

CONTRACT 402-S

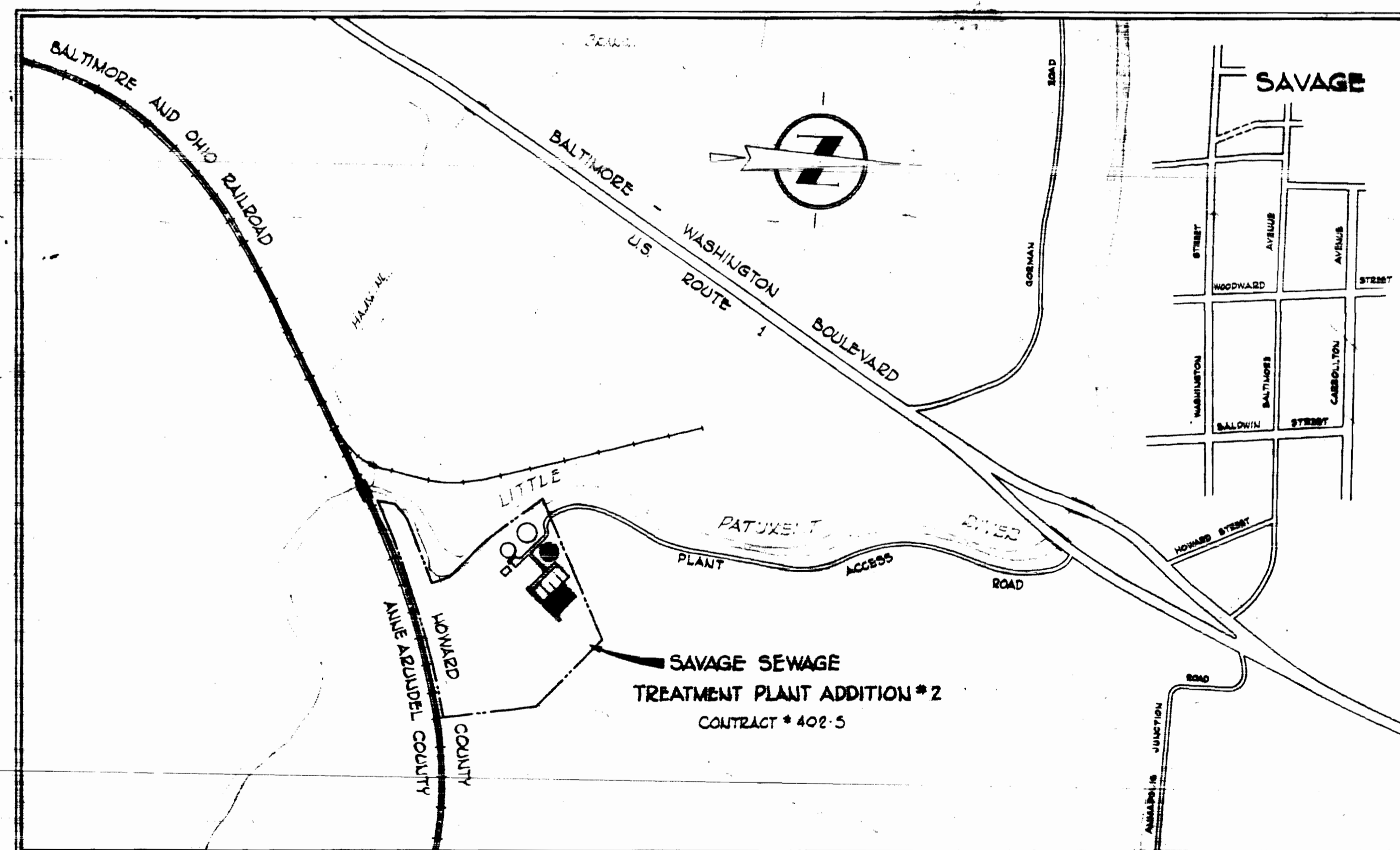
SAVAGE SEWAGE

TREATMENT PLANT ADDITION NO. 2

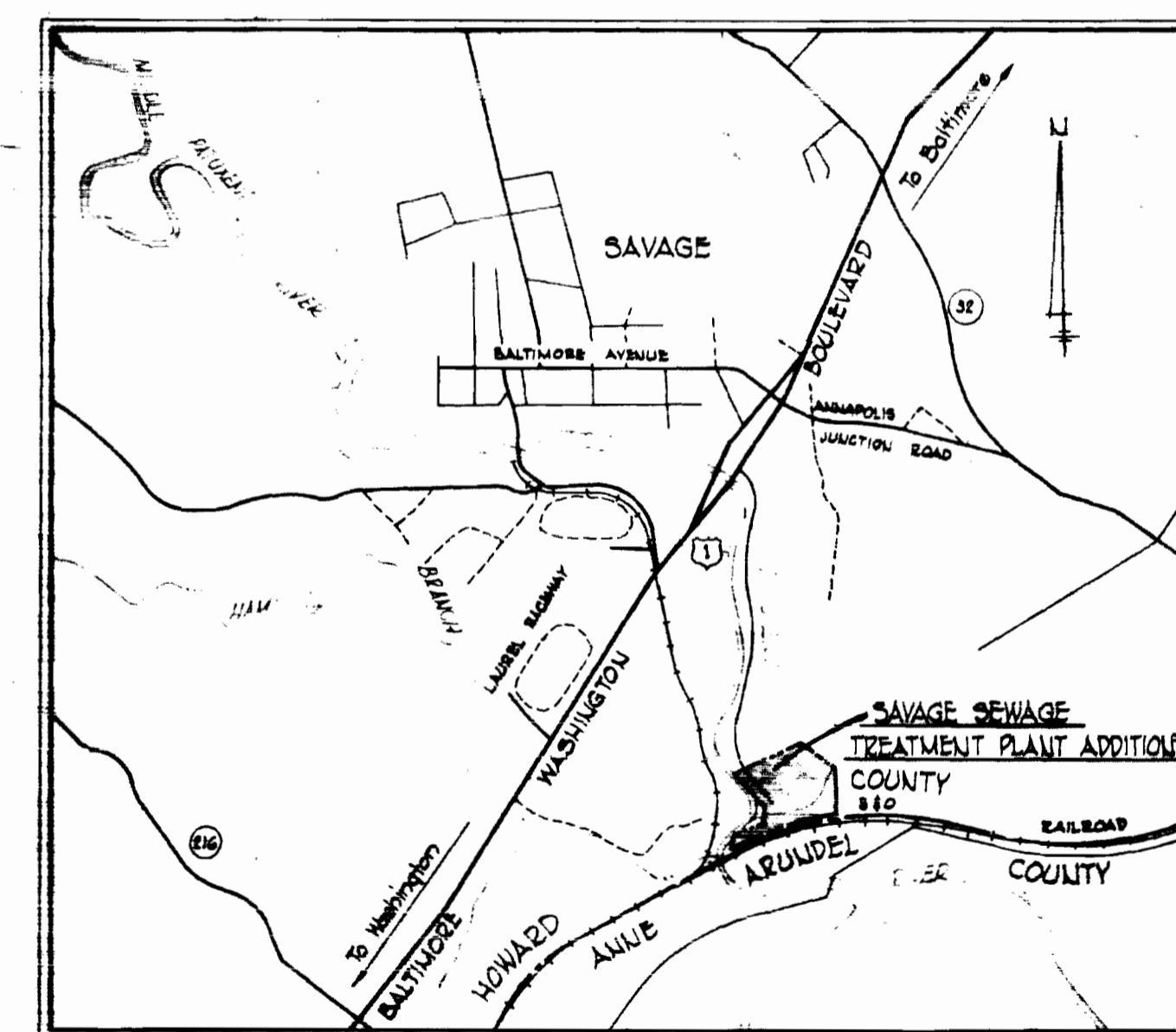
HOWARD COUNTY DEPT. OF PUBLIC WORKS

TREATMENT PLANT DESIGN DATA

	Unit #1	Unit #2	Unit #3	Composite
Design Population	10,000	20,000	20,000	50,000
Design Flow - Avg. Daily (m.g.)	1.0	2.0	2.0	5.0
Type of Treatment	Walker	Dravo	Dravo	Contact Stabilization
B.O.D. Loading (*day)	1700	3400	3400	8500
Settling Zone				
Detention Time (hrs.)	4.25	2.51	2.51	2.75
Surface Rate (gpd/sf)	480	785	785	750
Aeration & Reaeration				
Volume (sf/*B.O.D./day)	25	30	30	30
Air (cf/*B.O.D./day)	1100	1152	1152	3400
Digester Zone				
Volume (sf/capita)	25	20	20	21 (Avg)
Air (cf/*B.O.D./day)	500	500	500	1500
Total Air for Plant Operation (cfm)	2000	4000	4000	10000
Chlorine Contact - Detention (min)	30.0	30.3	30.3	30.2 (Avg)
Sludge Drying Beds Area (sf/capita)	0.5	1.0	1.0	0.9



LOCATION MAP
Scale: 1" = 600'



VICINITY MAP
Scale: 1" = 2000'

AS BUILT INFORMATION LIMITED
DUE TO LOSS IN FLOOD



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WHITMAN, BEQUARDT & ASSOCIATES
ENGINEERS
1324 ST. PAUL ST.
BALTIMORE, MARYLAND

HOWARD COUNTY DEPT. OF PUBLIC WORKS
5-13-71 *W. O. Pillant*
DATE CHIEF ENGINEER

CONTRACT NO. 402-S

LOCATION MAP
AND VICINITY MAP

SAVAGE SEWAGE
TREATMENT PLANT ADDITION NO. 2

DRAWING
NO. 1
OF 6
SCALE
AS SHOWN

1/S-206 SW

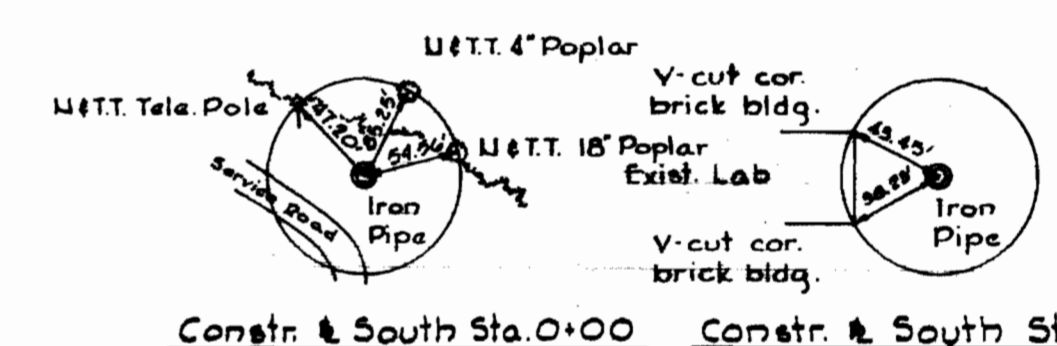
Construction Note:
For plan of fence construction at U.S. Rt. 1-See Detail A this sheet.

LEGEND

ITEM	EXISTING	*NEW
Grading Contours		
Buildings & Structures		
Roadway Pavement		
Fence		
Pole		
Sidewalk		
Drains		
Underdrains		
Valves		
Manhole		
Hydrant		
Gate		
Swale		

*New Work to be done under this Contract.
Note: Showing of utilities on this sheet have been minimized for clarity of the drawing. For new and existing utilities in the area of tank construction, see Sheet 3.

P.I. REFERENCES & BENCH MARKS

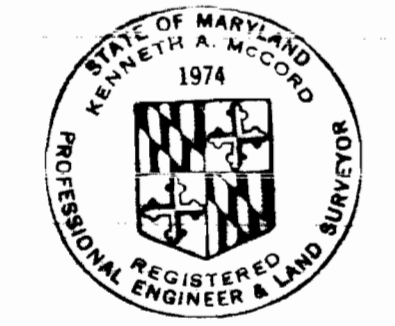
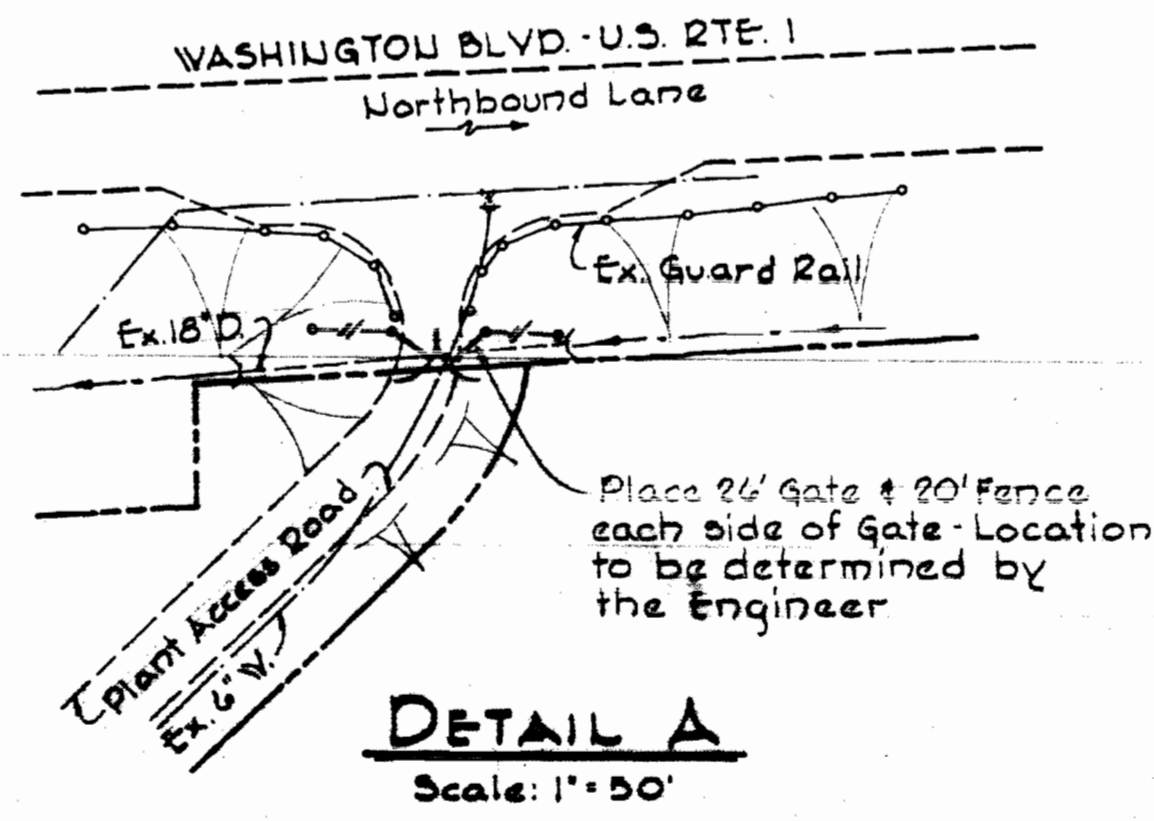
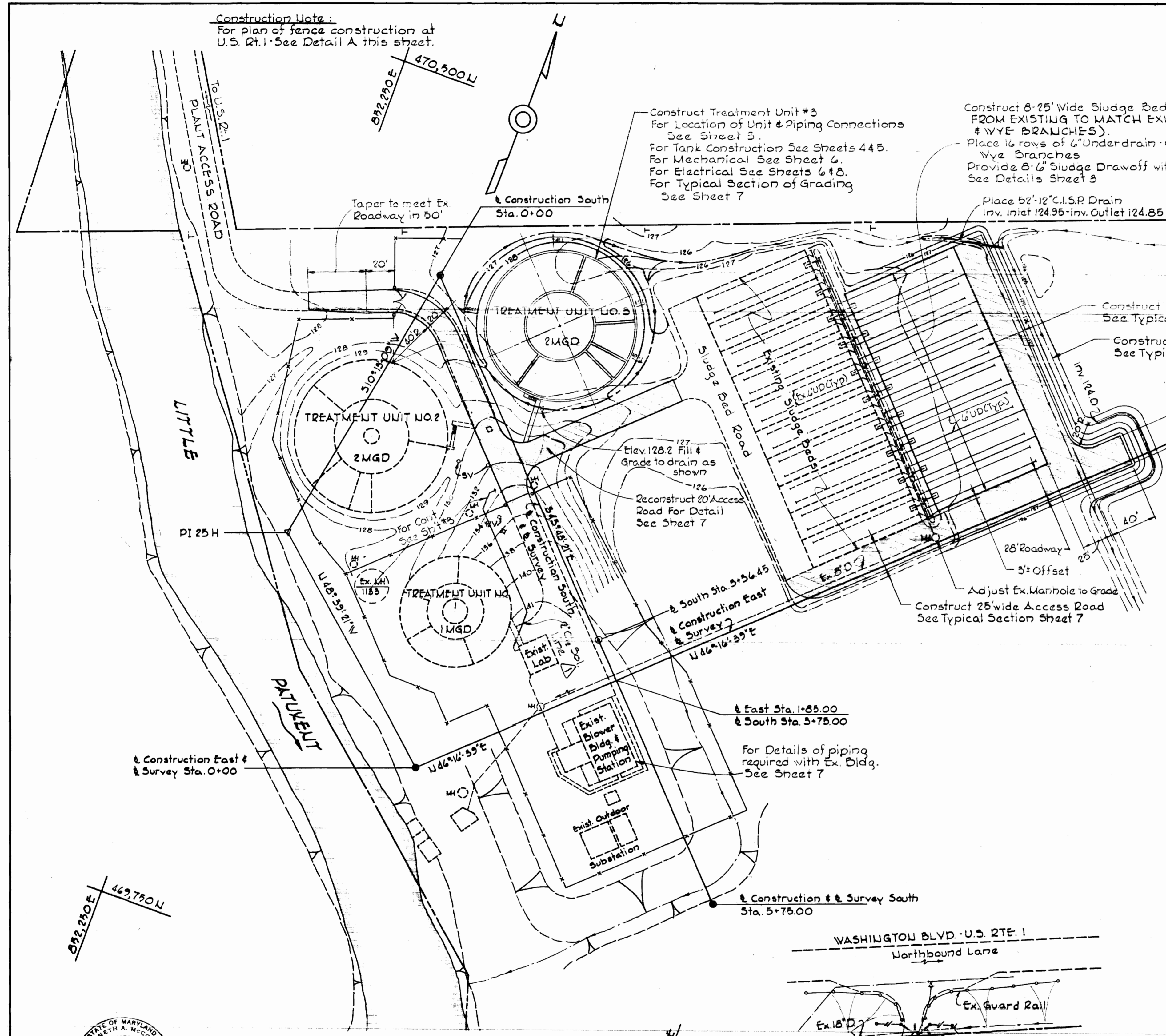


V.R. # A. B.M. "Blaine" Elev. 139.06
X-cut on flange bolt of fire hyd., 40'± Rt. of Sta. 2+25± @ South
V.R. # A. B.M. "A" Elev. 127.65
R.R. Spike in 36" Oak 8' Lt. P.I. 15-H (Not shown on Plan)

GENERAL NOTES

- Approximate location of existing mains are shown. The Contractor shall take all necessary precautions to protect existing mains and services and maintain uninterrupted supply. Any damage incurred shall be repaired immediately.
- All pipe elevations shown are invert elevations.
- The Contractor shall locate existing utilities a minimum of two weeks in advance of construction operations in vicinity of utilities.
- The location of all valves, fittings, etc. have been located in plan and dimensions shall be strictly adhered to unless otherwise directed by the Engineer.
- For all standard details see standards bound in the Specifications.
- Block all fittings with concrete. See Standard Details in the Specifications.
- Pipelines shall be of the material listed in the Specifications. All airlines shall have a minimum of 2' cover & all sewer and drains shall have a minimum of 5 1/2' cover unless otherwise noted by profiles and elevations on the plans.
- Clear all utilities by a minimum of 6' vertically. All parallel pipe systems to have 2'0" minimum horizontal clearance.
- All manholes shall be 4'0" inside diameter.
- The Contractor shall provide a joint in all sewer mains within 2'0" of exterior manhole walls.
- Brick manholes shall be adjusted as directed by the Engineer.
- All 8" Cast Iron Sewer Pipe to be Class 22 unless otherwise noted.
- Elevations & coordinates are based on the Maryland State Datum & Grid Systems.
- All outside valves shall be plug valves.
- All disturbed areas paved and earth shall be restored as specified.
- All existing valve boxes, manhole frames & covers and existing appurtenances shall be adjusted to finished grade as required.
- Tank drain valves & force main blowoff valves shall be sealed in accordance with MSHD requirements.
- For profiles of new pipes, see the Specifications.

8-5-71	Added Cl. line on Plan	Δ
DATE	REVISION	



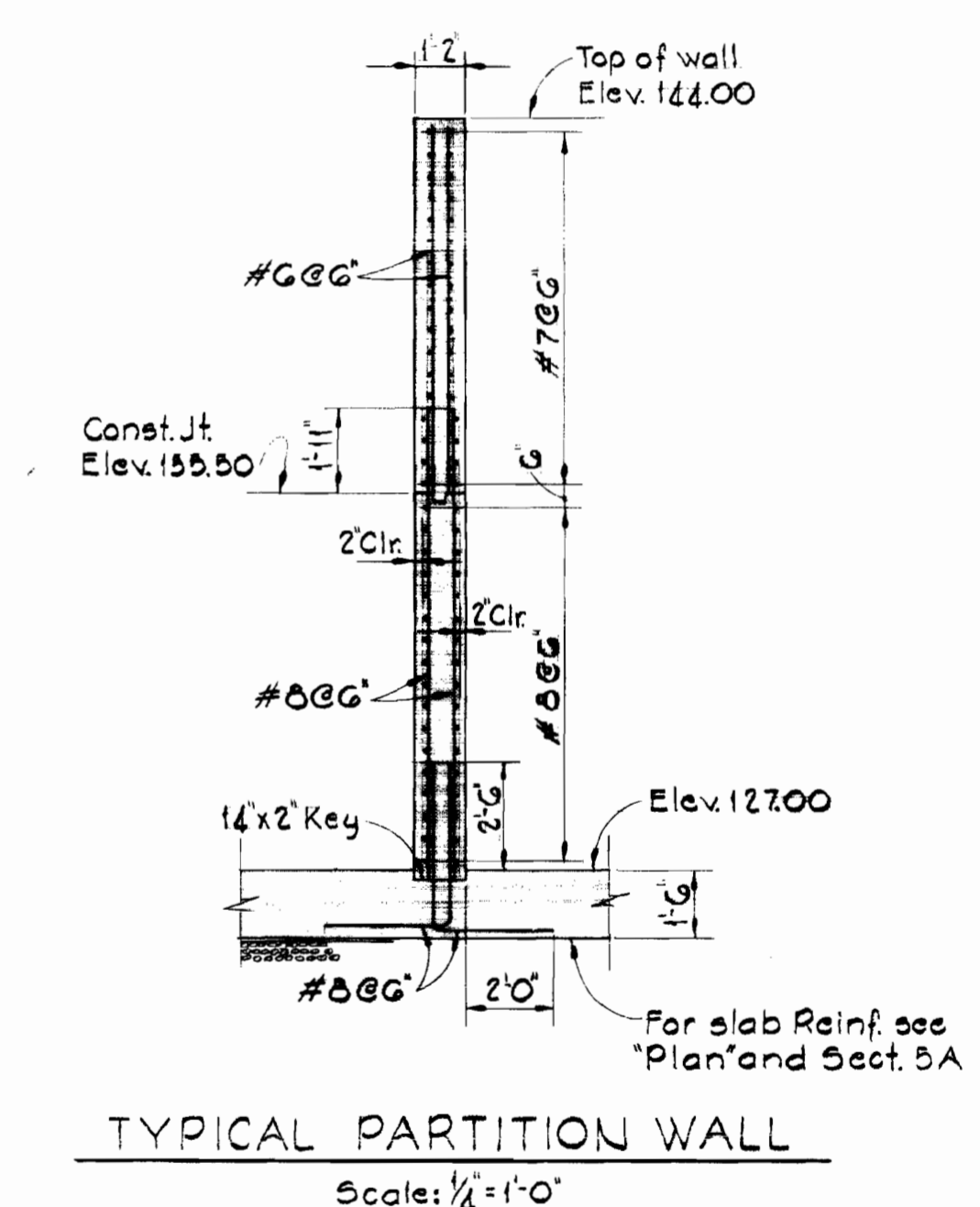
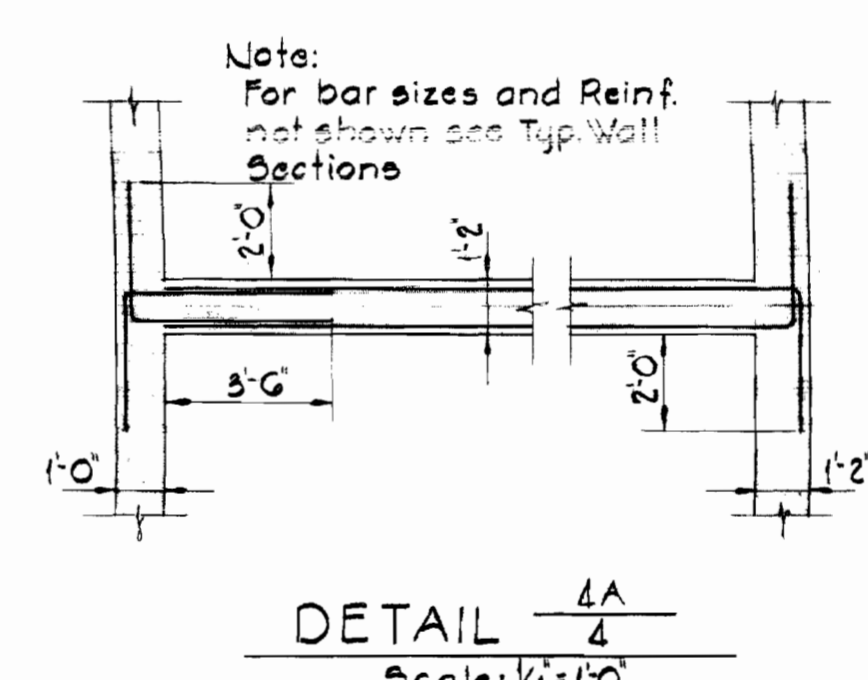
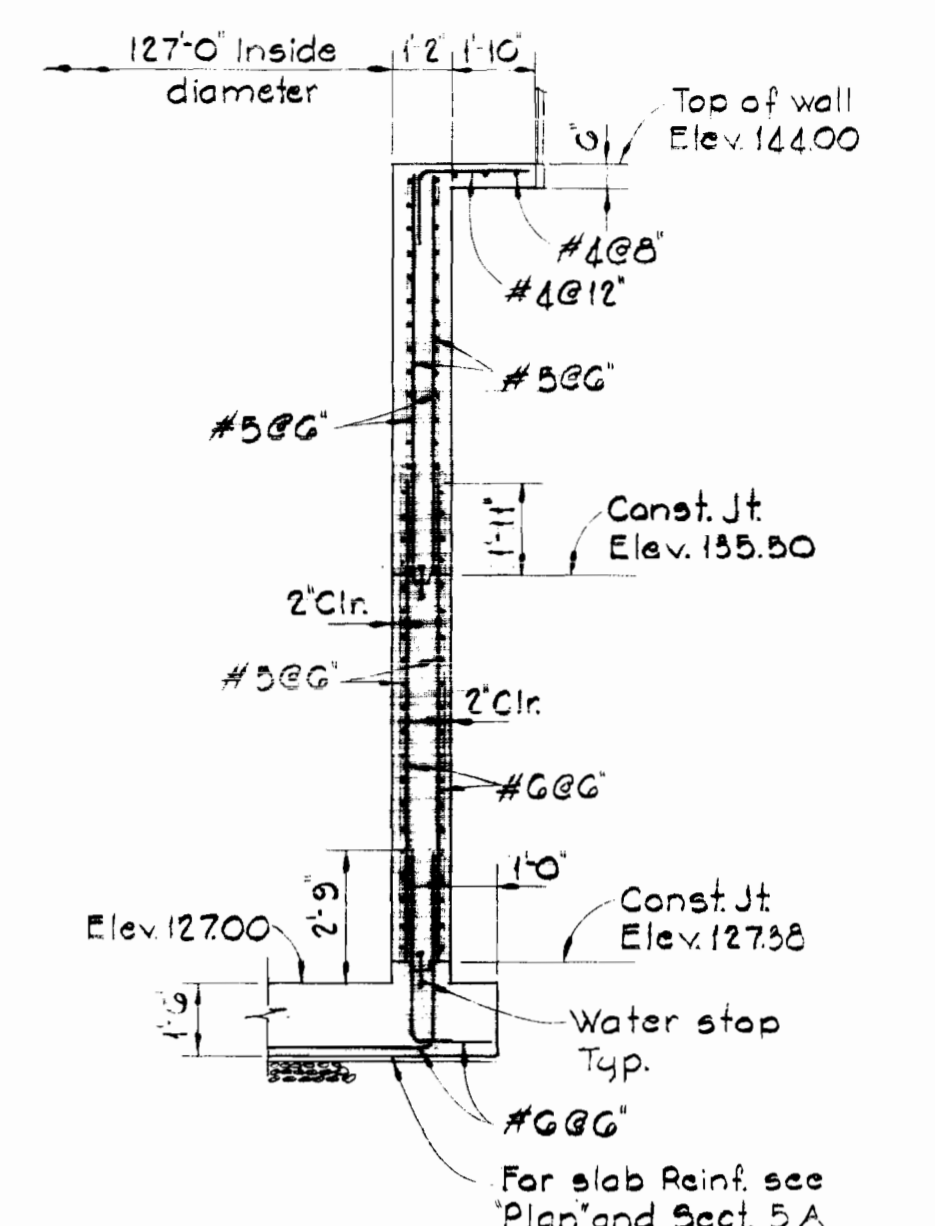
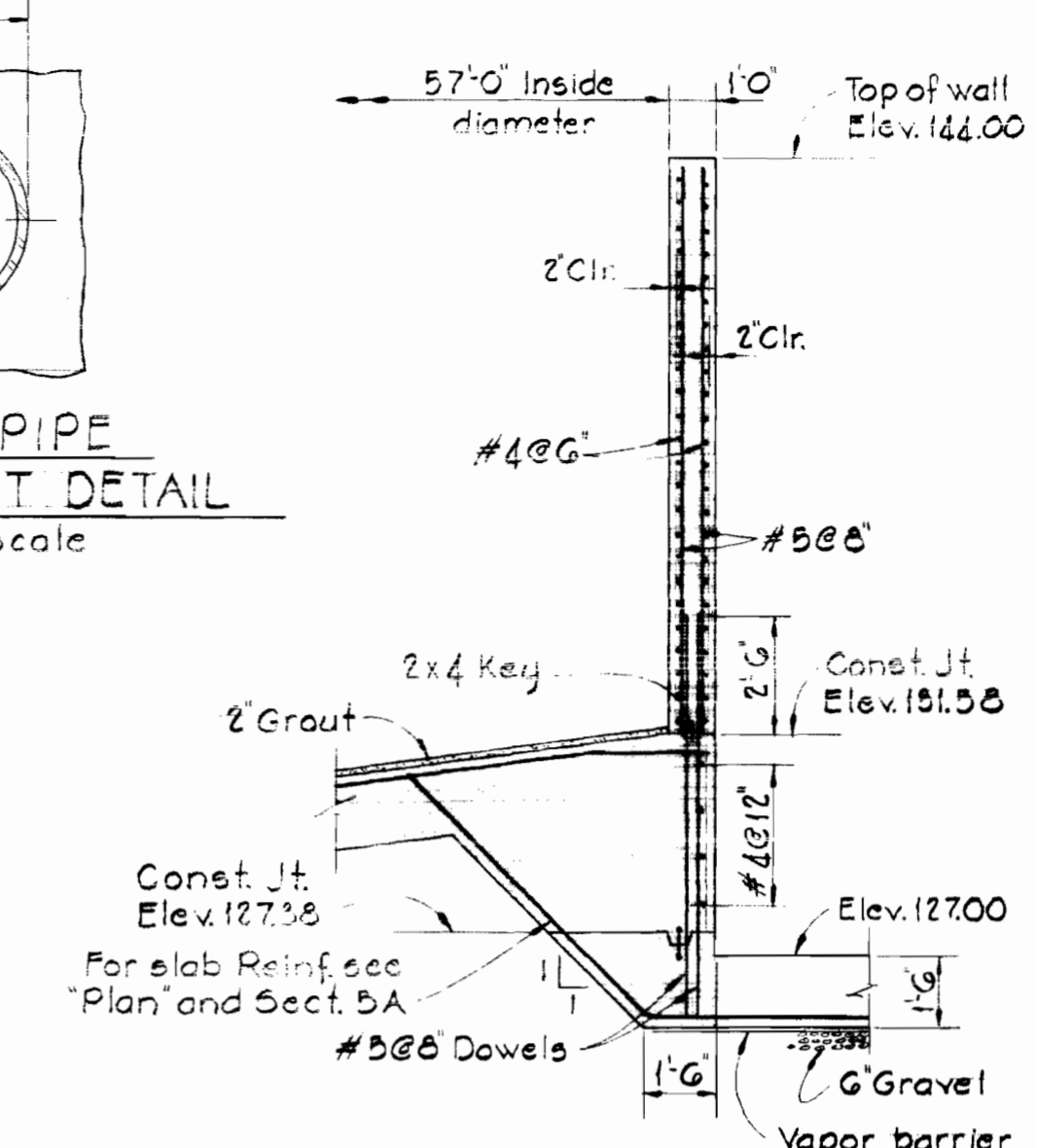
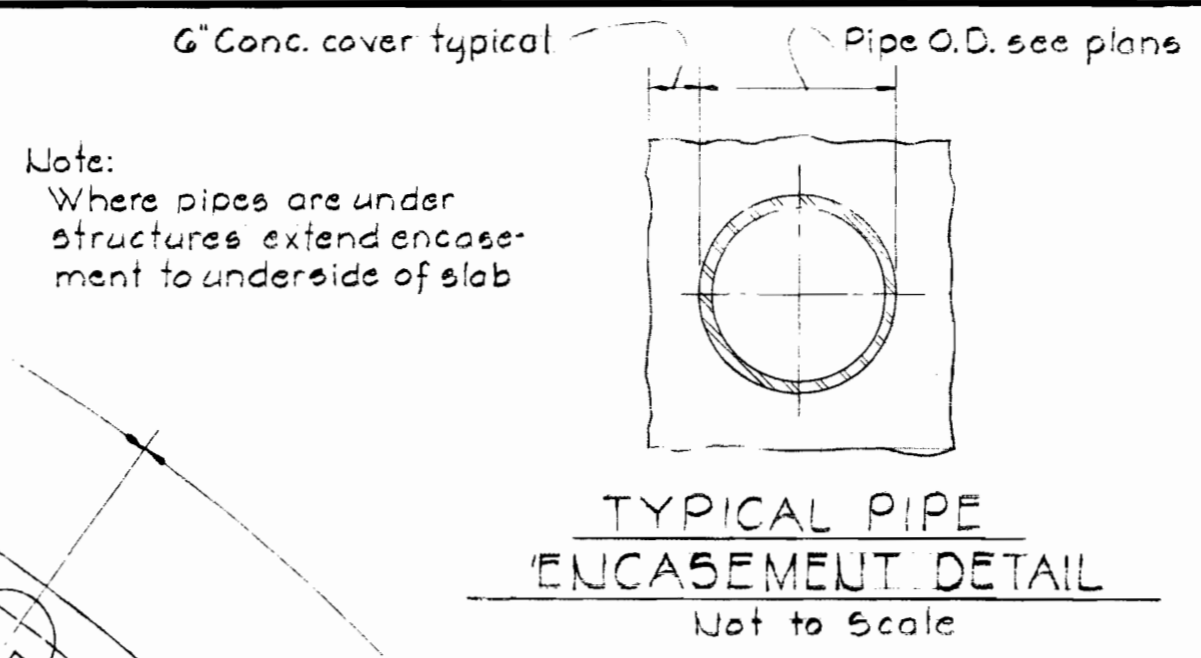
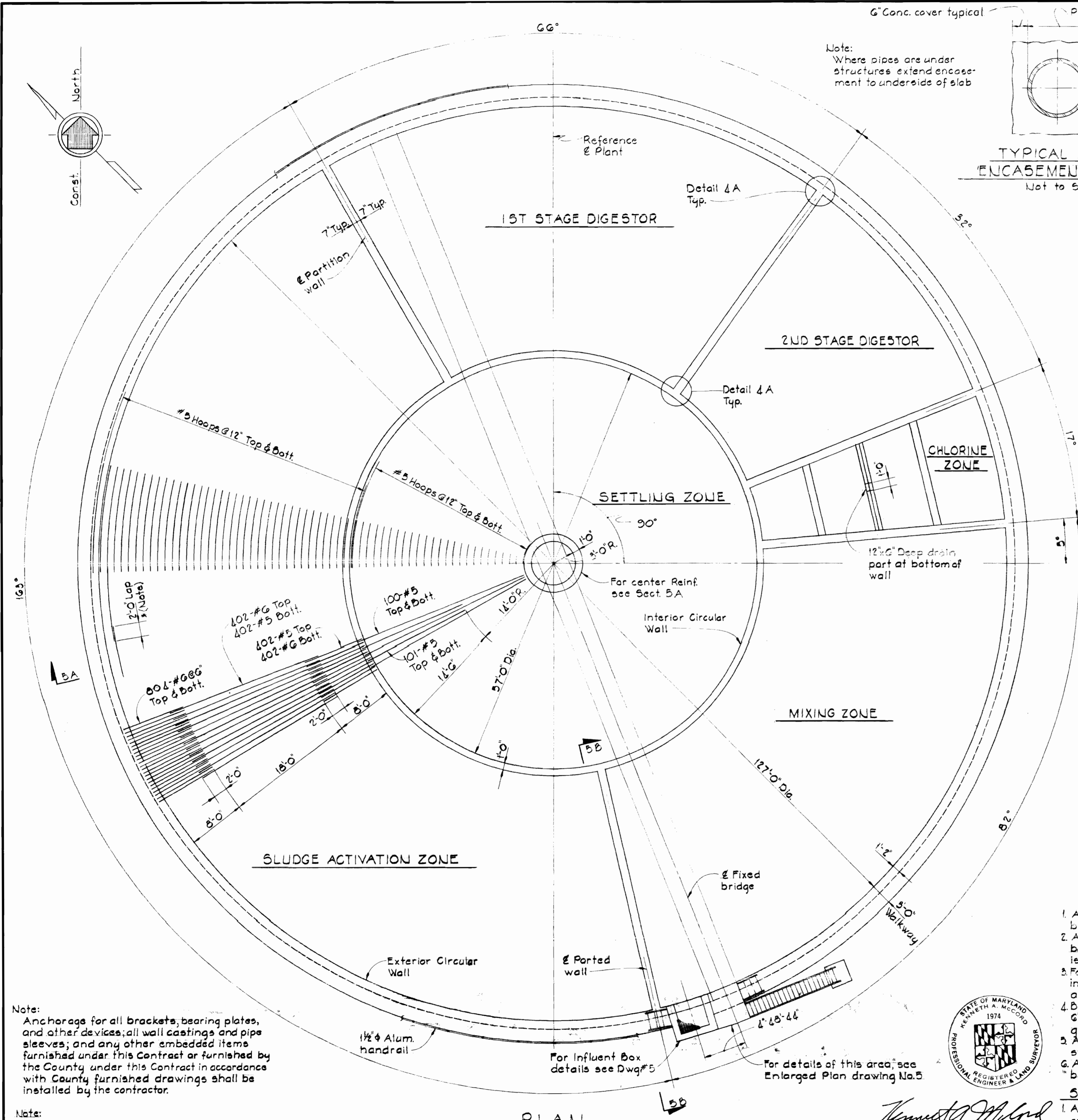
Kenneth A. McCord

SITE & GRADING PLAN
Scale: 1" = 50'

DETAIL A
Scale: 1" = 50'

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 8-13-71 DATE	CONTRACT NO. 402-S W. O. McCord CHIEF - BUREAU OF WATER AND SEWER	GRADING PLAN AND REFERENCES	SAVAGE SEWAGE TREATMENT PLANT ADDITION NO. 2	DRAWING NO. 2 OF 8	SCALE AS SHOWN 470-488
					W.O. 640B-2	FB 2876 4501

WS 402-S/2



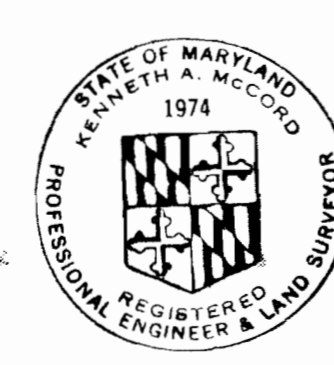
- STRUCTURAL NOTES**
- FOUNDATION NOTES**
- All foundations have been designed for safe soil bearing capacity of 2000 P.S.F.
 - All excavations shall be inspected and approved by the Engineer before any gravel and/or concrete is placed.
 - For Mechanical and/or Electrical work to be incorporated in foundation work. See Mechanical and Electrical drawings.
 - Bottom of all excavations shall receive a minimum of 6" of well compacted coarse aggregate, S.R.C. #2 gravel.
 - A layer of vapor barrier shall be placed on crushed stone or gravel before any concrete is poured.
 - All excavations must be kept dry. Water shall not be allowed to stand in excavations.
- CONCRETE NOTES**
- All concrete shall have a minimum compressive strength of 3500 P.S.I. at 28 days.
 - All reinforcement steel shall be intermediate grade (ASTM-A-615-GS; grade 40).
 - Unless otherwise noted on the drawings, concrete cover for reinforcement shall be as follows:
 - Unformed concrete, bottom bars in footings, and slabs on earth, rock, gravel, or stone - 5 inches.
 - Walls, beams and slabs after the removal of forms exposed to ground, weather, water or sewage - 2 inches.
 - All exposed concrete edges shall be chamfered 3/4" unless otherwise noted.
 - Concrete slabs and walls shall be poured between indicated joints allowing a minimum period of 3 days to elapse between adjacent pours.
 - All reinforcing bar laps shall be 30 diameters. Unless otherwise noted.
 - See Dravo Corporation Inc. drawings for all embedded items such as sleeves and anchors and all openings, chases, etc. See Electrical drawings for all embedded Electrical conduits.
- STRUCTURAL ALUMINUM NOTES**
- All aluminum in contact with concrete shall, before erection, be heavily coated, as specified.
 - All structural aluminum shall be alloy 6061-T6.

Note: Anchorage for all brackets, bearing plates, and other devices; all wall castings and pipe sleeves; and any other embedded items furnished under this Contract or furnished by the County under this Contract in accordance with County furnished drawings shall be installed by the contractor.

Note: Laps in slab hoop bars shall not occur within 5'-0" of any partition wall.

8-5-71	Concrete Note #7	
DATE	REVISION	

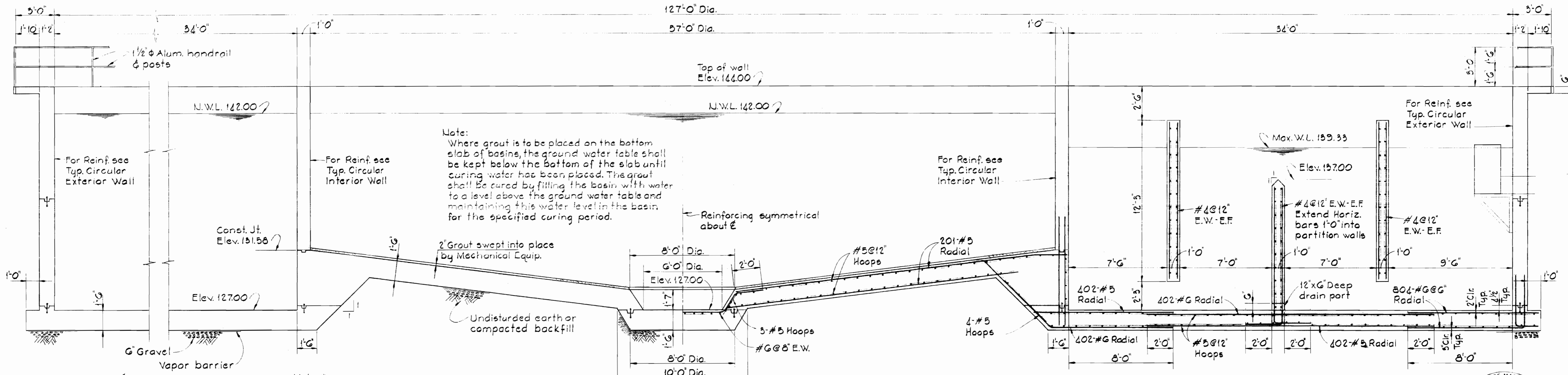
PLAN
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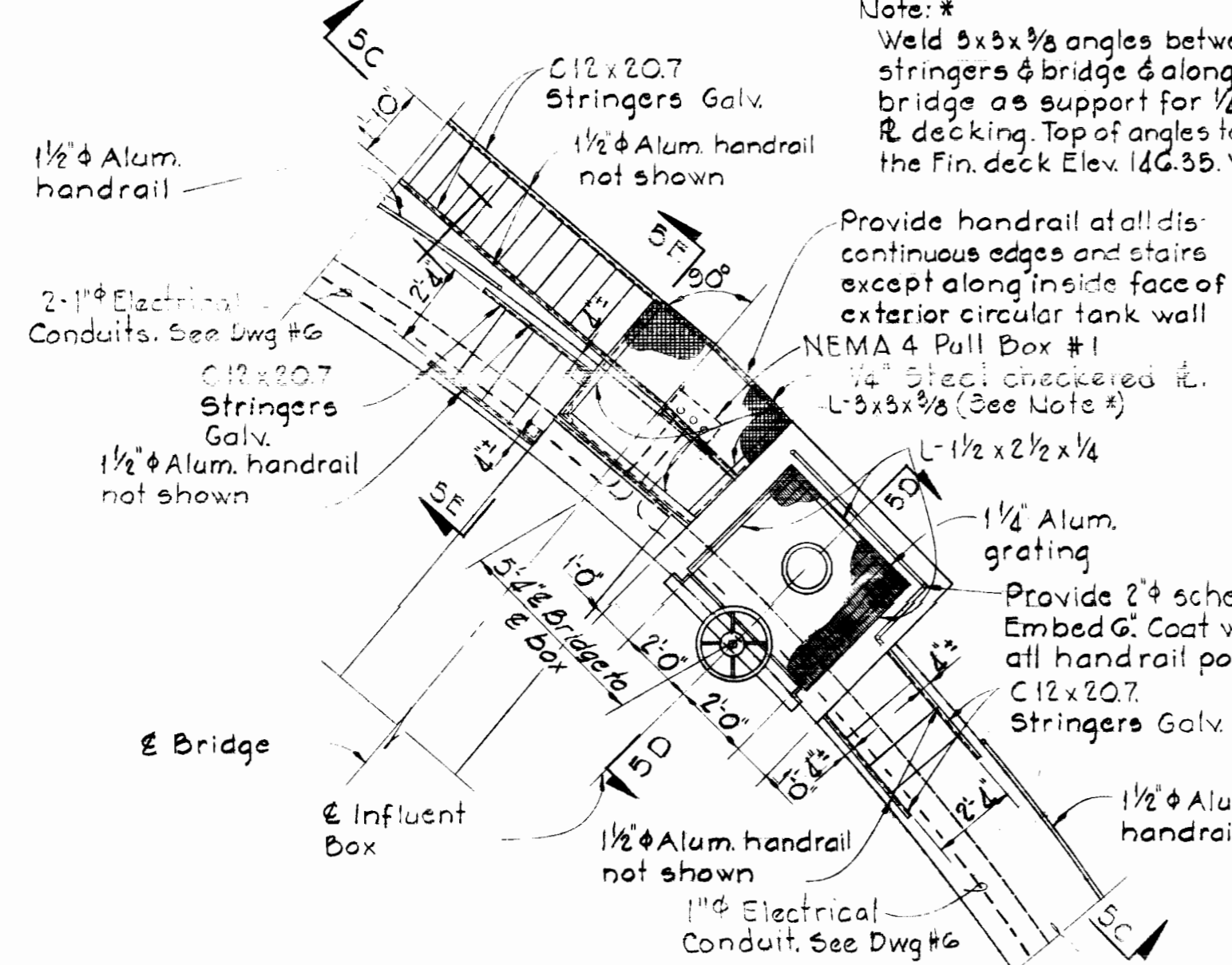
Kenneth A. McLeod

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 5-13-71 DATE <i>W. O. Palmer</i> CHIEF - BUREAU OF WATER AND SEWER	CONTRACT NO. <u>402-S</u>	STRUCTURAL PLAN & DETAILS TREATMENT UNIT NO. 3	SAVAGE SEWAGE TREATMENT PLANT ADDITION NO. 2	DRAWING NO. <u>4</u>	SCALE AS SHOWN
					OF <u>8</u>	

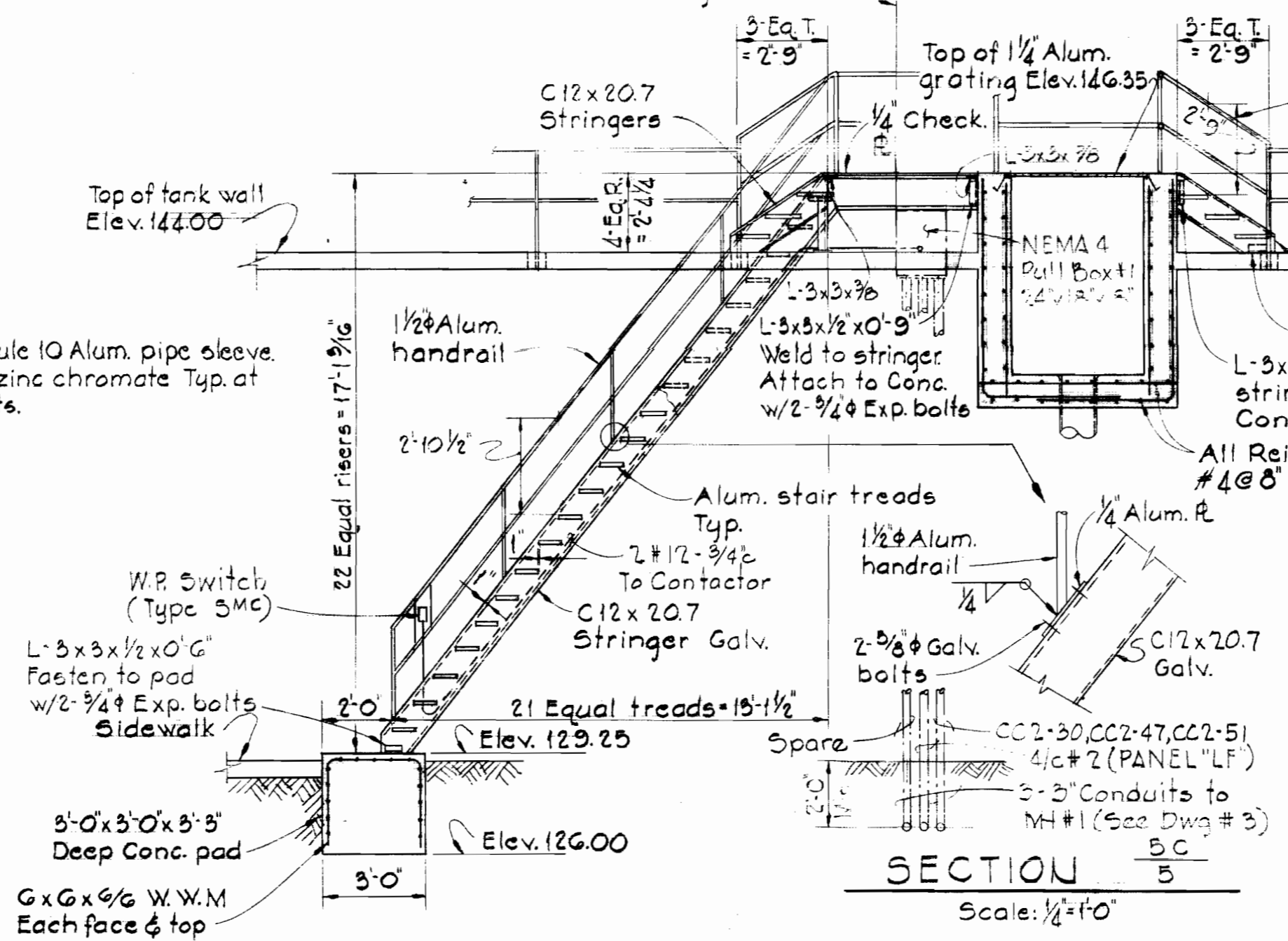
H/S-204 S



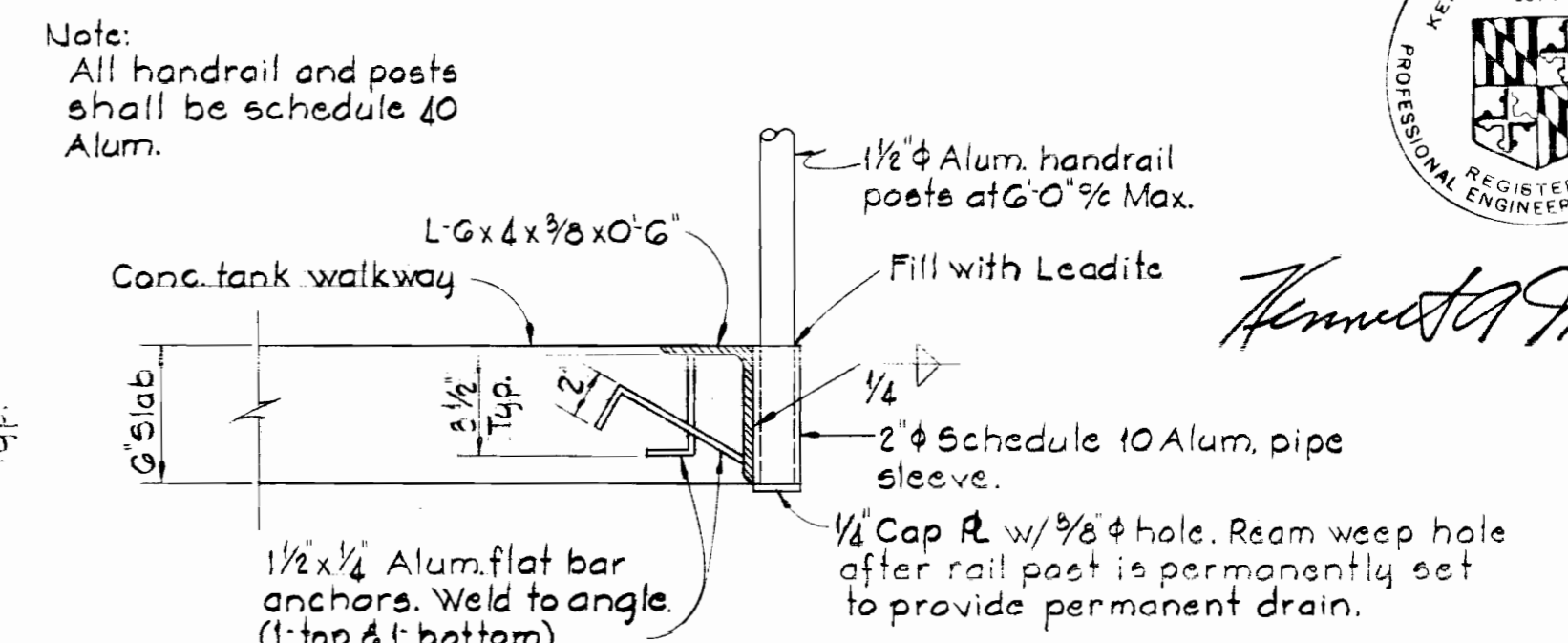
SECTION 5A
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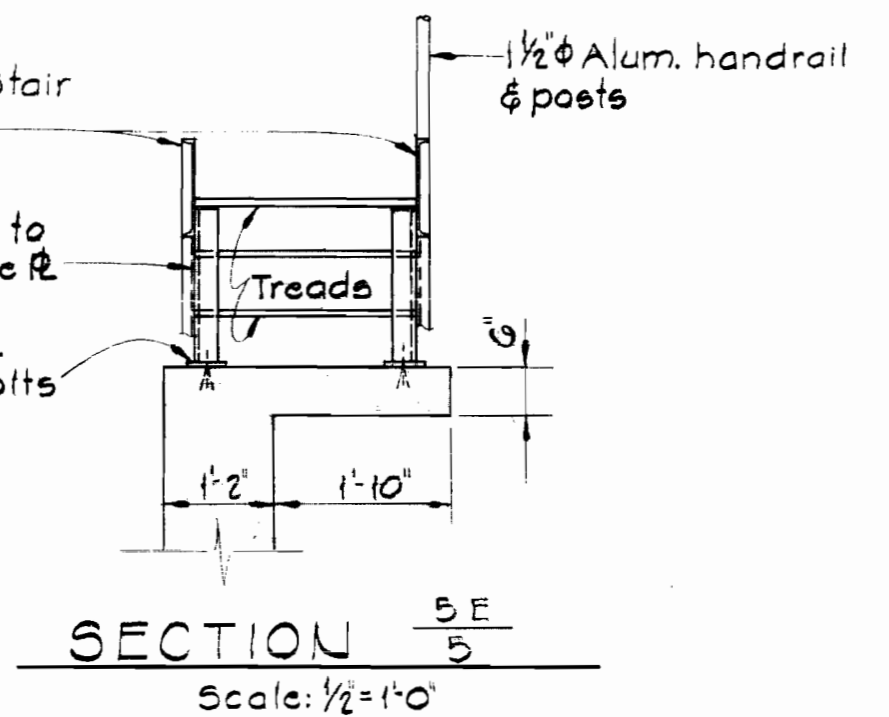
ENLARGED PLAN AT INFLUENT BOX AND BRIDGE ACCESS
Scale: 1/4"=1'-0"



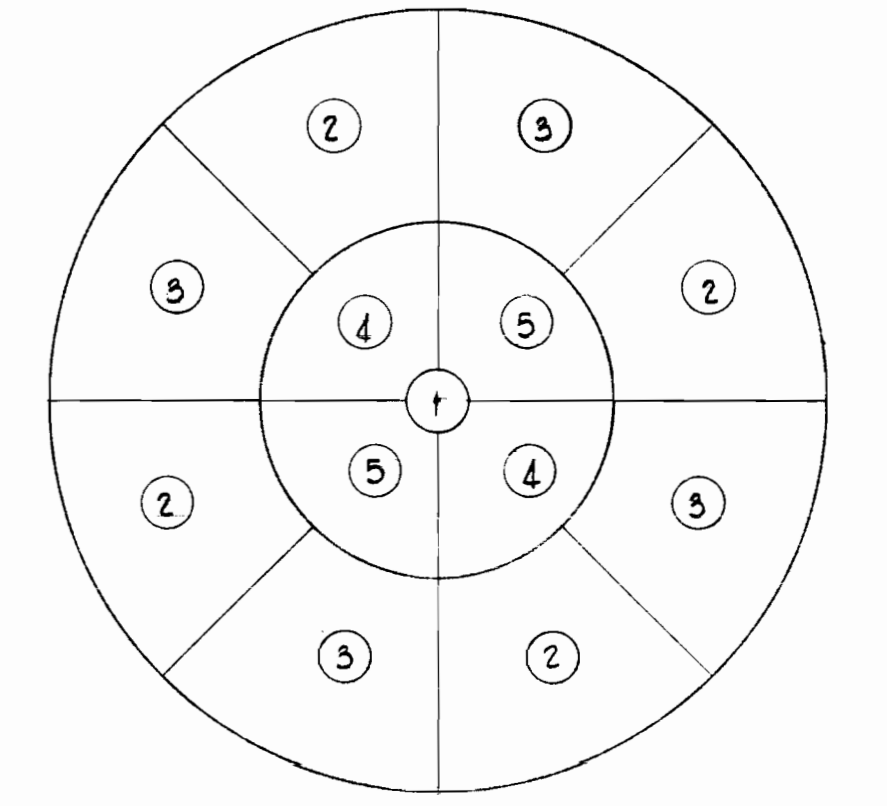
SECTION 5B
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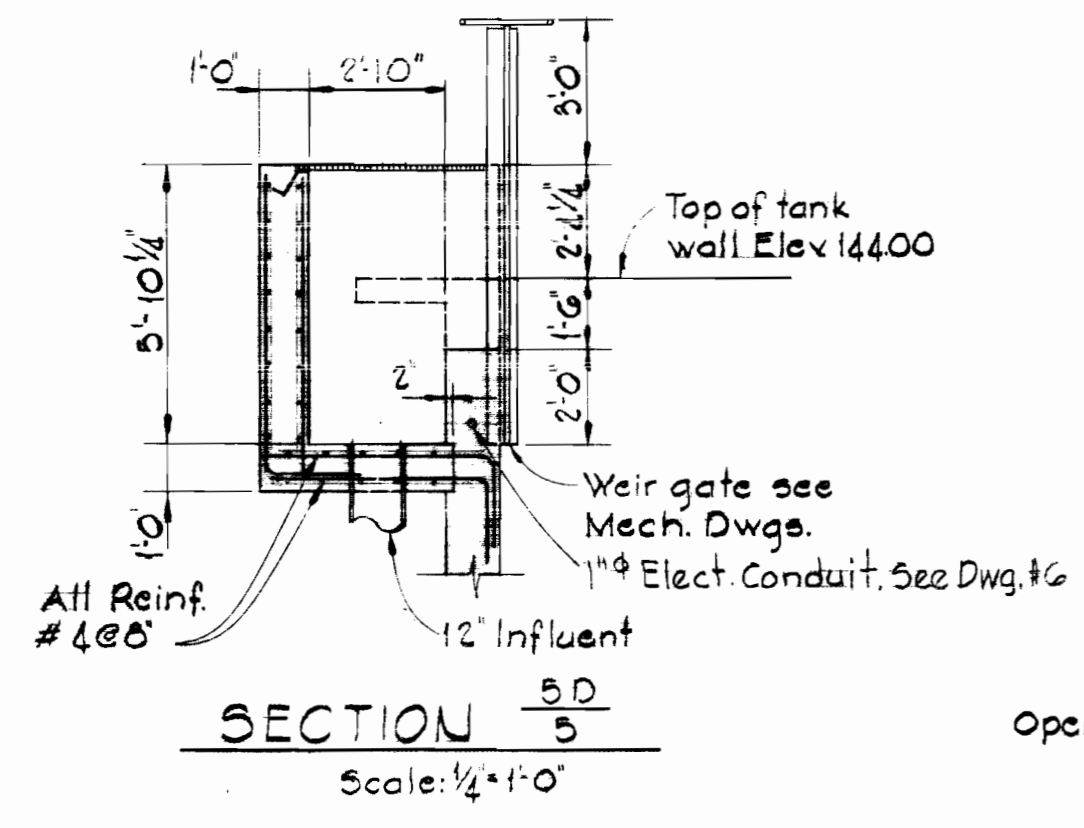
HANDRAIL DETAIL
Scale: 1/2"=1'-0"



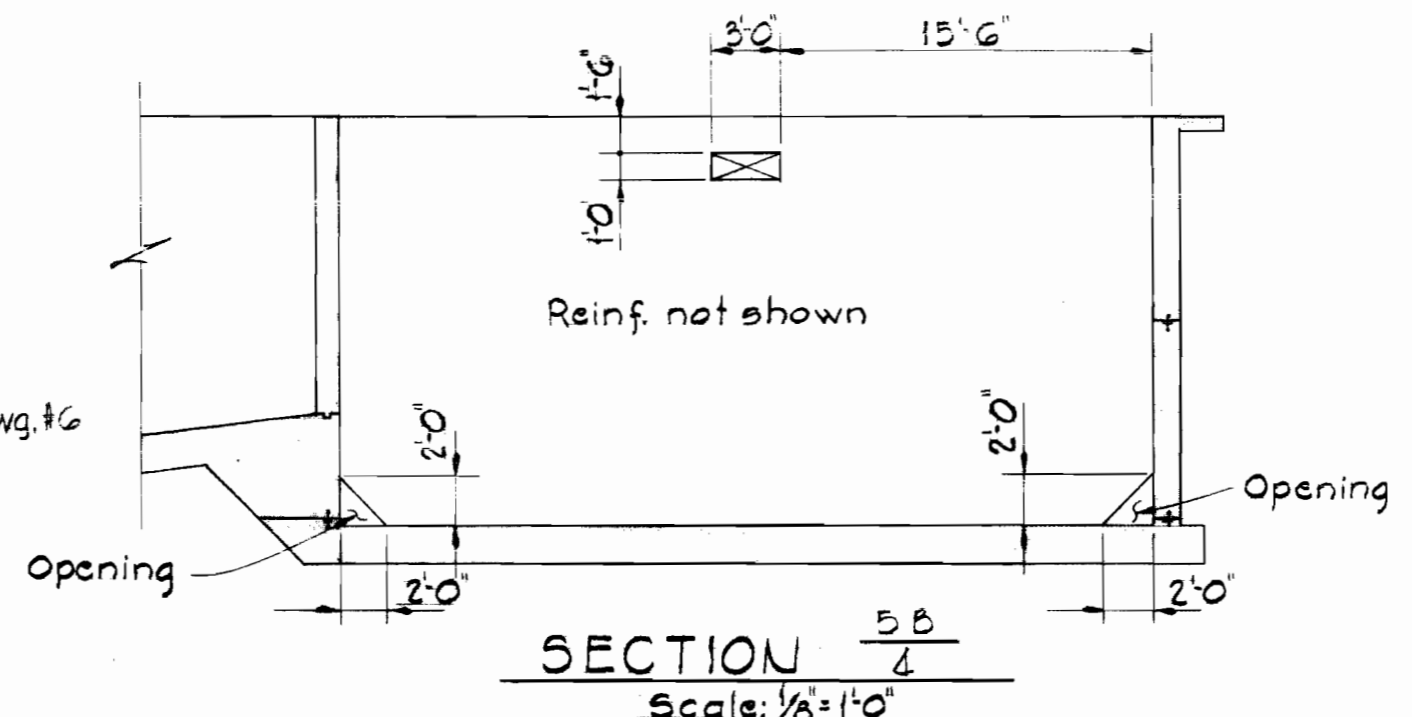
SECTION 5E
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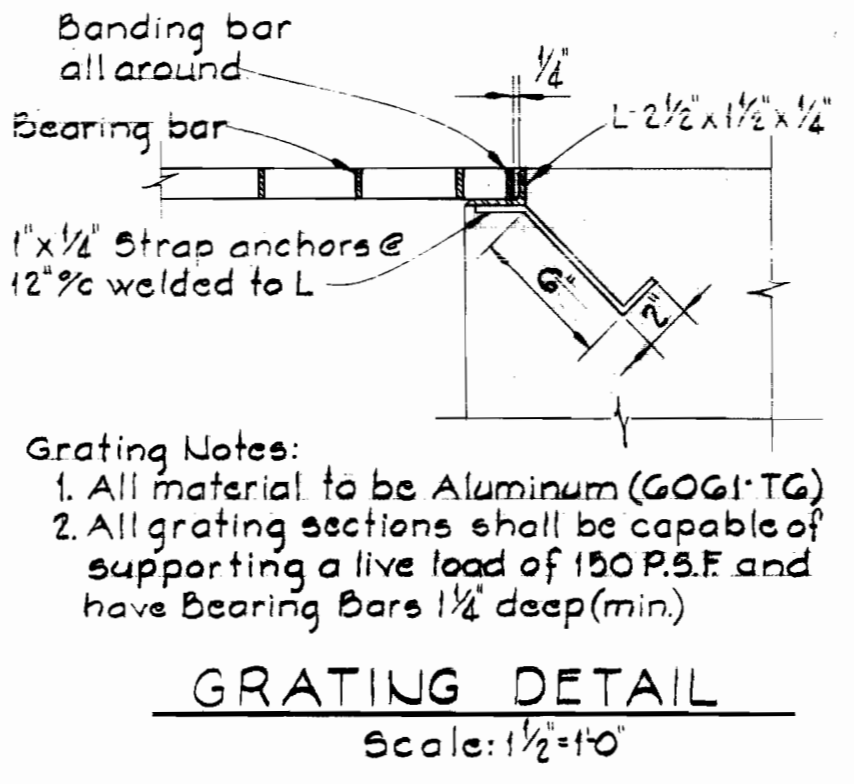
FOUNDATION SLAB POURING SEQUENCE



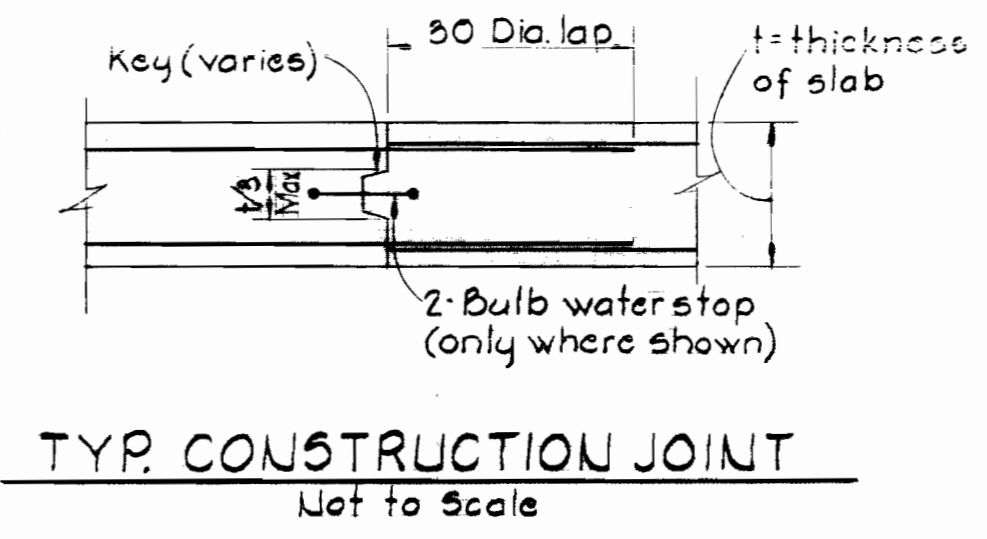
SECTION 5D
Scale: 1/2"=1'-0"



SECTION 5B
Scale: 1/2"=1'-0"



GRATING DETAIL
Scale: 1/2"=1'-0"



TYP. CONSTRUCTION JOINT
Not to Scale

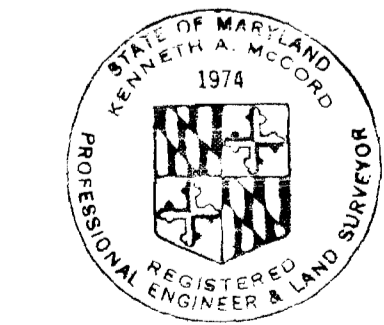


Kenneth A. McCord

Note: Reinforcing bars shall be continuous through const. joints. Three days min. shall elapse between adjacent pours. Vertical joints in walls shall be located above slab joints as directed by the Engineer and shall contain waterstops to within 6 inches of the top of the tank. Horizontal construction joints in the tank slab shall contain waterstops. Numbers in circles indicate the sequence of pours.

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND DATE 5-13-71 <i>W. O. Palbert</i> CHIEF-BUREAU OF WATER AND SEWER	CONTRACT NO. 402-S	STRUCTURAL SECTIONS & DETAILS	SAVAGE SEWAGE TREATMENT PLANT ADDITION NO. 2	DRAWING NO. 5	SCALE AS SHOWN
					OF 8	

NS 402-S/6



Kenneth A. McLeod

WHITMAN, REQUARDT & ASSOCIATES
ENGINEERS
1304 ST. PAUL ST.
BALTIMORE, MARYLAND

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
S-13-71
DATE

CONTRACT NO. 402-S

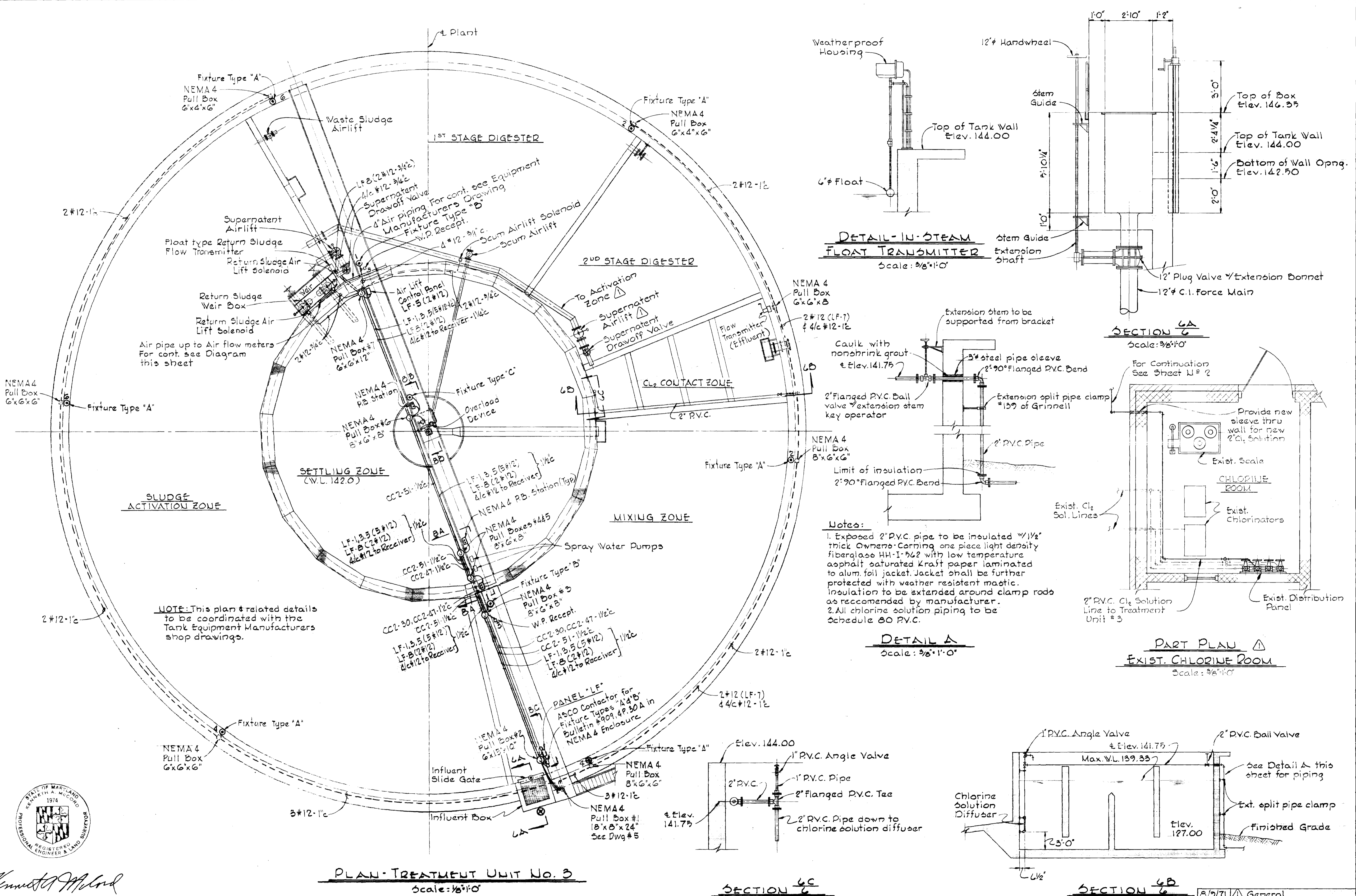
MECHANICAL & ELECTRICAL
PLAN & DETAILS
TREATMENT UNIT NO. 3

SAVAGE SEWAGE
TREATMENT PLANT ADDITION NO. 2

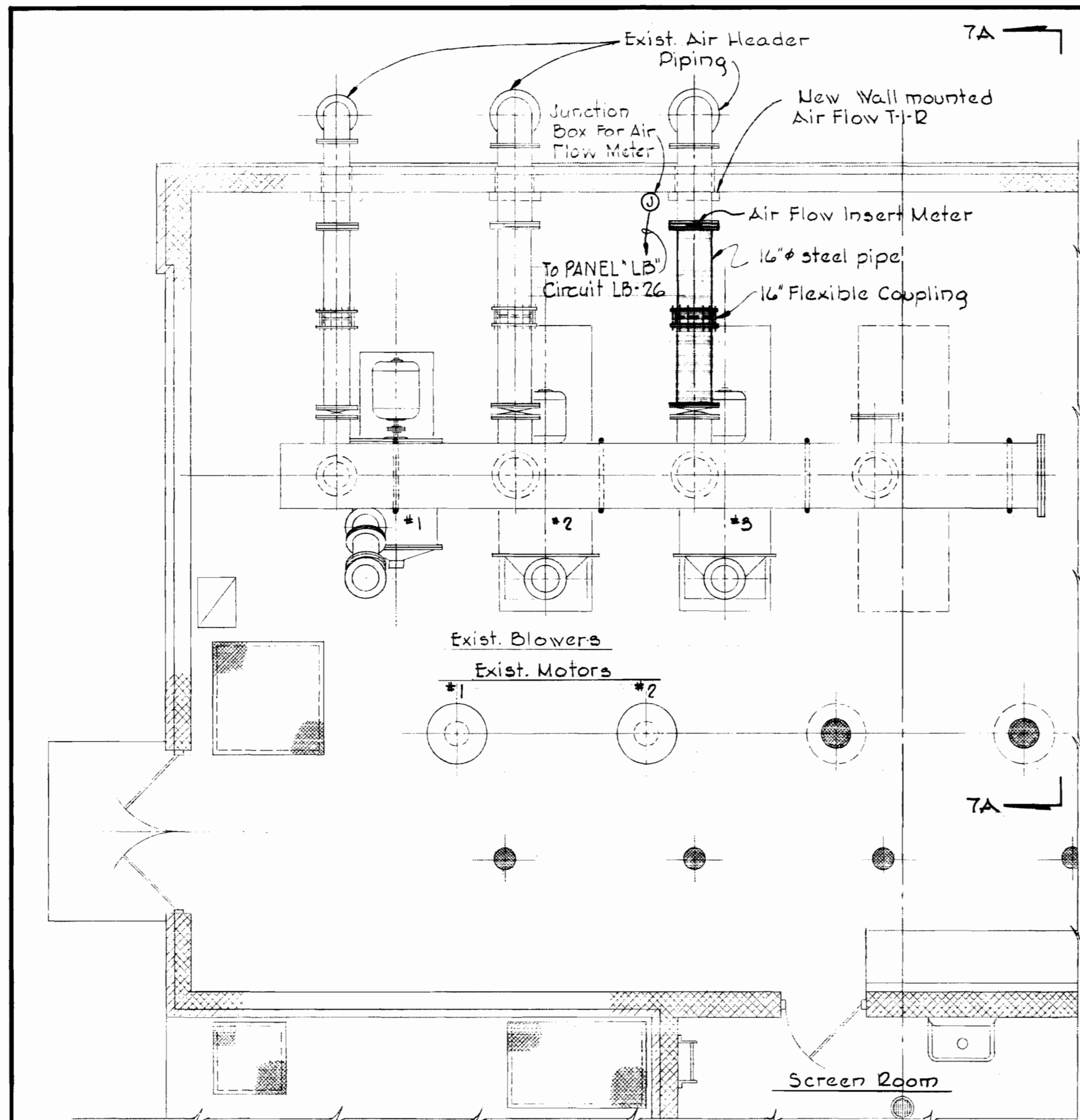
DATE	REVISIONS	DRAWING NO. OF	SCALE AS SHOWN
8/9/71	General	6 OF 8	

W.O. - 6408-2

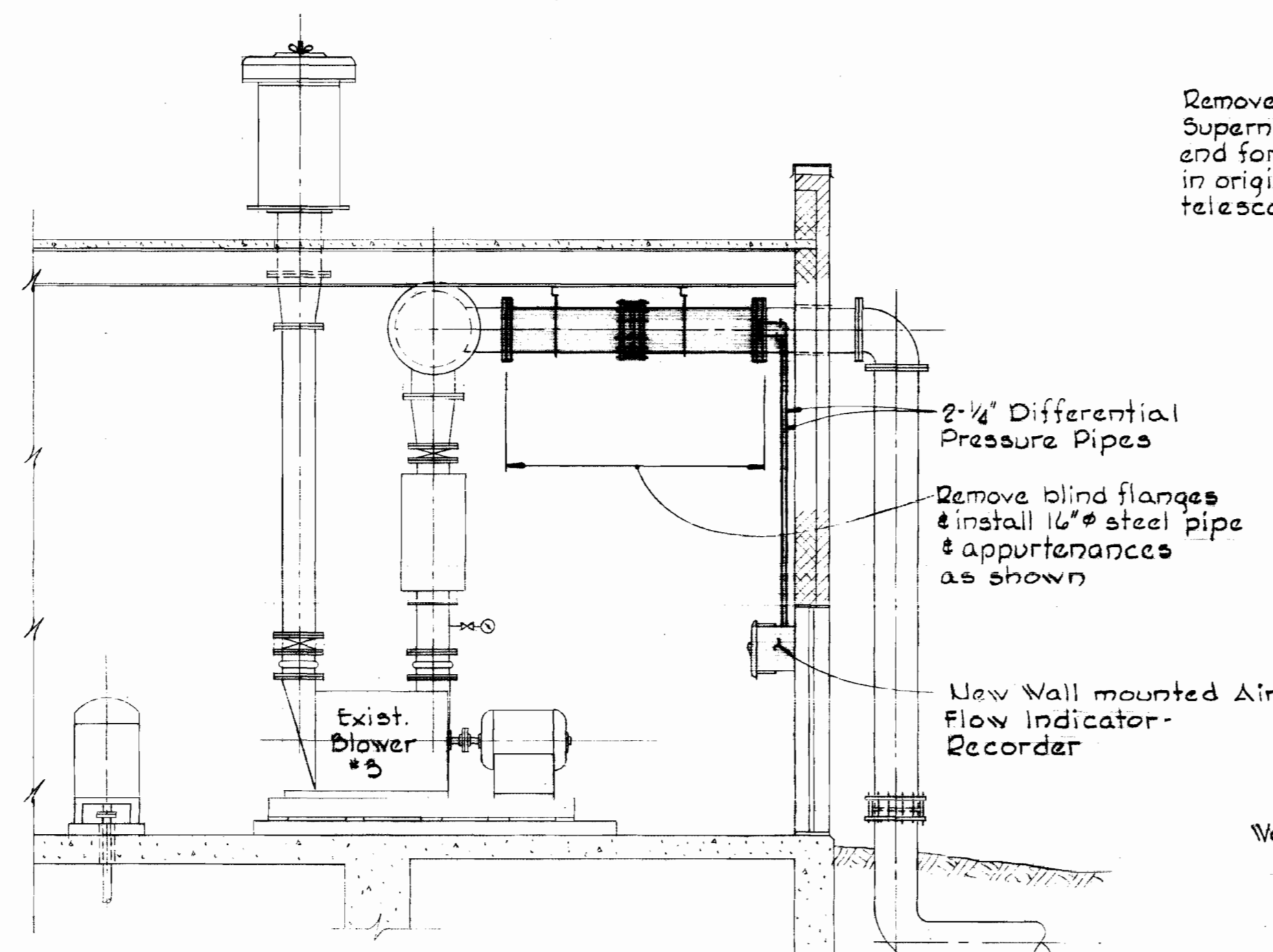
REVISED - ADDENDUM NO. 1 6/4/71



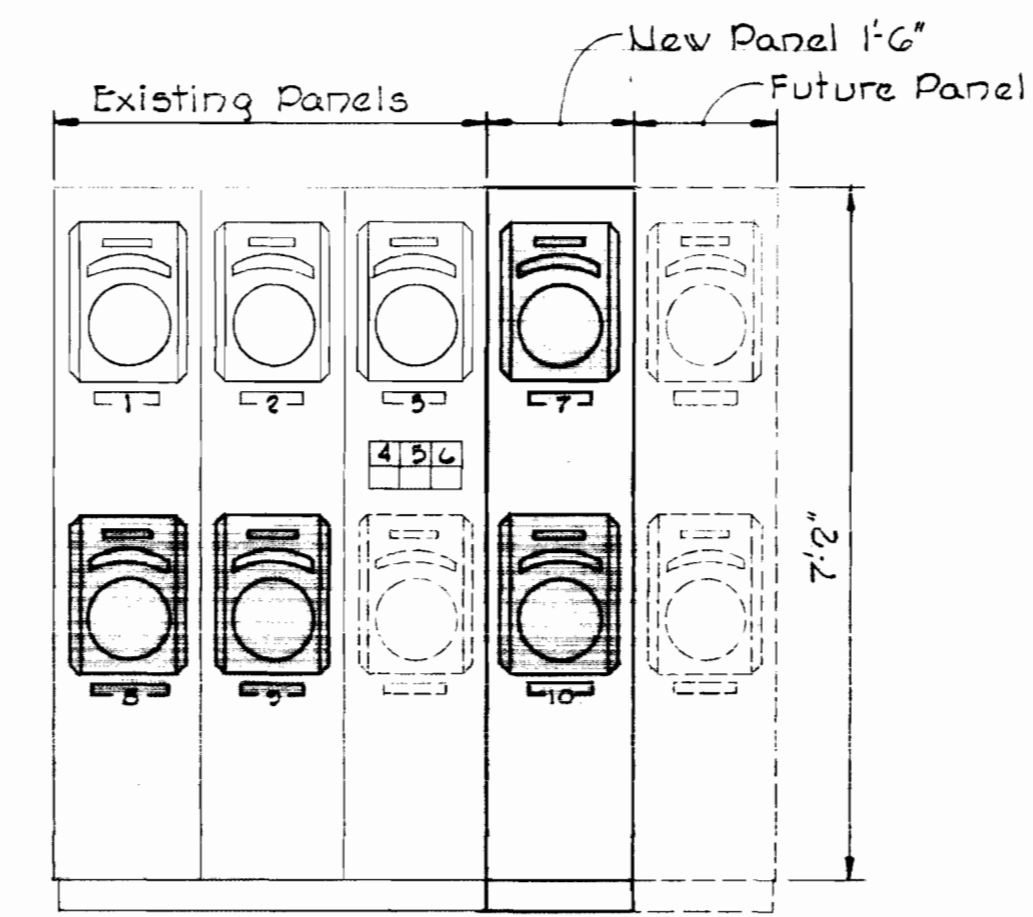
WS 402-5/6



EXIST. BLOWER BUILDING & PUMPING STATION
PART PLAN - BLOWER ROOM
 Scale: 1/4" = 1'-0"

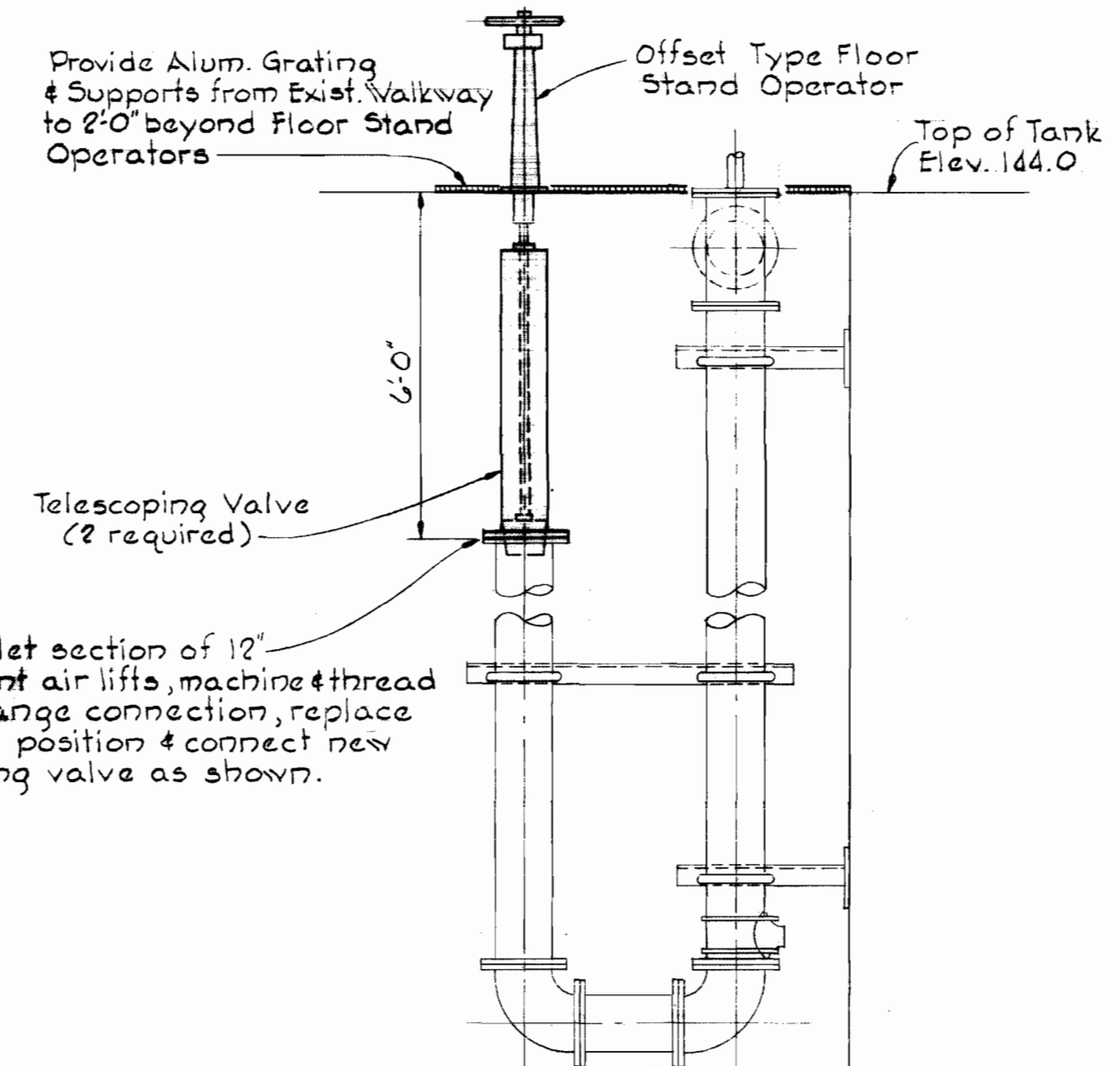


SECTION 7A
 Scale: 1/4" = 1'-0"

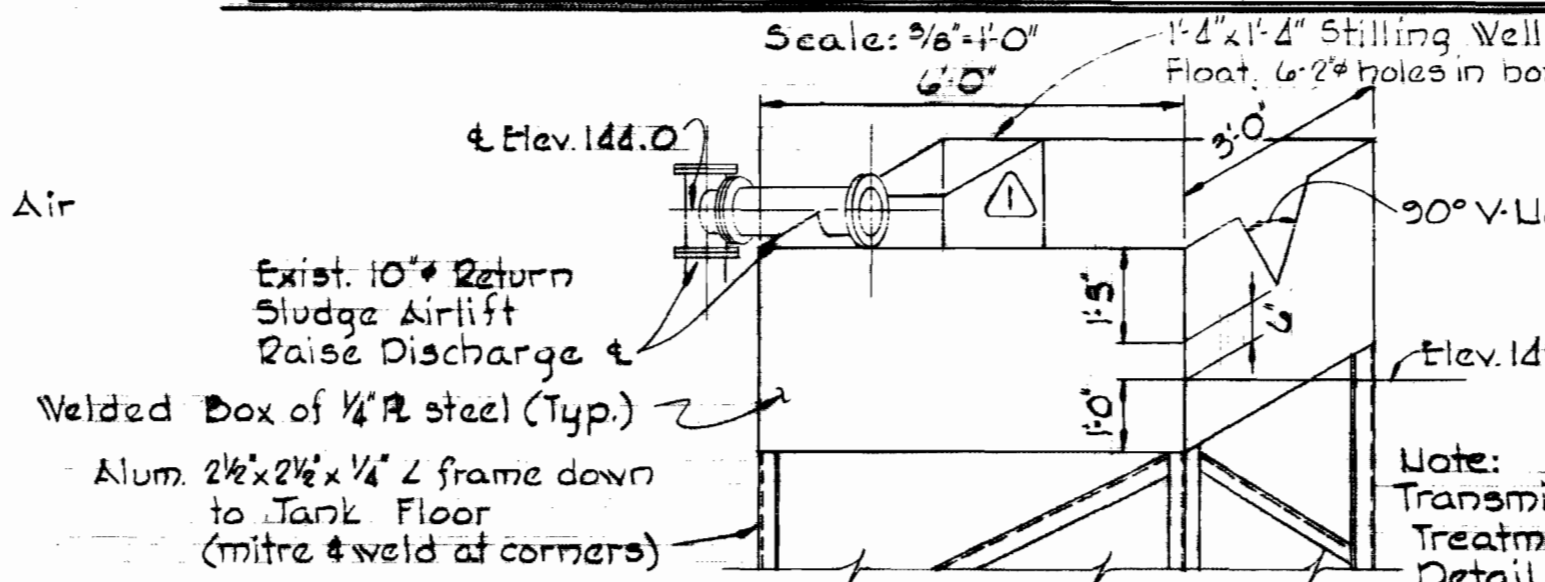


- PANELBOARD LEGEND**
1. Sewage Effluent Flow - Treatment Unit No. 1
 2. Sewage Effluent Flow - Treatment Unit No. 2
 3. Sewage Effluent Total Flow
 4. Collector Drive Trouble
 5. Blower Surge
 6. Wet Well Level & Control Air
 7. New Sewage Effluent Flow - Treatment Unit No. 3
 8. Return Sludge Flow Treatment Unit #1
 9. Return Sludge Flow Treatment Unit #2
 10. Return Sludge Flow Treatment Unit #3

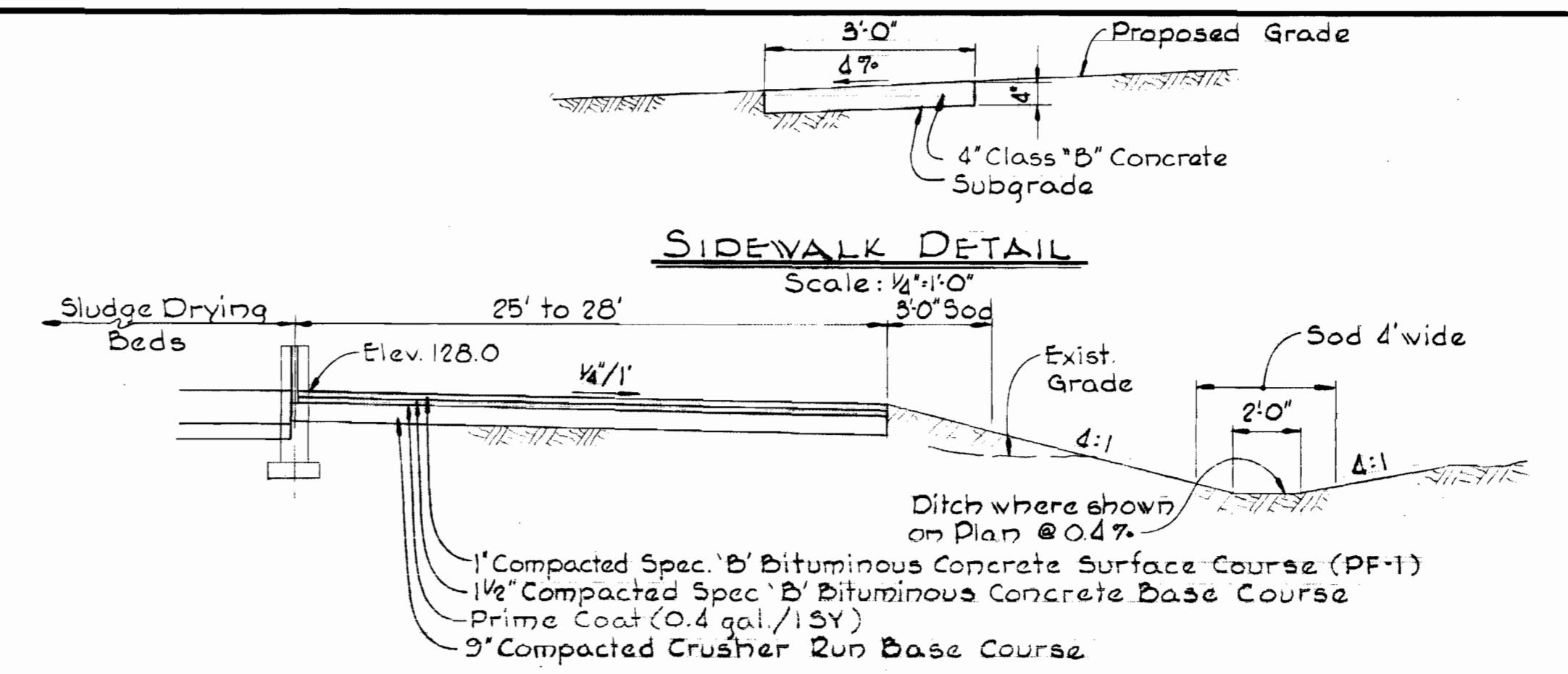
ELEVATION - PANELBOARD
 No Scale



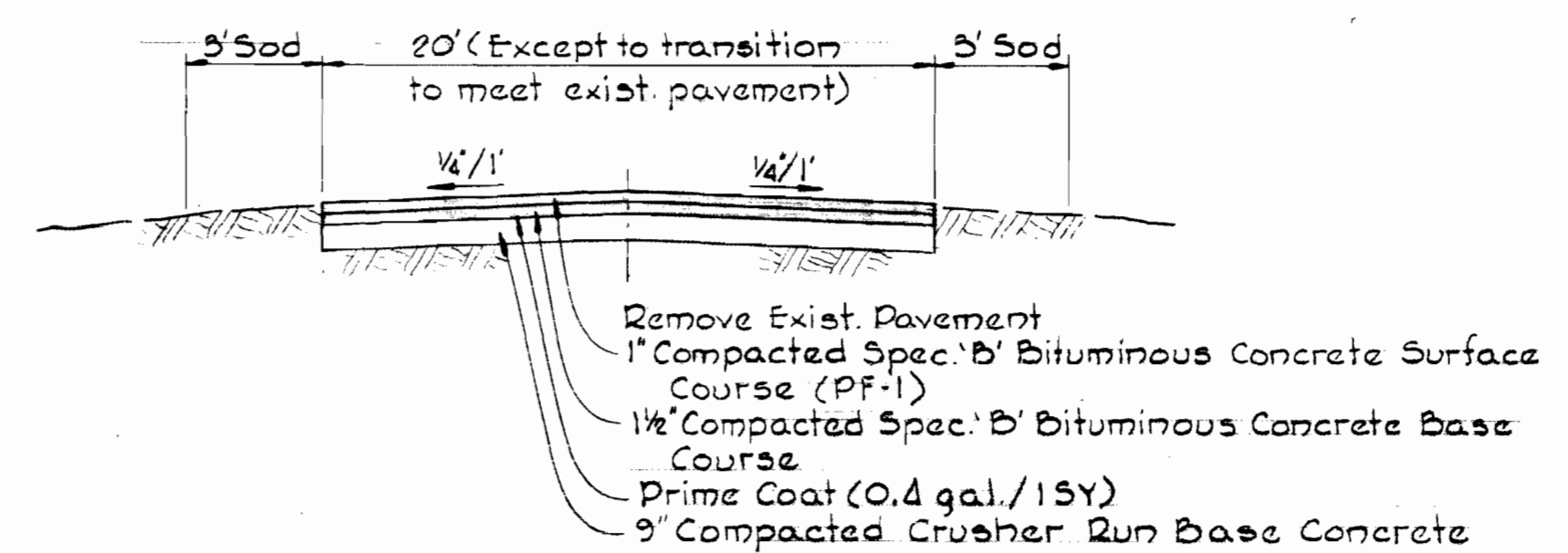
DETAIL - TELESCOPING VALVE
 ADAPTION TO SUPERNATANT AIR LIFTS TREATMENT UNIT # 2
 Scale: 3/8" = 1'-0"



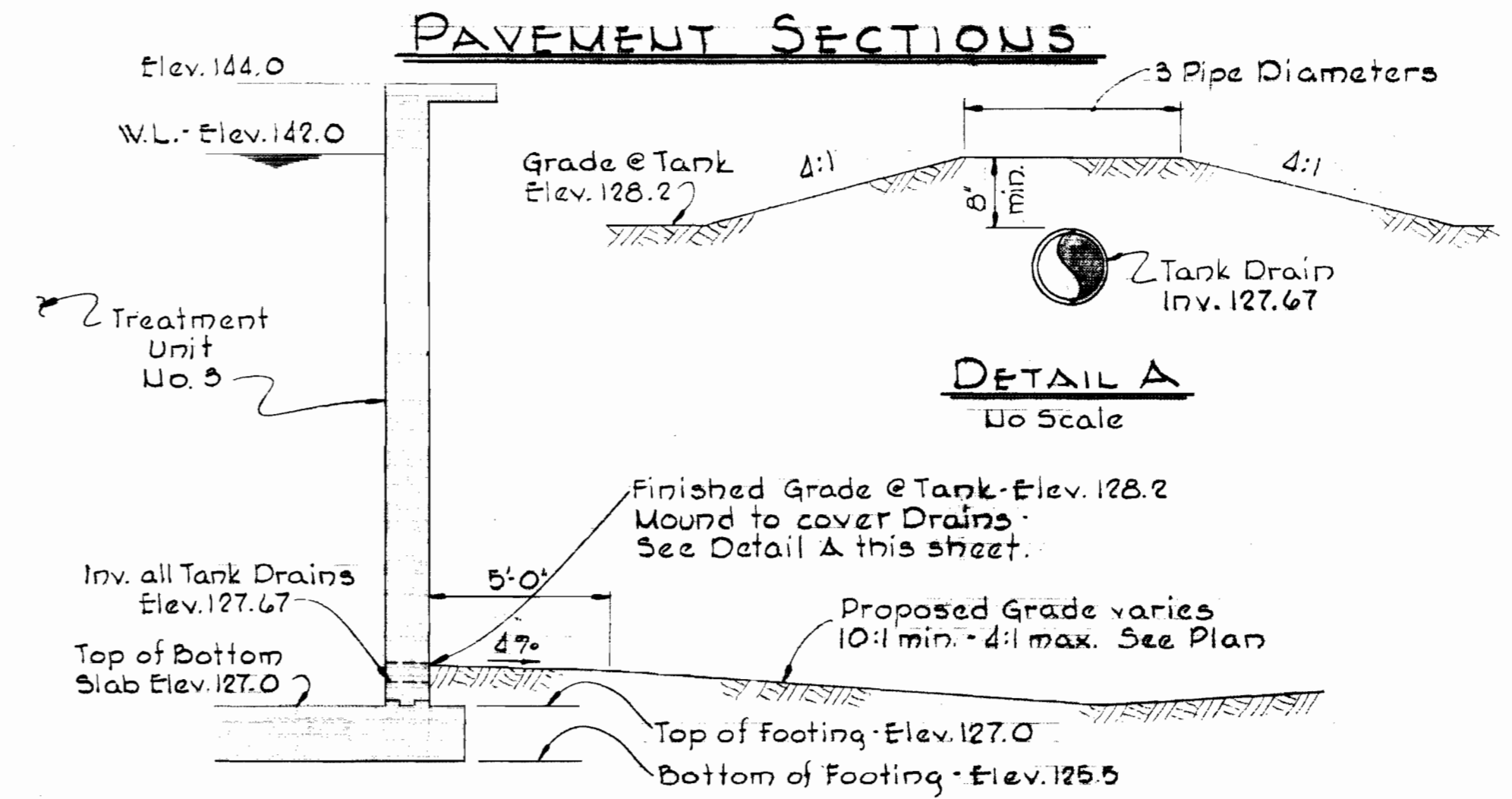
DETAIL - RETURN SLUDGE WEIR BOXES
 TREATMENT UNIT # 1
 Scale: 3/8" = 1'-0"



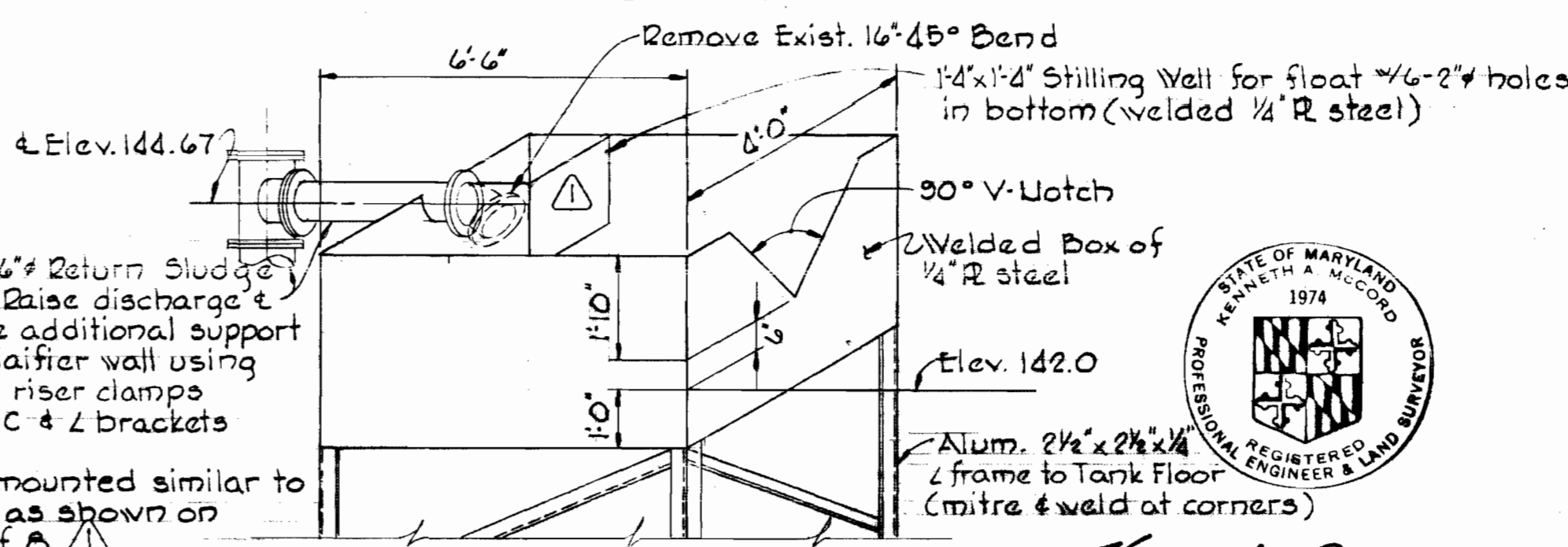
SLUDGE BED ROAD
 No Scale



RECONSTRUCTED PLANT ACCESS ROAD
 No Scale



TYPICAL SECTION OF GRADING AT TREATMENT UNIT NO. 3
 No Scale



DETAIL A
 No Scale

DETAIL - RETURN SLUDGE WEIR BOXES
 TREATMENT UNIT # 2
 Scale: 3/8" = 1'-0"

DATE	REVISION
6/9/71	General

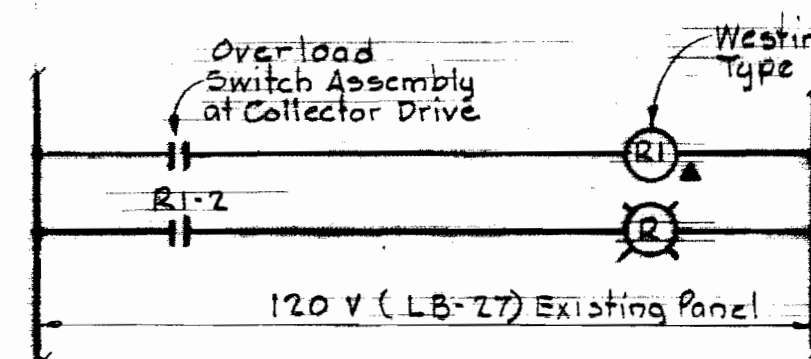
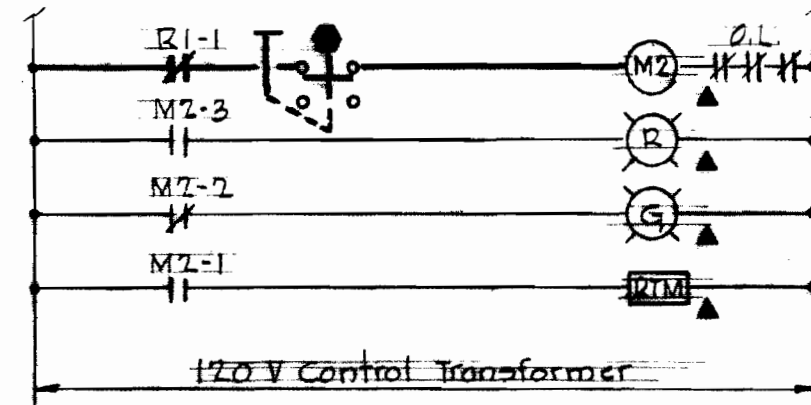
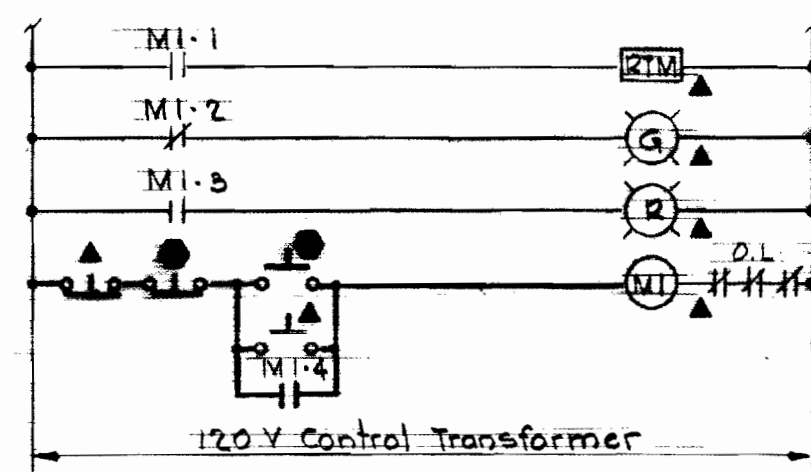
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND S-13-71 DATE <i>W.O. Gilbert</i> CHIEF - BUREAU OF WATER AND SEWER	CONTRACT NO. 402-S	MECHANICAL & CIVIL PLANS & DETAILS	SAVAGE SEWAGE TREATMENT PLANT ADDITION NO. 2	DRAWING NO. 7	SCALE AS SHOWN
					OF 8	

WS 402-S/7

CC2-1	CC2-5	CC2-9	CC2-12	CC2-15	CC2-21	CC2-25	CC2-31	CC2-34	CC2-39	CC2-42	CC2-48	CC2-51	CC2-57
CC2-2	CC2-6	CC2-10		CC2-16	CC2-22	CC2-26		CC2-35		CC2-45		CC2-52	
CC2-3	CC2-7		CC2-17	CC2-23	CC2-27					CC2-44	CC2-49	CC2-55	
CC2-4	CC2-8	CC2-11		CC2-18		CC2-28	CC2-32	CC2-36	CC2-40	CC2-45		CC2-54	CC2-58
			CC2-13	CC2-19	CC2-24	CC2-29		CC2-33	CC2-37	CC2-41		CC2-56	
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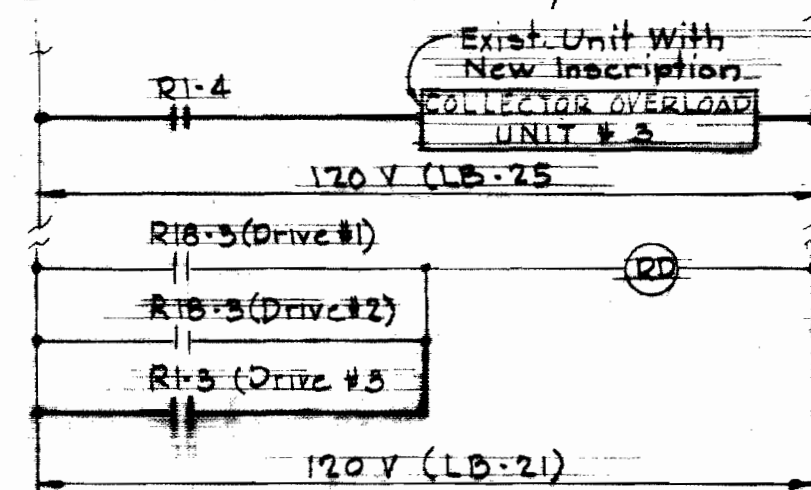
ELEVATION - EXISTING MOTOR CONTROL CENTER 'CC2'
No. Scale

Unit & Run Number	NAMEPLATE DATA	DEVICE DESCRIPTION	HP or KVA	Aux. Descr.	BREAKER	WIRE	Ground Wires	Conduit
CC2-30	Spray Water Pump # 6	Combination Starter Size 1, FVNR (Existing)	5	a.c.d. e.f.	100A 3 15	4/c 12 Multi Conductor	12	See Dwg.
CC2-47	Spray Water Pump # 5	Combination Starter Size 1, FVNR (Existing)	5	a.c.d. e.f.	100A 3 15	4/c 12 Multi Conductor	12	See Dwg.
CC2-51	Collector Drive # 3	Combination Starter Size 1, FVNR (Existing)		a.c.d. e.f.	100A 3 15	4/c 12 Multi Conductor	12	See Dwg.
CC2-36a	Blank (Existing)	Circuit Breaker (Existing)						
CC2-36b	15 KVA Transformer	Circuit Breaker			100A 3 30	3 10 THW		1"

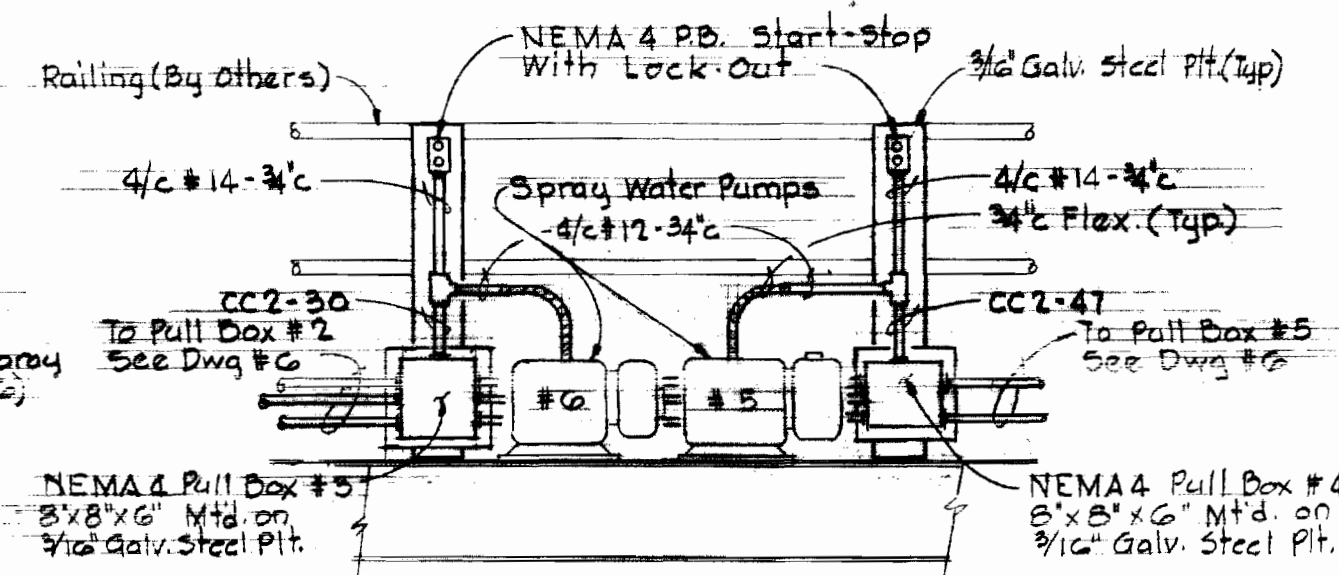


LOCATION SYMBOLS FOR ELEMENTARY CONTROL WIRING DIAGRAMS

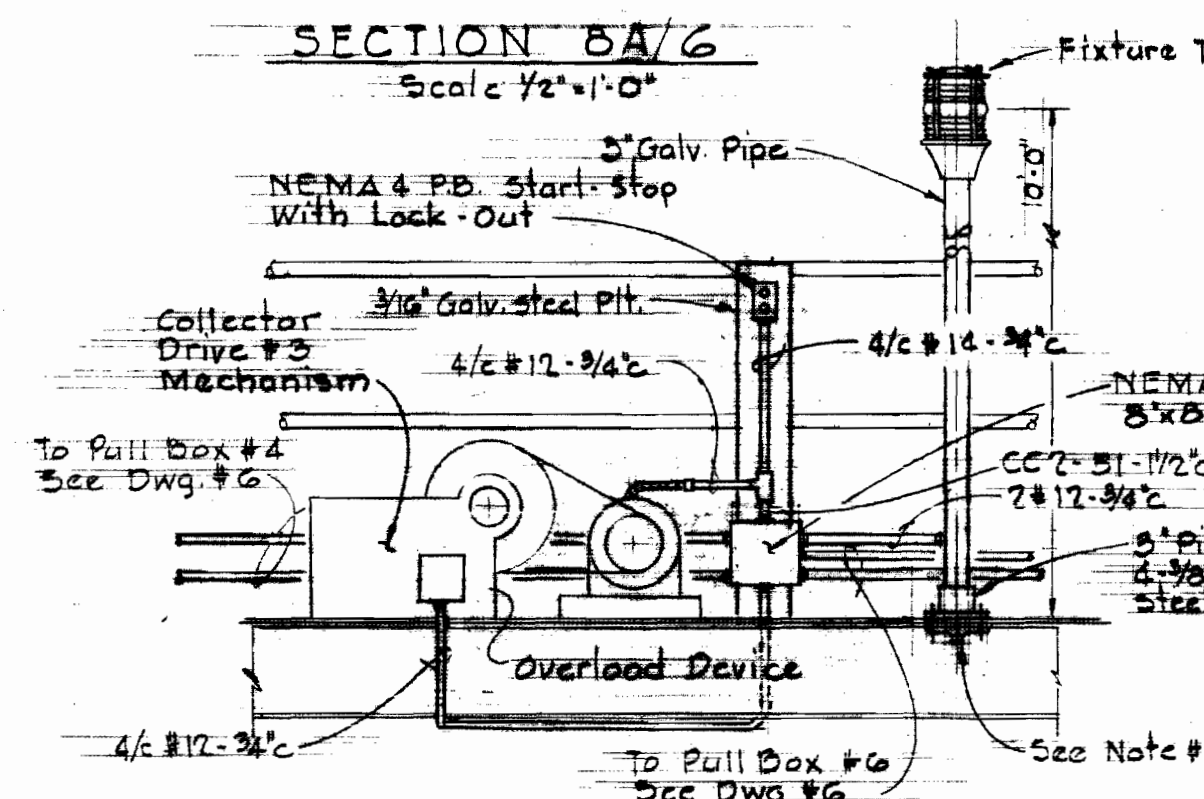
- Device located in Motor Control Center 'CC2'
- ▲ Device located at Motor and/or Unit



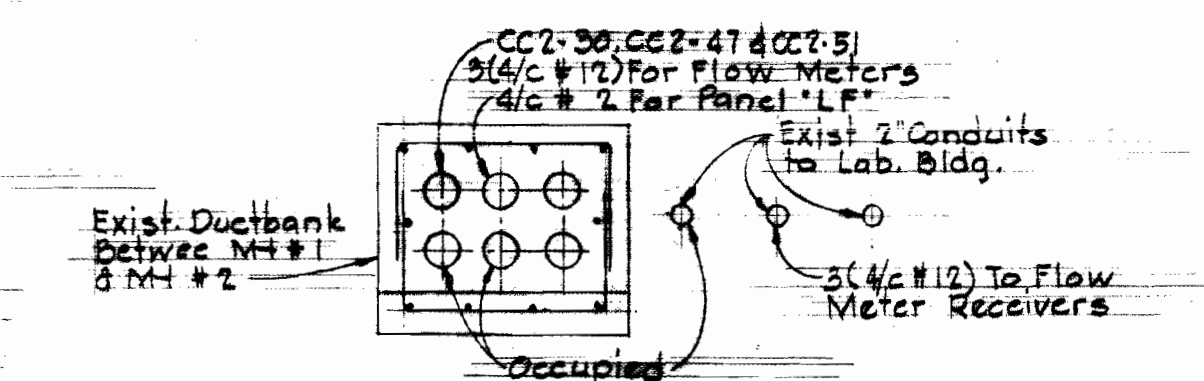
ELEMENTARY CONTROL WIRING DIAGRAMS



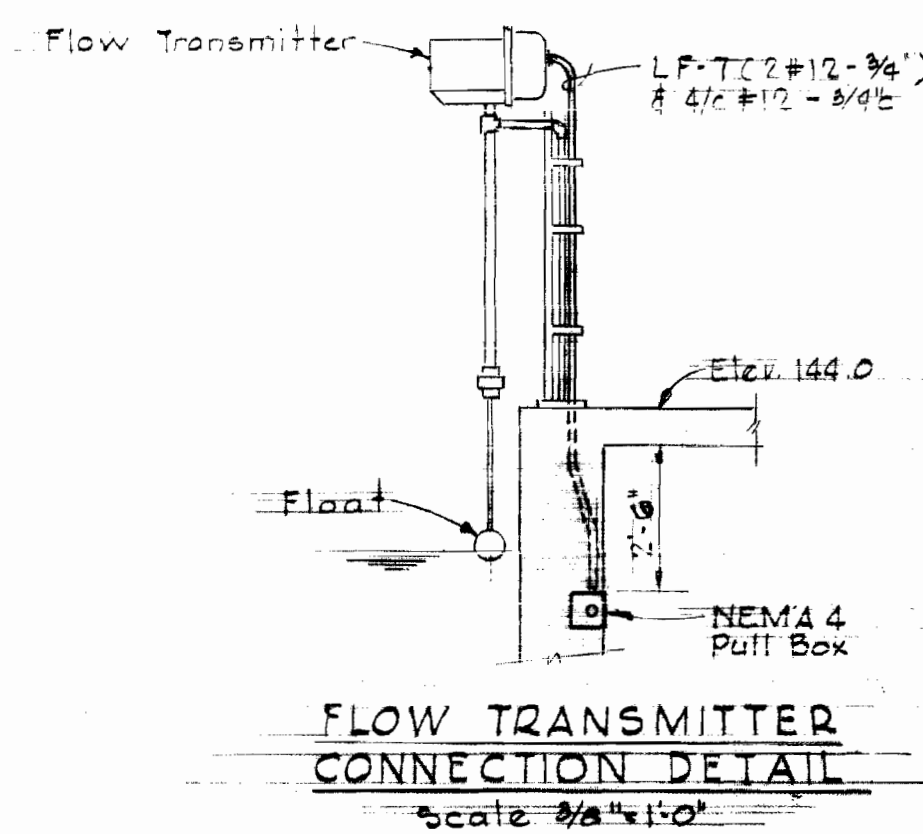
SECTION 8A/6
Scale 1/2"=1'-0"



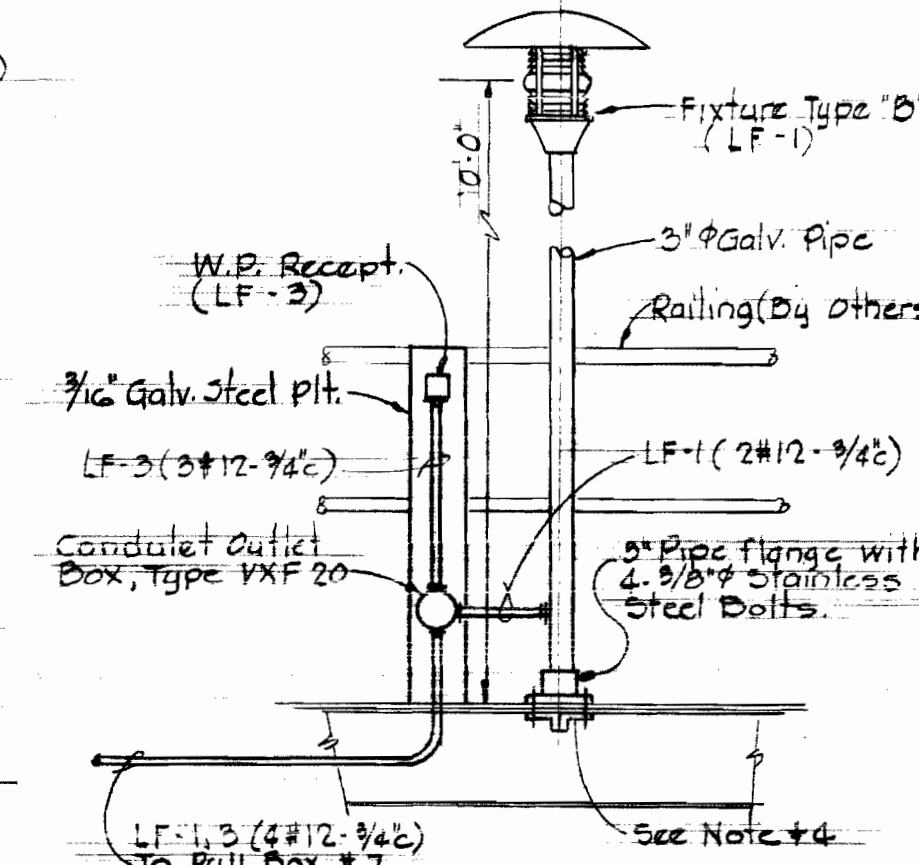
SECTION 8B/6
Scale 1/2"=1'-0"



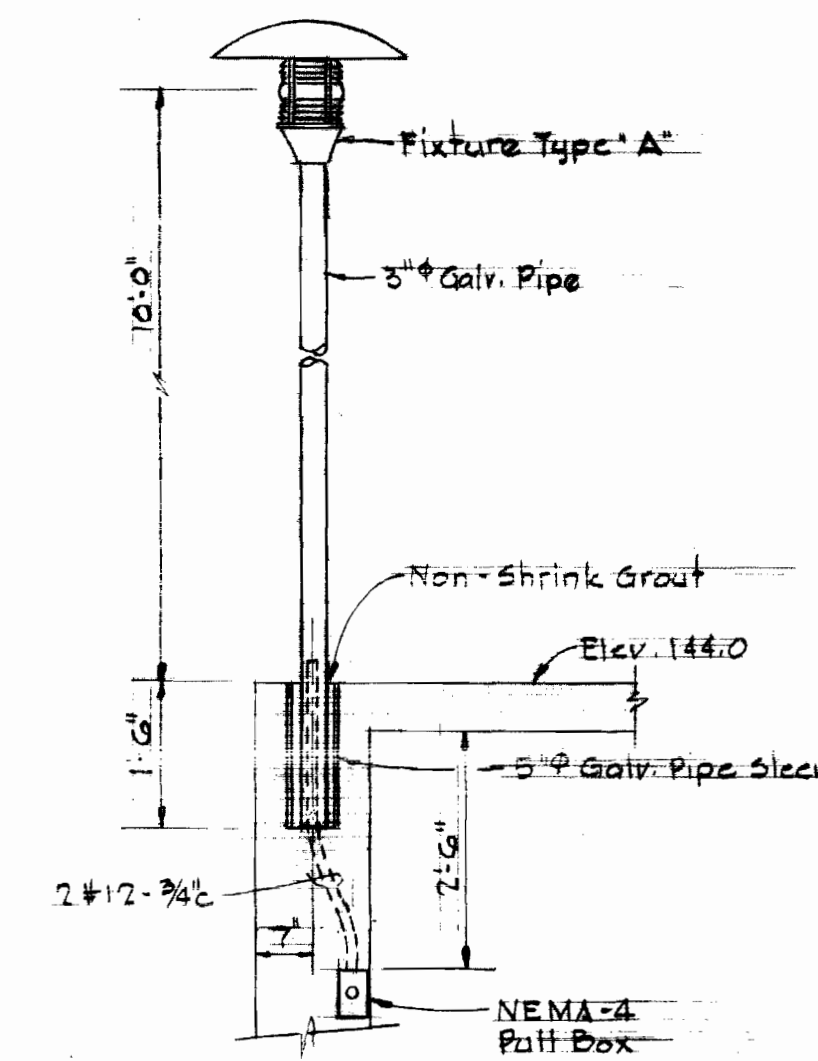
SECTION DETAIL OF EXIST. U.G. RACEWAYS LOOKING SOUTH AT EXIST. MANHOLE ADJACENT TO LAB BUILDING
No. Scale



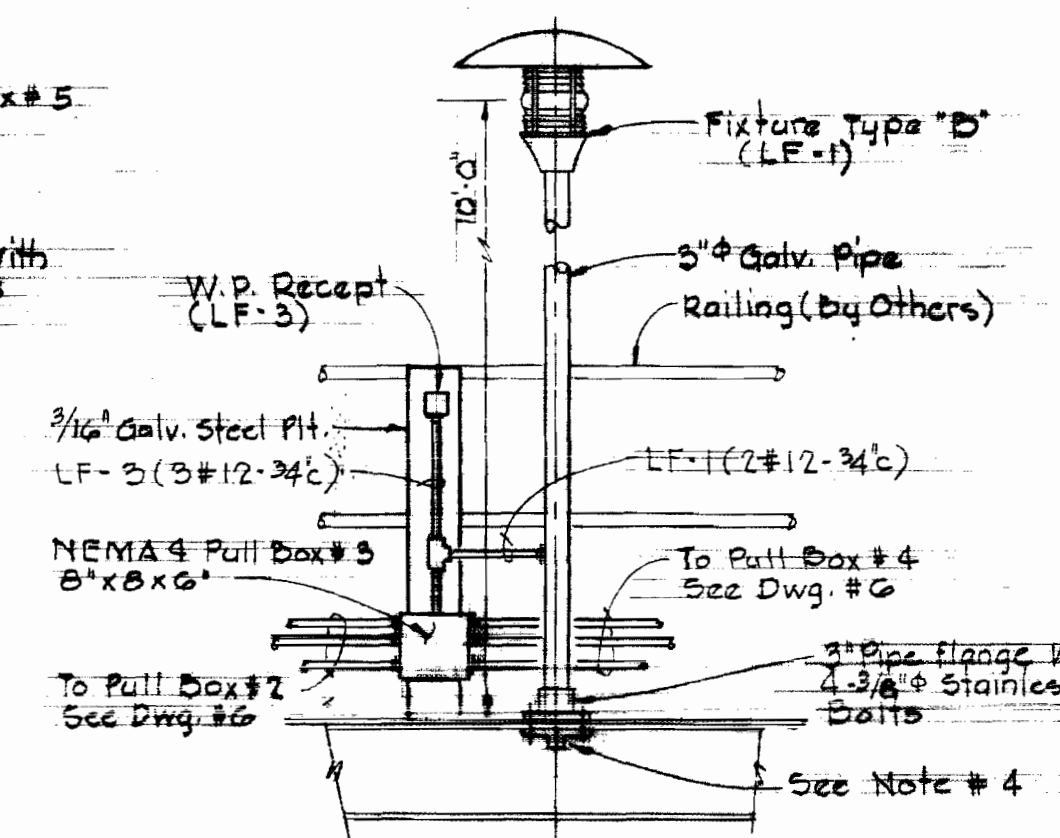
FLOW TRANSMITTER CONNECTION DETAIL
Scale 3/4"=1'-0"



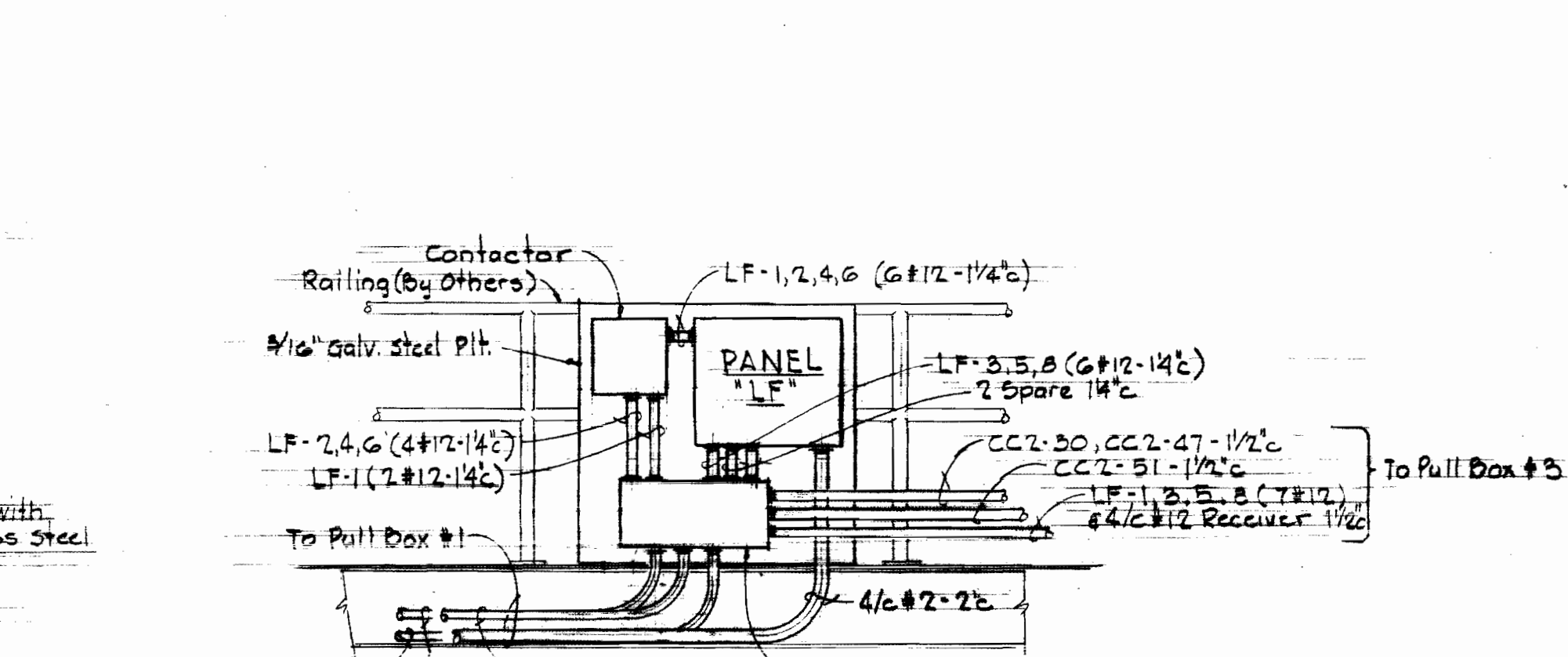
SECTION 8E/6
Scale 1/2"=1'-0"



FIXTURE MOUNTING DETAIL
Scale 1/2"=1'-0"



FIXTURE MOUNTING DETAIL
Scale 1/2"=1'-0"



SECTION 8C/6
Scale 1/2"=1'-0"

GENERAL NOTES

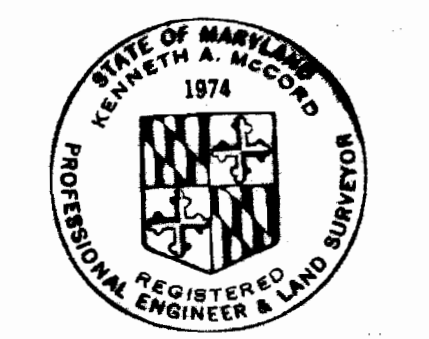
- For Panelboard Schedule, See Specifications, General Electrical Requirements.
- For Lighting Fixture Types, See Specifications, General Electrical Requirements.
- For Electrical Work at Treatment Unit # 3 See Drwg # 402-5.
- At Each Location of Lighting Fixtures Types 'B' & 'C' on Tonic Bridge Weld 2" x 2" x 3/8" Ls to Structure, Short Leg Down.
- In Elementary Control Wiring Diagrams, Heavy Line Work Indicates New & Light Line Work Indicates Existing.
- In Elevation Existing Motor Control Center 'CC2' Units Encircled with Heavy Line Work Indicates Existing Units That Shall Be Used For The Various Loads.
- See Drawing # 7 For Required Wiring of Air Flow Meter # 3.

LEGEND

- Outlet - Incandescent - Pole Top
- ⊗ Indicating Light - Color As Noted
- ⊞ Pushbutton Station, Start-Stop With Lockout
- CC2-30 Unit & Run Number - See M.C.C. Schedule
- ||- Contactor - Normally Open - Normally Closed

AUXILIARY DESCRIPTION FOR MOTOR CONTROL CENTER 'CC2'

- a Red & Green Indicating Light
- b Hand-Off-Automatic Selector Switch
- c Third Overload Relay
- d 480-120 Volt Control Transformer
- e Start-Stop Pushbutton station
- f Running Time Meters



Kenneth M. Conrad

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1304 ST. PAUL ST.
BALTIMORE, MARYLAND

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
5-13-71
DATE

CONTRACT NO. 402-5

ELECTRICAL
DETAILS

SAVAGE SEWAGE
TREATMENT PLANT ADDITION NO. 2

DRAWING NO. 8 OF 8
SCALE AS SHOWN