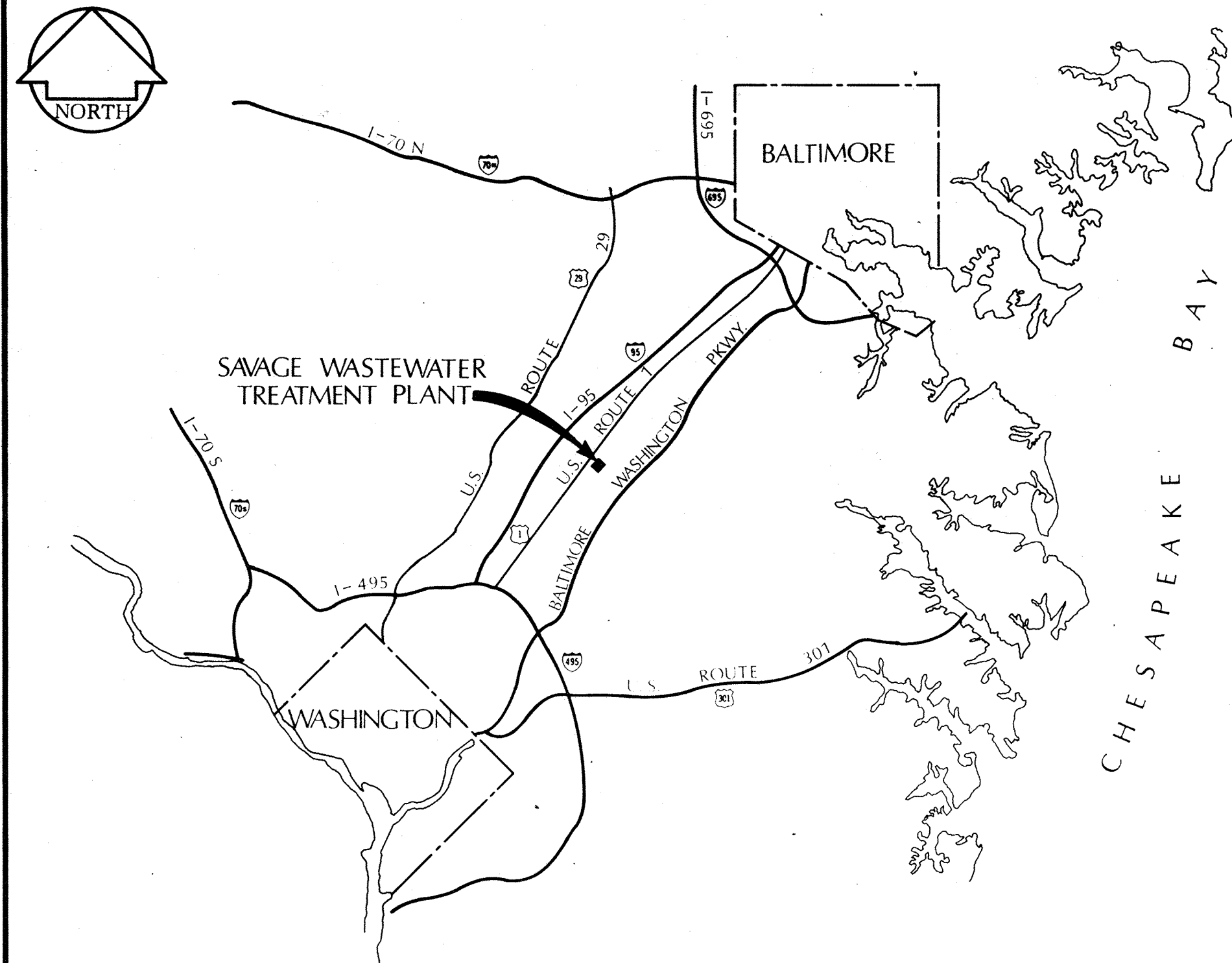
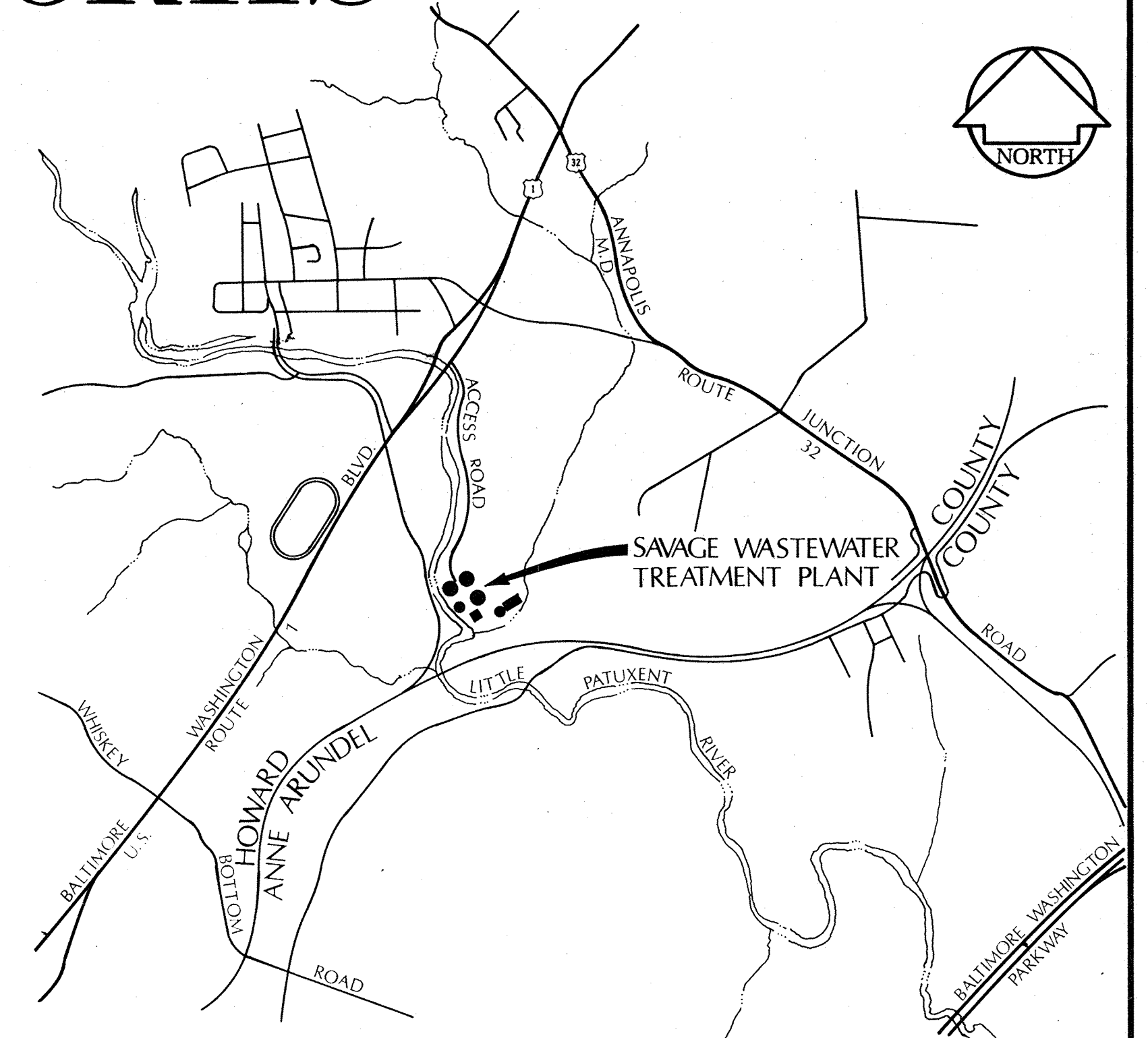
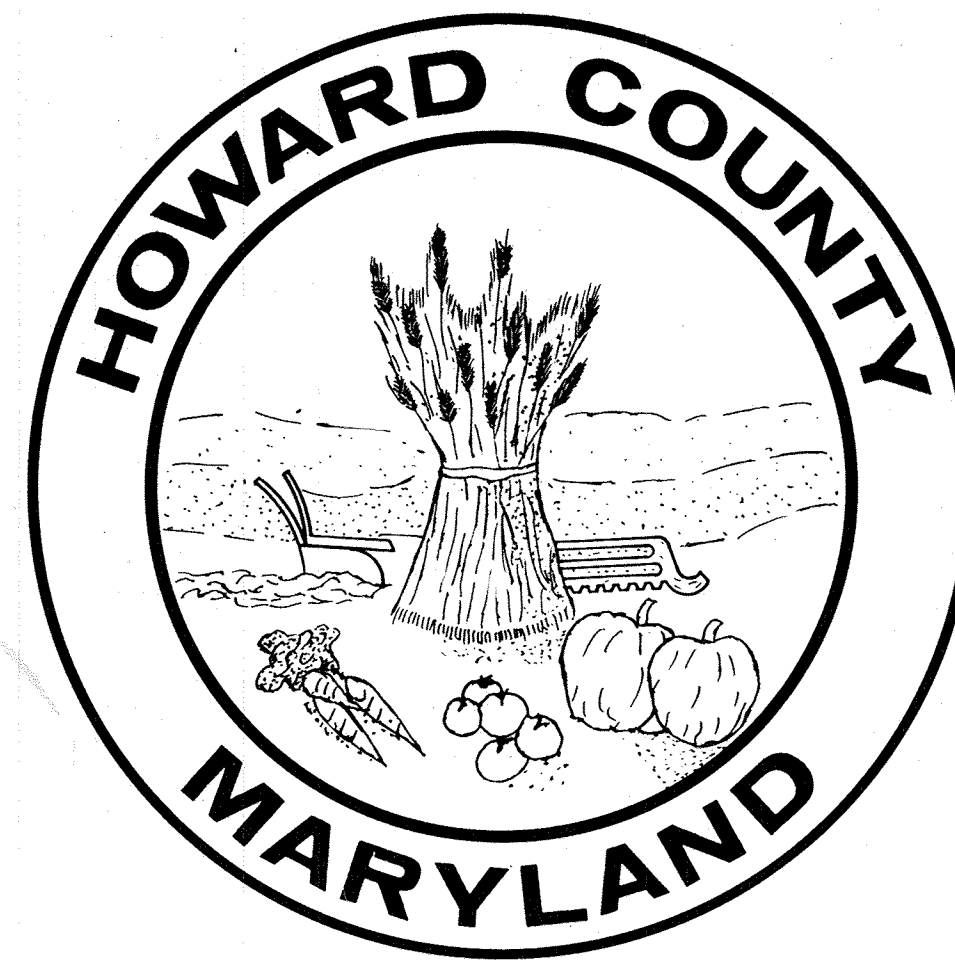


# HOWARD COUNTY, MARYLAND

## DEPARTMENT OF PUBLIC WORKS



LOCATION MAP  
SCALE: 1" = 6 MILES



VICINITY PLAN  
SCALE: 1" = 2000'

# SAVAGE WASTEWATER TREATMENT PLANT

ADDITION NO. 4  
CONTRACT 502-S

HOWARD COUNTY

*Thomas J. Regan Jr.* 12-13-77  
THOMAS J. REGAN JR. DIRECTOR - DEPARTMENT OF PUBLIC WORKS

*Richard E. Freudenberger* 12/13/77  
RICHARD FREUDENBERGER - CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

WHITMAN, REQUARDT & ASSOCIATES - ENGINEERS

*Kenneth A. McCord*  
KENNETH A. McCORD



| GENERAL             |             |   | STRUCTURAL          |             |   | MECHANICAL          |             |   | ELECTRICAL          |             |   |
|---------------------|-------------|---|---------------------|-------------|---|---------------------|-------------|---|---------------------|-------------|---|
| DRAWING & SHEET NO. | DESCRIPTION |   | DRAWING & SHEET NO. | DESCRIPTION |   | DRAWING & SHEET NO. | DESCRIPTION |   | DRAWING & SHEET NO. | DESCRIPTION |   |
| 1                   | G-1         | TITLE SHEET                                 | 19                  | S-1         | STRUCTURAL NOTES & TYPICAL DETAILS  | 46                  | M-1         | PLANT FLOW SCHEMATIC DIAGRAM  | 69                  | E-1         | POWER - MASTER ONE LINE WIRING DIAGRAM            |
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| 10                  | C-6         | PROFILES                                    | 28                  | S-10        | FLOCCULATORS NOS 1 THRU 6 - PLAN @ ELEV. 141.00                               | 59                  | M-14        | CHLORINE BUILDING - SECTIONS  | 81                  | E-13        | MOTOR CONTROL CENTER "CC11" WIRING DIAGRAMS       |
| 11                  | C-7         | PROFILES                                    | 29                  | S-11        | FILTER CONTROL BUILDING - ROOF PLAN, SECTIONS & DETAILS                       | 60                  | M-15        | DISINFECTION SYSTEM - SCHEMATIC DIAGRAM                             |                     |             | DISINFECTION                                      |
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|                     |             |   | 36                  | S-18        | ROOF PLAN AND SECTIONS  | 68                  | M-23        | MISCELLANEOUS DETAILS   | 89                  | E-21        | ANNUNCIATOR SYSTEM SCHEDULES & DETAILS            |
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|                     |             |   |                     |             |   |                     |             |   | 92                  | E-24        | UNDERGROUND DUCTBANK DETAILS                      |
| 12                  | A-1         | PLAN AND ELEVATIONS                         |                     |             | CHLORINE CONTACT CHAMBER  |                     |             |   | 93                  | E-25        | MISCELLANEOUS SECTIONS & DETAILS                  |
| 13                  | A-2         | ROOF PLAN AND DETAILS                       | 39                  | S-21        | PLAN @ ELEVATION 131.00 SECTIONS & DETAILS                                    |                     |             |   | 94                  | E-26        | FILTER #1, #2, #3, #4 - PLAN & DETAILS            |
| 14                  | A-3         | FILTER CONTROL BUILDING - PLAN & SECTIONS   | 40                  | S-22        | PLAN @ ELEVATION 142.00 SECTIONS & DETAILS                                    |                     |             |   | 95                  | E-27        | MISCELLANEOUS SECTIONS & DETAILS                  |
| 15                  | A-4         | CHLORINE BUILDING - PLAN & SECTIONS         | 41                  | S-23        | SECTIONS  |                     |             |   | 96                  | E-28        | CONTROL CABLE SCHEDULE                            |
| 16                  | A-5         | WALL SECTIONS                               | 42                  | S-24        | SECTIONS & DETAILS  |                     |             |   |                     |             |   |
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| 18                  | A-7         | SCHEDULES & DETAILS                         | 44                  | S-26        | 54" VENTURI VAULT - PLANS & SECTIONS  |                     |             |   |                     |             |   |
|                     |             |   | 45                  | S-27        | 54" VENTURI VAULT - SECTIONS & COLUMN SCHEDULE                                |                     |             |   |                     |             |   |

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

DEPARTMENT OF PUBLIC WORKS

HOWARD COUNTY, MARYLAND

12/13/77  
DATE

*Richard E. Brudenbury*  
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

LIST OF DRAWINGS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO.

DRAWING  
NO. 2  
OF 96

SCALE  
NONE



# SAVAGE WASTEWATER TREATMENT PLANT

## DESIGN CRITERIA

DESIGN YEAR - 1985  
 AVERAGE DAILY SEWAGE FLOW: JUNE 1974 - 4.0 MGD  
 - MID 1978 - 10.0 MGD (EXISTING CAPACITY)  
 - MID 1985 - 15.0 MGD (DESIGN CAPACITY - 4th ADDITION)  
 - YR. 2,000-25.0 MGD (ULTIMATE CAPACITY)  
 - 37.5 MGD (ULTIMATE PEAK CAPACITY)

### AERATION BASINS

DETENTION TIME, DESIGN FLOW 11 MIN.

### SULPHUR DIOXIDE CONTACT CHAMBER

DETENTION TIME, DESIGN FLOW 11 MIN.

### FILTRATION PROCESS

|                                      |                                   |
|--------------------------------------|-----------------------------------|
| NUMBER                               | 4                                 |
| CAPACITY                             | 15 MGD                            |
| FILTER RATE                          | 2 GPM/S.F. (3 FILTERS IN SERVICE) |
| MEDIA                                | SAND                              |
| EFFLUENT SUSPENDED SOLIDS LIMITATION | 10 PPM (DESIGN 5 PPM)             |
| BACKWASH RATE WATER (MAXIMUM)        | 30 GPM/S.F.                       |

### DISINFECTION PROCESS

|                           |             |
|---------------------------|-------------|
| TOTAL COLIFORM LIMITATION | 70MPN/100ML |
| DISINFECTANT              | CHLORINE    |
| MAX. DOSAGE RATE          | 15 PPM      |

### CHLORINE CONTACT CHAMBER

DETENTION TIME, DESIGN FLOW 45 MIN.

## ABBREVIATIONS

### PIPELINE

|                 |                                     |
|-----------------|-------------------------------------|
| A               | AIR                                 |
| ABI             | AERATION BASIN INFLUENT             |
| CCBI            | CHLORINE CONTACT BASIN INFLUENT     |
| CL <sub>2</sub> | 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              | UNDER DRAIN                         |
| PCI             | PRIMARY CLARIFIER INFLUENT          |
| W               | WATER (POTABLE)                     |
| PS              | PRIMARY SLUDGE                      |
| FW              | FLUSHING WATER                      |
| DNS             | DENITRIFIED SLUDGE                  |
| SC              | SCUM                                |
| WAS             | WASTE ACTIVATED SLUDGE              |
| WDNS            | WASTE DENITRIFIED SLUDGE            |
| FS              | PHOSPHATE SLUDGE                    |
| SSD             | SECONDARY SANITARY DRAIN            |
| DABI            | DENITRIFIED AERATION BASIN INFLUENT |
| P S D           | PRIMARY SANITARY DRAIN              |

### MISCELLANEOUS

|      |                       |
|------|-----------------------|
| B    | BASELINE              |
| C    | CENTERLINE            |
| EX   | EXISTING              |
| FF   | FIRST FLOOR           |
| MH   | MANHOLE               |
| INV  | INVERT ELEVATION      |
| PC   | POINT OF CURVATURE    |
| PI   | POINT OF INTERSECTION |
| PT   | POINT OF TANGENCY     |
| R    | RADIUS                |
| N    | NORTH                 |
| No   | NUMBER                |
| E    | EAST                  |
| S    | SOUTH                 |
| W    | WEST                  |
| WL   | WATER LEVEL           |
| SC   | SECONDARY CLARIFIER   |
| PS   | PUMPING STATION       |
| PC   | PRIMARY CLARIFIER     |
| CFM  | CUBIC FEET/MINUTE     |
| FD   | FLOOR DRAIN           |
| BLDG | BUILDING              |

### APPURTENANCES

|    |                 |    |                                  |
|----|-----------------|----|----------------------------------|
| C  | CROSS           | P  | PLUG                             |
| T  | TEE             | VB | VERTICAL BEND                    |
| V  | VALVE           | R  | REDUCER / INCREASER (CONCENTRIC) |
| Y  | WYE             | ER | REDUCER / INCREASER (ECCENTRIC)  |
| HB | HORIZONTAL BEND |    |                                  |

## LEGEND

|                                 | EXISTING | CONSTRUCTION THIS CONTRACT | EXISTING | CONSTRUCTION THIS CONTRACT |
|---------------------------------|----------|----------------------------|----------|----------------------------|
| PROPERTY LINE                   |          |                            |          |                            |
| RAILROAD                        |          |                            |          |                            |
| EMBANKMENT                      |          |                            |          |                            |
| SURVEY TRAVERSE or CONSTRUCTION |          |                            |          |                            |
| WOODS                           |          |                            |          |                            |
| STREAM                          |          |                            |          |                            |
| RIP RAP-PAVED                   |          |                            |          |                            |
| DITCH                           |          |                            |          |                            |
| CONTOURS                        |          |                            |          |                            |
| GRADE CONTROL ELEVATION         |          |                            |          |                            |
| BUILDINGS or STRUCTURES         |          |                            |          |                            |
| ROADWAYS                        |          |                            |          |                            |
| CURB                            |          |                            |          |                            |
| PARKING CHOCKS                  |          |                            |          |                            |
| AND GRUBBING                    |          |                            |          |                            |
|                                 |          | — LCEG —                   |          |                            |

|                                       | EXISTING | CONSTRUCTION THIS CONTRACT |
|---------------------------------------|----------|----------------------------|
| SIDEWALK                              |          |                            |
| STAIRWAY                              |          |                            |
| FENCE & GATE                          |          |                            |
| TELEPHONE W/GUY                       |          |                            |
| PIPELINE (LESS THAN 6") (6" & LARGER) |          |                            |
| MANHOLES                              |          |                            |
| VALVES                                |          |                            |
| BEND, WYE, TEE, REDUCER / INCREASER   |          |                            |
| CAP or PLUG                           |          |                            |
| HYDRANT (STANDARD FIRE) (SIAMESE)     |          |                            |
| FLARED END SECTION                    |          |                            |
| ELECTRICAL DUCTBANK                   |          |                            |
| CONDUIT                               |          |                            |

(CONSTRUCTION BY OTHERS - SO NOTED & IDENTIFIED)

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

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 3/20/75  
 DATE

CONTRACT NO. 502-S

DESIGN CRITERIA,  
 ABBREVIATIONS AND LEGEND

SAVAGE WASTEWATER  
 TREATMENT PLANT ADDITION NO. 4

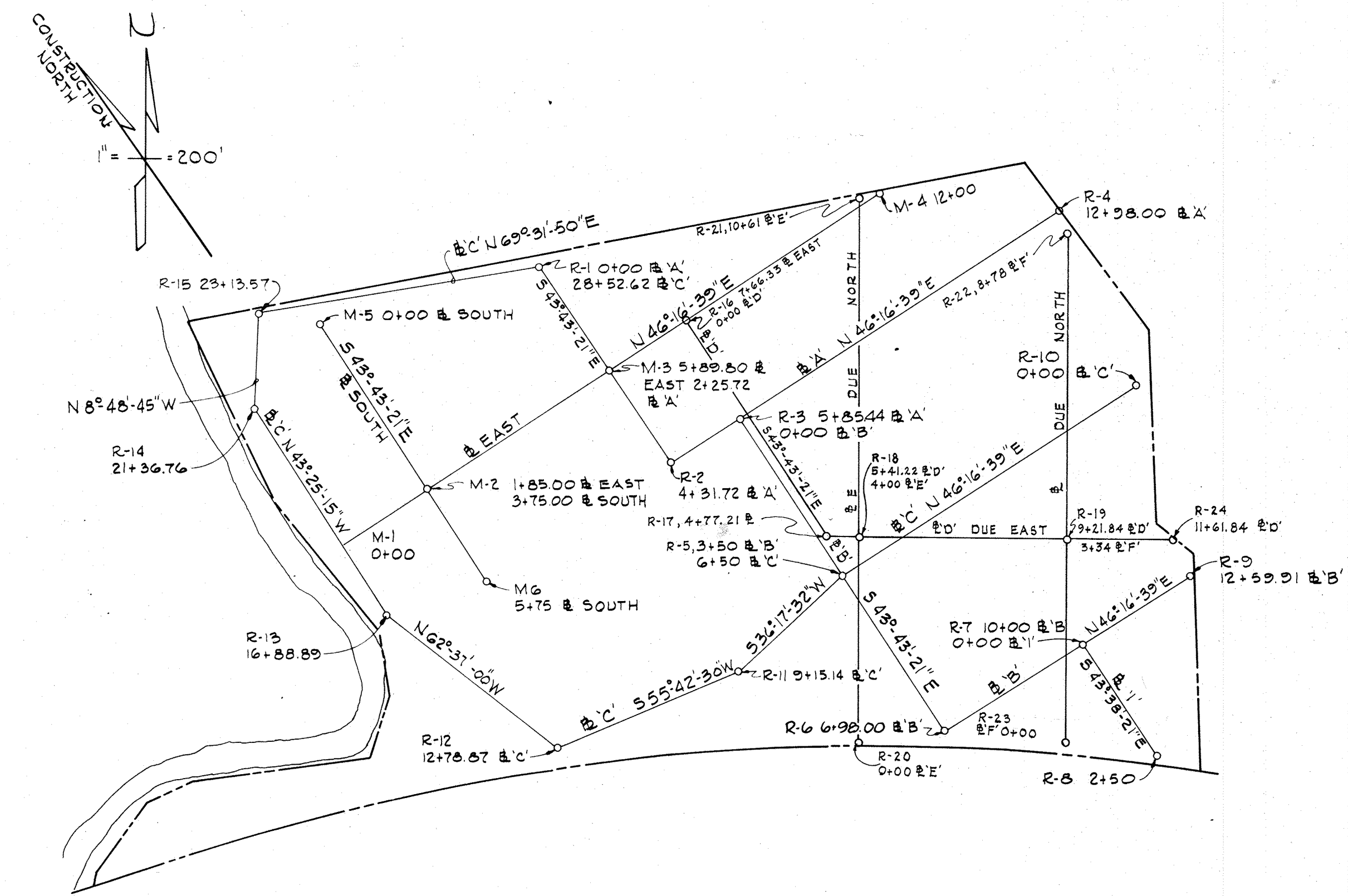
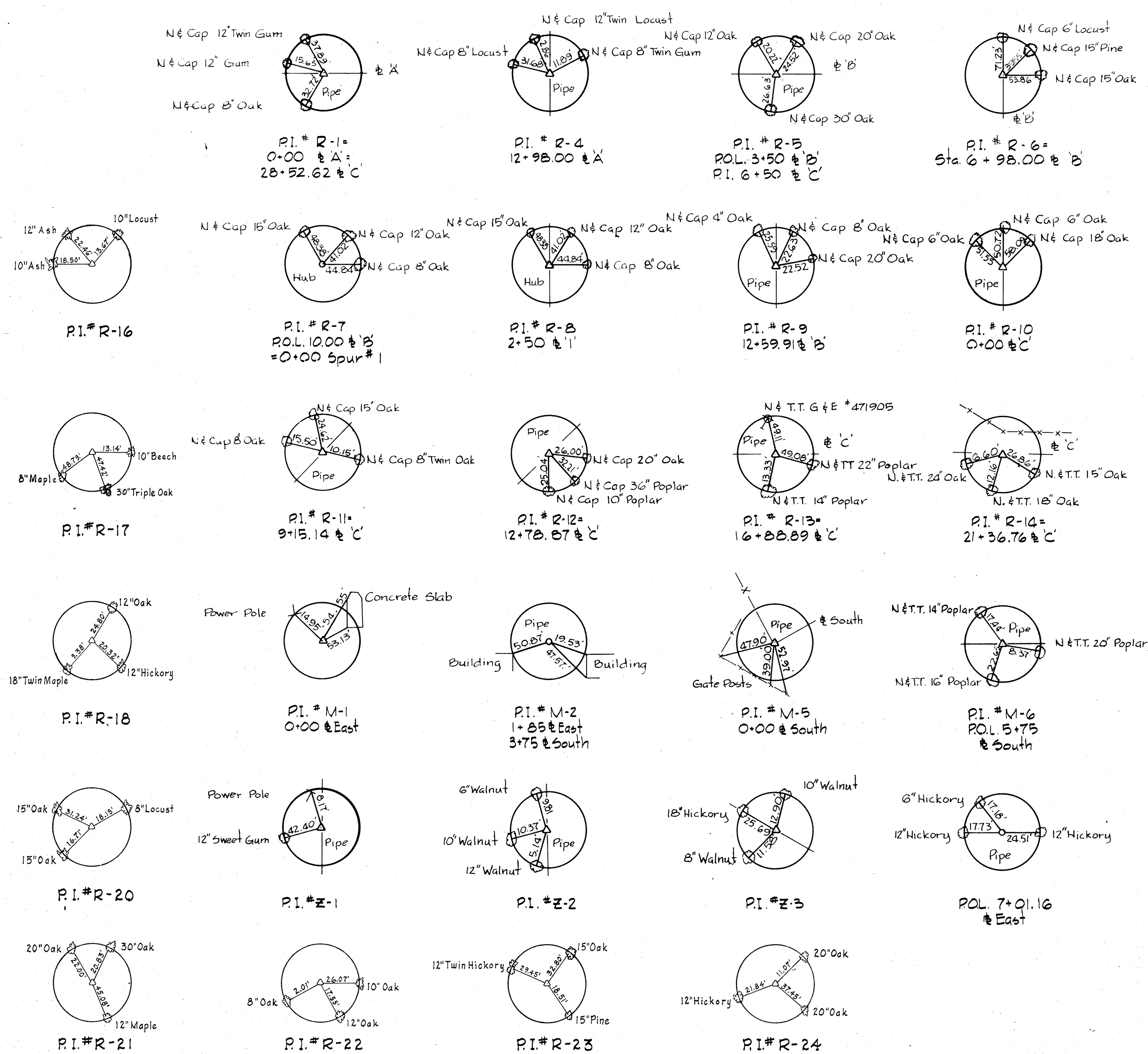
DRAWING  
 NO. 3  
 CF 96

SCALE  
 NONE

## GENERAL NOTES

1. The location of existing pipelines and structures are approximate. The Contractor shall take all necessary precautions to protect existing lines and structures and maintain uninterrupted supply. Any damage incurred shall be repaired immediately.
2. The Contractor shall locate existing utilities by test pits a minimum of two weeks in advance of construction operations in the vicinity of the utilities.
3. All pipeline profile elevations are invert elevations unless otherwise noted.
4. The location of all valves, fittings etc. shall be located where shown on the drawings unless otherwise directed by the Engineer.
5. For standard details - See Specifications.
6. All fittings shall be buttressed or anchored with concrete or restrained with special approved devices - See Specifications.
7. Pipelines shall be of the material listed in the specifications. All pipelines shall have a minimum cover of 2 feet except sewer and water lines shall have a minimum cover of 3 feet unless otherwise shown by profiles or elevations on the plans.
8. Clear all utilities by a minimum of 6 inches vertically. All parallel pipe systems shall have 1.5 feet minimum horizontal clearance unless otherwise directed by the Engineer.
9. The Contractor shall provide a joint in all exterior loose jointed pipe systems within 2 feet of exterior walls.
10. All existing valve boxes manhole frames and covers and similar appurtenances shall be adjusted to finished grade.
11. All outside valves in sewer lines up to and including 12 inch diameter shall be plug valves. All valves larger than 12 inches shall be gate valves, and shall be horizontal or vertical as indicated on profile drawings. All outside valves in water lines (potable and flushing) shall be gate valves. All buried valves shall have roadway boxes with concrete slabs in all areas other than paved areas. All valves shall be the same size as the pipeline unless otherwise indicated. Valves in Meter Vault shall be butterfly valves as specified in mechanical section.
12. Elevations and grid coordinates are based on the Maryland State System. All structures, buildings, roadways, pipe, centerlines etc. are located by construction coordinates. Zero base for the construction coordinated system is as noted on Sheet C-1 @ the intersection of survey baselines. All building coordinates are front face of monolithic concrete.
13. For location of utilities entering buildings, see Mechanical & Electrical Drawings.
14. Connections to existing pipelines may be made by tapping existing pipelines under pressure or with shutdown of System during off peak hours if allowed by the Engineer.
15. All pipelines that are capped or plugged shall be flagged with striped 2x4's set 3 ft. into ground and 2 feet above grade identified with all weather markings.
16. All existing walkways paved areas that require removal for construction purposes or that are disturbed or damaged by construction activities shall be replaced.
17. All pipelines, conduits and utility systems including structures that are designated to be abandoned shall be removed by the Contractor to the degree necessary to complete construction as determined by the Engineer. Voids left by systems removed shall be backfilled with select material and compacted as per the specifications. Systems that are designed to be abandoned and allowed by the Engineer to be left in place, shall be permanently capped or sealed watertight at each end. Materials and appurtenances removed shall be salvaged and become the property of the County unless otherwise directed by the Engineer then they shall become the property of the Contractor and removed from the site.
18. Sediment control measures shall be constructed as directed by the Engineer.
19. Major clearing and grubbing of the construction area is being completed by others, however, select clearing and grubbing may be required under this Contract in order to complete certain facilities.

## P.I. REFERENCES



**PLAN-CONSTRUCTION & SURVEY BASELINE**  
Scale 1" = 200'

### BENCH MARKS

- W.R. & A. B.M. "Blaine" Elev. 137.77  
X-Cut on flange bolt of fire hydrant  
40± Rt. of Sta. 2+25 ± South
- W.R. & A. B.M. "Rolly-3" Elev. 132.162  
R.R. Spike in 15" at foot of R.R. Fill  
35± East of P.I. # R-6
- W.R. & A. B.M. "Rolly-1" Elev. 130.385  
R.R. Spike in 12" Oak 25± Lt. of  
Sta. 12+50 ± East (Not shown on plan)
- W.R. & A. B.M. "Rolly-2" Elev. 147.087  
R.R. Spike in 8" Locust 4± from  
P.I. # R-4 (Not shown on plan)
- W.R. & A. B.M. "Rolly-4" Elev. 137.222  
R.R. Spike in 18" Oak 25± Rt. of P.I. # R-9  
(Not shown on plan)
- W.R. & A. B.M. "Rolly-5" Elev. 132.996  
R.R. Spike in 36" Poplar-30' Lt. of  
P.I. # R-12

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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
3/20/75  
DATE  
W. O. LaBette  
CHIEF, BUREAU OF ENGINEERING

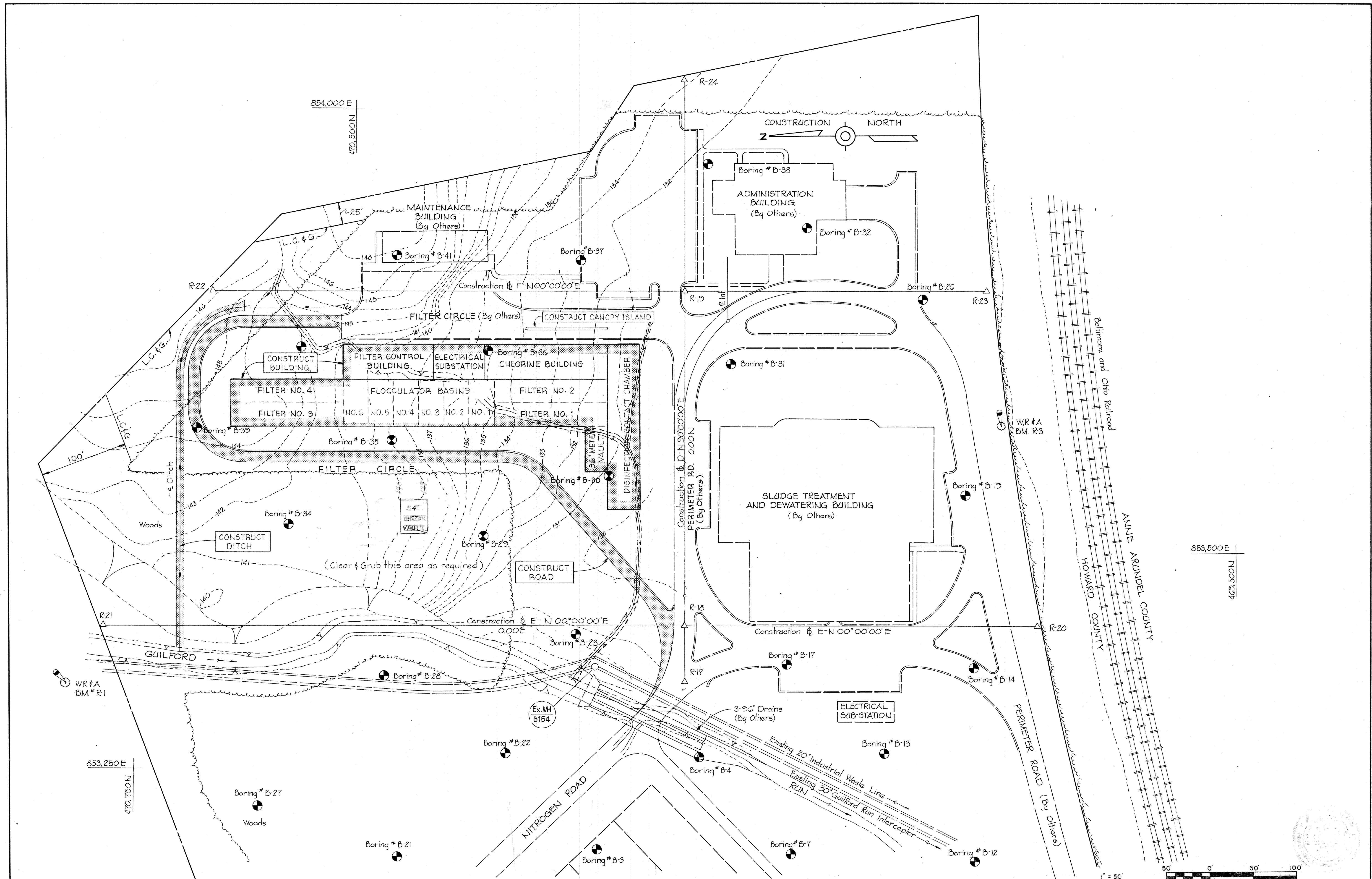
CONTRACT NO. 502-S

GENERAL NOTES, REFERENCES  
& BASELINE PLAN

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

|               |            |
|---------------|------------|
| DRAWING NO. 4 | SCALE NONE |
| OF 96         |            |





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

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 DATE: 12/13/77  
 Chief Bureau of Environmental Services

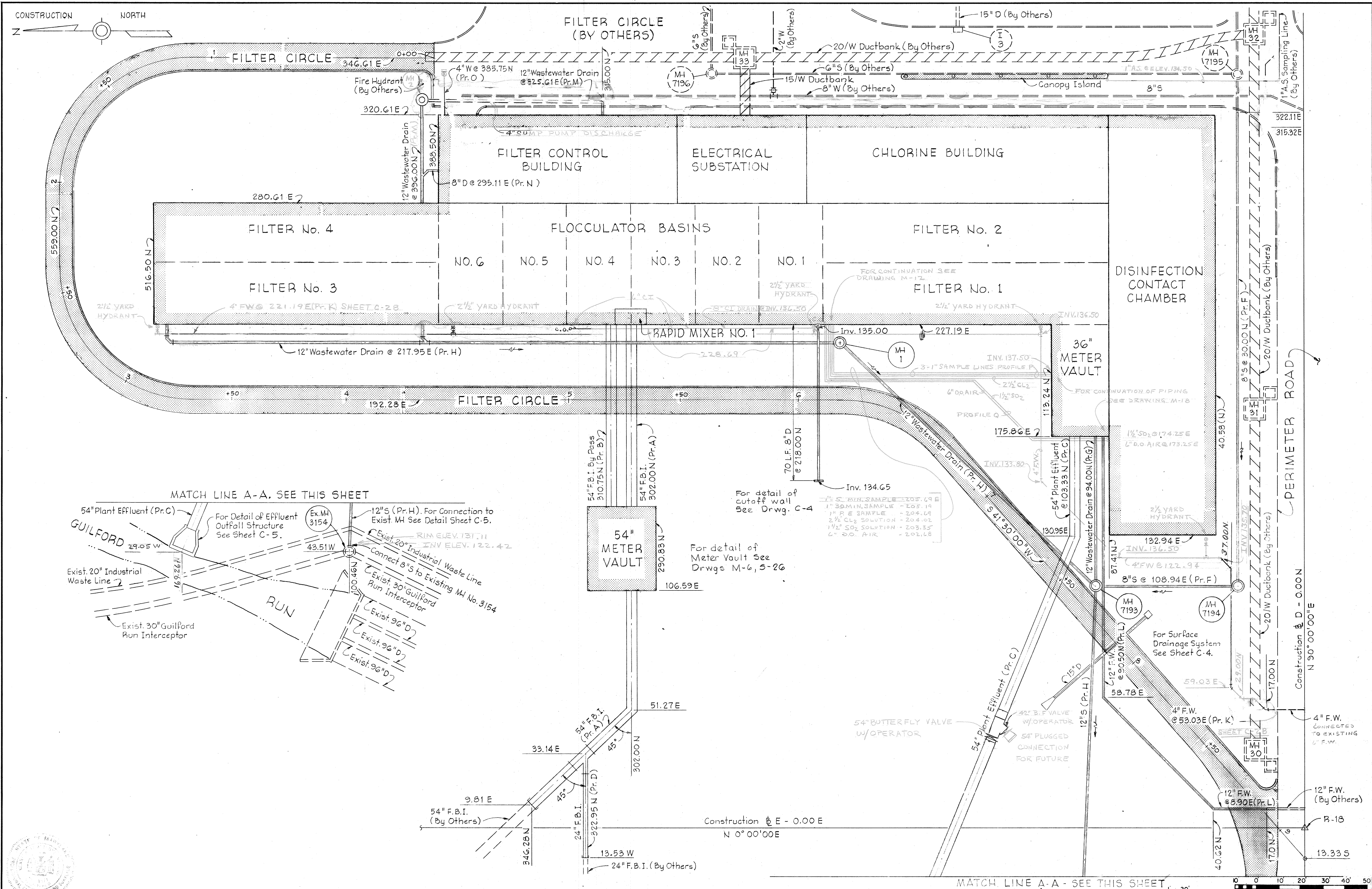
CONTRACT NO. 502-S

LOCATION PLAN

SAVAGE WASTEWATER  
 TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 5 OF 96  
 SCALE 1"=50'  
 SHEET C-1





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

**DEPARTMENT OF PUBLIC WORKS**  
 HOWARD COUNTY, MARYLAND  
 12/13/77  
 DATE  
*Richard S. Stuedemann*  
 CHIEF BUREAU OF ENVIRONMENTAL SERVICES

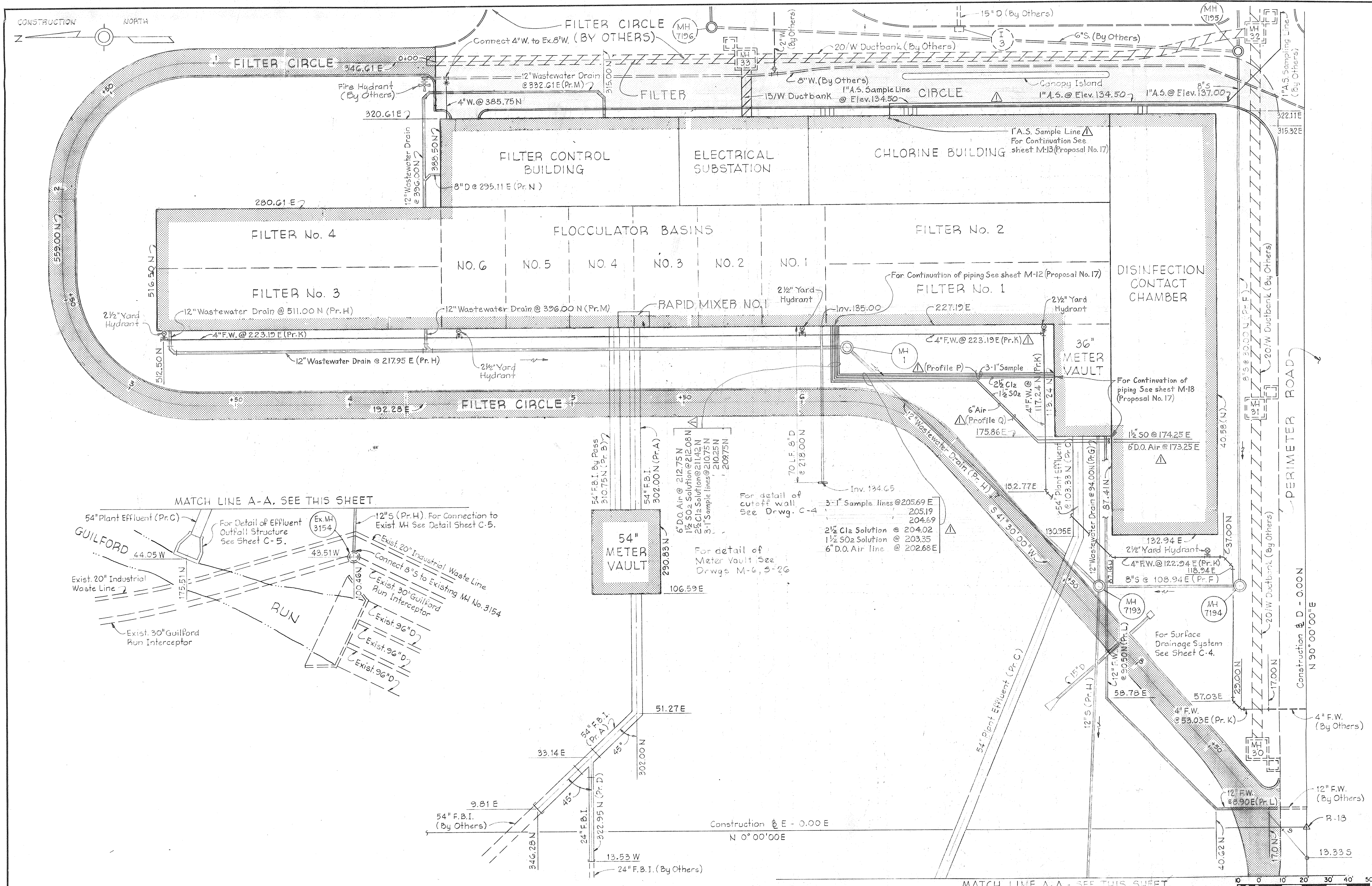
**CONTRACT NO. 502-S**

**SITE & UTILITY PLAN**

**SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4**

**DRAWING NO. 6 OF 96**  
**SCALE 1" = 20'**





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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY MARYLAND

CONTRACT NO. 502-S

SITE AND UTILITY PLAN

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

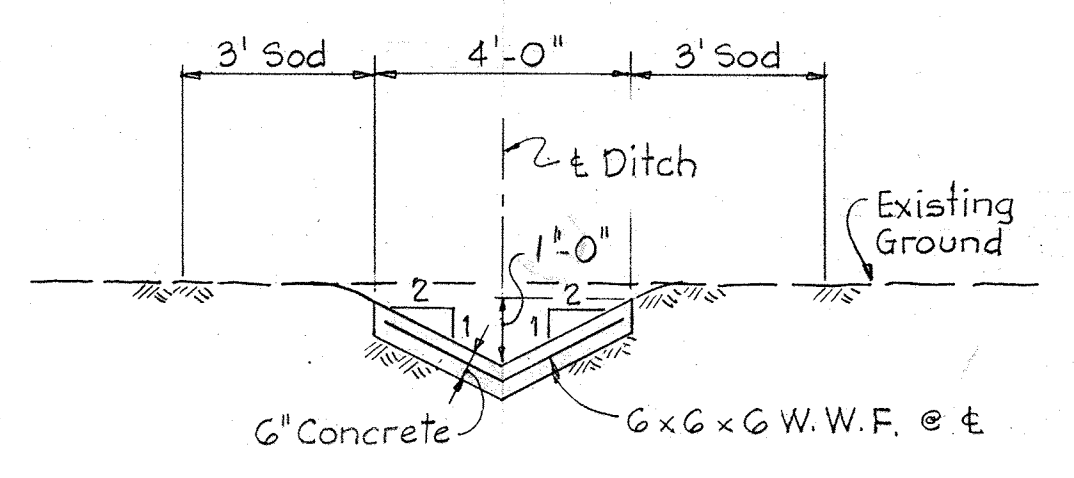
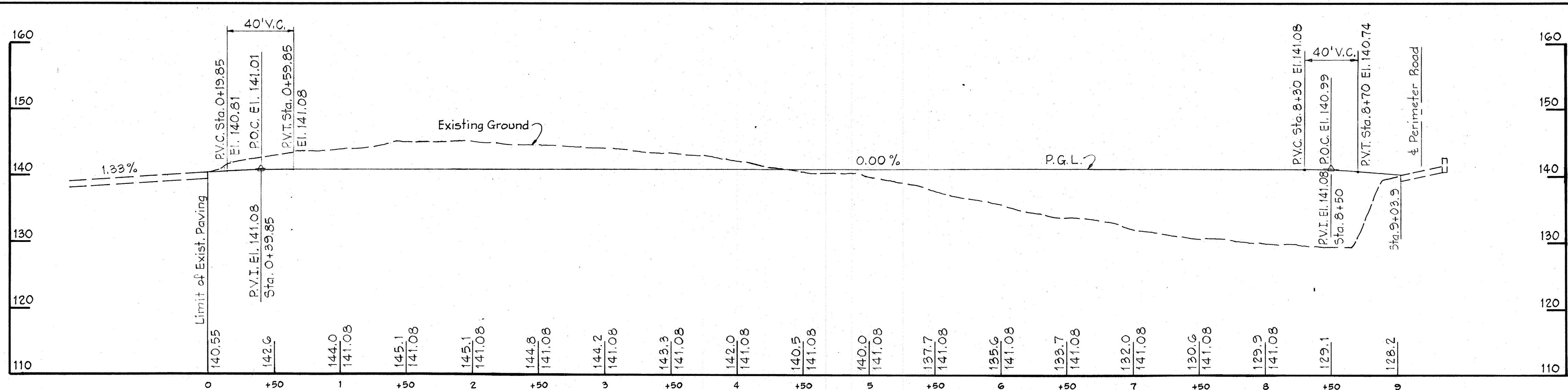
DRAWING NO. 6A  
OF 96  
SCALE 1" = 20'

SHEET C-2A









C-4C  
SECTION C-4  
No Scale

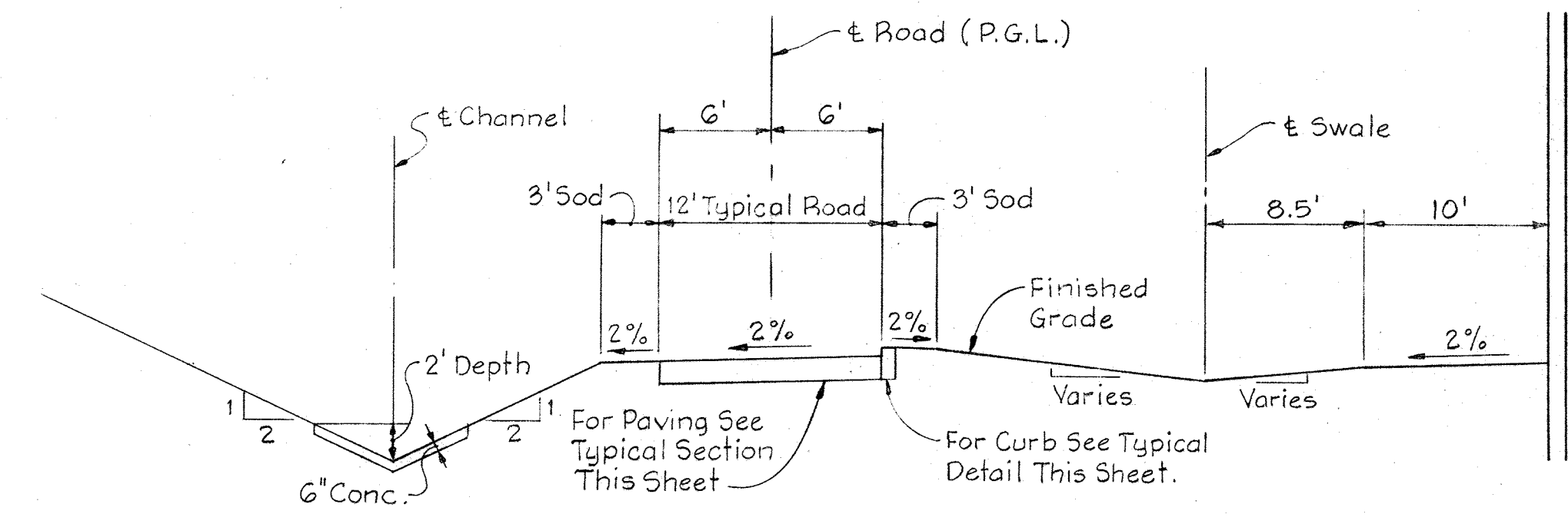
PROFILE - FILTER CIRCLE

Scale: Hor. 1" = 50'  
Vert. 1" = 10'

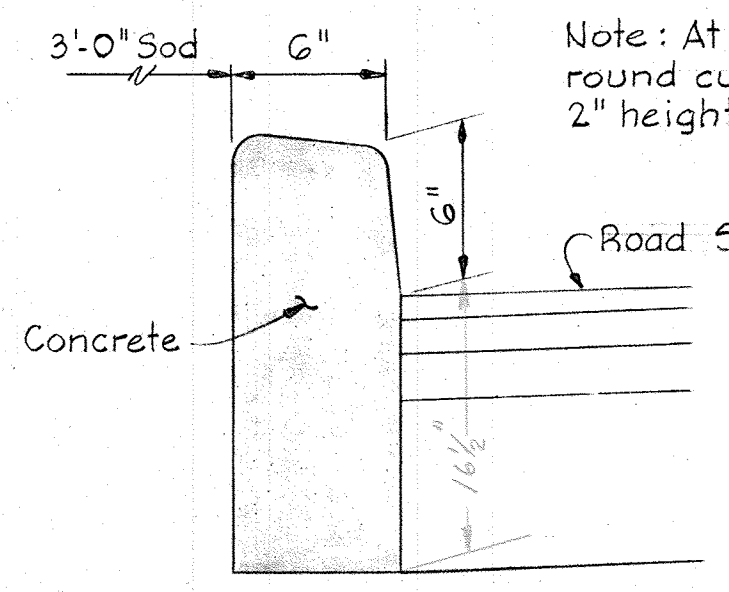
INLET DRAINAGE SCHEDULE

| No. | Coordinates |       | Top Elev. | Inv. In | Inv. Out |
|-----|-------------|-------|-----------|---------|----------|
|     | North       | East  |           |         |          |
| I-1 | 70.00       | 96.00 | 136.5     | —       | 134.5    |

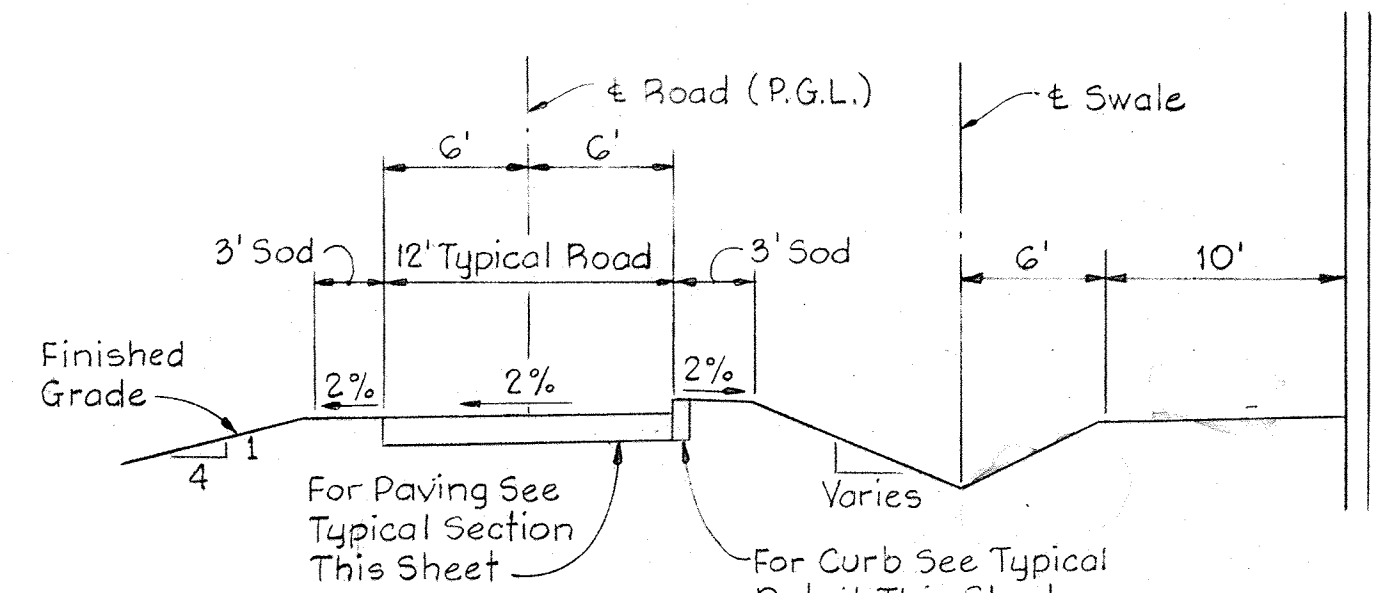
\* Type D Inlet - See Specifications Standard Details.



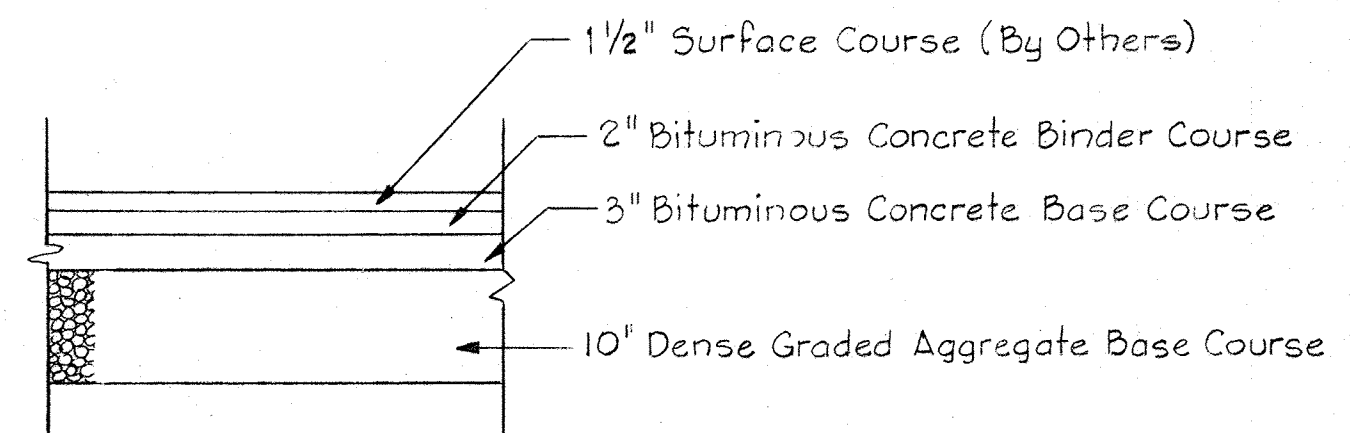
C-4A  
SECTION C-3  
Scale: 1/8" = 1'-0"



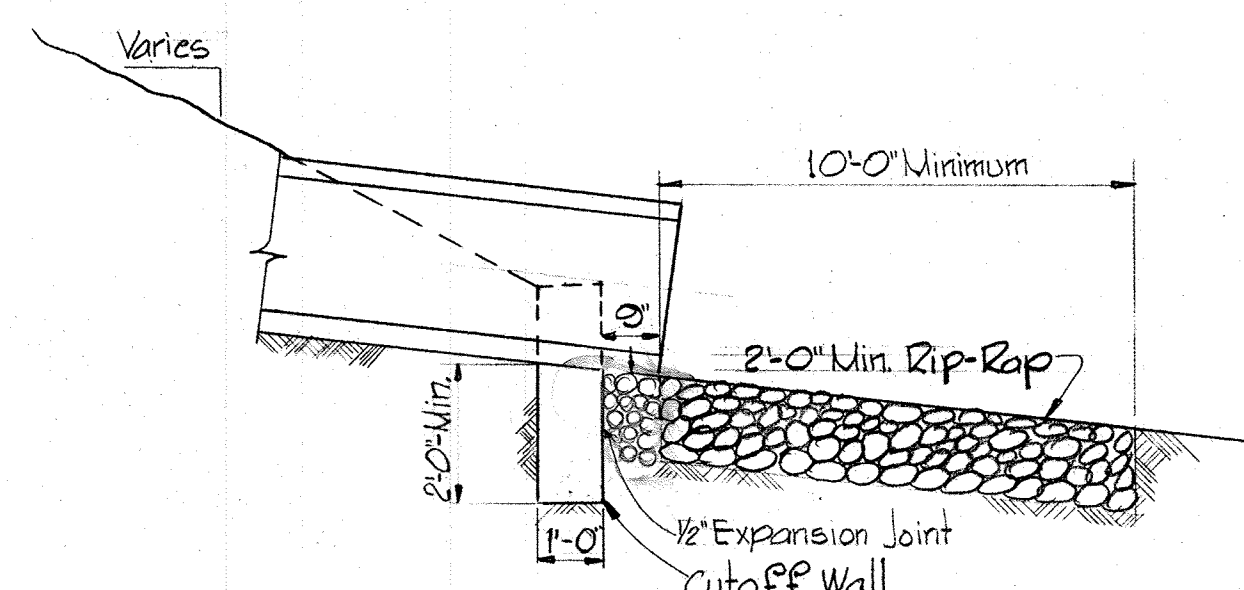
CURB AND PAVING DETAIL  
No Scale



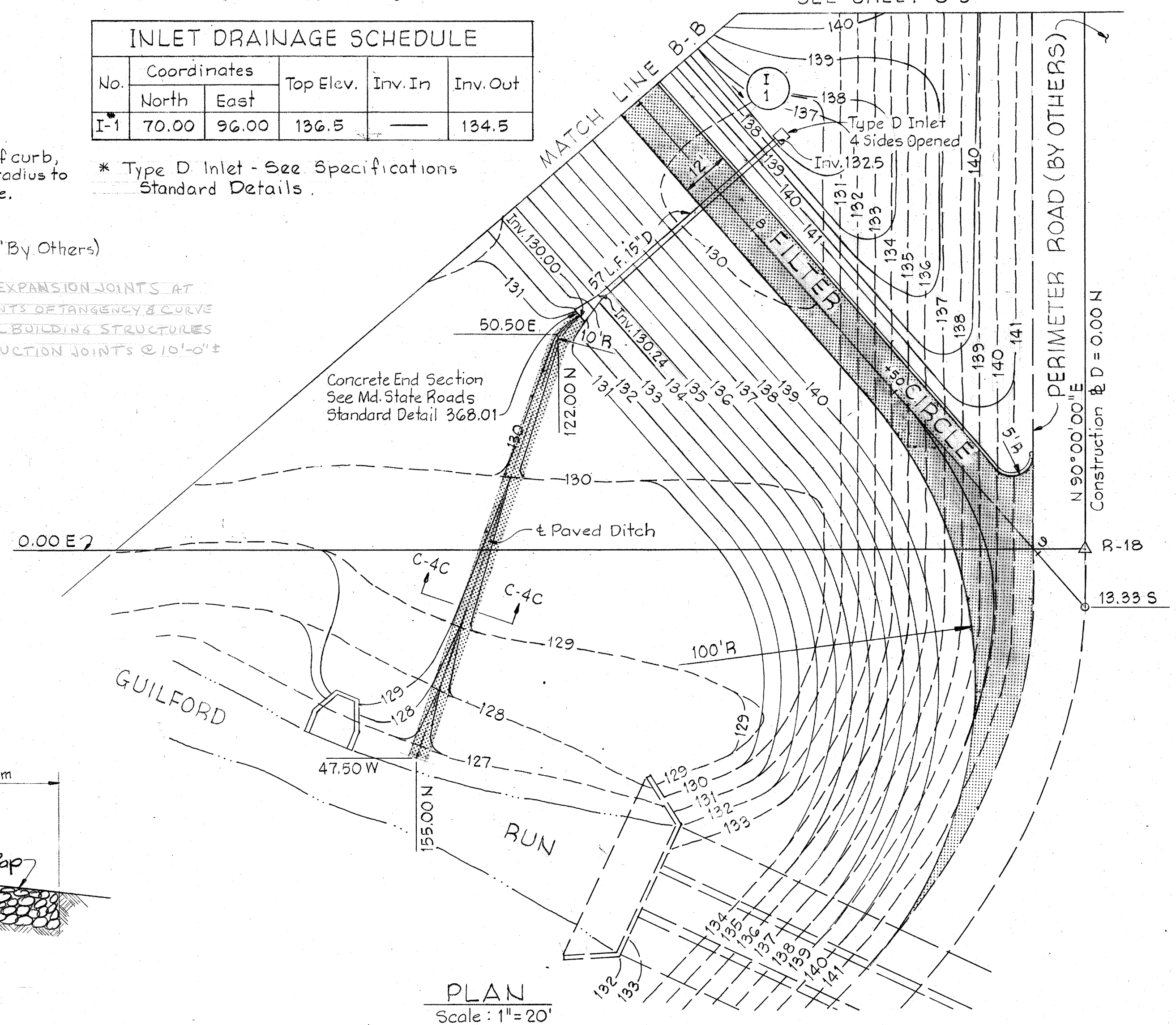
C-4B  
SECTION C-3  
Scale: 1/8" = 1'-0"



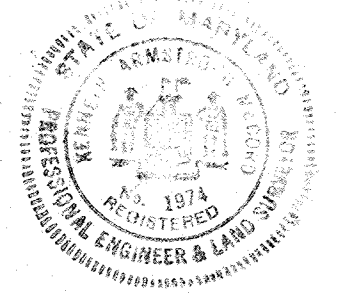
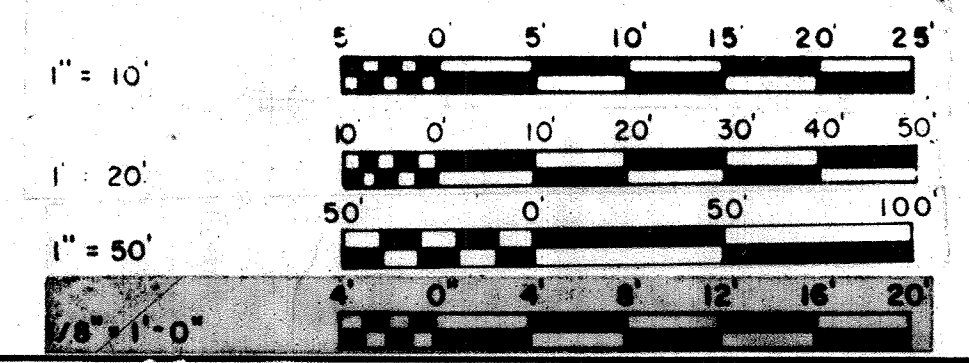
TYPICAL PAVING SECTION  
No Scale



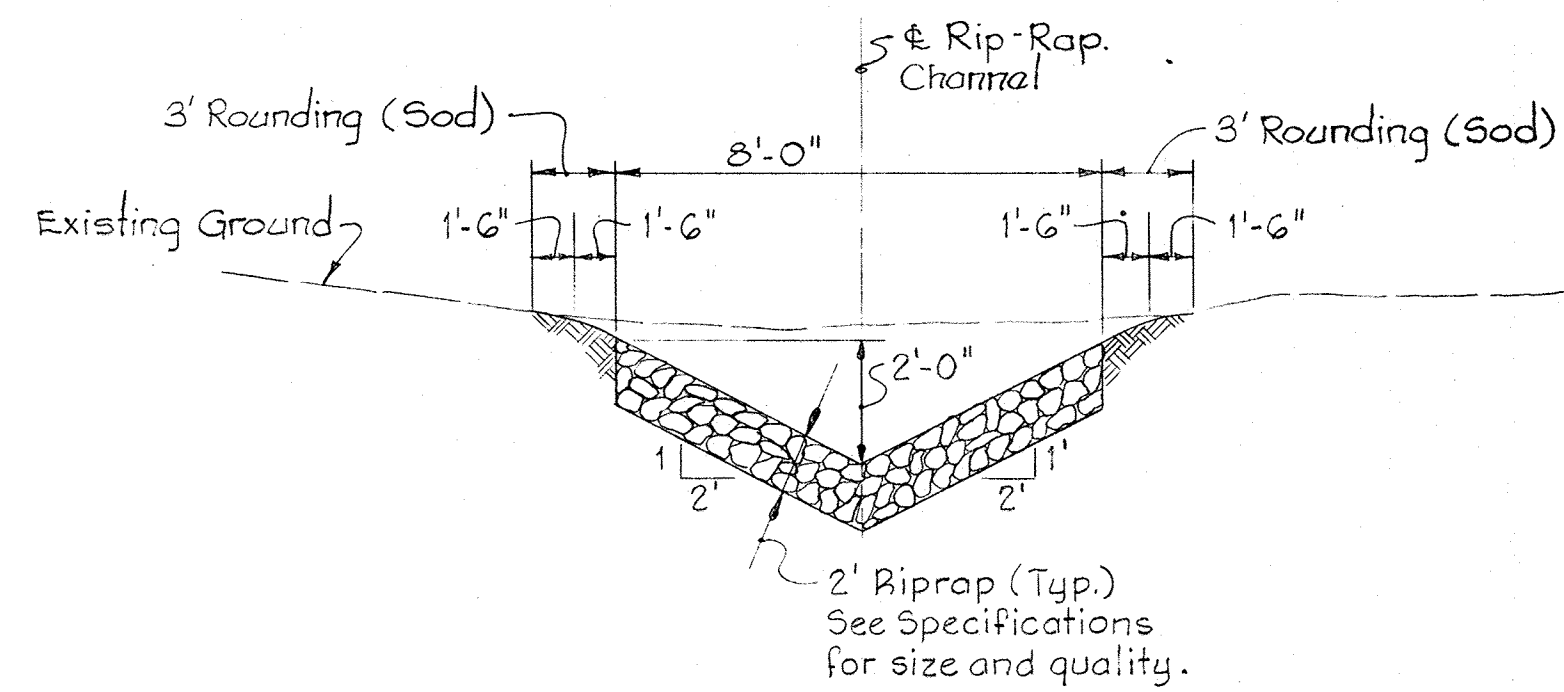
CUTOFF WALL DETAIL  
No Scale



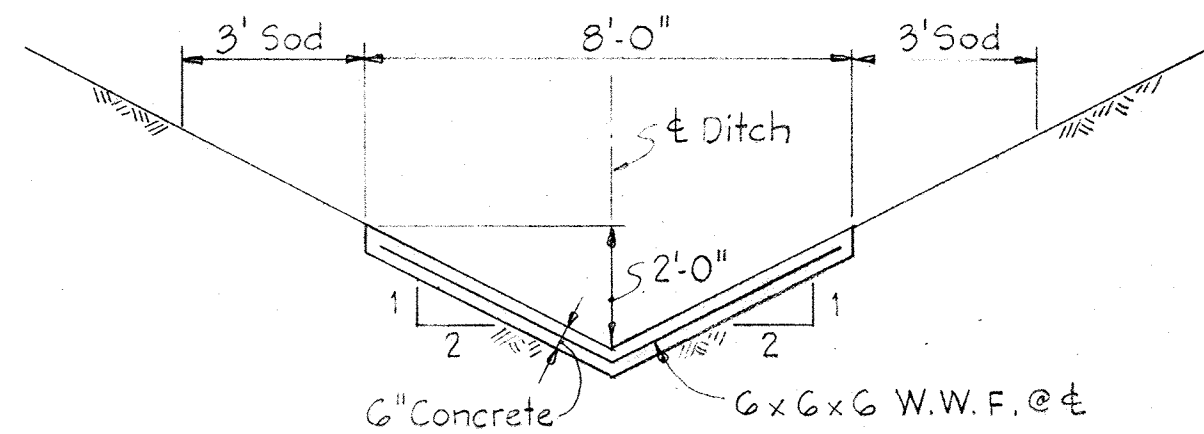
PLAN  
Scale: 1" = 20'



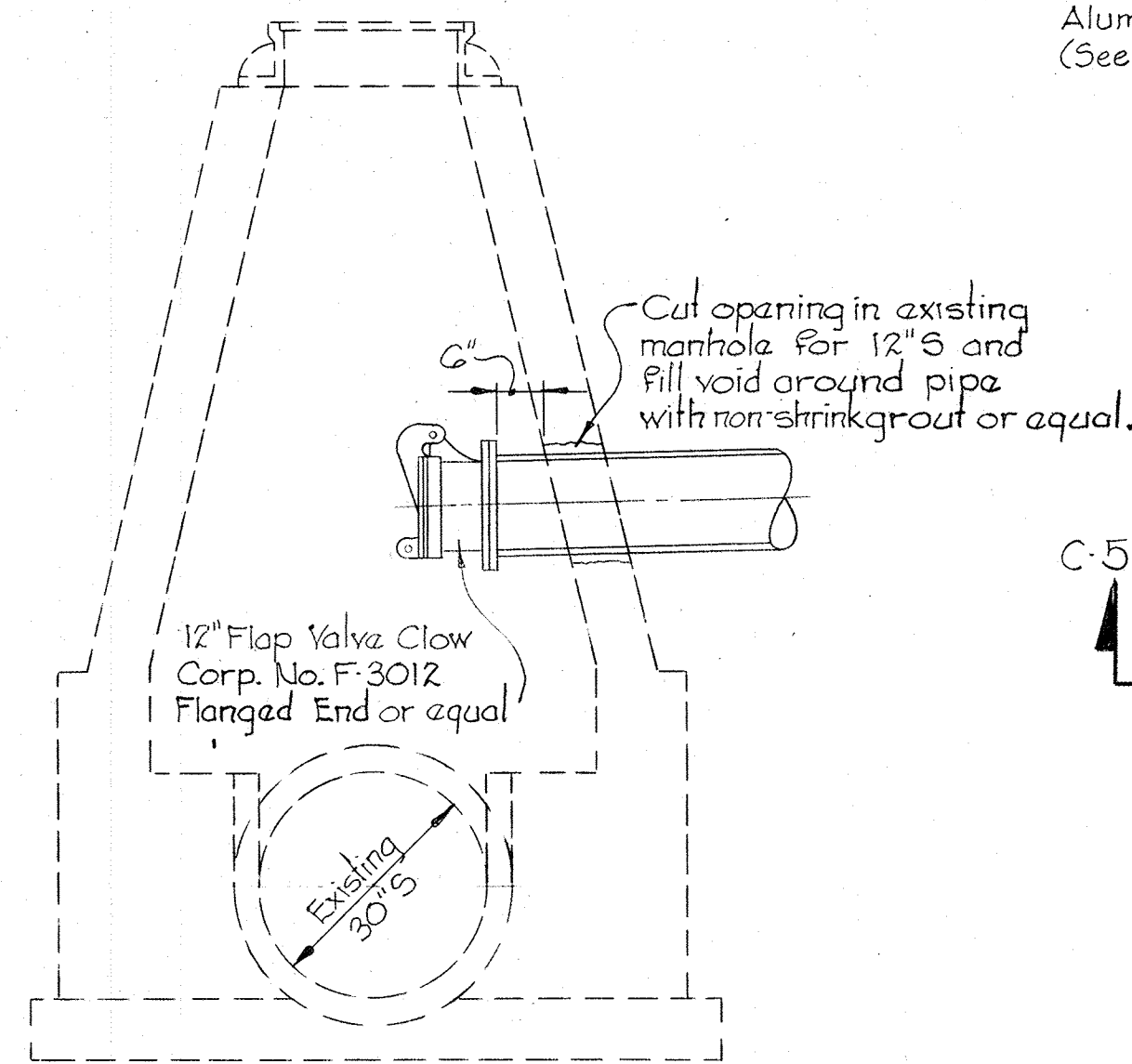
|   |  |                    |                           |   |               |                |
|---|--|--------------------|---------------------------|---|---------------|----------------|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br>Richard E. Sreeders<br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | PROFILE, PLAN AND DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 8 | SCALE AS SHOWN |
|   |  |                    |                           |   | OF 96         |                |



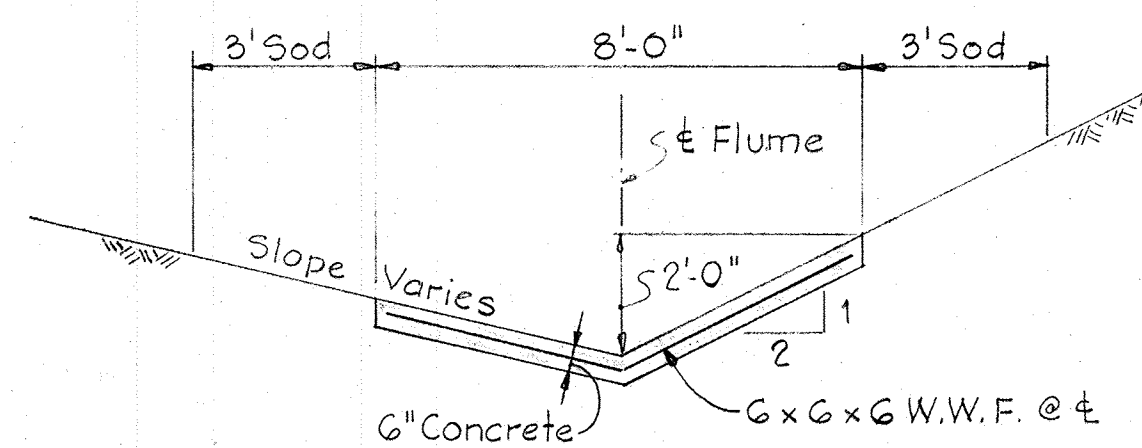
TYPICAL RIPRAP CHANNEL  
No Scale



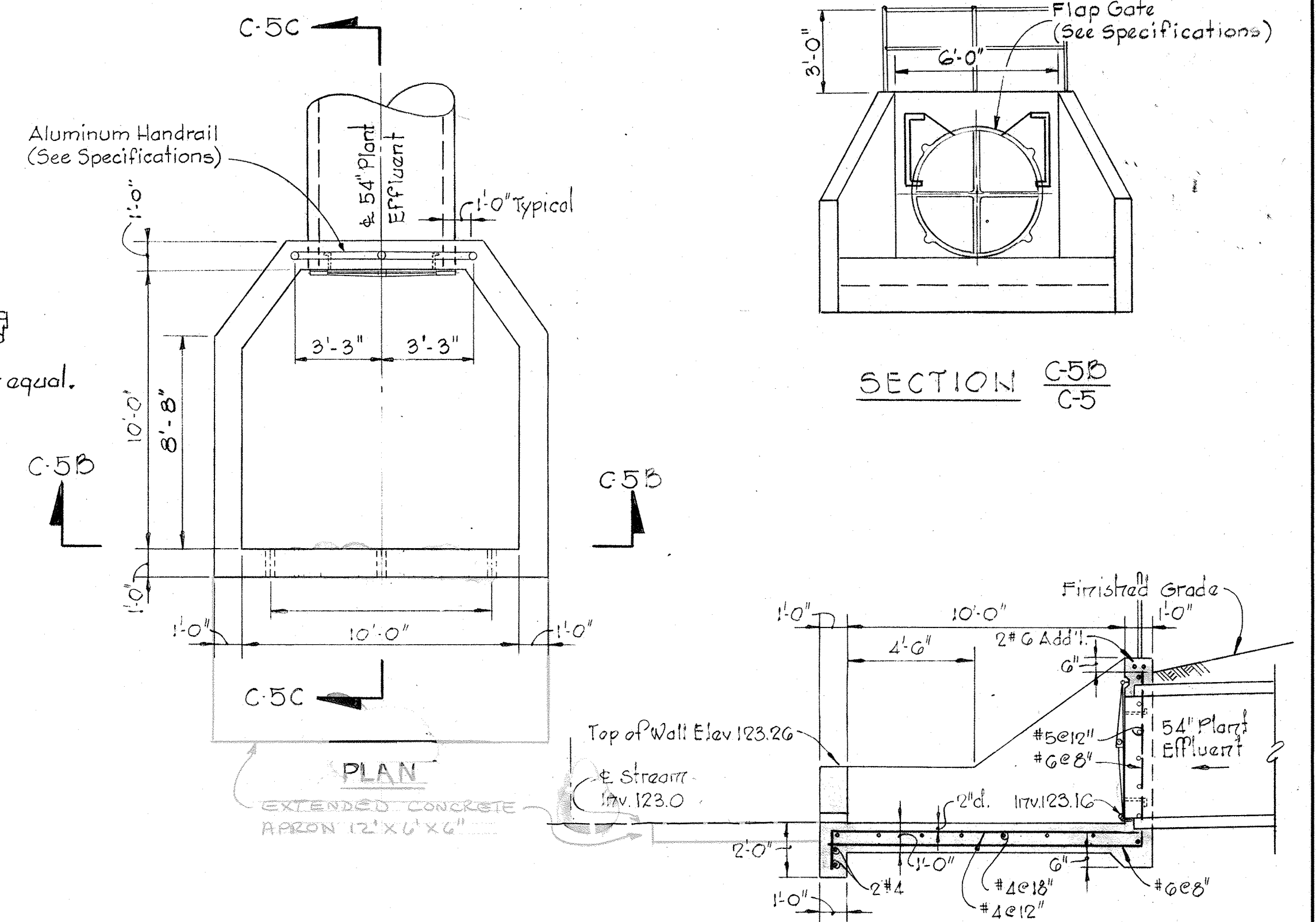
DETAIL PAVED DITCH  
No Scale



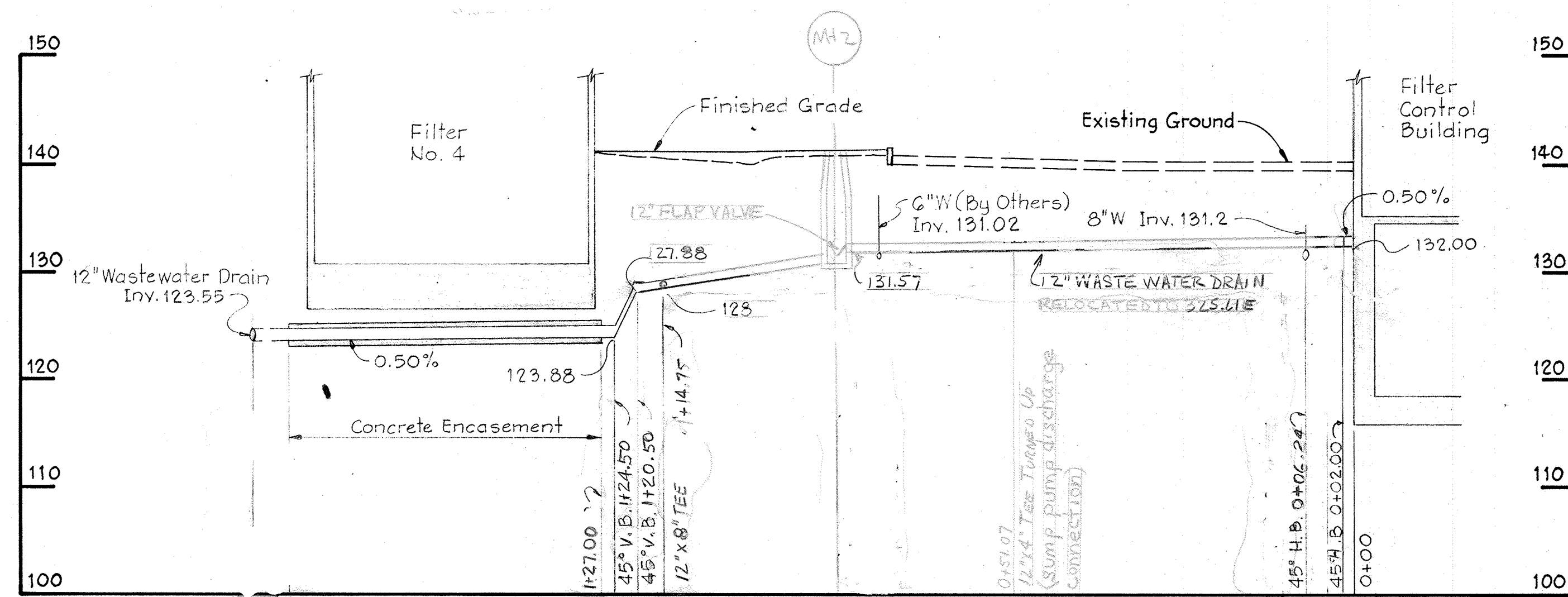
12" SEWER CONNECTION  
TO EXISTING MANHOLE 3154  
Scale: 1/2" = 1'-0"



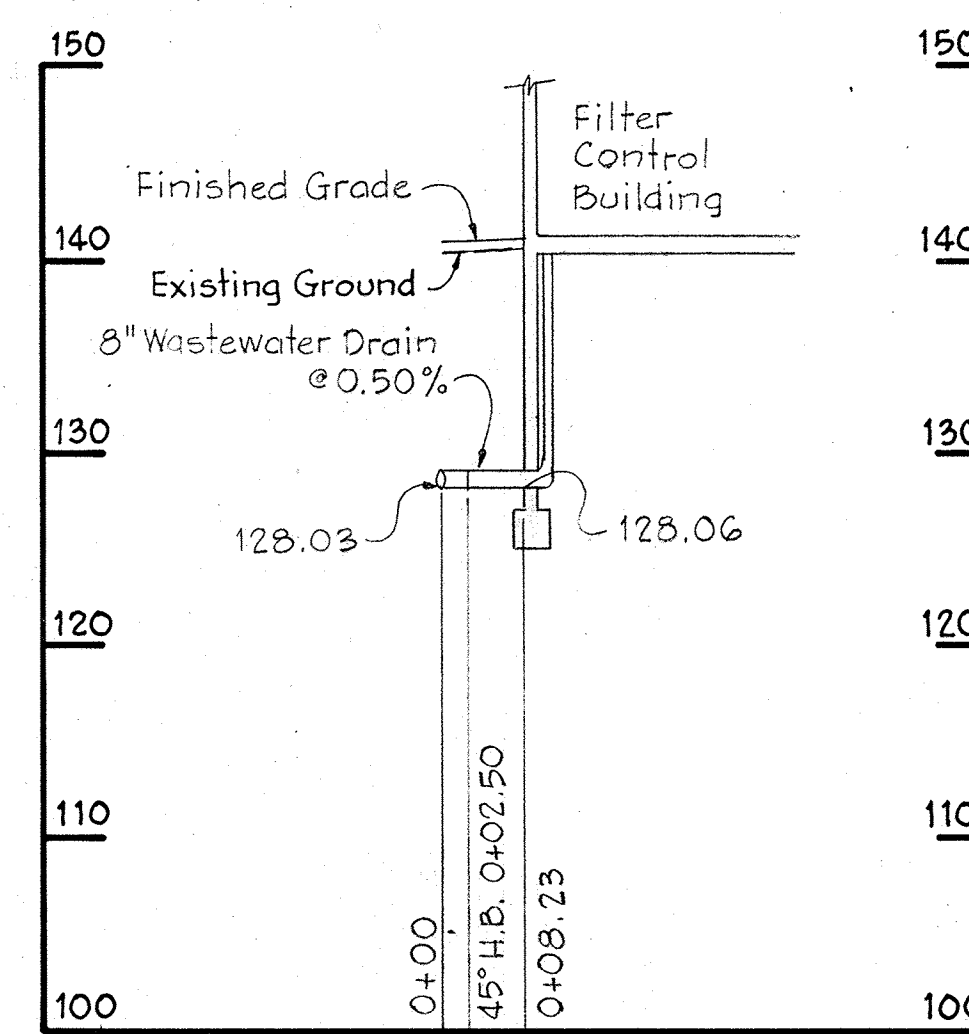
DETAIL PAVED FLUME  
No Scale



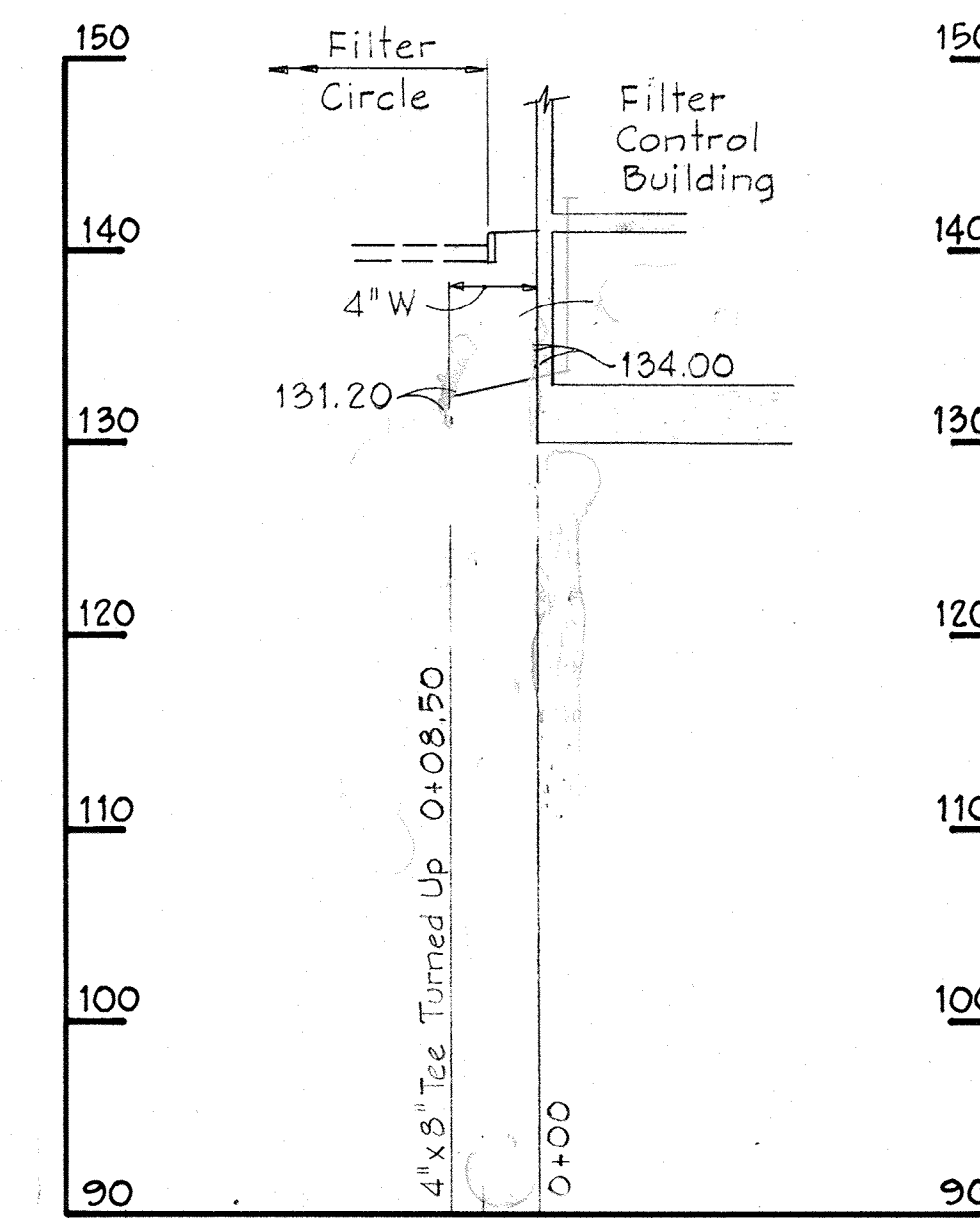
SECTION C-5C  
C-5  
SECTION C-5B  
C-5  
PLAN  
EXTENDED CONCRETE  
RAZON 12" X 6" X 6"  
SECTION C-5C  
C-5  
EFFLUENT DISCHARGE STRUCTURE  
Scale: 1/4" = 1'-0"



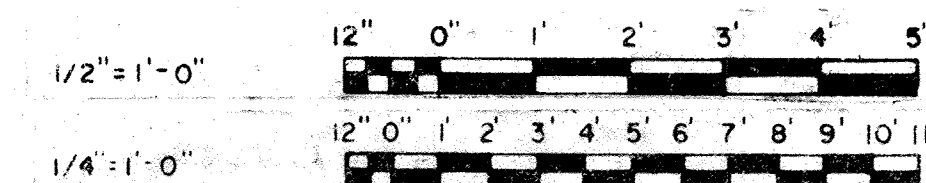
PROFILE M  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



PROFILE N  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



PROFILE O  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



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HOWARD COUNTY, MARYLAND  
3/20/75  
DATE  
W. O. Albert  
CHIEF BUREAU OF ENGINEERING

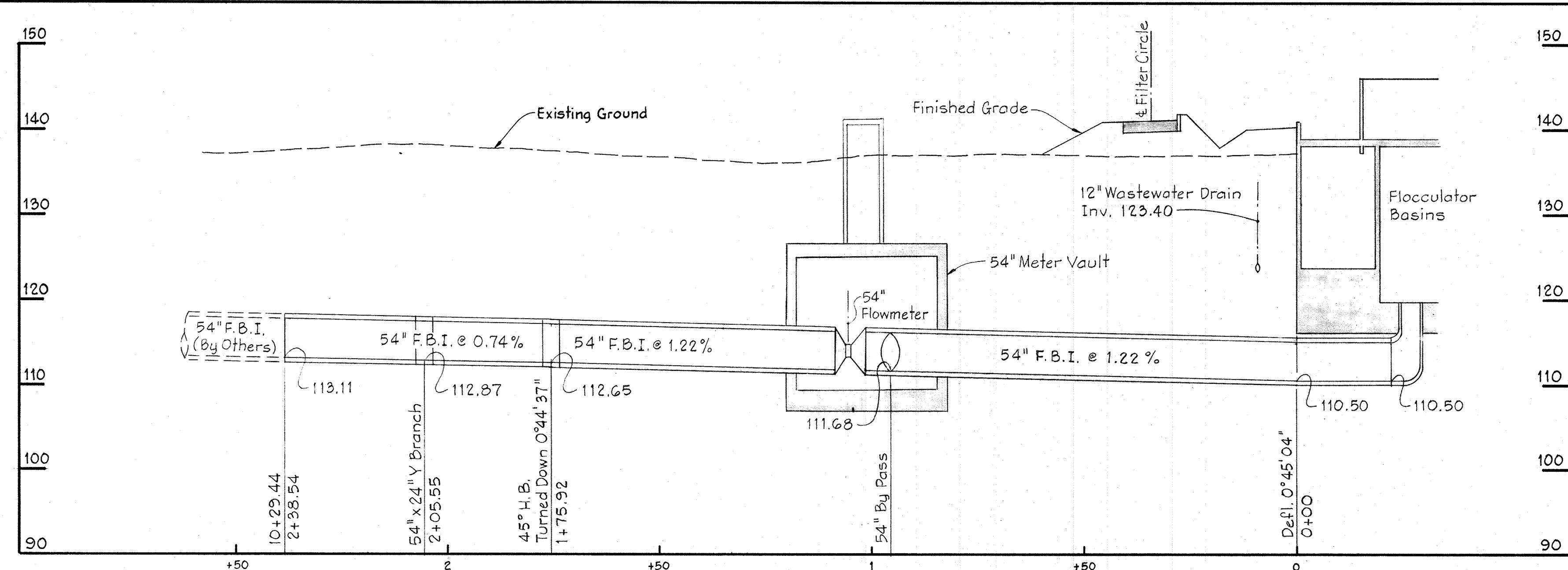
CONTRACT NO. 502-S

MISCELLANEOUS DETAILS  
AND PROFILES

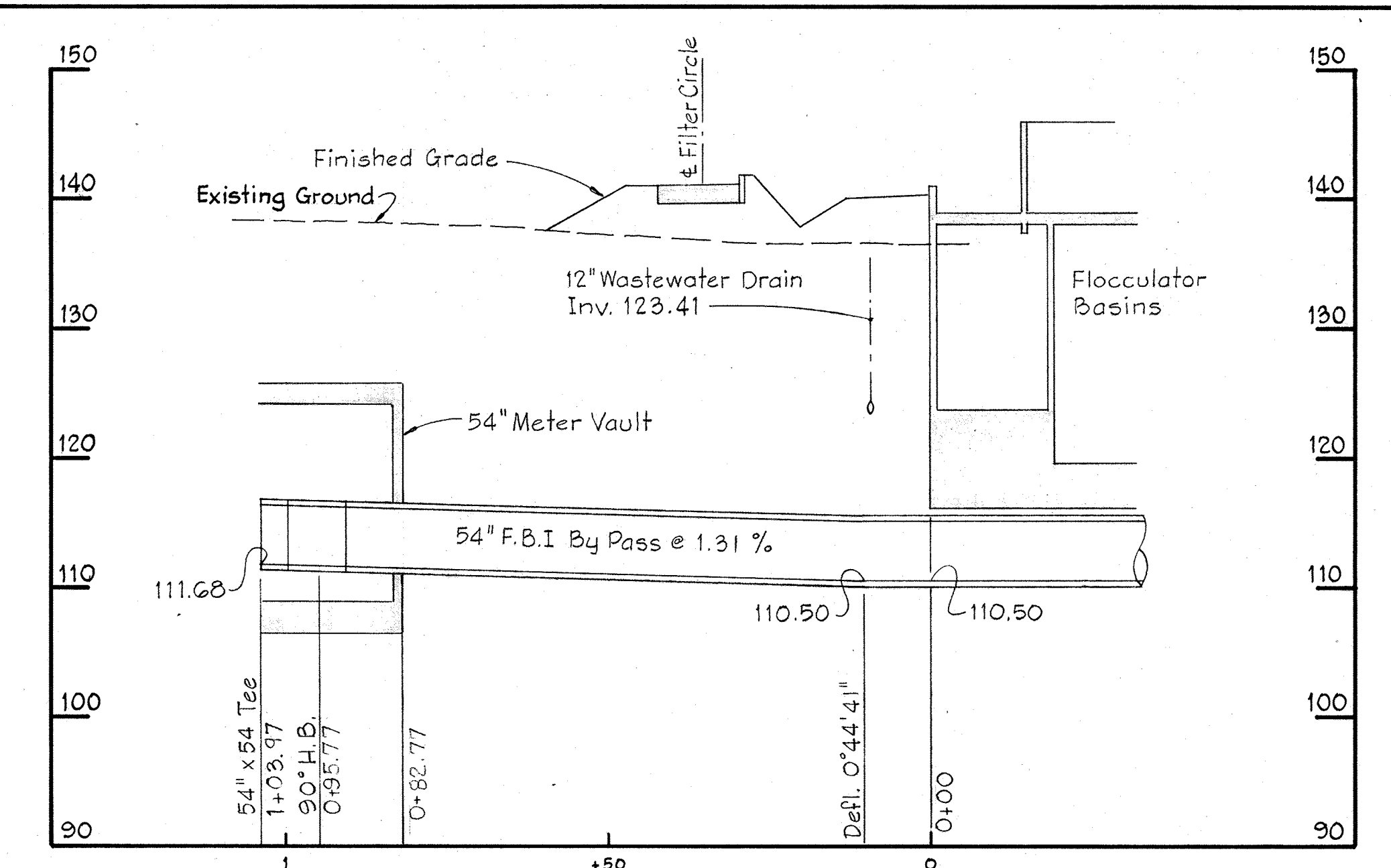
SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 2  
OF 96  
SCALE  
AS  
NOTED

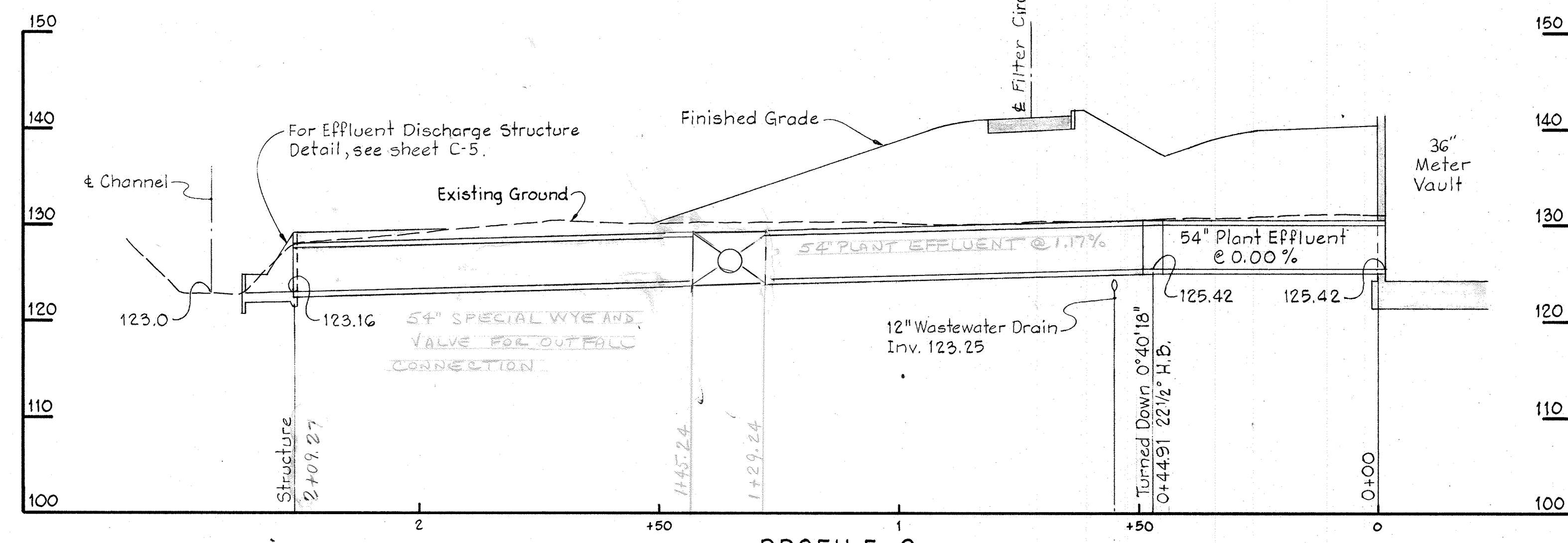




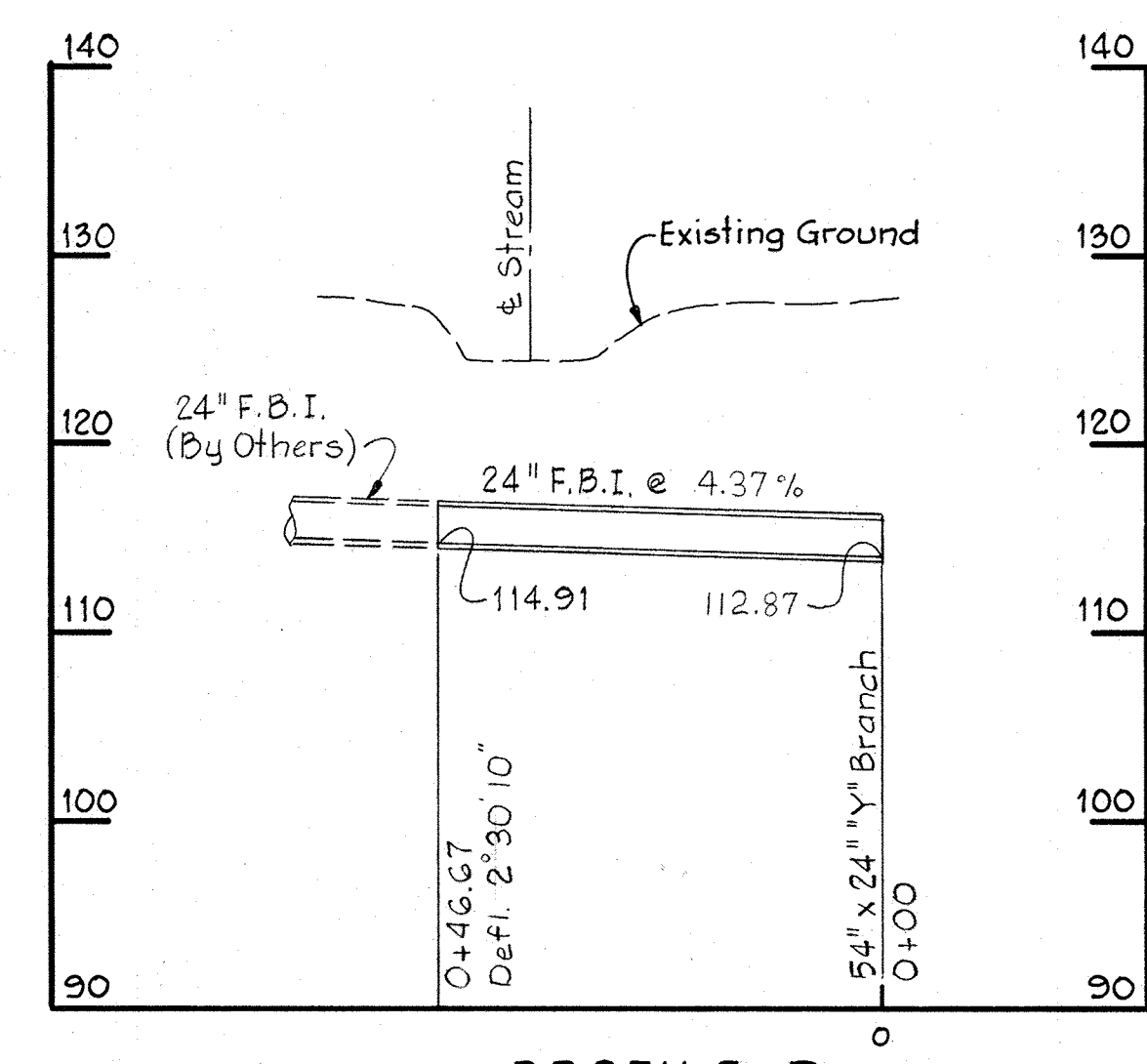
**PROFILE A**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



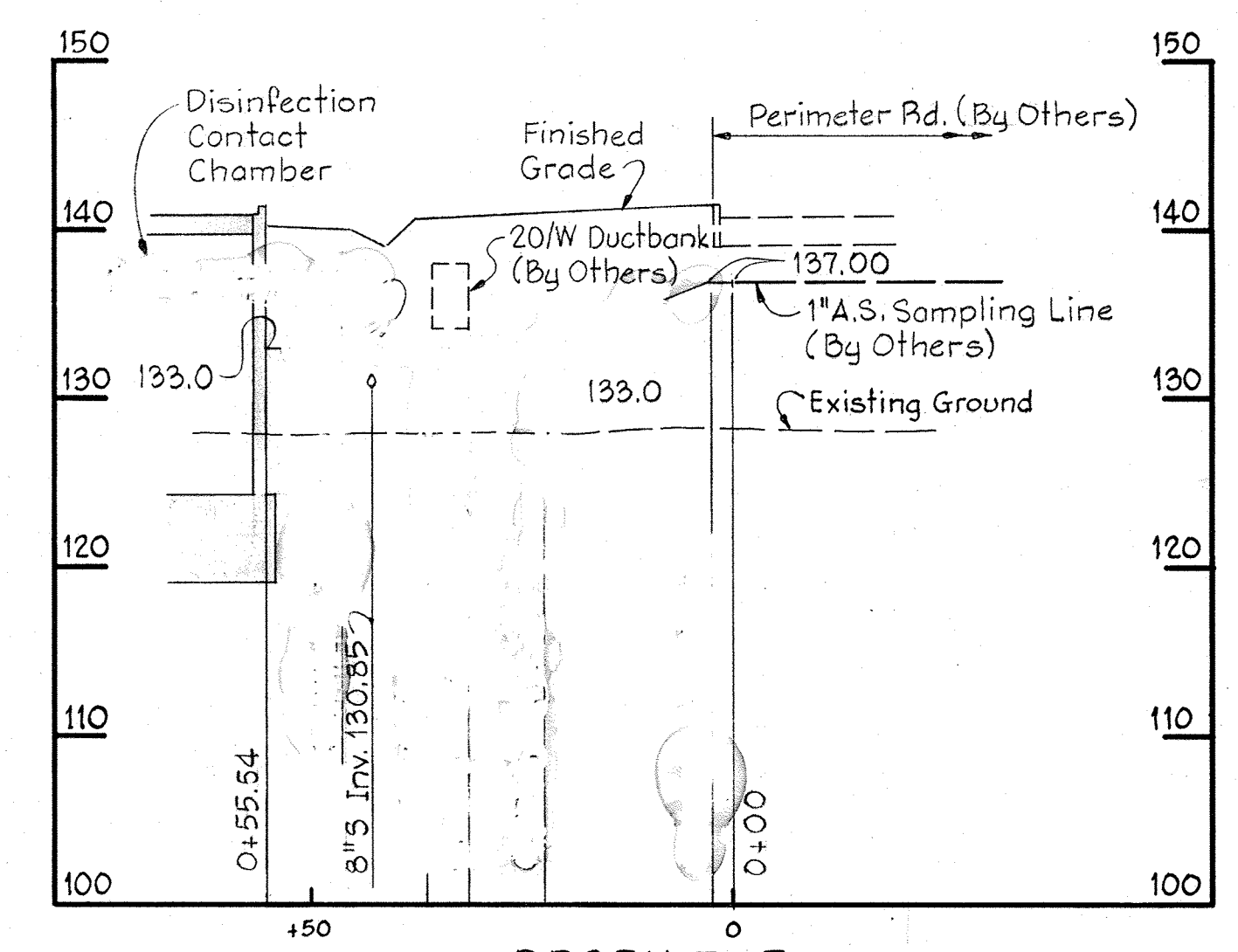
**PROFILE B**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



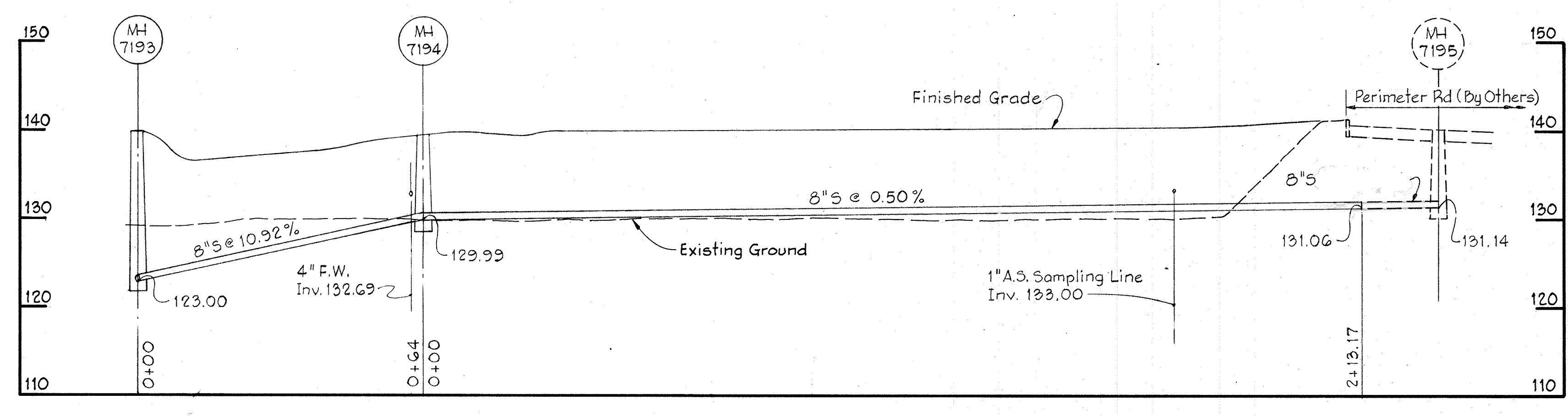
**PROFILE C**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



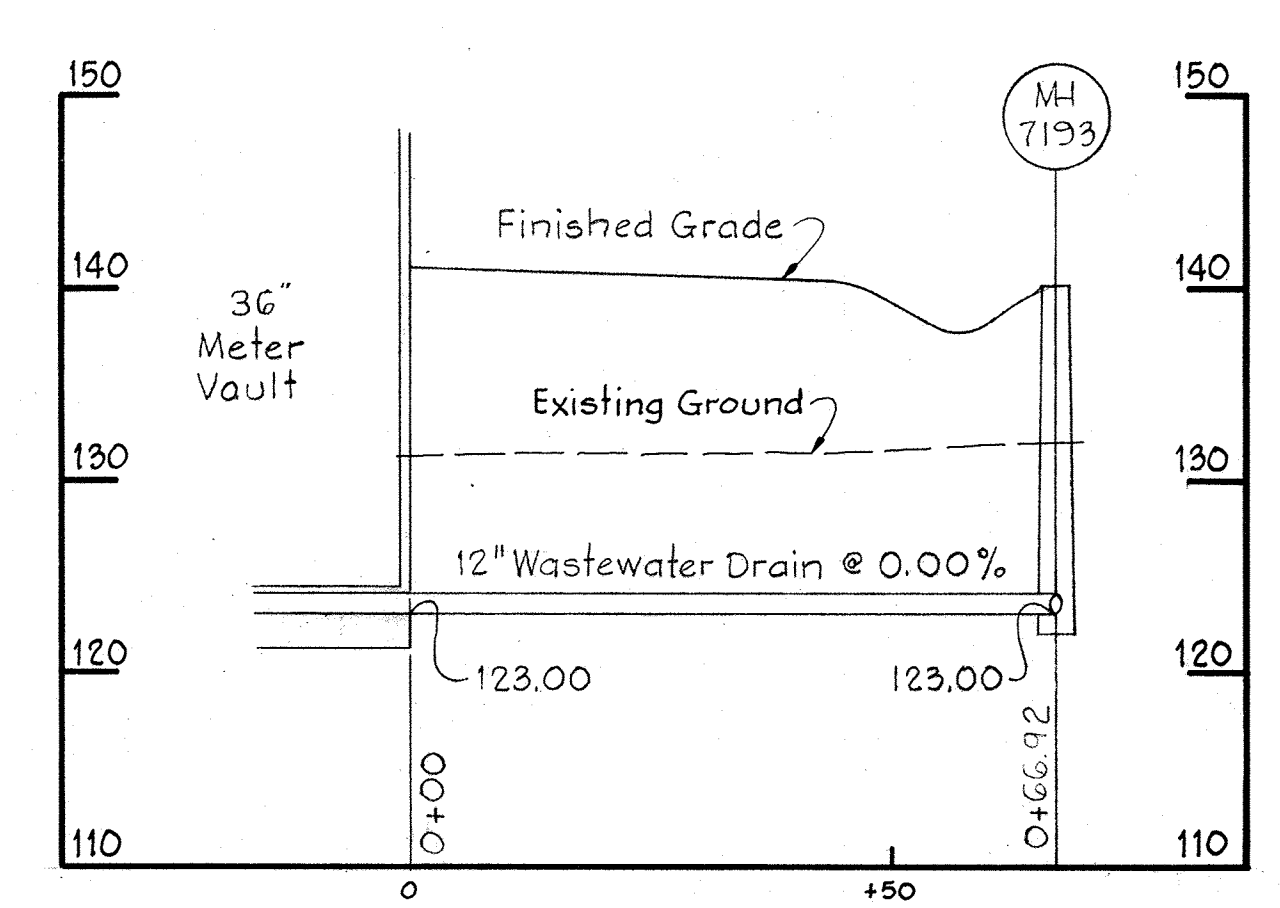
**PROFILE D**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



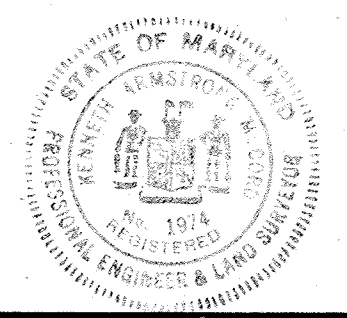
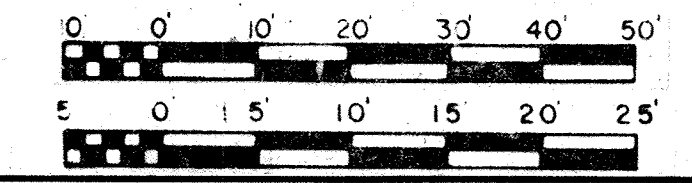
**PROFILE E**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



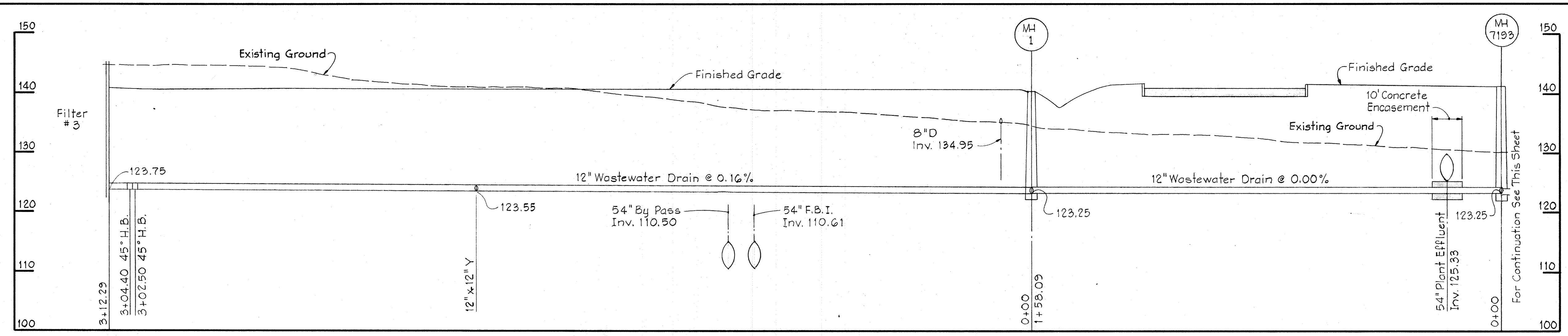
**PROFILE F**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



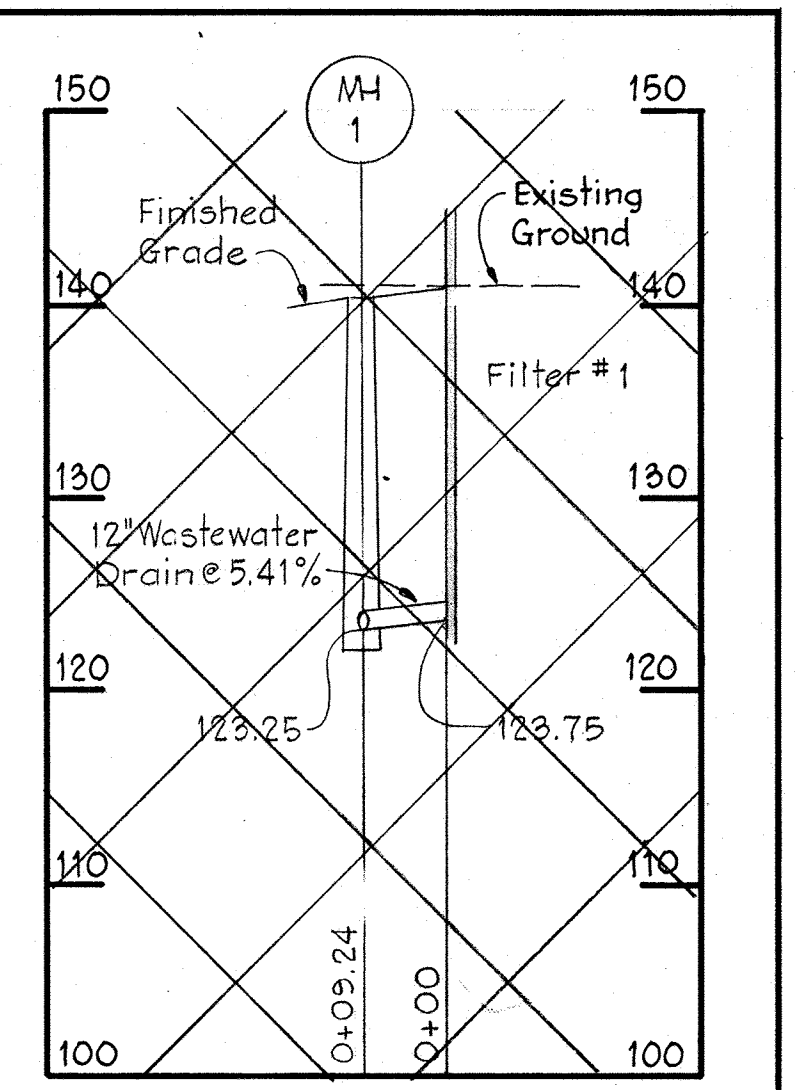
**PROFILE G**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



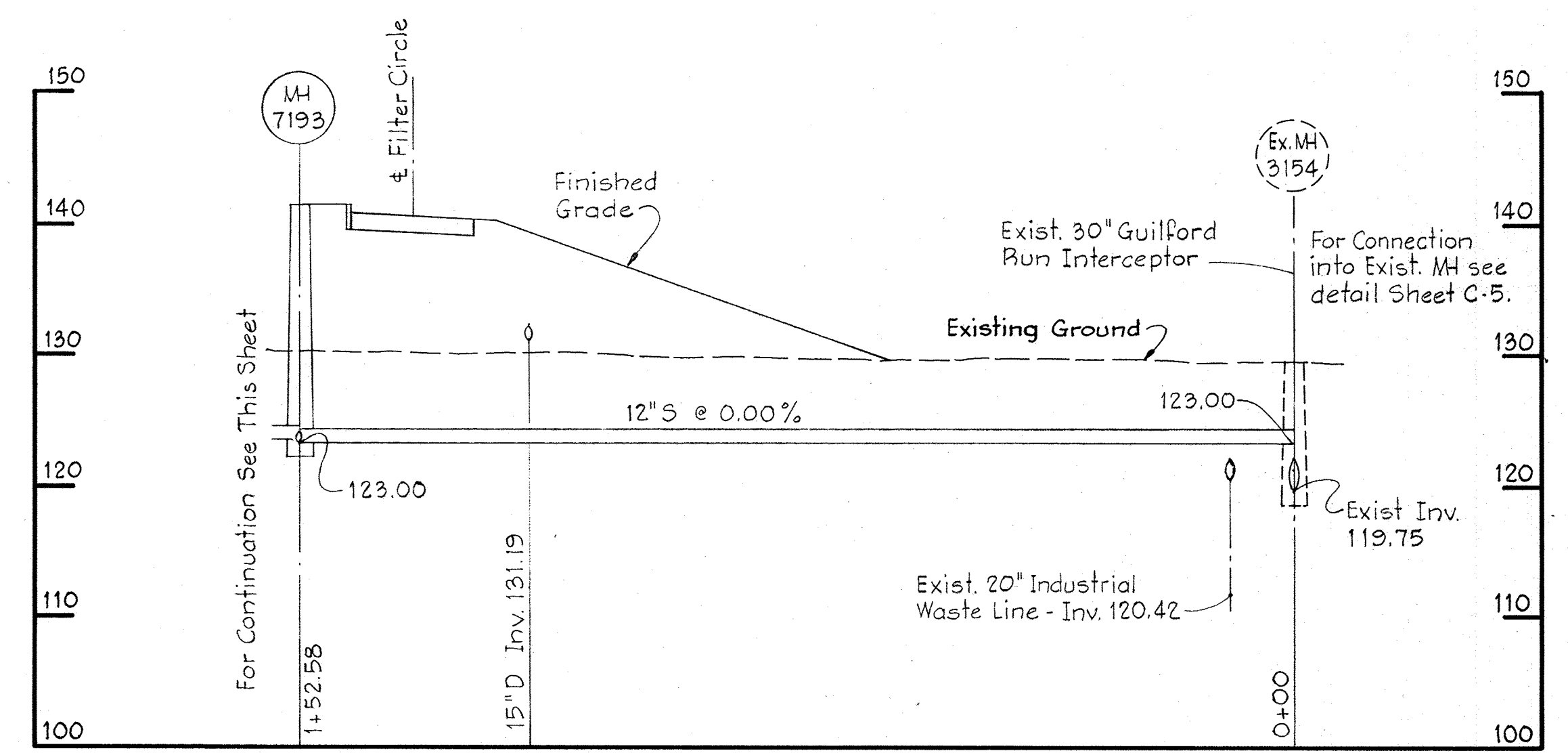
|  |  |                                  |                        |  |   |
|--|--|----------------------------------|------------------------|--|---|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE</p> <p><i>Richard S. Freudenberg</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>PROFILES</b></p> | <p><b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 10 OF 96</b></p> <p><b>SCALE AS SHOWN</b></p> |
|--|--|----------------------------------|------------------------|--|---|



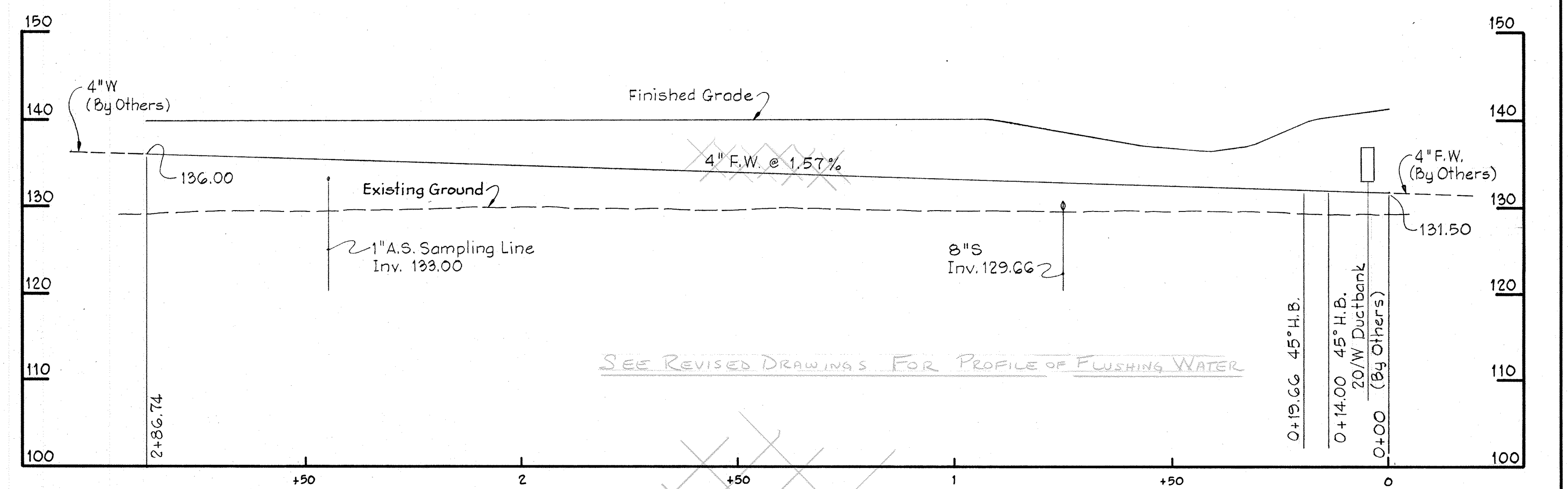
**PROFILE H**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



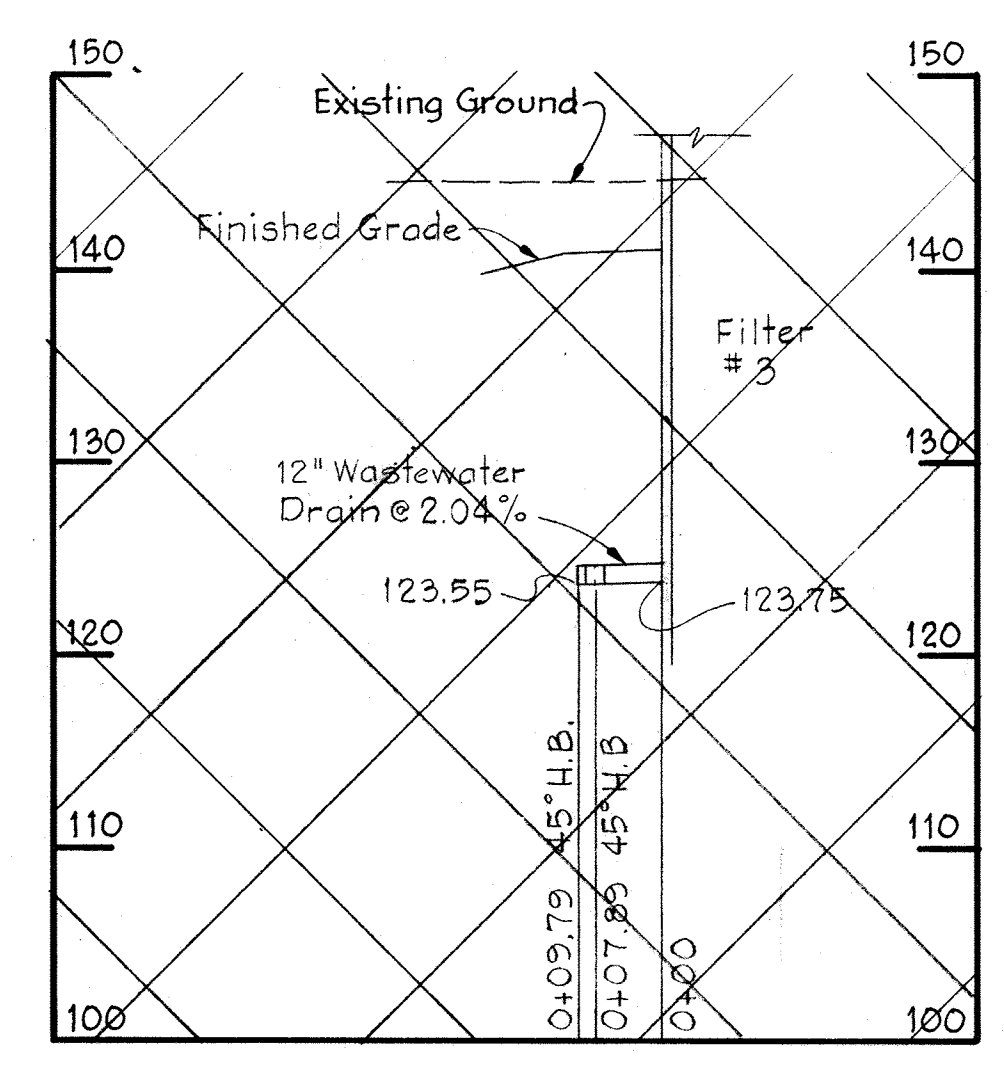
**PROFILE I**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



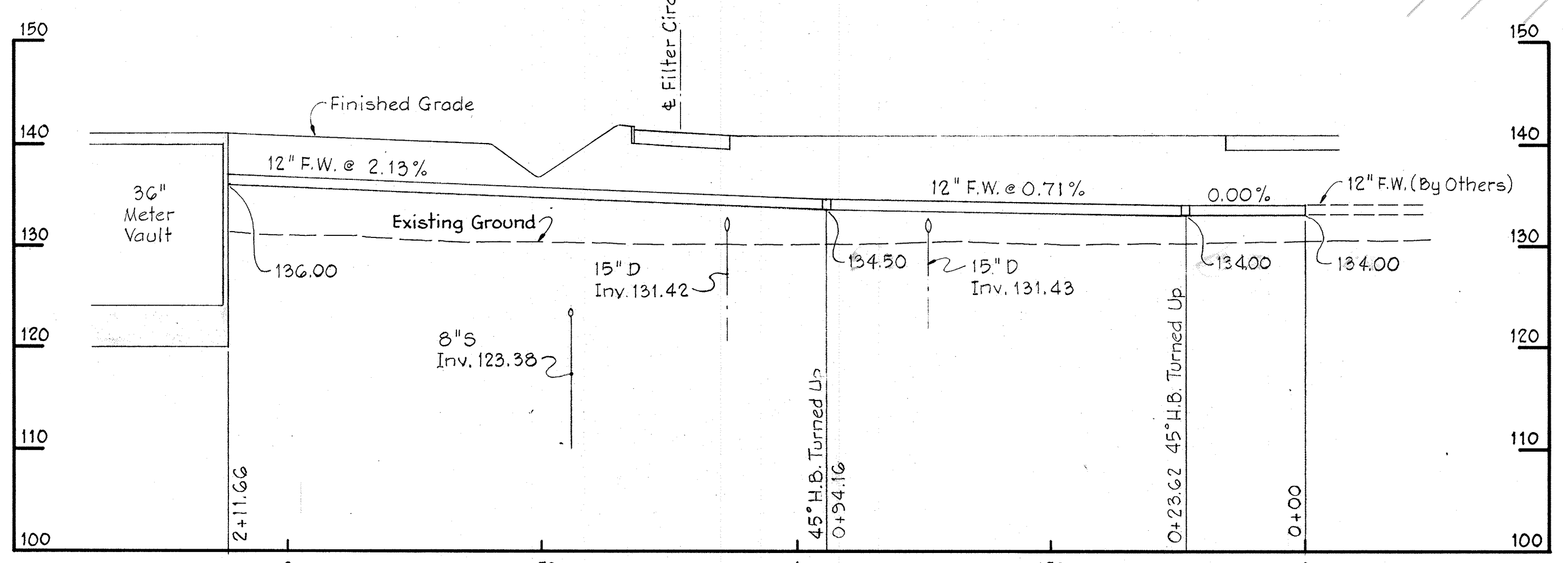
**PROFILE H**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



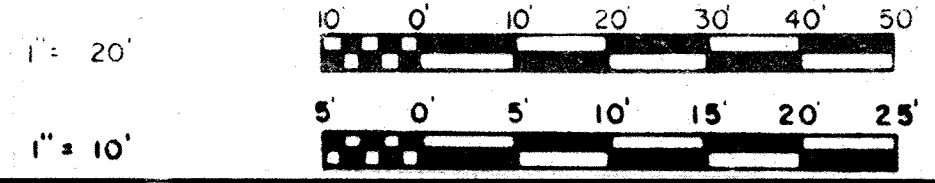
**PROFILE K**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'



**PROFILE J**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'

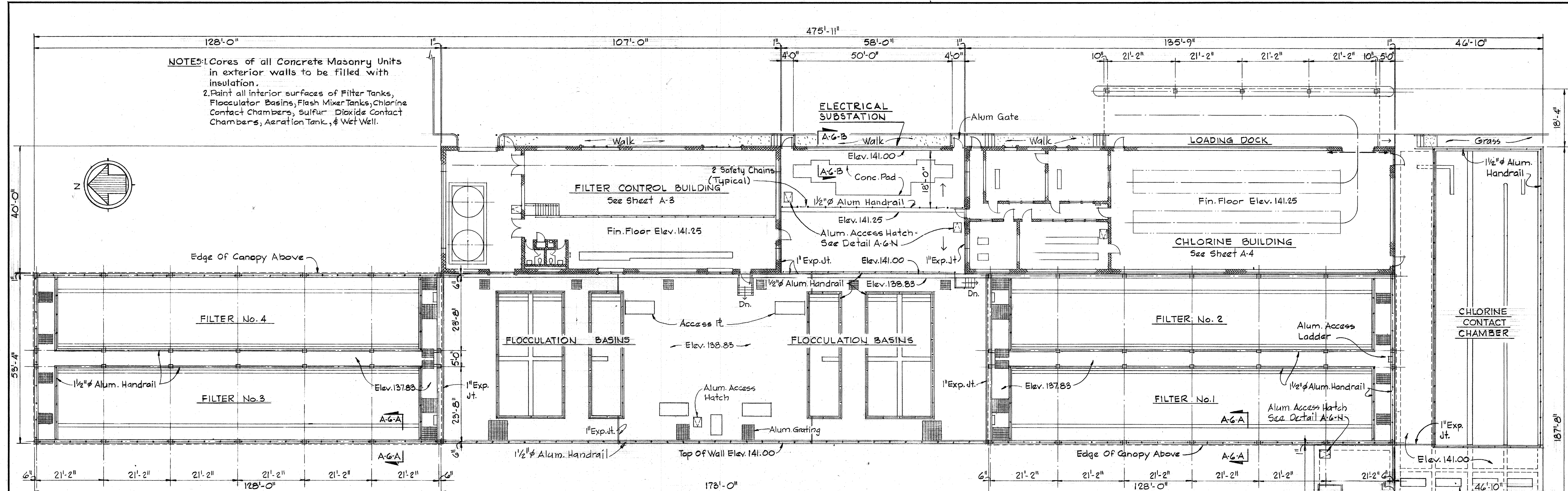


**PROFILE L**  
Scale: Hor. 1" = 20'  
Vert. 1" = 10'

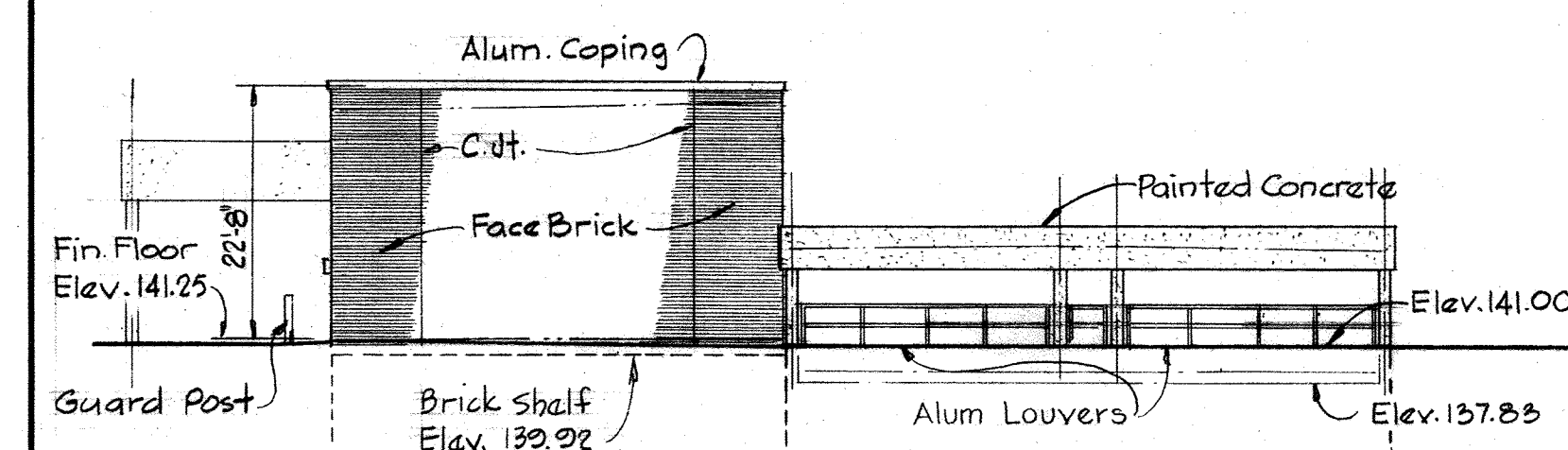


|  |   |                                  |                        |  |  |
|--|---|----------------------------------|------------------------|--|--|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/>DATE: 12/13/77<br/><i>Richard E. Brudenberg</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>PROFILES</b></p> | <p><b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 11 OF 96</b><br/><b>SCALE AS SHOWN</b></p> |
|--|---|----------------------------------|------------------------|--|--|

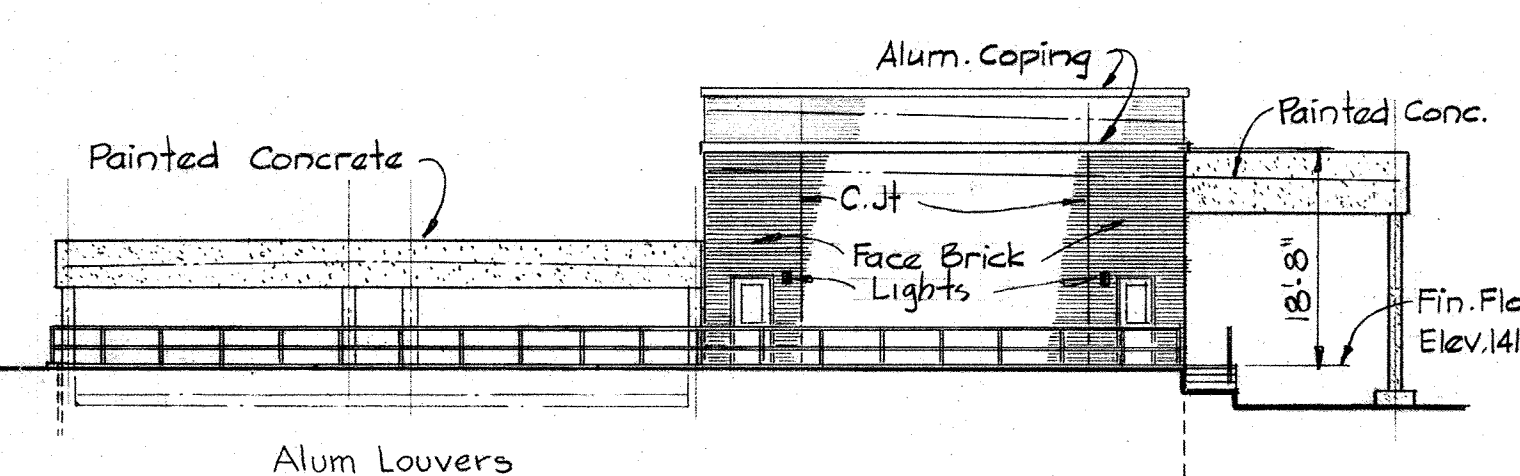




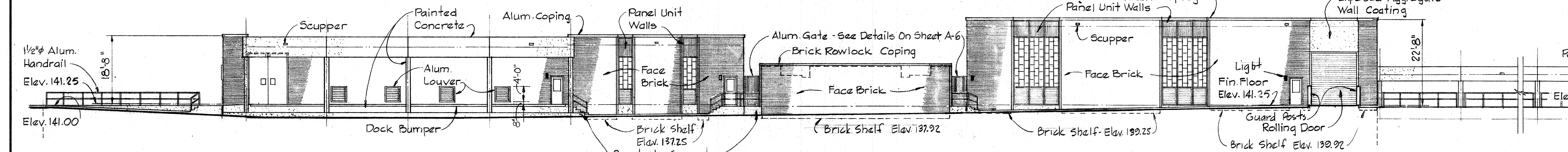
**PLAN - FILTRATION & DISINFECTION FACILITIES**  
Scale: 1/16" = 1'-0"



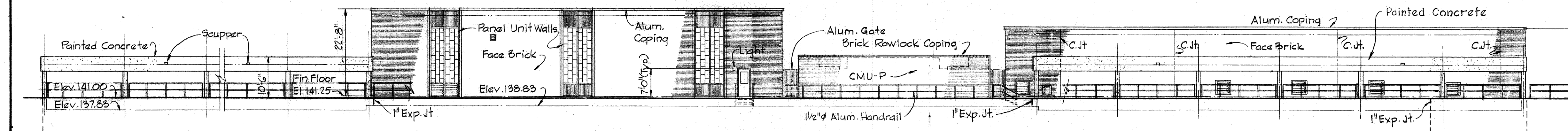
**NORTH ELEVATION**  
Scale: 1/16" = 1'-0"



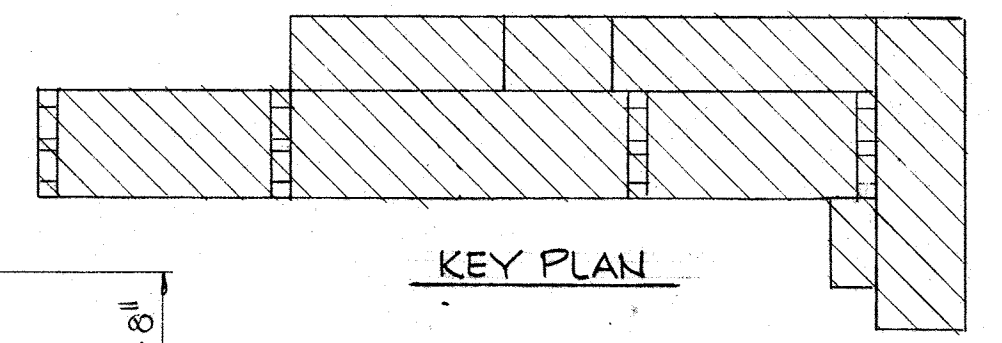
**SOUTH ELEVATION**  
Scale: 1/16" = 1'-0"



**EAST ELEVATION**  
Scale: 1/16" = 1'-0"



**WEST ELEVATION**  
Scale: 1/16" = 1'-0"



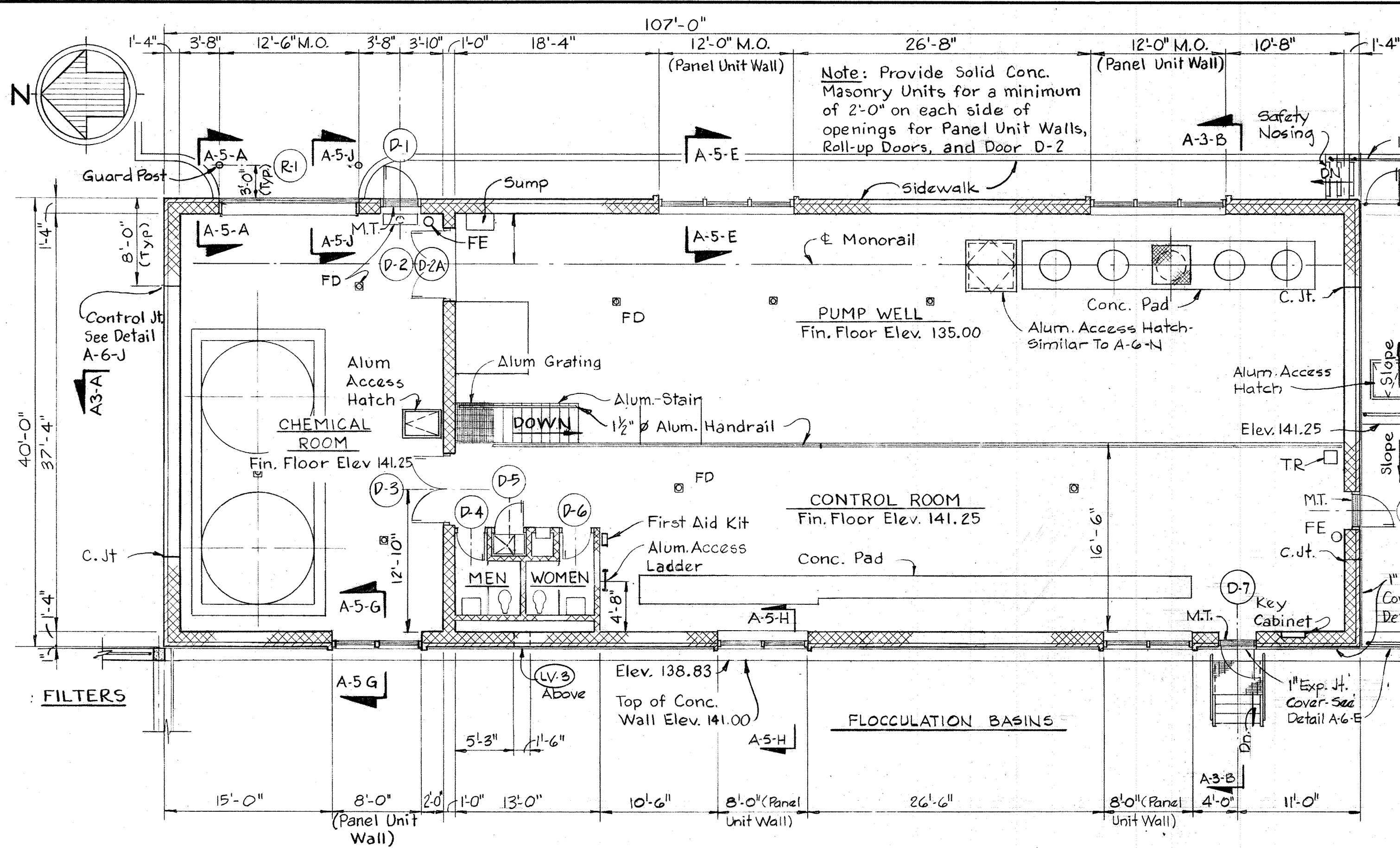
**KEY PLAN**

|  |   |                                  |                                     |  |  |
|--|---|----------------------------------|-------------------------------------|--|--|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE<br/><i>Richard S. Freudenberger</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>PLAN &amp; ELEVATIONS</b></p> | <p><b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 12 OF 96</b><br/><b>SCALE AS NOTED</b></p> |
|--|---|----------------------------------|-------------------------------------|--|--|

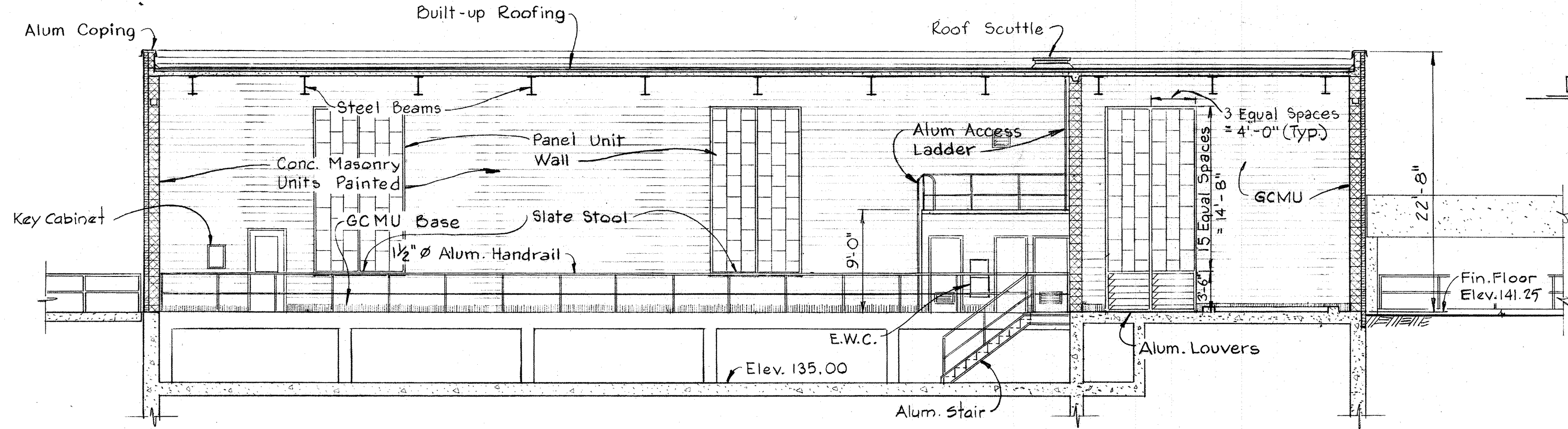
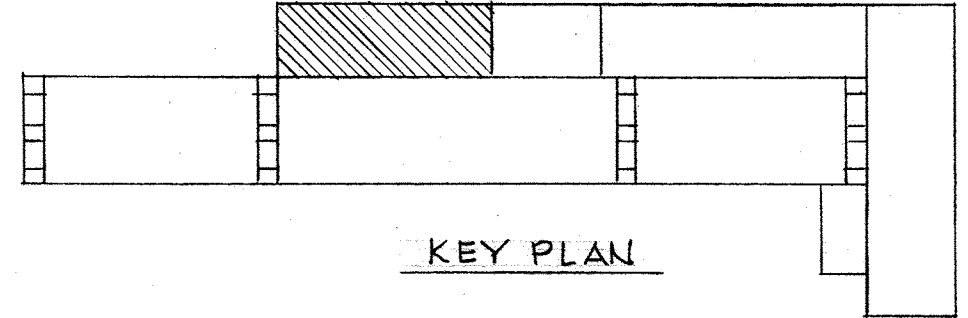




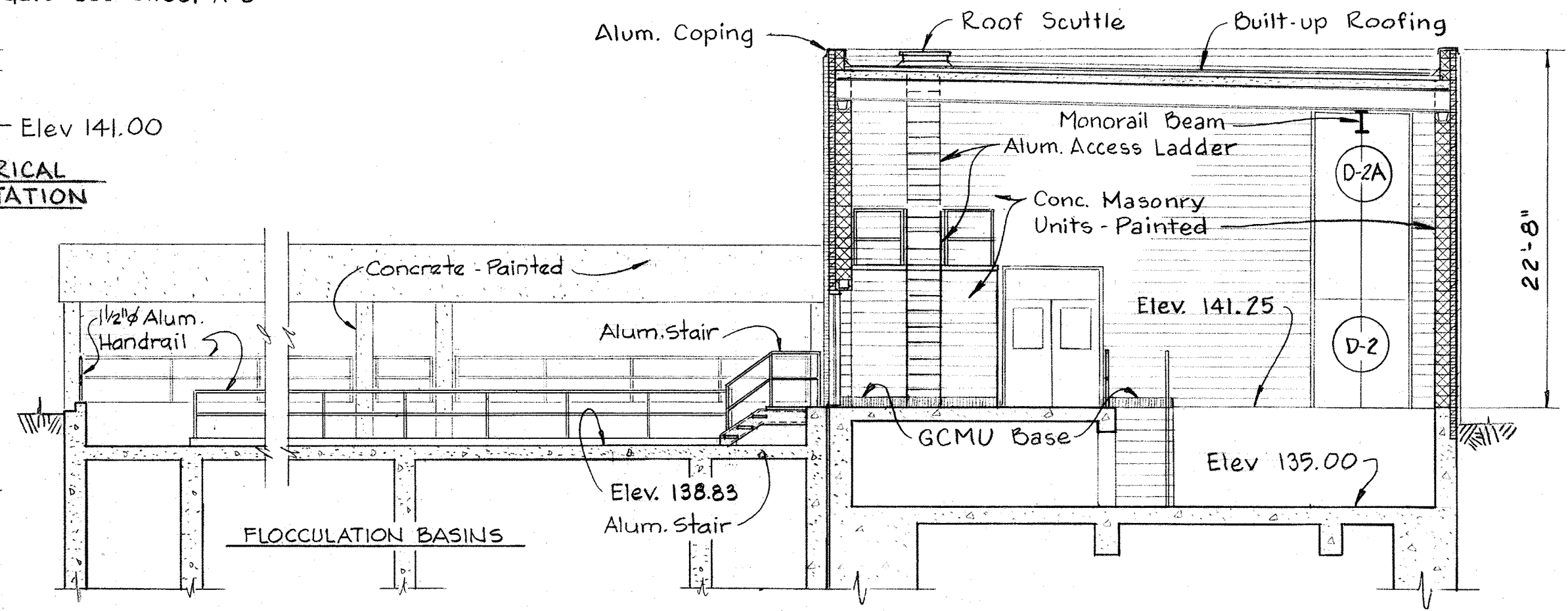




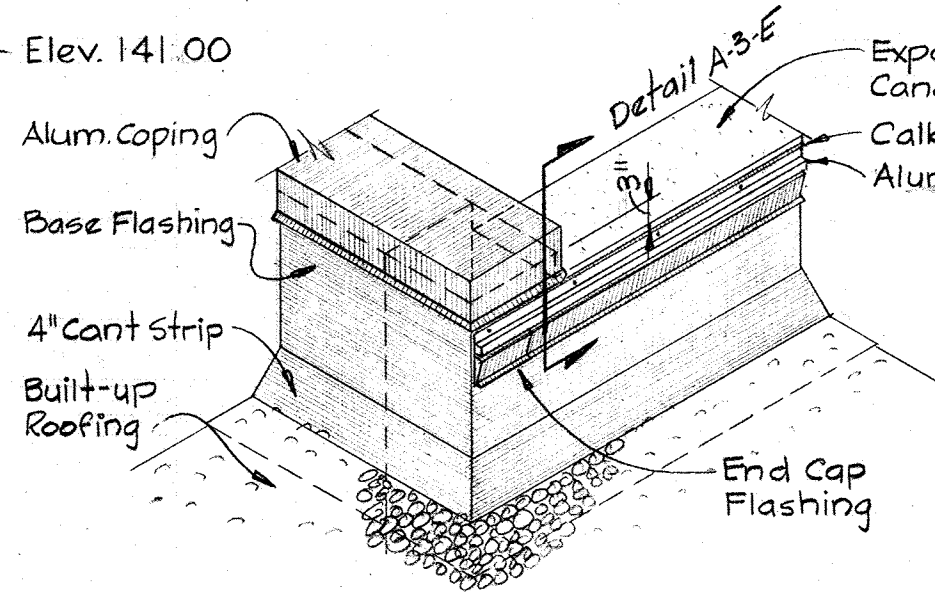
FLOOR PLAN-FILTER CONTROL BUILDING-ELEV. 141.25  
Scale: 1/8" = 1'-0"



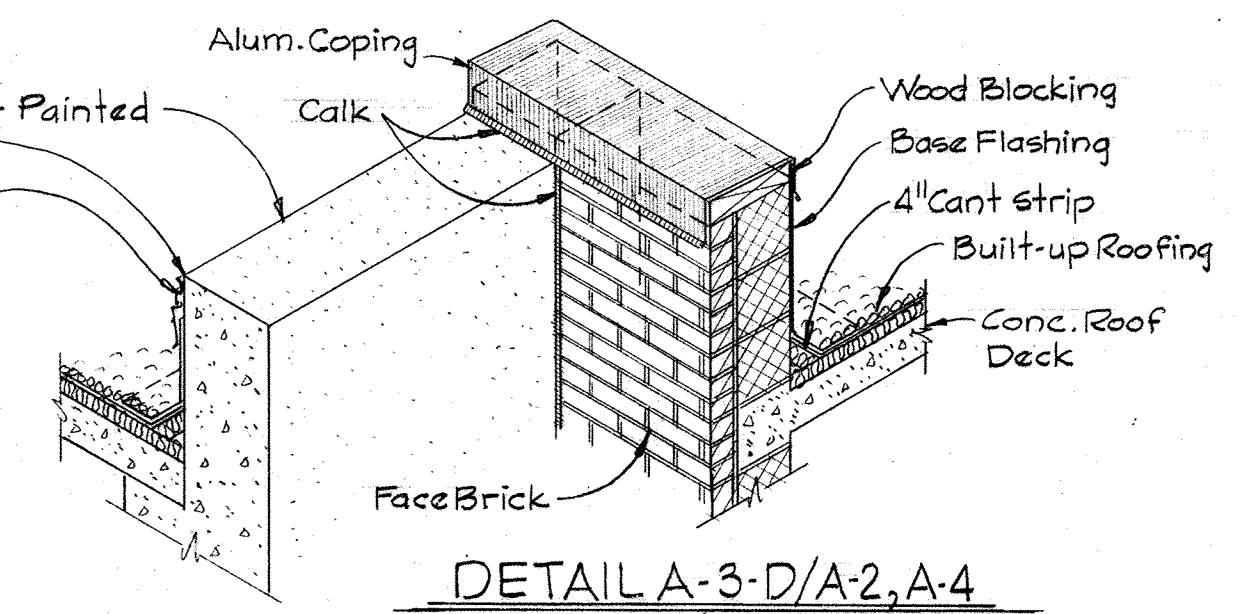
SECTION A3-A/A3  
Scale 1/8" = 1'-0"



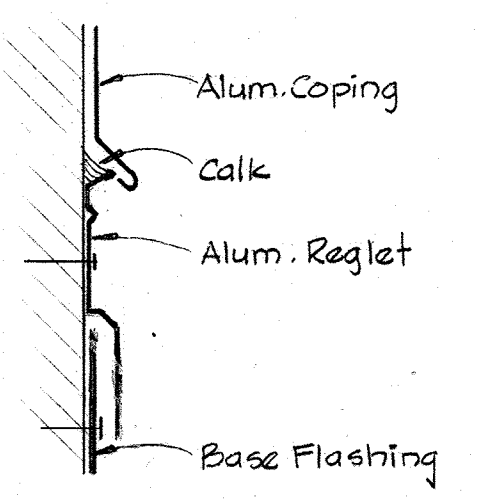
SECTION A3-B/A3  
Scale: 1/8" = 1'-0"



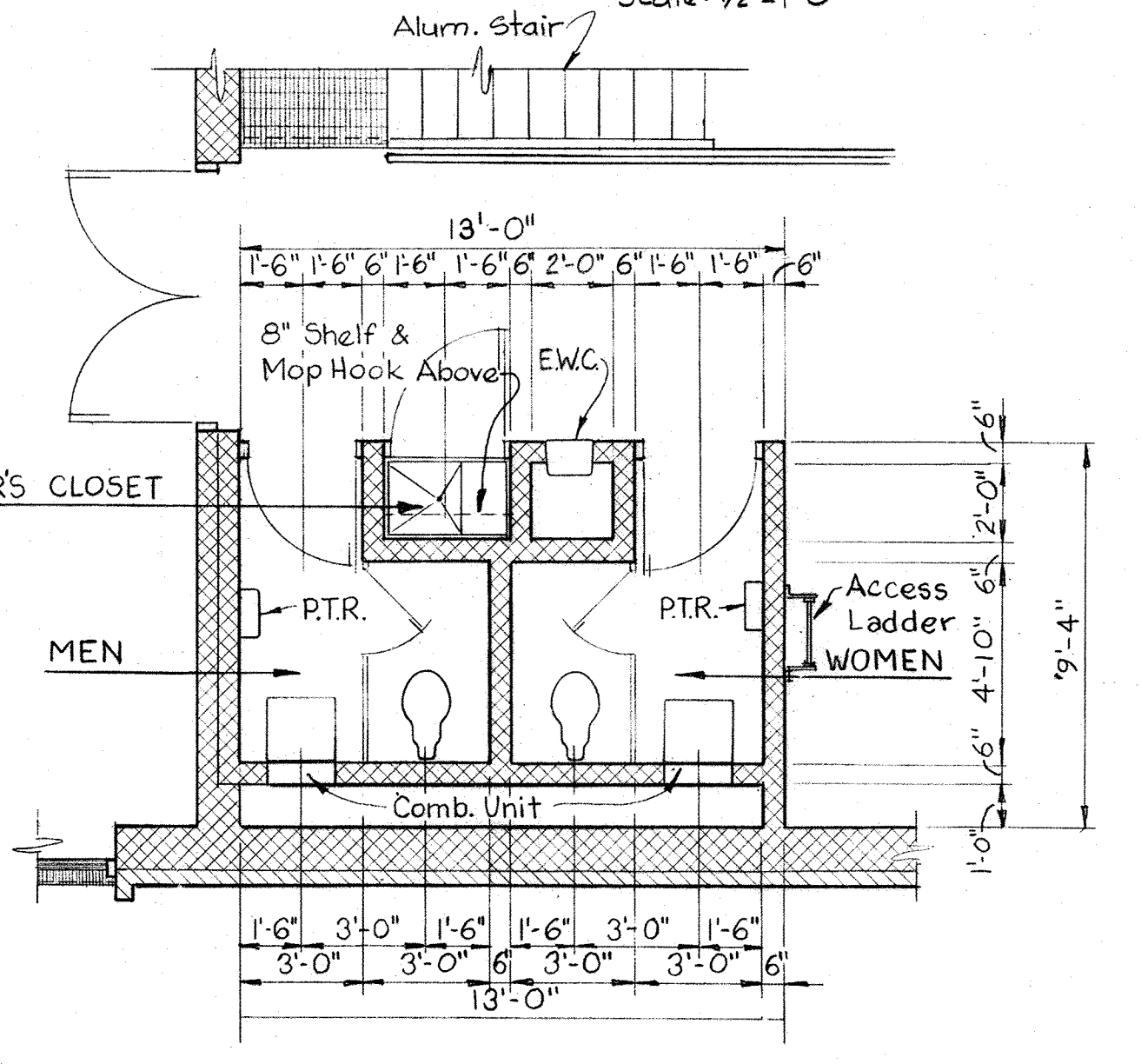
DETAIL A3-C/A2, A4  
Scale: 1/2" = 1'-0"



DETAIL A3-D/A2, A4  
Scale: 1/2" = 1'-0"

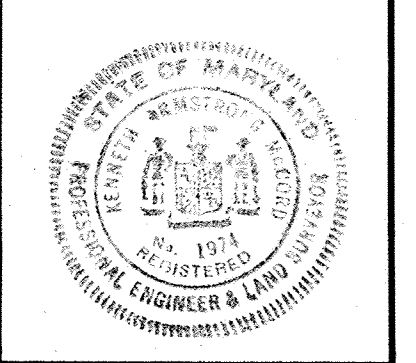
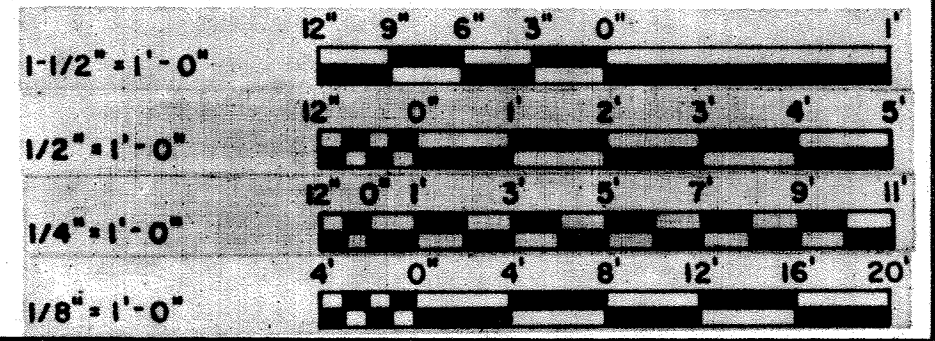


DETAIL A3-E/A3  
No Scale



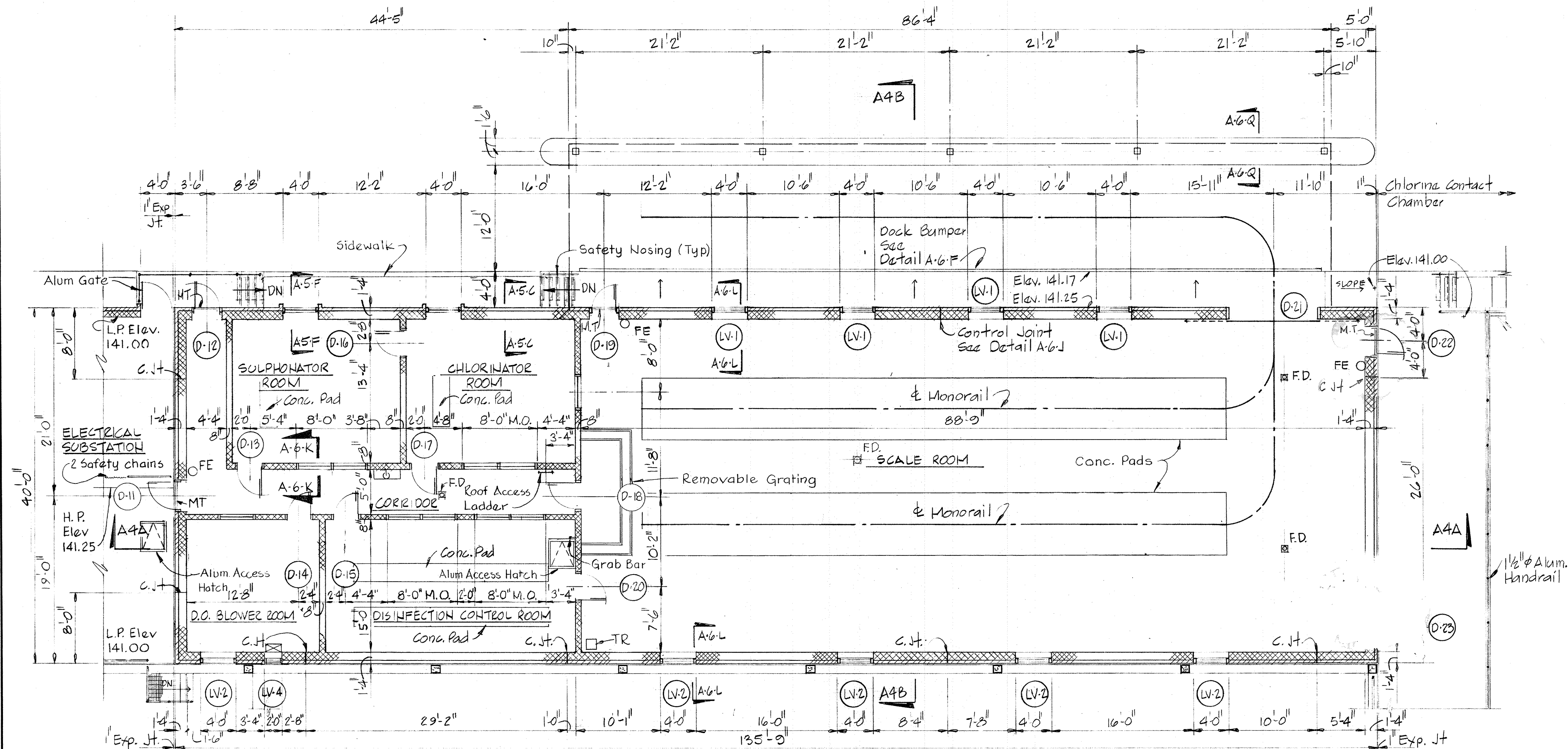
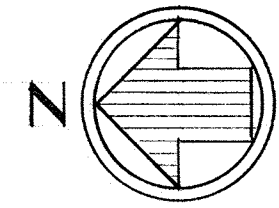
TOILET PLAN  
Scale: 1/4" = 1'-0"

- MOUNTING NOTES:**
1. Top of Combination Unit - 6'-0" above floor on sink.
  2. Bottom of Paper Towel Receptacle - 8" Min. above floor.
  3. Top of Fire Extinguishers - 3'-4" Max. above floor.
  4. Top of First Aid Kit - 5'-0" above floor.
  5. Top of Key Cabinet - 6'-0" above floor.

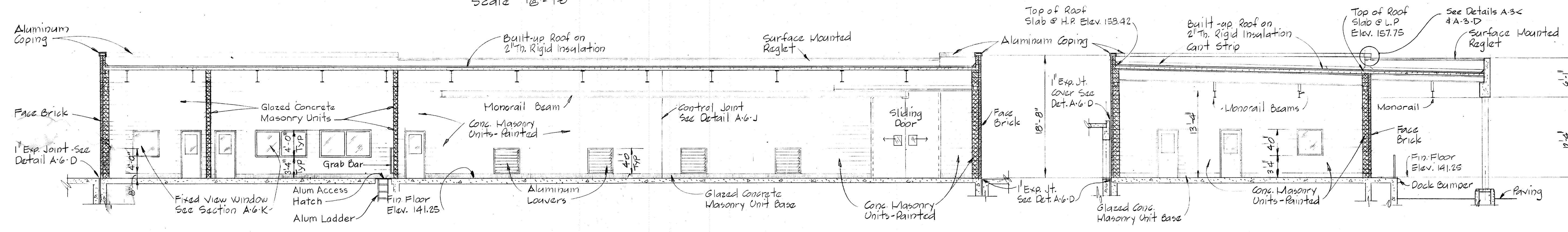


|   |  |                    |  |   |   |
|---|--|--------------------|--|---|---|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br>Richard S. Brundage<br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTER CONTROL BUILDING<br>PLAN & SECTIONS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 14<br>OF 96<br>SCALE AS NOTED |
|---|--|--------------------|--|---|---|



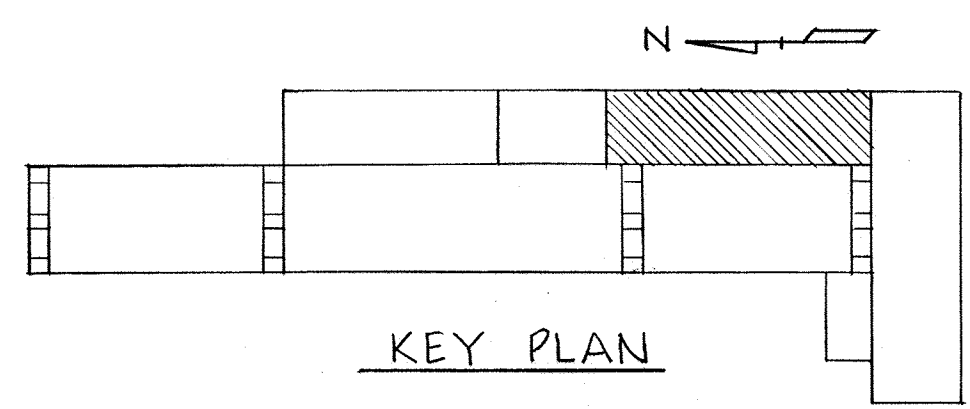


FLOOR PLAN-CHLORINE BUILDING - ELEV. 141.25  
Scale 1/8" = 1'-0"



LONGITUDINAL SECTION A-4A/A-4  
Scale 1/8" = 1'-0"

CROSS SECTION A-4B/A-4  
Scale 1/8" = 1'-0"



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
DATE  
Richard E. Freudenberg  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

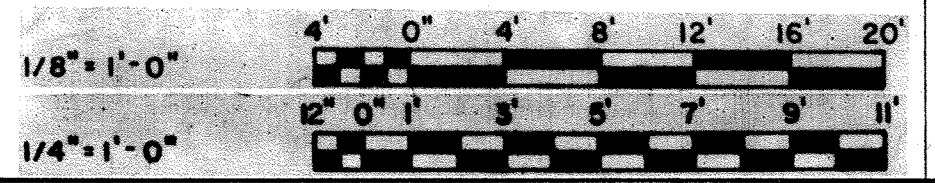
CONTRACT NO. 502-S

CHLORINE BUILDING  
PLAN & SECTIONS

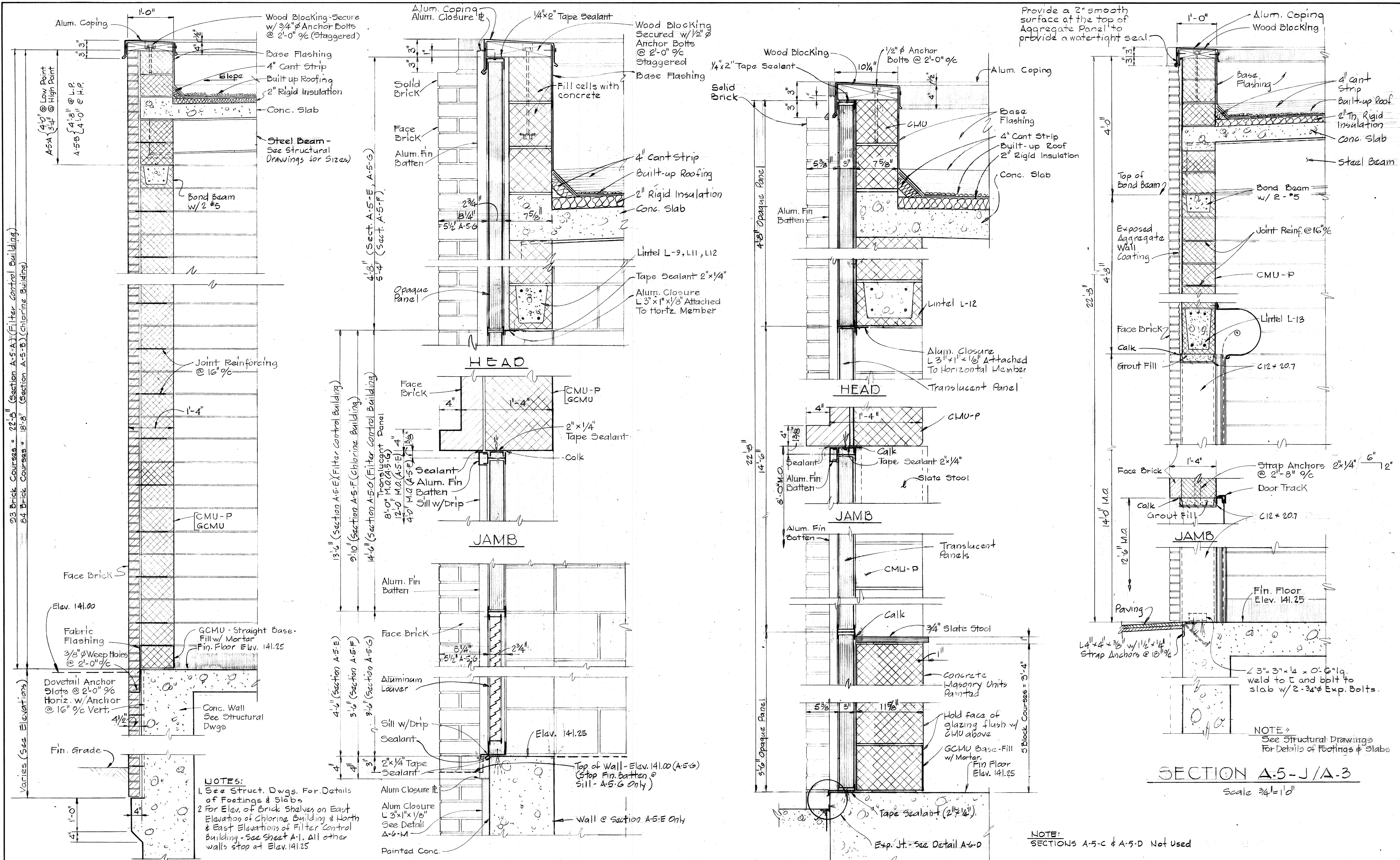
SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 15  
OF 96

SCALE  
AS  
NOTED







SECTION A-5-A/A-3  
SECTION A-5-B/A-4  
Scale: 3/4" = 1'-0"

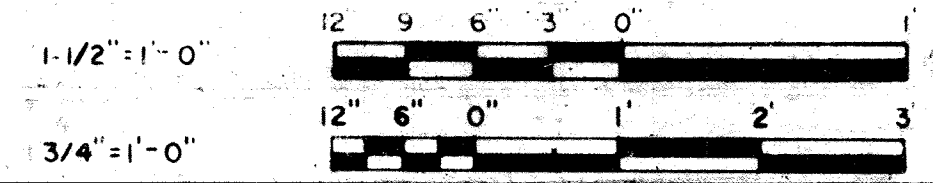
SILL  
A-5-E/A-3  
A-5-F/A-4  
A-5-G/A-3  
Scale: 1/2" = 1'-0"

SILL  
SECTION A-5-H/A-3  
Scale: 1/2" = 1'-0"

SECTION A-5-J/A-3  
Scale: 3/4" = 1'-0"

NOTES:  
1. See Struct. Dwg. For Details of Footings & Slabs  
2. For Elev. of Brick Shelves on East Elevation of Chlorine Building & North & East Elevations of Filter Control Building - See Sheet A-1. All other walls stop at Elev. 141.25

NOTE:  
SECTIONS A-5-C & A-5-D Not Used



WHITMAN, REQUARDT & ASSOCIATES  
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BALTIMORE, MARYLAND

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
3/20/75  
DATE  
W.D. Albert  
CHIEF-BUREAU OF ENGINEERING

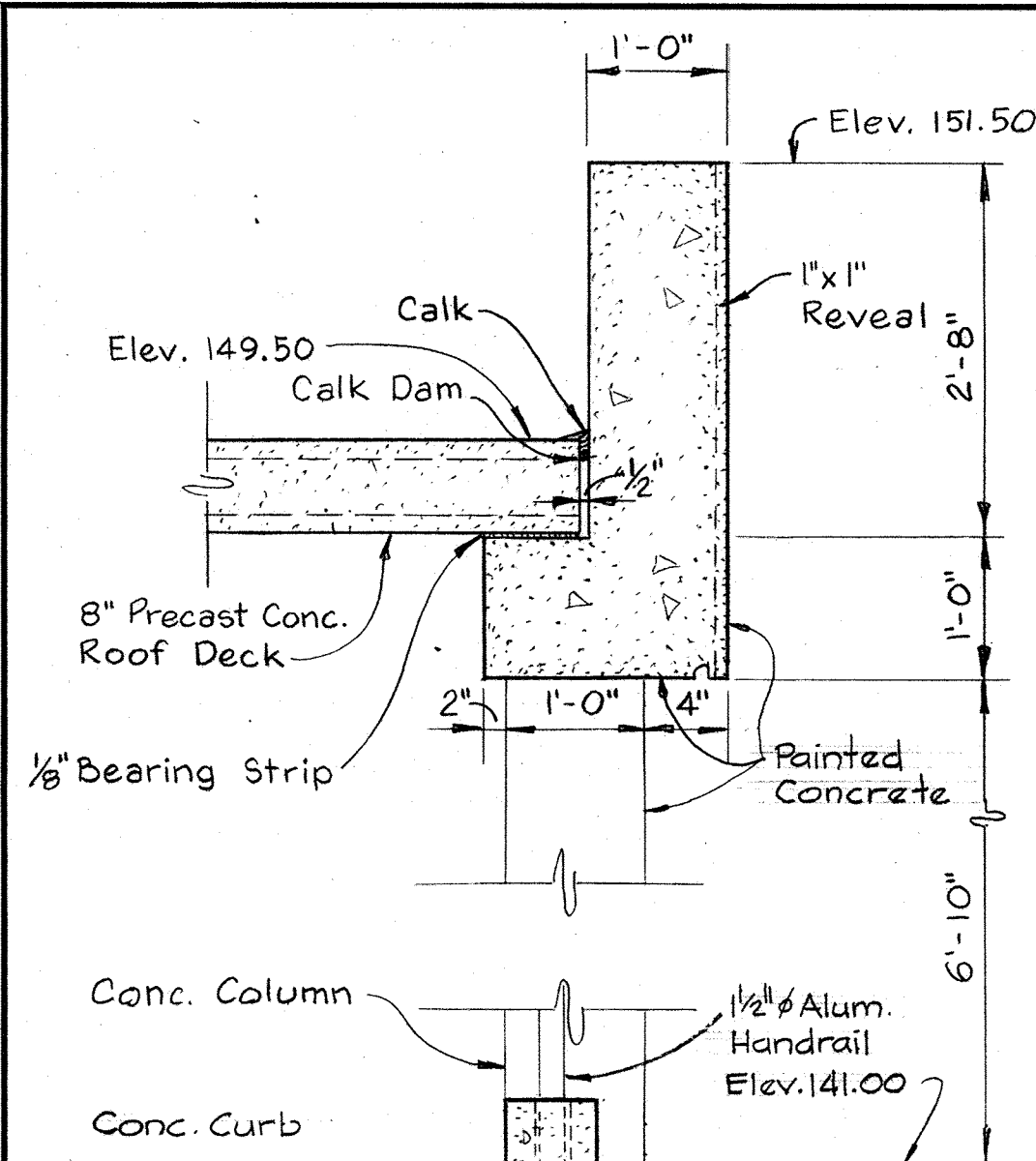
CONTRACT NO. 502-S

WALL SECTIONS

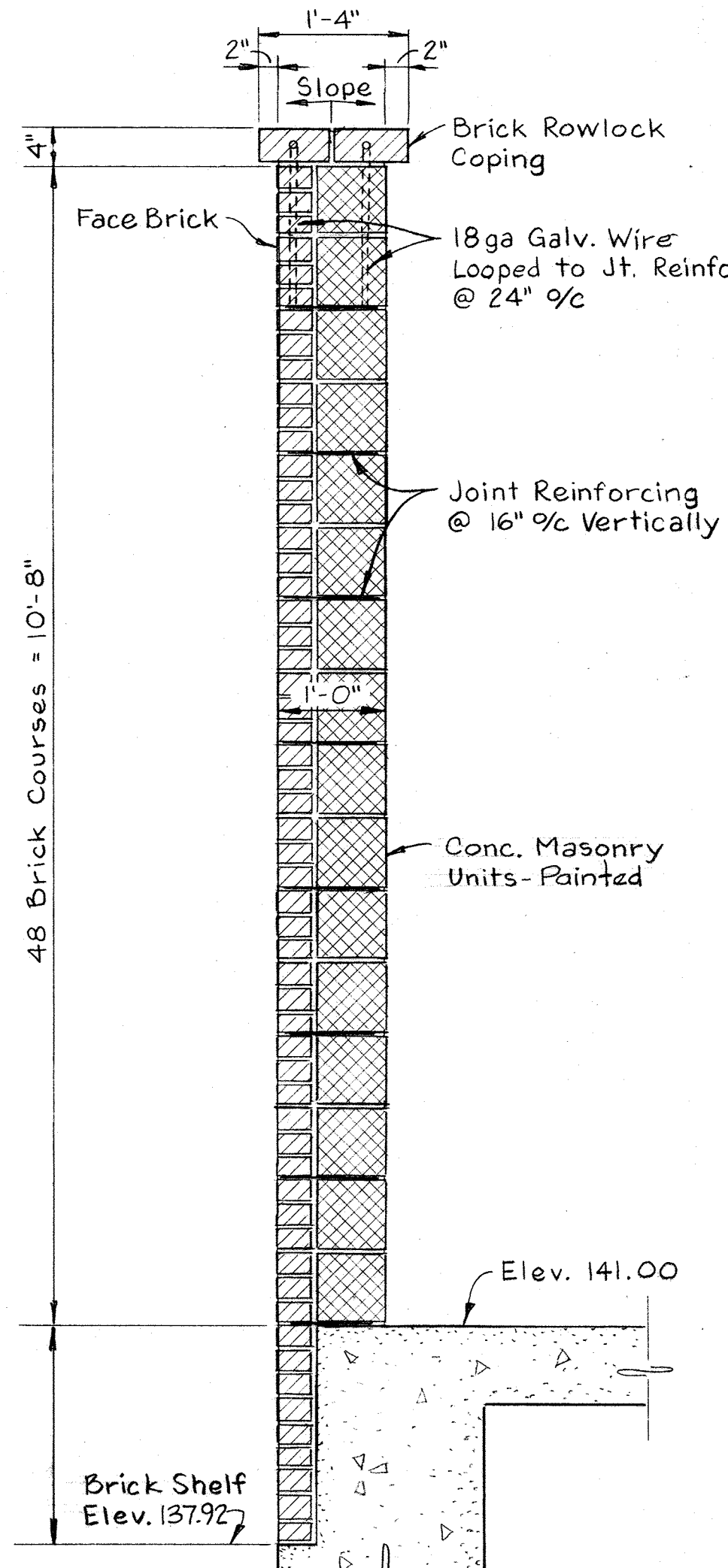
SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 16 OF 96  
SCALE AS NOTED

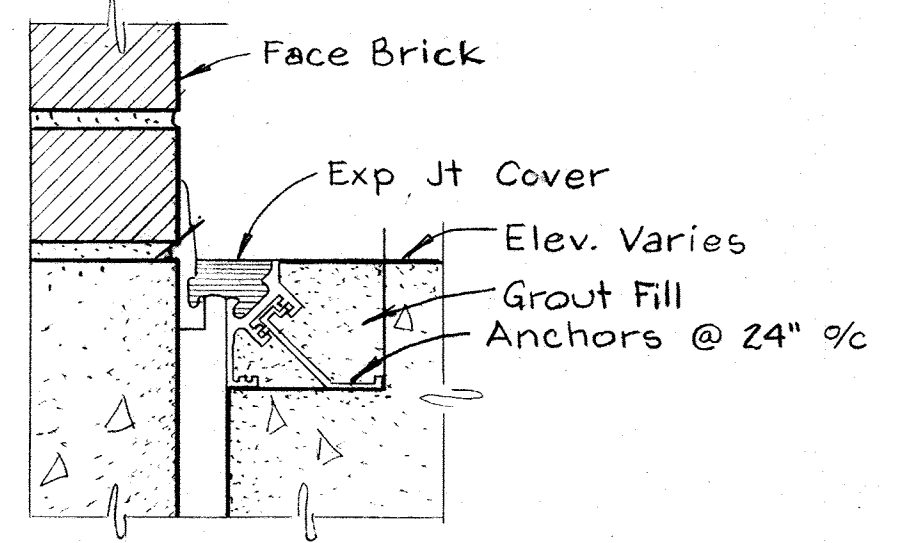




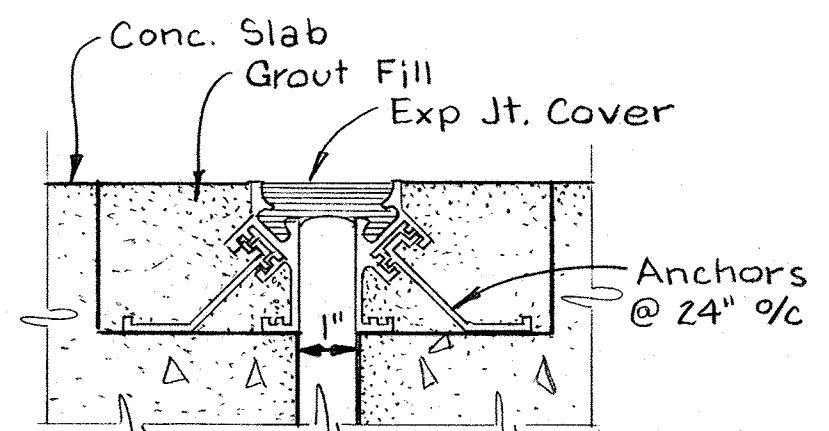
**SECTION A6-A/A-1, A-2**  
Scale: 3/4" = 1'-0"



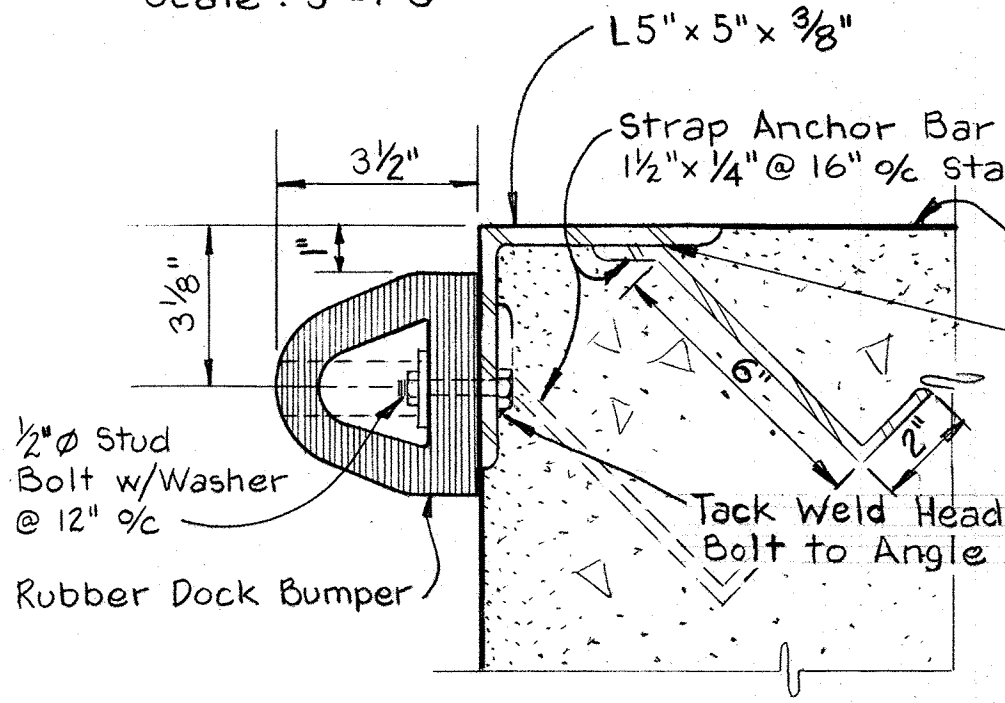
**SECTION A6-B/A-1**  
Scale: 3/4" = 1'-0"



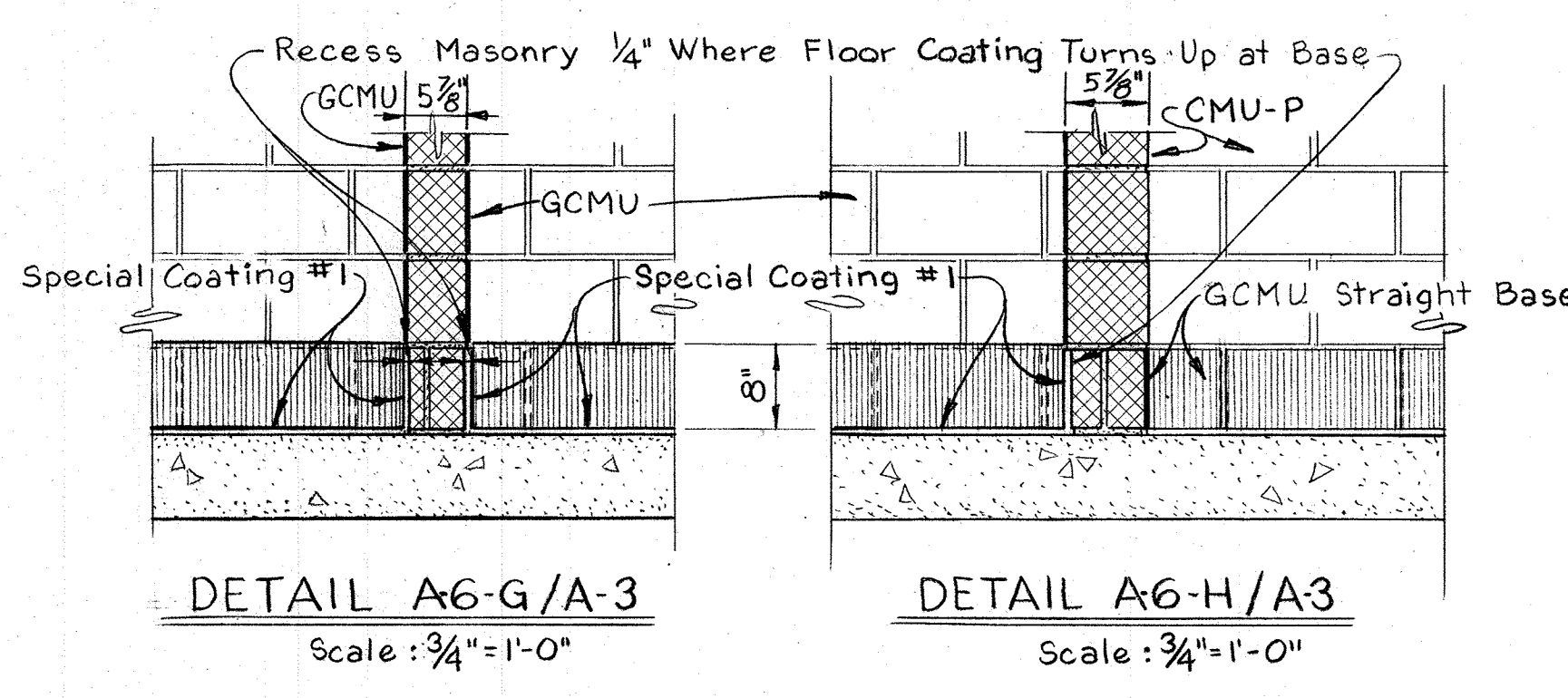
**SECTION A6-D/A2, A3, A4, A6**  
Scale: 3" = 1'-0"



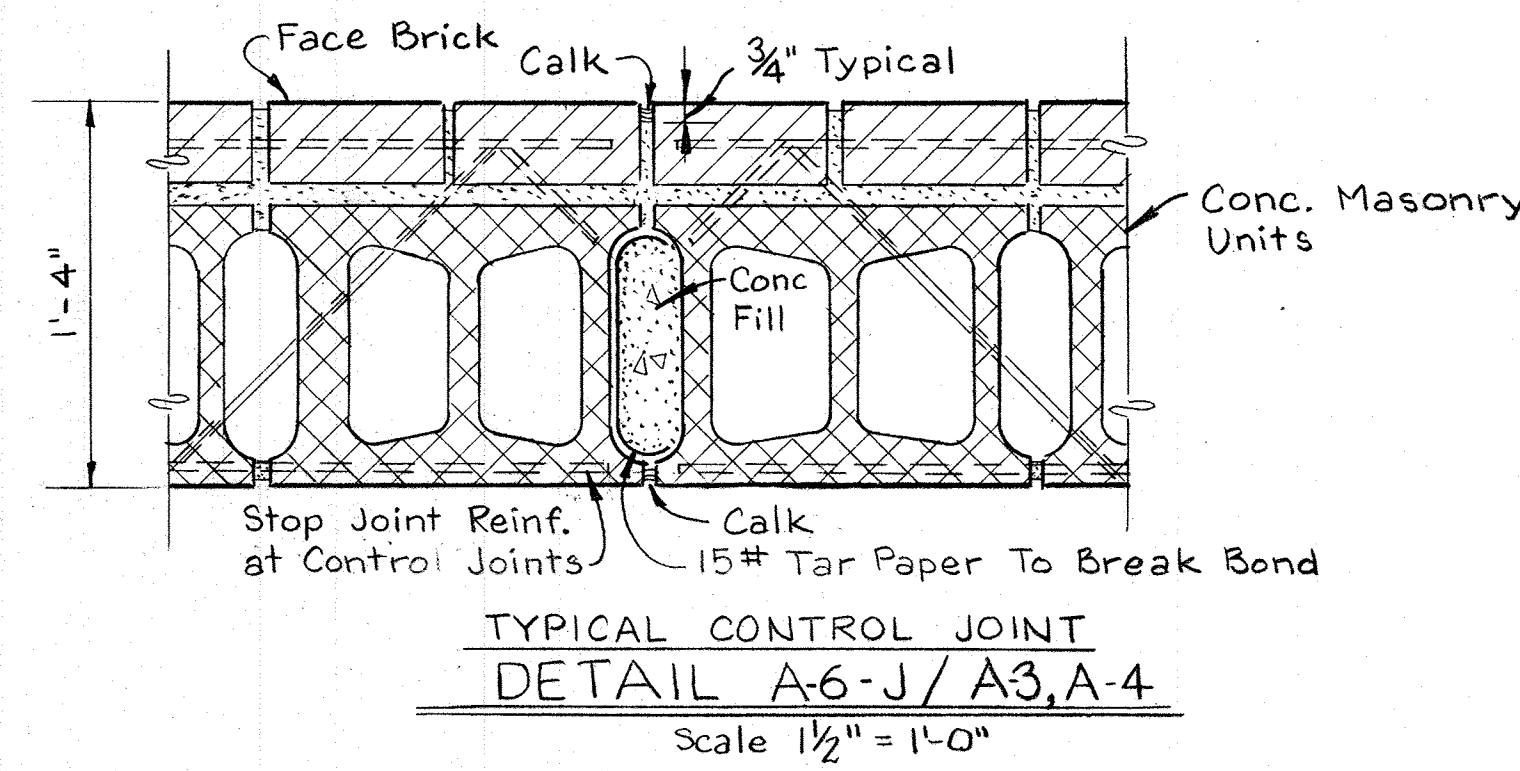
**SECTION A6-E/A3**  
Scale: 3" = 1'-0"



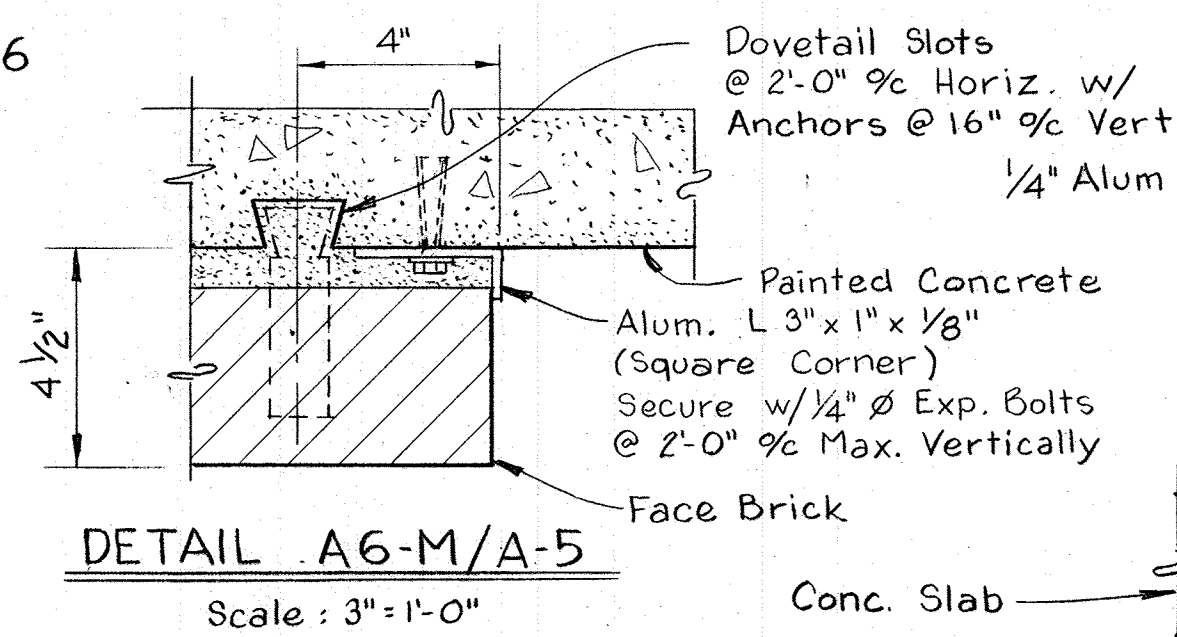
**DETAIL A6-F/A-4**  
Scale: 3" = 1'-0"



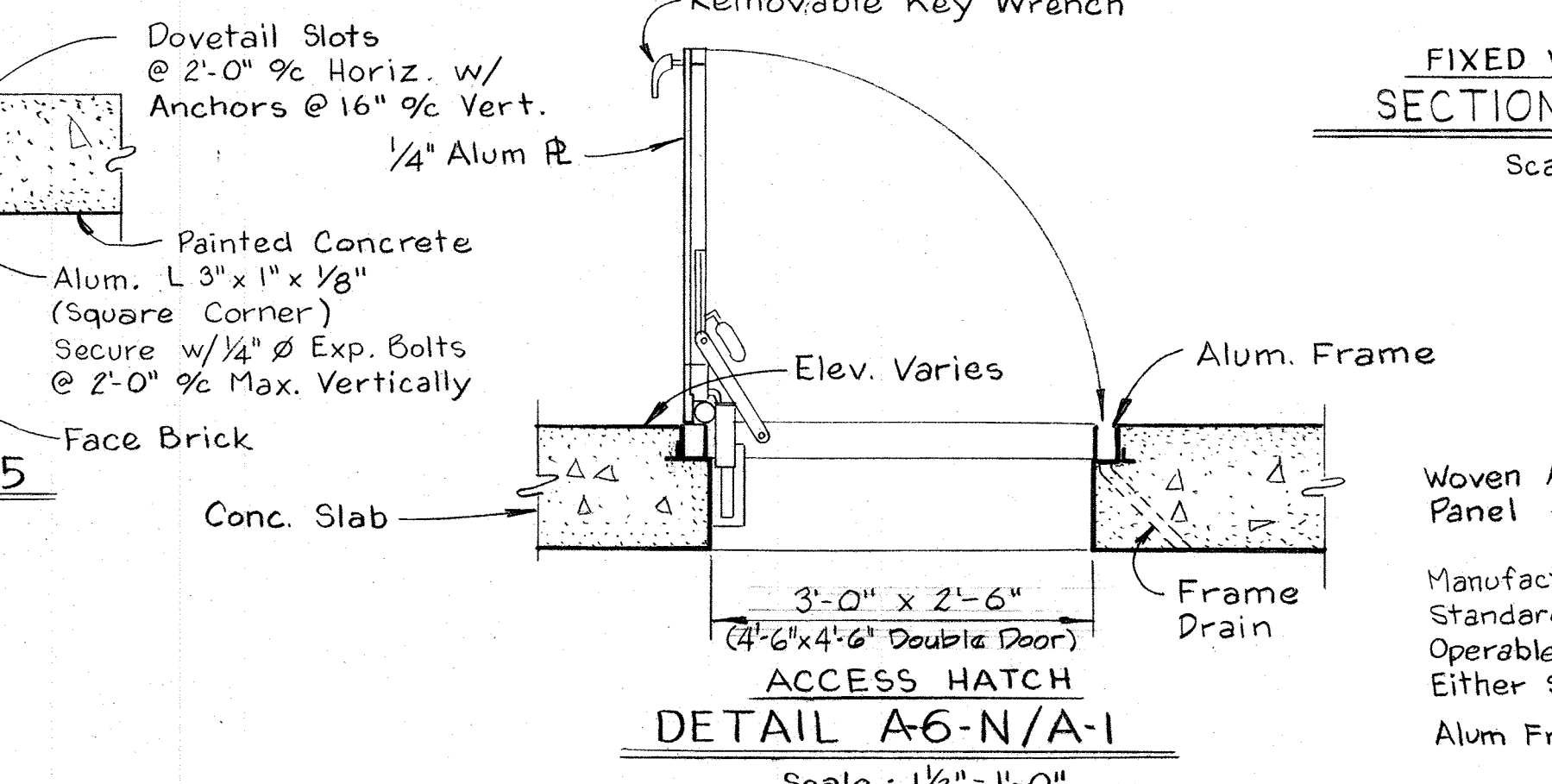
**DETAIL A6-G/A-3** Scale: 3/4" = 1'-0"  
**DETAIL A6-H/A-3** Scale: 3/4" = 1'-0"



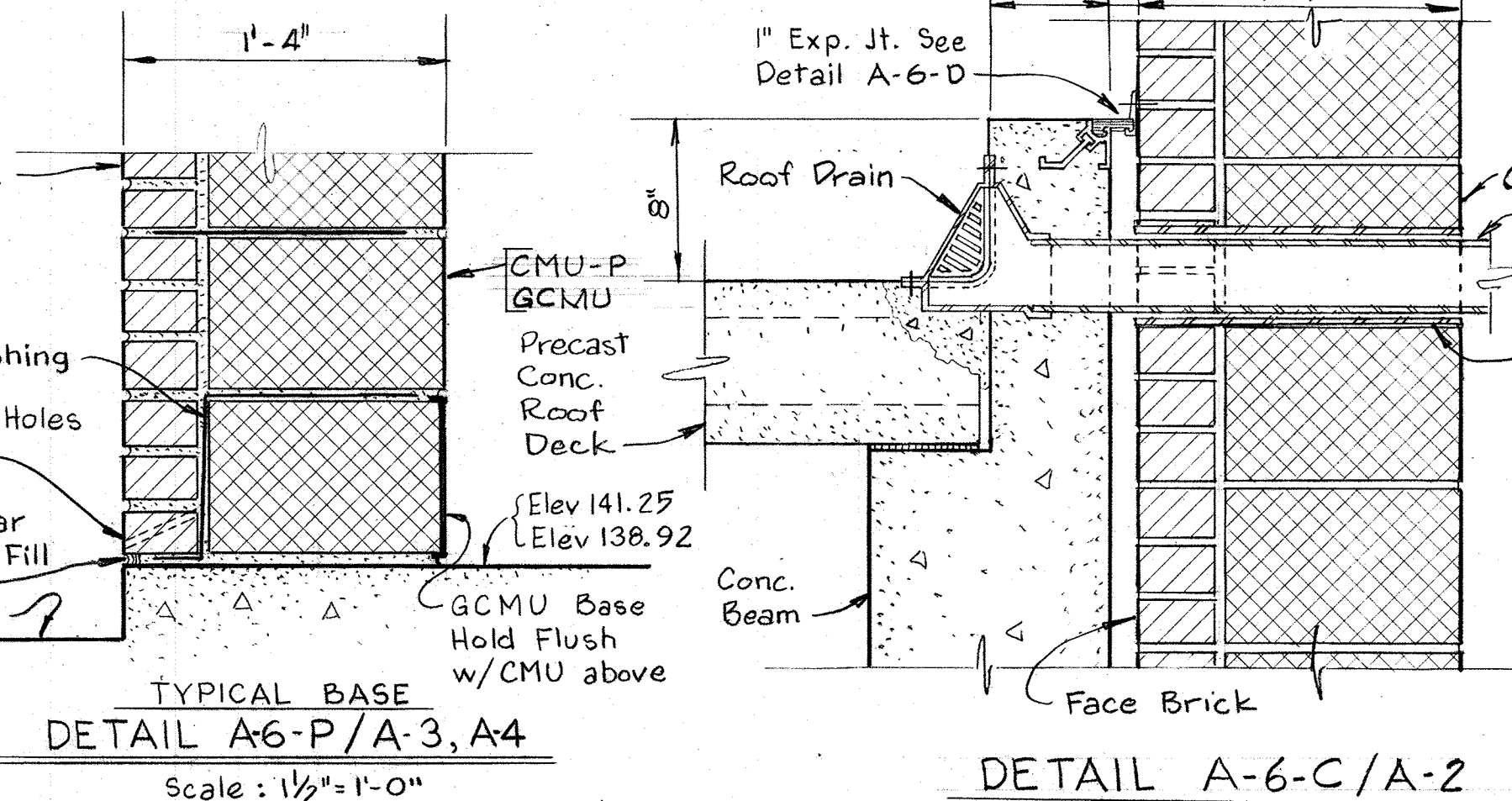
**TYPICAL CONTROL JOINT**  
**DETAIL A6-J/A3, A-4**  
Scale: 1 1/2" = 1'-0"



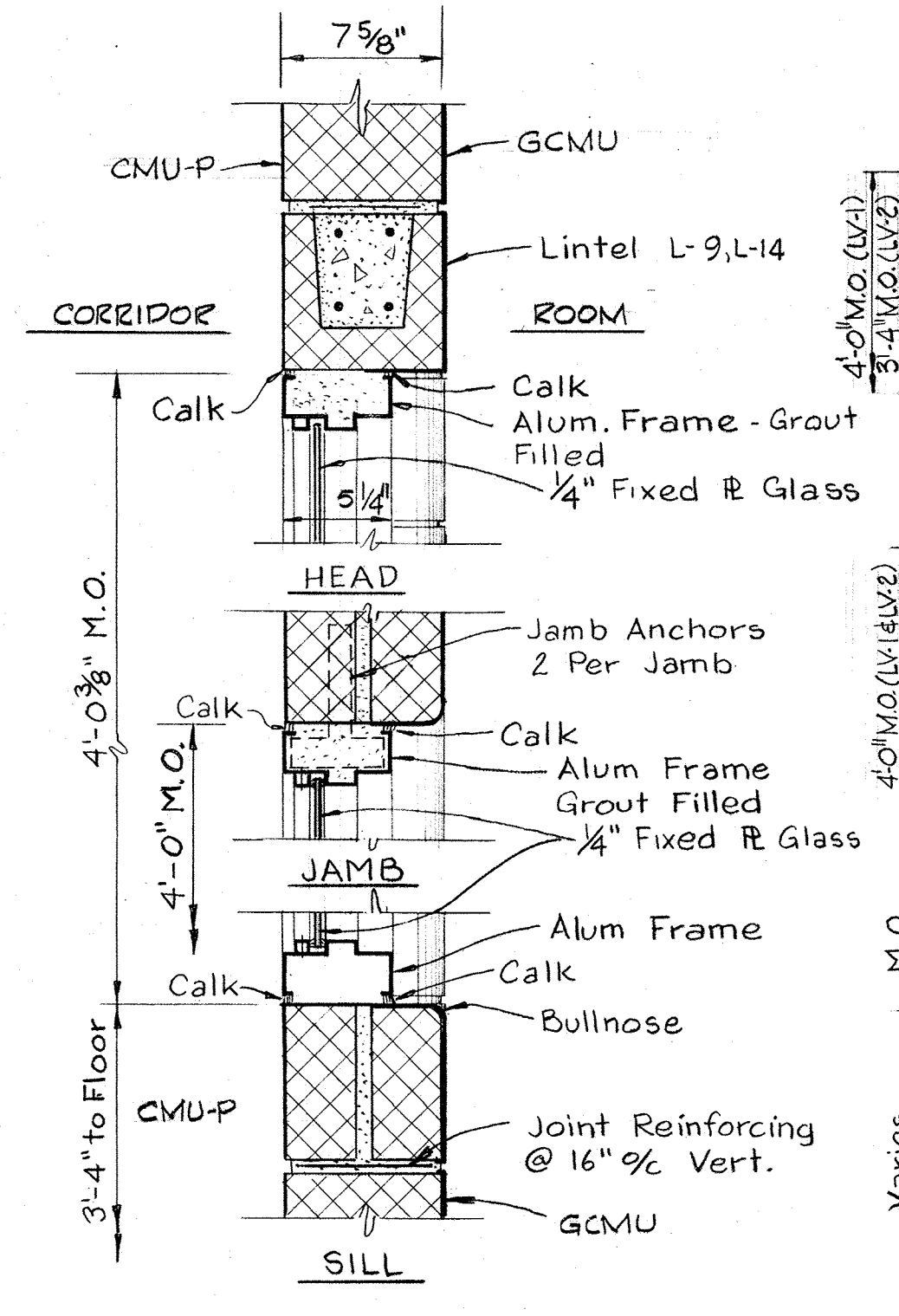
**DETAIL A6-M/A-5**  
Scale: 3" = 1'-0"



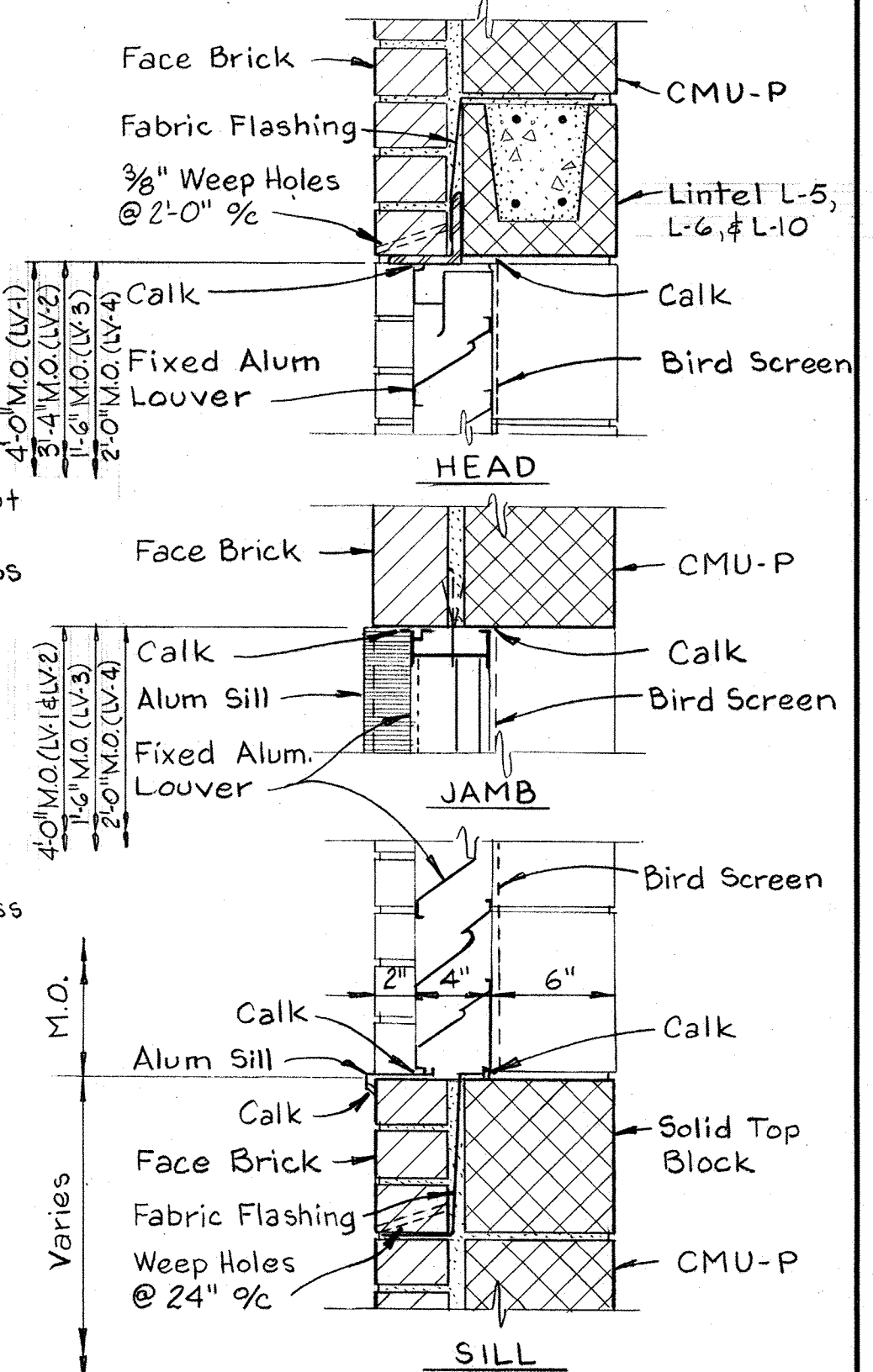
**DETAIL A6-N/A-1**  
Scale: 1 1/2" = 1'-0"



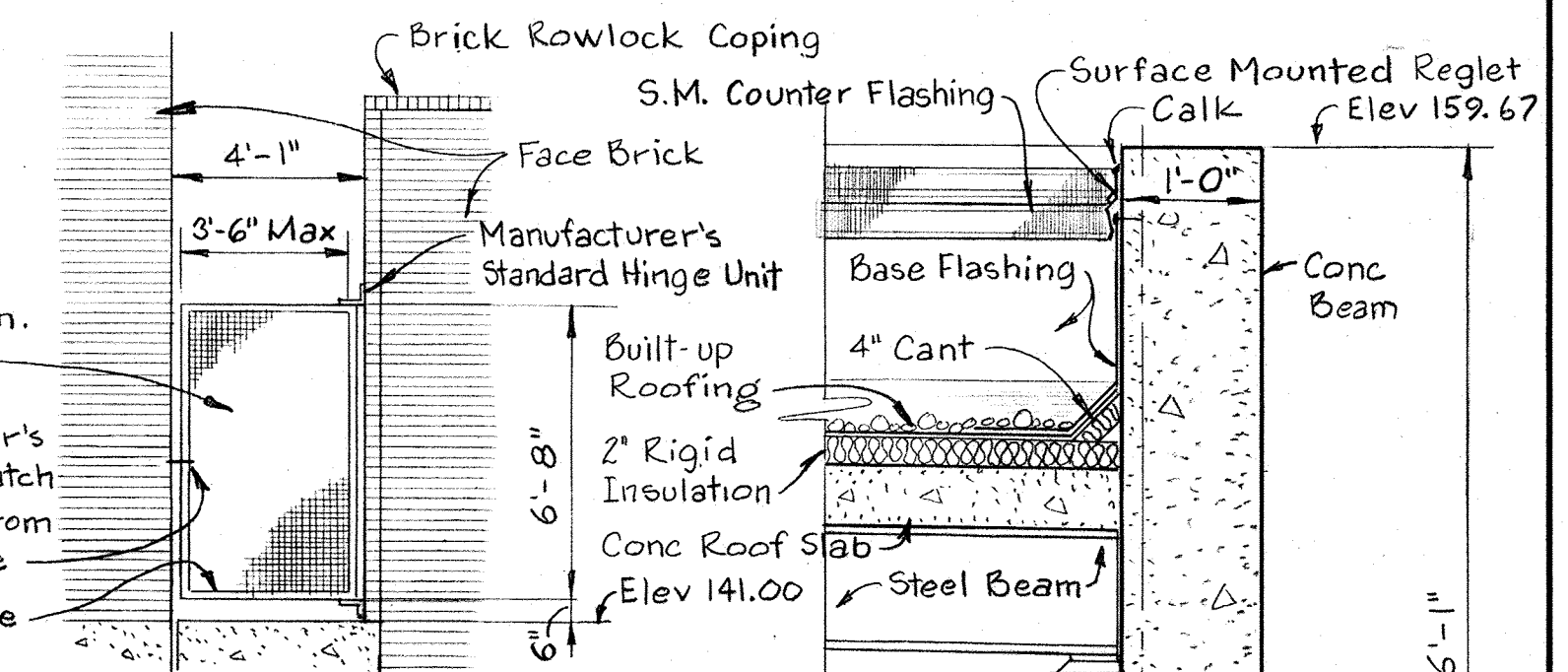
**TYPICAL BASE**  
**DETAIL A6-P/A-3, A-4**  
Scale: 1 1/2" = 1'-0"



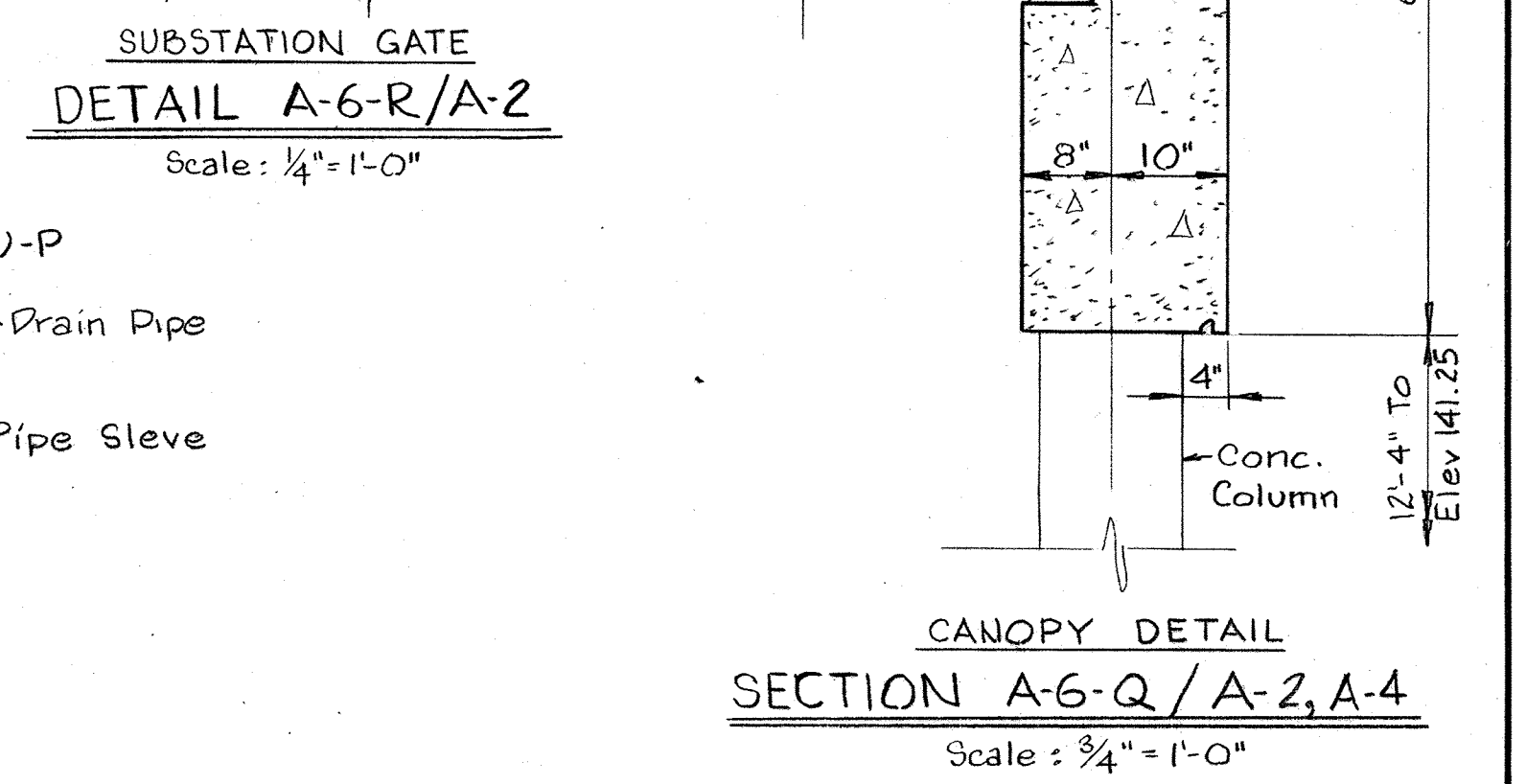
**FIXED VIEW WINDOW**  
**SECTION A6-K/A-4**  
Scale: 1 1/2" = 1'-0"



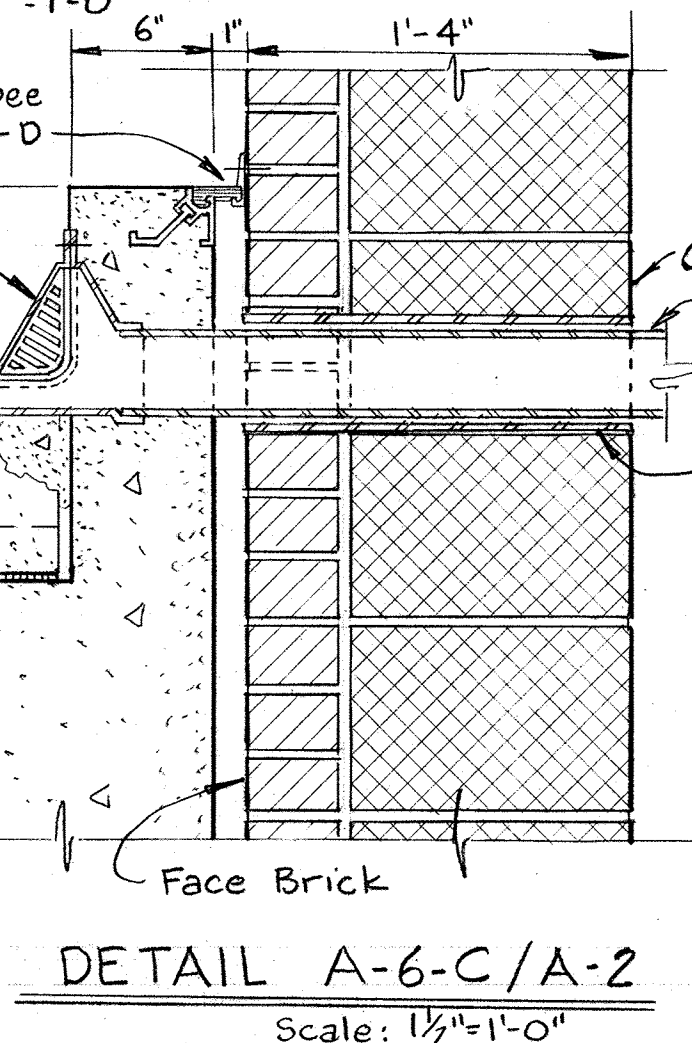
**TYPICAL LOUVER**  
**SECTION A6-L/A-3, A-4**  
Scale: 1 1/2" = 1'-0"



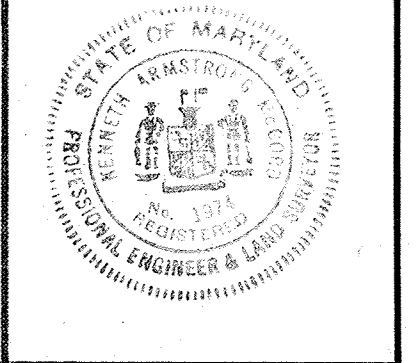
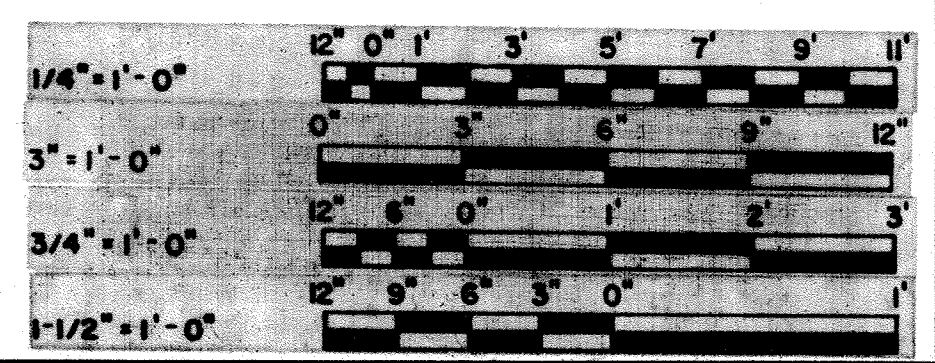
**SUBSTATION GATE**  
**DETAIL A6-R/A-2**  
Scale: 1/4" = 1'-0"



**CANOPY DETAIL**  
**SECTION A6-Q/A-2, A-4**  
Scale: 3/4" = 1'-0"



**DETAIL A-6-C/A-2**  
Scale: 1 1/2" = 1'-0"



|   |   |                    |                    |   |                            |                      |
|---|---|--------------------|--------------------|---|----------------------------|----------------------|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br>Richard S. Freudenberger<br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING<br>NO. 17<br>OF 96 | SCALE<br>AS<br>NOTED |
|---|---|--------------------|--------------------|---|----------------------------|----------------------|



# FINISH SCHEDULE

ABBREVIATIONS USED IN FINISH SCHEDULE AND DRAWINGS

|          |                                    |        |                            |    |                   |
|----------|------------------------------------|--------|----------------------------|----|-------------------|
| ACT      | ACOUSTICAL TILE                    | HM     | HOLLOW METAL               | SF | SEAMLESS FLOORING |
| ALUM     | ALUMINUM                           | HT     | HEIGHT                     |    |                   |
| CARP     | CARPETING                          | KCPL   | KEENE'S CEMENT PLASTER     |    |                   |
| CFH      | CONCRETE FLOOR HARDENER            | MT     | METAL THRESHOLD            |    |                   |
| CJT      | CONTROL JOINT                      | PLAS-P | PLASTER (P-PAINTED)        |    |                   |
| CMU-P    | CONCRETE MASONRY UNITS-(P-PAINTED) | PTD    | PAPER TOWEL DISPENSER      |    |                   |
| CONC     | CONCRETE                           | PTR    | PAPER TOWEL RECEPTOR       |    |                   |
| ES-P     | EXPOSED STRUCTURE-(P-PAINTED)      | RD     | ROOF DRAIN                 |    |                   |
| EXP. JT. | EXPANSION JOINT                    | SAT    | SUSPENDED ACOUSTICAL TILE  |    |                   |
| FD       | FLOOR DRAIN                        | SST    | STAINLESS STEEL            |    |                   |
| GA       | GAUGE                              | TPD    | TOILET PAPER DISPENSER     |    |                   |
| GCMU     | GLAZED CONCRETE MASONRY UNITS      | VAT    | VINYL ASBESTOS TILE        |    |                   |
| GPDW-P   | GYPSUM DRY WALL-(P-PAINTED)        | VCB    | VINYL COVE BASE            |    |                   |
| HDW      | HARDWARE                           | VCGB   | VINYL COVERED GYPSUM BOARD |    |                   |

| ROOM OR AREA              | FLOOR |       | BASE   |       | WALL   |       | CEILING |       | REMARKS                      |
|---------------------------|-------|-------|--------|-------|--------|-------|---------|-------|------------------------------|
|                           | MAT'L | COLOR | MAT'L  | COLOR | MAT'L  | COLOR | MAT'L   | HT    |                              |
| CHEMICAL ROOM             | SF    |       | SF     |       | GCMU   |       | CONC-P  |       |                              |
| PUMP WELL                 | CFH   |       | CONC-P |       | CONC-P |       | CONC-P  |       |                              |
| CONTROL ROOM              | CFH   |       | GCMU   |       | GCMU-P |       | CONC-P  |       |                              |
| MEN'S TOILET              | SF    |       | SF     |       | GCMU   |       | CONC-P  | 8'-8" |                              |
| WOMEN'S TOILET            | SF    |       | SF     |       | GCMU   |       | CONC-P  | 8'-8" |                              |
| JANITORS CLOSET           | CFH   |       | GCMU   |       | GCMU   |       | CONC-P  | 8'-8" |                              |
| ELECTRICAL SUBSTATION     |       |       |        |       |        |       |         |       |                              |
| CORRIDOR                  | CFH   |       | GCMU   |       | GCMU-P |       | CONC-P  |       | SCREEN WALL-INSIDE FACE ONLY |
| SOPHOMATOR ROOM           | CFH   |       | GCMU   |       | GCMU   |       | CONC-P  |       |                              |
| CHLORINATOR ROOM          | CFH   |       | GCMU   |       | GCMU   |       | CONC-P  |       |                              |
| D.O. BLOWER ROOM          | CFH   |       | GCMU   |       | GCMU   |       | CONC-P  |       |                              |
| DISINFECTION CONTROL ROOM | CFH   |       | GCMU   |       | GCMU   |       | CONC-P  |       |                              |
| SCALE ROOM                | CFH   |       | GCMU   |       | GCMU-P |       | CONC-P  |       |                              |

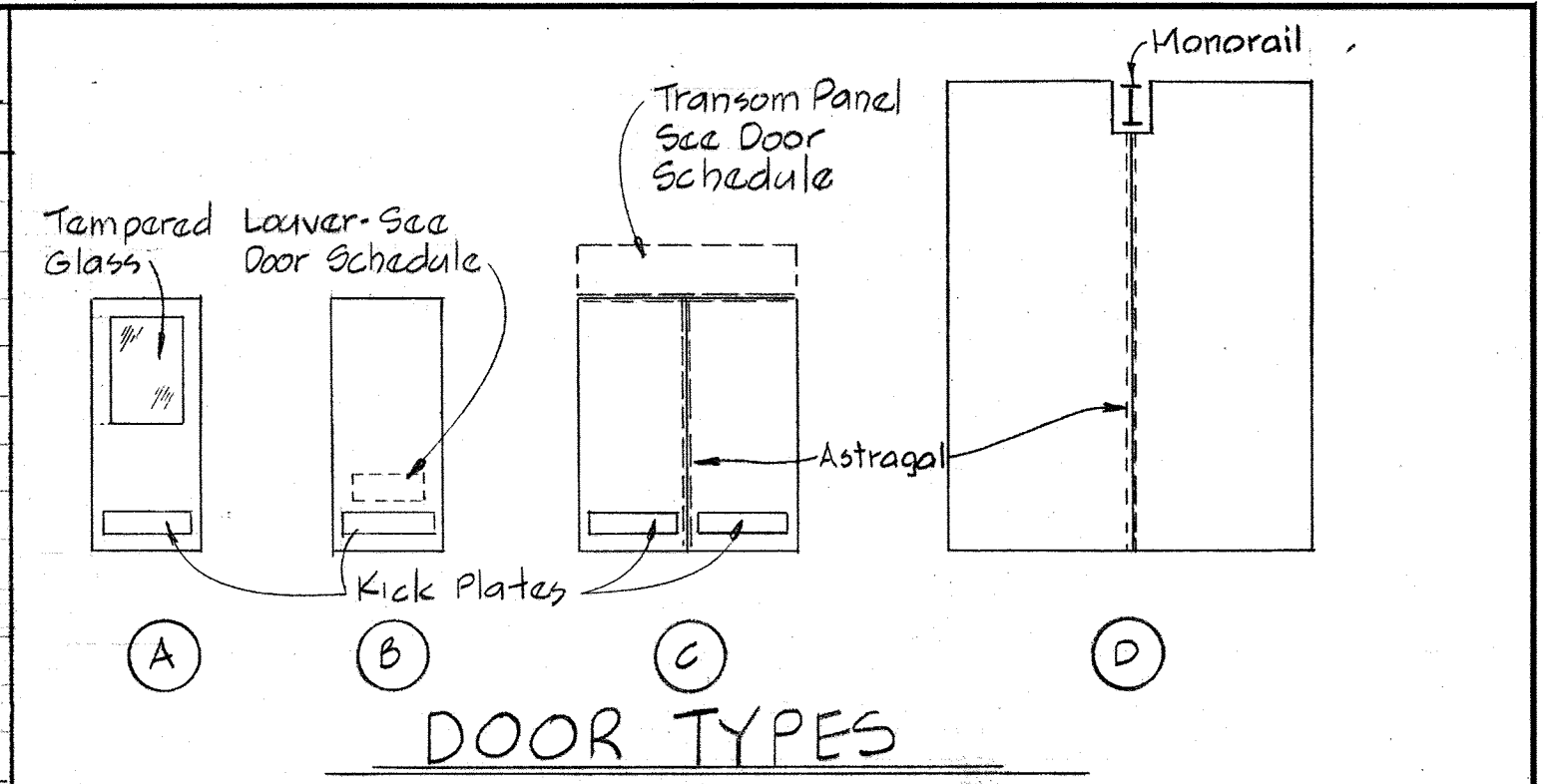
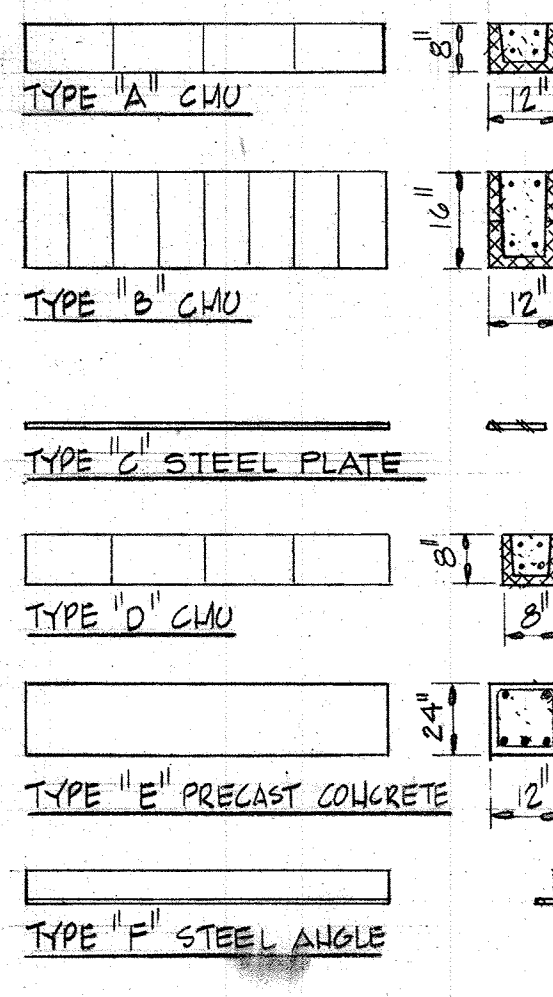
# DOOR SCHEDULE

| NO.  | SIZE                    | MAT'L | TYPE | HEAD              | JAMB | LINTEL | LOUVER     | KICK PL.    | HDW. | REMARKS                    |
|------|-------------------------|-------|------|-------------------|------|--------|------------|-------------|------|----------------------------|
| D-1  | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-1 |                            |
| D-2  | 2'-3" x 7'-2" x 1 3/4"  | ALUM  | C    | H-2               | J-2  | L-2    |            |             | HW-2 |                            |
| D-2A | 2'-3" x 11'-7" x 1 3/4" | ALUM  | D    | H-2               | J-2  | L-2    |            |             | HW-3 |                            |
| D-3  | 2'-3" x 7'-2" x 1 3/4"  | ALUM  | C    | H-3               | J-2  | L-3    |            | 2'-8" x 30" | HW-4 | 1'-4" REMOVABLE TRANSOM    |
| D-4  | 2'-8" x 7'-2" x 1 3/4"  | ALUM  | B    | H-4               | J-3  | L-4    | 8" x 18" W | 8" x 30"    | HW-5 |                            |
| D-5  | 2'-8" x 7'-2" x 1 3/4"  | ALUM  | B    | H-4               | J-3  | L-4    |            | 8" x 30"    | HW-6 |                            |
| D-6  | 2'-8" x 7'-2" x 1 3/4"  | ALUM  | B    | H-4               | J-3  | L-4    | 8" x 18" W | 8" x 30"    | HW-5 |                            |
| D-7  | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-1 |                            |
| D-8  | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-1 |                            |
| D-9  | NOT USED                |       |      |                   |      |        |            |             |      |                            |
| D-10 | NOT USED                |       |      |                   |      |        |            |             |      |                            |
| D-11 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-7 |                            |
| D-12 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-7 |                            |
| D-13 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-5               | J-4  | L-7    |            | 8" x 30"    | HW-8 |                            |
| D-14 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-5               | J-4  | L-7    |            | 8" x 30"    | HW-8 |                            |
| D-15 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-5               | J-4  | L-7    |            | 8" x 30"    | HW-8 |                            |
| D-16 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-5               | J-4  | L-7    |            | 8" x 30"    | HW-8 |                            |
| D-17 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-5               | J-4  | L-7    |            | 8" x 30"    | HW-8 |                            |
| D-18 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-5               | J-4  | L-7    |            | 8" x 30"    | HW-8 |                            |
| D-19 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-7 |                            |
| D-20 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-6               | J-4  | L-7    |            | 8" x 30"    | HW-8 | 1'-4" REMOVABLE TRANSOM    |
| D-21 | 2'-3" x 13'-4"          | STEEL |      | H-7               | J-5  | L-8    |            |             |      | SLIDING DOOR - MOTOR OPER. |
| D-22 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-7 |                            |
| D-23 | 3'-0" x 7'-2" x 1 3/4"  | ALUM  | A    | H-1               | J-1  | L-1    |            | 8" x 30"    | HW-7 |                            |
| R-1  | 12'-0" x 13'-10"        | STEEL |      | SEE SECTION A-5-J |      |        |            |             |      | MOTOR OPERATED             |

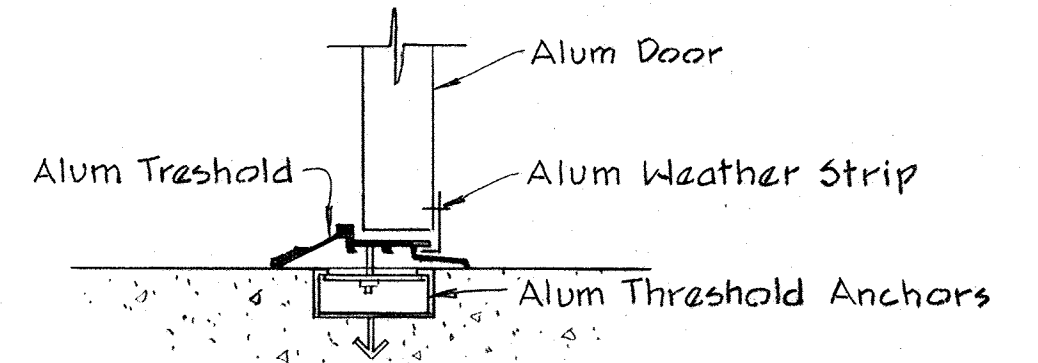
NOTES: 1. Provide Jamb Anchors @ 2'-8" o/c for Doors over 7'-4" M.O. high.  
 2. Kick Plates to be installed on inside face of exterior doors and outside of doors swinging into rooms or corridors.  
 3. All Aluminum hardware on doors except thresholds and threshold anchors shall be Duranodic-Dark Bronze 313.  
 4. All Lintels shall have 8" min. bearing on each end unless otherwise noted.  
 5. Additional masonry lintels as required for mechanical and electrical services shall match reinforcing and bearing requirements indicated on Lintel Schedule.

# LINTEL SCHEDULE

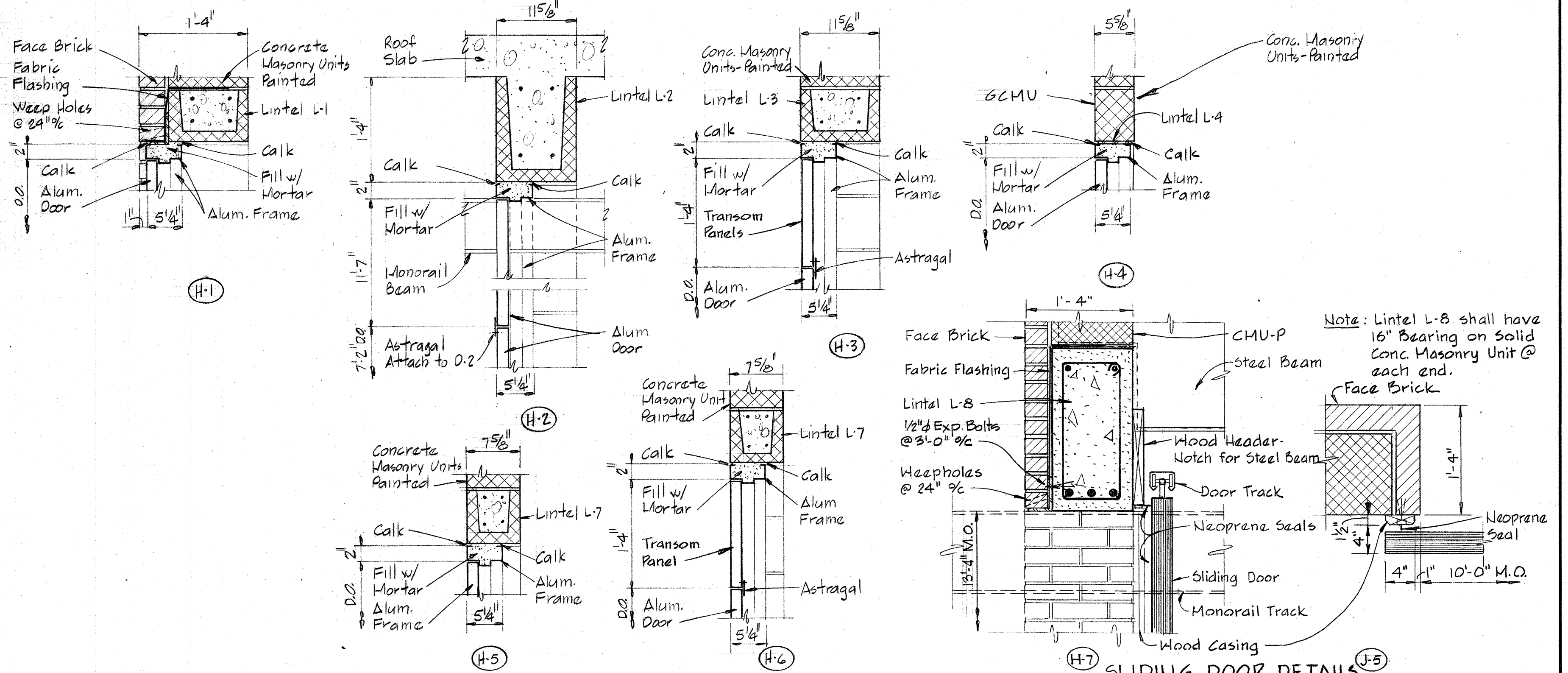
| NO.  | TYPE | H.O.   | REINFORCING            | LISC. STEEL             | REMARKS                       |
|------|------|--------|------------------------|-------------------------|-------------------------------|
| L-1  | A-F  | 3'-4"  | 2 #5 (T&B)             | L5" x 3 1/2" x 5/8" LLV | D-1, 8, 11, 12, 19, 22, 23, 7 |
| L-2  | B    | 6'-4"  | 2 #5 (T&B)             |                         | D-2A                          |
| L-3  | A    | 6'-4"  | 2 #5 (T&B)             |                         | D-3                           |
| L-4  | C    | 3'-0"  |                        | R 5/16" x 5"            | D-4, 5, 6                     |
| L-5  | D-F  | 1'-6"  | 2 #5 (T&B)             | L5" x 3 1/2" x 5/8" LLV | LV-3 (SECTION A-6-L)          |
| L-6  | D-F  | 2'-0"  | 2 #5 (T&B)             | L5" x 3 1/2" x 5/8" LLV | LV-4 (SECTION A-6-L)          |
| L-7  | D    | 3'-4"  | 2 #5 (T&B)             |                         | D-13, 14, 15, 16, 17, 18, 20  |
| L-8  | E-F  | 10'-0" | 2 #5 Top, 3 #10 Bottom | L5" x 3 1/2" x 5/8" LLV | D-21-16" BEARING EACH END     |
| L-9  | D    | 4'-0"  | 2 #5 (T&B)             |                         | SECTION A-6-K, A-5-F          |
| L-10 | A-F  | 4'-0"  | 2 #5 (T&B)             | L5" x 3 1/2" x 5/8" LLV | LV-1, LV-2 (SECTION A-6-L)    |
| L-11 | D    | 12'-0" | 2 #5 (T&B)             |                         | SECTION A-5-E                 |
| L-12 | A    | 8'-0"  | 2 #5 (T&B)             |                         | SECTION A-5-H, A-5-G          |
| L-13 | B    | 12'-6" | 2 #5 (T&B)             |                         | SECTION A-5-J                 |
| L-14 | D    | 8'-0"  | 2 #5 (T&B)             |                         | SECTION A-6-K                 |



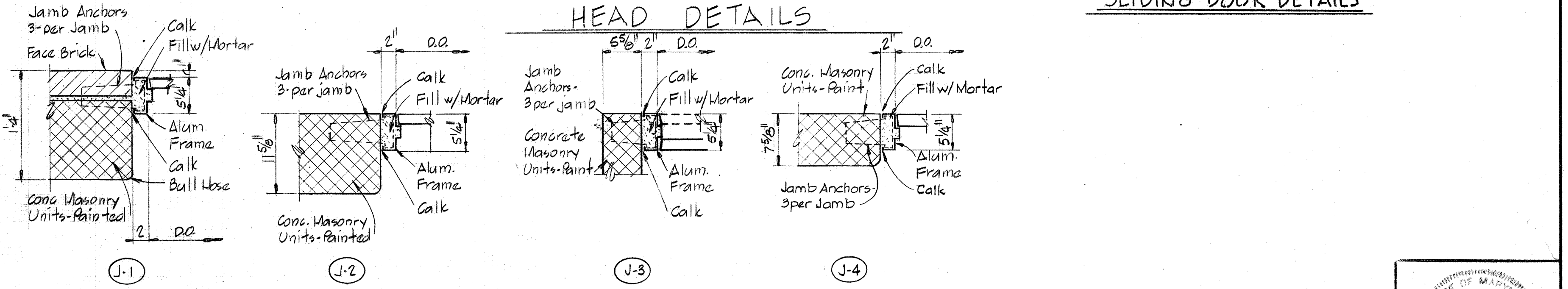
DOOR TYPES



TYPICAL THRESHOLD



HEAD DETAILS



JAMB DETAILS

Scale: 1"=1'-0"

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

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 12/13/77  
 DATE  
 Richard E. Freudenberg  
 CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

SCHEDULES & DETAILS

SAVAGE WASTEWATER  
 TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 19 OF 96  
 SCALE AS NOTED



**CONCRETE NOTES**

- All concrete shall have a minimum compressive strength of 3,500 p.s.i. at 28 days.
- Reinforced concrete has been designed and shall be constructed in accordance with the current A.C.I. Specification 318-71 and all supplements to the code. All structures have been designed using the alternate design method.
- All reinforcing steel shall conform to A.S.T.M. A615-76a Grade 40.
- Concrete cover for reinforcing shall be as follows, unless noted otherwise on the drawings;
 

|   | Minimum Cover, in. |
|---|--------------------|
| a. Bottom bars in unformed concrete cast against and permanently exposed to earth, rock, gravel or crushed stone. | 3                  |
| b. Beams, columns, walls, slabs, or piers exposed to earth, weather or process liquid after removal of forms.     | 2                  |
| c. Beams, columns, walls, or piers not exposed to earth, weather or process liquid.                               | 1 1/2              |
| d. Slabs not exposed to earth, weather or process liquid.   | 3/4                |
- Exposed concrete edges shall be chamfered 3/4" unless noted otherwise.
- Slabs and walls shall be poured between indicated joints, allowing a minimum period of 3 days to elapse between adjacent pours.
- Construction and expansion joints shall be as shown on the drawings and no additional joints shall be used nor any omitted except by the written authorization of the Engineer.
- Splices in reinforcement shall be class C splice lengths as per A.C.I. 318-71 unless noted otherwise on the drawings.
- Embedment length shall be equal to the development length in accordance with A.C.I. 318-71 unless shown otherwise on the drawings.
- Horizontal bars in walls shall be considered top bars.
- See Civil, Architectural, Mechanical and Electrical drawings for all embedded items such as pipe sleeves, anchors, electrical conduit openings, chases, etc. which interfere with concrete construction.
- Reinforcing bars shall be detailed in accordance with A.C.I. 315-74, "Manual of Standard Practice for Detailing Reinforced Concrete".

**FOUNDATION NOTES**

- 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.
- Maximum density and optimum moisture shall be in accordance with AASTHO test designation "T180-74 method D".
- All foundations have been designed for a maximum allowable soil bearing pressure of 4,000 p.s.f.

**STRUCTURAL ALUMINUM NOTES**

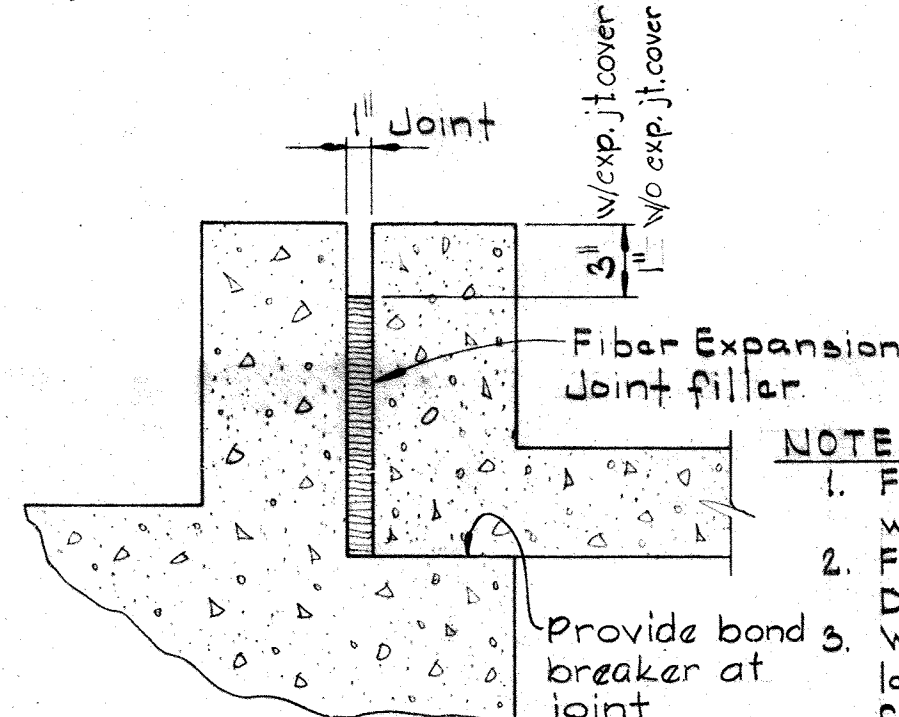
- All structural aluminum is designed and shall be fabricated in accordance with the current specification of the Aluminum Association.
- All structural aluminum shall be alloy 6061-T6.
- All aluminum in contact with concrete or a dissimilar metal shall, before erection, be heavily coated as specified.
- All aluminum grating shall be capable of supporting a live load of 150 p.s.f. with a maximum deflection of 1/4" at 100 p.s.f.

**PRECAST PRESTRESSED CONCRETE PLANK**

- Roof slabs shall be precast prestressed concrete plank.
- Planks shall be designed for a superimposed load of 35 p.s.f. for the spans shown on the drawings.
- Plank manufacturer shall design and supply the saddles required at openings in planks.

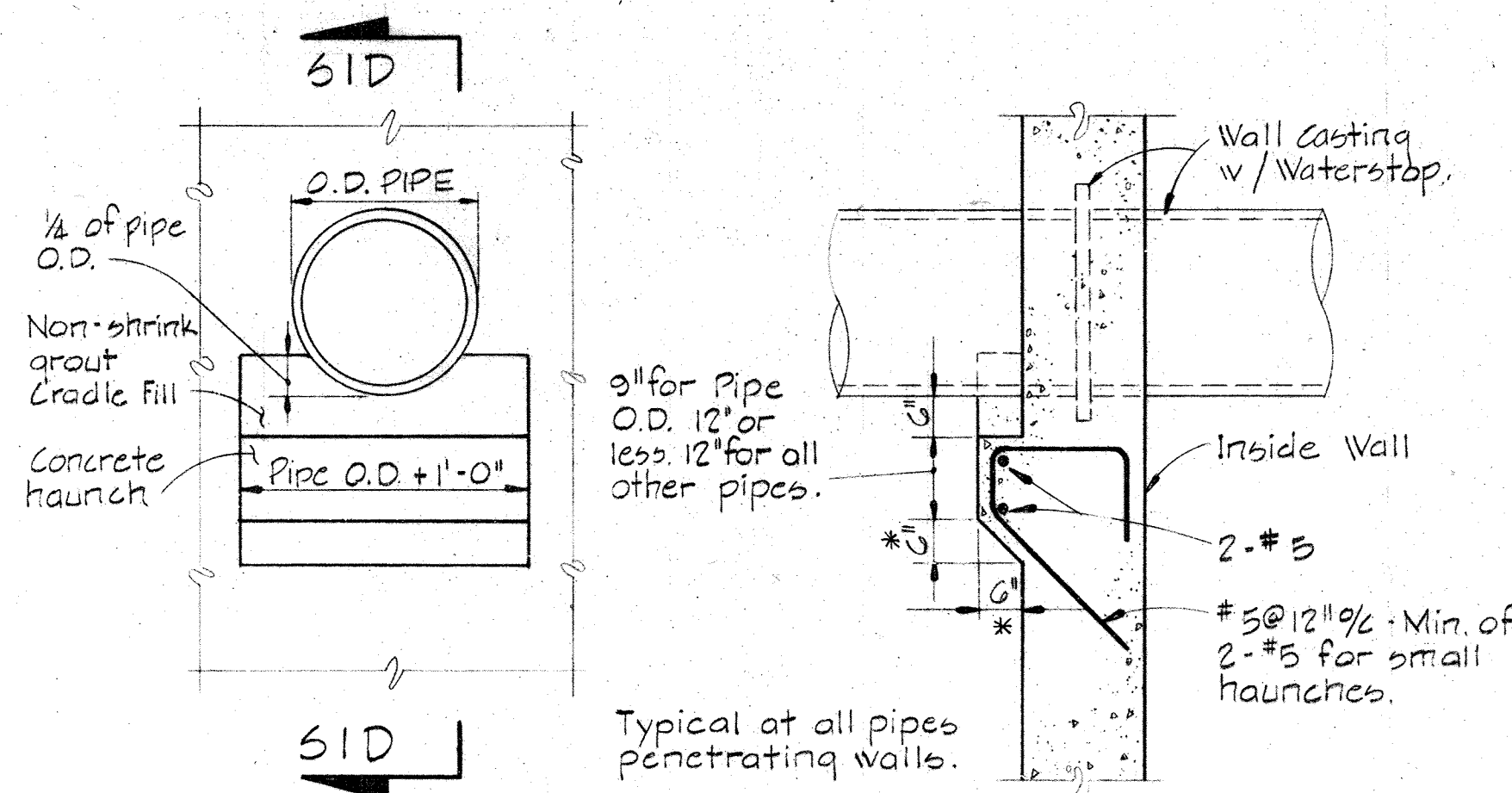
**DESIGN LIVE LOADS**

Roof 30 p.s.f.  
 Floors 125 p.s.f. + Equipment.  
 Platforms 125 p.s.f. + Equipment.



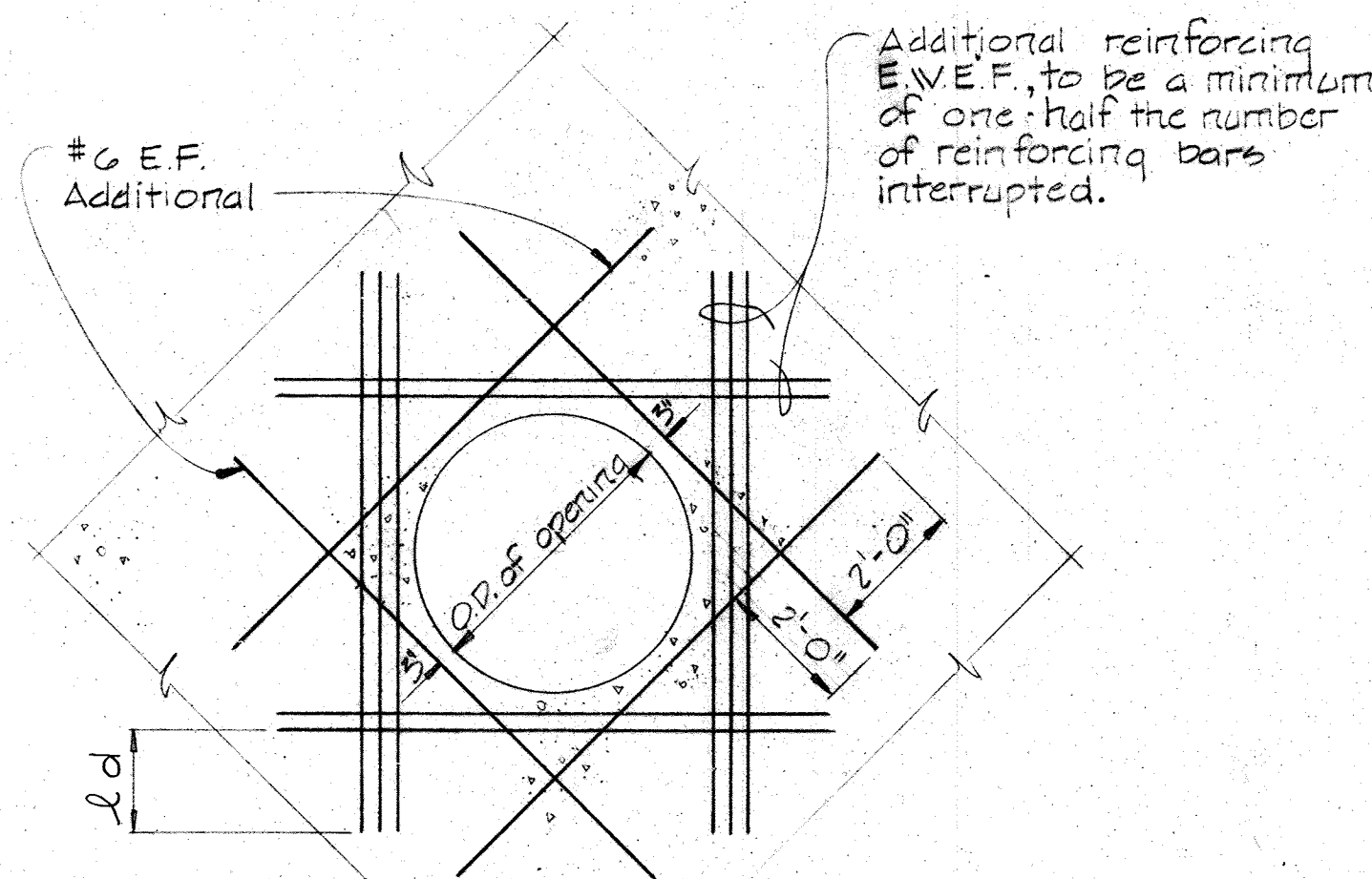
**TYPICAL EXPANSION JOINT BETWEEN WALLS**  
 Scale: None

- NOTES:**
- Fasten Fiber Expansion joint filler to wall with adhesive.
  - For Exp. Jt. cover see Architectural Drawings.
  - Where no Exp. Jt. cover occurs, place a layer of building paper on top of the Fiber Jt. filler and apply specified sealant.

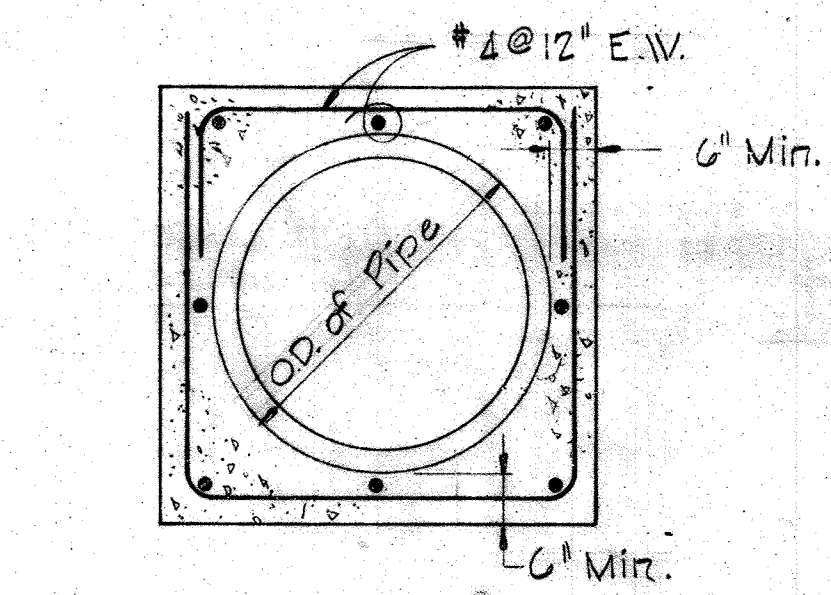


**ELEVATION SECTION SID/SI**  
**TYPICAL PIPE HAUNCH DETAIL**  
 Scale: 1/2" = 1'-0"

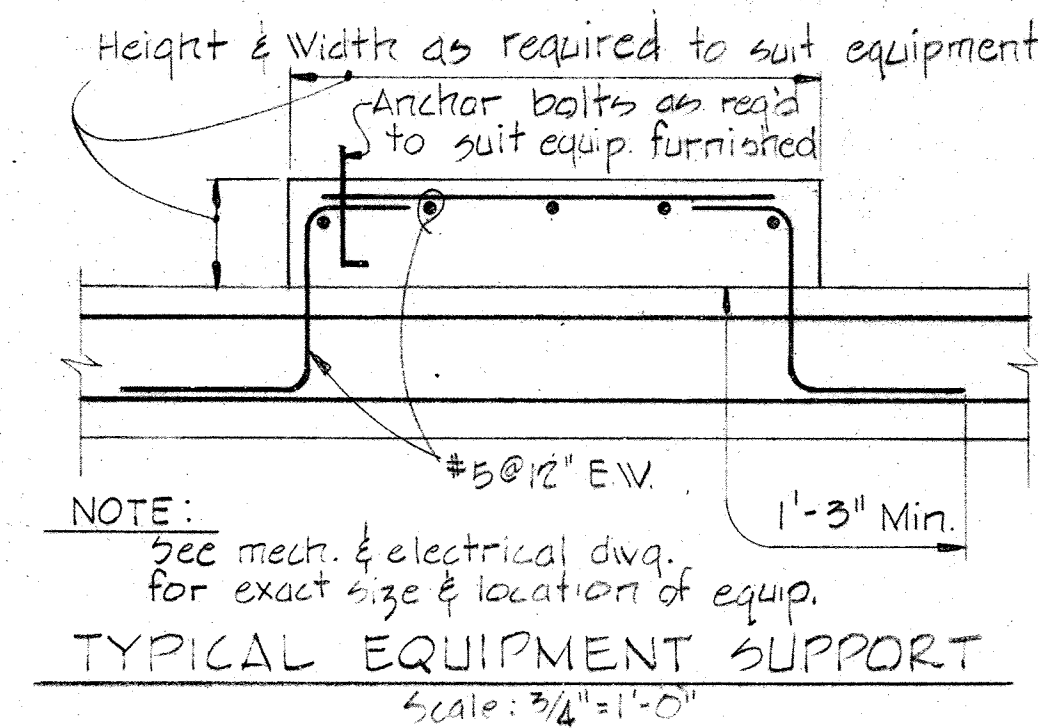
- NOTES:**
- Where invert of pipe is 2'-0" or less above footing, omit haunch and build cradle on extension of footing.
  - Concrete haunch, as shown, shall apply for 12" and smaller pipes. For larger pipes increase dimensions marked \* to 9".



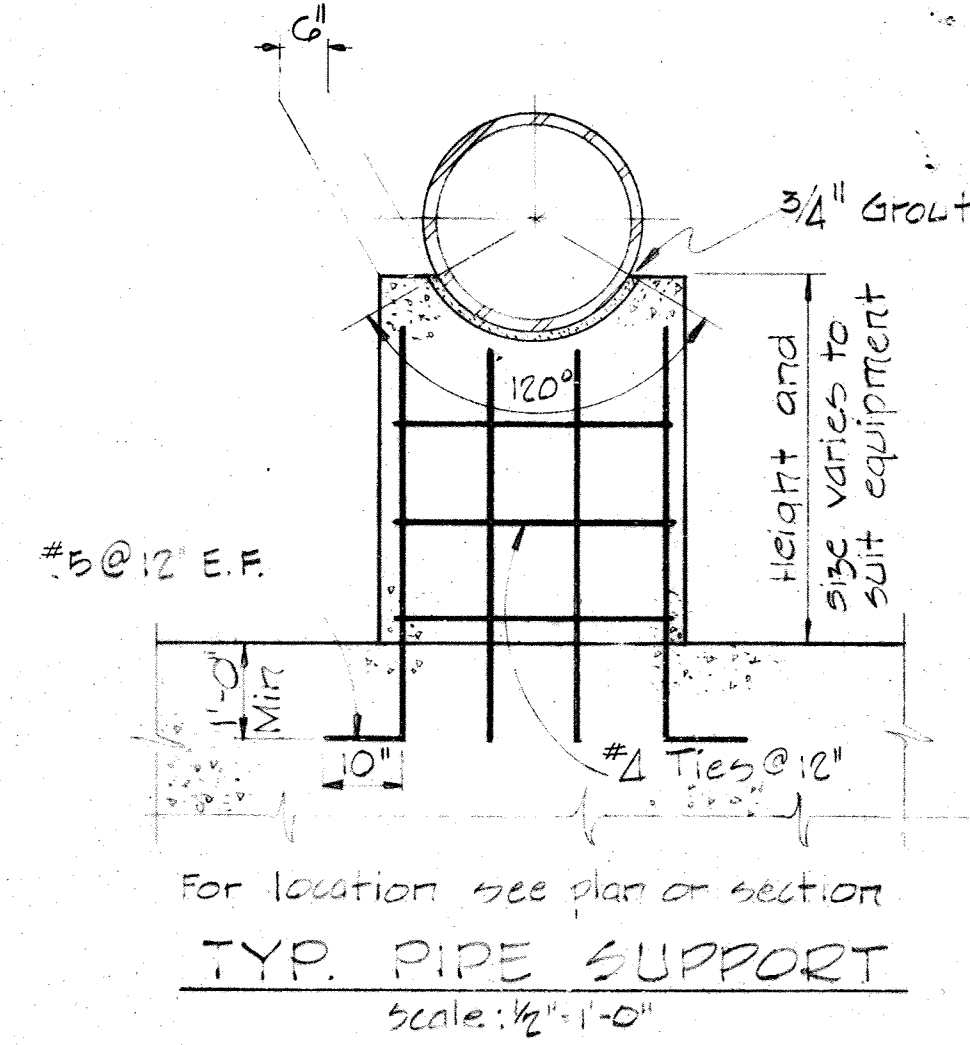
**REINFORCING DETAIL IN SLAB OR WALL FOR PIPE OR MANHOLE**  
 Scale: 3/8" = 1'-0"



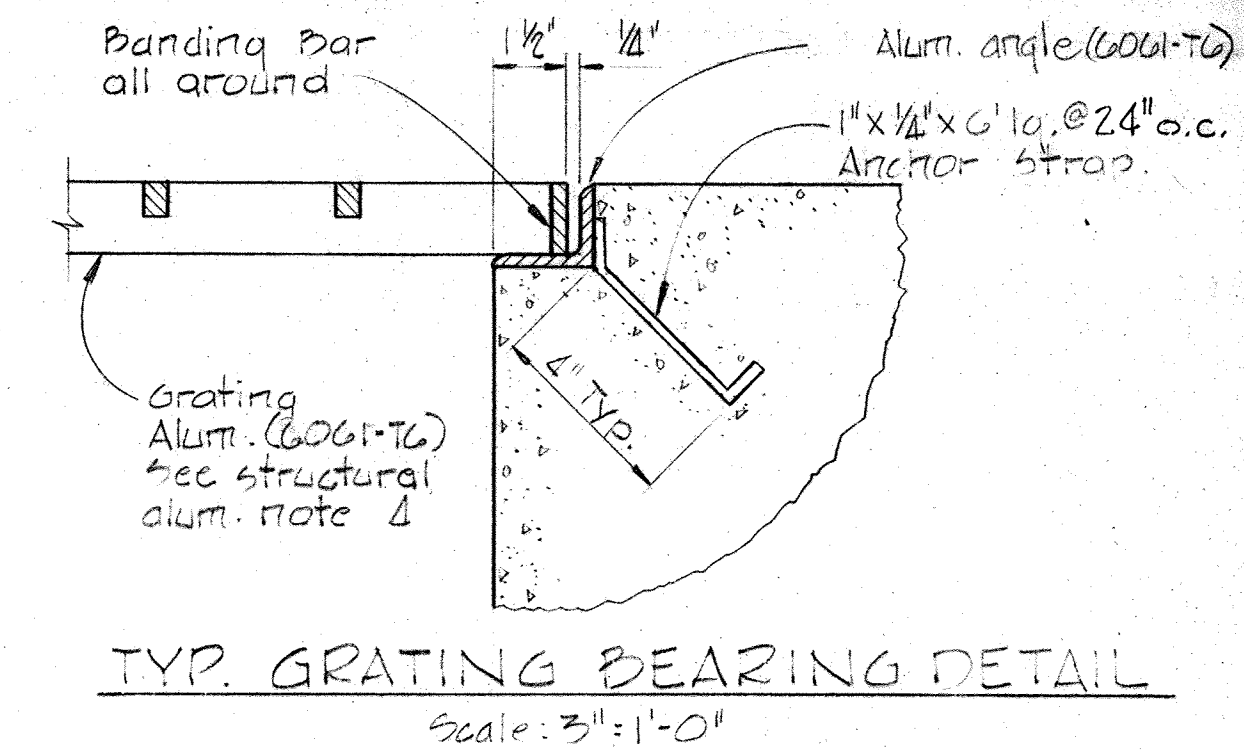
**TYPICAL CONCRETE ENCASEMENT OF PIPE**  
 Scale: None



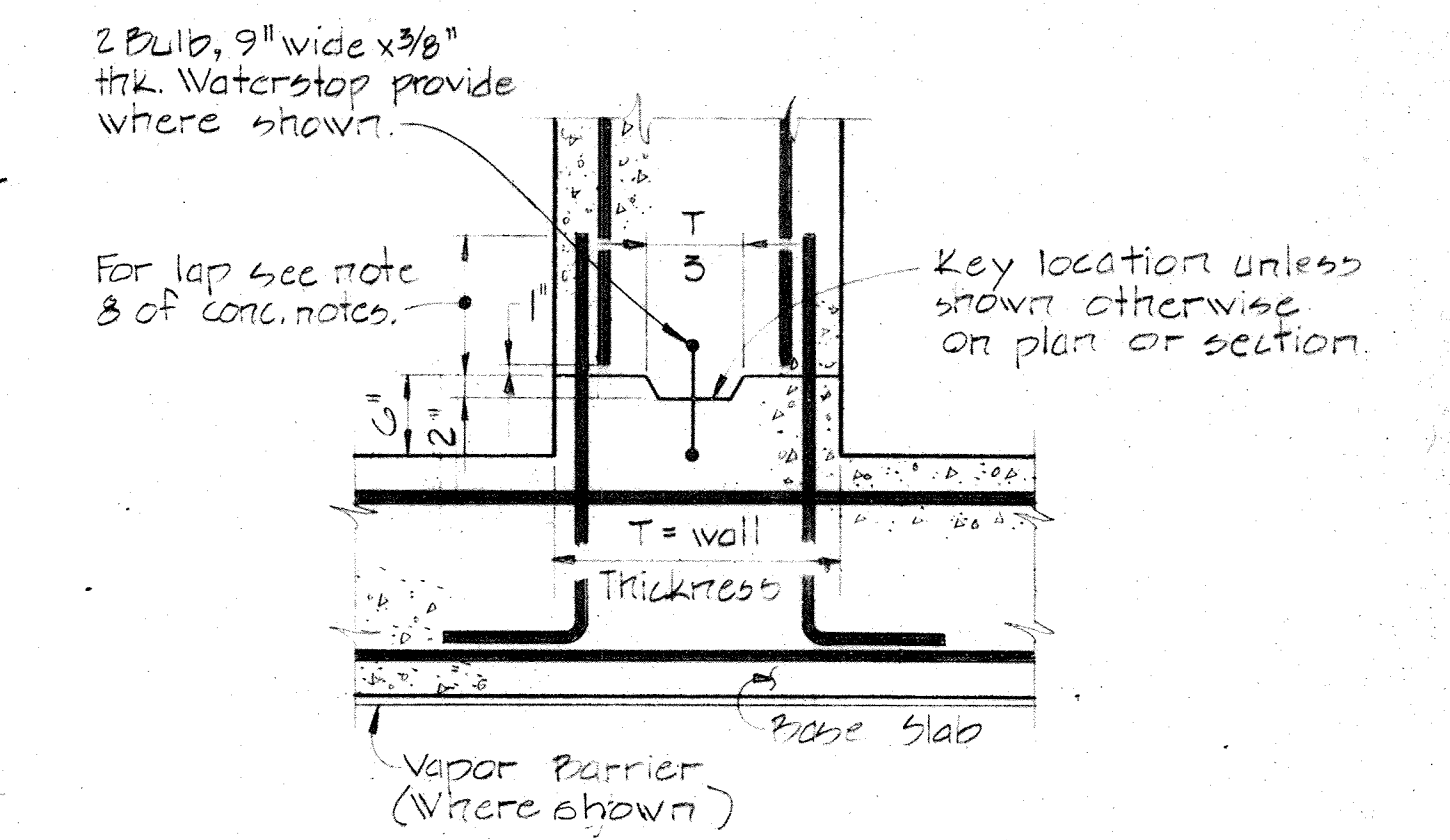
**TYPICAL EQUIPMENT SUPPORT**  
 Scale: 3/4" = 1'-0"



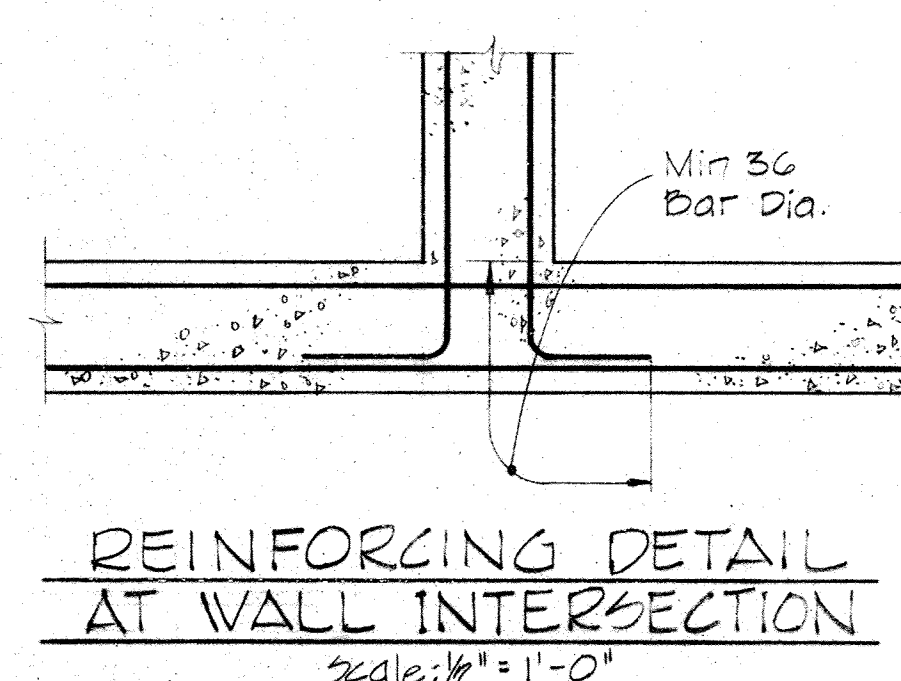
**TYP. PIPE SUPPORT**  
 Scale: 1/2" = 1'-0"



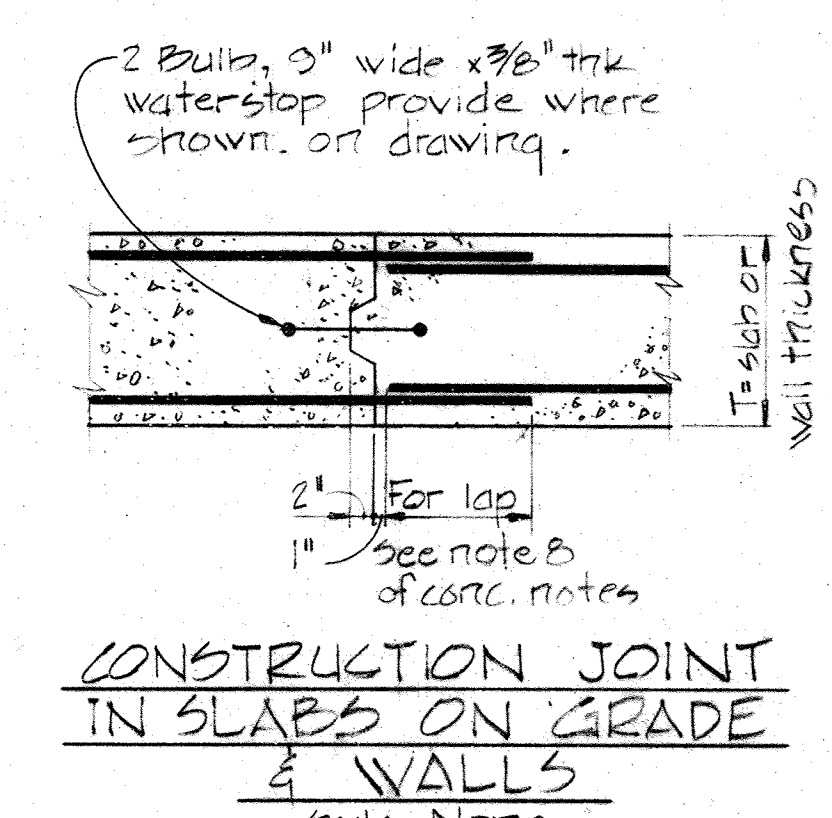
**TYP. GRATING BEARING DETAIL**  
 Scale: 3/4" = 1'-0"



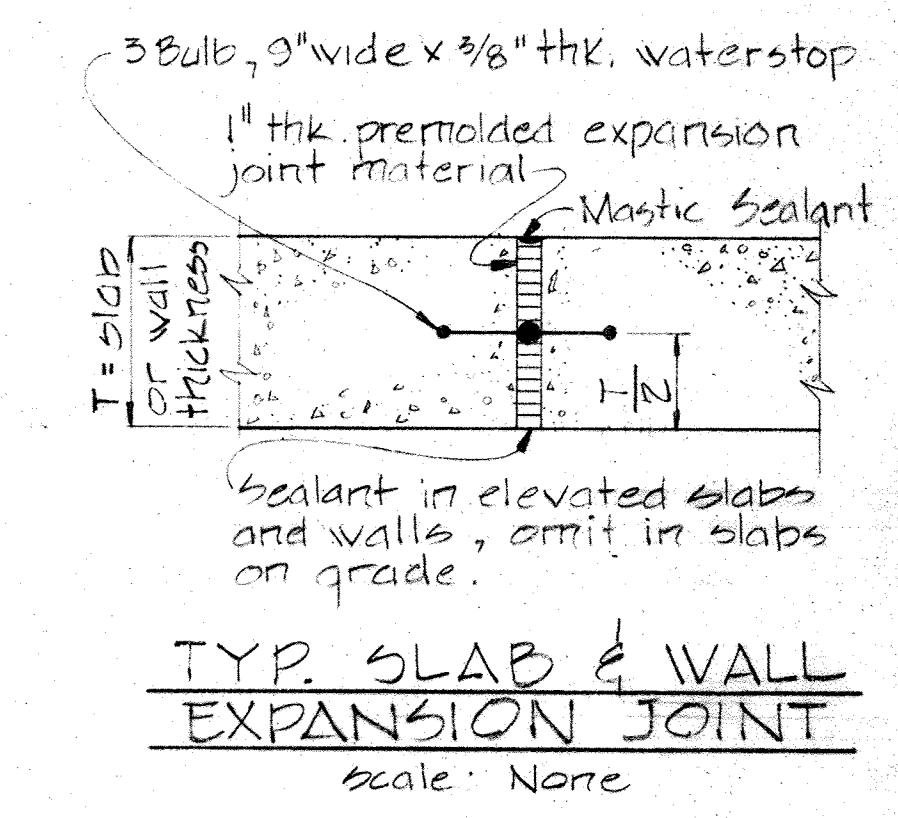
**HORIZONTAL CONSTRUCTION JOINT IN WALLS & BASE SLAB**  
 Scale: None



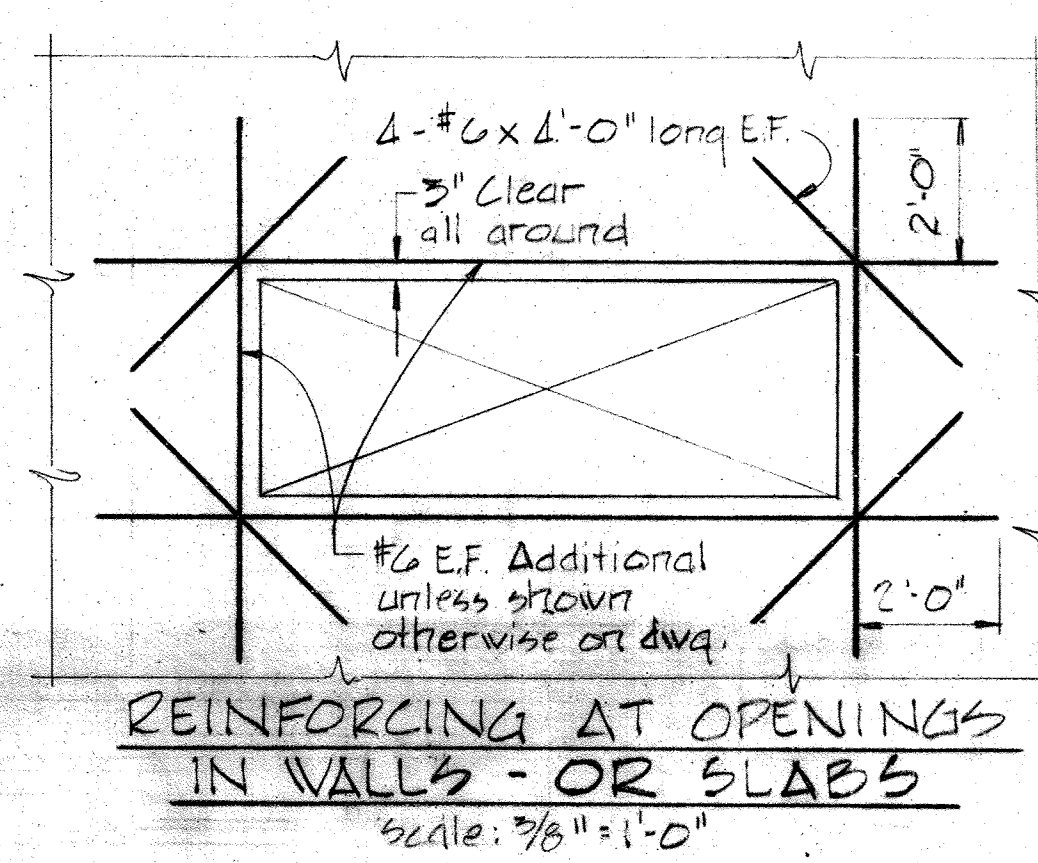
**REINFORCING DETAIL AT WALL INTERSECTION**  
 Scale: 1/2" = 1'-0"



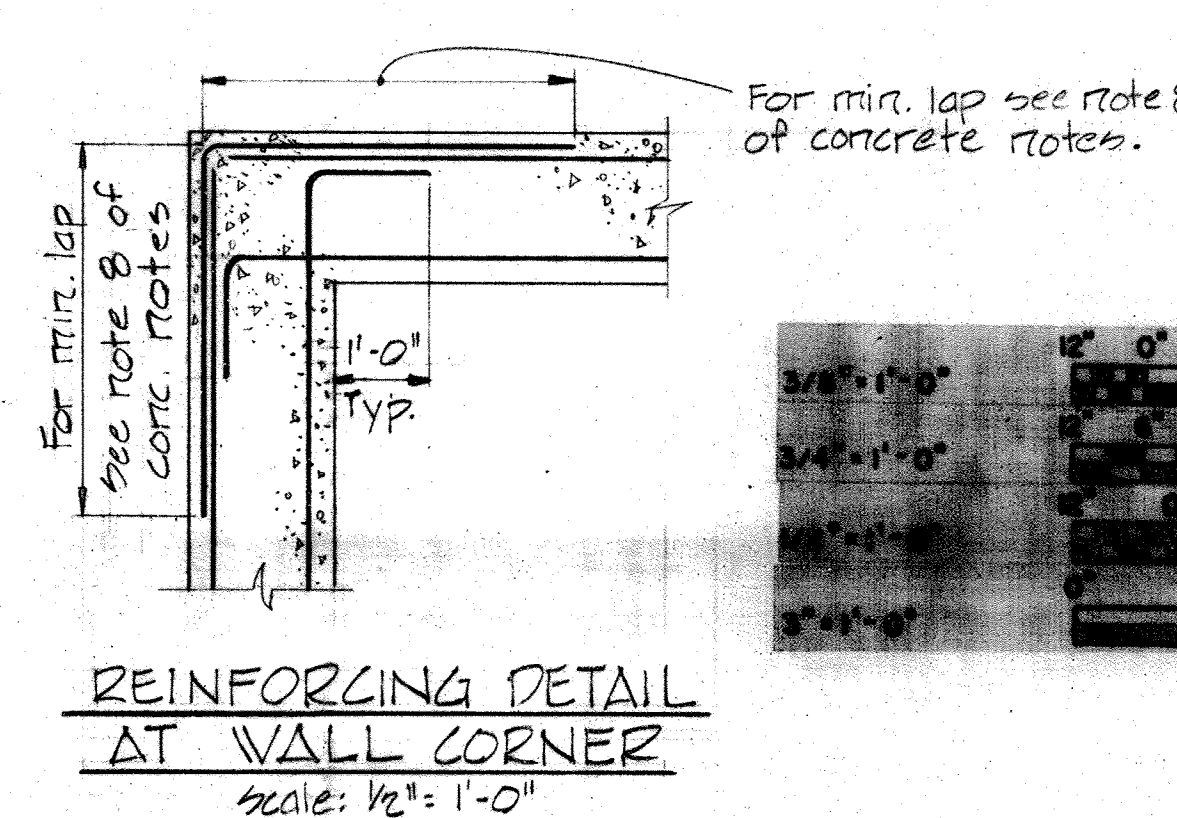
**CONSTRUCTION JOINT IN SLABS ON GRADE & WALLS**  
 Scale: None



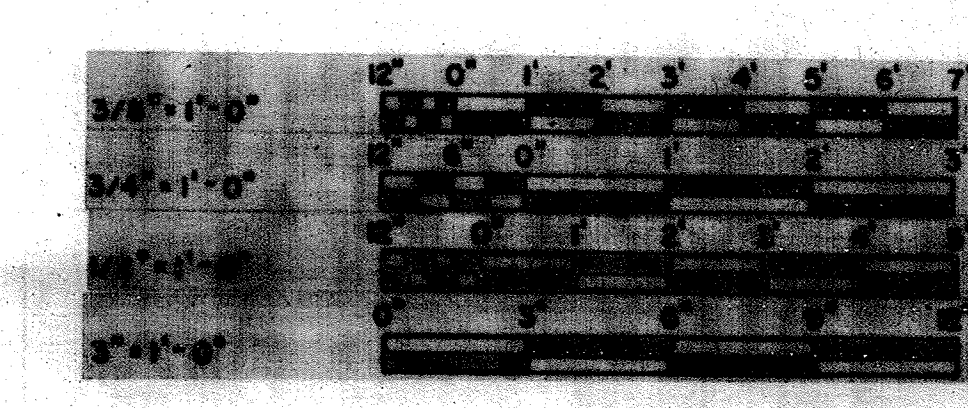
**TYP. SLAB & WALL EXPANSION JOINT**  
 Scale: None



**REINFORCING AT OPENINGS IN WALLS - OR SLABS**  
 Scale: 3/8" = 1'-0"

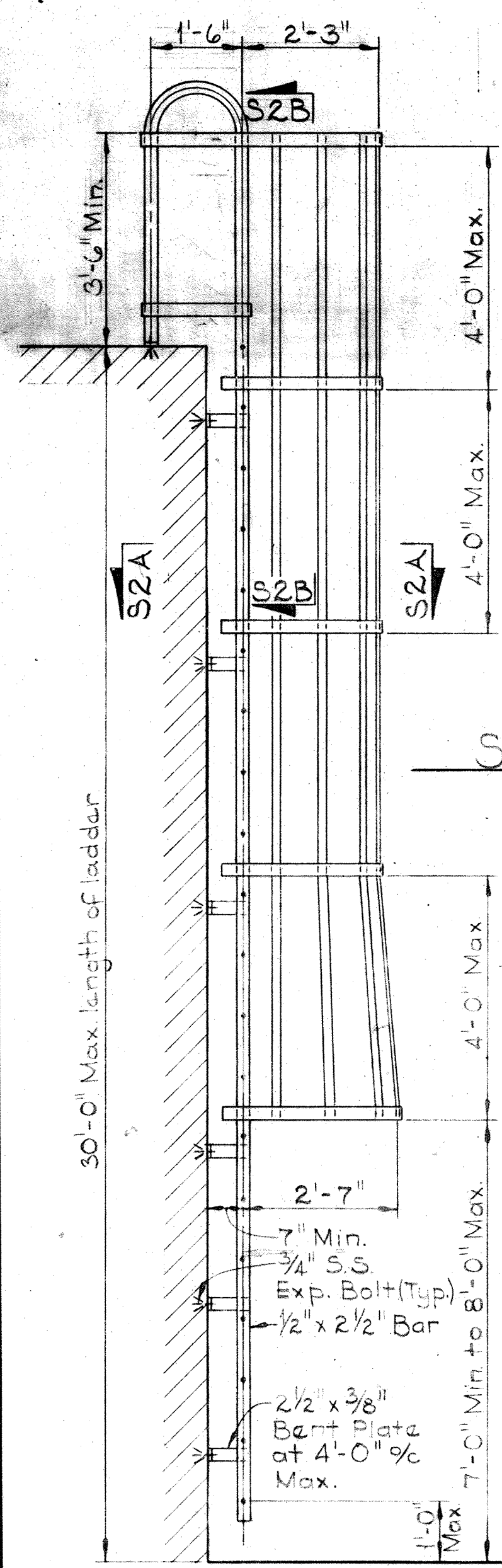


**REINFORCING DETAIL AT WALL CORNER**  
 Scale: 1/2" = 1'-0"

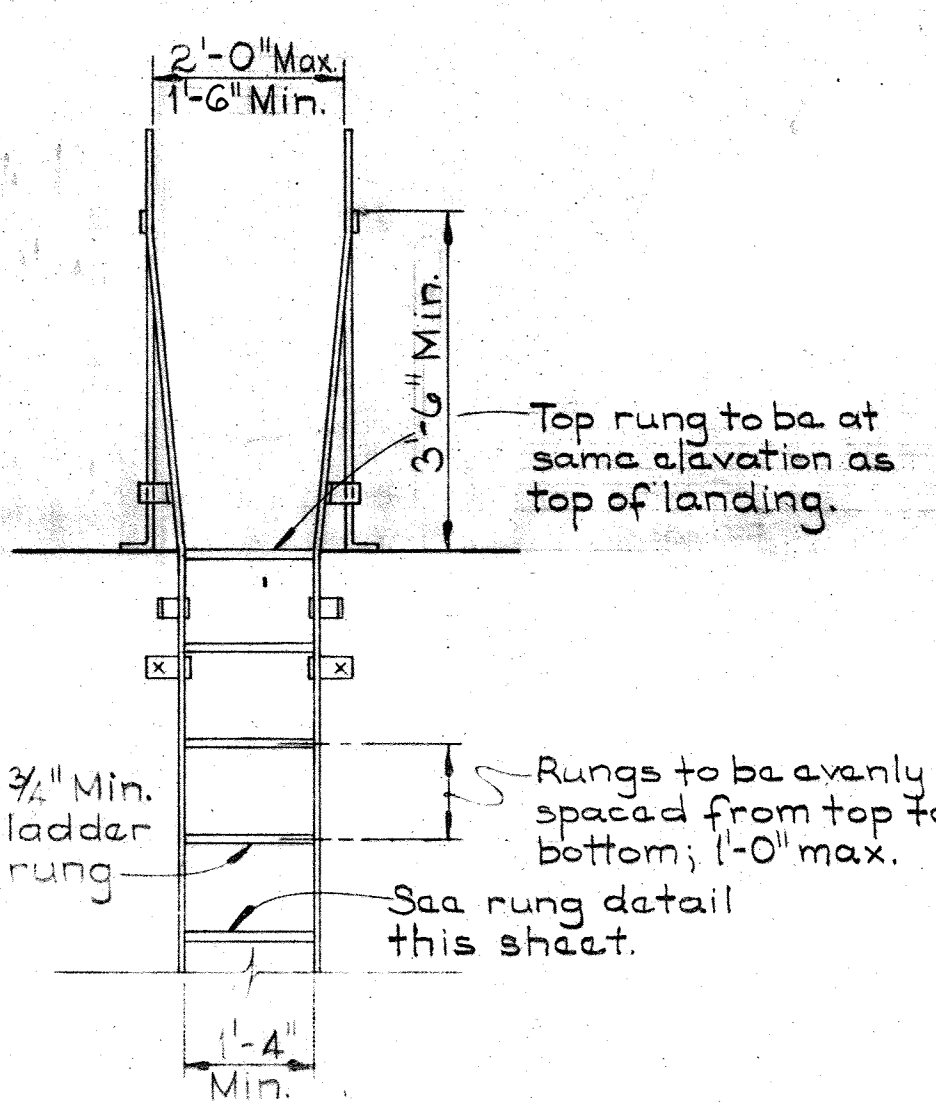


|   |  |                    |                                       |  |                         |                |
|---|--|--------------------|---------------------------------------|--|-------------------------|----------------|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br>Richard E. Freudenberg<br>CHIEF - BUREAU OF ENVIRONMENTAL SERV. CES | CONTRACT NO. 502-S | STRUCTURAL NOTES 8<br>TYPICAL DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO.4 | DRAWING NO. 19<br>OF 96 | SCALE AS NOTED |
|---|--|--------------------|---------------------------------------|--|-------------------------|----------------|

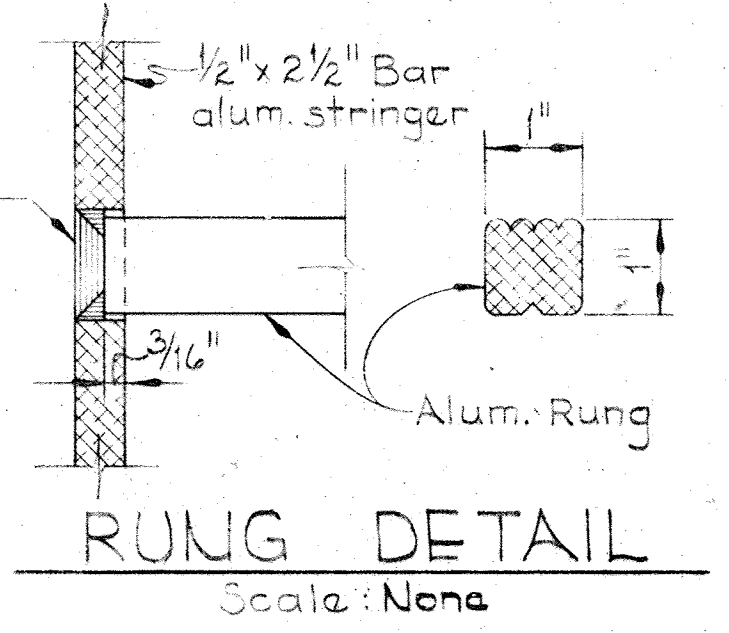




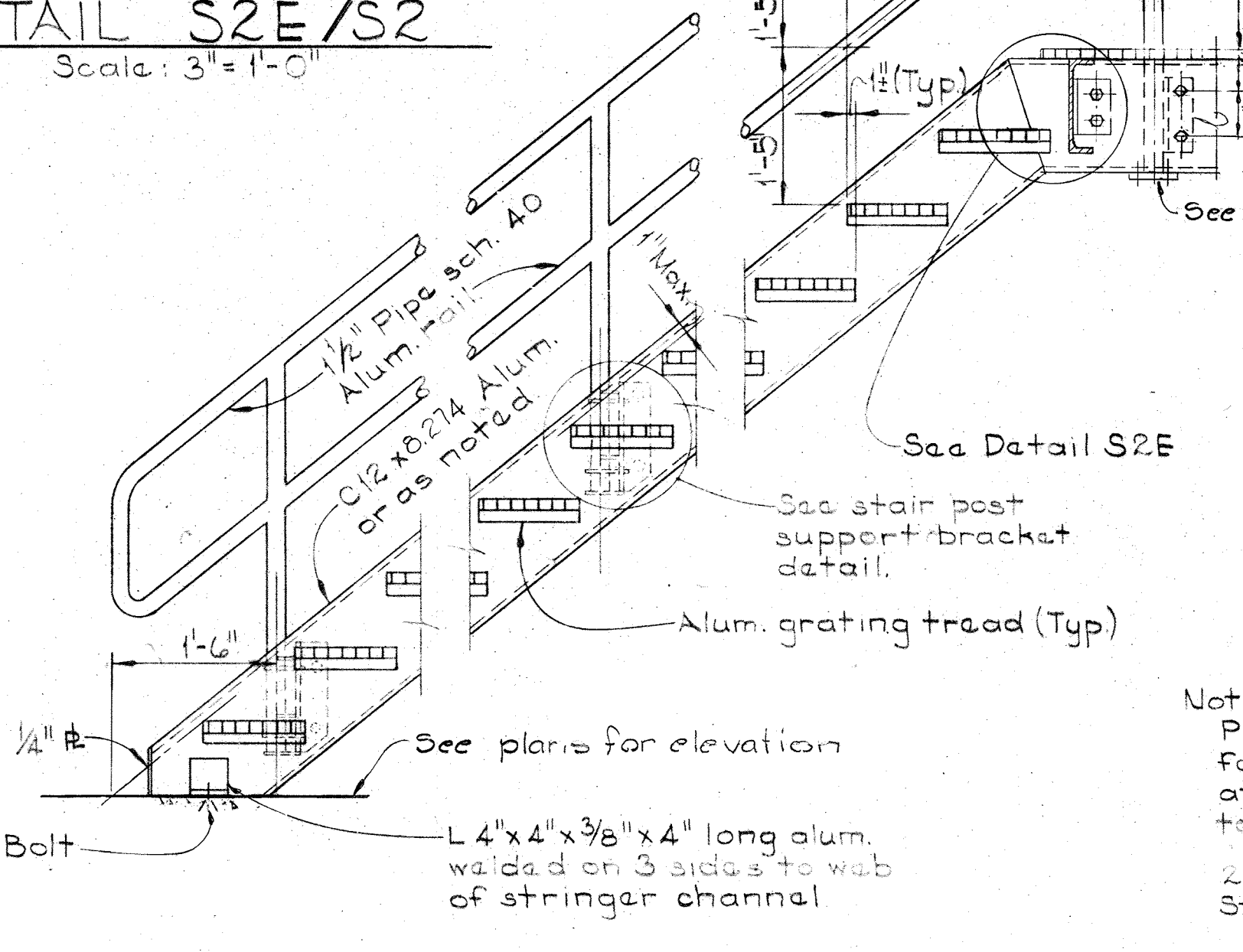
SECTION S2B/S2  
Scale: 1/2" = 1'-0"



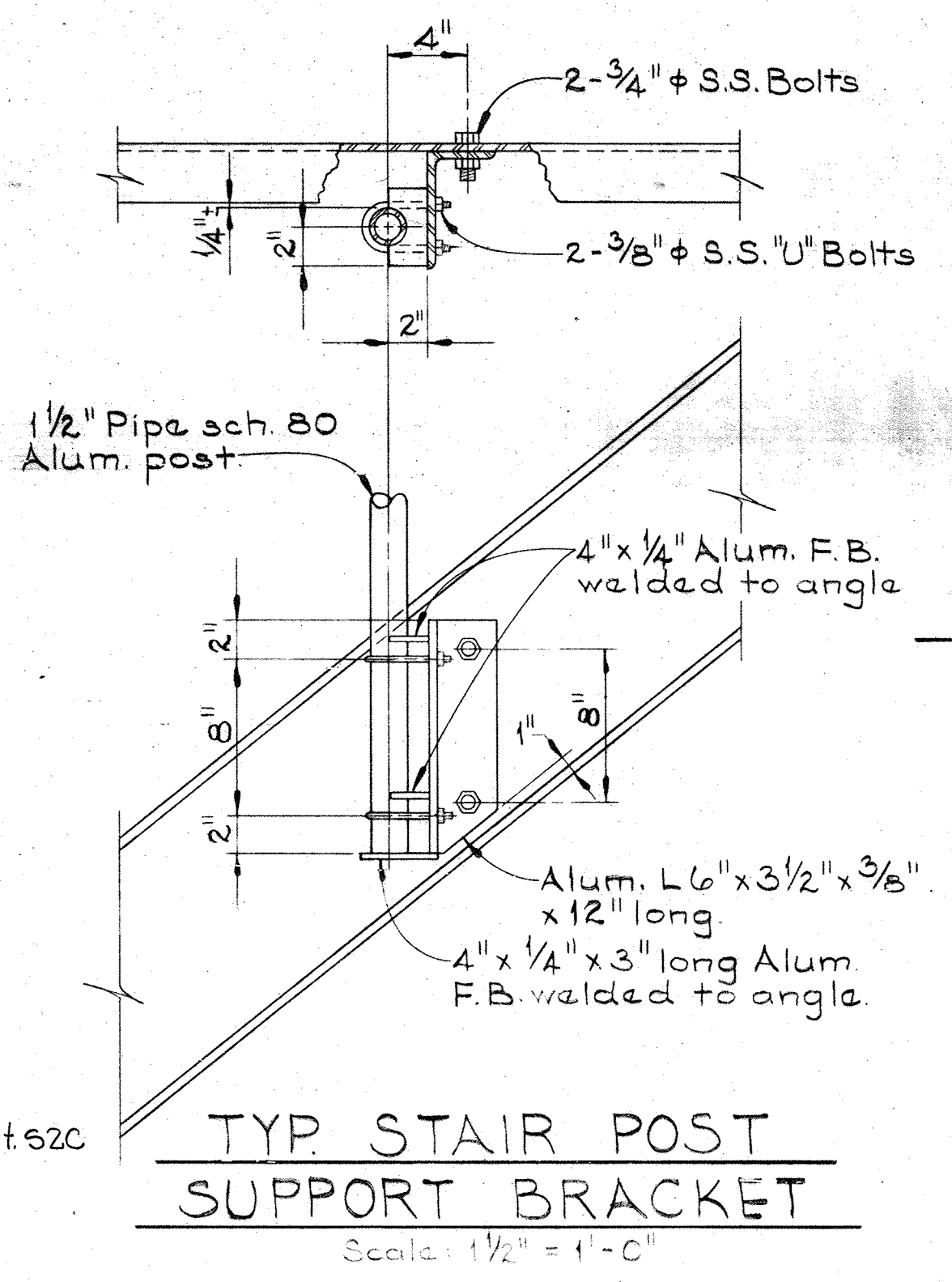
DETAIL S2E/S2  
Scale: 3" = 1'-0"



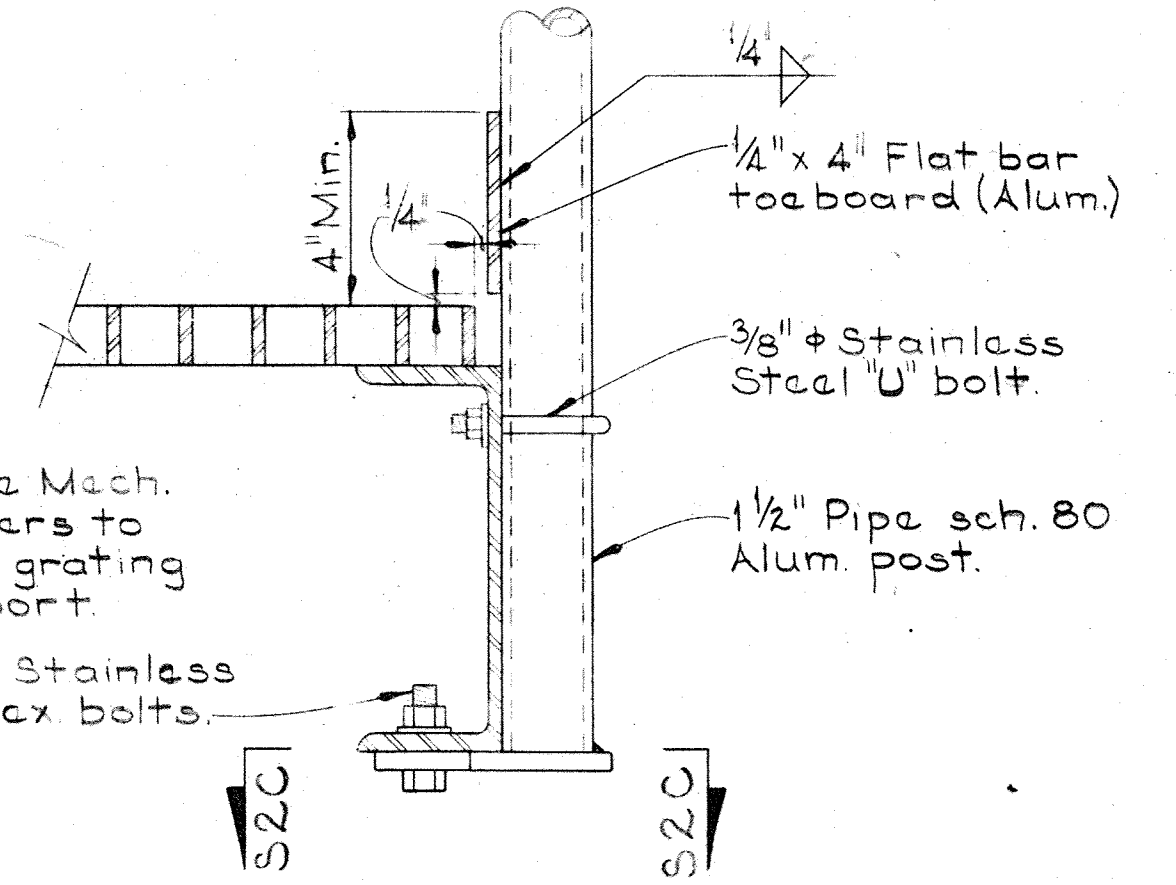
RUNG DETAIL  
Scale: None



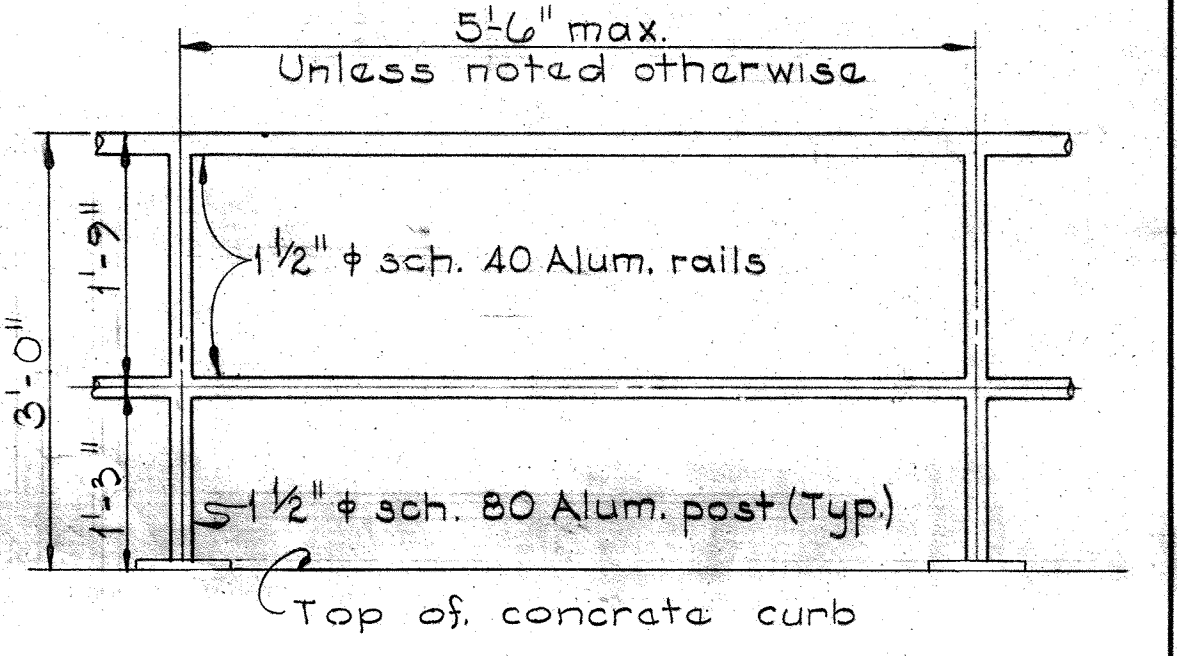
TYP. STAIR & RAILING SECTION  
Scale: 3/4" = 1'-0"



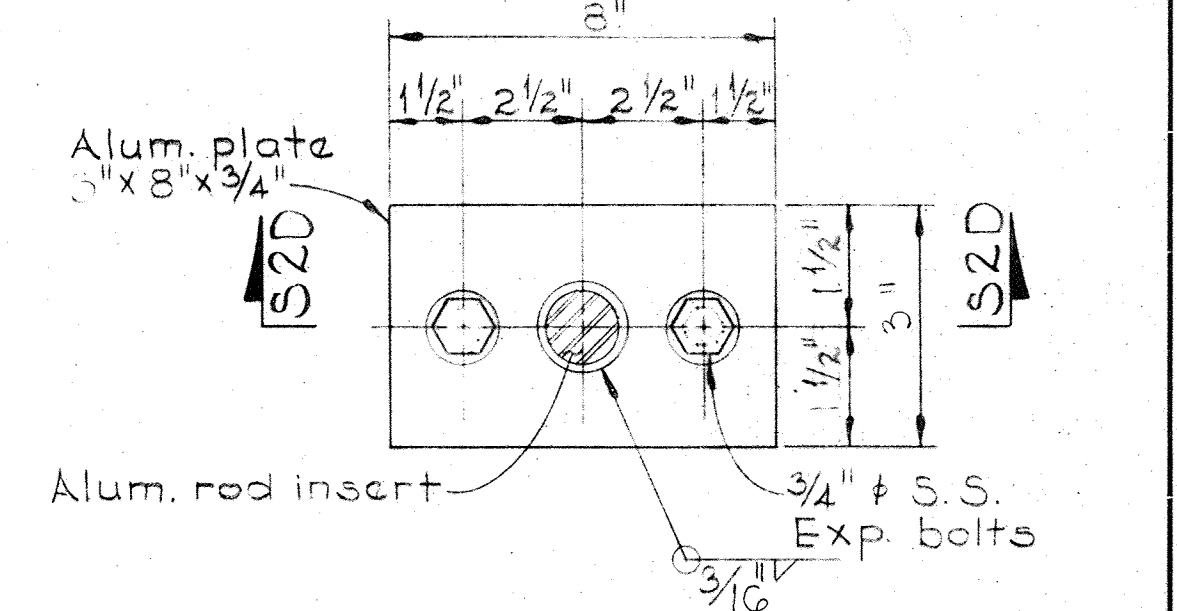
TYP STAIR POST SUPPORT BRACKET  
Scale: 1 1/2" = 1'-0"



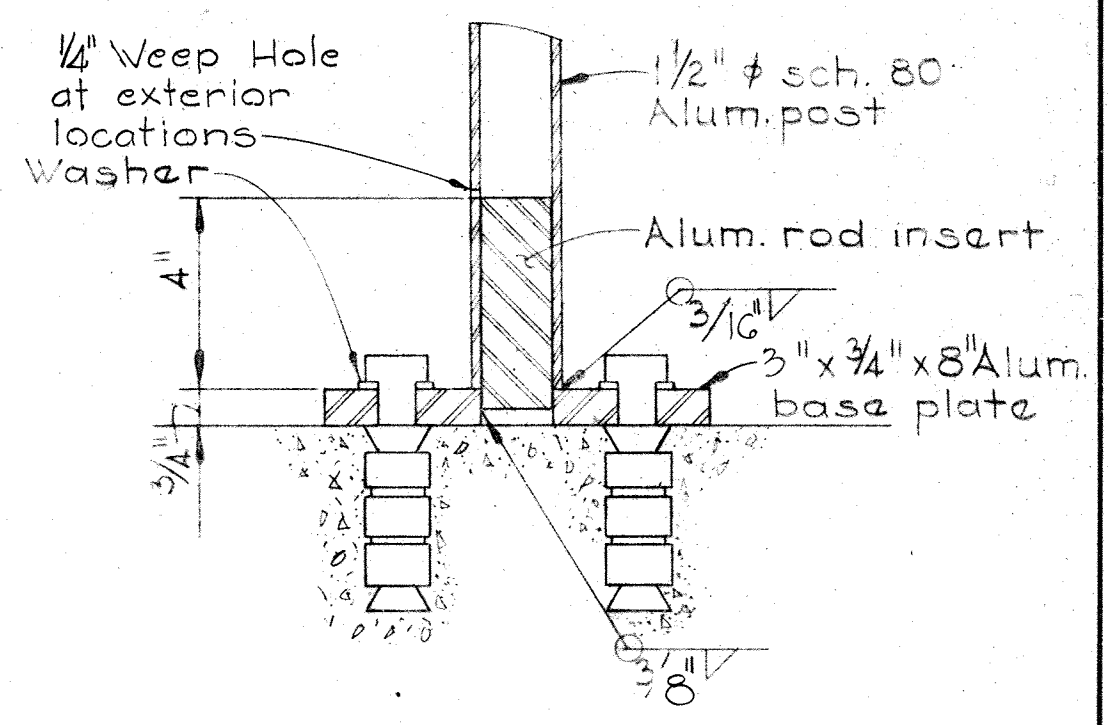
TYPICAL HANDRAIL POST CONNECTION AT PLATFORMS  
Scale: 3" = 1'-0"



TYP. ALUMINUM HANDRAIL ELEVATION  
Scale: 3/4" = 1'-0"

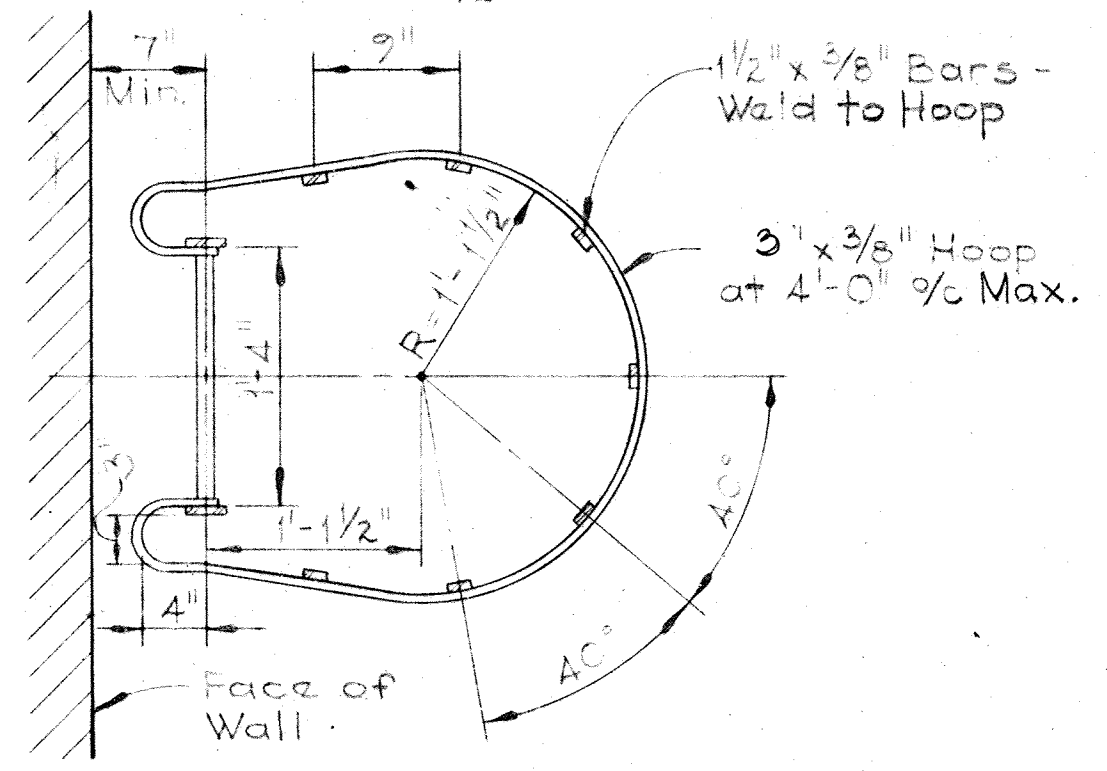


PLAN  
Scale: 3" = 1'-0"

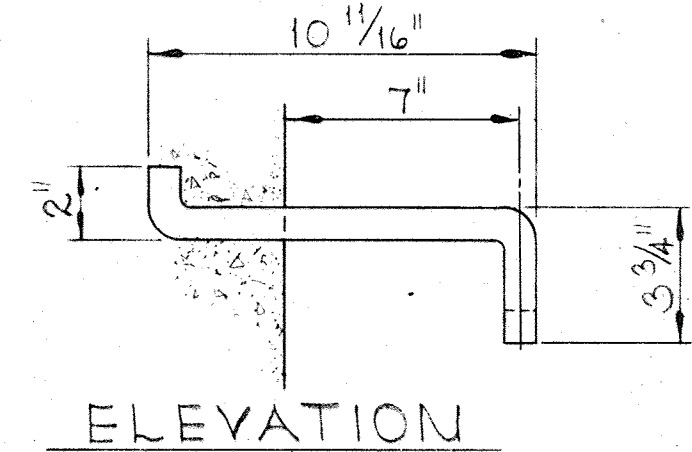


SECTION S2D/S2  
ALUMINUM HANDRAIL BASE DETAIL  
Scale: 3" = 1'-0"

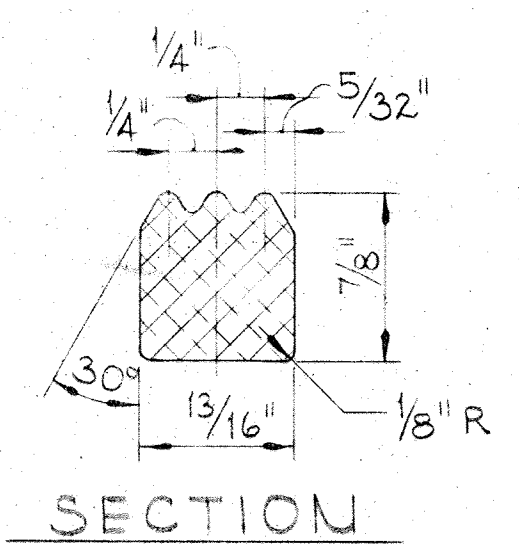
All material to be aluminum unless noted otherwise  
TYP. LADDER WITH CAGE  
Scale: 1/2" = 1'-0"



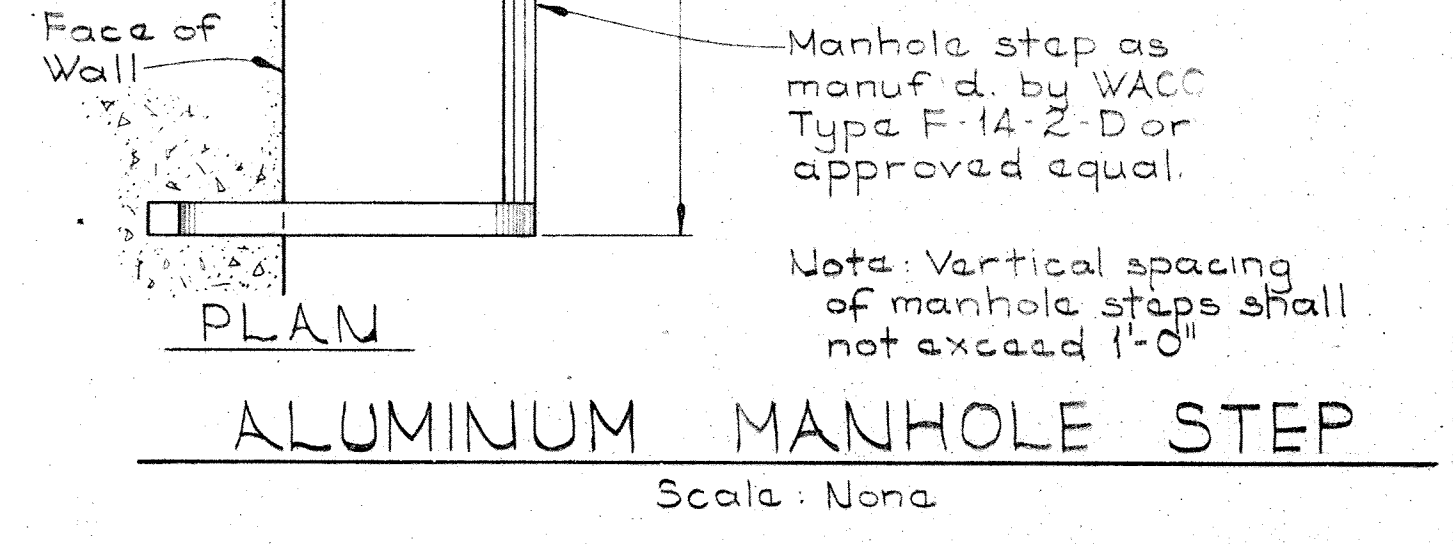
SECTION S2A/S2  
Scale: 1" = 1'-0"



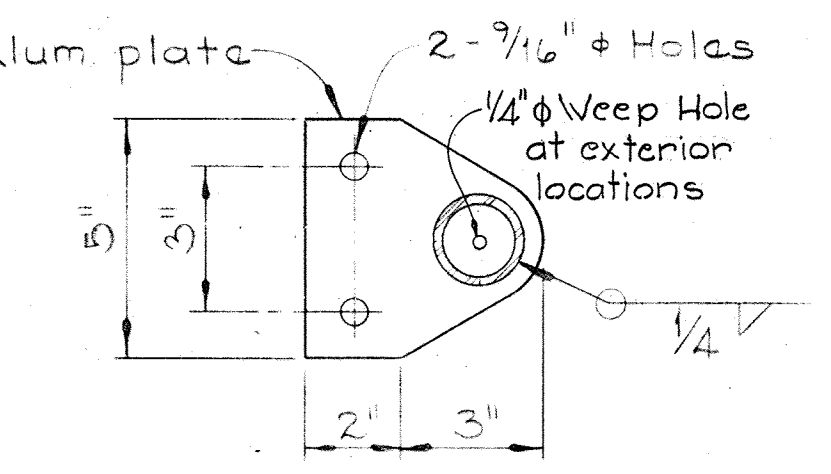
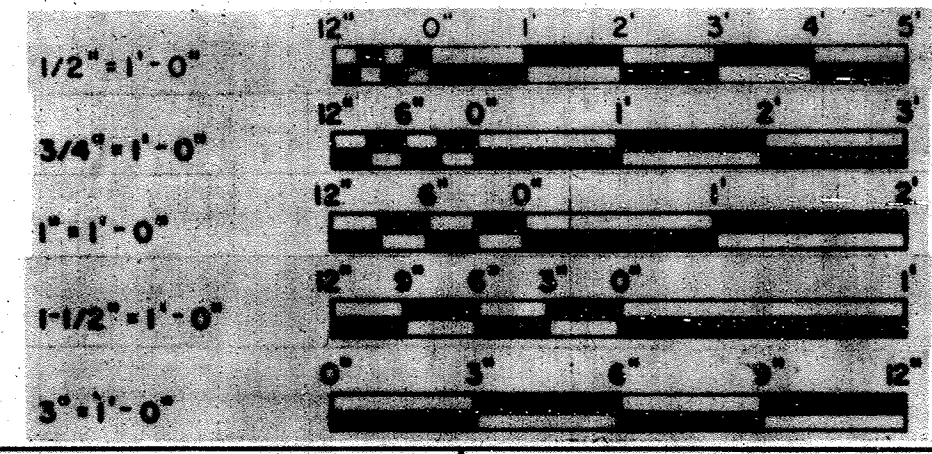
ELEVATION



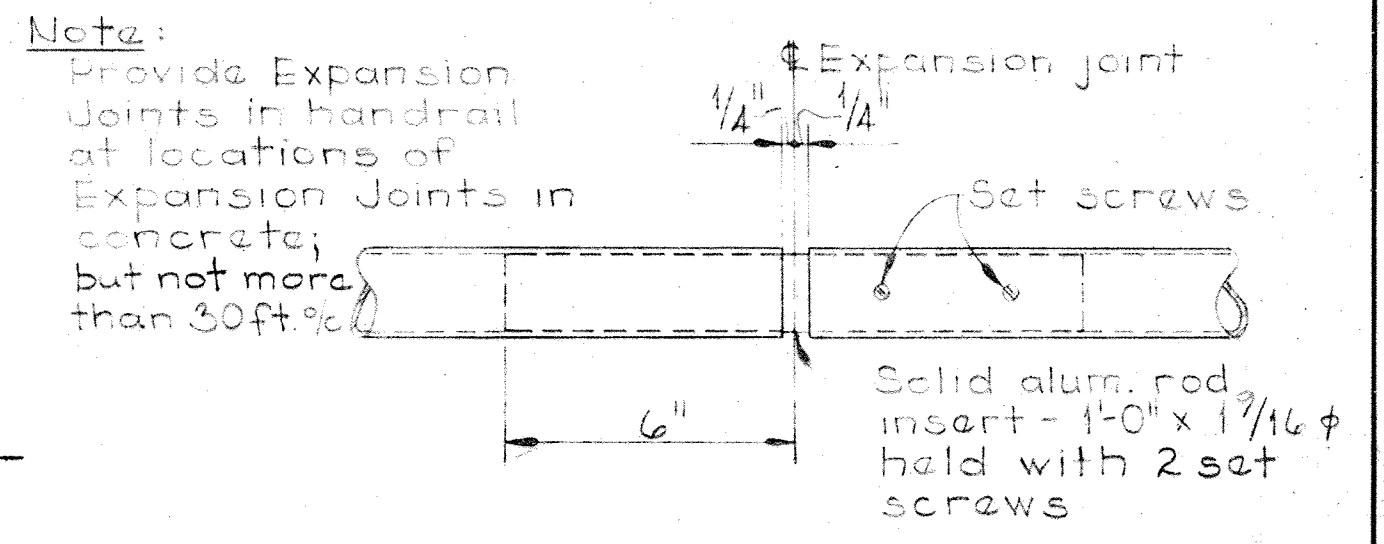
SECTION



ALUMINUM MANHOLE STEP  
Scale: None



SECTION S2C/S2  
Scale: 3" = 1'-0"



TYP. EXPANSION JOINT ALUMINUM HANDRAIL  
Scale: 3" = 1'-0"

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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
Richard E. Freudenberg  
DATE 12/13/77  
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

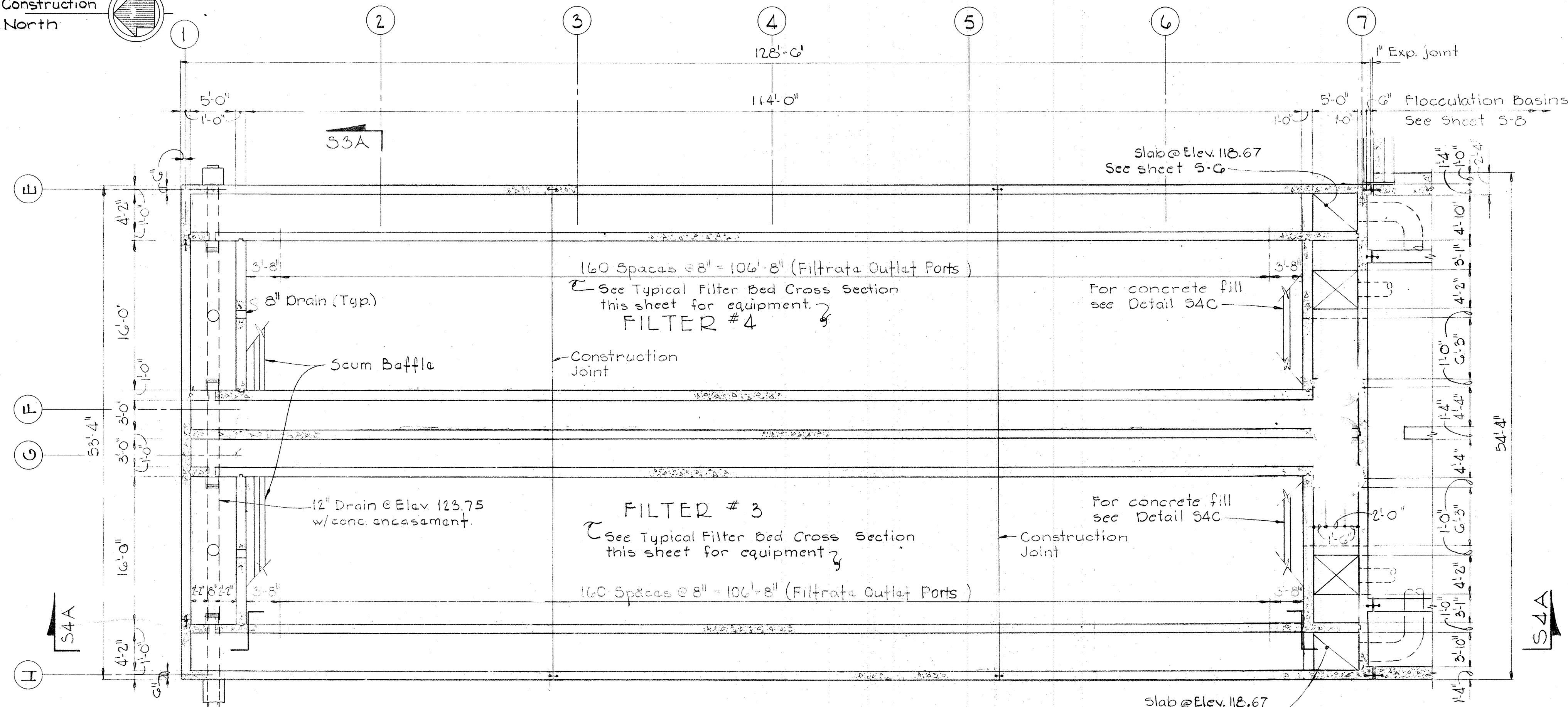
TYPICAL DETAILS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 20 OF 96  
SCALE AS NOTED

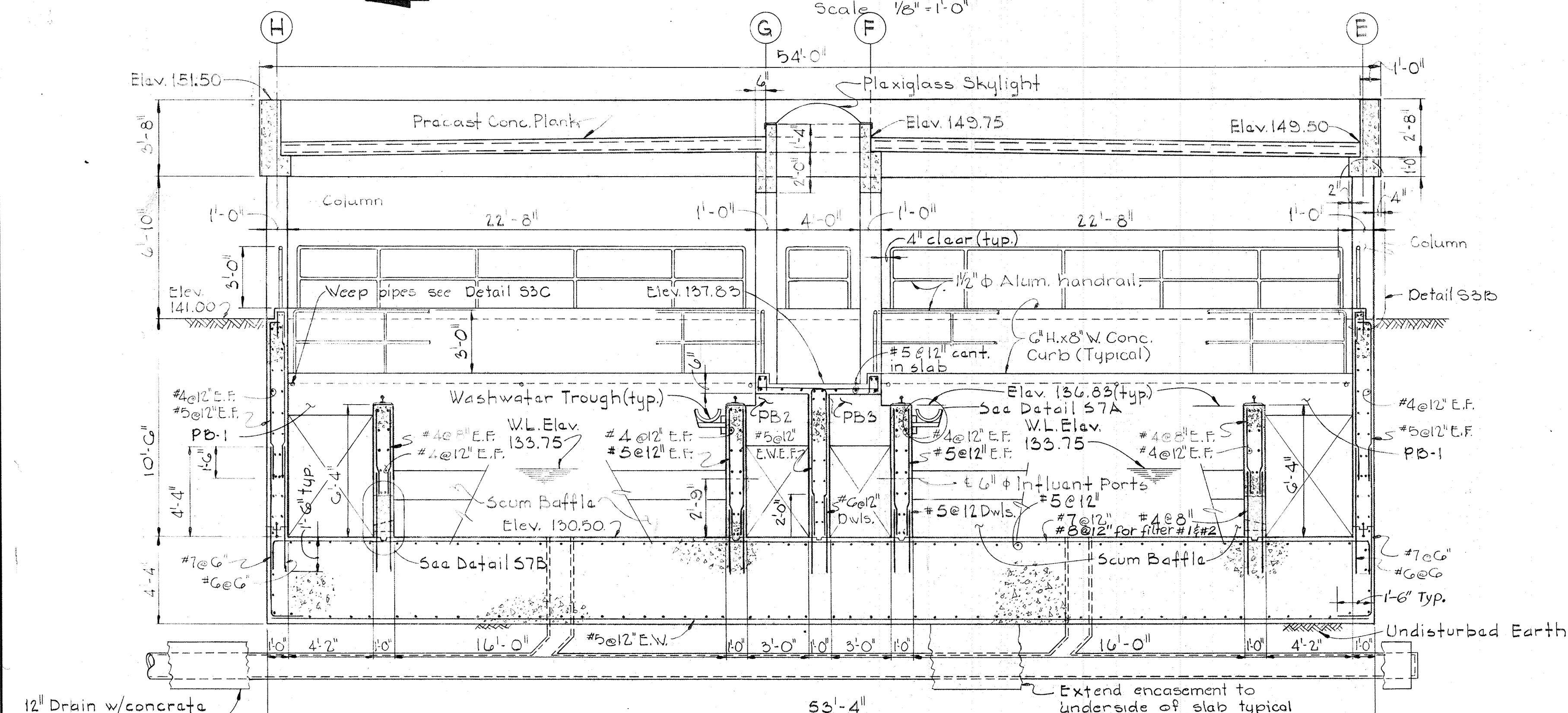


Construction North



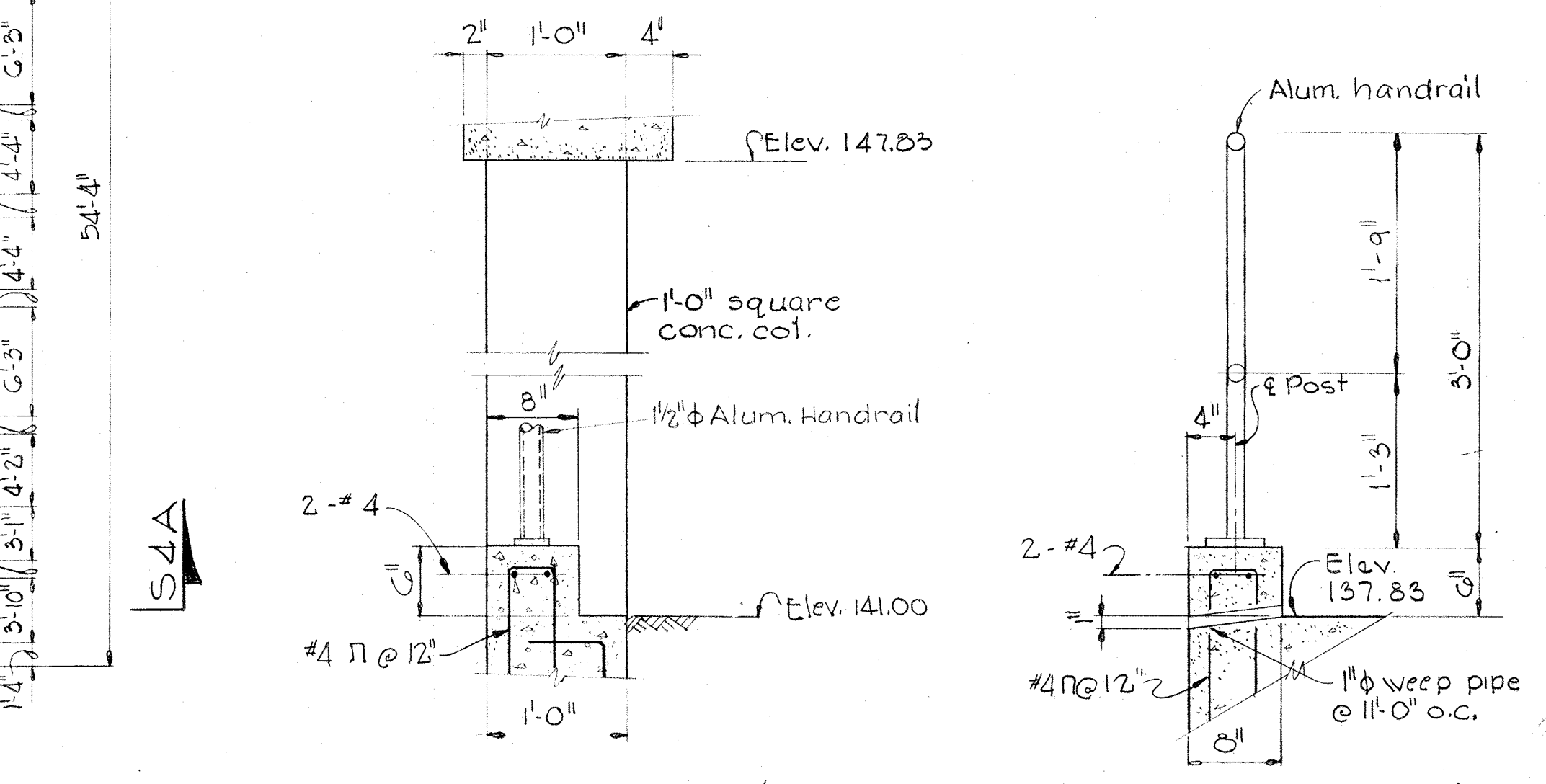
PLAN AT ELEVATION 133.00

Scale: 1/8" = 1'-0"



SECTION 53A/53, 54, 55

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

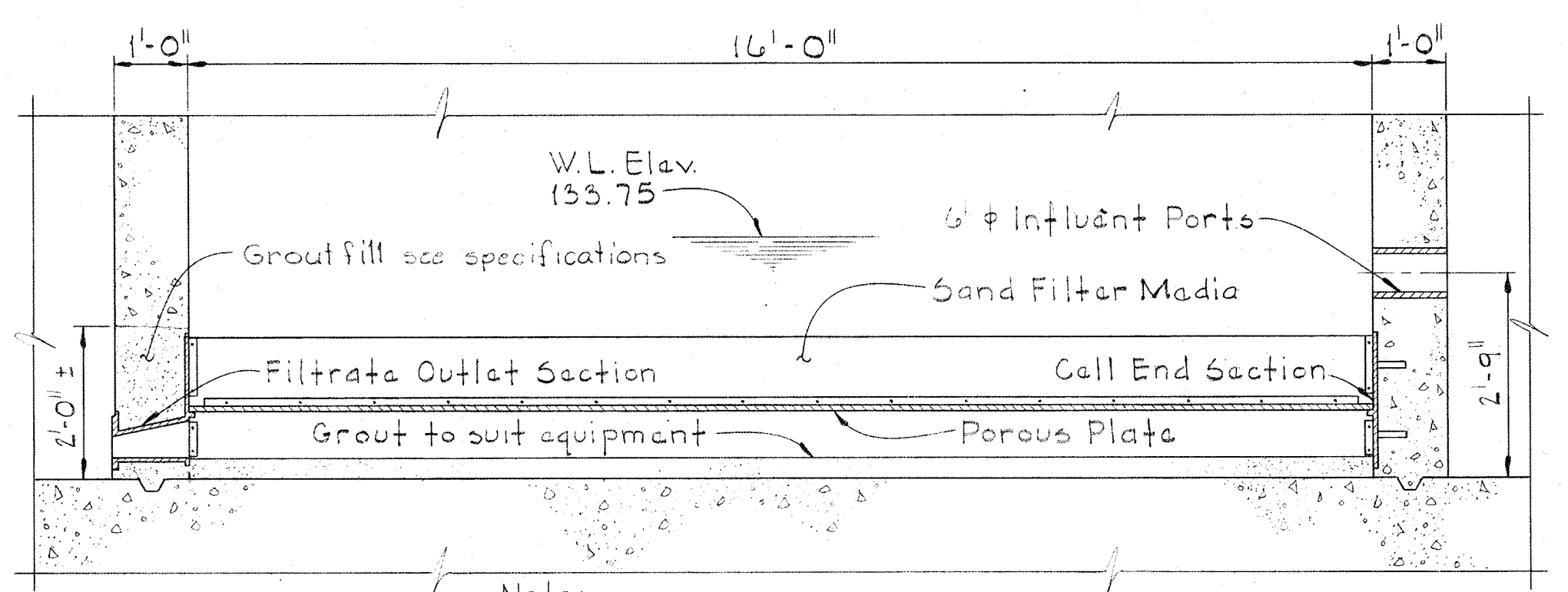


DETAIL 53B/53

Scale: 1" = 1'-0"

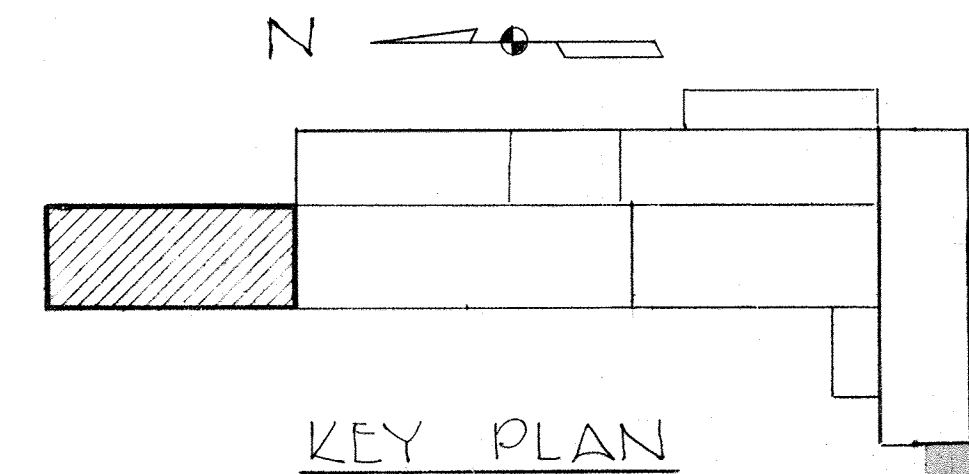
DETAIL 53C/53

Scale: 1" = 1'-0"

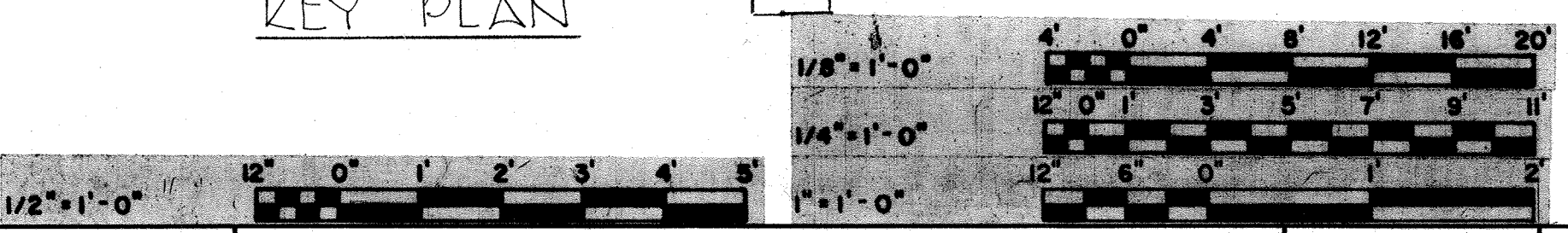


TYP. FILTER BED CROSS SECTION

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



KEY PLAN



NOTES

1. For Aluminum Handrail Details see Sheet S-2.
2. For Expansion Joint Details see Sheet S-1.
3. For Construction Joint Details see Sheet S-1.
4. Waterstops to extend to within 3' of top of wall.
5. Depth of grout fill in filter area to suit equipment furnished.
6. See Exp. End sheet Detail see sheet S-1.
7. For wall sleeve sizes see Mechanical drawings.
8. For concrete fill at South end of Filters #1 & 2 see Sh. S-4.
9. For concrete fill at Scum Baffle see Sh. S-4.

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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard E. Sanderberg  
CHIEF-BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

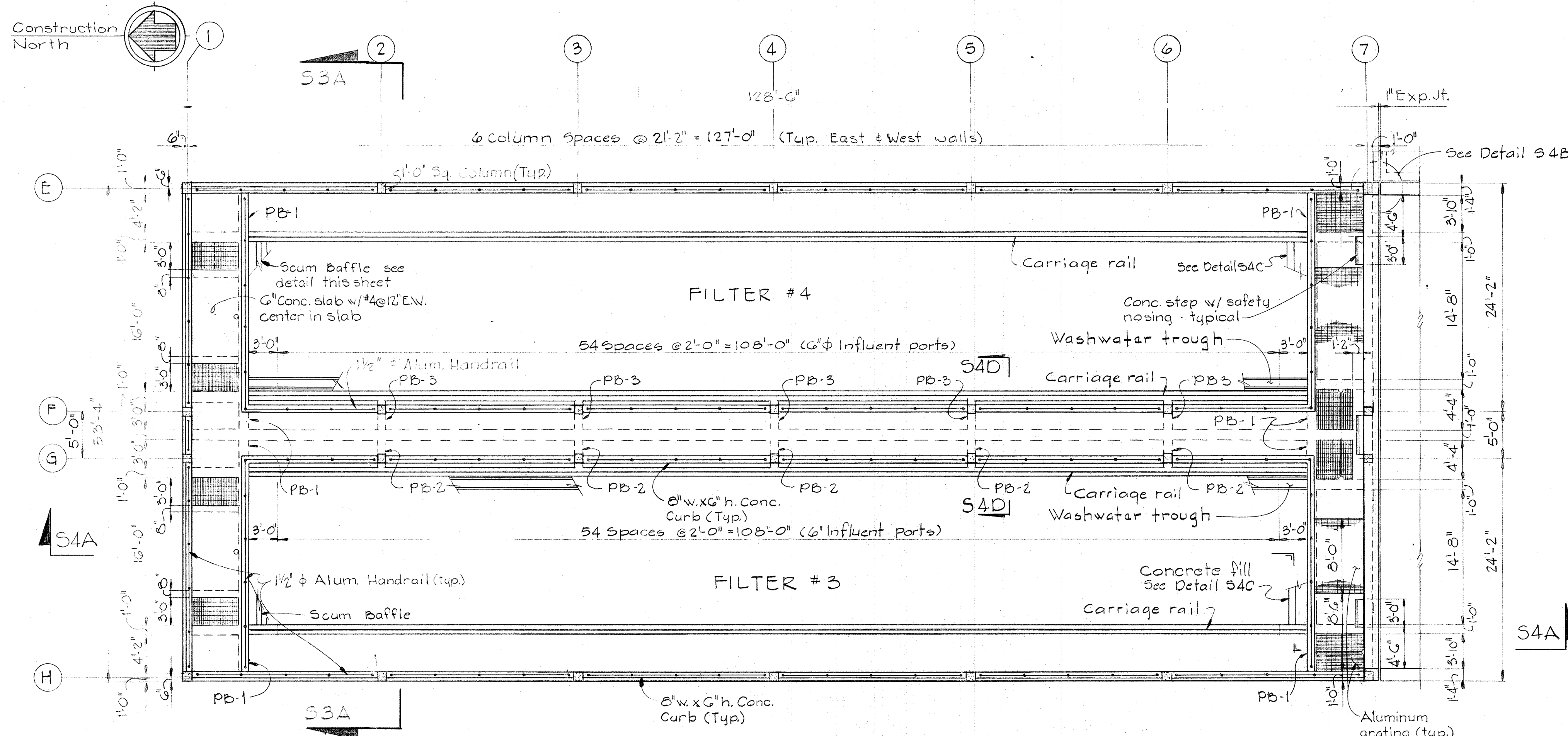
FILTRATION FILTERS NO. 3 & 4  
PLAN AT ELEV. 133.00,  
SECTIONS & DETAILS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 21  
OF 96  
SCALE AS NOTED

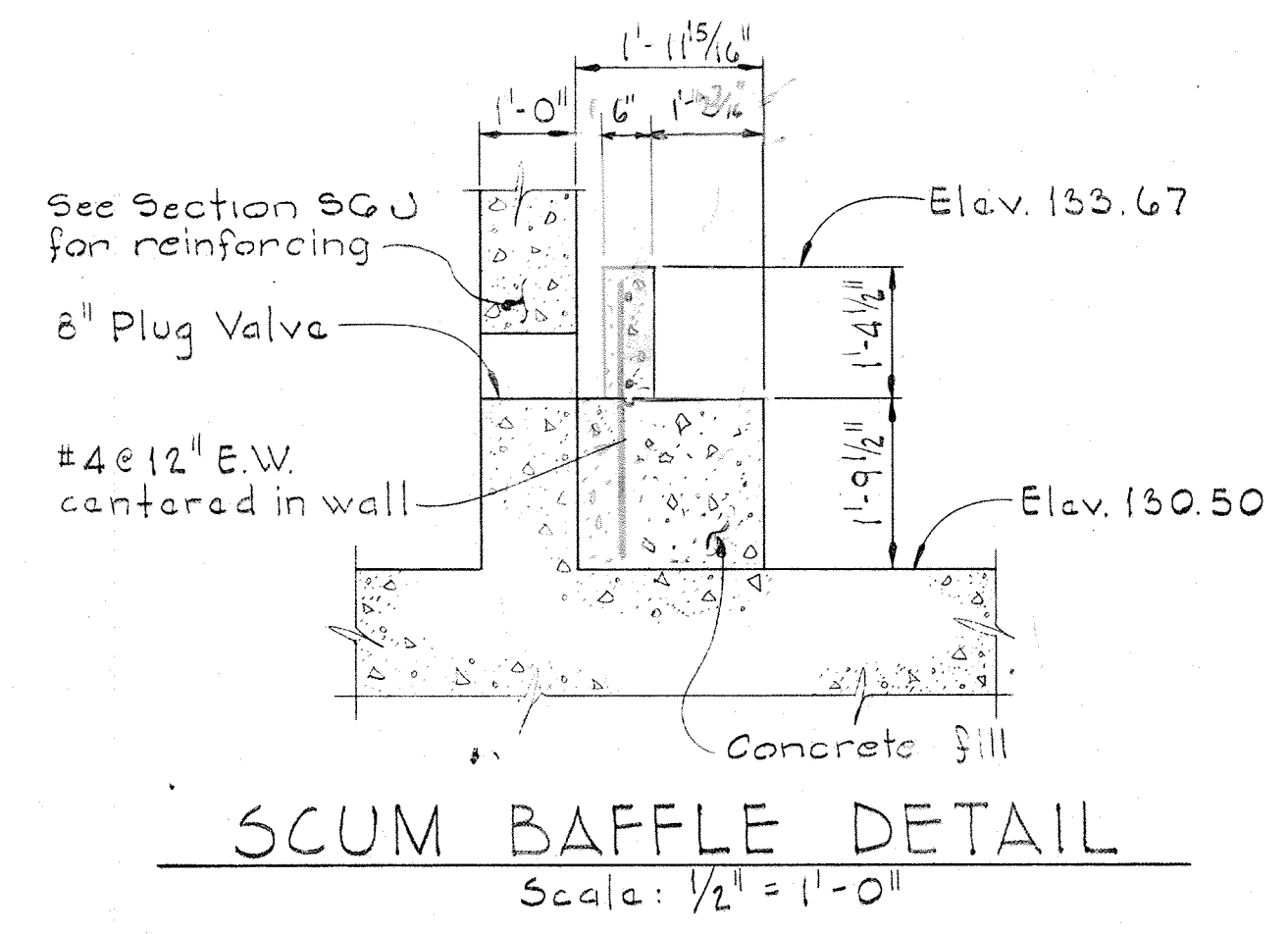
BRUNING 44-510 32872



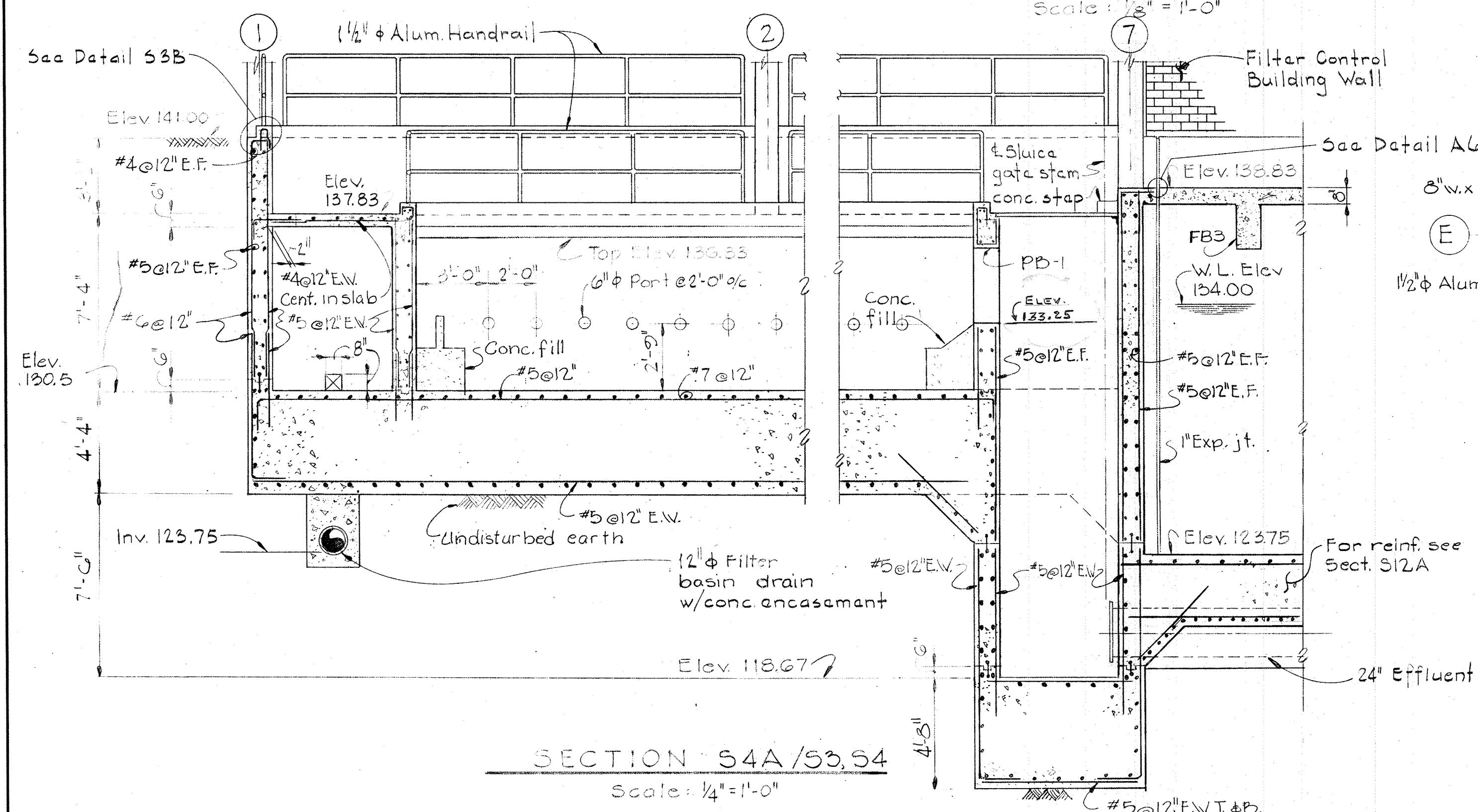


PLAN AT ELEVATION 141.00  
Scale: 1/8" = 1'-0"

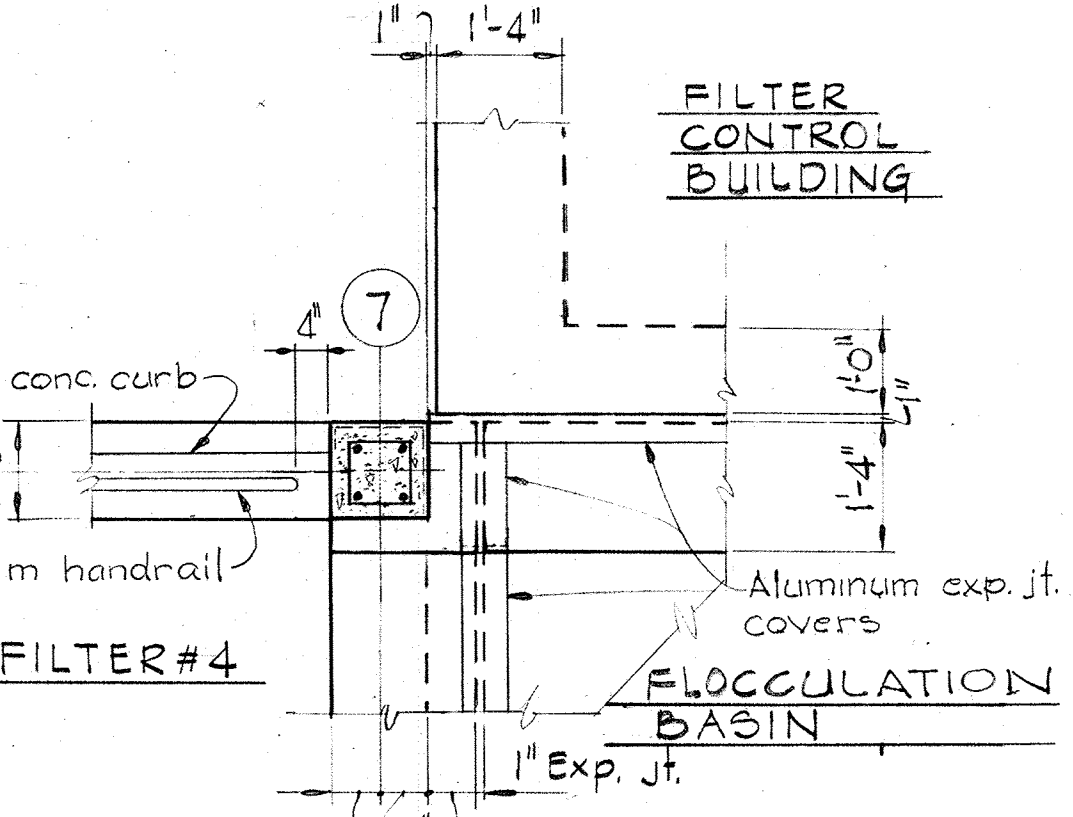
- NOTES:**
1. For aluminum grating & frame details see sheet S-1
  2. For aluminum handrail details see sheet S-2
  3. For carriage rail detail see sheet S-7
  4. See sheet S-6 for part plans of North & South ends of filter.
  5. See Mechanical & Electrical Dwg's for size & loc. of sleeves.
  6. For beam schedule see Sh. S-25.
  7. For Washwater Trough detail see Sh. S-7.
  8. For column schedule see Sh. S-27.



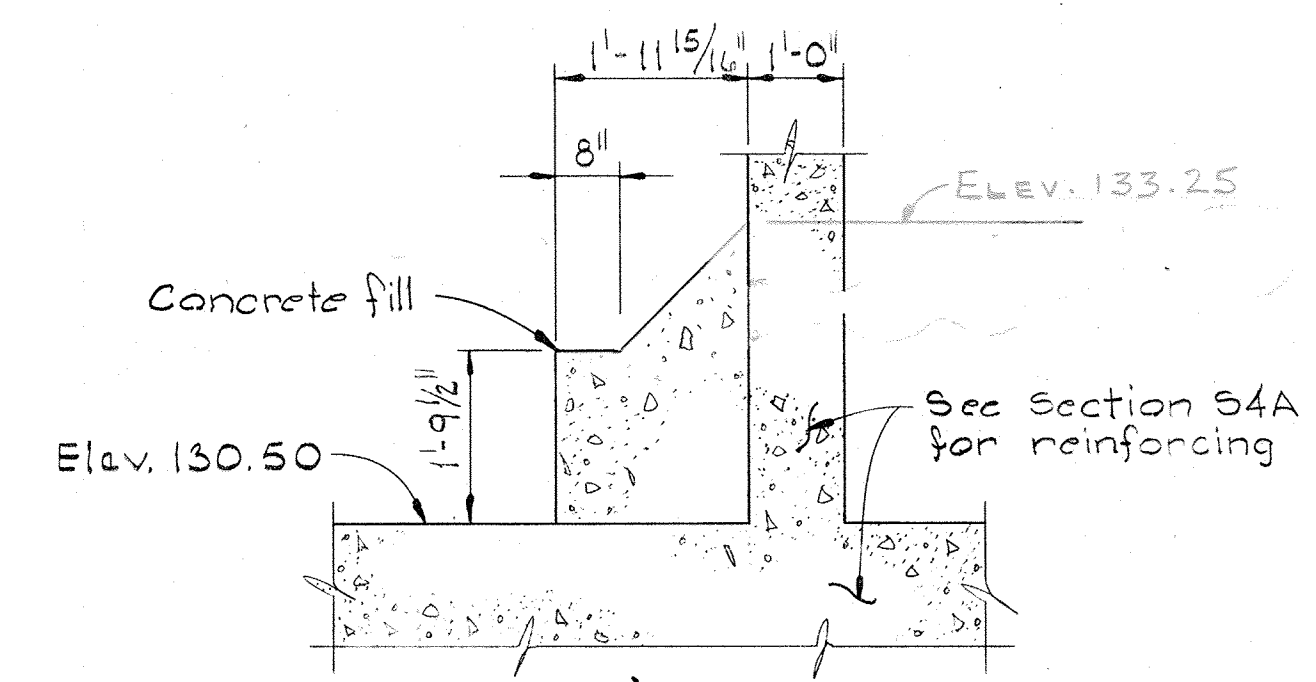
SCUM BAFFLE DETAIL  
Scale: 1/2" = 1'-0"



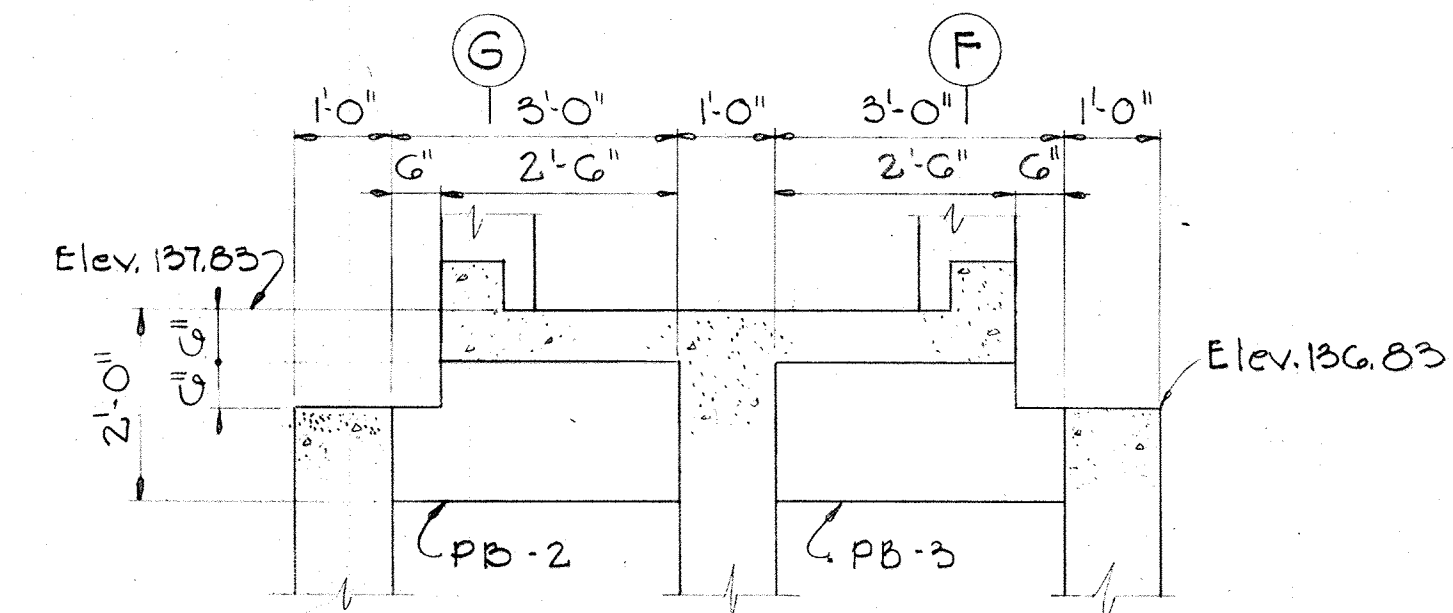
SECTION S4A/S3, S4  
Scale: 1/4" = 1'-0"



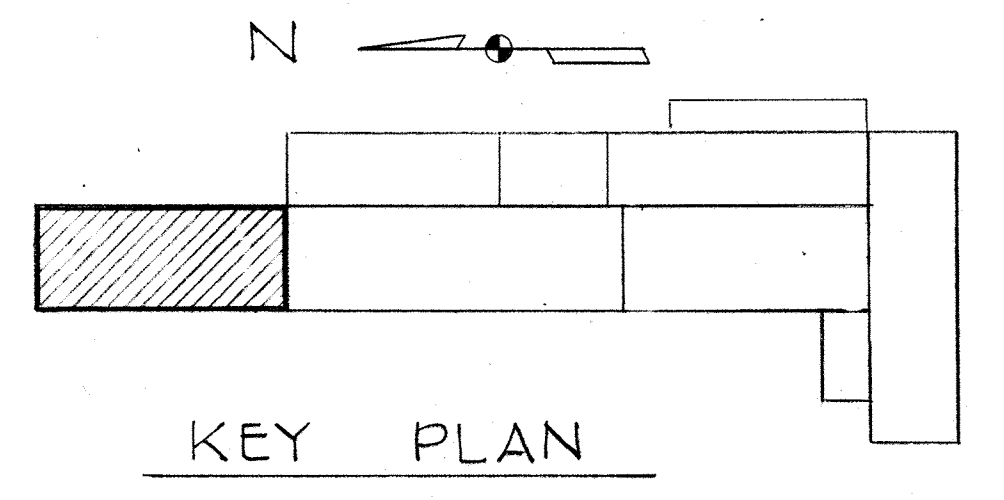
DETAIL S4B/S4  
Scale: 1/2" = 1'-0"



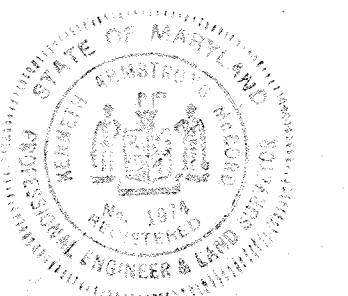
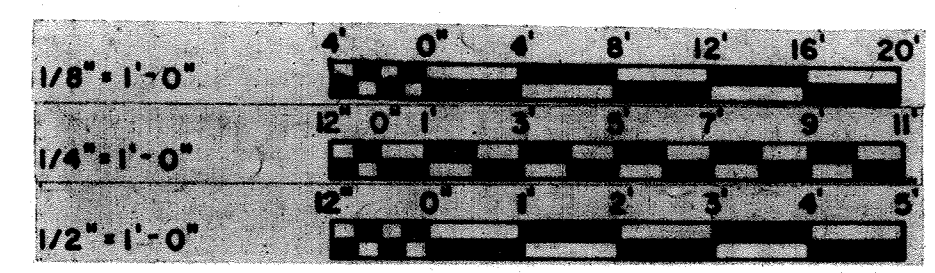
DETAIL S4C/S3, S4, S1G, S17  
Scale: 1/2" = 1'-0"



SECTION S4D/S4, S17  
Scale: 1/2" = 1'-0"



KEY PLAN



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
DATE  
Richard S. Reardon  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FILTRATION FILTERS NO. 3 & 4  
PLAN AT ELEV. 141.00,  
SECTIONS & DETAILS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 22  
OF 96

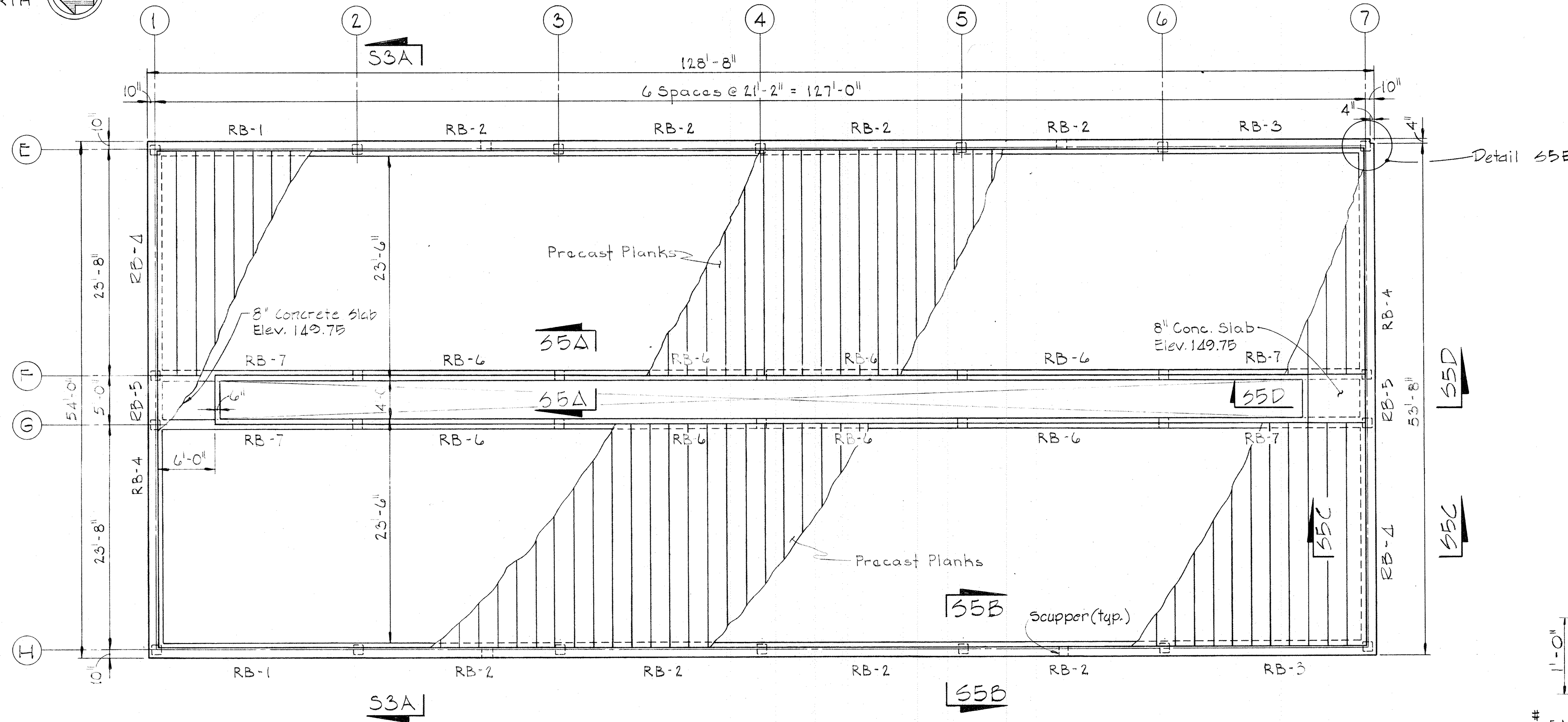
SCALE  
AS  
NOTED



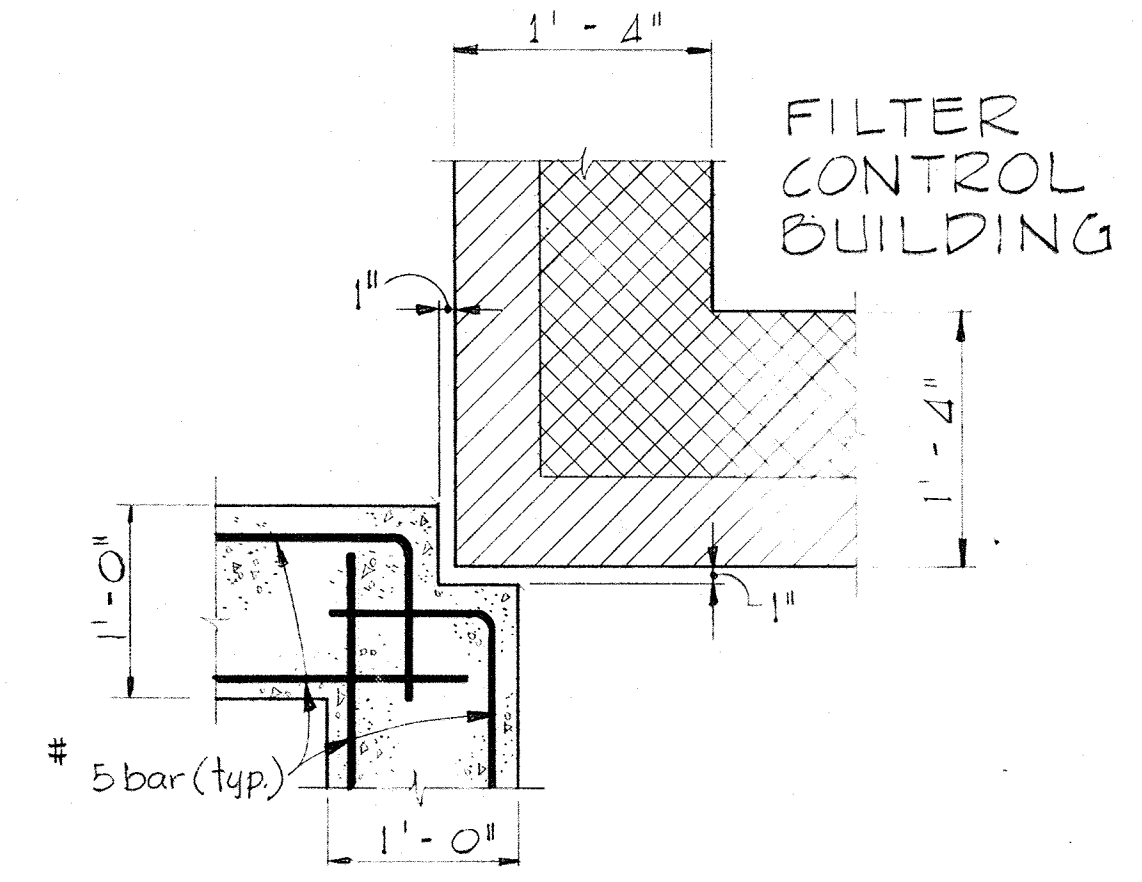
CONSTR. NORTH

NOTES

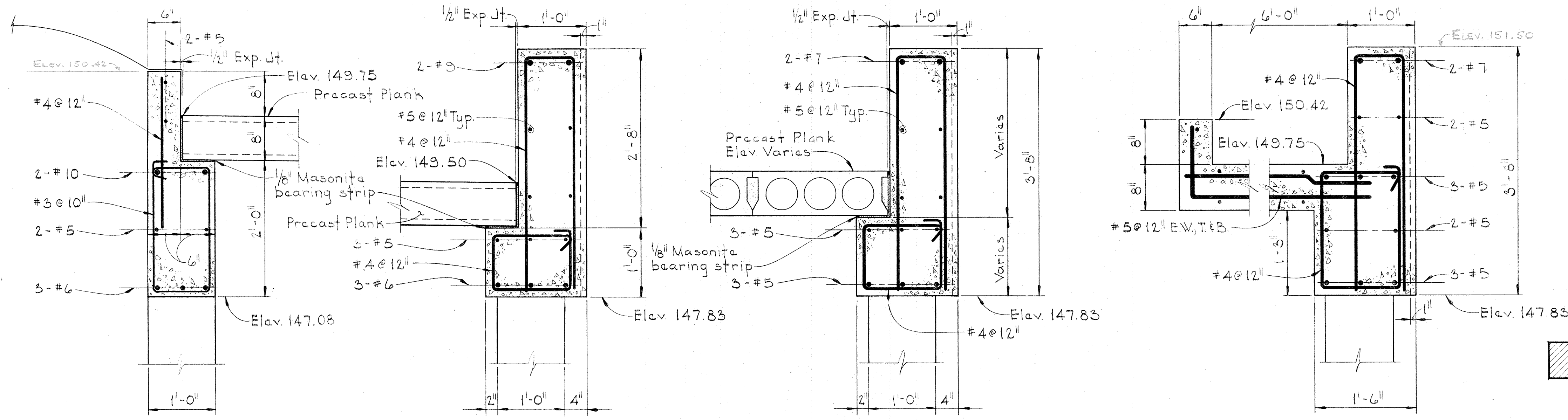
1. For Plexiglass dome details see sheet A-2.
2. For Scupper sizes & locations see sheet A-2.



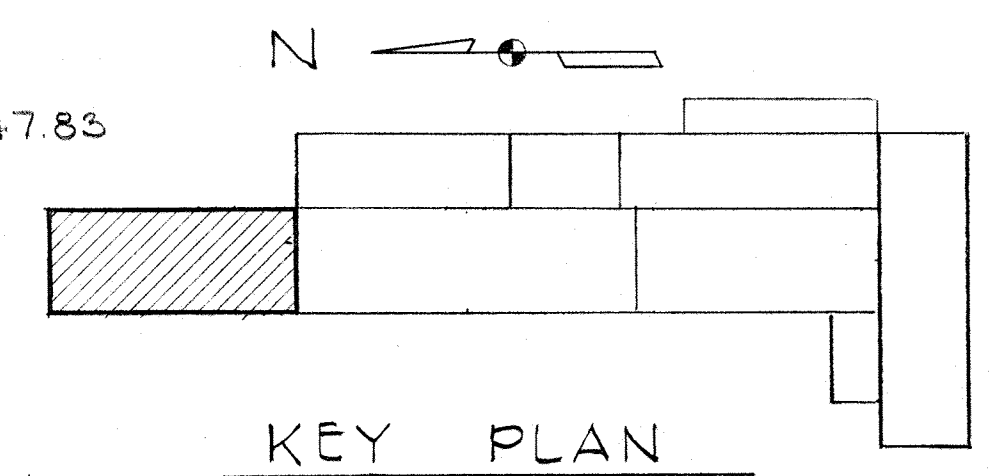
ROOF PLAN  
Scale: 1/8" = 1'-0"



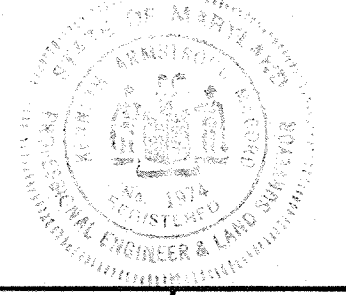
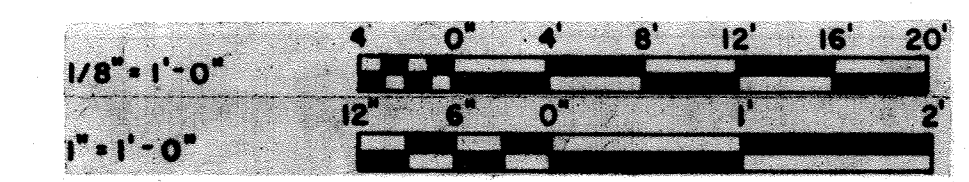
DETAIL S5E/S5  
Scale 1" = 1'-0"



SECTION S5A/S5, S5B/S5, S5C/S5, S5D/S5  
Scale: 1" = 1'-0"



KEY PLAN



|   |   |                           |   |   |  |
|---|---|---------------------------|---|---|--|
| <p>WHITMAN, REQUARDT &amp; ASSOCIATES<br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE<br/><i>Richard L. Grossenkopf</i><br/>CHIEF, BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. 502-S</p> | <p>FILTRATION FILTERS NO. 3 &amp; 4.<br/>ROOF PLAN,<br/>SECTIONS &amp; DETAIL</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO. 4</p> | <p>DRAWING NO. 23 OF 96<br/>SCALE AS NOTED</p> |
|---|---|---------------------------|---|---|--|

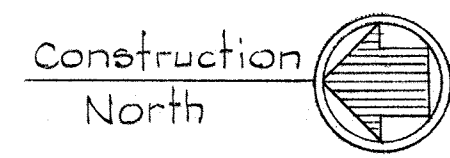












7

8

9

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11

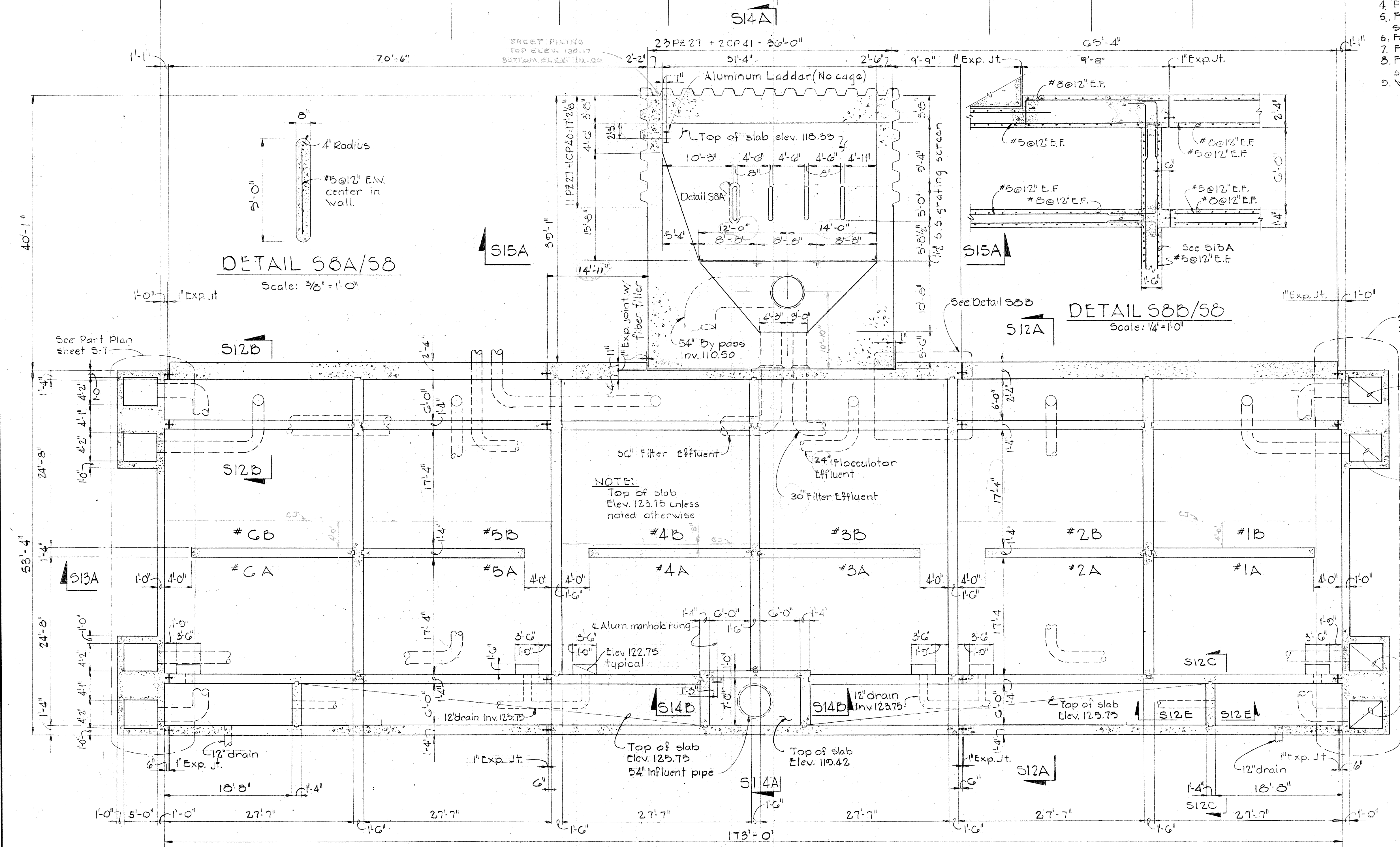
12

13

14

15

- Notes:
1. For fiber filler detail see sheet S-1
  2. For aluminum ladder detail see sheet S-2
  3. For details where pipes pass thru expansion joints see sheet M-6.
  4. For sheet piling notes see Sh. 57.
  5. For construction jt. & Expansion jt. details see sheet S-1.
  6. For aluminum manhole step detail see sheet S-2
  7. For pipe encasement detail see sheet S-1
  8. For details of 1/2" stainless steel grating screen see sheet S-15.
  9. Waterstops to extend within 3" of top of wall.



**DETAIL S8A/S8**  
Scale: 3/8" = 1'-0"

**DETAIL S8B/S8**  
Scale: 1/4" = 1'-0"

**PLAN AT ELEV. 126.00**  
Scale: 1/8" = 1'-0"

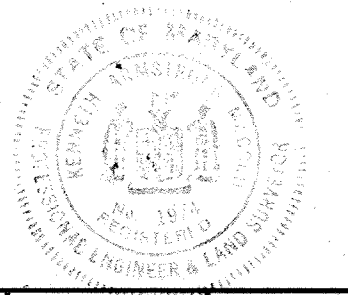
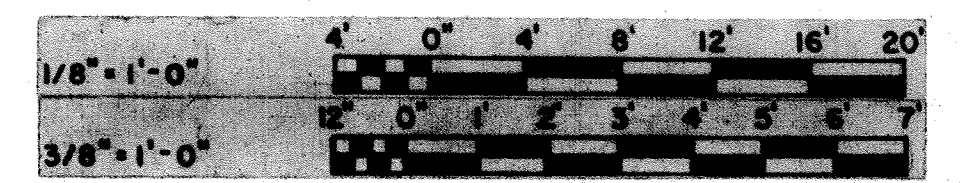
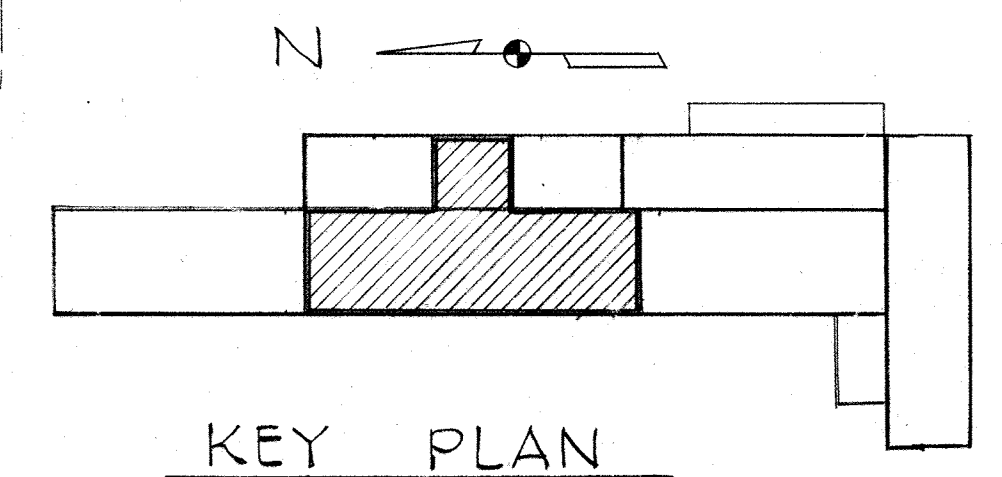
See Part Plan Sheet S-7

Top of slab Elev. 118.67 (typ)

Top of slab Elev. 116.00 (typ)

Top of slab Elev. 116.00 (typ)

Top of slab Elev. 118.67 (typ)



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

**DEPARTMENT OF PUBLIC WORKS**  
HOWARD COUNTY, MARYLAND  
DATE: 12/13/77  
*Richard S. Greedemeyer*  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

**CONTRACT NO. 502-S**

**FLOCCULATORS NO. 1 thru 6**  
PLAN AT ELEV. 126.00

**SAVAGE WASTEWATER**  
TREATMENT PLANT ADDITION NO. 4

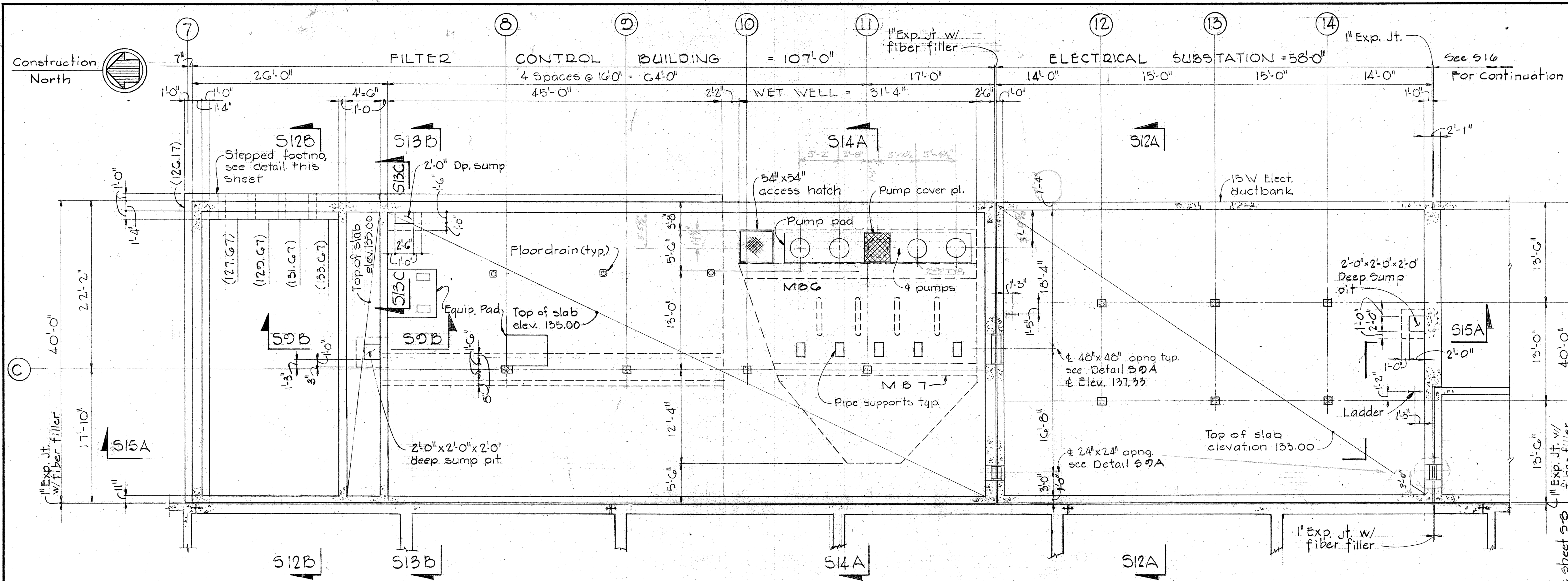
**DRAWING NO. 26**  
**OF 96**  
**SCALE AS NOTED**

W.O. 7275-2C

SHEET S-8

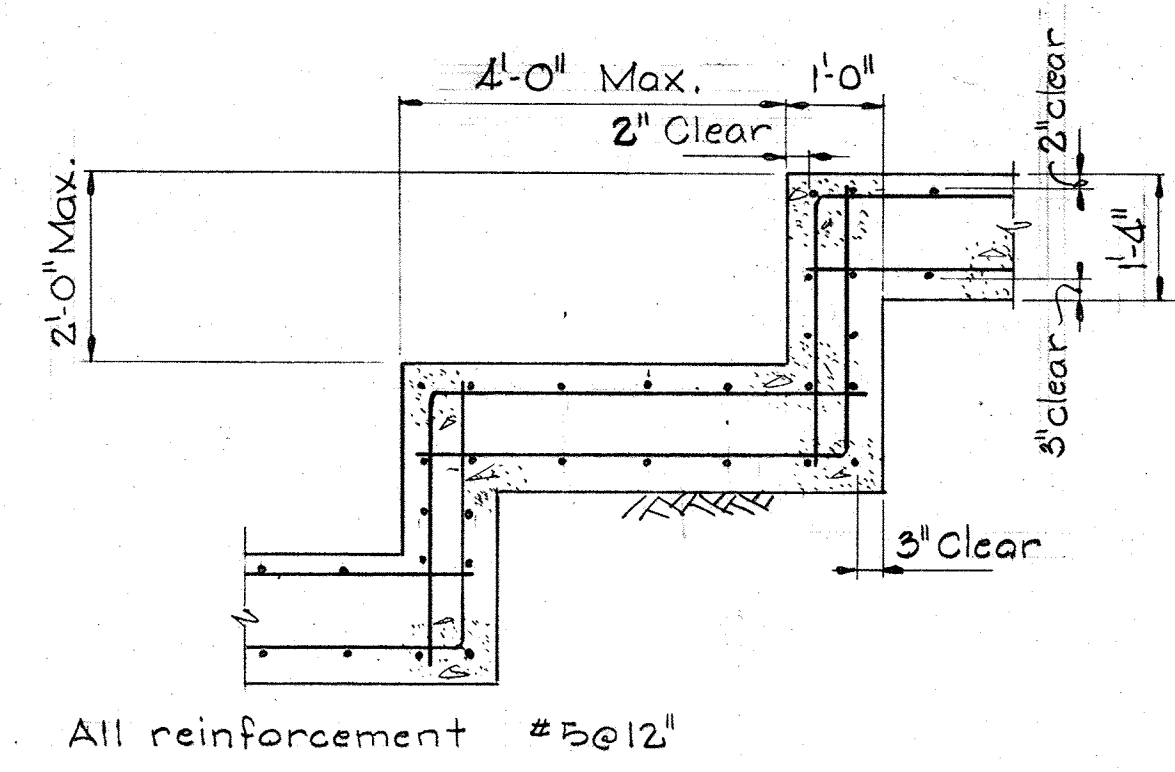
BRUNING 44-510 32872



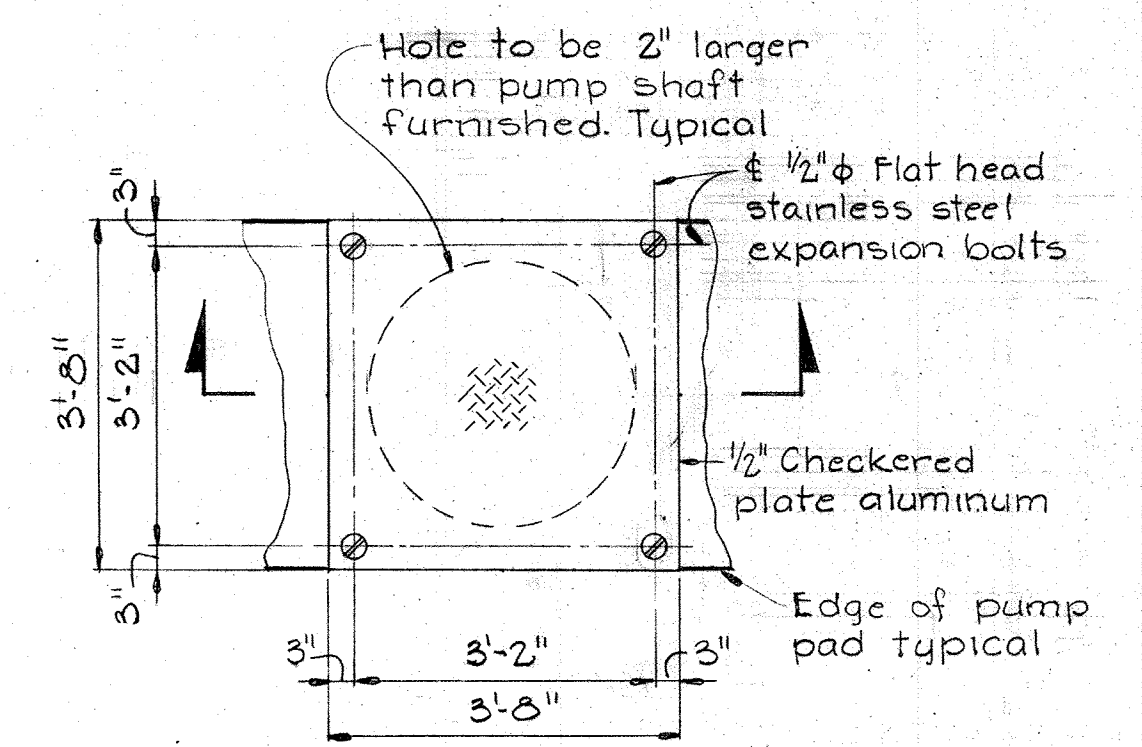


PART PLAN AT ELEV. 136.00  
Scale: 1/8" = 1'-0"

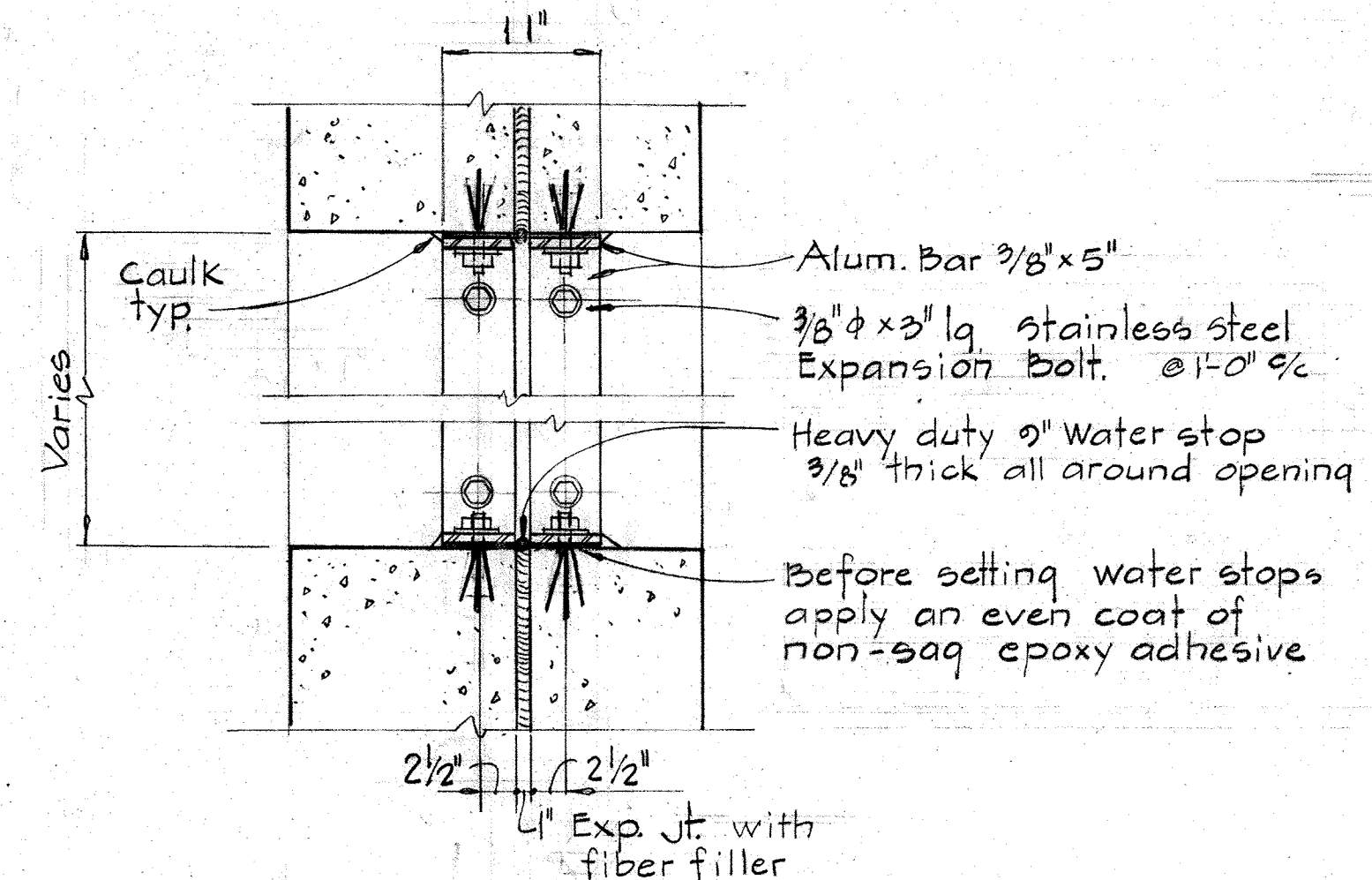
- NOTES**
1. Pump locations to be coordinated with equipment furnished.
  2. For ladder details see sheet S-2.
  3. For access hatch details see sheet A-G.
  4. For construction joint details see sheet S-1.
  5. See sheet S-1 for additional reinforcing at holes in walls & slabs, pipe supports & equipment pads.
  6. See sheet S-25 for beam reinforcing.
  7. (∞) Indicates bottom of footing elev.
  8. \* Indicate dimensions to be coordinated with pump supplier.
  9. See sheet S-27 for column reinforcing.
  10. For Duct bank details see Electrical drawings.
  11. For brick shelf elevation see A-1.



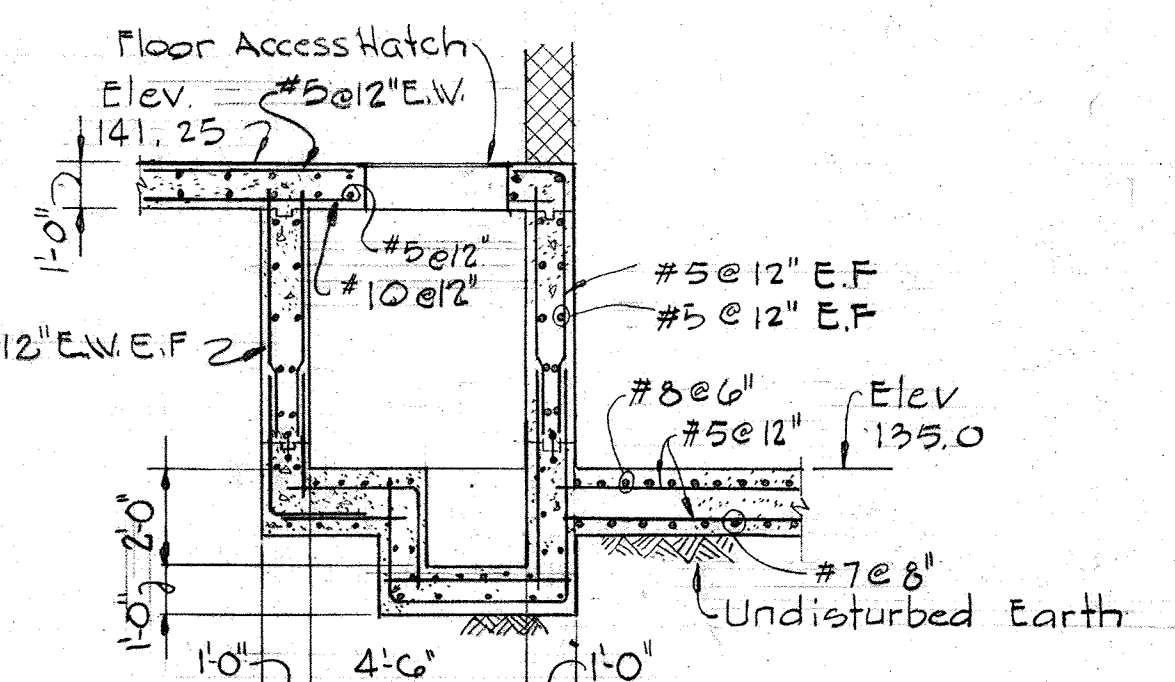
TYPICAL STEPPED FOOTING  
Scale: 1/2" = 1'-0"



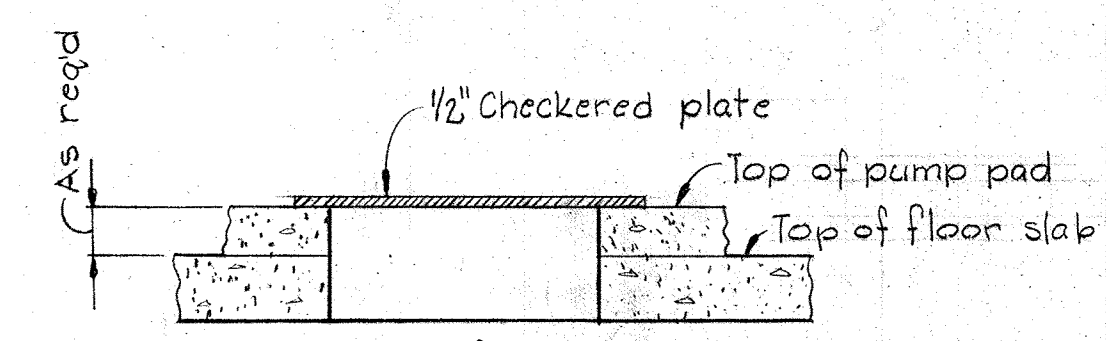
PLAN  
Scale: 1/2" = 1'-0"



DETAIL 59A/59  
Scale: 1" = 1'-0"

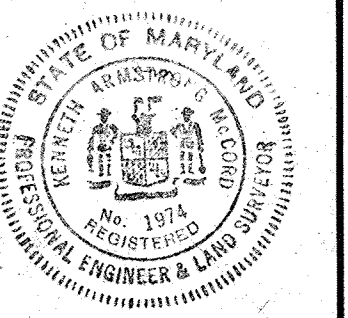
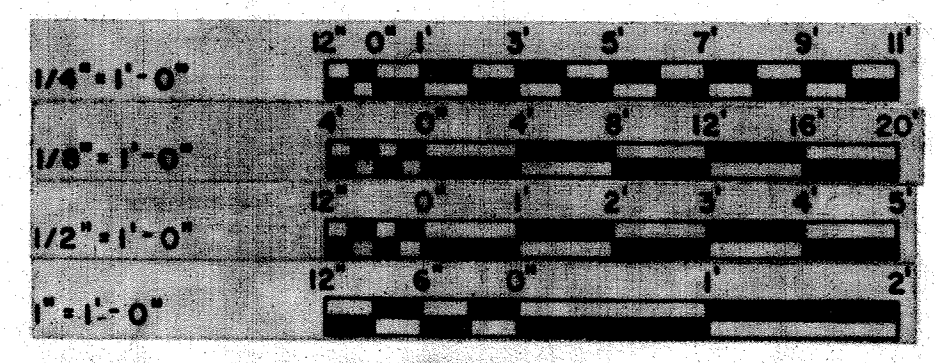
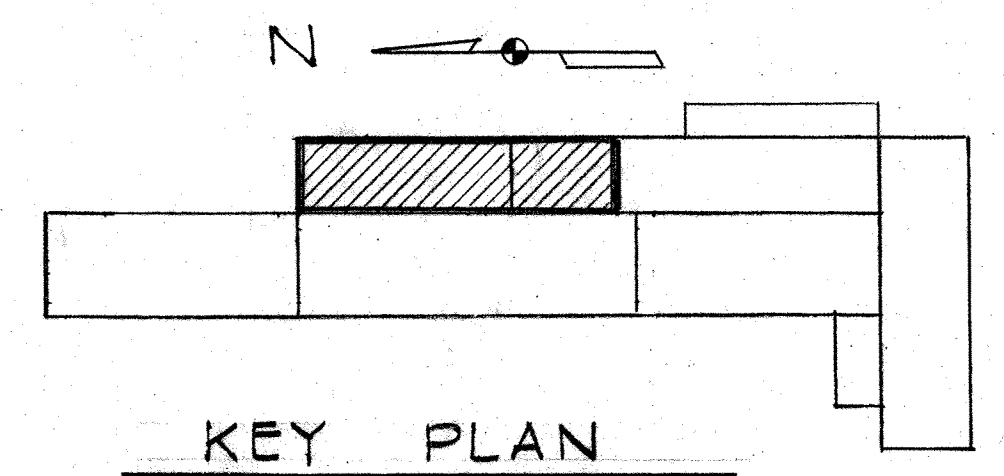


SECTION 59B/59, S10  
Scale: 1/4" = 1'-0"



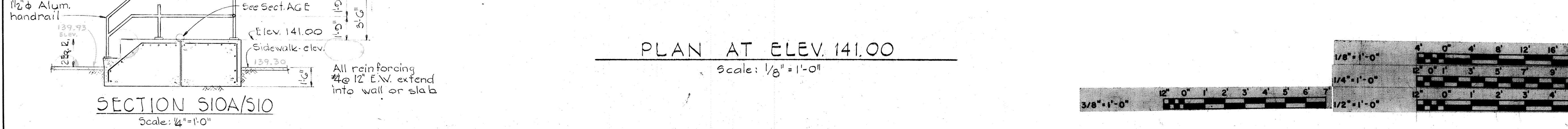
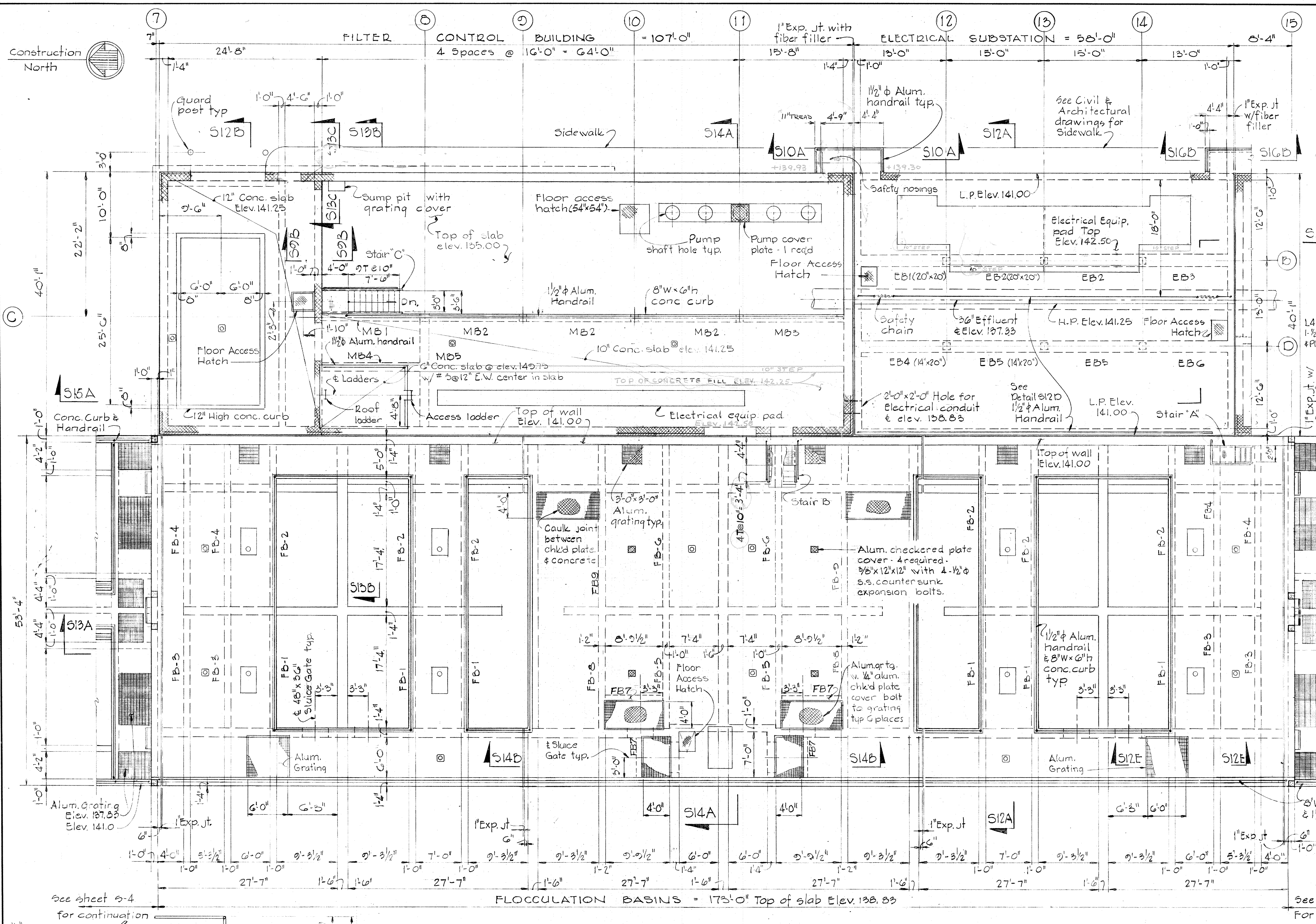
SECTION  
Scale: 1/2" = 1'-0"

PUMP COVER PLATE

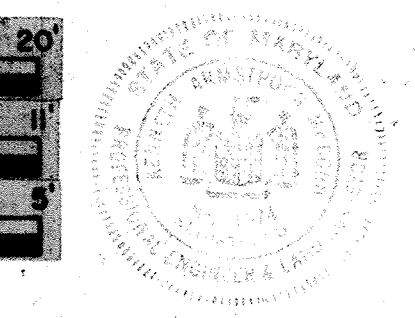


|   |   |                    |  |   |  |
|---|---|--------------------|--|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br>Richard S. Stenderberg<br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTER CONTROL BUILDING<br>PLAN AT ELEV. 136.00<br>& DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 27 OF 96<br>SCALE AS NOTED |
|---|---|--------------------|--|---|--|





|   |   |                           |   |   |  |
|---|---|---------------------------|---|---|--|
| <b>WHITMAN, REQUARDT &amp; ASSOCIATES ENGINEERS</b><br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | <b>DEPARTMENT OF PUBLIC WORKS</b><br>HOWARD COUNTY, MARYLAND<br>DATE: _____<br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | <b>CONTRACT NO. 502-S</b> | <b>FLOCCULATORS NO. 1 thru 6 &amp; FILTER CONTROL BUILDING PLAN AT ELEV. 141.00</b> | <b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b> | <b>DRAWING NO. 28 OF 96</b><br><b>SCALE AS NOTED</b> |
|---|---|---------------------------|---|---|--|

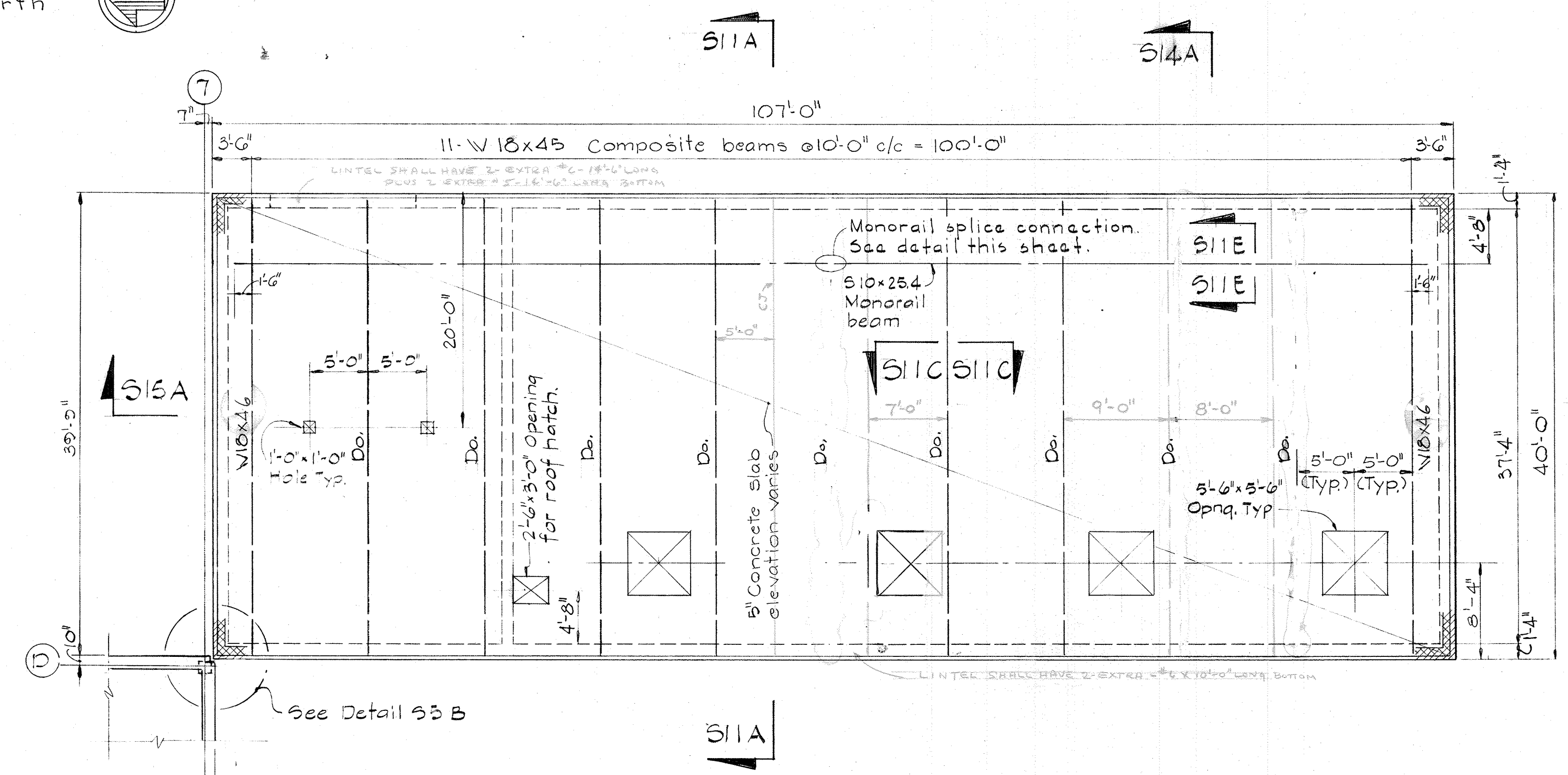
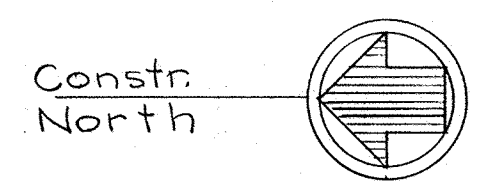


BRUNING 44-510 32872

W.O. 7275-2C

SHEET S-10



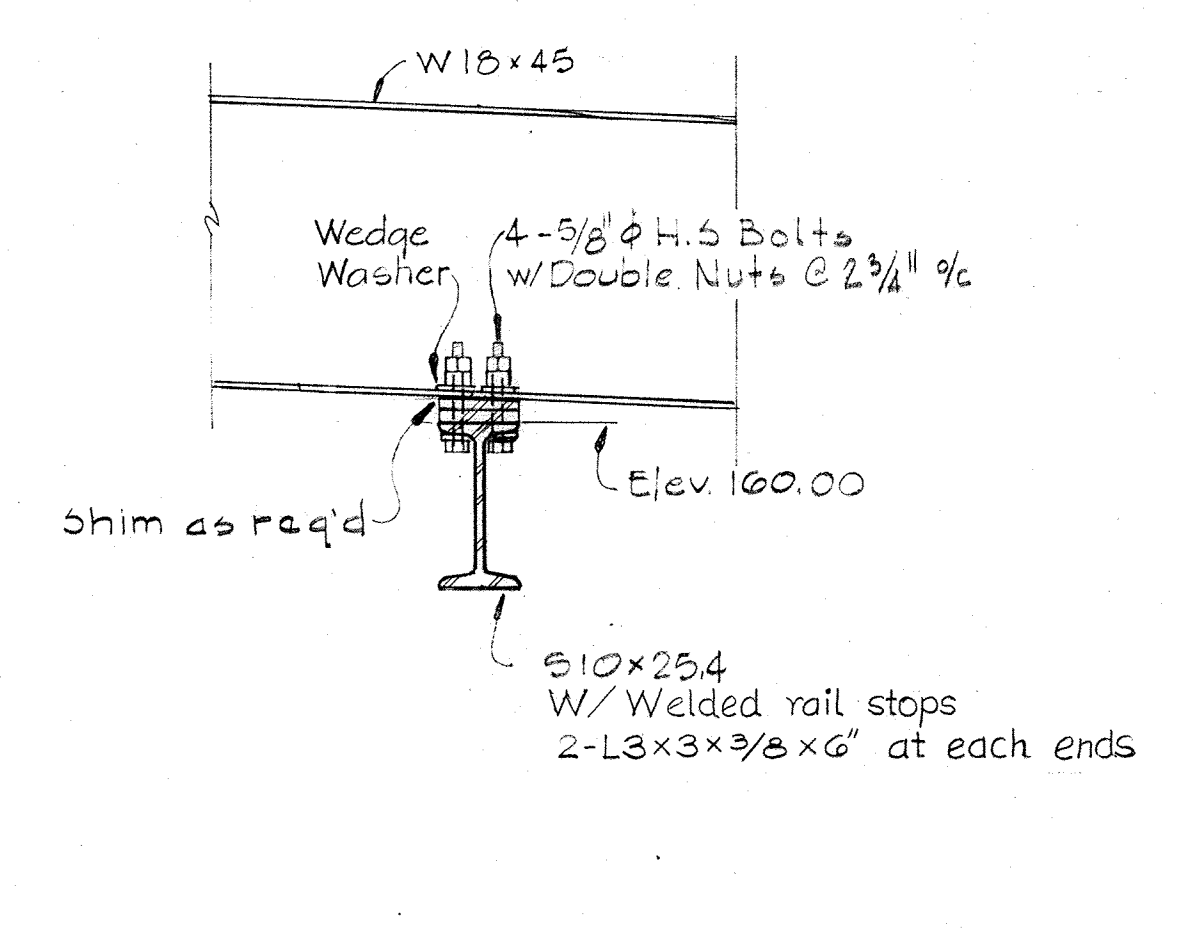


See sheet S-5 for continuation

- NOTE:
1. See sheet A-2 for curbs at roof openings
  2. Plank manufacturer shall saddle at openings in planks.
  3. See sheet S-1 for additional reinforcing of opening.

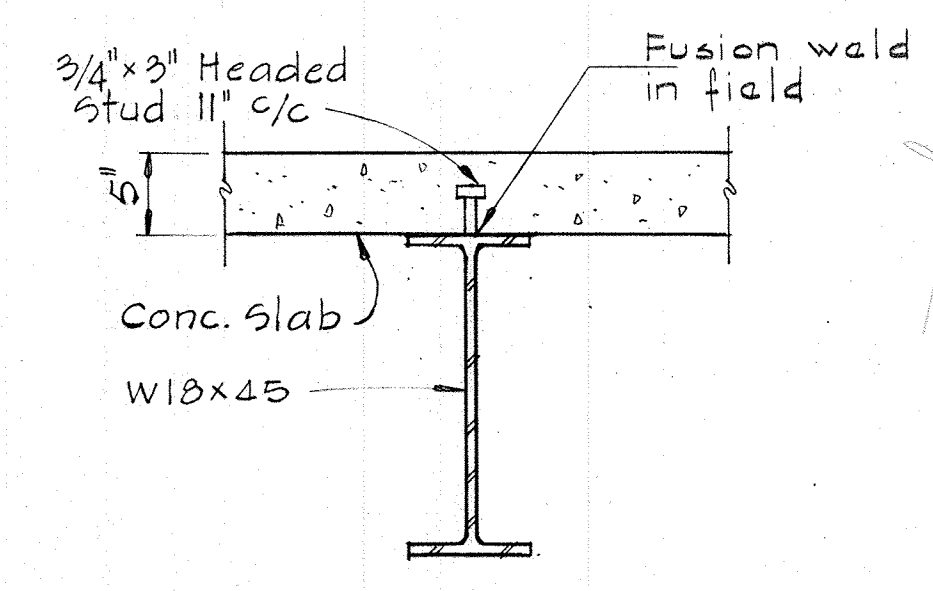
**ROOF PLAN**

Scale: 1/8" = 1'-0"



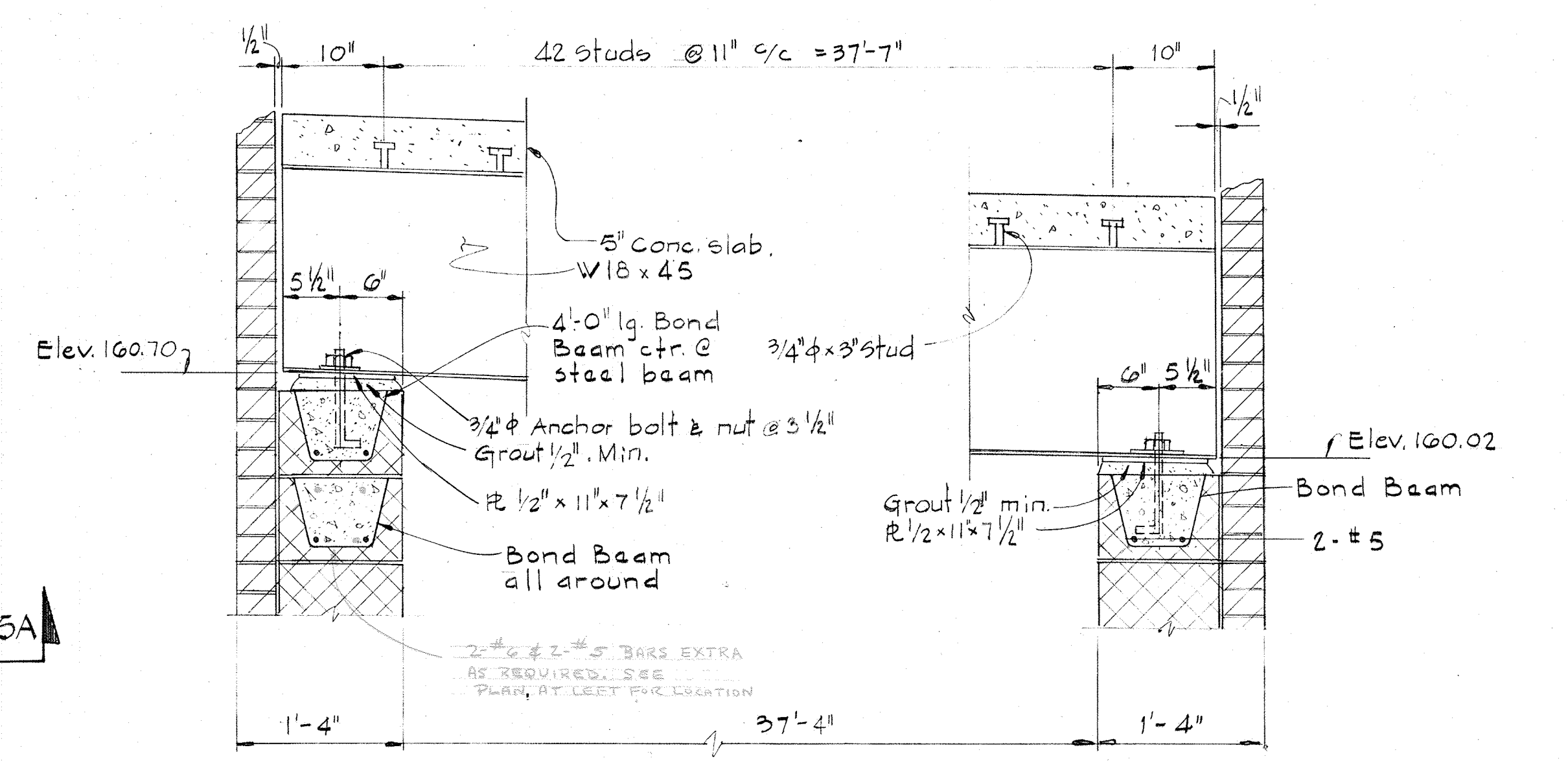
**SECTION S11E/S11**

Scale: 1" = 1'-0"



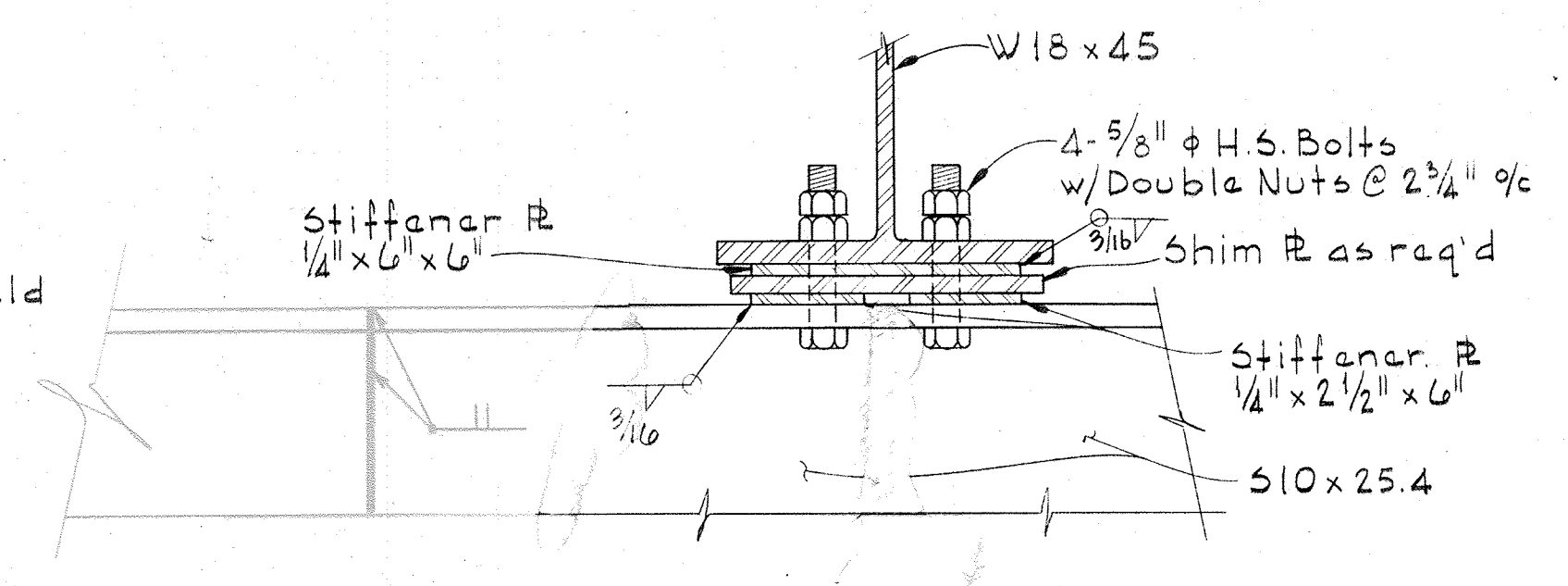
**SECTION S11C/S11**

Scale: 1" = 1'-0"



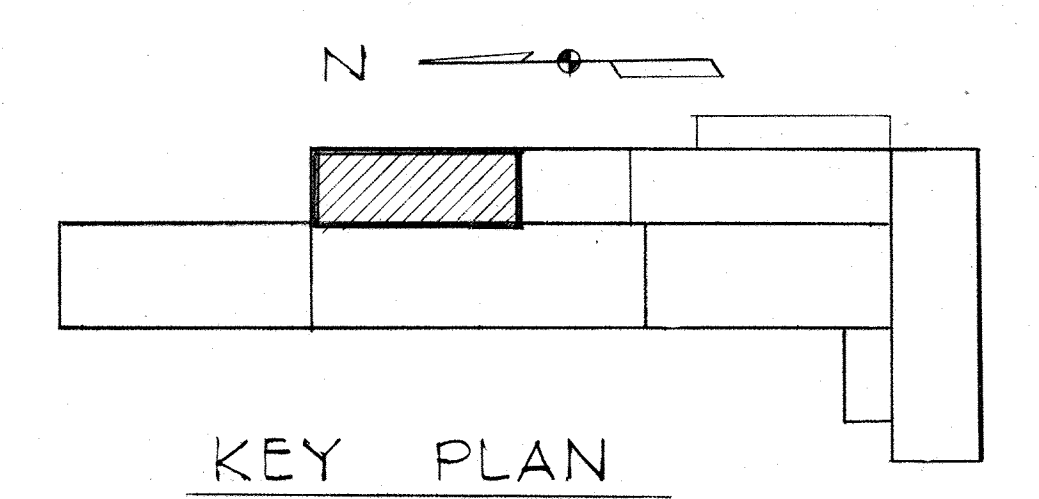
**SECTION S11A/S11**

Scale: 1" = 1'-0"

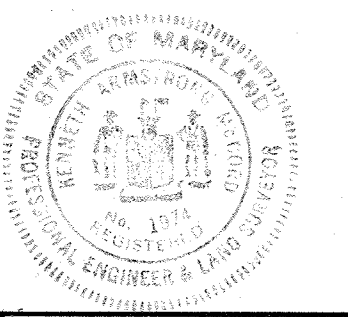
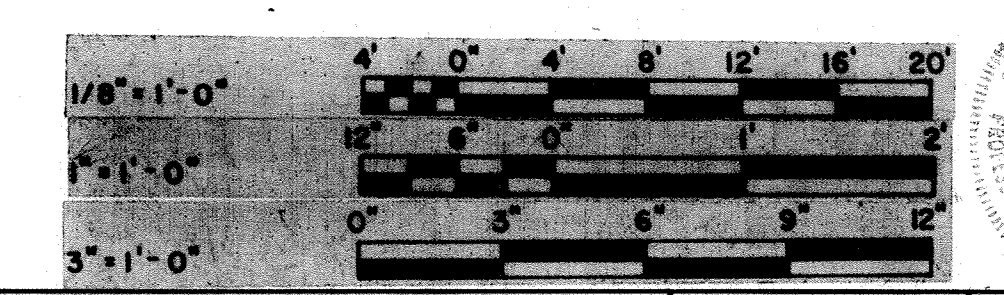


**MONORAIL SPLICE DETAIL**

Scale: 3/8" = 1'-0"

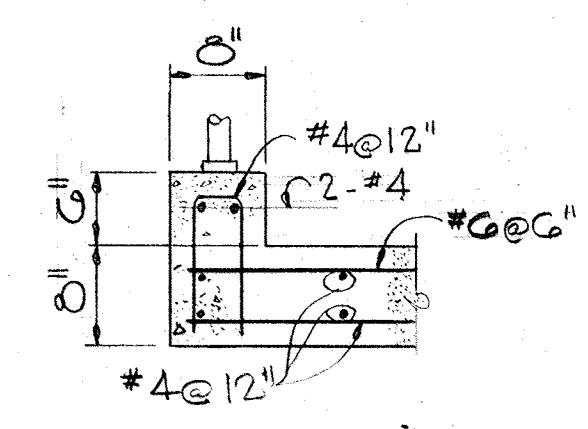


**KEY PLAN**

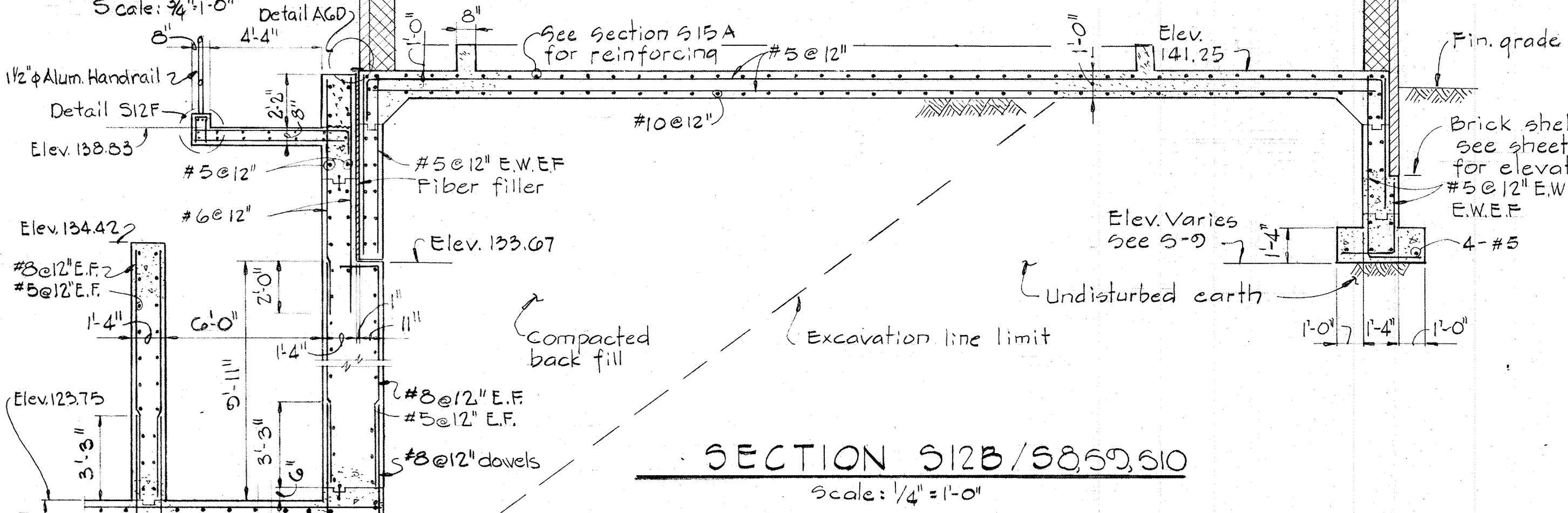


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|---|---|---------------------------|--|--|--|
| <p>WHITMAN, REQUARDT &amp; ASSOCIATES<br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE<br/>Richard E. O'Connell<br/>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. 502-S</p> | <p>FILTER CONTROL BUILDING<br/>ROOF PLAN,<br/>SECTIONS &amp; DETAILS</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO.4</p> | <p>DRAWING NO. 29 OF 96<br/>SCALE AS NOTED</p> |
|---|---|---------------------------|--|--|--|

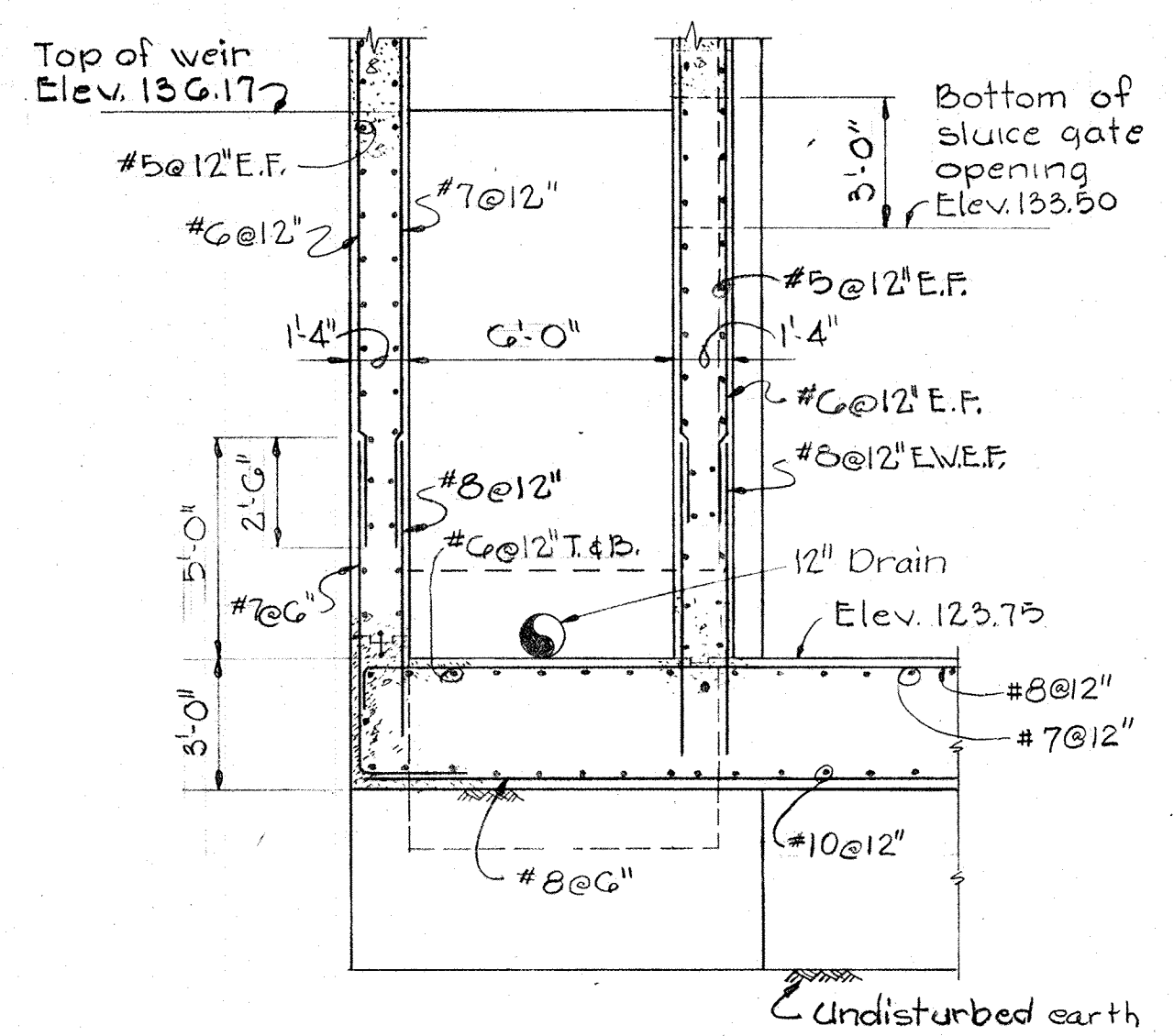




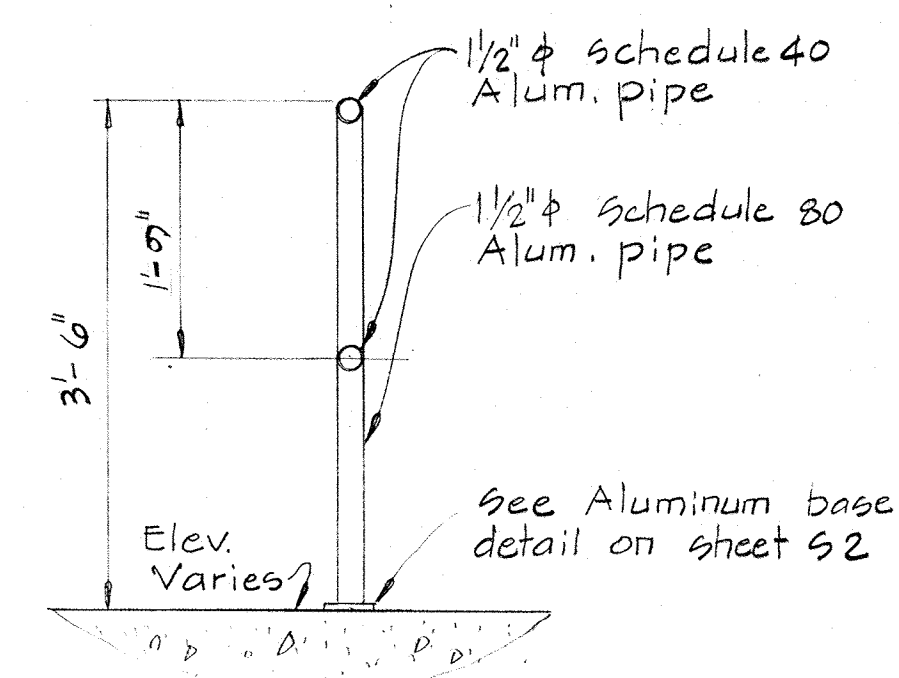
DETAIL S12F/S12  
Scale: 3/4" = 1'-0"



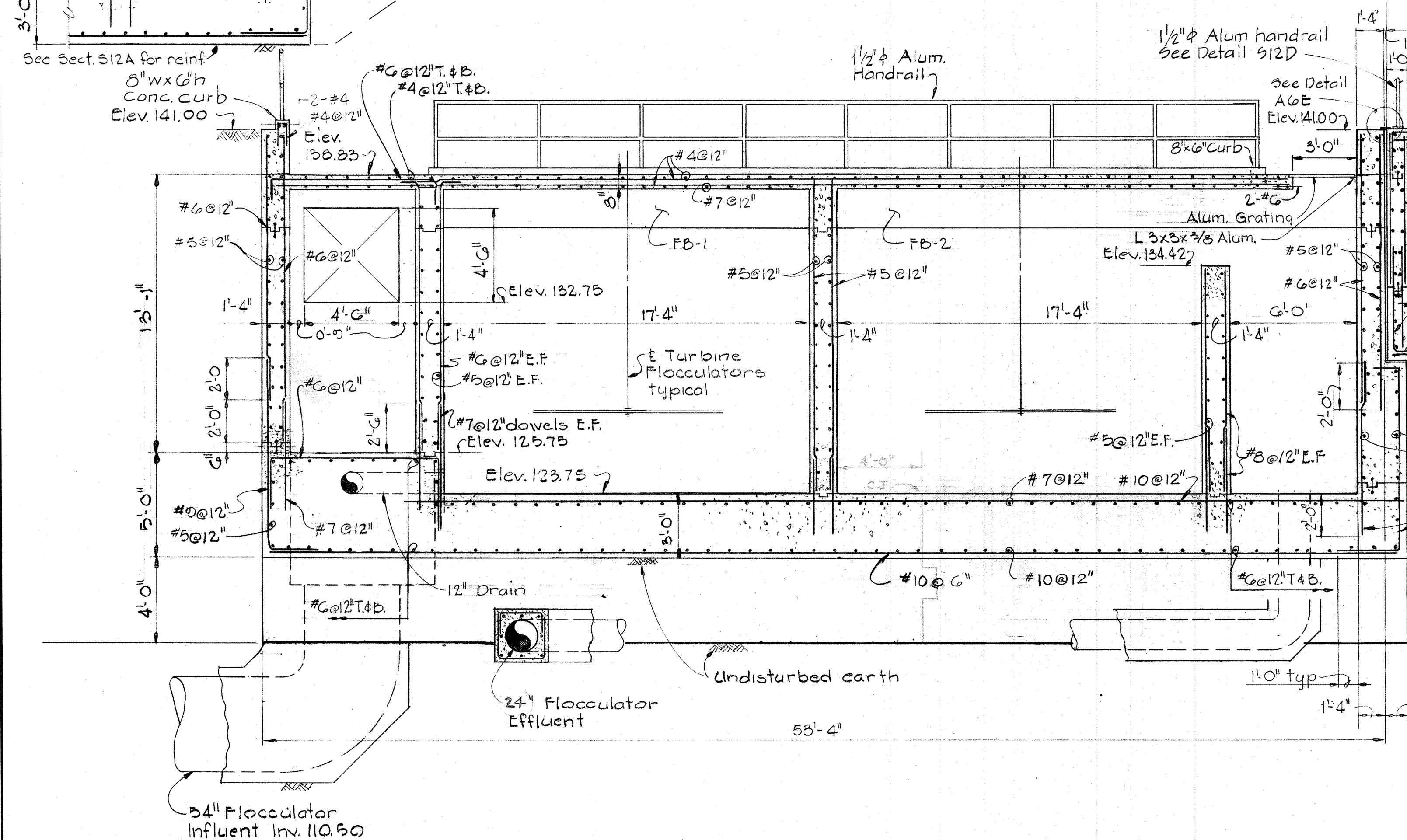
SECTION S12B/S8,S9,S10  
Scale: 1/4" = 1'-0"



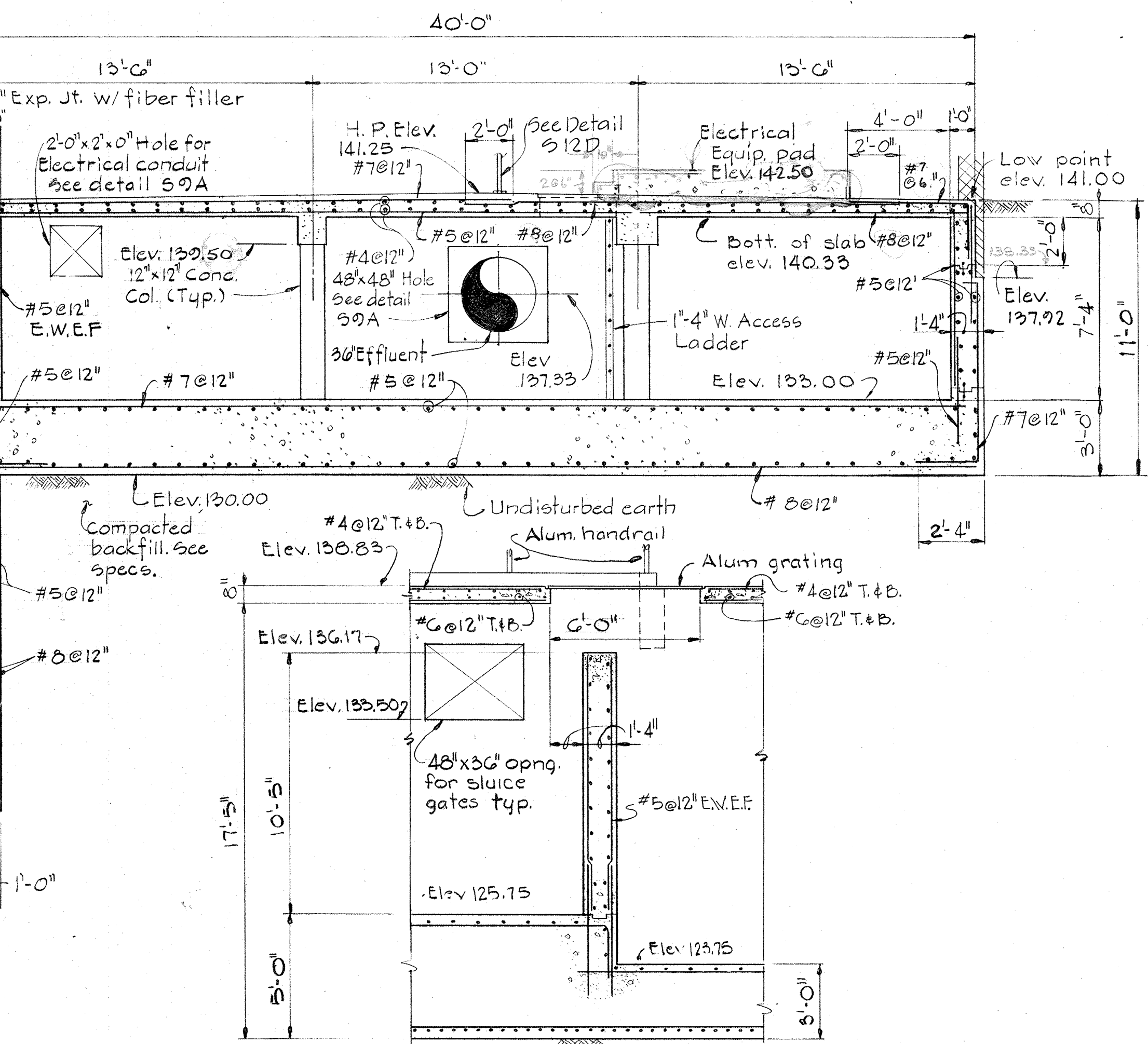
SECTION S12C/S8  
Scale: 1/4" = 1'-0"



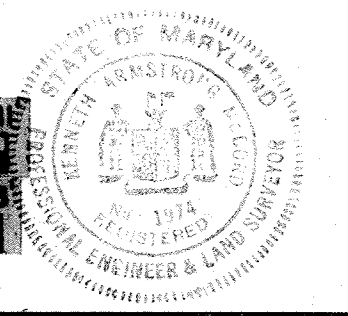
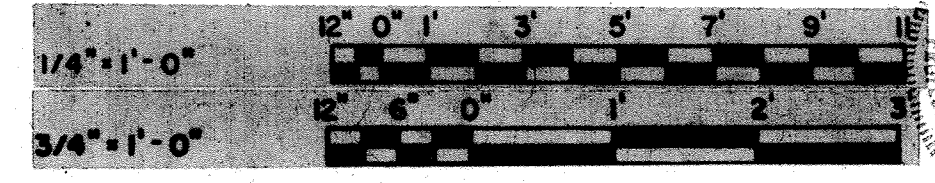
DETAIL S12D/S12  
Scale: 3/4" = 1'-0"



SECTION S12A/S8,S9,S10  
Scale: 1/4" = 1'-0"



SECTION S12E/S8,S10  
Scale: 1/4" = 1'-0"



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
DATE: 12/13/83  
RICHARD B. BREIDENBACH  
CHIEF-BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FLOCCULATORS NO. 1 thru 6  
& FILTER CONTROL BUILDING  
SECTIONS

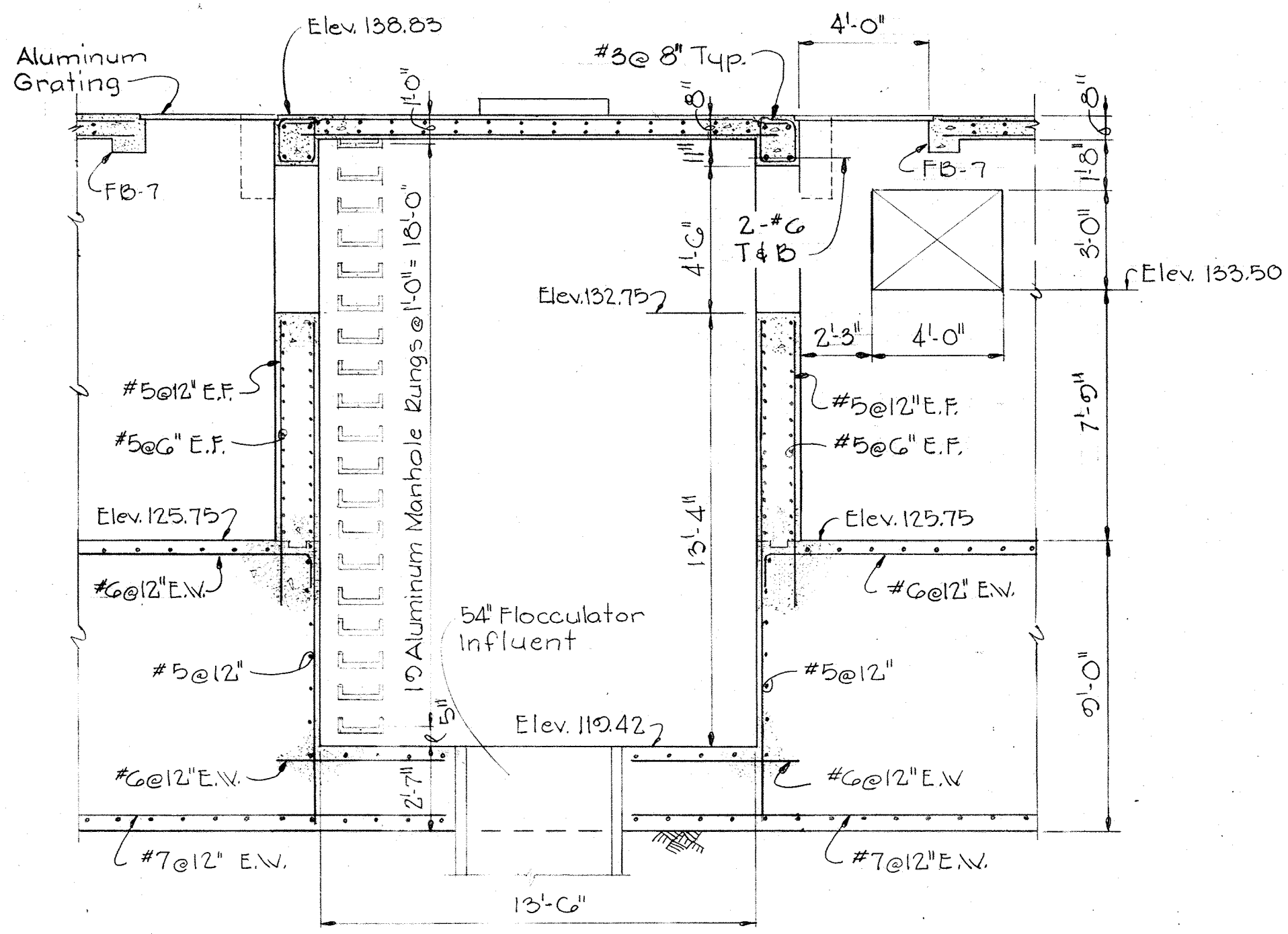
SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 30  
OF 96  
SCALE AS NOTED

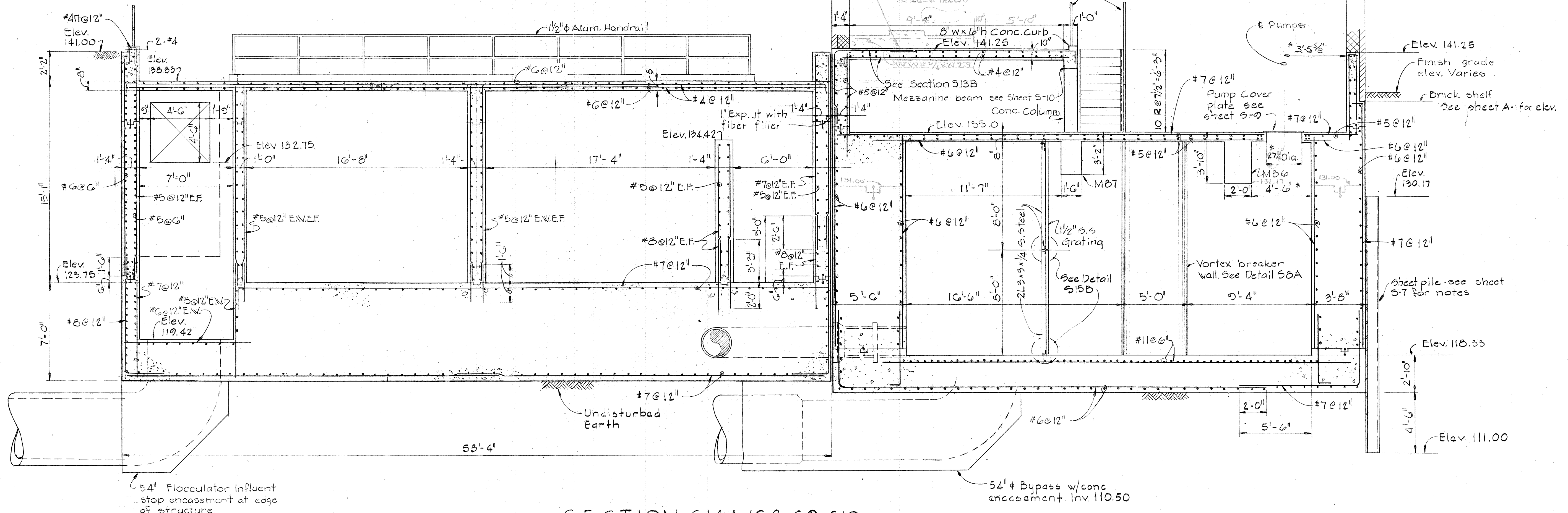






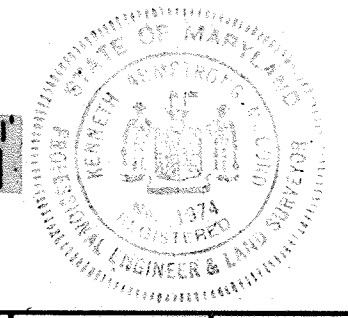
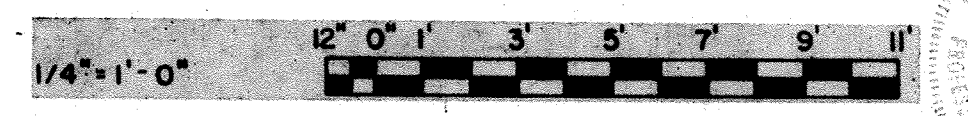


SECTION 514B/58, 510  
Scale: 1/4" = 1'-0"



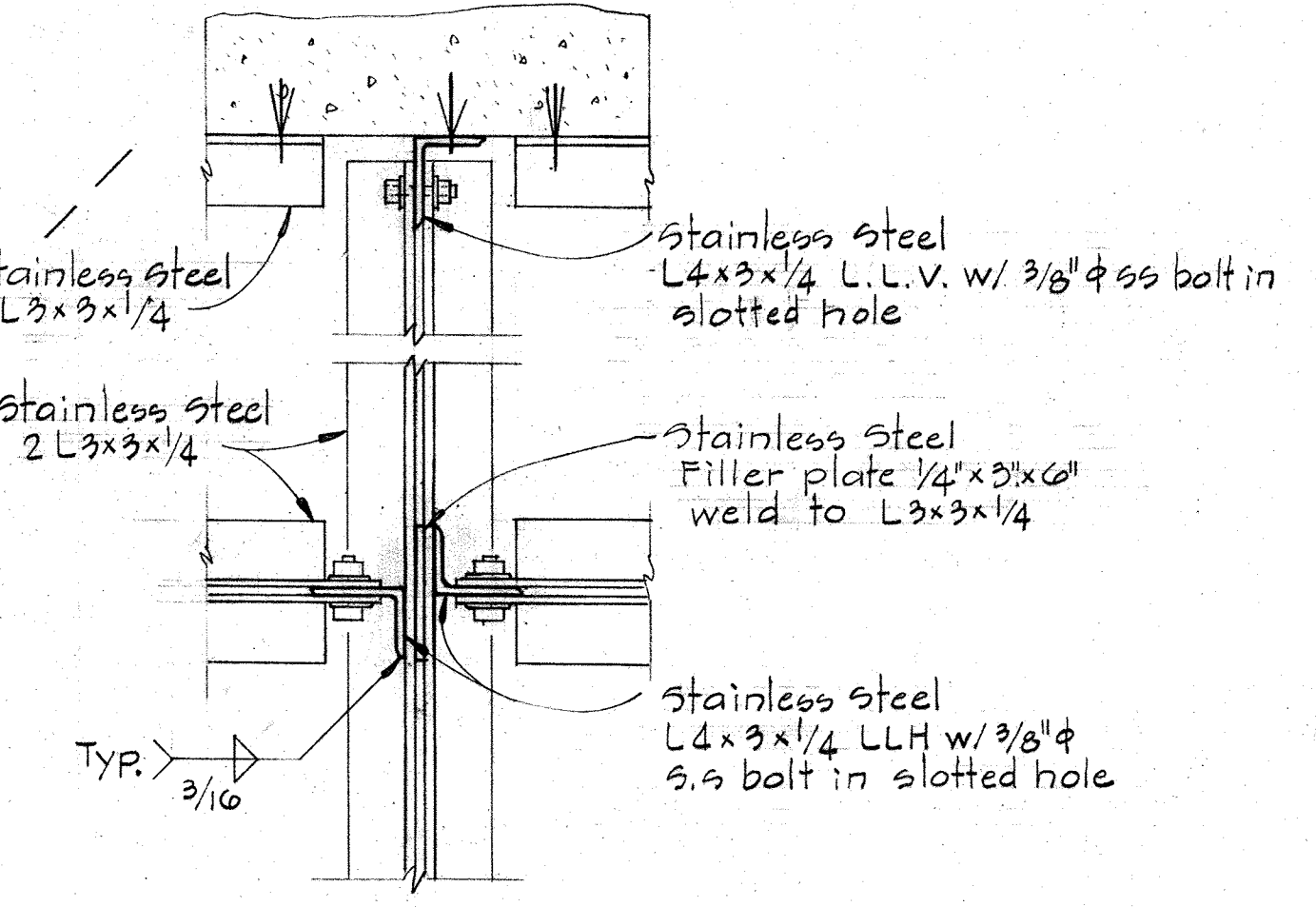
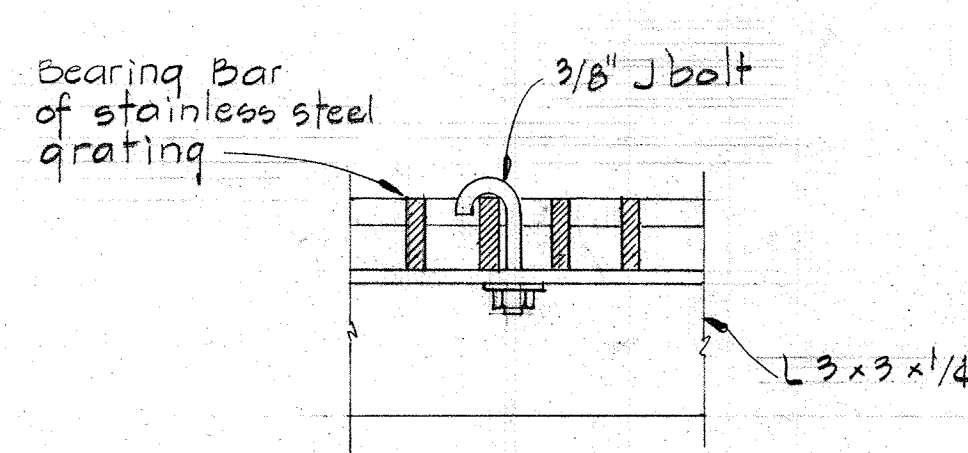
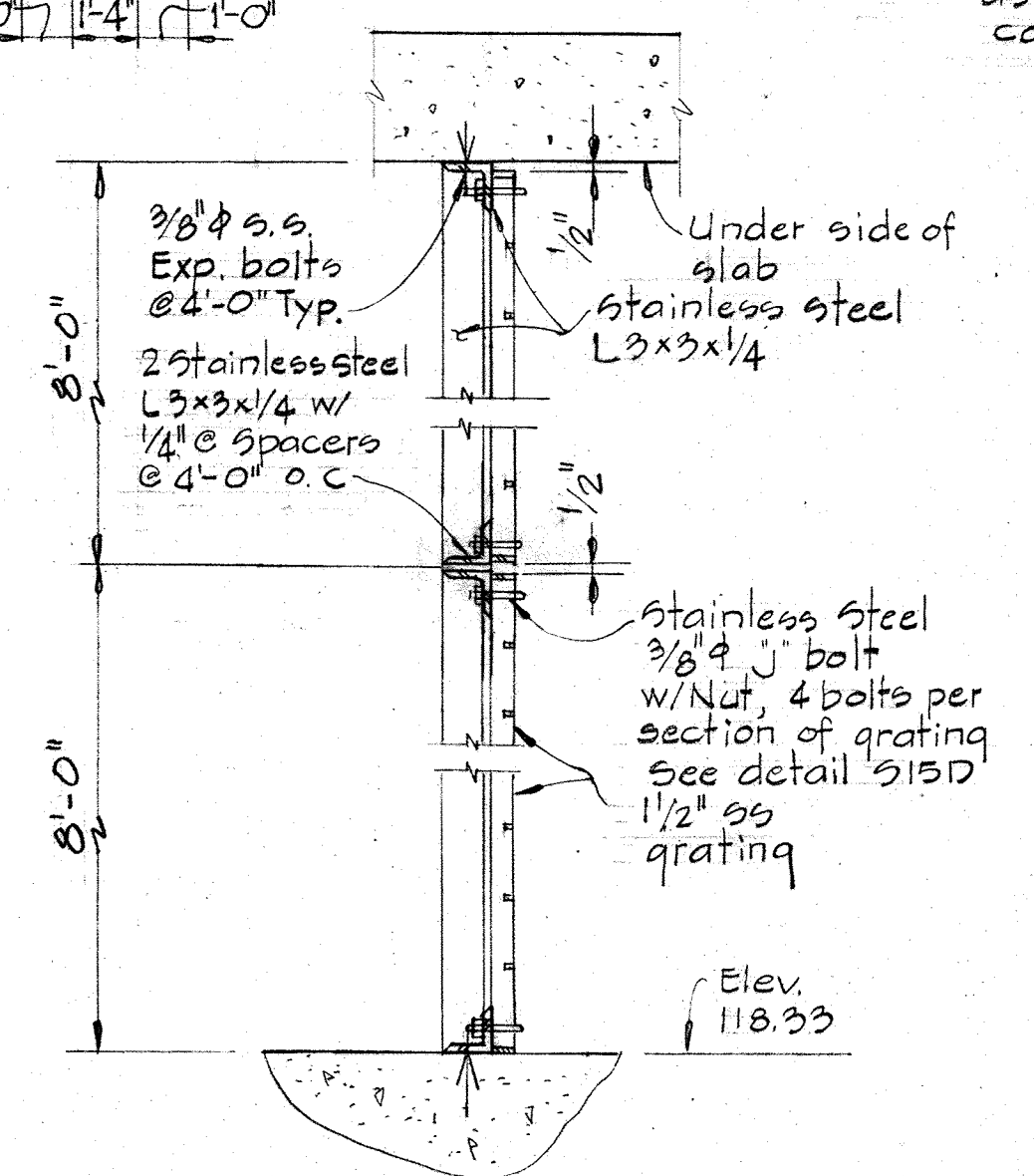
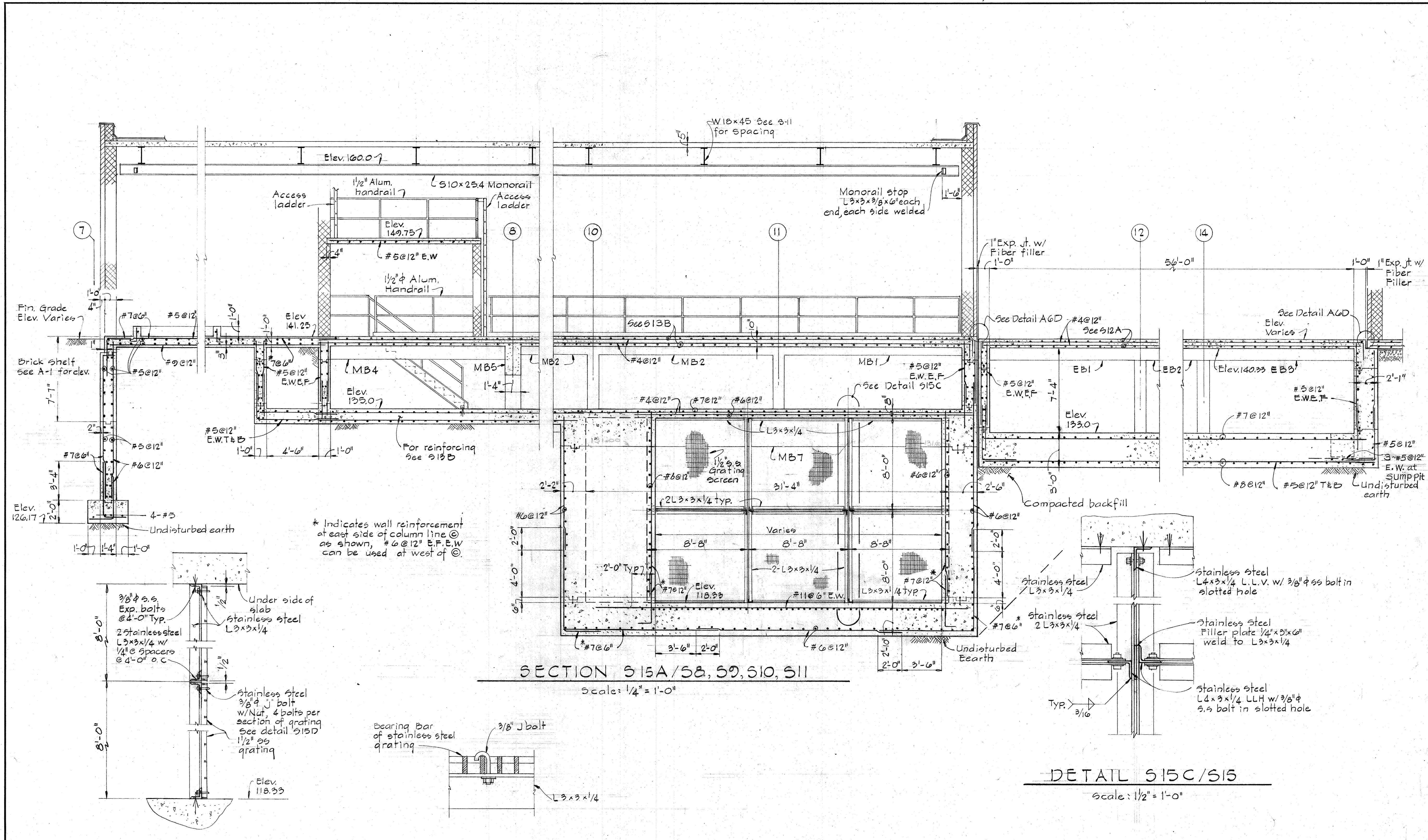
SECTION 514A/58, 59, 510  
Scale: 1/4" = 1'-0"

Notes  
\* Indicates dimension to be coordinated with equipment furnished.



|   |   |                    |   |   |  |
|---|---|--------------------|---|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br><i>Richard E. Prescher</i><br>CHIEF/BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FLOCCULATORS NO. 1 thru 6<br>& FILTER CONTROL BUILDING<br>SECTION | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 32 OF 96<br>SCALE AS NOTED |
|---|---|--------------------|---|---|--|



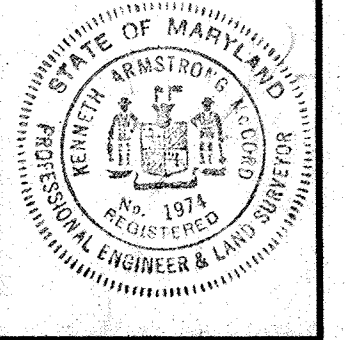
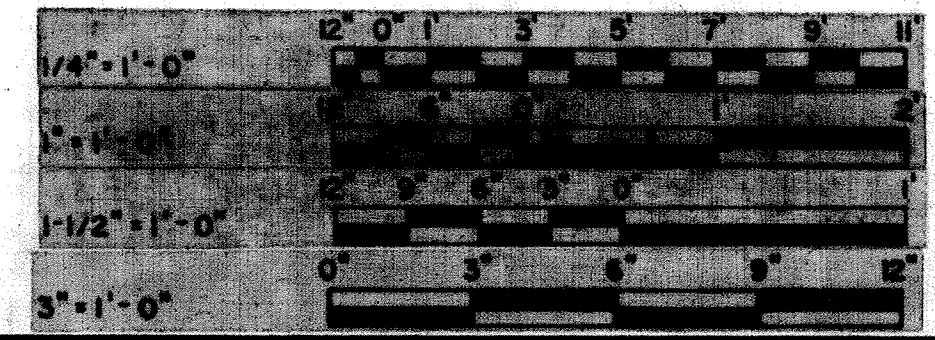


**DETAIL 515B/514**  
Scale: 1" = 1'-0"

**DETAIL 515D/515**  
Scale: 3" = 1'-0"

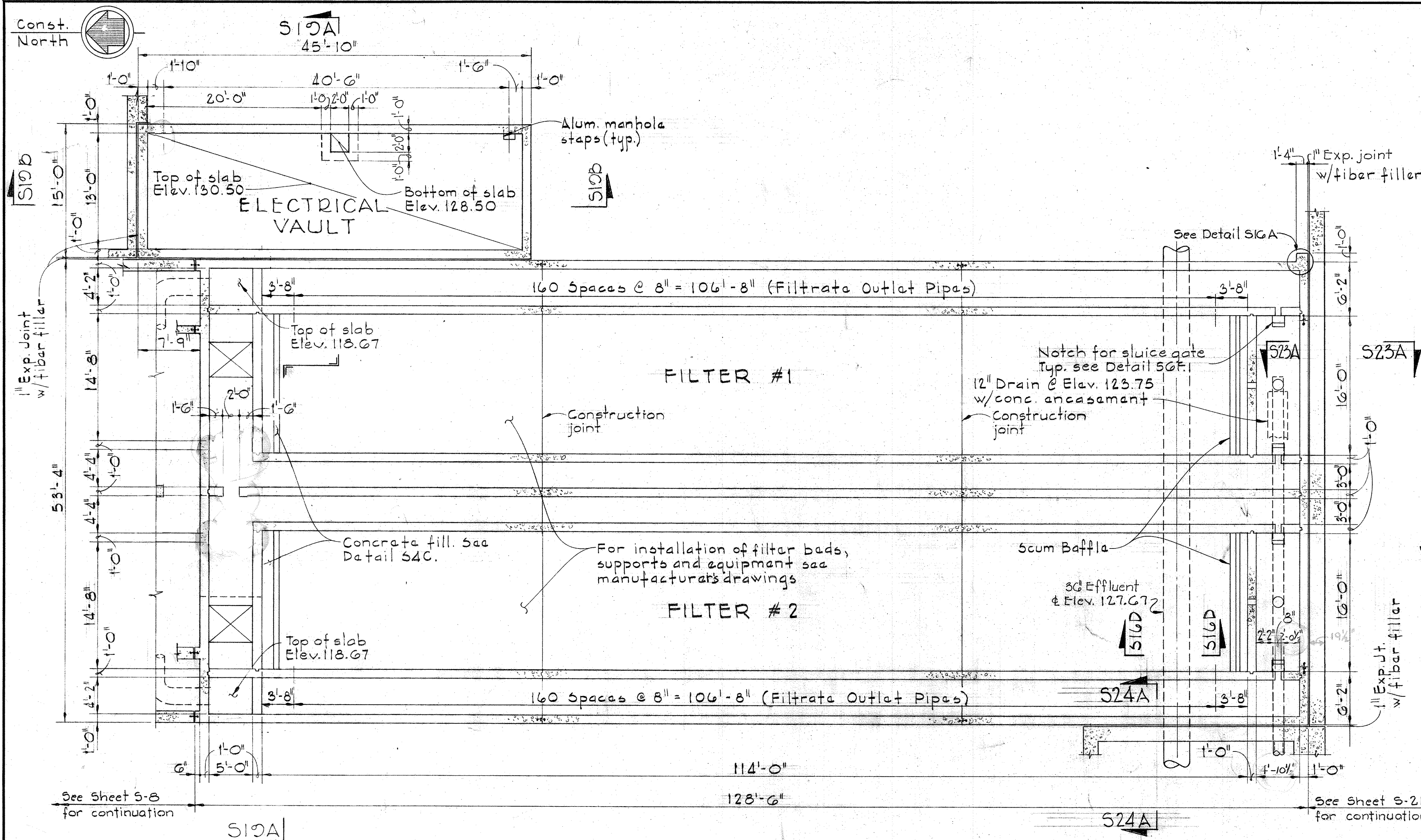
**DETAIL 515C/515**  
Scale: 1/2" = 1'-0"

**SECTION 515A/58, 59, 510, 511**  
Scale: 1/4" = 1'-0"



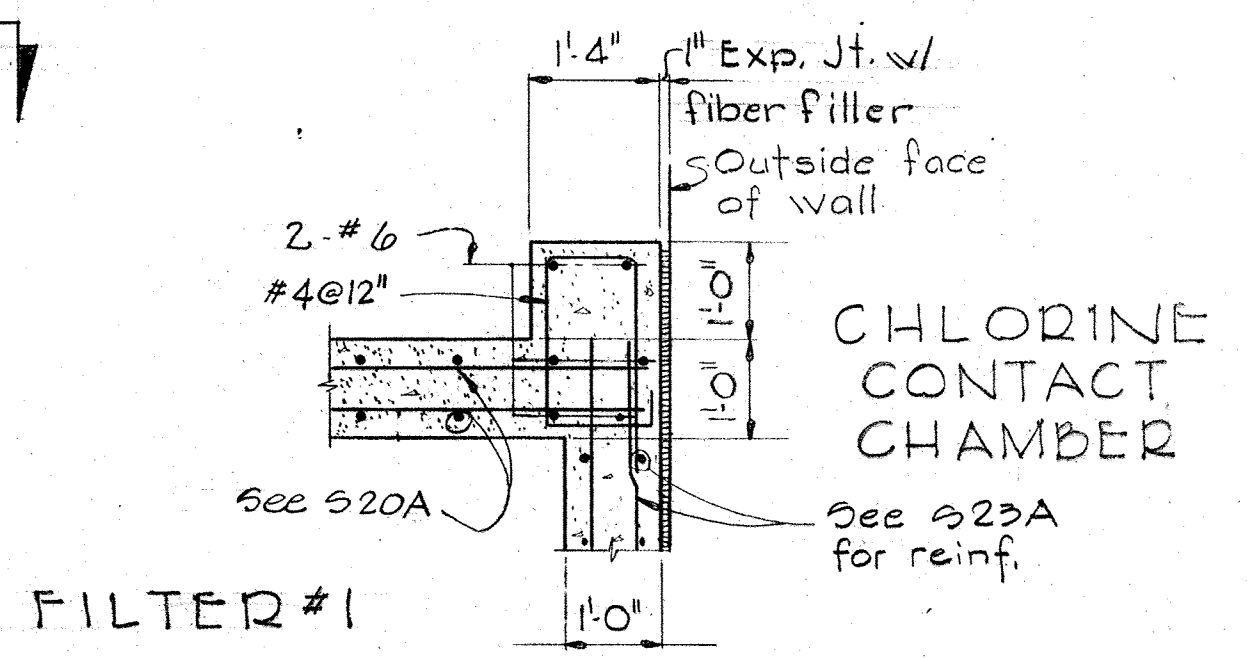
|  |  |                                  |  |  |  |
|--|--|----------------------------------|--|--|--|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE<br/><i>Richard S. Brundage</i><br/>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>FILTER CONTROL BUILDING &amp; ELECTRICAL SUBSTATION SECTIONS &amp; DETAILS</b></p> | <p><b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 33 OF 96</b><br/><b>SCALE AS NOTED</b></p> |
|--|--|----------------------------------|--|--|--|



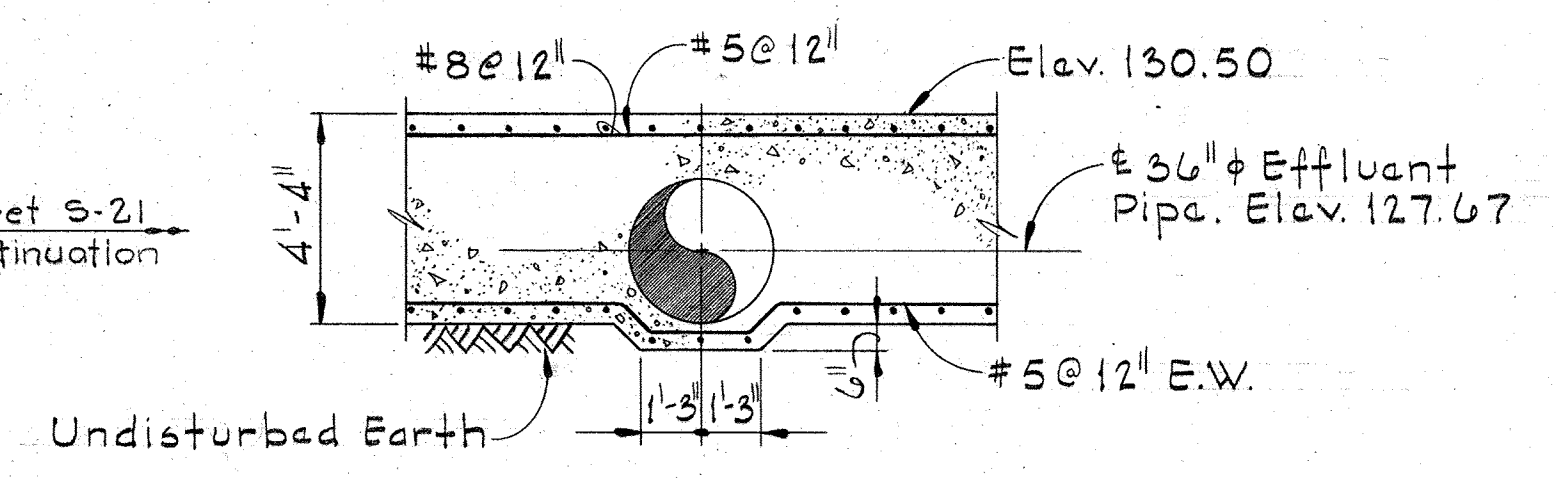


PLAN AT ELEV. 133.00  
Scale: 1/8" = 1'-0"

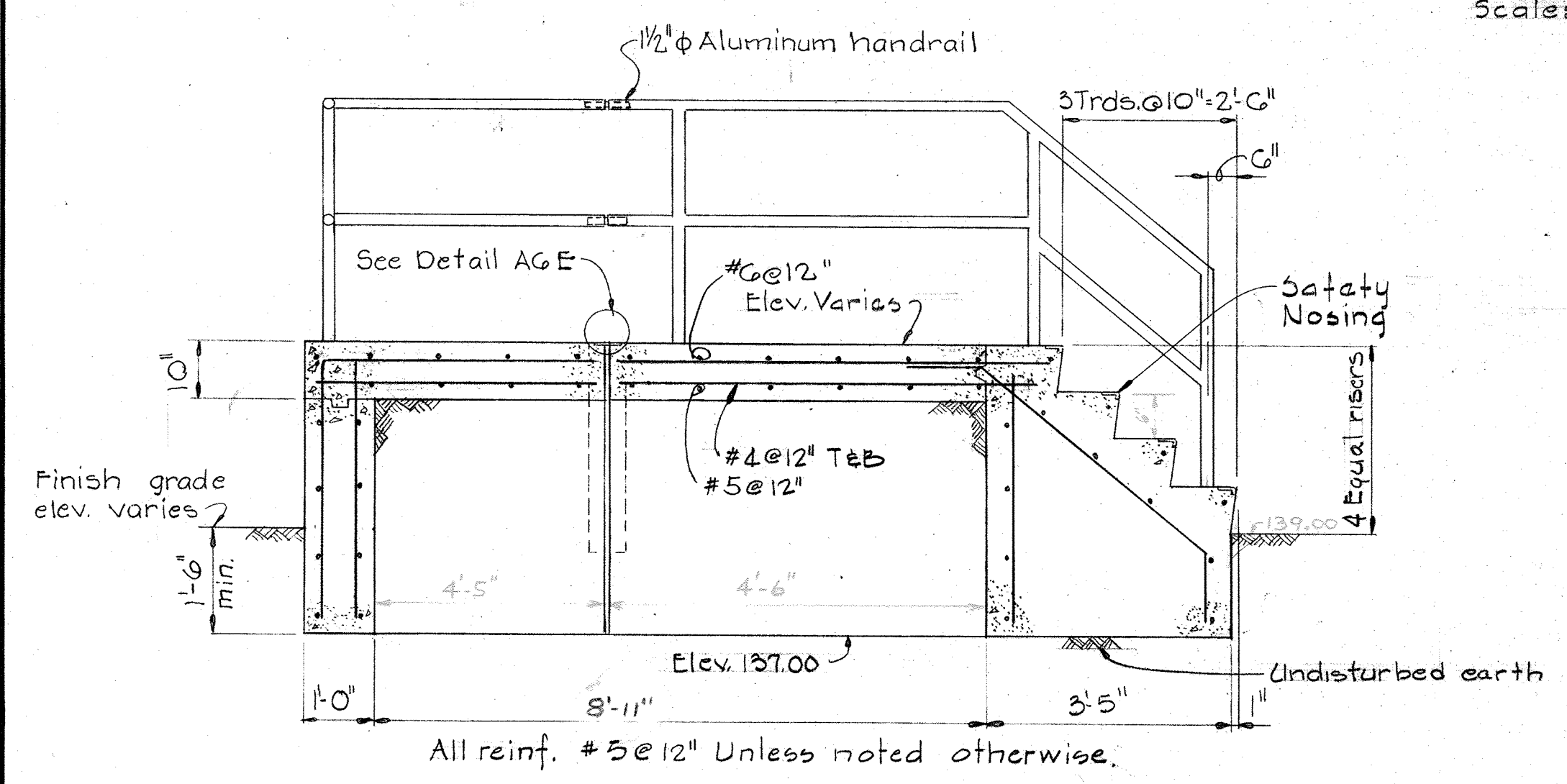
- NOTES**
1. For Aluminum Handrail Details see sheet S-2.
  2. For Construction Joint Details see sheet S-1.
  3. Waterstops to extend to within 3" of top of wall.
  4. Depth of grout fill in filter area to suit equipment furnished.
  5. See mechanical drawings for pipes and sleeves cast into walls and slabs.
  6. For Scum Baffle detail see sheet S-4.
  7. For Conc. Fill detail see sheet S-4.
  8. For Pipe Encasement detail see sheet S-1.
  9. For Expansion Jt. details see sheet S-1.
  10. For Typical Filter Bed detail see sheet S-5.



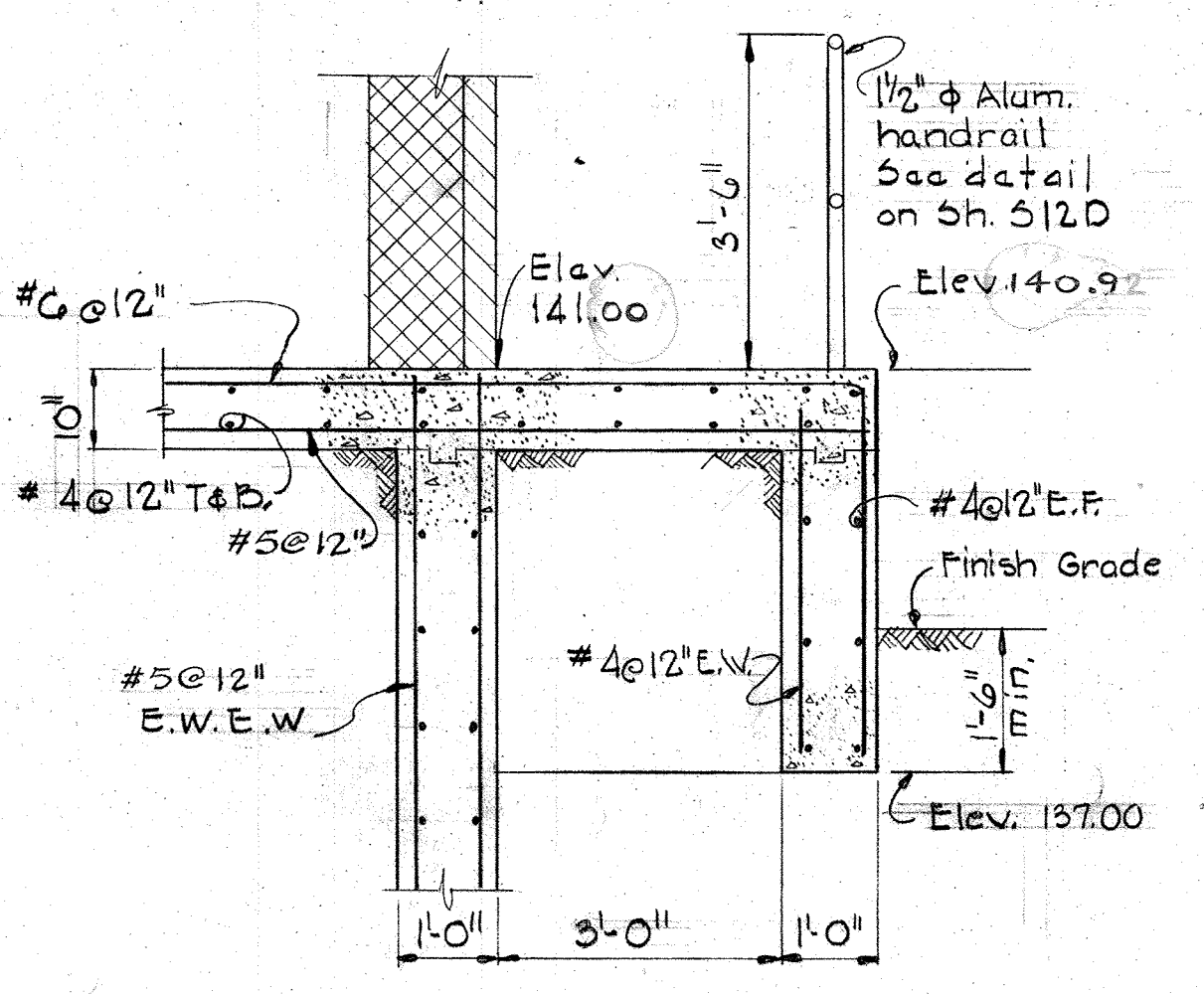
DETAIL S16C/S16  
Scale: 1/2" = 1'-0"



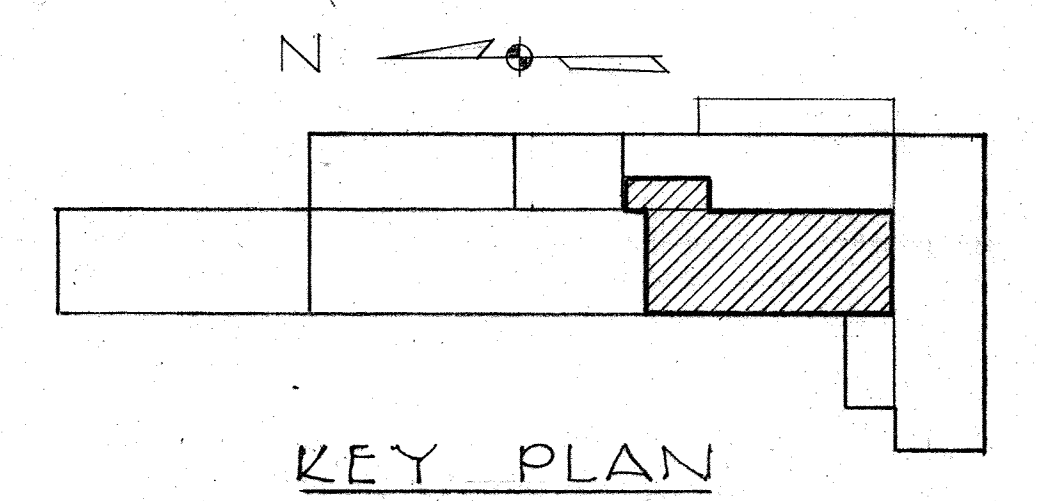
SECTION S16D/S16  
Scale: 1/4" = 1'-0"



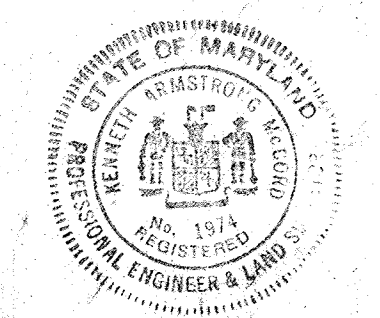
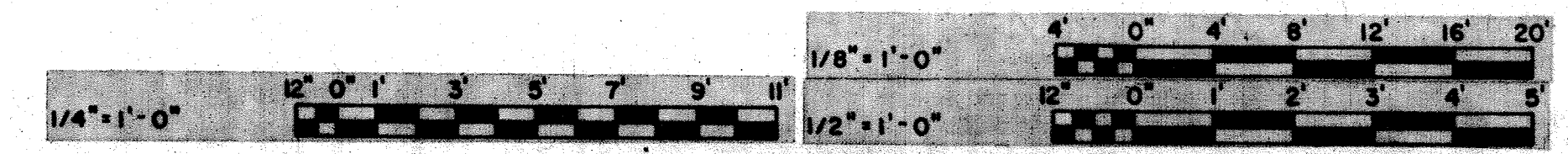
SECTION S10B/S10, S17  
Scale: 1/2" = 1'-0"



SECTION S16C/S17  
Scale: 1/2" = 1'-0"

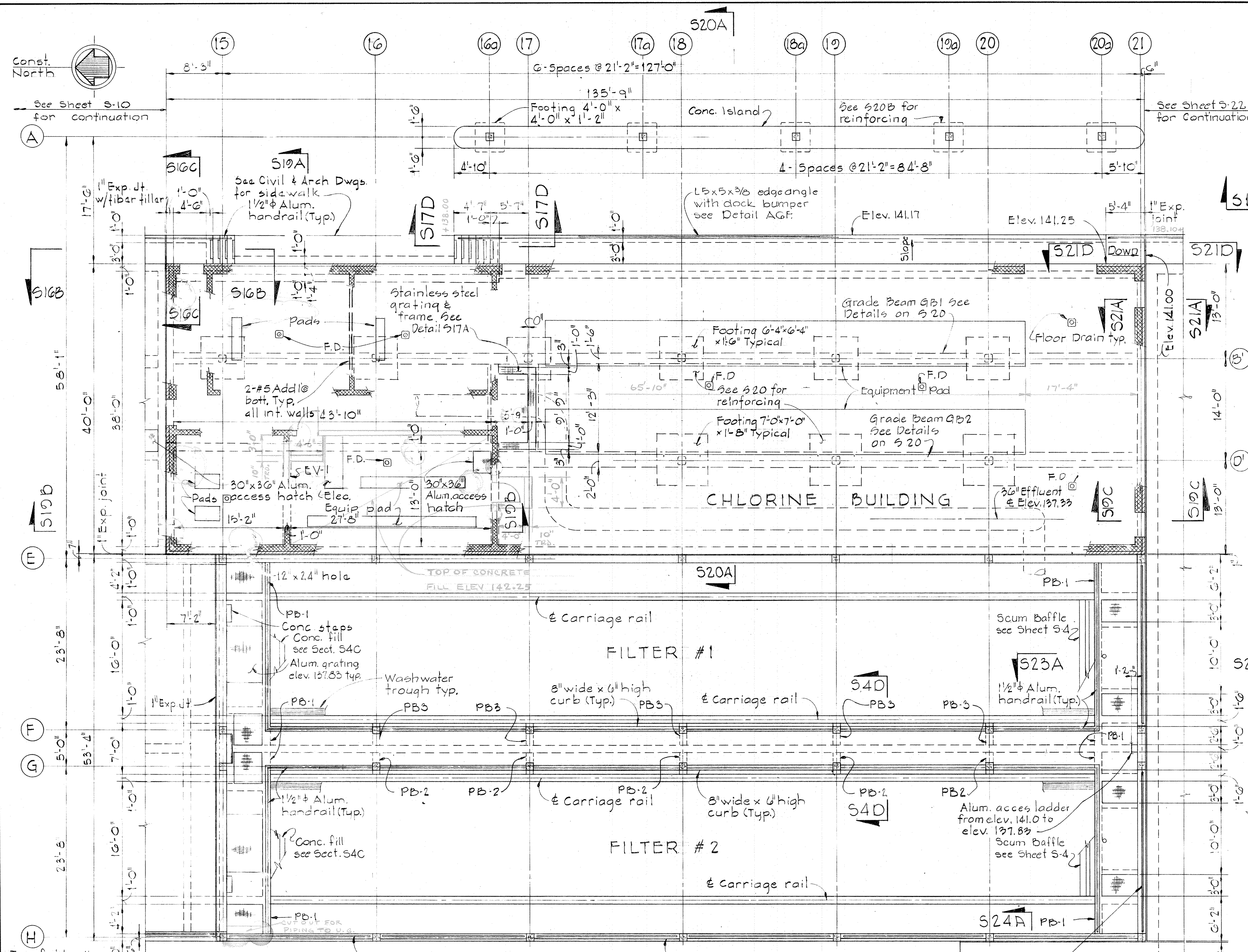


KEY PLAN

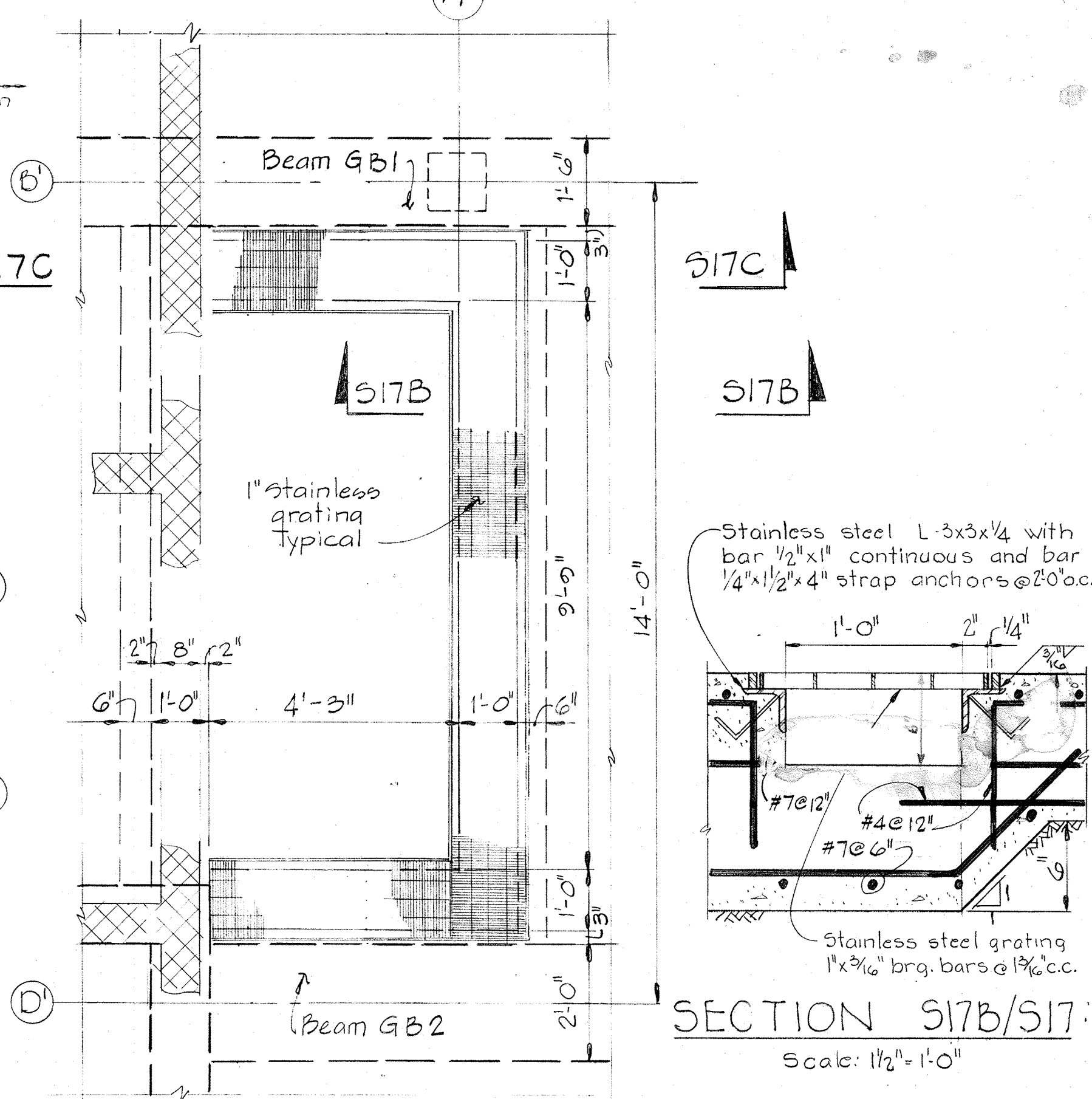


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|---|---|--------------------|---|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard S. Greder</i><br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION FILTERS NO. 1 & 2<br>PLAN AT ELEV. 133.00<br>& DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 34 OF 96<br>SCALE AS NOTED |
|---|---|--------------------|---|---|--|

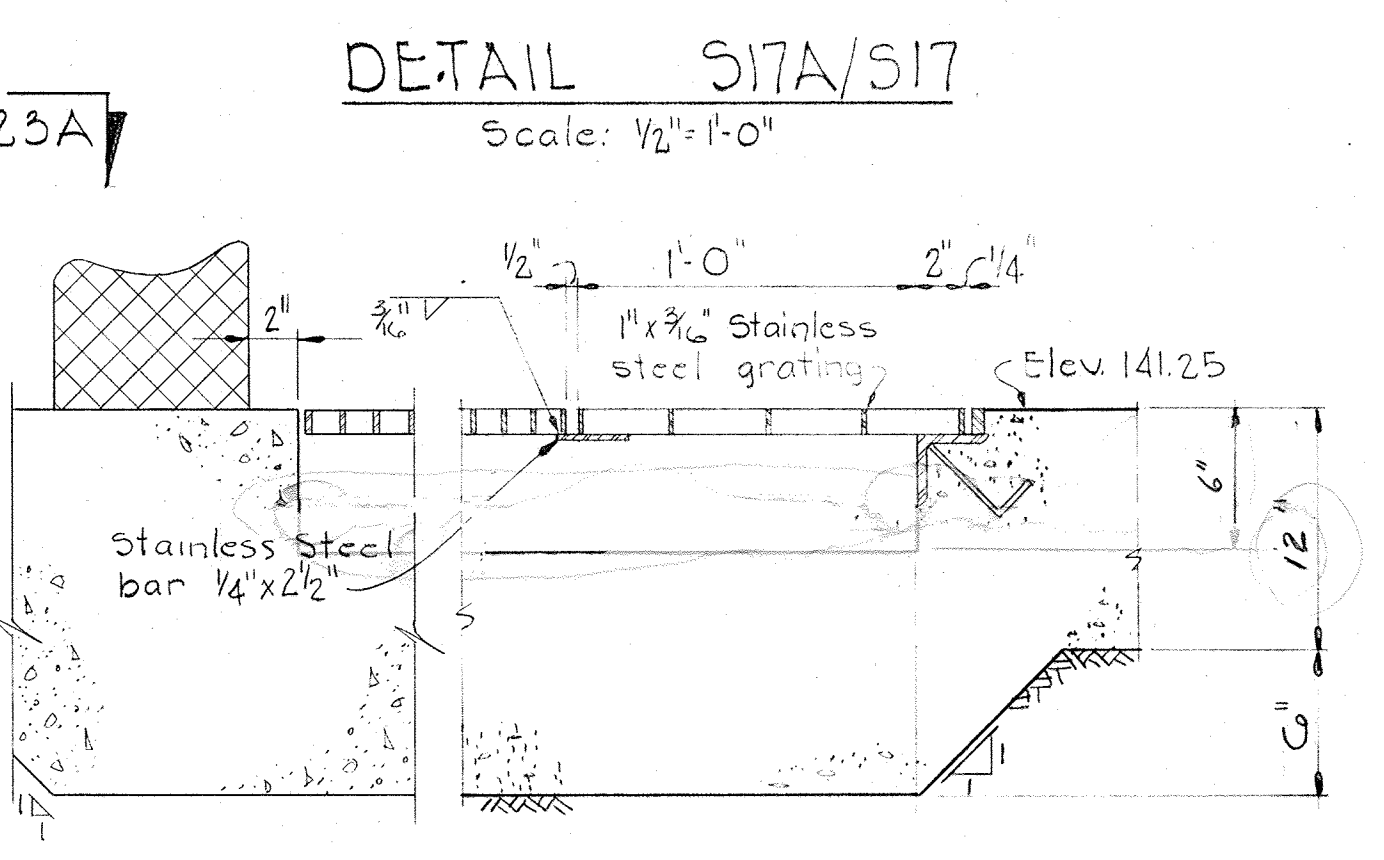




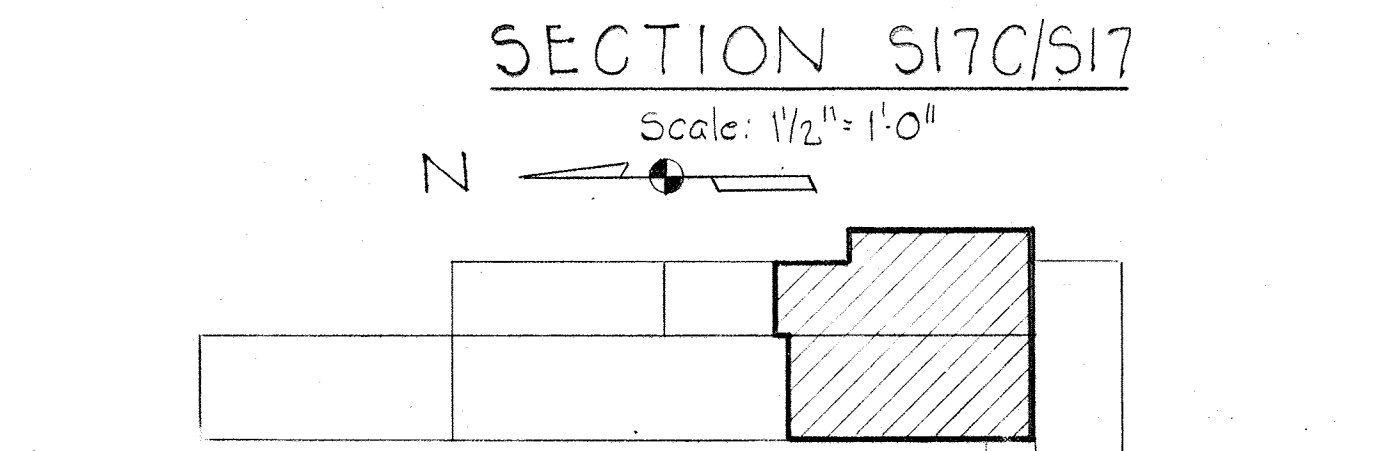
PLAN AT ELEV. 141.00  
Scale: 1/8" = 1'-0"



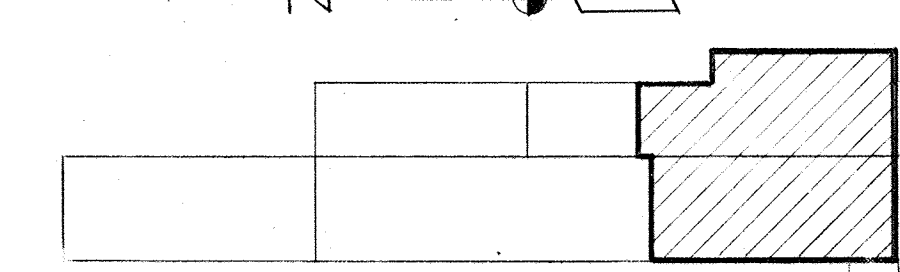
SECTION S17B/S17C  
Scale: 1/2" = 1'-0"



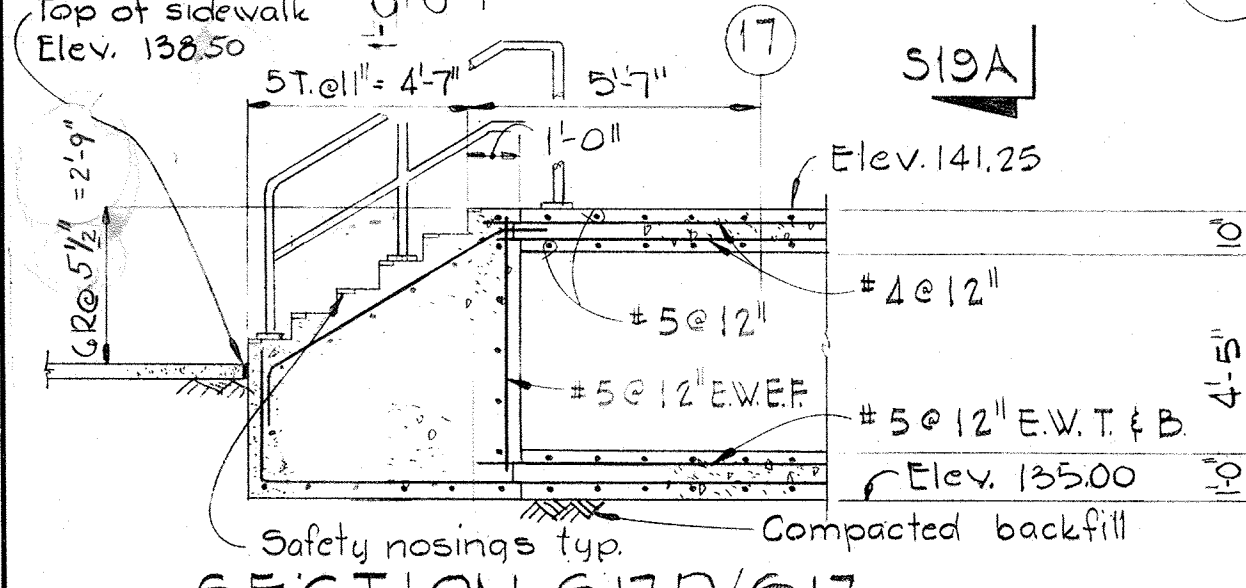
DETAIL S17A/S17  
Scale: 1/2" = 1'-0"



SECTION S17C/S17  
Scale: 1/2" = 1'-0"



KEY PLAN



SECTION S17D/S17  
Scale: 1/2" = 1'-0"

- Notes:
1. For Aluminum handrail details see sheet S-2
  2. For Aluminum ladder details see sheet S-2
  3. For Expansion joint details see sheet S-1
  4. For Construction joint details see sheet S-1
  5. Water stops to extend to within 3" of top of wall.
  6. Depth of grout fill in filter area to suit equipment furnished.
  7. For beam schedule see sheet S-25
  8. For column schedule see sheet S-27
  9. For access hatch details see sheet A-G
  10. See sheet S-C for details of North & South ends of Filters #1 & 2.

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

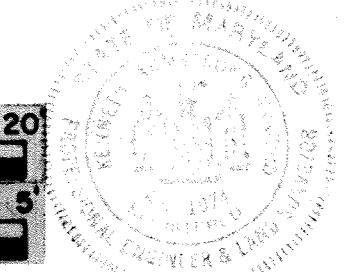
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
DATE

CONTRACT NO. 502-S

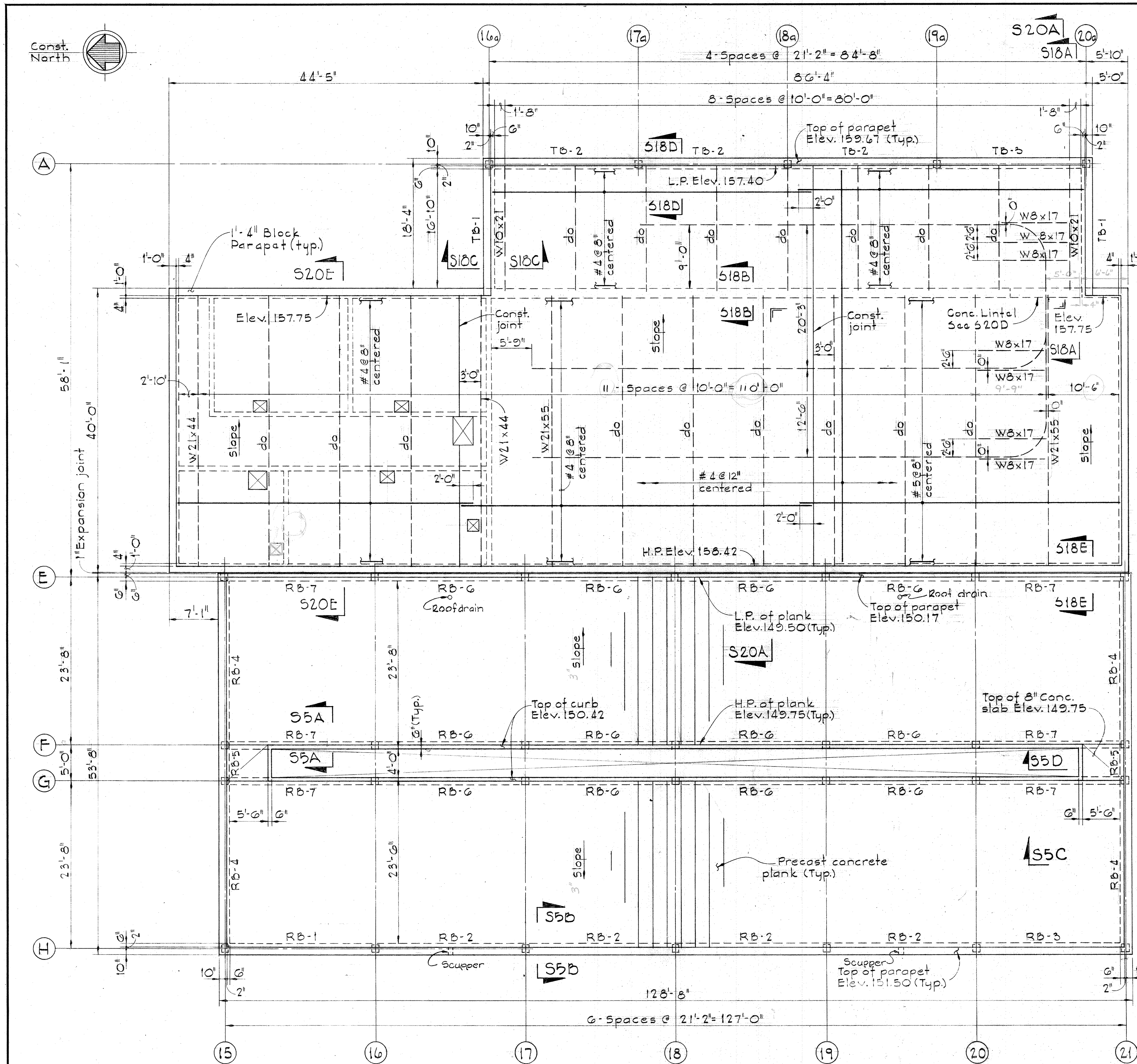
FILTRATION FILTERS NO. 1 & 2  
& CHLORINE BUILDING  
PLAN, SECTIONS & DETAIL

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 35  
OF 96  
SCALE AS NOTED



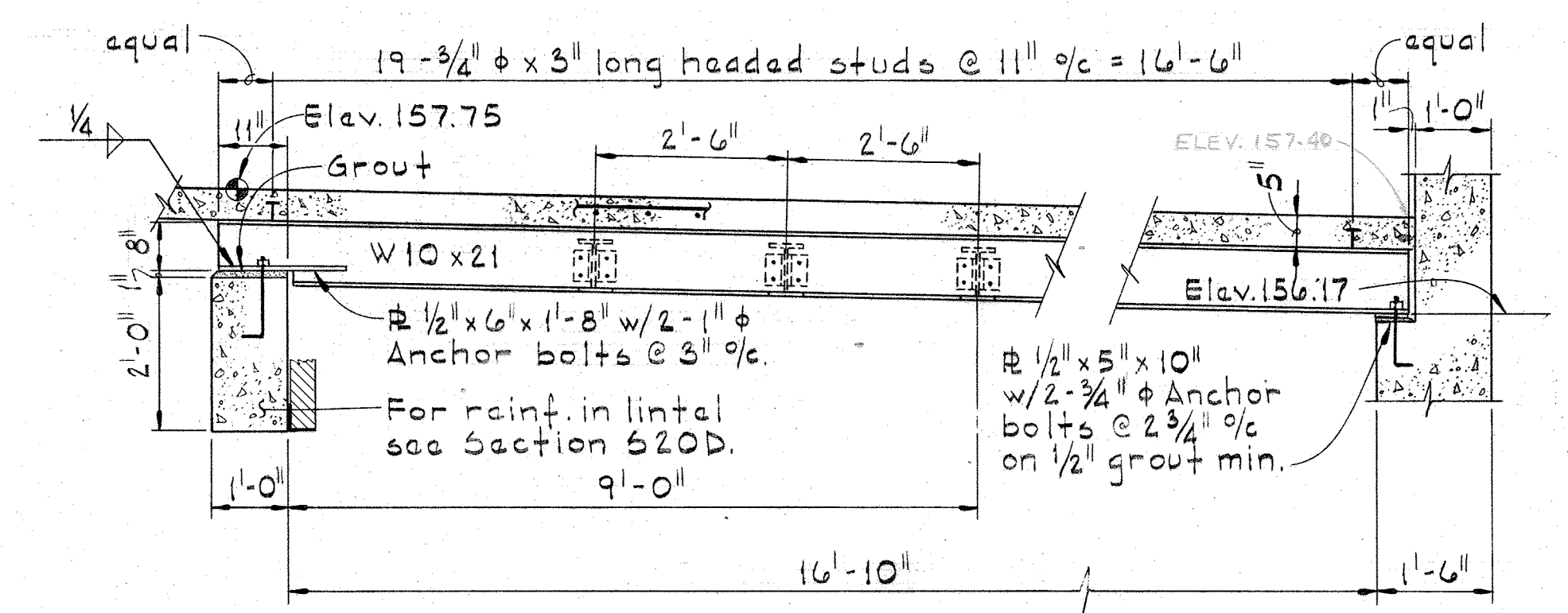




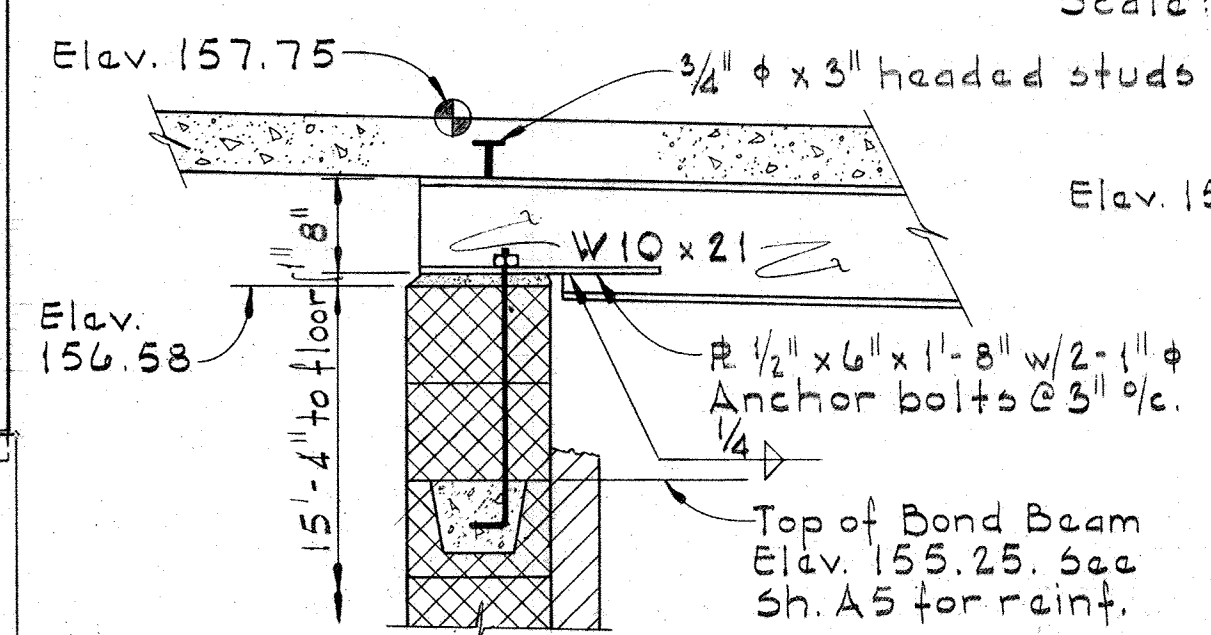
**ROOF PLAN**  
Scale: 1/8" = 1'-0"

**NOTES**

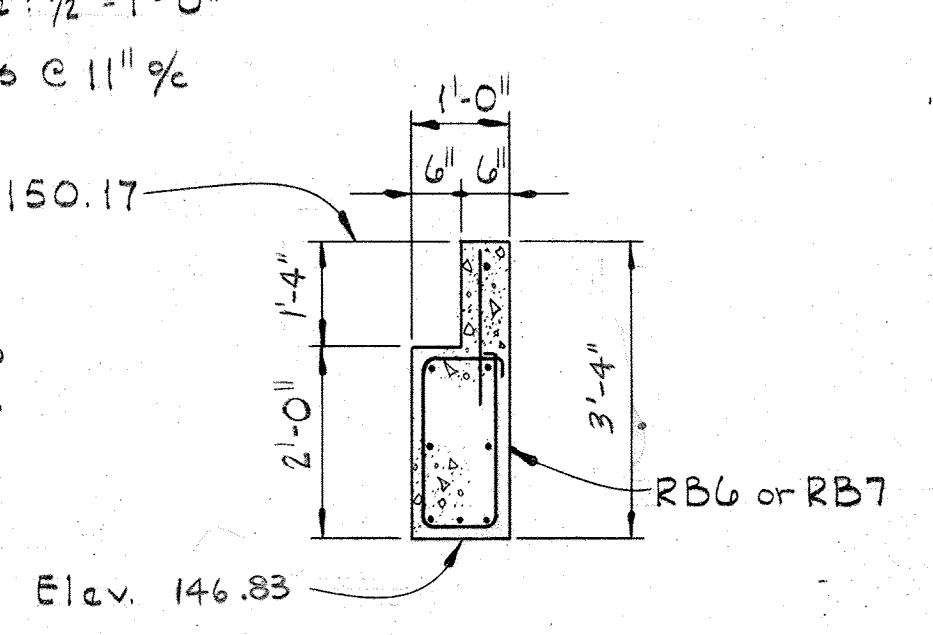
1. For curbs at roof openings see sheet A-2.
2. For plexiglass dome details see sheet A-2.
3. For scupper locations & sizes see sheet A-2.
4. For reinforcing in concrete beams see sheet S-25.
5. For reinforcing in concrete columns see Sh S27.



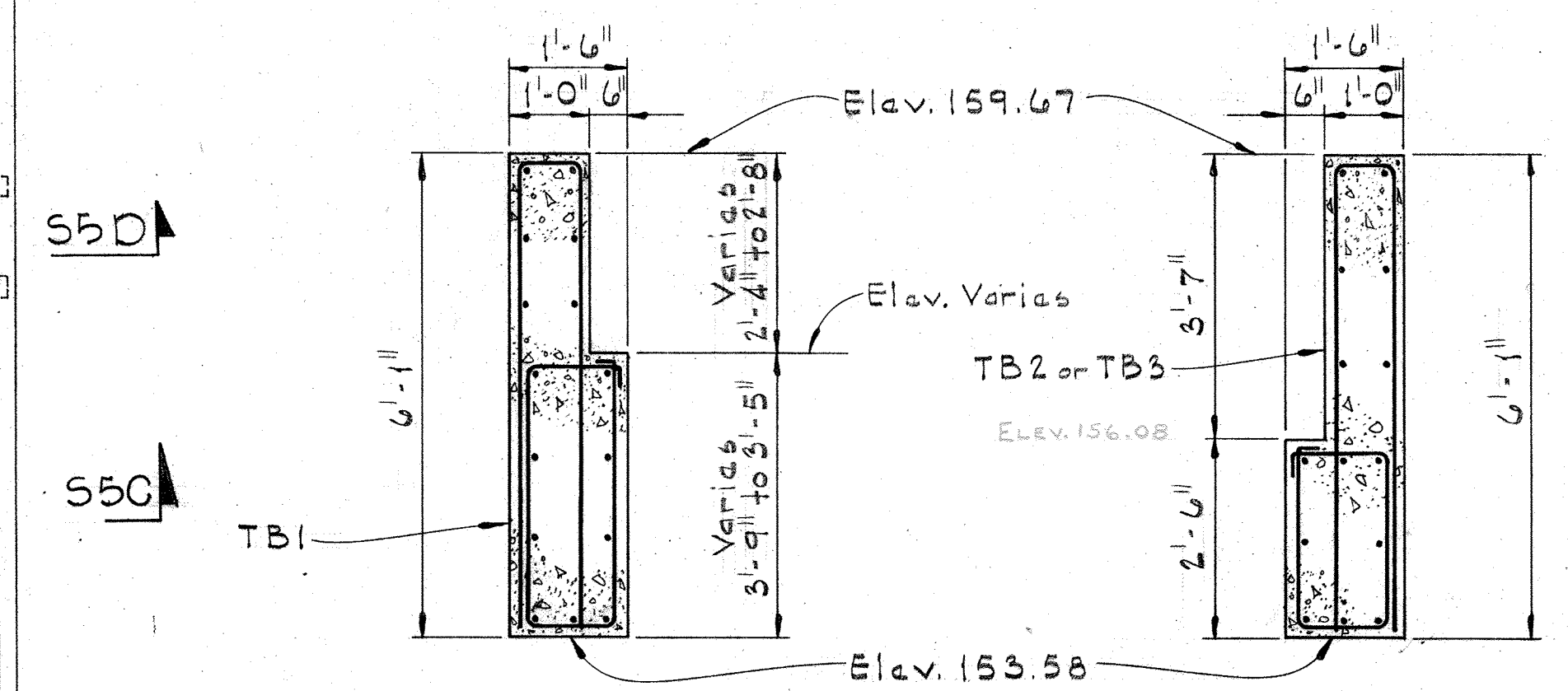
**SECTION 518A/518**  
Scale: 1/2" = 1'-0"



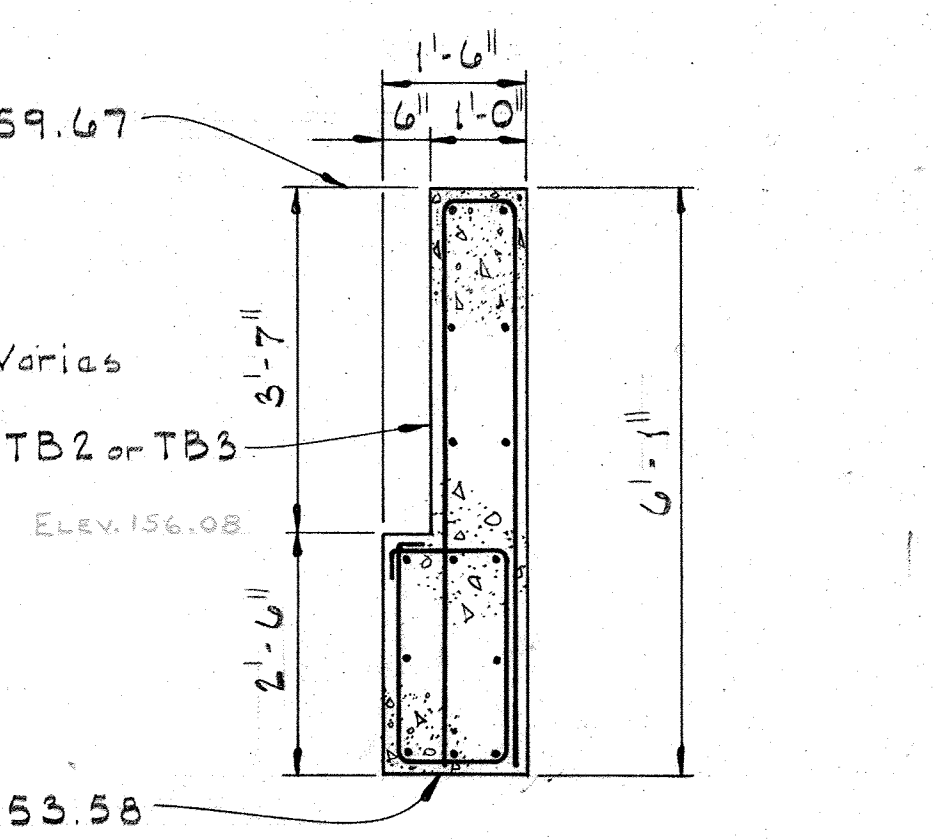
**SECTION 518B/518**  
Scale: 3/4" = 1'-0"



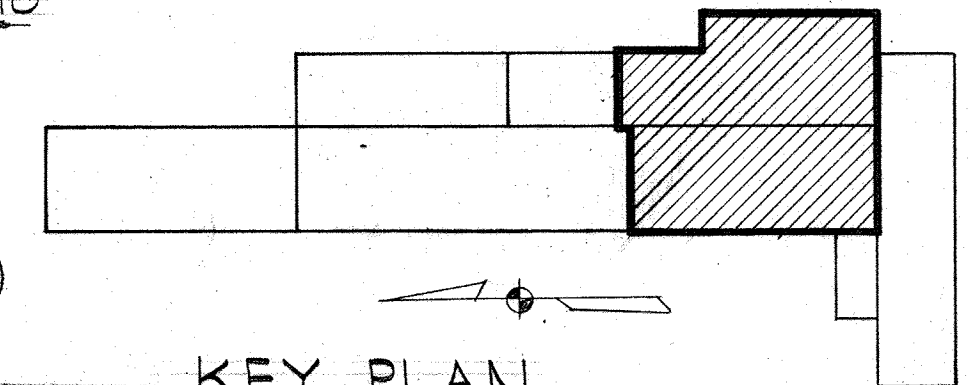
**SECTION 518E/518**  
Scale: 1/2" = 1'-0"



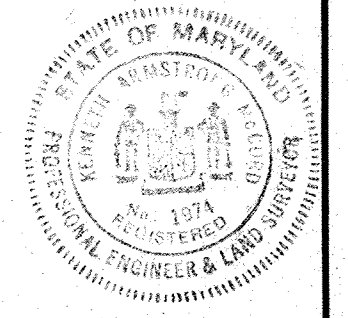
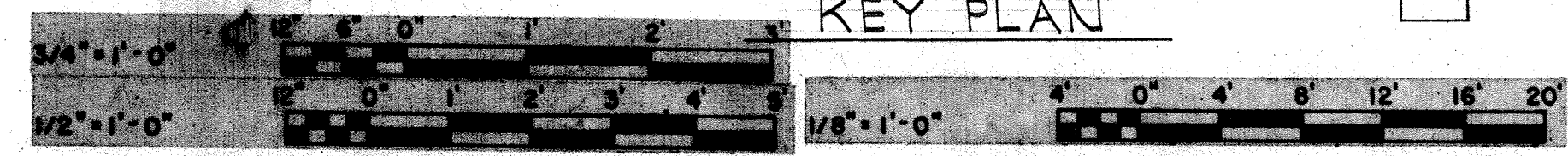
**SECTION 518C/518**  
Scale: 1/2" = 1'-0"



**SECTION 518D/518**  
Scale: 1/2" = 1'-0"

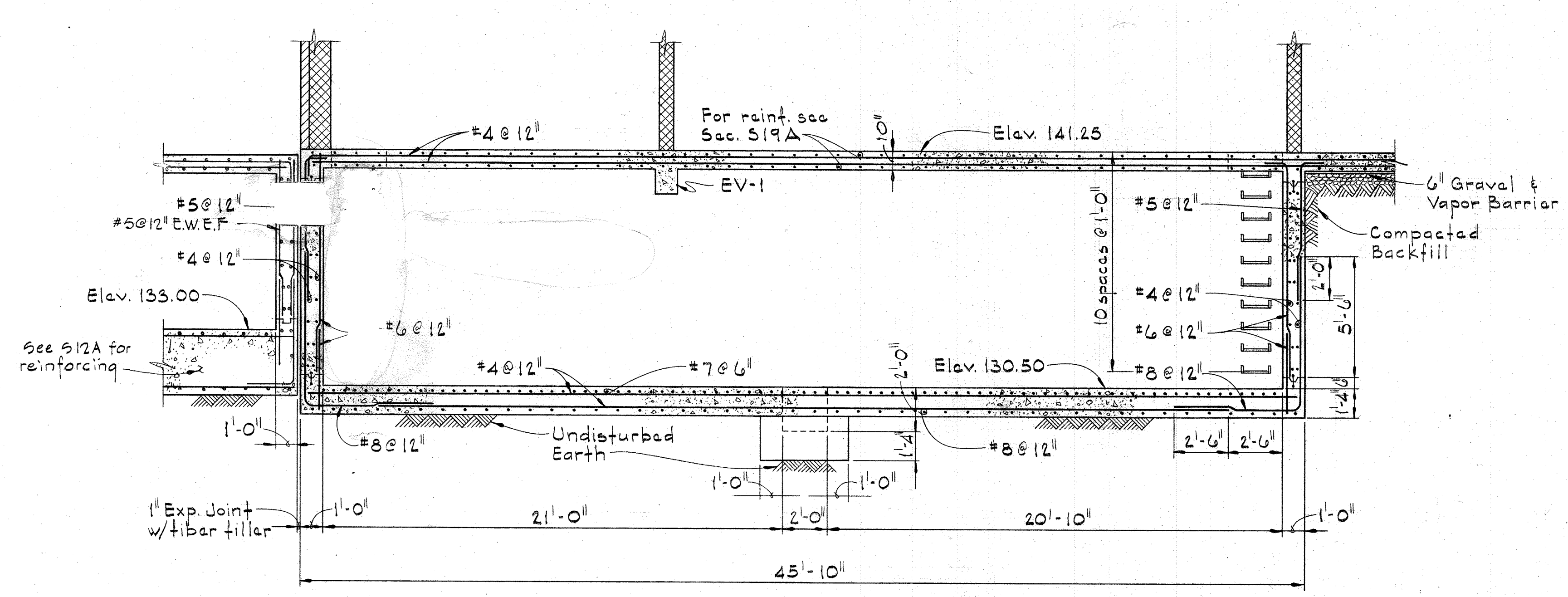


**KEY PLAN**

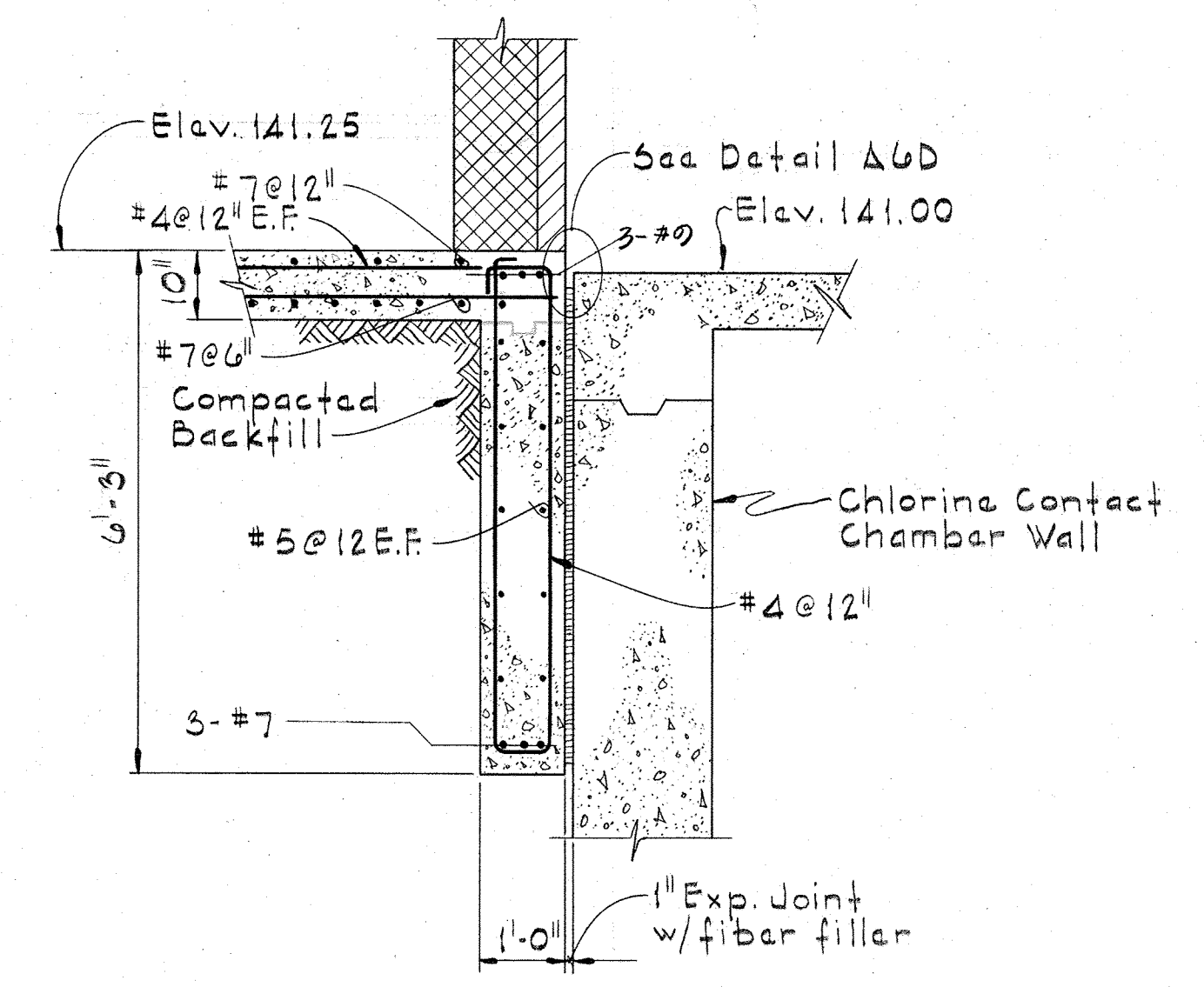


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|---|--|--------------------|--|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br>Chief: Bureau of Environmental Services | CONTRACT NO. 502-S | FILTRATION FILTERS NO. 1 & 2<br>& CHLORINE BUILDING<br>ROOF PLAN | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 36 OF 96<br>SCALE AS NOTED |
|---|--|--------------------|--|---|--|

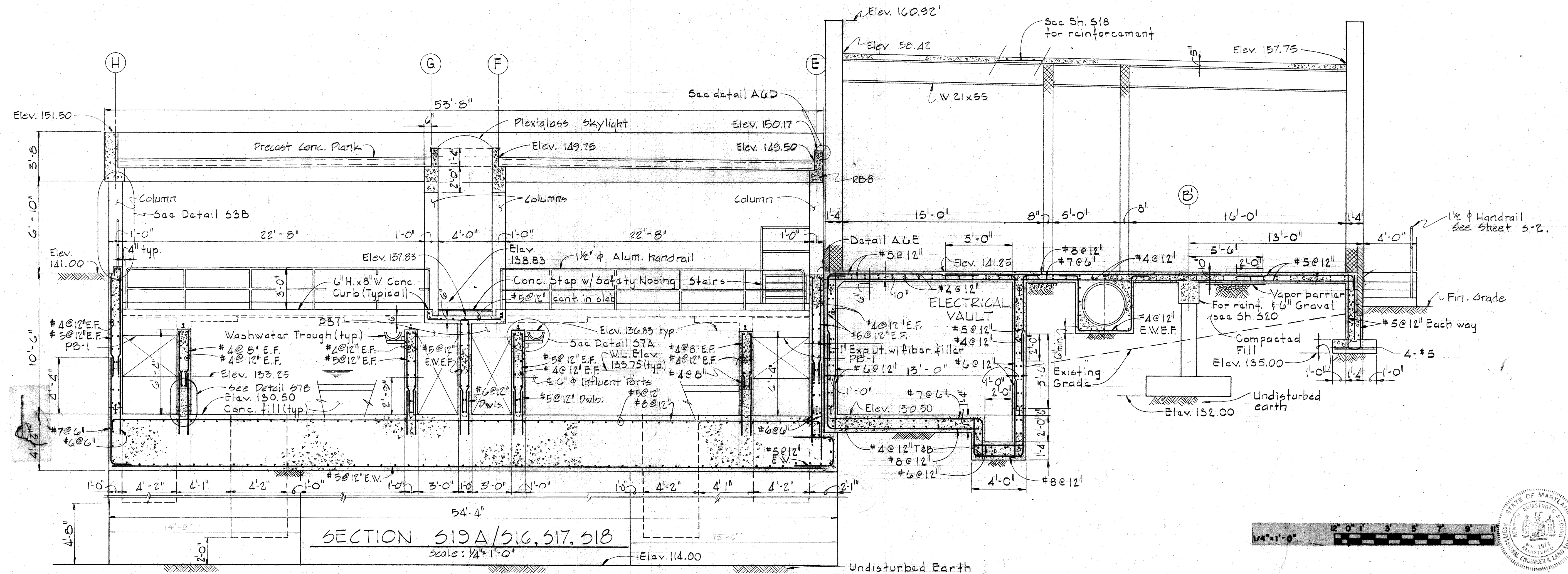




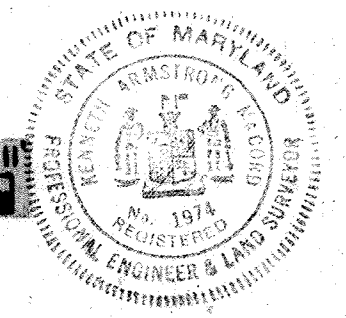
SECTION 519B/516, 517  
Scale: 1/4" = 1'-0"



SECTION 519C/517  
Scale: 1/2" = 1'-0"

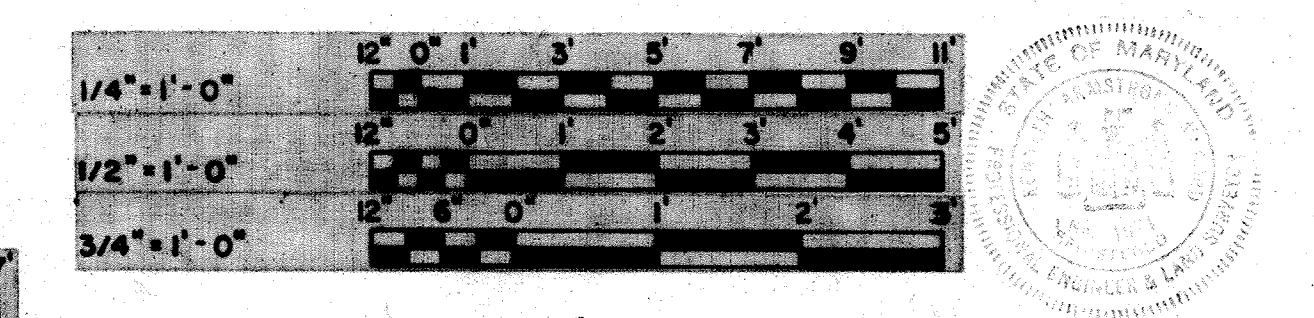
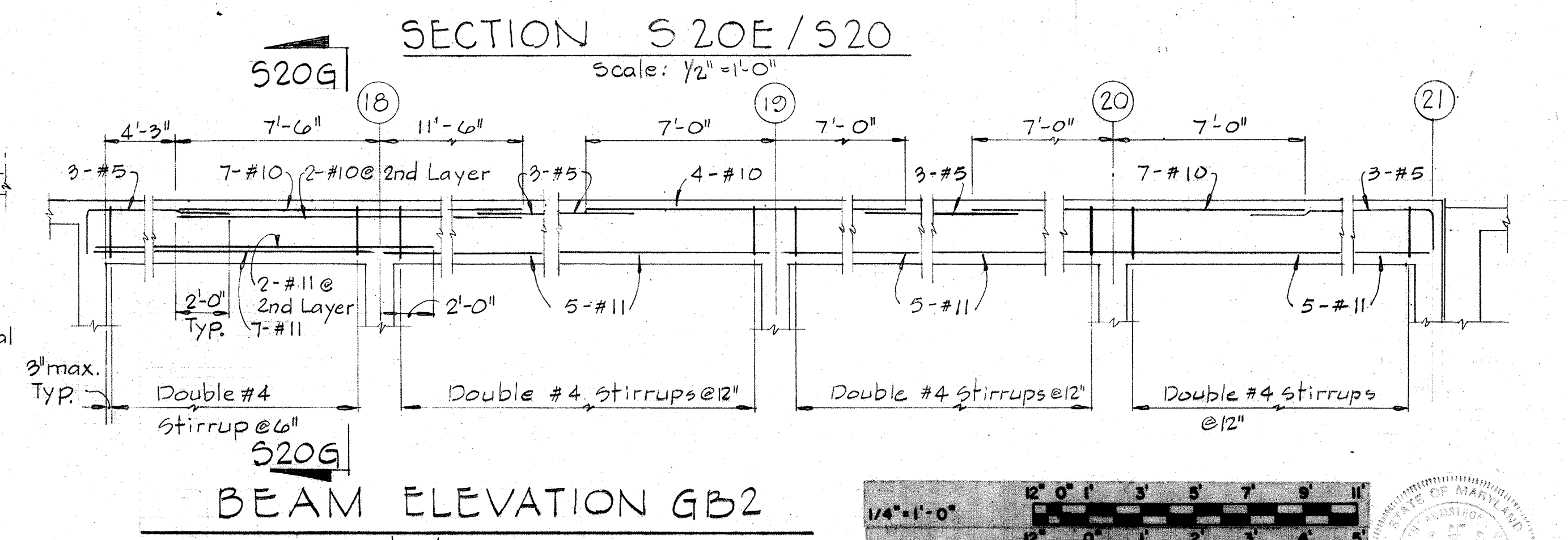
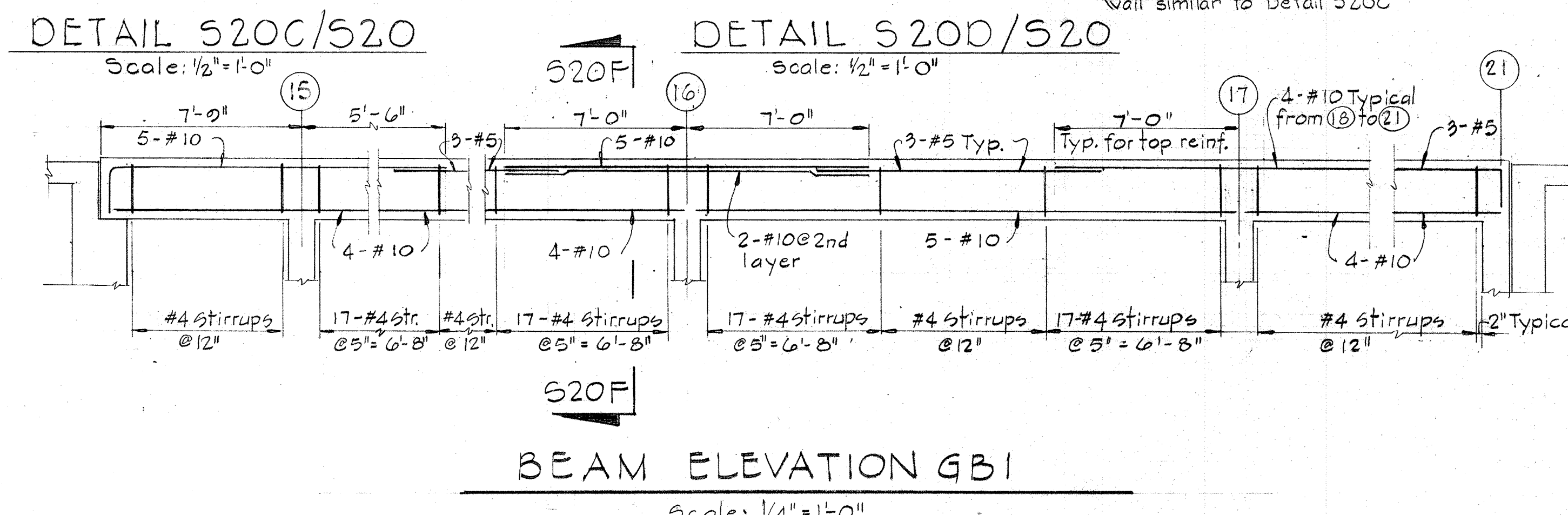
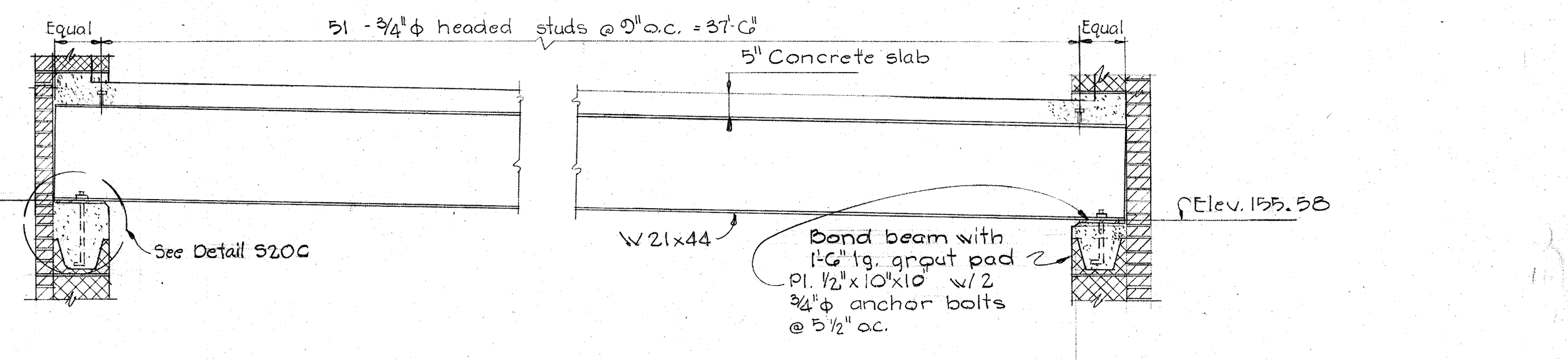
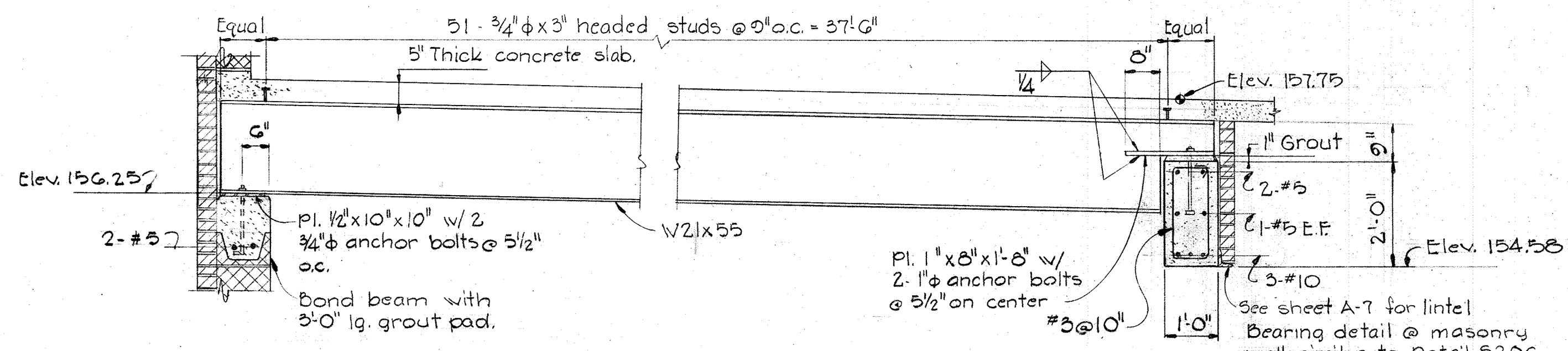
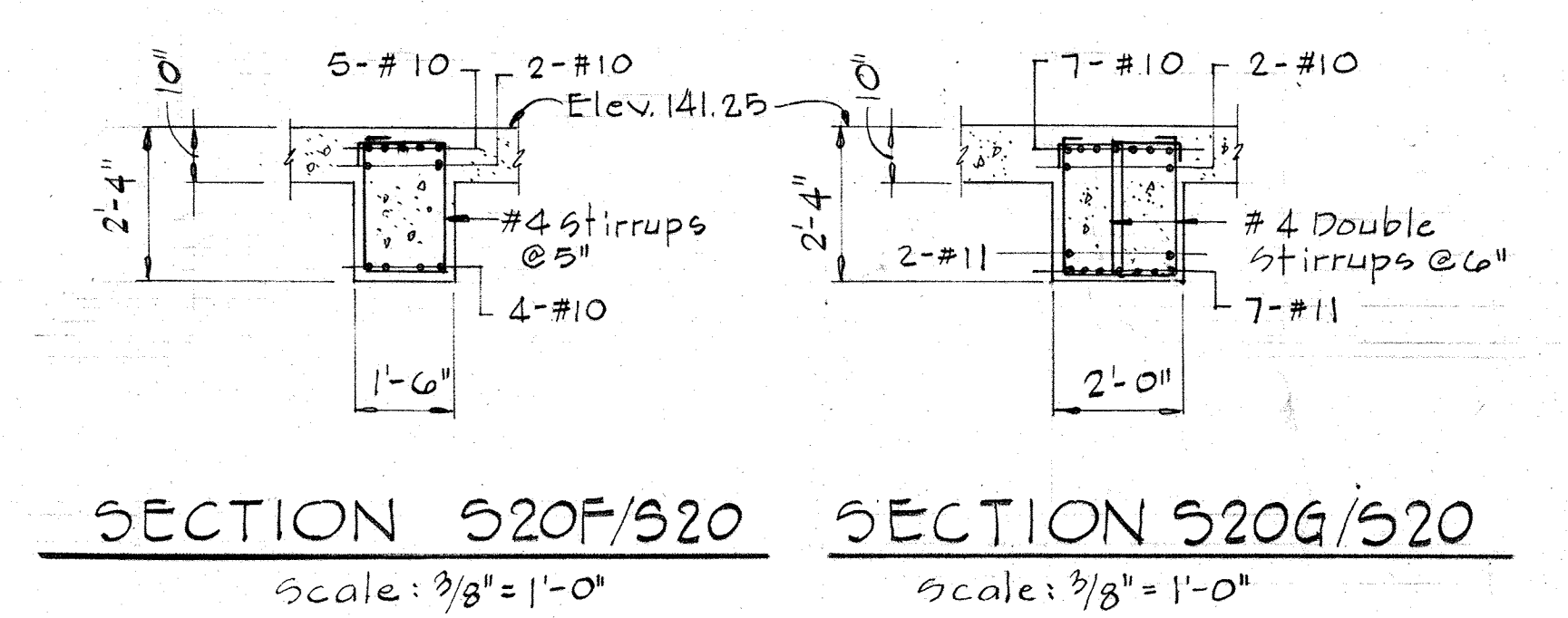
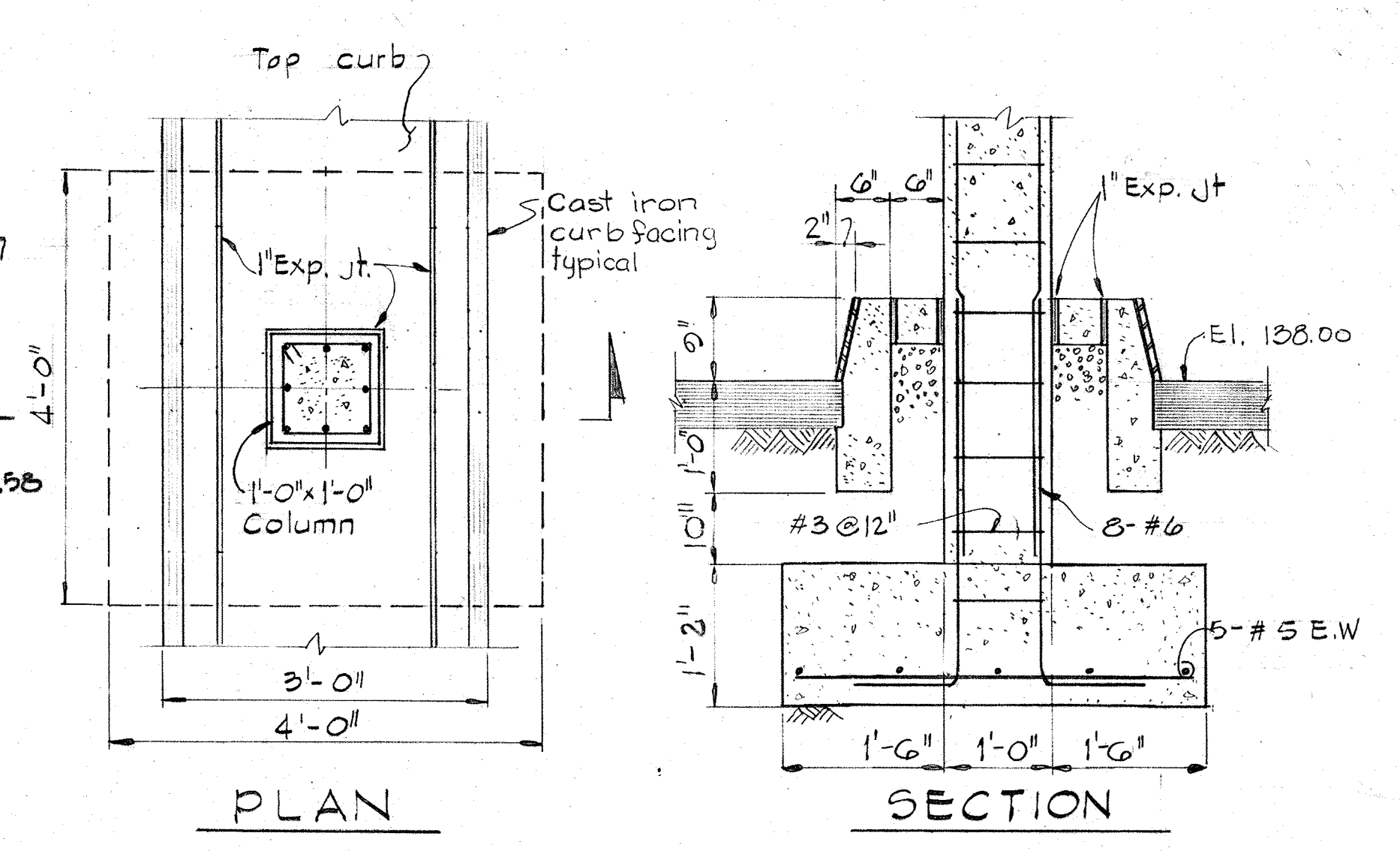
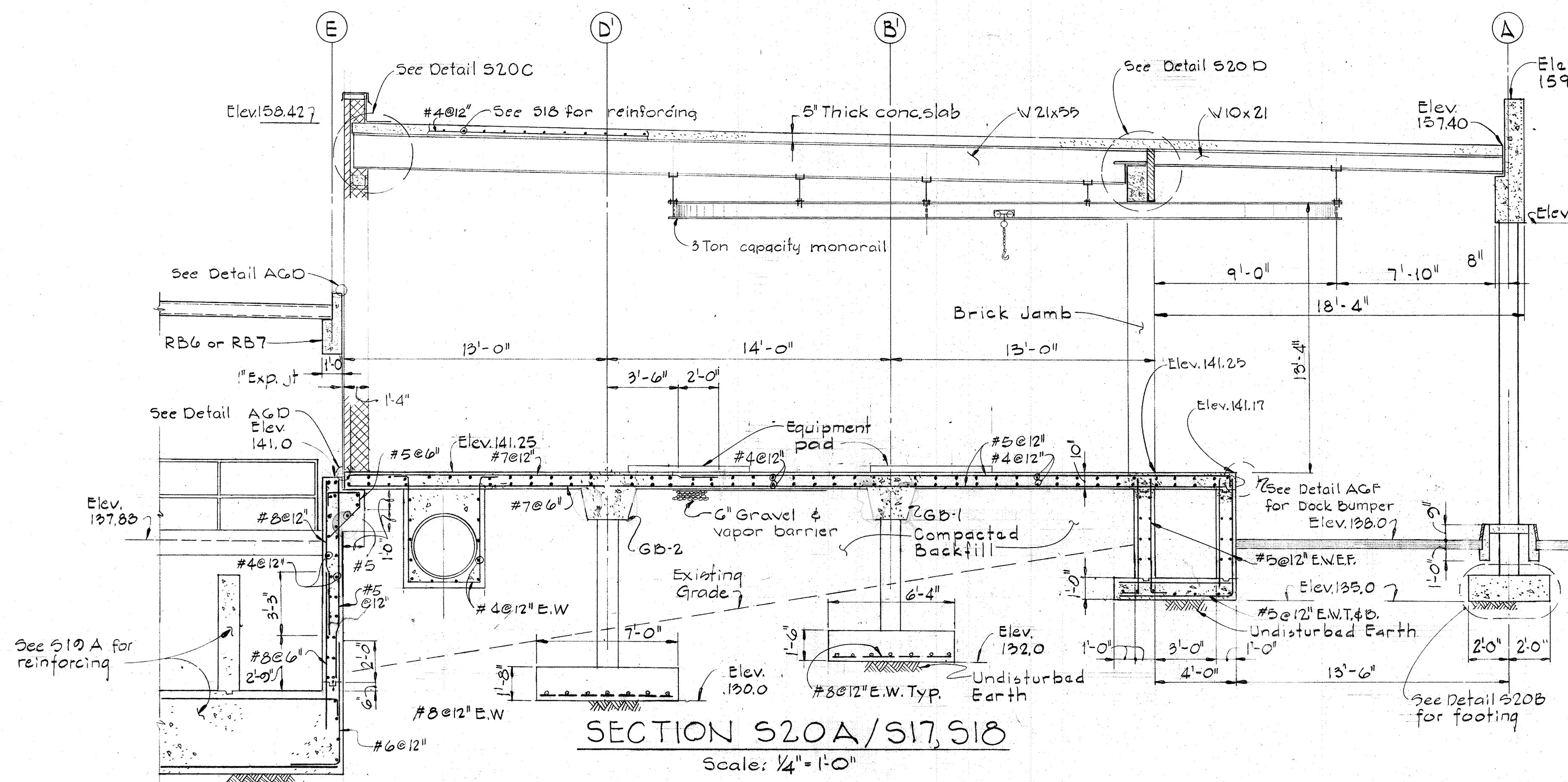


SECTION 519A/516, 517, 518  
Scale: 1/4" = 1'-0"



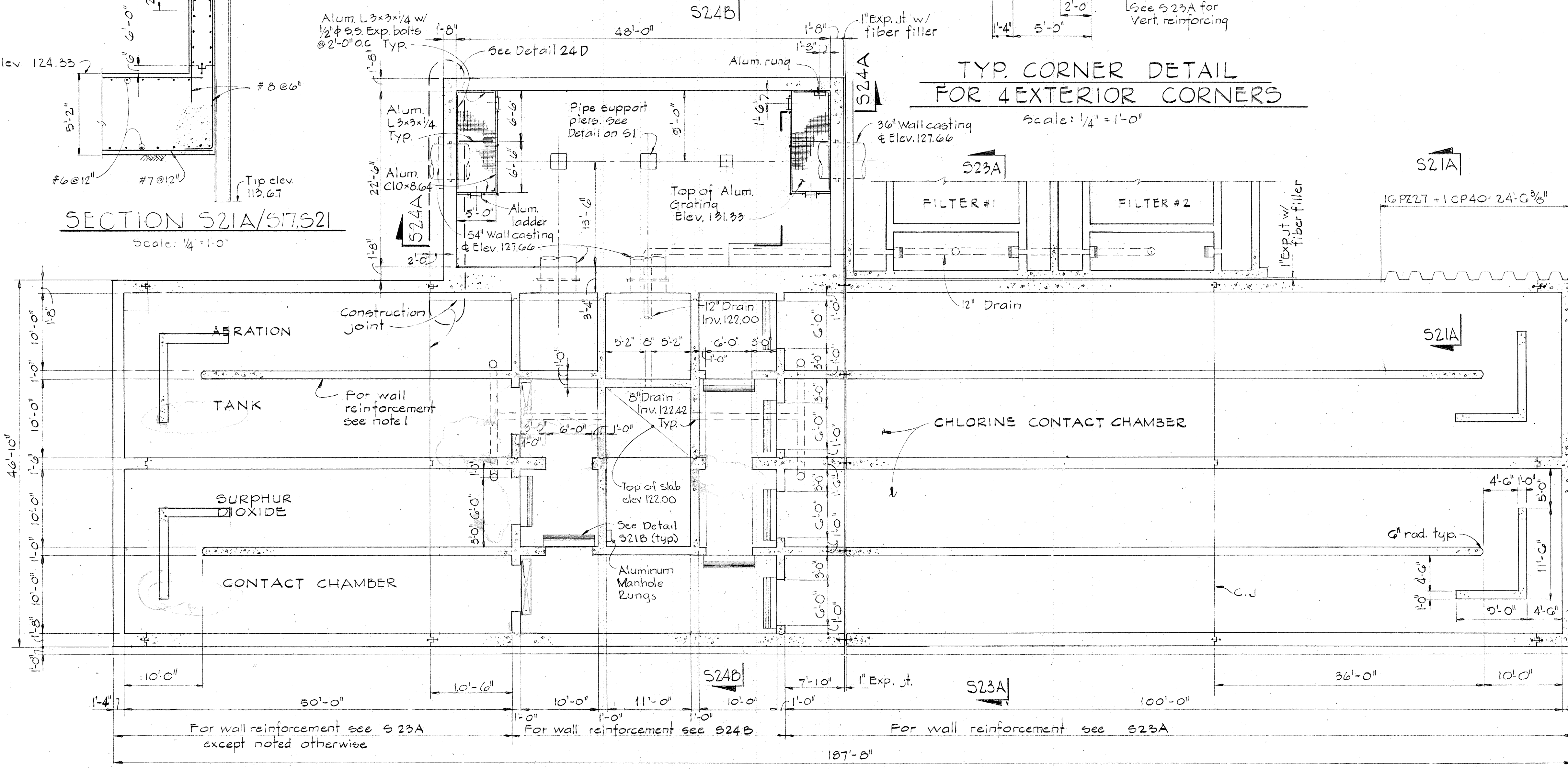
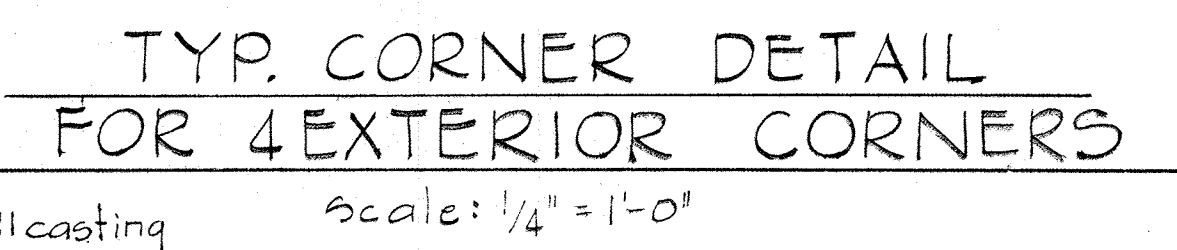
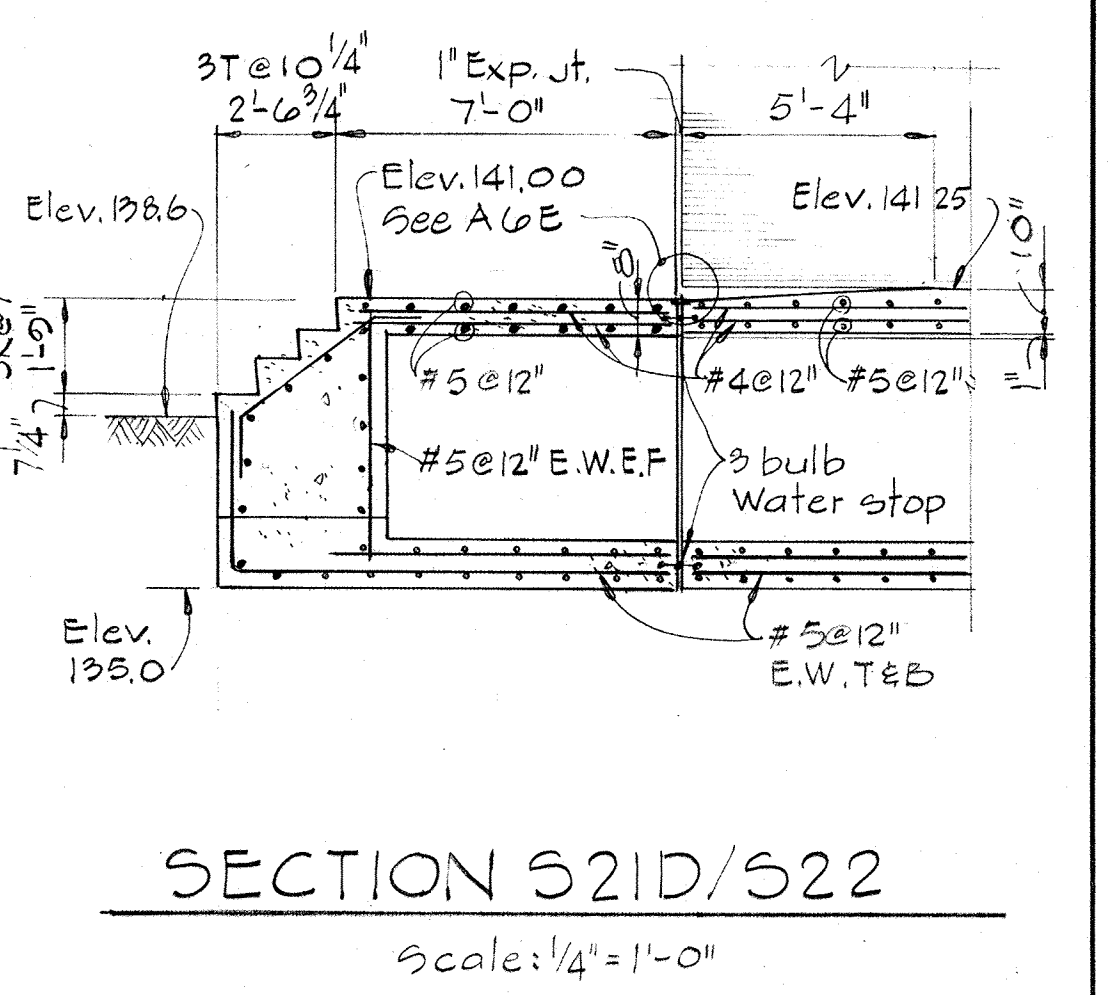
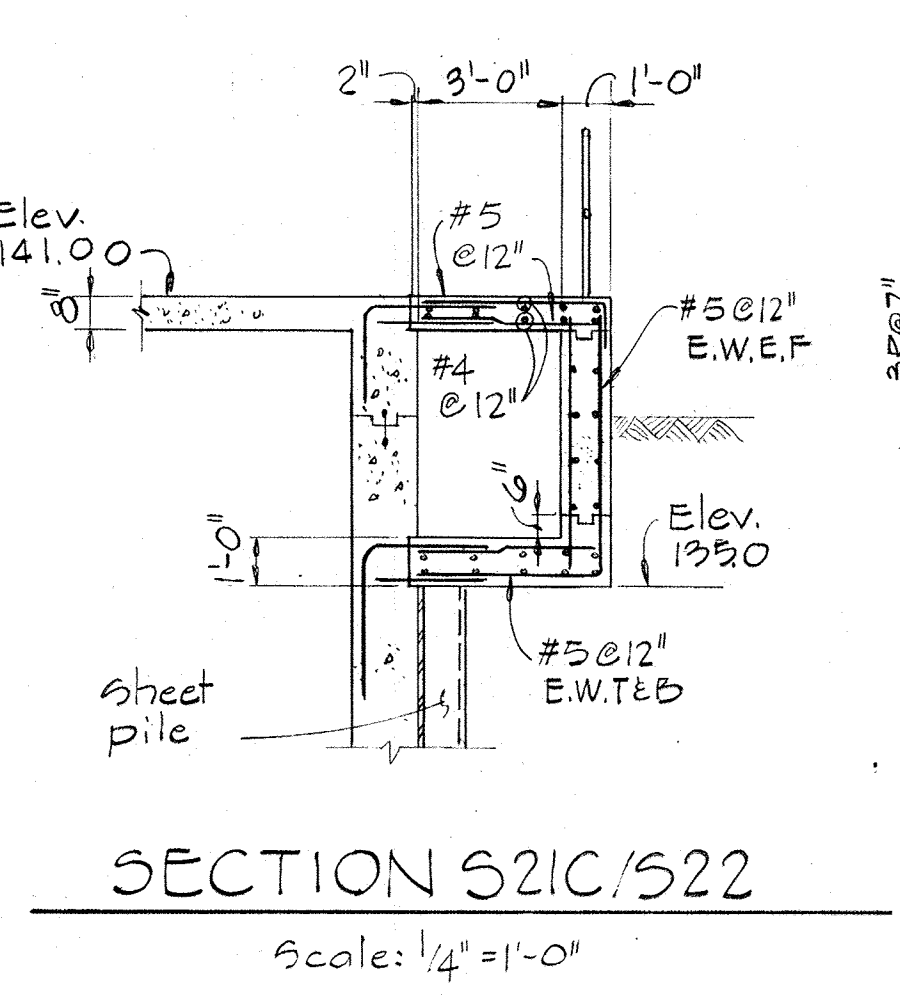
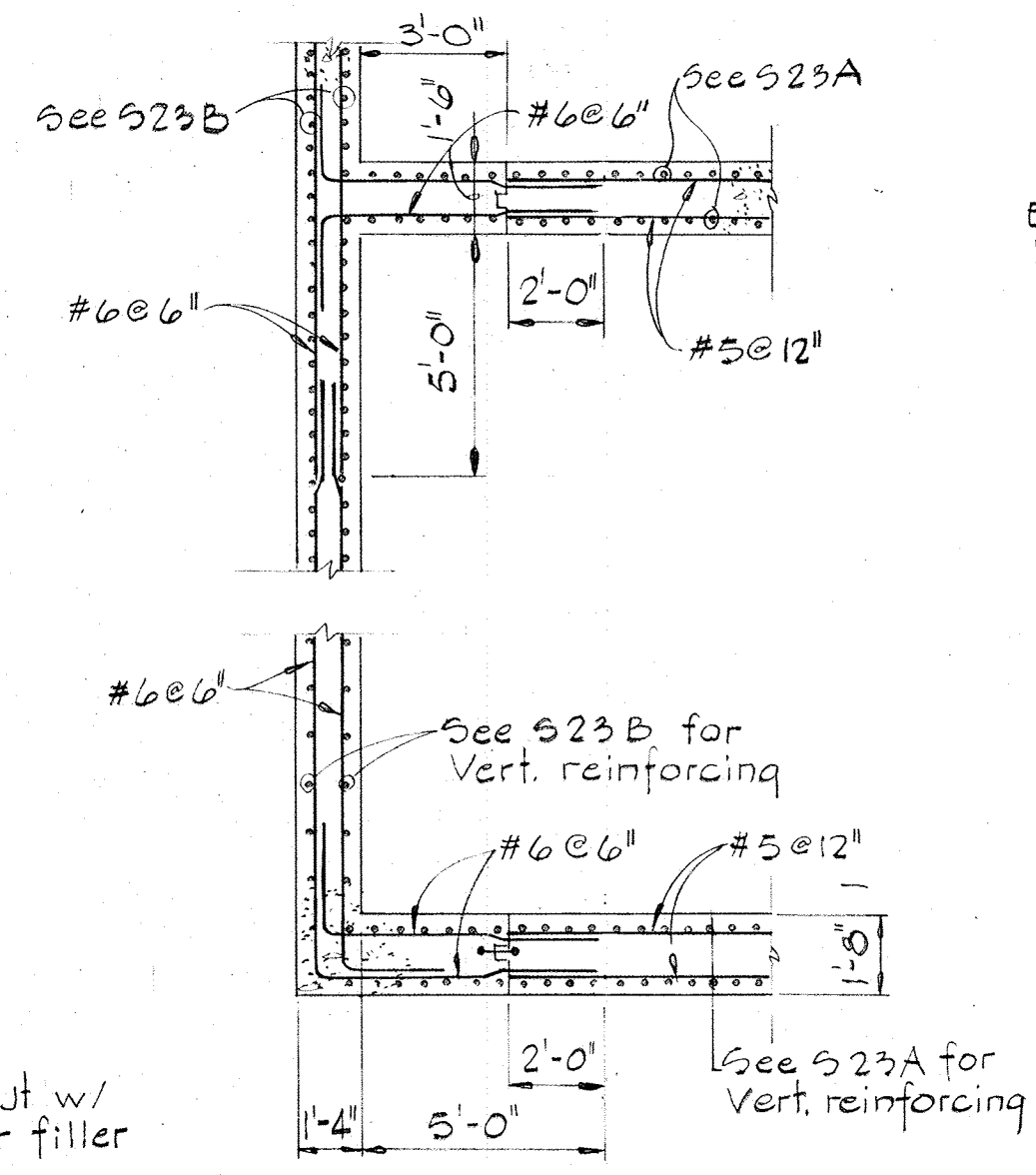
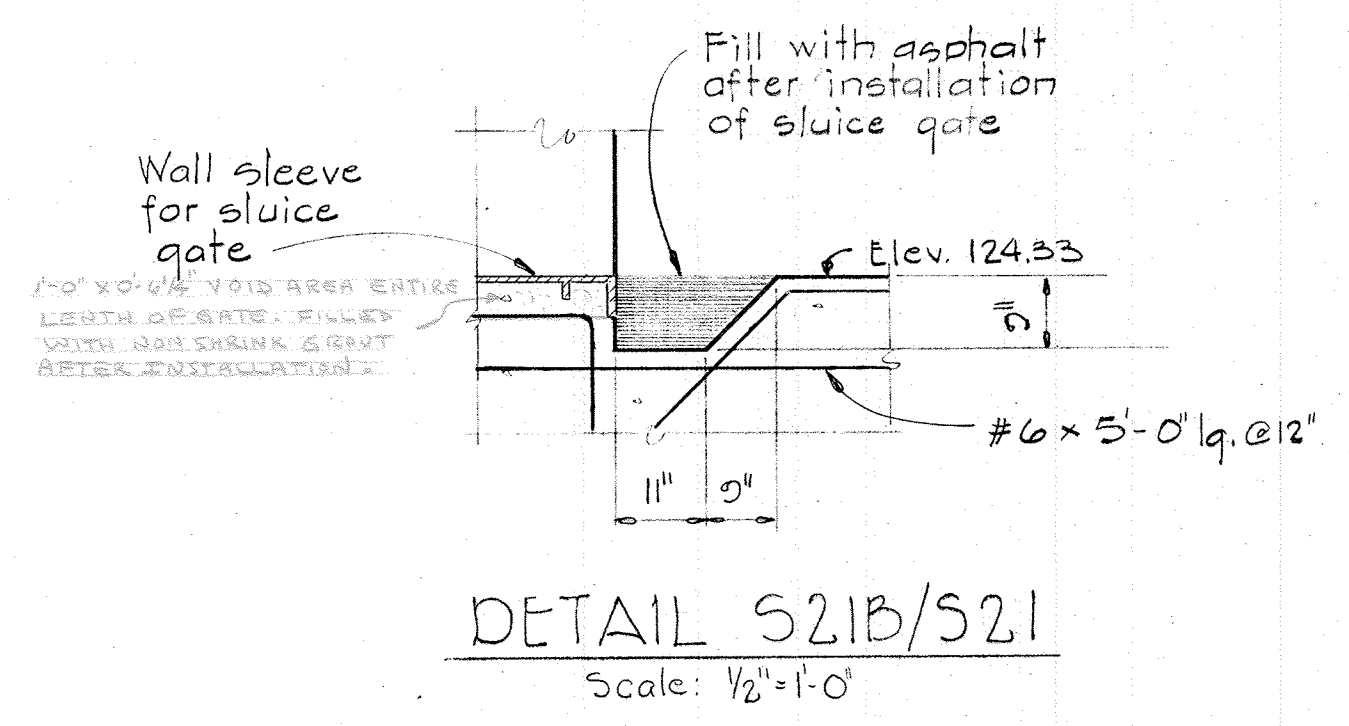
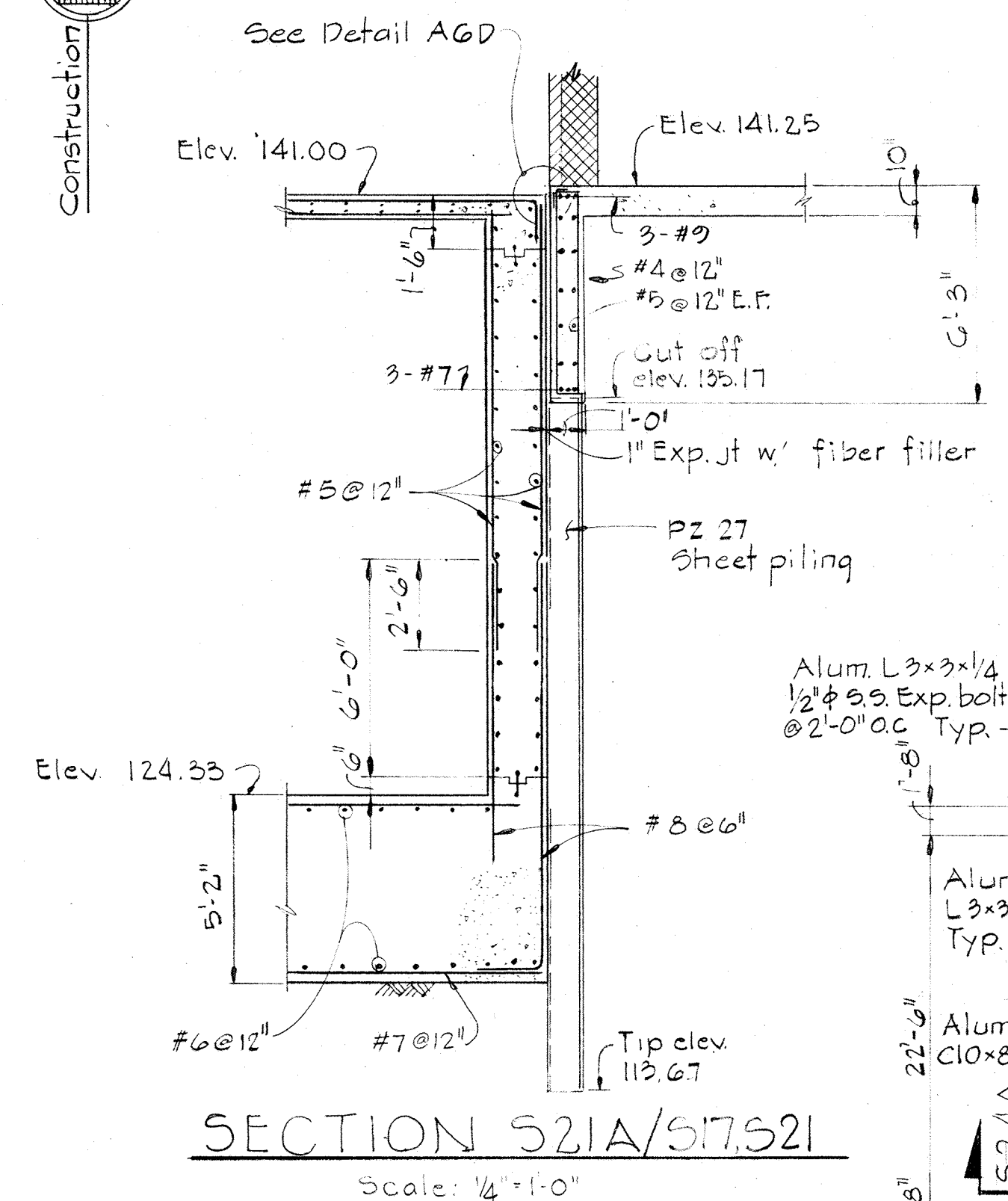
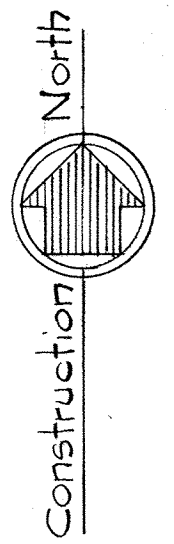
|   |  |                    |   |   |  |
|---|--|--------------------|---|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard E. Freudenberger</i><br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION FILTERS NO. 1 & 2<br>& CHLORINE BUILDING<br>SECTIONS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 37 OF 96<br>SCALE AS NOTED |
|---|--|--------------------|---|---|--|





|   |  |                    |   |  |  |
|---|--|--------------------|---|--|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard S. Srunderberger</i><br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | CHLORINE BUILDING<br>SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO.4 | DRAWING NO. 38 OF 96<br>SCALE AS NOTED |
|---|--|--------------------|---|--|--|

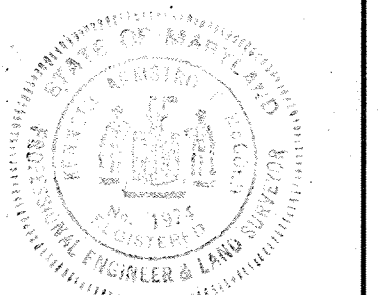
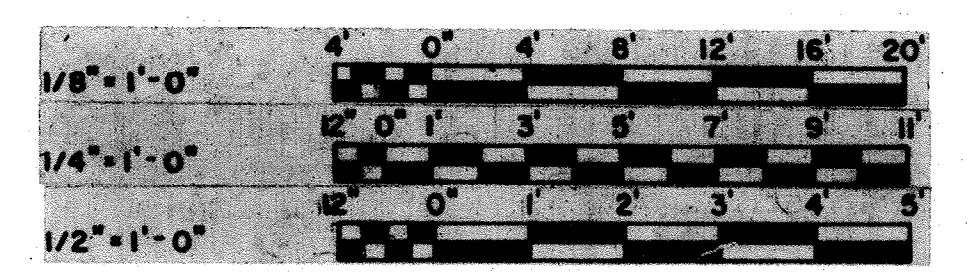




Note:  
1. For sheet piling notes see sheet S-7

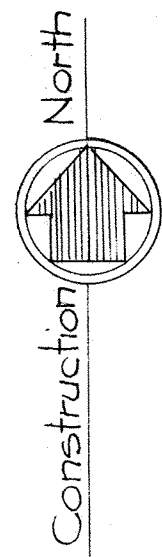
Note: 1. Reinforcement to be #5 @ 12" each way each face

PLAN AT ELEVATION 131.00  
Scale: 1/8" = 1'-0"

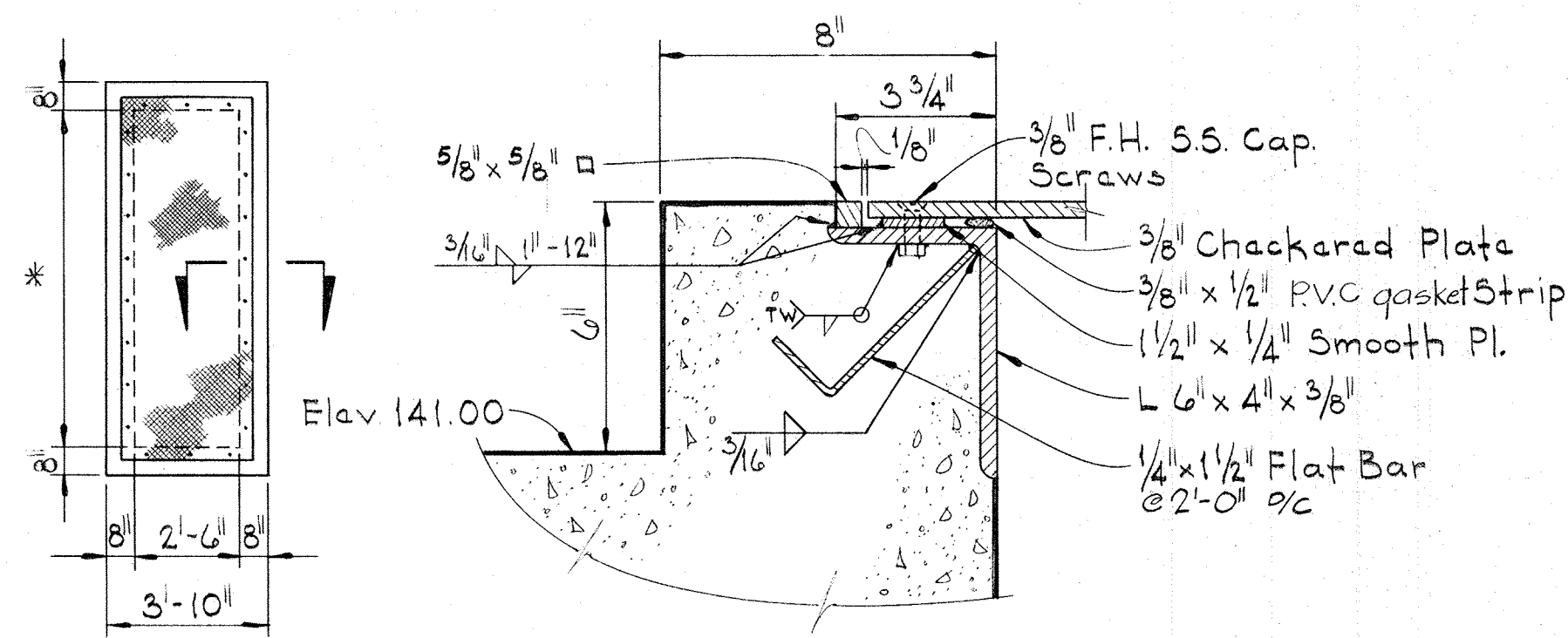


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|---|--|--------------------|---|--|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE 12/13/77<br><i>Richard E. Brudenberg</i><br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | CHLORINE CONTACT CHAMBER<br>PLAN AT ELEV. 131.00,<br>SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO.4 | DRAWING NO. 39 OF 96<br>SCALE AS NOTED |
|---|--|--------------------|---|--|--|





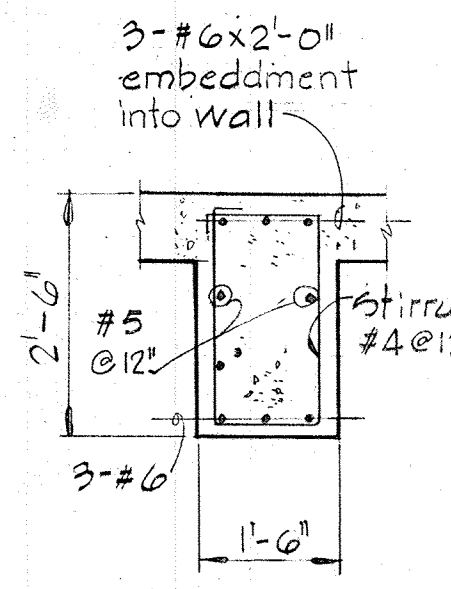
- NOTE:
- All materials are stainless steel except where noted.
  - \* B Covers 2'-6" x 5'-0"
  - \* G Covers 2'-6" x 5'-0"



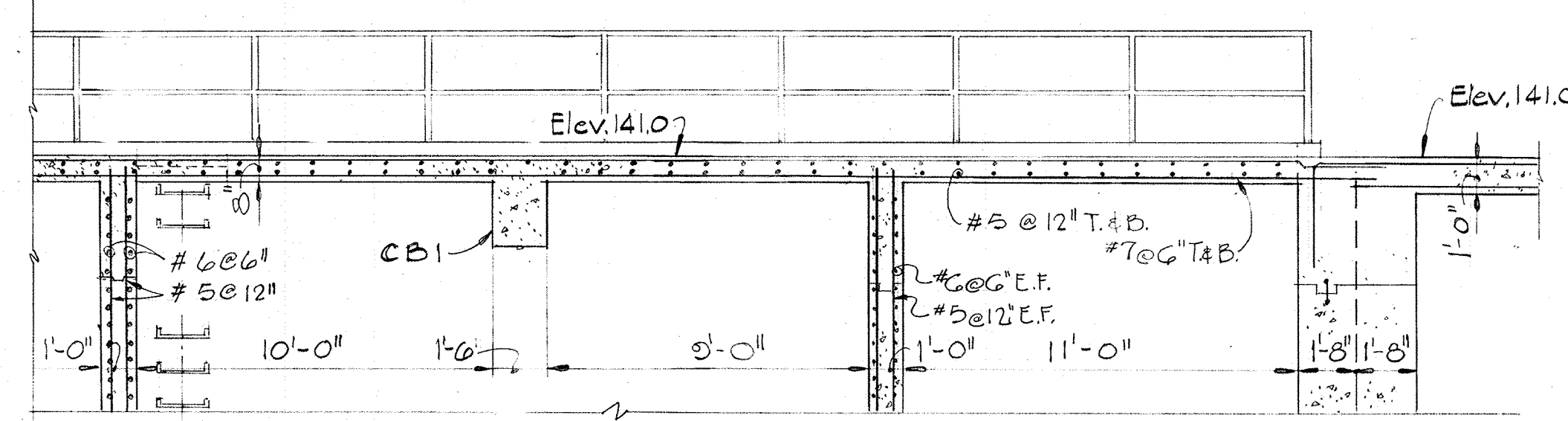
**PLAN**  
Scale: 1/4" = 1'-0"

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

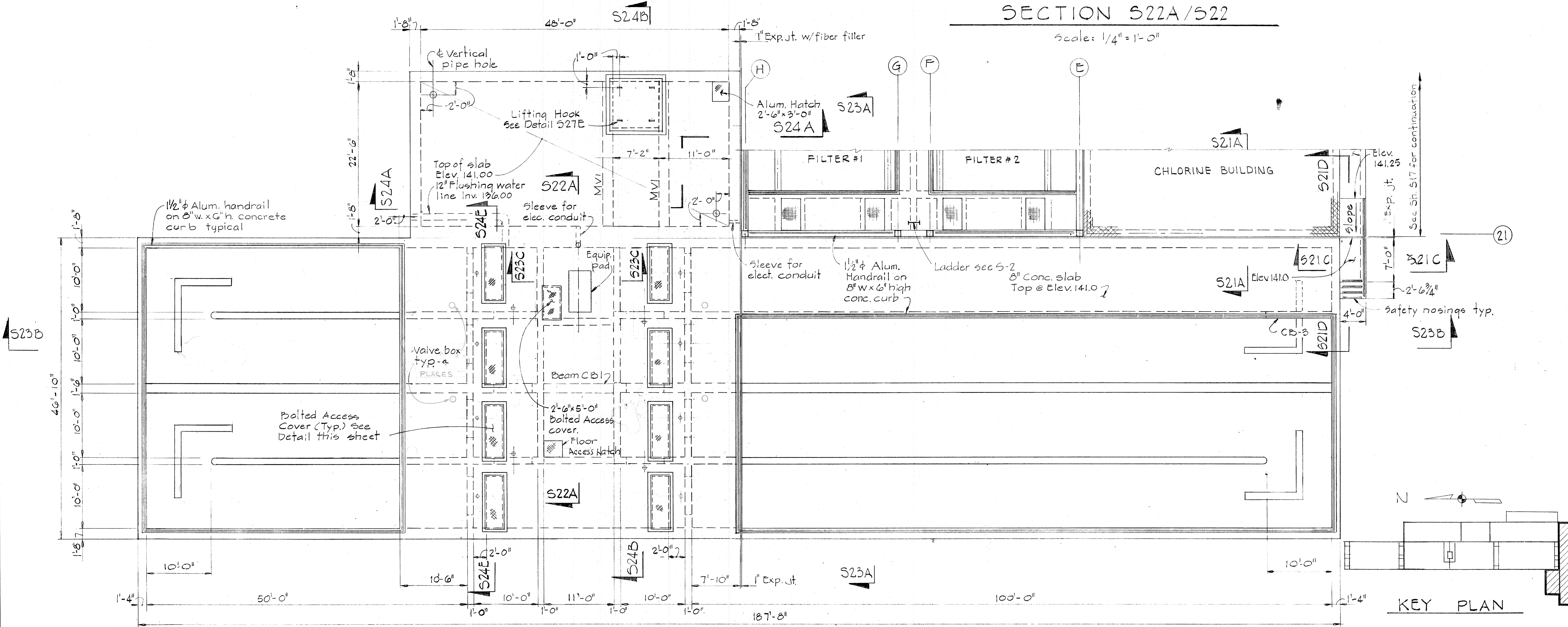
**BOLTED ACCESS COVER**



**DETAIL BEAM CBI**  
Scale: 1/2" = 1'-0"

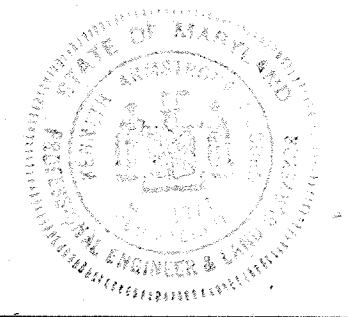
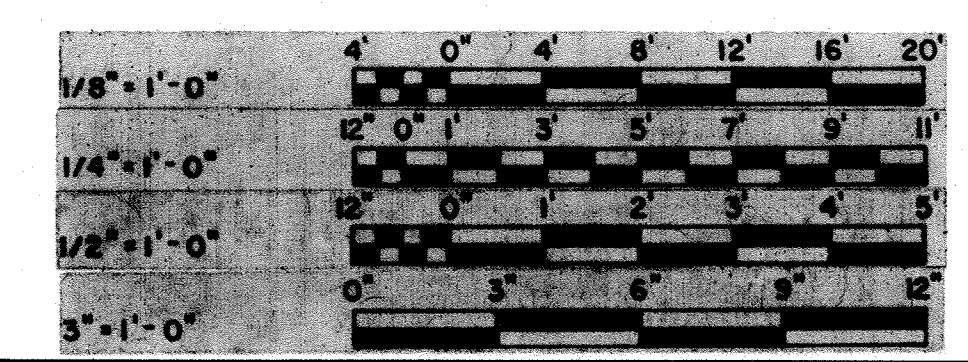


**SECTION S22A/S22**  
Scale: 1/4" = 1'-0"



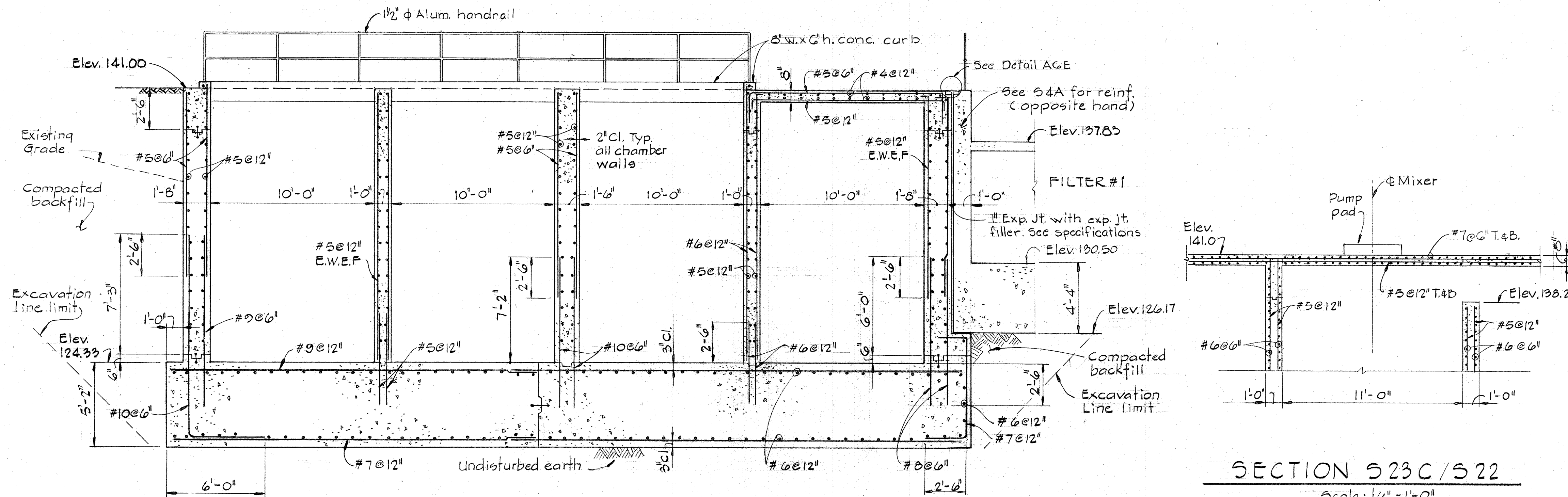
**PLAN @ ELEV. 142.00**  
Scale: 1/8" = 1'-0"

- Notes:
- For Aluminum handrail details see sheet S-2
  - For valve box details & locations see sheet M-18
  - For floor access hatches see A-G



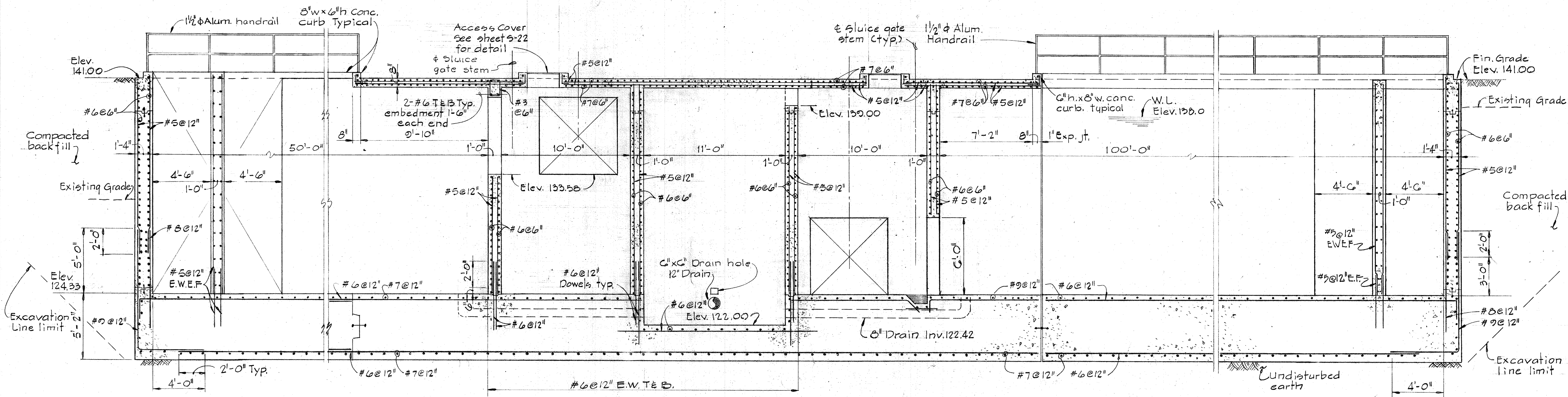
|  |   |                           |  |   |                                     |                               |
|--|---|---------------------------|--|---|-------------------------------------|-------------------------------|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE</p> <p><i>Richard E. Sreudenberg</i><br/>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. 502-S</p> | <p>CHLORINE CONTACT CHAMBER<br/>PLAN AT ELEV. 142.00,<br/>SECTIONS &amp; DETAILS</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO. 4</p> | <p>DRAWING<br/>NO. 40<br/>OF 96</p> | <p>SCALE<br/>AS<br/>NOTED</p> |
|--|---|---------------------------|--|---|-------------------------------------|-------------------------------|



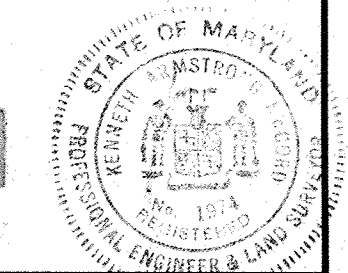


SECTION 523A/521, 522  
Scale: 1/4" = 1'-0"

SECTION 523C/522  
Scale: 1/4" = 1'-0"

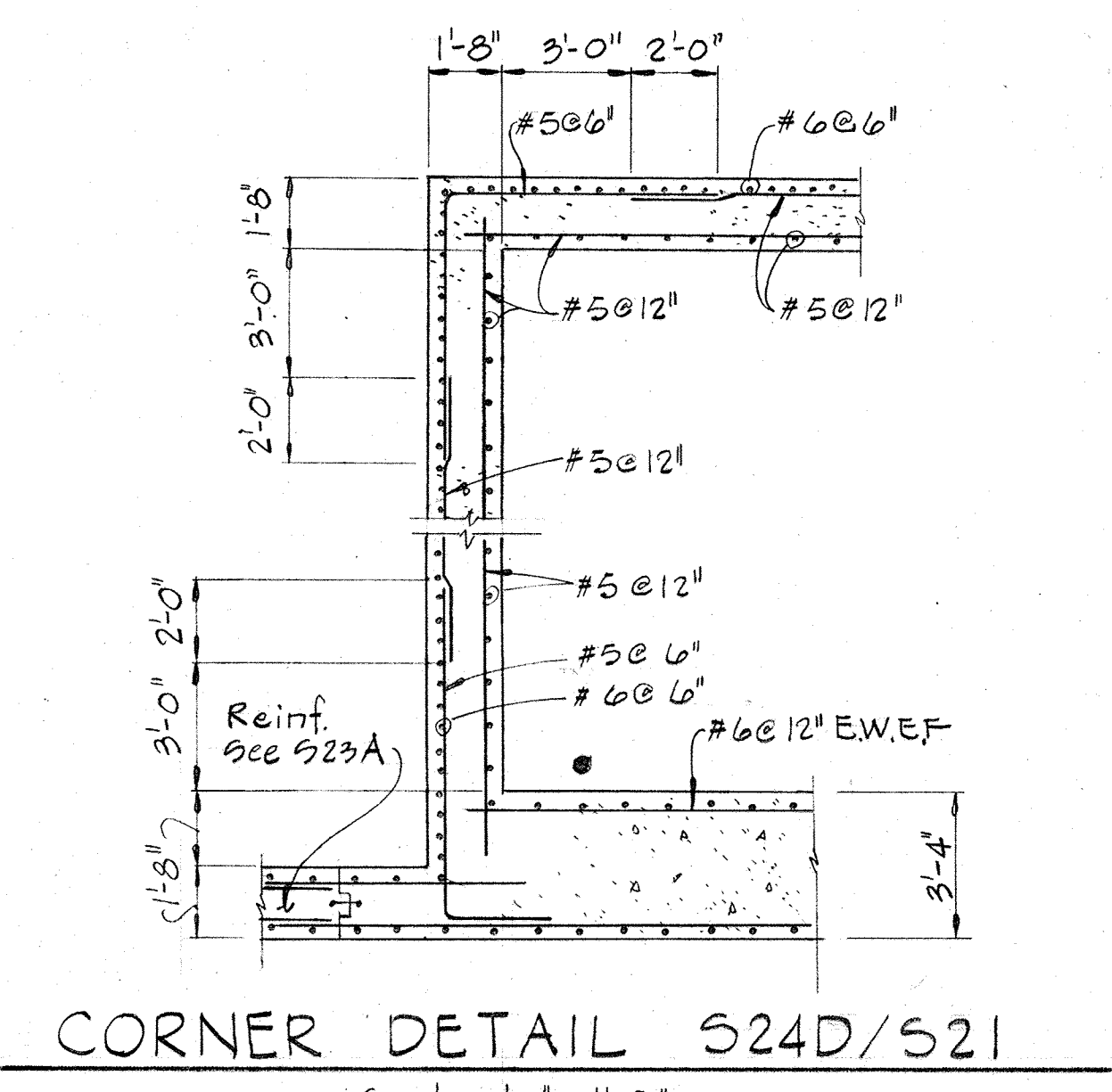
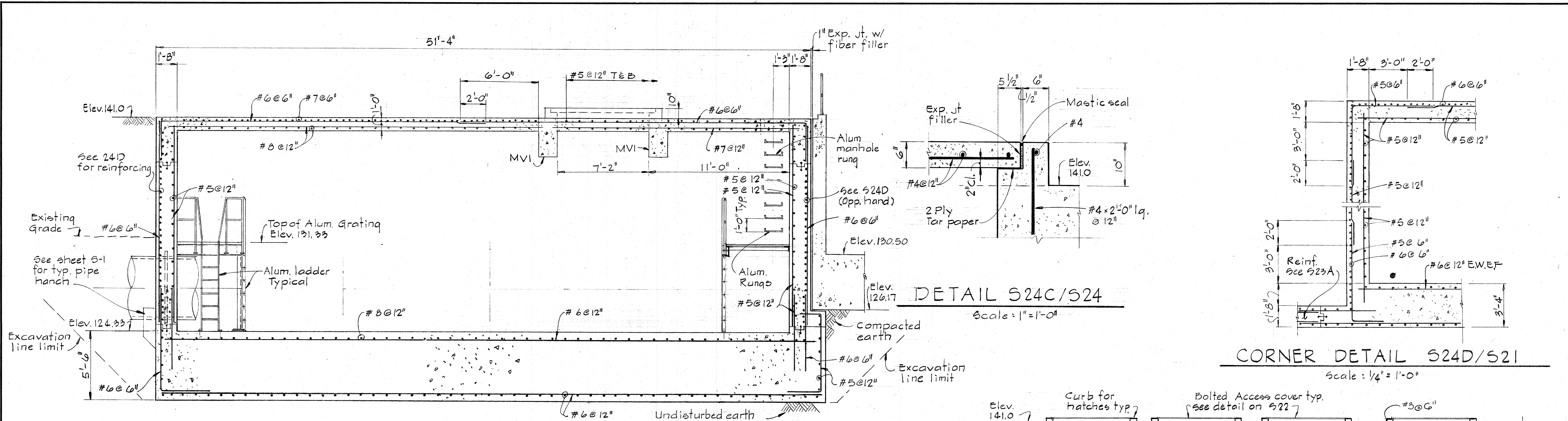


SECTION 523B/521, 522  
Scale: 1/4" = 1'-0"

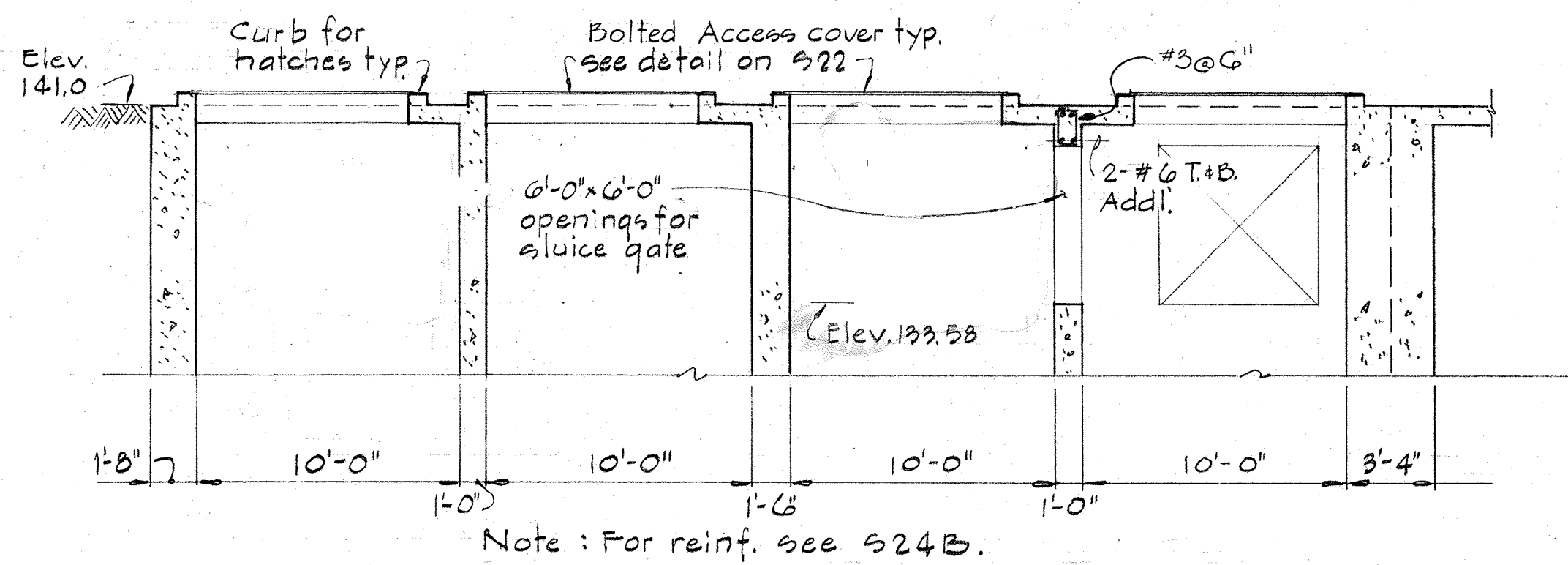


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|---|---|--------------------|--------------------------------------|--|---|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard E. Brudenberg</i><br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | CHLORINE CONTACT CHAMBER<br>SECTIONS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO.4 | DRAWING NO. 41<br>OF 96<br>SCALE AS NOTED |
|---|---|--------------------|--------------------------------------|--|---|

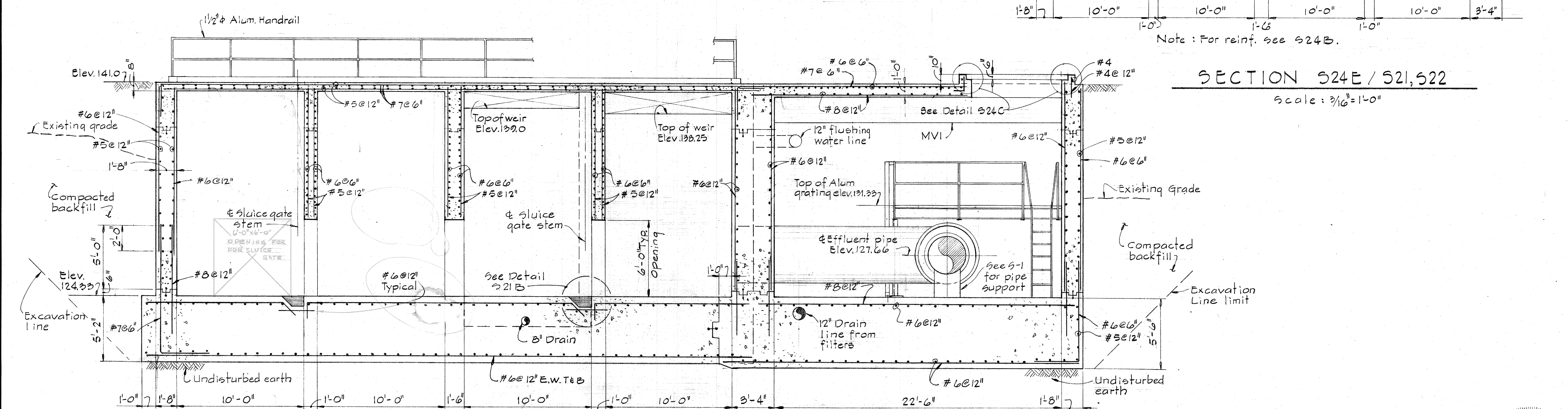




**SECTION 524A/521,522**  
Scale: 1/4" = 1'-0"



**SECTION 524E/521,522**  
Scale: 3/16" = 1'-0"



**SECTION 524B/521,522**  
Scale: 1/4" = 1'-0"

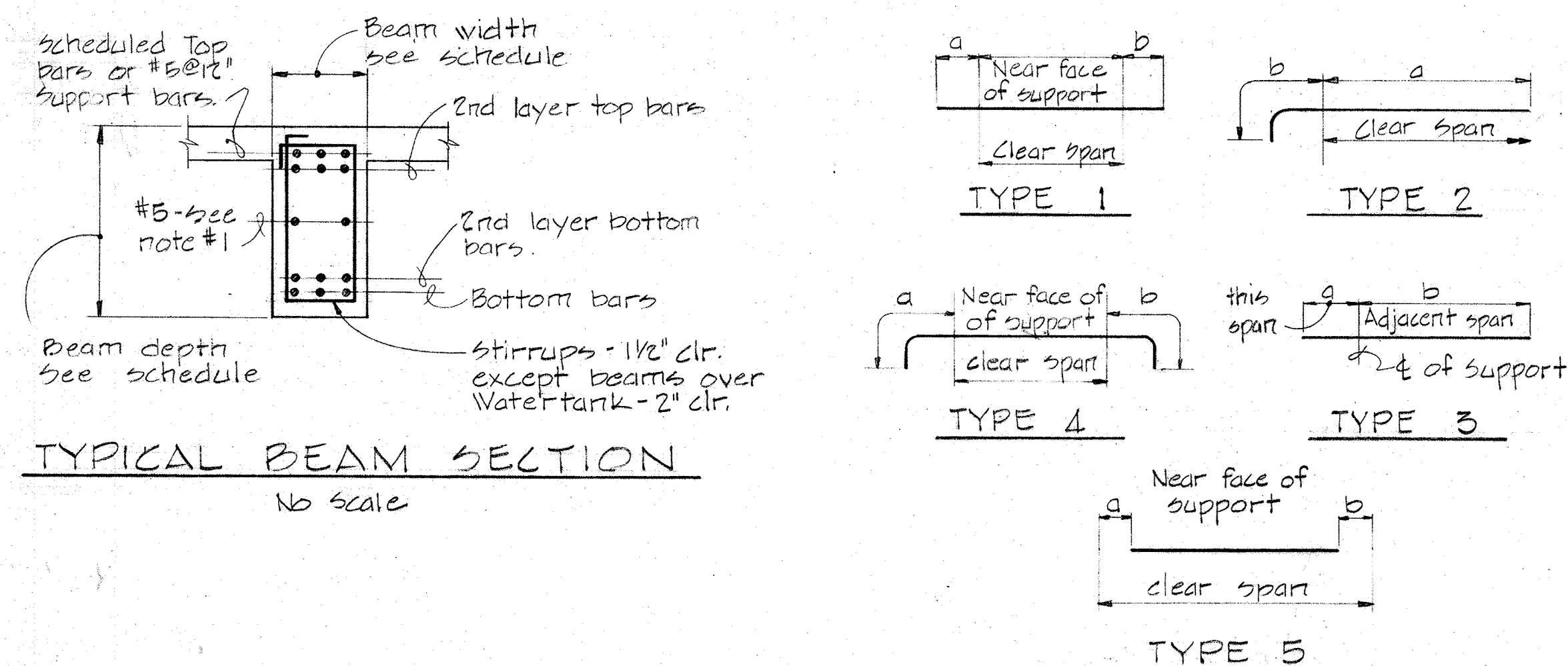
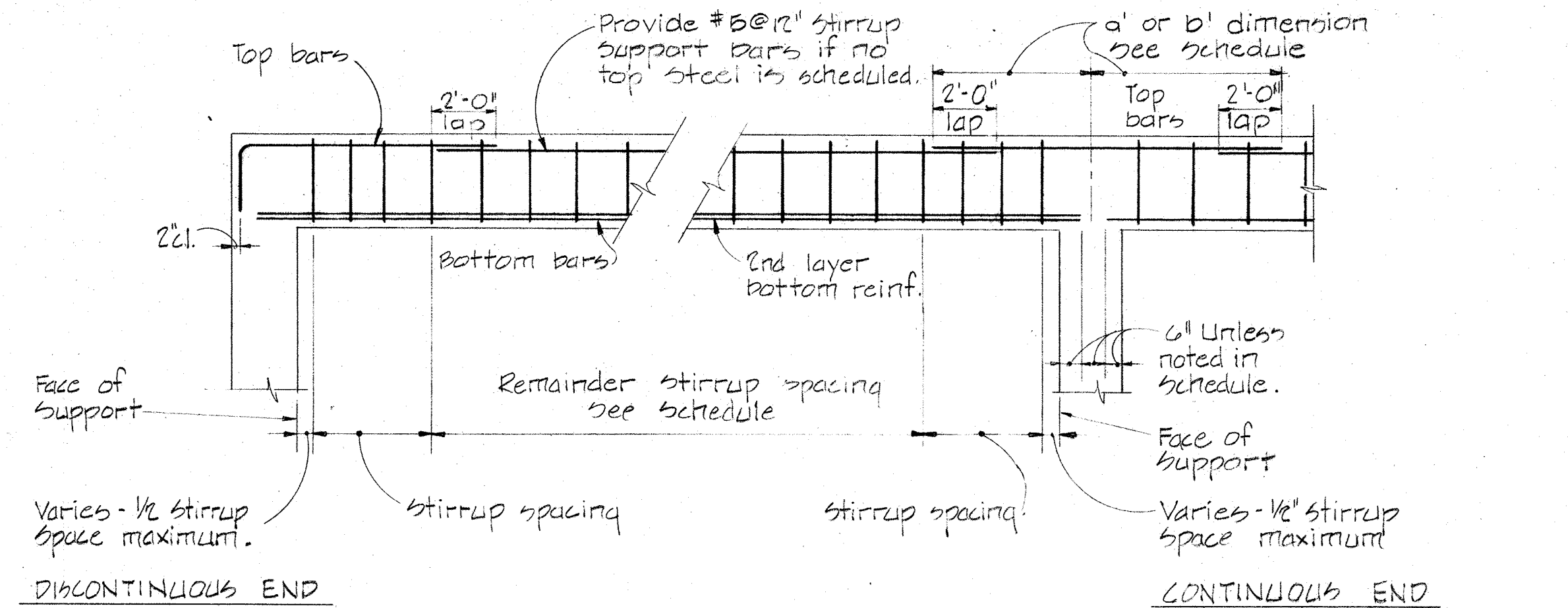


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| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br>Richard E. Brudenieck<br>CHIEF-BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | CHLORINE CONTACT CHAMBER<br>SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO.4 | DRAWING NO. 42 OF 96<br>SCALE AS NOTED |
|---|--|--------------------|--|--|--|



## BEAM SCHEDULE

| MARK | WIDTH (in)      | DEPTH (in)      | BOTTOM BARS |            |               | TOP BARS |            |               | STIRRUPS |              | REMARKS       | LOCATION                        |
|------|-----------------|-----------------|-------------|------------|---------------|----------|------------|---------------|----------|--------------|---------------|---------------------------------|
|      |                 |                 | TYPE        | No. & Size | DIMENSION a b | TYPE     | No. & Size | DIMENSION a b | SIZE     | SPACING      |               |                                 |
| PB1  | 12              | 18              | 1           | 2-#5       | 6" 6"         | 4        | 2-#5       | 1'-6" 1'-6"   | #3       | @6" thruout  | See sheet 56  | Filter Floor                    |
| PB2  | 12              | 24              | 1           | 3-#5       | 6" 4'-0"      | 4        | 3-#5       | 2'-0" 6'-0"   | #4       | @10" thruout | See sheet 56  | Filter Floor                    |
| PB3  | 12              | 24              |             |            |               |          |            |               | #4       | @10" thruout | See sheet 53  | Filter Floor                    |
| RB1  | 12 <sup>Δ</sup> | 44              | 1           | 3-#6       | 6" 6"         | 2        | 2-#5       | 11'-1" 2'-0"  | #4       | @12" thruout | See sheet 55  | Filter Roof                     |
| RB2  | 12 <sup>Δ</sup> | 44              | 1           | 3-#6       | 6" 6"         | 3        | 2-#9       | 11'-7" 11'-7" | #4       | @12" thruout | See sheet 55  | Filter Roof                     |
| RB3  | 12 <sup>Δ</sup> | 44              | 1           | 3-#6       | 6" 6"         | 2        | 2-#5       | 11'-1" 1'-6"  | #4       | @12" thruout | See sheet 55  | Filter Roof                     |
| RB4  | 12 <sup>Δ</sup> | 44              | 1           | 3-#5       | 6" 4'-0"      | 2        | 2-#5       | 18'-0" 1'-6"  | #4       | @12" thruout | See sheet 55  | Filter Roof                     |
| RB5  | 12 <sup>Δ</sup> | 44              |             |            |               | 1        | 2-#7       | 7'-2" 7'-2"   | #4       | @12" thruout | See sheet 55  | Filter Roof                     |
| RB6  | 12              | 24 <sup>Δ</sup> | 1           | 3-#6       | 6" 6"         | 5        | 2-#5       | 4'-6" 4'-6"   | #3       | @10" thruout | See sheet 55  | Filter Roof                     |
| RB7  | 12              | 24 <sup>Δ</sup> | 1           | 3-#7       | 6" 6"         | 3        | 2-#10      | 7'-0" 7'-0"   | #3       | @10" thruout | See sheet 55  | Filter Roof                     |
| FB1  | 12              | 30              | 1           | 2-#7       | 6" 6"         | 3        | 3-#9       | 9'-0" 9'-0"   | #3       | @12" thruout |               | Flocculator Area                |
| FB2  | 12              | 30              | 1           | 3-#8       | 6" 6"         |          |            |               | #3       | @12" thruout |               | Flocculator Area                |
| FB3  | 12              | 30              | 1           | 3-#7       | 6" 6"         | 3        | 2-#9       | 9'-0" 9'-0"   | #3       | @12" thruout |               | Flocculator Area                |
| FB4  | 12              | 30              | 1           | 3-#10      | 6" 6"         |          |            |               | #3       | @8" thruout  |               | Flocculator Area                |
| FB5  | 12              | 30              | 1           | 2-#7       | 6" 6"         | 2        | 3-#7       | 5'-0" 4'-0"   | #3       | @12" thruout |               | Flocculator Area                |
| FB6  | 12              | 30              | 1           | 3-#10      | 6" 6"         | 3        | 2-#10      | 9'-0" 9'-0"   | #3       | @6" thruout  |               | Flocculator Area                |
| FB7  | 12              | 14              | 1           | 3-#7       | 6" 6"         | 4        | 2-#5       | 2'-0" 2'-0"   | #3       | @5" thruout  |               | Flocculator Area                |
| FB8  | 14              | 30              | 1           | 3-#8       | 6" 6"         | 3        | 4-#10      | 9'-0" 9'-0"   | #3       | @10" thruout |               | Flocculator Area                |
| FB9  | 14              | 30              | 1           | 4-#10      | 6" 6"         |          |            |               | #3       | @6" thruout  |               | Flocculator Area                |
| MB1  | 12              | 18              | 1           | 3-#6       | 6" 6"         | 3        | 3-#7       | 5'-6" 5'-6"   | #3       | @6" thruout  |               | Pump Room                       |
| MB2  | 12              | 18              | 1           | 3-#6       | 6" 6"         | 3        | 3-#8       | 5'-6" 5'-6"   | #3       | @6" thruout  |               | Pump Room                       |
| MB3  | 12              | 18              | 1           | 3-#7       | 6" 6"         |          |            |               | #3       | @6" thruout  |               | Pump Room                       |
| MB4  | 16              | 24              | 1           | 4-#10      | 6" 6"         | 4        | 2-#5       | 2'-0" 2'-0"   | #3       | @10" thruout |               | Pump Room                       |
| MB5  | 16              | 30              | 1           | 4-#11      | 6" 6"         | 4        | 2-#5       | 2'-0" 2'-0"   | #3       | @12" thruout |               | Pump Room                       |
| MB6  | 24              | 46              | 1           | 2-#11      | 12" 12"       | 4        | 3-#7       | 5'-6" 5'-6"   | #4       | @16" thruout |               | Pump Room                       |
| MB7  | 18              | 36              | 1           | 5-#9       | 12" 12"       | 2        | 2-#11      | 9'-8" 6'-0"   | #4       | @12" thruout |               | Pump Room                       |
| EB1  | 18              | 20 <sup>Δ</sup> | 1           | 4-#8       | 6" 6"         | 3        | 4-#9       | 5'-0" 5'-0"   | #4       | @8" thruout  | See sheet 512 | Elac. Substation (Elev. 141.25) |
| EB2  | 18              | 20 <sup>Δ</sup> | 1           | 4-#8       | 6" 6"         | 3        | 4-#9       | 5'-0" 5'-0"   | #4       | @8" thruout  | See sheet 512 | Elac. Substation (Elev. 141.25) |
| EB3  | 18              | 20 <sup>Δ</sup> | 1           | 4-#8       | 6" 6"         |          |            |               | #4       | @8" thruout  | See sheet 512 | Elac. Substation (Elev. 141.25) |
| EB4  | 14              | 20 <sup>Δ</sup> | 1           | 3-#8       | 6" 6"         | 3        | 3-#9       | 5'-0" 5'-0"   | #3       | @8" thruout  | See sheet 512 | Elac. Substation (Elev. 141.25) |
| EB5  | 14              | 20 <sup>Δ</sup> | 1           | 3-#8       | 6" 6"         | 3        | 3-#9       | 5'-0" 5'-0"   | #3       | @8" thruout  | See sheet 512 | Elac. Substation (Elev. 141.25) |
| EB6  | 14              | 20 <sup>Δ</sup> | 1           | 3-#8       | 6" 6"         |          |            |               | #3       | @8" thruout  | See sheet 512 | Elac. Substation (Elev. 141.25) |



**BAR TYPES**  
No scale

## BEAM SCHEDULE (CONT'D)

| MARK | WIDTH (in)      | DEPTH (in) | BOTTOM BARS |            |               | TOP BARS |            |               | STIRRUPS |                                   | REMARKS       | LOCATION  |                                    |
|------|-----------------|------------|-------------|------------|---------------|----------|------------|---------------|----------|-----------------------------------|---------------|---|------------------------------------|
|      |                 |            | TYPE        | No. & Size | DIMENSION a b | TYPE     | No. & Size | DIMENSION a b | SIZE     | SPACING                           |               |   |                                    |
| EV1  | 12              | 24         | 1           | 3-#10      | 6" 6"         |          |            |               | #3       | @10" thruout                      |               | Electrical Vault in Chlorine Rm. (Elev. 141.25) |                                    |
| MV1  | 18              | 36         | 1           | 5-#11      | 12" 12"       |          |            |               | #4       | @16" thruout                      |               | Water Vault next to Contact Chamber             |                                    |
| VB1  | 18              | 40         | 1           | 2-#10      | 12" 12"       | 4        | 3-#5       | 3'-0" 3'-0"   | #5       | @14" at East and remainder at 18" |               | 54" φ Venturi Vault (Elev. 126.42)              |                                    |
| VB2  | 24              | 42         | 1           | 8-#10      | 10" 10"       | 3        | 7-#10      | 6'-0" 6'-0"   | 3        | 2-#10                             | 6'-0" 6'-0"   | at South cont. and                              | 54" φ Venturi Vault (Elev. 126.42) |
| TB1  | 12 <sup>Δ</sup> | 73         | 1           | 3-#5       | 10" 10"       | 4        | 2-#5       | 2'-0" 2'-0"   | #4       | @12" thruout                      | See sheet 518 | Truck bay Roof                                  |                                    |
| TB2  | 12 <sup>Δ</sup> | 73         | 1           | 3-#7       | 6" 6"         | 3        | 3-#7       | 11'-7" 11'-7" | #4       | @12" thruout                      | See sheet 518 | Truck bay Roof                                  |                                    |
| TB3  | 12 <sup>Δ</sup> | 73         | 1           | 3-#7       | 6" 6"         |          |            |               | #4       | @12" thruout                      | See sheet 518 | Truck bay Roof                                  |                                    |

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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard E. Freudenberger  
CHIEF-BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

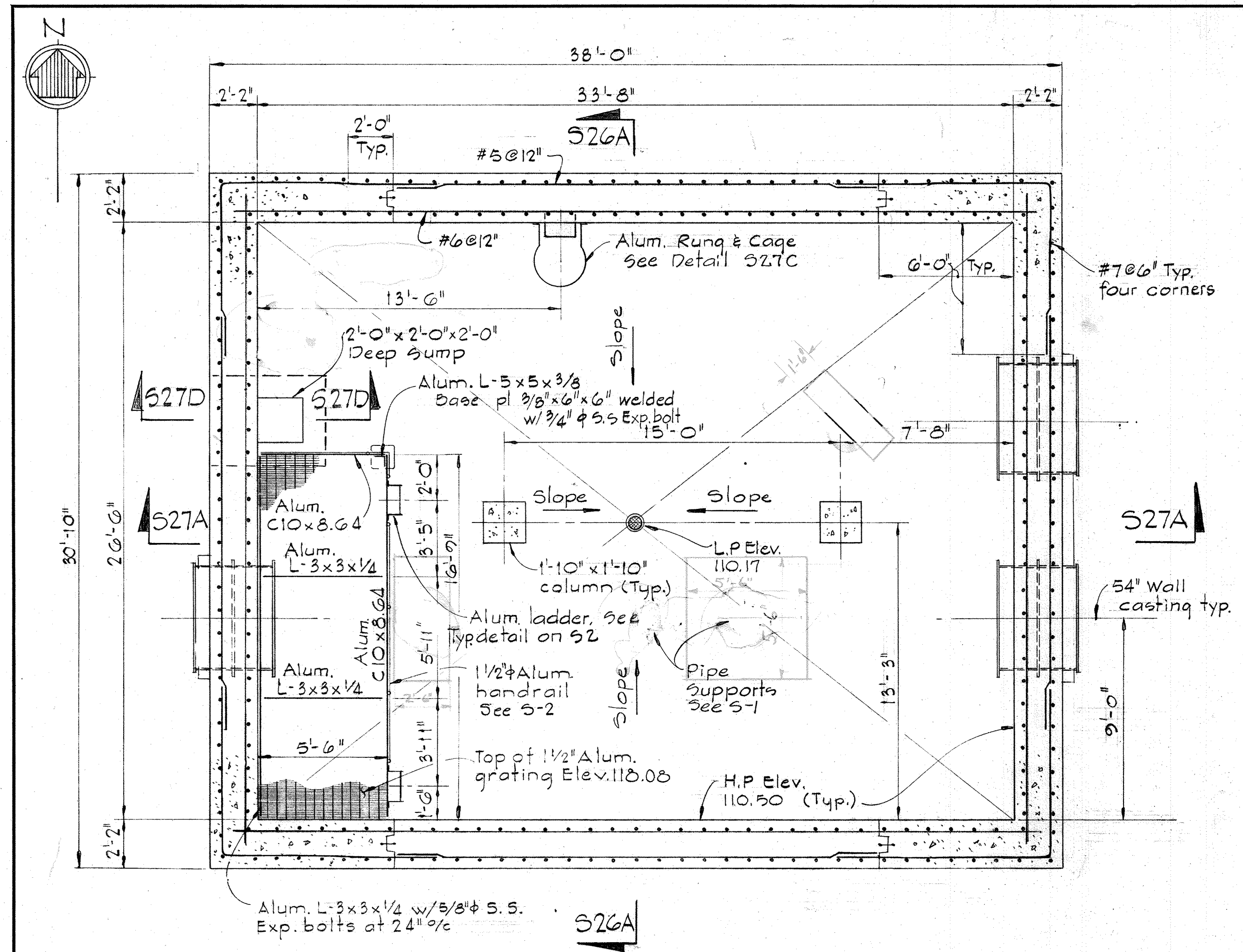
BEAM SCHEDULE

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 43  
OF 96

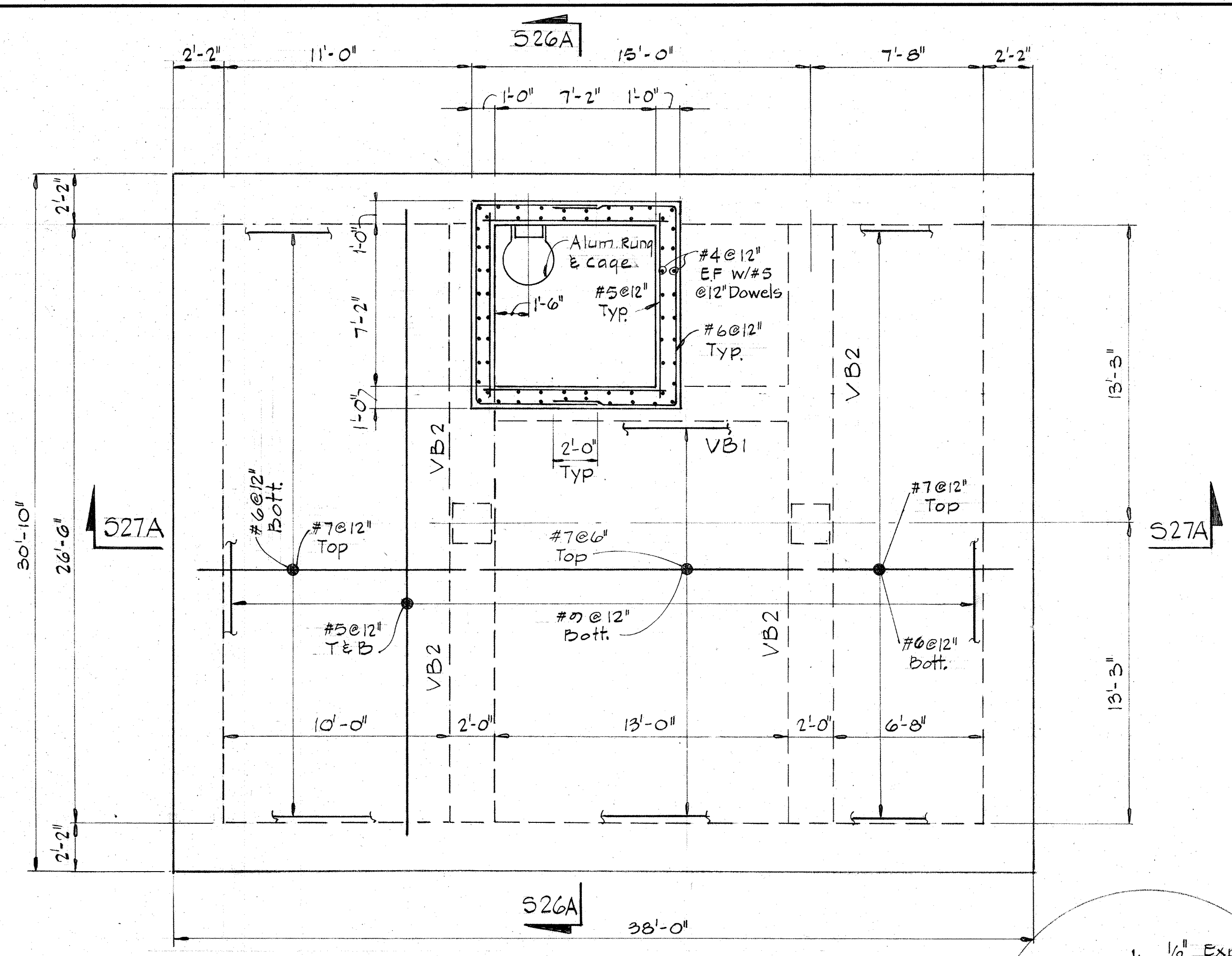
SCALE  
AS  
NOTED





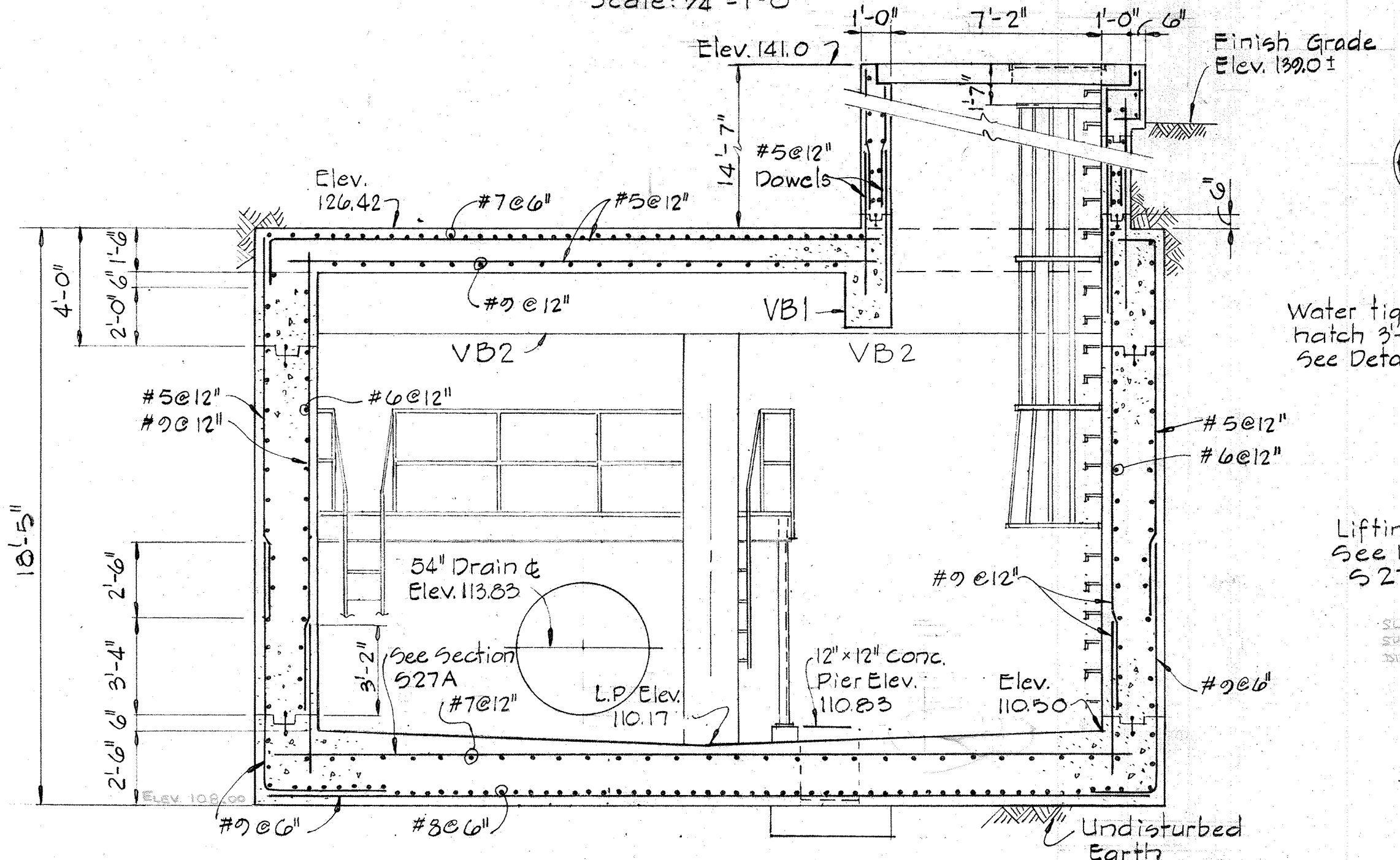
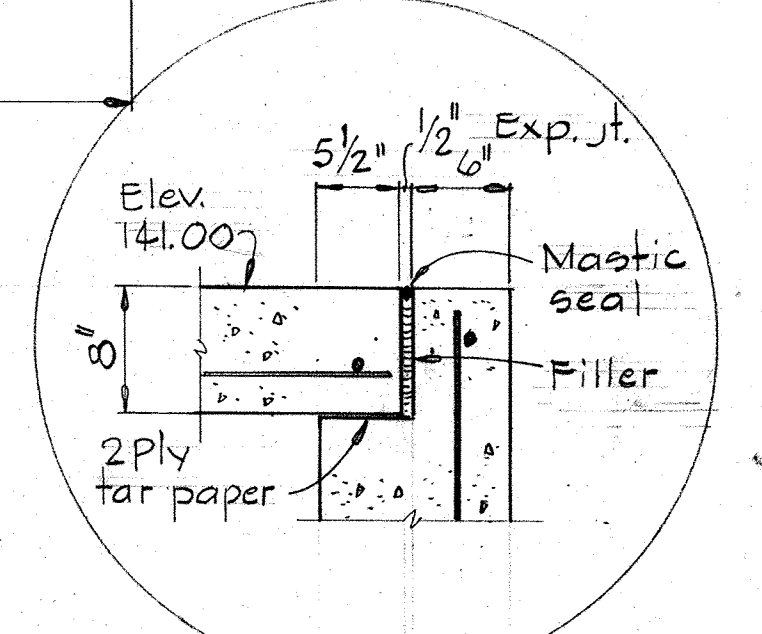
PLAN AT ELEV. 117.00

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



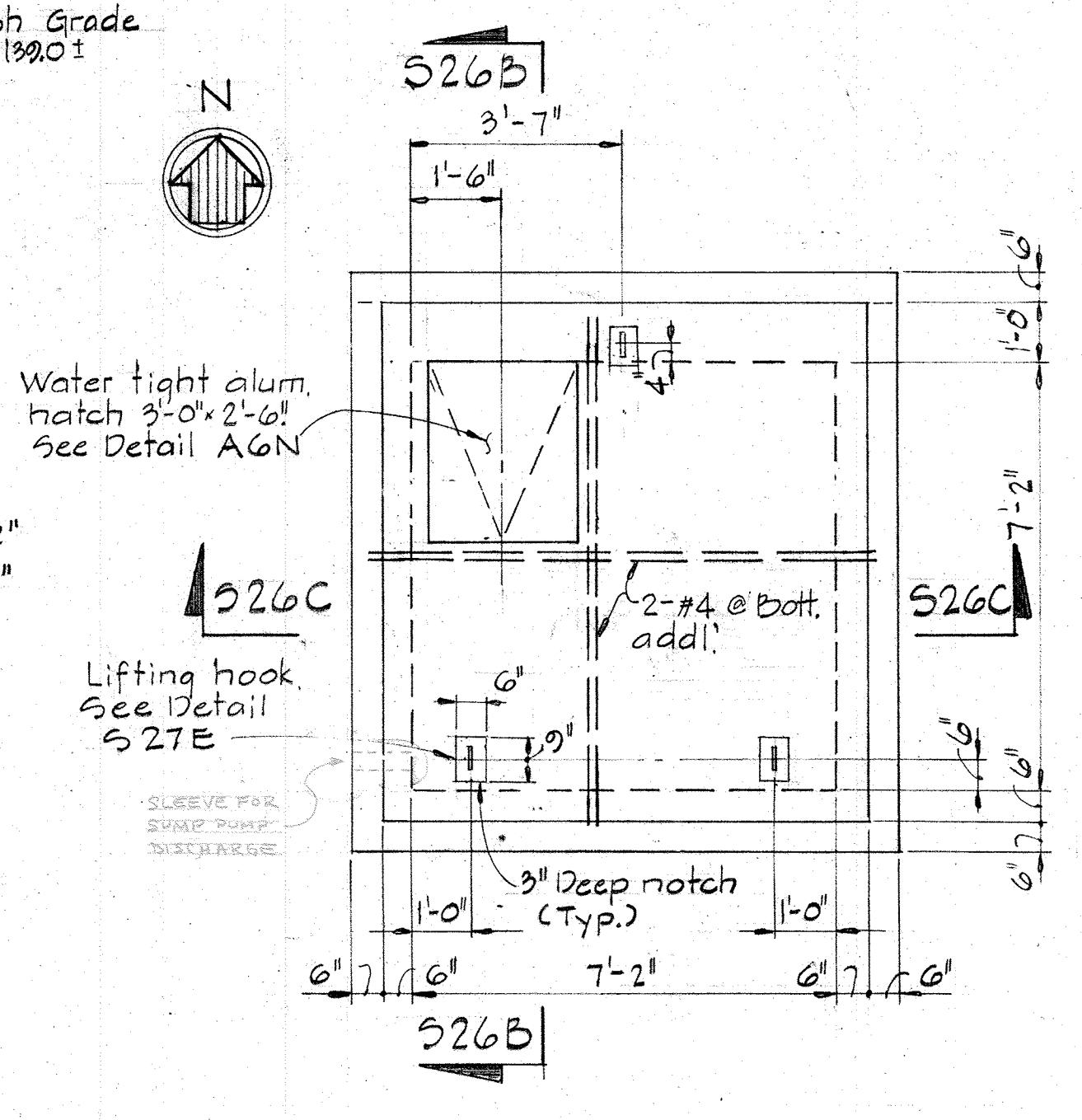
PLAN AT ELEV. 130.00

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



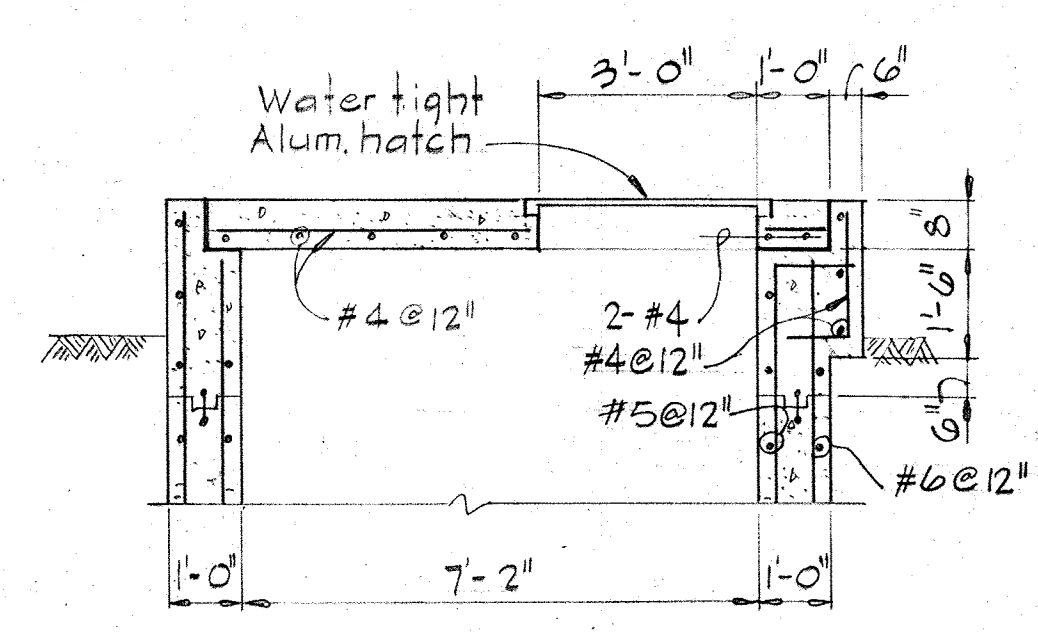
SECTION S26A/S26

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



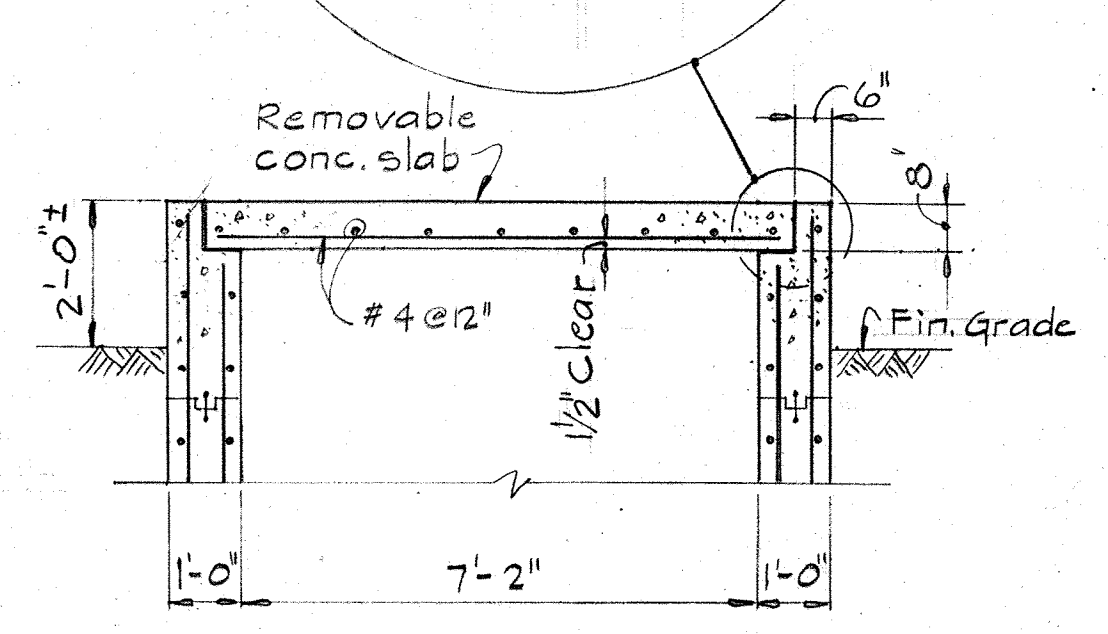
TOP PLAN @ ELEV. 141.00

Scale: 3/8" = 1'-0"



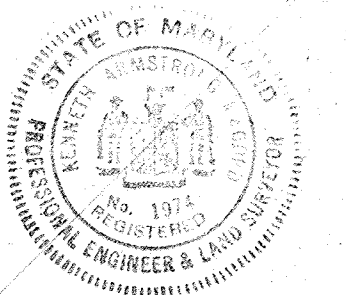
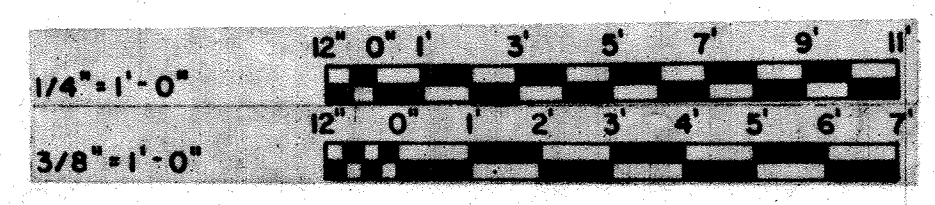
SECTION S26B/S26

Scale: 3/8" = 1'-0"



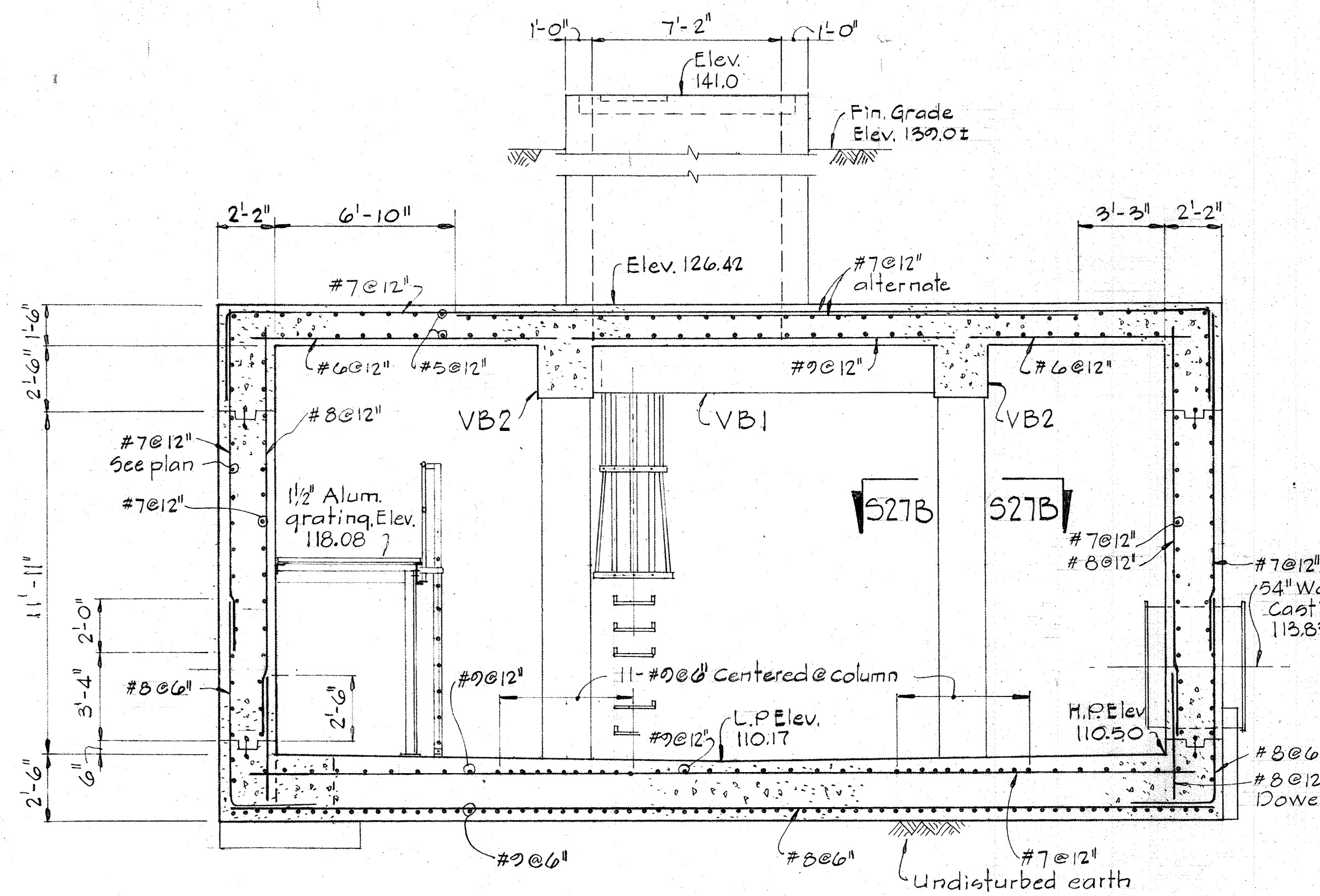
SECTION S26C/S26

Scale: 3/8" = 1'-0"

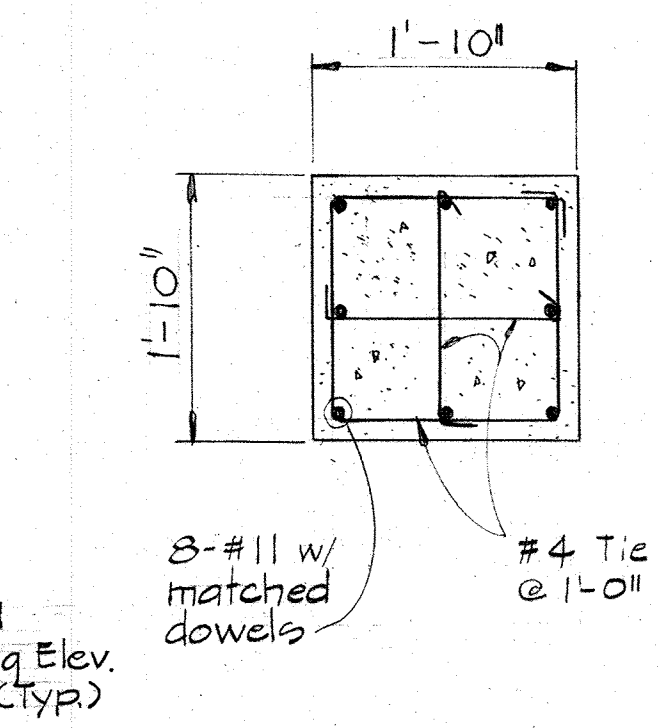


|   |   |                    |                                       |  |  |
|---|---|--------------------|---------------------------------------|--|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br>Chief-Bureau of Environmental Services | CONTRACT NO. 502-S | 54" VENTURI VAULT<br>PLANS & SECTIONS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO.4 | DRAWING NO. 44 OF 96<br>SCALE AS NOTED |
|---|---|--------------------|---------------------------------------|--|--|

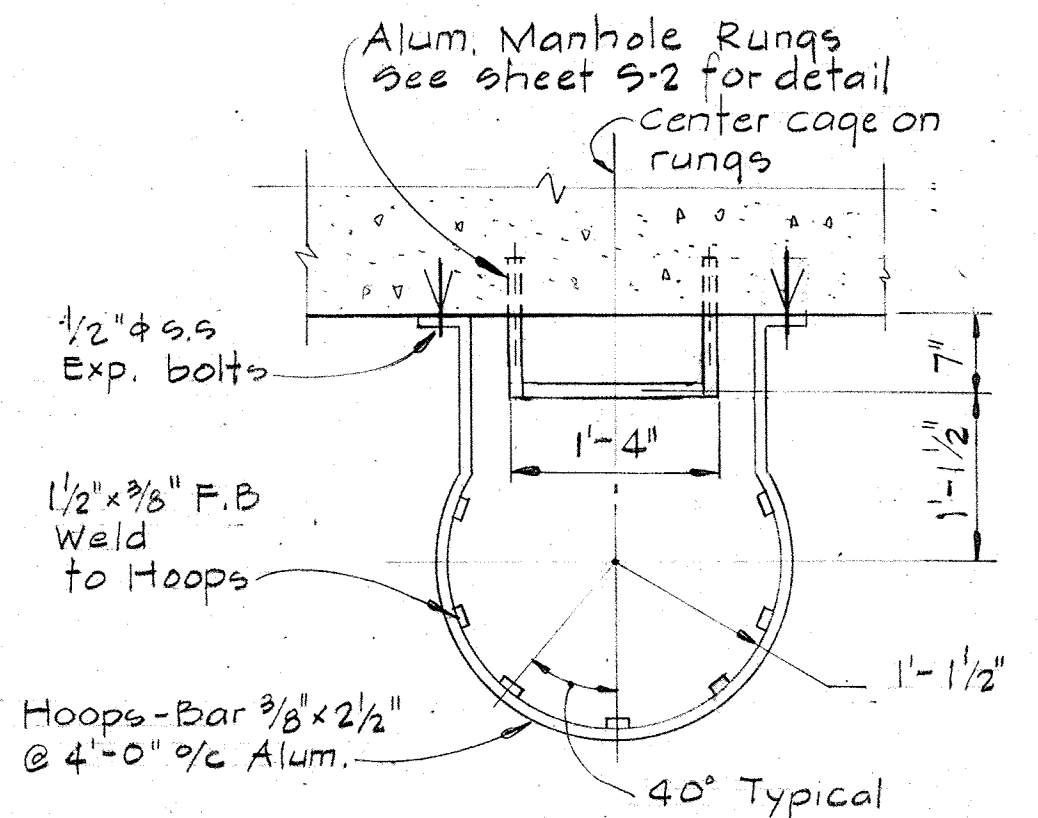




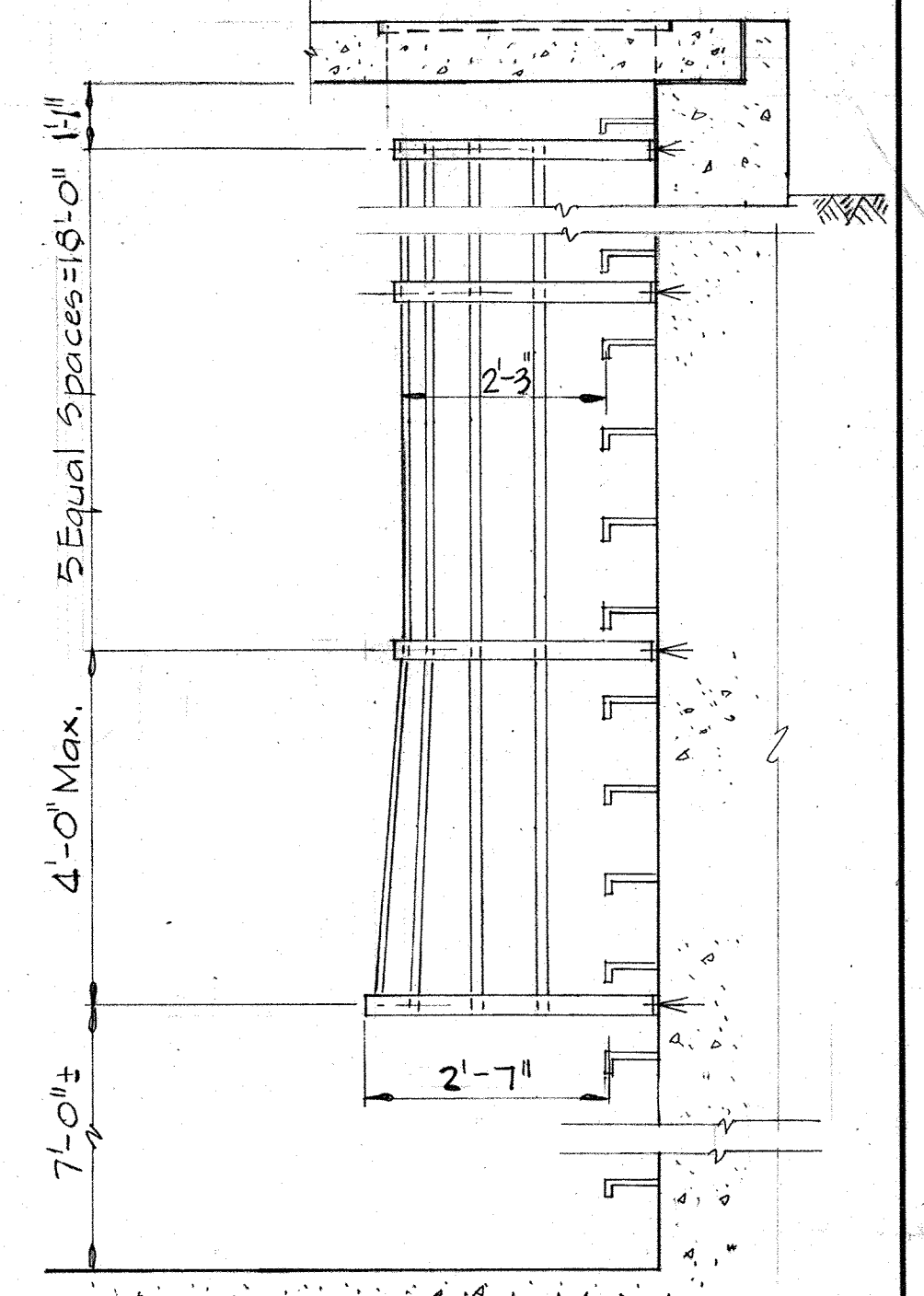
SECTION 527A/526  
Scale: 1/4" = 1'-0"



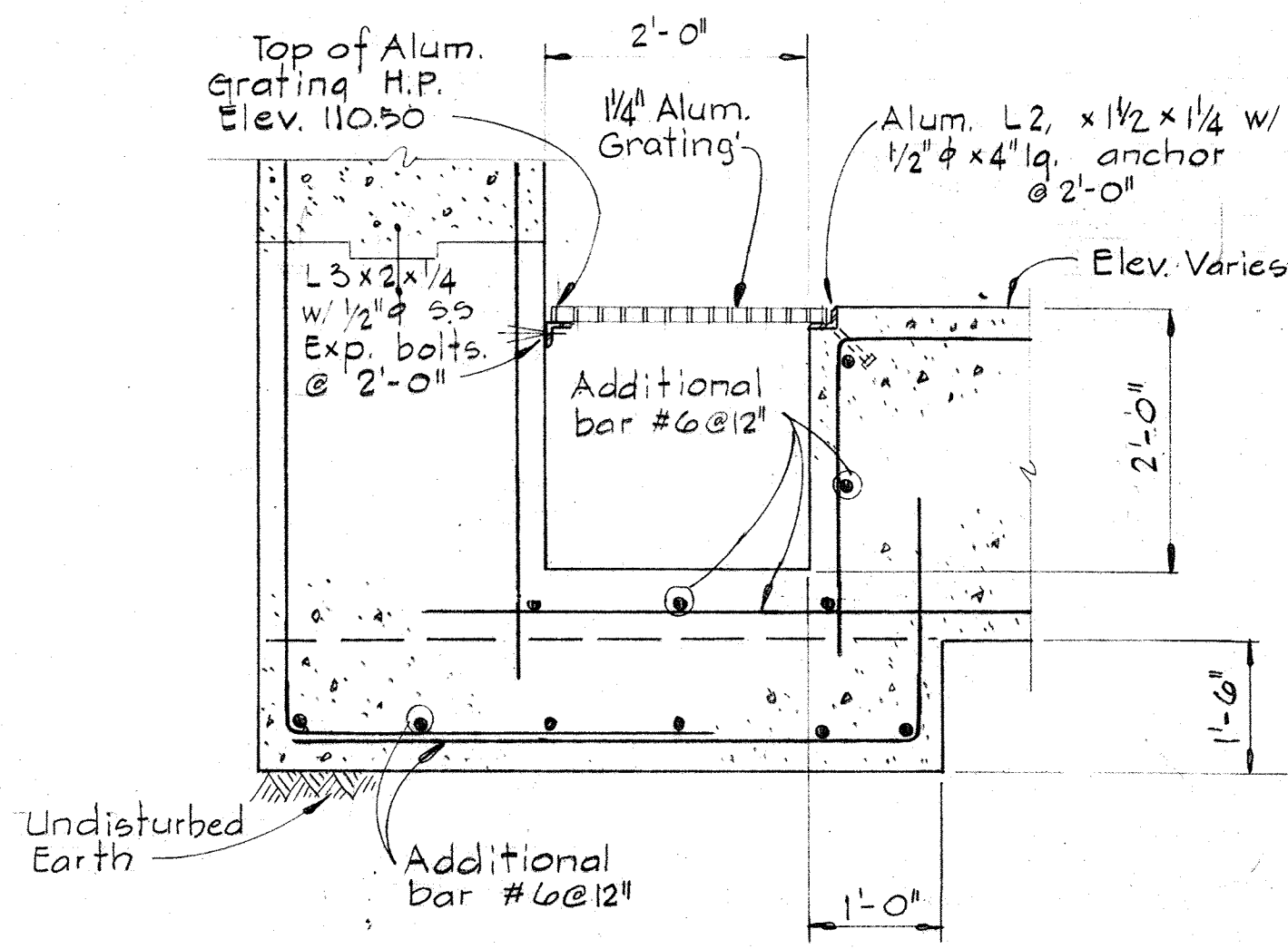
SECTION 527B/526  
Scale: 3/4" = 1'-0"



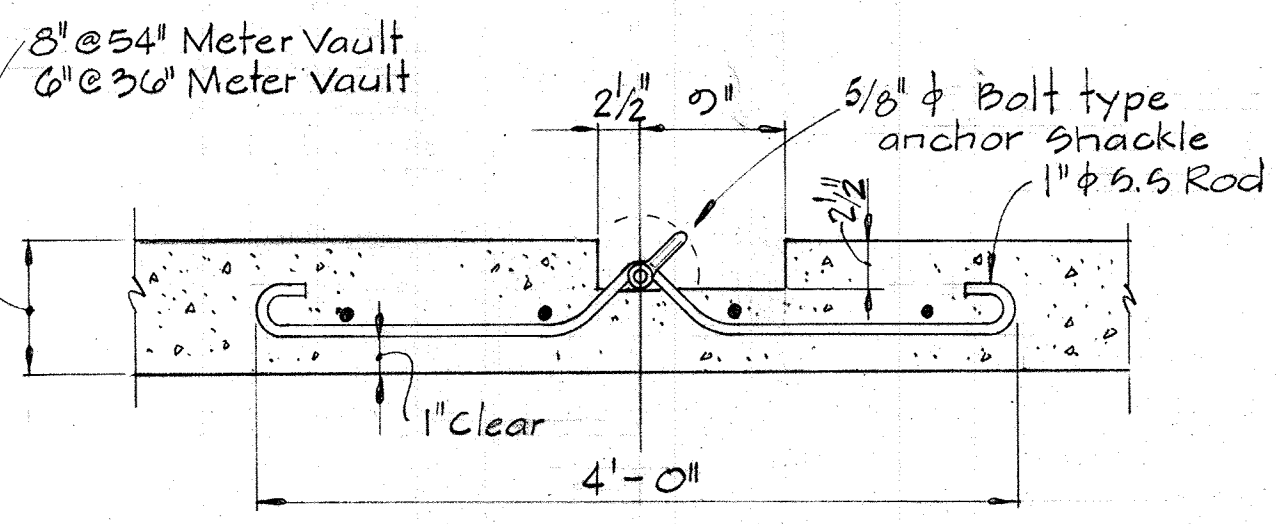
Note: Alum. cage shall be removable  
PLAN  
Scale: 3/4" = 1'-0"



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



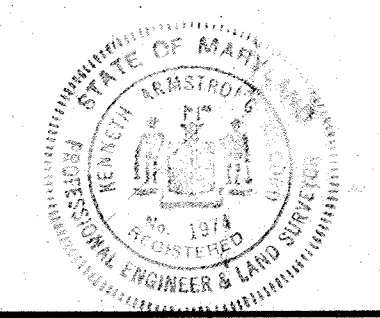
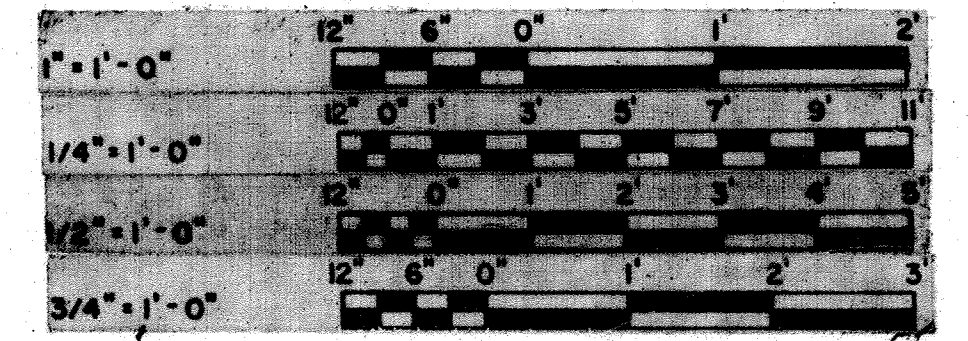
SECTION 527D/526  
Scale: 3/4" = 1'-0"



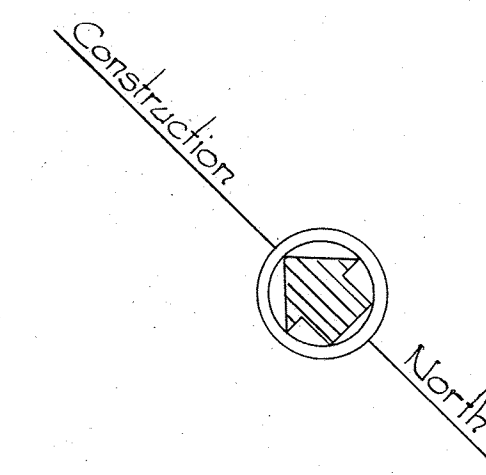
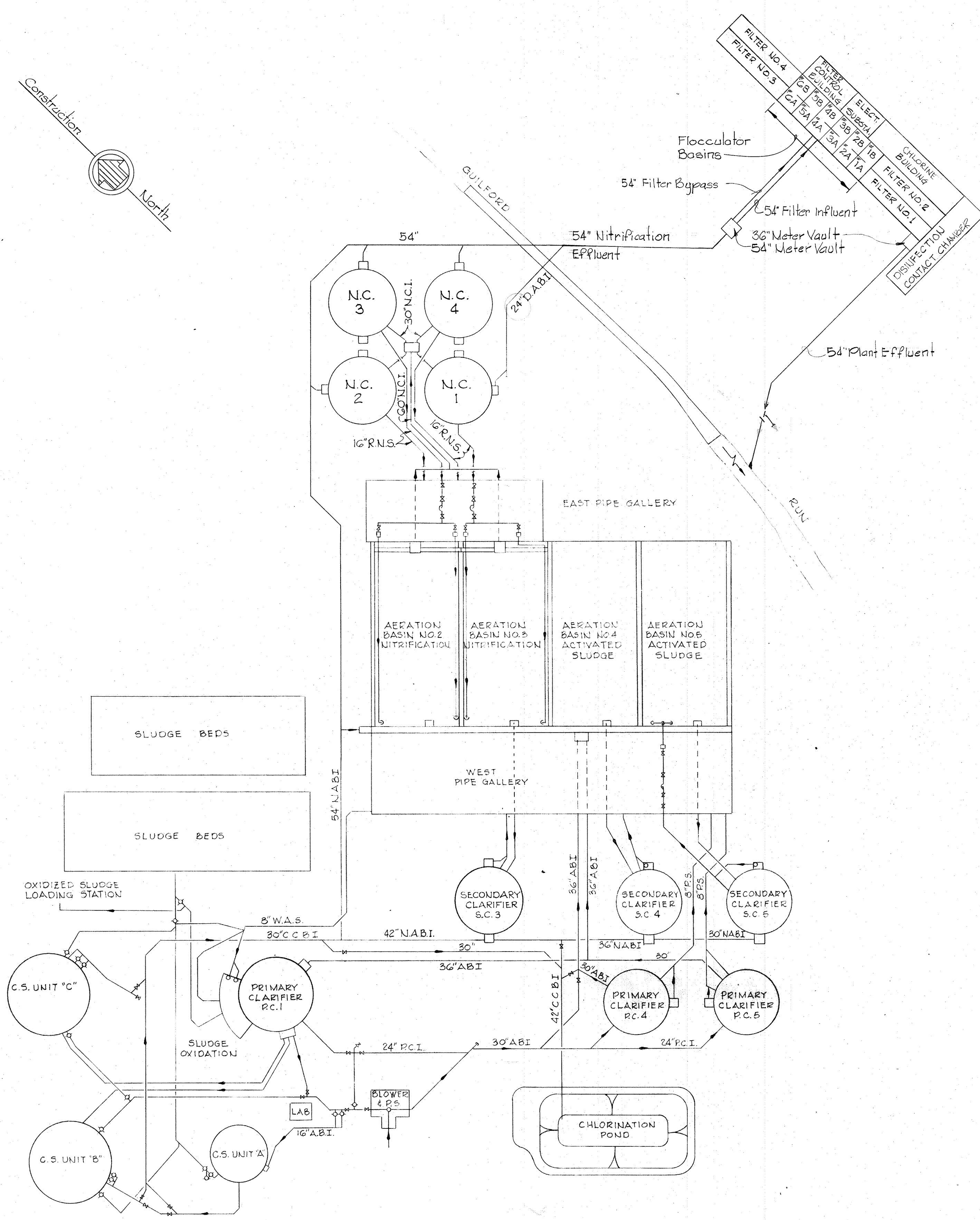
DETAIL 527E/522, 526  
Scale: 1" = 1'-0"

| COLUMN SCHEDULE |  |              |   |              |                  |              |                              |              |                              |              |                              |              |               |
|-----------------|--|--------------|---|--------------|------------------|--------------|------------------------------|--------------|------------------------------|--------------|------------------------------|--------------|---------------|
| Column Mark     | E1, E2, E3, E4, E5, E6, E7, E15, E16, E17, E18, E19, E20, E21, F1, F7, F15, F21, G1, G7, G13, G21, H1, H2, H3, H4, H5, H6, H7, H15, H16, H17, H18, H19, H20, H21 | Column Mark  | F2, F3, F4, F5, F6, F16, F17, F8, F19, F20, G2, G3, G4, G5, G6, G16, G17, G18, G19, G20 | Column Mark  | C8, C9, C10, C11 | Column Mark  | B12, B13, B14, D12, D13, D14 | Column Mark  | A16a, A17a, A18a, A19a, A20a | Column Mark  | B15, B16, B17, B18, B19, B20 | Column Mark  | D18, D19, D20 |
| Elevation       | Elev. 148.85   | Elevation    | Elev. 149.08  | Elevation    | Elev. 141.25     | Elevation    | Elev. 141.00                 | Elevation    | Elev. 156.17                 | Elevation    | Elev. 138.92                 | Elevation    | Elev. 138.92  |
| Size            | 12" x 12"  | Size         | 12" x 12"   | Size         | 16" x 12"        | Size         | 12" x 12"                    | Size         | 12" x 12"                    | Size         | 14" x 14"                    | Size         | 14" x 14"     |
| Reinf           | 4-#8   | Reinf        | 4-#8  | Reinf        | 6-#6, 4-#8       | Reinf        | 4-#8                         | Reinf        | 8-#8                         | Reinf        | 4-#8                         | Reinf        | 4-#8          |
| Ties            | #3@12"   | Ties         | #3@12"  | Ties         | #3@12"           | Ties         | #3@12"                       | Ties         | #3@12"                       | Ties         | #3@12"                       | Ties         | #3@12"        |
| Splice          | 3'-3"  | Splice       | 1'-6"   | Splice       | 1'-6"            | Splice       | 1'-6"                        | Splice       | 2'-0"                        | Splice       | 1'-6"                        | Splice       | 1'-6"         |
| Elev. 141.00    |  | Elev. 137.85 |   | Elev. 135.00 |                  | Elev. 133.00 |                              | Elev. 136.17 |                              | Elev. 133.50 |                              | Elev. 131.67 |               |

NOTE:  
1. Provide dowels the same size as the main column reinforcing.  
2. \* 16" Dimension is in North-South direction.







**LEGEND**

**SYMBOLS DESCRIPTION ABBREVIATIONS**

**PIPING**

|              |                           |          |
|--------------|---------------------------|----------|
| — C.W. —     | Cold Water, City Water    | C. W.    |
| — H.W. —     | Hot Water                 | H. W.    |
| — V.T.R. —   | Vent Thru Roof            | V.T.R.   |
| — A —        | Compressed Air            |          |
| — F.D. —     | Floor Drainage            |          |
| — W.W. —     | Wash Water                | W.W.     |
| — R.D.N.S. — | Return Denitrified Sludge | R.D.N.S. |
| — W.D.N.S. — | Waste Denitrified Sludge  | W.D.N.S. |
| — W.N.S. —   | Waste Nitrified Sludge    | W.N.S.   |
| — S.S. —     | Stainless Steel           | S. S.    |
| — F.W. —     | Flushing Water            | F.W.     |

**VALVES**

|          |                         |  |
|----------|-------------------------|--|
| [Symbol] | Gate Valve              |  |
| [Symbol] | Butterfly Valve         |  |
| [Symbol] | Globe Valve             |  |
| [Symbol] | Plug Valve              |  |
| [Symbol] | Swing Check Valve       |  |
| [Symbol] | Pressure Reducing Valve |  |
| [Symbol] | Solenoid Valve          |  |
| [Symbol] | Pressure Relief Valve   |  |
| [Symbol] | Needle Valve            |  |
| [Symbol] | Ball Valve              |  |

**FITTINGS**

|          |                           |        |
|----------|---------------------------|--------|
| [Symbol] | Floor Drain               | F. D.  |
| [Symbol] | Cleanout, Flush Type      | F.C.O. |
| [Symbol] | Cleanout                  | C.O.   |
| [Symbol] | Strainer                  |        |
| [Symbol] | Shock Absorber            |        |
| [Symbol] | Hose Bibb                 | H.B.   |
| [Symbol] | Flexible Coupling         |        |
| [Symbol] | Reducer                   |        |
| [Symbol] | Union                     |        |
| [Symbol] | Freeze Proof Wall Hydrant | FPH    |

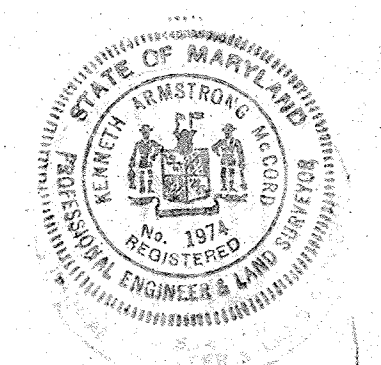
**MISCELLANEOUS**

|          |               |  |
|----------|---------------|--|
| [Symbol] | Pressure Gage |  |
|----------|---------------|--|

**VENTILATION**

|          |                                 |  |
|----------|---------------------------------|--|
| [Symbol] | Motor Operated Damper           |  |
| [Symbol] | Splitter Damper                 |  |
| [Symbol] | Square Elbow with Turning Vanes |  |
| [Symbol] | Supply Air Duct                 |  |
| [Symbol] | Return or Exhaust Air Duct      |  |
| [Symbol] | Duct Thermostat                 |  |
| [Symbol] | Air Flow Switch                 |  |

Scale: None



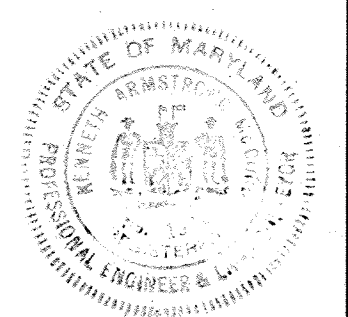
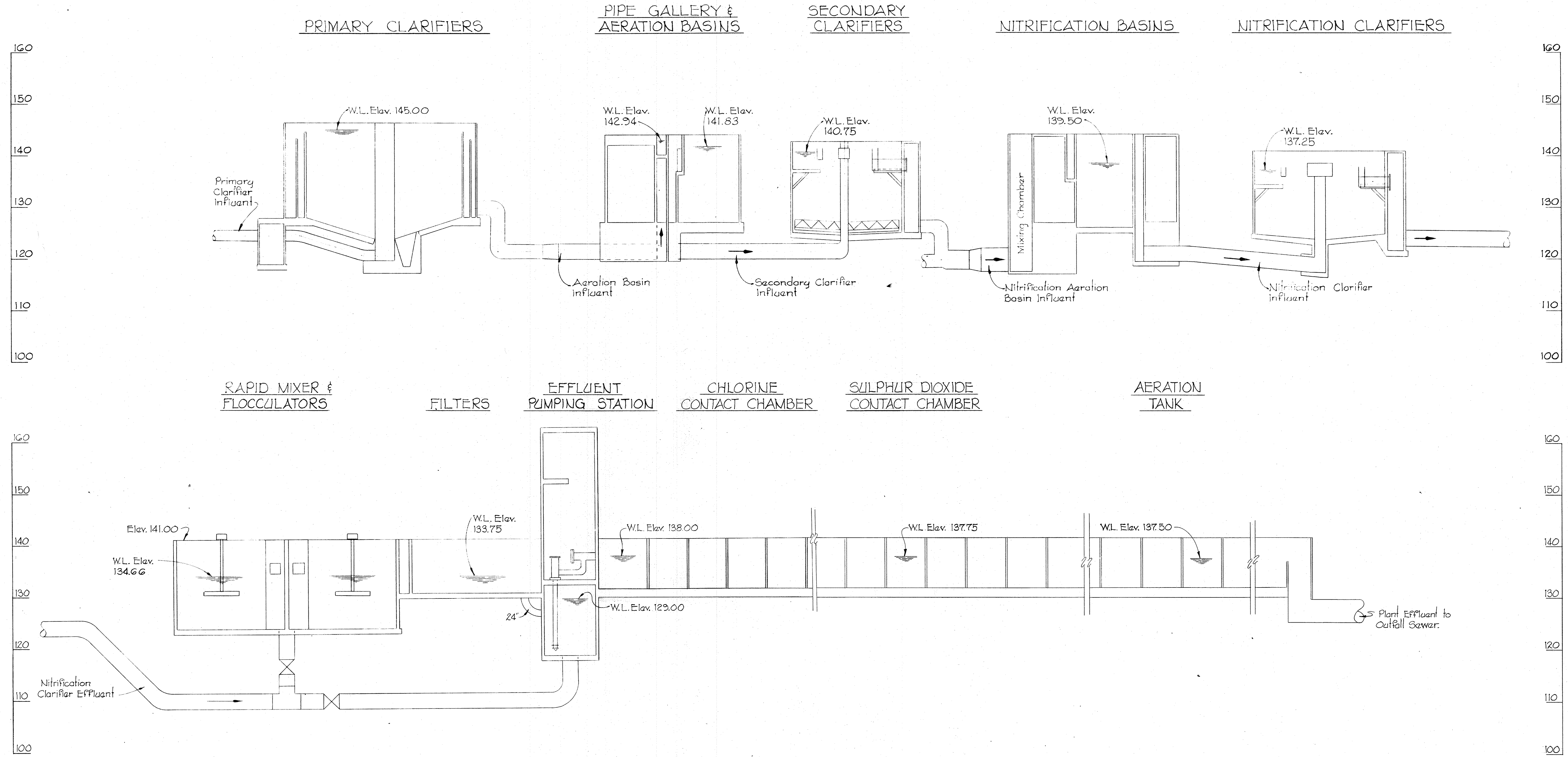
|  |   |                                  |   |   |  |  |
|--|---|----------------------------------|---|---|--|--|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/>DATE: 12/13/77<br/><i>Robert E. Freudenberger</i><br/>CHIEF - BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>PLANT FLOW</b><br/><b>SCHEMATIC DIAGRAM</b></p> | <p><b>SAVAGE WASTEWATER</b><br/><b>TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING</b><br/><b>NO. 46</b><br/><b>OF 96</b></p> | <p><b>SCALE</b><br/><b>AS</b><br/><b>SHOWN</b></p> |
|--|---|----------------------------------|---|---|--|--|

W.O. 7275-2C

SHEET M-1

DRAWING 44-510 18392





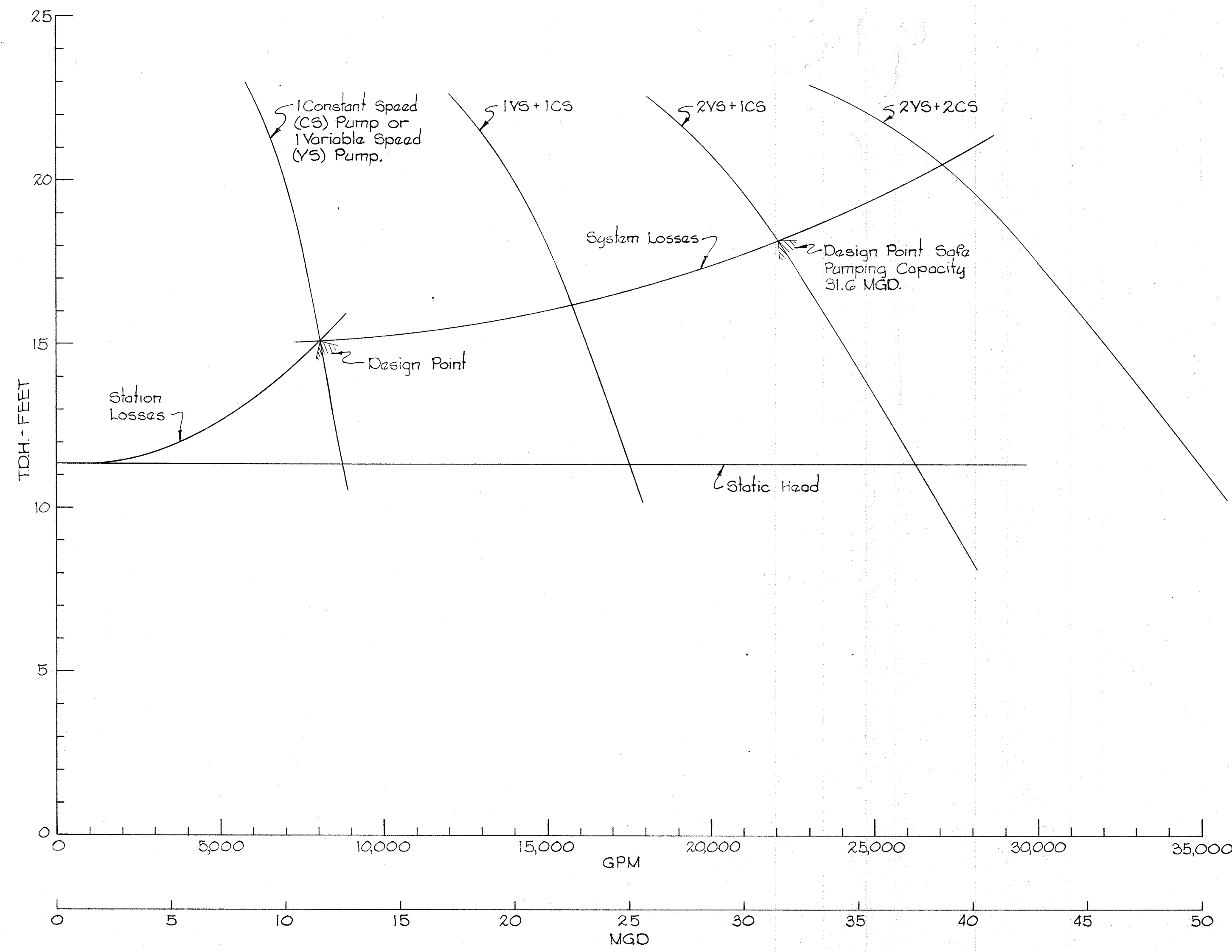
|   |   |                    |                   |   |  |
|---|---|--------------------|-------------------|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br>Chief Bureau of Environmental Services | CONTRACT NO. 502-S | HYDRAULIC PROFILE | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 47 OF 96<br>SCALE AS SHOWN |
|---|---|--------------------|-------------------|---|--|

W. O. 7275-2C

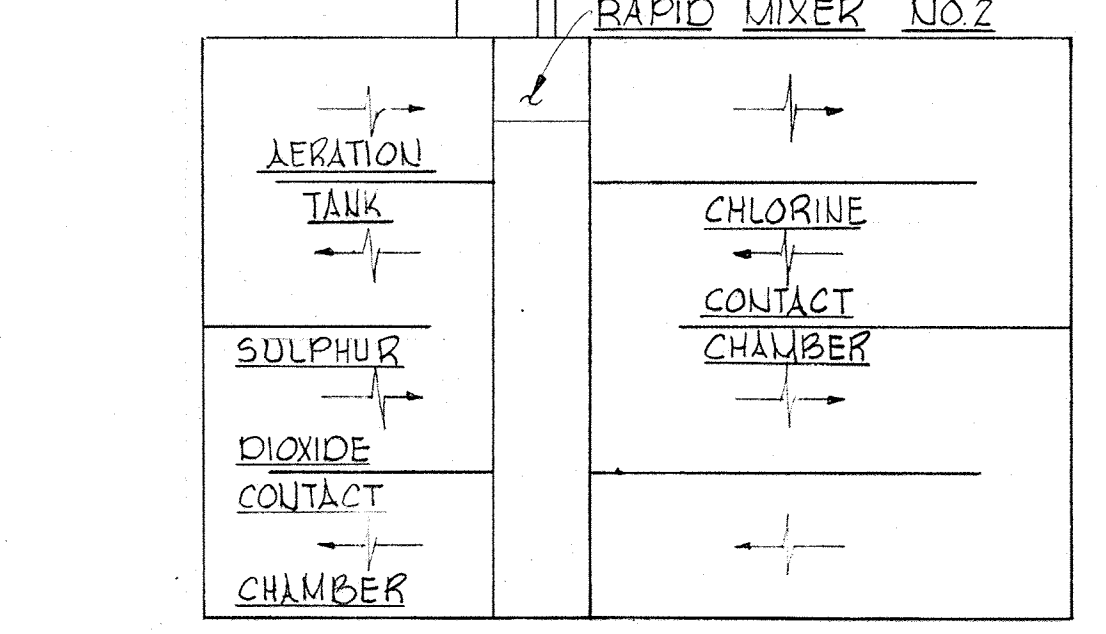
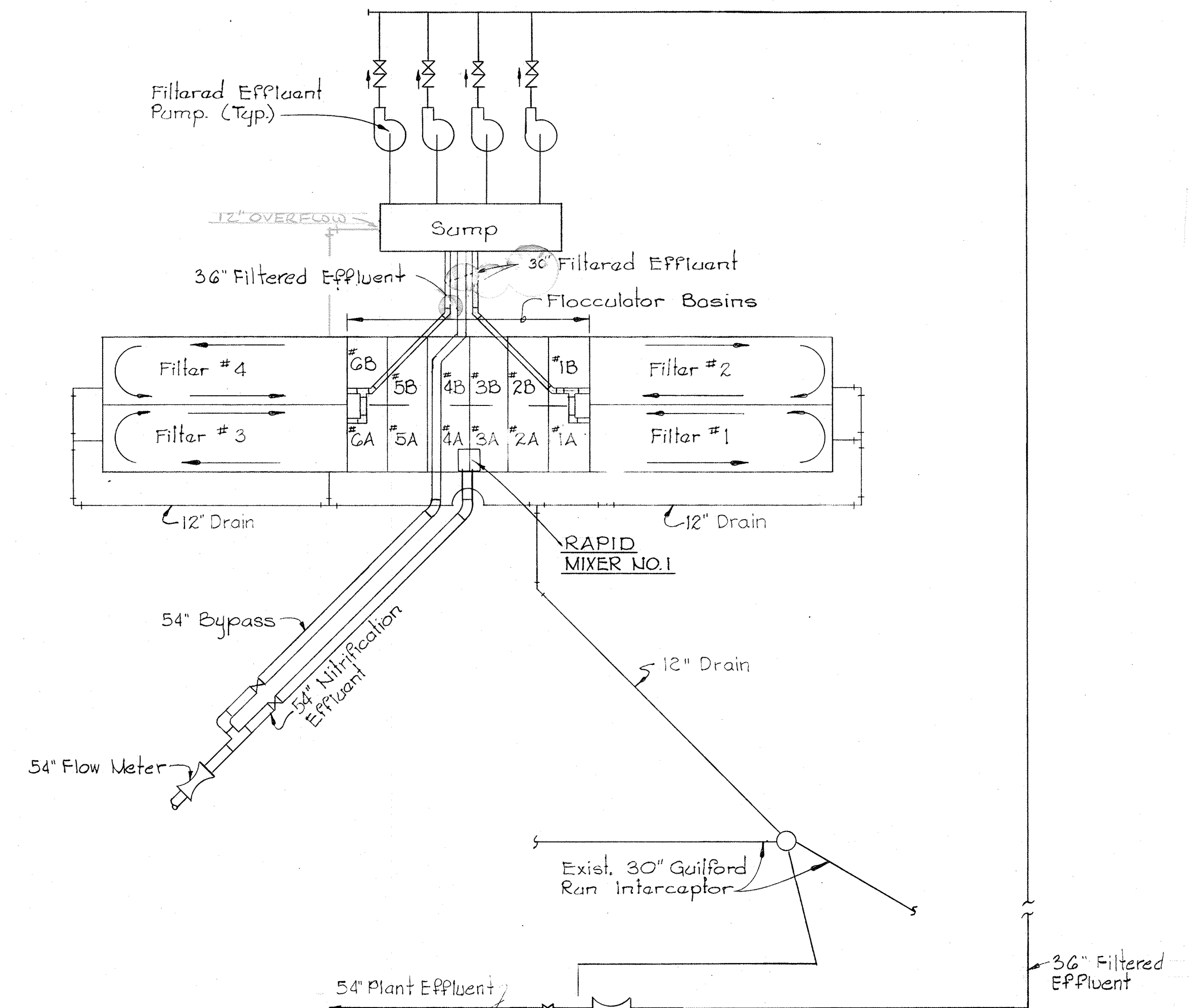
SHEET M-2

BRUNING 44-510-32872

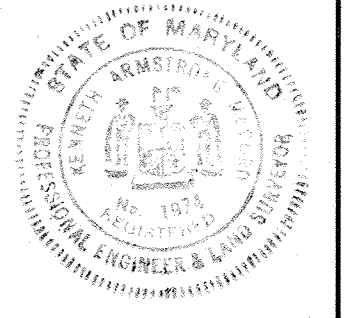




SYSTEM CURVE - FILTER EFFLUENT PUMPS



PROCESS DIAGRAM  
Not to Scale



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard S. Brudenien  
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

PROCESS DIAGRAM

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 48  
OF 96

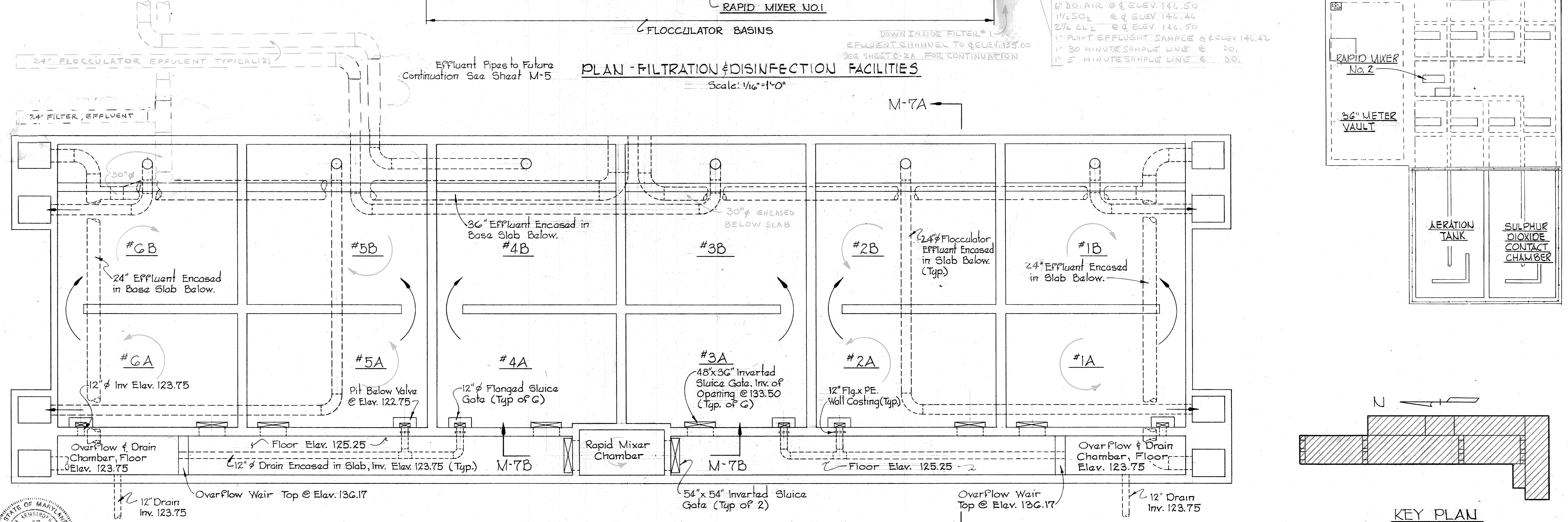
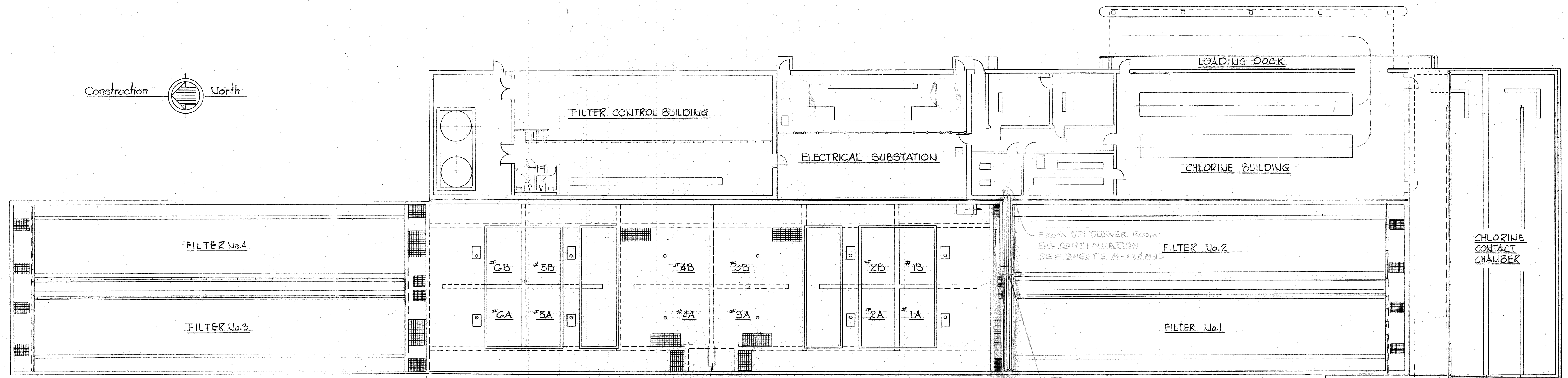
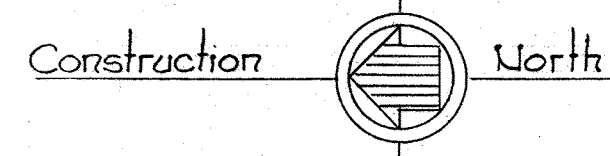
SCALE AS SHOWN

W. O. 7275-2C

SHEET M-3

BRUNING 441510 33872



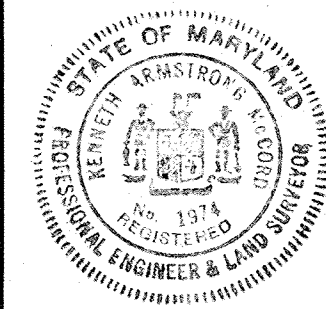
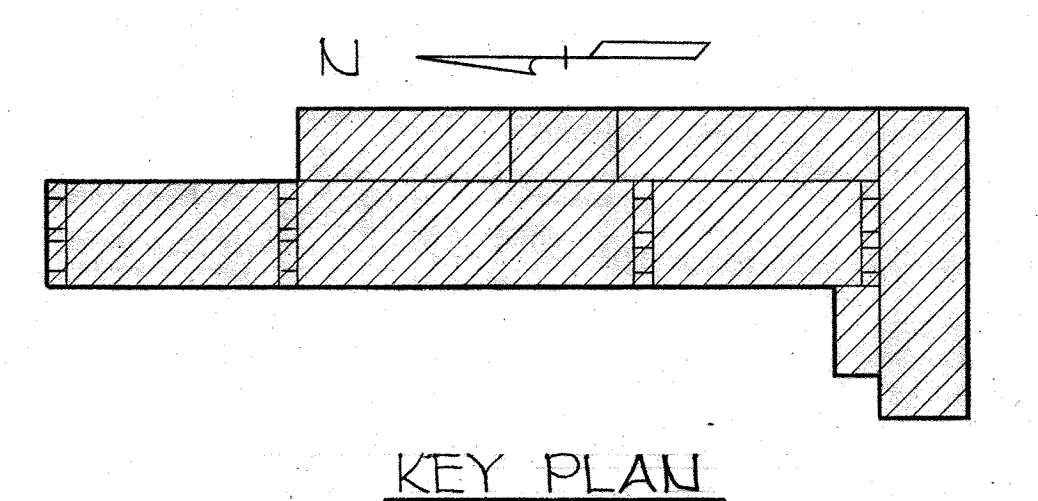


PLAN - FILTRATION & DISINFECTION FACILITIES

Scale: 1/16" = 1'-0"

FLOCCULATOR BASINS - PLAN @ ELEV. 123.75

Scale: 1/8" = 1'-0"



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

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

12/13/77 DATE

Richard E. Brudenberg CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FILTRATION AND DISINFECTION PLAN

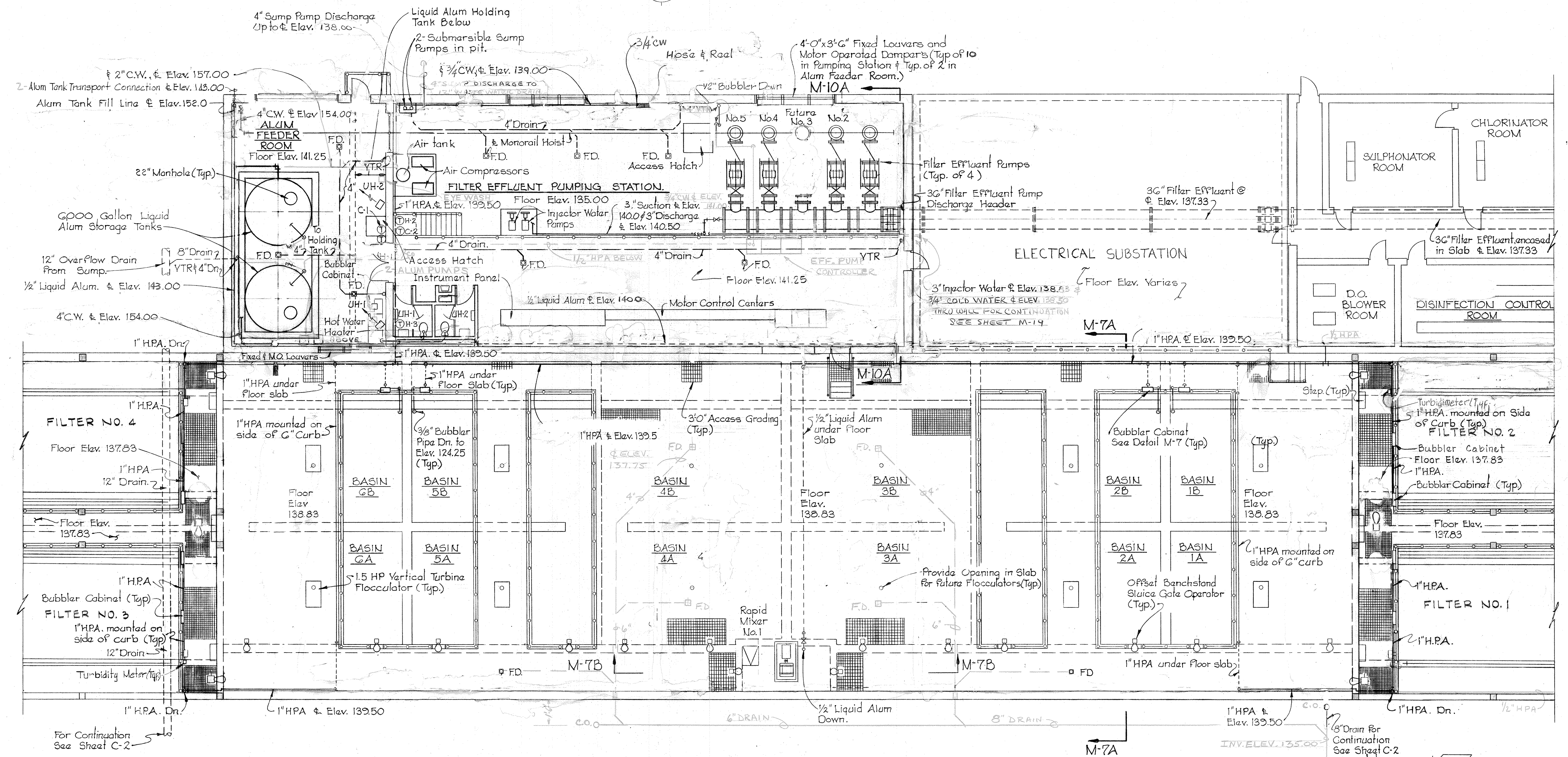
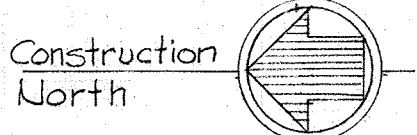
SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 49 OF 96

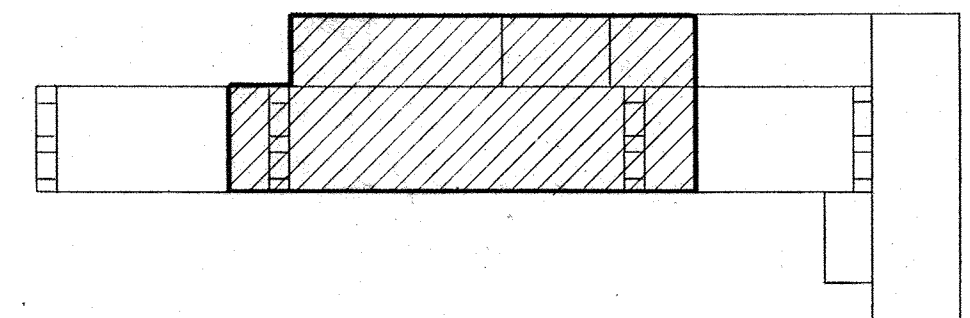
SCALE AS SHOWN



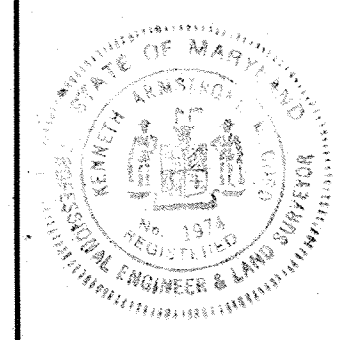




**PLAN**  
Scale: 1/8" = 1'-0"



**KEY PLAN**



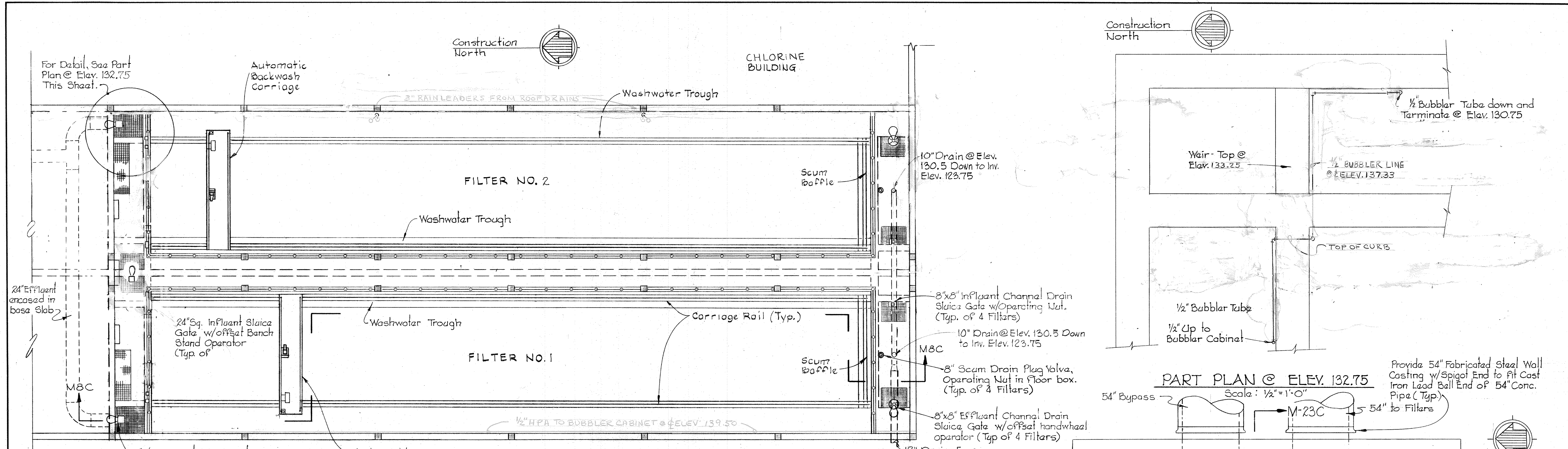
|   |  |                    |   |   |   |
|---|--|--------------------|---|---|---|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br><i>Richard E. Freudenberger</i><br>CHIEF - BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION, FLOCCULATION<br>AND PUMPING STATION<br>PLAN | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 50<br>OF 96<br>SCALE AS SHOWN |
|---|--|--------------------|---|---|---|

W. O. 7275-2C

SHEET M-5

BRUNING 44-510-32872

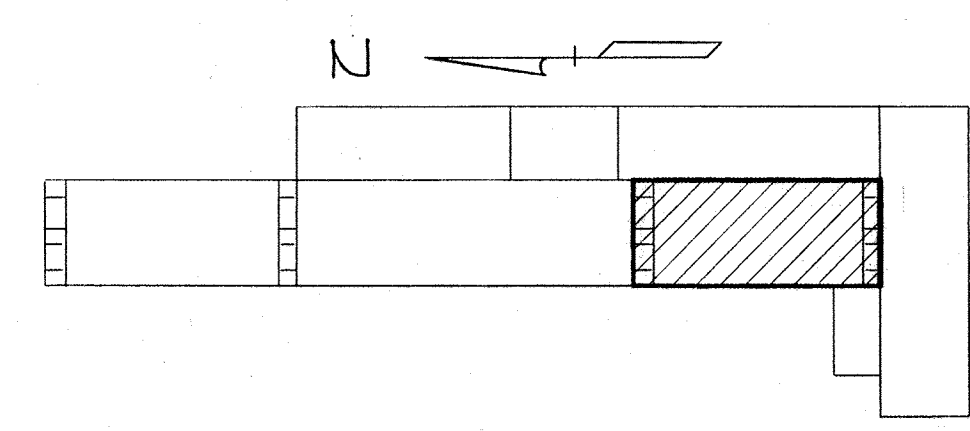




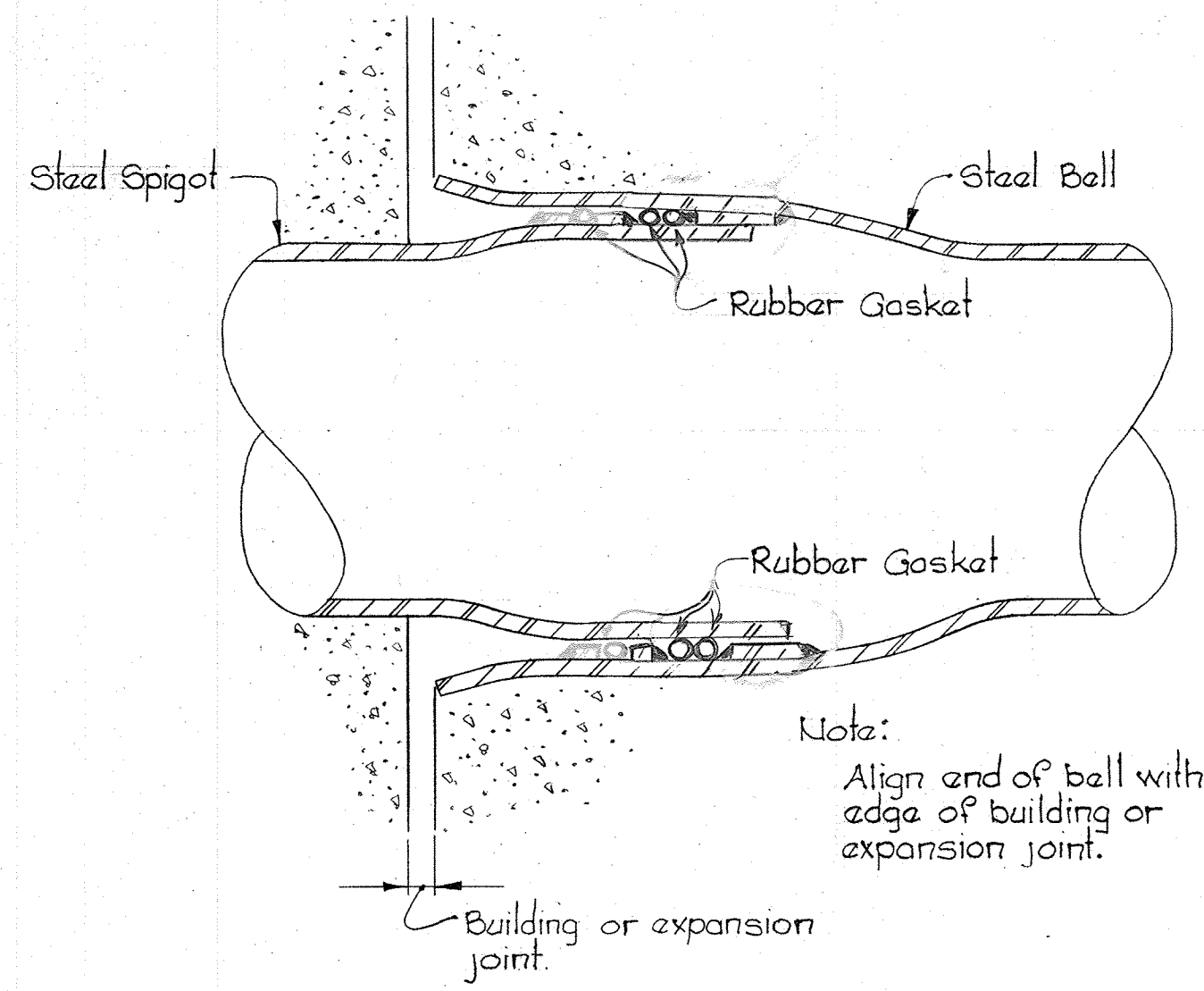
**PART PLAN @ ELEVATION 137.83**  
Scale: 1/8" = 1'-0"

**LARGE BUTTERFLY VALVE SCHEDULE**

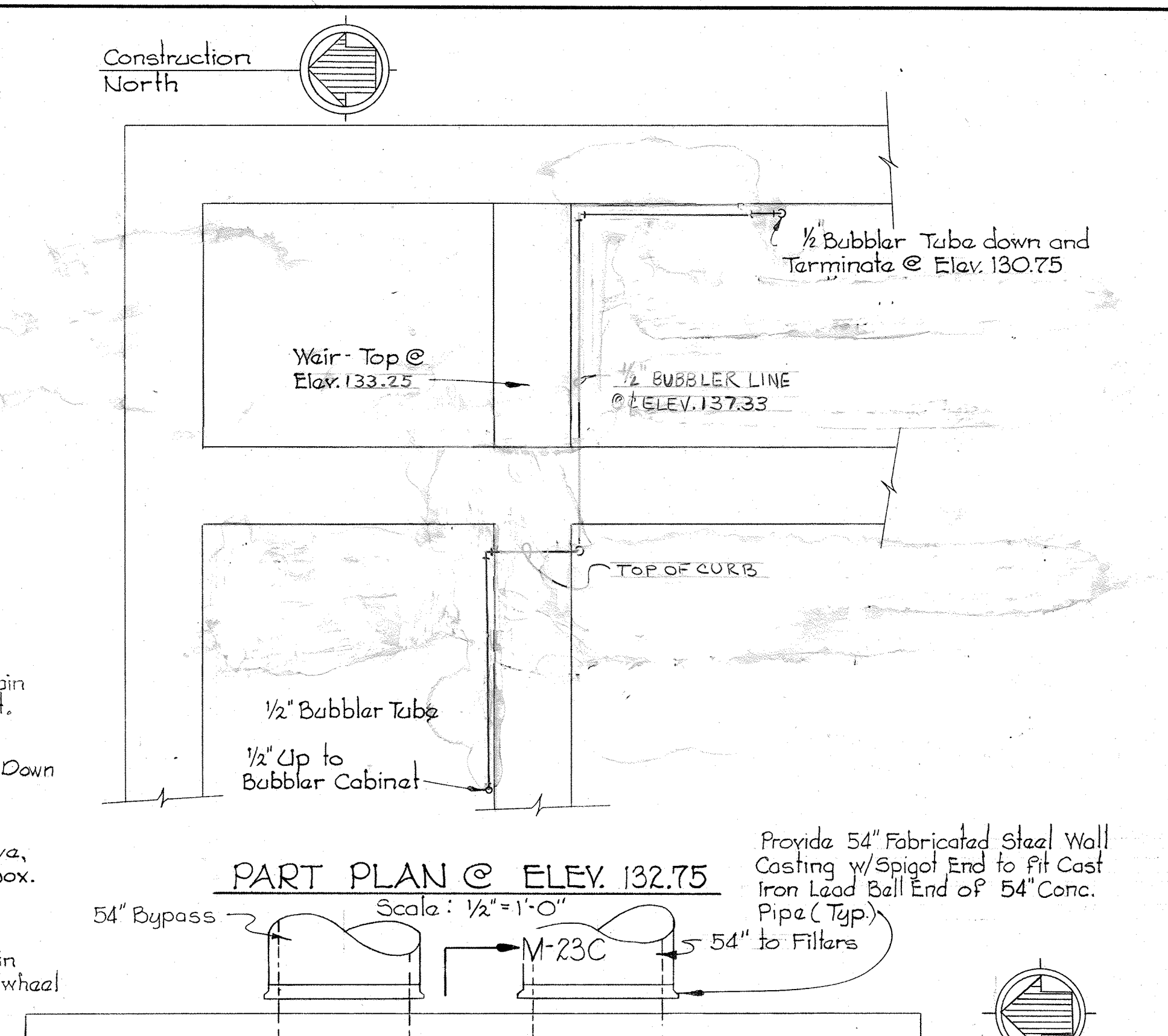
| Valve No. | Size | Location        | Operator Type  |
|-----------|------|-----------------|----------------|
| BV-1      | 54"  | 54" Meter Vault | Electric Motor |
| BV-2      | 54"  | 54" Meter Vault | Electric Motor |
| BV-3      | 54"  | 36" Meter Vault | Electric Motor |
| BV-4      | 54"  | 36" Meter Vault | Electric Motor |
| BV-5      | 54"  | 36" Meter Vault | Electric Motor |



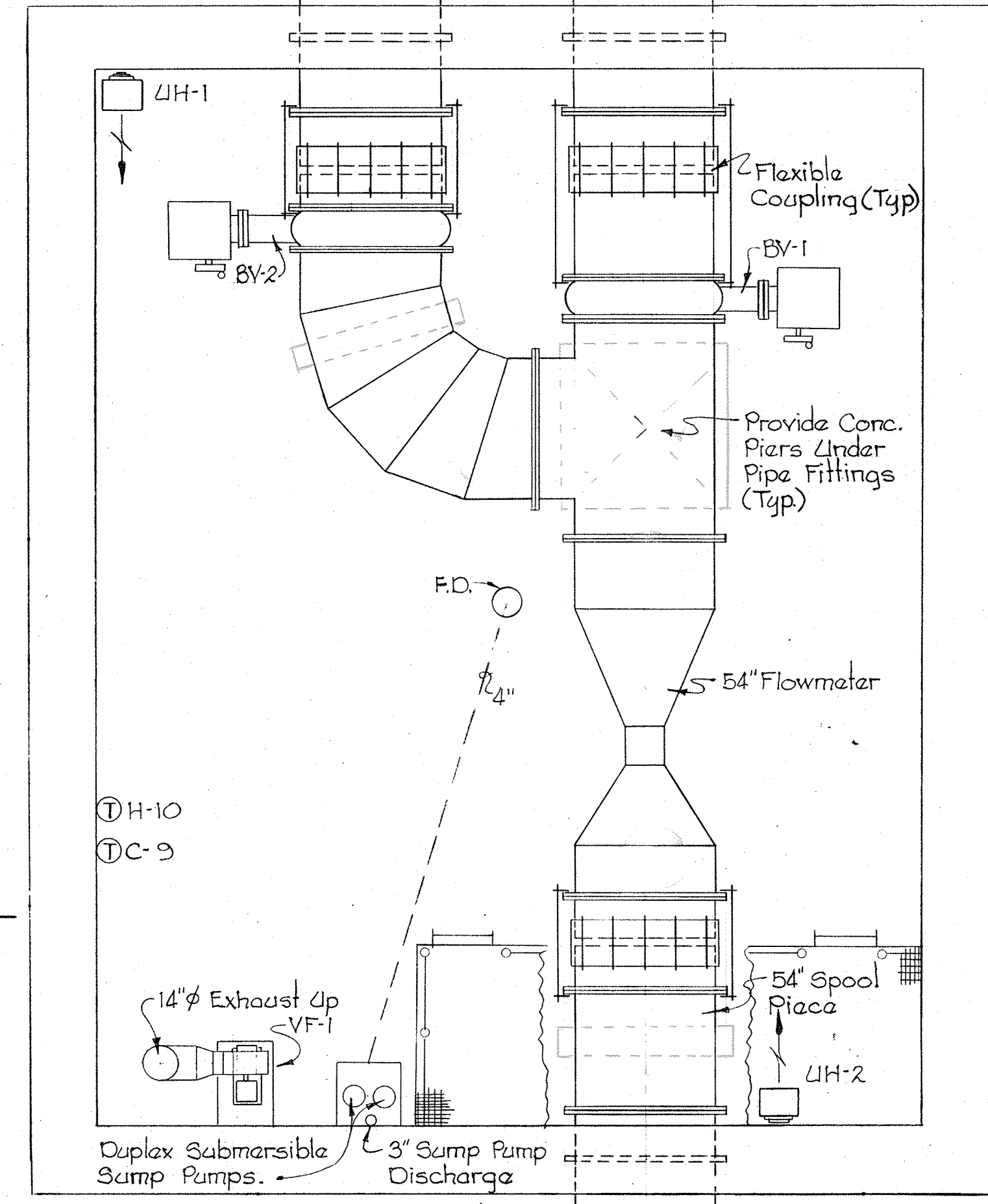
**KEY PLAN**



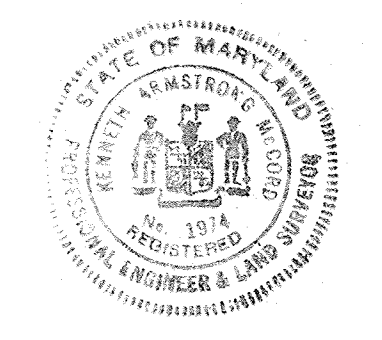
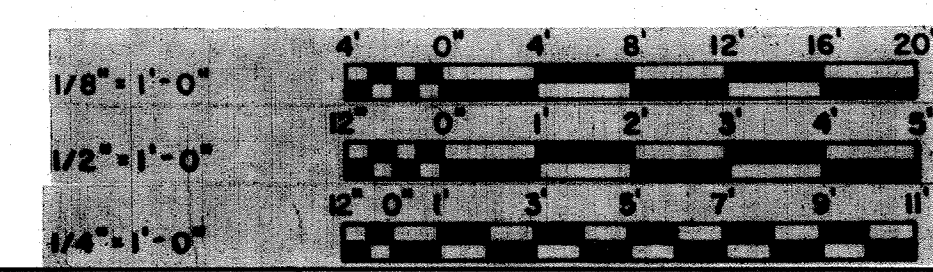
**DETAIL - STEEL PIPE CONNECTIONS ACROSS BUILDING & EXPANSION JOINTS.**  
Not to Scale



**PART PLAN @ ELEV. 132.75**  
Scale: 1/2" = 1'-0"



**54" METER VAULT**  
Scale: 1/2" = 1'-0"



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

**DEPARTMENT OF PUBLIC WORKS**  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard E. Brudenbury  
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

**CONTRACT NO. 502-S**

**FILTRATION PLANS & DETAILS**

**SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4**

**DRAWING NO. 51 OF 96**

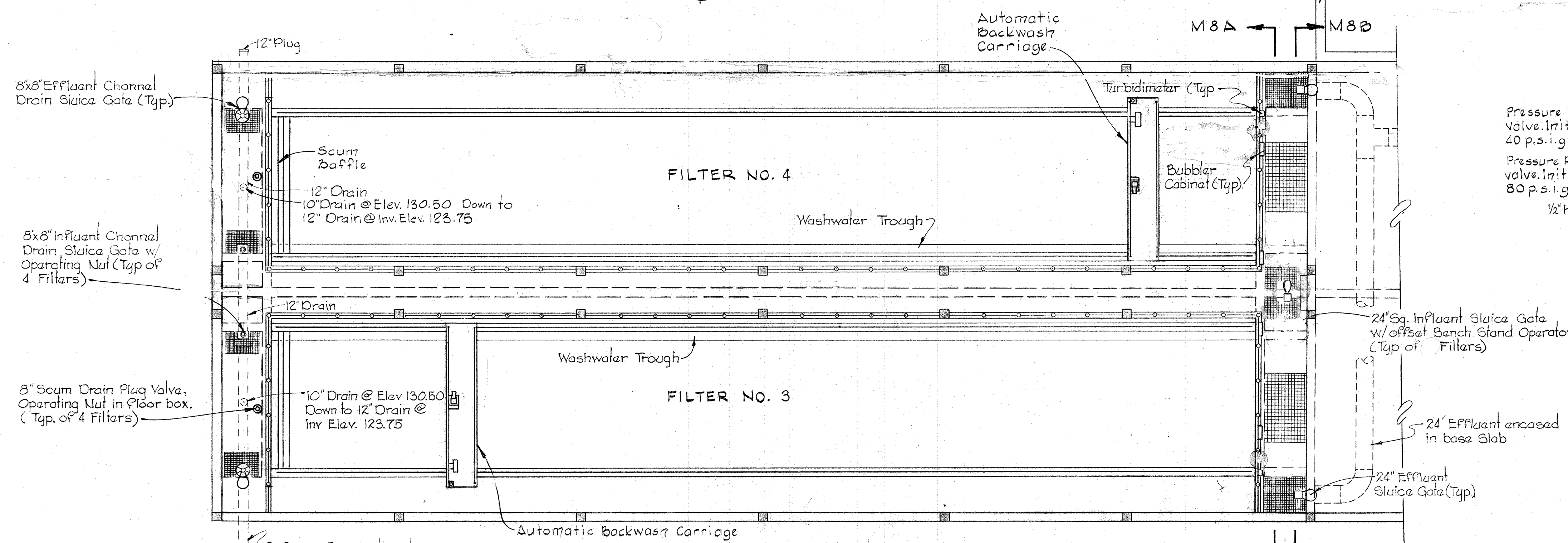
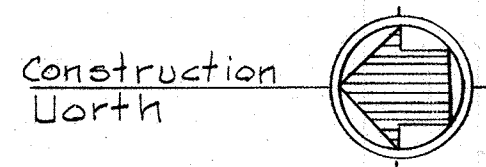
**SCALE AS SHOWN**

**SHEET M-6**

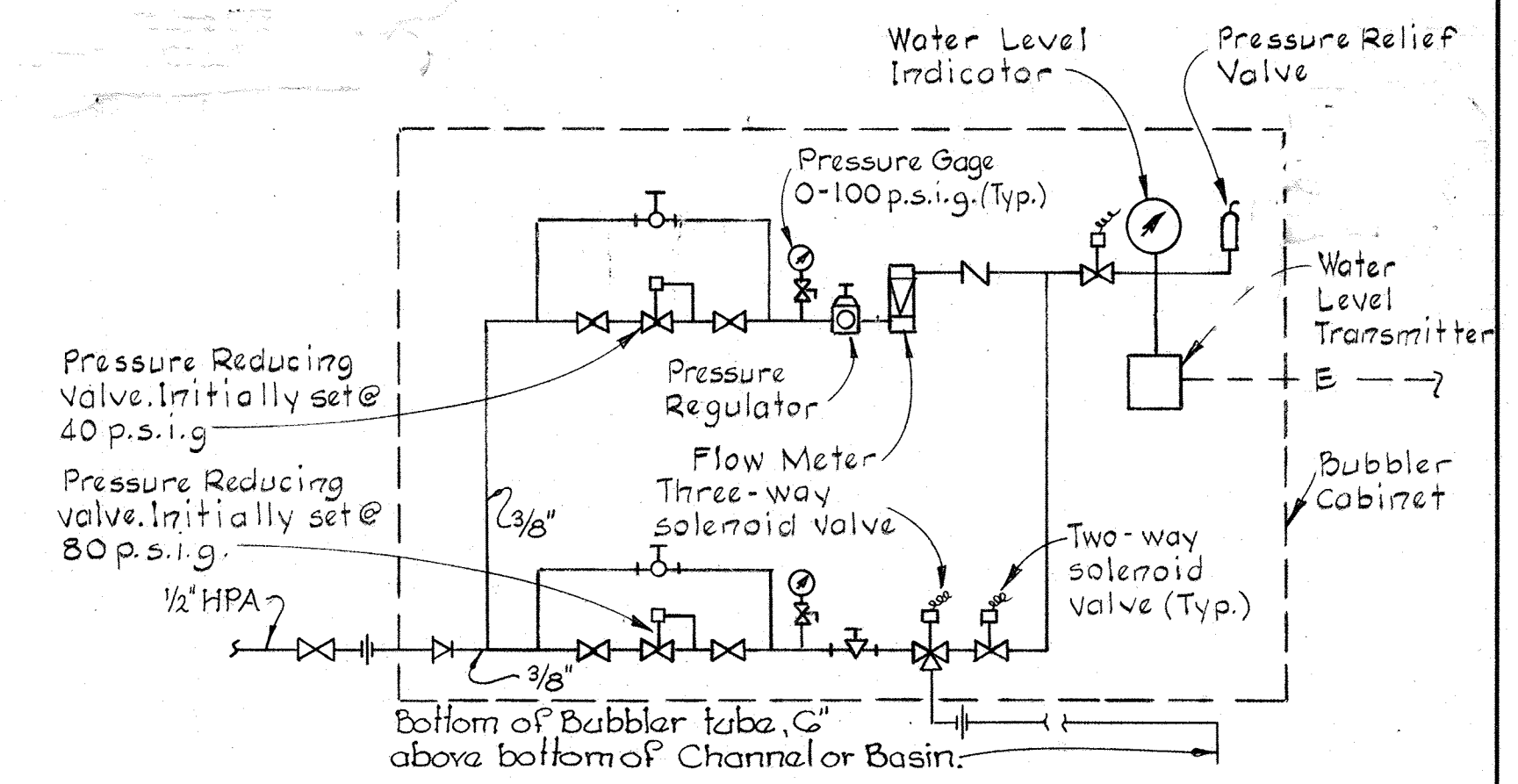
W.O. 7275 - 2C

BRUNING 44510 32872

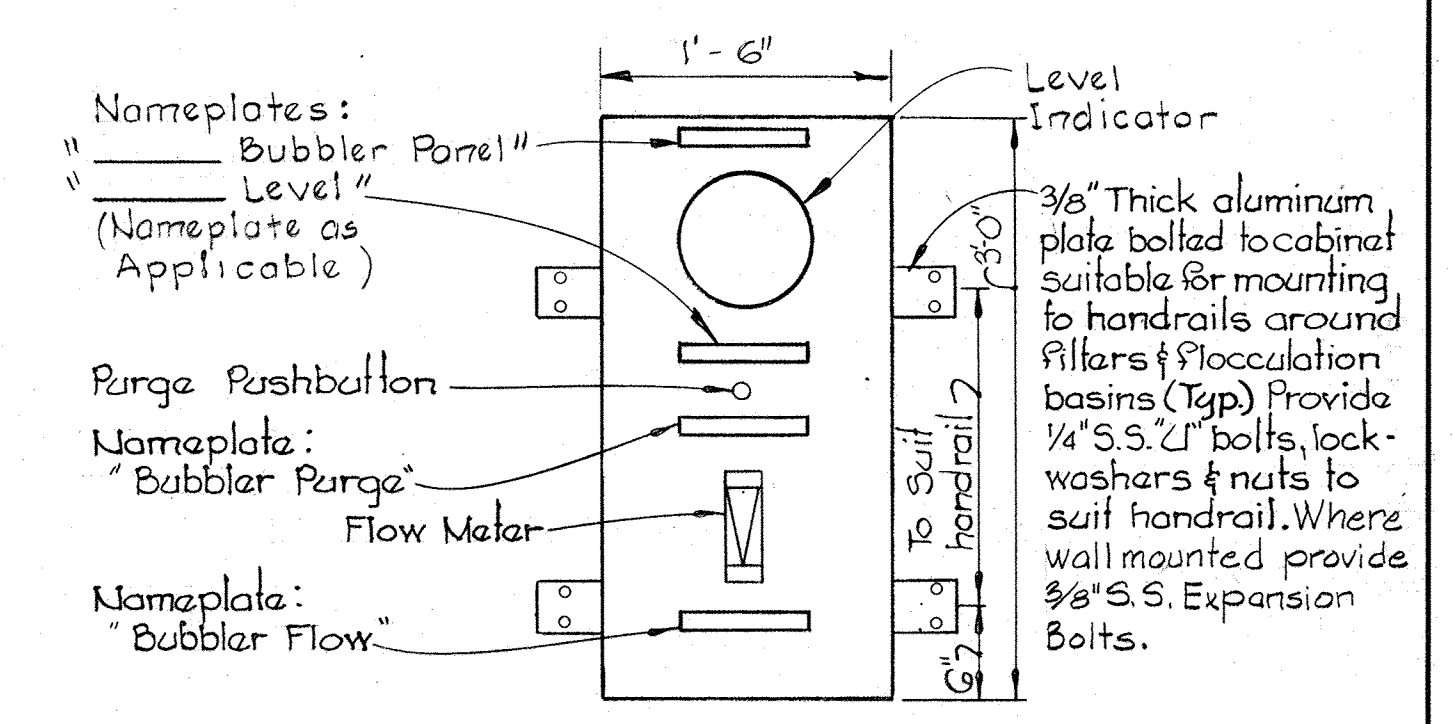




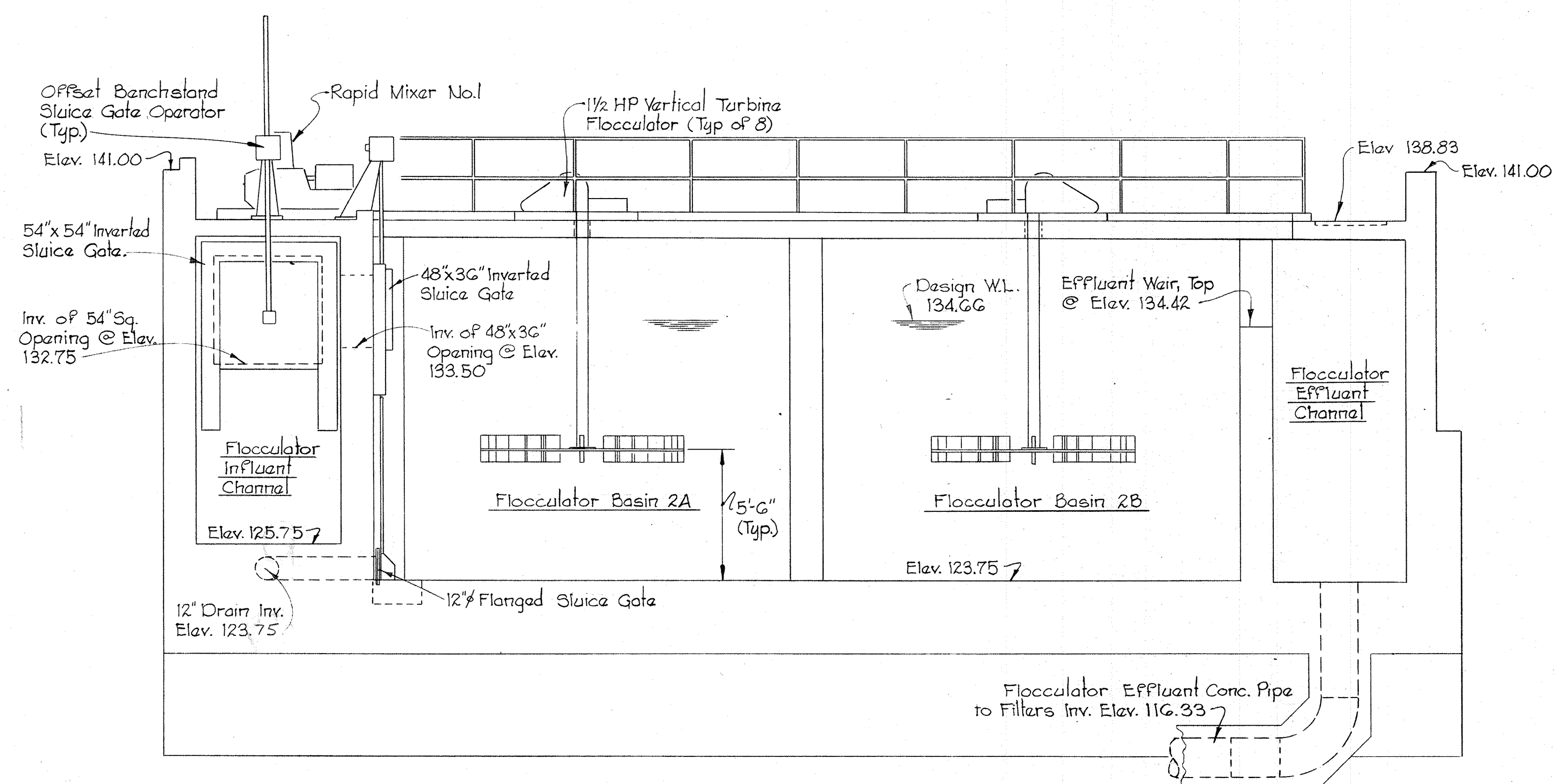
**PART PLAN @ ELEVATION 137.83**  
Scale: 1/8"=1'-0"



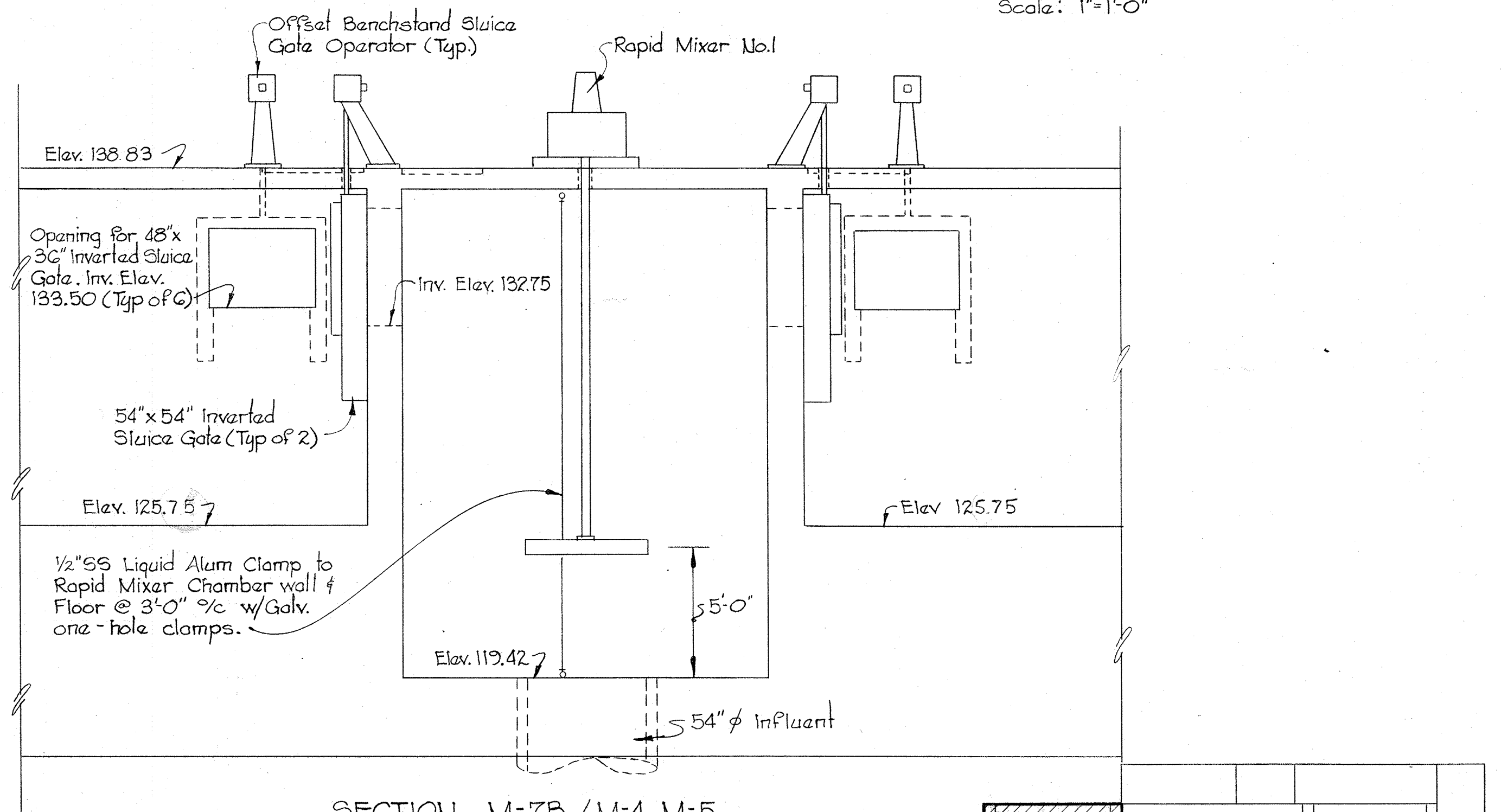
**SCHEMATIC DIAGRAM OF AIR BUBBLERS (TYPICAL)**  
Not to Scale



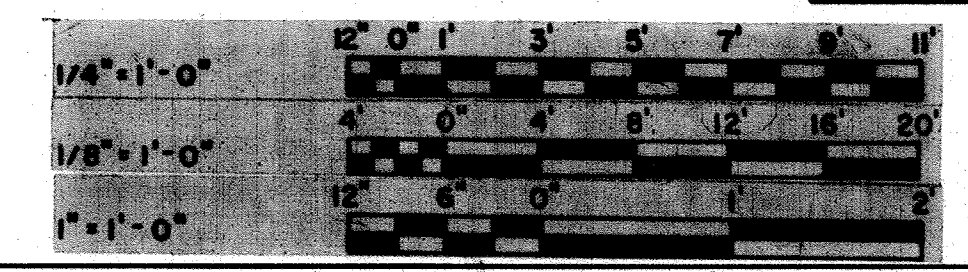
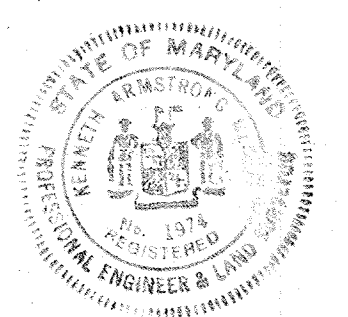
**DETAIL OF BUBBLER CABINET (TYPICAL)**  
Scale: 1"=1'-0"



**SECTION M-7A/M-4, M-5**  
Scale 1/4"=1'-0"



**SECTION M-7B/M-4, M-5**  
Scale: 1/4"=1'-0"



**KEY PLAN**

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

**DEPARTMENT OF PUBLIC WORKS**  
HOWARD COUNTY, MARYLAND  
12/13/77  
DATE  
*Richard S. Freudenberg*  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

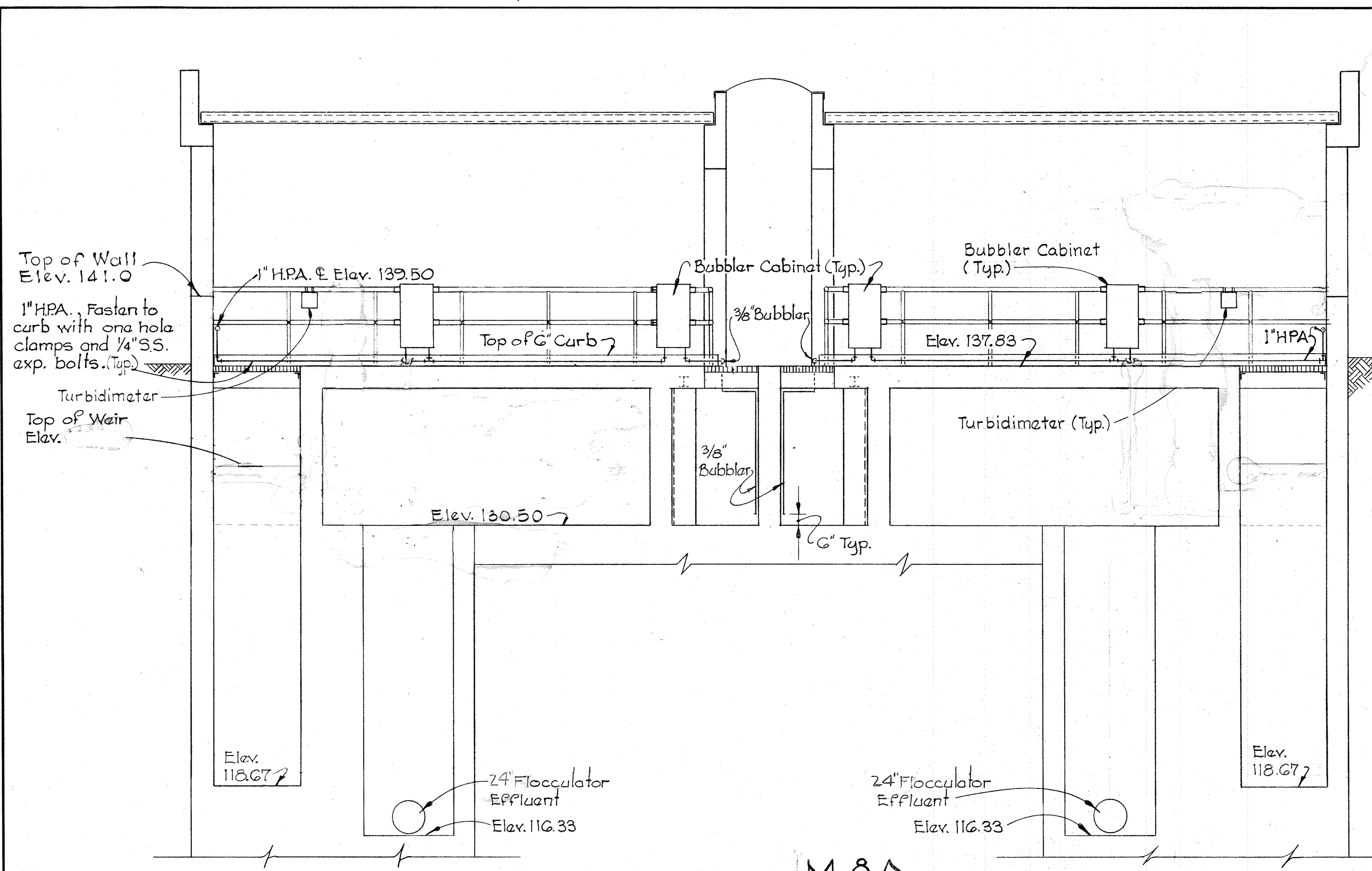
**CONTRACT NO. 502-S**

**FILTRATION, FLOCCULATION AND RAPID MIXER NO.1 PLANS & SECTIONS**

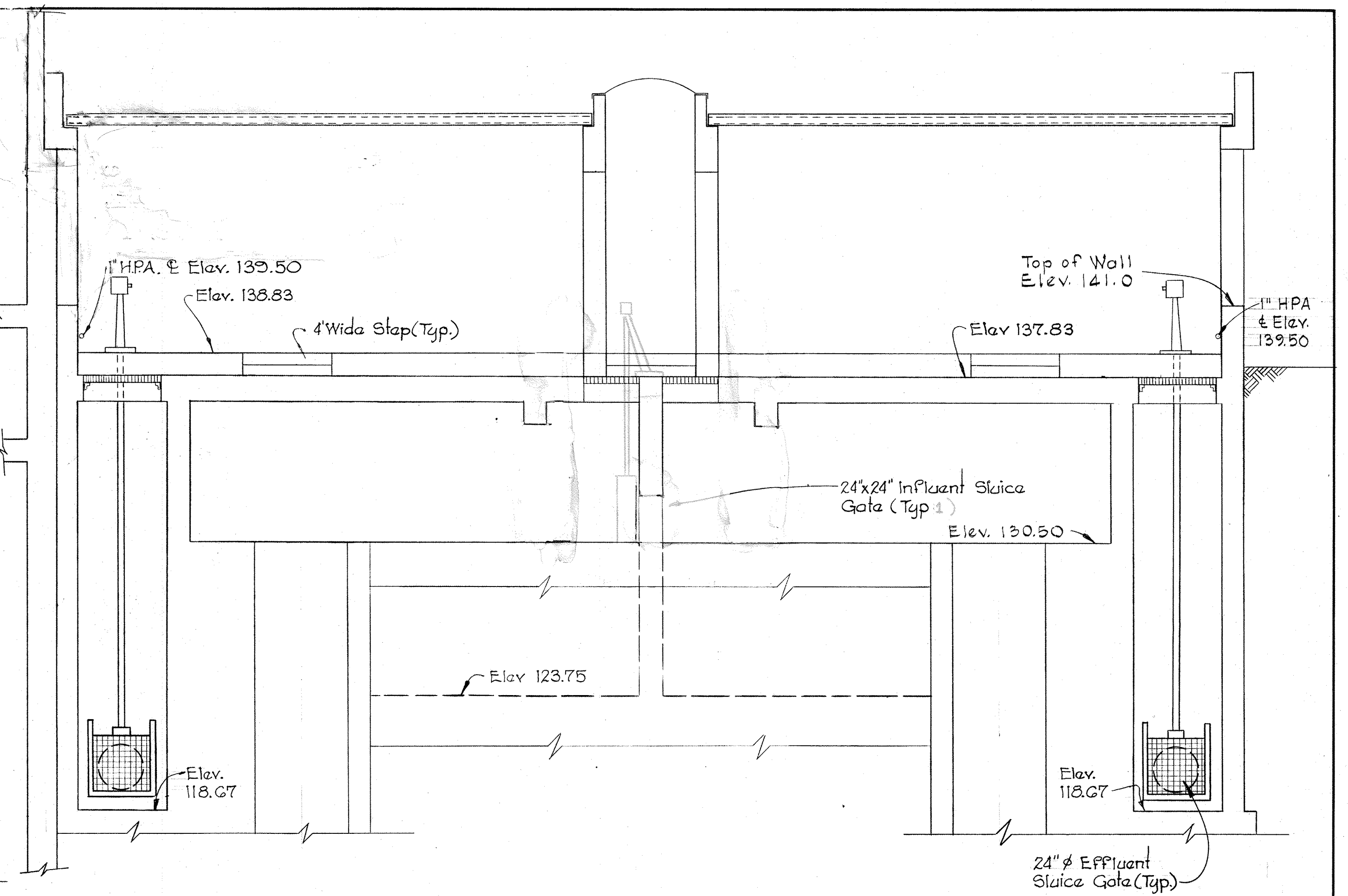
**SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO.4**

**DRAWING NO. 52 OF 96**  
**SCALE AS SHOWN**

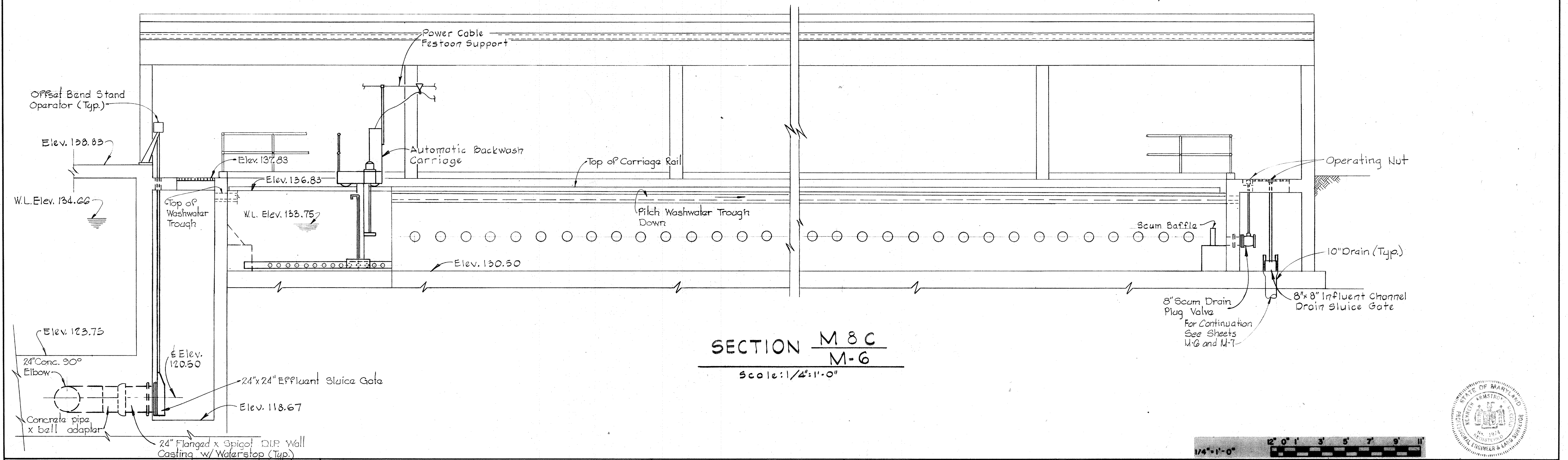




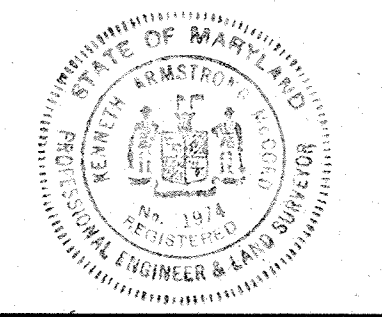
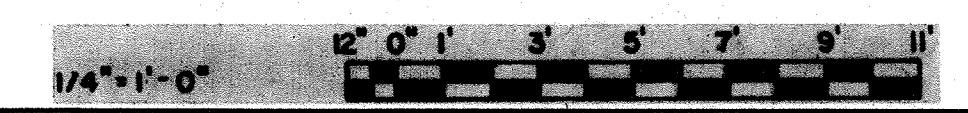
SECTION M8A  
M-7  
Scale: 1/4" = 1'-0"



SECTION M8B  
M-7  
Scale: 1/4" = 1'-0"



SECTION M8C  
M-6  
Scale: 1/4" = 1'-0"

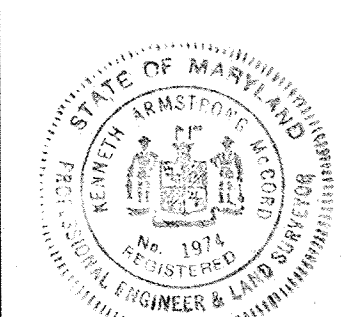
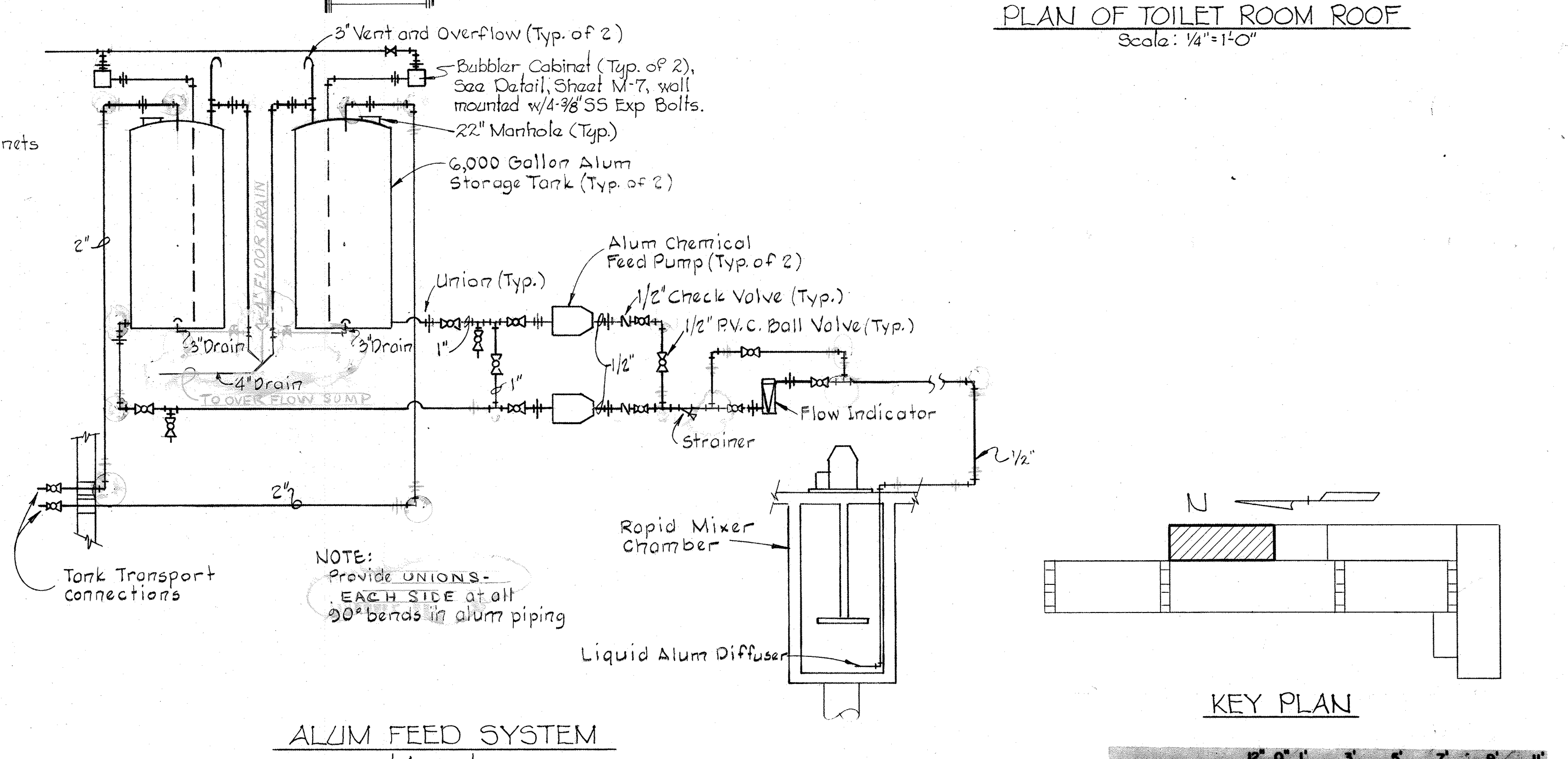
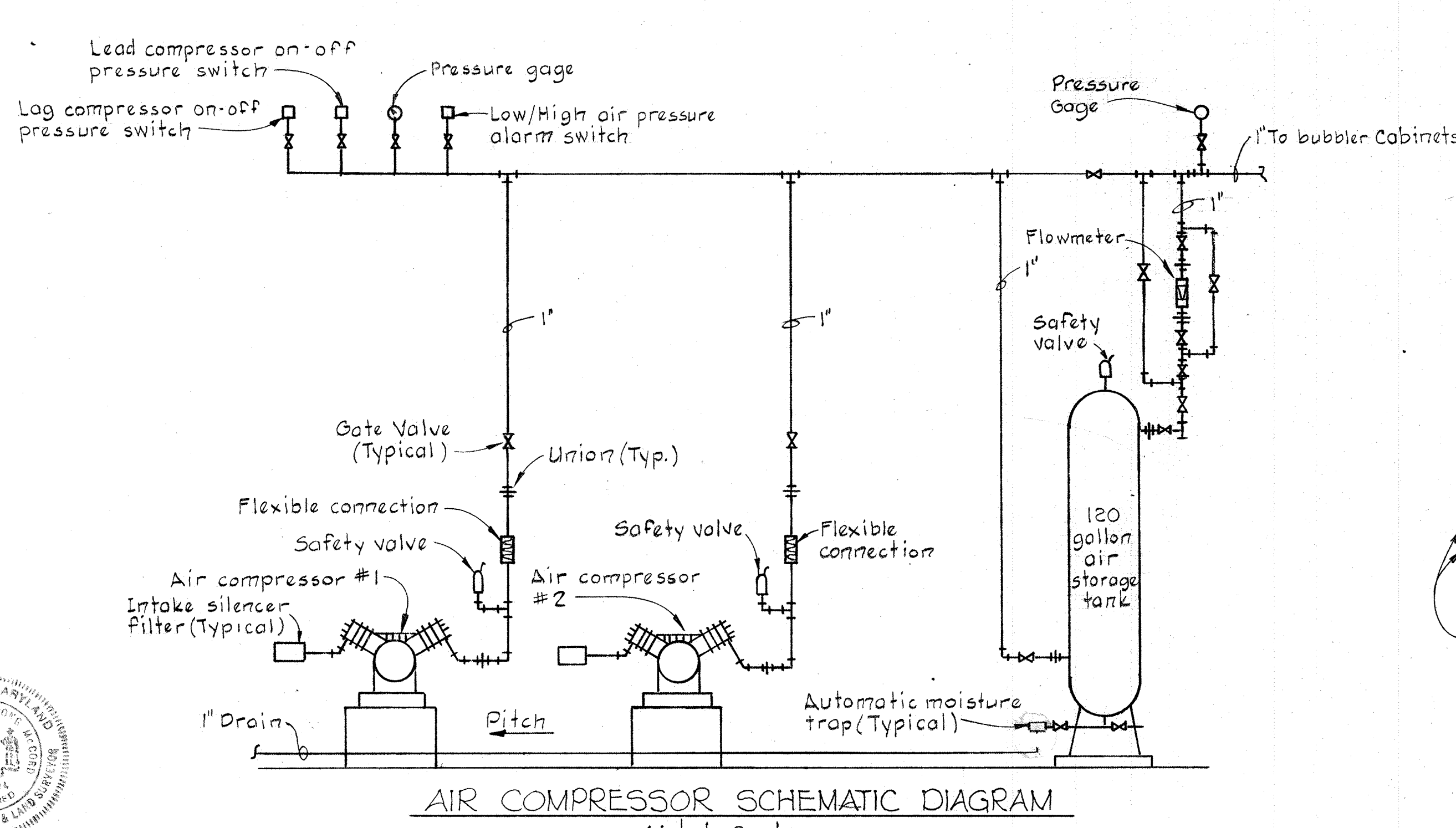
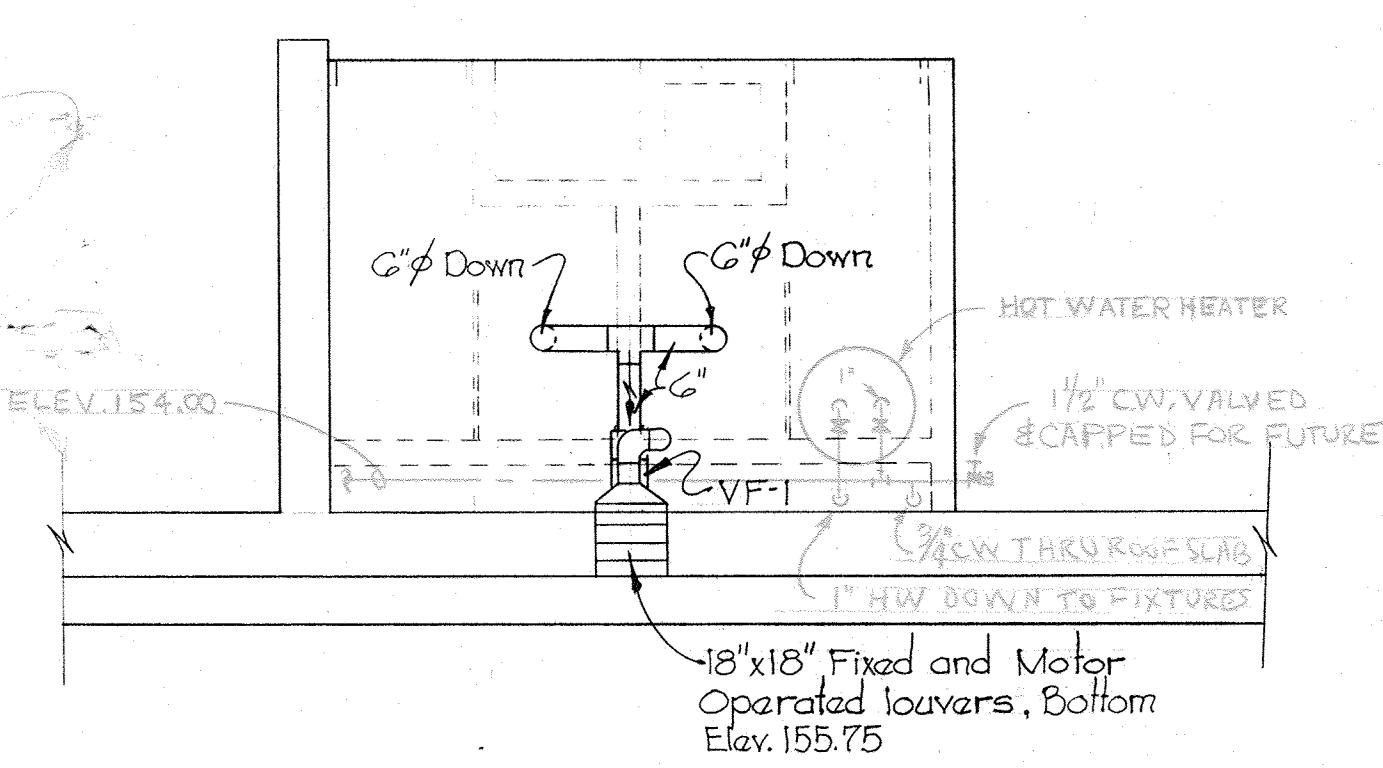
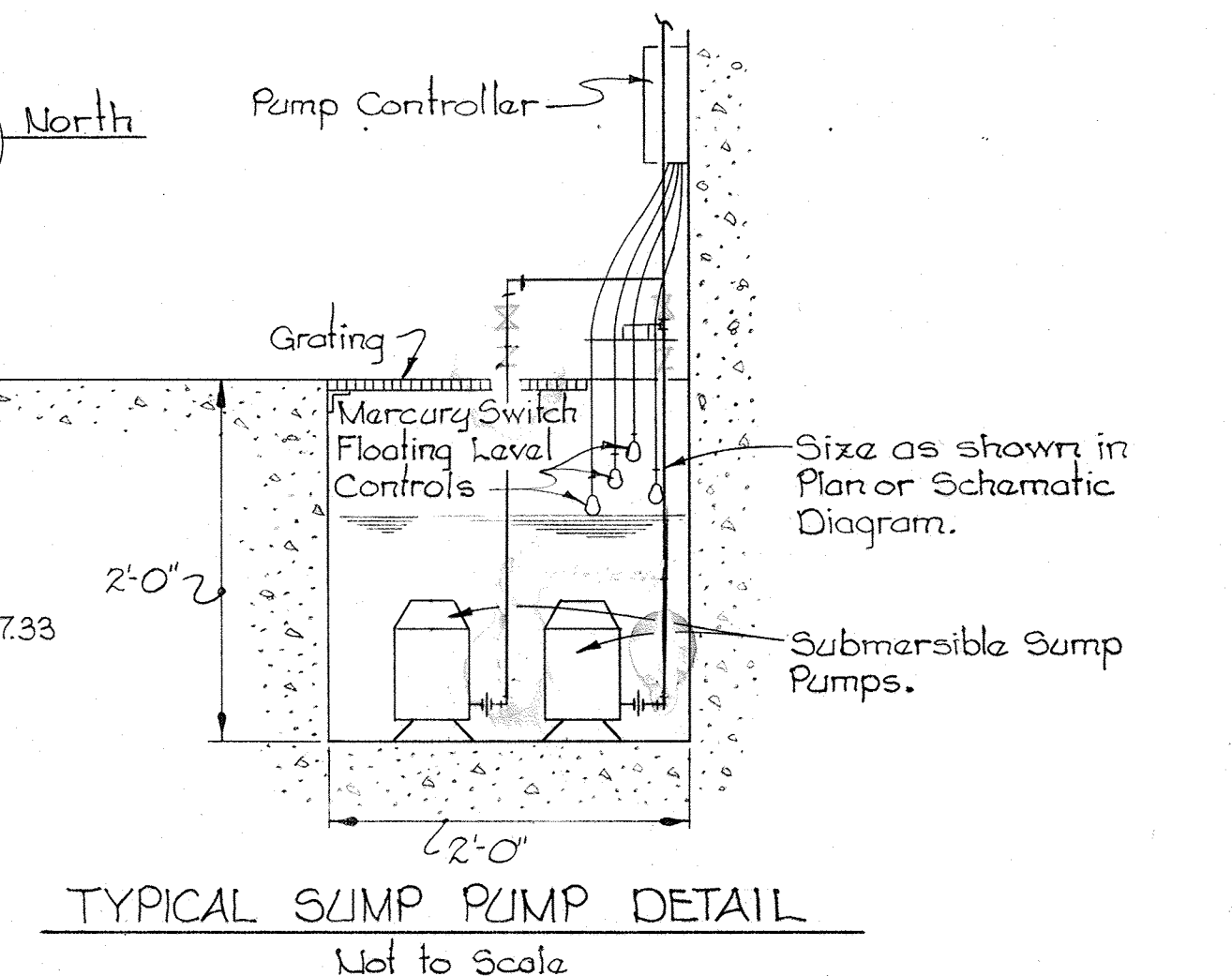
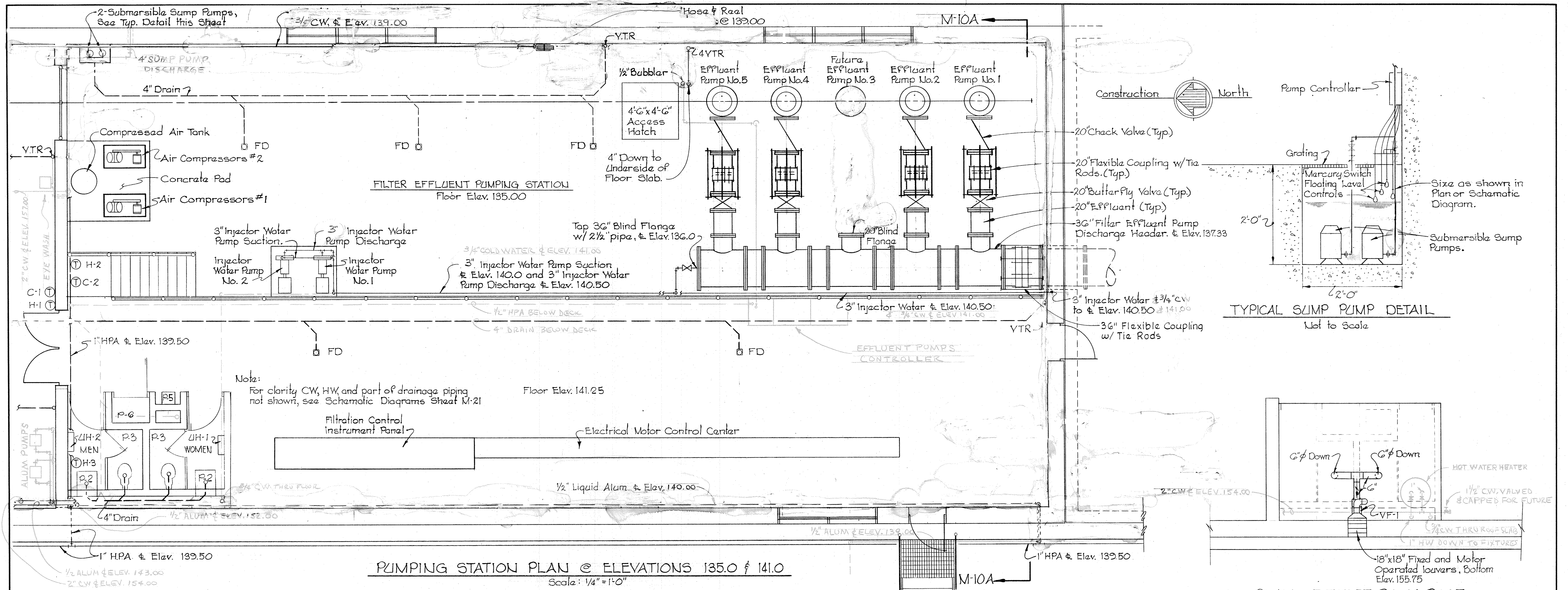


|   |   |                    |                               |   |                            |                      |
|---|---|--------------------|-------------------------------|---|----------------------------|----------------------|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br><i>Richard S. Brudenberg</i><br>DATE: 12/27/77<br>CHIEF - BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION<br>FILTER SECTIONS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING<br>NO. 53<br>OF 96 | SCALE<br>AS<br>SHOWN |
|---|---|--------------------|-------------------------------|---|----------------------------|----------------------|

W. O. 7275-2C

SHEET M-8





|  |  |                    |   |   |   |
|--|--|--------------------|---|---|---|
| <b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br><i>Richard E. Greenberg</i><br>DATE: 12/13/77<br>CHIEF - BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION CONTROL BUILDING<br>PLANS & DIAGRAMS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 54 OF 96<br>SCALE AS SHOWN<br>SHEET M-9 |
|--|--|--------------------|---|---|---|

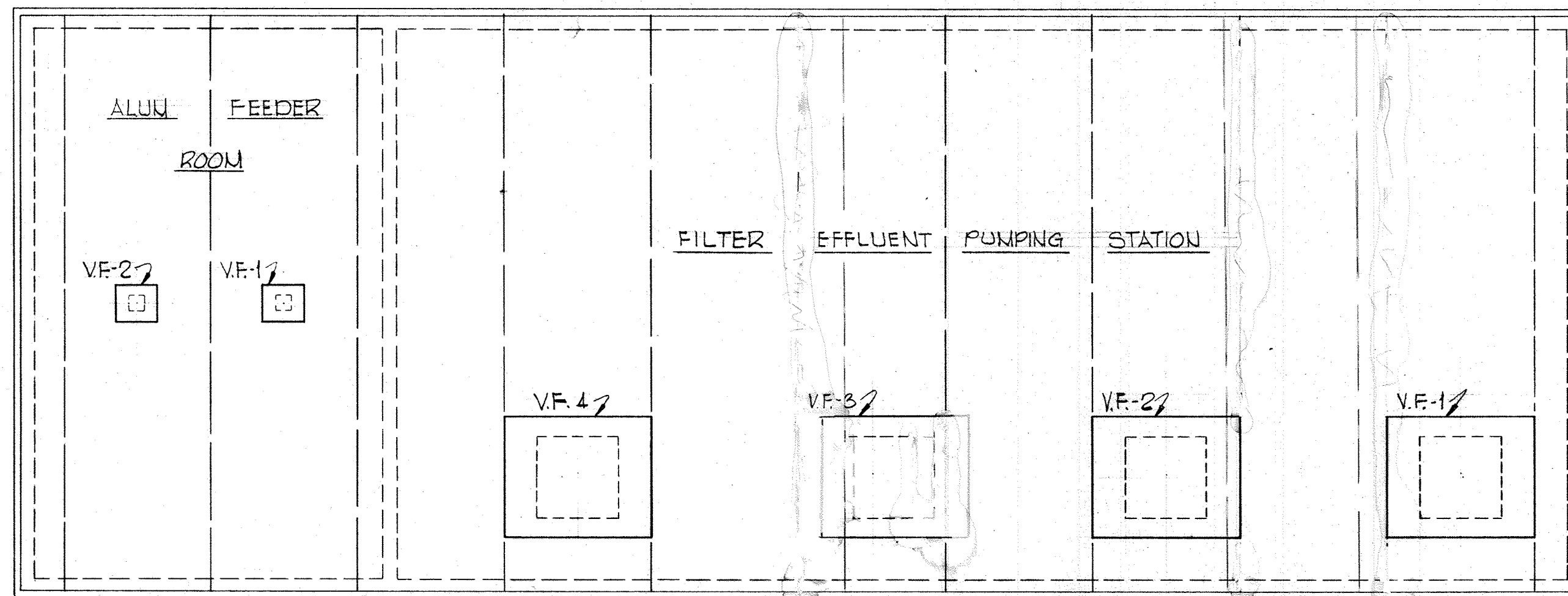
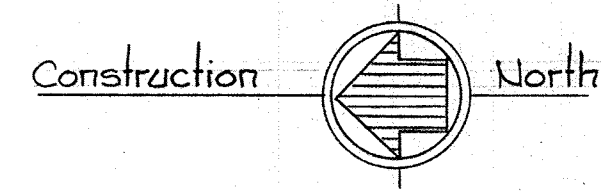
W. O. 7275-2C

DRAWING 44-510 3287Z

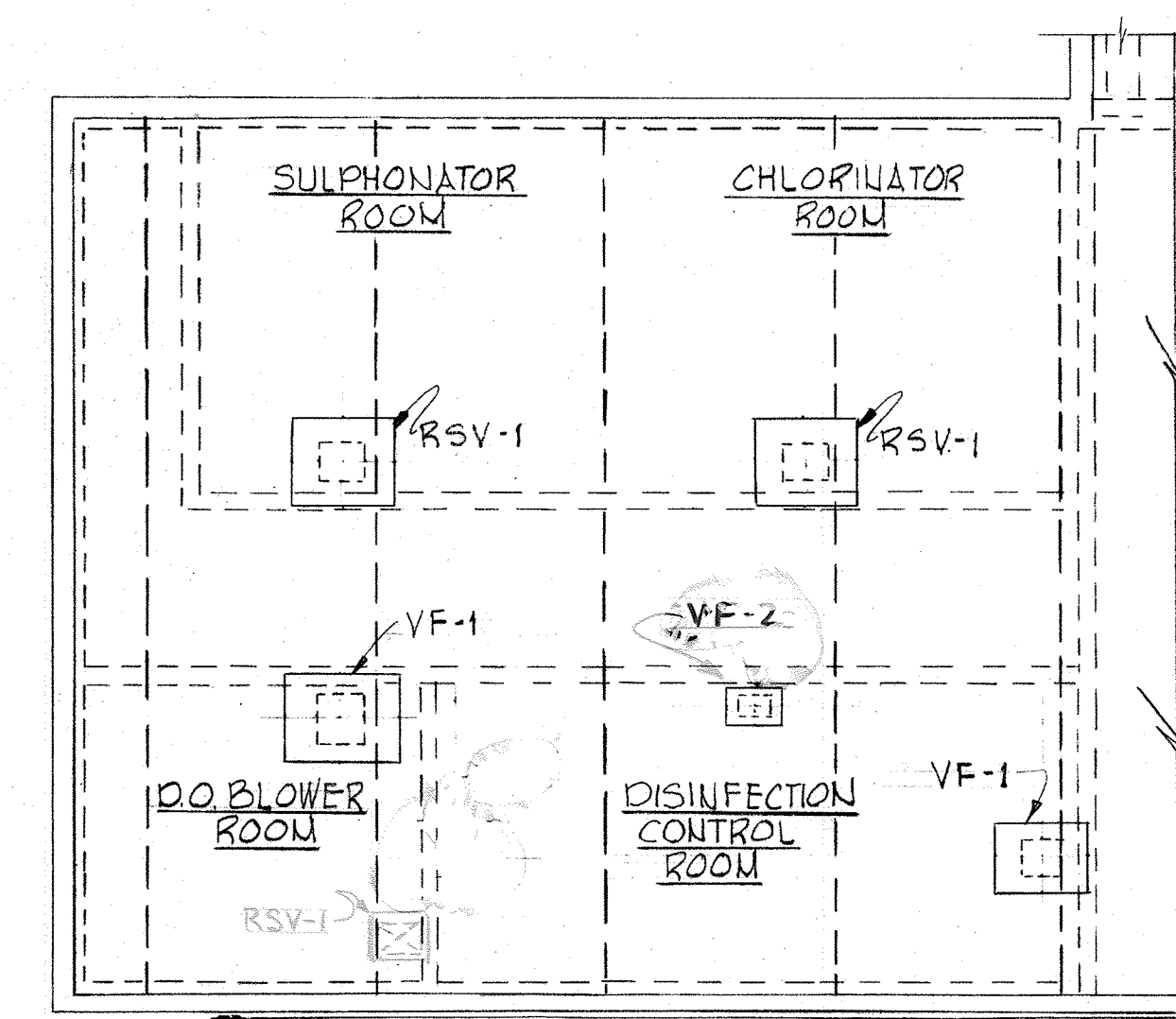
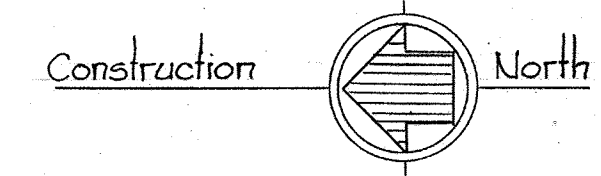




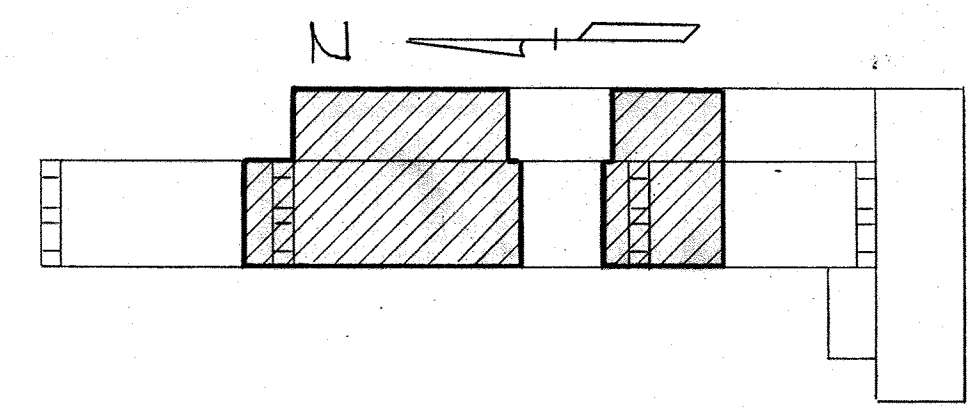
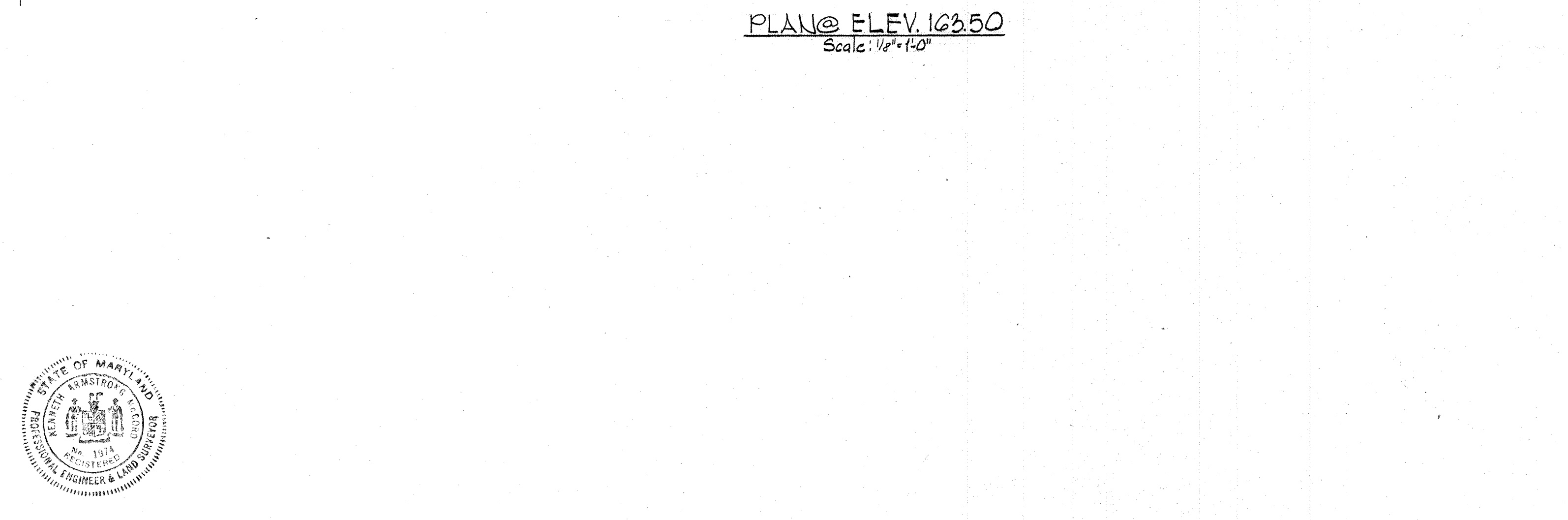
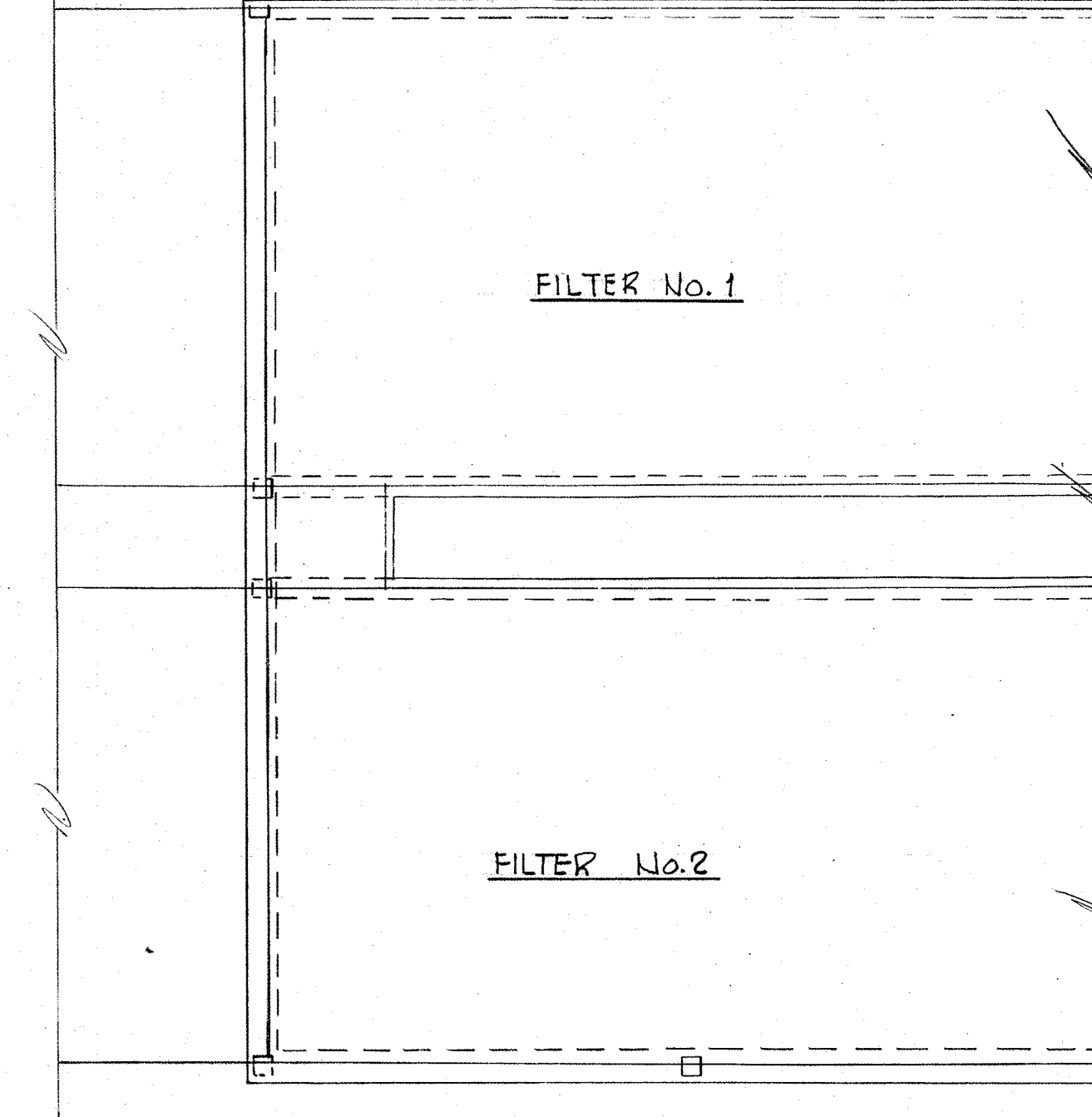
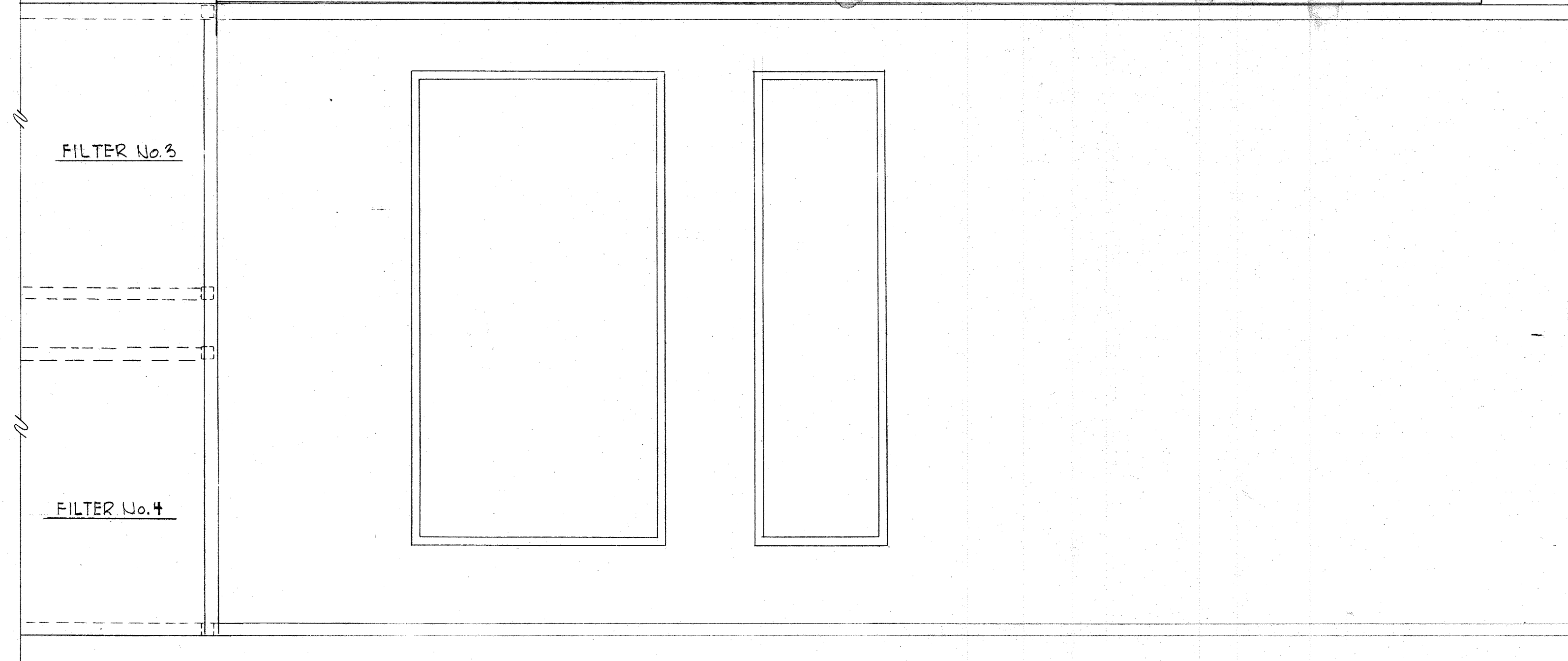




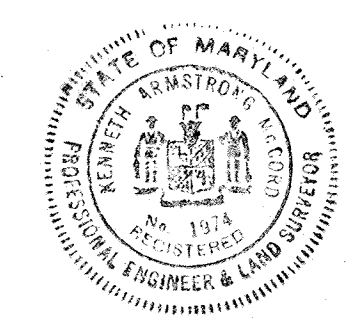
PLAN @ ELEV. 103.50  
Scale: 1/8" = 1'-0"



PLAN @ ELEV. 159.00  
Scale: 1/8" = 1'-0"

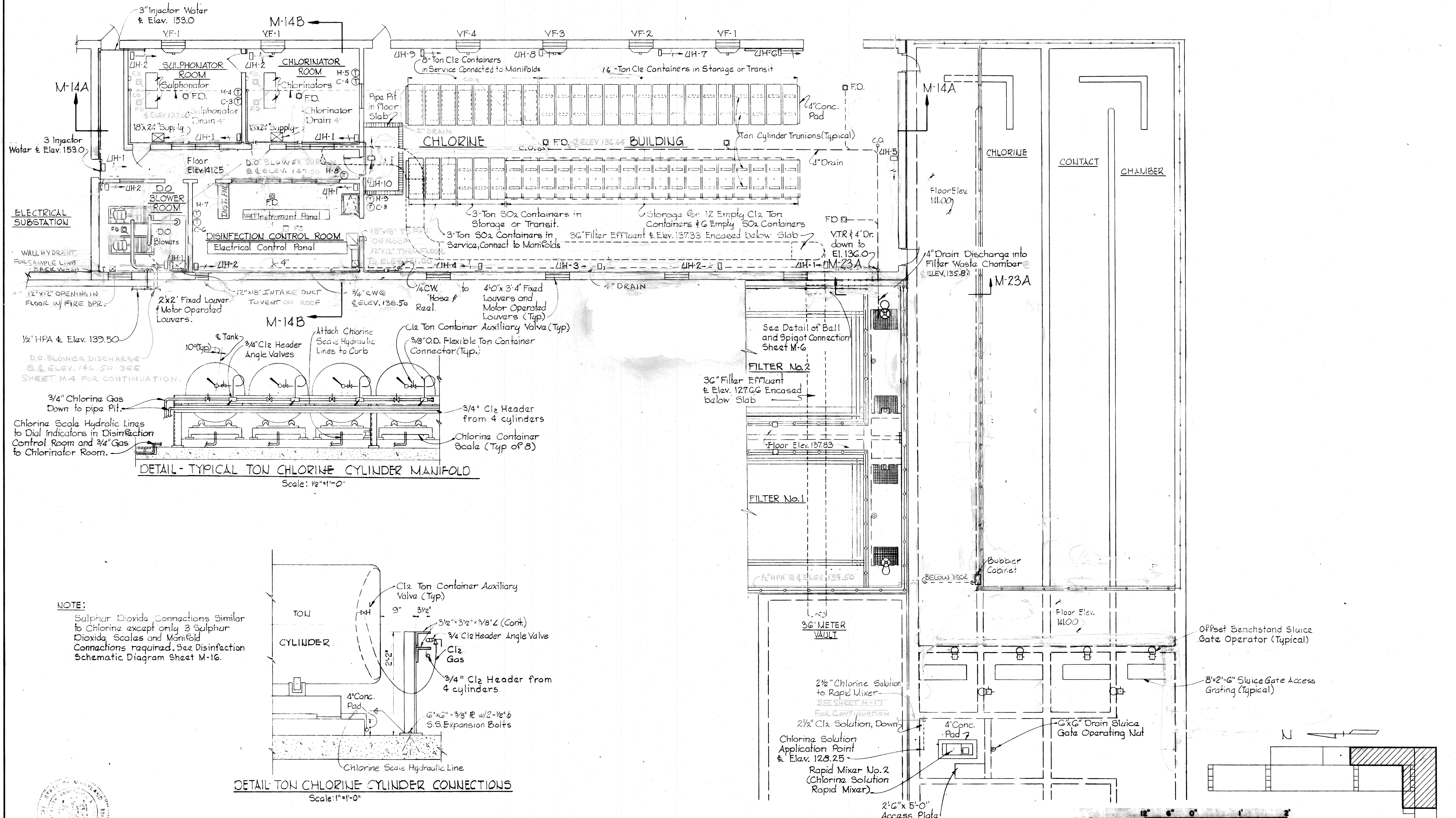
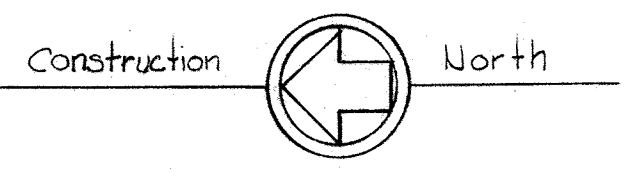


KEY PLAN



|   |   |                    |            |   |  |
|---|---|--------------------|------------|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br><i>Richard E. Sneider</i><br>CHIEF, BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | ROOF PLANS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 56 OF 96<br>SCALE AS SHOWN |
|---|---|--------------------|------------|---|--|





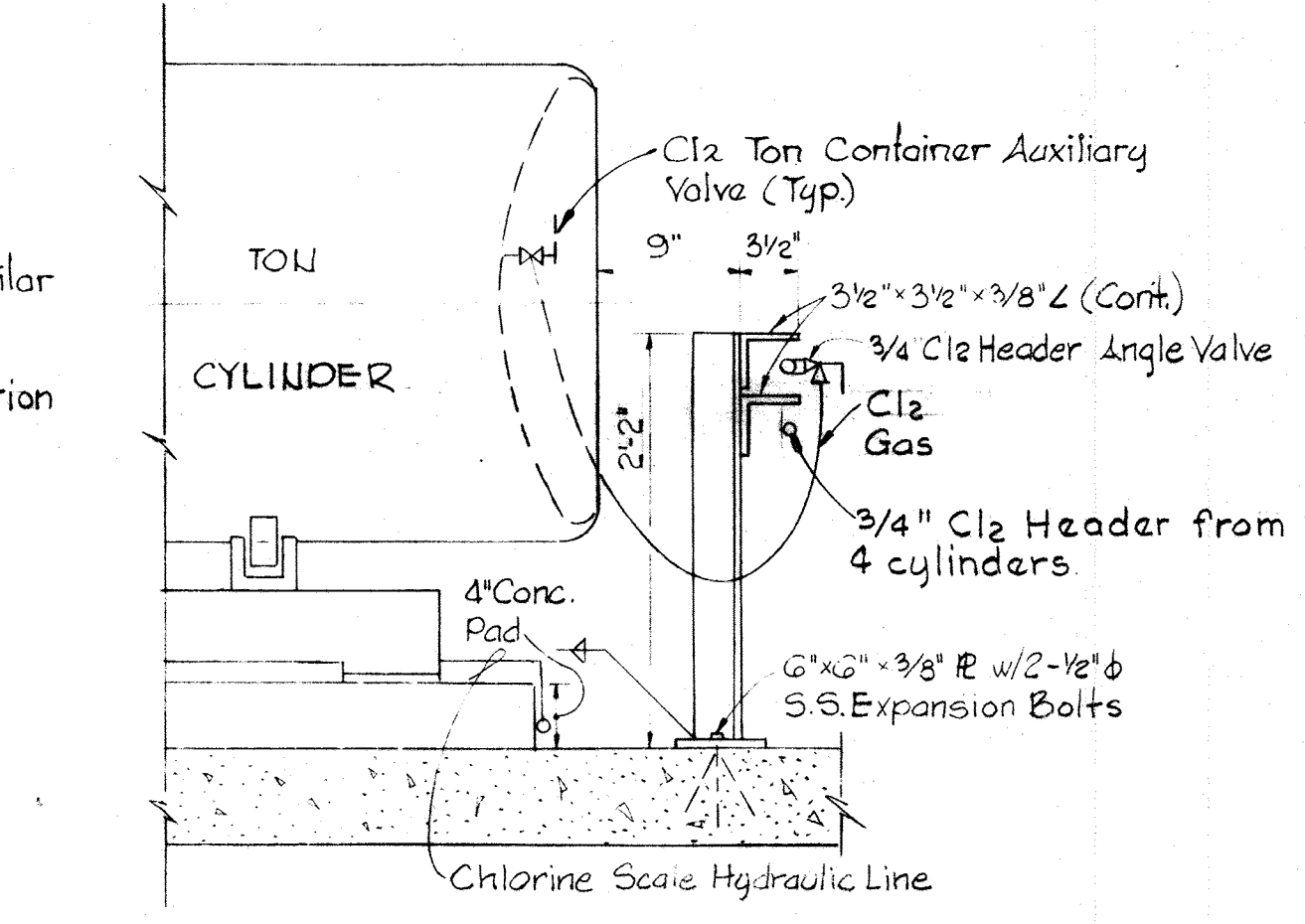
**ELECTRICAL SUBSTATION**

1/2" HPA @ Elev. 139.50  
 D.O. BLOWER DISCHARGE @ Elev. 144.50 SEE SHEET M-4 FOR CONTINUATION.

3/4" Chlorine Gas Down to pipe Pit.  
 Chlorine Scale Hydraulic Lines to Dial Indicators in Disinfection Control Room and 3/4" Gas to Chlorinator Room.

**DETAIL - TYPICAL TON CHLORINE CYLINDER MANIFOLD**  
 Scale: 1/2" = 1'-0"

**NOTE:**  
 Sulphur Dioxide Connections Similar to Chlorine except only 3 Sulphur Dioxide Scales and Manifold Connections required. See Disinfection Schematic Diagram Sheet M-16.



**DETAIL TON CHLORINE CYLINDER CONNECTIONS**  
 Scale: 1" = 1'-0"

**PLAN @ ELEV. 141.00**  
 Scale: 1/8" = 1'-0"

**KEY PLAN**

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

**DEPARTMENT OF PUBLIC WORKS**  
 HOWARD COUNTY, MARYLAND  
 12/13/77  
 Richard E. Suedenberger  
 CHIEF, BUREAU OF ENVIRONMENTAL SERVICES

**CONTRACT NO. 502-S**

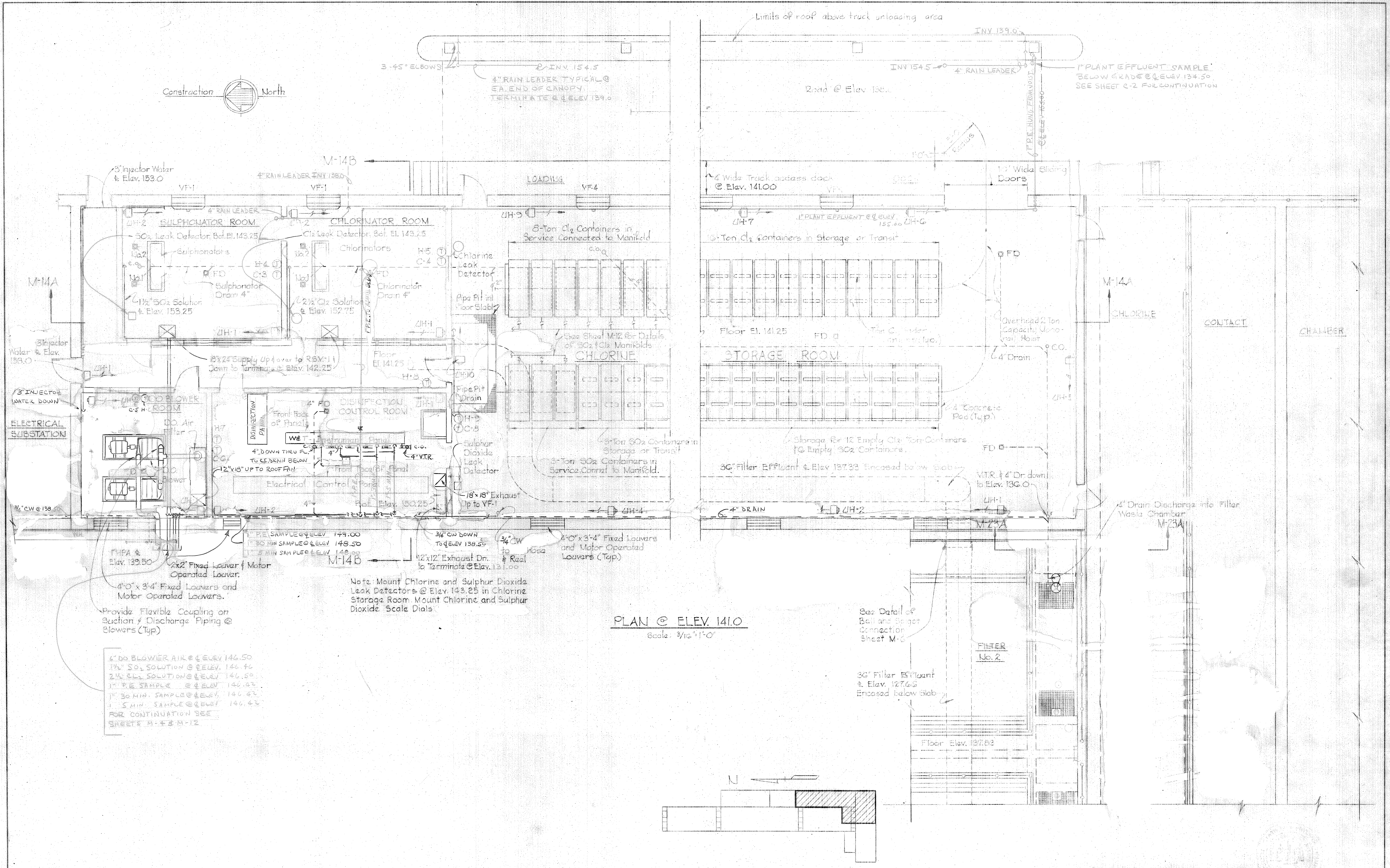
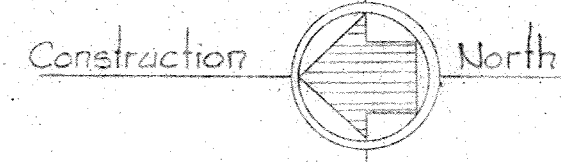
**CHLORINE BUILDING**  
 PLAN & DETAILS

**SAVAGE WASTEWATER**  
 TREATMENT PLANT ADDITION NO. 4

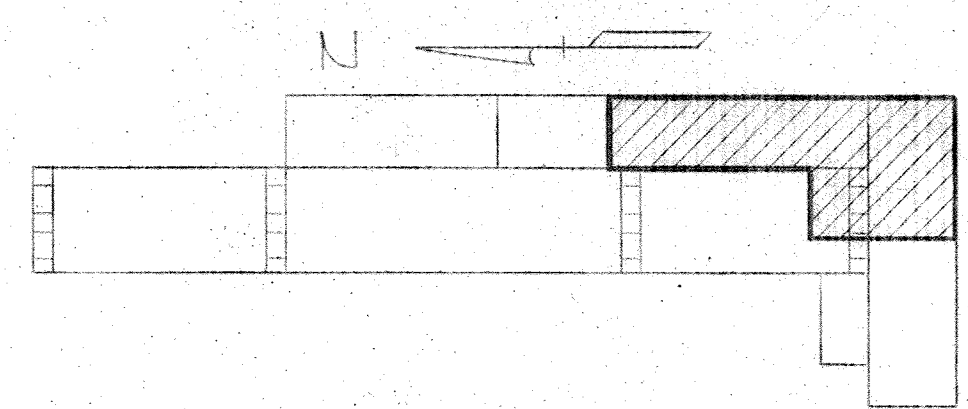
**DRAWING**  
 NO. 57  
 OF 96

**SCALE**  
 AS  
 SHOWN





**PLAN @ ELEV. 141.0**  
Scale: 3/16" = 1'-0"



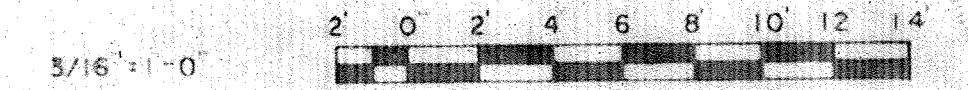
**KEY PLAN**

4" DO BLOWER AIR @ ELEV. 146.50  
1 1/2" SO<sub>2</sub> SOLUTION @ ELEV. 146.46  
2 1/2" CL<sub>2</sub> SOLUTION @ ELEV. 146.59  
1" P.E. SAMPLE @ ELEV. 146.47  
1" 30 MIN. SAMPLE @ ELEV. 146.47  
1" 5 MIN. SAMPLE @ ELEV. 146.47  
FOR CONTINUATION SEE  
SHEETS M-11 & M-12

Note: Mount Chlorine and Sulphur Dioxide Leak Detectors @ Elev. 143.25 in Chlorine Storage Room. Mount Chlorine and Sulphur Dioxide Scale Dials.

See Detail of Ball and Socket Connection Sheet M-6

30" Filter Effluent @ Elev. 127.63 Encased Below Slab

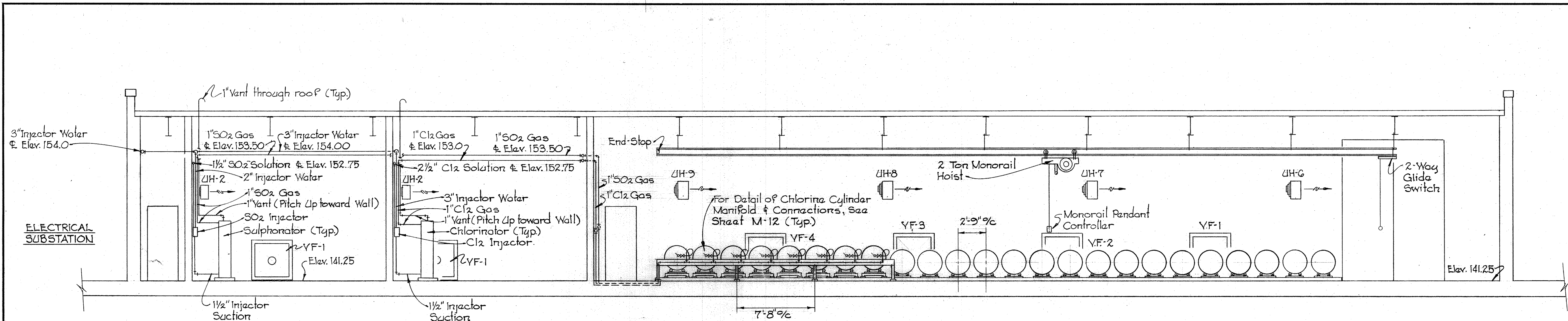


|  |  |                           |                               |   |  |
|--|--|---------------------------|-------------------------------|---|--|
| <b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | <b>DEPARTMENT OF PUBLIC WORKS</b><br>HOWARD COUNTY, MARYLAND<br><i>Richard E. Sandberg</i><br>DATE: 12/13/77<br>CHIEF - BUREAU OF ENVIRONMENTAL SERVICES | <b>CONTRACT NO. 502-S</b> | <b>CHLORINE BUILDING PLAN</b> | <b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b> | <b>DRAWING NO. 58 OF 96</b><br><b>SCALE AS SHOWN</b> |
|--|--|---------------------------|-------------------------------|---|--|

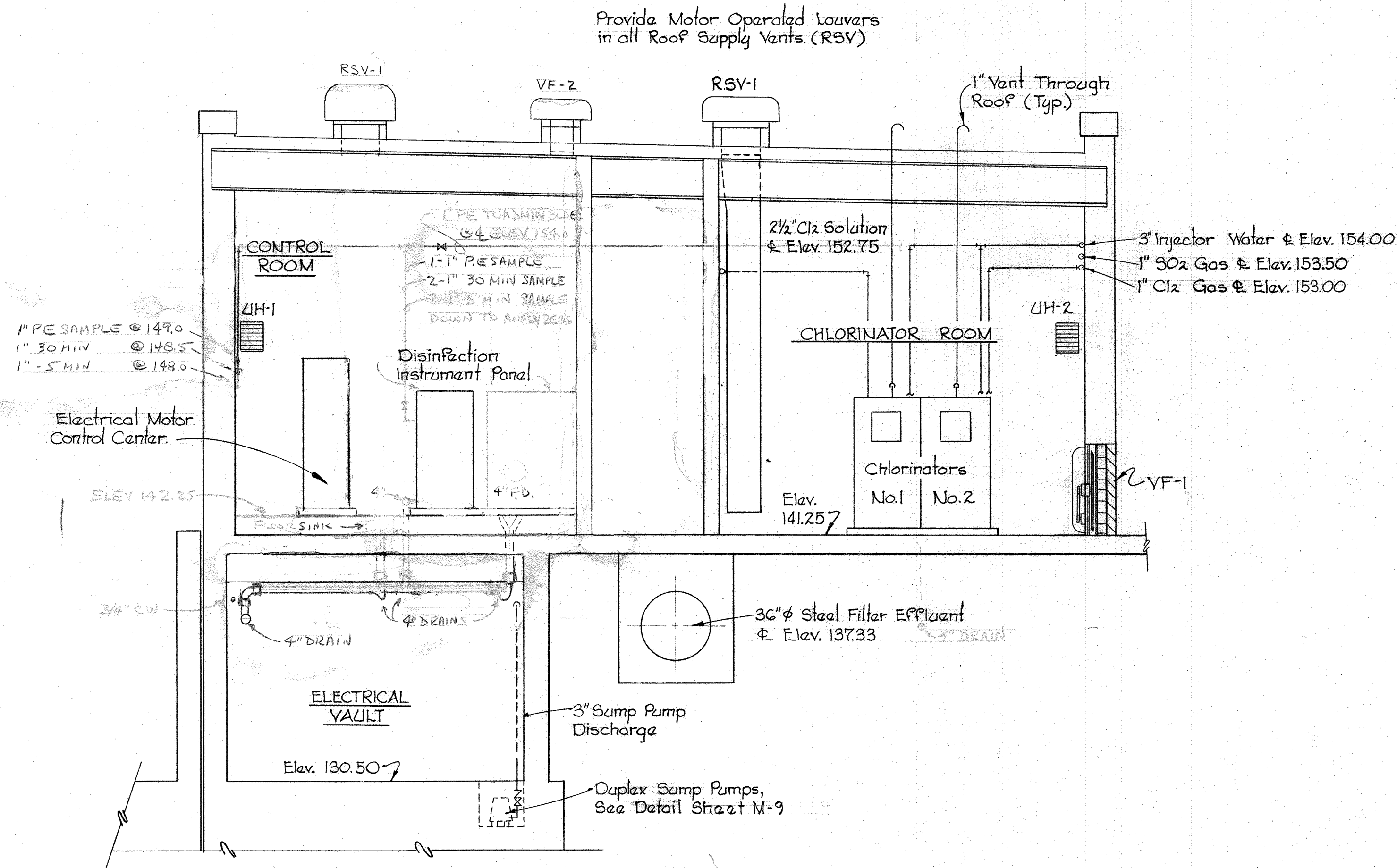
W.O. 7275-2C

SHEET M-13

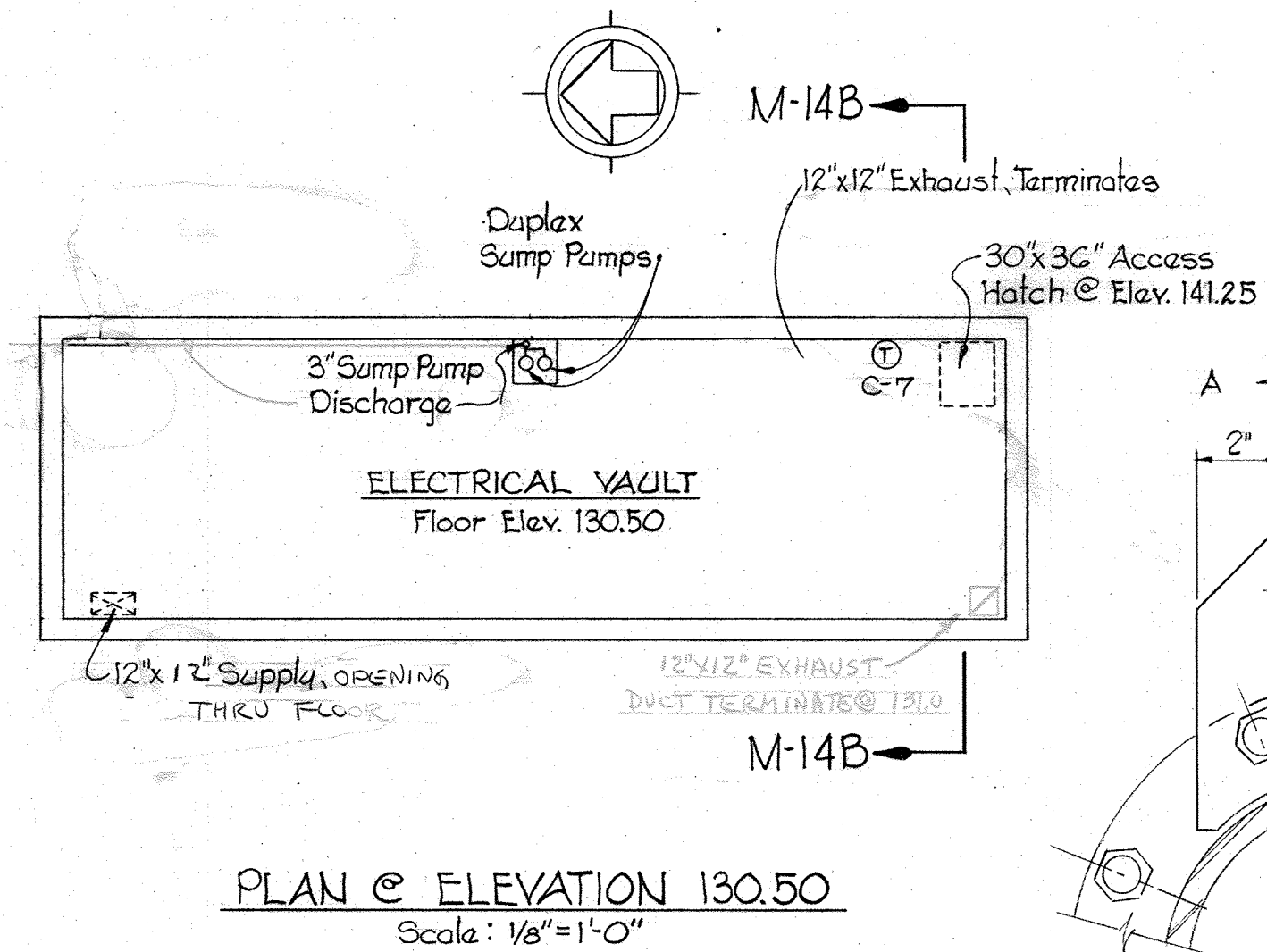




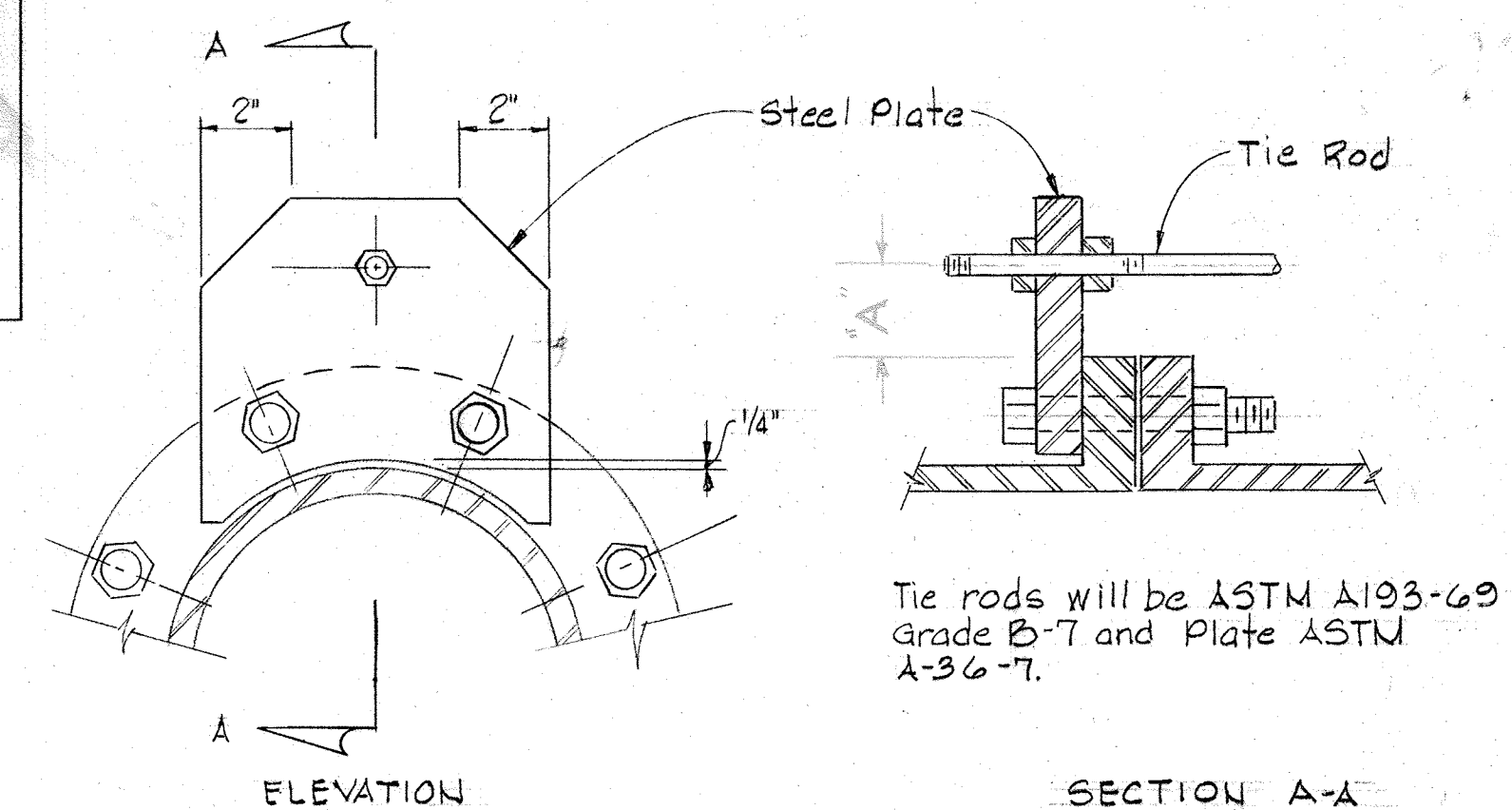
SECTION M-14A/M-12,M-13  
Scale: 3/16"=1'-0"



SECTION M-14B/M-12,M-13,M-14  
Scale: 1/4"=1'-0"

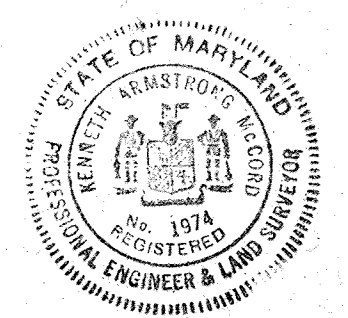
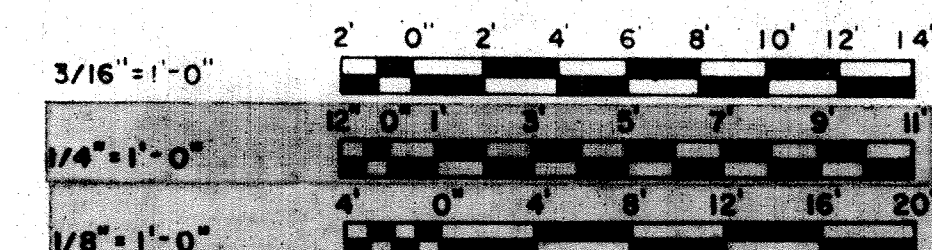


PLAN @ ELEVATION 130.50  
Scale: 1/8"=1'-0"



TIE ROD DETAIL  
No Scale

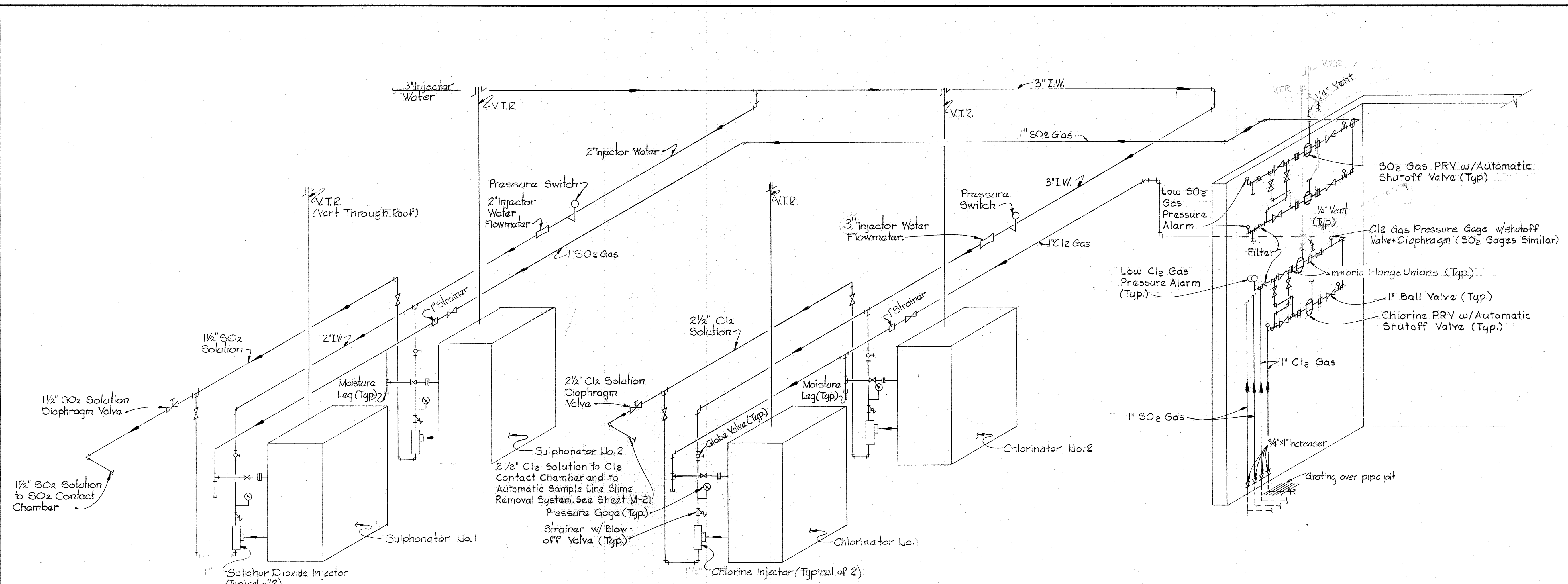
| TIE       | ROD          | DETAIL                    |                  |
|-----------|--------------|---------------------------|------------------|
| Pipe Size | Press. (PSI) | No. and Sizes of Tie Rods | Plate Width Thk. |
| 20"       | 30           | 4-1" Ø                    | 7 3/4" 1"        |
| 36"       | 30           | 4-1 1/4" Ø                | 9" 1 1/2"        |
| 54"       | 30           | 4-1 3/4" Ø                | 10" 1 1/2"       |
| 12"       | Gravity      | 2-1 1/4" Ø                | 7" 1 1/2"        |
| 54"       | Gravity      | 2-1 3/4" Ø                | 7" 1 1/2"        |



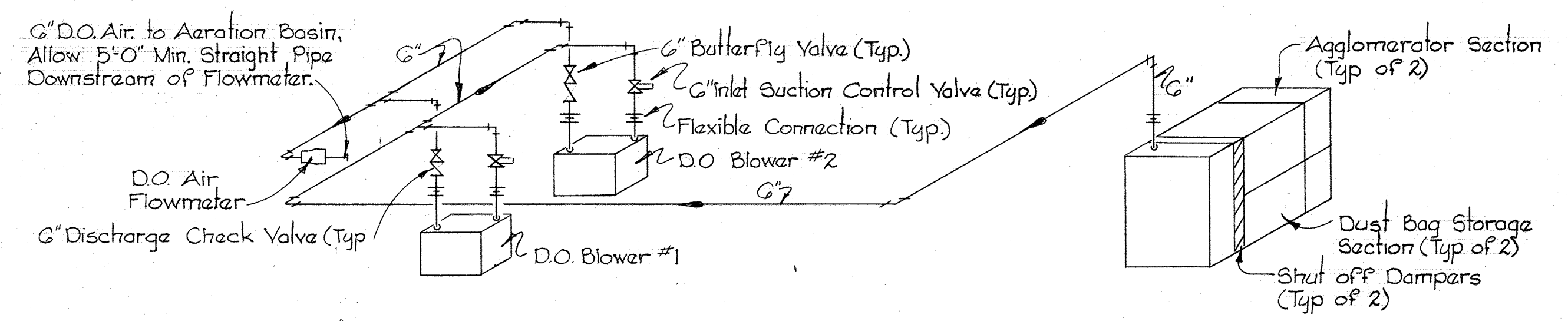
|  |   |                           |                                       |   |                                     |                               |
|--|---|---------------------------|---------------------------------------|---|-------------------------------------|-------------------------------|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE</p> <p><i>Richard E. Breidenberger</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. 502-S</p> | <p>CHLORINE BUILDING<br/>SECTIONS</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO. 4</p> | <p>DRAWING<br/>NO. 59<br/>OF 96</p> | <p>SCALE<br/>AS<br/>SHOWN</p> |
|--|---|---------------------------|---------------------------------------|---|-------------------------------------|-------------------------------|

SHEET M-14



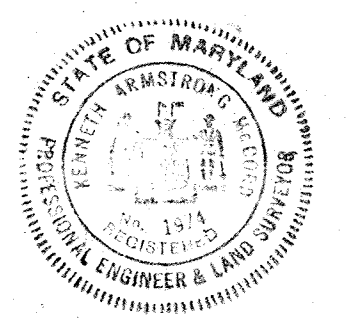


**DISINFECTION SCHEMATIC DIAGRAM**  
Not to Scale

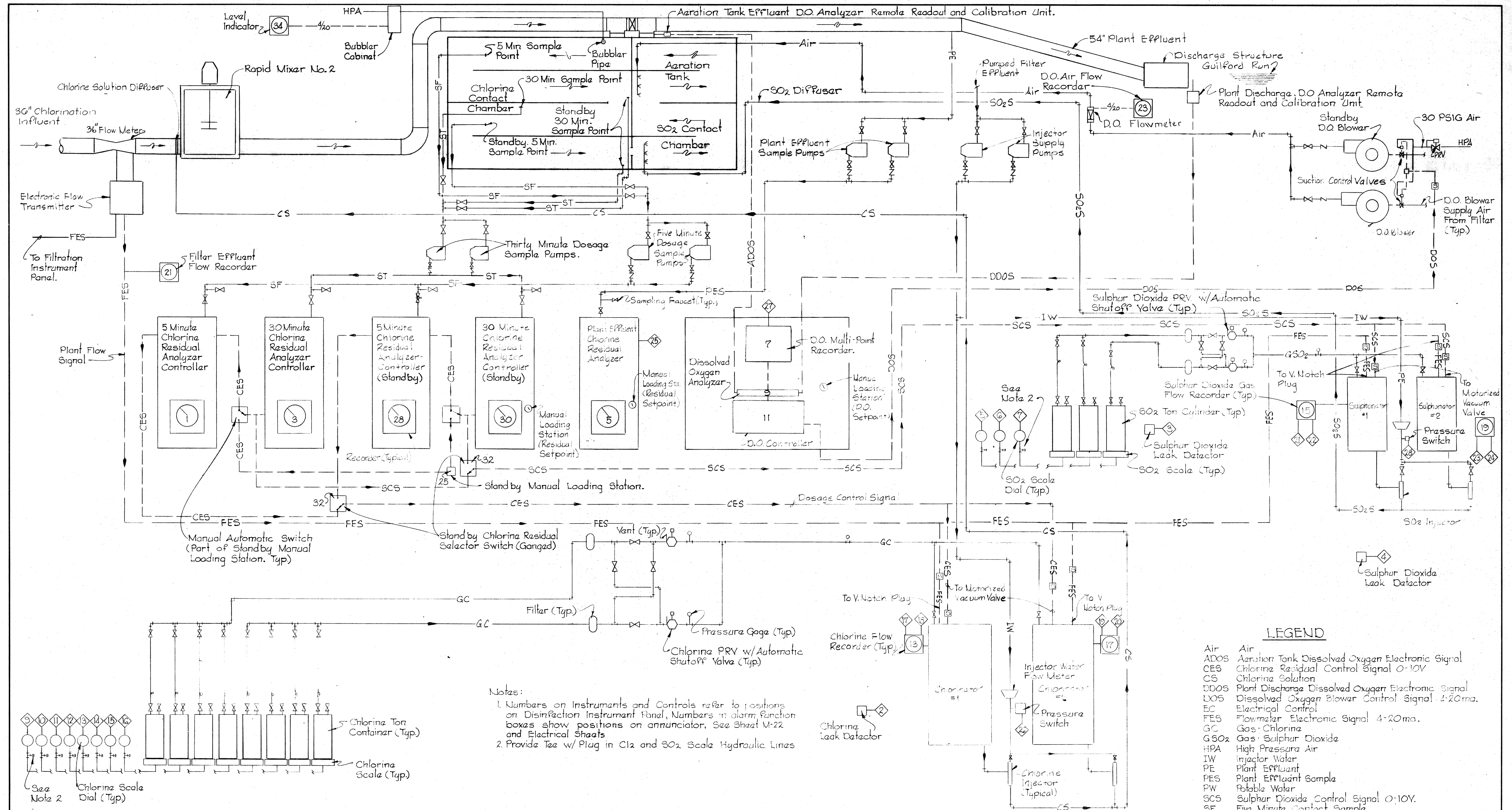


**AERATION SCHEMATIC DIAGRAM**  
Not to Scale

|   |   |                           |  |  |  |
|---|---|---------------------------|--|--|--|
| <p>WHITMAN, REQUARDT &amp; ASSOCIATES<br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE<br/><i>Richard E. Luedemeyer</i><br/>CHIEF - BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. 502-S</p> | <p>DISINFECTION SYSTEM<br/>SCHEMATIC DIAGRAM</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO.4</p> | <p>DRAWING NO. 60 OF 96<br/>SCALE AS SHOWN</p> |
|---|---|---------------------------|--|--|--|







Notes:  
 1. Numbers on Instruments and Controls refer to positions on Disinfection Instrument Panel. Numbers in alarm function boxes show positions on annunciator. See Sheet M-22 and Electrical Sheets  
 2. Provide Tee w/ Plug in Cl<sub>2</sub> and SO<sub>2</sub> Scale Hydraulic Lines

**DISINFECTION SCHEMATIC DIAGRAM**  
 No Scale

**LEGEND**

- Air Air
- ADOS Aeration Tank Dissolved Oxygen Electronic Signal
- CES Chlorine Residual Control Signal 0-10V
- CS Chlorine Solution
- DDOS Plant Discharge Dissolved Oxygen Electronic Signal
- DOES Dissolved Oxygen Blower Control Signal 4-20ma. Electrical Control
- FES Flowmeter Electronic Signal 4-20ma.
- GC Gas - Chlorine
- GSO<sub>2</sub> Gas - Sulphur Dioxide
- IW Injector Water
- PE Plant Effluent
- PES Plant Effluent Sample
- PW Potable Water
- SCS Sulphur Dioxide Control Signal 0-10V.
- SF Five Minute Contact Sample
- SO<sub>2</sub>S Sulphur Dioxide Solution
- ST 30 Minute Contact Sample
- 4/20 4 to 20ma Electronic Signal
- Alarm Function
- Selector Switch: Computer - Manual - Automatic.

WHITMAN, REQUARDT & ASSOCIATES  
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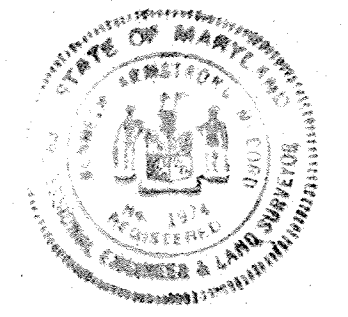
DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 12/13/77  
 DATE  
 Richard E. Brudenberg  
 CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

DISINFECTION SYSTEM  
 SCHEMATIC DIAGRAM

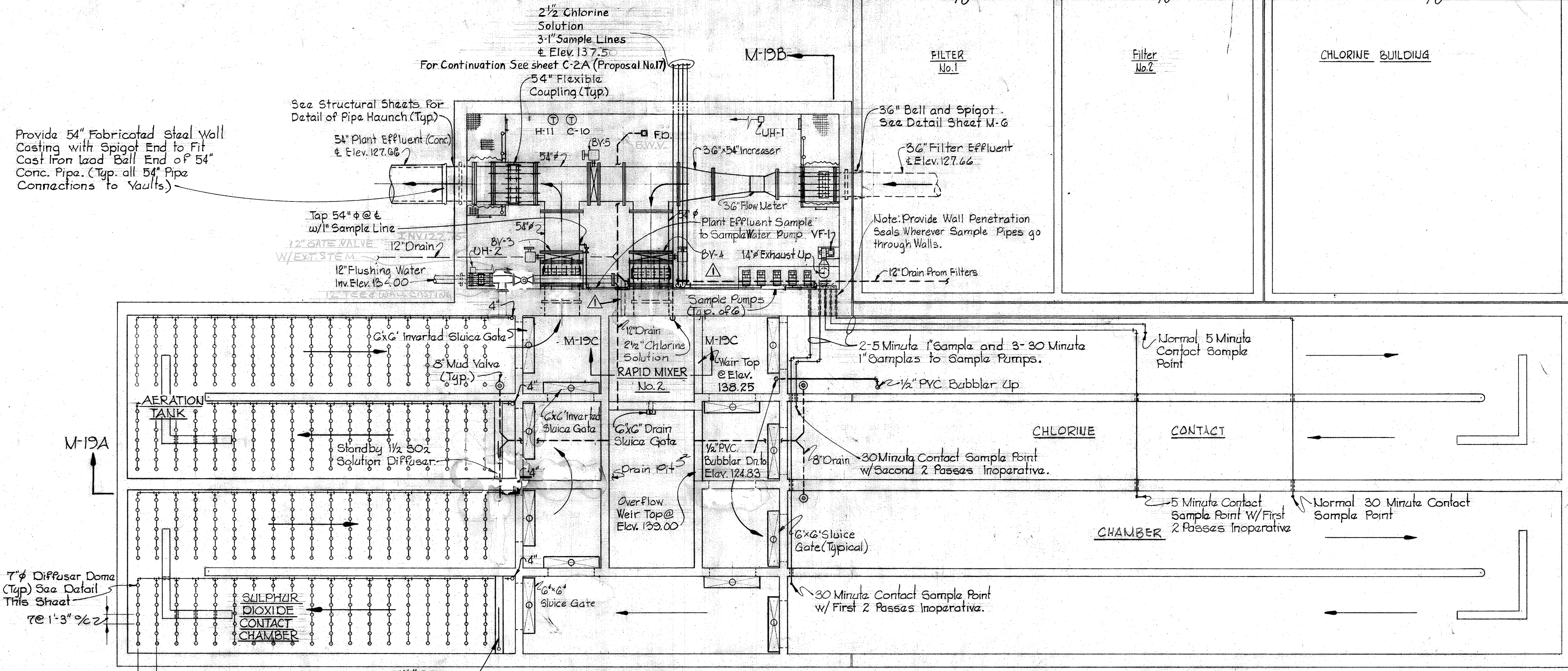
SAVAGE WASTEWATER  
 TREATMENT PLANT ADDITION NO.4

DRAWING NO. 61 OF 96  
 SCALE AS SHOWN

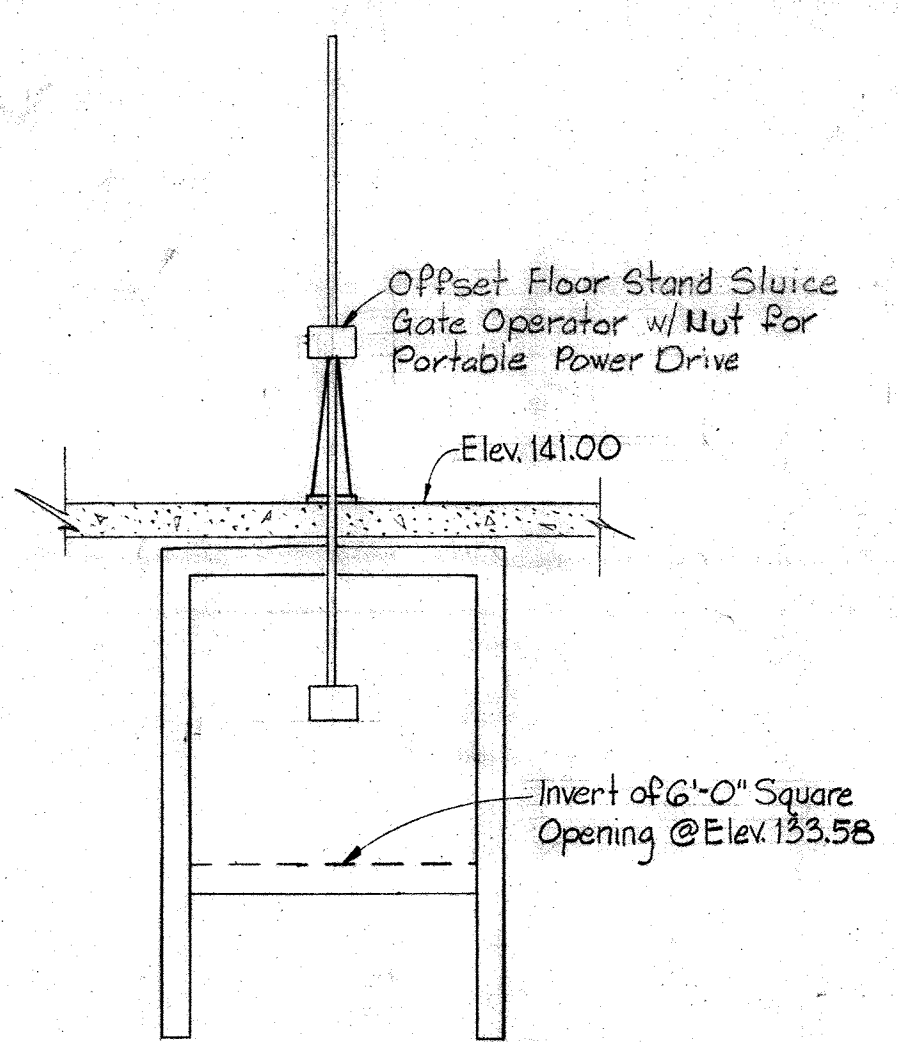


BRUNING 44510 1892E

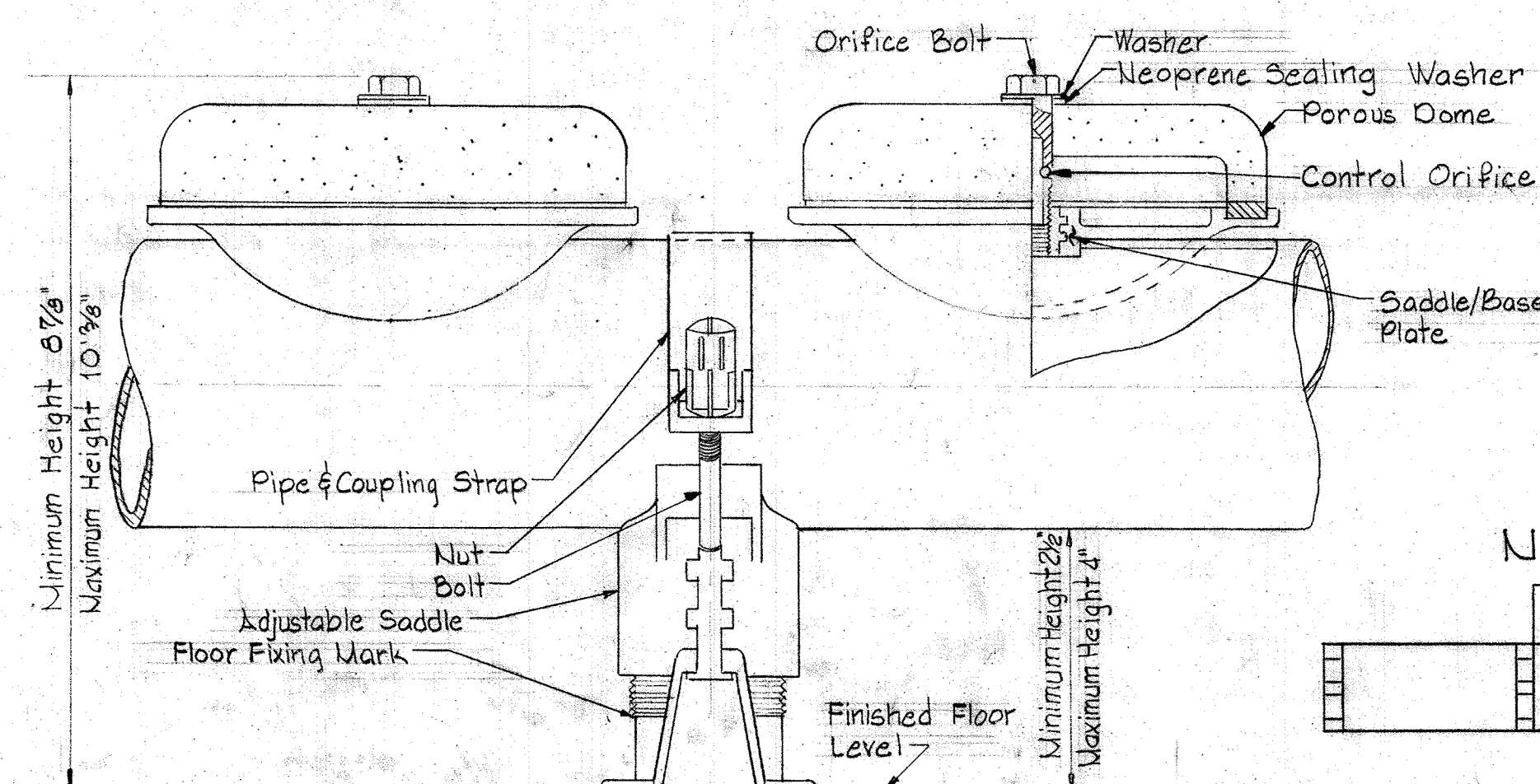




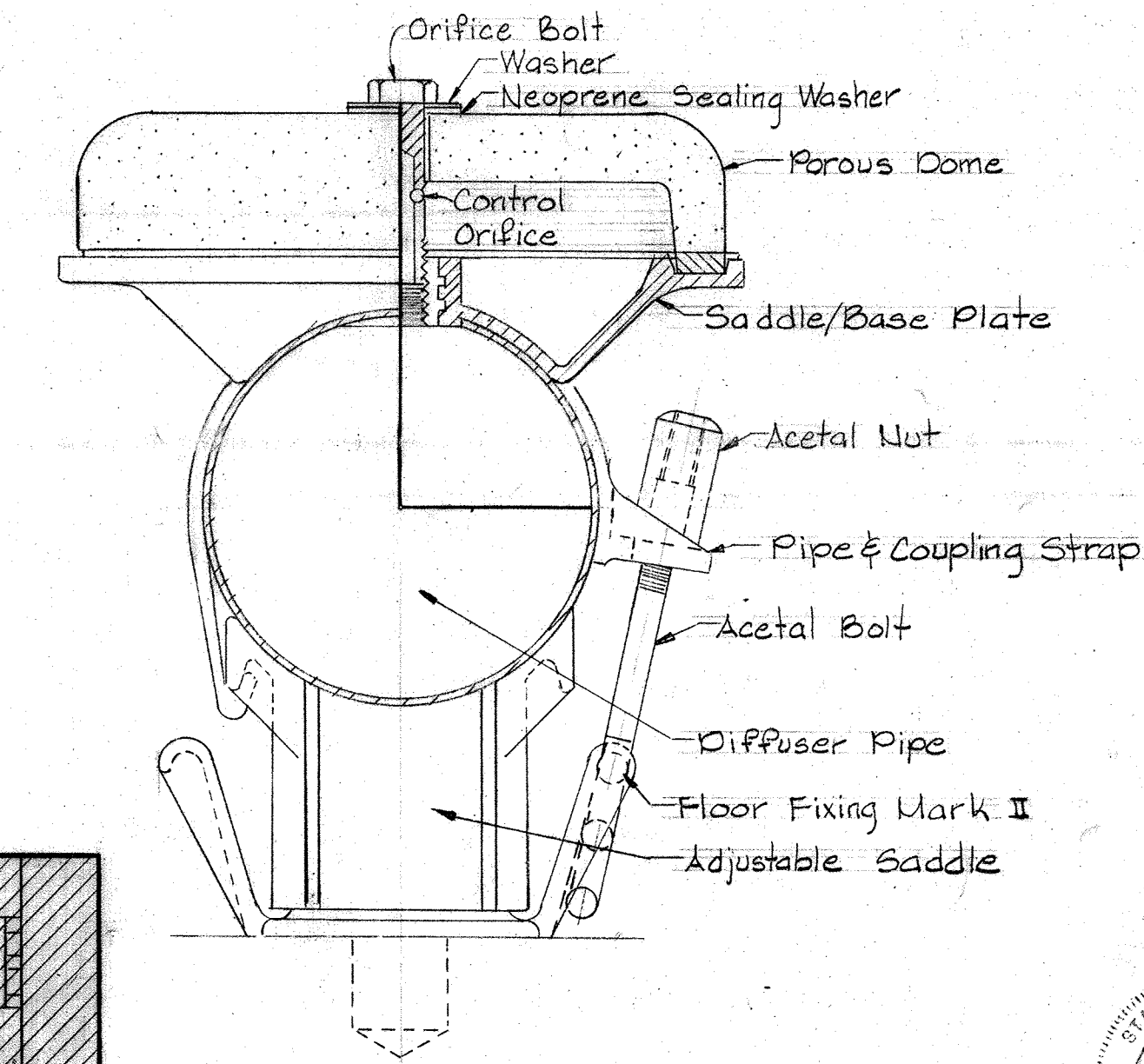
PLAN @ ELEV. 124.33  
Scale: 1/8" = 1'-0"



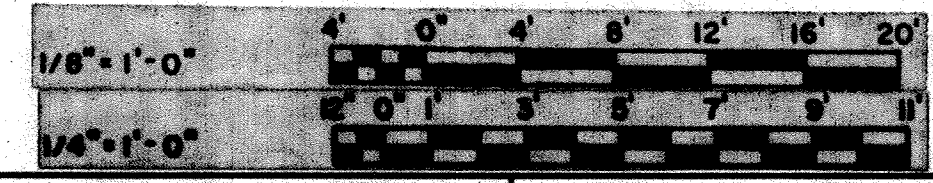
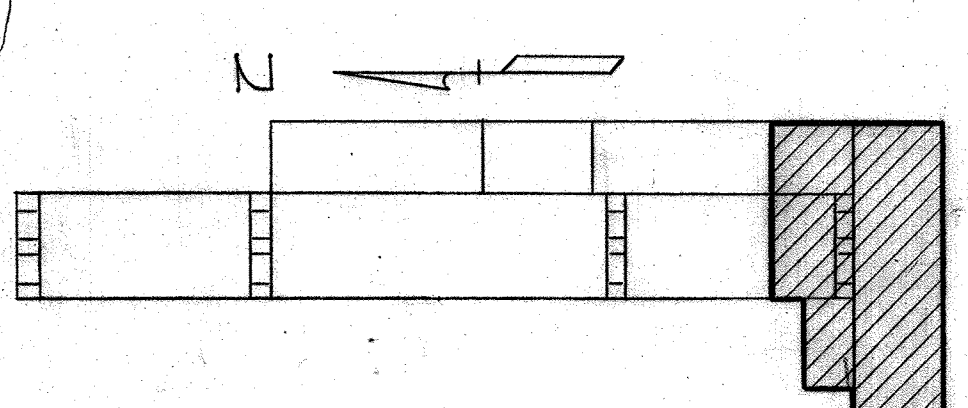
DETAIL - INVERTED SLUICE GATE (TYPICAL OF 2)  
Scale: 1/4" = 1'-0"



DETAIL - DIFFUSER DOME & PIPE  
No Scale



DIFFUSER MOUNTING DETAIL  
No Scale



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard E. Sueden  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

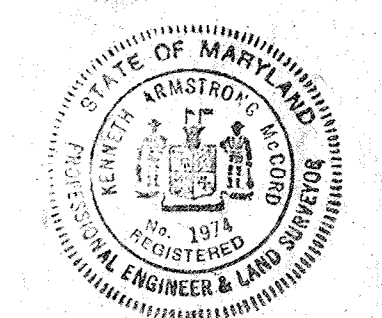
CONTRACT NO. 502-S

DISINFECTION CONTACT CHAMBERS  
PLAN

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 62  
OF 96

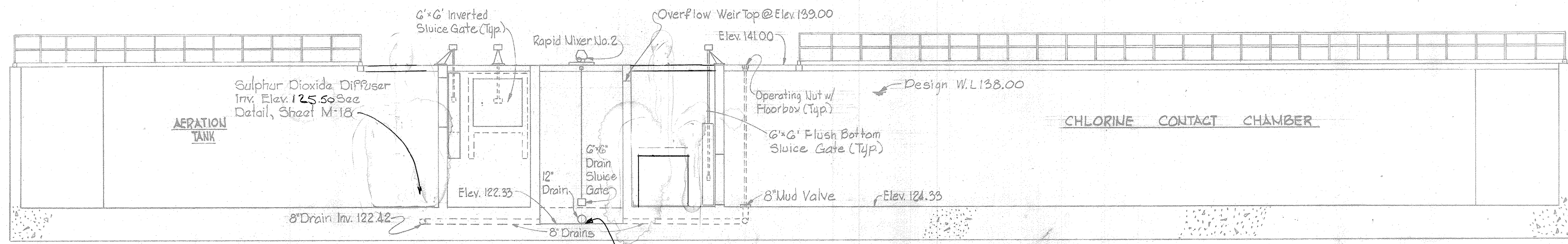
SCALE  
AS  
SHOWN





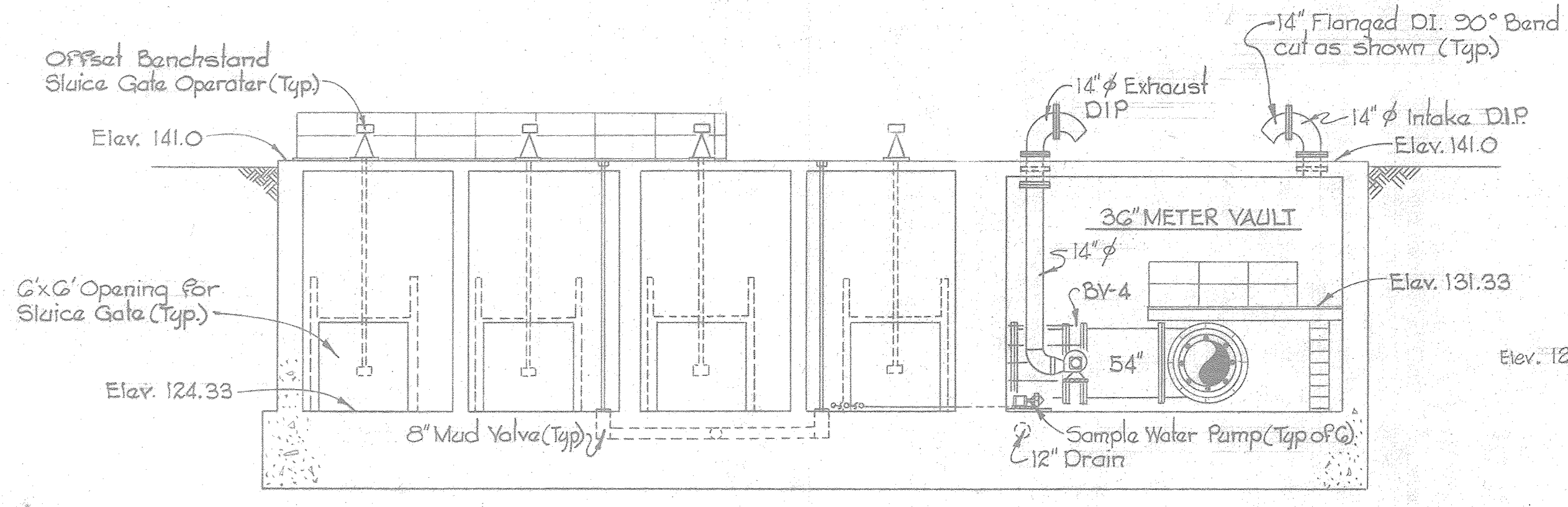




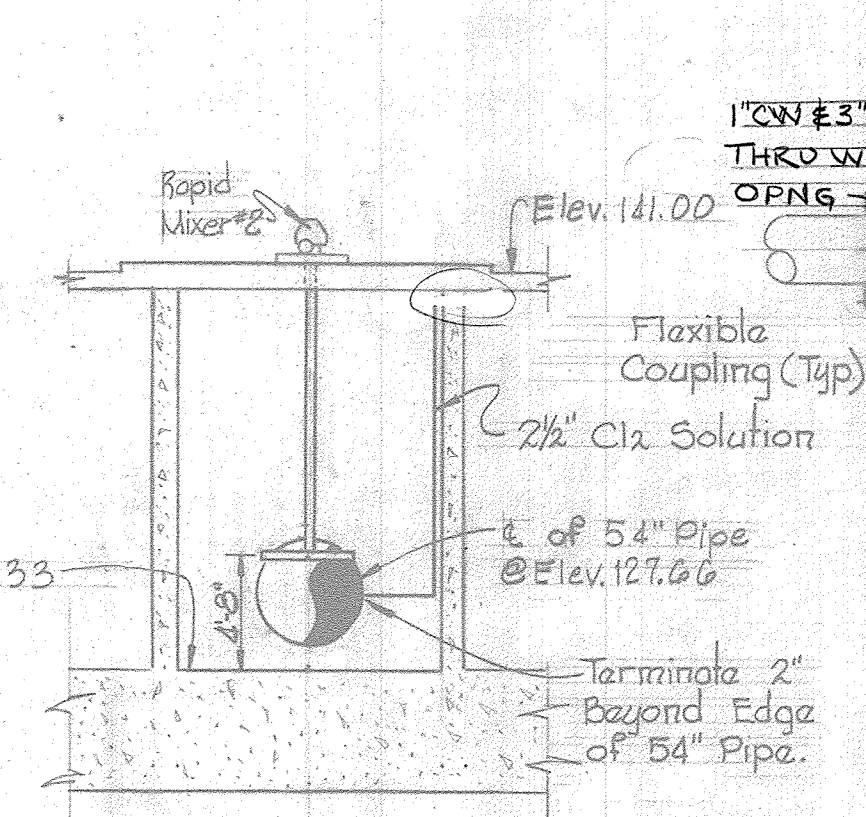


Note:  
All Mud Valves shall be provided with Spigot ends.

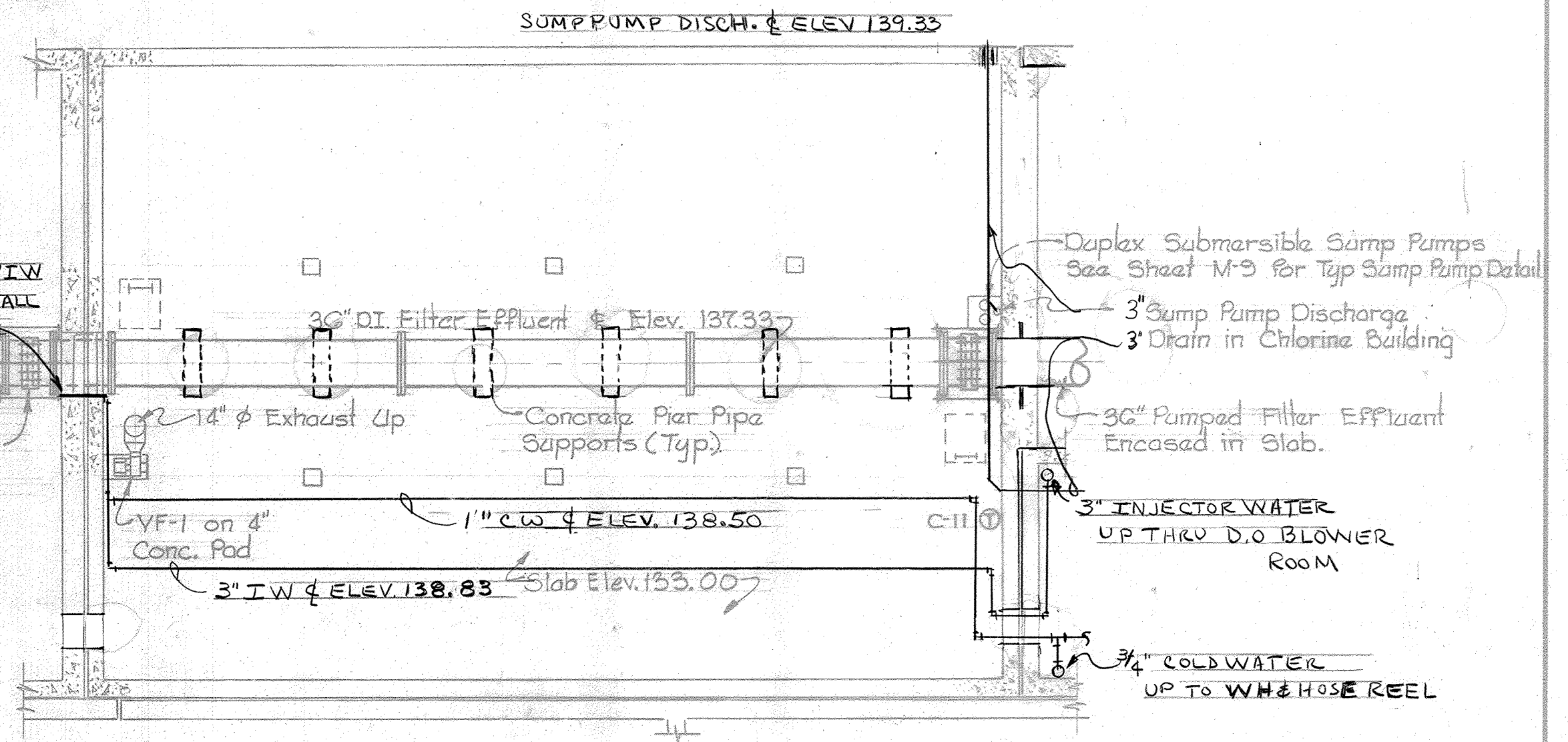
SECTION M-19 A/M-17.M-18  
Scale: 1/8"=1'-0"



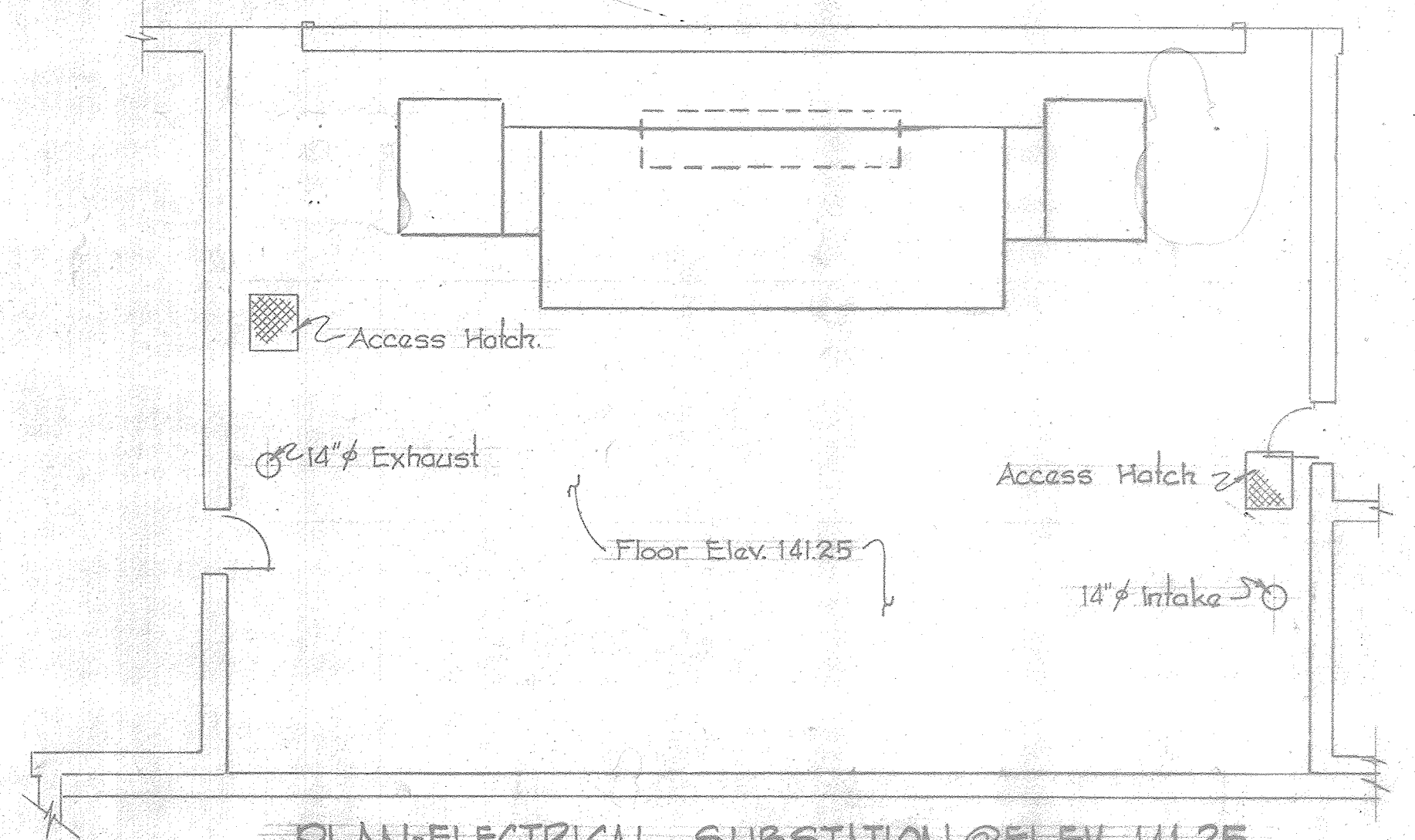
SECTION M-19 B/M-17.M-18  
Scale: 1/8"=1'-0"



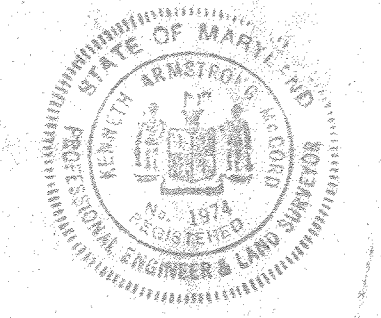
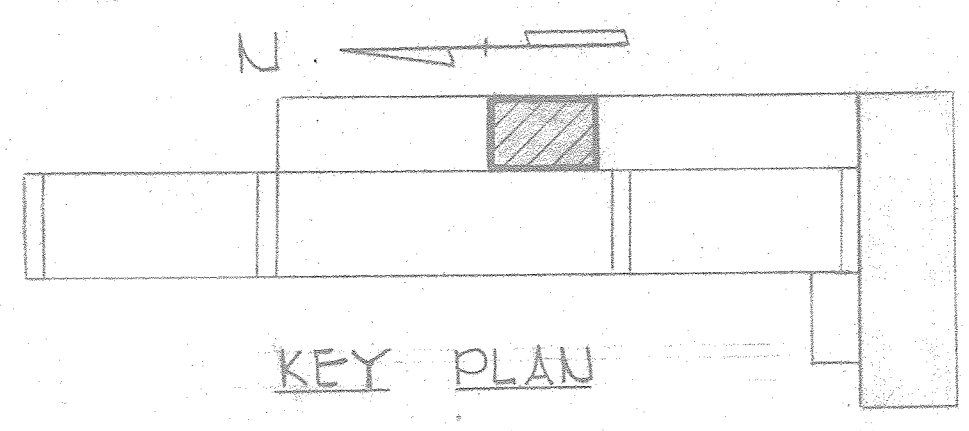
SECTION U-10 C/U-17  
Scale: 1/8"=1'-0"



PLAN-ELECTRICAL SUBSTATION @ ELEV. 133.00  
Scale: 1/8"=1'-0"



PLAN-ELECTRICAL SUBSTATION @ ELEV. 141.25  
Scale: 1/8"=1'-0"

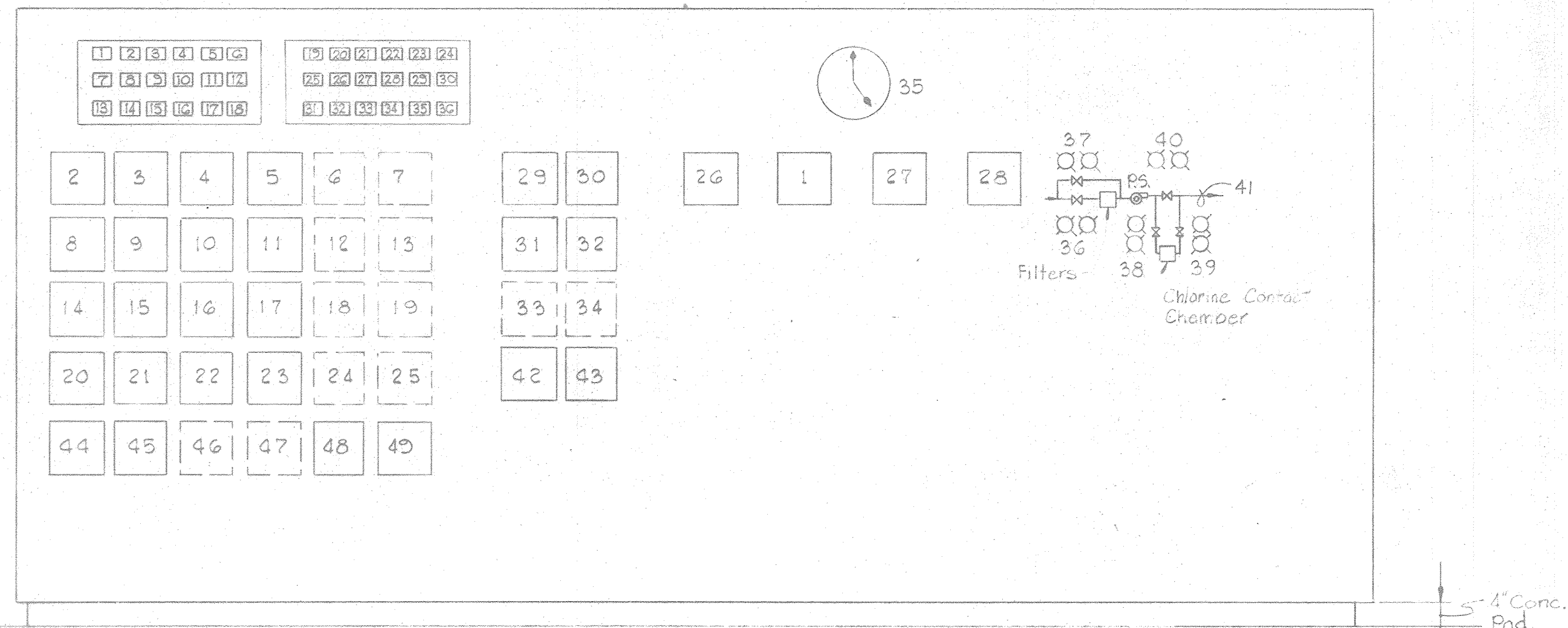


|   |   |                    |  |  |  |
|---|---|--------------------|--|--|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br>Richard E. Sreudenberger<br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | DISINFECTION CONTACT CHAMBERS SECTIONS | SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 64 OF 96<br>SCALE AS SHOWN<br>SHEET M-19 |
|---|---|--------------------|--|--|--|



INSTRUMENT PANEL LEGEND

| No. | TITLE                                       | No. | TITLE                               |
|-----|---|-----|-------------------------------------|
| 1.  | Total Filtered Effluent Flow                | 35  | Clock                               |
| 2.  | Filtered Effluent Flow Rate - Filter No.1   | 36  | Position Indicator Lights - B.V.-1  |
| 3.  | " " " " " " No.2                            | 37  | " " " " " " B.V.-2                  |
| 4.  | " " " " " " No.3                            | 38  | " " " " " " B.V.-3                  |
| 5.  | " " " " " " No.4                            | 39  | " " " " " " B.V.-4                  |
| 6.  | Spare                                       | 40  | " " " " " " B.V.-5                  |
| 7.  | Spare                                       | 41  | Filtration Process Diagram          |
| 8.  | Filter Influent Channel Level - Filter No.1 | 42  | Liquid Alarm Level - Tank No. 1     |
| 9.  | " " " " " " No.2                            | 43  | " " " " " " No.2                    |
| 10. | " " " " " " No.3                            | 44  | Flocculation Basin No.1 Water Level |
| 11. | " " " " " " No.4                            | 45  | " " " " " " No.2                    |
| 12. | Spare                                       | 46  | Spare                               |
| 13. | Spare                                       | 47  | Spare                               |
| 14. | Filter Effluent Channel Level - Filter No.1 | 48  | Flocculation Basin No.5 Water Level |
| 15. | " " " " " " No.2                            | 49  | " " " " " " No.6                    |
| 16. | " " " " " " No.3                            |     |                                     |
| 17. | " " " " " " No.4                            |     |                                     |
| 18. | Spare                                       |     |                                     |
| 19. | Spare                                       |     |                                     |
| 20. | Loss of Head - Filter No.1                  |     |                                     |
| 21. | " " " " " " No.2                            |     |                                     |
| 22. | " " " " " " No.3                            |     |                                     |
| 23. | " " " " " " No.4                            |     |                                     |
| 24. | Spare                                       |     |                                     |
| 25. | Spare                                       |     |                                     |
| 26. | Total Nitrification Effluent Flow           |     |                                     |
| 27. | Effluent Sump Water Level                   |     |                                     |
| 28. | Total Filtered Flow to Chlorination         |     |                                     |
| 29. | Filtered Effluent Turbidity - Filter No.1   |     |                                     |
| 30. | " " " " " " No.2                            |     |                                     |
| 31. | " " " " " " No.3                            |     |                                     |
| 32. | " " " " " " No.4                            |     |                                     |
| 33. | Spare                                       |     |                                     |
| 34. | Spare                                       |     |                                     |

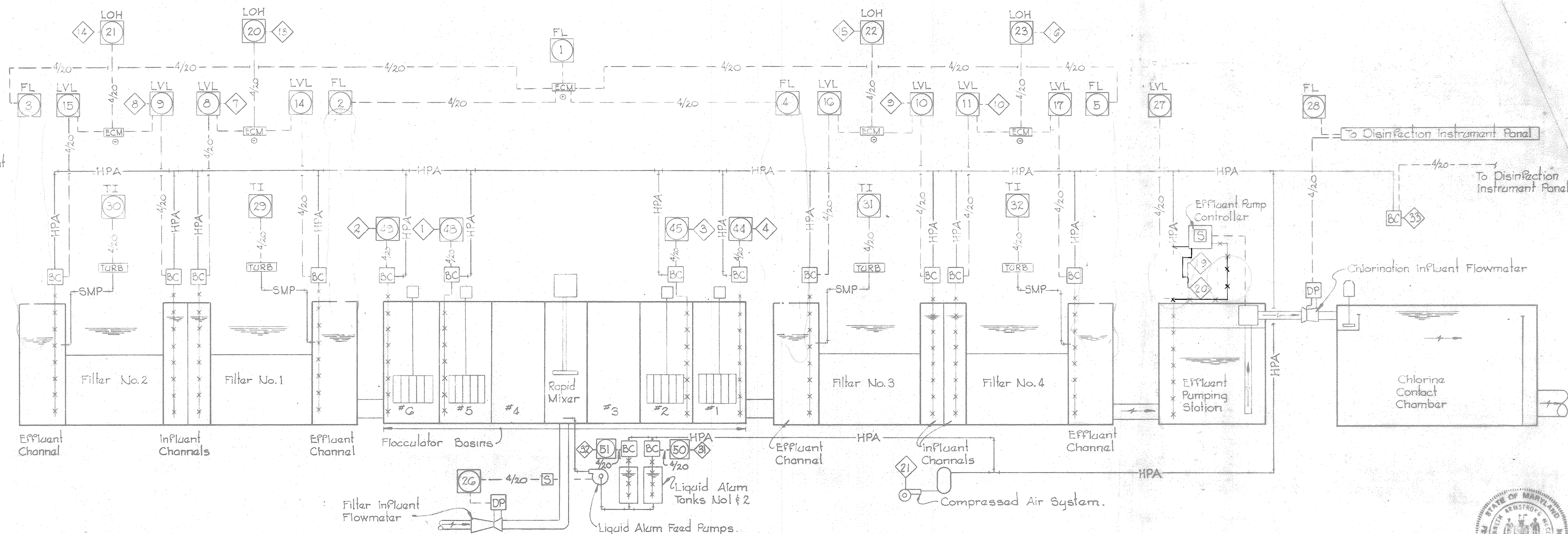


ELEVATION - INSTRUMENT PANEL

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

SCHEMATIC DIAGRAM  
LEGEND

- \*\*\* Air Bubbler
- 4/20- 4-20ma. Electronic Signal
- ◇ Alarm Function and Related Annunciator Window
- Electronic Indicator and Instrument Panel Reference
- BC. Bubbler Cabinet
- DP. Electronic Differential Pressure Flow Transmitter
- ECM Electronic Computing Module (⊖ = Subtractor ⊕ = Adder)
- FL Flow
- HPA High Pressure Air from Compressed Air System.
- LOH Loss of Head
- LVL Level
- SMP Sample
- TI Turbidity Indicator
- TURB Turbidimeter
- WFT Water Flow Transmitter
- PS Pneumatic Switch - Computer - Manual - Automatic
- ⊞ Detector Switch - Computer - Manual - Automatic



FILTRATION CONTROL SCHEMATIC DIAGRAM

Not to Scale

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BALTIMORE, MARYLAND

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

12/13/77  
DATE

*Richard E. Suedewitz*  
CHIEF - BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502 - S

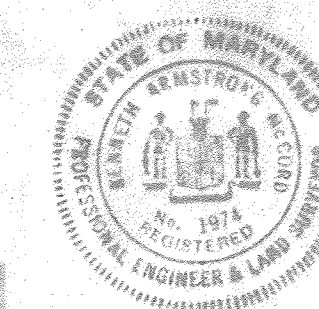
FILTRATION CONTROL,  
INSTRUMENT PANEL &  
SCHEMATIC DIAGRAM

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

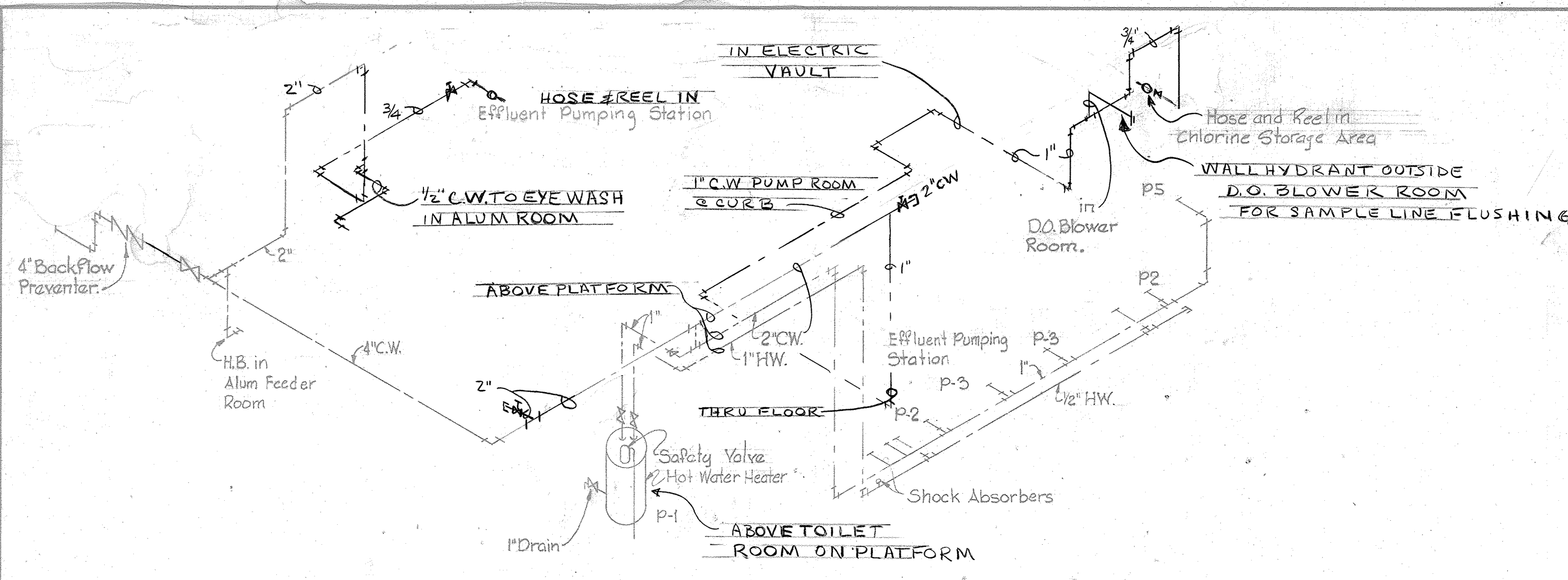
DRAWING  
NO. 65  
OF 96

SCALE  
AS  
SHOWN

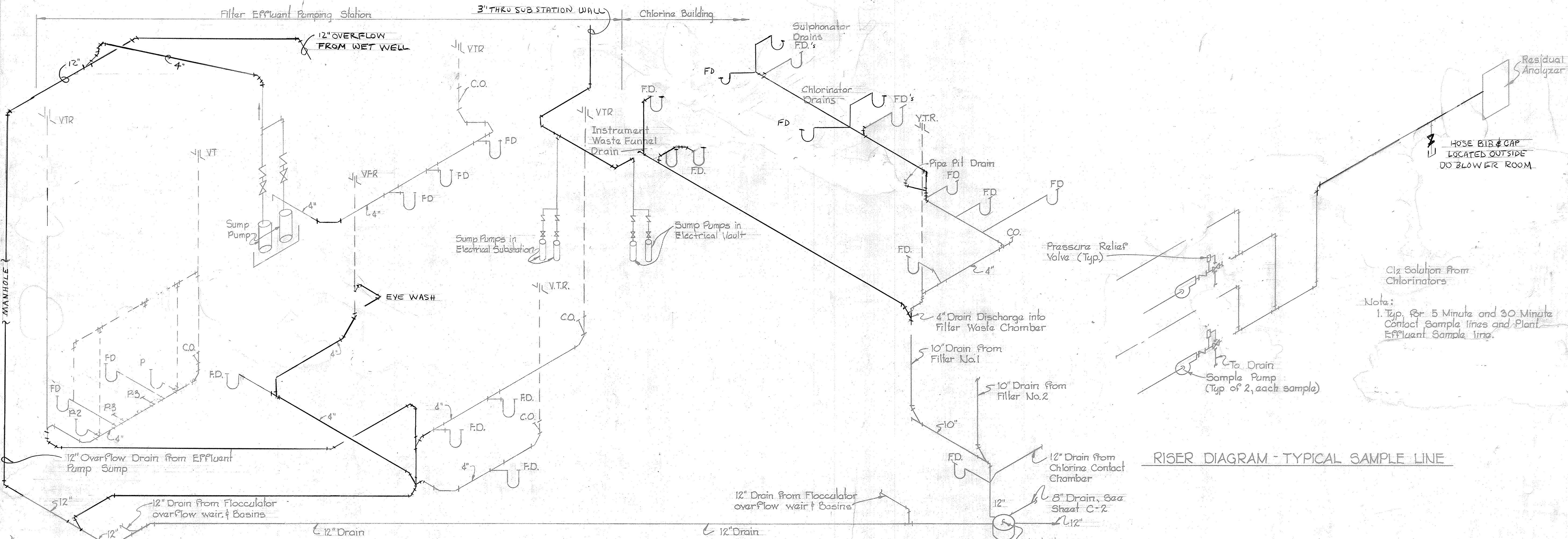
SHEET M-20







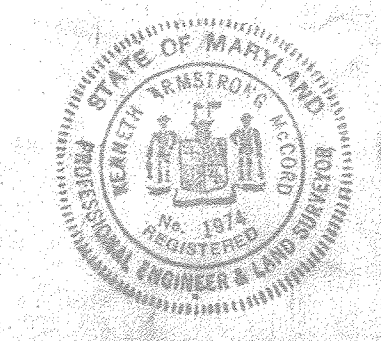
RISER DIAGRAM - HOT & COLD WATER SUPPLY  
Not to Scale



RISER DIAGRAM - SANITARY DRAIN PIPING  
Not to Scale

RISER DIAGRAM - TYPICAL SAMPLE LINE  
Not to Scale

Note:  
1. Typ. for 5 Minute and 30 Minute Contact Sample lines and Plant Effluent Sample line.

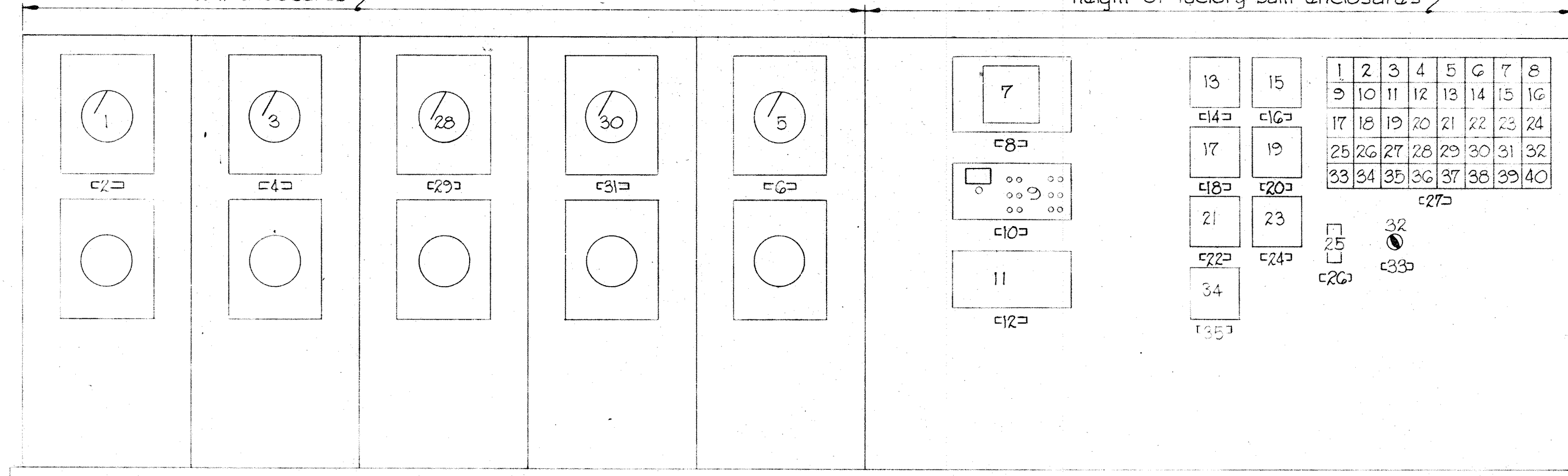


|   |   |                    |                |   |                            |                      |
|---|---|--------------------|----------------|---|----------------------------|----------------------|
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|---|---|--------------------|----------------|---|----------------------------|----------------------|



Instruments shall be in factory built enclosures

Panel shall be fabricated to match height of factory built enclosures



ELEVATION - DISINFECTION INSTRUMENT PANEL

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

Note: See Electrical Sheets for Details of Annunciator.

DISINFECTION INSTRUMENT PANEL LEGEND

1. Chlorine Residual Analyzer - Controller: 5 Minute Contact Time.
2. Namplate: 5 Minute Contact Chlorine Residual No.1
3. Chlorine Residual Analyzer - Controller: 30 Minute Contact Time.
4. Namplate: 30 Minute Contact Chlorine Residual No.1
5. Chlorine Residual Analyzer - Controller: Plant Effluent
6. Namplate: Plant Effluent Chlorine Residual
7. Dissolved Oxygen Recorder.
8. Namplate: Dissolved Oxygen Level, Effluent and Discharge
9. Dissolved Oxygen Analyzer, Plant Effluent and Discharge.
10. Namplate: Plant Effluent Dissolved Oxygen
11. D.O. Controller
12. Namplate: D.O. Controller
13. Chlorine Gas Flow Recorder - Chlorinator No.1
14. Namplate: Cl<sub>2</sub> Gas Flow - Chlorinator No.1
15. Sulphur Dioxide Gas Flow Recorder - Sulphonator No.1
16. Namplate: SO<sub>2</sub> Gas Flow - Sulphonator No.1
17. Chlorine Gas Flow Recorder - Chlorinator No.2
18. Namplate: Cl<sub>2</sub> Gas Flow - Chlorinator No.2
19. Sulphur Dioxide Gas Flow Recorder - Sulphonator No.2
20. Namplate: SO<sub>2</sub> Gas Flow - Sulphonator No.2
21. Filter Effluent Flow Recorder
22. Namplate: Filter Effluent Flow
23. Dissolved Oxygen Blower Flow Recorder.
24. Namplate: D.O. Blower Air Flow.
25. Chlorine Residual Stand by Manual Loading Station and Switch
26. Namplate: Stand by Chlorine Residual Loading Station.
27. Disinfection Annunciator (For Annunciator window details, See Electrical Sheets)
28. Standby Chlorine Residual Analyzer Controller: 5 Minute Contact Time
29. Namplate: 5 Minute Contact Chlorine Residual Analyzer No.2
30. Standby Chlorine Residual Analyzer Controller: 30 Minute Contact Time
31. Namplate: 30 Minute Contact Chlorine Residual Analyzer No.2
32. Selector Switch
33. Namplate: No.1 Chlorine Residual Analyzers No.2
34. Chlorine Contact Chamber Level Indicator
35. Namplate: Chlorine Contact Chamber Level

HEATING SCHEDULE

| ROOM                         | HEATER No. | TYPE                   | CAPACITY PER HEATER | MOUNTING HEIGHT ABOVE FIN. FLOOR | HORIZONTAL THROW | THERMOSTAT CONTROLLER |
|------------------------------|------------|------------------------|---------------------|----------------------------------|------------------|-----------------------|
| Alum Feeder Room             | UH-1,2     | Horizontal Unit Heater | 12.5 K.W.           | 8'                               | 27'              | TH-1                  |
| Filter Effluent Pumping Sta. | RH-1-10    | Radiant                | 5 K.W.              | As Shown                         | Not Applicable   | TH-2                  |
| Toilet Room                  | UH-1,2     | Cabinet                | 1.5 K.W.            | 0'-6"                            | Not Applicable   | TH-3                  |
| Sulphonator Room             | UH-1,2     | Horizontal Unit Heater | 4 K.W.              | 8'                               | 12'              | TH-4                  |
| Chlorinator Room             | UH-1,2     | Horizontal Unit Heater | 4 K.W.              | 8'                               | 12'              | TH-5                  |
| D.O. Blower Room             | UH-1,2     | Horizontal Unit Heater | 4 K.W.              | 8'                               | 12'              | TH-6                  |
| Disinfection Control Room    | UH-1,2     | Horizontal Unit Heater | 5 K.W.              | 8'                               | 18'              | TH-7                  |
| Chlorine Building Corridor   | UH-1       | Horizontal Unit Heater | 7.5 K.W.            | 8'                               | 27'              | TH-8                  |
| Chlorine Storage Room        | UH-1-10    | Horizontal Unit Heater | 7.5 K.W.            | 8'                               | 27'              | TH-9                  |
| 54" Meter Vault              | UH-1,2     | Horizontal Unit Heater | 4 K.W.              | 8'                               | 12'              | TH-10                 |
| 36" Meter Vault              | UH-1,2     | Horizontal Unit Heater | 5 K.W.              | 8'                               | 18'              | TH-11                 |

VENTILATION SCHEDULE

| ROOM                            | FAN NO. | TYPE                      | CAPACITY CFM. per FAN | STATIC PRESSURE RATE, W.G. | MOTOR HP per FAN | THERMOSTAT CONTROLLER |
|---------------------------------|---------|---------------------------|-----------------------|----------------------------|------------------|-----------------------|
| Alum Room                       | VF-1,2  | Power Roof Vent.          | 1600                  | 3/8                        | 1/2              | TC-1                  |
| Filter Effluent Pumping Station | VF-1,4  | Power Roof Vent.          | 34,900                | 3/8                        | 7 1/2            | TC-2                  |
| Toilet Room                     | VF-1    | C.I. Centrifugal Vent Set | 340                   | 3/8                        | 1/6              | N.L.                  |
| Sulphonator Room                | VF-1,2  | Propeller Fan             | 4,950                 | 1/2                        | 1                | TC-3                  |
| Chlorinator Room                | VF-1,2  | Propeller Fan             | 4,950                 | 1/2                        | 1                | TC-4                  |
| D.O. Blower Room                | VF-1    | Power Roof Vent.          | 4,650                 | 1/2                        | 1                | TC-5                  |
| Control Room                    | VF-2    | Power Roof Vent.          | 2,540                 | 1/2                        | 1/2              | TC-6                  |
| Electrical Vault                | VF-1    | Power Roof Vent.          | 2,540                 | 1/2                        | 1/2              | TC-7                  |
| Chlorine Storage Building       | VF-1,4  | Propeller Fan             | 13,400                | 1/2                        | 3                | TC-8                  |
| 54" Meter Vault                 | VF-1    | C.I. Centrifugal Vent Set | 1,195                 | 3/8                        | 3/4              | TC-9                  |
| 36" Meter Vault                 | VF-1    | C.I. Centrifugal Vent Set | 1,195                 | 3/8                        | 3/4              | TC-10                 |
| Electrical Substation           | VF-1    | C.I. Centrifugal Vent Set | 1,000                 | 3/8                        | 1/2              | TC-11                 |

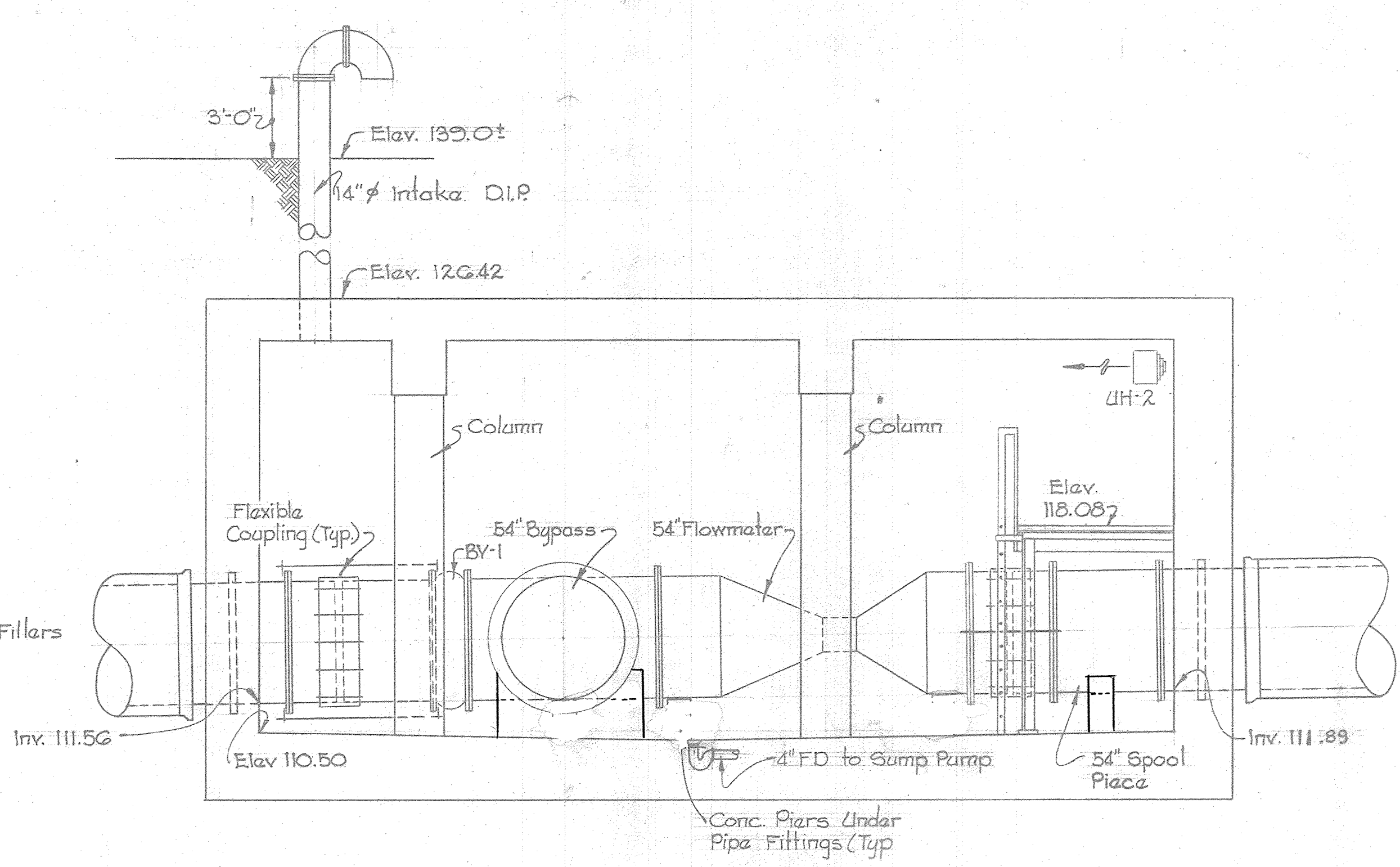


|   |   |                    |                                  |   |                            |                      |
|---|---|--------------------|----------------------------------|---|----------------------------|----------------------|
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|---|---|--------------------|----------------------------------|---|----------------------------|----------------------|

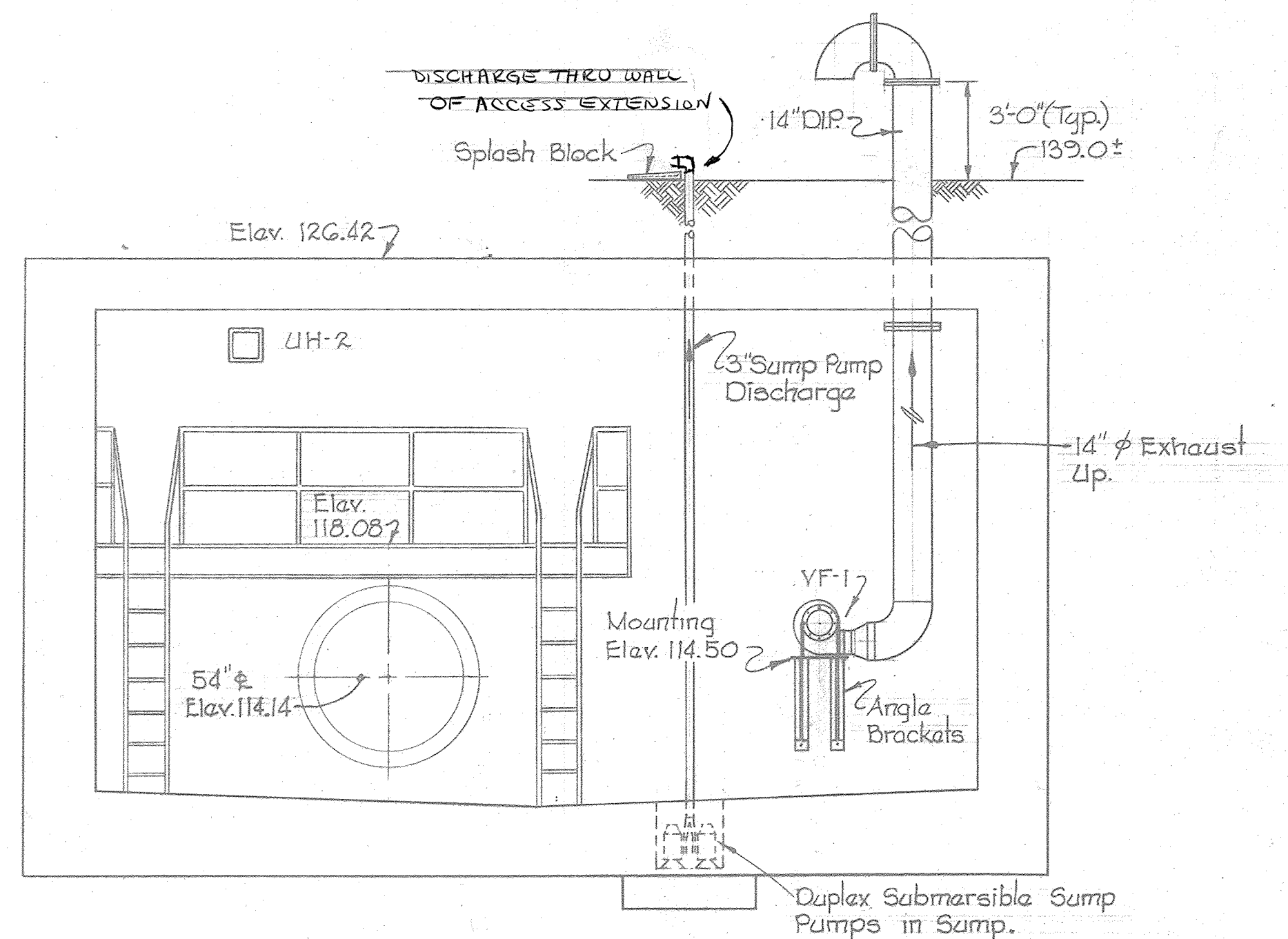




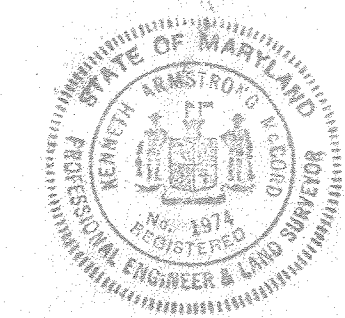
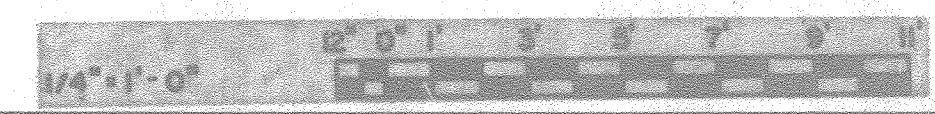
SECTION M-23A / M-12, M-13  
Scale: 1/4" = 1'-0"



SECTION M-23C / M-6  
Scale: 1/4" = 1'-0"



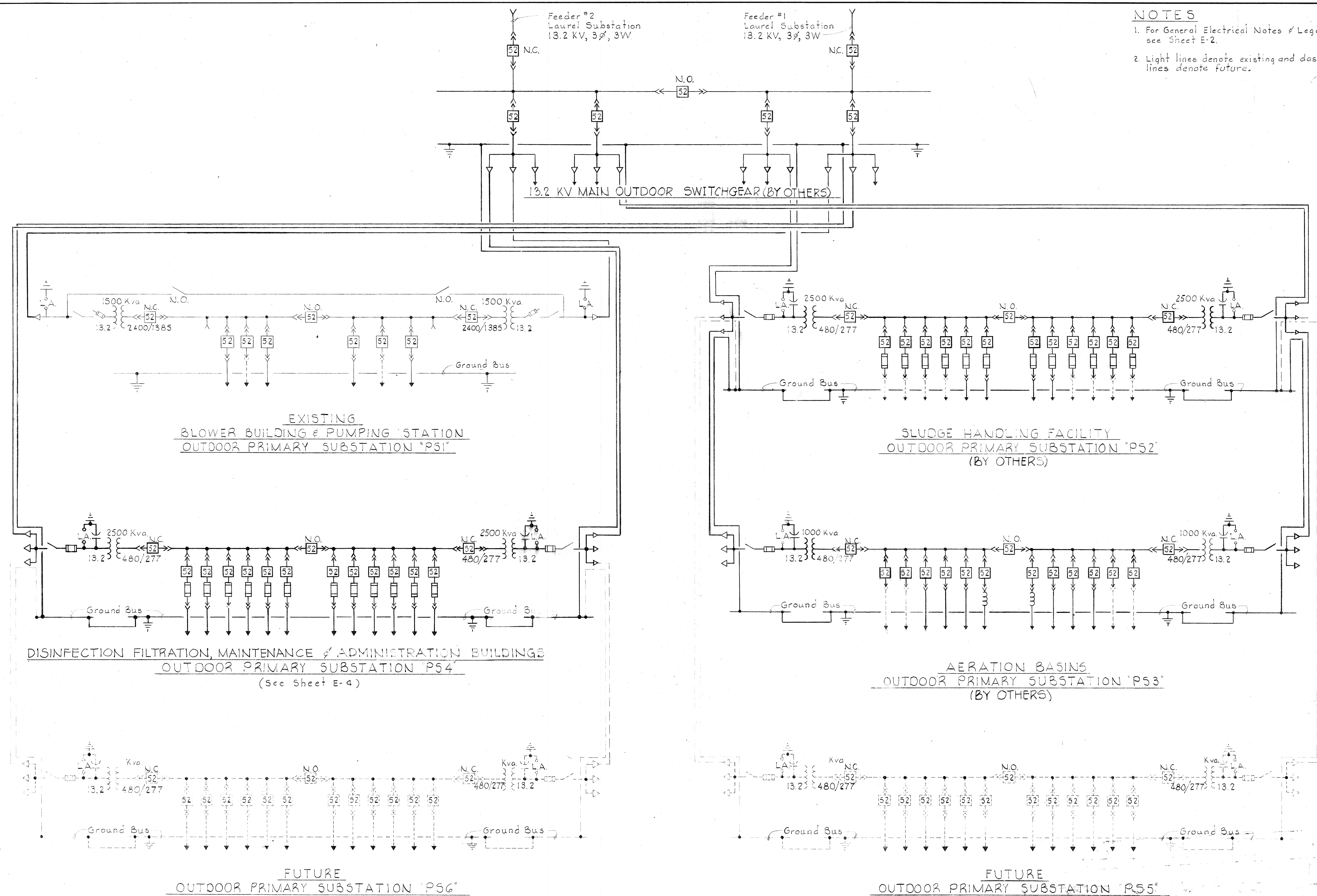
SECTION M-23B / M-6  
Scale: 1/4" = 1'-0"



|   |   |                    |                       |   |   |
|---|---|--------------------|-----------------------|---|---|
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|---|---|--------------------|-----------------------|---|---|



- NOTES**
1. For General Electrical Notes & Legend, see Sheet E-2.
  2. Light lines denote existing and dashed lines denote future.



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BALTIMORE, MARYLAND

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
3/20/75  
DATE  
W.O. Edgerly  
CHIEF-BUREAU OF ENGINEERING

CONTRACT NO. 502-S

POWER  
MASTER ONE LINE  
WIRING DIAGRAM.

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 69  
OF 96

SCALE  
AS  
SHOWN

BRUNING 44-510 18392

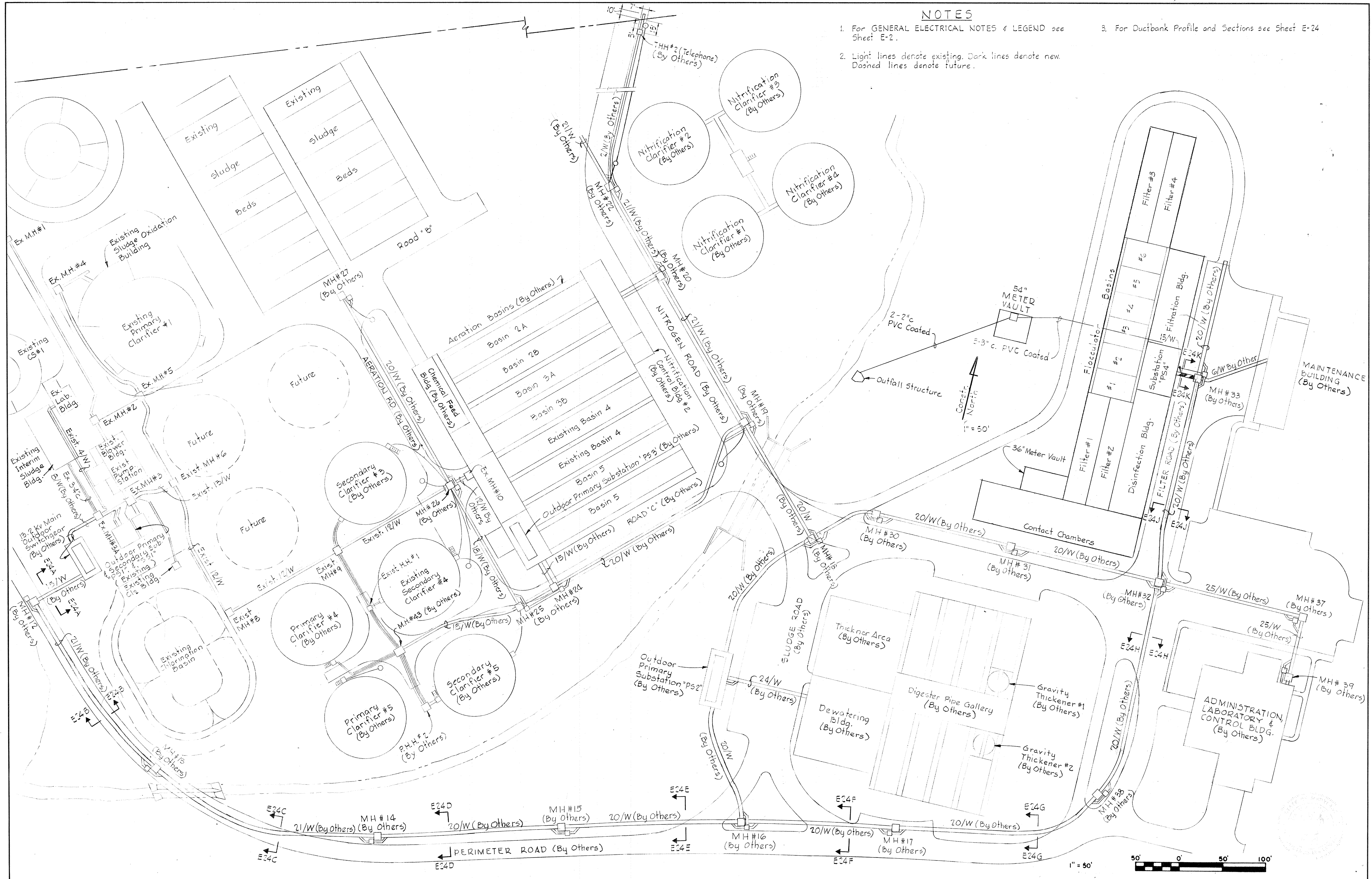






**NOTES**

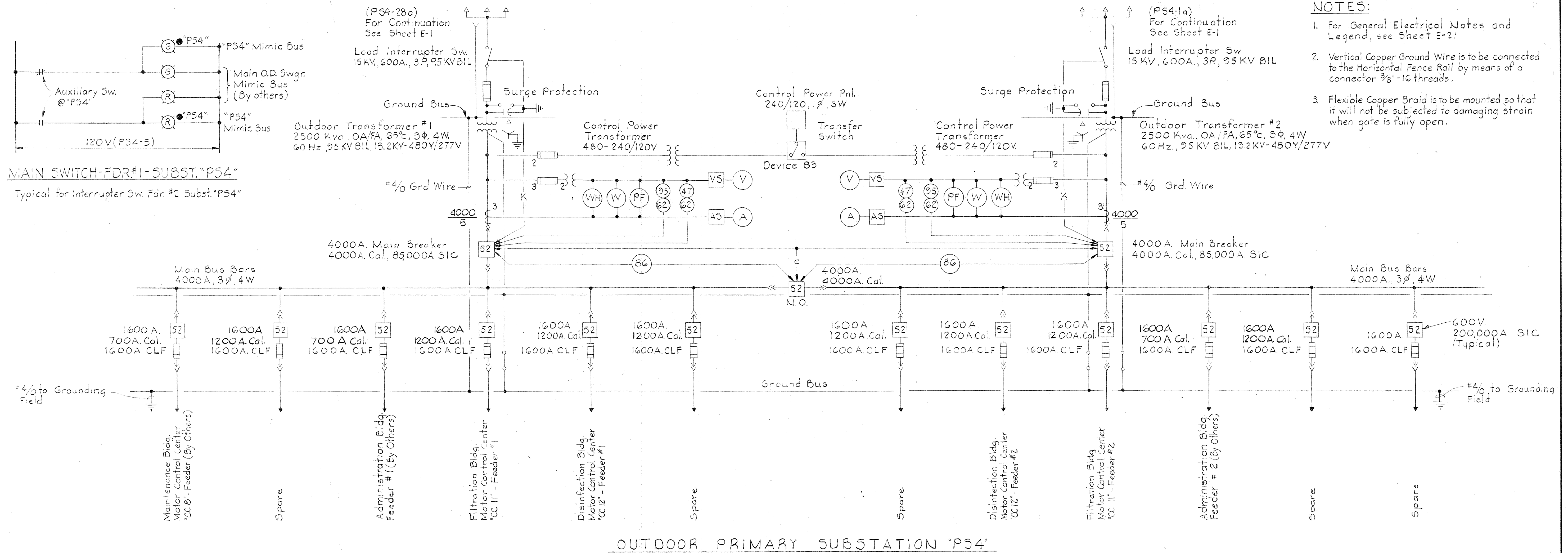
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
2. Light lines denote existing. Dark lines denote new. Dashed lines denote future.
3. For Ductbank Profile and Sections see Sheet E-24



|  |  |                                  |                                    |  |   |
|--|--|----------------------------------|------------------------------------|--|---|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/><i>Robert E. Bruderman</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>ELECTRICAL SITE PLAN</b></p> | <p><b>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 71<br/>OF 96</b></p> <p><b>SCALE AS SHOWN</b></p> |
|--|--|----------------------------------|------------------------------------|--|---|

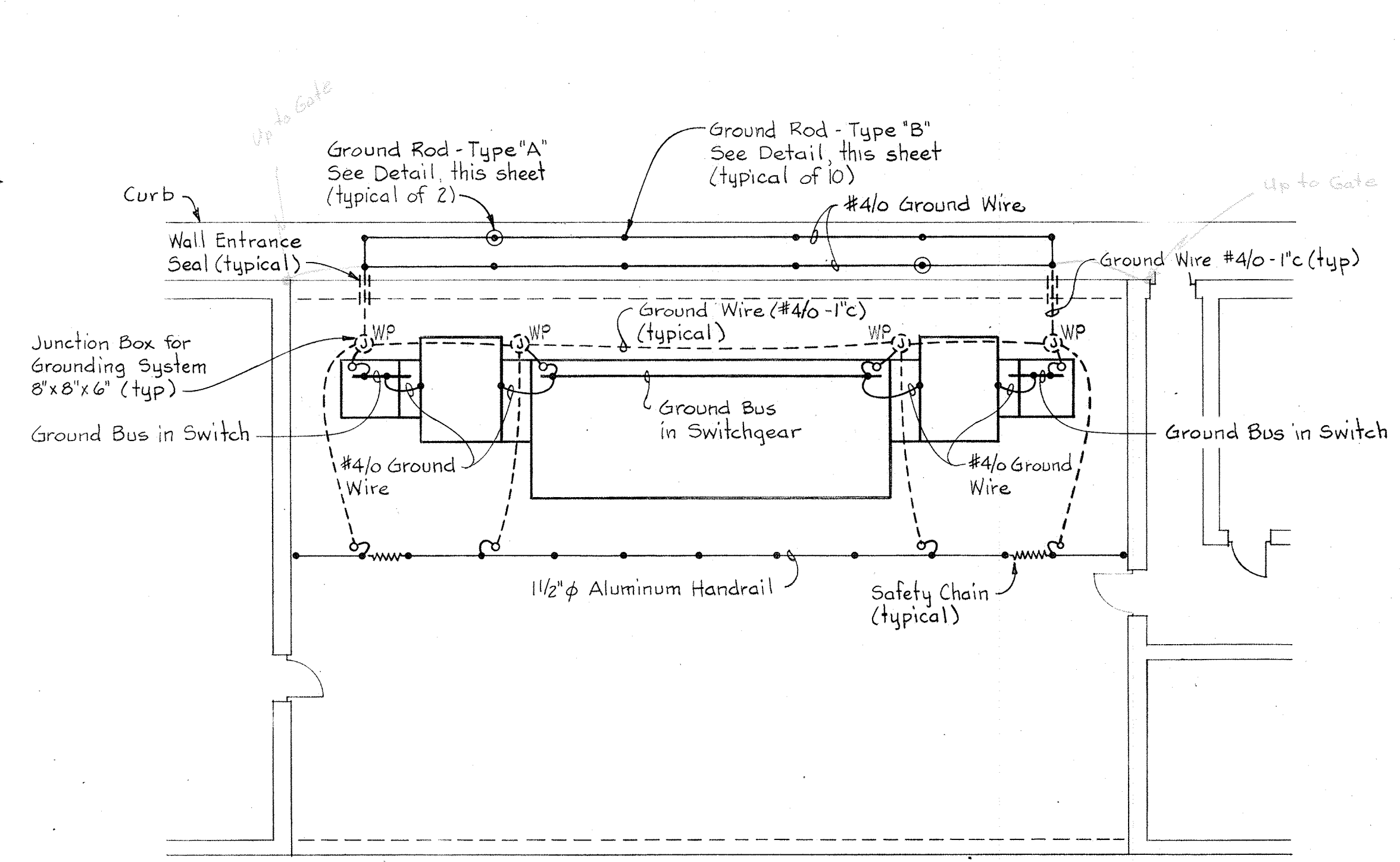
BRUNING 441510 32872



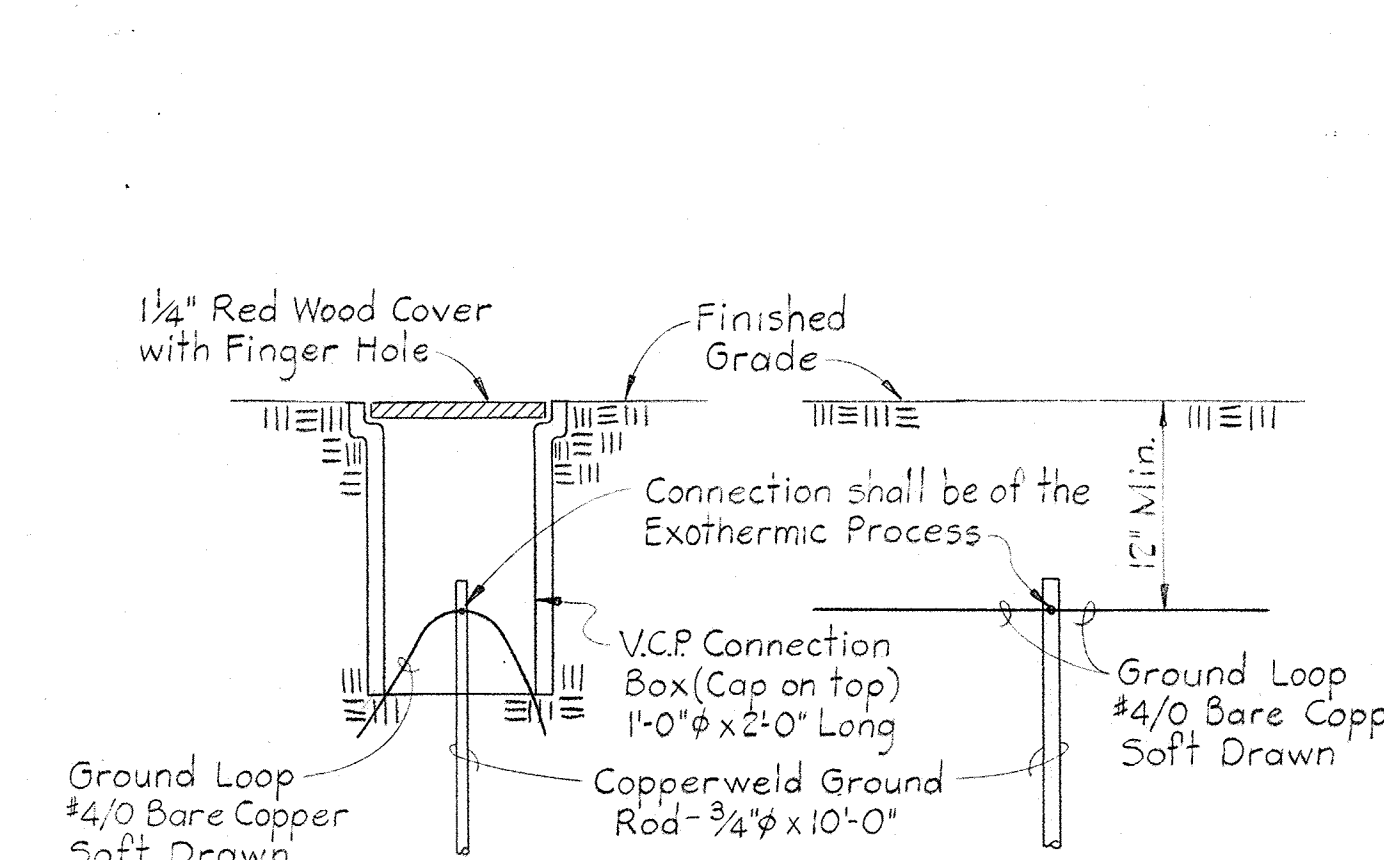


- NOTES:**
1. For General Electrical Notes and Legend, see Sheet E-2.
  2. Vertical Copper Ground Wire is to be connected to the Horizontal Fence Rail by means of a connector 3/8"-16 threads.
  3. Flexible Copper Braid is to be mounted so that it will not be subjected to damaging strain when gate is fully open.

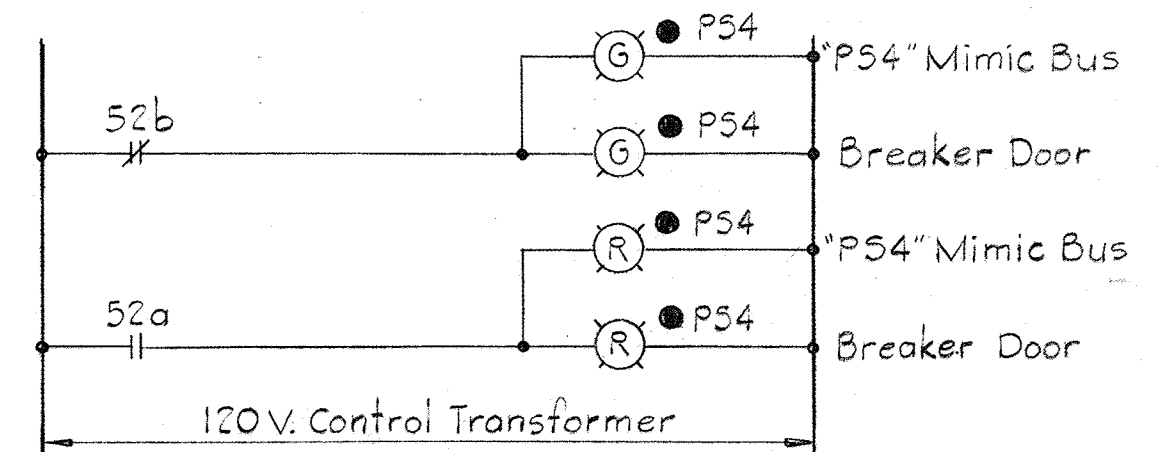
**OUTDOOR PRIMARY SUBSTATION "PS4"**



**OUTDOOR SUBSTATION GROUNDING PLAN**  
Scale: 1/8" = 1'-0"



**GROUND ROD DETAILS**  
No Scale



- MAIN BREAKER FOR #1-SUBST. "PS4"**
- Typical for the following Breakers:
1. Main Breaker Fdr.#2
  2. Spare
  3. Filtration Bldg. MCC-CC11 - Fdr.#1
  4. Disinfection Bldg. MCC-CC12 - Fdr.#1
  5. Administration Bldg. Fdr.#1
  6. Spare
  7. Spare
  8. Tie Breaker
  9. Spare
  10. Filtration Bldg. MCC-CC11 Fdr.#2
  11. Disinfection Bldg. MCC-CC12 Fdr.#2
  12. Administration Bldg. Fdr.#2
  13. Spare
  14. Spare
  15. Maintenance Bldg. MCC-CC8 Fdr.

**POWER ON-SERVICE FOR #1-SUBST. "PS4"**  
Typical for Service Fdr.#2 Subst."PS4"

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HOWARD COUNTY, MARYLAND  
DATE: 3/20/75  
W.O. Liffert  
CHIEF BUREAU OF ENGINEERING

**CONTRACT NO. 502-S**

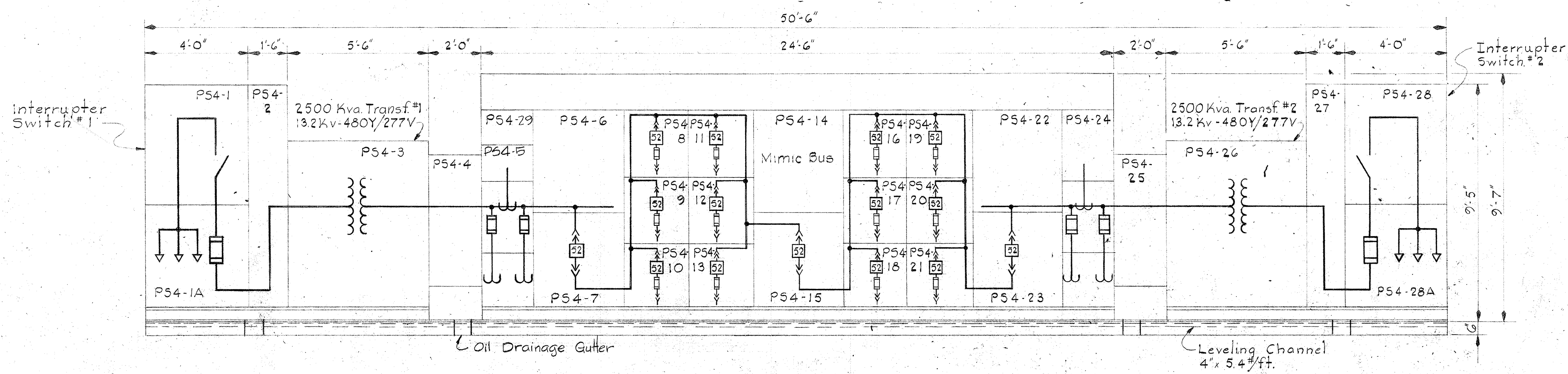
**OUTDOOR PRIMARY SUBSTATION "PS4" WIRING DIAGRAMS**

**SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4**

**DRAWING NO. 72 OF 96**

**SCALE AS SHOWN**





- NOTES:**
1. For General Electrical Notes and Legend, see Sheet E-2.
  2. \* - Indicates interrupting capacity in thousands.
  3. For Mimic Bus Elementary Control Diagrams see Sheet E-4.

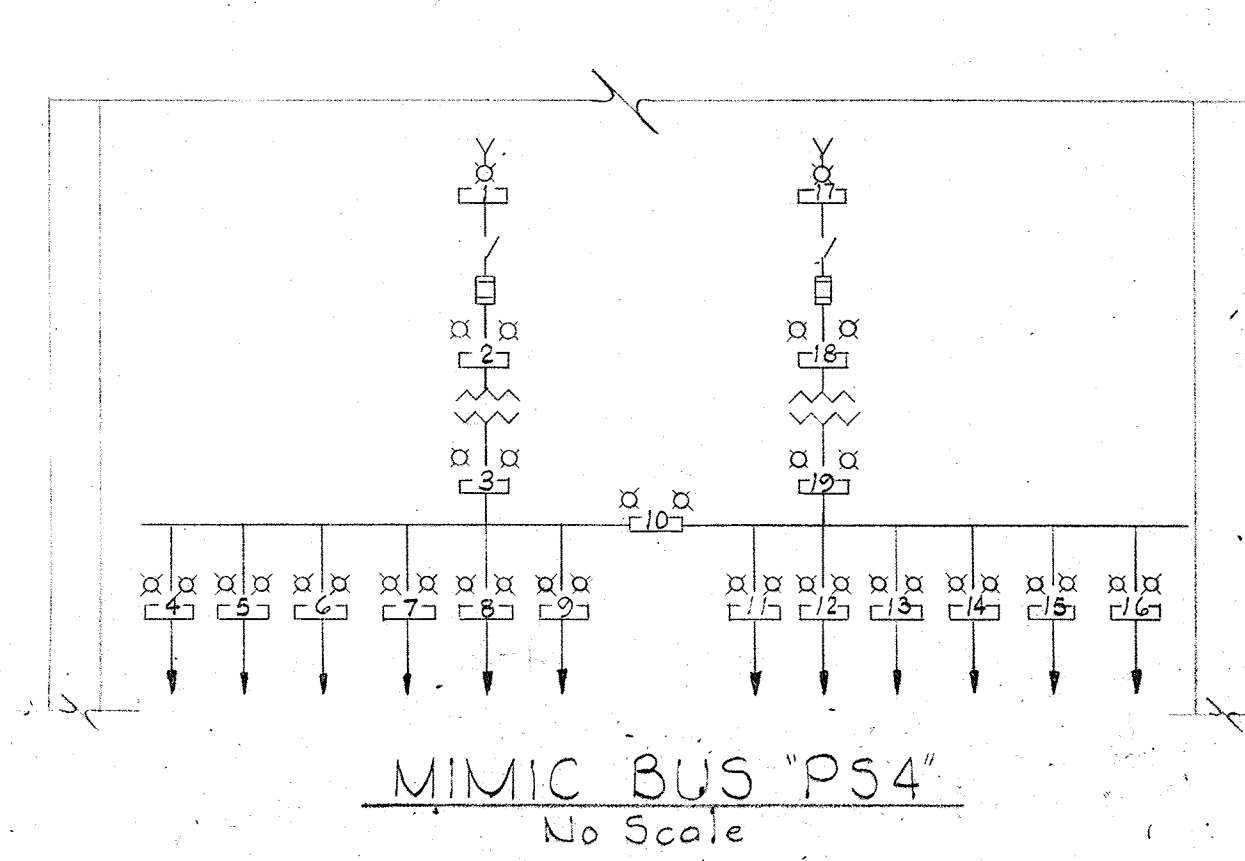
**ELEVATION - OUTDOOR PRIMARY SUBSTATION "PS4"**  
Scale: 3/8" = 1'-0"

**OUTDOOR PRIMARY SUBSTATION "PS4" SCHEDULE - 13.2 KV-480Y/277V**

| UNIT NUMBER | NAMEPLATE DATA                          | DEVICE DESCRIPTION   | AUX. DESCR. | BREAKER OR FUSED SWITCH |      |        |              | RUN NUMBER      | WIRE OR BUS |      |                 | GRD. COND. WIRE SIZE |        |          |
|-------------|---|--|-------------|-------------------------|------|--------|--------------|-----------------|-------------|------|-----------------|----------------------|--------|----------|
|             |   |  |             | FRAME                   | POLE | CALIB. | SIC.* RATING |                 | TYPE        | NO.  | SIZE            |                      | TYPE   |          |
| PS4-1       | MAIN SWITCH FEEDER No. 1                | Interrupter Switch Single Throw, gang operated                   | See Spec.   | 600A                    | 3    | —      | 60           | 15KV Load Break | PS4-28a     | 3    | 500 MCM         | 15KV                 | 1/0    | See Dwg. |
| PS4-1A      | MAIN SWITCH FEEDER No. 1                | Fuses (3)  | See Spec.   | —                       | —    | —      | —            | 15KV C.L.       | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-2       | —                                       | Transition Section   | —           | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-3       | Standard Nameplates                     | 2500KVa Transformer #1 13.2 kv - 480Y/277V                       | See Spec.   | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-4       | —                                       | Transition Section   | —           | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-5       | Standard Nameplates                     | Control Power Transf., Panelbd, Potential Transf., Curr. Transf. | See Spec.   | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-6       | Standard Nameplates                     | Meters, Switches, Protective Relays                              | See Spec.   | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-7       | MAIN BREAKER FEEDER No. 1               | Power Circuit Breaker Drawout Mounting                           | See Spec.   | 4000A                   | 3    | 4000A  | 85           | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-8       | MAINTENANCE BLDG. MCC "CCB" FEEDER      | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 700A   | 200          | —               | —           | —    | By Others       | —                    | —      | —        |
| PS4-9       | BLANK (Spare)                           | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1200A  | 200          | —               | —           | —    | —               | —                    | —      | —        |
| PS4-10      | FILTRATION BLDG. MCC "CC11" FEEDER #1   | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1000A  | 200          | —               | PS4-10a     | 2(3) | 750 MCM         | See Spec.            | 2(1/0) | 2(4)     |
| PS4-11      | ADMINISTRATION BLDG. FEEDER #1          | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 700A   | 200          | —               | —           | —    | By Others       | —                    | —      | —        |
| PS4-12      | BLANK (Spare)                           | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1200A  | 200          | —               | —           | —    | —               | —                    | —      | —        |
| PS4-13      | DISINFECTION BLDG. MCC "CC12" FEEDER #1 | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 600A   | 200          | —               | PS4-13a     | 2(3) | 350 MCM         | See Spec.            | 2(2)   | 2(4)     |
| PS4-14      | See Drawings                            | Mimic Bus, Indicating Lights                                     | See Spec.   | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-15      | TIE BREAKER                             | Power Circuit Breaker Drawout Mounting                           | See Spec.   | 4000A                   | 3    | —      | 200          | —               | —           | —    | By Manufacturer | —                    | —      | —        |
| PS4-16      | BLANK (Spare)                           | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1200A  | 200          | —               | —           | —    | —               | —                    | —      | —        |
| PS4-17      | BLANK (Spare)                           | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1200A  | 200          | —               | —           | —    | —               | —                    | —      | —        |
| PS4-18      | DISINFECTION BLDG. MCC "CC12" FEEDER #2 | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 600A   | 200          | —               | PS4-18a     | 2(3) | 350 MCM         | See Spec.            | 2(2)   | 2(4)     |
| PS4-19      | ADMINISTRATION BLDG. FEEDER #2          | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 700A   | 200          | —               | —           | —    | By Others       | —                    | —      | —        |
| PS4-20      | BLANK (Spare)                           | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1200A  | 200          | —               | —           | —    | —               | —                    | —      | —        |
| PS4-21      | FILTRATION BLDG. MCC "CC11" FEEDER #2   | Fused Power Circuit Breaker Drawout Mounting                     | See Spec.   | 1600A                   | 3    | 1000A  | 200          | —               | PS4-21a     | 2(3) | 750 MCM         | See Spec.            | 2(1/0) | 2(4)     |
| PS4-22      | Standard Nameplates                     | Meters, Switches, Protective Relays                              | See Spec.   | —                       | —    | —      | —            | —               | —           | —    | By Manufacturer | —                    | —      | —        |

**OUTDOOR PRIMARY SUBSTATION "PS4" SCHEDULE - 13.2 KV-480Y/277V**

| UNIT NUMBER | NAMEPLATE DATA            | DEVICE DESCRIPTION                                      | AUX. DESCR. | BREAKER OR FUSED SWITCH |      |        |              | RUN NUMBER      | WIRE OR BUS |     |                 | GRD. COND. WIRE SIZE |      |          |
|-------------|---------------------------|---|-------------|-------------------------|------|--------|--------------|-----------------|-------------|-----|-----------------|----------------------|------|----------|
|             |                           |   |             | FRAME                   | POLE | CALIB. | SIC.* RATING |                 | TYPE        | NO. | SIZE            |                      | TYPE |          |
| PS4-23      | MAIN BREAKER FEEDER No. 2 | Power Circuit Breaker Drawout Mounting                  | See Spec.   | 4000A                   | 3    | 4000A  | 85           | —               | —           | —   | By Manufacturer | —                    | —    | —        |
| PS4-24      | Standard Nameplates       | Control Power Transf., Potential Transf., Curr. Transf. | See Spec.   | —                       | —    | —      | —            | —               | —           | —   | By Manufacturer | —                    | —    | —        |
| PS4-25      | —                         | Transition Section                                      | —           | —                       | —    | —      | —            | —               | —           | —   | By Manufacturer | —                    | —    | —        |
| PS4-26      | Standard Nameplates       | 2500KVa Transformer #2 13.2 kv - 480Y/277V              | See Spec.   | —                       | —    | —      | —            | —               | —           | —   | By Manufacturer | —                    | —    | —        |
| PS4-27      | —                         | Transition Section                                      | —           | —                       | —    | —      | —            | —               | —           | —   | By Manufacturer | —                    | —    | —        |
| PS4-28      | MAIN SWITCH FEEDER No. 2  | Interrupter Switch, Single Throw, gang operated         | See Spec.   | 600A                    | 3    | —      | 60           | 15KV Load Break | PS4-1a      | 3   | 500 MCM         | 15KV                 | 1/0  | See Dwg. |
| PS4-28A     | MAIN SWITCH FEEDER No. 2  | Fuses (3)   | See Spec.   | —                       | —    | —      | —            | 15KV C.L.       | —           | —   | By Manufacturer | —                    | —    | —        |
| PS4-29      | ANNUNCIATOR #15           | 16 Point Annunciator                                    | See Spec.   | —                       | —    | —      | —            | —               | —           | —   | See Dwg.        | 14                   | TAW  | —        |



**NAMEPLATE LEGEND MIMIC BUS PS4**

|  |   |
|--|---|
| 1. FEEDER #1                           | 11. Blank (Spare)                       |
| 2. MAIN SWITCH FEEDER #1               | 12. DISINFECTION BLDG. "CC12" FEEDER #2 |
| 3. MAIN BREAKER FEEDER #1              | 13. FILTRATION BLDG "CC11" FEEDER #2    |
| 4. MAINTENANCE BLDG. "CCB"             | 14. ADMINISTRATION BLDG. FEEDER #2      |
| 5. Blank (Spare)                       | 15. Blank (Spare)                       |
| 6. ADMINISTRATION BLDG. FEEDER #1      | 16. Blank (Spare)                       |
| 7. FILTRATION BLDG. "CC11" FEEDER #1   | 17. FEEDER #2                           |
| 8. DISINFECTION BLDG. "CC12" FEEDER #1 | 18. MAIN SWITCH FEEDER #2               |
| 9. Blank (Spare)                       | 19. MAIN BREAKER FEEDER #2              |
| 10. TIE BREAKER                        |   |



|  |   |                           |  |   |                             |                       |
|--|---|---------------------------|--|---|-----------------------------|-----------------------|
| <b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | <b>DEPARTMENT OF PUBLIC WORKS</b><br>HOWARD COUNTY, MARYLAND<br>DATE: _____ CHIEF-BUREAU OF ENGINEERING | <b>CONTRACT NO. 502-S</b> | <b>OUTDOOR PRIMARY SUBSTATION "PS4"</b><br><b>ELEVATION AND SCHEDULE</b> | <b>SAVAGE WASTEWATER</b><br><b>TREATMENT PLANT ADDITION NO. 4</b> | <b>DRAWING NO. 73 OF 96</b> | <b>SCALE AS SHOWN</b> |
|--|---|---------------------------|--|---|-----------------------------|-----------------------|

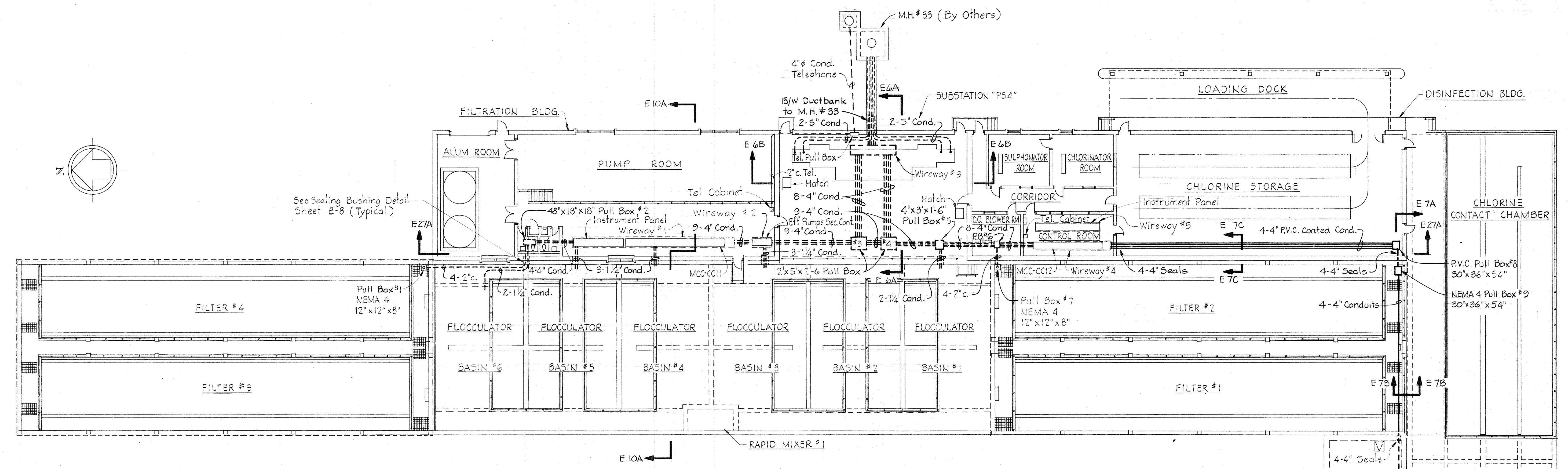




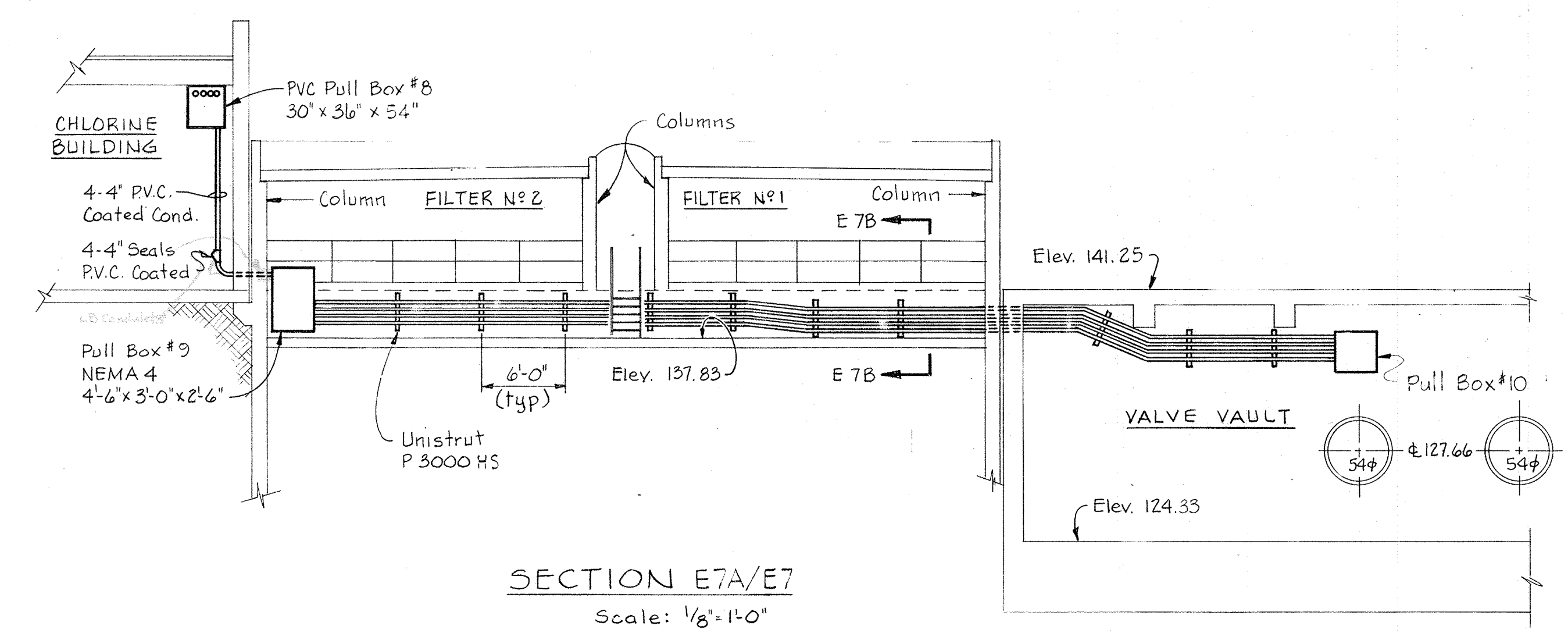


**NOTES**

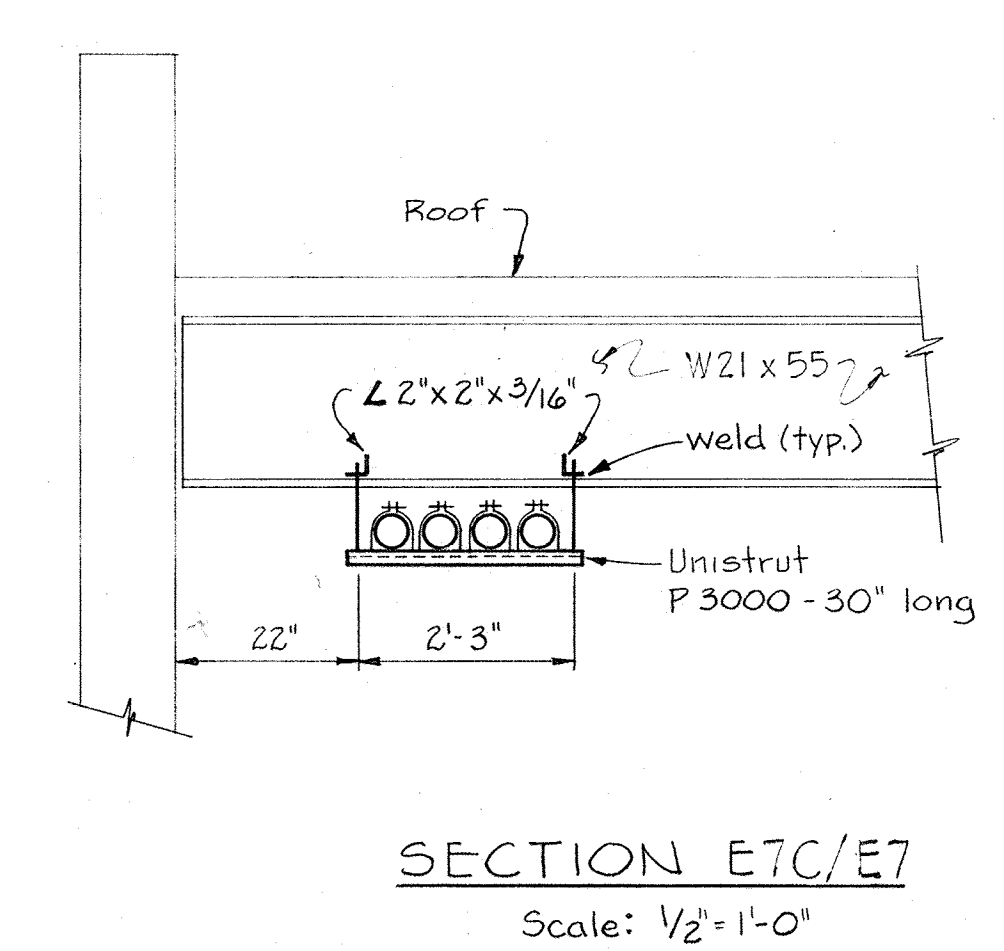
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.



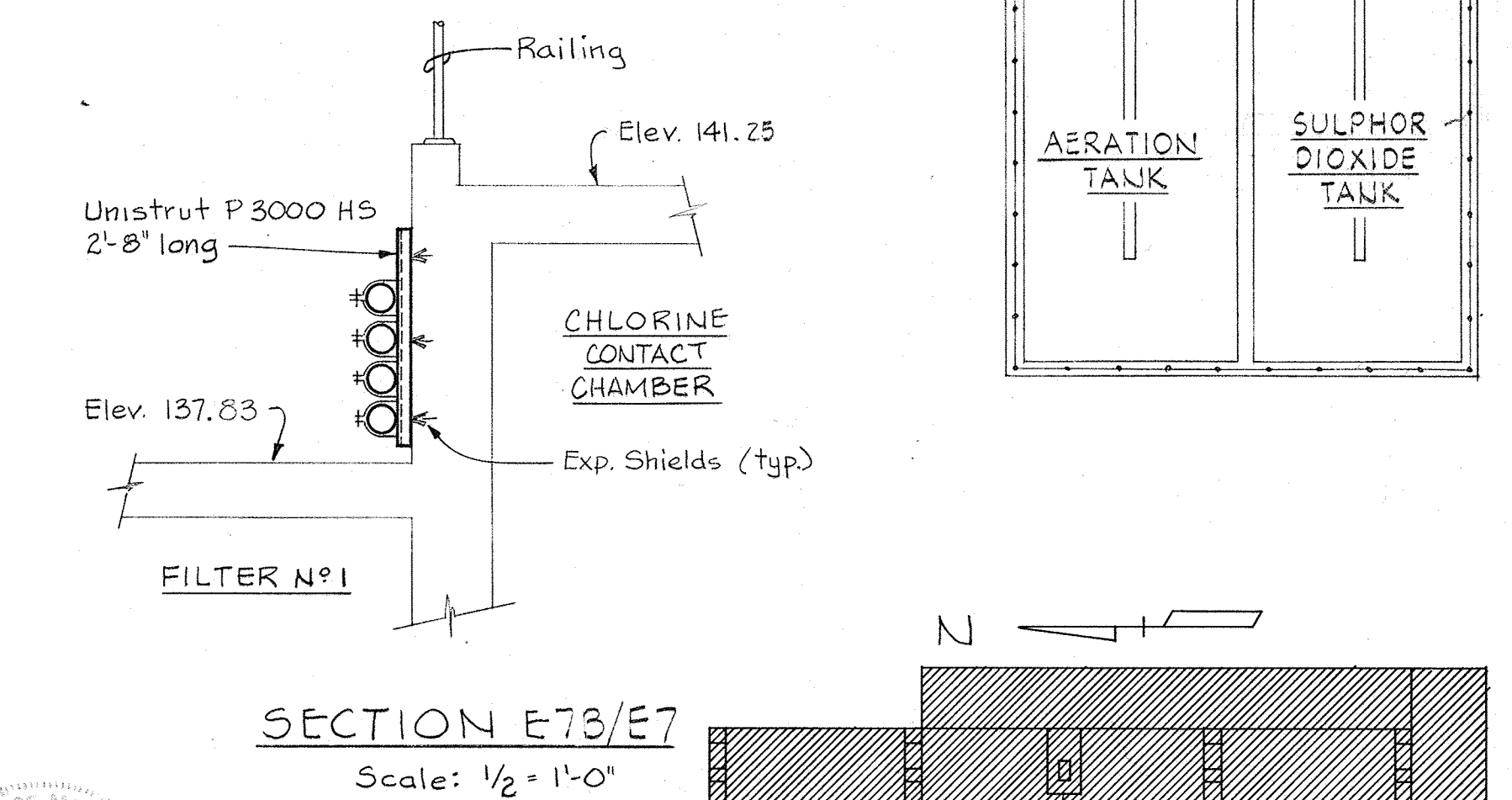
**PLAN-FILTRATION & DISINFECTION FACILITIES**  
Scale: 1/16" = 1'-0"



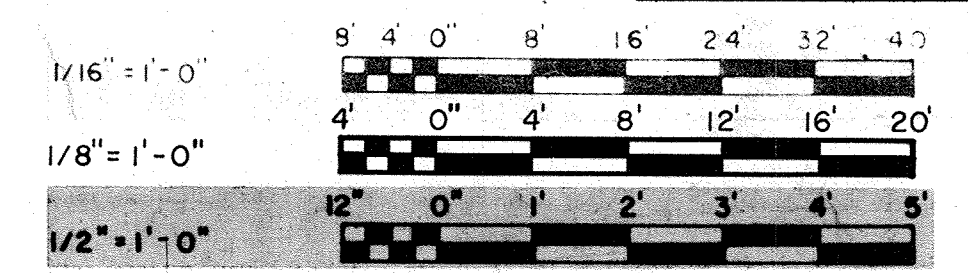
**SECTION E7A/E7**  
Scale: 1/8" = 1'-0"



**SECTION E7C/E7**  
Scale: 1/2" = 1'-0"



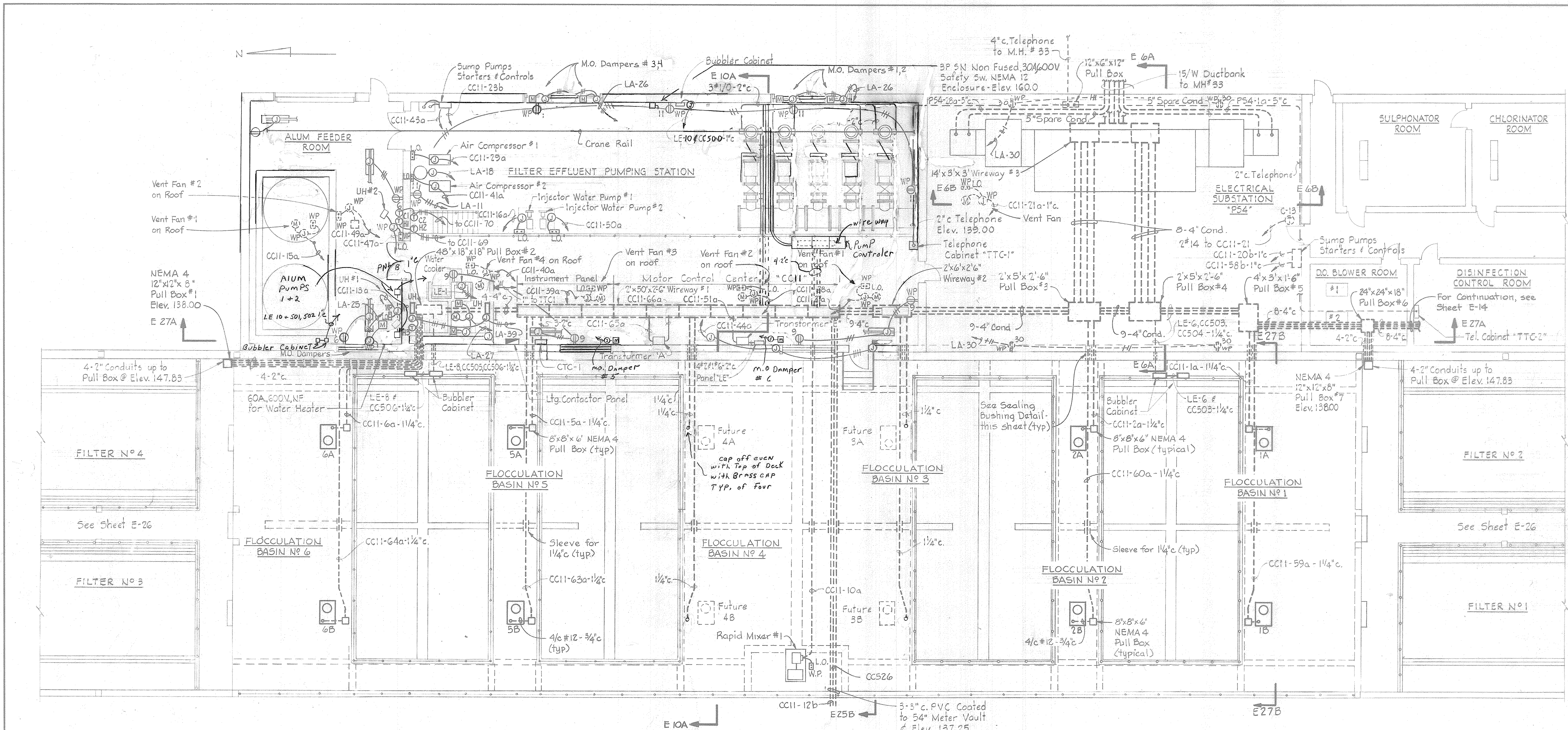
**SECTION E7B/E7**  
Scale: 1/2" = 1'-0"



**KEY PLAN**

|   |  |                                  |   |   |  |
|---|--|----------------------------------|---|---|--|
| <p>WHITMAN, REQUARDT &amp; ASSOCIATES<br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/><i>Richard L. Freudenberg</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. <u>502-S</u></p> | <p>FILTRATION &amp; DISINFECTION<br/>STRUCTURE<br/>KEY PLAN</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO. 4</p> | <p>DRAWING NO. <u>75</u><br/>OF <u>96</u><br/>SCALE<br/>AS SHOWN</p> |
|---|--|----------------------------------|---|---|--|

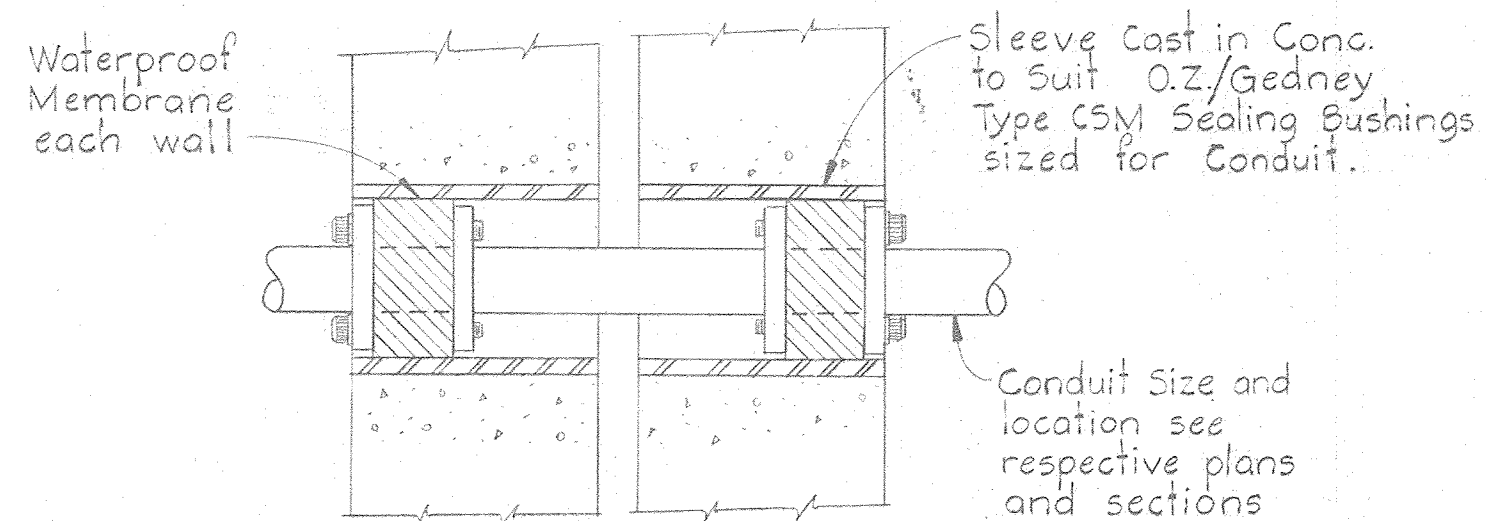




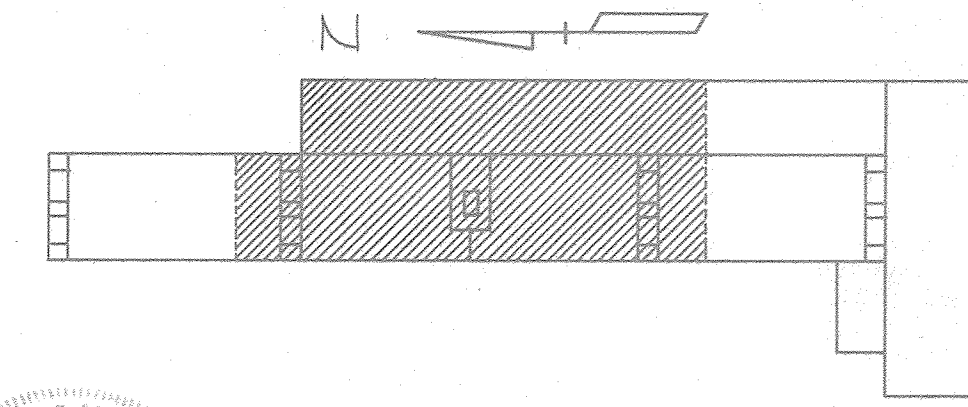
PLAN  
Scale: 1/8"=1'-0"

NOTES

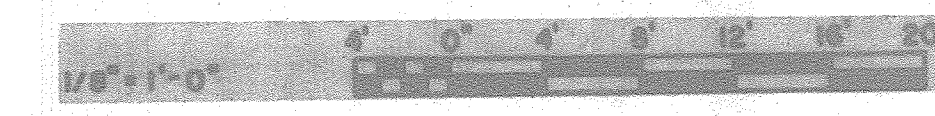
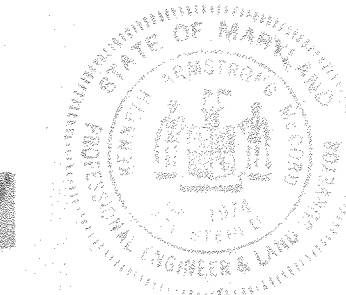
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
2. For Instrumentation wiring see Sheets E-23, E-28.
3. For Lighting Plan see Sheet E-9.
4. For Fire Alarm System see Sheet E-20.



SEALING BUSHING DETAIL  
FOR CONDUITS RUNNING BETWEEN  
FLOCCULATION & FILTRATION/DISINFECTION STRUCTURES

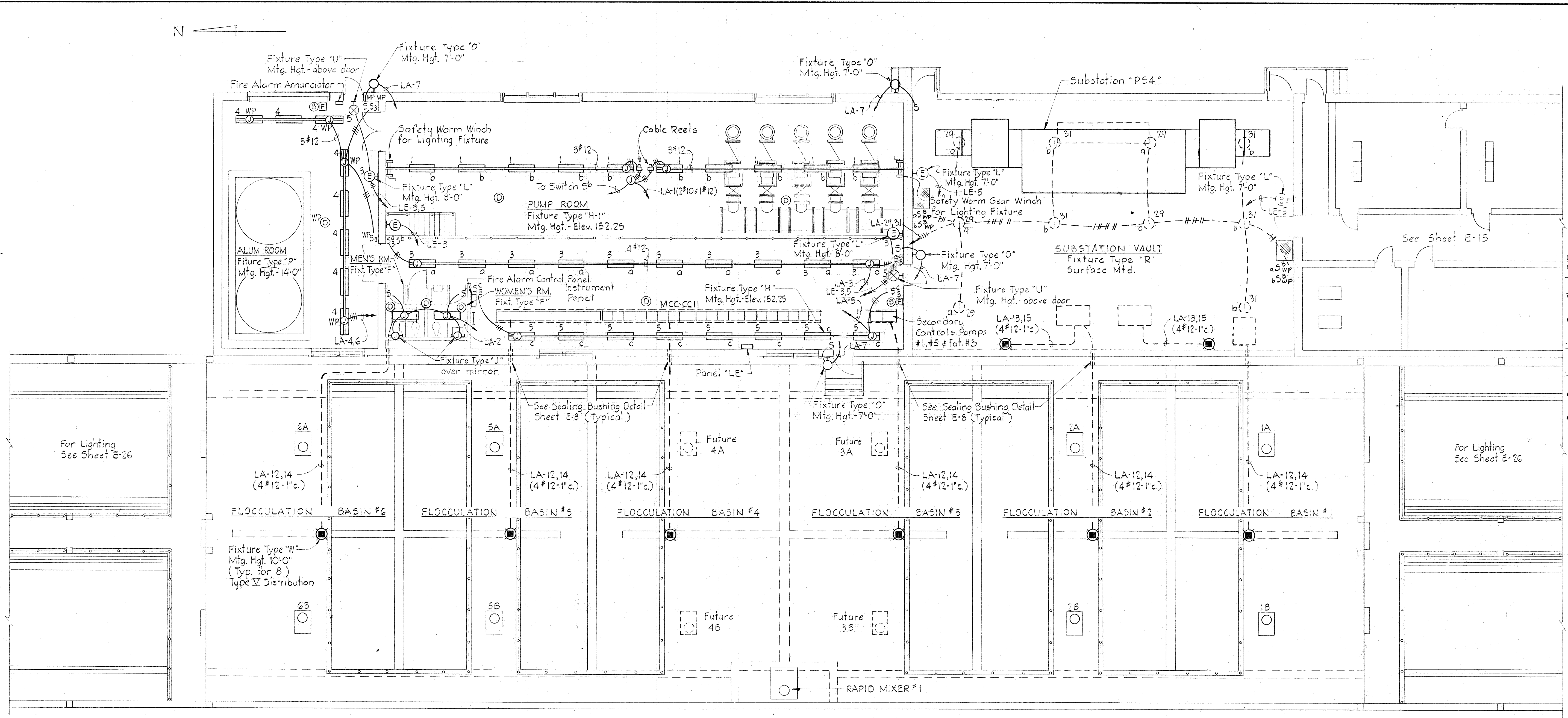


KEY PLAN



|   |   |                    |   |   |   |
|---|---|--------------------|---|---|---|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE 12/13/77<br>Richard E. Sullivan<br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION<br>CONTROL BLDG & SUBSTATION<br>POWER PLAN | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 76<br>OF 96<br>SCALE AS SHOWN |
|---|---|--------------------|---|---|---|

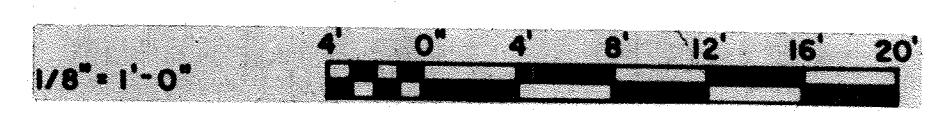
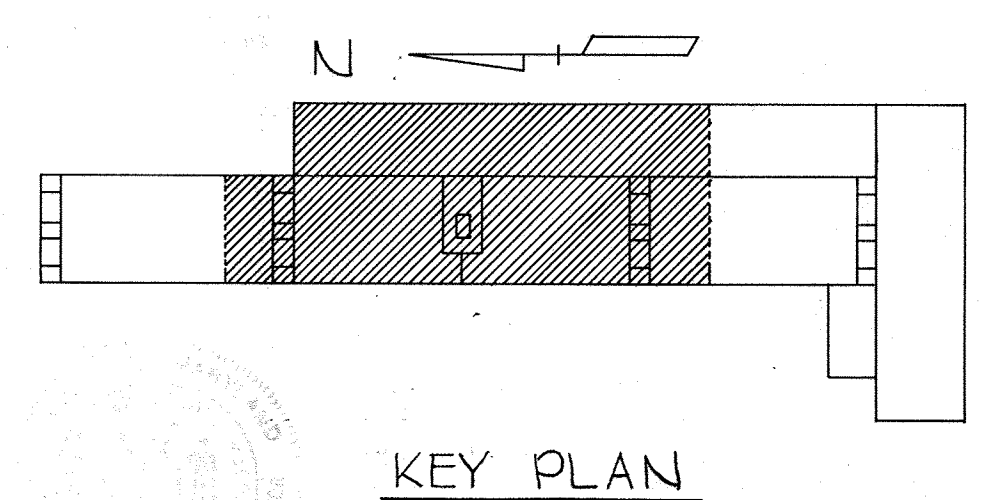




**LIGHTING PLAN**  
Scale: 1/8" = 1'-0"

**NOTES**

1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
2. For Fire Alarm System wiring see Sheet E-20.



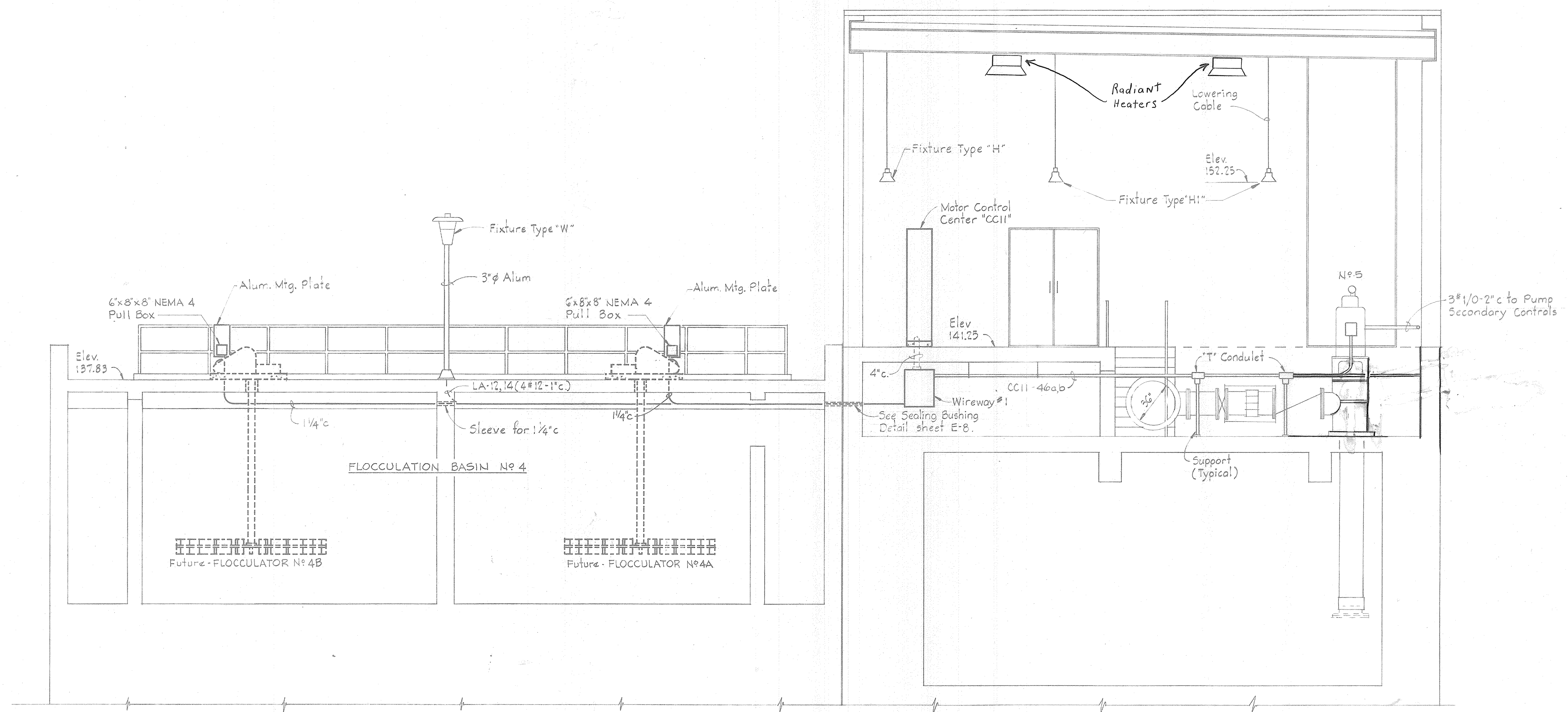
|   |  |                           |  |   |  |
|---|--|---------------------------|--|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard S. ...</i><br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. <u>502-S</u> | FILTRATION<br>CONTROL BLDG & SUBSTATION<br>LIGHTING PLAN | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING<br>NO. <u>77</u><br>OF <u>96</u><br>SCALE<br>AS<br>SHOWN |
|---|--|---------------------------|--|---|--|

BRUNING 44-510 32872

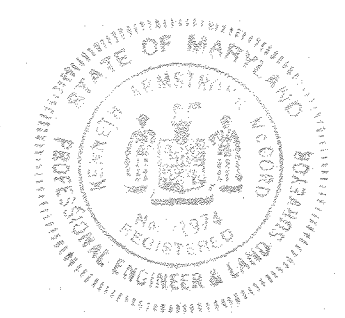
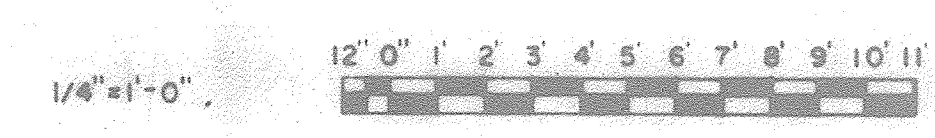


**NOTES**

1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.

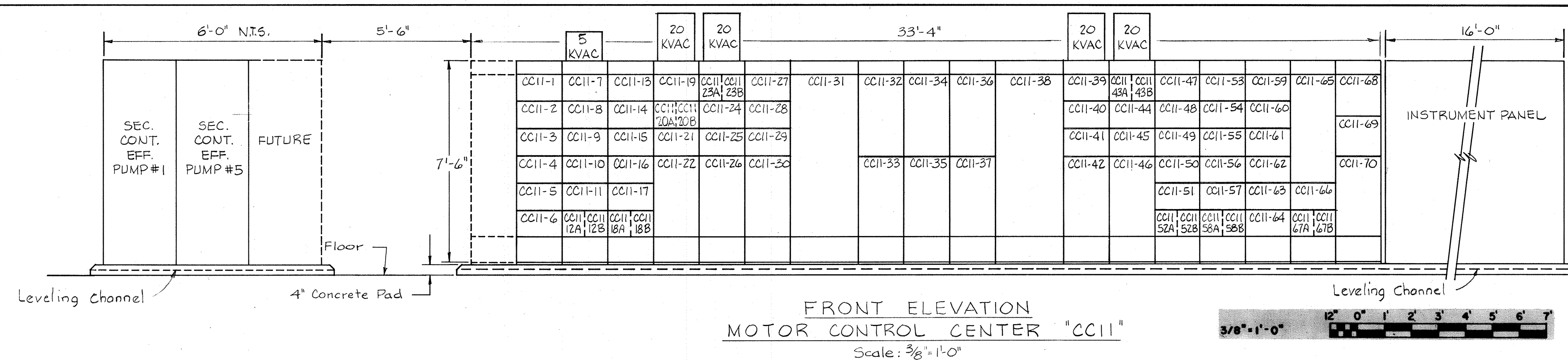


**SECTION E10A/E8**  
Scale: 1/4"=1'-0"



|   |  |                    |                                  |   |                            |                      |
|---|--|--------------------|----------------------------------|---|----------------------------|----------------------|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE: 12/13/77<br>Robert E. Boudreau<br>CHIEF, BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION<br>SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING<br>NO. 78<br>OF 96 | SCALE<br>AS<br>SHOWN |
|---|--|--------------------|----------------------------------|---|----------------------------|----------------------|





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

FRONT ELEVATION  
MOTOR CONTROL CENTER "CCII"  
Scale: 3/8"=1'-0"

MOTOR CONTROL CENTER SCHEDULE "CCII" - 480V - 3φ - 3W - 60Hz.

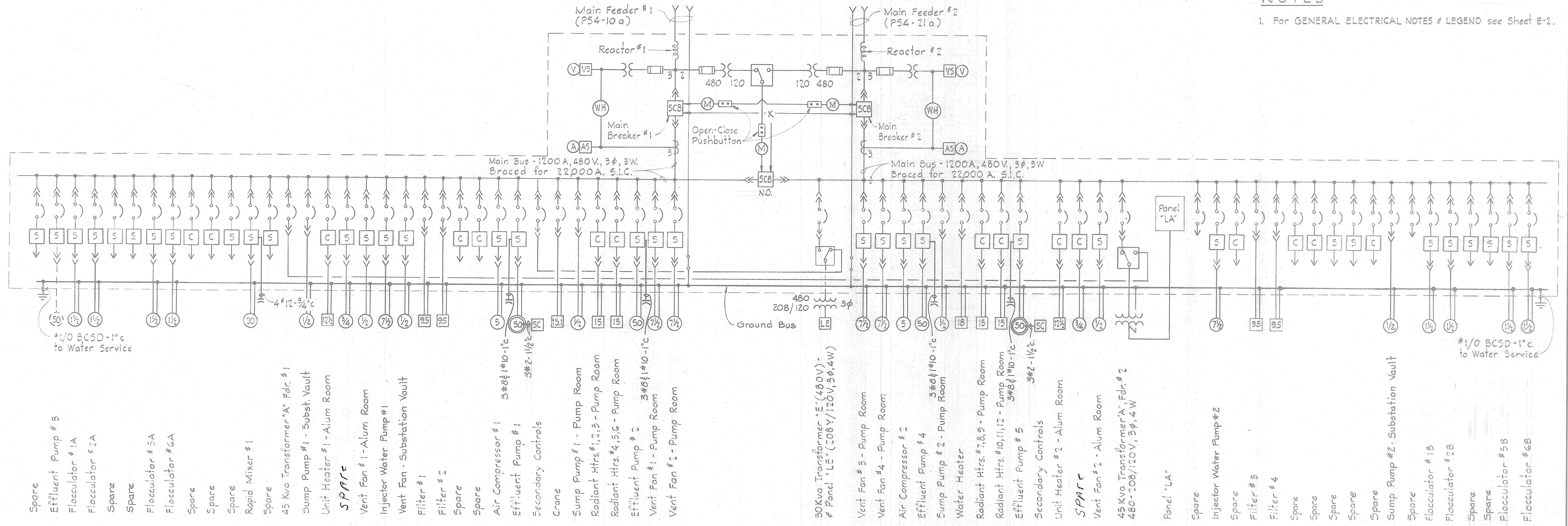
| UNIT NUMBER | NAMEPLATE DATA                | DEVICE DESCRIPTION                                  | HP or KVA | AUX. DESCR. | BREAKER or MCP | FRAME | POLE | CALIB. | SIC      | RUN NUMBER | WIRE-POWER | WIRE-CONTROL | GRD WIRE | COND. SIZE | E.C.D. No. & SHEET No. |          |          |                |      |     |      |      |          |            |                        |  |
|-------------|-------------------------------|---|-----------|-------------|----------------|-------|------|--------|----------|------------|------------|--------------|----------|------------|------------------------|----------|----------|----------------|------|-----|------|------|----------|------------|------------------------|--|
|             |                               |   |           |             |                |       |      |        |          |            | NO.        | SIZE         | TYPE     | NO.        | SIZE                   | TYPE     | NO.      | SIZE           | TYPE | NO. | SIZE | TYPE | GRD WIRE | COND. SIZE | E.C.D. No. & SHEET No. |  |
| CCII-1      | FLOCCULATOR #1A               | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     | CCII-1a  | 4/c        | 12         | See Spec     | 4/c      | 14         | See Spec               | 12; E-13 |          |                |      |     |      |      |          |            |                        |  |
| CCII-2      | FLOCCULATOR #2A               | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     | CCII-2a  | 4/c        | 12         | See Spec     | 4/c      | 14         | See Spec               | 12; E-13 |          |                |      |     |      |      |          |            |                        |  |
| CCII-3      | BLANK (Spare)                 | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-4      | BLANK (Spare)                 | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-5      | FLOCCULATOR #5A               | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     | CCII-5a  | 4/c        | 12         | See Spec     | 4/c      | 14         | See Spec               | 12; E-13 |          |                |      |     |      |      |          |            |                        |  |
| CCII-6      | FLOCCULATOR #6A               | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     | CCII-6a  | 4/c        | 12         | See Spec     | 4/c      | 14         | See Spec               | 12; E-13 |          |                |      |     |      |      |          |            |                        |  |
| CCII-7      | BLANK (Spare)                 | Combination Contactor NEMA Size 1, FVNR             |           | a,b,c,d     | 100            | 3     | 15   | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-8      | BLANK (Spare)                 | Combination Contactor NEMA Size 1, FVNR             |           | a,b,c,d     | 100            | 3     | 15   | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-9      | BLANK (Spare)                 | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c,d     | 100            | 3     | 10x  | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-10     | RAPID MIXER #1                | Combination Starter NEMA Size 2, FVNR               | 20        | a,b,c       | 100            | 3     | 10x  | 22     | CCII-10a | 3          | 8          | THW          | 2        | 14         | THW                    | 10       | 1 1/2"   | 8              | E-13 |     |      |      |          |            |                        |  |
| CCII-11     | BLANK (Spare)                 | Combination Starter NEMA Size 1, FVNR               | 10        | a,b,c       | 100            | 3     | 10X  | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-12A    | 45 KVA TRANS "A" FDR #1       | Circuit Breaker                                     | 45        |             | 100            | 3     | 60   | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-12B    | 54" METER VAULT               | Circuit Breaker                                     | 28        |             | 250            | 3     | 150  | 22     | CCII-12b | 3/c        | 2/0        | Spec.        |          |            | W/3φ                   | Dwg.     |          |                |      |     |      |      |          |            |                        |  |
| CCII-13     | ALUM ROOM UNIT HEATER #1      | Combination Contactor NEMA Size 2, FVNR             | 12 1/2    | a,b,c,d     | 100            | 3     | 30   | 22     | CCII-13a | 3          | 10         | THW          | 2        | 14         | THW                    | 12       | 1"       | 6,7; E-13      |      |     |      |      |          |            |                        |  |
| CCII-14     | SPARE                         | Combination Starter NEMA Size 1, FVNR               | 3/4       | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-14a | 3          | 12         | THW          | 4        | 14         | THW                    | 12       | 1"       | 11; E-13       |      |     |      |      |          |            |                        |  |
| CCII-15     | ALUM ROOM VENT FAN #1         | Combination Starter NEMA Size 1, FVNR               | 1/2       | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-15a | 3          | 12         | THW          | 2        | 14         | THW                    | 12       | 1"       | 33,34; E-12    |      |     |      |      |          |            |                        |  |
| CCII-16     | INJECTOR WATER PUMP #1        | Combination Starter NEMA Size 1, FVNR               | 7 1/2     | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-16a | 3          | 12         | THW          | 2        | 14         | THW                    | 12       | 1"       | 5; E-13        |      |     |      |      |          |            |                        |  |
| CCII-17     | BLANK (Spare)                 | Combination Starter NEMA Size 2, FVNR               | 20        | a,b,c       | 100            | 3     | 10X  | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-18A    | FILTER #1                     | Circuit Breaker                                     | 9.5       |             | 100            | 3     | 30   | 22     | CCII-18a | 4/c        | 8          | See Spec.    |          |            | 8                      | See Dwg. |          |                |      |     |      |      |          |            |                        |  |
| CCII-18B    | FILTER #2                     | Circuit Breaker                                     | 9.5       |             | 100            | 3     | 30   | 22     | CCII-18b | 4/c        | 8          | See Spec.    |          |            | 8                      | See Dwg. |          |                |      |     |      |      |          |            |                        |  |
| CCII-19     | BLANK (Spare)                 | Combination Contactor NEMA Size 2, FVNR             | 15        | a,b,c,d     | 100            | 3     | 30   | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-20A    | 30KVA TRANS "E" FDR #1        | Circuit Breaker                                     | 30        |             | 100            | 3     | 50   | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-20B    | SUMP PUMP #1-SUBST. VAULT     | Circuit Breaker                                     | 1/2       |             | 100            | 3     | 15   | 22     | CCII-20b | 3          | 12         | THW          |          |            | 12                     | Dwg.     |          |                |      |     |      |      |          |            |                        |  |
| CCII-21     | SUBSTATION VAULT VENT FAN     | Combination Starter NEMA Size 1, FVNR               | 1/2       | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-21a | 3          | 12         | THW          | 2        | 14         | THW                    | 12       | See Dwg. | 28,29; E-18    |      |     |      |      |          |            |                        |  |
| CCII-22     | EFFLUENT PUMP #1              | Combination Starter NEMA Size 4, FVNR               | 50        | a,b,c,d,e   | 225            | 3     | 10X  | 22     | CCII-22a | 3          | 2          | THW          | 2        | 14         | THW                    | 4        | 1 1/2"   | 10; E-13       |      |     |      |      |          |            |                        |  |
| CCII-23A    | CRANE FEEDER                  | Circuit Breaker                                     | 11.3      |             | 100            | 3     | 20   | 22     | CCII-23a | 3          | 10         | THW          |          |            | 12                     | 1"       |          |                |      |     |      |      |          |            |                        |  |
| CCII-23B    | SUMP PUMP #1-PUMP RM          | Circuit Breaker                                     | 1/2       |             | 100            | 3     | 20   | 22     | CCII-23b | 3          | 12         | THW          |          |            | 12                     | 1"       |          |                |      |     |      |      |          |            |                        |  |
| CCII-24     | PUMP ROOM RADIANT HTRS #1,2,3 | Combination Contactor NEMA Size 2, FVNR             | 15        | a,b,c,d     | 100            | 3     | 30   | 22     | CCII-24a | 3          | 10         | THW          | 2        | 14         | THW                    | 12       | 1"       | 1,2; E-13      |      |     |      |      |          |            |                        |  |
| CCII-25     | PUMP ROOM RADIANT HTRS #4,5,6 | Combination Contactor NEMA Size 2, FVNR             | 15        | a,b,c,d     | 100            | 3     | 30   | 22     | CCII-25a | 3          | 10         | THW          | 2        | 14         | THW                    | 12       | 1"       | 1,2; E-13      |      |     |      |      |          |            |                        |  |
| CCII-26     | EFFLUENT PUMP #2              | Combination Starter NEMA Size 4, FVNR               | 50        | a,b,c,d,e   | 225            | 3     | 10X  | 22     | CCII-26a | 3          | 2          | THW          | 2        | 14         | THW                    | 4        | 1 1/2"   | 9; E-13        |      |     |      |      |          |            |                        |  |
| CCII-27     | PUMP ROOM VENT FAN #1         | Combination Starter NEMA Size 1, FVNR               | 7 1/2     | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-27a | 3          | 12         | THW          | 2        | 14         | THW                    | 12       | 1"       | 35,36,38; E-12 |      |     |      |      |          |            |                        |  |
| CCII-28     | PUMP ROOM VENT FAN #2         | Combination Starter NEMA Size 1, FVNR               | 7 1/2     | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-28a | 3          | 12         | THW          | 2        | 14         | THW                    | 12       | 1"       | 35,37,38; E-12 |      |     |      |      |          |            |                        |  |
| CCII-29     | AIR COMPRESSOR #1             | Combination Starter NEMA Size 1, FVNR               | 5         | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-29a | 3          | 12         | THW          | 2        | 14         | THW                    | 12       | 1"       | 3,4; E-13      |      |     |      |      |          |            |                        |  |
| CCII-30     | BLANK (Spare)                 | Combination Starter NEMA Size 4, FVNR               | 50        | a,b,c,d,e   | 225            | 3     | 10X  | 22     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-31     | INCOMING FEEDER #1            | 000A Current Limiting Reactor                       |           | See Spec.   |                |       |      |        | PS4-10a  | 2(3)       | 750 MCM    | See Spec.    |          |            | 2(1/2)                 | 2(4)     |          |                |      |     |      |      |          |            |                        |  |
| CCII-32     | Standard Nameplates           | Ammeter, Voltmeter, Watt-hour Sws, Ct's, Pt's, etc. |           | See Spec.   |                |       |      |        |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-33     | MAIN BREAKER #1               | System Circuit Breaker - Drawout                    |           | See Spec.   | 1200           | 3     | 1000 | 50     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-34     | ANNUNCIATOR #9                | Annunciator (12 point)                              |           | See Spec.   |                |       |      |        |          |            | See Dwg.   | 14           | THW      |            | See Dwg.               |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-35     | TIE BREAKER                   | System Circuit Breaker - Drawout                    |           | See Spec.   | 1200           | 3     | 1000 | 50     |          |            |            |              |          |            |                        |          |          |                |      |     |      |      |          |            |                        |  |

| UNIT NUMBER | NAMEPLATE DATA                      | DEVICE DESCRIPTION                                  | HP or KVA | AUX. DESCR. | BREAKER or MCP | FRAME | POLE | CALIB. | SIC      | RUN NUMBER | WIRE-POWER | WIRE-CONTROL | GRD WIRE  | COND. SIZE | E.C.D. No. & SHEET No. |          |          |                |      |     |      |      |          |            |                        |  |
|-------------|-------------------------------------|---|-----------|-------------|----------------|-------|------|--------|----------|------------|------------|--------------|-----------|------------|------------------------|----------|----------|----------------|------|-----|------|------|----------|------------|------------------------|--|
|             |                                     |   |           |             |                |       |      |        |          |            | NO.        | SIZE         | TYPE      | NO.        | SIZE                   | TYPE     | NO.      | SIZE           | TYPE | NO. | SIZE | TYPE | GRD WIRE | COND. SIZE | E.C.D. No. & SHEET No. |  |
| CCII-36     | Standard Nameplates                 | Ammeter, Voltmeter, Watt-hour Sws, Ct's, Pt's, etc. |           | See Spec.   |                |       |      |        |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-37     | MAIN BREAKER #2                     | System Circuit Breaker - Drawout                    |           | See Spec.   | 1200           | 3     | 1000 | 50     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-38     | INCOMING FEEDER #2                  | 000A Current Limiting Reactor                       |           | See Spec.   |                |       |      |        |          | PS4-21a    | 2(3)       | 750 MCM      | See Spec. |            |                        | 2(1/2)   | 2(4)     |                |      |     |      |      |          |            |                        |  |
| CCII-39     | PUMP ROOM VENT FAN #3               | Combination Starter NEMA Size 1, FVNR               | 7 1/2     | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-39a | 3          | 12         | THW          | 2         | 14         | THW                    | 12       | 1"       | 35,37,38; E-12 |      |     |      |      |          |            |                        |  |
| CCII-40     | PUMP ROOM VENT FAN #4               | Combination Starter NEMA Size 1, FVNR               | 7 1/2     | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-40a | 3          | 12         | THW          | 2         | 14         | THW                    | 12       | 1"       | 35,36,38; E-12 |      |     |      |      |          |            |                        |  |
| CCII-41     | AIR COMPRESSOR #2                   | Combination Starter NEMA Size 1, FVNR               | 5         | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-41a | 3          | 12         | THW          | 2         | 14         | THW                    | 12       | 1"       | 3,4; E-13      |      |     |      |      |          |            |                        |  |
| CCII-42     | EFFLUENT PUMP #4                    | Combination Starter NEMA Size 4, FVNR               | 50        | a,b,c,d,e   | 225            | 3     | 10X  | 22     | CCII-42a | 3          | 2          | THW          | 2         | 14         | THW                    | 4        | 1 1/2"   | 9; E-13        |      |     |      |      |          |            |                        |  |
| CCII-43A    | SUMP PUMP #2-PUMP RM                | Circuit Breaker                                     | 1/2       |             | 100            | 3     | 20   | 22     | CCII-43a | 3          | 12         | THW          |           |            | 12                     | 1"       |          |                |      |     |      |      |          |            |                        |  |
| CCII-43B    | WATER HEATER                        | Circuit Breaker                                     | 1/2       |             | 100            | 3     | 30   | 22     | CCII-43b | 3          | 10         | THW          |           |            | 12                     | 1"       |          |                |      |     |      |      |          |            |                        |  |
| CCII-44     | PUMP ROOM RADIANT HTR. #7,8,9       | Combination Contactor NEMA Size 2, FVNR             | 15        | a,b,c,d     | 100            | 3     | 30   | 22     | CCII-44a | 3          | 10         | THW          | 2         | 14         | THW                    | 12       | 1"       | 1,2; E-13      |      |     |      |      |          |            |                        |  |
| CCII-45     | PUMP ROOM RADIANT HTR #10,11,12     | Combination Contactor NEMA Size 2, FVNR             | 15        | a,b,c,d     | 100            | 3     | 30   | 22     | CCII-45a | 3          | 10         | THW          | 2         | 14         | THW                    | 12       | 1"       | 1,2; E-13      |      |     |      |      |          |            |                        |  |
| CCII-46     | EFFLUENT PUMP #5                    | Combination Starter NEMA Size 4, FVNR               | 50        | a,b,c,d,e   | 225            | 3     | 10X  | 22     | CCII-46a | 3          | 2          | THW          | 2         | 14         | THW                    | 4        | 1 1/2"   | 10; E-13       |      |     |      |      |          |            |                        |  |
| CCII-47     | ALUM ROOM UNIT HEATER #2            | Combination Contactor NEMA Size 2, FVNR             | 12 1/2    | a,b,c,d     | 100            | 3     | 30   | 22     | CCII-47a | 3          | 10         | THW          | 2         | 14         | THW                    | 12       | 1"       | 6,7; E-13      |      |     |      |      |          |            |                        |  |
| CCII-48     | SPARE                               | Combination Starter NEMA Size 1, FVNR               | 3/4       | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-48a | 3          | 12         | THW          | 4         | 14         | THW                    | 12       | 1"       | 11; E-13       |      |     |      |      |          |            |                        |  |
| CCII-49     | ALUM ROOM VENT FAN #2               | Combination Starter NEMA Size 1, FVNR               | 1/2       | a,b,c,d     | 100            | 3     | 10X  | 22     | CCII-49a | 3          | 12         | THW          | 2         | 14         | THW                    | 12       | 1"       | 33,34; E-12    |      |     |      |      |          |            |                        |  |
| CCII-50     | INJECTOR WATER PUMP #2              | Combination Starter NEMA Size 1, FVNR               | 7 1/2     | a,b,c,f     | 100            | 3     | 10X  | 22     | CCII-50a | 3          | 12         | THW          | 2         | 14         | THW                    | 12       | 1"       | 5; E-13        |      |     |      |      |          |            |                        |  |
| CCII-51     | TRANSFER SWITCH FOR TRANSFORMER "E" | Automatic Transfer Sw. 100A, 3P, 480V.              |           | See Spec.   |                |       |      |        | CCII-51a | 3          | 4          | THW          |           |            | 6                      | 1 1/2"   |          |                |      |     |      |      |          |            |                        |  |
| CCII-52A    | FILTER #3                           | Circuit Breaker                                     | 9.5       |             | 100            | 3     | 30   | 22     | CCII-52a | 4/c        | 8          | See Spec.    |           |            | 8                      | See Dwg. |          |                |      |     |      |      |          |            |                        |  |
| CCII-52B    | FILTER #4                           | Circuit Breaker                                     | 9.5       |             | 100            | 3     | 30   | 22     | CCII-52b | 4/c        | 8          | See Spec.    |           |            | 8                      | See Dwg. |          |                |      |     |      |      |          |            |                        |  |
| CCII-53     | BLANK (Spare)                       | Combination Contactor NEMA Size 1, FVNR             |           | a,b,c,d     | 100            | 3     | 15   | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-54     | BLANK (Spare)                       | Combination Contactor NEMA Size 1, FVNR             |           | a,b,c,d     | 100            | 3     | 15   | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-55     | BLANK (Spare)                       | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c,d     | 100            | 3     | 10X  | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-56     | BLANK (Spare)                       | Combination Starter NEMA Size 1, FVNR               | 5         | a,b,c,d     | 100            | 3     | 10X  | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-57     | BLANK (Spare)                       | Combination Contactor NEMA Size 1, FVNR             | 5         | a,b,c,d     | 100            | 3     | 15   | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-58A    | 30KVA TRANS "E" FDR #2              | Circuit Breaker                                     | 30        |             | 100            | 3     | 50   | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-58B    | SUMP PUMP #2-SUBST. VAULT           | Circuit Breaker                                     | 1/2       |             | 100            | 3     | 15   | 22     | CCII-58b | 3          | 12         | THW          |           |            | 12                     | Dwg.     |          |                |      |     |      |      |          |            |                        |  |
| CCII-59     | FLOCCULATOR #1B                     | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     | CCII-59a | 4/c        | 12         | See Spec     | 4/c       | 14         | See Spec               | 12       | See Dwg. | 12; E-13       |      |     |      |      |          |            |                        |  |
| CCII-60     | FLOCCULATOR #2B                     | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     | CCII-60a | 4/c        | 12         | See Spec     | 4/c       | 14         | See Spec               | 12       | See Dwg. | 12; E-13       |      |     |      |      |          |            |                        |  |
| CCII-61     | BLANK (Spare)                       | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       | 100            | 3     | 10X  | 22     |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |
| CCII-62     | BLANK (Spare)                       | Combination Starter NEMA Size 1, FVNR               | 1 1/2     | a,b,c       |                |       |      |        |          |            |            |              |           |            |                        |          |          |                |      |     |      |      |          |            |                        |  |



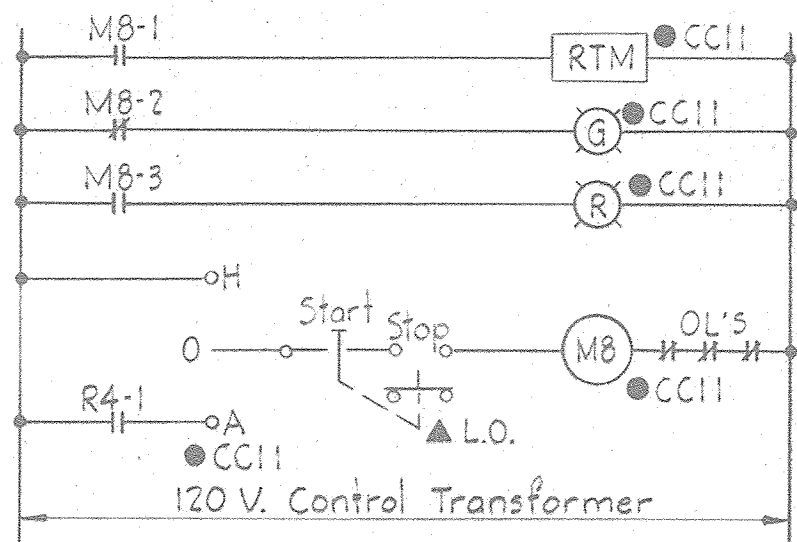
**NOTES**

1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.



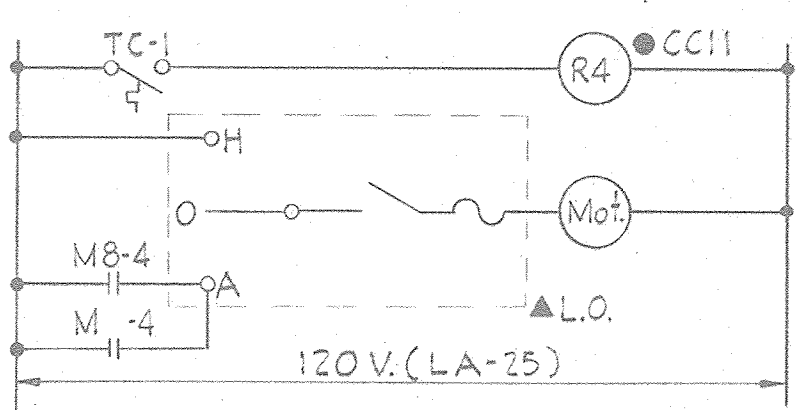
**ONE LINE WIRING DIAGRAM  
MOTOR CONTROL CENTER "CC11"**

- Spare
- Effluent Pump # 3
- Flocculator # 1A
- Flocculator # 2A
- Spare
- Spare
- Flocculator # 5A
- Flocculator # 6A
- Spare
- Spare
- Spare
- Rapid Mixer # 1
- Spare
- 45 Kva Transformer "A", Fdr. # 1
- Sump Pump # 1 - Subst. Vault
- Unit Heater # 1 - Alum Room
- SPARC**
- Vent Fan # 1 - Alum Room
- Injector Water Pump # 1
- Vent Fan - Substation Vault
- Filter # 1
- Filter # 2
- Spare
- Spare
- Air Compressor # 1
- Effluent Pump # 1
- Secondary Controls
- Crane
- Sump Pump # 1 - Pump Room
- Radiant Htrs. # 1, 2, 3 - Pump Room
- Radiant Htrs. # 4, 5, 6 - Pump Room
- Effluent Pump # 2
- Vent Fan # 1 - Pump Room
- Vent Fan # 2 - Pump Room
- 30 Kva Transformer "E" (480V) - # Panel "LE" (208Y/120V, 3φ, 4W)
- Vent Fan # 3 - Pump Room
- Vent Fan # 4 - Pump Room
- Air Compressor # 2
- Effluent Pump # 4
- Sump Pump # 2 - Pump Room
- Water Heater
- Radiant Htrs. # 7, 8, 9 - Pump Room
- Radiant Htrs. # 10, 11, 12 - Pump Room
- Effluent Pump # 5
- Secondary Controls
- Unit Heater # 2 - Alum Room
- SPARC**
- Vent Fan # 2 - Alum Room
- 45 Kva Transformer "A", Fdr. # 2
- 480-208/120V, 3φ, 4W
- Panel "LA"
- Spare
- Injector Water Pump # 2
- Spare
- Filter # 3
- Filter # 4
- Spare
- Spare
- Spare
- Spare
- Spare
- Sump Pump # 2 - Substation Vault
- Spare
- Flocculator # 1B
- Flocculator # 2B
- Spare
- Spare
- Flocculator # 5B
- Flocculator # 6B



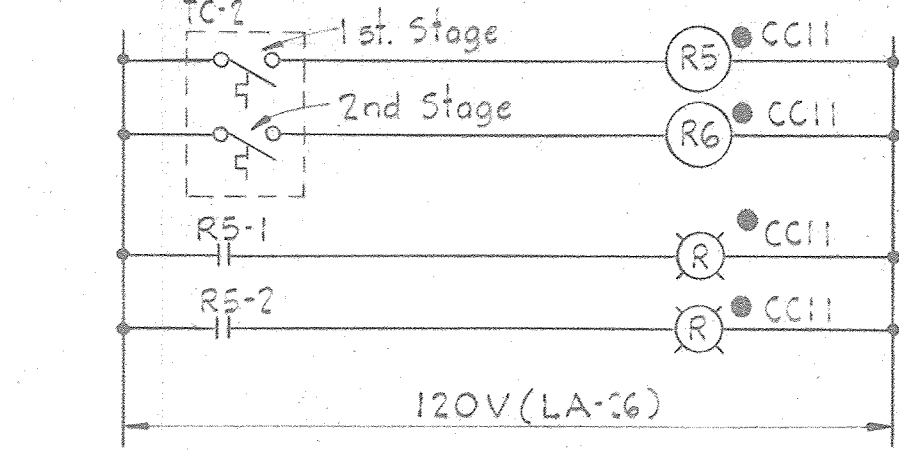
**ECD #33**  
ALUM ROOM - VENT FAN # 1

Typical for the following unit:  
1. Alum Room - Vent Fan # 2

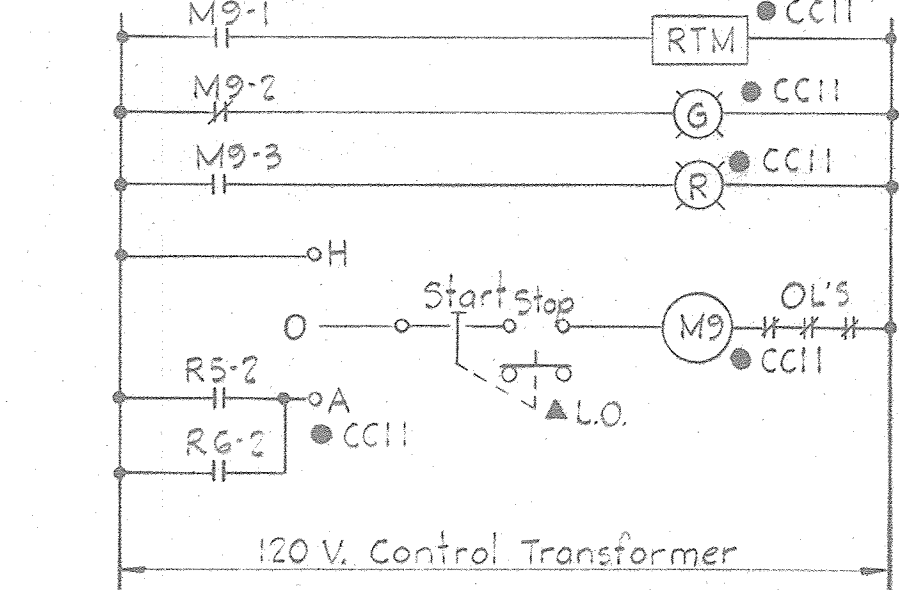


**ECD #34**  
ALUM ROOM - M.O. LOUVER # 1

Typical for the following units:  
1. Alum Room - M.O. Louver # 2

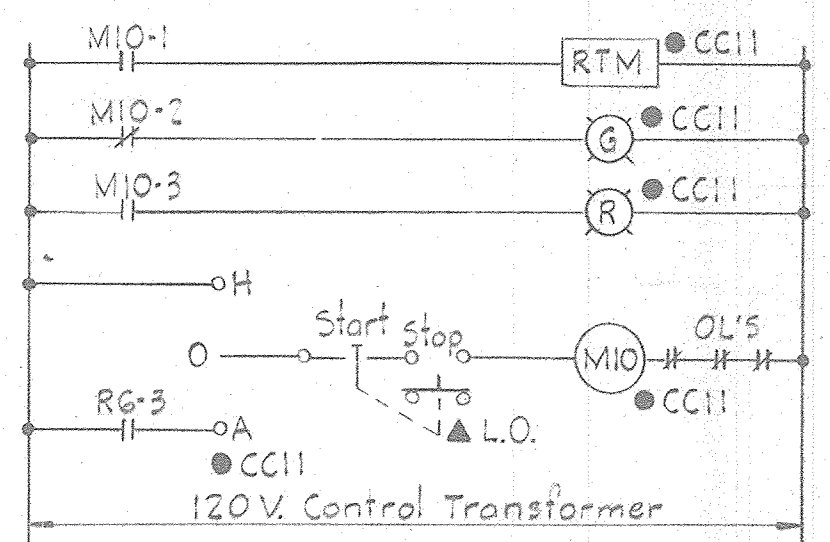


**ECD #35**  
CONTROL - PUMP ROOM VENT FANS



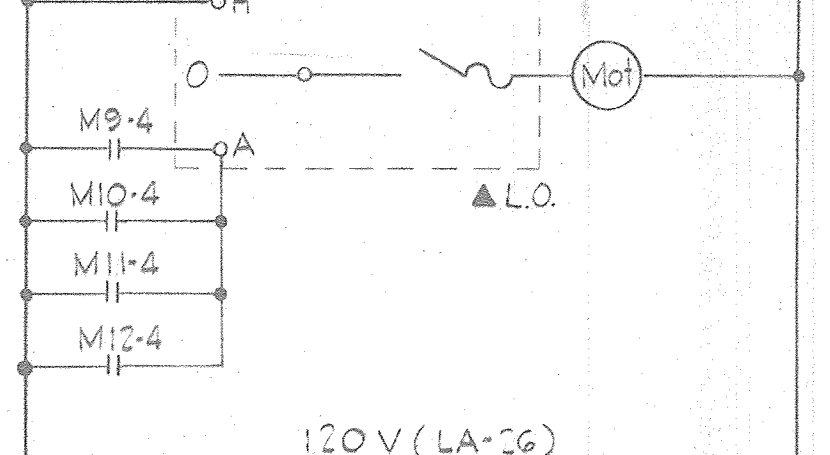
**ECD #36**  
PUMP ROOM - VENT FAN # 1

Typical for the following units:  
1. Pump Room - Vent Fan # 4



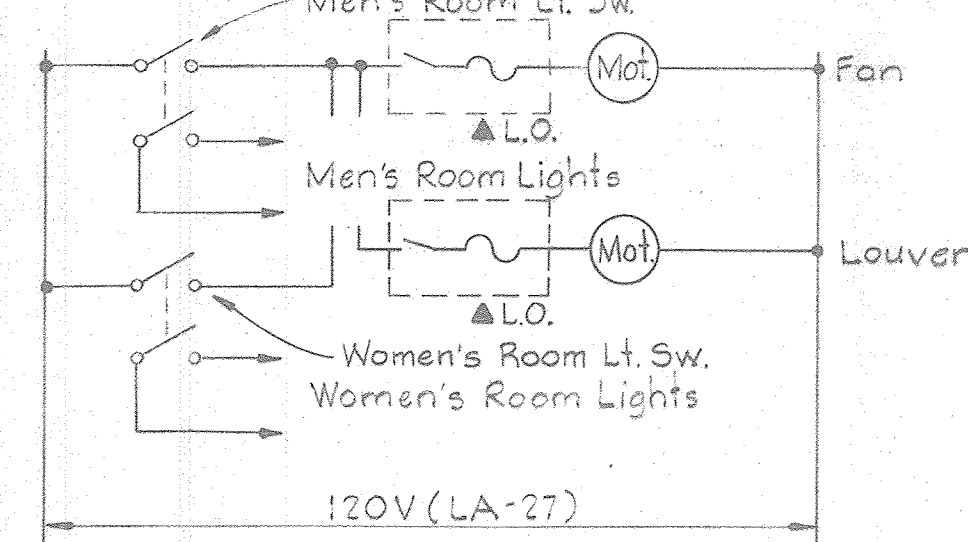
**ECD #37**  
PUMP ROOM - VENT FAN # 2

Typical for the following units:  
1. Pump Room - Vent Fan # 3

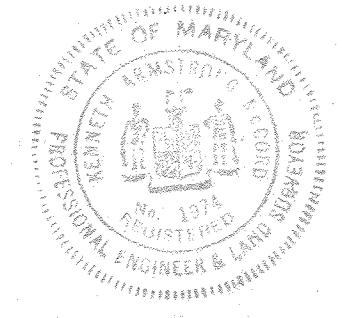


**ECD #38**  
PUMP ROOM - M.O. LOUVER # 1

Typical for the following units:  
1. Pump Room - M.O. Louvers # 2, # 3, # 4, # 5 & # 6



**ECD #39**  
TOILET ROOM - VENT FAN



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ENGINEERS  
1304 ST. PAUL ST.  
BALTIMORE, MARYLAND

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard E. Brudenberg  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FILTRATION  
MOTOR CONTROL CENTER "CC11"  
WIRING DIAGRAMS

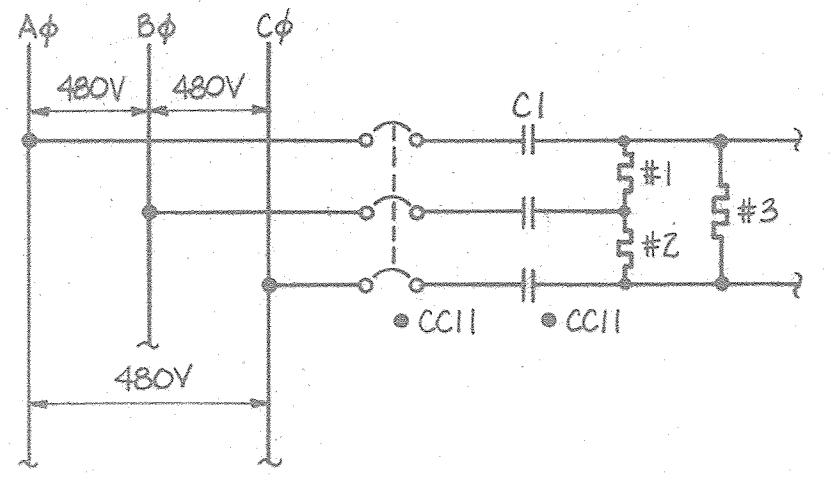
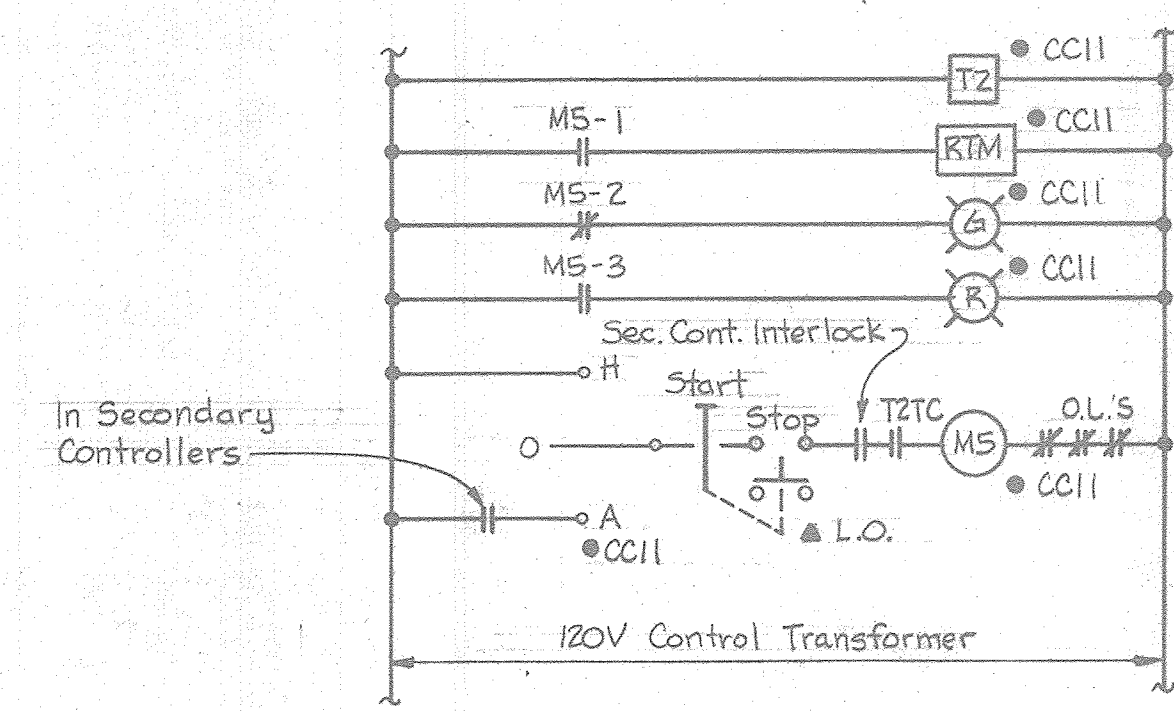
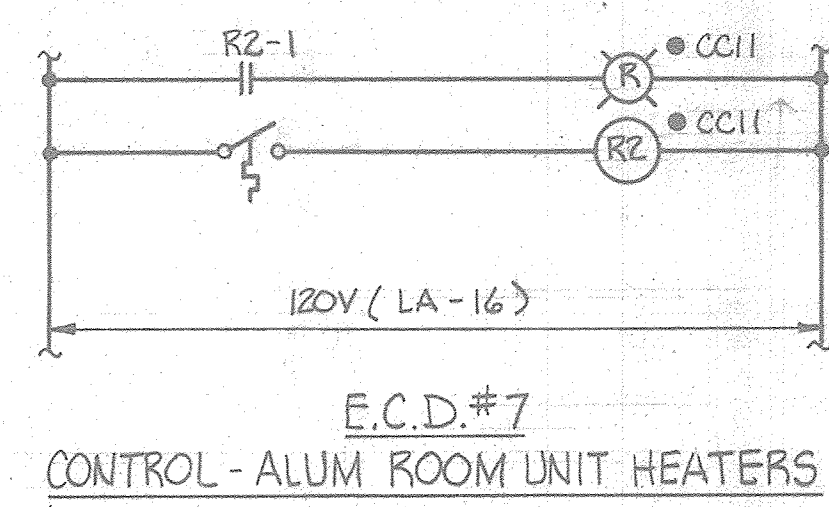
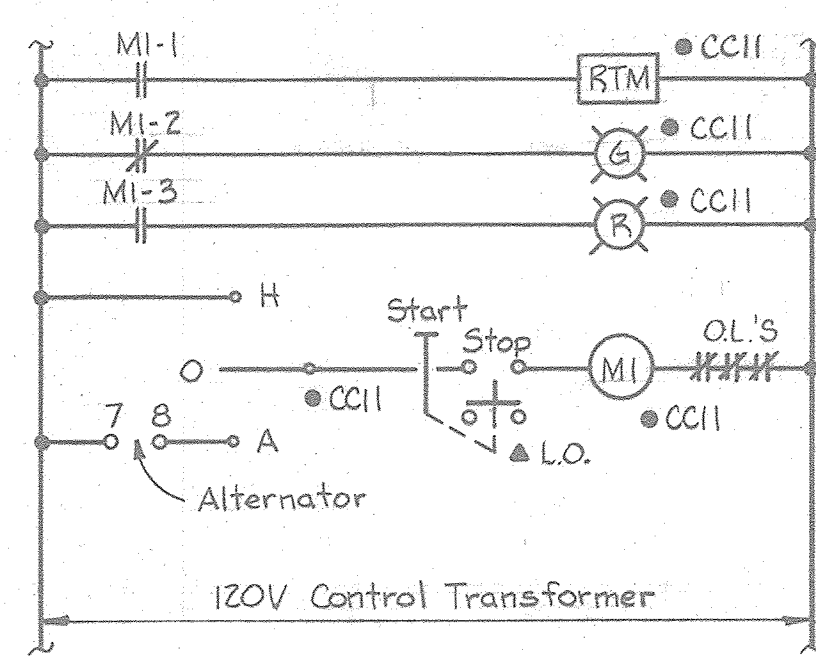
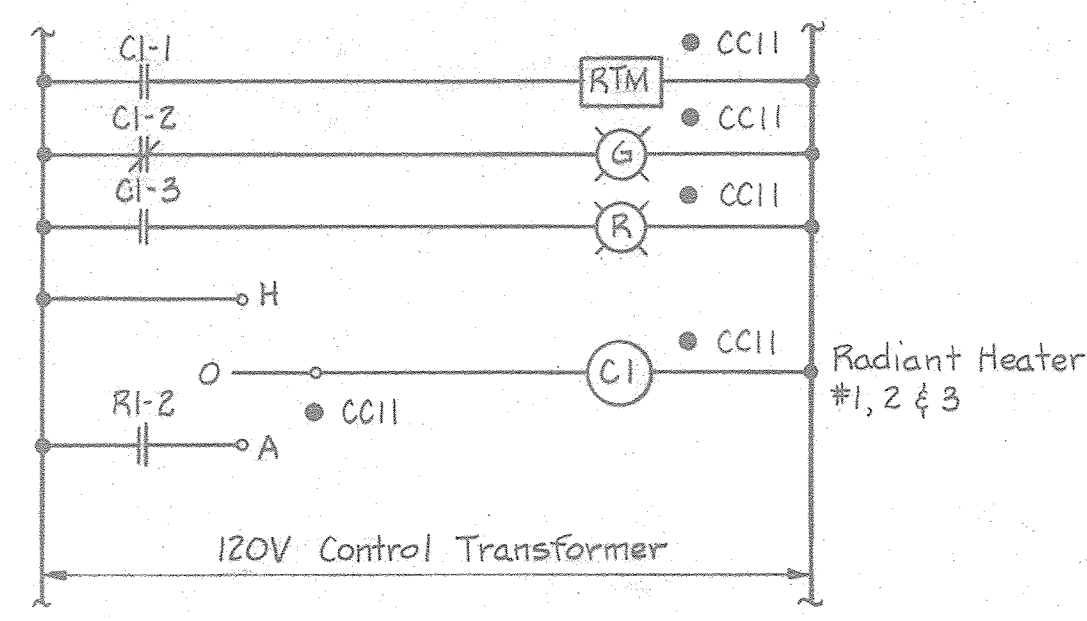
SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 80 OF 96  
SCALE AS SHOWN

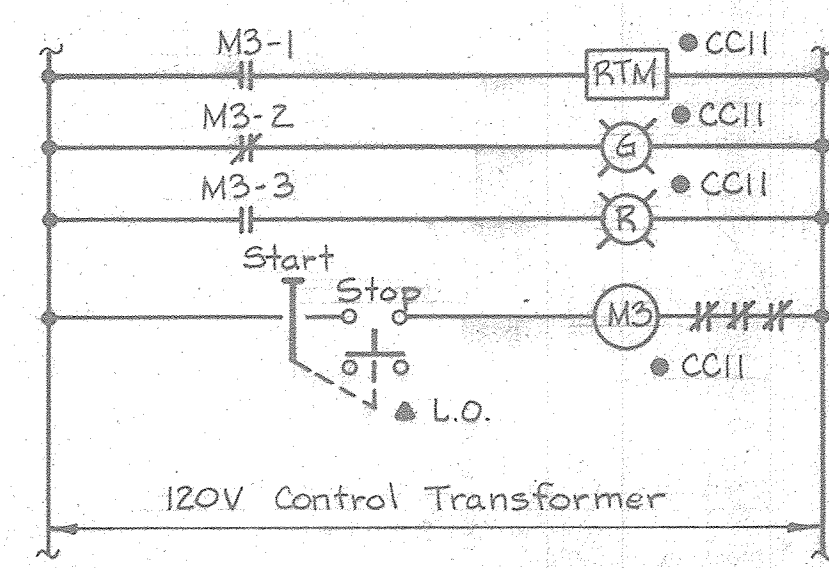


NOTES

1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.

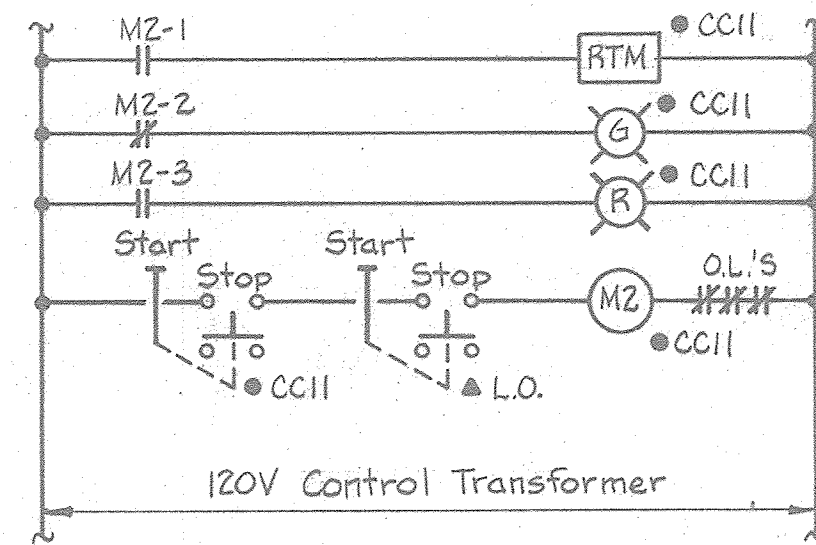


E.C.D.#4  
AIR COMPRESSOR #1  
Typical for the following Unit:  
1. Air Compressor #2

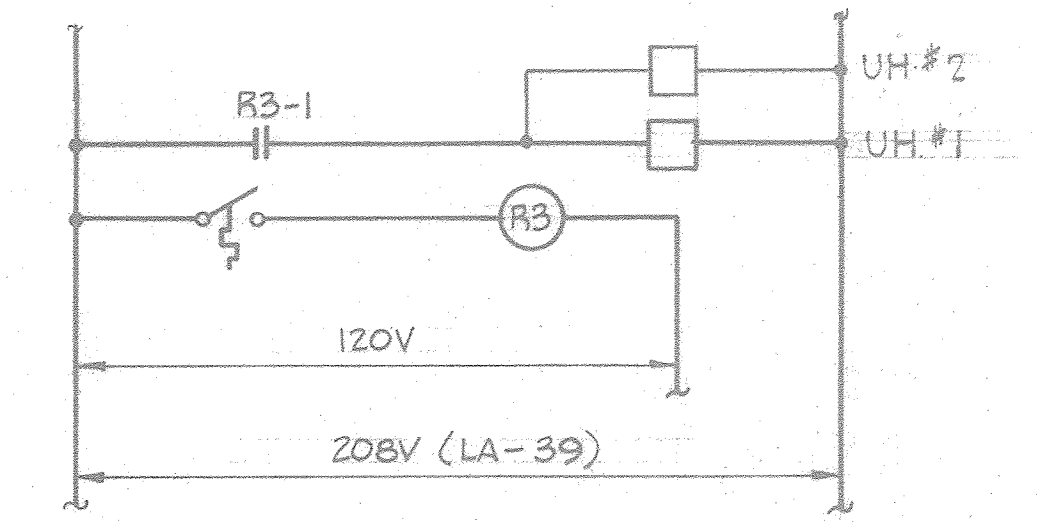
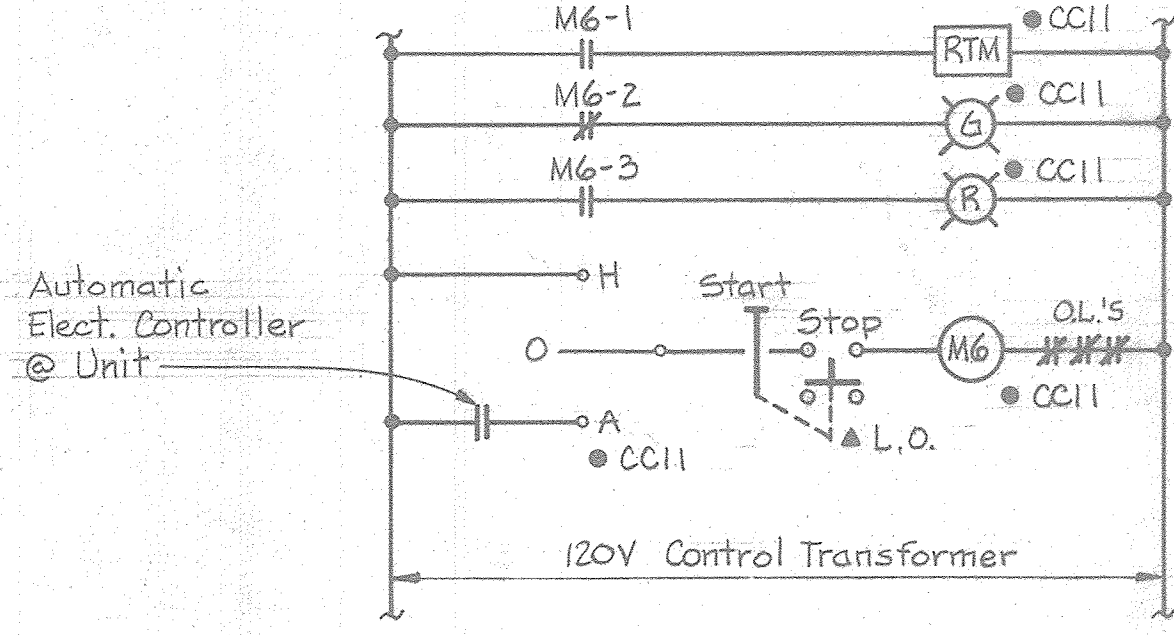


E.C.D.#10  
EFFLUENT PUMP #1  
Typical for the following Unit:  
1. Effluent Pump #5

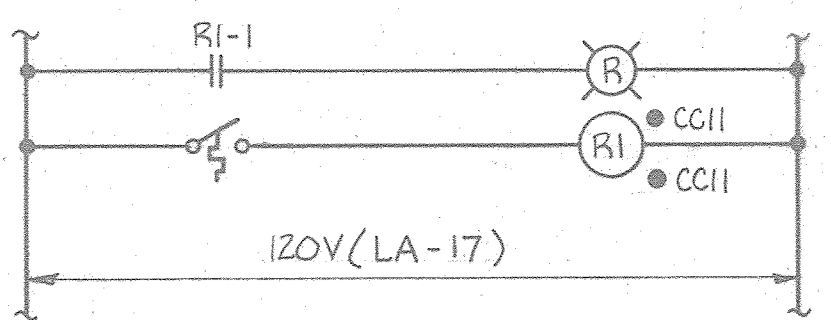
E.C.D.#1  
PUMP ROOM - RADIANT HEATERS #1, 2, 3  
Typical for the following Units:  
1. Radiant Heaters #4, 5, 6  
2. Radiant Heaters #7, 8, 9  
3. Radiant Heaters #10, 11, 12



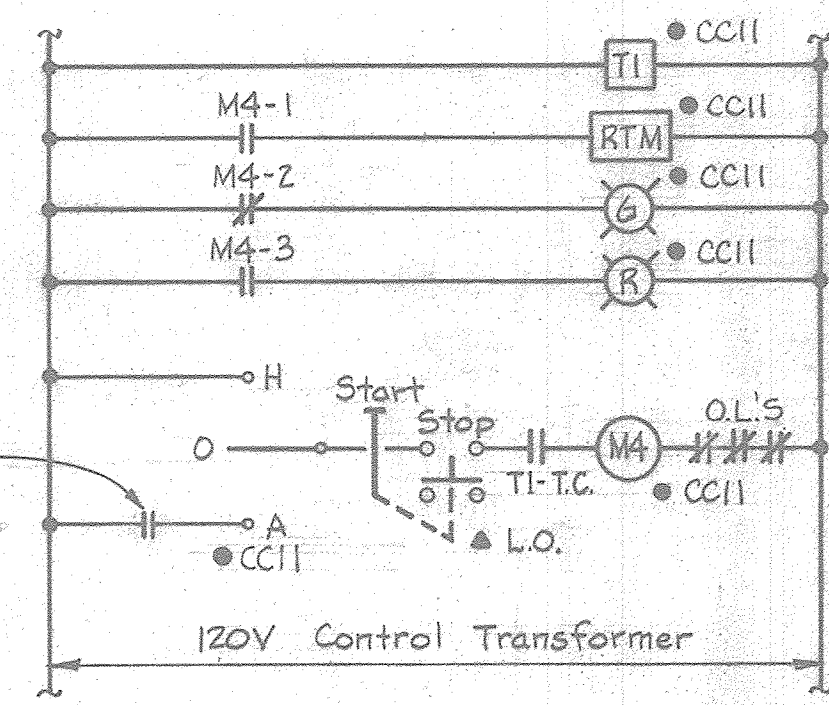
E.C.D.#8  
RAPID MIXER #1



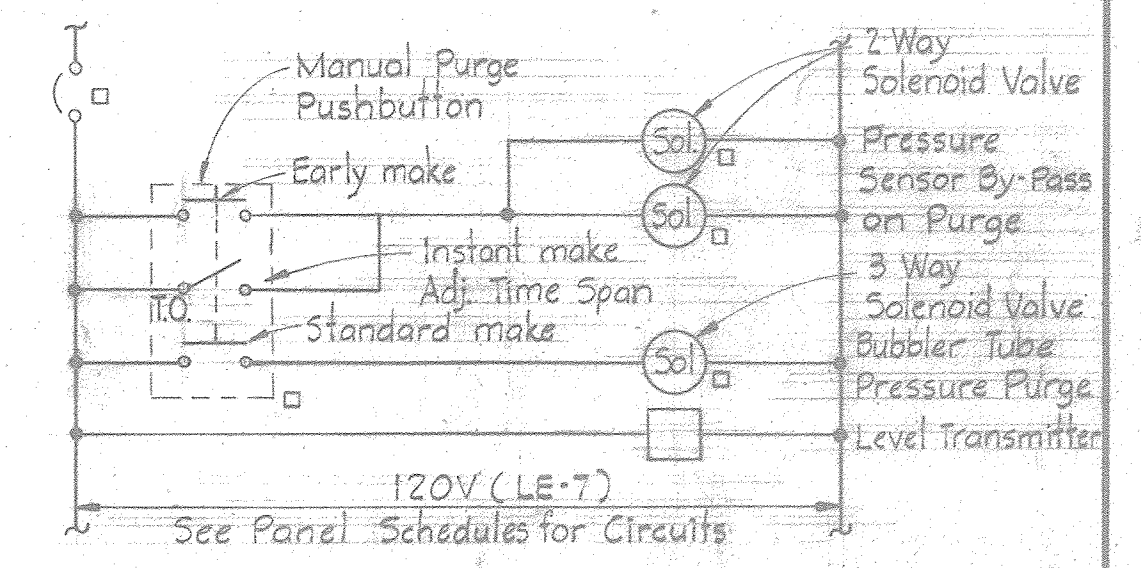
E.C.D.#13  
TOILET ROOM - HEATER #1 & #2



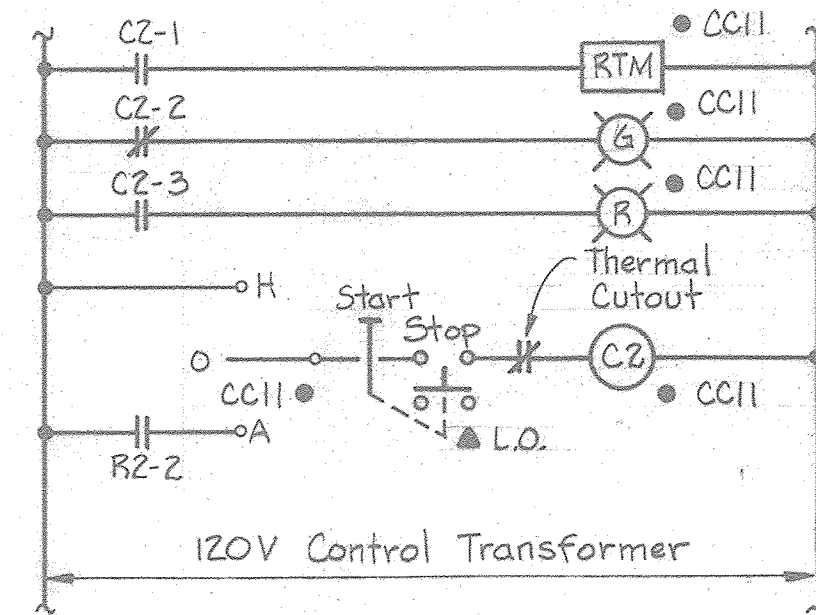
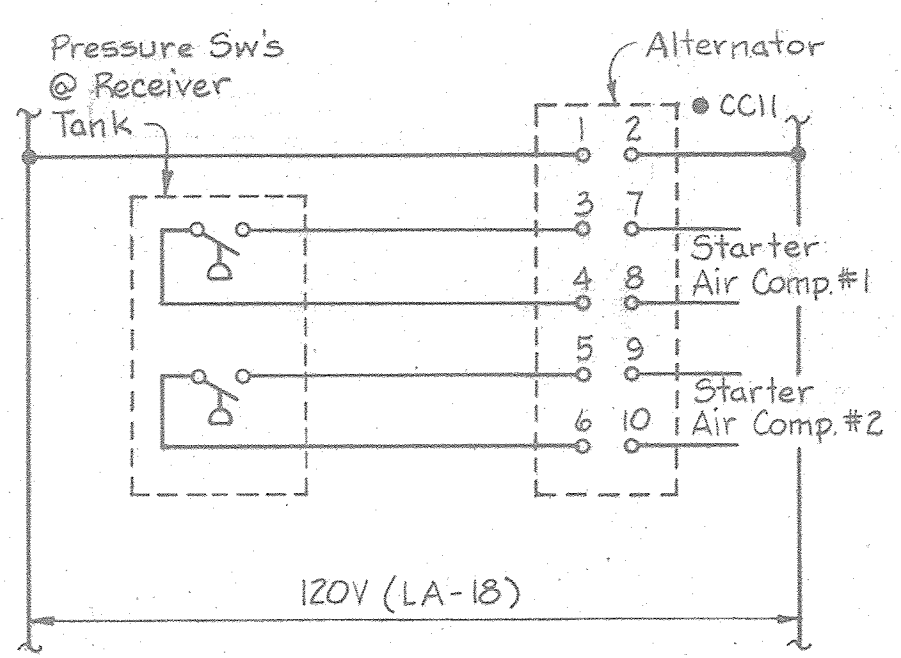
E.C.D.#5  
INJECTOR WATER PUMP #1  
Typical for the following Unit:  
1. Injector Water Pump #2



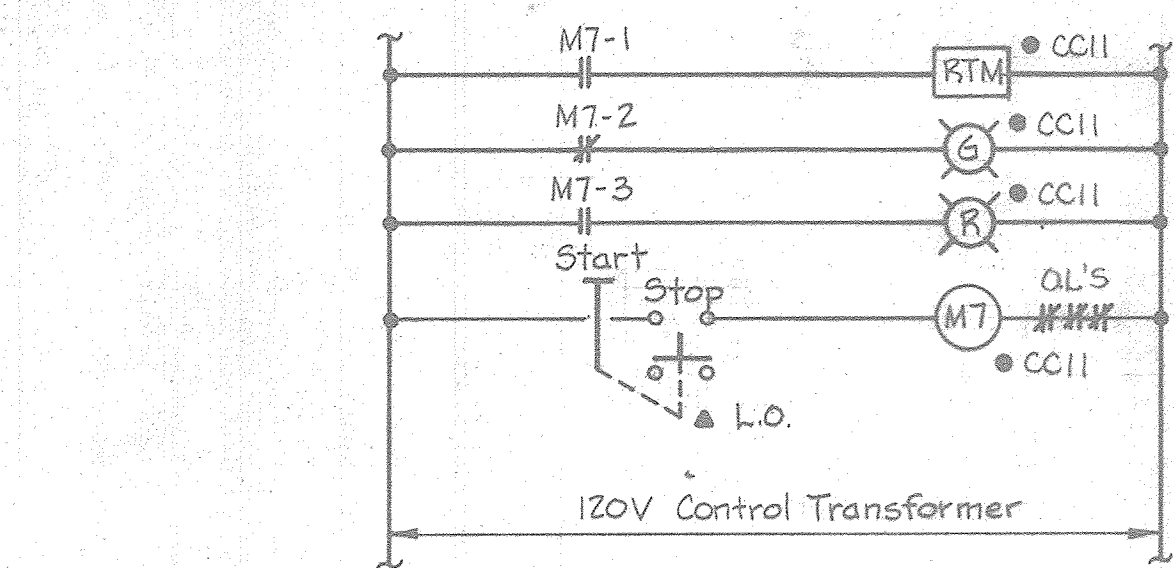
E.C.D.#11  
SPARE



E.C.D.#42  
BUBBLER CABINET - ALUM TANK #1  
Typical for the following units:  
1. Bubbler Cabinet - Alum Tank #2  
2. Bubbler Cabinets - Flocculation Basins Nos. 1, 2, 5 & 6  
3. Bubbler Cabinets - Filters Nos. 1, 2, 3 & 4 Effluent  
4. Bubbler Cabinets - Filters Nos. 1, 2, 3 & 4 Influent  
5. Bubbler Cabinet - Effluent Pumping Station  
6. Bubbler Cabinet - Chlorine Contact Chamber



E.C.D.#9  
EFFLUENT PUMP #2  
Typical for the following Unit:  
1. Effluent Pump #4



E.C.D.#12  
FLOCCULATOR #1A  
Typical for the following Units:  
1. Flocculator # 1B  
2. Flocculator # 2A, 2B  
3. Flocculator # 5A, 5B  
4. Flocculator # 6A, 6B

E.C.D.#3  
CONTROL - DUPLEX AIR COMPRESSORS

E.C.D.#6  
ALUM ROOM - UNIT HEATER #1  
Typical for the following Units:  
1. Alum Room - Unit Heater #2

WHITMAN, REQUARDT & ASSOCIATES  
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BALTIMORE, MARYLAND

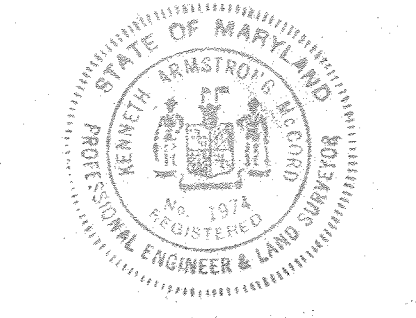
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
DATE  
Richard E. Brudenberg  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FILTRATION  
MOTOR CONTROL CENTER "CC11"  
WIRING DIAGRAMS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

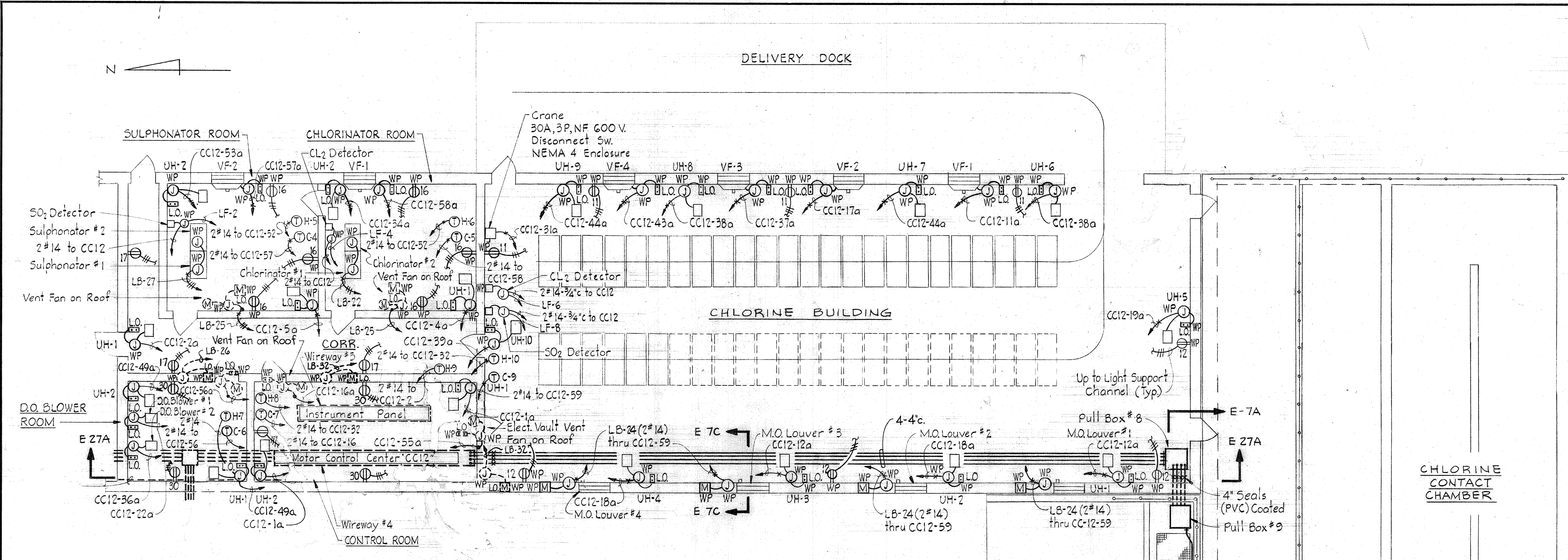
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OF 96  
SCALE AS SHOWN



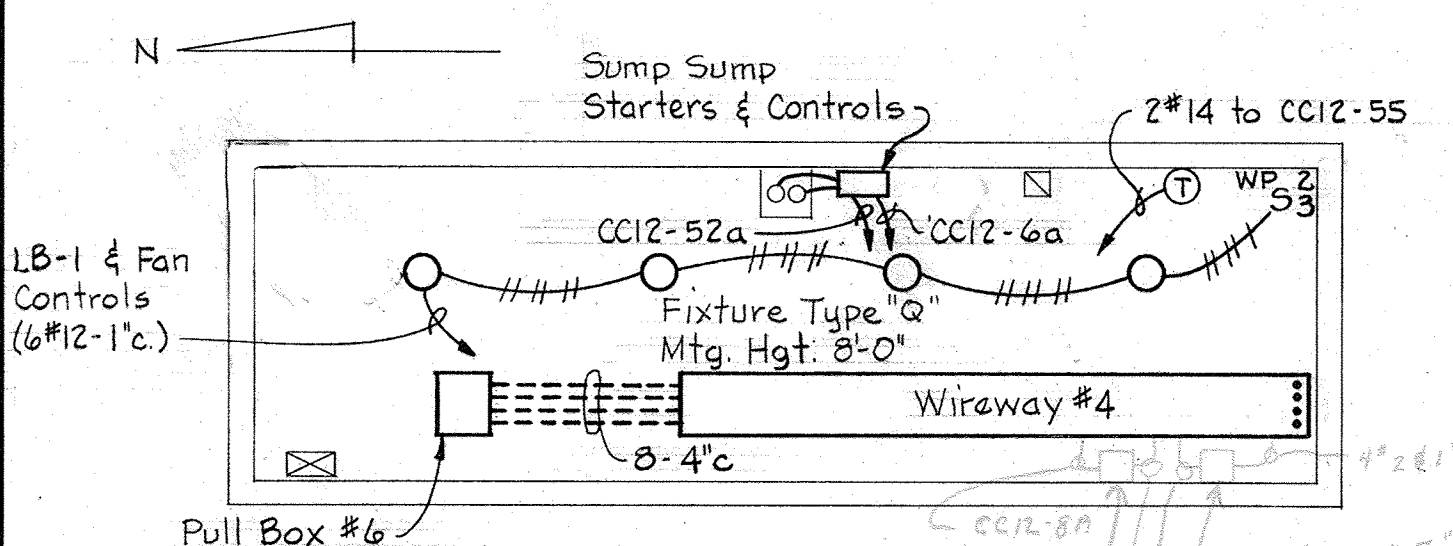


**NOTES**

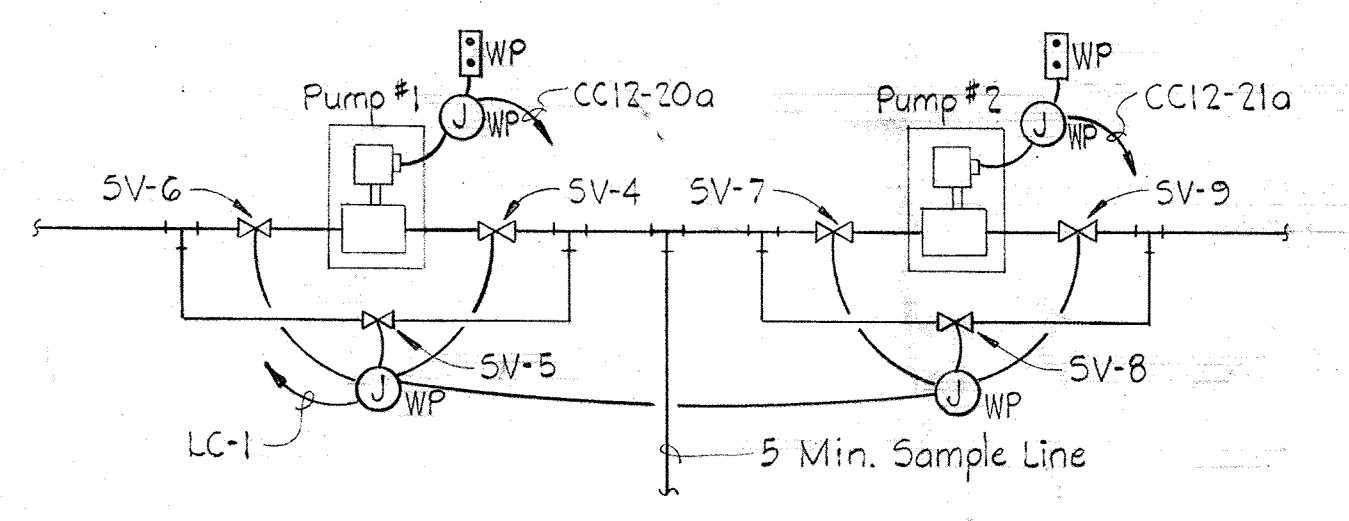
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
2. For Instrumentation wiring see Sheets E-16, E-28.
3. For Lighting Plan see Sheet E-15.



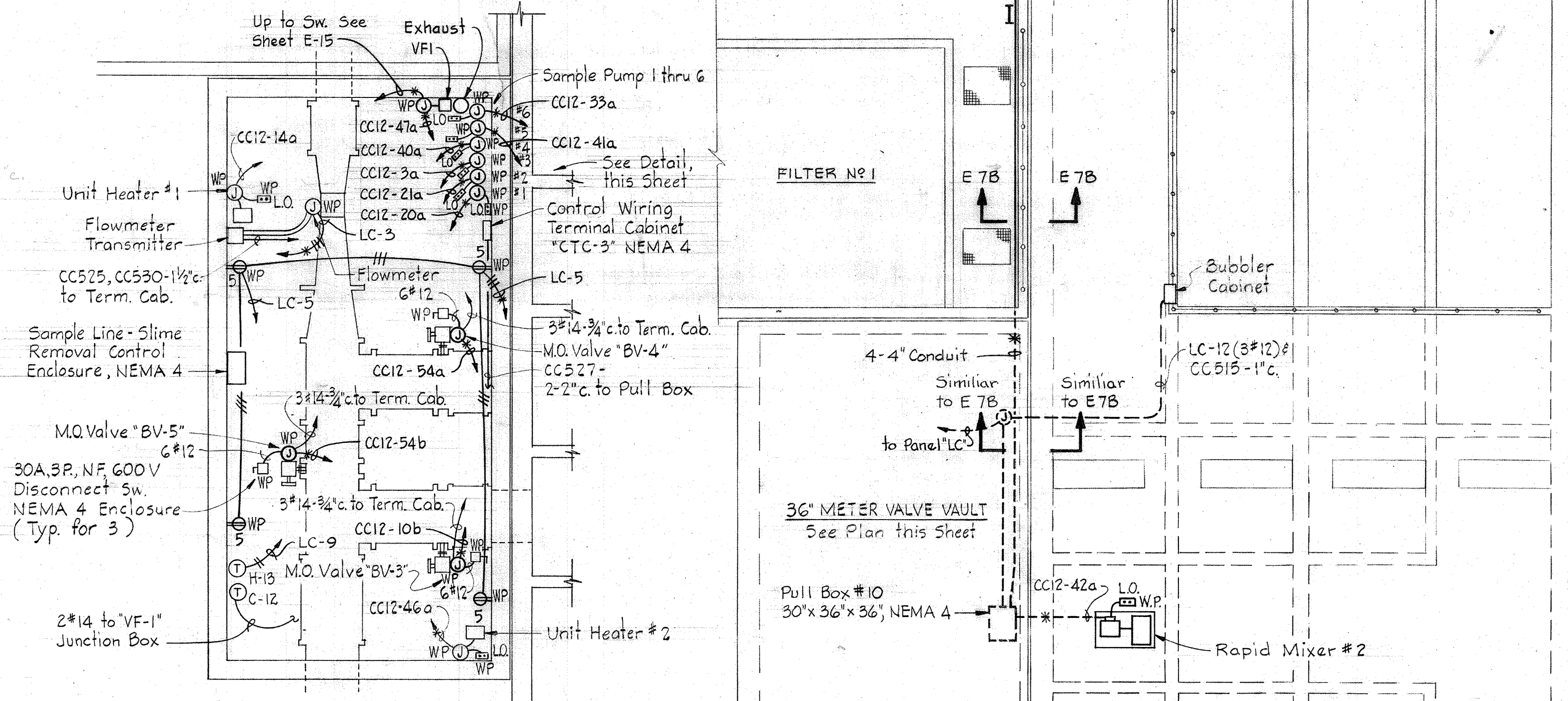
**PLAN**  
Scale: 1/8" = 1'-0"



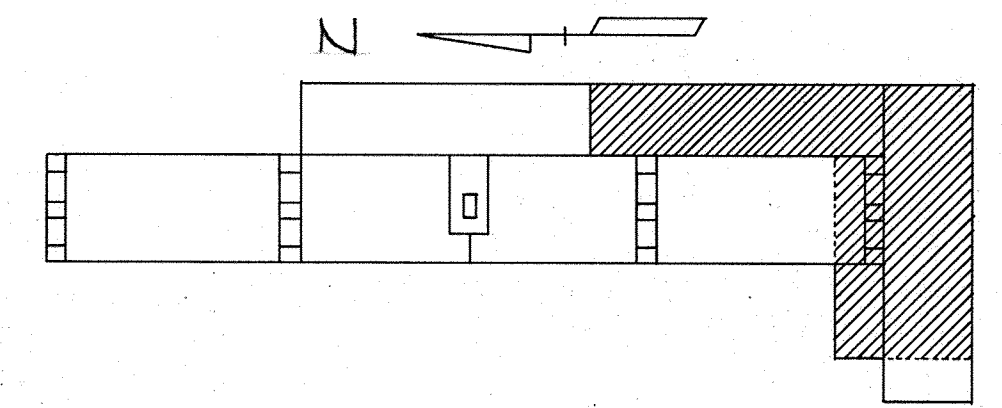
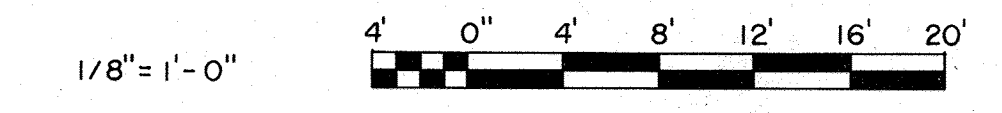
**PLAN - ELECTRICAL VAULT**  
Scale: 1/8" = 1'-0"



**DETAIL - SAMPLE PUMP #1 & #2**  
Typical for the following units  
1. Sample Pumps #3 & #4 - 30 Min. Sample Line  
2. Sample Pumps #5 & #6 - Effluent Sample Line



**PART PLAN**  
36" METER VALVE VAULT  
Scale: 1/8" = 1'-0"



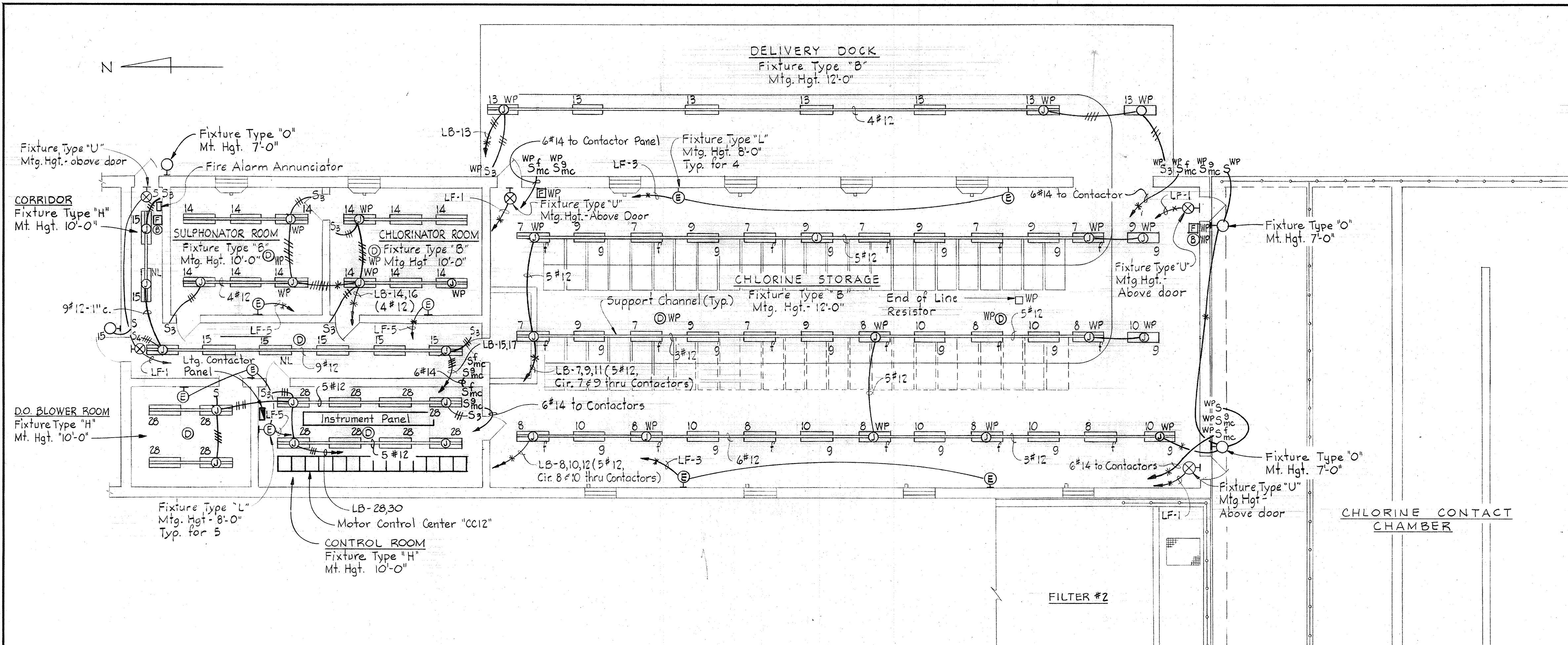
**KEY PLAN**

|  |   |                                  |  |  |  |
|--|---|----------------------------------|--|--|--|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>DATE<br/><i>Richard C. Freudenberger</i><br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>DISINFECTION CONTROL BUILDING POWER PLAN</b></p> | <p><b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 82 OF 96</b><br/><b>SCALE AS SHOWN</b></p> |
|--|---|----------------------------------|--|--|--|



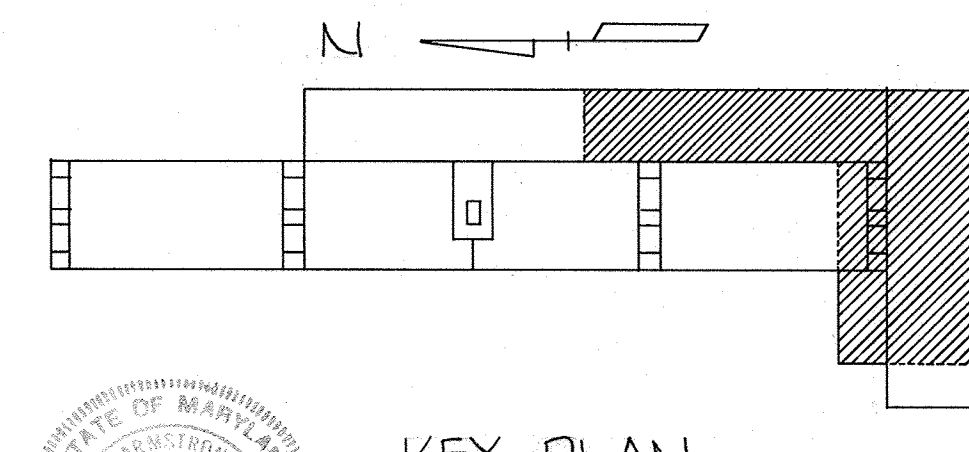
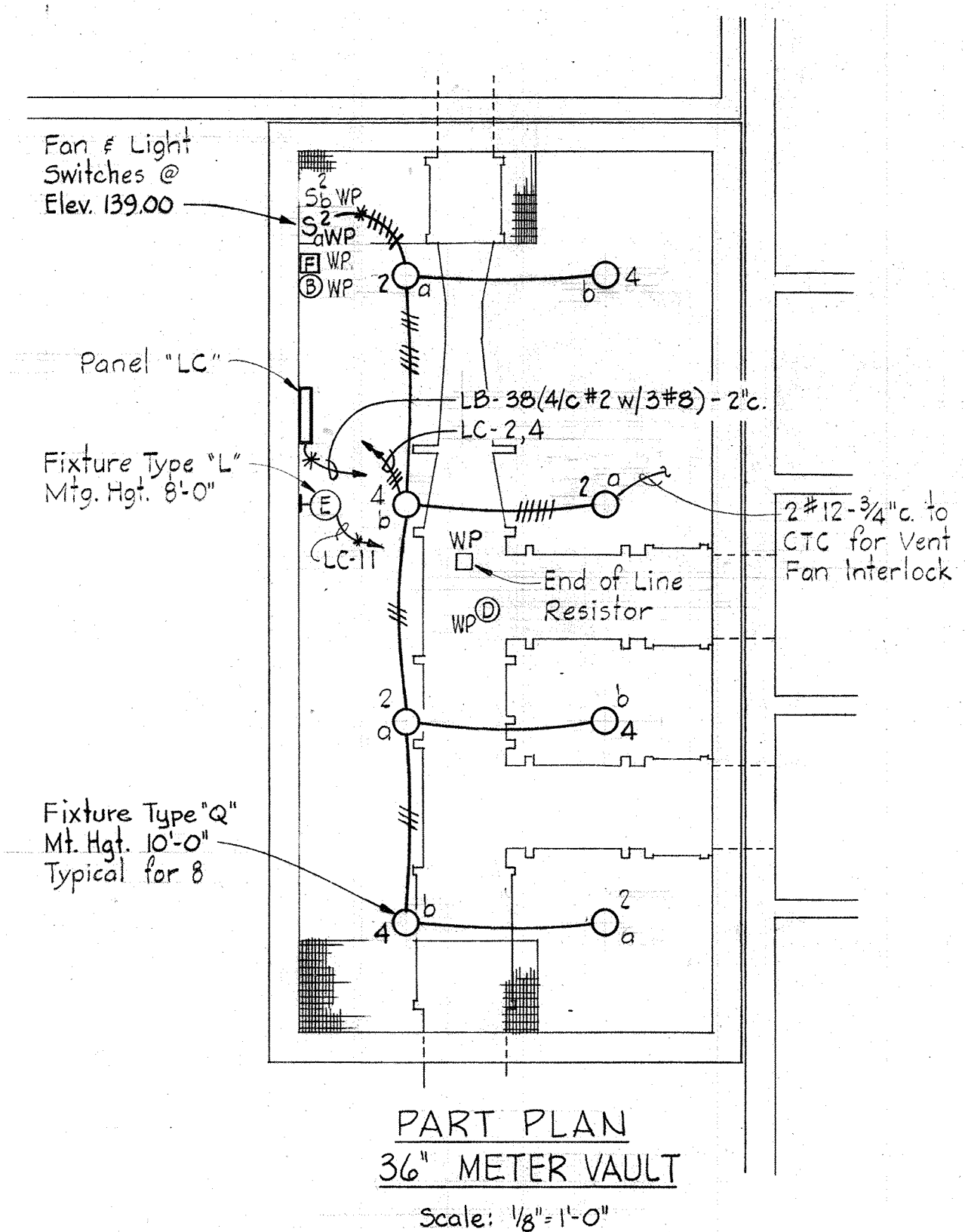
NOTES

- 1 For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
- 2 For Fire Alarm System Wiring see Sheet E-20.



PLAN

Scale: 1/8" = 1'-0"



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
DATE  
Richard E. Heidenberg  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

DISINFECTION  
CONTROL BUILDING  
LIGHTING PLAN

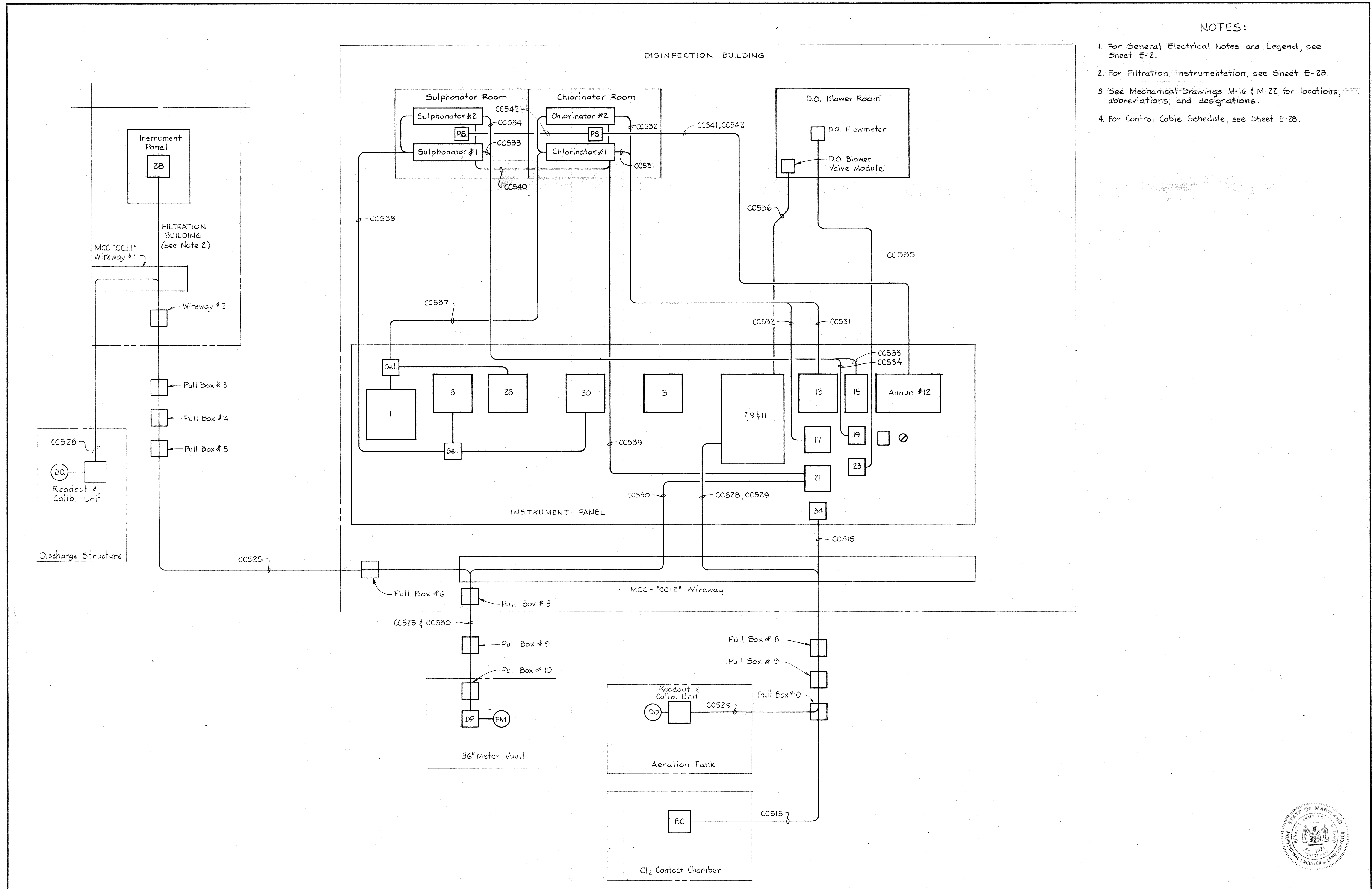
SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING NO. 83 OF 96  
SCALE AS SHOWN

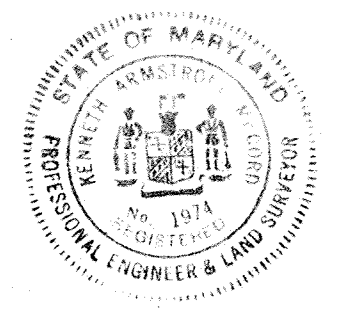


NOTES:

1. For General Electrical Notes and Legend, see Sheet E-2.
2. For Filtration Instrumentation, see Sheet E-23.
3. See Mechanical Drawings M-16 & M-22 for locations, abbreviations, and designations.
4. For Control Cable Schedule, see Sheet E-28.



|   |   |                                  |  |  |                                    |                              |
|---|---|----------------------------------|--|--|------------------------------------|------------------------------|
| <p><b>WHITMAN, REQUARDT &amp; ASSOCIATES</b><br/>                 ENGINEERS<br/>                 1304 ST. PAUL ST.<br/>                 BALTIMORE, MARYLAND</p> | <p><b>DEPARTMENT OF PUBLIC WORKS</b><br/>                 HOWARD COUNTY, MARYLAND<br/>                 DATE: 12/13/77<br/> <i>Richard E. Brudenberg</i><br/>                 CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p><b>CONTRACT NO. 502-S</b></p> | <p><b>DISINFECTION INSTRUMENTATION</b></p> | <p><b>SAVAGE WASTEWATER TREATMENT PLANT ADDITION NO. 4</b></p> | <p><b>DRAWING NO. 84 OF 96</b></p> | <p><b>SCALE AS SHOWN</b></p> |
|---|---|----------------------------------|--|--|------------------------------------|------------------------------|



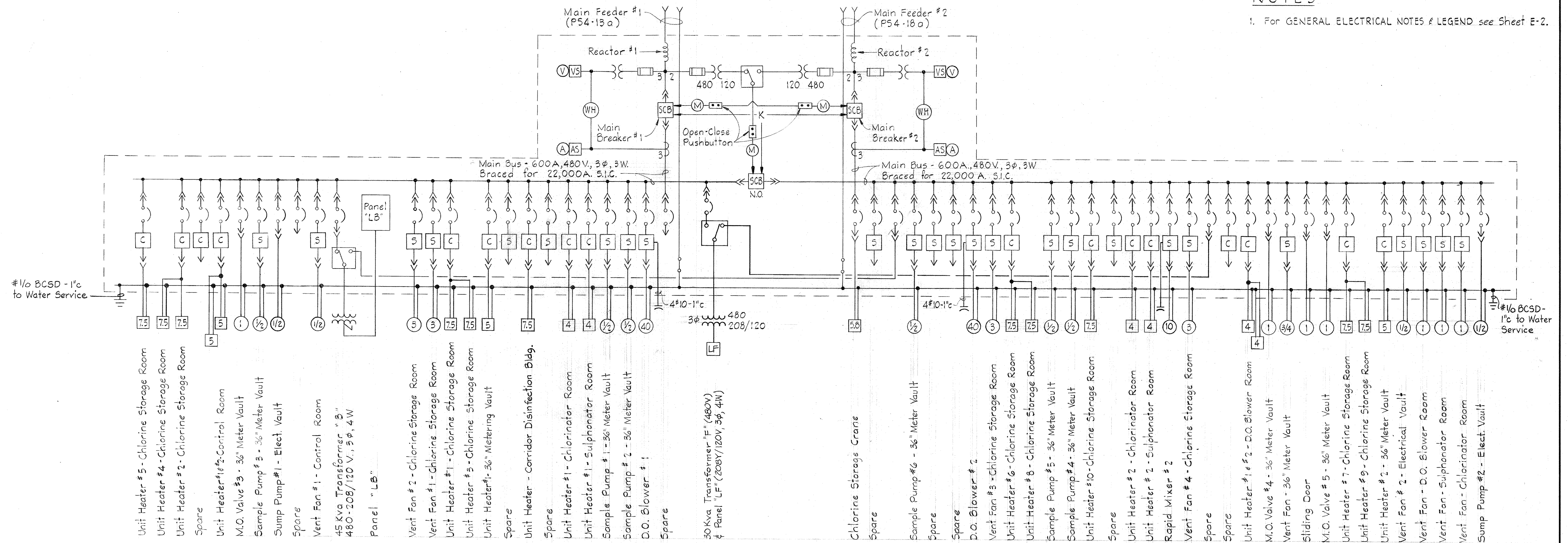




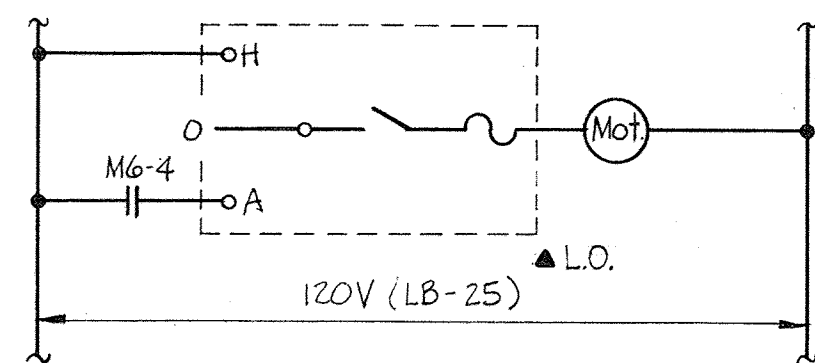


NOTES

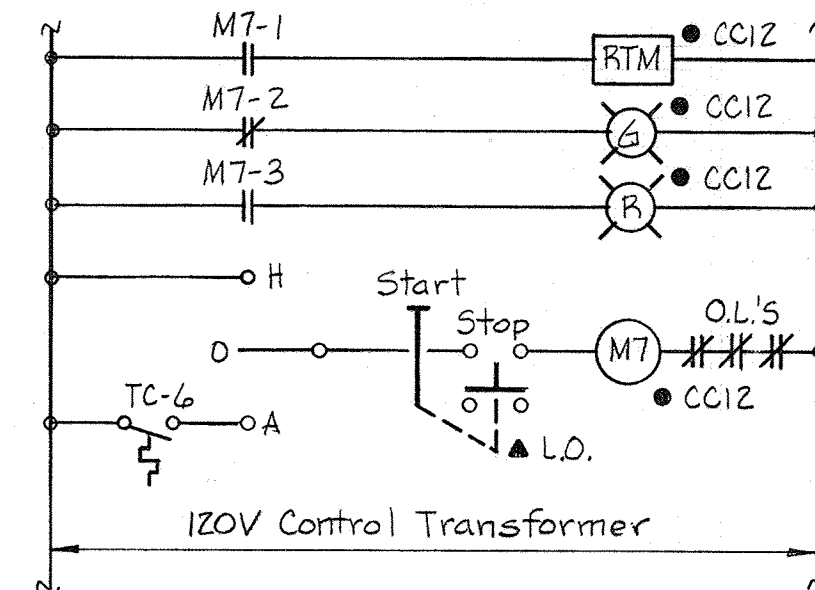
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.



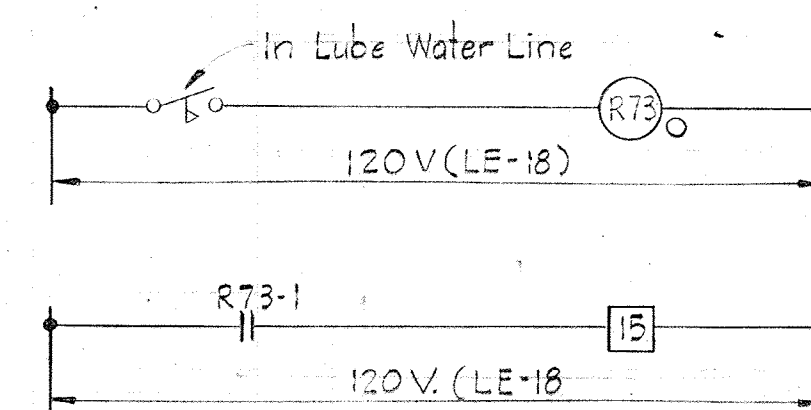
ONE LINE WIRING DIAGRAM  
MOTOR CONTROL CENTER "CC12"



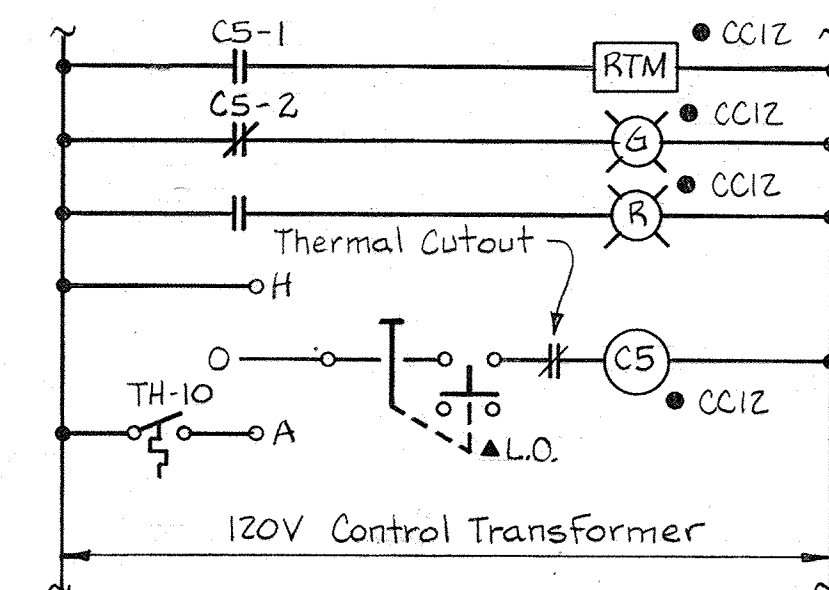
**E.C.D. #28**  
**SULPHONATOR RM - M.O. LOUVER**  
Typical for the following Units:  
1. Chlorinator Room - M.O. Louver  
2. D.O. Blower Room - M.O. Louver  
3. Control Room - M.O. Louver  
4. Substation Vault - M.O. Louver  
5. Electric Vault - M.O. Louver



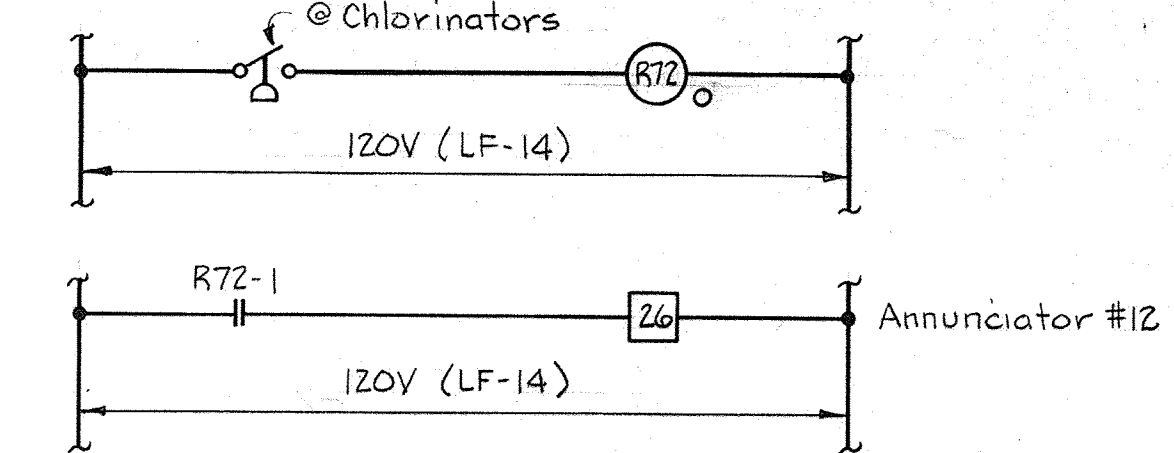
**E.C.D. #29**  
**D.O. BLOWER ROOM - VENT FAN**  
Typical for the following Units:  
1. Control Room - Vent Fan  
2. Electrical Vault - Vent Fan  
3. 36" Meter Vault - Vent Fan  
4. Substation Vault - Vent Fan



**E.C.D. #31**  
**LOSS OF LUBE WATER EFFLUENT PUMP #1**  
Typical for the following units:  
1. Loss of Lube Water - Effluent Pump #2  
2. Loss of Lube Water - Effluent Pump #4  
3. Loss of Lube Water - Effluent Pump #5

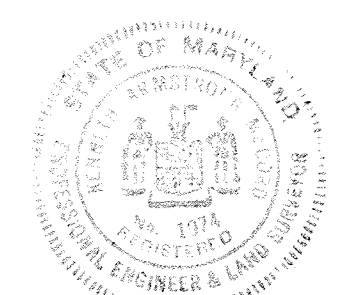


**E.C.D. #32**  
**CORRIDOR DISINFECTION BLDG - UNIT HEATER**



**E.C.D. #41**  
**LOW H<sub>2</sub>O PRESSURE CHLORINATORS INJECTOR WATER**  
Typical for the following Units:  
1. Low H<sub>2</sub>O Pressure - Sulphonators Injector Water

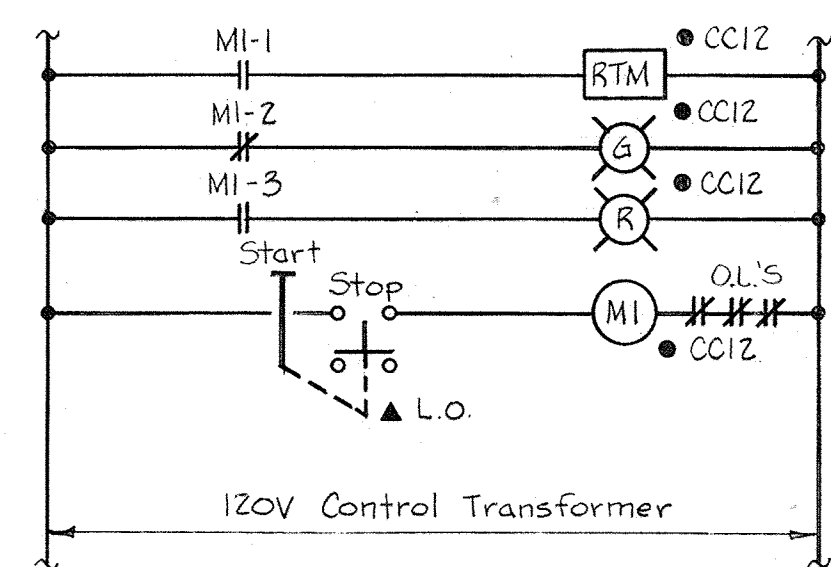
|   |  |                           |   |   |  |
|---|--|---------------------------|---|---|--|
| <p>WHITMAN, REQUARDT &amp; ASSOCIATES<br/>ENGINEERS<br/>1304 ST. PAUL ST.<br/>BALTIMORE, MARYLAND</p> | <p>DEPARTMENT OF PUBLIC WORKS<br/>HOWARD COUNTY, MARYLAND<br/>12/13/77<br/>Richard E. Croudenberg<br/>CHIEF BUREAU OF ENVIRONMENTAL SERVICES</p> | <p>CONTRACT NO. 502-S</p> | <p>DISINFECTION<br/>MOTOR CONTROL CENTER "CC12"<br/>WIRING DIAGRAMS</p> | <p>SAVAGE WASTEWATER<br/>TREATMENT PLANT ADDITION NO. 4</p> | <p>DRAWING NO. 86 OF 96<br/>SCALE AS SHOWN</p> |
|---|--|---------------------------|---|---|--|



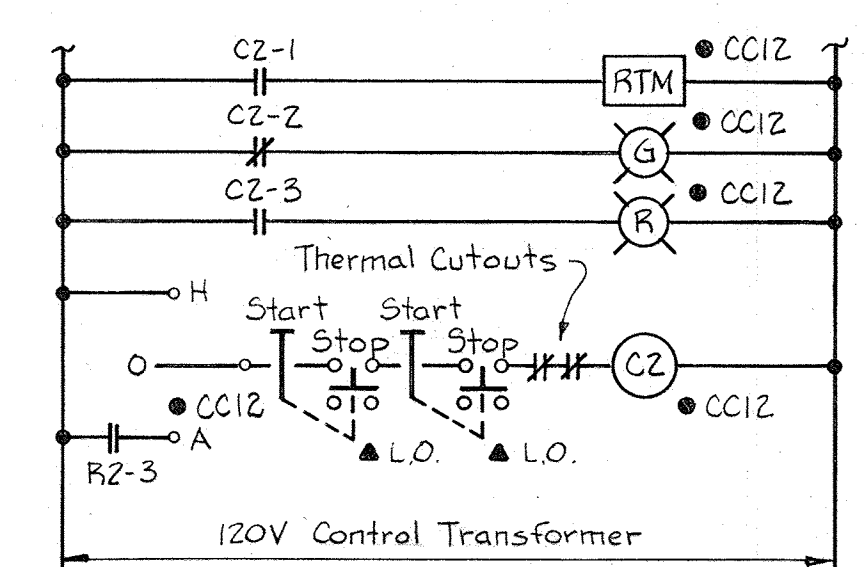


NOTES

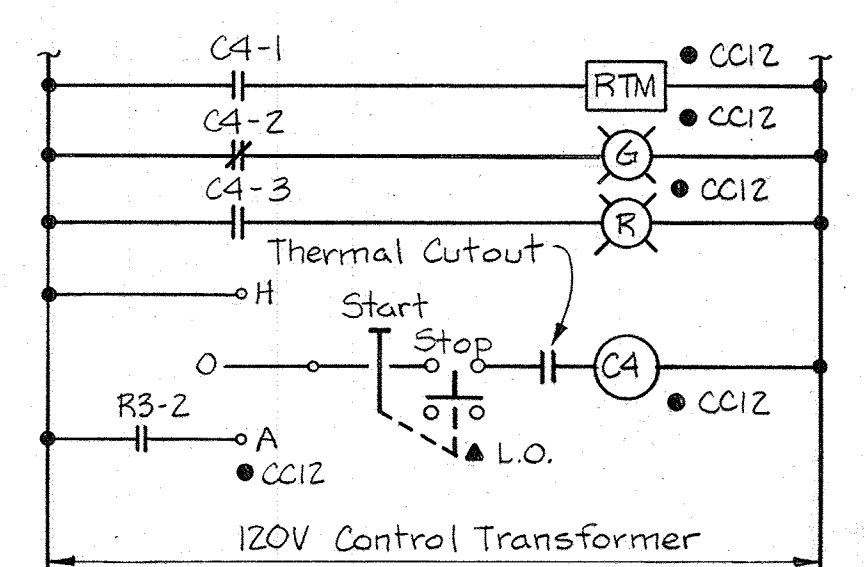
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.



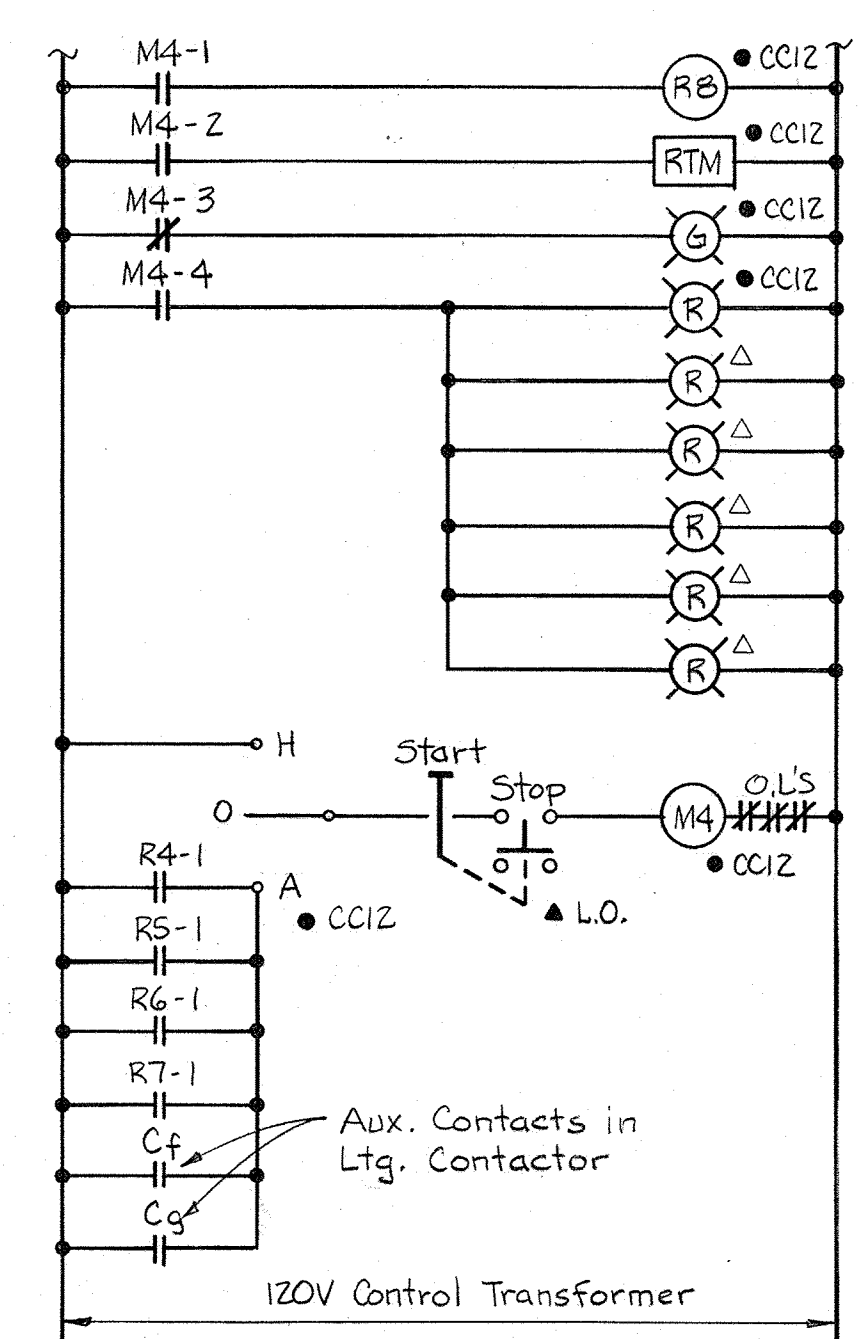
E.C.D. #14  
D.O. BLOWER #1  
Typical for the following Unit:  
1. D.O. Blower #2



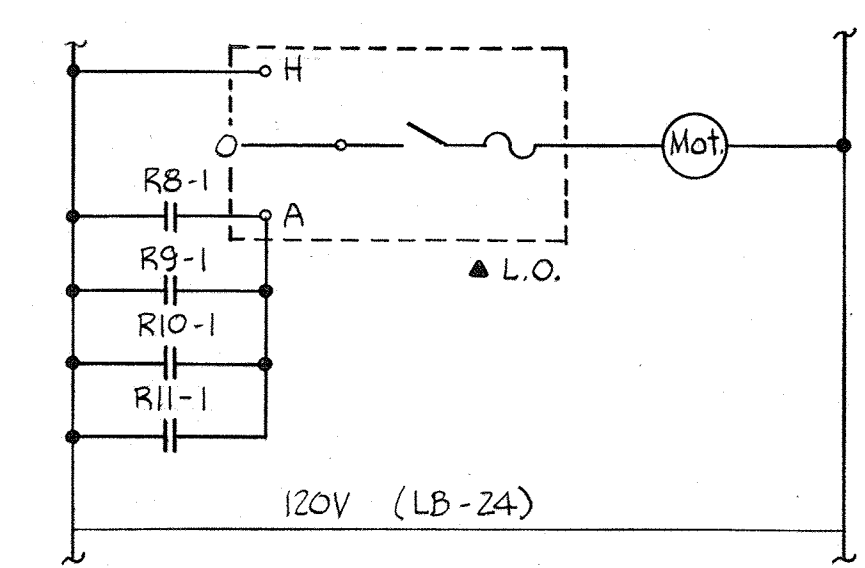
E.C.D. #17  
CHLORINE STORAGE-UNIT HEATERS #2 & 4  
Typical for the following Units:  
1. Chlorine Storage - Unit Heaters #6 & 8  
2. Control Room - Unit Heaters #1 & 2  
3. D.O. Blower Room - Unit Heaters #1 & 2



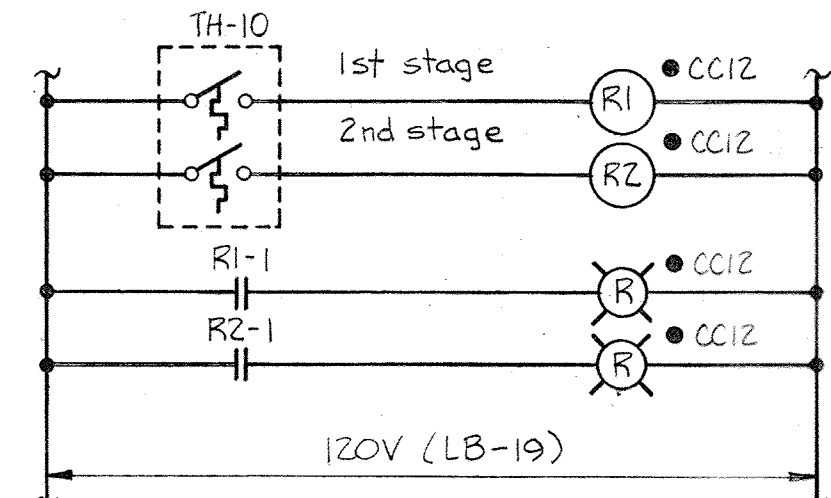
E.C.D. #20  
SULPHONATOR ROOM-UNIT HEATER #1  
Typical for the following Units:  
1. Sulphonator Room - Unit Heater #2  
2. Chlorinator Room - Unit Heaters #1 & 2  
3. 36" Meter Vault - Unit Heaters #1 & 2



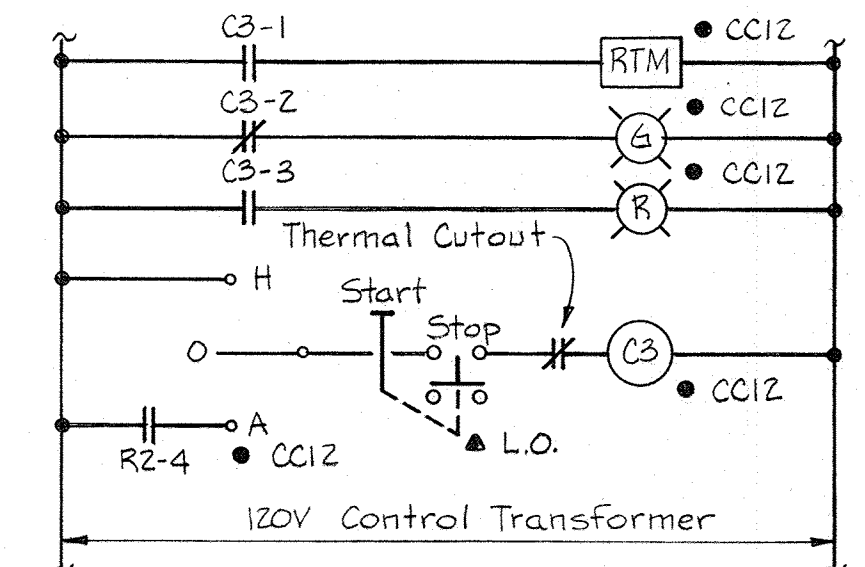
E.C.D. #24  
CHLORINE STORAGE - VENT FAN #1  
Typical for the following Units:  
1. Chlorine Storage - Vent Fan #4



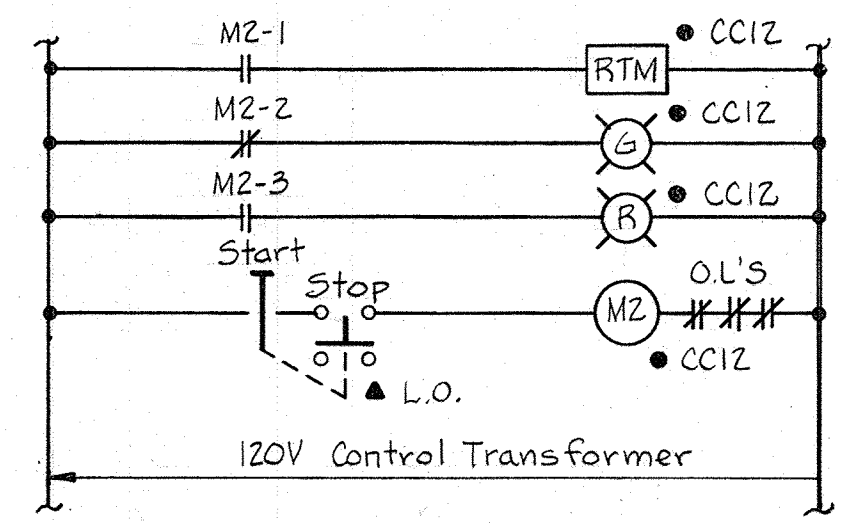
E.C.D. #26  
CHLORINE STORAGE - M.O. LOUVER #1  
Typical for the following Units:  
1. Chlorine Storage - M.O. Louver #2, 3 & 4



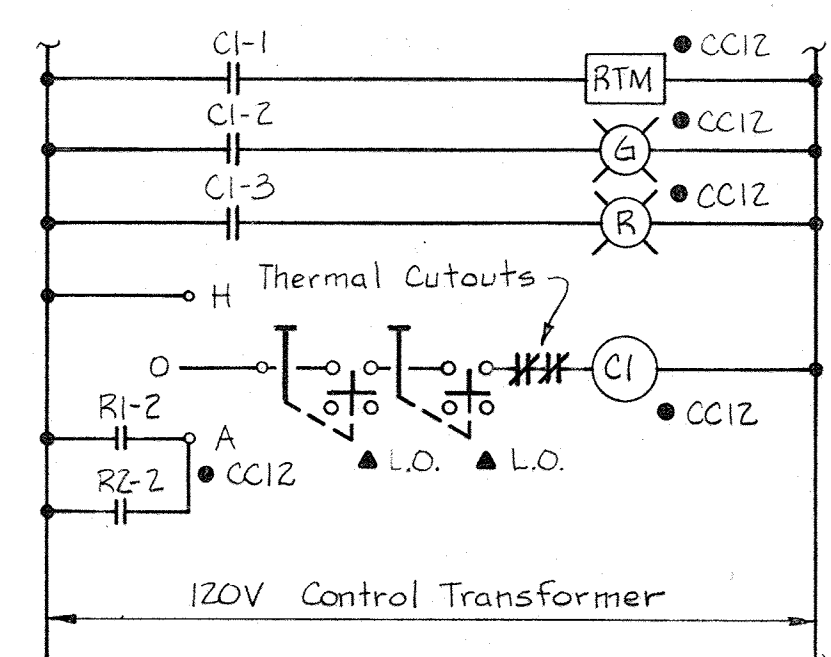
E.C.D. #15  
CONTROL - CHLORINE STORAGE UNIT HEATERS



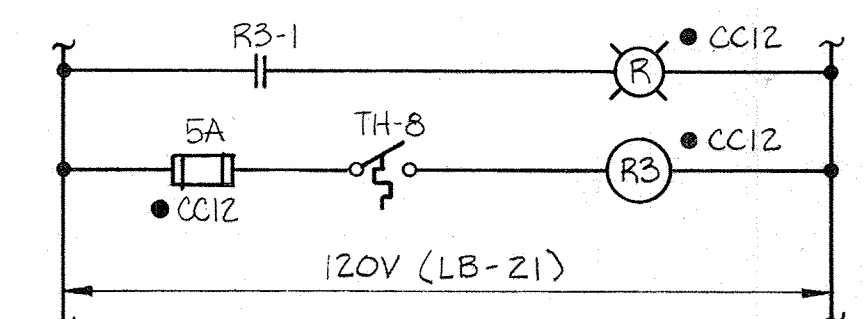
E.C.D. #18  
CHLORINE STORAGE-UNIT HEATER #5  
Typical for the following Unit:  
1. Chlorine Storage - Unit Heater #10



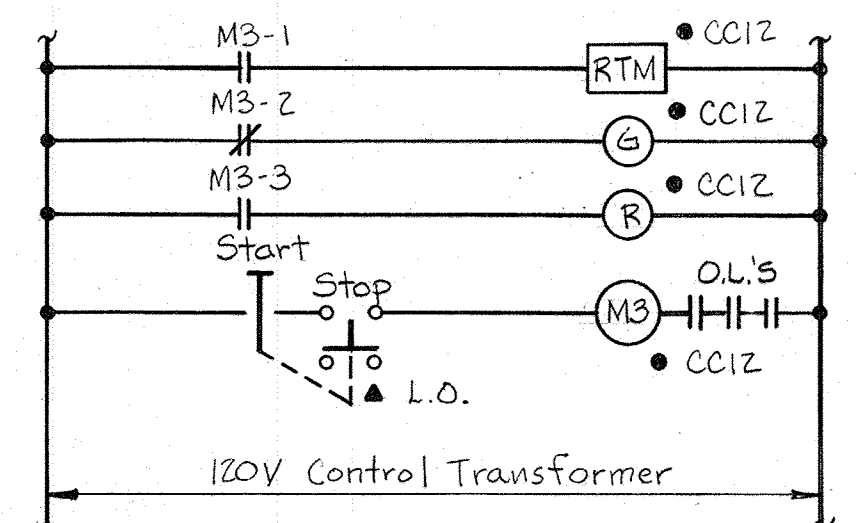
E.C.D. #21  
RAPID MIXER #2



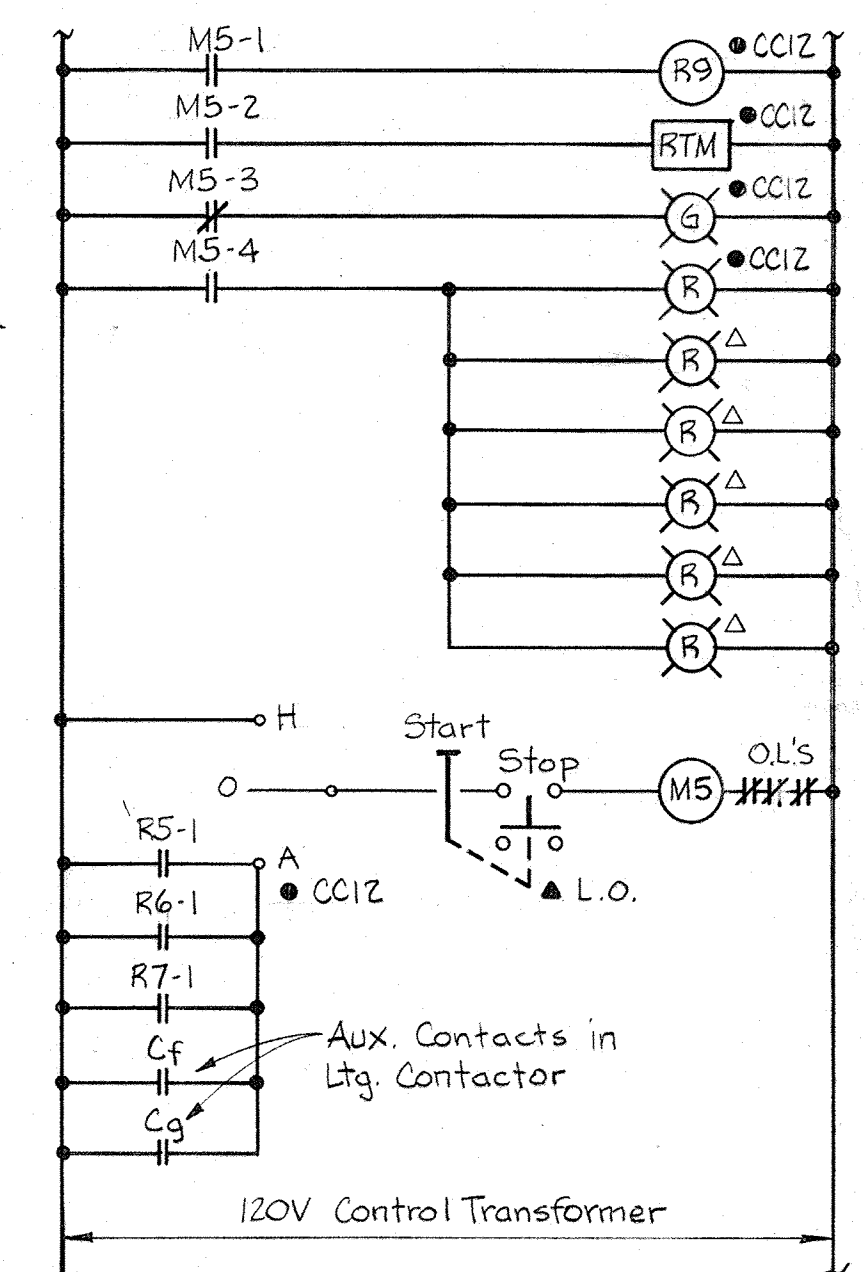
E.C.D. #16  
CHLORINE STORAGE-UNIT HEATERS #1 & 3  
Typical for the following Units:  
1. Chlorine Storage - Unit Heaters #7 & 9



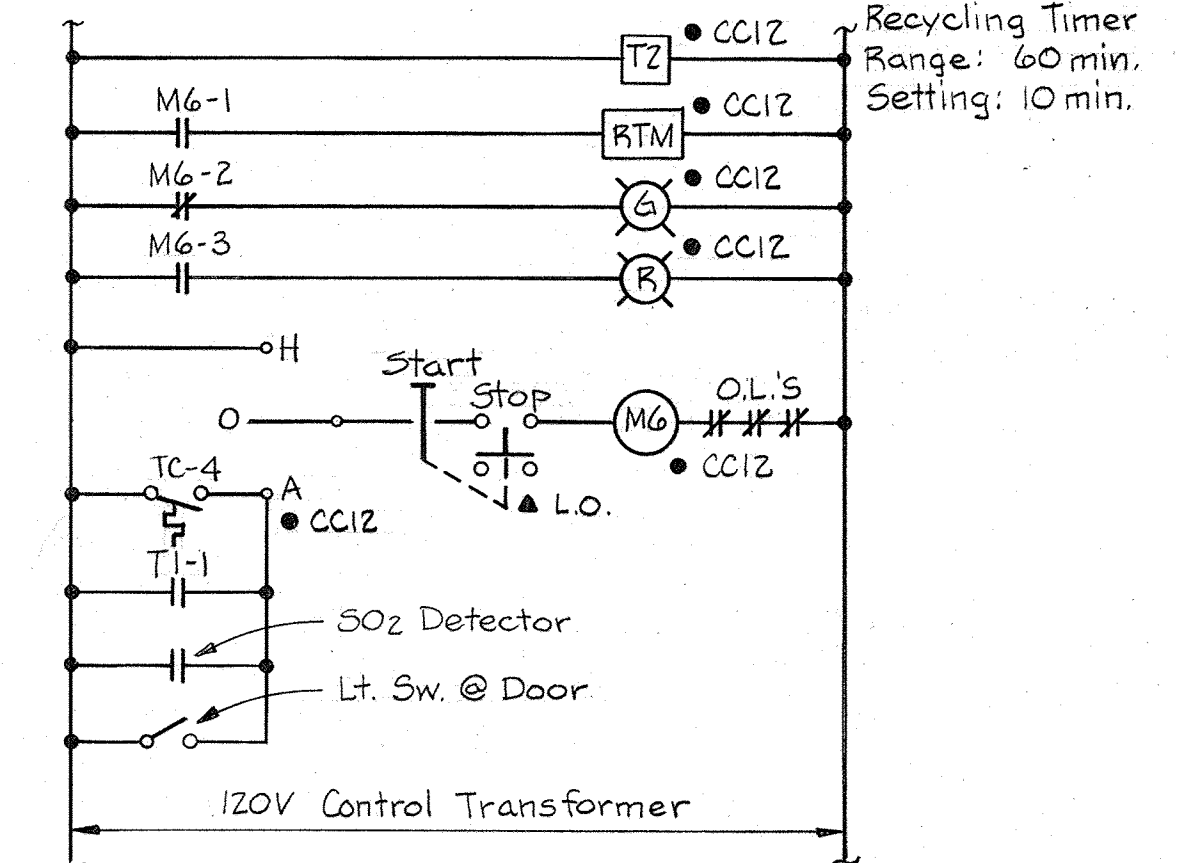
E.C.D. #19  
CONTROL - CONTROL ROOM UNIT HEATERS  
Typical for the following Units:  
1. Control-Sulphonator Room Unit Heaters  
2. Control-Chlorinator Room Unit Heaters  
3. Control-36" Meter Vault Unit Heaters  
4. Control-Control Room Unit Heaters  
5. Control-D.O. Blower Room Unit Heaters



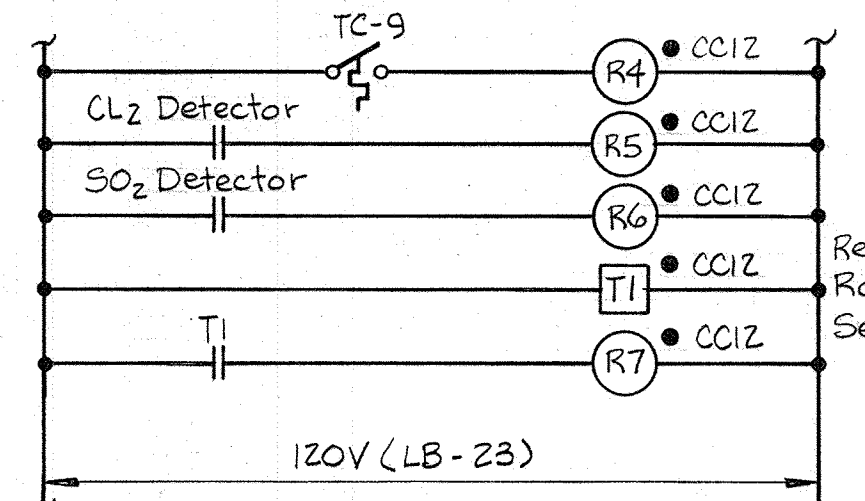
E.C.D. #22  
SAMPLE PUMP #1  
Typical for the following Units:  
1. Sample Pumps #2, 3, 4, 5 & 6



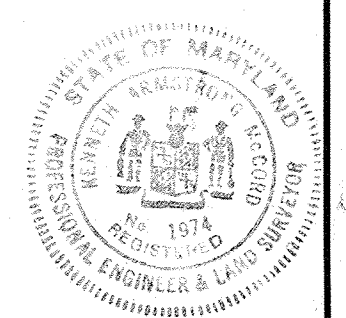
E.C.D. #25  
CHLORINE STORAGE-VENT FAN #2  
Typical for the following Unit:  
1. Chlorine Storage - Vent Fan #3



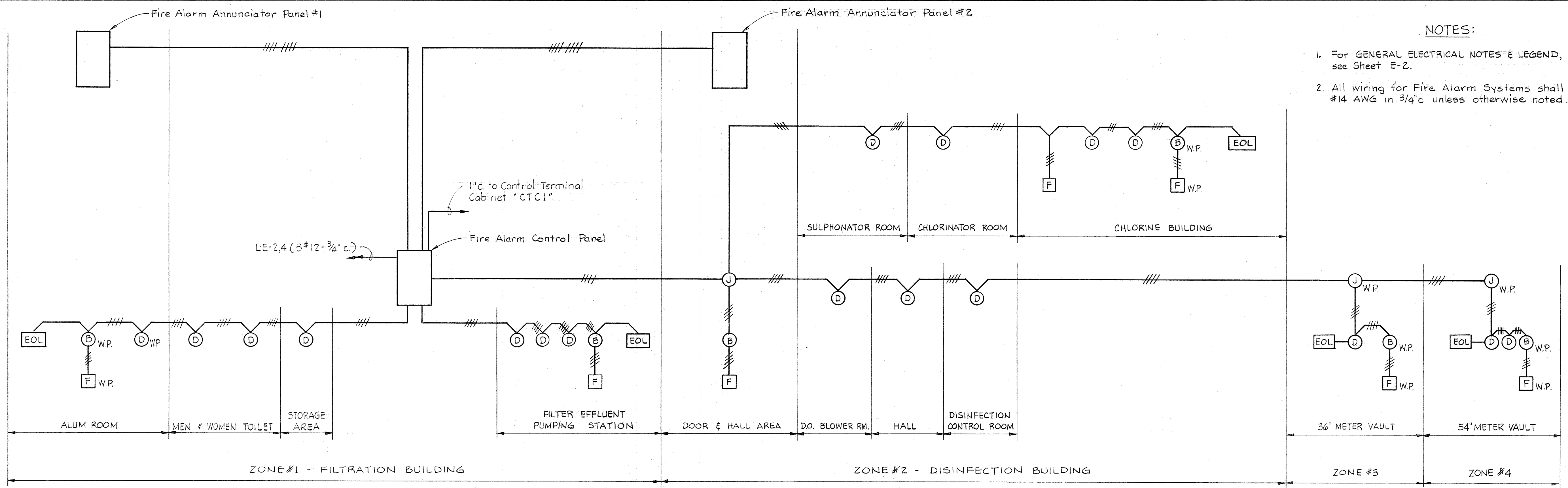
E.C.D. #27  
SULPHONATOR ROOM-VENT FAN  
Typical for the following Unit:  
1. Chlorinator Room - Vent Fan



E.C.D. #23  
CONTROL - CHLORINE STORAGE VENT FANS





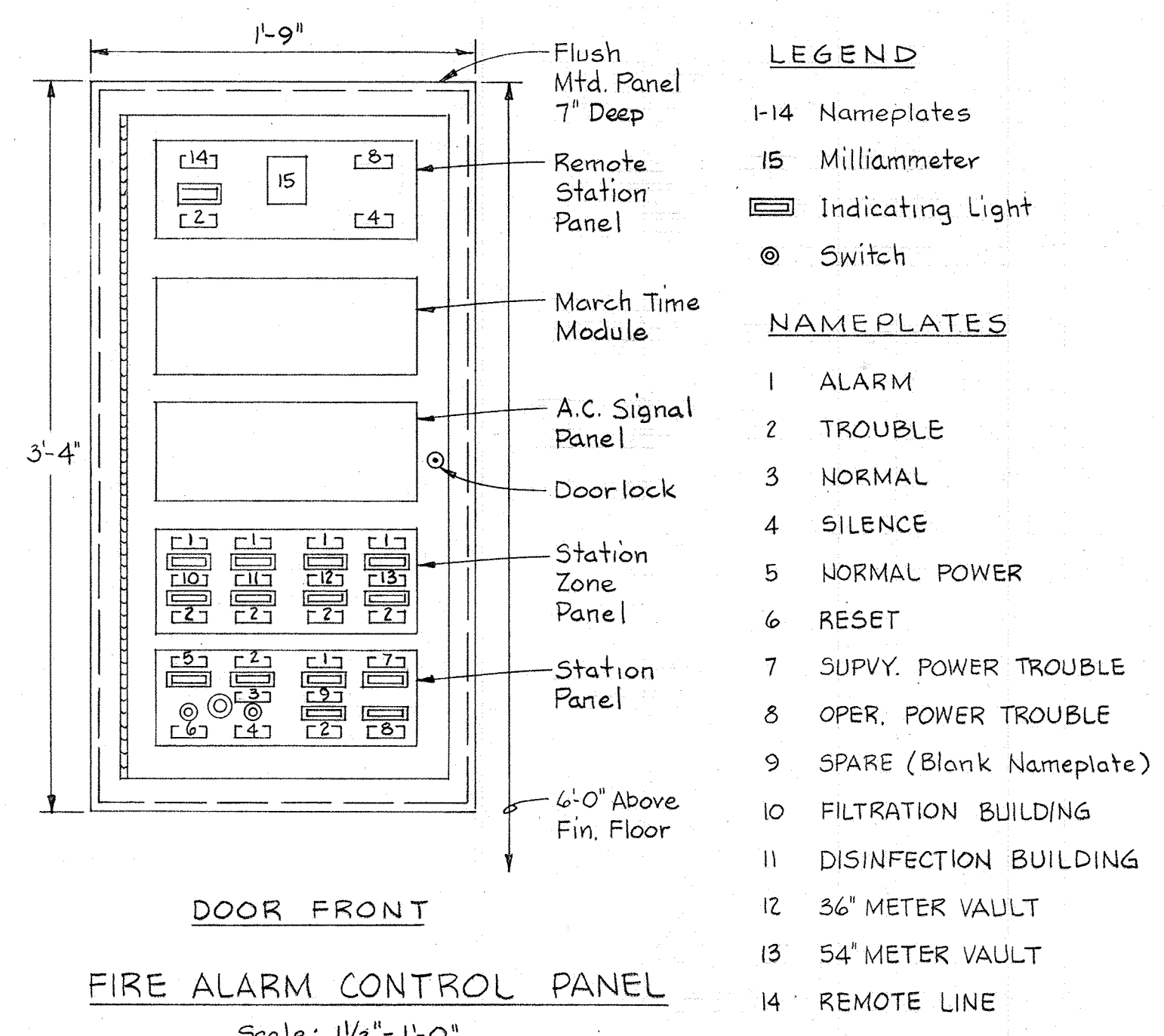


- NOTES:**
1. For GENERAL ELECTRICAL NOTES & LEGEND, see Sheet E-2.
  2. All wiring for Fire Alarm Systems shall be #14 AWG in 3/4\"/>

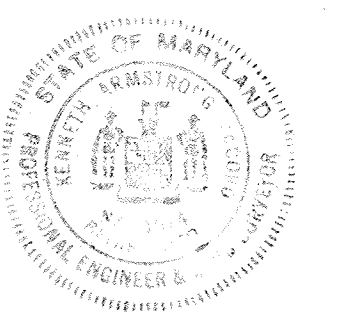
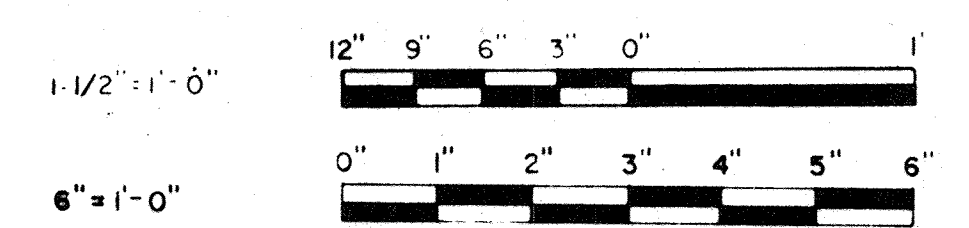
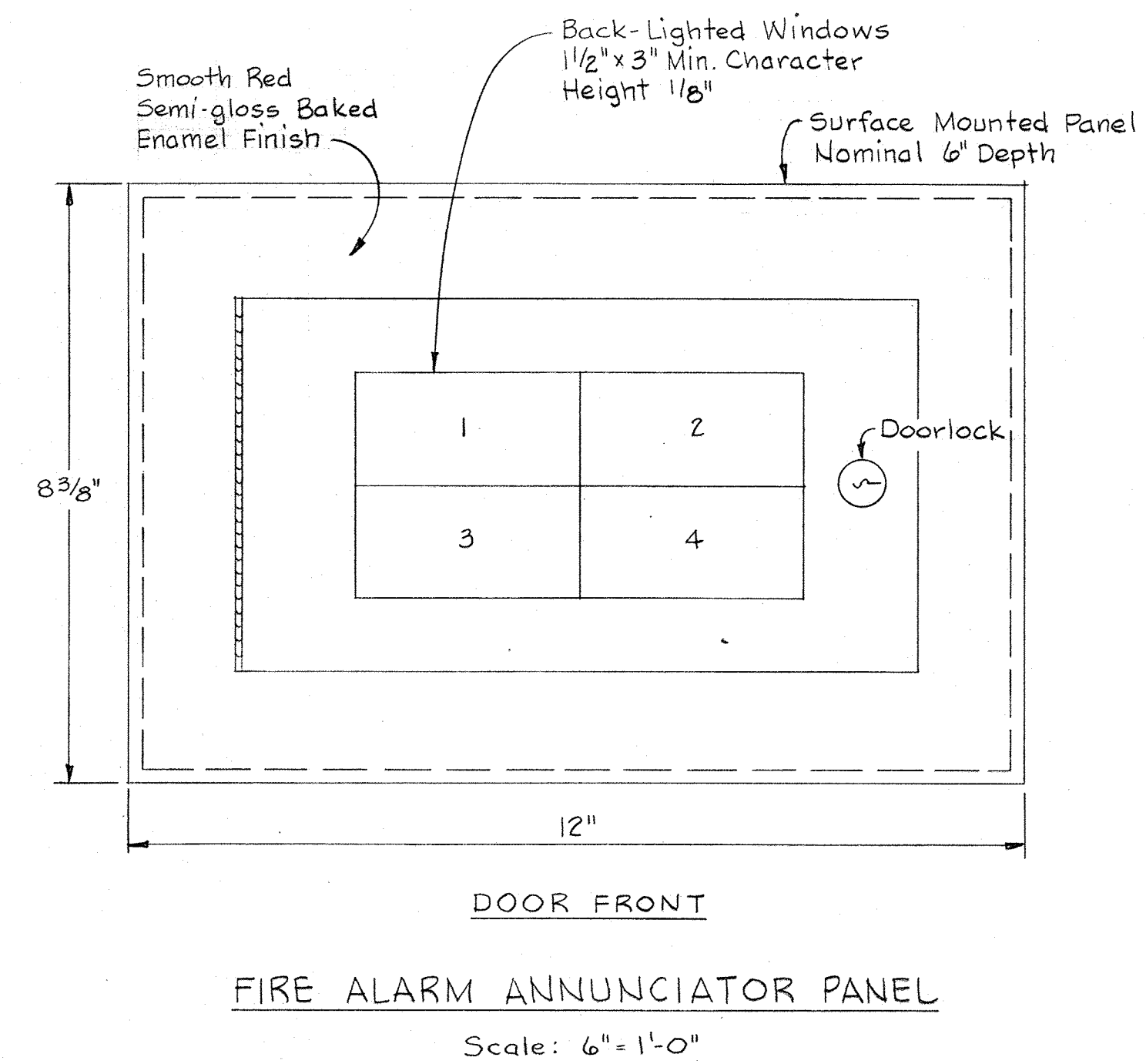
**ONE LINE DIAGRAM FOR FIRE ALARM SYSTEM**  
No Scale

| Point No. | Window Inscription    | Remarks |
|-----------|-----------------------|---------|
| 1         | FILTRATION BUILDING   |         |
| 2         | DISINFECTION BUILDING |         |
| 3         | 36\"/>                |         |

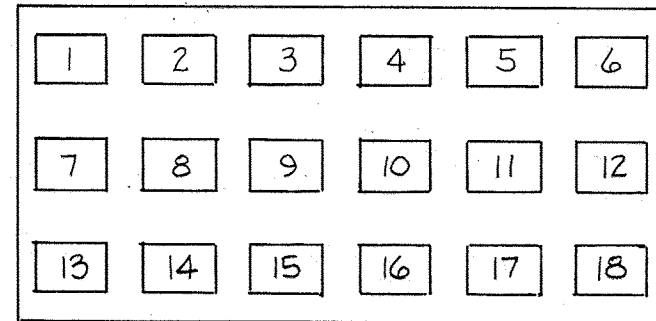
**FIRE ALARM ANNUNCIATOR SCHEDULE**



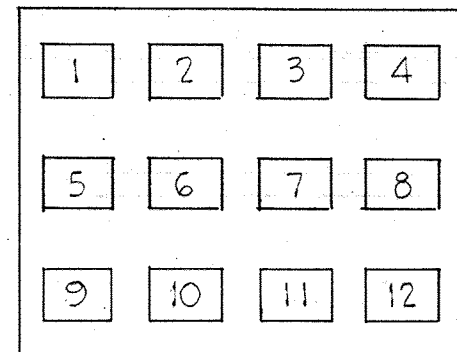
- LEGEND**
- 1-14 Nameplates
  - 15 Milliammeter
  - Indicating Light
  - Switch
- NAMEPLATES**
- 1 ALARM
  - 2 TROUBLE
  - 3 NORMAL
  - 4 SILENCE
  - 5 NORMAL POWER
  - 6 RESET
  - 7 SUPVY. POWER TROUBLE
  - 8 OPER. POWER TROUBLE
  - 9 SPARE (Blank Nameplate)
  - 10 FILTRATION BUILDING
  - 11 DISINFECTION BUILDING
  - 12 36\"/>



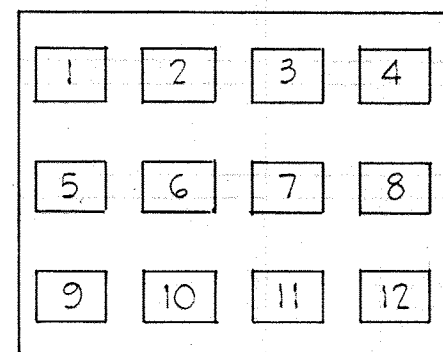




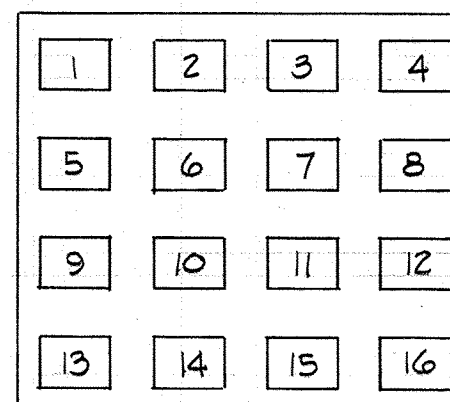
ANNUNCIATOR #10-1  
FILTRATION CONTROL BOARD  
FILTRATION BUILDING



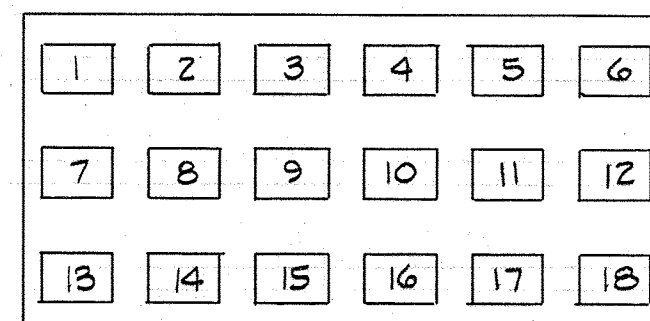
ANNUNCIATOR #9  
MOTOR CONTROL CENTER 'CC11'  
DISINFECTION BUILDING



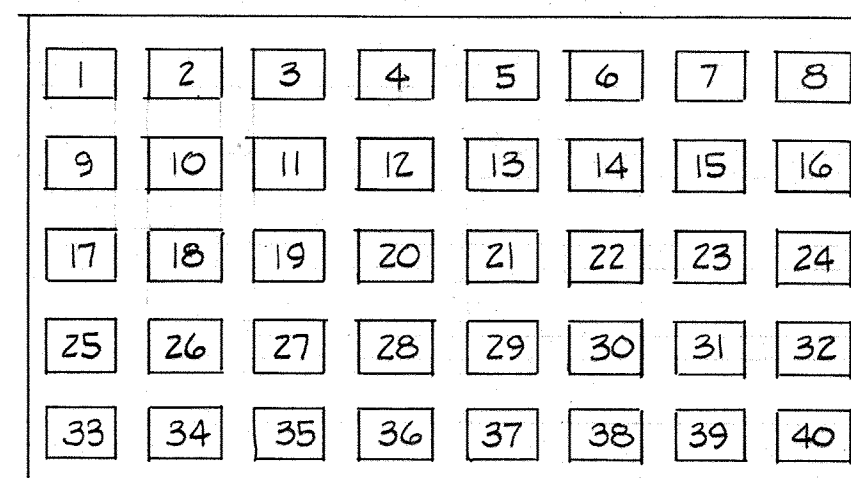
ANNUNCIATOR #11  
MOTOR CONTROL CENTER 'CC12'  
DISINFECTION BUILDING



ANNUNCIATOR #15  
OUTDOOR SUBSTATION 'PS4'



ANNUNCIATOR #10-2  
FILTRATION CONTROL BOARD  
FILTRATION BUILDING



ANNUNCIATOR #12  
DISINFECTION CONTROL BOARD  
DISINFECTION BUILDING

| POINT N° | WINDOW INSCRIPTION   | E.C.D. N° |
|----------|--|-----------|
| 1        | HIGH WATER LEVEL FLOCCULATOR BASIN N°1 FILTRATION BUILDING | 56 E-22   |
| 2        | HIGH WATER LEVEL FLOCCULATOR BASIN N°2 FILTRATION BUILDING | 56 E-22   |
| 3        | HIGH WATER LEVEL FLOCCULATOR BASIN N°3 FILTRATION BUILDING | 56 E-22   |
| 4        | HIGH WATER LEVEL FLOCCULATOR BASIN N°4 FILTRATION BUILDING | 56 E-22   |
| 5        | BLANK (SPARE UNIT)   |           |
| 6        | BLANK (SPARE UNIT)   |           |
| 7        | HIGH WATER LEVEL INFLUENT FILTER N°1 FILTRATION BUILDING   | 53 E-22   |
| 8        | HIGH WATER LEVEL INFLUENT FILTER N°2 FILTRATION BUILDING   | 53 E-22   |
| 9        | HIGH WATER LEVEL INFLUENT FILTER N°3 FILTRATION BUILDING   | 53 E-22   |
| 10       | HIGH WATER LEVEL INFLUENT FILTER N°4 FILTRATION BUILDING   | 53 E-22   |
| 11       | BLANK (SPARE UNIT)   |           |
| 12       | BLANK (SPARE UNIT)   |           |
| 13       | EXCESS LOSS OF HEAD FILTER N°1 FILTRATION BUILDING         | 50 E-22   |
| 14       | EXCESS LOSS OF HEAD FILTER N°2 FILTRATION BUILDING         | 50 E-22   |
| 15       | EXCESS LOSS OF HEAD FILTER N°3 FILTRATION BUILDING         | 50 E-22   |
| 16       | EXCESS LOSS OF HEAD FILTER N°4 FILTRATION BUILDING         | 50 E-22   |
| 17       | BLANK (SPARE UNIT)   |           |
| 18       | BLANK (SPARE UNIT)   |           |

| POINT N° | WINDOW INSCRIPTION                                      | E.C.D. N° |
|----------|---|-----------|
| 1        | MAIN BREAKER-1 OPEN 480V MCC-CC11 FILTRATION BUILDING   | 51 E-22   |
| 2        | TIE BREAKER CLOSED 480V MCC-CC11 FILTRATION BUILDING    | 52 E-22   |
| 3        | MAIN BREAKER-2 OPEN 480V MCC-CC11 FILTRATION BUILDING   | 51 E-22   |
| 4        | NO VOLTAGE SER. FDR-1 480V MCC-CC11 FILTRATION BUILDING | 54 E-22   |
| 5        | NO VOLTAGE SER. FDR-2 480V MCC-CC11 FILTRATION BUILDING | 54 E-22   |
| 6        | BLANK (SPARE UNIT)                                      |           |
| 7        | BLANK (SPARE UNIT)                                      |           |
| 8        | BLANK (SPARE UNIT)                                      |           |
| 9        | BLANK (SPARE UNIT)                                      |           |
| 10       | BLANK (SPARE UNIT)                                      |           |
| 11       | BLANK (SPARE UNIT)                                      |           |
| 12       | BLANK (SPARE UNIT)                                      |           |

| POINT N° | WINDOW INSCRIPTION  | E.C.D. N° |
|----------|---|-----------|
| 1        | MAIN BREAKER-1 OPEN 480V MCC-CC12 DISINFECTION BUILDING   | 51 E-22   |
| 2        | TIE BREAKER CLOSED 480V MCC-CC12 DISINFECTION BUILDING    | 52 E-22   |
| 3        | MAIN BREAKER-2 OPEN 480V MCC-CC12 DISINFECTION BUILDING   | 51 E-22   |
| 4        | NO VOLTAGE SER. FDR-1 480V MCC-CC12 DISINFECTION BUILDING | 54 E-22   |
| 5        | NO VOLTAGE SER. FDR-2 480V MCC-CC12 DISINFECTION BUILDING | 54 E-22   |
| 6        | BLANK (SPARE UNIT)  |           |
| 7        | BLANK (SPARE UNIT)  |           |
| 8        | BLANK (SPARE UNIT)  |           |
| 9        | BLANK (SPARE UNIT)  |           |
| 10       | BLANK (SPARE UNIT)  |           |
| 11       | BLANK (SPARE UNIT)  |           |
| 12       | BLANK (SPARE UNIT)  |           |

| POINT N° | WINDOW INSCRIPTION                               | E.C.D. N° |
|----------|--|-----------|
| 1        | MAIN SWITCH-1 OPEN PLANT FDR #1 SUBSTATION PS-4  | 43 E-22   |
| 2        | HIGH TEMPERATURE 2500 KVA XFMR-1 SUBSTATION PS-4 | 44 E-22   |
| 3        | LOW LIQUID LEVEL 2500 KVA XFMR-1 SUBSTATION PS-4 | 44 E-22   |
| 4        | HIGH PRESSURE 2500 KVA XFMR-1 SUBSTATION PS-4    | 44 E-22   |
| 5        | MAIN BREAKER-1 OPEN 480V SWGR. SUBSTATION PS-4   | 47 E-22   |
| 6        | TIE BREAKER CLOSED 480V SWGR. SUBSTATION PS-4    | 48 E-22   |
| 7        | MAIN BREAKER-2 OPEN 480V SWGR. SUBSTATION PS-4   | 47 E-22   |
| 8        | HIGH PRESSURE 2500 KVA XFMR-2 SUBSTATION PS-4    | 44 E-22   |
| 9        | LOW LIQUID LEVEL 2500 KVA XFMR-2 SUBSTATION PS-4 | 44 E-22   |
| 10       | HIGH TEMPERATURE 2500 KVA XFMR-2 SUBSTATION PS-4 | 44 E-22   |
| 11       | MAIN SWITCH-2 OPEN PLANT FDR #2 SUBSTATION PS-4  | 43 E-22   |
| 12       | NO VOLTAGE 480V SER.-1 SUBSTATION PS-4           | 49 E-22   |
| 13       | NO VOLTAGE 480V SER.-2 SUBSTATION PS-4           | 49 E-22   |
| 14       | BLANK (SPARE UNIT)                               |           |
| 15       | BLANK (SPARE UNIT)                               |           |
| 16       | BLANK (SPARE UNIT)                               |           |

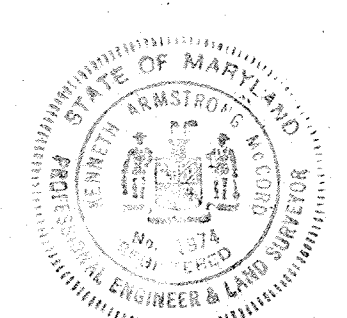
| POINT N° | WINDOW INSCRIPTION                                       | E.C.D. N° |
|----------|--|-----------|
| 1        | HIGH WATER LEVEL EFFLUENT SUMP FILTRATION BUILDING       | 53 E-22   |
| 2        | LOW WATER LEVEL EFFLUENT SUMP FILTRATION BUILDING        | 53 E-22   |
| 3        | LOW AIR PRESSURE STATION AIR FILTRATION BUILDING         | 55 E-22   |
| 4        | BLANK (SPARE UNIT)                                       |           |
| 5        | BLANK (SPARE UNIT)                                       |           |
| 6        | BLANK (SPARE UNIT)                                       |           |
| 7        | FILTER MALFUNCTION A.B.W. FILTER N°1 FILTRATION BUILDING | 46 E-22   |
| 8        | FILTER MALFUNCTION A.B.W. FILTER N°2 FILTRATION BUILDING | 46 E-22   |
| 9        | FILTER MALFUNCTION A.B.W. FILTER N°3 FILTRATION BUILDING | 46 E-22   |
| 10       | FILTER MALFUNCTION A.B.W. FILTER N°4 FILTRATION BUILDING | 46 E-22   |
| 11       | BLANK (SPARE UNIT)                                       |           |
| 12       | BLANK (SPARE UNIT)                                       |           |
| 13       | LOW ALUM LEVEL ALUM TANK N°1 FILTRATION BUILDING         | 45 E-22   |
| 14       | LOW ALUM LEVEL ALUM TANK N°2 FILTRATION BUILDING         | 45 E-22   |
| 15       | LOSS OF LUBE WATER EFFLUENT PUMP #1 FILTRATION BUILDING  | 31 E-18   |
| 16       | LOSS OF LUBE WATER EFFLUENT PUMP #2 FILTRATION BUILDING  | 31 E-18   |
| 17       | LOSS OF LUBE WATER EFFLUENT PUMP #4 FILTRATION BUILDING  | 31 E-18   |
| 18       | LOSS OF LUBE WATER EFFLUENT PUMP #5 FILTRATION BUILDING  | 31 E-18   |

| POINT N° | WINDOW INSCRIPTION  | E.C.D. N° |
|----------|---|-----------|
| 1        | CHLORINE LEAK CHLORINE STORAGE AREA DISINFECTION BUILDING   | 57 E-22   |
| 2        | CHLORINE LEAK CHLORINATOR ROOM DISINFECTION BUILDING        | 57 E-22   |
| 3        | SULPHUR DIOXIDE LEAK STORAGE AREA DISINFECTION BUILDING     | 57 E-22   |
| 4        | SULPHUR DIOXIDE LEAK SULPHONATOR ROOM DISINFECTION BUILDING | 57 E-22   |
| 5        | LOW WEIGHT SO <sub>2</sub> SCALE N°1 DISINFECTION BUILDING  | 58 E-22   |
| 6        | LOW WEIGHT SO <sub>2</sub> SCALE N°2 DISINFECTION BUILDING  | 58 E-22   |
| 7        | LOW WEIGHT SO <sub>2</sub> SCALE N°3 DISINFECTION BUILDING  | 58 E-22   |
| 8        | BLANK (SPARE UNIT)  |           |
| 9        | LOW WEIGHT CHLORINE SCALE N°1 DISINFECTION BUILDING         | 58 E-22   |
| 10       | LOW WEIGHT CHLORINE SCALE N°2 DISINFECTION BUILDING         | 58 E-22   |
| 11       | LOW WEIGHT CHLORINE SCALE N°3 DISINFECTION BUILDING         | 58 E-22   |
| 12       | LOW WEIGHT CHLORINE SCALE N°4 DISINFECTION BUILDING         | 58 E-22   |
| 13       | LOW WEIGHT CHLORINE SCALE N°5 DISINFECTION BUILDING         | 58 E-22   |
| 14       | LOW WEIGHT CHLORINE SCALE N°6 DISINFECTION BUILDING         | 58 E-22   |
| 15       | LOW WEIGHT CHLORINE SCALE N°7 DISINFECTION BUILDING         | 58 E-22   |
| 16       | LOW WEIGHT CHLORINE SCALE N°8 DISINFECTION BUILDING         | 58 E-22   |
| 17       | LOW GAS FLOW CHLORINATOR N°1 DISINFECTION BUILDING          | 59 E-22   |
| 18       | HIGH GAS FLOW CHLORINATOR N°1 DISINFECTION BUILDING         | 59 E-22   |
| 19       | LOW GAS FLOW CHLORINATOR N°2 DISINFECTION BUILDING          | 59 E-22   |
| 20       | HIGH GAS FLOW CHLORINATOR N°2 DISINFECTION BUILDING         | 59 E-22   |

| POINT N° | WINDOW INSCRIPTION  | E.C.D. N° |
|----------|---|-----------|
| 21       | LOW GAS FLOW SULPHONATOR N°1 DISINFECTION BUILDING                            | 59 E-22   |
| 22       | HIGH GAS FLOW SULPHONATOR N°1 DISINFECTION BUILDING                           | 59 E-22   |
| 23       | LOW GAS FLOW SULPHONATOR N°2 DISINFECTION BUILDING                            | 59 E-22   |
| 24       | HIGH GAS FLOW SULPHONATOR N°2 DISINFECTION BUILDING                           | 59 E-22   |
| 25       | HIGH CL <sub>2</sub> RESIDUAL PLANT EFFLUENT DISINFECTION BUILDING            | 60 E-22   |
| 26       | LOW H <sub>2</sub> O PRESS. CHLORINATORS INJECTOR WATER DISINFECTION BUILDING | 61 E-18   |
| 27       | LOW D.O. PLANT EFFLUENT OUTFALL STRUCTURE                                     | 62 E-22   |
| 28       | LOW H <sub>2</sub> O PRESS. SULPHONATOR INJECTOR WATER DISINFECTION BUILDING  | 61 E-18   |
| 29       | BLANK (SPARE UNIT)  |           |
| 30       | BLANK (SPARE UNIT)  |           |
| 31       | BLANK (SPARE UNIT)  |           |
| 32       | BLANK (SPARE UNIT)  |           |
| 33       | BLANK (SPARE UNIT)  |           |
| 34       | BLANK (SPARE UNIT)  |           |
| 35       | BLANK (SPARE UNIT)  |           |
| 36       | BLANK (SPARE UNIT)  |           |
| 37       | BLANK (SPARE UNIT)  |           |
| 38       | BLANK (SPARE UNIT)  |           |
| 39       | BLANK (SPARE UNIT)  |           |
| 40       | BLANK (SPARE UNIT)  |           |

NOTES:  
1. For GENERAL ELECTRICAL NOTES & LEGEND, see Sheet E-2.

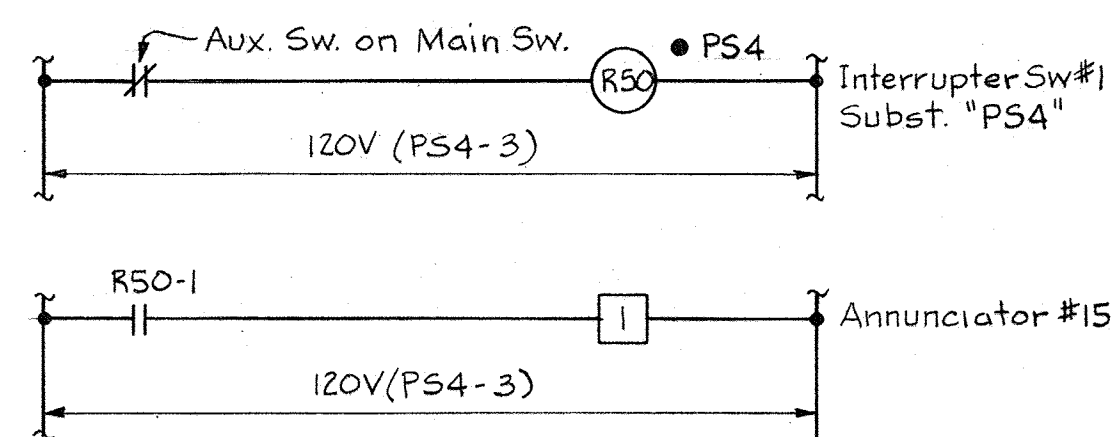
|   |  |                    |  |   |                         |                |
|---|--|--------------------|--|---|-------------------------|----------------|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard S. Freudenberger</i><br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | FILTRATION & DISINFECTION<br>ANNUNCIATOR SYSTEM<br>SCHEDULES & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 89<br>OF 96 | SCALE AS SHOWN |
|---|--|--------------------|--|---|-------------------------|----------------|



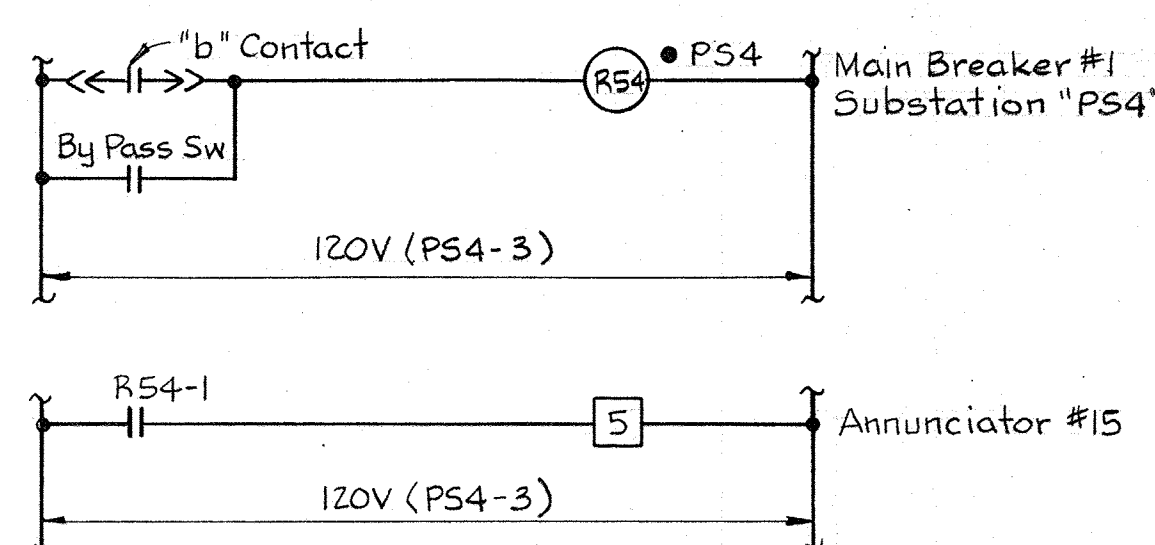


NOTES:

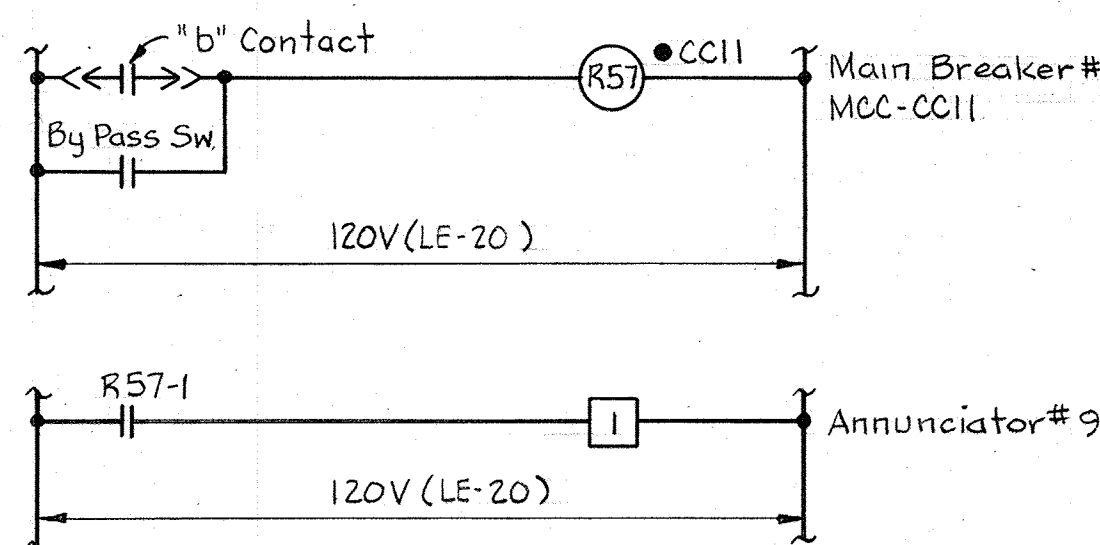
1. For GENERAL ELECTRICAL NOTES & LEGEND, see Sheet E-2.
2. For ANNUNCIATOR SCHEDULE & DETAILS, see Sheet E-21.



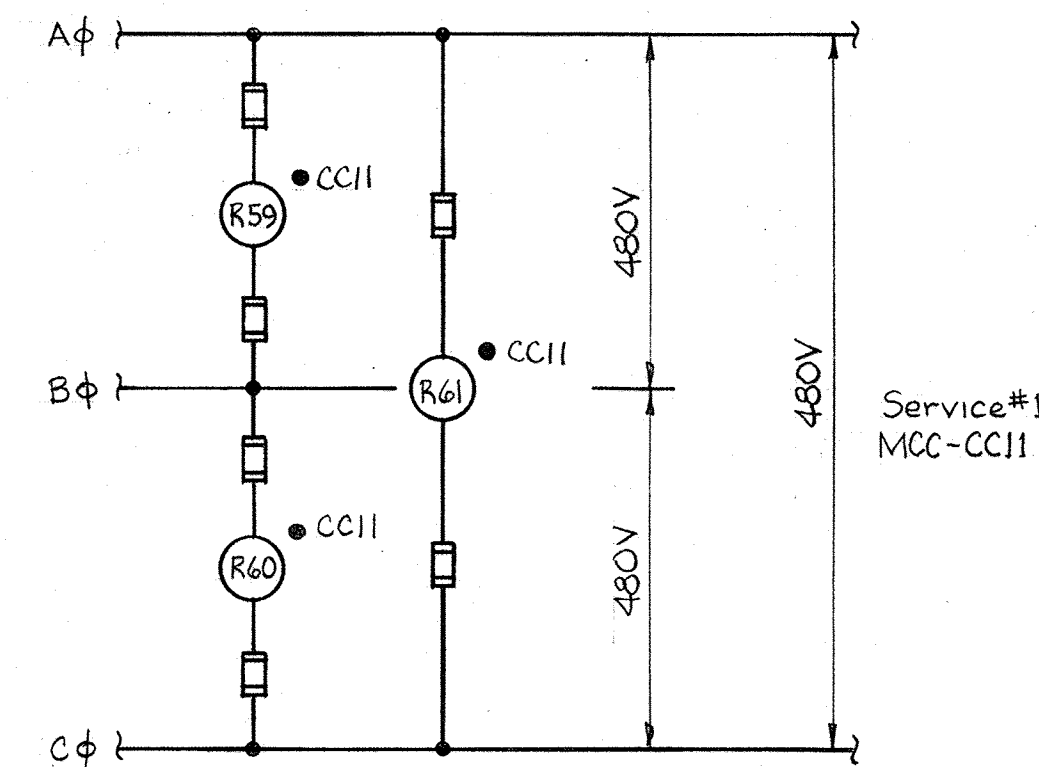
E.C.D. #43  
MAIN INTERRUPTER SW. 1  
SUBSTATION "PS4"  
Typical for Main Interrupter Sw. 2



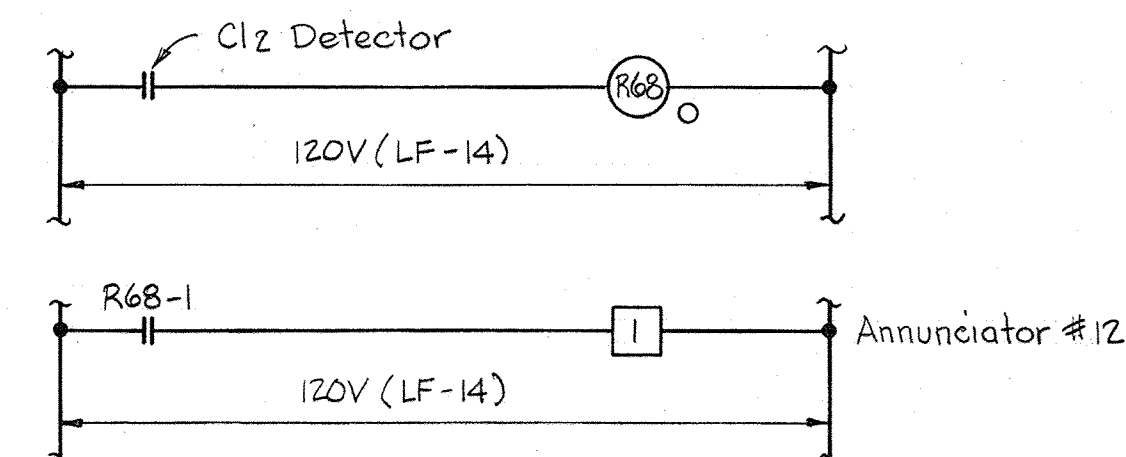
E.C.D. #47  
MAIN BREAKER #1-480V-SUBST. "PS4"  
Typical for Main Breaker #2-480V Subst. "PS4"



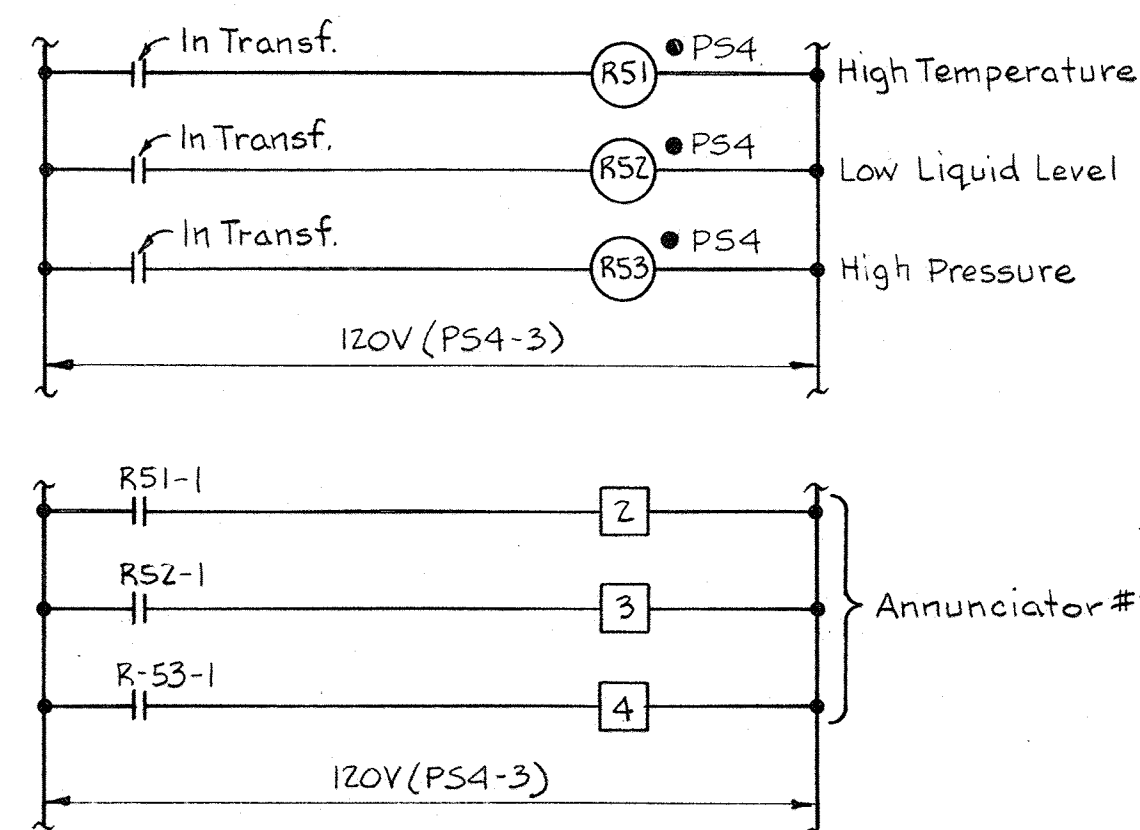
E.C.D. #51  
MAIN BREAKER #1 - MCC-CC11  
FILTRATION BUILDING  
Typical for the following Units:  
1. Main Breaker #2 - MCC-CC11 - Annun. #9  
2. Main Breaker #1 - MCC-CC12 - Annun. #11  
3. Main Breaker #2 - MCC-CC12 - Annun. #11



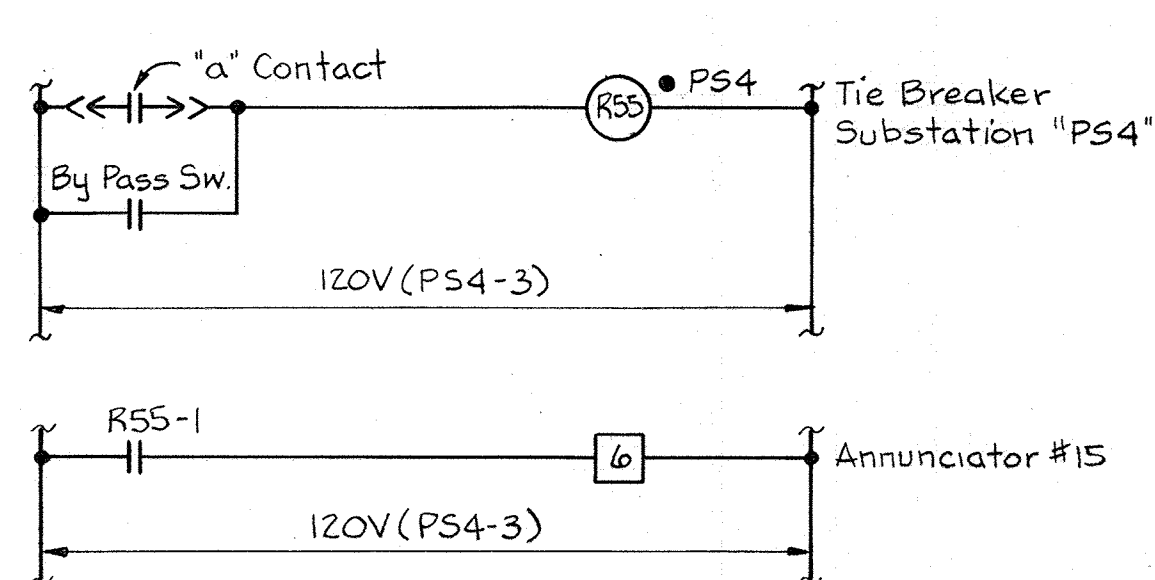
E.C.D. #54  
NO VOLTAGE - SERV. #1 - 480V-MCC-CC11  
Typical for the following Units:  
1. Service #2 - 480V-MCC-CC11 - Annun. #9  
2. Service #1 - 480V-MCC-CC12 - Annun. #11  
3. Service #2 - 480V-MCC-CC12 - Annun. #11



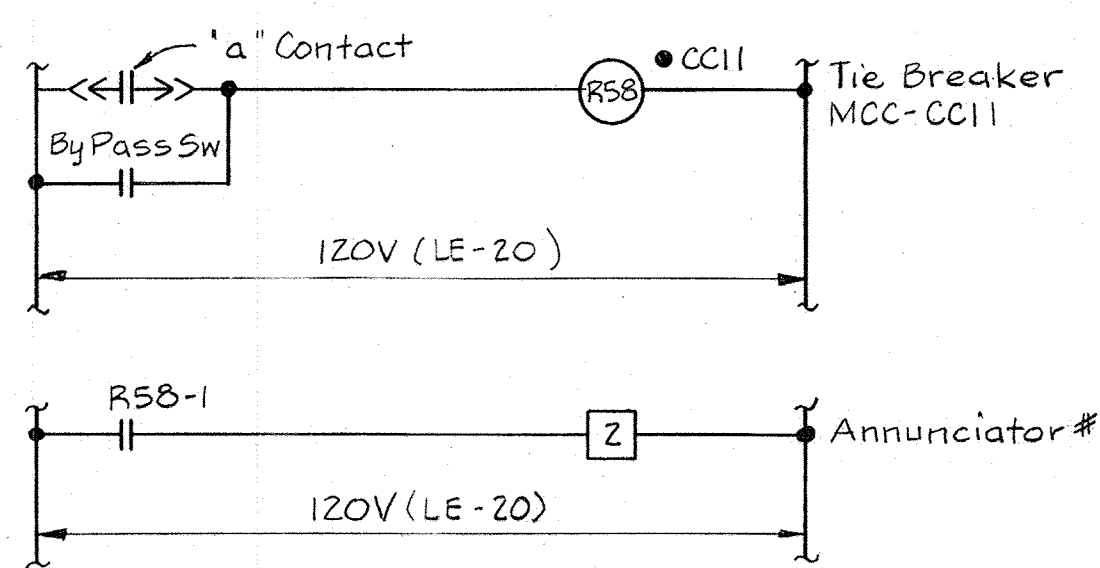
E.C.D. #57  
CHLORINE LEAK - Cl<sub>2</sub> STORAGE AREA  
Typical for the following Units:  
1. Chlorine Leak - Chlorinator Room  
2. Sulphur Dioxide Leak - Storage Area  
3. Sulphur Dioxide Leak - Sulphonator Room



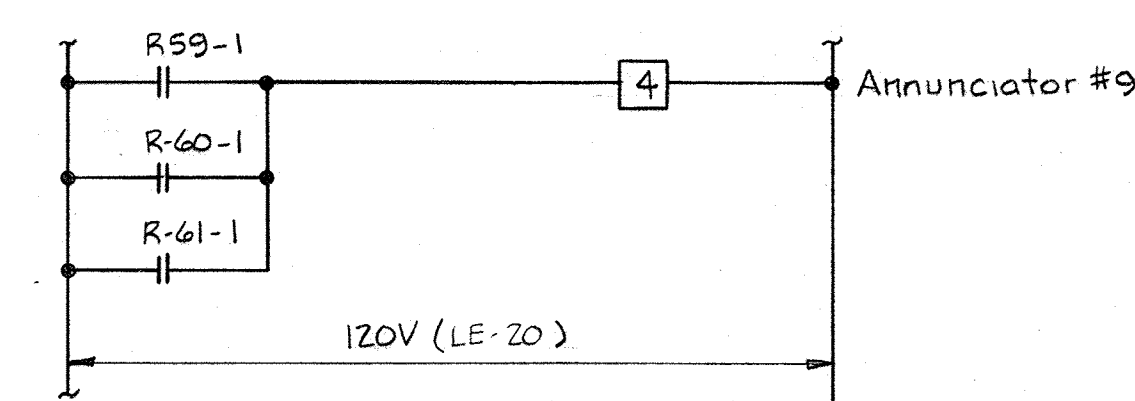
E.C.D. #44  
2500 KVA TRANSFORMER #1  
SUBSTATION "PS4"  
Typical for 2500 KVA Transformer #2



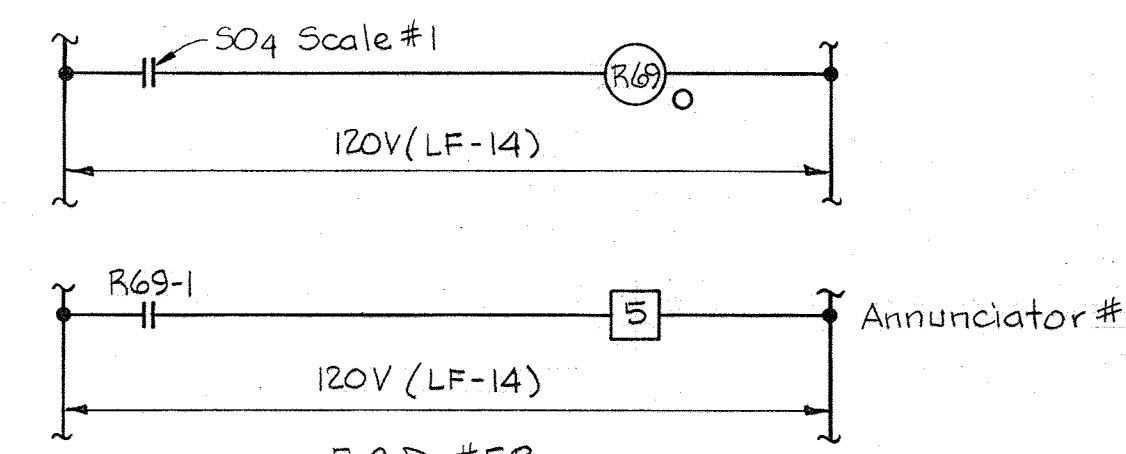
E.C.D. #48  
TIE BREAKER - 480V-SUBST. "PS4"



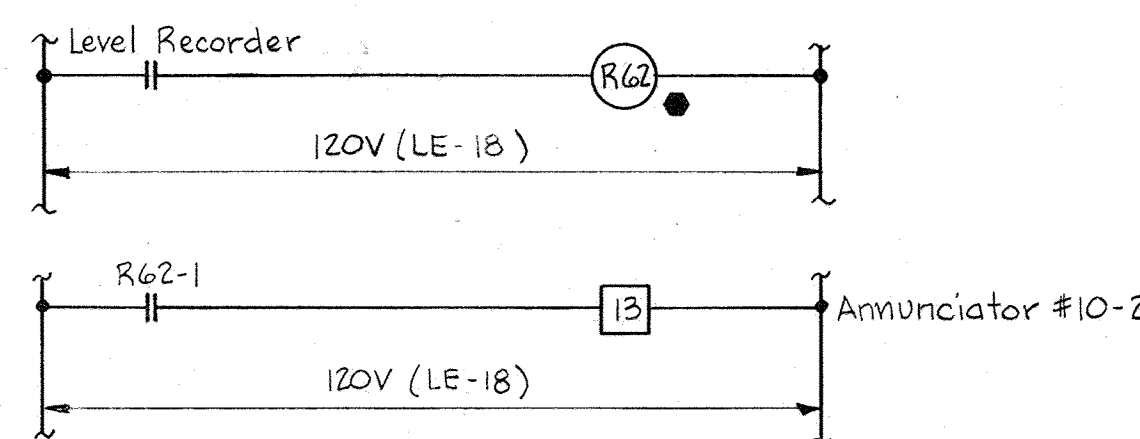
E.C.D. #52  
TIE BREAKER - MCC-CC11  
FILTRATION BUILDING  
Typical for the following Unit:  
1. Tie Breaker - MCC-CC12 - Annun. #11



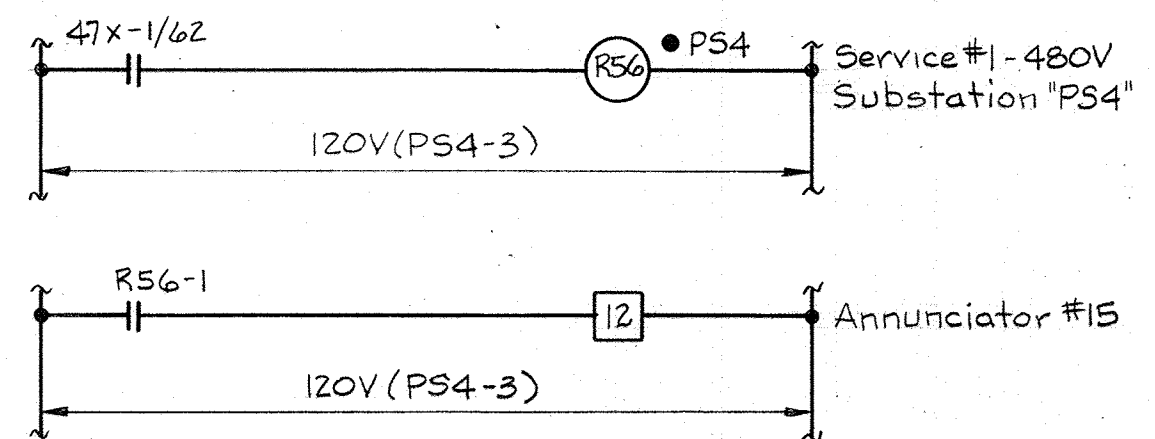
E.C.D. #55  
LOW AIR PRESSURE STATION AIR  
FILTER BLDG.



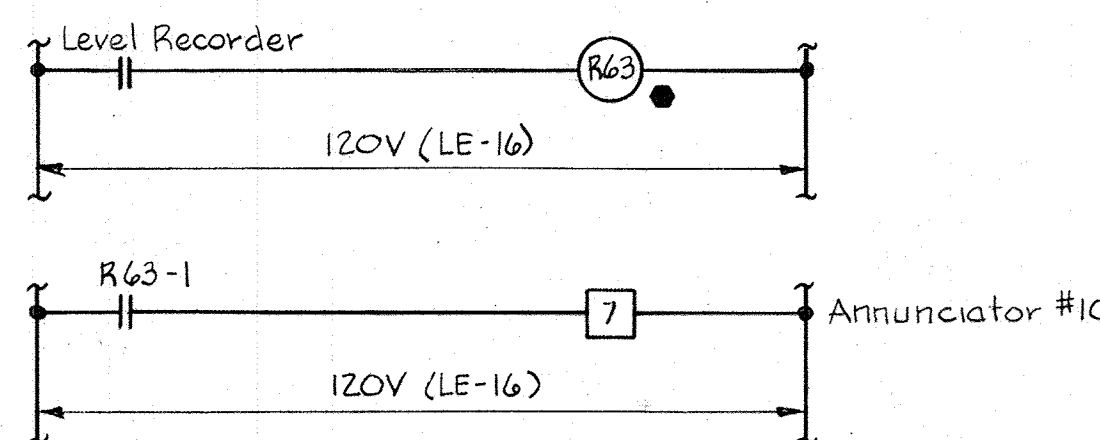
E.C.D. #58  
LOW WEIGHT - SO<sub>4</sub> SCALE #1  
Typical for the following Units:  
1. Low Weight - SO<sub>4</sub> Scales #2 & #3  
2. Low Weight - Cl<sub>2</sub> Scales #1, 2, 3, 4, 5, 6, 7, 8



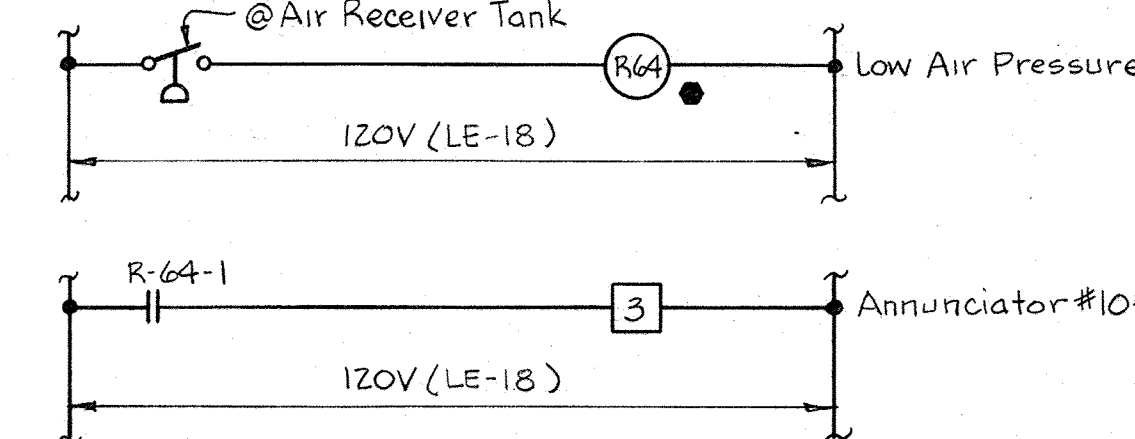
E.C.D. #45  
LOW ALUM LEVEL - ALUM TANK #1  
Typical for Alum Tank #2



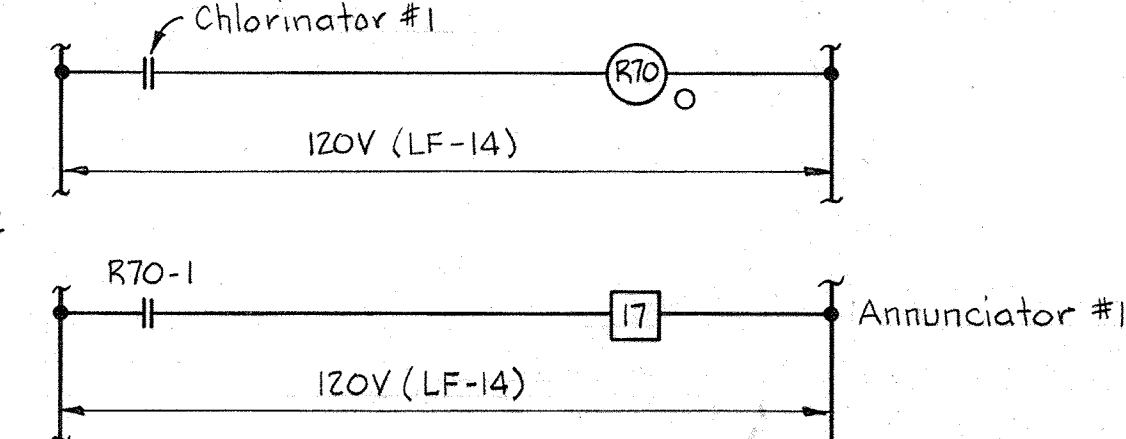
E.C.D. #49  
NO VOLTAGE - SERV #1 - 480V-SUBST. "PS4"  
Typical for No Voltage - Serv. #2 - Substation "PS4"



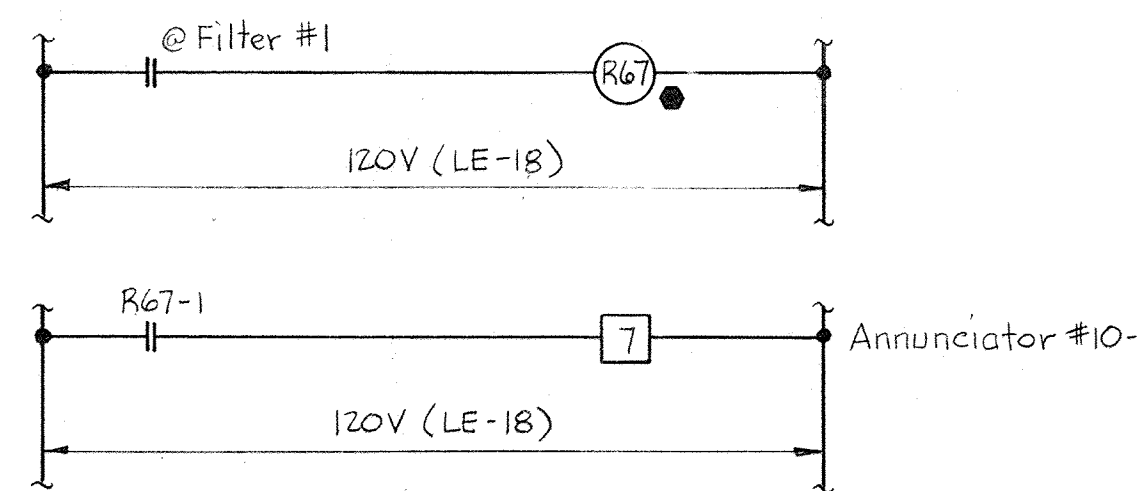
E.C.D. #53  
HIGH WATER LEVEL INFLUENT CHANNEL  
FILTER NO 1  
Typical for the following Units:  
1. High Water Level Infl. Channel Filter No 2  
2. High Water Level Infl. Channel Filter No 3  
3. High Water Level Infl. Channel Filter No 4  
4. High Water Level Eff. Sump (LE-18)  
5. Low Water Level Eff. Sump (LE-18)



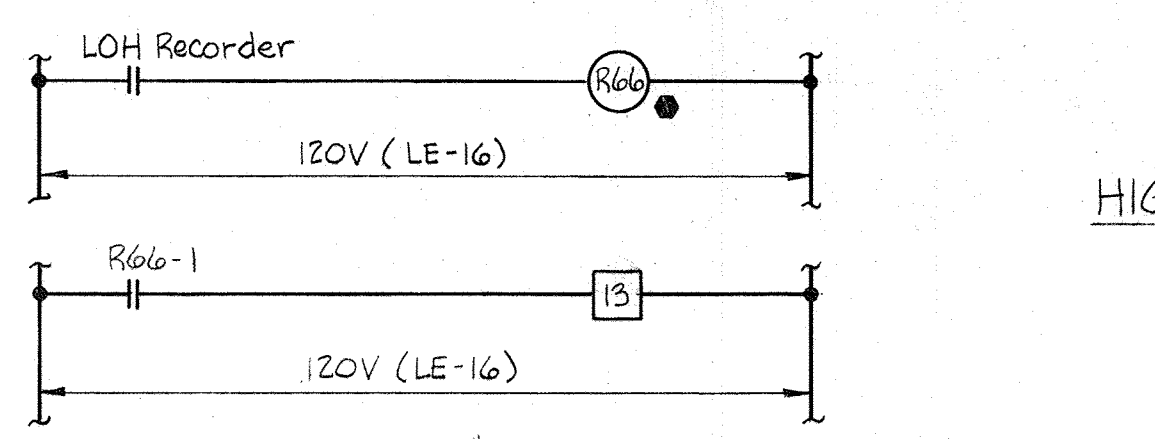
E.C.D. #56  
HIGH WATER LEVEL  
FLOCCULATOR BASIN NO 1  
FILTER BLDG.



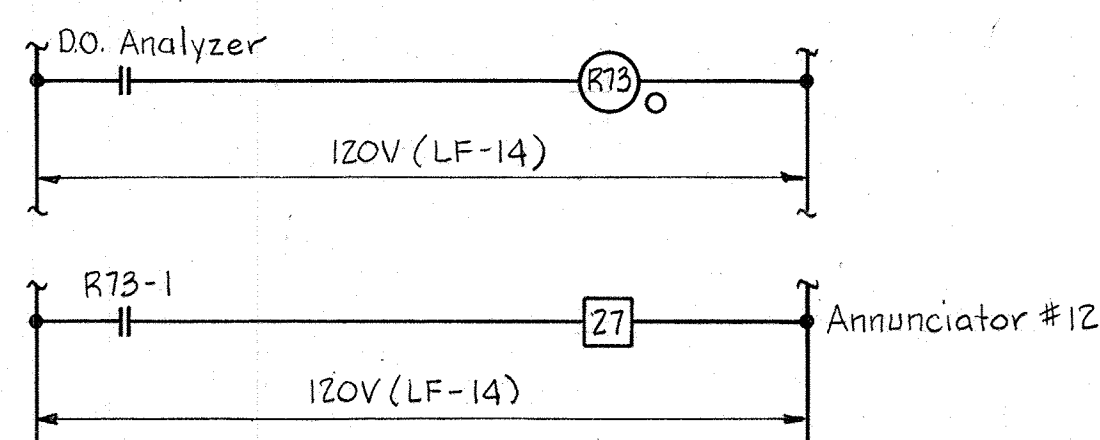
E.C.D. #59  
LOW GAS FLOW - CHLORINATOR #1  
Typical for the following Units:  
1. Low Gas Flow - Chlorinator #2  
2. Low Gas Flow - Sulphonators #1 & #2  
3. High Gas Flow - Chlorinators #1 & #2  
4. High Gas Flow - Sulphonators #1 & #2



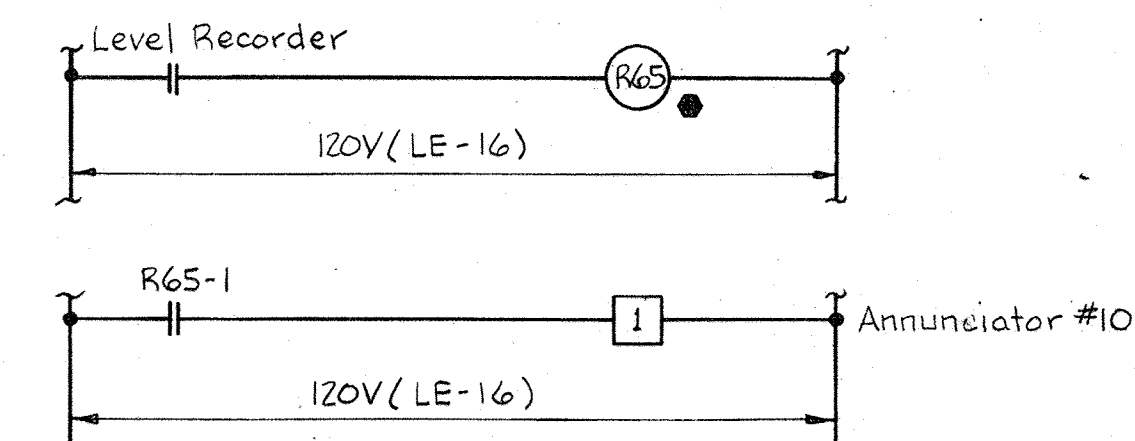
E.C.D. #46  
FILTER MALFUNCTION - FILTER #1  
Typical for the following Unit:  
1. Filter #2, #3, #4



E.C.D. #50  
EXCESS LOSS OF HEAD - FILTER #1  
Typical for the following Units:  
1. Loss of Head - Filter #2  
2. Loss of Head - Filter #3  
3. Loss of Head - Filter #4



E.C.D. #62  
LOW D.O. - PLANT EFFLUENT



E.C.D. #60  
HIGH Cl<sub>2</sub> RESIDUAL - PLANT EFFLUENT  
Typical for the following Units:  
1. High Water Level Flocculator Basin No 2  
2. High Water Level Flocculator Basin No 5  
3. High Water Level Flocculator Basin No 6

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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
12/13/77  
Richard E. Sanderberg  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

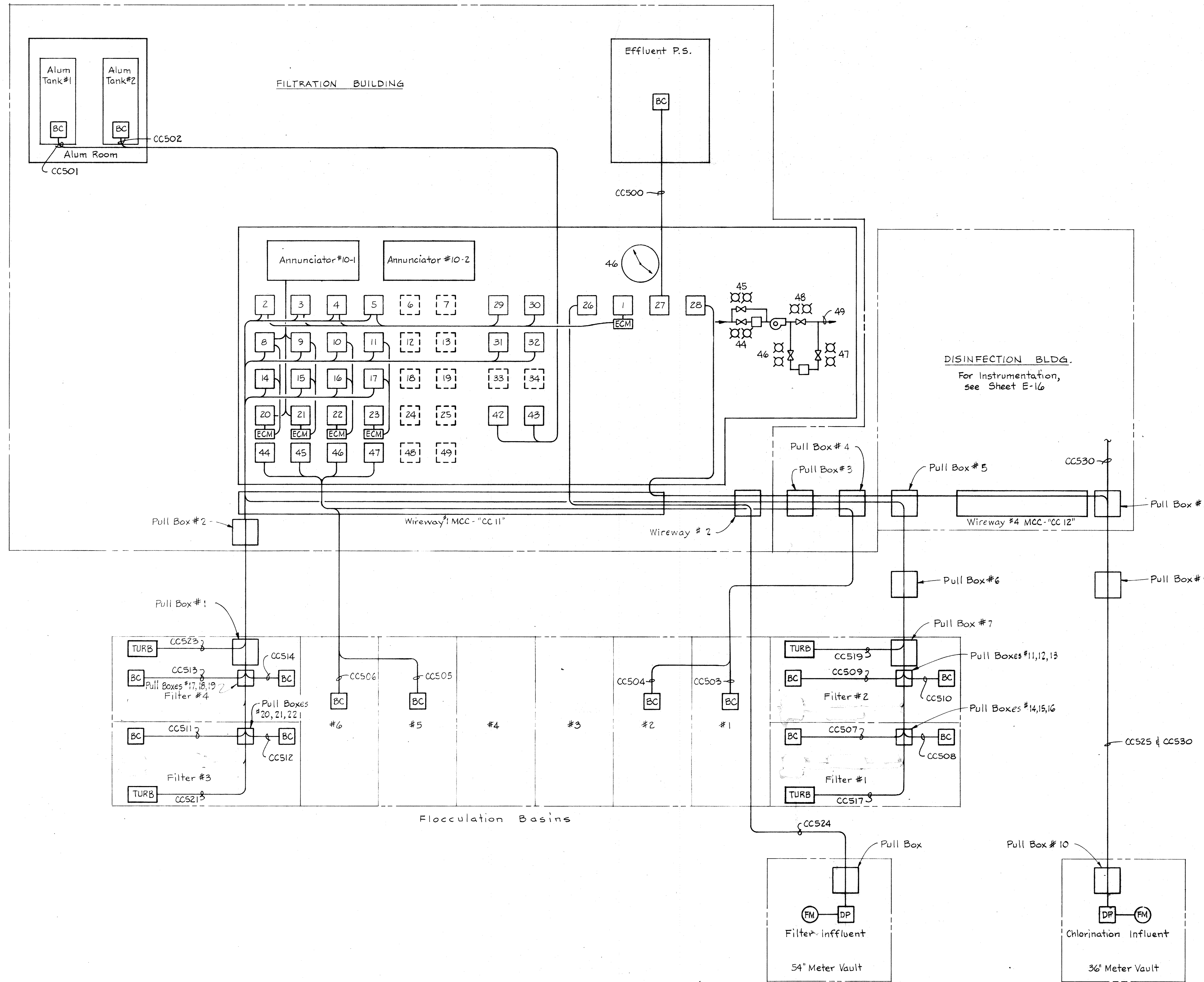
FILTRATION & DISINFECTION  
ANNUNCIATOR SYSTEM  
WIRING DIAGRAMS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO. 4

DRAWING  
NO. 90  
OF 96

SCALE  
AS  
SHOWN





- NOTES:**
1. For General Electrical Notes & Legend, see Sheet E-2
  2. See Mechanical Drawing M-20 for device no. designation, locations and abbreviations.
  3. For Disinfection Instrumentation, see Sheet E-16.
  4. For Control Cable Schedule, see Sheet E-28.

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

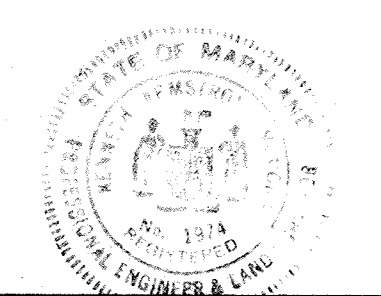
DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 12/13/77  
*Richard E. Sreudenberg*  
 CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FILTRATION  
 INSTRUMENTATION

SAVAGE WASTEWATER  
 TREATMENT PLANT ADDITION NO.4

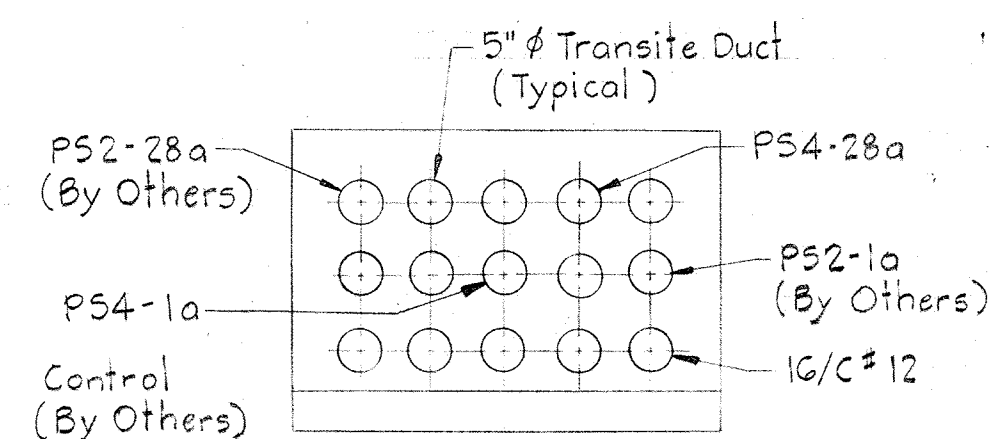
DRAWING NO. 91 OF 96  
 SCALE AS SHOWN



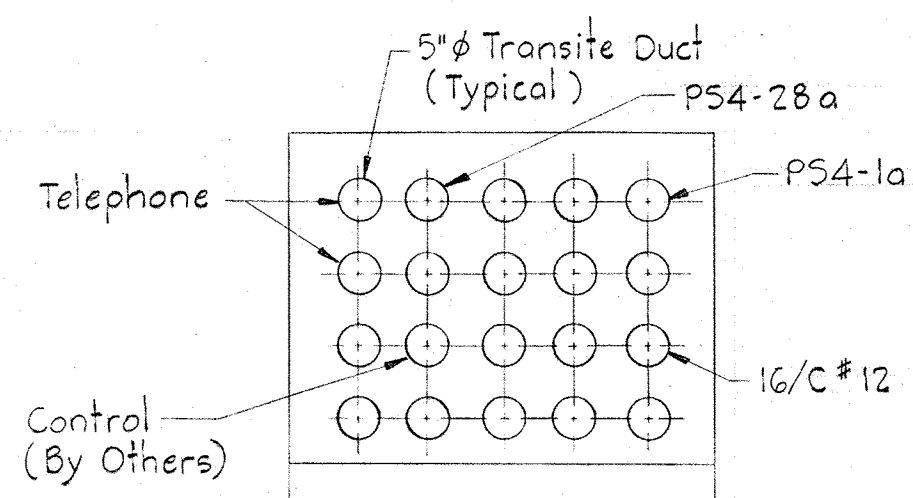


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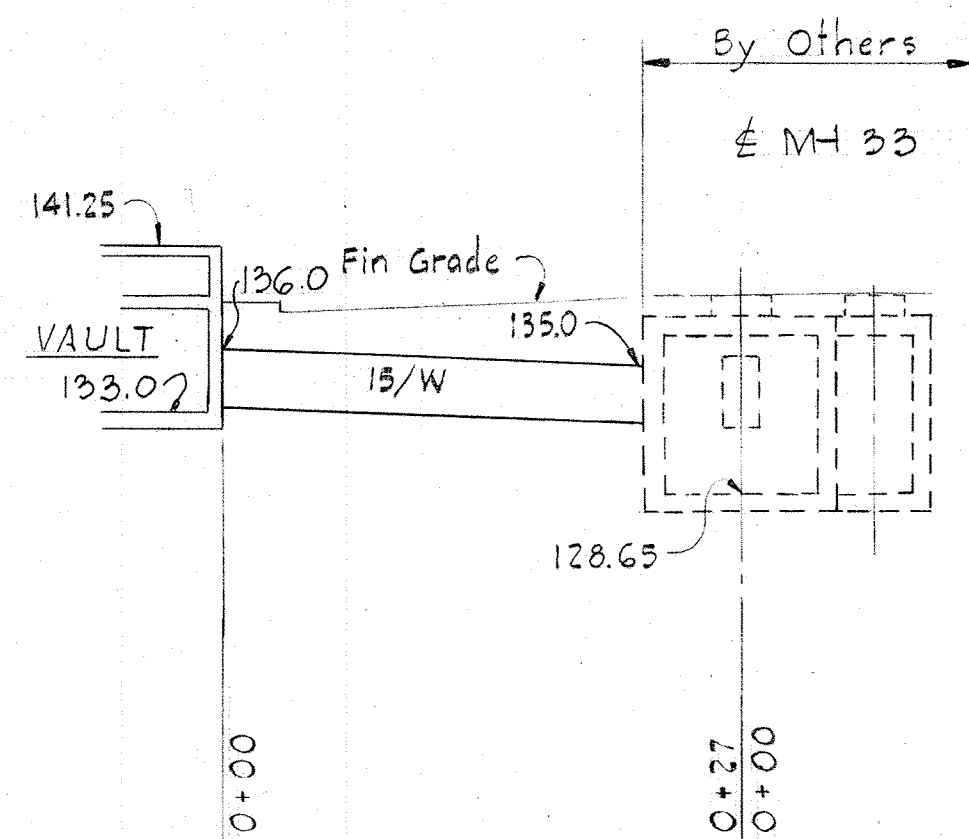
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
2. For Electrical Site Plan see Sheet E-3



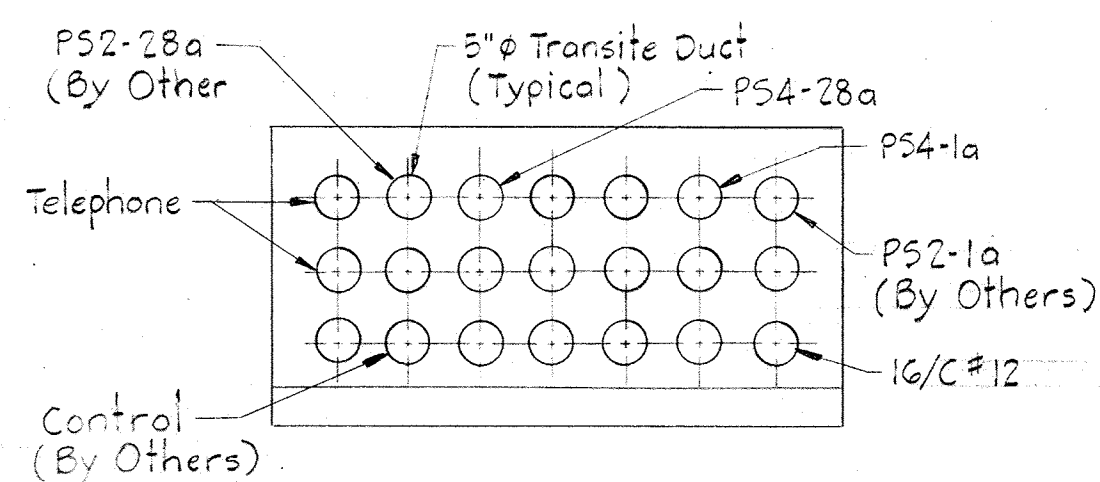
SECTION E24A/E3



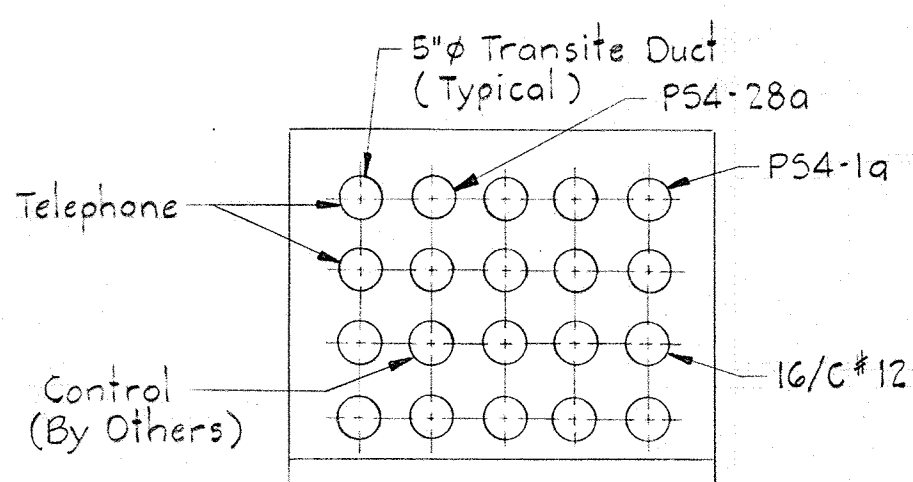
SECTION E24F/E3



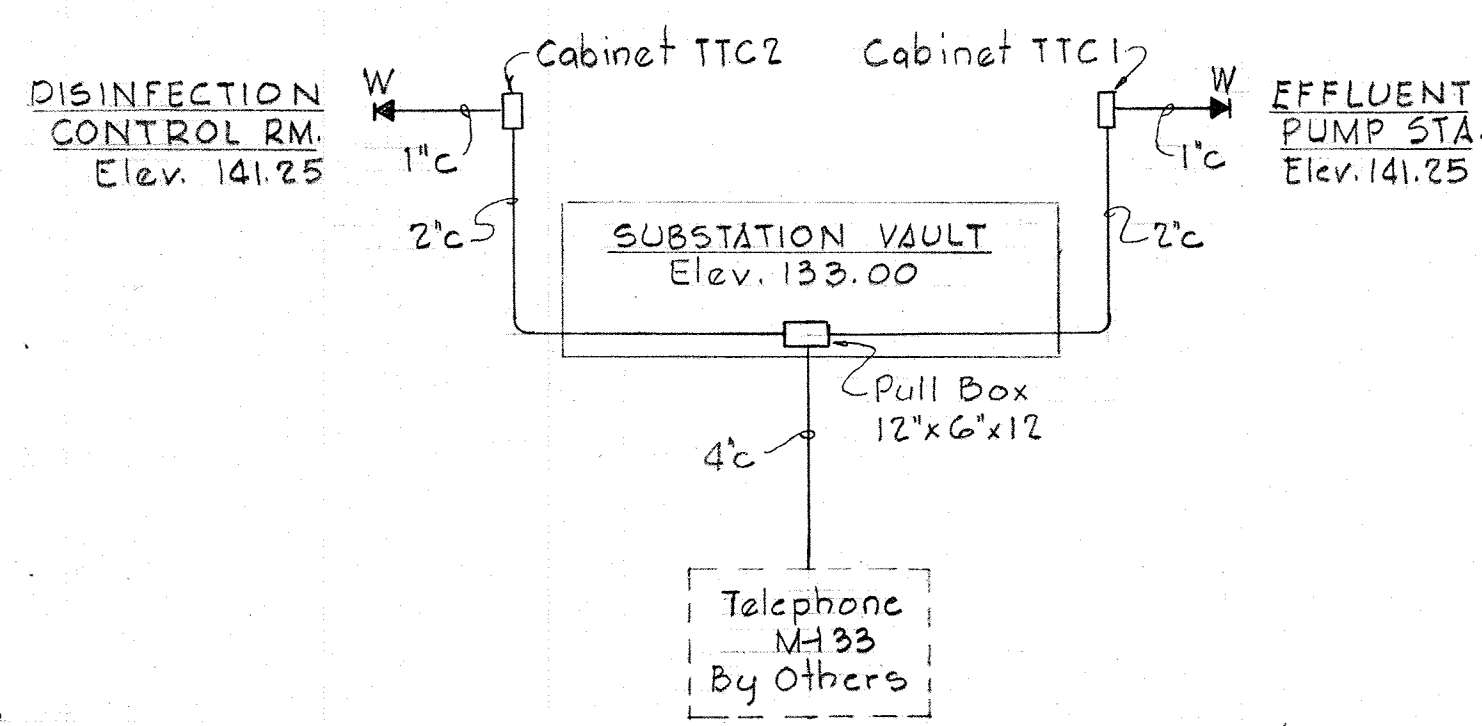
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Scale: 1"=10'



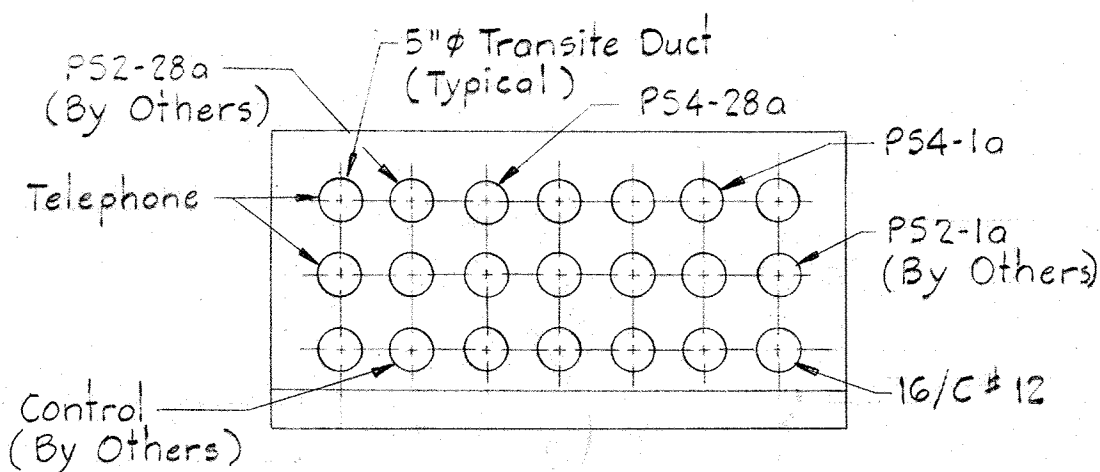
SECTION E24B/E3



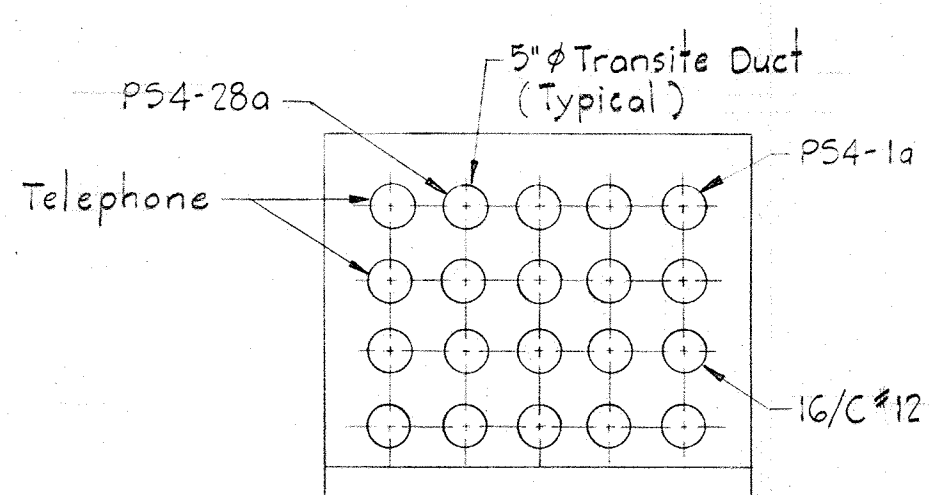
SECTION E24G/E3



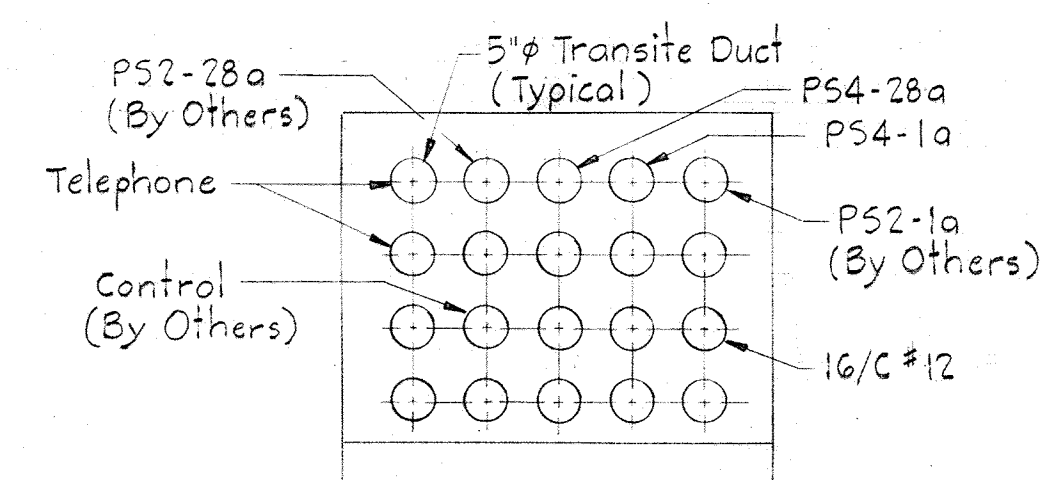
TELEPHONE RISER DIAGRAM  
No Scale



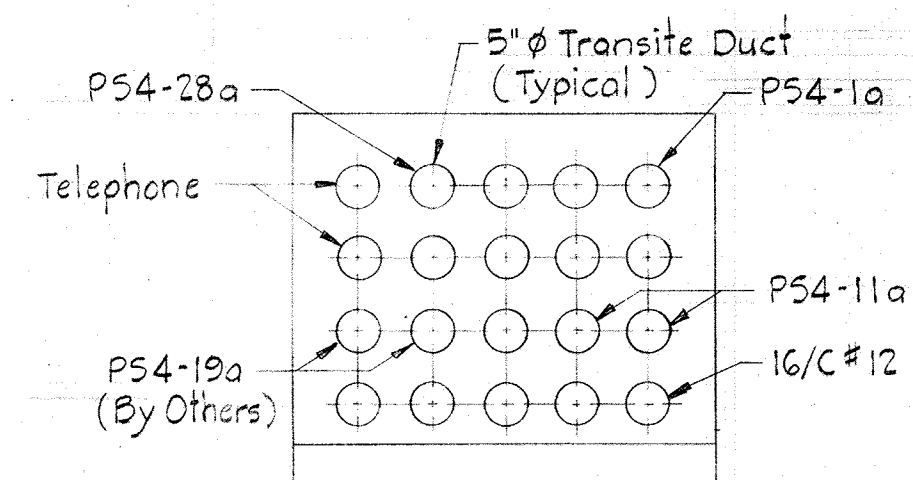
SECTION E24C/E3



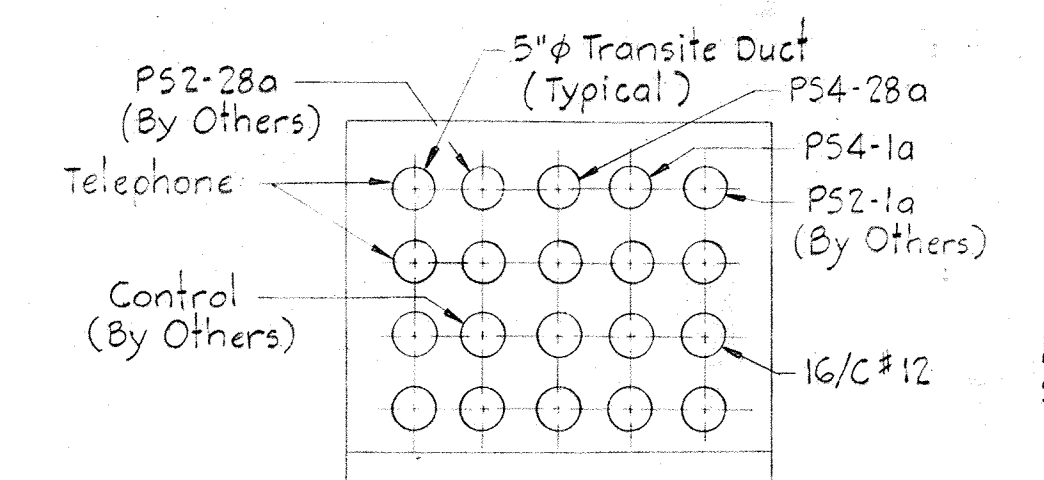
SECTION E24H/E3



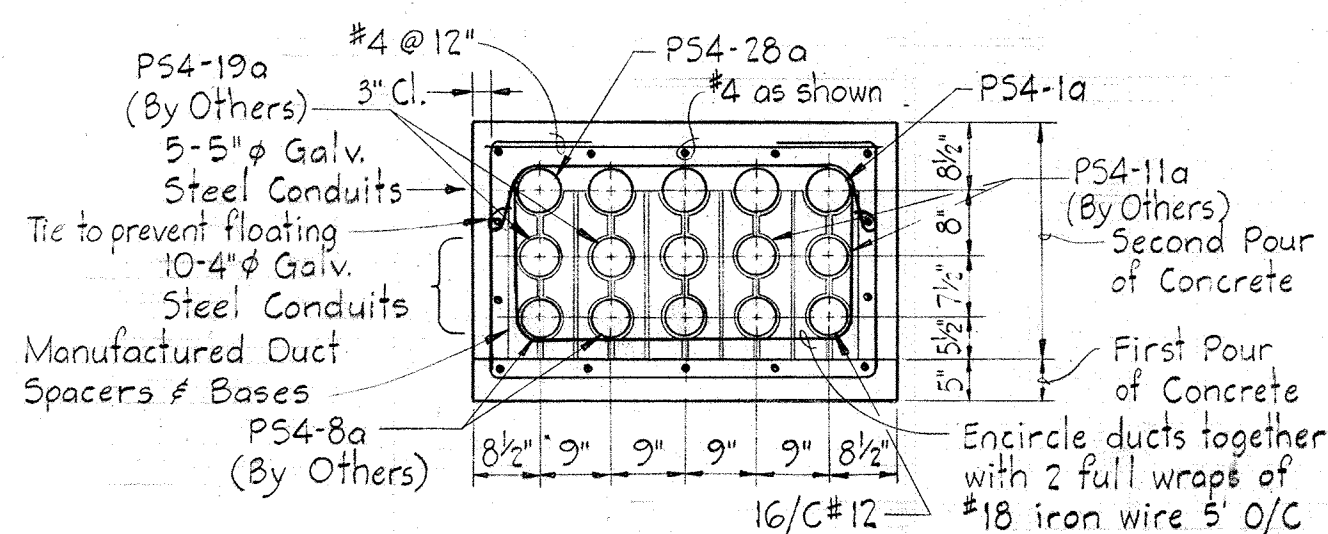
SECTION E24D/E3



SECTION E24J/E3

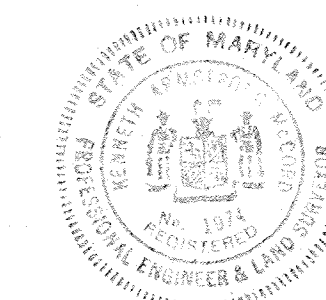
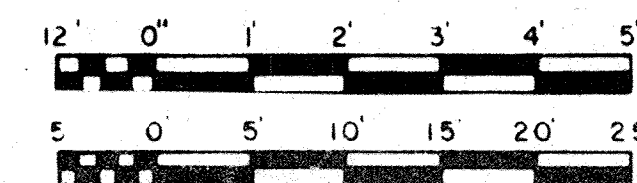


SECTION E24E/E3



SECTION E24K/E3

1/2" = 1'-0"  
1" = 10'



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DEPARTMENT OF PUBLIC WORKS  
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DATE  
Richard E. Brudenberg  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

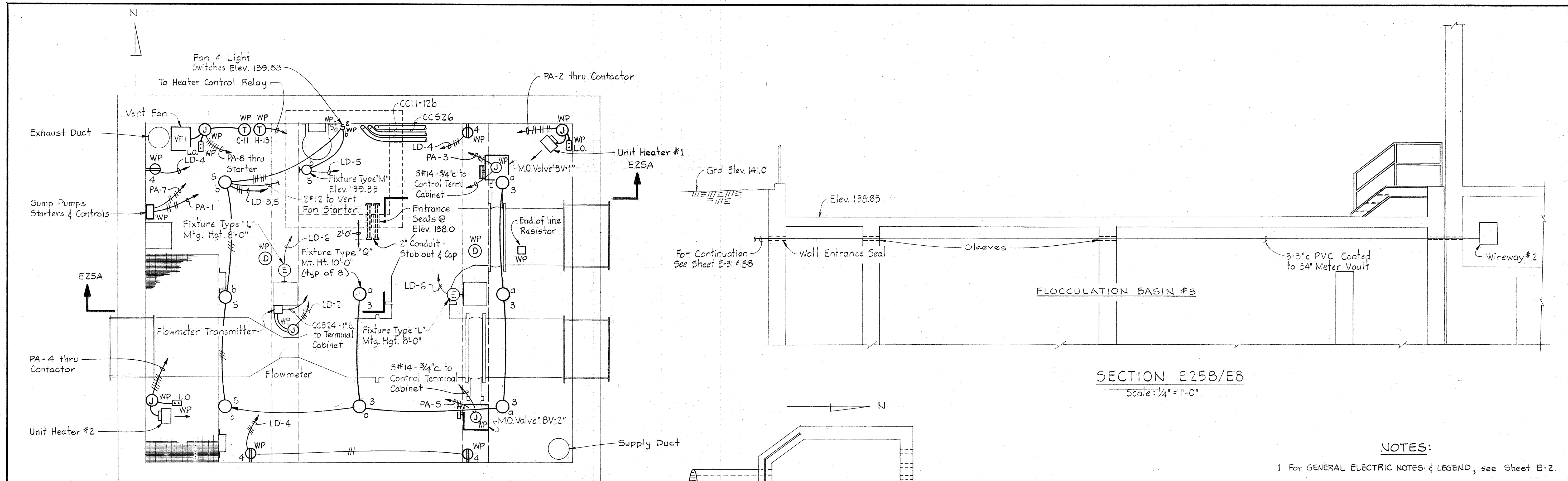
UNDERGROUND  
DUCTBANK DETAILS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO.4

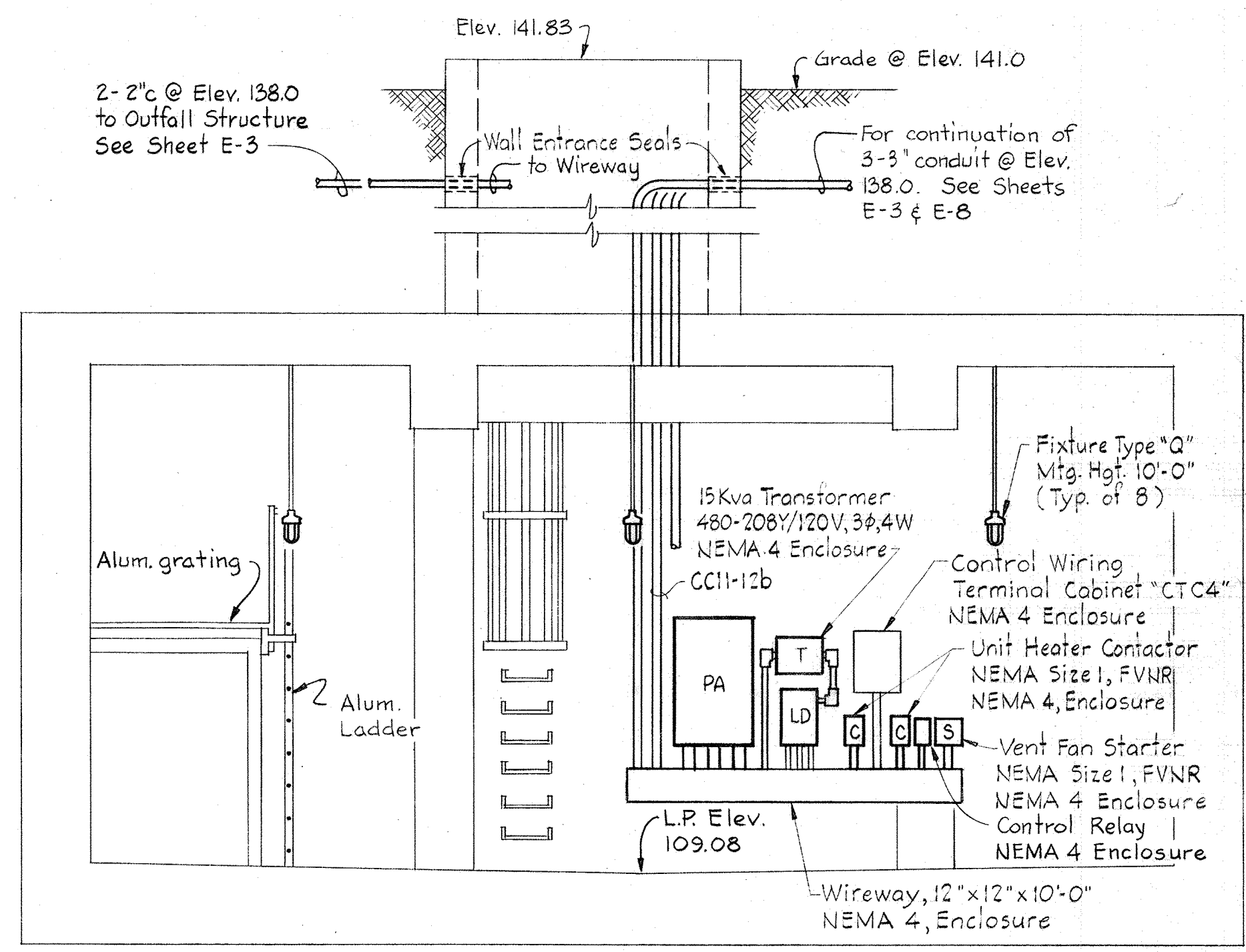
DRAWING  
NO. 92  
OF 96

SCALE  
AS  
SHOWN

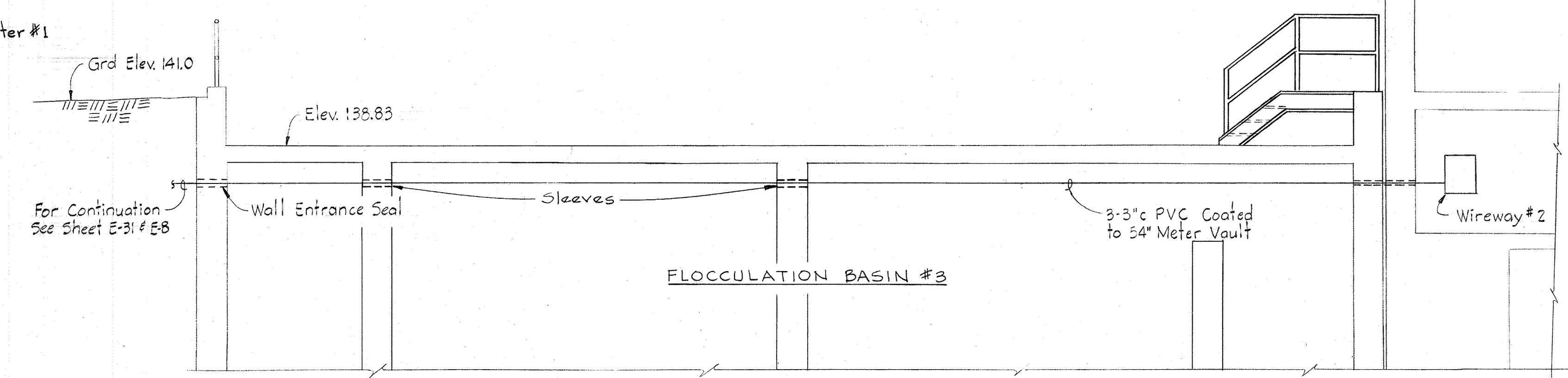




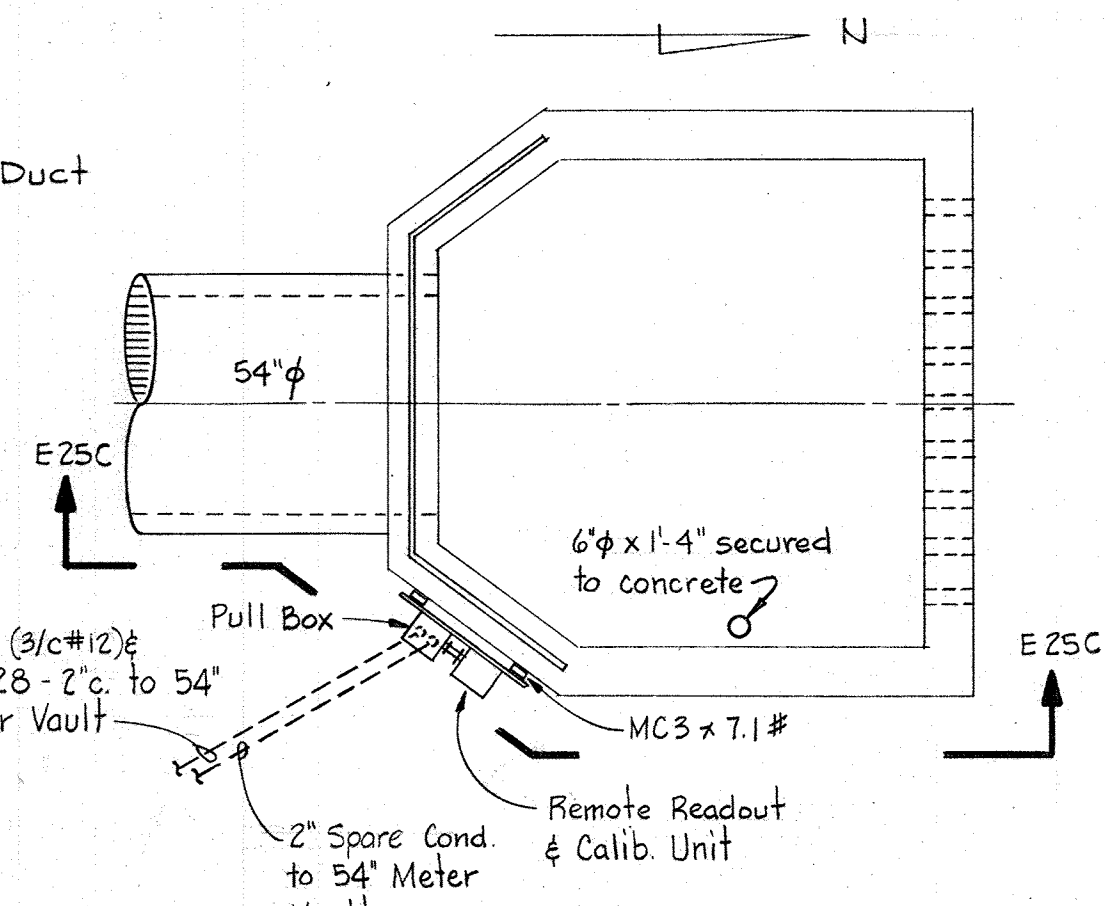
PLAN - 54" METER VAULT  
Scale: 1/4" = 1'-0"



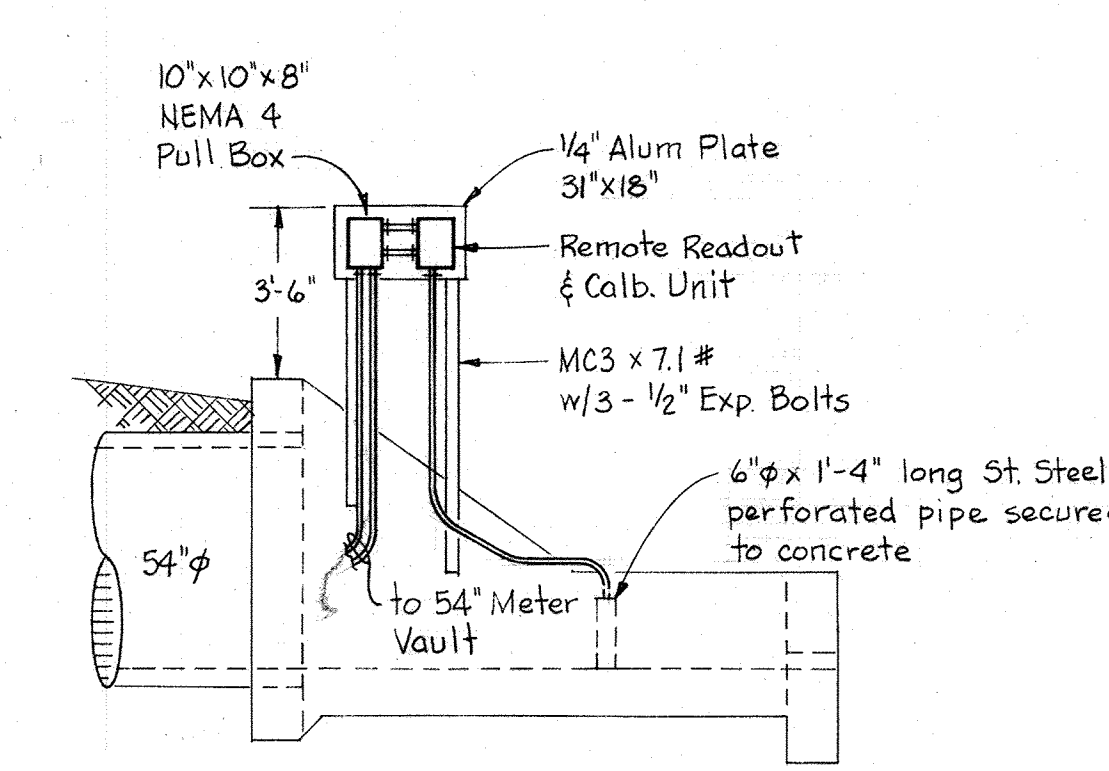
SECTION E25A/E25  
Scale: 1/4" = 1'-0"



SECTION E25B/E8  
Scale: 1/4" = 1'-0"

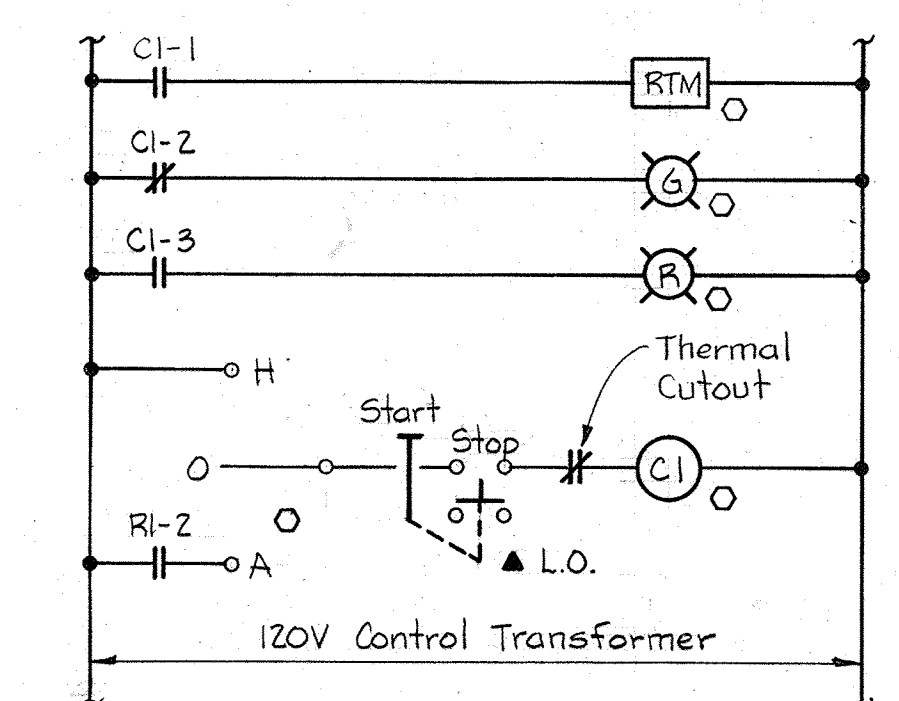


PLAN

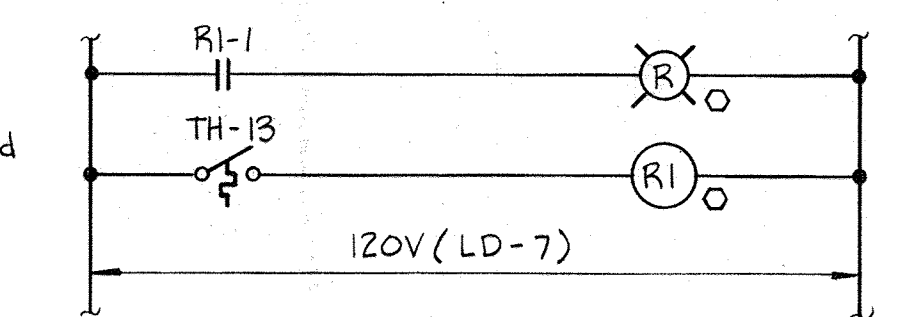


SECTION E25C/E25

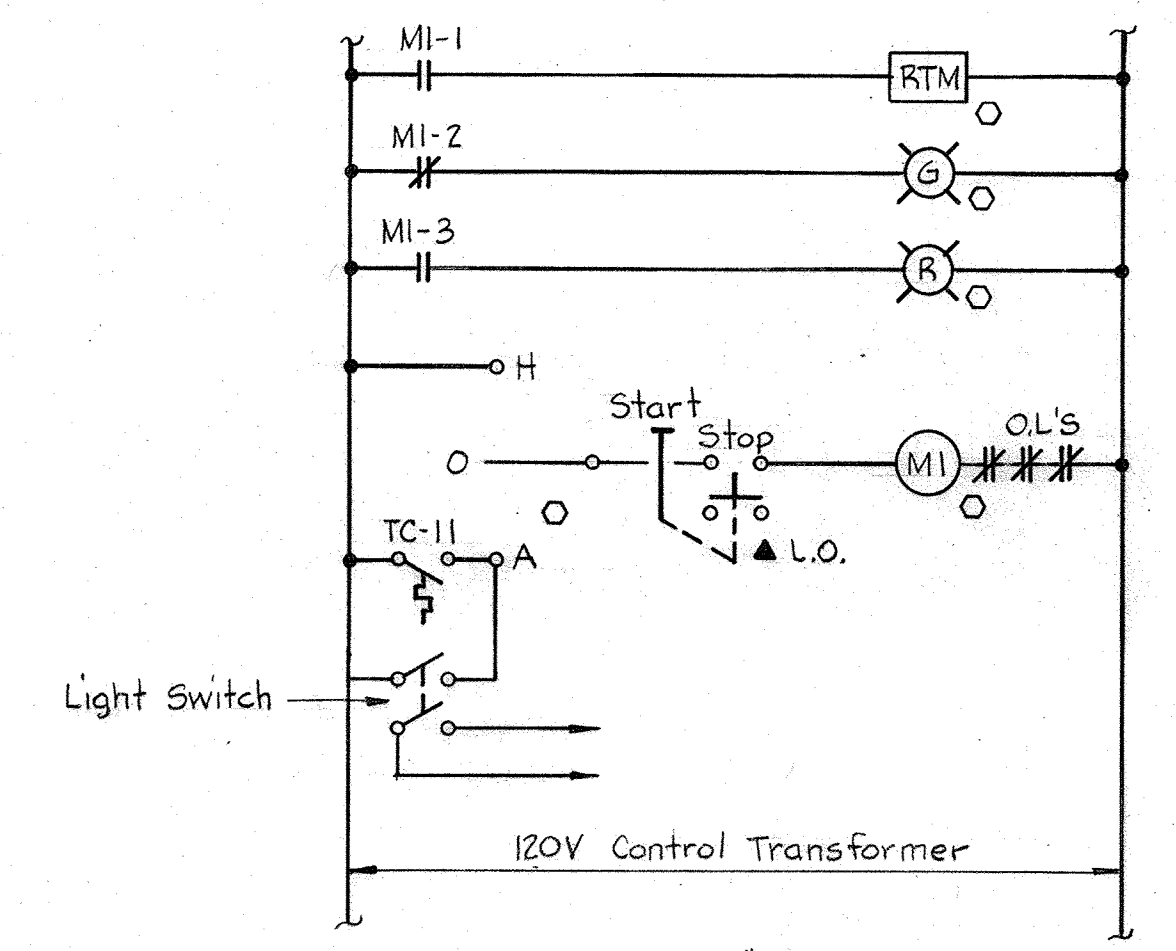
OUTFALL STRUCTURE  
Scale: 1/4" = 1'-0"



ECD #63  
54" METER VAULT - UNIT HEATER #1  
Typical for the following Units:  
1. 54" Meter Vault - Unit Heater #2

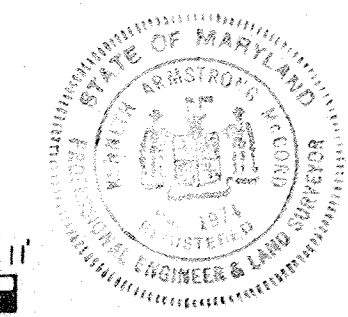
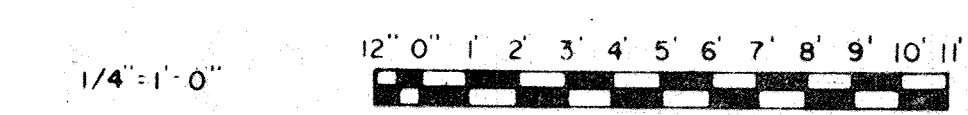


ECD #64  
CONTROL-UNIT HEATERS 54" MET. VAULT



ECD #65  
VENT FAN - 54" METER VAULT

NOTES:  
1 For GENERAL ELECTRIC NOTES & LEGEND, see Sheet E-2.

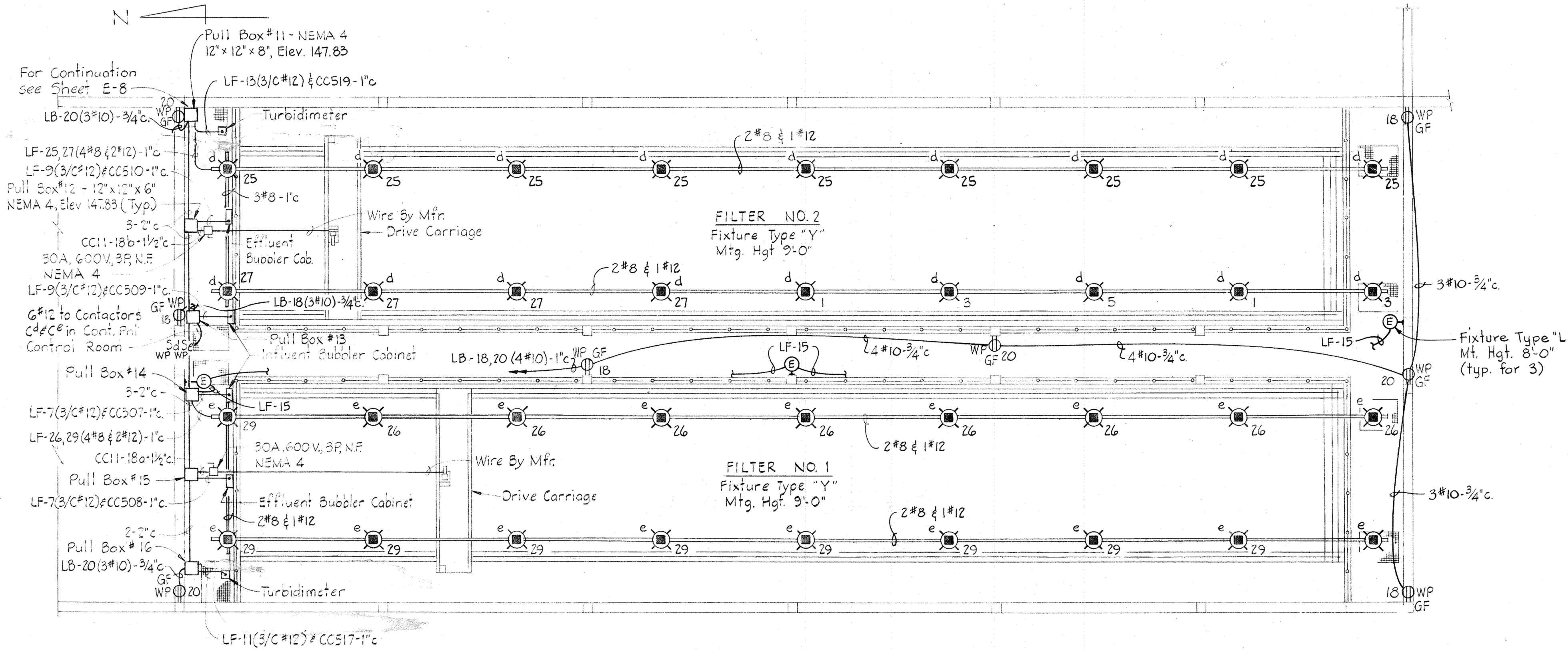


|   |  |                    |                                     |   |  |
|---|--|--------------------|-------------------------------------|---|--|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>DATE 12/13/77<br>Richard E. Spundenberg<br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | MISCELLANEOUS<br>SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 93 OF 96<br>SCALE AS SHOWN |
|---|--|--------------------|-------------------------------------|---|--|

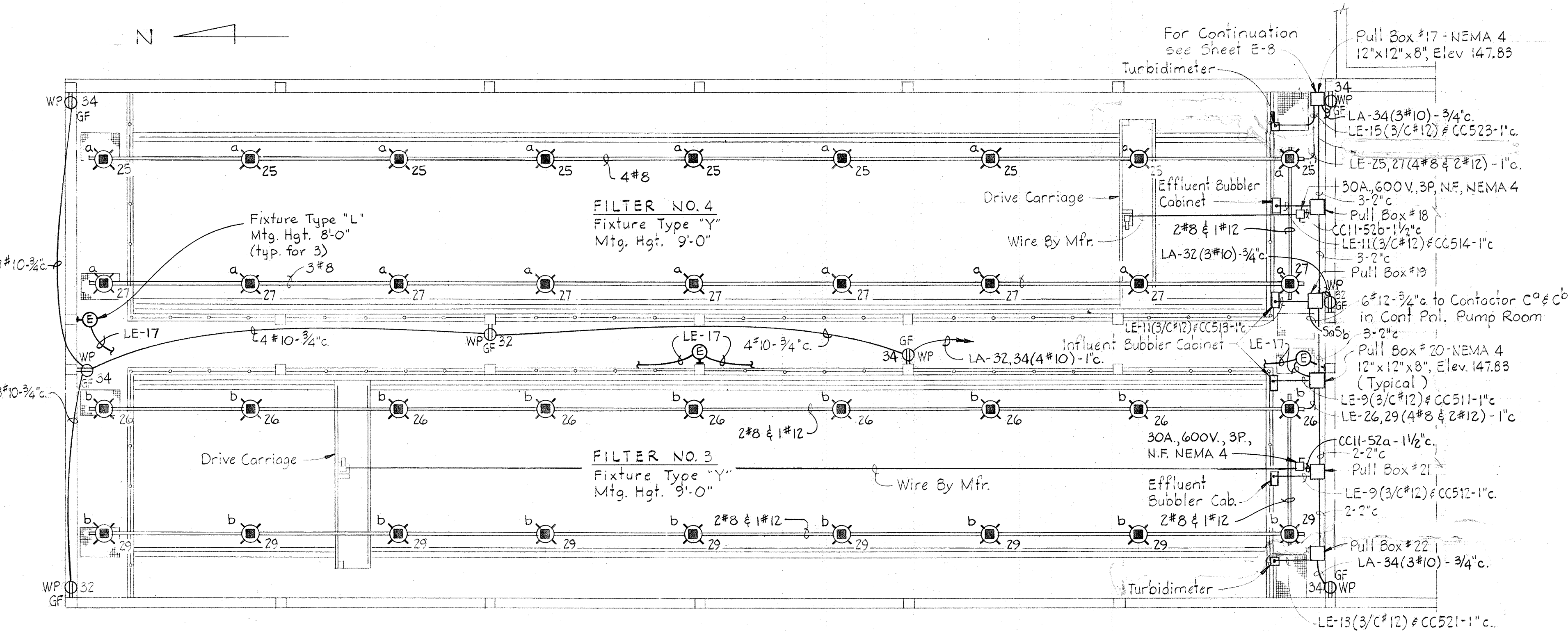


NOTES

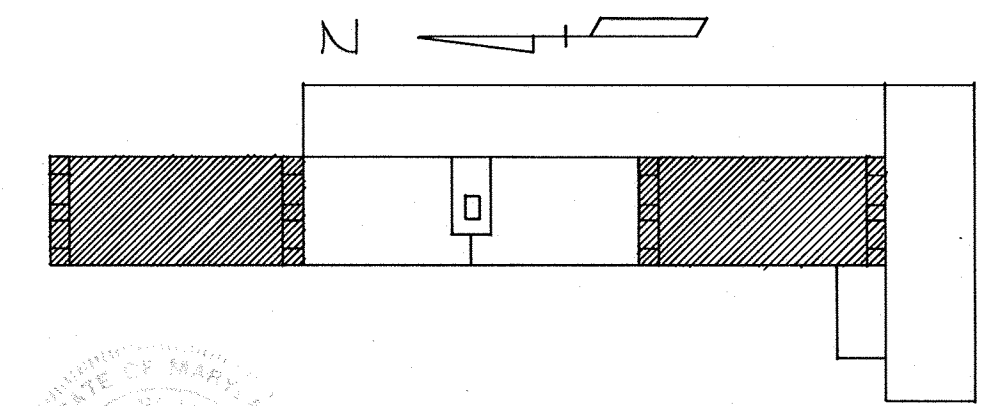
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.



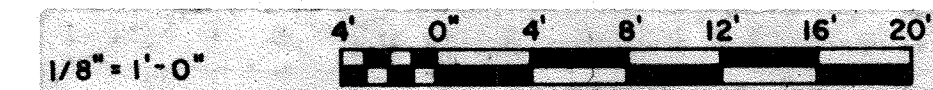
PLAN - FILTERS NO.1 & NO.2  
Scale: 1/8" = 1'-0"



PLAN - FILTERS NO.3 & NO.4  
Scale: 1/8" = 1'-0"



KEY PLAN



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

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
DATE: \_\_\_\_\_  
CHIEF BUREAU OF ENVIRONMENTAL SERVICES

CONTRACT NO. 502-S

FILTERS NO.1,2,3,4  
PLAN & DETAILS

SAVAGE WASTEWATER  
TREATMENT PLANT ADDITION NO.4

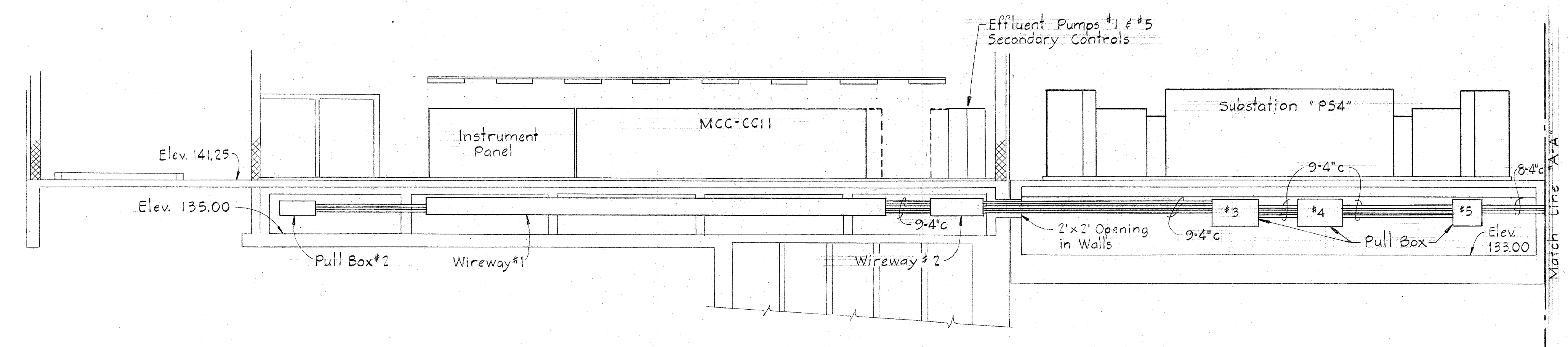
DRAWING  
NO. 94  
OF 96

SCALE  
AS  
SHOWN

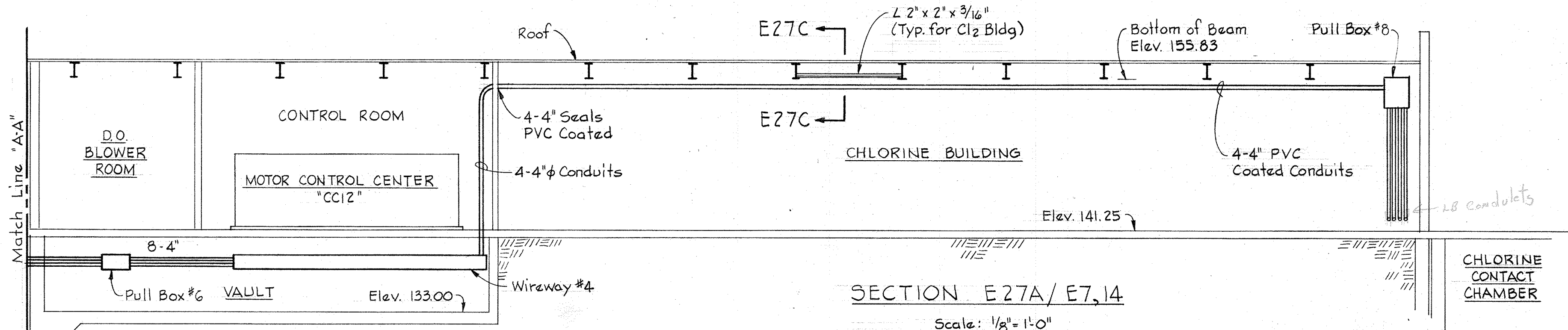


NOTES

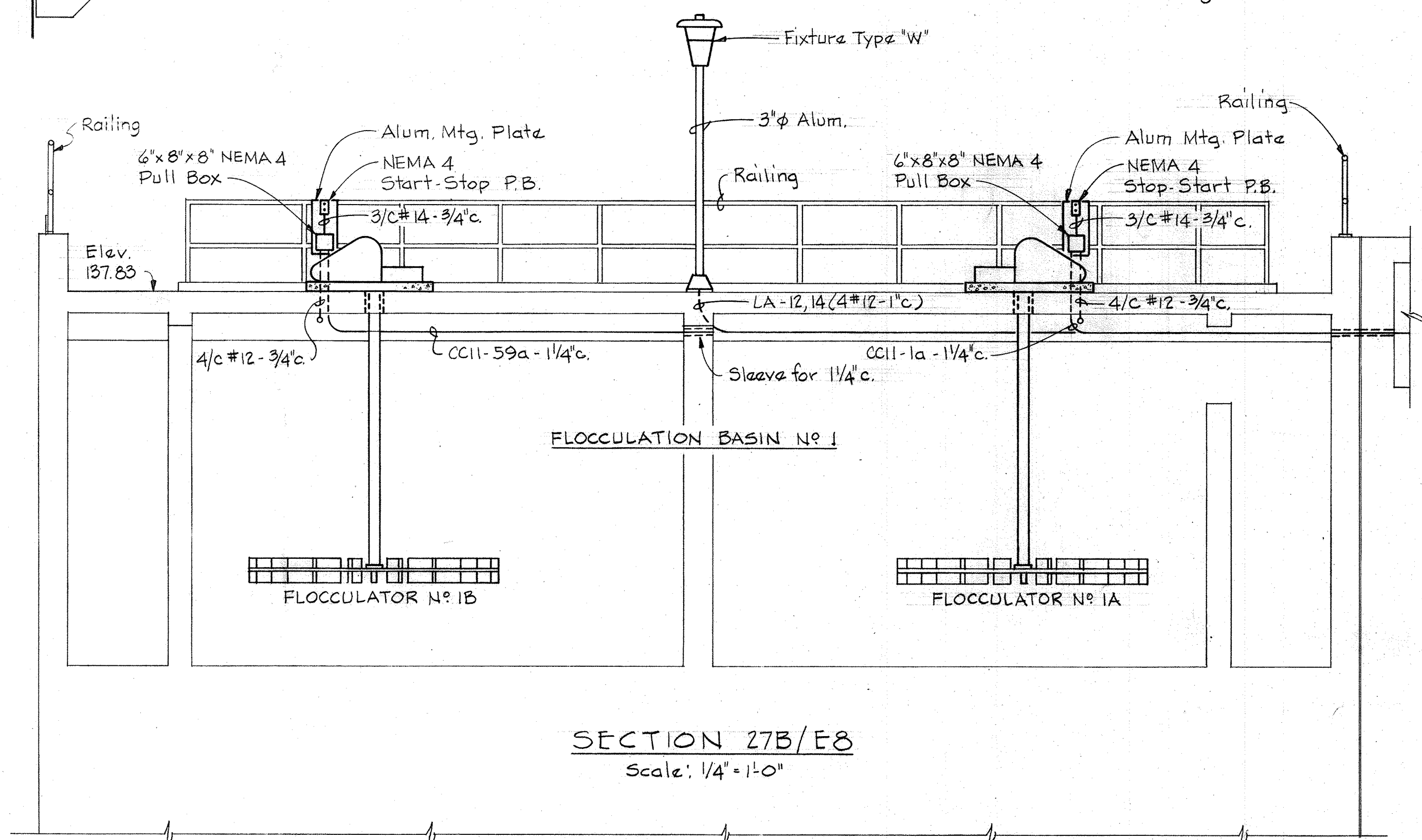
1. For GENERAL ELECTRICAL NOTES & LEGEND see Sheet E-2.
2. For Wireway details see Sheet E-6



SECTION E27A/E7,14  
Scale: 1/8" = 1'-0"



SECTION E27A/E7,14  
Scale: 1/8" = 1'-0"

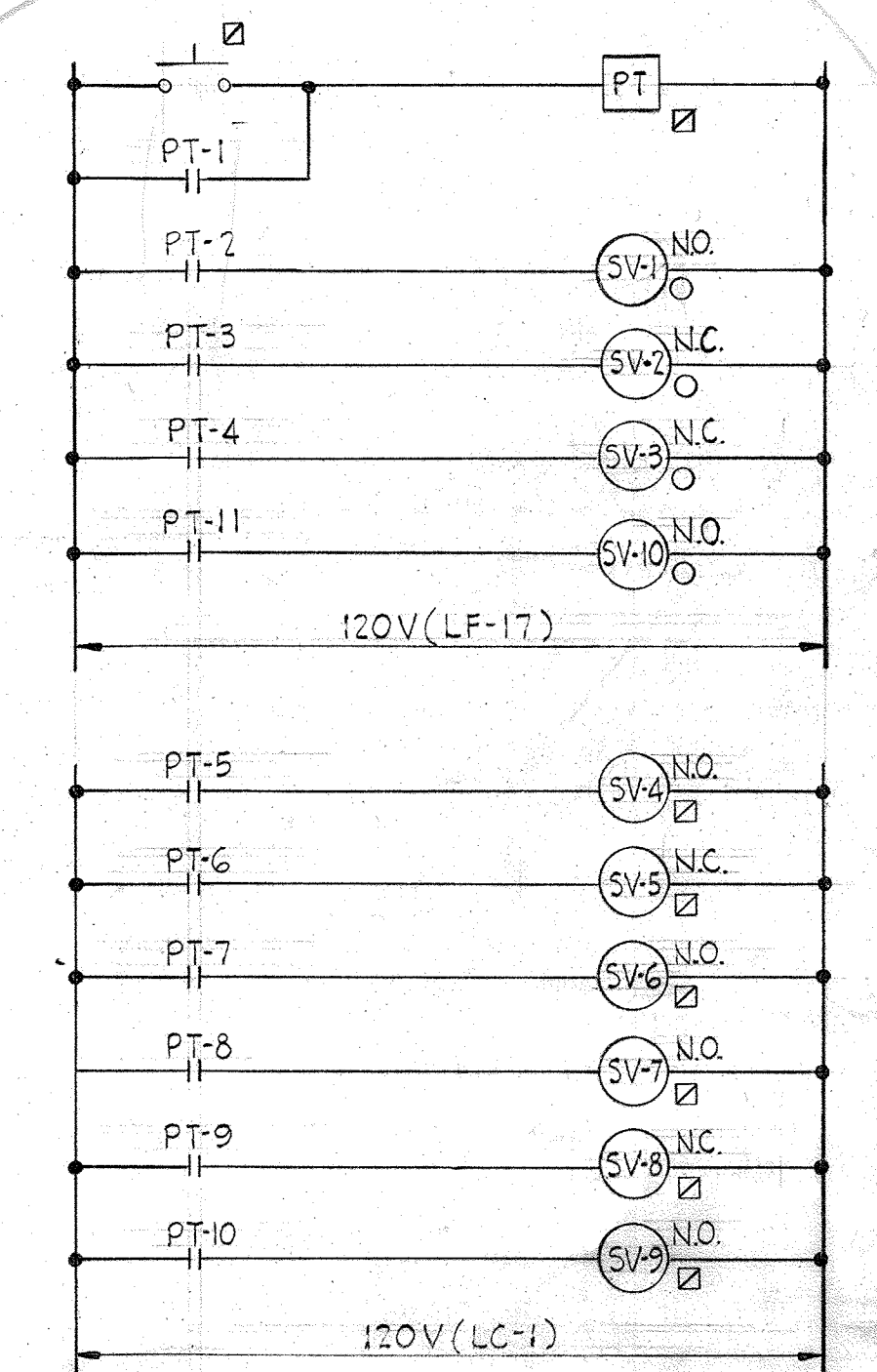
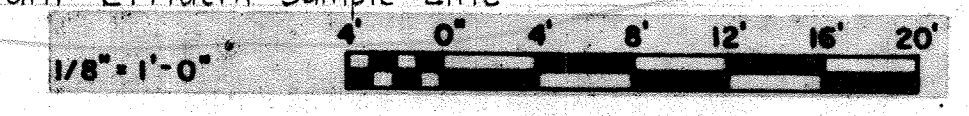


SECTION 27B/E8  
Scale: 1/4" = 1'-0"

| Contact |              | Time - Seconds |    |    |    |     | Remarks |       |
|---------|--------------|----------------|----|----|----|-----|---------|-------|
| Pos.    |              | 0              | 30 | 60 | 90 | 120 |         | 150   |
| PT-1    | N.O.<br>N.C. | ///            |    |    |    |     |         | Timer |
| PT-2    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-1  |
| PT-3    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-2  |
| PT-4    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-3  |
| PT-5    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-4  |
| PT-6    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-5  |
| PT-7    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-6  |
| PT-8    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-7  |
| PT-9    | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-8  |
| PT-10   | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-9  |
| PT-11   | N.O.<br>N.C. | ///            |    |    |    |     |         | SV-10 |

PROGRAM TIMER - SLIME REMOVAL SYSTEM  
FOR 5 MINUTE SAMPLE LINE

- Typical for the following units:
1. 30 Min. Sample Line
  2. Plant Effluent Sample Line



ECD #30  
SLIME REMOVAL SYSTEM  
5 MINUTE SAMPLE LINE

- Typical for the following unit:
1. 30 Min. Sample Line
  2. Plant Effluent Sample Line

Deleted

|   |   |                    |                                     |   |   |
|---|---|--------------------|-------------------------------------|---|---|
| WHITMAN, REQUARDT & ASSOCIATES<br>ENGINEERS<br>1304 ST. PAUL ST.<br>BALTIMORE, MARYLAND | DEPARTMENT OF PUBLIC WORKS<br>HOWARD COUNTY, MARYLAND<br>12/13/77<br>DATE<br><i>Richard S. Spindler</i><br>CHIEF BUREAU OF ENVIRONMENTAL SERVICES | CONTRACT NO. 502-S | MISCELLANEOUS<br>SECTIONS & DETAILS | SAVAGE WASTEWATER<br>TREATMENT PLANT ADDITION NO. 4 | DRAWING NO. 95<br>OF 96<br>SCALE AS SHOWN |
|---|---|--------------------|-------------------------------------|---|---|



