

PROVISIONAL PRELIMINARY NETWORK
 SAVAGE WWTP
 HOWARD COUNTY, MARYLAND
 CONTRACT NUMBER 763-S
 HEERY ASSOCIATES INC.
 G-1A

RECORD DRAWING

INDEX TO DRAWINGS

GENERAL

- G-1 TITLE SHEET, VICINITY AND LOCATION MAPS
- G-1A PROVISIONAL SCHEDULE
- G-2 INDEX SHEET & ABBREVIATIONS
- G-3 HYDRAULIC PROFILE & DESIGN SUMMARY

SITE

- C-1 LEGEND
- C-2 BORING LOGS & STRUCTURAL FILL SEQUENCE
- C-3 GRADING PLAN
- C-4 GRADING PLAN
- C-5 YARD PIPING PLAN
- C-6 PIPING PROFILES
- C-7 PIPING PROFILES
- C-8 SITE DETAILS

ARCHITECTURAL

- A-1 GRIT PROCESSING BUILDING - FLOOR PLANS & SCHEDULES
- A-2 GRIT PROCESSING BUILDING - ELEVATIONS
- A-3 GRIT PROCESSING BUILDING - WALL SECTIONS
- A-4 GRIT PROCESSING BUILDING - ROOF PLAN & SECTIONS
- A-5 GRIT PROCESSING BUILDING - DETAILS
- A-6 GRIT PROCESSING BUILDING - DETAILS

STRUCTURAL

- S-1 KEY PLAN
- S-2 GRIT REMOVAL BASINS - FOUNDATION PLAN
- S-3 GRIT REMOVAL BASINS - SECTIONS
- S-4 FLOW METERING CHAMBERS - PLAN
- S-5 FLOW METERING CHAMBERS - SECTIONS
- S-6 FLOW METERING CHAMBERS - SECTIONS
- S-7 GRIT PROCESSING BUILDING - FOUNDATION PLAN & SECTIONS
- S-8 GRIT PROCESSING BUILDING - FRAMING PLANS
- S-9 GRIT PROCESSING BUILDING - DETAILS
- S-10 GRIT PROCESSING BUILDING - STORAGE BIN
- S-11 ELECTRICAL MANHOLE #9 - MODIFICATIONS

PROCESS MECHANICAL

- M-1 LEGEND & ABBREVIATIONS
- M-2 GRIT REMOVAL BASINS & FLOW METERING CHAMBERS - PLAN
- M-3 FLOW METERING CHAMBERS - PLAN & SECTIONS
- M-4 GRIT REMOVAL BASINS - SECTIONS
- M-5 GRIT REMOVAL BASINS - SECTIONS
- M-6 GRIT PROCESSING BUILDING - PLAN
- M-7 GRIT PROCESSING BUILDING - SECTIONS
- M-8 GRIT PROCESSING BUILDING - PIPING ISOMETRIC
- M-9 GRIT PROCESSING BUILDING - STORAGE BIN GATES

HEATING & BUILDING SERVICES

- HP-1 LEGEND
- HP-2 GRIT PROCESSING BUILDING - PLAN
- HP-3 GRIT REMOVAL BASINS - PLAN
- HP-4 FLOW METERING CHAMBERS - PLAN & SECTIONS

INSTRUMENTATION & CONTROL

- I-1 LEGEND
- I-2 LEGEND
- I-3 PROCESS & INSTRUMENTATION DIAGRAM
- I-4 PROCESS & INSTRUMENTATION DIAGRAM
- I-5 CONTROL PANEL ELEVATION & SCHEDULES
- I-6 CONTROL DIAGRAMS
- I-7 LOGIC DIAGRAMS

ELECTRICAL

- E-1 LEGEND
- E-2 SITE PLAN
- E-3 MCC ELEVATION - ONE-LINE DIAGRAM & SCHEDULES
- E-4 120/208V ONE LINE DIAGRAM
- E-5 GRIT PROCESSING BUILDING - POWER & LIGHTING PLAN
- E-6 GRIT REMOVAL BASINS & FLOW METERING CHAMBERS - POWER & LIGHTING PLAN
- E-7 FLOW METERING CHAMBERS - POWER & LIGHTING PLAN & DETAILS
- E-8 CONTROL SCHEMATICS
- E-9 AHU-1, EF-1 CONTROL SCHEMATICS AND MMP DETAIL
- E-10 DETAILS
- E-11 DETAILS

STANDARD DETAILS

STRUCTURAL

- D-1 - STANDARD DETAILS
- D-2 - STANDARD DETAILS
- D-3 - STANDARD DETAILS
- D-4 - STANDARD DETAILS

MECHANICAL

- D-5 - STANDARD DETAILS
- D-6 - STANDARD DETAILS
- D-7 - STANDARD DETAILS
- D-8 - STANDARD DETAILS

INSTRUMENTATION AND CONTROL

- D-9 - STANDARD DETAILS

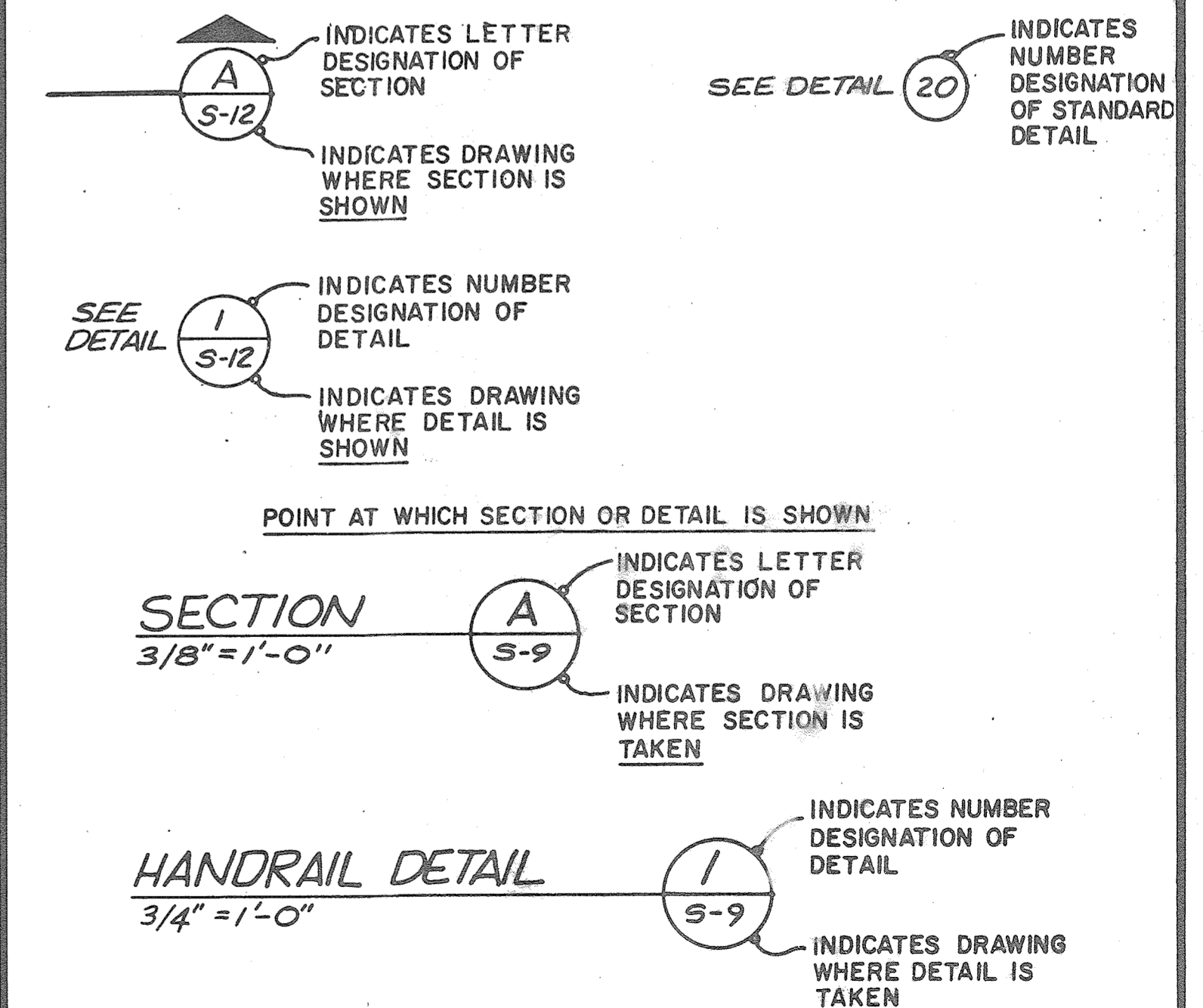
GENERAL ABBREVIATIONS

AB	ANCHOR BOLT			SH-SHT	SHEET SPECIFICATION
AL	ALUMINUM			SPEC STRUCT	STRUCTURAL
BLDG	BUILDING	IN	INCHES	S	SOUTH
		INF	INFLUENT	SIM	STIMLAR
		INVT	INVERT	SST	STAINLESS STEEL
				SC	SECONDARY CLARIFIER
CB	CATCH BASIN			TYP	TYPICAL
CND	CONDUIT			TO	TOP OF
CI	CAST IRON			VTR	VENT THRU ROOF
CLR	CENTERLINE	MATL	MATERIAL		
CO	CLEAR	MECH	MECHANICAL		
CO	CLEANOUT	MFR	MANUFACTURER		
CONC	CONCRETE	MGD	MILLION GALLONS PER DAY		
CMU	CONCRETE MASONRY UNIT	MH	MANHOLE		
CS	CONTACT STABILIZATION	MJ	MECHANICAL JOINT		
CU	COPPER	MMP	MECHANICAL MOUNTING PANEL		
				W	WEST
				W	WIDE
				WS	WELDED STEEL
				WL	WATER LEVEL
		N	NORTH		
		NO	NUMBER		
DI	DUCTILE IRON				
DIA	DIAMETER				
DN	DOWN				
DWG	DRAWING	OC	ON CENTER		
		OPNG	OPENING		
		OTO	OUT TO OUT		
E	EAST				
EA	EACH	P	PIPE		
EFF	EFFLUENT	PF	PROFILE		
ELEC	ELECTRICAL	P&ID	PROCESS & INSTRUMENTATION DIAGRAM		
EL	ELEVATION	PJF	PREMOULDED JOINT FILLER		
EQUIP	EQUIPMENT	PVC	POLYVINYL CHLORIDE		
EXST	EXISTING	PC	PRIMARY CLARIFIER		
		RCP	REINFORCED CONCRETE PIPE		
FEXT	FIRE EXTINGUISHER				
FT	FOOT				
FD	FLOOR DRAIN				
FEB	FLOW EQUALIZATION BASIN				

PIPELINE & CONDUIT SERVICE IDENTIFICATION

LEGEND	SERVICE	RD	ROOF DRAIN
A	AIR	SD	STORM DRAIN
ABI	AERATION BASIN INFLUENT	SM	SCUM
CL ₂	CHLORINE	TD	TANK DRAIN
CCBI	CHLORINE CONTACT BASIN INFLUENT	V	VENT
D	DRAIN	W	WATER (POTABLE)
EO	EMERGENCY OVERFLOW	WS	WATER SURFACE
FEI	FLOW EQUALIZATION INFLUENT		
FEE	FLOW EQUALIZATION EFFLUENT		
FEIE	FLOW EQUALIZATION INFLUENT/EFFLUENT		
FW	FLUSHING WATER		
GBI	GRIT BASIN INFLUENT		
GS	GRIT SLURRY		
HW	HOT WATER		
IA	INSTRUMENTATION		
OF	OVERFLOW		
PCI	PRIMARY CLARIFIER INFLUENT		
PS	PRIMARY SLUDGE		

POINT AT WHICH SECTION OR DETAIL IS TAKEN



RECORD DRAWING



DES.					
DR.					
CHK.					
APPD.		NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

INDEX SHEET AND ABBREVIATIONS

GENERAL

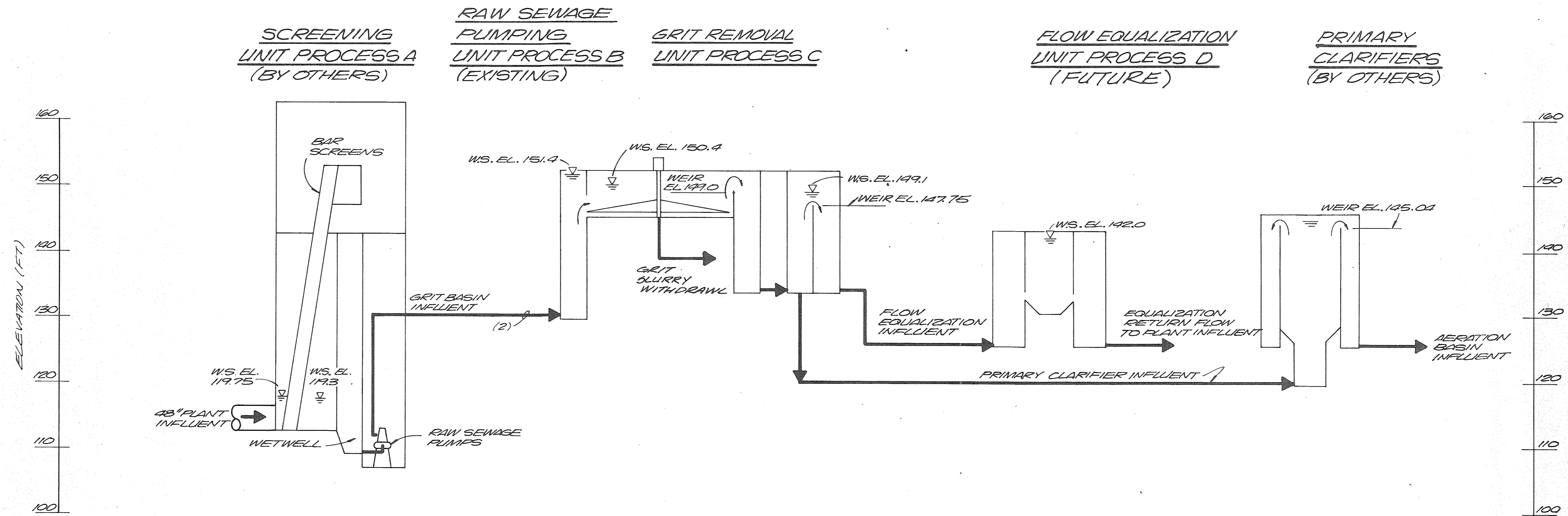
SHEET OF G-2

DATE 8-78

DWG. NO. W11078.B1

HYDRAULIC PROFILE - MAXIMUM FLOW 50 MGD

WS. ELEVATIONS ARE MAXIMUM AT 50 MGD,
ASSUMING NO FLOW EQUALIZATION
VOLUME AVAILABLE



GRIT REMOVAL - DESIGN SUMMARY

FLOW

INITIAL AVERAGE 15 MGD
INITIAL MAXIMUM 30 MGD
ULTIMATE AVERAGE 25 MGD
ULTIMATE MAXIMUM 50 MGD

GRIT REMOVAL BASINS

NO. OF BASINS 2
NO. NORMALLY IN SERVICE 2
BASIN DIMENSIONS 42' X 42' X 3' SWD
GRIT DESIGN SPECIFIC GRAVITY 2.0
GRIT DESIGN MESH SIZE 100
GRIT QUANTITY (APPROXIMATE) 5.5 FT³/MG
AVERAGE DAILY GRIT VOLUME 15 MGD 83 FT³
DESIGN CAPACITY, EACH BASIN 25 MGD 133 FT³
25 MGD 100 MESH, 2.0 SR GR, GRIT SEPERATION
50 MGD 65 MESH, 2.65 SR GR, GRIT SEPERATION

GRIT PUMPS

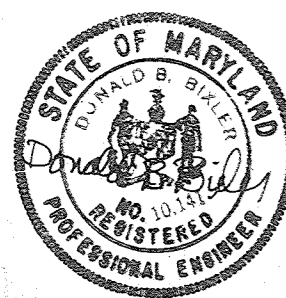
TYPE ADJUSTABLE SPEED* RECESSED IMPELLER CENTRIFUGAL (*MANUAL)
NO. OF PUMPS 3
NO. NORMALLY IN SERVICE 2
CAPACITY, EA. PUMP, GPM. 250 MAXIMUM
200 MINIMUM
TOTAL DESIGN HEAD, FT. 54 MAXIMUM
26 MINIMUM

GRIT CYCLONE/CLASSIFIERS

NO. OF UNITS 2
NO. NORMALLY IN SERVICE 2

GRIT STORAGE BIN

MAXIMUM STRUCK CAPACITY, CU. FT. 360 FT³



	DES. DBB				
	DR. C.F.E. JR.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

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HOWARD COUNTY, MARYLAND

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SAVAGE WASTEWATER TREATMENT PLANT
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HYDRAULIC PROFILE & DESIGN CRITERIA

GENERAL

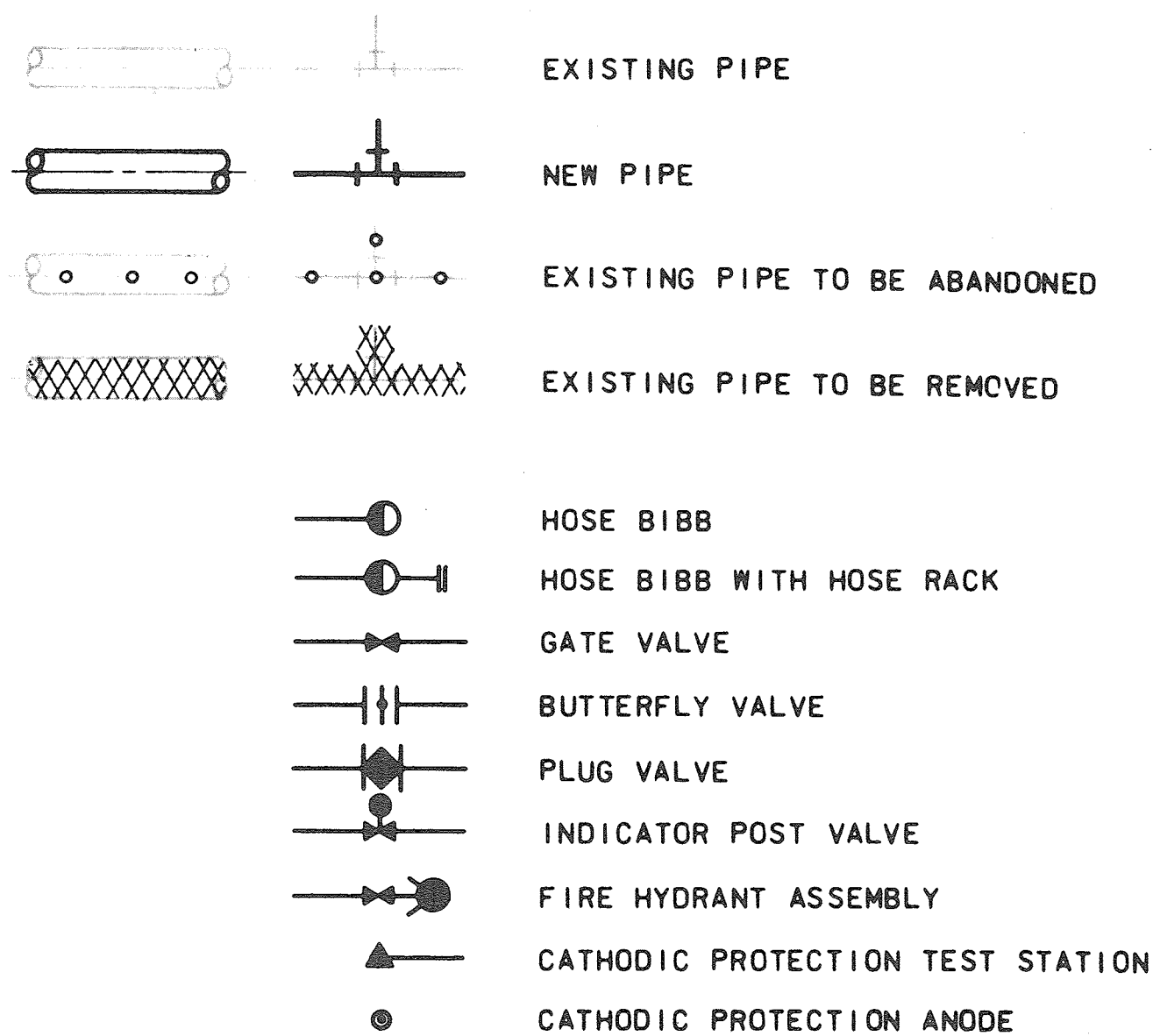
SHEET	G-3
OF	
DATE	8-78
DWG. NO.	W11078.B1

YARD PIPING LEGEND AND NOTES

GENERAL PIPING NOTES

- LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
- SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
- LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. FINAL SUPPORT REQUIREMENTS SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. MAXIMUM SPACING SHALL BE AS SPECIFIED.
- ALL JOINTS SHALL BE WATERTIGHT. STANDARD WALL PIPE DETAIL SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
- ALL FLEXIBLE CONNECTORS OR FLANGED COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST TIES WHERE INDICATED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
- SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE PLANS, WHEREVER APPLICABLE. ALL OF THE VARIOUS PIPING APPLICATIONS ARE NOT NECESSARILY USED IN THE PROJECT.
- ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, OR SCREWED PIPING, SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS AT ALL DIRECTION CHANGES, UNLESS OTHERWISE NOTED. SEE THRUST DETAILS AND NOTES ON THIS SHEET.
- NUMBER AND LOCATION OF UNIONS SHOWN ON PLANS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
- WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE USED TO JOIN THE COUPLING ADAPTER.

YARD PIPING LEGEND

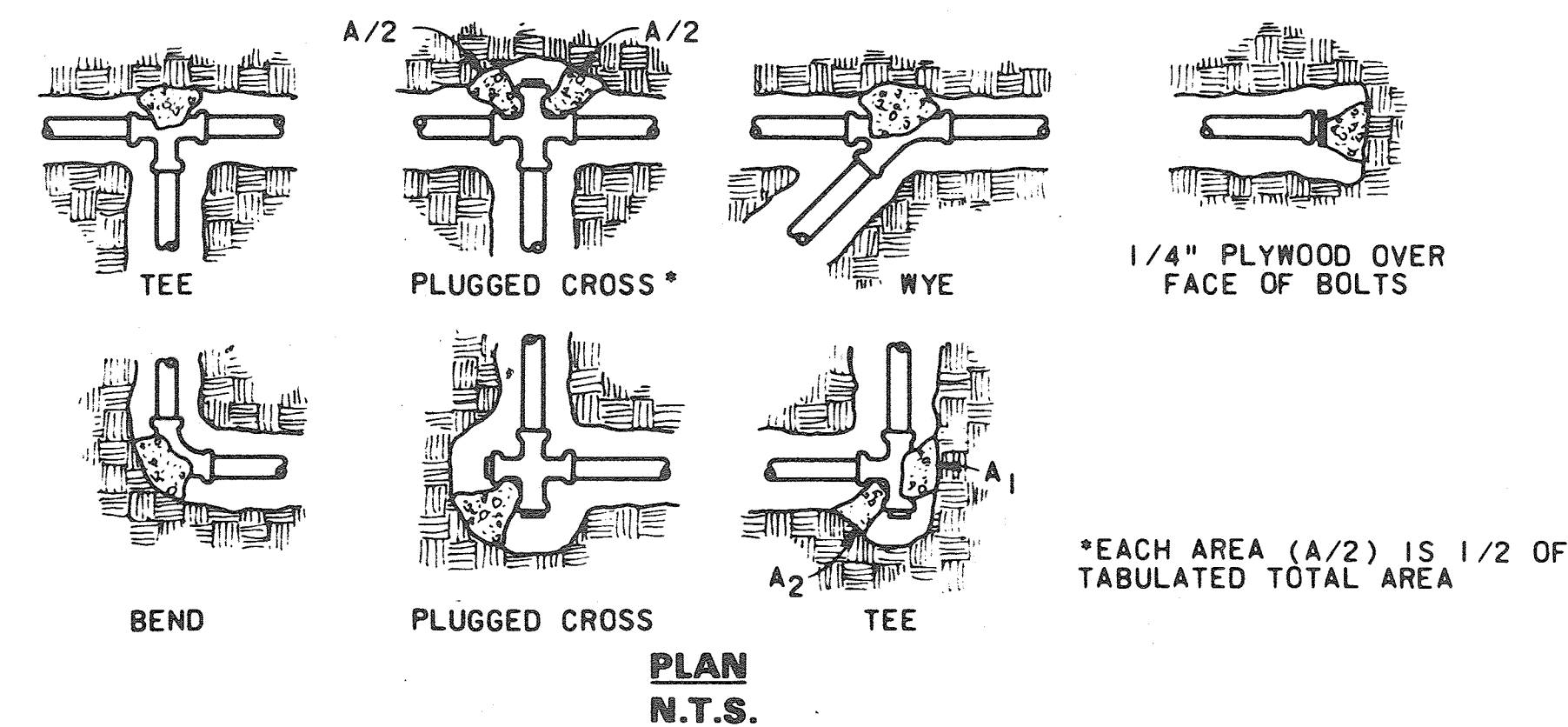


THRUST BLOCK NOTES AND DETAILS

THRUST BLOCK NOTES

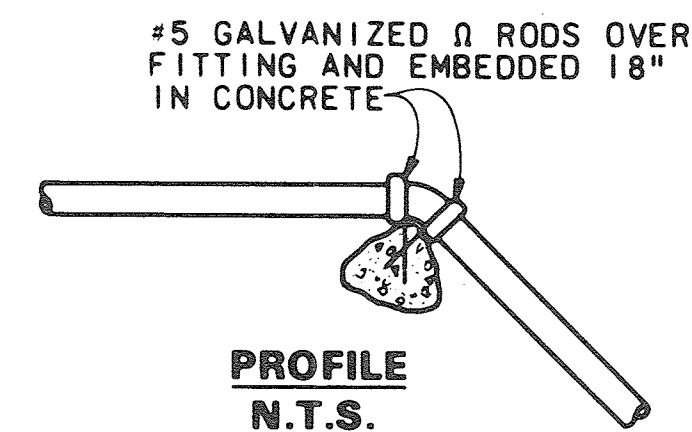
- KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES.
- CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.
- REQUIRED VOLUMES OR BEARING AREAS AT FITTINGS SHALL BE AS INDICATED BELOW ADJUSTED, IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIFICATIONS.
- THRUST BLOCK VOLUMES ARE BASED ON TEST PRESSURE OF 150 PSIG AND THE WEIGHT OF CONCRETE = 4050 LBS/CU. YD. TO COMPUTE VOLUMES FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:
VOLUME = (TEST PRESS./150) x (TABLE VALUE).
- BEARING AREAS ARE BASED ON TEST PRESSURE OF 150 PSIG AND AN ALLOWABLE STRESS OF 2000 LBS/SQ. FT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES USE THE FOLLOWING EQUATION:
BEARING AREA = (TEST PRESS./150) x (2000/SOIL BEARING STRESS) x (TABLE VALUE).
- THRUST BLOCKS FOR VERTICAL UP-BENDS SHALL BE THE SAME AS FOR HORIZONTAL BENDS.
- BEARING AREAS, VOLUMES, AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER THIS STANDARD.
- BEARING AREA OF THRUST BLOCK SHALL NOT BE LESS THAN 1.0 SQ. FT.

THRUST BLOCK DETAILS



FITTING SIZE	BEARING AREA OF THRUST BLOCKS IN SQ. FT. (HORIZONTAL BENDS)						
	TEE, WYE, PLUG, OR CAP	90° BEND, PLUGGED CROSS	TEE PLUGGED ON RUN		BEND ANGLE		
			A ₁	A ₂	45°	22 1/2°	11 1/4°
4	1.0	1.4	1.9	1.4	1.0	-	-
6	2.1	3.0	4.3	3.0	1.6	1.0	-
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

FITTING SIZE	VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)			
	BEND ANGLE			
	90°	45°	22 1/2°	11 1/4°
4	2.9	1.1	0.4	0.2
6	6.0	2.7	1.0	0.4
8	10.3	4.0	1.5	0.6
10	15.5	6.0	2.3	0.9
12	22.0	8.5	3.2	1.3
14	29.5	11.5	4.3	1.8
16	38.2	14.8	5.6	2.3



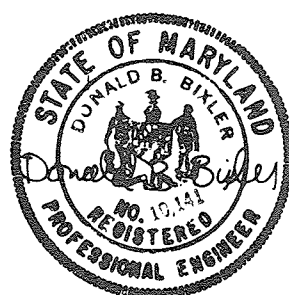
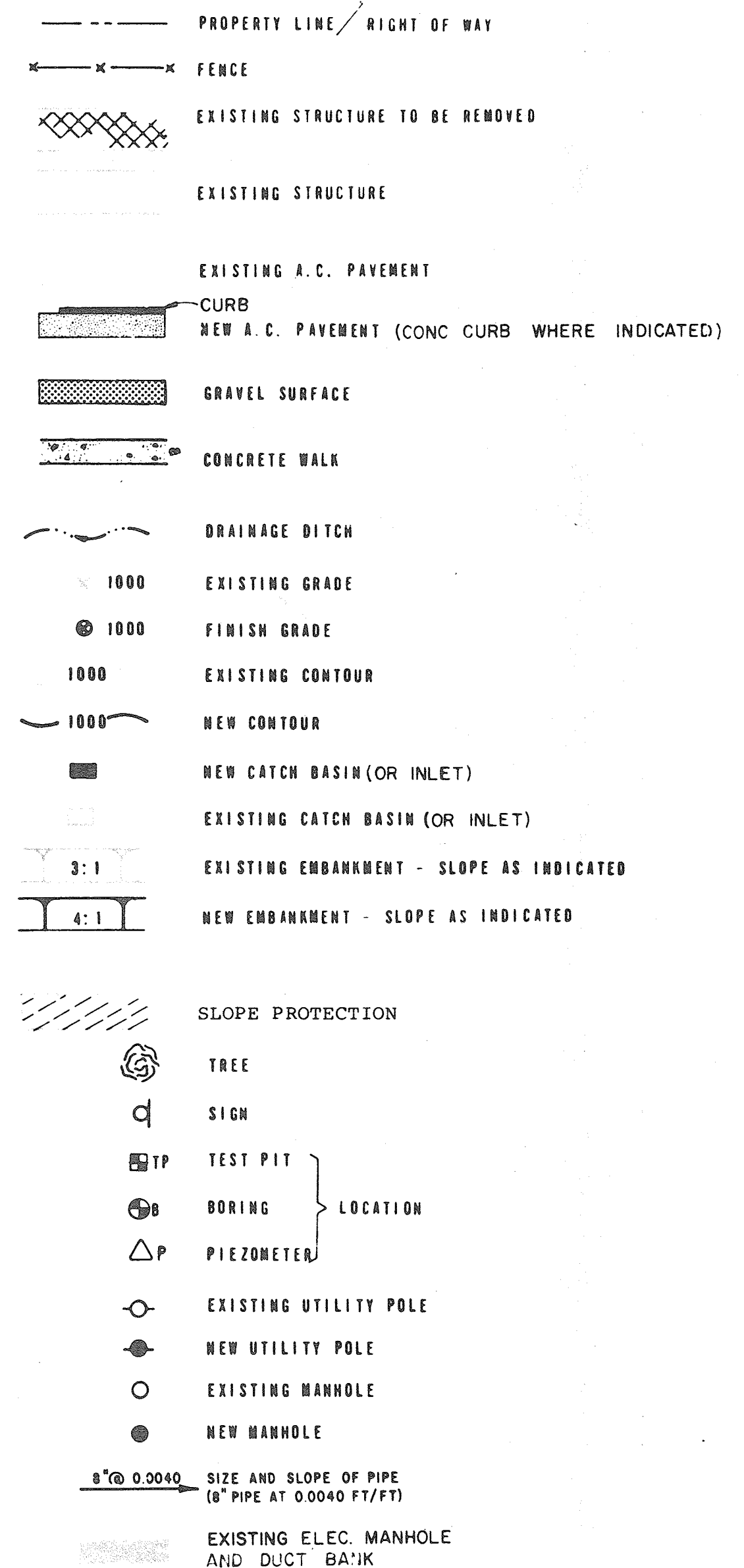
RECORD DRAWING

SITE LEGEND

NOTES:

- IN GENERAL, EXISTING STRUCTURES AND FACILITIES ARE NOTED AS "EXISTING" AND ARE SHOWN IN LIGHT LINE WEIGHTS, OR AS HALFTONED BACKGROUND. NEW STRUCTURES ARE SHOWN IN HEAVY LINE WEIGHTS.

LEGEND:



CH2M HILL	DES.					
	DR.					
	CHK.					
	APPD.					
	NO.	DATE	REVISION	BY	APPD.	

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

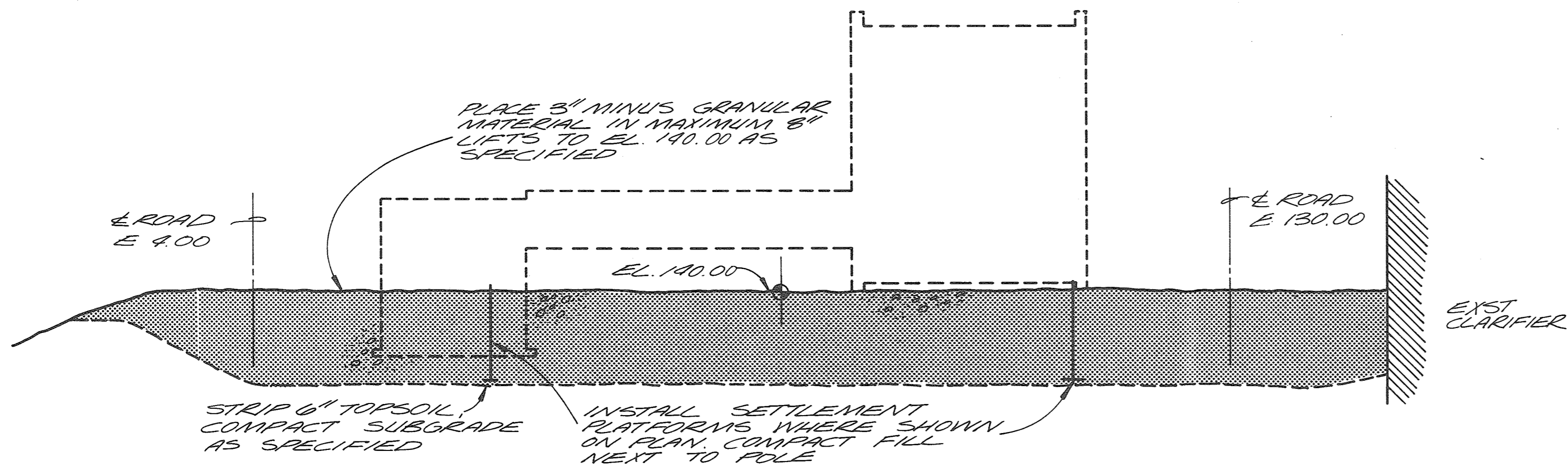
Chief B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

LEGEND

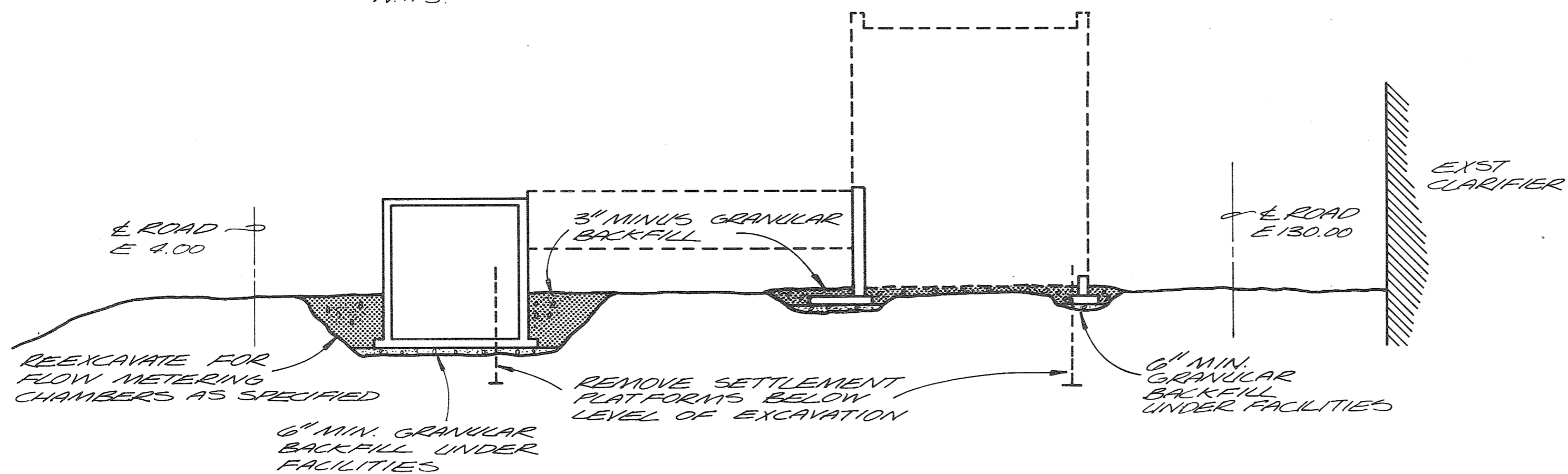
SITE

SHEET C-1
OF
DATE 8-78
DWG. NO. W1078.B1



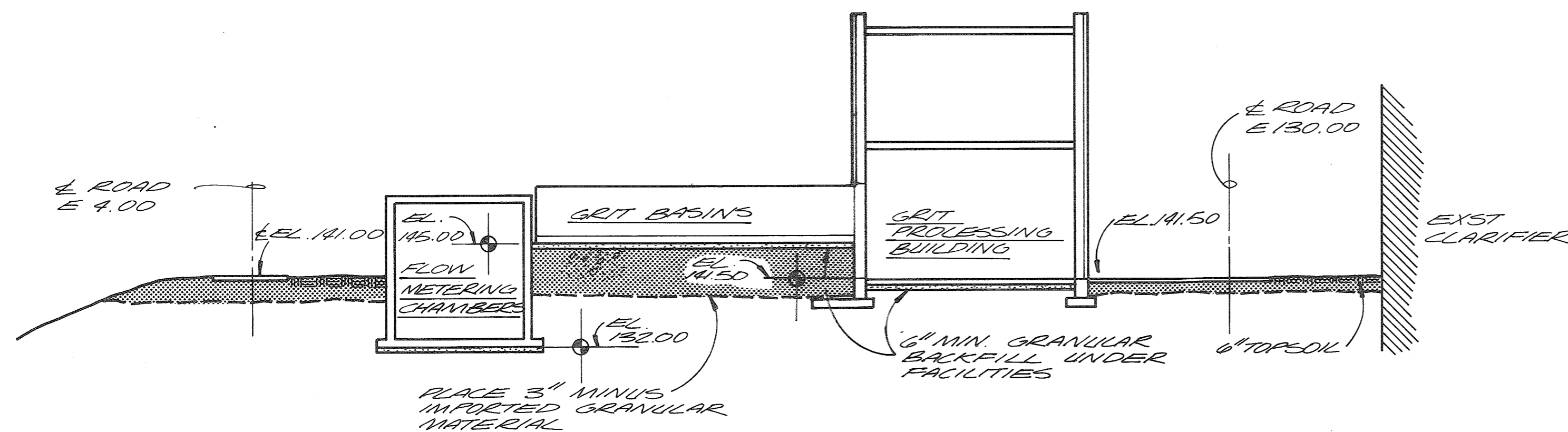
**PHASE I - EARTHWORK -
CONSTRUCTION OF EMBANKMENT
AND PRELOAD**

N.T.S.



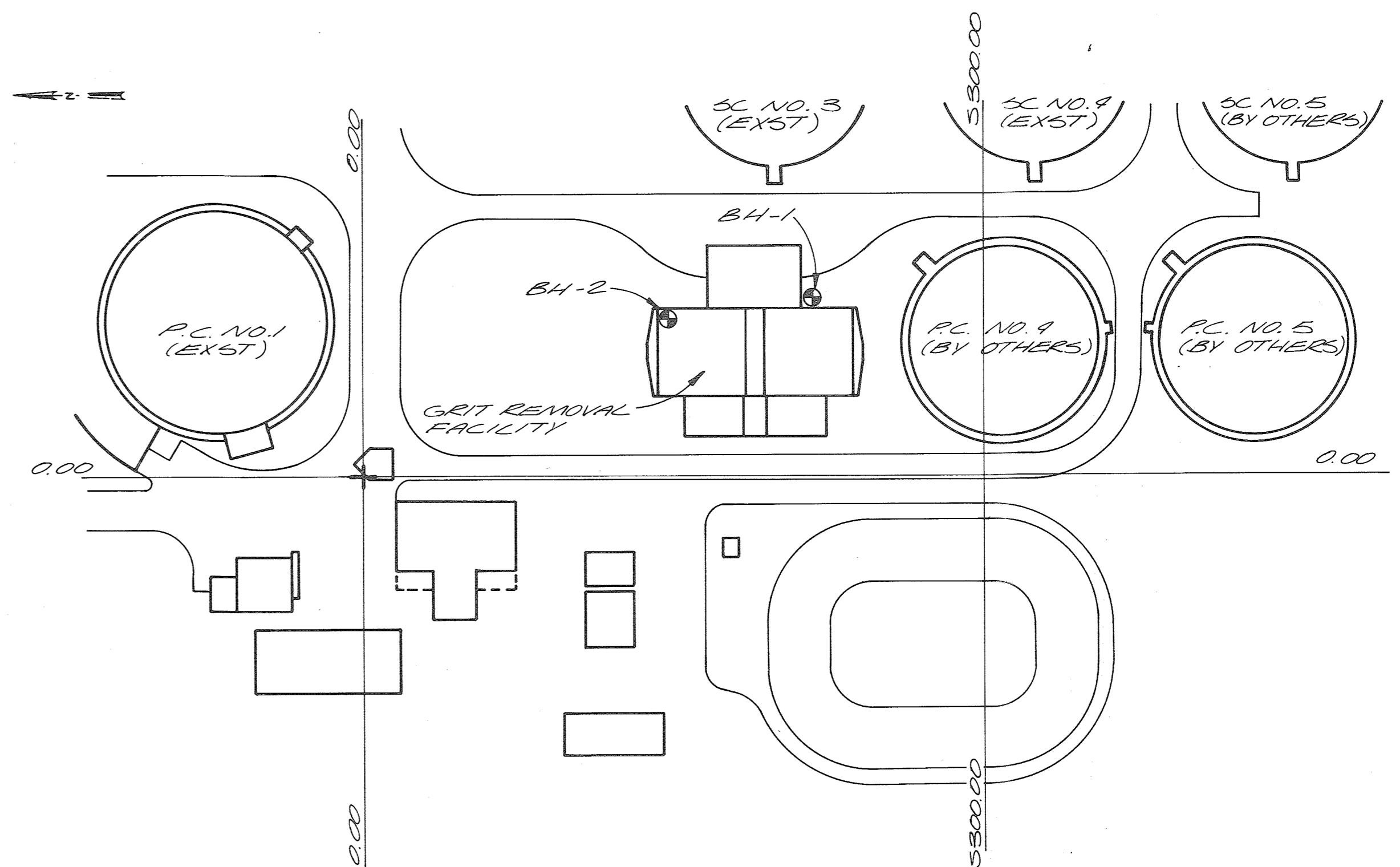
**PHASE II EARTHWORK -
FOOTING EXCAVATION**

N.T.S.



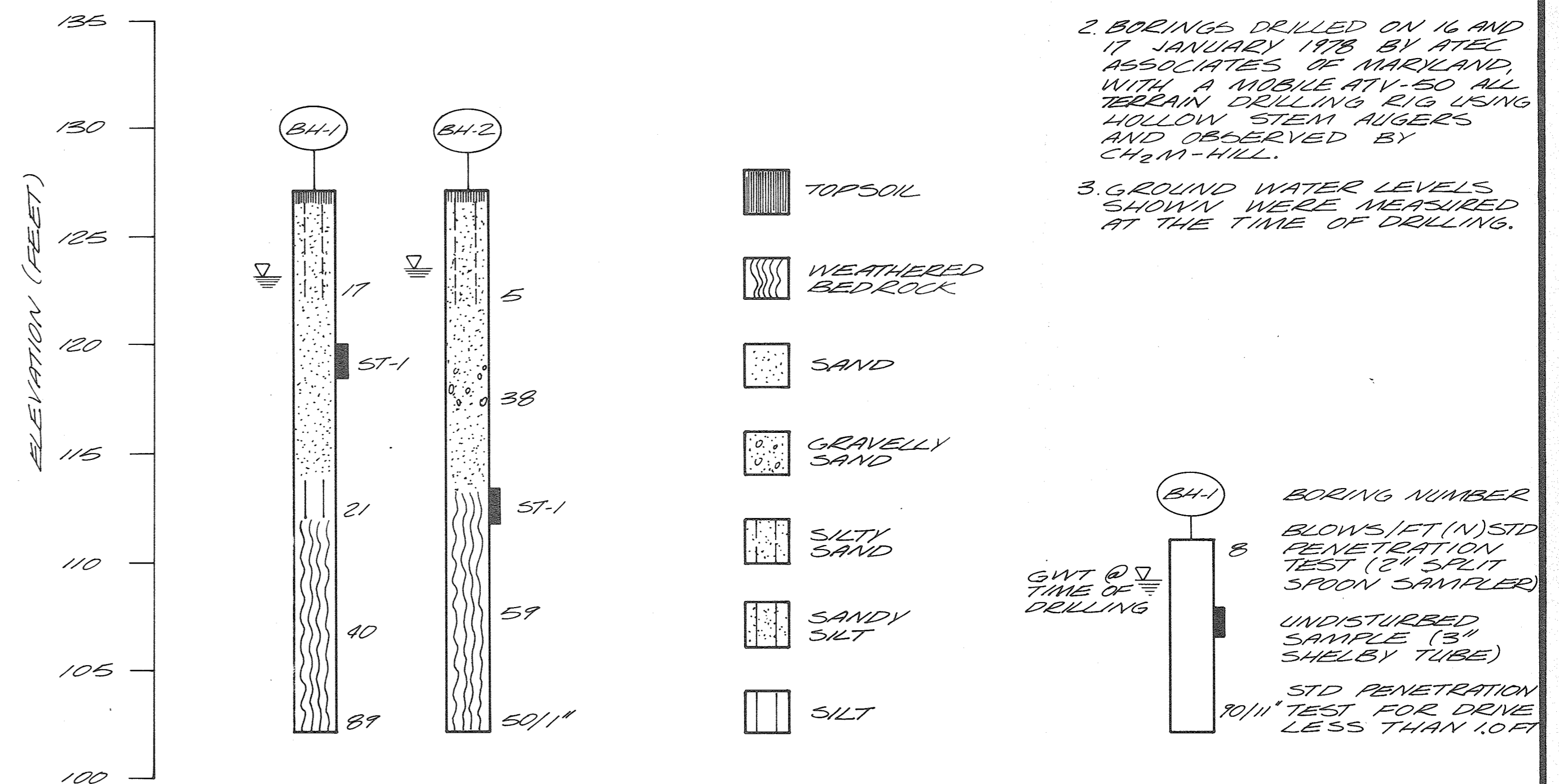
**PHASE III EARTHWORK -
FINAL GRADES - AND FILL**

N.T.S.



LOCATION OF BORINGS

N.T.S.



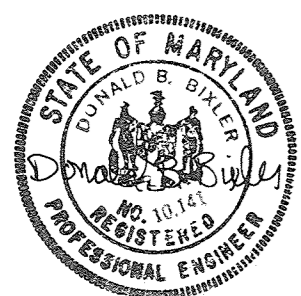
SOIL BORINGS LOG

SYMBOLS

LEGEND

- NOTES:
1. THE DEPTHS OF THE INTERFACES BETWEEN SOIL TYPES SHOWN ARE APPROXIMATE. TRANSITIONS BETWEEN MATERIALS MAY BE GRADUAL.
 2. BORINGS DRILLED ON 16 AND 17 JANUARY 1978 BY ATEC ASSOCIATES OF MARYLAND, WITH A MOBILE ATV-50 ALL TERRAIN DRILLING RIG USING HOLLOW STEM AUGERS AND OBSERVED BY CH2M-HILL.
 3. GROUND WATER LEVELS SHOWN WERE MEASURED AT THE TIME OF DRILLING.

RECORD DRAWING



CH2M HILL	DES. B.J.H.				
	DR. V.A.W.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

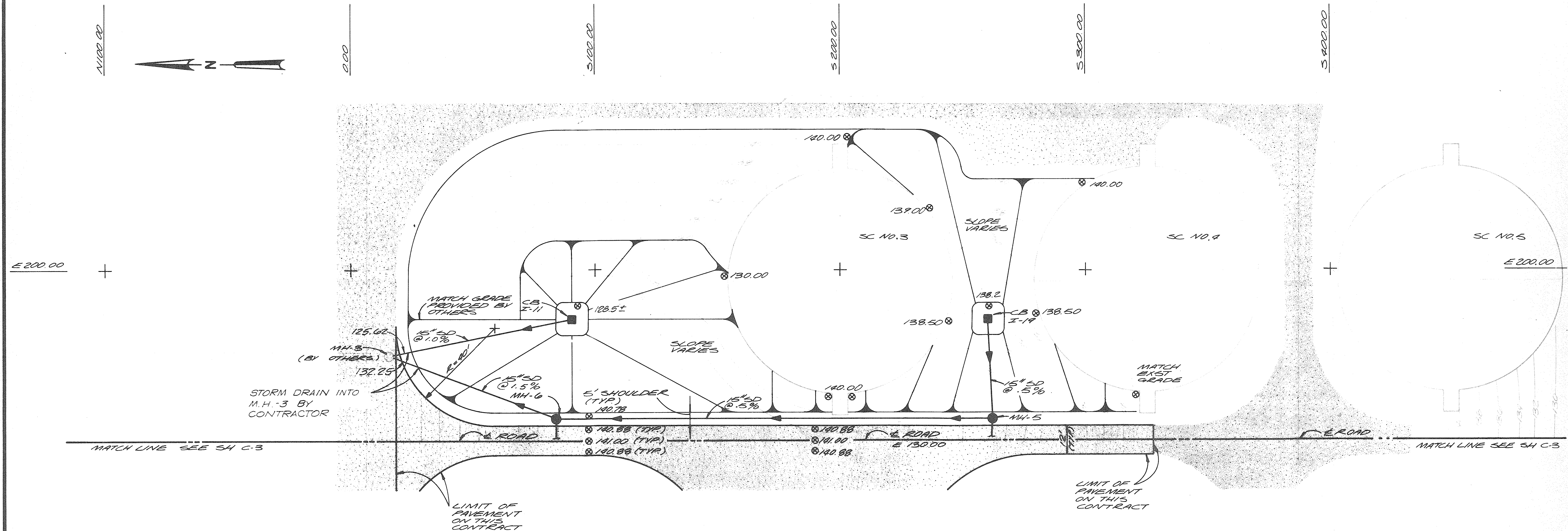
Robert A. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

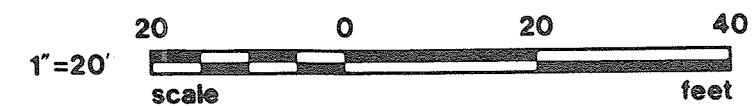
BORING LOGS & STRUCTURAL FILL
SEQUENCE

SITE

SHEET
OF C-2
DATE 8-78
DWG.
NO. W1078.61



STORM DRAIN INLET SCHEDULE				
NO	LOCATION	TOP ELEV.	INVT. IN	INVT. OUT
I-8	5 88 E 118	138.33	—	135.50
I-11	5 90 E 180	128.50	—	126.25
I-18	5 260 E 17	140.00	138.00	137.00
I-18A	5 262 E 115	140.00	136.00	136.00
I-19	5 260 E 180	138.00	135.00	135.00
MH-5	5 262 E 139.5	140.00	134.80 (I-19) 135.42 (I-18A)	134.63
MH-6	5 89 E 139.5	140.90	133.75 (MH-5) 135.90 (I-8)	133.50
I-20	5 71.5 W 7.0	140.25	—	138.10
I-21	5 198.5 E 16.0	140.00	—	138.50



RECORD DRAWING



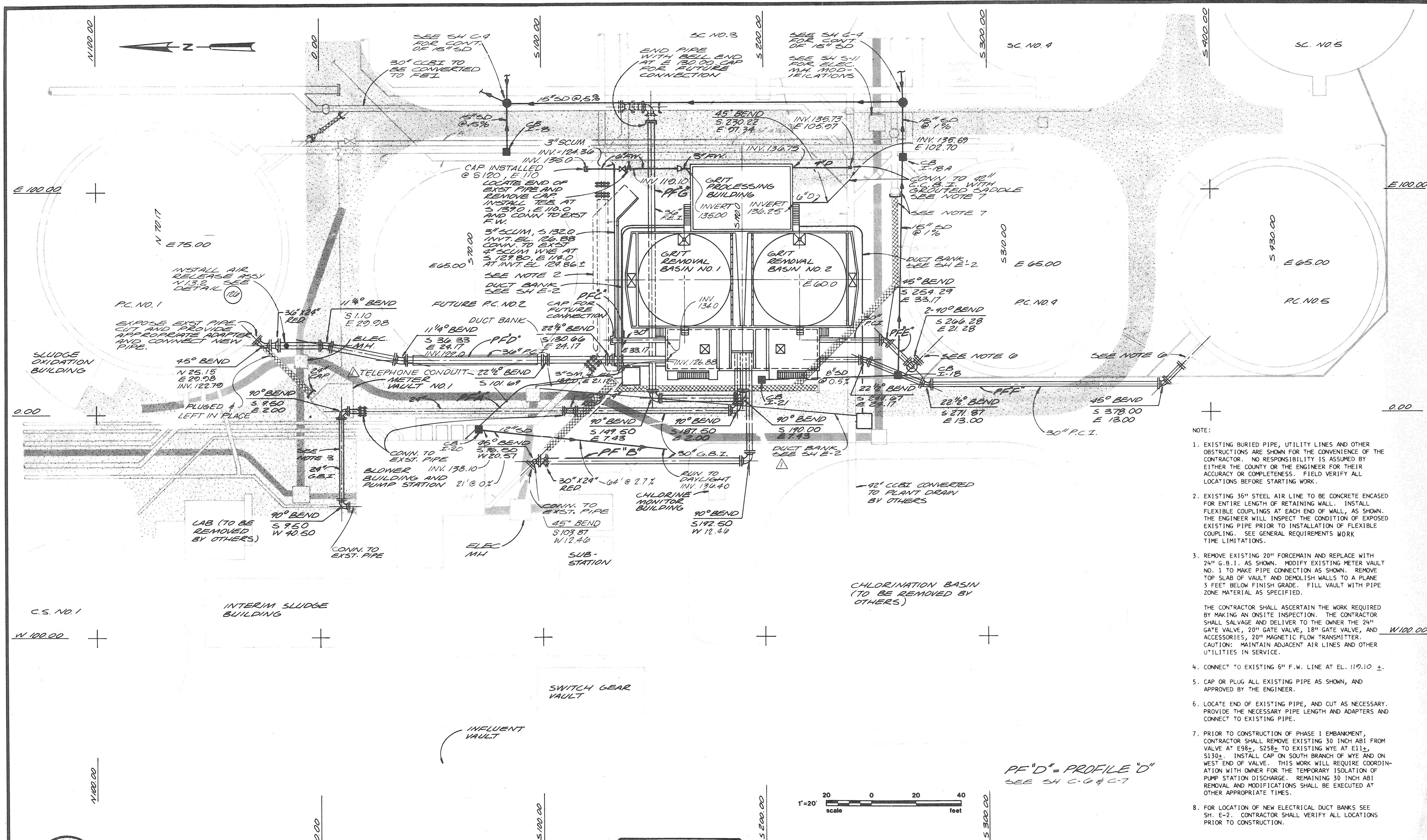
DES. <i>BJH/DBB</i>					
DR. <i>V.A.W.</i>					
CHK.					
APPD.					
	NO.	DATE	REVISION	BY	APPD.
		2-15-82	EXTEND STORM DRAIN INTO MH-3 & ADD INVT.	DLT	

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

GRADING PLAN
 SITE

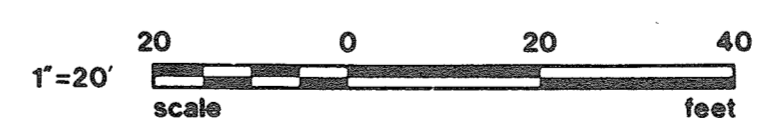
SHEET OF **C-4**
 DATE 8-78
 DWG. NO. W1078.B1



- NOTE:
- EXISTING BURIED PIPE, UTILITY LINES AND OTHER OBSTRUCTIONS ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. NO RESPONSIBILITY IS ASSUMED BY EITHER THE COUNTY OR THE ENGINEER FOR THEIR ACCURACY OR COMPLETENESS. FIELD VERIFY ALL LOCATIONS BEFORE STARTING WORK.
 - EXISTING 36" STEEL AIR LINE TO BE CONCRETE ENCASED FOR ENTIRE LENGTH OF RETAINING WALL. INSTALL FLEXIBLE COUPLINGS AT EACH END OF WALL, AS SHOWN. THE ENGINEER WILL INSPECT THE CONDITION OF EXPOSED EXISTING PIPE PRIOR TO INSTALLATION OF FLEXIBLE COUPLING. SEE GENERAL REQUIREMENTS WORK TIME LIMITATIONS.
 - REMOVE EXISTING 20" FORCEMAIN AND REPLACE WITH 24" G.B.I. AS SHOWN. MODIFY EXISTING METER VAULT NO. 1 TO MAKE PIPE CONNECTION AS SHOWN. REMOVE TOP SLAB OF VAULT AND DEMOLISH WALLS TO A PLANE 3 FEET BELOW FINISH GRADE. FILL VAULT WITH PIPE ZONE MATERIAL AS SPECIFIED.

THE CONTRACTOR SHALL ASCERTAIN THE WORK REQUIRED BY MAKING AN ONSITE INSPECTION. THE CONTRACTOR SHALL SALVAGE AND DELIVER TO THE OWNER THE 24" GATE VALVE, 20" GATE VALVE, 18" GATE VALVE, AND ACCESSORIES, 20" MAGNETIC FLOW TRANSMITTER. CAUTION: MAINTAIN ADJACENT AIR LINES AND OTHER UTILITIES IN SERVICE.
 - CONNECT TO EXISTING 6" F.W. LINE AT EL. 110.10 ±.
 - CAP OR PLUG ALL EXISTING PIPE AS SHOWN, AND APPROVED BY THE ENGINEER.
 - LOCATE END OF EXISTING PIPE. PROVIDE THE NECESSARY PIPE LENGTH AND ADAPTERS AND CONNECT TO EXISTING PIPE.
 - PRIOR TO CONSTRUCTION OF PHASE I EMBANKMENT, CONTRACTOR SHALL REMOVE EXISTING 30 INCH ABI FROM VALVE AT E98±, S258± TO EXISTING WYE AT E11±, S130±. INSTALL CAP ON SOUTH BRANCH OF WYE AND WEST END OF VALVE. THIS WORK WILL REQUIRE COORDINATION WITH OWNER FOR THE TEMPORARY ISOLATION OF PUMP STATION DISCHARGE. REMAINING 30 INCH ABI REMOVAL AND MODIFICATIONS SHALL BE EXECUTED AT OTHER APPROPRIATE TIMES.
 - FOR LOCATION OF NEW ELECTRICAL DUCT BANKS SEE SH. E-2. CONTRACTOR SHALL VERIFY ALL LOCATIONS PRIOR TO CONSTRUCTION.

PF "D" = PROFILE "D"
SEE SH C-0 & C-7



RECORD DRAWING



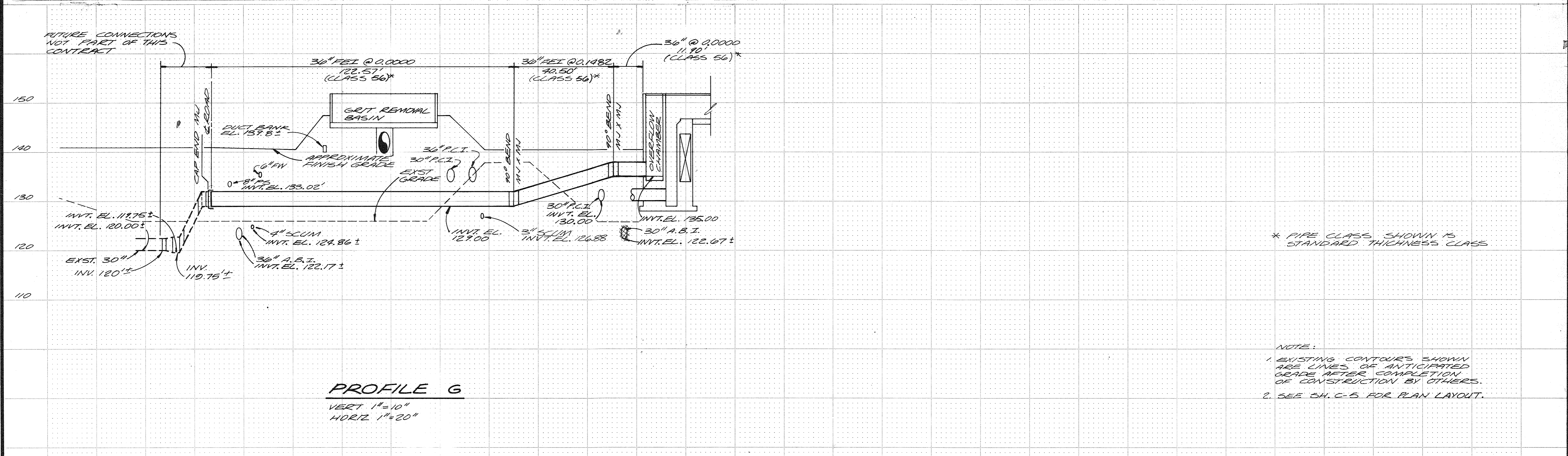
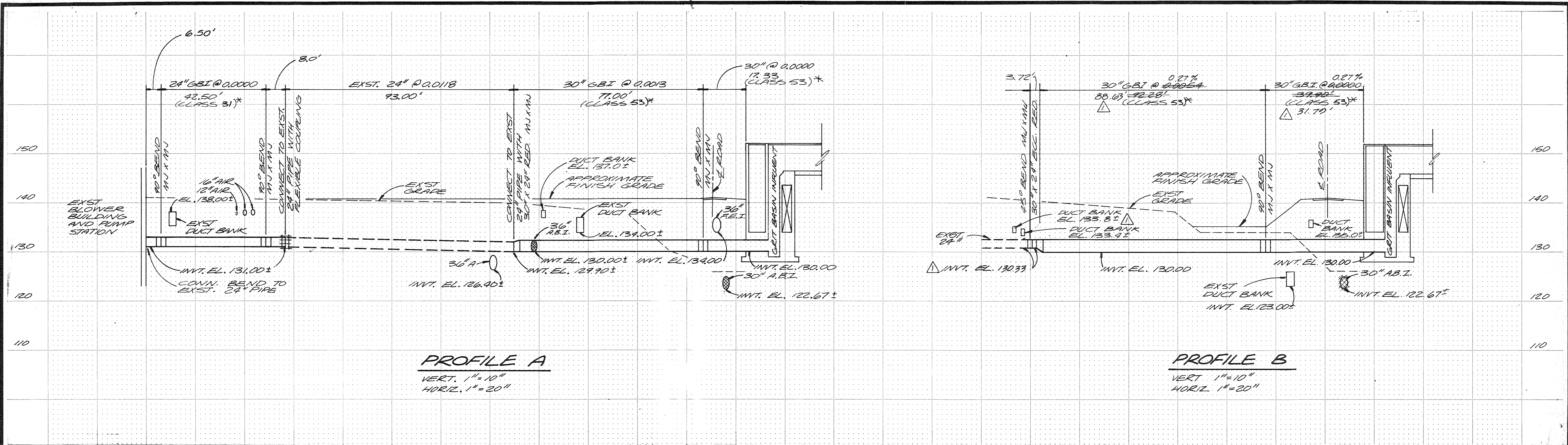
	DES. DBB/LG	2-1988 ADD TELEPHONE CONDUIT, RELOCATE DUCT BANK & ADD INVERT'S	DLT	
	DR. VAW			
	CHK.			
	APPD.			
NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

YARD PIPING PLAN
SITE

SHEET
OF C-5
DATE 8-78
DWG. NO. W1078.B1



* PIPE CLASS SHOWN IS STANDARD THICKNESS CLASS

NOTE:
1. EXISTING CONTOURS SHOWN ARE LINES OF ANTICIPATED GRADE LINES AFTER COMPLETION OF CONSTRUCTION BY OTHERS.
2. SEE SH. C-5 FOR PLAN LAYOUT.



CH2M HILL	DES. DBB/LG	2-15-82 LENGTH & SLOPE OF 30" GBI (PROFILE 'B') DLT	NO.	DATE	REVISION	BY	APPD.
	DR. VAW						
	CHK.						
	APPD.						

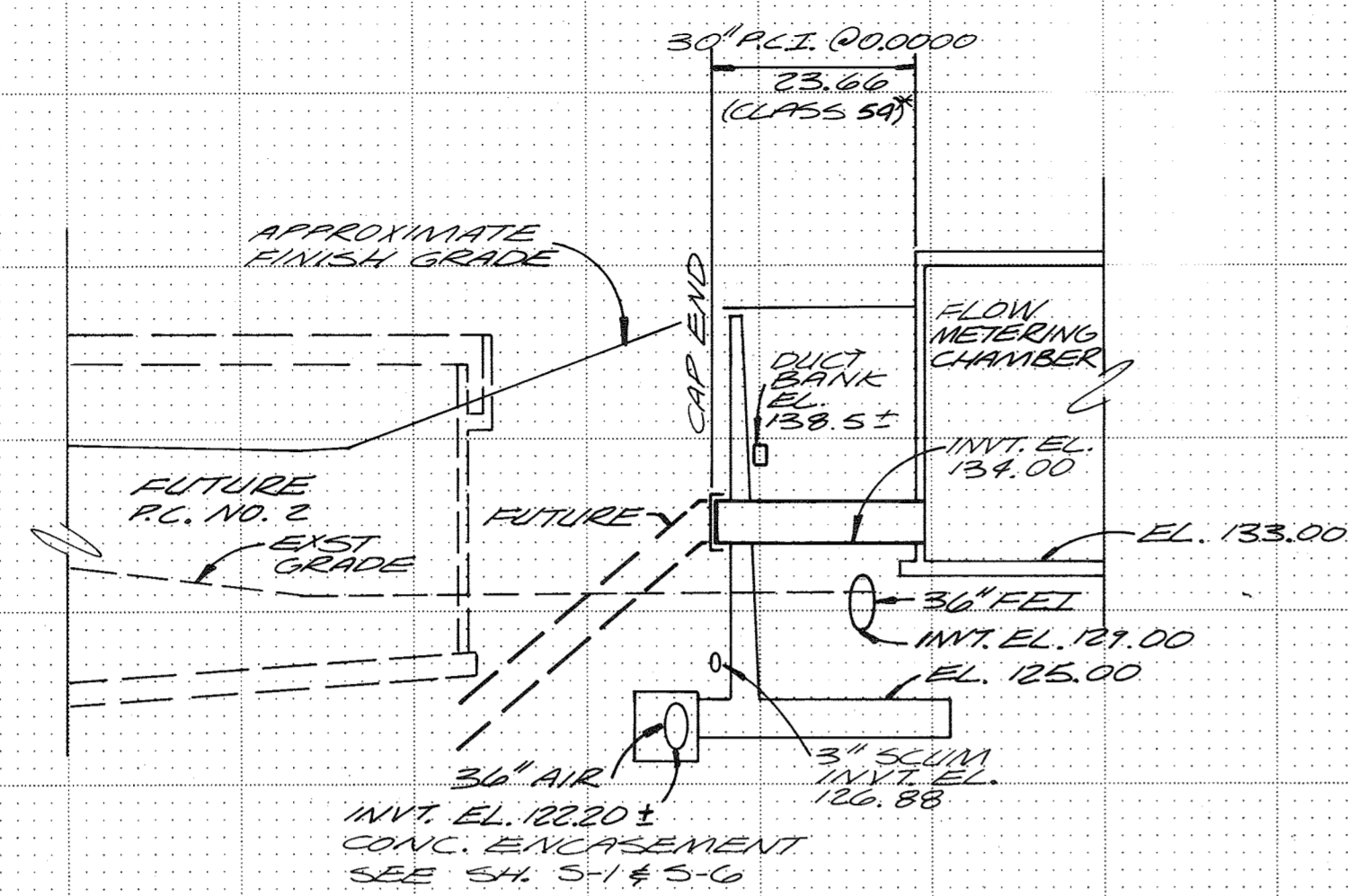
RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

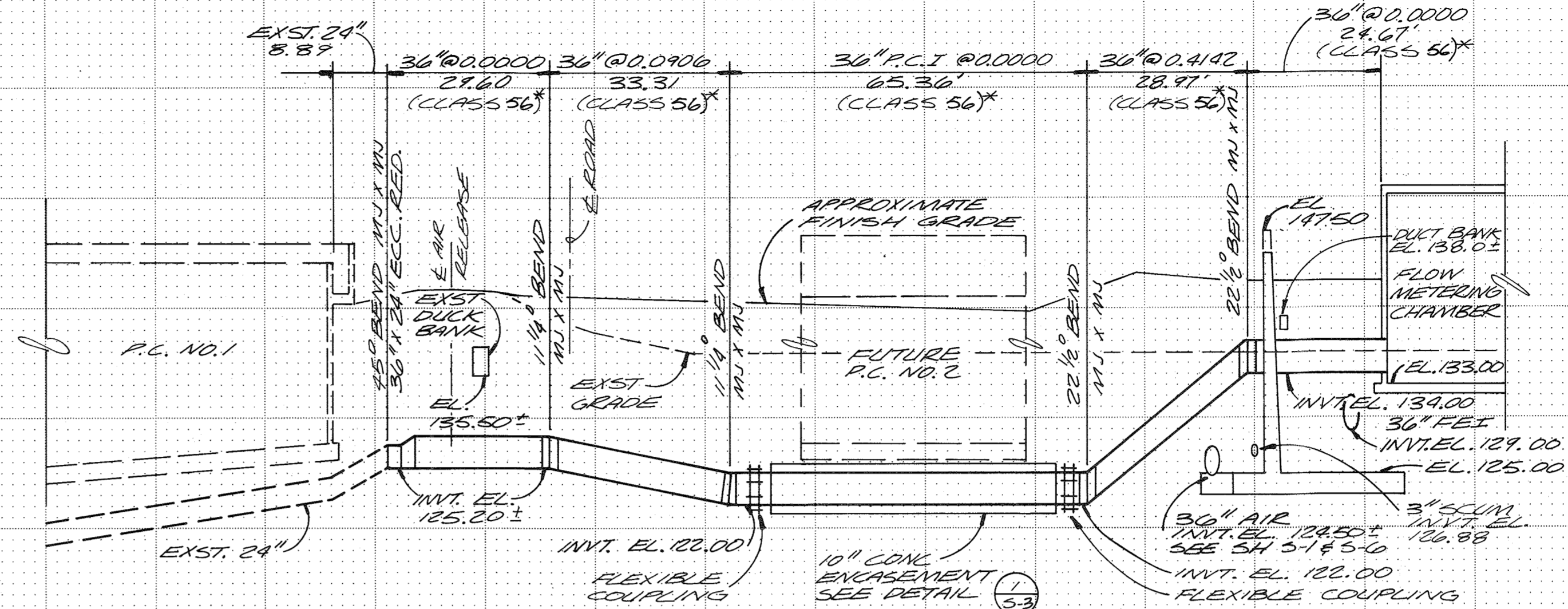
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

PIPING PROFILES
SITE

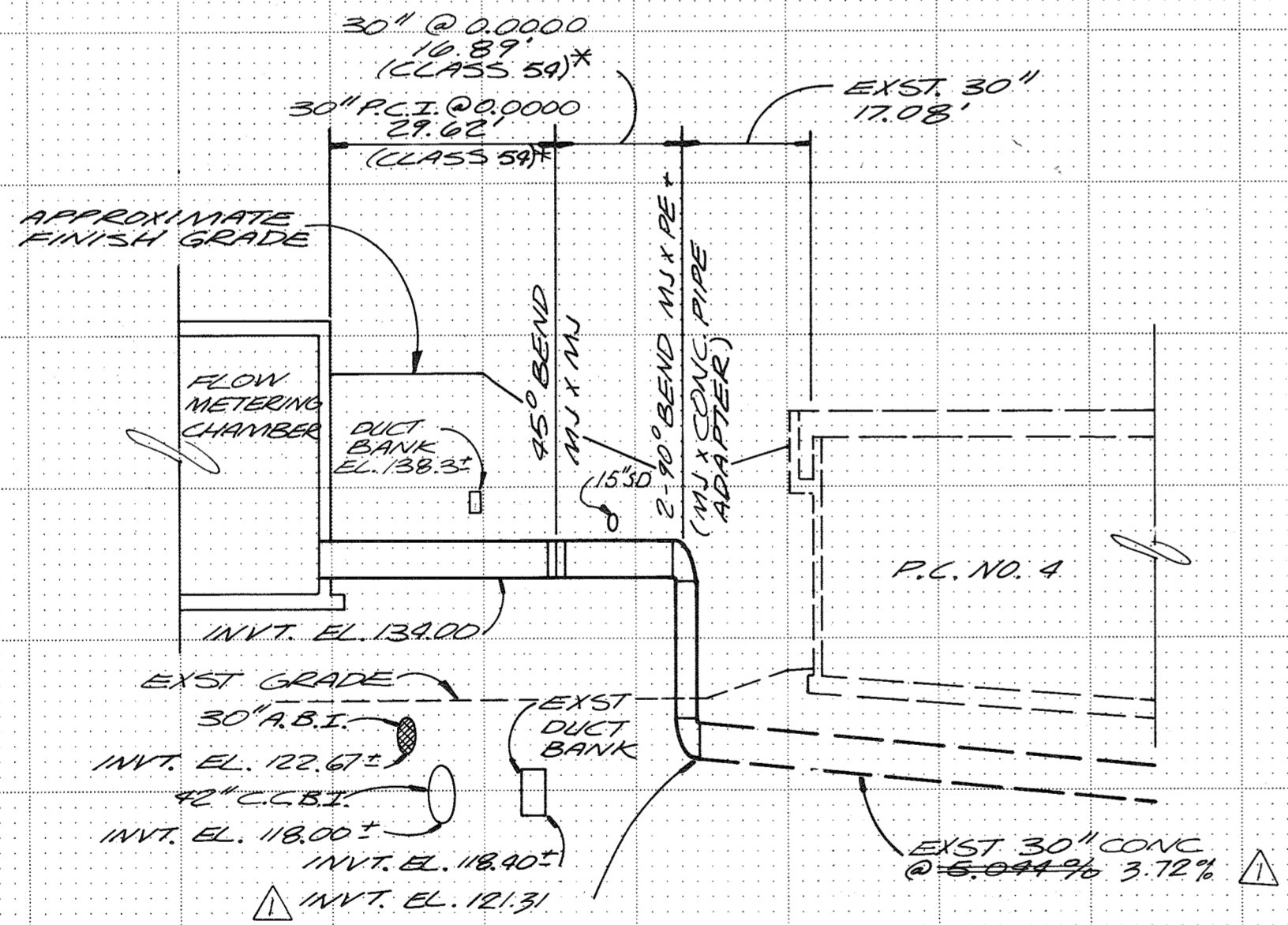
SHEET OF C-6
DATE 8-78
DWG. NO. W1078.B1



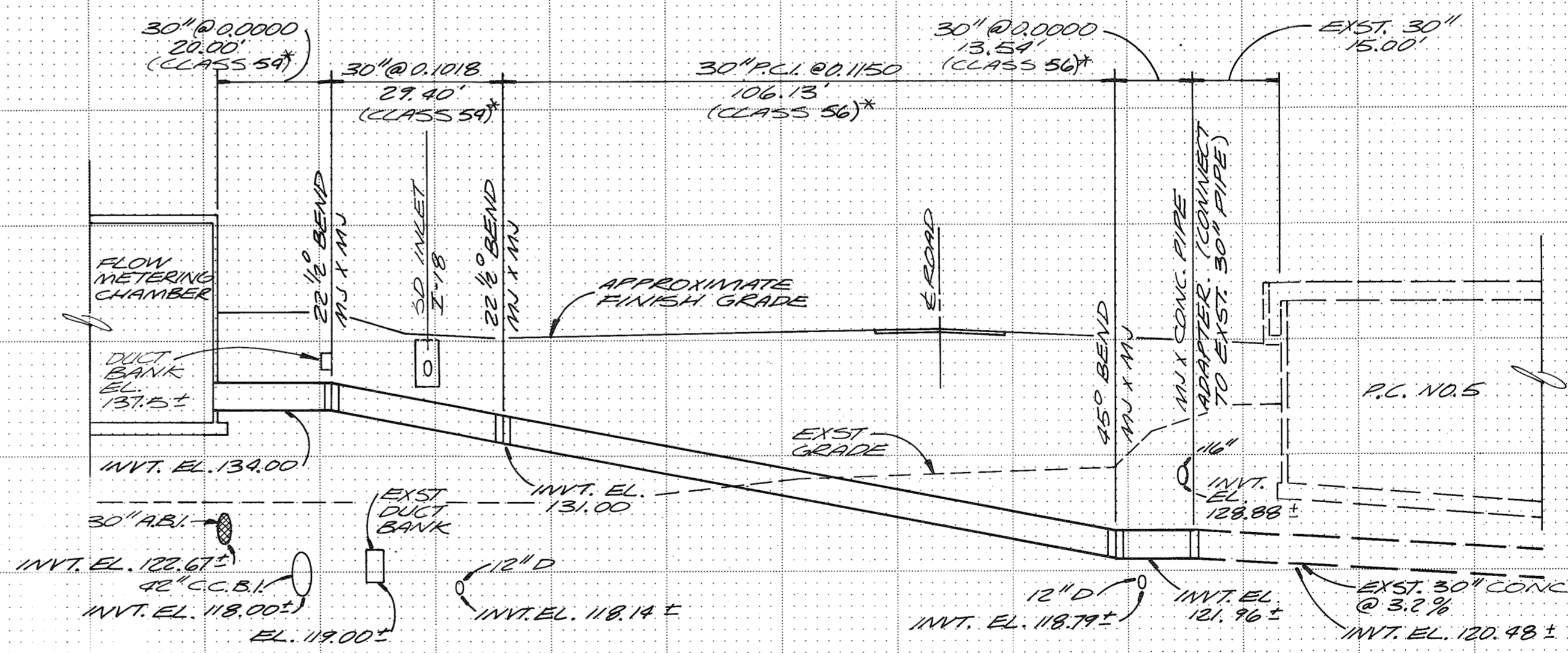
PROFILE C
 VERT 1"=10'
 HORIZ 1"=20'



PROFILE D
 VERT 1"=10'
 HORIZ 1"=20'



PROFILE E
 VERT 1"=10'
 HORIZ 1"=20'



PROFILE F
 VERT 1"=10'
 HORIZ 1"=20'

NOTE:
 1. EXISTING CONTOURS SHOWN ARE LINES OF ANTICIPATED GRADE AFTER COMPLETION OF CONSTRUCTION BY OTHERS.
 2. SEE SH. C-5 FOR PLAN LAYOUT.



	DES. DBB / LG	8-15-88 INVT. EL. ON PROFILE "E"	DIT	
	DR. VAW			
	CHK.			
	APPD.			
NO.	DATE	REVISION	BY	APPD.

RECORD DRAWING

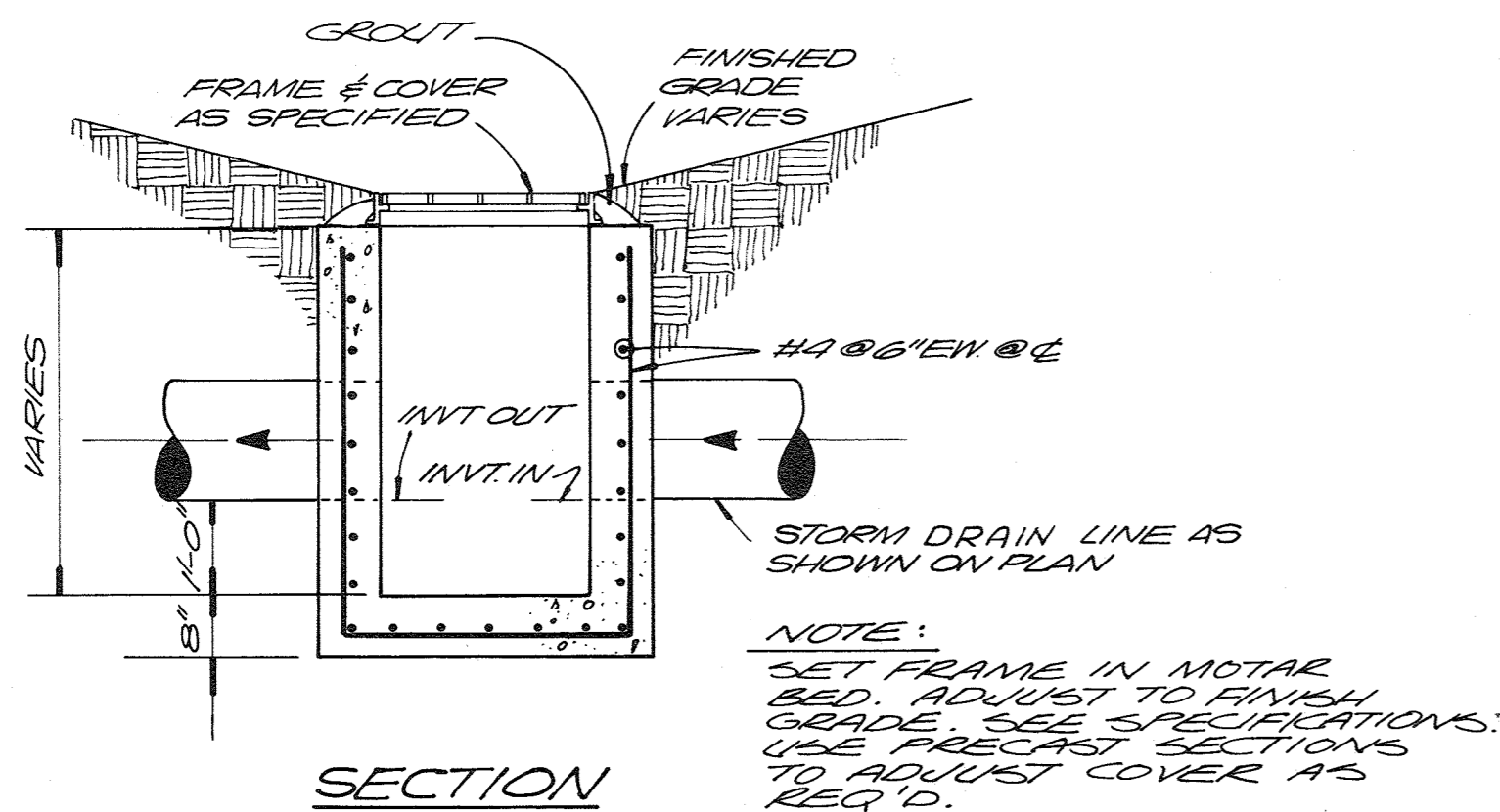
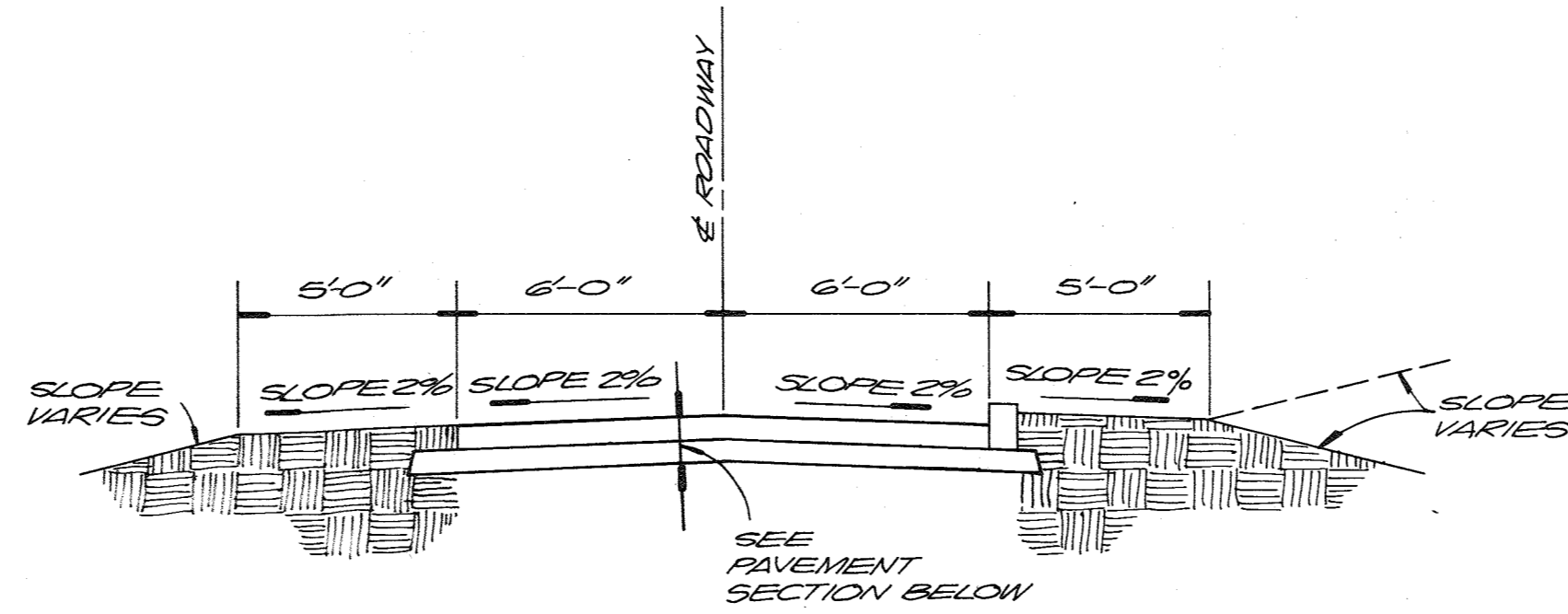
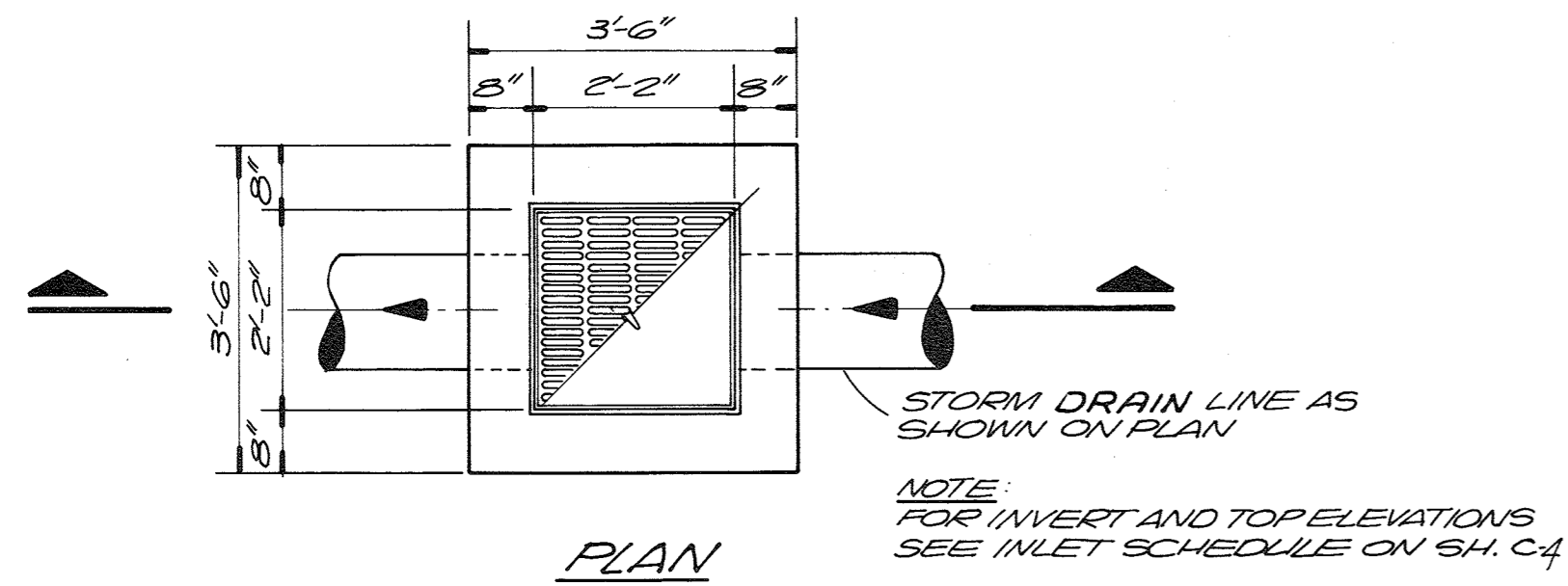
DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

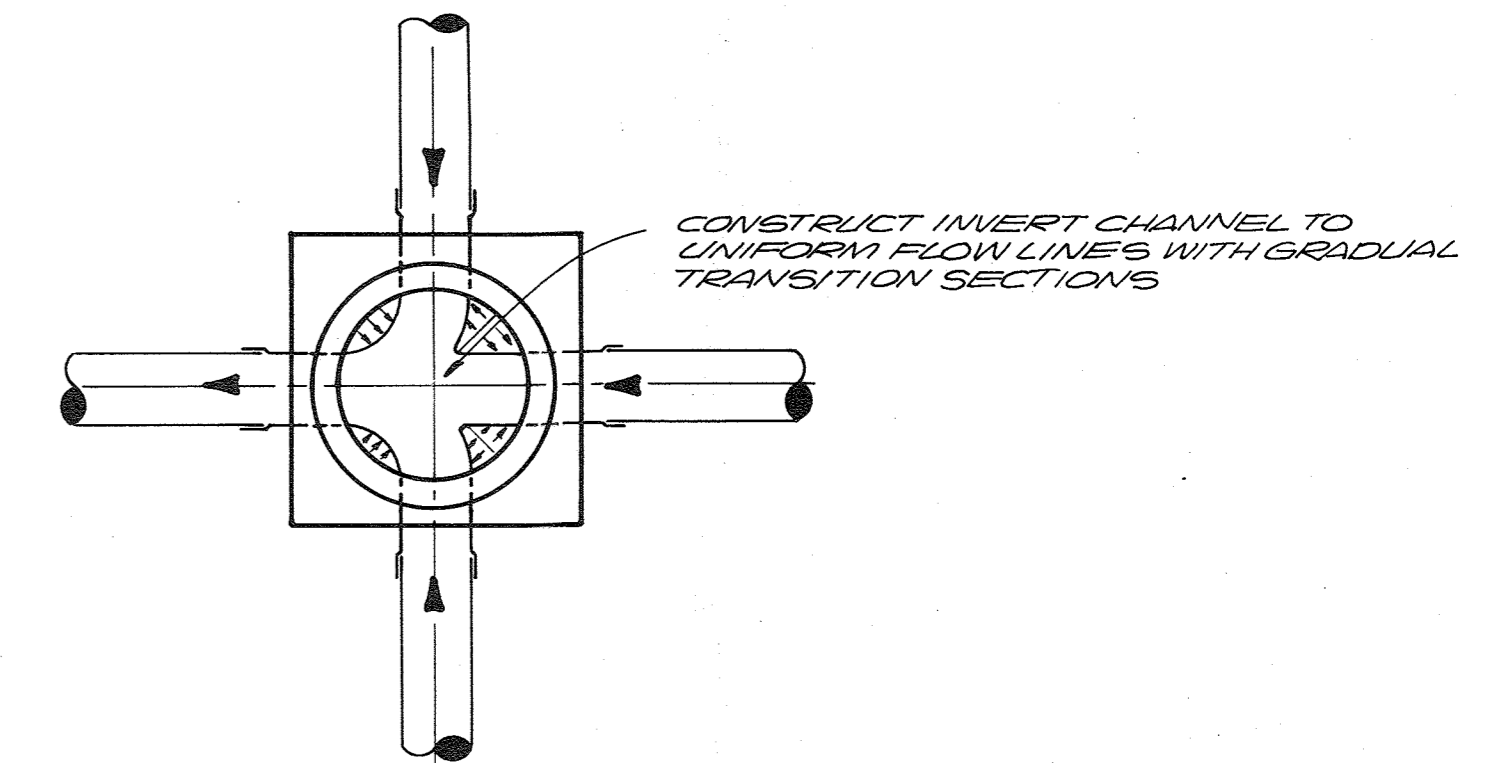
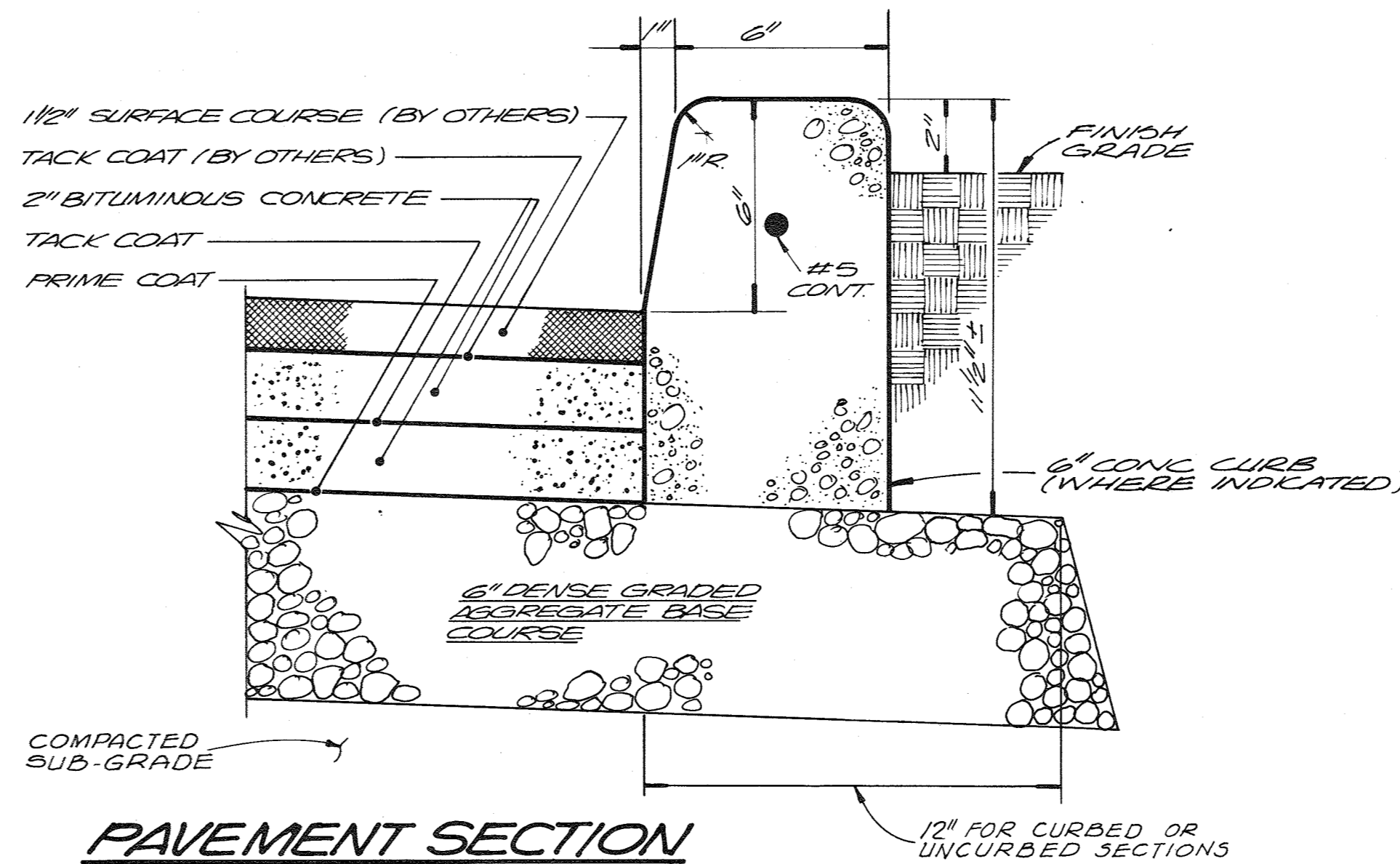
PIPING PROFILES

SITE

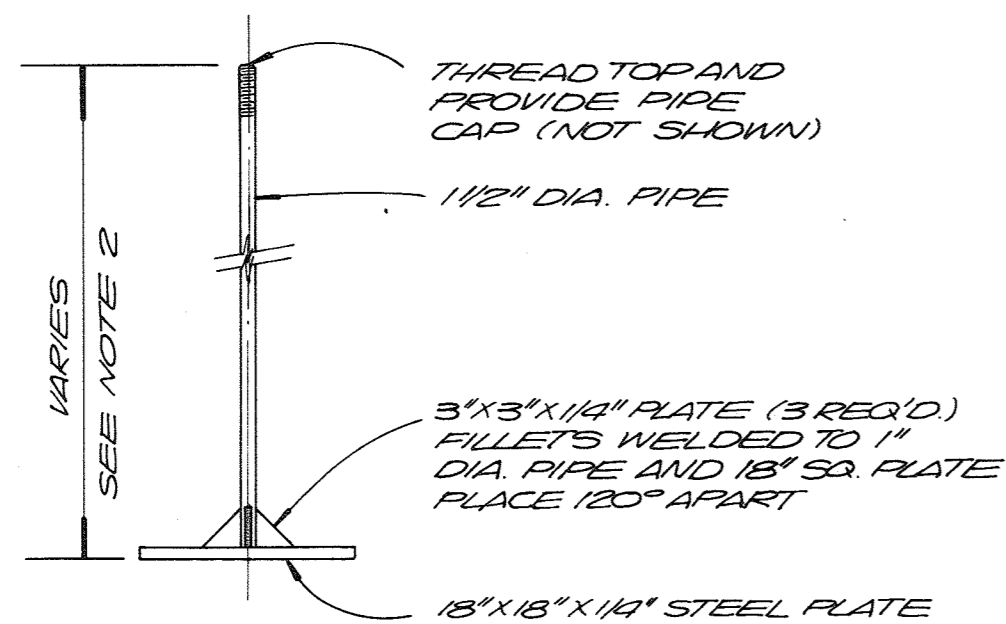
SHEET
 OF
 C-7
 DATE 8-78
 DWG.
 NO. W1078.B1



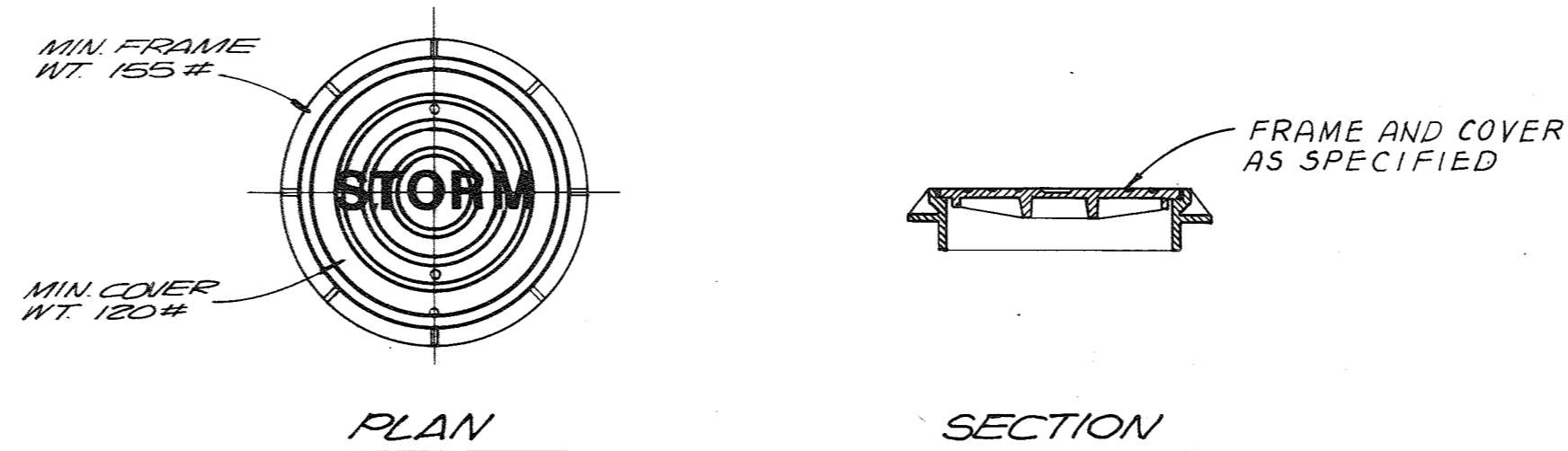
CATCH BASIN DETAIL
1/2" = 1'-0"



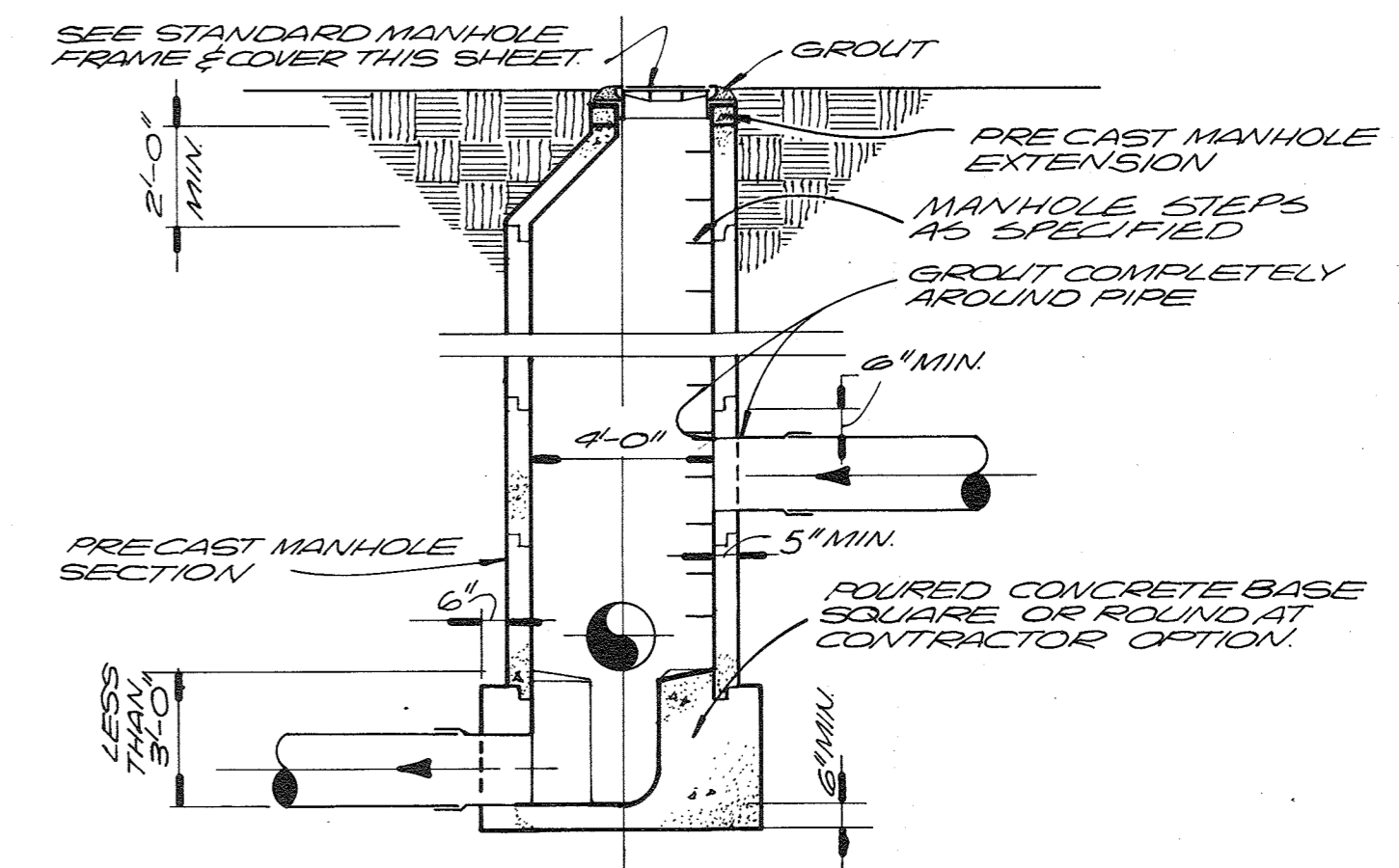
GENERAL PLAN OF CHANNEL INTERSECTION



- NOTES:
1. 3 REQUIRED SEE SHEET C-3 FOR LOCATION
 2. FIELD ADJUST LENGTH SO THAT PIPE CAP TOP ELEVATION IS BETWEEN 140.0 AND 141.0 WHEN INSTALLED. COUPLING AND RANDOM LENGTHS OF PIPE MAY BE USED TO FIELD ADJUST

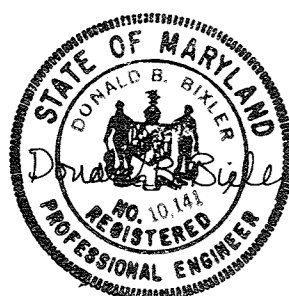


STANDARD MANHOLE FRAME & COVER
NTS



TYPICAL MANHOLE SECTION

TYPICAL MANHOLE DETAIL
NTS



CH2M HILL	DES. BJH					
	DR. CFE, JR.					
	CHK.					
	APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

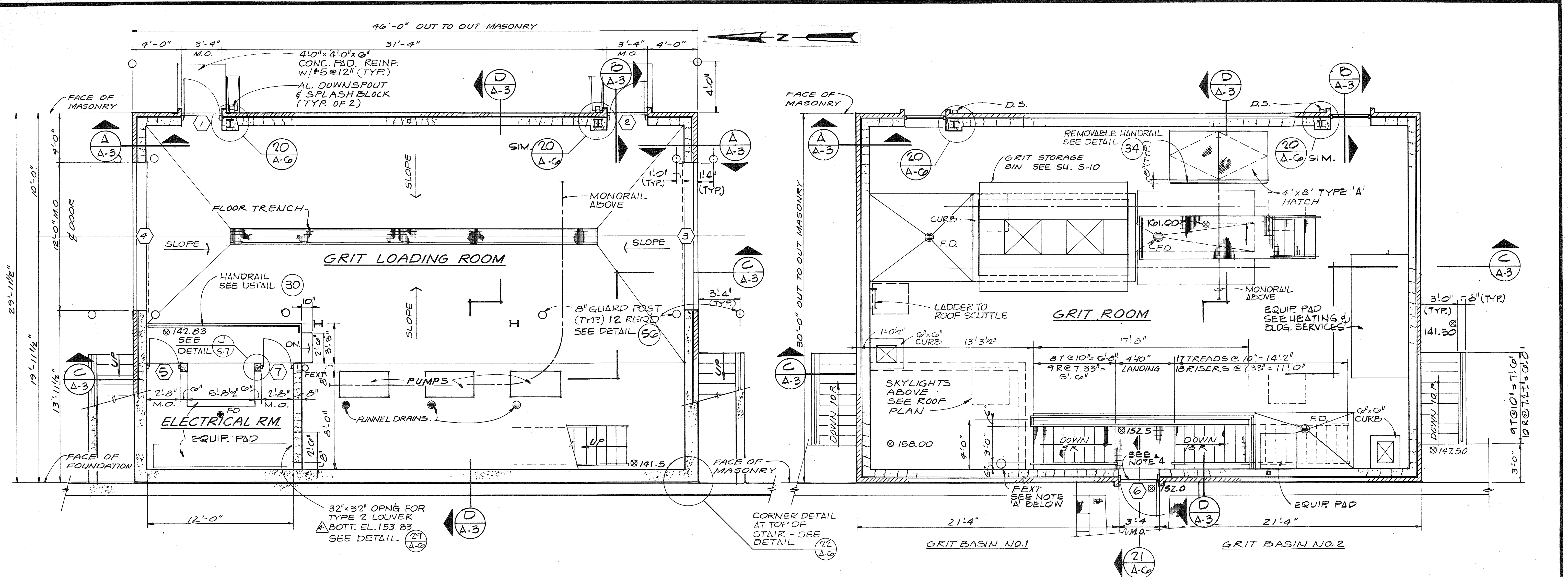
Savage WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

SITE DETAILS

SITE

SHEET C-8
OF
DATE 8-78
DWG. NO. W11078.B1

RECORD DRAWING



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

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

ROOM	FLOOR			WALLS			CEILING			REMARKS	
	MATERIAL	FINISH	COLOR	MATERIAL	FINISH	COLOR	HEIGHT	MATERIAL	FINISH		COLOR
GRIT LOADING ROOM	CONC.	HARD.	NONE	CMU/CONC.	12	*	16'-0"	CONC.	12	*	APPLY FLOOR HARDNER
ELECTRICAL ROOM	CONC.	HARD.	NONE	CMU/CONC.	12	*	16'-0"	CONC.	12	*	APPLY FLOOR HARDNER
GRIT ROOM	CONC.	HARD.	NONE	CMU	12"	*	VARIES	CONC.	12	*	APPLY FLOOR HARDNER

NO.	DOOR SIZE		TYPE	HARDWARE	FINISH	COLOR	REMARKS
	HEIGHT	WIDTH					
1.	3'-0"	7'-0"	1	HDW-1	3	*	
2.	3'-0"	7'-0"	1-A	HDW-1	3	*	
3.	12'-0"	13'-6"	3	HDW-3	3	*	ROLL-UP, ELECTRIC OPERATION
4.	12'-0"	13'-6"	3	HDW-3	3	*	ROLL-UP, ELECTRIC OPERATION
5.	2'-4"	7'-2"	4	HDW-2	3	*	TRANSOM, LOUVER 24 x 30-1/2 TYPE 3
6.	3'-0"	7'-0"	2	HDW-1	3	*	
7.	2'-4"	7'-2"	4	HDW-2	3	*	TRANSOM
8.	3'-0"	7'-2"	5	HDW-1	3	*	SEE DETAILS
9.	3'-0"	7'-2"	5	HDW-1	3	*	SEE DETAILS

NOTES:
 'A' HAND FIRE EXTINGUISHERS (PEXT) SHALL BE AS SPECIFIED IN SECTION 10540-HAND FIRE EXTINGUISHERS.
 FOR LOCATIONS OF FIRE EXTINGUISHERS IN THE FLOW METERING CHAMBERS SEE HEATING AND BUILDING SERVICES SHEET HP-4.

- NOTES:**
- FOR PAINT FINISH SYSTEMS SEE SPECIFICATIONS.
 - DOOR FINISH AND COLOR INDICATED ON THE DOOR SCHEDULE.
 - ARCHITECTURAL EXPOSED ALUMINUM SHALL BE ANODIZED A DARK BRONZE TONE. STAIRWAYS, PLATFORMS AND HANDRAILS, SHALL BE ANODIZED NATURAL.
 - PAINT DOOR THRESHOLD SAFETY YELLOW.

EXTERIOR FINISH
 BRICK - MATCH EXISTING -
 FLASHINGS, DOWNSPOUTS - MATCH EXISTING
 OPAQUE CURTAIN WALL PANELS - MATCH EXISTING
 TRANSLUCENT CURTAIN WALL PANELS - MATCH EXISTING
 EXPOSED CONCRETE - SYSTEM NO. 13

RECORD DRAWING

- NOTES:**
- SEE SPECIFICATION FOR DOOR HARDWARE.
 - FOR DOOR AND FRAME TYPES, SEE SHEET A-5.
 - SEE SHT. S-4 FOR DOORS 8 & 9



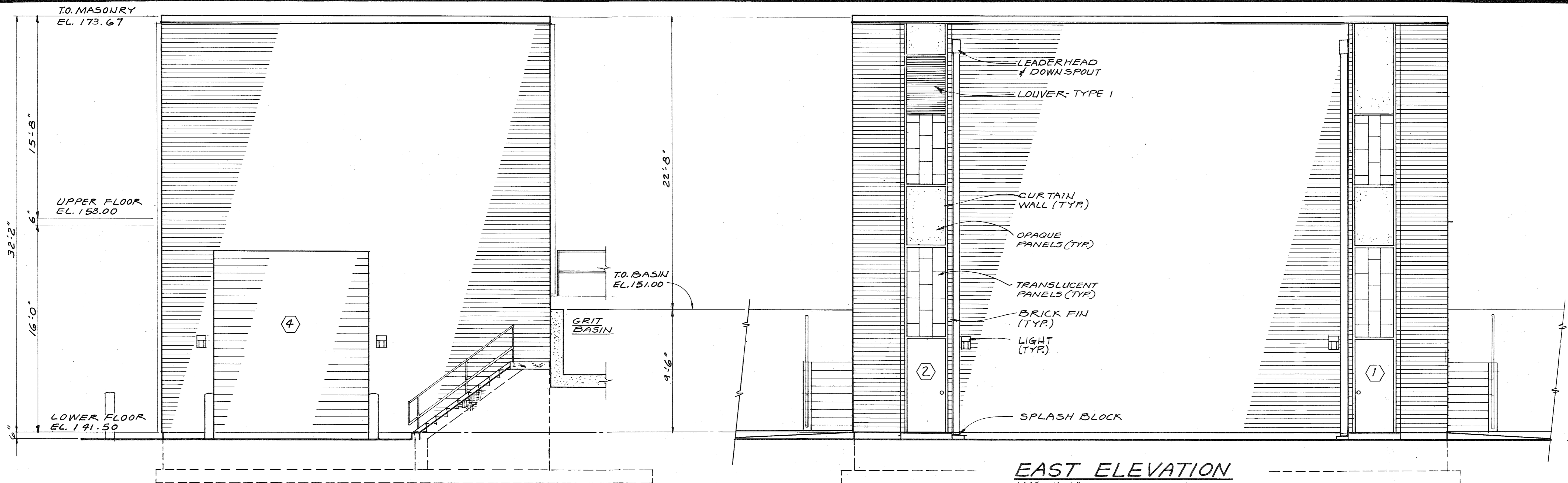
DES.	DR.	CHK.	APPD.	NO.	DATE	REVISION	BY	APPD.
WTG	TWM				2/11/84	ELEVATION ON OPENING FOR LOUVER	DLT	
					10/30/78	MODIFICATION TO DOOR HEIGHT	LG	DBB
					10/23/78	ADDENDUM NO. 3	LG	DBB
					10/23/78	ADDENDUM NO. 2	LG	DBB

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

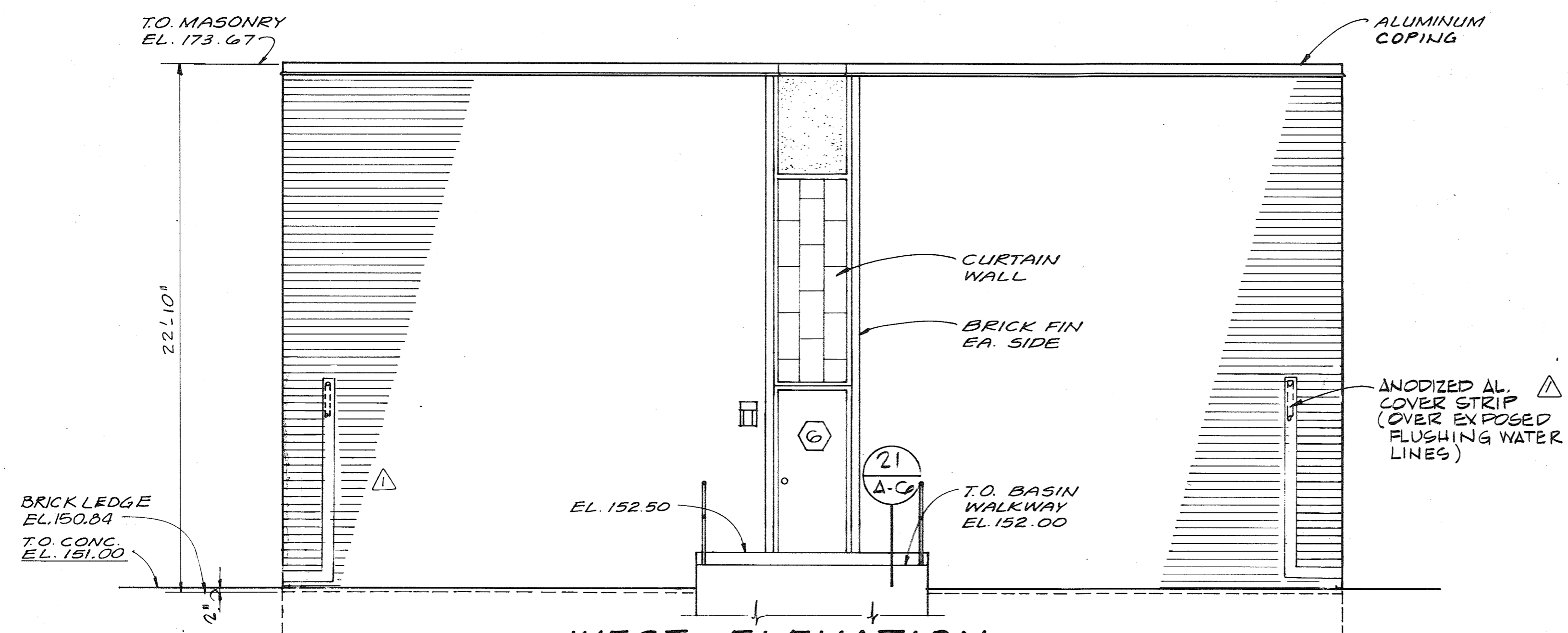
GRIT PROCESSING BLDG.
FLOOR PLANS & SCHEDULES
 ARCHITECTURAL

SHEET
 OF
A-1
 DATE 8-78
 DWG.
 NO. W1078.B1

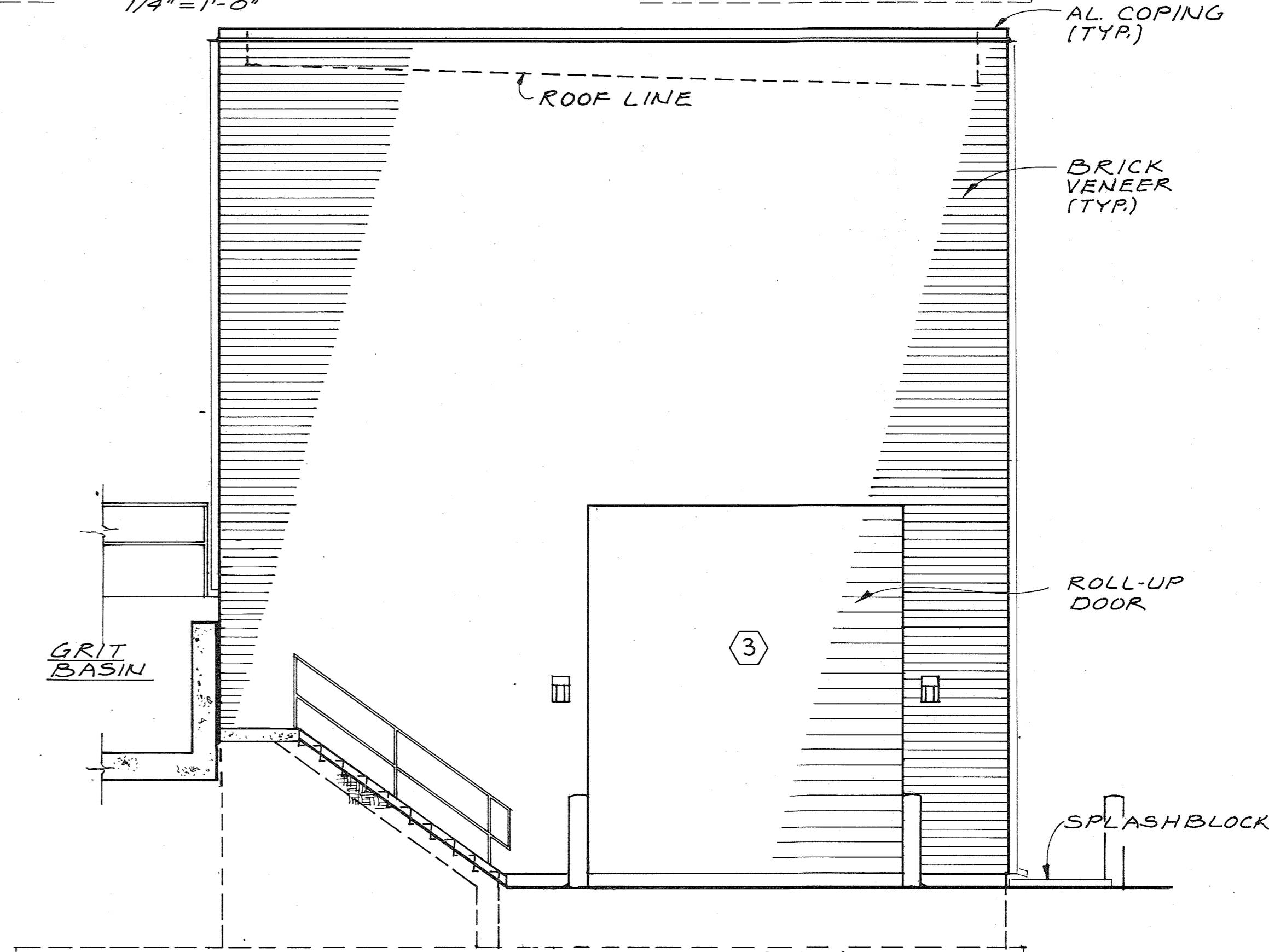


NORTH ELEVATION
1/4" = 1'-0"

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



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



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

RECORD DRAWING



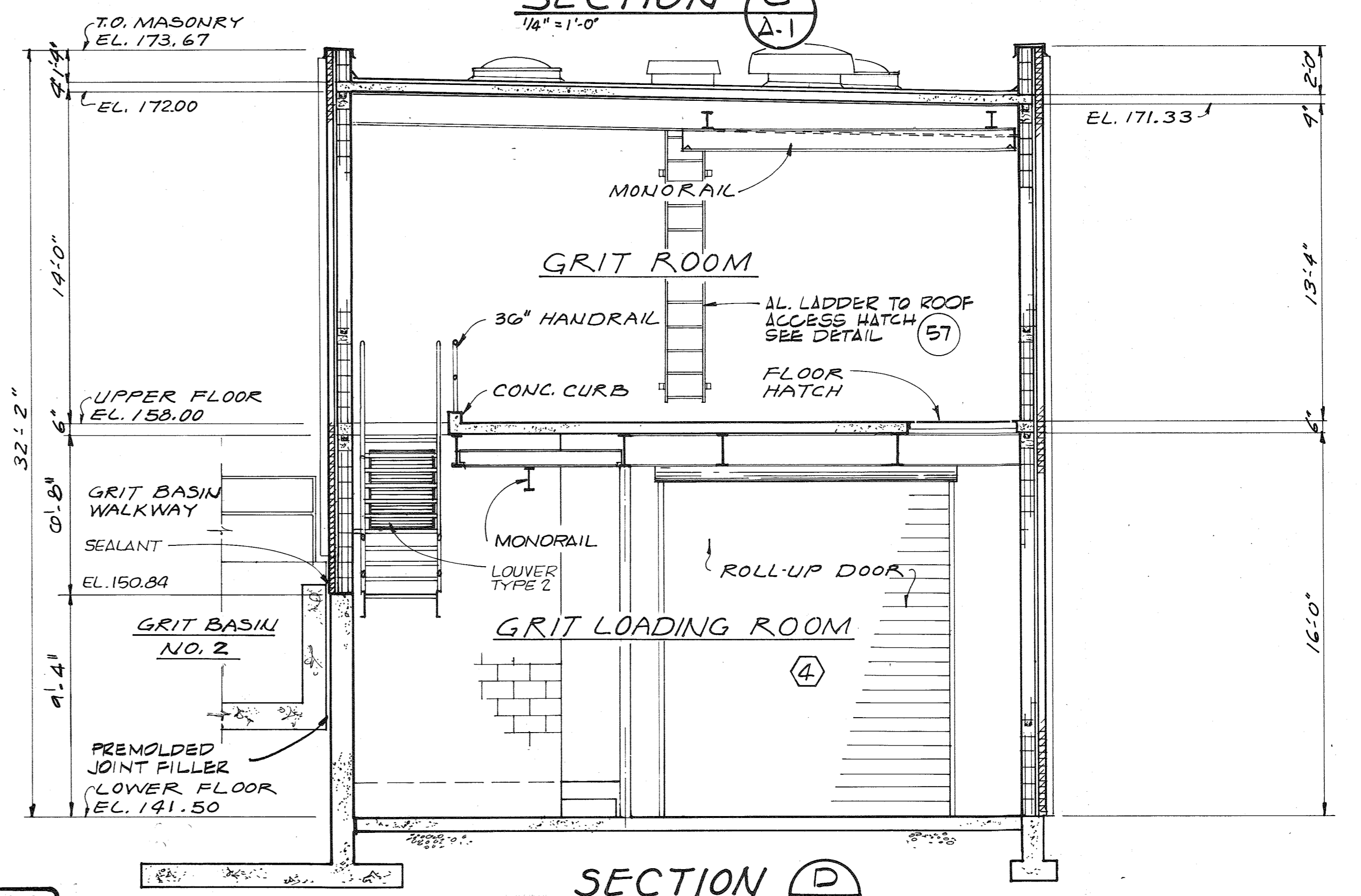
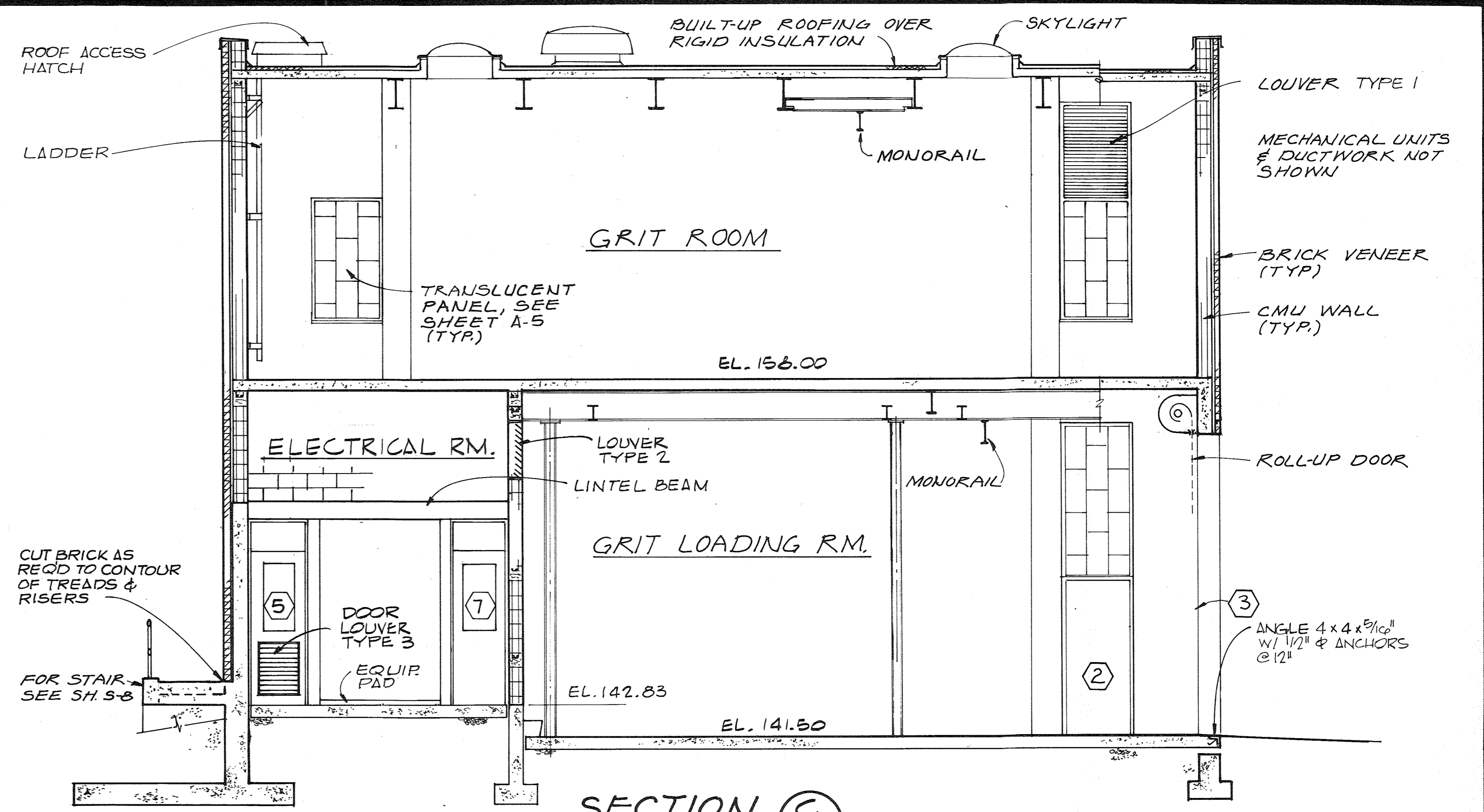
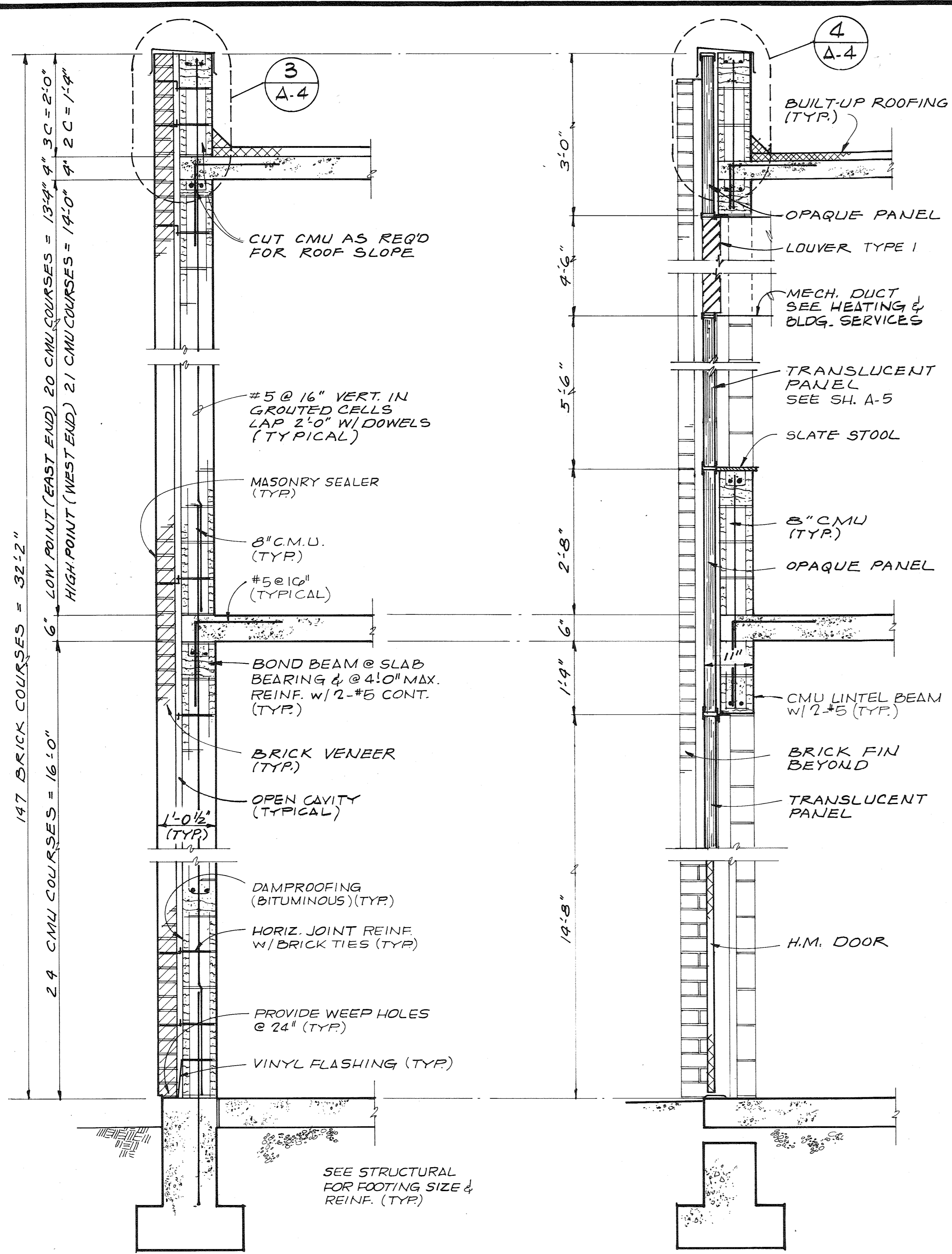
CH2M HILL	DES.	WTG	NO.	DATE	REVISION	BY	APPD.
	DR.	TWM					
	CHK.						
	APPD.						

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
ELEVATIONS
ARCHITECTURAL

SHEET
OF
A-2
DATE 8-78
DWG.
NO. W1078.B1



RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

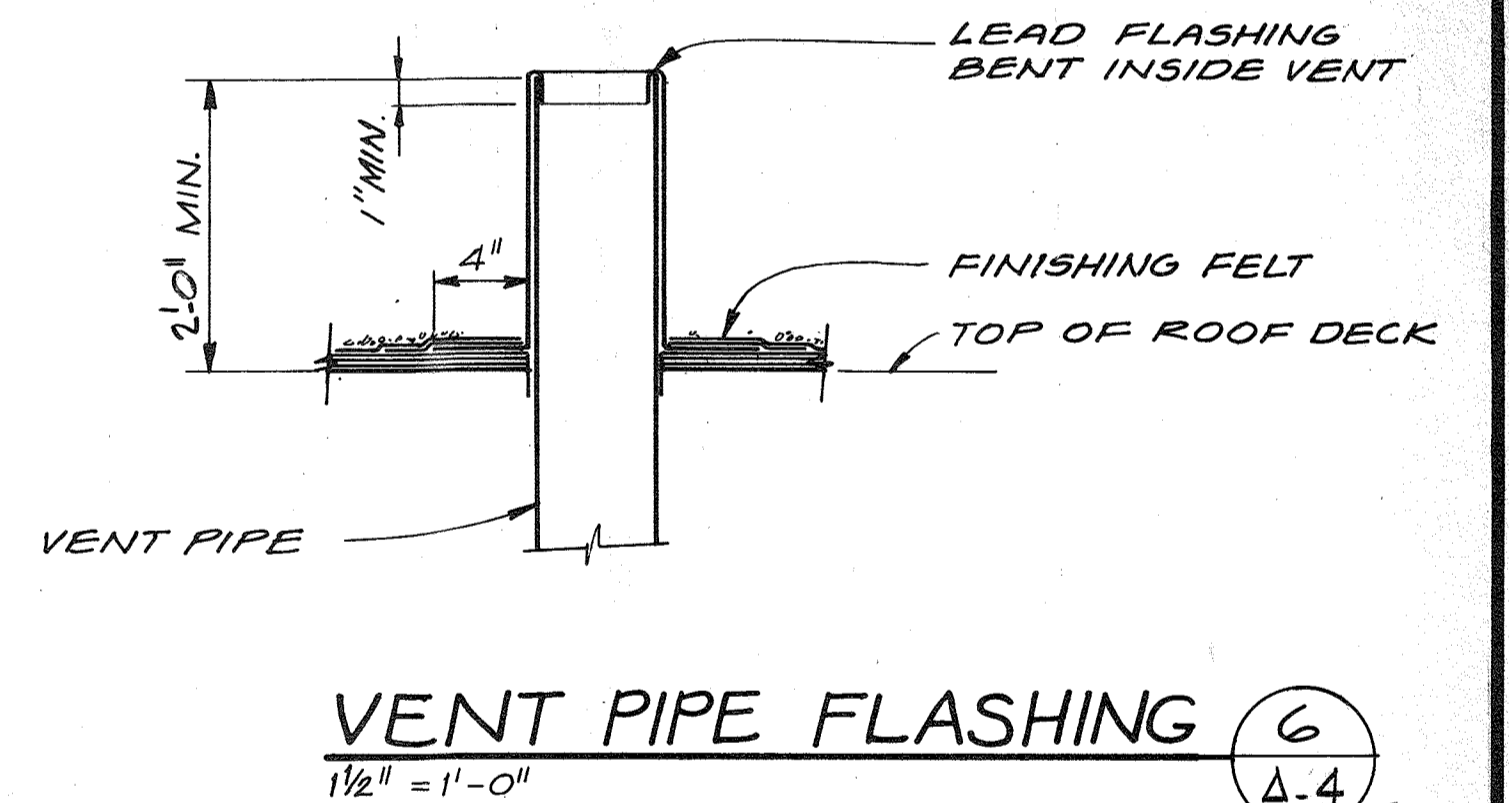
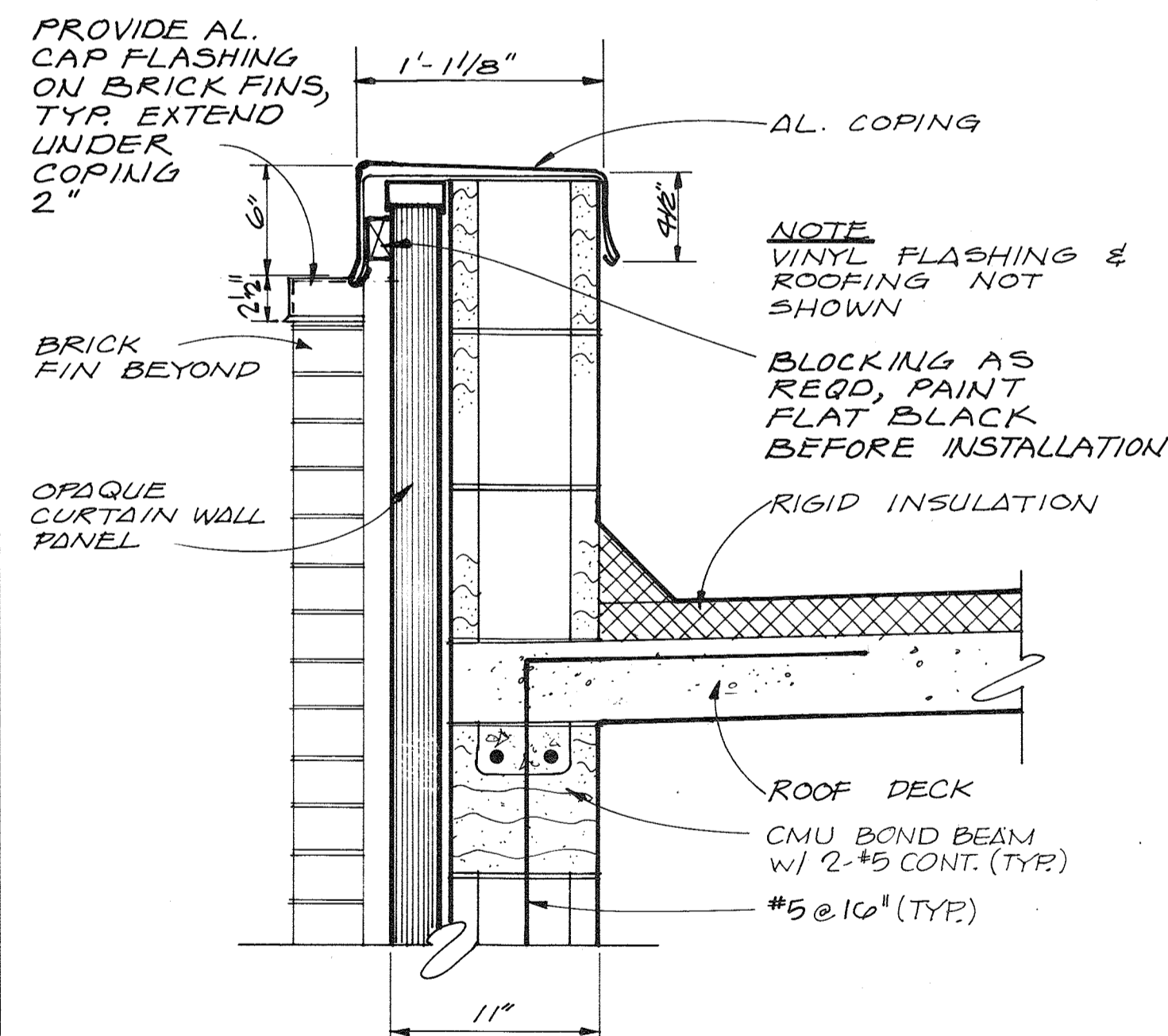
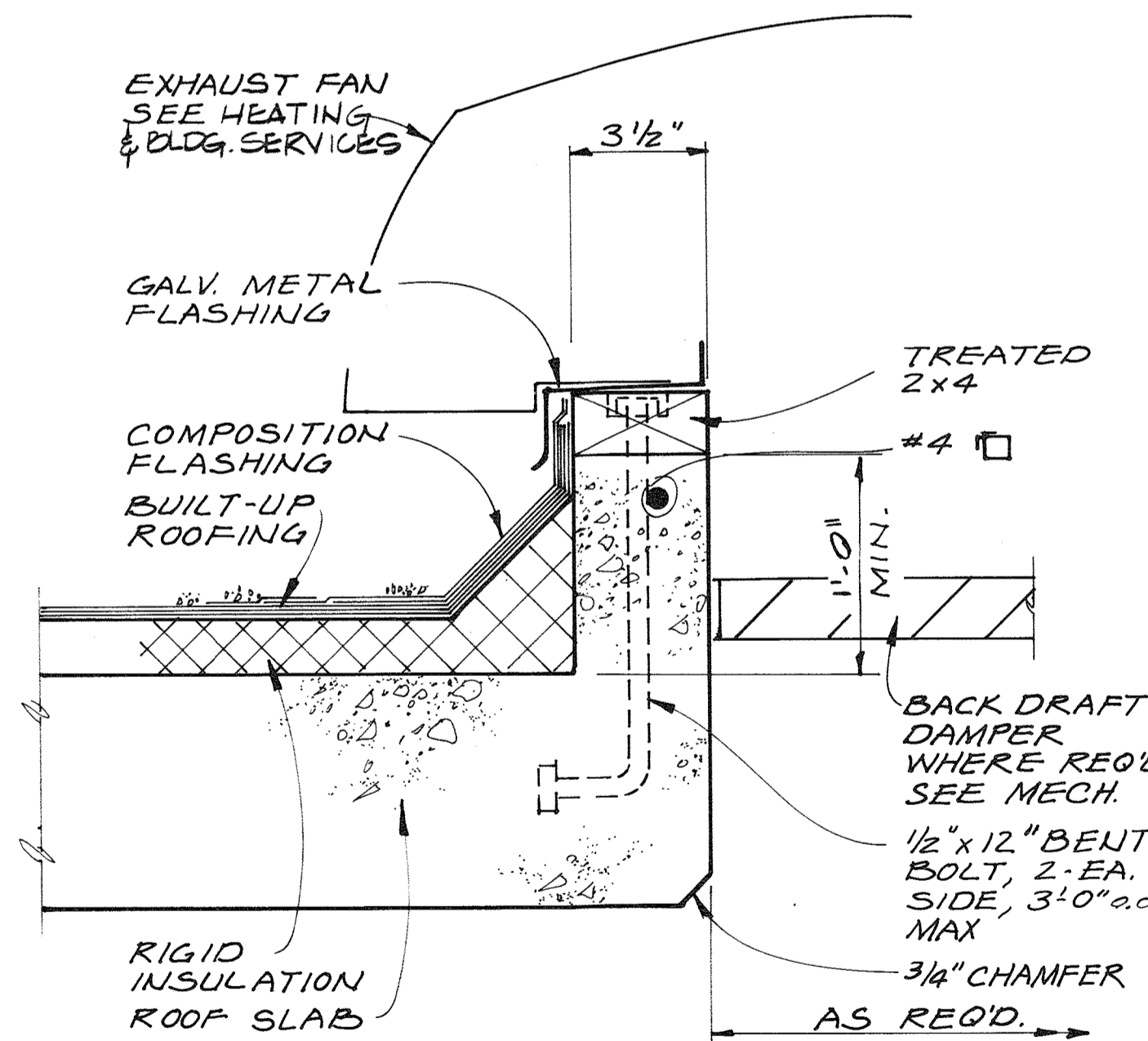
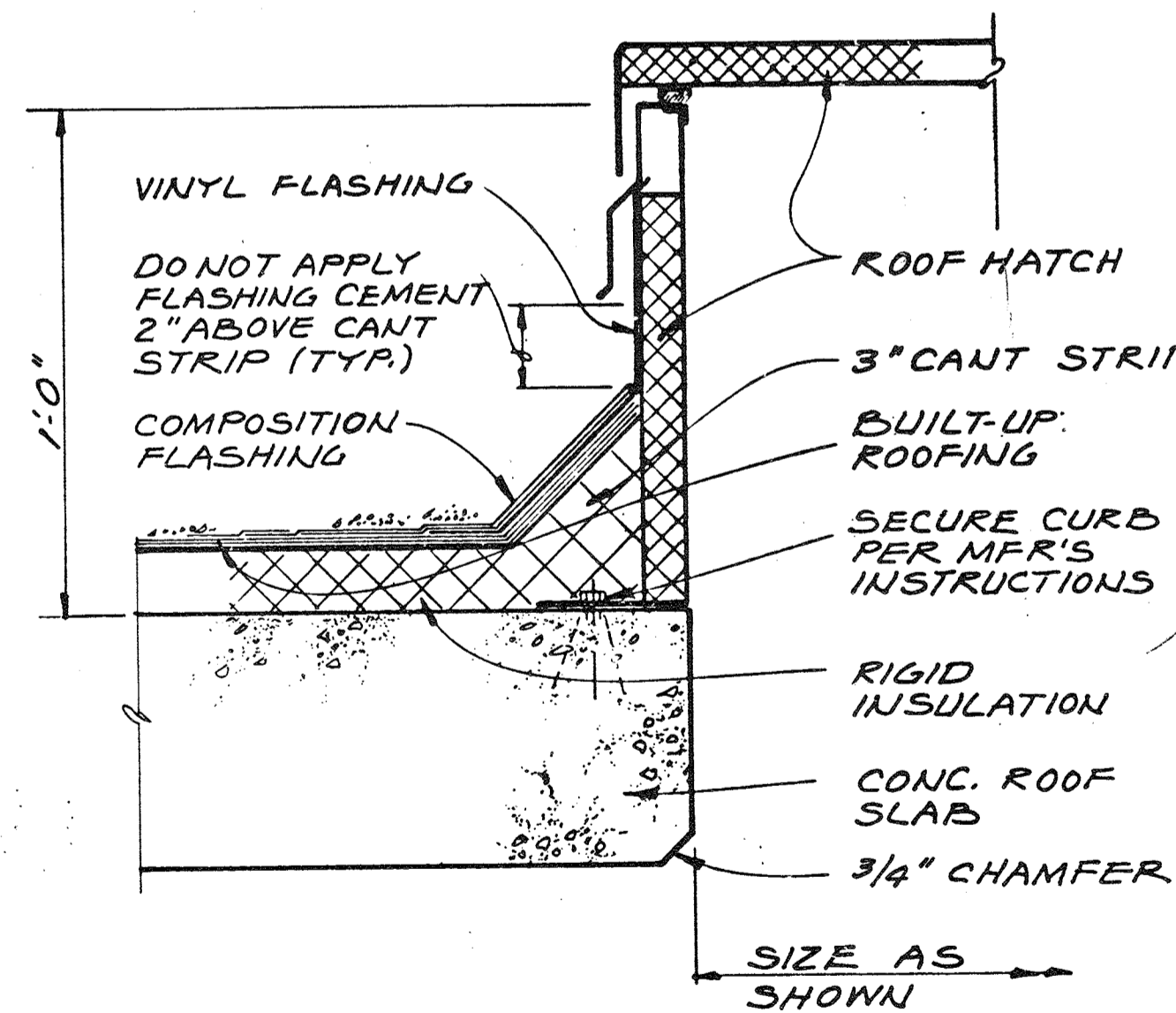
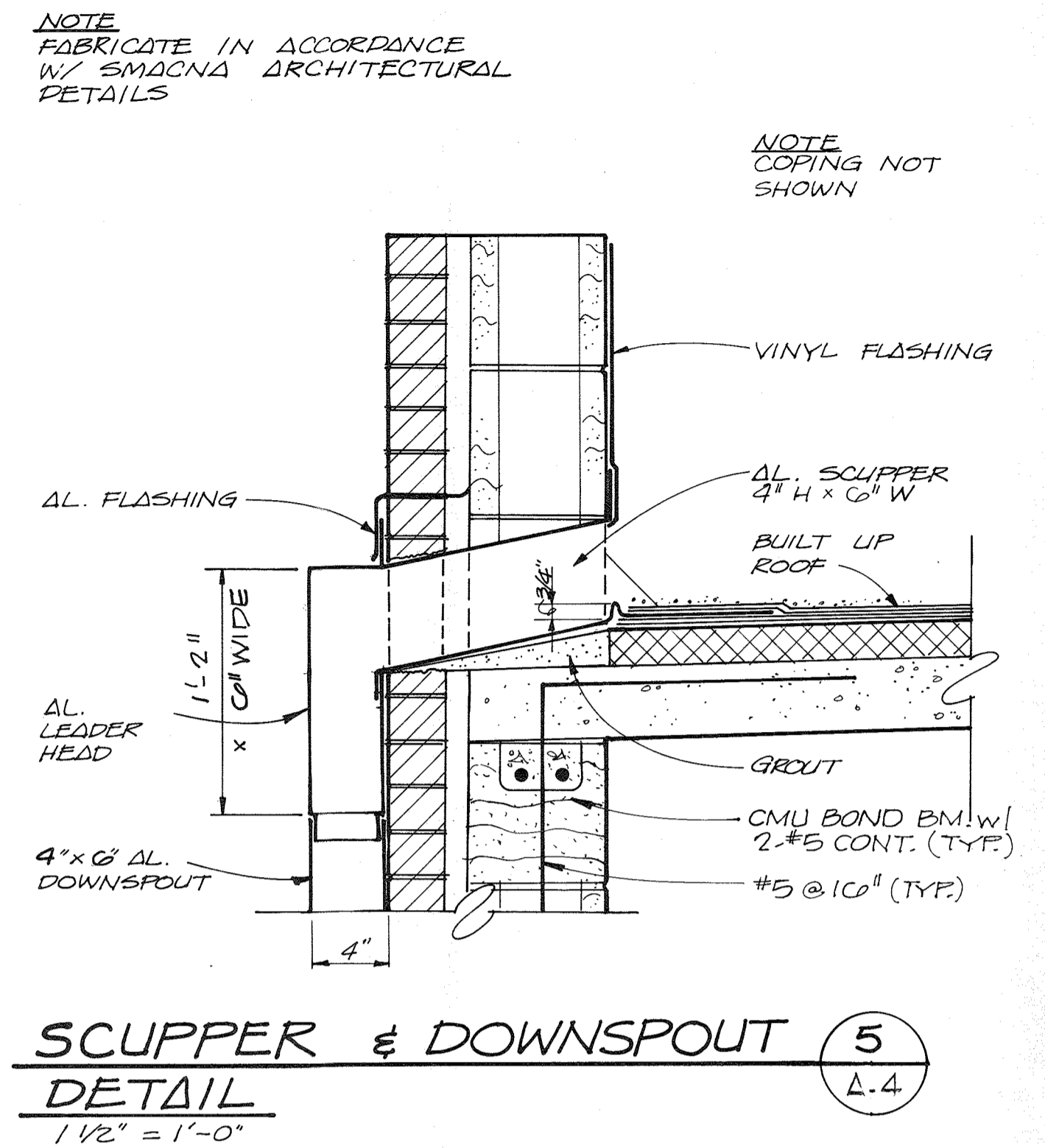
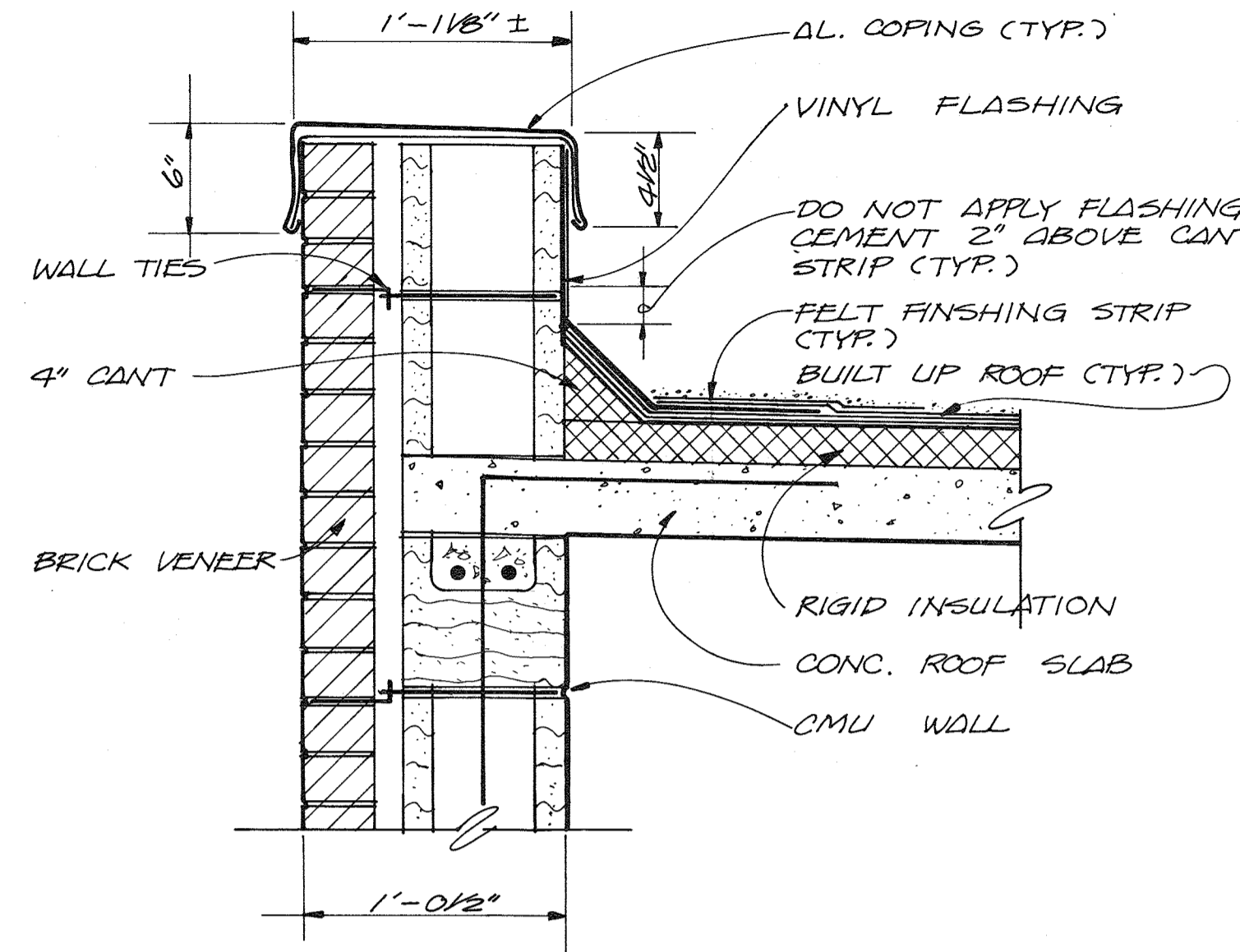
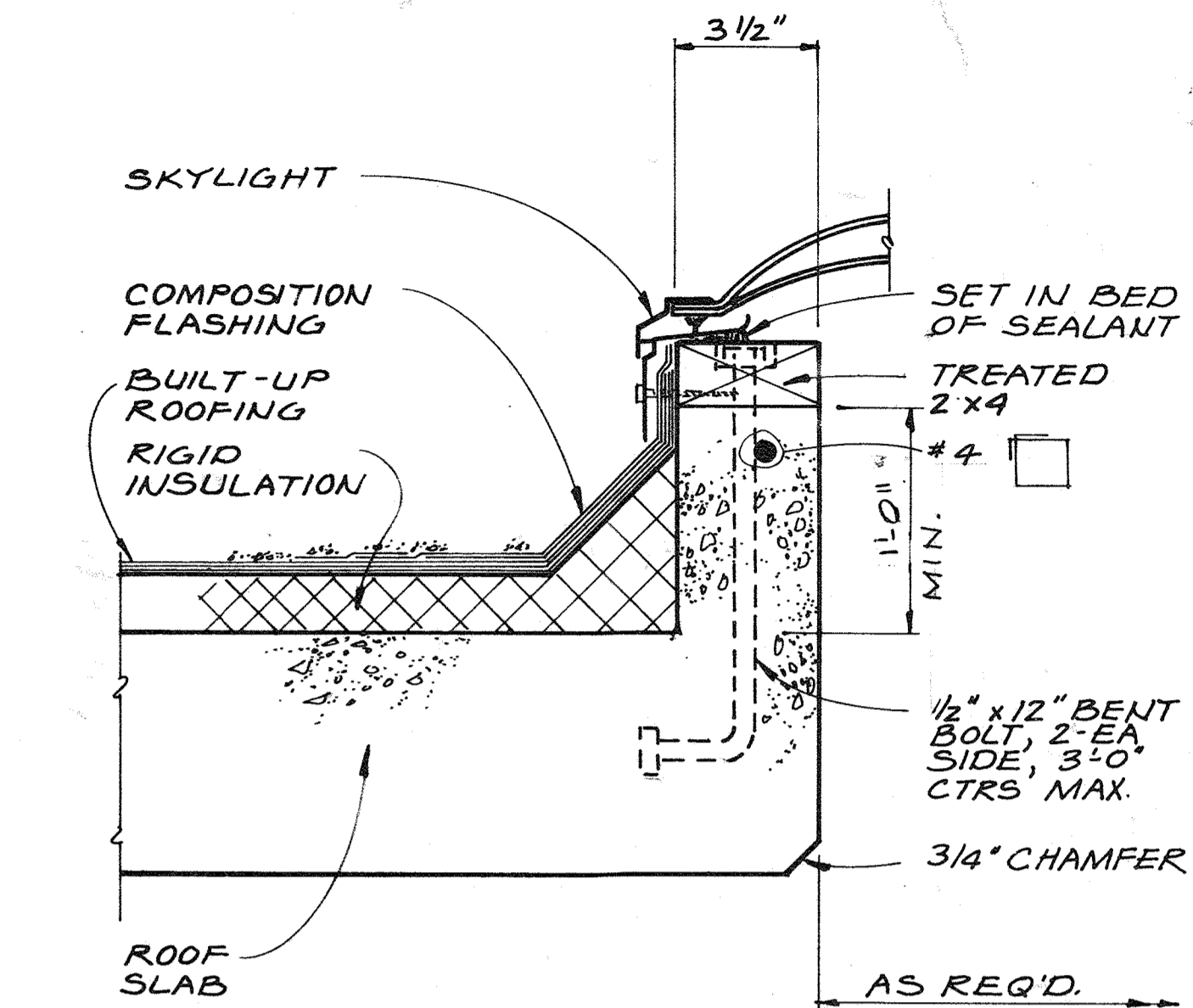
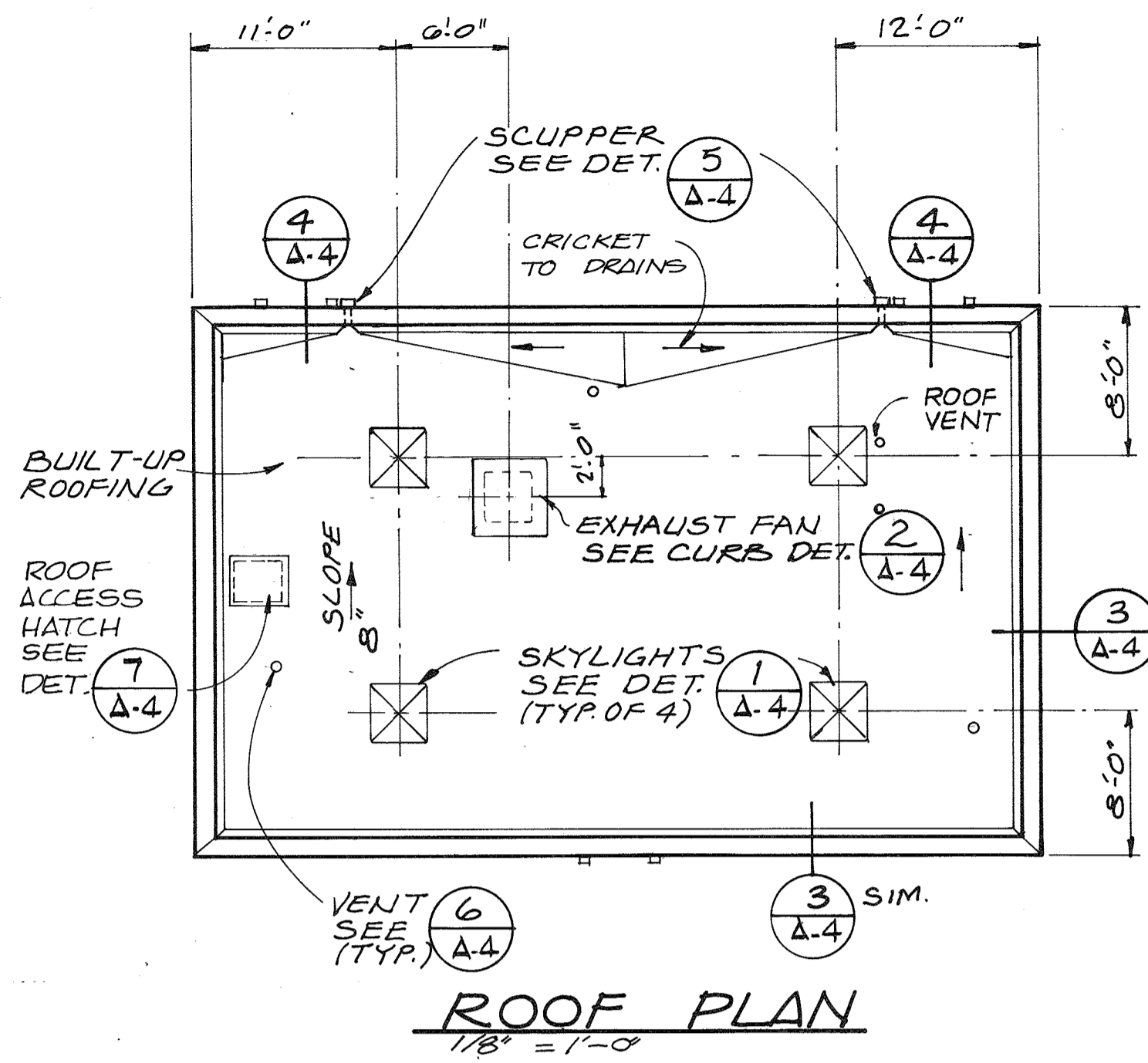
GRIT PROCESSING BLDG.
WALL SECTIONS

ARCHITECTURAL

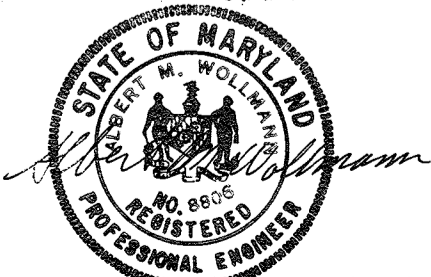
SHEET
OF
A-3
DATE 8-78
DWG.
NO. W1078.B1



CH2M HILL	DES. WTG/FLG				
	DR. AFW				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY



RECORD DRAWING



DES. WTG					
DR. AFW					
CHK.					
APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

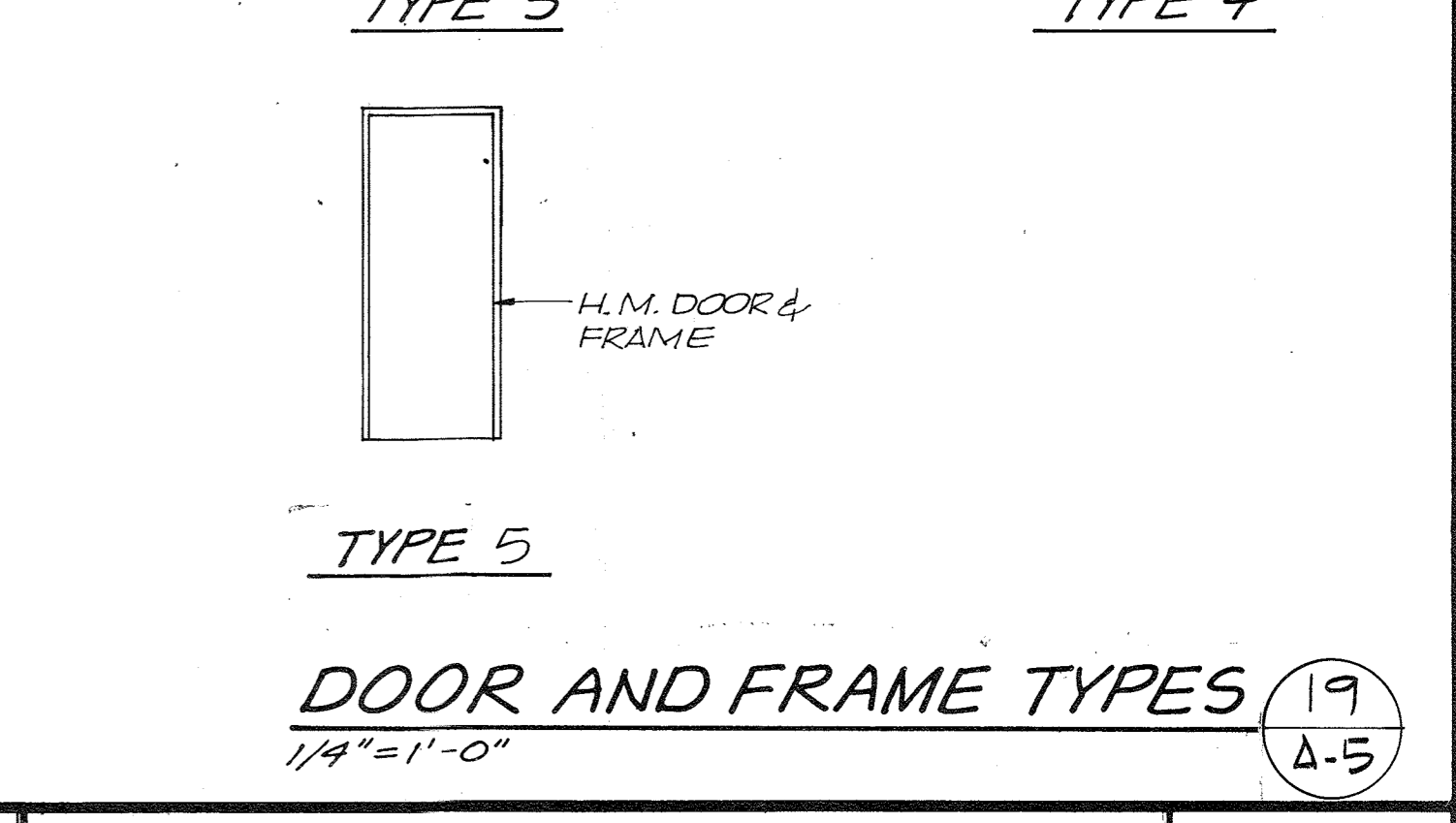
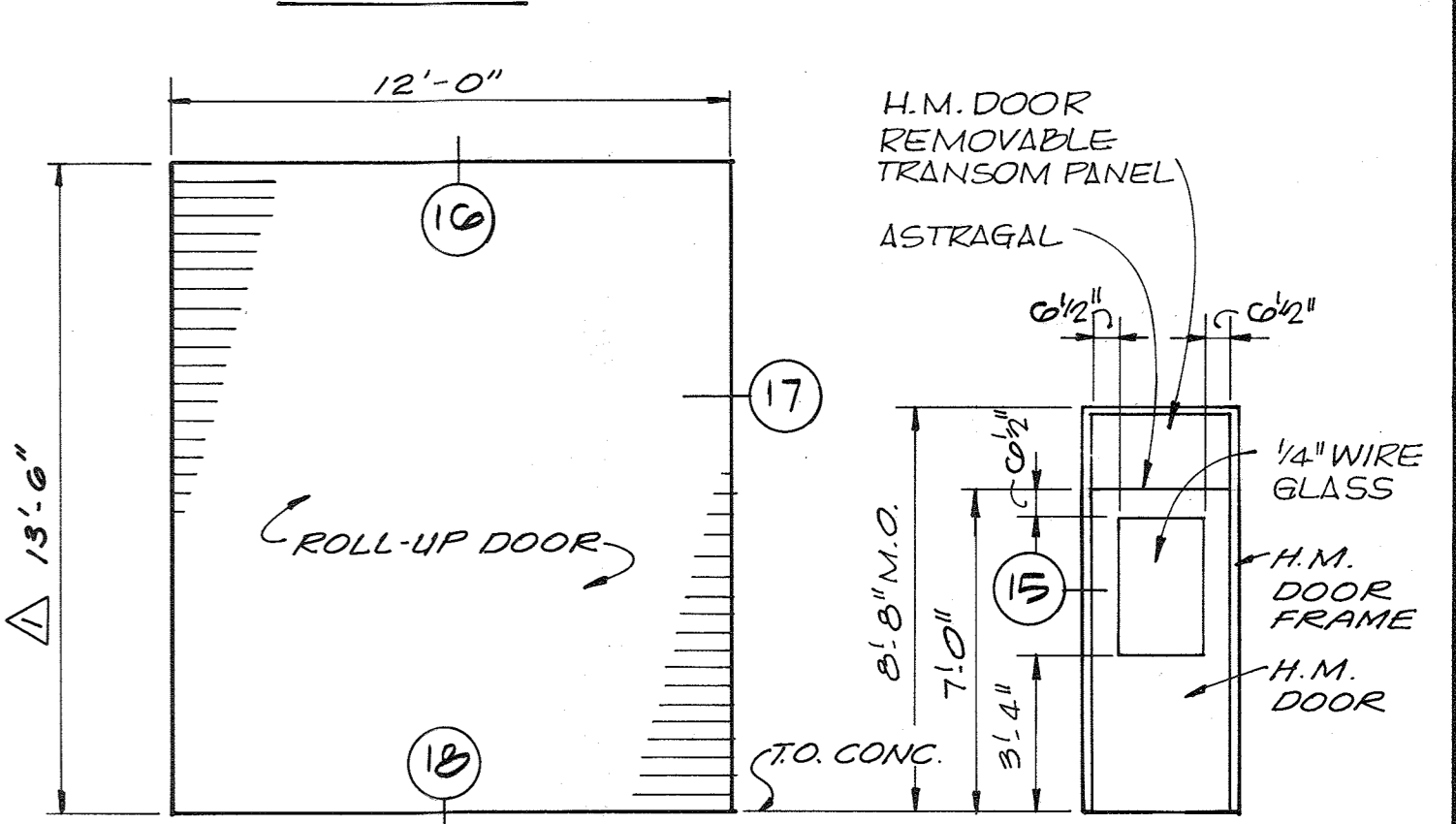
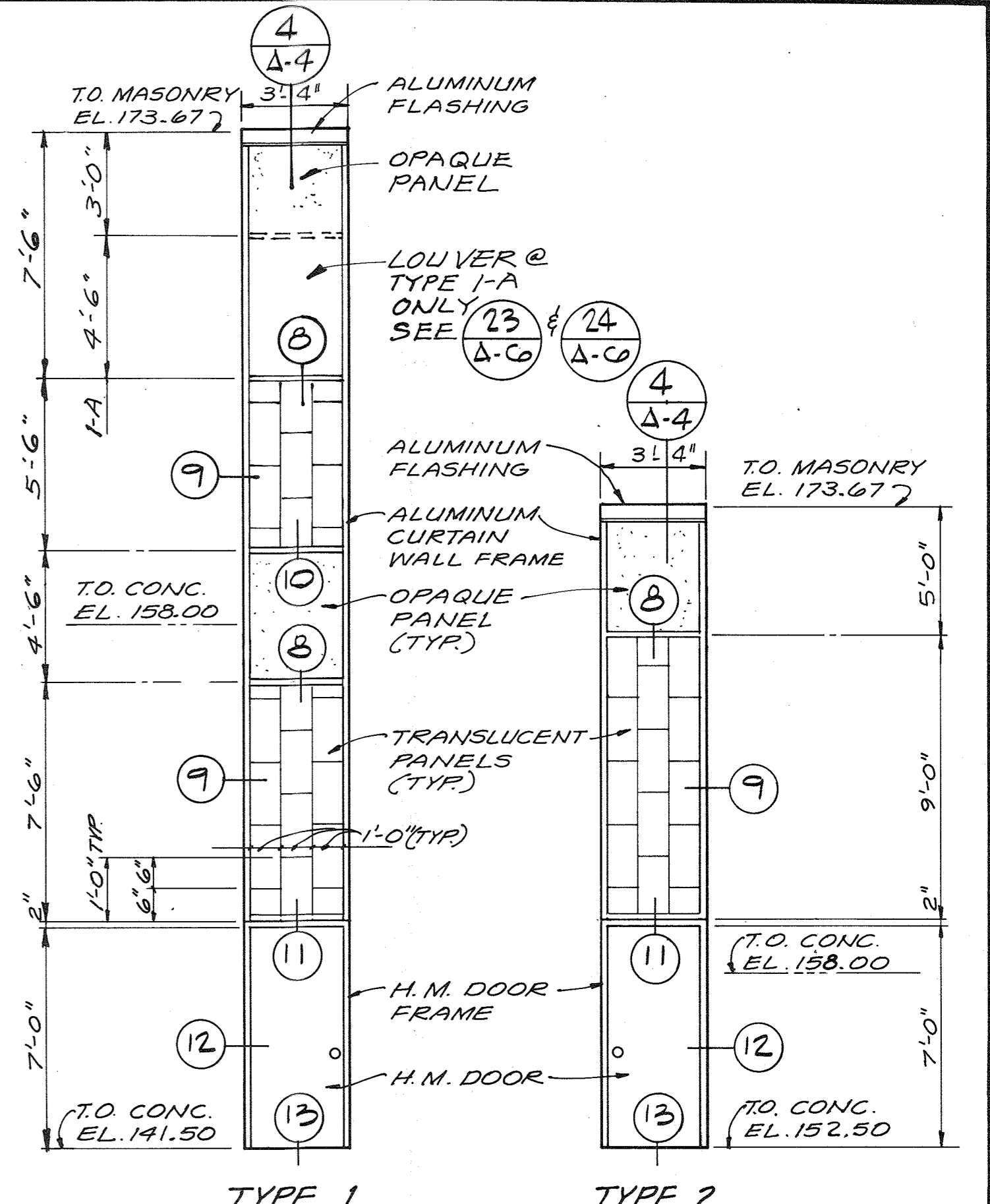
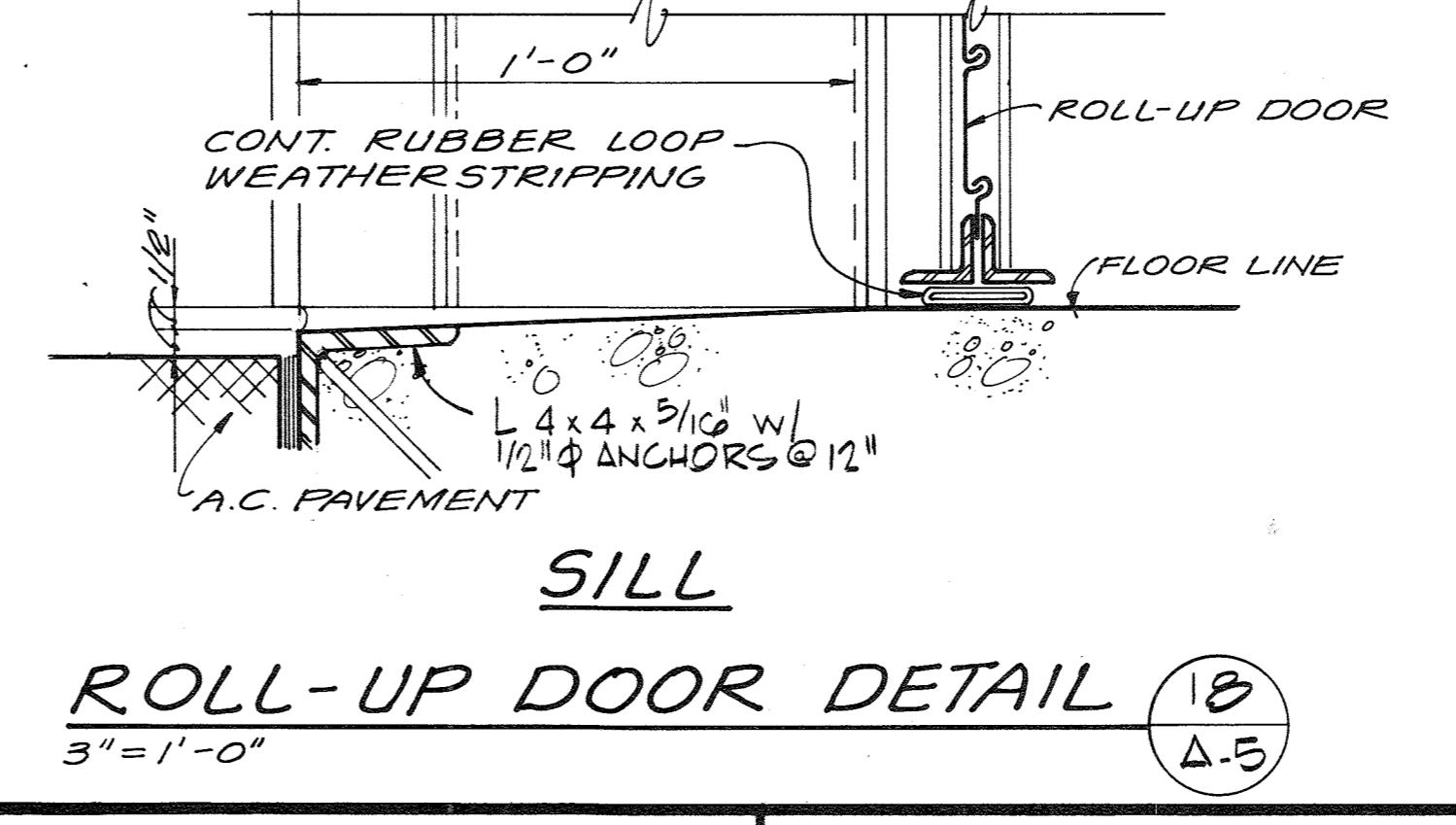
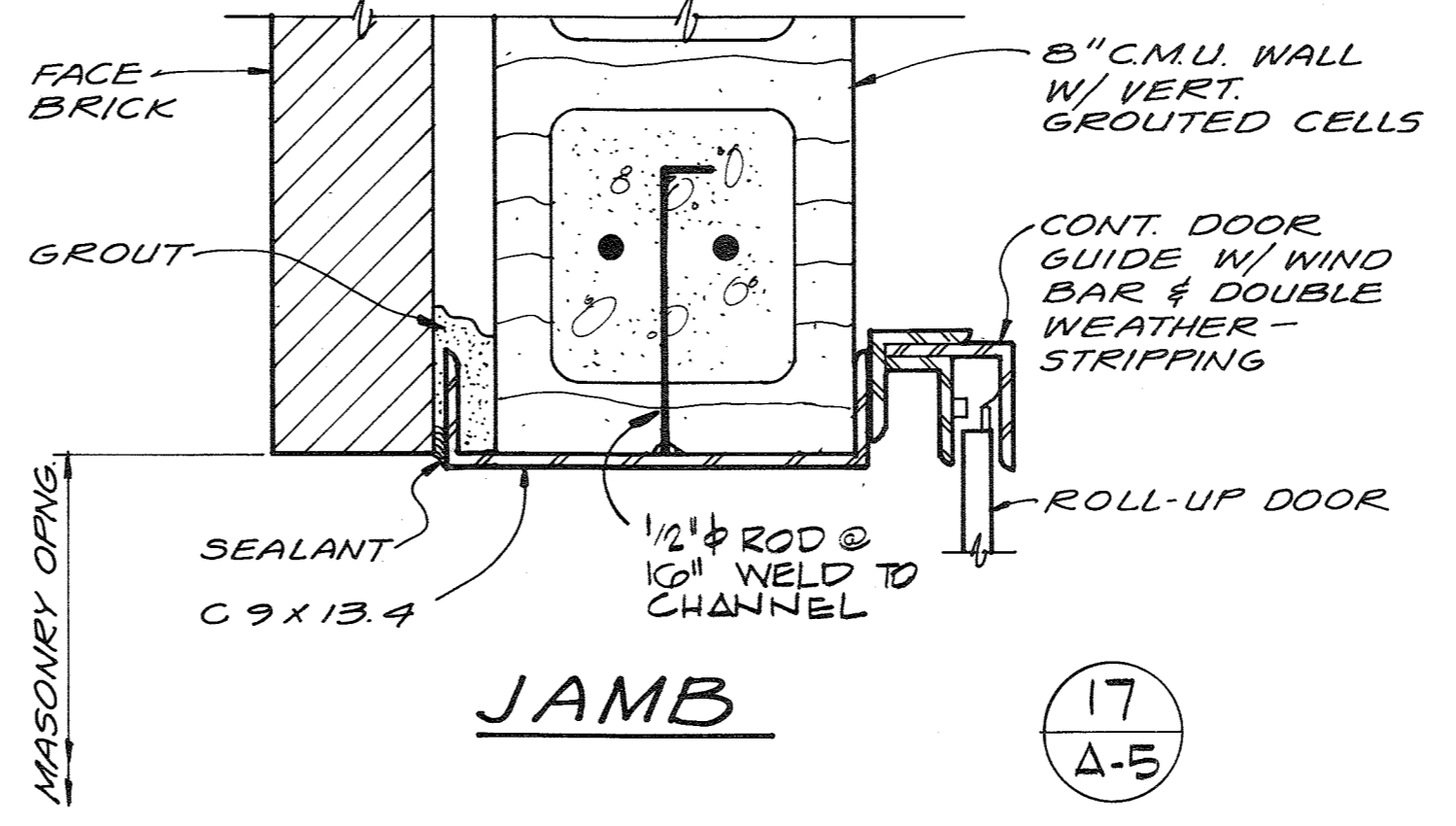
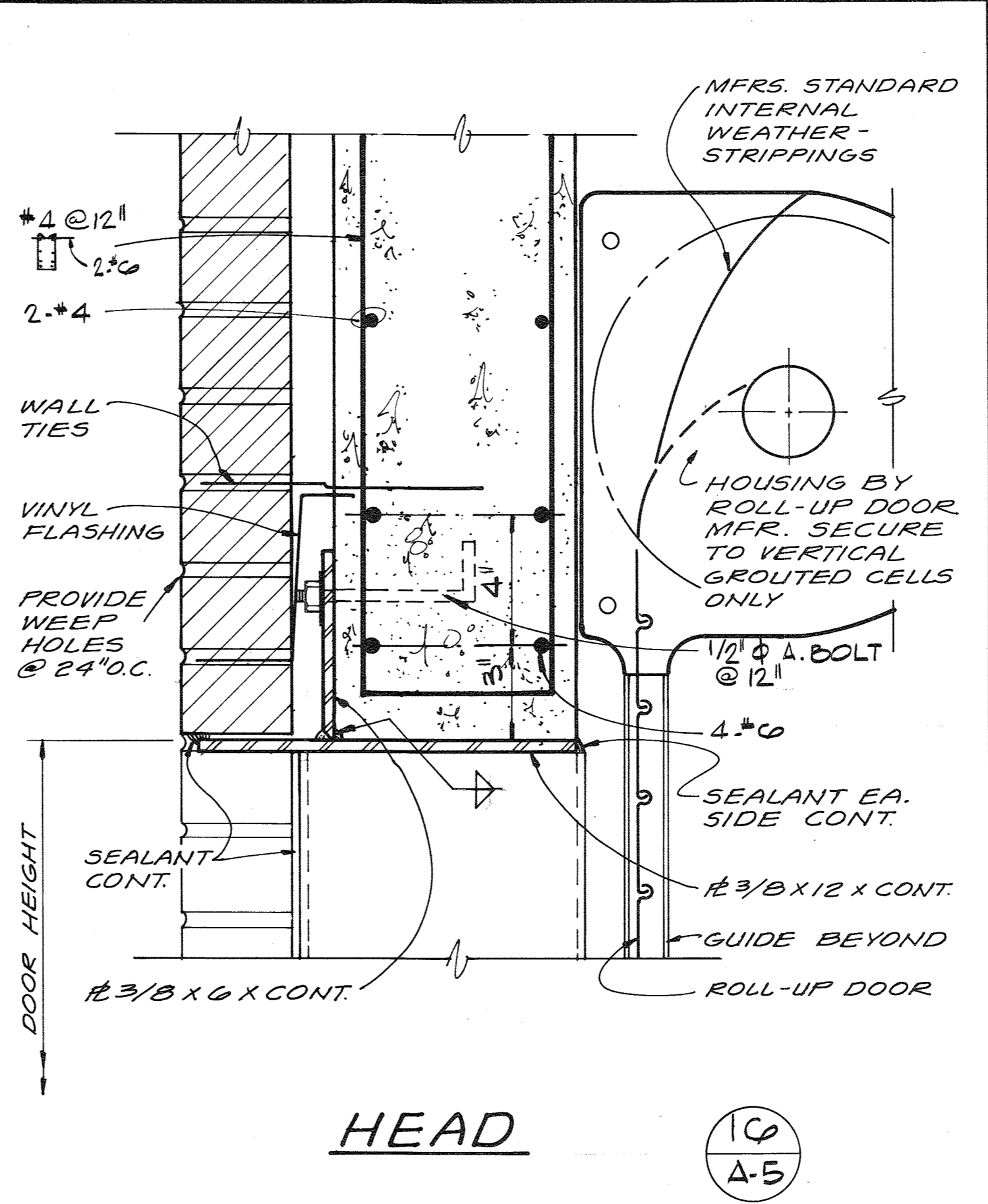
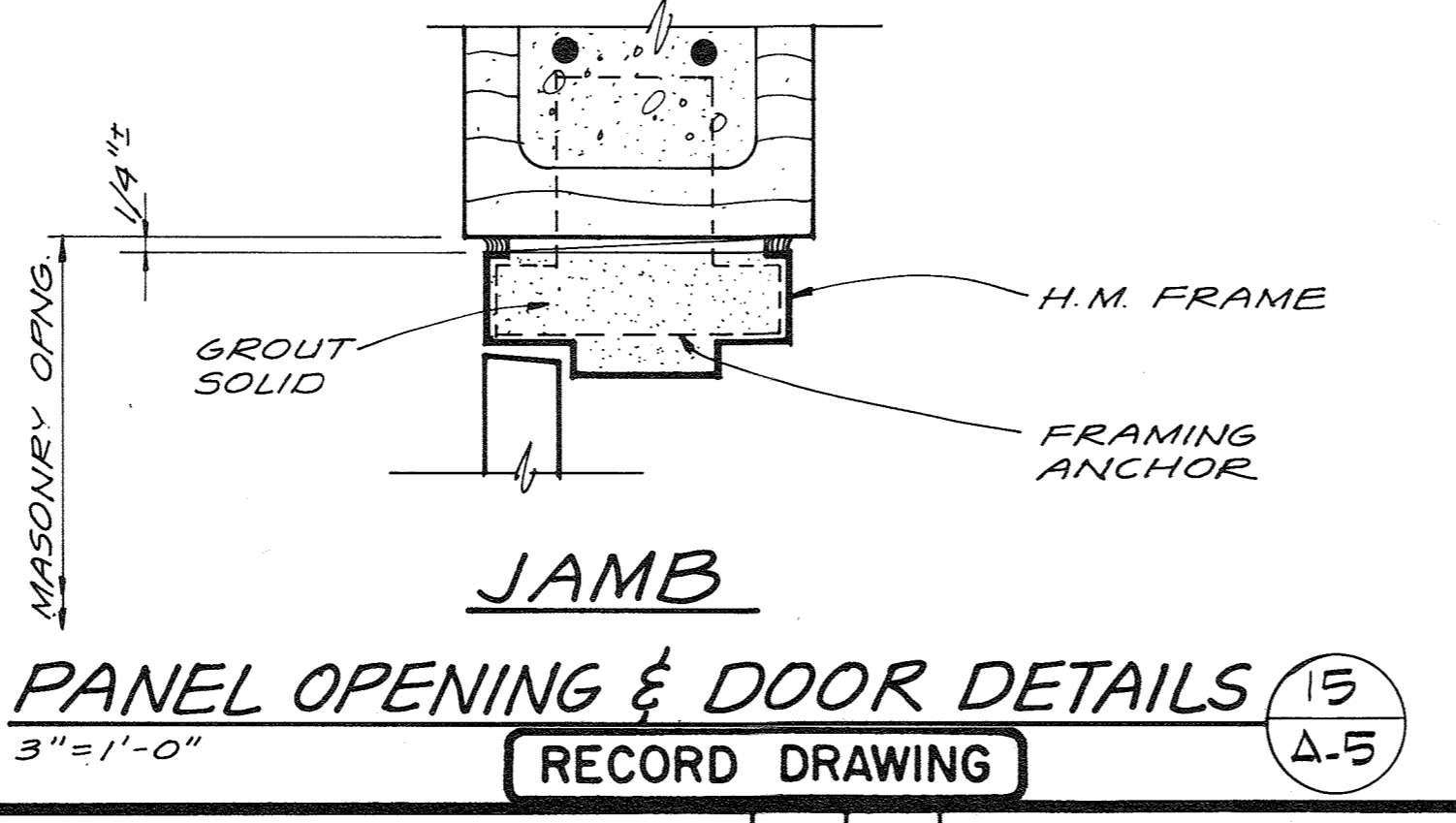
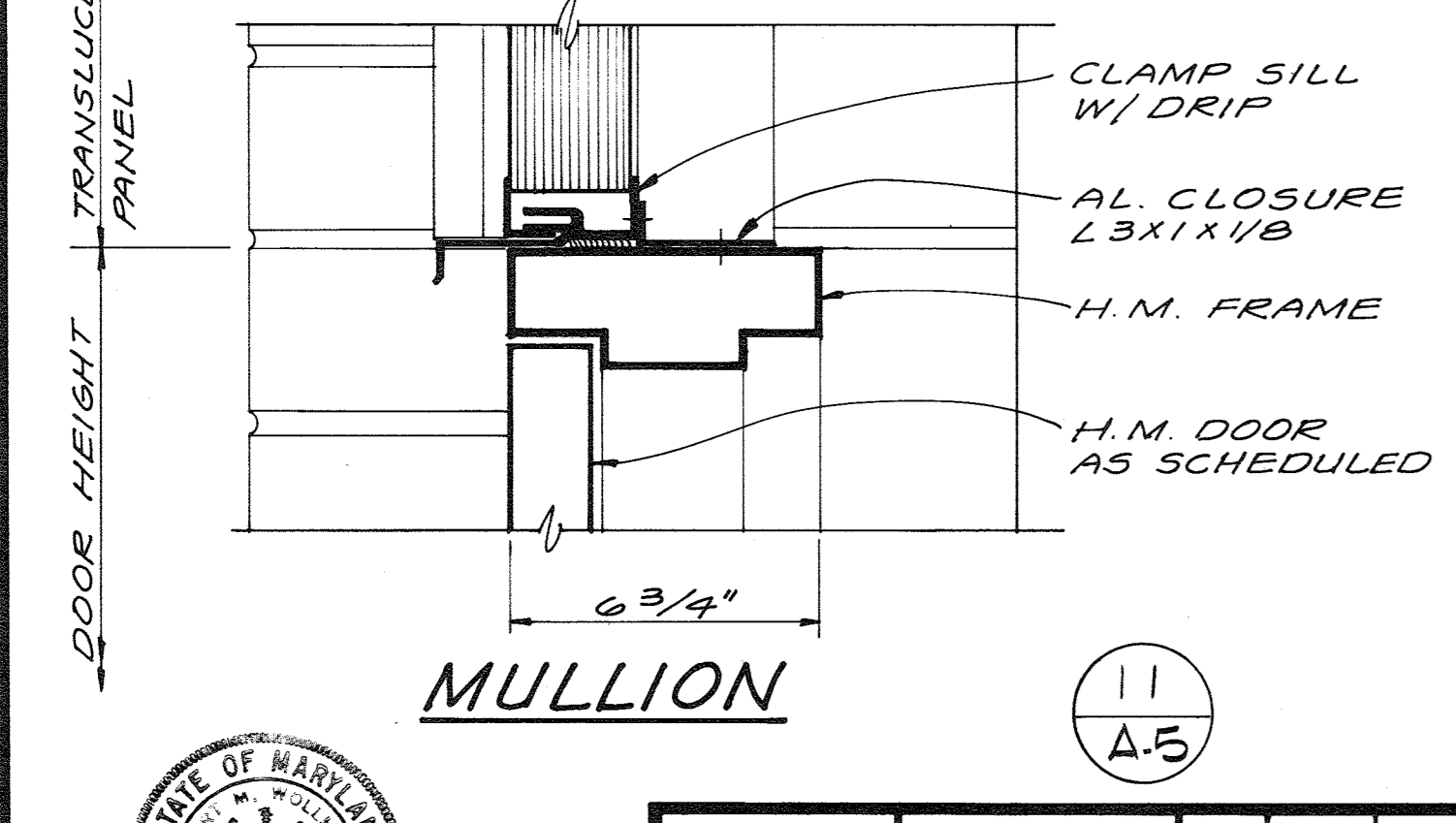
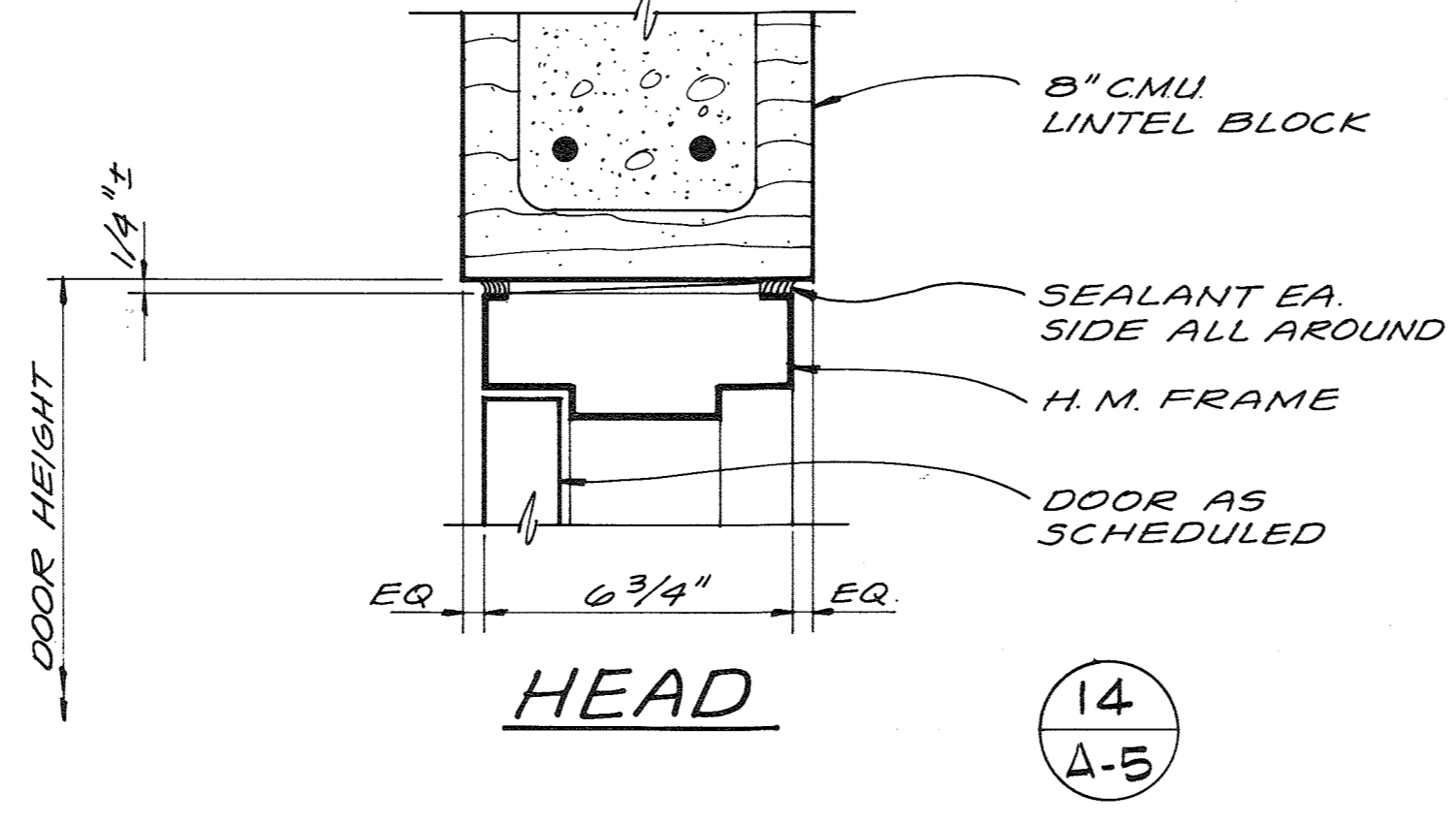
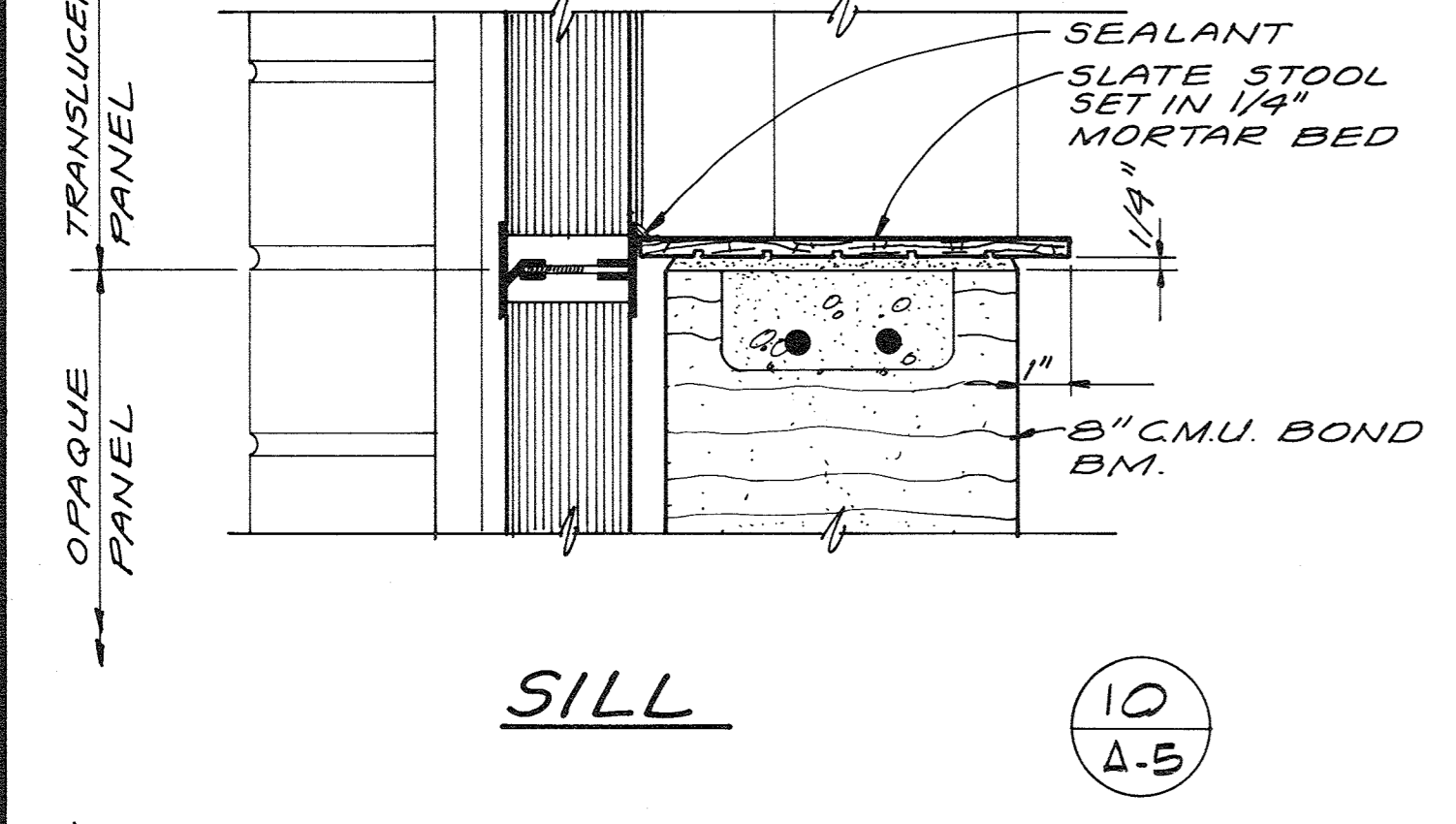
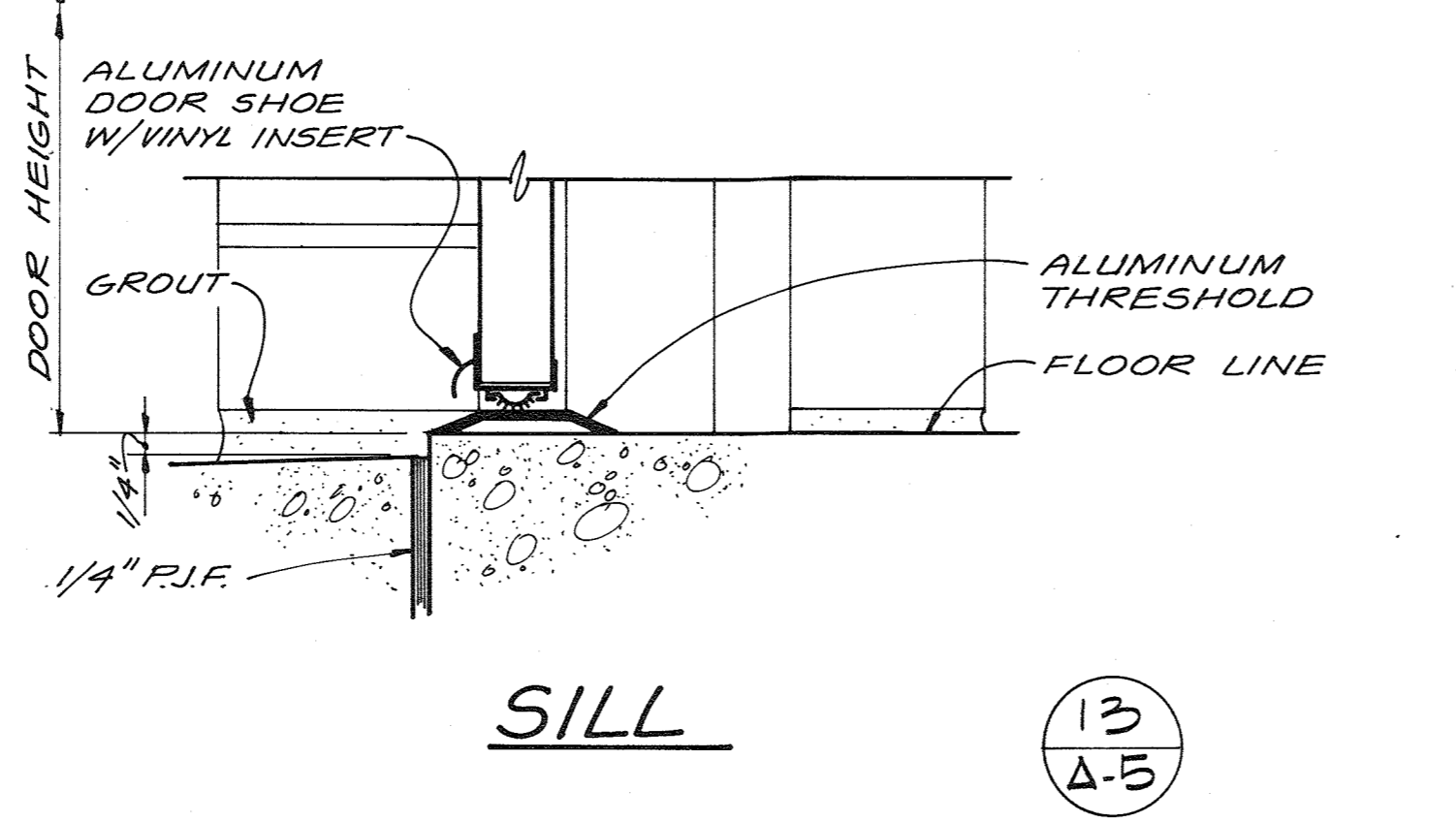
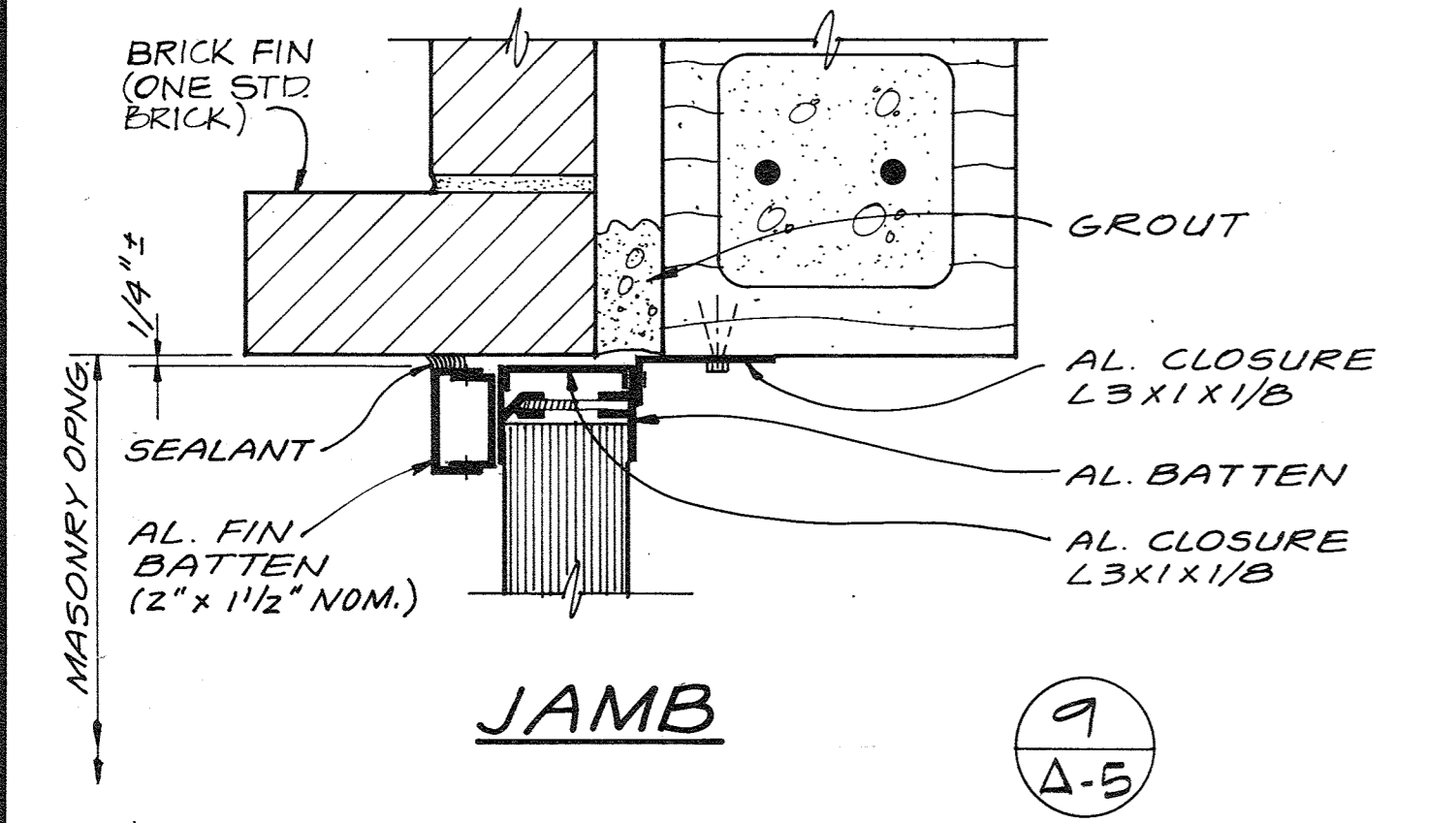
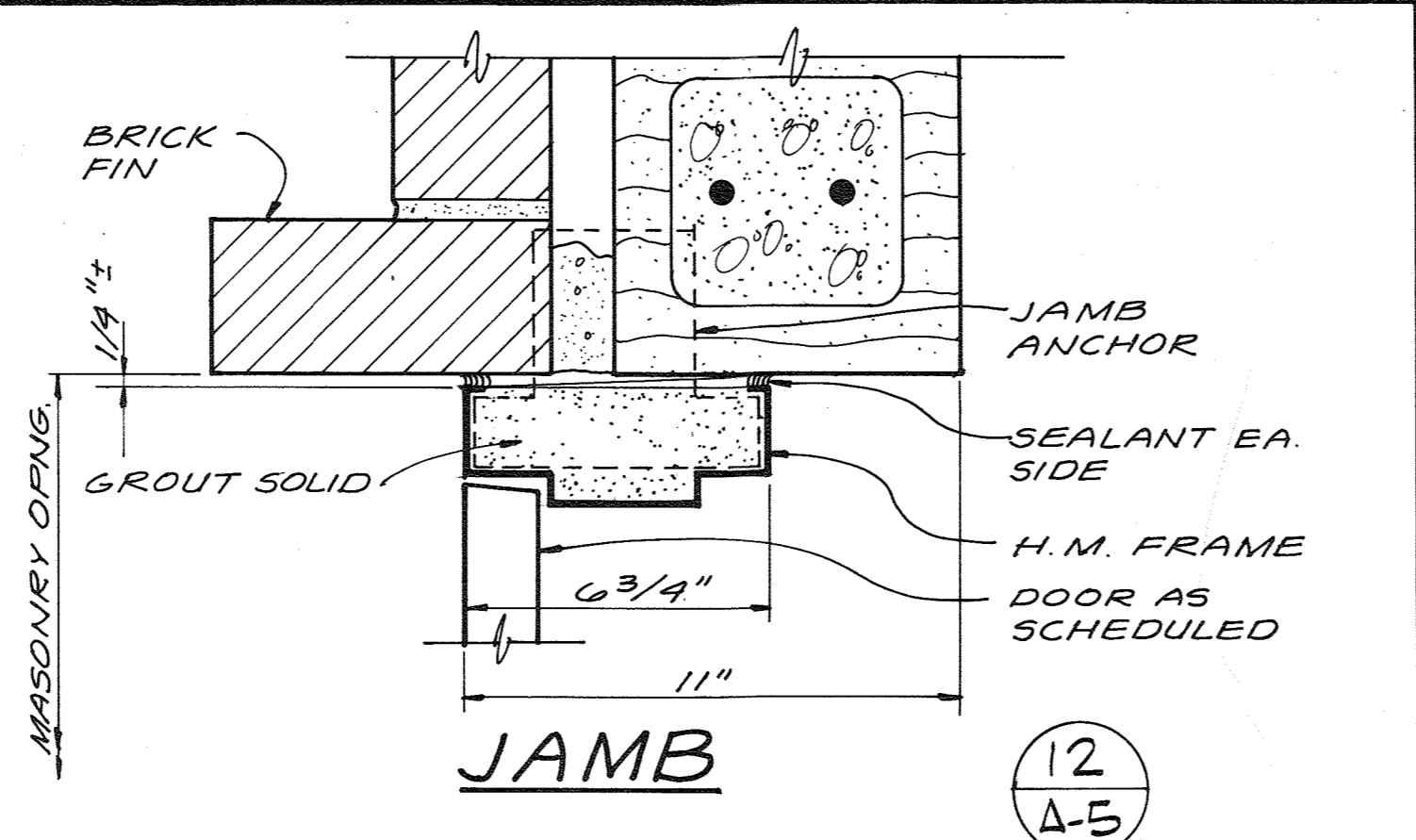
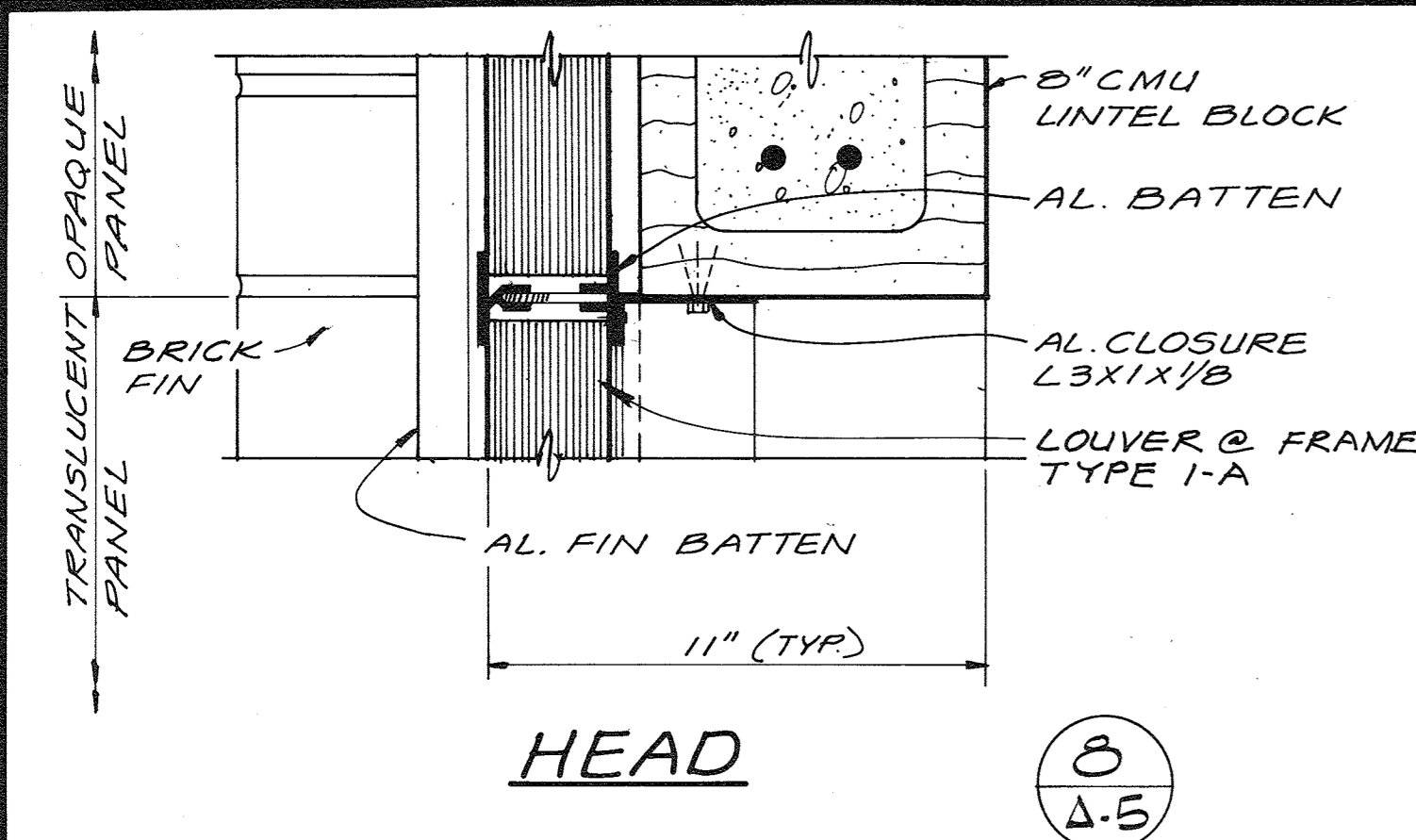
Robert E. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
ROOF PLAN & SECTIONS

ARCHITECTURAL

SHEET
OF
A-4
DATE 8-78
DWG.
NO. W1078.B1



PANEL OPENING & DOOR DETAILS
3" = 1'-0"

ROLL-UP DOOR DETAIL
3" = 1'-0"

DOOR AND FRAME TYPES
1/4" = 1'-0"

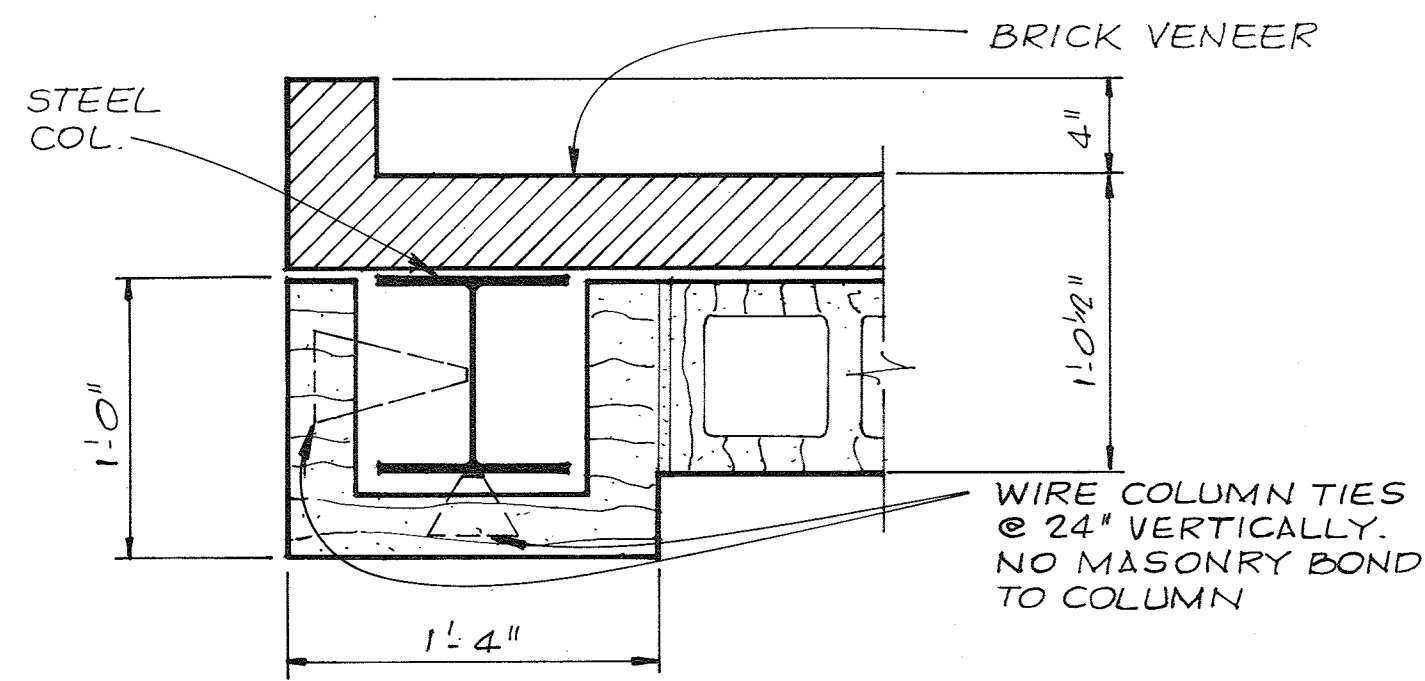


DES. WTG/AFW					
DR. TWM					
CHK.	10/30/78	MODIFICATION TO DOOR HEIGHT	LG	DBB	
APPD.					

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

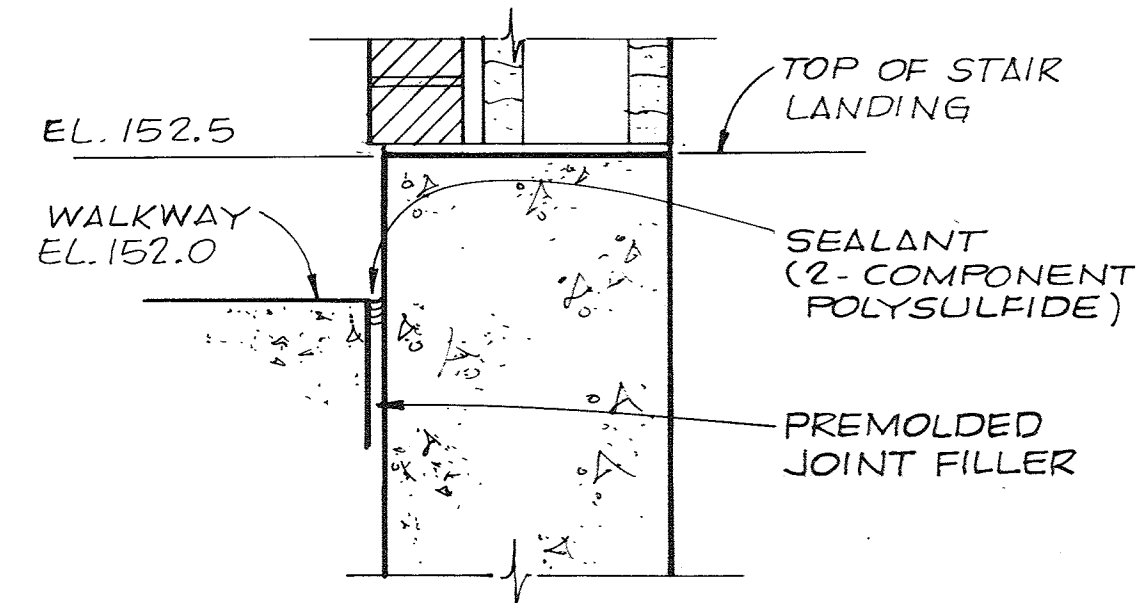
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
DETAILS
ARCHITECTURAL
SHEET A-5
OF
DATE 8-78
DWG. NO. W1078.B1



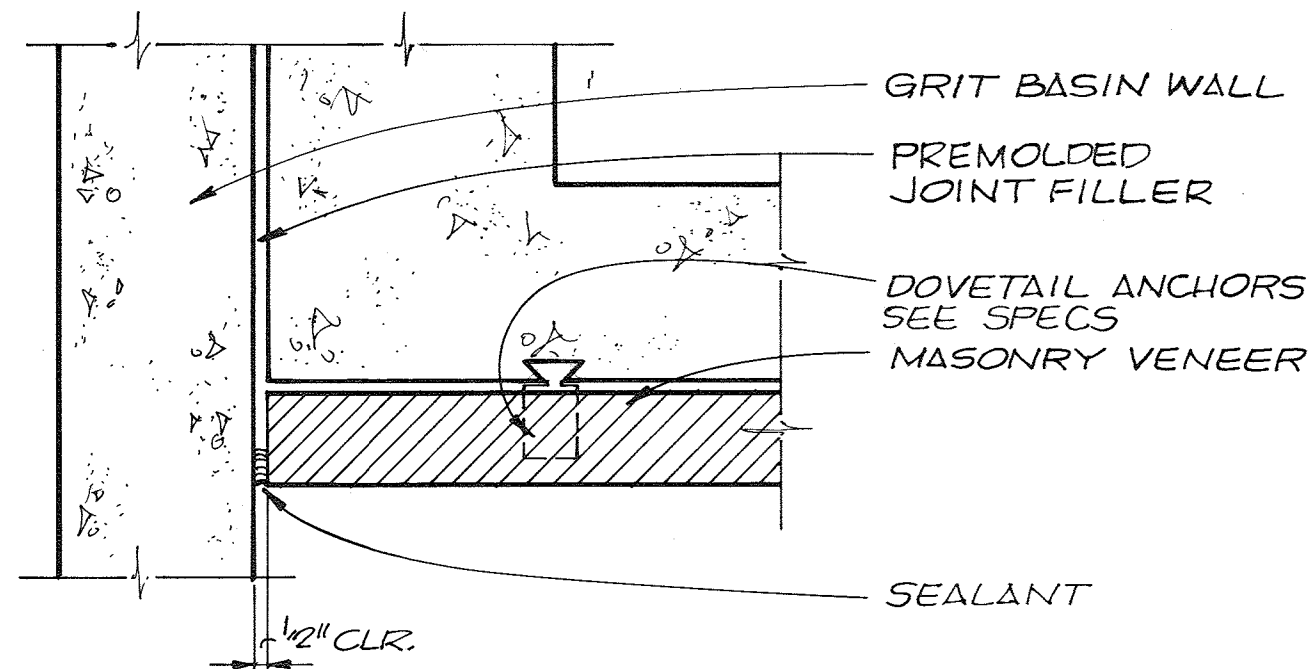
**WIDE FLANGE COL.
@ DOORS #1 & #2**
1/2" = 1'-0"

20
A-1



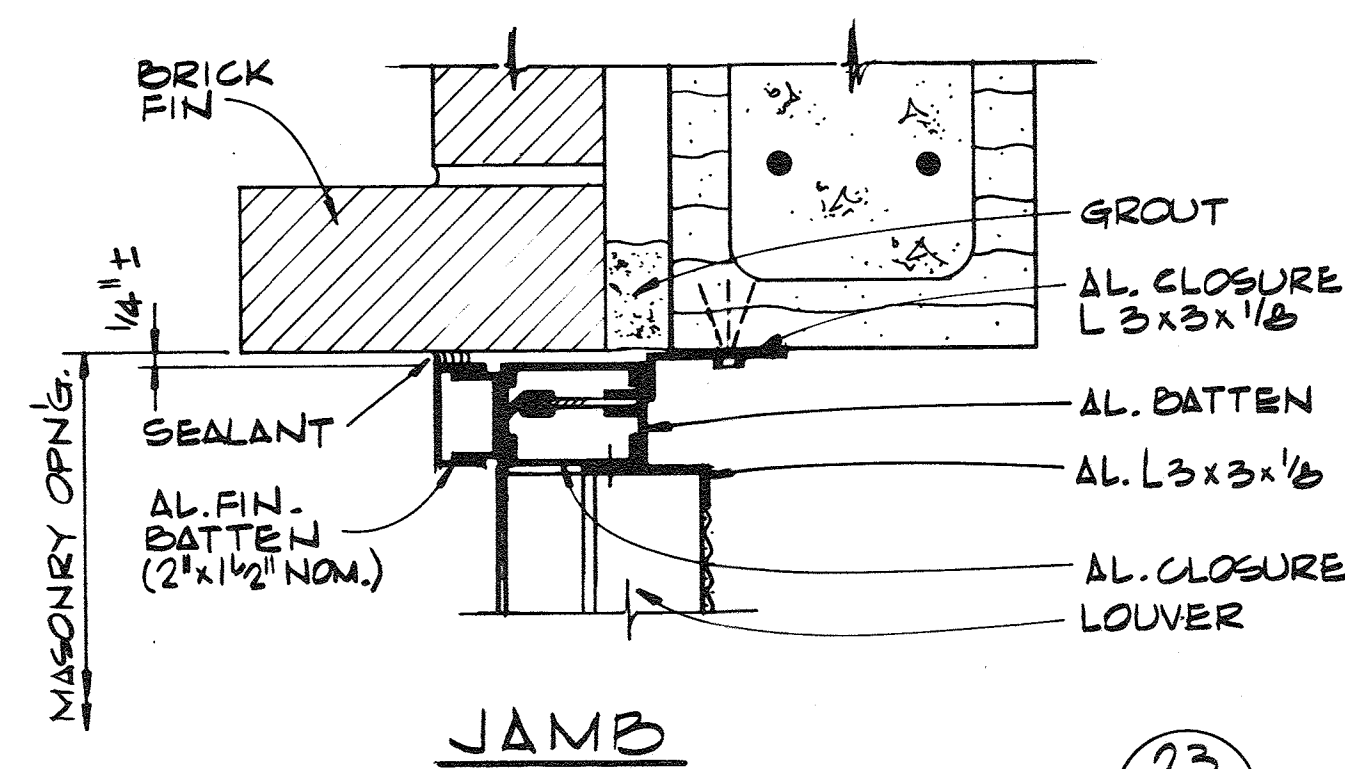
**BRICK DETAIL
@ DOOR #6**
1/2" = 1'-0"

21
A-1



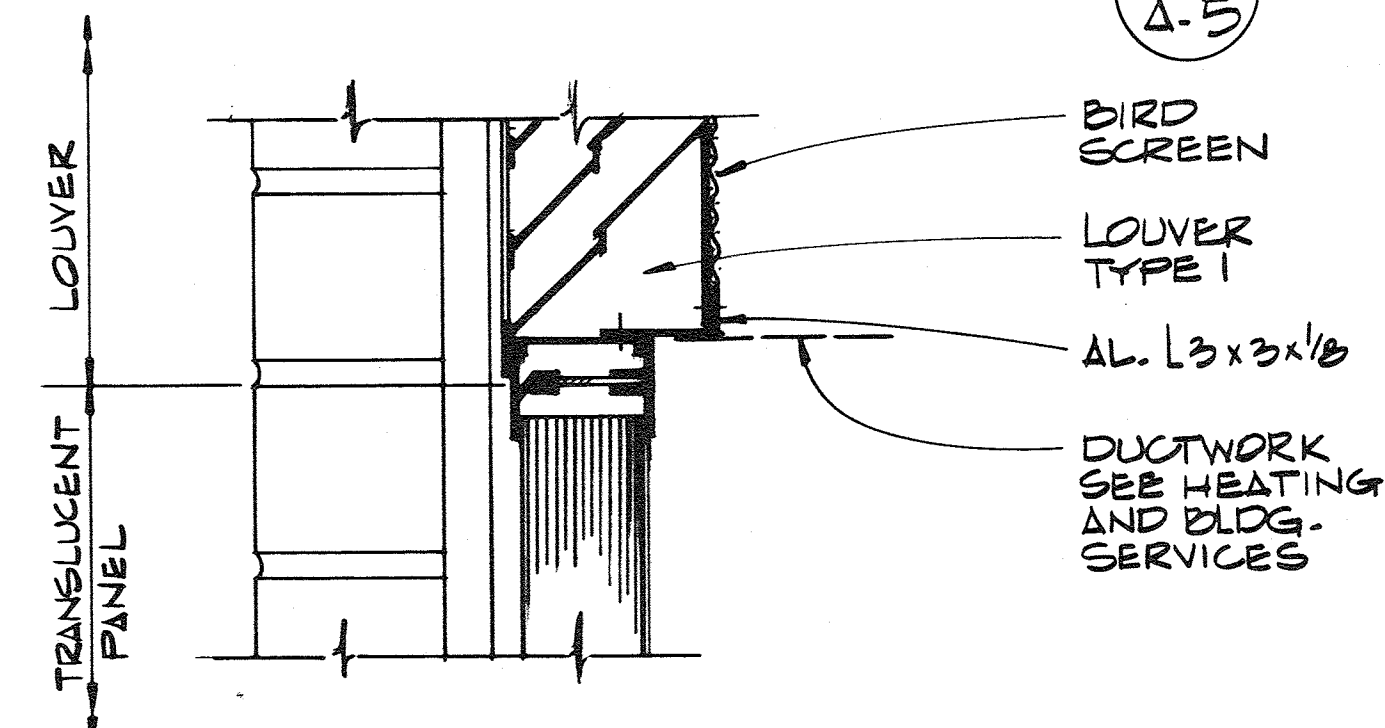
CORNER DETAIL
1/2" = 1'-0"

22
A-1



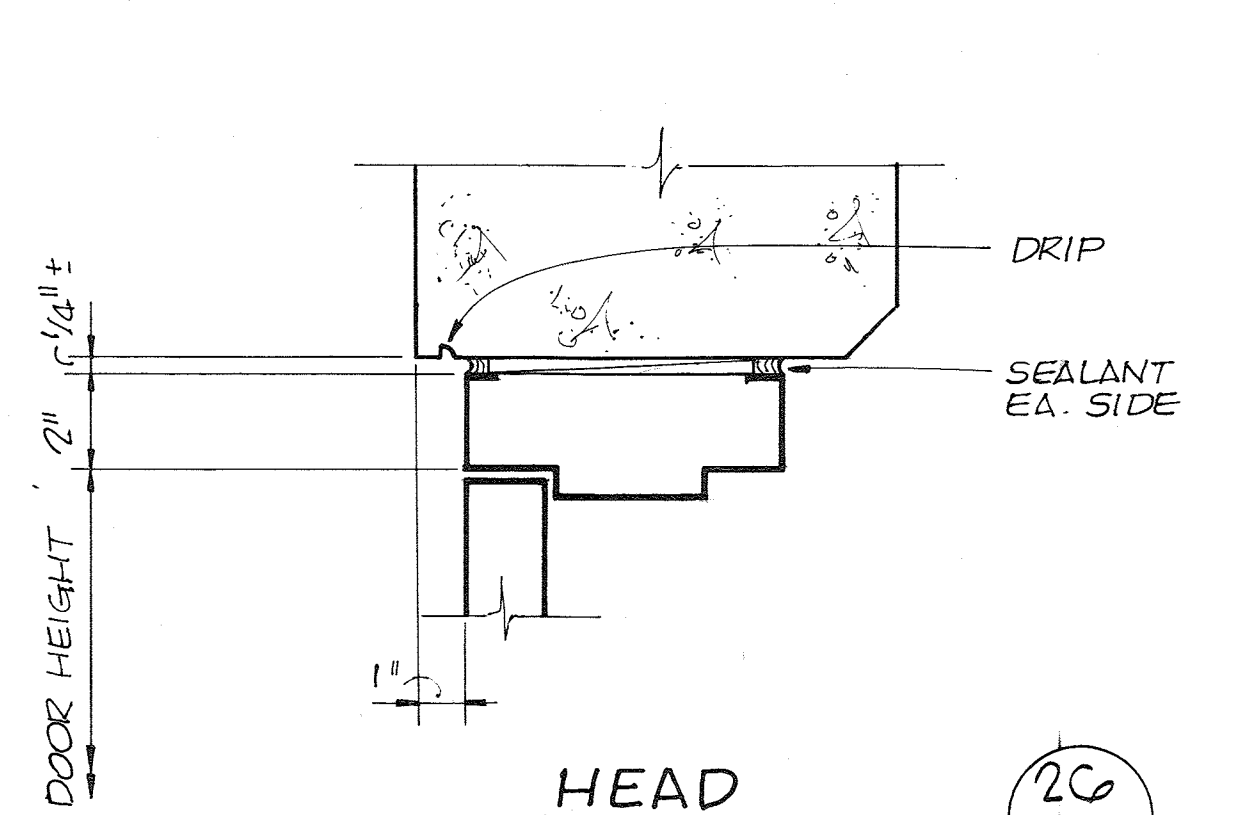
JAMB

23
A-5



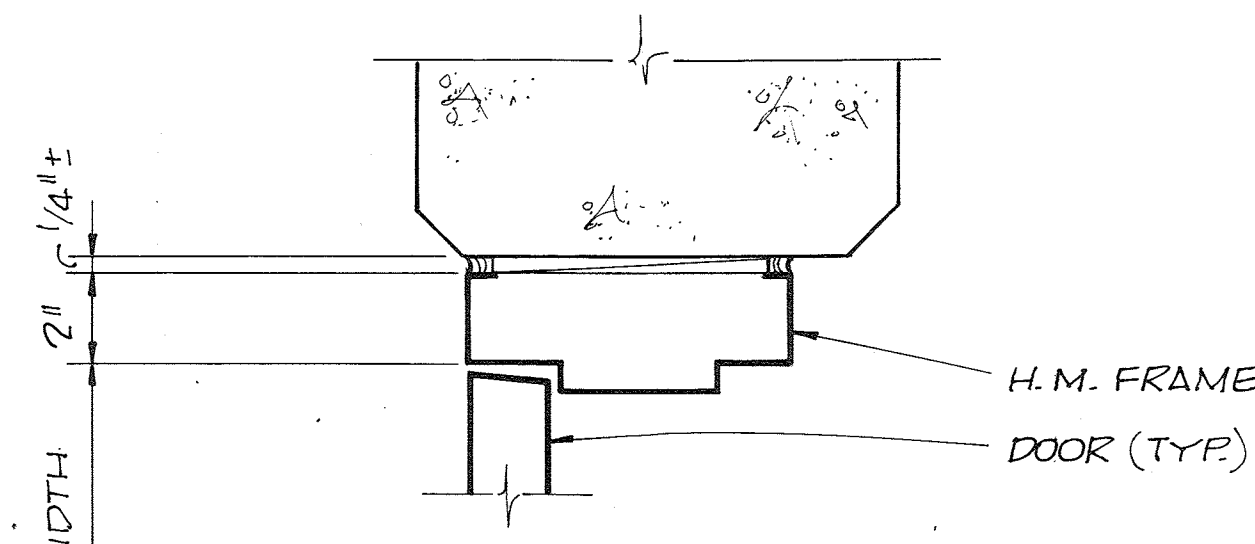
**MULLION
LOUVER DETAILS**
3/4" = 1'-0"

24
A-5



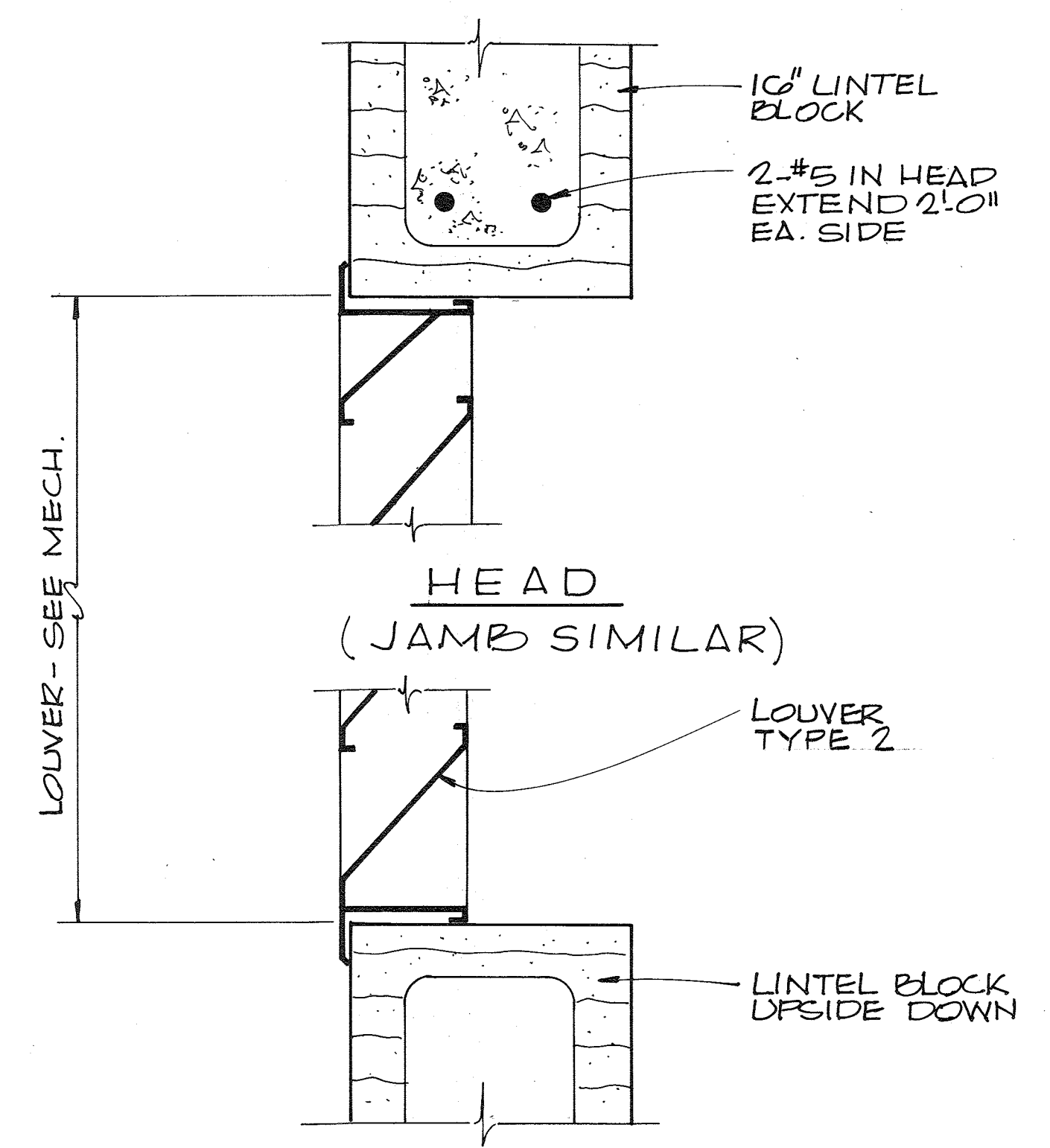
HEAD

26
S-4



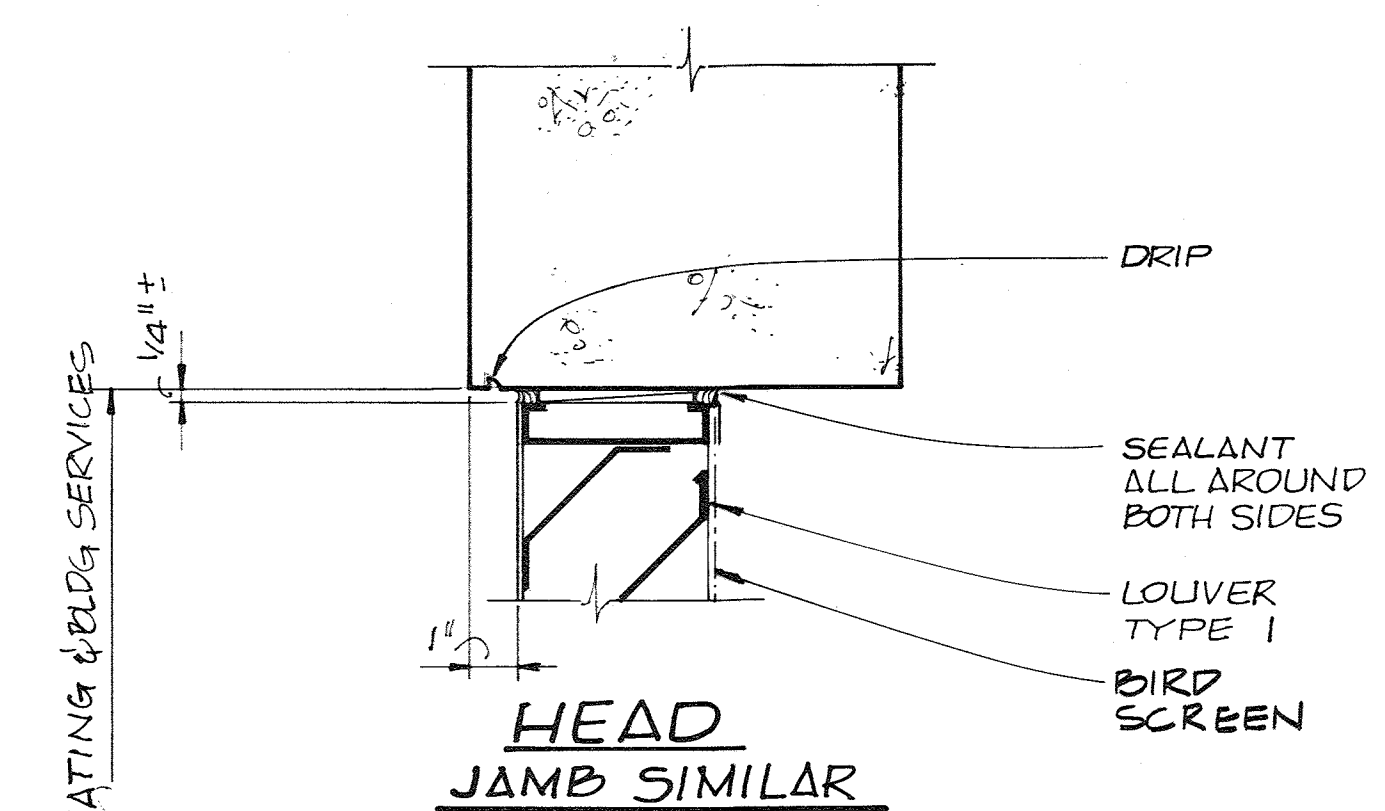
JAMB

27
S-4

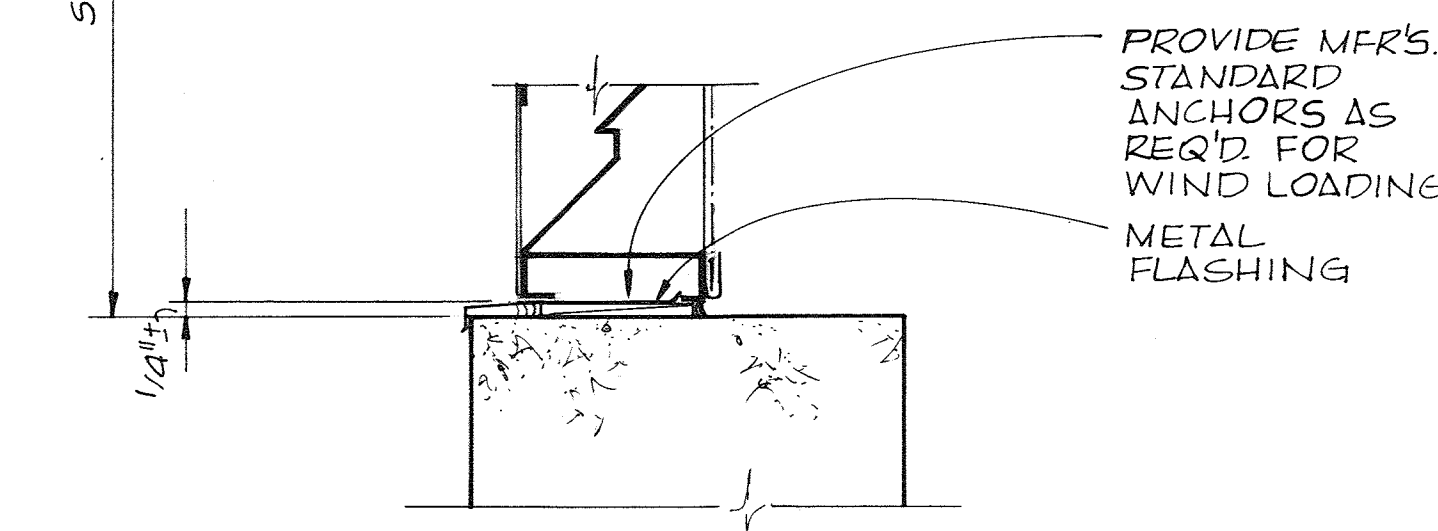


**HEAD
(JAMB SIMILAR)
SILL
INTERIOR LOUVER DETAIL**
3/4" = 1'-0"

29
A-1

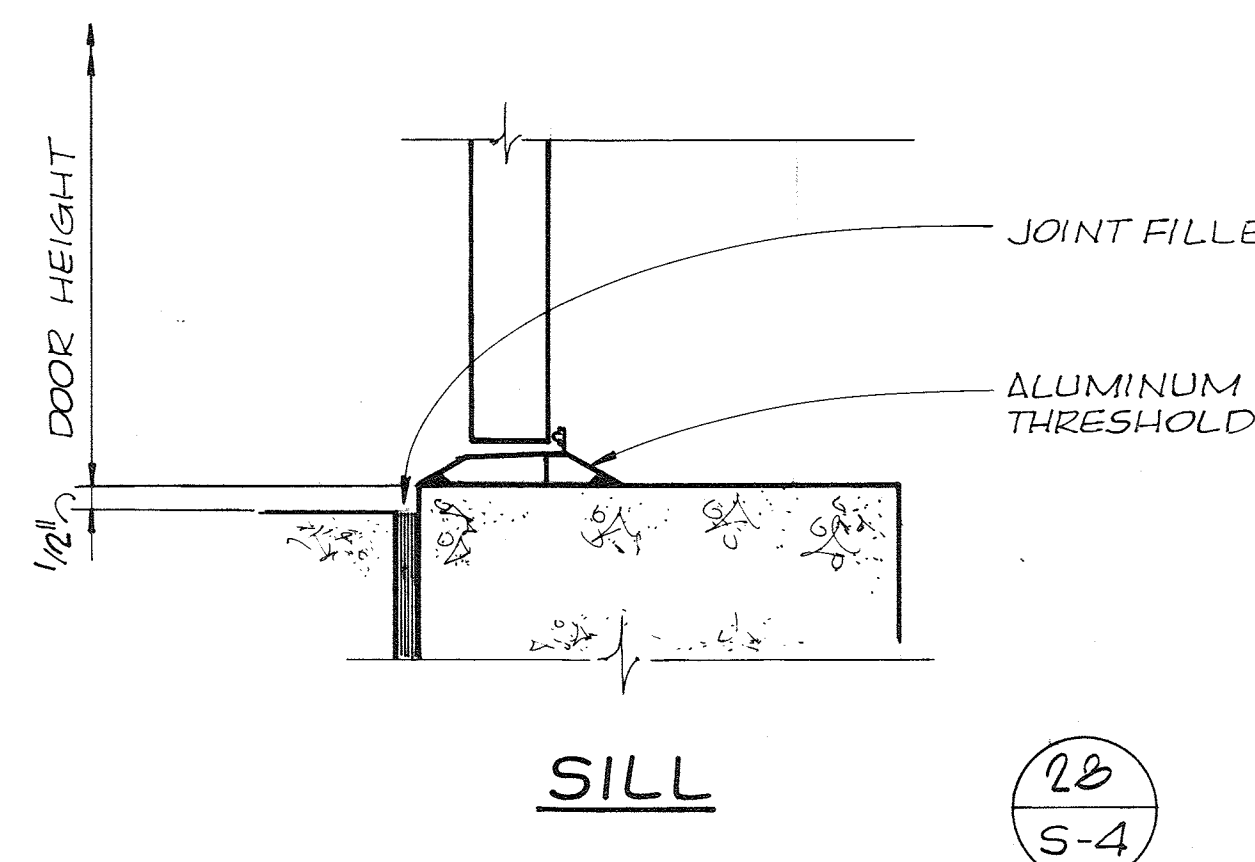


**HEAD
JAMB SIMILAR**



**SILL
LOUVER DETAILS**
3/4" = 1'-0"

25
S-4



SILL

28
S-4

RECORD DRAWING



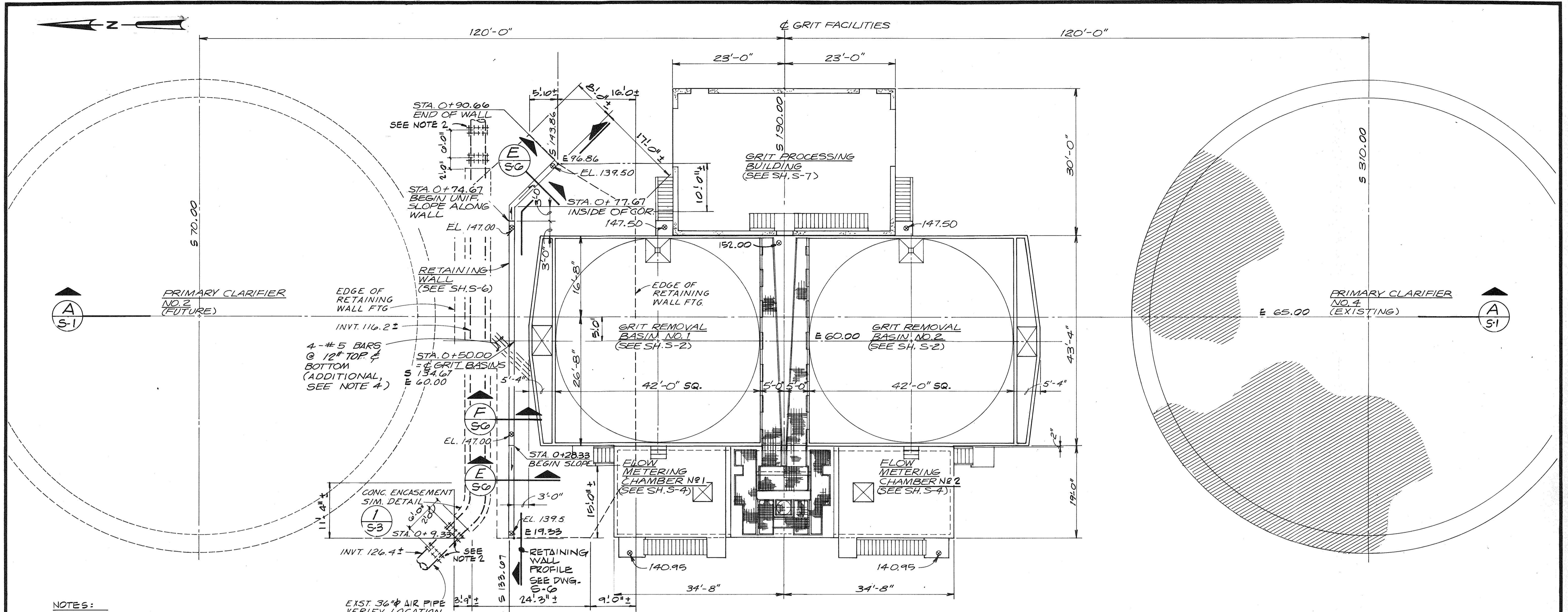
CH2M HILL	DES. DHA				
	DR. DHA				
	CHK.				
	APPD.				
	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

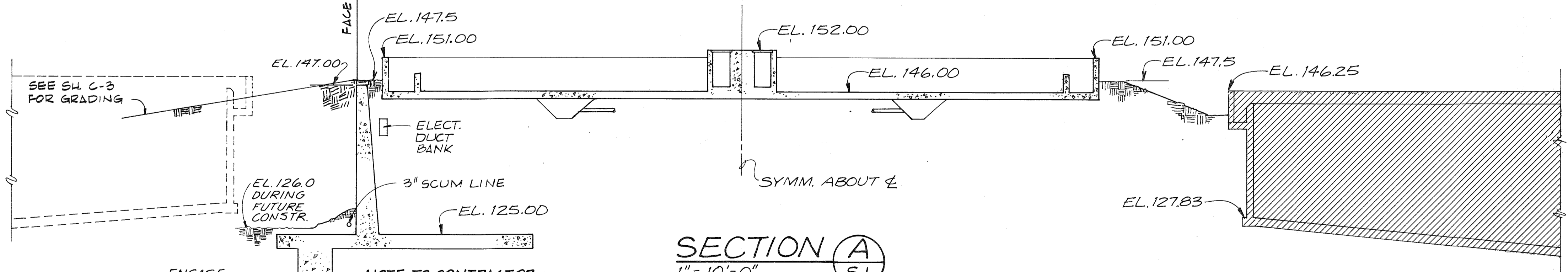
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
DETAILS
ARCHITECTURAL

SHEET
OF
A-6
DATE 8-78
DWG.
NO. W11078.B1

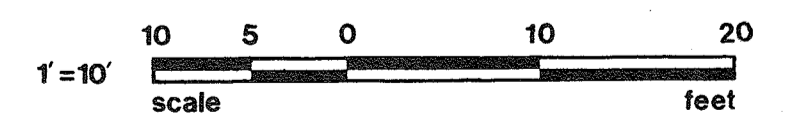


- NOTES:**
- CO-ORDINATE OPENINGS IN RETAINING WALL FOR PIPING WITH PIPING CONTRACTOR. PROVIDE WALL SLEEVE FOR ALL PIPE PENETRATIONS. SEE DETAIL 119 AND 4
 - INSTALL FLEXIBLE COUPLINGS AT EACH END OF RETAINING WALL AS INDICATED.
 - FIELD LOCATE CUTBACK TO CLEAR CONCRETE ENCASUREMENT.
 - REFERENCE SHOP DRAWING 5177.A1. USE #5 "G" BARS THAT ARE NOT USED IN FOOTING CUT BACK. #5 "G" BARS TO BE 14'-0"



NOTE TO CONTRACTOR:
LOCATE EXISTING PIPE & ENCASE WITH CONCRETE PRIOR TO CONSTRUCTION OF RETAINING WALL.

RECORD DRAWING



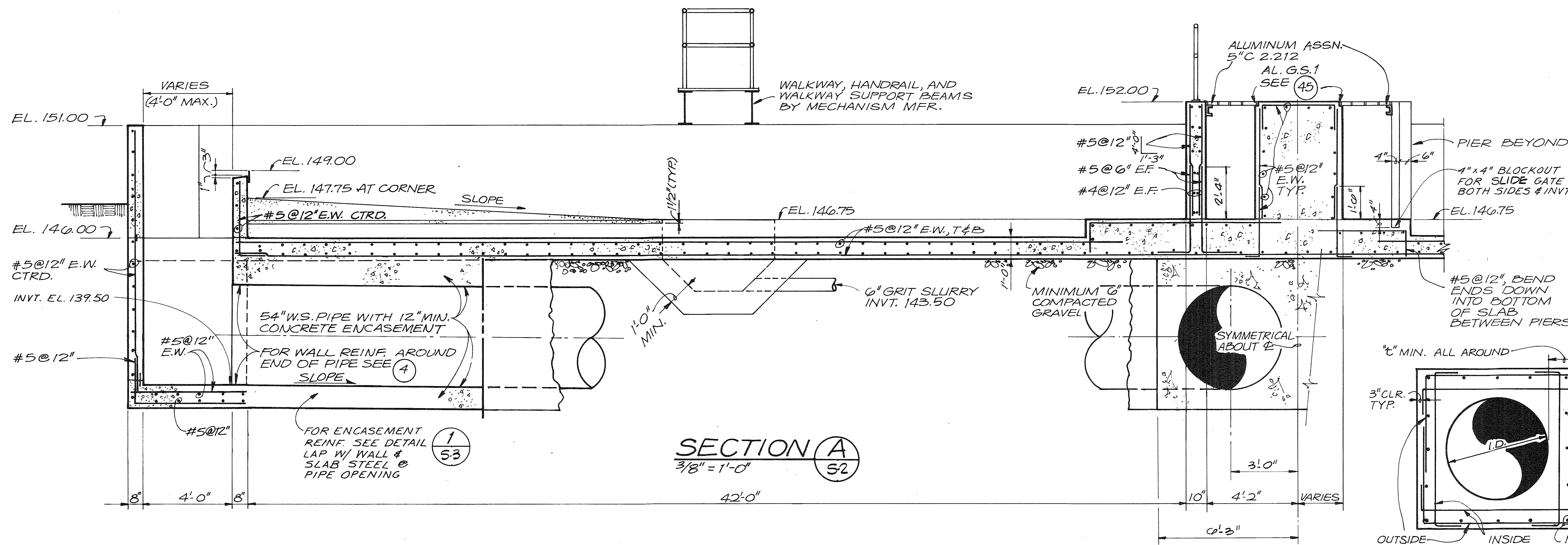
CH2M HILL	DES. RAH/SMF				
	DR. MAW				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

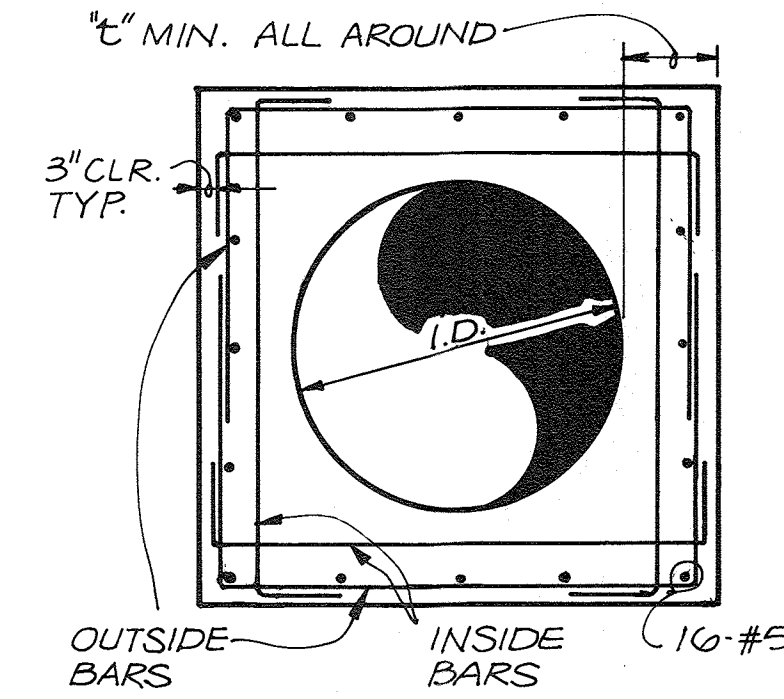
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

KEY PLAN
STRUCTURAL

SHEET S-1
OF
DATE 8-78
DWG. NO. W1078.B1

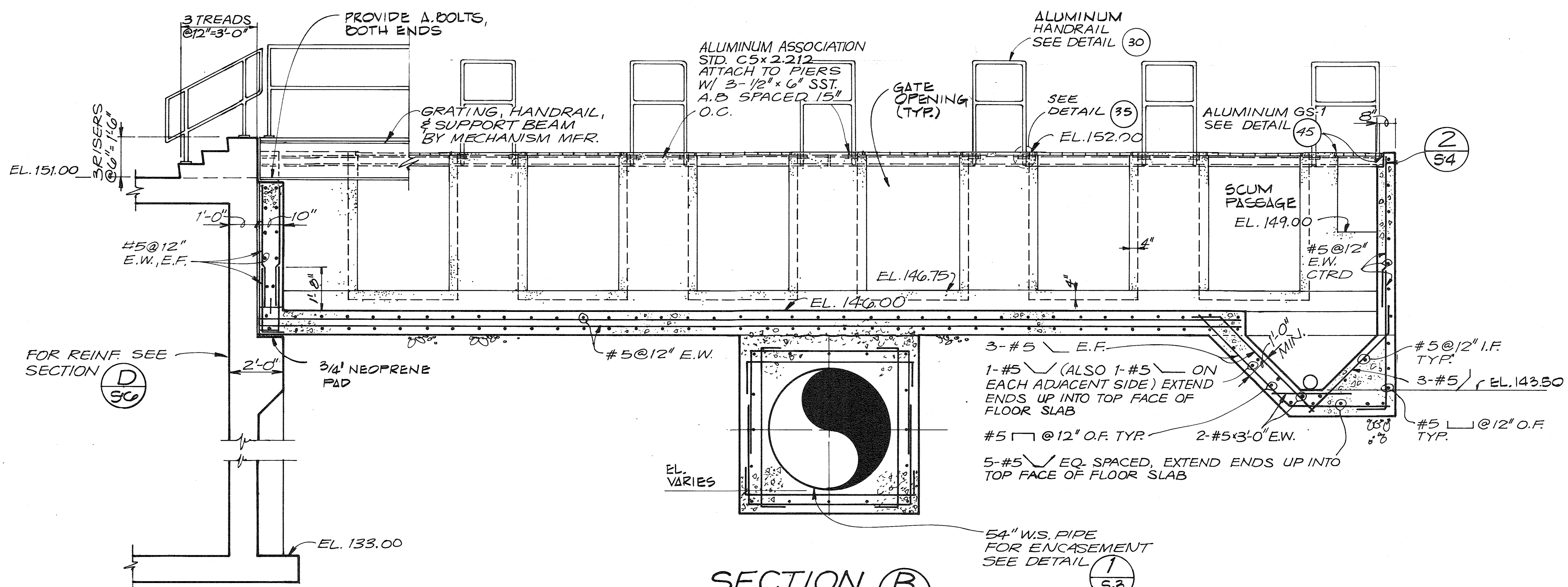


SECTION A
3/8" = 1'-0"

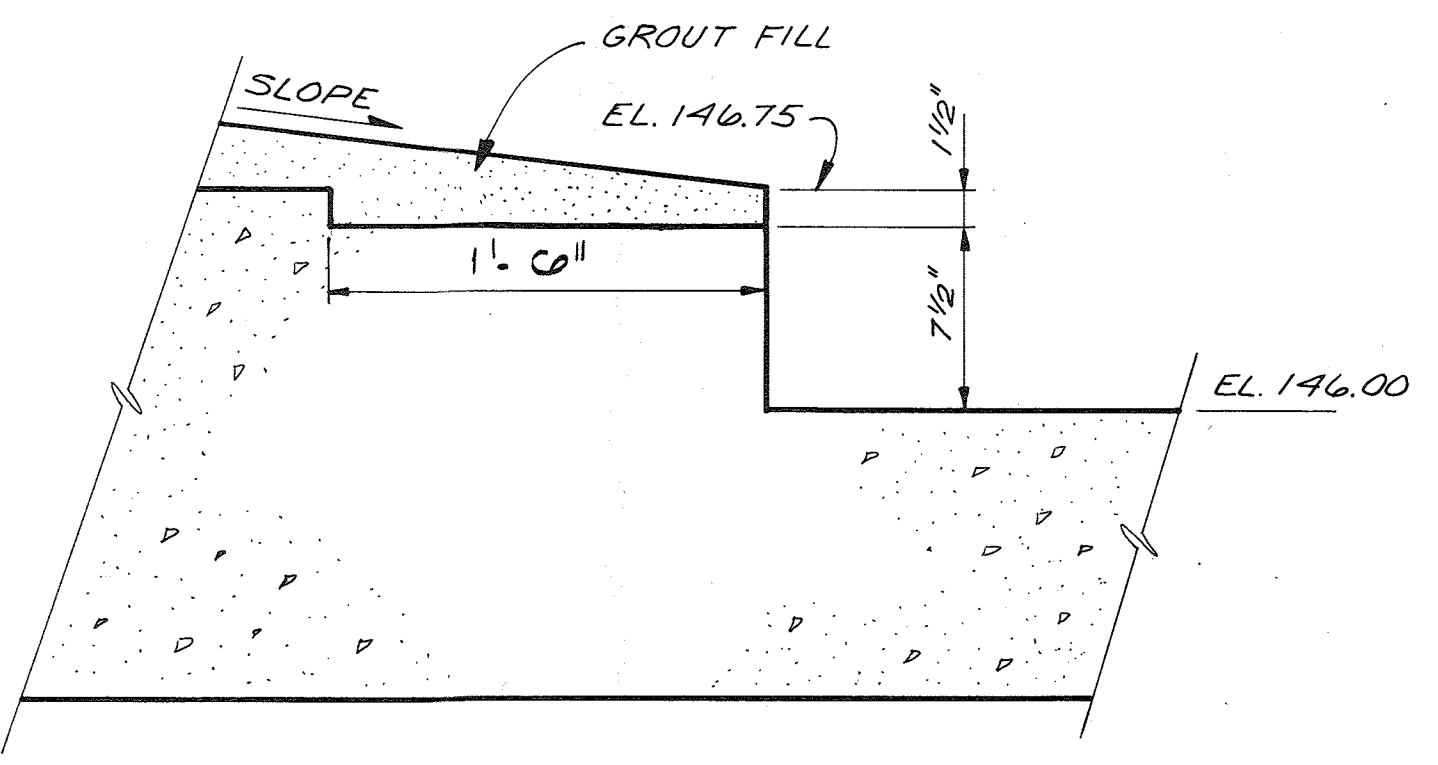


I.D.	t	INSIDE BARS	OUTSIDE BARS
≤24"	SEE DETAIL (22)		
30"	10"	#4@12"	#4@12"
36"	10"	#5@12"	#5@12"
42"	10"	#5@12"	#5@12"
54"	12"	#5@12"	#5@12"

ENCASEMENT REINFORCING (1)
N.T.S. (51)



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

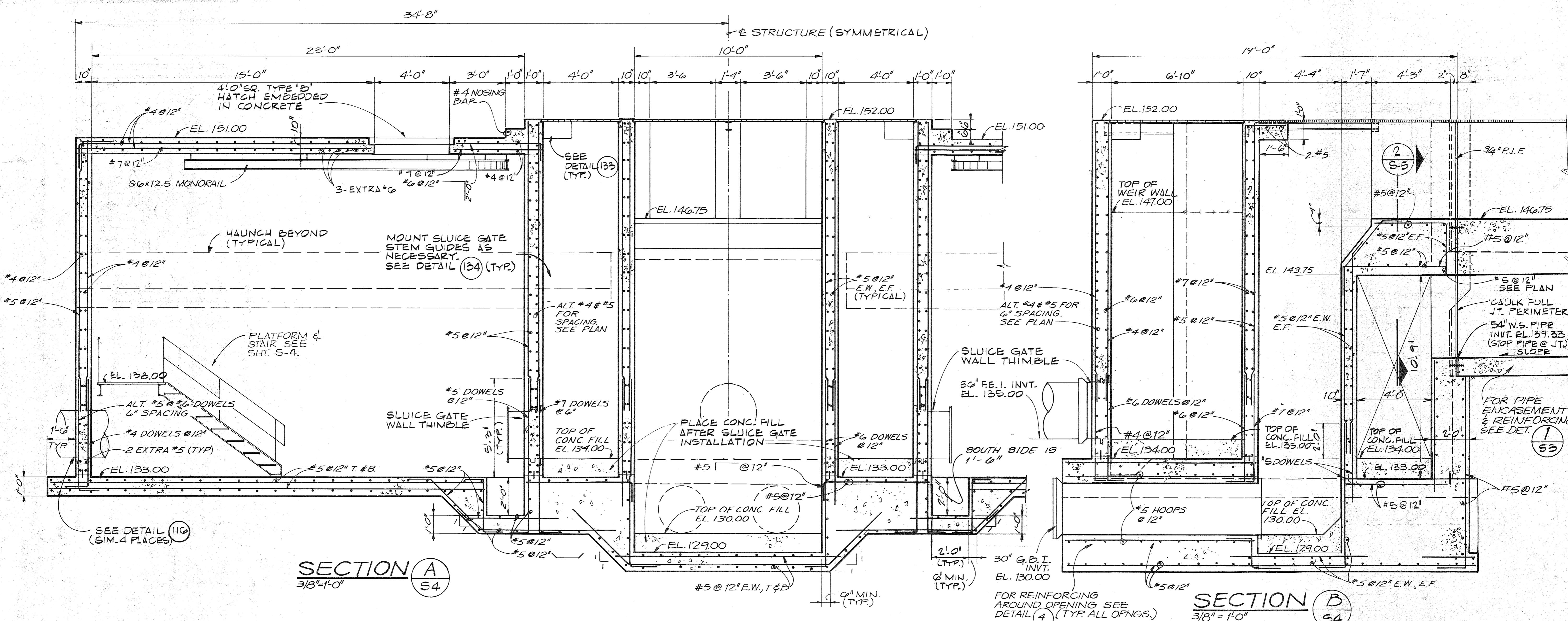


SECTION C
1/2" = 1'-0"

RECORD DRAWING

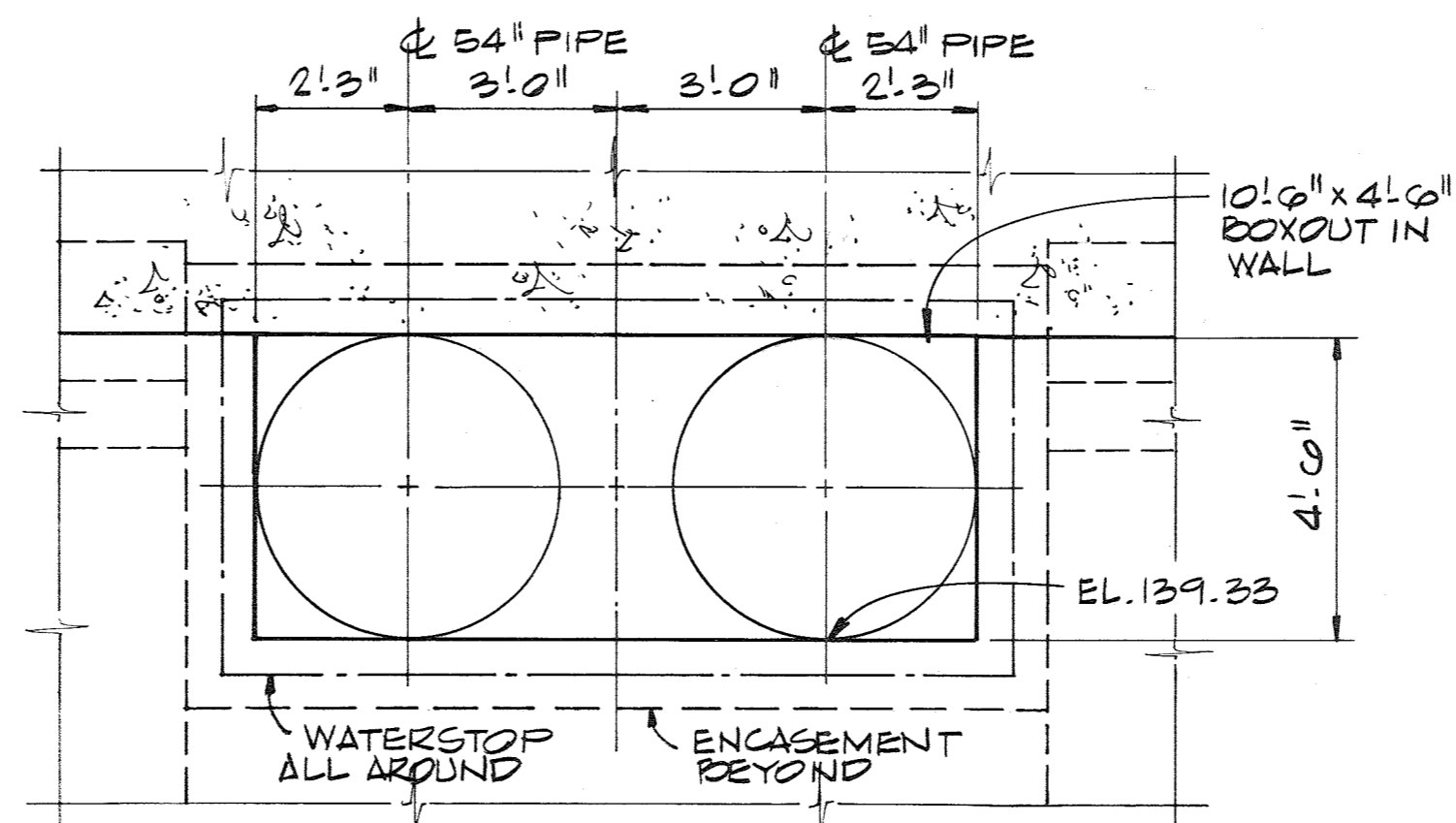


CH2M HILL DES. SMF DR. DLA CHK. APPD.	NO.	DATE	REVISION	BY	APPD.	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 8-22-78 DATE <i>Robert B. Miller</i> CHIEF - BUREAU OF ENVIRONMENTAL SERVICES	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4 CONTRACT NO. 763-S	GRIT REMOVAL BASINS SECTION STRUCTURAL	SHEET OF S-3 DATE 8-78 DWG. NO. W1078.B1

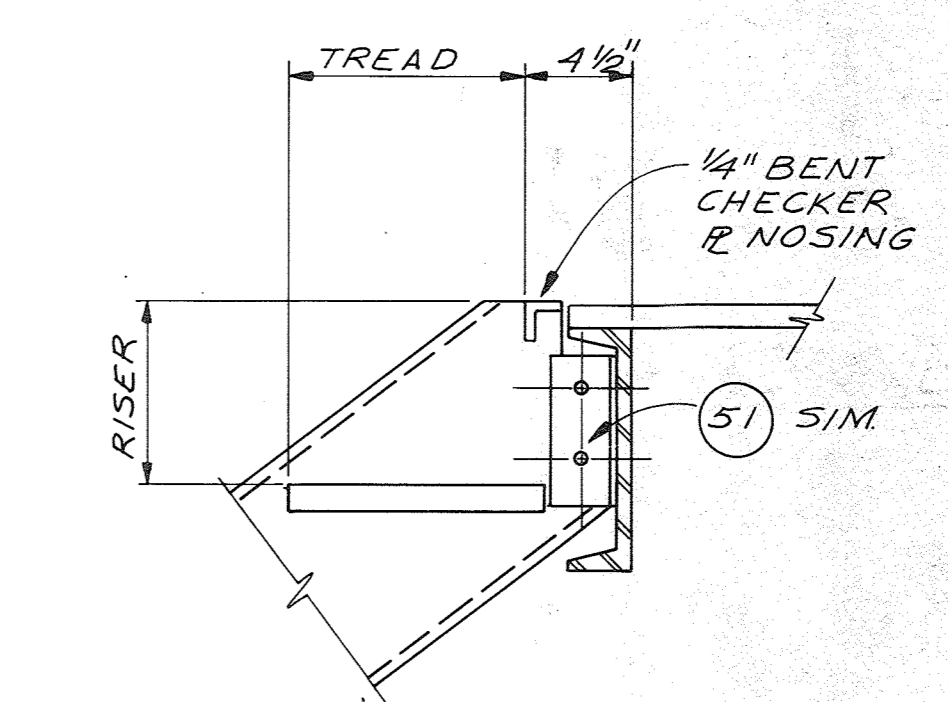


SECTION A
3/8" = 1'-0" (S4)

SECTION B
3/8" = 1'-0" (S4)



ELEVATION 2
3/8" = 1'-0" (S5)



STAIR TOP CONN. 1
1/2" = 1'-0" (S4)

RECORD DRAWING



CH2M HILL	DES. SMF					
	DR. DLA					
	CHK.					
	APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

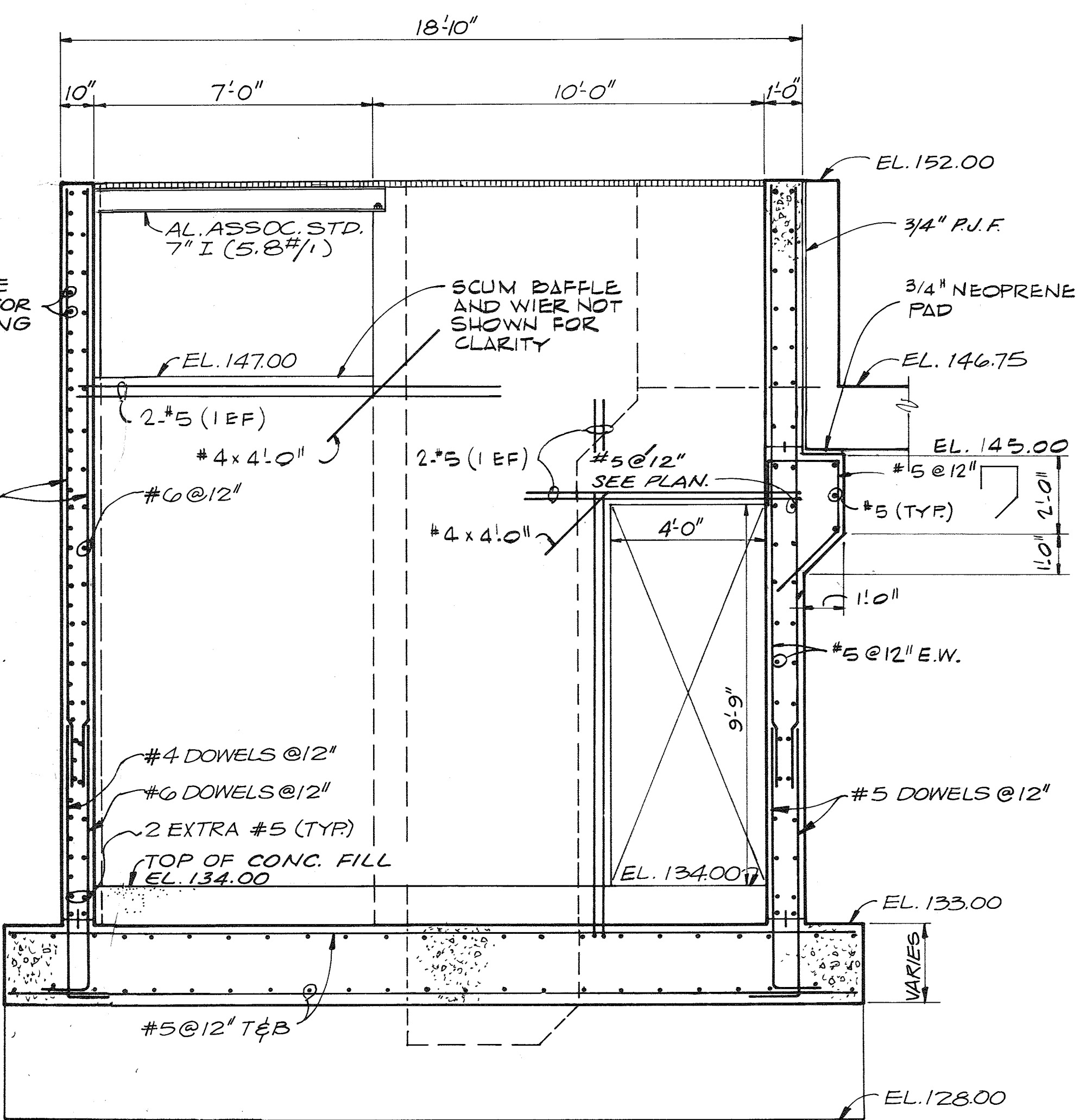
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

FLOW METERING CHAMBERS
SECTIONS
STRUCTURAL

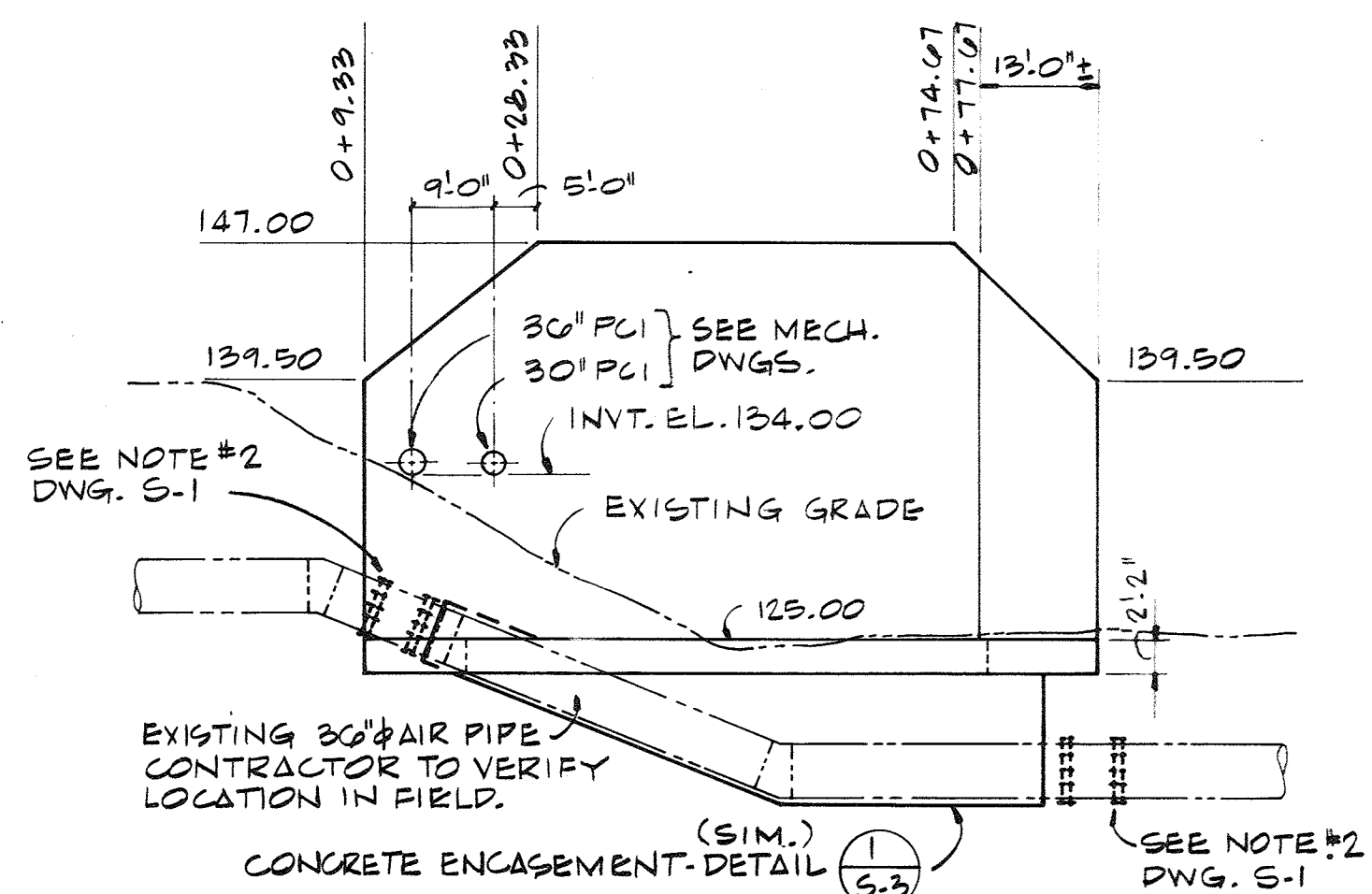
SHEET
OF S-5
DATE 8-78
DWG. NO. W1078.B1

FROM STA.	TO STA.	a	b	x
9.33	15.00	#8 @ 7'4" @ 6"	#6 @ 11'3" @ 6"	8'4"
15.07	22.00	#9 @ 8'3" @ 6"	#8 @ 10'0" @ 6"	6'9"
22.00	82.66	SEE SECTION (F)		
82.66	86.66	#9 @ 8'5" @ 6"	#8 @ 10'0" @ 6"	6'9"
86.66	90.66	#8 @ 7'4" @ 6"	#6 @ 11'3" @ 6"	8'4"

EL. 139.5 MIN. EL. 147.0 MAX. EL. 140.0 MIN. EL. 147.5 MAX.

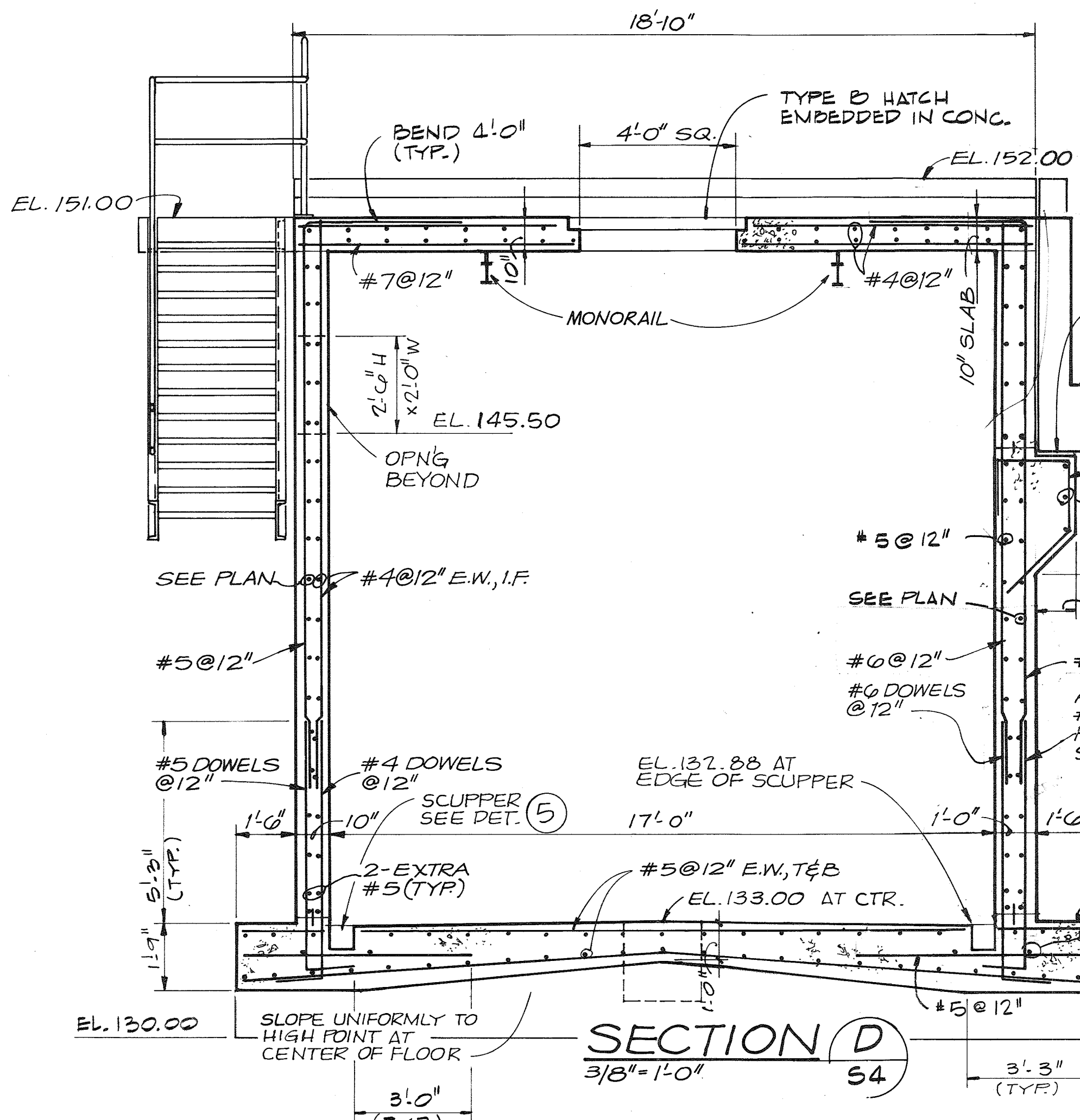


SECTION C
3/8" = 1'-0" (S4)

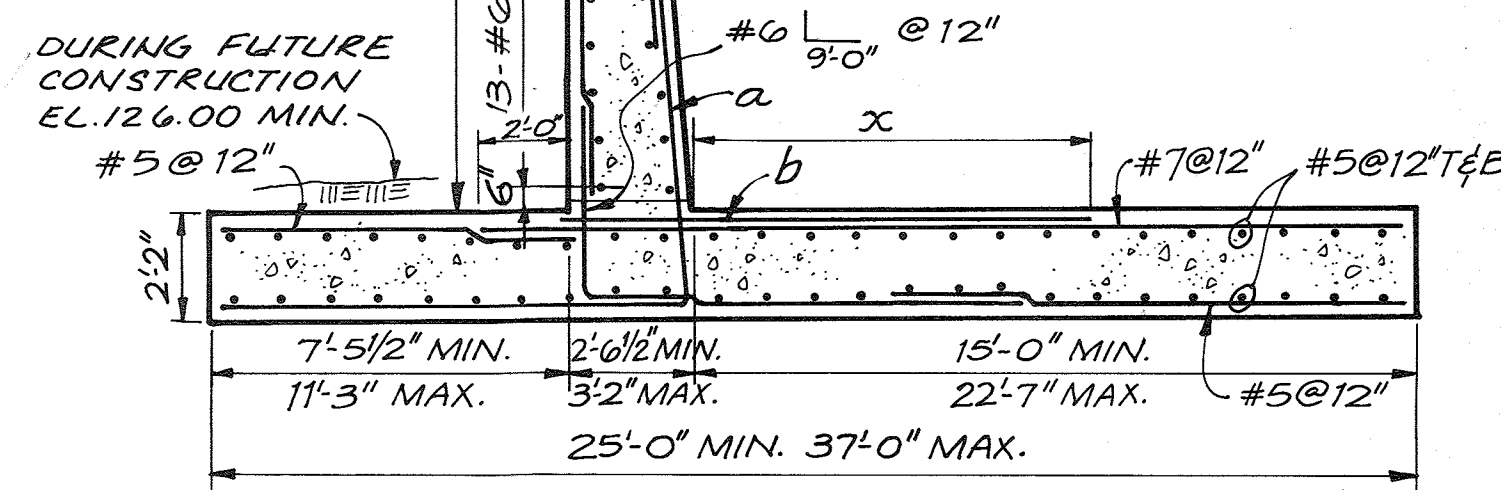


RETAINING WALL PROFILE

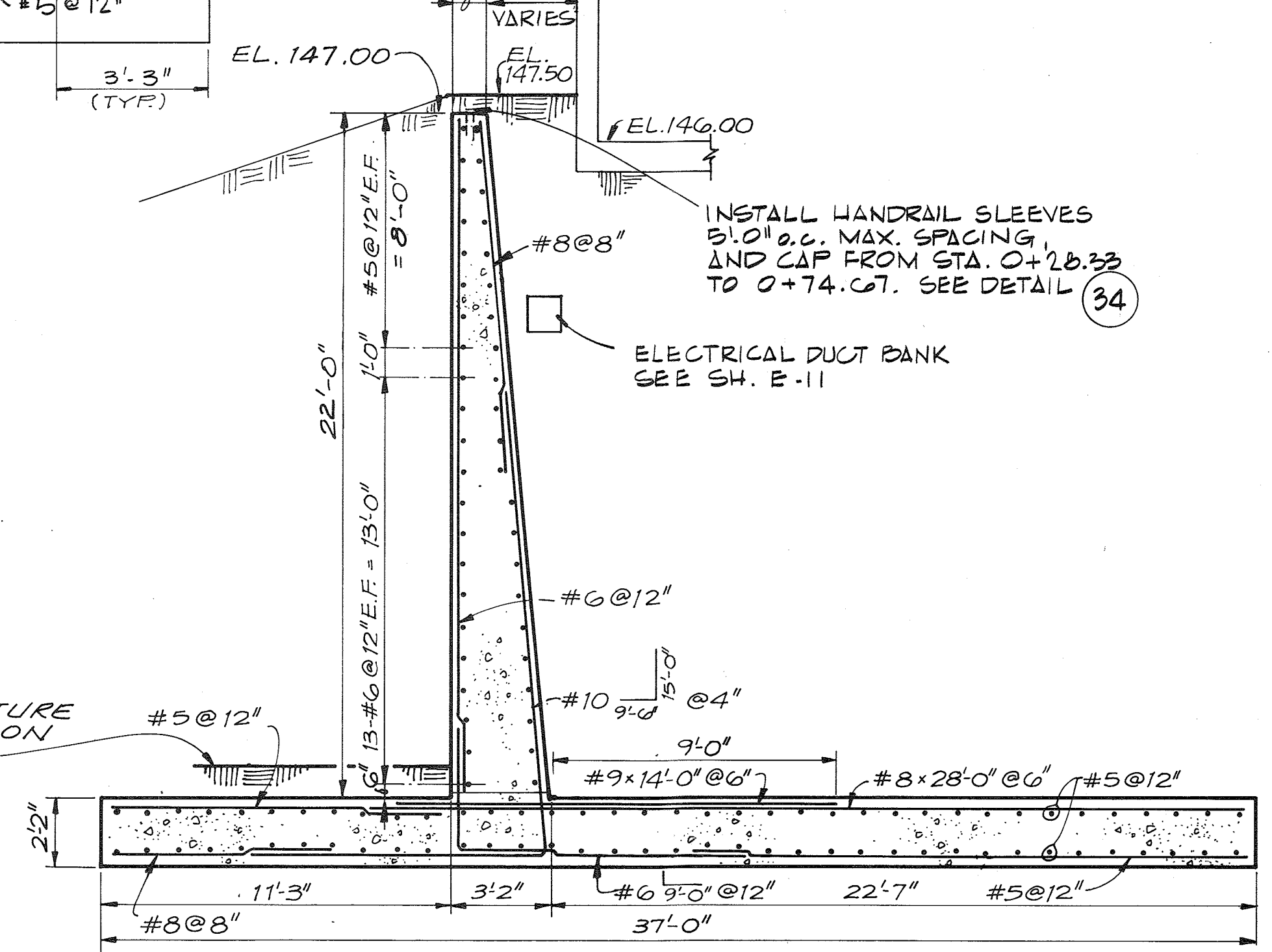
1" = 20' H
1" = 10' V



SECTION D
3/8" = 1'-0" (S4)



SECTION E
1/4" = 1'-0" (S1)



SECTION F
1/4" = 1'-0" (S1)



DES. SMF					
DR. DLA					
CHK.					
APPD.	NO.	DATE	REVISION	BY	APPD.

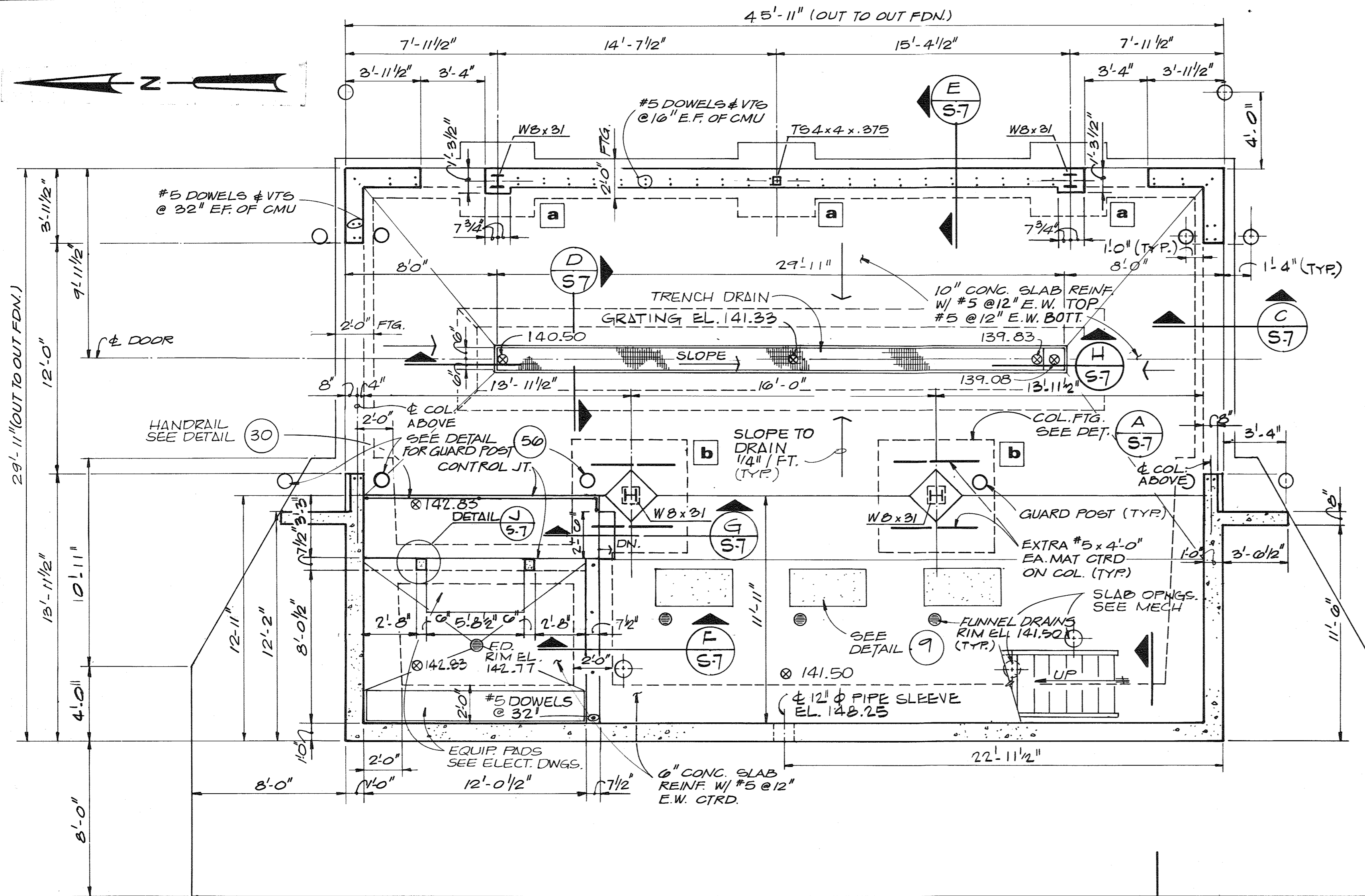
RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

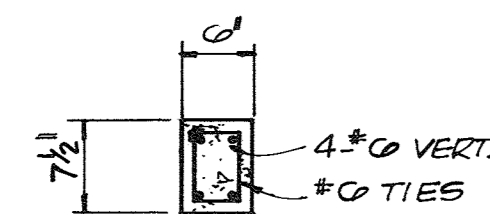
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

FLOW METERING CHAMBERS
SECTIONS
STRUCTURAL

SHEET
OF S-6
DATE 8-78
DWG. NO. W1078.B1

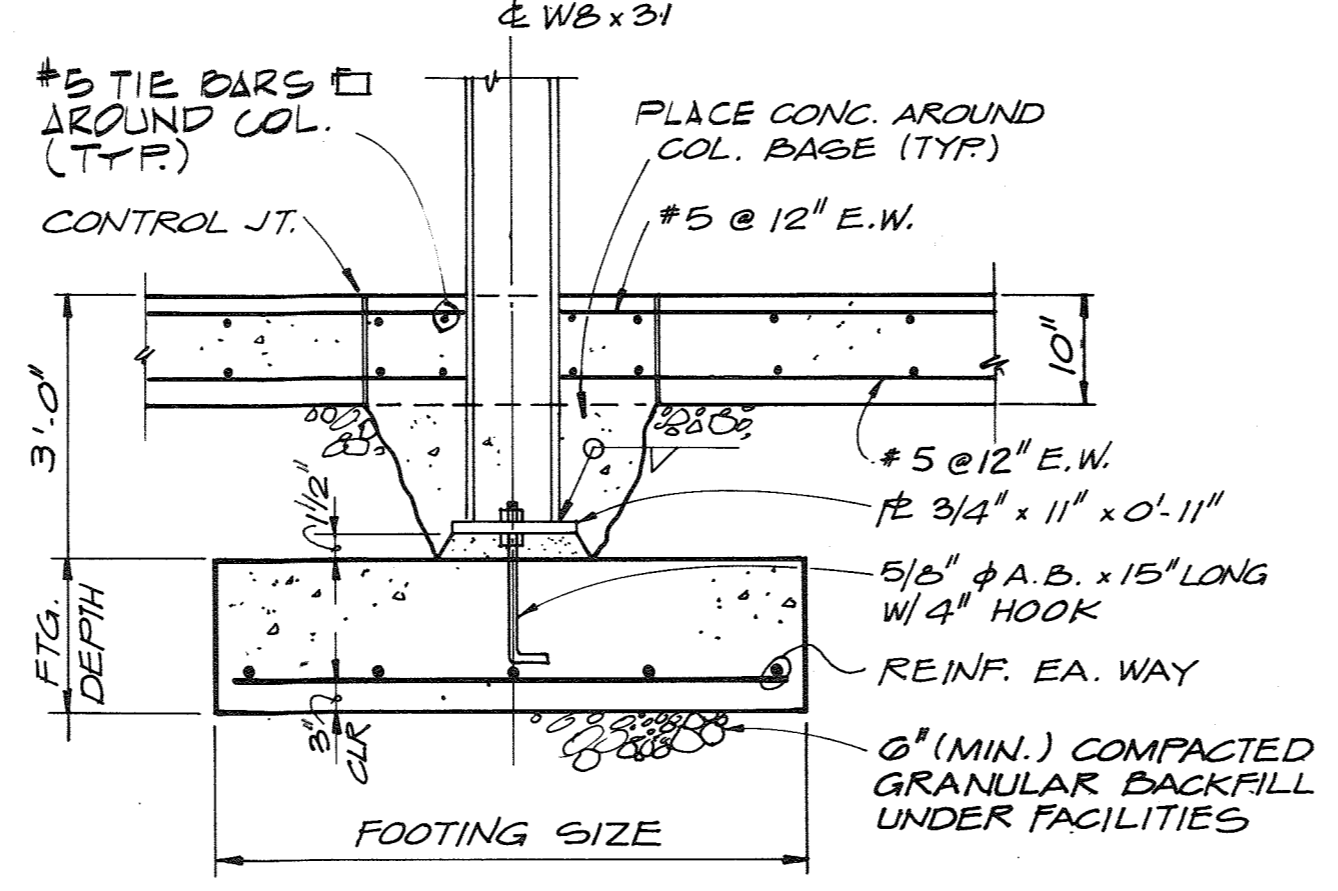


FOUNDATION & FLOOR PLAN
1/4" = 1'-0"

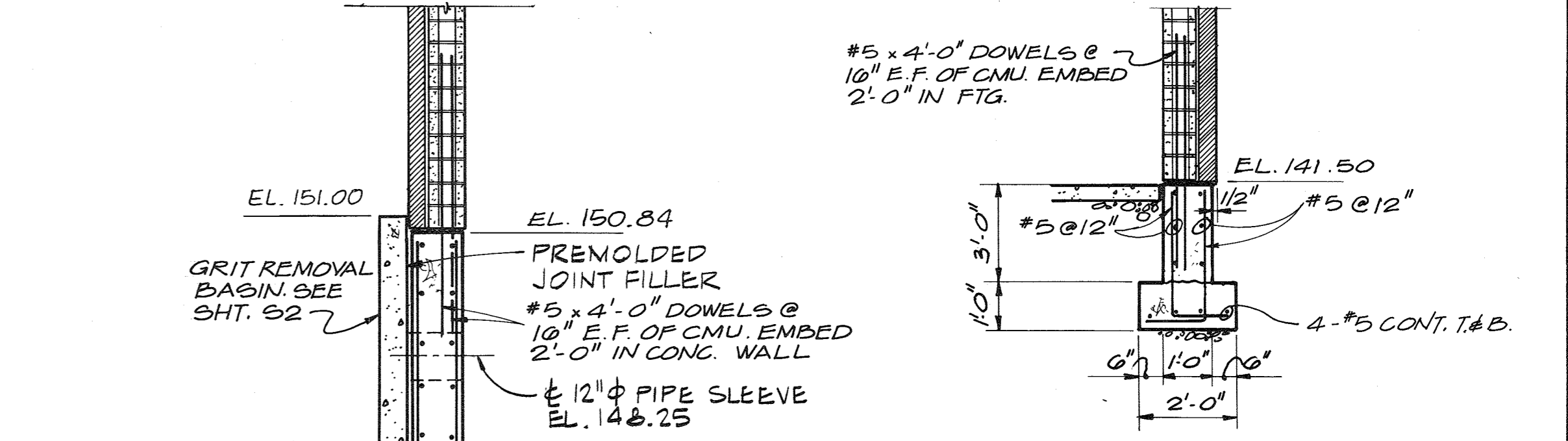


DETAIL J
3/4" = 1'-0"

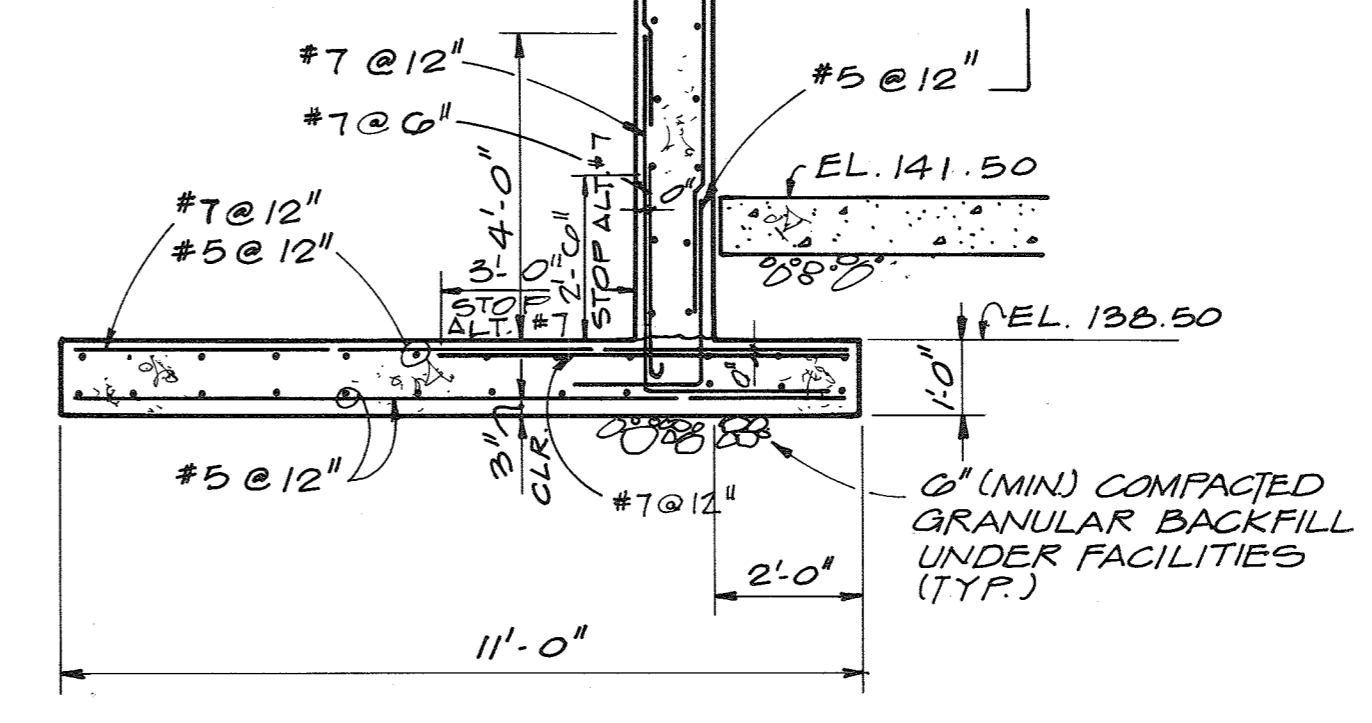
COLUMN FOOTING SCHEDULE			
FOOTING TYPE	FOOTING SIZE (SQ.)	FOOTING DEPTH	REINFORCING (EACH WAY)
a	4'-0"	1'-0"	5-#5
b	6'-0"	1'-6"	7-#7



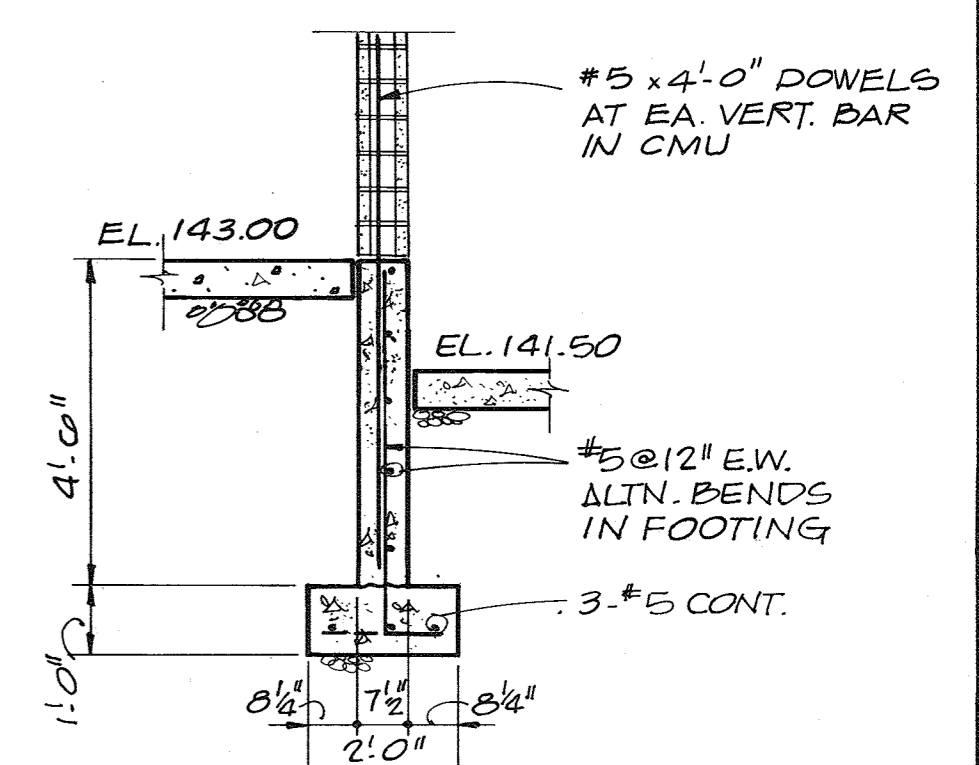
TYPICAL COLUMN FTG
A
5/8"



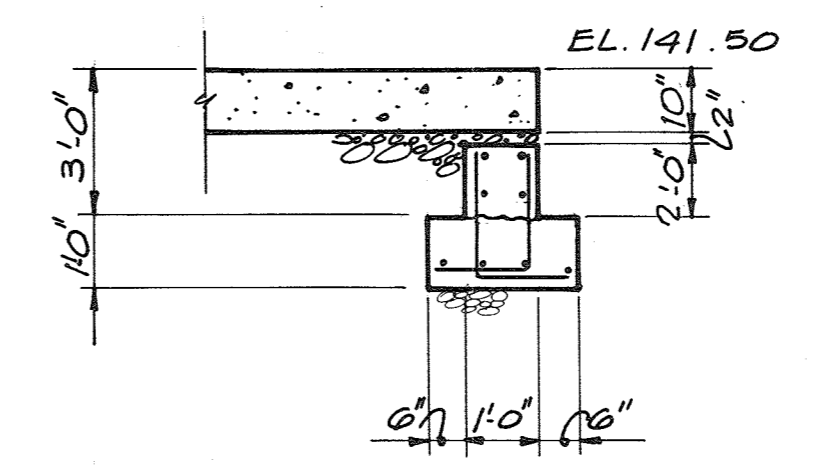
SECTION E
3/8" = 1'-0"



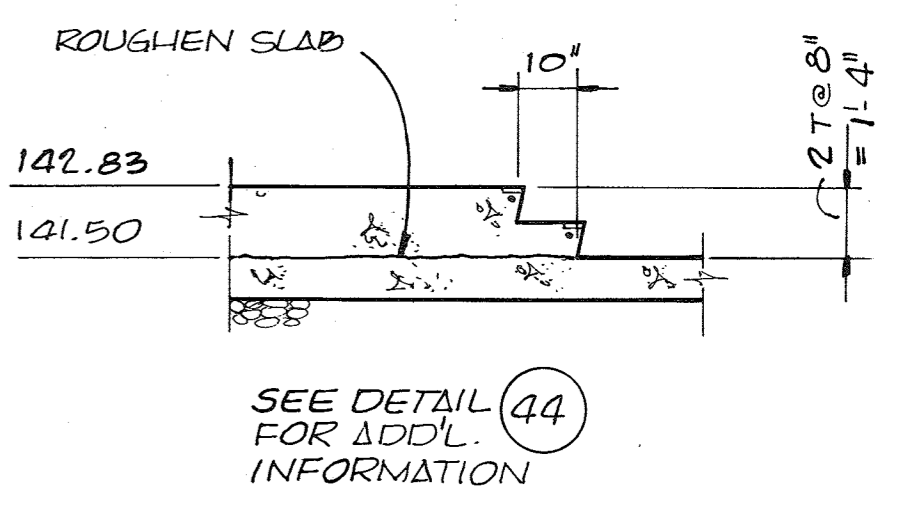
SECTION B
3/8" = 1'-0"



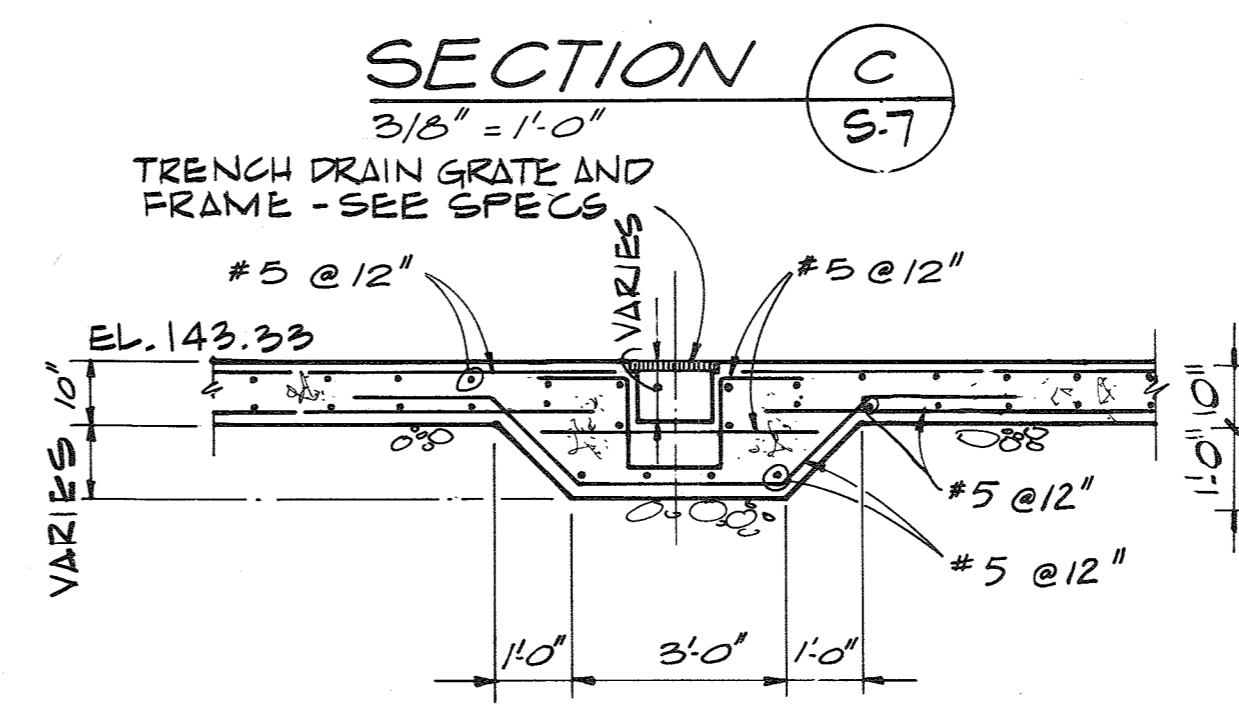
SECTION F
3/8" = 1'-0"



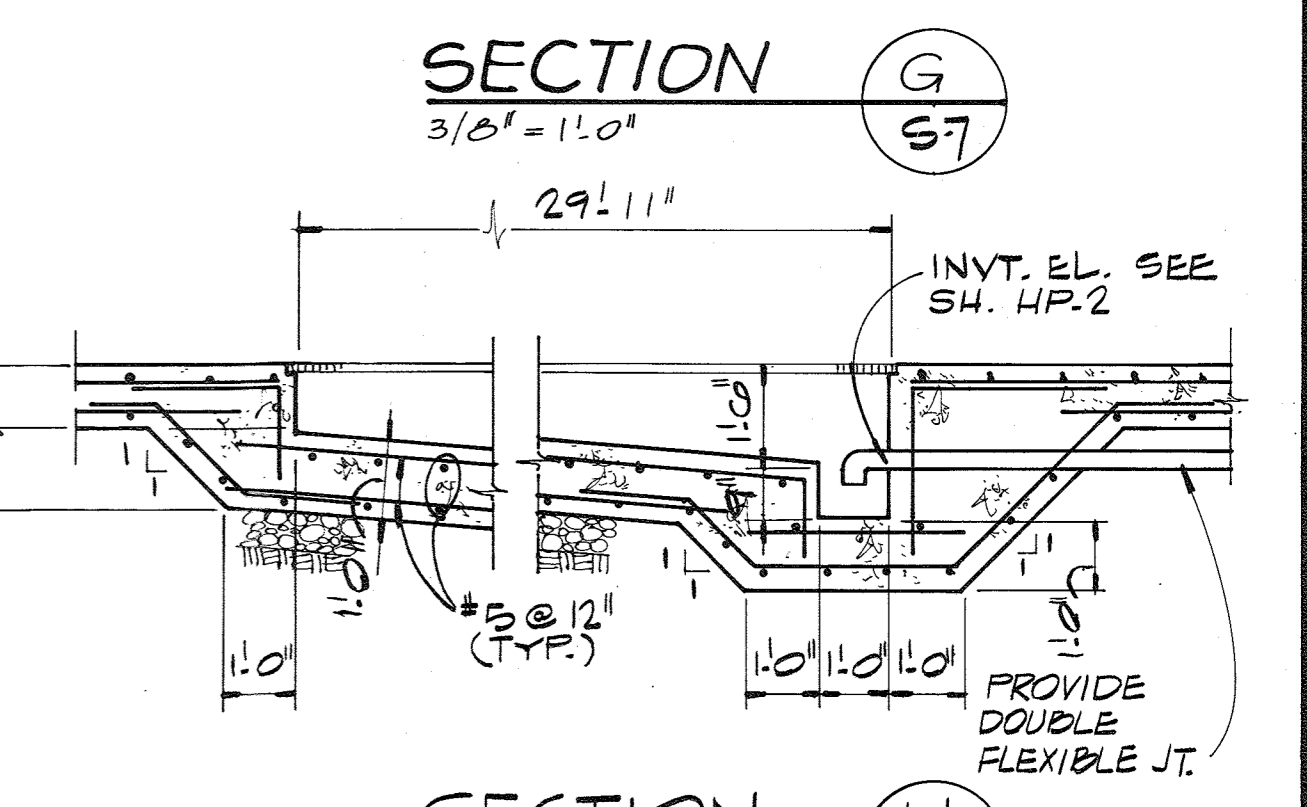
SECTION C
3/8" = 1'-0"



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



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



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

RECORD DRAWING



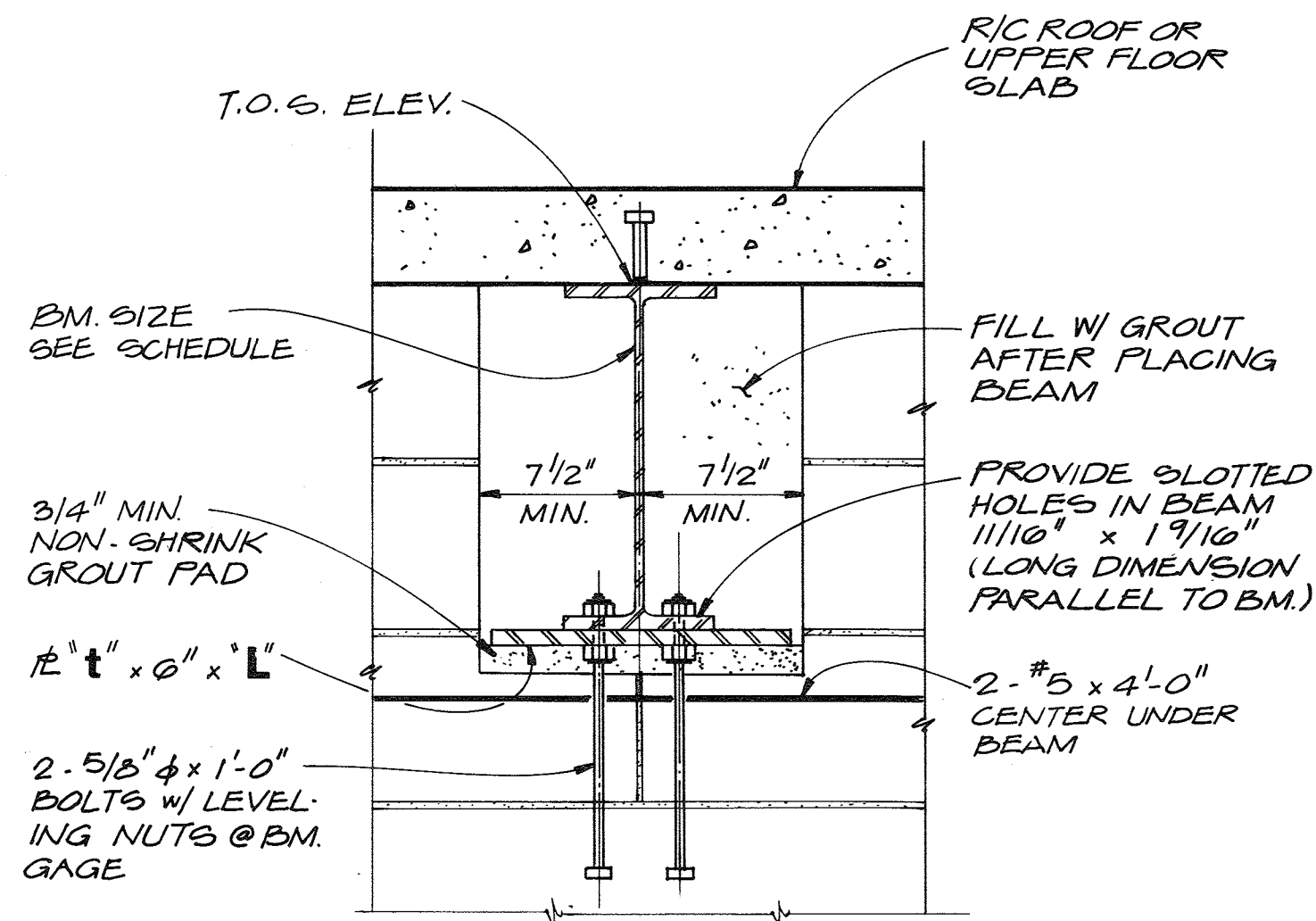
CH2M HILL	DES. FLG			
	DR. KMT			
	CHK.			
	APPD.			
	NO.	DATE	REVISION	BY
				APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
FOUNDATION PLAN - SECTIONS
STRUCTURAL

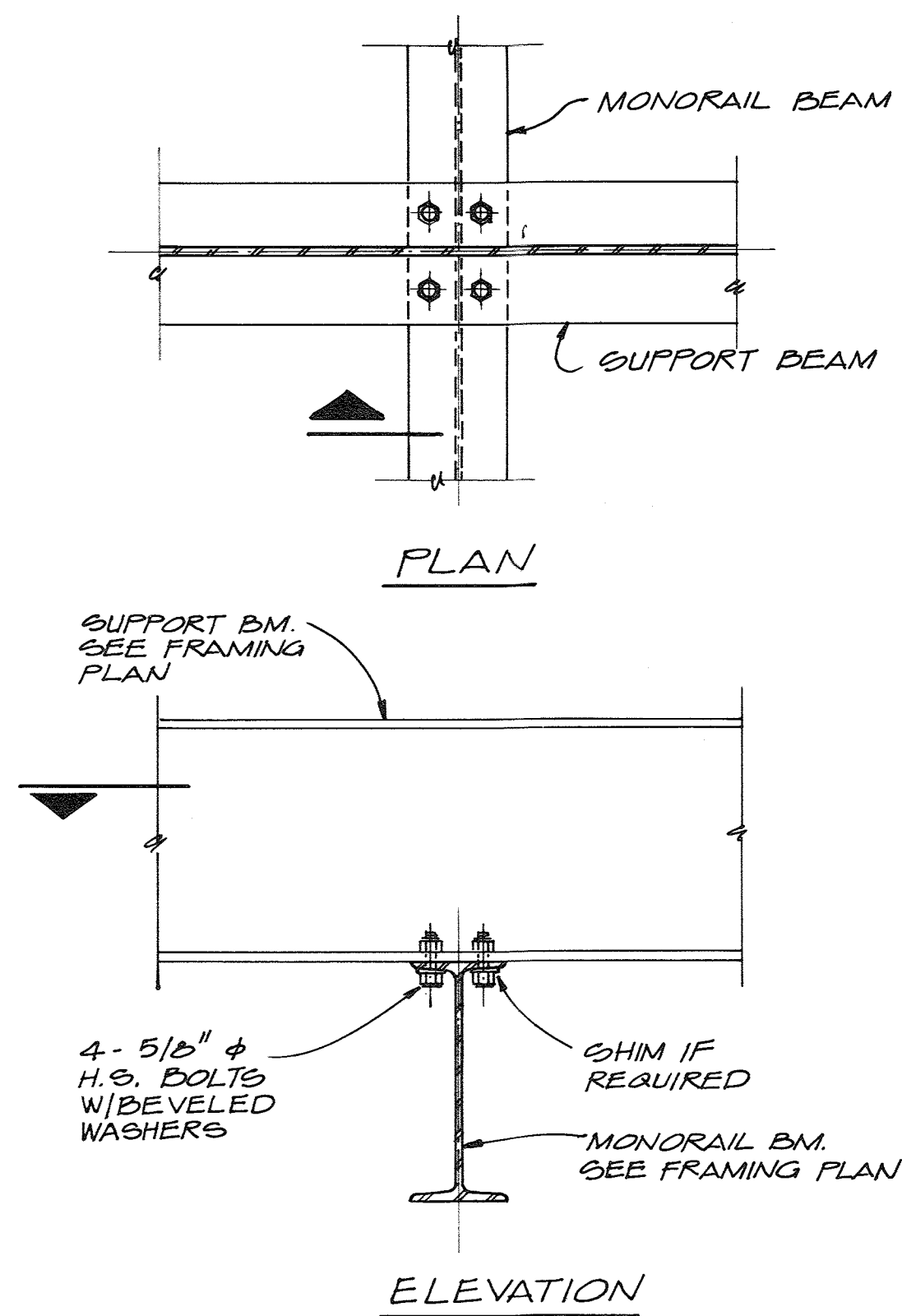
SHEET **S-7**
OF
DATE 8-78
DWG. NO. W1078.B1



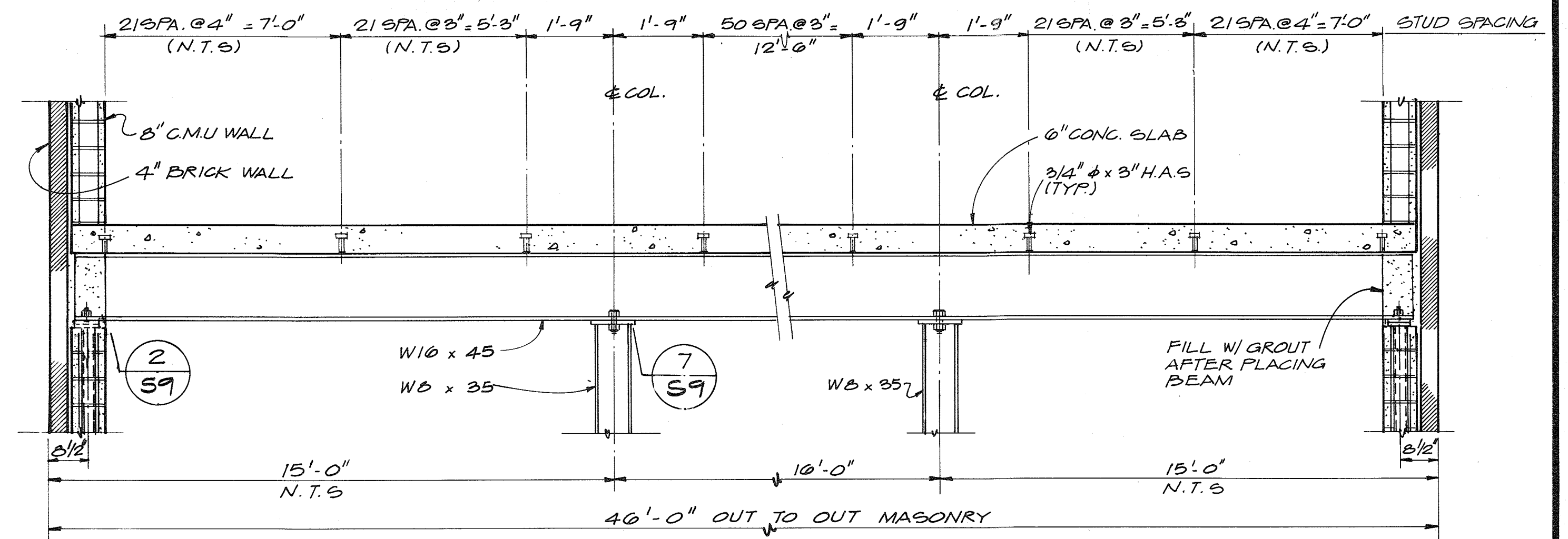
BEARING \bar{t} SCHEDULE

BEAM SIZE	T.O.S. ELEVATION	\bar{t} THICKNESS	\bar{t} LENGTH
W10 x 40	172.00 171.33	7/8"	1'-2"
W10 x 31	157.50	3/4"	1'-0"

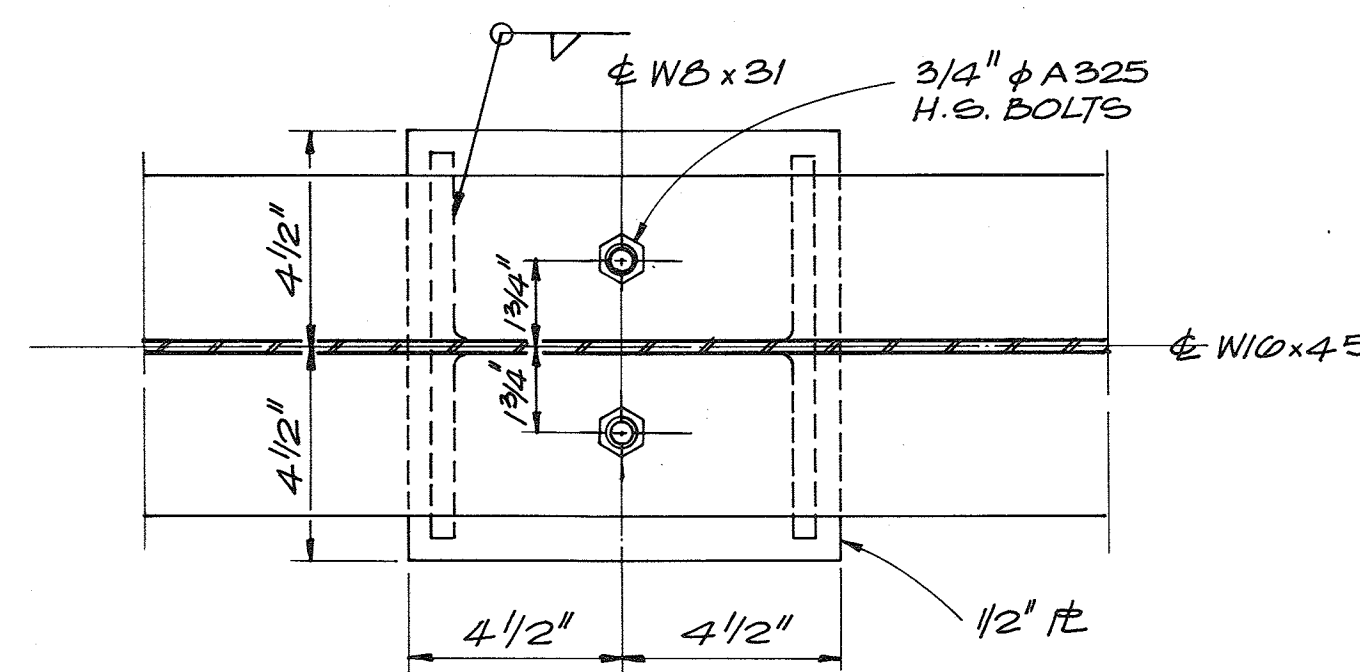
DETAIL 1
1 1/2" = 1'-0" SB



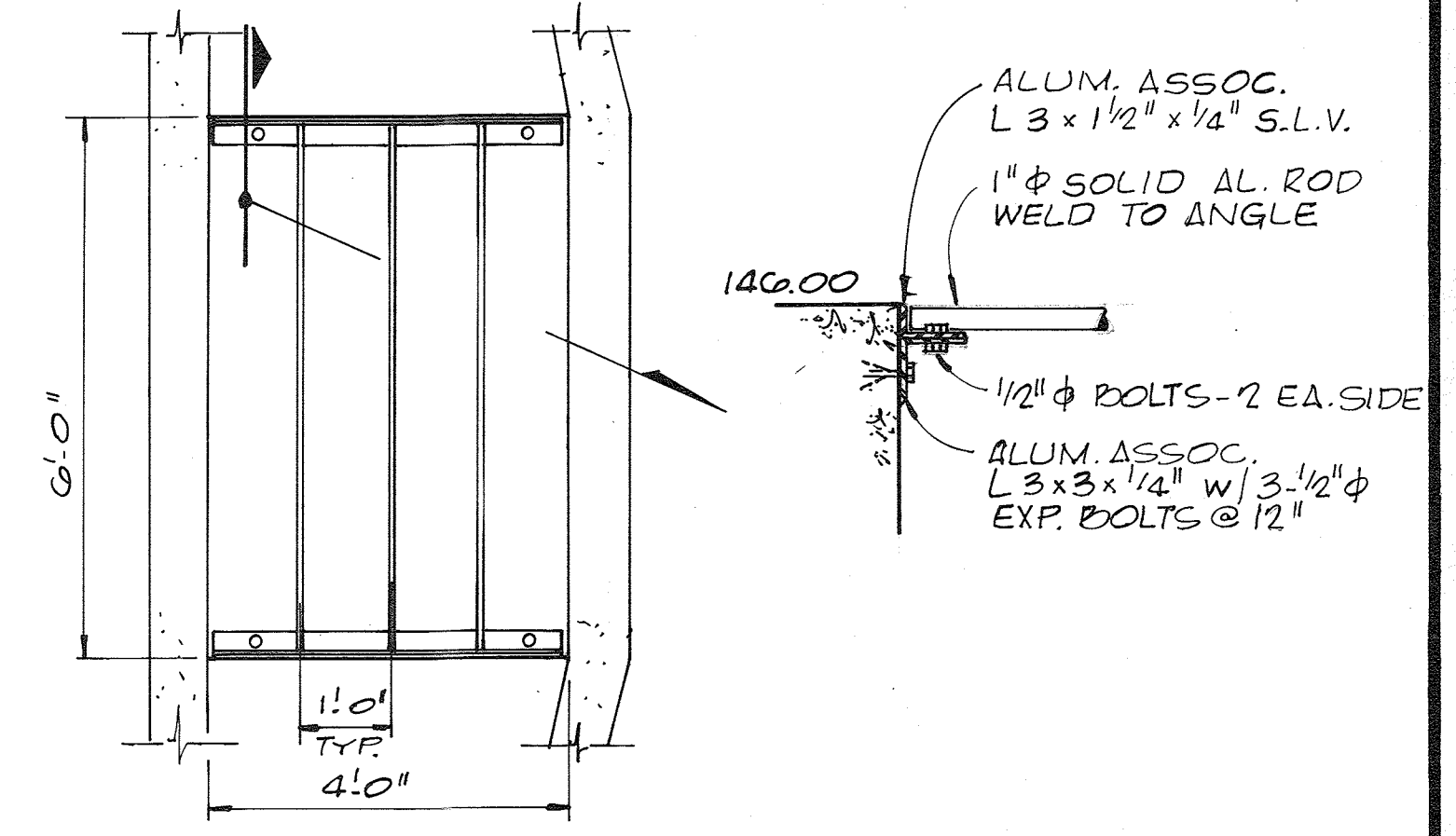
DETAIL 3
N.T.S. SB



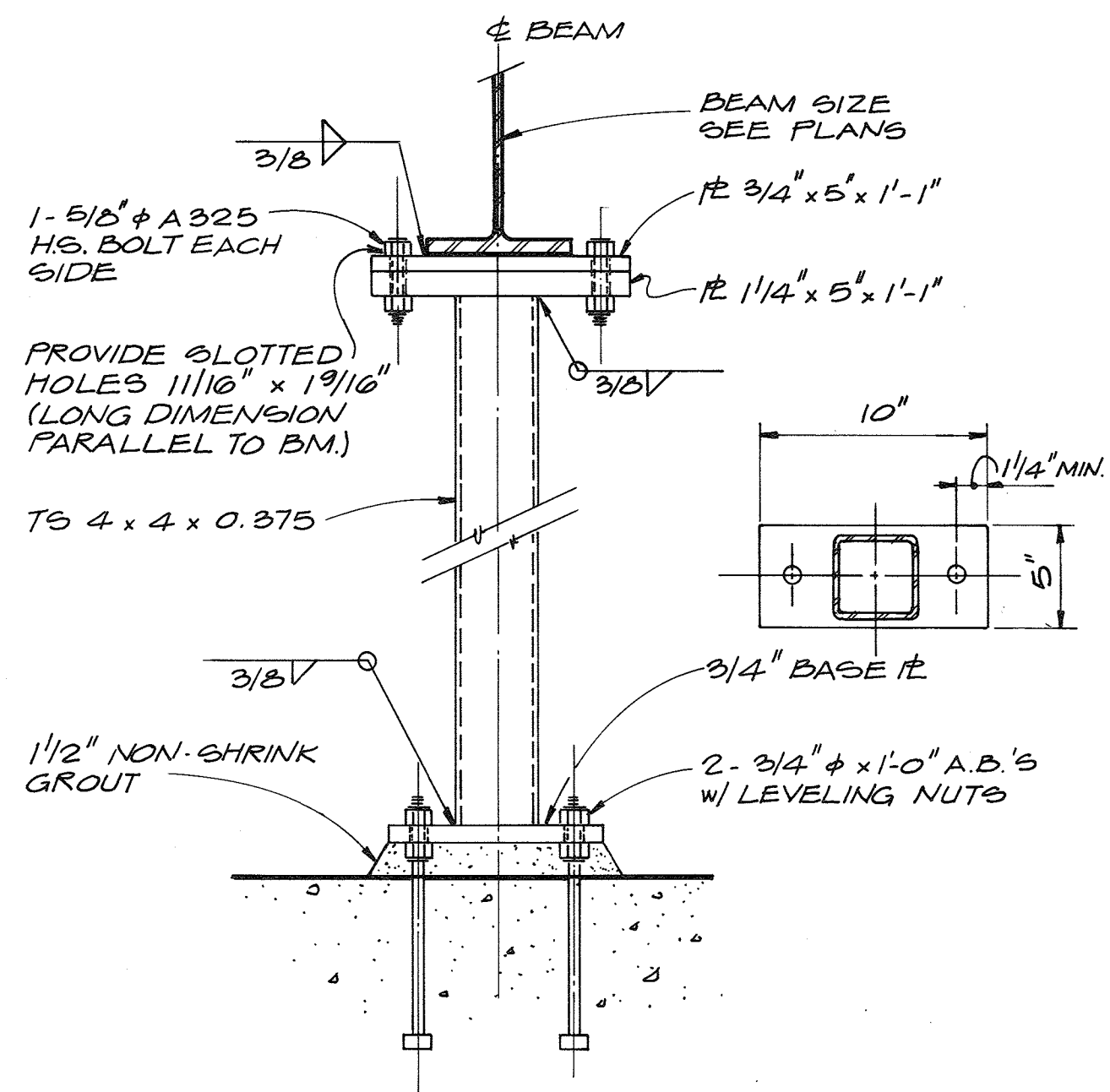
DETAIL 6
N.T.S. SB



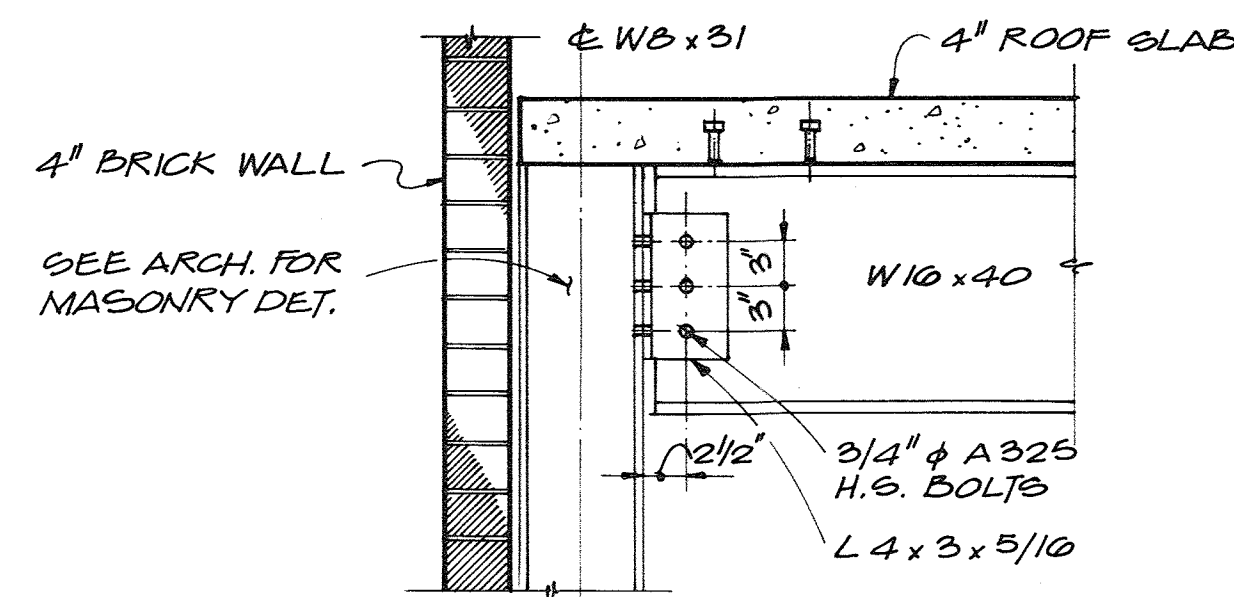
DETAIL 7
3" = 1'-0" SB



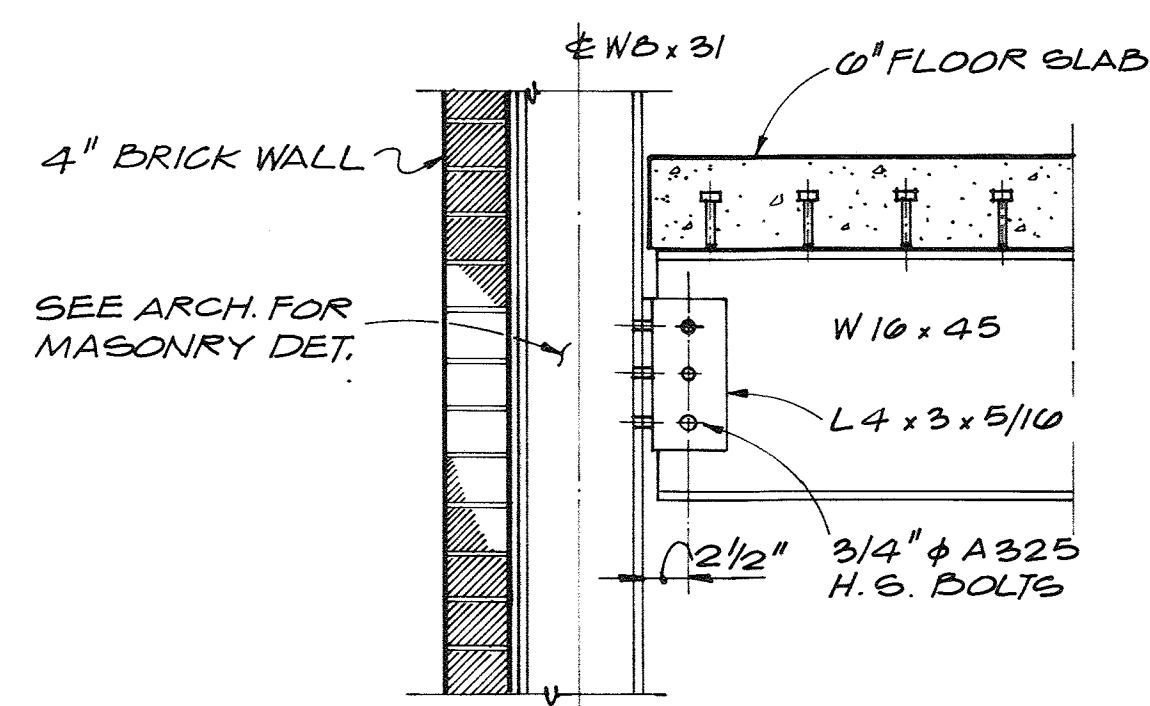
GUARD RACK DETAIL 9
1/2" = 1'-0" S-2



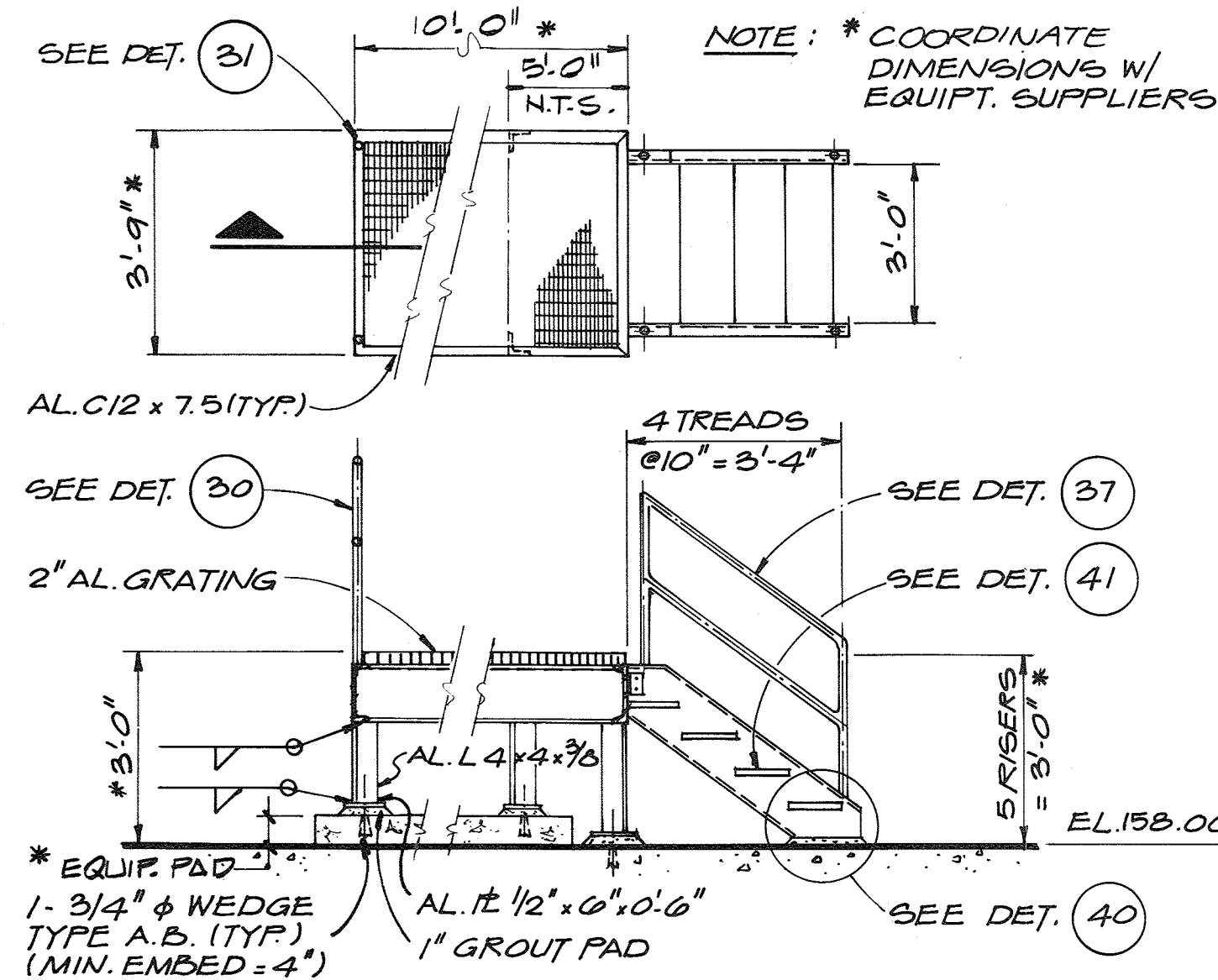
DETAIL 2
1 1/2" = 1'-0" SB



DETAIL 4
1" = 1'-0" SB



DETAIL 5
1" = 1'-0" SB



DETAIL 8
3/8" = 1'-0" SB



CH2M HILL	DES. FLG				
	DR. KMT				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

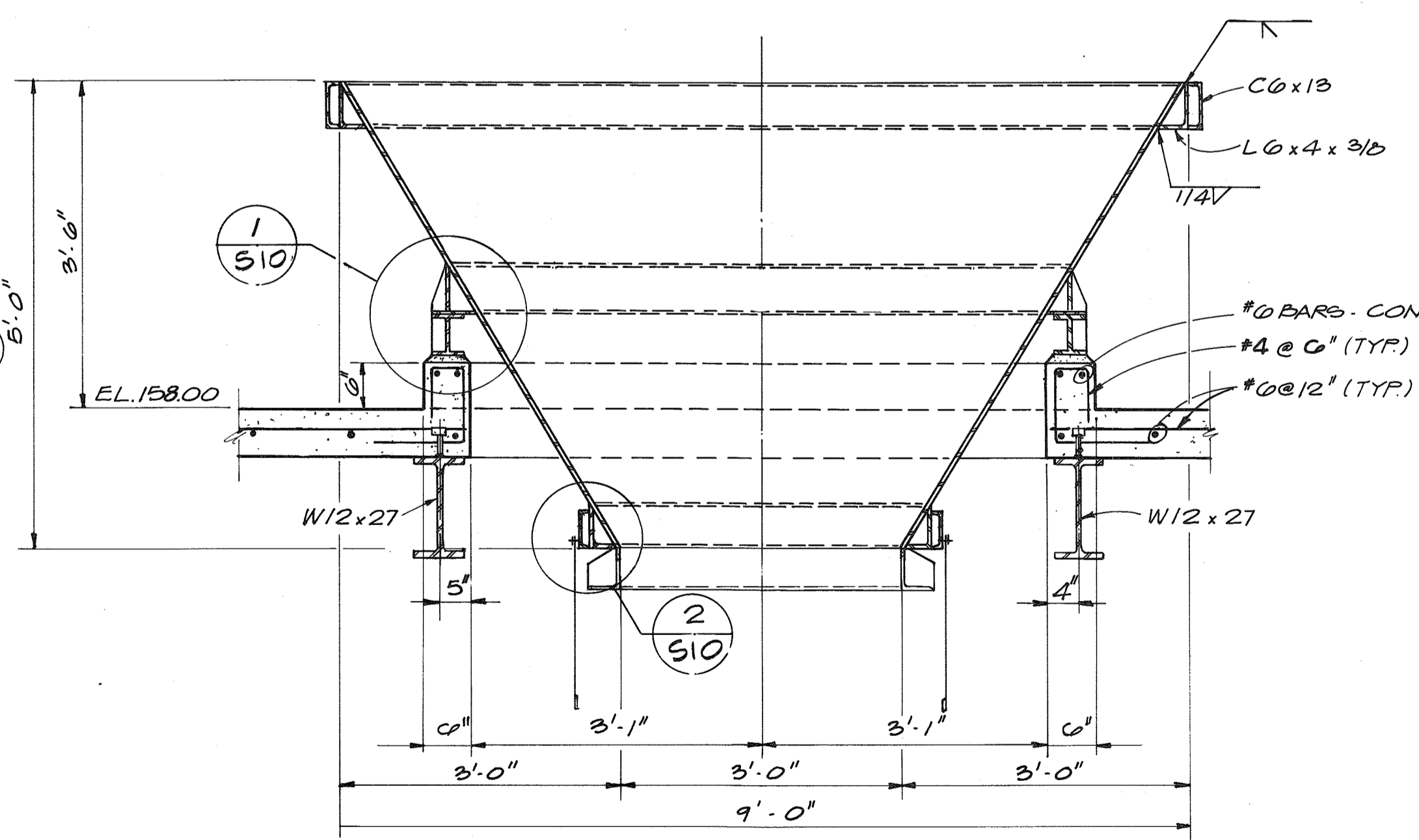
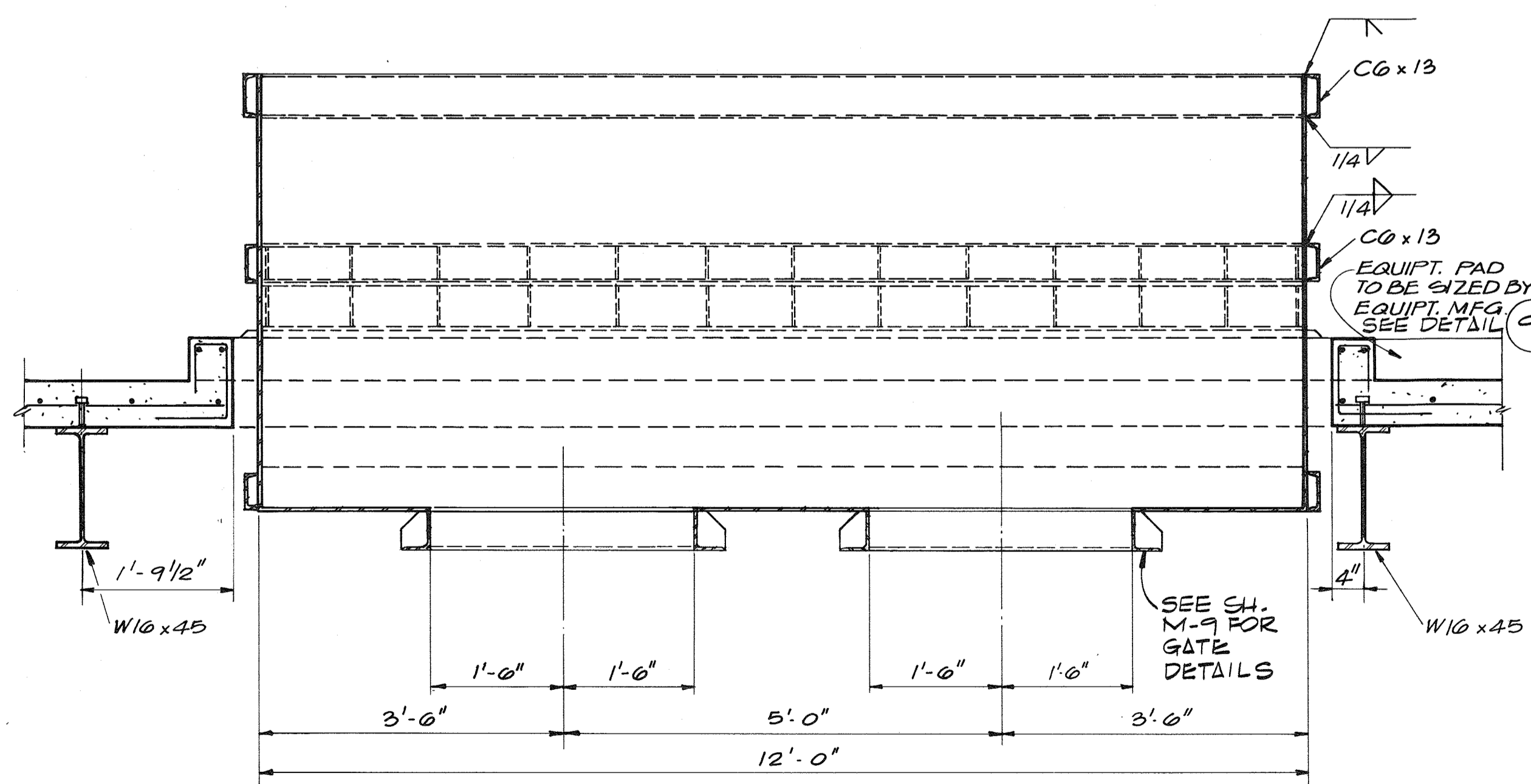
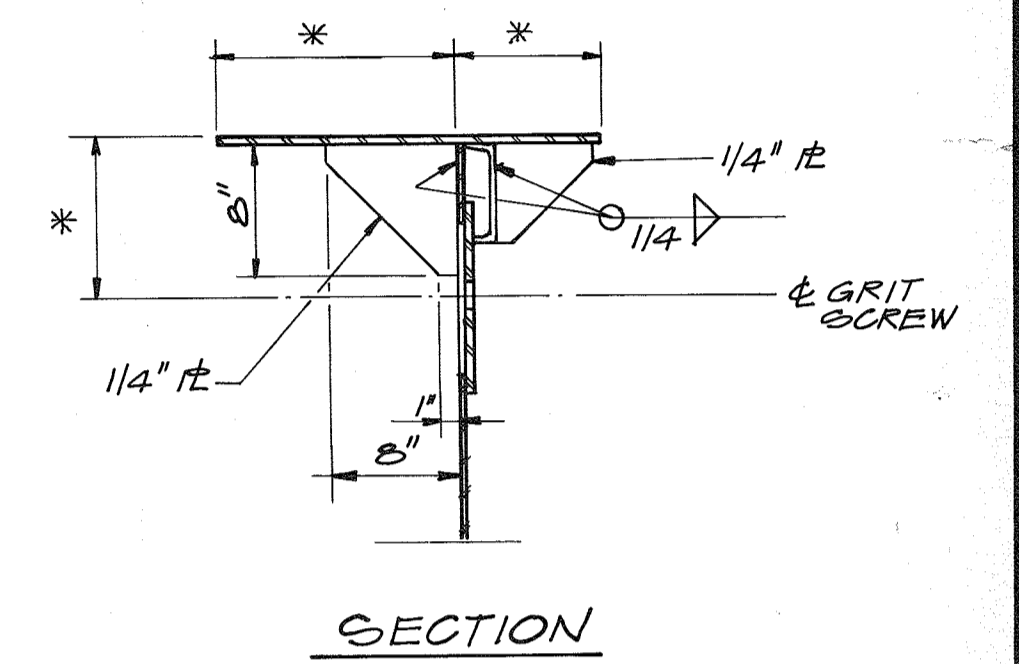
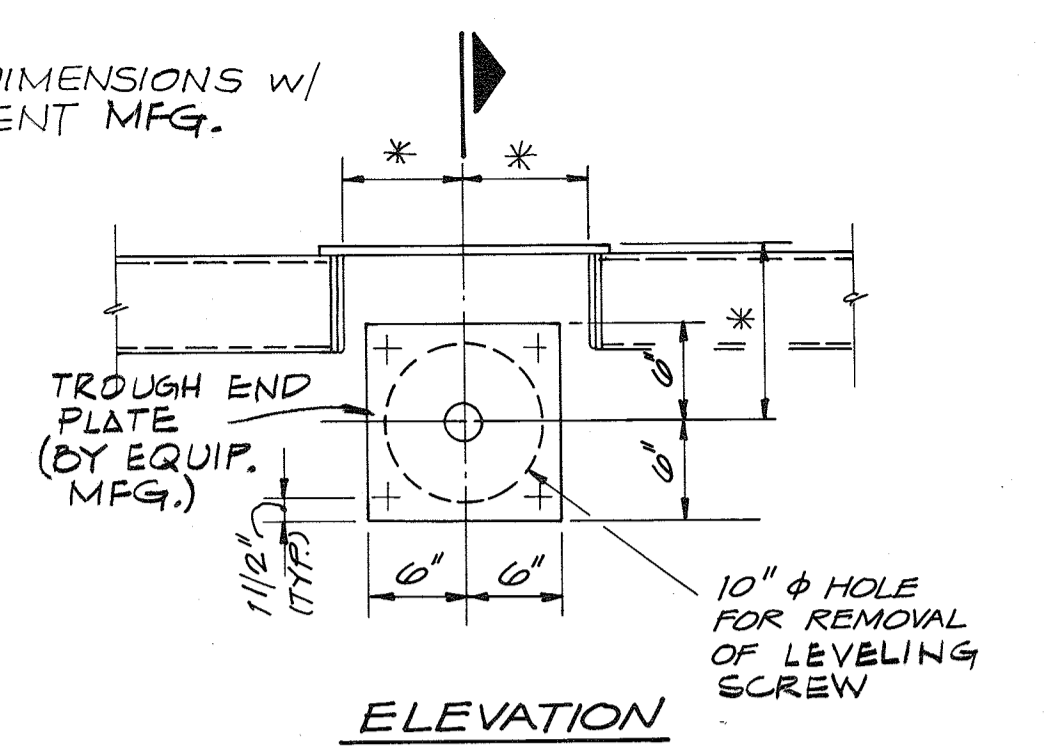
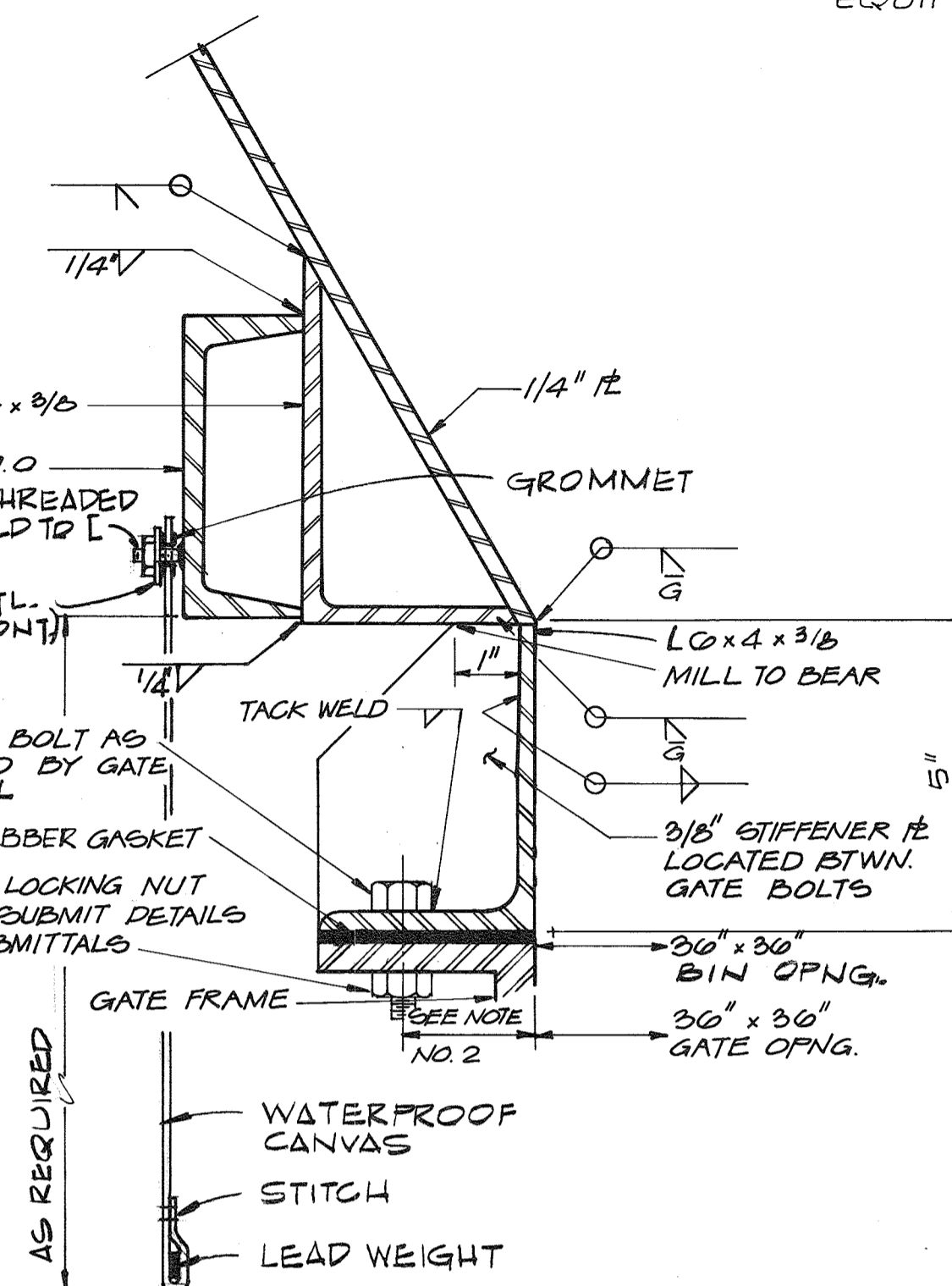
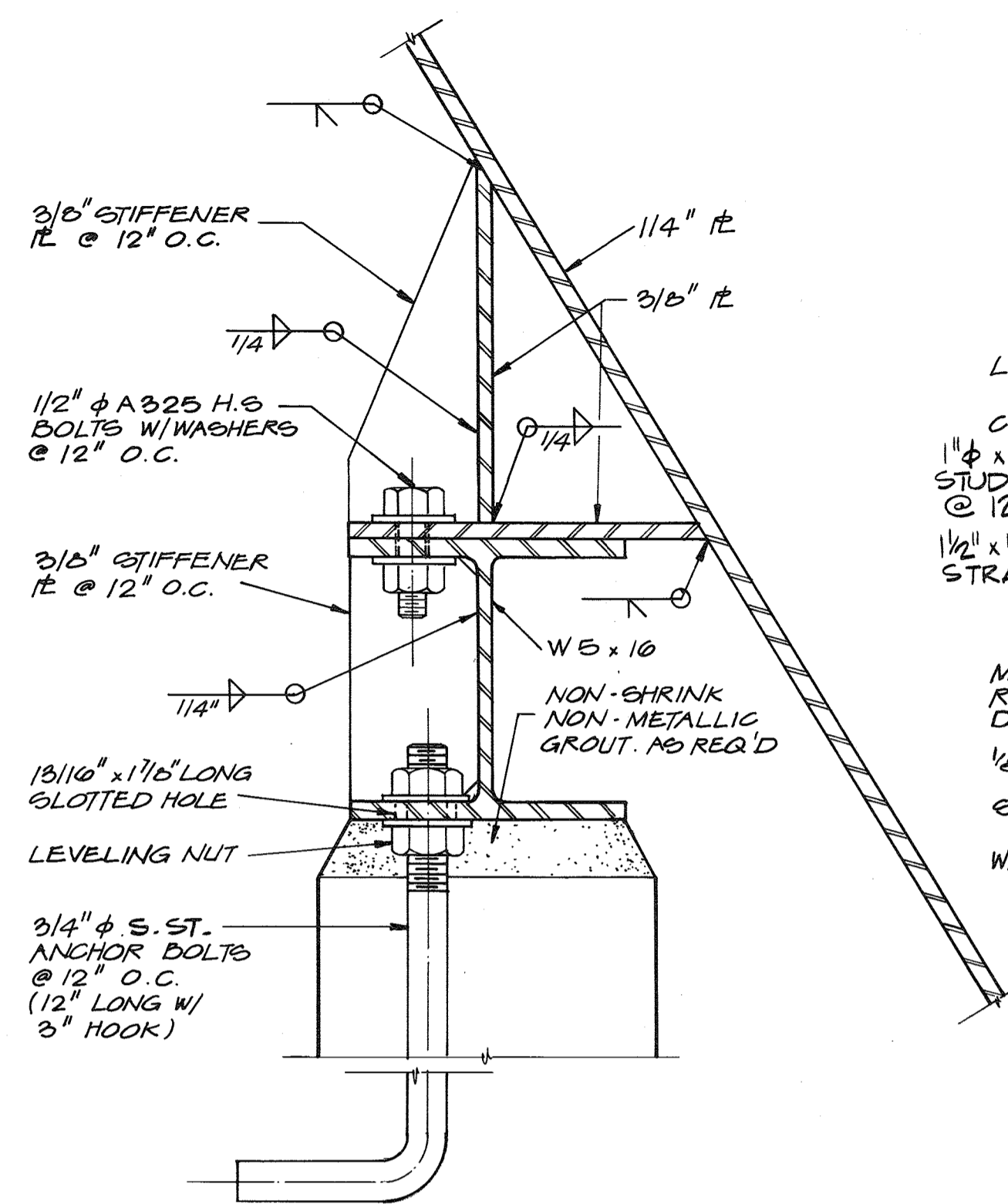
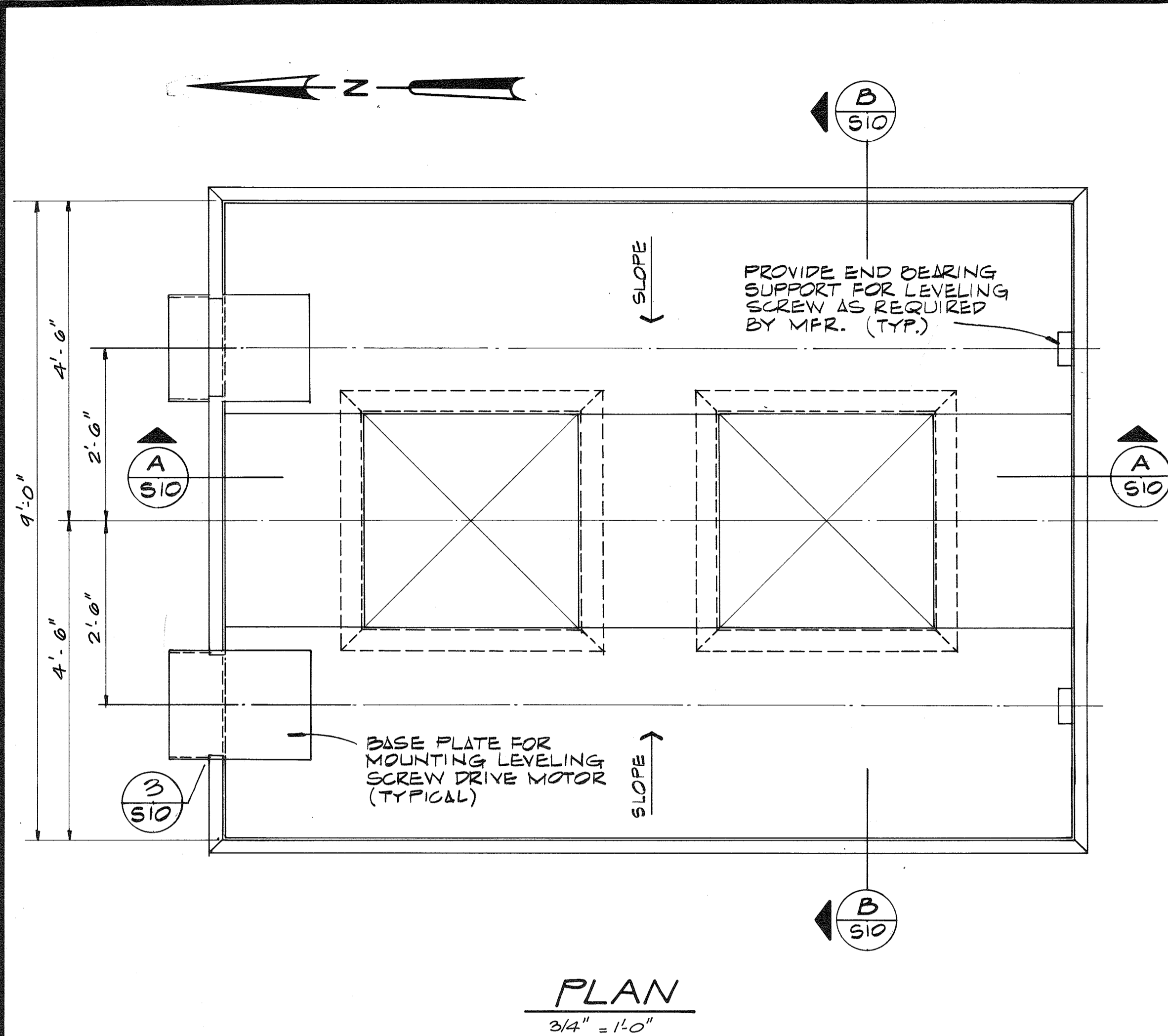
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

RECORD DRAWING

GRIT PROCESSING BLDG.
DETAILS
STRUCTURAL

SHEET
S-9
OF
DATE 8-78
DWG.
NO. W1078.B1



- GENERAL NOTES:**
1. ACCURATELY BEVEL EDGES OF ALL STRUCTURAL SHAPES AND PLATES TO BE WELDED. USE FULL PENETRATION WELDS UNLESS OTHERWISE SHOWN.
 2. NUMBER, SIZE, LENGTH AND SPACING OF BOLTS TO CONNECT GATE FRAME TO BIN, SEE BIN GATE DETAIL, M-9.
 3. ALL STEEL TO BE ASTM A-36 UNLESS OTHERWISE SHOWN.

RECORD DRAWING



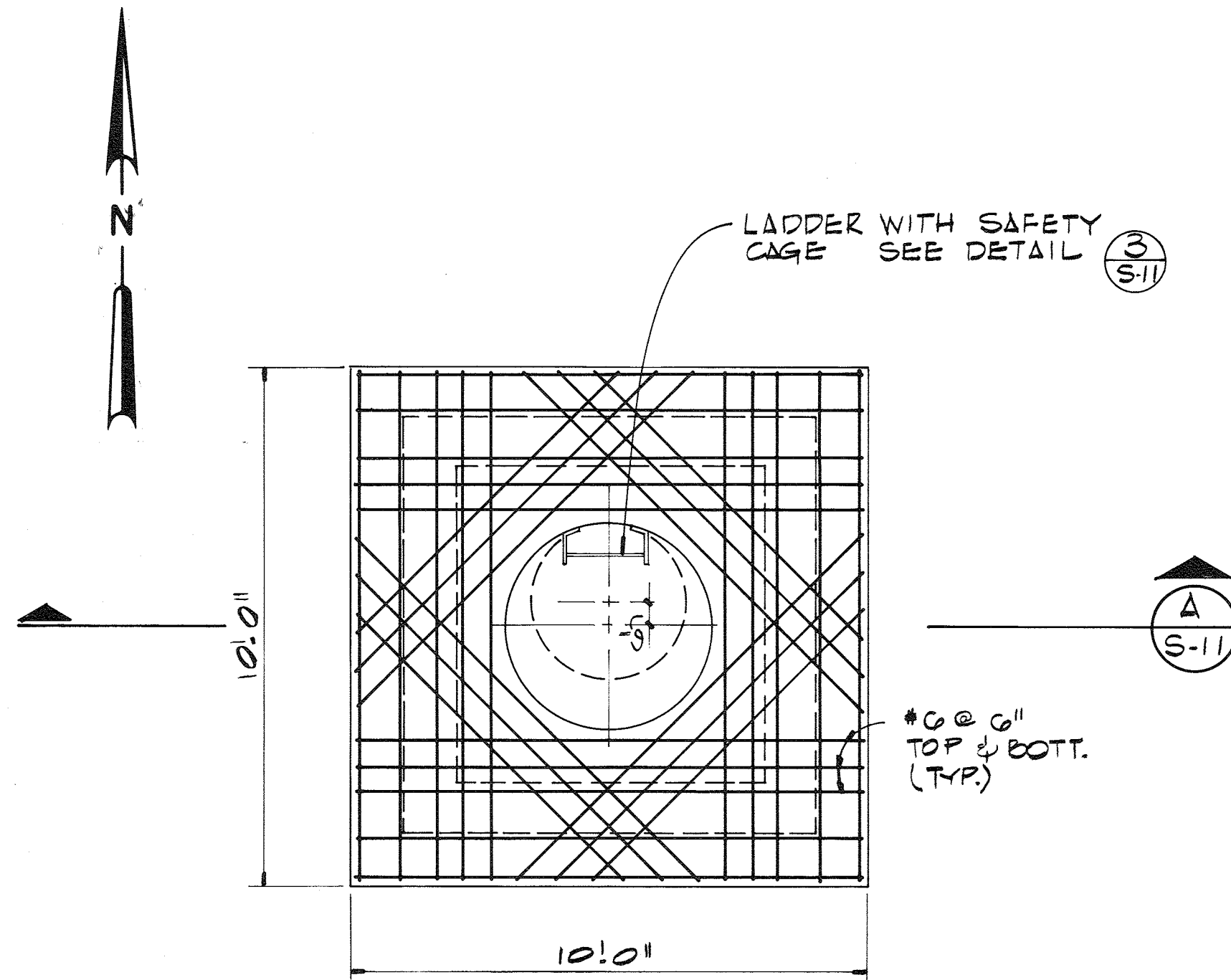
CH ₂ M HILL	DES. F.L.G.				
	DR. K.M.T.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

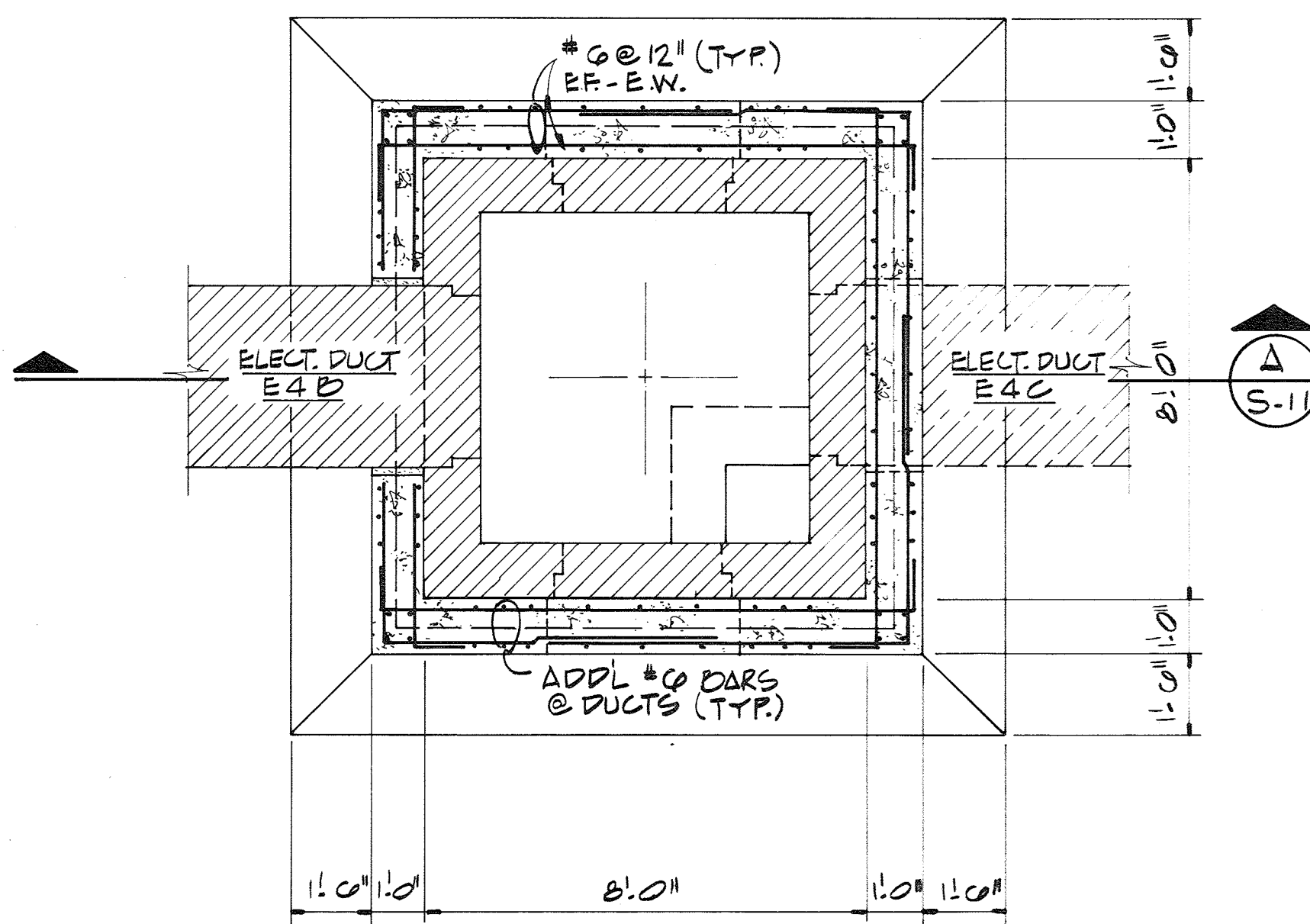
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
STORAGE BIN
STRUCTURAL

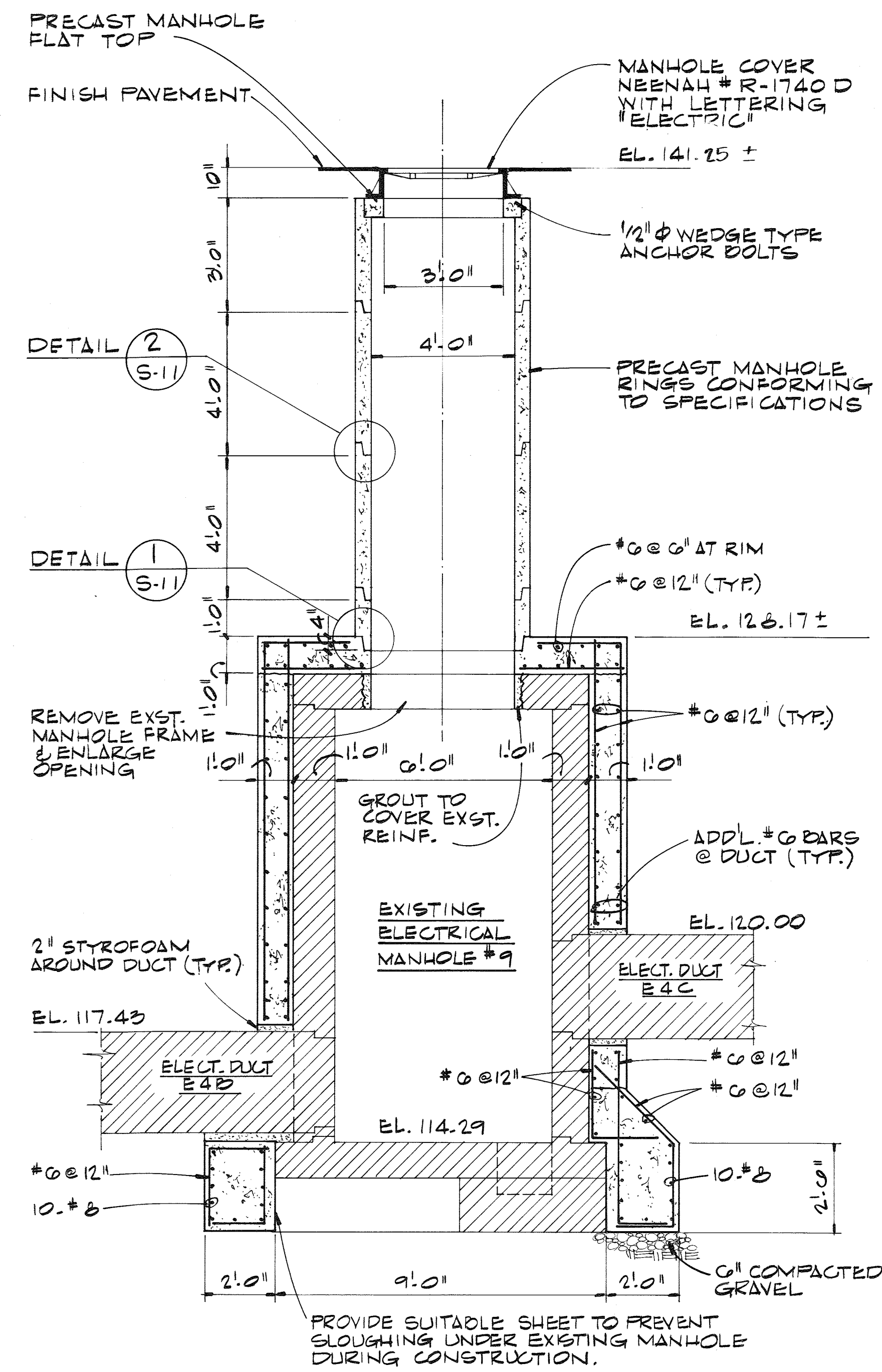
SHEET OF **S-10**
DATE 8-78
DWG. NO. W1078.B1



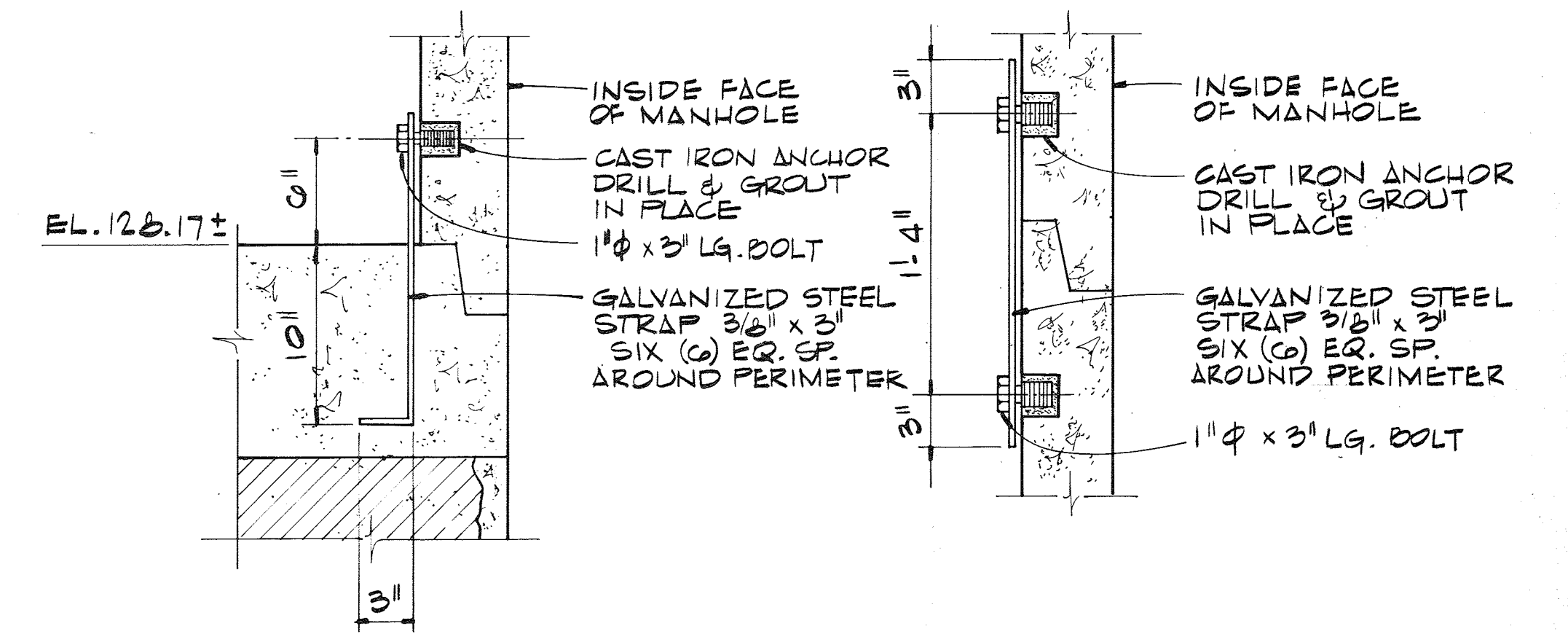
PLAN @ EL. 128.17
3/8" = 1'-0"



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

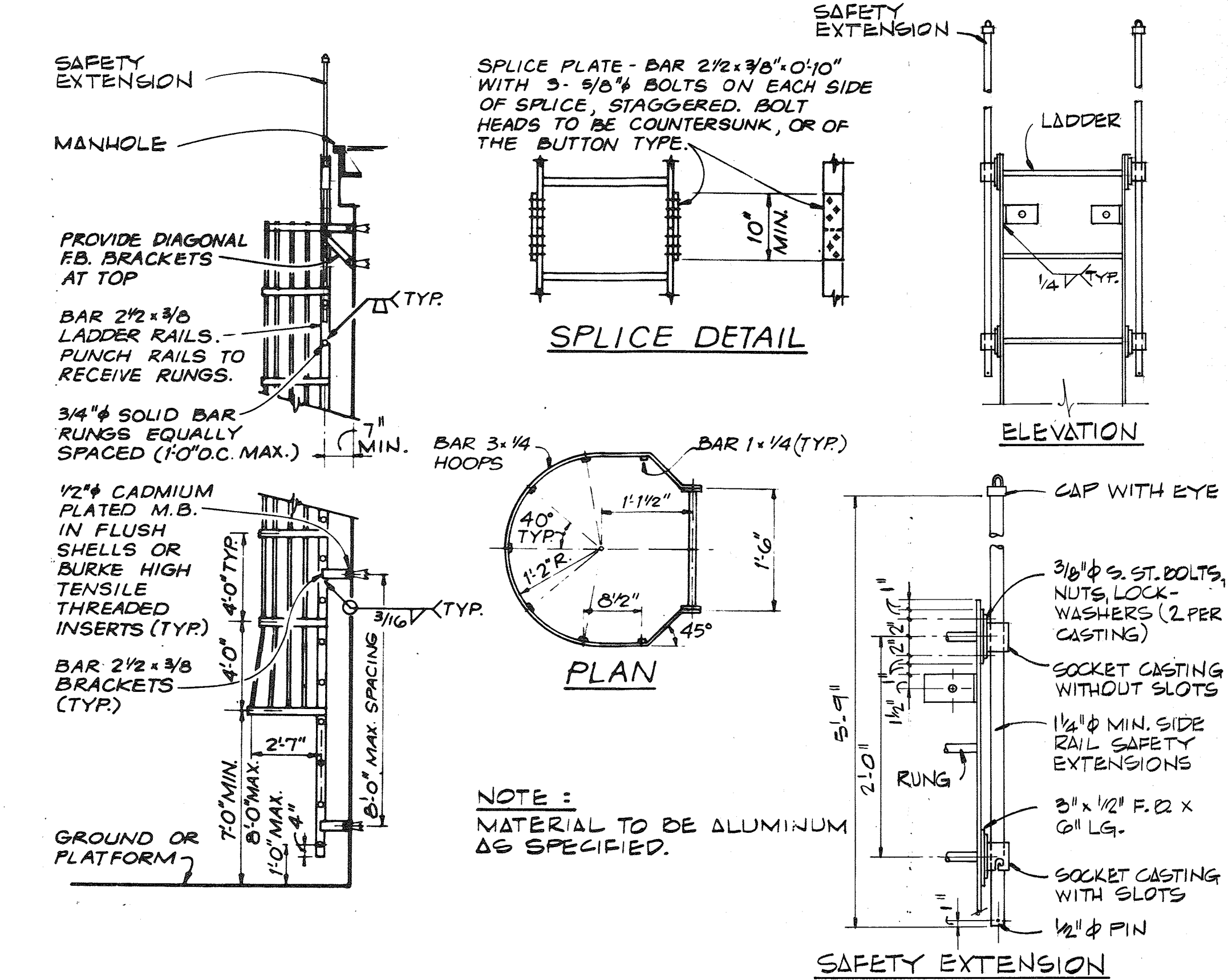


SECTION A
3/8" = 1'-0"



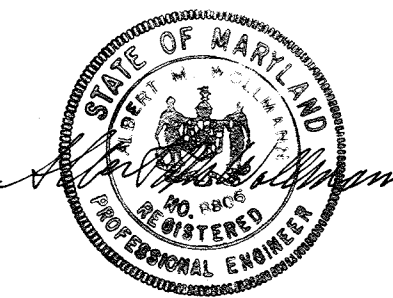
DETAIL 1
1/2" = 1'-0"

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



LADDER WITH SAFETY CAGE
N.T.S.

NOTE TO CONTRACTOR:
FIELD VERIFY ALL EXISTING ELEVATIONS, DIMENSIONS, DUCT AND SUMP LOCATIONS BEFORE CONSTRUCTION OF NEW STRUCTURE.



CH2M HILL	DES. FLG				
	DR. DWA				
	CHK.				
	APPD.				
	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
Robert B. Miller
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

ELECTRICAL MANHOLE NO 9 - MODIFICATIONS
STRUCTURAL

SHEET S-11
OF
DATE 8-78
DWG. NO. W1078.B1

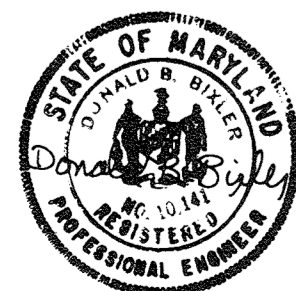
RECORD DRAWING

PIPE AND FITTING SYMBOLS

DOUBLE LINE SINGLE LINE

		EXISTING PIPE
		NEW PIPE
		EXISTING PIPE TO BE ABANDONED
		EXISTING PIPE TO BE REMOVED
		WELDED JOINT
		GROOVED END JOINT
		FLANGED JOINT
		MECHANICAL JOINT
		BELL & SPIGOT JOINT (LEADED)
		HUB & SPIGOT JOINT (RUBBER GASKET)
		BALL JOINT
		FLANGED COUPLING ADAPTER
		GROOVED END ADAPTER FLANGE
		FLEXIBLE COUPLING
		FLEXIBLE COUPLING WITH THRUST TIES
		STEEL BELLOWS XP JOINT
		ELASTOMER BELLOWS XP JOINT
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		LATERAL OR WYE UP
		LATERAL OR WYE DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION

NOTE: ONLY FLANGED FITTINGS ARE SHOWN. FITTINGS WITH OTHER END PATTERNS ARE SIMILAR.



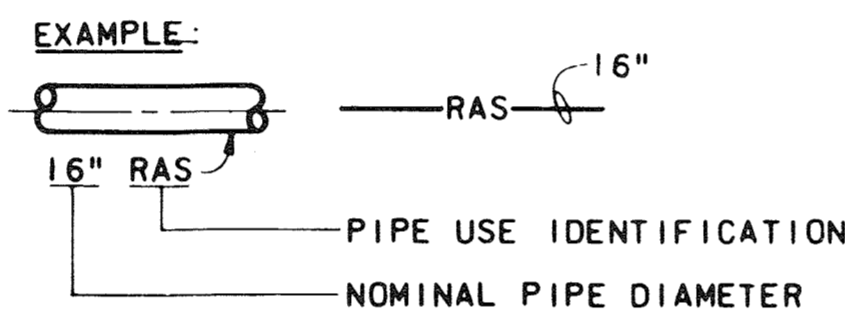
CH2M HILL

DES.					
DR.					
CHK.					
APPD.					
	NO.	DATE	REVISION	BY	APPD.

MISCELLANEOUS PIPING SYMBOLS

	STRAINER		TYPICAL EQUIPMENT TAG NUMBER (SEE I&C LEGEND)
	SIGHT GLASS		
	FLEXIBLE (ELASTOMER) PIPE CONNECTION		
	GAUGE WITH COCK		
	THERMOMETER		
	ROTAMETER		
	PIG LAUNCHER		
	PIG CATCHER		
	AIR SET		
	SUPPLY PRESSURE - PSIG		
	TYPICAL INSTRUMENT SYMBOL (SEE I&C LEGEND)		

PIPING DESIGNATION

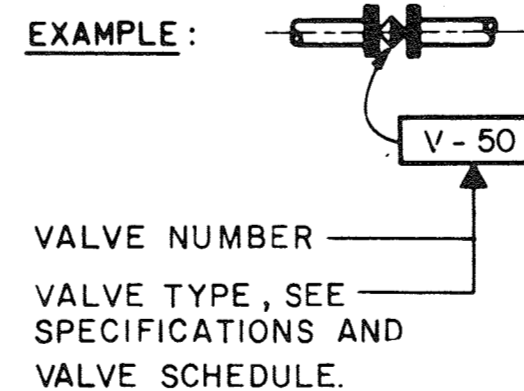


PIPE AND FITTING END PATTERNS

B	BELL	PE	PLAIN END	EXAMPLE:
S	SPIGOT	GE	GROOVED END	
F	FLANGE	MJ	MECHANICAL JOINT	

VALVE SYMBOLS

	GATE		PRESSURE RELIEF
	KNIFE GATE		AIR AND/OR VACUUM RELEASE
	BUTTERFLY		REGULATED SIDE
	GLOBE		PRESSURE CONTROL
	BALL		MULTI-PORT VALVES (BALL VALVE SHOWN. FOR OTHER VALVE TYPES, USE APPROPRIATE VALVE SYMBOL.)
	VEE-BALL		ARROWS INDICATE FLOW PATTERN. SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
	PLUG SEAT PORT		
	ECCENTRIC PLUG		
	DIAPHRAGM		
	PINCH		
	NEEDLE		
	SWING CHECK		
	BALL CHECK		
	BALL CHECK (SPRING LOADED)		
	SAMPLE		
	MUD		



RECORD DRAWING

GATE SYMBOLS

	SLUICE
	BUTTERFLY
	FLAP
	SHEAR
	FABRICATED SLIDE

GENERAL PIPING NOTES

- LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
- SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
- LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. FINAL SUPPORT REQUIREMENTS SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. MAXIMUM SPACING SHALL BE AS SPECIFIED.
- ALL JOINTS SHALL BE WATERTIGHT. STANDARD WALL PIPE DETAIL SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
- ALL FLEXIBLE CONNECTORS OR FLANGED COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST TIES WHERE INDICATED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
- SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE PLANS, WHEREVER APPLICABLE. ALL OF THE VARIOUS PIPING APPLICATIONS ARE NOT NECESSARILY USED IN THE PROJECT.
- ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, OR SCREWED PIPING, SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS AT ALL DIRECTION CHANGES, UNLESS OTHERWISE NOTED. SEE THRUST DETAILS AND NOTES ON SH C-1.
- NUMBER AND LOCATION OF UNIONS SHOWN ON PLANS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
- WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE USED TO JOIN THE COUPLING ADAPTER.

Pipe Fitting Symbols

PIPE FITTING SYMBOLS

①	90° BEND	⑬	ECCENTRIC REDUCER
②	90° LONG RADIUS BEND	⑭	FLEXIBLE COUPLING
③	90° REDUCING BEND	⑮	FLANGED COUPLING ADAPTER
④	45° BEND	⑯	VICTALIC COUPLING
⑤	22½° BEND	⑰	BLIND FLANGE
⑥	11¼° BEND	⑱	FLUSHING CONNECTION
⑦	SIDE OUTLET 90° BEND	⑲	SIGHT GLASS
⑧	BEND AS SHOWN	⑳	STANDARD WALL PIPE ASSEMBLY
⑨	TEE	㉑	STANDARD WALL SLEEVE
⑩	SIDE OUTLET TEE	㉒	VALVE BOX W/ STEM EXTENSION-SET IN 1'-6" SO + 6" THICK CONCRETE SLAB, UNLESS SHOWN OTHERWISE. LID TO BE FLUSH WITH TOP OF CONCRETE.
⑪	CROSS		
⑫	WYE		
⑬	WYE (TRUE)		
⑭	CONCENTRIC REDUCER		

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

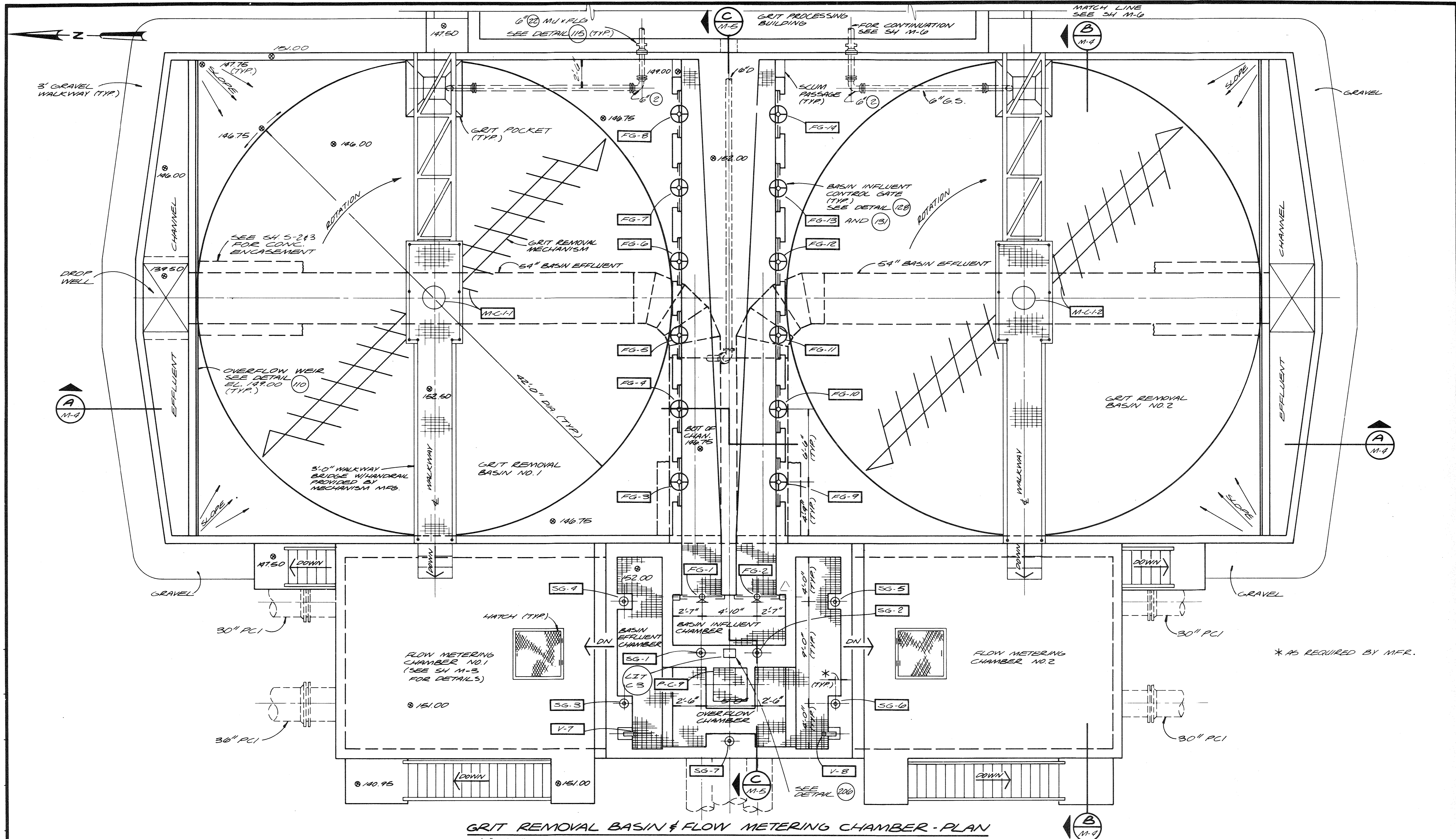
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

LEGEND & ABBREVIATIONS

MECHANICAL

SHEET OF M-1
DATE 8-78
DWG. NO. W11078.B1



RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

8-22-78
 DATE

Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

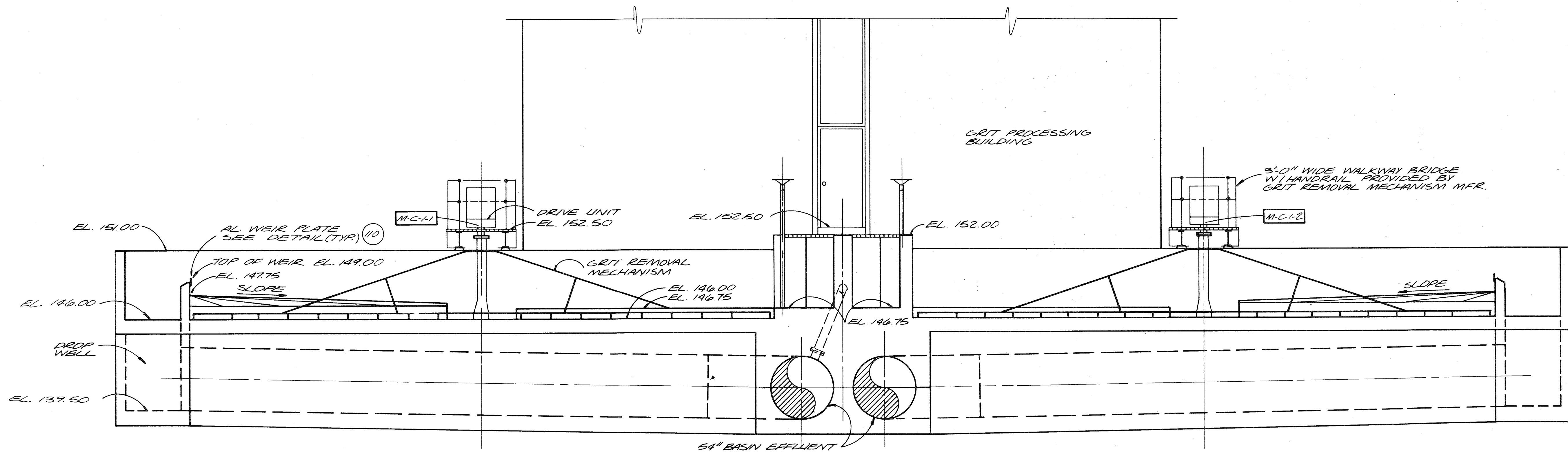
SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

GRIT REMOVAL BASINS & FLOW METERING CHAMBERS
PLAN
 MECHANICAL

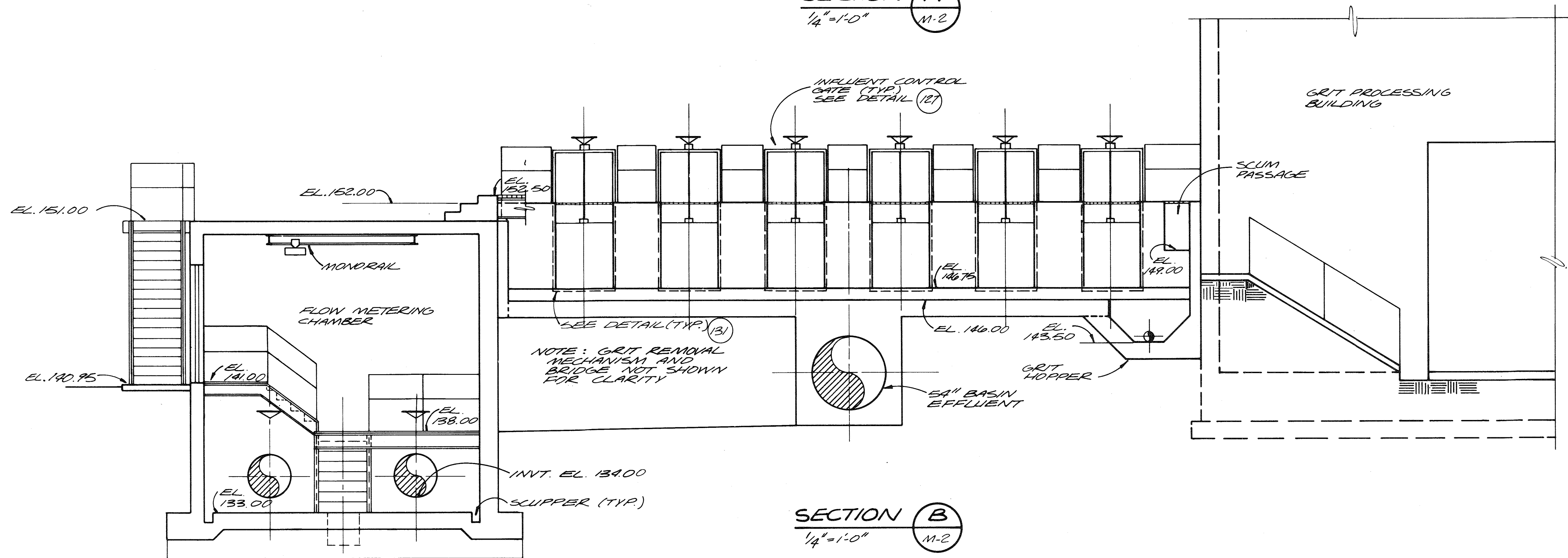
SHEET
 OF **M-2**
 DATE 8-78
 DWG. NO. W11078.B1



DES. DBB					
DR. YAW					
CHK.					
APPD.					
	NO.	DATE	REVISION	BY	APPD.
		02/23/78	ADDENDUM NO. 2	DHA	DDP

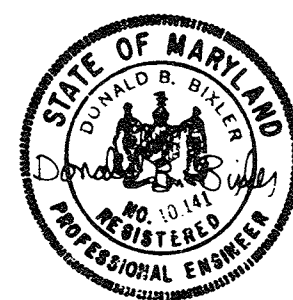


SECTION A
1/4" = 1'-0" M-2



SECTION B
1/4" = 1'-0" M-2

RECORD DRAWING



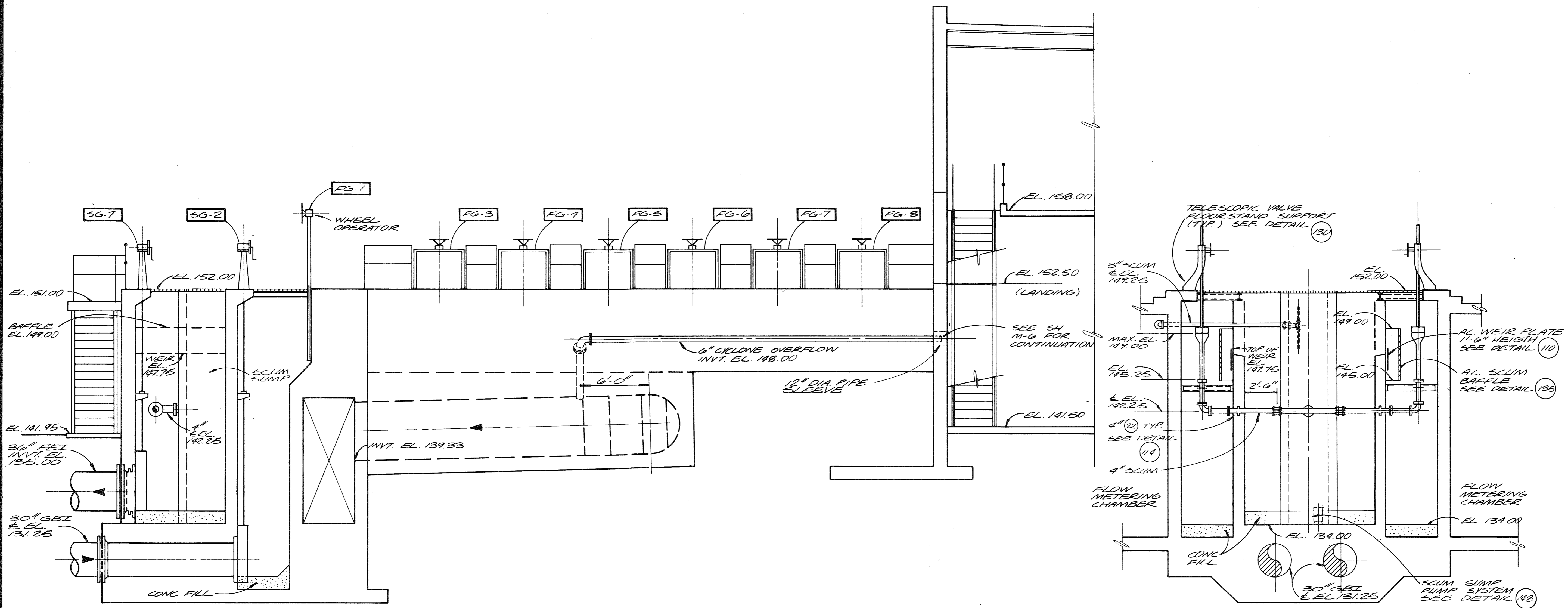
CH2M HILL	DES. DBB				
	DR. KAW				
	CHK.				
	APPD.				
	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

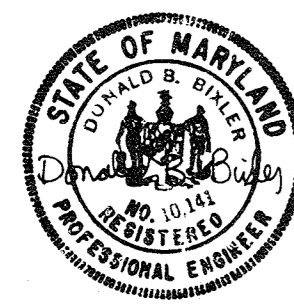
GRIT REMOVAL BASINS
SECTIONS
MECHANICAL

SHEET OF M-4
DATE 8-78
DWG. NO. W1078.B1



SECTION C
1/4" = 1'-0" M-2

SECTION D
1/4" = 1'-0" M-3



CH2M HILL	DES. DBB				
	DR. V.A.W.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

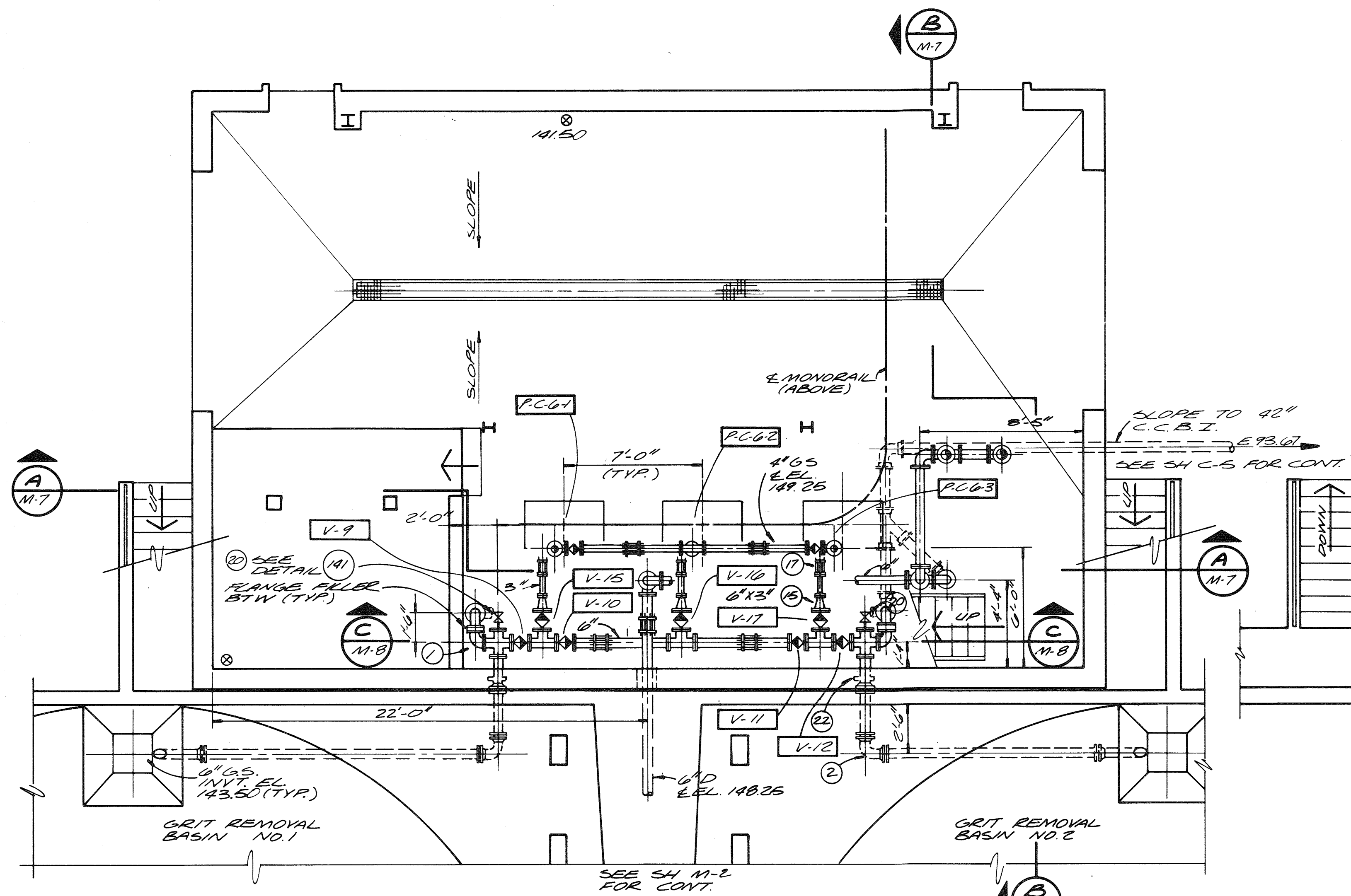
Robert E. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

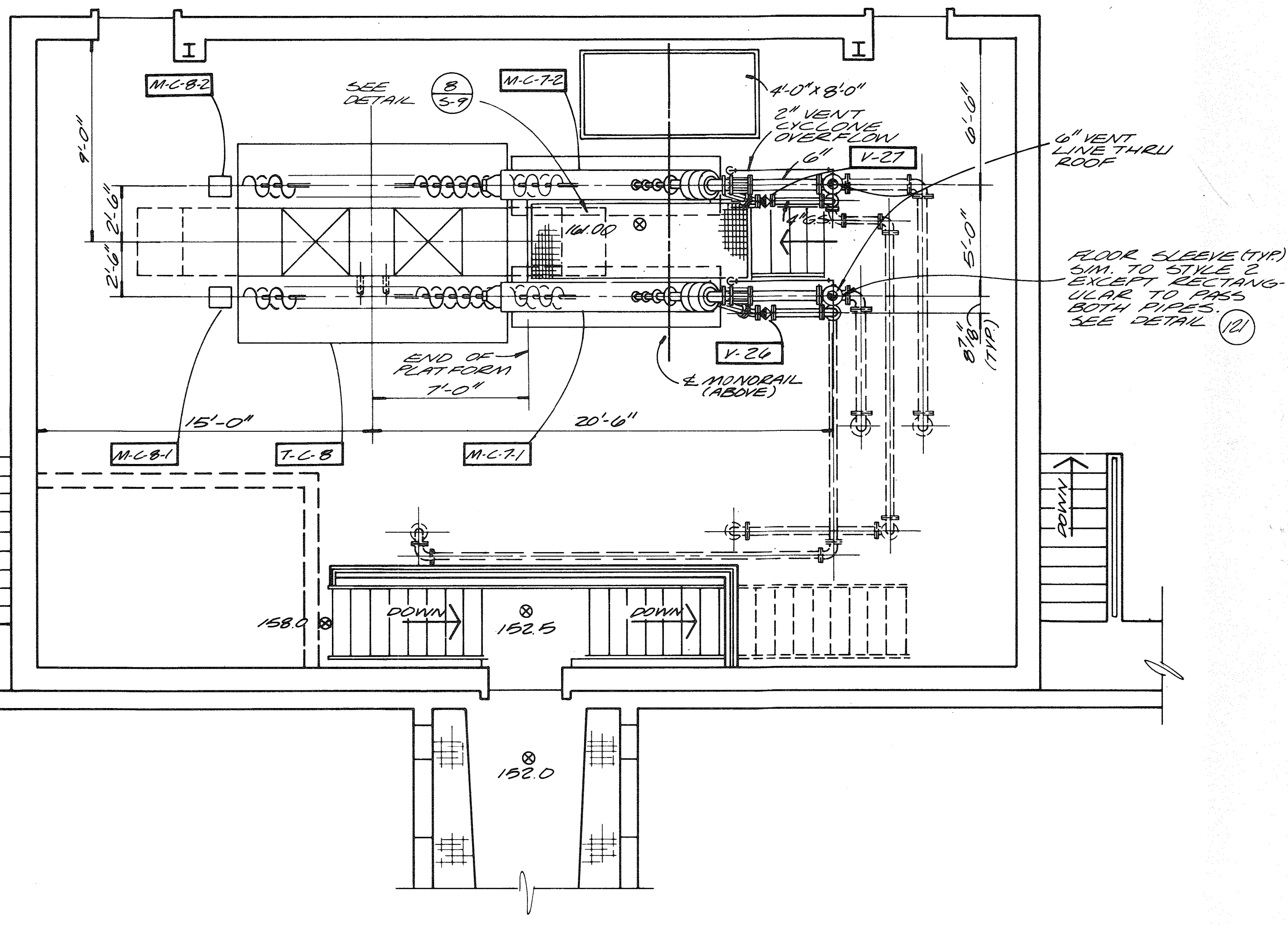
GRIT REMOVAL BASINS
SECTIONS

MECHANICAL

SHEET OF M-5
DATE 8-78
DWG. NO. W1078.B1



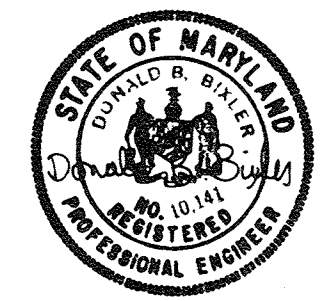
LOWER FLOOR PLAN - BELOW EL. 152.0



UPPER FLOOR PLAN - ABOVE EL. 152.0

GRIT PROCESSING BUILDING
1/4" = 1'-0"

RECORD DRAWING



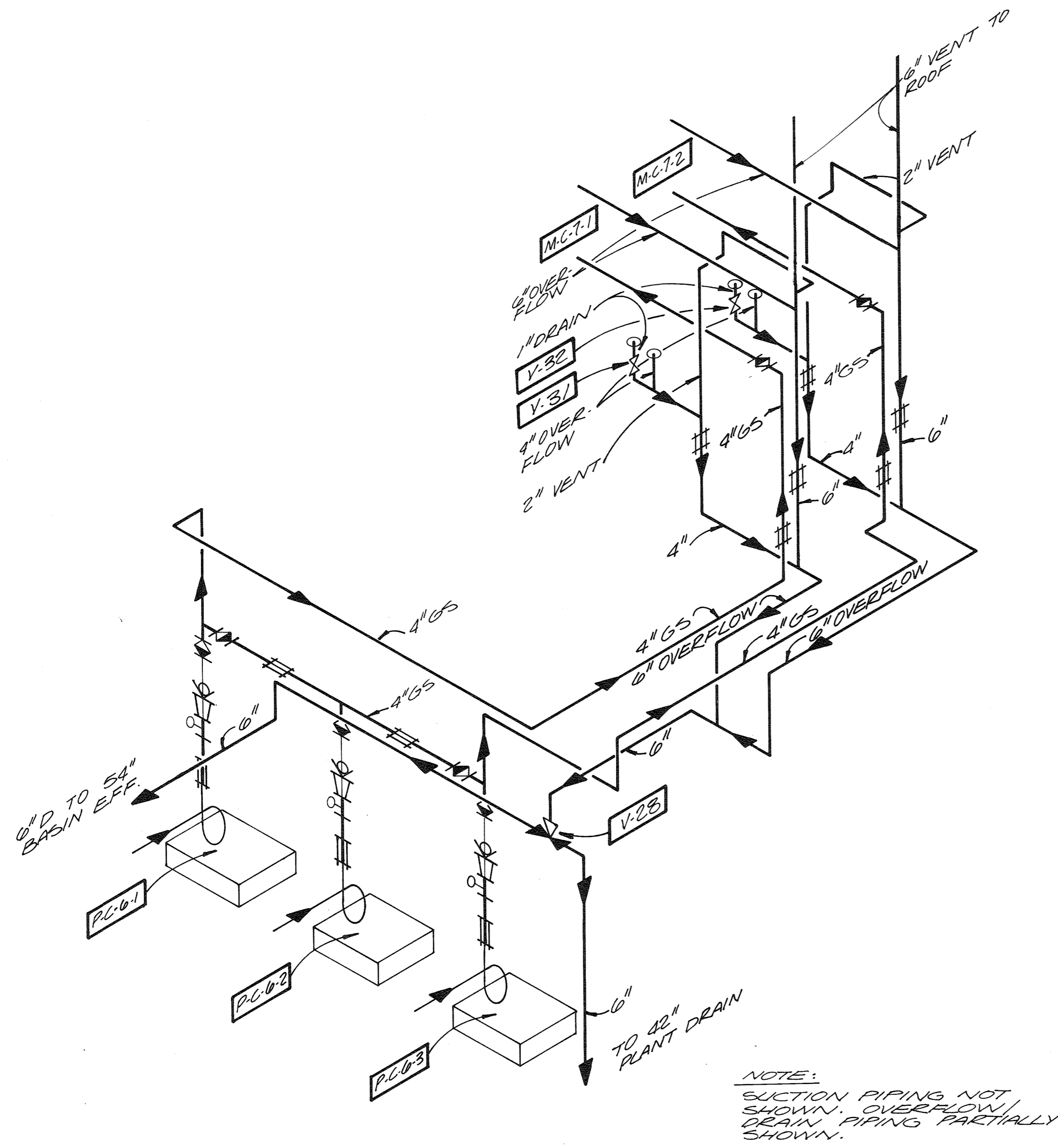
CH2M HILL	DES. DBB				
	DR. VAW				
CHK.					
APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
PLAN
MECHANICAL

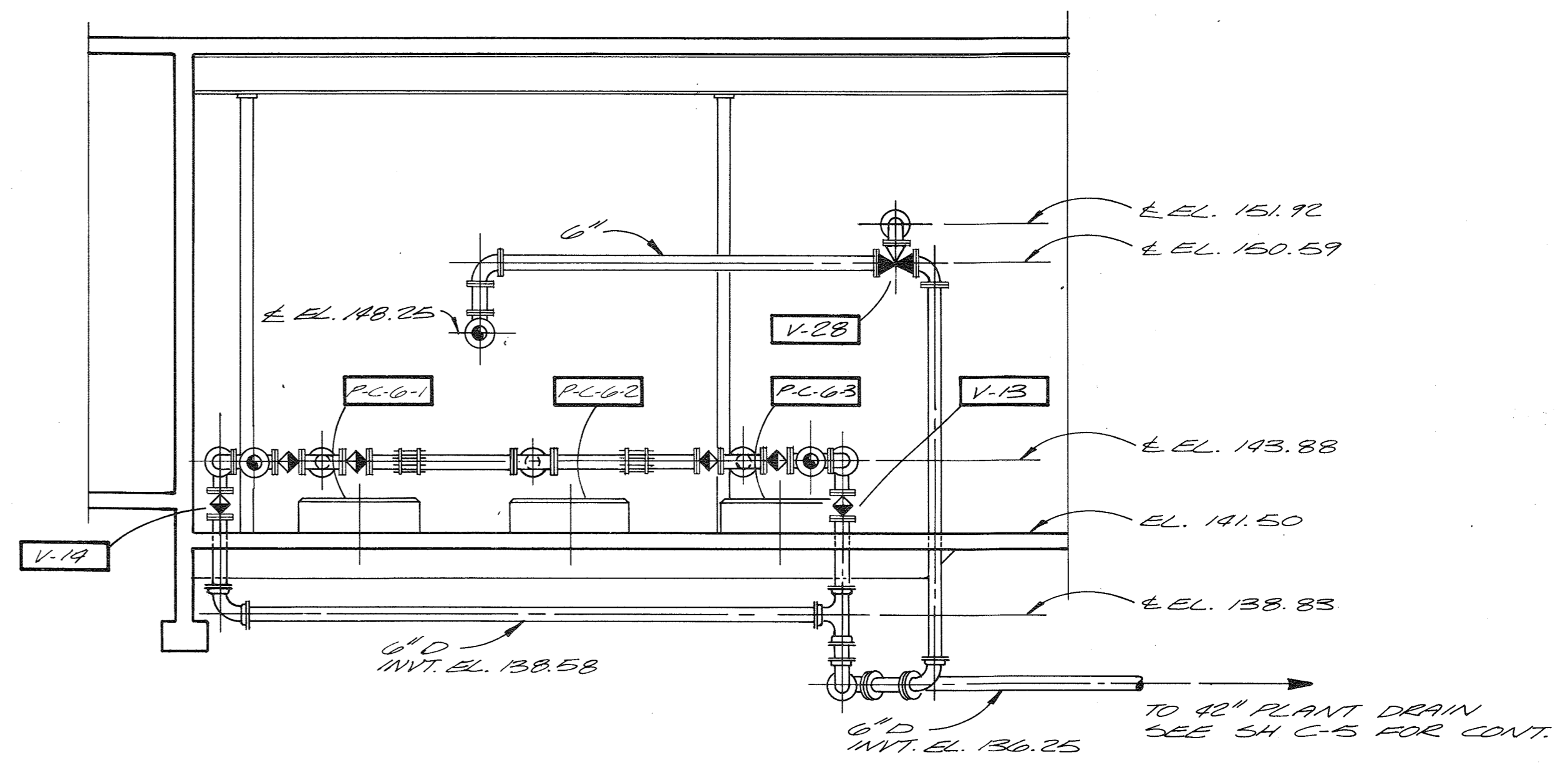
SHEET
OF M-6
DATE 8-78
DWG.
NO. W1078.B1



NOTE:
 SUCTION PIPING NOT SHOWN. OVERFLOW/ DRAIN PIPING PARTIALLY SHOWN.

**GRIT PROCESSING BUILDING
 PIPING ISOMETRIC**

N.T.S.



NOTE:
 DISCHARGE PIPES NOT SHOWN FOR CLARITY.

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



CH2M HILL	DES. DBB						
	DR. V.A.W.						
	CHK.						
	APPD.	NO.	DATE	REVISION	BY	APPD.	

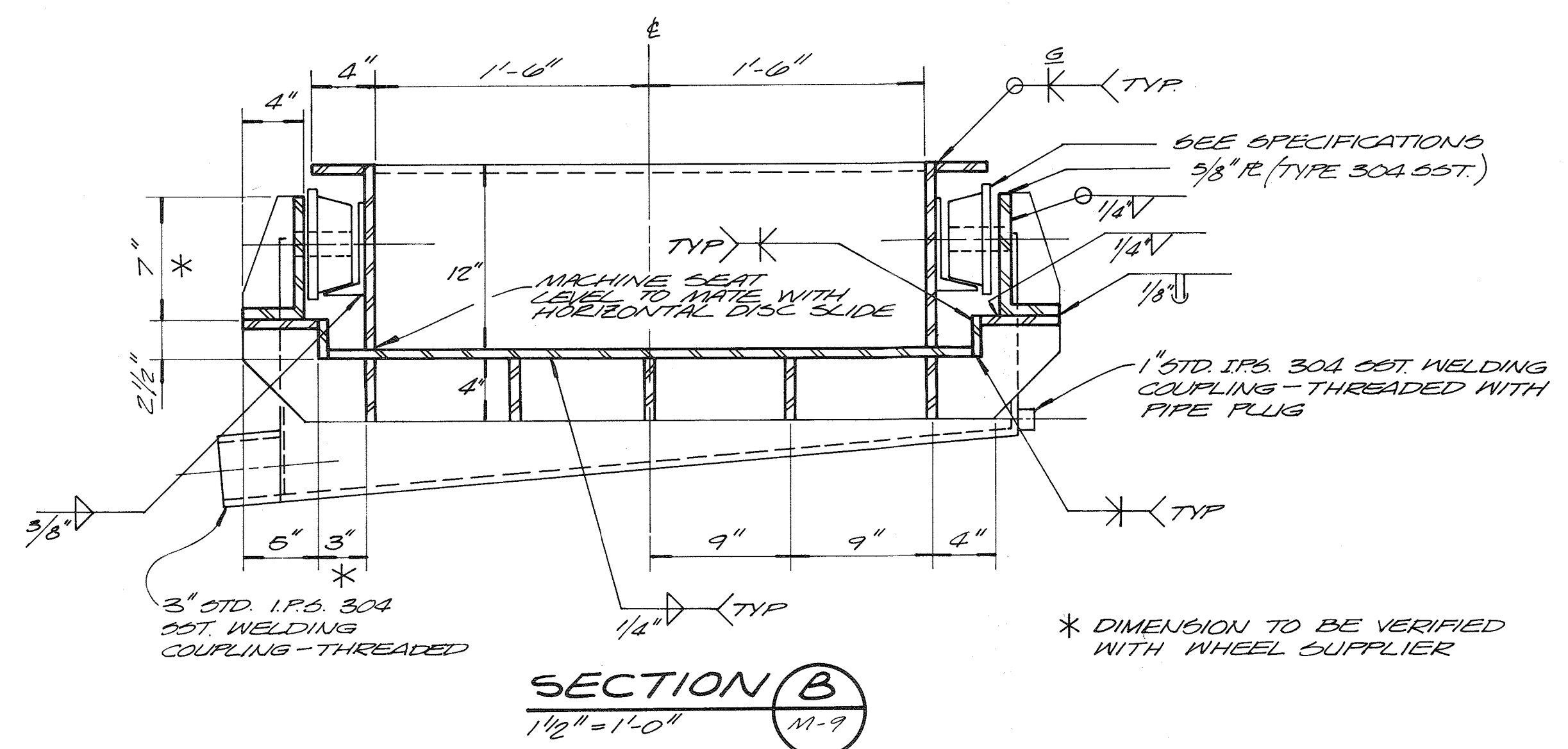
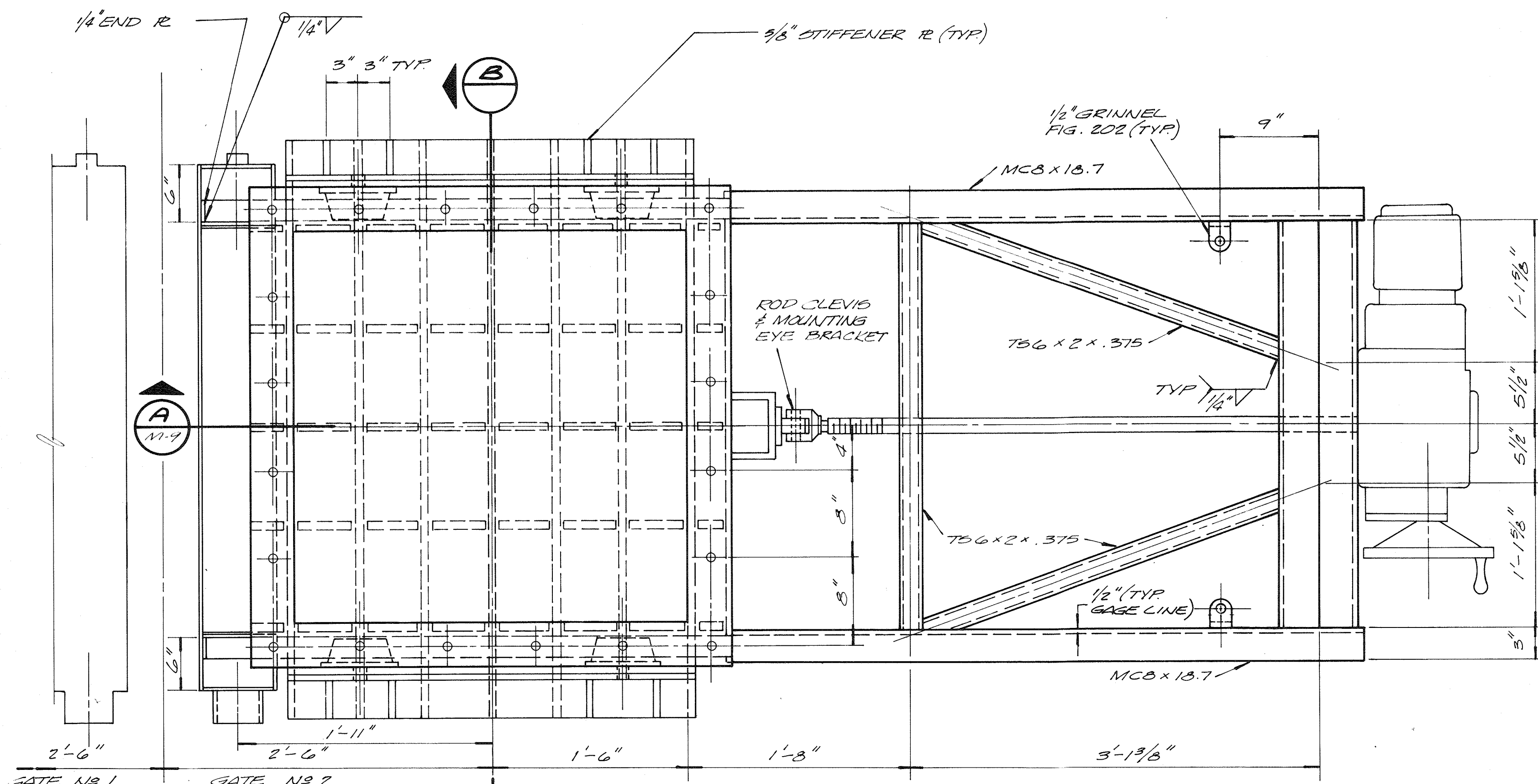
RECORD DRAWING

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 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

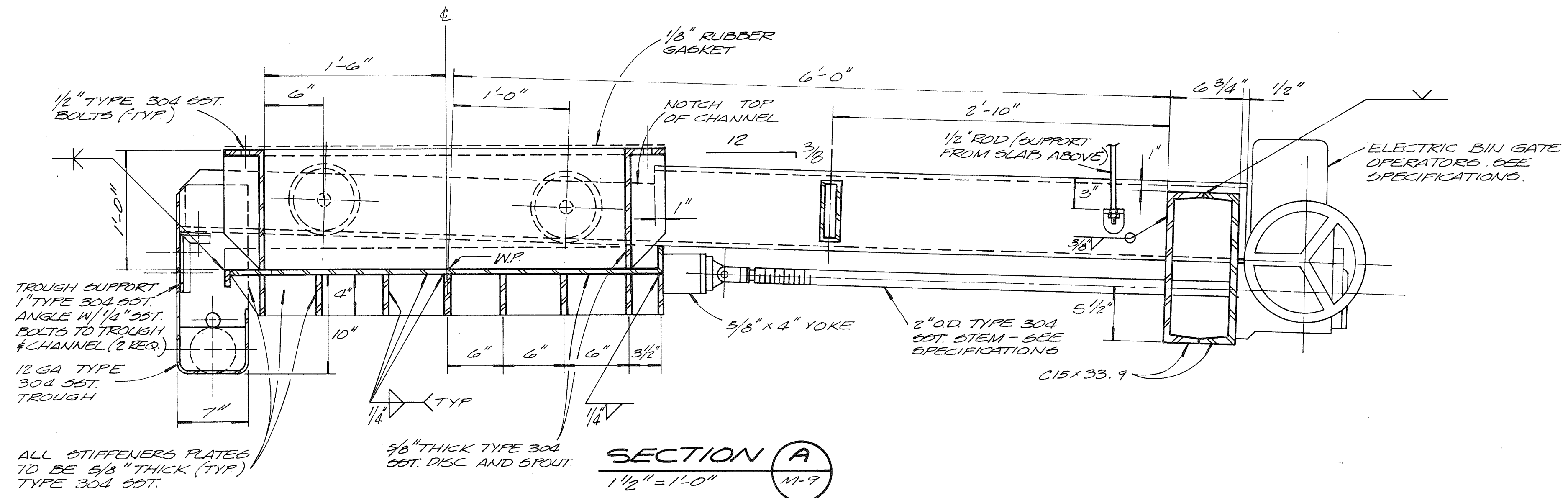
SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
 PIPING ISOMETRIC
 MECHANICAL

SHEET
 OF
M-8
 DATE 8-78
 DWG.
 NO. W11078.B1

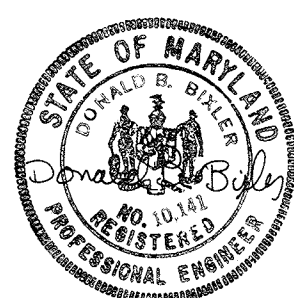


STORAGE BIN GATES - PLAN
1 1/2" = 1'-0"



- NOTES:
1. CONTRACTOR TO SUBMIT COMPLETE DETAILED FABRICATION DRAWINGS FOR BIN GATES.
 2. ALL STEEL TO BE ASTM A-36, UNLESS OTHERWISE NOTED.
 3. ALL WELDS TO BE FULL PENETRATION UNLESS OTHERWISE NOTED.
 4. TWO COMPLETE ASSEMBLIES REQUIRED.

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



CH2M HILL DES. F.L.G. DR. EEM/VAN CHK. APPD.	NO.	DATE	REVISION	BY	APPD.

RECORD DRAWING

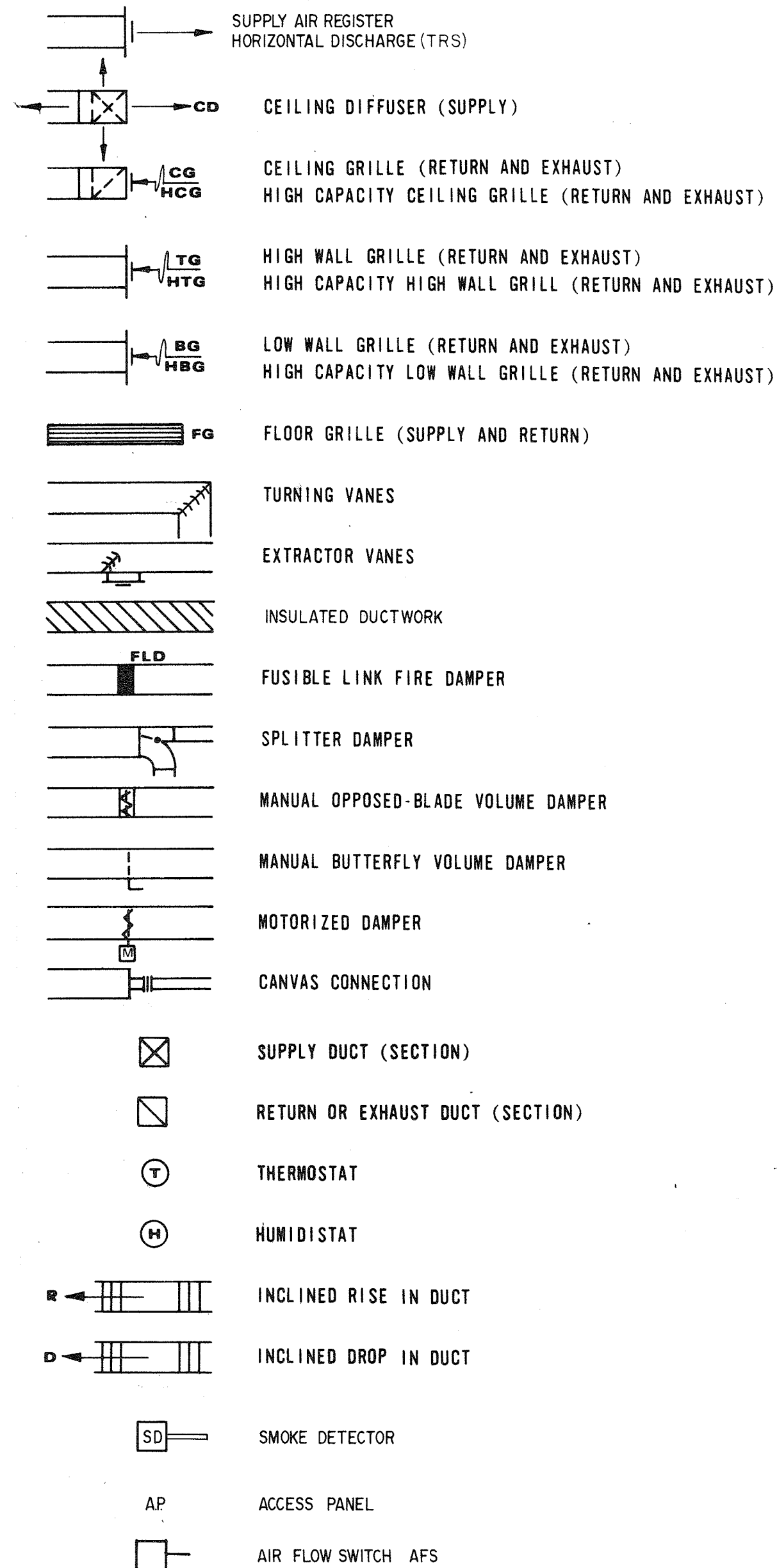
DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

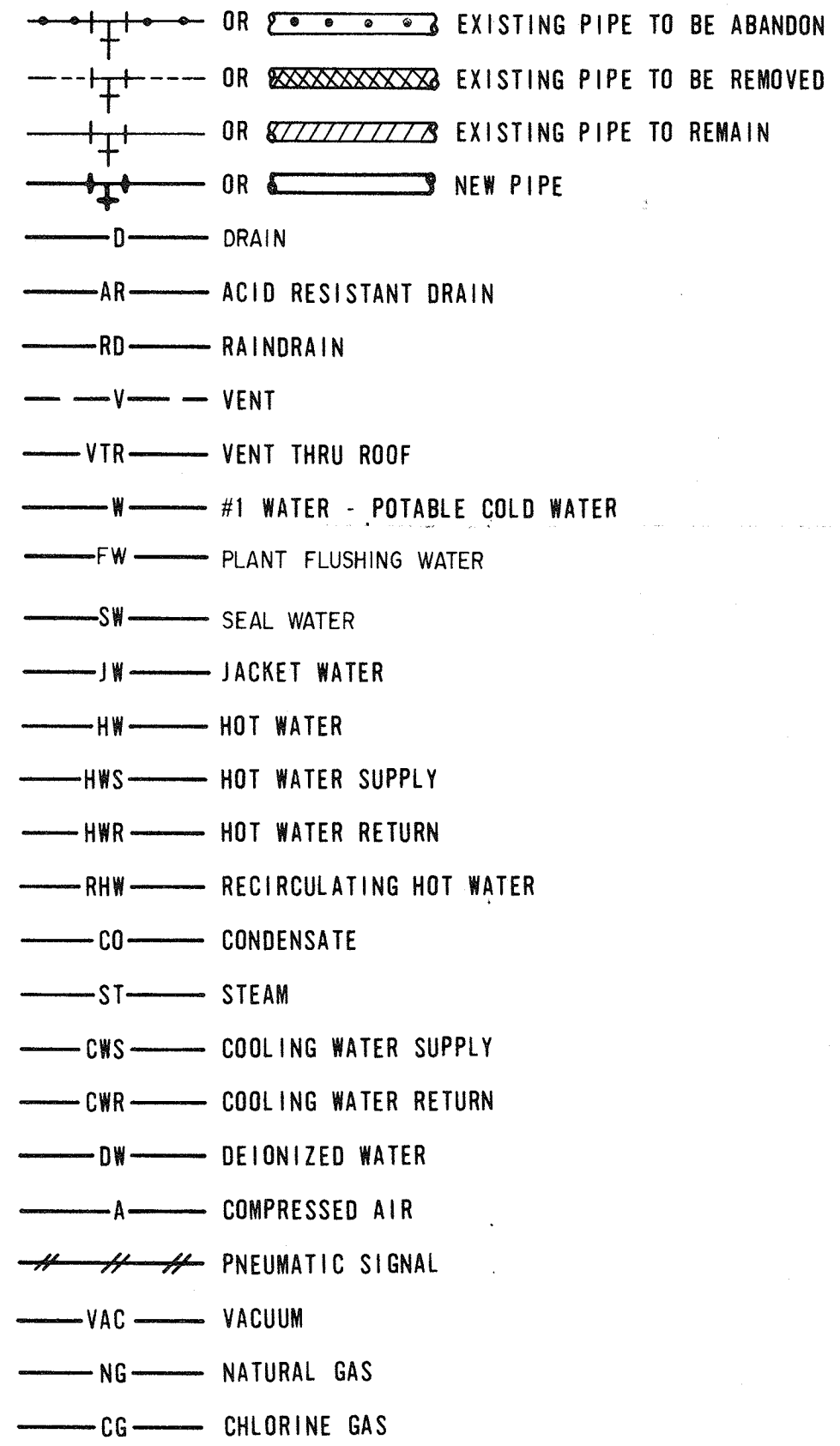
GRIT PROCESSING BLDG.
STORAGE BIN GATES
 MECHANICAL

SHEET
 OF **M-9**
 DATE 8-78
 DWG.
 NO. W1078.B1

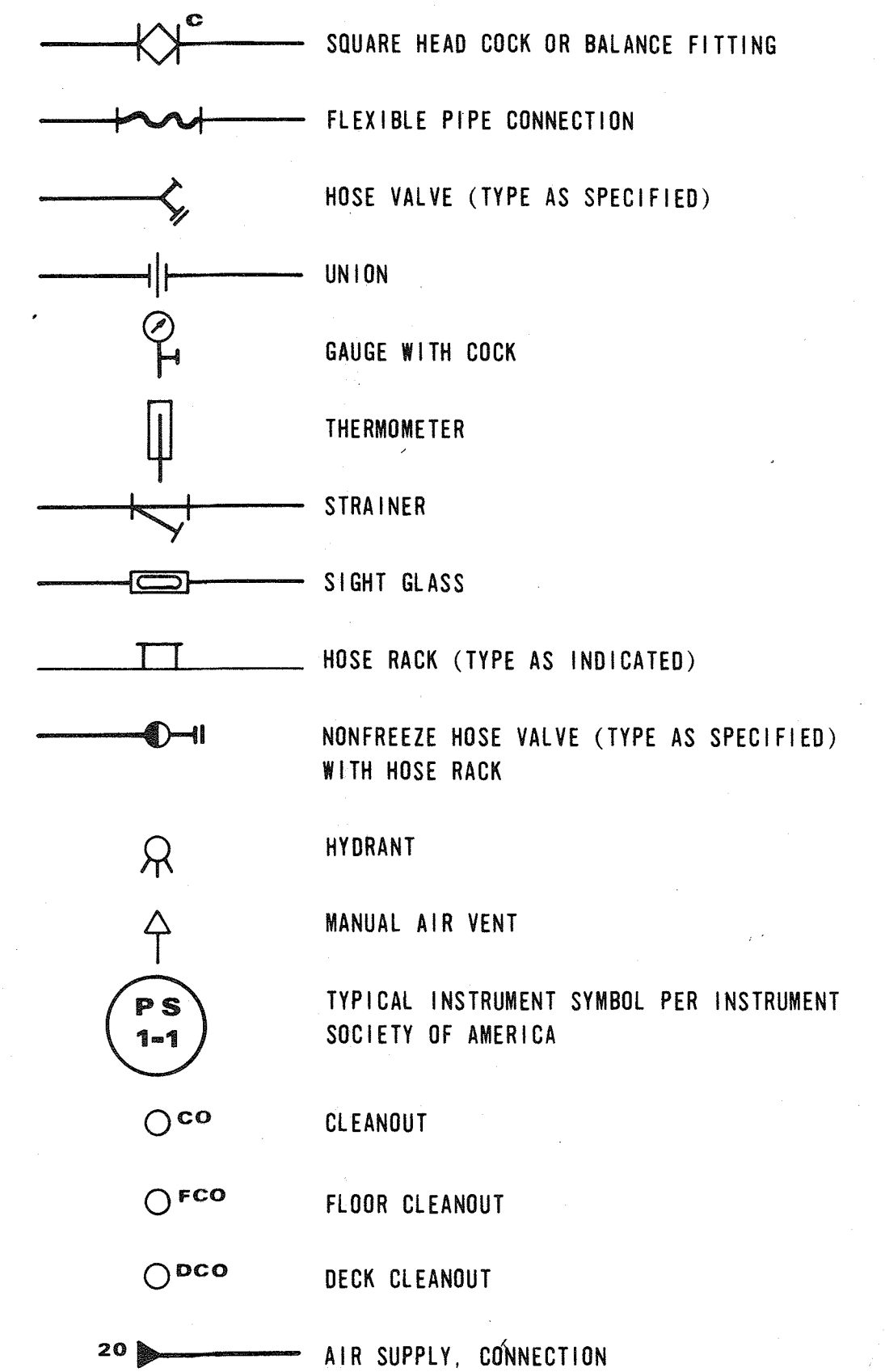
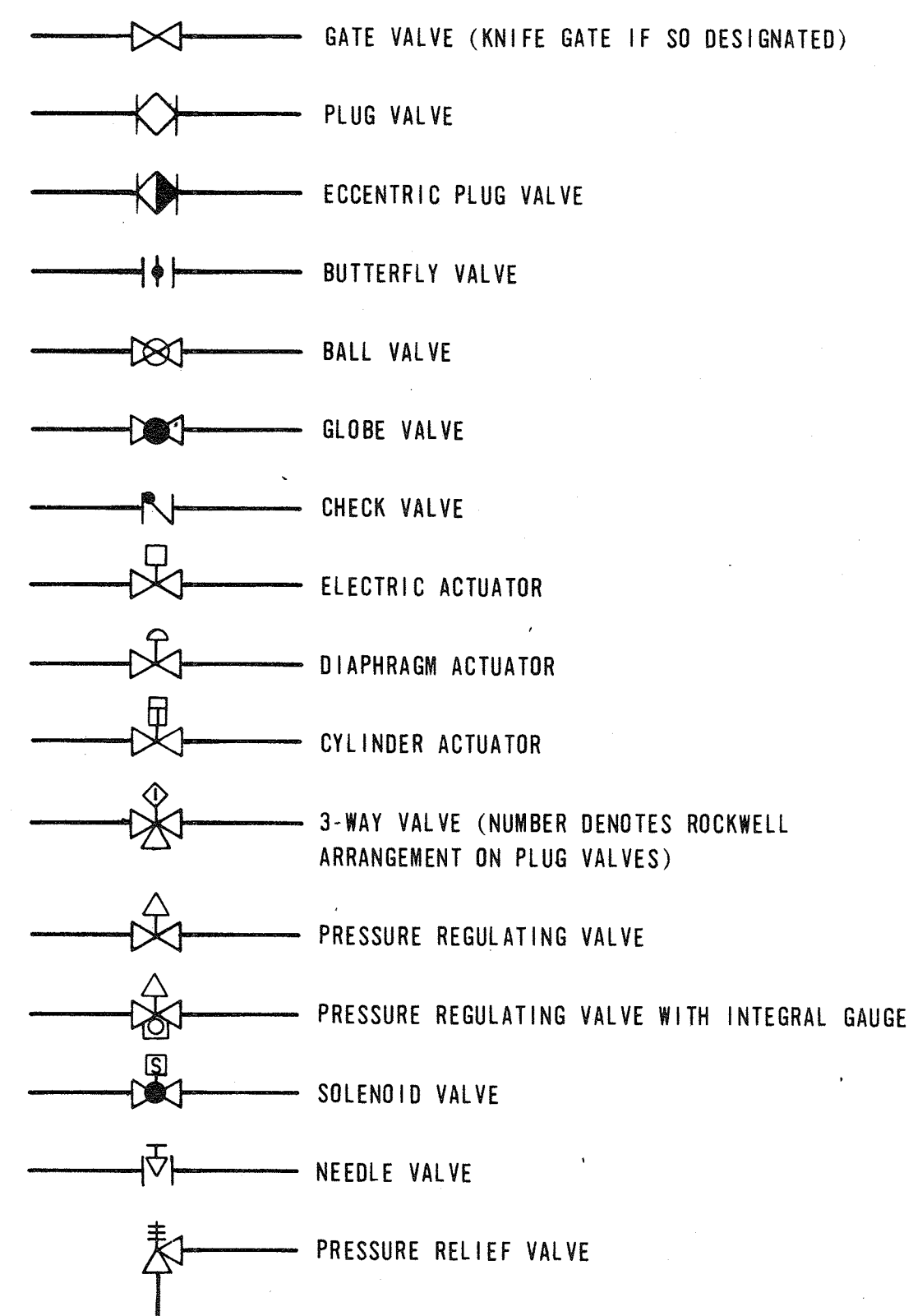
HEATING, VENTILATING AND AIR CONDITIONING:



PIPING:



VALVES AND MISCELLANEOUS PIPING ITEMS:



CH2M HILL DES <i>RWM</i> DR. <i>C.F.E. JR.</i> CHK. APPD.	NO.	DATE	REVISION	BY	APPD.

RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

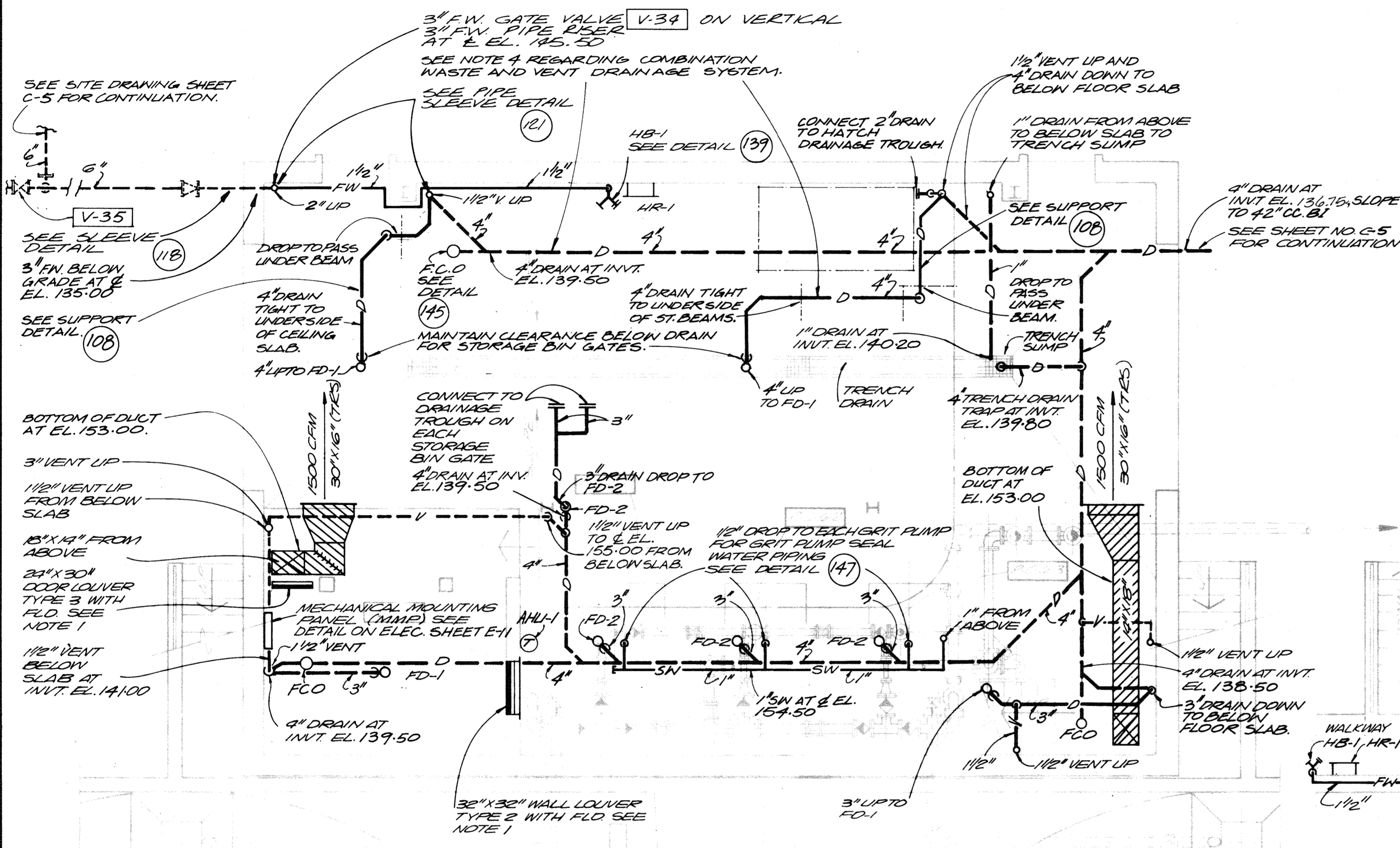
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

LEGEND

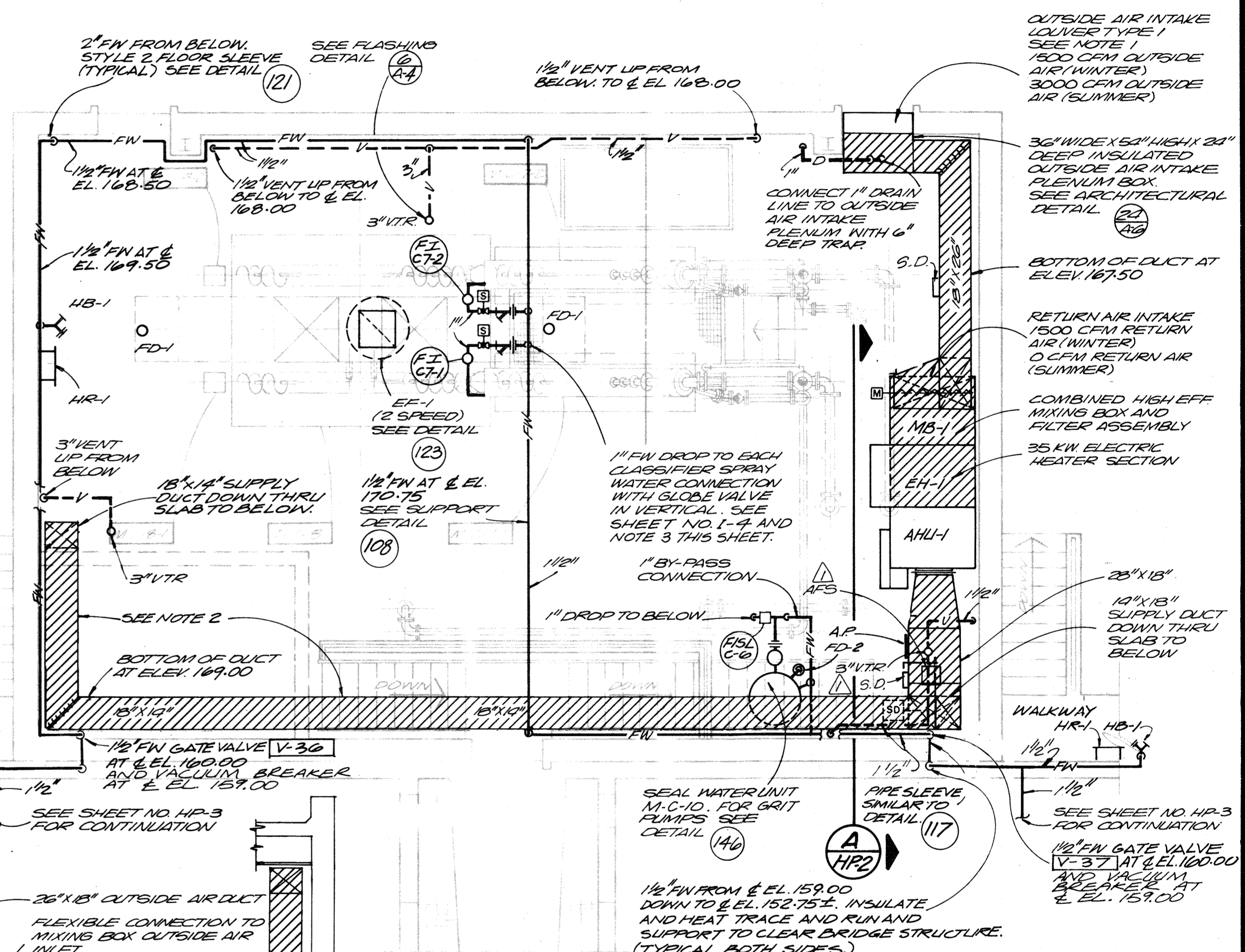
HEATING & BUILDING SERVICES

SHEET
OF
HP-1
DATE 8-78
DWG.
NO. W11078.B1

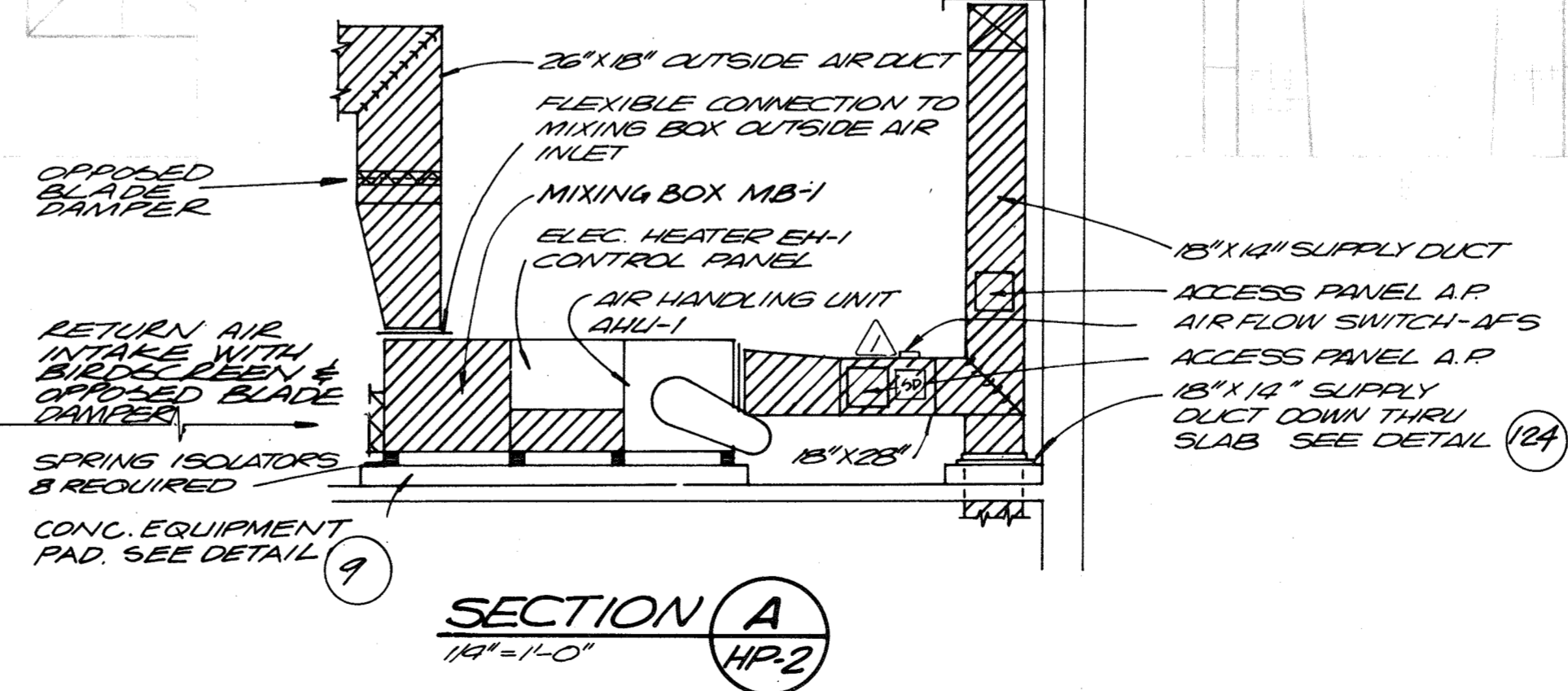
- NOTES**
1. WALL AND DOOR LOUVER TYPES SHOWN ON ARCHITECTURAL DWGS. AND SPECIFIED IN SECTION 10200
 2. ALL DUCT SIZES SHOWN ARE NET INTERNAL DIMENSIONS.
 3. MOUNT ROTAMETERS AND ACCESSORIES ON FIBERGLASS OR ALUM. PANEL. SUPPORT PANEL FROM HANDRAIL. ALL DETAILS TO BE AS APPROVED BY THE ENGINEER.
 4. THE COMBINATION WASTE AND VENT DRAINAGE SYSTEM AS SHOWN ON THIS SHEET SHALL BE AS SPECIFIED IN SECTION 15400, BUILDING SERVICES



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

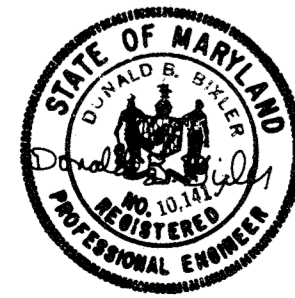


UPPER FLOOR PLAN
1/4" = 1'-0"



SECTION A
HP-2
1/4" = 1'-0"

RECORD DRAWING



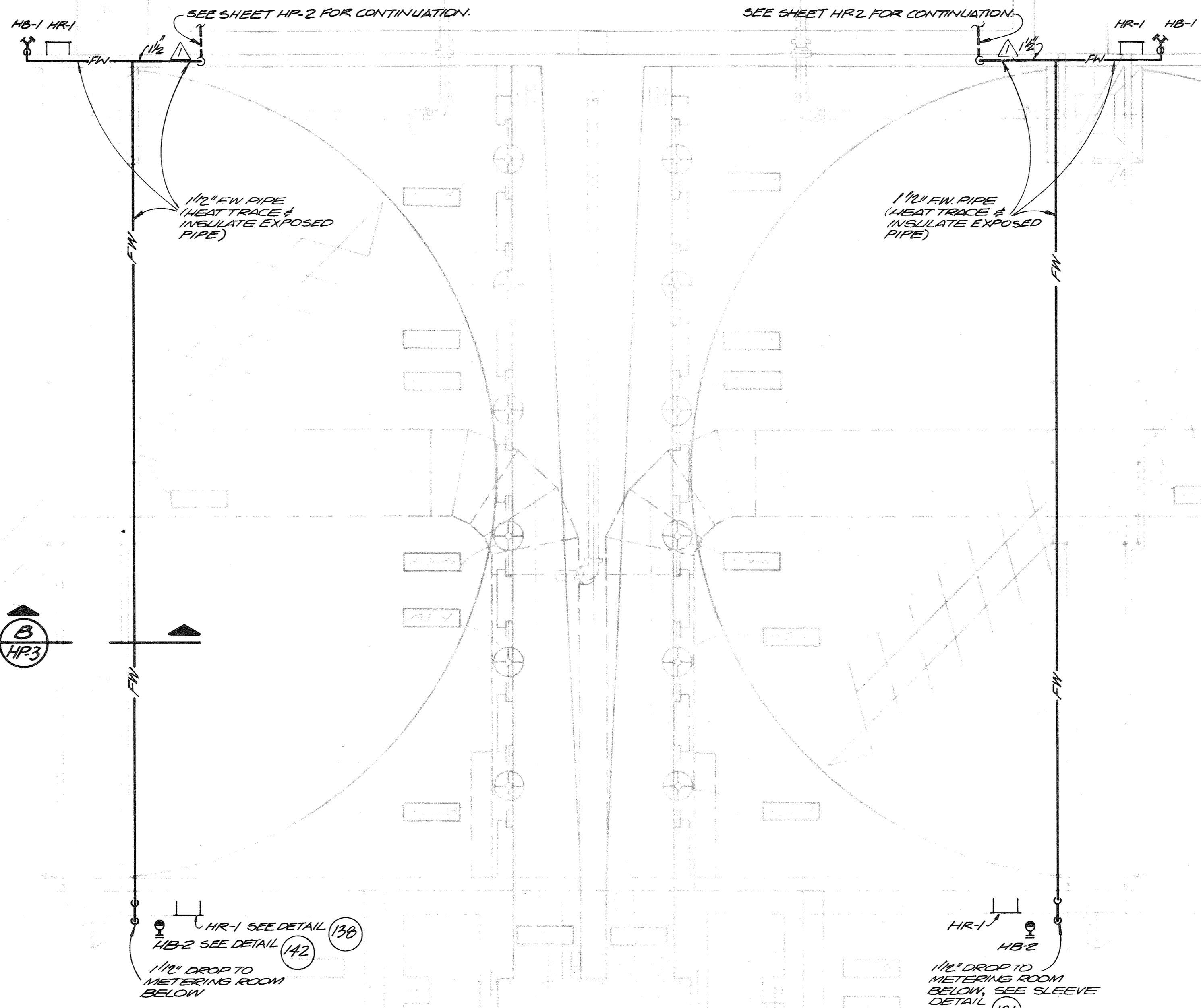
CH2M HILL	DES. RWM	2-19-88	RELOCATE SMOKE DET. & AIR FLOW SWITCH DIT	BY	APPD.
	DR. CEE, JR.				
	CHK.				
	APPD.				
	NO.				

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

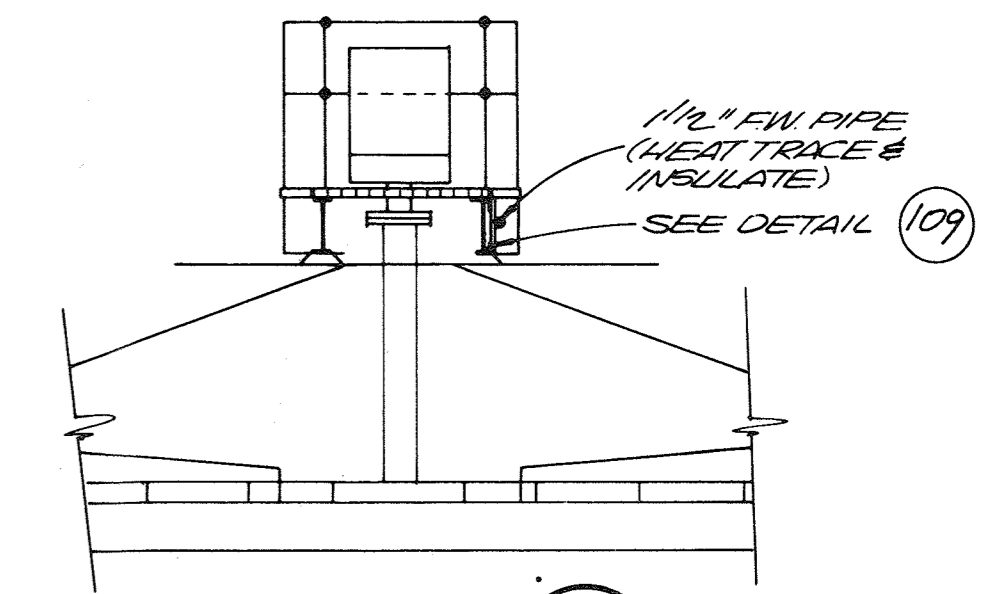
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
PLAN
HEATING & BUILDING SERVICES

SHEET
HP-2
OF
DATE 8-78
DWG. NO. W11078.B1



EF-2 CURB DETAIL SIMILAR TO DETAIL (2) OMIT INSULATION AND ROOFING (TYPICAL FOR EF-3)



GRIT REMOVAL BASIN AND FLOW METERING CHAMBER PLAN
 1/4" = 1'-0"

RECORD DRAWING



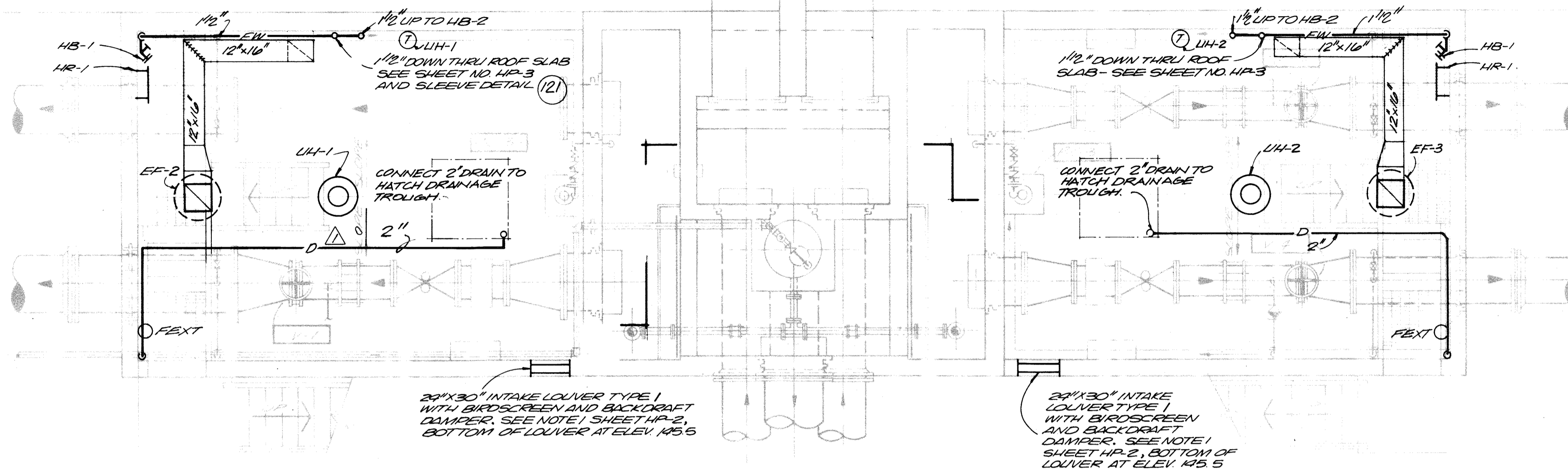
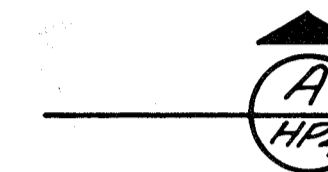
CH2M HILL	DES. RWM	NO.	DATE	REVISION	BY	APPD.
	DR. CFE JR.					
CHK.	1-19-82	REVISED	1 1/2" FW PIPE		DLT	
APPD.						

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

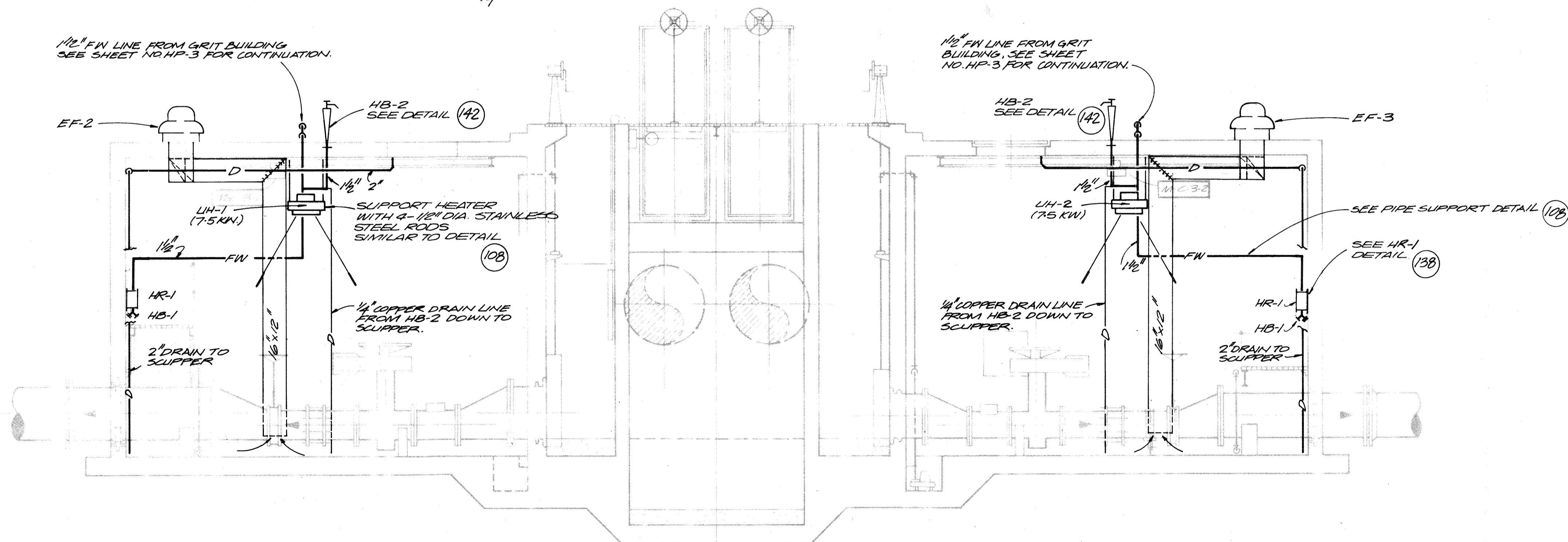
SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

GRIT REMOVAL BASIN
PLAN
 HEATING & BUILDING SERVICES

SHEET
 OF **HP-3**
 DATE 8-78
 DWG. NO. W11078.B1



FLOW METERING CHAMBERS - PLAN
 1/4" = 1'-0"



SECTION A
 1/4" = 1'-0" HPA

RECORD DRAWING



CH2M HILL	DES. RWM	NO.	DATE	REVISION	BY	APPD.
	DR. CFEJR					
CHK.	3/30/78	LOCATIONS OF DRAIN ON FLOW MET. CHAM.		DLT		
APPD.						

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Chief - Bureau of Environmental Services

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

FLOW METERING CHAMBER
PLAN
 HEATING & BUILDING SERVICES

SHEET
 OF **HP-4**
 DATE 8-78
 DWG. NO. W11078.B1

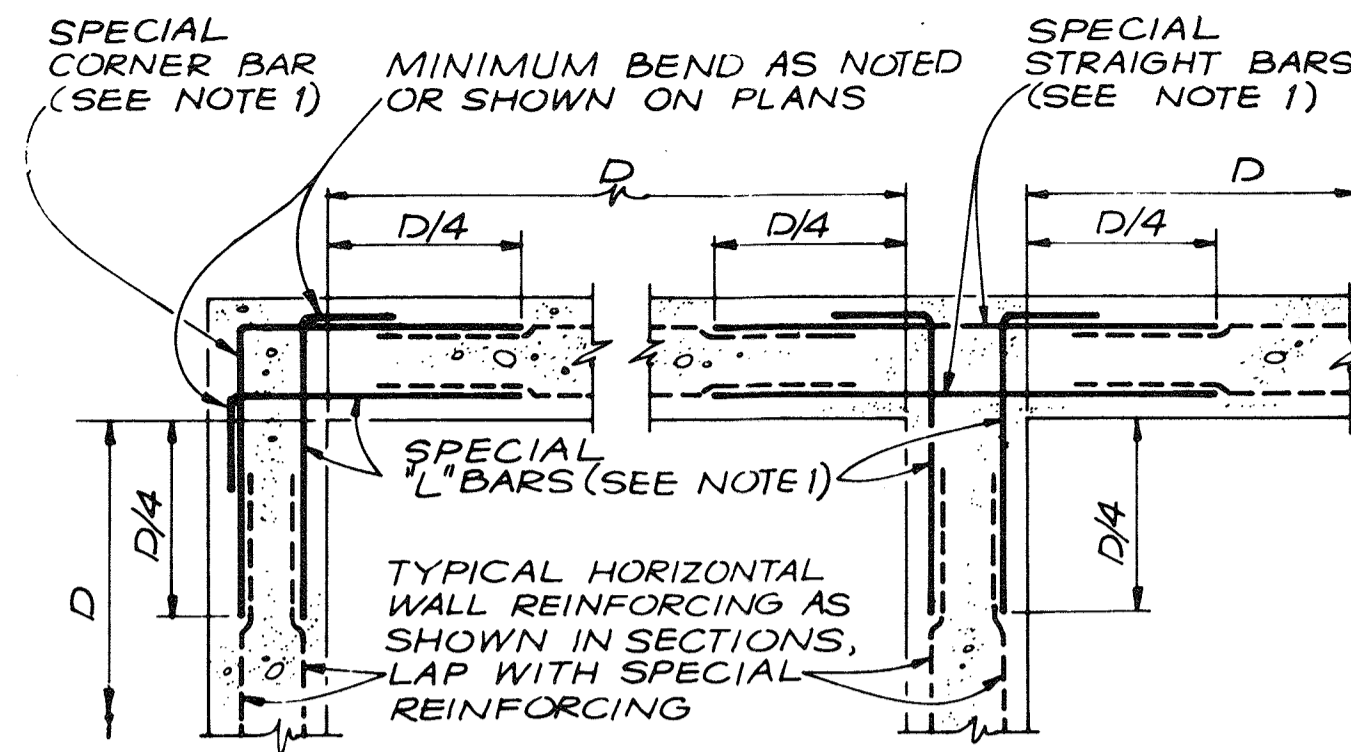
GENERAL STRUCTURAL NOTES

- UNLESS OTHERWISE SHOWN CONC. WALLS & SLABS SHALL BE REINF. AS FOLLOWS: #4@12" E.W. CENTER OF 8" SECTIONS; #5@12" E.W. CENTER OF 8" SECTIONS; #4@12" E.W.E.F. OF 10" SECTIONS; #5@12" E.W.E.F. OF 12" SECTIONS. SINGLE MAT REINF. SHALL BE AT CENTER OF SECTION, UNLESS SHOWN OTHERWISE.
- MIN. CLR. FOR REINF. BARS, UNLESS SHOWN OTHERWISE, SHALL BE 3" WHEN POURED ON GROUND; FOR SURFACES EXPOSED TO WATER OR WEATHER-1 1/2" CLR. FOR #5 BAR AND SMALLER AND 2" CLR. FOR LARGER BARS; INTERIOR SLABS 3/4" CLR., INTERIOR BEAMS 1 1/2" CLR.
- UNLESS OTHERWISE NOTED, ALL WALL REINF. BARS SHALL BE CONT. AROUND CORNERS AND THROUGH COL. OR PILASTERS. REINF. SHALL BE EXTENDED INTO CONNECTING WALLS AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING WALLS, AS INDICATED ELSEWHERE ON THIS SHEET. VERT. WALL BARS SHALL BE LAPPED WITH DOWELS FROM BASE SLABS AND EXTENDED INTO THE TOP FACE OF ROOF SLABS AND LAPPED WITH TOP SLAB REINF. ALL REINF. BENDS & LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENT:

DETAILS OF REINFORCEMENT								
BAR SIZE	#8 OR SMALLER BARS		#9 BAR		#10 BAR		#11 BAR	
	BEND	LAP	BEND	LAP	BEND	LAP	BEND	LAP
TOP BAR*	28 DIAM. MIN. 1'-0"	42 DIAM. MIN. 2'-0"	3'-0"	4'-9"	3'-9"	6'-0"	4'-6"	7'-3"
OTHER BAR	20 DIAM. MIN. 1'-0"	30 DIAM. MIN. 1'-6"	2'-0"	3'-3"	2'-9"	4'-3"	3'-3"	5'-3"

* TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR, IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

- CONT. GALV. STL. W.S. AS SPEC. SHALL BE INSTALLED IN ALL C.J. IN WALLS OF WATER HOLDING BASINS & CHANNELS, EXCEPT WHERE INDICATED OTHERWISE.
- PROVIDE AND INSTALL SELECT GRANULAR MATERIAL AS SPECIFIED UNDER ALL SLABS AND FOOTINGS TO UNDISTURBED EARTH WITH MINIMUM THICKNESS EQUAL 6", UNLESS OTHERWISE NOTED.



NOTES:

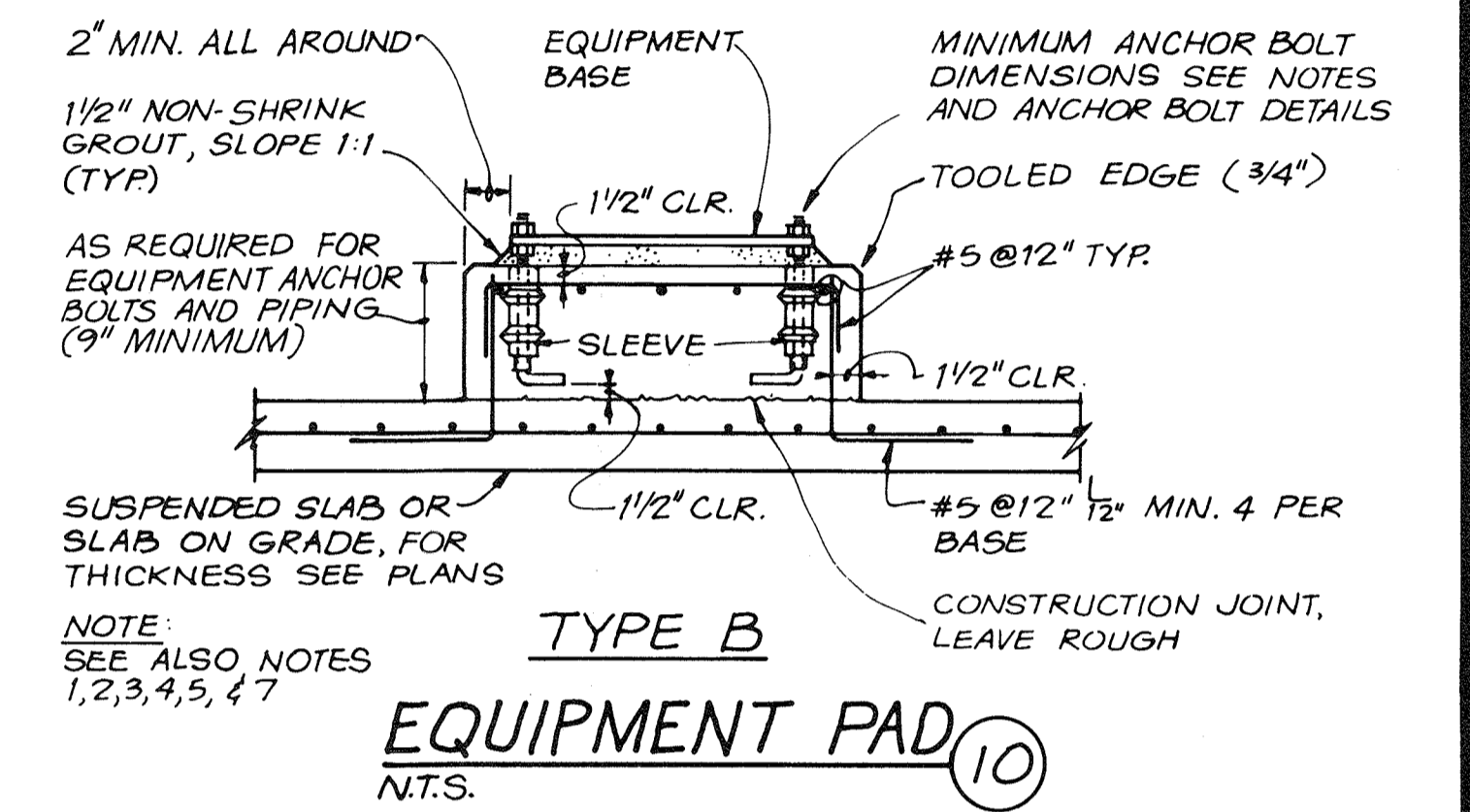
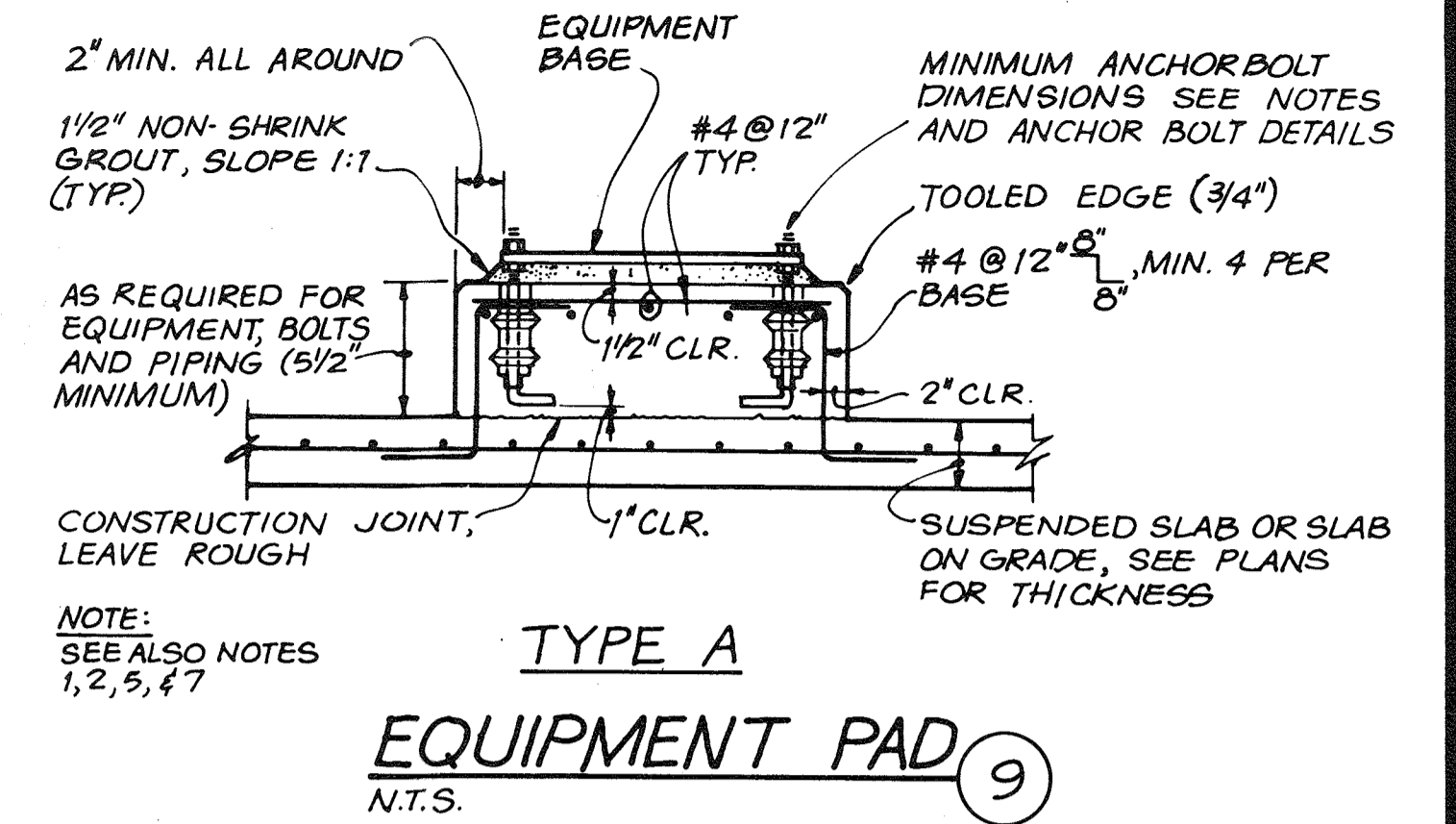
- SPECIAL HORIZONTAL WALL REINFORCING SHOWN FOR CORNERS AND WALL INTERSECTIONS WHERE SPECIAL REINFORCING IS INDICATED ON PLANS. SEE PLANS FOR SIZE AND SPACING.
- SPLICE LENGTHS AND BENDS SHALL BE AS INDICATED ON PLANS OR AS NOTED IN GENERAL STRUCTURAL NOTES.
- D/4 = BAR LENGTH EXCEPT WHERE INDICATED OTHERWISE ON PLANS.
- D = LENGTH OF WALL PARALLEL TO BAR LENGTH IN QUESTION.

SPECIAL CORNER AND INTERSECTION REINFORCING (3)

N.T.S.

EQUIPMENT BASE NOTES

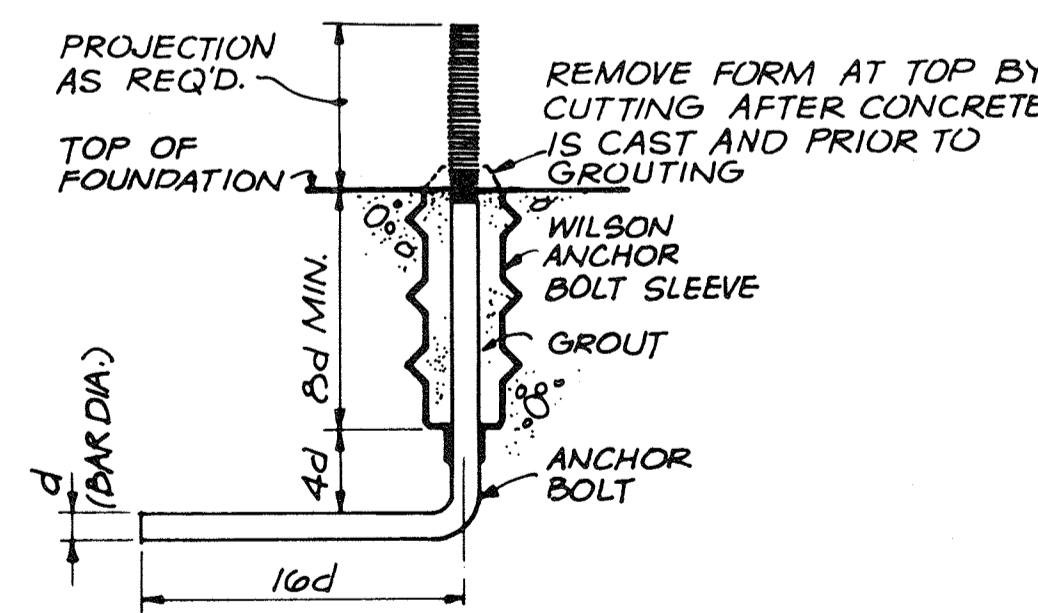
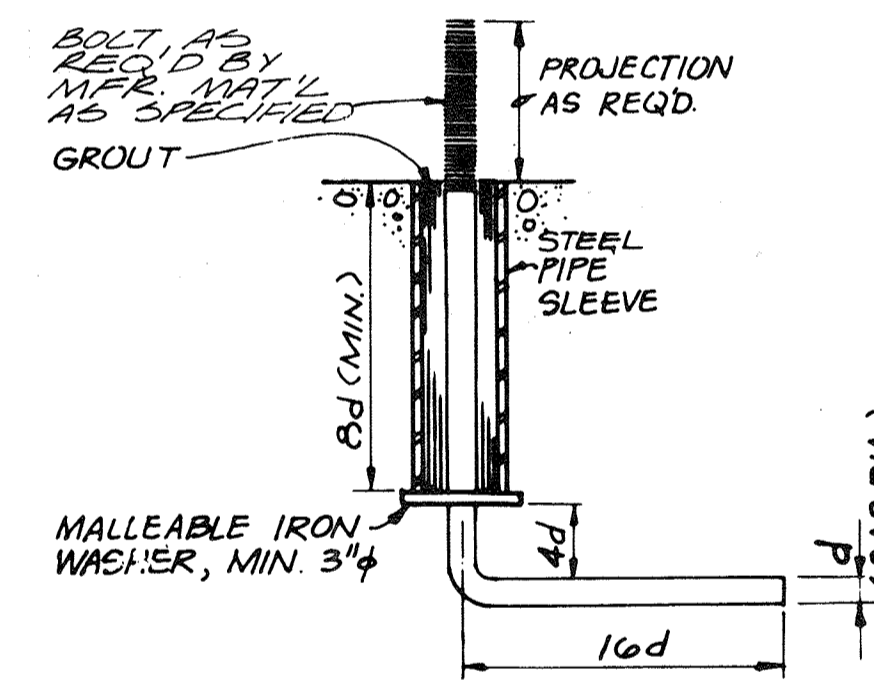
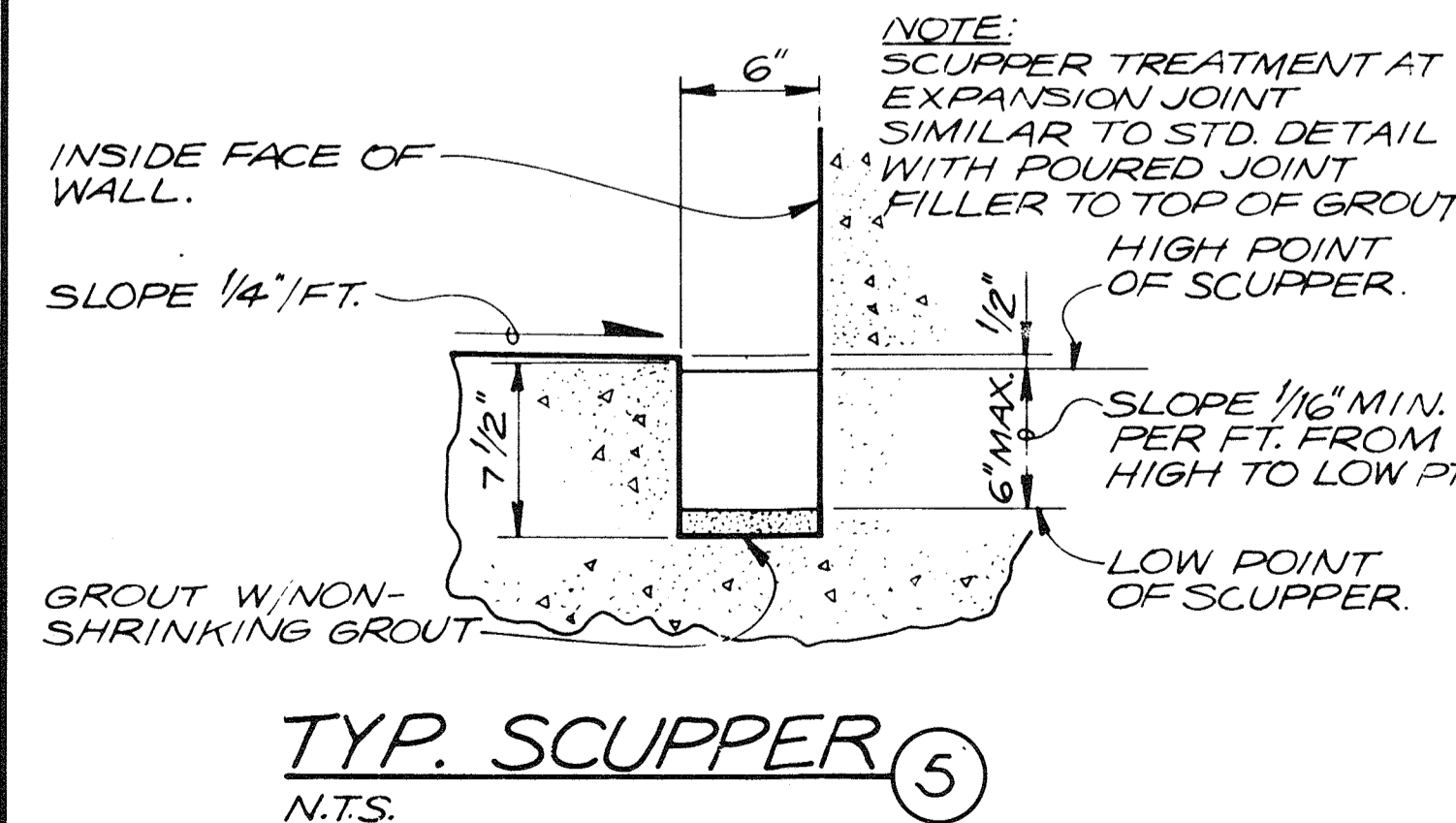
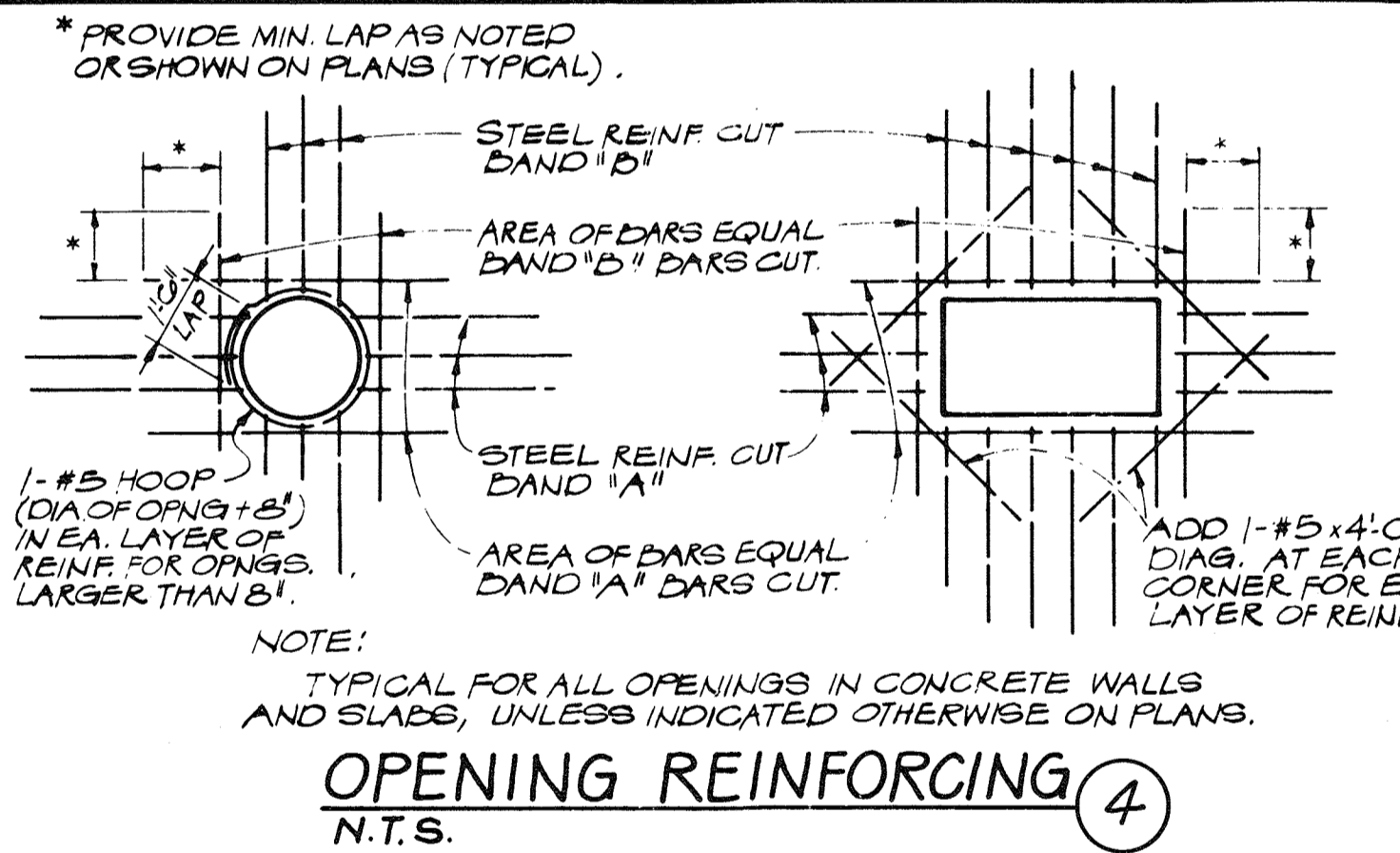
- PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS DETERMINED BY THE EQUIPMENT MANUFACTURER AND APPROVED BY THE ENGINEER.
- THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER, AND SHALL BE AS APPROVED BY THE ENGINEER. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH A TEMPLATE WHILE PAD IS BEING POURED.
- PIPE SLEEVES SHALL BE USED TO PROVIDE THE ANCHOR BOLT A MINIMUM MOVEMENT OF 1/2" IN ALL DIRECTIONS. THE MINIMUM SLEEVE LENGTH SHALL BE 8 TIMES THE BOLT DIAMETER. SLEEVES SHALL BE FILLED WITH NON-SHRINK GROUT.
- PIPE SLEEVES SHALL HAVE A MINIMUM INTERNAL DIAMETER 1" GREATER THAN BOLT DIAMETER AND A MAXIMUM INTERNAL DIAMETER 3" GREATER THAN ANCHOR BOLT DIAMETER. SLEEVES SHALL BE FILLED WITH NON-SHRINK GROUT.
- EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS SPECIFIED OTHERWISE.
- TYPE "D" DETAIL SHALL BE USED ONLY FOR SLABS ON GRADE AND AT GRADE. THE SURROUNDING FLOOR SLAB SHALL NOT BE PLACED UNTIL THE EXACT SIZE AND LOCATION OF THE PAD IS KNOWN.
- WEDGES OR SHIMS SHALL BE USED TO SUPPORT THE BASE WHILE THE NON-SHRINK GROUT IS PLACED. TEMPORARY LEVELING NUTS SHALL BE BACKED OFF. IF LEFT IN, THE WEDGES OR SHIMS SHALL NOT BE EXPOSED TO VIEW.



STRUCTURAL ABBREVIATIONS

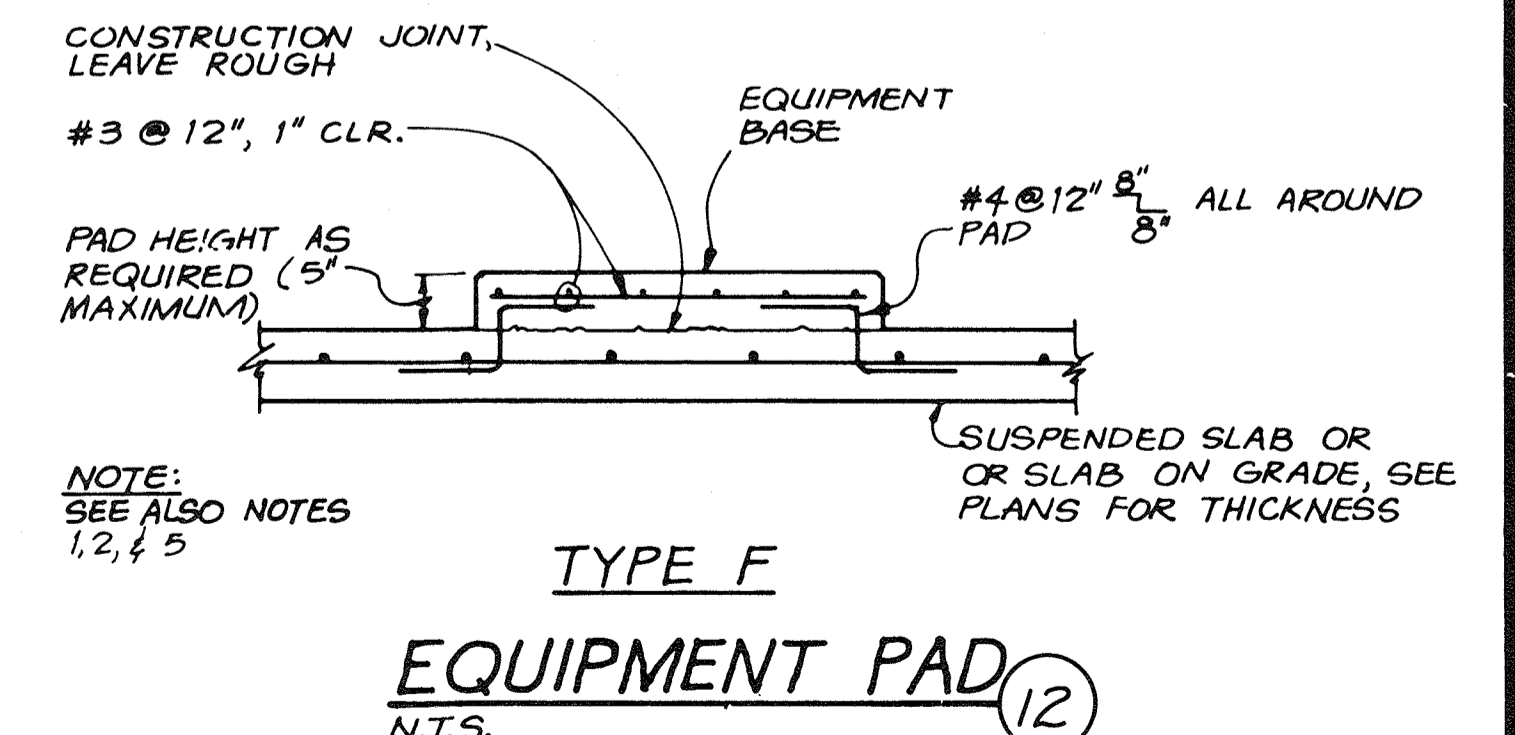
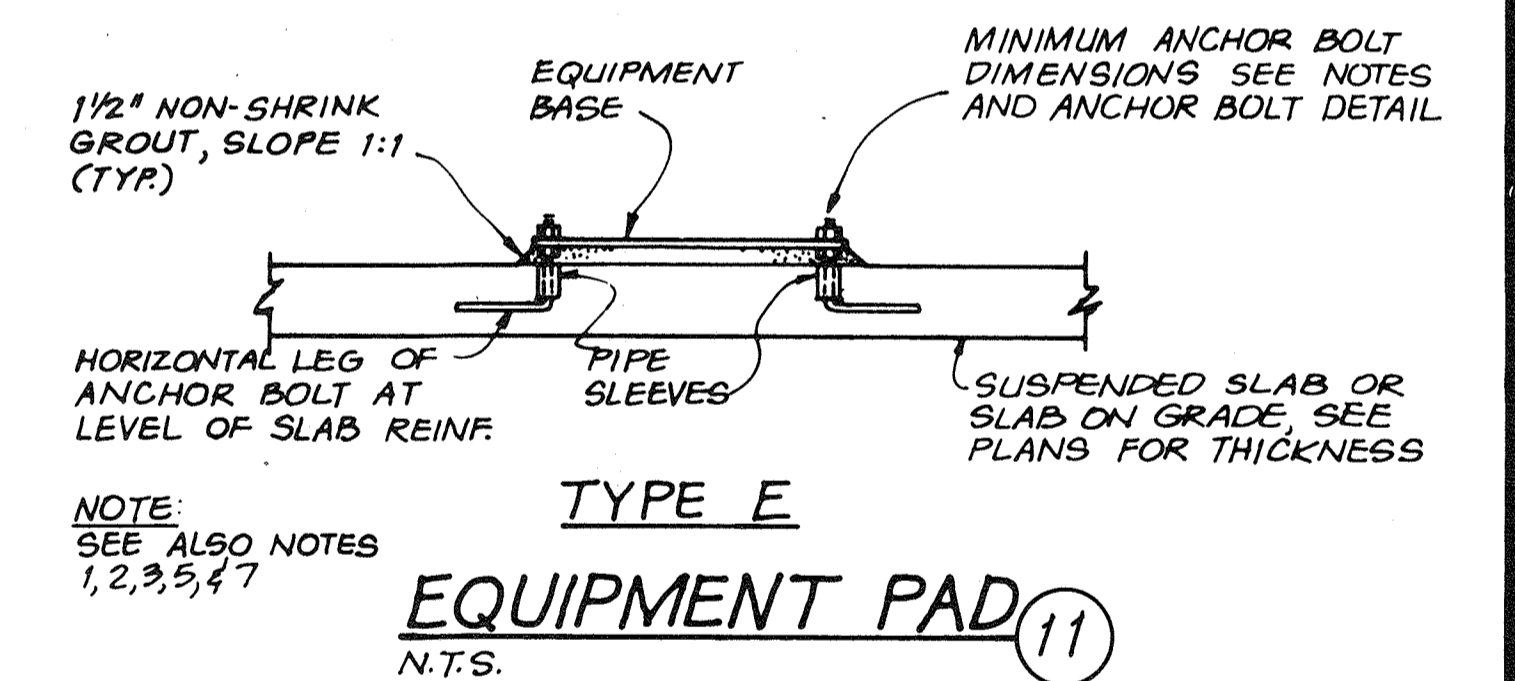
AB ANCHOR BOLT	FD FLOOR DRAIN	RC REINFORCED CONCRETE
AHR ANCHOR	FON FOUNDATION	REINF REINFORCE
AL ALUMINUM	FNSH GR FINISHED GRADE	RST REINFORCING STEEL
ALTN ALTERNATE	FTG FOOTING	
APVD APPROVED		SIM SIMILAR
	GALV HOT DIP GALVANIZED	SPECS SPECIFICATIONS
BOT BOTTOM	GVL GRAVEL	SQ SQUARE
BF BOTTOM FACE		STD STANDARD
BM BEAM	HAS HEADED ANCHOR STUD	STIF STIFFENER
BRG BEARING	HDR HEADER	STL STEEL
	HORIZ HORIZONTAL	STR STRAIGHT
		STRUCT STRUCTURES
		SYMM SYMMETRICAL
C TO C CENTER TO CENTER	IF INSIDE FACE	
CJ CONSTRUCTION JOINT		T & B TOP AND BOTTOM
CL CENTER LINE	LNTL LINTEL	TC TOP OF CONCRETE
CLR CLEARANCE	LONG LONGITUDINAL	TF TOP FACE
COL COLUMN		THK THICK
CONC CONCRETE	MAX MAXIMUM	TRANSV TRANSVERSE
CONN CONNECTION	MB MACHINE BOLTS	TST TOP OF STEEL
CONT CONTINUOUS	MIN MINIMUM	TW TOP OF WALL
CTR CENTER		TY? TYPICAL
	NIC NOT IN CONTRACT	
	NTS NOT TO SCALE	
DBA DEFORMED ANCHOR BAR		VERT VERTICAL
DIA. φ DIAMETER		
DIR DIRECTION	OC ON CENTER	
DWG DRAWING	OF OUTSIDE FACE	
	OS OUT TO OUT	
EA EACH	OPNG OPENING	
EF EACH FACE		
EL ELEVATION		
EQL SP EQUALLY SPACED	PJF PREMOLDED JOINT FILLER	
EW EACH WAY	PLYWD PLYWOOD	
EXP JT EXPANSION JOINT	PRCST PRECAST	
EXST EXISTING		

NOTE: FOR ABBREVIATIONS NOT LISTED SEE "ABBREVIATIONS FOR USE ON DRAWINGS AND TEXT", PUBLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE INC. (ANSI)



ALTERNATE MACHINERY ANCHOR BOLT DETAILS (8)

N.T.S.



RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-79
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS

DETAILS

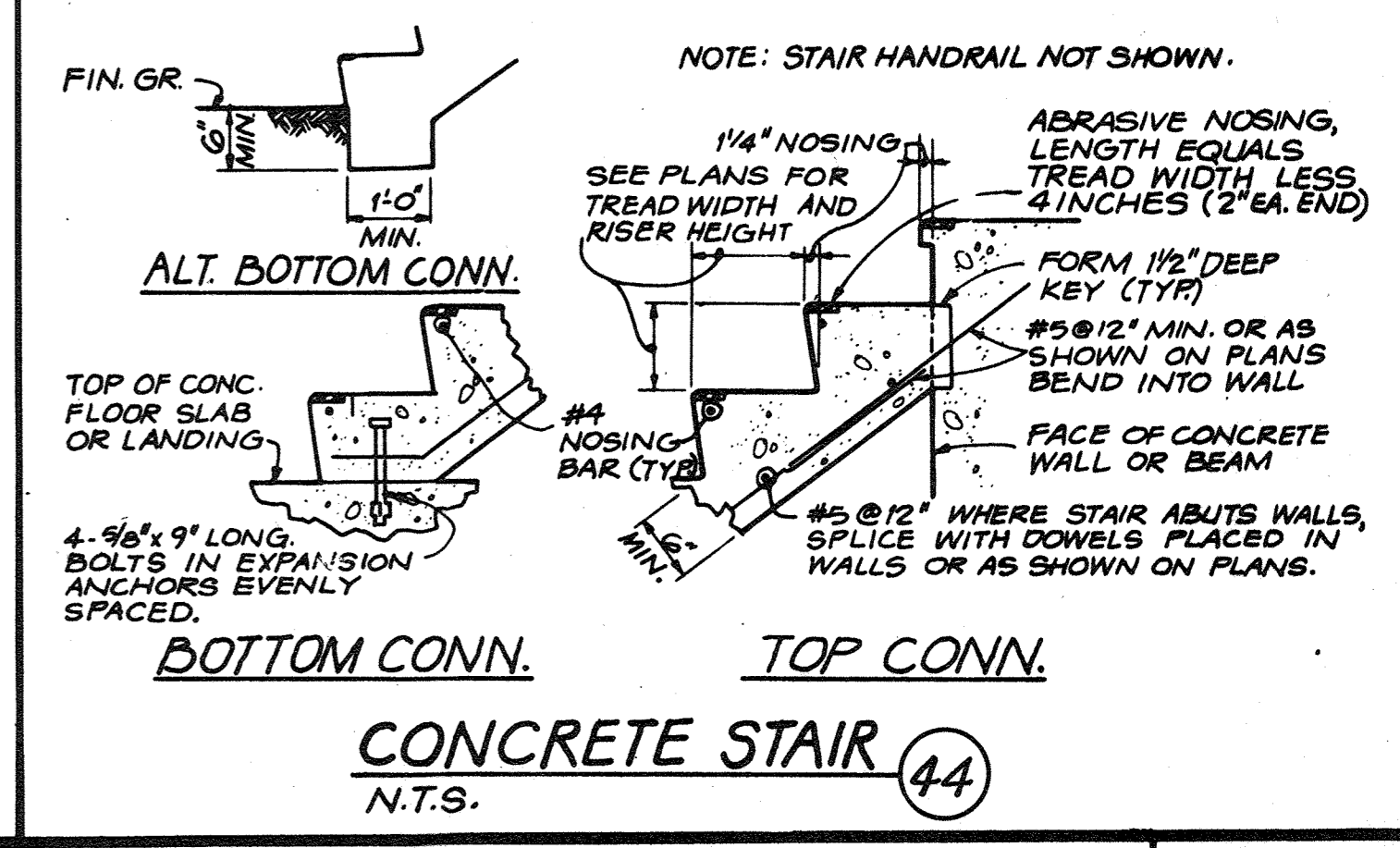
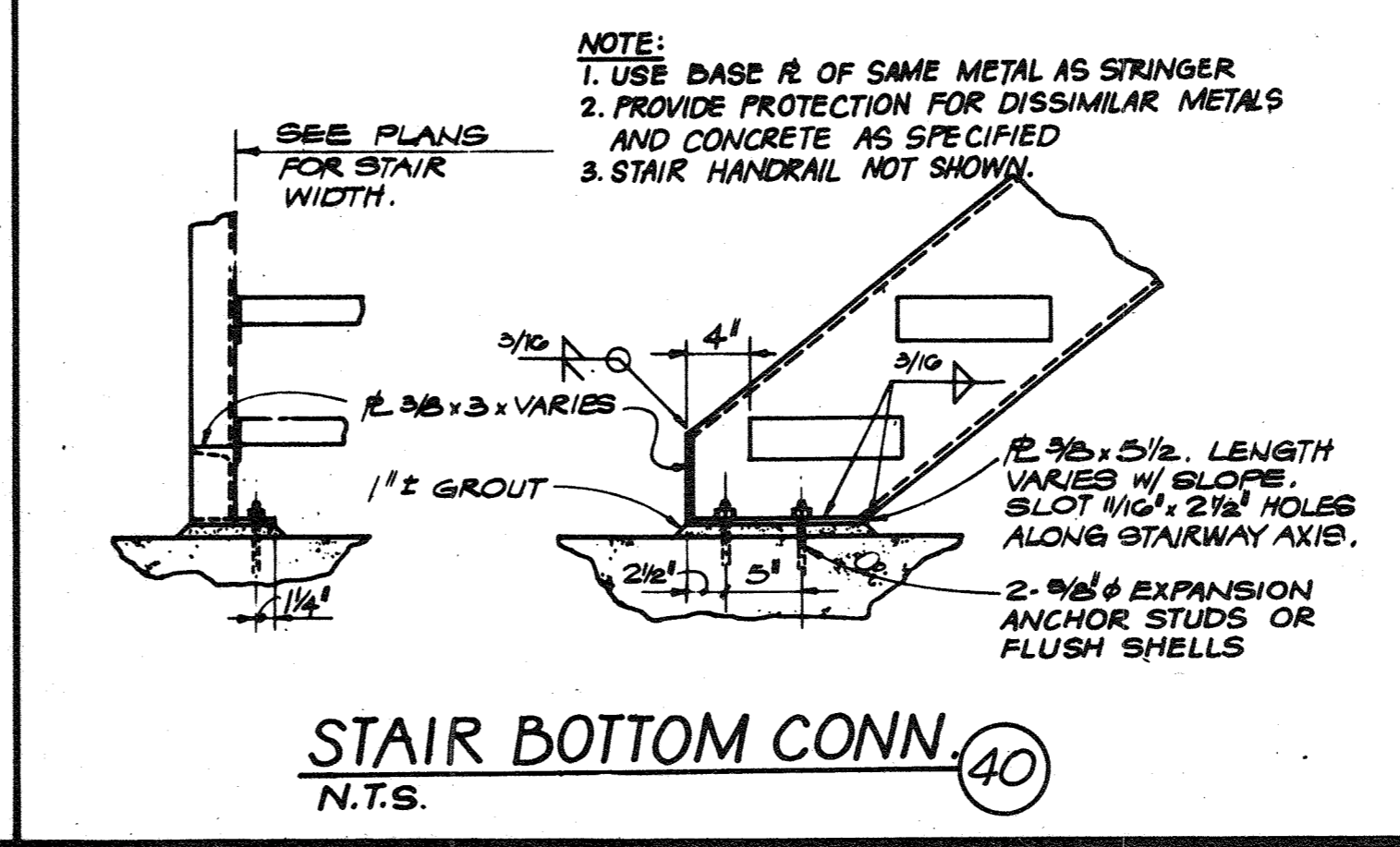
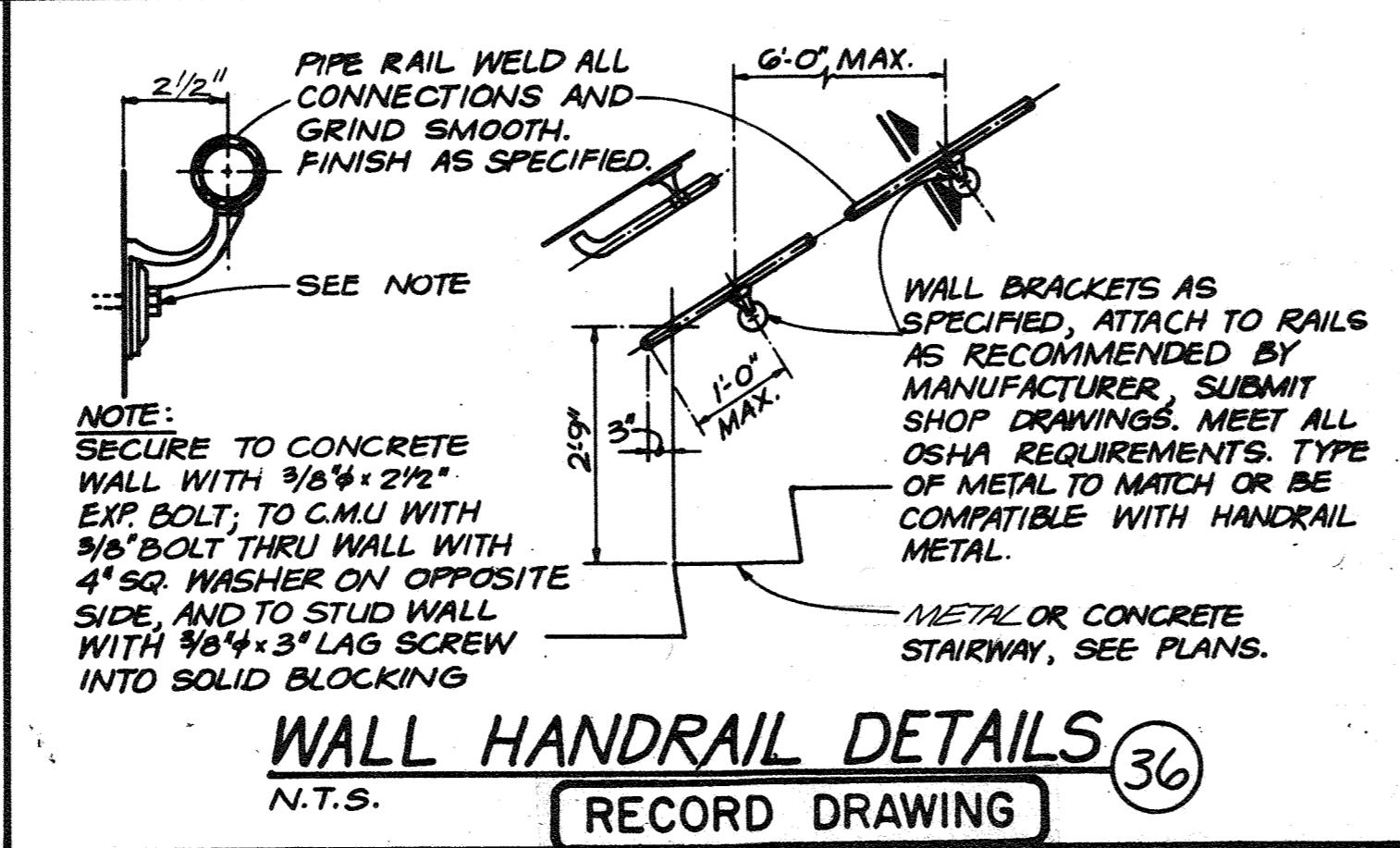
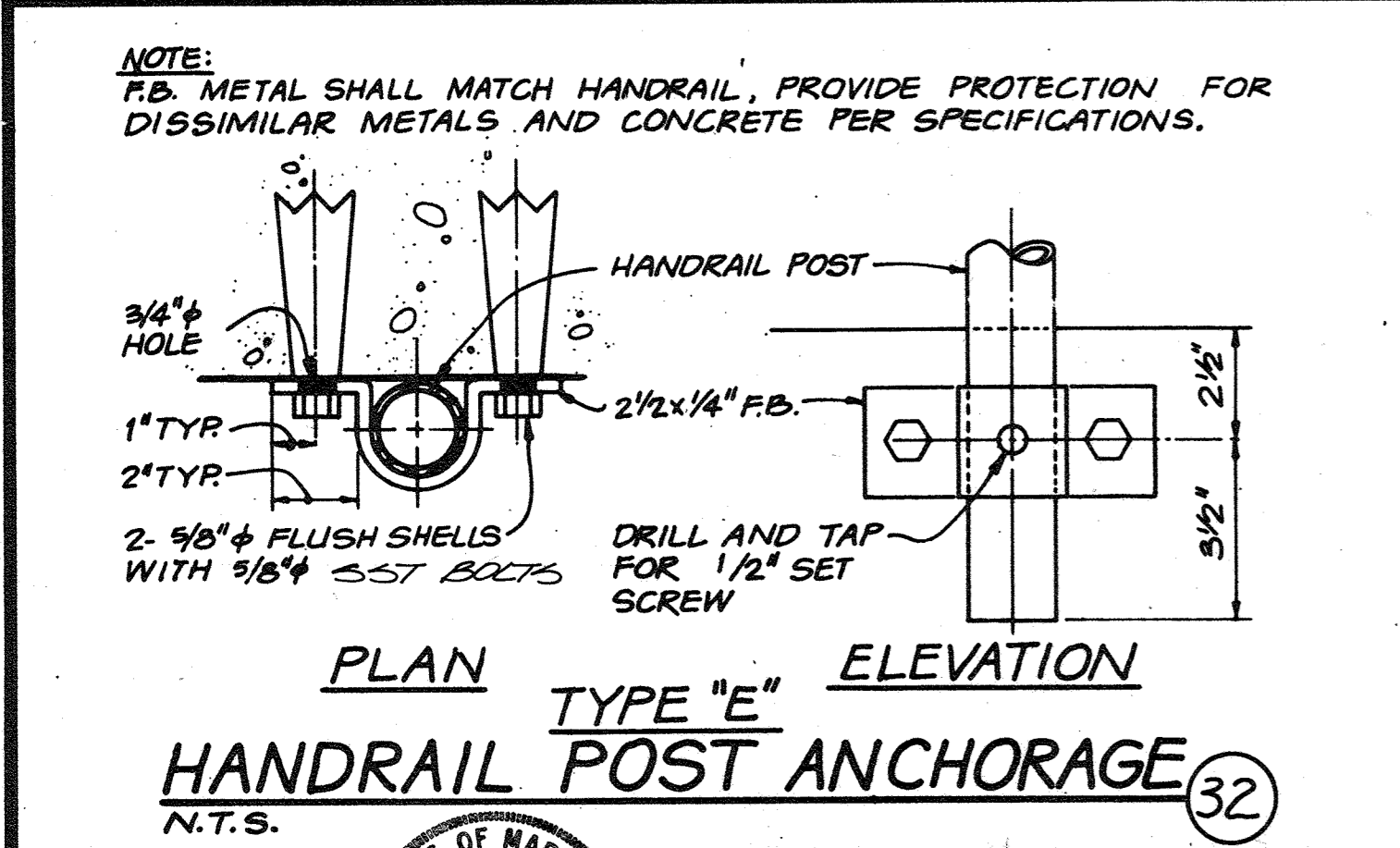
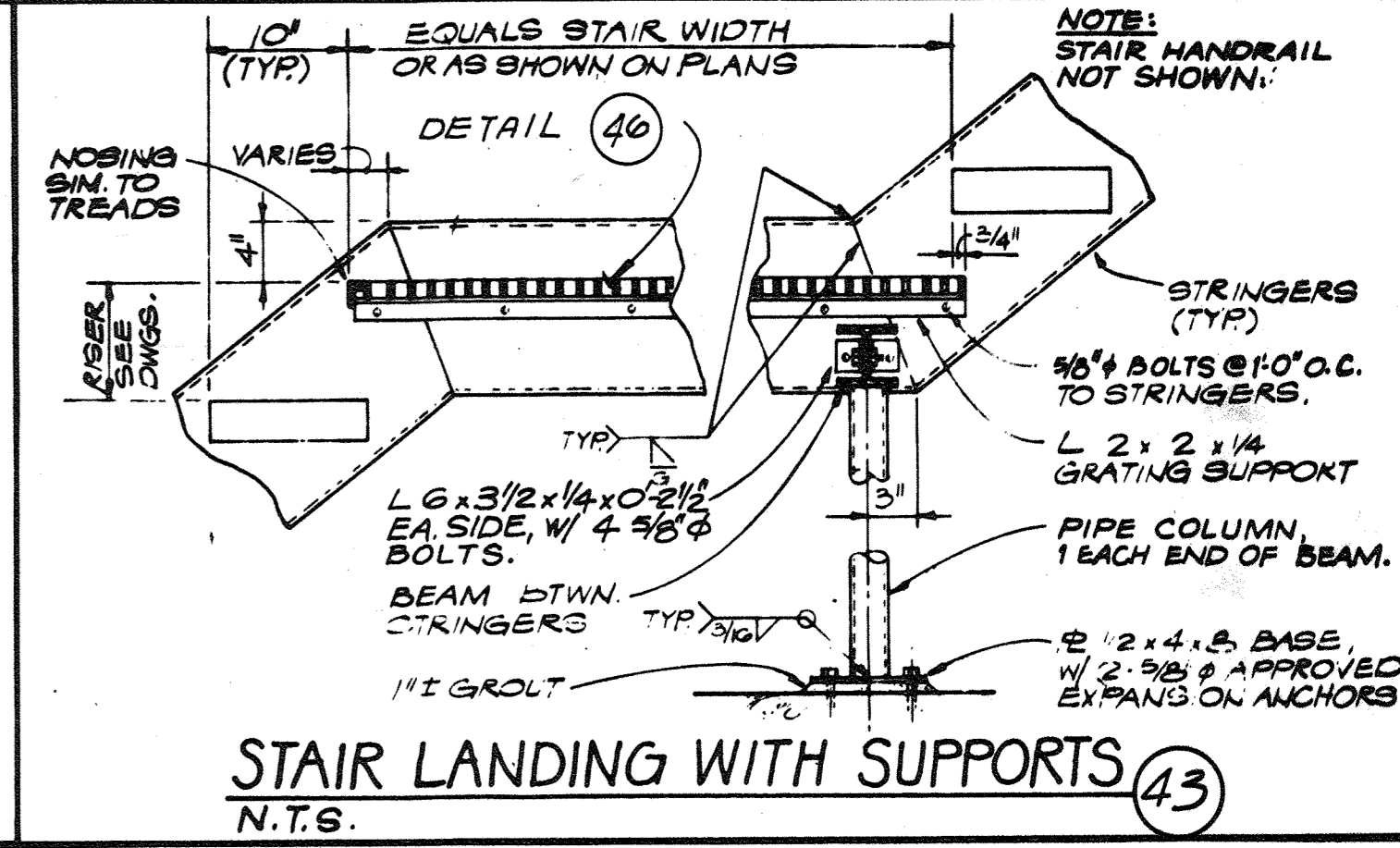
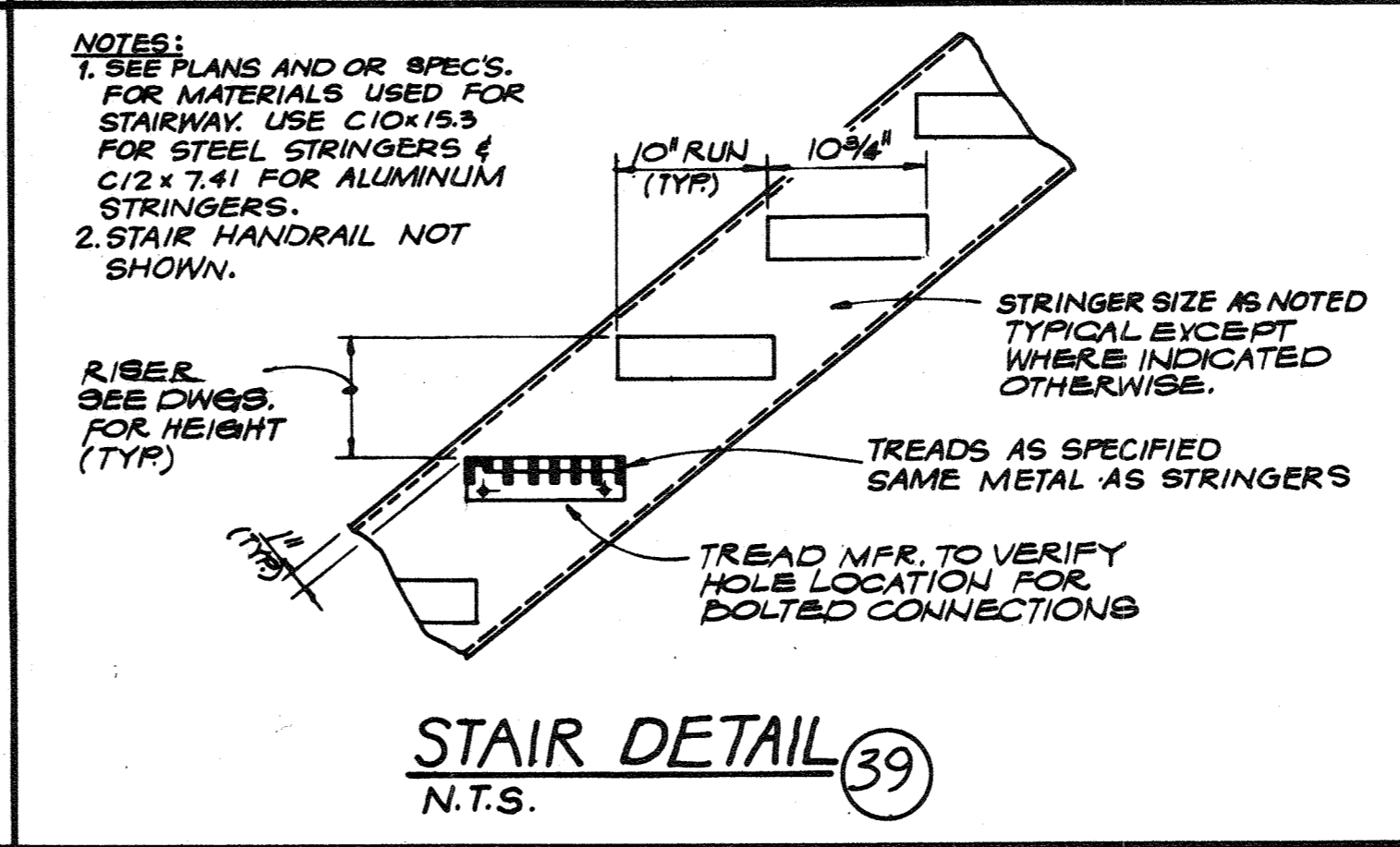
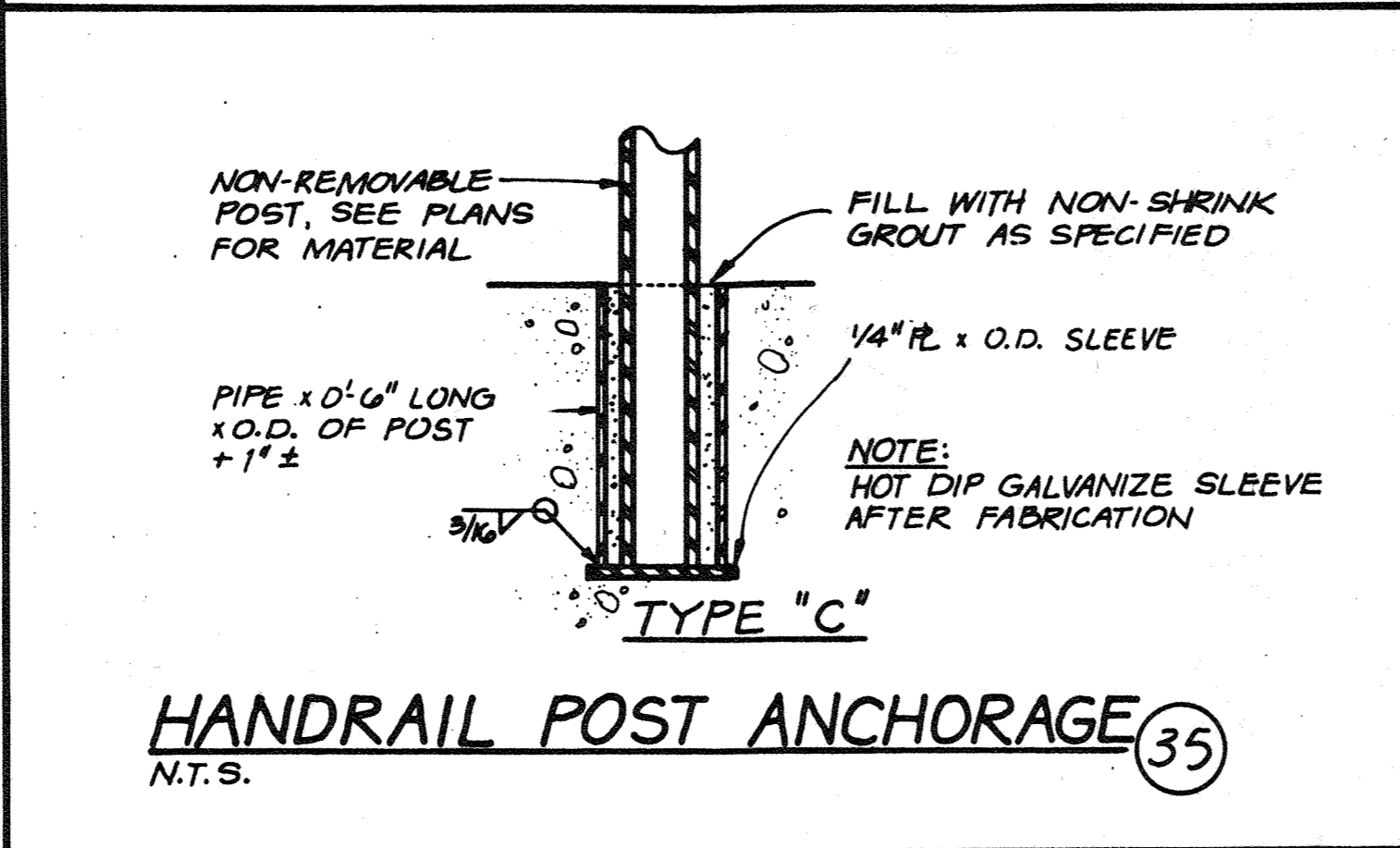
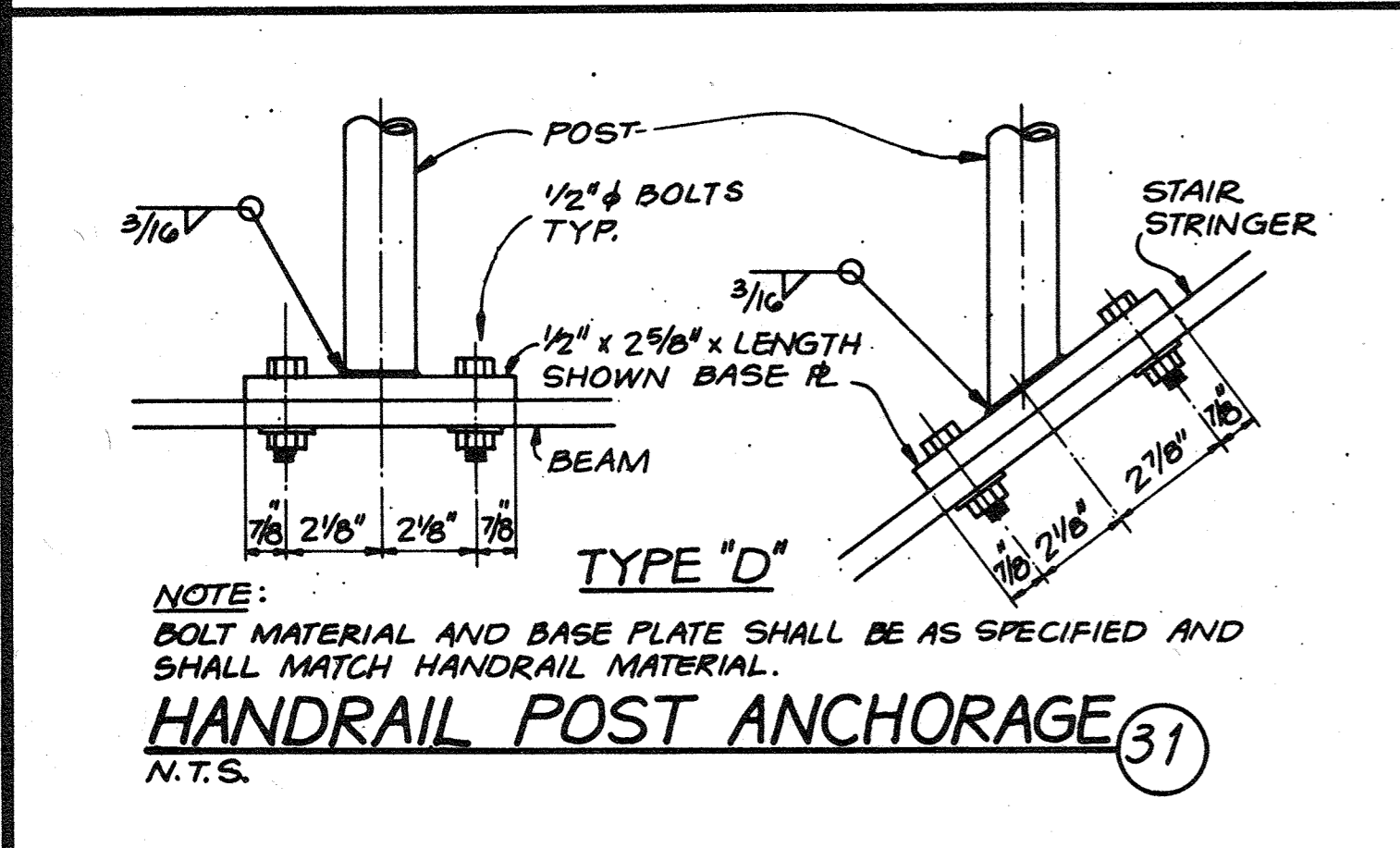
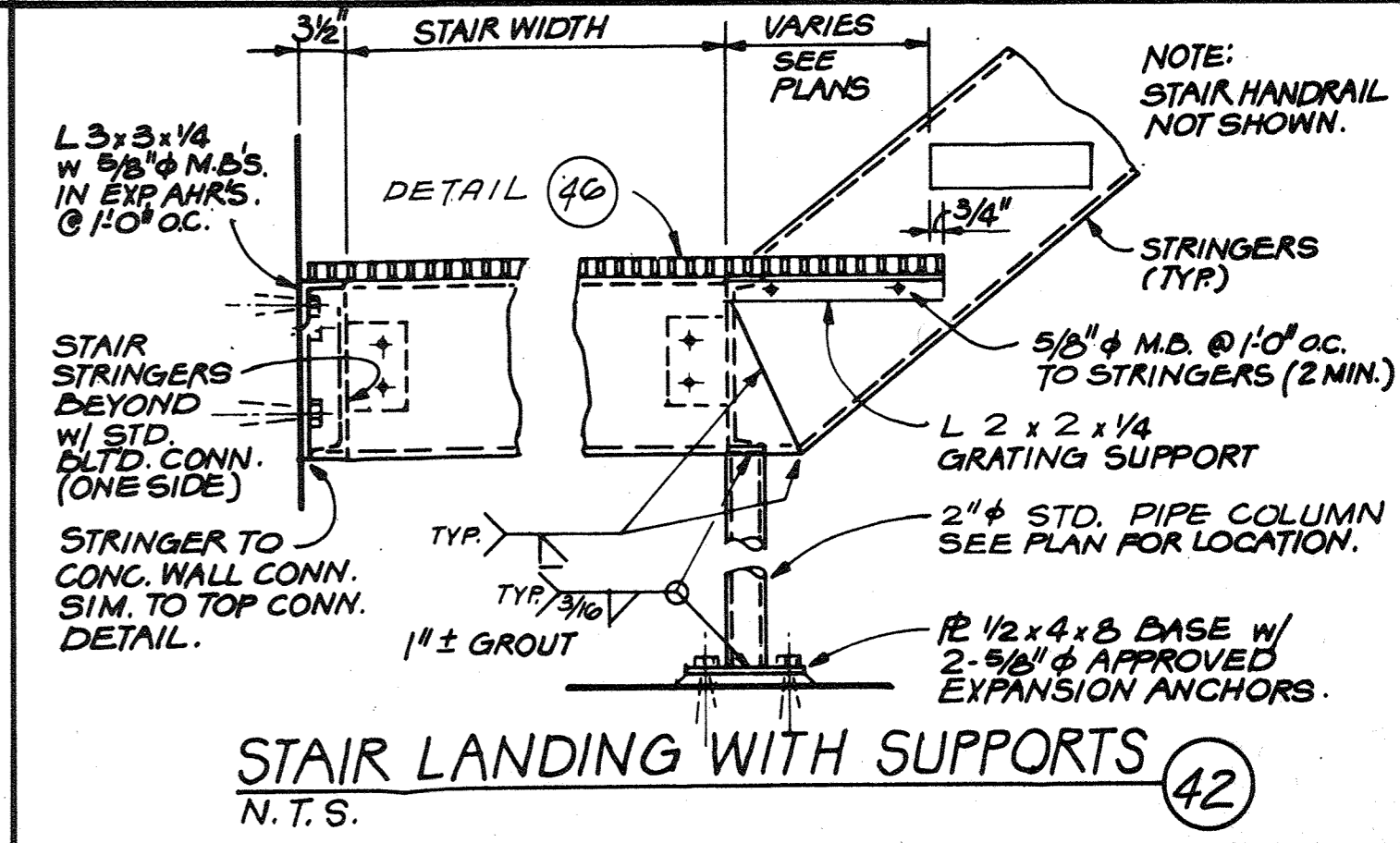
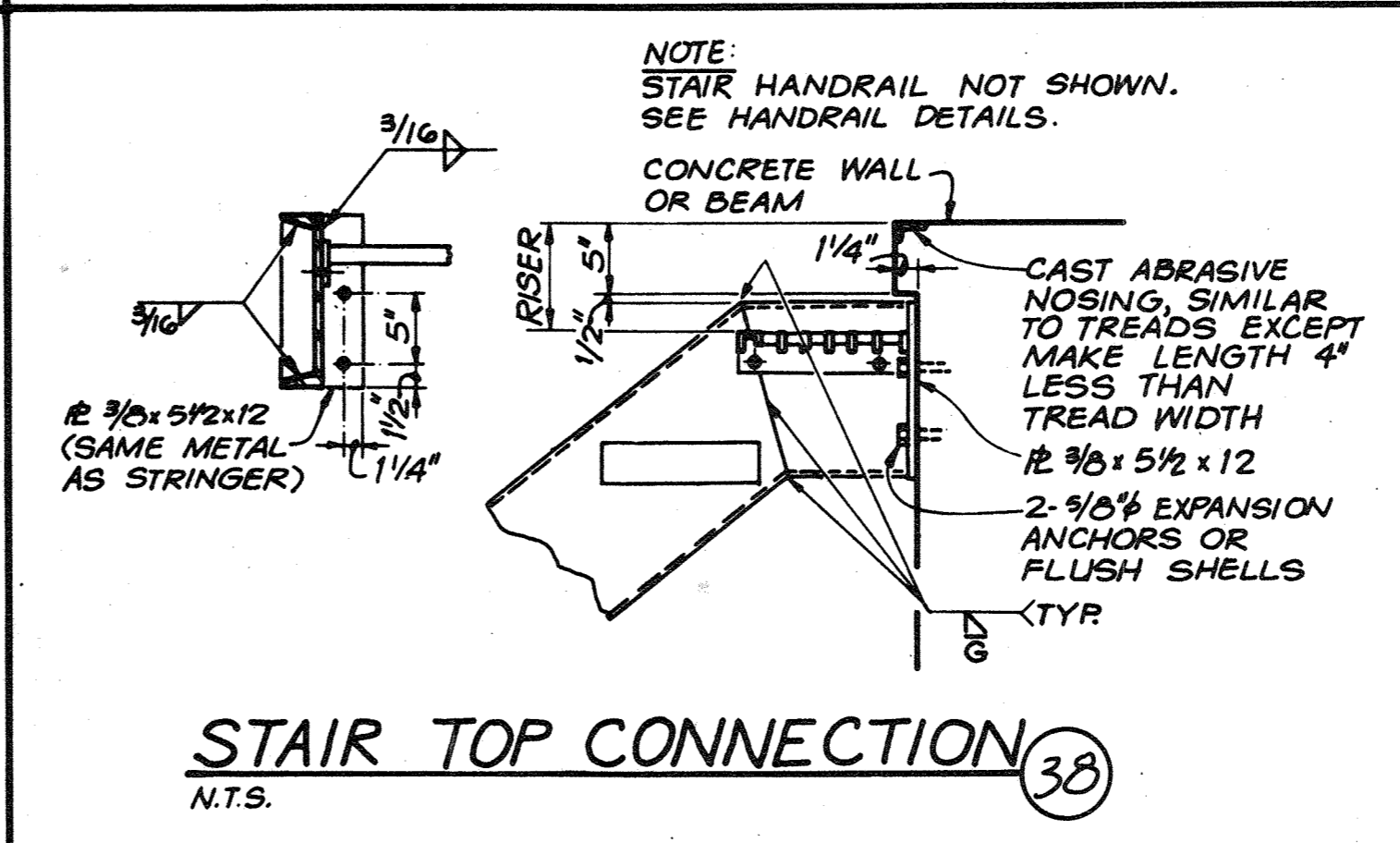
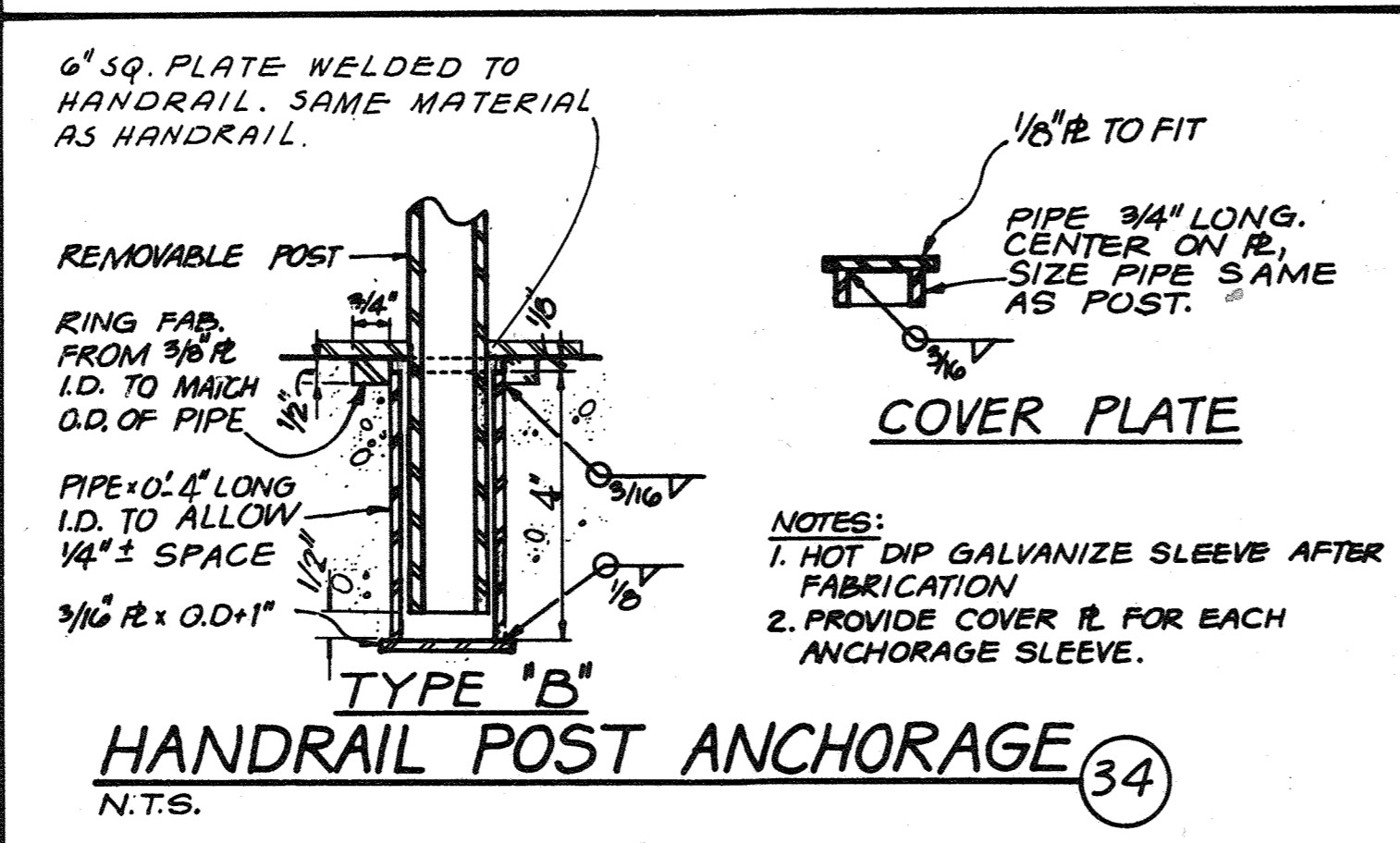
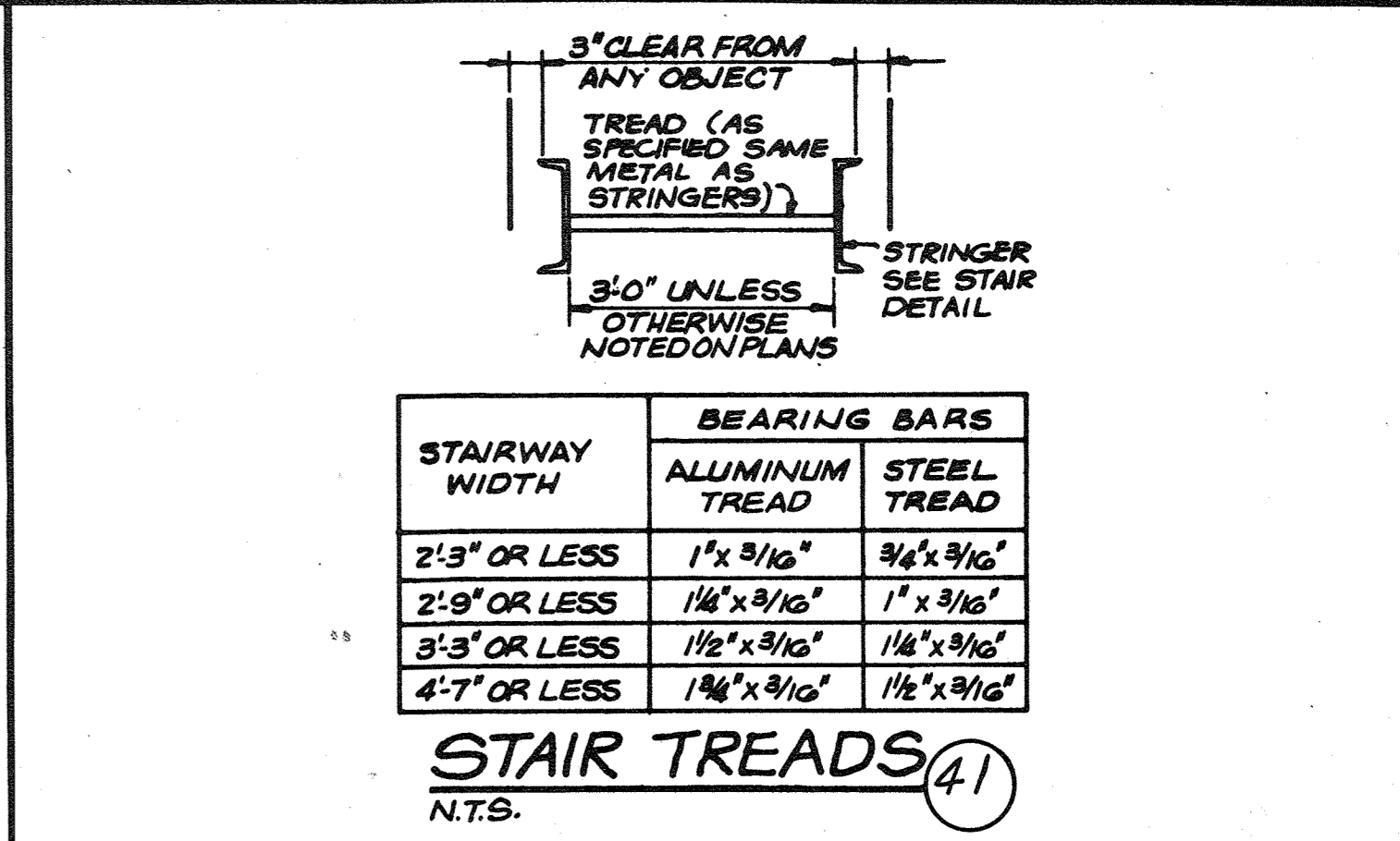
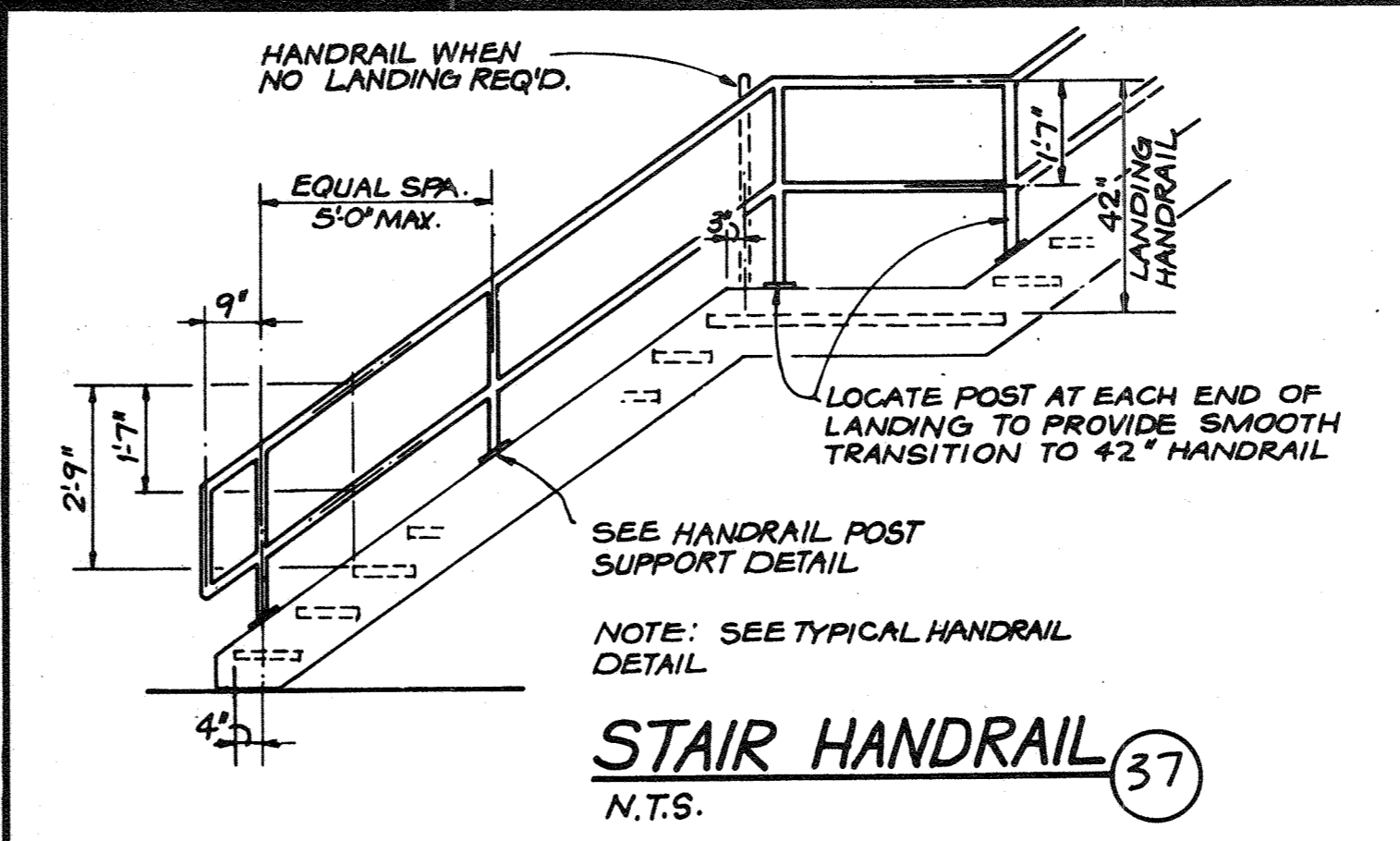
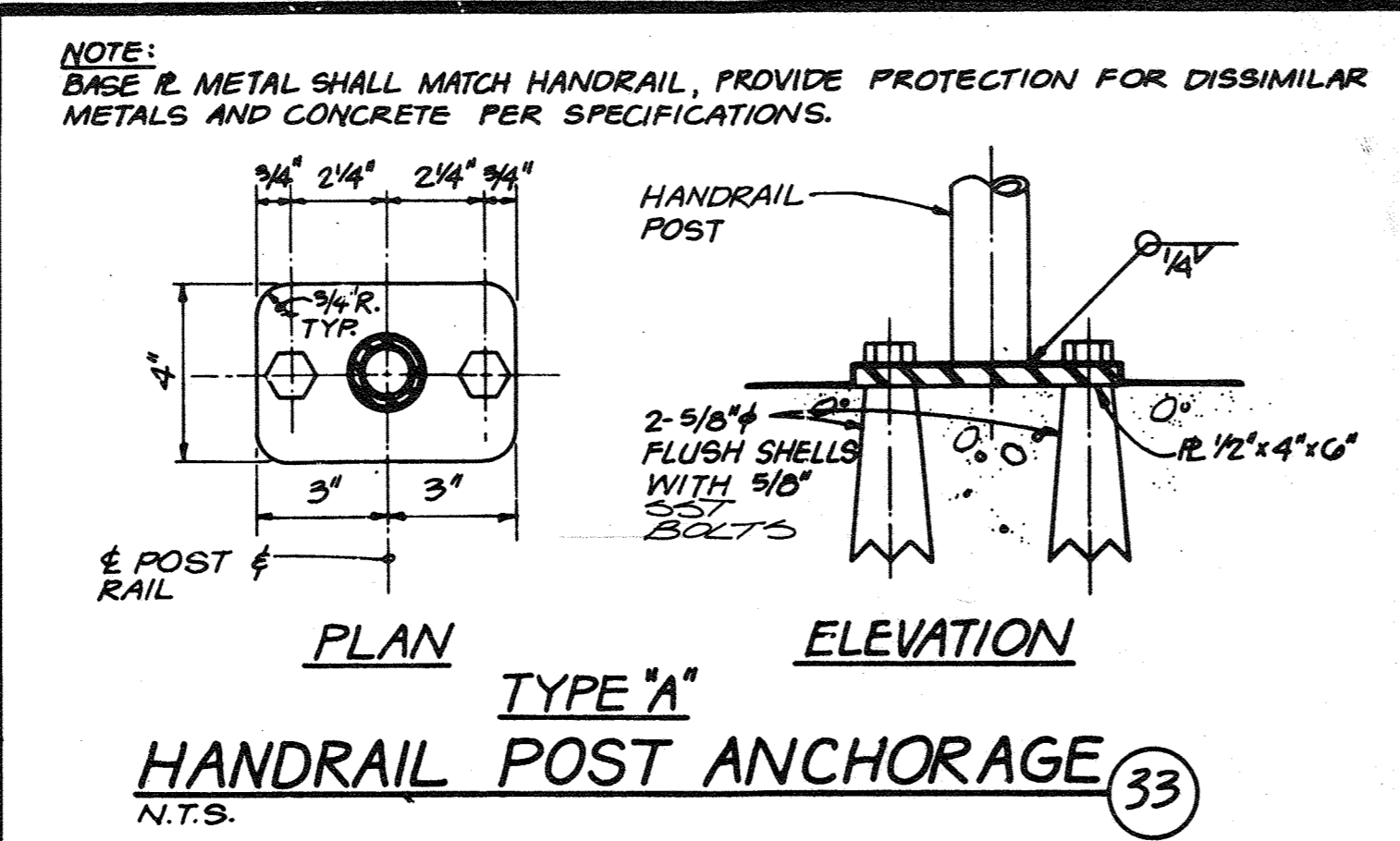
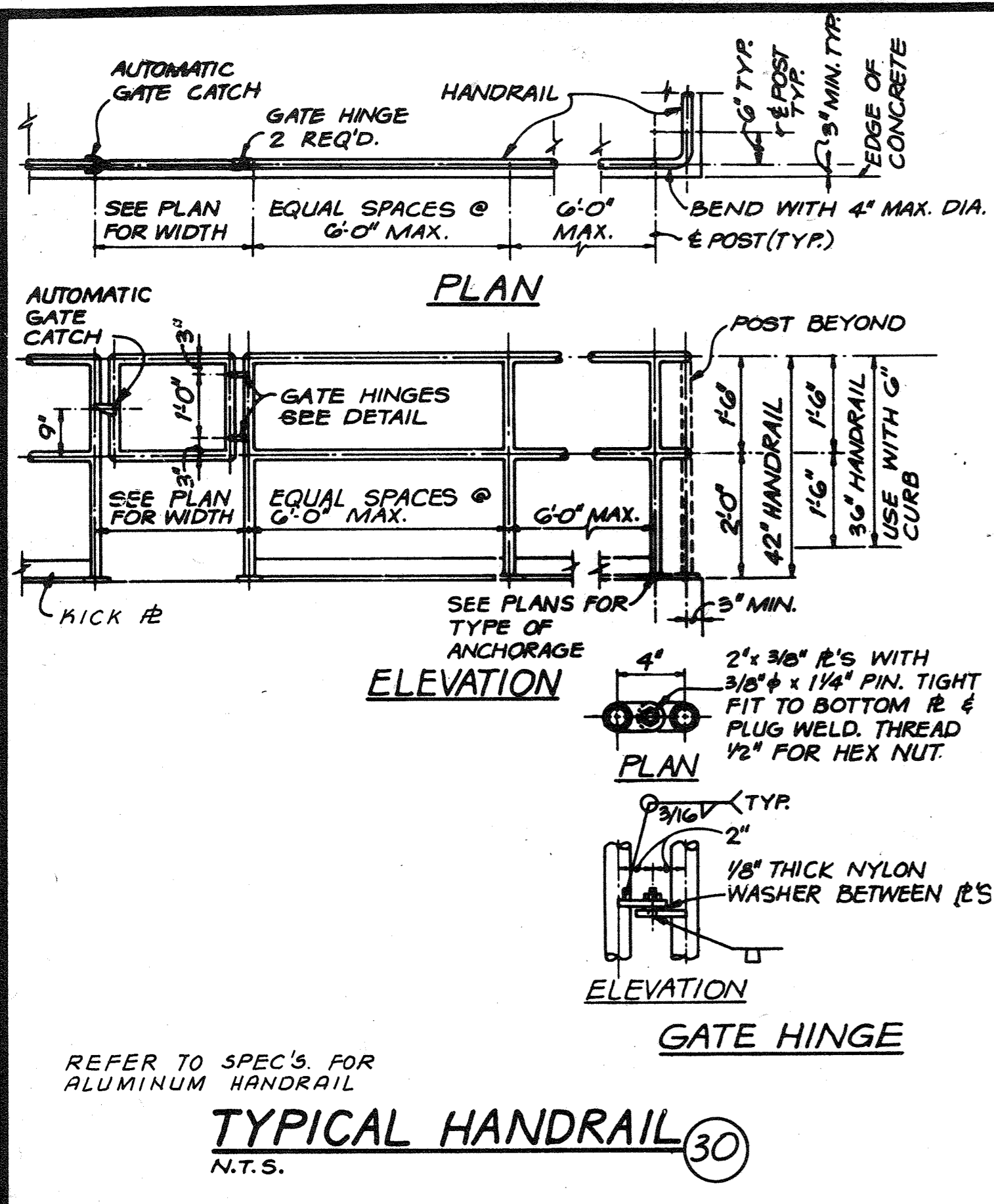
SHEET
OF
D-1
DATE 6-78
DWG.
NO. W1078.B1



CH2M HILL

DES. RAH
DR. MAW
CHK.
APPD.

NO.	DATE	REVISION	BY	APPD.



DES. RAH					
DR. MAW					
CHK.					
APPD.					

NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

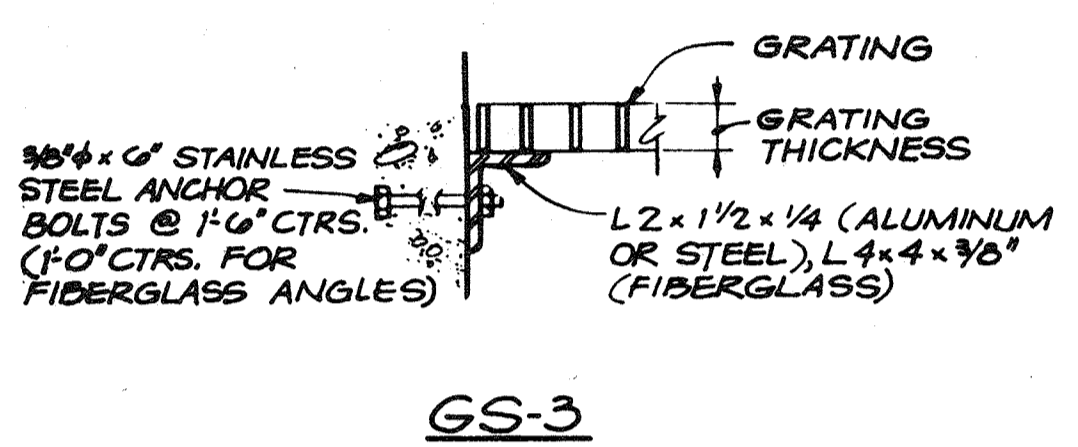
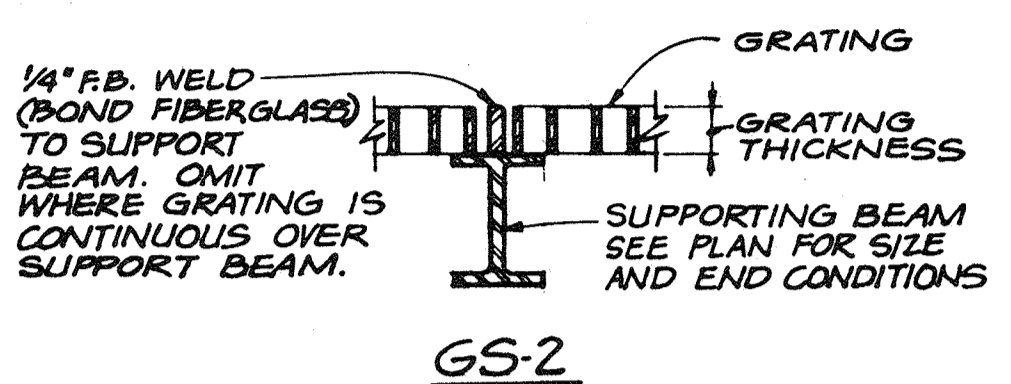
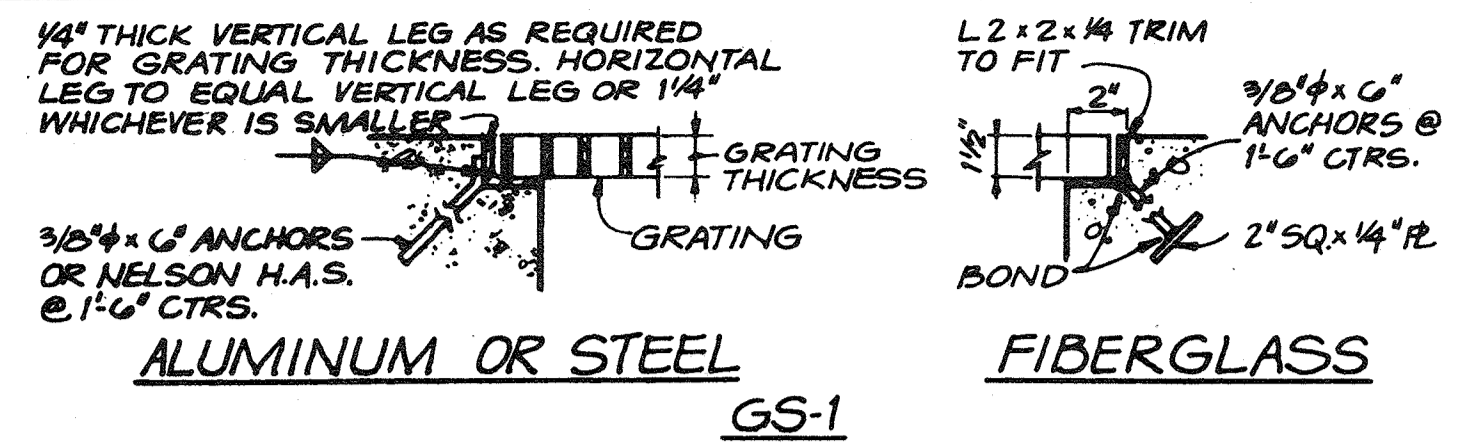
8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS
DETAILS

SHEET OF D-3
DATE 8-78
DWG. NO. W1078.B1



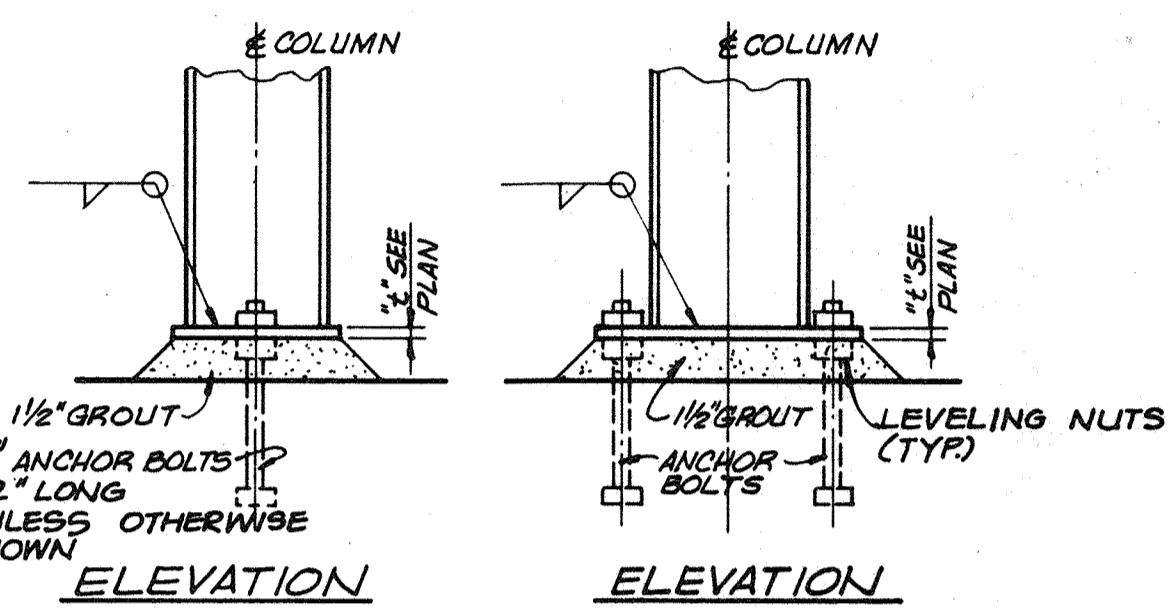
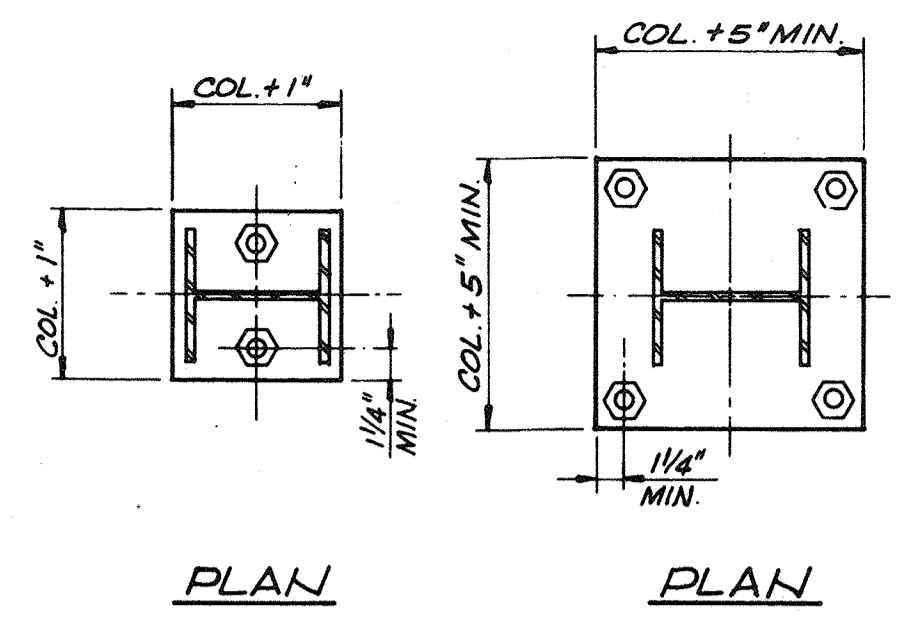
GRATING SUPPORT (45)
N.T.S.

GRATING NOTES

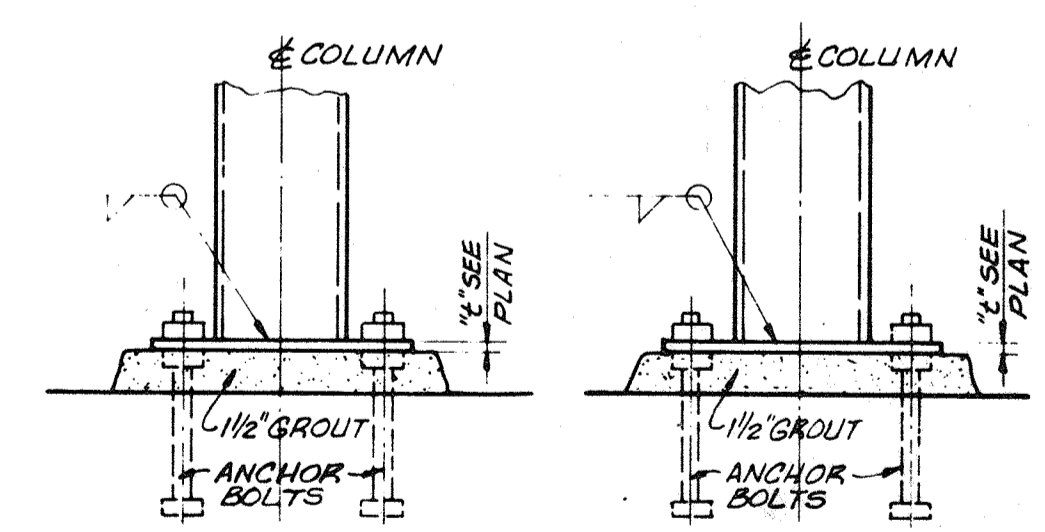
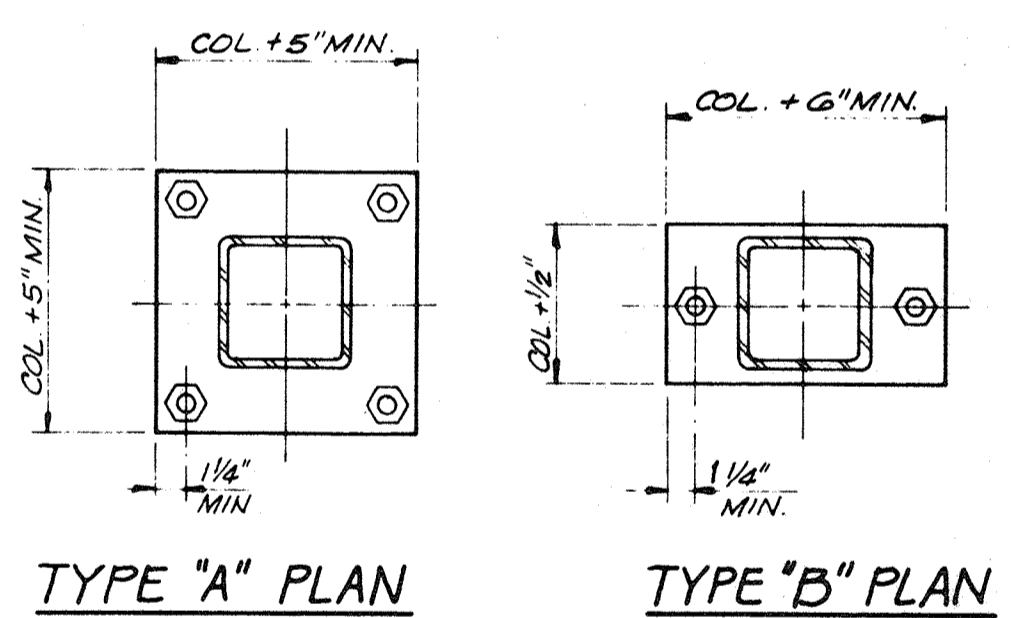
1. EXTEND GRATING CONTINUOUSLY OVER GATE GUIDES AND GATES.
2. NOTCH GRATING SUPPORTS AT GATES AS REQUIRED.
3. GRATING SPAN ← SEE PLAN.
4. NORMAL WIDTH OF GRATING SECTIONS SHALL BE BETWEEN 2'-0" AND 3'-0".
5. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER BASED ON FIELD DIMENSIONS PRIOR TO FABRICATION.
6. MATERIAL FOR SUPPORTS OF STEEL AND ALUMINUM GRATING TO BE SAME AS GRATING.
7. STEEL GRATING AND SUPPORT TO BE GALVANIZED UNLESS NOTED OTHERWISE ON PLANS.
8. UNLESS NOTED OTHERWISE ON PLANS, GRATING THICKNESS SHALL BE AS TABULATED IN "GRATING THICKNESS TABLE".
9. BEARING BAR THICKNESS FOR GRATING TO BE 3/16" MINIMUM.
10. BAND ALL EDGES WITH 1/4" x DEPTH OF BEARING BAR.
11. PROVIDE MISCELLANEOUS GRATING FASTENERS AS REQUIRED.
12. TYPE OF MATERIAL USED SHALL BE AS SHOWN ON PLANS OR AS SPECIFIED. THIS STANDARD DETAIL INCLUDES 3 TYPES ALTHOUGH ALL 3 MAY NOT BE INCLUDED IN PROJECT.

MIN. GRATING THICKNESS TABLE			
MAXIMUM SPAN	ALUMINUM (IN)	STEEL (IN)	FIBERGLASS (IN)
3'-6"	1 1/4"	1"	1 1/2"
4'-0"	1 1/2"	1"	1 1/2"
4'-6"	1 3/4"	1"	MAXIMUM ALLOWABLE SPAN IS 4'-0"
5'-0"	1 3/4"	1 1/2"	
5'-6"	1 3/4"	1 1/2"	
6'-0"	2"	1 1/2"	
6'-6"	2 1/4"	1 1/2"	
7'-0"	2 1/2"	1 1/2"	

(46)



WIDE FLANGE COLUMN BASE (47)
N.T.S.

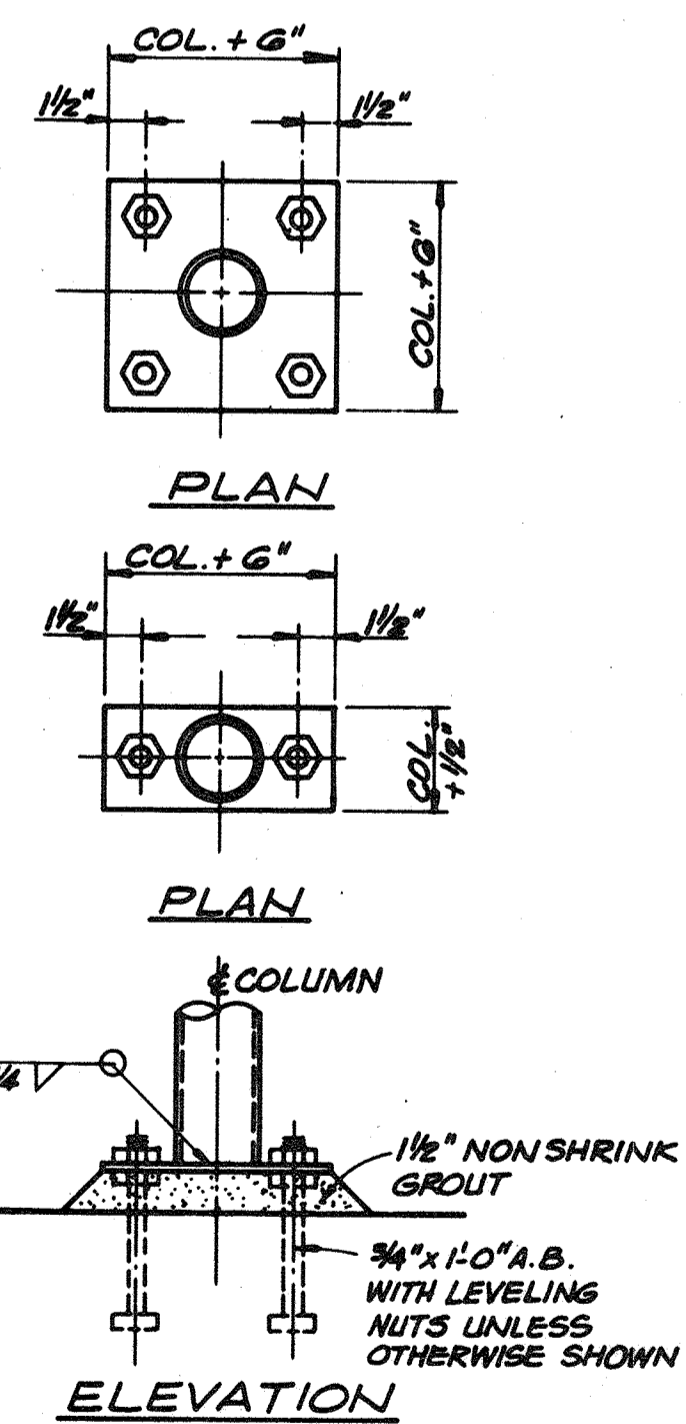
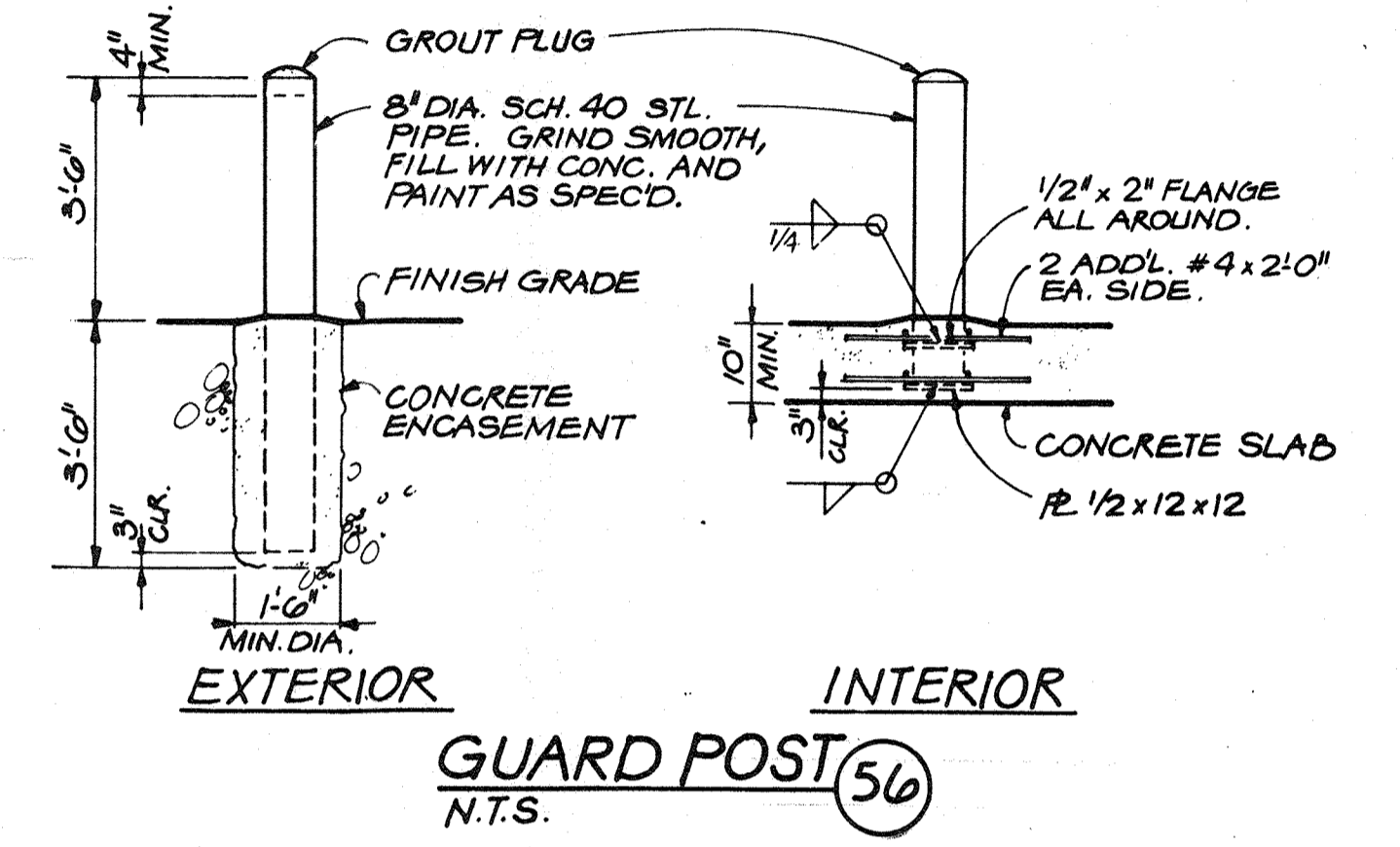
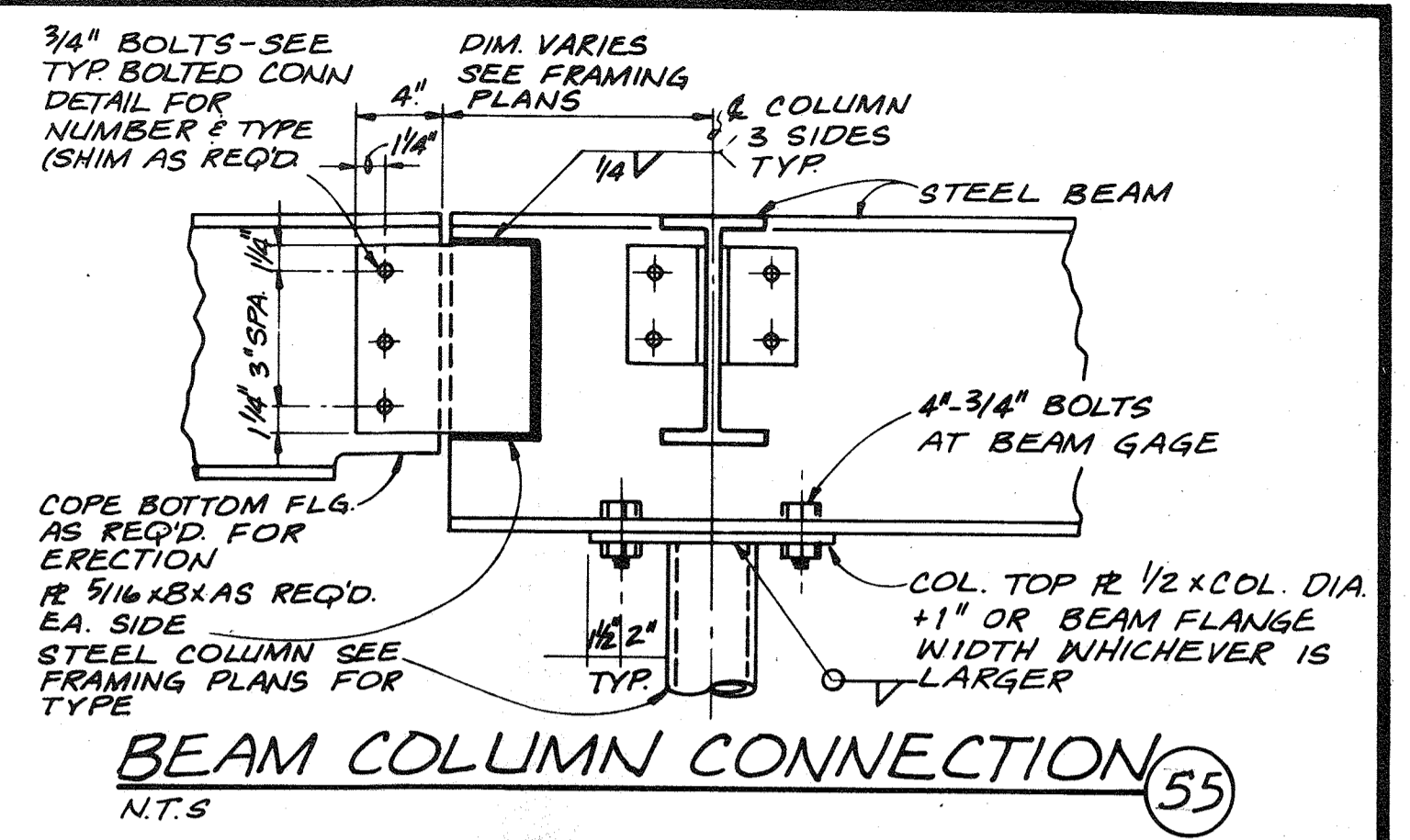
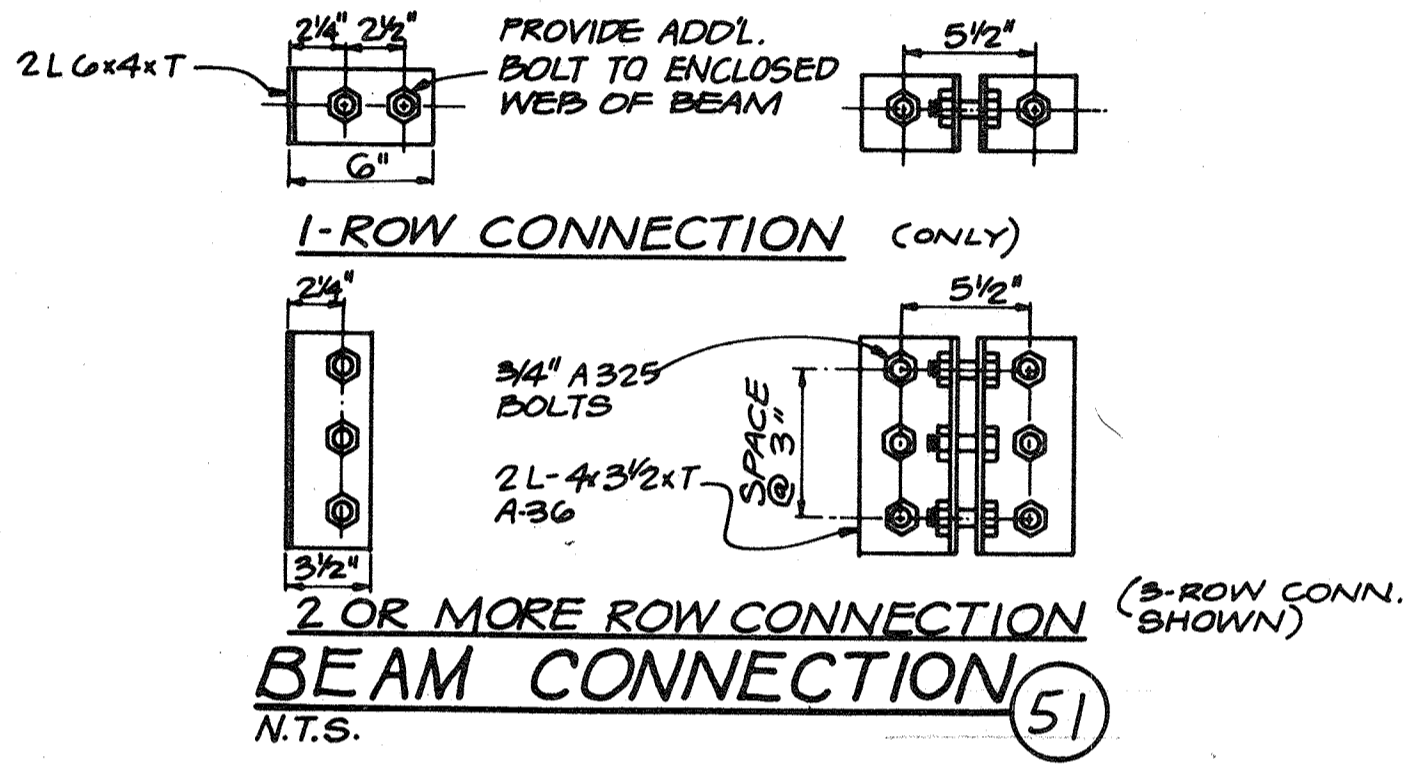


NOTES:
1. ANCHOR BOLTS SHALL BE 3/4" x 12" LONG WITH LEVELING NUTS UNLESS OTHERWISE SHOWN.
2. GROUT SHALL BE NONSHRINK AS PER SPECIFICATIONS.

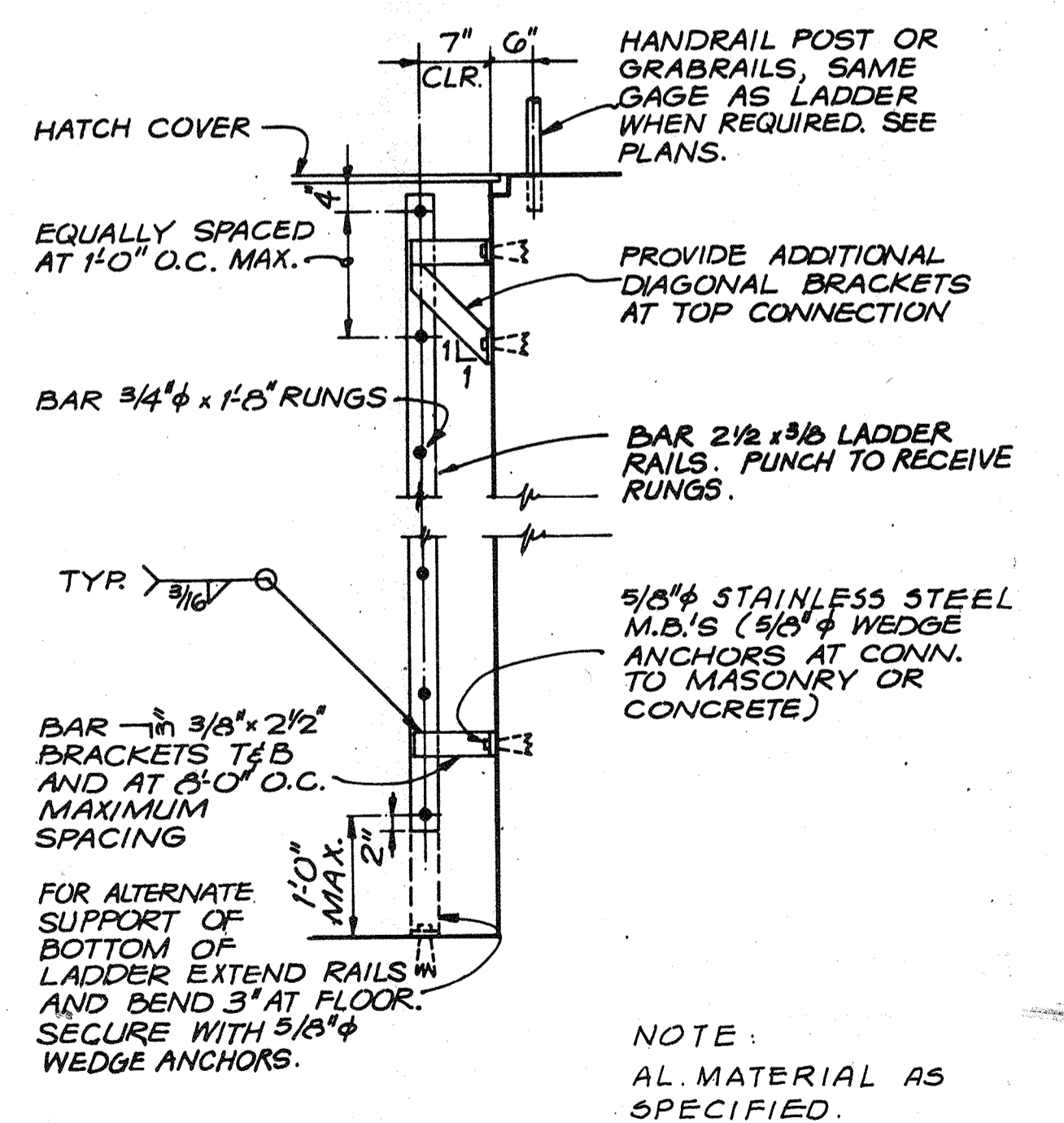
TUBE COLUMN BASE (49)
N.T.S.

NOMINAL BEAM DEPTH	ROWS OF BOLTS	LENGTH OF ANGLE	T
W 33, 36	9	2'-2 1/2"	3/8"
W 30, 27, 24	7	1'-8 1/2"	3/8"
W 21, 18 S 24, 20, 18 C 15	5	1'-2 1/2"	3/8"
W 16 S 15 C 15	4	11 1/2"	1/4"
W 14, 12 S 12 C 12	3	8 1/2"	1/4"
W 10, 8 S 10, 8 C 10, 9 8	2	5 1/2"	1/4"
W 6 S 7, 6, 5 C 7, 6, 5	1	3"	1/4"

NUMBER OF ROWS IS EQUAL TO NUMBER OF BOLTS TO ENCLOSED WEB



PIPE COLUMN BASE (53)
N.T.S.



LADDER (57)
N.T.S.



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8-22-78
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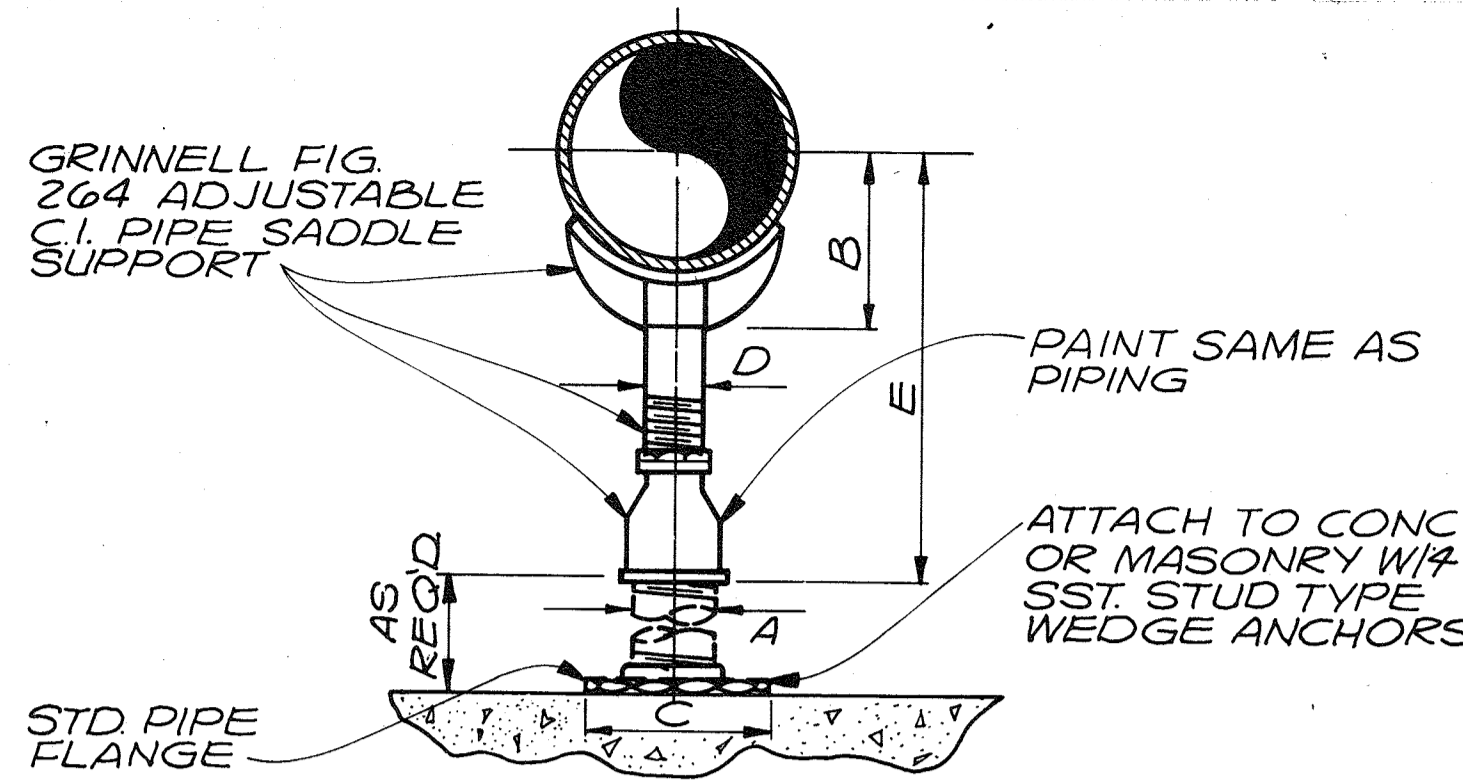
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS
DETAILS

SHEET OF D-4
DATE 8-78
DWG. NO. W1078.B1

RECORD DRAWING

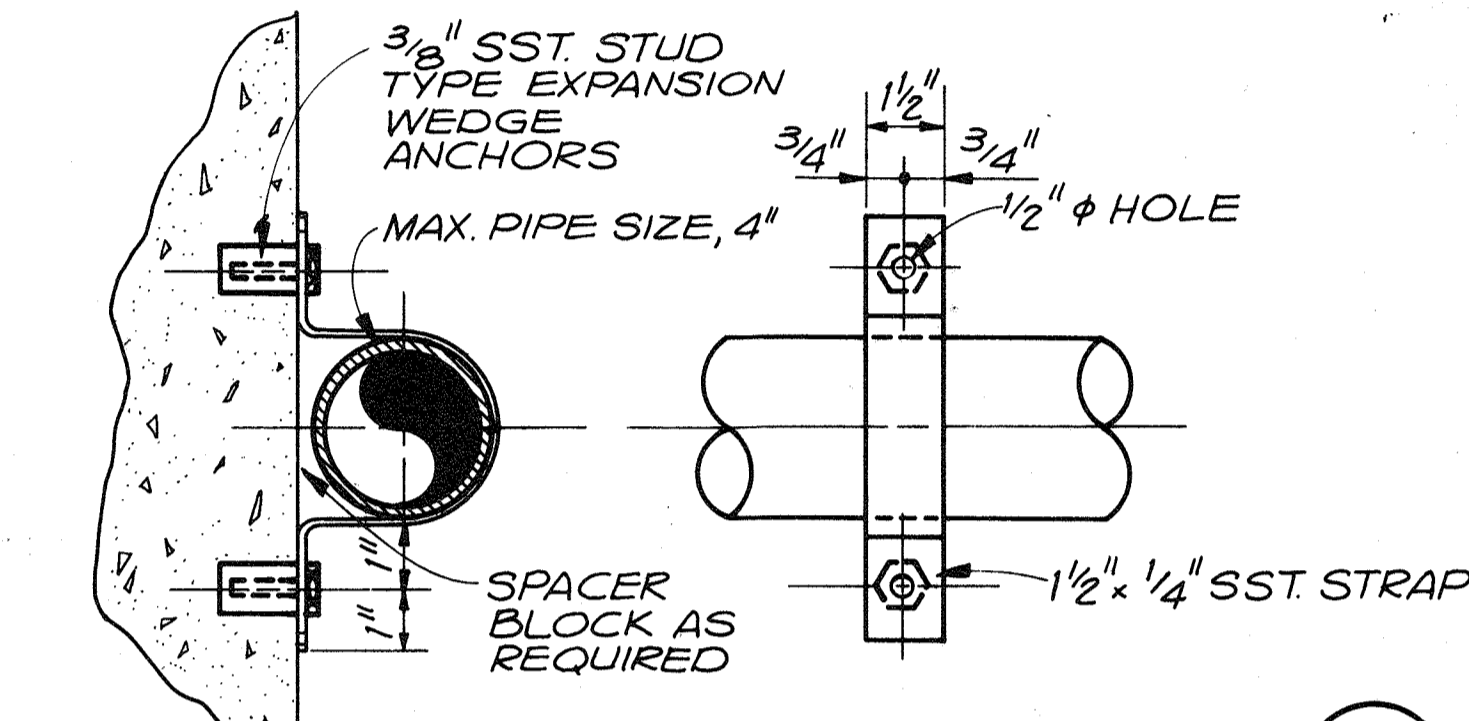


- NOTES:
1. PROVIDE HALF ROUND RIGID INSULATION & INSULATION PROTECTION SHIELD, SIMILAR TO GRINNELL FIG. 167, WHERE PIPING IS INSULATED.
 2. PROVIDE NEOPRENE WAFFLE INSULATION PAD, SIMILAR TO MASIN TYPE 'W' UNDER SUPPORT FOOT WHEN PIPING IS ISOLATED & ALL CONNECTIONS TO MECHANICAL EQUIPMENT.
 3. FOR BASE, HEIGHT & FLANGE DIMENSIONS SEE DETAIL (103)

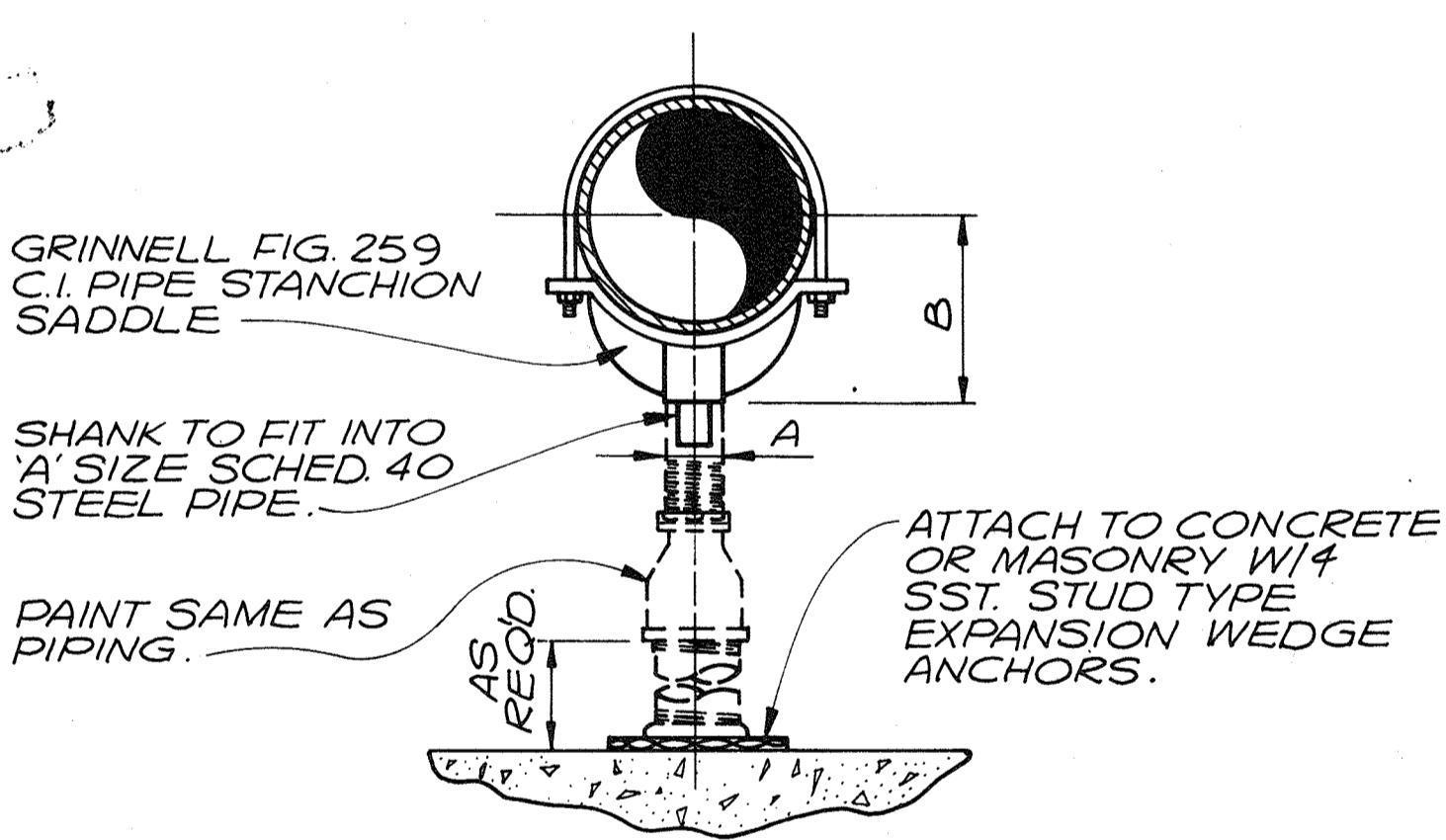
STD. PIPE SUPPORT TYPE (101)
N.T.S.

PIPE SIZE	A	B	C	D	E	
					MIN.	MAX.
2 1/2	2 1/2	3 1/2	9	1 1/2	8	13
3	2 1/2	3 3/4	9	1 1/2	8 1/4	13 1/4
3 1/2	2 1/2	4	9	1 1/2	8 1/2	13 1/2
4	3	4 1/4	9	2 1/2	9 1/4	14
5	3	4 7/8	9	2 1/2	10	14 3/4
6	3	5 1/2	9	2 1/2	10 1/2	15 1/4
8	3	6 7/8	9	2 1/2	11 3/4	16 1/2
10	3	8 1/2	9	2 1/2	13 1/2	18 1/4
12	3	9 15/16	9	2 1/2	15	19 3/4
14	4	10 15/16	11	3	16 1/4	20 3/4
16	4	12 3/8	11	3	17 3/4	22 1/4
18	6	13 7/8	13 1/2	3 1/2	19 1/2	24
20	6	15 3/8	13 1/2	3 1/2	21	25 1/2
24	6	17 15/16	13 1/2	4	23 3/4	28 1/4
30	6	21 5/16	13 1/2	4	27	31 1/2
32	6	22 1/2	13 1/2	4	28 1/4	32 3/4
36	6	24 1/2	13 1/2	4	30 1/4	34 3/4

(103)

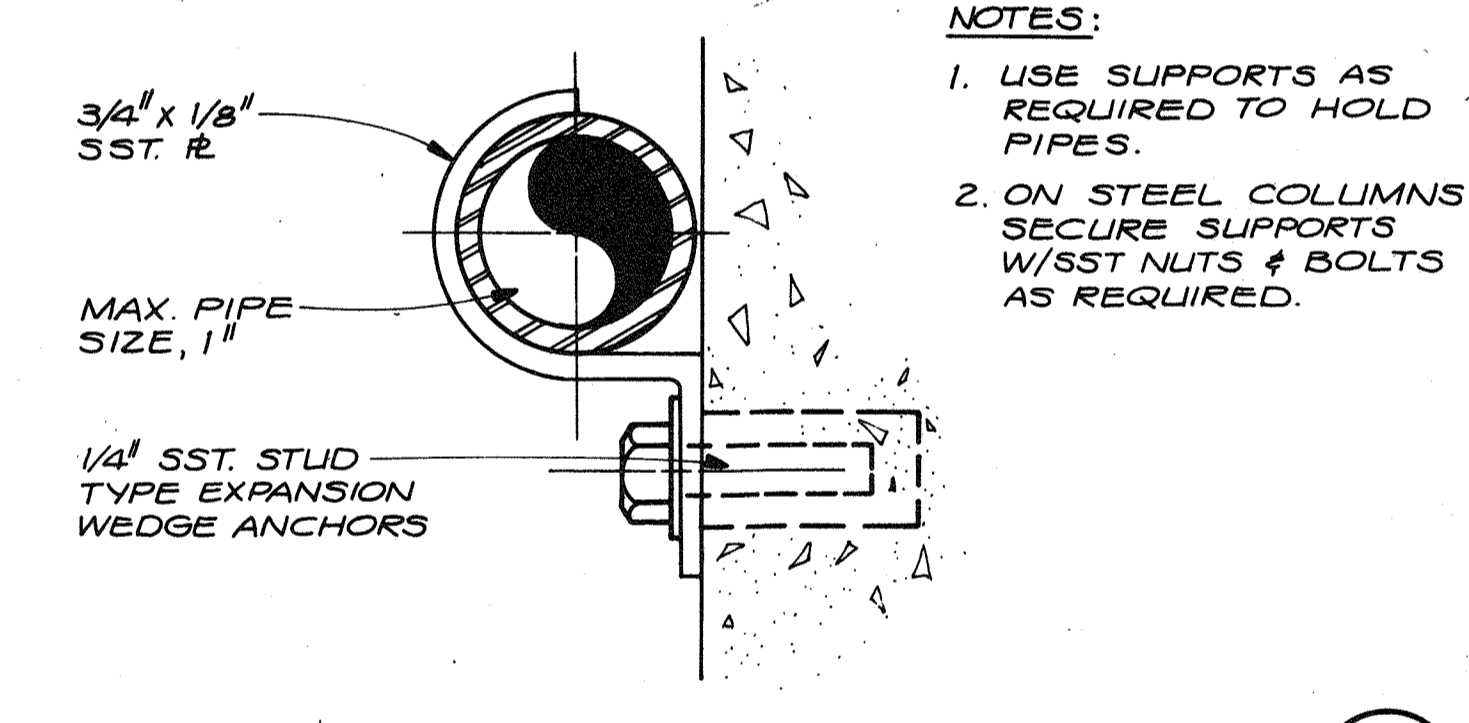


STD. PIPE SUPPORT TYPE (104)
N.T.S.



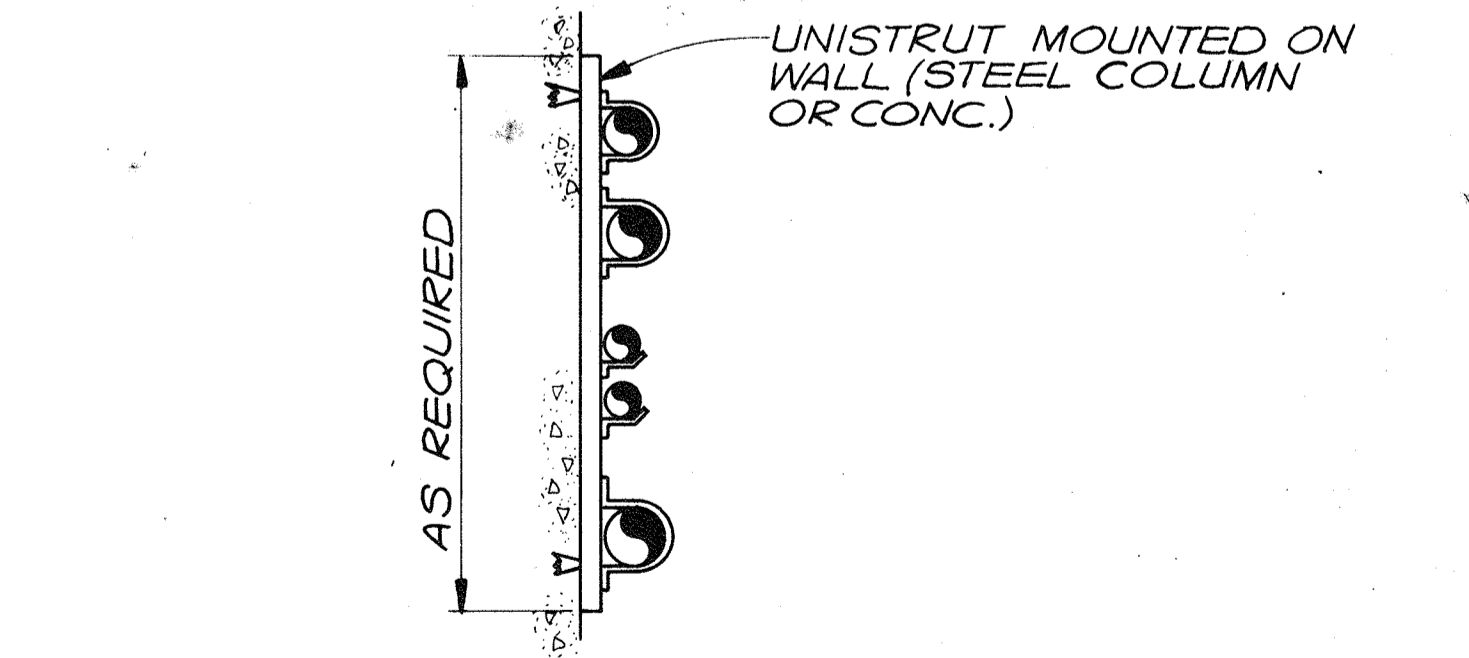
- NOTES:
1. PROVIDE HALF ROUND RIGID INSULATION & INSULATION PROTECTION SHIELD, SIMILAR TO GRINNELL FIG. 167, WHERE PIPING IS INSULATED.
 2. PROVIDE NEOPRENE WAFFLE INSULATION PAD, SIMILAR TO MASIN TYPE 'W' UNDER SUPPORT FOOT WHEN PIPING IS ISOLATED & ALL CONNECTIONS TO MECHANICAL EQUIPMENT.
 3. FOR BASE, HEIGHT & FLANGE DIMENSIONS SEE DETAIL (103)

STD. PIPE SUPPORT TYPE (102)
N.T.S.

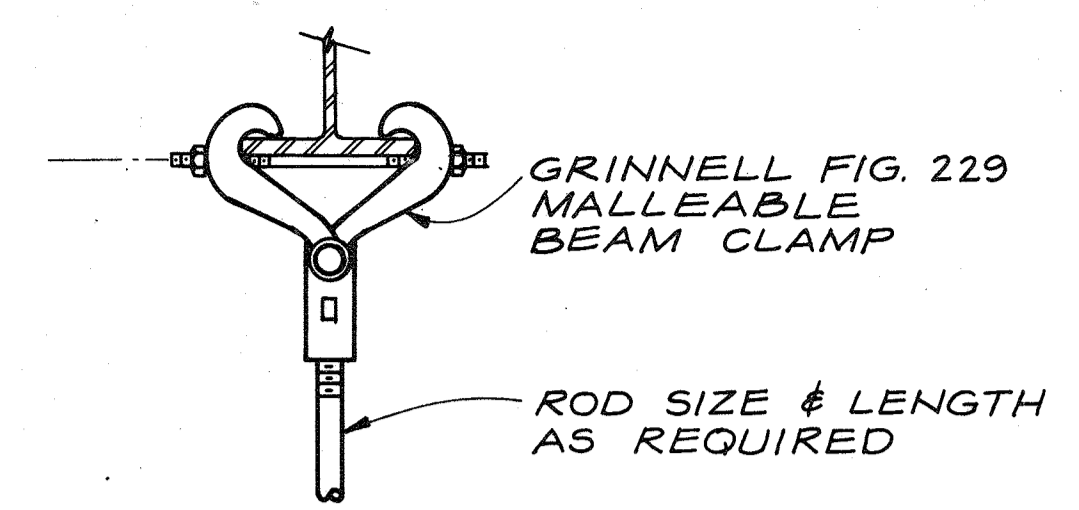


- NOTES:
1. USE SUPPORTS AS REQUIRED TO HOLD PIPES.
 2. ON STEEL COLUMNS SECURE SUPPORTS W/SST NUTS & BOLTS AS REQUIRED.

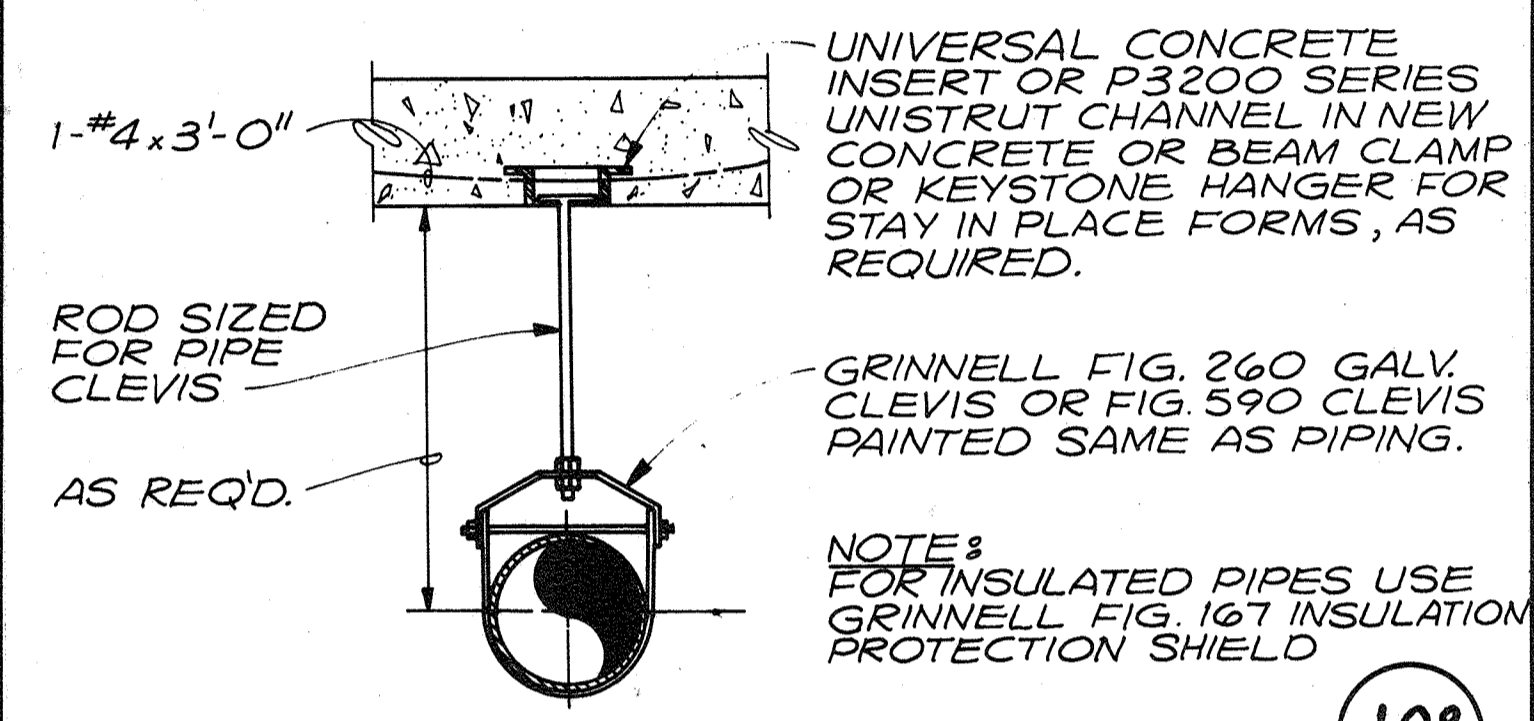
STD. PIPE SUPPORT TYPE (105)
N.T.S.



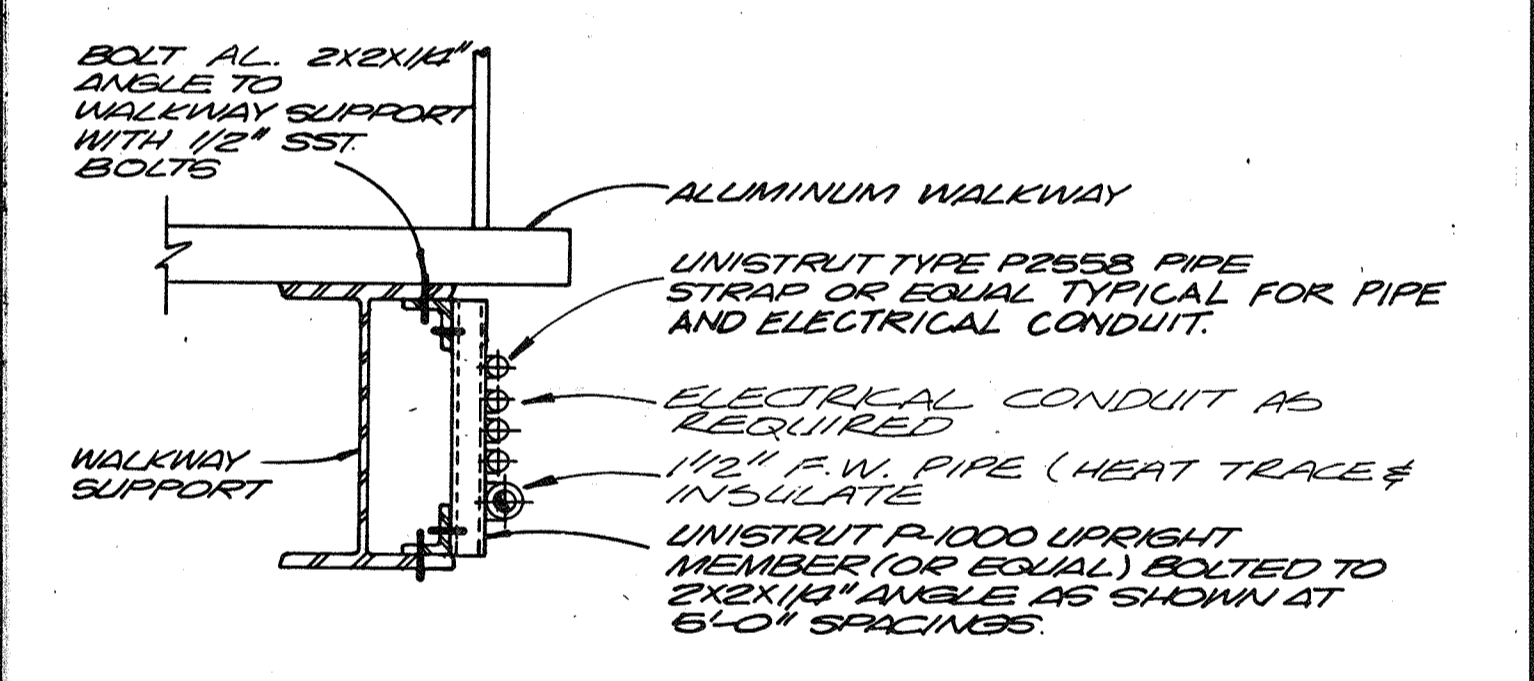
TYPICAL STACKED PIPE WALL SYSTEM DETAIL (106)
N.T.S.



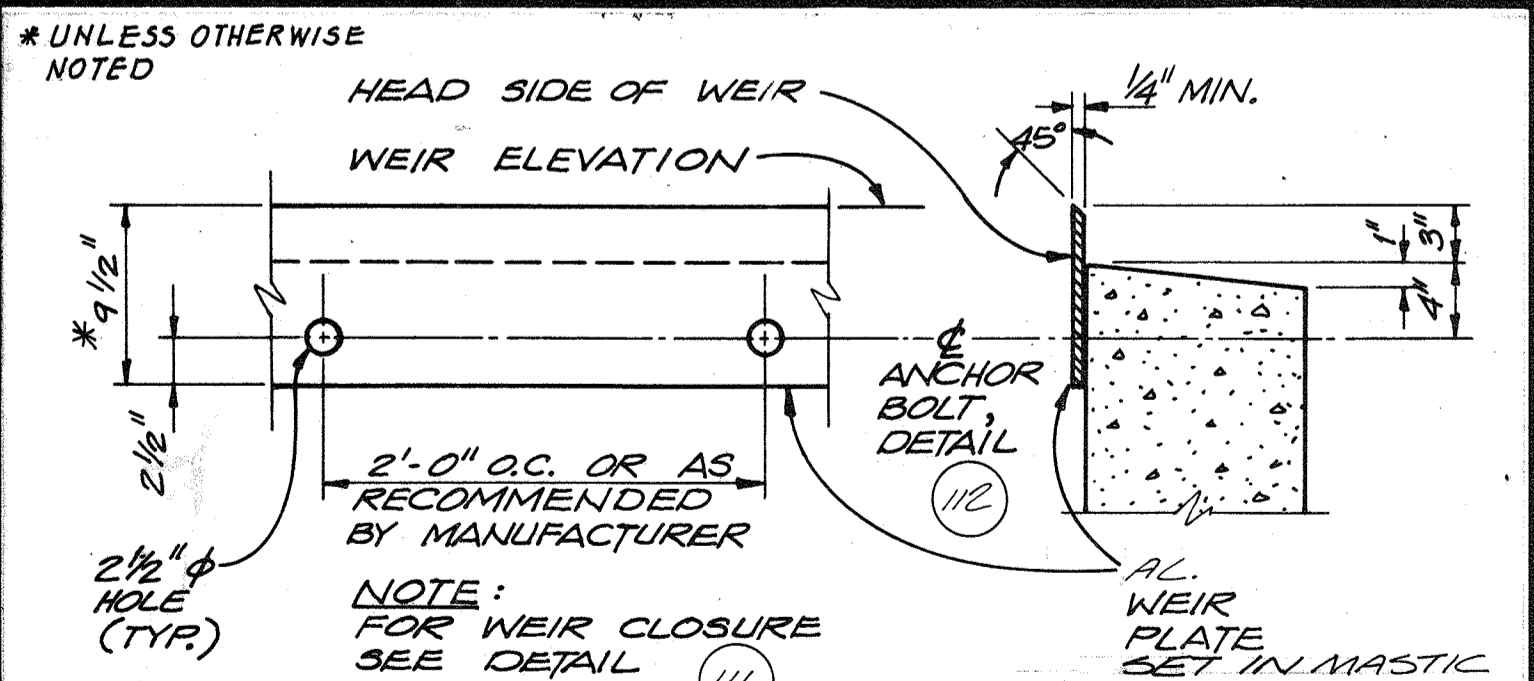
STANDARD PIPE HANGER BEAM CLAMP DETAIL (107)
N.T.S.



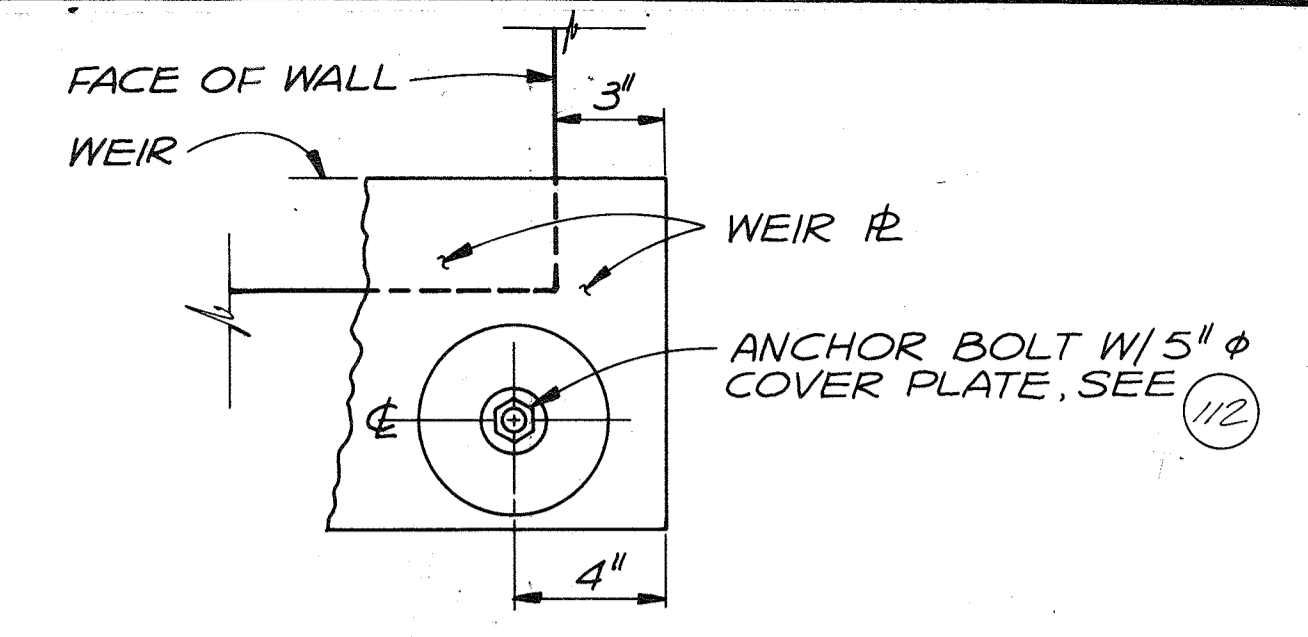
STD. PIPE HANGER TYPE (108)
N.T.S.



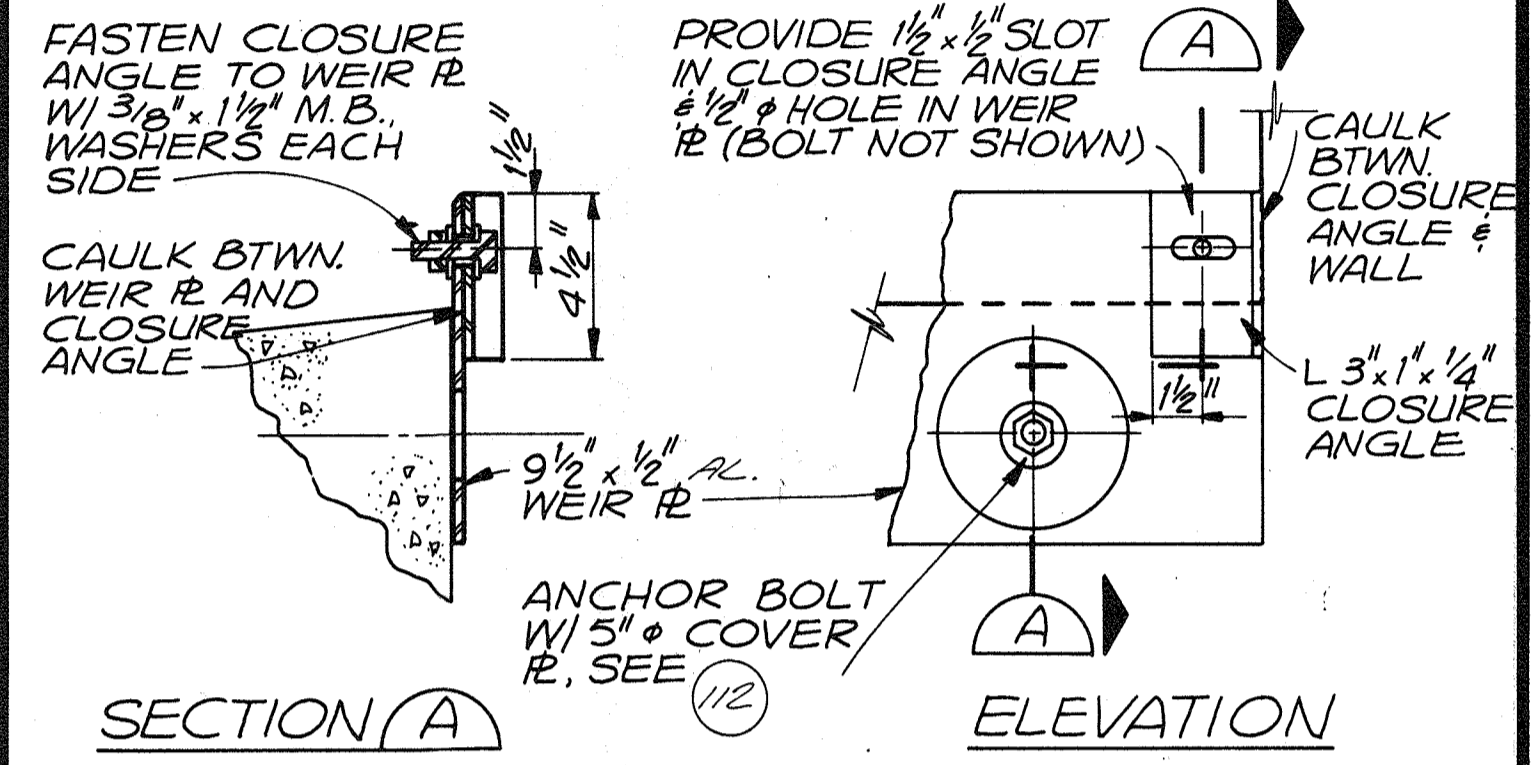
PIPE SUPPORT DETAIL (109)
N.T.S.



TYP. STRAIGHT EDGE WEIR & PLATE DETAIL (110)
N.T.S.

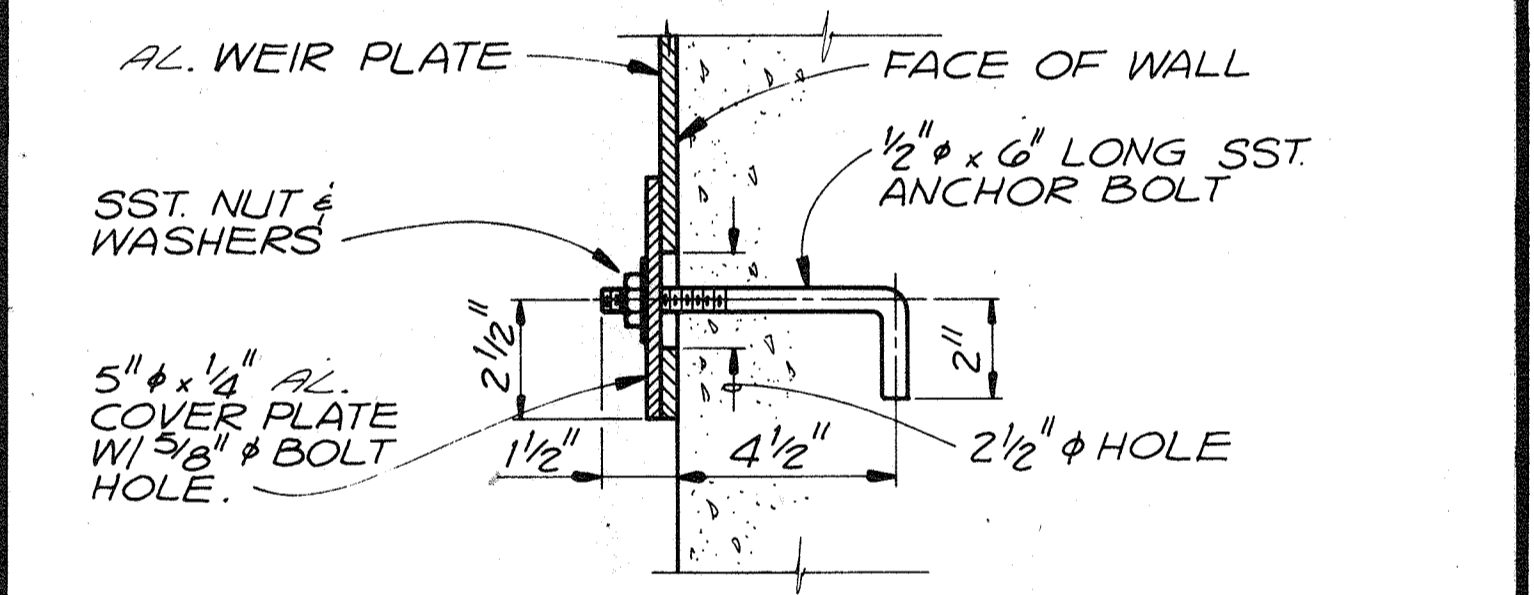


ELEVATION TYPE-1 CLOSURE



ELEVATION TYPE-2 CLOSURE

WEIR CLOSURE DETAIL (111)
N.T.S.



STD. ANCHOR BOLT FOR WEIR & BAFFLE PLATES DETAIL (112)
N.T.S.

RECORD DRAWING

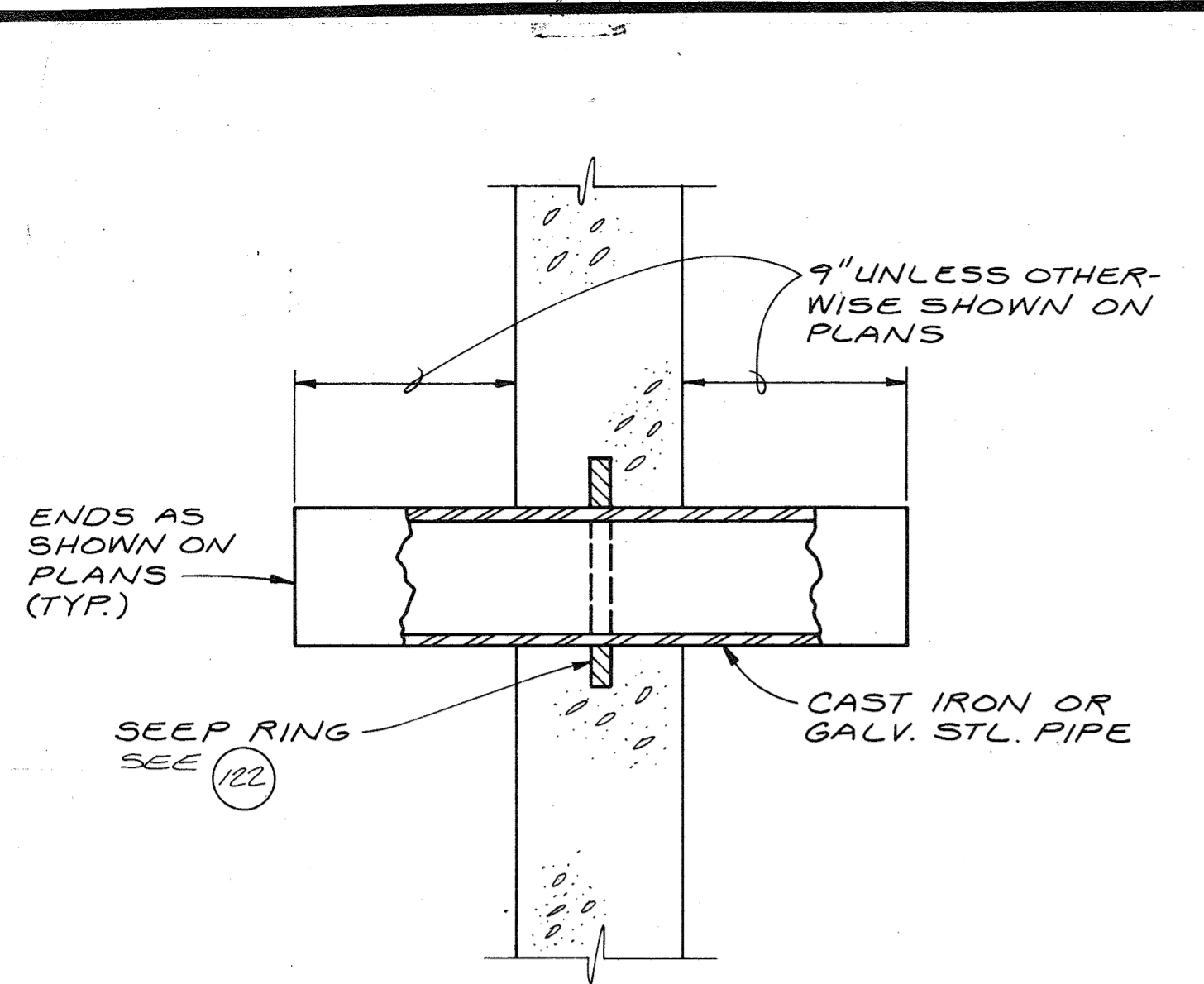


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DR.					
CHK.					
APPD.					
NO.	DATE	REVISION	BY	APPD.	

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
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SAVAGE WASTEWATER TREATMENT PLANT
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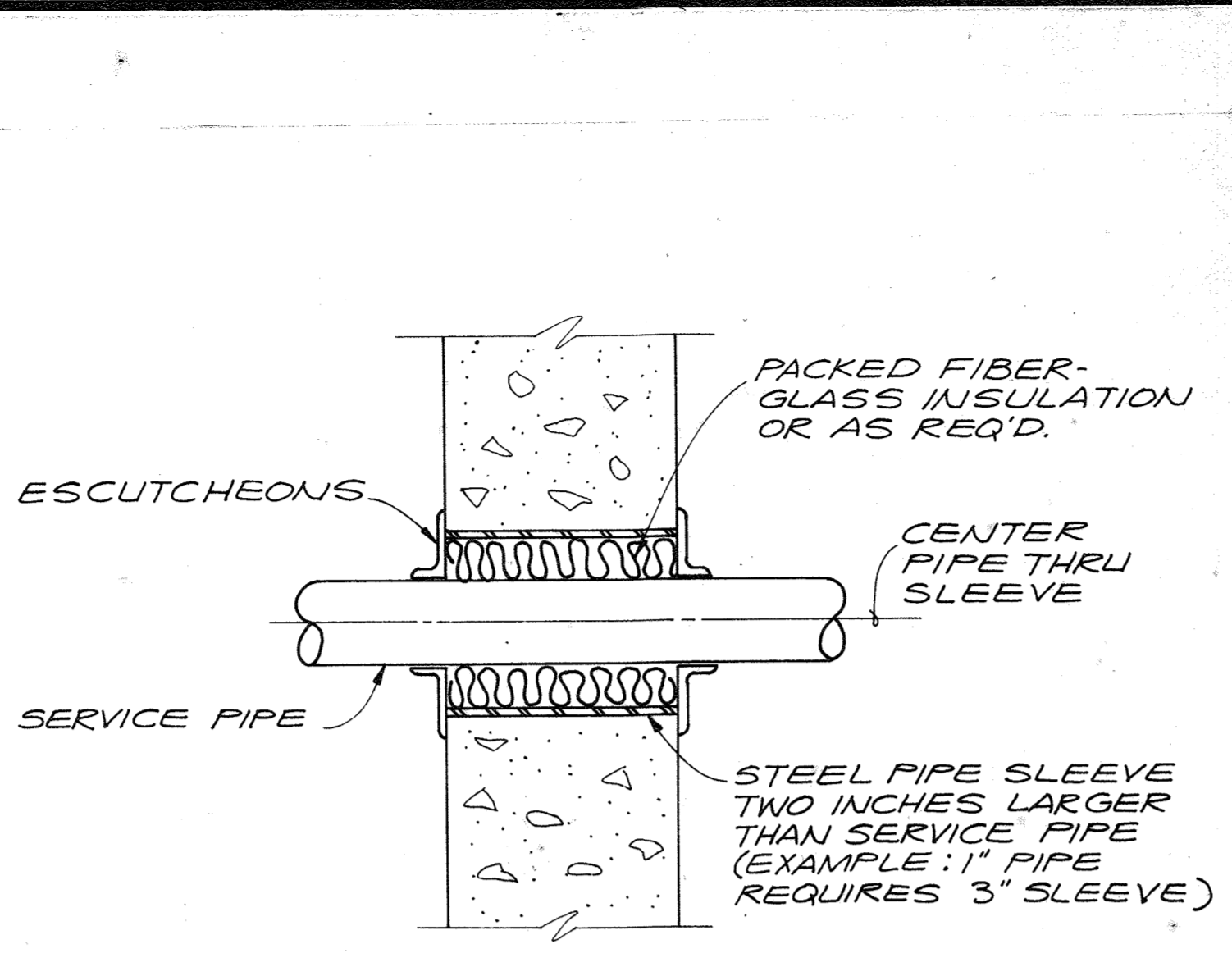
STANDARD DETAILS
MECHANICAL
SHEET OF D-5
DATE 8-78
DWG. NO. W1078.B1



**STANDARD WALL
PIPE DETAIL**

N.T.S.

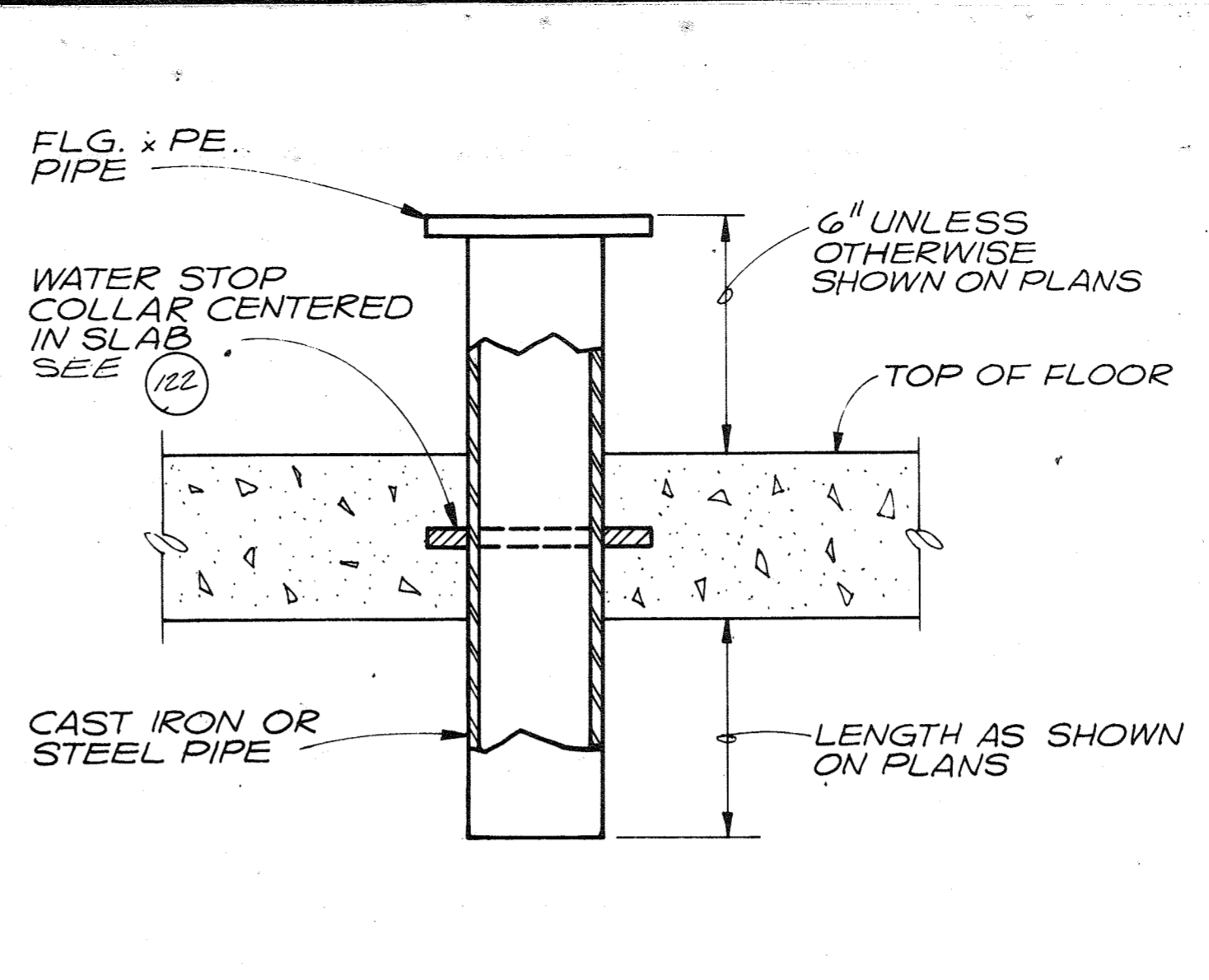
114



**PIPE PENETRATION THRU
MECHANICAL ROOM WALLS
AND FLOORS DETAIL**

N.T.S.

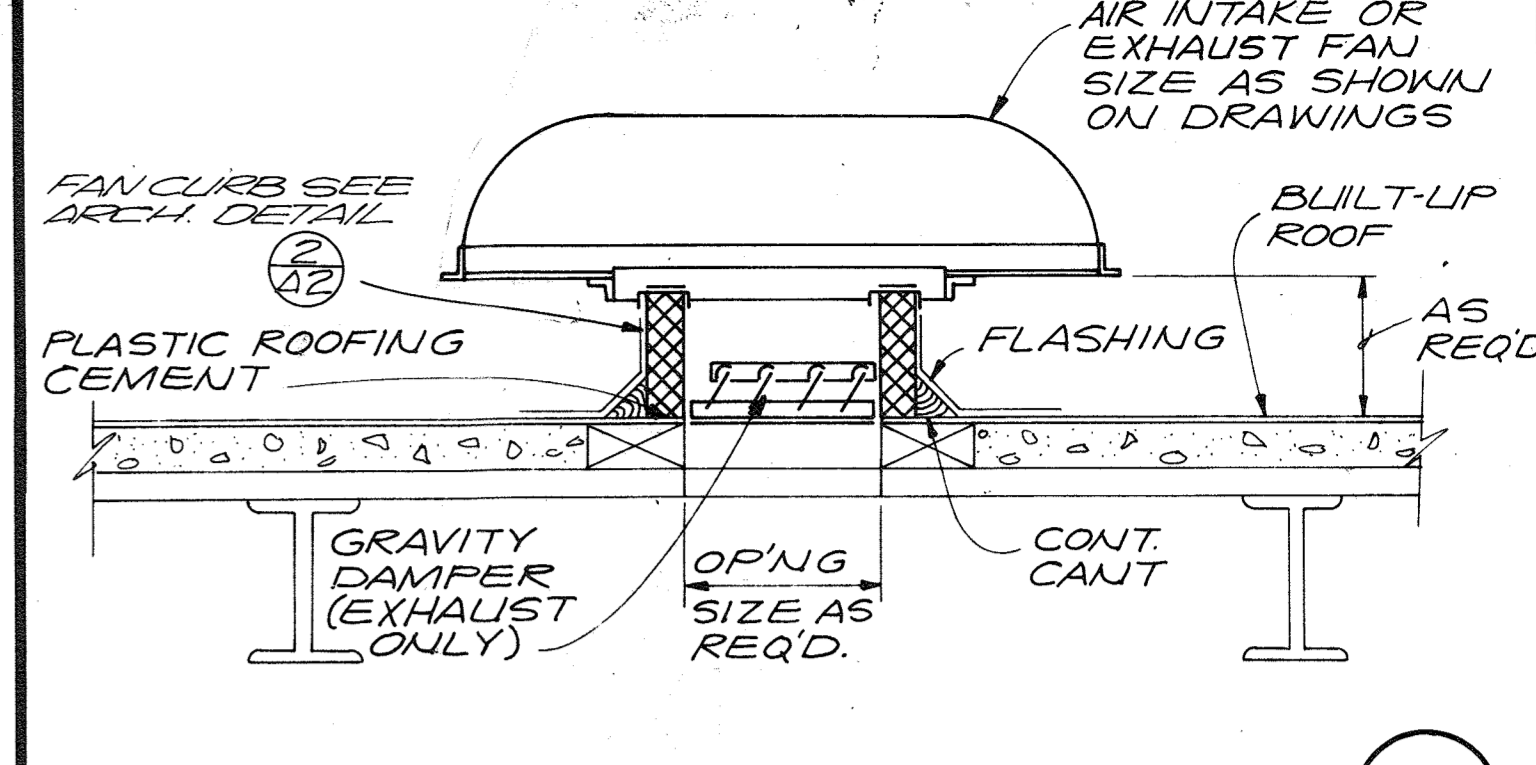
117



**STYLE 1 FLOOR
PIPE DETAIL**

N.T.S.

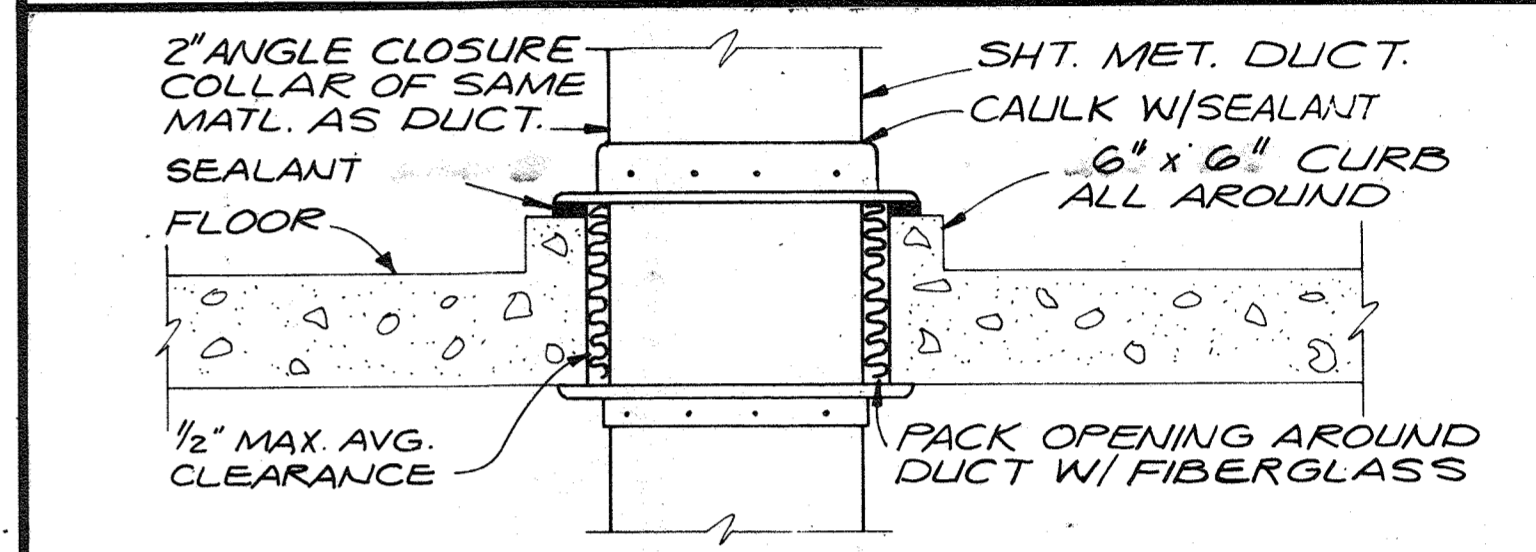
120



ROOF EXHAUST DETAIL

N.T.S.

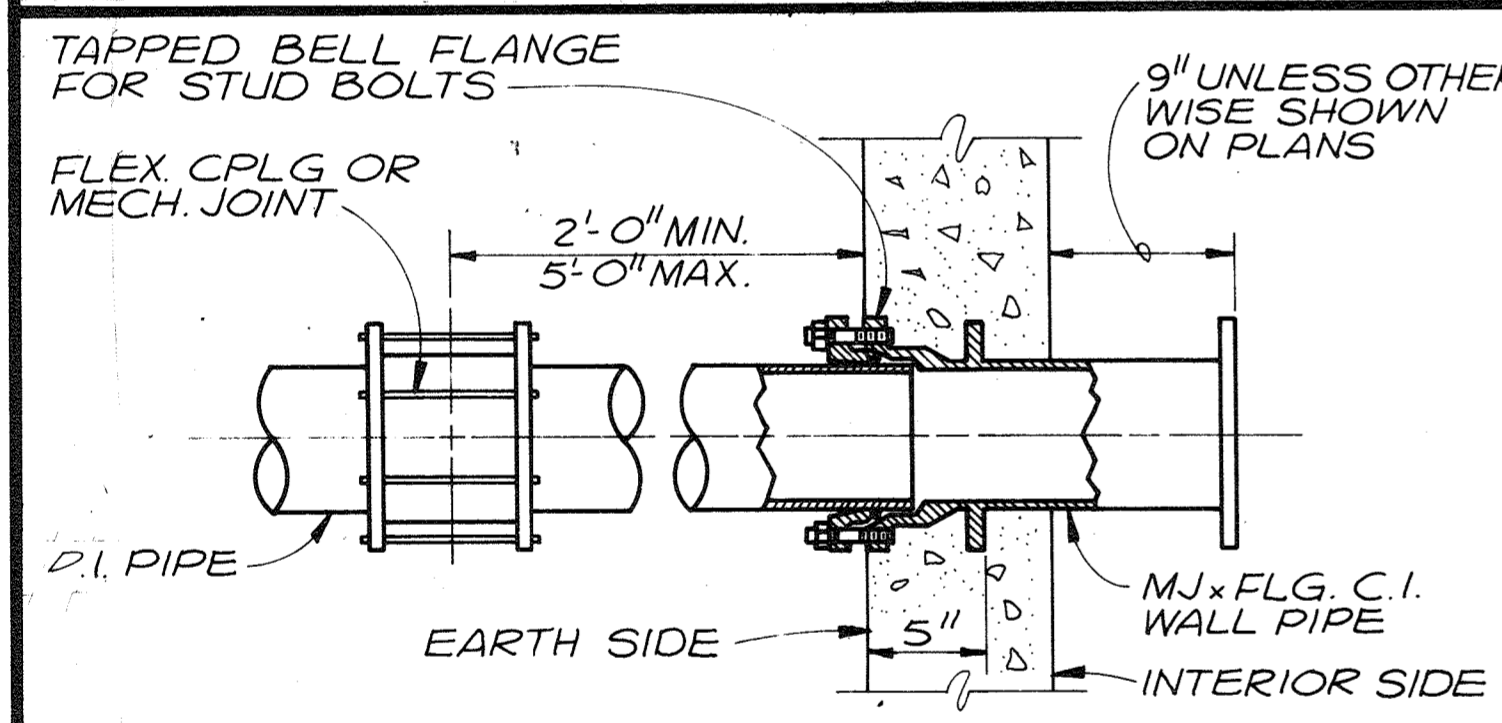
123



**FLOOR PENETRATION
WET AREA DETAIL**

N.T.S.

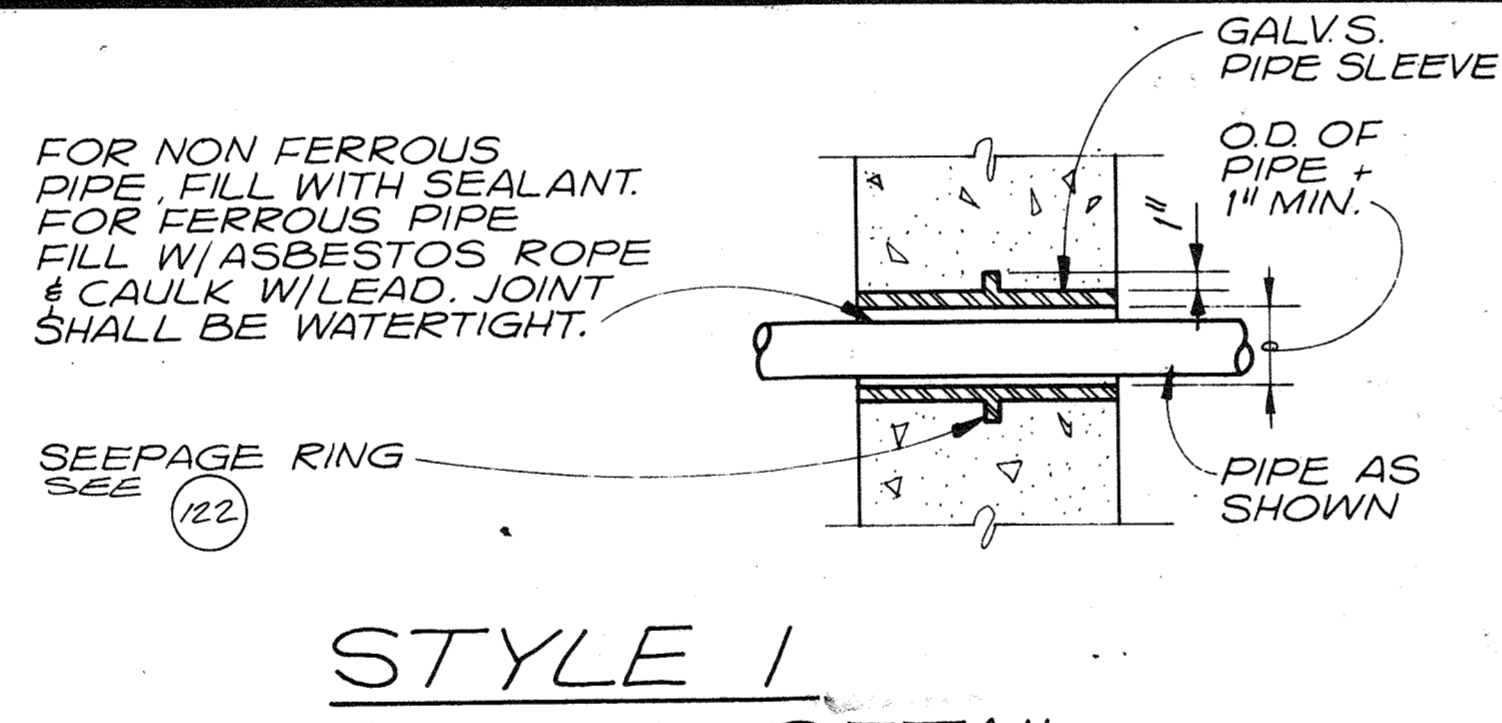
124



**STANDARD WALL
PIPE DETAIL**

N.T.S.

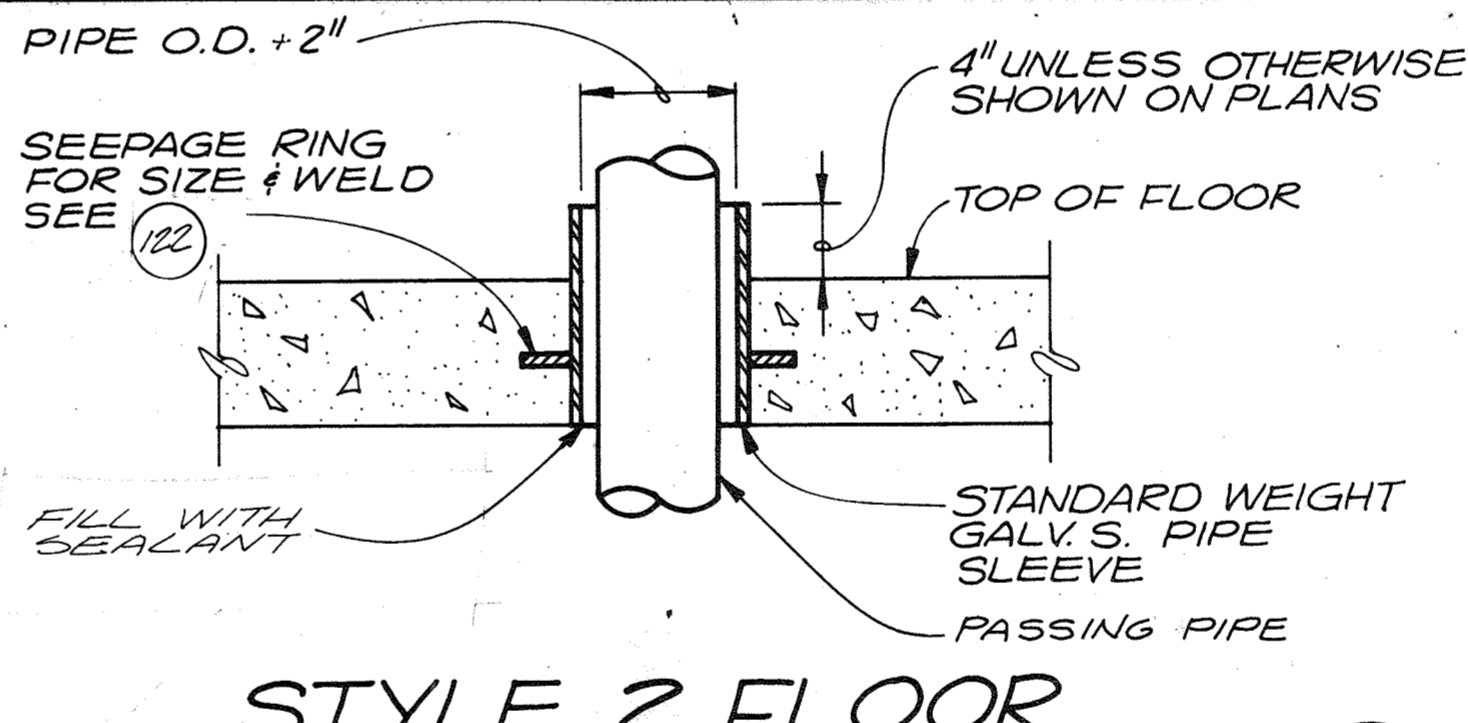
115



**STYLE 1
SLEEVE DETAIL**

N.T.S.

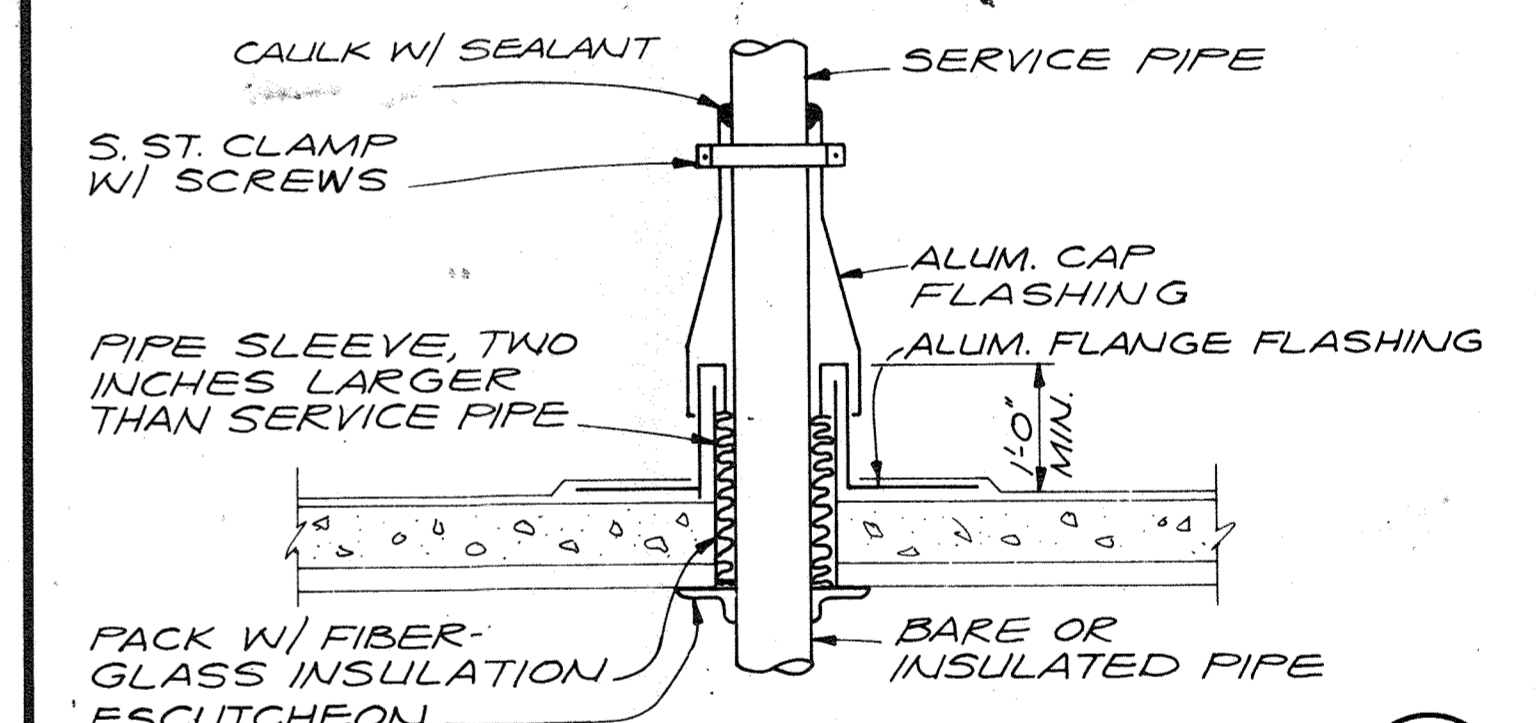
118



**STYLE 2 FLOOR
SLEEVE DETAIL**

N.T.S.

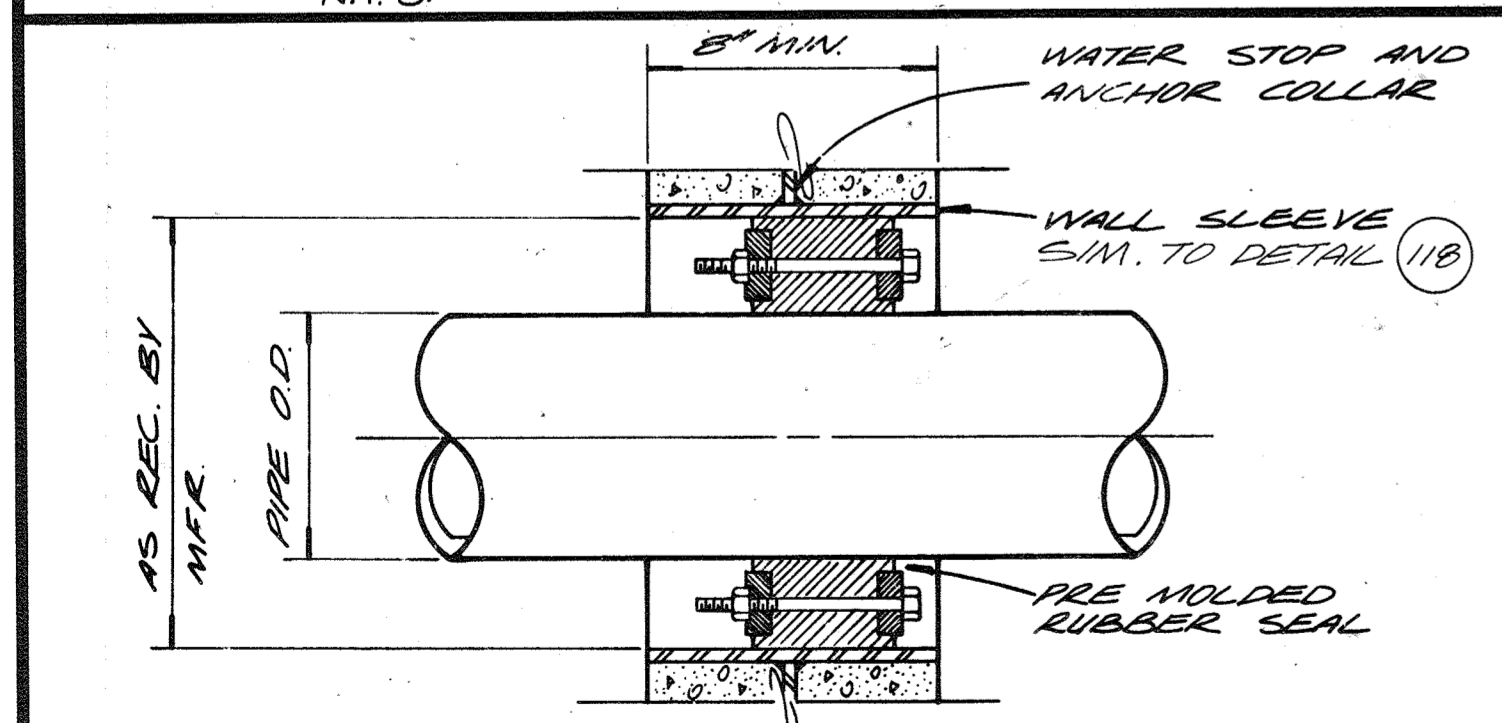
121



ROOF PENETRATION DETAIL

N.T.S.

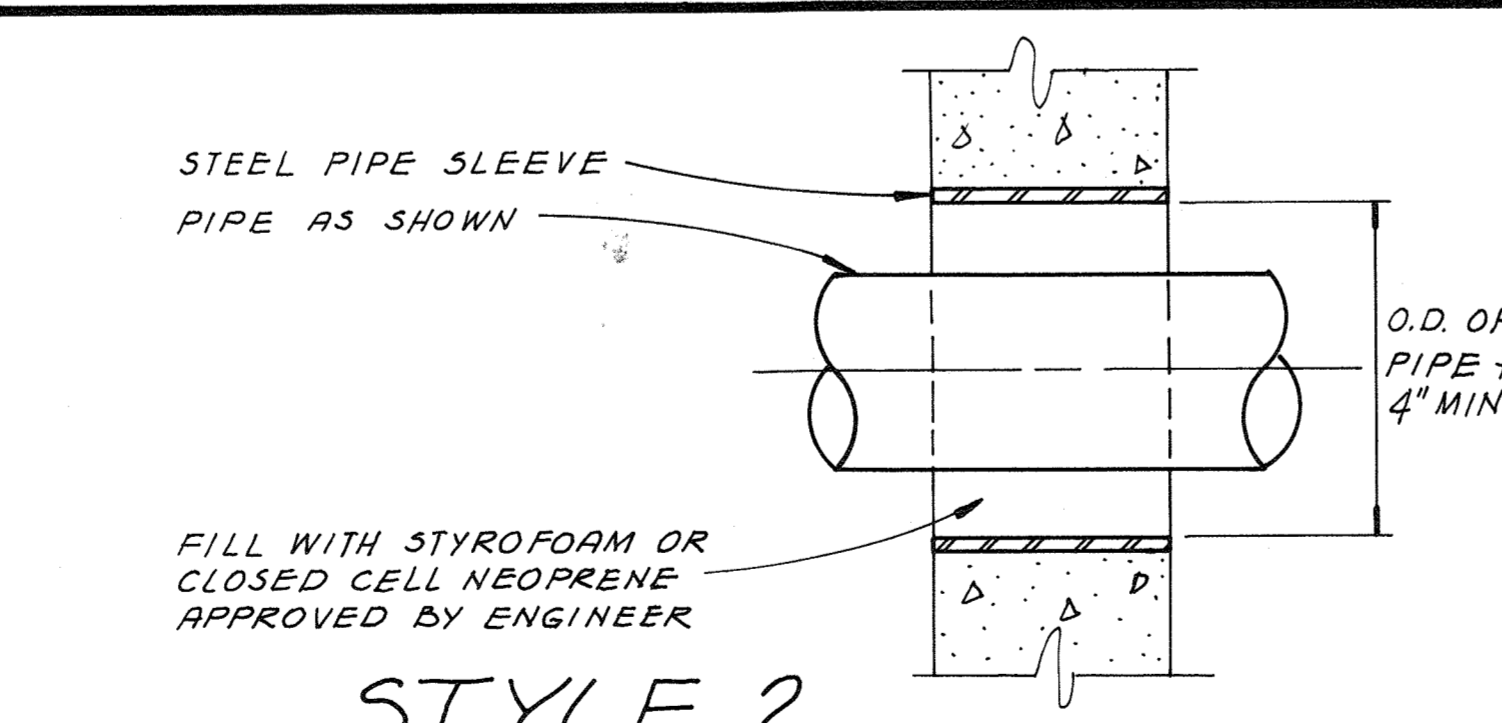
125



**HYDRO-STATIC
WALL CLOSURE**

N.T.S.

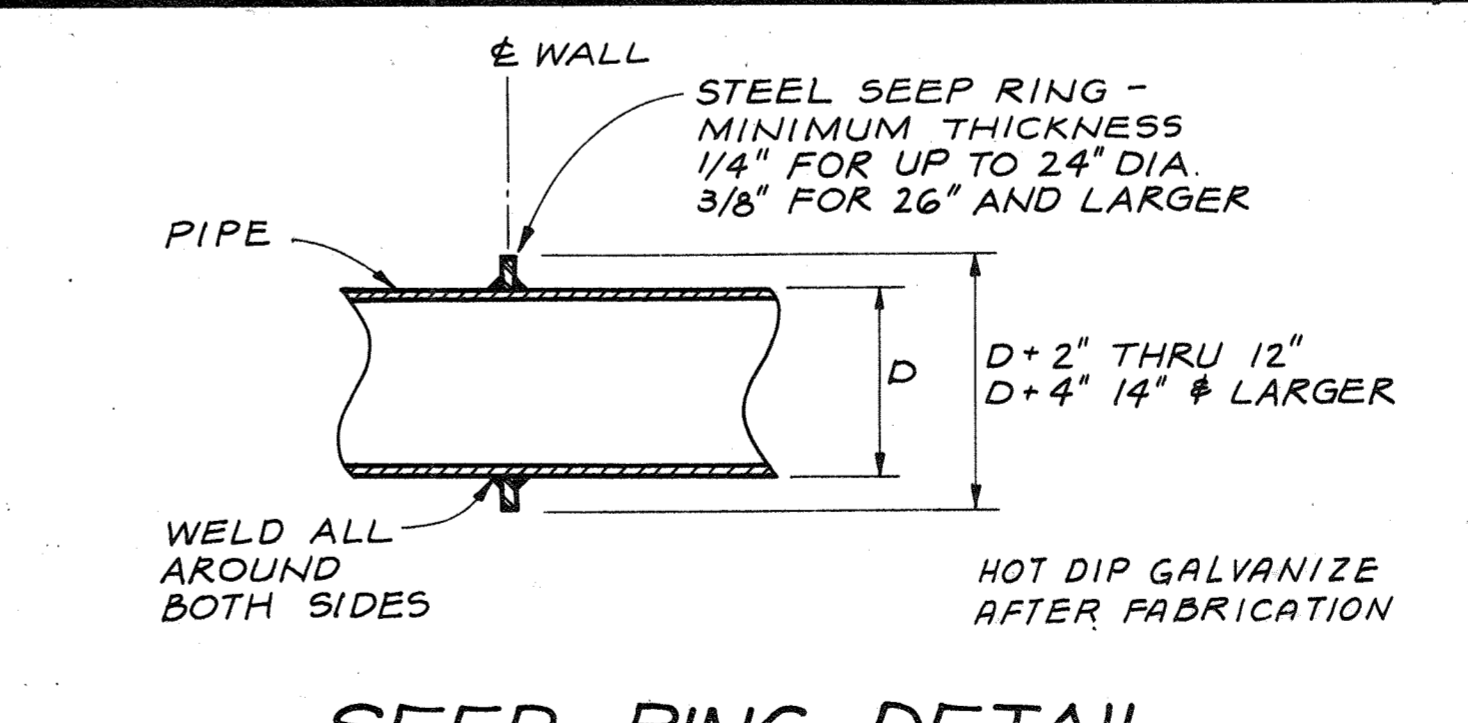
116



**STYLE 2
SLEEVE DETAIL**

N.T.S.

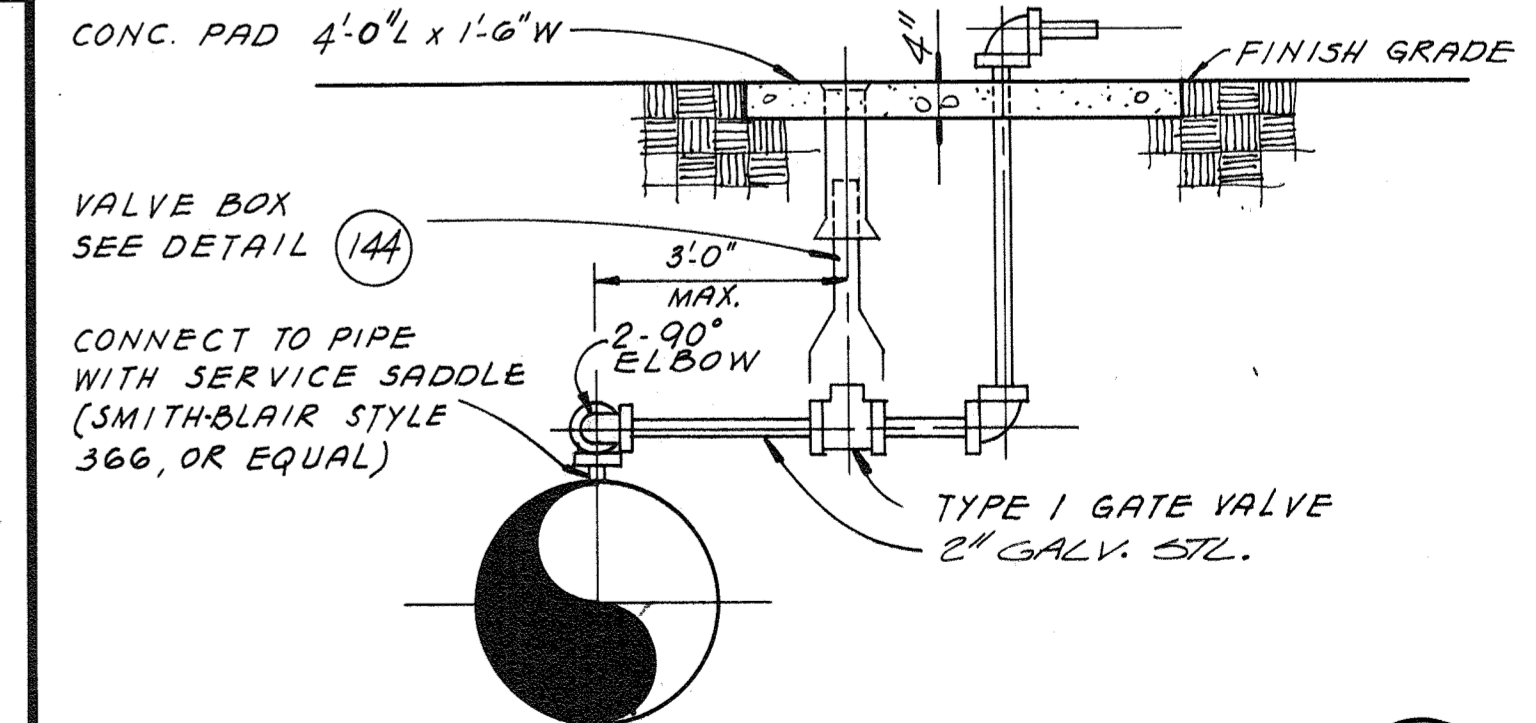
119



SEEP RING DETAIL

N.T.S.

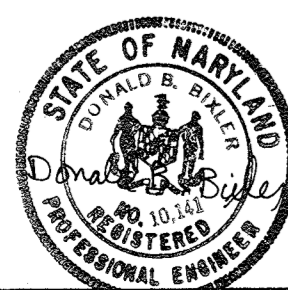
122



AIR RELEASE DETAIL

N.T.S.

126



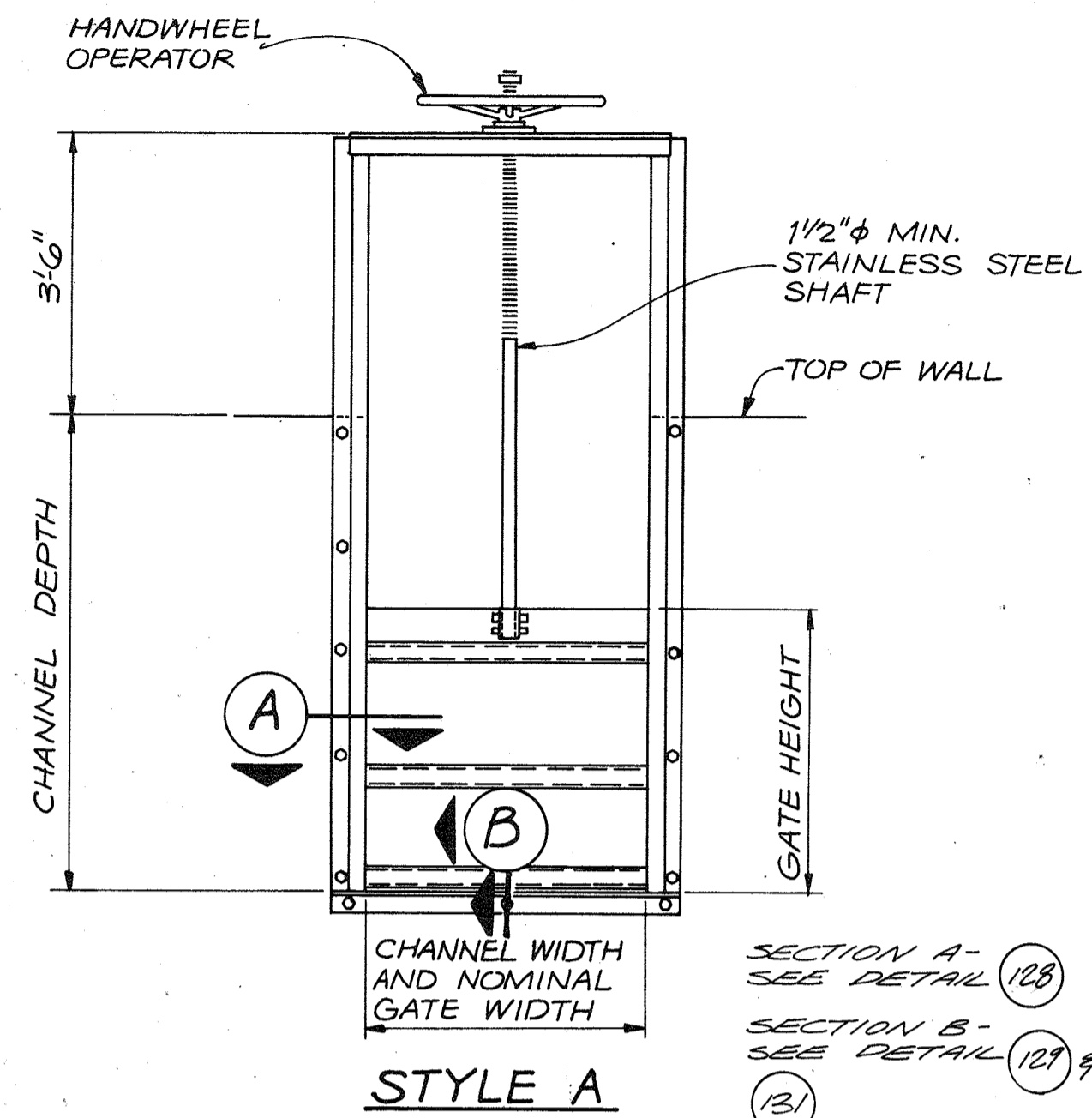
DES.					
DR.					
CHK.					
APPD.					
	NO.	DATE	REVISION	BY	APPD.

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8-22-78
DATE
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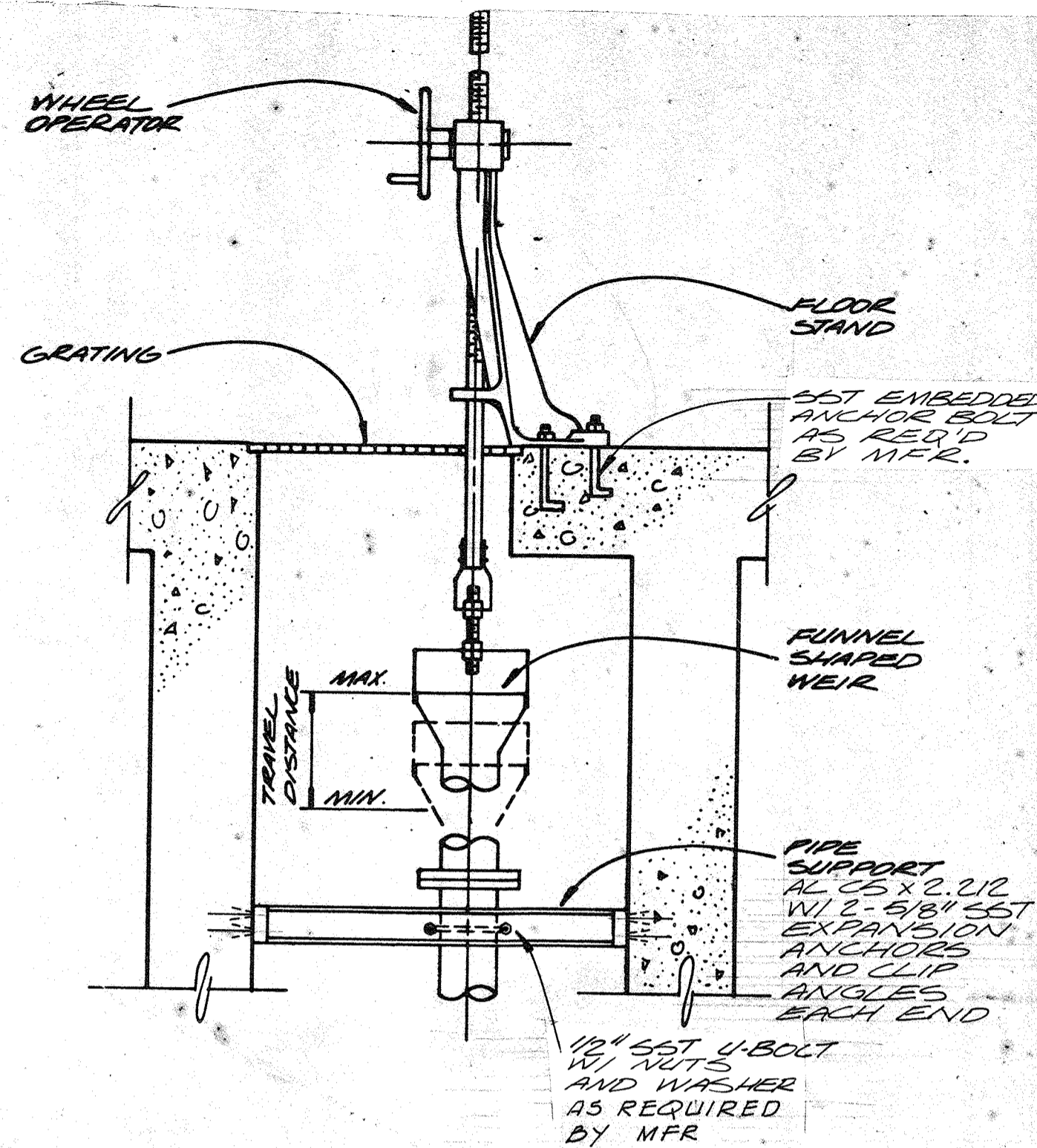
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS
MECHANICAL

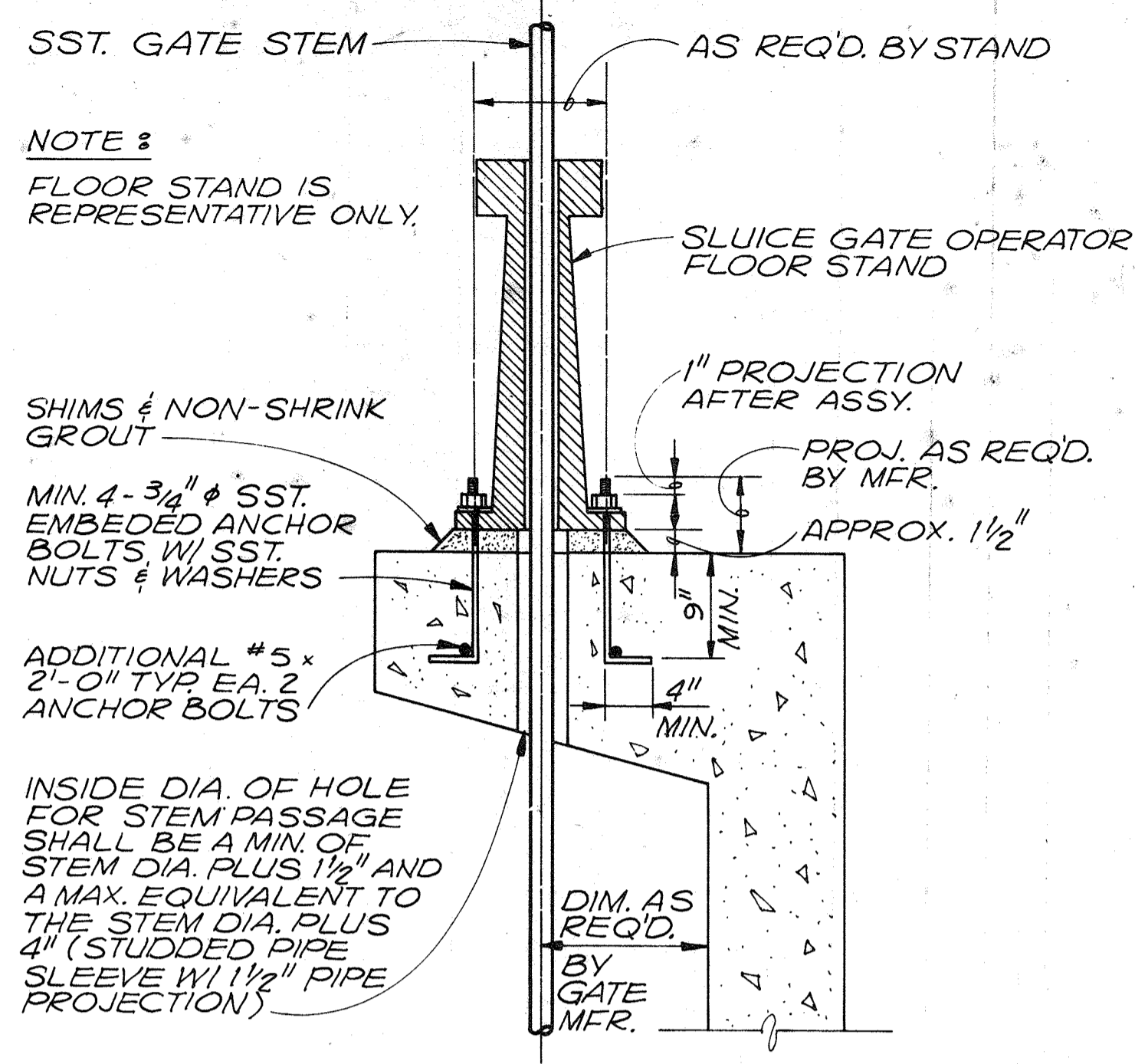
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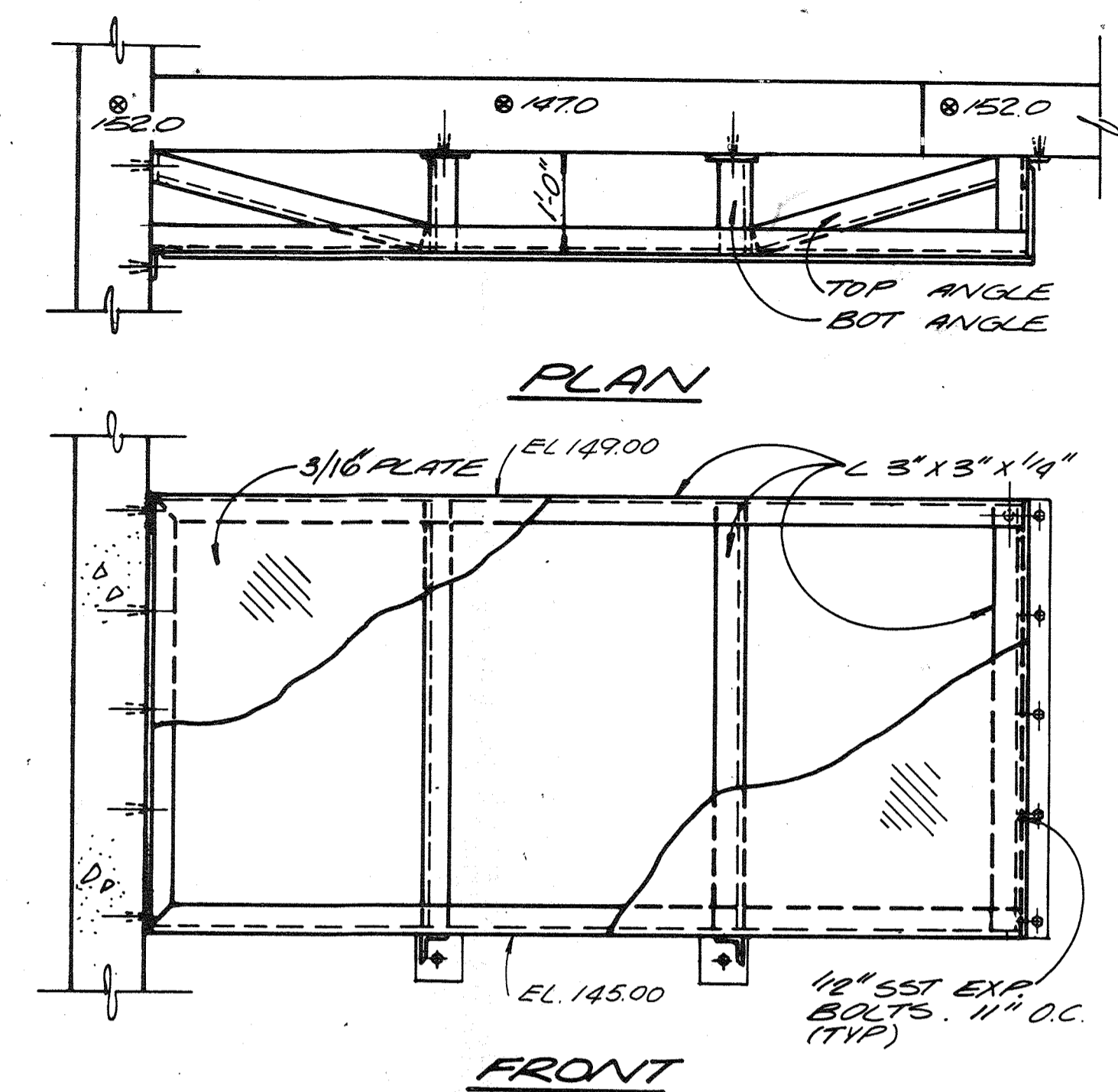
FABRICATED ALUMINUM SLIDE GATES (127)



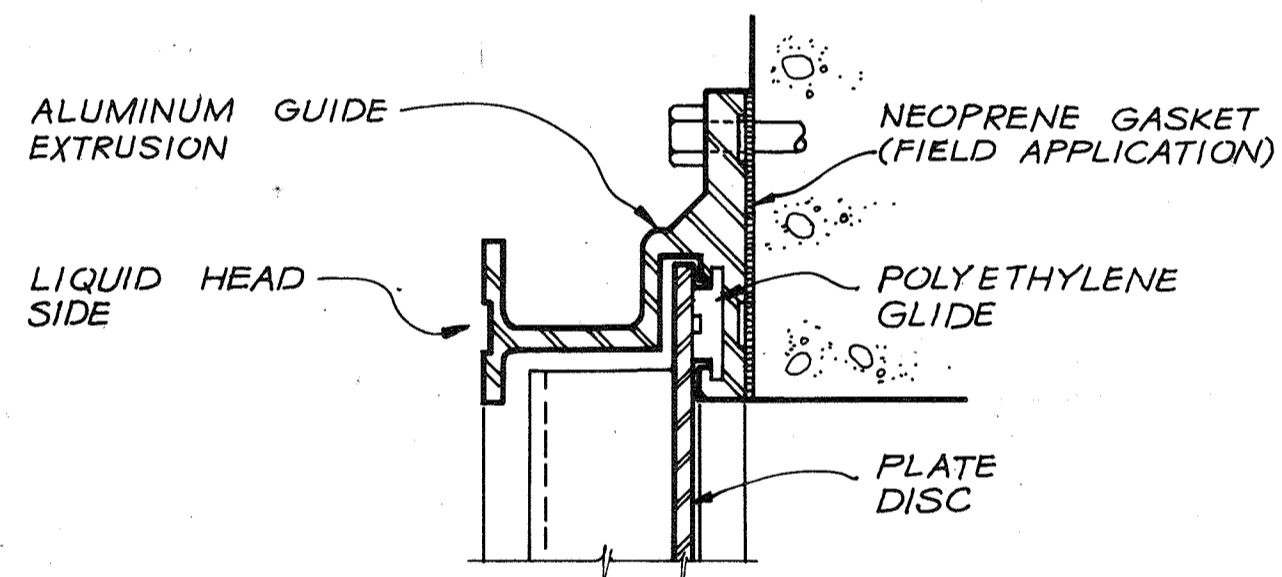
TELESCOPIC VALVE DETAIL (130)



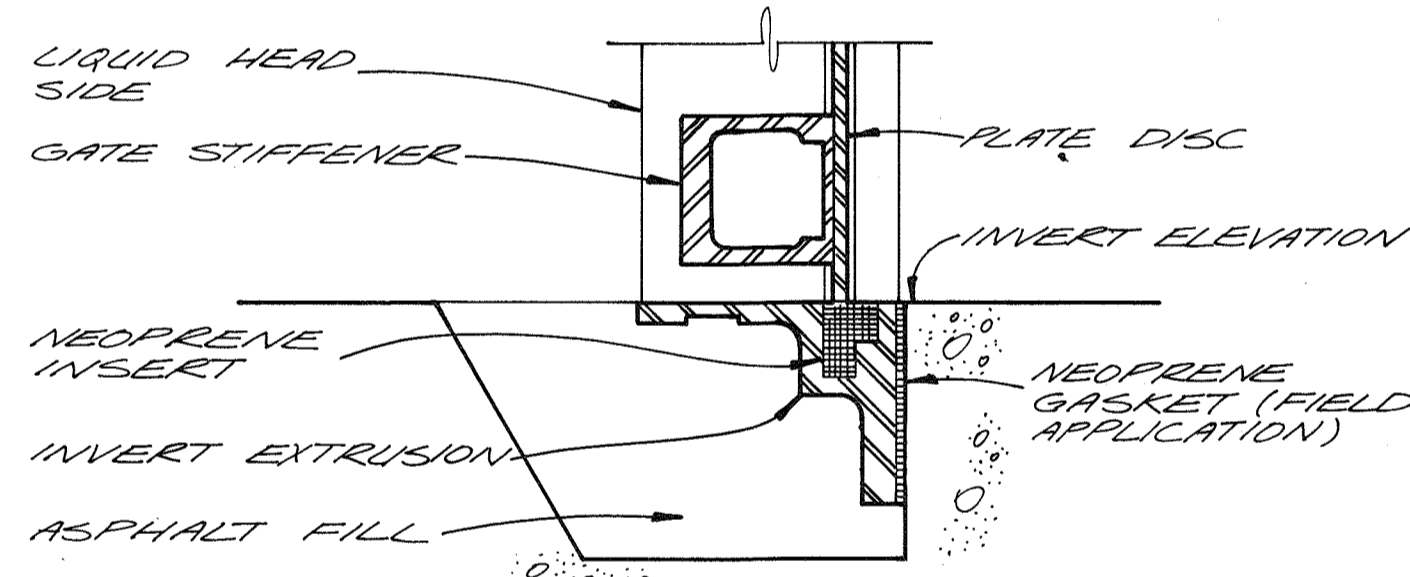
FLOOR STAND INSTALLATION DETAIL (133)



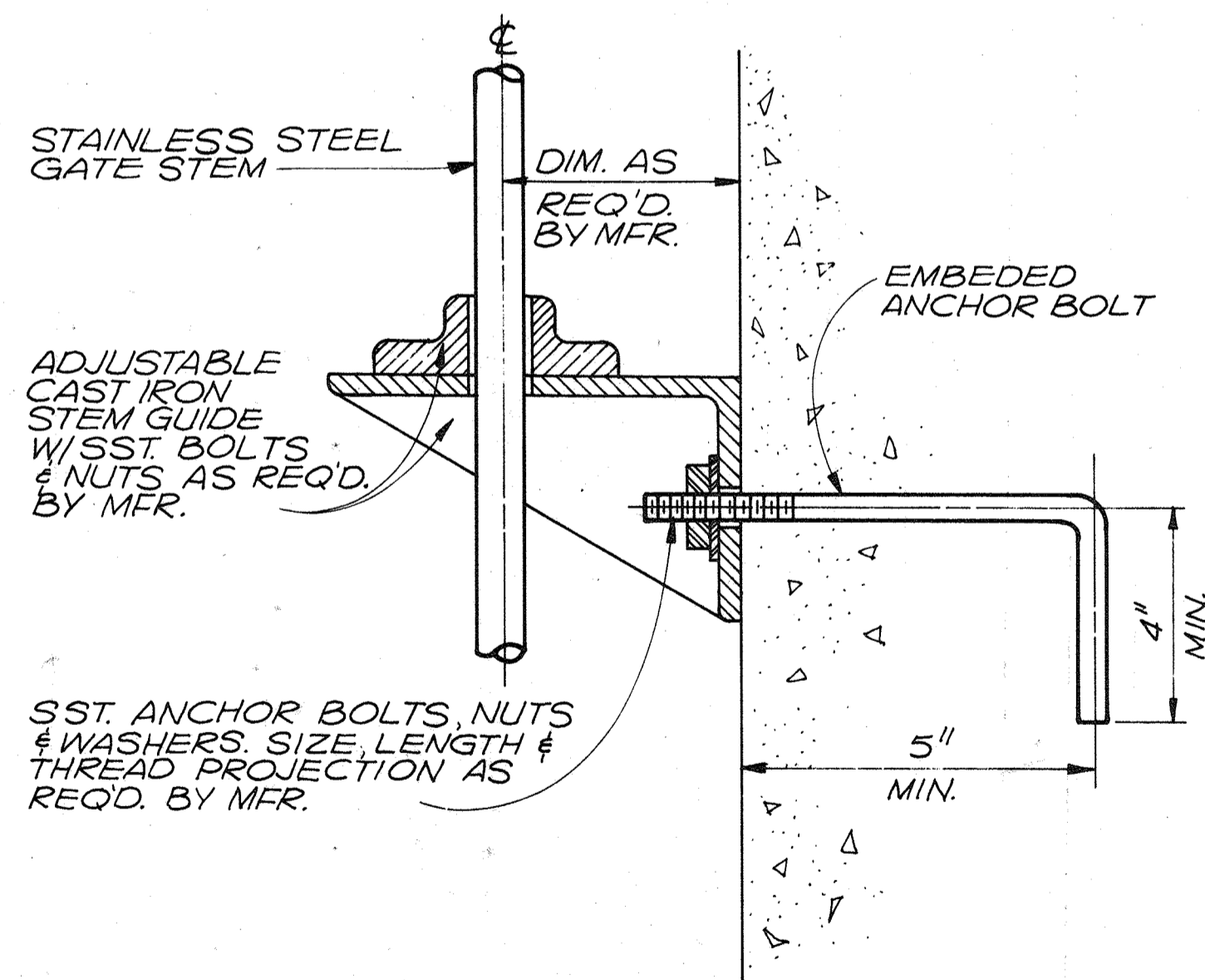
ALUMINUM SCUM Baffle DETAIL (135)



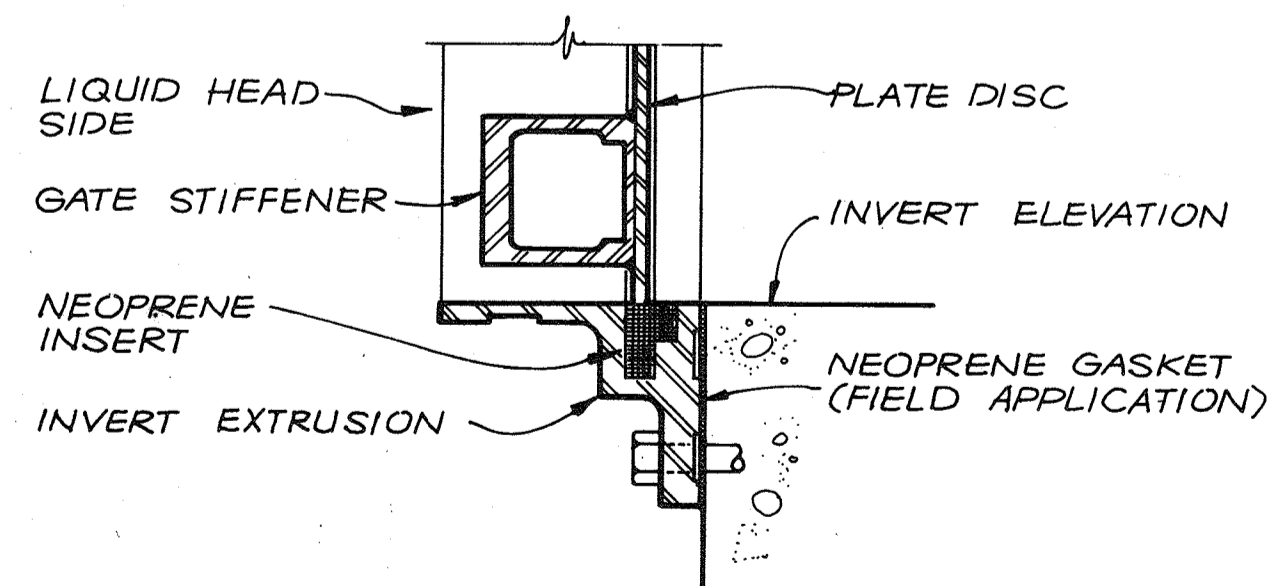
GUIDE CROSS SECTION (128)



FLUSH INVERT 2 (131)

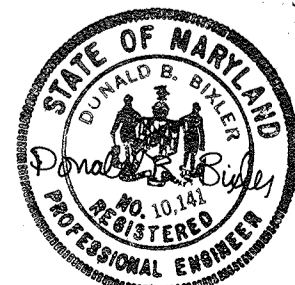


STEM GUIDE INSTALLATION DETAIL (134)



FLUSH INVERT 1 (129)

RECORD DRAWING



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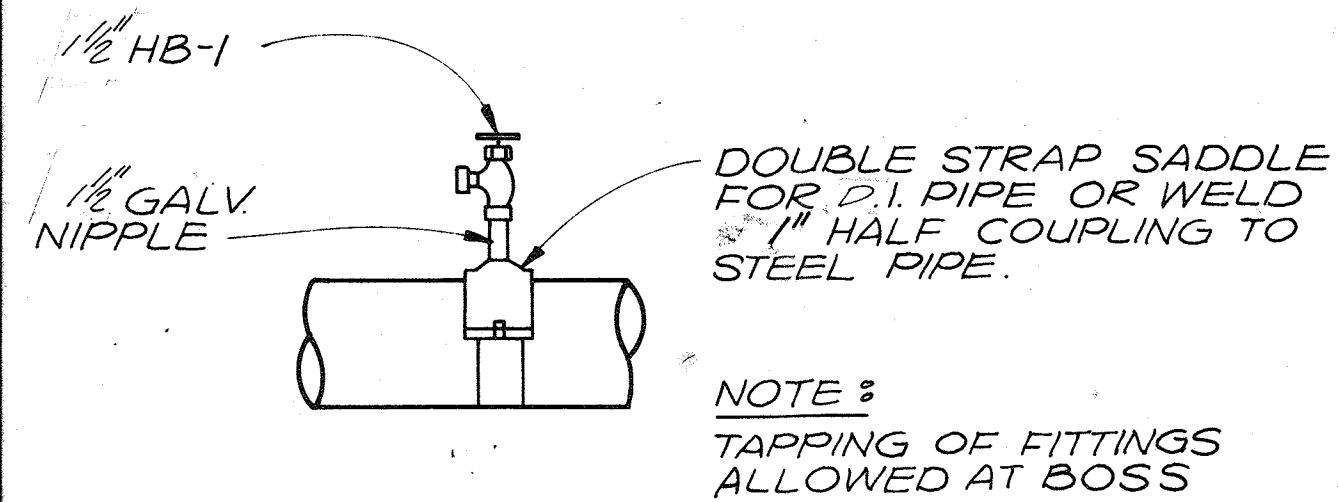
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SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS

MECHANICAL

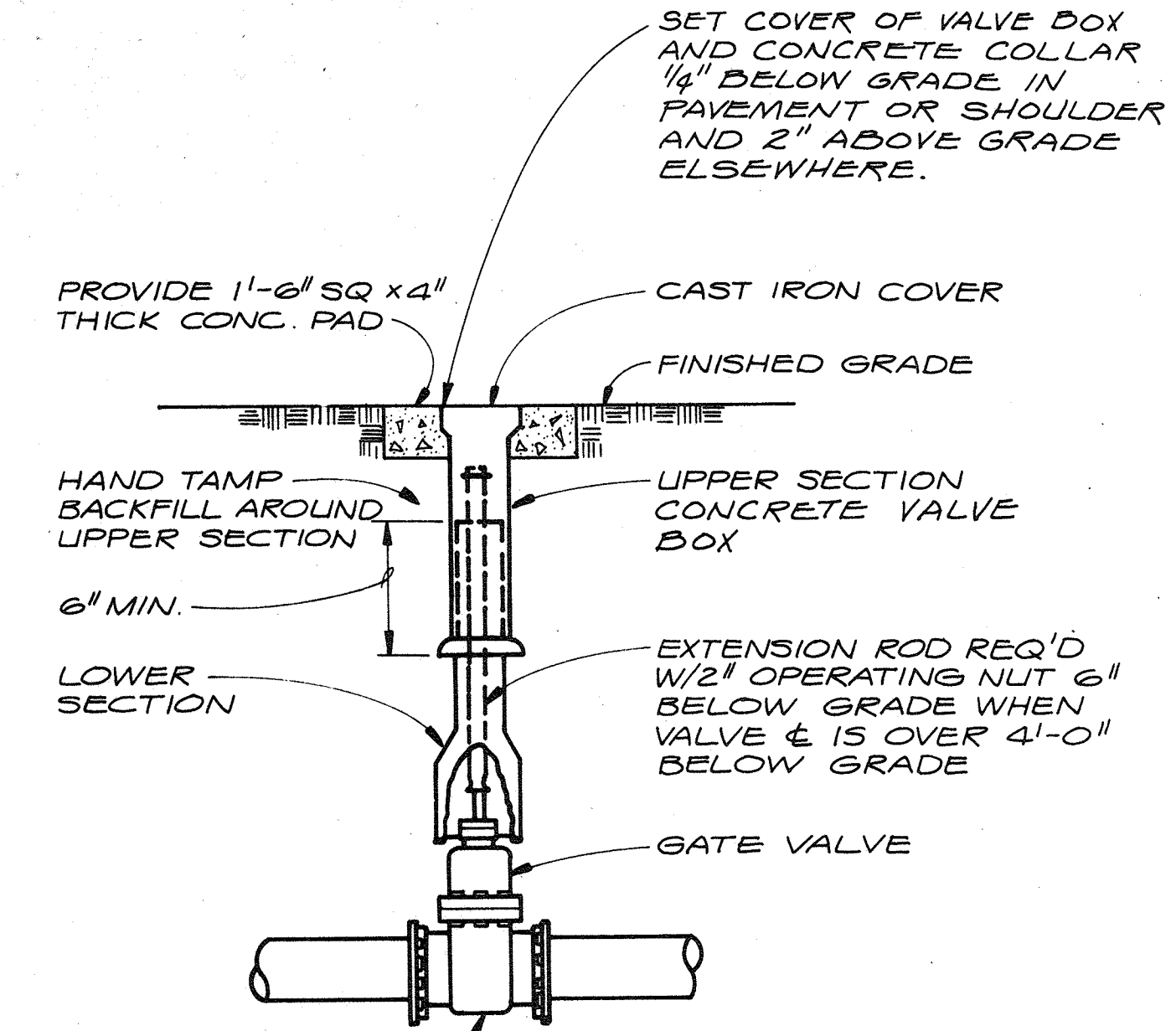
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TYPE 1 STD. FLUSHING CONNECTION DETAIL

N.T.S.

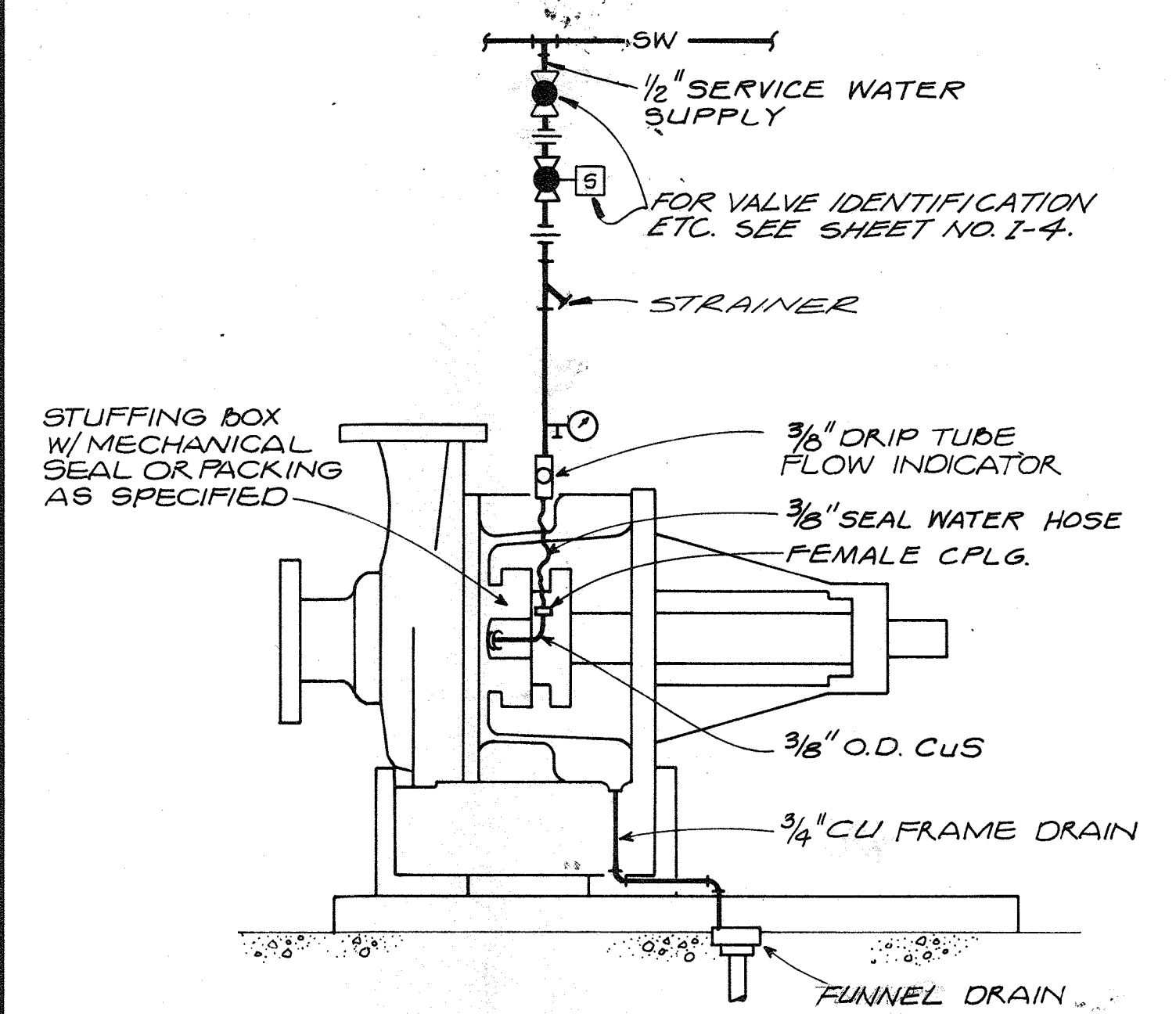
140



STANDARD GATE VALVE AND VALVE BOX SETTING DETAIL

N.T.S.

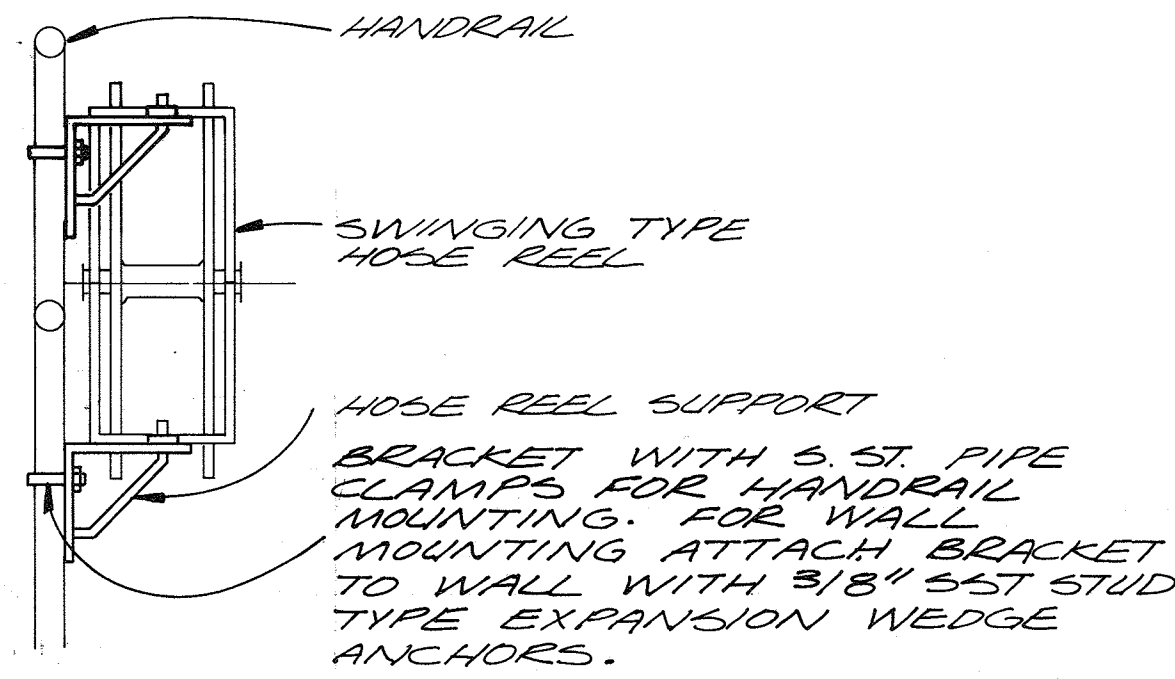
144



TYPICAL HORIZONTAL CENTRIFUGAL END SUCTION PUMP SEAL WATER PIPING

N.T.S.

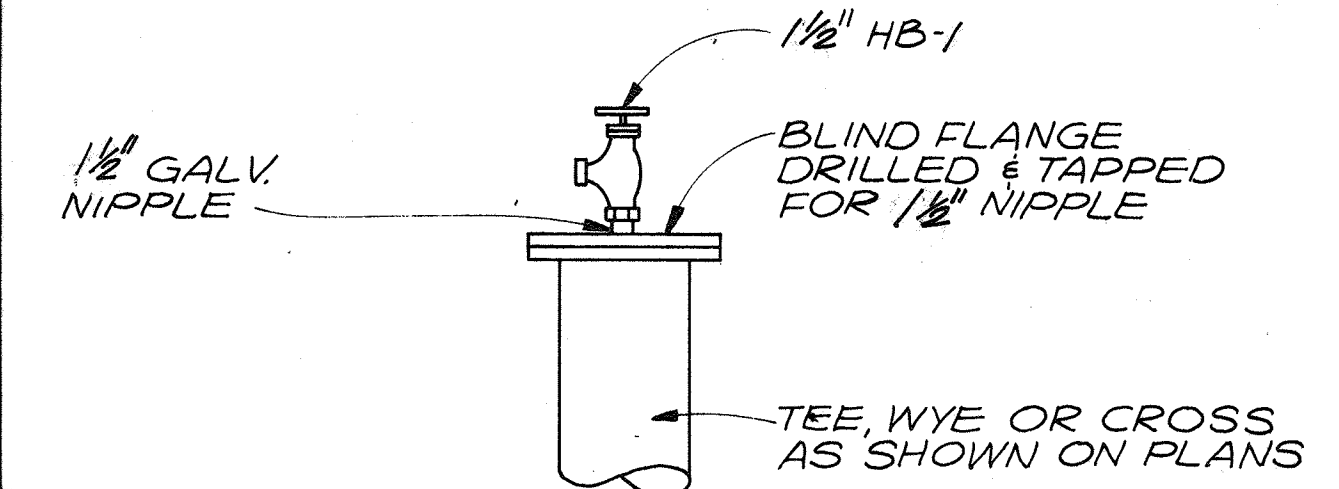
147



HOSE REEL HR-1

N.T.S.

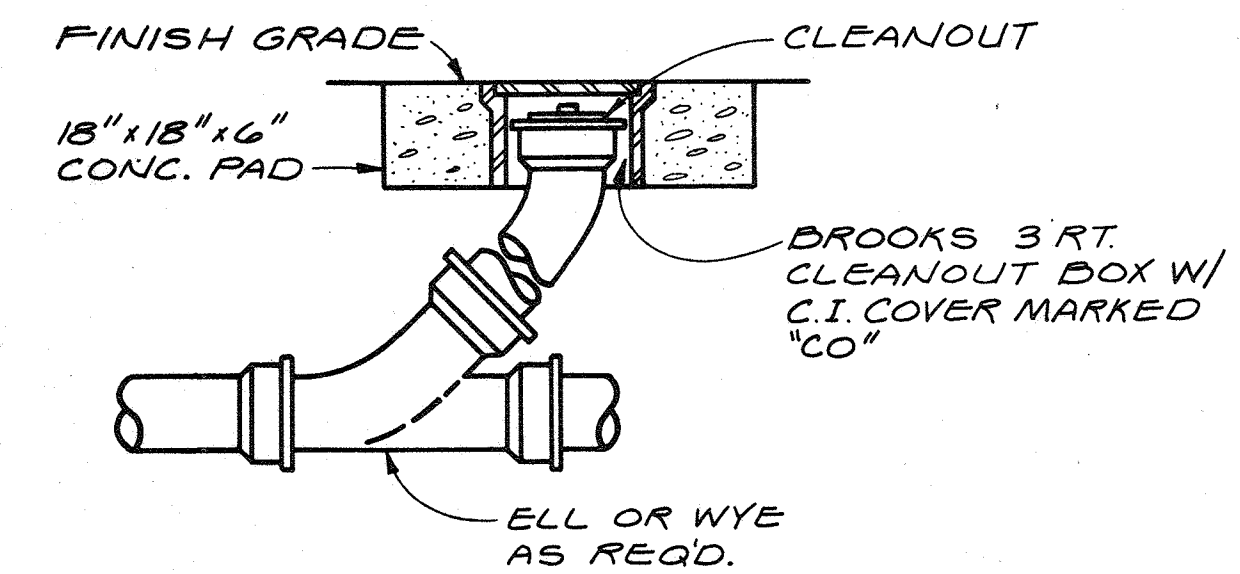
138



TYPE 2 STD. FLUSHING CONNECTION DETAIL

N.T.S.

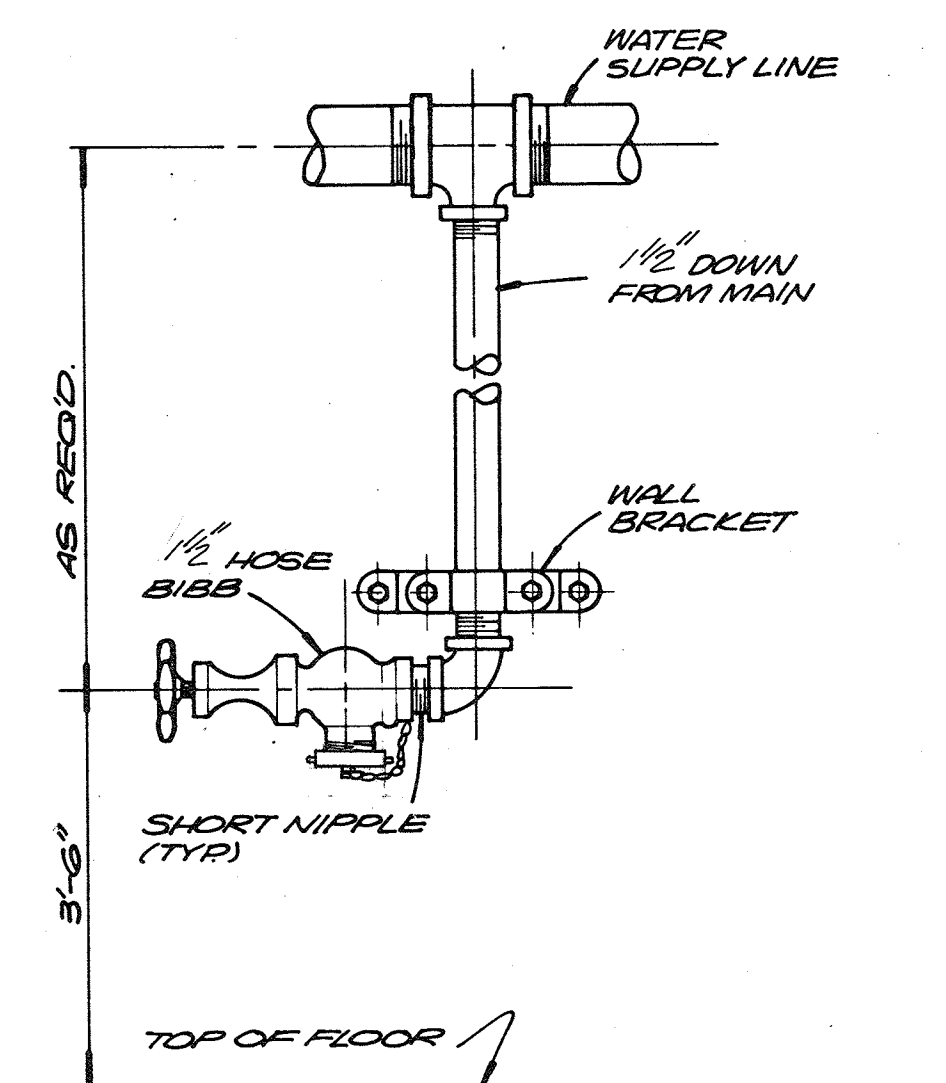
141



CLEANOUT DETAIL

N.T.S.

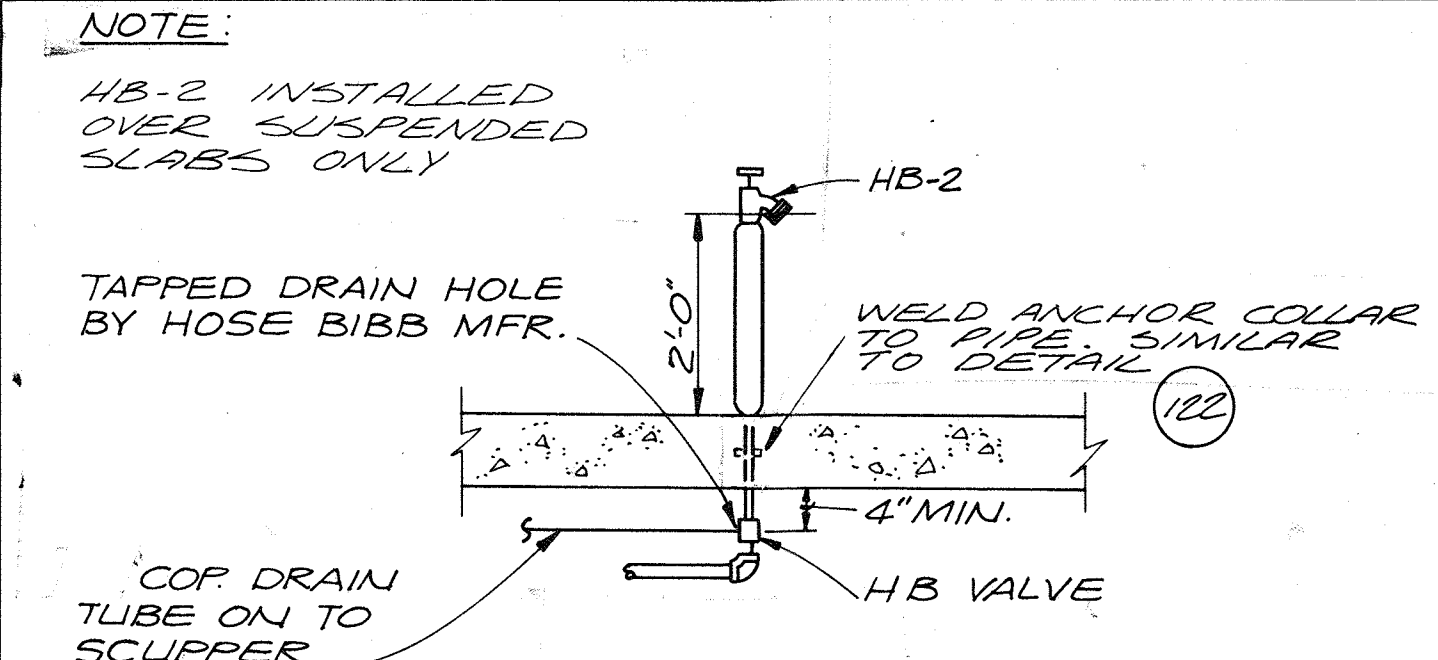
145



HOSE BIBB HB-1 DETAIL

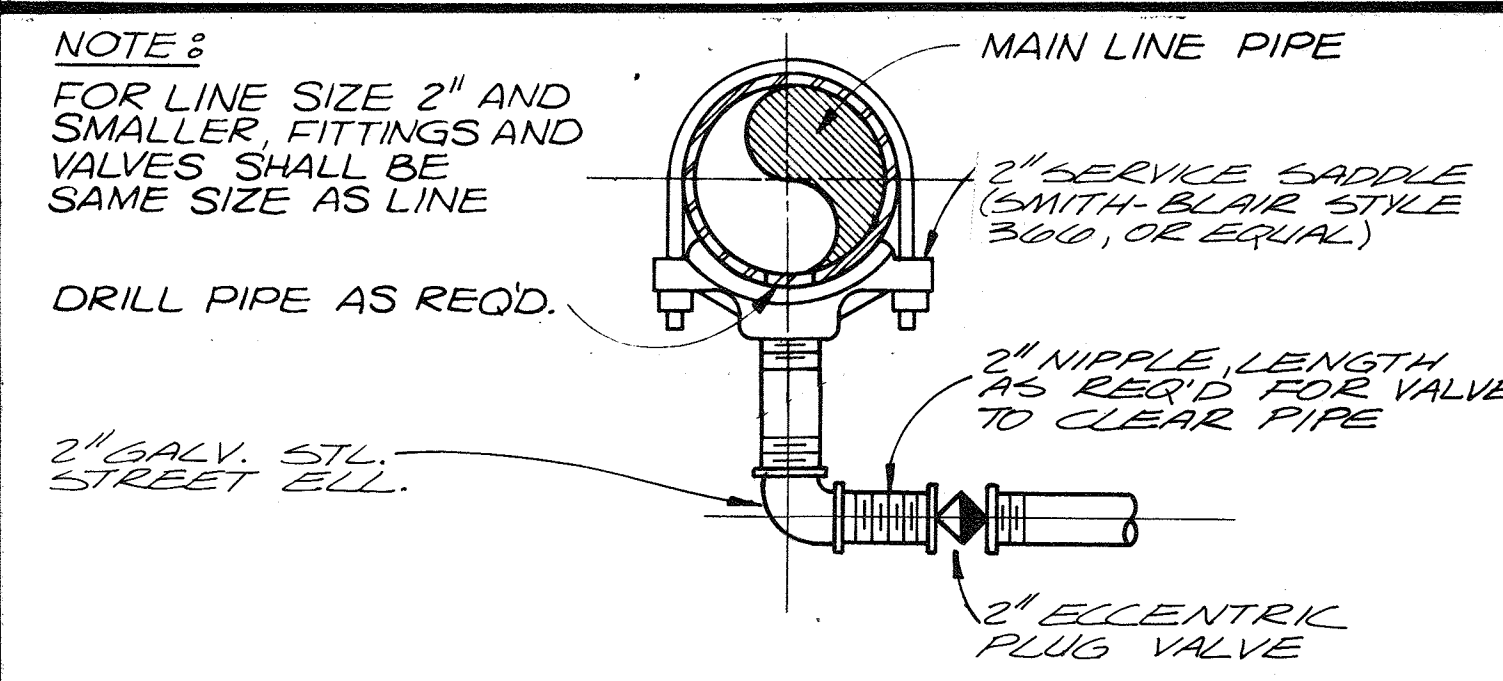
N.T.S.

139



HOSE BIBB MOUNTING DETAIL TYPE HB-2

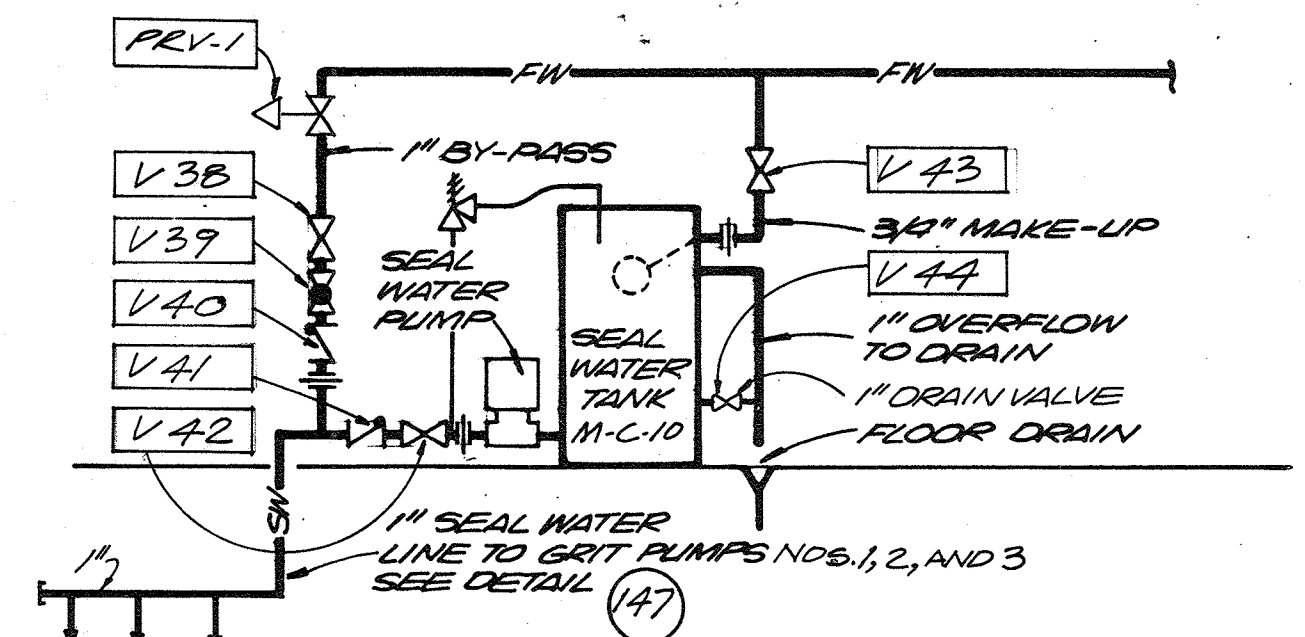
N.T.S.



LINE DRAIN VALVE INSTALLATION DETAIL

N.T.S.

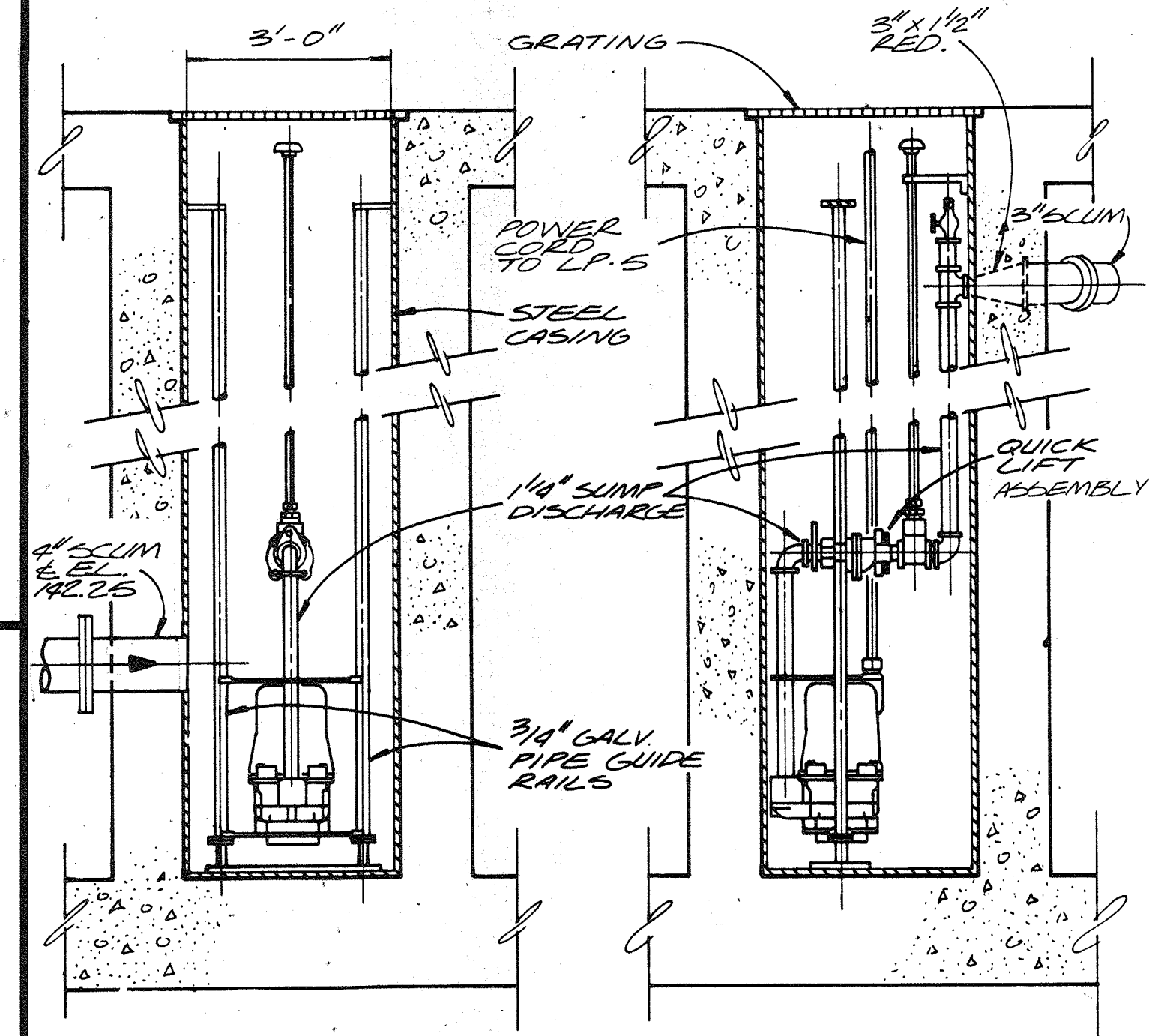
143



SEAL WATER UNIT DETAIL

N.T.S.

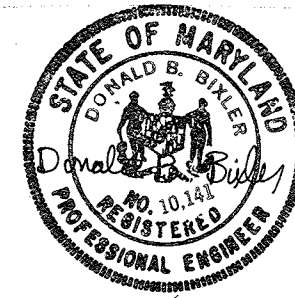
146



SUMP PUMP DETAIL

N.T.S.

148



RECORD DRAWING

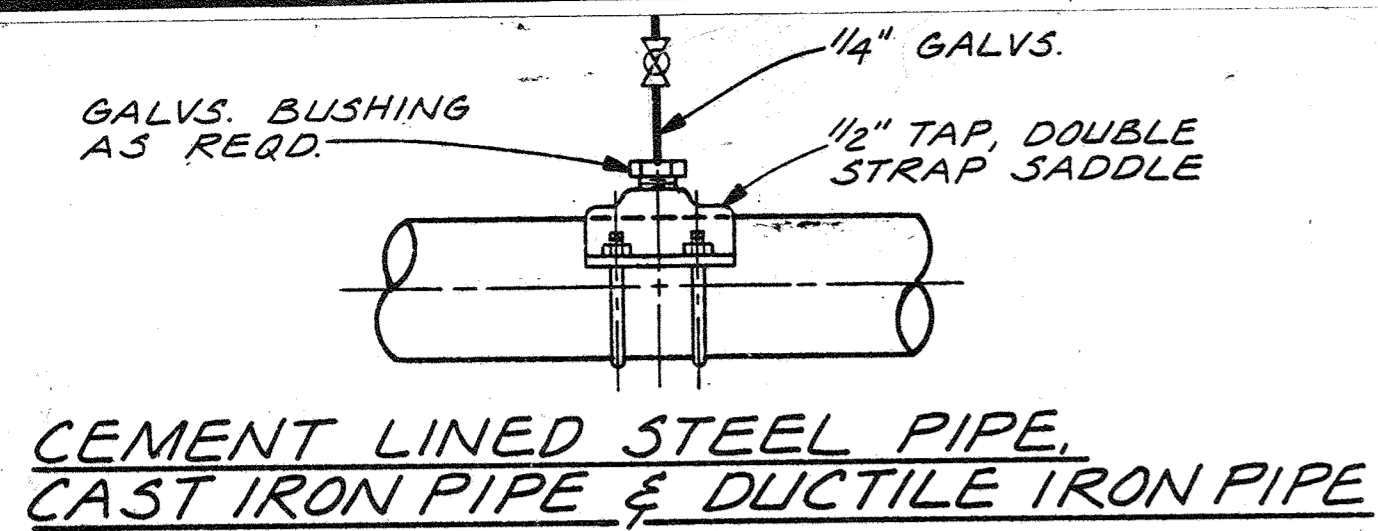
DES.					
DR.					
CHK.					
APPD.					
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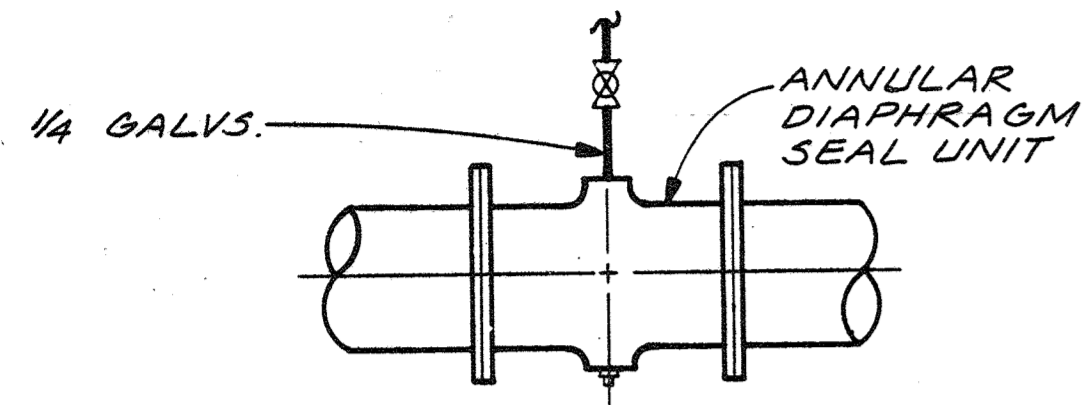
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS
MECHANICAL

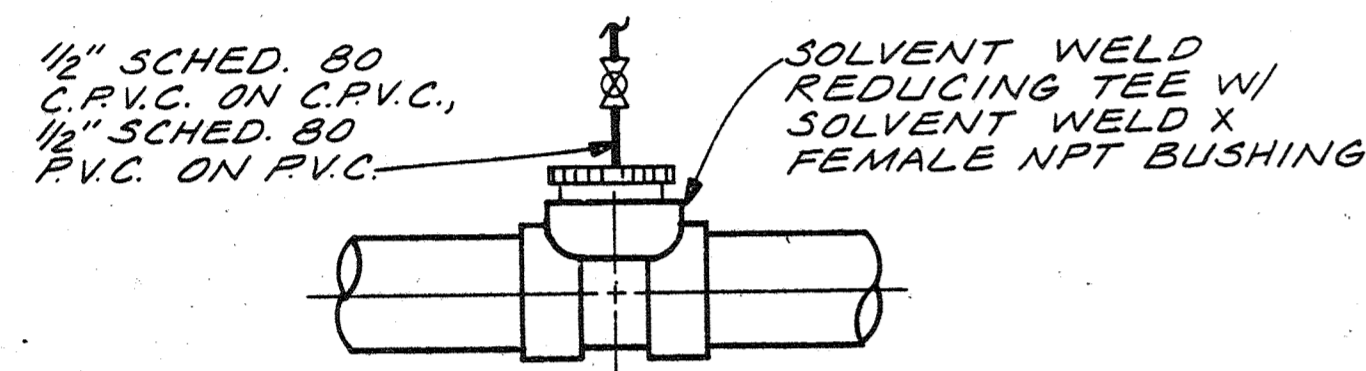
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**CEMENT LINED STEEL PIPE,
CAST IRON PIPE & DUCTILE IRON PIPE**

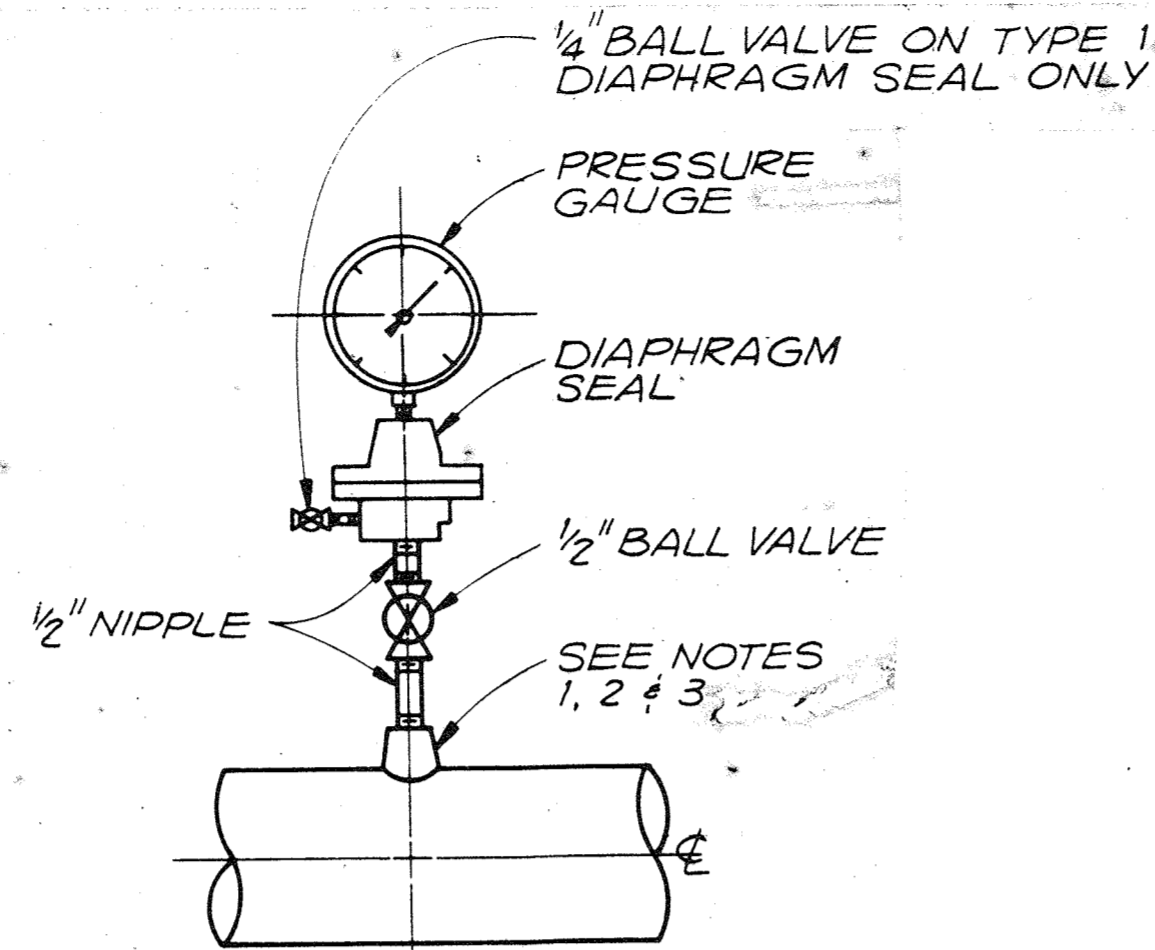


DUCTILE OR CAST IRON PIPE

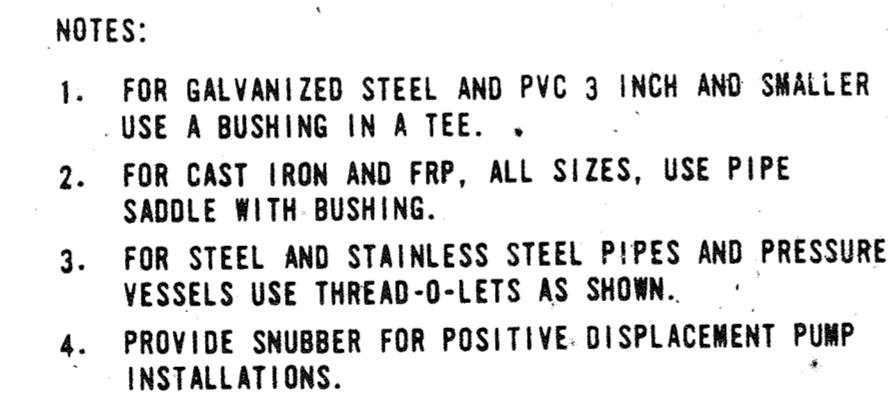


**PVC & CPVC PIPE
PRESSURE CONNECTION
INSTALLATION DETAIL**

201



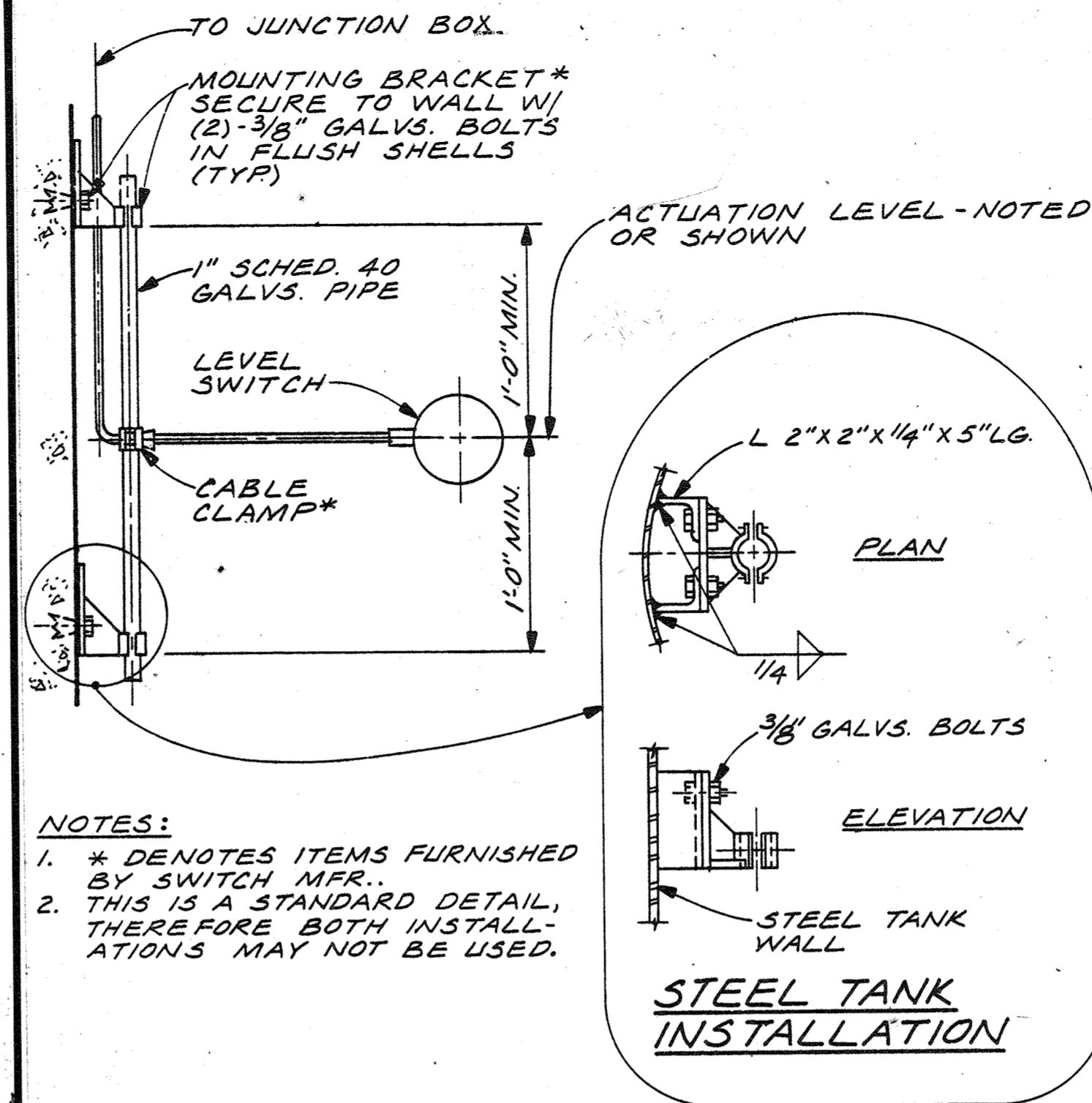
**DIAPHRAGM
PRESSURE GAUGE**



**PRESSURE GAUGE
MOUNTING DETAIL**

**PRESSURE GAUGE
MOUNTING DETAIL**

203

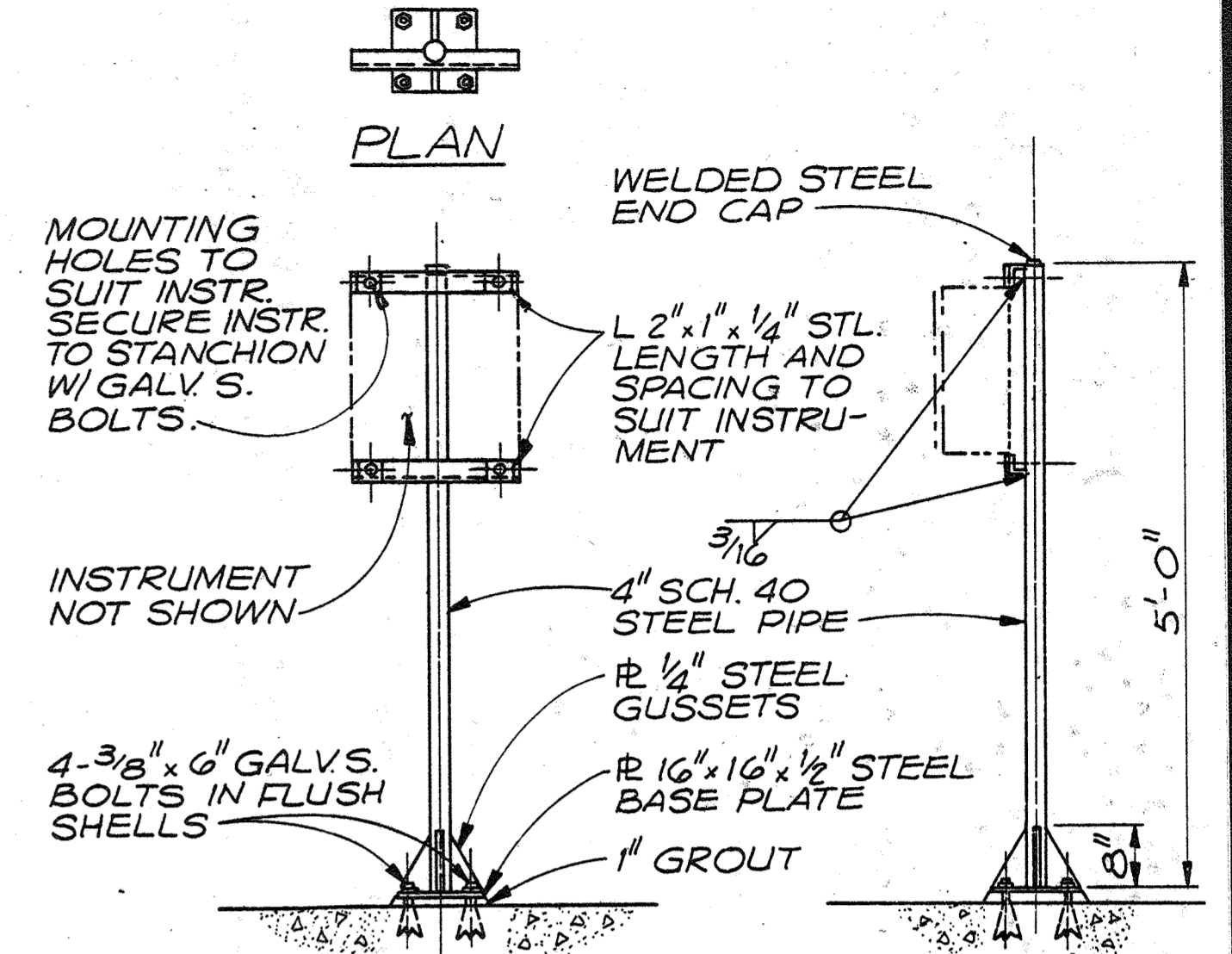


NOTES:
1. * DENOTES ITEMS FURNISHED BY SWITCH MFR.
2. THIS IS A STANDARD DETAIL, THEREFORE BOTH INSTALLATIONS MAY NOT BE USED.

**TYPICAL FLOAT TYPE LEVEL
SWITCH INSTALLATION DETAIL**

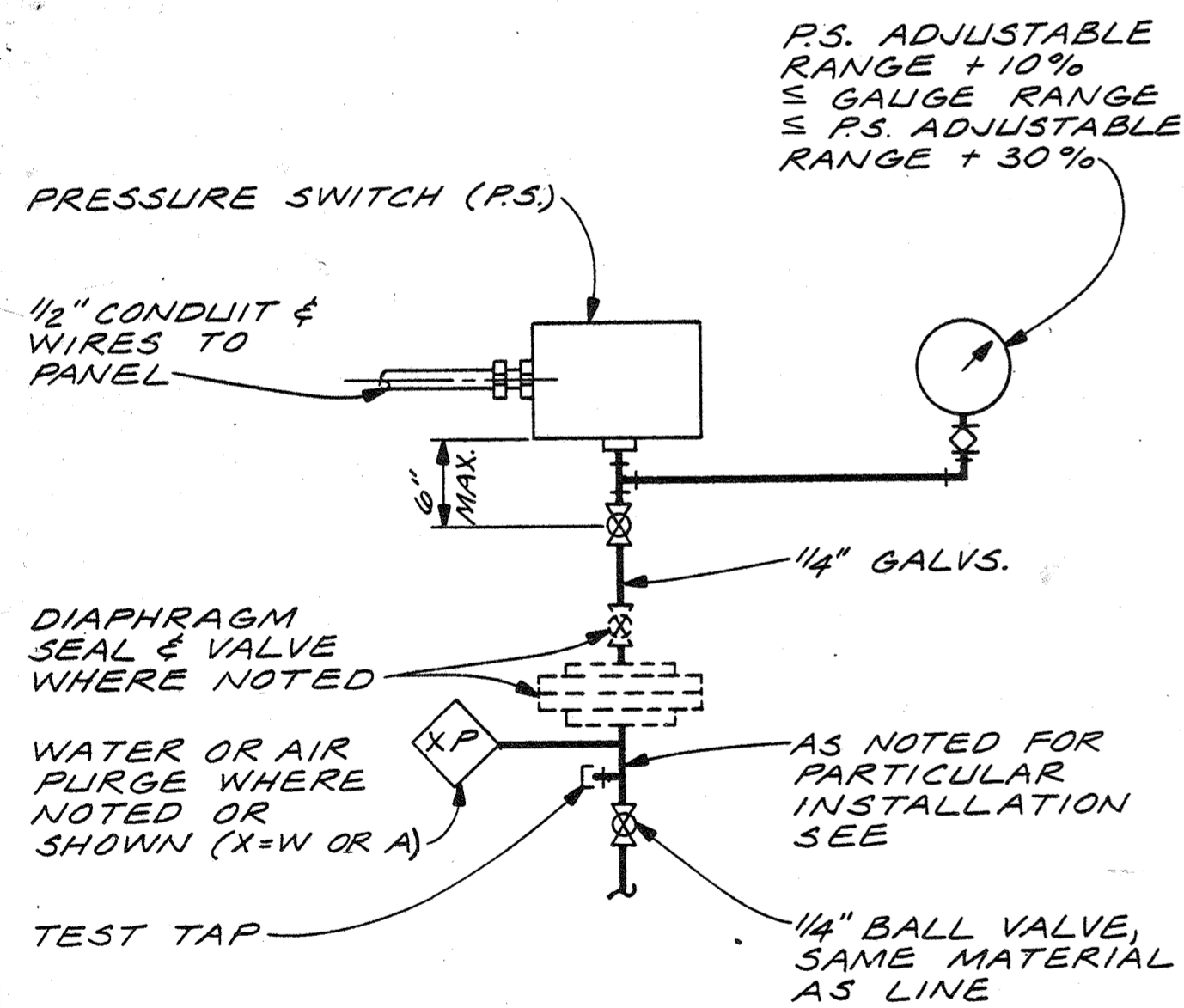
204

NOTES:
1. ROUND OFF ALL EXPOSED EDGES & CORNERS PRIOR TO GALV.
2. HOT DIP GALV. AFTER FABRICATION.



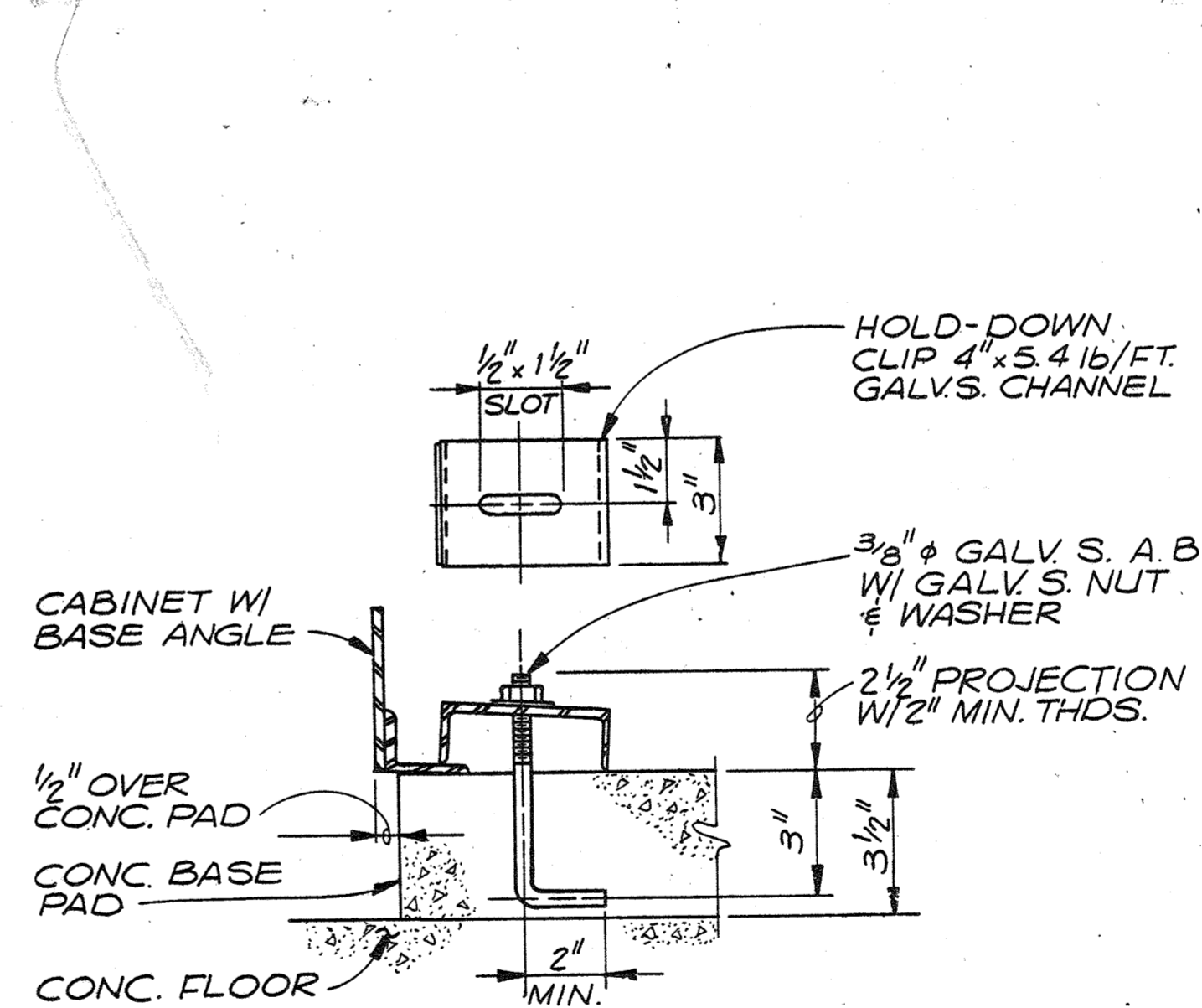
**STANCHION SUPPORT
FOR CASE MOUNTED
INSTRUMENTS DETAIL**

206



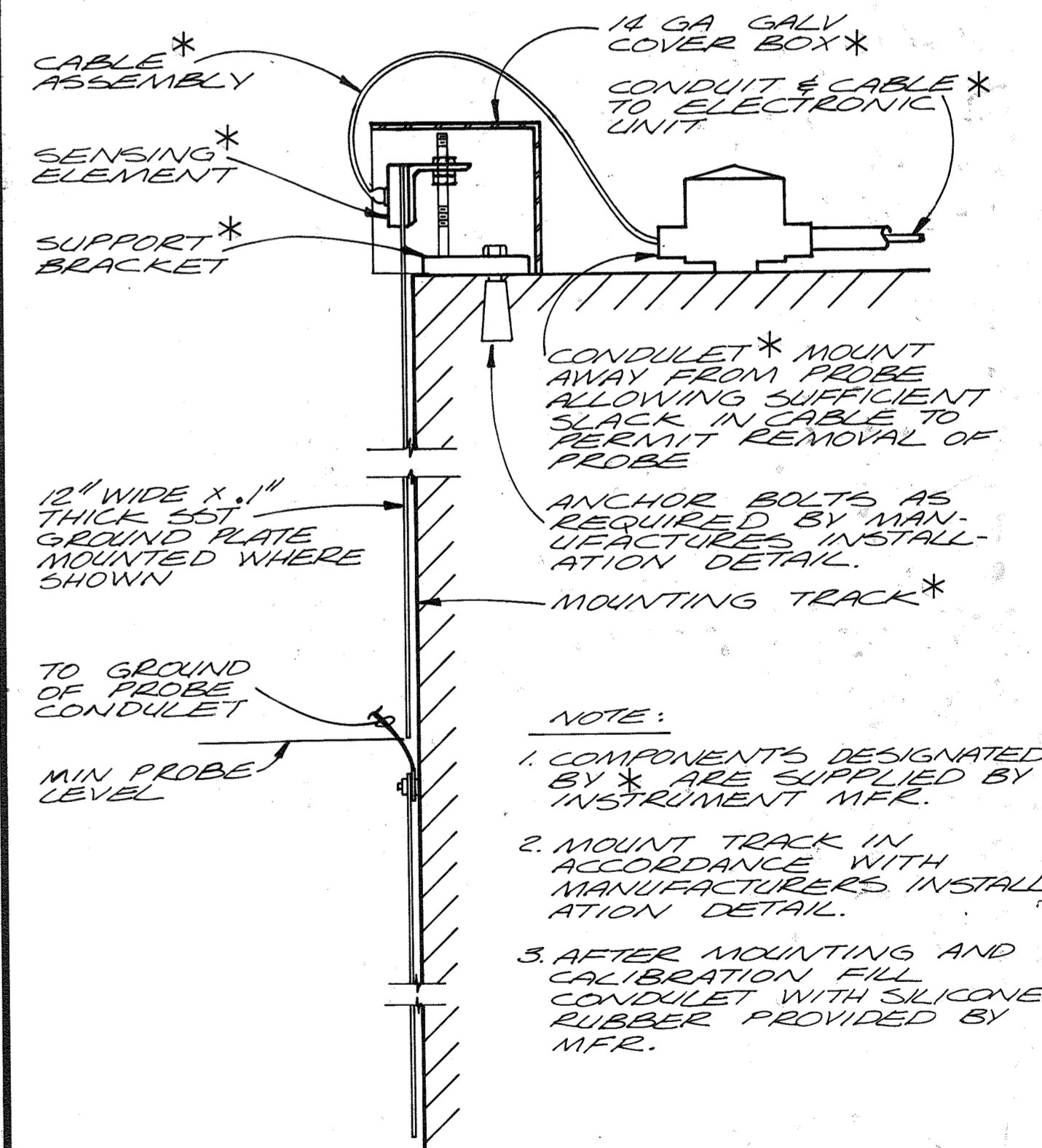
**TYPICAL PRESSURE
SWITCH INSTALLATION DET.**

202



**STANDARD PANEL
MOUNTING DETAIL**

205



**LEVEL ELEMENT
INSTALLATION DETAIL**

207



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SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

STANDARD DETAILS

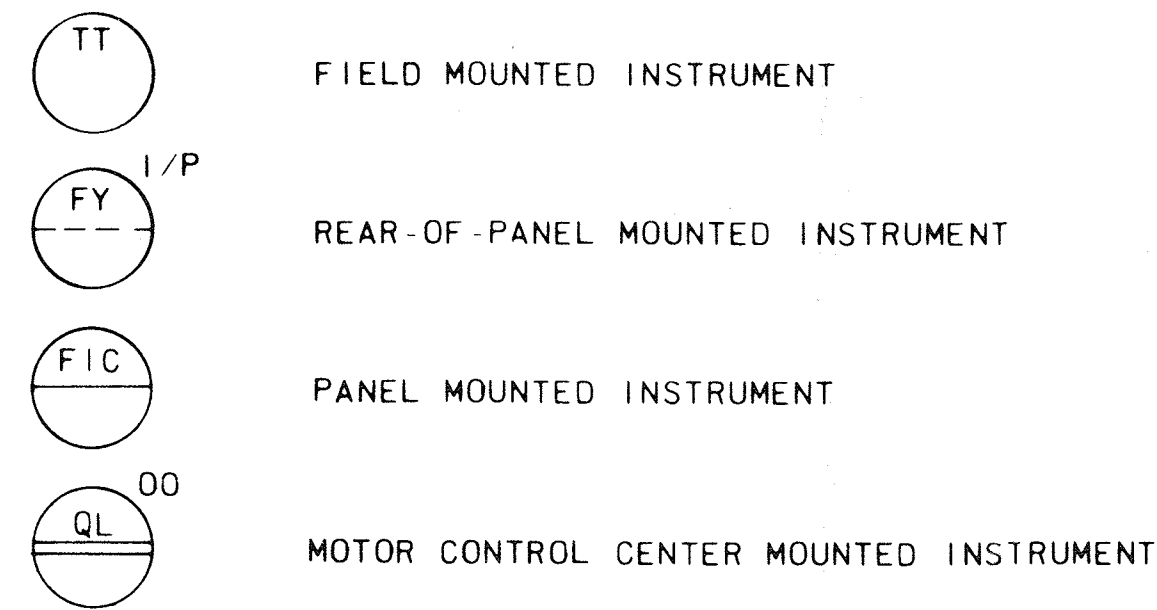
INSTRUMENTATION & CONTROL

SHEET
OF
D-9
DATE 8-78
DWG. NO. W1078.B1

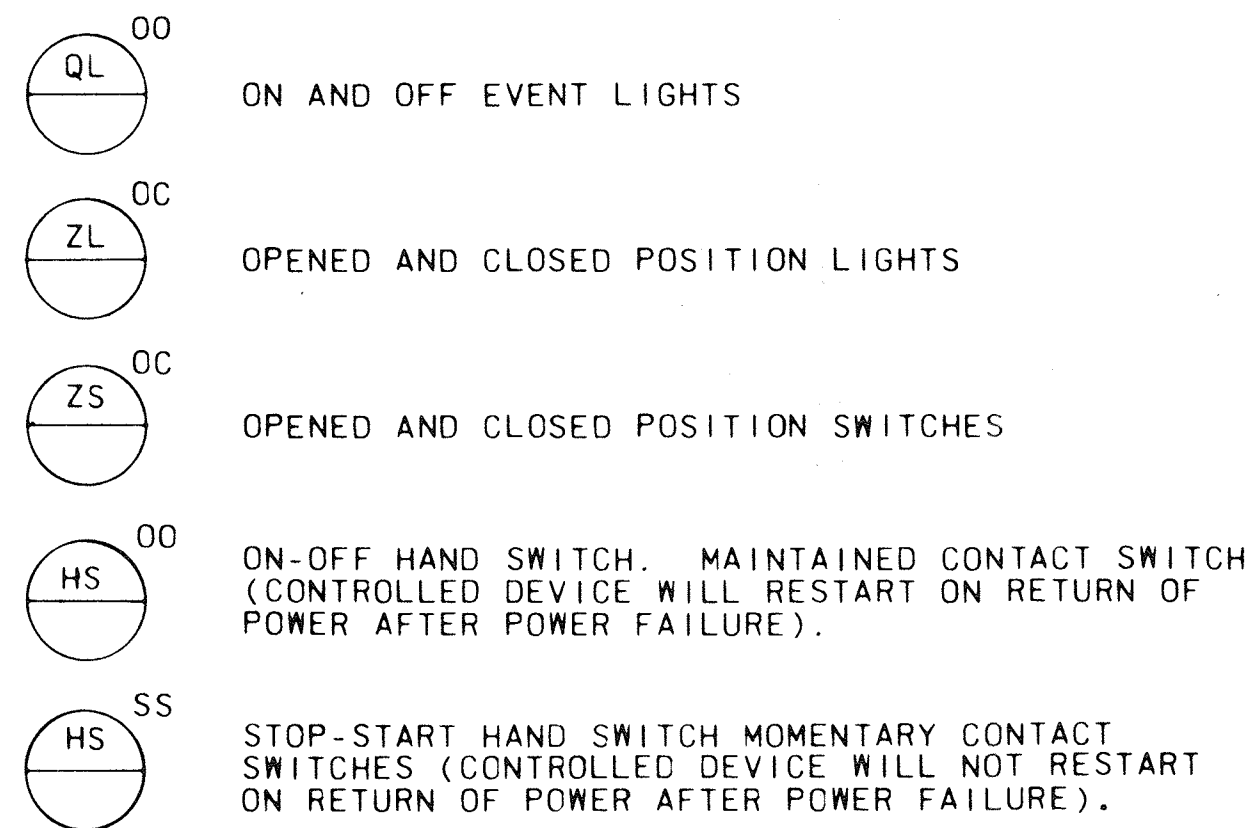
INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS

FIRST LETTER(S)
 SUCCEEDING LETTERS
 THE TOTAL NUMBER OF UNITS WITH THE SAME UNIT PROCESS AND LOOP DESIGNATIONS (W & X)
 THE TOTAL NUMBER OF UNITS WITH THE SAME UNIT PROCESS LOOP AND UNIT DESIGNATIONS (W, X, & Y)
 SECOND UNIT NUMBER (USED WHEN THERE ARE MORE THAN ONE UNIT WITH THE SAME W, X, & Y DESIGNATIONS)
 UNIT NUMBER (USED WHEN THERE ARE MORE THAN ONE UNIT WITH THE SAME W & X DESIGNATIONS)
 LOOP NUMBER
 UNIT PROCESS LETTER



SPECIAL CASES



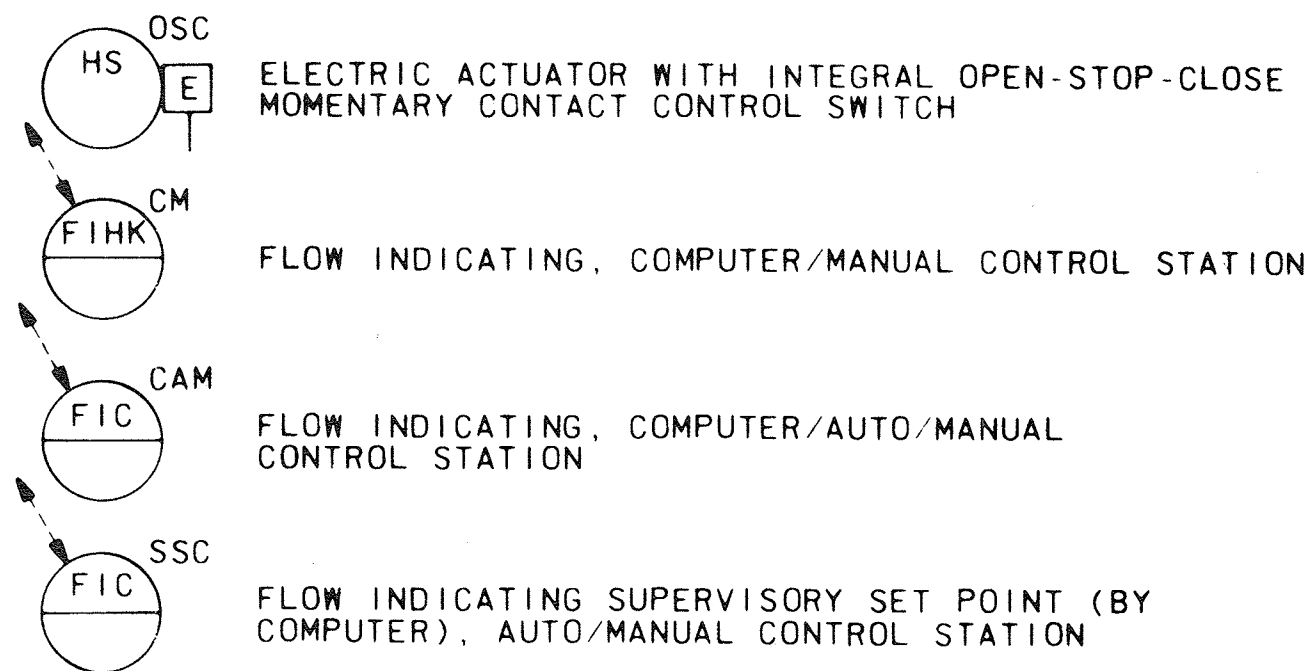
TRANSDUCERS

- A ANALOG
- D DIGITAL
- E VOLTAGE
- F FREQUENCY
- I CURRENT
- P PNEUMATIC
- PF PULSE FREQUENCY
- PD PULSE DURATION

INSTRUMENT SOCIETY OF AMERICA TABLE

LETTER	FIRST LETTER(S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS(t)		ALARM		
B	BURNER FLAME		USERS CHOICE(t)	USERS CHOICE(t)	USERS CHOICE(t)
C	CONDUCTIVITY			CONTROL	
D	DENSITY (S G)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO		GATE	
G	GAUGE		GLASS		
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION				MIDDLE
N	USERS CHOICE(t)		USERS CHOICE(t)	USERS CHOICE(t)	USERS CHOICE(t)
O	USERS CHOICE(t)		ORIFICE		
P	PRESSURE (OR VACUUM)		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT(t)	INTEGRATE	INTEGRATE		
R			RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE(t)		MULTIFUNCTION(t)		
V	VISCOSITY			VALVE	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED(t)		UNCLASSIFIED(t)	UNCLASSIFIED(t)	UNCLASSIFIED(t)
Y	USERS CHOICE(t)			RELAY OR COMPUTE(t)	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

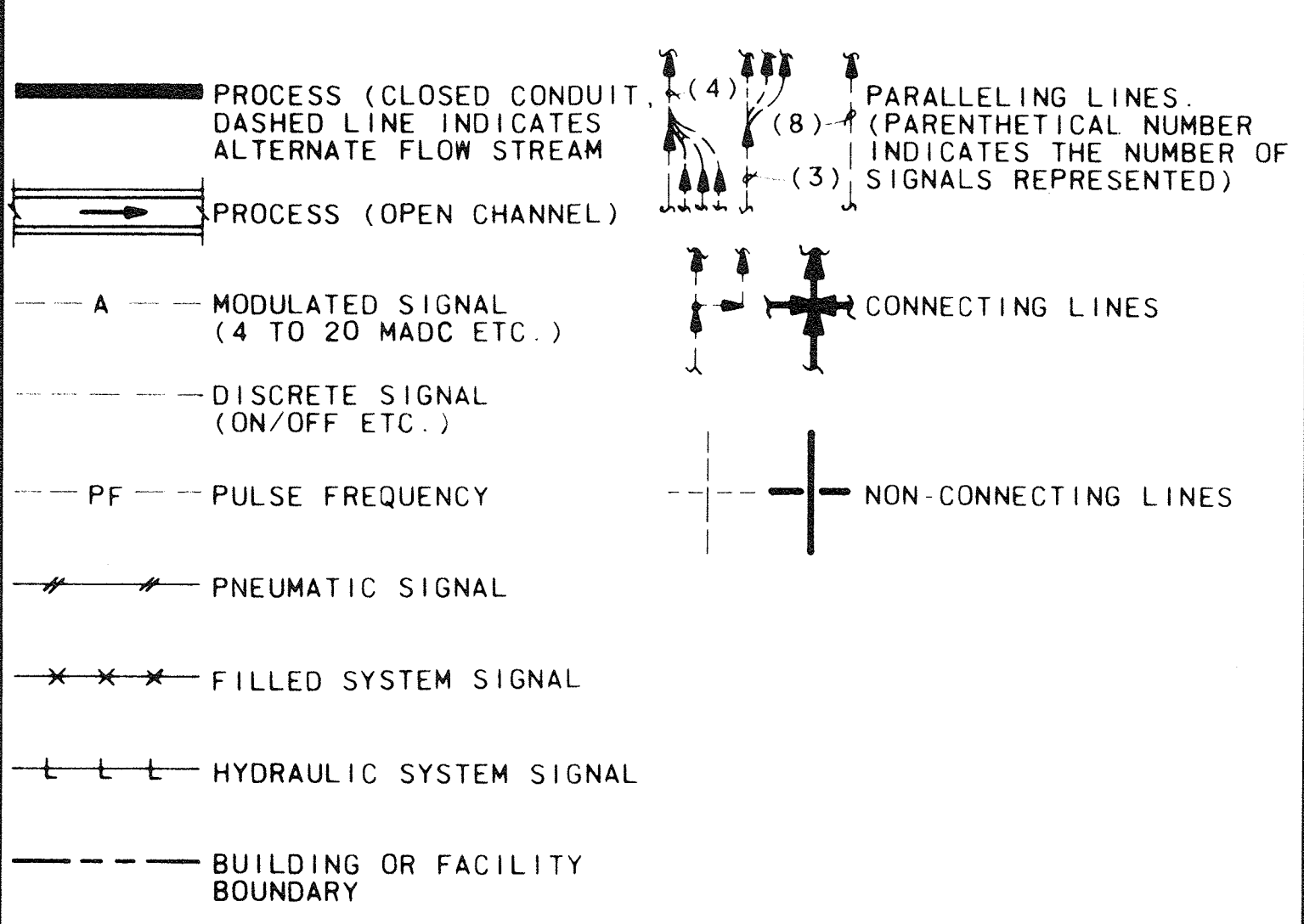
(t) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.



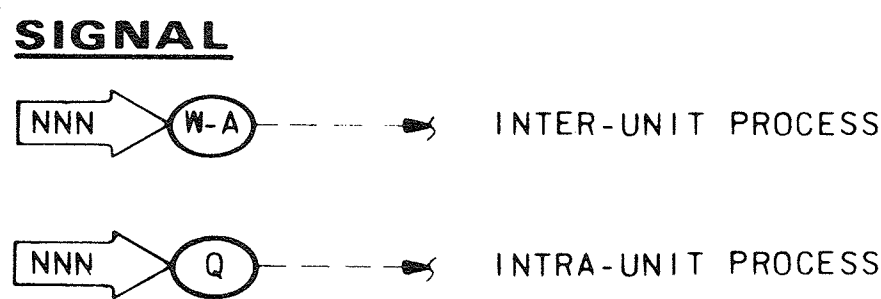
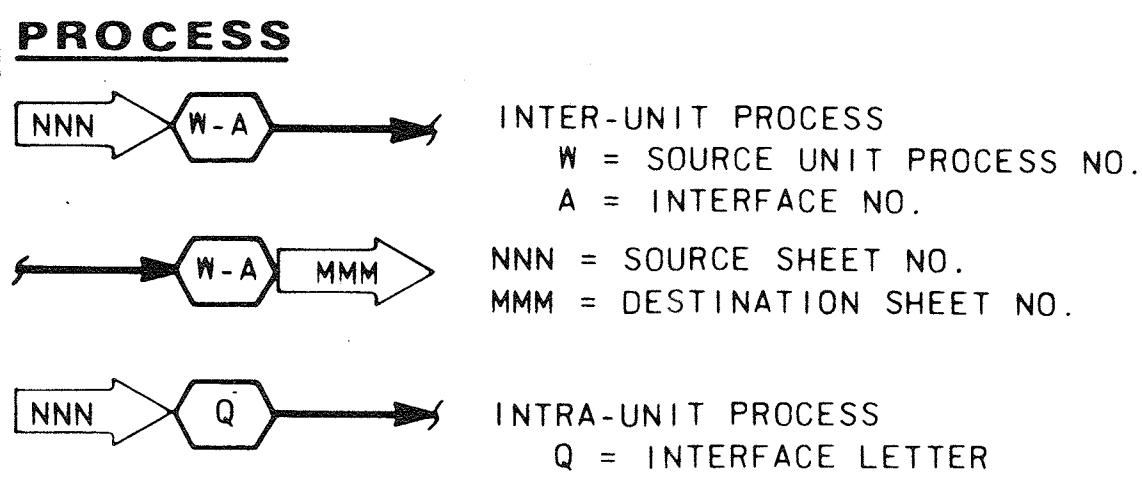
EXAMPLE: CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

RECORD DRAWING

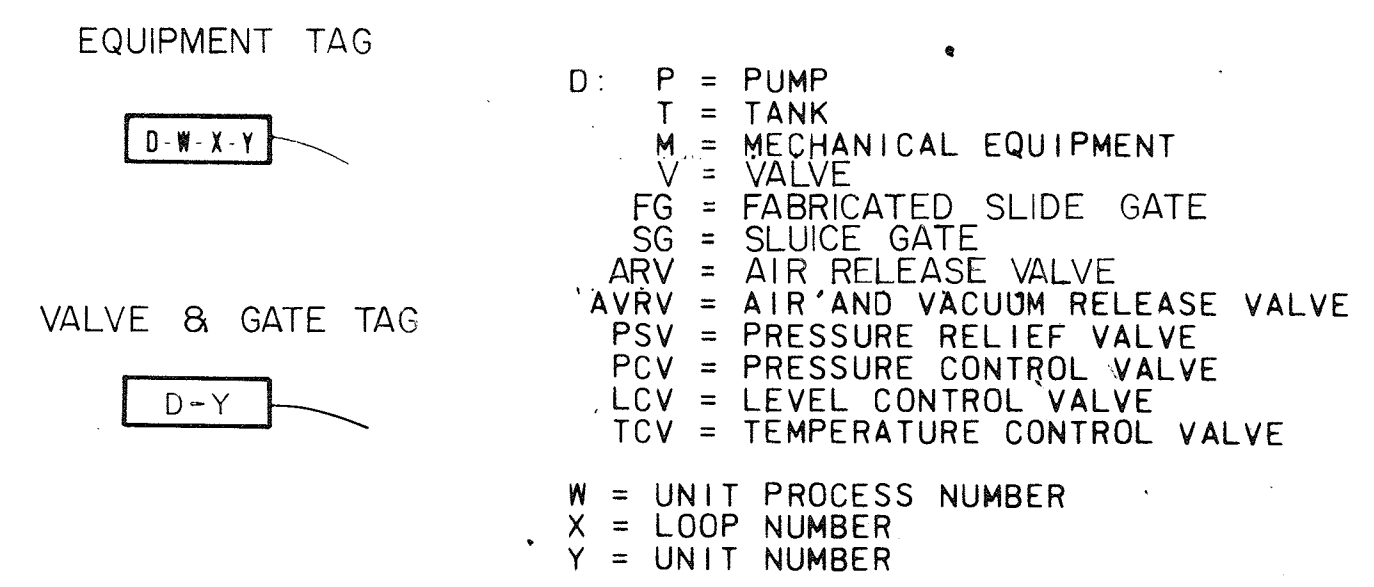
LINE LEGEND



INTERFACE SYMBOLS



VALVE & EQUIPMENT TAG NUMBERS



- D: P = PUMP
 - T = TANK
 - M = MECHANICAL EQUIPMENT
 - V = VALVE
 - FG = FABRICATED SLIDE GATE
 - SG = SLUICE GATE
 - ARV = AIR RELEASE VALVE
 - AVRV = AIR AND VACUUM RELEASE VALVE
 - PSV = PRESSURE RELIEF VALVE
 - PCV = PRESSURE CONTROL VALVE
 - LCV = LEVEL CONTROL VALVE
 - TCV = TEMPERATURE CONTROL VALVE
- W = UNIT PROCESS NUMBER
 X = LOOP NUMBER
 Y = UNIT NUMBER

ABBREVIATIONS & LETTER SYMBOLS

- AC ALTERNATING CURRENT
- ALKY ALKALINITY
- AM AUTO-MANUAL
- CAM COMPUTER-AUTO-MANUAL
- CCS CENTRAL CONTROL SYSTEM
- Cl₂ etc. CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATION)
- CM COMPUTER-MANUAL
- CNDCT CONDUCTIVITY
- COD CHEMICAL OXYGEN DEMAND
- CP-X CONTROL PANEL NO. X
- DC DIRECT CURRENT
- DO DISSOLVED OXYGEN
- FCI₂ FREE CHLORINE RESIDUAL
- FOS FAST-OFF SLOW
- FOSA FAST-OFF SLOW-AUTO
- FOSR FAST-OFF SLOW-REMOTE
- FR FORWARD-REVERSE
- HONS HARDNESS
- HOA HAND-OFF-AUTO
- HOR HAND-OFF-REMOTE
- LEL LOWER EXPLOSIVE LIMIT
- LOS LOCKOUT STOP
- LP-W LOCAL PANEL NO. W (W= PANEL NUMBER)
- LR LOCAL-REMOTE
- MA MANUAL-AUTO
- MBAS METHYLENE BLUE ACTIVE SUBSTANCES
- MC MODULATE-CLOSE
- MCC-X MOTOR CONTROL CENTER NO. X
- OC OPEN-CLOSE(D)
- OCA OPEN-CLOSE-AUTO
- OO ON-OFF
- OOA ON-OFF-AUTO
- OP ORTHO PHOSPHORUS
- ORP OXIDATION REDUCTION POTENTIAL
- OSC OPEN-STOP-CLOSE
- pH HYDROGEN ION CONCENTRATION
- RM-X REMOTE MULTIPLEXING MODULE NO. X
- SF SLOWER-FASTER
- SS START-STOP
- SSC SUPERVISORY SET POINT CONTROL
- TCI₂ TOTAL CHLORINE RESIDUAL
- TOC TOTAL ORGANIC CARBON
- TOD TOTAL OXYGEN DEMAND
- TURB TURBIDITY
- VHC VOLATILE HYDROCARBONS
- VIB VIBRATION
- Δ DIFFERENCE
- Σ SUM
- x MULTIPLY
- = DIVIDE
- f(x) CHARACTERIZED
- xⁿ RAISE TO THE Nth POWER
- √ SQUARE ROOT
- AVG AVERAGE
- ↑ REPEAT OR BOOST
- > SELECT HIGHEST SIGNAL
- < SELECT LOWEST SIGNAL

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A (♦) ARE NOT TO BE PROVIDED UNDER SECTION INSTRUMENTATION AND CONTROLS.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (**) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.



DES.					
DR.					
CHK.					
APPD.					

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

LEGEND
 INSTRUMENTATION & CONTROL
 SHEET 1-1
 DATE 8-78
 DWG. NO. W11078.B1

VALVE SYMBOLS

- GATE
- KNIFE GATE
- BUTTERFLY
- GLOBE
- BALL
- VEE-BALL
- PLUG SEAT PORT
- ECCENTRIC PLUG
- DIAPHRAGM
- PINCH
- NEEDLE
- SWING CHECK
- BALL CHECK
- BALL CHECK (SPRING LOADED)
- SAMPLE
- MUD
- PRESSURE RELIEF
- AIR AND/OR VACUUM RELEASE
- REGULATED SIDE
- PRESSURE CONTROL
- MULTI-PORT VALVES (BALL VALVE SHOWN. FOR OTHER VALVE TYPES, USE APPROPRIATE VALVE SYMBOL.) ARROWS INDICATE FLOW PATTERN. SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.

GATE SYMBOLS

- SLUICE
- BUTTERFLY
- FLAP
- FABRICATED SLIDE
- SHEAR

ACTUATOR SYMBOLS

- PNEUMATIC W/POSITIONER
- PNEUMATIC W/SOLENOID
- ELECTRIC
- ELECTRIC W/POSITIONER
- HYDRAULIC
- MANUAL
- SOLENOID

NOTE: ON LOSS OF PRIMARY POWER (PNEUMATIC OR ELECTRICAL)
 XX: FO = FAIL OPEN EO = ENERGIZE OPEN
 FC = FAIL CLOSED EC = ENERGIZE CLOSE
 FLP = FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

- PARSHALL FLUME
- WEIR
- ORIFICE PLATE
- FLOW TUBE
- PITOT-STATIC
- ROTAMETER
- ULTRASONIC FLOWMETER
- PROPELLER OR TURBINE METER
- ELECTROMAGNETIC FLOWMETER
- LEVEL (BUBBLE TUBE)
- LEVEL (FLOAT)
- LEVEL (ULTRASONIC)
- DENSITY METER (X: N = NUCLEAR, O = OPTICAL, U = ULTRASONIC)

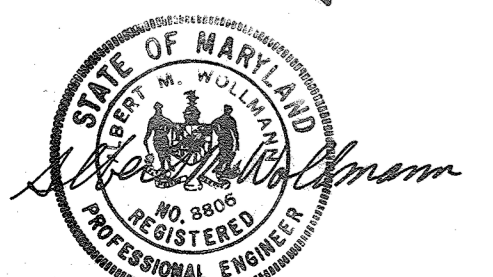
MISCELLANEOUS SYMBOLS

- SIGHT GLASS
- DIAPHRAGM SEAL
- BLIND FLANGE
- AIR GAP
- VENT TO ATMOSPHERE
- AERATOR
- PLUG
- RECEPTACLE
- SELF CONTAINED AIR SUPPLY
- COMPOSITE SAMPLER (DIPPER TYPE)
- COMPOSITE SAMPLER (SUCTION TYPE)
- TV CAMERA
- RADIO ANTENNA
- "ON" TIME DELAY: B "ON" X-SEC. AFTER A "ON" INSTANT "OFF"
- "OFF" TIME DELAY: B "OFF" X-SEC. AFTER A "OFF" INSTANT "ON"
- INTERLOCK. SEE CONTROL DIAGRAMS
- PURGE SET X: W = WATER, A = AIR
- FLUSHING CONNECTION
- HOSE ADAPTOR
- SEAL WATER SET
- AIR SET XX = SUPPLY PRESSURE IN PSIG.
- FILTER/REGULATOR/GAUGE SET
- 120V 120 VOLT, 60 HZ POWER SUPPLY POINT
- ANNULAR DIAPHRAGM SEAL
- RUPTURE DISK
- PIG INSERT POINT
- PIG CATCH POINT
- MIXER
- ELECTRIC MOTOR
- PRESSURE GAUGE
- TONE TRANSMITTER NO. X
- TONE RECEIVER NO. X
- VOICE COMMUNICATION POINT
- TV MONITOR
- LOGIC ELEMENT: IF A AND NOT B THEN C
- LOGIC ELEMENT: IF A OR B THEN C
- ON/OFF RELAY. INPUT IS CONNECTED TO OUTPUT WHEN SWITCHING SIGNAL IS PRESENT
- SWITCHING RELAY. INPUT WITH DOT IS CONNECTED TO OUTPUT WHEN SWITCHING SIGNAL IS PRESENT. OTHER INPUT IS CONNECTED TO OUTPUT WHEN SWITCHING SIGNAL IS NOT PRESENT.
- SPOOL VALVE (NORMAL POSITION) TO INSTRUMENT
- SPOOL VALVE (PLUNGER DEPRESSED) TO BUBBLER OR PURGED LINE

PUMP & COMPRESSOR SYMBOLS

- NOTE: XX: AS ADJUSTABLE SPEED
 CS-1 CONSTANT SPEED (SINGLE SPEED)
 CS-2 CONSTANT SPEED (TWO SPEED)
- CENTRIFUGAL PUMP (DRY PIT)
 - CENTRIFUGAL PUMP (WET PIT)
 - CHEMICAL FEED PUMP
 - DIAPHRAGM PUMP
 - GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
 - PISTON PUMP
 - PROGRESSING CAVITY PUMP
 - SUBMERSIBLE SUMP PUMP
 - COMPRESSOR (CENTRIFUGAL) OR BLOWER
 - COMPRESSOR (PISTON)
 - EJECTOR

RECORD DRAWING



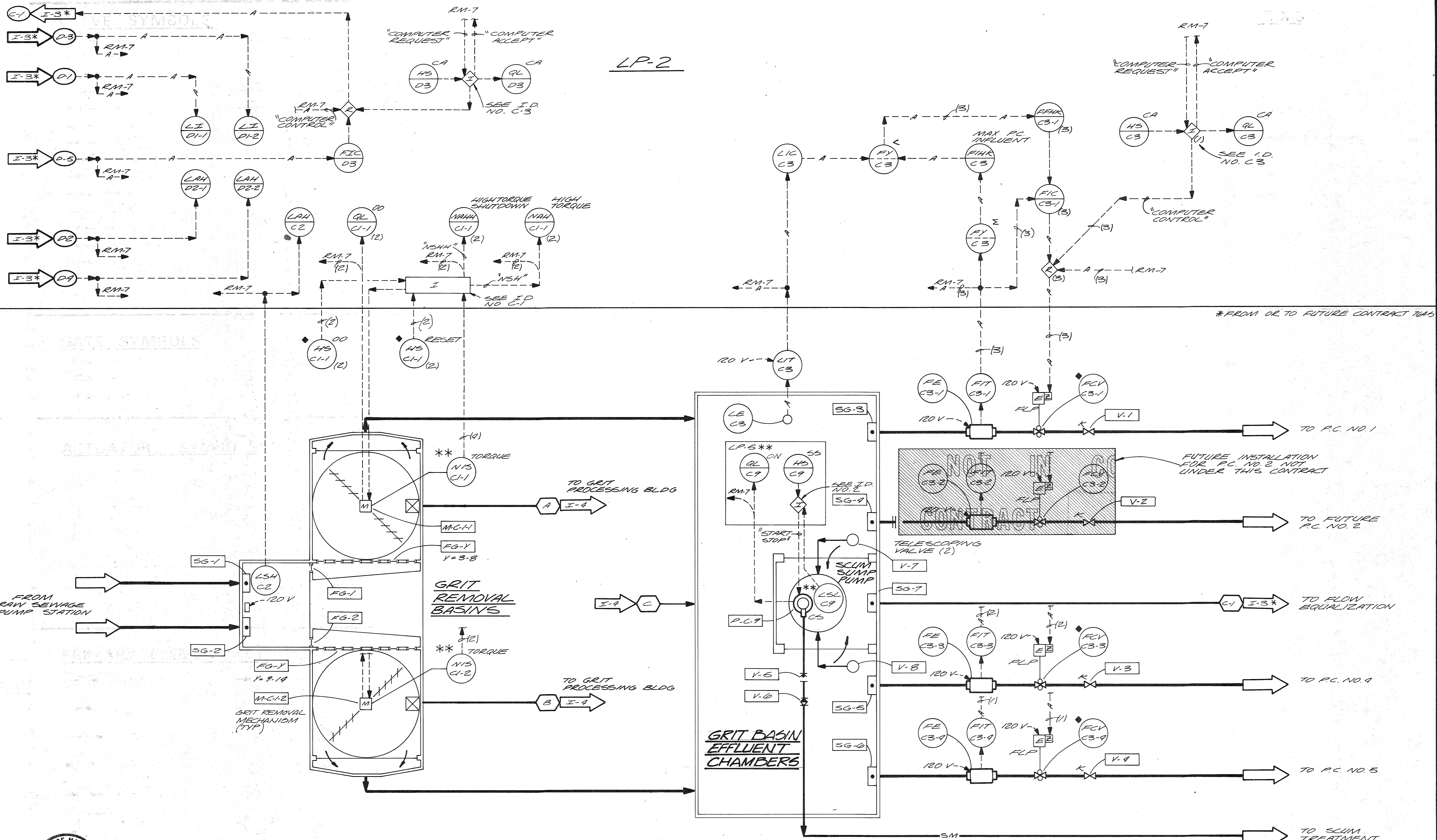
DES.					
DR.					
CHK.					
APPD.					
	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

LEGEND
 INSTRUMENTATION & CONTROL

SHEET 1-2
 DATE 8-78
 DWG. NO. W1078.B1



LP-2

*FROM OR TO FUTURE CONTRACT 7645

RECORD DRAWING



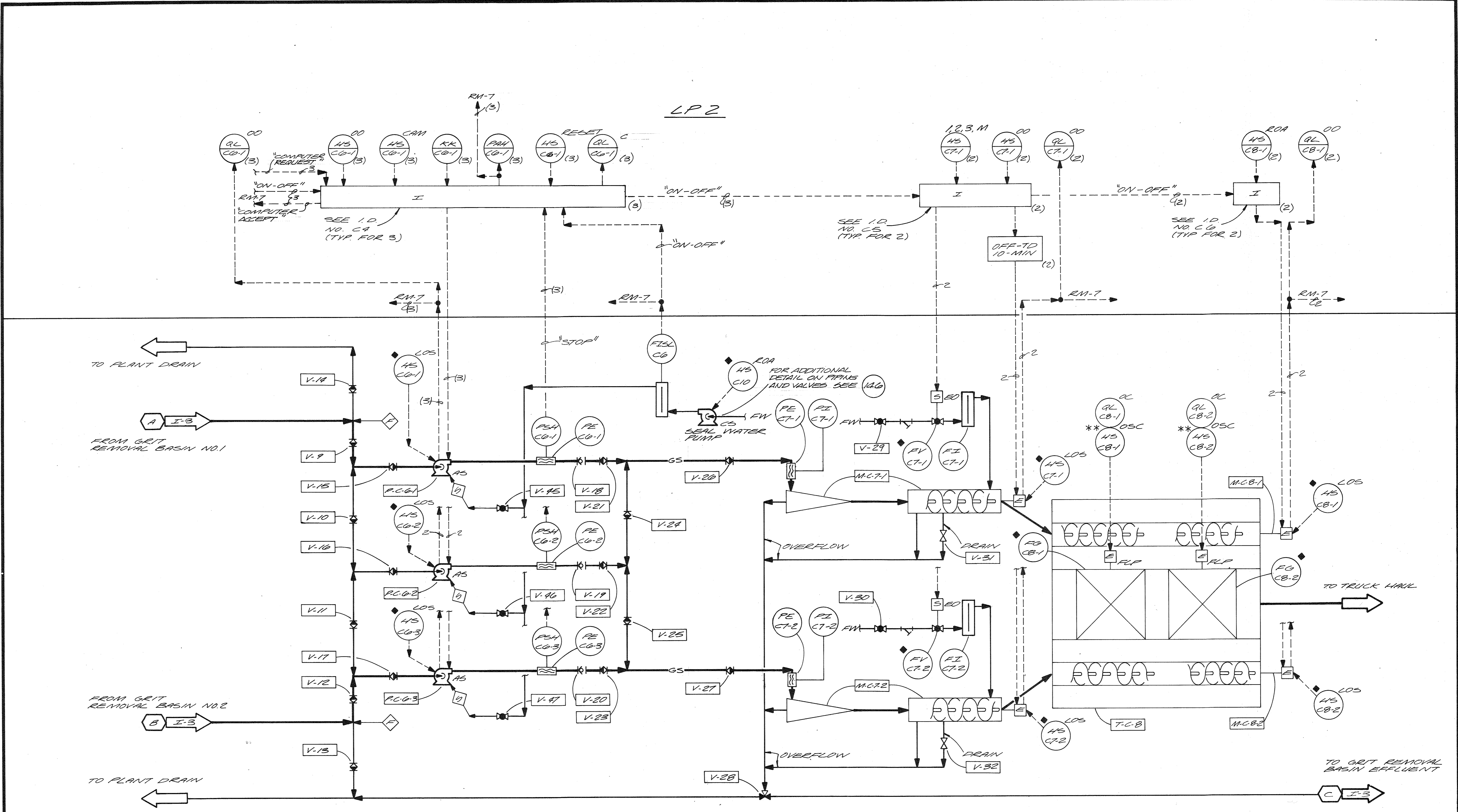
	DES. DBB				
	DR. V.A.W.				
	CHK.				
	APPD.				
	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

GRIT REMOVAL (UNIT PROCESS C)
PROCESS & INSTRUMENTATION DIAGRAM
 INSTRUMENTATION & CONTROL

SHEET
 OF
 DATE 8-78
 DWG.
 NO. W1078.B1



LP 2

RECORD DRAWING



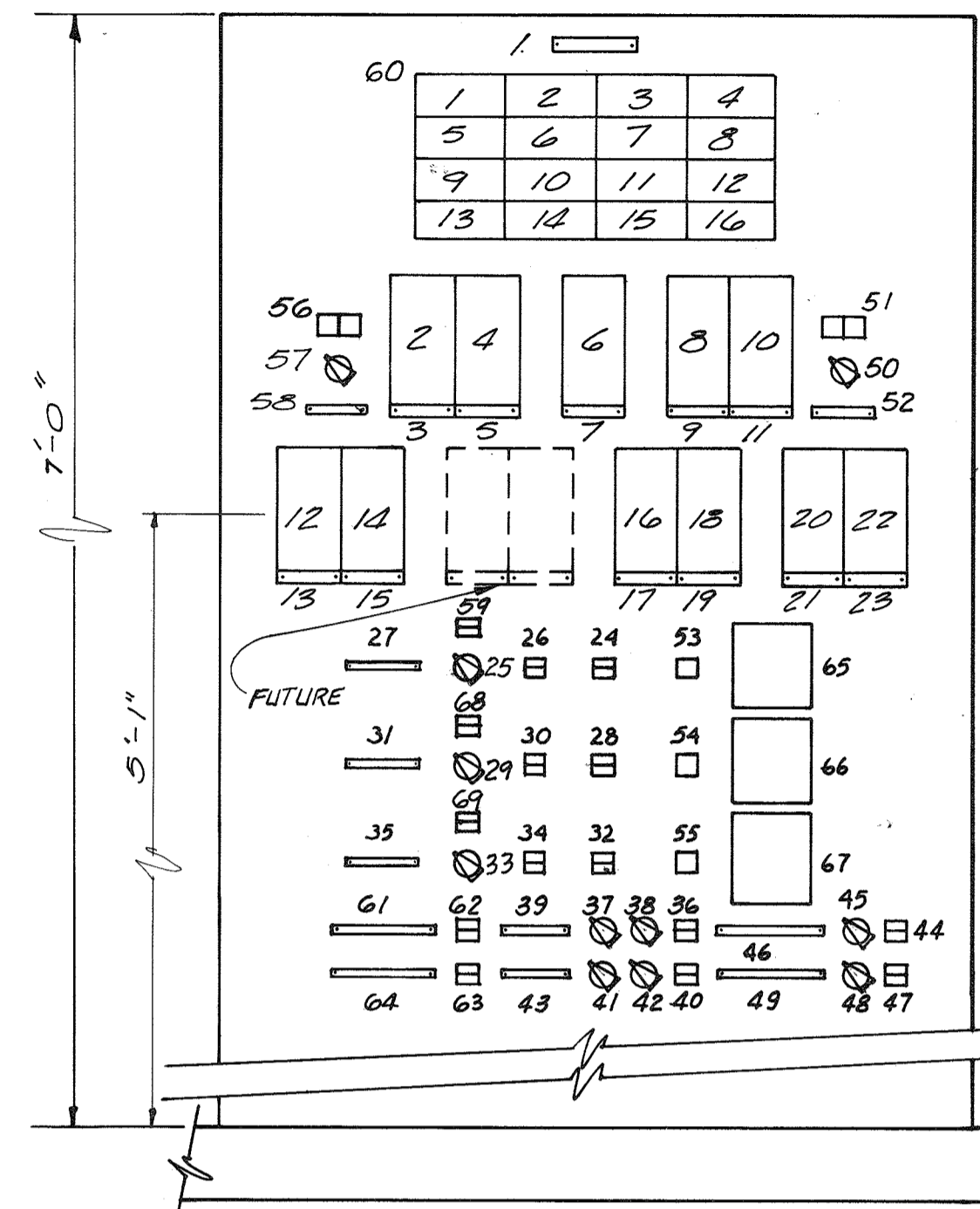
CH2M HILL	DES. DBB				
	DR. V.A.W.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Chief-Bureau of Environmental Services

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 764-S
 763-S

GRIT REMOVAL (UNIT PROCESS C)
PROCESS & INSTRUMENTATION DIAGRAM
 INSTRUMENTATION & CONTROL

SHEET
 OF
 1-4
 DATE 8-78
 DWG.
 NO. W1078.B1



GRIT REMOVAL CONTROL PANEL (LP-2)
1/2" = 1'-0"

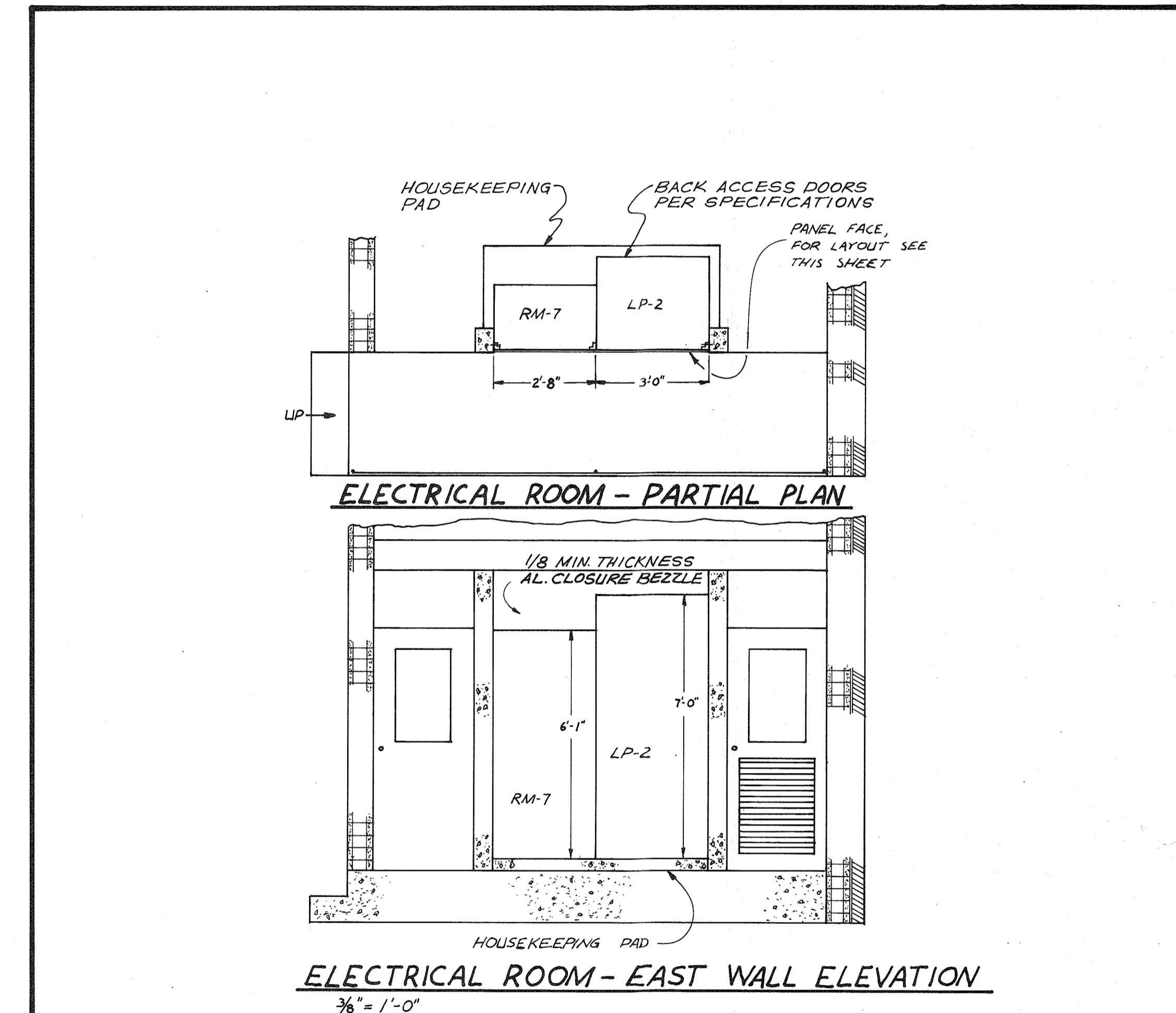
No.	INSCRIPTION	REMARKS
1	GRIT REMOVAL BASIN No 1 HIGH TORQUE	NAH-CI-1 [HI TORQ]
2	GRIT REMOVAL BASIN No 2 HIGH TORQUE	NAH-CI-2 [HI TORQ]
3	GRIT REMOVAL BASIN No 1 HIGH TORQUE SHUTDOWN	NAHH-CI-1 [HI TORQ SHUTDOWN]
4	GRIT REMOVAL BASIN No 2 HIGH TORQUE SHUTDOWN	NAHH-CI-2 [HI TORQ SHUTDOWN]
5	GRIT REMOVAL BASIN No 1 MOTOR OVERLOAD	[MOTOR OVERLOAD]
6	GRIT REMOVAL BASIN No 2 MOTOR OVERLOAD	[MOTOR OVERLOAD]
7	SPARE	
8	SPARE	
9	GRIT PUMP No 1 HIGH PRESSURE	PAH-C6-1
10	GRIT PUMP No 2 HIGH PRESSURE	PAH-C6-2
11	GRIT PUMP No 3 HIGH PRESSURE	PAH-C6-3
12	SPARE	
13	EQUALIZATION BASIN No 1 HIGH LEVEL	LAH-D2-1
14	EQUALIZATION BASIN No 2 HIGH LEVEL	LAH-D2-2
15	SPARE	
16	GRIT BASIN INFLUENT CHAMBER HIGH LEVEL	LAH-C2

LP-2 ANNUNCIATOR PANEL SCHEDULE

No	DESCRIPTION	INSCRIPTION
1	NAMEPLATE 2" x 12"	GRIT REMOVAL CONTROL PANEL 'LP-2'
2	LEVEL INDICATOR, LI-DI-1	
3	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	LEVEL/EQUAL. BASIN No 1
4	LEVEL INDICATOR, LI-DI-2	
5	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	LEVEL/EQUAL. BASIN No 2
6	FLOW INDICATOR CONTROLLER FIC-D3	
7	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	FLOW/EQUAL. RETURN
8	LEVEL INDICATOR CONTROLLER LIC-C3	
9	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	LEVEL/GRIT BASIN EFL.
10	FLOW INDICATOR HAND CONTROLLER FHK-C3	
11	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	MAX. PC. INFLUENT
12	RATIO MANUAL LOADING STATION FFHK-C3-1	
13	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	RATIO/ P.C. No 1
14	FLOW INDICATOR CONTROLLER FIC-C3-1	
15	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	FLOW/ P.C. No 1
16	RATIO MANUAL LOADING STATION FFHK-C3-3	
17	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	RATIO/ P.C. No 4
18	FLOW INDICATOR CONTROLLER FIC-C3-3	
19	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	FLOW/ P.C. No 4
20	RATIO MANUAL LOADING STATION FFHK-C3-4	
21	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	RATIO/ P.C. No 5
22	FLOW INDICATOR CONTROLLER FIC-C3-4	
23	NAMEPLATE (LENGTH TO MATCH CONTROLLER)	FLOW/ P.C. No 5
24	QL-C 6-1 [00] DOUBLE IND. LIGHT	ON/OFF
25	HS-C 6-1 [CAM] 2 POLE, 3 POSITION ON.	COMPUTER/AUTO/MANUAL
26	HS-C 6-1 [00] 2 POLE, 3 MAINTAINED P.B.'S	ON/OFF
27	3/16" x 3/16" NAMEPLATE	GRIT PUMP No 1
28	QL-C 6-2 [00] DOUBLE IND. LIGHT	ON/OFF
29	HS-C 6-2 [CAM] 2 POLE, 3 POSITION ON.	COMPUTER/AUTO/MANUAL
30	HS-C 6-2 [00] 2 POLE MAINT. P.B.'S	ON/OFF
31	3/16" x 3/16" NAMEPLATE	GRIT PUMP No 2
32	QL-C 6-3 [00] DOUBLE IND. LIGHT	ON/OFF
33	HS-C 6-3 [CAM] 2 POLE, 3 POSITION ON.	COMPUTER/AUTO/MANUAL
34	HS-C 6-3 [00] 2 POLE MAINT. P.B.'S	ON/OFF
35	3/16" x 3/16" NAMEPLATE	GRIT PUMP No 3
36	QL-C 7-1 [00] DOUBLE IND. LIGHT	ON/OFF
37	HS-C 7-1 [1,2,3,M] 1 POLE, 2 POSITION ON.	START WITH PUMP/ 1,2,3,MAN
38	HS-C 7-1 [00] 2 POLE MAINT. P.B.'S	ON/OFF
39	3/16" x 3/16" NAMEPLATE	GRIT CLASSIFIER No 1
40	QL-C 7-2 [00] DOUBLE IND. LIGHT	ON/OFF
41	HS-C 7-2 [1,2,3,M] 1 POLE, 2 POSITION ON.	START WITH PUMP/ 1,2,3,MAN
42	HS-C 7-2 [00] 2 POLE MAINT. P.B.'S	ON/OFF
43	3/16" x 4 1/16" NAMEPLATE	GRIT CLASSIFIER No 2
44	QL-C 8-1 [00] DOUBLE IND. LIGHT	ON/OFF
45	HS-C 8-1 [ROA] 1 POLE, 3 POSITION ON.	RUN/OFF/AUTO
46	3/16" x 3/16" NAMEPLATE	GRIT BIN/LVL. SCREW No 1
47	QL-C 8-2 [00] DOUBLE IND. LIGHT	ON/OFF
48	HS-C 8-2 [ROA] 1 POLE, 3 POSITION ON.	RUN/OFF/AUTO
49	3/16" x 4 1/16" NAMEPLATE	GRIT BIN/LVL. SCREW No 2
50	HS-C 3 [CA] 1 POLE, 2 POSITION SW.	COMPUTER/AUTO
51	QL-C 3 [CA] 2 SINGLE SIDE BY SIDE IND. LIGHTS	COMPUTER/AUTO
52	3/16" x 4 1/16" NAMEPLATE	PRI. CLARIFIER FLOW CONTROL

LP-2 EQUIPMENT IDENTIFICATION AND NAMEPLATE SCHEDULE

No	DESCRIPTION	INSCRIPTION
53	HS-C 6-1 [RESET] (1) POLE, P.B. GUARDED	RESET
54	HS-C 6-2 [RESET] (1) POLE, P.B. GUARDED	RESET
55	HS-C 6-3 [RESET] (1) POLE, P.B. GUARDED	RESET
56	QL-D3 [CA] (2) SINGLE SIDE BY SIDE IND. LIGHTS	COMPUTER/AUTO
57	HS-D3 [CA] 1 POLE, 2 POSITION SWITCH	COMPUTER/AUTO
58	3/16" x 3/16" NAMEPLATE	FLOW/EQUAL. RETURN
59	QL-C6-1 [C] SINGLE IND. LIGHT	COMPUTER ACCEPT
60	ANNUNCIATOR PANEL	
61	3/16" x 3/16" NAMEPLATE	GRIT REMOVAL MECHANISM No 1
62	QL-C1-1 DOUBLE INDICATING LIGHT	ON/OFF
63	QL-C1-2 DOUBLE INDICATING LIGHT	ON/OFF
64	3/16" x 3/16" NAMEPLATE	GRIT REMOVAL MECHANISM No 2
65	KK-C6-1 ON/OFF CYCLE TIMER	
66	KK-C6-2 ON/OFF CYCLE TIMER	
67	KK-C6-3 ON/OFF CYCLE TIMER	
68	QL-C6-2 [C] SINGLE IND. LIGHT	COMPUTER ACCEPT
69	QL-C6-3 [C] SINGLE IND. LIGHT	COMPUTER ACCEPT



NOTE: CLOSURE BEZZLE AND DETAILS TO BE AS APPROVED BY THE ENGINEER.

RECORD DRAWING



DES. E.L.S.	
DR. E.E.M. JR.	
CHK.	
APPD.	

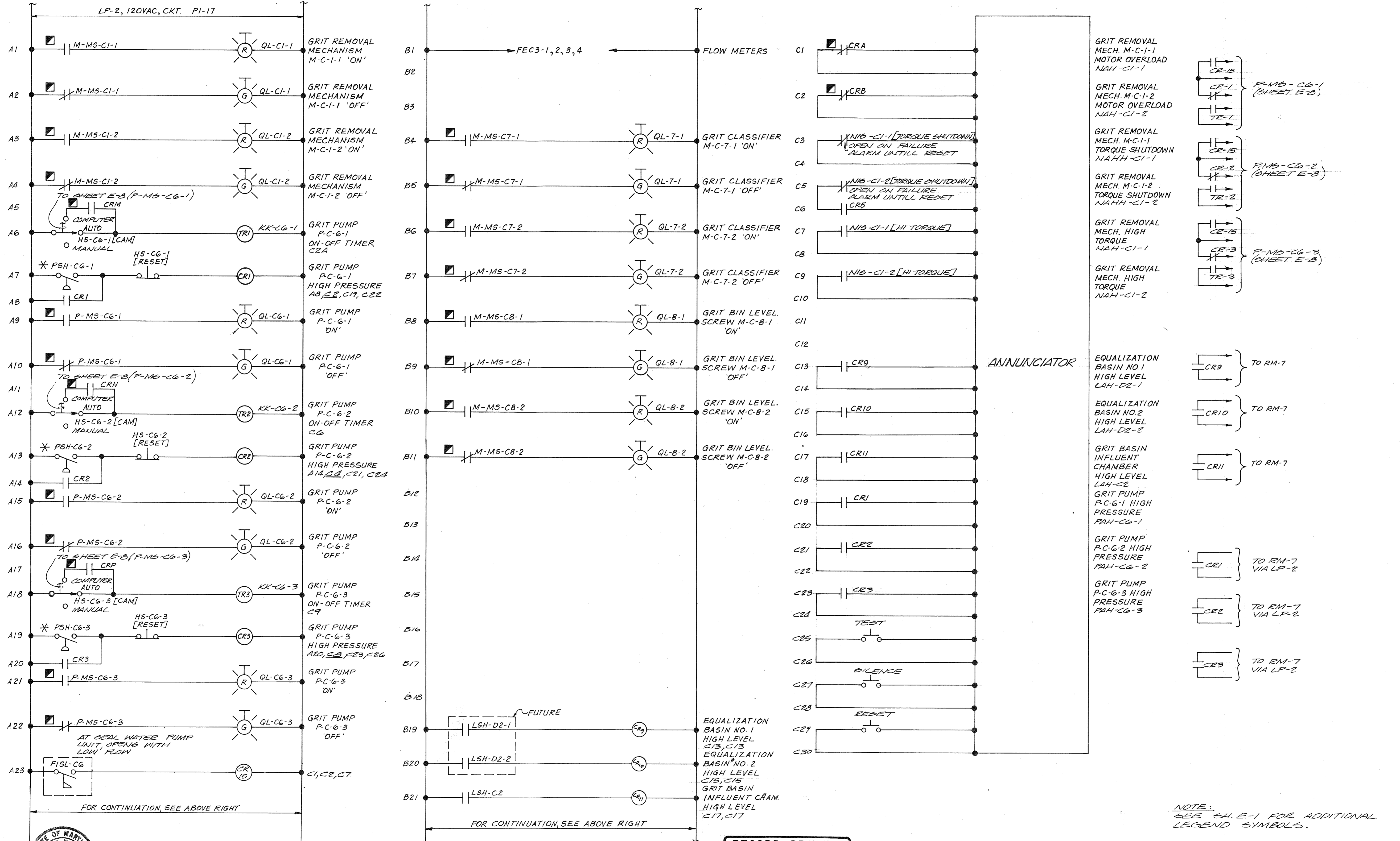
NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

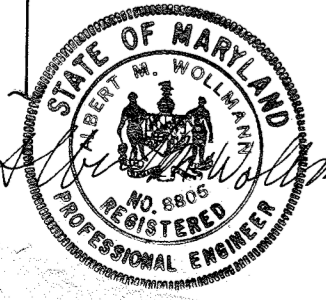
CONTROL PANEL ELEV. & SCHEDULES
INSTRUMENTATION

SHEET OF	1-5
DATE	8-78
DWG. NO.	WI1078.BI



NOTE:
SEE SHEET E-1 FOR ADDITIONAL
LEGEND SYMBOLS.

RECORD DRAWING



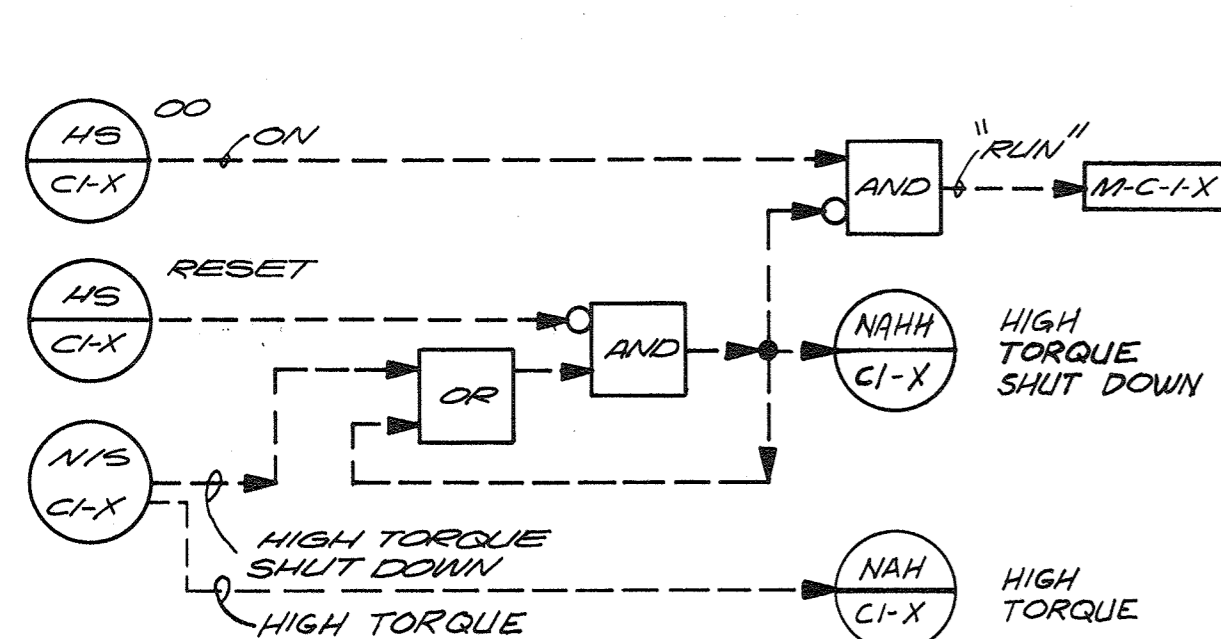
	DES. BSH/ELS				
	DR. TQ/BSH				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
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SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

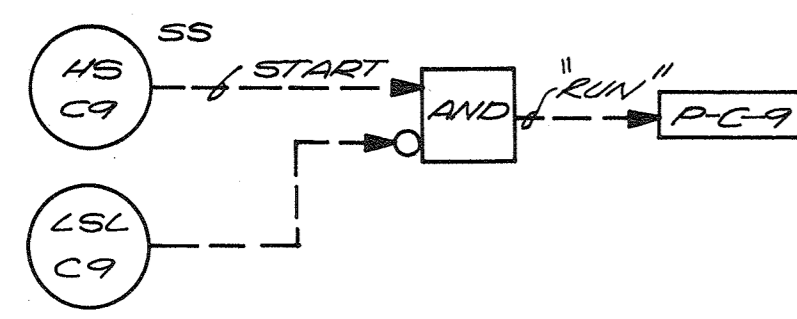
LP-2 CONTROL DIAGRAM
INSTRUMENTATION AND CONTROL

SHEET
OF 1-6
DATE 8-78
DWG. NO. W1078.B1

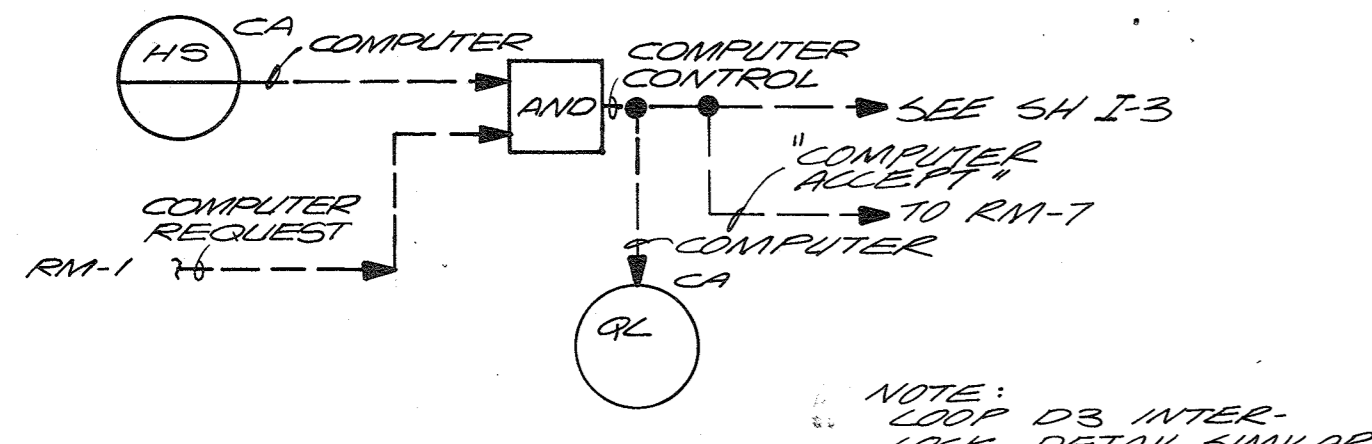


INTERLOCK DETAIL NO. C1
GRIT REMOVAL MECHANISMS (M-C-1-X)

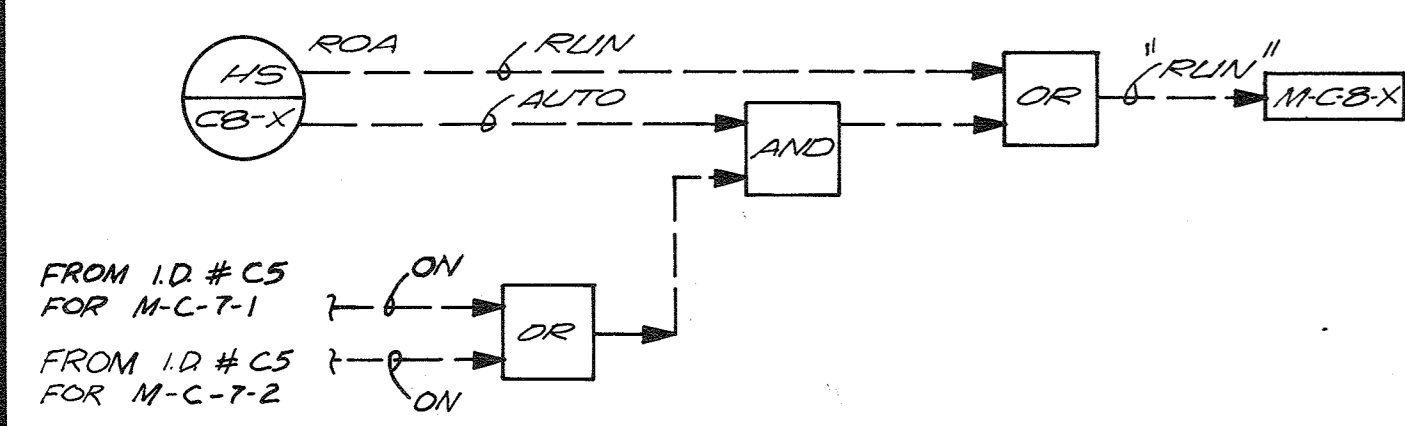
X=1,2



INTERLOCK DETAIL NO. C2
SCUM PUMP (P-C-9)

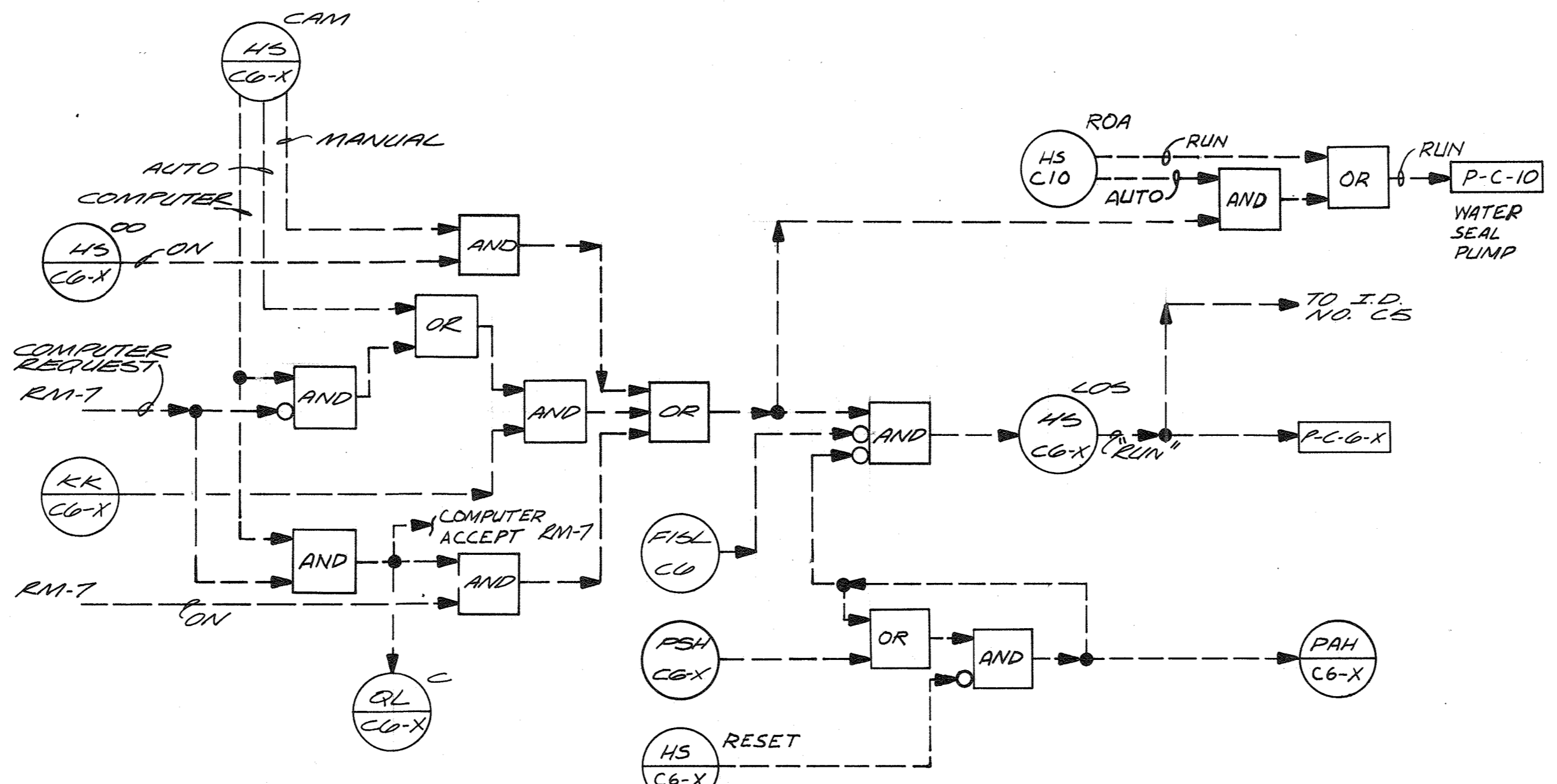


INTERLOCK DETAIL NO. C3
FLOW METERING-COMPUTER CONTROL



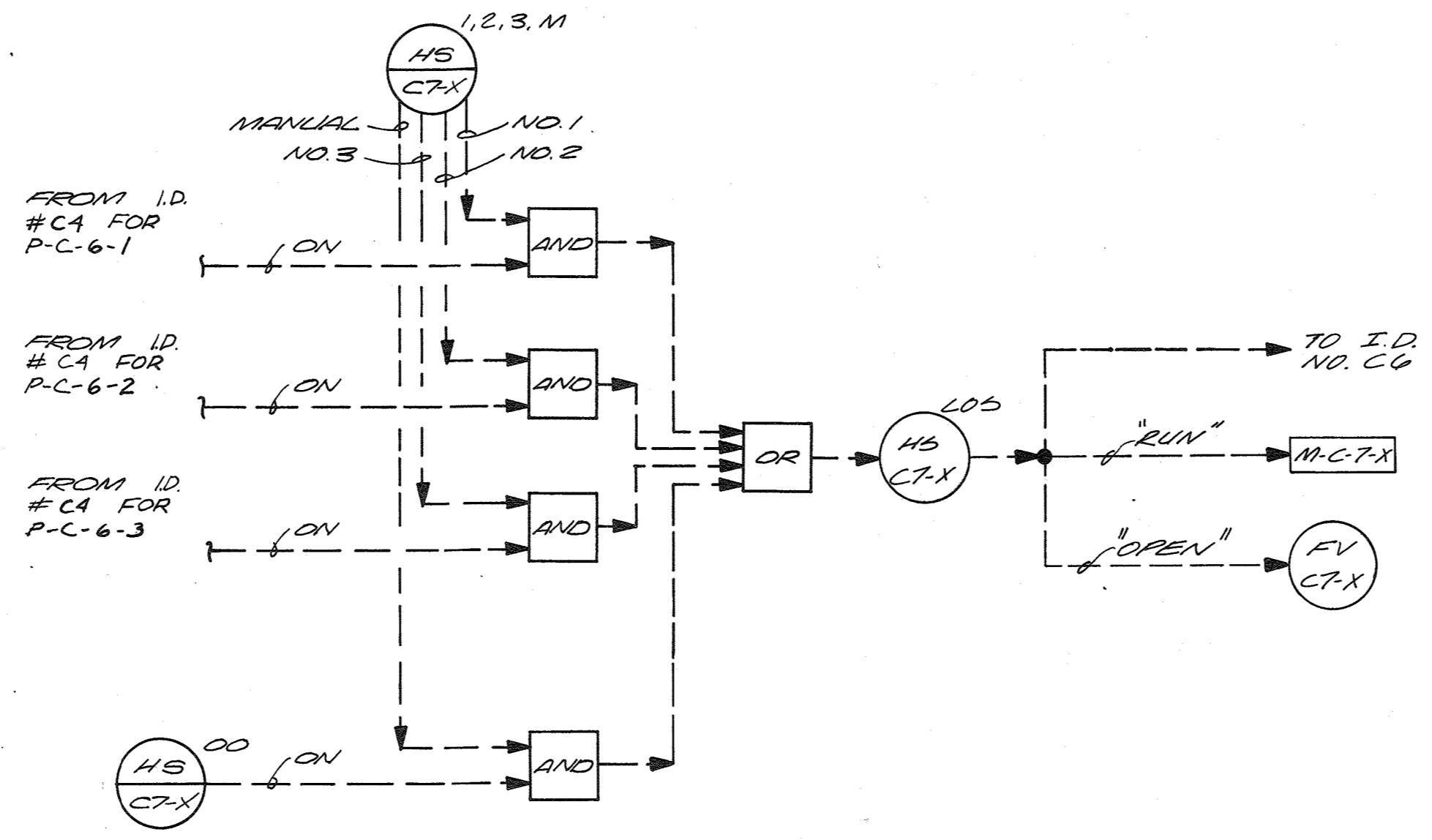
INTERLOCK DETAIL NO. C6
GRIT BIN LEVELING SCREWS (M-C-8-X)

X=1,2



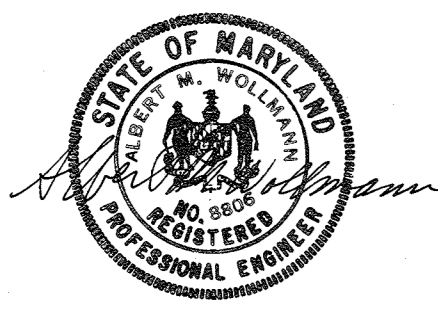
INTERLOCK DETAIL NO. C4
GRIT PUMPS (P-C-6-X)

X=1,2,3



INTERLOCK DETAIL NO. C5
GRIT CLASSIFIERS (M-C-7-X)

X=1,2



CH2M HILL	DES. DBB				
	DR. CFE JR.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

LOGIC DIAGRAMS
INSTRUMENTATION & CONTROL

SHEET
OF 1-7
DATE 8-78
DWG.
NO. W11078.B1

ELECTRICAL LEGEND

ABBREVIATIONS OR LETTER SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION																
	CONTROL DEVICE - FURNISHED AND INSTALLED UNDER OTHER SECTIONS; RACEWAYS, CONDUCTORS, AND CONDUCTOR END TERMINATORS FURNISHED AND INSTALLED UNDER THIS SECTION AS SHOWN. CONDUCTOR FINAL CONNECTIONS PROVIDED UNDER OTHER SECTIONS.		CONVENIENCE RECEPTACLE, PEDESTAL, DUPLEX SINGLE FACE UNLESS INDICATED OTHERWISE		DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE	A	AMMETER	M	MAGNETIC CONTACTOR COIL																
	CONNECTION POINT TO EQUIPMENT SPECIFIED. FURNISHED AND INSTALLED UNDER OTHER SECTIONS. RACEWAY, CONDUCTOR AND CONNECTION IN THIS SECTION.		RECEPTACLE - 240V., 1Ø, AMPERAGE INDICATED		DRAWOUT AIR CIRCUIT BREAKER, MEDIUM VOLTAGE	AC	AIR COMPRESSOR	MCC	MOTOR CONTROL CENTER																
	NAMEPLATE OR LEGEND PLATE - SEE SCHEDULE		RECEPTACLE, SPECIAL PURPOSE - AMPERAGE AS INDICATED		DRAWOUT FUSED SWITCH, MEDIUM VOLTAGE	AFF	ABOVE FINISHED FLOOR AIR SUPPLY UNIT	MERC	MERCURY VAPOR MANHOLE																
	INDICATES RACEWAYS AND CIRCUIT NUMBERS. FIRST NUMBER IS RACEWAY AND NUMBER AFTER DASH IS CIRCUIT NUMBER. 5-E(3) INDICATES THAT THERE ARE 3 EMPTY RACEWAY NO. 5. SEE SCHEDULE.		DUPLEX CONVENIENCE RECEPTACLE - FLUSH IN FLOOR		LIGHTNING ARRESTER	ASU		MMP	MECHANICAL MOUNTING PANEL																
	MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN.		MULTI OUTLET ASSEMBLY		FUSE	B	BELL	MS	MOTOR STARTER																
	BRANCH CIRCUIT PANEL		WALL CLOCK WITH CLOCK HANGER CONVENIENCE RECEPTACLE		CAPACITOR - KVAR INDICATED			MSP	MOTOR STARTER PANEL																
	UNIT HEATER NO. 1 - SEE SCHEDULE		TELEPHONE RECEPTACLE (OUTLET BOX ONLY) FLUSH IN FLOOR		METER WITH SWITCH - SCALE RANGE SHOWN	C	CONDUIT	N, NEUT	NEUTRAL																
	TELEPHONE TERMINAL CABINET		TELEPHONE RECEPTACLE (OUTLET BOX ONLY) FLUSH IN WALL		GROUND	CB	CIRCUIT BREAKER	NA	NON-AUTOMATIC																
	TERMINAL JUNCTION BOX		FIRE ALARM STATION, MANUAL		TRANSFORMER, SECONDARY VOLTAGES, PHASE AND RATING INDICATED AS APPLICABLE	CC	CONTROL CABLE	NC	NORMALLY CLOSED																
	WOUND-ROTOR MOTOR, HORSEPOWER INDICATED		FIRE ALARM STATION, AUTOMATIC, HEAT DETECTOR		PICK-UP SETTING	CKT	CIRCUIT	NL	NIGHT LIGHT																
	MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED		FIRE ALARM BELL		TIME CURRENT CHARACTERISTIC	CPT	CONTROL POWER TRANSFORMER	NO	NORMALLY OPEN																
	LUMINAIRE - SEE SCHEDULE		FIRE ALARM HORN		GROUND FAULT RELAY WITH C.T.	CR	CONTROL RELAY	NP	NAMEPLATE																
	LUMINAIRE AND POLE - SEE SCHEDULE		FIRE ALARM IONIZATION DETECTOR		TIME DELAY RELAY CONTACT NORMALLY OPEN CONTACT	CT	CURRENT TRANSFORMER																		
	WALL MOUNTED LUMINAIRE - SEE SCHEDULE		AIR DUCT IONIZATION DETECTOR		TIME DELAY RELAY CONTACT NORMALLY CLOSED	CUH	CABINET UNIT HEATER	OL	OVERLOAD RELAY																
	FLOODLIGHTS - AIM IN DIRECTION SHOWN - SEE SCHEDULE		GENERAL ELECTRICAL CONTROL OR WIRING DEVICE. NEMA 1 ENCLOSURE UNLESS INDICATED OTHERWISE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE.		SELECTOR SWITCH MAINTAINED CONTACT	DC	DIRECT CURRENT	PB	PUSH-BUTTON SWITCH																
	EXIT LIGHT - SEE SCHEDULE		PUSH-BUTTON STATION, NEMA 1 ENCLOSURE UNLESS INDICATED OTHERWISE. (WP = NEMA 4 ENCLOSURE) SEE CONTROL DIAGRAMS FOR TYPE PUSH-BUTTON REQUIRED.		TIME DELAY RELAY CONTACT NORMALLY OPEN CONTACT	DO	DISSOLVED OXYGEN	PC	PHOTOCELL																
	SMALL LETTER SUBSCRIPT ON SWITCH AND LUMINAIRE INDICATES SWITCHING		NONFUSED DISCONNECT SWITCH, SIZE INDICATED, 3 POLE UNLESS INDICATED OTHERWISE. NEMA 1 ENCLOSURE, WP = WEATHERPROOF (NEMA 3R)		TIME DELAY RELAY CONTACT NORMALLY CLOSED	E	EMPTY	PCP	PLANT CONTROL PANEL																
	HOME RUN - DESTINATION SHOWN		FUSED DISCONNECT SWITCH, SIZE INDICATED (60/40, 60 = SWITCH RATING; 40 = FUSE RATING) 3 POLE UNLESS INDICATED OTHERWISE. NEMA 1 ENCLOSURE, WP = WEATHERPROOF (NEMA 3R)		TIME DELAY RELAY CONTACT NORMALLY CLOSED	EF	EXHAUST FAN	PIP	PLANT INDICATING PANEL																
	EXPOSED CONDUIT AND CONDUCTORS*		CONTACTOR, MAGNETIC, NEMA SIZE INDICATED, THREE POLE, NEMA 1 ENCLOSURE, UNLESS INDICATED OTHERWISE.		TIME DELAY RELAY CONTACT NORMALLY CLOSED	EP	EXPLOSION PROOF	POP	PLANT OPERATIONS PANEL																
	CONCEALED CONDUIT AND CONDUCTORS*		LIGHTING CONTACTOR, CURRENT RATING INDICATED, NEMA 1 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM FOR NUMBER OF POLES.		TIME DELAY RELAY CONTACT NORMALLY CLOSED	ETM	ELAPSED TIME METER	PS	PRESSURE SWITCH																
<p>NOTE: *ALL UNMARKED CONDUIT RUNS CONSIST OF TWO NO. 12 TW CONDUCTORS IN CONDUIT. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF NO. 12 TW WIRE. CROSSHATCH WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.</p>			COMBINATION (FUSE OR CIRCUIT BREAKER AS INDICATED) MAGNETIC STARTER, NEMA SIZE INDICATED, NEMA 1 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM.		ASTERISK DENOTES DEVICE AT MOTOR	FDR	FEEDER	PT	POTENTIAL TRANSFORMER																
	CROSSHATCHES WITH BAR INDICATE #10 TW WIRE. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.		METERING FACILITIES		SELECTOR SWITCH - MAINTAINED CONTACT - CHART DEFINES OPERATION:	FV	FUSE	PVC	POLYVINYL CHLORIDE																
	CONDUIT, DOWN		CONTACT - NORMALLY OPEN WITH NEMA SIZE INDICATED AS APPLICABLE	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th rowspan="2">CKT.</th> <th colspan="3">POSITION</th> </tr> <tr> <th>HAND</th> <th>OFF</th> <th>AUTO</th> </tr> <tr> <td>1</td> <td>X</td> <td>0</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> <td>X</td> </tr> </table>	CKT.	POSITION			HAND	OFF	AUTO	1	X	0	0	2	0	0	X		CONTACT - NORMALLY CLOSED WITH NEMA SIZE INDICATED AS APPLICABLE	FVNR	FULL VOLTAGE NON-REVERSING	RM	REMOTE MULTIPLEXER
CKT.	POSITION																								
	HAND	OFF	AUTO																						
1	X	0	0																						
2	0	0	X																						
	CONDUIT, UP		OVERLOAD RELAY HEATER		INDICATING LIGHT - LETTER INDICATES COLOR	FV	FUSE	RS	RIGID STEEL																
	CONDUIT, STUBBED AND CAPPED AS SHOWN		MAGNETIC STARTER WITH NEMA SIZE INDICATED		INDICATING LIGHT - LETTER INDICATES COLOR	FL	FLASHER MOTOR	RVMR	REDUCED VOLTAGE NON-REVERSING																
	CABLE TRAY - SEE SPECIFICATIONS		CIRCUIT BREAKER, MAGNETIC TRIP ONLY, FRAME SIZE SHOWN, 3 POLE UNLESS INDICATED OTHERWISE.		INDICATING LIGHT - LETTER INDICATES COLOR	FLUOR	FLUORESCENT	RVR	REDUCED VOLTAGE REVERSING																
	BUS DUCT - SEE SPECIFICATIONS		CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE UNLESS INDICATED OTHERWISE.		MULTI-PARTY DESK TOP COMMUNICATIONS SYSTEM STATION WITH REMOTE AMPLIFIER	FM	FLOW METER	SCU	SPEED CONTROL UNIT																
	TRENCHING FOR UTILITY COMPANY PRIMARY POWER CIRCUITS		CIRCUIT BREAKER WITH CURRENT LIMITING FUSES, TRIP AND FUSE RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.		MULTI-PARTY WALL MOUNTED COMMUNICATIONS SYSTEM STATION WITH INTEGRAL AMPLIFIER	FS	FLOAT SWITCH	SV	SOLENOID VALVE																
	TRENCHING FOR TELEPHONE COMPANY CIRCUITS		FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.		CONE TYPE PAGING SPEAKER, RECESSED IN CEILING	FT	FLOW TRANSMITTER	SW	SWITCH																
	WALL SWITCH: 2 - DOUBLE POLE P - PILOT LIGHT 3 - THREE WAY K - KEY OPERATED 4 - FOUR WAY D - DIMMER WP - WEATHERPROOF		SWITCH - CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.		INTERIOR PAGING TRUMPET SOUND REPRODUCER, 120° x 60°, WITH REMOTE AMPLIFIER, SURFACE MOUNTED	FVR	FULL VOLTAGE REVERSING																		
	CONVENIENCE RECEPTACLE - DUPLEX UNLESS SPECIFIED OTHERWISE WP - WEATHERPROOF C - CLOCK HANGER TL - TWIST LOCK R - RETRACTABLE COIL				OUTDOOR PAGING TRUMPET SOUND REPRODUCER, 120° x 60°, WITH REMOTE AMPLIFIER, SURFACE MOUNTED																				

NOTE:
THIS IS A STANDARD LEGEND SHEET. THEREFORE SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PLANS.

RECORD DRAWING



CH2M HILL	DES.				
	DR.				
	CHK.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

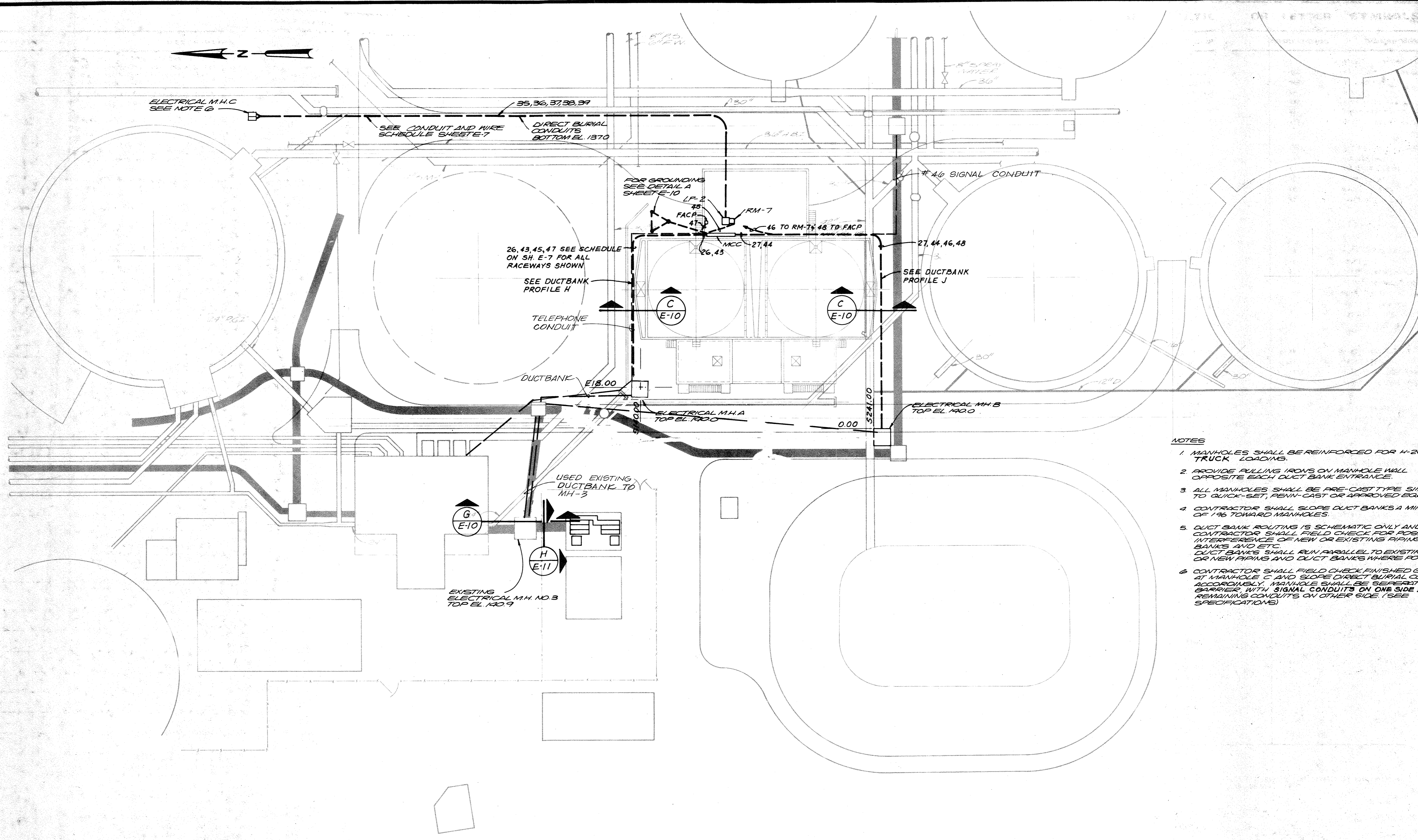
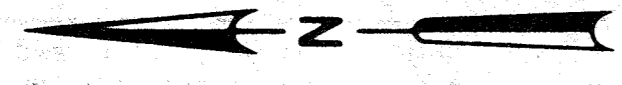
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

LEGEND

ELECTRICAL

SHEET
E-1
OF
DATE
8-78
DWG.
NO. W1078.B1



- NOTES**
1. MANHOLES SHALL BE REINFORCED FOR 4-20 TRUCK LOADING.
 2. PROVIDE PULLING IRONS ON MANHOLE WALL OPPOSITE EACH DUCT BANK ENTRANCE.
 3. ALL MANHOLES SHALL BE PRE-CAST TYPE SIMILAR TO QUICK-SET, PENN-CAST OR APPROVED EQUAL.
 4. CONTRACTOR SHALL SLOPE DUCT BANKS A MINIMUM OF 1/8" TOWARD MANHOLES.
 5. DUCT BANK ROUTING IS SCHEMATIC ONLY AND CONTRACTOR SHALL FIELD CHECK FOR POSSIBLE INTERFERENCE OF NEW OR EXISTING PIPING, DUCT BANKS AND ETC. DUCT BANKS SHALL RUN PARALLEL TO EXISTING OR NEW PIPING AND DUCT BANKS WHERE POSSIBLE.
 6. CONTRACTOR SHALL FIELD CHECK FINISHED GRADE AT MANHOLE C AND SLOPE DIRECT BURIAL CONDUITS ACCORDINGLY. MANHOLE SHALL BE SEPERATED BY BARRIER WITH SIGNAL CONDUITS ON ONE SIDE AND REMAINING CONDUITS ON OTHER SIDE. (SEE SPECIFICATIONS)

RECORD DRAWING



DES. B.S.H.	DR. C.F.E.J.R.	CHK. E.L.S.	APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

P-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

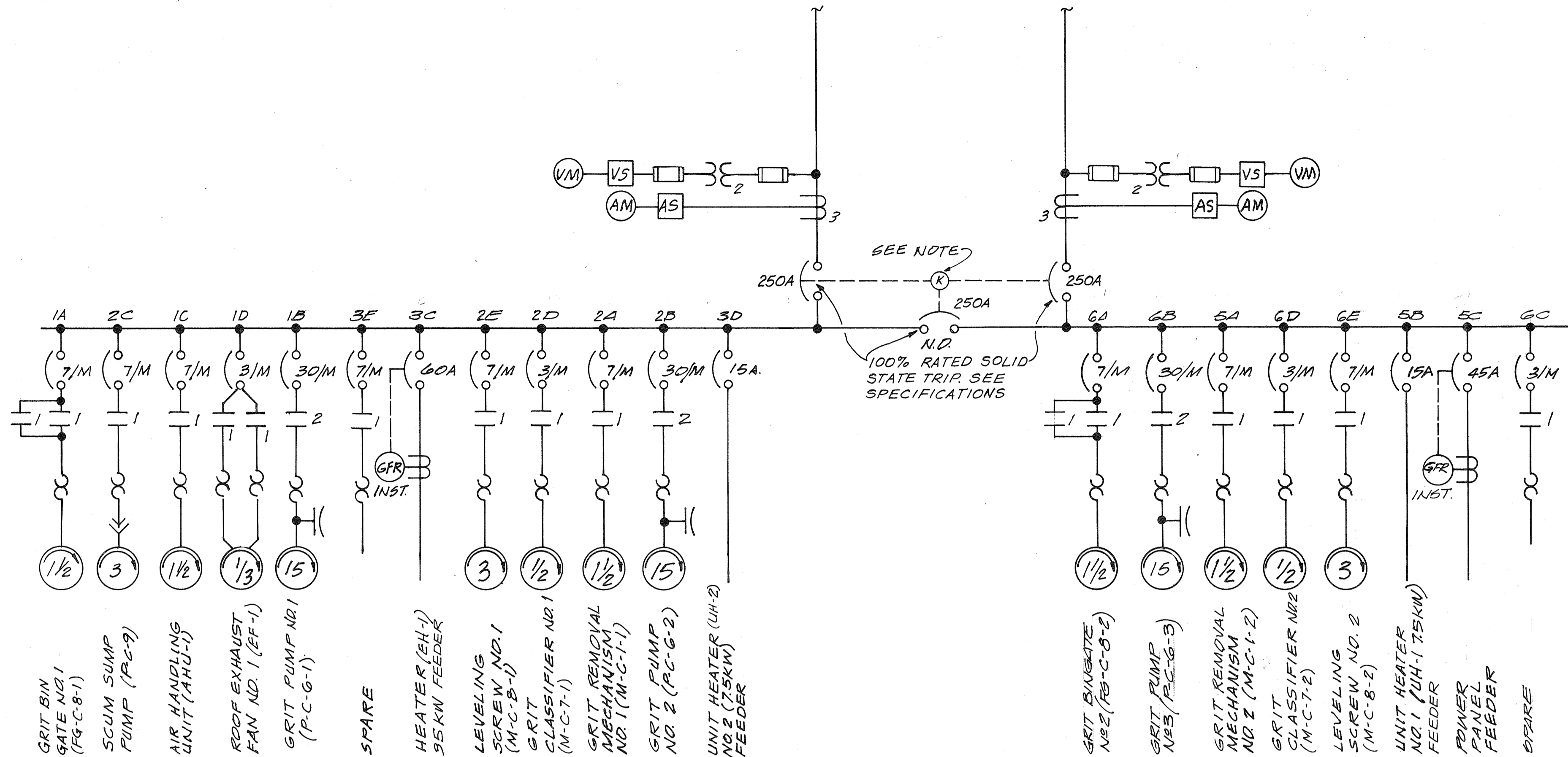
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

SITE PLAN

ELECTRICAL

SHEET OF **E-2**
DATE 8-78
DWG. NO. W1078.B1

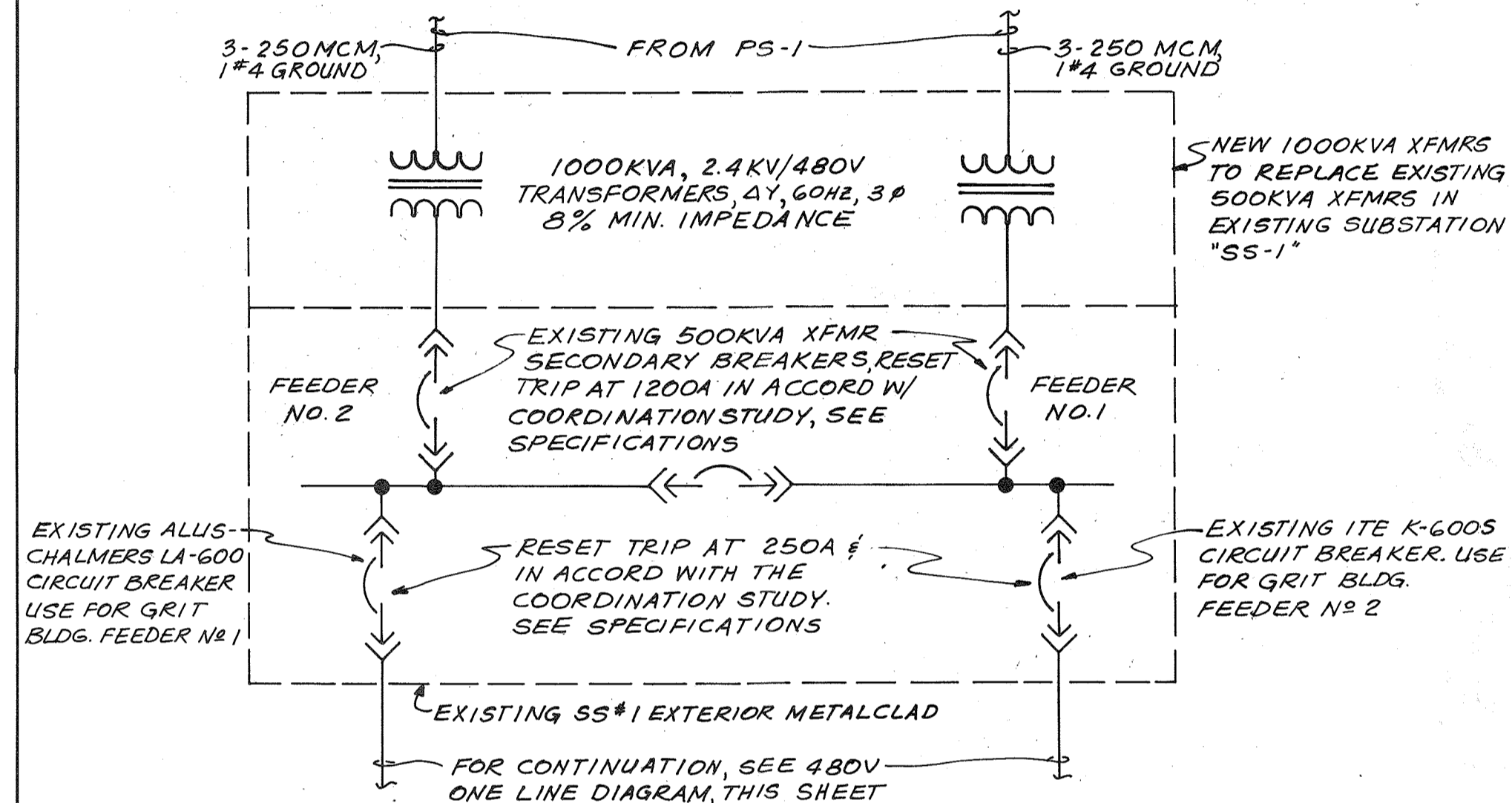
FOR CONTINUATION, SEE EXISTING SUBSTATION "SS-1" ONE LINE DIAGRAM ON THIS SHEET



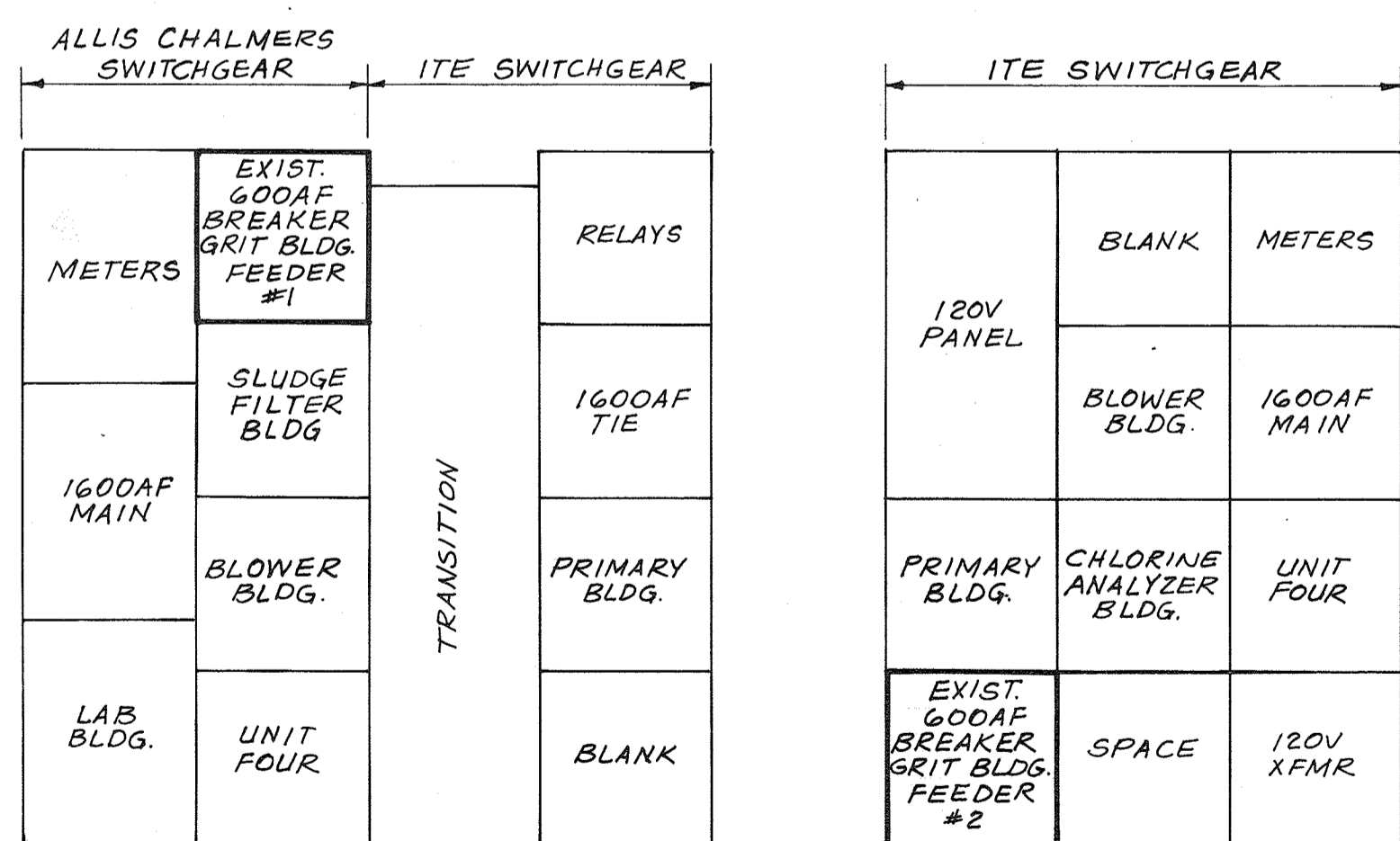
480V ONE LINE DIAGRAM

NOTE: KIRK KEY INTERLOCKS SHALL BE SUCH THAT ONLY TWO OF THREE CIRCUIT BREAKERS CAN BE CLOSED AT THE SAME TIME.

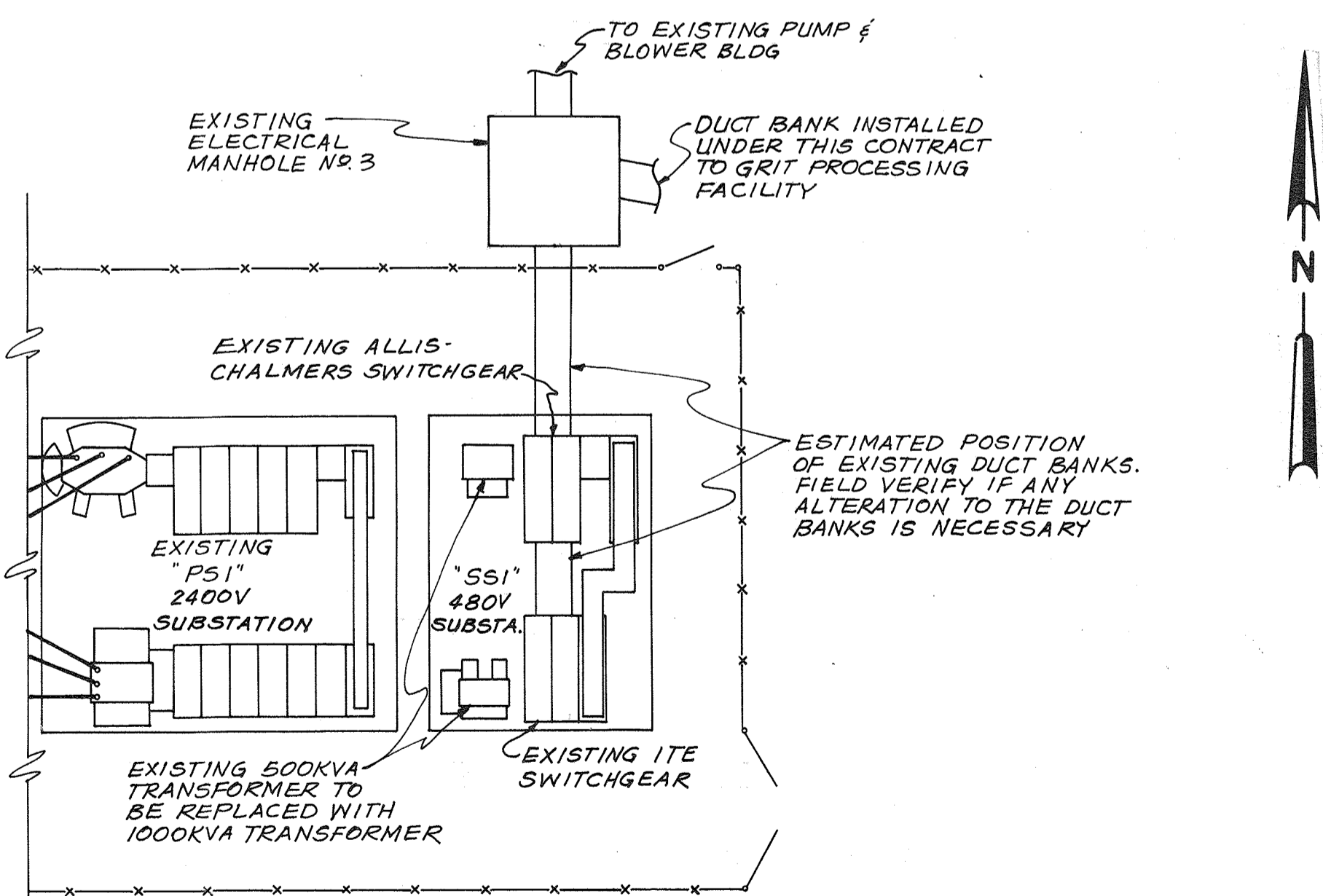
LIGHTING FIXTURE SCHEDULE				
FIXTURE SYMBOL	FIXTURE TYPE	VOLTAGE	MANUFACTURER	MOUNTING
①	2-4DW FLUOR	120	WESTINGHOUSE H24ORS, DAYBRITE R81252-4 OR EQUAL	M.H. AS SHOWN ON DWG.
②	150W INCAND.	120	CROUSE-HINDS VXHF25GP, HOLOPHANE 400CG OR EQUAL	MOUNT 3'-0" BELOW TOP OF WALL
③	70W H.P.S.	120	HOLOPHANE 1927-WL-120, CROUSE HINDS VMV22W070GP OR EQUAL	M.H. AS SHOWN ON DWG.
④	40W-6FM	120	DUAL-LITE MODEL C, WESTINGHOUSE M-22 OR EQUAL	MOUNT ABOVE DOORWAY
⑤	150W H.P.S.	120	HOLOPHANE 1928-ST-1200-06, WESTINGHOUSE VSP-SJMK-5JA OR EQUAL	1 1/4" DIA. - 16'-0" LONG STANCHION
⑥	28W	120	DUAL-LITE ALC-X-SERIES, TELEDYNE BIG BEAM 6N SERIES OR EQUAL	MOUNT 6'-0" ABOVE FIN. FLOOR



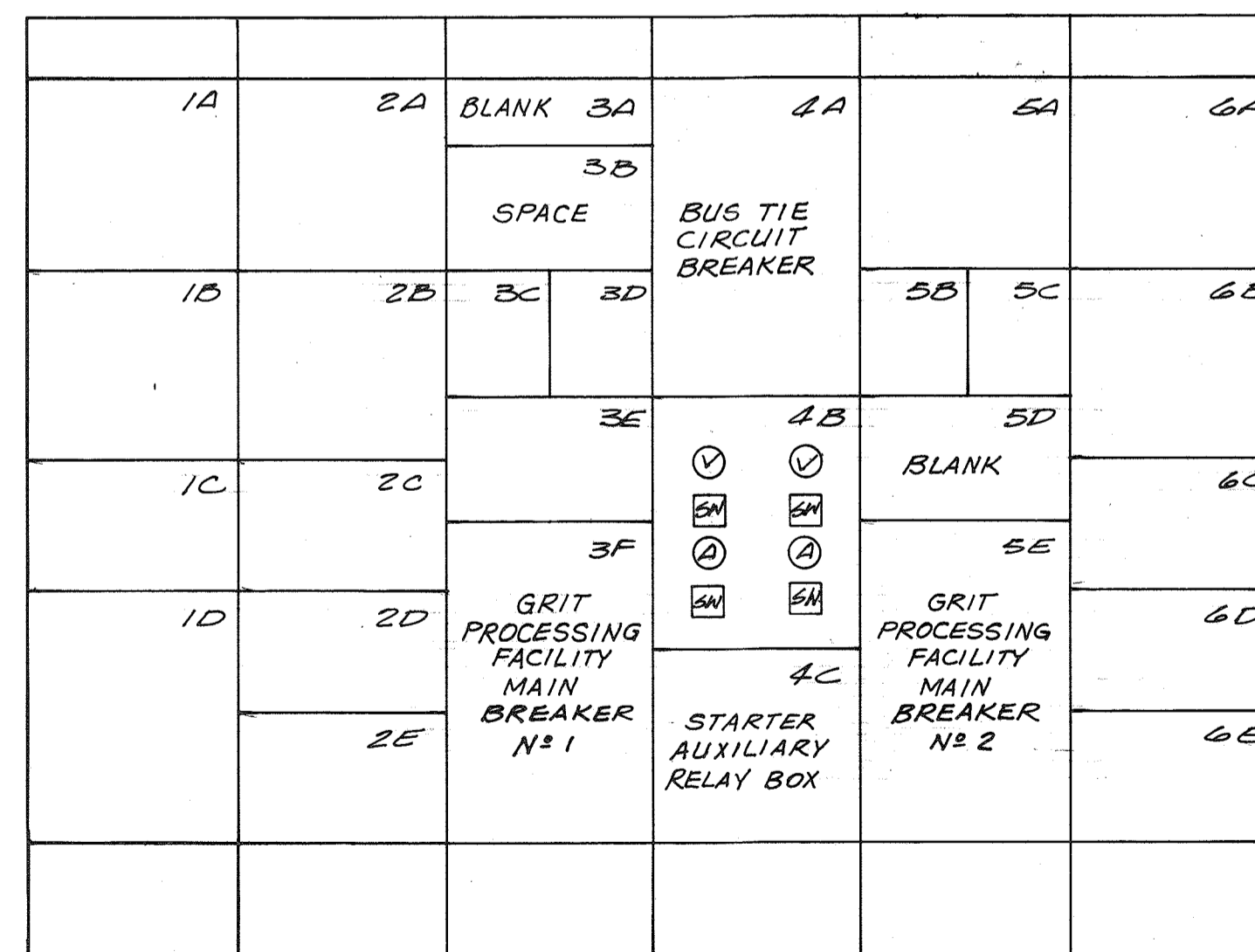
EXISTING SUBSTATION "SS-1"



EXISTING 480V SWITCHGEAR "SSI" FRONT ELEVATIONS N.T.S.



PRI. & SEC. SUBSTATIONS PLAN ("PSI" & "SSI") SCALE: 3/32" = 1'-0"



NOTE: FURNISH BLANK NAMEPLATE FOR FIELD ENGRAVING OF "CC"

MCC ELEVATION



CH2M HILL

DES. N.V./BSH
DR. T.Q.
CHK. E.L.S.
APPD.

NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

Robert B. Miller
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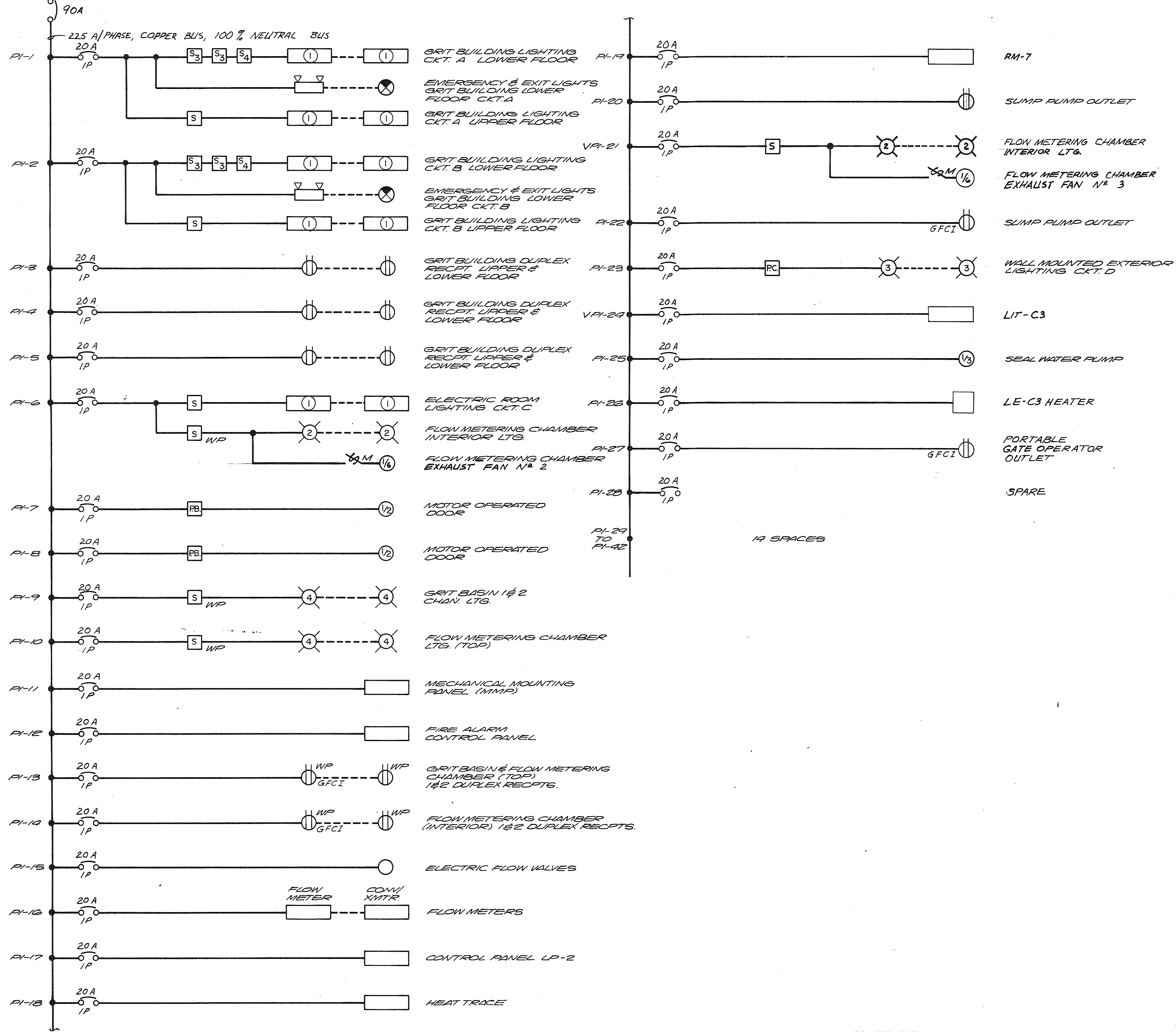
SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

MCC ELEVATION
ONE LINE DIAGRAM & SCHEDULES

ELECTRICAL

SHEET OF E-3
DATE 8-78
DWG. NO. W1078.B1

480-120/208 V, 3-PHASE,
30 KVA, 60 HZ, Δ-Y
TRANSFORMER, WALL MTD.



RECORD DRAWING



	DES. B.S.H.				
	DR. C.F.E. JR.				
	CHK. E.L.S.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
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SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

120/208 V. ONE LINE DIAGRAM

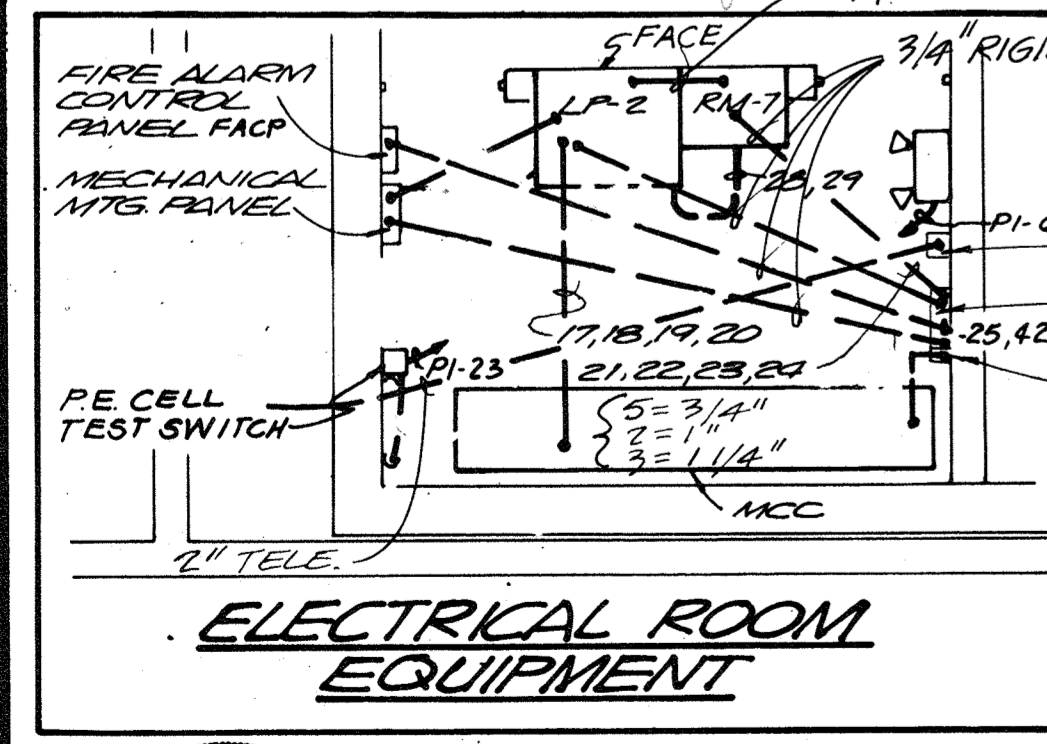
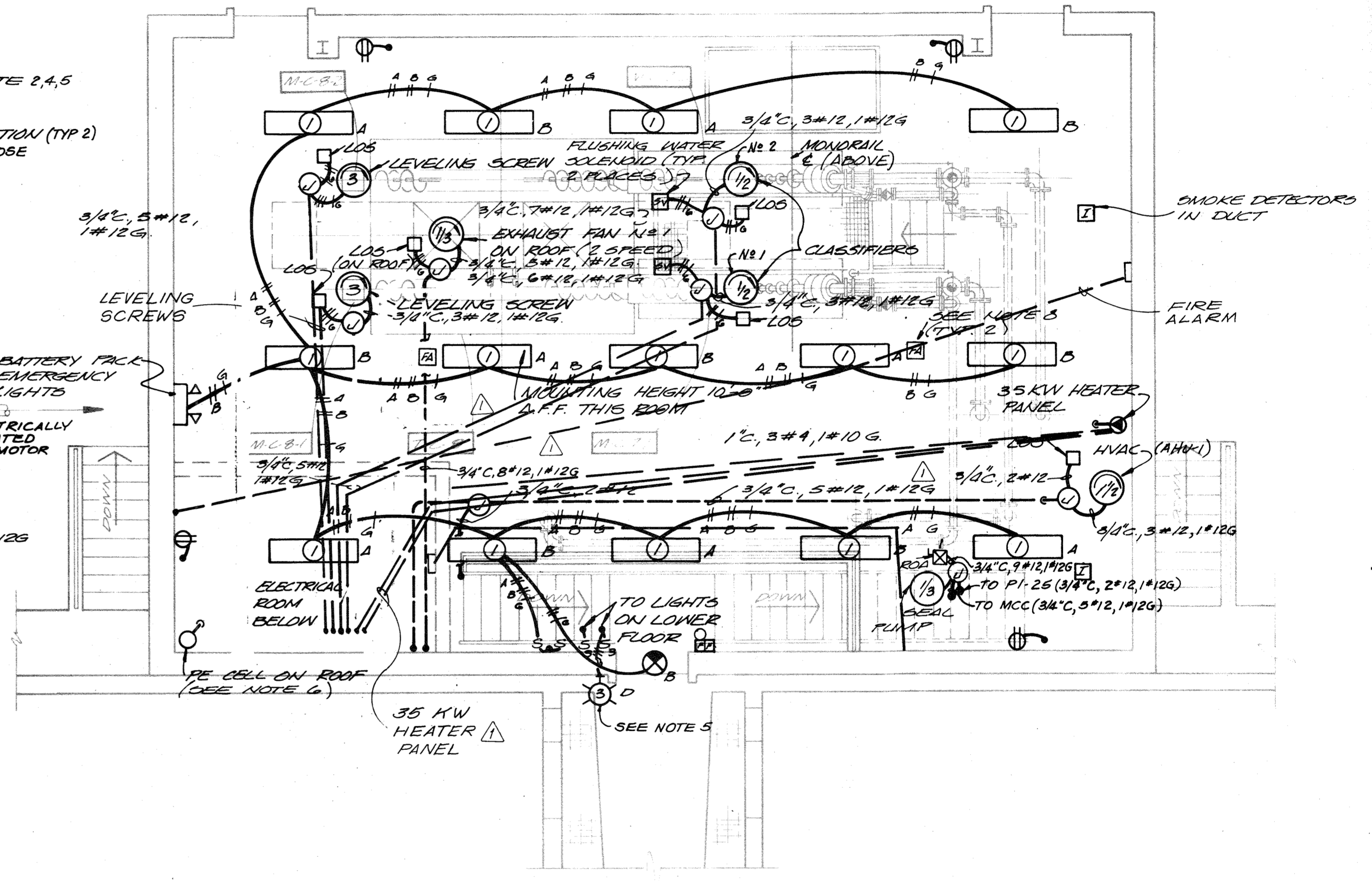
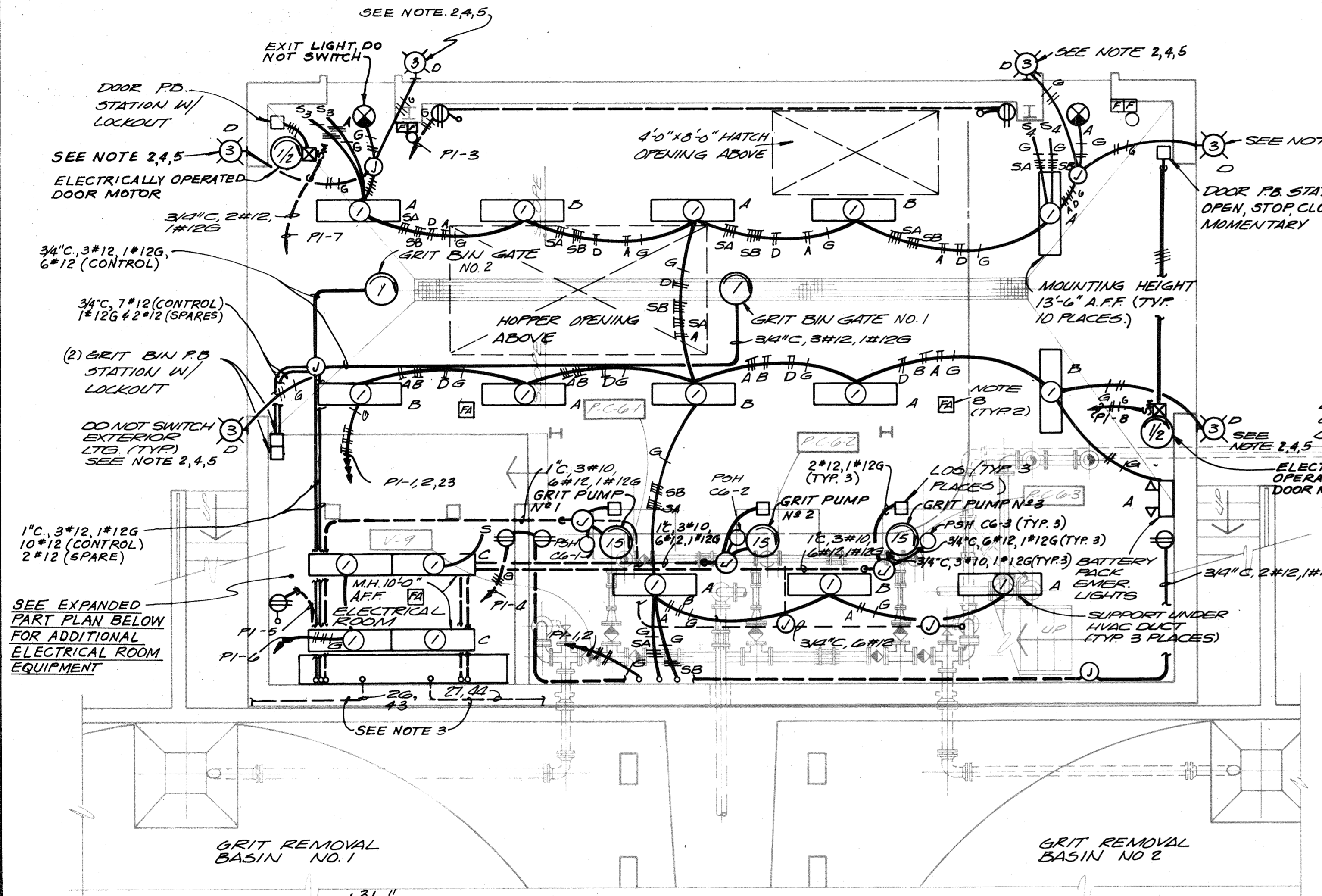
ELECTRICAL

SHEET OF E-4
DATE 8-78
DWG. NO. W1078.B1



NOTES

1. COORDINATE ALL LIGHT FIXTURE MOUNTING HEIGHTS W/ OTHER SPECIALTY CONTRACTORS TO AVOID CONFLICTS W/ PIPING.
2. ALL EXTERIOR LIGHTING CONDUIT SHALL BE RUN INSIDE BUILDING, EXPOSED ON EXT. LPH-23, 2#12, 1#12 GND. DO NOT SWITCH. EXTERIOR LIGHTING.
3. SEE DRAWING E-7 FOR CONDUIT SIZE.
4. DO NOT MOUNT ANY LIGHTING FIXTURE ON THE HINGE SIDE OF A DOOR, WITH ANY PART OF THE FIXTURE BELOW THE TOP OF THE DOOR.
5. WALL MOUNT EXTERIOR LIGHTING FIXTURES 8'-0" ABOVE FINISHED GRADE. (MIN.)
6. MOUNT PHOTOCELL ON BUILDING ROOF FACING NORTH. SEE DETAILS ON SH. E-10
7. ALL CONDUITS ENTERING & LEAVING STRUCTURE SHALL HAVE A WATERTIGHT SEAL.
8. MOUNT THERMAL FIRE DETECTORS ON UNDERSIDE OF STEEL BEAMS.
9. MOUNT LOS FOR CLASSIFIERS ON COMMON PANEL PROVIDED FOR ROTAMETERS.



LOWER FLOOR PLAN - BELOW EL. 152.0

UPPER FLOOR PLAN - ABOVE EL. 152.0

GRIT PROCESSING BUILDING
1/4" = 1'-0"

RECORD DRAWING



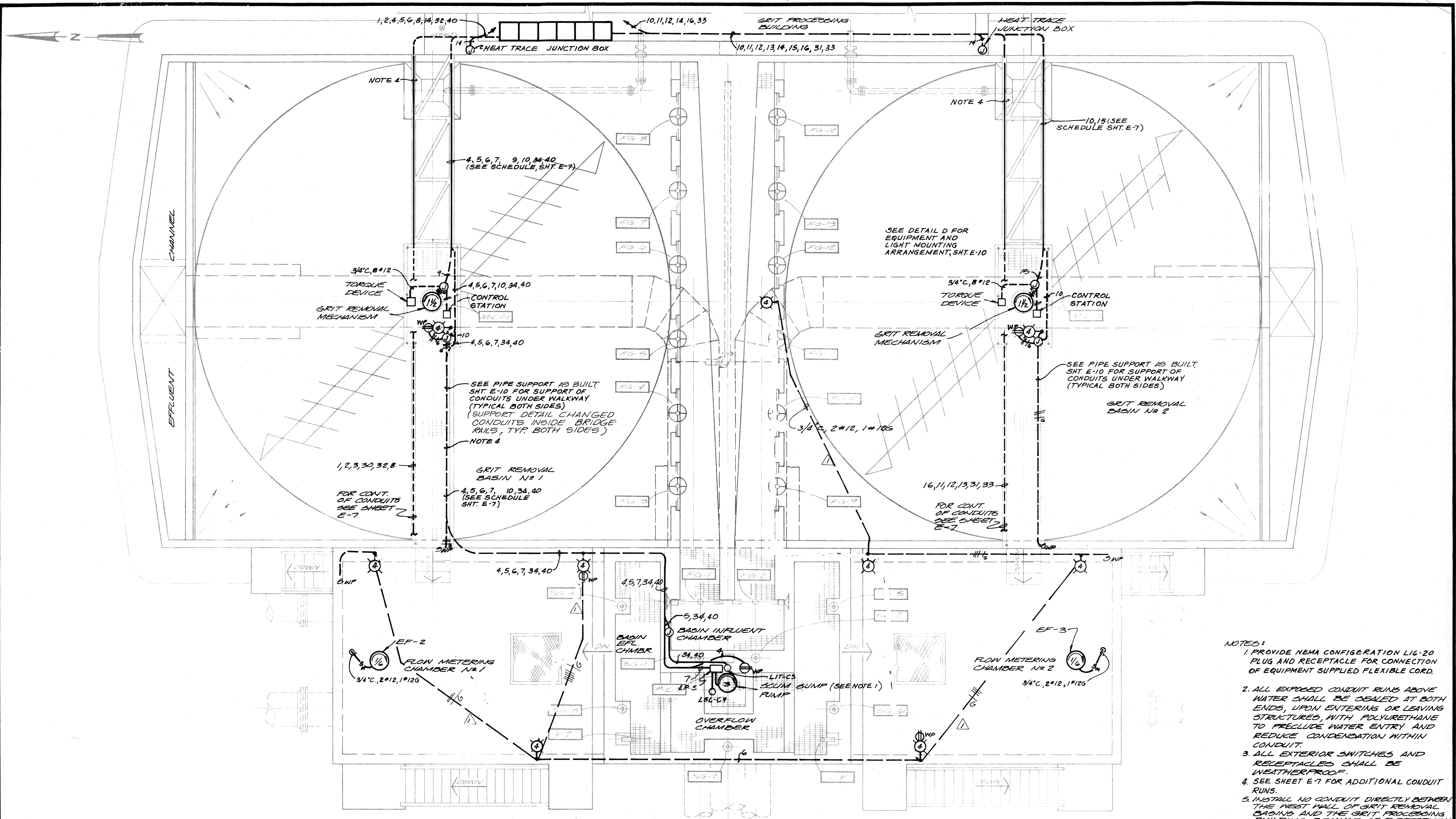
	DES. BSH	RELOCATE CONDUITS AS INSTALLED DLT	NO. DATE REVISION BY APPD.
	DR. SEM		
	CHK. ELS		
	APPD.		

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
DATE
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

GRIT PROCESSING BLDG.
POWER & LIGHTING PLAN
ELECTRICAL

SHEET OF **E-5**
DATE 8-78
DWG. NO. W11078.B1



- NOTES:
1. PROVIDE NEMA CONFIGURATION LI6-20 PLUG AND RECEPTACLE FOR CONNECTION OF EQUIPMENT SUPPLIED FLEXIBLE CORD.
 2. ALL EXPOSED CONDUIT RUNS ABOVE WATER SHALL BE SEALED AT BOTH ENDS, UPON ENTERING OR LEAVING STRUCTURES, WITH POLYURETHANE TO PRECLUDE WATER ENTRY AND REDUCE CONDENSATION WITHIN CONDUIT.
 3. ALL EXTERIOR SWITCHES AND RECEPTACLES SHALL BE WEATHERPROOF.
 4. SEE SHEET E-7 FOR ADDITIONAL CONDUIT RUNS.
 5. INSTALL NO CONDUIT DIRECTLY BETWEEN THE WEST WALL OF GRIT REMOVAL BASIN AND THE GRIT PROCESSING BUILDING BECAUSE OF DIFFERENTIAL SETTLEMENT BETWEEN STRUCTURES.

GRIT REMOVAL BASIN & FLOW METERING CHAMBER - PLAN
 1/4" = 1'-0"

RECORD DRAWING



CH2M HILL	DES. NV/BSH	1	1/11/81	RELOCATE CONDUITS AS BUILT	DLT
	DR. EEM				
	CHK. ELS				
APPD.		NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

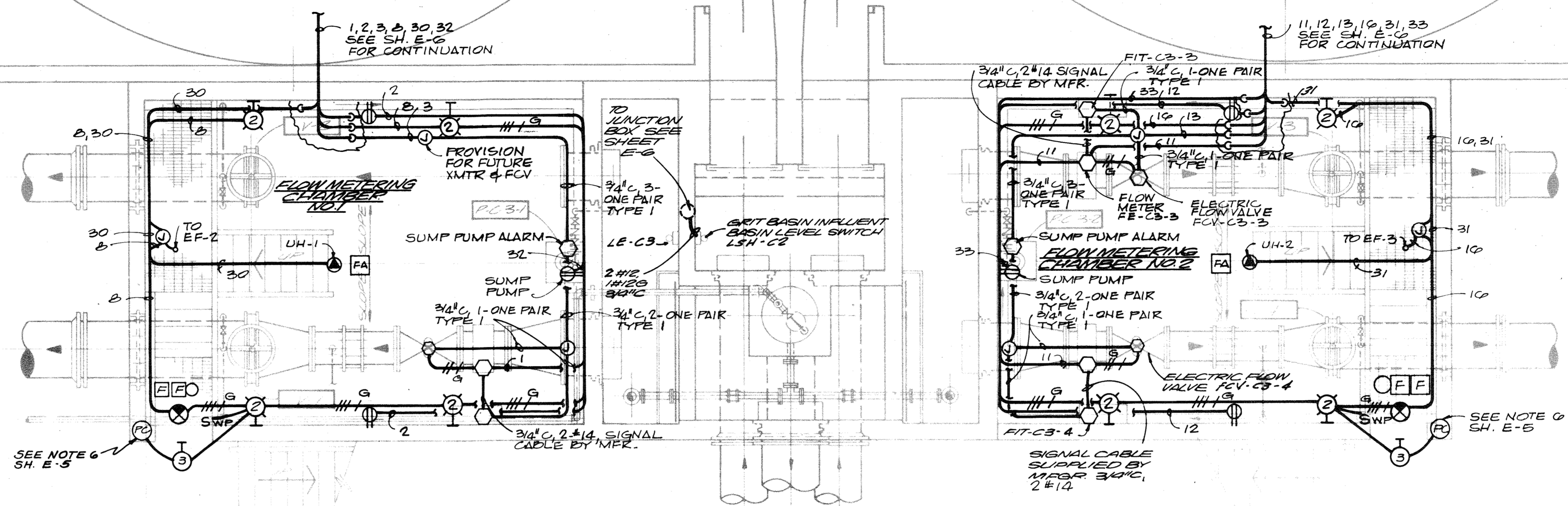
8-22-78
 DATE

Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

GRIT REMOVAL BASIN & FLOW METERING CHAMBERS
POWER & LIGHTING PLAN
 ELECTRICAL

SHEET
E-6
 OF
 DATE 8-78
 DWG. NO. W1078 B1



FLOW METERING CHAMBERS - PLAN
SCALE: 1/4" = 1'-0"

NOTE
ALL CONDUITS ENTERING AND LEAVING STRUCTURES SHALL HAVE A WATER-TIGHT SEAL TO PRECLUDE WATER ENTRY UNDER THE 100 YEAR FLOOD LEVEL (30 FEET HEAD)

CONDUIT & WIRE SCHEDULE

NO.	CONDUIT & WIRE	FROM	TO
1	3/4" C, 4#12	P-1-15 & 16	ELECTRIC FLOW VALVE & FLOW METER (FLOW METERING CHAMBER NO. 1)
2	3/4" C, 6#12, 1#12G	P-1-14	RECEPTACLES
3	1" C, 5-ONE PAIR, TYPE 1	FLOW METER LP-2	(INCLUDES SPARE CABLES FOR XMTR, ELEC. VALVE FUTURE XMTR, FCV.)
4	3/4" C, 2#12, 1#12G	P-1-27	PORTABLE GATE OPERATOR OUTLET
5	3/4" C, 2#12, 1#12G	LP-2	GRIT BASIN INFLUENT BASIN LEV. SWITCH
6	3/4" C, 2#12, 1#12G	P-1-10-13	FLOW METERING CHAMBER LIGHTING & RECEPTACLES (TOP)
7	3/4" C, 8#12, 1#12G	P.M.S.-C-9	SCUM SUMP PUMP
8	3/4" C, 2#12, 1#12G	P-1-9	EF-2, LIGHTS
9	1" C, 12#12, 1#12G	M-MS-C-7-2	GRIT REM. MECH. NO. 1
10	3/4" C, 2#12, 1#12G	P-1-9, P-1-13	GRIT BASIN #2 LIGHTING & RECEPTACLES
11	3/4" C, 4#12, 1#12G	P-1-15 & 16	ELEC. FLOW VALVE & FLOW METER FLOW METERING CHAMBER NO. 2
12	3/4" C, 2#12, 1#12G	P-1-14	RECEPTACLES
13	1" C, 5 ONE PAIR TYPE 1	FLOW METER XMTR, ELEC. VALVE, SUMP PUMP ALARM	LP-2
14	3/4" C, 2#12, 1#12G	P-1-18	HEAT TRACE
15	1" C, 12#12, 1#12G	M-MS-C-1-1	GRIT REM. MECH. NO. 2
16	3/4" C, 2#12, 1#12G	P-1-21	EF-3, LIGHTS
17	3/4" C, 9#12	M-MS-C-8-2	LP-2
18	3/4" C, 11#12	M-MS-C-7-2	LP-2
19	1" C, 16#12	M-MS-C-1-2	LP-2
20	1/2" C, 23#12 (1G, 3SP)	P.M.S.-C-6-3	LP-2
21	3/4" C, 9#12	M-MS-C-8-1	LP-2
22	3/4" C, 11#12	M-MS-C-7-1	LP-2
23	1" C, 16#12	M-MS-C-1-1	LP-2
24	1/2" C, 23#12 (1G, 3SP)	P.M.S.-C-6-2	LP-2
25	1/2" C, 23#12 (1G, 3SP)	P.M.S.-C-6-1	LP-2
26	3" C, 3#150 MCM, 1#3G	CC2-24	MCC (GRIT BUILDING)
27	3" C, 3#150 MCM, 1#3G	CC2-50	MCC (GRIT BUILDING)
28	3/4" C, ONE PAIR, TYPE 1	LP-2	MULTIPLEXER
29	1" C, ONE PAIR, TYPE 2	LP-2	MULTIPLEXER

NO.	CONDUIT & WIRE	FROM	TO
30	3/4" C, 3#12, 1#12G	MCC	UH-1
31	3/4" C, 3#12, 1#12G	MCC	UH-2
32	3/4" C, 2#12, 1#12G	LP-20	SUMP PUMP RECEPTACLE (CHAMBER NO. 1)
33	3/4" C, 2#12, 1#12G	LP-22	SUMP PUMP RECEPTACLE (CHAMBER NO. 2)
34	3/4" C, ONE PAIR, TYPE 1	LIT-C3	LP-2
35	1" C	LP-2	MANHOLE C (FUTURE)
36	1" C	LP-2	MANHOLE C (FUTURE)
37	1" C	LP-2	MANHOLE C (FUTURE)
38	1" C	LP-2	MANHOLE C (FUTURE)
39	1" C	LP-2	MANHOLE C (FUTURE)
40	3/4" C, 2#12	LIT-C3	P-1-24
41	3/4" C, 2#12	MMP	LP-2
42	3/4" C, 2#12	MCC-1C	LP-2
43	3" C	MCC	MANHOLE 3 VIA MANHOLE A
44	3" C	MCC	MANHOLE 3 VIA MANHOLE B
45	2-1" C	RM-7	MANHOLE 3 VIA MANHOLE A
46	2-1" C	RM-7	MANHOLE 3
47	2-1" C	FACP	MANHOLE 3 VIA MANHOLE A
48	2-1" C	FACP	MANHOLE 3 VIA MANHOLE B

RECORD DRAWING



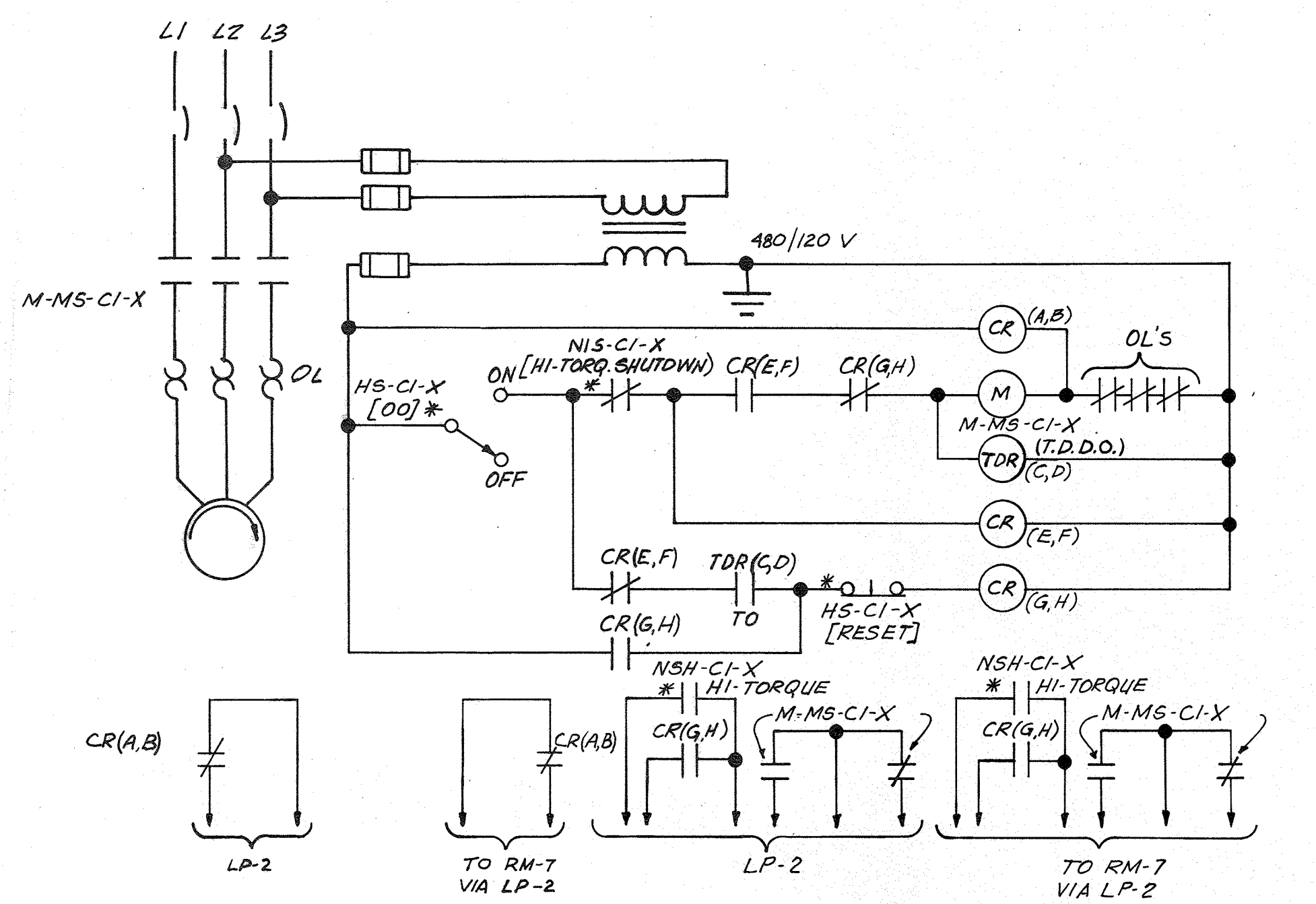
	DES. N.V.	11-82 CONDUIT & WIRE SCHEDULE # 46	OLT		
	DR. CFE JR.				
	CHK. E.L.S.				
APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 8-22-78
 DATE
 Robert B. Miller
 CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
 ADDITION NO. 4
 CONTRACT NO. 763-S

FLOW METERING CHAMBERS
POWER & LIGHTING PLAN & DETAILS
 ELECTRICAL

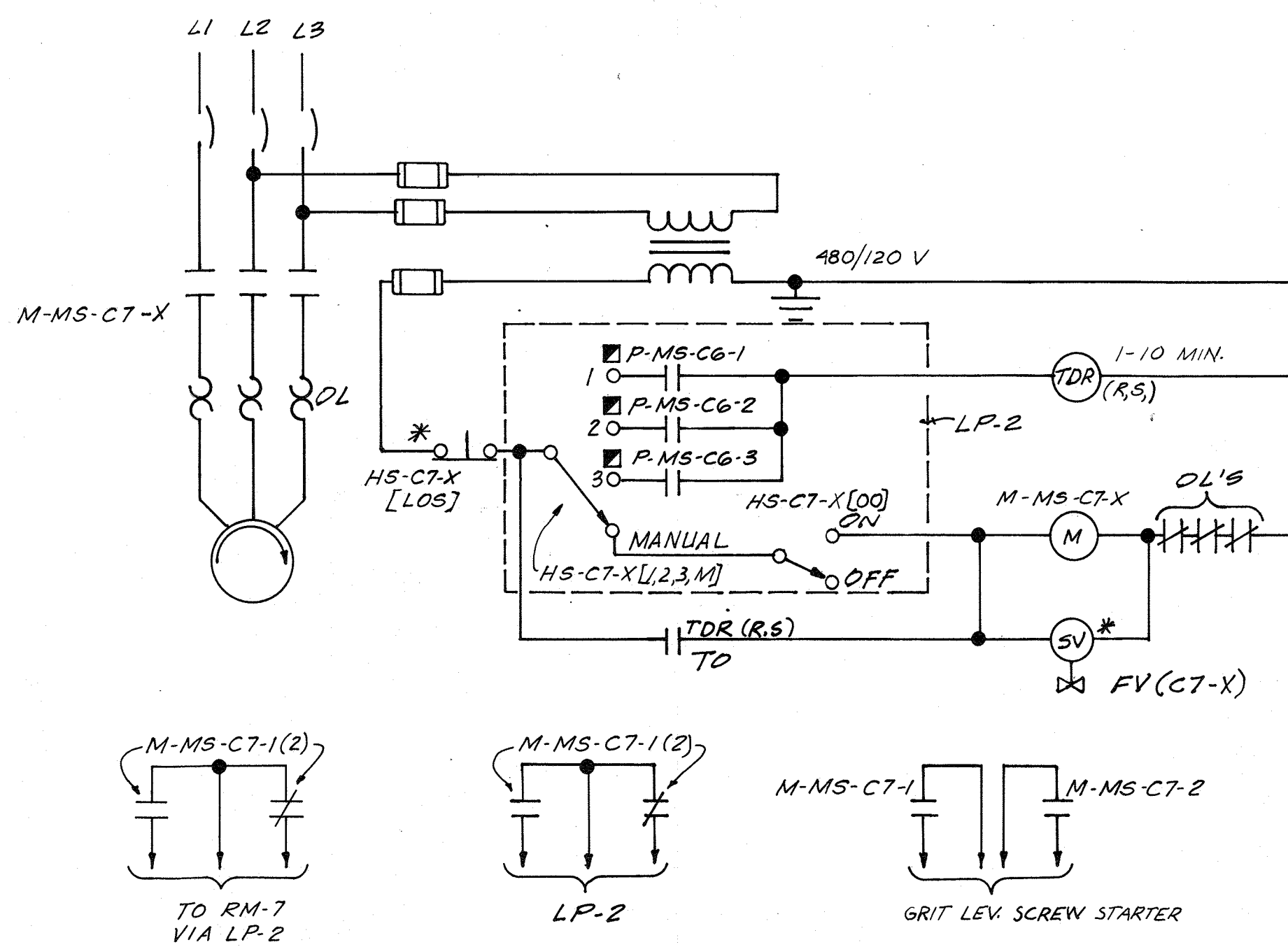
SHEET OF **E-7**
 DATE 8-78
 DWG. NO. W1078.B1



X=1	M-C1-1	HS-C1-1[00]	NIS-C1-1	CR-A	M-MS-C1-1	TDR-C	CR-E	CR-G	NIS-C1-1	HI-TORQ	HS-C1-1[RESET]
X=2	M-C1-2	HS-C1-2[00]	NIS-C1-2	CR-B	M-MS-C1-2	TDR-D	CR-F	CR-H	NIS-C1-2	HI-TORQ	HS-C1-2[RESET]

GRIT REMOVAL MECHANISM M-C 1-1 & M-C 1-2

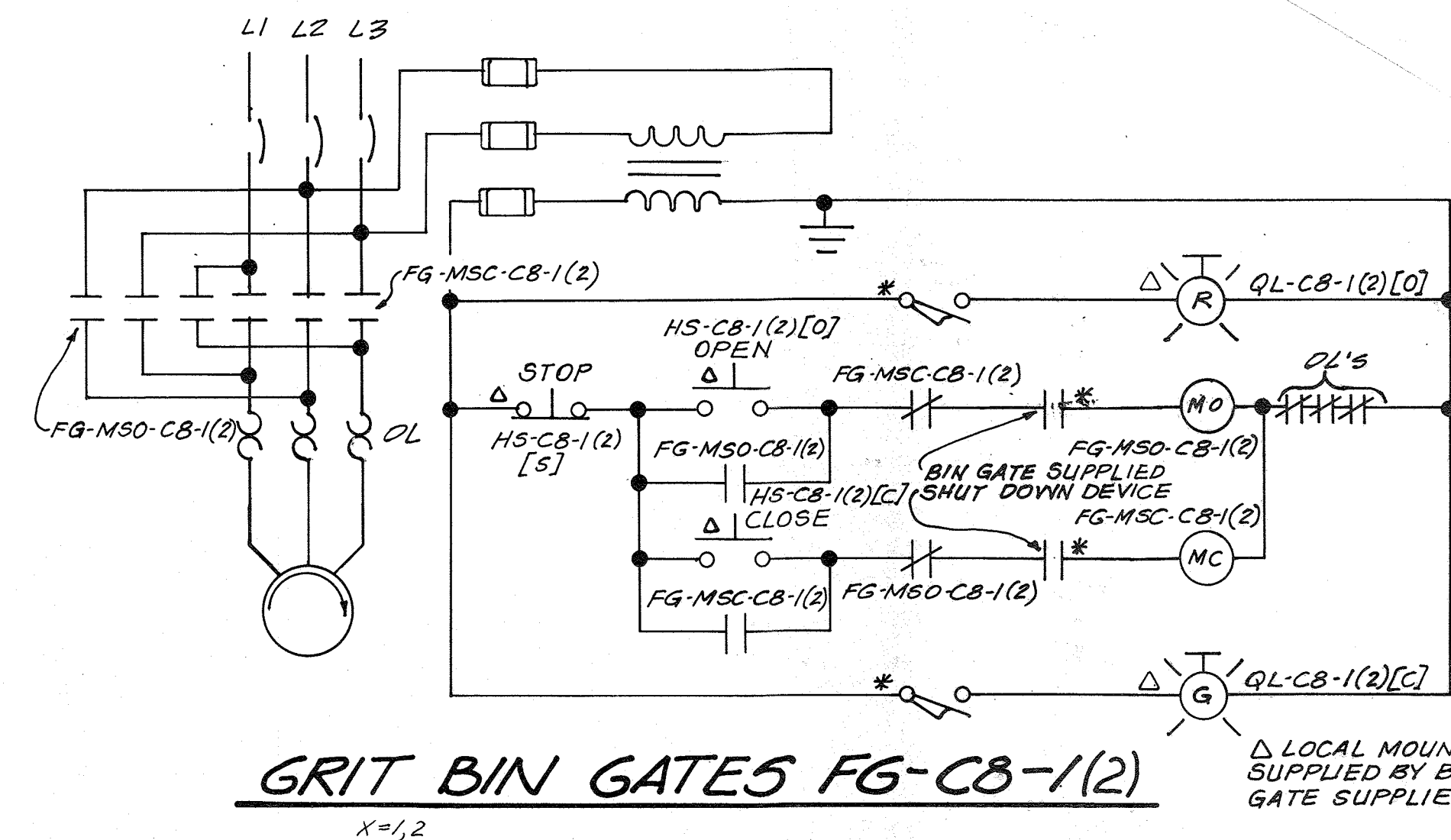
X=1,2



X=1	M-C7-1	HS-C7-1[LOS]	HS-C7-1[1,2,3,M]	HS-C7-1[00]	TDR-R	FV-C7-1
X=2	M-C7-2	HS-C7-2[LOS]	HS-C7-2[1,2,3,M]	HS-C7-2[00]	TDR-S	FV-C7-2

GRIT CLASSIFIER M-C 7-1 & M-C 7-2

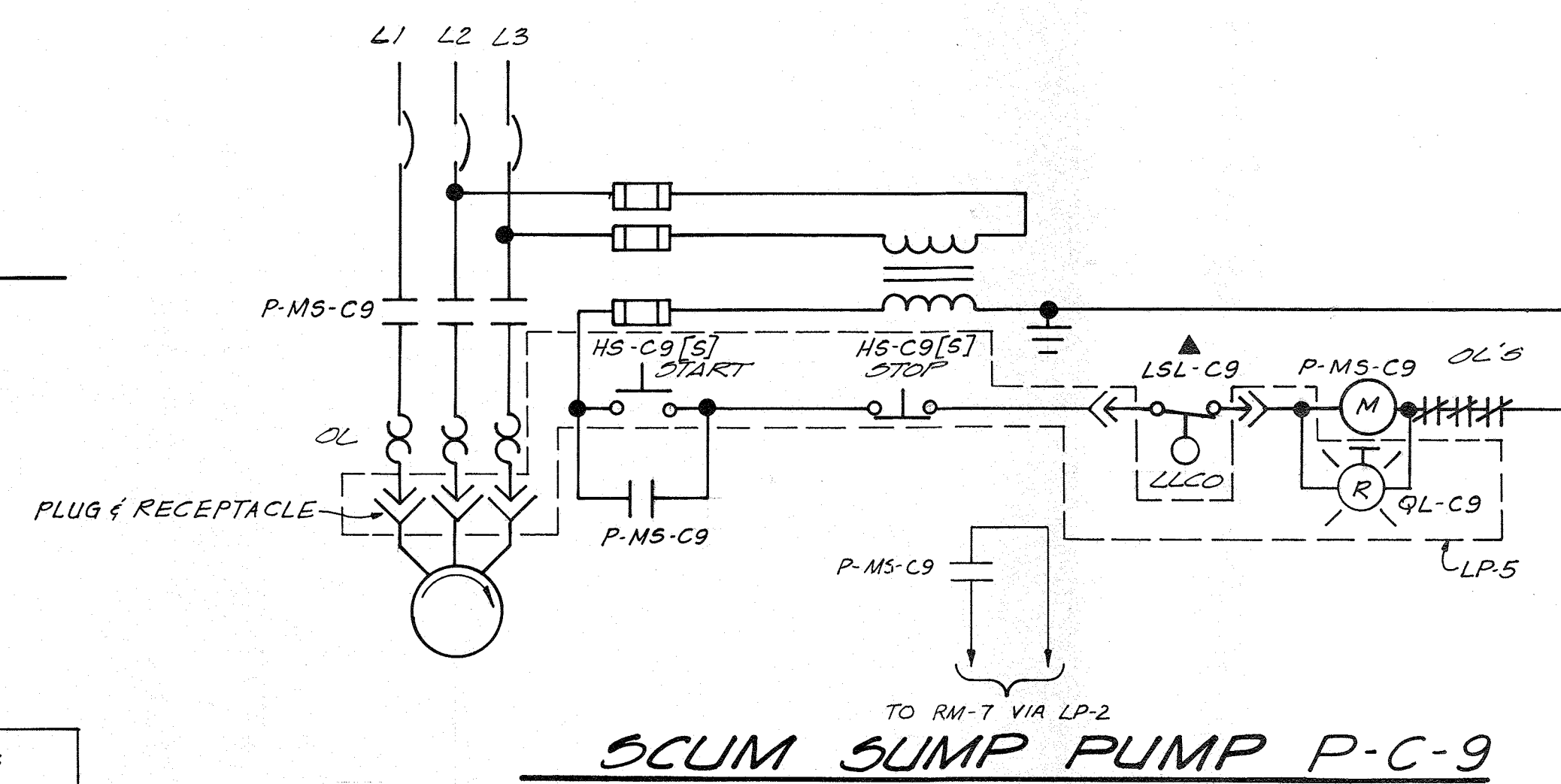
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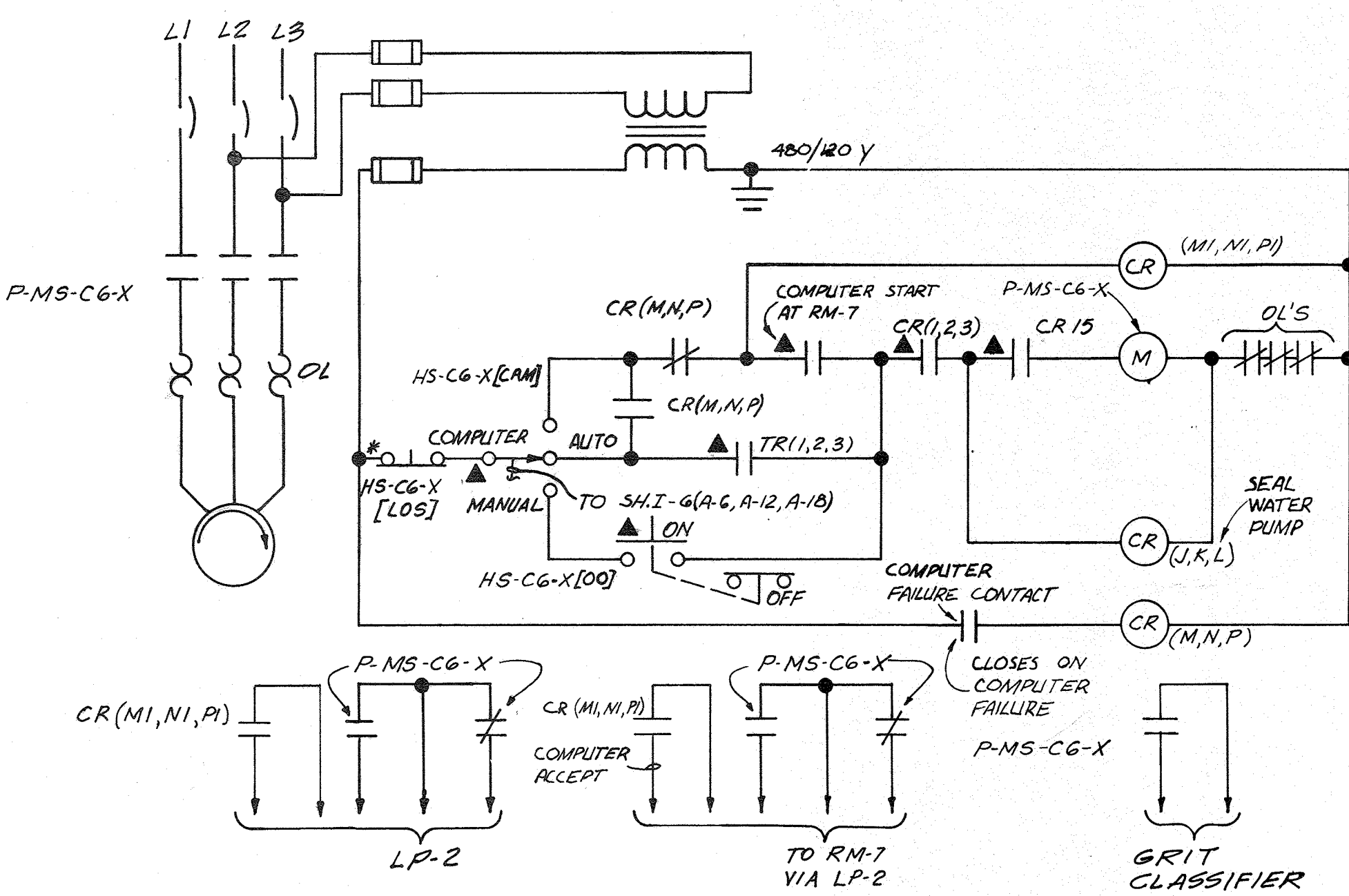
GRIT BIN GATES FG-C8-1(2)

X=1,2

LOCAL MOUNT SUPPLIED BY BIN GATE SUPPLIER



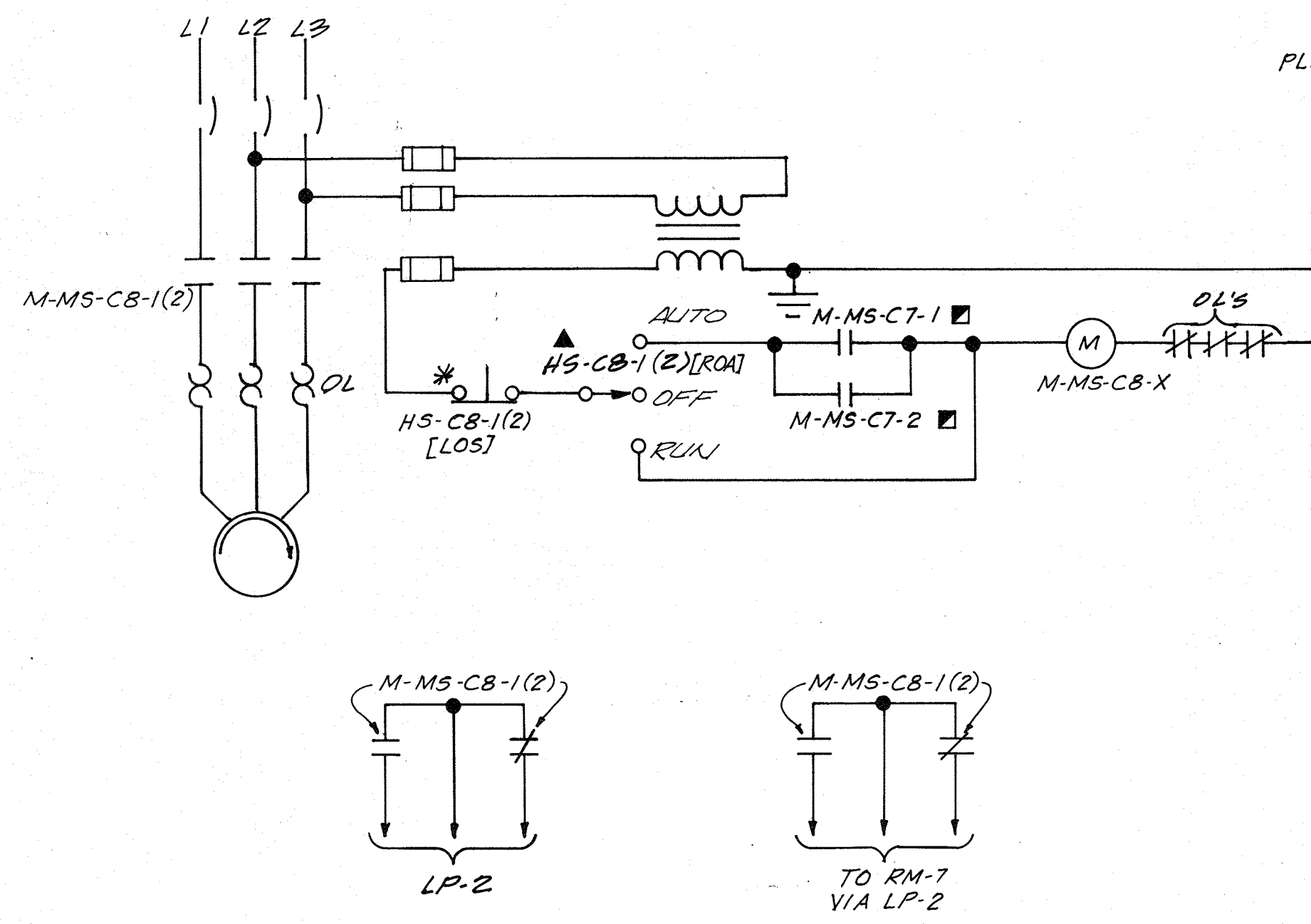
SCUM SUMP PUMP P-C 9



X=1	P-C6-1	HS-C6-1[LOS]	HS-C6-1[CAM]	HS-C6-1[00]	TR-1	CR-1	CR-J	CR-M	CR-N
X=2	P-C6-2	HS-C6-2[LOS]	HS-C6-2[CAM]	HS-C6-2[00]	TR-2	CR-2	CR-K	CR-N	CR-W
X=3	P-C6-3	HS-C6-3[LOS]	HS-C6-3[CAM]	HS-C6-3[00]	TR-3	CR-3	CR-L	CR-P	CR-B

GRIT PUMP P-C 6-1, P-C 6-2, P-C 6-3

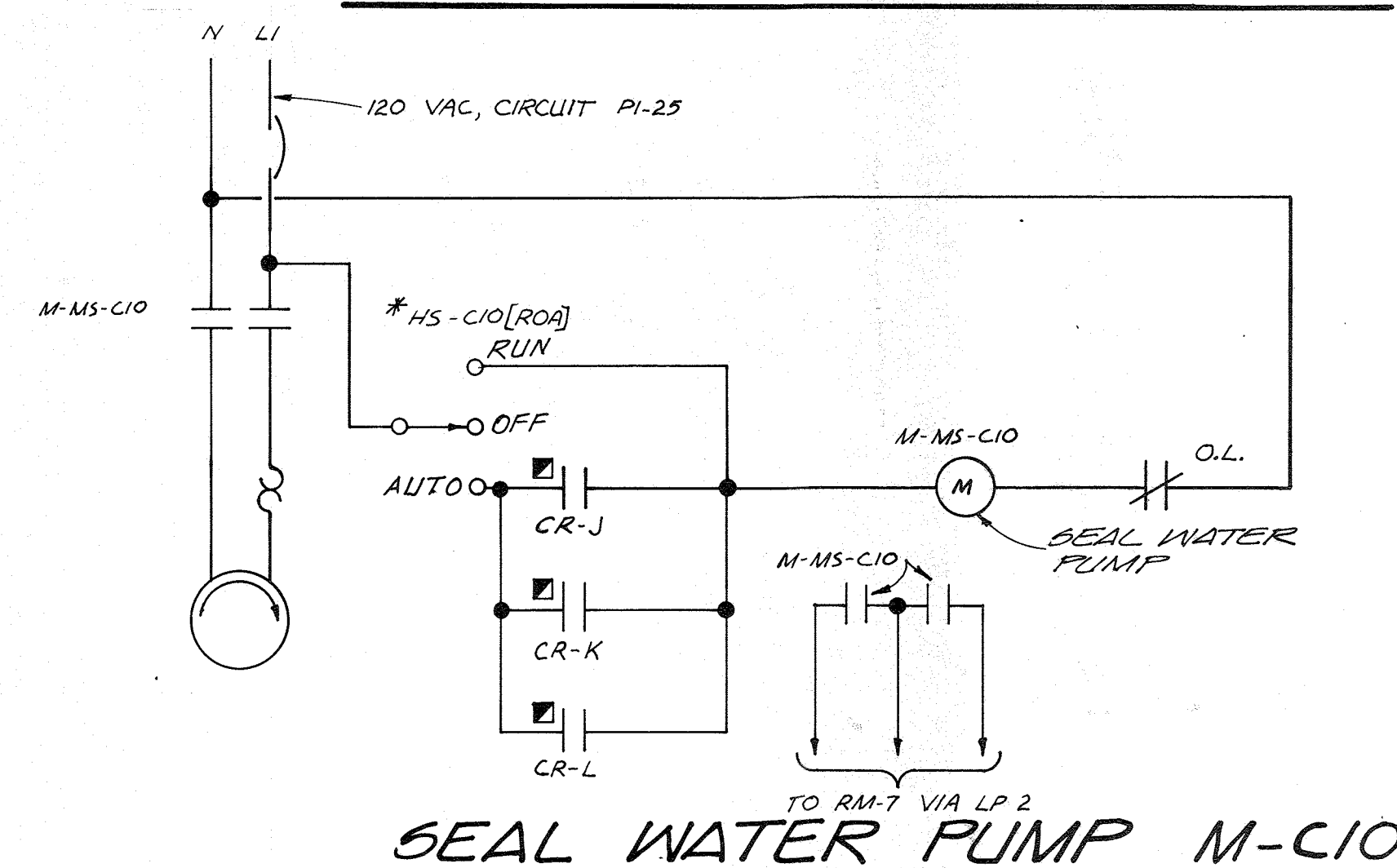
X=1,2,3



X=1	M-C8-1	HS-C8-1[LOS]	HS-C8-1[ROA]
X=2	M-C8-2	HS-C8-2[LOS]	HS-C8-2[ROA]

GRIT BIN LEVELING SCREEN M-C 8-1 & M-C 8-2

X=1,2



SEAL WATER PUMP M-C 10

RECORD DRAWING



CH2M HILL	DES. E.L.S.								
	DR. T.Q.								
	CHK. E.L.S.								
	APPD.	NO.	DATE	REVISION	BY	APPD.			

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

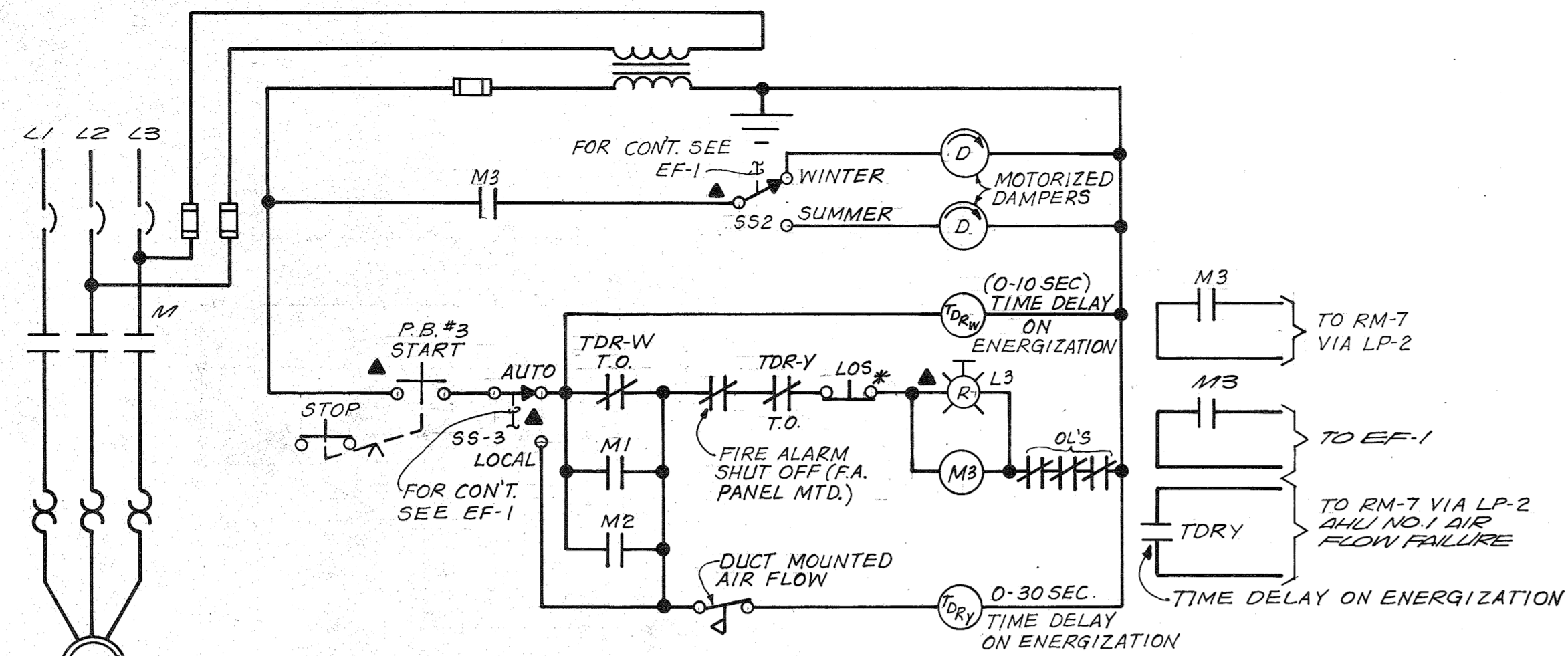
Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

CONTROL SCHEMATIC

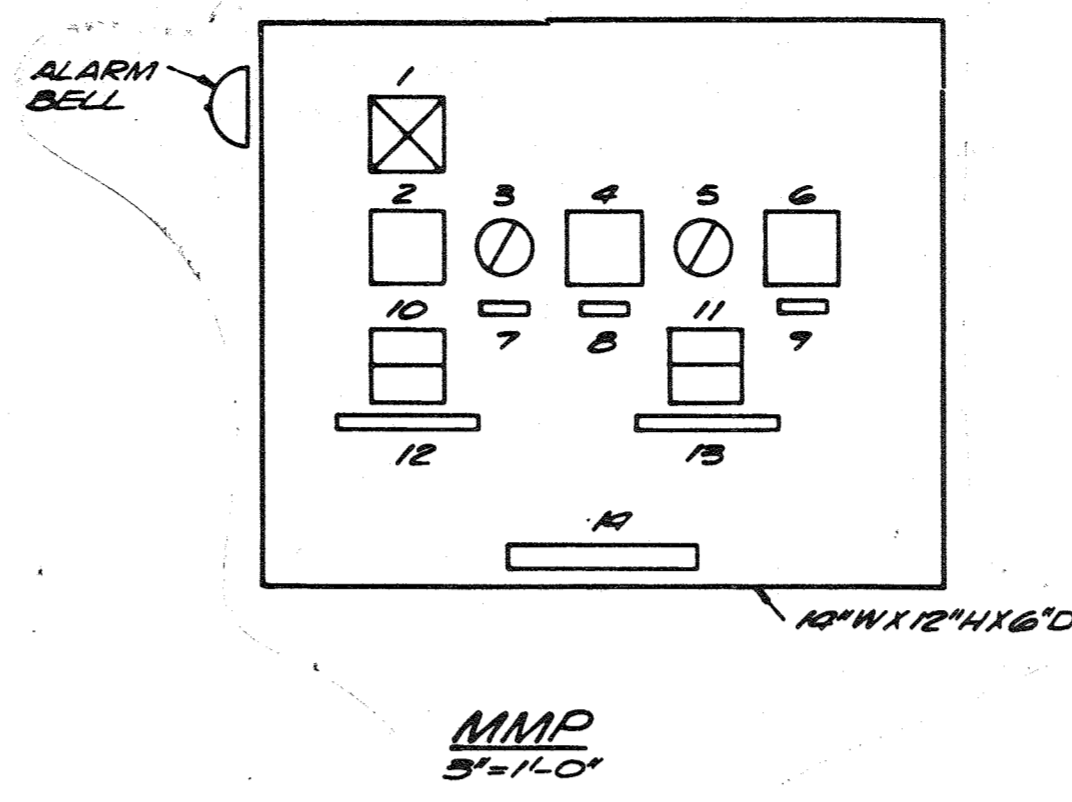
ELECTRICAL

SHEET
OF
E-8
DATE 8-78
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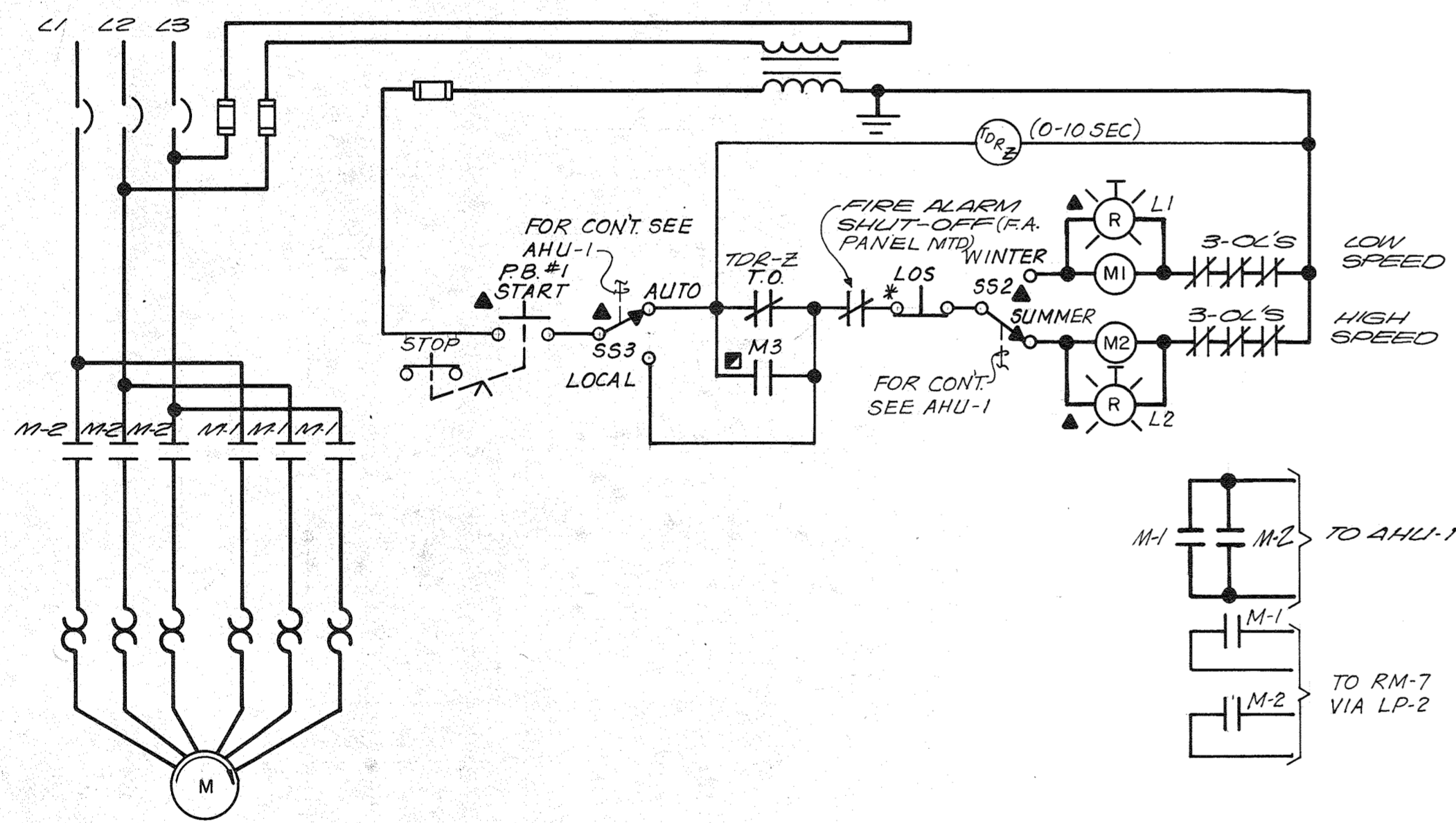


NOTE:
ELECTRICAL CONTRACTOR TO CLOSELY COORDINATE WITH THE HVAC CONTROL SYSTEM SUPPLIER. STARTER FURNISHED, INSTALLED AND WIRED UNDER ELECTRICAL. ALL MOTOR CONTROL EXTERIOR TO THE STARTER IS FURNISHED, INSTALLED, AND WIRED UNDER HVAC.

AIR HANDLING UNIT - AHU-1

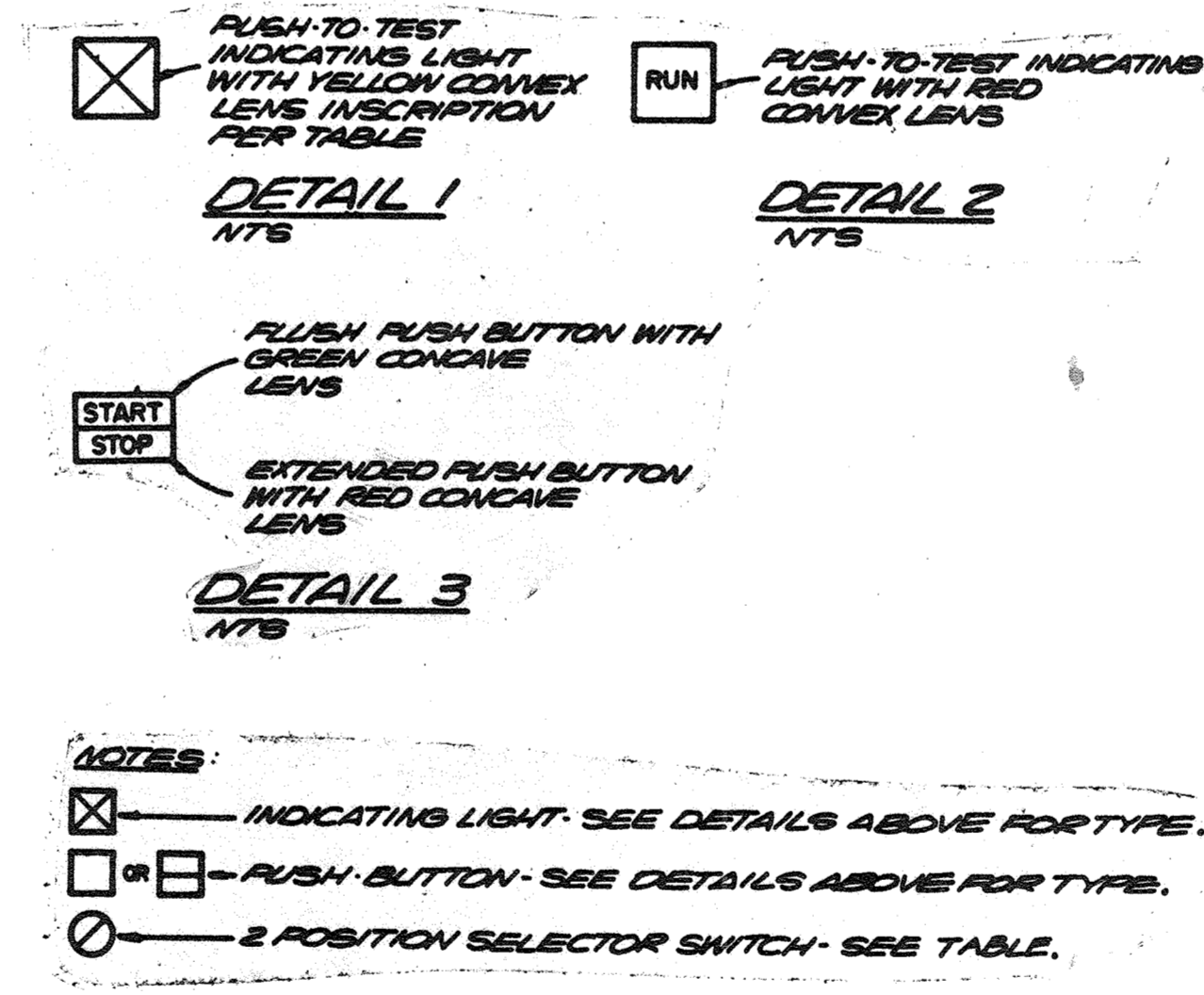


ITEM	DESCRIPTION	REMARKS / INSCRIPTION
1	DETAIL 1	AIR HANDLING UNIT AIRFLOW FAILURE
2	DETAIL 2	LOCAL - AUTO
3	SEL. SW	LOCAL - AUTO
4	DETAIL 2	WINTER - SUMMER
5	SEL. SW	WINTER - SUMMER
6	DETAIL 2	EXH. FAN & AIR HANDLING UNIT LOCAL - AUTO
7	1/2" X 1/2" NAMEPLATE	EXH. FAN & AIR HANDLING UNIT LOCAL - AUTO
8	1/2" X 1/2" NAMEPLATE	WINTER
9	1/2" X 1/2" NAMEPLATE	SUMMER
10	DETAIL 3	
11	DETAIL 3	
12	1/2" X 1/2" NAMEPLATE	AIR HANDLING UNIT AHU-1
13	1/2" X 1/2" NAMEPLATE	EXHAUST FAN EF-1
14	1/4" X 1/4" NAMEPLATE	MECHANICAL CONTROL PANEL MMP



NOTE:
ELECTRICAL CONTRACTOR TO CLOSELY COORDINATE WITH THE HVAC CONTROL SYSTEM SUPPLIER. STARTER FURNISHED, INSTALLED AND WIRED UNDER ELECTRICAL. ALL MOTOR CONTROL EXTERIOR TO THE STARTER IS FURNISHED, INSTALLED AND WIRED UNDER HVAC.

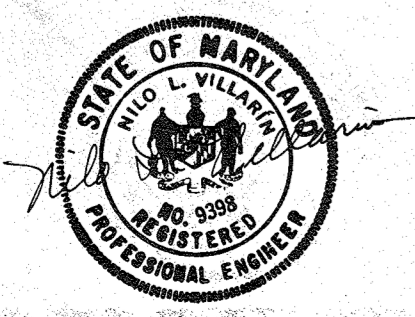
EXHAUST FAN EF-1



NOTES:
 ☒ INDICATING LIGHT - SEE DETAILS ABOVE FOR TYPE.
 ☐ OR ☐ PUSH BUTTON - SEE DETAILS ABOVE FOR TYPE.
 Ⓞ 2 POSITION SELECTOR SWITCH - SEE TABLE.

MECHANICAL MOUNTING PANEL DETAIL (F)
NTS

RECORD DRAWING



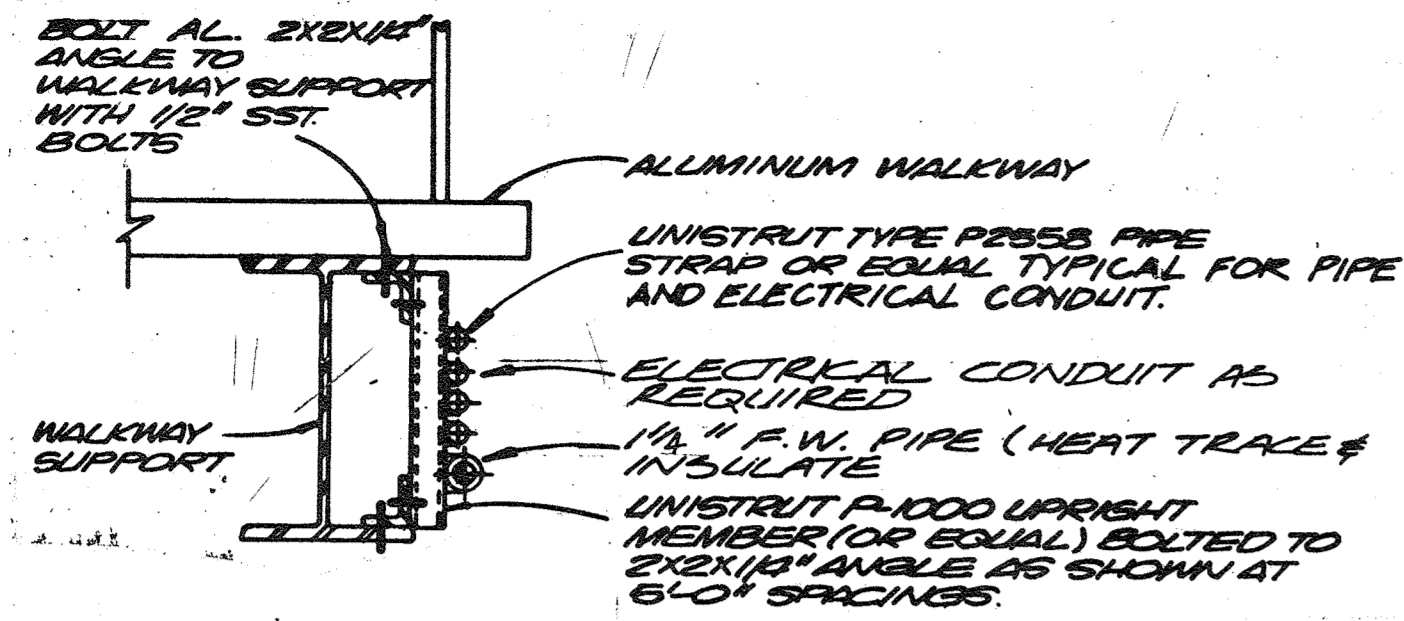
DES. BSH					
DR. C.E. JR.					
CHK. E.L.S.					
APPD.	NO.	DATE	REVISION	BY	APPD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
8-22-78
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Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

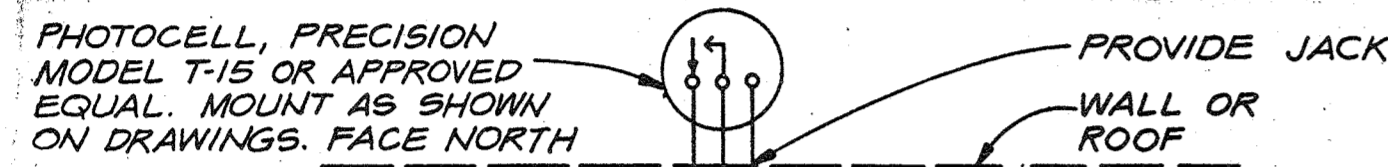
AHU-1, EF-1 CONTROL SCHEMATICS
AND MMP DETAIL
ELECTRICAL

SHEET E-9
OF
DATE 8-78
DWG. NO. W1078.B1



NOTE THIS DETAIL IS TYPICAL FOR BOTH SIDES OF WALKWAY AS REQUIRED

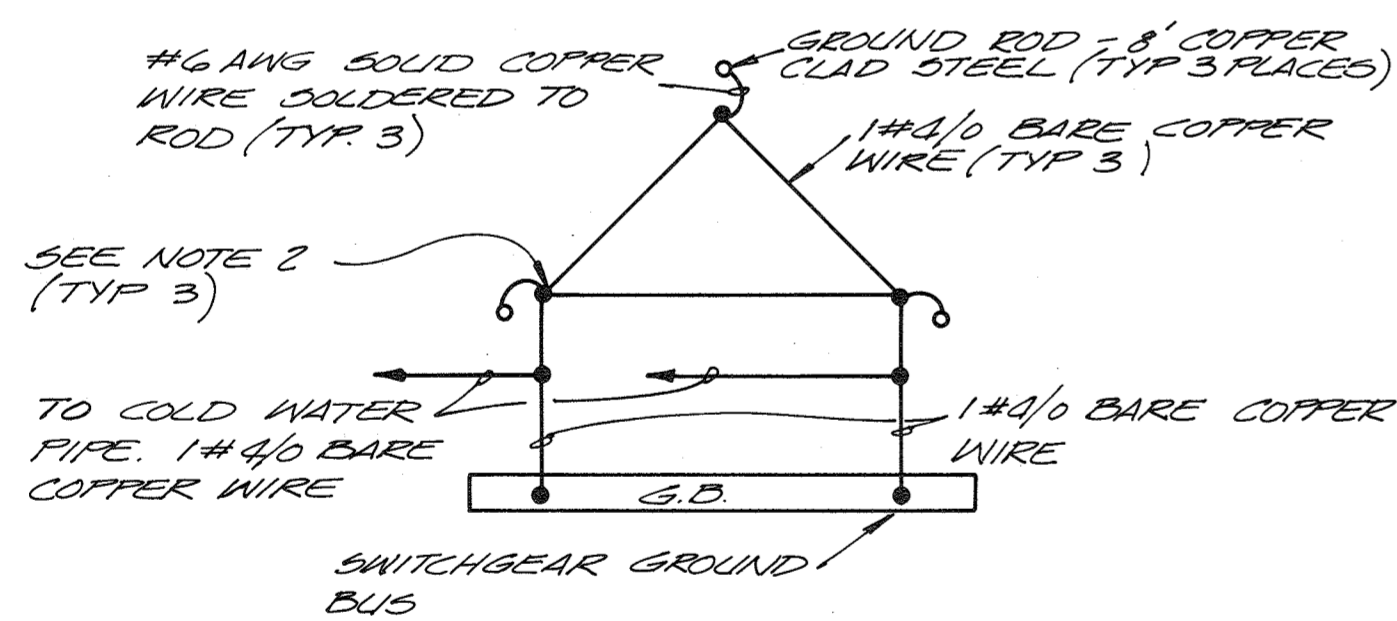
PIPE SUPPORT DETAIL E-6
N.T.S.



PHOTOCELL BYPASS TEST SWITCH
N.T.S.

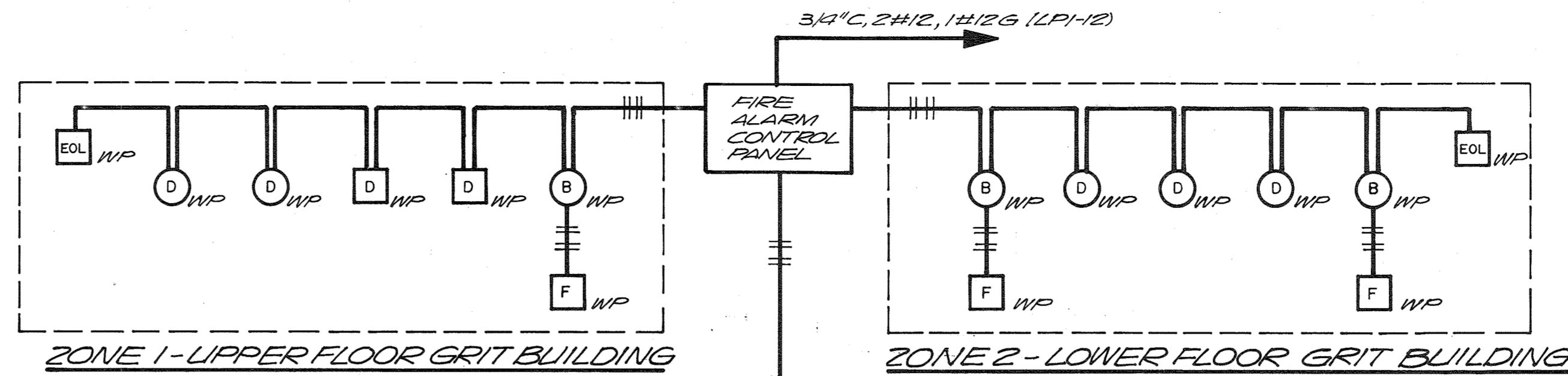
UNISTRUT BOLTED TO BOTTOM BEAM FLANGE. CONDUIT STRAPPED TO UNISTRUT UNDER WALKWAY. TYP. BOTH BASIN

PIPE SUPPORT AS BUILT
N.T.S.



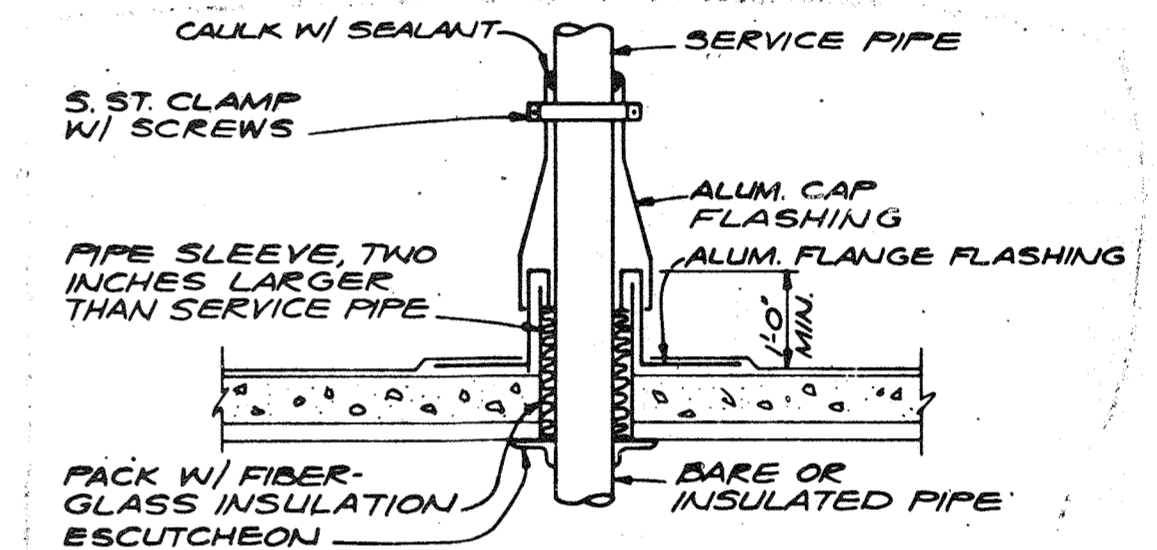
- NOTES:
1. LOCATE GROUND RODS 10'-0" MINIMUM APART WITH TOP 1'-0" UNDER FINISHED GRADE.
 2. THERMAL-WELD ALL CONNECTIONS TO GROUND RODS. OTHER GROUNDING CONNECTIONS BOLTED.
 3. IN ADDITION TO GROUNDING PROVISIONS INDICATED, PROVIDE GROUNDING REQUIRED BY NATIONAL ELECTRIC CODE.

DETAIL A E-2
N.T.S.

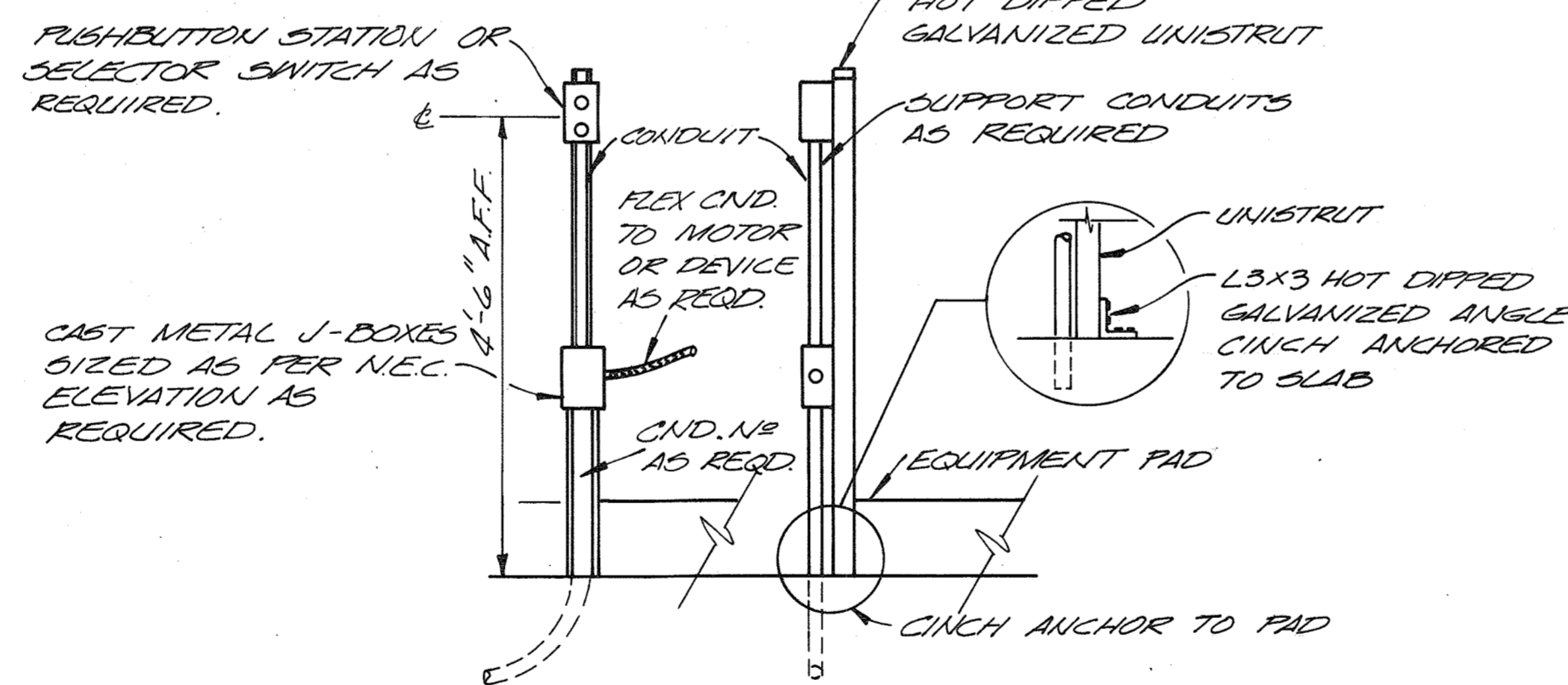


1. FOUR ZONE FIRE ALARM CONTROL PANEL SHALL BE CONNECTED AS SHOWN IN ABOVE DIAGRAM.
2. ALL WIRING IN FIRE ALARM SYSTEM SHALL BE #14 AWG UNLESS OTHERWISE NOTED.
3. THERMAL SMOKE DETECTORS SHALL BE INTERLOCKED IN ORDER TO SHUT DOWN HVAC FAN WHEN FIRE ALARM SOUNDS.
4. FAILURE OF ANY SENSOR SHALL SOUND THE FIRE SYSTEM TROUBLE SIGNAL.

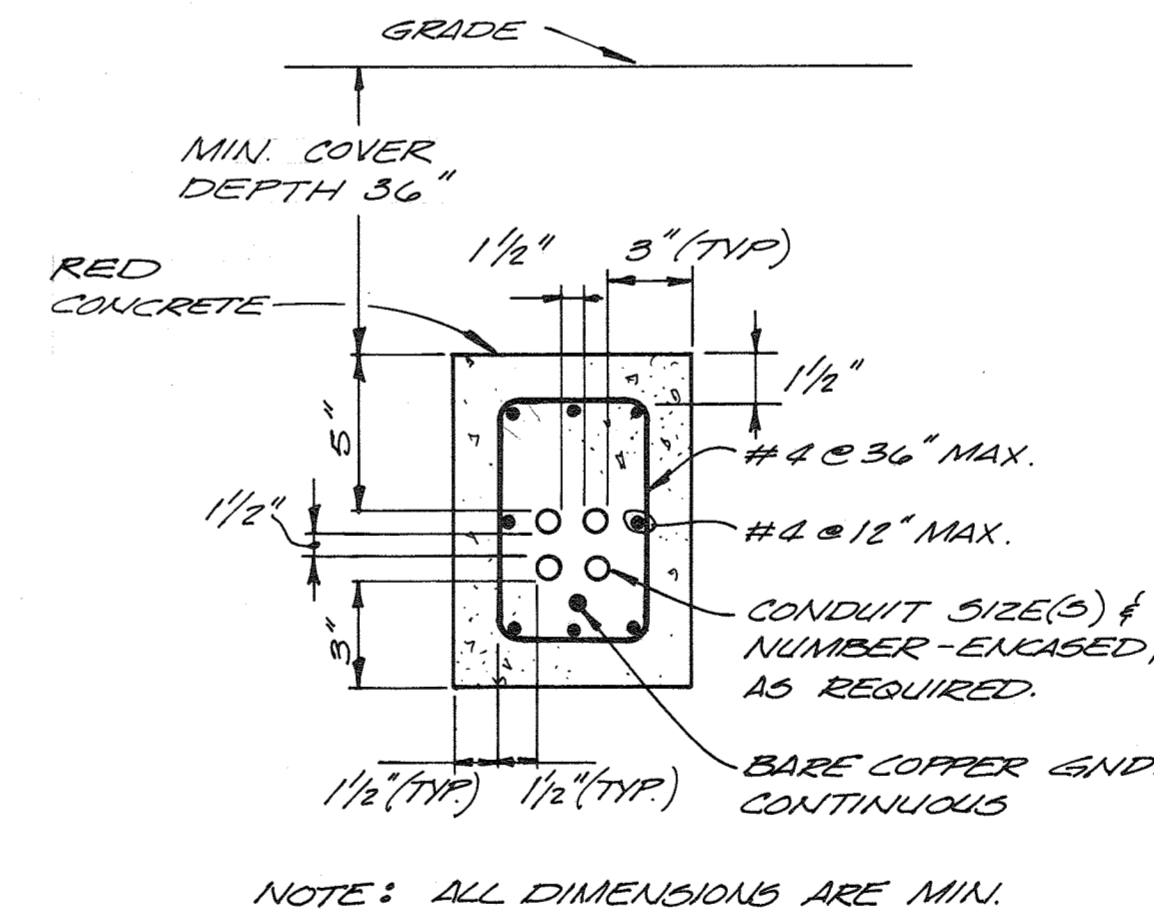
FIRE ALARM CONTROL DIAGRAM
N.T.S.



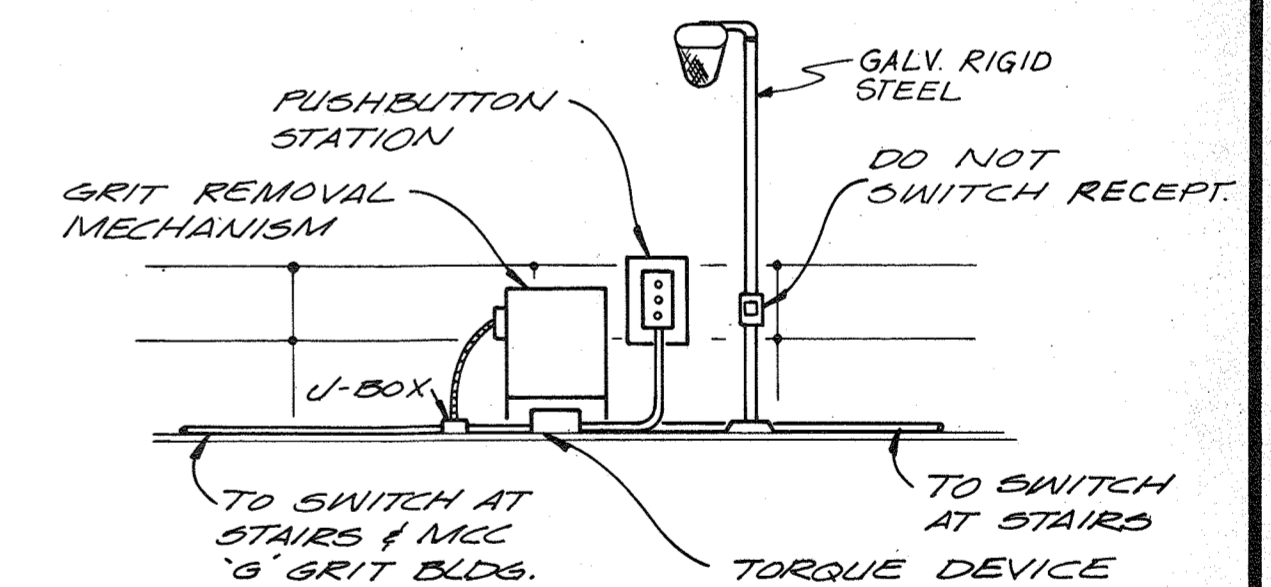
ROOF PENETRATION DETAIL FOR PHOTOELECTRIC (P.E) CELL
N.T.S.



PUSHBUTTON STATION DETAIL B E-6
N.T.S.



ENCAGED CONDUIT-REINFORCED C E-2
N.T.S.



DETAIL D E-6
N.T.S.

RECORD DRAWING

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

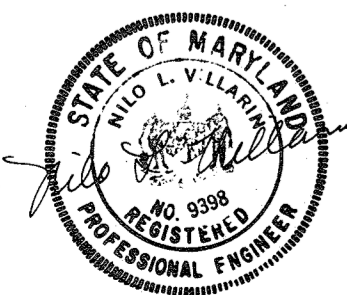
8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

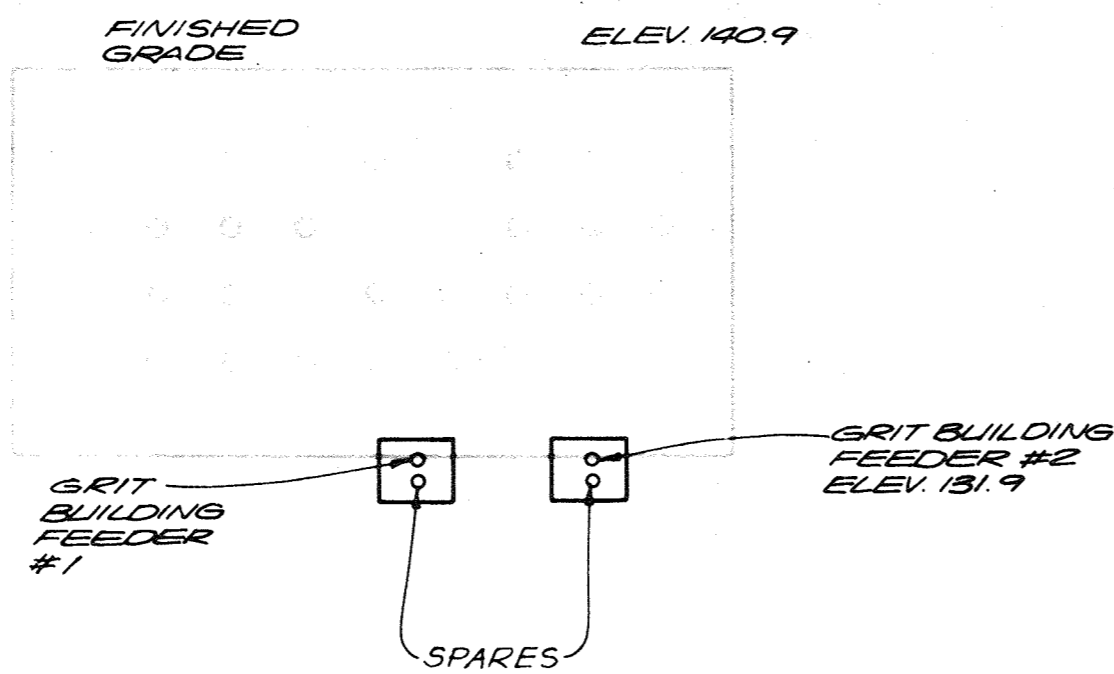
DETAILS:
ELECTRICAL

SHEET E-10
OF
DATE 8-78
DWG. NO. W1078.B1

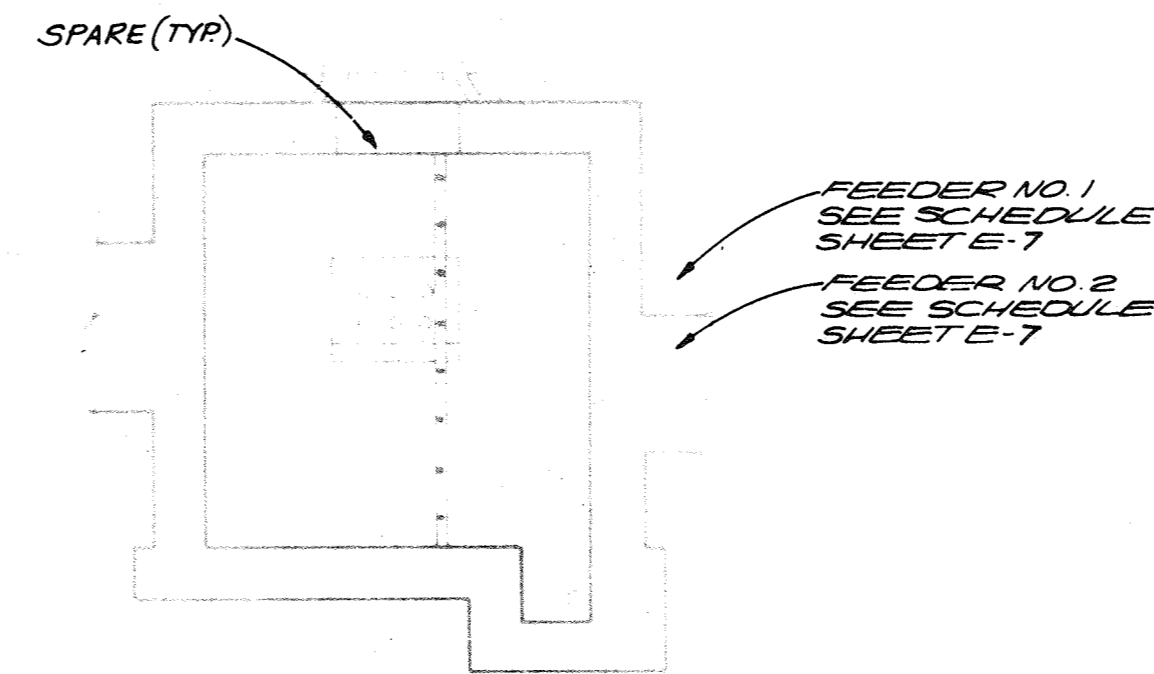


CH2M HILL

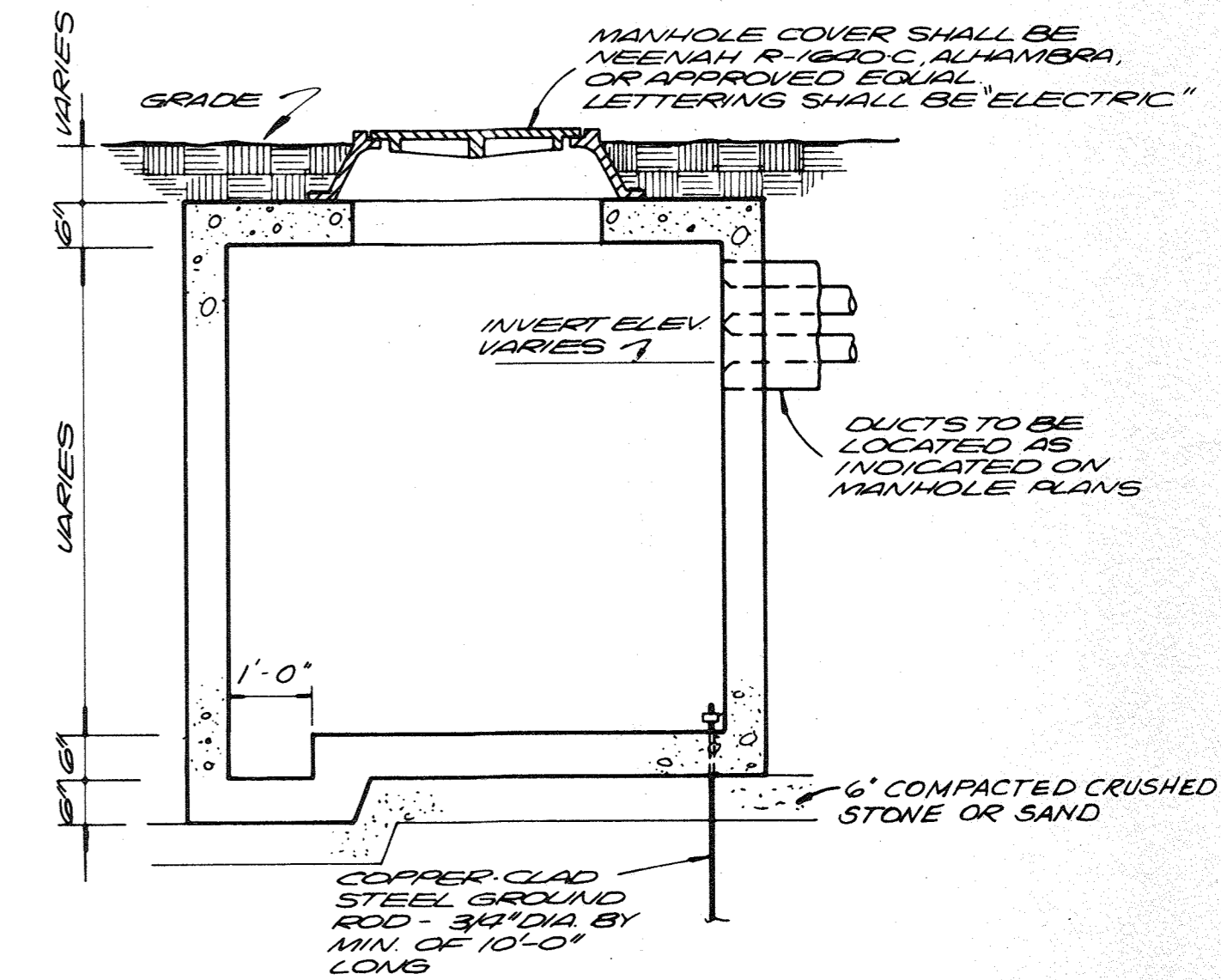
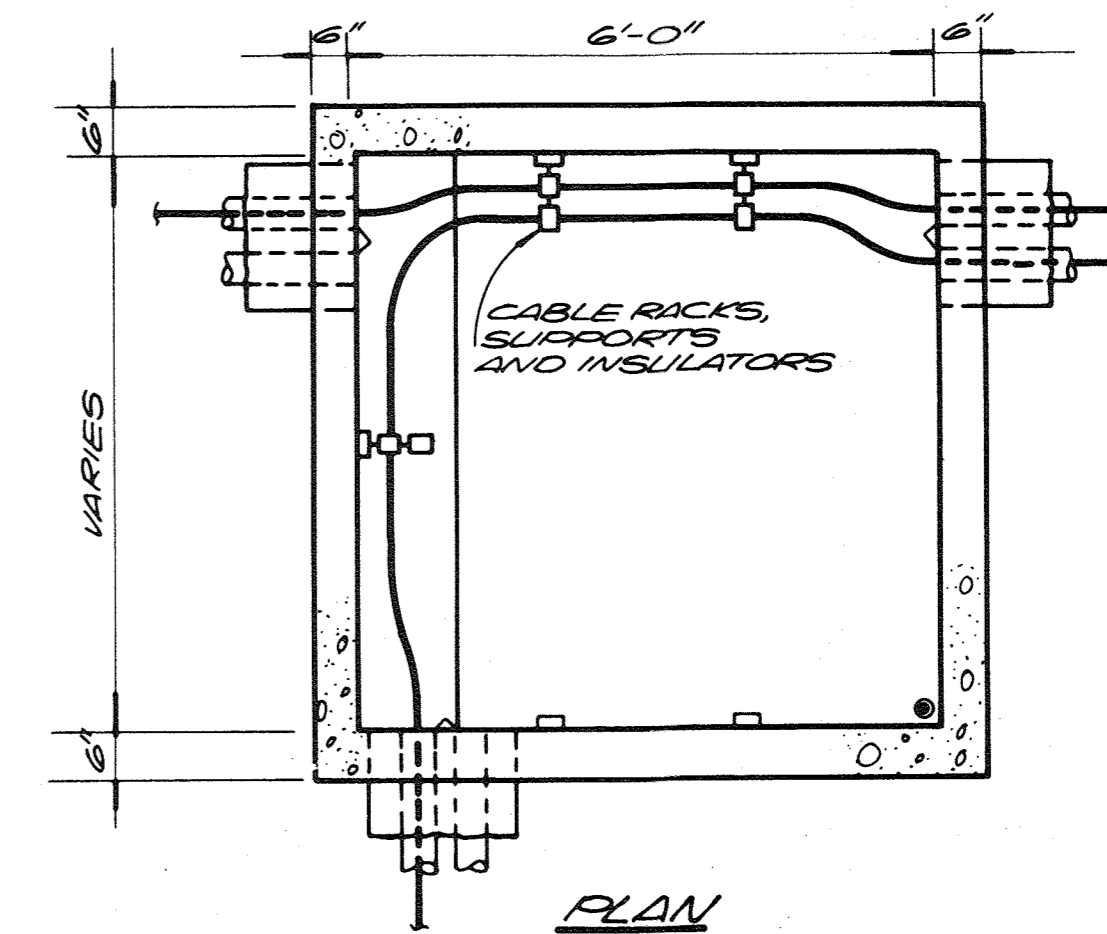
DES. BSH
DR. E.E.M.
CHK. E.L.S.
APPD. NO. DATE REVISION BY APPD.



EXISTING MANHOLE NO. 3 (G)
E-2
1/4" = 1'-0"

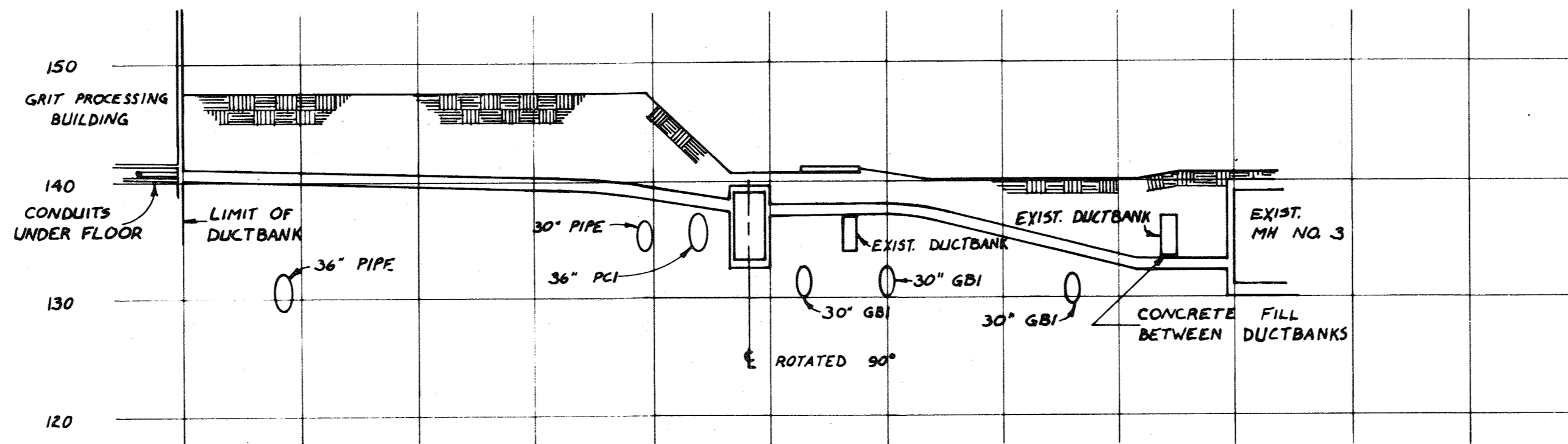


EXISTING DUCT BANK DETAIL (H)
E-2
NTS

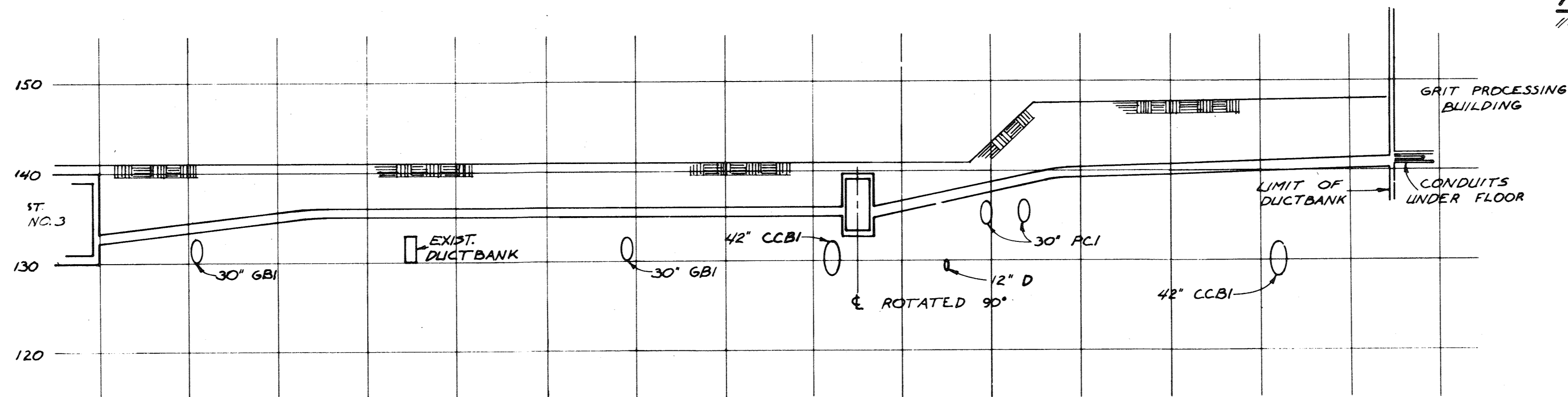


- NOTES:
1. MANHOLES SHALL BE REINFORCED FOR 4-20 BRIDGE LOADING
 2. PROVIDE PULLING IRONS ON WALL OPPOSITE EACH DUCT BANK ENTRANCE.
 3. MANHOLES SHALL BE PRE-CAST TYPE SIMILAR TO QUICK SET, PENN-CAST OR APPROVED EQUAL.

TYPICAL MANHOLE DETAIL (J)
E-2
1/2" = 1'-0"



DUCTBANK PROFILE "H"
VERT. 1" = 10'
HORIZ. 1" = 20'



DUCTBANK PROFILE "J"
VERT. 1" = 10'
HORIZ. 1" = 20'

RECORD DRAWING



CH2M HILL	DES. BSH				
	DR. CFE, JR.				
	CHK. E.L.S.				
	APPD.	NO.	DATE	REVISION	BY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

8-22-78
DATE

Robert B. Miller
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

SAVAGE WASTEWATER TREATMENT PLANT
ADDITION NO. 4
CONTRACT NO. 763-S

DETAILS
ELECTRICAL

SHEET
OF E-11
DATE 8-78
DWG. NO. W11078.B1