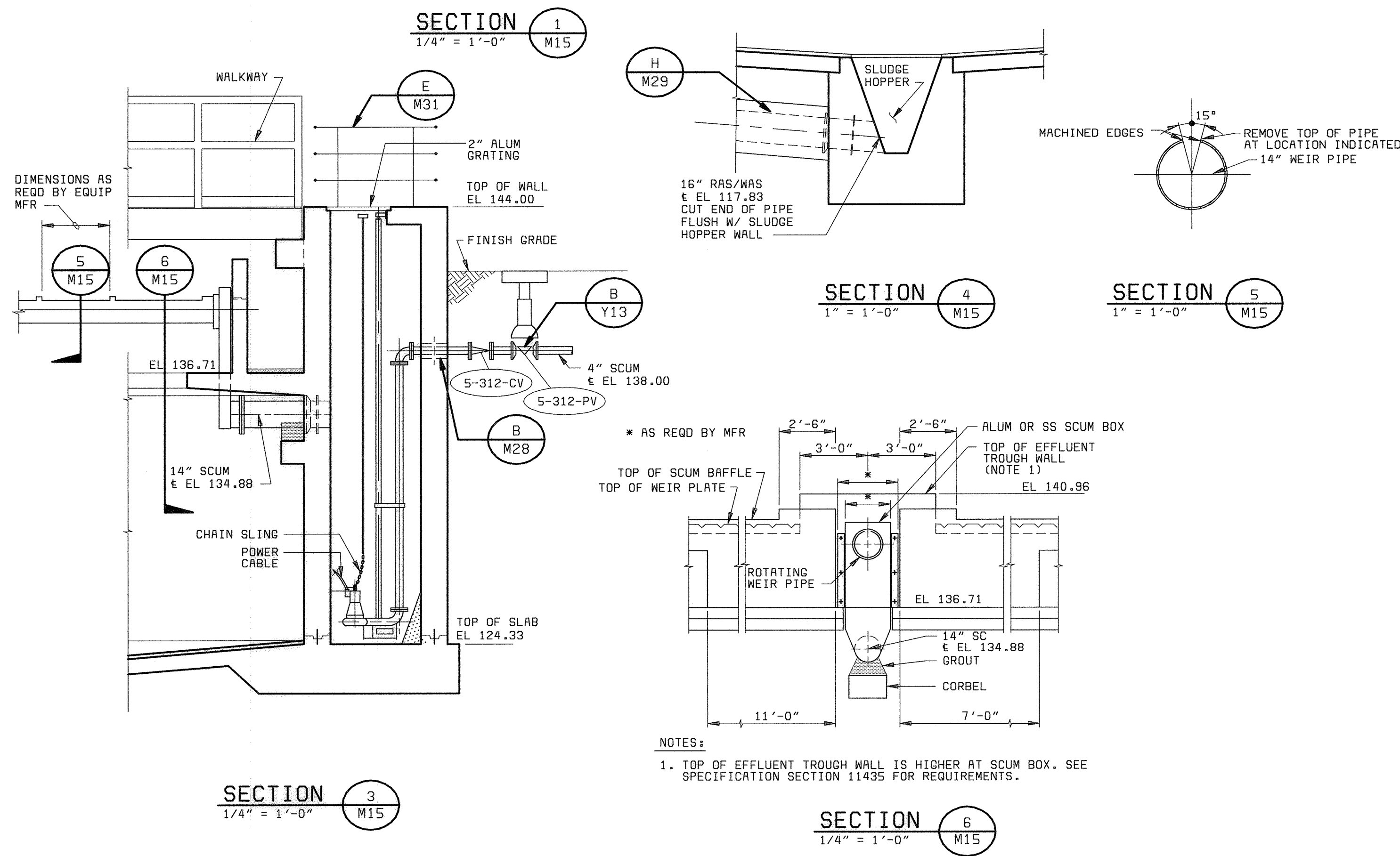
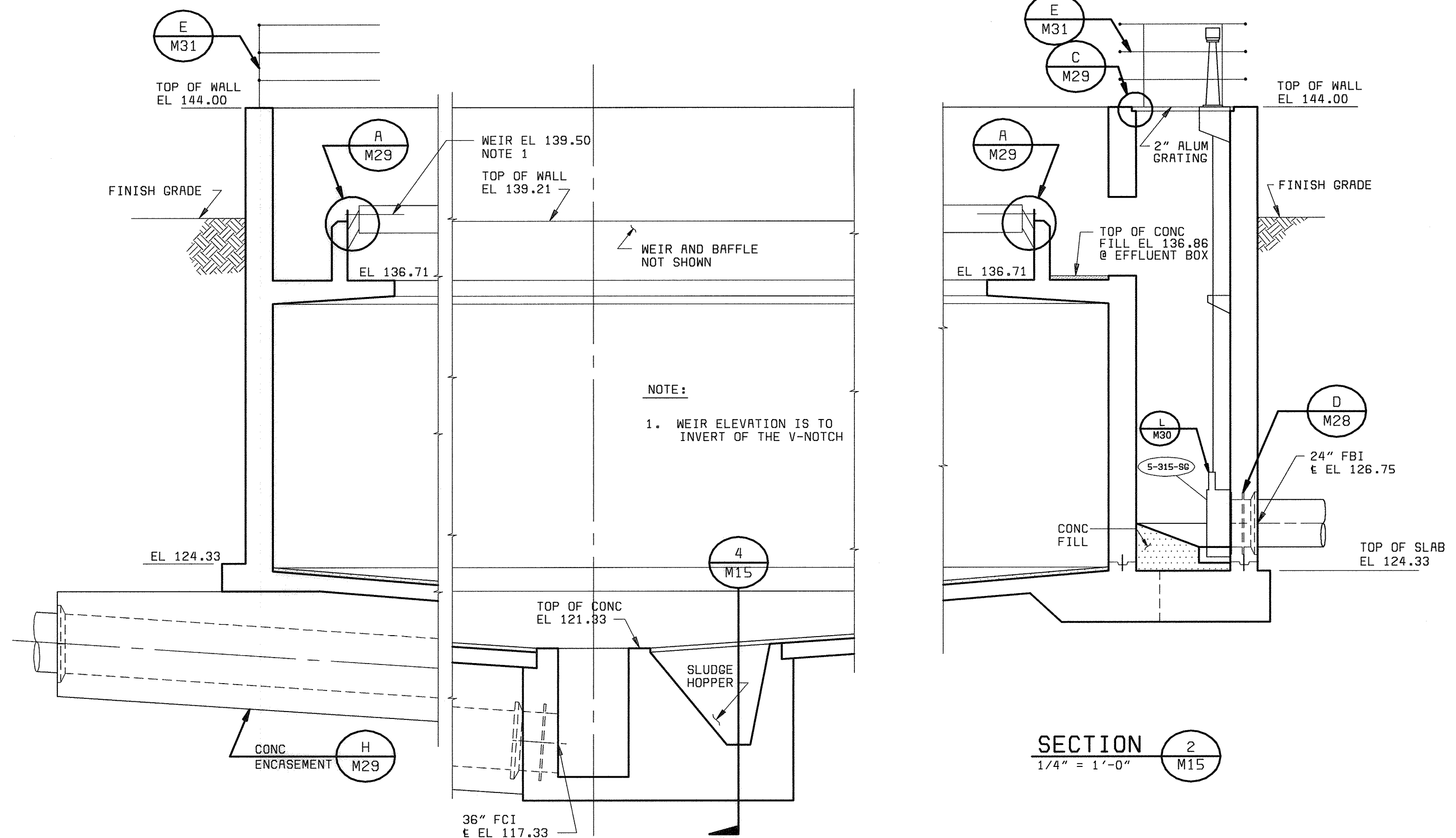
SHEET 80 OF 161

**M14**





NOTE:  
FOR PIPE CONTINUATION, SEE YARD PIPING DWGS



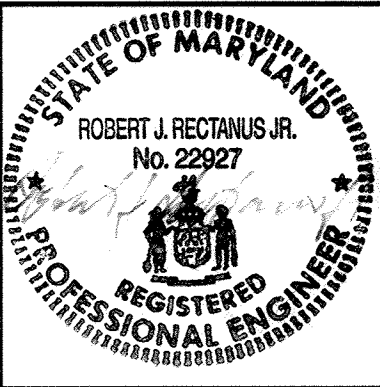
58472-101-FC-M-A0000178

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Bainger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** L.P.  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE



DES: FKA									
DRN: RLC									
CHK: WLK									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

FC 12  
MECHANICAL

PLAN AND SECTIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

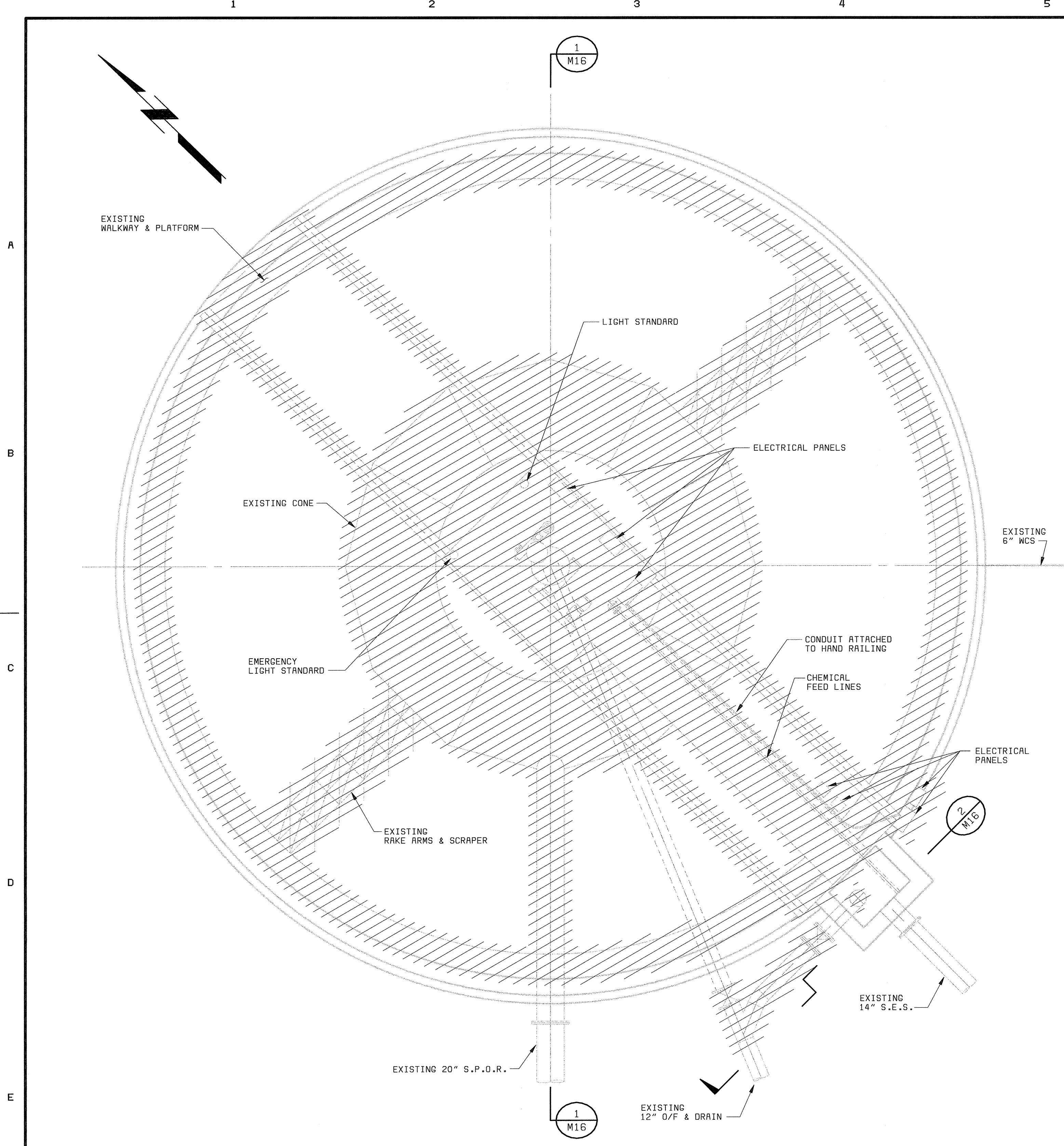
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

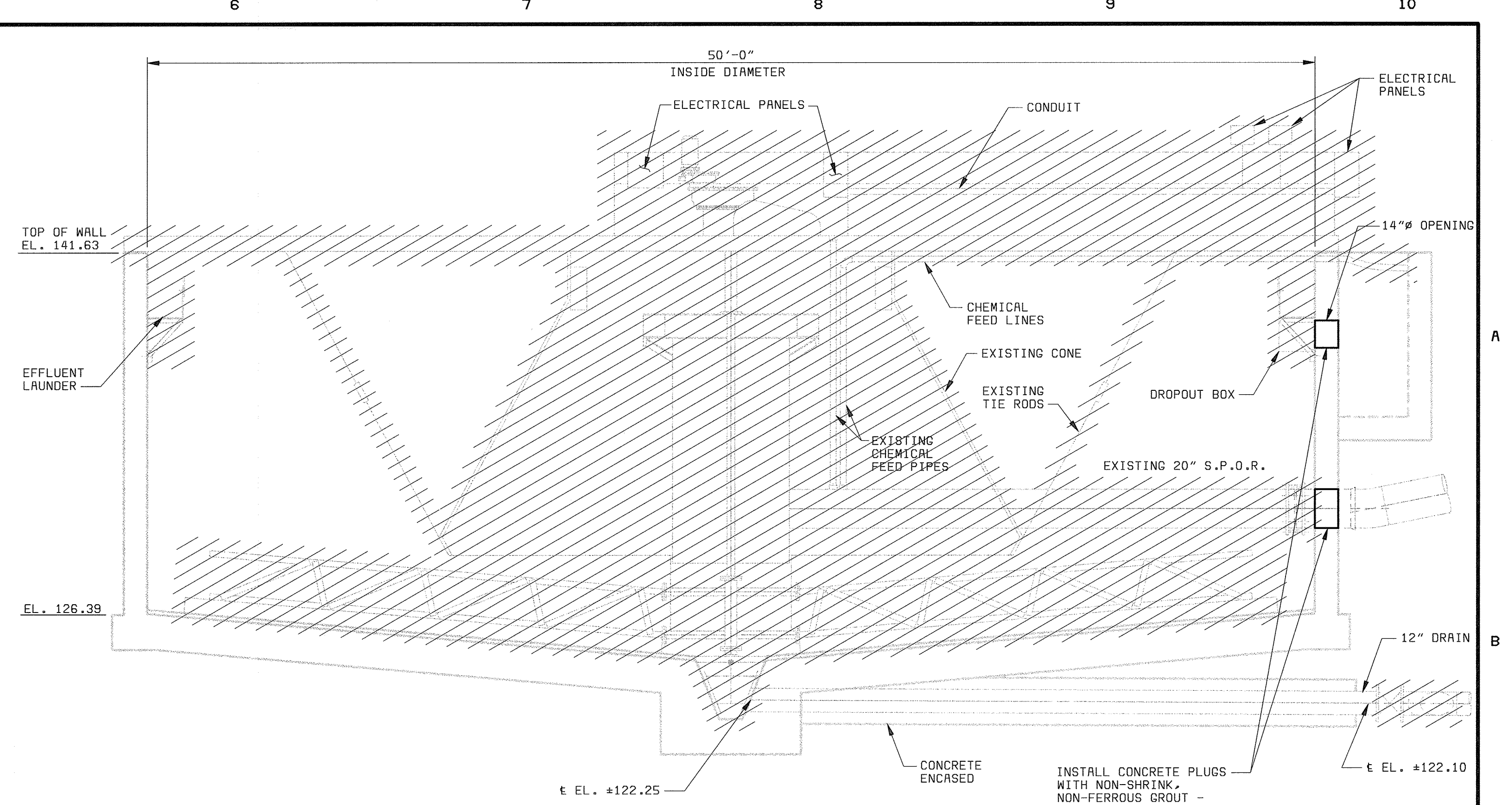
SHEET 81 OF 161

**M15**

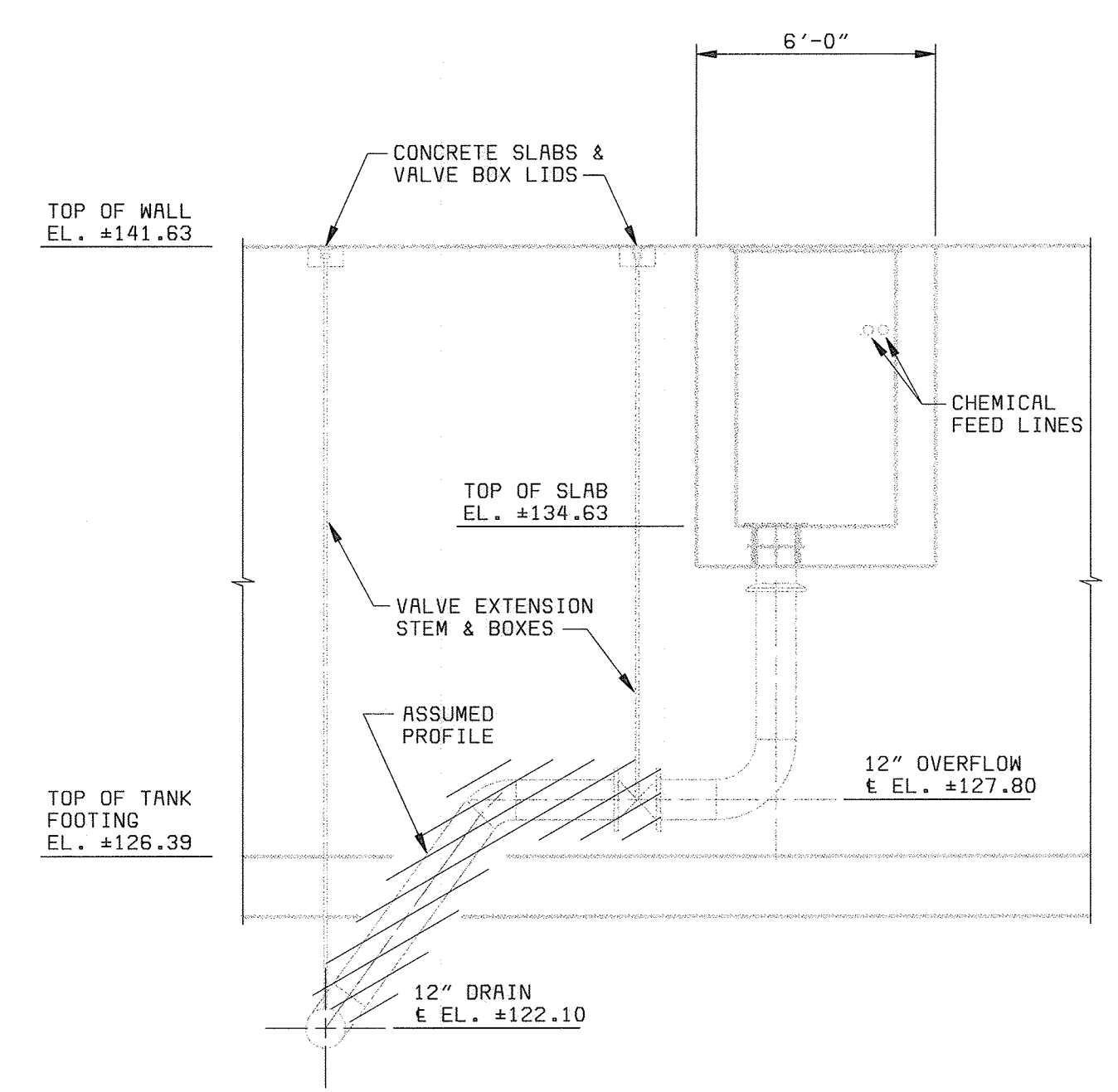


**PLAN**  
1/4" = 1'-0"

**EXISTING REACTOR CLARIFIER No.1  
TO BE CONVERTED TO FERMENTER No. 2**



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



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

**LEGEND:**

TO BE REMOVED

**NOTES:**

1. REACTOR CLARIFIER No.1 SHOWN - DEMOLITION WORK AS SHOWN ALSO APPLIES TO REACTOR CLARIFIER No.2. REACTOR CLARIFIER No.2 WILL BE CONVERTED TO FERMENTER No.1
2. ALL EXISTING ELEVATIONS ARE TO BE CONFIRMED BY THE CONTRACTOR.
3. INCLUDE REMOVAL OF ALL ELECTRICAL PANELS, CONDUIT & WIRING - EXTEND REMOVAL OF WIRING TO THE MCC.
4. REMOVE ALL BOLTS TO AT LEAST 2" DEPTH INTO CONCRETE. GROUT ALL RESULTING HOLES WITH NON-SHRINK, NON FERROUS GROUT. GROUT SIMILARLY ANY OPENINGS, HOLES, ETC. REMAINING FROM REMOVAL OF PIPE, CONDUIT, ETC.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Deminger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**Stantec Consulting Ltd.**  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: surrey@stantec.com

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.* 7/19/00  
REG. PROF. ENGR. DATE

DES: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RCF							
CHK: RVJ							

**FERMENTER  
MECHANICAL**

**DEMOLITION  
PLAN AND SECTION**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

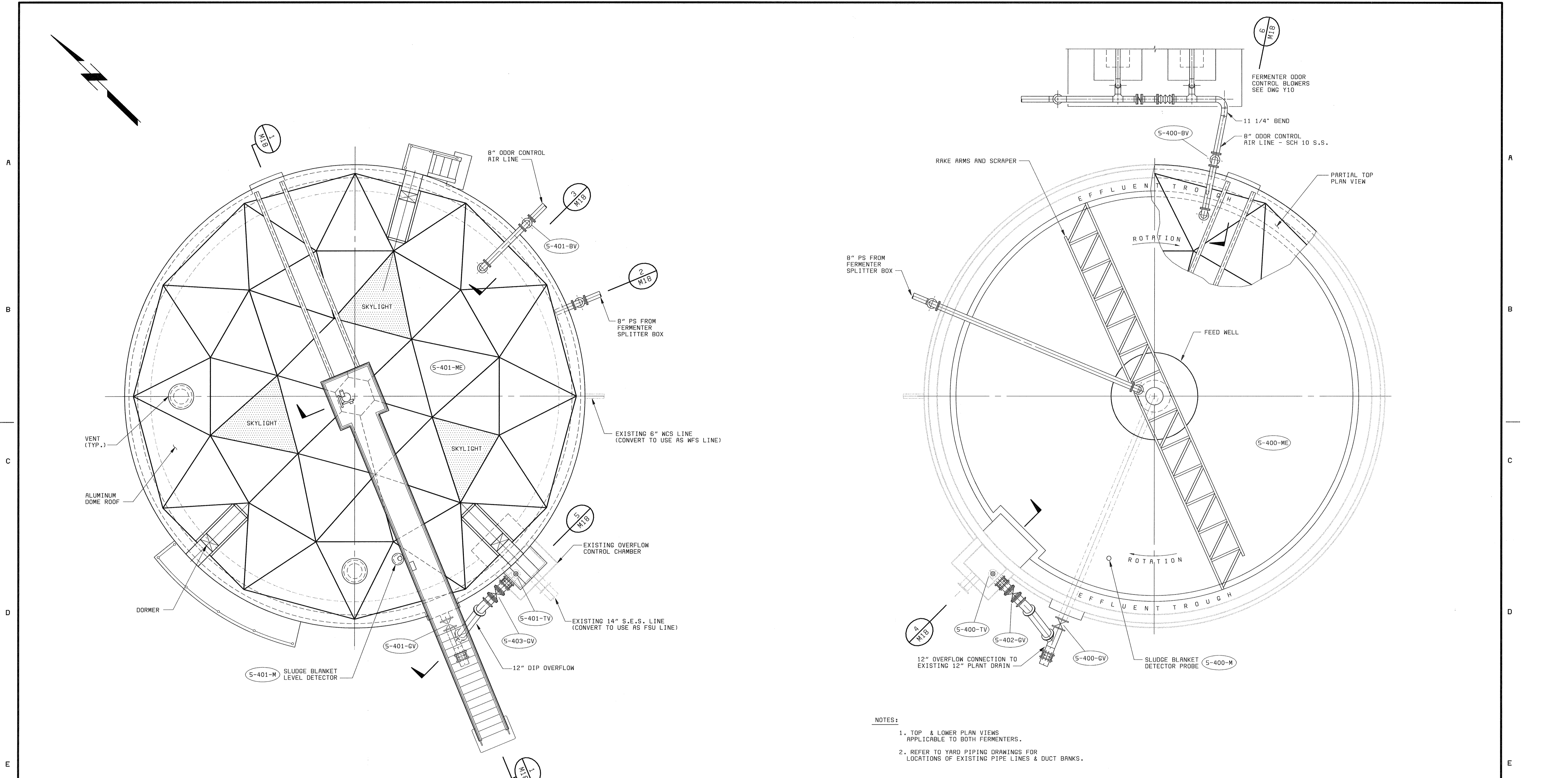
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
82 OF 161

**M16**

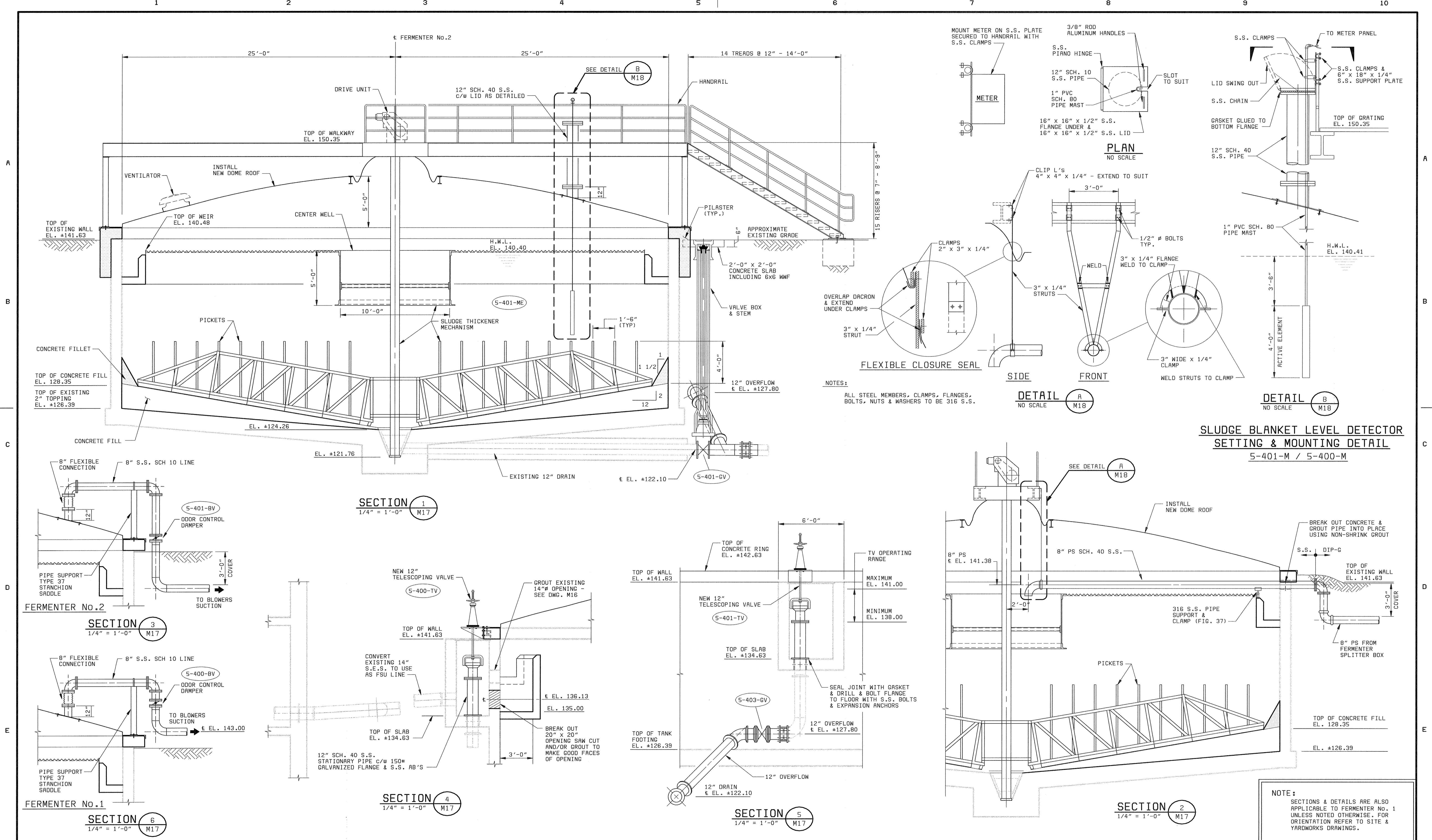


**TOP PLAN**  
**FERMENTER No. 2**  
3/16" = 1'-0"

**LOWER PLAN**  
**FERMENTER No. 1**  
3/16" = 1'-0"

- NOTES:**
1. TOP & LOWER PLAN VIEWS APPLICABLE TO BOTH FERMENTERS.
  2. REFER TO YARD PIPING DRAWINGS FOR LOCATIONS OF EXISTING PIPE LINES & DUCT BANKS.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  <i>Robert J. Rectanus Jr.</i> 7/19/00 REG. PROF. ENGR. DATE	 ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: RVJ								FERMENTER MECHANICAL  TOP AND LOWER PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: RCF	CHK: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK			APP



DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Robert J. Rectanus Jr.  
CHIEF, BUREAU OF UTILITIES DATE

**Stantec**  
Stantec Consulting Ltd.  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: surrey@stantec.com

**BLACK & VEATCH**  
Gaithersburg, Maryland

Robert J. Rectanus Jr.  
No. 22922  
REGISTERED PROFESSIONAL ENGINEER  
REG. PROF. ENGR. DATE

STATE OF MARYLAND  
REGISTERED PROFESSIONAL ENGINEER  
ROBERT J. RECTANUS JR.  
No. 22922

DES: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RCF							
CHK: RVJ							

**FERMENTER MECHANICAL**

**SECTIONS & DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

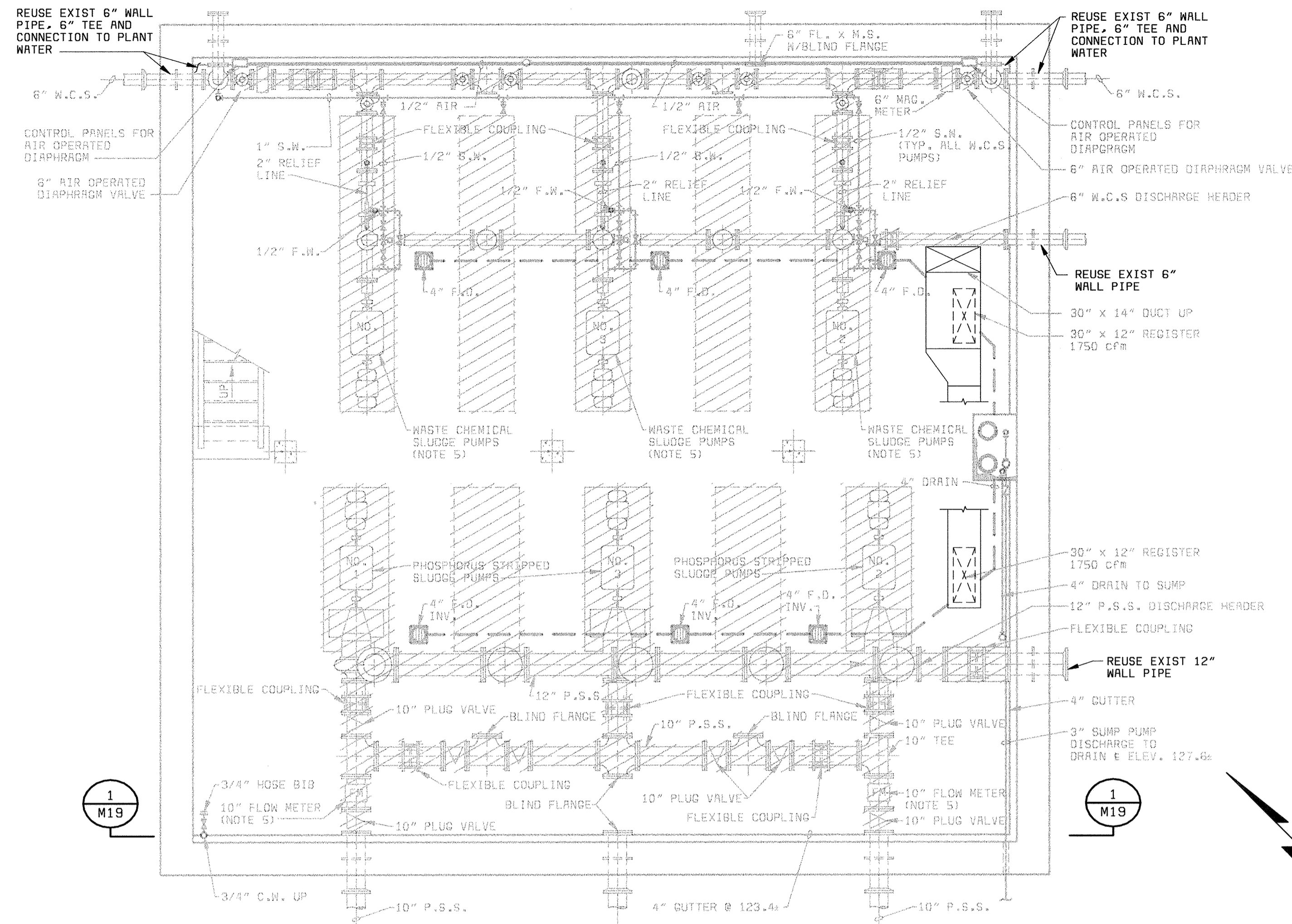
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

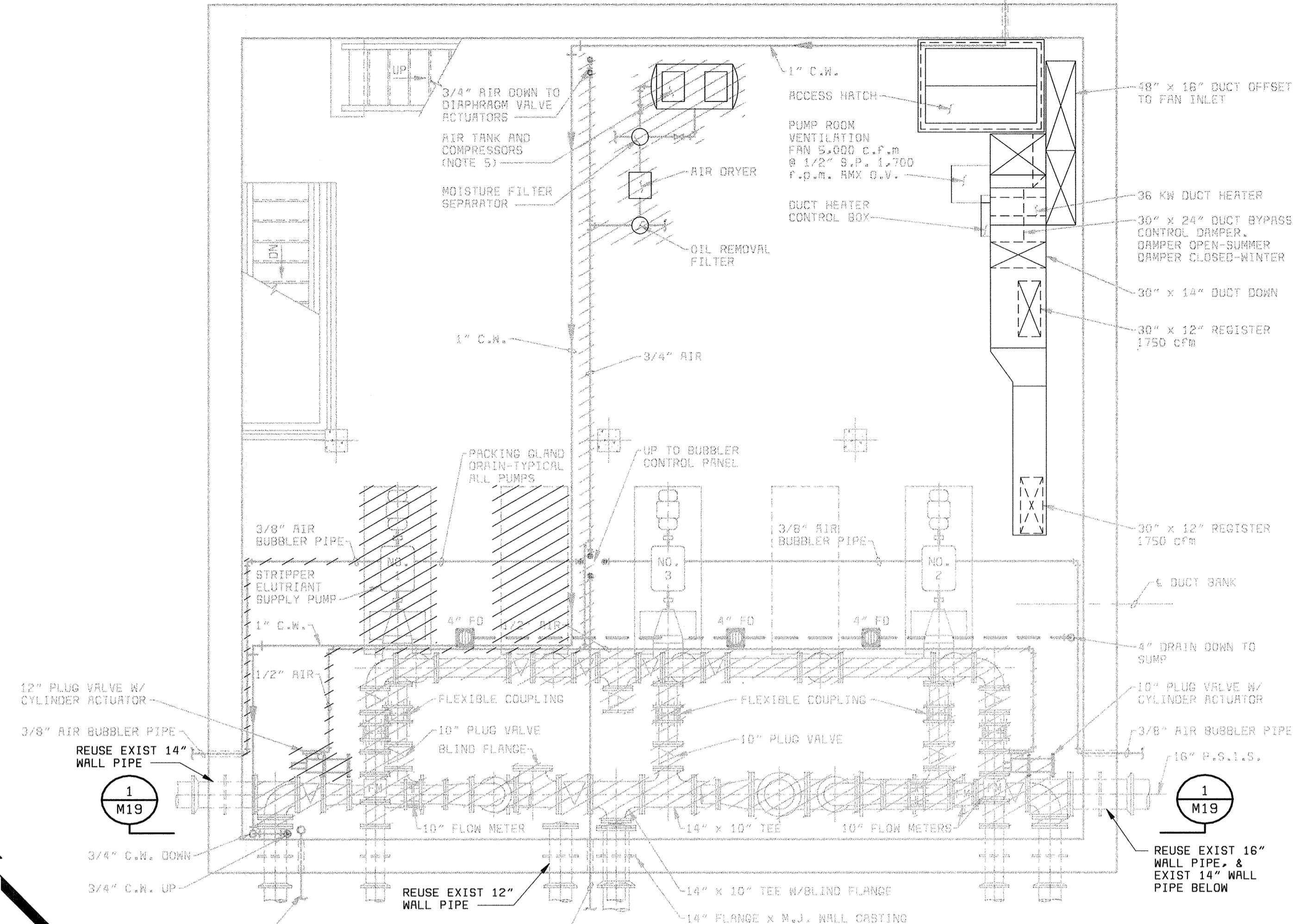
SCALE AS SHOWN

SHEET 84 OF 161

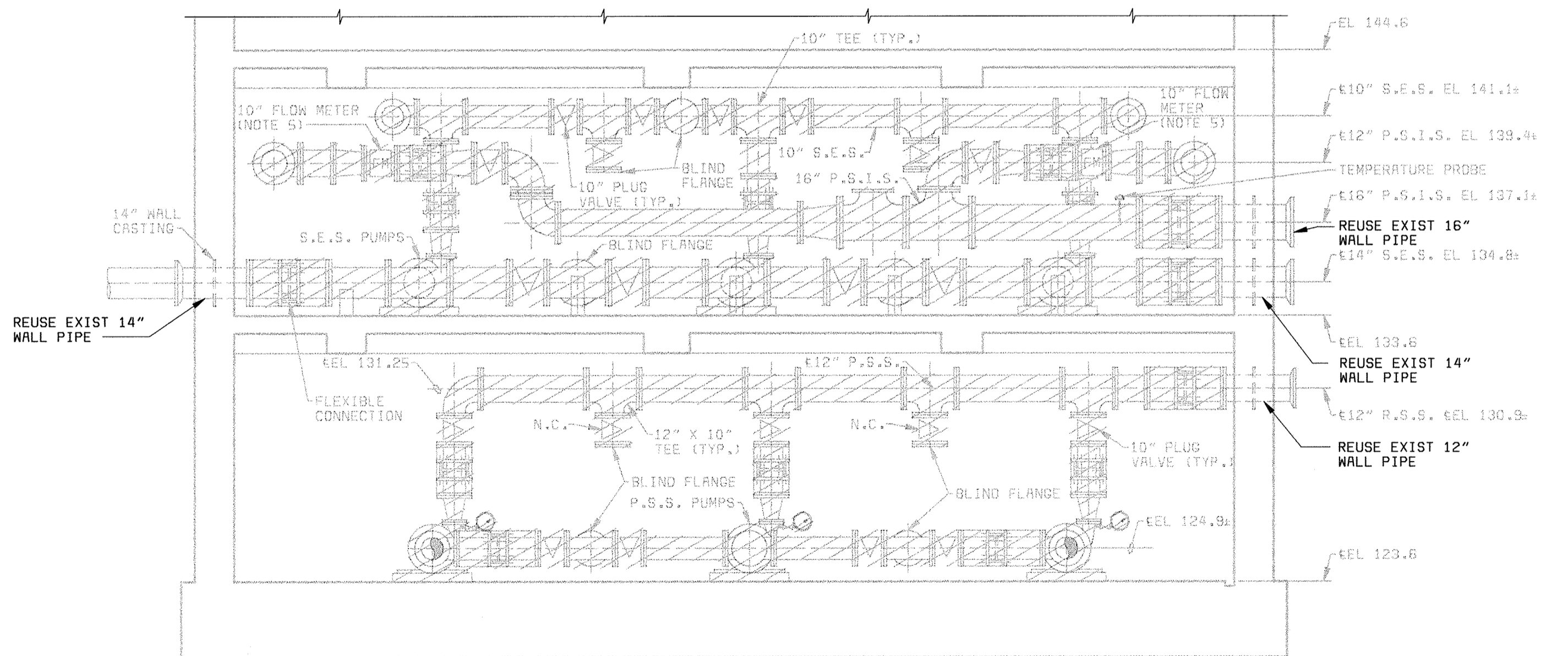
**M18**



**PLAN AT ELEVATION 124.00**  
1/4" = 1'-0"



**PLAN AT ELEVATION 134.00**  
1/4" = 1'-0"

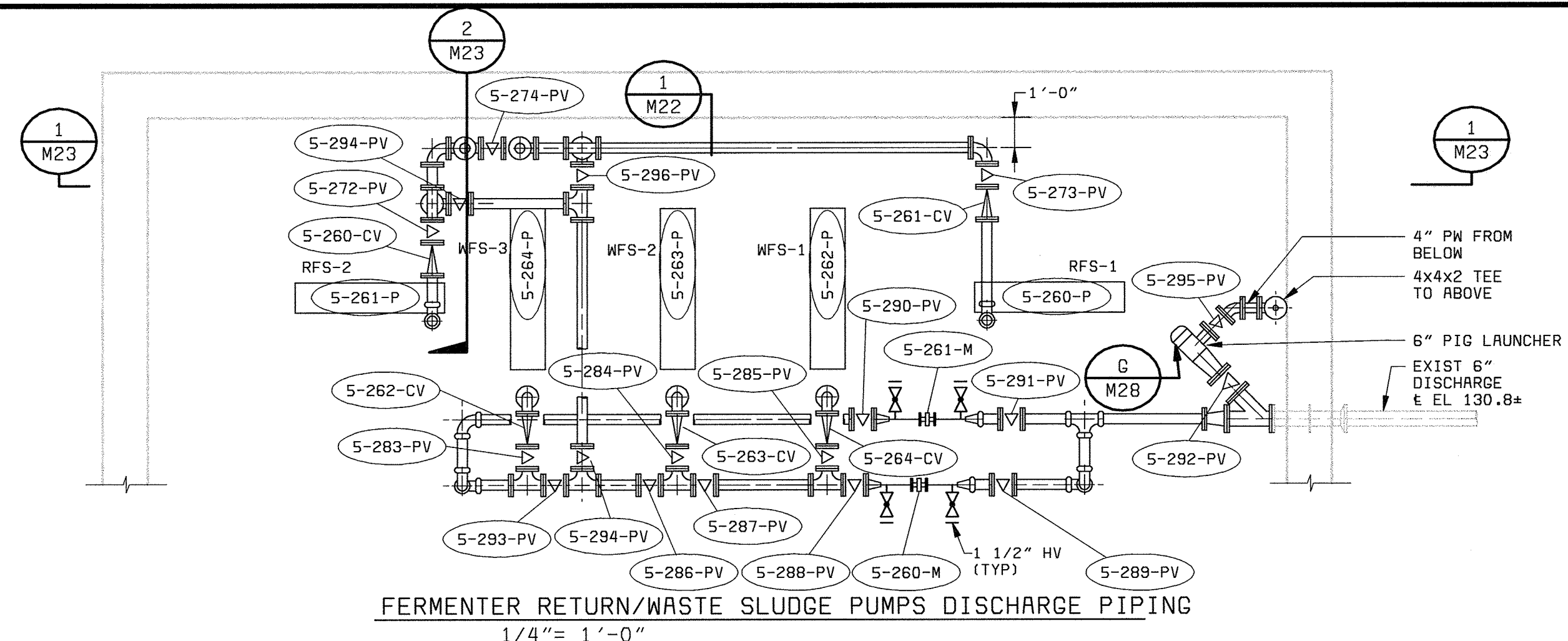


**SECTION 1**  
1/4" = 1'-0"

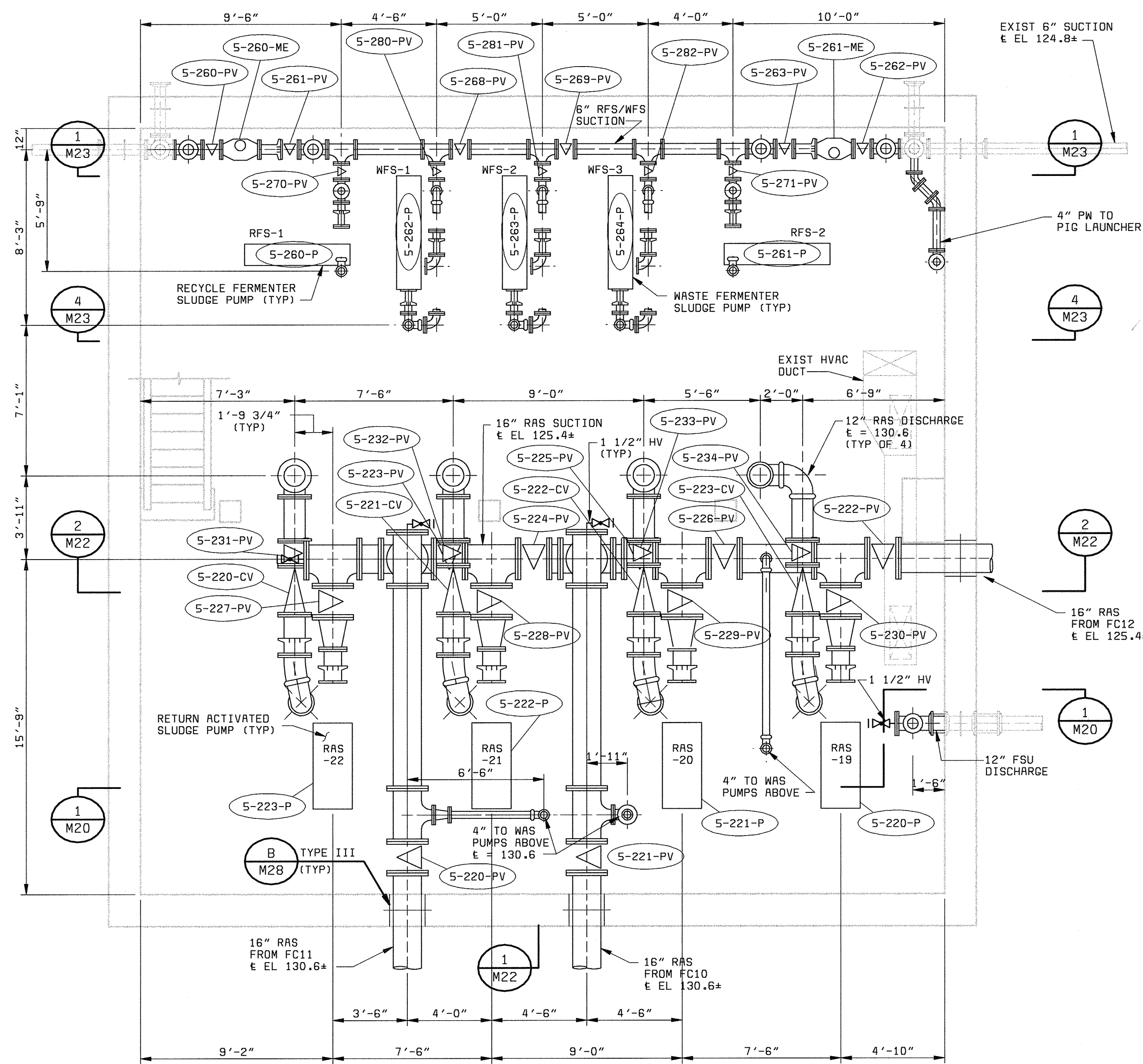
**NOTES:**

1. ALL EXIST WALL PIPES NOT IDENTIFIED FOR REUSE SHALL BE PLUGGED AND CAPPED. THOSE EXIST WALL PIPES WHICH INTERFERE WITH PROPOSED WALL PENETRATIONS SHALL BE REMOVED AND THE WALL GROUDED AS NECESSARY.
2. ALL ELECTRICAL EQUIPMENT PANELS AND WIRING TO BE REMOVED. SEE DWG E35. EXISTING FIRE ALARM SYSTEM TO REMAIN.
3. ALL EXISTING DUCTWORK, VENTILATION FAN, HEATER, AND OTHER HVAC EQUIPMENT TO REMAIN EXCEPT AS NOTED ON THE HVAC DRAWINGS.
4. THE EXISTING POTABLE WATER SYSTEM, INCLUDING HOSE BIBS, AND SERVICE TO THE BATHROOM SHALL REMAIN. THE EXISTING SANITARY DRAIN SYSTEM SHALL REMAIN. THE EXISTING FLOOR DRAINS, SUMP PUMPS AND SUMP DISCHARGE SHALL REMAIN.
5. THE FOLLOWING ITEMS SHALL BE SALVAGED. THE CONTRACTOR SHALL REMOVE THEM FROM THE BUILDING AND MOVE THEM TO A STORAGE AREA ON THE PLANT SITE TO BE IDENTIFIED BY THE OWNER.
  - "SAFETRONICS" VARIABLE FREQUENCY DRIVES (2)
  - "SYNCO" VARIABLE FREQUENCY DRIVES (3)
  - AIR COMPRESSOR - ON MIDDLE FLOOR
  - PROGRESSIVE CAVITY PUMPS (3)
  - 8" "SPARKING" FLOW METERS (4)

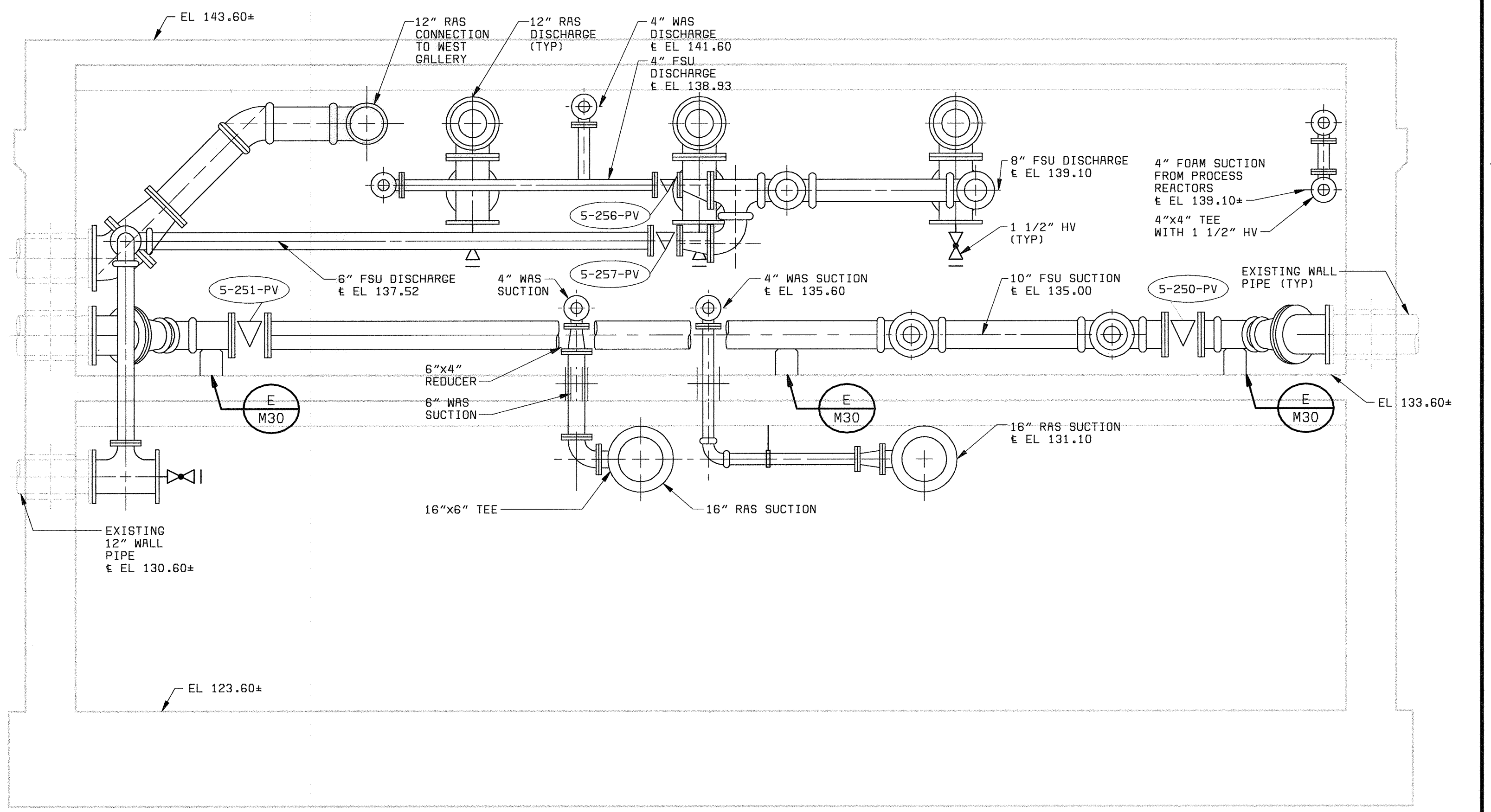
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert J. Rectanus Jr.</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LP Gaithersburg, Maryland  REG. PROF. ENGR. DATE	 REGISTERED PROFESSIONAL ENGINEER	DES: KMH						<b>NORTH GALLERY MECHANICAL</b>  <b>DEMOLITION PLAN</b>	<b>LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION</b>  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: ET	CHK: WLK	DATE: 6/23/00						
			REVISIONS AND RECORD OF ISSUE NO. BY CK APP								<b>M19</b>



FERMENTER RETURN/WASTE SLUDGE PUMPS DISCHARGE PIPING  
1/4" = 1'-0"



PIPING PLAN @ EL 131.00  
(LOWER FLOOR)  
1/4" = 1'-0"



SECTION 1  
3/8" = 1'-0" M20, M21

58472-101-RSPS-M-A0000205  
058472  
F058472R

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
*Robert J. Reitan* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland  
  
*Robert J. Reitan*  
REG. PROF. ENGR. DATE

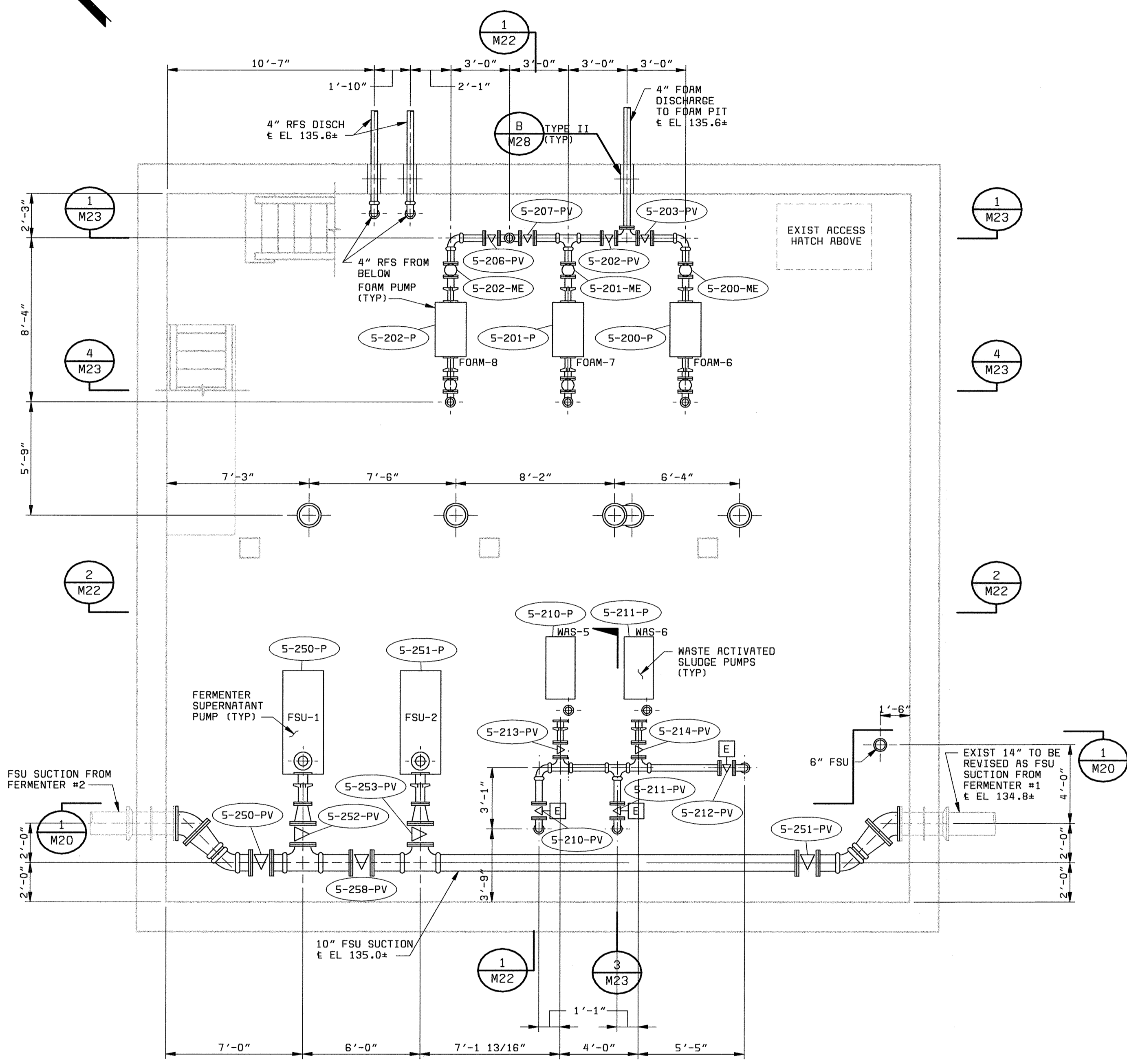
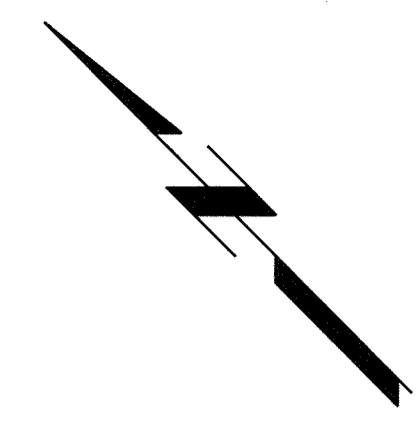
STATE OF MARYLAND  
ROBERT J. REITAN JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER  
MECHANICAL

DES: KMH					
DRN: SLF					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

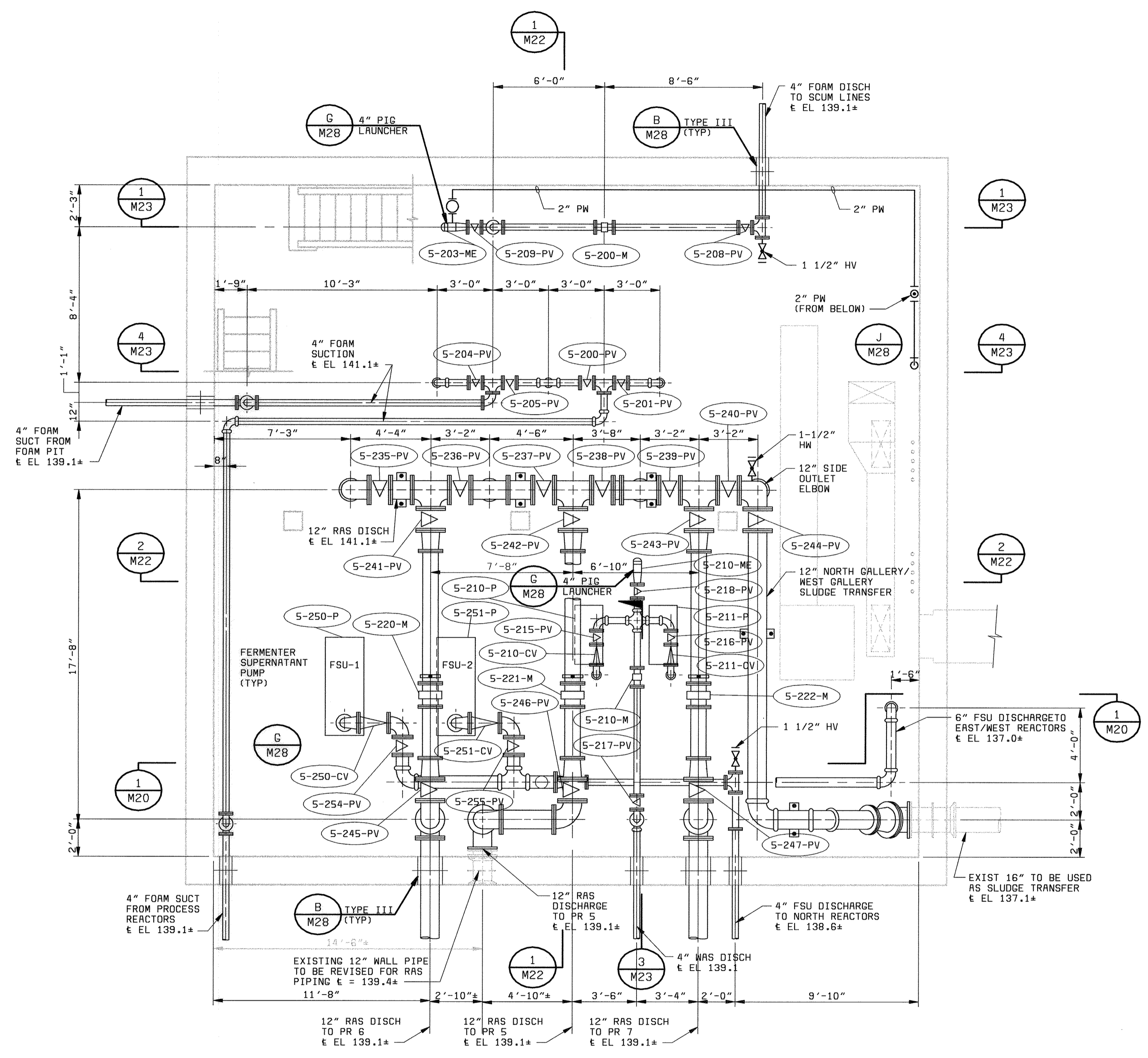
NORTH GALLERY  
MECHANICAL  
  
 PIPING PLANS @ EL 131.00  
& EL 137.00

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION  
  
 CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN  
  
 SHEET  
86 OF 161  
  
**M20**



PIPING PLAN @ EL 137.00  
(MIDDLE FLOOR)  
1/4" = 1'-0"



PIPING PLAN @ EL 137.00  
(MIDDLE FLOOR)  
1/4" = 1'-0"

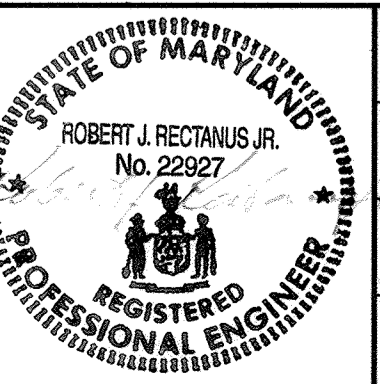
58472-101-ASPS-M-A0000205

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE



DES: KMH	DATE:	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: SLF	DATE:					
CHK: WLK	DATE: 6/23/00					

NORTH GALLERY  
MECHANICAL

PIPING PLAN @ EL 141.50

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

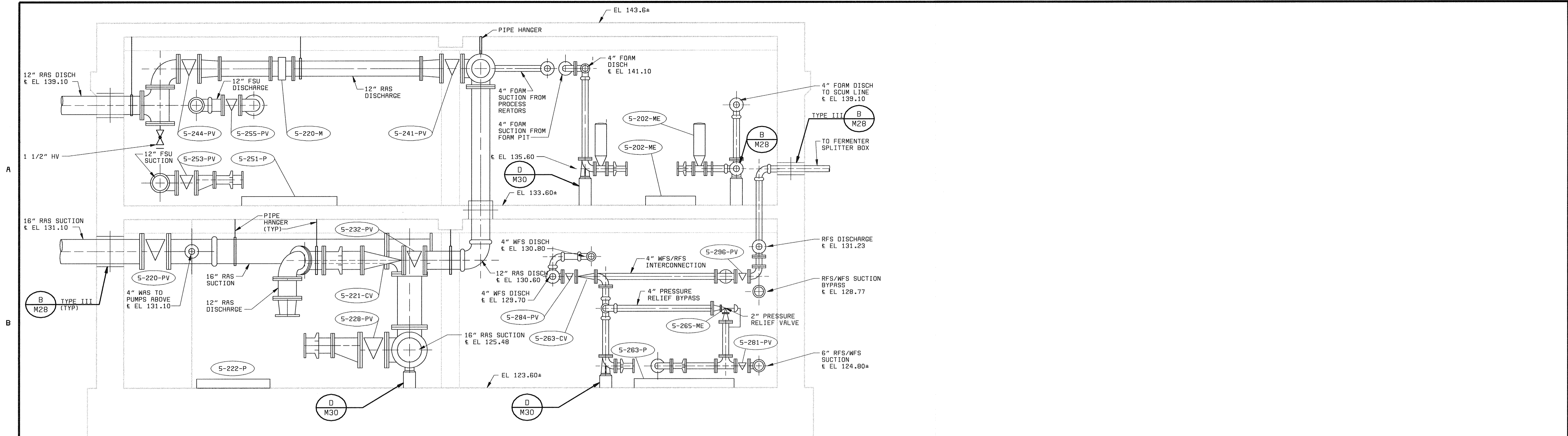
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

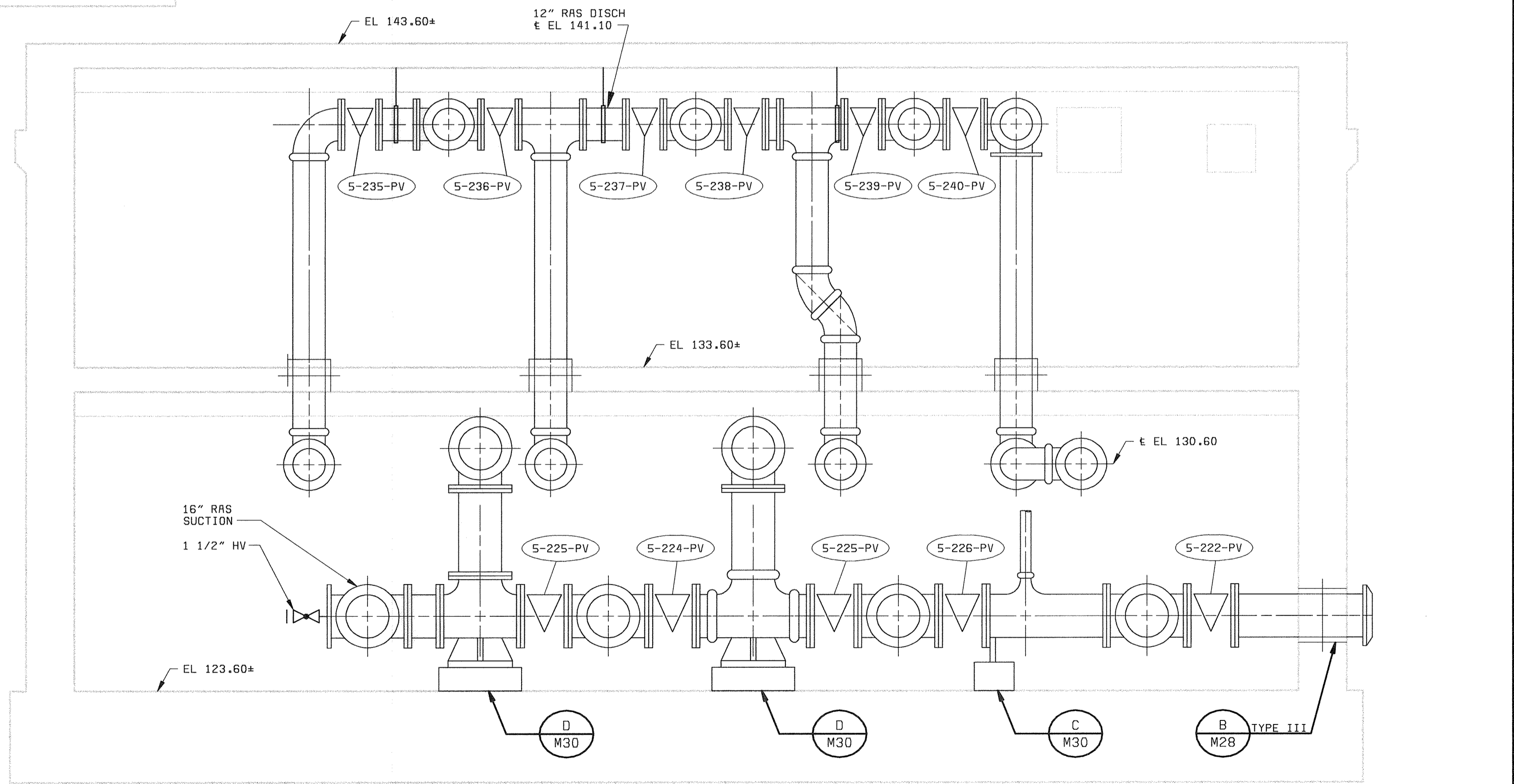
SCALE AS SHOWN

SHEET 87 OF 161

M21



SECTION 1  
3/8" = 1'-0" M20, M21



SECTION 2  
3/8" = 1'-0" M20, M21

58472-101-RSPS-M-10000205

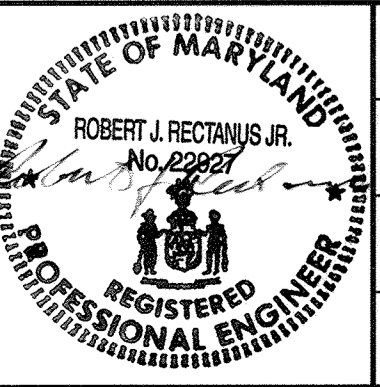
058472-101-RSPS-M-10000205

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Berger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus, Jr.* 6/26/00  
REG. PROF. ENGR. DATE



DES: KMH, SLF									
DRN: SLF									
CHK: WLK									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

NORTH GALLERY  
MECHANICAL

SECTIONS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 88 OF 161

**M22**



A

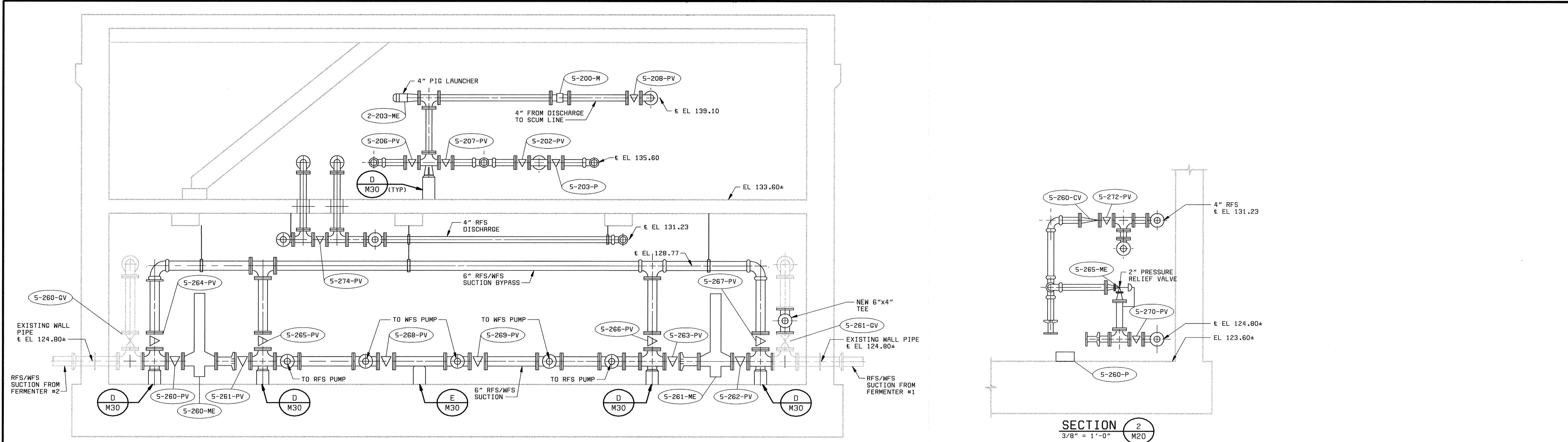
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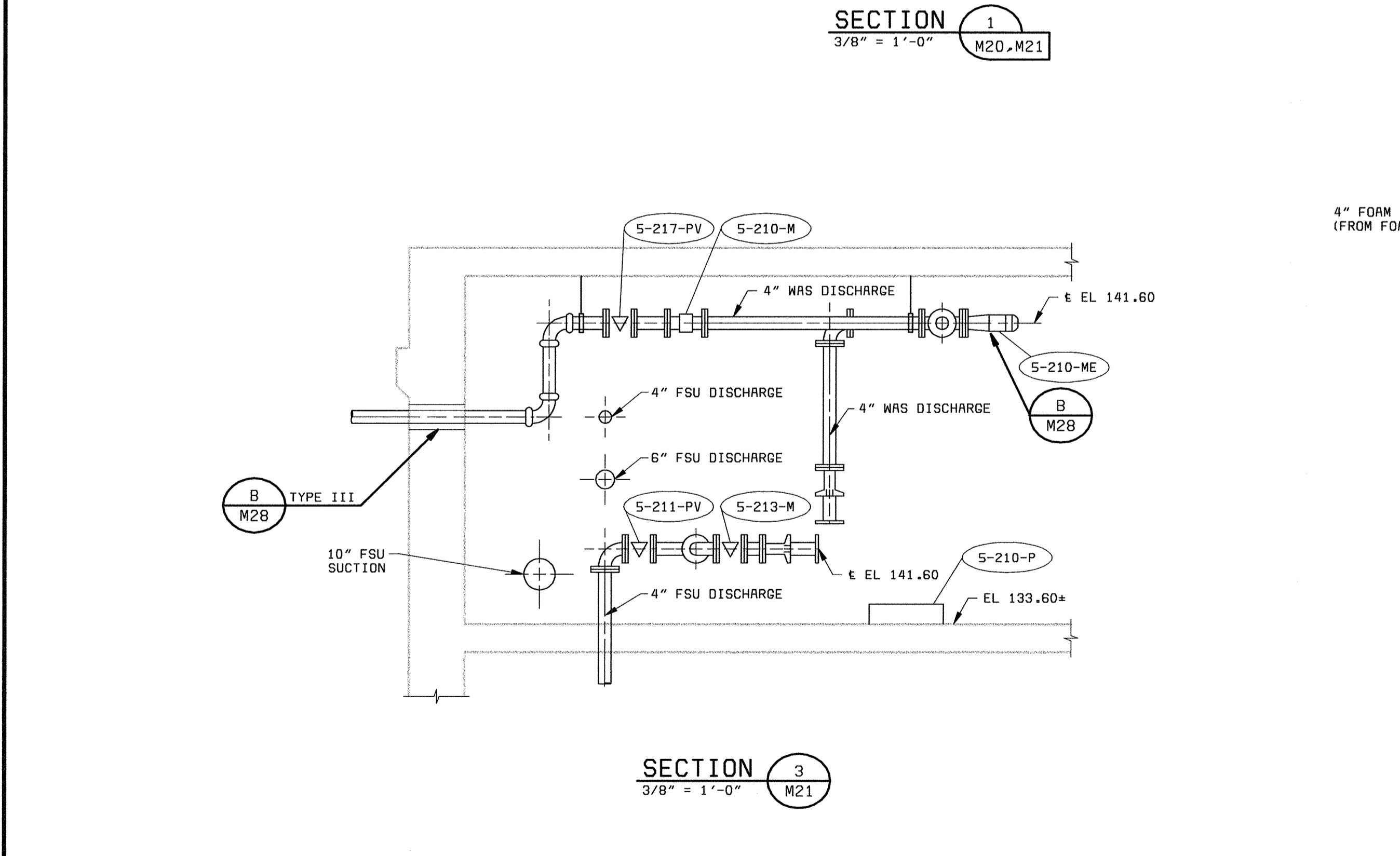
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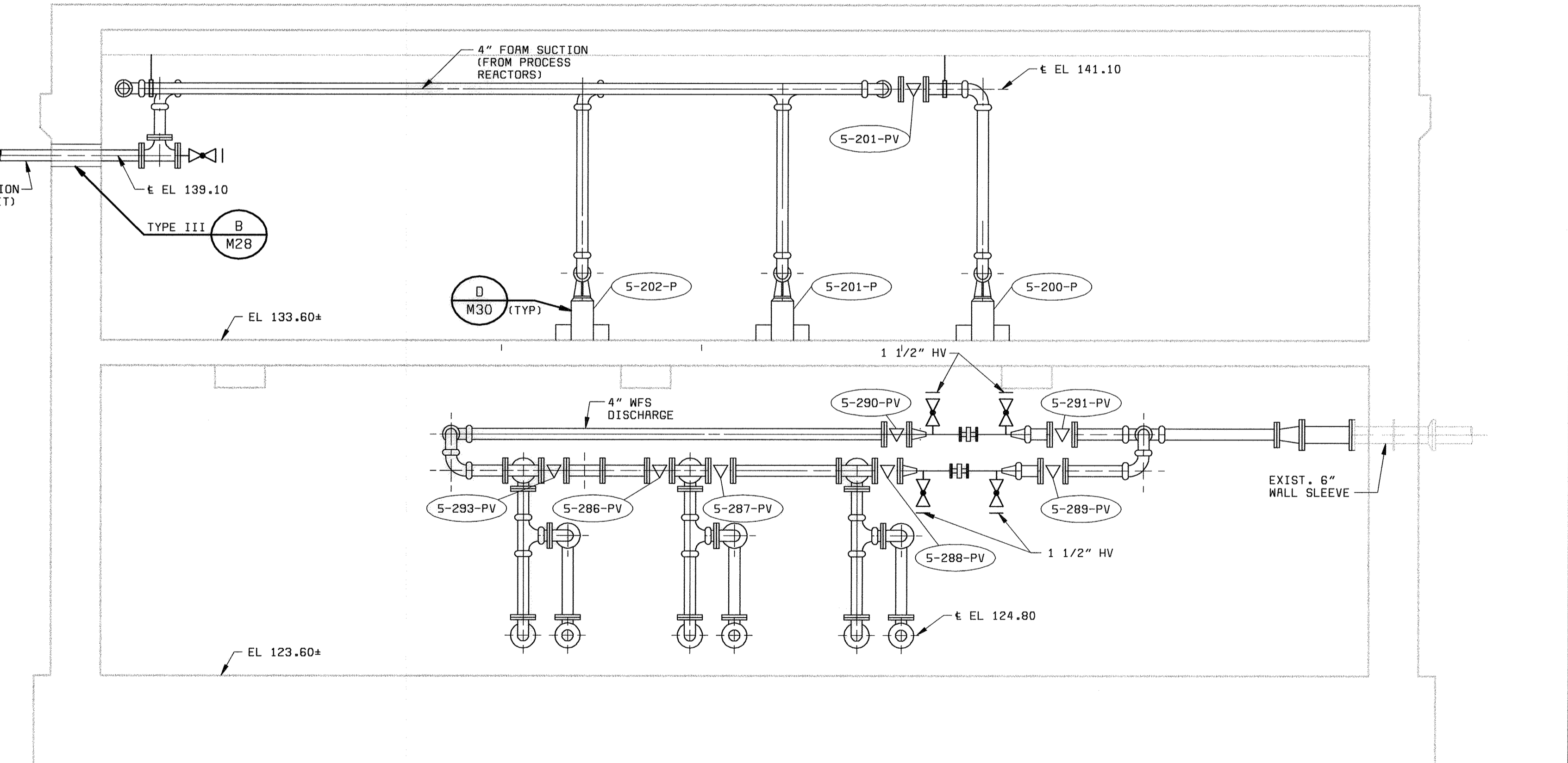
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**SECTION 1**  
3/8" = 1'-0" M20, M21



**SECTION 3**  
3/8" = 1'-0" M21



**SECTION 4**  
3/8" = 1'-0" M20, M21

58472-101-RSPS-M-R0000205

058472-101-RSPS-M-R0000205

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus Jr.*  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE 6/26/00

STATE OF MARYLAND  
ROBERT J. RECTANUS JR.  
No. 22927  
REGISTERED PROFESSIONAL ENGINEER

DES: KMH, SLF					
DRN: SLF					
CHK: WLK					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH GALLERY  
MECHANICAL**

**SECTIONS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

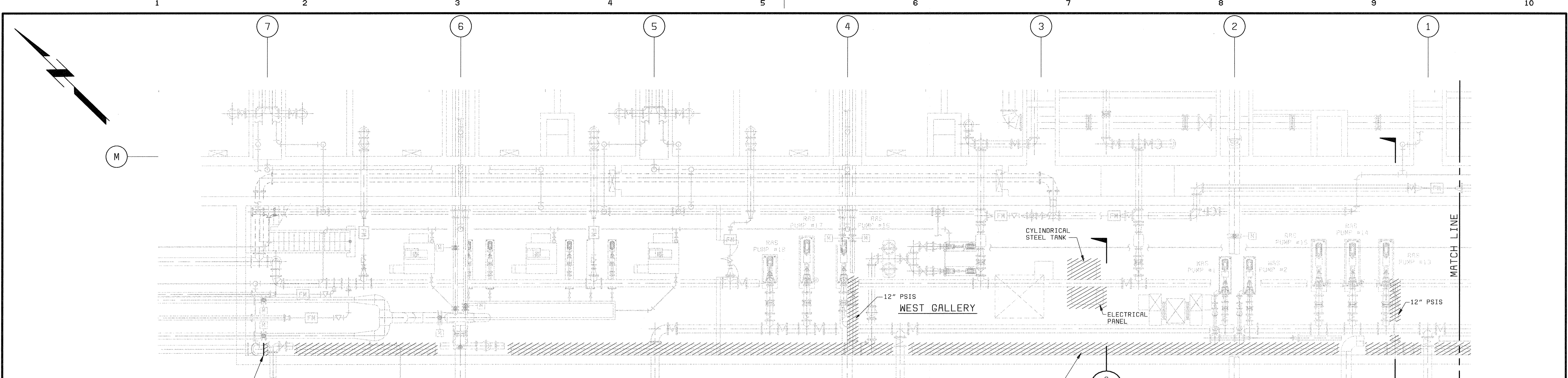
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

**HOWARD COUNTY, MARYLAND**

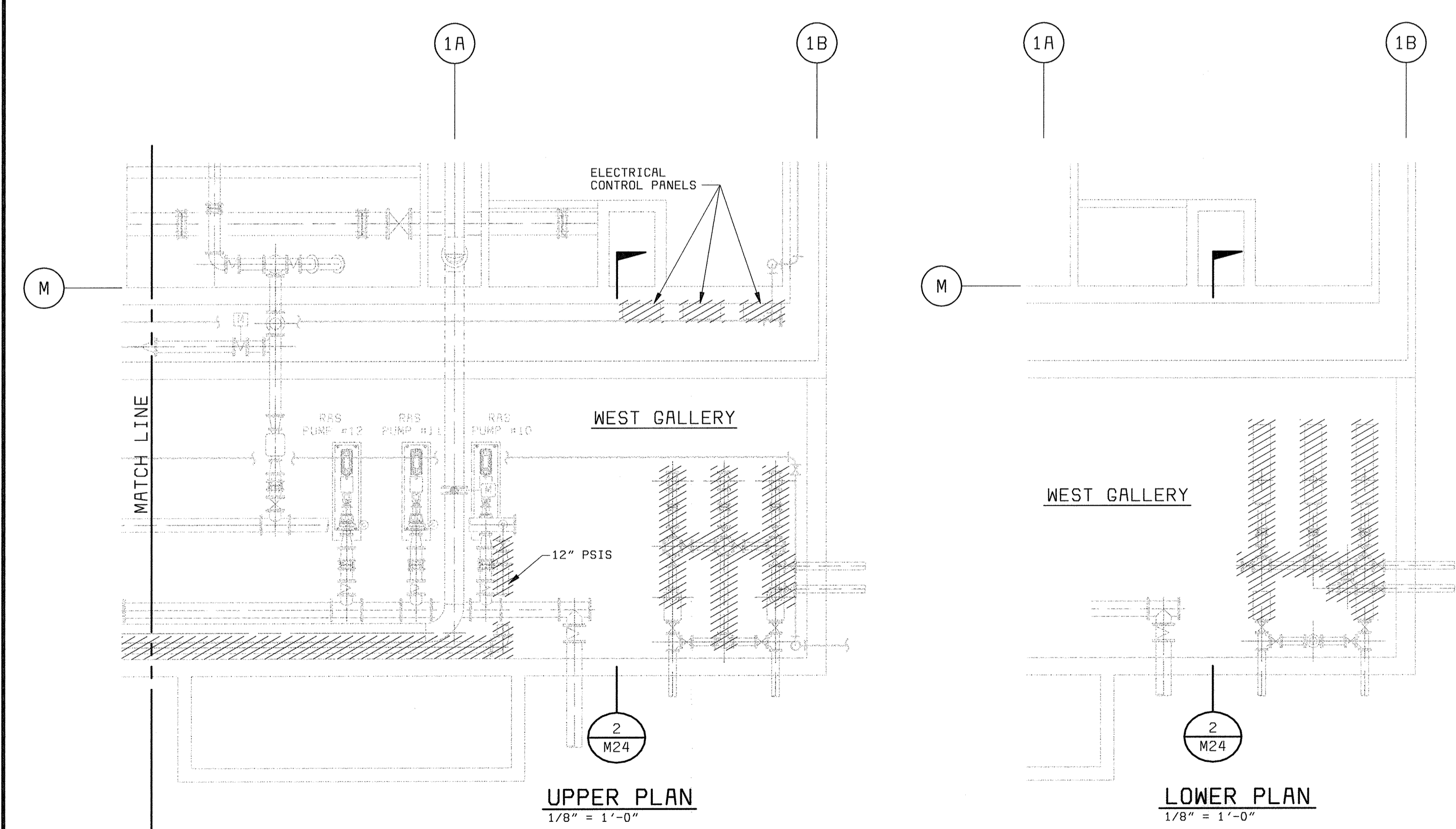
SCALE AS SHOWN

SHEET 89 OF 161

**M23**

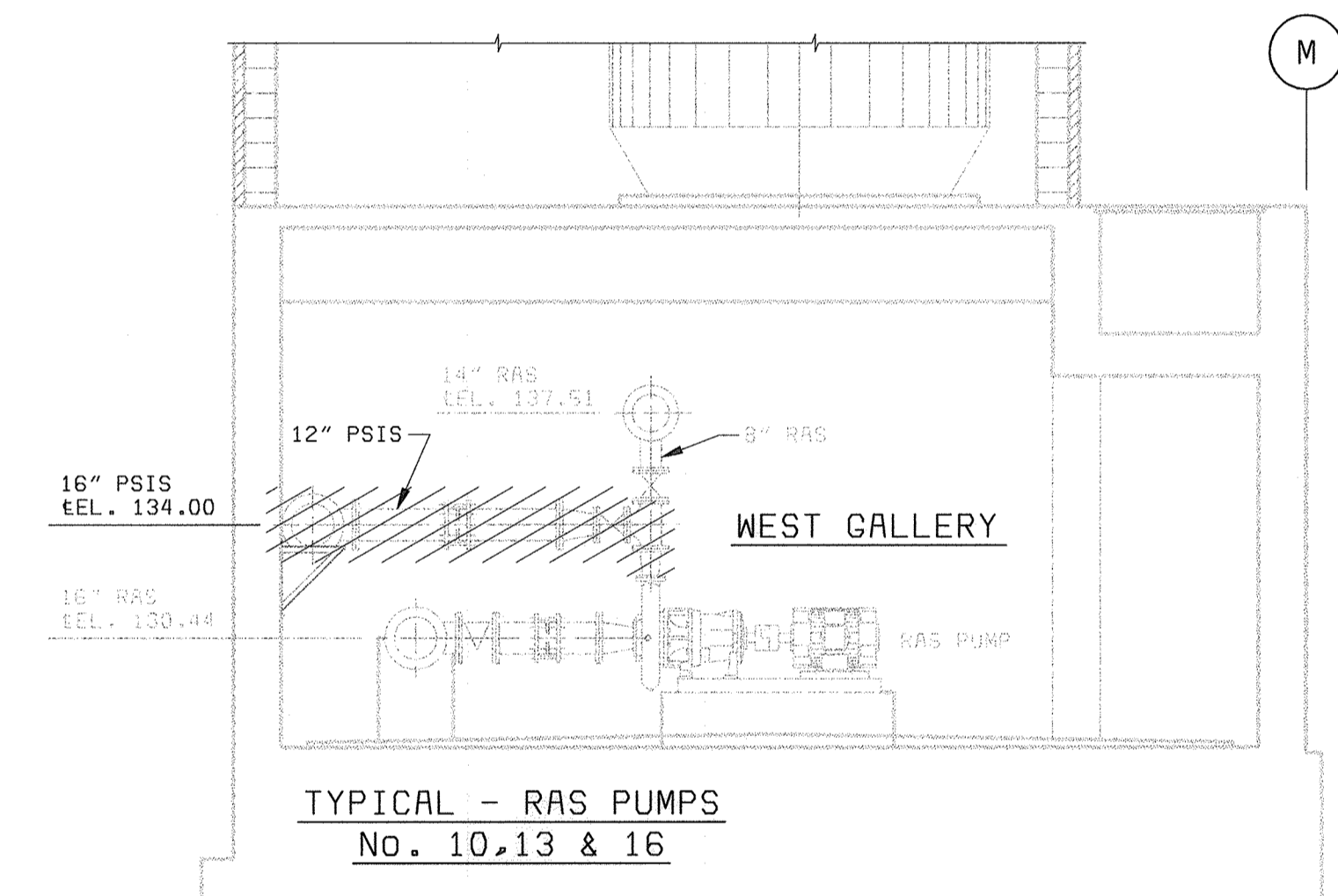


**PLAN**  
1/8" = 1'-0"



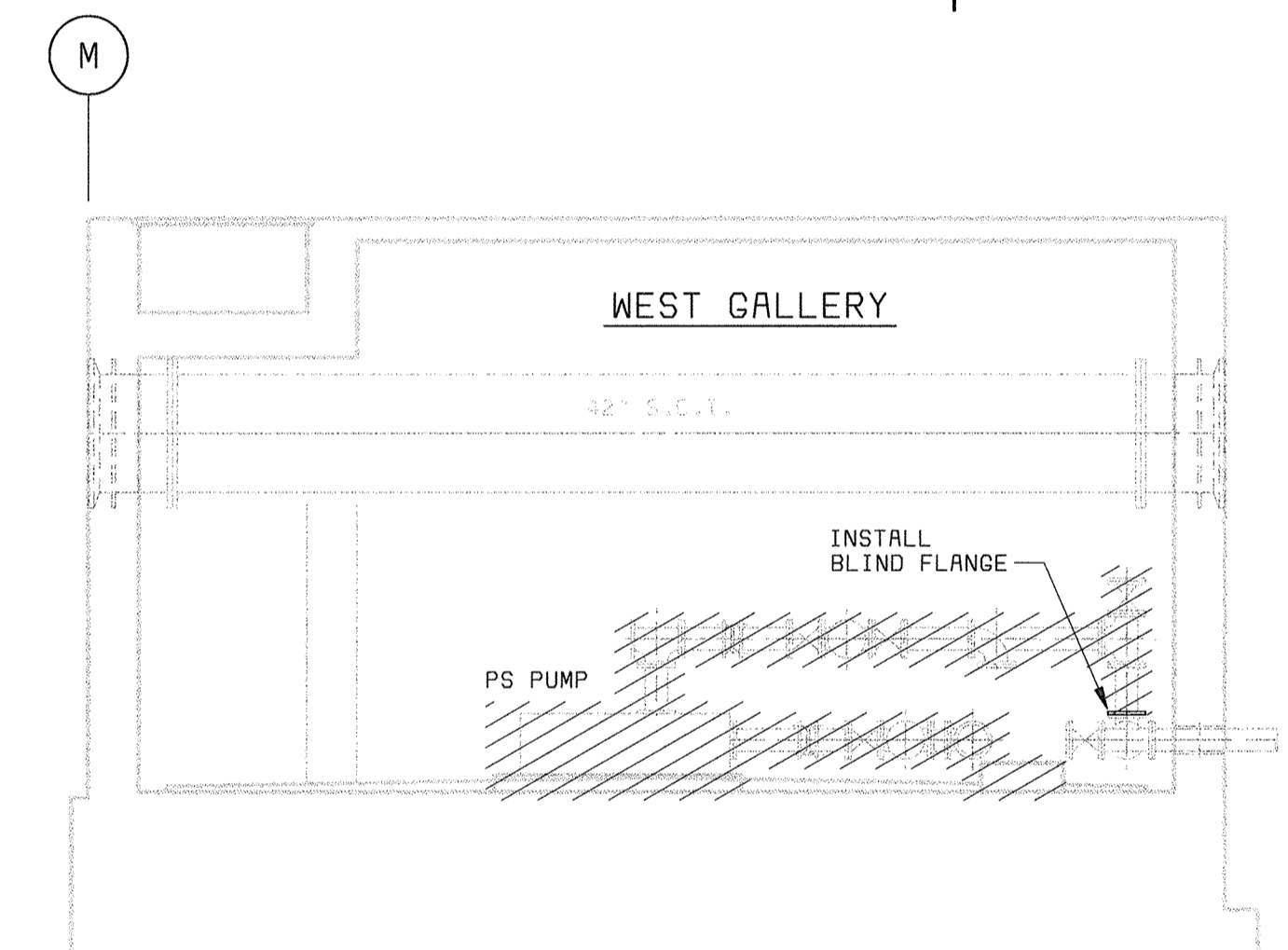
**UPPER PLAN**  
1/8" = 1'-0"

**LOWER PLAN**  
1/8" = 1'-0"

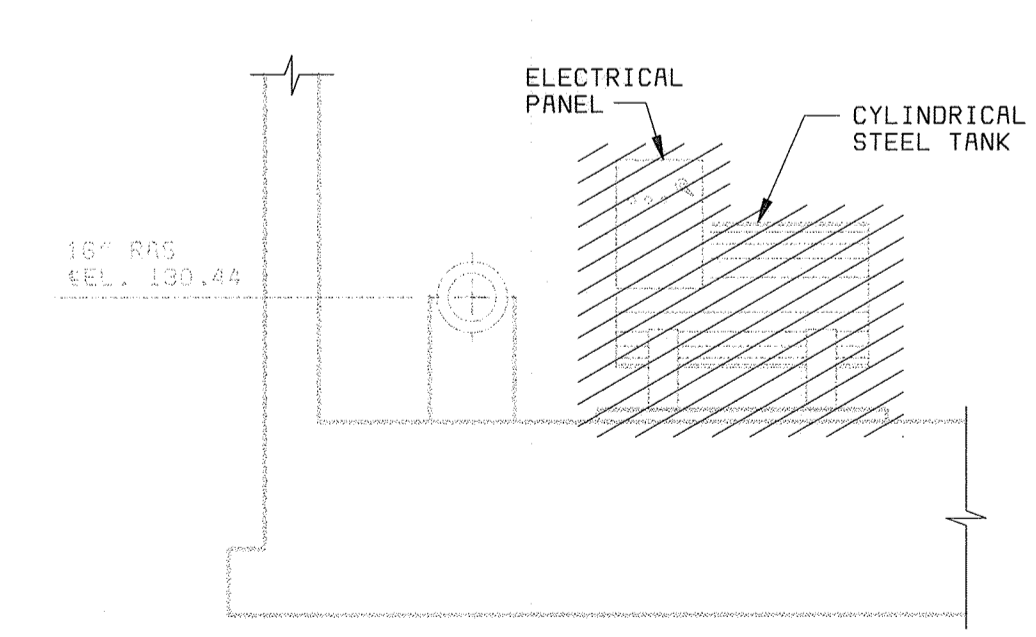


**TYPICAL - RAS PUMPS**  
No. 10, 13 & 16

**SECTION 1**  
3/16" = 1'-0" M24

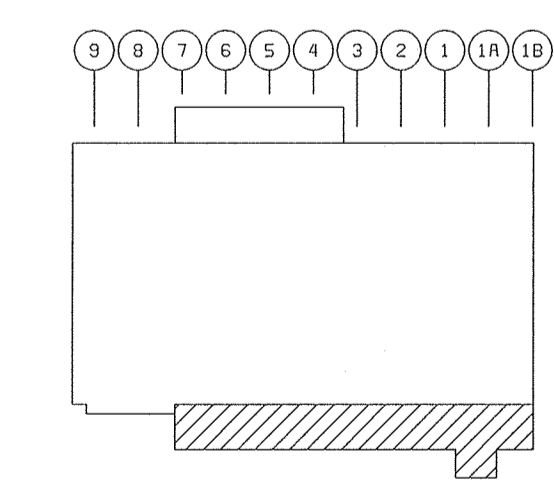


**SECTION 2**  
3/16" = 1'-0" M24



**SECTION 3**  
3/16" = 1'-0" M24

- NOTES:**
1. REMOVE ELECTRICAL PANELS WHERE INDICATED & ALL ASSOCIATED CONDUIT & WIRING - REMOVE WIRING TO SOURCE.
  2. INCLUDE REMOVAL OF CONCRETE FOUNDATION PADS WHERE INDICATED - PATCH & TROWEL SMOOTH AREAS WHERE FOUNDATIONS HAVE BEEN REMOVED. BLEND PATCHED AREAS WITH SURROUNDING FINISHED AREAS.



**KEY PLAN**  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Beninger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

Stantec Consulting Ltd.  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: surroy@stantec.com

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE 6/23/00

DES: RVJ									
DRN: RCF									
CHK: RVJ									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**WEST GALLERY MECHANICAL**

**PIPING DEMOLITION PLAN & SECTION**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

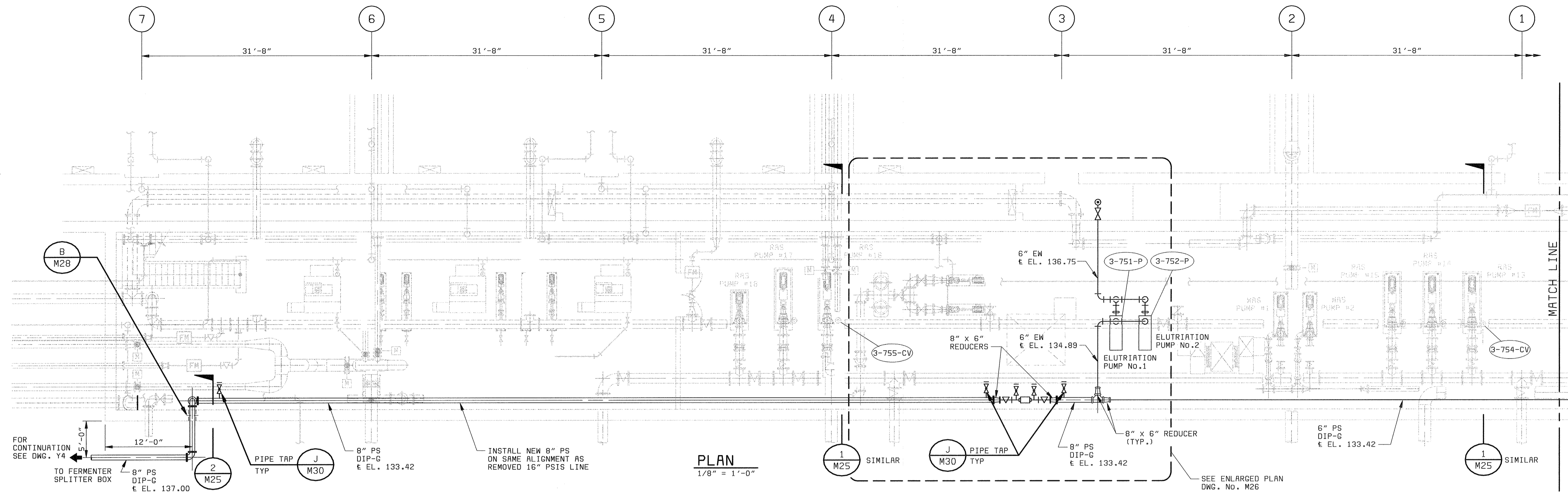
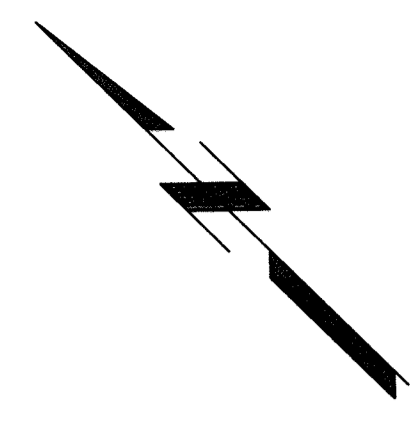
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

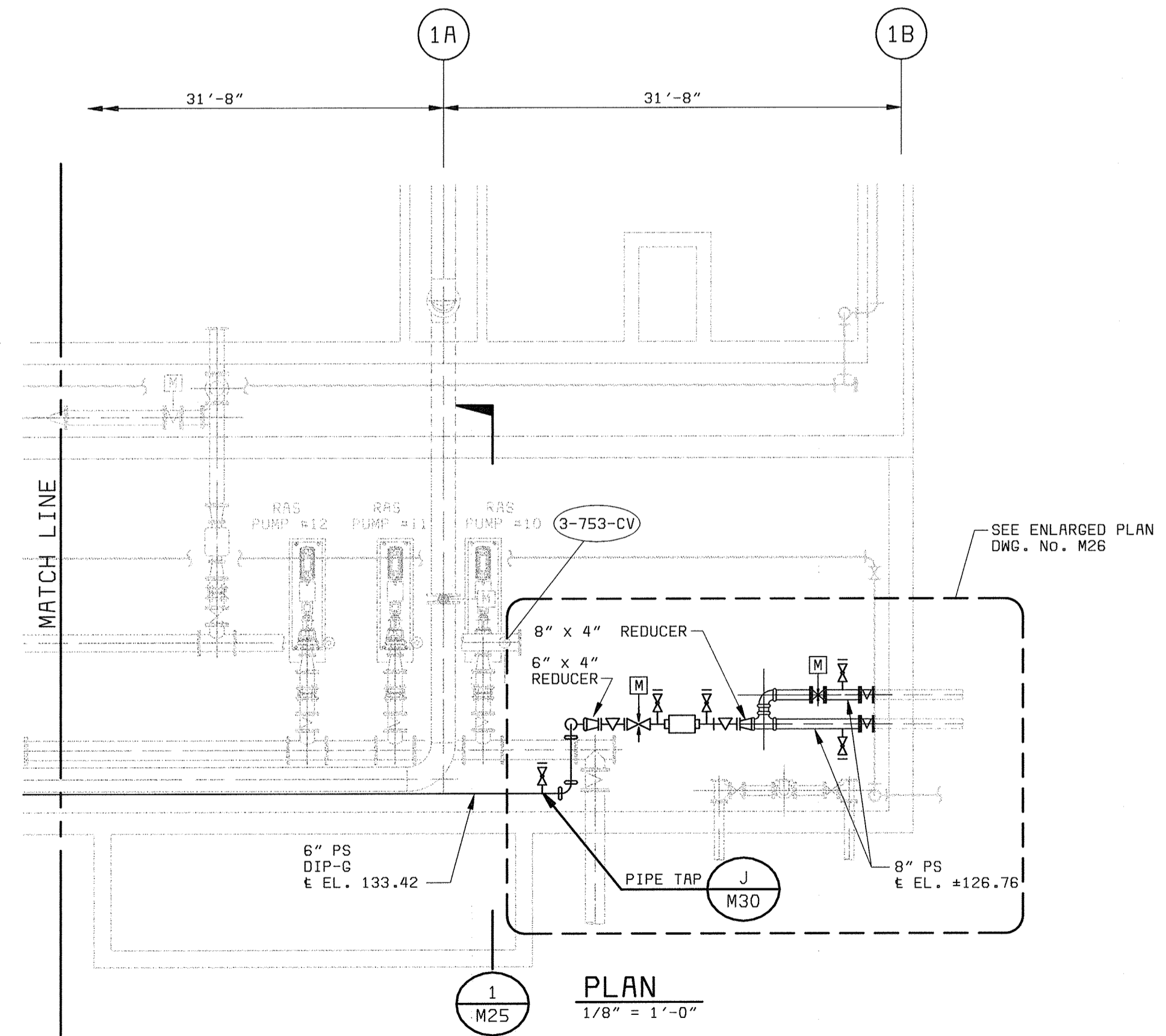
SHEET 90 OF 161

**M24**

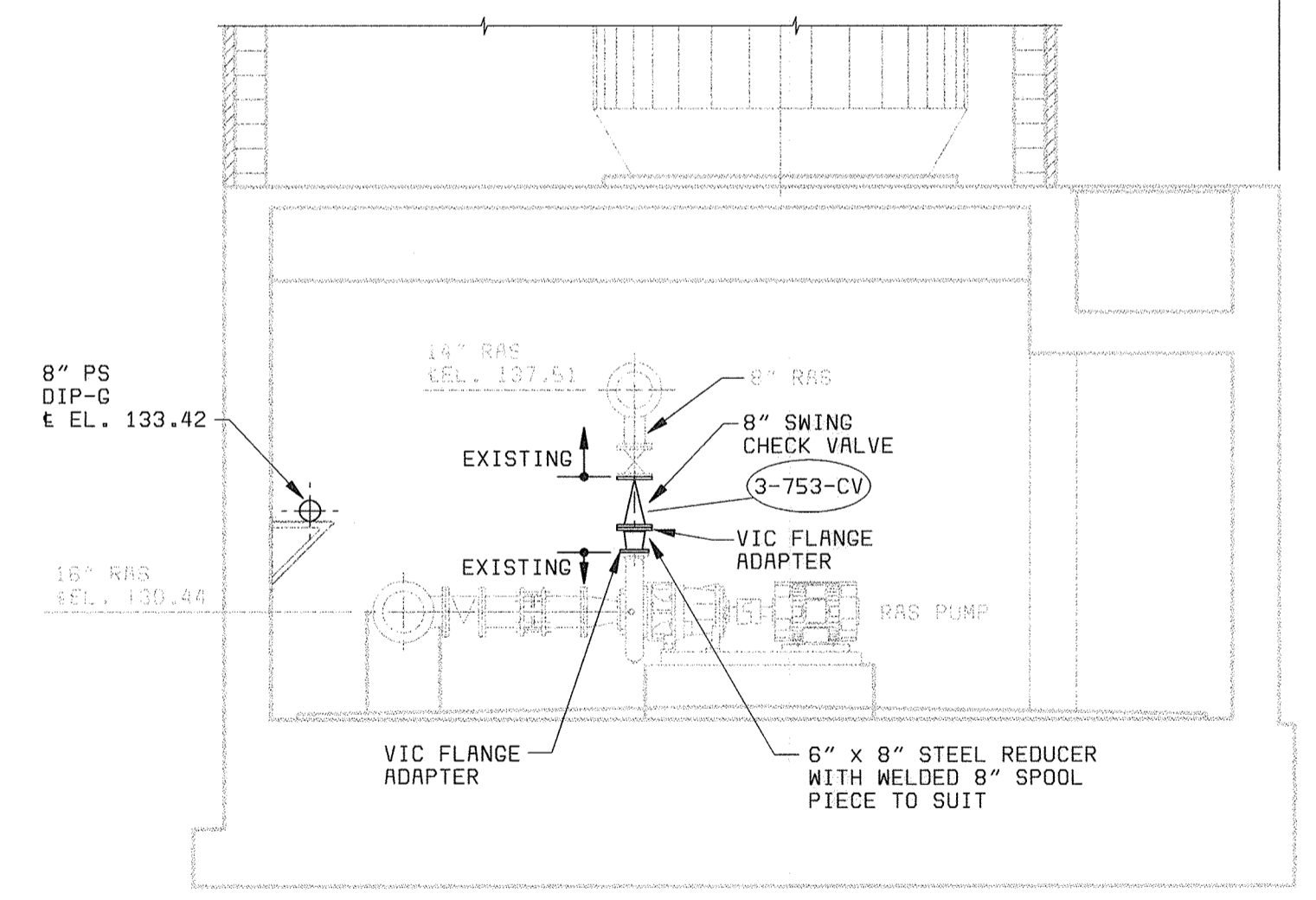
058472  
F058472A



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

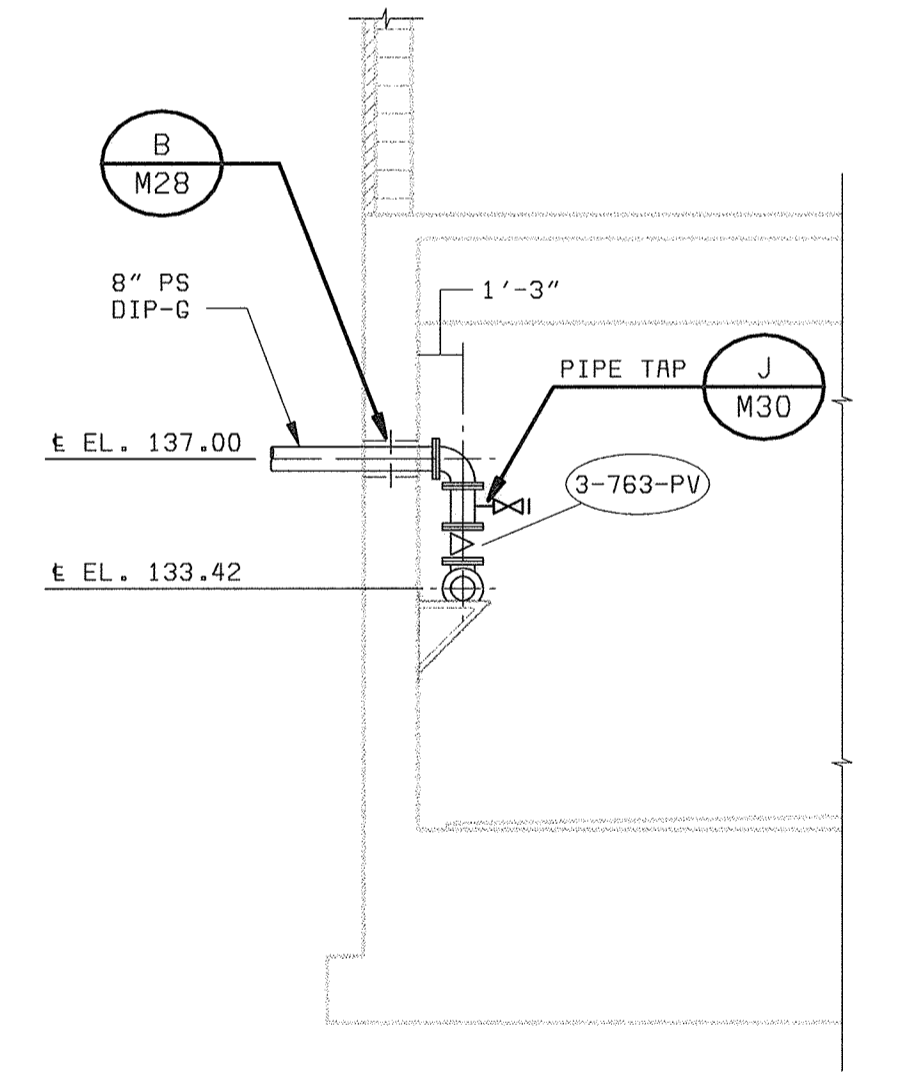


**PLAN**  
1/8" = 1'-0"

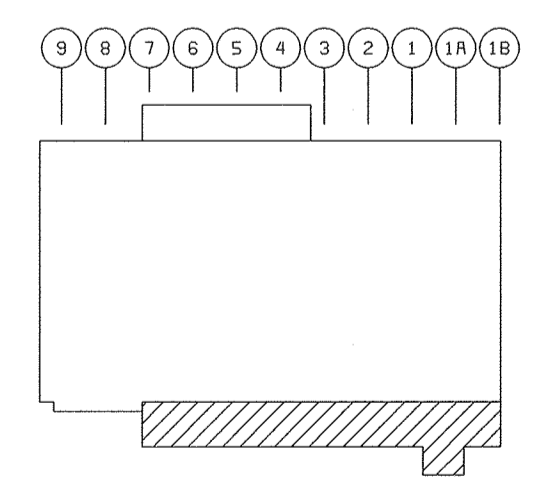


**TYPICAL - RAS PUMPS**  
No. 10, 13 & 16

**SECTION 1**  
3/16" = 1'-0" M25



**SECTION 2**  
3/16" = 1'-0" M25



**KEY PLAN**  
NO SCALE

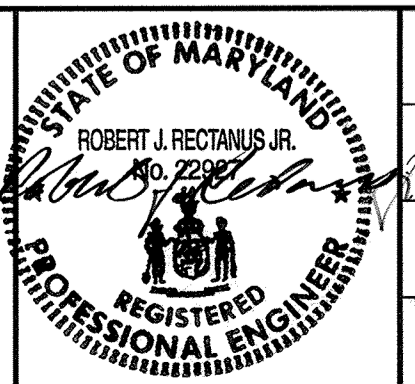
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Bainger 6-29-00*  
CHIEF, BUREAU OF UTILITIES DATE

Stantec Consulting Ltd.  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: surrey@stantec.com

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
REG. PROF. ENGR. DATE: 6/23/00



DES: RVJ									
DRN: RCF									
CHK: RVJ									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**WEST GALLERY MECHANICAL**

**PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

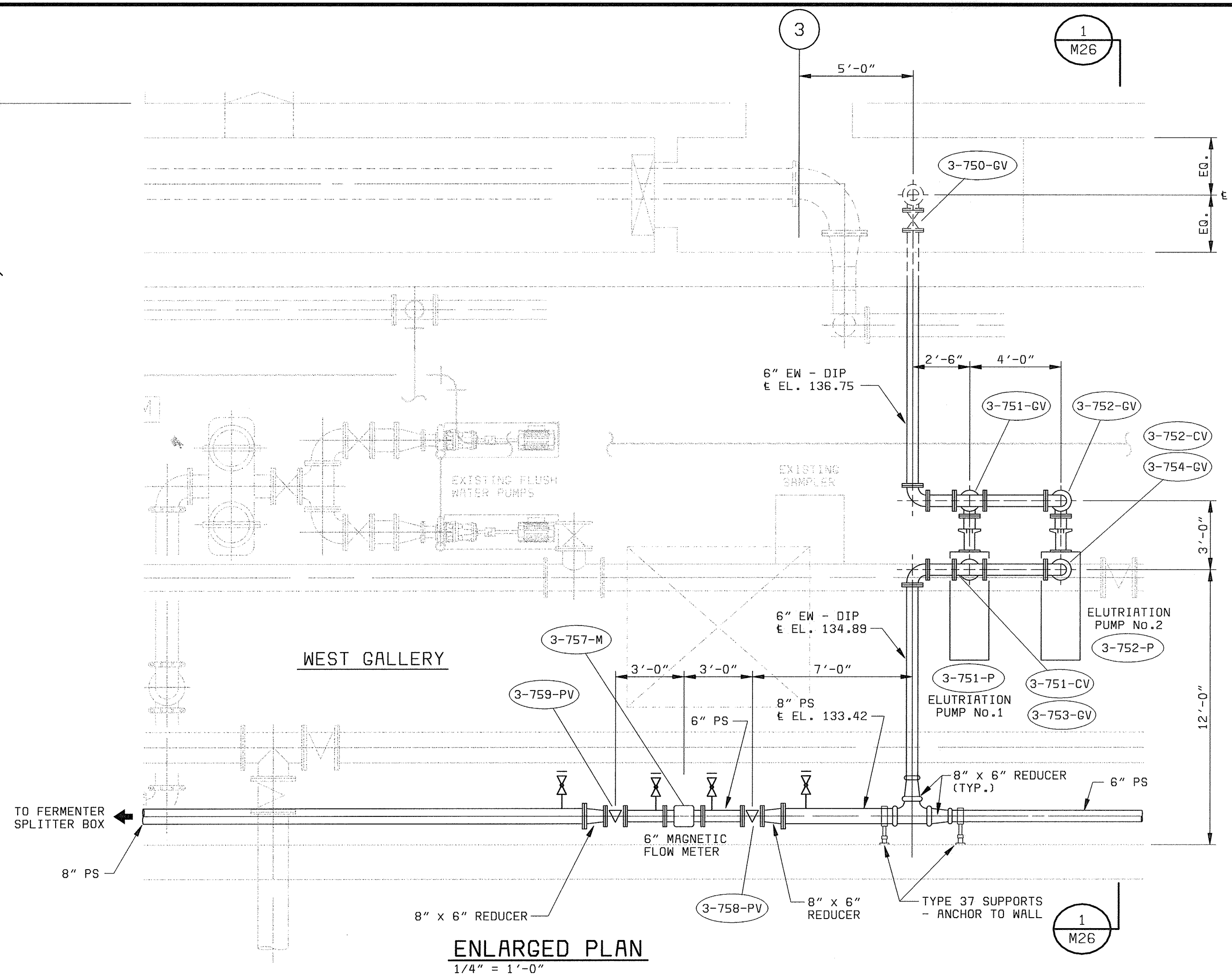
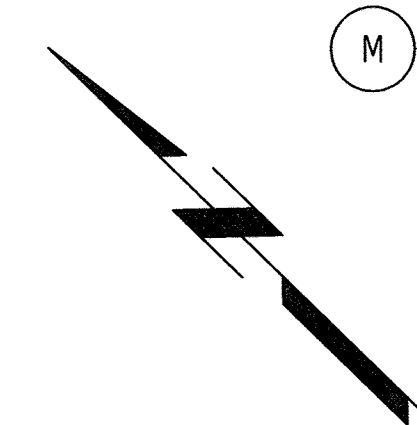
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

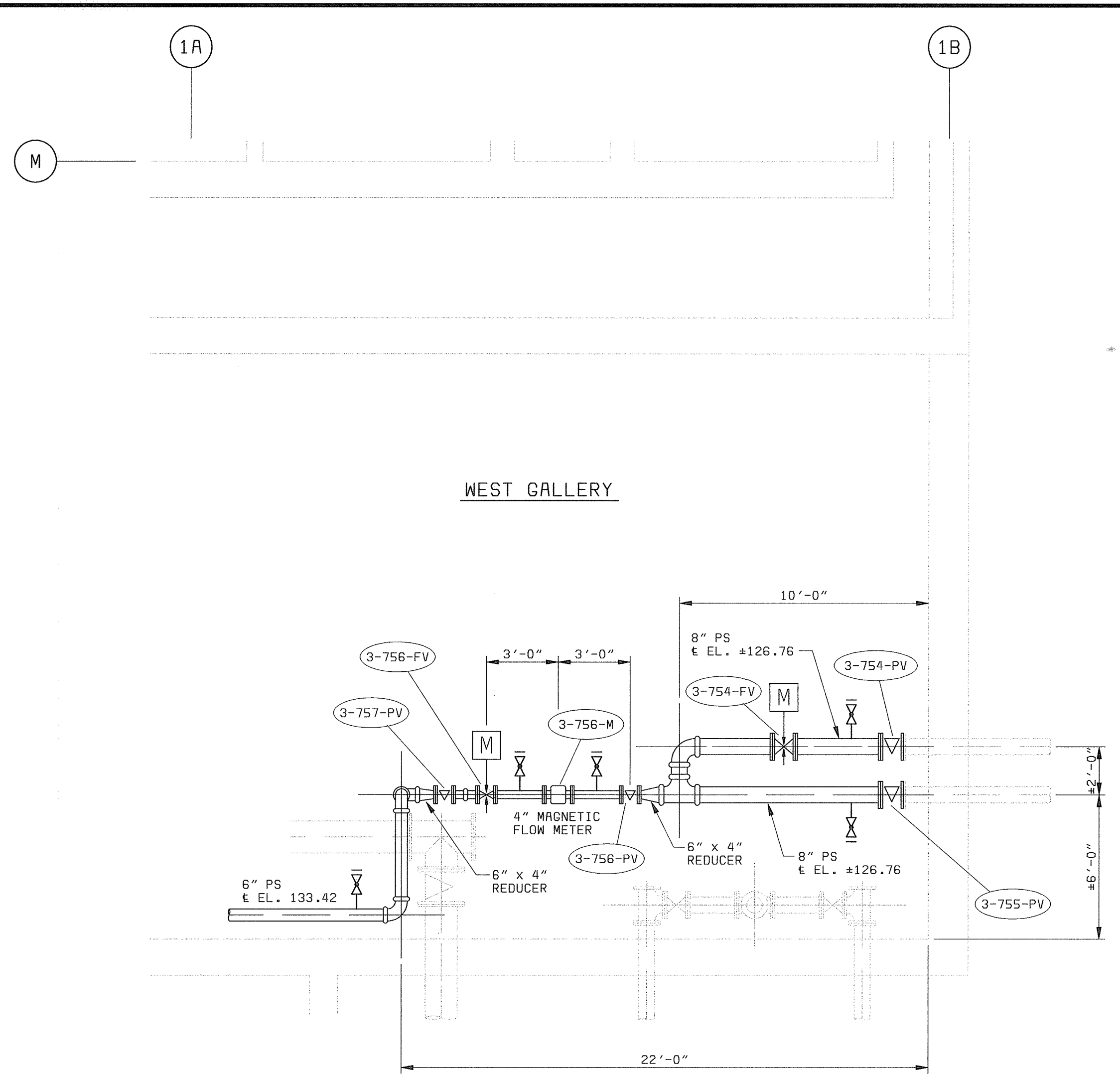
SCALE AS SHOWN

SHEET 91 OF 161

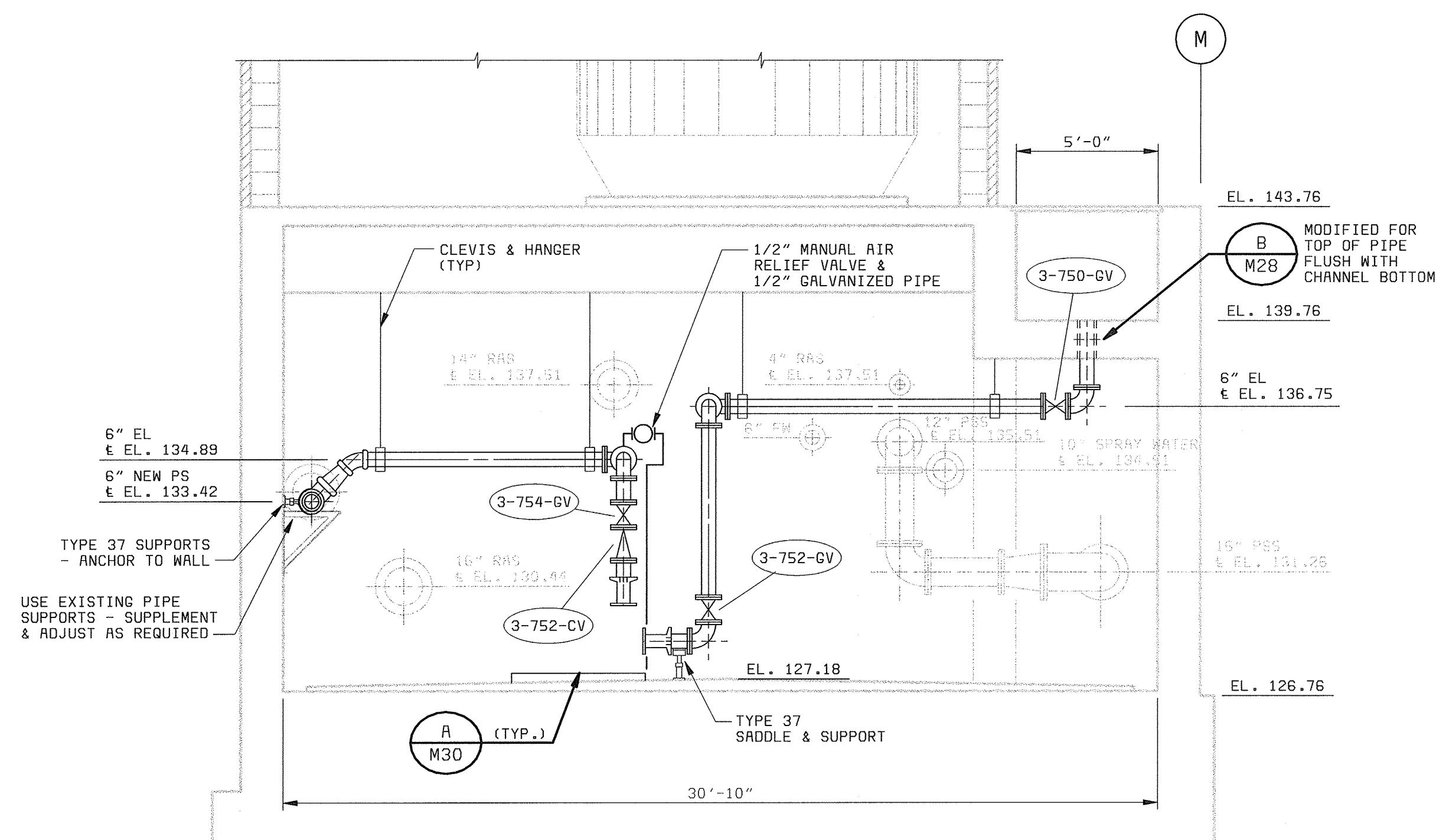
**M25**



**ENLARGED PLAN**  
1/4" = 1'-0"



**ENLARGED PLAN**  
1/4" = 1'-0"



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

Stantec Consulting Ltd.  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: surrey@stantec.com

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.* 6/24/00  
REG. PROF. ENGR. DATE

STATE OF MARYLAND  
ROBERT J. RECTANUS JR.  
No. 22927  
*Robert J. Rectanus Jr.*  
REGISTERED PROFESSIONAL ENGINEER

DES: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RCF							
CHK: RVJ							

**WEST GALLERY MECHANICAL**

**ENLARGED PLANS & SECTION**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

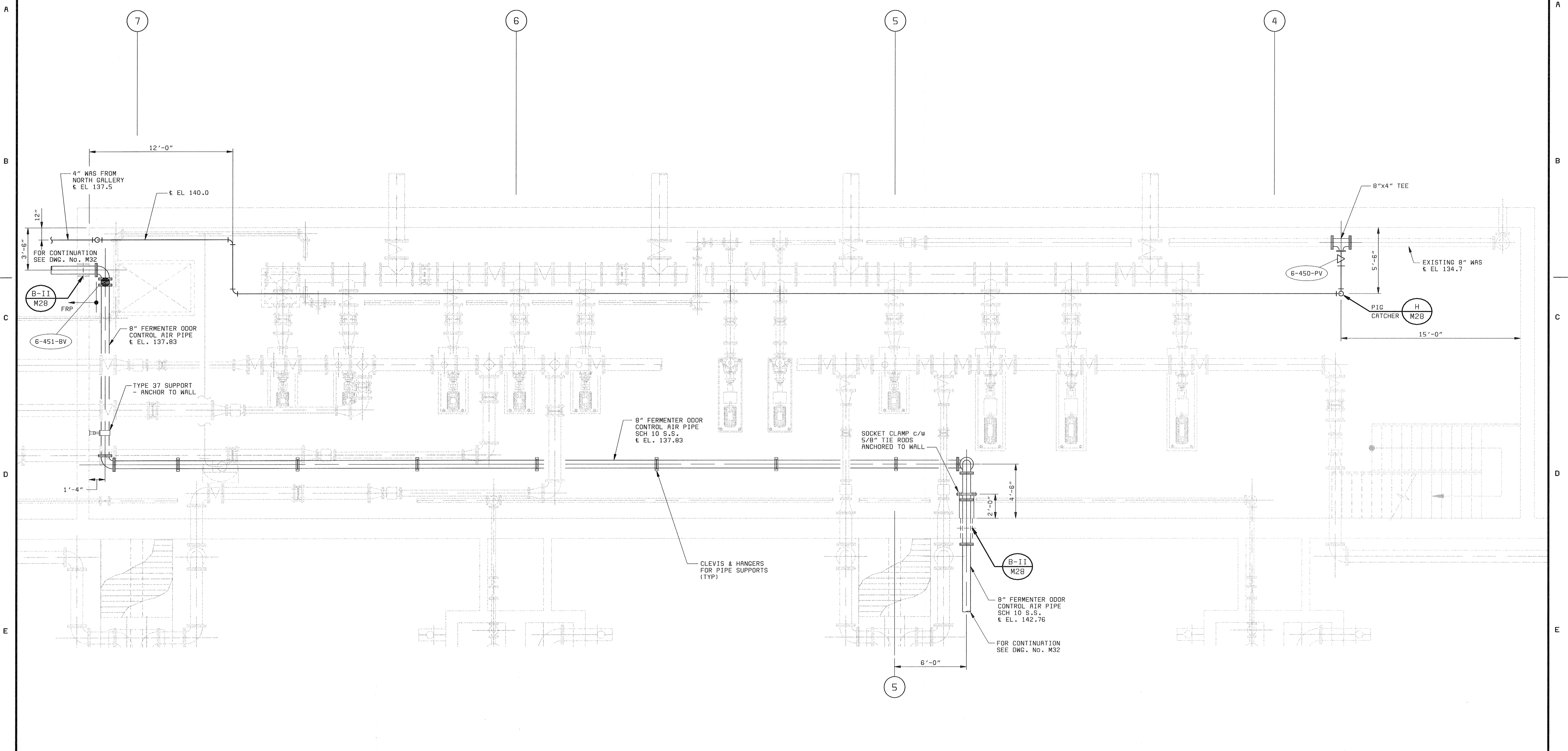
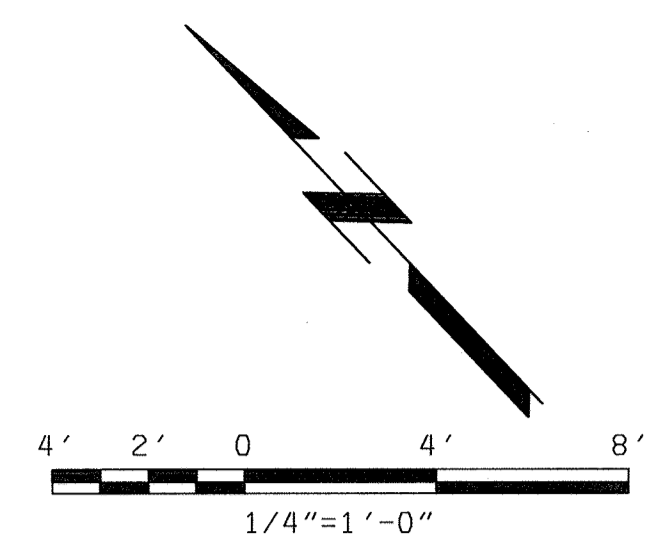
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 92 OF 161

**M26**


DES: RVJ  
FDS: RCF



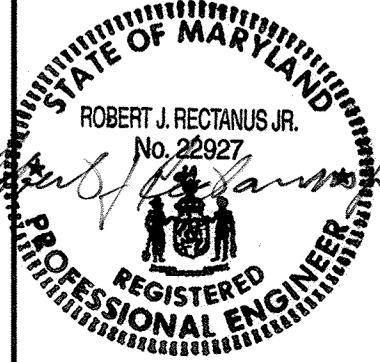
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Reitan* 6/29/00  
CHIEF, BUREAU OF UTILITIES DATE

 Stantec  
Stantec Consulting Ltd.  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: [surrey@stantec.com](mailto:surrey@stantec.com)

 **BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Reitan* 6/22/01  
REG. PROF. ENGR. DATE



DES: KMH/RVJ					
DRN: RLC/RCF					
CHK: KMH/RVJ					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**EAST GALLERY  
MECHANICAL**

**PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

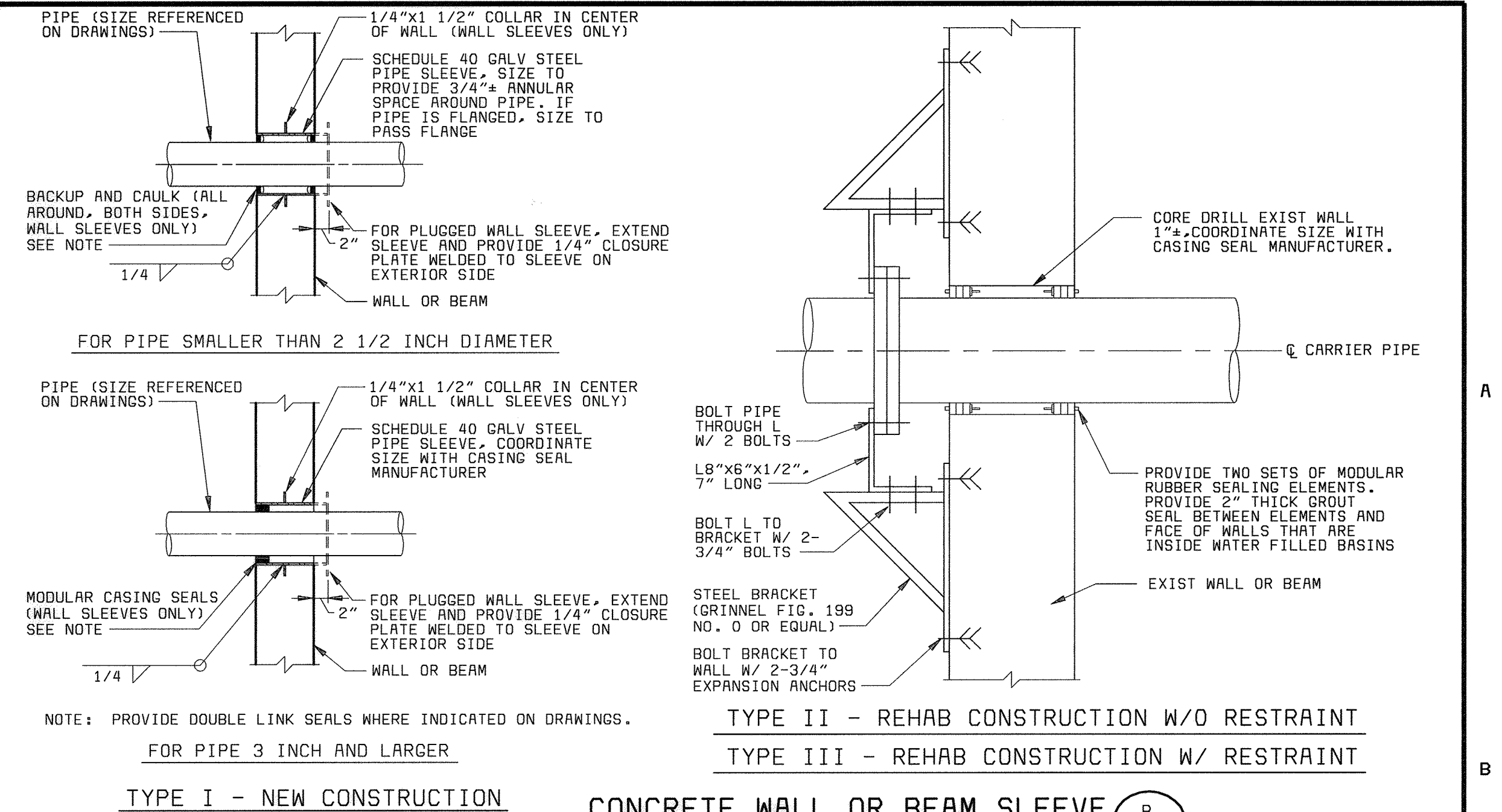
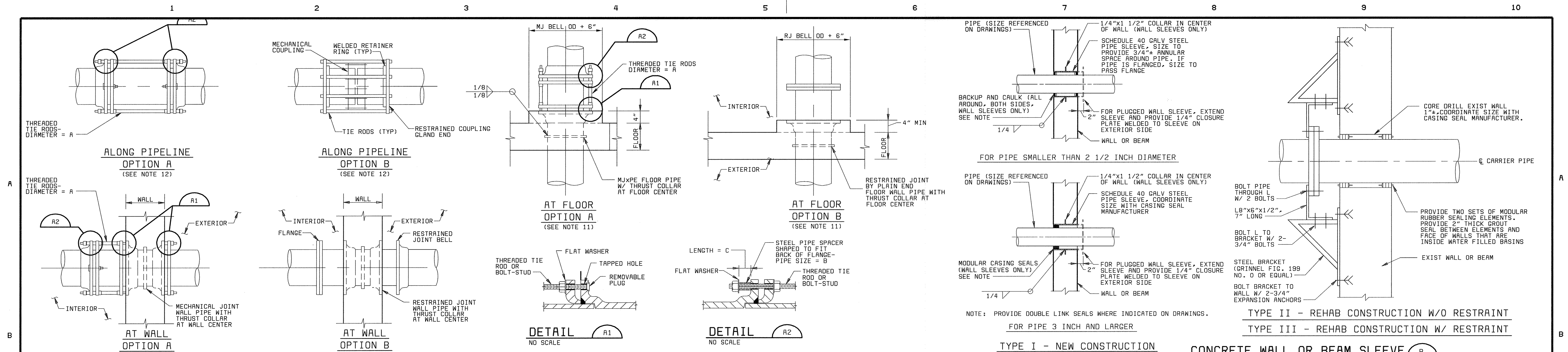
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
93 OF 161

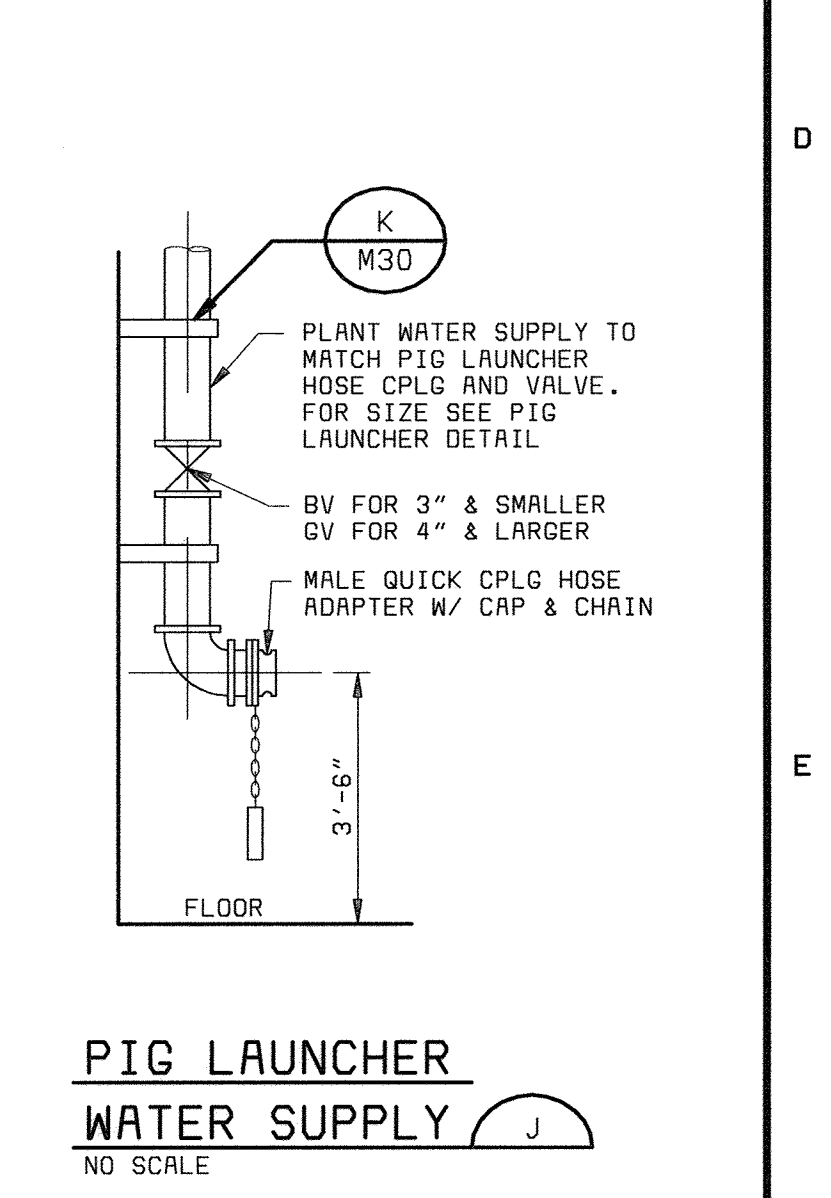
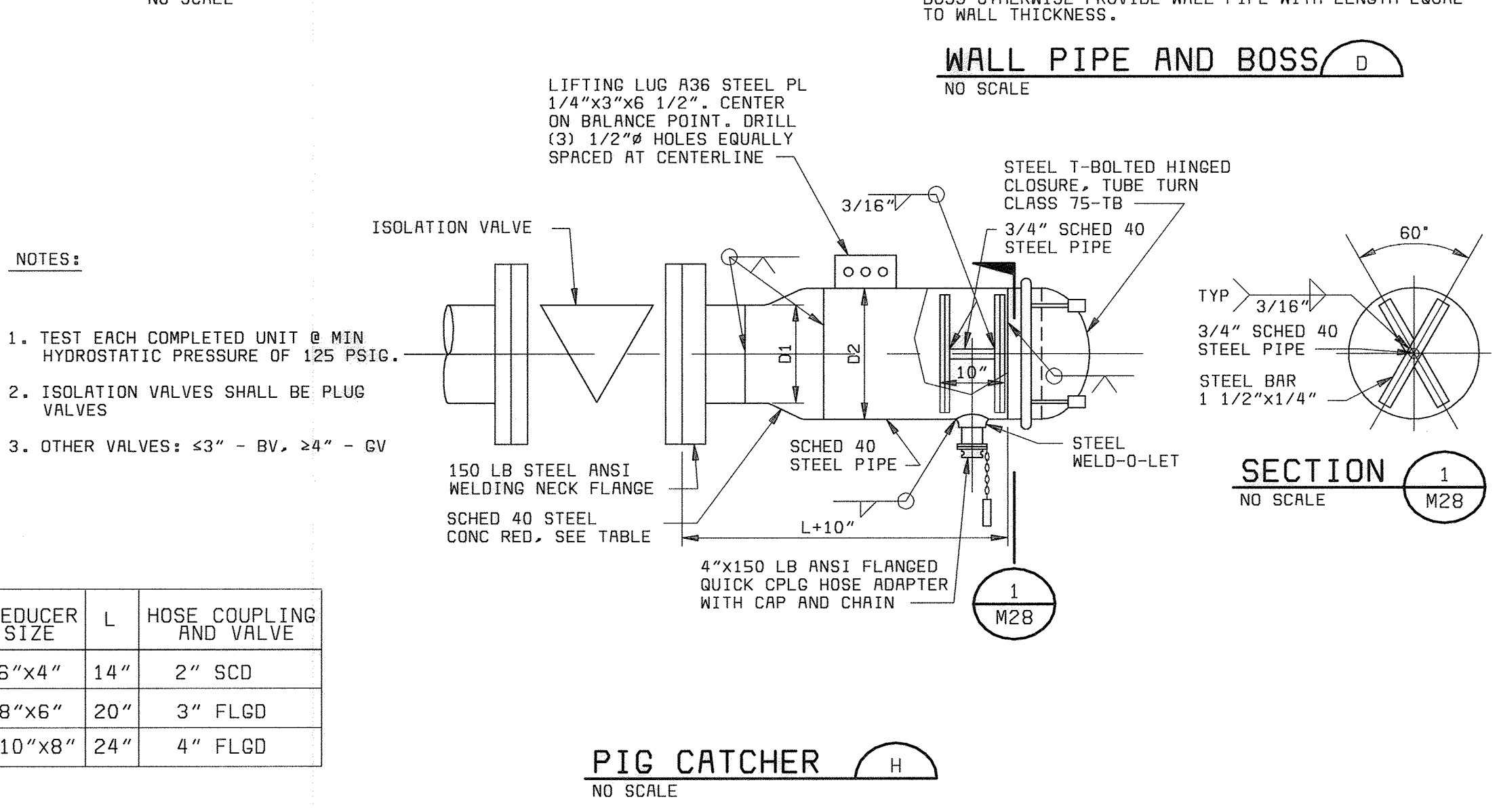
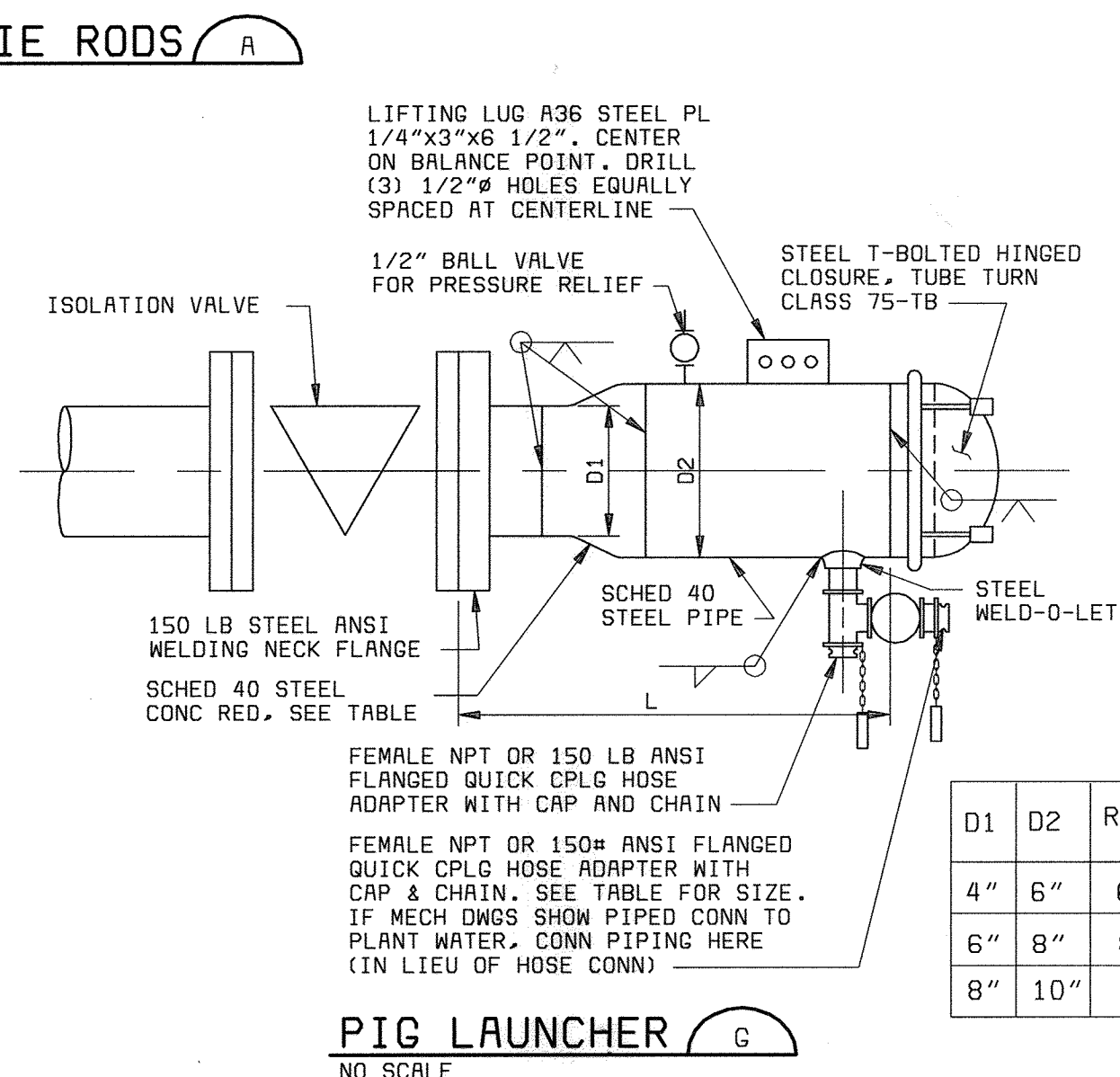
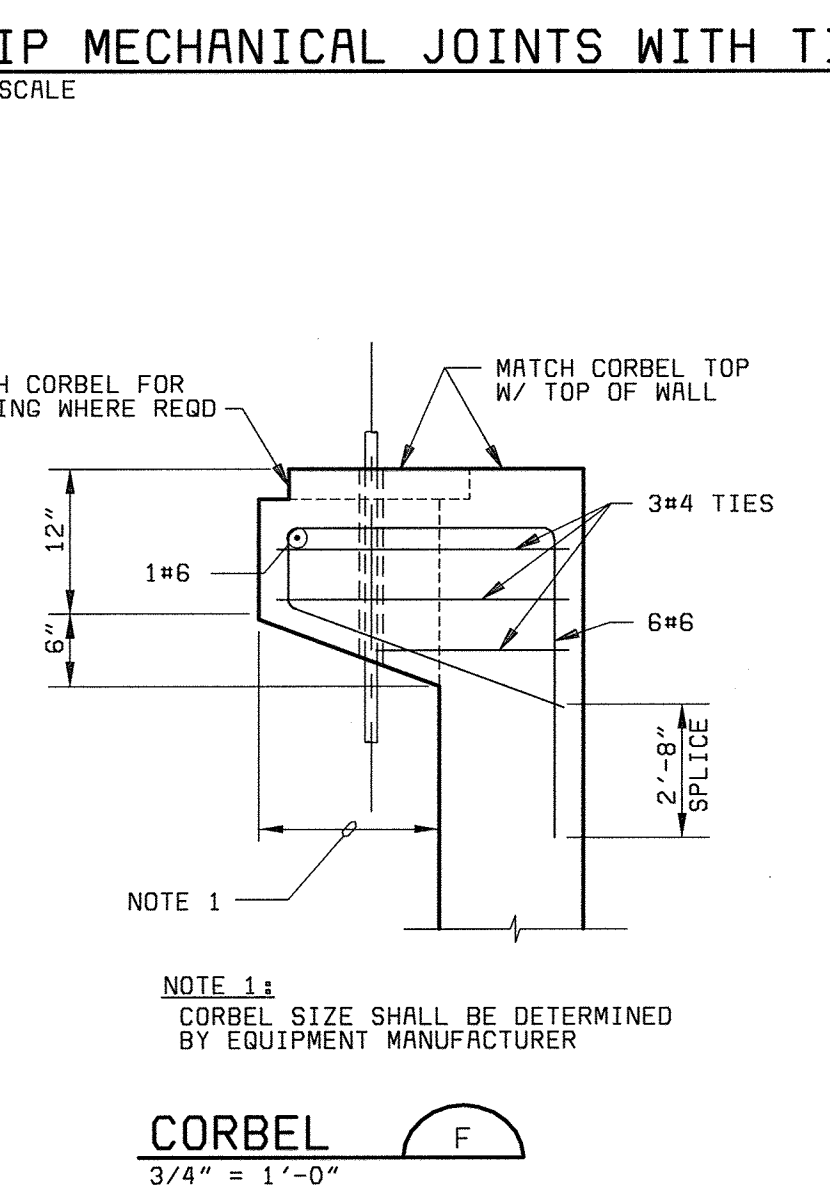
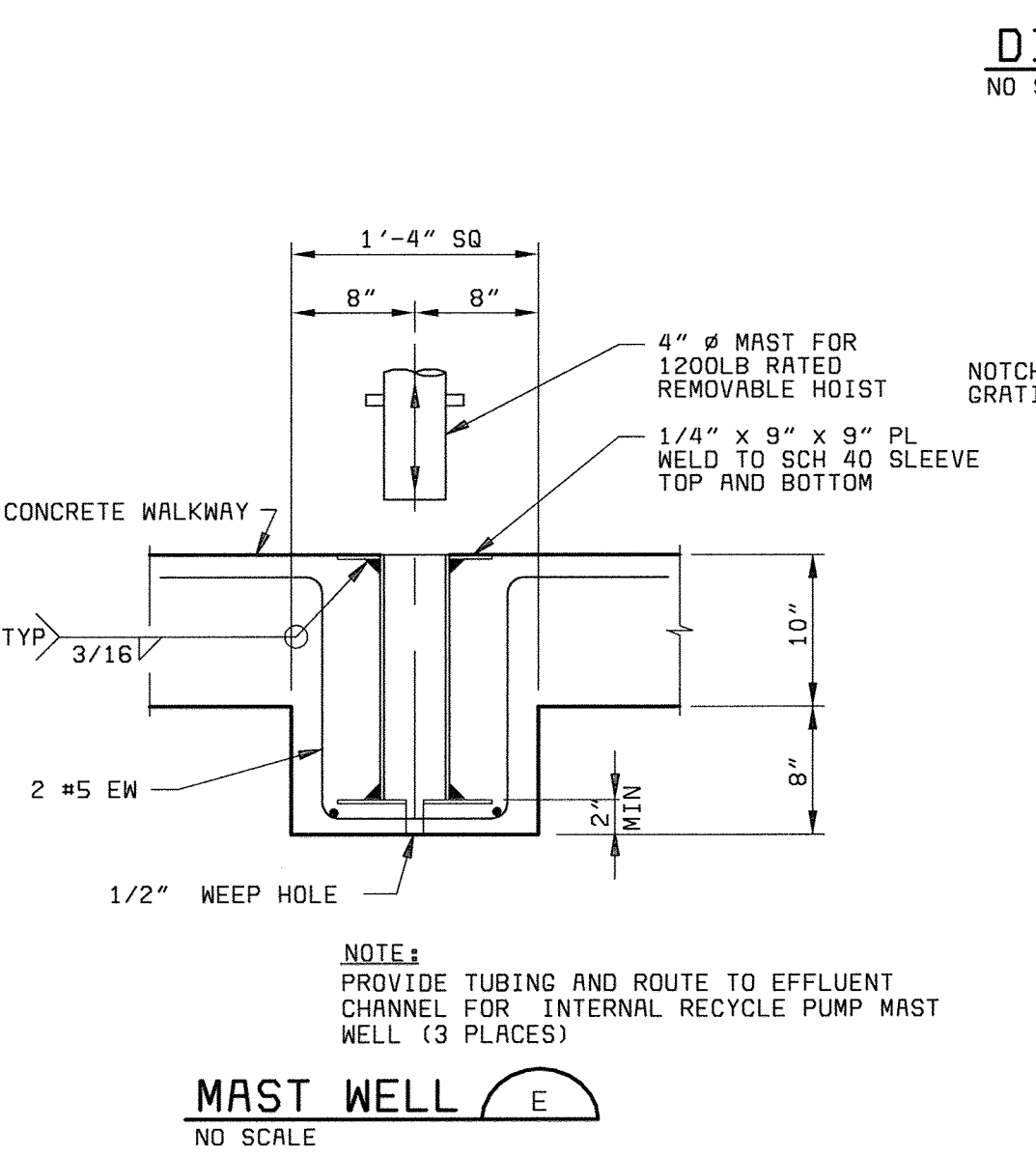
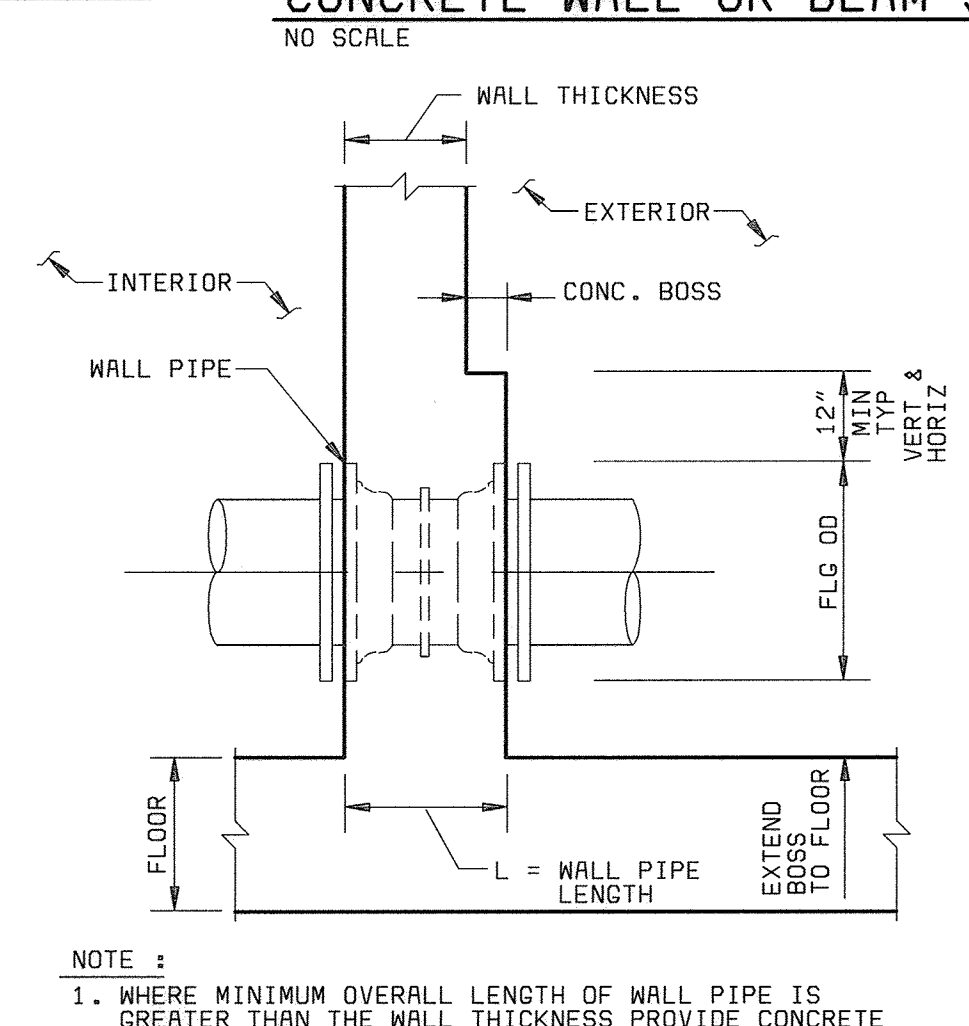
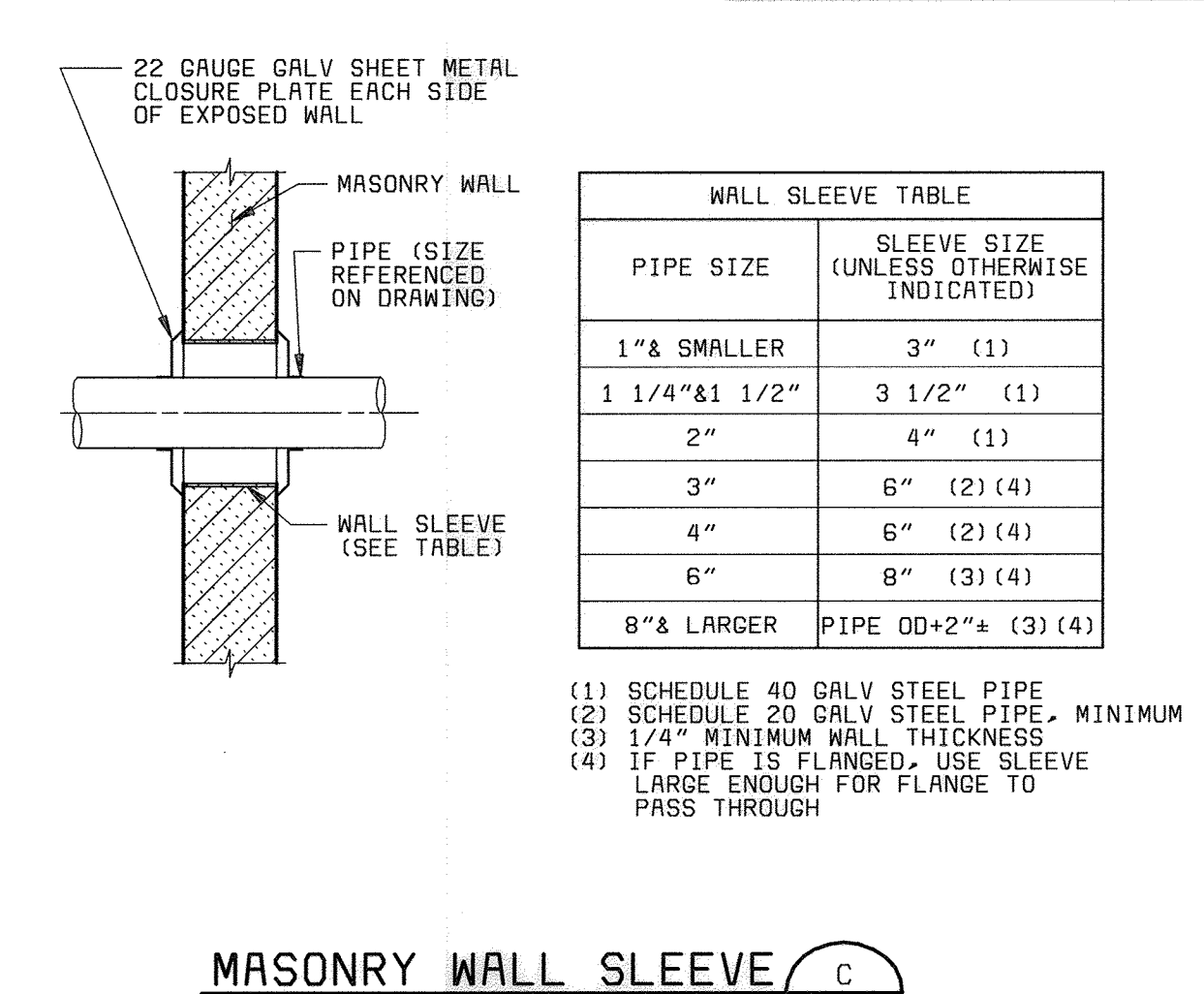
**M27**

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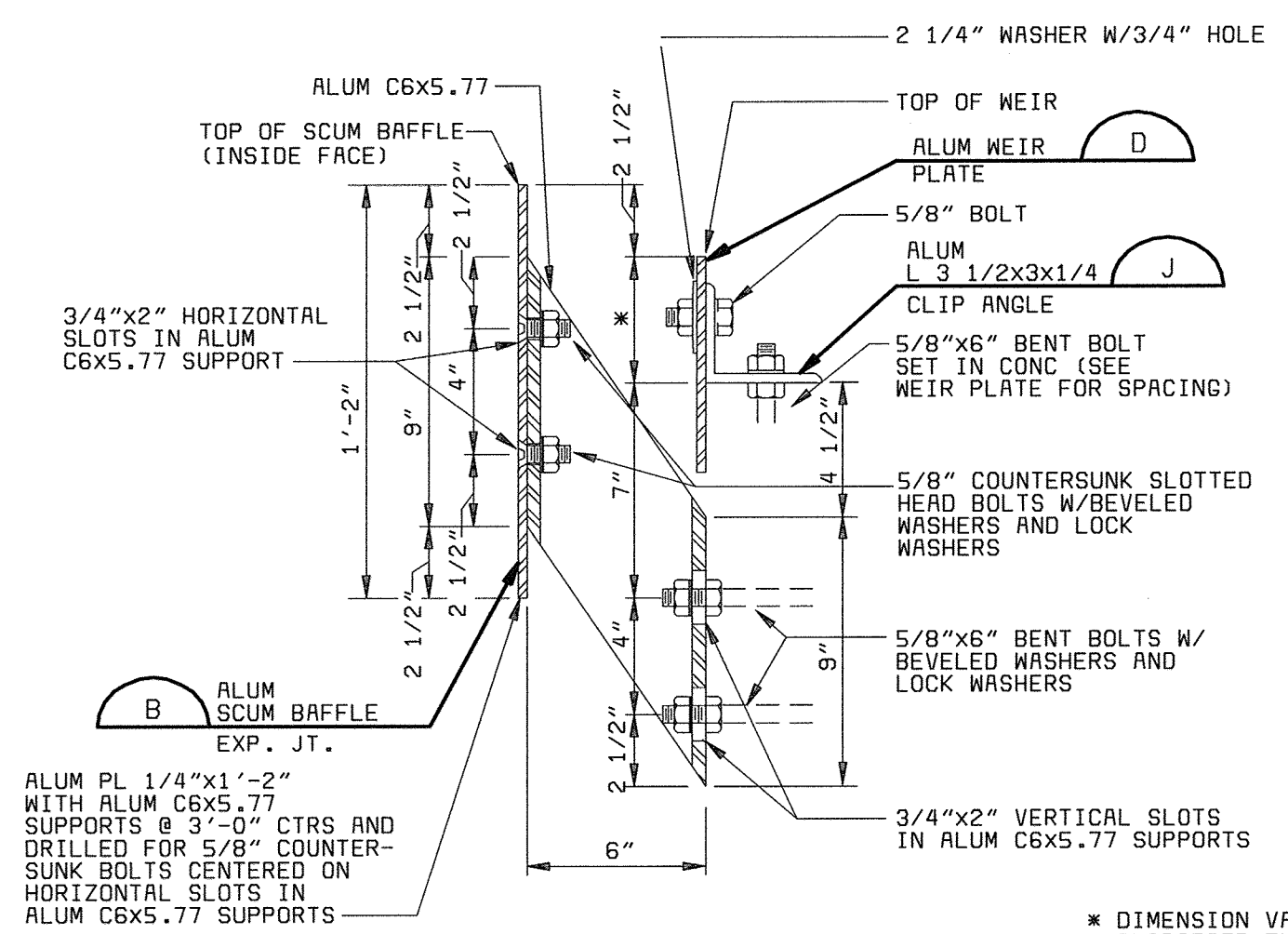


PIPE SIZE	A TIE ROD DIAMETER	B SPACER NOM. DIA	C SPACER LENGTH	NO. RODS
3" - 8"	3/4"	3/4"	2 1/2"	2
10" - 12"	3/4"	1"	2 1/2"	2
14"	3/4"	1"	3 1/2"	2
16" - 20"	3/4"	1"	3 1/2"	4
24"	3/4"	1"	3 1/2"	6
30"	1"	1 1/4"	4"	8
36"	1"	1 1/4"	4"	8
42"	1 1/4"	1 1/2"	4"	8
48"	1 1/4"	1 1/2"	4"	12

- NOTES:**
- EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON ALL WALL PIPES AND TEE HEAD BOLTS IN OTHER LOCATIONS.
  - WALL PIPE FITTINGS SHALL BE DUCTILE IRON AND SHALL HAVE A PRESSURE RATING NOT LESS THAN 250 PSI.
  - TIE RODS SHALL BE INSTALLED IN PAIRS, DIAMETRICALLY OPPOSITE EACH OTHER, IN THE BOLT CIRCLE OF THE PIPE.
  - ALL BOLT HOLES IN THE WALL OR FLOOR CASTINGS SHALL BE DRILLED AND TAPPED AND SIZED IN ACCORDANCE WITH COLUMN A. PLASTIC PROTECTIVE CAPS OR TAPPED INSERTS SHALL BE PLACED IN THE TAPPED BOLT HOLES TO PROTECT THE BOLT HOLES FROM FILLING WITH CONCRETE DURING THE PLACEMENT OF CONCRETE. EXTENSIONS OF THE CAP OR TAPPED INSERT SHALL HAVE SUFFICIENT LENGTH TO PLACE BOLT IN FINAL POSITION.
  - BOLT HOLES IN ALL WALL CASTINGS, EXCEPT IN 6, 8, AND 14 INCH PIPE SIZES, SHALL BE ORIENTED WITH THE BOLT HOLES STRADDLING THE VERTICAL CENTERLINE OF HORIZONTAL PIPE.
  - BOLT HOLES IN WALL CASTINGS FOR 6, 8, 14, AND 20 INCH PIPE SIZES SHALL BE ORIENTED ON THE HORIZONTAL CENTERLINE OF HORIZONTAL PIPE.
  - BOLT HOLES FOR FLOOR CASTINGS SHALL BE PLACED SIMILAR TO WALL CASTINGS.
  - TIE ROD MATERIALS SHALL BE ASTM A307 OR EQUAL FOR ALL DUCTILE IRON WALL AND FLOOR CASTINGS. HIGH STRENGTH BOLT MATERIALS SHALL NOT BE USED IN HARNESSING PIPE JOINTS TO DUCTILE IRON PIPE OR WALL PIPE CASTINGS.
  - ALL WALL AND FLOOR CASTINGS SHALL BE NOTCHED OR PERMANENTLY MARKED AT THE TWO PIPE CENTERLINES.
  - TIE ROD INSTALLATION AT MECHANICAL JOINT WALL OR FLOOR SLEEVES SHALL BE THE SAME AS USED FOR MECHANICAL JOINT WALL OR FLOOR PIPES.
  - AT CONTRACTOR'S OPTION, RESTRAINED JOINT WALL PIPES MAY BE USED IN PLACE OF MECHANICAL JOINT WALL OR FLOOR PIPES SHOWN ON THE DRAWINGS WHERE APPROPRIATE LENGTHS ARE AVAILABLE AND SPACE FOR TRANSITION PIECES ARE AVAILABLE. FLANGE WALL PIPES WILL NOT BE ACCEPTABLE UNLESS OTHERWISE INDICATED.
  - AT CONTRACTOR'S OPTION, RESTRAINED COUPLING GLAND END (AS MANUFACTURED BY AMERICAN CAST IRON PIPE COMPANY) WITH MECHANICAL COUPLING MAY BE USED IN PLACE OF HARNESSING MECHANICAL JOINTS AS SHOWN ON THE DRAWINGS WHERE SPACE IS AVAILABLE.

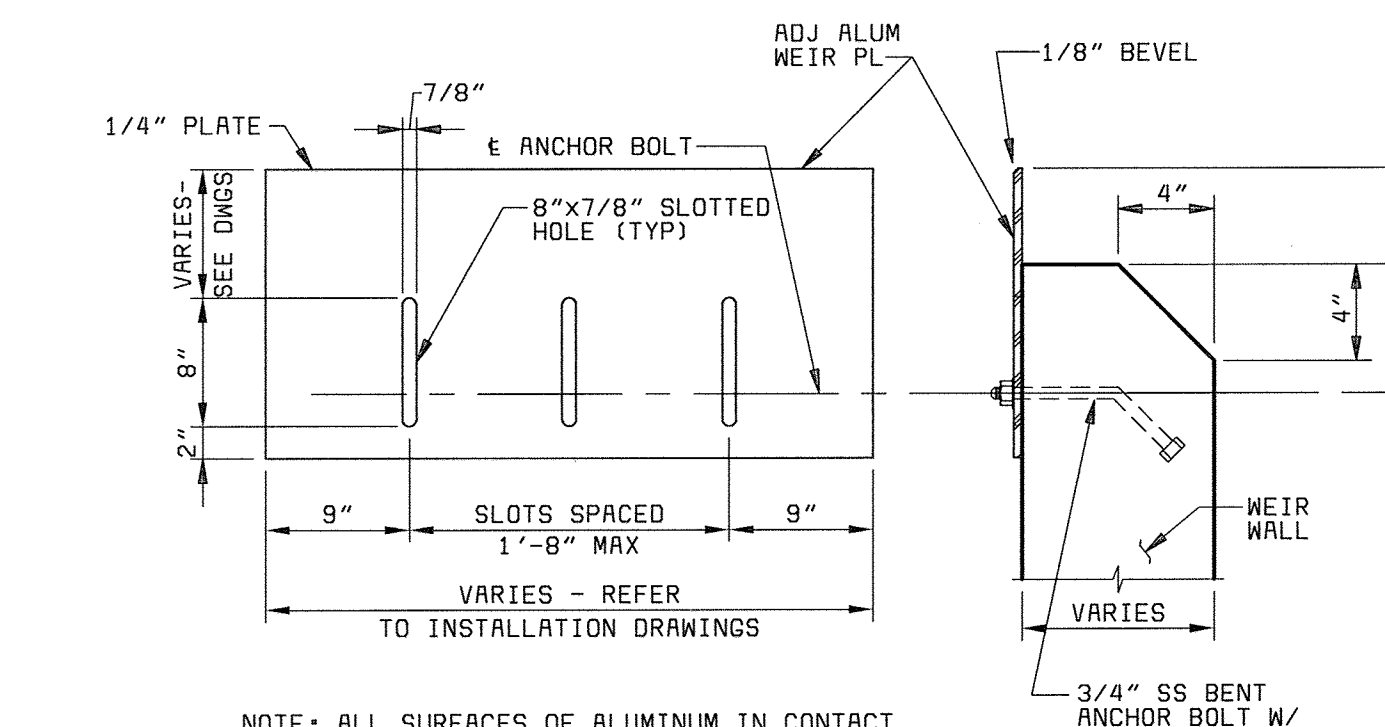


DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert J. Rectanus, Jr. CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LLP Gaithersburg, Maryland  Robert J. Rectanus, Jr. REG. PROF. ENGR. DATE	 ROBERT J. RECTANUS, JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER	DES: DMP						<b>GENERAL MECHANICAL</b>  <b>MISCELLANEOUS DETAILS</b>	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: WHS, VVR	CHK: WLK	DATE: 6/23/00						
											<b>M28</b>

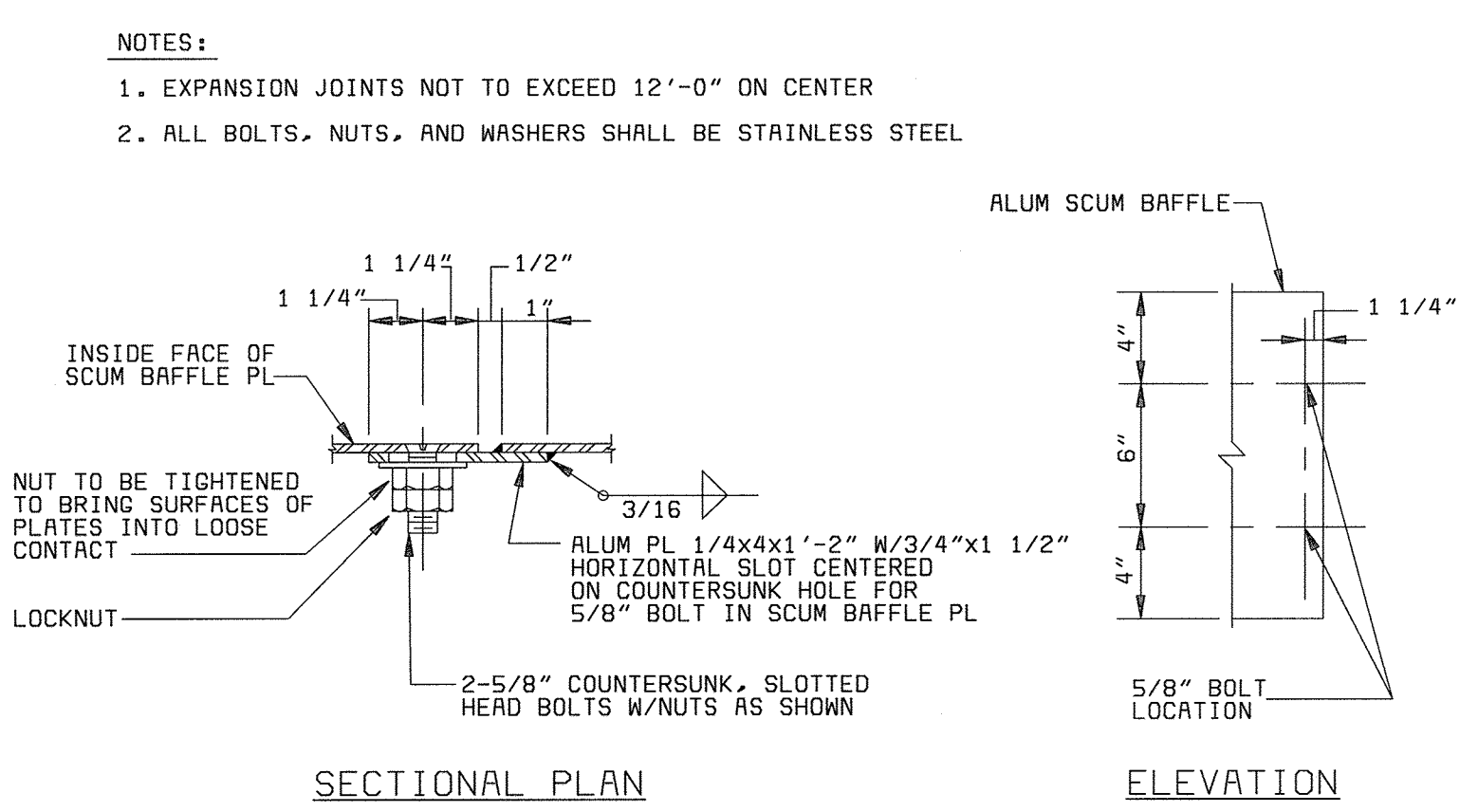


- NOTES:
1. SURFACE OF CONCRETE AND ADJACENT SIDE OF WEIR PLATE TO BE COATED WITH A HEAVY LAYER OF SEALANT PRIOR TO PLACING WEIR PLATE.
  2. ALL BOLTS, NUTS, AND WASHERS TO BE STAINLESS STEEL.
  3. 5/8" EPOXY GROUTED THREADED ROD MAY BE USED IN LIEU OF ANCHOR BOLTS AT CONTRACTORS OPTION.
  4. ALL SURFACES OF ALUMINUM IN CONTACT WITH CONCRETE SHALL BE COATED WITH COAL TAR PAINT.
  5. SEE SPECIFICATION SECTION 05990, STRUCTURAL AND MISCELLANEOUS METALS FOR ADDITIONAL REQUIREMENTS.
  6. SEE SPECIFICATION SECTIONS 11410 AND 11435, CIRCULAR CLARIFYING EQUIPMENT AND SECONDARY WASTE WATER TREATMENT CLARIFYING EQUIPMENT, FOR MODIFICATIONS TO WEIR AND SCUM BAFFLE IN VICINITY OF SCUM BOXES.
- DIMENSION VARIES W/ CLARIFIER TYPE:
- |                   |        |
|-------------------|--------|
| PRIMARY CLARIFIER | 3 1/2" |
| FINAL CLARIFIER   | 3"     |

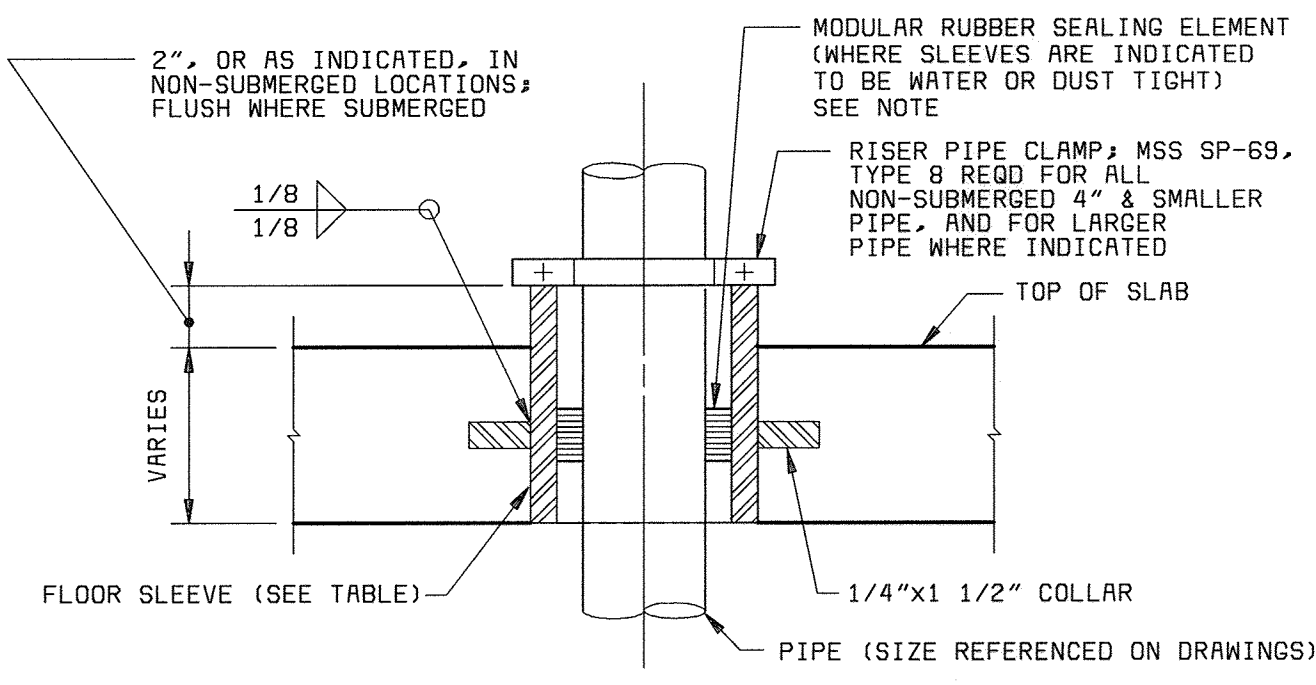
**SCUM BAFFLE & WEIR SUPPORT (A)**  
NO SCALE



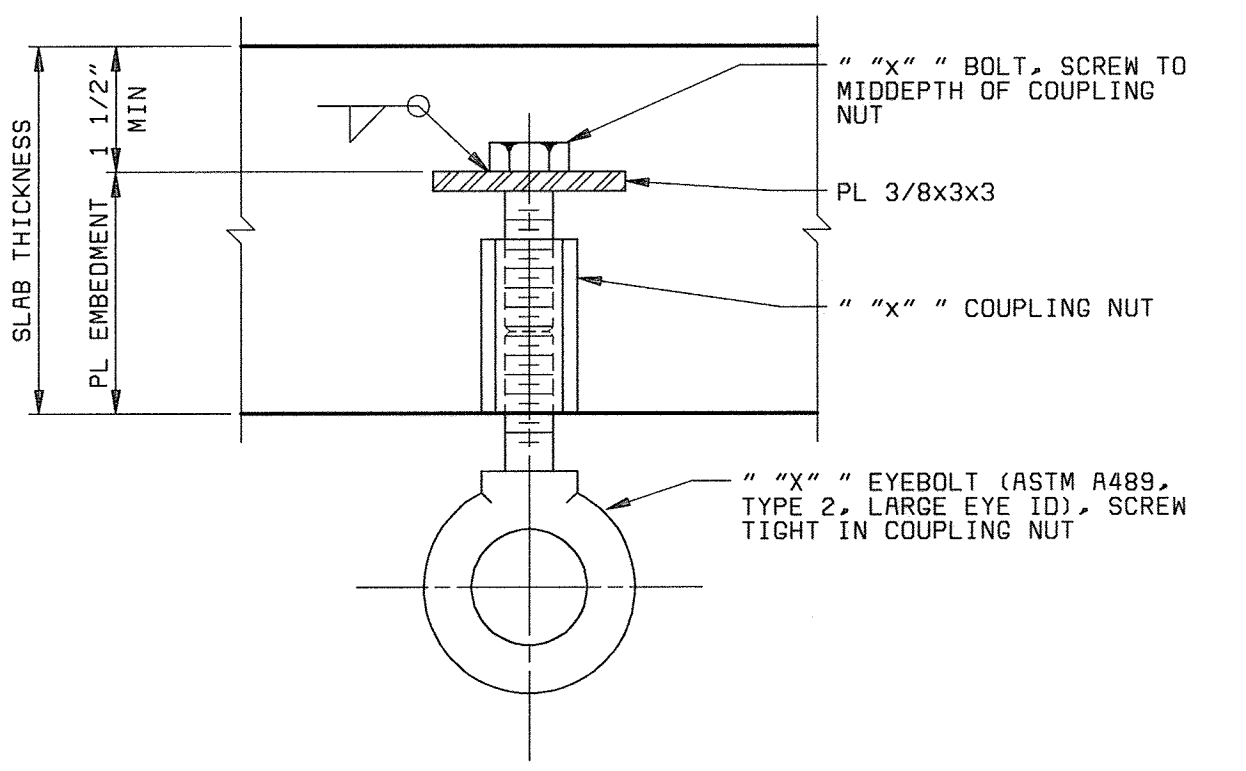
**WEIR CLIP ANGLE (J)**  
NO SCALE



**SCUM BAFFLE EXPANSION JOINT (B)**  
1" = 1'-0"

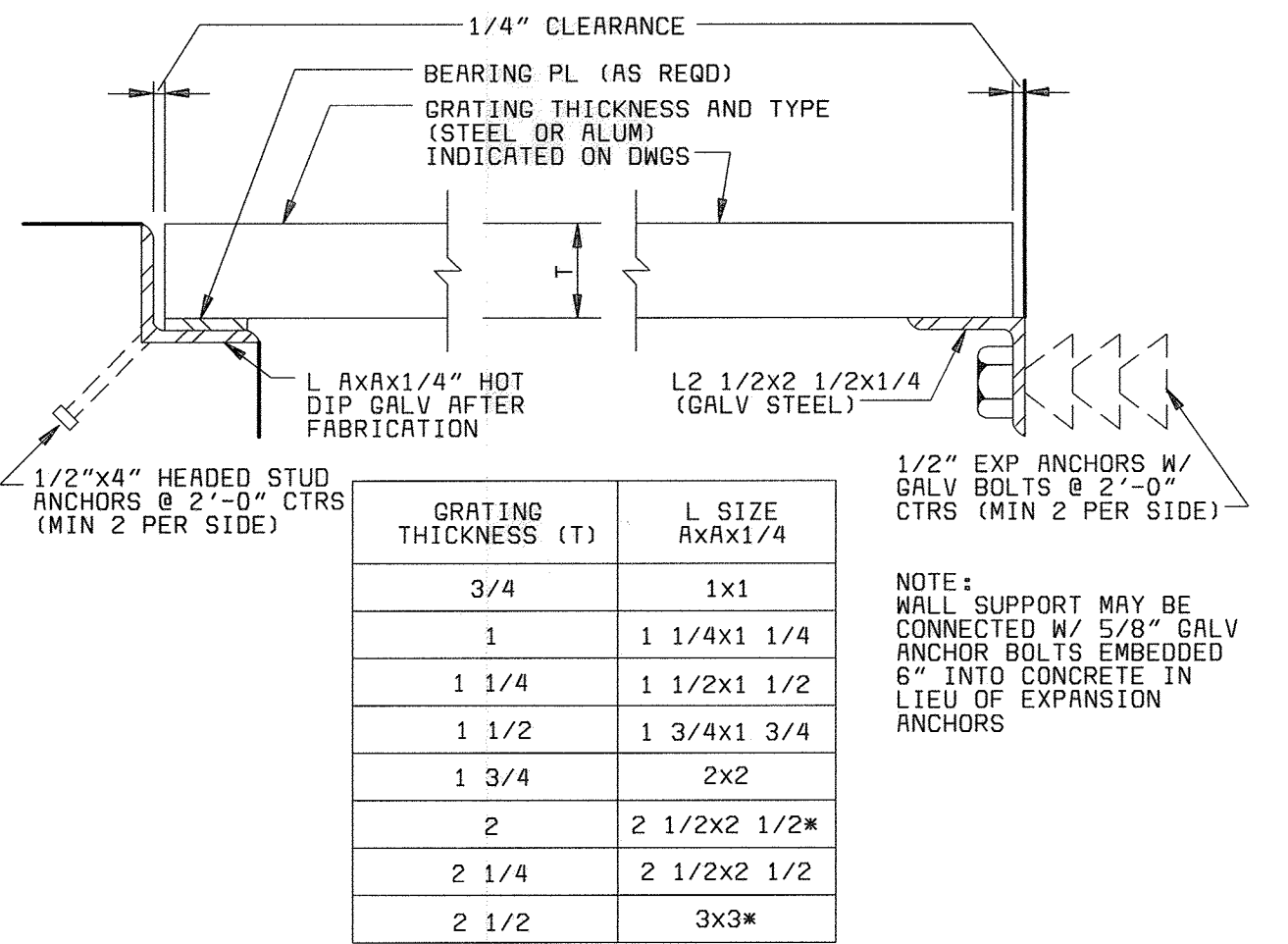


**FLOOR SLEEVE NEW CONSTRUCTION (F)**  
NO SCALE



**TYPICAL EYEBOLT (K)**  
NO SCALE

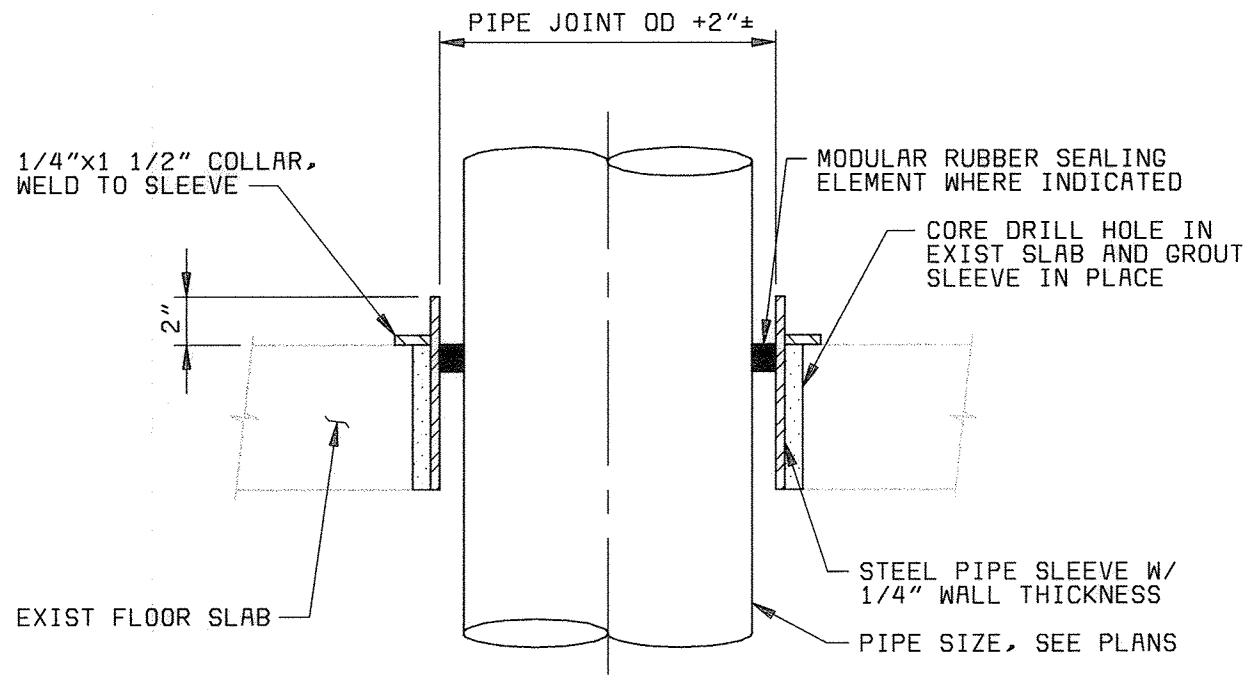
SAFE WORKING LOAD-POUNDS	BOLT SIZE DIA X LENGTH (IN)	SLAB THICKNESS IN (MINIMUM)	PL EMBED DEPTH IN (MINIMUM)	COUPLING NUT SIZE DIA X LENGTH IN	EYEBOLT SIZE IN
4000	3/4 x 3 1/4	6	4	3/4 x 2 1/4	3/4
6000	3/4 x 5 1/4	8	6	3/4 x 2 1/4	3/4
8000	1 x 5	8	6	1 x 3	1



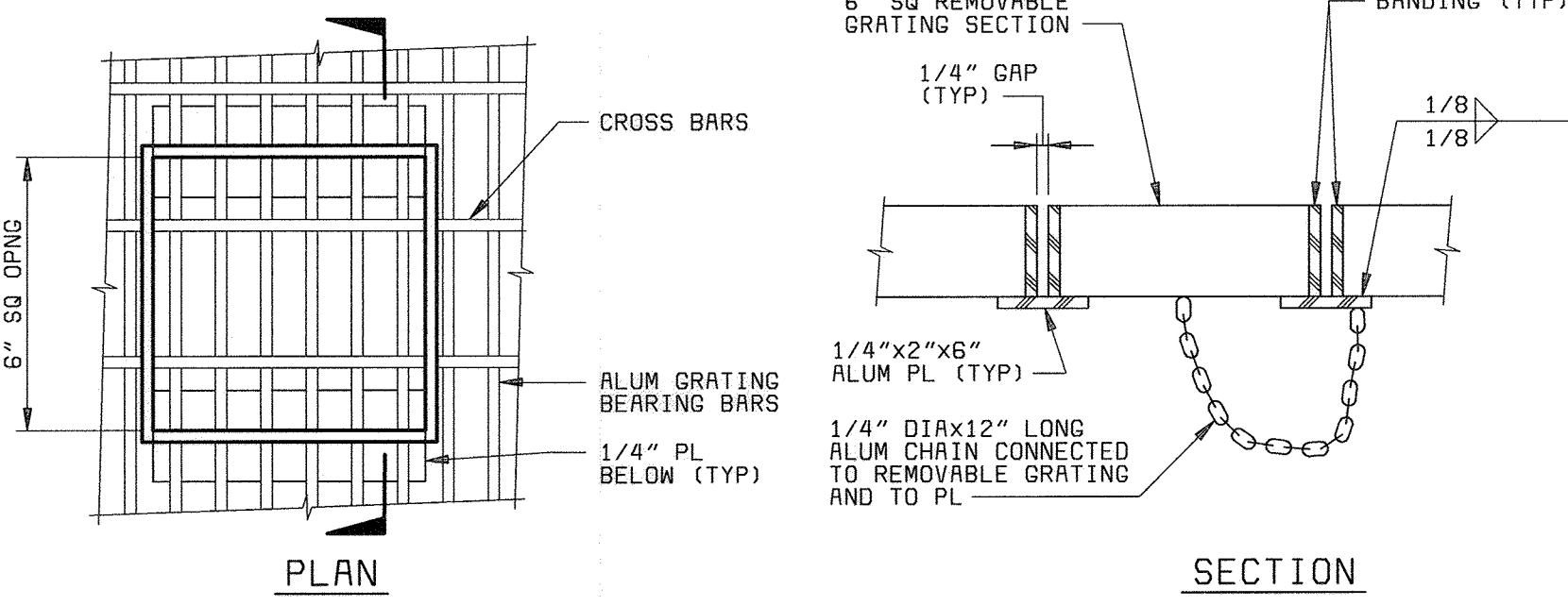
**GRATING SUPPORT (C)**  
NO SCALE

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" & LARGER	FLANGE OD+2"

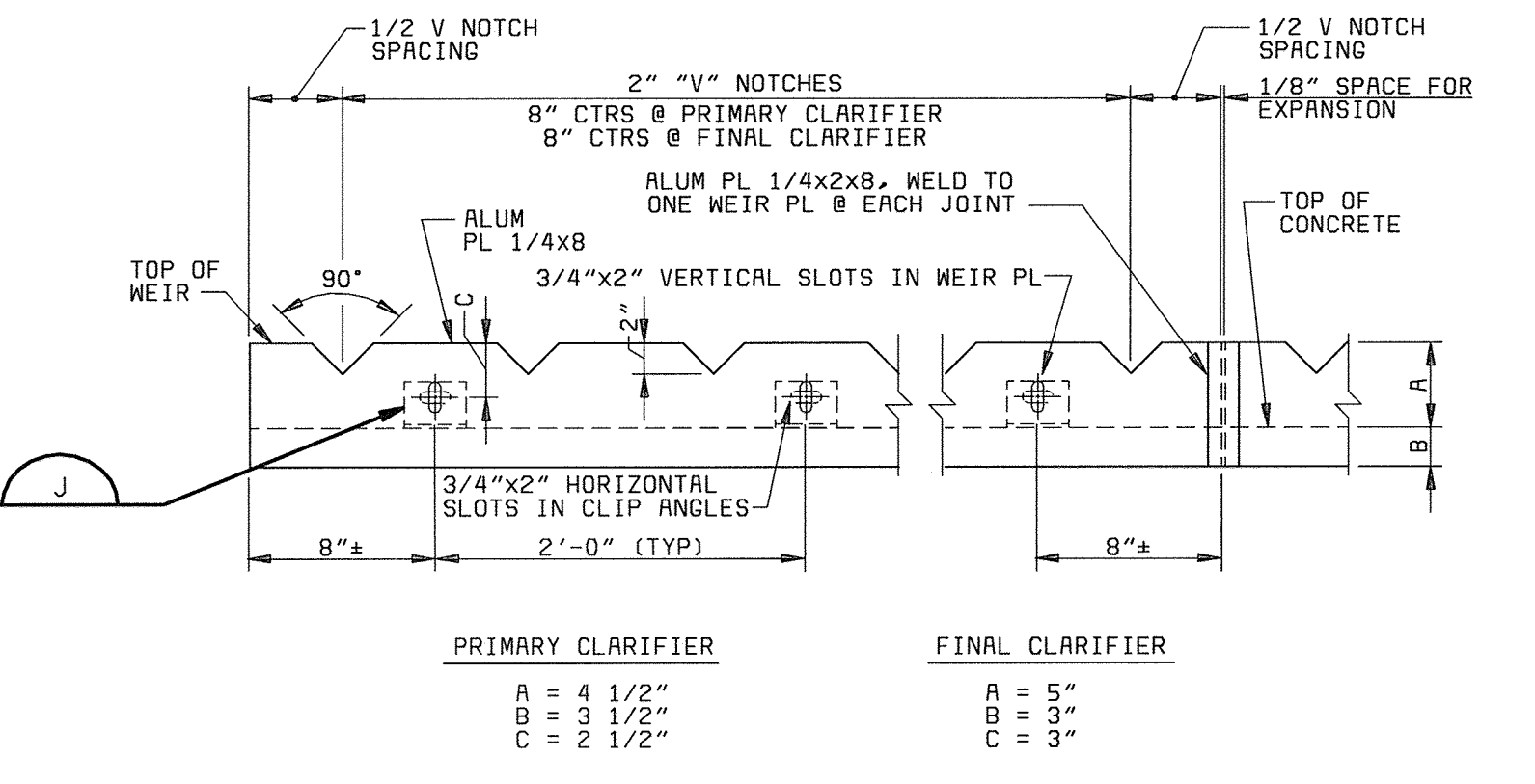
■ SCHEDULE 40 STANDARD STEEL PIPE  
■ STEEL PIPE, 1/4" WALL



**FLOOR SLEEVE REHAB CONSTRUCTION (G)**  
NO SCALE

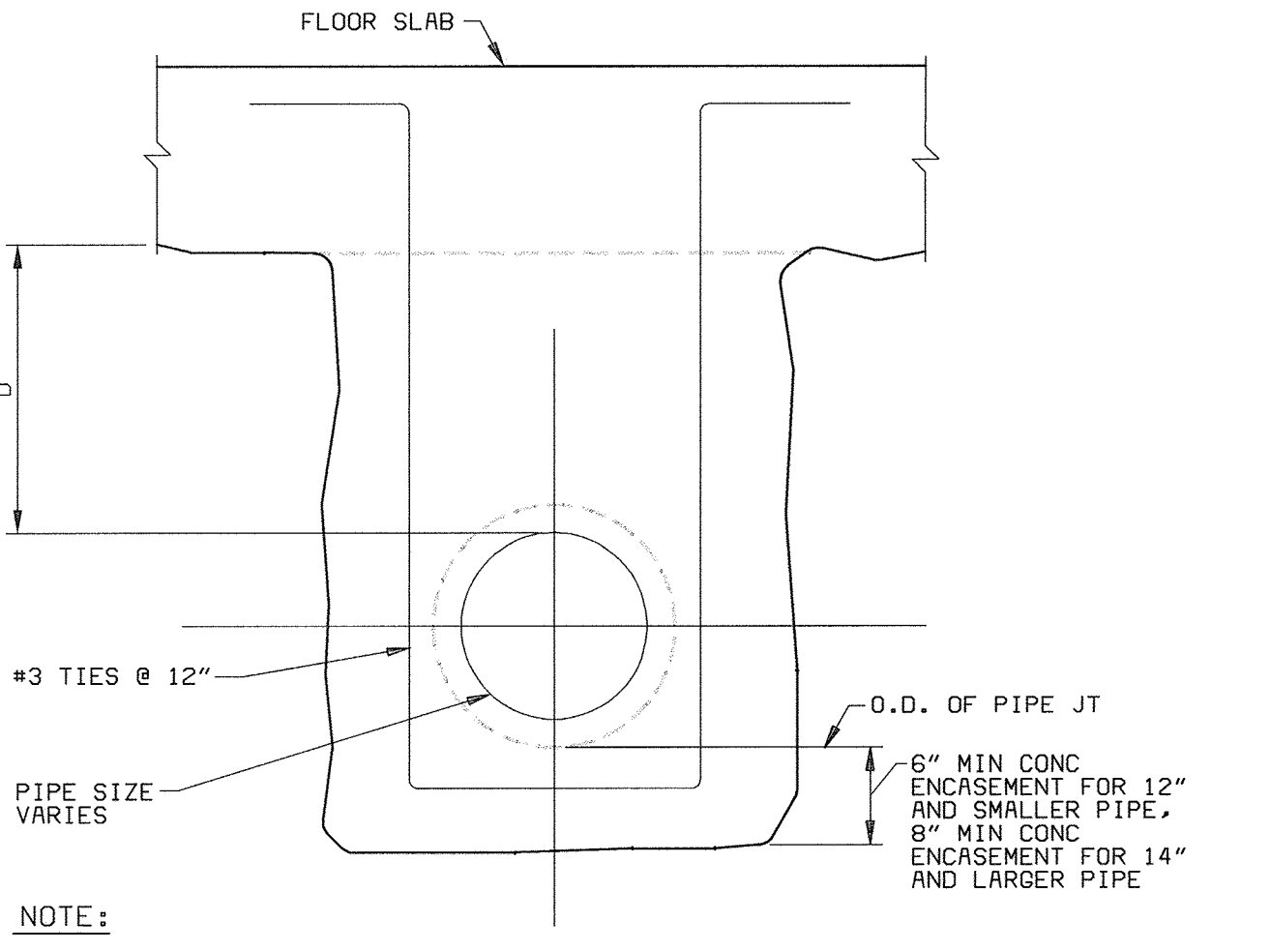


**REMOVABLE GRATING DETAIL (L)**  
NO SCALE



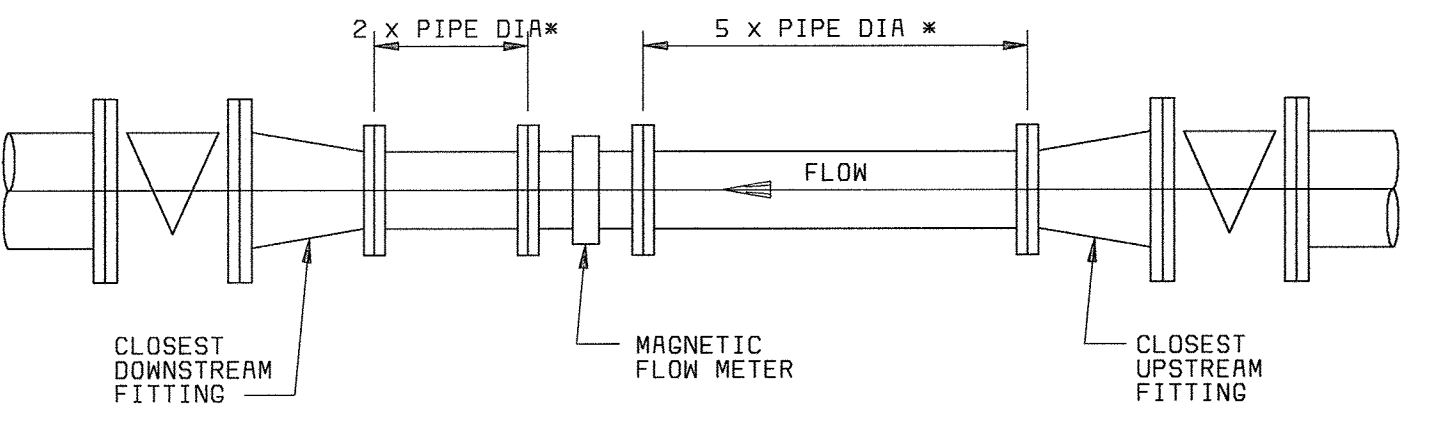
**V-NOTCH WEIR PLATE (D)**  
NO SCALE

- NOTES:
1. TOP EDGE OF WEIR PL. & "V" NOTCHES TO BE MACHINED TO A TRUE EDGE. SURFACE OF CONCR. & ADJACENT SIDE OF WEIR PL. TO BE COATED W/ HEAVY LAYER OF SEALANT PRIOR TO INSTALLATION. WEIR PL. S FOR CIRCULAR TANKS TO BE BENT TO RADIUS. MAXIMUM WEIR PLATE LENGTH 11'-4"
  2. ALL SURFACES OF ALUMINUM IN CONTACT WITH CONCRETE SHALL BE COATED WITH COAL TAR PAINT.



**CONCRETE ENCASEMENT (H)**  
NO SCALE

- NOTE:
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 UNLESS OTHERWISE INDICATED ON DRAWINGS. FILL VOID BETWEEN TOP OF ENCASEMENT AND BOTTOM OF SLAB WITH COMPACTED GRANULAR MATERIAL.
  2. PROVIDE A BELL AT THE END OF CONCRETE ENCASEMENT WHERE PIPELINE CHANGES FROM AN ENCASED PIPELINE TO A BURIED PIPELINE.



**MAGNETIC FLOW METER INSTALLATION (M)**  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

Robert M. Bauman 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

STATE OF MARYLAND  
ROBERT J. RECTANUS, JR.  
No. 22997  
REGISTERED PROFESSIONAL ENGINEER

DES: DMP	DRN: WHS, VVR	CHK: WLK	DATE: 6/23/00	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP
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GENERAL MECHANICAL  
MISCELLANEOUS DETAILS

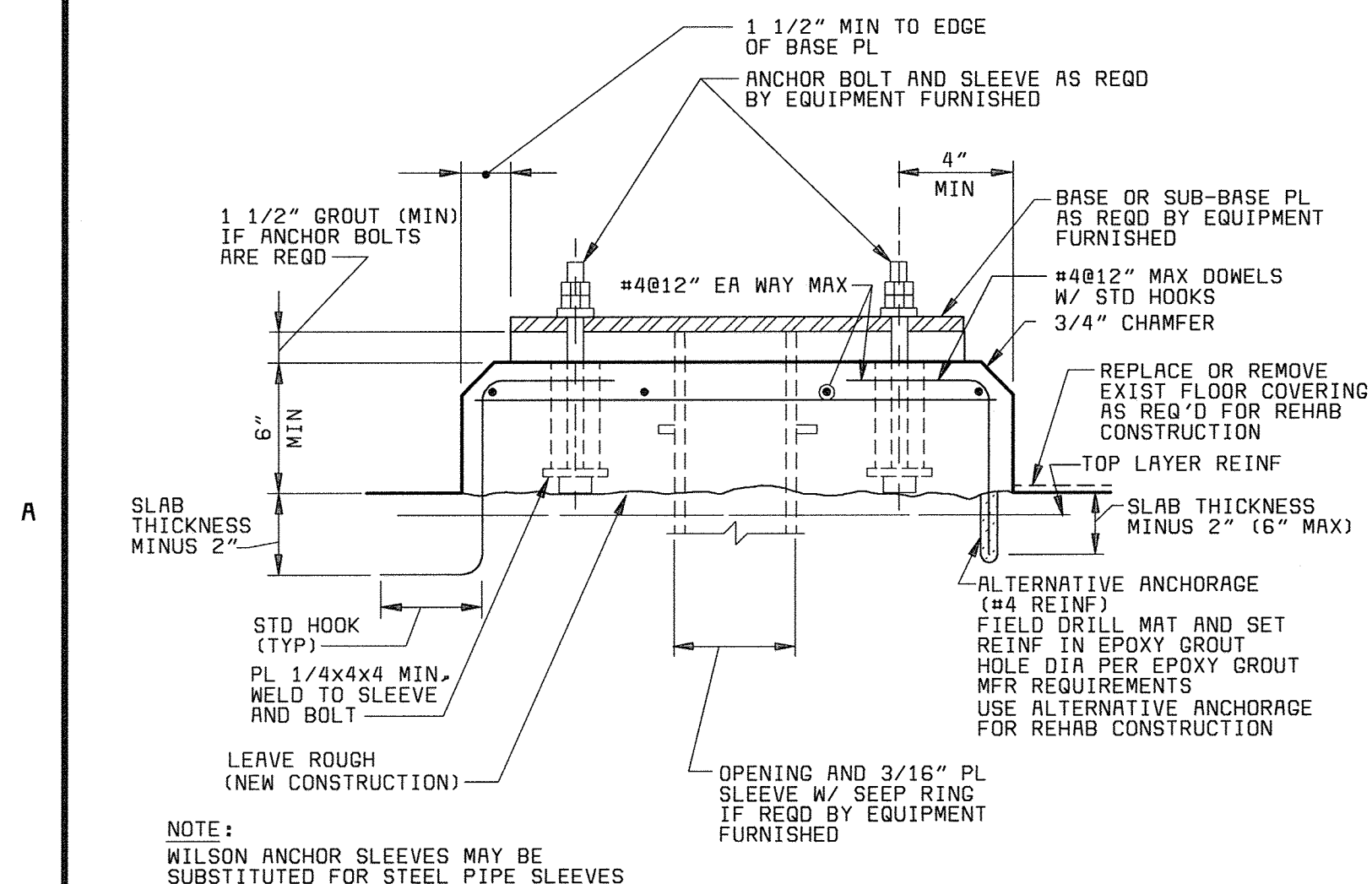
LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

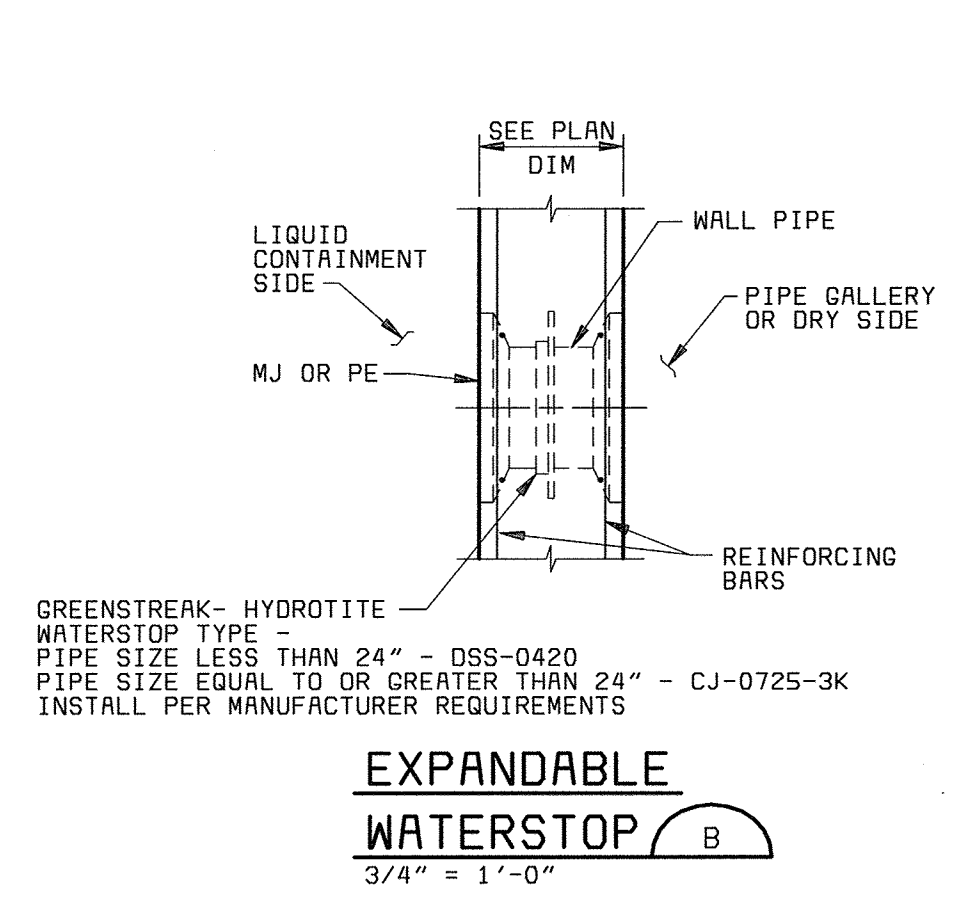
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 95 OF 161  
M29

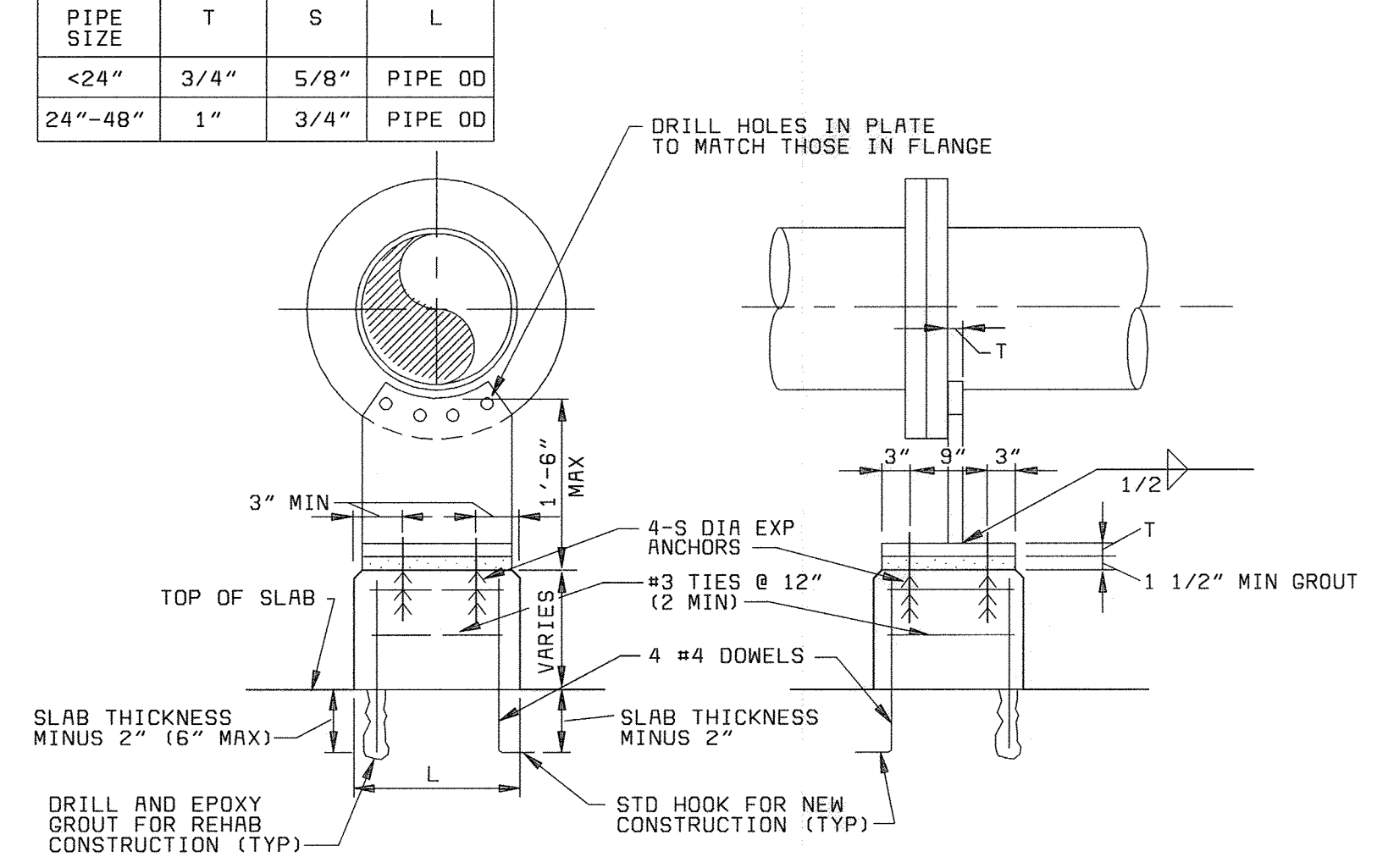
PIPE SIZE	T	S	L
<24"	3/4"	5/8"	PIPE OD
24"-48"	1"	3/4"	PIPE OD



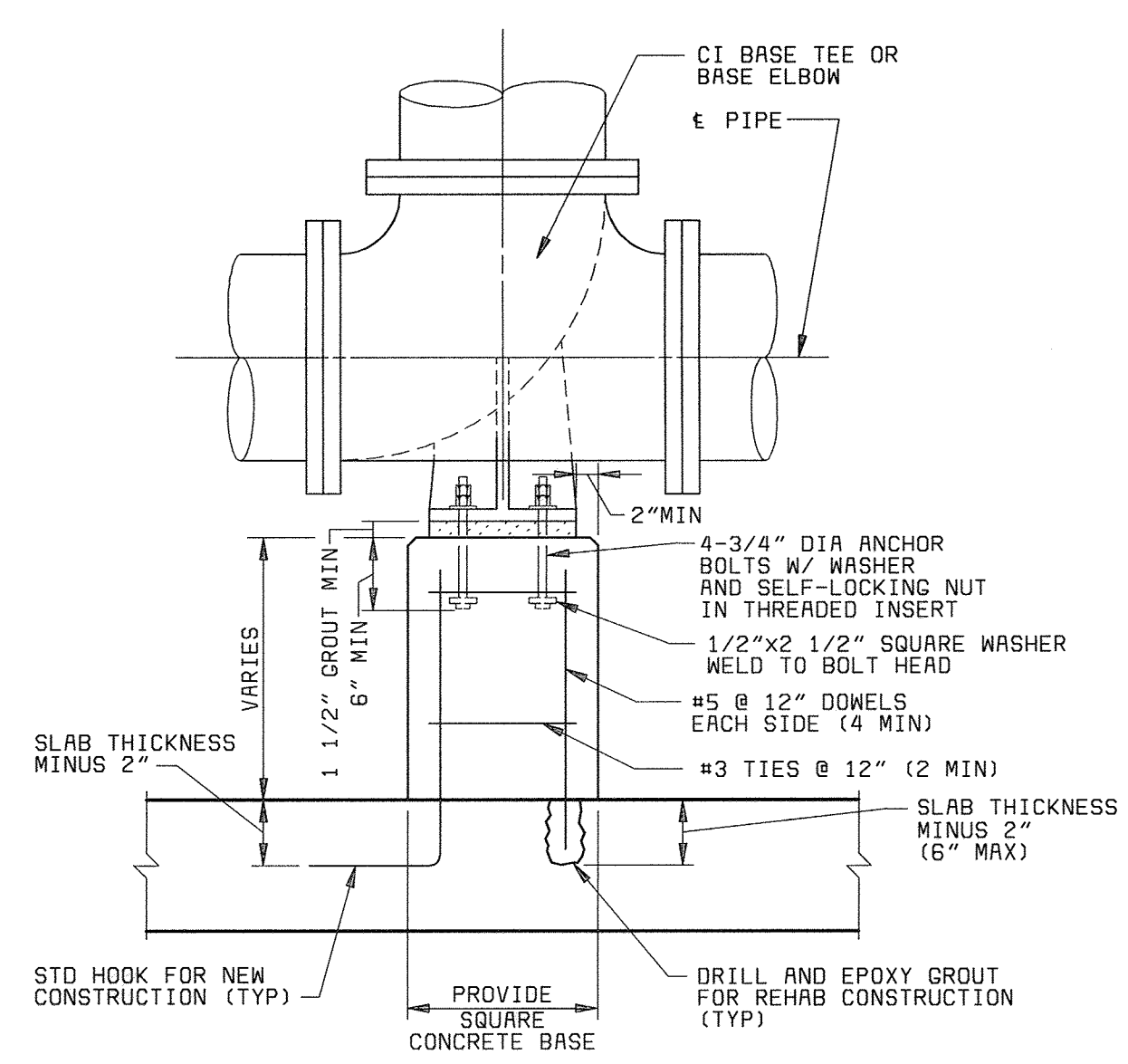
**EQUIPMENT BASE (A)**  
NO SCALE



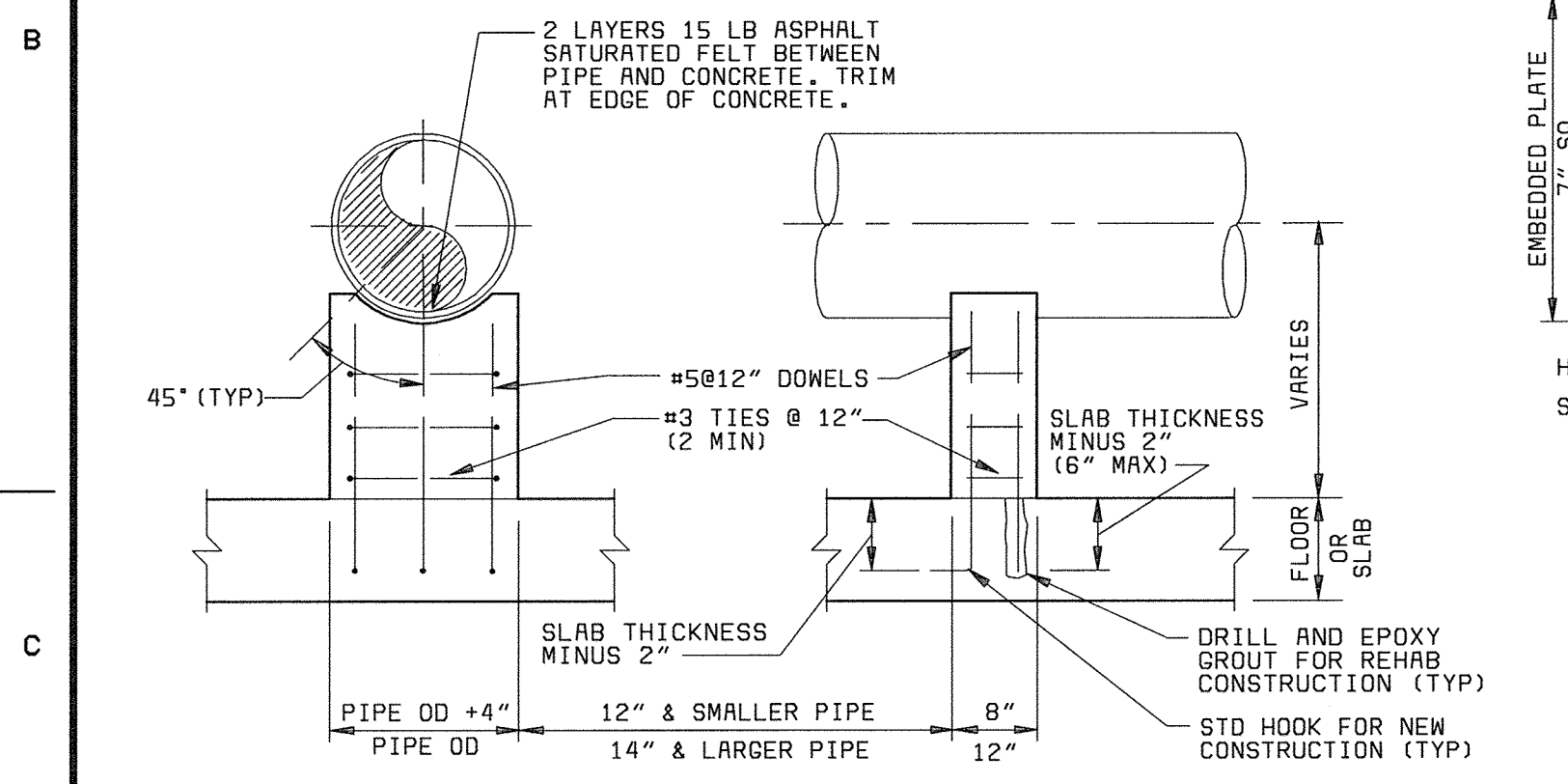
**EXPANDABLE WATERSTOP (B)**  
3/4" = 1'-0"



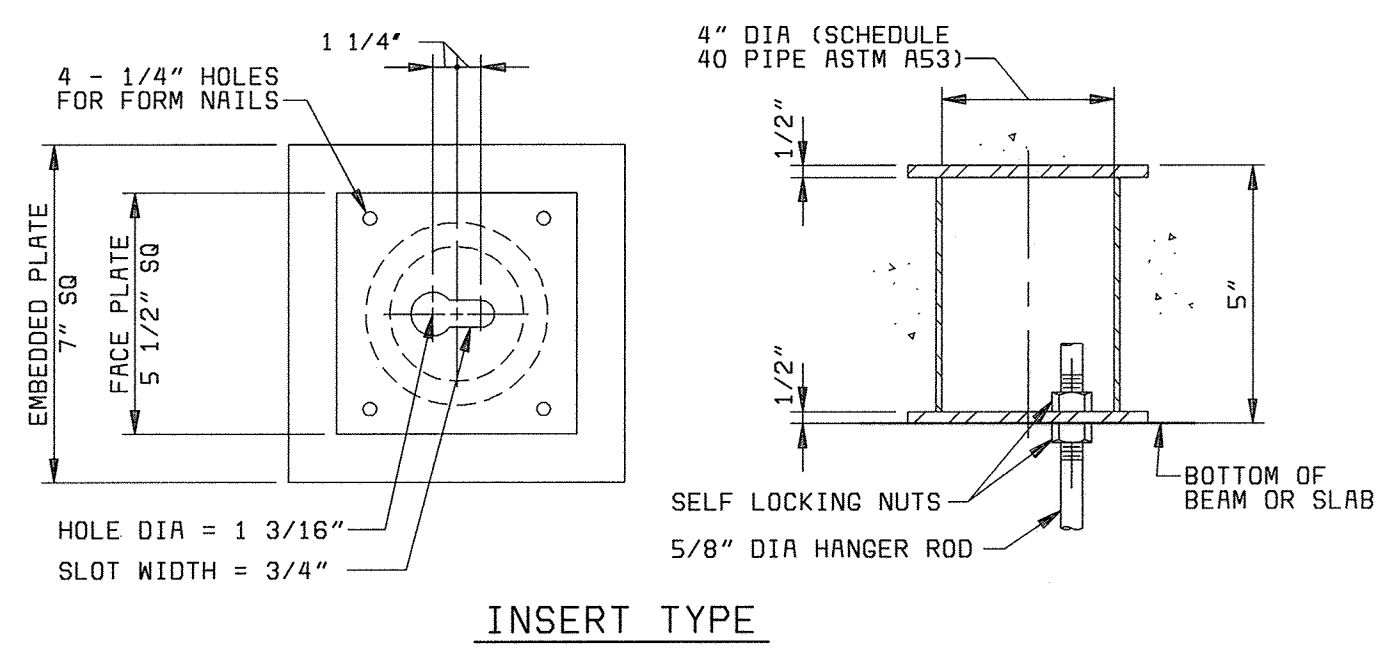
**FLANGE PIPE SUPPORT (C)**  
NO SCALE



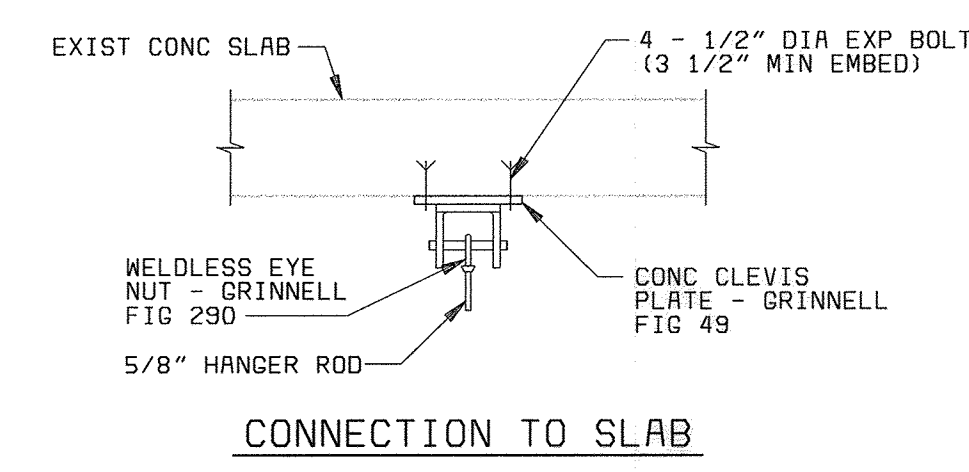
**DUCTILE IRON BASE TEE OR ELBOW (D)**  
NO SCALE



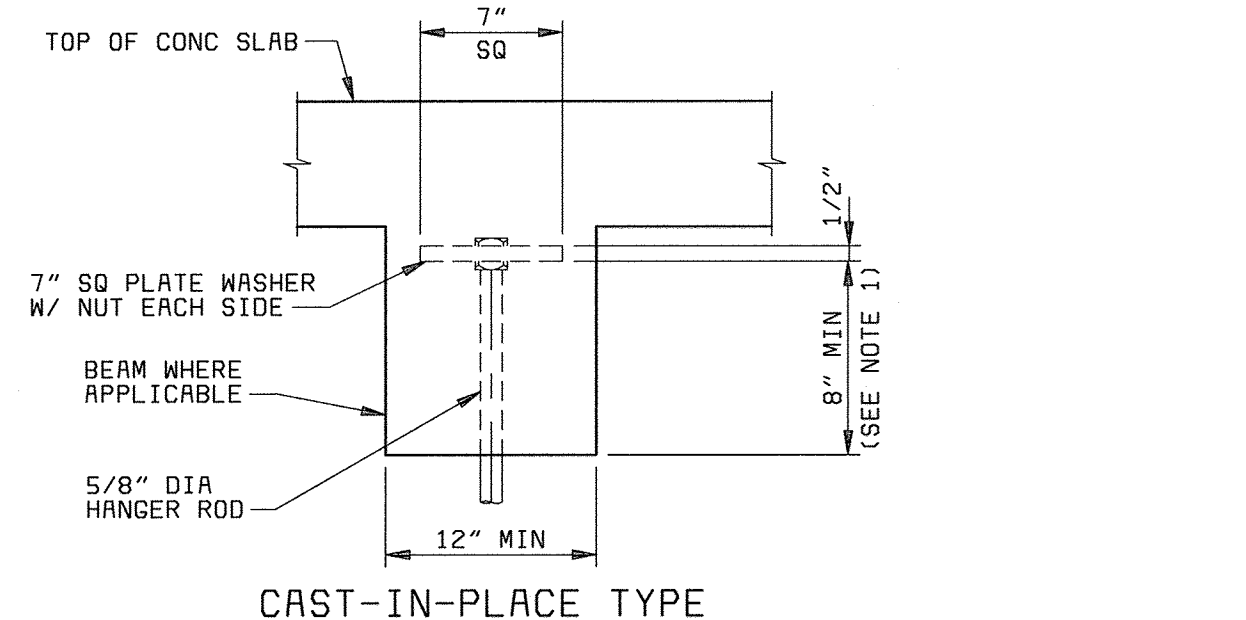
**CONCRETE PIPE SUPPORT (E)**  
NO SCALE



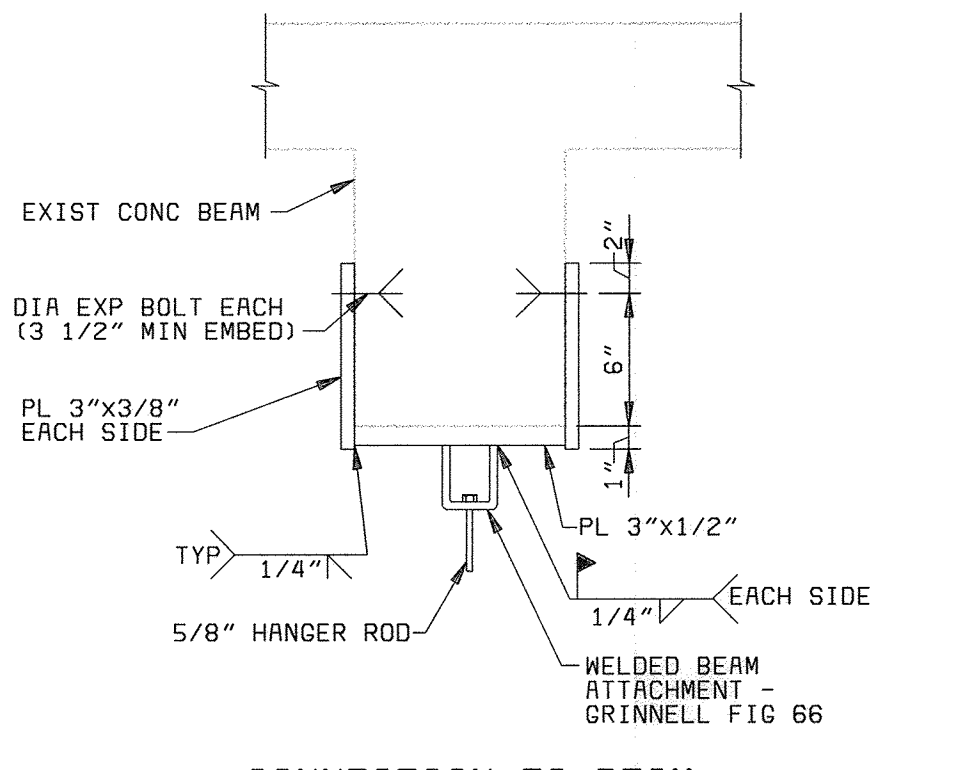
**INSERT TYPE**



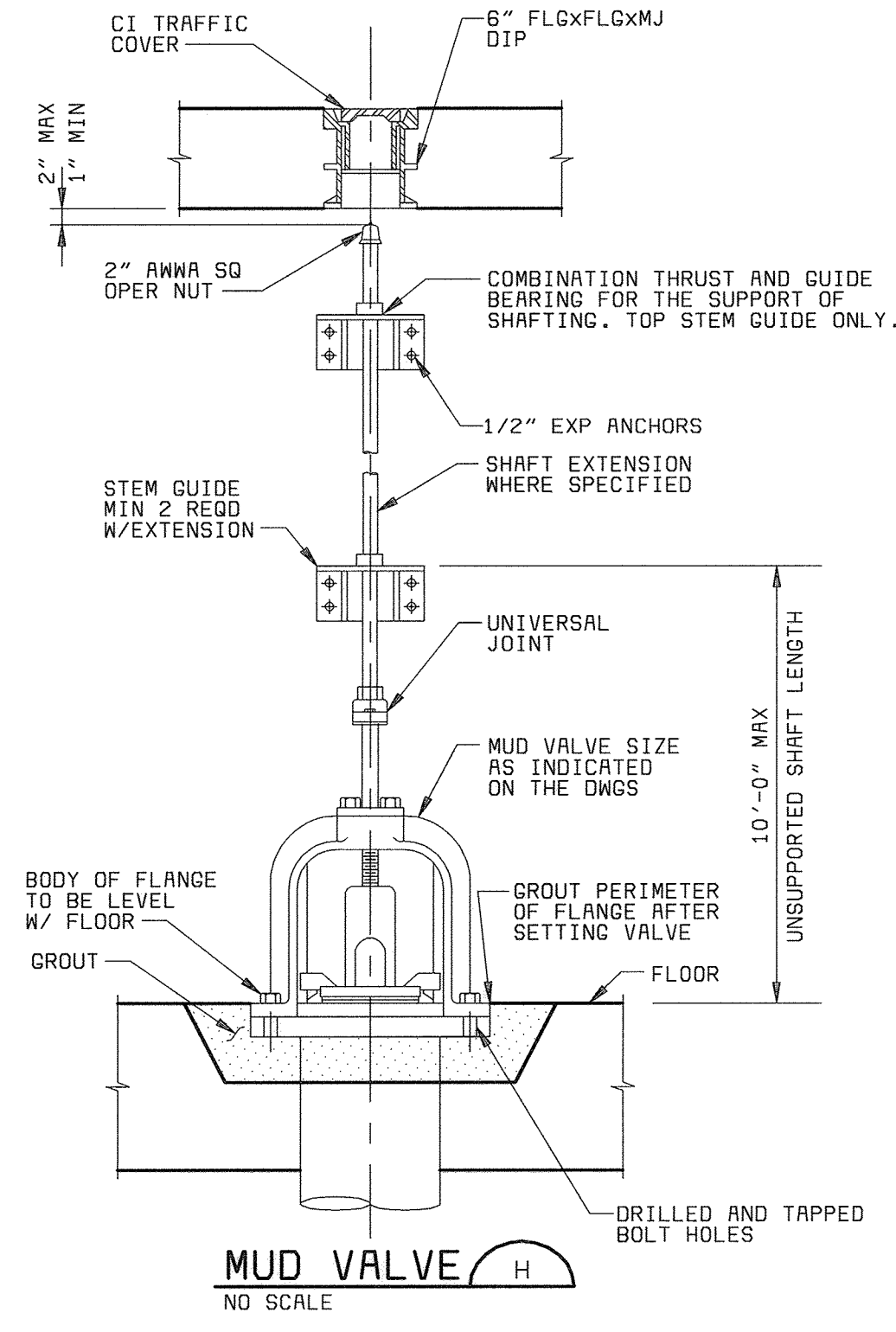
**CONNECTION TO SLAB**



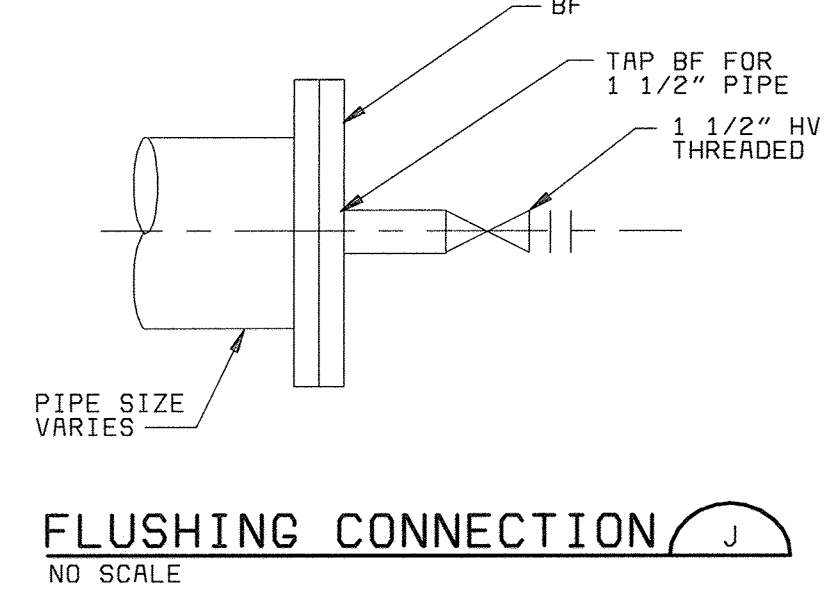
**CAST-IN-PLACE TYPE**



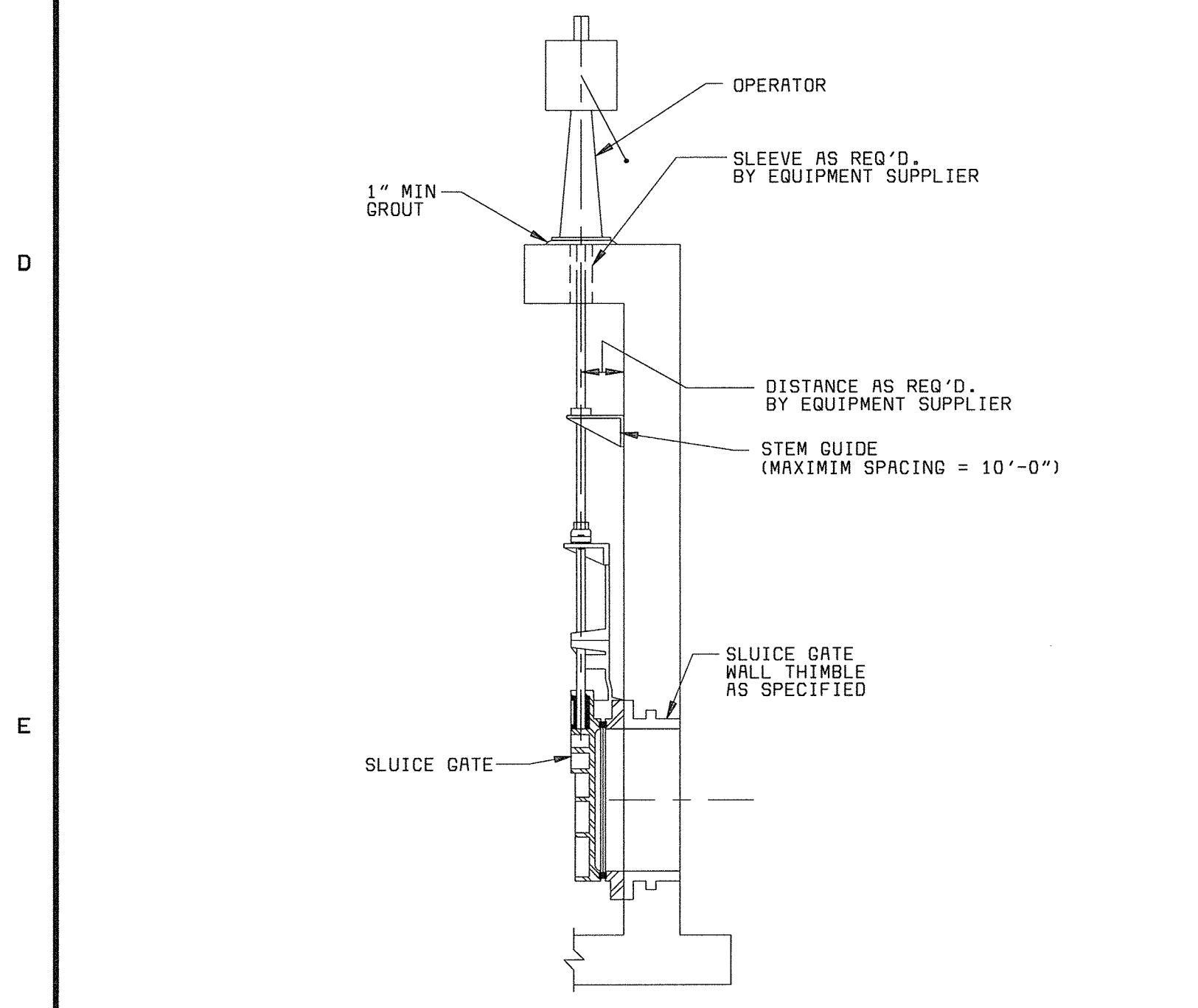
**CONNECTION TO BEAM**



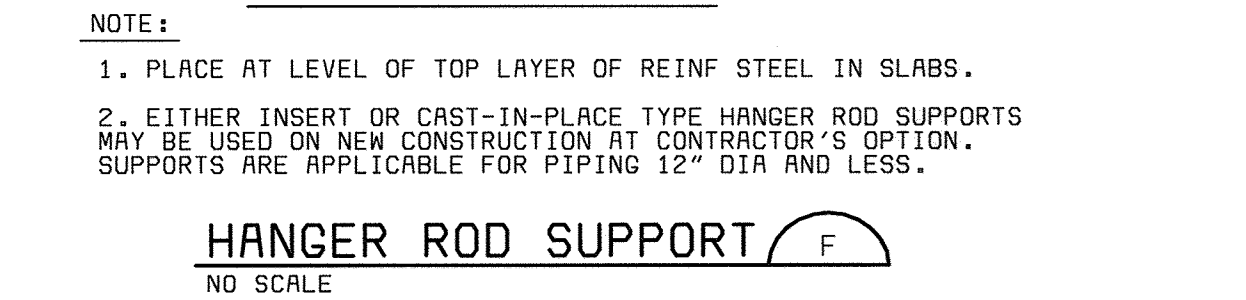
**MUD VALVE (H)**  
NO SCALE



**FLUSHING CONNECTION (J)**  
NO SCALE



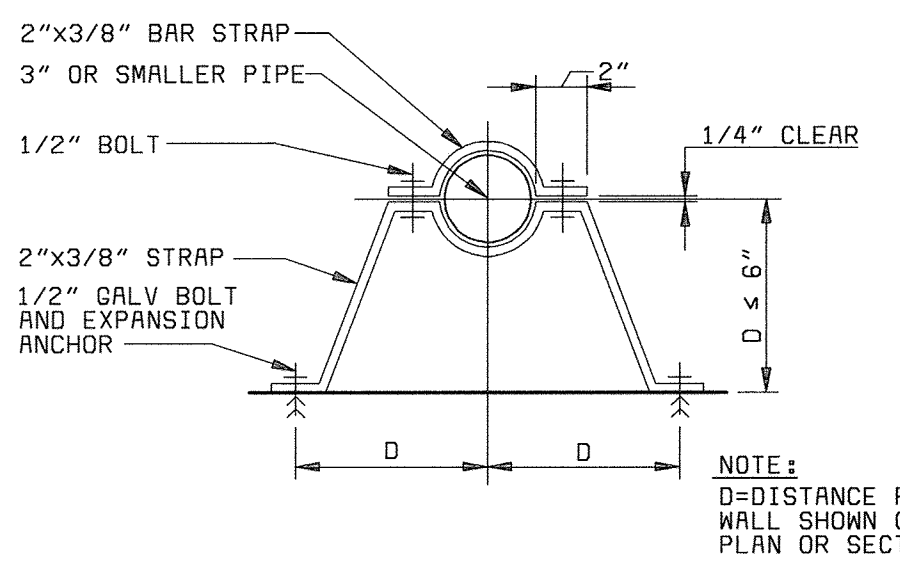
**SLUICE GATE (L)**  
NO SCALE



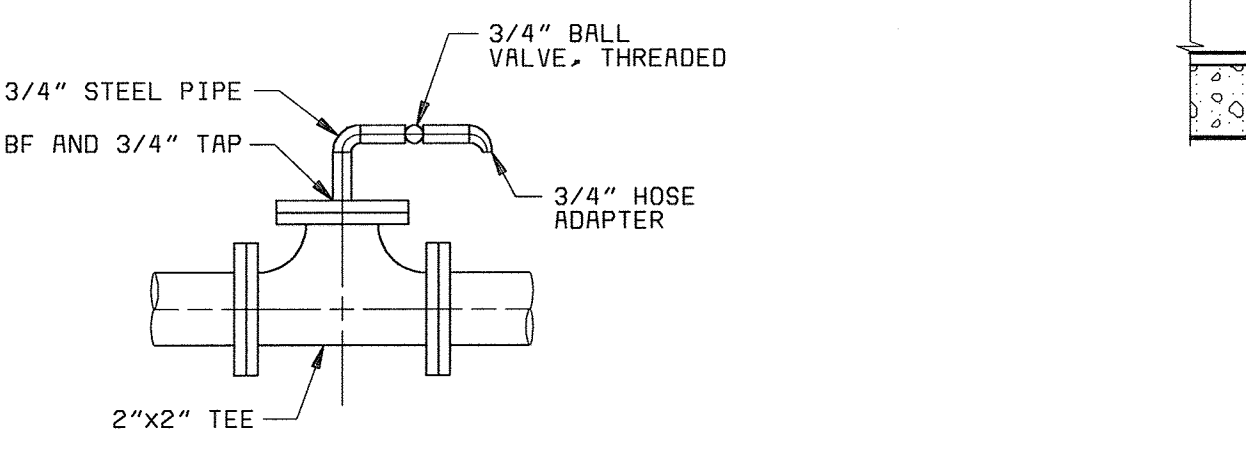
**HANGER ROD SUPPORT (F)**  
NO SCALE



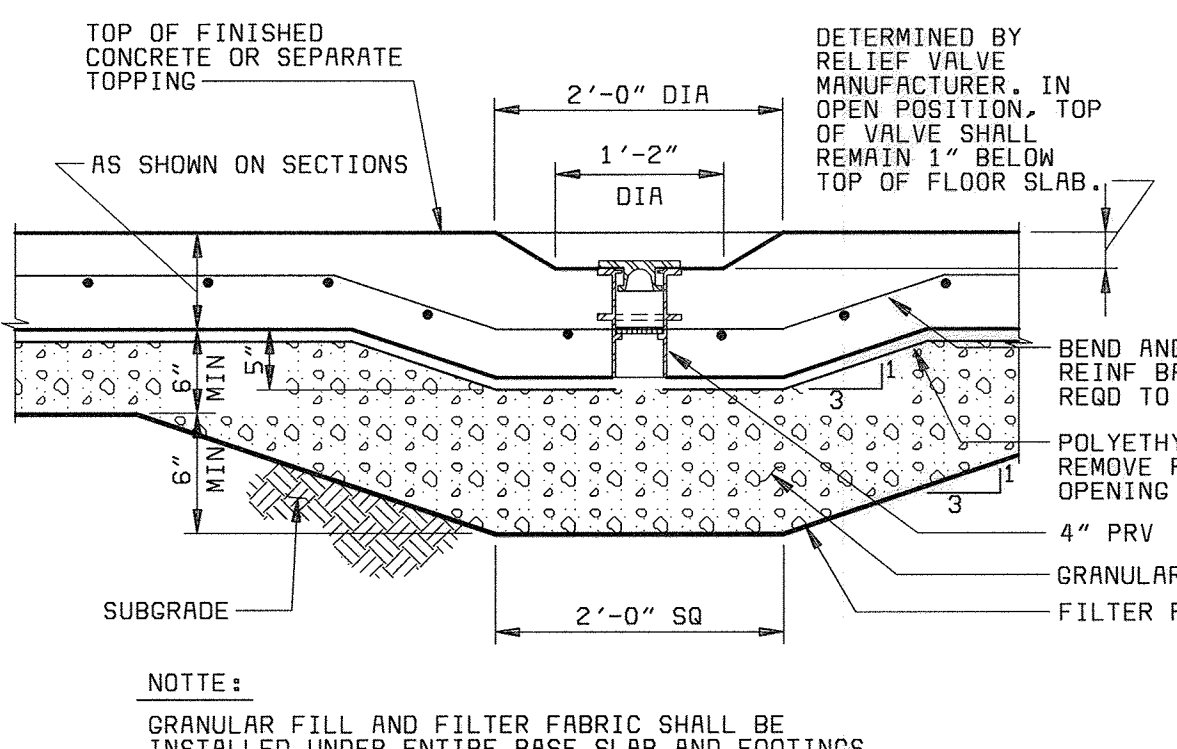
**PIPE HANGER ROD SUPPORT (G)**  
NO SCALE (EXISTING CONSTRUCTION)



**VERTICAL PIPE SUPPORT (K)**  
NO SCALE



**AIR RELEASE VALVE DETAIL (M)**  
NO SCALE



**PRESSURE RELIEF VALVE (N)**  
NO SCALE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Rectanus Jr.*  
6/29/02  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.*  
6/26/02  
REG. PROF. ENGR. DATE

STATE OF MARYLAND  
REGISTERED PROFESSIONAL ENGINEER  
ROBERT J. RECTANUS JR.  
No. 22927

DES: DMP	DRN: WHS-VVR	CHK: WLK	DATE: 6/23/00
DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY
		CK	APP

GENERAL MECHANICAL

MISCELLANEOUS DETAILS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

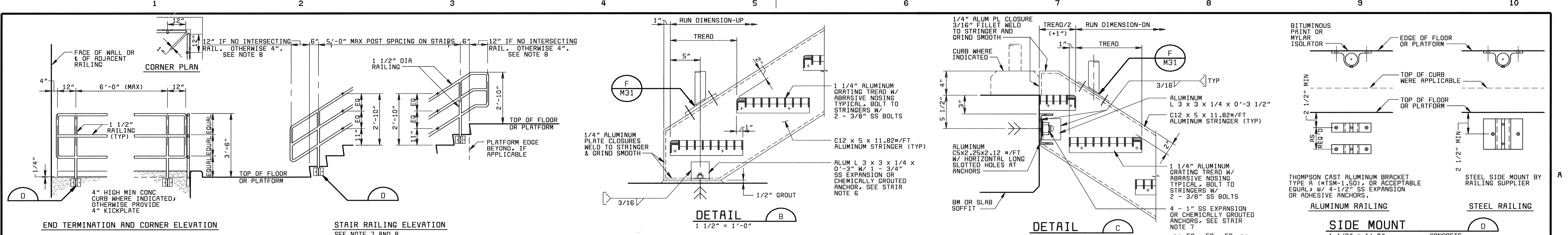
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 96 OF 161

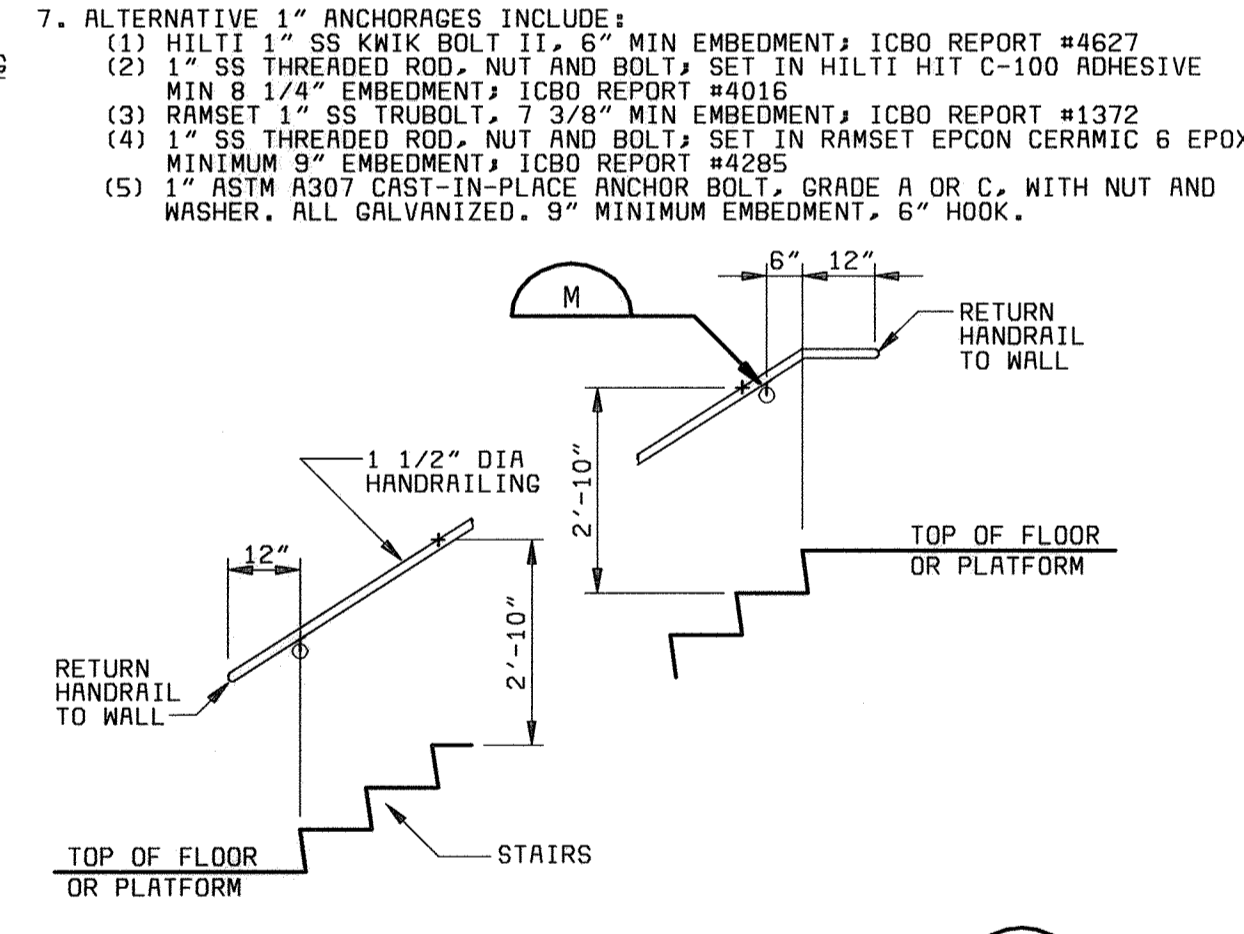
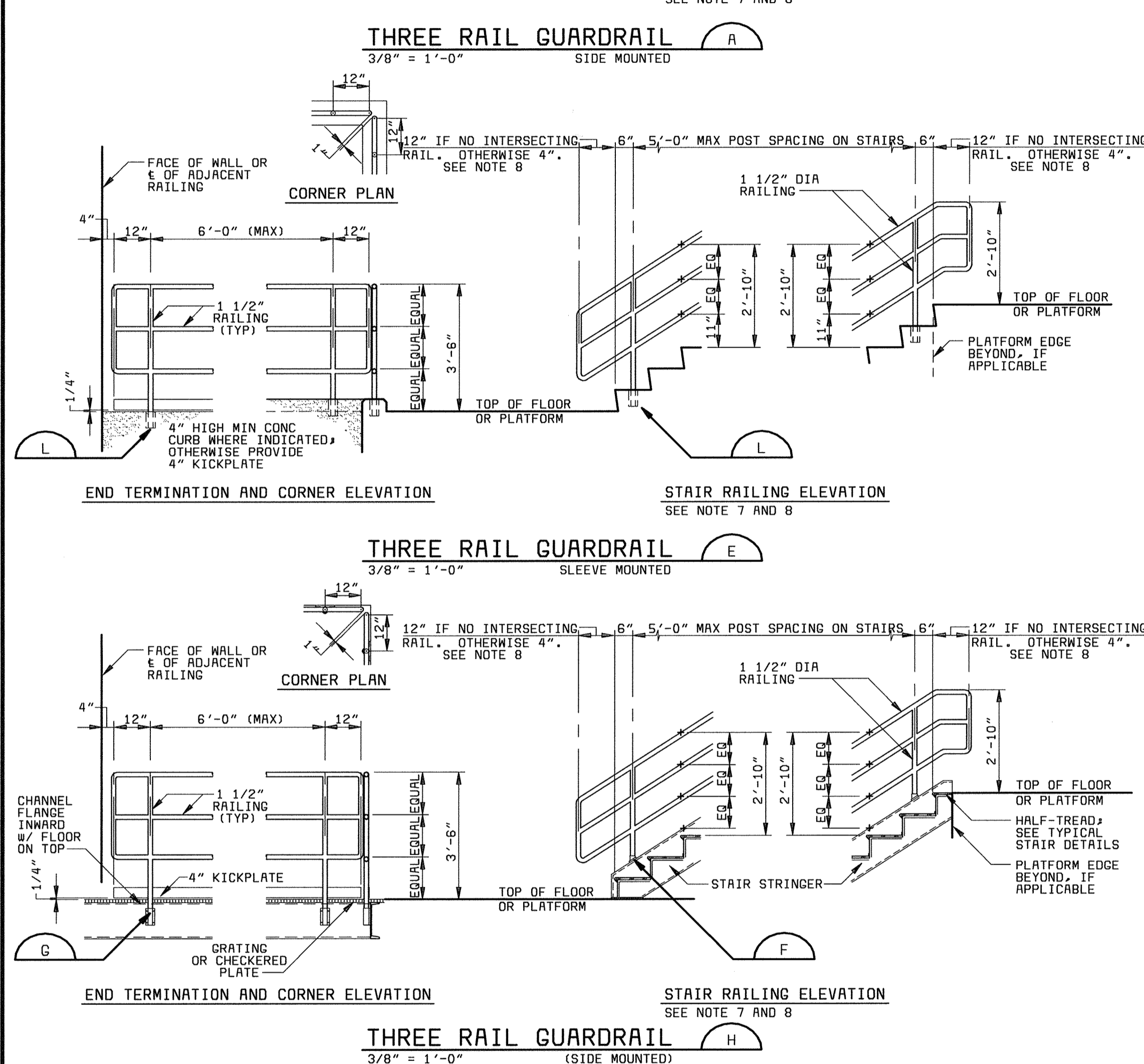
M30





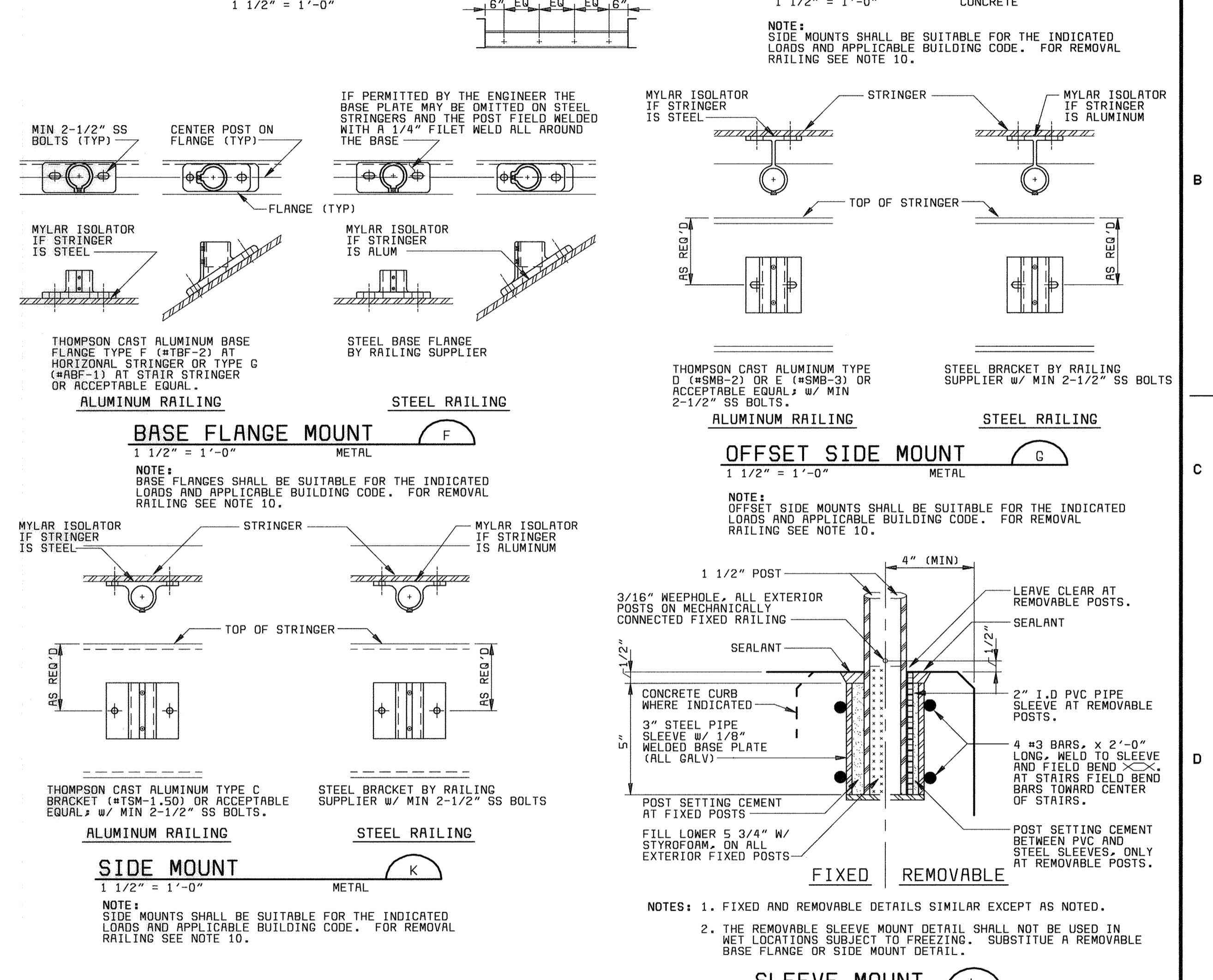
**ALUMINUM GRATING STAIR NOTES:**

- ALL MISCELLANEOUS ALUMINUM SHAPES ON THIS SHEET TO BE ROLLED TO ALUMINUM ASSOCIATION STANDARD STRUCTURAL SHAPES.
- DESIGNATION LEGEND FOR ALUMINUM SHAPES:  
CHANNEL C 12 x 5 x 11.822 #/FT  
FLANGE WIDTH MEMBER WEIGHT  
ANGLE L 5 x 5 x 3/8
- WELDS NOT DIMENSIONED ON THE DRAWINGS SHALL BE SIZED TO DEVELOP THE FULL STRENGTH OF THE LEAST STRENGTH COMPONENT OF THE CONNECTION.
- 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 #4285  
(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.
- 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 1/8" 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 #4285  
(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.
- 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 5 5/8" EMBEDMENT; ICBO REPORT #4016  
(3) RAMSET 3/4" SS TRUBOLT, 6 3/8" MIN EMBEDMENT; ICBO REPORT #1372  
(4) 3/4" SS THREADED ROD, NUT, BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 5 3/4" EMBEDMENT; ICBO REPORT #4285  
(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.
- 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 8" EMBEDMENT; ICBO REPORT #4285  
(5) 1" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER, ALL GALVANIZED, 9" MINIMUM EMBEDMENT, 6" HOOK.



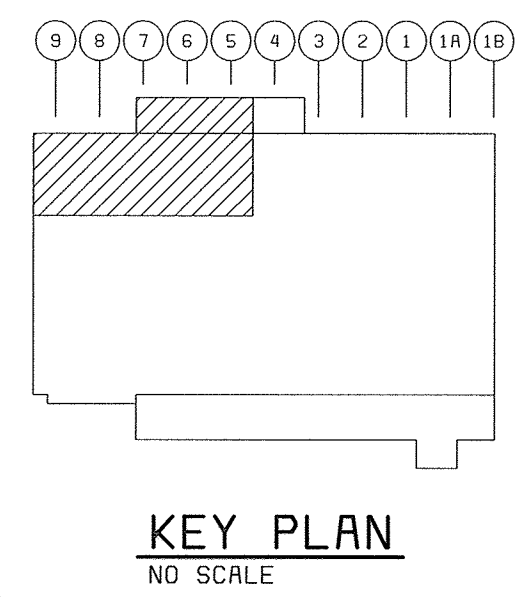
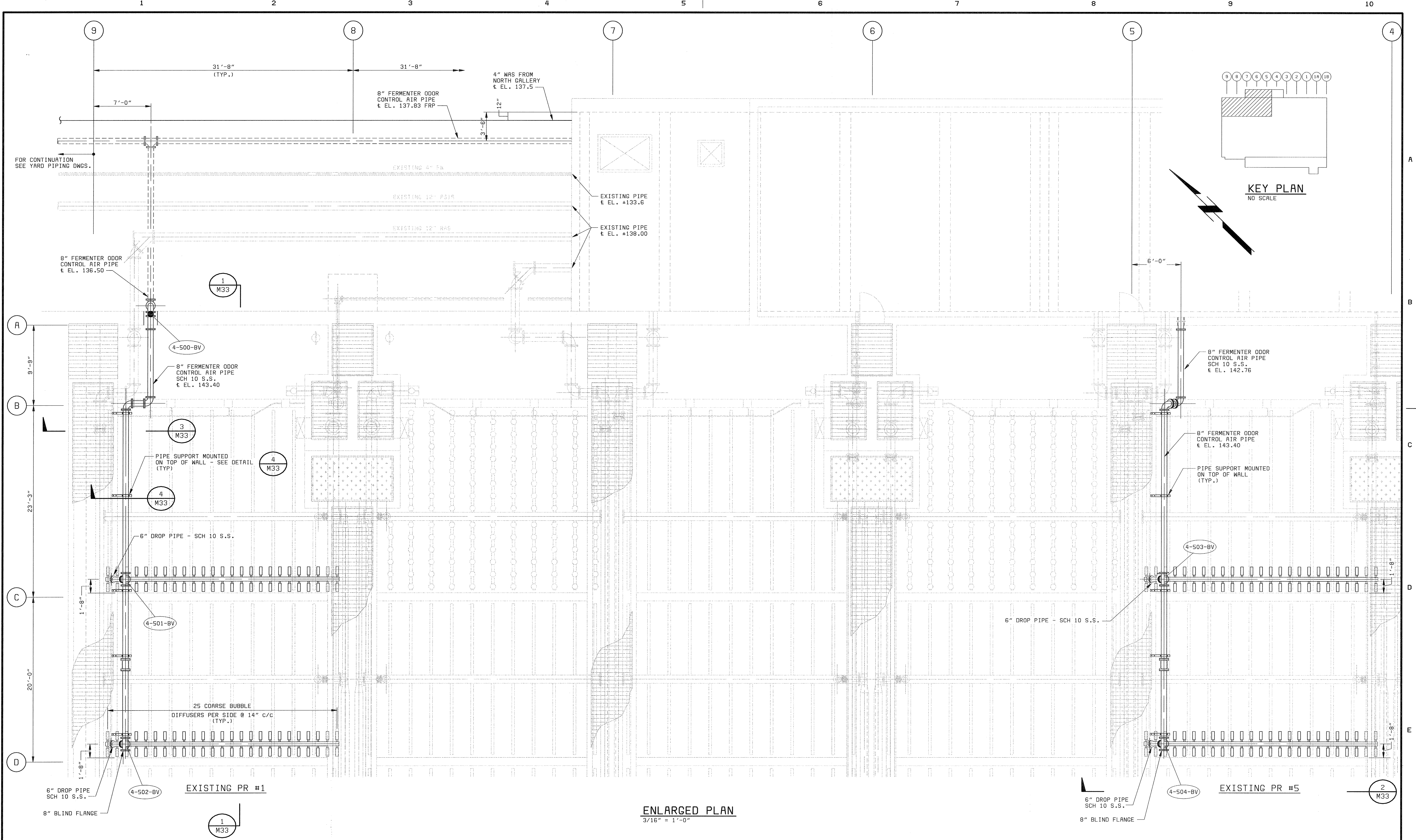
**NOTES:**

- ALL RAILING SHALL BE THREE RAIL OR PICKET TYPE UNLESS INDICATED OTHERWISE ON THE DESIGN DRAWINGS. RAILING IN AREAS INDICATED TO BE ACCESSIBLE TO THE PUBLIC SHALL BE PICKET TYPE, UNLESS ANOTHER CONFIGURATION IS ACCEPTABLE TO THE ENGINEER, AND SHALL PROVIDE FOR NO UNGUARDED GAP NO GREATER THAN A 4 INCH DIAMETER SPHERE. RAILING MATERIAL AND FABRICATION SHALL BE AS INDICATED ON THE DESIGN DRAWINGS AND IN THE PROJECT SPECIFICATIONS FOR HANDRAILING AND GUARDRAILINGS.
- ALL RAILING SHALL BE DESIGNED AND FABRICATED IN COMPLIANCE WITH THE MOST STRINGENT REQUIREMENTS OF NOTE 3 BELOW, THE APPLICABLE LOCAL BUILDING CODE, OSHA 29 CFR PART 1926 SUBPART R, AND ALL OTHER PERTINENT OSHA REGULATIONS AND LOCAL SAFETY REGULATIONS.
- GUARDRAILING SHALL BE DESIGNED TO WITHSTAND A UNIFORM HORIZONTAL LOAD OF 50 POUNDS PER FOOT WITH A SIMULTANEOUS VERTICAL LOAD OF 100 POUNDS PER FOOT APPLIED TO THE TOP RAIL. HANDRAILING SHALL BE DESIGNED TO WITHSTAND A UNIFORM HORIZONTAL LOAD OF 50 POUNDS PER FOOT APPLIED TO THE TOP RAIL. IN ADDITION, GUARDRAILING AND HANDRAILING SHALL BE DESIGNED TO WITHSTAND A CONCENTRATED LOAD OF 200 POUNDS APPLIED IN ANY DIRECTION, AT ANY POINT ON THE RAILING SYSTEM. THE 200 POUND CONCENTRATED LOAD NEED NOT BE APPLIED SIMULTANEOUSLY WITH THE 50 POUNDS PER FOOT UNIFORM HORIZONTAL LOAD.
- 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.
- EXPANSION ANCHORS FOR GUARDRAILING AND HANDRAILING SHALL BE STAINLESS STEEL, HILTI "KWIK-BOLT II", ITW RAMSET/REDHEAD "TRUBOLT WEDGE ANCHOR", OR POWERS RAWL "RAWL-STUD ANCHOR".
- ADHESIVE ANCHORS FOR GUARDRAILING AND HANDRAILING SHALL BE STAINLESS STEEL, HILTI "HIT HY 150 SYSTEM" OR ITW RAMSET/REDHEAD "EPOXY CERAMIC 6 SYSTEM", POWERS RAWL "POWER-POST EPOXY INJECTION GEL SYSTEM".
- 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.
- 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.
- THE GUARDRAIL AND HANDRAIL CONFIGURATIONS ON THIS SHEET WILL NOT COMPLETELY SATISFY ADA REQUIREMENTS FOR HANDICAPPED ACCESSIBILITY. AT LOCATIONS ON THE DESIGN DRAWINGS WHERE CONFORMANCE WITH ADA REQUIREMENTS IS SPECIFICALLY NOTED, THE RAILING SUPPLIER SHALL MODIFY THE CONFIGURATIONS TO COMPLY WITH THE MOST STRINGENT REQUIREMENTS OF ANSI 117.1 UNIFORM FEDERAL ACCESSIBILITY STANDARDS AND THE ACCESSIBILITY STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
- 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.



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  Robert M. Bauman 6-29-02 CHIEF, BUREAU OF UTILITIES DATE	 <b>ROBERT J. RECTANUS JR.</b> No. 29227 REGISTERED PROFESSIONAL ENGINEER	DES: IFH	DRN: RLC	CHK: WLK	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	GENERAL MECHANICAL  MISCELLANEOUS DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
		DATE: 6/23/00												SHEET 97 OF 161  <b>M31</b>

058472A



ENLARGED PLAN  
3/16" = 1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

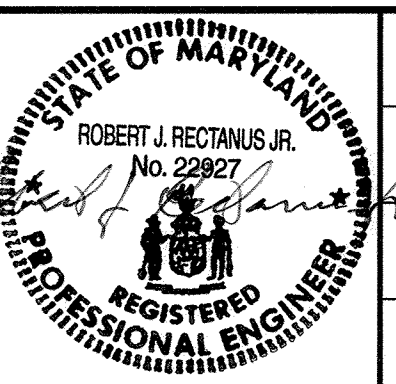
*Robert M. Bauman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**Stantec**

Stantec Consulting Ltd.  
Suite 1007, 7445-132 St.  
Surrey, BC  
V3W 1J8  
Ph. (604) 597-0422  
Fax (604) 591-1856  
Email: surrey@stantec.com

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Robert J. Rectanus Jr.* 6/26/00  
REG. PROF. ENGR. DATE



DES: RVJ	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP
DRN: RCF							
CHK: RVJ							

EAST-WEST PROCESS REACTOR  
MECHANICAL

ODOR CONTROL AIR PIPING  
PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

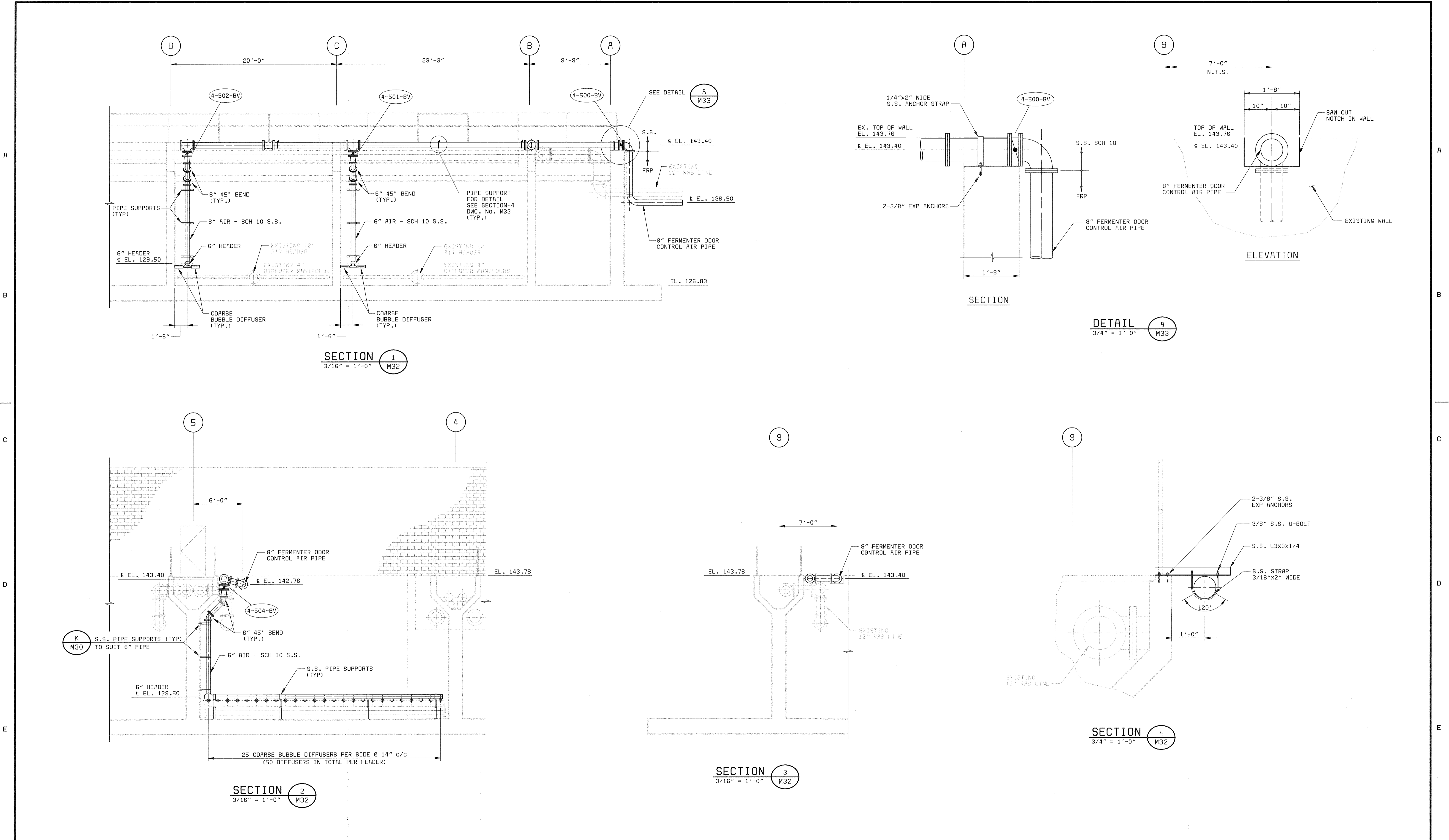
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
98 OF 161

**M32**

D569472  
F058472R



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surroy@stantec.com	BLACK & VEATCH LLP Gaithersburg, Maryland  Robert J. Rectanus, Jr. No. 22827 REGISTERED PROFESSIONAL ENGINEER REG. PROF. ENGR. DATE 6/26/00	DES: RVJ DRN: RCF CHK: RVJ DATE: 6/23/00	EAST-WEST PROCESS REACTOR MECHANICAL  ODOR CONTROL AIR PIPING SECTIONS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 99 OF 161  M33
		DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert J. Rectanus, Jr. 6-23-00 CHIEF, BUREAU OF UTILITIES DATE	REVISIONS AND RECORD OF ISSUE NO. BY CK APP	CONTRACT NO. 20-3752	HOWARD COUNTY, MARYLAND

ABBREVIATIONS

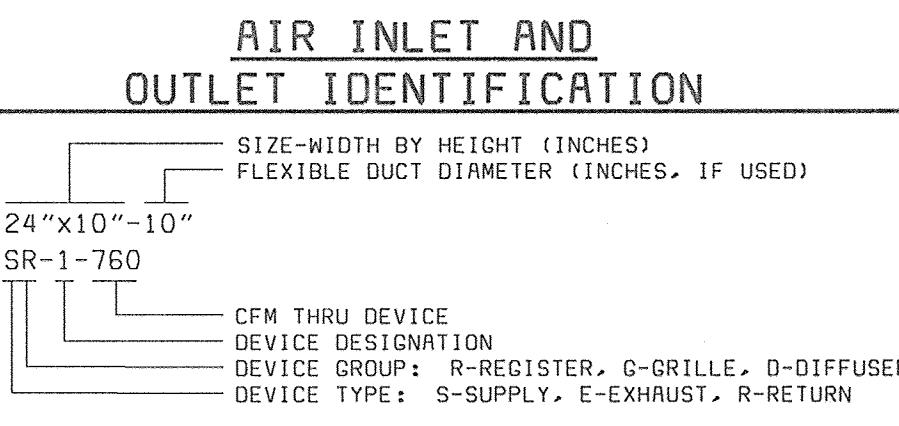
Table of abbreviations for various mechanical components including pumps, valves, ducts, and electrical symbols.

GENERAL MECHANICAL NOTES

- 1. THIS IS A GENERAL LEGEND AND ABBREVIATION SHEET FOR PLUMBING AND HVAC DRAWINGS...
2. FOR ROOFTOP EQUIPMENT CURB, FLUES, AND FLASHING DETAILS, SEE ARCHITECTURAL DRAWINGS.
3. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL EQUIPMENT BASE DETAILS.
4. "SCREENED" DELINEATION DENOTES EXISTING AND NEW FACILITIES AND IS FOR REFERENCE ONLY...

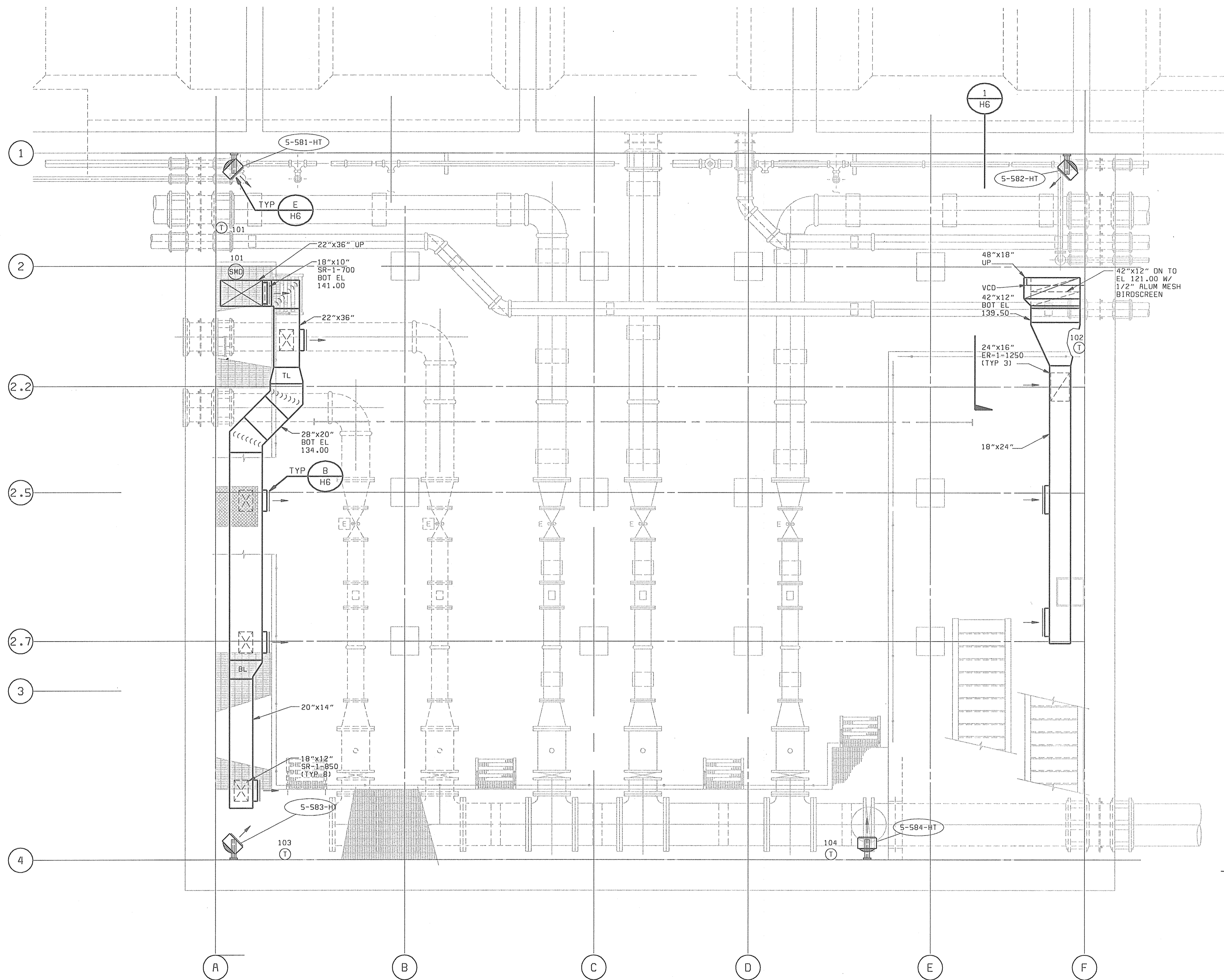
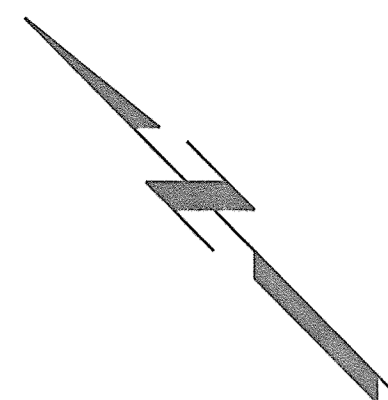
LEGEND

Legend section containing symbols and descriptions for General, Pipe Fittings, Valves, HVAC, Plumbing, Controls and Instrumentation, and Fire Protection.



Project information block including Department of Public Works, Black & Veatch logo, project title 'HVAC/PLUMBING NORTH BASIN COMPLEX', and drawing title 'LEGEND, ABBREVIATIONS, AND GENERAL NOTES'.

056472 056472a




**GENERAL NOTES:**

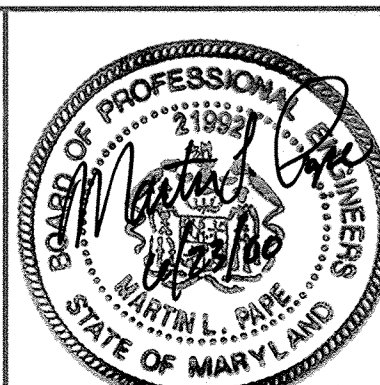
1. ALL DUCTWORK SHOWN ON THIS SHEET SHALL BE GALVANIZED SHEET METAL.

**BASEMENT PLAN**  
1/4" = 1'-0"

XREF: 58472-205-BB-FR-A0000556  
 XREF: 58472-101-FR-M-A0000550

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
  
*Robert Benning* 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE


**BLACK & VEATCH**<sup>LLP</sup>  
 Gaithersburg, Maryland  
  
*Martin J. Pope* 6/23/00  
 REG. PROF. ENGR. DATE

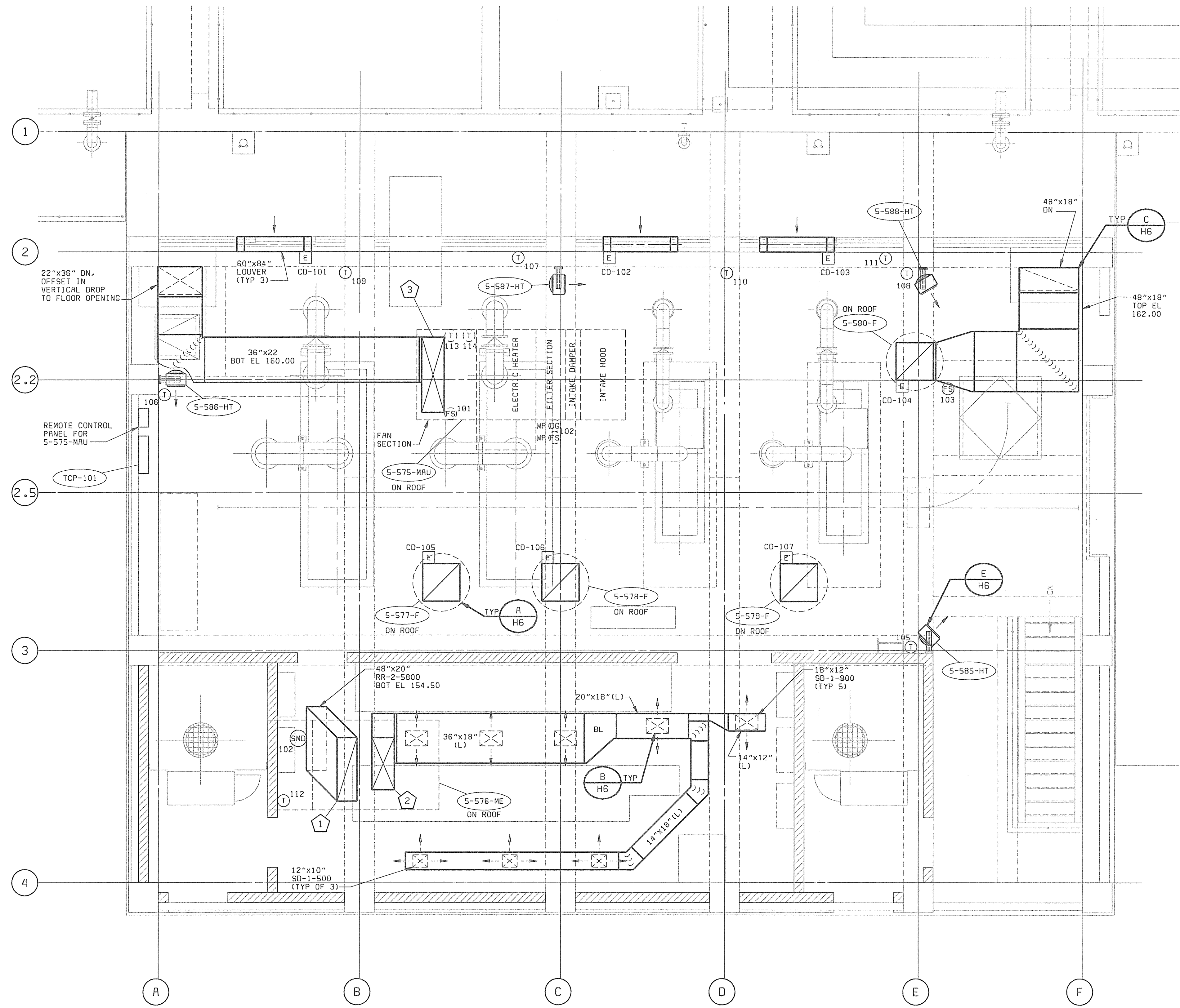
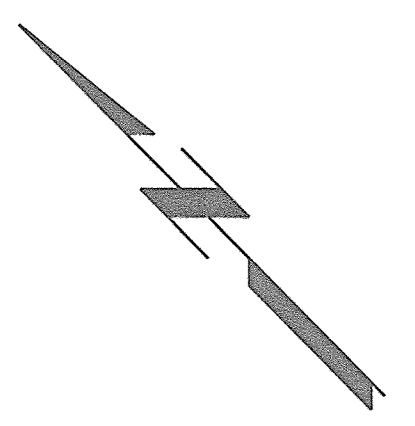


DES: GWP, HX					
DRN: BDL, LDW					
CHK: JEP					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

HVAC  
 NORTH BLOWER BUILDING  
  
**BASEMENT PLAN**

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION  
  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
  
 HOWARD COUNTY, MARYLAND

SCALE  
 AS  
 SHOWN  
  
 SHEET  
 101 OF 161  
  
**H2**



**OPERATING FLOOR PLAN**  
1/4" = 1'-0"

**GENERAL NOTES:**

1. SEE ARCHITECTURAL DRAWINGS FOR ROOF EQUIPMENT CURBING DETAILS.
2. ALL DUCTWORK SHOWN ON THIS SHEET SHALL BE GALVANIZED SHEET METAL.

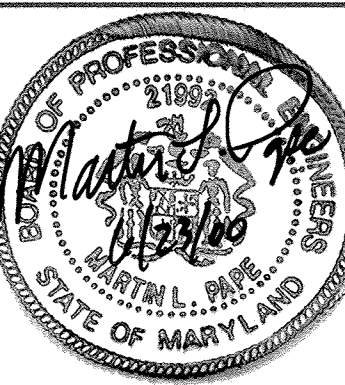
**PLAN NOTES:**

- ① TRANSITION FROM UNIT RETURN CONNECTION TO 48"x20"(L) IN VERTICAL, OFFSET AND ROUTE 48"x20"(L) THRU ELECTRICAL ROOMS ROOF.
- ② TRANSITION FROM UNIT SUPPLY CONNECTION TO 36"x18" IN VERTICAL, OFFSET AND ROUTE 36"x18"(L) THRU ELECTRICAL ROOMS ROOF.
- ③ TRANSITION FROM UNIT SUPPLY CONNECTION TO 36"x22" IN VERTICAL DROP.

XREF: 58472-205-BB-PR-R0000585  
XREF: 58472-101-PR-R0000550  
DSE472  
PDS8472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
*Robert Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

 **BLACK & VEATCH**<sup>LLP</sup>  
Gaithersburg, Maryland  
  
*Martin J. Fazio* 4/23/00  
REG. PROF. ENGR. DATE



DES: GWP, HX							
DRN: BDL, LDW							
CHK: JEP							
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	

**HVAC**  
**NORTH BLOWER BUILDING**  
  
**OPERATING FLOOR PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 102 OF 161  
**H3**

A

B

C

D

A

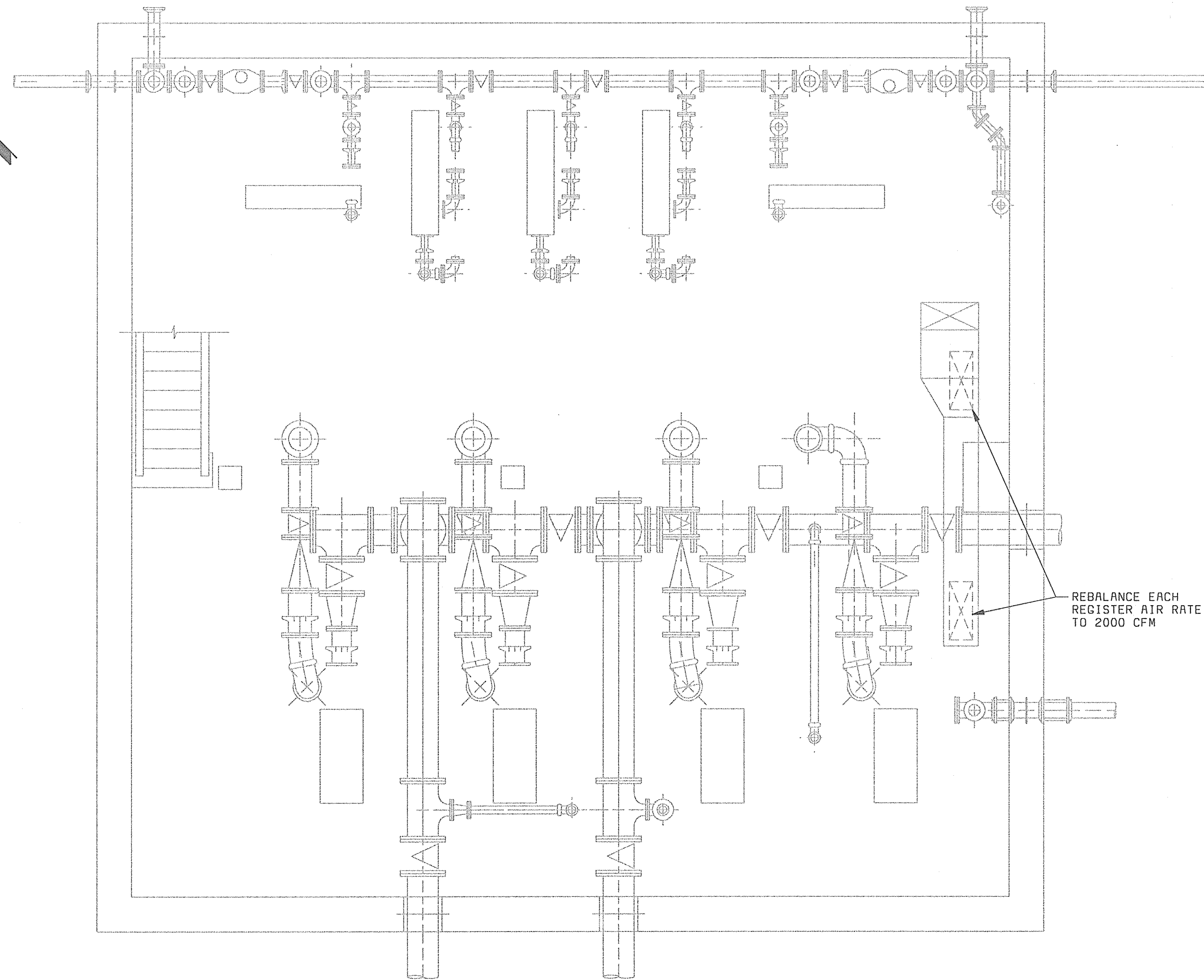
B

C

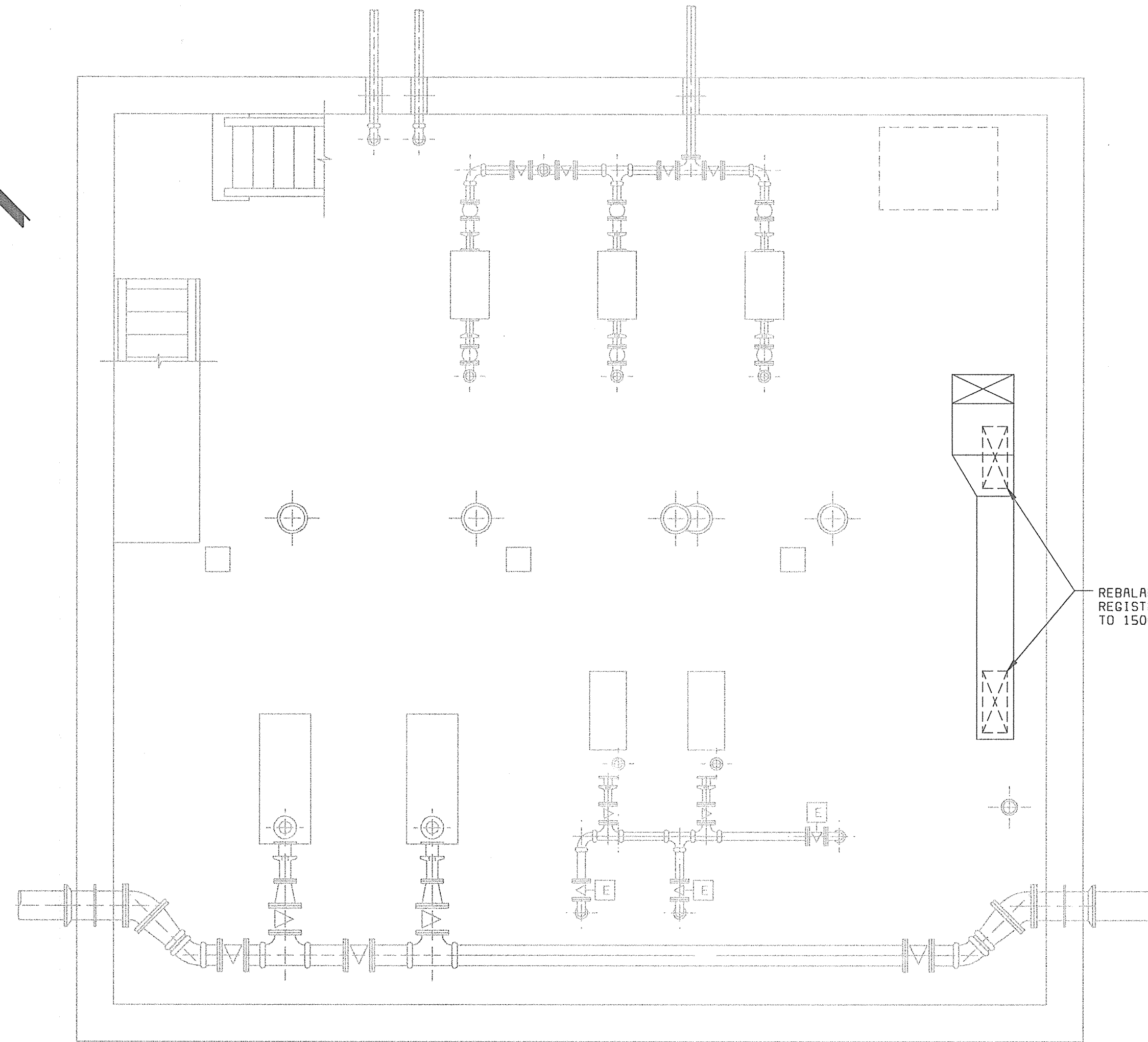
D

E

F



**LOWER LEVEL FLOOR PLAN - EL 124.00**  
1/4" = 1'-0"



**UPPER LEVEL FLOOR PLAN - EL 134.00**  
1/4" = 1'-0"

XREF: 58472-101-ASPS-H-R0000205  
 XREF: 58472-101-ASPS-H-R0000180  
 m

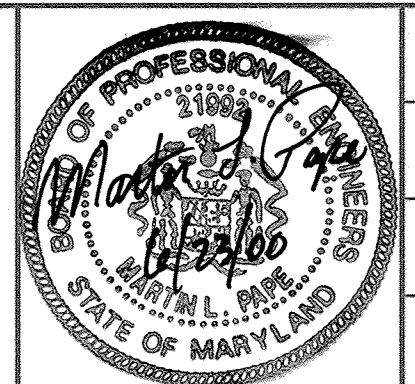
06/23/00  
 FDS8472R

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Beniger* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Master J. Page* 6/23/00  
REG. PROF. ENGR. DATE



DES: GWP.HX									
DRN: BDL.LDW									
CHK: JEP									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**HVAC**  
NORTH GALLERY

**LOWER LEVEL FLOOR AND  
UPPER LEVEL FLOOR PLANS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

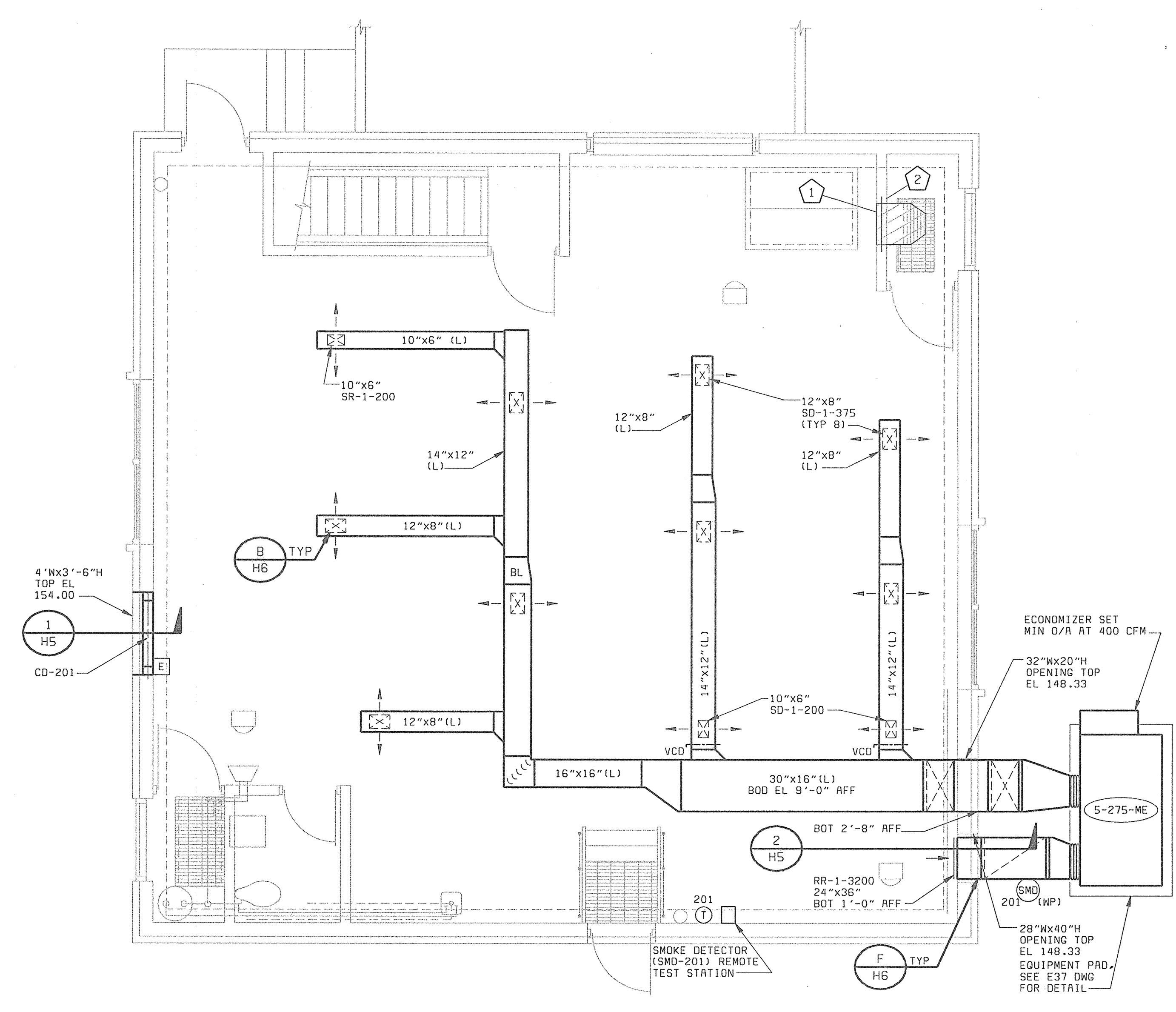
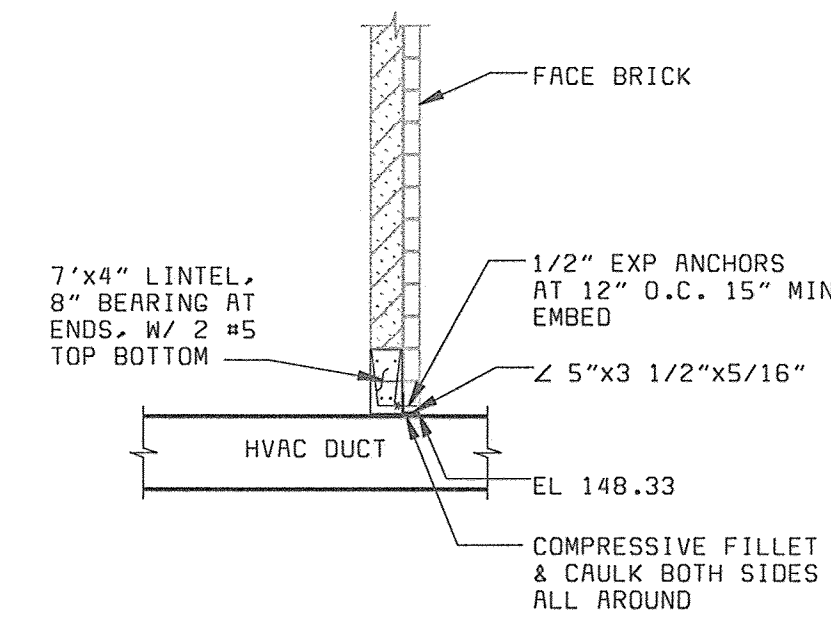
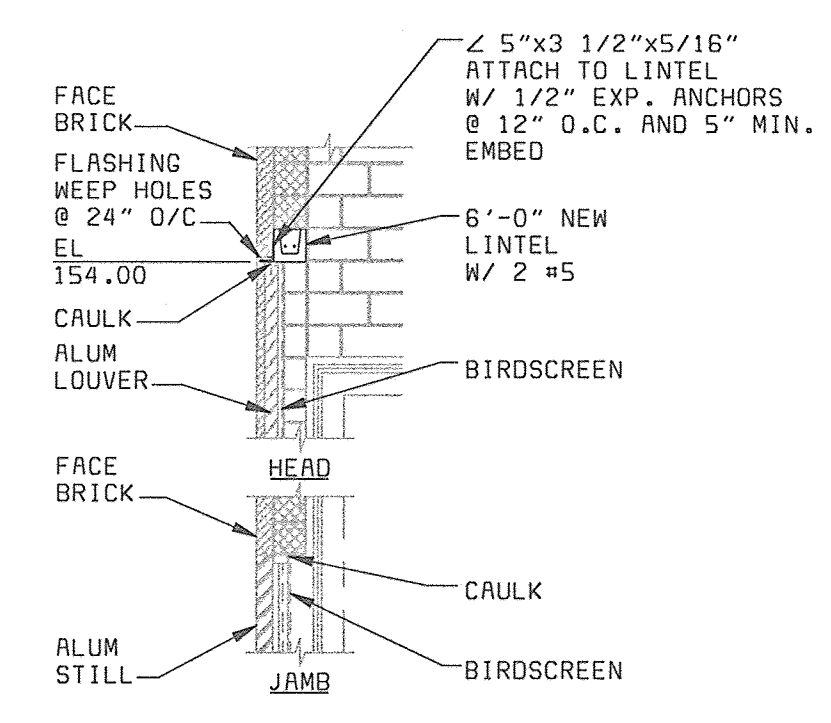
SCALE  
AS  
SHOWN

SHEET  
103 OF 161

**H4**

A  
B  
C  
D

A  
B  
C  
D



- GENERAL NOTES:**
- ALL DUCTWORK SHOWN ON THIS SHEET SHALL BE GALVANIZED SHEET METAL.
- PLAN NOTES:**
- REMOVE EXISTING 24"x24" REGISTER, DUCT, DUCT HEATER AND FAN. FILL THE WALL OPENING WITH MASONRY BLOCKS TO MATCH EXISTING WALL.
  - 6" MASONRY WALL.

XREF: 58472-106-RSPS-E-R0000674

058472  
F058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Matthew P. Reed* 6/23/00  
REG. PROF. ENGR. DATE



DES: GWP, HX									
DRN: BDL, LDW									
CHK: JEP									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

HVAC  
NORTH GALLERY

OPERATING LEVEL

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

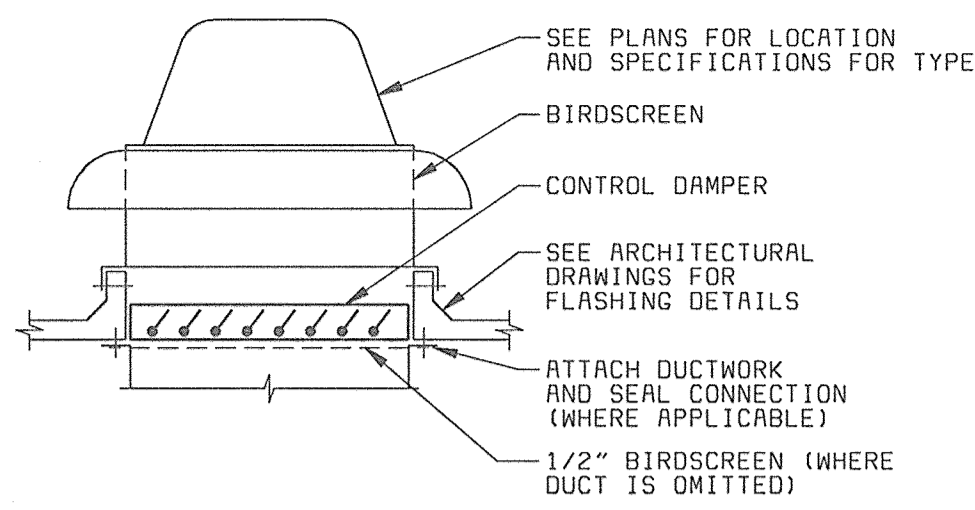
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

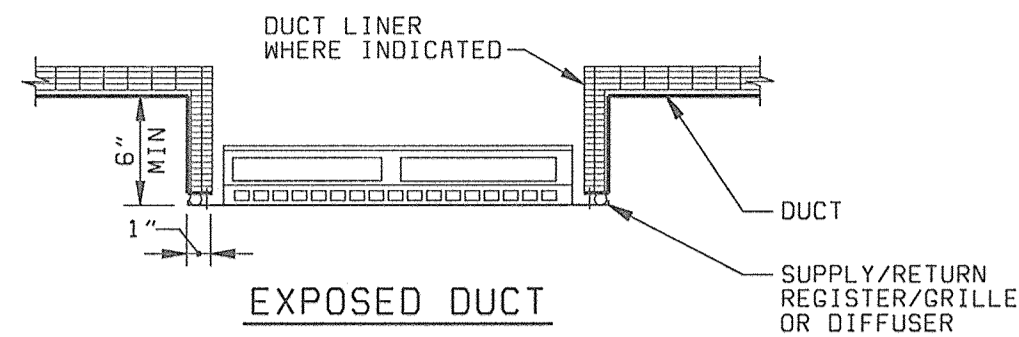
SHEET  
104 OF 161

H5

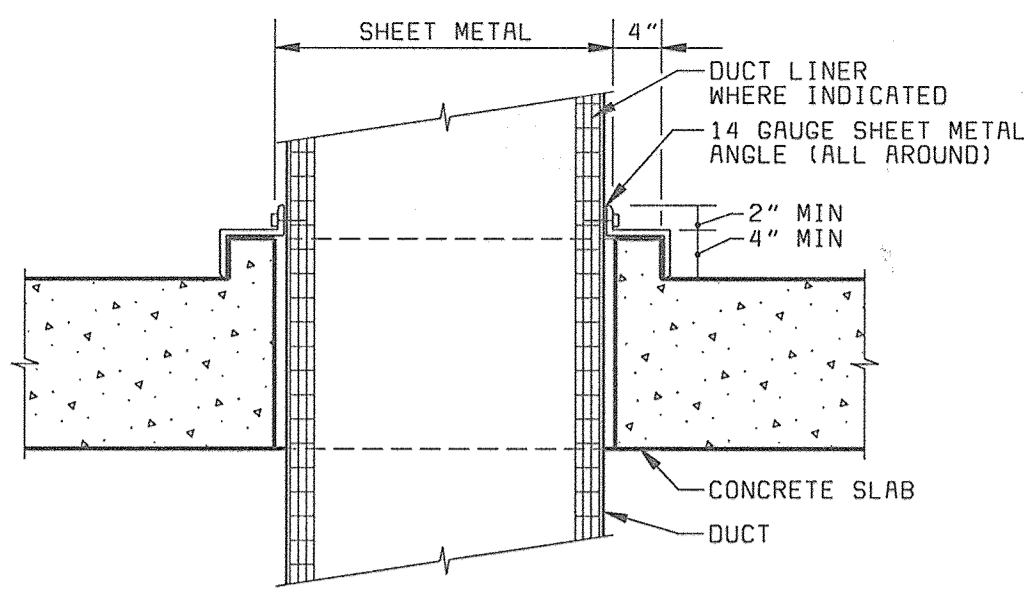




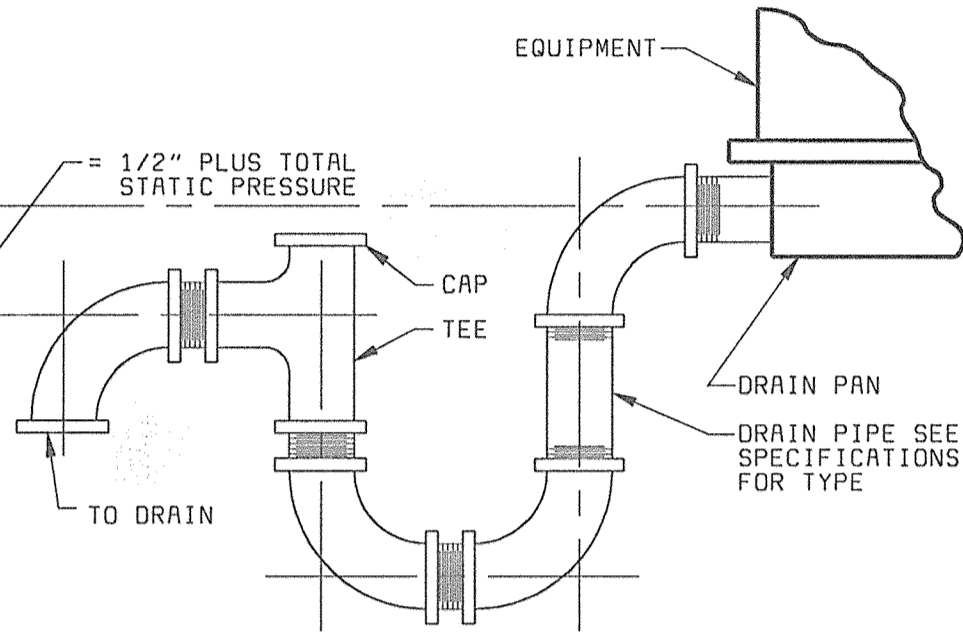
**POWER ROOF VENTILATOR** (A)  
 NO SCALE (H3)



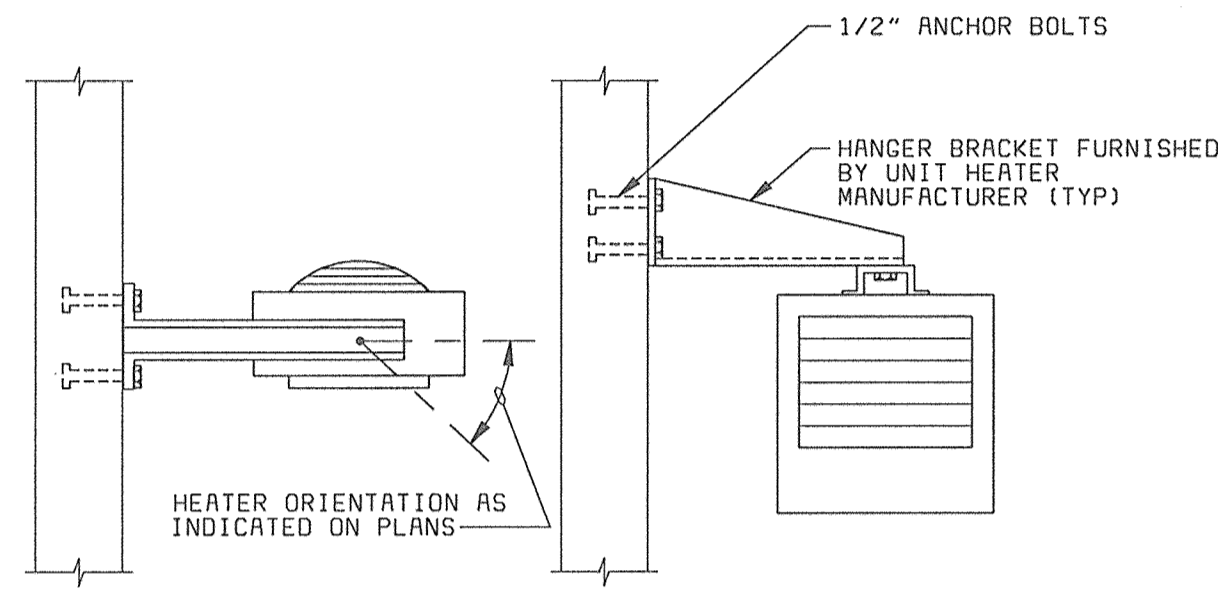
**REGISTER/GRILLE** (B)  
 NO SCALE (H2, H3, H5)



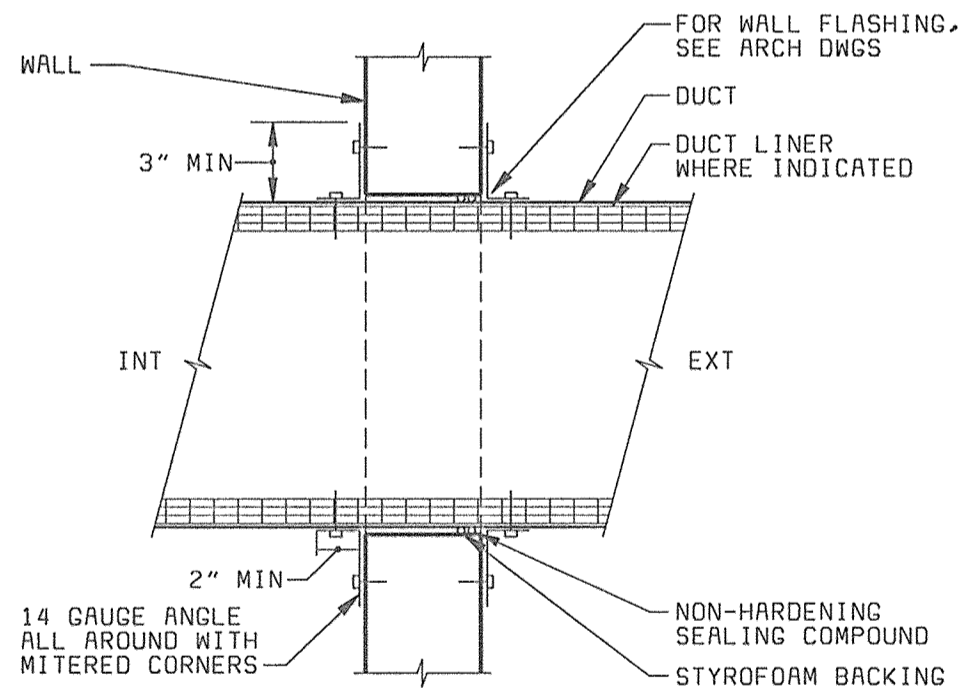
**DUCT FLOOR SLEEVE** (C)  
 NO SCALE (H3)



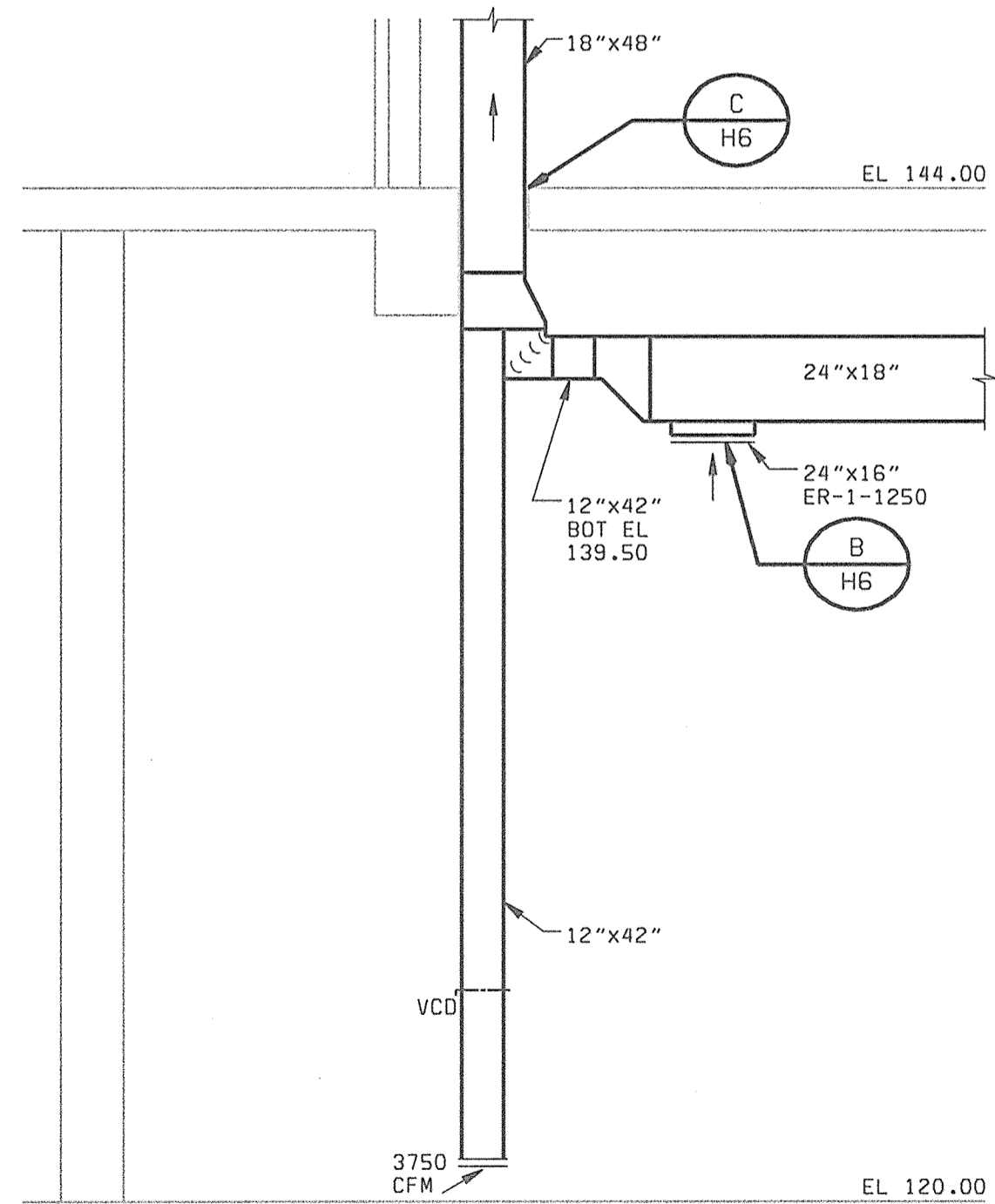
**DRAIN PAN TRAP** (D)  
 NO SCALE (H3, H5)



**ELECTRIC UNIT HEATER SUPPORT** (E)  
 NO SCALE (H2, H3)



**WALL PENETRATION** (F)  
 NO SCALE (H5)



**SECTION 1**  
 1/4" = 1'-0" (H2)

**AIR OUTLET & INLET DEVICE SCHEDULE**

SYMBOL	MODEL	FRAME/BORDER	MATERIAL	FINISH	DAMPER TYPE	ACCESSORIES	REMARKS
SR-1	301FS	SURFACE	ALUMINUM	ALUMINUM	OPPOSED BLADE		
SD-1	250-AA	SURFACE	ALUMINUM	ALUMINUM	OPPOSED BLADE		
ER-1	350ZFS	SURFACE	ALUMINUM	ALUMINUM	OPPOSED BLADE		
RR-1	350ZFS	SURFACE	ALUMINUM	ALUMINUM	OPPOSED BLADE		
RR-2	50F	SURFACE	ALUMINUM	ALUMINUM	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

**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
5-577-F	BLOWER BLDG	9600	0.375	3	480/3	30	B	210	1,3
5-578-F	BLOWER BLDG	9600	0.375	3	480/3	30	B	210	1,3
5-579-F	BLOWER BLDG	9600	0.375	3	480/3	30	B	210	1,3
5-580-F	BLOWER BLDG	7500	0.5	2	480/3	30	B	210	1,3

DRIVE NOTES: D - DIRECT  
 B - BELT

REMARKS: (1) - CONTROL DAMPER  
 (2) - PROPELLER  
 (3) - CENTRIFUGAL

**HEATER SCHEDULE**

UNIT NO	LOCATION	AIRFLOW (CFM)	AIR PD (IN WG)	OUTPUT CAPACITY		WATER FLOW (GPM)	WATER PD (FT)	MOTOR HP	POWER SUPPLY VOLTS/PHASE	APPROX WT (LBS)	REMARKS
				(BTUH)	(KW)						
5-581-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-582-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-583-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-584-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-585-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-586-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-587-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	
5-588-HT	BLOWER BLDG	420	-	-	5.0	-	-	1/50	480/3	35	

**MAKEUP AIR UNIT SCHEDULE**

UNIT NO	LOCATION	AIRFLOW (CFM)	ESP (IN WG)	MOTOR HP	POWER SUPPLY VOLTS/PHASE	HEATING CAPACITY (BTUH)	MIN WHEEL DIA (IN)	APPROX WT (LBS)	REMARKS
5-575-MAU	BLOWER BLDG	7500	0.5	5	480/3	415000	15x2	3000	

REMARKS: 1 - FILTER VELOCITY SHALL NOT EXCEED 350 FEET PER MINUTE.

**PACKAGED AIR CONDITIONING UNIT SCHEDULE**

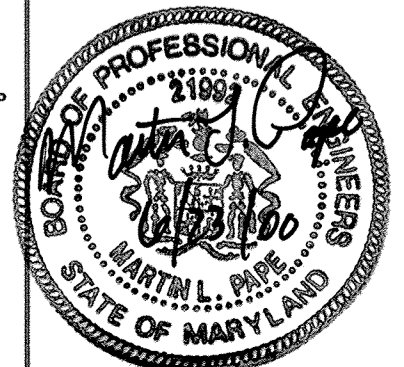
UNIT NO	LOCATION	AIRFLOW (CFM)	ESP (IN WG)	INDOOR FAN MOTOR HP	POWER SUPPLY VOLTS/PHASE	MINIMUM CIRCUIT AMPACITY	COOLING			HEATING			MIN OA (CFM)	APPROX WEIGHT (LBS)	REMARKS	
							EAT (FDB)	CAPACITY (BTUH)	TOTAL	EAT (FDB)	CAPACITY (KW)	AUX CAPACITY (KW)				
5-576-ME	BLOWER BLDG	6000	0.625	5.0	480/3	37.0	85.2	67	139,000	144,000	60	18	-	200	1500	(1), (2)
5-275-ME	N GALLY BLDG	3600	0.625	3.0	480/3	34.0	85.7	67	98,000	108,000	60	18	-	400	1000	(2), (3)

NOTES: 1. OUTDOOR COIL ENTERING AIR TEMPERATURE: COOLING - 95 F  
 2. THE EQUIPMENT SHALL HAVE A MINIMUM EFFICIENCY AT THE ARI STANDARD RATING CONDITIONS OF NOT LESS THAN THE FOLLOWING: 9.0 EER  
 3. BOTH UNITS SHALL HAVE 2 CAPACITY STEP REDUCTIONS.

REMARKS: (1) PROVIDE ECONOMIZER PACKAGE WITH DRY BULB CONTROLLER AND POWER EXHAUST (0.75 HP).  
 (2) PROVIDE LOW AMBIENT COOLING PACKAGE.  
 (3) PROVIDE ECONOMIZER PACKAGE WITH DRY BULB CONTROLLER.

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

**BLACK & VEATCH**  
 Gaithersburg, Maryland



DES: GWP, HX

DRN: BDL, LDW

CHK: JEP

DATE: 6/23/00

**HVAC**  
**NORTH BASIN COMPLEX**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 105 OF 161

**H6**

DETAILS, SECTION AND SCHEDULES

DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP

058472  
 058472A

HVAC - SEQUENCE OF OPERATIONS

EQUIPMENT TAG NUMBER	CONTROL SWITCH TYPE	CONTROL SWITCH LOCATION	AUTOMATIC CONTROL INTERLOCK	CONTROL DAMPER INTERLOCK	EMERGENCY VENTILATION SHUTOFF SWITCH INTERLOCK	GAS DETECTOR INTERLOCK	SMOKE DETECTOR INTERLOCK	HIGH FILTER LOSS	VENT FAN FAILURE	THERMOSTATS			HUMIDITY-STATS	REMARKS
										ROOM	LOW TEMP	SUPPLY		
NOTE 1	NOTE 2	NOTE 3	NOTE 4	NOTE 5	NOTE 6	NOTE 7	NOTE 8	NOTE 9	NOTE 10	NOTE 11	NOTE 12	NOTE 13		
5-575-MAU	O-O	ECP					SMD-101	FS-102	FS-101		T-113	T-114		T-113.114 & FS-101 FURN W/UNIT
5-576-ME	UFT	WM					SMD-102				T-112			T-112 FURN W/UNIT, NOTE 14
5-577-F	O-O-A	TCP-101		CD-101, CD-105							T-109			
5-578-F	O-O-A	TCP-101		CD-102, CD-106							T-110			
5-579-F	O-O-A	TCP-101		CD-103, CD-107							T-111			
5-580-F	O-O-A	TCP-101	5-575-MAU	CD-104			SMD-101		FS-103					
5-581-HT	T	WM									T-101			NOTE 20
5-582-HT	T	WM									T-102			NOTE 20
5-583-HT	T	WM									T-103			NOTE 20
5-584-HT	T	WM									T-104			NOTE 20
5-585-HT	T	WM									T-105			NOTE 20
5-586-HT	T	WM									T-106			NOTE 20
5-587-HT	T	WM									T-107			NOTE 20
5-588-HT	T	WM									T-108			NOTE 20
5-275-ME	UFT	WM		CD-201			SMD-201				T-201			T-201 FURN W/UNIT, NOTE 14

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
- ECP EQUIPMENT CONTROL PANEL

2. CONTROL SWITCH LOCATION

THE FOLLOWING CONTROL SWITCH LOCATION ABBREVIATIONS SHALL APPLY:  
 TCP MOUNTED ON A TEMPERATURE CONTROL PANEL  
 WM WALL MOUNTED INSIDE THE SPACE.

THE CONTROL CONTRACTOR AND SUPPLIER OF THE REMOTE CONTROL PANEL FOR MAKE UP AIR UNIT 5-575-MAU SHALL COORDINATE TO PROVIDE THE REQUIRED NUMBER OF EQUIPMENT INTERLOCKS TO SATISFY THE INDICATED SEQUENCE OF OPERATION.

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. SMOKE DETECTOR INTERLOCK

DUCT MOUNTED SMOKE DETECTORS SMD-101, 102 SHALL SEND SIGNALS OF BOTH "SMOKE DETECTED" AND "SMOKE DETECTOR MALFUNCTION" TO THE SMOKE DETECTOR REMOTE TEST STATION MOUNTED ON THE CONTROL PANEL TCP-101. THE ASSOCIATED EQUIPMENT ITEM AND ALL INTERLOCKED EQUIPMENT SHALL BE DE-ENERGIZED IN THE EVENT SMOKE IS DETECTED.

DUCT MOUNTED SMOKE DETECTOR SMD-201 SHALL SEND SIGNALS OF BOTH "SMOKE DETECTED" AND "SMOKE DETECTOR MALFUNCTION" TO THE SMOKE DETECTOR REMOTE TEST STATION MOUNTED ON THE WALL. THE AIR CONDITIONING UNIT 5-275-ME SHALL BE DE-ENERGIZED IN THE EVENT SMOKE IS DETECTED.

8. HIGH FILTER

THE DIFFERENTIAL PRESSURE SWITCH FS-102 MOUNTED ACROSS THE UNIT FILTER SECTION SHALL SEND AN INDICATION OF DIRTY FILTER CONDITION TO THE CONTROL PANEL TCP-101 WHEN THE PRESSURE DIFFERENCE ACROSS THE FILTER SECTION EXCEEDS 0.5 INCHES WATER COLUMN. A DIRTY FILTER ALARM INDICATING LIGHT SHALL BE PROVIDED ON THE ASSOCIATED CONTROL PANEL.

9. VENTILATION FAILURE

A DUCT MOUNTED DIFFERENTIAL PRESSURE SWITCH SHALL ENERGIZE A "VENTILATION FAILURE" INDICATING LIGHT ON THE FACE OF THE CONTROL PANEL TCP-101 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 AND A "LOW DISCHARGE AIR TEMPERATURE" INDICATING LIGHT ON THE FACE OF CONTROL PANEL TCP-101 SHALL BE ENERGIZED. INDICATION OF "LOW DISCHARGE AIR TEMPERATURE" SHALL BE SENT FROM THE CONTROL PANEL TCP-101 TO THE PLANT CONTROL SYSTEM. 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 THE MAKEUP AIR UNIT SHALL MODULATE THE UNIT OUTPUT CAPACITY TO MAINTAIN THE SUPPLY AIR SETPOINT.

13. NOT USED

14. PACKAGED DRY-BULB ECONOMIZER CONTROLS

THE UNIT SHALL COME WITH FACTORY INSTALLED DRY BULB ECONOMIZER CYCLE CONTROLS WITH 55 F CHANGE OVER AS INDICATED IN THE SPECIFICATIONS. CD-201 SHALL OPEN WHEN ECONOMIZER IS ENERGIZED.

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.

21. TEMPERATURE CONTROL PANEL

TEMPERATURE CONTROL PANEL TCP-101 SHALL BE PROVIDED WITH THE INDICATING LIGHTS, RUNNING LIGHTS, AND SELECTOR SWITCHES AS INDICATED IN THE SEQUENCE OF OPERATIONS. RUNNING LIGHTS SHALL BE PROVIDED FOR EACH CONTROL SWITCH TO INDICATE BOTH ENERGIZED AND DE-ENERGIZED STATUS. INDICATING LIGHT COLORS SHALL BE AS FOLLOWS:

- GREEN - DE-ENERGIZED
- RED - ENERGIZED
- AMBER - ALARM
- WHITE - STATUS

THE TEMPERATURE CONTROL PANEL SHALL BE PROVIDED WITH ALARM CONDITION INDICATING LIGHTS AND ONE ELECTRICALLY ISOLATED CONTACT FOR ANY ALARM CONDITION. THE ISOLATED CONTACT SHALL CLOSE IN THE EVENT THAT ANY ALARM CONDITION EXISTS, AND SHALL PROVIDE REMOTE ANNUNCIATION OF THE COMMON ALARM CONDITION TO THE PLANT CONTROL SYSTEM.

UNLESS OTHERWISE NOTED, THE CONTROL PANEL SHALL PROVIDE ALL NECESSARY CONTROLS AND INTERLOCKS TO OPERATE ALL ASSOCIATED CONTROL EQUIPMENT WITH THE EQUIPMENT ITEM AS INDICATED IN THE SEQUENCE OF OPERATION. THE CONTROL PANEL SHALL PROVIDE A SINGLE ISOLATED CONTACT OUTPUT WHICH CLOSURES TO ENERGIZE THE EQUIPMENT ITEM AND OPENS TO DE-ENERGIZE THE EQUIPMENT ITEM.

22. THERMOSTAT SETPOINTS

THERMOSTAT SETPOINTS SHALL BE AS FOLLOWS UNLESS INDICATED OTHERWISE.

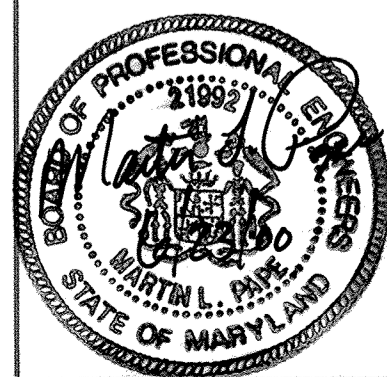
- LOW TEMPERATURE THERMOSTATS - 35°F
- HEATERS - 40°F
- MAKEUP AIR SUPPLY HEATING - 40°F
- VENTILATING EQUIPMENT - 100°F
- AIR CONDITIONED AREAS - 85°F
- COOLING - 85°F
- HEATING - 60°F

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*R. J. Bump* 6/29/00  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
 Calithersburg, Maryland

*Martin J. Pore* 6/23/00  
 REG. PROF. ENGR. DATE



DES: GWP:HX														
DRN: BDL:LDW														
CHK: JEP														
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP								

HVAC  
 NORTH BASIN COMPLEX

SEQUENCE OF OPERATION

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752

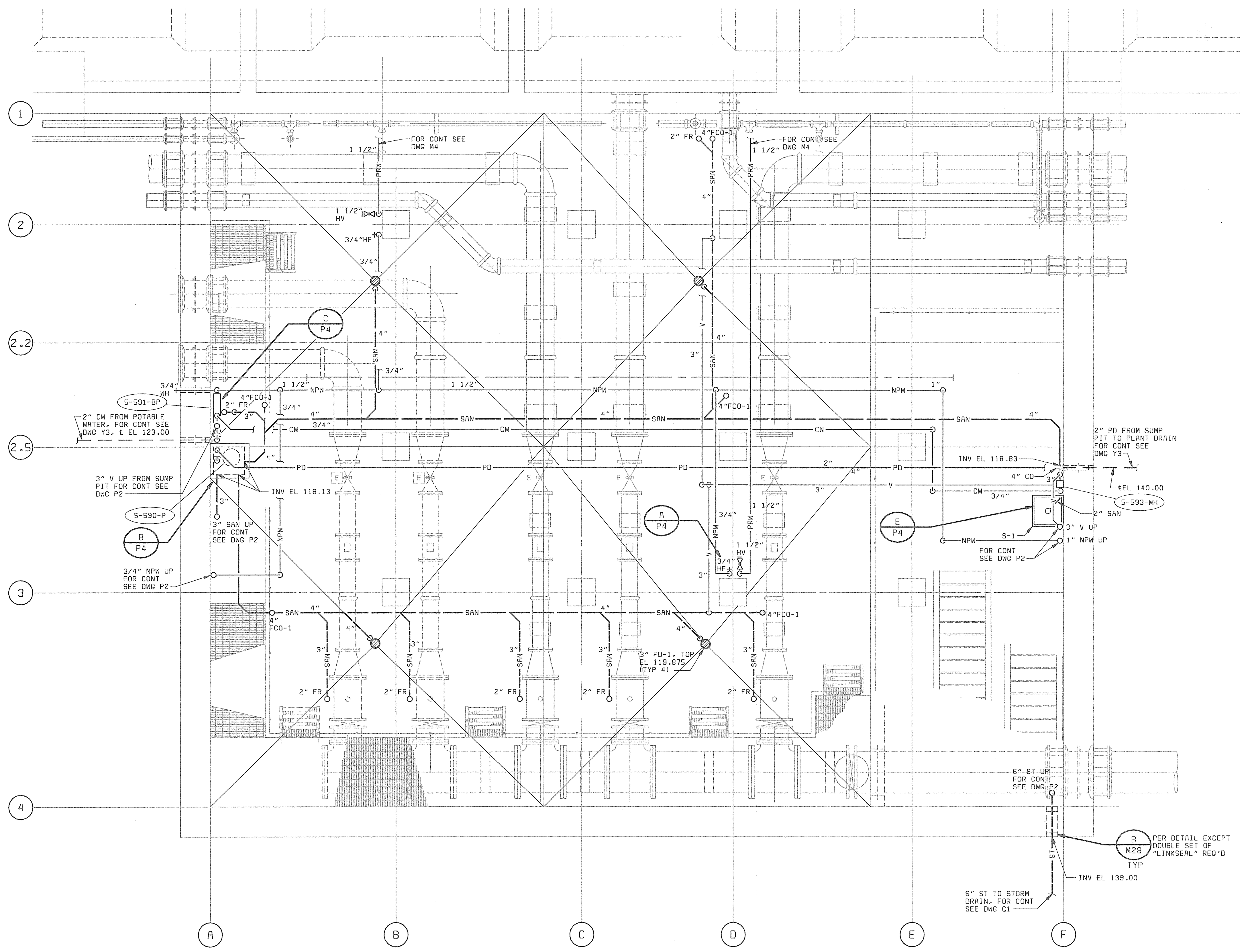
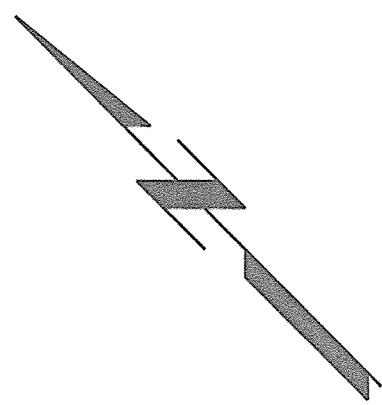
HOWARD COUNTY, MARYLAND

SCALE  
 AS  
 SHOWN

SHEET  
 106 OF 161

H7

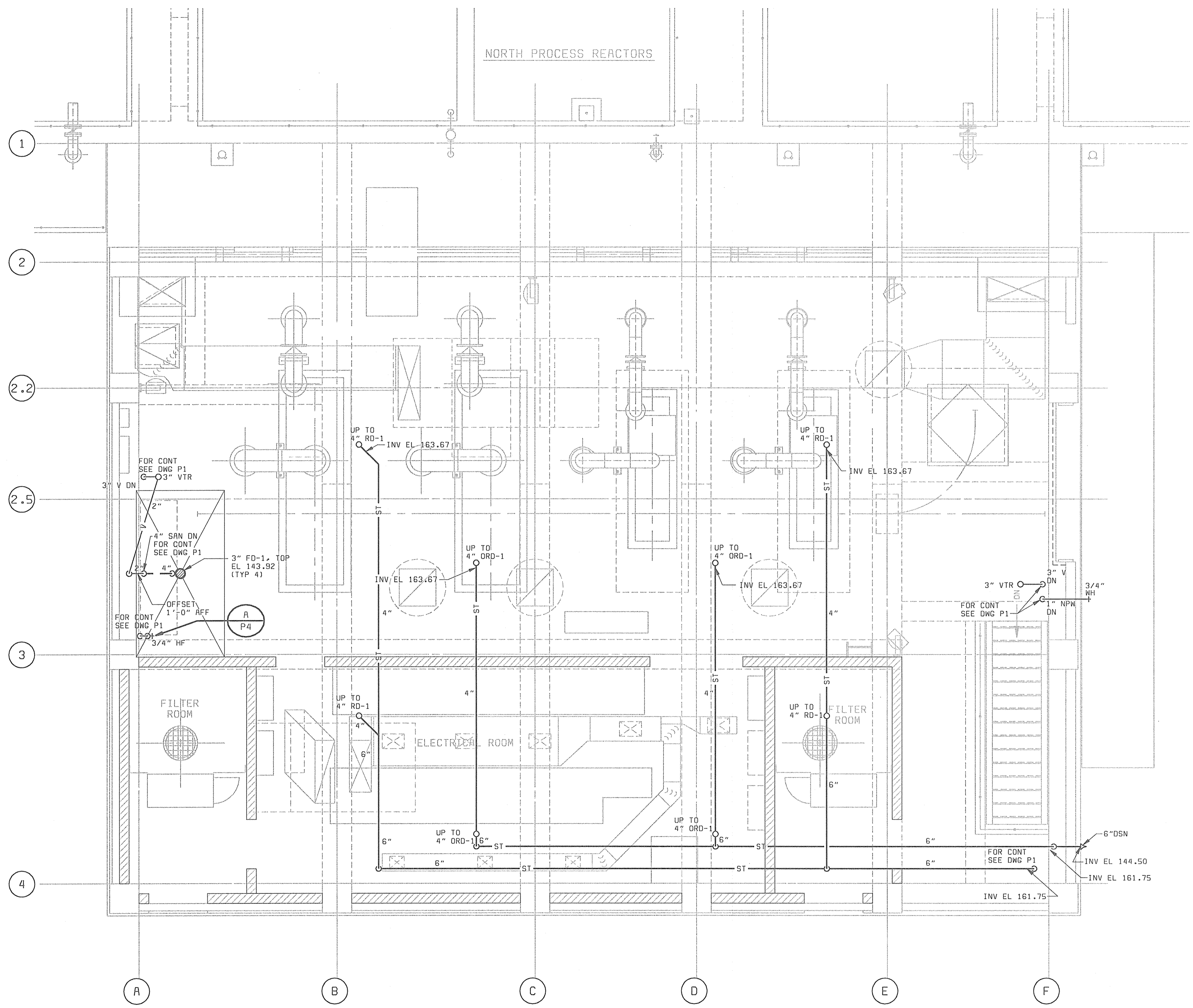
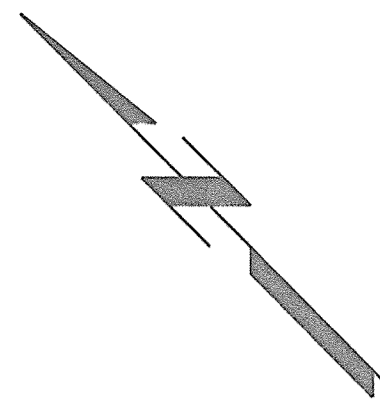
058472  
 F058472A



**BASEMENT PLAN**  
1/4" = 1'-0"

XREF: 58472-104-BB-N-0000666  
 XREF: 58472-205-BB-PR-0000556  
 XREF: 58472-101-PR-N-0000550

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert Berman 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	<b>BLACK &amp; VEATCH</b> <sup>LLP</sup> Gaithersburg, Maryland  M. D. Rife 6/23/00 REG. PROF. ENGR. DATE		DES: JPC DRN: JPC CHK: DWN DATE: 6/23/00	DATE: _____ REVISIONS AND RECORD OF ISSUE	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>CK</th> <th>APP</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	BY	CK	APP									<b>PLUMBING</b> NORTH BLOWER BUILDING  <b>BASEMENT PLAN</b>	<b>LITTLE PATUXENT WATER RECLAMATION PLANT</b> ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 107 OF 161  <b>P1</b>
NO.	BY	CK	APP																	



OPERATING FLOOR PLAN  
1/4" = 1'-0"

XREF: 58472-101-PP-W-R0000550  
XREF: 58472-205-BB-PR-R0000555  
XREF: 58472-104-BB-H-R0000558

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
Robert J. Bowers 6-29-07  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland  
  
Martin J. Pope 6/23/00  
REG. PROF. ENGR. DATE

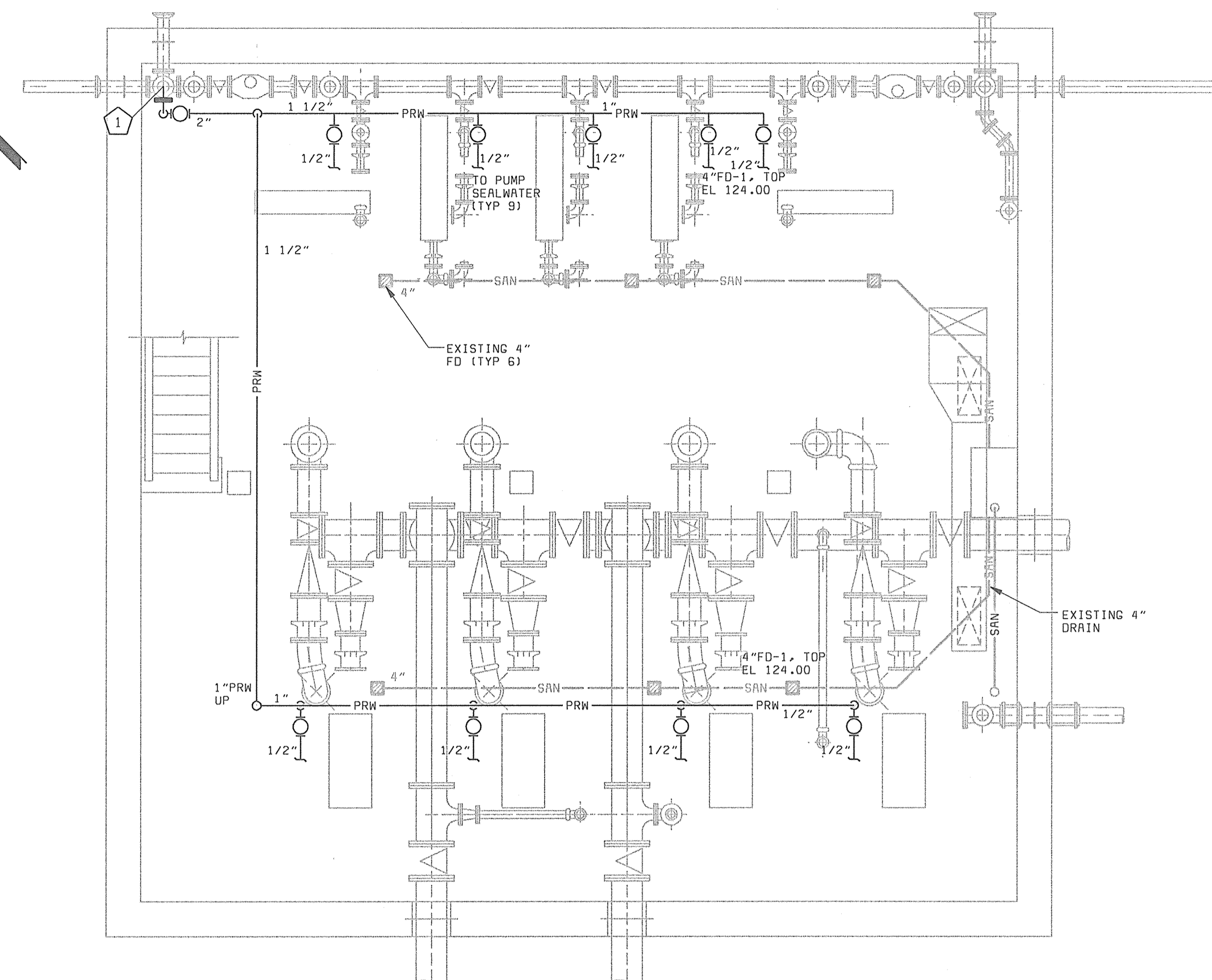


DES: JPC											
DRN: JPC											
CHK: DWN											
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP					

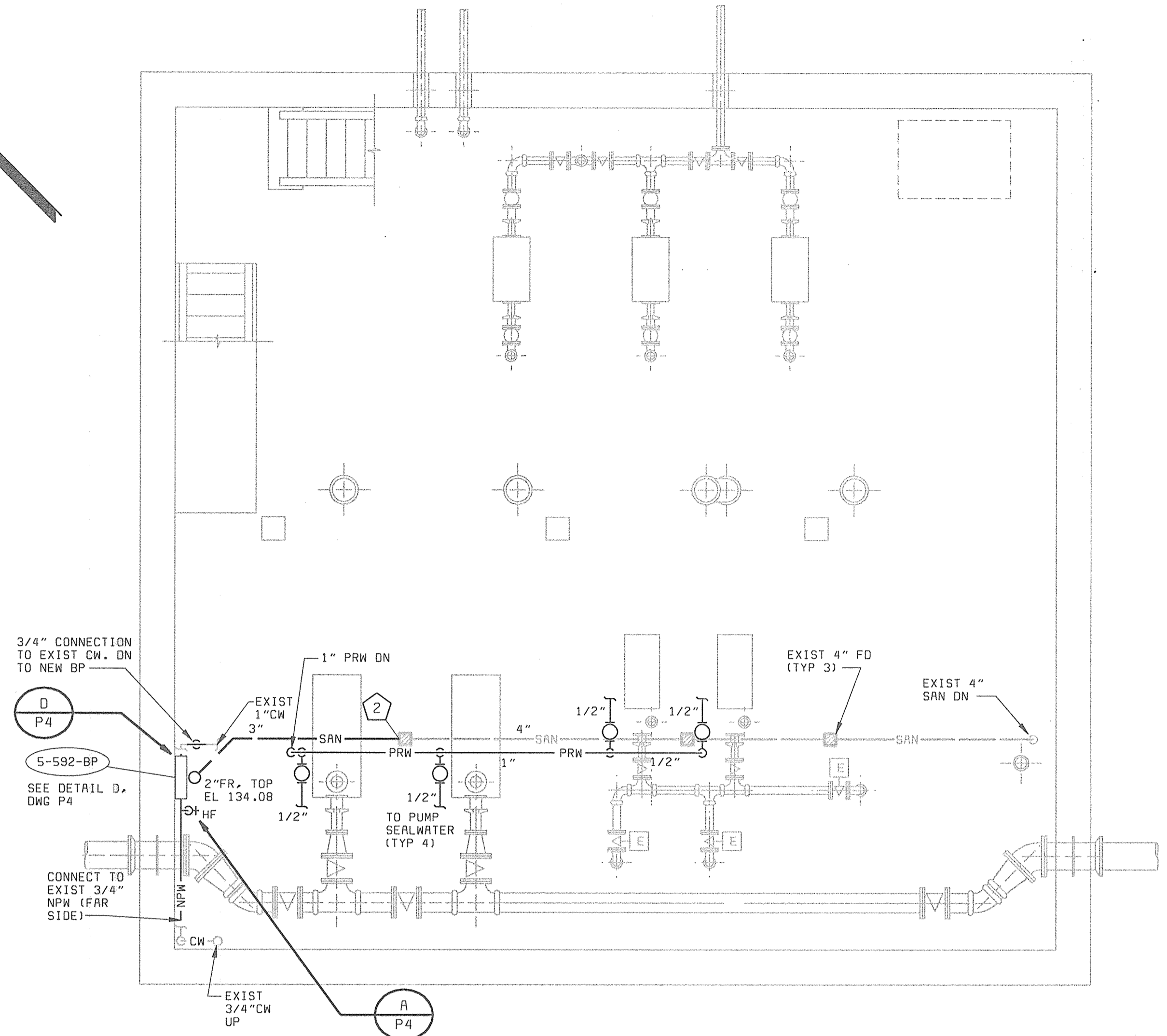
PLUMBING  
NORTH BLOWER BUILDING  
  
OPERATING FLOOR PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN  
  
SHEET  
108 OF 161  
  
P2



**LOWER LEVEL FLOOR PLAN - EL 124.00**  
1/4" = 1'-0"



**UPPER LEVEL FLOOR PLAN - EL 134.00**  
1/4" = 1'-0"

**PLAN NOTES:**

- 1 DRILL AND TAP 4" BLIND FLANGE FOR 2" PRW SUPPLY.
- 2 MODIFY EXISTING DRAIN TO INSTALL NEW 3" DRAIN & 2" FR.

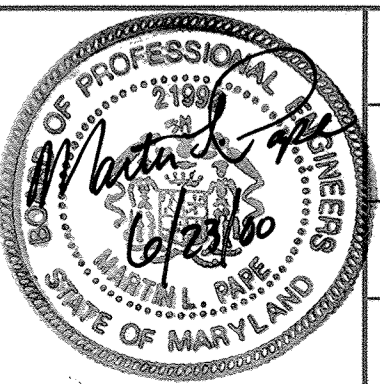
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert A. Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
GaitHERSburg, Maryland

*Matthew R. Ryan* 6/23/00  
REG. PROF. ENGR. DATE



DES: JPC							
DRN: JPC							
CHK: DWN							
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	

**PLUMBING**  
NORTH GALLERY

**LOWER LEVEL FLOOR AND  
UPPER LEVEL FLOOR PLANS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

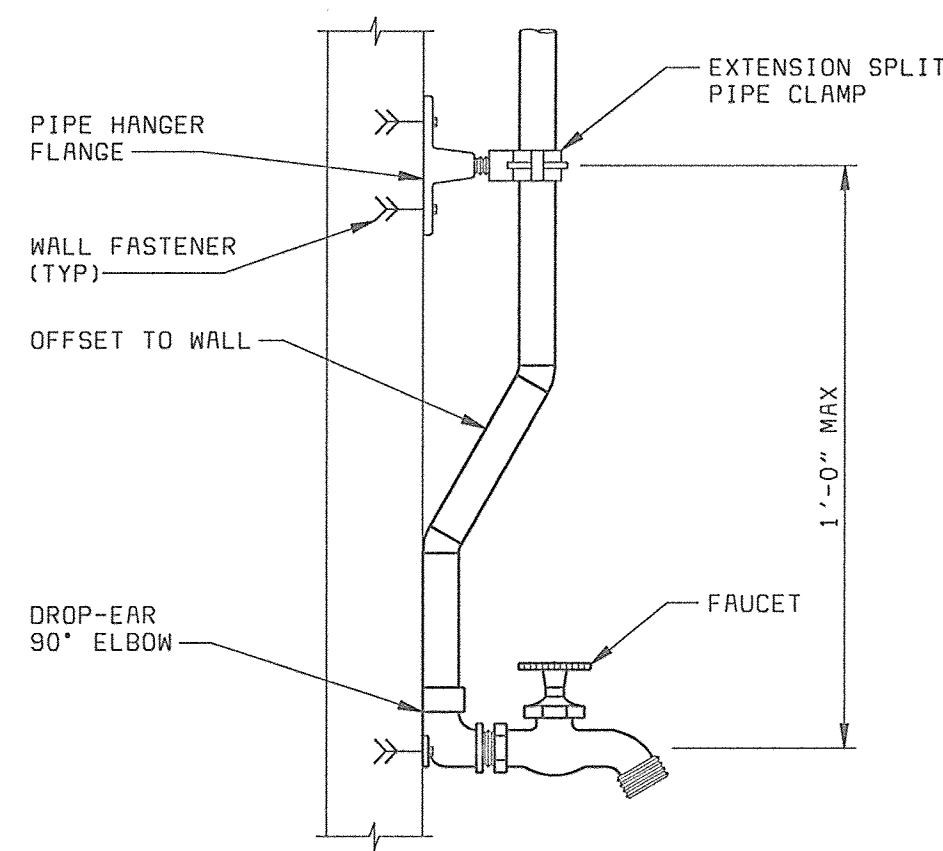
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

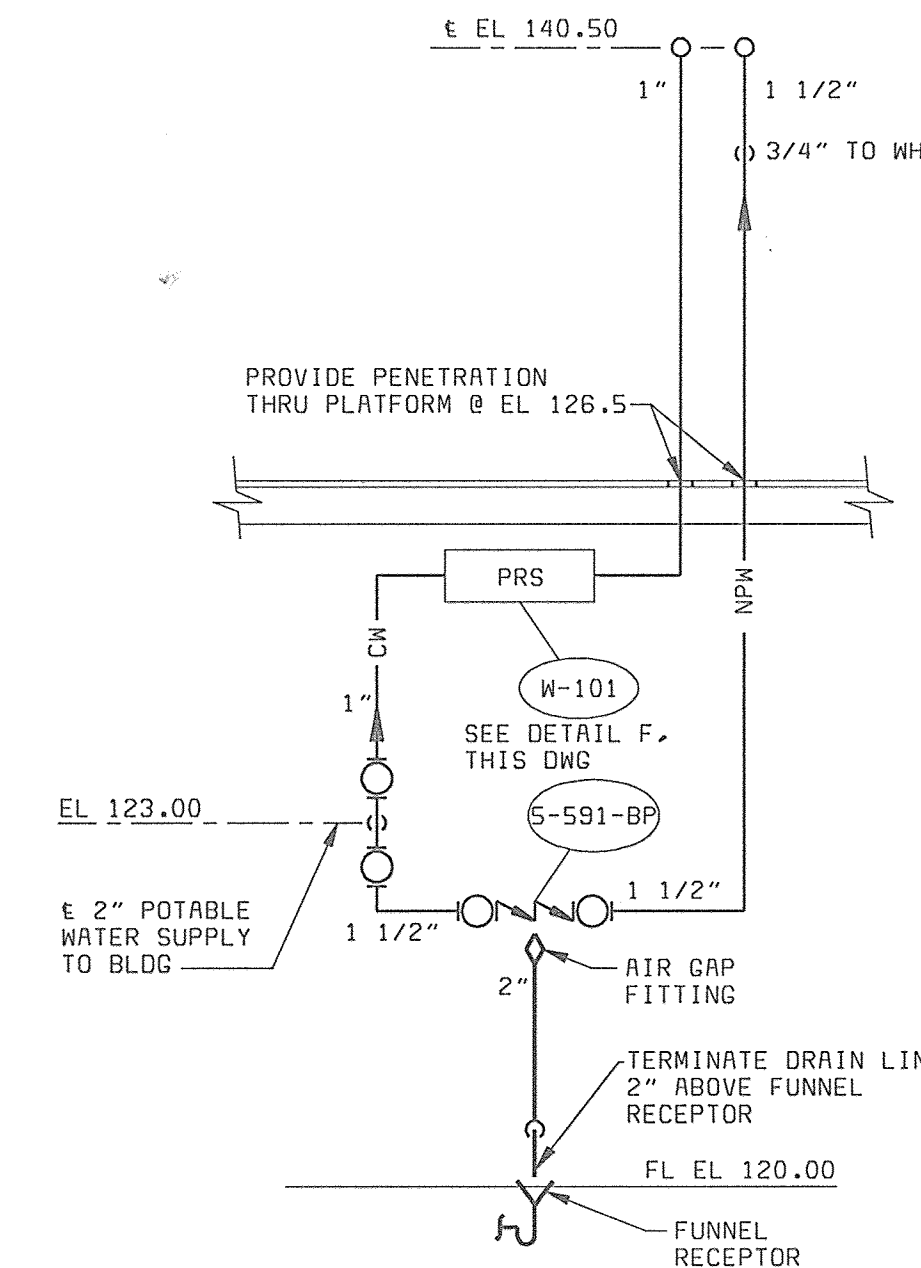
SHEET  
109 OF 161

**P3**



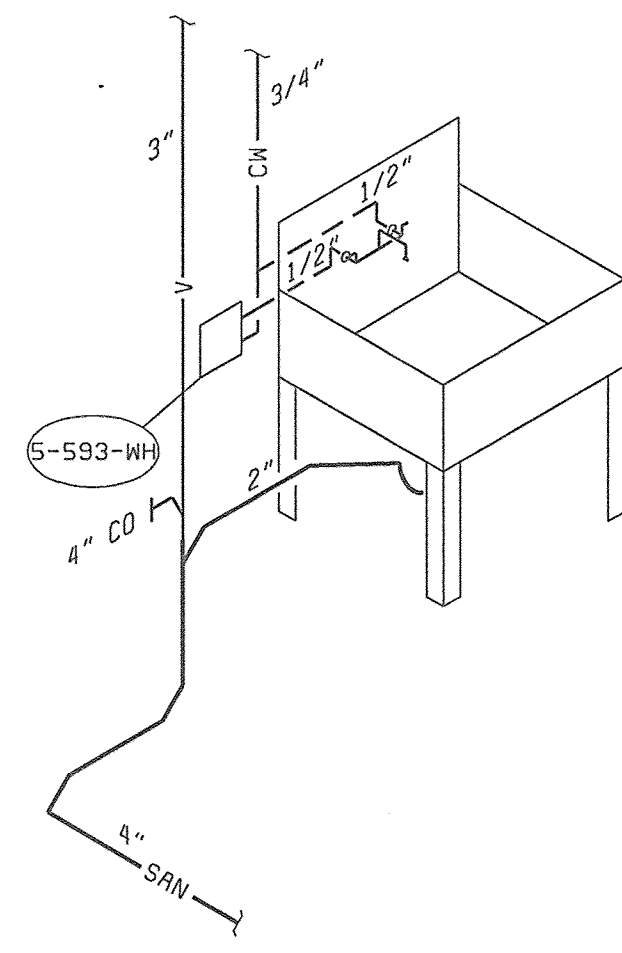
**HOSE FAUCET PIPE MOUNTING DETAIL A**

NO SCALE  
 NOTES:  
 1. MOUNTING SHALL BE SIMILAR FOR HOSE VALVES.  
 2. TOP SUPPLY SHOWN, BOTTOM SUPPLY SIMILAR.



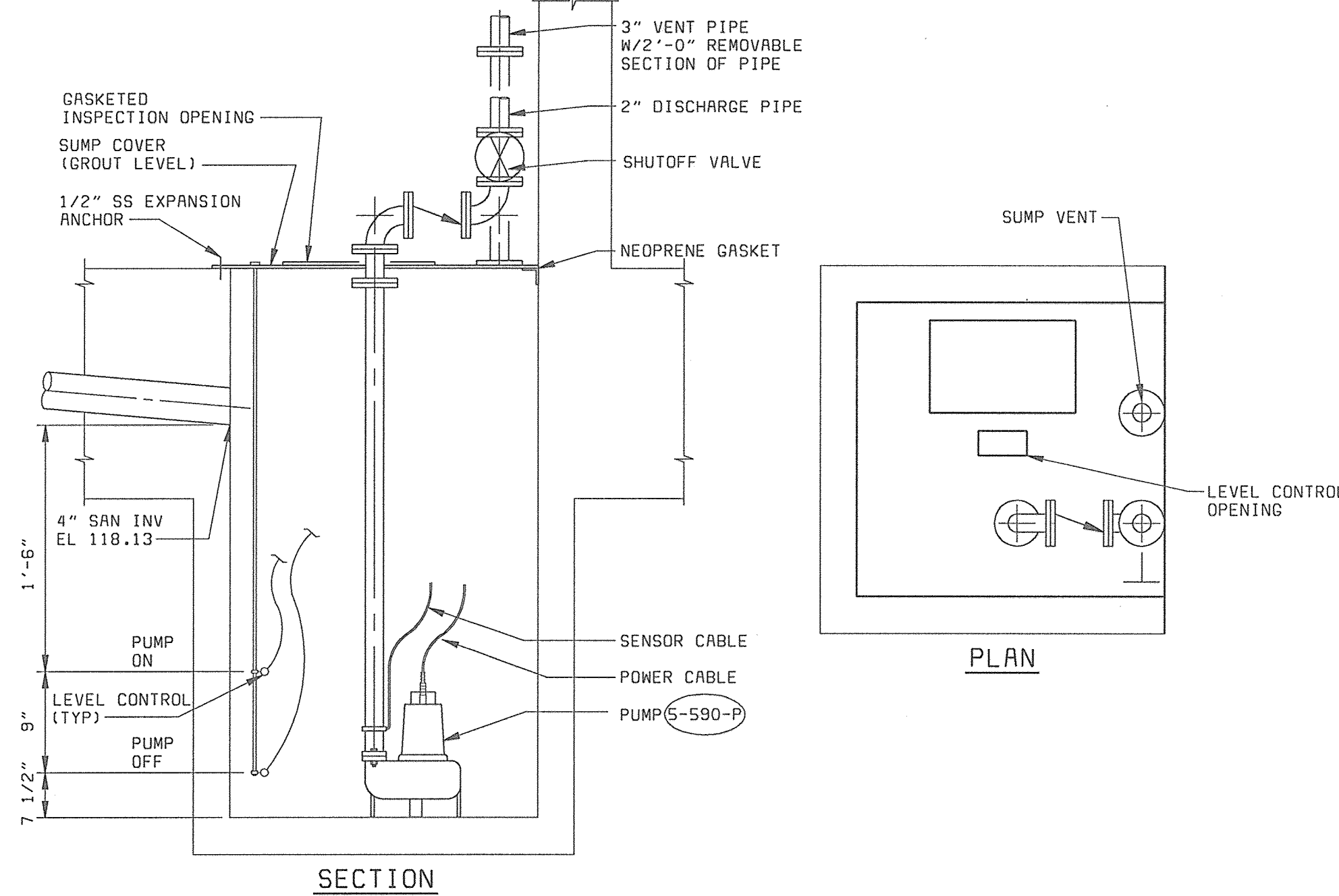
**BLOWER BUILDING WATER SUPPLY SCHEMATIC C**

NO SCALE



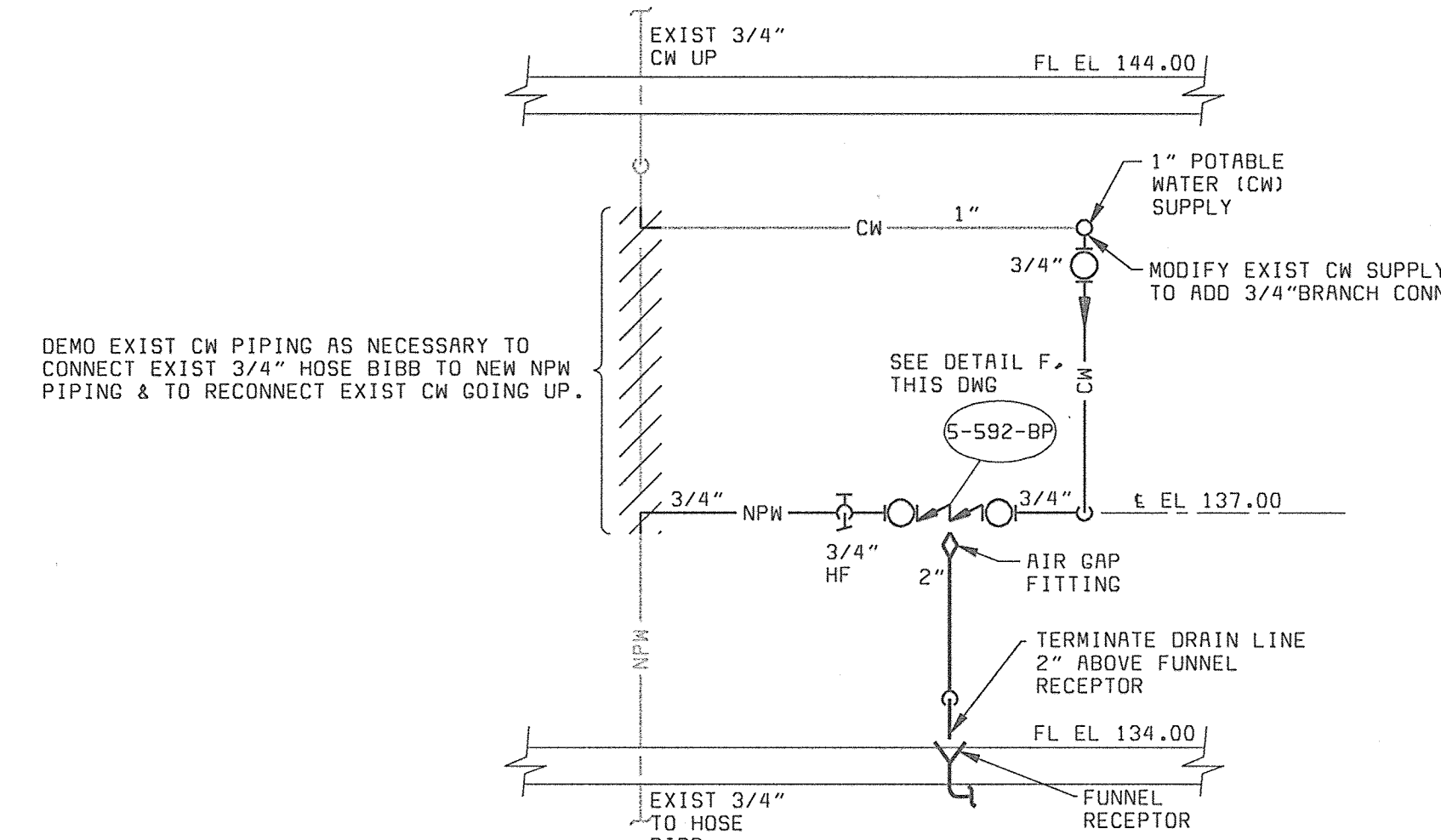
**HAND SINK PIPING DETAIL E**

NO SCALE



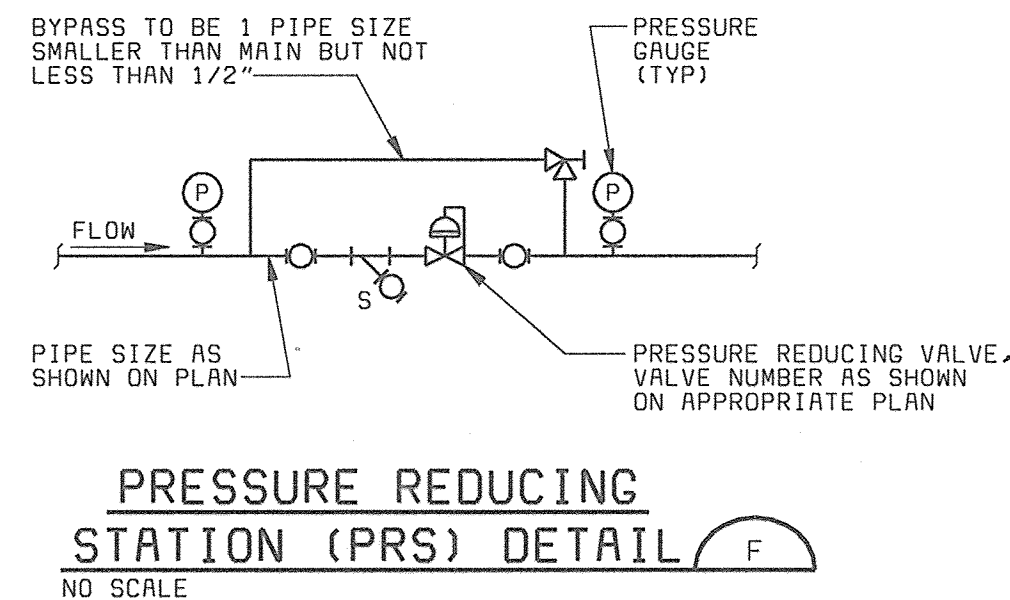
**SUMP PUMP DETAIL B**

NO SCALE



**NON POTABLE WATER SUPPLY SCHEMATIC D**

NO SCALE



**PRESSURE REDUCING STATION (PRS) DETAIL F**

NO SCALE

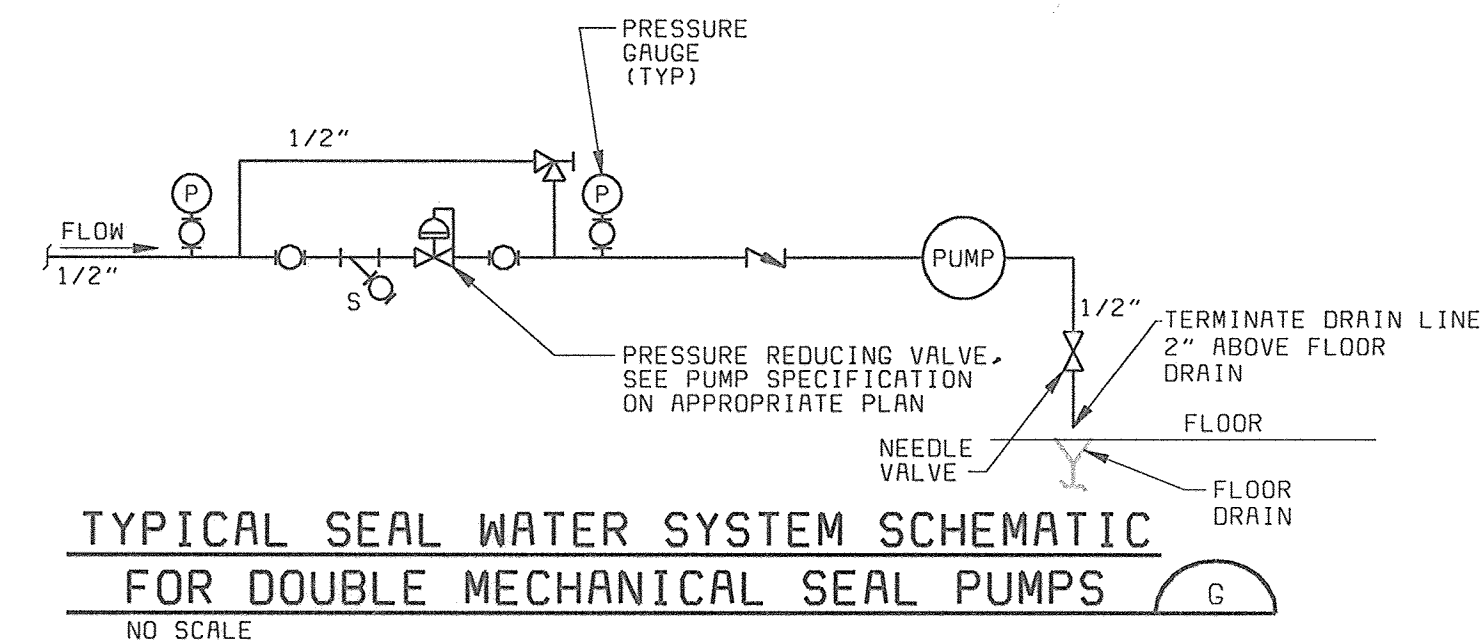
PLUMBING FIXTURE AND EQUIPMENT SCHEDULE			
LABEL	DESCRIPTION	MANUFACTURER MODEL	REMARKS
S-1	HAND SINK, 24 X 24 INCHES, SINGLE BOWL, 12 INCHES DEEP, 14 GAUGE STAINLESS STEEL, 2 HOLE PUNCHED, STAINLESS STEEL STRAINER, FLOOR MOUNTED	JUST SINK-SB-124 JUST FAUCET-JS-48-TA1 JUST STRAINER-J-35-BLA-2	
FD-1	MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, LOOSE SET CAST IRON GRATE.	SMITH 2310 SERIES	
FCO-1	HEAVY DUTY FLOOR CLEANOUT, SECURED ROUND ADJUSTABLE NICKEL BRONZE TOP.	SMITH 4100 SERIES	
RD-1	CAST IRON PRIMARY ROOF DRAIN.	SMITH 1010-E SERIES	
ORD-1	CAST IRON OVERFLOW ROOF DRAIN	SMITH 1070-E SERIES	
5-593-WH	ELECTRIC INSTANTANEOUS WATER HEATER, 1.0 GPM, 54 F RISE, 8.0 KW, 208 VOLT, 1 PHASE, 60 HZ.	CHRONOMITE-SERIES S-80	
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 LEVEL OFF LEAD LAG	HWA	REMARKS
5-590-P	NORTH BLOWER BUILDING	SUBMERSIBLE SEWAGE PUMP	32	41	1750	1 1/2	460/3	2	-	-	1,2,3
REMARKS (1) PUMPS - WEIL MODEL 2424 (2) CONTROL TYPE - 1S (3) SUMP COVER AND INSPECTION OPENING											

BACKFLOW PREVENTER SCHEDULE						
UNIT NO	SERVICE	BODY SIZE IN	MAXIMUM FLOW GPM	MAXIMUM DELTA P PSI	MANUFACTURER MODEL	REMARKS
5-591-BP	NONPOTABLE WATER SUPPLY	1 1/2	30	10	WATTS SERIES 909	REDUCED PRESSURE TYPE
5-592-BP	NONPOTABLE WATER SUPPLY	3/4	10	10	WATTS SERIES 909	REDUCED PRESSURE TYPE
REMARKS:						

PRESSURE REDUCING VALVE SCHEDULE										
UNIT NO	SERVICE	TYPE*	FLOW RATE**			REDUCED PRESSURE SETPOINT PSIG	INLET PRESSURE PSIG		MINIMUM PRESSURE AT MAX FLOW PSIG	REMARKS
			MAX	ORD	MIN		MAX	MIN		
W-101	CW TO POTABLE WATER SYSTEM	DA	10	3	0	70	100	80	65	
W-501	PRW TO SPRAY HEADER, PR5	DA	40	20	10	10	75	50	10	SHOWN ON MECH DWG M7
W-502	PRW TO SPRAY HEADER, PR6	DA	40	20	10	10	75	50	10	SHOWN ON MECH DWG M7
W-503	PRW TO SPRAY HEADER, PR7	DA	40	20	10	10	75	50	10	SHOWN ON MECH DWG M7
*DA - DIRECT ACTING      PQ - PILOT OPERATED **UNITS ARE SCFH FOR GAS, SCFM FOR AIR, AND GPM FOR WATER. "ORD" INDICATES ORDINARY FLOW RATE.										
REMARKS:										

PLUMBING FIXTURE CONNECTION SCHEDULE					
SYMBOL	FIXTURE	WATER		SANITARY	
		HOT	COLD	WASTE	VENT
S	HAND SINK	1/2"	1/2"	2"	-



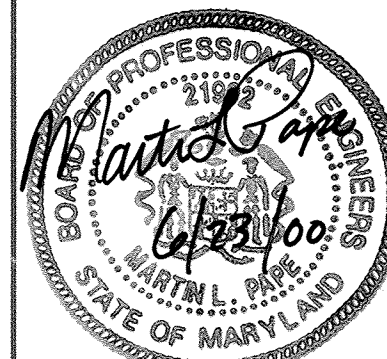
**TYPICAL SEAL WATER SYSTEM SCHEMATIC FOR DOUBLE MECHANICAL SEAL PUMPS G**

NO SCALE

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

**BLACK & VEATCH**  
 Gaithersburg, Maryland

*Martin R. Pope*  
 REG. PROF. ENGR.      4/23/00      DATE



DES: JPC									
DRN: JPC									
CHK: DWN									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

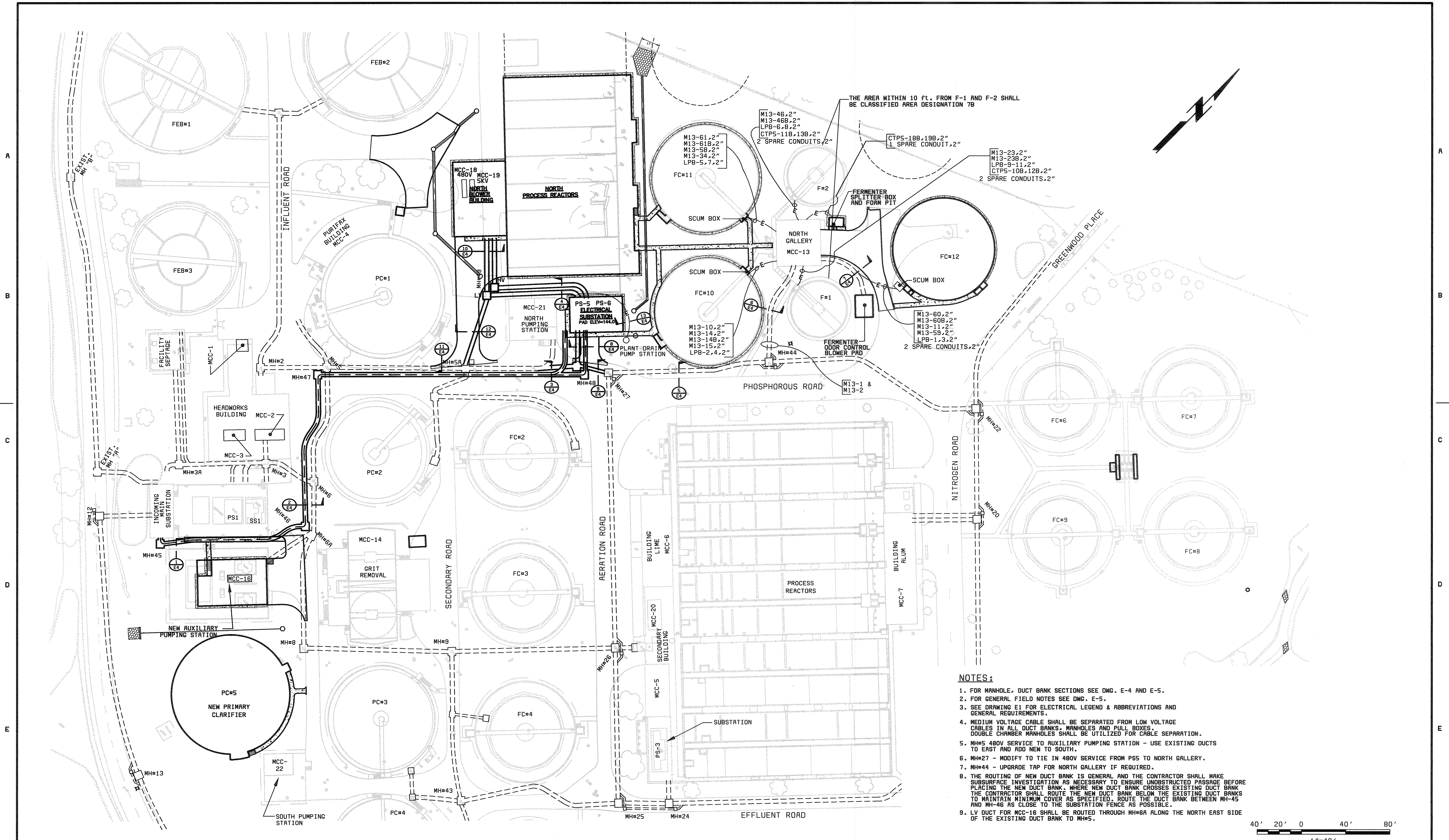
HVAC/PLUMBING  
 PLUMBING  
 SCHEMATICS, DETAILS,  
 AND SCHEDULES

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

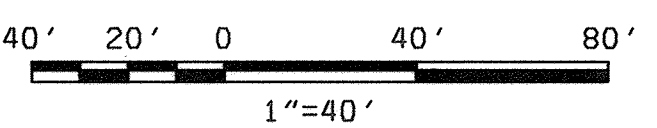
SCALE AS SHOWN  
 SHEET 110 OF 161  
 P4

058472  
 FD58472A





- NOTES:**
1. FOR MANHOLE, DUCT BANK SECTIONS SEE DWG. E-4 AND E-5.
  2. FOR GENERAL FIELD NOTES SEE DWG. E-5.
  3. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  4. MEDIUM VOLTAGE CABLE SHALL BE SEPARATED FROM LOW VOLTAGE CABLES IN ALL DUCT BANKS, MANHOLES AND PULL BOXES. DOUBLE CHAMBER MANHOLES SHALL BE UTILIZED FOR CABLE SEPARATION.
  5. MH#5 480V SERVICE TO AUXILIARY PUMPING STATION - USE EXISTING DUCTS TO EAST AND ADD NEW TO SOUTH.
  6. MH#27 - MODIFY TO TIE IN 480V SERVICE FROM PSS TO NORTH GALLERY.
  7. MH#44 - UPGRADE TAP FOR NORTH GALLERY IF REQUIRED.
  8. THE ROUTING OF NEW DUCT BANK IS GENERAL AND THE CONTRACTOR SHALL MAKE SUBSURFACE INVESTIGATION AS NECESSARY TO ENSURE UNOBSTRUCTED PASSAGE BEFORE PLACING THE NEW DUCT BANK. WHERE NEW DUCT BANK CROSSES EXISTING DUCT BANK THE CONTRACTOR SHALL ROUTE THE NEW DUCT BANK BELOW THE EXISTING DUCT BANKS TO MAINTAIN MINIMUM COVER AS SPECIFIED. ROUTE THE DUCT BANK BETWEEN MH#45 AND MH#46 AS CLOSE TO THE SUBSTATION FENCE AS POSSIBLE.
  9. LV DUCT FOR MCC-16 SHALL BE ROUTED THROUGH MH#6A ALONG THE NORTH EAST SIDE OF THE EXISTING DUCT BANK TO MH#5.



CADD FILE DIR: C:\BLACK&VEATCH\E-2.DWG  
 PLOT DATE: 06/21/2000  
 DSB#72  
 0586472

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND	<b>LACH ELECTRIC CORPORATION</b> Baltimore, Maryland	<b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland	DES: L.K. DRN: M.F.F. CHK: DATE: 6/23/00	ELECTRICAL  <b>SITE PLAN</b> NORTH BNR PROCESS TRAIN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET <b>112 OF 161</b>  <b>E2</b>
Robert Benjamin 6-21-00 CHIEF, BUREAU OF UTILITIES DATE	D. Kukreja 6-21-00 REG. PROF. ENGR. DATE	REG. PROF. ENGR. DATE	DATE: 6/23/00 DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP	1"=40'		E2

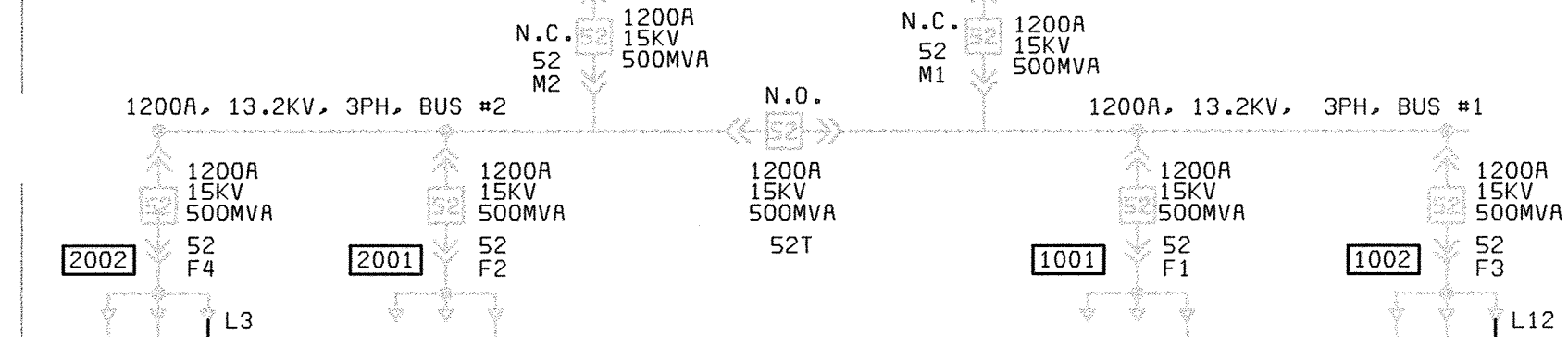


BALTIMORE GAS & ELECTRIC 13.2 KV

INCOMING SERVICE

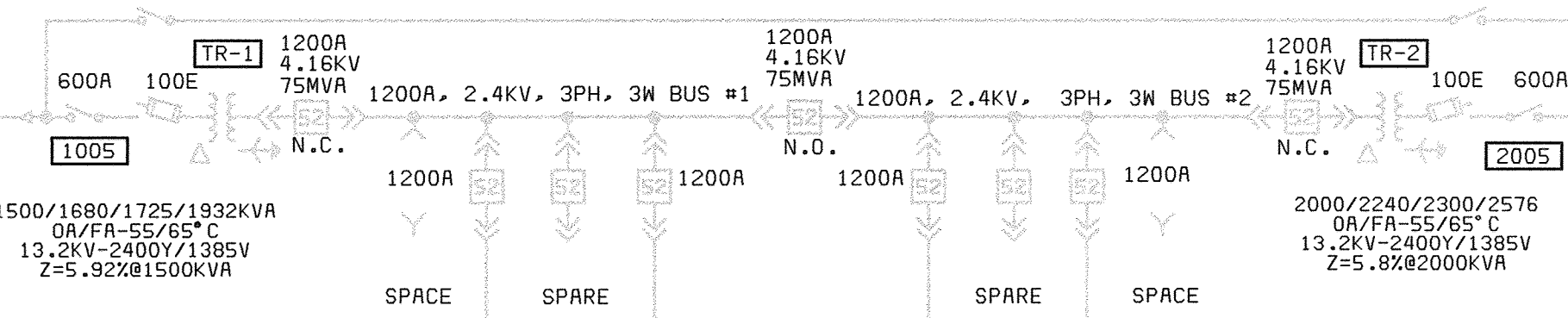
FDR #7680 LAUREL (OH) 1sc=2582A  
 FDR #7740 DORSEY RUN (UG) 1sc=3678A

13.2KV MAIN SWITCHGEAR

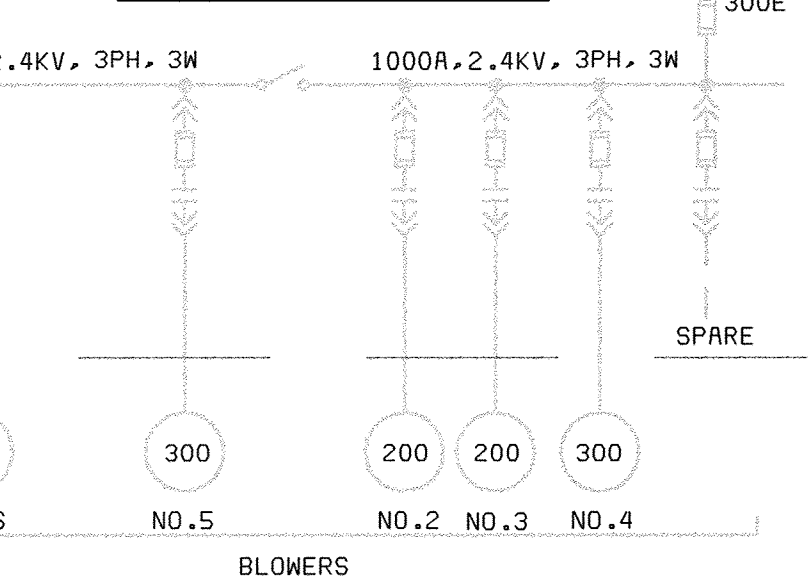


S-1, 3-250kcmil, (15KV), #2G, 5"  
 S-2, 3-250kcmil, (15KV), #2G, 5"

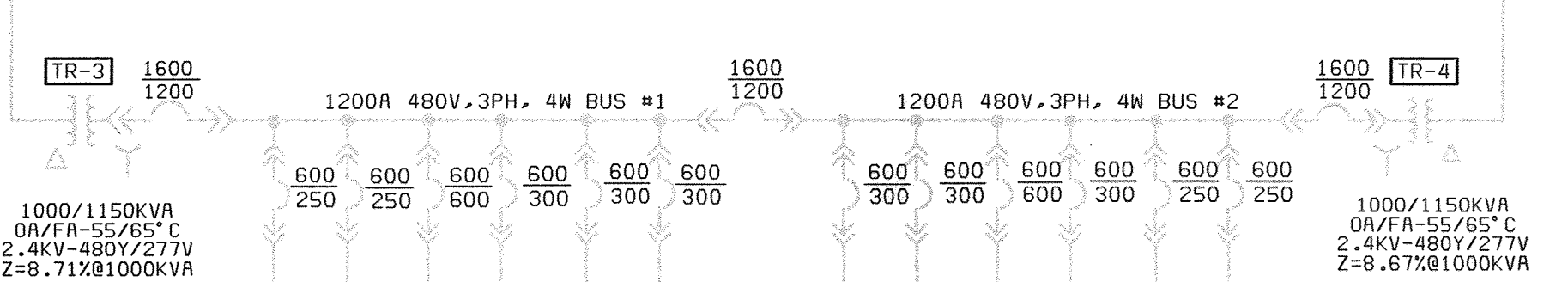
PS1 - BLOWER SUBSTATION



CC3 HEADWORKS BLOWERS

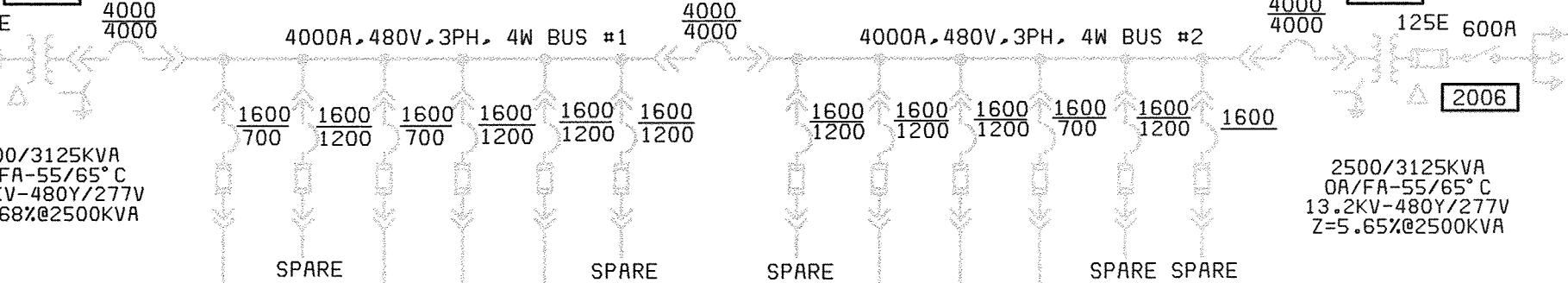


SS1 - HEADWORKS SUBSTATION



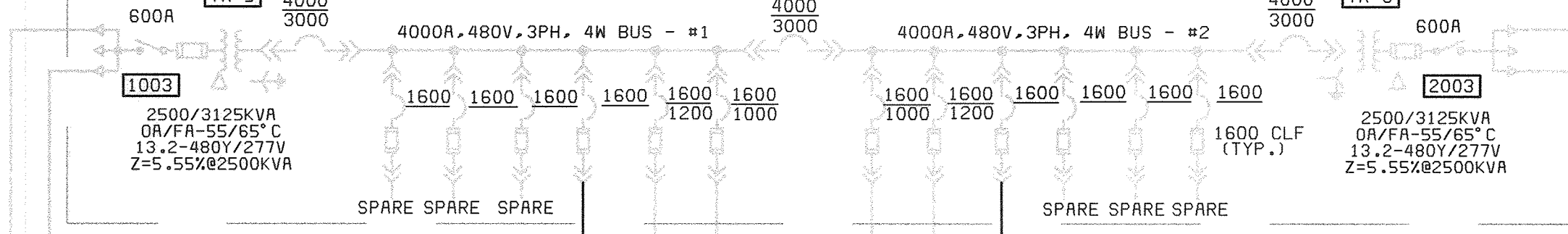
- MCC 14 GRIT BLDG.
- MCC 2 HEADWORKS BUILDING
- MCC 4 PURIFAX BUILDING (REPLACE)
- MCC 22 SOUTH PUMP STATION
- MCC 21 NORTH PUMP STATION
- MCC 1 SCREEN FACILITY

PS4 - EFFLUENT SUBSTATION



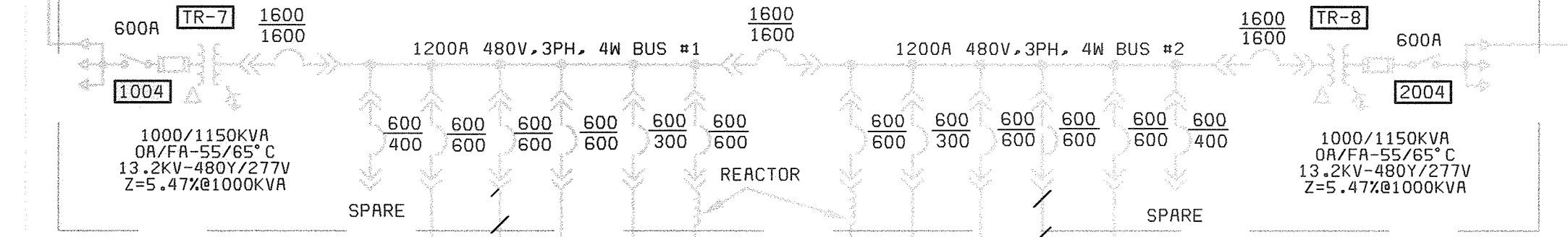
- CC8 MAINTENANCE BUILDING
- SWBD 1 ADMIN. BLDG. SWITCHBOARD (FEEDS CC17)
- CC11 FILTER BUILDING
- CC12 CHLORINE BUILDING

PS2 - DEWATERING SUBSTATION



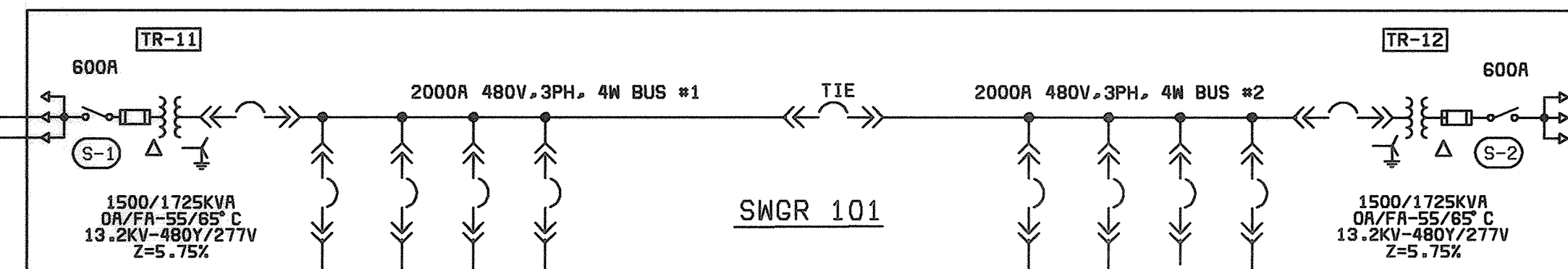
- MCC 15 SOLIDS BUILDING (NOT IN CONTRACT)
- CC9A & CC9B DEWATERING BUILDING
- PC1 BLOWERS 1 & 3 POWER CENTER
- PC2 BLOWERS 2 & 4 POWER CENTER
- CC10A & CC10B DEWATERING BUILDING

PS3 - SECONDARY SUBSTATION

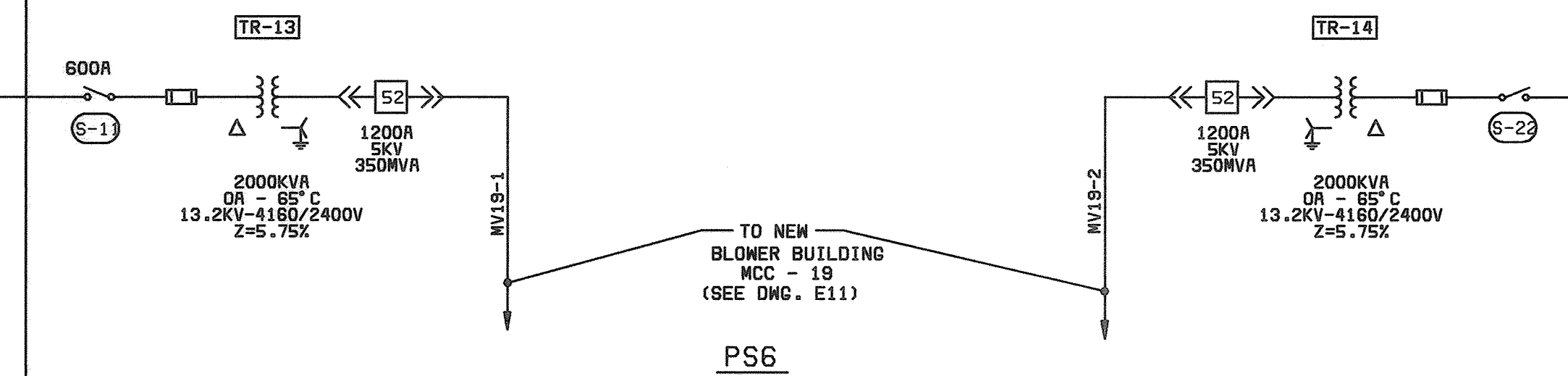


- MCC 20 PROCESS REACTORS (NOT IN CONTRACT)
- CC7A & CC7B ALUM. BLDG.
- CC-5 SECONDARY BLDG.
- CC-6 LIME BLDG. REPLACE
- CC-13 PHOTOSTRIP BLDG. (SEE DNG. E21)

PS5 AND PS6- NEW ADDITION



- MCC 18 NORTH NEW BLOWER BUILDING (SEE DNG.'S E8-E10)
- MCC 13 NORTH GALLERY BUILDING (SEE DNG.'S E22-E24)
- MCC 16 NEW AUXILIARY PUMPING STATION (NOT IN CONTRACT)



POWER DISTRIBUTION FUNCTIONAL DIAGRAM

CADD FILE DIR: C:\BLACK&VEATCH\E-3.DWG  
 PLOT DATE: 6/27/2000  
 058472  
 P058472A

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*Robert Berger* 6-29-00  
 CHIEF, BUREAU OF UTILITIES DATE

**LACH**  
 LACH ELECTRIC CORPORATION  
 Baltimore, Maryland

*A. Kukreja* 6-21-00  
 REG. PROF. ENGR. DATE

**BLACK & VEATCH**  
 Gaithersburg, Maryland

*[Signature]*  
 REG. PROF. ENGR. DATE



DES: L.K.										
DRN: M.F.F.										
CHK:										
DATE: 6/23/00	DATE:	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP				

ELECTRICAL

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION

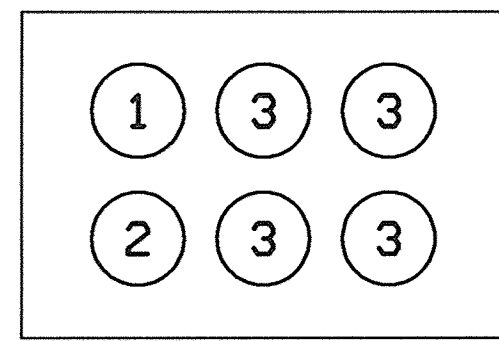
CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

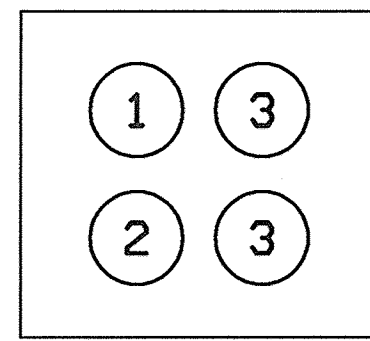
SCALE AS SHOWN

SHEET 113 OF 161

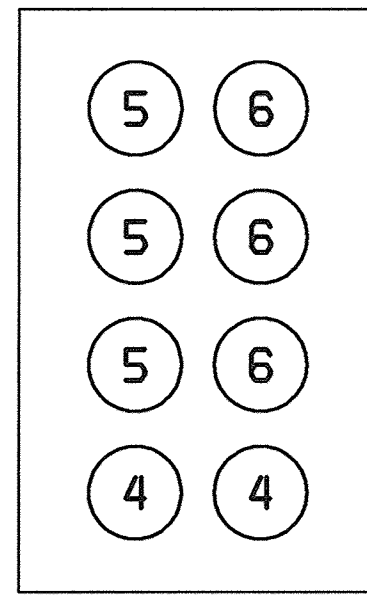
**E3**



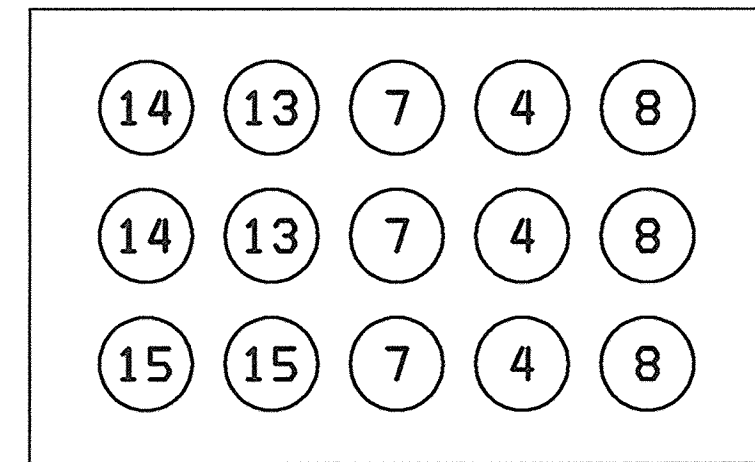
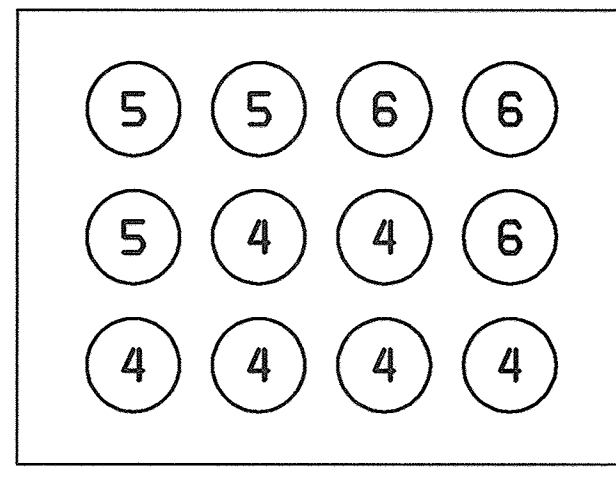
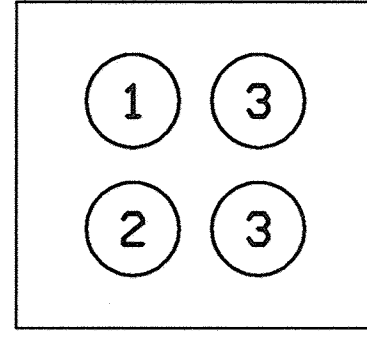
SECTION 1  
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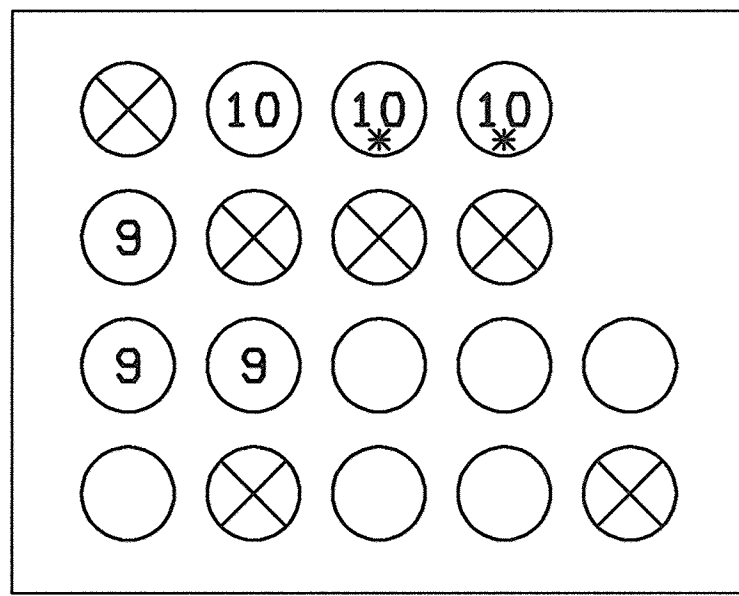
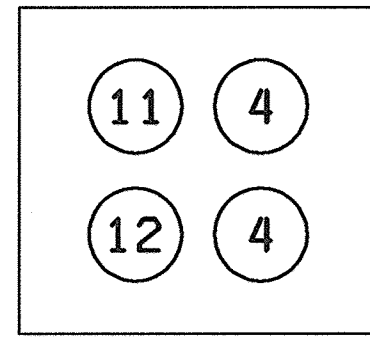
SECTION 2  
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SEE NOTE 1



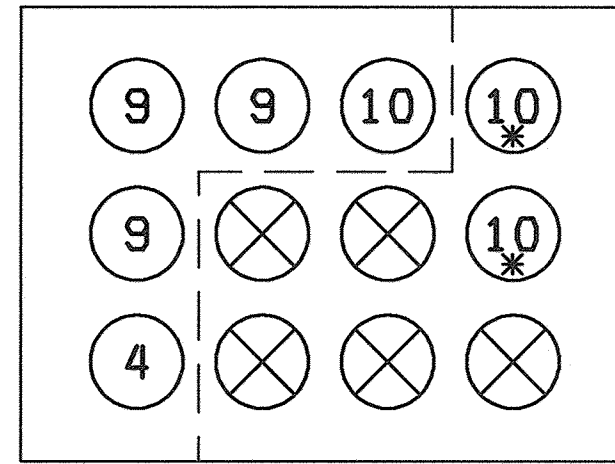
SECTION 3  
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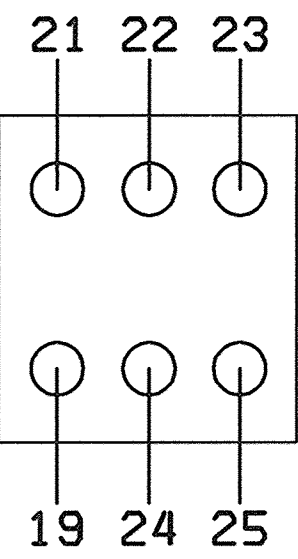
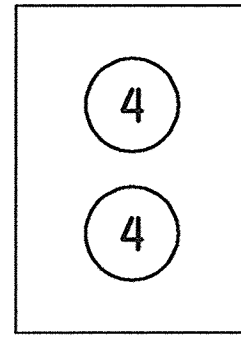
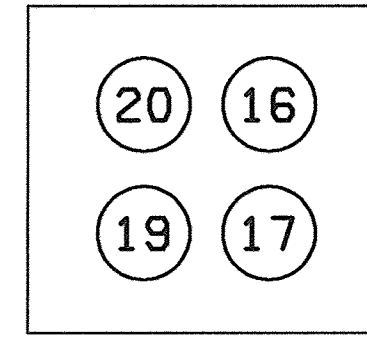
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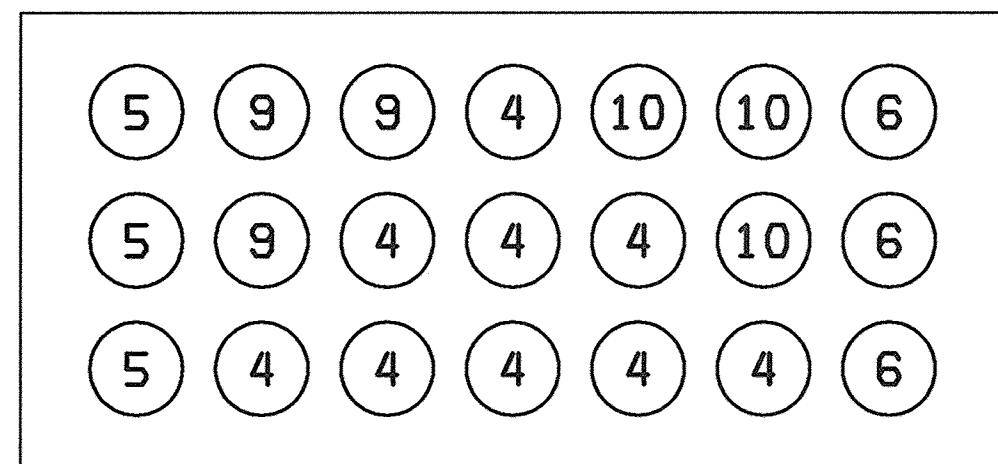
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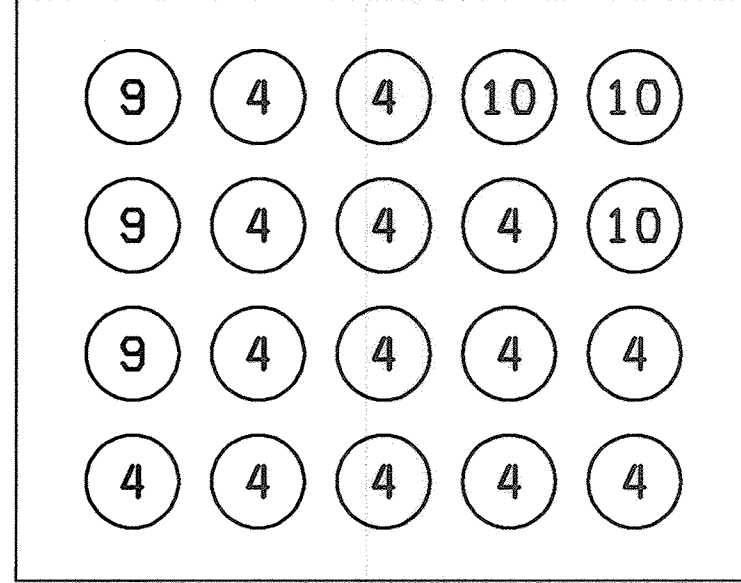
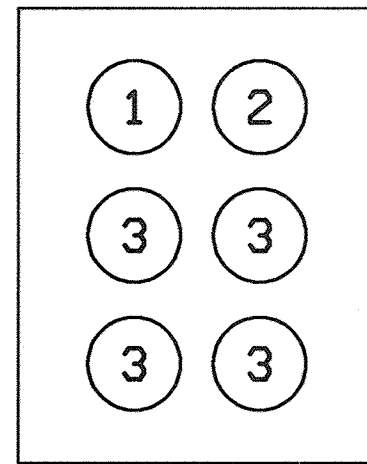
SECTION 6  
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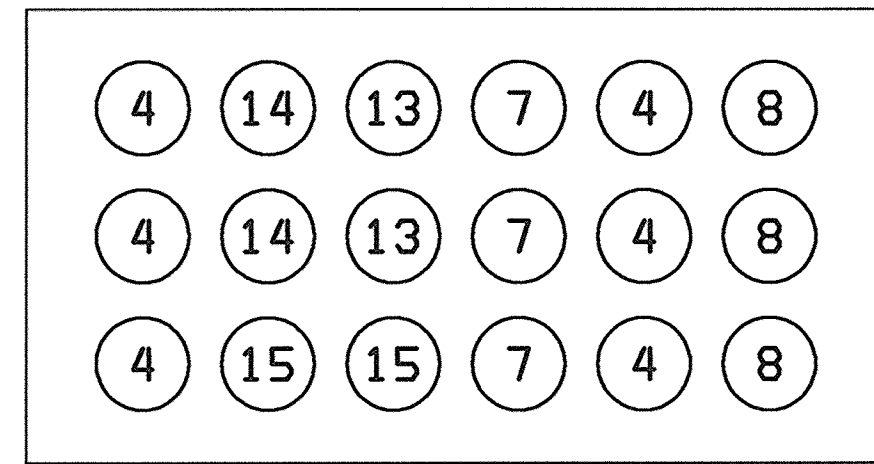
SECTION 7  
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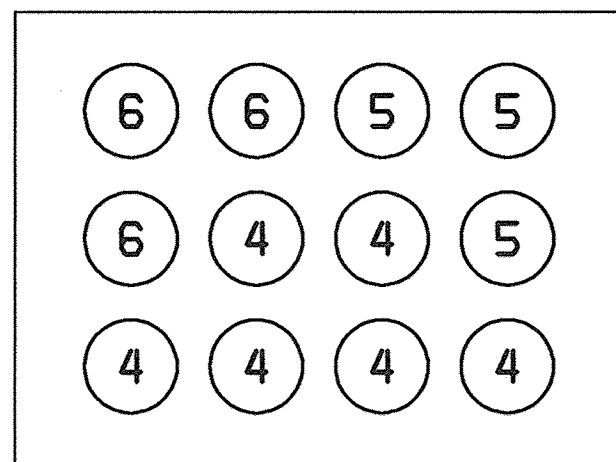
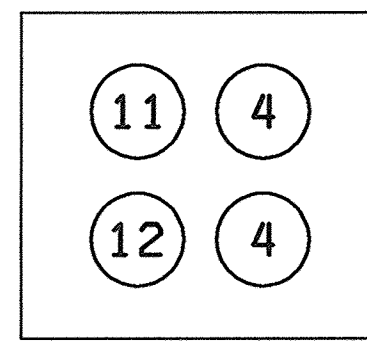
SECTION 8  
NO SCALE E2



SECTION 9  
NO SCALE E2

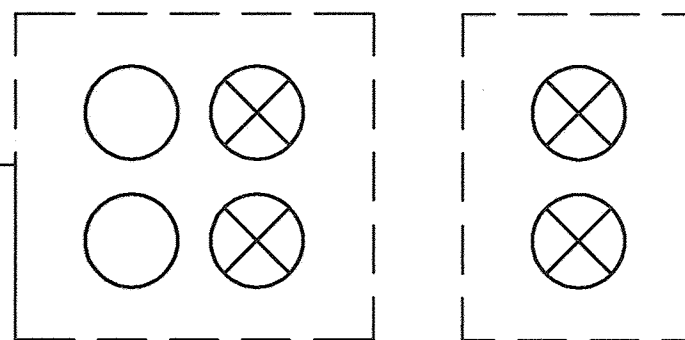


SECTION 10  
NO SCALE E2

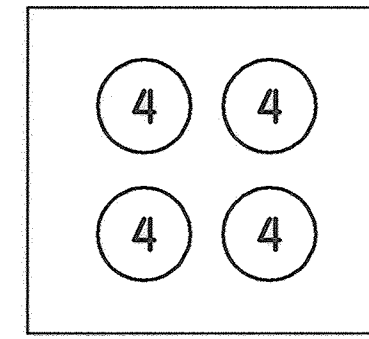


NEW

SECTION 11  
NO SCALE E2



EXISTING



SECTION 12  
NO SCALE E2

DUCT BANK SCHEDULE			
CONDUIT NO.	SIZE	CIRCUIT NUMBER	COMMENTS
1	5"	13.2KV S-1	
2	5"	13.2KV S-2	
3	5"	SPARE	
4	4"	SPARE	
5	4"	M16-1	FUTURE CONTRACT
6	4"	M16-2	FUTURE CONTRACT
7	4"	M18-1	
8	4"	M18-2	
9	4"	M13-1	
10	4"	M13-2	
11	4"	MV19-1	
12	4"	MV19-2	
13	4"	CONTROL WIRING FROM PS5	
14	4"	CONTROL WIRING FROM PS6	
15	2"	POWER AND CONTROL FOR M18-56 IN PLANT PUMP STATION	EXTEND FROM NORTH BLOWER BUILDING
16	3"	M13-32 ODOR CONTROL BLOWER	
17	3"	M13-35 ODOR CONTROL BLOWER	
18	2"	MCC13-11, MCC13-15, MCC13-23	
19	2"	SPARE	
20	2"	CTP5-14B, 15B	
21	2"	M13-60	
22	2"	M13-60B	
23	2"	M13-11	
24	2"	M13-59	
25	2"	LPB-1,3	

**NOTE:**

1. EXISTING DUCTS BETWEEN MH5 AND MH6A ARE NOT SHOWN. MODIFY EXISTING MH5 AND MH6A TO ACCEPT LOW VOLTAGE DUCTS SHOWN IN SECTION 2.

\* REMOVE EXISTING CIRCUIT BACK TO SOURCE AND INSTALL CIRCUITS INDICATED. PLACE PULL CORD IN ANY SEGMENTS LEFT EMPTY.

⊗ INDICATES EXISTING OCCUPIED DUCTS AND CIRCUITS TO BE PROTECTED FROM DAMAGE DURING CONSTRUCTION AND INSTALLATION OF NEW CIRCUITS.

○ INDICATES EXISTING SPARE DUCTS.

CADD FILE DIR: C:\BLACK&VEATCH\E-4.DWG  
 PLOT DATE: 06/21/2000  
 0568472  
 F0568472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

**LACH**  
LACH ELECTRIC CORPORATION  
Baltimore, Maryland

**BLACK & VEATCH**  
Gaithersburg, Maryland

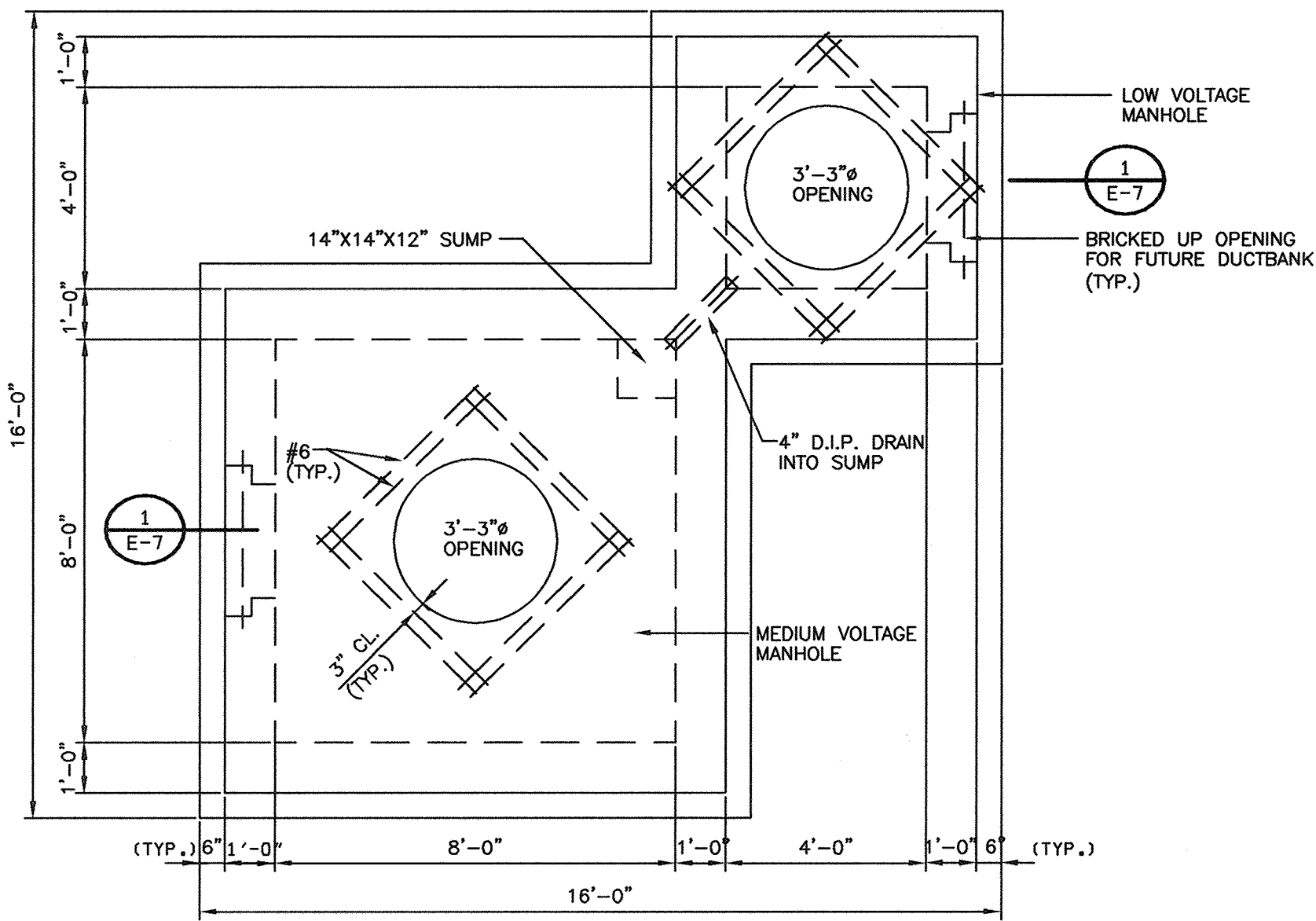


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DRN: M.F.F.									
CHK:									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

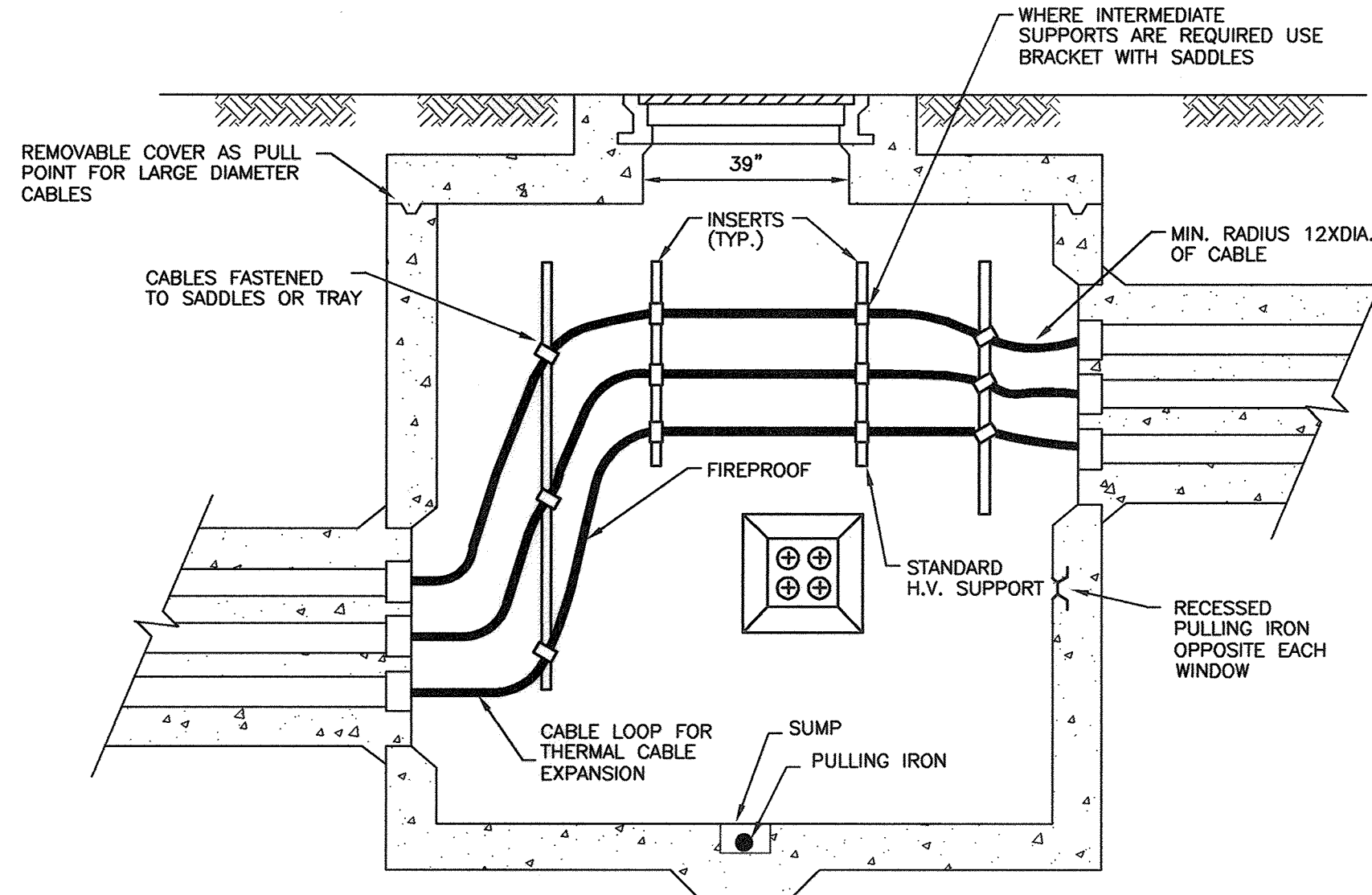
ELECTRICAL  
DUCT BANK SECTIONS  
DETAILS AND SCHEDULE

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
HOWARD COUNTY, MARYLAND

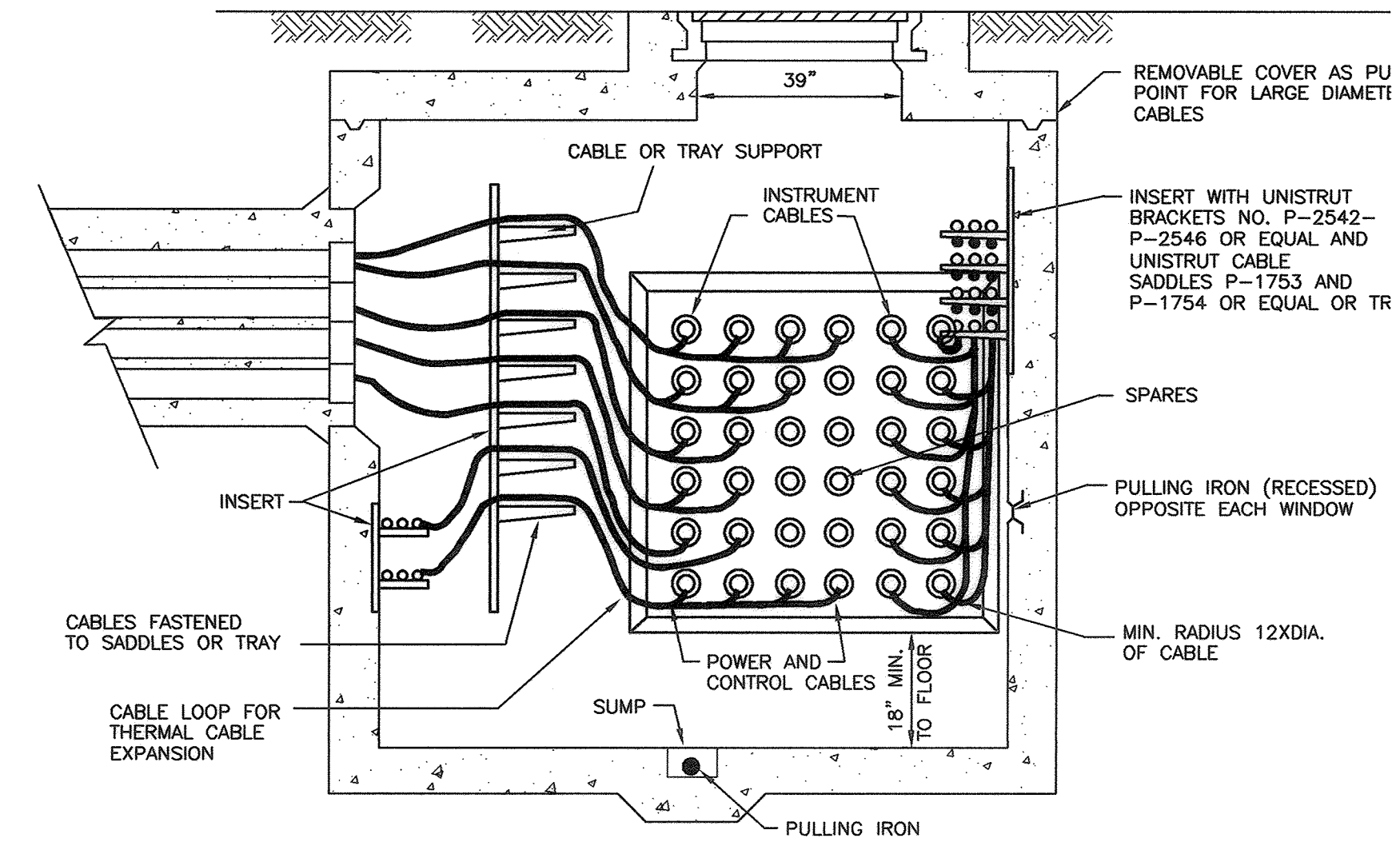
SCALE AS SHOWN  
SHEET 114 OF 161  
E4



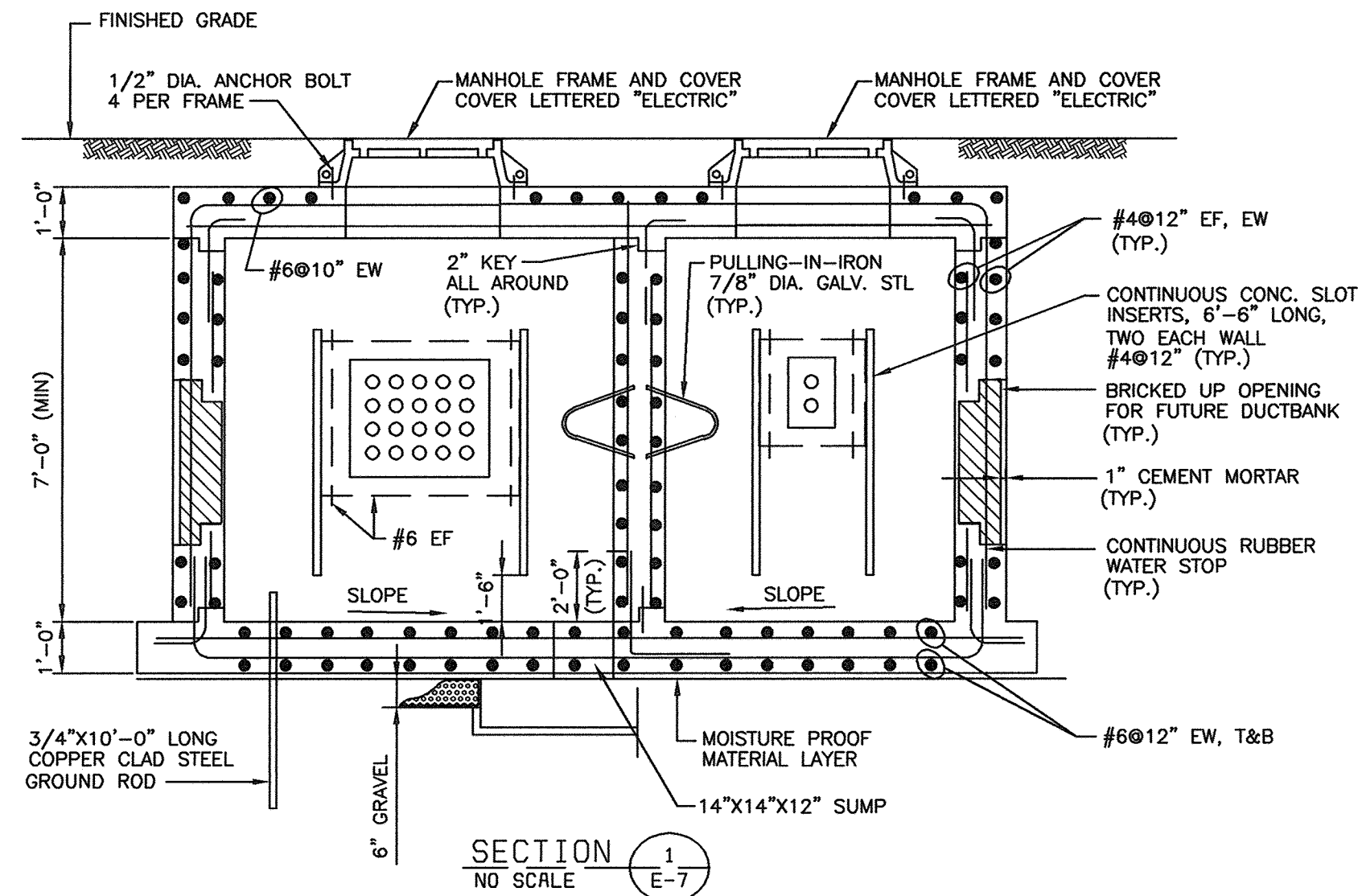
PLAN



PRE-CAST OR CAST IN PLACE MANHOLE MEDIUM VOLTAGE CABLE



TYPICAL PRE-CAST OR CAST IN PLACE MANHOLE LOW VOLTAGE CABLE



TYPICAL MEDIUM VOLTAGE AND LOW VOLTAGE MANHOLE

NOTES

- SEE DRAWING E-1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- ALL CONDUIT AND DUCT BANK ROUTING SHOWN ON SITE PLAN IS INTENDED TO SHOW SCOPE OF WORK. ACTUAL ROUTING SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO EXCAVATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE INSTALLATION SO THAT CROSS OVER OF PIPING IS MINIMIZED, UNLESS SPECIFIED OTHERWISE, PIPING HAS RIGHT-OF-WAY.
- UNDERGROUND CONDUITS SHALL NOT BE LESS THAN 2 INCH IN UNDERGROUND DUCT BANKS AND 1 INCH MINIMUM FOR DIRECT BURIED APPLICATIONS.
- DUCT BANKS INDICATED AS DIRECT-BURIED SHALL BE CONCRETE-ENCASED UNDER ROADWAYS, PARKING AREAS AND OTHER AREAS SUBJECT TO VEHICULAR TRAFFIC.
- UNDERGROUND CONDUIT WITHIN DUCT BANKS SHALL BE POLYVINYL CHLORIDE (PVC) SCHEDULE 40. DUCT ENCASEMENT SHALL EXTEND A MINIMUM OF THREE INCHES BEYOND THE OUTSIDE SURFACES OF THE DUCTS. THE TOP SURFACE OF THE ENCASEMENT SHALL HAVE DUCTBANK MARKING TAPE.
- CONDUITS LEAVING A DUCT BANK BETWEEN MANHOLES TO TERMINATE IN A TRENCH OR OTHER RACEWAY SHALL BE RIGID STEEL GALVANIZED ENCASED IN UNREINFORCED CONCRETE WITH A THREE INCH COVER ALL AROUND.
- PVC STUB-UPS, WHEN REQUIRED, SHALL BE TERMINATED WITH PVC TO THREADED CONDUIT FEMALE ADAPTERS FLUSH WITH THE FLOOR, TOP OF FOUNDATION, ETC.
- CONDUITS SHALL BE ROUTED SO AS TO AVOID RUNNING THROUGH FOUNDATIONS. WHERE SUCH RUNS ARE UNAVOIDABLE, THEY SHALL BE RIGID STEEL CONDUIT.
- AFTER DUCT IS INSTALLED AND AFTER CONCRETE IS PLACED OR TRENCH BACKFILLED, A MANDREL SHALL BE PULLED THROUGH EACH DUCT. THEN EACH DUCT SHALL BE REAMED FREE OF BURRS AND CAREFULLY SWABBED. A 1/8 OR 3/16 INCH DIAMETER POLYPROPYLENE PULL ROPE SHALL BE INSTALLED IN EACH DUCT AND LEFT IN ALL SPARE DUCTS AT THE END OF THE JOB.

CADD FILE: D:\C:\BLACK&VEATCH\E-5.DWG  
 PLOT DATE: 06/17/2000  
 058472  
 P058472A

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Chief, Bureau of Utilities DATE

**LACH**  
 LACH ELECTRIC CORPORATION  
 Baltimore, Maryland  
 REG. PROF. ENGR. DATE

**BLACK & VEATCH**  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE



DES: L.K.									
DRN: M.F.F.									
CHK:									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

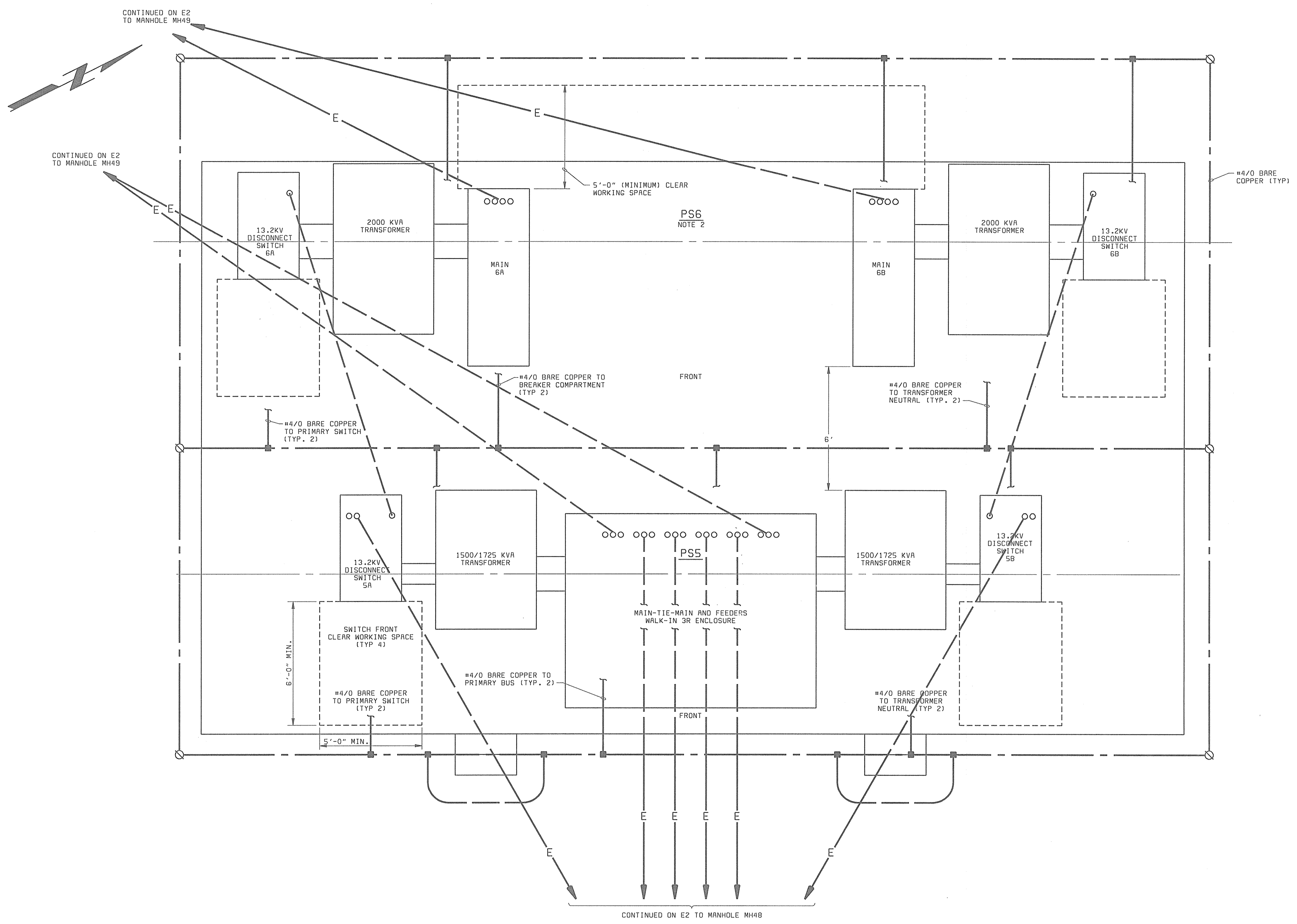
**ELECTRICAL**  
**DUCT BANK SECTIONS AND DETAILS**

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 NORTH BNR PROCESS TRAIN  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 115 OF 161  
**E5**

A  
B  
C  
D  
E

A  
B  
C  
D  
E



- NOTES:**
1. EXACT EQUIPMENT LOCATION MAY VARY FROM THAT SHOWN. CONTRACTOR SHALL ADJUST EQUIPMENT, PADS, CONDUITS, ETC., AS REQUIRED TO PROPERLY INSTALL EQUIPMENT FURNISHED. ALL WORKING SPACES AND CLEARANCES INDICATED SHALL BE MAINTAINED.
  2. SPACING BETWEEN MAIN CIRCUIT BREAKER SECTIONS 6A AND 6B SHALL ALLOW FUTURE ADDITION OF 3 TO 4 CIRCUIT BREAKERS OF MANUFACTURER USED WITHOUT HAVING TO MOVE EQUIPMENT.
  3. DUCT BANKS AND CONDUIT LOCATIONS SHALL BE PROPERLY COORDINATED WITH EQUIPMENT ENTRANCE LOCATIONS. SEE DRAWING E2 FOR DUCT BANK ROUTING, CONDUIT SIZES AND QUANTITIES.
  4. SEE CIVIL/STRUCTURAL PLANS FOR CONCRETE PAD, CURB, SIDEWALK AND OTHER DETAILS.

**POWER SUBSTATION NO.5 & 6**  
3/8"=1'-0"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Benner* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*David H. Hines*  
REG. PROF. ENGR. DATE 6/23/00



DES: GNS-WEB					
DRN: JCB					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**POWER SUBSTATION NO.5 AND NO.6**  
**ELECTRICAL**

**POWER, LIGHTING & GROUND PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

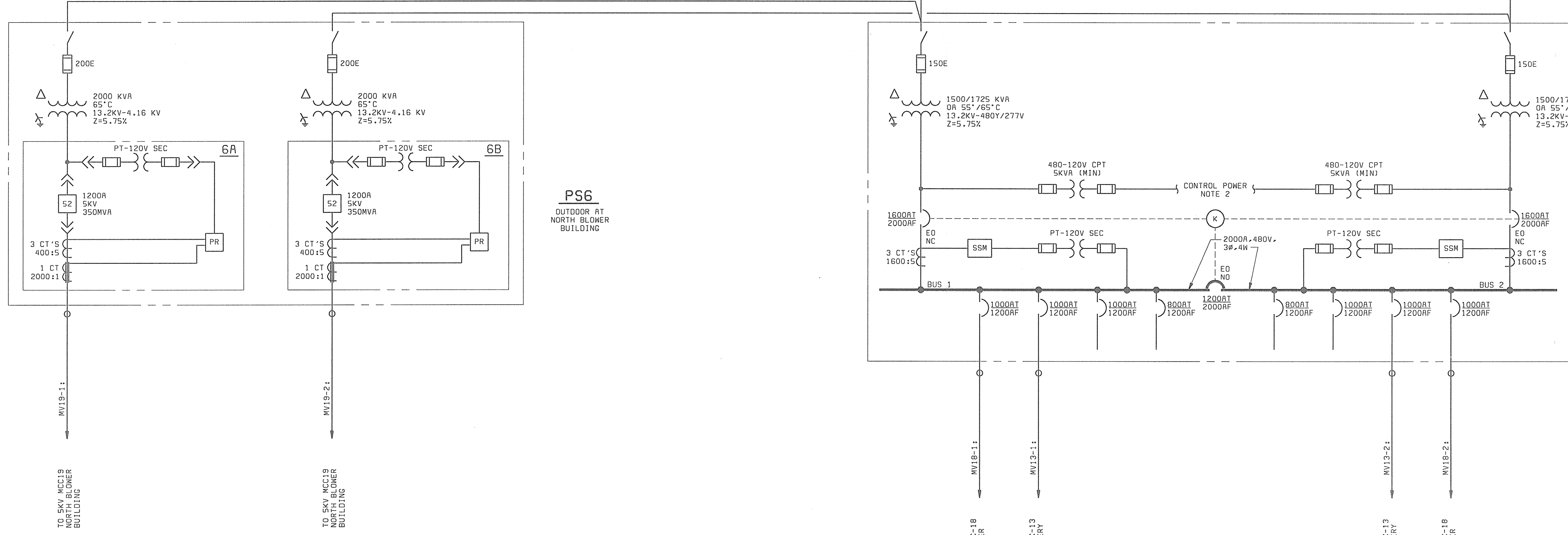
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

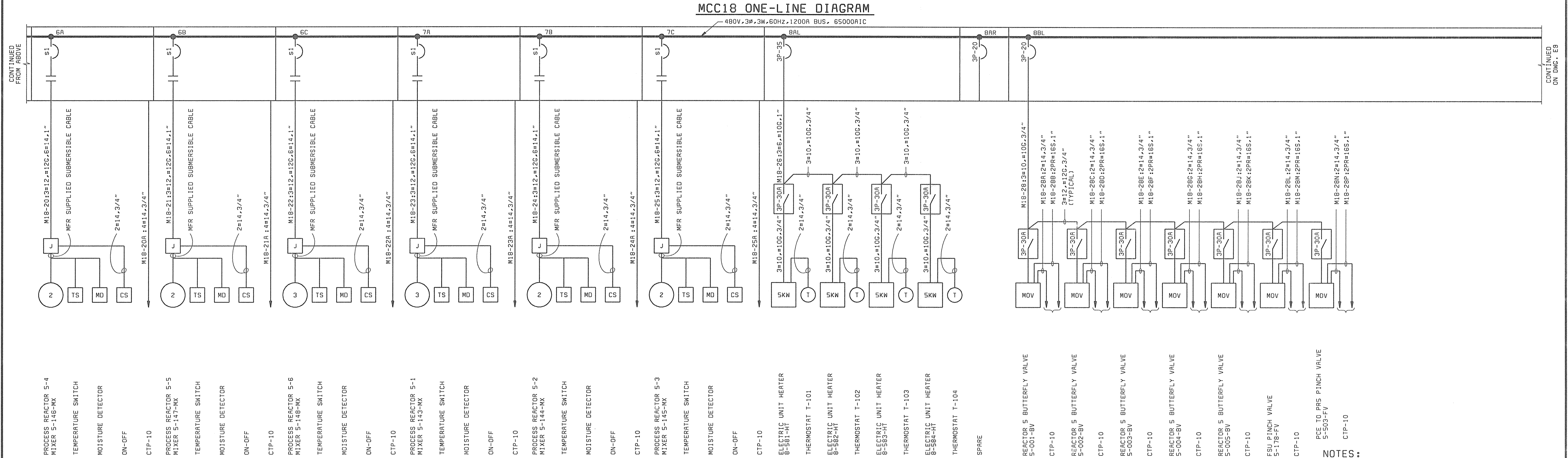
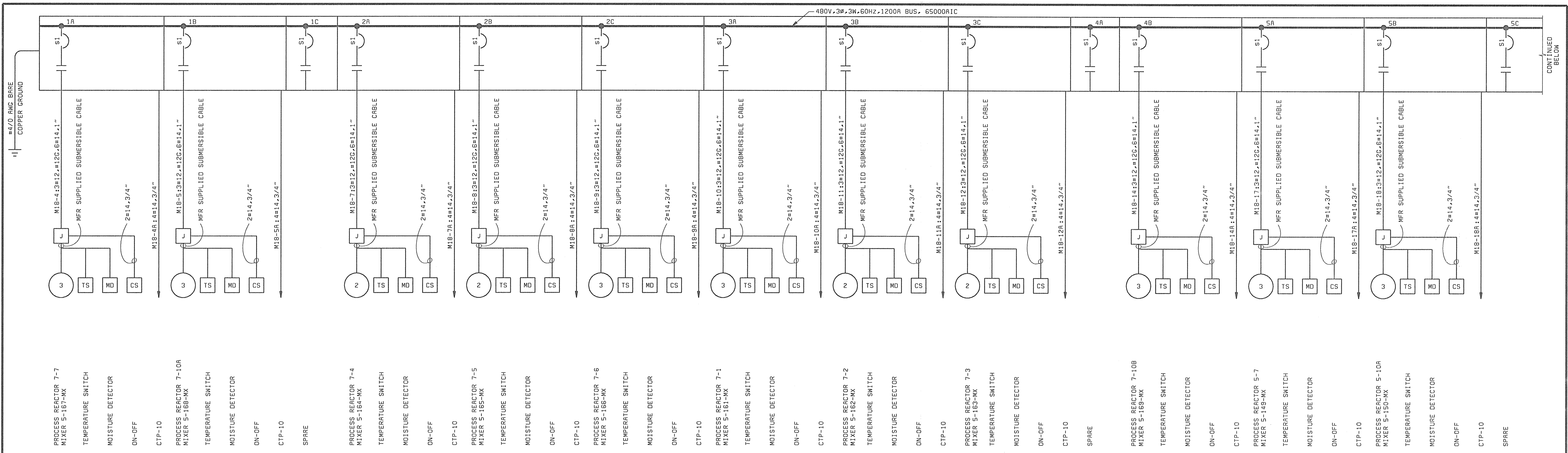
SHEET 116 OF 161

**E6**



- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  2. CONTROL POWER TRANSFORMERS IN PS5 SHALL PROVIDE 120 VAC, SINGLE-PHASE CONTROL POWER TO PS5, PS6, AND MCC19. CONTRACTOR SHALL CONFIRM SIZE IS SUFFICIENT, OR SIZE AS REQUIRED.

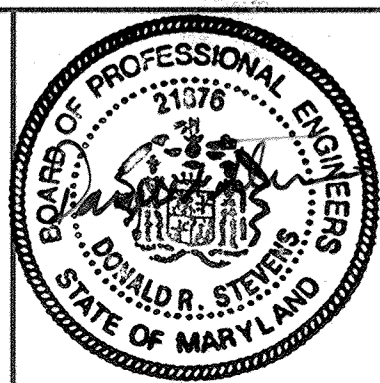
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Robert Benjamin CHIEF, BUREAU OF UTILITIES DATE 6-25-00	 BLACK & VEATCH LLP Gaithersburg, Maryland  David J. Steiner REG. PROF. ENGR. DATE 6/24/00	 DONALD R. STEVENS STATE OF MARYLAND	DES: GNS								POWER SUBSTATION NO. 5 AND NO. 6 ELECTRICAL  DISTRIBUTION SYSTEM ONE-LINE DIAGRAM	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: JCB	CHK: JTF	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK			APP



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
*Robert Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland  
*Donald H. ...*  
REG. PROF. ENGR. DATE 6/23/00



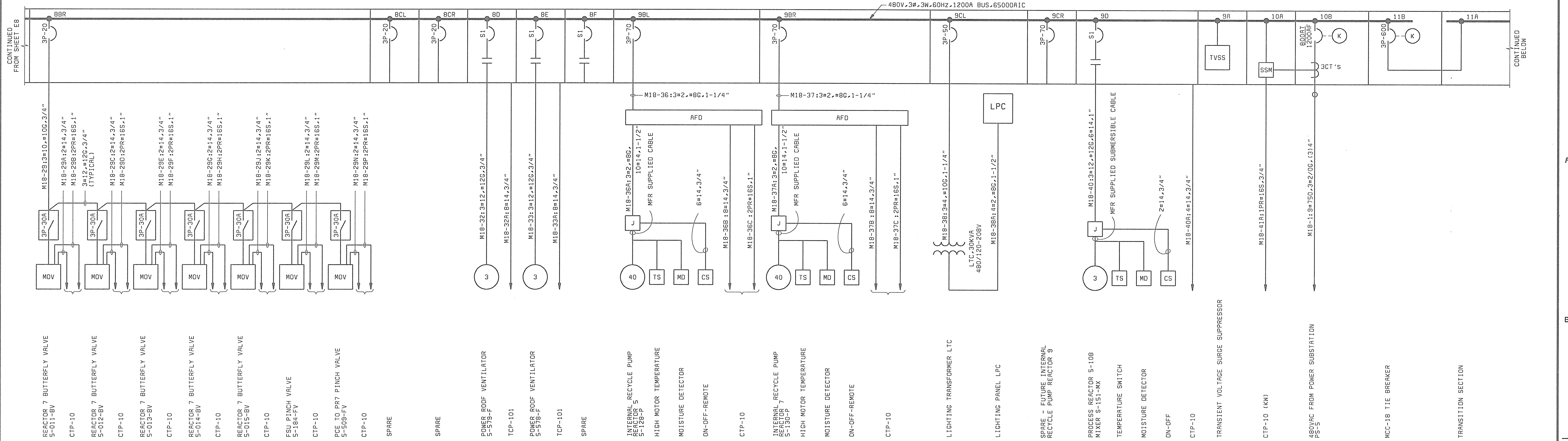
DES: GNS.SFP					
DRN: JCB					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH BLOWER BUILDING  
ELECTRICAL**  
  
**MCC18 ONE-LINE DIAGRAM**

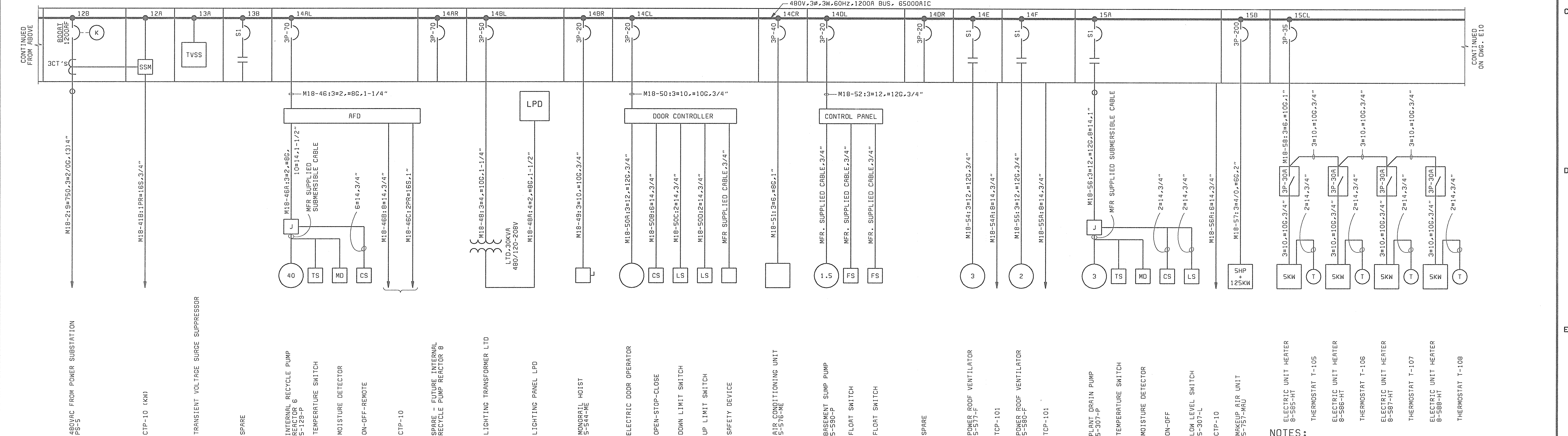
**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
**HOWARD COUNTY, MARYLAND**

SCALE AS SHOWN  
SHEET 118 OF 161  
**E8**

058472  
F058472A



MCC18 ONE-LINE DIAGRAM (CONTINUED)



MCC18 ONE-LINE DIAGRAM (CONTINUED)

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

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Chief, Bureau of Utilities DATE

**BLACK & VEATCH**  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE



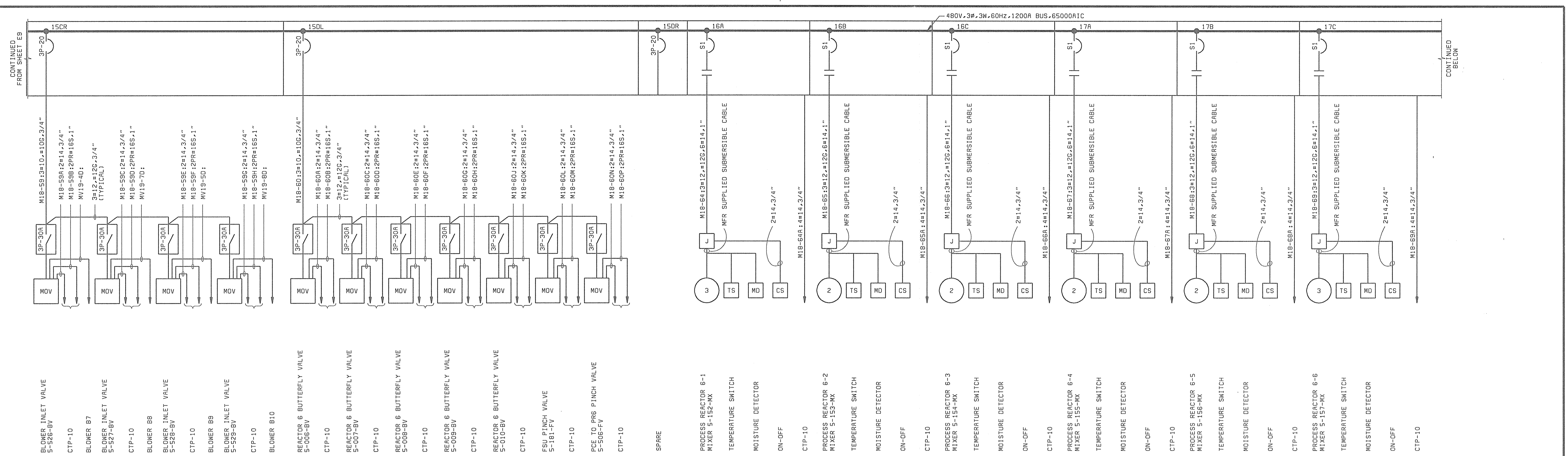
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DRN: JCB					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

NORTH BLOWER BUILDING  
 ELECTRICAL  
 MCC18 ONE-LINE DIAGRAM  
 CONTINUATION

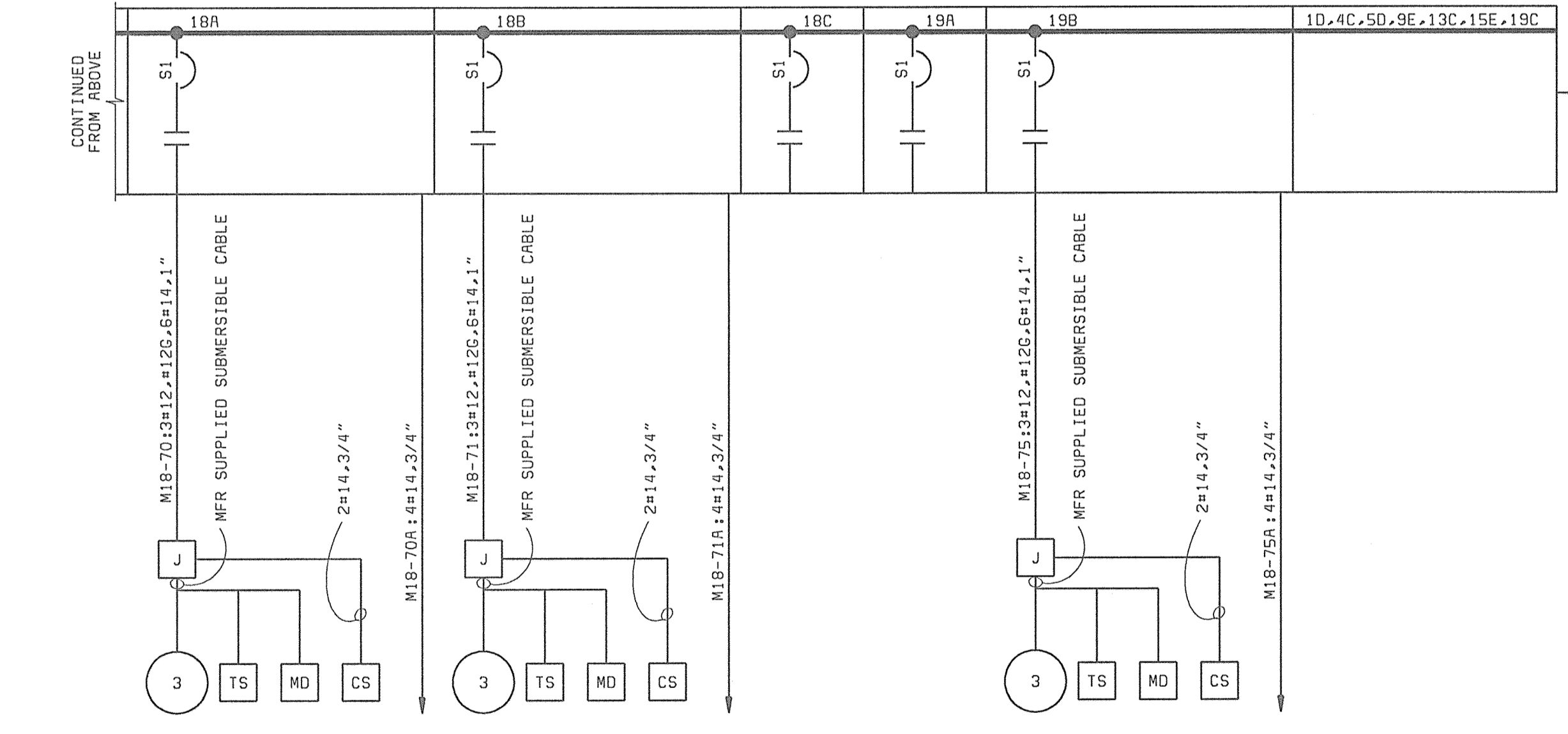
LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 119 OF 161  
 E9

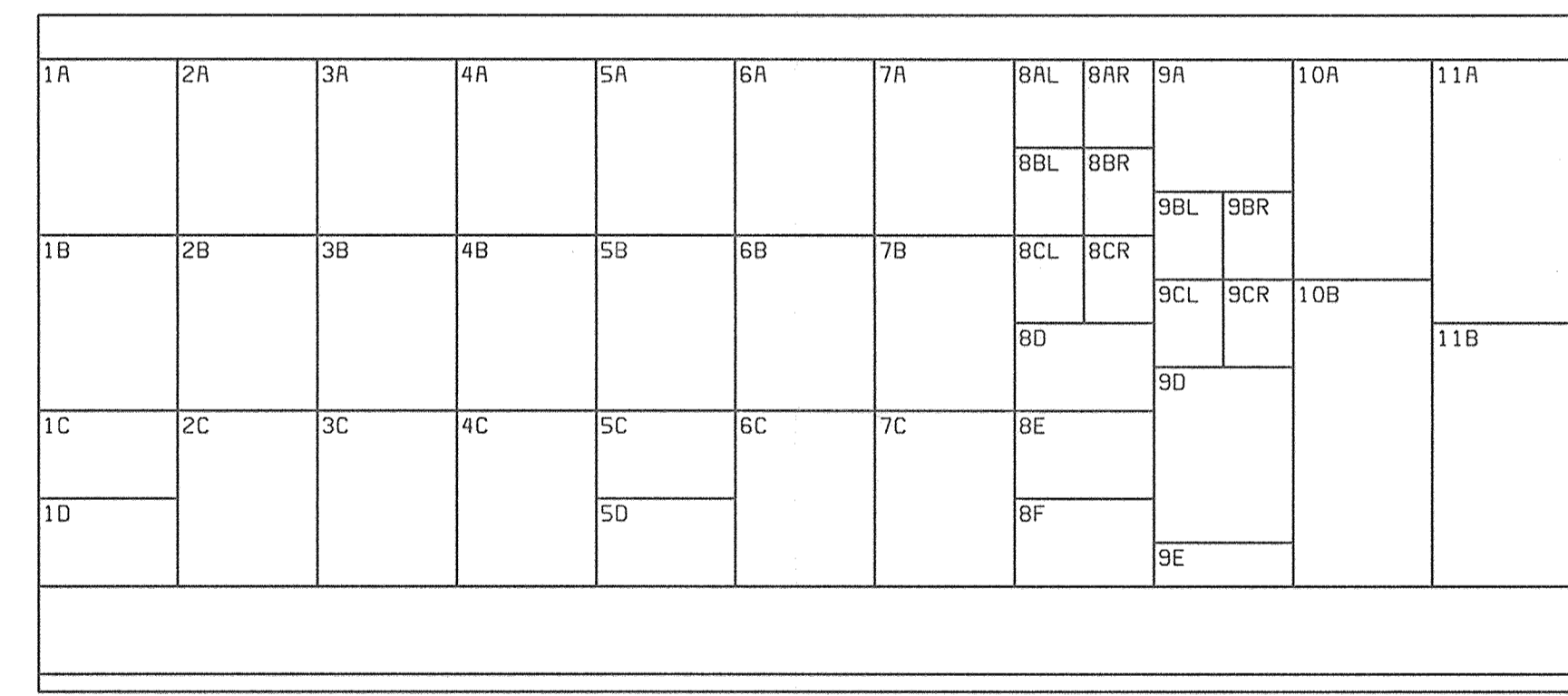
D58472  
 F058472A  
 Chief, Bureau of Utilities DATE



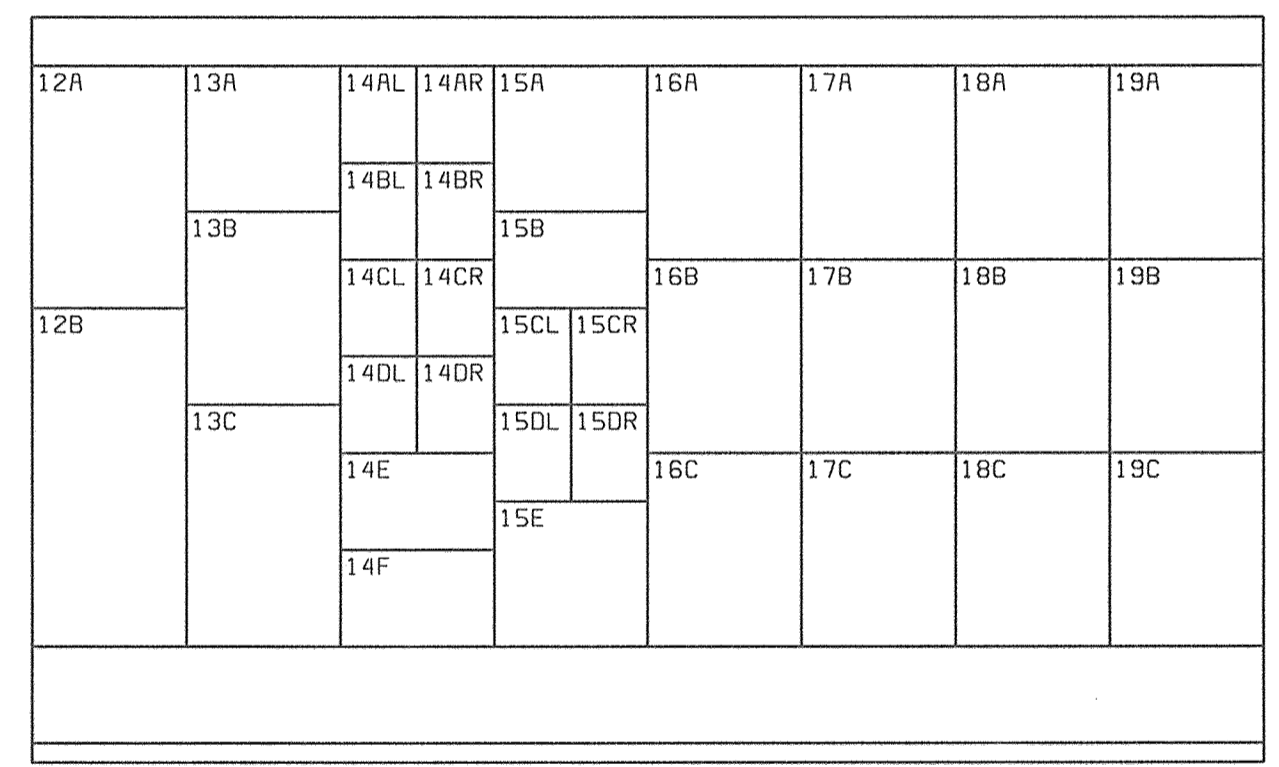
MCC18 ONE-LINE DIAGRAM (CONTINUED)



MCC18 ONE-LINE DIAGRAM (CONTINUED)



MCC18 FRONT ELEVATION - NORTH SIDE  
NO SCALE



MCC18 FRONT ELEVATION - SOUTH SIDE  
NO SCALE

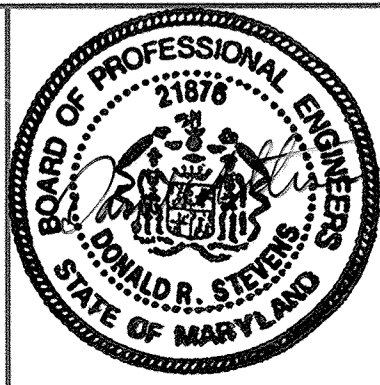
NOTES:  
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*R. J. ...*  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Daniel ...*  
REG. PROF. ENGR. DATE



DES: CNS.SFP										
DRN: JCB										
CHK: JTF										
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP				

NORTH BLOWER BUILDING  
ELECTRICAL

MCC18 ONE-LINE DIAGRAM  
CONTINUATION

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

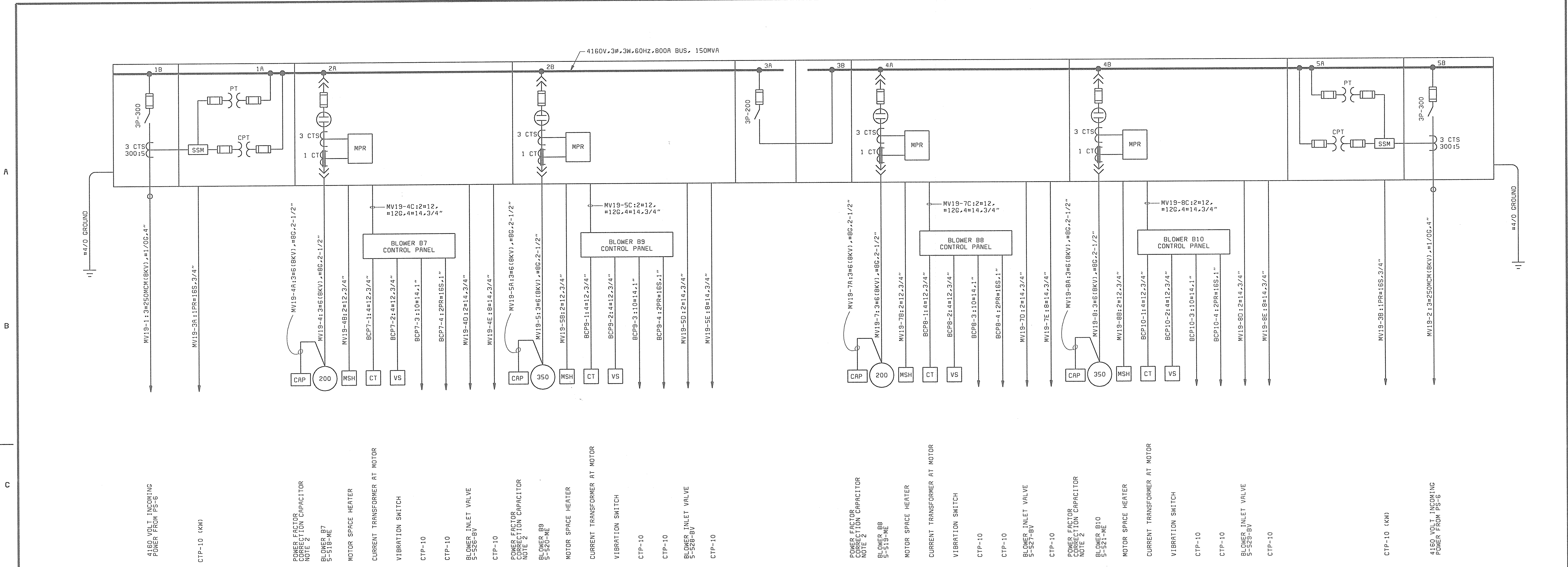
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 120 OF 161

E10





**MCC19 ONE-LINE DIAGRAM**  
NORTH BLOWER BUILDING ELECTRICAL ROOM

1A	2A	3A	4A	5A
METERING	BLOWER B7 STARTER	BUS TIE SWITCH	BLOWER B8 STARTER	METERING
1B	2B	3B	4B	5B
MAIN INCOMING SWITCH	BLOWER B9 STARTER	SPACE	BLOWER B10 STARTER	MAIN INCOMING SWITCH

**MCC19 FRONT VIEW**  
NO SCALE

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - TUNED POWER FACTOR CORRECTION CAPACITOR WILL BE FURNISHED BY AFD SUPPLIER FOR INSTALLATION BY CONTRACTOR.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** L.P.  
Gaithersburg, Maryland

*Donna ...*  
REG. PROF. ENGR. DATE



DES: GNS,SFP	DATE: 6/23/00
DRN: JCB	REVISIONS AND RECORD OF ISSUE
CHK: JTF	NO. BY CK APP

**NORTH BLOWER BUILDING ELECTRICAL**

**MCC19 ONE-LINE DIAGRAM**

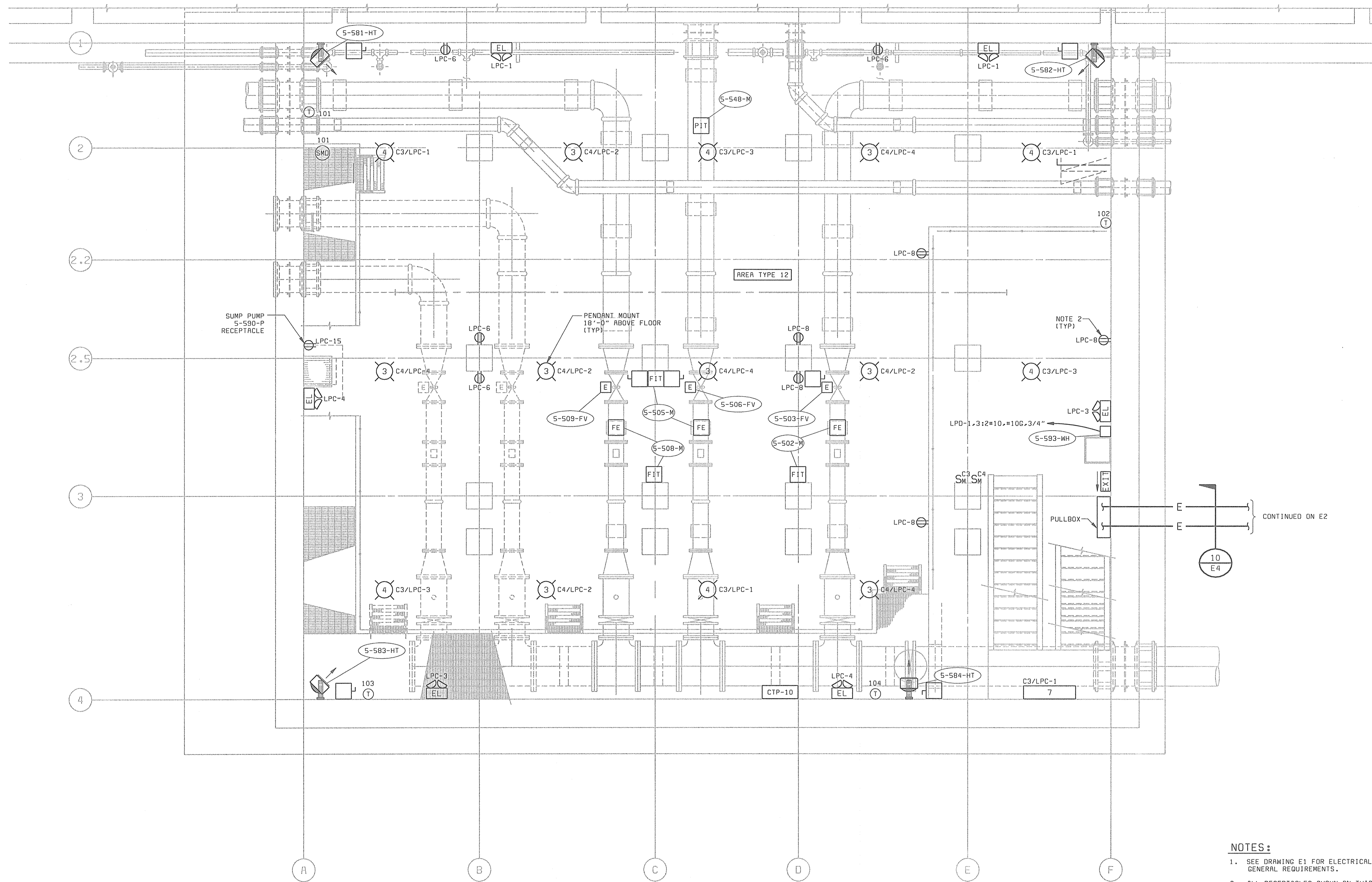
**LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 121 OF 161

**E11**



- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE WP/GFI AND MOUNTED 4'-0" ABOVE FLOOR.

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

58472-205-BB-PR-A0000556  
 58472-101-PR-M-A0000550  
 58472-104-BB-H-A0000556

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*Richard Bauman* 6/29/00  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
 Gaithersburg, Maryland

*David H. ...*  
 REG. PROF. ENGR. DATE 6/29/00



DES: SFP,DVH					
DRN: DVH,ECC					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH BLOWER BUILDING**  
**ELECTRICAL**

**BASEMENT FLOOR**  
**POWER AND LIGHTING PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

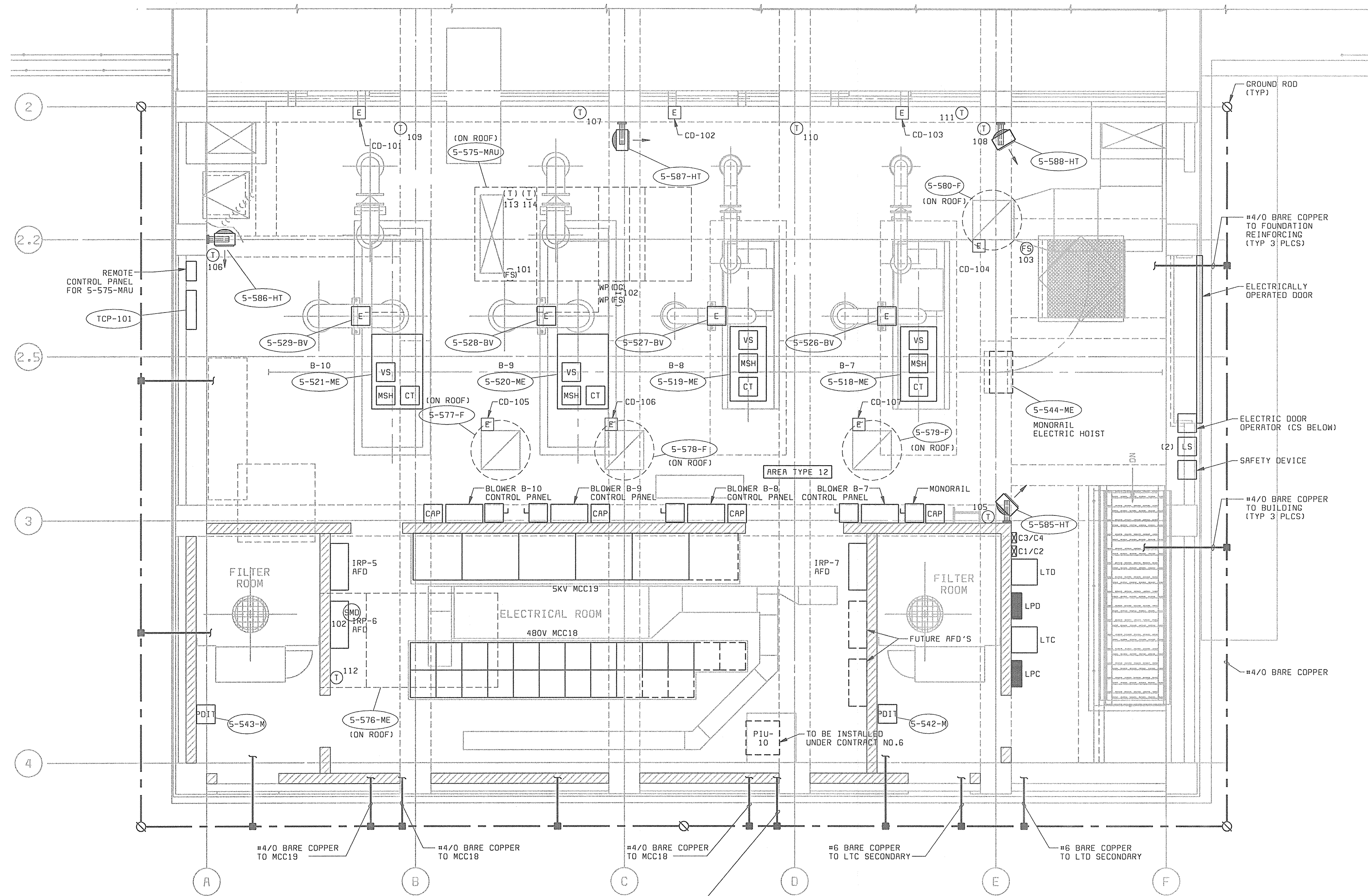
CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 122 OF 161

**E12**



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

**NOTES:**

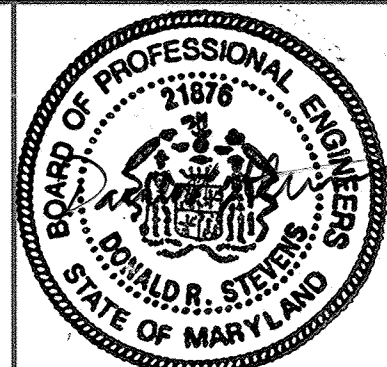
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

58472-205-BB-PR-R0000565  
58472-101-PR-M-R0000550  
58472-104-BB-H-R0000658

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND



*David A. Steiner*  
REG. PROF. ENGR. DATE 6/23/00



DES: SFP.DVH									
DRN: DVH.EEC									
CHK: JTF									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**NORTH BLOWER BUILDING  
ELECTRICAL**

**OPERATING FLOOR  
POWER PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

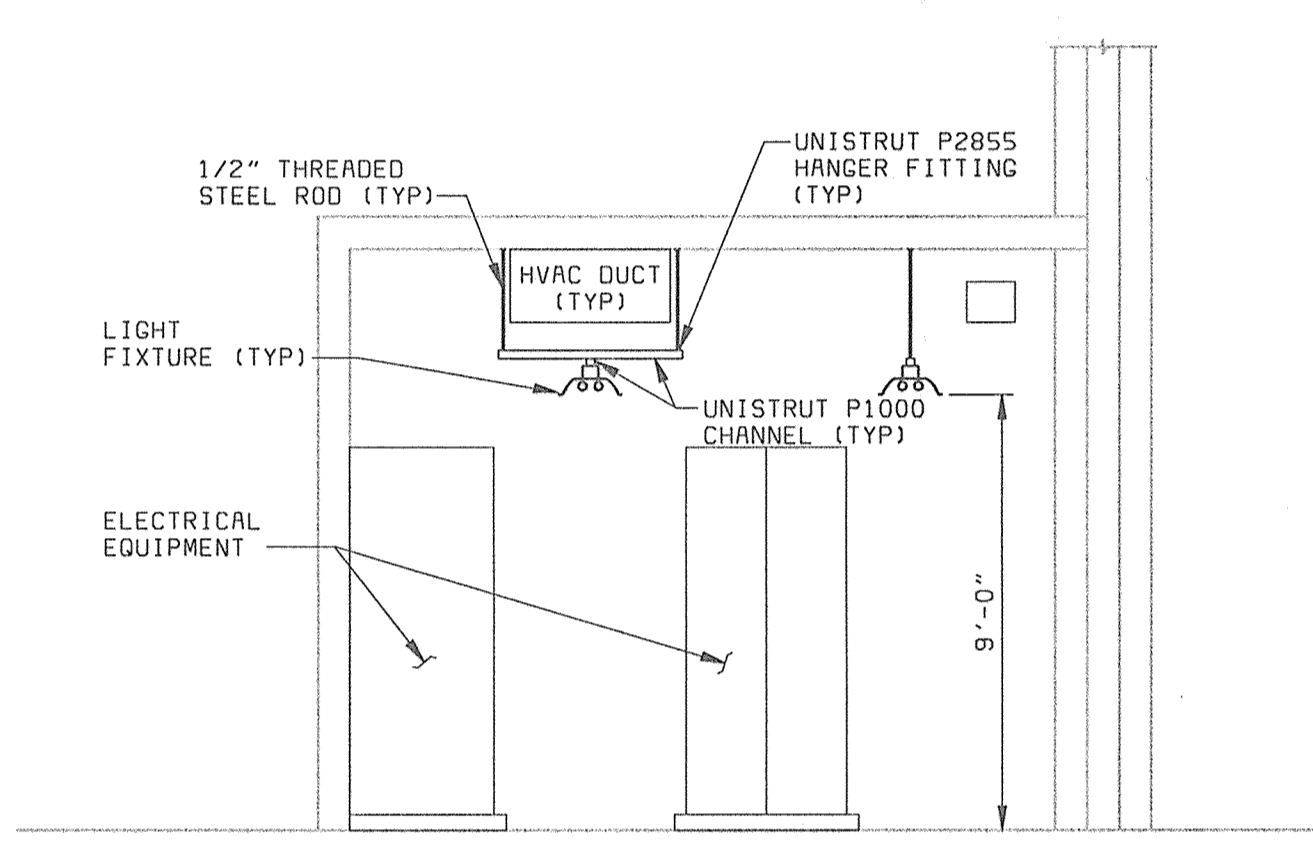
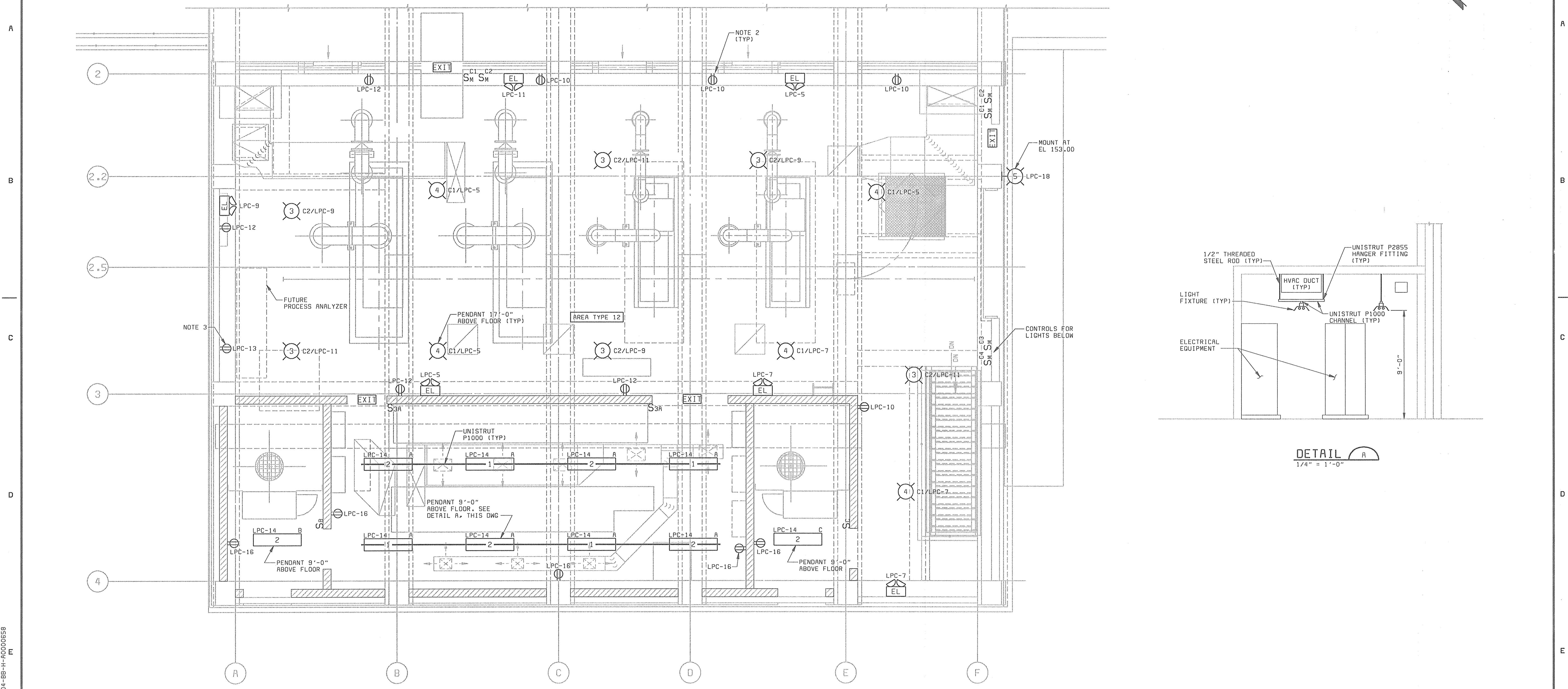
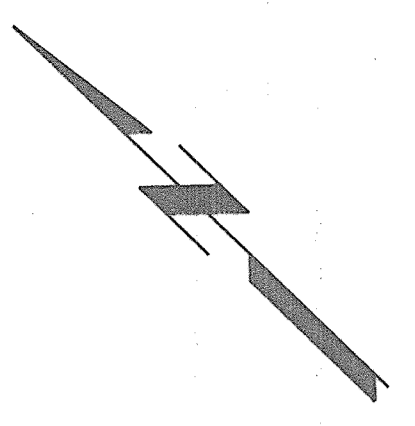
SCALE  
AS  
SHOWN

SHEET  
123 OF 161

**E13**

*Robert B. ...*  
CHIEF, BUREAU OF UTILITIES DATE 6/29/00

058472  
F058472A



**LIGHTING PLAN**  
1/4" = 1'-0"

- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  2. ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE GFI TYPE.
  3. 20 AMP, 120V RECEPTACLE FOR FUTURE PROCESS ANALYZER.

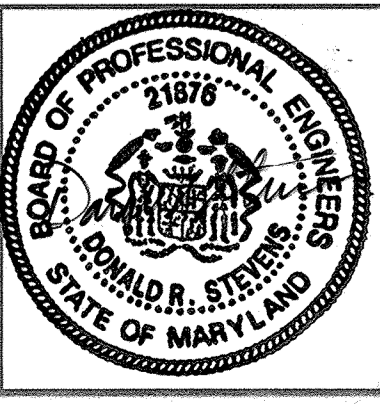
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58472-101-PR-M-A0000550  
58472-104-BB-H-A0000658  
058472  
F058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert W. Baer* C-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*David A. Allen*  
REG. PROF. ENGR. DATE



DES: SFP,DVH									
DRN: DVH,ECC									
CHK: JTF									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**NORTH BLOWER BUILDING  
ELECTRICAL**

**OPERATING FLOOR  
LIGHTING PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

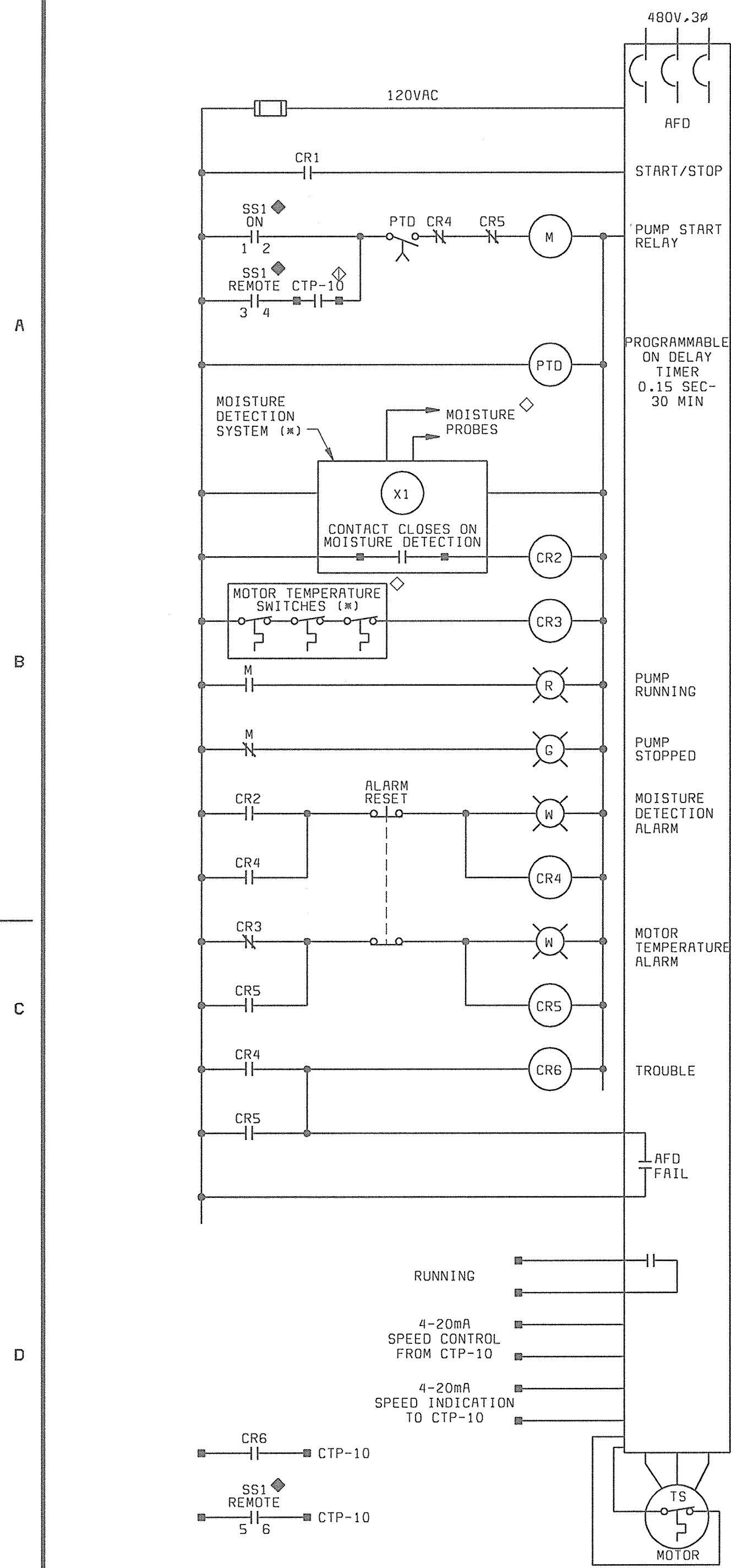
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

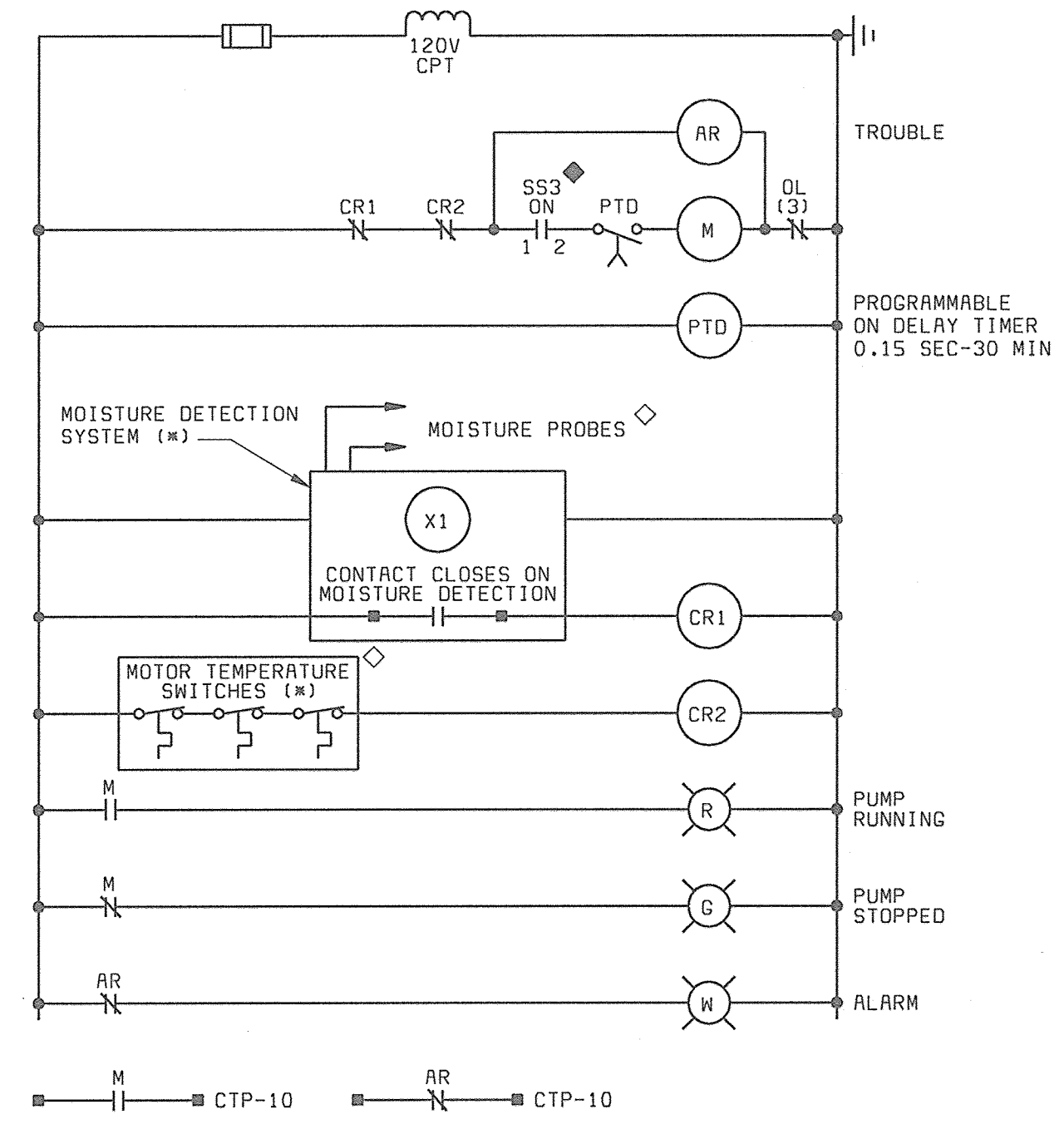
SHEET 124 OF 161

**E14**



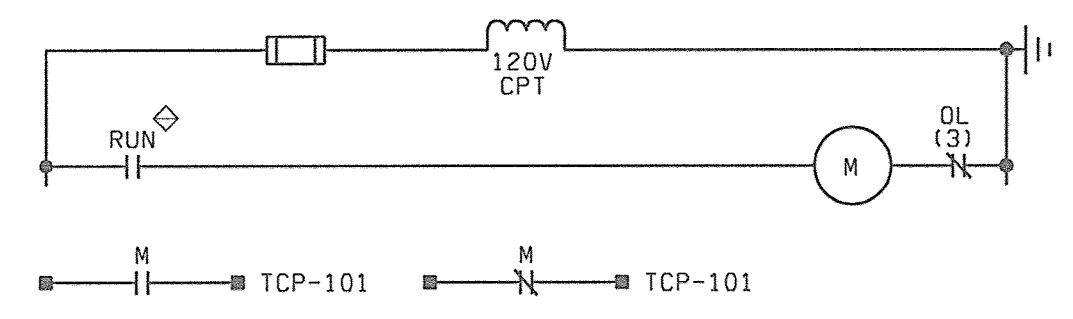
**INTERNAL RECYCLE PUMP**  
5-128-P THROUGH 5-130-P

(\*) PROVIDED UNDER SPECIFICATION 11155

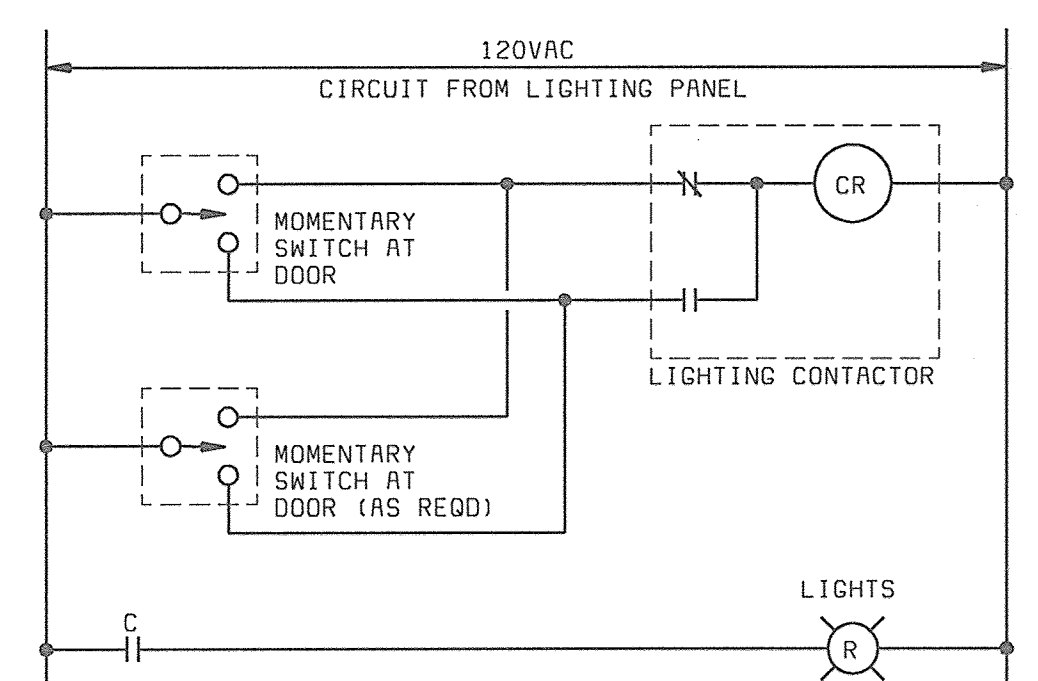


**PROCESS REACTOR MIXER 5-143-MX**

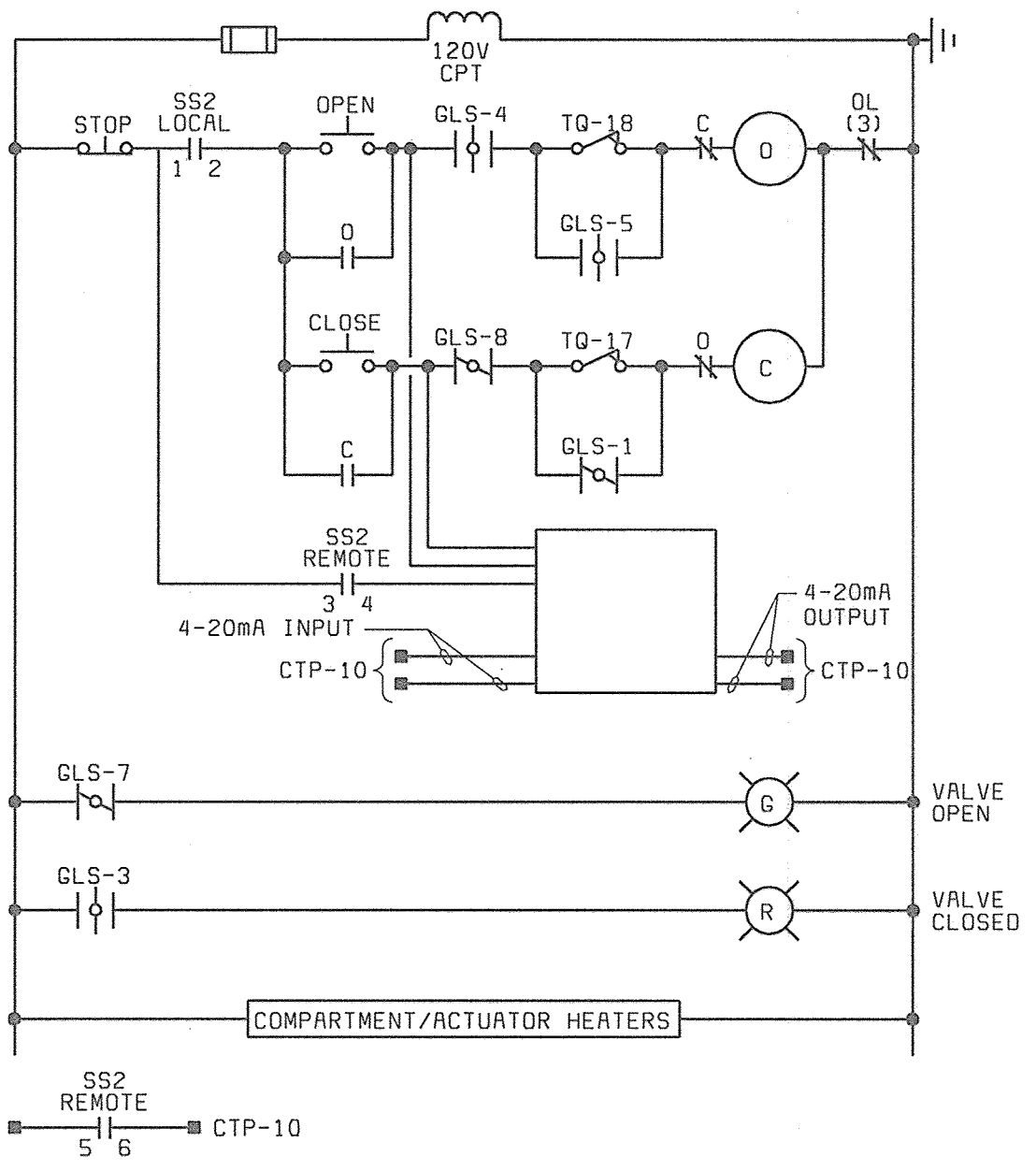
(SIMILAR FOR 5-144 THROUGH 149-MX,  
5-152 THROUGH 158-MX,  
5-161 THROUGH 167-MX)  
(\*) PROVIDED UNDER SPECIFICATION SECTION 11515



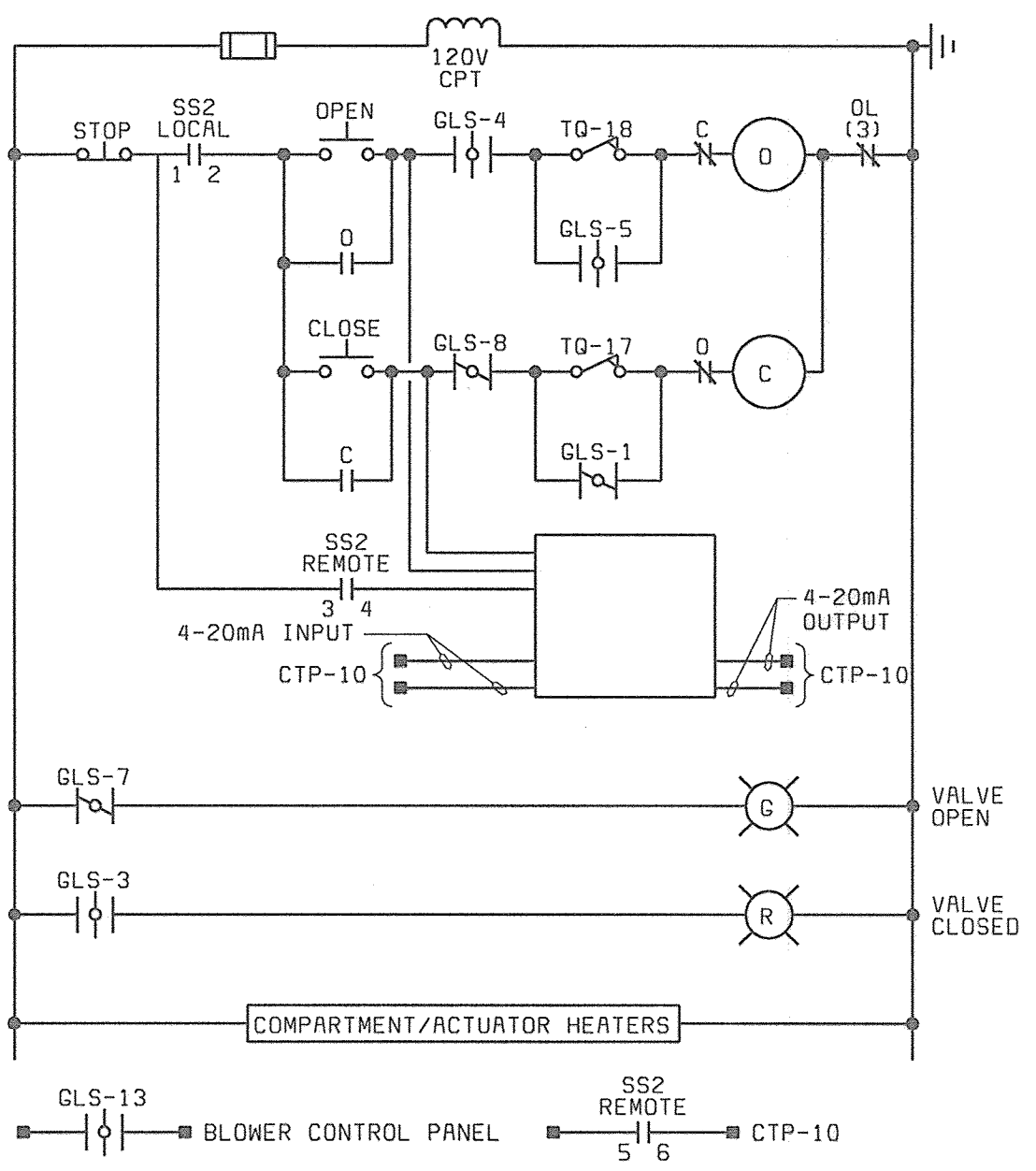
**POWER ROOF VENTILATORS**  
5-577 THROUGH 580-F



**LIGHTING CONTROL OR LIGHTING CONTACTORS C1 THROUGH C4**



**TYPICAL MODULATING VALVE ELECTRIC OPERATOR**



**BLOWER INLET VALVE ELECTRIC OPERATOR**

**GENERAL LIMIT SWITCH DEVELOPMENT:**

R/O CONTACT	ACTUATOR POSITION			
	GLS CONTACT	FULL OPEN (90%)	INTERMEDIATE POSITION (100%)	FULL CLOSED (100%)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

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

**SWITCH DEVELOPMENTS:**

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

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

CONTACTS	POSITION	
	ON	OFF
1-2	X	

**DEVICE LOCATION LEGEND:**

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ CONTROLS TERMINATION PANEL CTP-10 (PIU-10)
- ◇ FROM TCP-101

**NOTES:**

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. AFD SCHEMATICS SHOW FUNCTIONAL CONTROL AND INTERLOCKS. NOT ALL DEVICES ON THE DRIVE ARE SHOWN. SEE SPECIFICATION SECTION 16150 FOR ADDITIONAL REQUIREMENTS. ALL DEVICES ARE LOCATED AT THE DRIVES UNLESS OTHERWISE NOTED. SELECTOR SWITCHES AND PUSHBUTTONS AT AFD SHALL BE MOUNTED ON AFD ENCLOSURE FRONT.
3. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
4. 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 DEFINED IN THE SCHEMATIC SYMBOL LEGEND.
5. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
6. 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.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
R. J. Bauman 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland  
  
David Stein  
REG. PROF. ENGR.  
6/23/00  
DATE



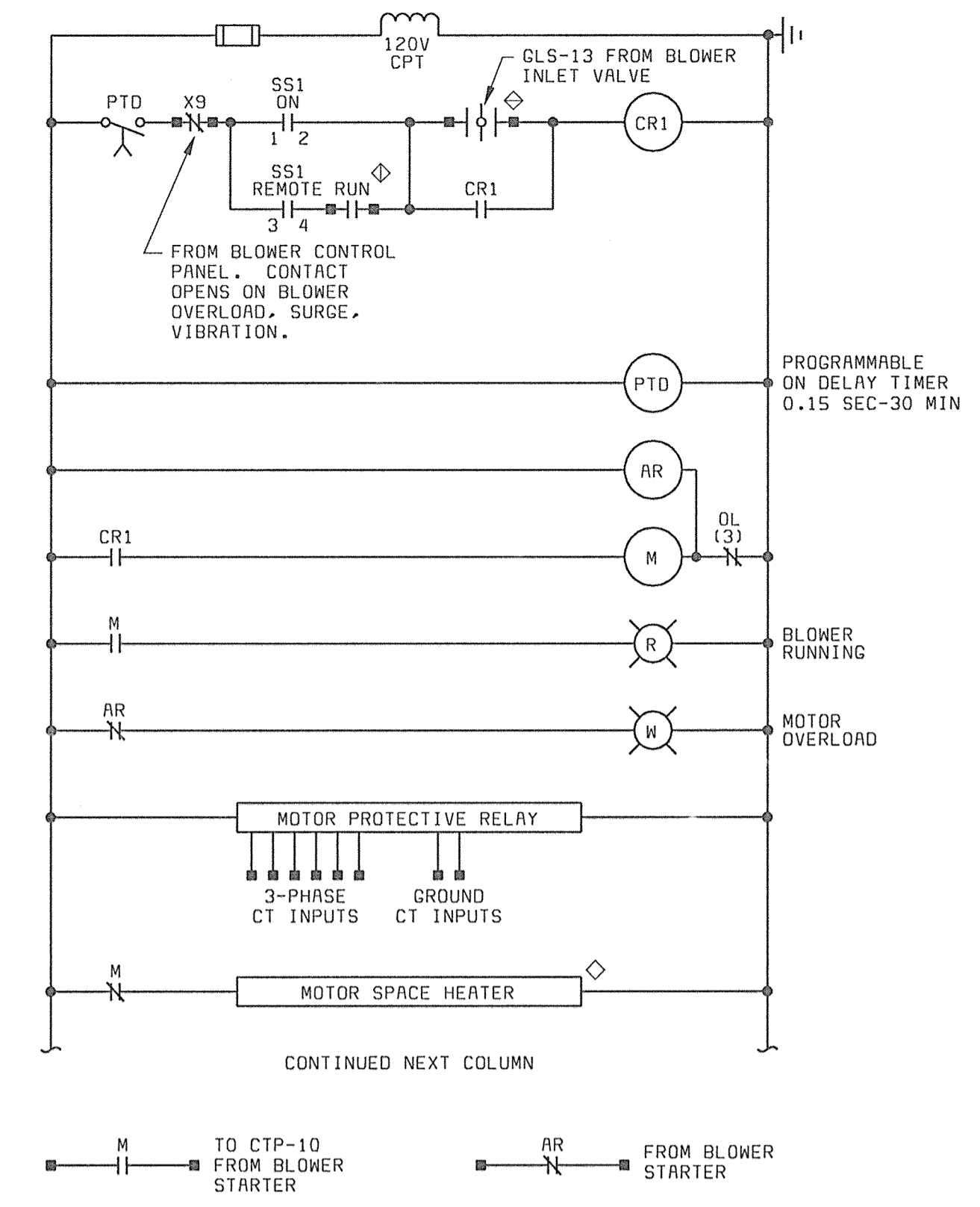
DES: GNS-SFP					
DRN: JCB					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH BLOWER BUILDING ELECTRICAL**  
  
**SCHEMATICS**

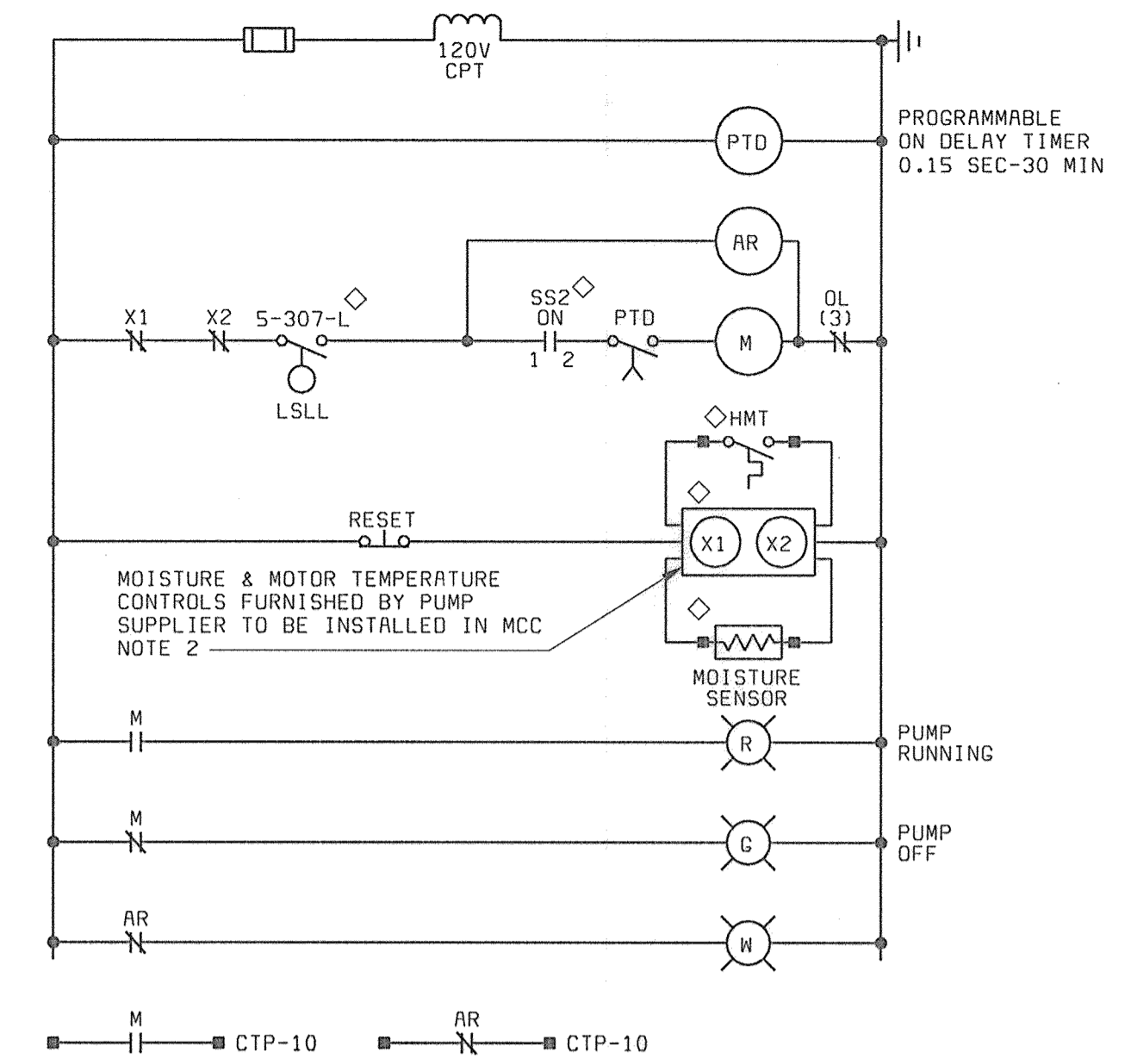
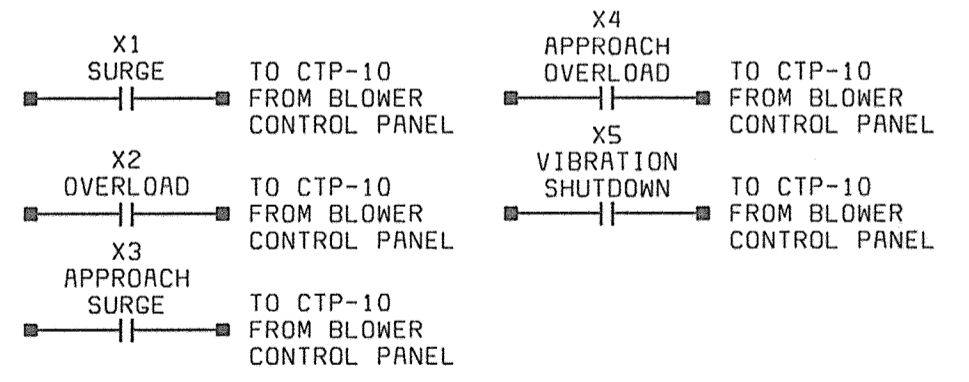
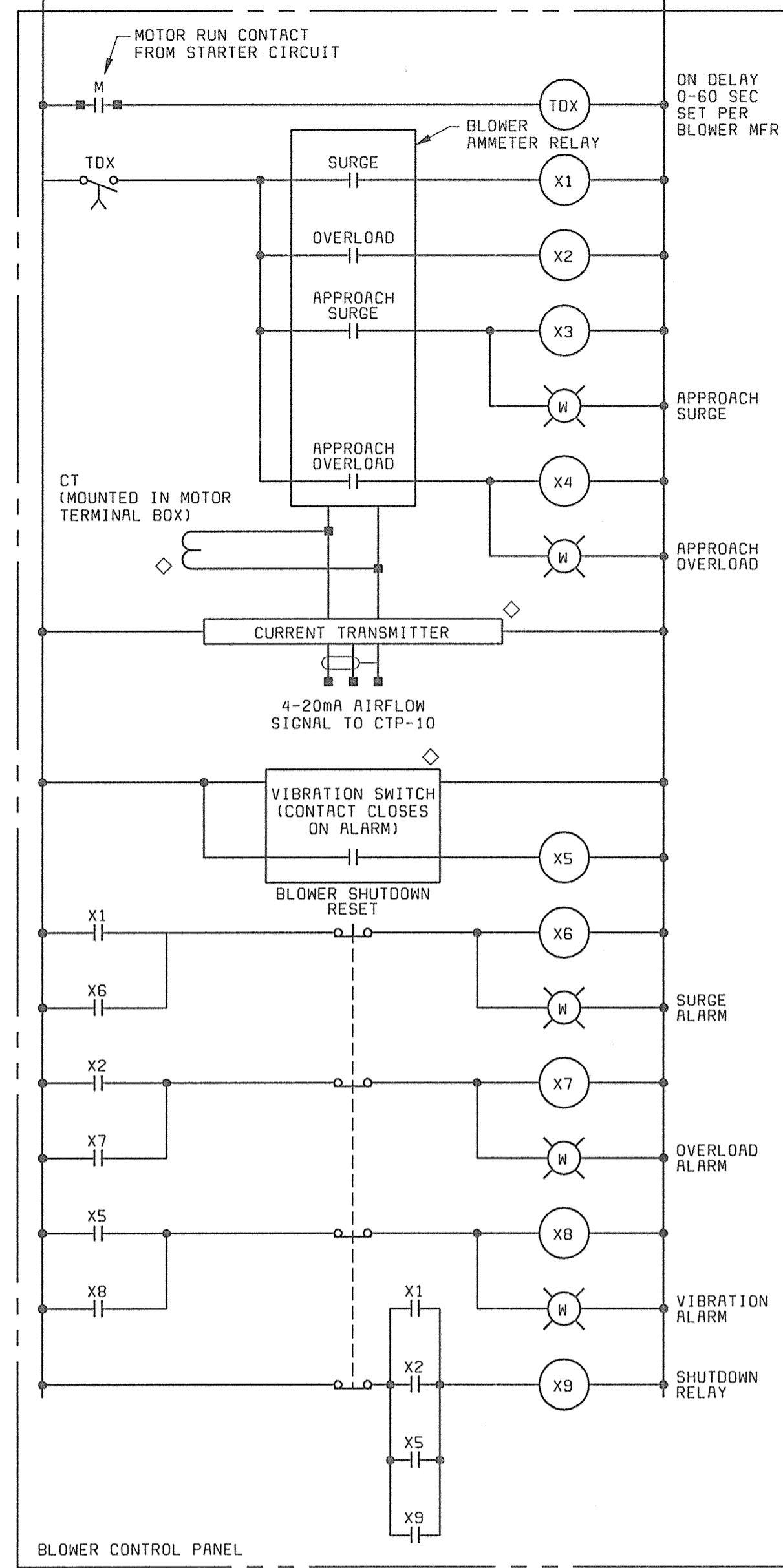
**LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
  
SHEET 125 OF 161  
**E15**

CONTINUED FROM PREVIOUS COLUMN



CONTINUED NEXT COLUMN



PLANT DRAIN PUMP 5-307-P

GEARED LIMIT SWITCH DEVELOPMENT:

ROW CONTACT	GLS CONTACT	ACTUATOR POSITION		
		FULL OPEN (%)	INTERMEDIATE POSITION (90%)	FULL CLOSED (100%)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

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

SWITCH DEVELOPMENTS:

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

CONTACTS	POSITION	
	ON	OFF
1-2	X	

DEVICE LOCATION LEGEND:

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ CONTROL TERMINATION PANEL CTP-10 (PIU-10)
- ◇ FROM TCP-101

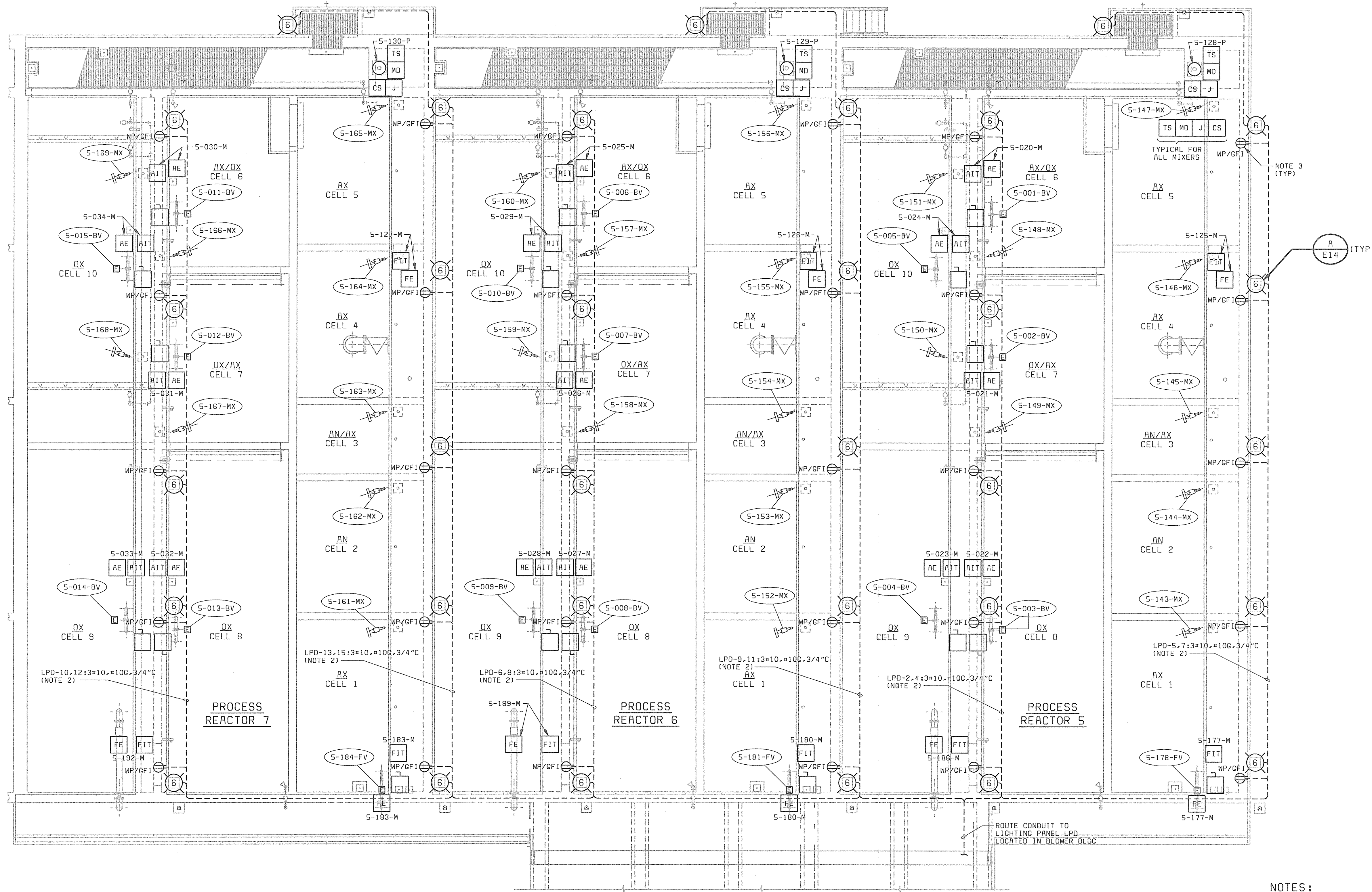
NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. COORDINATE WITH PUMP SUPPLIER PRIOR TO SHOP DRAWING SUBMITTALS. IF 24V POWER SUPPLY IS REQUIRED FOR RELAYING, 120/24V CPT SHALL BE PROVIDED FOR INSTALLATION IN MCC.
3. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
4. 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 DEFINED IN THE SCHEMATIC SYMBOL LEGEND.
5. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
6. 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.

BLOWERS 5-518-MO THROUGH 5-521-MO

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert Benner</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	<b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  <i>Daniel A. Steiner</i> REG. PROF. ENGR. DATE		DES: GNS,SFP DRN: JCB CHK: JTF DATE: 6/23/00	NORTH BLOWER BUILDING ELECTRICAL  SCHEMATICS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 126 OF 161  <b>E16</b>
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058472 F058472A



**POWER AND LIGHTING PLAN**

1/8" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - CIRCUITS LPD-2, LPD-5, LPD-6, LPD-9, LPD-10, LPD-13 ARE FOR LIGHTS. CIRCUITS LPD-4, LPD-7, LPD-8, LPD-11, LPD-12, LPD-15 ARE RECEPTACLES. ALL CONDUITS SHALL BE CONCEALED IN SLAB/WALKWAY CONCRETE.
  - MOUNT RECEPTACLE ON HANDRAIL NEXT TO LIGHT POLE.

59472-101-PR-N-0000172  
59472-101-PR-N-0000550

058472  
F058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
CHIEF, BUREAU OF UTILITIES DATE 6-21-00

**BLACK & VEATCH, L.P.**  
Gaithersburg, Maryland

*David A. ...*  
REG. PROF. ENGR. DATE 6/29/00



DES: SFP, DVH					
DRN: DVH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH PROCESS REACTORS  
ELECTRICAL**

**POWER AND LIGHTING PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

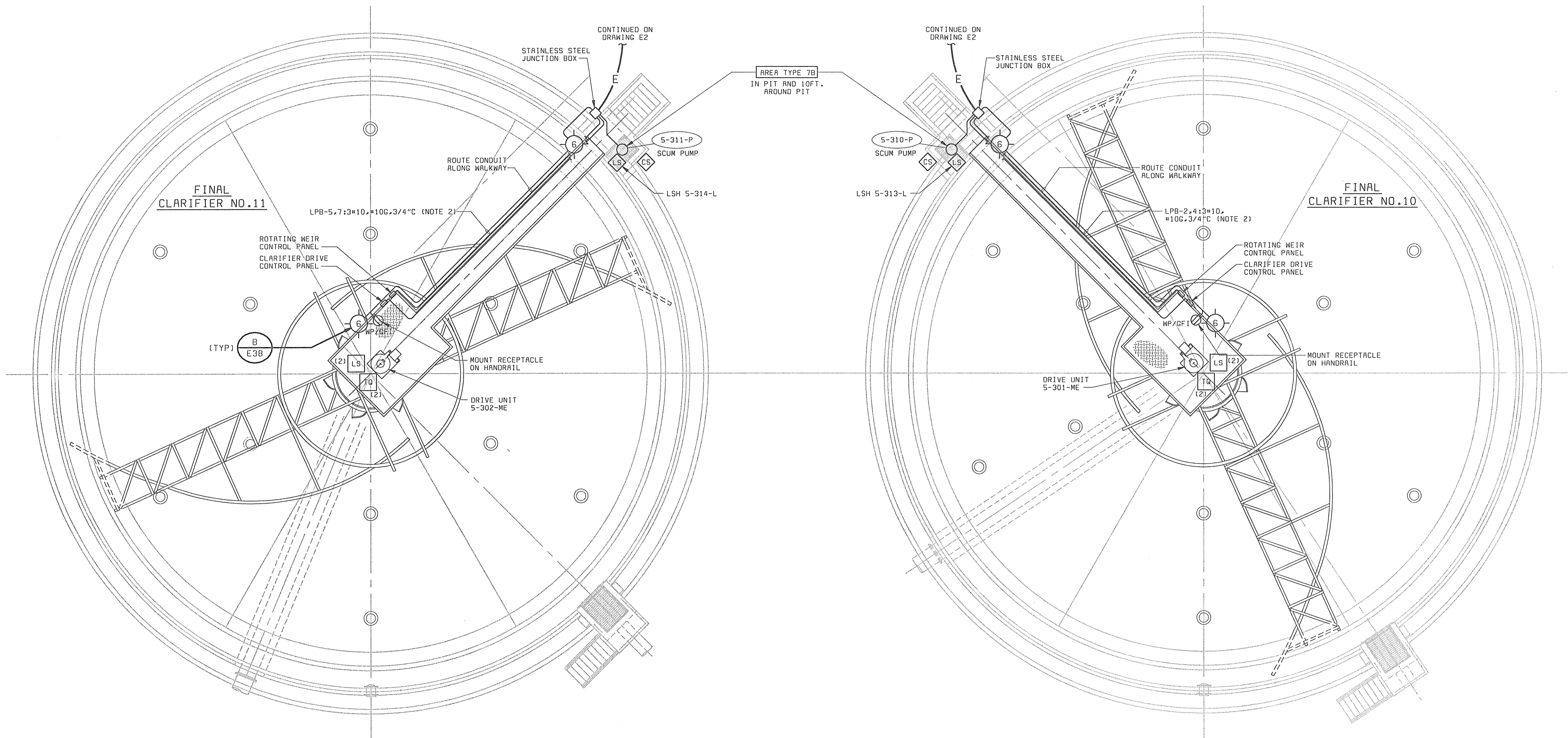
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 127 OF 161

**E17**



**POWER AND LIGHTING PLANS**  
1/8" = 1'-0"

- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  2. CIRCUITS LPB-2 & LPB-5 ARE FOR LIGHTS. CIRCUITS LPB-4 & LPB-7 ARE FOR RECEPTACLES.

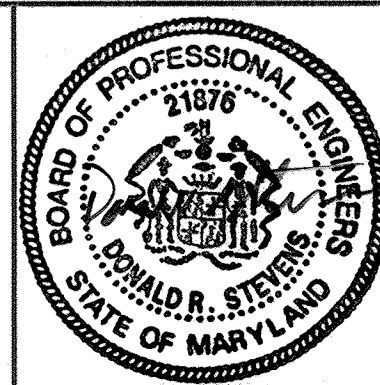
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert Berman* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Daniel Mann* 6/29/00  
REG. PROF. ENGR. DATE



DES: SFP,DVH									
DRN: DVH									
CHK: JTF									
DATE: 6/32/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**FINAL CLARIFIERS  
NO.10 & NO.11  
ELECTRICAL**

**POWER AND LIGHTING PLANS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

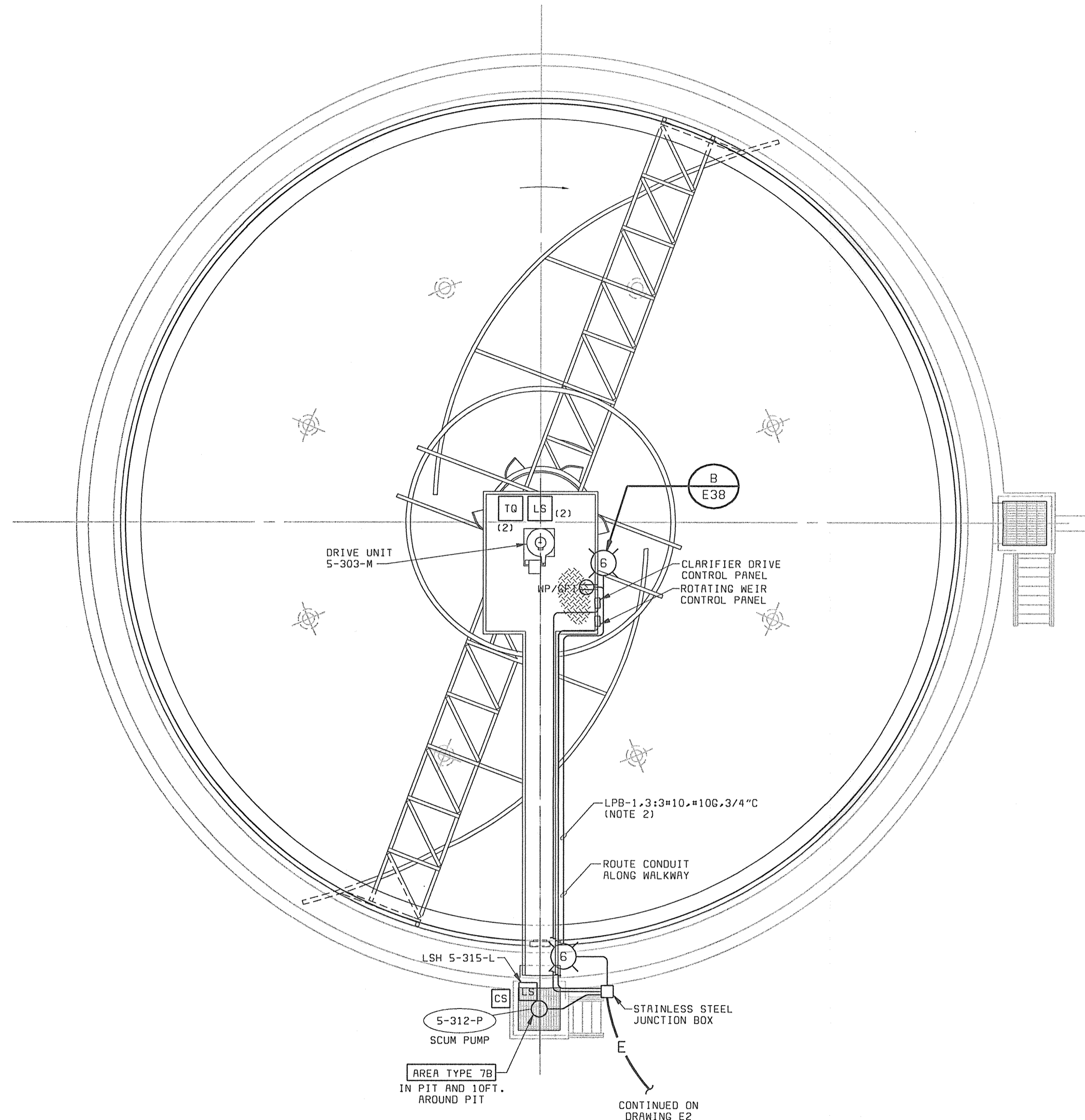
SHEET  
128 OF 161

**E18**



1 2 3 4 5 6 7 8 9 10

A  
B  
C  
D  
E  
F





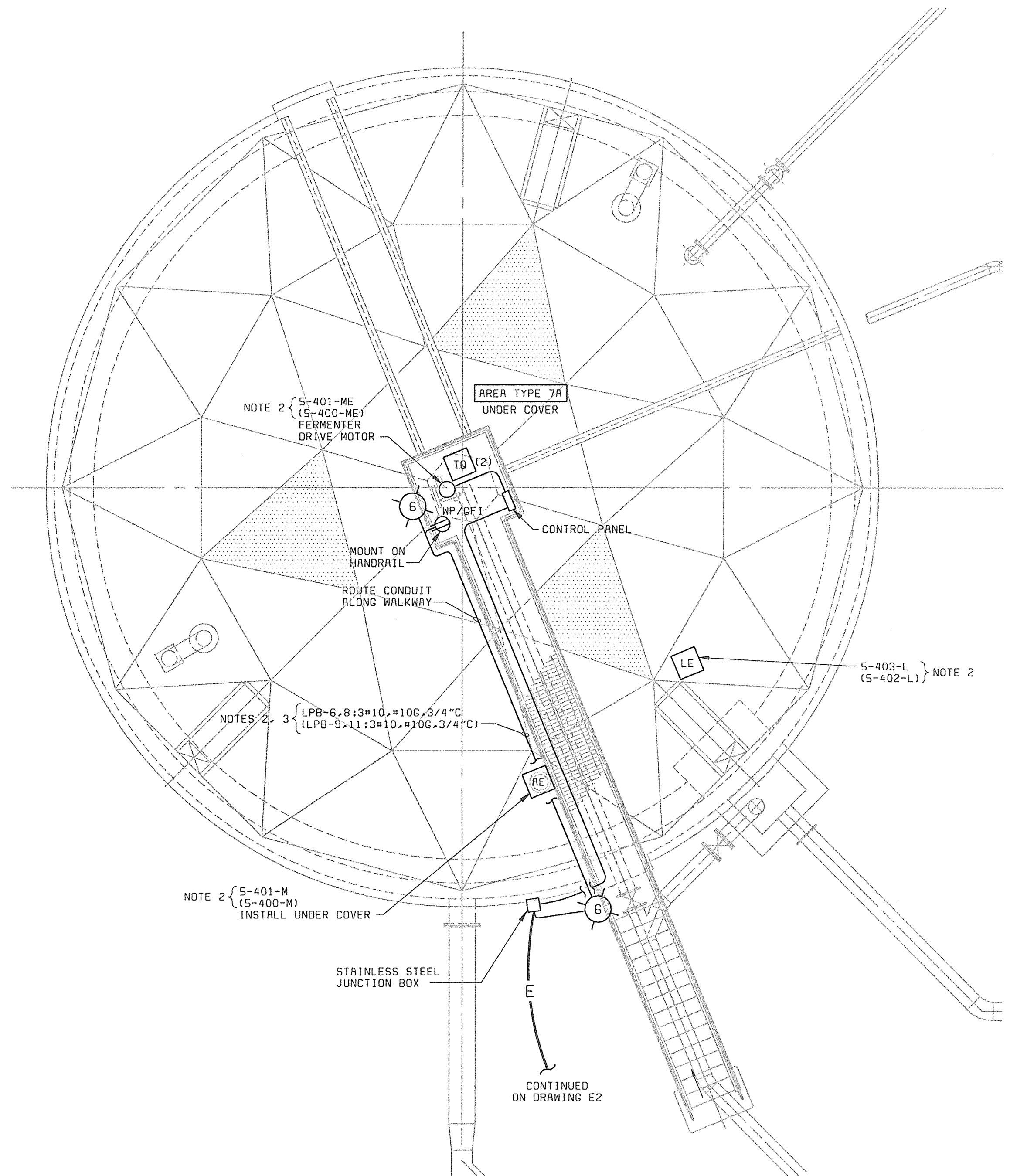
**POWER AND LIGHTING PLAN**

1/8" = 1'-0"

- NOTES:**
- 1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - 2. CIRCUIT LPB-1 IS FOR LIGHTS AND CIRCUIT LPB-3 IS FOR RECEPTACLE.

58472-101-FC-M-AC000178  
 58472-101-FC-M-AC000750  
 58472-101-FC-M-AC000750  
 58472-101-FC-M-AC000750

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert Bennett</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> <sup>LLP</sup> Gaithersburg, Maryland  <i>David Klein</i> 6/24/00 REG. PROF. ENGR. DATE	 BOARD OF PROFESSIONAL ENGINEERS JOHN R. STEVENS STATE OF MARYLAND	DES: SFP, DVH											FINAL CLARIFIER NO.12 ELECTRICAL  <b>POWER AND LIGHTING PLAN</b>	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: DVH	CHK: JTF	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP	SHEET 129 OF 161	E19			



**FERMENTER NO.2 - POWER AND LIGHTING PLAN**  
 3/16" = 1'-0"  
 (FERMENTER NO.1 SIMILAR)

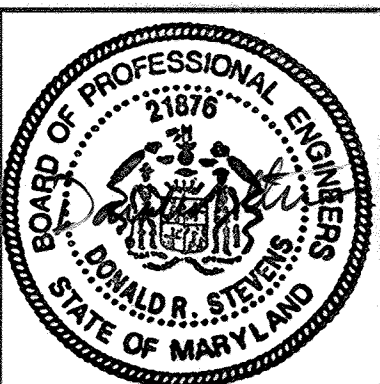
- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  2. ITEMS SHOWN IN PARENTHESIS ARE FOR FERMENTER NO.1
  3. CIRCUITS LPB-6 AND LPB-9 ARE FOR LIGHTS. CIRCUITS LPB-8 AND LPB-11 ARE FOR RECEPTACLES.

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*Robert B. ...*  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** L.P.  
 Gaithersburg, Maryland

*Daniel ...*  
 REG. PROF. ENGR. DATE 6/23/00



DES: RDB, DVH									
DRN: DVH									
CHK: JTF									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**FERMENTERS  
 ELECTRICAL**

**POWER AND LIGHTING PLAN**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

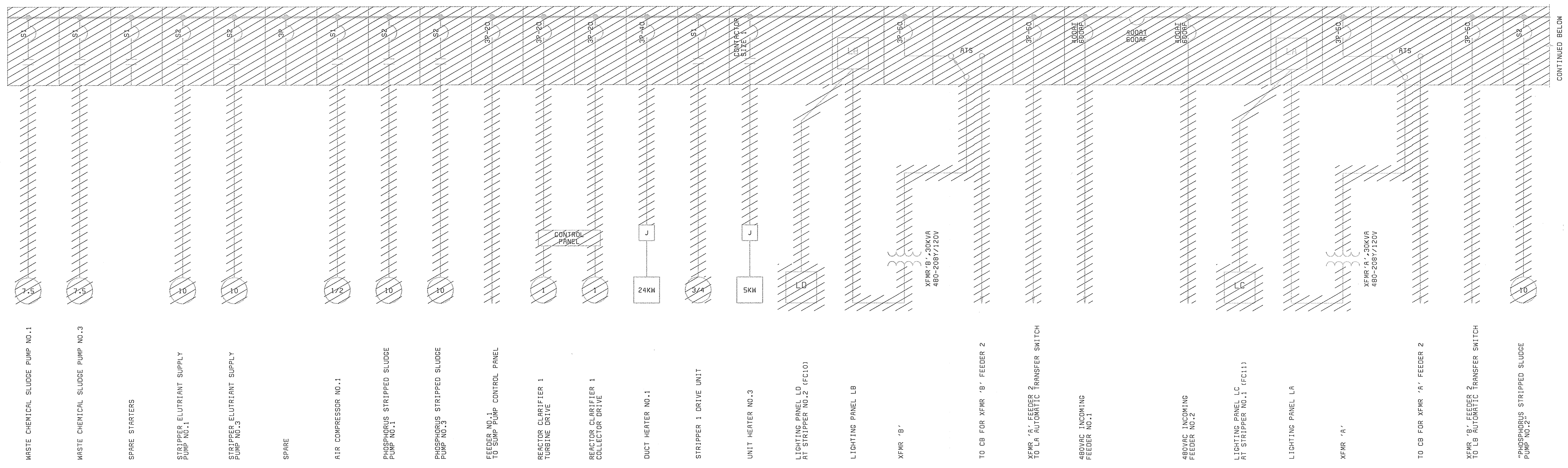
SCALE  
 AS  
 SHOWN

SHEET  
 130 OF 161

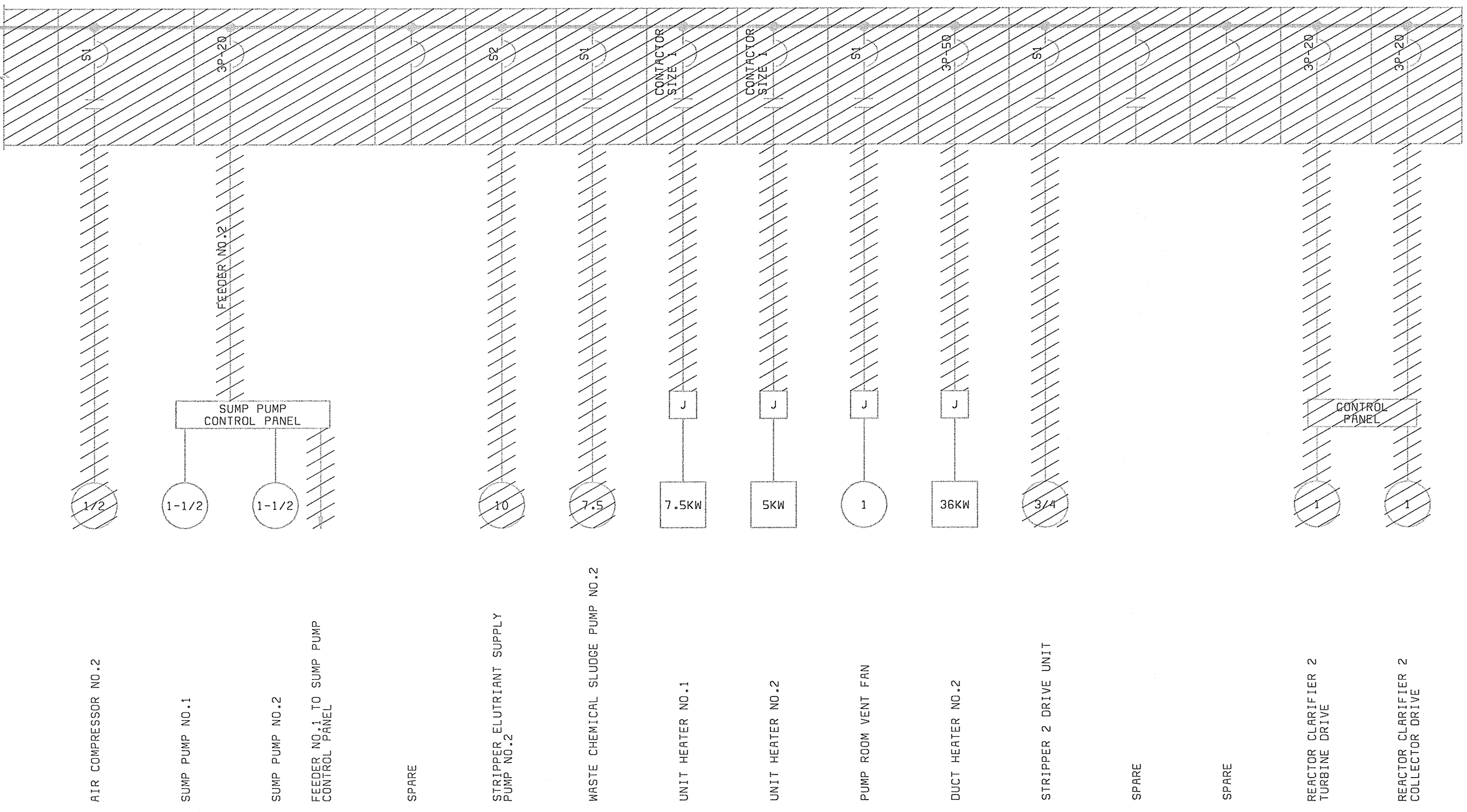
**E20**

D58472  
 F058472A

A  
B  
C  
D  
E  
F



MCC13 DEMOLITION ONE-LINE DIAGRAM



MCC13 DEMOLITION ONE-LINE DIAGRAM (CONTINUED)

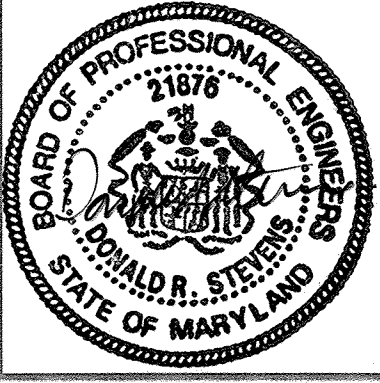
- NOTES:**
- EXISTING MCC CC13 SHALL BE REMOVED AND REPLACED WITH NEW MCC13. LOADS SHOWN AS REMOVED INCLUDE REMOVAL OF CONTROL SYSTEM (SWITCHES, SOLENOIDS, ETC), CAPACITORS, ETC.
  - EXISTING HVAC SYSTEM SHALL REMAIN INTACT, EXCEPT FOR NEW POWER FEEDS FROM THE NEW MCC13 AND NEW LIGHTING PANELS.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert M. Boring* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Daniel J. Hines* 6/23/00  
REG. PROF. ENGR. DATE



DES: GNS,SFP					
DRN: JCB					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

NORTH GALLERY BUILDING  
ELECTRICAL

CC13 DEMOLITION  
ONE-LINE DIAGRAM

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

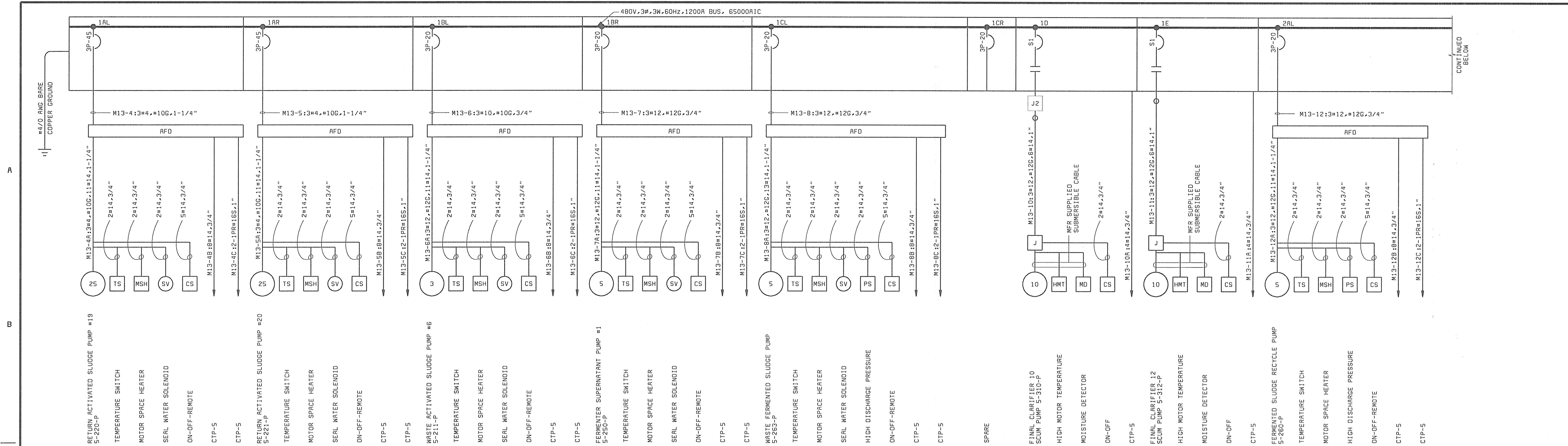
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

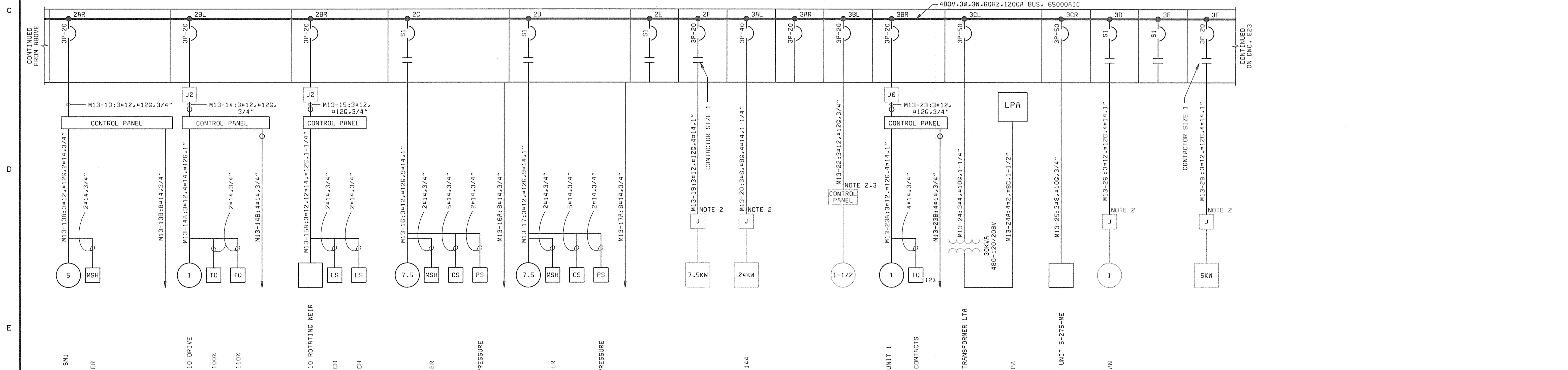
SCALE AS SHOWN

SHEET 131 OF 161

E21



NEW MCC13 ONE-LINE DIAGRAM



NEW MCC13 ONE-LINE DIAGRAM (CONTINUED)

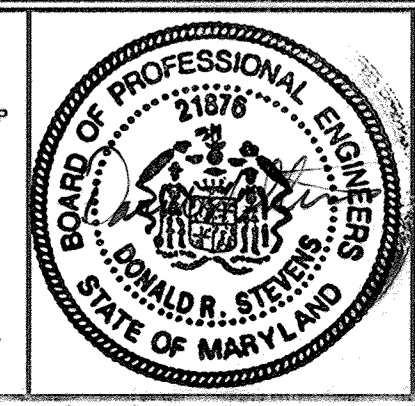
- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - FIELD VERIFY EXISTING WIRING TO DEVICE. USE CORRESPONDING CABLE, TO SPLICE IN JUNCTION BOX, PULLBOX, OR PANEL AS INDICATED.
  - SUMP PUMP 1 AND 2 SHARE THE SAME CONTROL PANEL, WHICH REQUIRES ONE FEED FROM EACH SIDE OF MCC13.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  REG. PROF. ENGR. DATE: 6/23/00	DES: GNS,SFP DRN: DAH CHK: JTF DATE: 6/23/00	NORTH GALLERY BUILDING ELECTRICAL  NEW MCC13 ONE-LINE DIAGRAM	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 132 OF 161 E22
	REVISIONS AND RECORD OF ISSUE NO. BY CK APP			

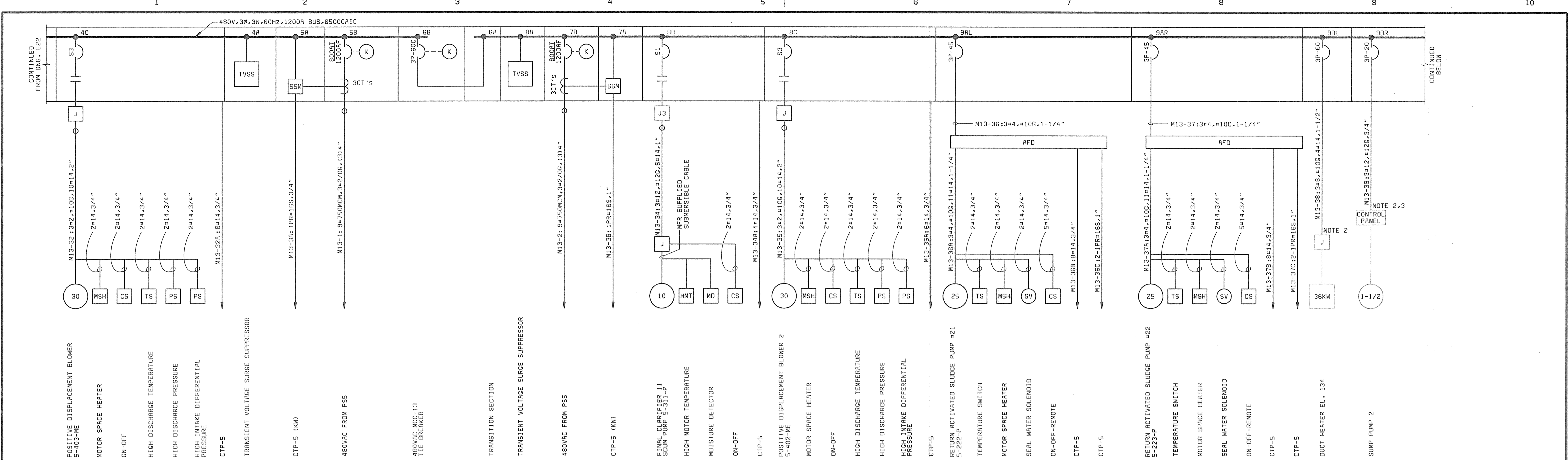
058472  
F058472A

*Robert Brown* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

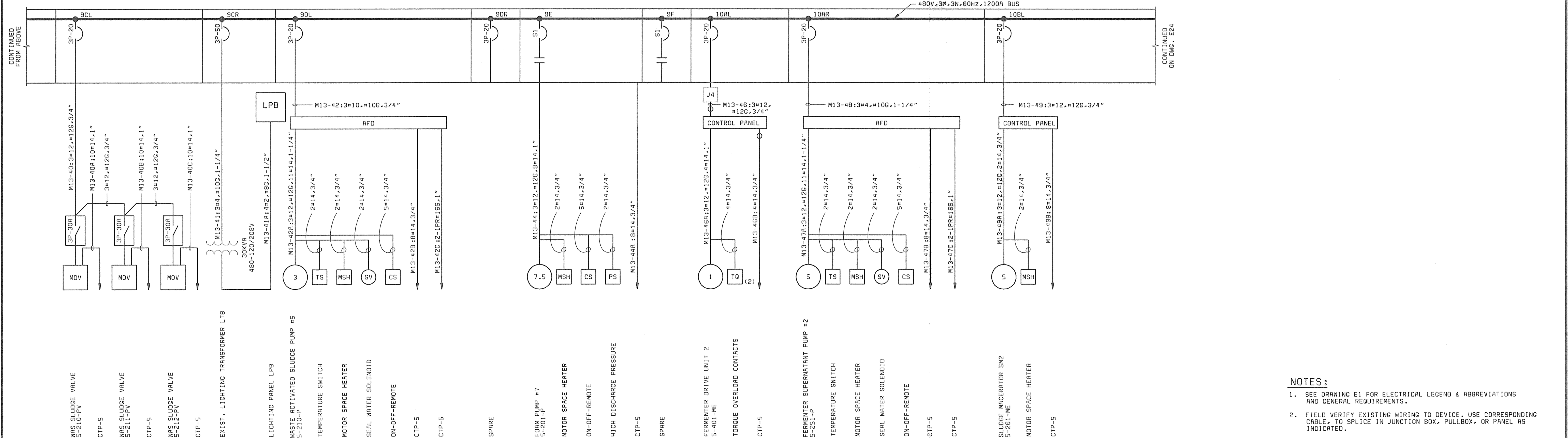
*Donald R. Stevens* 6/23/00  
REG. PROF. ENGR. DATE



NO.	BY	CK	APP



NEW MCC13 ONE-LINE DIAGRAM (CONTINUED)



NEW MCC13 ONE-LINE DIAGRAM (CONTINUED)

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - FIELD VERIFY EXISTING WIRING TO DEVICE. USE CORRESPONDING CABLE, TO SPLICE IN JUNCTION BOX, PULLBOX, OR PANEL AS INDICATED.
  - SUMP PUMP 1 AND 2 SHARE THE SAME CONTROL PANEL, WHICH REQUIRES ONE FEED FROM EACH SIDE OF MCC13.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Ralph Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*David M. ...*  
REG. PROF. ENGR. DATE 6/24/00



DES: GNS-SFP					
DRN: DAH.EEC					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

NORTH GALLERY BUILDING  
ELECTRICAL

NEW MCC13 ONE-LINE DIAGRAM  
CONTINUATION

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

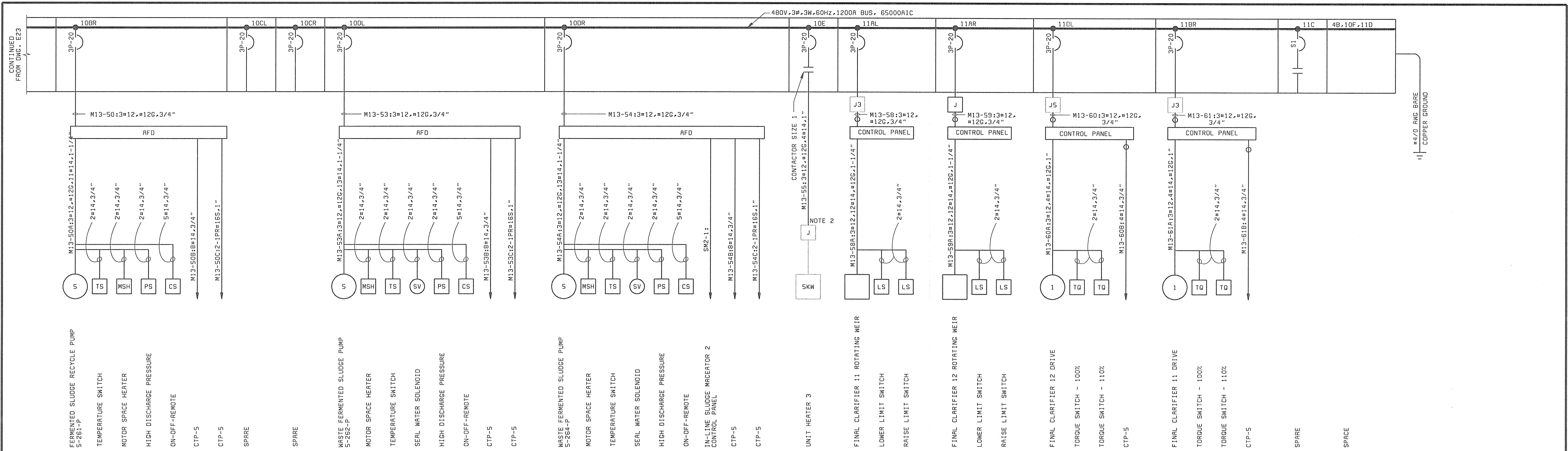
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 133 OF 161

E23



MCC13 ONE-LINE DIAGRAM  
(CONTINUED)

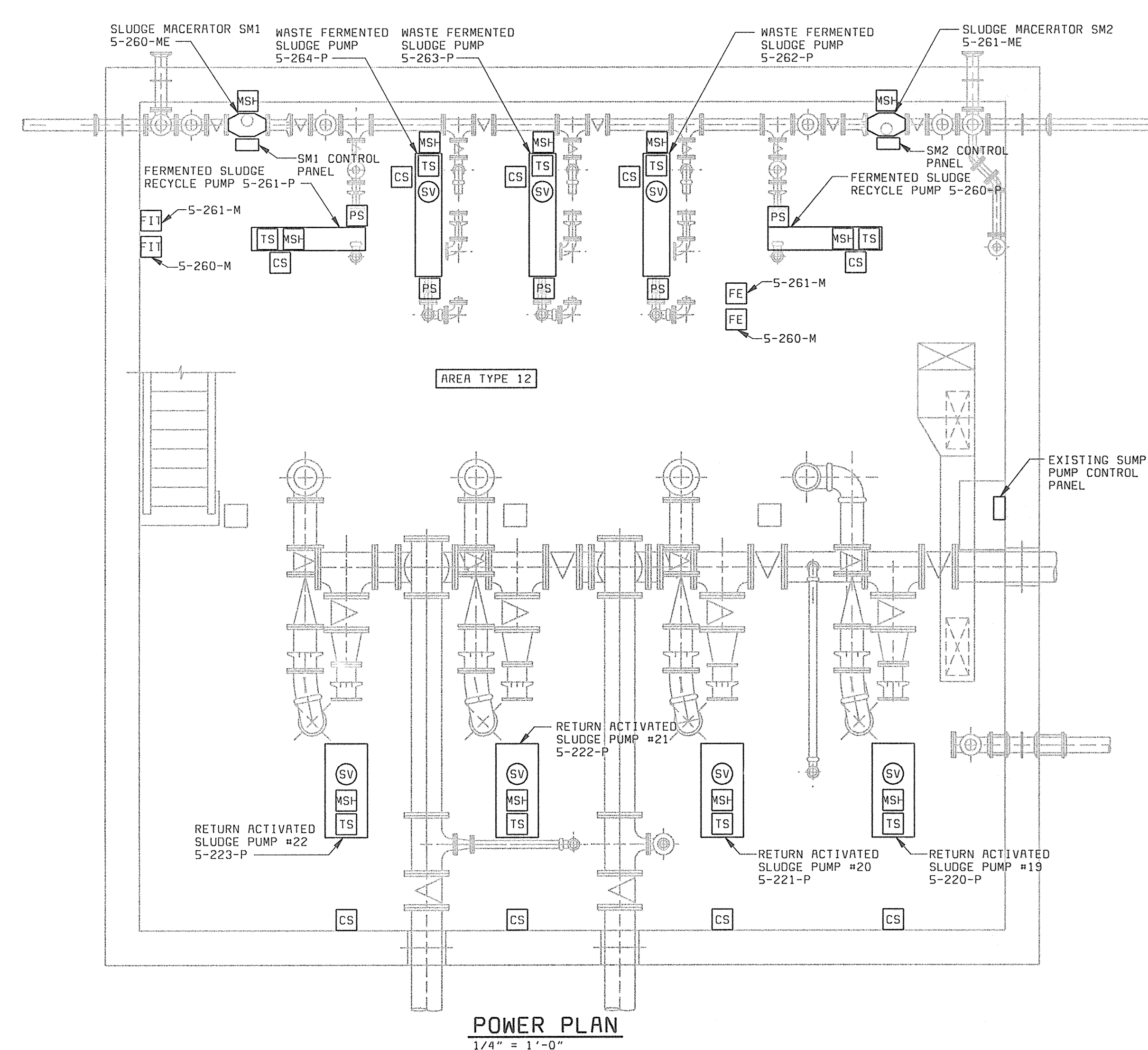
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1BL	1BR	2BL	2BR	3BL	3BR						9BL	9BR	10BL	10BR	11BL	11BR
1CL	1CR	2CL	2CR	3CL	3CR	4B	5B			8B	9CL	9CR	10CL	10CR	11C	
1D		2D		3D		4C		6B	7B	8C	9DL	9DR	10DL	10DR	11D	
		2E		3E							9E		10E			
1E		2F		3F							9F		10F			

MCC13 FRONT ELEVATION  
NO SCALE

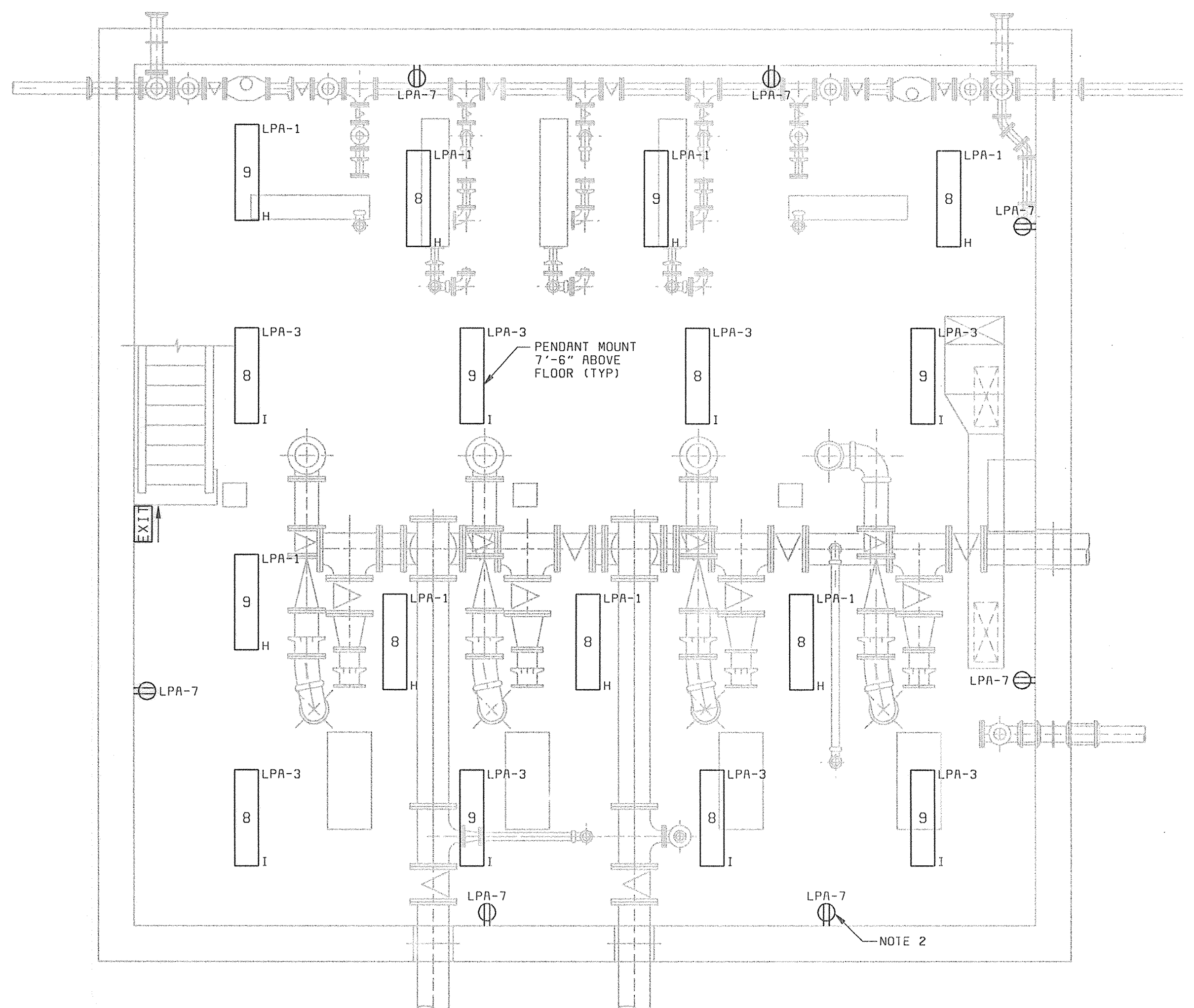
- NOTES:
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - FIELD VERIFY EXISTING WIRING TO DEVICE. USE CORRESPONDING CABLE, TO SPLICE IN JUNCTION BOX, PULLBOX, OR PANEL AS INDICATED.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland  REG. PROF. ENGR. DATE: 6/24/00	DES: GNS.SFP DRN: OAH.EEC CHK: JTF DATE: 6/23/00	NORTH GALLERY BUILDING ELECTRICAL  NEW MCC13 ONE-LINE DIAGRAM CONTINUATION	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 134 OF 161  <b>E24</b>
	CHIEF, BUREAU OF UTILITIES DATE: 6-29-00 	REVISIONS AND RECORD OF ISSUE NO. BY CK APP		

058472  
F058472R



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



**LIGHTING PLAN**  
1/4" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE WP/GFI. MOUNT RECEPTACLES 4'-0" ABOVE FLOOR.

56472-101-RSPS-W-R0000205

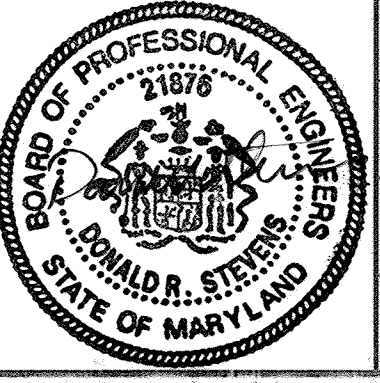
56472-101-RSPS-W-R0000205

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Donald R. Steiner*  
REG. PROF. ENGR. DATE 6/23/00



DES: GNS, DVH					
DRN: DVH, DAH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH GALLERY BUILDING**  
**ELECTRICAL**

**POWER AND LIGHTING PLANS**  
EL 124.00

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

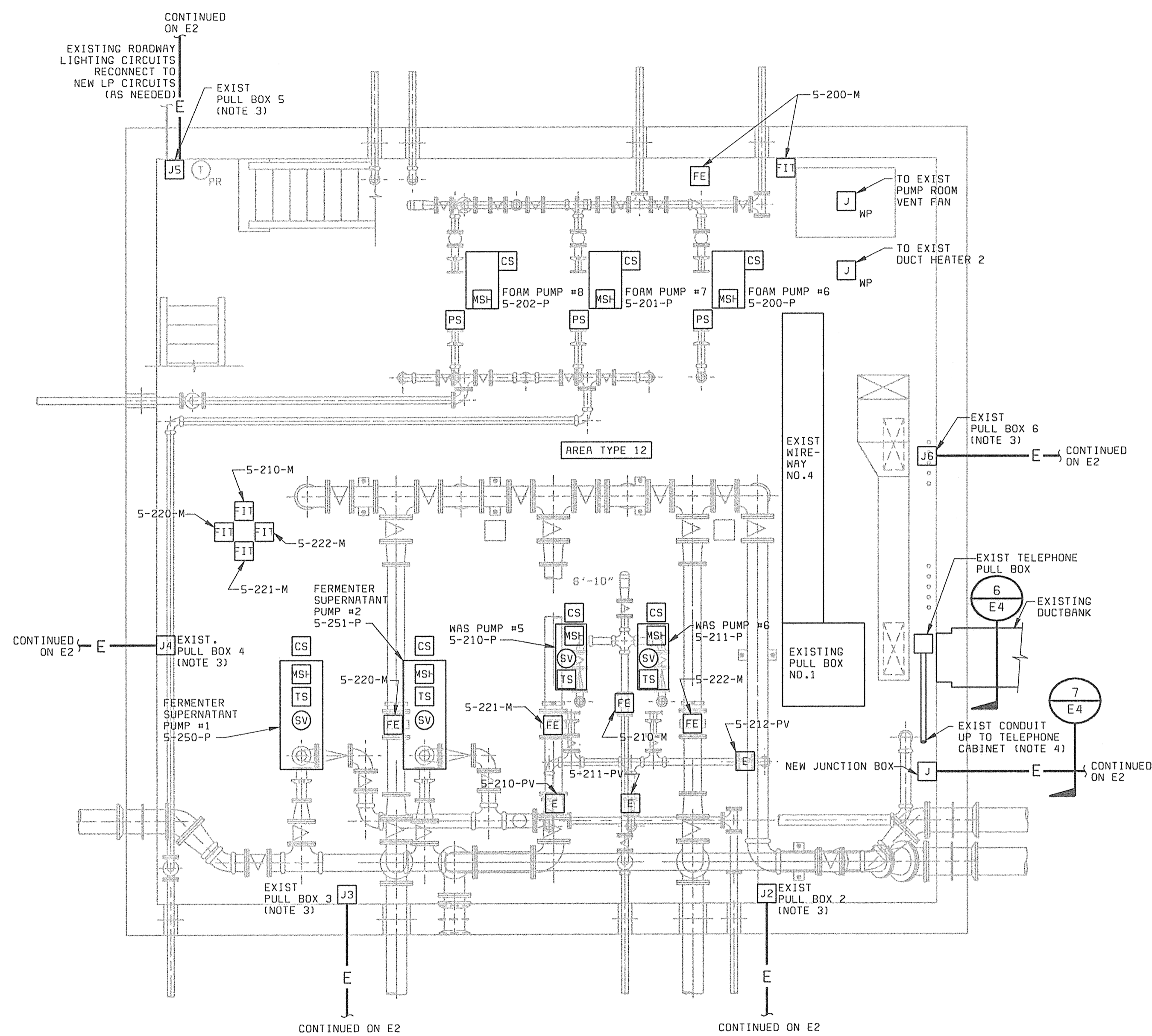
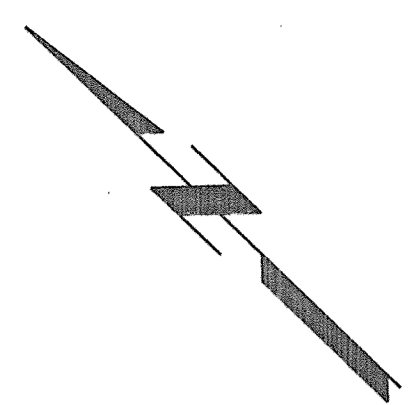
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

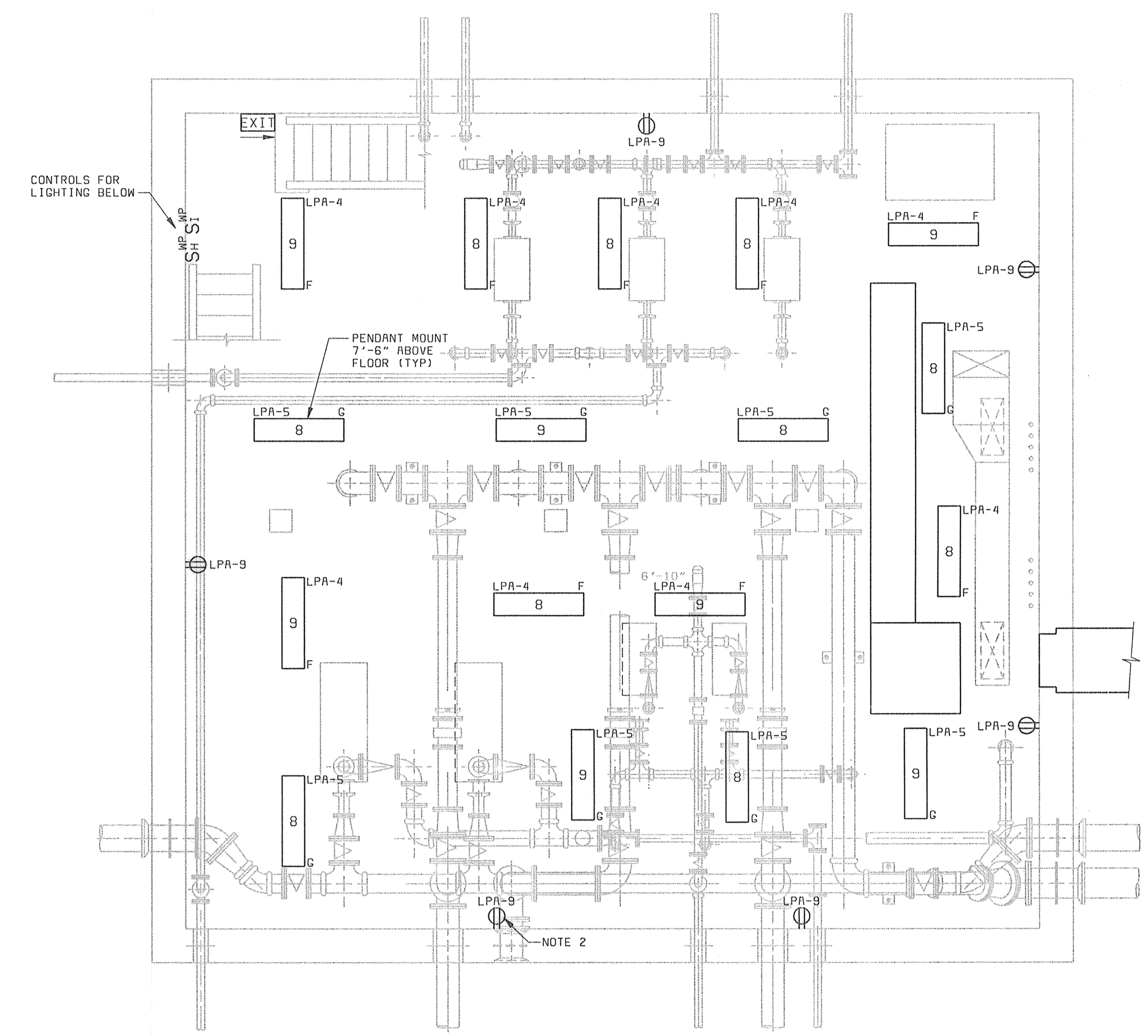
SCALE AS SHOWN

SHEET 135 OF 161

**E25**



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



**LIGHTING PLAN**  
1/4" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE WP/GFI. MOUNT RECEPTACLES 4'-0" ABOVE FLOOR.
  - EXISTING PULL BOXES 1 THROUGH 6 PROVIDE THE REQUIRED CONDUIT WALL PENETRATIONS. USE ONE 2" PENETRATION FROM J2 FOR ALL FC10 LOADS, ONE 2" PENETRATION FOR ALL FC11 LOADS, ONE 3" PENETRATION FROM J6 FOR FERMENTER 1 LOADS, ONE 3" PENETRATION FROM J6 FOR THE POSITIVE DISPLACEMENT BLOWERS, ONE 3" PENETRATION FROM J4 FOR ALL FERMENTER 2 LOADS, AND THE EXISTING EXTRA 2" PENETRATION FROM J5 FOR ALL FC12 LOADS. ALL PENETRATIONS NOT USED SHALL BE STUBBED OUT AND CAPPED.
  - EXISTING CONDUIT TO TELEPHONE CABINET WILL REQUIRE SOME RE-ROUTING TO AVOID INTERFERENCE WITH NEW DUCTWORK INSTALLATION FOR 5-275-ME AT ELEVATION 144.00.

56472-101-RSPS-W-R0000205

D58472 F058472A

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. ...*  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Paul A. ...*  
REG. PROF. ENGR. DATE 6/28/00



DES: GNS/DVH					
DRN: DVH/DAH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH GALLERY BUILDING  
ELECTRICAL**

**POWER AND LIGHTING PLANS  
EL 134.00**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

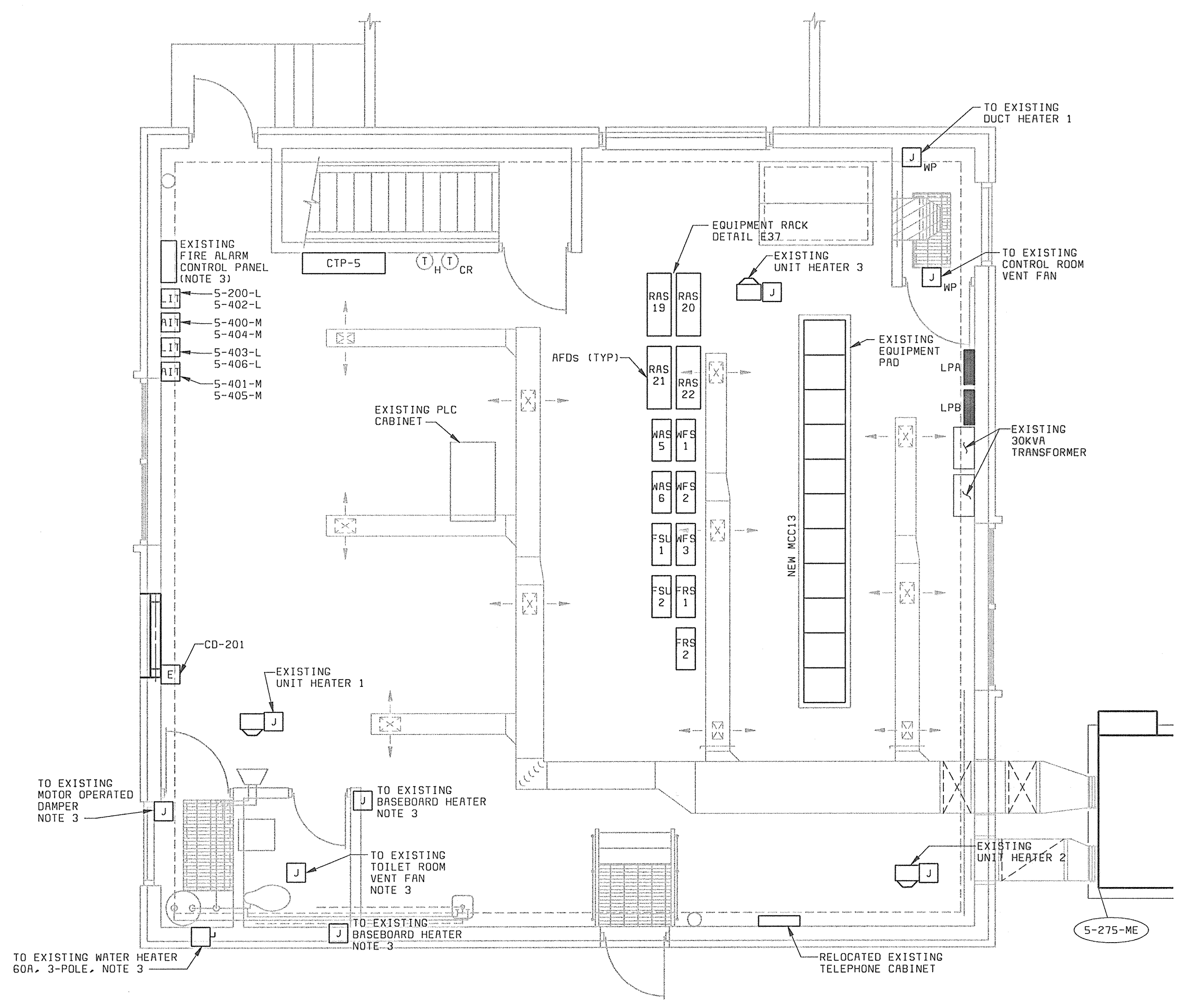
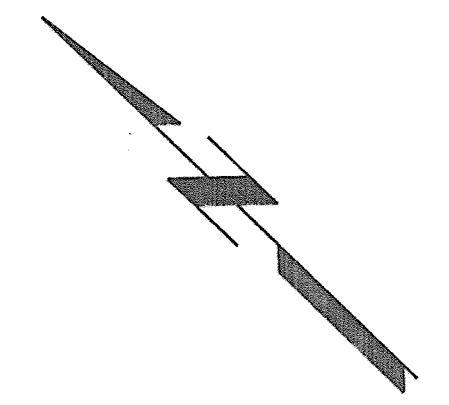
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

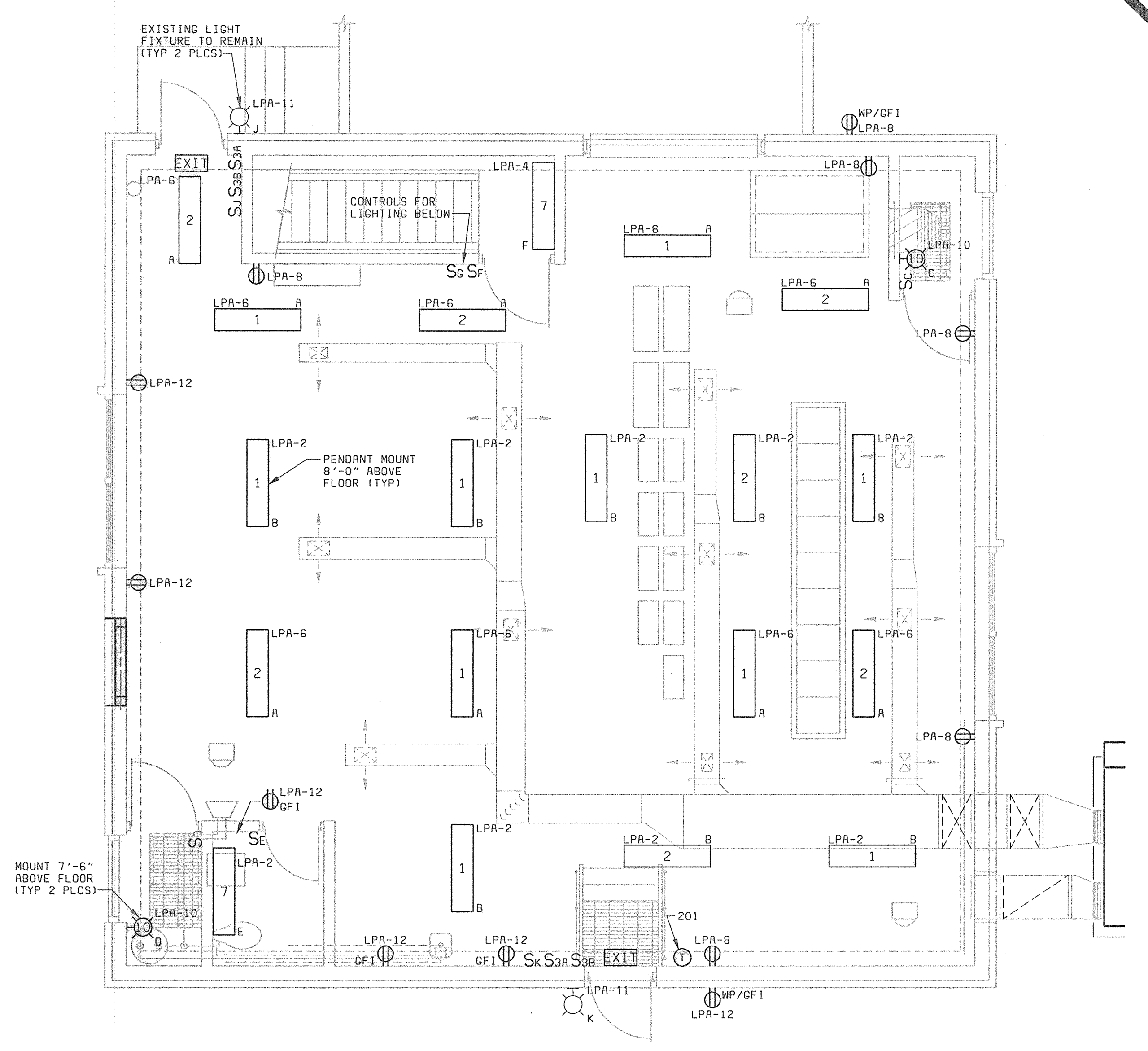
SHEET 136 OF 161

**E26**





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



**LIGHTING PLAN**  
1/4" = 1'-0"

- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  2. ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE GF1 TYPE.
  3. EXISTING HVAC AND WATER HEATER LOADS, AND FIRE ALARM CONTROL PANEL, SHALL BE PRESERVED AND RE-POWERED FROM NEW ELECTRICAL EQUIPMENT AS REQUIRED.

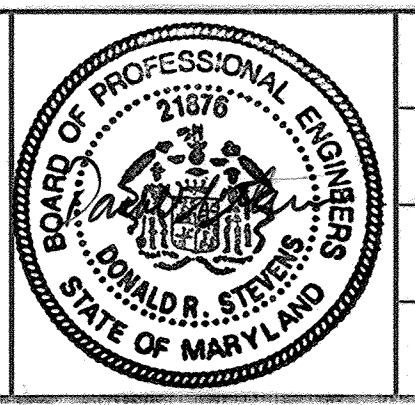
58472-104-ASPS-H-00000700  
58472-106-ASPS-E-00000674

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert J. ...* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Donald ...*  
REG. PROF. ENGR. DATE: 6/29/00



DES: GNS.DVH					
DRN: DVH.DAH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**NORTH GALLERY BUILDING  
ELECTRICAL**

**POWER AND LIGHTING PLANS  
EL 144.00**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

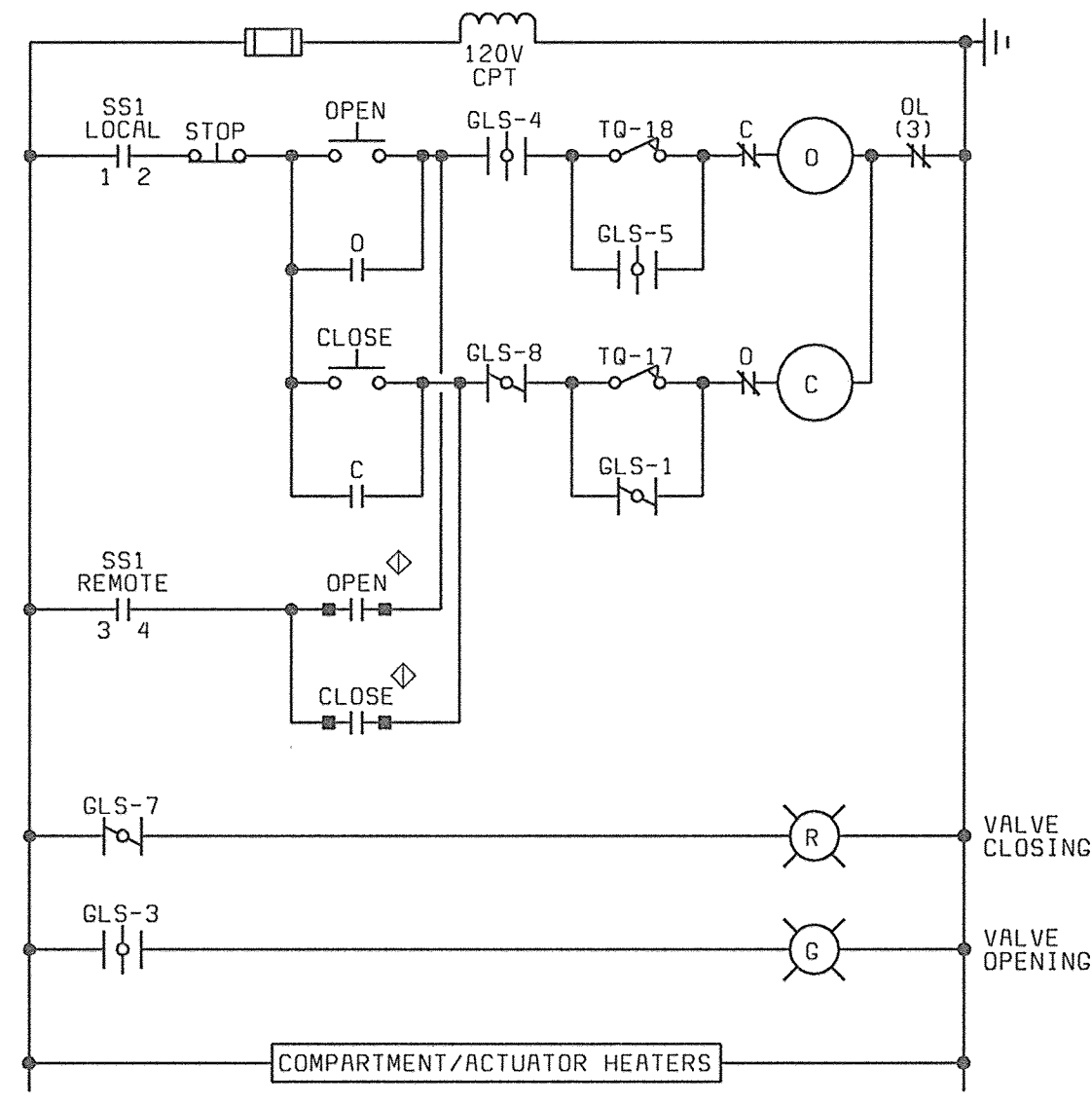
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

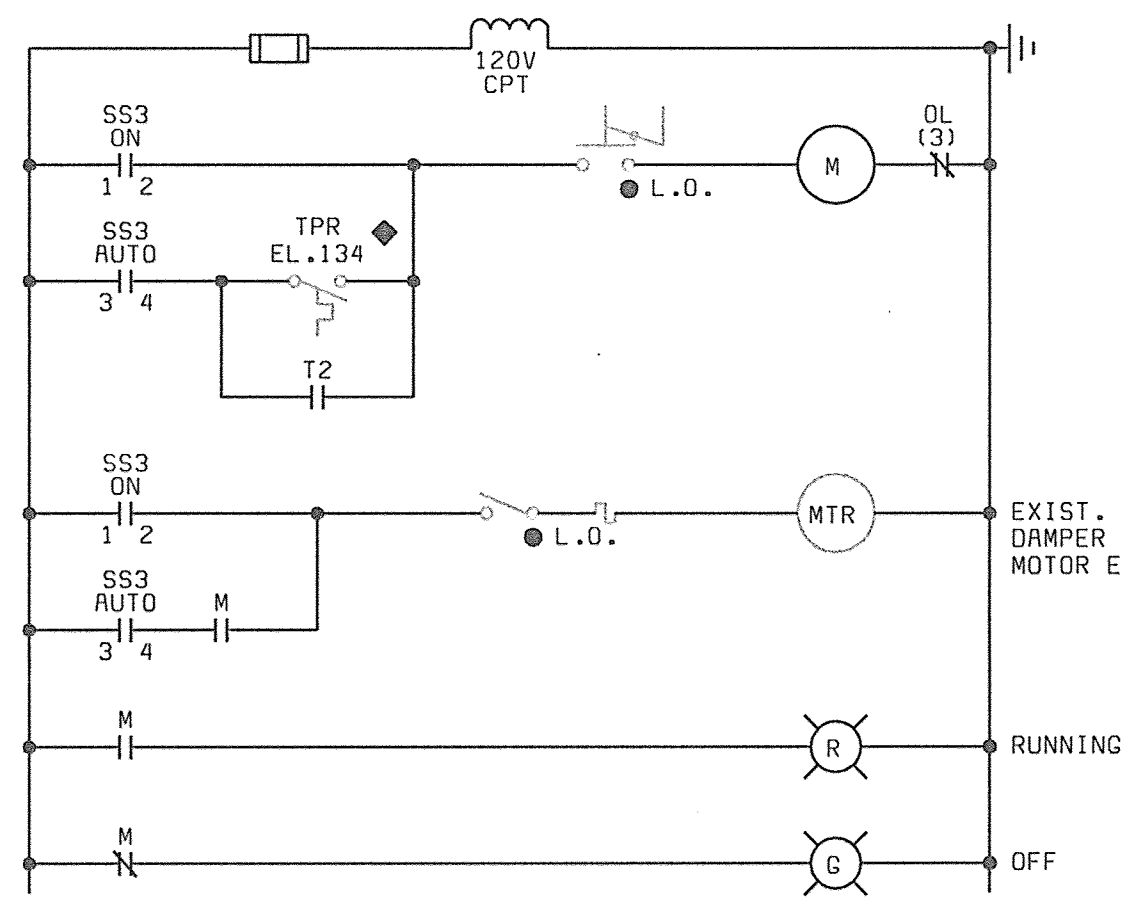
SCALE AS SHOWN

SHEET 137 OF 161

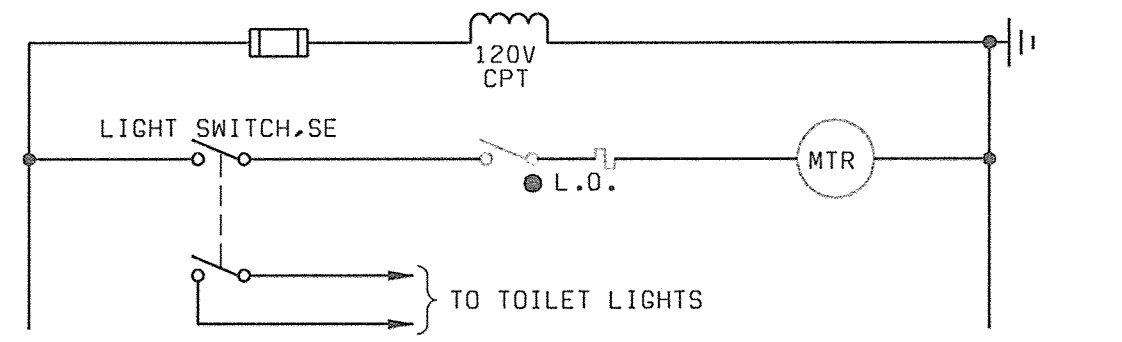
**E27**



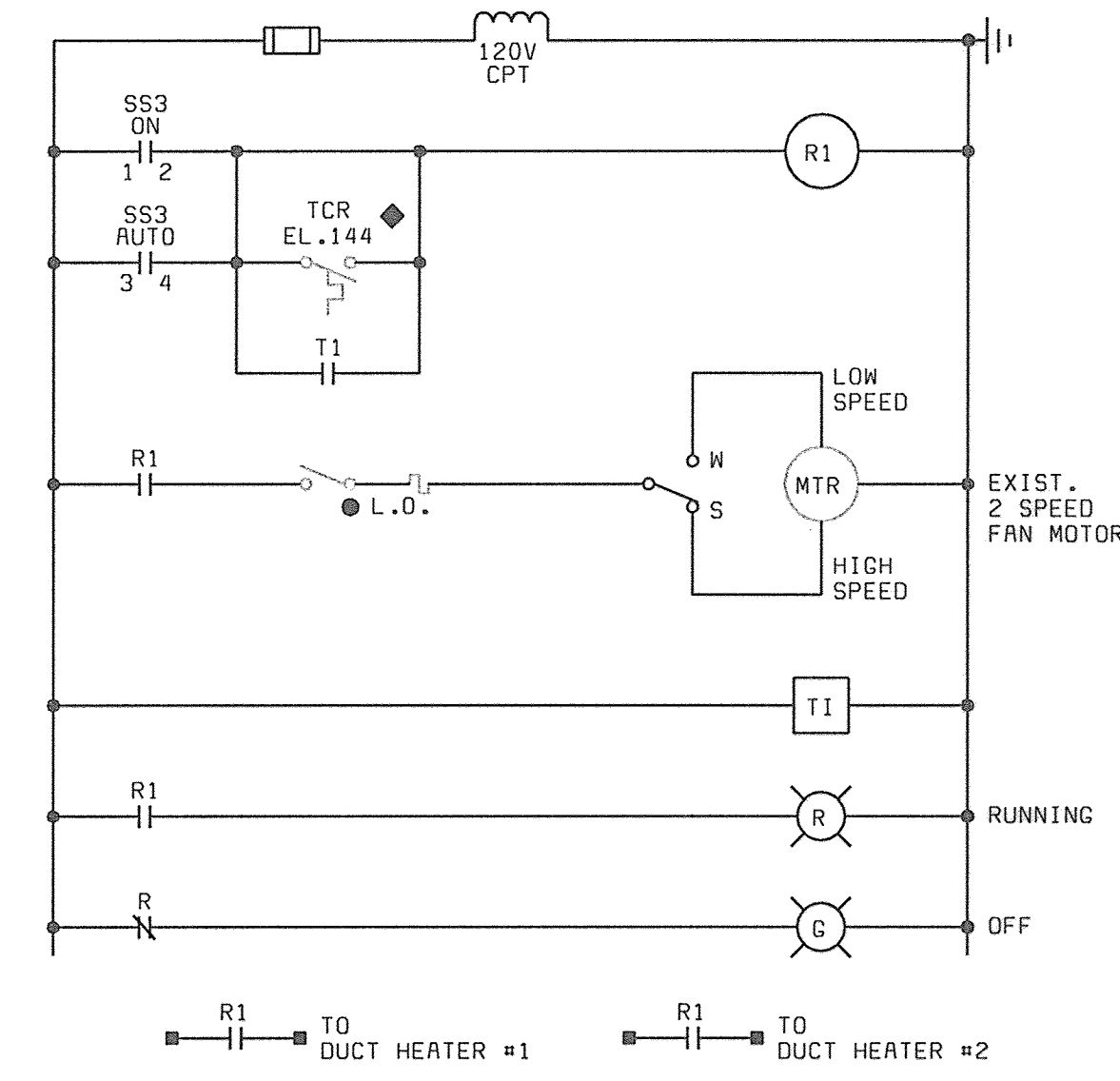
**PLUG VALVES**  
5-210-PV THRU 5-212-PV



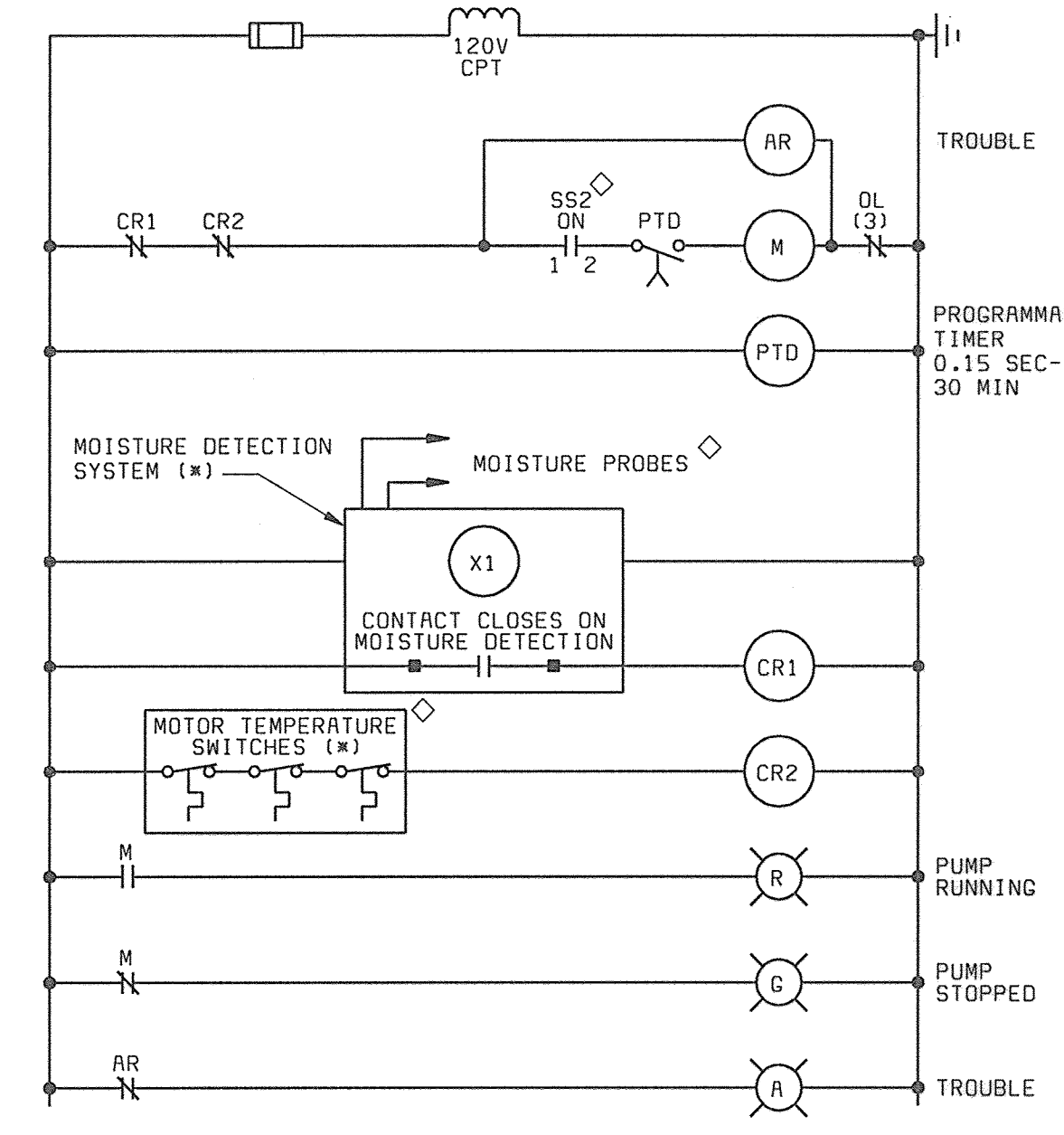
**EXIST. PUMP ROOM VENT FAN**



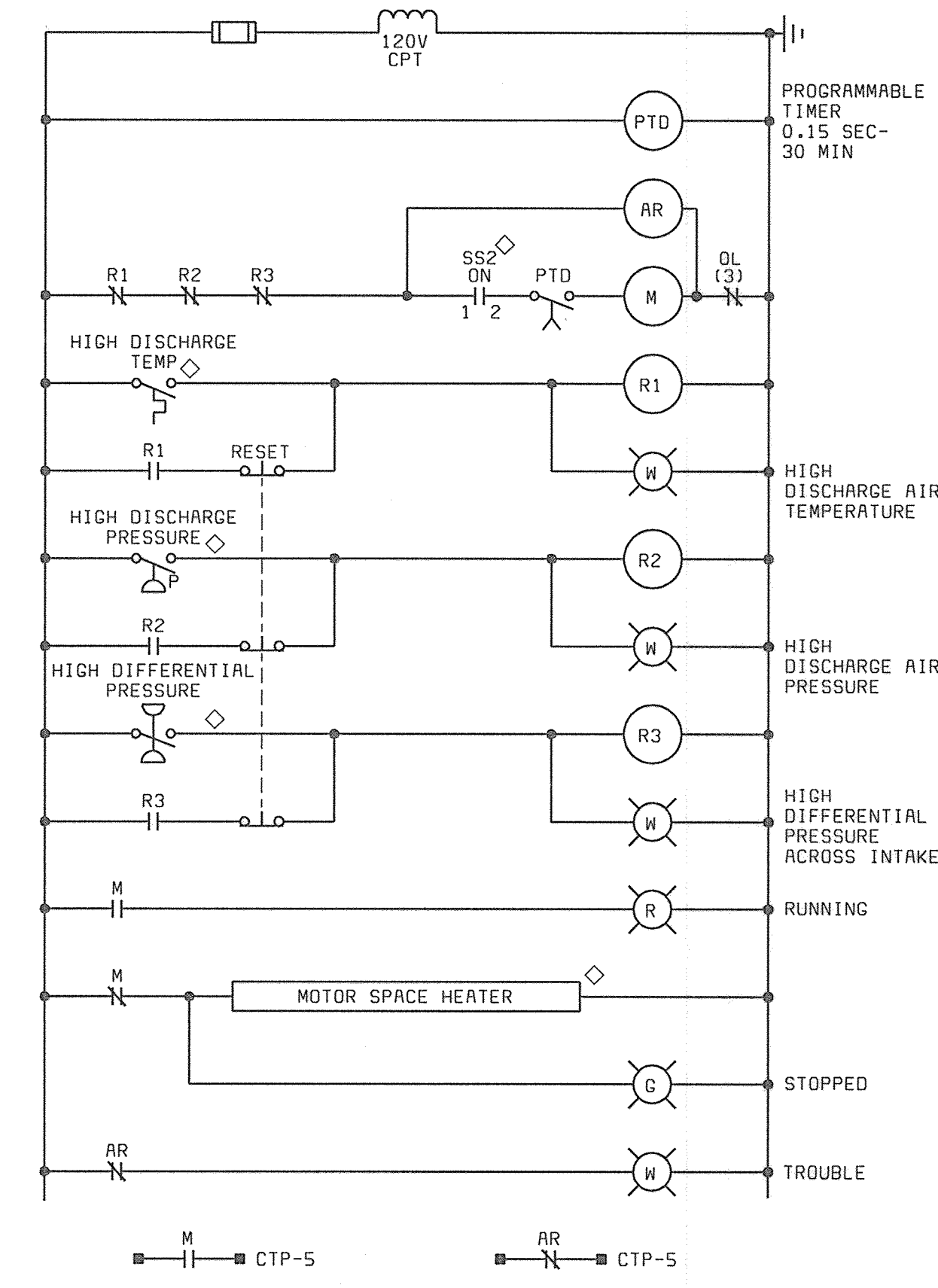
**EXIST. TOILET ROOM EXHAUST FAN**



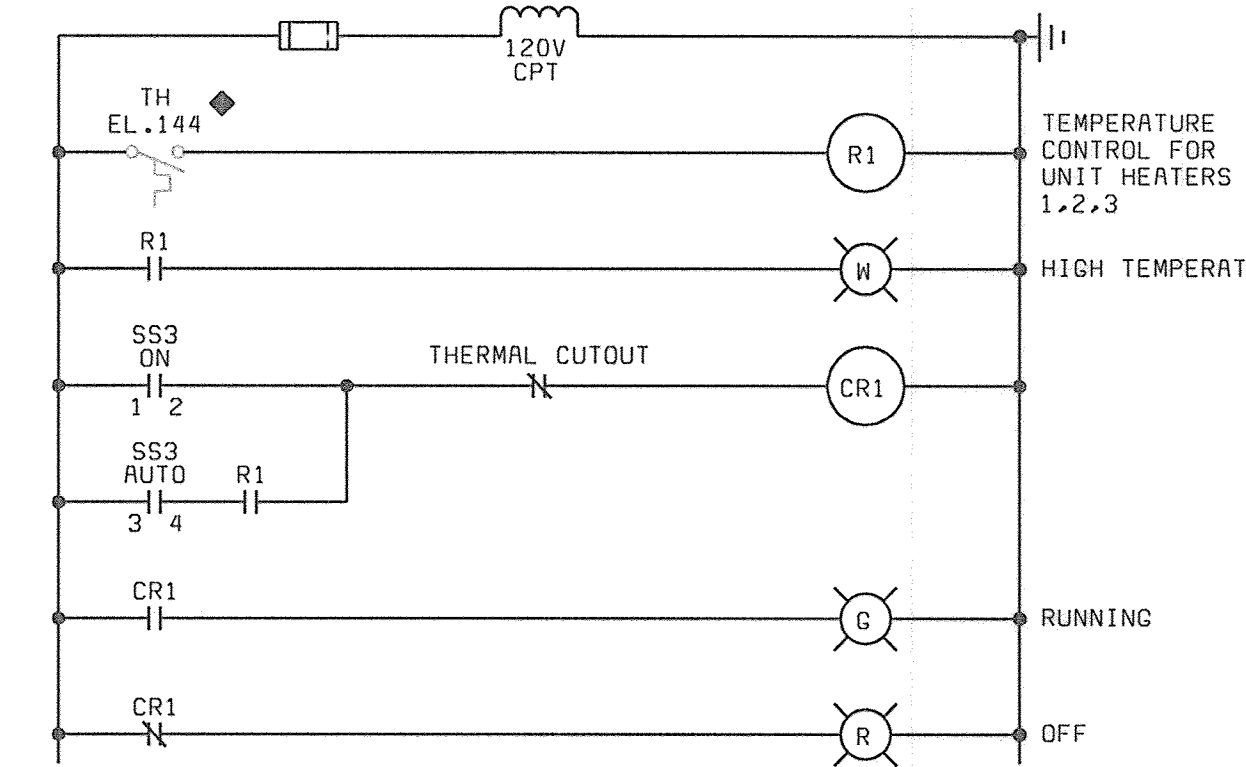
**EXIST. CONTROL ROOM VENT FAN**



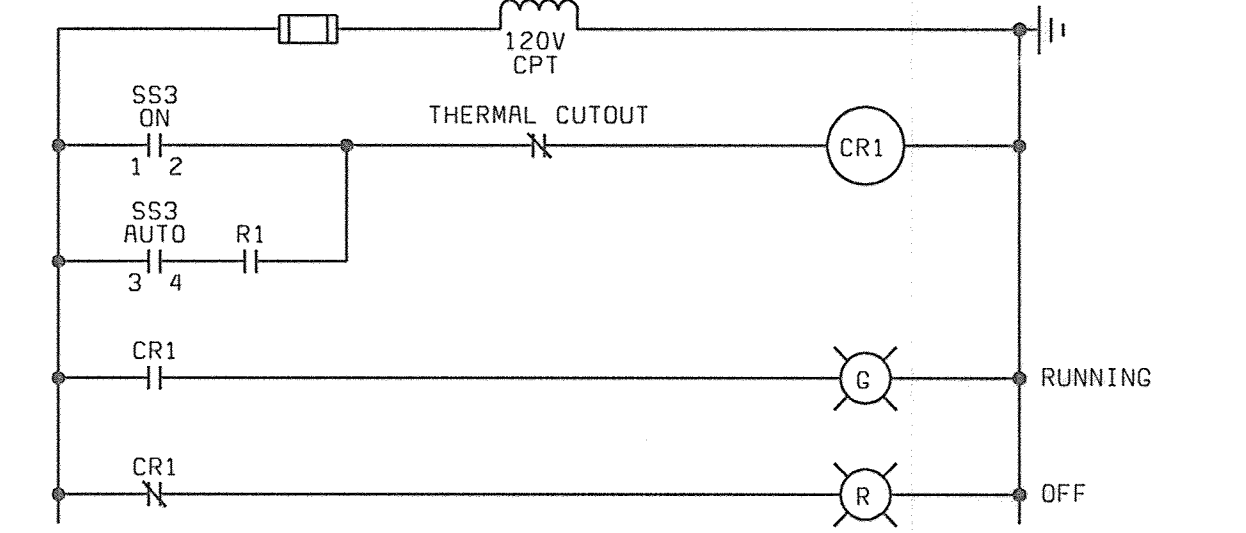
**FINAL CLARIFIER SCUM PUMPS**  
5-310-P THRU 5-312-P  
(\* PROVIDED UNDER SPECIFICATION SECTION 11150)



**POSITIVE DISPLACEMENT BLOWERS**  
5-402-ME & 5-403-ME



**EXIST. UNIT HEATER #1**



**EXIST. UNIT HEATER #2**  
(SIMILAR FOR EXIST. UNIT HEATER #3)

**GEARED LIMIT SWITCH DEVELOPMENT:**

G L S C O N T A C T	ACTUATOR POSITION	ACTUATOR POSITION		
		FULL OPEN (0%)	INTERMEDIATE POSITION (90%)	FULL CLOSED (100%)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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		SS3 CONTACTS	POSITION		
	LOCAL	REMOTE		ON	OFF	AUTO
1-2	X		1-2	X		
3-4		X	3-4			X
5-6		X				

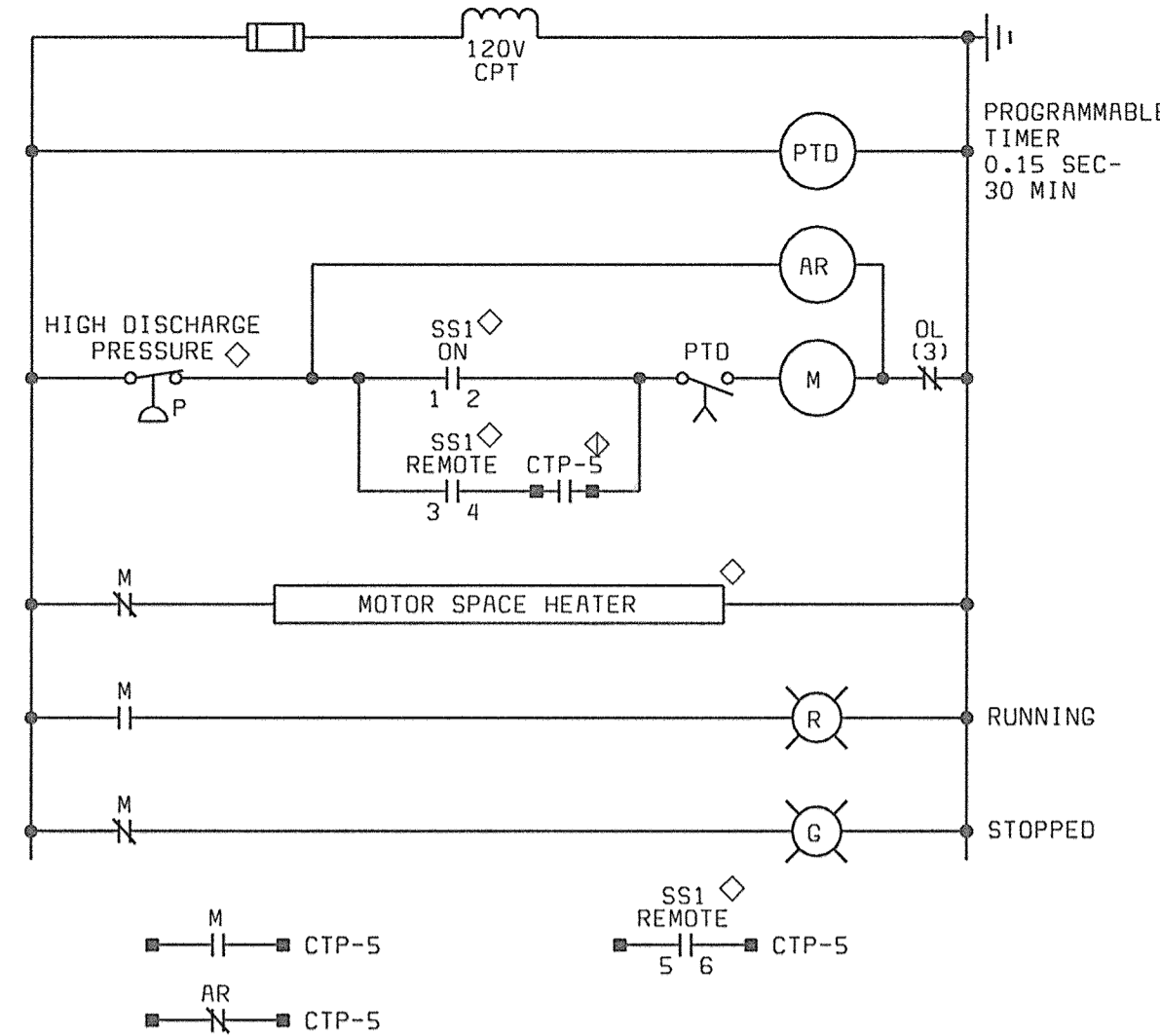
**DEVICE LOCATION LEGEND:**

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ CONTROLS TERMINATION PANEL CTP-5 (FOR PIU-5)
- EXISTING HVAC CONTROLS

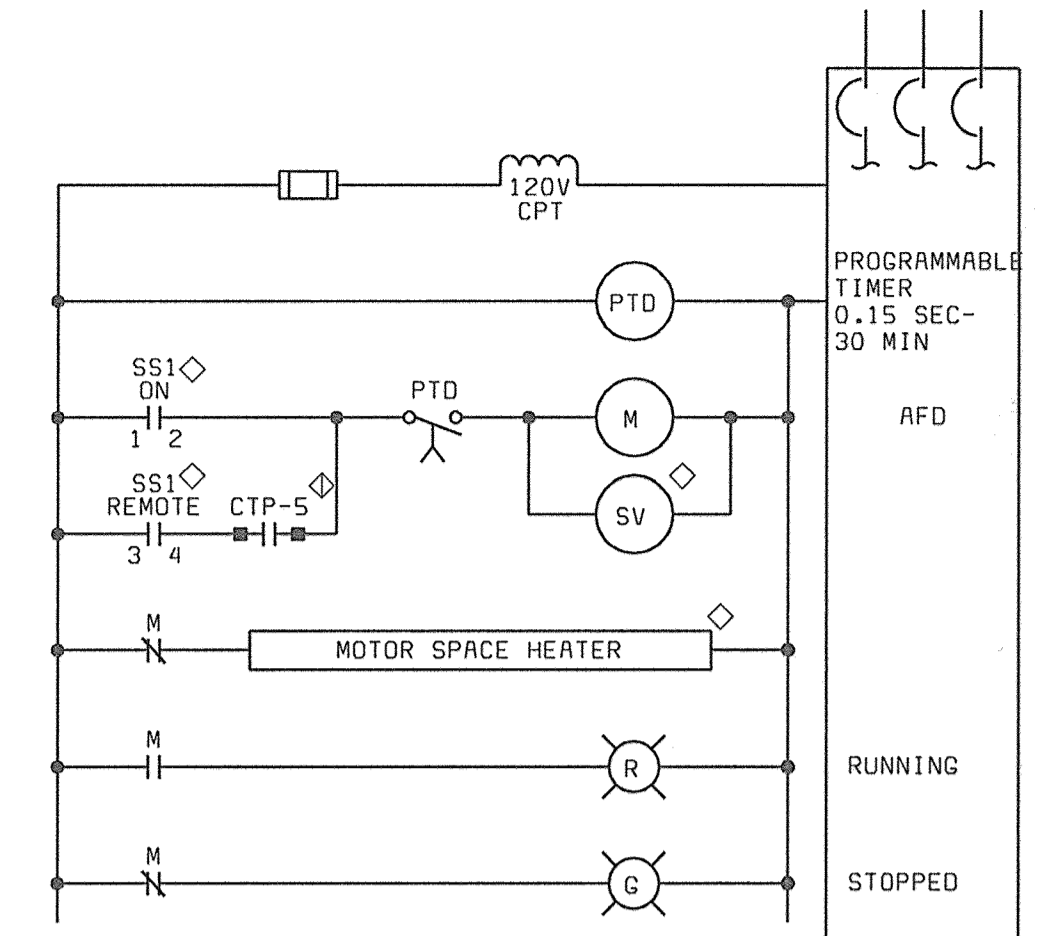
**NOTES:**

- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
- 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 DEFINED IN THE SCHEMATIC SYMBOL LEGEND.
- RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
- 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.

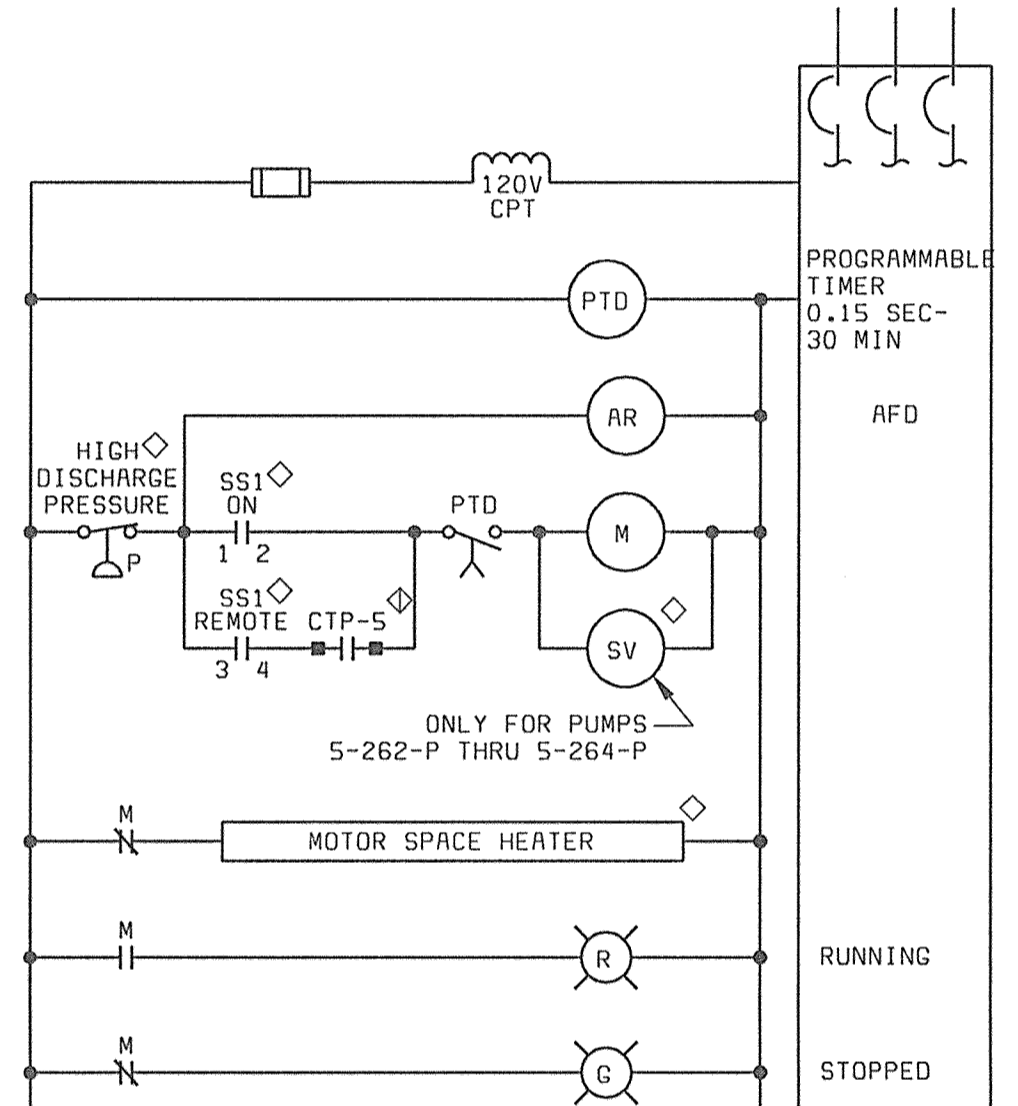
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Galtersburg, Maryland   <b>DONALD R. STEINER</b> STATE OF MARYLAND REG. PROF. ENGR.	DES: GNS.SFP DRN: MDR CHK: JTF DATE: 6/23/00	NORTH GALLERY BUILDING ELECTRICAL  SCHEMATICS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
				SHEET 138 OF 161  <b>E28</b>



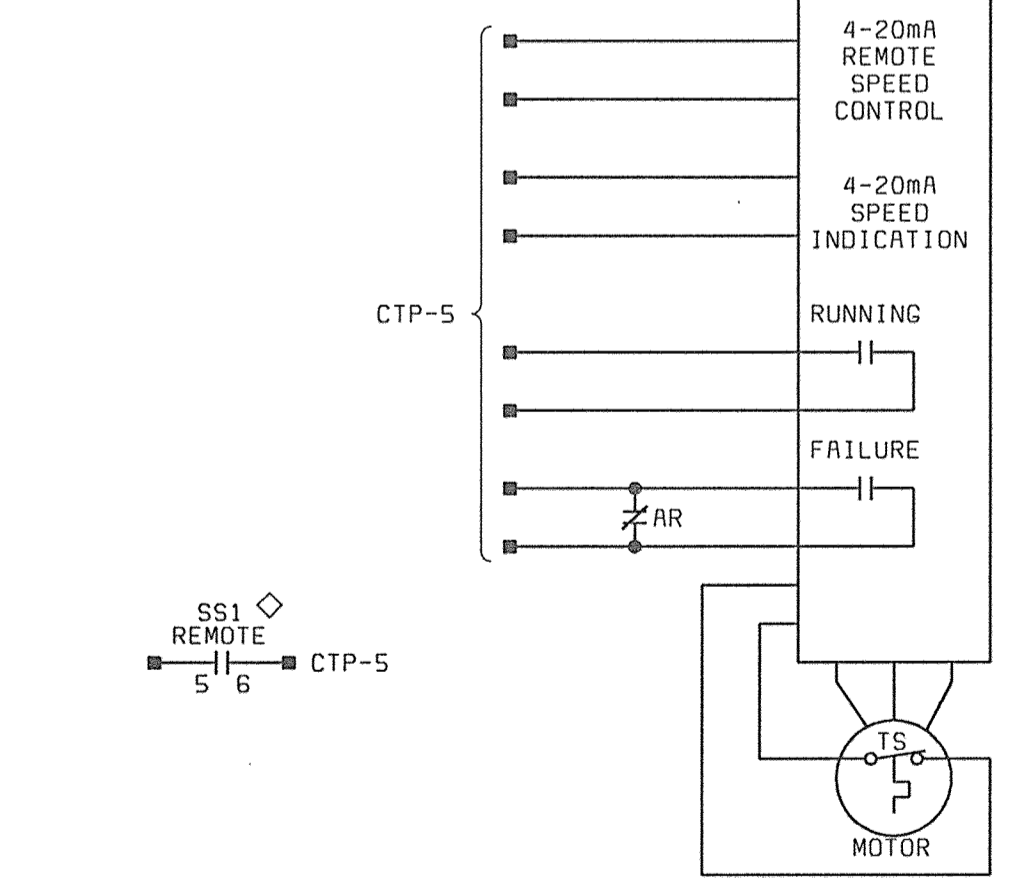
**FOAM PUMPS**  
5-200-P THRU 5-202-P



**RETURN ACTIVATED SLUDGE PUMPS**  
5-220-P THRU 5-223-P



**WASTE ACTIVATED SLUDGE PUMPS**  
5-210-P AND 5-211-P



**FERMENTER SUPERNATANT PUMPS**  
5-250-P AND 5-251-P

**WASTE FERMENTED SLUDGE PUMPS**  
5-262-P THRU 5-264-P

**FERMENTED RECYCLE PUMPS**  
5-260-P AND 5-261-P

**SWITCH DEVELOPMENTS:**


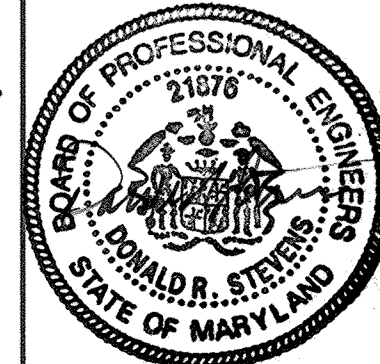
CONTACTS	POSITION		
	ON	OFF	REMOTE
1-2	X		
3-4			X
5-6			X

**DEVICE LOCATION LEGEND:**

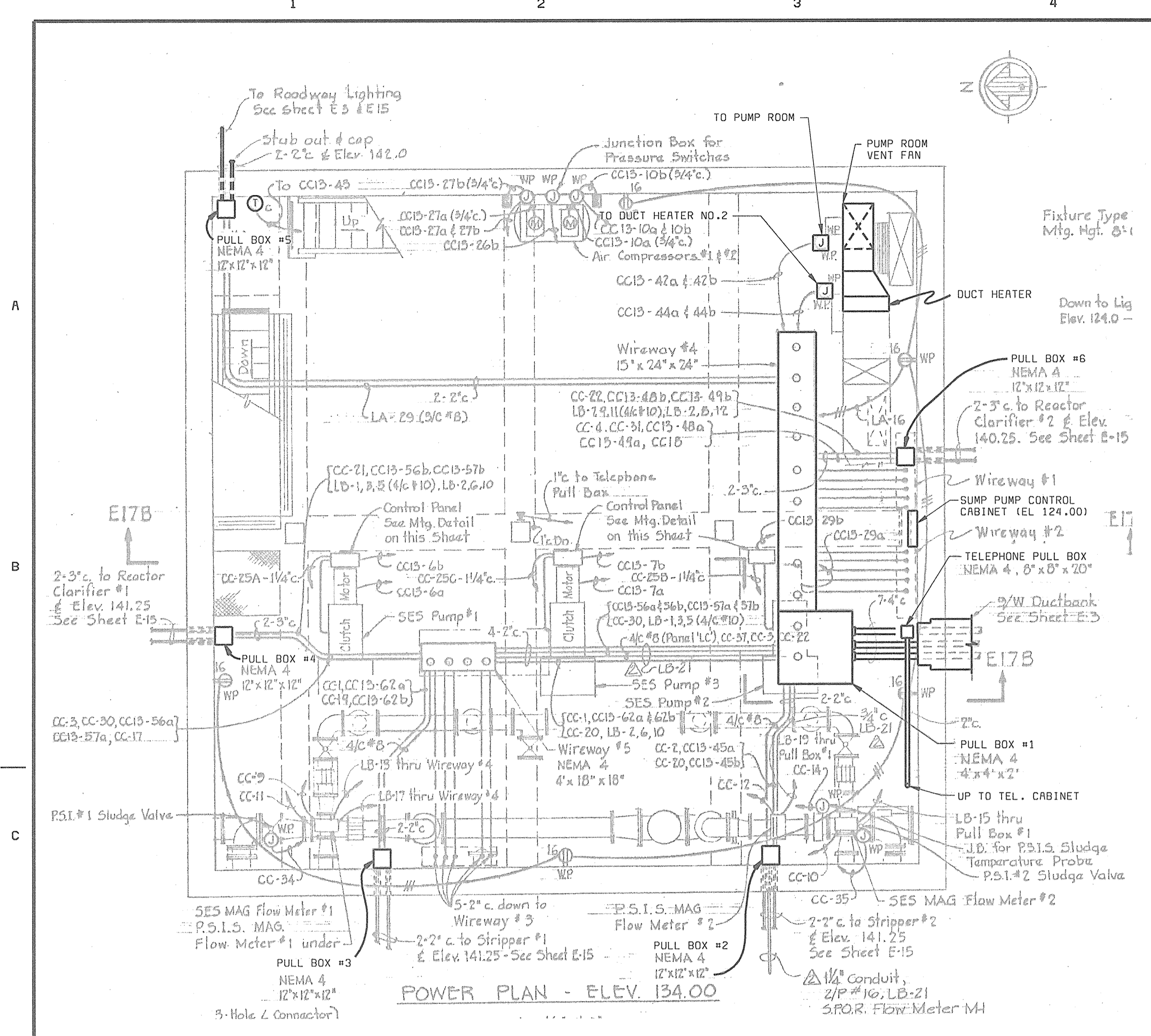
- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◊ CONTROLS TERMINATION PANEL CTP-5 (FOR PIU-5)

**NOTES:**

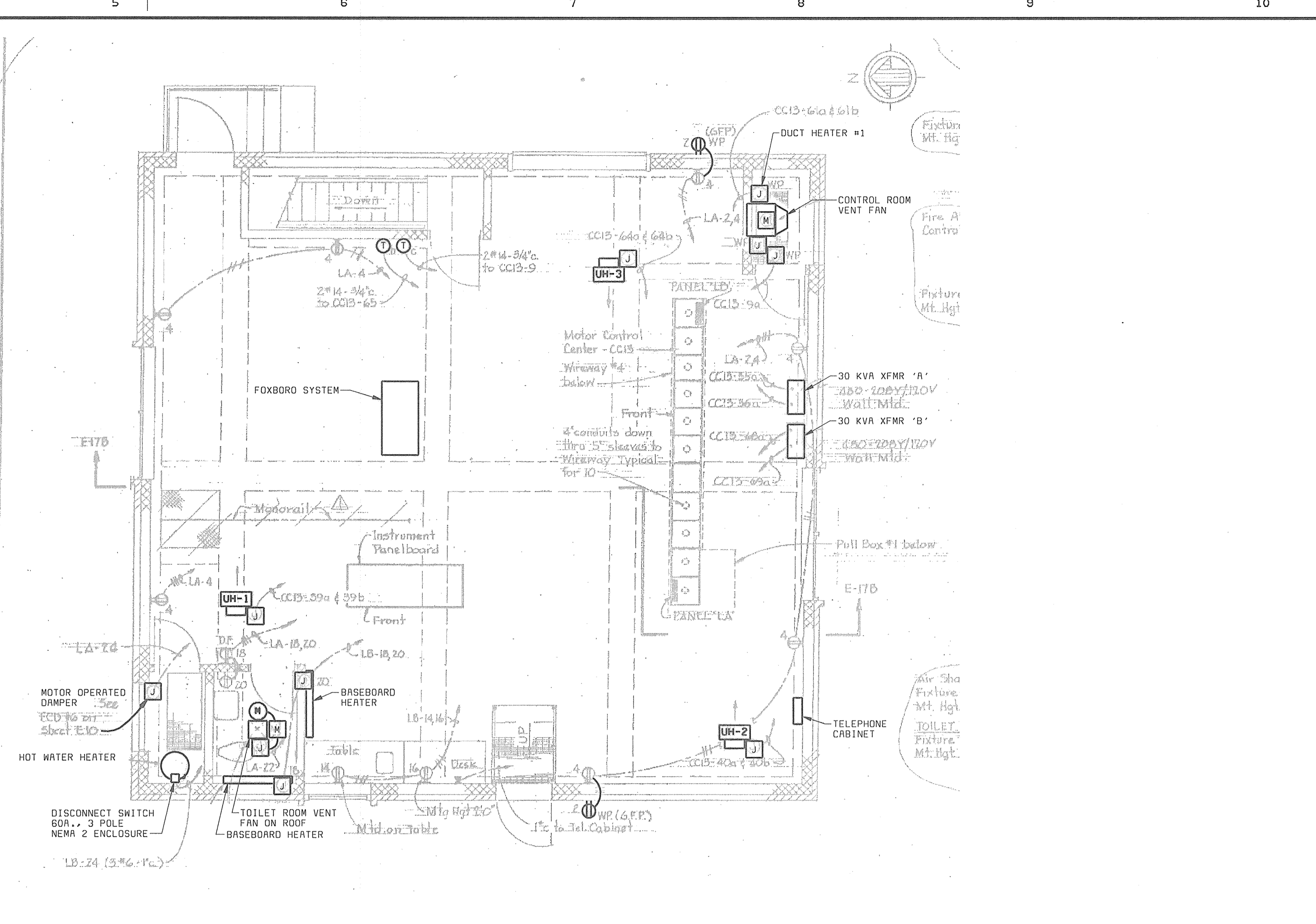
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATION.
3. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE 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.
6. AFD SCHEMATICS SHOW FUNCTIONAL CONTROL AND INTERLOCKS. NOT ALL DEVICES ON THE DRIVE ARE SHOWN. SEE SPECIFICATION SECTION 16150 FOR ADDITIONAL REQUIREMENTS. ALL DEVICES ARE LOCATED AT THE DRIVES UNLESS OTHERWISE NOTED. SELECTOR SWITCHES AND PUSH BUTTONS AT AFD SHALL BE MOUNTED ON AFD ENCLOSURE FRONT.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  Chief, Bureau of Utilities DATE	 <b>BLACK &amp; VEATCH</b> Gallithersburg, Maryland  David Klein REG. PROF. ENGR. DATE	 BOARD OF PROFESSIONAL ENGINEERS DONALD R. STIEBER STATE OF MARYLAND	DES: GNS DRN: MDR.EEC CHK: JTF DATE: 6/23/00	NORTH GALLERY BUILDING ELECTRICAL  SCHEMATICS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 139 of 161  E29
REVISIONS AND RECORD OF ISSUE						

PDS:ATZ  
PDS:6/23/00



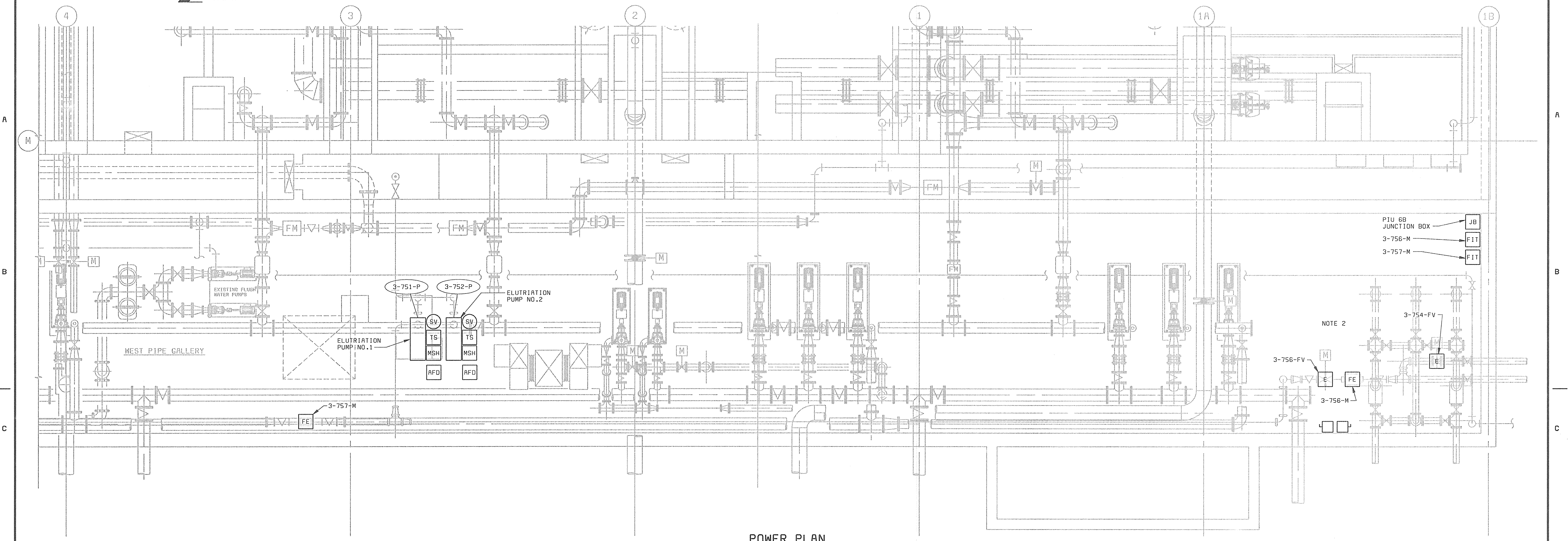
DEMOLITION PLAN - ELEV. 134.00



DEMOLITION PLAN - ELEV. 144.00

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - ALL ITEMS SHOWN IN BOLD ARE TO REMAIN THROUGH THE DEMOLITION TO RECONNECT THE INDICATED EQUIPMENT TO THE NEW ELECTRICAL SYSTEM.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   REG. PROF. ENGR. DATE 6/24/00	DES: GNS DRN: TDR CHK: JTF DATE: 6/23/00	NORTH GALLERY BUILDING ELECTRICAL  DEMOLITION PLAN	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND	SCALE AS SHOWN SHEET 140 OF 161 <b>E30</b>
	CHIEF, BUREAU OF UTILITIES DATE 6-29-00	REVISIONS AND RECORD OF ISSUE NO. BY CK APP		



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

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - MCC CCS AND PIU 6B ARE IN SECONDARY BUILDING ABOVE.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*R. B. ...* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Galthersburg, Maryland

*Daniel ...* 6/23/00  
REG. PROF. ENGR. DATE



DES: GNS					
DRN: DVH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK /APP

WEST GALLERY  
ELECTRICAL

POWER PLAN

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

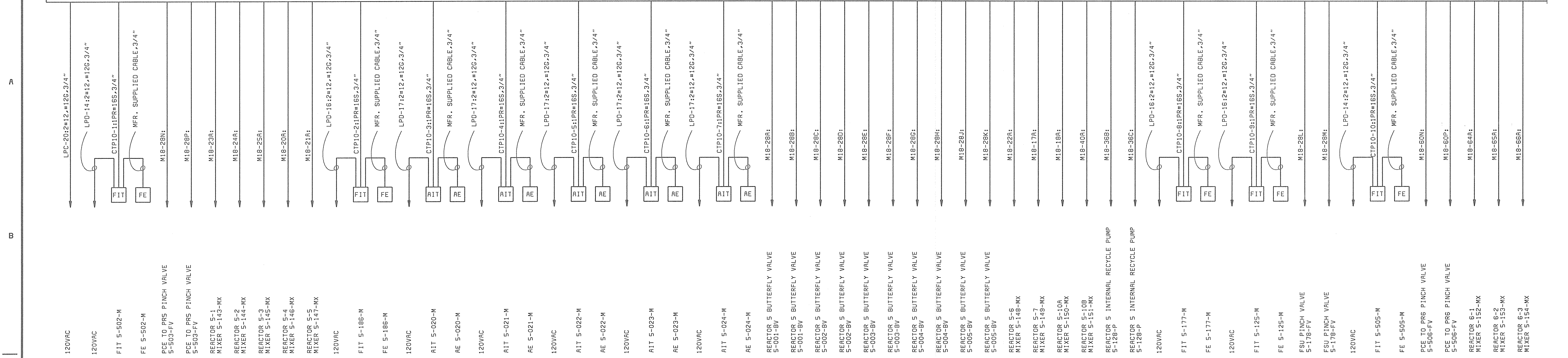
SHEET  
141 OF 161

**E31**

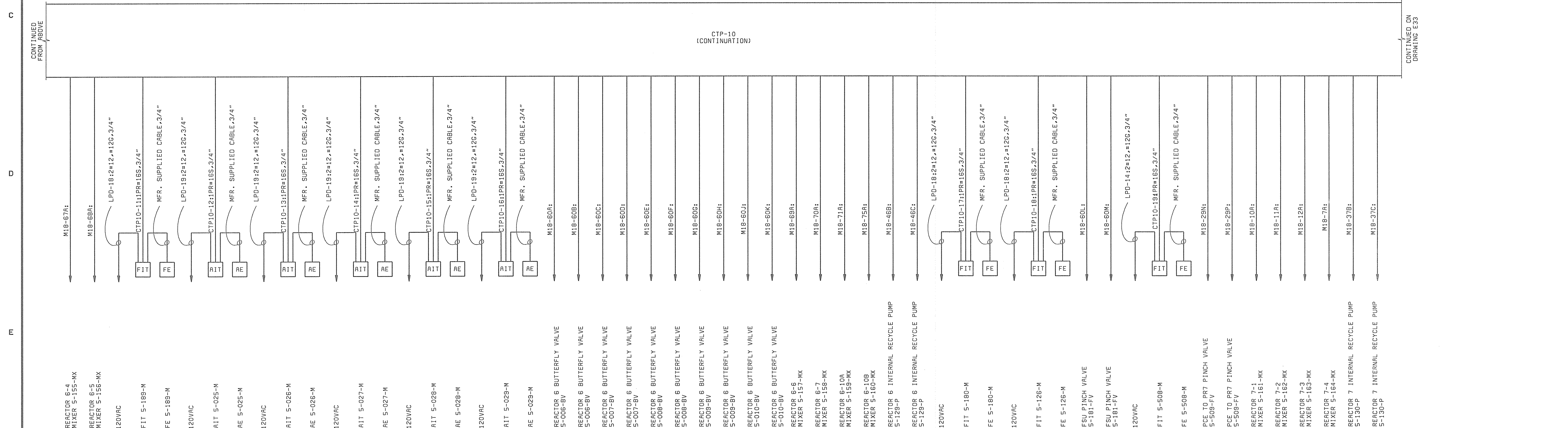
068472  
F058472A

CTP-10

CONTINUED BELOW



CTP-10 ONE-LINE DIAGRAM (NBB)



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)

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

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Chief, Bureau of Utilities DATE

**BLACK & VEATCH**  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE

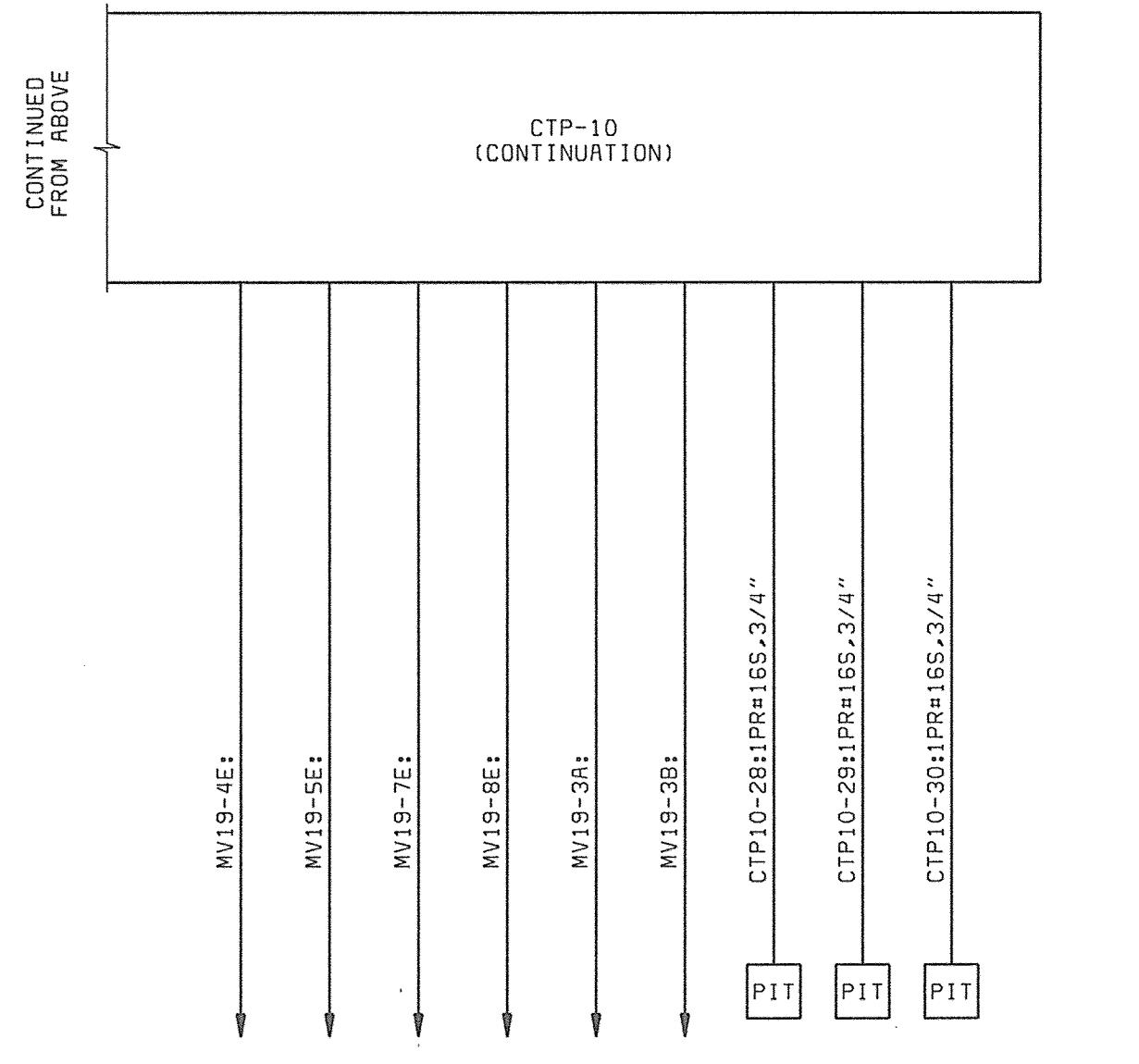


DES: SFP.GNS					
DRN: TOR					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

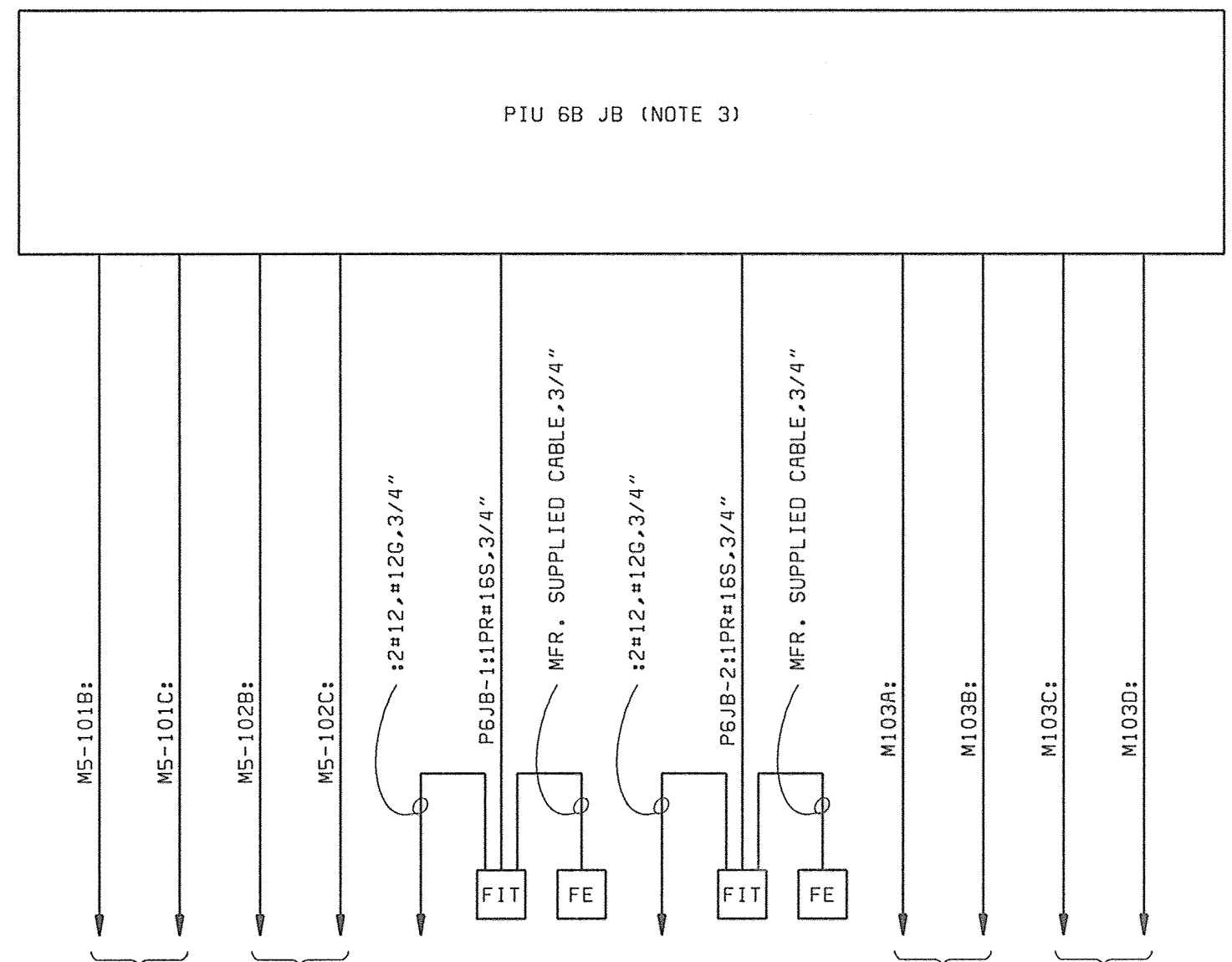
GENERAL ELECTRICAL  
 CONTROL SYSTEM SCHEMATIC  
 ONE-LINE DIAGRAM  
 CTP-10

LITTLE PATUXENT WATER RECLAMATION PLANT  
 ADDITION NO. 6  
 BNR TREATMENT CAPACITY EXPANSION  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 142 OF 161  
 E32



CTP-10 ONE-LINE DIAGRAM(NBB) (CONTINUED)



PIU 6B JUNCTION BOX ONE-LINE DIAGRAM  
(WEST GALLERY)

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*David A. ...*  
REG. PROF. ENGR. DATE 6/24/00



DES: CNS,SFP					
DRN: DAH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK

GENERAL  
ELECTRICAL

**CONTROL SYSTEM ONE-LINE DIAGRAM  
CTP-10 CONTINUATION  
AND WEST GALLERY**

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

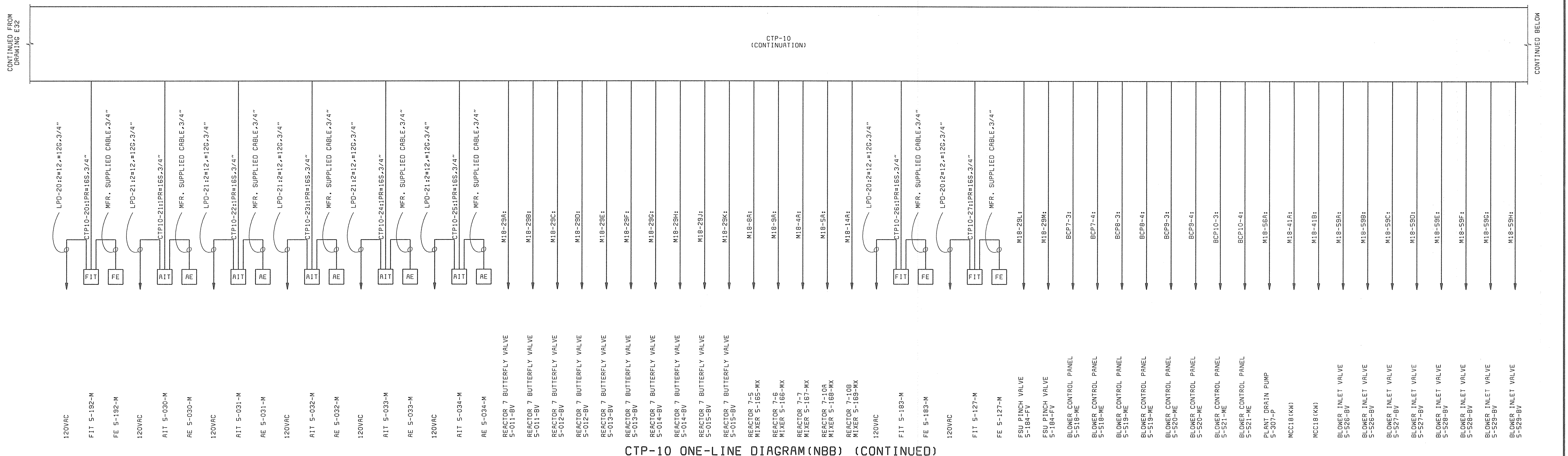
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
143 OF 161

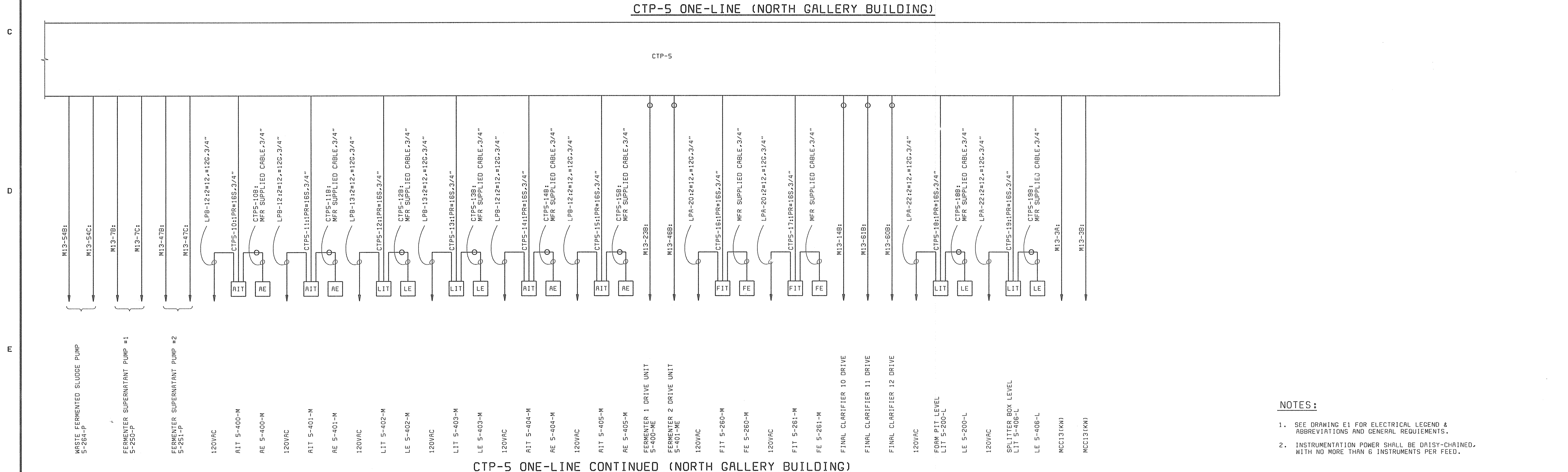
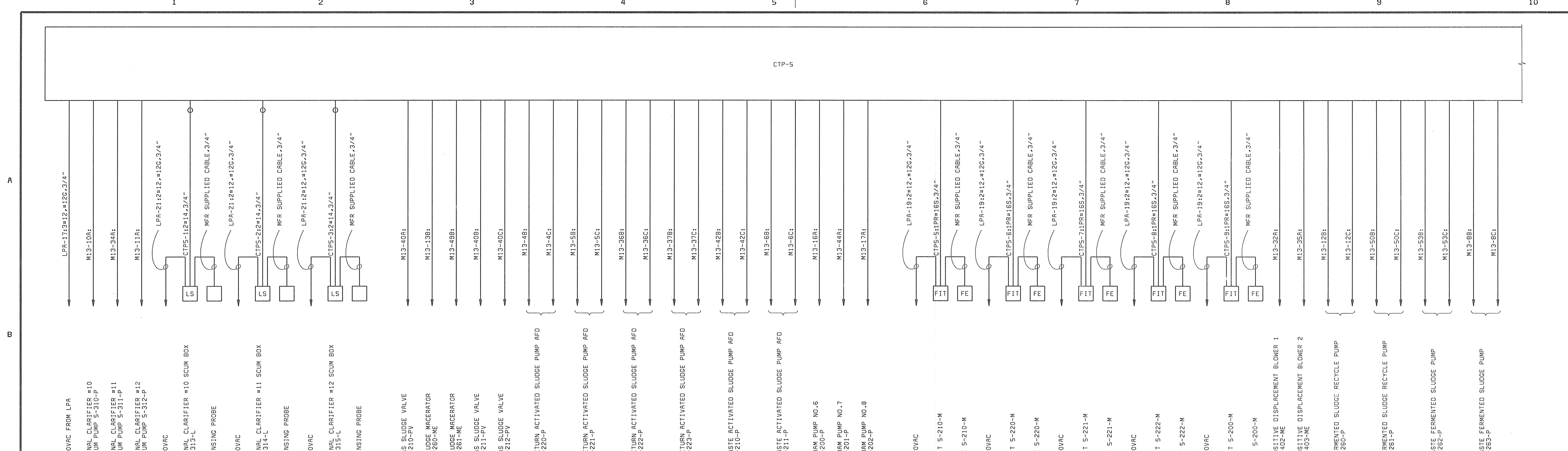
**E33**



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - DAISY CHAIN INSTRUMENTS TO EXISTING LIGHTING PANEL CIRCUIT.
  - COIL ENOUGH WIRE INTO JB TO EXTEND TO PIU IN FUTURE CONTRACT.

D58472  
F058472A

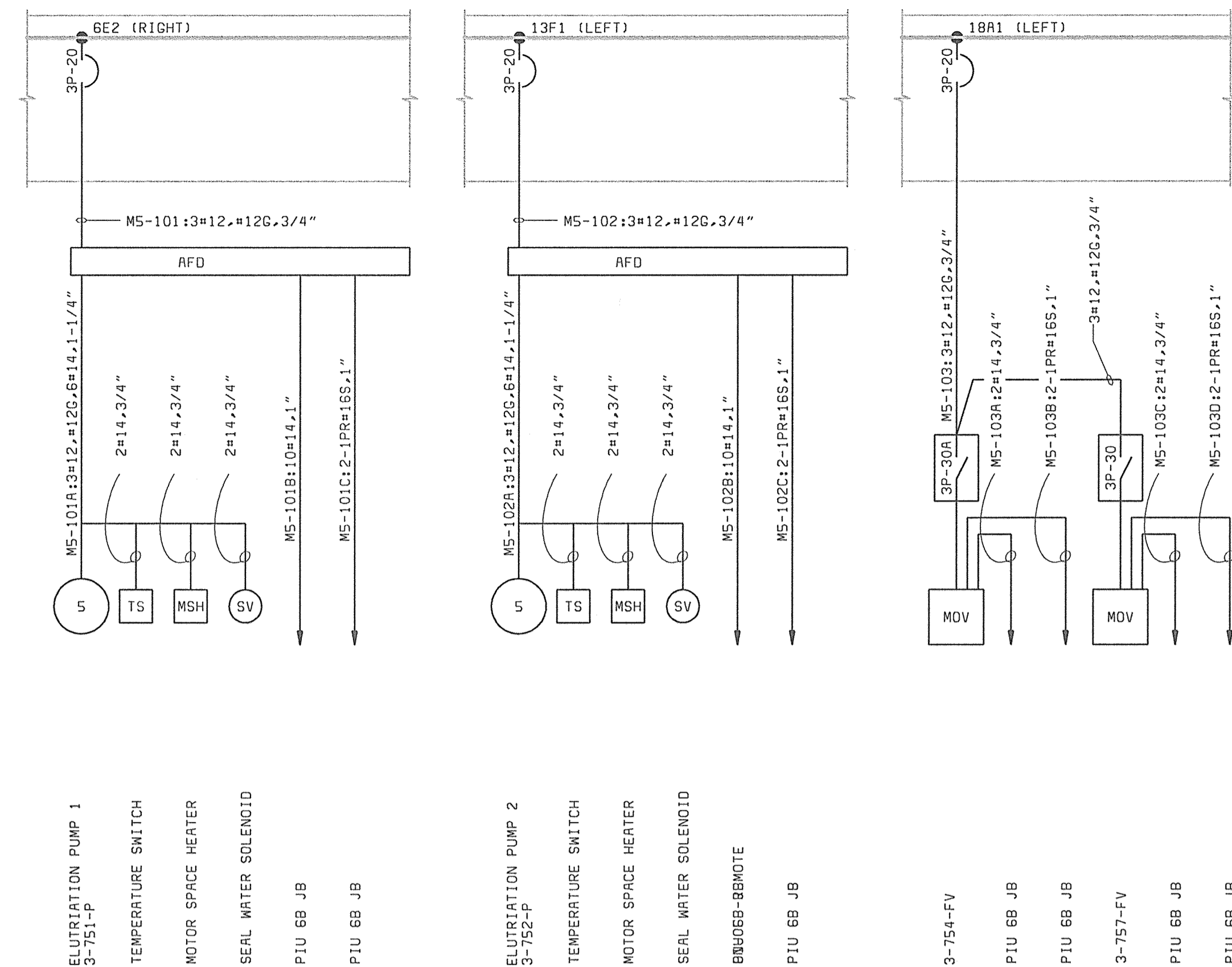


NOTES:

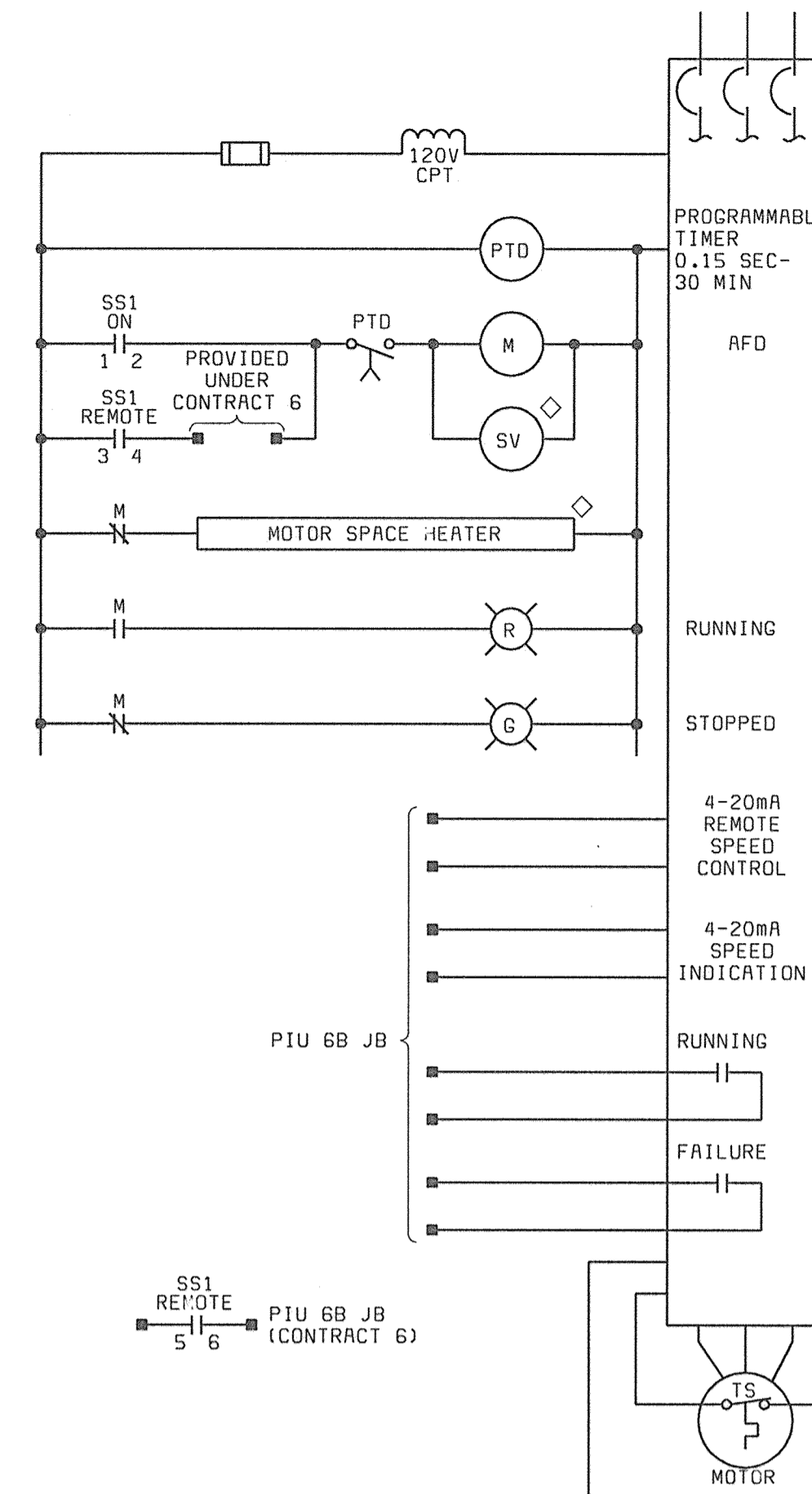
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- INSTRUMENTATION POWER SHALL BE DAISY-CHAINED, WITH NO MORE THAN 6 INSTRUMENTS PER FEED.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   REG. PROF. ENGR. DATE	 DONALD R. STEVENS STATE OF MARYLAND	DES: GNS,SFP							NORTH GALLERY BUILDING ELECTRICAL  CONTROL SYSTEM ONE-LINE DIAGRAM CTP-5	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: MDR	CHK: JTF	DATE: 6/23/00							
											E34	

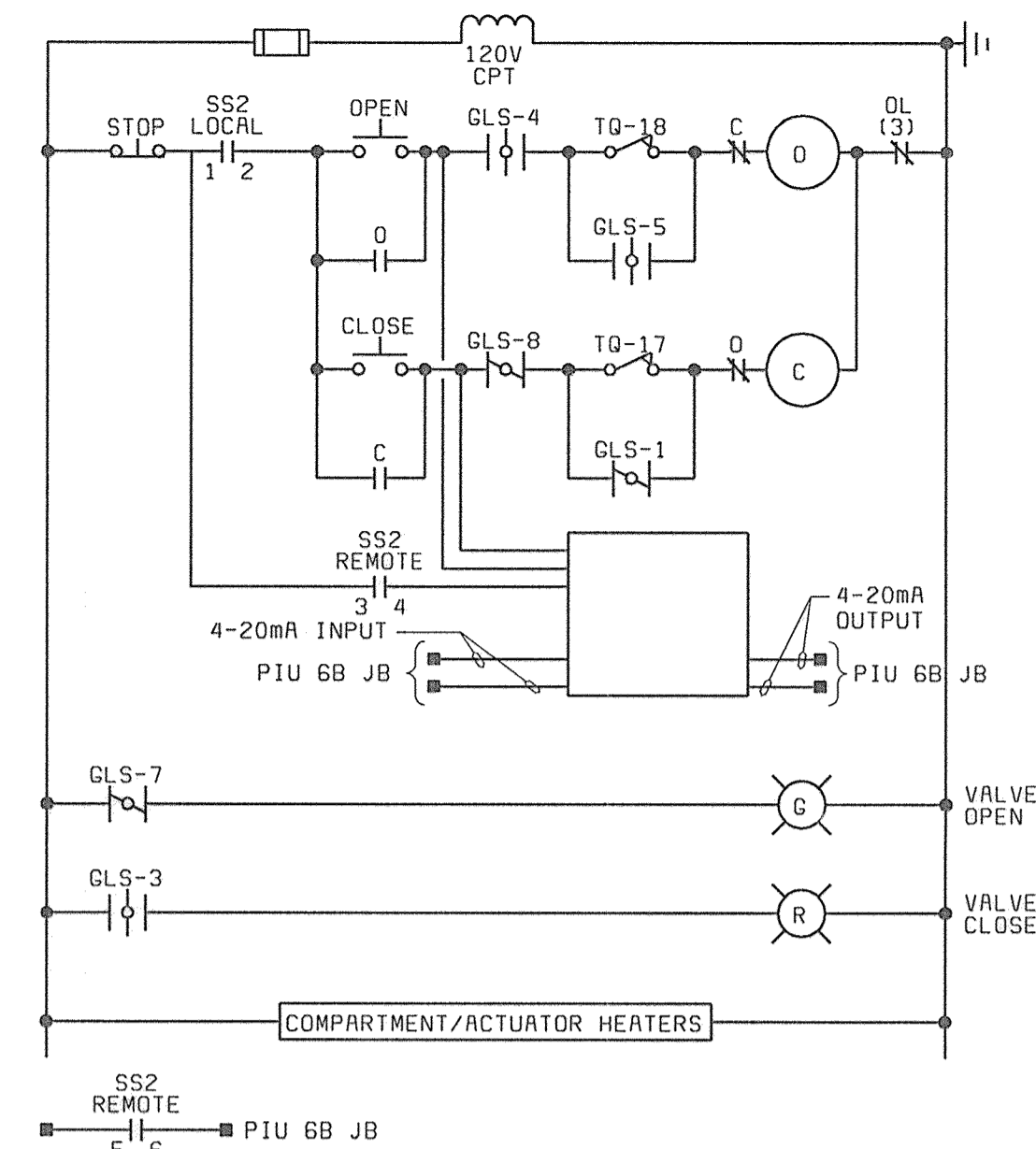




**PARTIAL MCC CC5 ONE-LINE DIAGRAM**  
NOTE 2



**ELUTRIATION PUMPS 3-751-P AND 3-752-P**



**TYPICAL MODULATING VALVE ELECTRIC OPERATOR**

**GEARED LIMIT SWITCH DEVELOPMENT:**

ROT OR	GLS CONTACT	ACTUATOR POSITION		
		FULL OPEN (0%)	INTERMEDIATE POSITION (90%)	FULL CLOSED (100%)
1	1			
1	2			
1	3			
1	4			
1	5			
2	6			
2	7			
2	8			
2	9			
2	10			
3	11			
3	12			
3	13			
3	14			
3	15			
3	16			

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

**SWITCH DEVELOPMENTS:**

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

**DEVICE LOCATION LEGEND:**

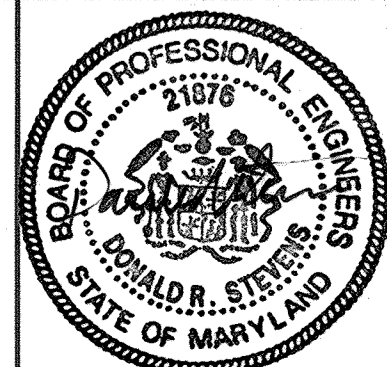
- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT

**NOTES:**

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. EXISTING MCC CC5 AND PIU 6B ARE LOCATED IN SECONDARY BUILDING.
3. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATION.
4. 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.
5. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
6. 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.
7. AFD SCHEMATICS SHOW FUNCTIONAL CONTROL AND INTERLOCKS. NOT ALL DEVICES ON THE DRIVE ARE SHOWN. SEE SPECIFICATION SECTION 16150 FOR ADDITIONAL REQUIREMENTS. ALL DEVICES ARE LOCATED AT THE DRIVES UNLESS OTHERWISE NOTED. SELECTOR SWITCHES AND PUSH BUTTONS AT AFD SHALL BE MOUNTED ON AFD ENCL0

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

**BLACK & VEATCH**  
Gaithersburg, Maryland  
*Donald A. Stein*  
REG. PROF. ENGR. DATE: 6/24/00



DES: GNS									
DRN: DAH.EEC									
CHK: JTF									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

WEST GALLERY  
ELECTRICAL

ONE-LINE AND  
SCHEMATIC DIAGRAMS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

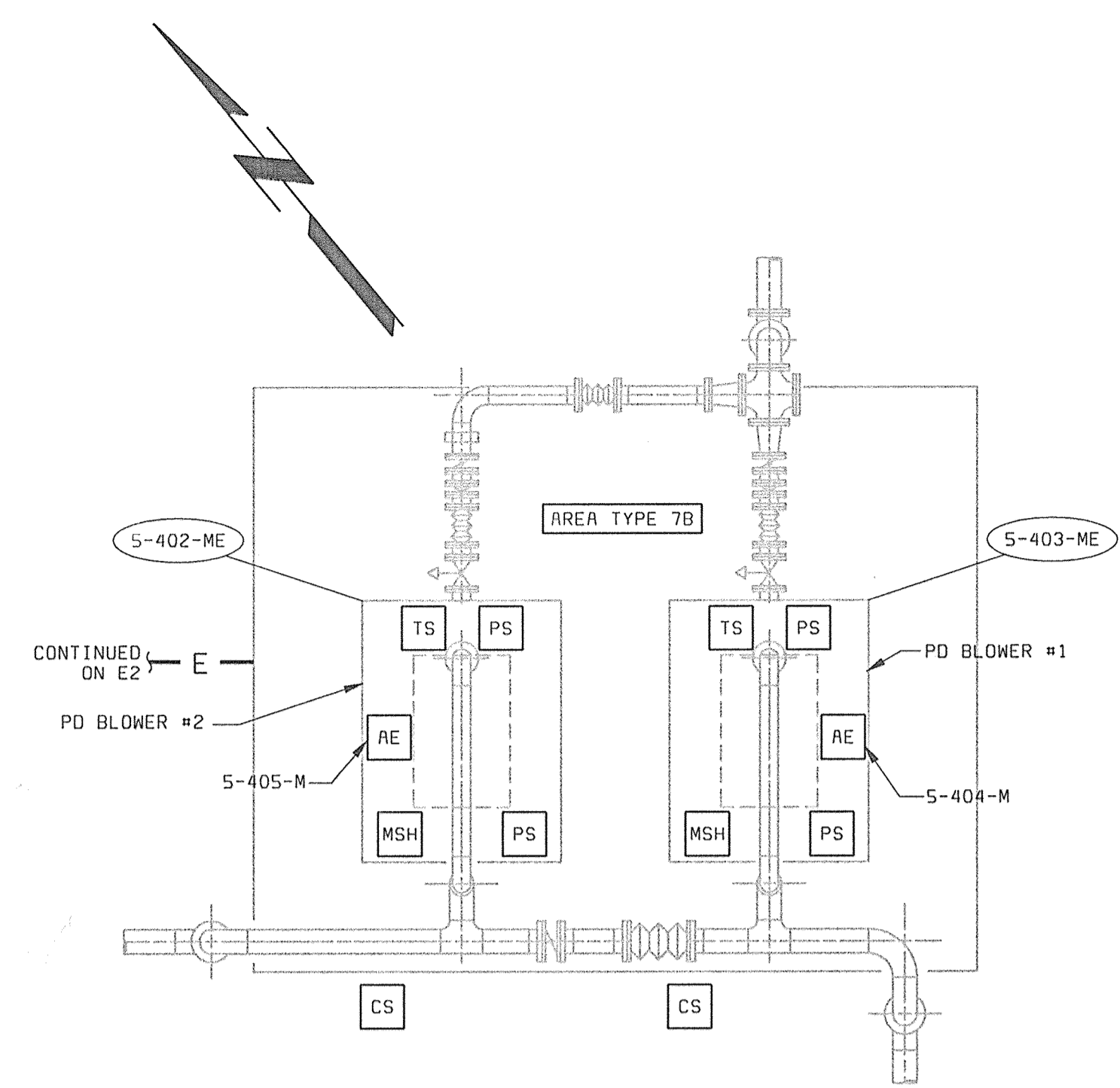
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

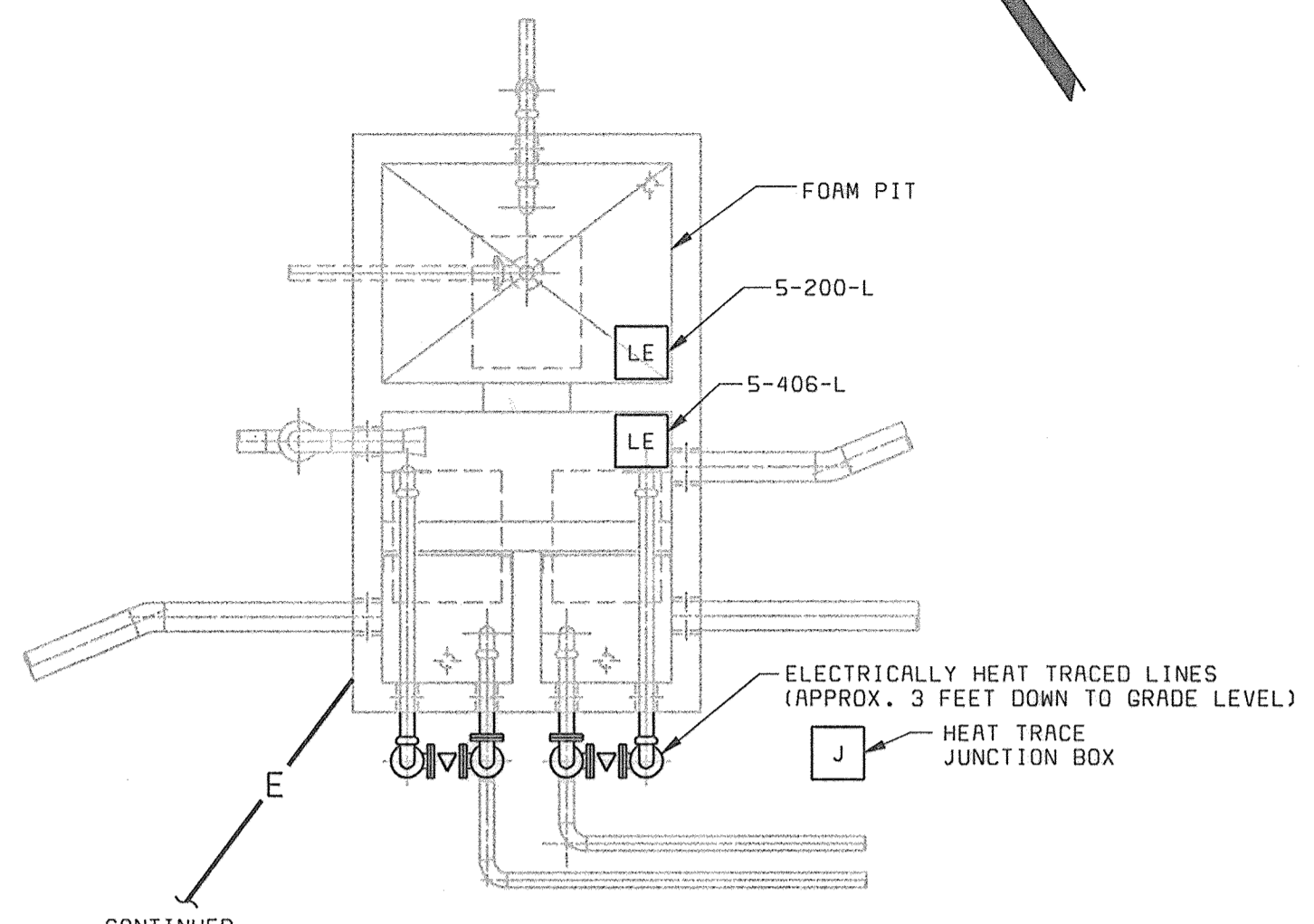
SCALE  
AS  
SHOWN

SHEET  
145 OF 161

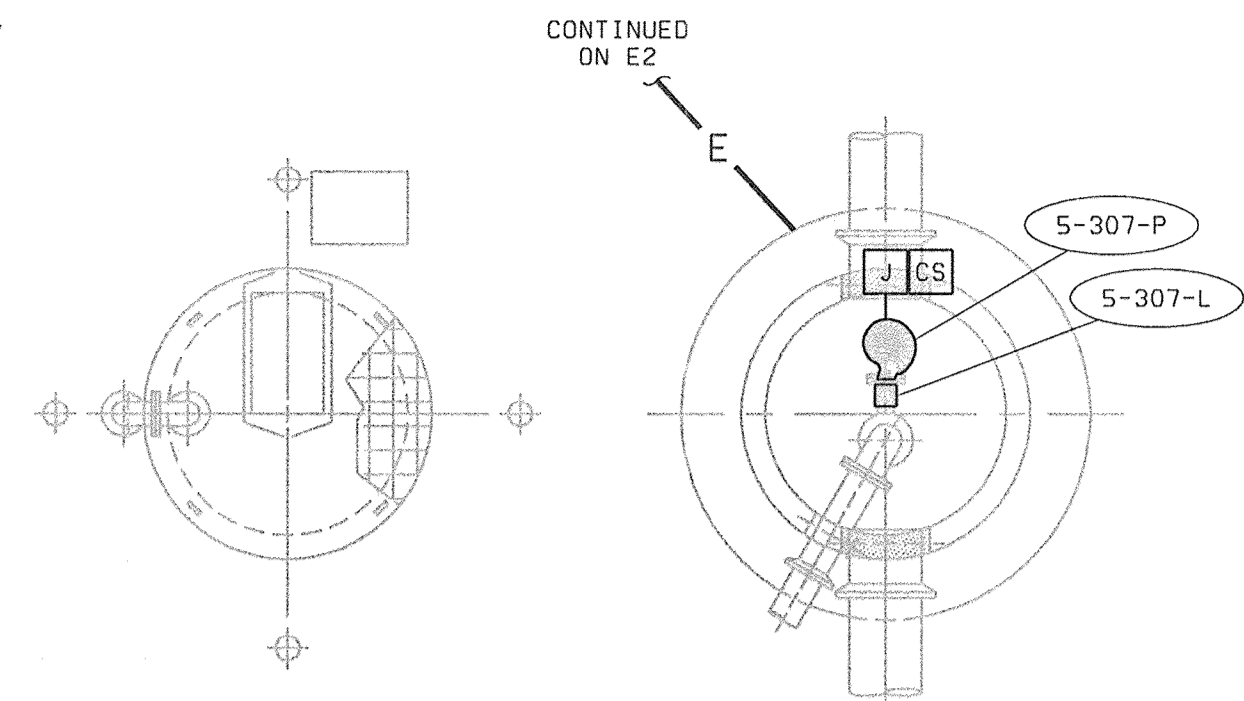
E35



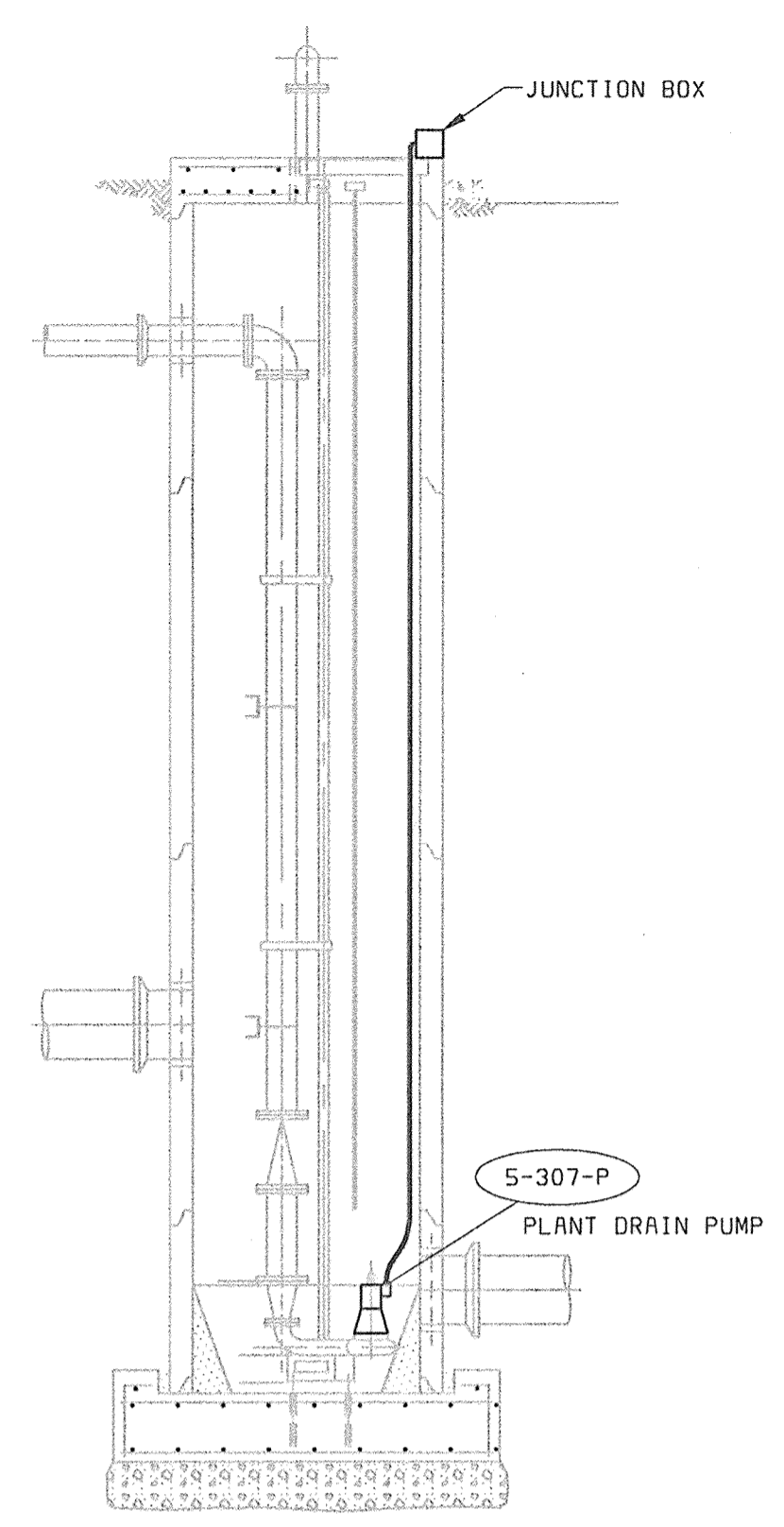
**ODOR CONTROL FERMENTER BLOWERS  
POWER PLAN**  
1/4" = 1'-0"



**FERMENTER SPLITTER BOX  
POWER PLAN**  
1/4" = 1'-0"



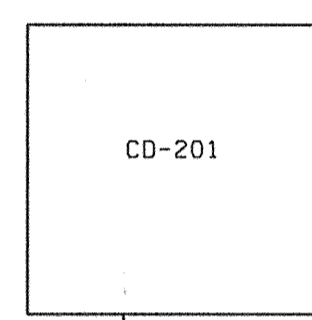
TOP PLAN



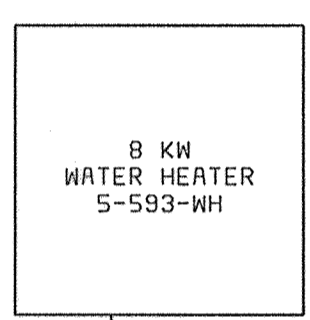
SECTIONAL PLAN



**FIRE ALARM CONTROL  
PANEL ONE-LINE**  
(NORTH GALLERY BUILDING)

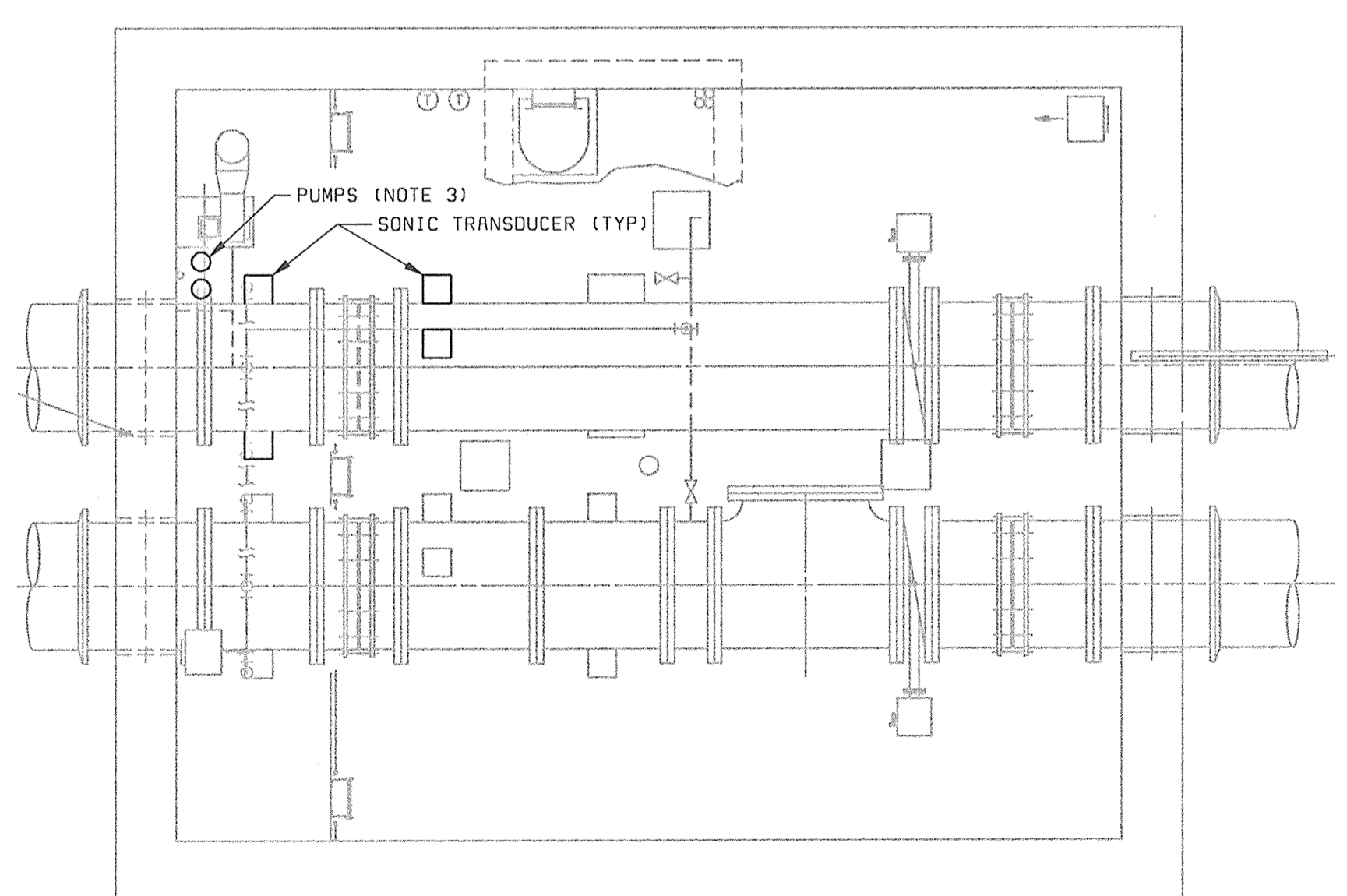


**CONTROL DAMPER  
CD-201 ONE-LINE**  
(NORTH GALLERY BUILDING)



**WATER HEATER  
ONE-LINE**  
(NORTH BLOWER BUILDING)

**PLANT DRAIN - POWER PLAN**  
1/4" = 1'-0" NOTE 2



**54" METER VAULT - POWER PLAN**  
3/16" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
  - PLANT DRAIN PUMP LOCATED NEAR FC10 AND SOUTHWEST CORNER OF PROCESS REACTORS. REFER TO YARD WORK DRAWINGS FOR DETAILS.
  - PUMPS AND TRANSDUCERS ADDED TO EXISTING 54" METER VAULT TO UTILIZE SAME 120VAC POWER SOURCE AS IS EXISTING IN THIS VAULT.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*David A. Stein* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
GaitHERSburg, Maryland

*David A. Stein* 6/29/00  
REG. PROF. ENGR. DATE



DES: GNS					
DRN: DVH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

**GENERAL  
ELECTRICAL**

**MISCELLANEOUS PLANS AND  
ONE-LINE DIAGRAMS**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

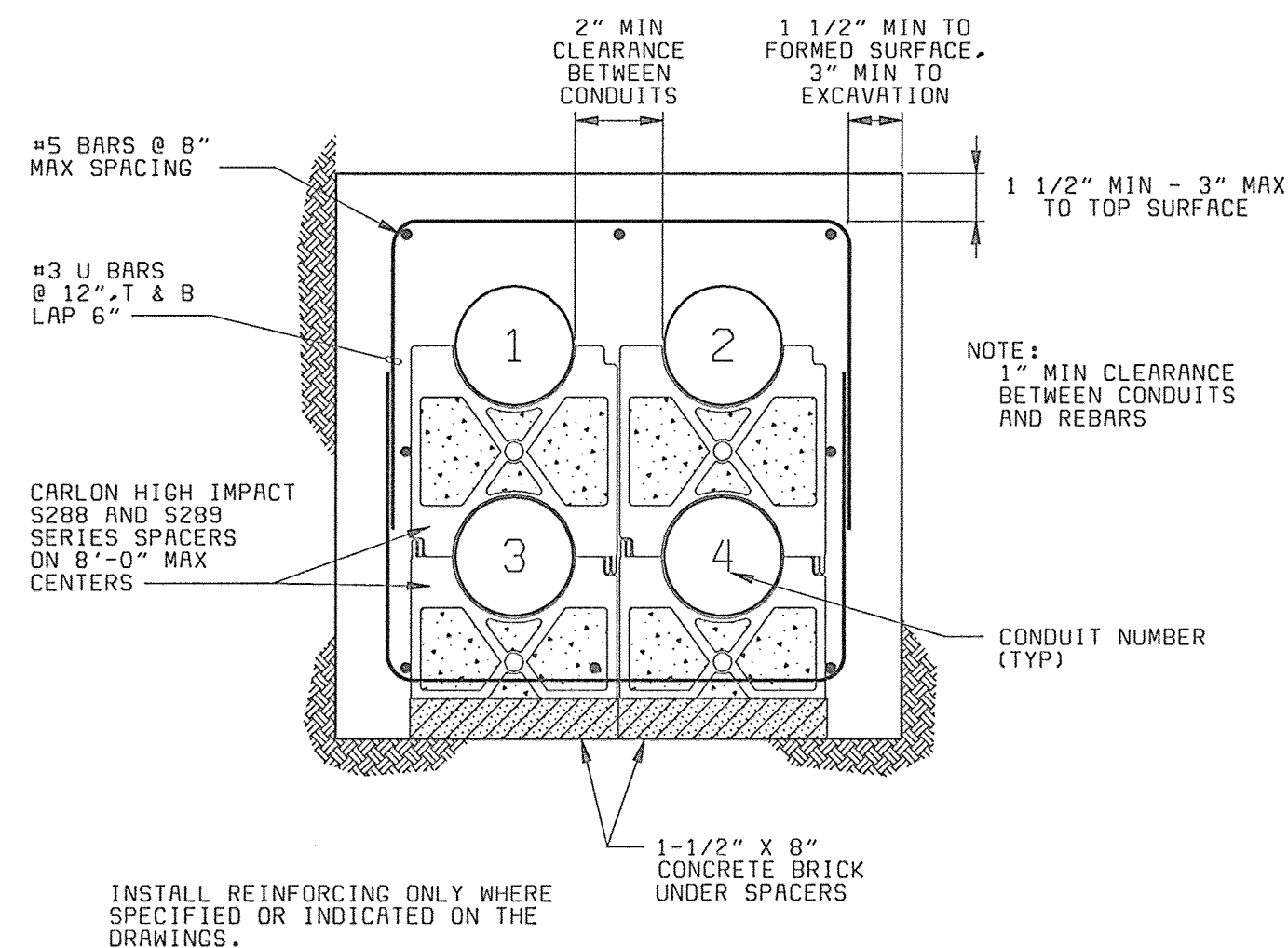
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

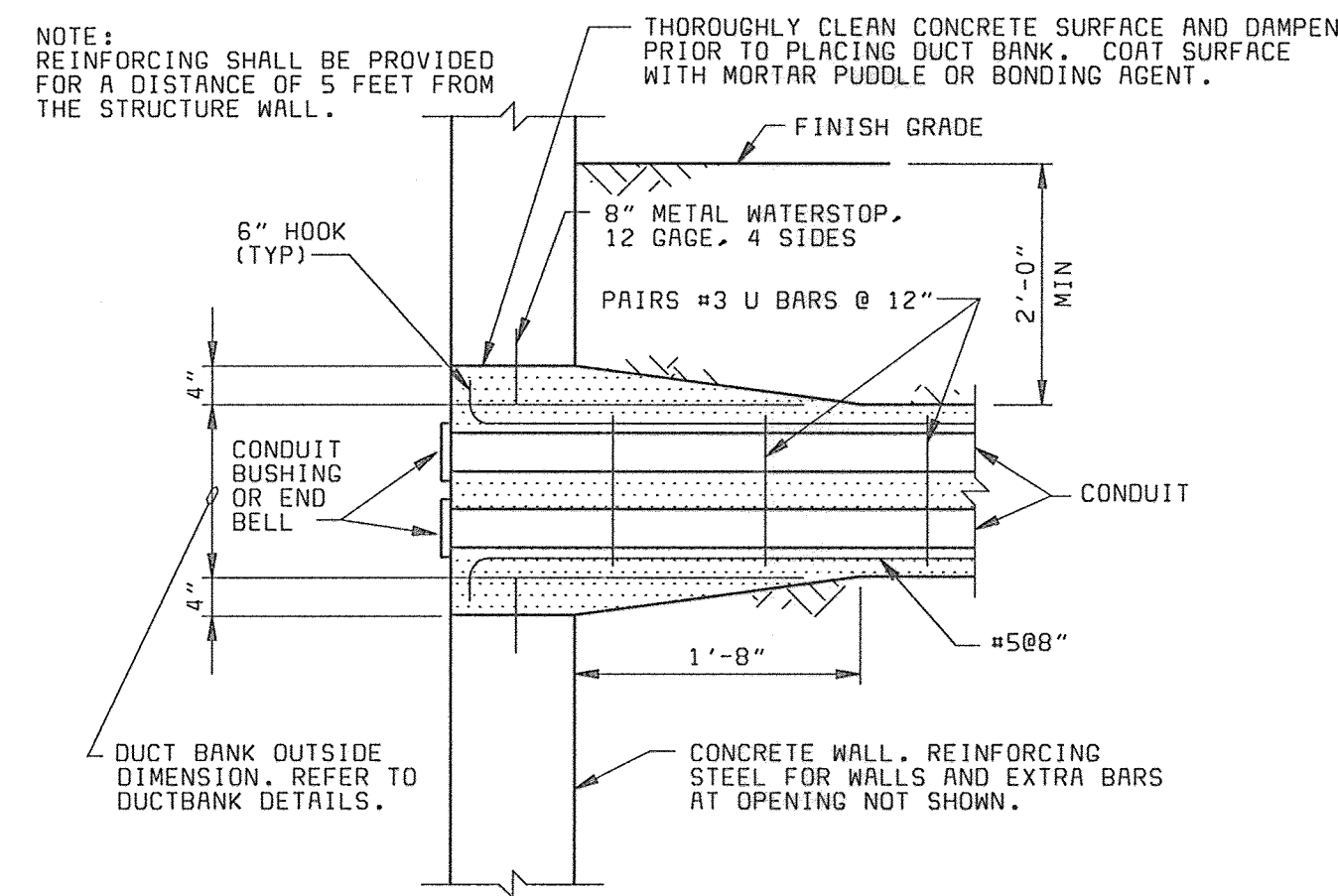
SCALE  
AS  
SHOWN

SHEET  
146 OF 161

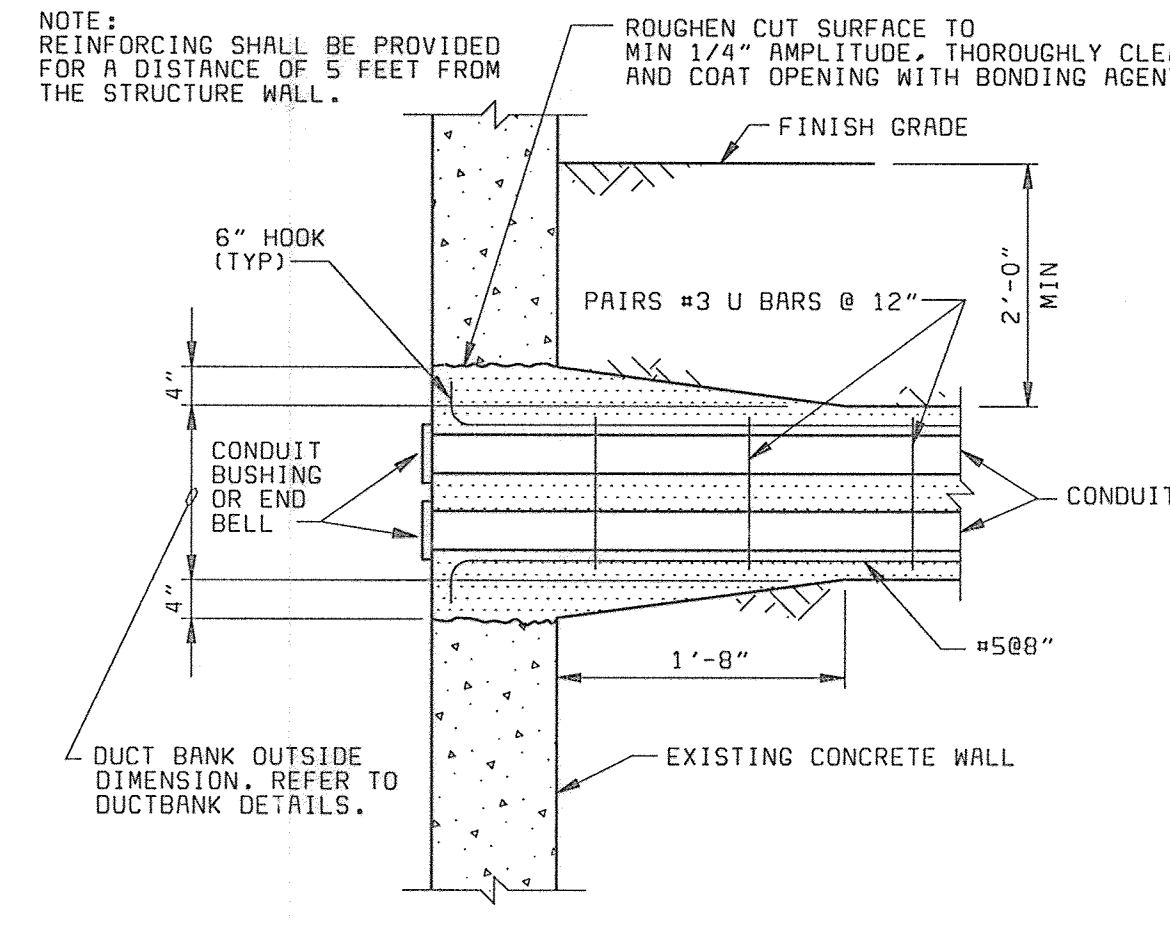
**E36**



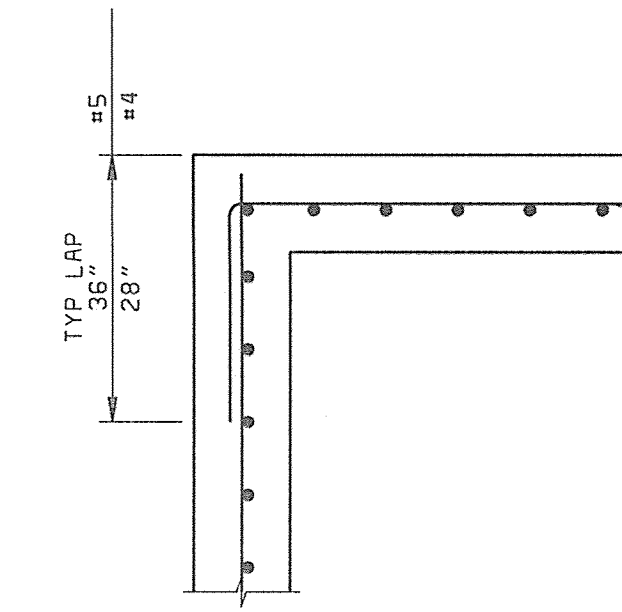
**TYPICAL DUCT BANK SECTION**  
NO SCALE



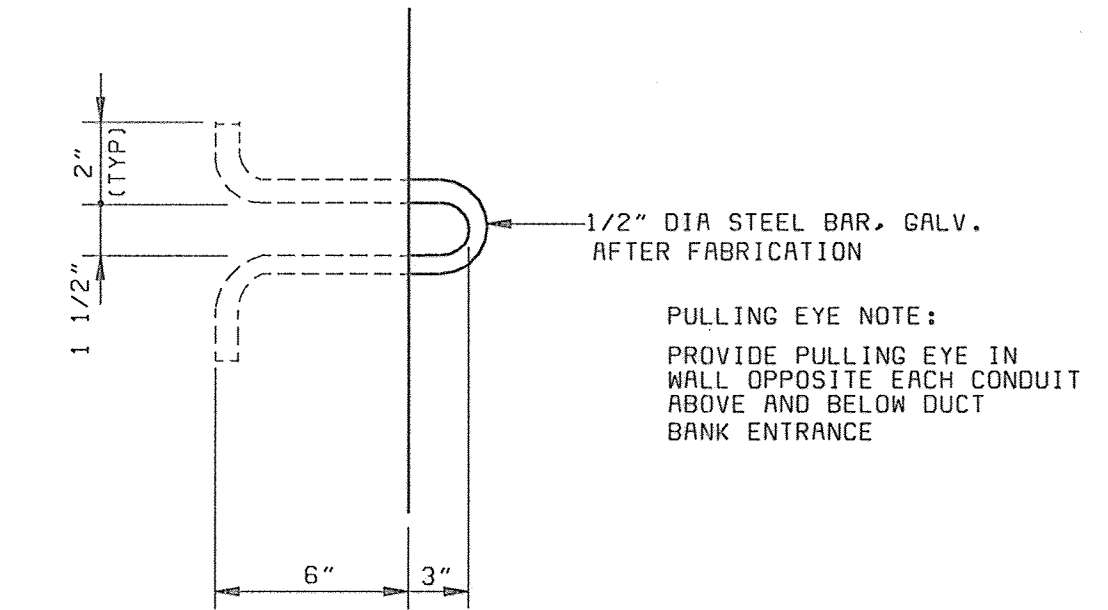
**TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL**  
NO SCALE



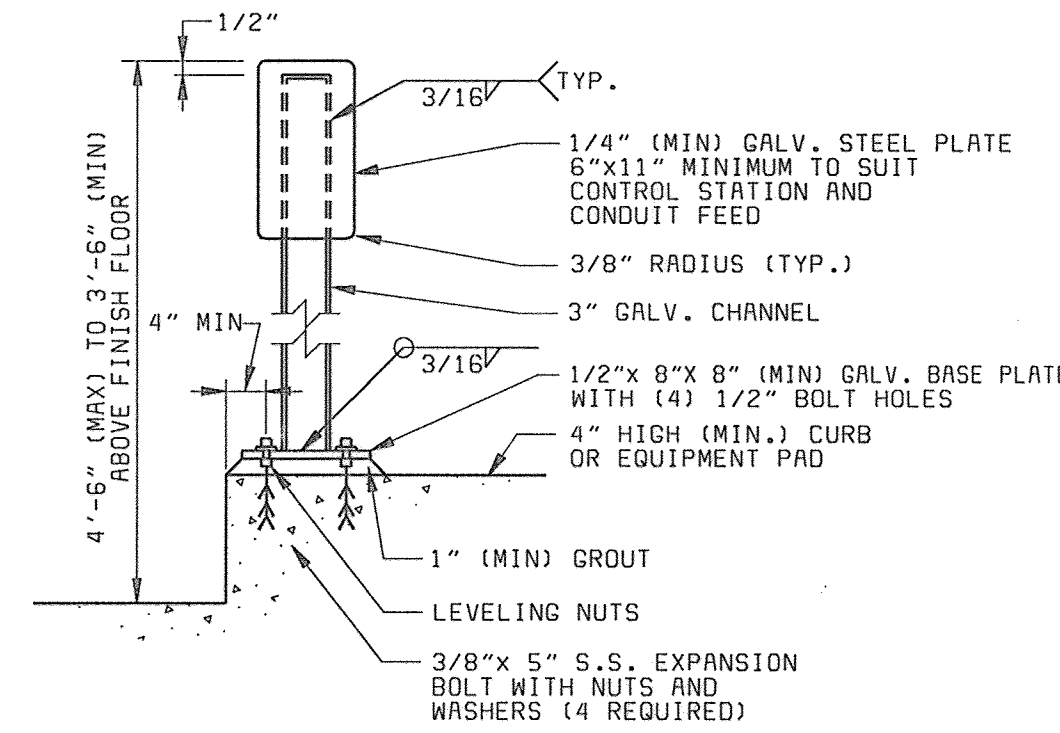
**TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL**  
NO SCALE  
NOTE: FOR EXISTING WALL



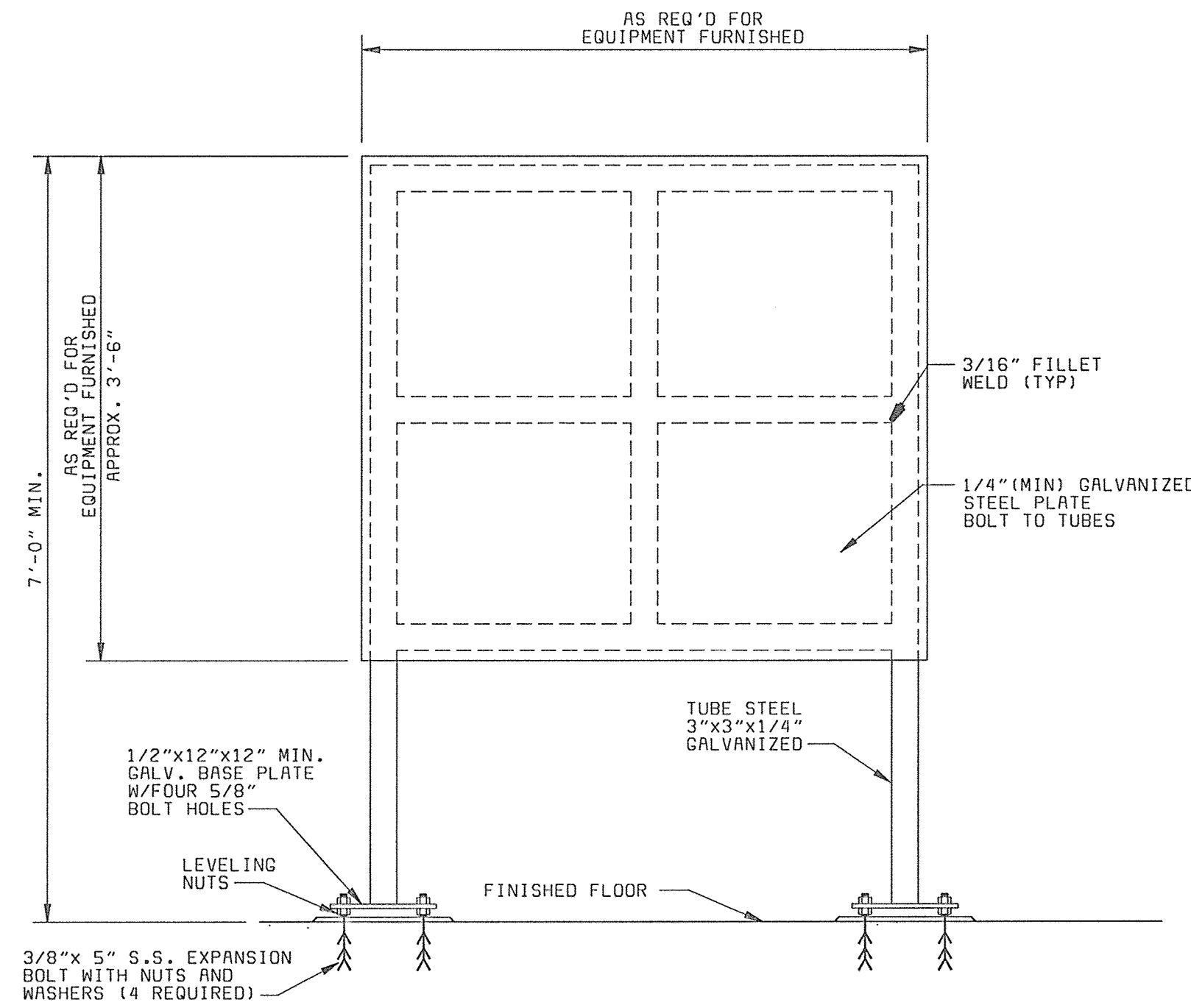
**TYPICAL CORNER DETAIL**  
NO SCALE



**PULLING EYE**  
NO SCALE

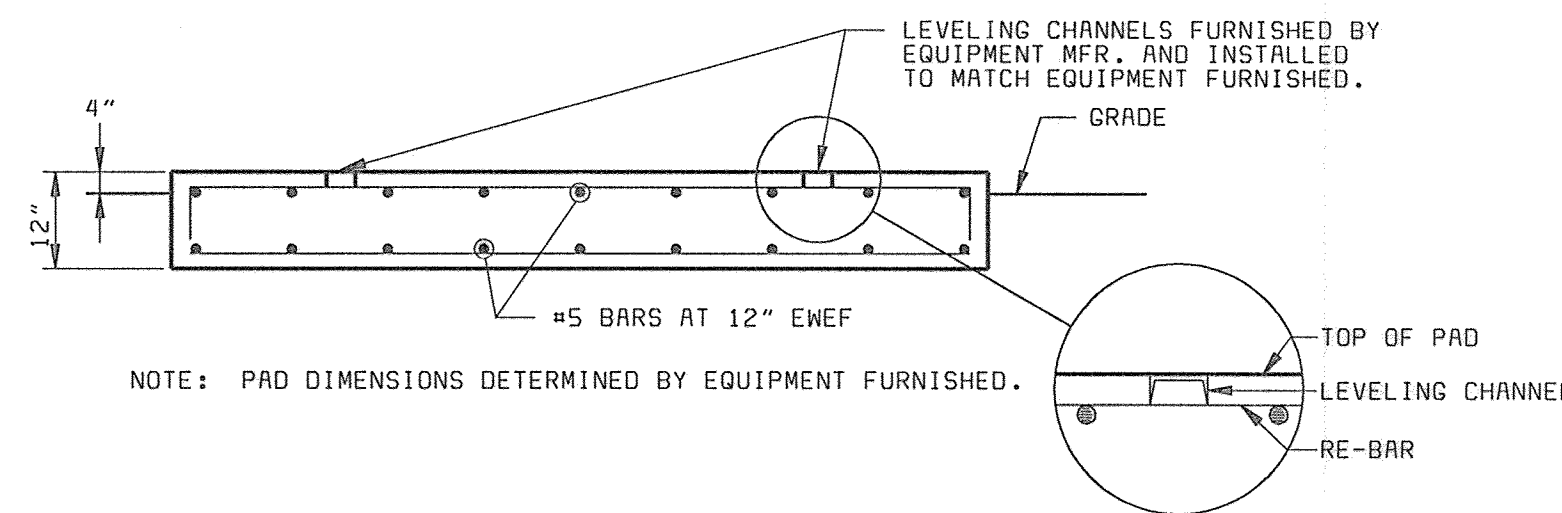


**TYPICAL CONTROL STATION MOUNTING DETAIL**  
NO SCALE



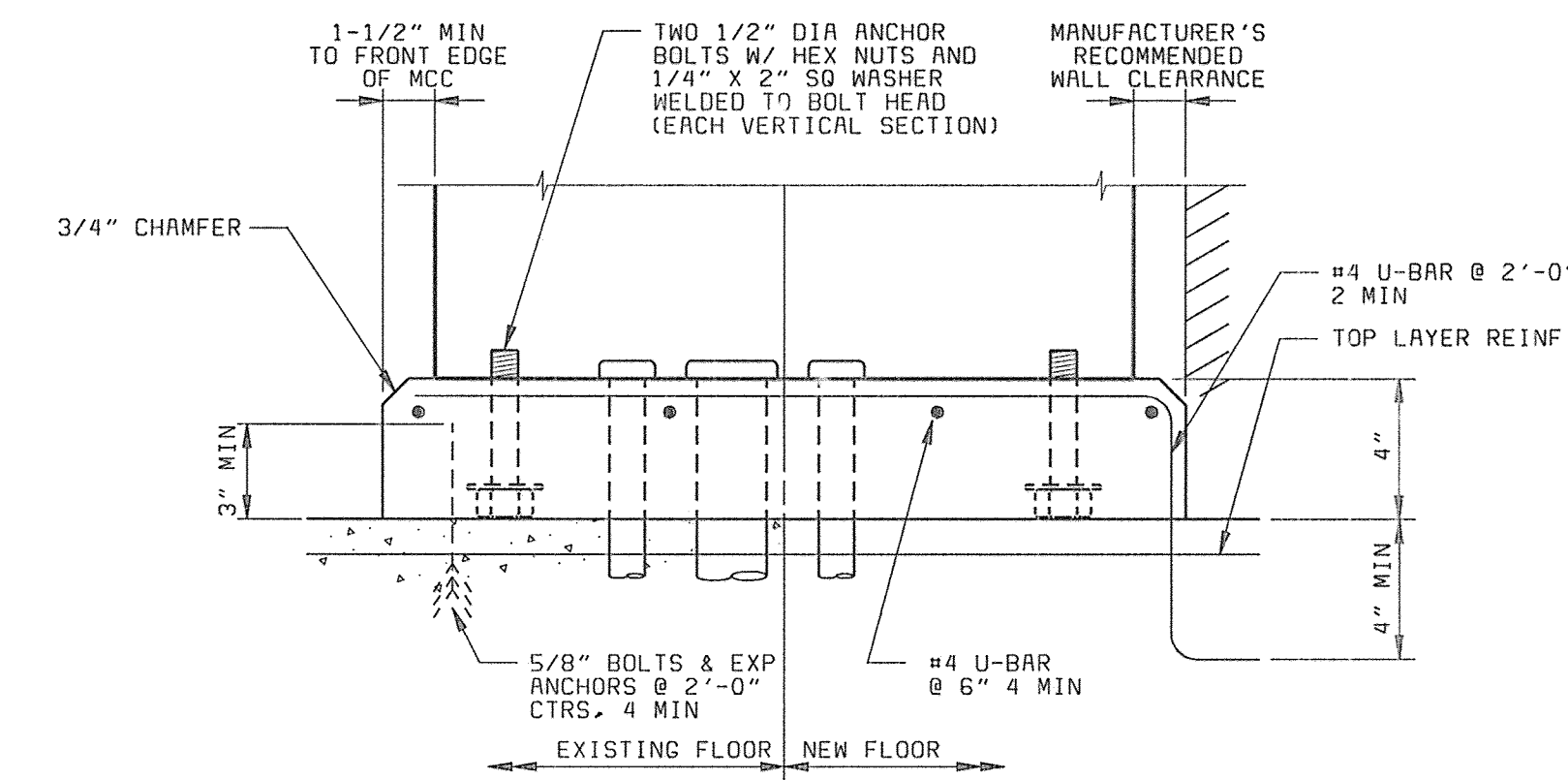
**TYPICAL EQUIPMENT RACK MOUNTING DETAIL**  
NO SCALE

NOTE: FOR SINGLE PANEL LARGER THAN 18" H X 12" W X 8" D OR MULTIPLE PANELS ANY SIZE.



**TYPICAL EQUIPMENT PAD DETAIL**  
NO SCALE

NOTE: PAD DIMENSIONS DETERMINED BY EQUIPMENT FURNISHED.



**MOTOR CONTROL CENTER BASE**  
NO SCALE

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

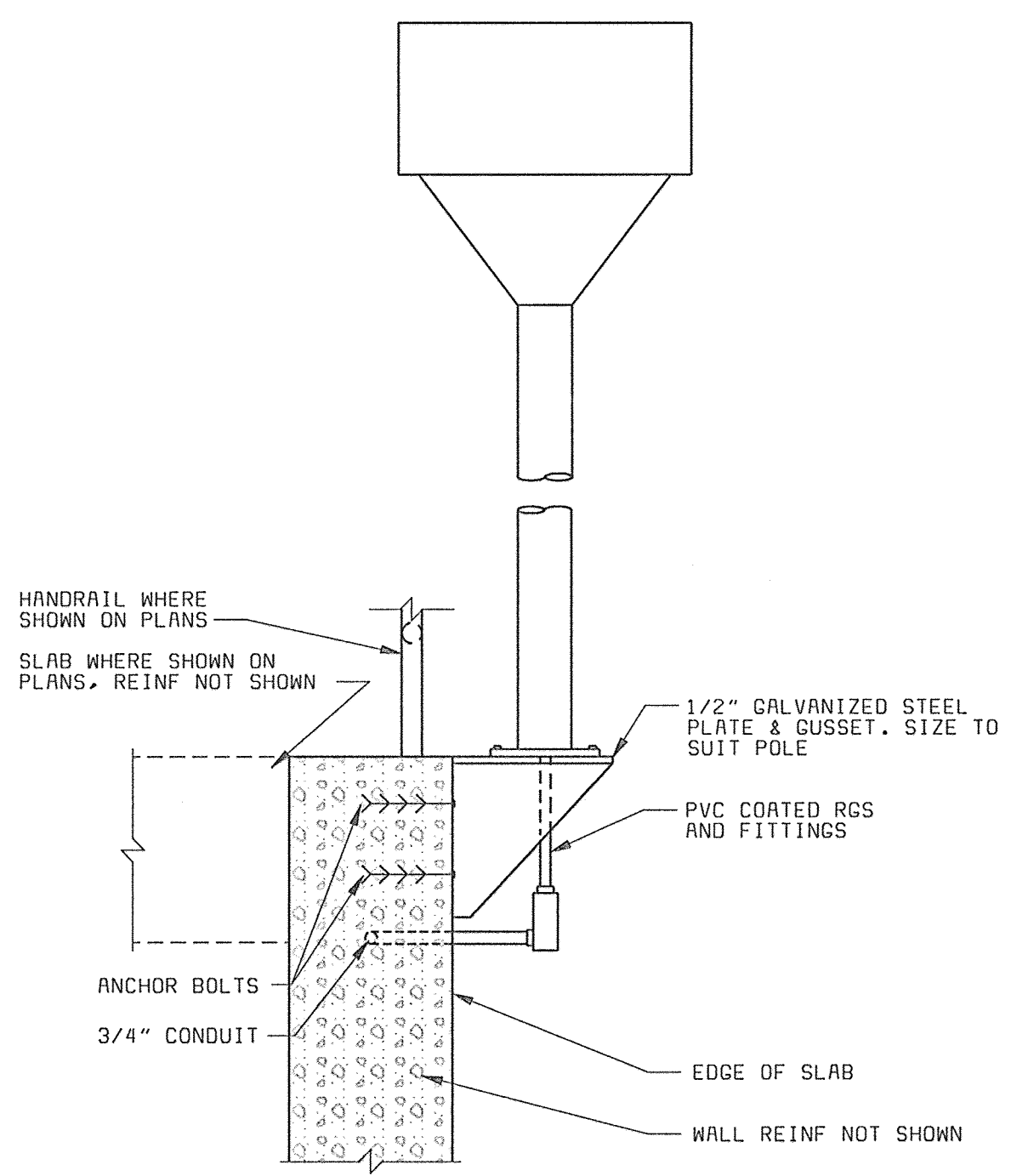
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND   <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   REG. PROF. ENGR. DATE: 6/24/00	DES: SFP DRN: DVH CHK: JTF DATE: 6/23/00	GENERAL ELECTRICAL  MISCELLANEOUS DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 147 OF 161  <b>E37</b>
	REVISIONS AND RECORD OF ISSUE NO. BY CK APP			

058472  
FD58472A

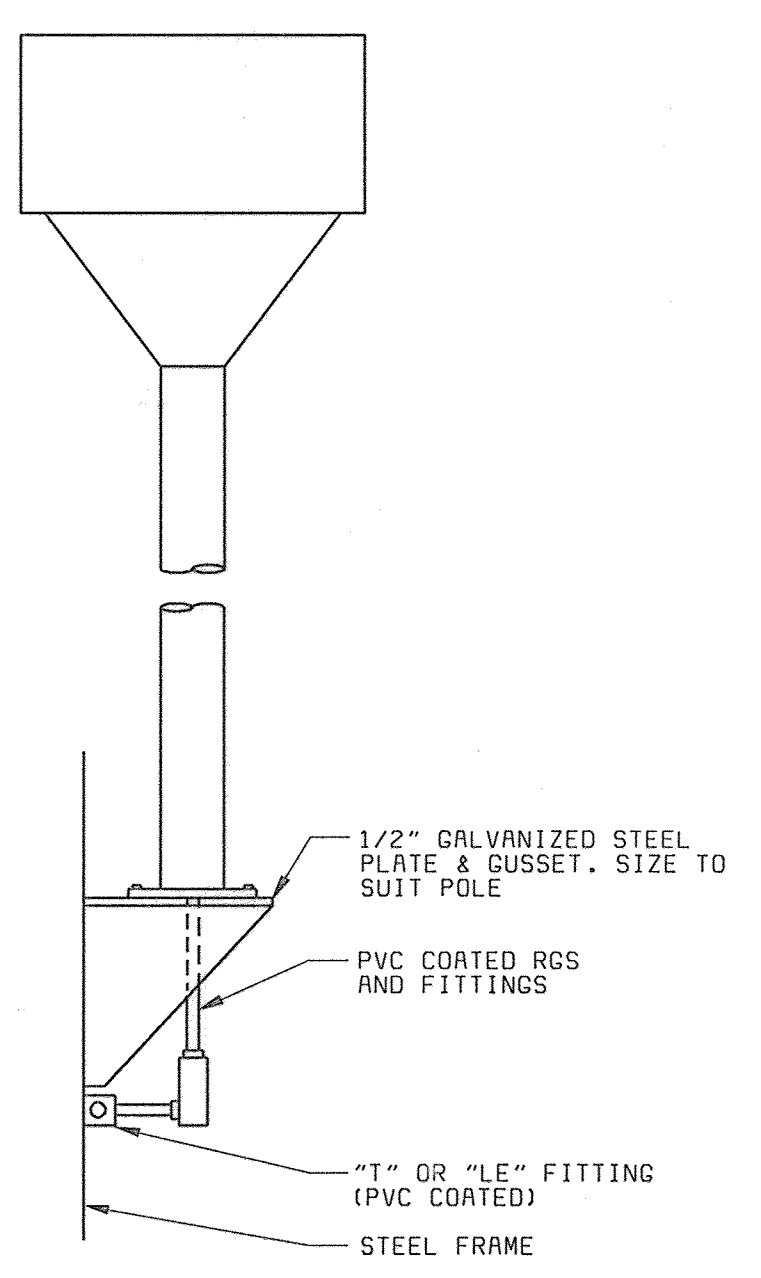
*John B. G-29-00*  
CHIEF, BUREAU OF UTILITIES DATE

50472-100 (REV. 11/11/00)

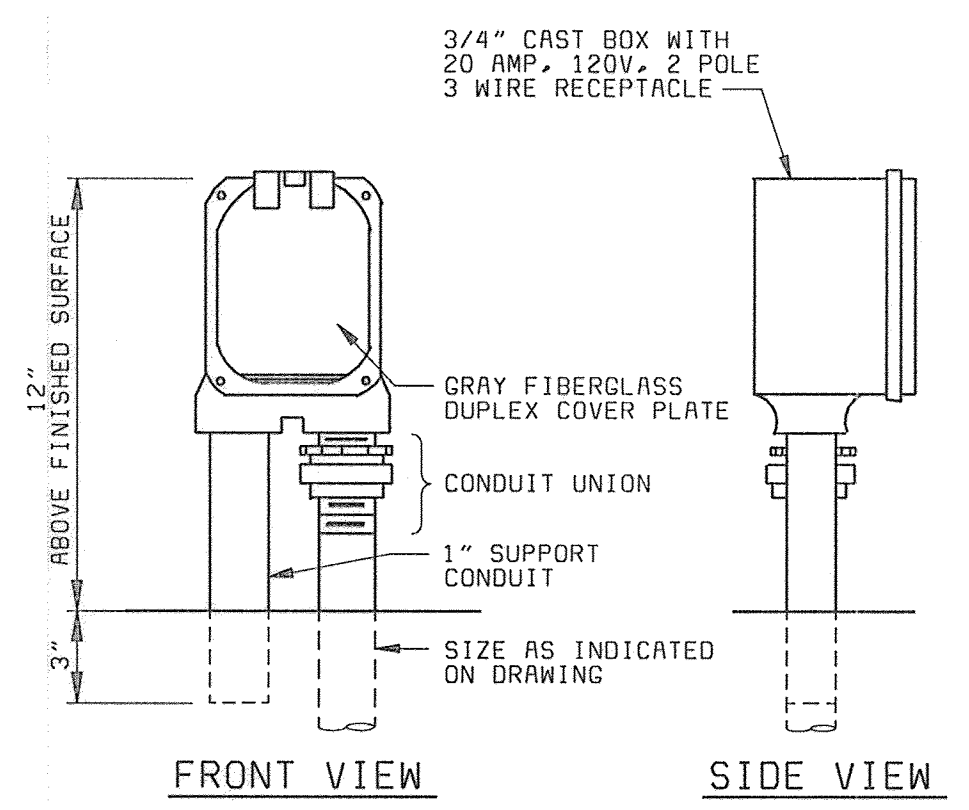
A  
B  
C  
D  
E  
F



**CONCRETE WALKWAY  
POLE MOUNTING DETAIL A**  
NO SCALE

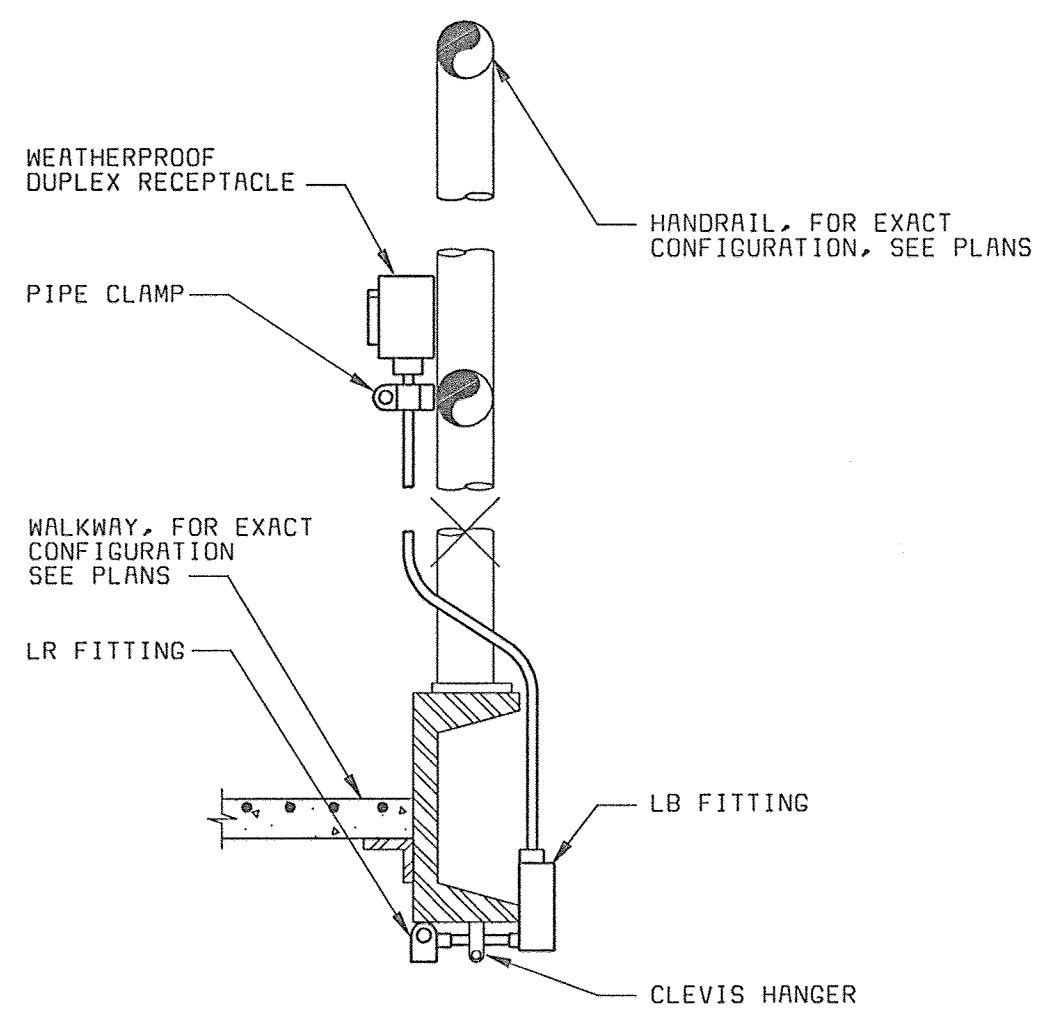


**STEEL WALKWAY POLE  
MOUNTING DETAIL B**  
NO SCALE

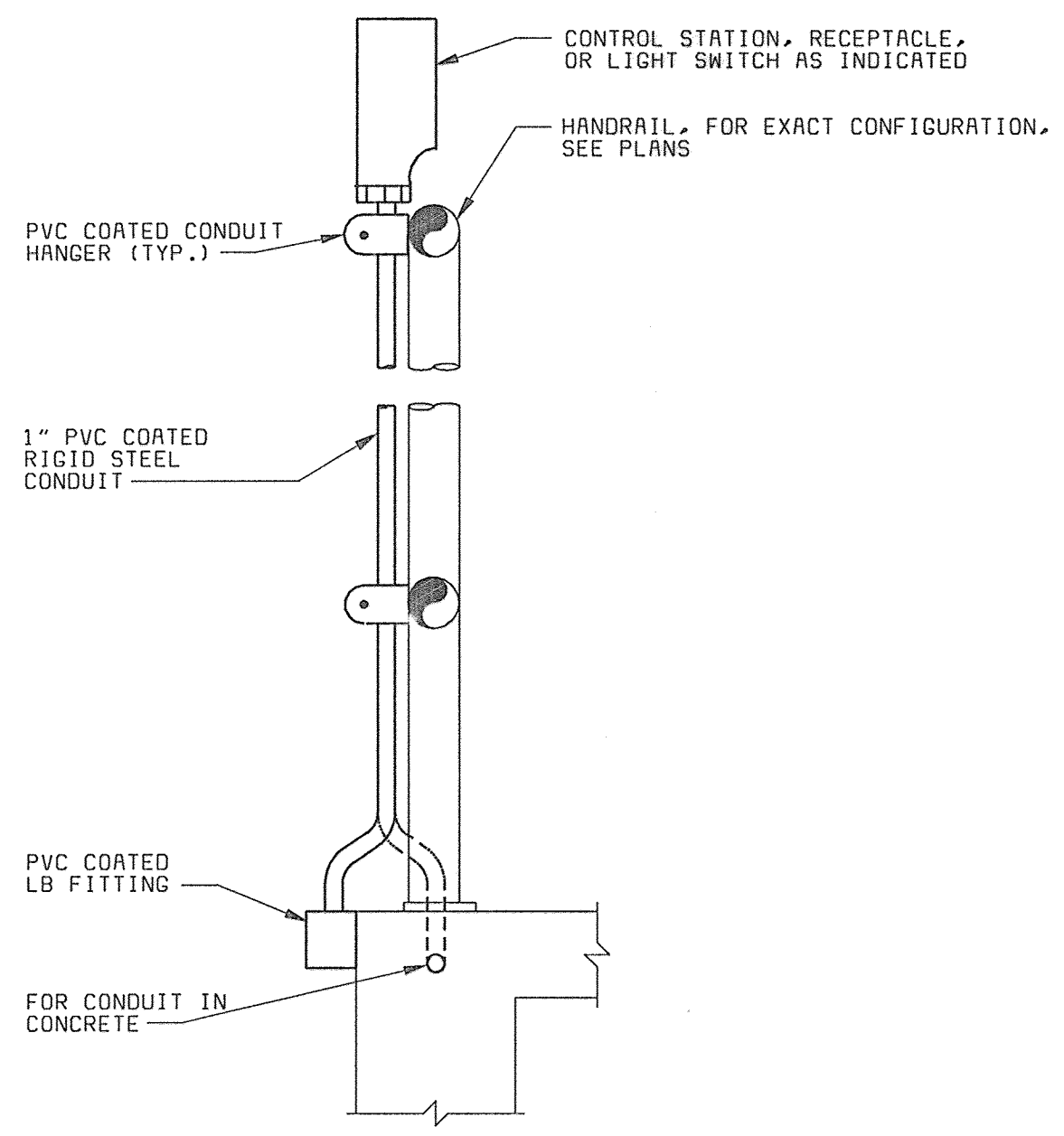


**TYPICAL WEATHERPROOF RECEPTACLE  
MOUNTING DETAIL**  
NO SCALE

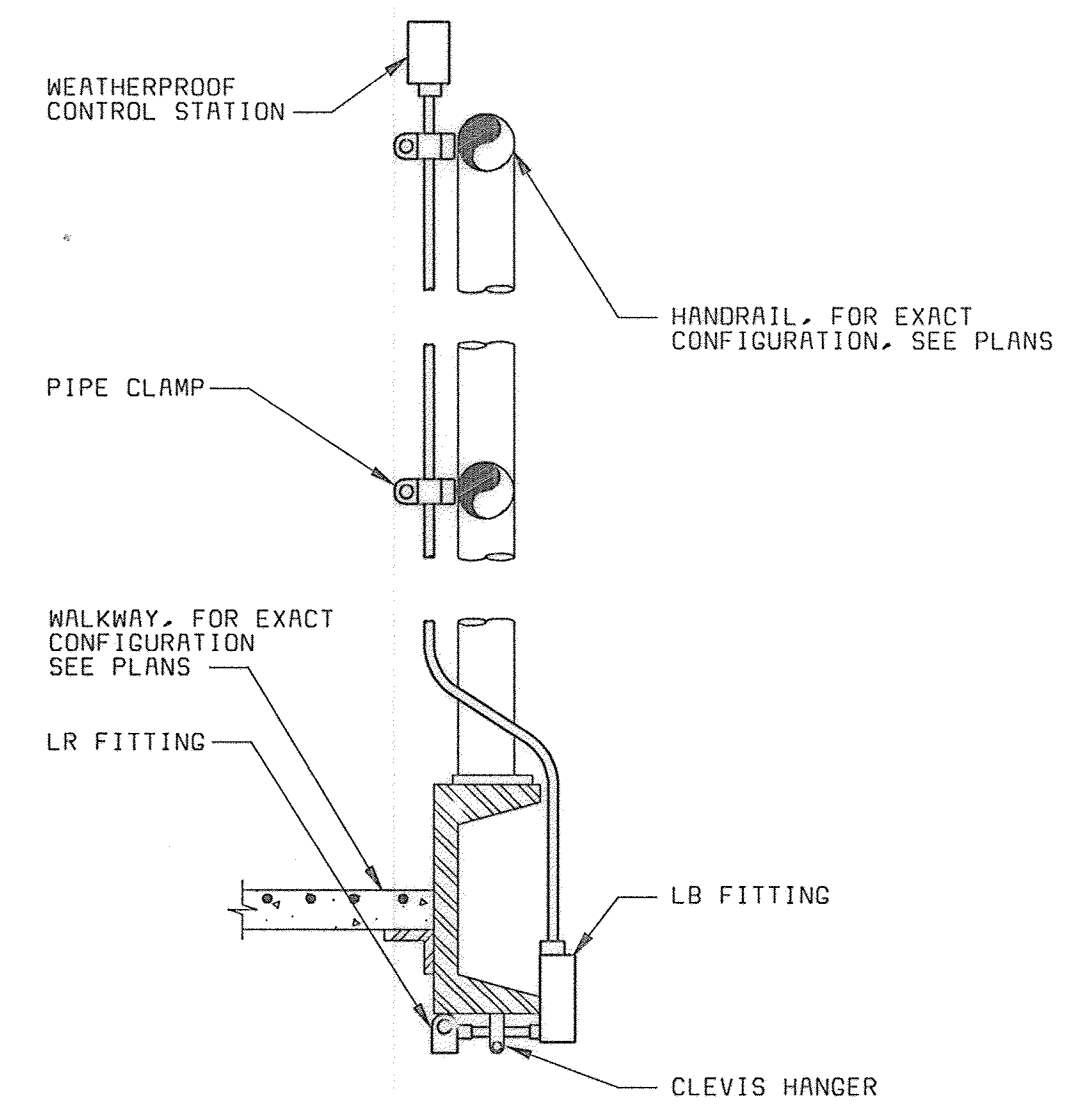
NOTE: ALL EXPOSED CONDUIT SHALL BE PVC COATED RIGID STEEL.



**TYPICAL RECEPTACLE MOUNTING  
AT METAL WALKWAY DETAIL**  
NO SCALE



**TYPICAL HANDRAIL  
MOUNTING DETAIL**  
NO SCALE



**TYPICAL CONTROL STATION  
MOUNTING AT METAL WALKWAY DETAIL**  
NO SCALE

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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert W. Benjamin* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LLP  
Gaithersburg, Maryland

*David A. Steiner* 6/23/00  
REG. PROF. ENGR. DATE



DES: SFP					
DRN: DVH					
CHK: JTF					
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK APP

GENERAL  
ELECTRICAL

MISCELLANEOUS DETAILS

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
148 OF 161

**E38**

068472  
P058472A

LIGHTING FIXTURE SCHEDULE table with columns: SYMBOL, LAMP, MTG HGT, DESCRIPTION, MANUFACTURER

PANELBOARD: LPB BUS: COPPER MAINS: 3P-100A MAIN BREAKER SERVICE: 120/208V, 3Ø, 4W, S/N RATING: 225A LOCATION: NORTH GALLERY BUILDING CONTROL ROOM

PANELBOARD: LPC BUS: COPPER MAINS: 3P-100A MAIN BREAKER SERVICE: 120/208V, 3Ø, 4W, S/N RATING: 225A LOCATION: NORTH BLOWER BUILDING ELECTRICAL ROOM

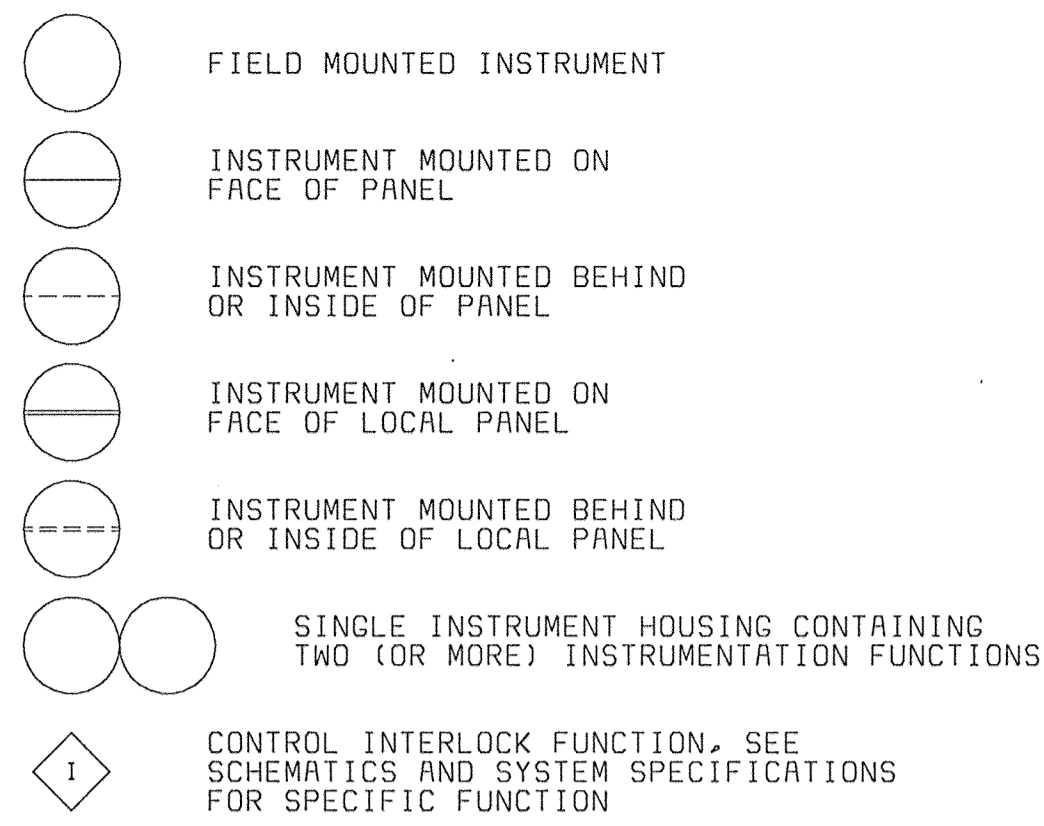
PANELBOARD: LPA BUS: COPPER MAINS: 3P-100A MAIN BREAKER SERVICE: 120/208V, 3Ø, 4W, S/N RATING: 225A LOCATION: NORTH GALLERY BUILDING CONTROL ROOM

PANELBOARD: LPD BUS: COPPER MAINS: 3P-100A MAIN BREAKER SERVICE: 120/208V, 3Ø, 4W, S/N RATING: 225A LOCATION: NORTH BLOWER BUILDING ELECTRICAL ROOM

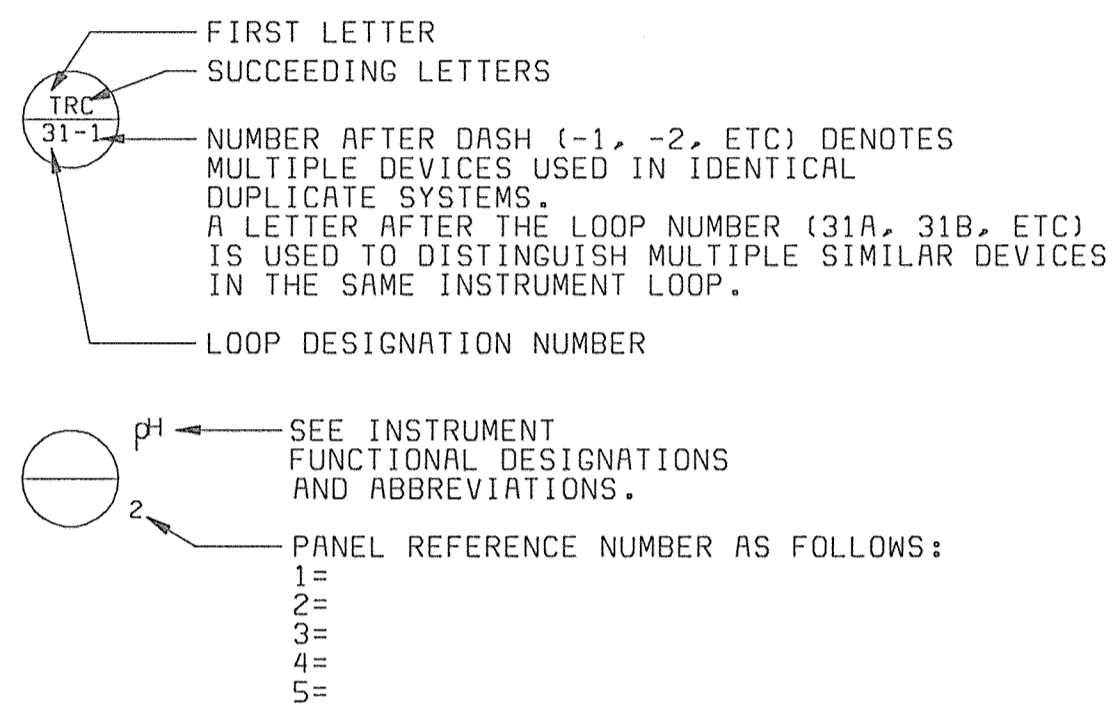
- NOTES: 1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS. 2. CONTRACTOR SHALL VERIFY EXISTING LOAD IS 3-PHASE, AND SHALL SIZE FEEDERS AS REQUIRED TO POWER.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND. BLACK & VEATCH. GENERAL ELECTRICAL. LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION. SCALE AS SHOWN. SHEET 149 OF 161. E39

GENERAL INSTRUMENT SYMBOLS



TAG NUMBERS AND ADDITIONAL DESIGNATIONS

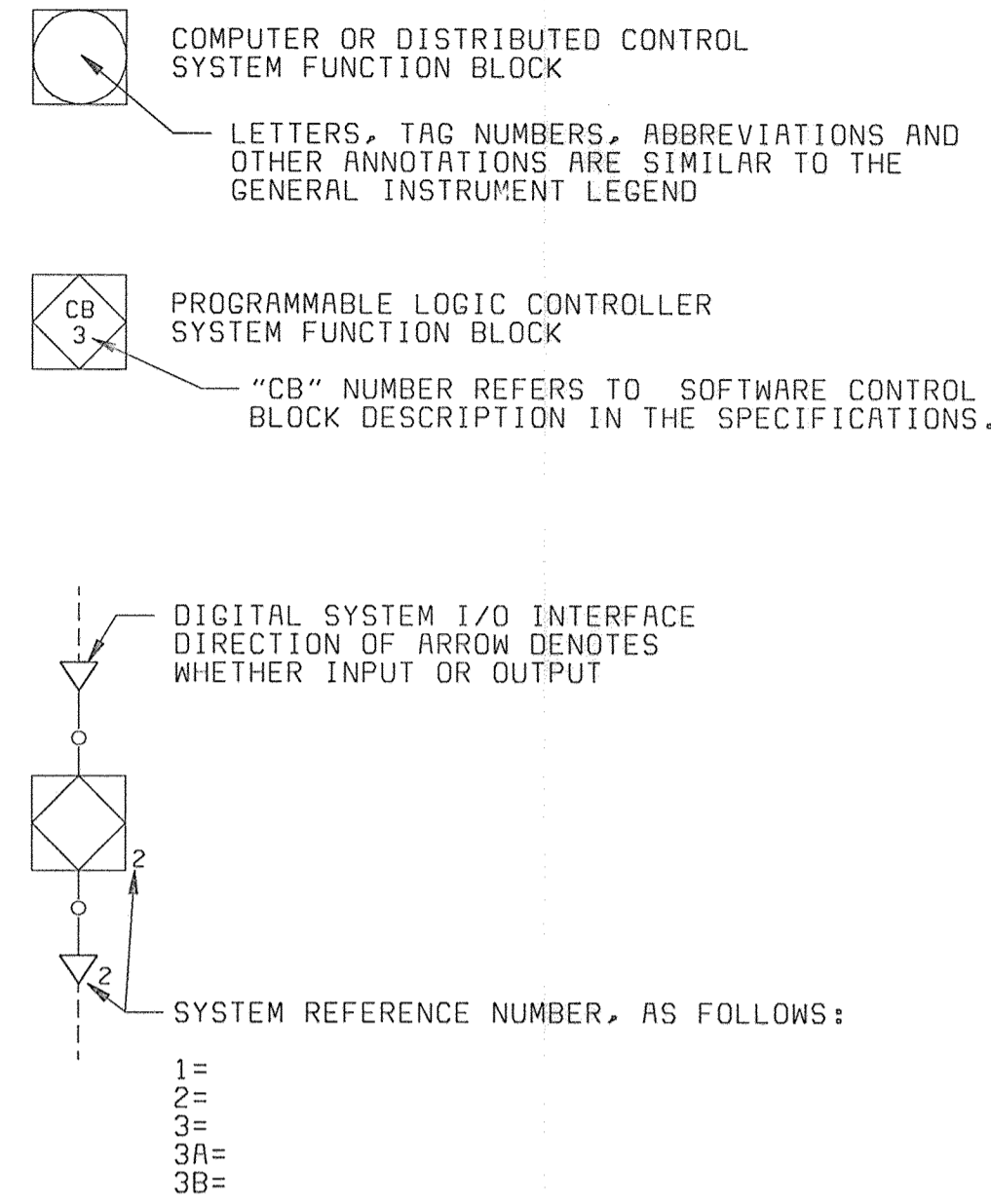


TAG NUMBERS MEANINGS OF IDENTIFICATION LETTERS

Table with columns: LETTER, FIRST LETTER (MEASURED OR INITIATING VARIABLE, MODIFIER), SUCCEEDING LETTERS (READOUT OR PASSIVE FUNCTION, OUTPUT FUNCTION, MODIFIER). Rows include A through Z with specific meanings like ANALYSIS, BURNER, COMBUSTION, CONDUCTIVITY, etc.

DIGITAL SYSTEMS INTERFACE SYMBOLS

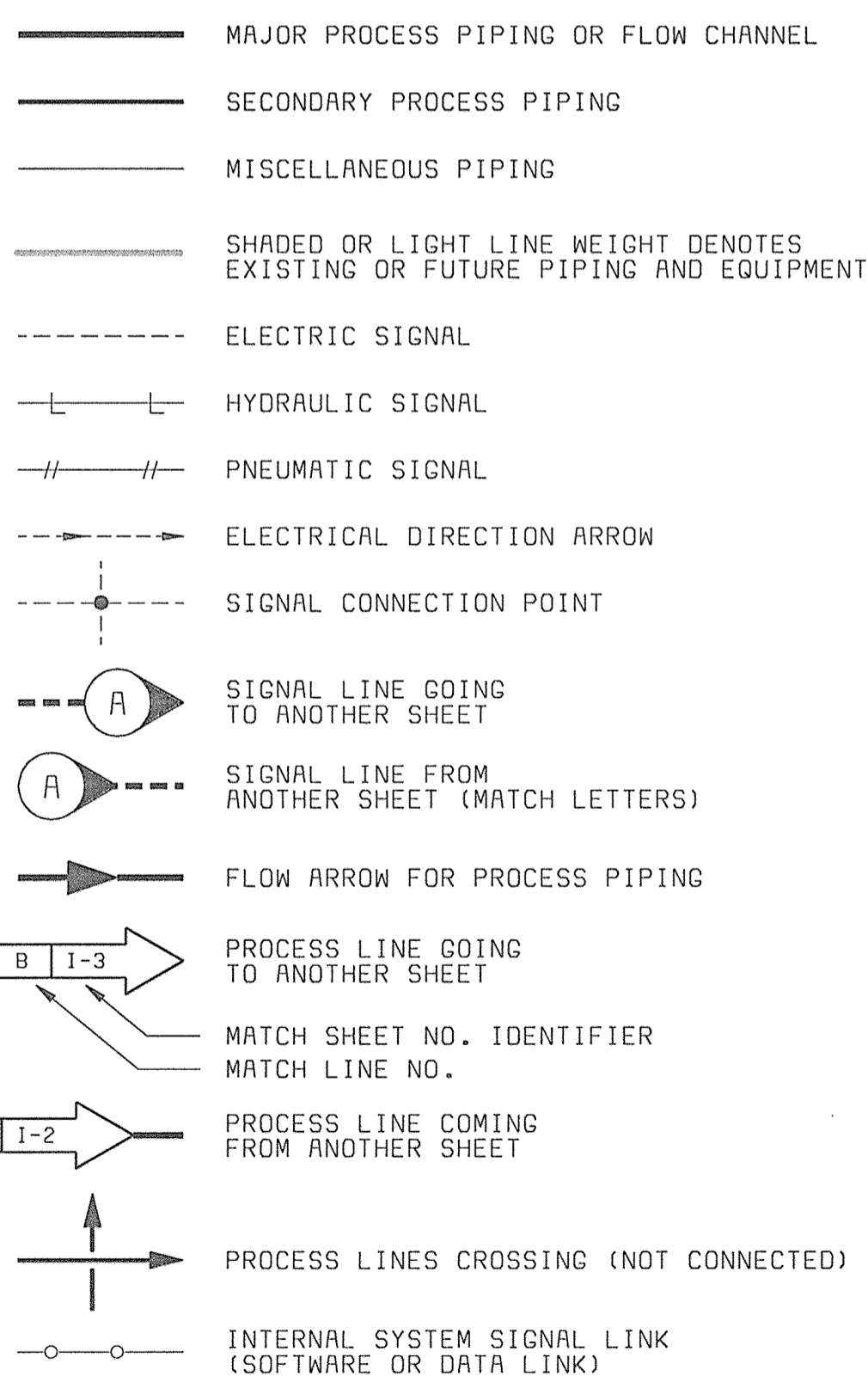
NOTE: REFER TO DETAILED SYSTEM SPECIFICATIONS FOR FUNCTIONAL DESCRIPTION. ALSO SEE I/O SCHEDULES FOR COMPLETE INPUT AND OUTPUT LISTINGS.



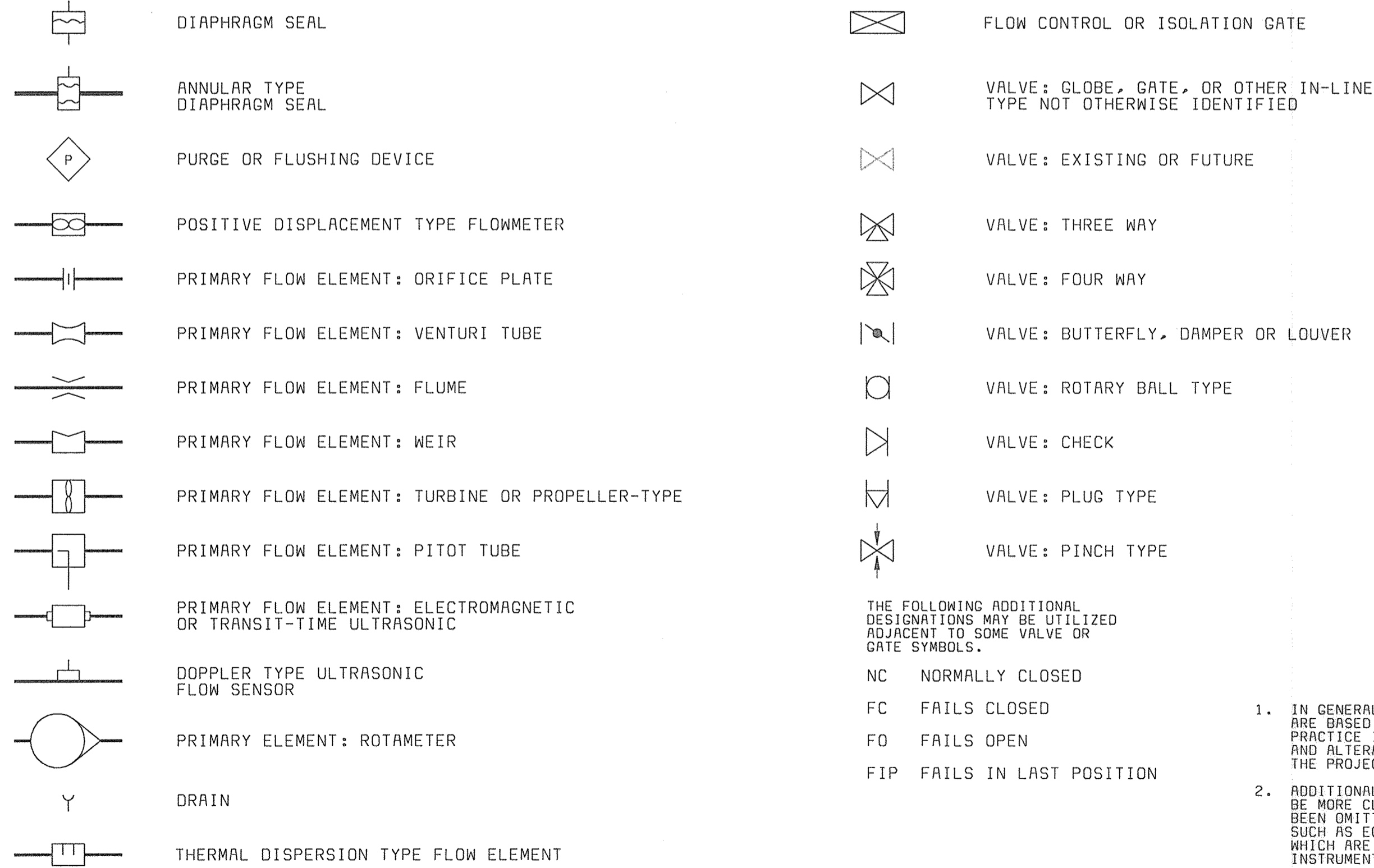
FUNCTION DESIGNATIONS AND ABBREVIATIONS

Table with columns: INSTRUMENT DESIGNATIONS (K, -K, Σ, Δ, √, ÷, F(X), >, <, X, /, CH4, CL2, CO2, DO, LEL, MCC, MLSS, O2, pH, TURB), TRANSDUCER & CONVERTER DESIGNATION (E, FSK, H, I, P, PD, PF, R), POWER SUPPLY ABBREVIATIONS (AS, ES, GS, HS, NS, SS, WS), and HAND SWITCH DESIGNATIONS (HOA, LR, OC, OO, LOR, OOA, OCR, OOR).

LINE SYMBOLS



PROCESS DEVICE SYMBOLS

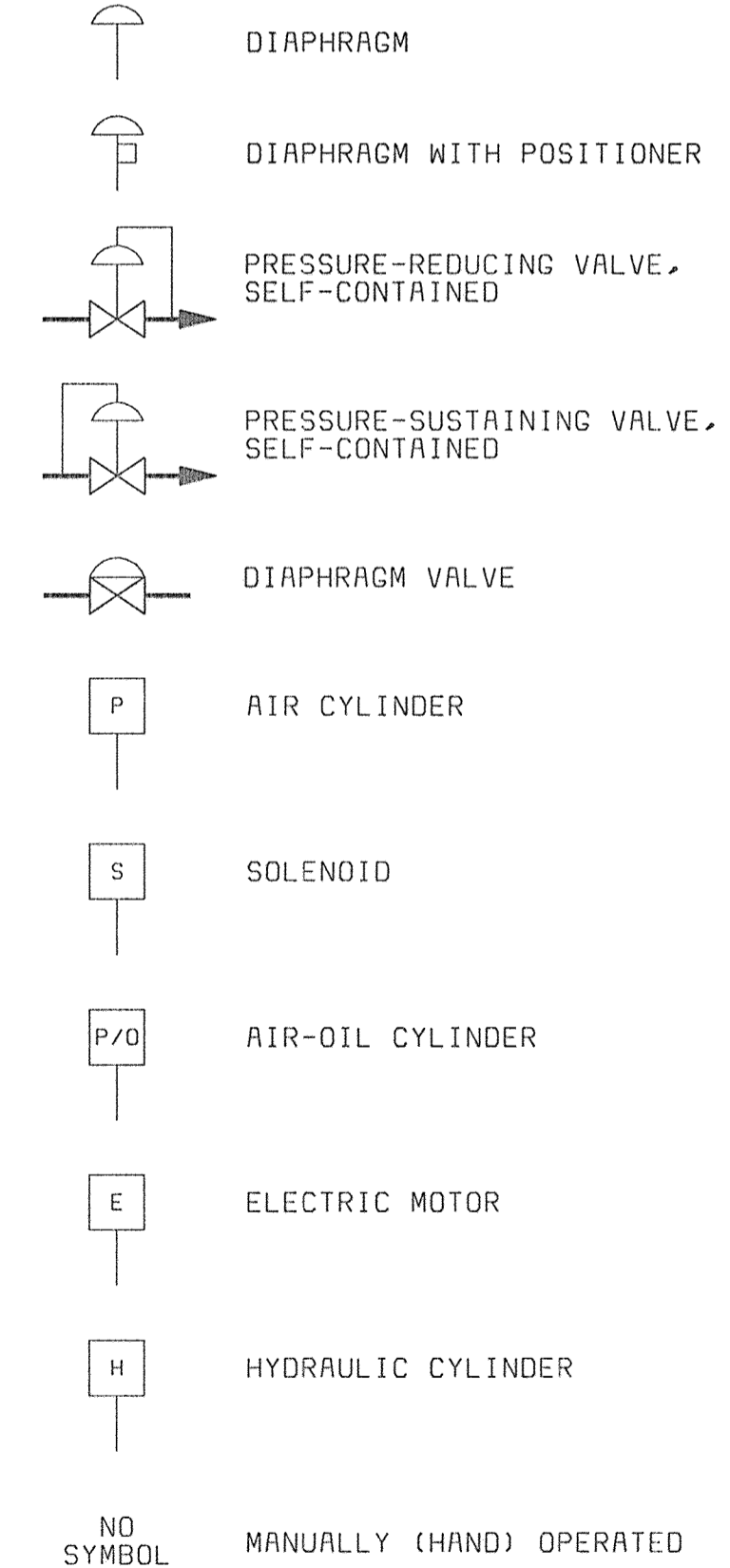


THE FOLLOWING ADDITIONAL DESIGNATIONS MAY BE UTILIZED ADJACENT TO SOME VALVE OR GATE SYMBOLS. NC NORMALLY CLOSED, FC FAILS CLOSED, FO FAILS OPEN, FIP FAILS IN LAST POSITION.

GENERAL NOTES

- 1. IN GENERAL, THE P & ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA, STANDARD PRACTICE ISA-55.1 (1988). 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.

VALVE AND GATE ACTUATOR SYMBOLS



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

BLACK & VEATCH logo and name, Galithersburg, Maryland, with signature of David A. Miller and date 6/24/00.

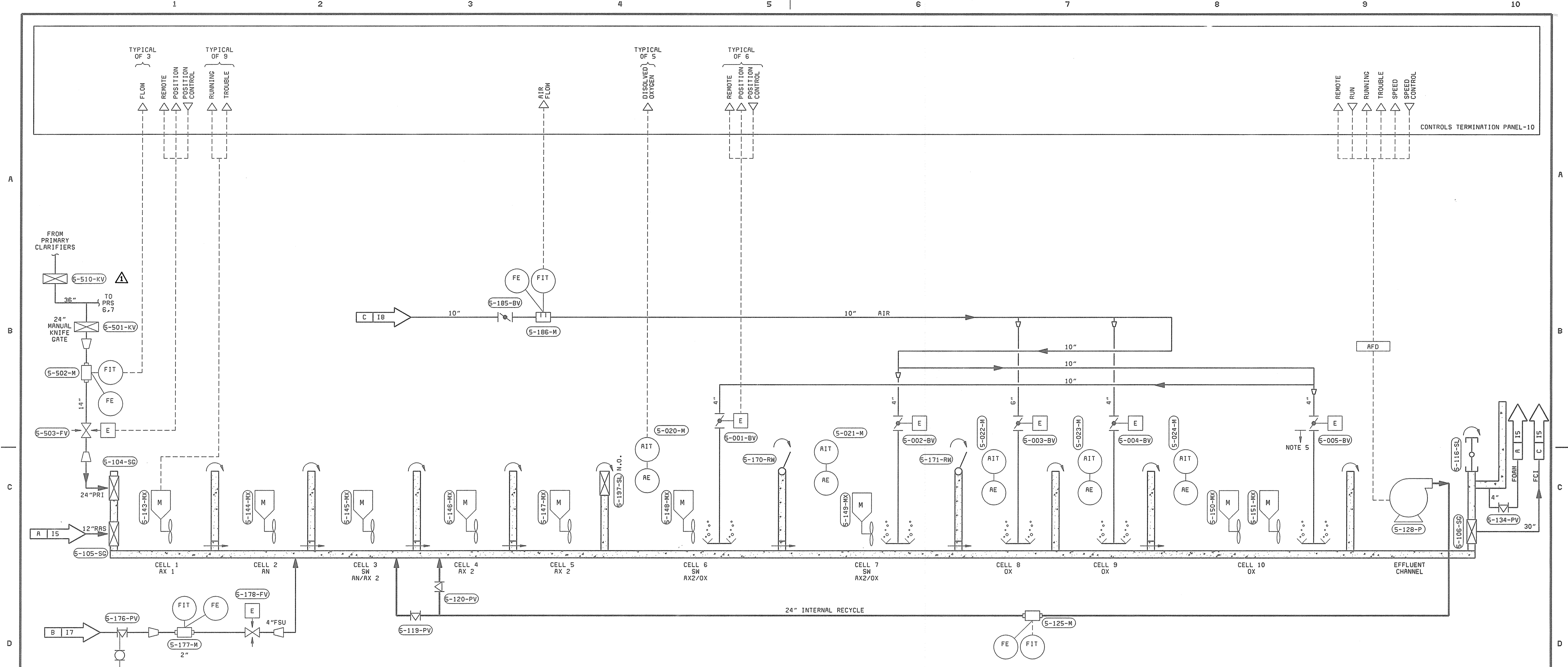


Table with columns: DES: STD, DRN: RLC, CHK: AWH, DATE: 6/23/00, and a grid for REVISIONS AND RECORD OF ISSUE.

INSTRUMENTATION AND CONTROLS P&ID LEGEND AND ABBREVIATIONS

LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN SHEET 150 OF 161 I 1



**PROCESS REACTOR #5  
5-101-PR**

**LEGEND:**

- PCI PRIMARY CLARIFIER INFLUENT
- RAS RETURN ACTIVATED SLUDGE
- M MOTOR, MIXER
- AX ANOXIC ZONE
- AN ANAEROBIC ZONE
- OX OXIC ZONE
- FSU FERMENTER SUPERNATANT

**NOTES:**

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
5. PIPING BY DIFFUSER SUPPLIER (TYP.)

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland  
  
*David Allen*  
REG. PROF. ENGR. DATE 9-16-00

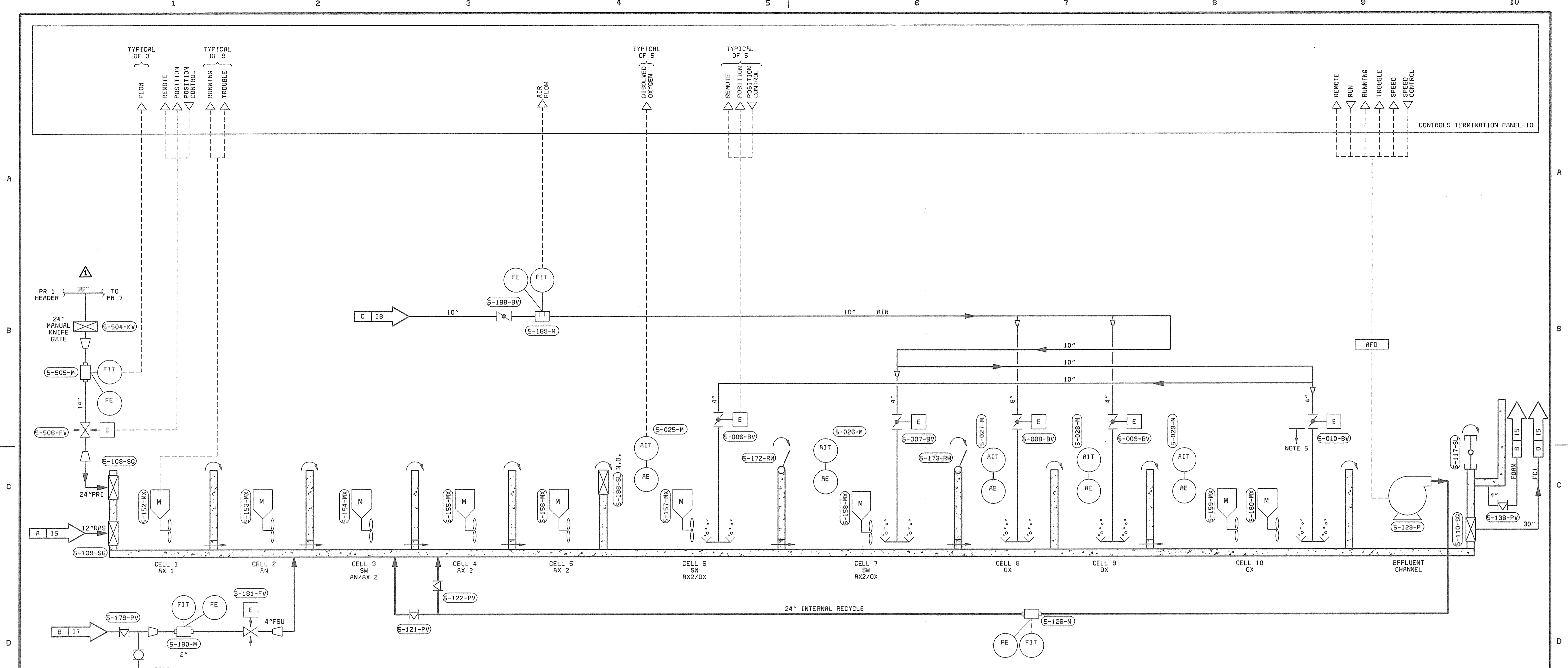


DES: RSF	8/16/00	ADDENDUM NO. 1	RSF
DRN: MDR			
CHK: AWH			
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP

**INSTRUMENTATION**  
  
**P & ID  
PROCESS REACTOR NO.5**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**  
  
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752  
  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
  
SHEET 151 OF 161  
  
**12**



**PROCESS REACTOR #6  
5-102-PR**

**LEGEND:**

- PRI PRIMARY INFLUENT
- RAS RETURN ACTIVATED SLUDGE
- M MOTOR, MIXER
- AN ANOXIC ZONE
- AN ANAEROBIC ZONE
- OX OXIC ZONE
- FSU FERMENTER SUPERNATANT

**NOTES:**

1. SE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
5. PIPING BY DIFFUSER SUPPLIER (TYP.)

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
GaitHERSburg, Maryland

*Donald R. Stevens*  
REG. PROF. ENGR. DATE 8-16-00



DES: RSF	8/16/00	ADDENDUM NO. 1	RSF
DRN: DAH			
CHK: AMH			
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP

**INSTRUMENTATION**

**P & ID  
PROCESS REACTOR NO.6**

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

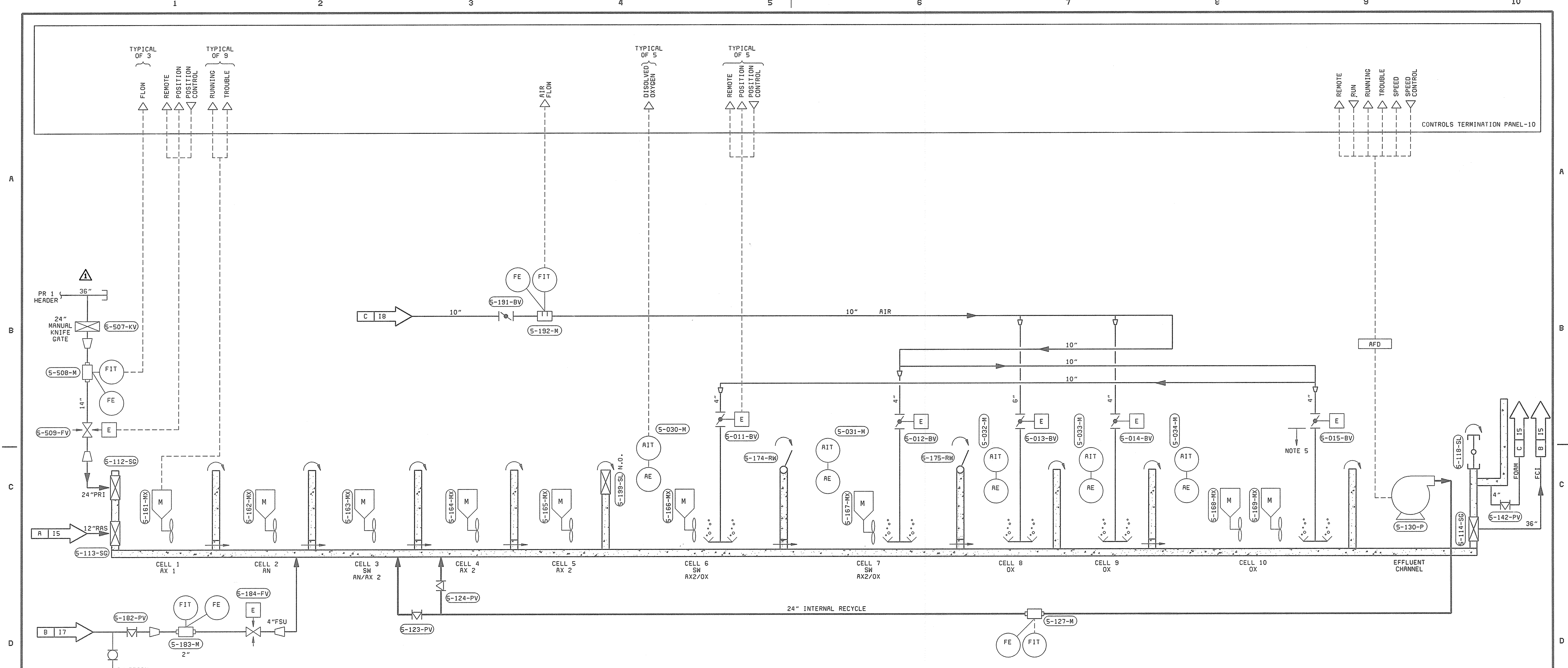
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 152 OF 161

**13**






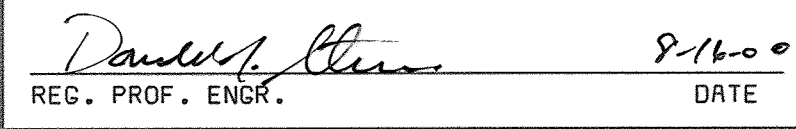
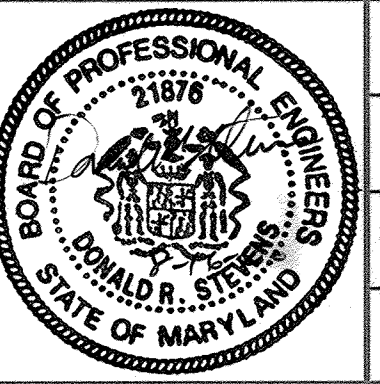
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**5-103-PR**

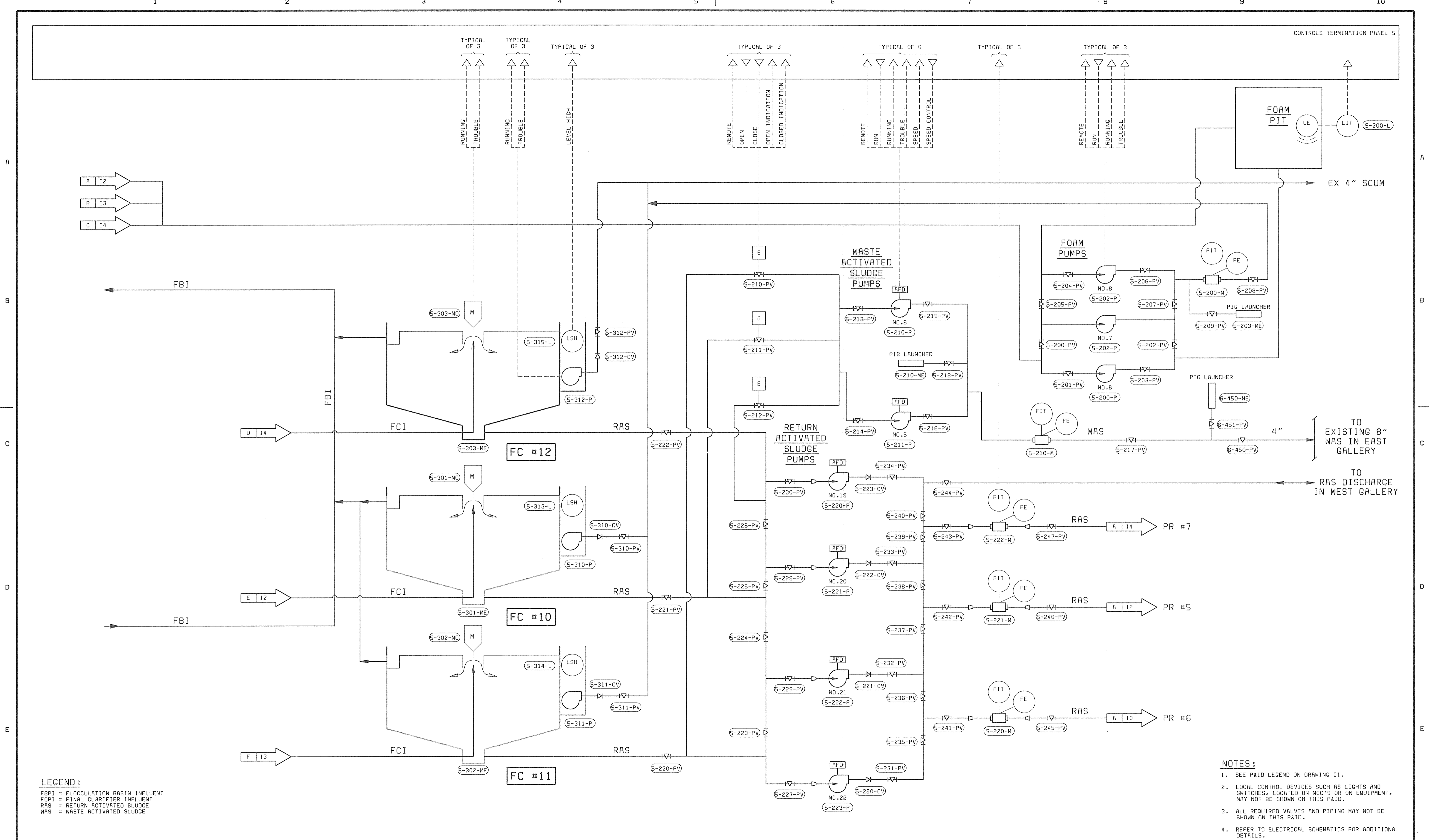
**LEGEND:**

- PRI PRIMARY INFLUENT
- RAS RETURN ACTIVATED SLUDGE
- M MOTOR, MIXER
- AX ANOXIC ZONE
- AN ANAEROBIC ZONE
- OX OXIC ZONE
- FSU FERMENTER SUPERNATANT

**NOTES:**

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
5. PIPING BY DIFFUSER SUPPLIER (TYP.)

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> Gaithersburg, Maryland   REG. PROF. ENGR. DATE	 BOARD OF PROFESSIONAL ENGINEERS STATE OF MARYLAND DONALD R. STUBBS	DES: RSF DRN: MDR CHK: ANH DATE: 6/23/00	8/16/00 ADDENDUM NO. 1 REVISIONS AND RECORD OF ISSUE <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>CK</th> <th>APP</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	BY	CK	APP					<b>INSTRUMENTATION</b>  <b>P &amp; ID</b> <b>PROCESS REACTOR NO.7</b>	<b>LITTLE PATUXENT WATER RECLAMATION PLANT</b> <b>ADDITION NO. 6</b> <b>BNR TREATMENT CAPACITY EXPANSION</b>  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN  SHEET 153 OF 161  <b>I 4</b>
NO.	BY	CK	APP												

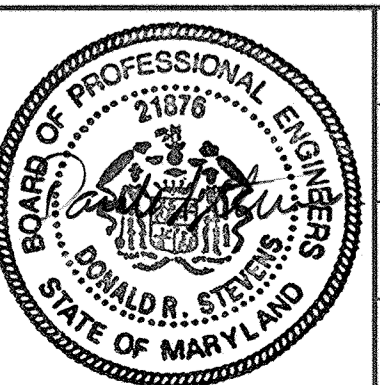


DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND

*John B. ...*  
 CHIEF, BUREAU OF UTILITIES DATE 6-29-00

**BLACK & VEATCH**  
 Galithersburg, Maryland

*Donald R. Steyers*  
 REG. PROF. ENGR. DATE 6/23/00



DES: FKA									
DRN: RLC									
CHK: AWB									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**INSTRUMENTATION AND CONTROLS**

**P & ID**  
**FINAL CLARIFIERS**  
**NO. 10, 11 AND 12**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752

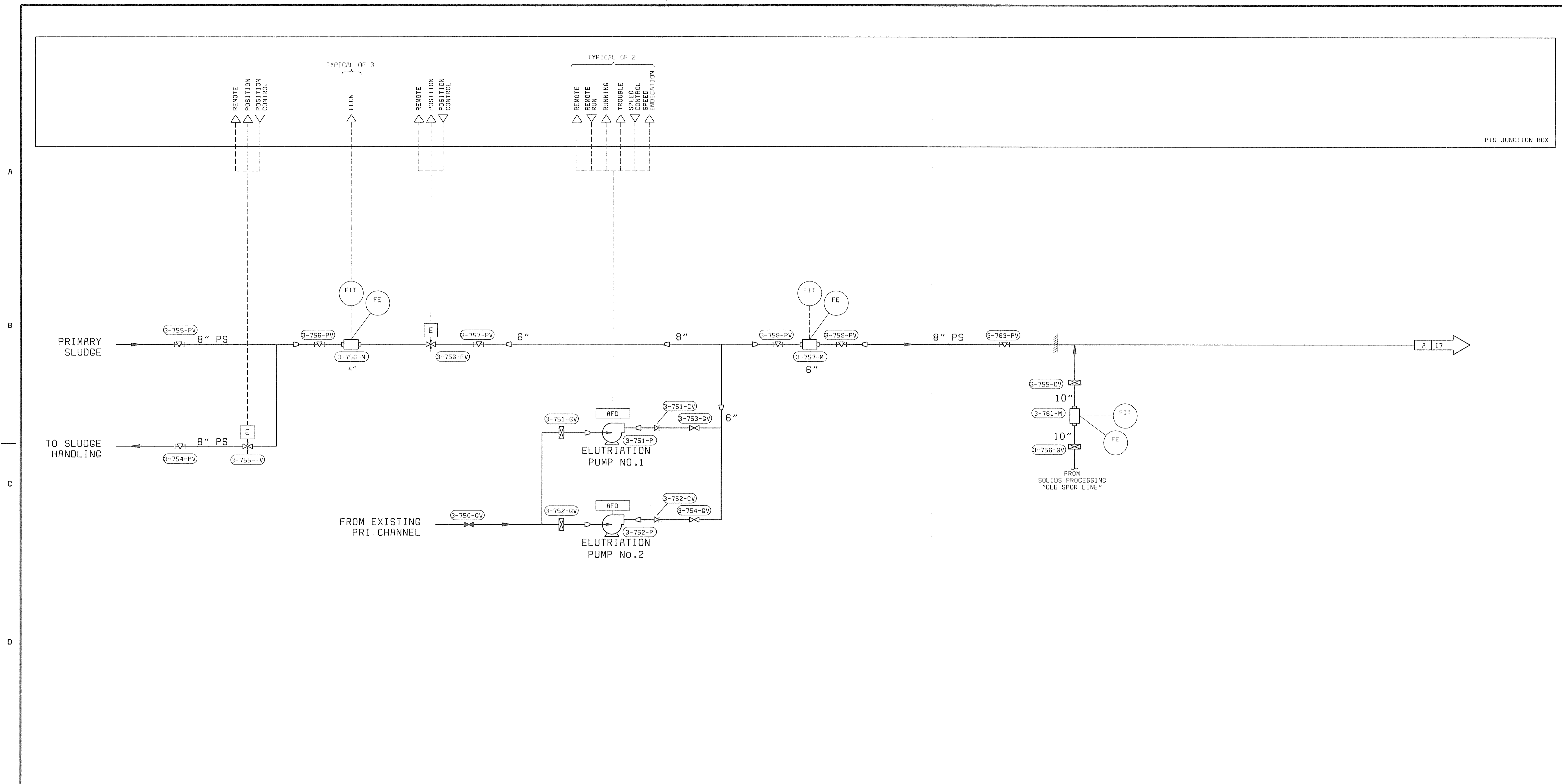
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 154 OF 161

**15**

056472  
 P056472A



**LEGEND:**

PS = PRIMARY SLUDGE

**NOTES:**

1. SEE P&ID LEGEND ON DRAWING 1-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS PID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Robert B. ...*  
CHIEF, BUREAU OF UTILITIES DATE 6-29-00

**BLACK & VEATCH**  
GaitHERSburg, Maryland

*David A. ...*  
REG. PROF. ENGR. DATE 6/29/00



DES: RSF									
DRN: JGT,DAH									
CHK: AWH									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**INSTRUMENTATION & CONTROLS**

P & ID  
WEST GALLERY

**LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION**

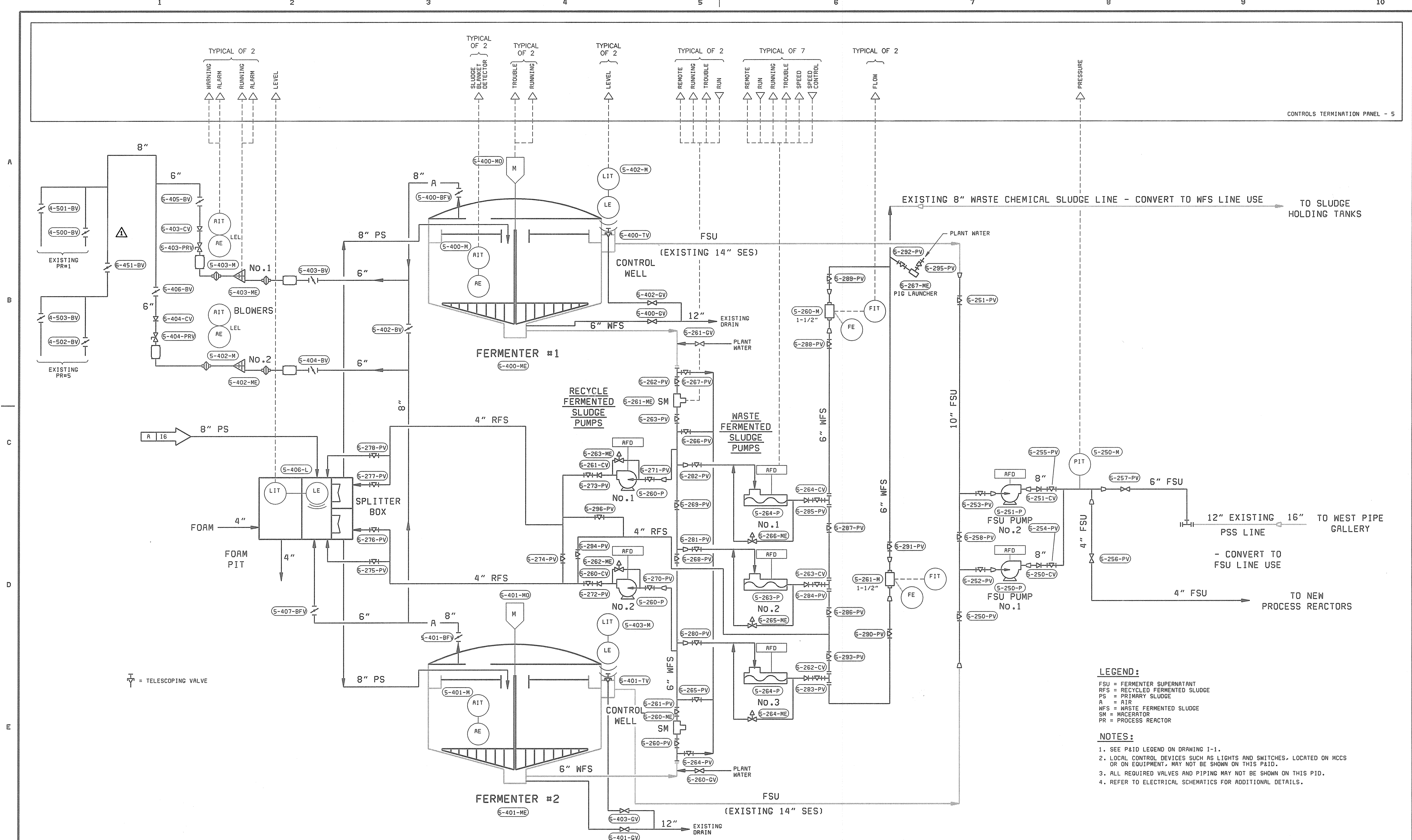
CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE  
AS  
SHOWN

SHEET  
155 OF 161

**I6**



CONTROLS TERMINATION PANEL - 5

**LEGEND:**  
 FSU = FERMENTER SUPERNATANT  
 RFS = RECYCLED FERMENTED SLUDGE  
 PS = PRIMARY SLUDGE  
 A = AIR  
 WFS = WASTE FERMENTED SLUDGE  
 SM = MACERATOR  
 PR = PROCESS REACTOR

**NOTES:**  
 1. SEE P&ID LEGEND ON DRAWING I-1.  
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.  
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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
 Gaithersburg, Maryland  
 REG. PROF. ENGR. DATE 8-16-00

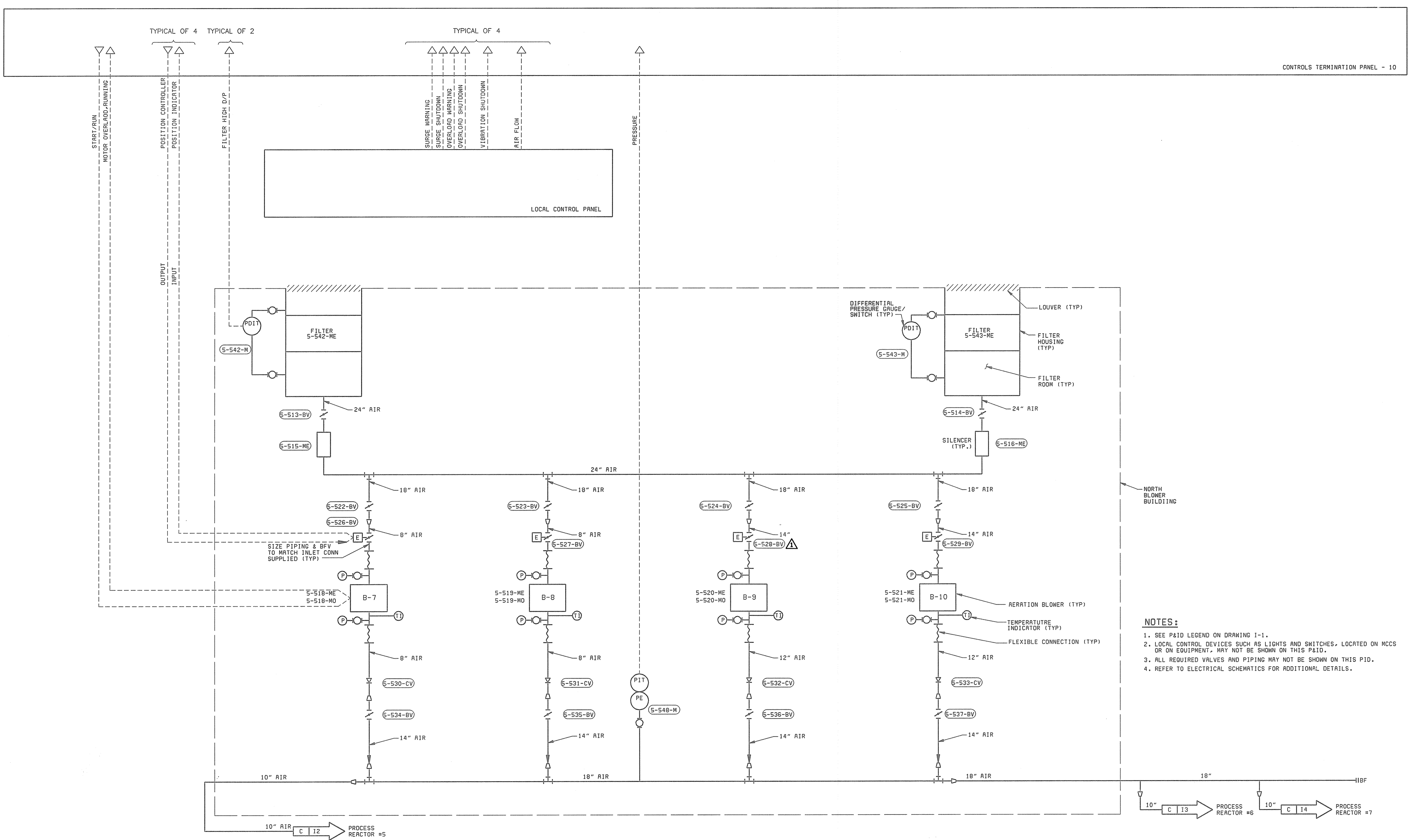


DES: RSF	8/18/00	ADDENDUM NO. 1	RSF
DRN: DAH			
CHK: RAW			
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP

**INSTRUMENTATION & CONTROLS**  
**P & ID**  
**FERMENTER**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**  
 CAPITAL PROJECT S-6205  
 CONTRACT NO. 20-3752  
 HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
 SHEET 156 OF 161  
**17**



- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I-1.
  2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Galliersburg, Maryland

*Donald A. Stearns*  
REG. PROF. ENGR. DATE 2-16-00



DES: RSF	8/16/00	ADDENDUM NO. 1	RSF
DRN: JGT			
CHK: AMW			
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO. BY CK APP

**INSTRUMENTATION & CONTROLS**

**P & ID**  
**NORTH BLOWERS**

**LITTLE PATUXENT WATER RECLAMATION PLANT**  
**ADDITION NO. 6**  
**BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 157 OF 161

**18**

A

B

C

D

E

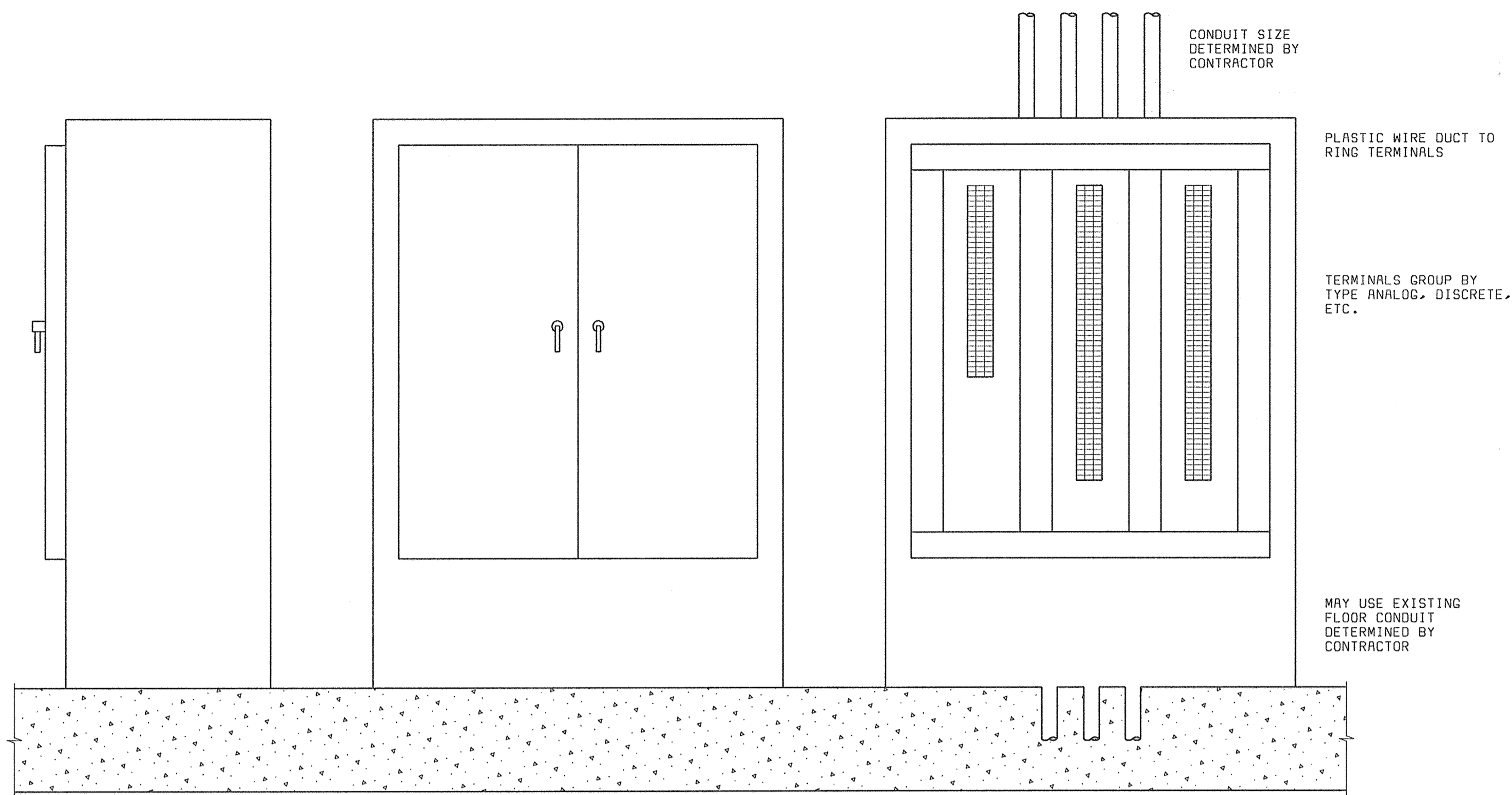
A

B

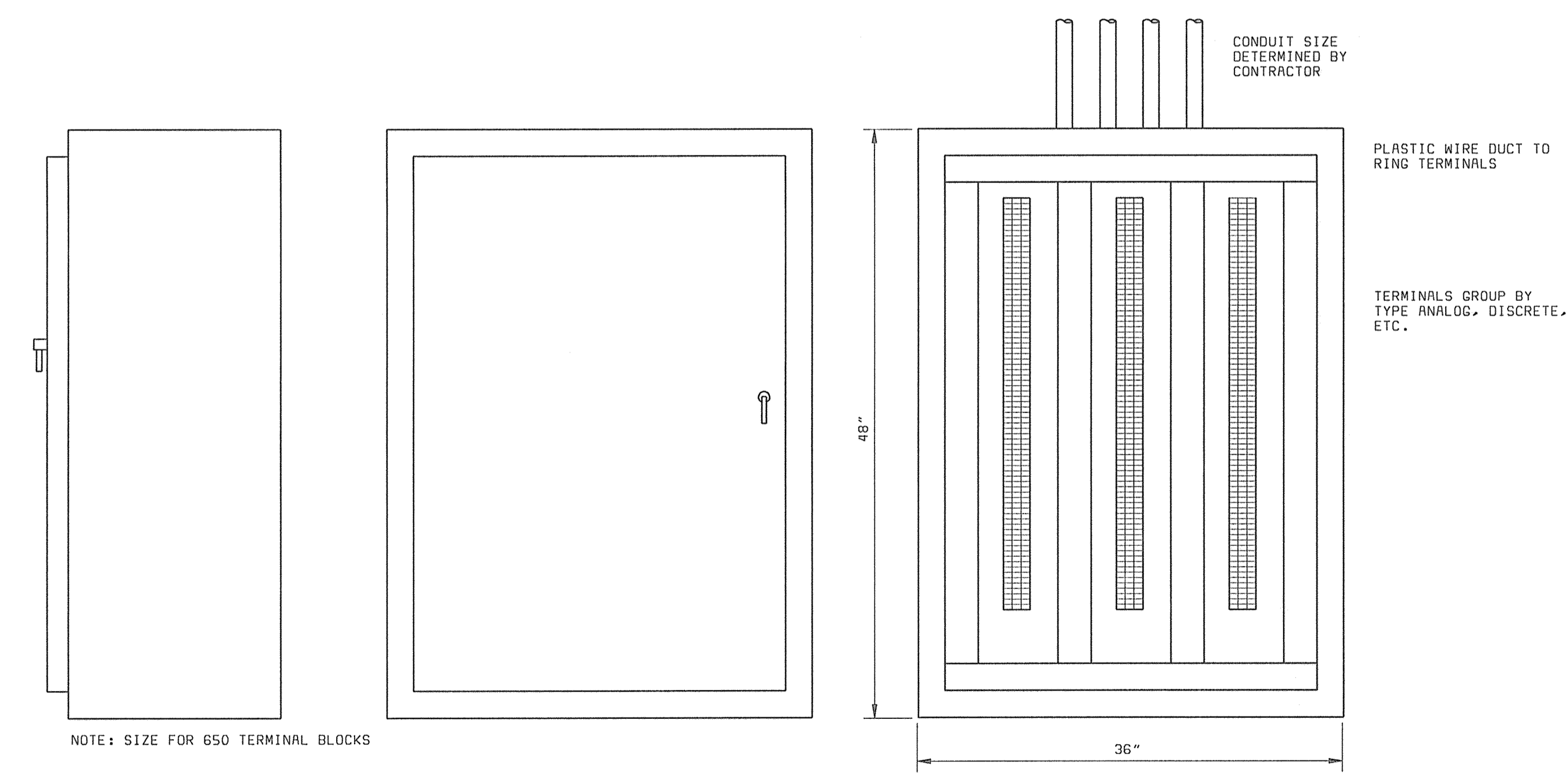
C

D

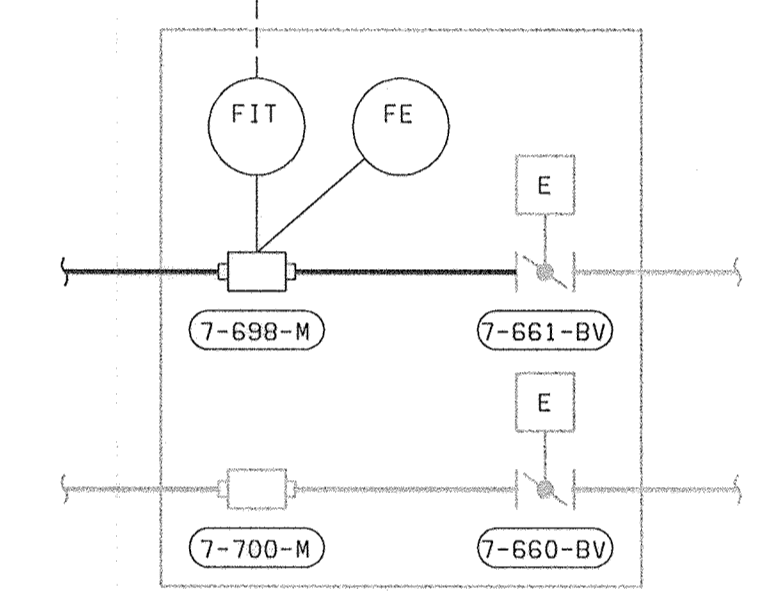
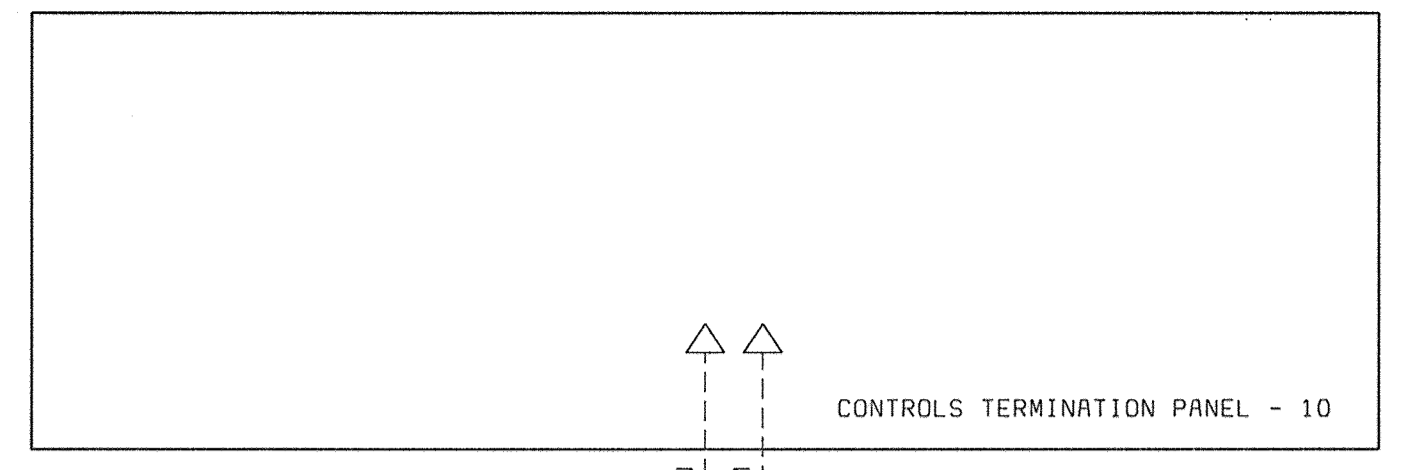
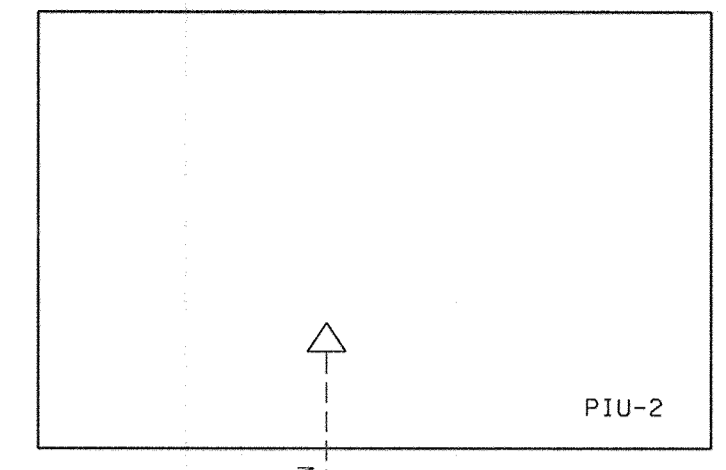
E



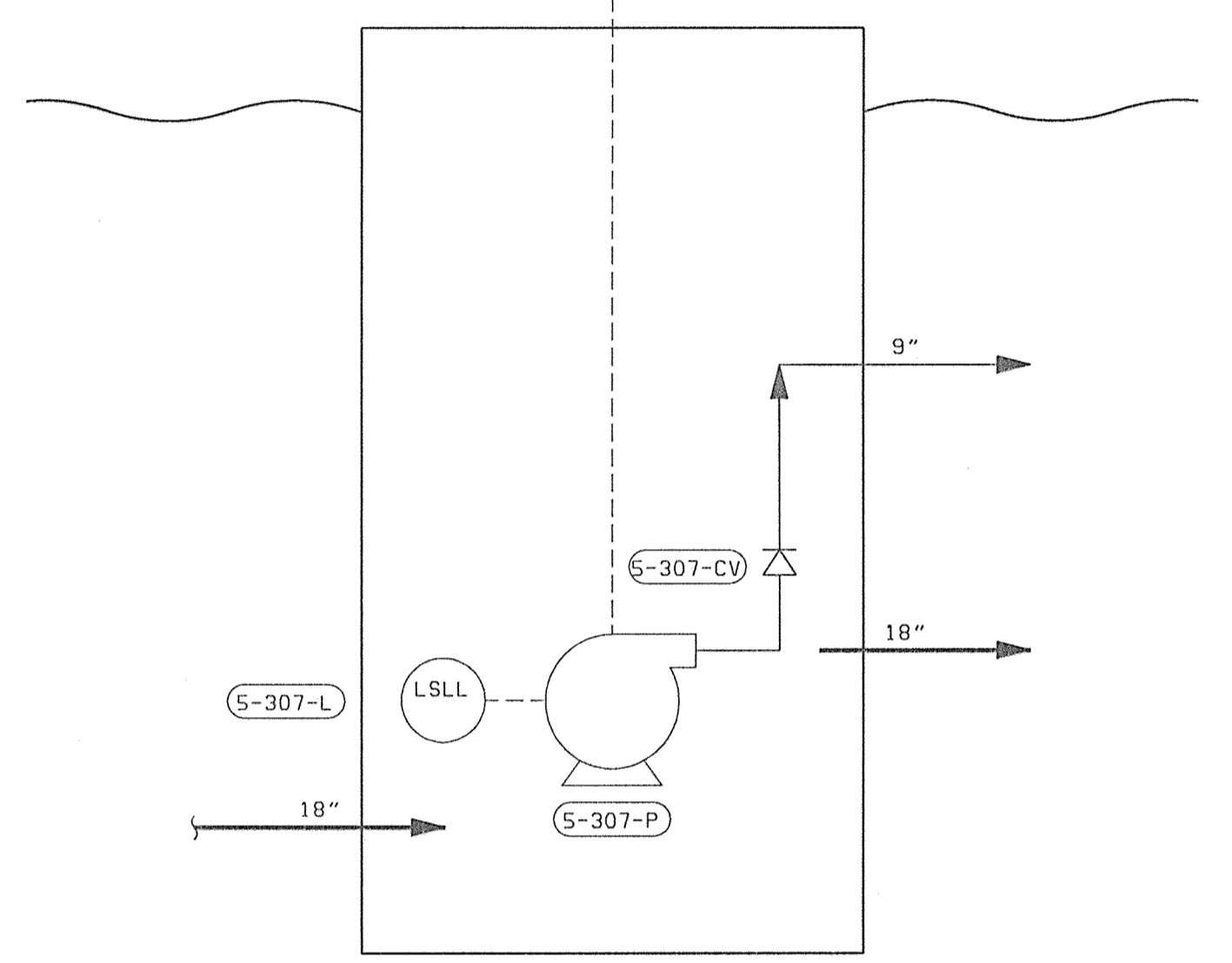
NOTE: SIZE FOR 650 TERMINAL BLOCKS  
**NORTH GALLERY BUILDING**  
**FREE STANDING CONTROL SIGNAL JUNCTION BOX**  
 NO SCALE



NOTE: SIZE FOR 650 TERMINAL BLOCKS  
**NORTH BLOWER BUILDING & WEST GALLERY**  
**WALL MOUNT CONTROL SIGNAL JUNCTION BOX**  
 NO SCALE



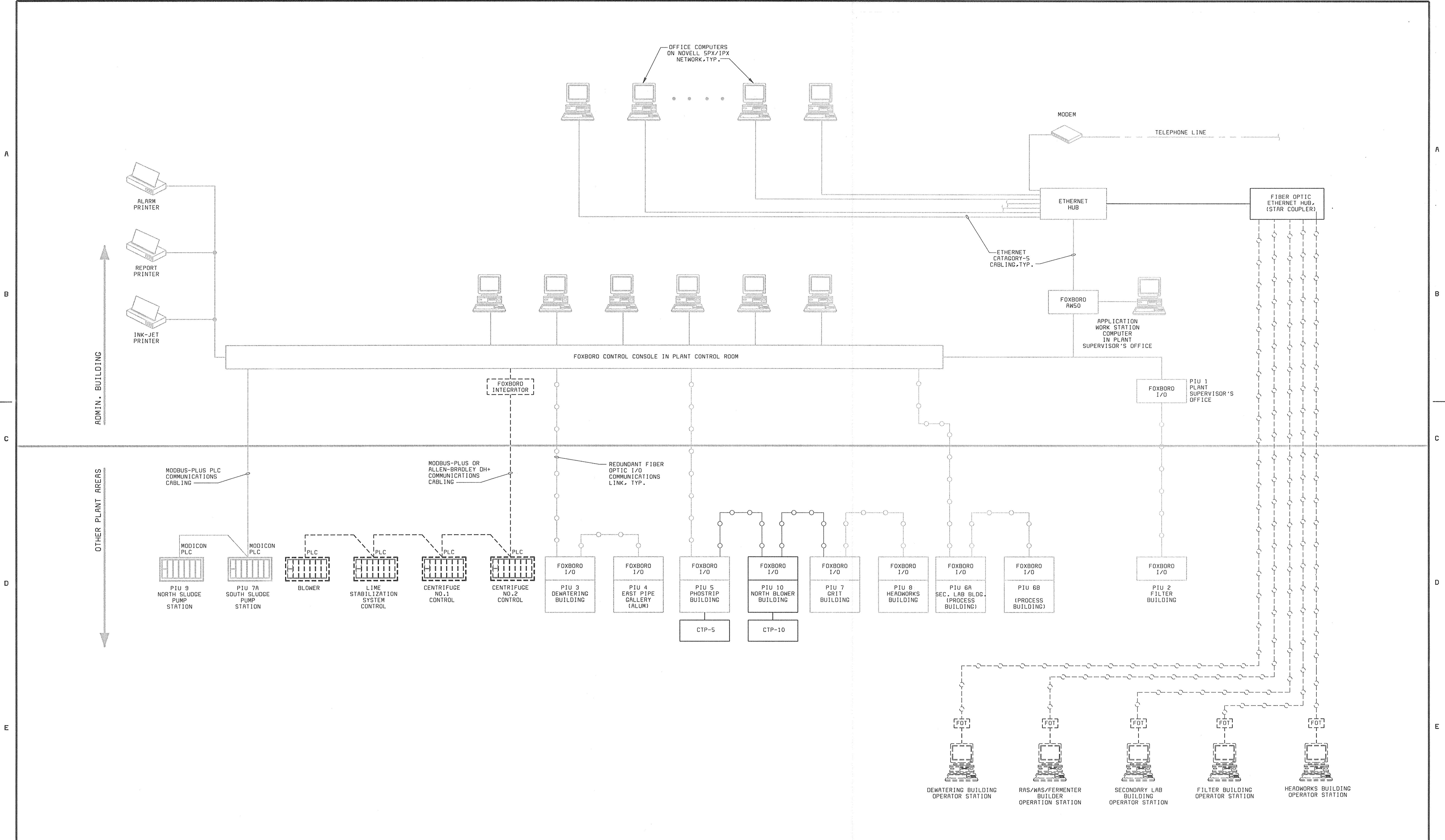
**54" METER VAULT**



**PLANT DRAIN MANHOLE PUMP STATION**

- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I-1.
  2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  <i>Robert B. ...</i> CHIEF, BUREAU OF UTILITIES DATE	 <b>BLACK &amp; VEATCH</b> LP Gaithersburg, Maryland  <i>David A. ...</i> REG. PROF. ENGR. DATE 6/23/00	 DONALD R. ... STATE OF MARYLAND	DES: RSF						INSTRUMENTATION & CONTROLS  P & ID MISCELLANEOUS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: DAH	CHK: AWH	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.			BY

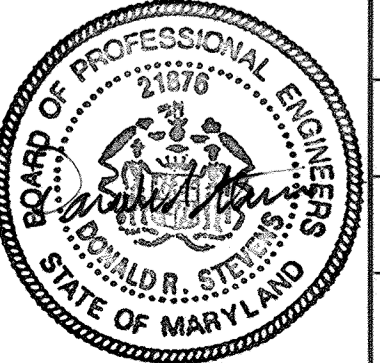


DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*R. J. ...* 6-29-01  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH**  
Gaithersburg, Maryland

*Daniel ...* 6/24/00  
REG. PROF. ENGR. DATE



DES: PWM									
DRN: DAH									
CHK: AWH									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

INSTRUMENTATION

P & ID  
CONTROL BLOCK DIAGRAM

LITTLE PATUXENT WATER RECLAMATION PLANT  
ADDITION NO. 6  
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

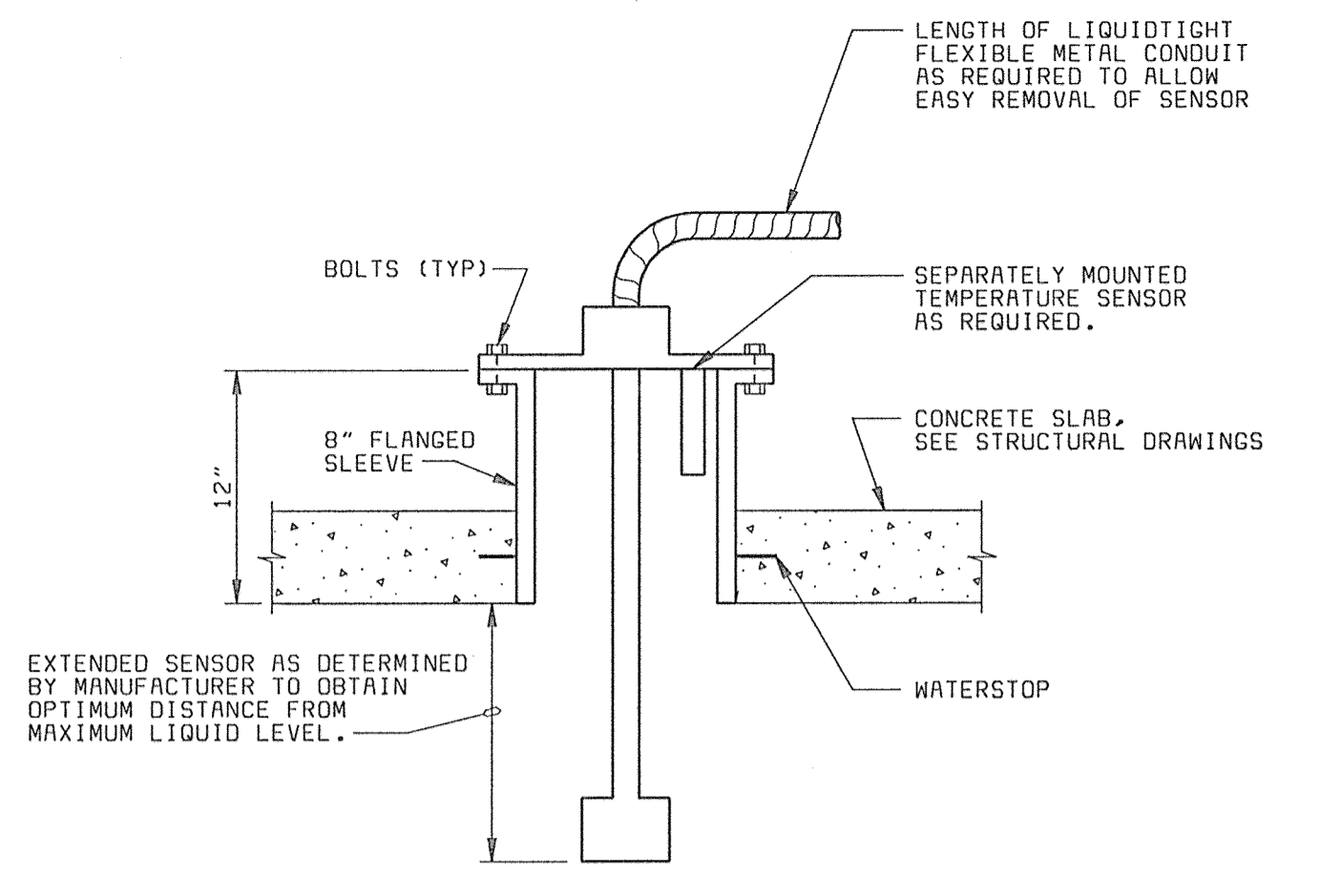
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

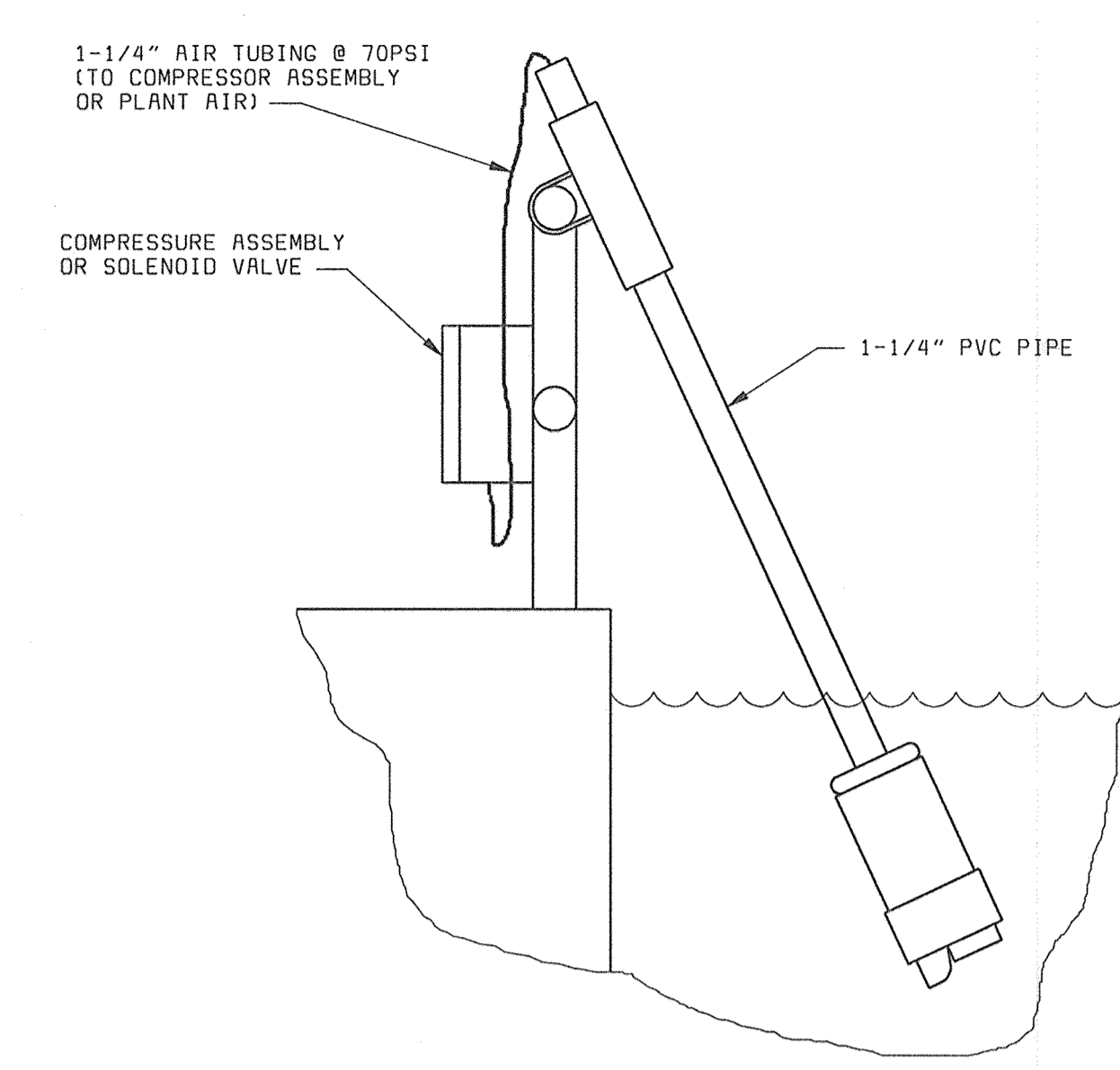
SHEET 159 OF 161

I 10

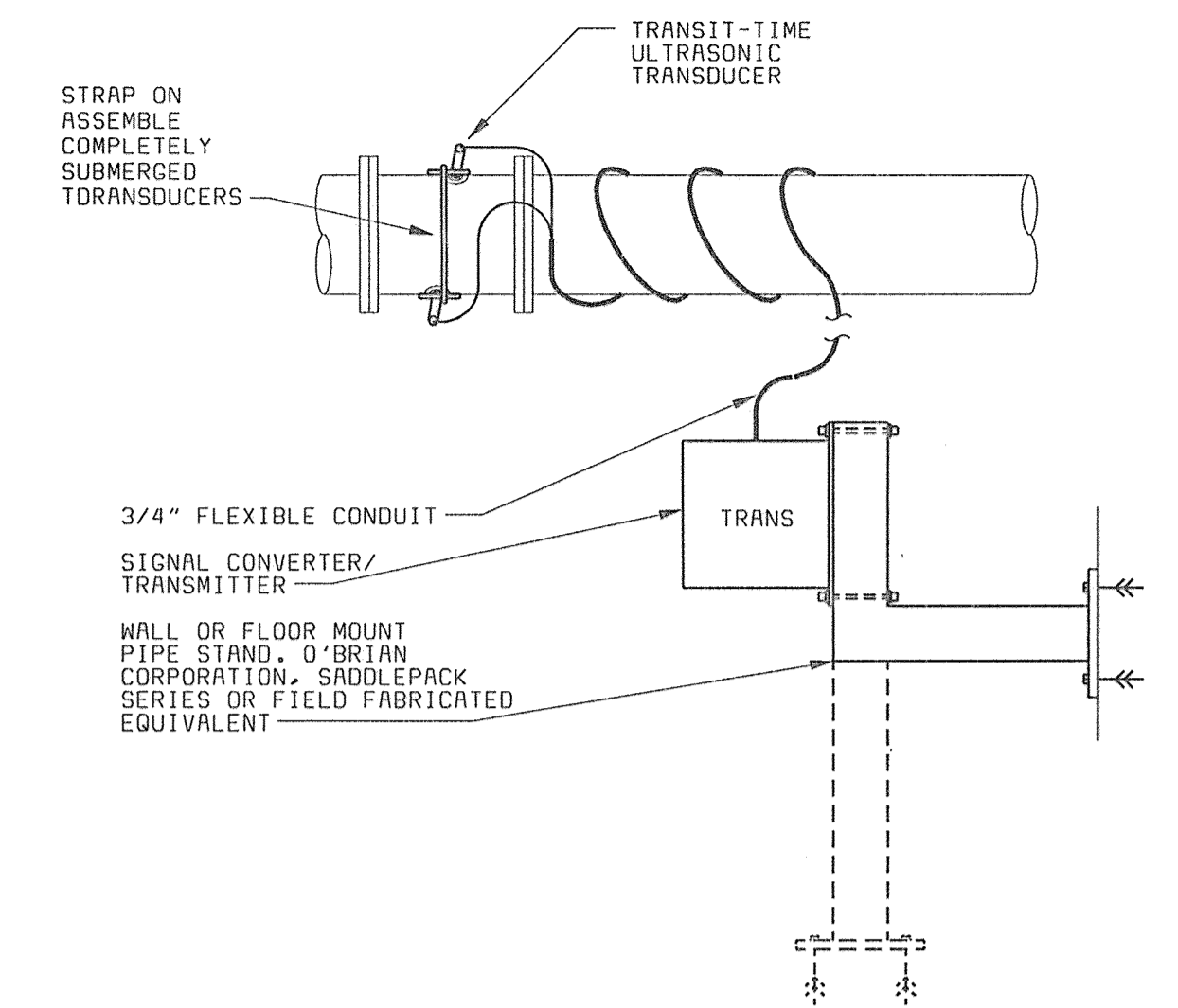
DESIGN: PDSB/12R



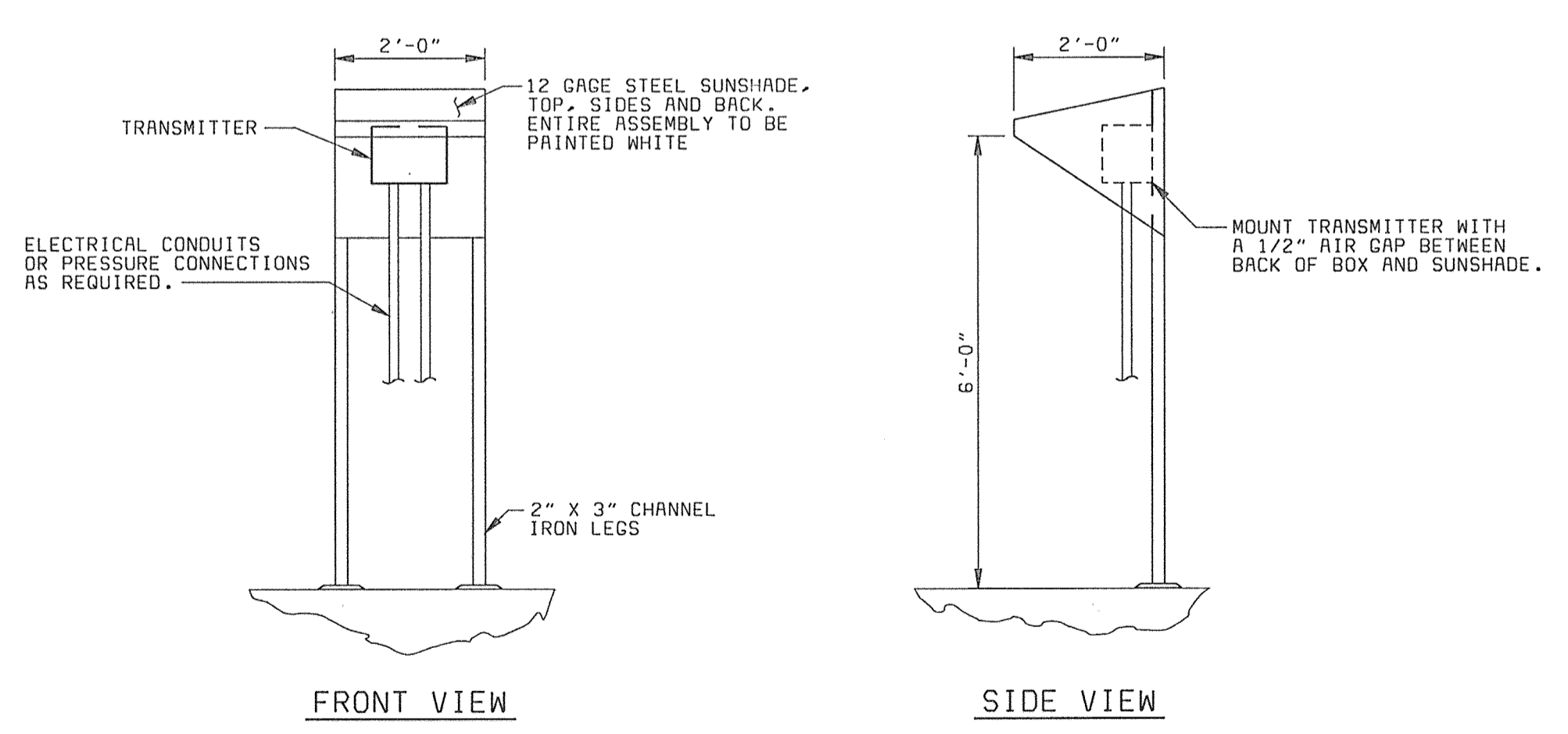
**ULTRASONIC LEVEL SENSOR  
INSTALLATION DETAIL**  
NO SCALE  
TYPICAL FOR:



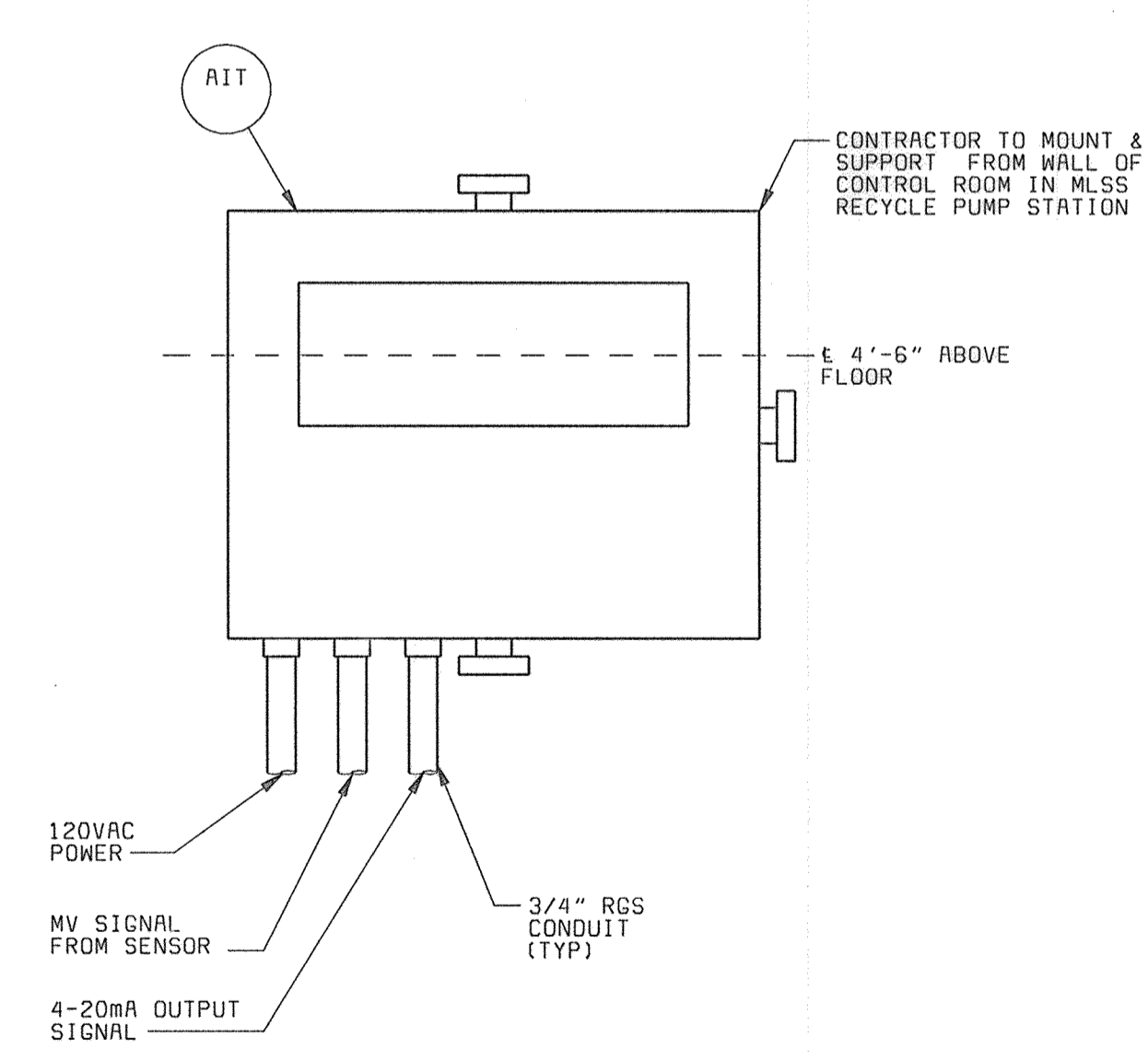
**PROCESS REACTOR**  
NO SCALE



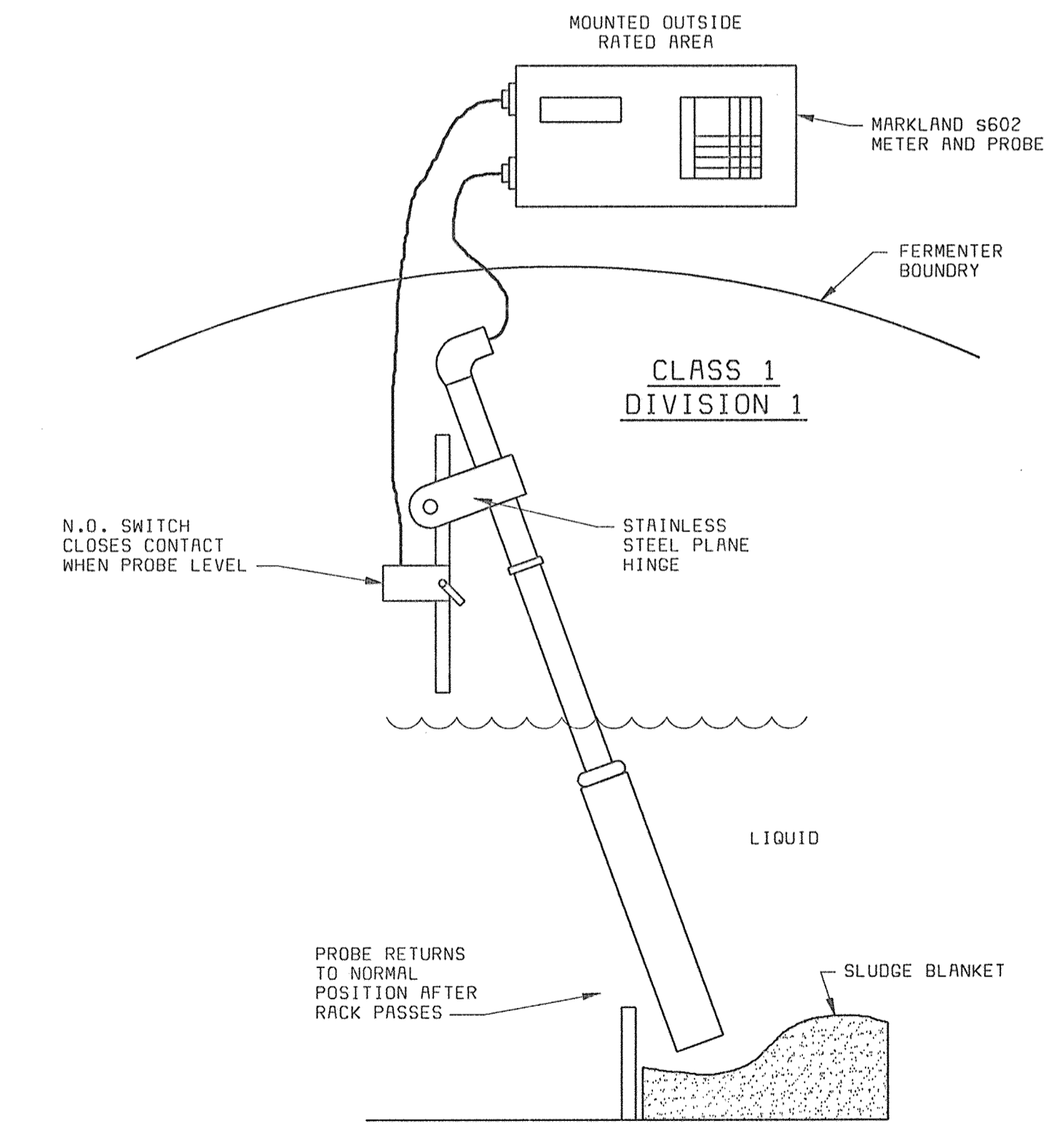
**TRANSIT-TIME ULTRASONIC FLOWMETER  
INSTALLATION DETAIL**  
NO SCALE



**OUTDOOR TRANSMITTER MOUNT  
INSTALLATION DETAIL**  
NO SCALE



**PROCESS REACTOR D.O. TRANSMITTER**  
NO SCALE

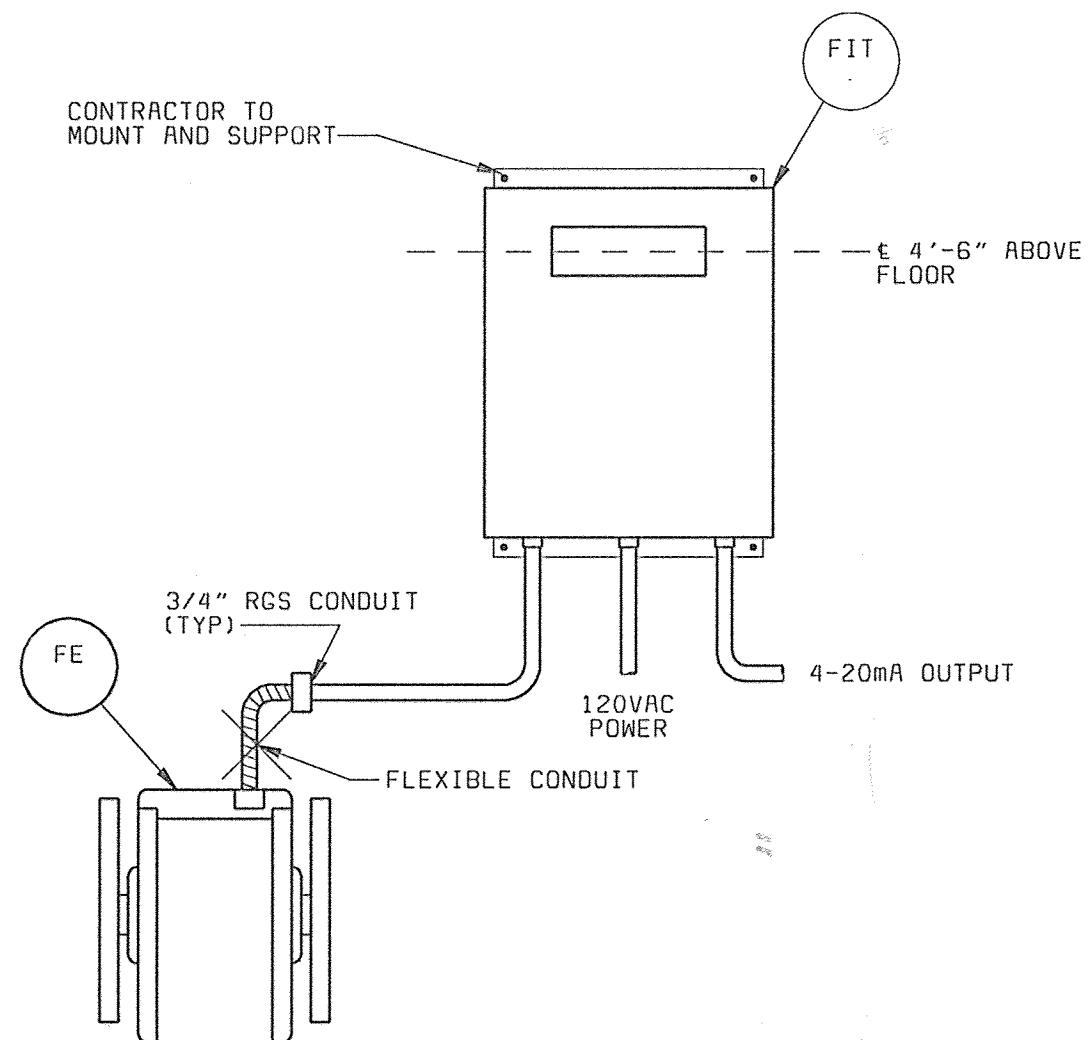


**SLUDGE BLANKET DETECTOR  
INSTALLATION DETAIL**  
NO SCALE  
TYPICAL FOR: S-400-M, 5-401-M

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  6-25-00 CHIEF, BUREAU OF UTILITIES DATE	 BLACK & VEATCH, L.P. Gaithersburg, Maryland  REG. PROF. ENGR. DATE 6/24/00	 DONALD R. STINES STATE OF MARYLAND	DES: RSF							INSTRUMENTATION  P&ID INSTALLATION DETAILS	LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION  CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752  HOWARD COUNTY, MARYLAND	SCALE AS SHOWN
			DRN: TOR	CHK: AWH	DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY			CK

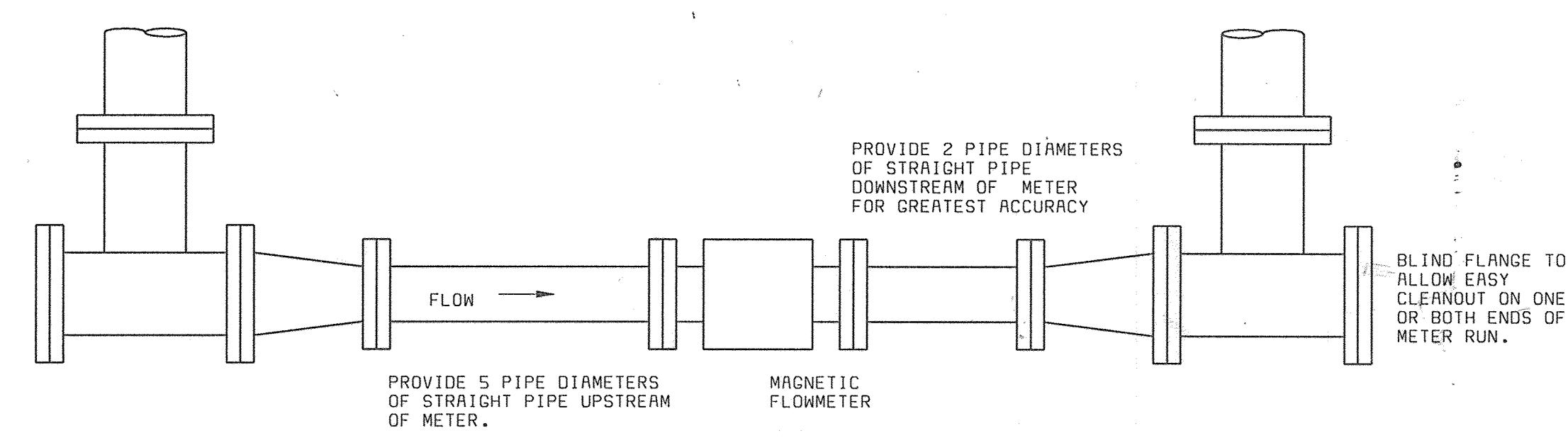
DESIGN: P556472A





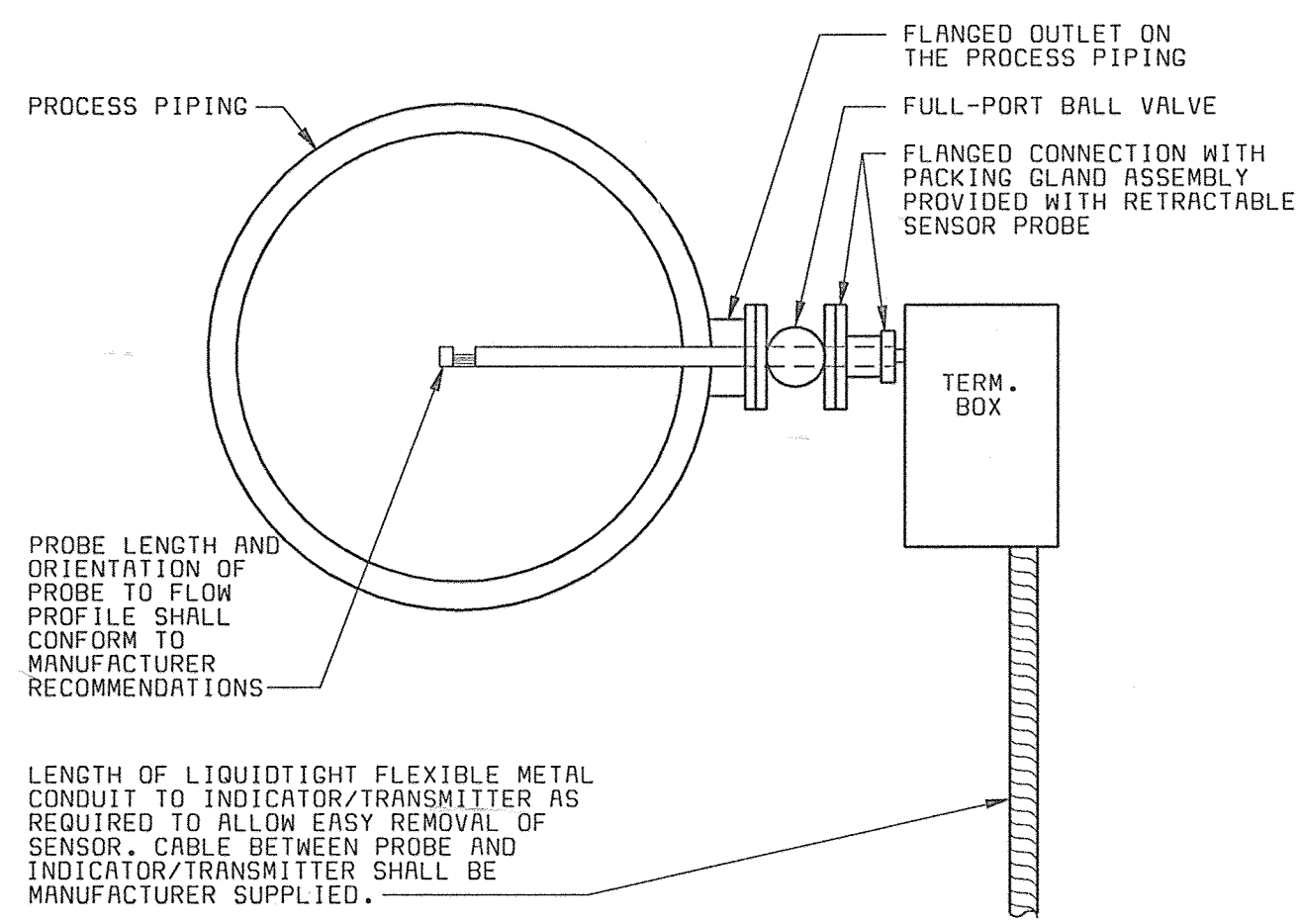
**MAGNETIC FLOWMETER INSTALLATION DETAIL**

NO SCALE



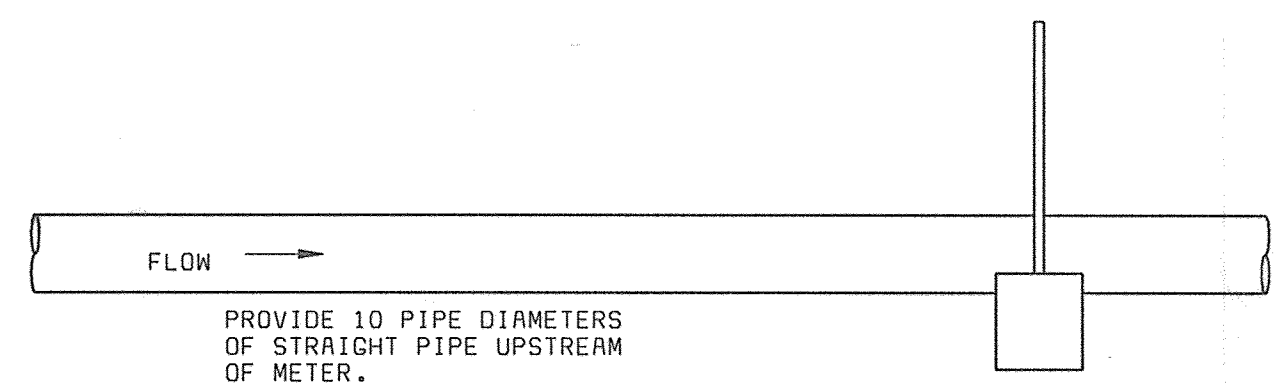
**TYPICAL MAGNETIC FLOWMETER INSTALLATION WITH CLEAN-OUTS**

NO SCALE



**THERMAL DISPERSION FLOWMETER HOT-TAP TYPE SENSOR INSTALLATION DETAIL**

NO SCALE  
TYPICAL FOR: PROCESS REACTOR AERATION



**TYPICAL THERMAL DISPERSION FLOWMETER INSTALLATION DETAIL**

NO SCALE

**NOTES:**

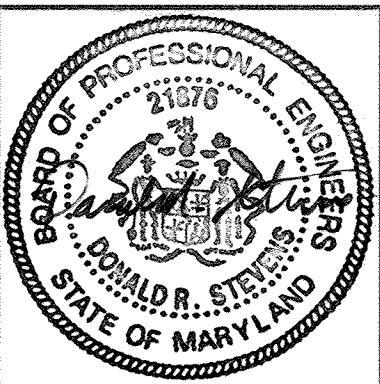
1. SEE P&ID LEGEND ON DRAWING 11.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*R. J. ...* 6-29-00  
CHIEF, BUREAU OF UTILITIES DATE

**BLACK & VEATCH** LP  
Gaithersburg, Maryland

*Donald A. ...* 6/24/00  
REG. PROF. ENGR. DATE



DES: RSF									
DRN: TDR									
CHK: AWH									
DATE: 6/23/00	DATE	REVISIONS AND RECORD OF ISSUE	NO.	BY	CK	APP			

**INSTRUMENTATION**

**P&ID INSTALLATION DETAILS**

**LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION**

CAPITAL PROJECT S-6205  
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

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**I 12**

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