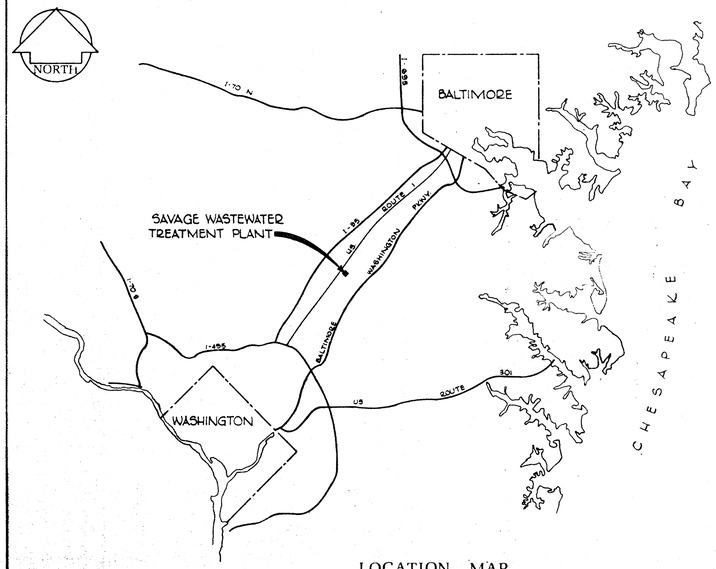
HOWARD COUNTY, MARYLAND

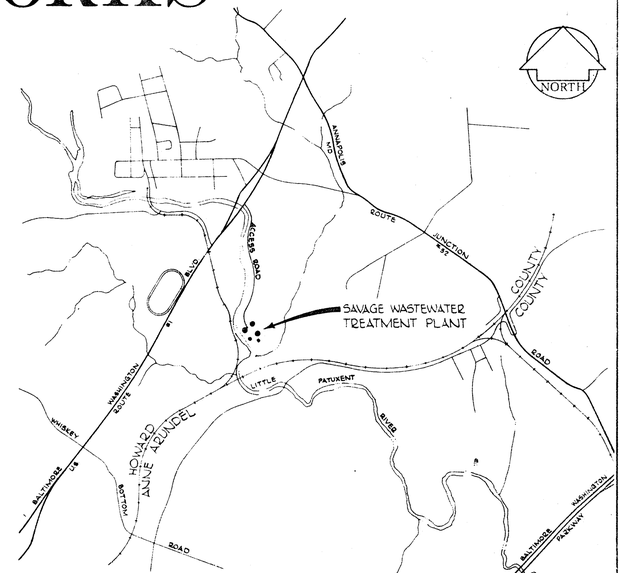
DEPARTMENT OF PUBLIC WORKS



LOCATION MAP

SCALE: 1" = 6 MILES

HOWARD COUNTY MARYLAND



VICINITY PLAN

SCALE: 1" = 2000'

SAVAGE WASTEWATER TREATMENT PLANT

ADDITION NO. 3

CONTRACT 525-S

HOWARD COUNTY

WILLIAM O. FILBERT - CHIEF - BUREAU OF ENGINEERING

WHITMAN, REQUARDT & ASSOCIATES - ENGINEERS

KENNETH A. McCORD

STATE OF MARYLAND KENNETH A. McCORD 1974 REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

W.O. 6538-2

SHEET G-1

SAVAGE WASTEWATER TREATMENT PLANT
LIST OF DRAWINGS

GENERAL

DRAWING & SHEET NO.		DESCRIPTION
1	G-1	TITLE SHEET
2	G-2	LIST OF DRAWINGS AND DESIGN DATA

CIVIL

3	C-1	SITE PLAN AND REFERENCES
4	C-2	UTILITY PLAN
5	C-3	GRADING PLAN AND TYPICAL SECTIONS
6	C-4	PROFILES
7	C-5	PROFILES AND DETAILS

ARCHITECTURAL

8	A-1	SLUDGE OXIDATION BUILDING - PLAN AND SCHEDULES
9	A-2	SLUDGE OXIDATION BUILDING - ROOF PLAN AND ELEVATIONS
10	A-3	SLUDGE OXIDATION BUILDING - SECTIONS
11	A-4	SLUDGE OXIDATION BUILDING - DETAILS

STRUCTURAL

12	S-1	SLUDGE OXIDATION BUILDING - FOUNDATIONS
13	S-2	SLUDGE OXIDATION BUILDING - FLOOR PLAN (ELEVATION 145)
14	S-3	SLUDGE OXIDATION BUILDING ROOF PLAN (ELEVATION 158)
15	S-4	PRIMARY CLARIFIER - PLAN AND DETAILS
16	S-5	PRIMARY CLARIFIER - SECTIONS AND DETAILS

MECHANICAL

17	M-1	HYDRAULIC PROFILE
18	M-2	SETTLED SEWAGE DISTRIBUTION CHAMBERS - PLAN, SECTIONS AND DETAILS
19	M-3	SLUDGE OXIDATION BUILDING - PLAN AND SECTIONS
20	M-4	SLUDGE OXIDATION BUILDING - PLAN AND SECTIONS
21	M-5	SLUDGE PROCESS DIAGRAM
22	M-6	MISCELLANEOUS DETAILS

ELECTRICAL

23	E-1	ONE LINE WIRING DIAGRAM
24	E-2	GENERAL ELECTRICAL NOTES AND ELECTRICAL LEGEND
25	E-3	SLUDGE OXIDATION BUILDING
26	E-4	MOTOR CONTROL CENTER
27	E-5	ELECTRICAL SITE PLAN AND MISCELLANEOUS DETAILS
28	E-6	WIRING DIAGRAMS AND MISCELLANEOUS DETAILS
⚠ 28-A	SC-1	SEDIMENT CONTROL PLAN

SAVAGE WASTEWATER TREATMENT PLANT
DESIGN CRITERIA

DESIGN YEAR - 1978
EXPECTED AVERAGE DAILY SEWAGE FLOW
- JANUARY 1973 - 3.2 MGD
- APRIL 1974 - 5.0 MGD (EXISTING CAPACITY)
- MID 1978 - 10.0 MGD (DESIGN CAPACITY - 3rd ADDITION)
- 2000 - 25.0 MGD (ULTIMATE CAPACITY)

INSTALLED PUMPING CAPACITY - 24 MGD
DESIGN PUMPING CAPACITY - 19 MGD (ONE PUMP OUT OF SERVICE)

PRIMARY CLARIFIER - 105 FOOT DIAMETER
- CAPACITY - 7.0 MGD AVERAGE DAILY FLOW
- DESIGN OVERFLOW RATE - 800 GPD/SF (W/O RECYCLE)
- DETENTION TIME - 3.7 HOURS
- WEIR RATE - 21,200 GPD/L.F.

AERATION BASIN
- CONTACT STABILIZATION - 3 UNITS FOR 5 MGD (EXISTING)
- (FUTURE CONVERSION OF 1 MGD UNIT TO THICKENER - DIGESTER)
- DESIGN ACTIVATED SLUDGE - TWO-PASS TANK FOR 5 MGD
- DETENTION TIME - 6 HOURS

SECONDARY CLARIFIERS
- CONTACT STABILIZATION - TWO - 57' Ø UNITS FOR 5 MGD (EXISTING)
- DETENTION TIME - 2.0 HOURS
- OVERFLOW RATE - 1980 GPD/SF (W/FLOW MODULES)
- WEIR RATE - 9200 GPD/LINEAR FOOT
- DESIGN ACTIVATED SLUDGE - ONE - 90' Ø FOR 5 MGD
- DETENTION TIME - 3.65 HOURS
- DESIGN OVERFLOW RATE - 800 GPD/SF
- WEIR RATE - 12,000 GPD/L.F.

CHLORINATION - INTERIM LAGOON FOR 30 MGD PEAK FLOW
- DESIGN DETENTION TIME - 15 MINUTES - PEAK FLOW
- DESIGN DOSAGE - 10 PPM
- 1250 POUNDS / DAY / 15 MGD

SLUDGE OXIDATION - DESIGN CAPACITY 230 GPM AT 2.5% SUSPENDED SOLIDS

ABBREVIATIONS

PIPELINE

A	AIR
ABI	AERATION BASIN INFLUENT
CCBI	CHLORINE CONTACT BASIN INFLUENT
CL_2	CHLORINE
CS	CONTACT STABILIZATION
D	DRAIN
DB	DUCTBANK
FM	FORCE MAIN
IS	INCINERATOR SLUDGE
OS	OXIDIZED SLUDGE
Pr	PROFILE
S	SEWER OR INTERCEPTOR
TD	TANK DRAIN
TSE	THICKENED SLUDGE EFFLUENT
UD	UNDERDRAIN
W	WATER
WS	WASTE SLUDGE
PCI	PRIMARY CLARIFIER INFLUENT

APPURTENANCES

T	TEE
V	VALVE
HB	HORIZONTAL BEND
VB	VERTICAL BEND
R	REDUCER / INCREASER (CONCENTRIC)
ER	REDUCER / INCREASER (ECCENTRIC)

MISCELLANEOUS

℄	BASELINE
℄	CENTERLINE
EX.	EXISTING
FF	FIRST FLOOR
MH	MANHOLE
INV. ELEV.	INVERT ELEVATION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
N	NORTH
E	EAST
S	SOUTH
W	WEST

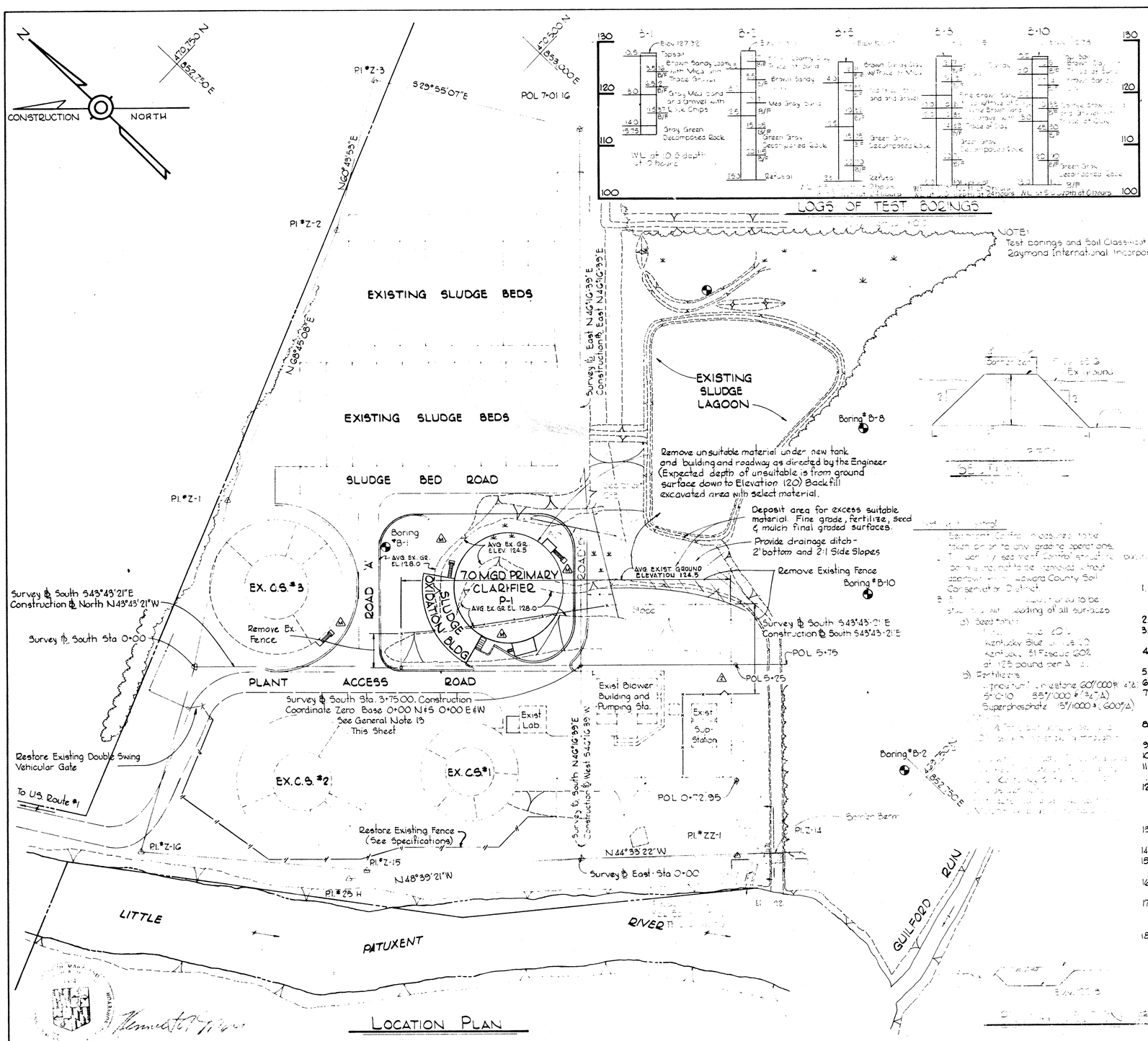
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND DATE / CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	LIST OF DRAWINGS AND DESIGN DATA	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 2 OF 28	SCALE AS SHOWN

W.O. 6538-2

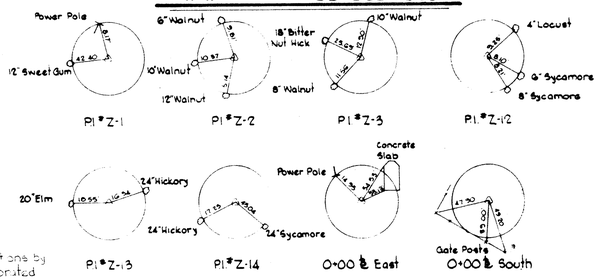
Construction Modification ⚠

SHEET G-2

BRUNING 44510 14778



Pl. References



NOTE All Stationing on Survey Baseline

Bench Marks

W.R.&A. BM "Blaine" Elev. 139.06
X-cut on flange bolt of fire hyd.
40'± Rt of ℄ Sta 2+25± ℄ South

W.R.&A. BM #1-A Elev. 127.65
2.2 Spike in 36" Oak 8' Lt of Pl.#19-H
(not shown on Plan)

General Notes

1. 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.
2. All pipe elevations shown are invert Ⓘ elevations.
3. The Contractor shall locate existing utilities a minimum of two weeks in advance of construction operations in vicinity of utilities.
4. 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.
5. For all standard details see standards bound in Specifications.
6. Block all fittings with concrete, or use restraining devices - See Specifications.
7. Pipelines shall be of the material listed in the specifications. All airlines shall have a minimum of 2' cover and all sewer and water shall have a minimum of 3½' cover unless otherwise noted by profiles or elevations on the plans.
8. Clear all utilities by a minimum of 6" vertically. All parallel pipe systems to have 2'-0" minimum horizontal clearance.
9. The Contractor shall provide a joint in all sewer mains within 2'-0" of exterior walls.
10. Elevations and coordinates are based on the Maryland State Datum and Grid System.
11. All existing valve boxes, manhole frames and covers and existing appurtenances shall be adjusted to finished grade.
12. All outside valves in sewer lines up to and including 12" diameter shall be plug valves. All outside valves in sewer line 16" and larger shall be gate valves. All buried water valves shall be gate valves. All buried valves will have roadway boxes with concrete slabs in all areas other than paved areas. All valves to be of same size as pipeline unless otherwise indicated.
13. All structures, buildings, roadways, pipelines, etc. are located by construction coordinates. Zero base for the coordinate system is as noted on sheet C-1 @ intersection of survey base lines.
14. For the exact location of utilities entering buildings see mechanical and electrical drawings.
15. Existing valve boxes and associated concrete slabs and manhole frames and covers shall be adjusted to grade as required.
16. Existing parking chocks along the east side of the Plant Access Road will be relocated as shown or as directed by the Engineer.
17. Connection of new to existing pipeline may be made by tapping existing pipelines, or by sleeves and spacers or by other means approved by the Engineer. Attention is directed to specifications for Plant operational requirements while making connections.
18. All pipelines that are capped or plugged shall be flagged with striped 2"x4" set 36" into ground and identified with all-weather markings.

REFERENCES:
1) For Utility Plan and Structure Location see sheet C-2
2) For Grading Plan see sheet C-3
3) For Legend see sheet C-2
4) For Abbreviations See sheet G-2

Location Plan

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 4/1/73 DATE — W.O. Gilbert CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	LOCATION PLAN AND REFERENCES	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 3 OF 28	SCALE 1"=50'

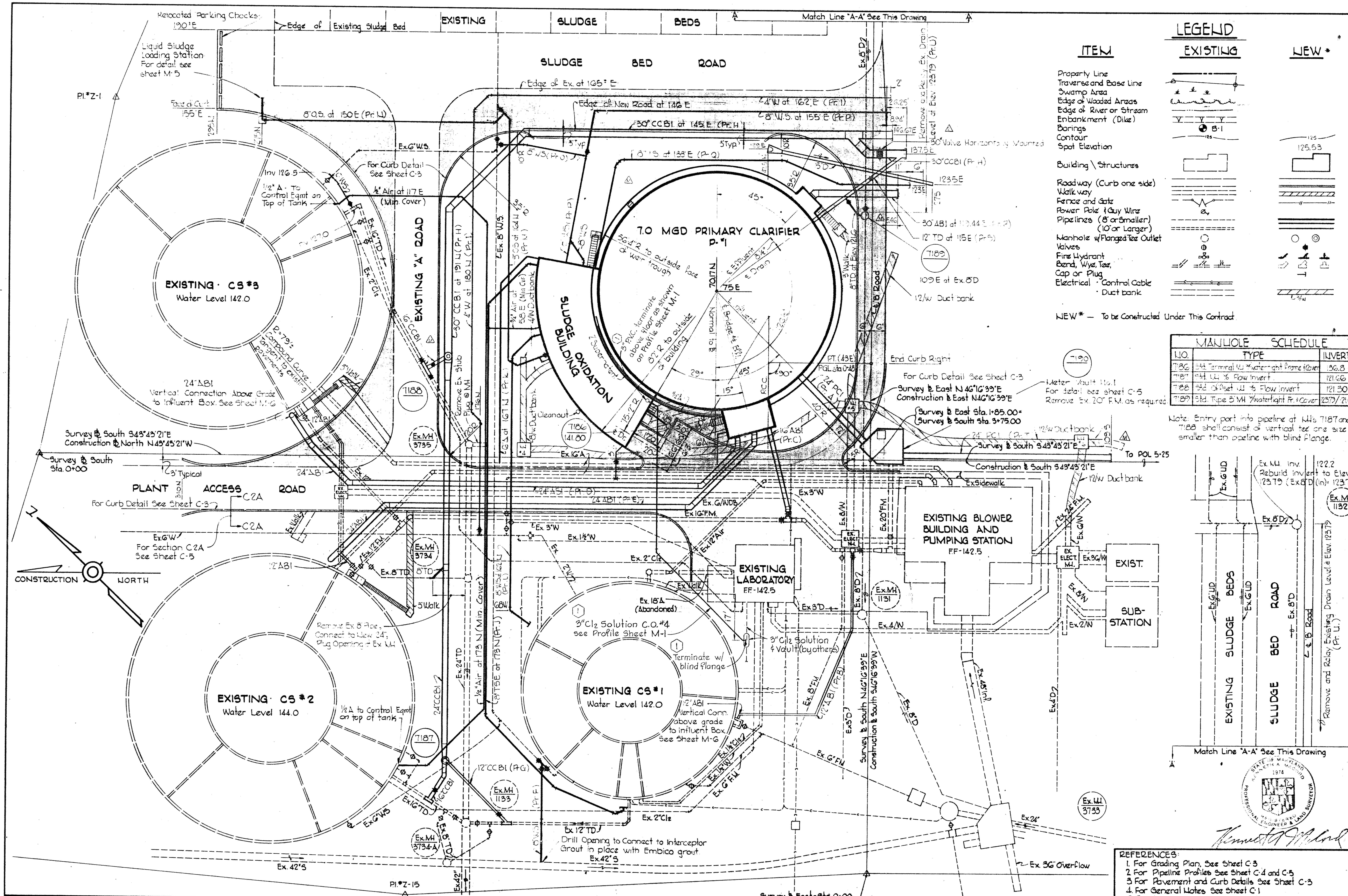
470-486
470-487
469-488

SHEET C-1

Addendum Ⓐ
Construction Modification Ⓜ

W. O. 6538-2

BRUNING 44 510 14778



LEGEND

ITEM	EXISTING	NEW *
Property Line		
Traverse and Base Line		
Swamp Area		
Edge of Wooded Areas		
Edge of River or Stream		
Embankment (Dike)		
Borings	B-1	
Contour	125	125
Spot Elevation		125.53
Building \ Structures		
Roadway (Curb one side)		
Walk way		
Fence and Gate		
Power Pole & Guy Wire		
Pipelines (8" or Smaller)		
(10" or Larger)		
Manhole w/Flanged Tee Outlet		
Valves		
Fire Hydrant		
Bend, Wye, Tee,		
Cap or Plug		
Electrical · Control Cable		
· Duct bank		3/w

NEW * — To be Constructed Under This Contract

MANHOLE SCHEDULE

NO.	TYPE	INVERT
7186	Std. Terminal MH Watertight Frame & Cover	136.8
7187	Std. MH ⅔ Flow Invert	121.66
7188	Std. Offset MH ⅔ Flow Invert	121.30
7189	Std. Type 5' MH Watertight Fr. & Cover	123.79/121.6

Note: Entry port into pipeline at MHs 7187 and 7188 shall consist of vertical tee one size smaller than pipeline with blind flange.

REFERENCES:
1. For Grading Plan, See Sheet C-3
2. For Pipeline Profiles See Sheet C-4 and C-5
3. For Pavement and Curb Details See Sheet C-3
4. For General Notes See Sheet C-1
5. For Abbreviations See Sheet G-2

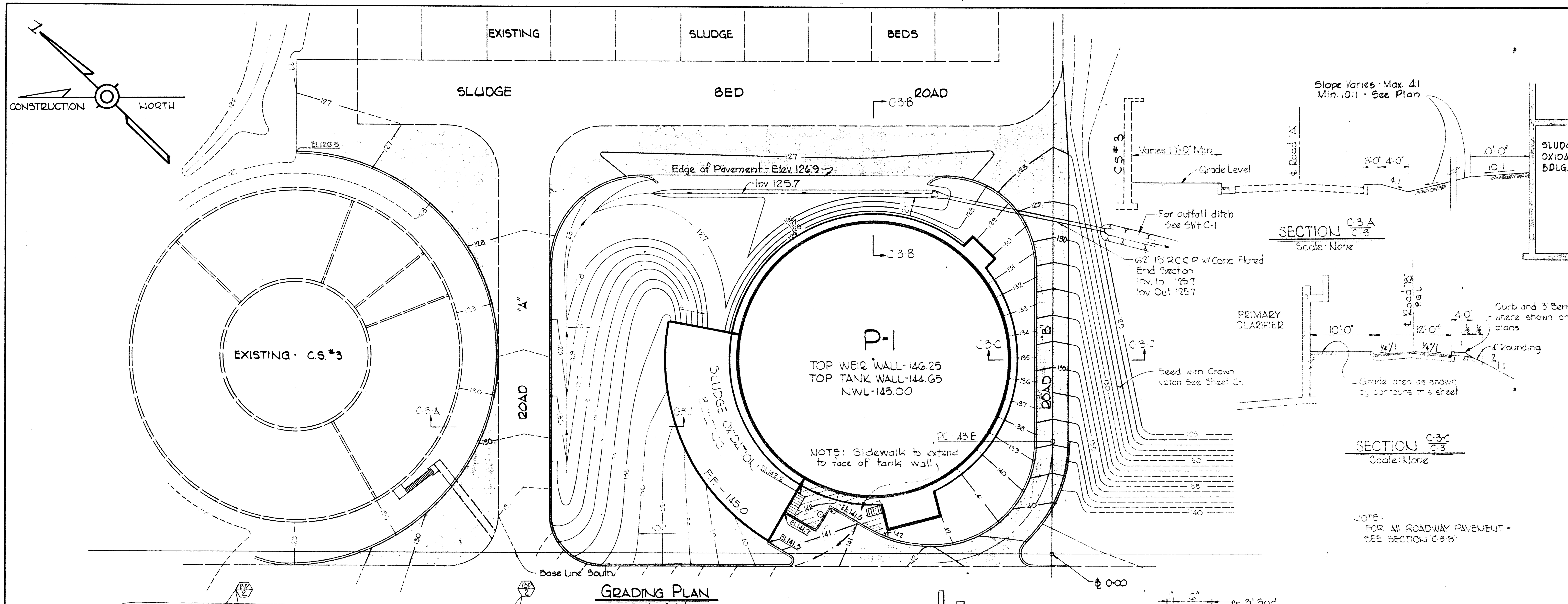
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	UTILITY PLAN	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 4 OF 28	SCALE 1" = 20'	FB*5249 FB*5044 FB*4501

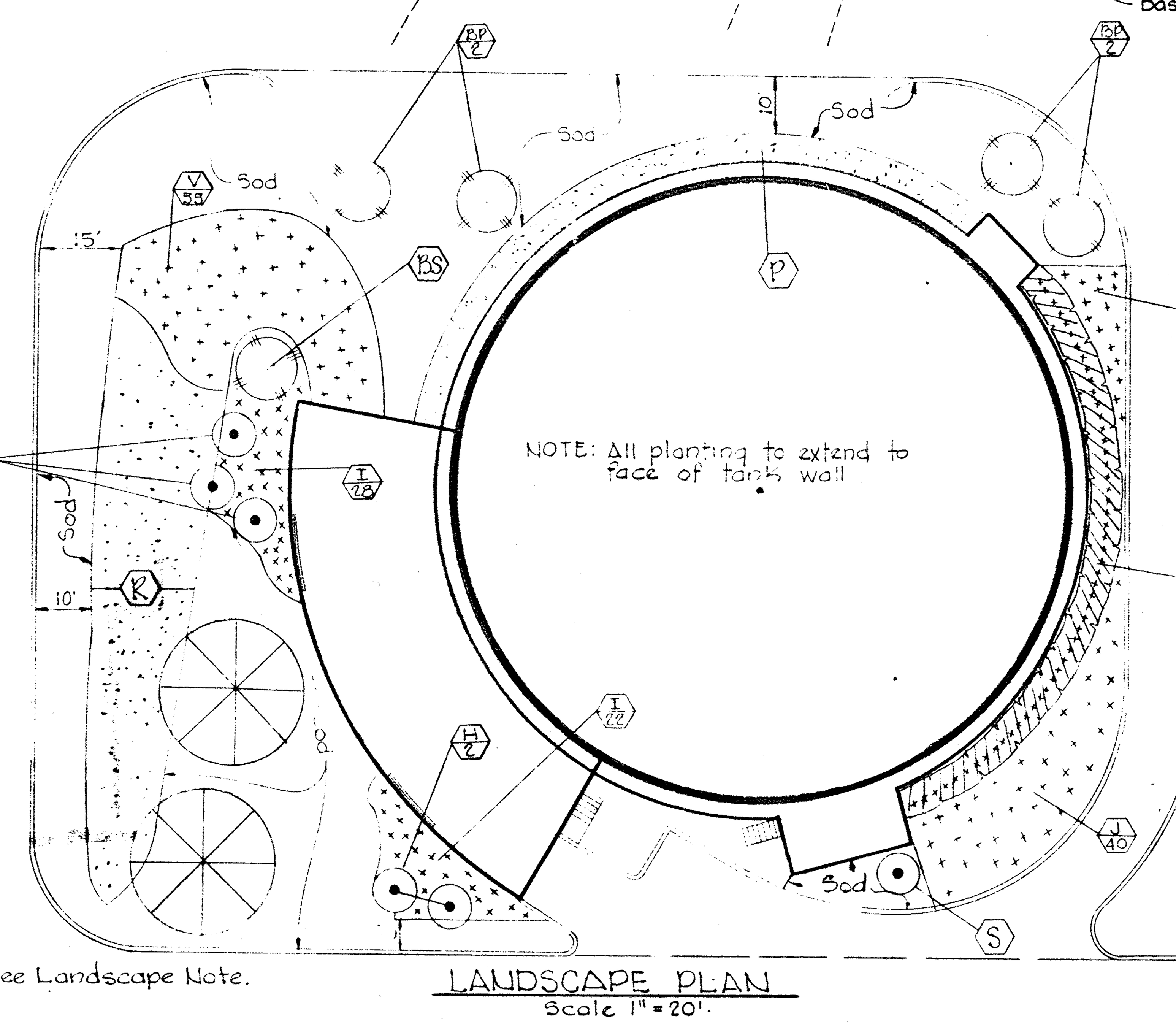
W. O. 6538-2 ① Change Order No. 4 2-19-74 ⚠M Relocated Ductbank 4-15-74

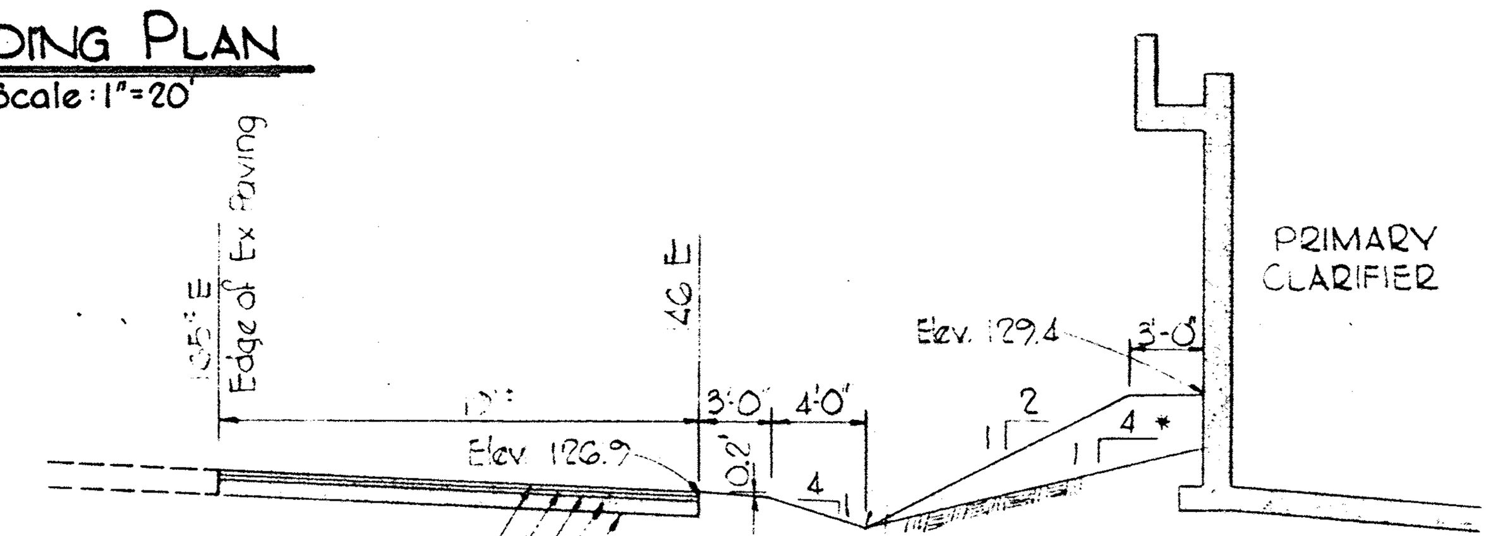
Addendum △
Construction Modification △

SHEET C-2

BRUNING 44-510 14778

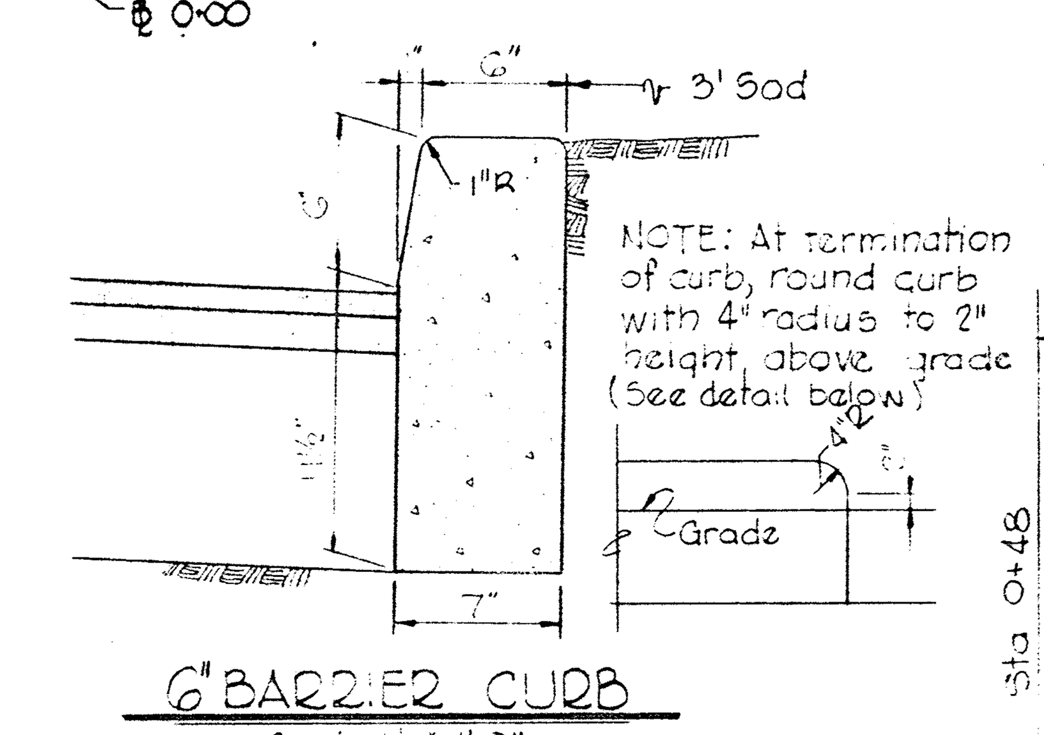

CONSTRUCTION NORTH
EXISTING SLUDGE BEDS
SLUDGE BED ROAD
EXISTING · C.S. #3
ROAD "A"
Edge of Pavement - Elev. 126.9
Inv 125.7
P-1
TOP WEIR WALL - 146.25
TOP TANK WALL - 144.65
NWL - 145.00
NOTE: Sidewalk to extend to face of tank wall
SLUDGE OXIDATION BLDG.
FF - 145.0
ROAD "B"
Seed with Crown Vetch See Sheet C-
Base Line South
℄ 0+00
GRADING PLAN
Scale: 1" = 20'
For outfall ditch See Sht C-1
62'-15" R.C.C.P. w/ Conc. Flared End Section Inv. In 125.7 Inv. Out 125.7
Slope Varies · Max 4:1 Min. 10:1 · See Plan
Varies 10'-0" Min.
Grade Level
SLUDGE OXIDAT. BDLG.
SECTION C-3-A / C-3
Scale: None
PRIMARY CLARIFIER
Curb and 3' Berm where shown on plans
4" Rounding
Grade area as shown by contours this sheet
SECTION C-3-C / C-3
Scale: None
NOTE: FOR ALL ROADWAY PAVEMENT - SEE SECTION C-3-B

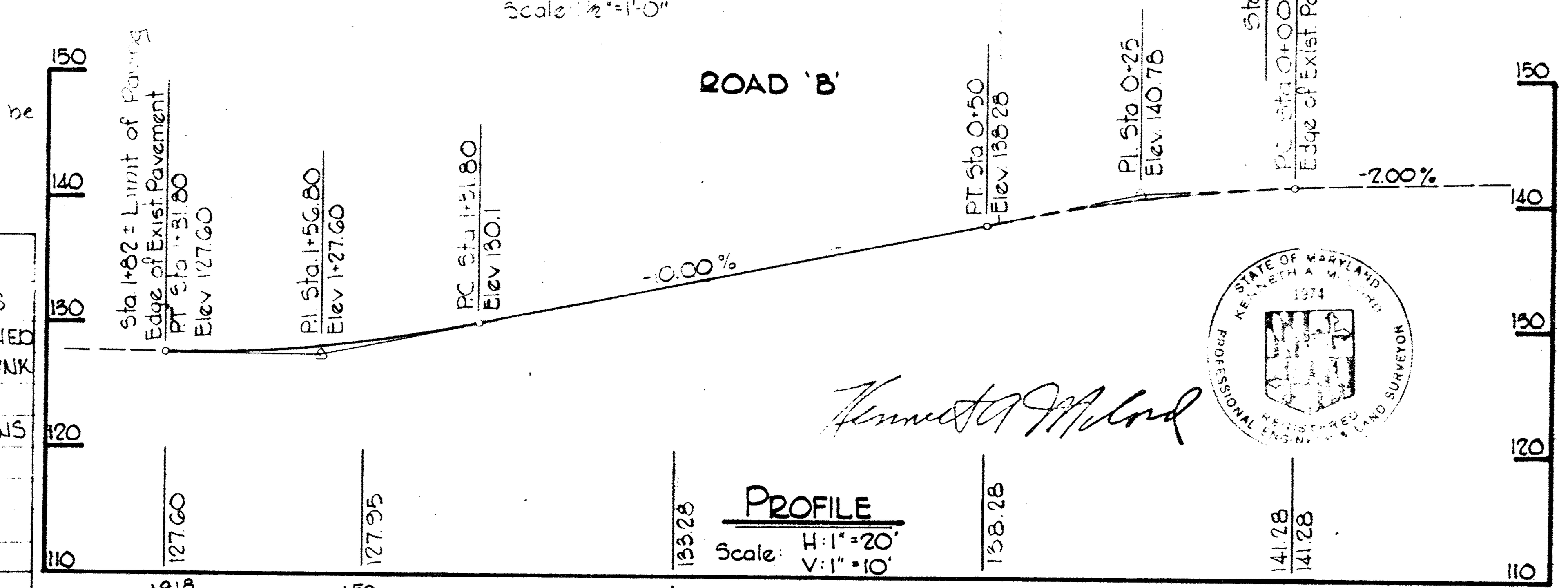




1" Compacted Spec. 'B' Bituminous Concrete Surface Course (BF-1)
1½" Compacted Spec. 'B' Bituminous Concrete Base Course
Prime Coat
9" Compacted Crusher Run Base Course
Compacted Subgrade

SECTION C-3-B / C-3
Scale: None





LANDSCAPE NOTES

1. Check underground utility drawings before planting, adjust planting accordingly
2. All plant beds and Tree pits to be mulched. See specifications
3. All Trees to be staked.

(symbol) - PLATANUS ACERIFOLIA - LONDON PLAINTREE, 2½"-3" cal. (13'-15' Ht) 2 each.

PLANT LIST

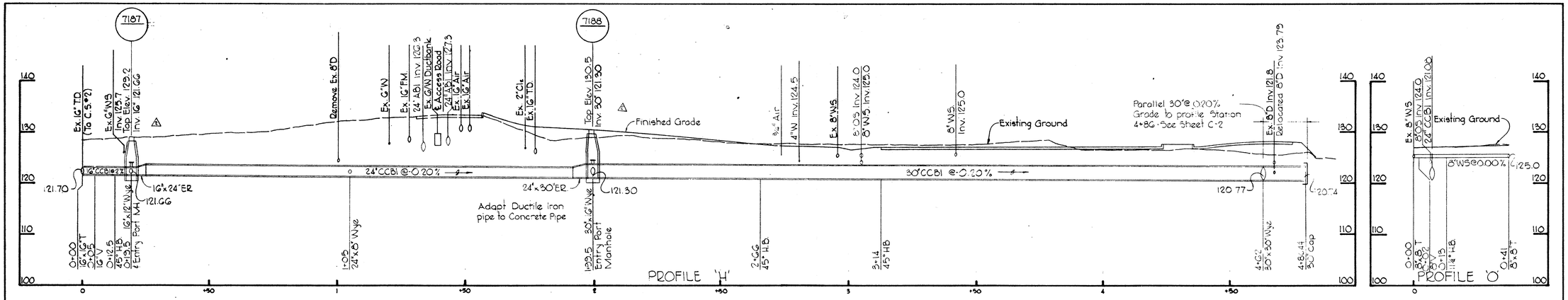
SYMBOL	CODE	NOMENCLATURE	SIZE	QUANT.	REMARKS
	H	CRATEAGUS PHAENOPYRUM - WASHINGTON THORN	8'-10' Ht.	5	HEAVY-BRANCHED
	S.	OXYDENDRON ARBOREUM - SOURWOOD	10-12 Ht.	1	STRAIGHT TRUNK
	BS	PICEA PUNGENS - BLUE SPRUCE	6-8' Ht.	1	SPECIMEN
	BP	PINUS THUNBERGI - JAPANESE BLACKPINE	8-10 Ht.	4	HEAVY SPECIMENS
	B	BERBERIS JULIANAE - WINTERGREEN BARBERRY	18"-24" Ht	55	PLANT 2' c/c
	I	ILEX CRENATA RODUNDIFOLIA - ROUNDLEAF HOLLEY	30"-36" Ht	50	PLANT 4' c/c
	J	JUNIPERUS SARGENTI - SARGENT JUNIPER	12"-15" SP.	55	PLANT 4' c/c
	V	SPIREA VANHOUTTEI - VANHOUTTE SPIREA	2'-3' Ht.	55	PLANT 4' c/c
	R	ROSA WICHURAIANA - MEMORIAL ROSE	9"-12" Ht.	1000	PLANT 18" c/c
	P	VINCA MINOR - PERIWINKLE	2yr., No2	800	3 RUNNERS

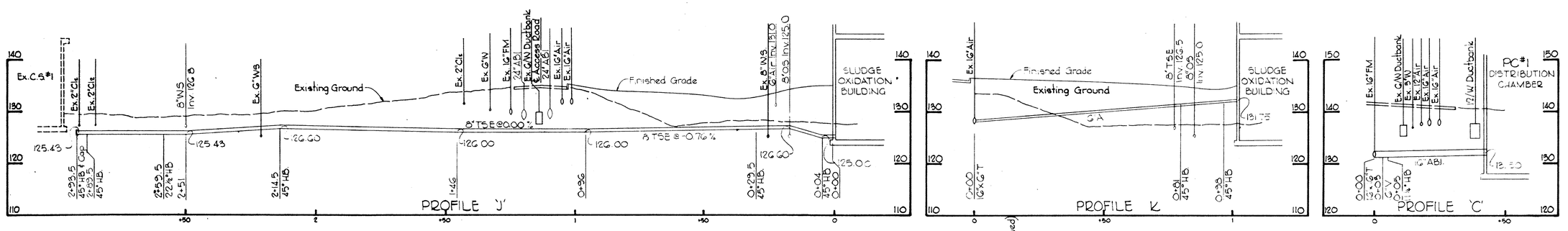
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — W O Filbert CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	GRADING PLAN AND TYPICAL SECTIONS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 5 OF 28	SCALE AS SHOWN

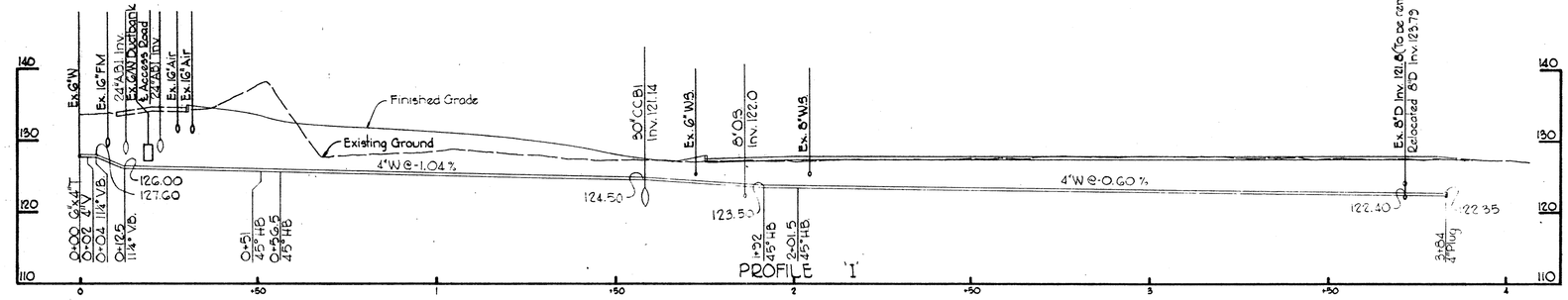
W.O. 6538-2

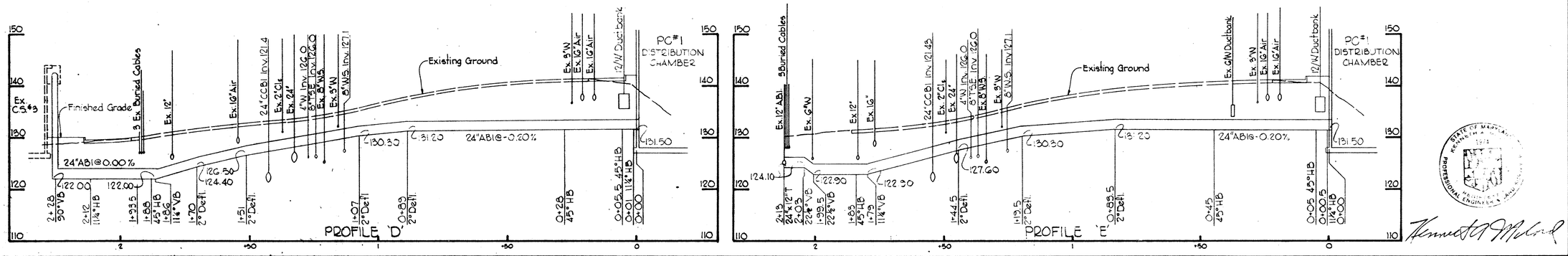
SHEET C-3

BRUNING 44-510 14778









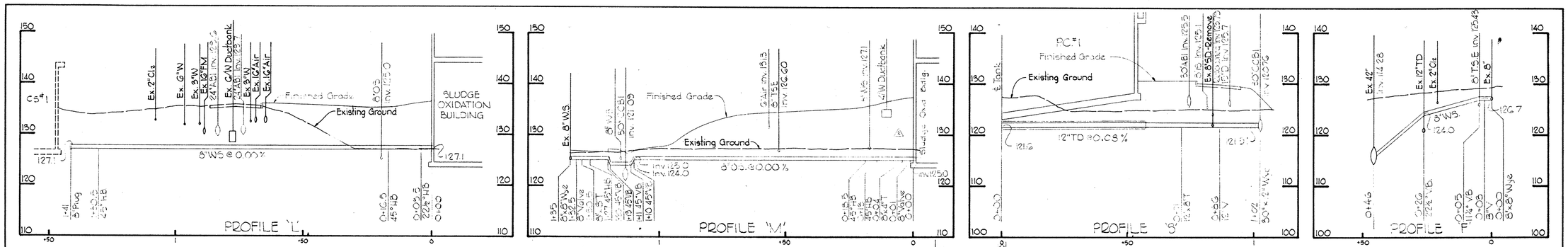
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	PROFILES	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 6 OF 28	SCALE H-1"=20' V-1"=10'

Addendum ⚠

W. O. 6538-2

SHEET C-4

BRUNING 44-510 14778



1. Valves - 18" Valve Vertical w/ Handwheel side mounted
   20" & 24" Valves - Horizontal w/ Handwheels side mounted
   All Bypass Valves - Vertical w/ Handwheels top mounted
2. Test Fit Ex. 16" Air & Electrical Duct prior to beginning construction of Vault.
3. All concrete 3500 psi. See general notes on concrete & reinforcing steel on sheet 3-1

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	DETAILS AND PROFILES	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 7 OF 28	SCALE AS SHOWN

W. O. 6538-2

Addendum A

SHEET C-5

BRUNING 44-510 14778

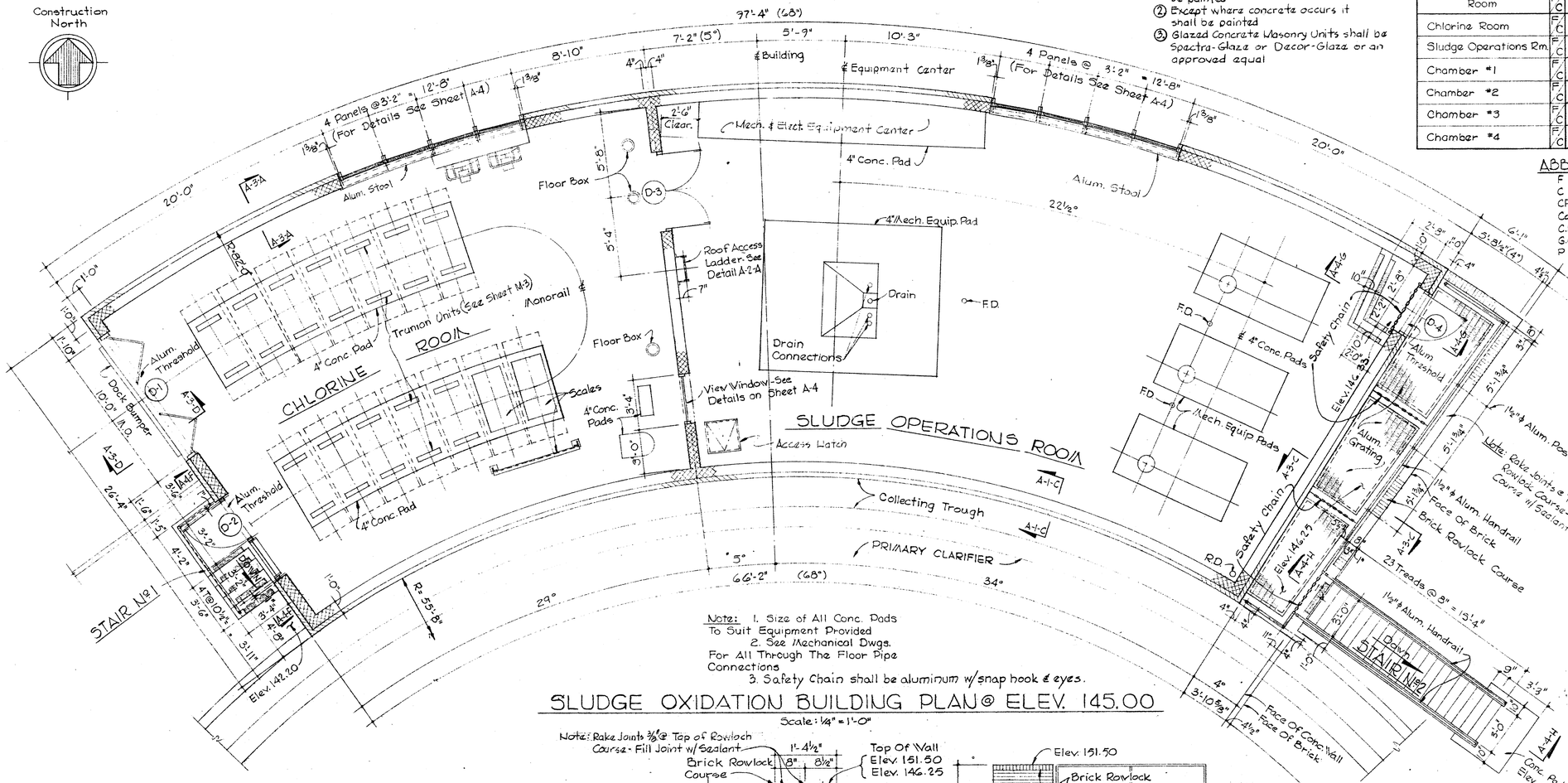
Construction North

NOTES:
1. Where base is concrete, it shall be painted
2. Except where concrete occurs it shall be painted
3. Glazed Concrete Masonry Units shall be Spectra-Glaze or Decor-Glaze or an approved equal

FINISH SCHEDULE

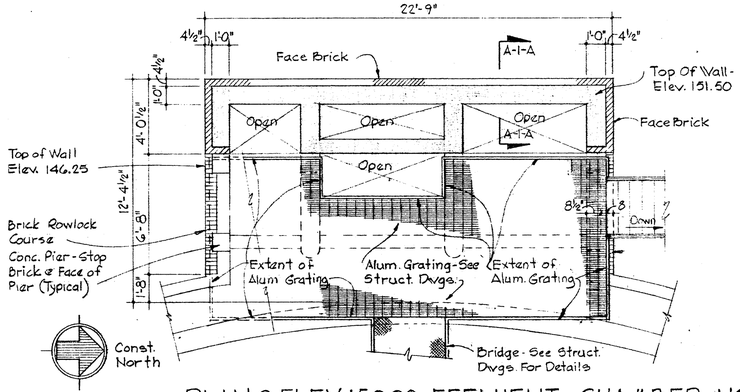
Room	F/C	Floor	Base	Wall	Ceiling
Chlorine Room	F/C	CFH	GCMU (1)	CMU-P (2)	Conc P
Sludge Operations Rm.	F/C	CFH	GCMU (1)	CMU-P (2)	Conc P
Chamber #1	F/C	Conc. P	Conc P	Conc P	Conc P
Chamber #2	F/C	Conc P	Conc P	Conc P	Conc P
Chamber #3	F/C	Conc P	Conc P	Conc P	Conc P
Chamber #4	F/C	Conc. P	Conc P	Conc P	Conc P

ABBREVIATIONS:
F - Finish
C - Color
CFH - Clear Floor Hardener
Conc - Concrete
C.M.U. - Concrete Masonry Unit
G.C.M.U. - Glazed Concrete Masonry Unit (1)
P - Painted

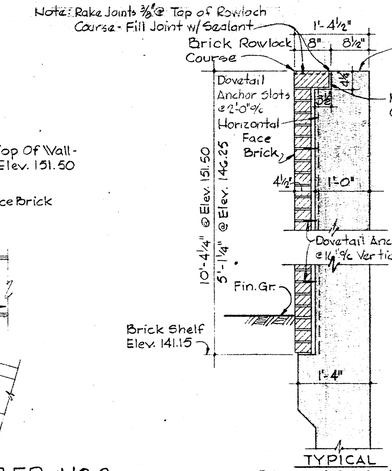


Note: 1. Size of All Conc. Pads To Suit Equipment Provided
2. See Mechanical Dwgs. For All Through The Floor Pipe Connections
3. Safety Chain shall be aluminum w/ snap hook & eyes.

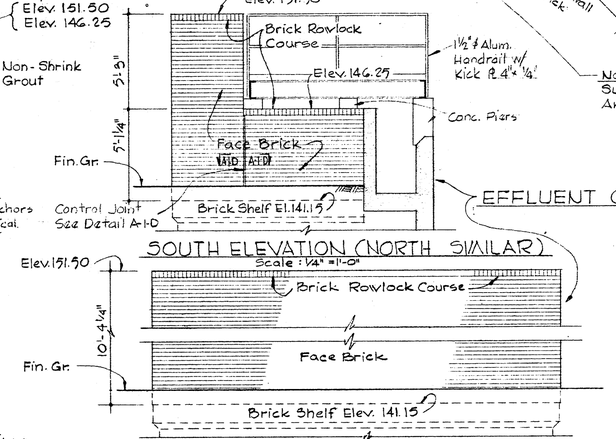
SLUDGE OXIDATION BUILDING PLAN @ ELEV. 145.00
Scale: 1/4" = 1'-0"



PLAN @ ELEV. 150.00 - EFFLUENT CHAMBER NO. 2
Scale: 1/4" = 1'-0"



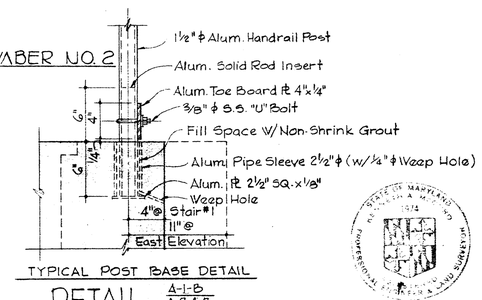
SECTION A-1-A / A-1
Scale: 3/4" = 1'-0"



SOUTH ELEVATION (NORTH SIMILAR)
Scale: 1/4" = 1'-0"

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

Note: All Dimensions On Curved Surfaces Are Measured On The Arc At The Face Of Brick



TYPICAL POST BASE DETAIL
DETAIL A-1-B / A-2, A-3
Scale: 1 1/2" = 1'-0"

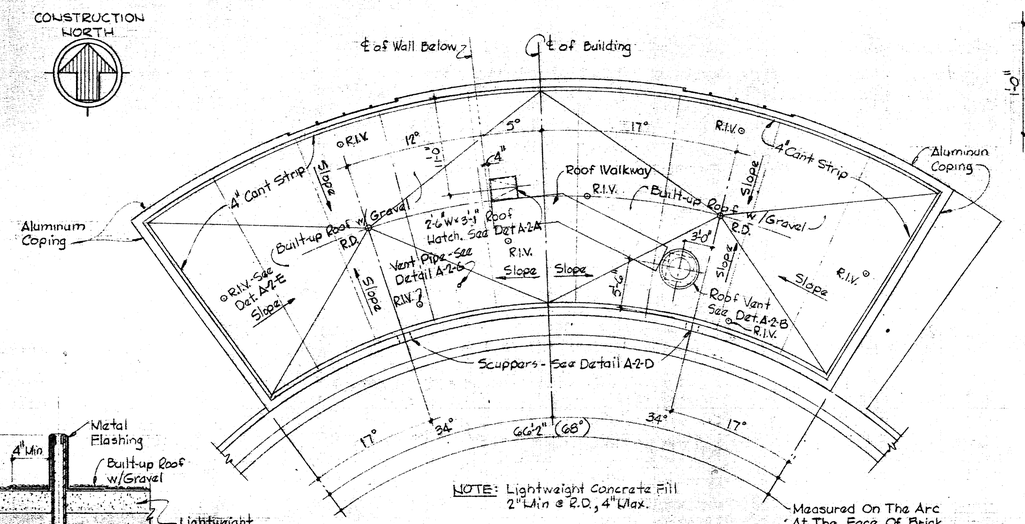
EFFLUENT CHAMBER NO. 2

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — CHIEF BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING PLANS AND SCHEDULES	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 8 OF 28	SCALE AS SHOWN

SHEET A-1

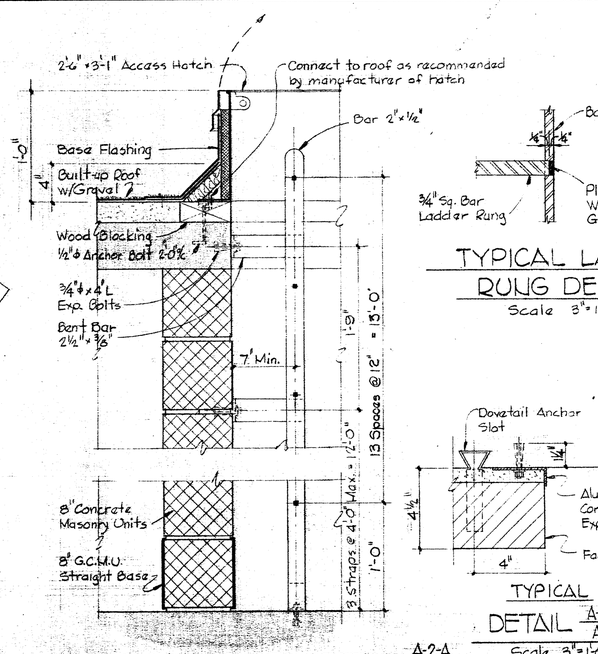
W.O. 6538-2

BRUNING 44 510 14778



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

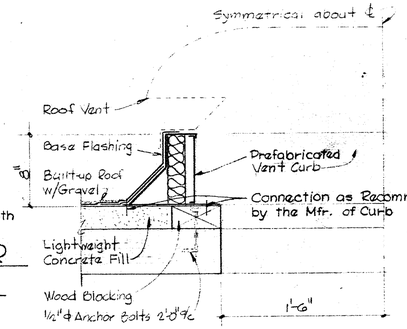
DETAIL A-2-G / A-2
Scale 1½" = 1'-0"



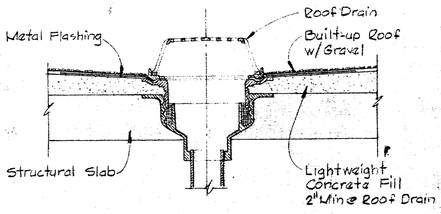
LADDER & ROOF HATCH DETAIL A-2-A / A-2
Scale 1½" = 1'-0"

TYPICAL LADDER RUNG DETAIL
Scale 3" = 1'-0"

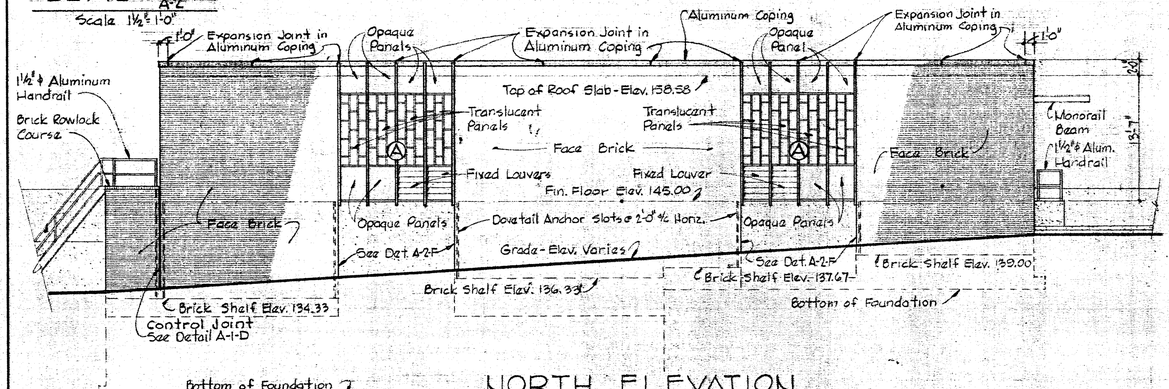
TYPICAL DETAIL A-2-F / A-2
Scale 3" = 1'-0"



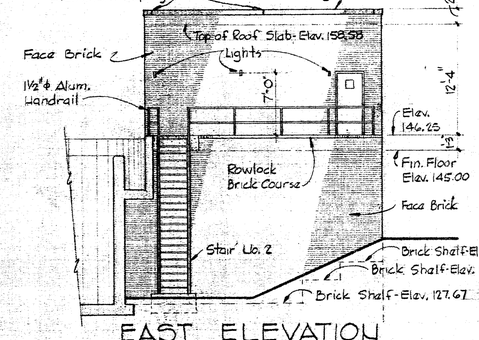
ROOF VENT CURB DETAIL A-2-B / A-2
Scale 1½" = 1'-0"



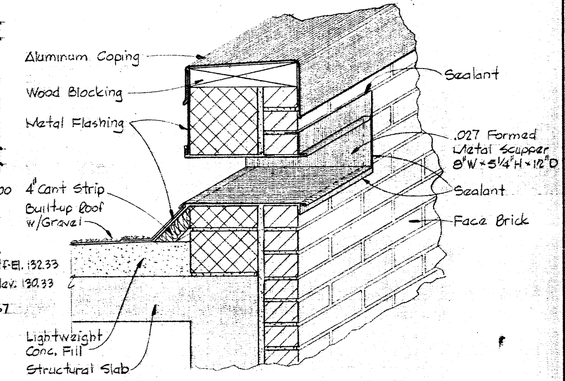
TYPICAL ROOF DRAIN DETAIL A-2-C / A-2
Scale 1½" = 1'-0"



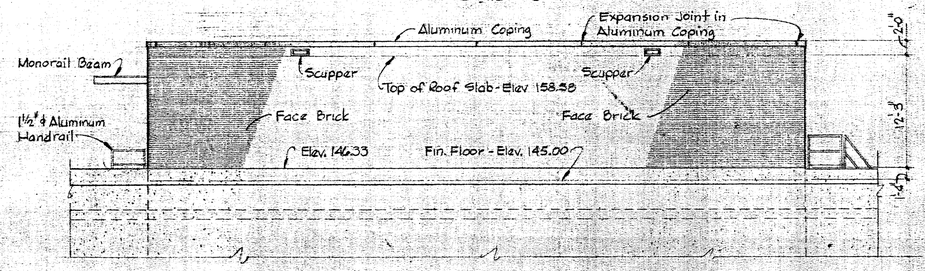
NORTH ELEVATION
Scale 1/8" = 1'-0"



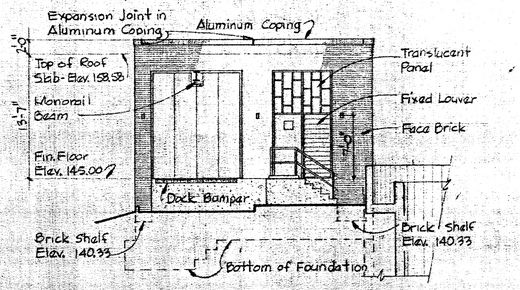
EAST ELEVATION
Scale 1/8" = 1'-0"



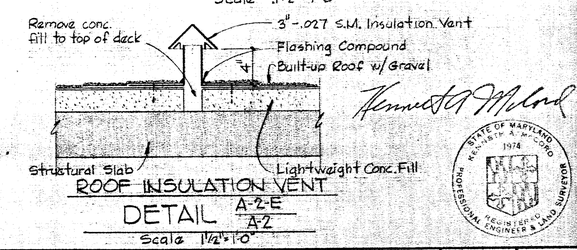
TYPICAL SCUPPER DETAIL A-2-D / A-2
Scale 1½" = 1'-0"



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



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



ROOF INSULATION VENT DETAIL A-2-E / A-2
Scale 1½" = 1'-0"

Kenneth A. McCord
STATE OF MARYLAND — KENNETH A. McCORD — 1974 — REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

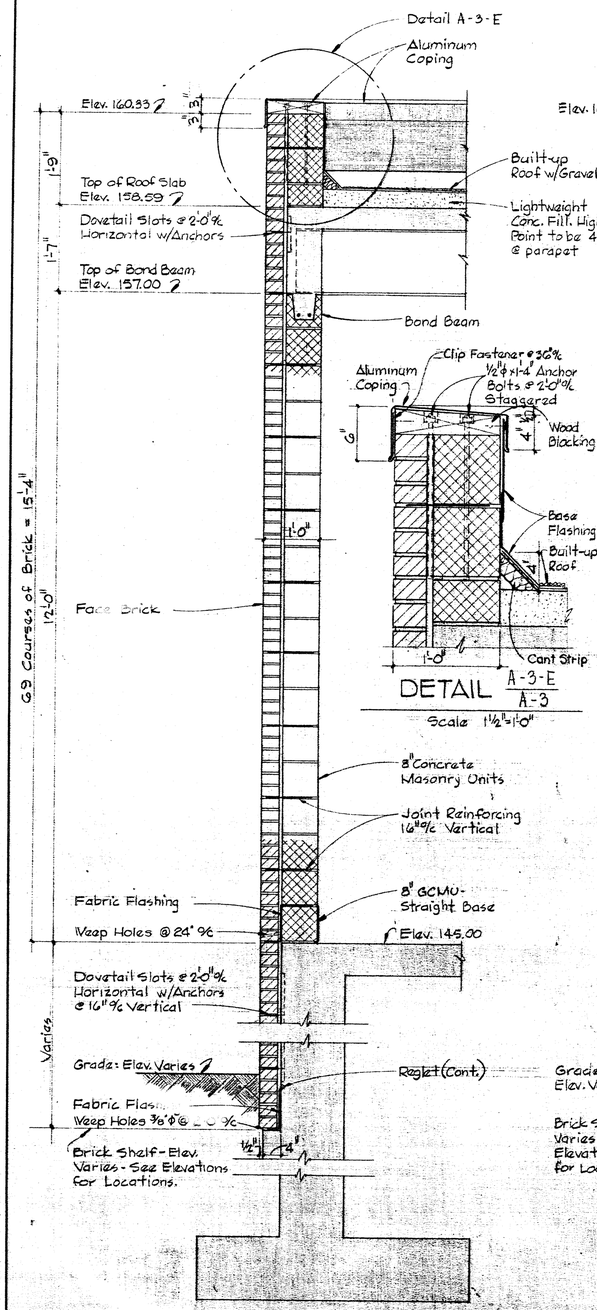
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING SECTIONS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 9 OF 28	SCALE AS SHOWN

W.O. 6538-2

SHEET A-2

AS BUILT JAN 1 1977

BRUNING 44-510 14778



WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING SECTIONS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 10 OF 28	SCALE AS SHOWN

W.O. 6538-2

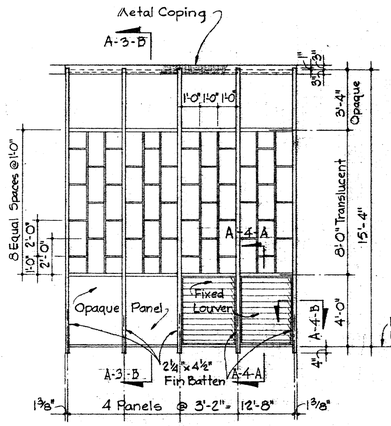
SHEET A-3

AS BUILT JAN 1977

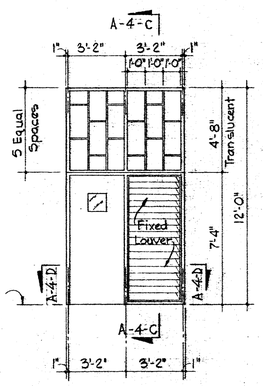
BRUNING 44-510 14778

DOOR SCHEDULE

DOOR NO.	SWING	SIZE	MAT'L	TYPE	HEAD	JAMB		HARDWARE
D1	Bi-fold	9'-8" x 11'-10"x1⅜"	Alum.	1	H-1	J-1		HW-1
D2	LHR	3'-0" x 7'-2"x1¾"	Alum.	2	H-2	J-2		HW-2
D3	RHR	2'-2'-6" x 7'-2"x1¾"	Alum.	3	H-3	J-3		HW-3
D4	RHR	3'-0" x 7'-2"x1¾"	Alum.	2	H-4	J-2		HW-4

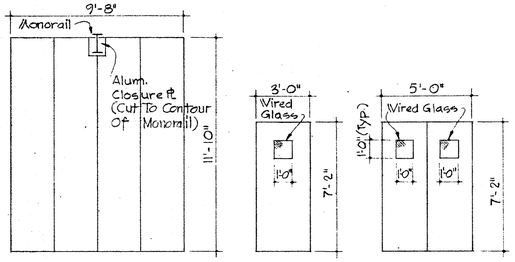


TYPICAL
Ⓐ NORTH ELEVATION



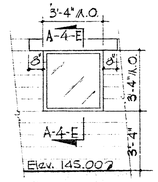
Ⓑ

PANEL TYPES
Scale: ¼"=1'-0"

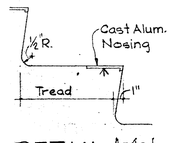


① ② ③

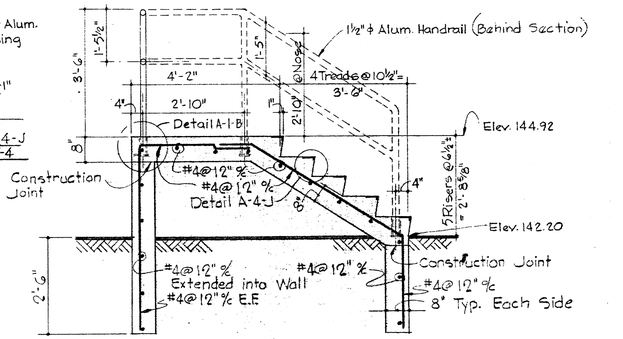
DOOR TYPES
Scale: ¼"=1'-0"



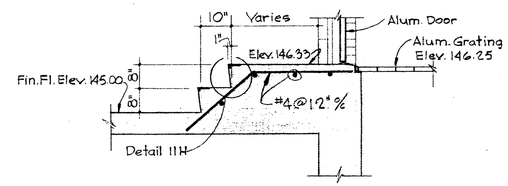
VIEW WINDOW
Scale: ¼"=1'-0"



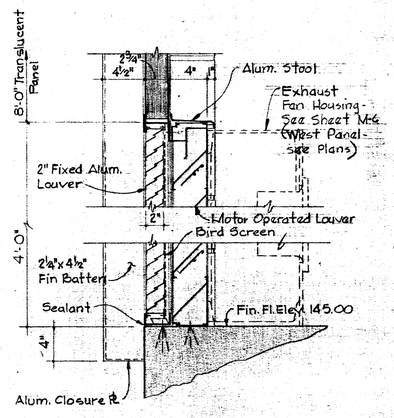
DETAIL A-4-J / A-4
Scale: 1½"=1'-0"



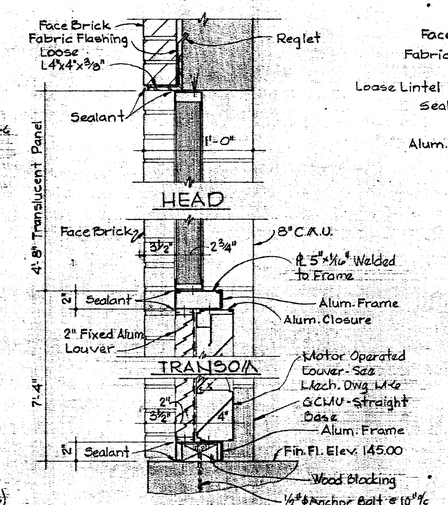
STAIR No 1
SECTION A-4-F / A-1
Scale: ½"=1'-0"



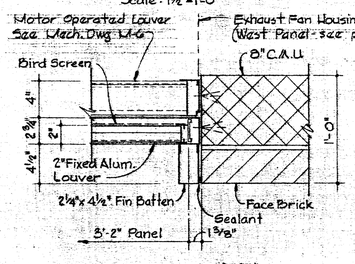
SECTION A-4-G / A-1
Scale: ½"=1'-0"



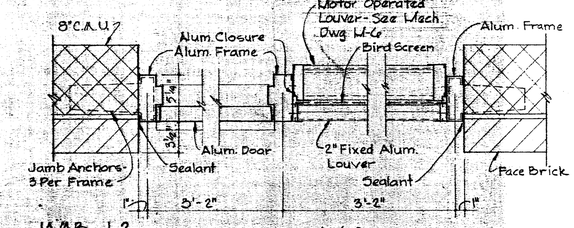
SECTION A-4-A / A-4
Scale: 1½"=1'-0"



SILL
SECTION A-4-C / A-4
Scale: 1½"=1'-0"

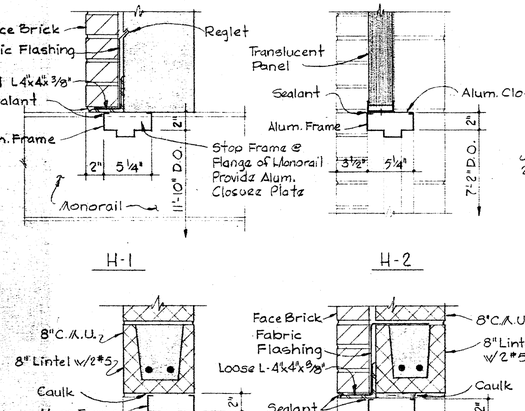


SECTION A-4-B / A-4
Scale: 1½"=1'-0"



JAMB J-2

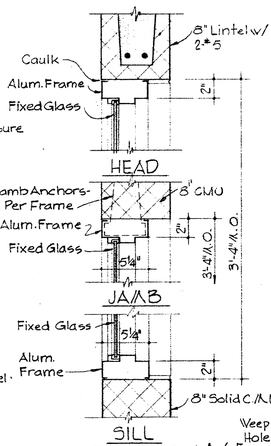
SECTION A-4-D / A-4
Scale: 1½"=1'-0"



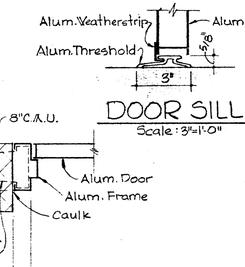
H-1 H-2

H-3 H-4

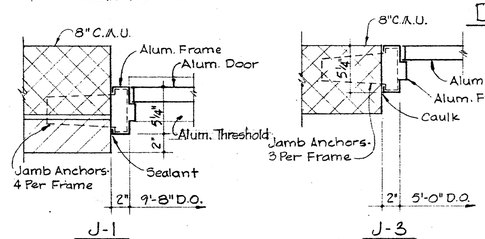
HEAD DETAILS
Scale: 1½"=1'-0"



SECTION A-4-E / A-4
Scale: 1½"=1'-0"

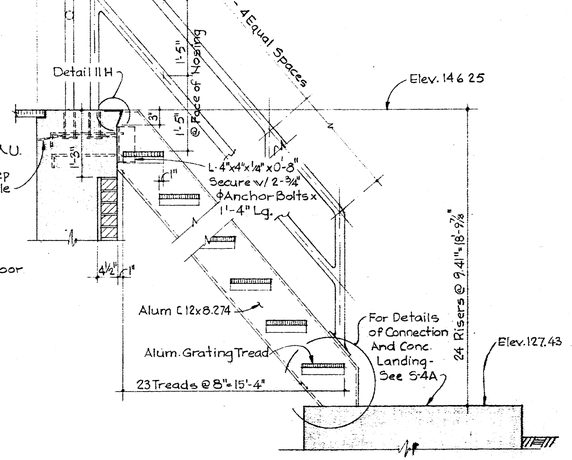


DOOR SILL
Scale: 3"=1'-0"



J-1 J-3

JAMB DETAILS
Scale: 1½"=1'-0"



STAIR No 2
SECTION A-4-H / A-1
Scale: ¾"=1'-0"

STATE OF MARYLAND — KENNETH A. McCORD — 1974 — REGISTERED PROFESSIONAL ENGINEER

Kenneth A. McCord

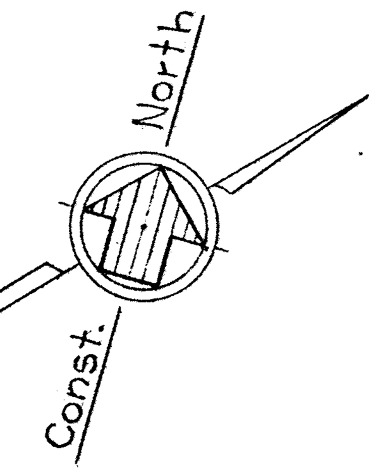
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE W.O. Gilbert CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING DETAILS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 11 OF 28	SCALE AS SHOWN

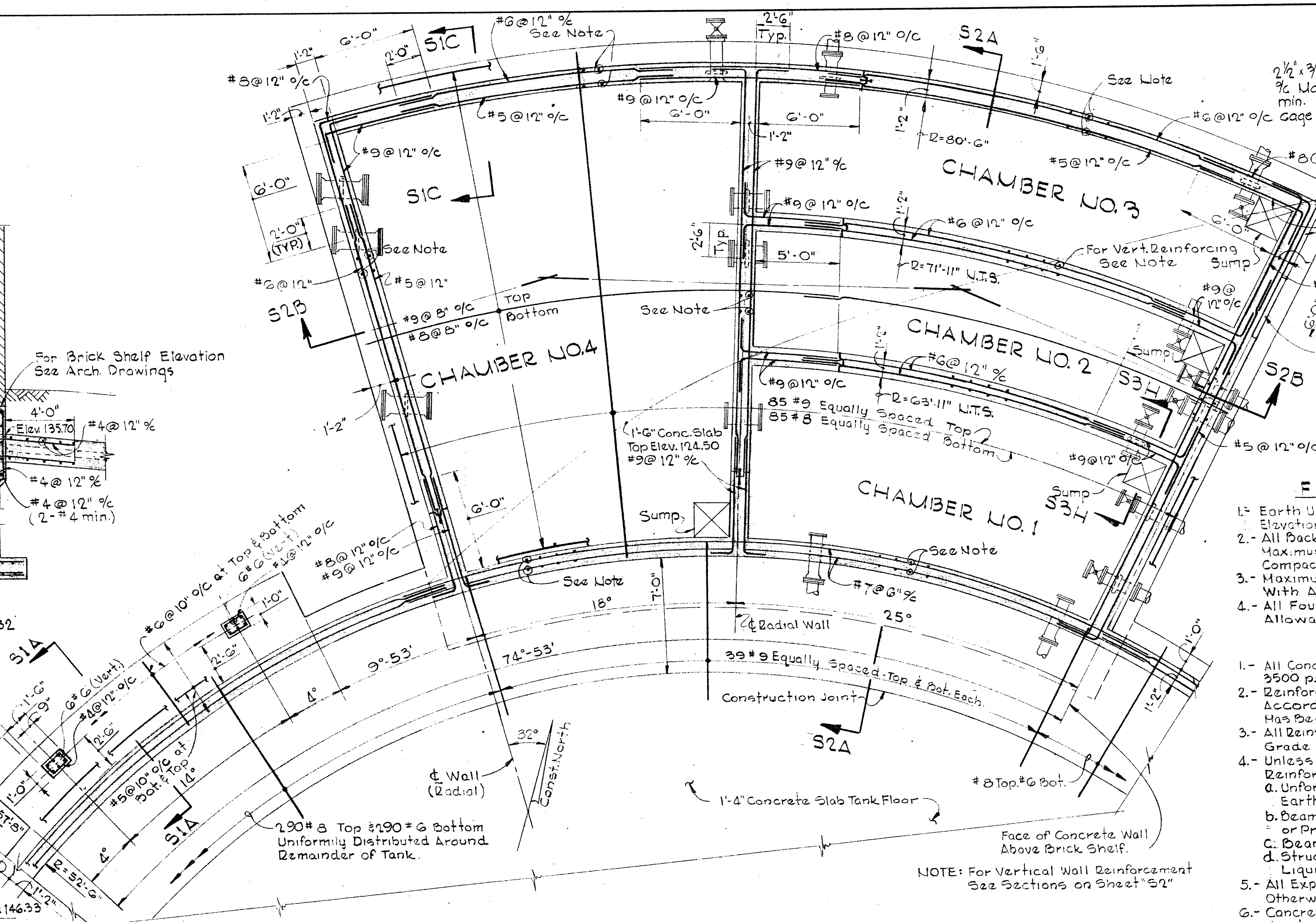
SHEET A-4

W.O. 6538-2

AS BUILT JAN 1977

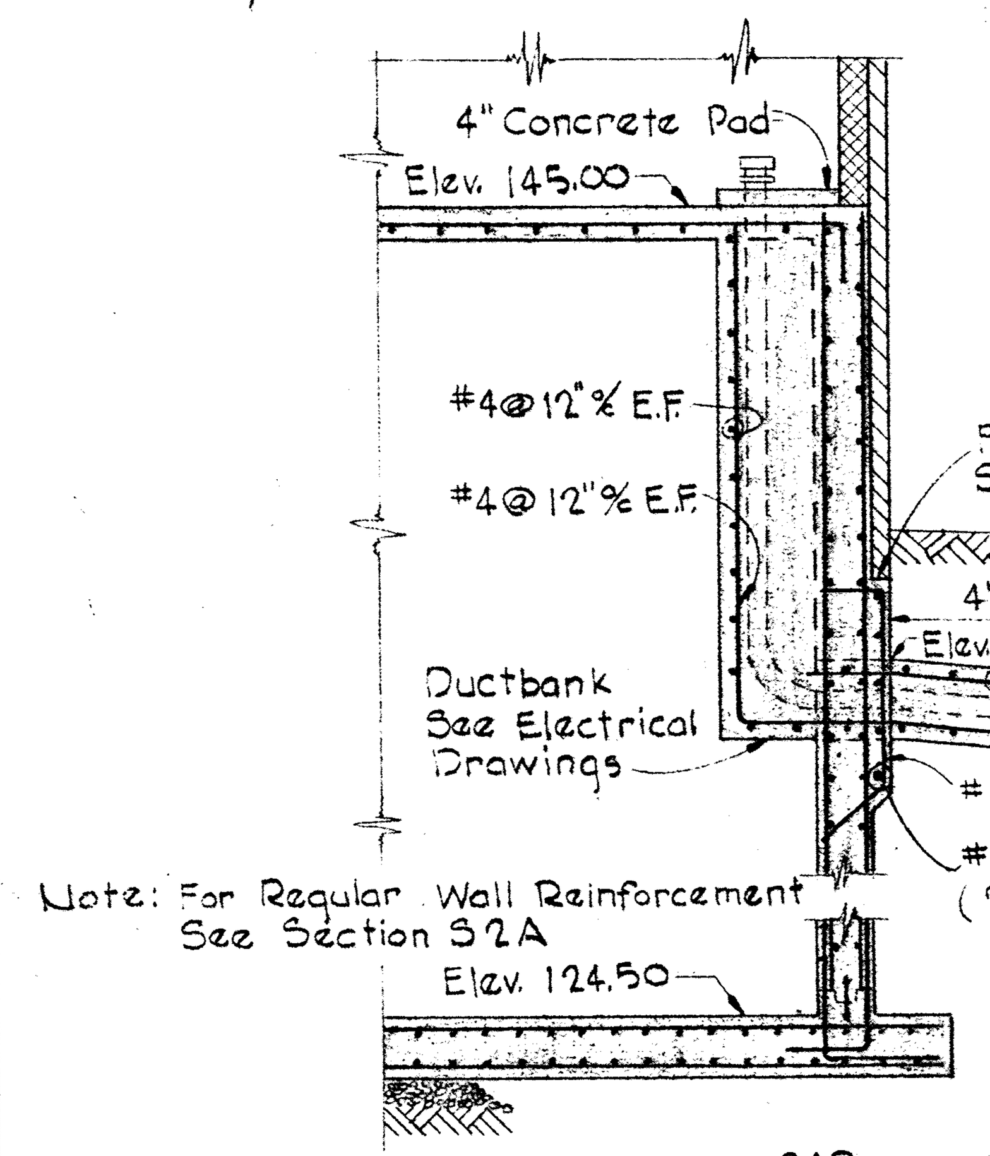
BRUNING 44-510 14778





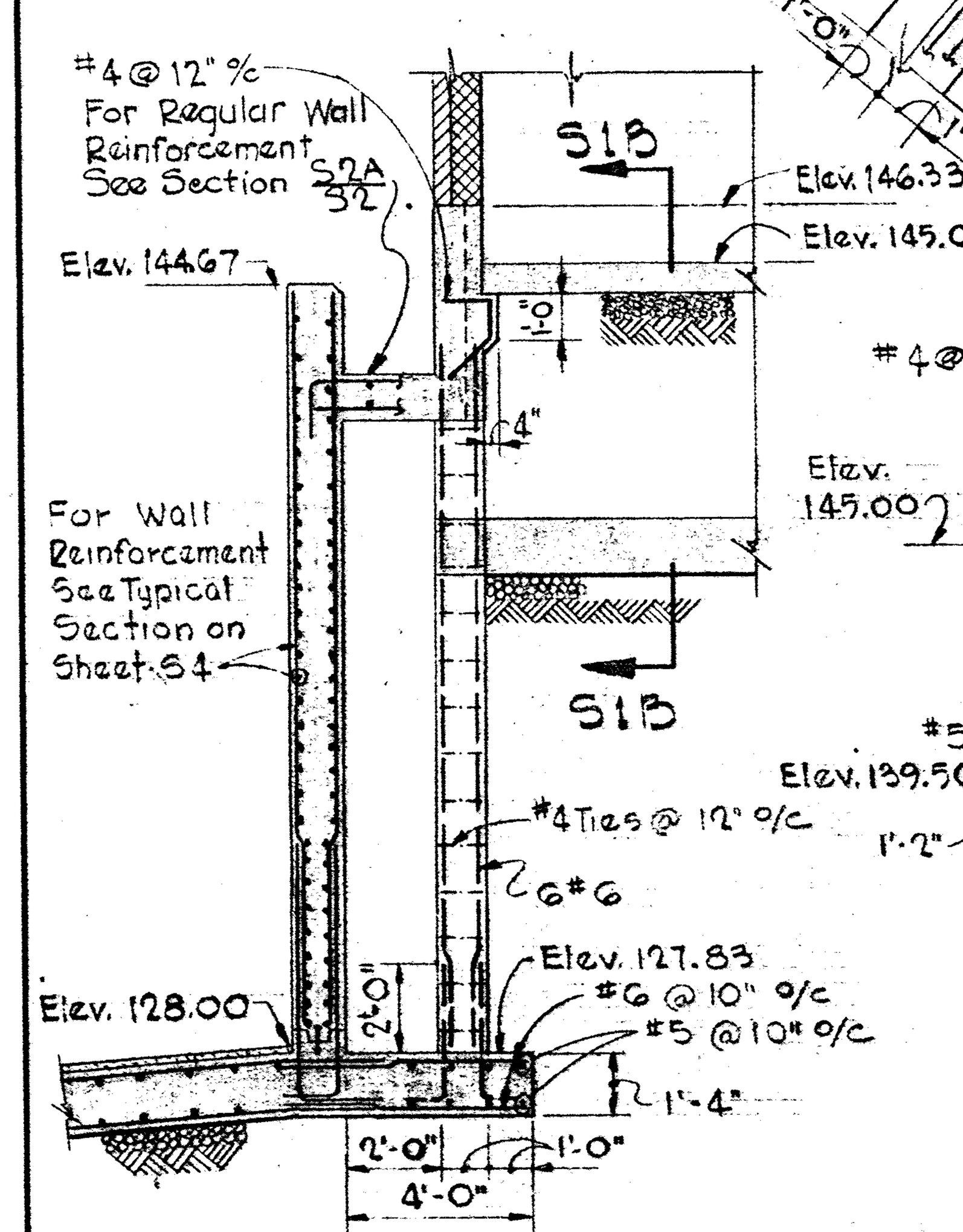
PLAN AT ELEVATION 128.00

Scale 1/4" = 1'-0"



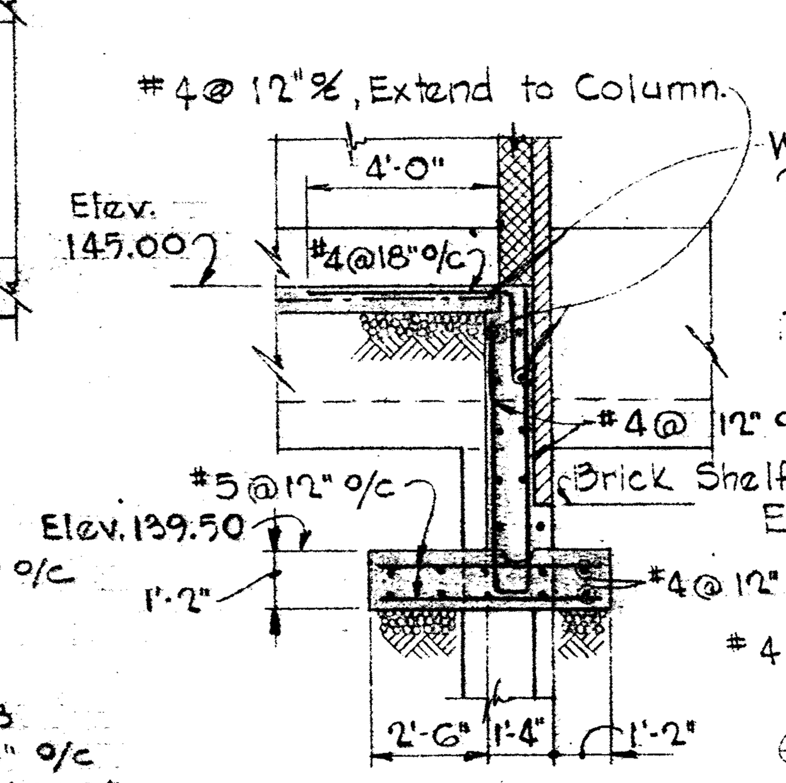
SECTION S1C/S1,S2

Scale 1/4" = 1'-0"



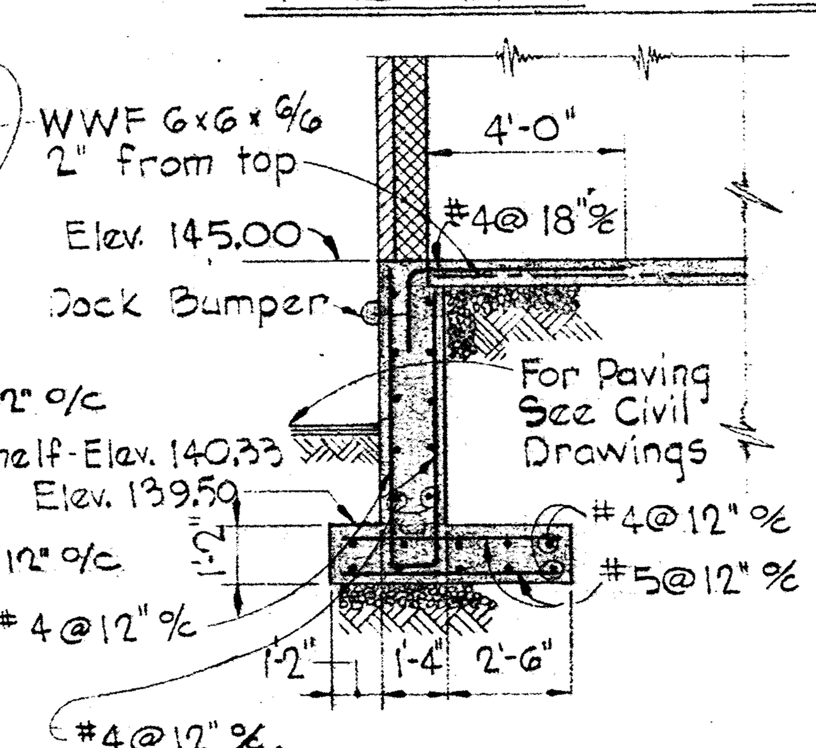
SECTION S1A/S1

SCALE 1/4" = 1'-0"



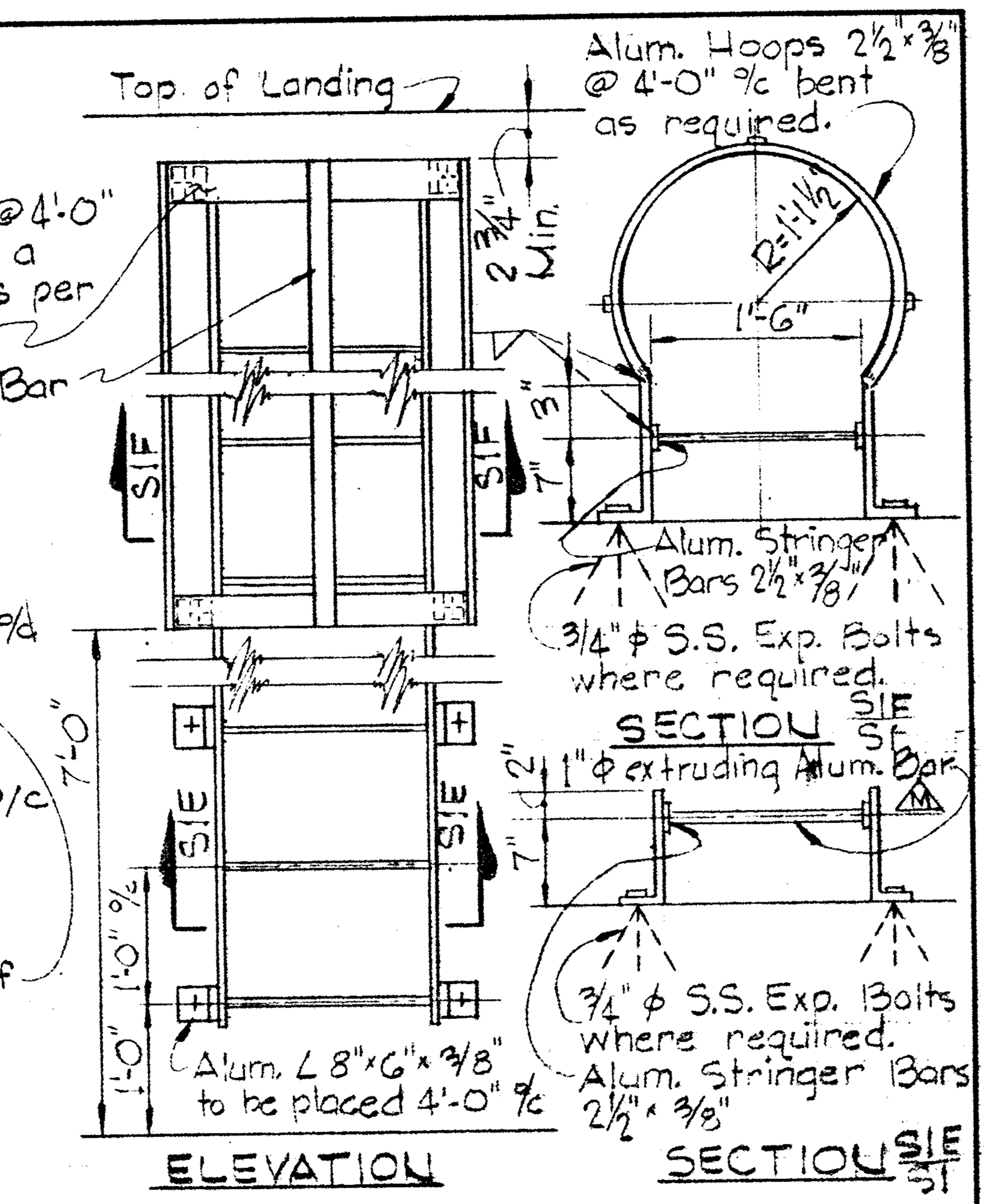
SECTION S1B/S1

SCALE 1/4" = 1'-0"



SECTION S1D/S2

Scale 1/4" = 1'-0"



ALUMINUM LADDER DETAIL

Scale 3/4" = 1'-0"

FOUNDATION NOTES

1.- Earth Under All Foundations and Base Slabs Must be Excavated to Elevation 120.00.
2.- All Backfill Shall be Compacted to 90% of Maximum Density in Maximum Increments of 6". Except The Top 12" Shall be Compacted to 95% of Maximum Density.
3.- Maximum Density and Optimum Moisture Shall be in Accordance With AASHO Test Designation "T180-57 Method D".
4.- All Foundations Have Been Designed For a Maximum Allowable Soil Bearing Pressure of 3000 p.s.f.

CONCRETE NOTES

1.- All Concrete Shall Have a Minimum Compressive Strength of 3500 p.s.i. at 28 Days.
2.- Reinforced Concrete Shall be Detailed and Constructed in Accordance With Current A.C.I. Specification 318-71. Concrete Has Been Designed by The Alternate Design Method.
3.- All Reinforcing Steel Shall Conform to ASTM Specification 615-68 Grade 40.
4.- Unless Otherwise Noted on The Drawings, Concrete Cover For Reinforcement Shall be as Follows: -
 a. Unformed Concrete, Bottom Bars in Footings and Slabs on Earth, Rock, Gravel or Crushed Stone, 3".
 b. Beams, Slabs, Columns and Walls Exposed to Ground, Weather or Process Liquid After The Removal of Forms, 2".
 c. Beams, Walls, Columns and Piers Not Exposed to Weather, 1½".
 d. Structural Slabs Not Exposed to Ground, Weather or Process Liquid, 3/4".
5.- All Exposed Concrete Edges Shall be Chamfered 3/4" Unless Otherwise Noted.
6.- Concrete Slabs and Walls Shall be Poured Between Indicated Joints Allowing a Minimum Period of 3 Days to Elapse Between Adjacent Pours.
7.- Construction, Expansion and Contraction Joints Shall be as Detailed on the Drawings and no Additional Joints Shall be Used Nor any Omitted Except by Written Authorization of The Engineer.
8.- The Contractor Shall Submit Shop Details of Reinforcing Steel Before Proceeding With Fabrication
9.- Unless Otherwise Noted, All Reinforcing Bar Laps Shall be as Follows:
 a. Sizes #3 to #5 - 24 Bar Diameters
 b. Sizes #6 to #8 - 32 Bar Diameters
 c. Sizes #9 to #11 - 44 Bar Diameters
10.- Anchor Bolts and Equipment Pedestals Shall be Sized and Located as Required to Suit Equipment Furnished.
11.- See Civil, Architectural, Mechanical and Electrical Drawings For All Embedded Items, Such as Sleeves, Anchors, Electrical Conduits, Openings, Chases Etc. Which Interfere With Concrete Construction.
12.- For Horizontal Reinforcing Bars of Wall, All Bar Laps Shall Be Increased 40% of the Laps Stated in Item 9.

STRUCTURAL STEEL NOTES

1.- All Structural Steel Shall Conform to ASTM-Designation "A-36".
2.- All Shop Connections Shall be Welded With A233 Class E-70 Series Electrodes. All Field Connections Shall be High Strength Bolted Using A325 Bolts Except Where Otherwise Noted.
3.- All Structural Steel is Designed by Elastic Analysis and Shall be Fabricated in Accordance With Current A.I.S.C. Specifications For Buildings.
4.- The Contractor Shall Submit Erection Plans and Shop Details Before Starting Fabrication.
5.- All Structural Steel Shall be Given One Shop Coat of Paint. See Specifications.
6.- All Steel Anchor Bolts Shall be Stainless Steel. See Specifications for Additional Requirements.

STRUCTURAL ALUMINUM NOTES

1.- All Aluminum in Contact With Concrete Shall, Before Erection, be Heavily Coated as Specified.
2.- All Structural Aluminum Shall be Alloy 6061-T6. Aluminum Handrails Shall be Alloy 6063-T6. Except Handrail Posts Shall be Alloy 6061-T6.
3.- All Structural Aluminum is Designed and Shall be Fabricated in Accordance With The Current Specifications of The Aluminum Association.
4.- All Aluminum Grating Shall be Capable of Supporting 150 p.s.f.

STATE OF MARYLAND — KENNETH A. McCORD — 1974 — REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE W O Gilbert CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING FOUNDATIONS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 12 OF 28	SCALE AS SHOWN

SHEET S-1

W.O. 6538-2

Construction Modification

BRUNING 44-510 14778

PLAN AT ELEVATION 145.00

Scale 1/4" = 1'-0"

Note: Extend Longitudinal Bars in Beam "FB2" to Far Face of Exterior Walls.

SECTION S2D / S1, S2

Scale 3/8" = 1'-0"

SECTION S2G / S2

Scale 3/8" = 1'-0"

SECTION S2A / S1, S2, S3

Scale 1/4" = 1'-0"

DETAIL - S2F / S2

NO SCALE

SECTION - S2E / S2

Scale 1/4" = 1'-0"

- NOTES -

1. All Material to be Aluminum 6061-T6.
2. Grating Bars 1 1/2" x 3/16" Min.
3. Provide Angles at all Four Sides of Openings.

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE W.O. Gilbert CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING FLOOR PLAN (ELEVATION 145)	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 13 OF 28	SCALE AS SHOWN

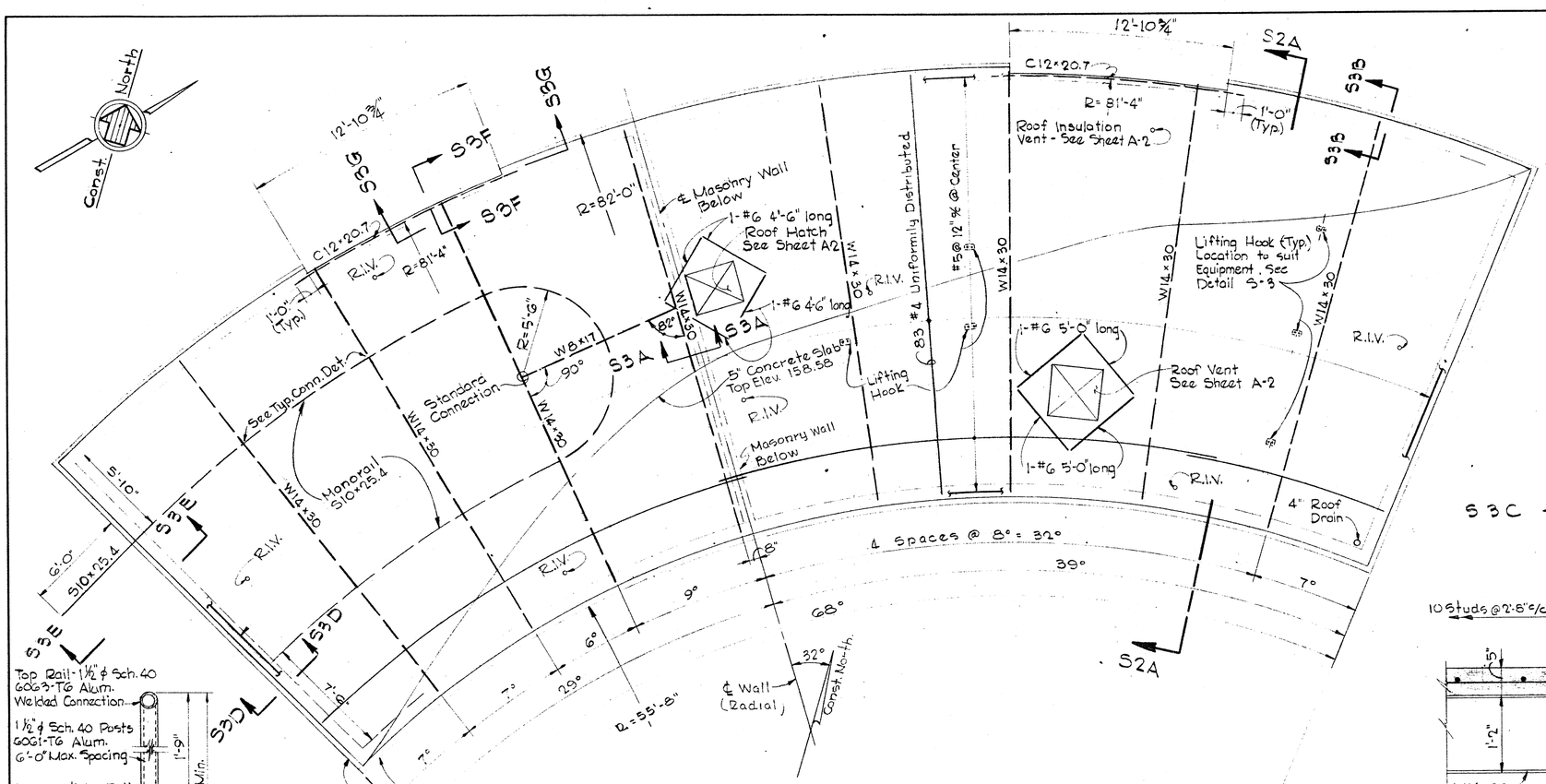
W.O. 6538-2

Addendum ⚠

AS BUILT JAN. 1977

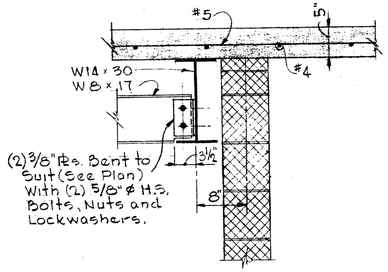
SHEET S-2

BRUNING 44-510-14778



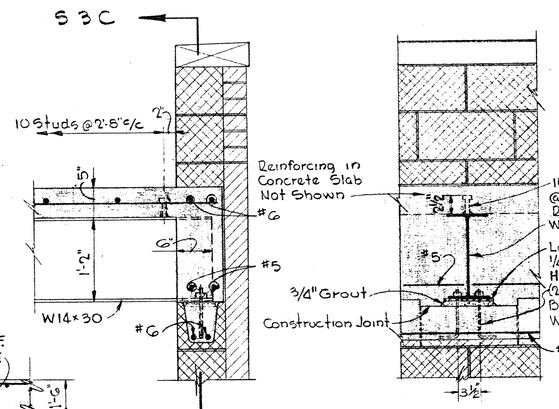
ROOF PLAN AT ELEVATION 158.58

SCALE: 1/4" = 1'-0"



SECTION S3A / S3

SCALE: 1" = 1'-0"

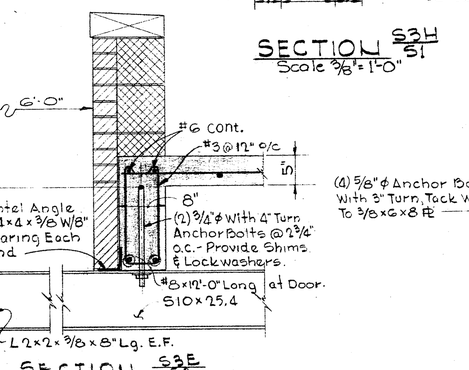


NOTE: Typical For All W14×30 Bearing

SECTION S3B / S3

SCALE: 1" = 1'-0"

S3C / S3

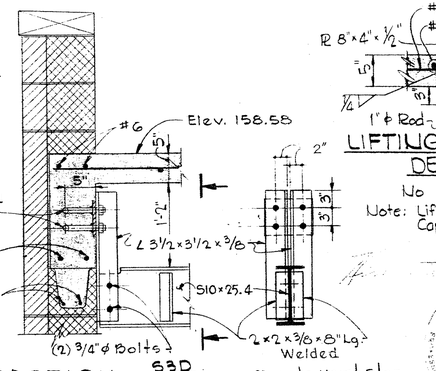


SECTION S3H / S1

Scale 3/8" = 1'-0"

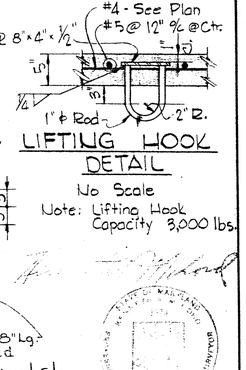
SECTION S3E / S5

SCALE: 1" = 1'-0"



SECTION S3D / S3

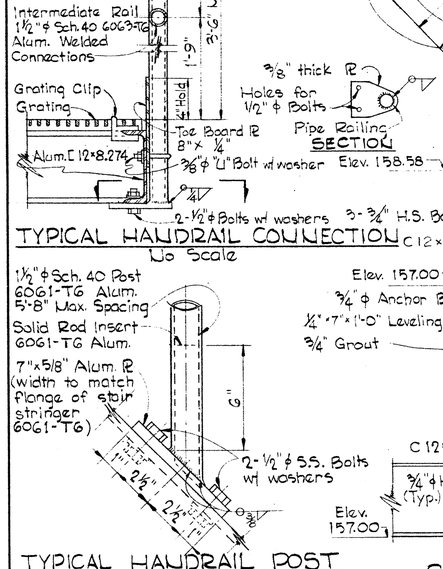
SCALE: 1" = 1'-0"



LIFTING HOOK DETAIL

No Scale

Note: Lifting Hook Capacity 3,000 lbs.



TYPICAL HANDRAIL CONNECTION

No Scale

TYPICAL HANDRAIL POST CONNECTION ON STRINGER

No Scale

SECTION S3F / S3

Scale 1" = 1'-0"

SECTION S3G / S3

Scale 1" = 1'-0"

TYPICAL MONORAIL CONNECTION

SCALE 1" = 1'-0"

-NOTES-

1. - All W14×30 Beams are in Radial Direction.
2. - The Monorail is to be Connected at All Roof Beams.
3. - The Monorail Capacity is 2 Tons

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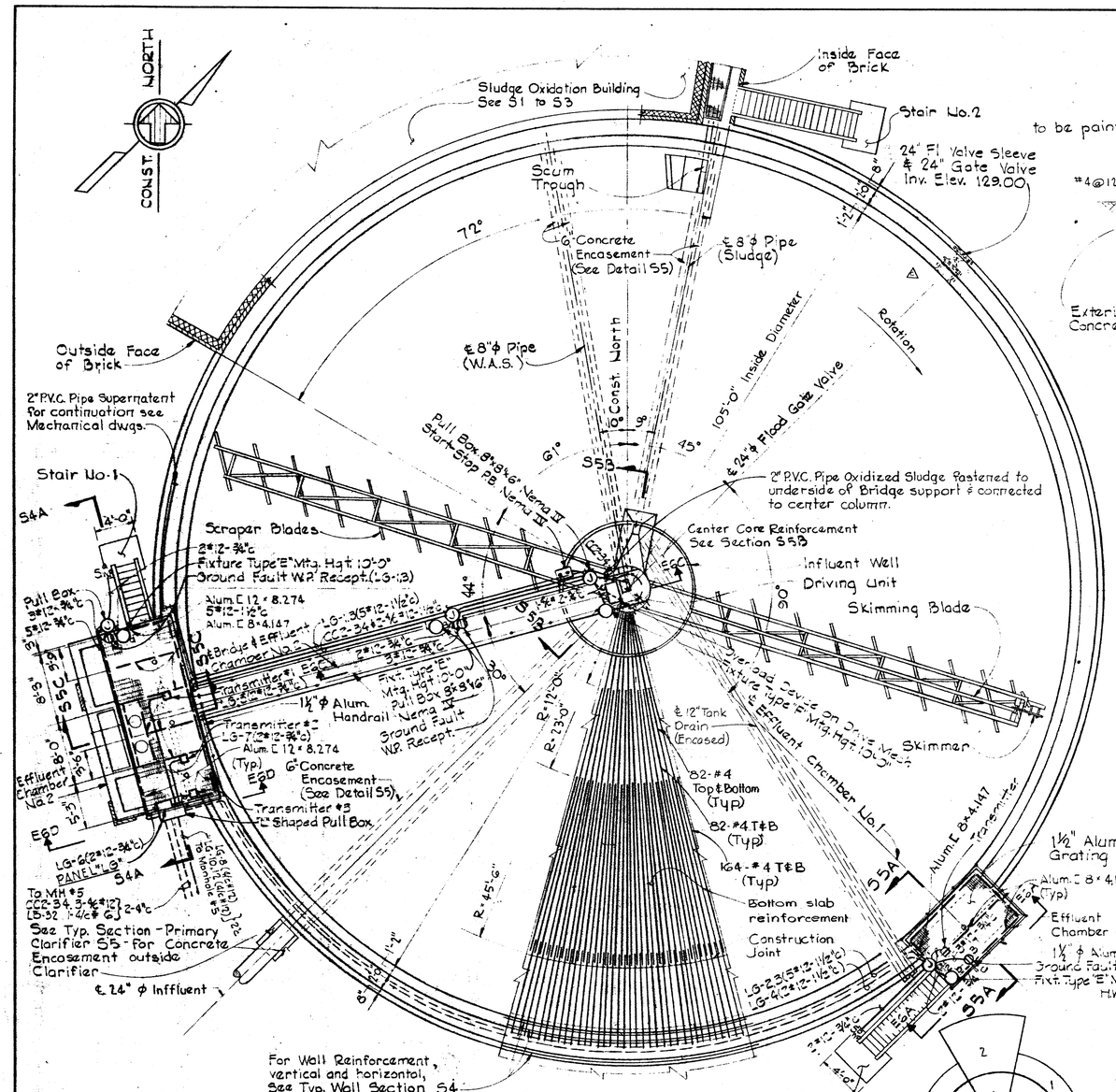
SHEET S-3

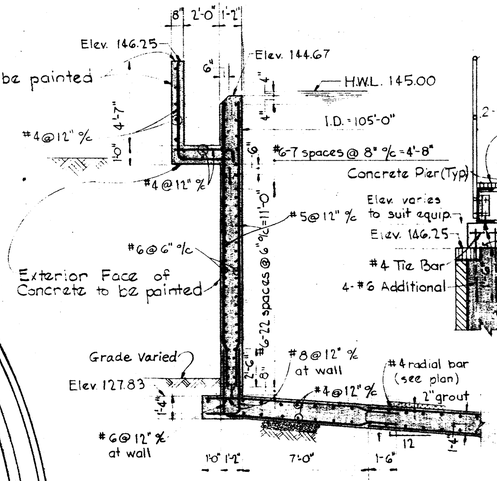
W.O. 6538-2

BRUNING 44-510 1477B



PLAN OF PRIMARY CLARIFER

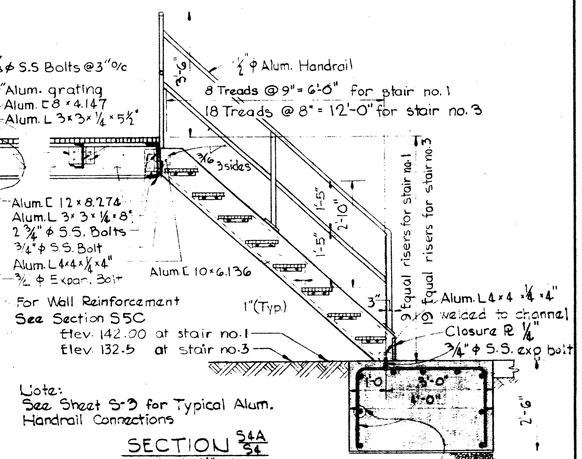
Scale 1/8" = 1'-0"



Note:
2" Grout in bottom shall be swept in place by use of mechanism. The mechanism shall not be operated by its motor when screeding grout.

TYPICAL WALL SECTION

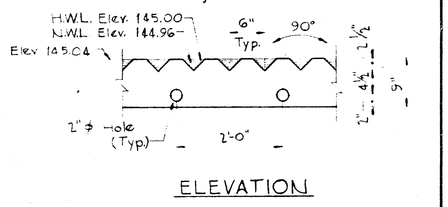
Scale 1/4" = 1'-0"



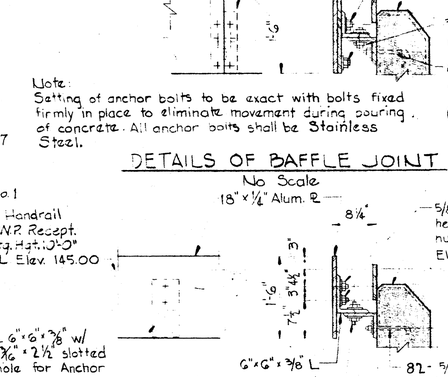
Note:
See Sheet S-3 for Typical Alum. Handrail Connections

SECTION S4A / S4

Scale 1/2" = 1'-0"



ELEVATION



Note:
Setting of anchor bolts to be exact with bolts fixed firmly in place to eliminate movement during pouring of concrete. All anchor bolts shall be Stainless Steel.

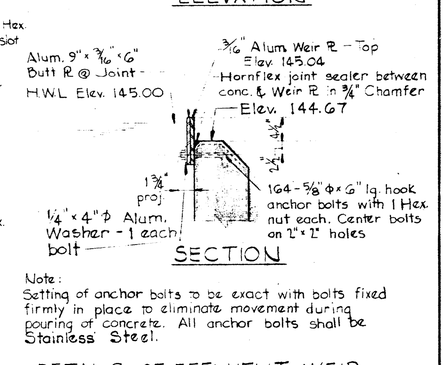
DETAILS OF BAFFLE JOINT

No Scale

Note:
Scum baffle angles & plates shall be Aluminum Alloy 6061-T6. Setting of anchor bolts to be exact with bolts fixed firmly in place to eliminate movement during pouring of concrete. All anchor bolts shall be Stainless Steel.

DETAILS OF SCUM BAFFLE

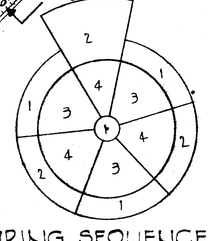
No Scale



SECTION

DETAILS OF EFFLUENT WEIR

No Scale



POURING SEQUENCE PLAN

No Scale

NOTES:

1. For Concrete and Foundation Notes - See Sheet S1.
2. Bottom Slab of Clarifier shall be poured in alternate segments - See Pouring Sequence Plan.
3. All Aluminum Beams on Effluence Chambers shall have 3" clearance from outside edge of concrete to the back of channel, unless otherwise noted.
4. Aluminum Grating on top of both Effluence Chambers shall be 1½" in thickness and with no projection from back of Exterior Channels, except where otherwise noted.

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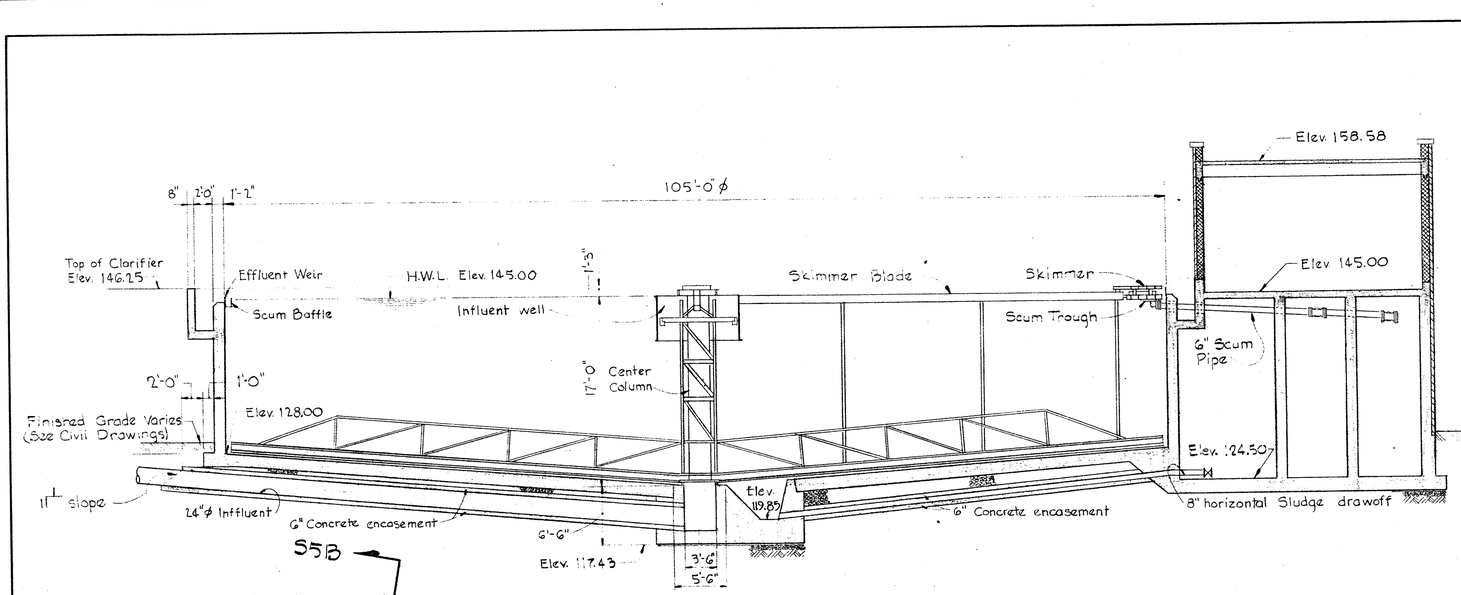
W.O. 6538-2

Construction Modification

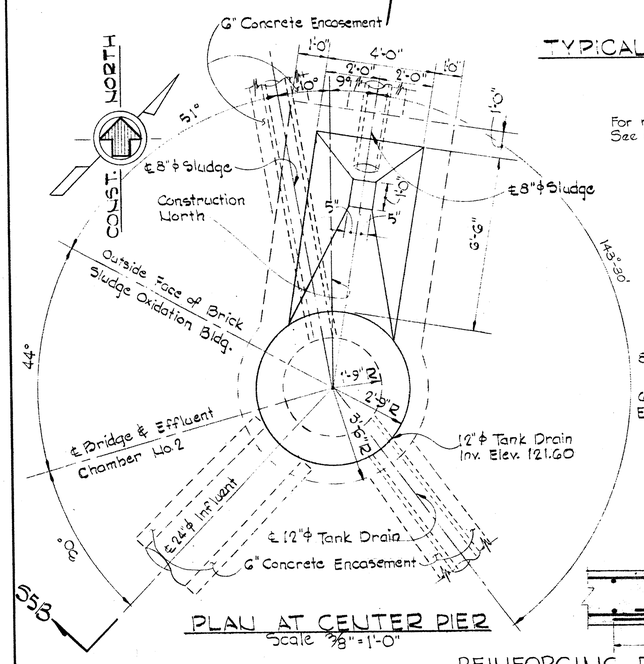
SHEET S-4

PRINTING 44-510 14779



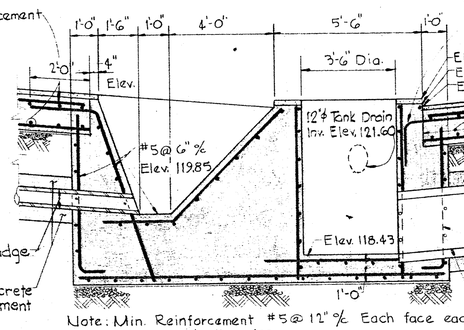
TYPICAL SECTION OF PRIMARY CLARIFIER

Scale 1/8" = 1'-0"



PLAN AT CENTER PIER

Scale 3/8" = 1'-0"



Note: Min. Reinforcement #5@12" % Each face each way, unless noted otherwise

SECTION S5B / S5

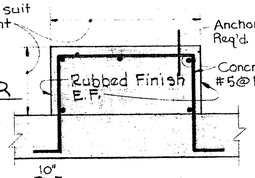
Scale 3/8" = 1'-0"

REINFORCING DETAIL AT CORNER

No Scale

REINFORCING DETAIL AT WALL INTERSECTION

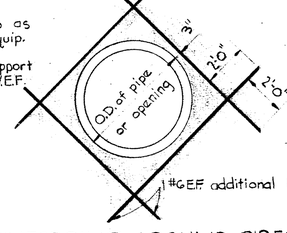
No Scale



Note: See mechanical and electrical drawings for location, size, and quantity of "concrete Equip. support"

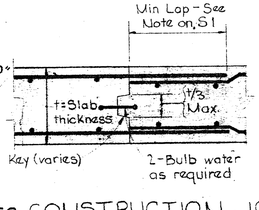
TYPICAL EQUIPMENT SUPPORT

No Scale



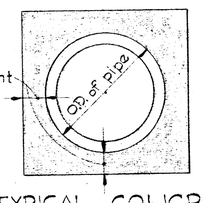
REINFORCING AROUND PIPES OR ROUND OPENINGS IN WALLS OR SLABS

No Scale



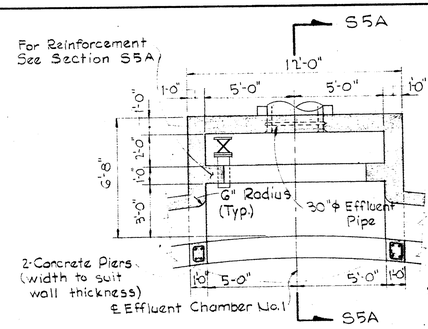
CONSTRUCTION JOINT IN WALL AND SLAB

No Scale



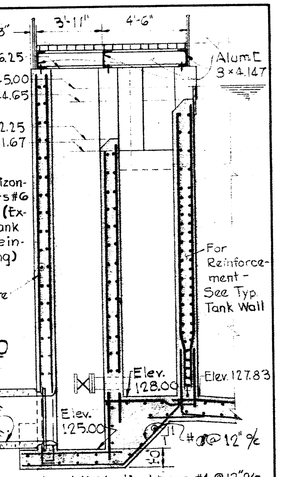
TYPICAL CONCRETE ENCASEMENT AROUND PIPE

No Scale



SECTIONAL PLAN AT ELEVATION 146.00 EFFLUENT CHAMBER NO. 1

Scale 1/4" = 1'-0"



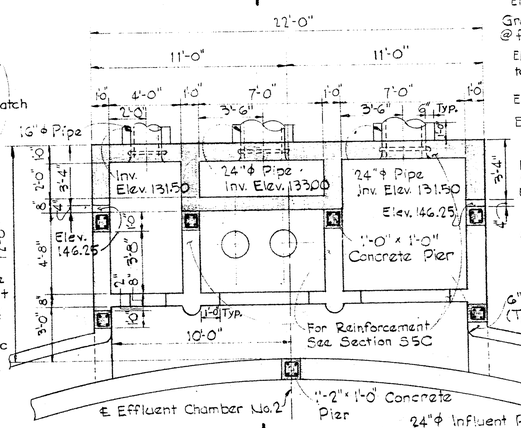
SECTION S5A / S5

Scale 1/4" = 1'-0"

S5C

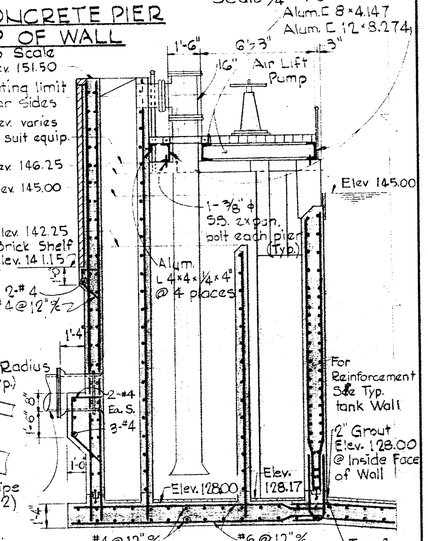
TYPICAL CONCRETE PIER AT TOP OF WALL

No Scale



SECTIONAL PLAN AT ELEVATION 146.50 EFFLUENT CHAMBER NO. 2

Scale 1/4" = 1'-0"



SECTION S5C / S5

Scale 1/4" = 1'-0"

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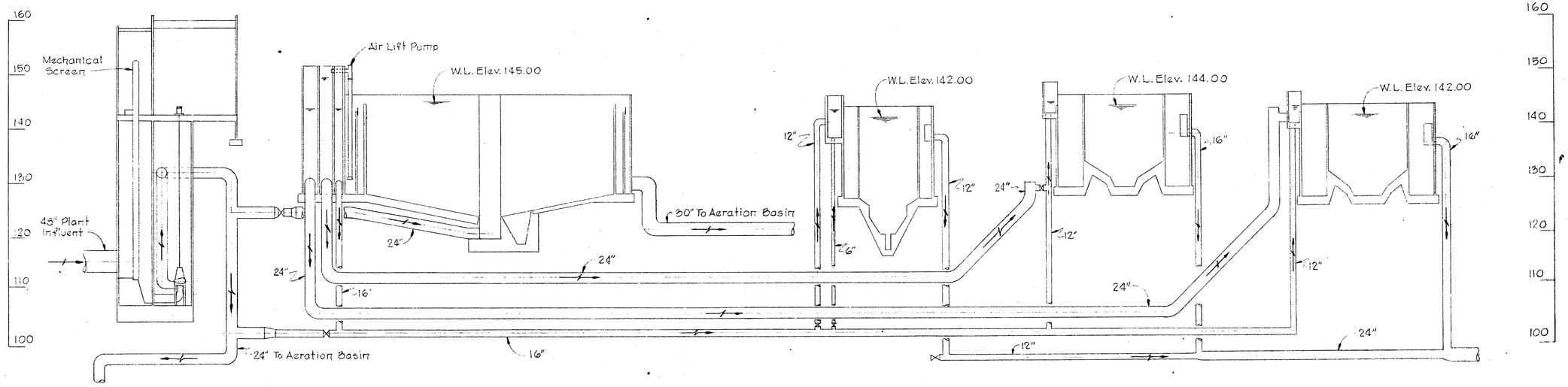
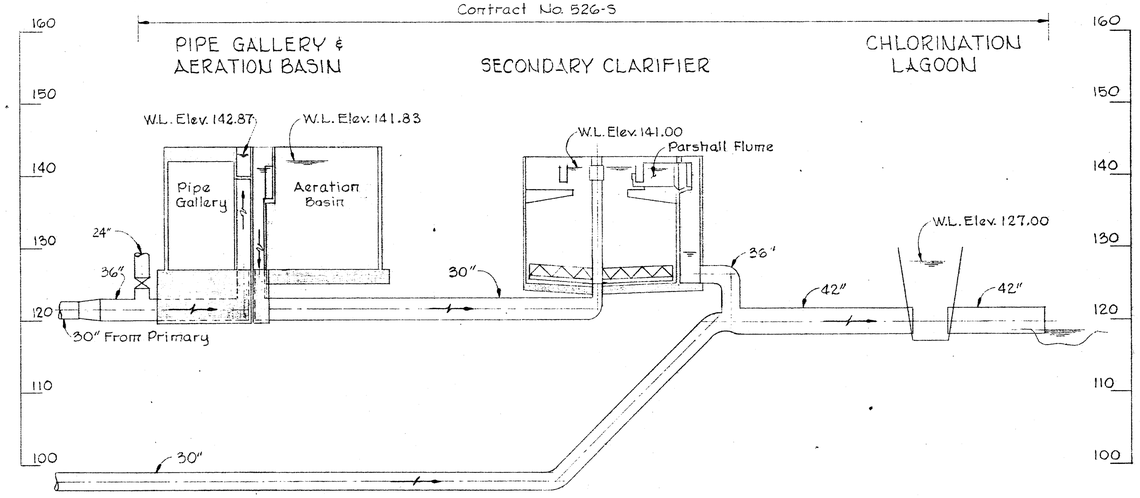
SHEET S-5

W.O. 6538-2

BRUNING 44-510 14778



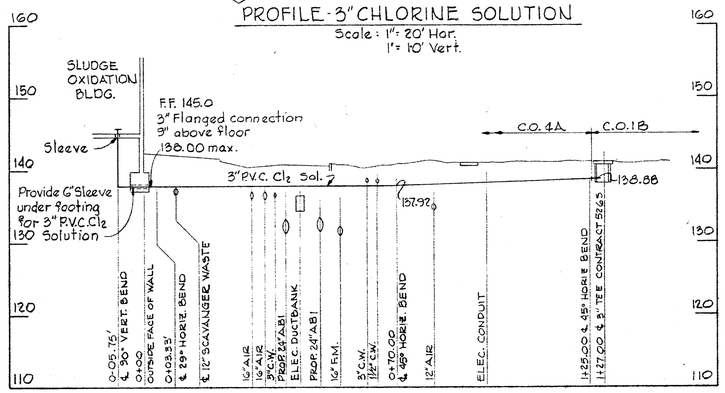


NOTE:
1. Pipe shown diagrammatic. For exact arrangement, elevations, and connections see civil and mechanical drawings.
2. Elevations shown for water levels are at maximum flows.

LEGEND

—C.W.—	Cold Water
W.L.	Water Level
—A—	Control Air
—⋈—	Gate Valve
—⋈—	Plug Valve
—⋈—	Ball Valve (Chlorine Service)
P.V.C.	Polyvinyl Chloride Pipe
C.I.P.	Cast Iron Pipe or Ductile Iron Pipe
C.S.	Contact Stabilization
A.S.	Activated Sludge
W.A.S.	Waste Activated Sludge
R.A.S.	Return Activated Sludge
⊘	Pressure Gage

① PROFILE - 3" CHLORINE SOLUTION
Scale: 1" = 20' Hor.
1" = 10' Vert.

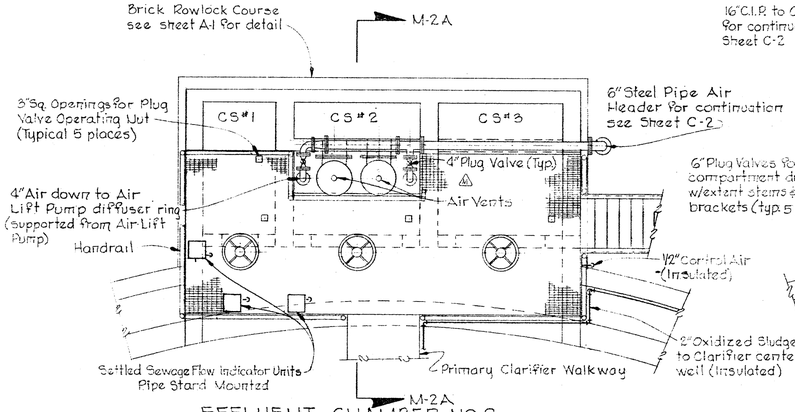


WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE W O Gilbert CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	HYDRAULIC PROFILE	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 17 OF 28	SCALE AS SHOWN SHEET M-1

W.O. 6538-2 ① Change Order No. 4 2-19-74

AS BUILT JAN 1 1977

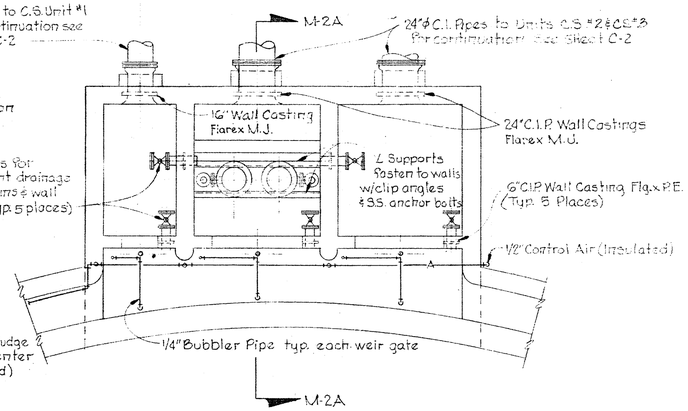
BRUNING 44-510 14778



EFFLUENT CHAMBER NO.2

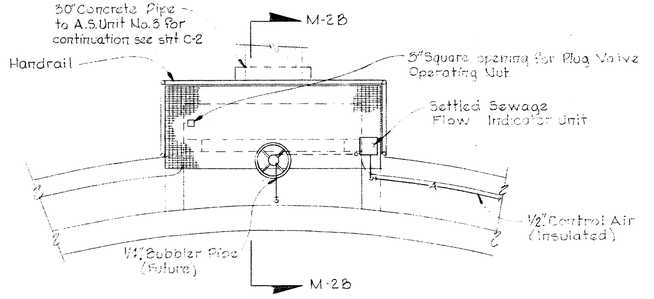
UPPER PLAN DISTRIBUTION CHAMBER FOR C.S. UNITS 1, 2 & 3

Scale: 1/4" = 1'-0"



LOWER PLAN

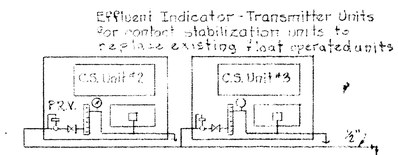
Scale: 1/4" = 1'-0"

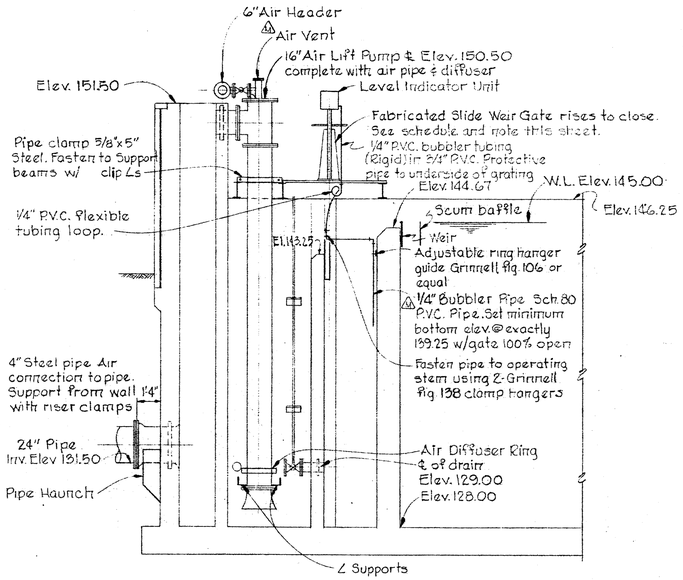


EFFLUENT CHAMBER NO.1

WEIR CHAMBER FOR FUTURE AERATION UNITS

Scale: 1/4" = 1'-0"



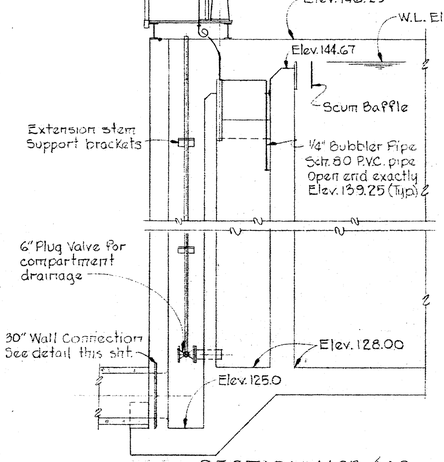


SECTION M-2A/M-2

Scale: 1/4" = 1'-0"

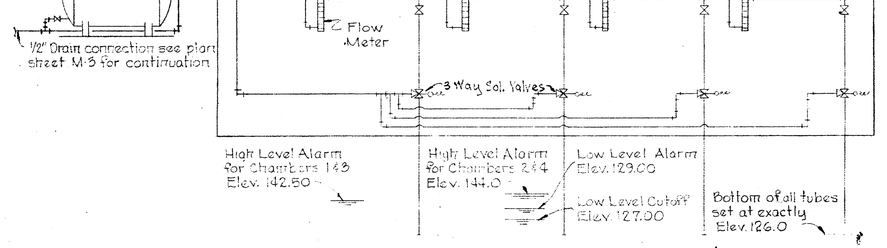
Gate	Size	Max. Flow
C.S.#1	2'x2'	2 MGD
C.S.#2	5'x2'	6 MGD
C.S.#3	5'x2'	6 MGD
A.S.	8'x2'	14 MGD

Note: Maximum elevation for control of flow 144.0. Minimum elevation for control of flow 143.25. Max. Elev. for shutoff 145.25



SECTION M-2B/M-2

Scale 1/4" = 1'-0"



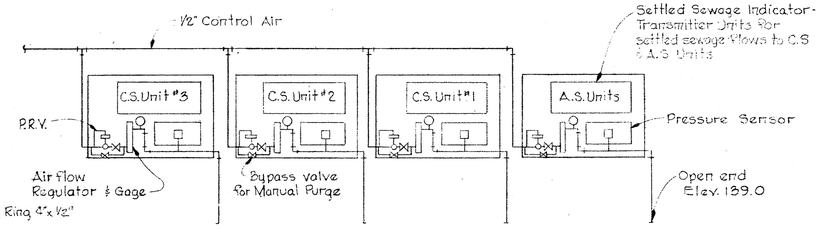
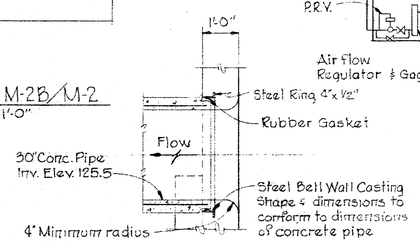


DIAGRAM - BUBBLER SYSTEM

No Scale



DETAIL 30" CONCRETE PIPE WALL CONNECTION

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

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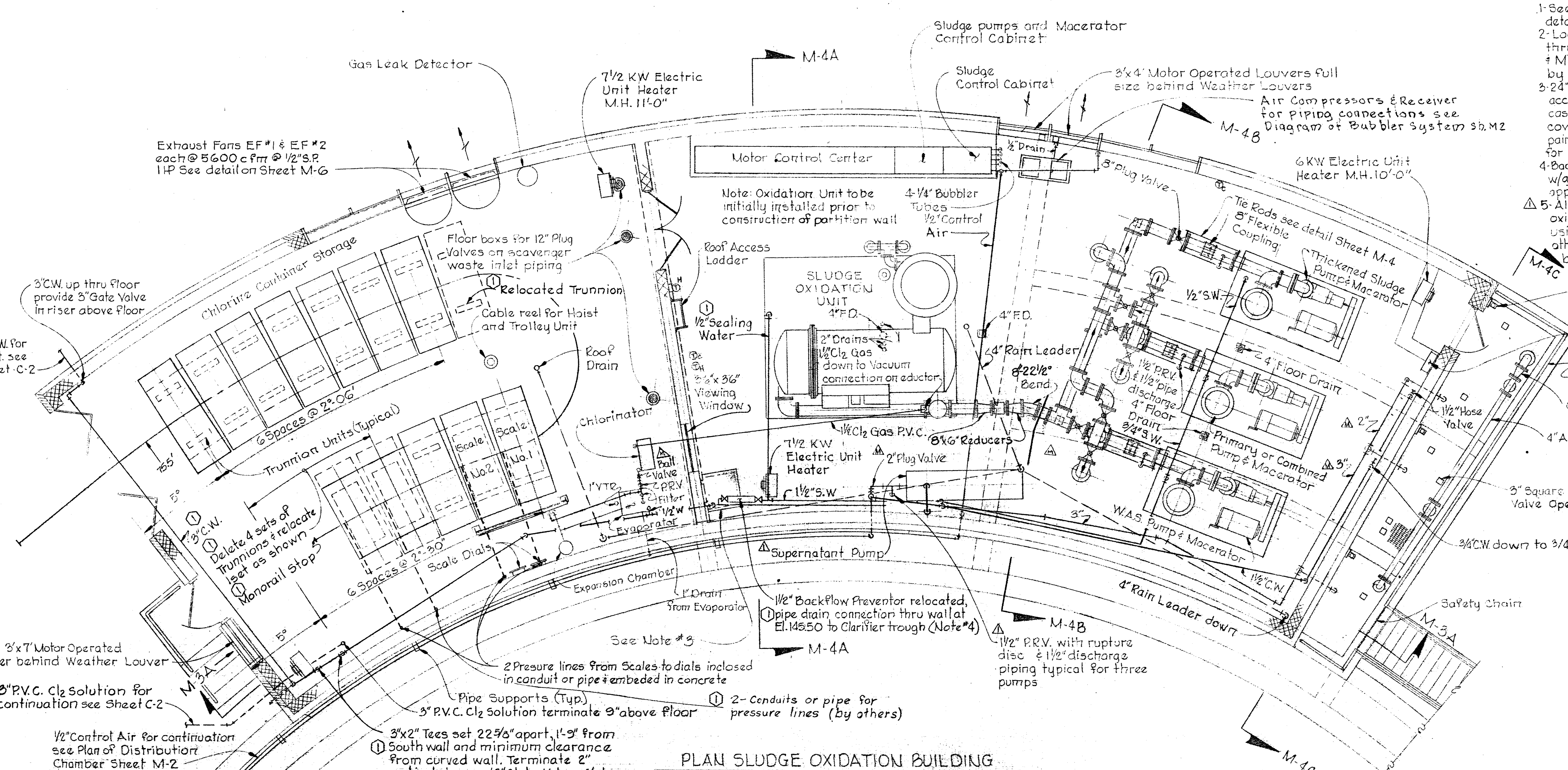
W.O.6538-2

Addendum ⚠
Construction Modification ⚠

SHEET M-2

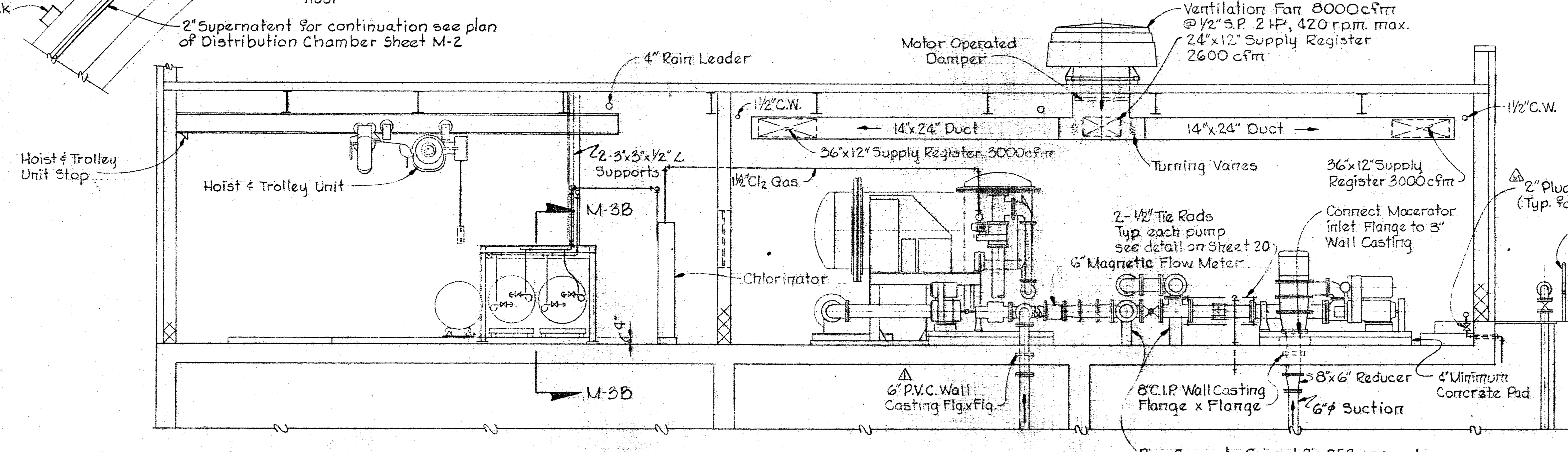
BRUNING 44-510 14778

Notes:
1- See diagram Chlorine piping Sheet M-6 for details of Chlorine liquid and gas piping.
2- Location of all piping and drain connections thru floor slab from Oxidation Unit and Pump & Macerator Units shall be located as required by manufacturers drawings.
3- 24"x24" inside opening waterfight double cover access opening Flockhart type 602-SA-62529 with cast iron frame & inner cover and aluminum outer cover. Inner cover and frame below slab shall be painted with chlorine resistant coating as specified for chamber walls and slabs.
4- Backflow Preventer shall be BEECO Model 6C 1½ inch size w/gate Valves as manufactured by Hershey-Sparling or approved equal.
△ 5- All mechanical equipment, pumps, compressors, sludge oxidation unit, etc. shall be mounted to concrete pads using anchor bolts. Size and spacing of bolts and other mounting procedures shall be as recommended by manufactures.



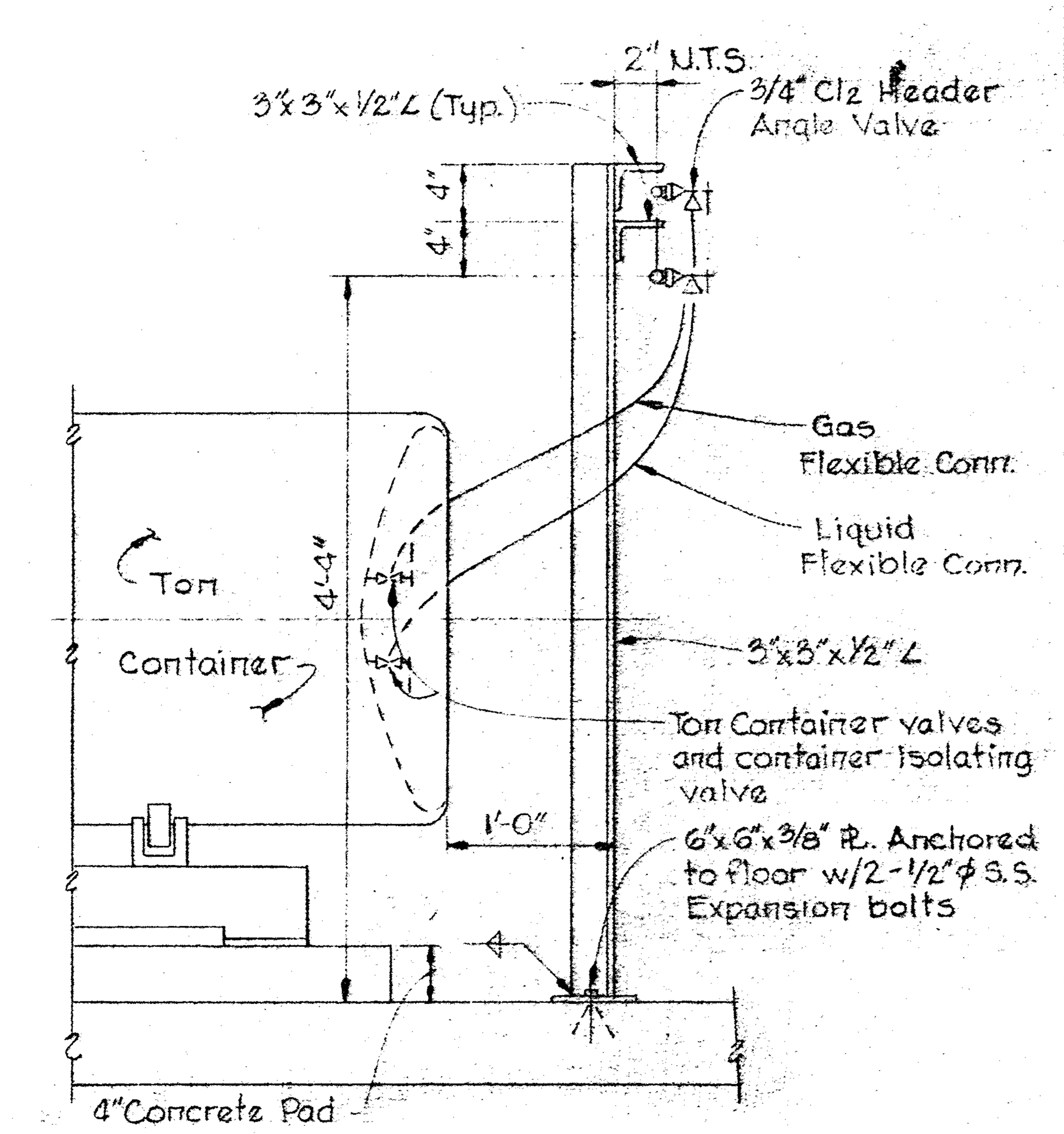
Gas Leak Detector
7½ KW Electric Unit Heater M.H. 11'-0"
M-4A
Sludge pumps and Macerator Control Cabinet
Sludge Control Cabinet
3'x4' Motor Operated Louvers full size behind Weather Louvers
Air Compressors & Receiver for piping connections see Diagram of Bubbler System Sh. M2
M-4B
Exhaust Fans EF#1 & EF#2 each @ 5600 cfm @ ½" S.P. 1 HP See detail on Sheet M-6
Motor Control Center
½" Drain
8" Plug Valve
6 KW Electric Unit Heater M.H. 10'-0"
Note: Oxidation Unit to be initially installed prior to construction of partition wall
4-¼" Bubbler Tubes
½" Control Air
Floor boxes for 12" Plug Valves on scavenger waste inlet piping
Roof Access Ladder
Tie Rods see detail Sheet M-4
8" Flexible Coupling
Thickened Sludge Pump & Macerator
M-4C
Chlorine Container Storage
Relocated Trunnion
Cable reel for Hoist and Trolley Unit
SLUDGE OXIDATION UNIT
4" F.D.
Suspended solids meter drive mechanism typical for chambers 1, 2 & 3. Mounting height 1'-0" above grating.
Hoserack with 50' of 1½" hose for washing down of chambers.
3" C.W. up thru floor provide 3" Gate Valve in riser above floor
½" Sealing Water
Roof Drain
2" Drains
1½" Cl₂ Gas down to Vacuum connection on eductor
4" Rain Leader
22½° Bend
½" S.W.
1½" P.R.V.
1½" pipe discharge
4" Floor Drain
1½" ϕ Handrail
3" C.W. for cont. see Sheet C-2
6 Spaces @ 2'-0½"
Trunnion Units (Typical)
Scale No.1
Scale No.2
Chlorinator
16"x36" Viewing Window
1¼" Cl₂ Gas P.V.C.
8"x6" Reducers
¾" S.W.
Primary or Combined Pump & Macerator
6"x4" Reducer
1½" Hose Valve
4" Air Header
Ball Valve
P.R.V.
Filter
½" W
7½ KW Electric Unit Heater
1½" S.W.
2" Plug Valve
3" Square opening for Plug Valve Operating Nut (Typ. 7 places)
3" C.W.
Delete 4 sets of Trunnions & relocate 1 set as shown
Monorail Stop
Evaporator
6 Spaces @ 2'-3½"
Scale Dials
Supernatant Pump
W.A.S. Pump & Macerator
¾" C.W. down to ¾" hose connection
1½" C.W.
Expansion Chamber
1" Drain from Evaporator
1½" Backflow Preventor relocated, pipe drain connection thru wall at El. 145.50 to Clarifier trough (Note #4)
4" Rain Leader down
Safety Chain
M-3A
3'x7' Motor Operated cover behind Weather Louver
See Note #3
M-4A
M-4B
1½" P.R.V. with rupture disc & 1½" discharge piping typical for three pumps
3" P.V.C. Cl₂ Solution for continuation see Sheet C-2
2 Presure lines from Scales to dials inclosed in conduit or pipe & embeded in concrete
Pipe Supports (Typ.)
3" P.V.C. Cl₂ Solution terminate 9" above floor
2- Conduits or pipe for pressure lines (by others)
½" Control Air for continuation see Plan of Distribution Chamber Sheet M-2
3"x2" Tees set 22½° apart, 1'-9" from South wall and minimum clearance from curved wall. Terminate 2" vertical risers w/2" Globe Valves 6' above floor
M-4C
Hoserack
2" Supernatent for continuation see plan of Distribution Chamber Sheet M-2

PLAN SLUDGE OXIDATION BUILDING
Scale: ¼"=1'-0"



4" Rain Leader
Motor Operated Damper
Ventilation Fan 8000 cfm @ ½" S.P. 2 HP, 420 r.p.m. max.
24"x12" Supply Register 2600 cfm
1½" C.W.
14"x24" Duct
14"x24" Duct
1½" C.W.
36"x12" Supply Register 3000 cfm
Turning Vanes
36"x12" Supply Register 3000 cfm
Hoist & Trolley Unit Stop
Hoist & Trolley Unit
2-3"x3"x½" ∠ Supports
1½" Cl₂ Gas
2" Plug Valve (Typ. for 3)
M-3B
2-½" Tie Rods Typ. each pump see detail on Sheet 20
Connect Macerator inlet Flange to 8" Wall Casting
1½" ϕ Handrail
6" Magnetic Flow Meter
Chlorinator
M-3B
6" P.V.C. Wall Casting Flg. x Flg.
8" C.I.P. Wall Casting Flange x Flange
8"x6" Reducer
6" ϕ Suction
4" Minimum Concrete Pad
Pipe Supports Grinnel fig. 258 or equal

SECTION M-3A/M-3
Scale: ¼"=1'-0"



SECTION M-3B/M-3
Scale: 1"=1'-0"

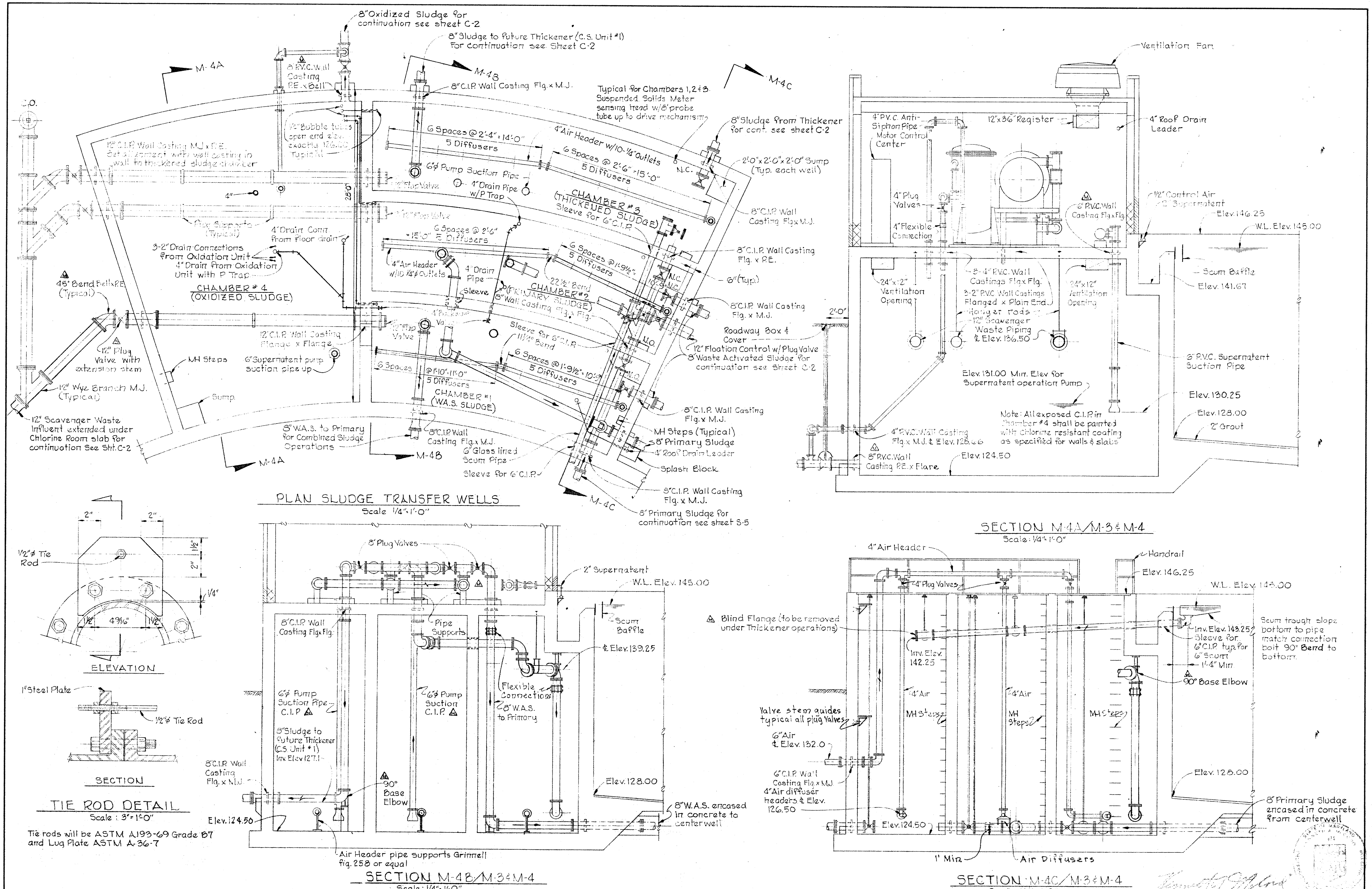
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE W O Gilbert CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING PLAN AND SECTIONS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 19 OF 28	SCALE AS SHOWN

W.O. 6538-2 ① Change Order No. 4 2-19-74

Addendum △
Construction Modification △

AS BUILT JAN 1 1977

SHEET M-3



WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING PLAN AND SECTIONS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 20 OF 28	SCALE AS SHOWN

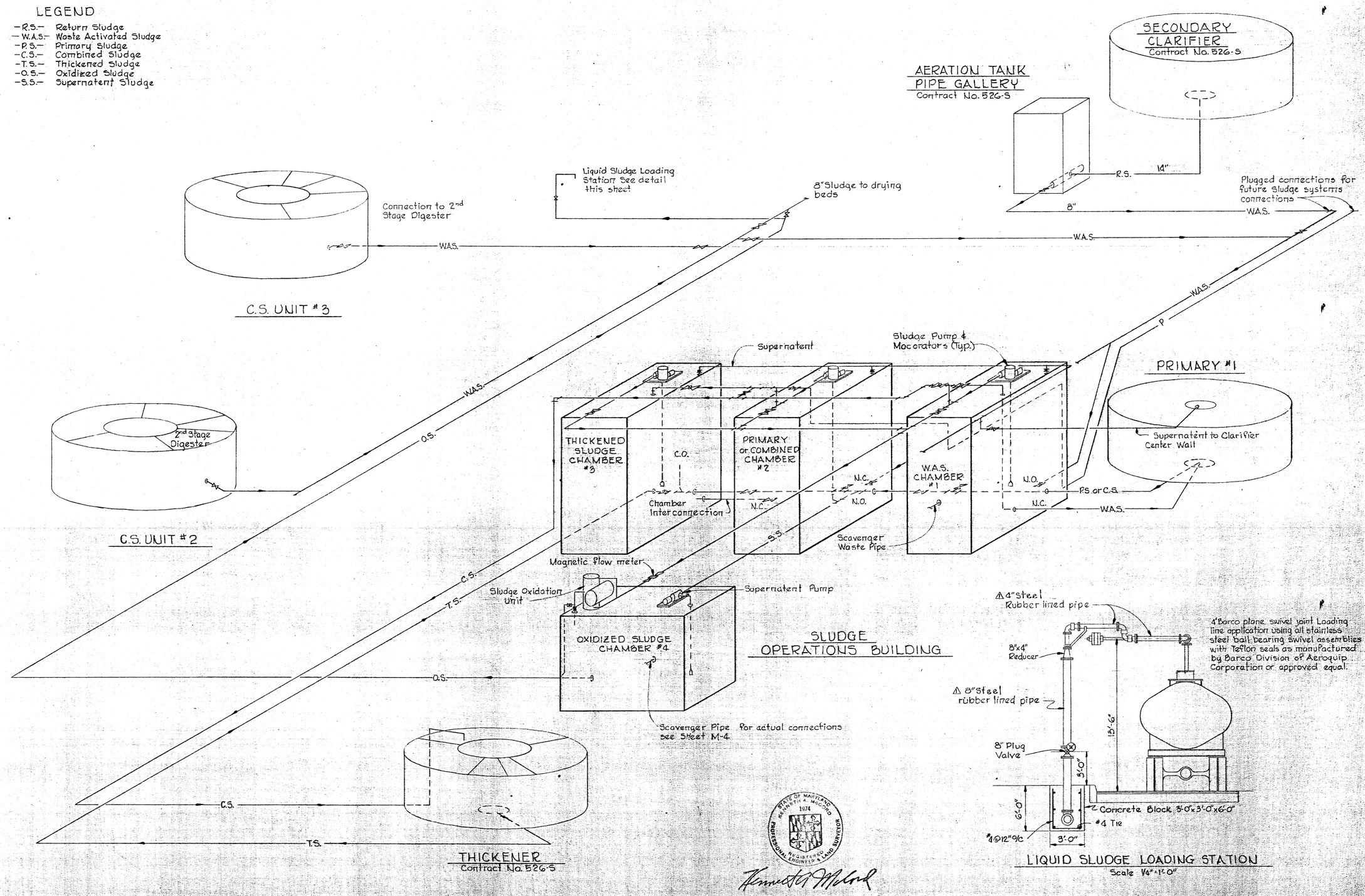
W.O. 6538-2

Construction Modification

SHEET M-4

LEGEND

-R.S.- Return Sludge
-W.A.S.- Waste Activated Sludge
-P.S.- Primary Sludge
-C.S.- Combined Sludge
-T.S.- Thickened Sludge
-O.S.- Oxidized Sludge
-S.S.- Supernatant Sludge



STATE OF MARYLAND KENNETH A. McCORD 1974 REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

Kenneth A. McCord

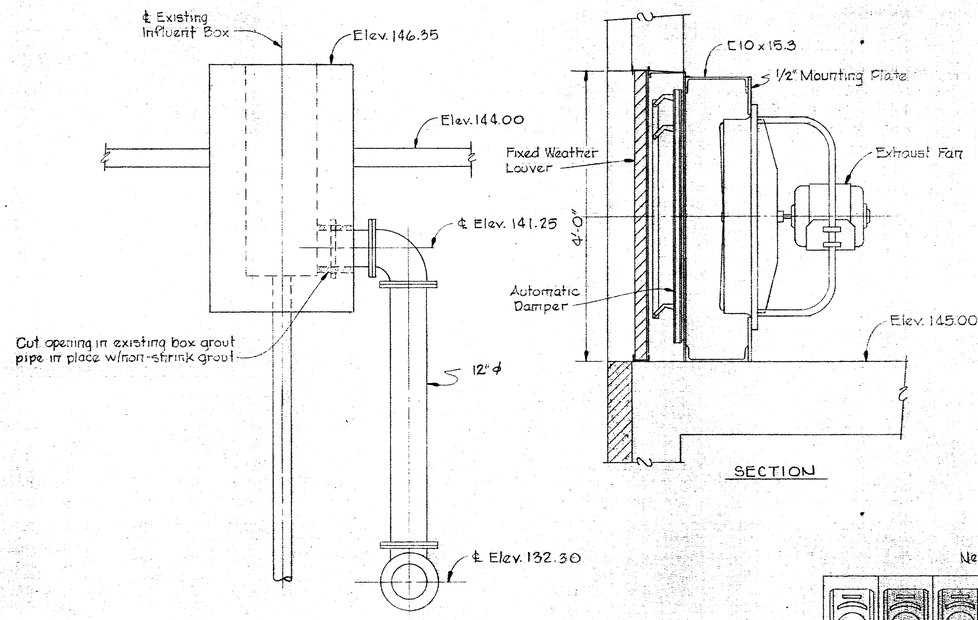
WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE PROCESS DIAGRAM	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 21 OF 28	SCALE AS SHOWN

W.O. 6538-2

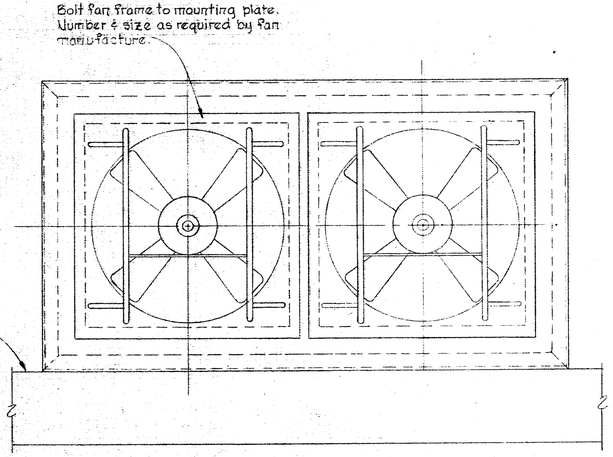
Addendum ⚠ AS BUILT JAN 1 1977

SHEET M-5

BRUNING 44-510 14778



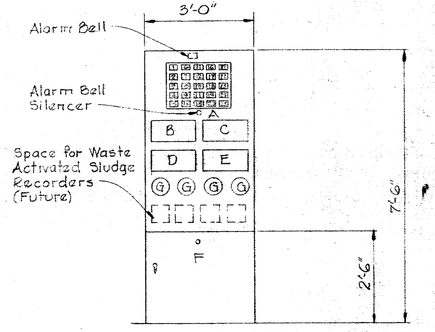
SECTION



ELEVATION

FAN DETAIL

Scale: 1"=1'-0"

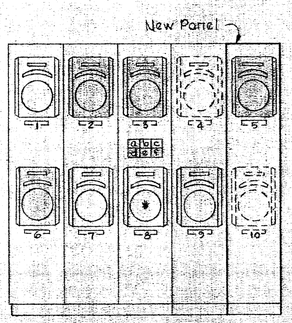


SLUDGE CONTROL CABINET

Scale 1/2"=1'-0"

SLUDGE CONTROL CABINET LEGEND

A-1-High Level Chamber #1
2-Low Level Chamber #1
3-High Density Chamber #1
4-Low Density Chamber #1
5-Secondary Clarifier Failure
6-High Level Chamber #2
7-Low Level Chamber #2
8-High Density Chamber #2
9-Low Density Chamber #2
10-Spare
11-High Level Chamber #3
12-Low Level Chamber #3
13-High Density Chamber #3
14-Low Density Chamber #3
15-Spare
16-High Level Chamber #4
17-Low Level Chamber #4
18-Spare
19-Sludge Pump & Macerator
20-Low Air Pressure
21-Oxidizer Failure
22-Chlorine Low Scale Weight
23-Chlorine Evaporator Low Temperature
24-Chlorine Evaporator High Temperature
25-Chlorine Leak
B-Sludge Density Chamber #1 (WAS) (Recorder Console)
C-Sludge Density Chamber #2 (Primary) (Recorder Console)
D-Sludge Density Chamber #3 (Thickened) (Recorder Console)
E-Oxidized Sludge Flow Recorder
F-Bubbler Control Cabinet -12 Pressure Switches, Purge Button and bubbler control accesories
G-Level Gages - Sludge Chambers 1 thru 4



EXISTING PANELBOARD ELEVATION

No Scale

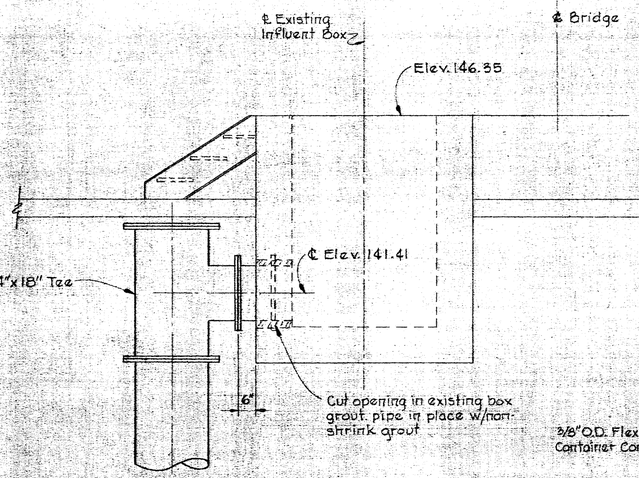
PANELBOARD LEGEND

1-Sewage Effluent Flow - Treatment Unit C.S.#1
2-Sewage Effluent Flow - Treatment Unit C.S.#2
3-Sewage Effluent Flow - Treatment Unit C.S.#3
526-S 4-Sewage Effluent Flow - Treatment Unit A.S.#3 (by others)
5-Sewage Effluent - Total Flow
6-Sewage Influent Flow - Primary No.1
7-Return Sludge Flow - Treatment Unit C.S.#2
8-Return Sludge Flow - Treatment Unit C.S.#3
526-S 9-Return Sludge Flow - Treatment Unit A.S.#3 (by others)
526-S 10-Plant Effluent - Chlorine Residual (by others)
a-Collector Drive Trouble
b-Blower Surge
c-Wet Well Level & Control Air
d-Sludge Oxidation
e-Chlorine Leak } Existing windows to be activated
f-Chlorine Weight

* Relocated
New Instrument or Alarm Panel

SECTION AT INFLUENT BOX TREATMENT UNIT NO. 1

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



SECTION AT INFLUENT BOX TREATMENT UNIT NO. 3

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

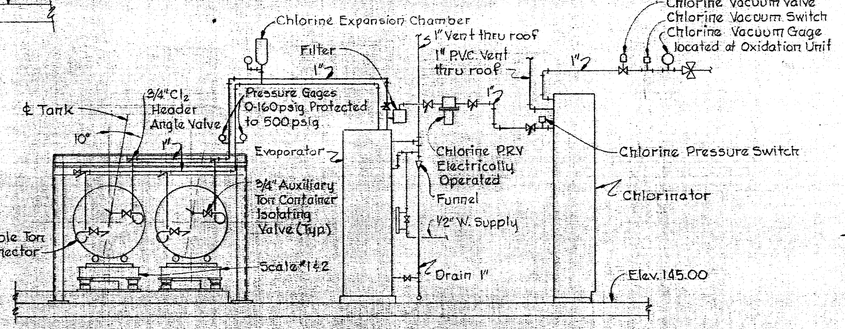
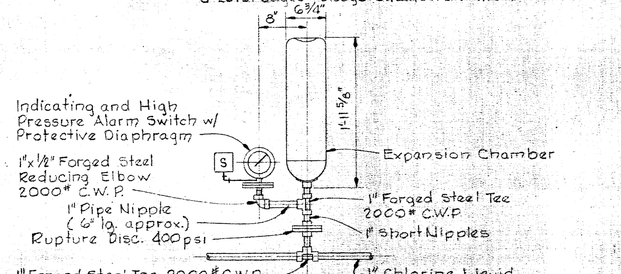


DIAGRAM - CHLORINE PIPING

No Scale



DETAIL - CHLORINE EXPANSION CHAMBER

Scale: 1"=1'-0"

STATE OF MARYLAND KENNETH A. McCORD 1974 REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

Kenneth A. McCord

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — W.O. Gilbert CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	MISCELLANEOUS DETAILS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 22 OF 28	SCALE AS SHOWN

W.O.6538-2

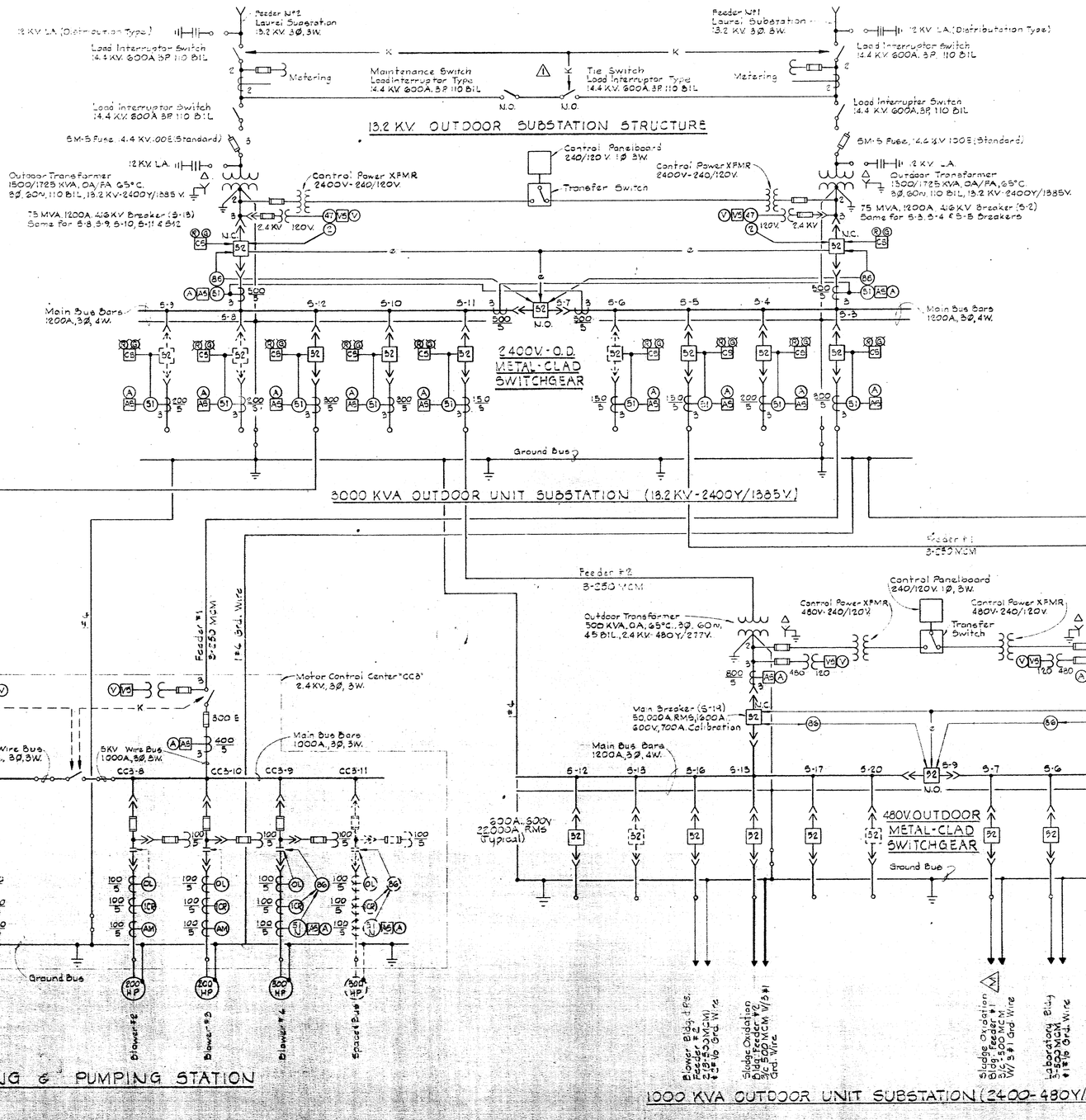
AS BUILT JUNE 1977

SHEET M-6

BRUNING A4-510 14778

NOTES

For General Electrical Notes & Electrical Legend
See Sheet E-0



WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF- BUREAU OF ENGINEERING	CONTRACT NO. 525-S	ONE LINE WIRING DIAGRAM	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 23 OF 28	SCALE AS SHOWN

W.O. 6538-2

Addendum ⚠

SHEET E-1

BRUNING 44-510 14778

INTERIOR

- Outlet Incandescent Ceiling Recessed Wall
- Outlet Incandescent Emergency Ceiling Wall
- Outlet Clock Single Face Ceiling Wall
- Outlet Clock Double Face Ceiling Wall
- Outlet Fluorescent 4 Foot
- Outlet Fluorescent 4 Foot With Kindorf Wiring Channel
- Outlet Fluorescent 4 Foot With Kindorf Support & Conduit
- Outlet Fluorescent 2 Foot
- Outlet Exit Light Ceiling Wall With Or Without Directional Arrows
- Outlet Mercury Ceiling Wall
- Outlet Duplex Convenience
- Outlet Special Purpose Floor
- Outlet 20A 250V Receptacle Polarized
- Outlet 30A 250V Receptacle & Plug Polarized
- Outlet Telephone Wall Desk Extension
- Outlet Intercommunication
- Junction Box
- EXP WP Explosion proof Weatherproof Where Indicated
- S S2 S Switch Single Pole Double Pole With Pilot Light
- S3 S4 Switch Three Way Four Way
- Sk SD Switch Key Operated Door Operated
- SMC SRC Switch Momentary Contact Remote Control
- C-1 Contactor Number As Indicated
- Th Tc Tf Thermostat Heating Cooling Freeze Stat
- A Aquastat
- Unit Heater
- G Generator
- Motor Constant Speed Variable Speed
- M Starter Manual Combination
- S RS Starter Magnetic (FVNR) Magnetic (FVR)
- RS Starter Magnetic [FVNR-25 (Two Speed)]
- F Disconnect Switch Fused Unfused
- Selector Switch Two Position
- SC Secondary Motor Controls
- Pull Box Size As Noted
- Telemetering Transmitter
- Lighting Panel
- Power Panel
- Telephone Or Signal Cabinet
- Contactor Cabinet
- Homerun To Panelboard Number Of Arrows Indicates Number Of Circuits, Number Of Cross Lines Indicates Number Of Wires. Where No Cross Lines Appear, Two Conductors Are Implied.
- Conduit In Or On Ceiling Or Wall
- Conduit In Or Under Floor
- —T— Conduit Telephone
- —PT— Conduit Private Telephone
- —FA— Conduit Fire Alarm
- —C— Conduit Communication
- —E— Conduit Emergency
- Conduit Stub Up Stub Down
- Conduit Seal
- CB Disconnect Circuit Breaker
- Outlet Incandescent Flood Lt
- Pushbutton Station One, Two & Three Pushbutton
- Horn
- Bell
- CC4-6a Motor Control Center Wire & Cable Run Number
- SW-1 Switchgear Wire & Cable Run Number
- SS1-1 Unit Substation Wire & Cable Run Number
- PC-1 Control Cable Number

UNDERGROUND

- 4/W Ductbank Number Of Ducts As Indicated
- 2" —C— Existing Conduit Size As Indicated
- —DB— 2#4 Existing Direct Buried Cable Number & Size As Indicated
- —DB— 2#4 Direct Buried Cable Number & Size As Indicated
- —C— Conduit Size As Indicated

CIRCUIT BREAKER S.I.C. LEGEND

10		10,000 Amperes At Operating Voltage
14	-	14,000 Amperes At Operating Voltage
22	-	22,000 Amperes At Operating Voltage
30	-	30,000 Amperes At Operating Voltage
50	-	50,000 Amperes At Operating Voltage
60	-	60,000 Amperes At Operating Voltage
65	-	65,000 Amperes At Operating Voltage

LOCATION SYMBOLS FOR ELEMENTARY CONTROL DIAGRAMS

- ● Device located in respective Motor Control Center
- ■ Device located at respective unit
- ▲ Device located at respective motor
- Device located in Sludge Pump Control Cabinet
- ⊕ Device located outside Chlorine Room Doors
- ⊞ Device located at Oxidizer Unit
- □ Device located at Sludge Operations Cont. Cab.
- △ Device located in Existing Motor Control Center "CC2"

△ MOTOR CONTROL CENTERS & UNIT SUBSTATIONS AUXILIARY DESCRIPTION

a	-	Red & Green Indicating Lights
b	-	Third Overload Relay
c	-	Running Time Meter
d	-	Hand Off Automatic Selector Switch
e	-	Start-Stop Pushbutton Station
f	-	Key Interlock
g	-	480-120Volt Control Transformer
h	-	Slow-Fast-Stop Pushbutton Station
j	-	Forward-Reverse-Stop Pushbutton Station
k	-	Open Close Control Switch
m	-	Hand-Automatic Selector Switch
△ n	-	Summer-Winter Selector Switch

ONE LINE/ELEMENTARY

- Molded Case Circuit Breaker
- OCB Oil Circuit Breaker
- Selector Switch
- Disconnecting Switch
- Interrupter Switch
- Selector Interrupter Switch
- Knife Switch
- Contacts Normally Open
- Contacts Normally Closed
- Current Transformer
- Potential Transformer
- Power Transformer
- Ground
- Resistor
- Fuse
- Pothead
- Pushbutton
- Pressure Switch
- Float Switch
- Flow Switch
- Limit Switch
- Thermostat
- Disconnect Link
- L.A. Lightning Arrester
- Incoming Line
- Outgoing Line
- Tie Line
- Capacitor
- Rectifier
- Mechanical Interlock
- ---e--- Electrical Interlock
- ---k--- Key Interlock
- Overcurrent Trip Thermal Type
- 50 Relay Instantaneous Overcurrent
- 51 Relay Time Overcurrent
- 52 A.C. Power Circuit Breaker
- M Motor (Three Phase) Constant Speed Variable Speed
- S RS Starter Magnetic (FVNR) Magnetic (FVR)
- 25 Starter Magnetic [FVNR-25 (Two Speed)]
- RTM Running Time Meter
- G Indicating Light Color As Indicated By Letter
- Sol M Solenoid Motor (Single Phase)
- C1 M1 Contactor Coil Starter Coil Number As Indicated
- A AS Ammeter Ammeter Switch
- V VS Voltmeter Voltmeter Switch
- W KW Wattmeter Kilowatt Meter
- TB TS Test Block Test Switch
- REC RD Recording Recording Demand Meter
- R1 Relay Number As Indicated
- SW CS Instrument Switch Control Switch
- GL Ground Lamps
- PF Power Factor Meter
- T1 Timer Number As Indicated
- WH WH Watt Hour Meter Watthour Meter
- 47 Phase Sequence Voltage Relay
- 86 87 Tripping Relay Lock out Type Differential Relay
- Automatic Transfer Switch
- Electric Radiant Heaters
- C Contactor
- Relay Time Overcurrent W/instantaneous Trip
- Ground Overcurrent Relay
- 94 Tripping Relay
- D Demand Meter
- F Frequency Meter
- PH Phase Meter
- PI Position Indicator
- GSR Ground Sensing Relay
- 52 — 55 A.C. Power Circuit Breaker With Solid State Trip & Ground Device
- Receptacle & Plug Polarized
- HP Horsepower Meter
- 69 Permissive Control Switch
- 46 Reverse-Phase, Or Phase Balance Current Relay
- 2 Time Delay Relay
- 95 Voltage Unbalance Relay
- 63 Liquid or Gas Pressure Relay

GENERAL ELECTRICAL NOTES

1. For PANELBOARD SCHEDULES, see Specifications, DETAILED ELECTRICAL REQUIREMENTS.
2. For explanation of Lighting Fixture Types shown on dwg see Specifications DETAILED ELECTRICAL REQUIREMENTS.
3. Mounting heights for interior lighting fixtures shall be from finished floor to bottom of fixture, unless otherwise noted.
4. Mounting heights for lighting fixtures mounted on exterior walls of buildings shall be from finished floor to center line of recessed junction box, unless otherwise noted.
5. Verify all door swings before installing switch boxes.
6. Receptacles shall be mounted 2'-0" above finished floor unless otherwise noted.
7. All Elementary Control Diagrams are shown in the de-energized position.
8. For Electrical Work on Primary Clarifier see Drawings S-4 & E-6.
9. For Control Cable Cable Schedule see Drawing E-4.

EXTERIOR

- Mercury Area Light
- Incandescent Area Light
- Existing Pole
- 35'-2 Pole Length & Class As Indicated
- 35'-2-20 Pole With Down Guy & Anchor Length, Class & Lead As Indicated
- 35'-2 Pole With Street Light Length & Class As Indicated
- 4#1/0 Primary Distribution Line KV Number & Size Of Wires As Indicated
- 4#2 Secondary Distribution Line 3ϕ Number & Size Of Wires As Indicated
- 4#2 Service Drop Number & Size Of Wires As Indicated
- Weatherhead & Rack

State of Maryland Registered Professional Engineer & Land Surveyor (seal)

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE W O Filbert CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	GENERAL ELECTRICAL NOTES AND ELECTRICAL LEGEND	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 24 OF 28 / SCALE AS SHOWN

W.O. 6538-2

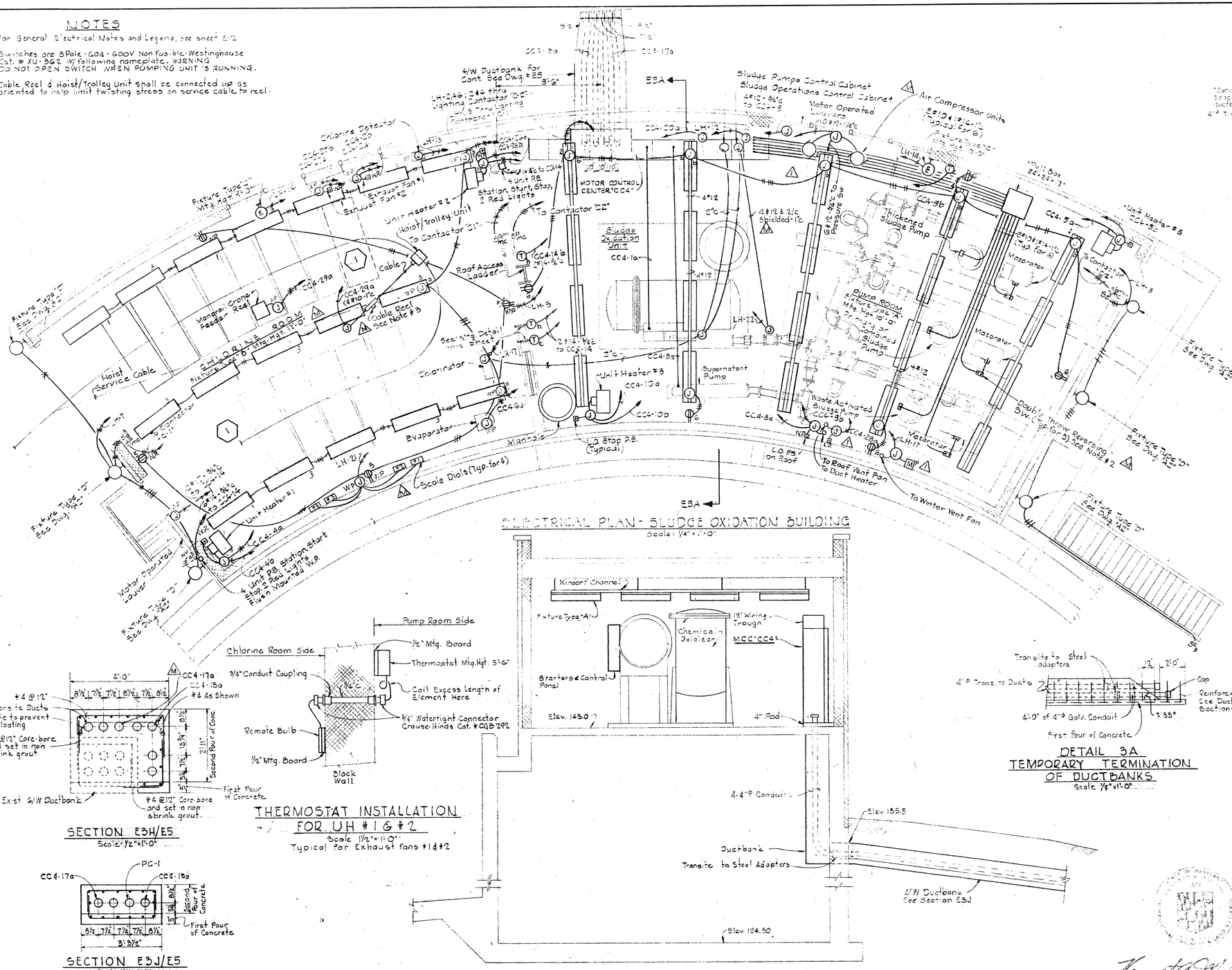
Addendum △

SHEET E-2

BRUNING 44-510 14778

NOTES

1. For General Electrical Notes and Legend, see sheet E-2
2. Switches are 3 Pole - 60A - 600V Non Fusible - Westinghouse Cat. # XU-362 W/ following nameplate. WARNING DO NOT OPEN SWITCH WHEN PUMPING UNIT IS RUNNING.
3. Cable Reel & Hoist/Trolley unit shall be connected up as oriented to help limit twisting stress on service cable to reel.



ELECTRICAL PLAN - SLUDGE OXIDATION BUILDING

Scale: 1/4" = 1'-0"

SECTION E3A/E3

Scale: 1/4" = 1'-0"

SECTION E3H/E5

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

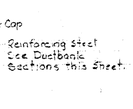
THERMOSTAT INSTALLATION FOR UH #1 & #2

Scale 1½" = 1'-0"
Typical for Exhaust Fans #1 & #2

SECTION E3J/E5

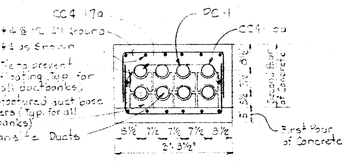
Scale ½" = 1'-0"

Note: 7½" duct spacing varies. See ELECTRICAL PLAN - SLUDGE OXIDATION BLDG. on this sheet.



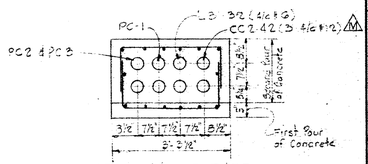
DETAIL 3A TEMPORARY TERMINATION OF DUCTBANKS

Scale ¾" = 1'-0"



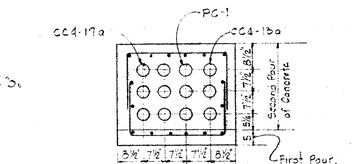
SECTION E3B/E5

Scale: 1/2" = 1'-0"
Typical for all ductbank sections



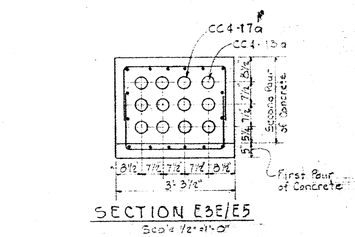
SECTION E3C/E5

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



SECTION E3D/E5

Scale 1/2" = 1'-0"

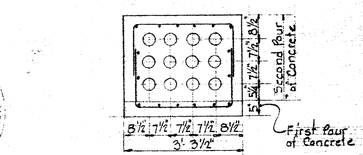


SECTION E3E/E5

Scale 1/2" = 1'-0"

SECTION E3F/E5

Scale 1/2" = 1'-0"



SECTION E3G/E5

Scale 1/2" = 1'-0"

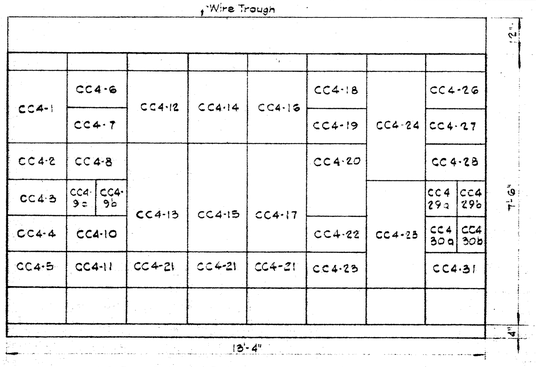
Addendum ⚠

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	SLUDGE OXIDATION BUILDING	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 25 OF 28	SCALE AS SHOWN

W.O. 6538-2 (1) Change Order No. 4 2-19-74

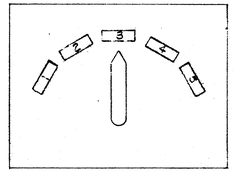
SHEET E-3

BRUNING 44-510 14778



MOTOR CONTROL CENTER "CC4"

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

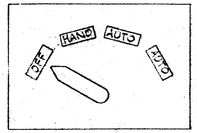


Contacts	Positions 1	Int 2	Int 3	Int 4	Int 5
1	X	X			
2	X	X			
3		X	X		
4			X	X	
5				X	X
6					X
7					X

Position	Nameplate
1	Thickened Sludge Pump & Mazorator - Primary or Combined Sludge Pump & Mazorator
2	Thickened Sludge Pumps & Mazorator
3	Primary or Combined Sludge Pump & Mazorator
4	Waste Activated Sludge Pump & Mazorator
5	Primary or Combined Sludge Pump & Mazorator - Waste Activated Sludge Pump & Mazorator

OXIDATION UNIT FEED PUMP & MAZORATOR SELECTOR SWITCH "S1"

Note: Additional Contacts shall be provided as required by the Equipment Manufacturer



	Positions Off	Hand	Intrm.	Auto	Intrm.	Auto
1		X	X			
2			X	X	X	
3					X	X

THICKENED SLUDGE PUMP & MAZORATOR SELECTOR SWITCH "S2"

Switch "S2" typical for:
"S3" - Primary or Combined Sludge Pump & Mazorator
"S4" - Waste Activated Sludge Pump & Mazorator

NOTES

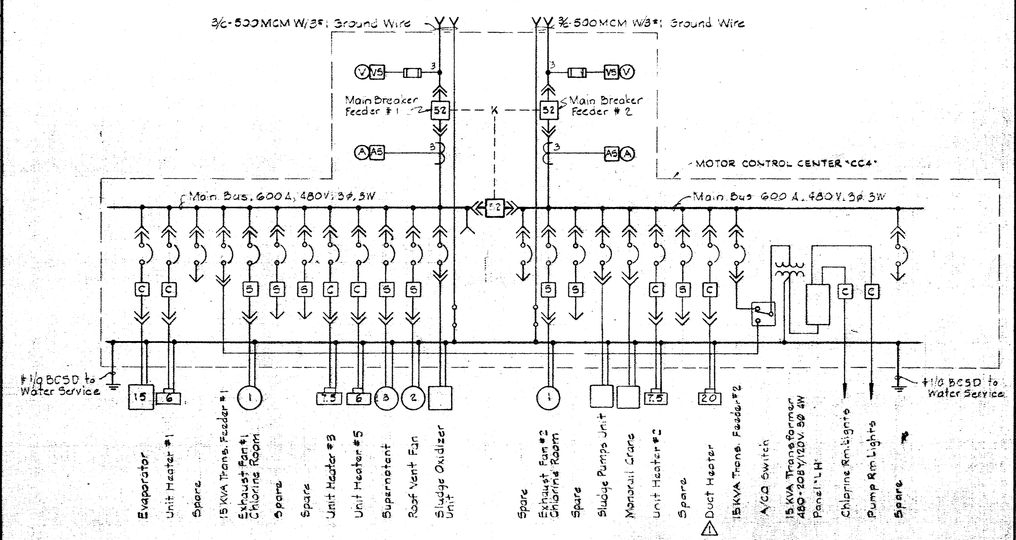
1. For General Electrical Notes and Legend, see Sheet E-2

CONTROL CABLE SCHEDULE

CABLE NO.	FROM	TO	FOR	WIRE NO	WIRE SIZE	WIRE TYPE	CONDUIT RACEWAY
PC-1	Sludge Operations Control Cabinet	Ex. Panelboard Lab. Bldg.	Alarms: Sludge Oxidation Unit, Chlorine Gas Leak, Chlorine Weight, Spare Wires	10/c	#12		See Drawing
PC-2	Valve Vault	Ex. Panelboard Lab. Bldg.	Primary Clarifier #1 Influent Flow Signal	2/c	-	Shield	See Drawings
PC-3	Valve Vault	Ex. Panelboard Lab. Bldg.	Control of Magnetic Flow Meter	4/c	#12		See Drawings

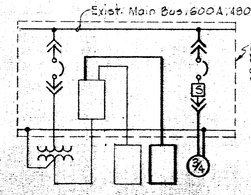
MOTOR CONTROL CENTER SCHEDULE "CC4" - 480V. - 3Ø - 3W - 60 Hz

UNIT NUMBER	NAMEPLATE DATA	DEVICE DESCRIPTION	HP or KVA	AUX. DESC.	BREAKER FRAME	POLE	CALIB.	S.I.C.	RUN NUMBER	WIRE - POWER NO.	SIZE	TYPE	WIRE - CONTROL NO.	SIZE	TYPE	GRD. WIRE SIZE	COND SIZE	REMARKS
CC4-1	Sludge Oxidizer Unit	Circuit Breaker	-	-	225	3	175	22	CC4-1a	3	#1/0	THW	-	-	-	#6	2"	
CC4-2	Exhaust Fan #1 Chlorine Room	Combination Starter Size 1, FVNR	1	a,b,c m,g	100	3	15	14	CC4-2a CC4-2g	3	#12	THW	2	14	THW	#14	1" 3/4"	
CC4-3	Supernatant Pump	Combination Starter Size 1, FVNR	3	a,c, d,g	100	3	15	14	CC4-3a	3	#12	THW				#14	1"	
CC4-4	Unit Heater #1	Combination Contactor Size 1, FVNR	6	a,c, d,g	100	3	15	14	CC4-4a CC4-4b	3	#12	THW	4	14	THW	#14	1" 3/4"	
CC4-5	Unit Heater #5	Combination Contactor Size 1, FVNR	6	a,c, d,g	100	3	15	14	CC4-5a CC4-5b	3	#12	THW	4	14	THW	#14	1" 3/4"	
CC4-6	Evaporator	Combination Contactor Size 2, FVNR	15	a,c, g	100	3	30	14	CC4-6a	3	#10	THW				#10	1"	
CC4-7	Blank (Spare)	Combination Starter Size 2, FVNR	-	a,b,c d,g	100	3	50	14	—	—	—	—	—	—	—	—	—	
⚠M CC4-8	Roof Vent Fan Pump Room	Combination Starter Size 1, FVNR	3	a,b,c d,g	100	3	15	14	CC4-8a CC4-8b	3	#12	THW	2	14	THW	#14	1" 3/4"	
CC4-9a CC4-9b	Blank (Spare) 15 KVA Transformer	Circuit Breaker Circuit Breaker	-	-	100 100	3 3	20 30	14 14	-	By Manufacturer						-	-	
CC4-10	Unit Heater #3	Combination Contactor Size 1, FVNR	7.5	a, c, d,g	100	3	15	14	CC4-10a CC4-10b	3	12	THW	4	14	THW	#14	1" 3/4"	
CC4-11	Blank (Spare)	Combination Starter Size 1, FVNR	-	a,b,c, d,g	100	3	15	14	-	-	-	-	-	-	-	-	-	
CC4-12	Standard Nameplates	Ammeter, Voltmeter, SW, C.T.'s	-	See Specs	-	-	-	-	-	By Manufacturer						-	-	
CC4-13	Main Breaker Feeder #1	Power Circuit Breaker Drawout Type		See Specs.	600	3	400	30	CC4-13a	3/c	500 MCM	RHW				W/ 3#1	4"	
CC4-14	-	Control Relays	-	n ⚠	-	-	-	-	-	-	-	-	-	-	-	-	-	
CC4-15	Tie Breaker	Power Circuit Breaker Drawout Type	-	See Specs.	600	3	400	30	-	By Manufacturer						-	-	
CC4-16	Standard Nameplates	Ammeter, Voltmeter, SW, C.T.'s	-	See Specs.	-	-	-	-	-	By Manufacturer						-	-	
CC4-17	Main Breaker Feeder #2	Power Circuit Breaker Drawout Type	-	See Specs.	600	3	400	30	CC4-17a	3/c	500 MCM	RHW				W/ 3#1	4"	
CC4-18	Lighting Contactor "C1" Chlorine Room	Contactor, 1-2P, 30A.		See Specs.	-	-	-	-	-	By Manufacturer						-	-	
CC4-19	Lighting Contactor "C2" Pump Room	Contactor, 1-2P, 30A.		See Specs.	-	-	-	-	-	By Manufacturer						-	-	
CC4-20	Sludge Pumps Unit	Circuit Breaker	—	—	225	3	150	22	CC4-20a	3	2/0	THW				#4	2	
CC4-21	—	Space for Incoming & Outgoing Cables	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
CC4-22	Blank (Spare)	Combination Starter Size 2, FVNR	-	a,b,c d,g	100	3	40	14	—	—	—	—	—	—	—	—	—	
CC4-23	Blank (Spare)	Combination Starter Size 1, FVNR	-	a,b,c, d,g	100	3	15	14	—	—	—	—	—	—	—	—	—	
CC4-24	Panelboard "LH" 208Y/120 - 3Ø - 4W	Circuit Breaker Panelboard, See Specs.	-	See Specs	-	-	-	-	-	By Manufacturer						-	-	
CC4-25	15 KVA Transformer 480V-208Y/120, 3Ø, 4W.	Transformer, 15 KVA 480V-208Y/120, 3Ø, 4W.	15	See Specs	-	-	-	-	-	By Manufacturer						-	-	
CC4-26	Unit Heater #2	Combination Contactor Size 1, FVNR	7.5	a,c, d,g	100	3	15	14	CC4-26a CC4-26b	3	12	THW	4	14	THW	#14	1" 3/4"	
CC4-27	Exhaust Fan #2 Chlorine Room	Combination Starter Size 1, FVNR	1	a,b,c m,g	100	3	15	14	CC4-27a CC4-27b	3	12	THW	2	14	THW	#14	1" 3/4"	
⚠ CC4-28	Duct Heater	Combination Contactor Size 2, FVNR	20	a,c, d,g	100	3	40	14	CC4-28a	3	8	THW	6	14	THW	#10	1 1/2"	
CC4-29a CC4-29b	Monorail Crane Blank (Spare)	Circuit Breaker Circuit Breaker	- -	- -	100 100	3 3	20 20	14 14	CC4-29a	3 -	#10 -	THW -	- -	- -	- -	#12 -	1" -	
CC4-30a CC4-30b	Blank (Spare) 15KVA Transformer	Circuit Breaker Circuit Breaker	- -	- -	100 100	3 3	20 50	14 14	-	By Manufacturer						- -	- -	
CC4-31	Transfer Switch	Automatic Transfer Switch A&CO Bulletin 940	-	See Specs	-	-	-	-	-	By Manufacturer						-	-	



SLUDGE OXIDATION BUILDING

No Scale



ADDITIONS TO MOTOR CONTROL CENTER "CC2"

STATE OF MARYLAND KENNETH A. McCORD 1971 REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR

Kenneth A. McCord

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — W.O. Gilbert CHIEF - BUREAU OF ENGINEERING	CONTRACT NO. 525-S	MOTOR CONTROL CENTER	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 26 OF 28 — SCALE AS SHOWN

W.O. 6538-2

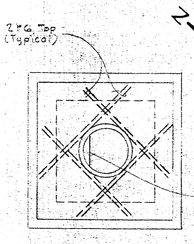
Addendum ⚠

SHEET E-4

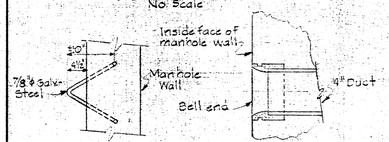
BRUNING 44-510 14778

NOTES

1. For General Electrical Notes & Electrical Legend See Sheet E-2
2. At Existing CS #2 & CS #3 disconnect existing Float Transmitter and connect new level Transmitter as required by manufacturer.

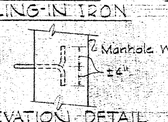


MANHOLE PLAN
(Typical for Manholes No 4, 5 & 6)
No Scale



PLAN DETAIL PULLING-IN IRON

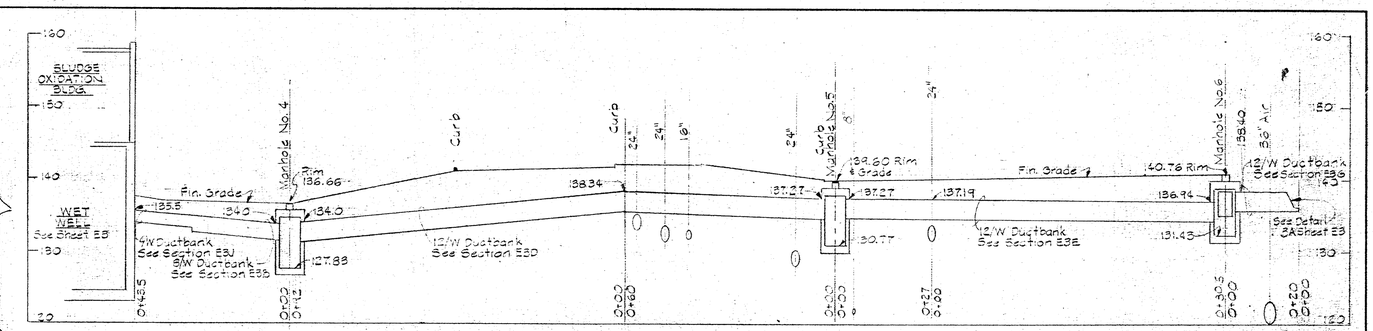
END BELL DETAIL



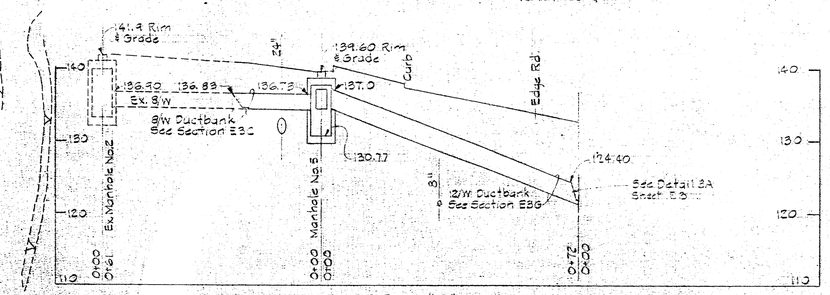
ELEVATION DETAIL PULLING-IN IRON

MISCELLANEOUS MANHOLE DETAILS
No Scale

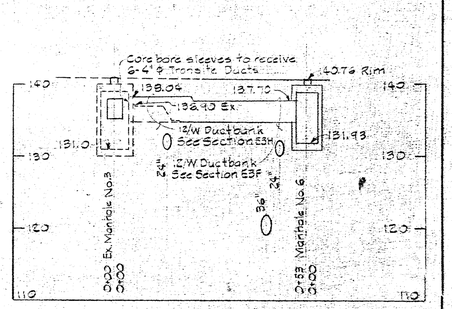
SITE PLAN
Scale 1"=50'
Note: See Sheet C-2 for details of Utility Layout



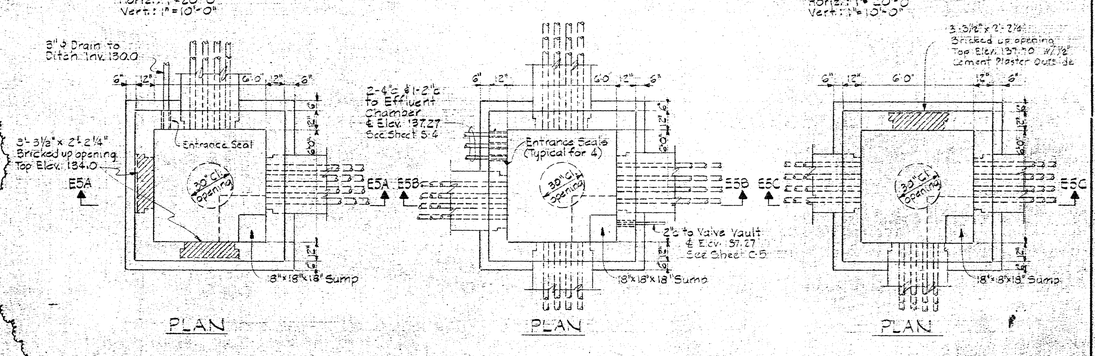
PROFILE "A"
Horiz.: 1"=20'-0"
Vert.: 1"=10'-0"

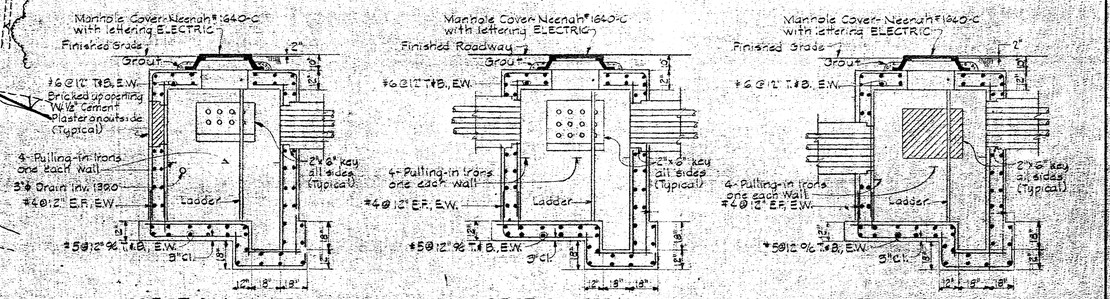


PROFILE "B"
Horiz.: 1"=20'-0"
Vert.: 1"=10'-0"



PROFILE "C"
Horiz.: 1"=20'-0"
Vert.: 1"=10'-0"





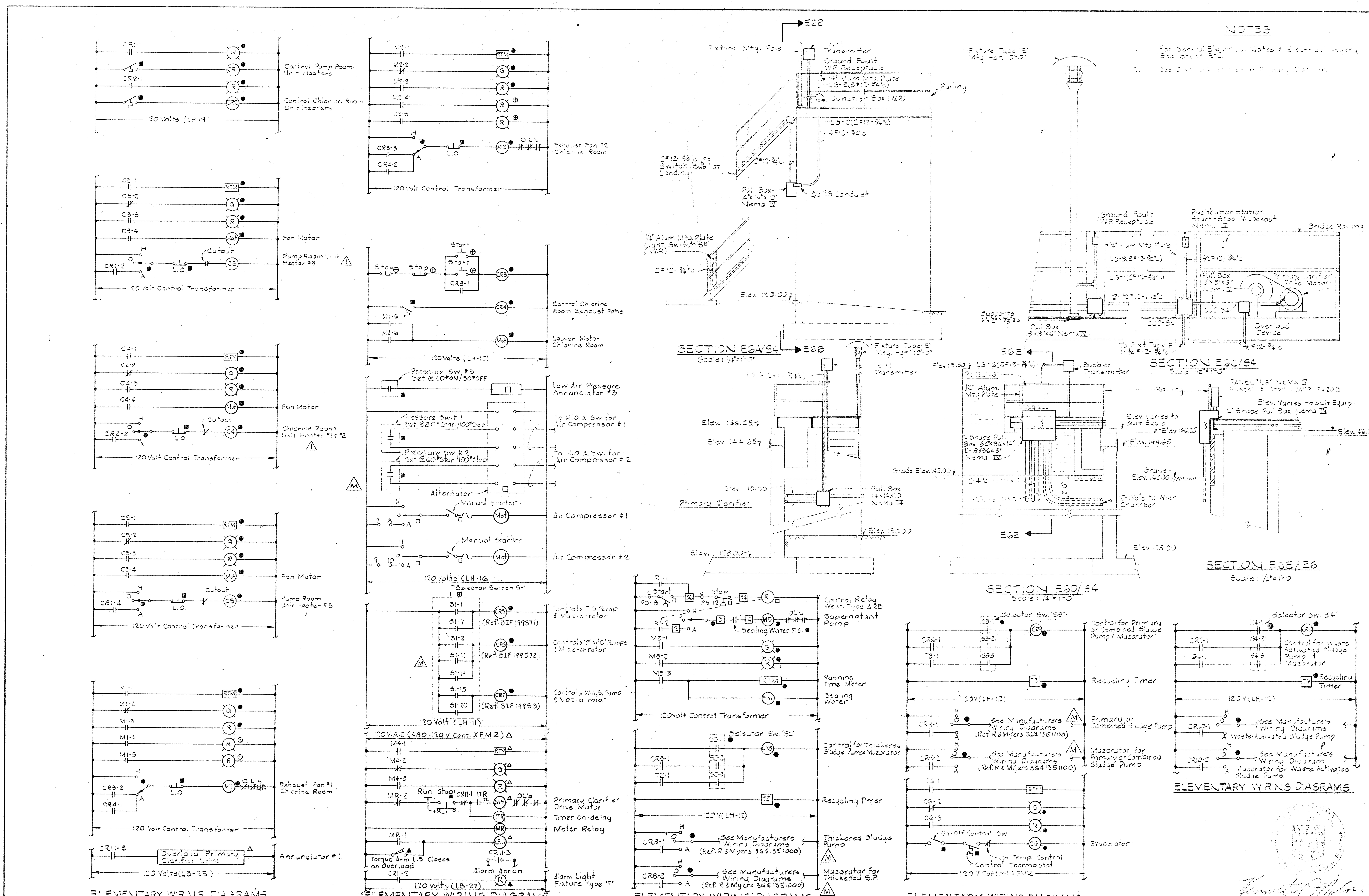
NOTE: For Depth of Manholes & Elev. of Ductbanks See Profiles Above.

WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE — CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	ELECTRICAL SITE PLAN AND MISCELLANEOUS DETAILS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 3	DRAWING NO. 27 OF 28	SCALE 1"=50'

W. O. 6538-2

SHEET E-5

BRUNING 44-510 14278



WHITMAN, REQUARDT & ASSOCIATES ENGINEERS 1304 ST. PAUL ST. BALTIMORE, MARYLAND	DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 2/1/73 DATE CHIEF-BUREAU OF ENGINEERING	CONTRACT NO. 525-S	WIRING DIAGRAMS AND MISCELLANEOUS DETAILS	SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO.3	DRAWING NO. 28 OF 28	SCALE AS SHOWN

W. O. 6538-2

Addendum ⚠

SHEET E-6

BRUNING 44 510 14778