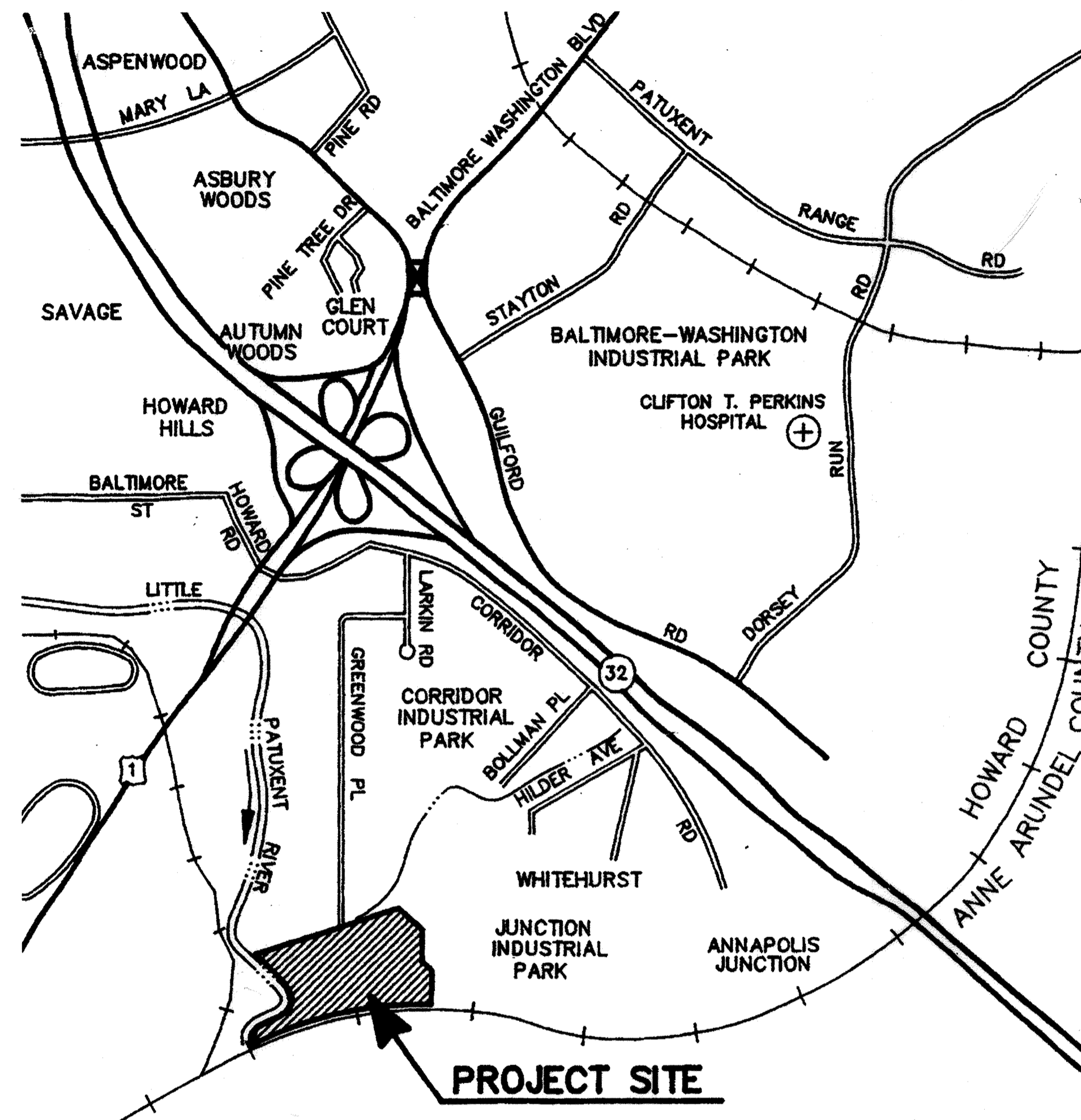


HOWARD COUNTY, MARYLAND

LITTLE PATUXENT WATER RECLAMATION PLANT



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

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

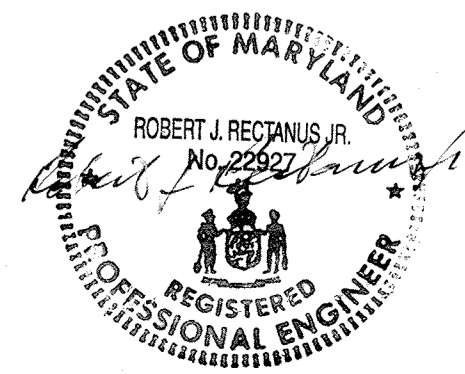
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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

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

Robert J. Restanius, Jr. 6-30-00
CHIEF, WATER & SEWER DIVISION DATE



ASSOCIATE DESIGN FIRMS

STANTEC CONSULTING, LTD.
Surrin, British Columbia

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

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

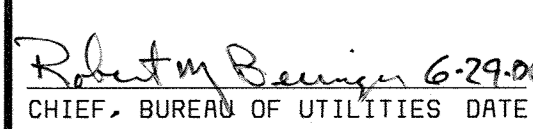

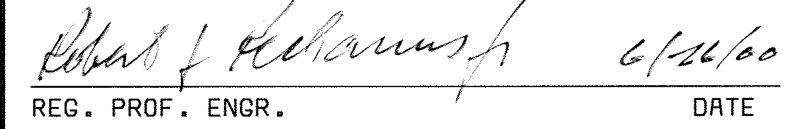
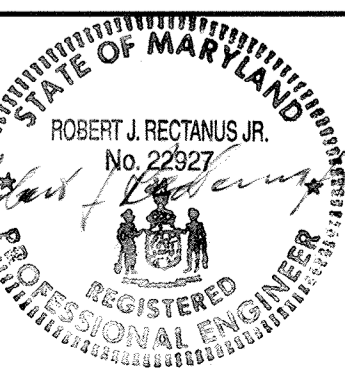
LACH ELECTRIC CORPORATION
Baltimore, Maryland

SHEET
1 OF 161

L1

LIST OF DRAWINGS

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| | | | | | | | | MISCELLANEOUS DETAILS |
| | | | | | | | | MISCELLANEOUS DETAILS |
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| | | | | | | | | HVAC/PLUMBING - LEGEND, ABBREVIATIONS AND GENERAL NOTES |
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| | | | | | | | | HVAC - NORTH GALLERY BUILDING - LOWER AND UPPER LEVEL FLOOR PLANS |
| | | | | | | | | HVAC - NORTH GALLERY BUILDING - OPERATING LEVEL |
| | | | | | | | | HVAC - DETAILS, SECTIONS AND SCHEDULES |
| | | | | | | | | HVAC - SEQUENCE OF OPERATION |
| | | | | | | | | PLUMBING - NORTH BLOWER BUILDING - BASEMENT PLAN |
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| | | | | | | | | PLUMBING - NORTH GALLERY - LOWER AND UPPER LEVEL FLOOR PLANS |
| | | | | | | | | HVAC/PLUMBING - SCHEMATICS, DETAILS & SCHEDULES |

| | | | | | | | | | | | | | | |
|---|--|---|----------|--|--|--|--|--|--|--|--|--|----------------|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  CHIEF, BUREAU OF UTILITIES DATE 6-29-00 |  BLACK & VEATCH LLP Gaithersburg, Maryland  REG. PROF. ENGR. DATE 6/24/00 |  ROBERT J. REITAN, JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: FKA | | | | | | | | LAYOUT/OVERVIEW CIVIL LIST OF DRAWINGS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN | |
| | | | DRN: RLC | | | | | | | | | | | SHEET 2 OF 161 |
| | | | CHK: WLK | | | | | | | | | | | |

GENERAL LEGEND

| | | | |
|--|---|--|---|
| | SURFACED STREET, ROAD OR DRIVE | | BUILDINGS, STRUCTURES |
| | SURFACED STREET, ROAD OR DRIVE WITH CURBS | | STRUCTURES UNDERGROUND |
| | NON-SURFACED STREET, ROAD OR DRIVE | | FUTURE BUILDINGS, STRUCTURES |
| | CONCRETE WALK | | FENCE |
| | CATCH BASIN | | FENCE, WOOD |
| | MANHOLE | | RAILROAD, EACH TRACK |
| | DRAINAGE COURSE OR FLOW LINE | | CENTERLINE |
| | EXISTING GROUND CONTOUR | | HEDGE, BRUSH, SHRUBS, WOODS |
| | FINISH GRADE CONTOUR | | SWAMP |
| | BANK OR SLOPE LINES | | FIRE HYDRANT |
| | TEST HOLE AND NUMBER | | YARD HYDRANT |
| | SURVEY LINE WITH PI, PT, OR POT | | STREET LIGHT POLE |
| | CONCRETE ENCASUREMENT-PLAN | | TRAFFIC SIGN |
| | CONCRETE REACTION BLOCKING AT BEND, PLUG OR TEE | | STOPSIGN |
| | DRAINS OR CULVERTS | | WATER OR GAS VALVE |
| | TUNNEL CASING - PLAN | | WATER OR GAS METER |
| | EXISTING | | TELEPHONE OR POWER POLE WITH GUY ANCHOR |
| | EXISTING | | SECTION NUMBER OR DETAIL LETTER |
| | NEW | | DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS, OR WHERE SECTION IS CUT OR DETAIL IS NOTED |
| | NEW | | WALL ELEVATION |
| | NEW WATER LINE OR SEWER IN PROFILE | | AREA DESIGNATION |
| | NON-CONNECTING PIPING | | DOOR, WINDOW AND LOUVER |
| | CONSTRUCTION EASEMENT LINE | | SCHEDULE REFERENCE |
| | EASEMENT LINE | | ROOM NUMBER |
| | RIGHT-OF-WAY LINE | | AREA DESIGNATION |
| | PROPERTY LINE | | EQUIPMENT REPRESENTATION WITH CALLOUT |
| | PERMANENT EASEMENT LINE | | EXISTING FACILITY TO BE DEMOLISHED OR REMOVED |
| | TEMPORARY EASEMENT LINE | | |
| | UTILITY EASEMENT LINE | | |
| | SURVEY LINE SECTION LINE | | |
| | WATER LINE | | |
| | GAS LINE | | |
| | TELEPHONE (UNDERGROUND) | | |
| | ELECTRICAL (UNDERGROUND) | | |
| | POWER OR TELEPHONE LINES (OVERHEAD) | | |

MATERIALS LEGEND

| | | | |
|--|--|--|--|
| | EARTH OR GRADE | | WOOD, SHEATHING, PANELING, DECKING, ETC. |
| | GRANULAR FILL (CRUSHED ROCK OR GRAVEL) | | WOOD, STUDS, BEAMS, JOISTS, ETC. |
| | ROCK | | RIPRAP |
| | NEW CONCRETE | | CHECKERED PLATE |
| | EXISTING CONCRETE, PRECAST OR PRESTRESSED CONCRETE | | STEEL (FOR 1" SCALE & LARGER) |
| | BRICK, FACE | | STEEL OR ALUMINUM (FOR 3/4" SCALE & SMALLER) |
| | BRICK, COMMON | | BAR GRATING (LINES IN DIRECTION OF SPAN) |
| | CONCRETE MASONRY UNITS (CMU) | | ALUMINUM |
| | CUT STONE OR SAND FILL, GROUT, MORTAR, AND PLASTER | | INSULATION (BATT) |
| | CAST STONE | | INSULATION (RIGID) |

PIPING SYSTEMS

| | | | |
|--|------------------------------------|--|----------------------------------|
| | NEW PIPING | | FIRE PROTECTION WATER SYSTEM |
| | UNDERGROUND PIPING | | FILTER BASIN INFLUENT |
| | EXISTING PIPING | | FINAL CLARIFIER INFLUENT |
| | FUTURE PIPING | | FILTER EFFLUENT |
| | ALUMINUM SULFATE - (ALUM) | | FLOW EQUALIZATION INFLUENT |
| | CHEMICAL RESISTANT ACID WASTE | | FLOW EQUALIZATION EFFLUENT |
| | CHEMICAL RESISTANT ACID WASTE VENT | | FERMENTER SUPERNATANT |
| | CHLORINE SOLUTION | | GAS, NATURAL |
| | CONDENSER WATER RETURN | | GRIT BASIN INFLUENT |
| | CONDENSER WATER SUPPLY | | HEATING SYSTEM WATER RETURN |
| | DRAIN | | HEATING SYSTEM WATER SUPPLY |
| | DISTILLED WATER | | WATER, POTABLE HOT |
| | | | HOT WATER CIRCULATING |
| | | | INSTRUMENT AIR |
| | | | INTERNAL RECYCLE |
| | | | LIME |
| | | | SODIUM HYDROXIDE |
| | | | SODIUM HYPOCHLORITE |
| | | | PROCESS, (NON-POTABLE) |
| | | | WATER, NON-POTABLE HOT |
| | | | OVERFLOW |
| | | | POLYMER SOLUTION |
| | | | PRIMARY CLARIFIER INFLUENT |
| | | | PRIMARY SLUDGE |
| | | | PROCESS REACTOR INFLUENT |
| | | | RETURN ACTIVATED SLUDGE |
| | | | SCUM |
| | | | SULFUR DIOXIDE |
| | | | STORM DRAIN |
| | | | SUMP PUMP DISCHARGE, PLANT DRAIN |
| | | | SANITARY SEWER |
| | | | VENT |
| | | | VACUUM |
| | | | WATER, POTABLE |
| | | | WASTE ACTIVATED SLUDGE |
| | | | LIME SOLUTION TRANSFER PIPE |
| | | | STRIPPER OVERFLOW |
| | | | SLUDGE PROCESS OVERFLOW RETURN |
| | | | WASTE PHOSPHOROUS SLUDGE |

VALVE LEGEND

| | | | |
|--|---------------------------|--|--|
| | PINCH VALVE | | BACKWATER VALVE |
| | PLUG VALVE, ECCENTRIC | | INLINE PRESSURE RELIEF VALVE |
| | PLUG VALVE, NON-ECCENTRIC | | PRESSURE REGULATING VALVE |
| | BUTTERFLY VALVE | | PRESSURE SUSTAINING OR MAINTAINING VALVE |
| | GATE VALVE | | VACUUM BREAKER |
| | BALL VALVE | | THERMAL SHUTOFF VALVE |
| | GLOBE VALVE | | EXPLOSION RELIEF VALVE |
| | CHECK VALVE | | HOSE FAUCET |
| | 3 WAY VALVE | | HOSE FAUCET W/VACUUM BREAKER |
| | 4 WAY VALVE | | HOSE VALVE W/HOSE NIPPLE |
| | ANGLE VALVE | | BACKFLOW PREVENTER |
| | CHLORINE INSTITUTE VALVE | | SAFETY RELIEF VALVE |
| | DIAPHRAGM VALVE | | VACUUM RELIEF CHECK VALVE |
| | THROTTLING VALVE | | |

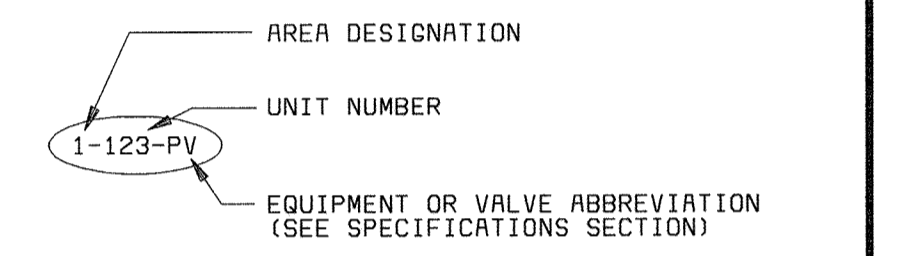
PIPING ACCESSORIES LEGEND

| | | | |
|--|--------------------------------------|--|--------------------------------------|
| | AUTOMATIC DRAIN TRAP | | FLUME |
| | BLIND FLANGE | | GAGE GLASS |
| | CALIBRATING COLUMN | | HOSE CONNECTION |
| | CAP OR PLUG | | HOSE REEL |
| | CENTRIFUGE | | INJECTOR, EDUCTOR, BLENDER |
| | CLEANOUT | | INLINE FILTER |
| | COMPRESSOR OR BLOWER | | INSULATING NIPPLE |
| | CROSS | | LEVEL SWITCH |
| | DIAPHRAGM SEAL | | MIXER |
| | DIFFERENTIAL PRESSURE INDICATOR | | OIL SEPARATOR |
| | DIFFERENTIAL PRESSURE SWITCH | | ORIFICE PLATE |
| | DIFFUSER, CHANNEL | | PIPE ANCHOR |
| | DIFFUSER, PIPE | | PIPE GUIDE |
| | DRAIN OR BELL-UP | | PITOT TUBE |
| | DRIP TRAP | | PRESSURE GAUGE WITH SNUBBER |
| | DUPLEX STRAINER | | PRESSURE SWITCH |
| | ELBOW | | PRESSURE TRANSMITTER |
| | ELBOW TURNING DOWN | | PUMP |
| | ELBOW TURNING UP | | QUICK COUPLING |
| | EXPANSION COMPENSATOR | | REDUCER |
| | EXPANSION TANK | | ROTAMETER |
| | FLAME ARRESTER OR CHECK | | RUPTURE DISK |
| | FLEXIBLE CONNECTOR | | SAMPLE TAP |
| | FLEXIBLE HOSE OR TUBING | | SCREEN |
| | FLOWMETER ELECTROMAGNETIC/ULTRASONIC | | SEDIMENT TRAP/CONDENSATE ACCUMULATOR |
| | FLOW SWITCH | | SET STOP METER |
| | FLOW TUBE | | SIGHT GLASS |
| | | | SIGHT FLOW INDICATOR |
| | | | SILENCER |
| | | | SLIDE GATE |
| | | | SLUICE GATE |
| | | | STATIC MIXER |
| | | | STOP PLATE |
| | | | STRAINER/BASKET |
| | | | SUCTION DIFFUSER |
| | | | SURGE CHAMBER |
| | | | TEE |
| | | | TEE LINE DOWN |
| | | | TEE LINE UP |
| | | | TEMPERATURE INDICATOR |
| | | | TEMPERATURE SENSING ELEMENT |
| | | | TEMPERATURE SWITCH |
| | | | TEMPERATURE TRANSMITTER |
| | | | THERMOMETER |
| | | | TRAP |
| | | | UNION |
| | | | VENT |
| | | | VENT - SCREENED |
| | | | VERTICAL MIXER |
| | | | WALL SLEEVE |
| | | | WATER HAMMER ARRESTOR |
| | | | WEIR |
| | | | WYE |
| | | | WYE STRAINER |
| | | | WYE STRAINER WITH BLOWOFF |

ACTUATOR LEGEND

| | |
|--|---------------------|
| | AIR, PNEUMATIC |
| | AIR/OIL TANDEM |
| | DIAPHRAGM |
| | ELECTRIC, MOTORIZED |
| | FLOAT |
| | HYDRAULIC |
| | SOLENOID |

EQUIPMENT DESIGNATION



AREA DESIGNATION

- # LOCATION
- 3 WEST GALLERY
- 5 NORTH BASIN COMPLEX
- 6 EAST GALLERY

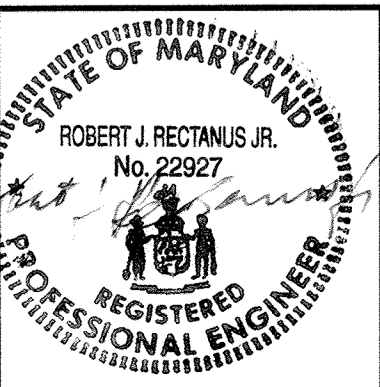
NOTE: SYMBOLS ON THIS SHEET WHICH ARE TO BE SHOWN AS EXISTING SHALL BE DELINEATED AS SCREENED THOSE SYMBOLS WHICH ARE TO BE SHOWN AS NEW SHALL BE DELINEATED AS SOLID (HEAVY)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

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



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

LAYOUT/OVERVIEW
CIVIL

LEGEND AND DESIGNATIONS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 3 OF 161

L3

ABBREVIATIONS

Table of abbreviations and their meanings, organized in columns. Includes terms like ACID, ALUMINUM, ANCHOR BOLT, etc., with corresponding definitions.

058472-1058472A

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

BLACK & VEATCH, L.P. logo and name, Gaithersburg, Maryland, with a signature and date.

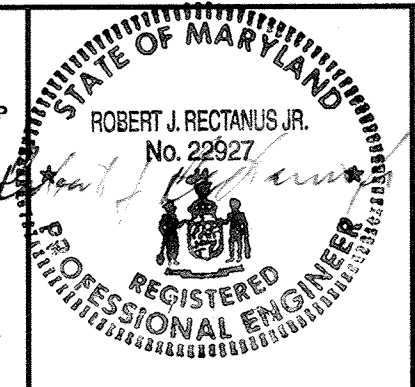


Table with columns for DES (DESIGNER), DRN (DRAWN), CHK (CHECKED), DATE, and a grid for REVISIONS AND RECORD OF ISSUE.

LAYOUT/OVERVIEW CIVIL ABBREVIATIONS

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

SCALE AS SHOWN SHEET 4 OF 161 L4

EXISTING LEGEND

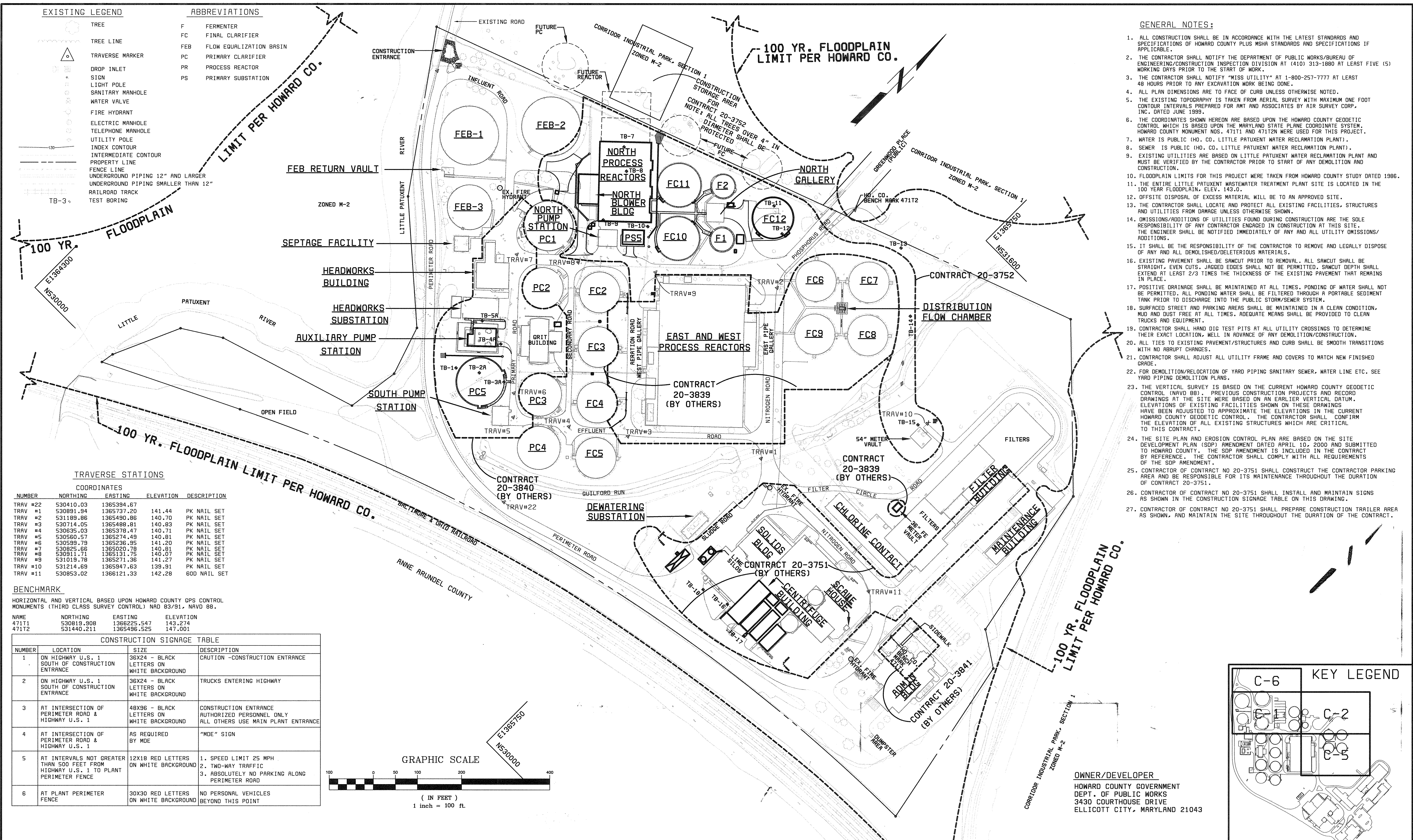
- TREE
- TREE LINE
- TRAVERSE MARKER
- DROP INLET
- SION
- LIGHT POLE
- SANITARY MANHOLE
- WATER VALVE
- FIRE HYDRANT
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- UTILITY POLE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- PROPERTY LINE
- FENCE LINE
- UNDERGROUND PIPING 12" AND LARGER
- UNDERGROUND PIPING SMALLER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

ABBREVIATIONS

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

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
3. THE CONTRACTOR SHALL NOTIFY "WISD UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
4. ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
5. THE EXISTING TOPOGRAPHY IS TAKEN FROM AERIAL SURVEY WITH MAXIMUM ONE FOOT CONTOUR INTERVALS PREPARED FOR AMT AND ASSOCIATES BY AIR SURVEY CORP., INC. DATED JUNE 1999.
6. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE COORDINATE SYSTEM, HOWARD COUNTY MONUMENT NOS. 47111 AND 47122 WERE USED FOR THIS PROJECT.
7. WATER IS PUBLIC (HO. CO. LITTLE PATUXENT WATER RECLAMATION PLANT).
8. SEWER IS PUBLIC (HO. CO. LITTLE PATUXENT WATER RECLAMATION PLANT).
9. EXISTING UTILITIES ARE BASED ON LITTLE PATUXENT WATER RECLAMATION PLANT AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO START OF ANY DEMOLITION AND CONSTRUCTION.
10. FLOODPLAIN LIMITS FOR THIS PROJECT WERE TAKEN FROM HOWARD COUNTY STUDY DATED 1986.
11. THE ENTIRE LITTLE PATUXENT WASTEWATER TREATMENT PLANT SITE IS LOCATED IN THE 100 YEAR FLOODPLAIN, ELEV. 143.0.
12. OFFSITE DISPOSAL OF EXCESS MATERIAL WILL BE TO AN APPROVED SITE.
13. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING FACILITIES, STRUCTURES AND UTILITIES FROM DAMAGE UNLESS OTHERWISE SHOWN.
14. OMISSIONS/ADDITIONS OF UTILITIES FOUND DURING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF ANY CONTRACTOR ENGAGED IN CONSTRUCTION AT THIS SITE. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY AND ALL UTILITY OMISSIONS/ADDITIONS.
15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND LEGALLY DISPOSE OF ANY AND ALL DEMOLISHED/DELETERIOUS MATERIALS.
16. EXISTING PAVEMENT SHALL BE SAWCUT PRIOR TO REMOVAL. ALL SAWCUT SHALL BE STRAIGHT, EVEN CUTS, JAGGED EDGES SHALL NOT BE PERMITTED. SAWCUT DEPTH SHALL EXTEND AT LEAST 2/3 TIMES THE THICKNESS OF THE EXISTING PAVEMENT THAT REMAINS IN PLACE.
17. POSITIVE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES. PONDING OF WATER SHALL NOT BE PERMITTED. ALL PONDING WATER SHALL BE FILTERED THROUGH A PORTABLE SEDIMENT TANK PRIOR TO DISCHARGE INTO THE PUBLIC STORM/SEWER SYSTEM.
18. SURFACED STREET AND PARKING AREAS SHALL BE MAINTAINED IN A CLEAN CONDITION, MUD AND DUST FREE AT ALL TIMES. ADEQUATE MEANS SHALL BE PROVIDED TO CLEAN TRUCKS AND EQUIPMENT.
19. CONTRACTOR SHALL HAND DIG TEST PITS AT ALL UTILITY CROSSINGS TO DETERMINE THEIR EXACT LOCATION, WELL IN ADVANCE OF ANY DEMOLITION/CONSTRUCTION.
20. ALL TIES TO EXISTING PAVEMENT/STRUCTURES AND CURB SHALL BE SMOOTH TRANSITIONS WITH NO ABRUPT CHANGES.
21. CONTRACTOR SHALL ADJUST ALL UTILITY FRAME AND COVERS TO MATCH NEW FINISHED GRADE.
22. FOR DEMOLITION/RELOCATION OF YARD PIPING SANITARY SEWER, WATER LINE ETC. SEE YARD PIPING DEMOLITION PLANS.
23. THE VERTICAL SURVEY IS BASED ON THE CURRENT HOWARD COUNTY GEODETIC CONTROL (NAVD 88). PREVIOUS CONSTRUCTION PROJECTS AND RECORD DRAWINGS AT THE SITE WERE BASED ON AN EARLIER VERTICAL DATUM. ELEVATIONS OF EXISTING FACILITIES SHOWN ON THESE DRAWINGS HAVE BEEN ADJUSTED TO APPROXIMATE THE ELEVATIONS IN THE CURRENT HOWARD COUNTY GEODETIC CONTROL. THE CONTRACTOR SHALL CONFIRM THE ELEVATION OF ALL EXISTING STRUCTURES WHICH ARE CRITICAL TO THIS CONTRACT.
24. THE SITE PLAN AND EROSION CONTROL PLAN ARE BASED ON THE SITE DEVELOPMENT PLAN (SDP) AMENDMENT DATED APRIL 10, 2000 AND SUBMITTED TO HOWARD COUNTY. THE SDP AMENDMENT IS INCLUDED IN THE CONTRACT BY REFERENCE. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE SDP AMENDMENT.
25. CONTRACTOR OF CONTRACT NO 20-3751 SHALL CONSTRUCT THE CONTRACTOR PARKING AREA AND BE RESPONSIBLE FOR ITS MAINTENANCE THROUGHOUT THE DURATION OF CONTRACT 20-3751.
26. CONTRACTOR OF CONTRACT NO 20-3751 SHALL INSTALL AND MAINTAIN SIGNS AS SHOWN IN THE CONSTRUCTION SIGNAGE TABLE ON THIS DRAWING.
27. CONTRACTOR OF CONTRACT NO 20-3751 SHALL PREPARE CONSTRUCTION TRAILER AREA AS SHOWN, AND MAINTAIN THE SITE THROUGHOUT THE DURATION OF THE CONTRACT.



TRAVERSE STATIONS

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

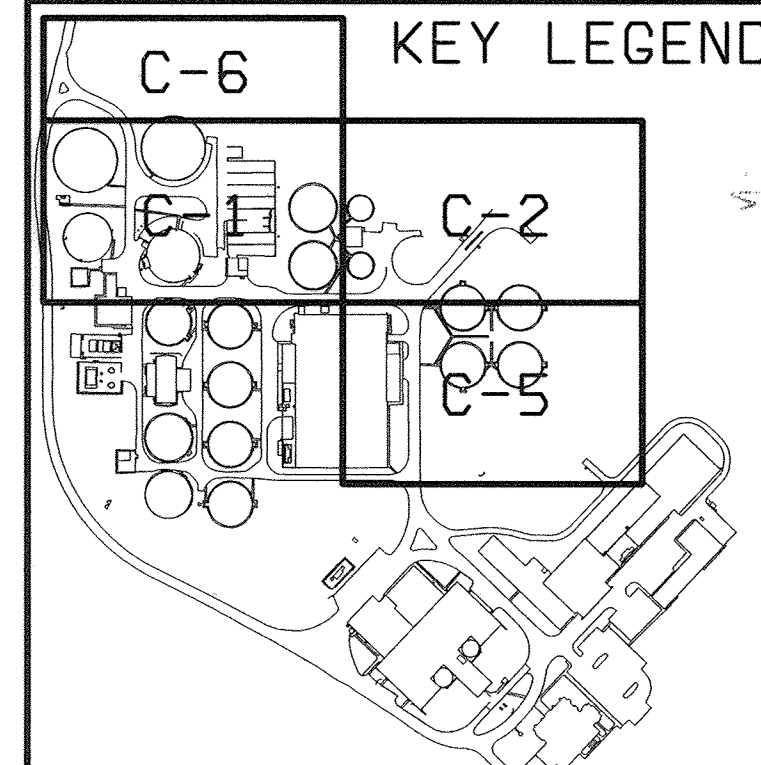
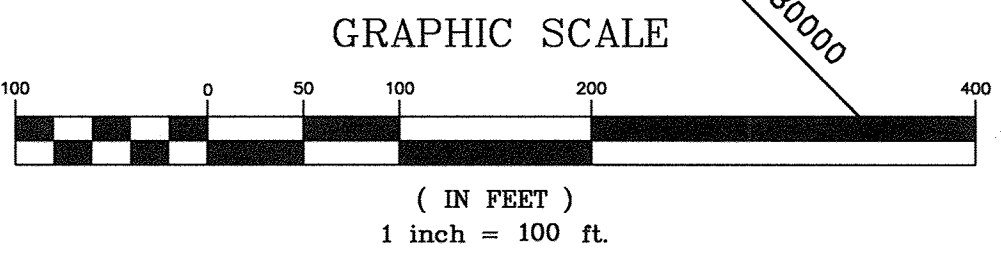
BENCHMARK

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

| NAME | NORTHING | EASTING | ELEVATION |
|-------|------------|-------------|-----------|
| 47111 | 530819.908 | 1366225.547 | 143.274 |
| 47172 | 531440.211 | 1365496.525 | 147.001 |

CONSTRUCTION SIGNAGE TABLE

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



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

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

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DESIGN WASTEWATER CHARACTERISTICS

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

RAW WASTEWATER SCREENING

Table with columns: NO. OF SCREENS, SCREEN WIDTH, TYPE OF SCREENS, NOMINAL BAR SPACING, CLEAN SCREEN CAPACITY, NO. OF SCREENS IN SERVICE. Rows include RAW WASTEWATER SCREENING and GRIT REMOVAL BASINS.

RAW WASTEWATER PUMPING

Table with columns: HEADWORKS PUMPS, NO. OF EXISTING PUMPS, RATED CAPACITY, NO. OF NEW PUMPS, RATED CAPACITY, AUXILIARY PUMP STATION, NO. OF PUMPS, RATED CAPACITY, COMBINED PUMPING CAPACITY, TOTAL CAPACITY, FIRM CAPACITY.

FLOW EQUALIZATION

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

PRIMARY CLARIFIERS

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

PRIMARY SLUDGE PUMPING

Table with columns: SOUTH PUMP STATION, EXISTING PUMPS, NEW PUMP, SCUM PUMPS, NORTH PUMP STATION, EXISTING PUMPS, SCUM PUMPS.

BIOLOGICAL PROCESS REACTORS

Table with columns: NORTH PROCESS REACTORS, NO. OF REACTOR BASINS, NO. OF REACTOR CELL PER BASIN, REACTOR CELL VOLUMES, CELL 1 (ANOXIC), CELL 2 (ANAEROBIC), CELL 3 (ANAEROBIC/ANOXIC), CELLS 4 & 5 (ANOXIC), CELLS 6 & 7 (ANOXIC/OXIC), CELLS 8, 9 & 10 (OXIC), REACTOR ZONE VOLUMES, 1ST ANOXIC, ANAEROBIC, 2ND ANOXIC, SWITCH ZONE, OXIC, TOTAL.

PROCESS LOADING

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

EXISTING PROCESS REACTORS

Table with columns: NO. OF REACTOR BASINS, NO. OF REACTOR CELL PER BASIN, REACTOR CELL VOLUMES, CELL 1 (ANOXIC), CELL 2 (ANAEROBIC), CELL 3 (ANAEROBIC/ANOXIC), CELLS 4 & 5 (ANOXIC), CELLS 6 & 7 (ANOXIC/OXIC), CELLS 8, 9 & 10 (OXIC), REACTOR ZONE VOLUMES, 1ST ANOXIC, ANAEROBIC, 2ND ANOXIC, SWITCH ZONE, OXIC, TOTAL.

PROCESS LOADING

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

ANAEROBIC FERMENTER

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

FINAL CLARIFIERS

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

EFFLUENT FILTERS

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

FILTER EFFLUENT PUMP STATION

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

CHLORINATION/DECHLORINATION/REAERATION

Table with columns: FLOCCULATION/1ST STAGE CHLORINE CONTACT BASINS, BASIN VOLUME, CONTACT TIME @ MAX FLOW, POST CHLORINATION BASIN, BASIN VOLUME, CONTACT TIME @ MAX FLOW, DECHLORINATION BASIN, BASIN VOLUME, CONTACT TIME @ MAX FLOW, REAERATION BASIN, BASIN VOLUME, CONTACT TIME @ MAX FLOW.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

BLACK & VEATCH logo and name, Gaithersburg, Maryland

Professional Engineer seal for Robert J. Rectanus Jr., No. 22927

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

LAYOUT/OVERVIEW CIVIL PROCESS DESIGN CRITERIA

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

SCALE AS SHOWN SHEET 6 OF 161 L6

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

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

HEADWORKS

GRIT REMOVAL

PRIMARY CLARIFIER

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

AX AN AX OX

FINAL CLARIFIER

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

EFLUENT FILTERS

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

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

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

SCREENINGS

GRIT

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

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

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

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

ANAEROBIC FERMENTER

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

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

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

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

DAF THICKENER

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

GRAVITY THICKENER

MISC. WASH WATER
 FLOW 0.18 mgd

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

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

LIME
 TSS 24,752 ppd

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


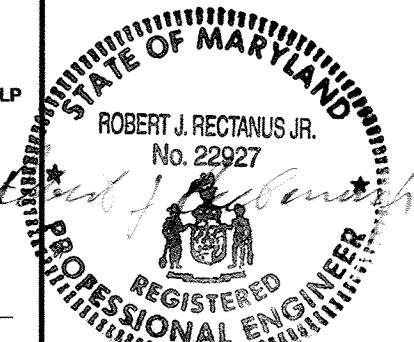
CENTRIFUGE

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

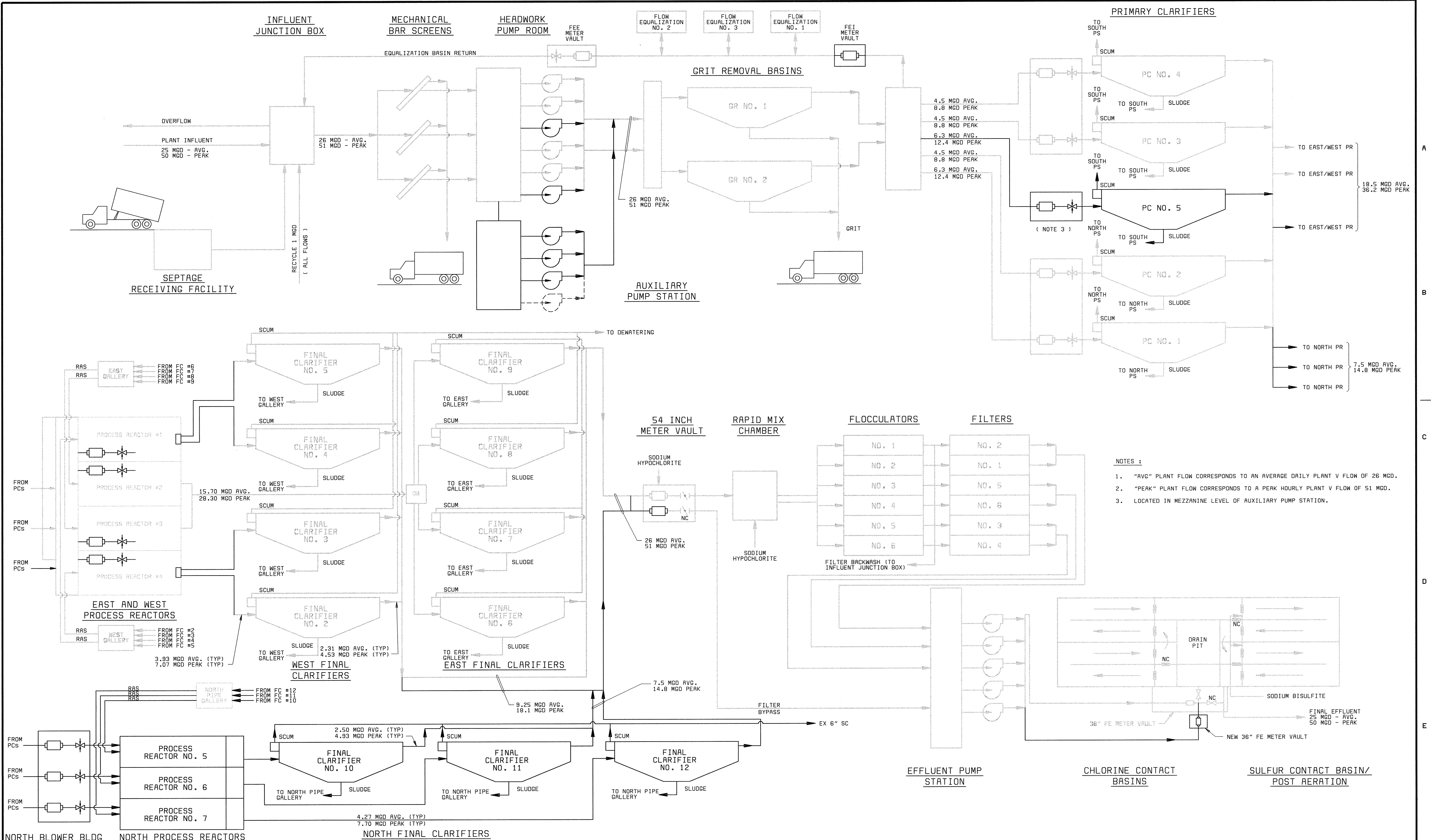
SLUDGE STABILIZATION

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

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

| | | | |
|---|--|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  BLACK & VEATCH Gaithersburg, Maryland  ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER STATE OF MARYLAND REG. PROF. ENGR. DATE | DES: RJR | LAYOUT/OVERVIEW CIVIL PROCESS MASS BALANCE DIAGRAM | SCALE AS SHOWN |
| | DRN: SLF | | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND |
| CHK: WLK DATE: 6/23/00 | REVISIONS AND RECORD OF ISSUE NO. BY CK APP | | L7 |

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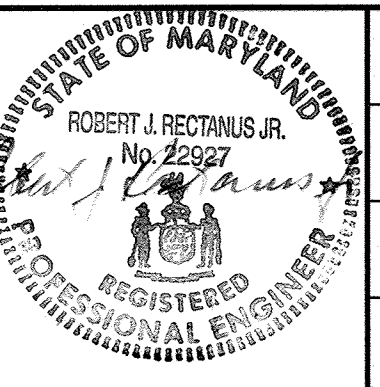
- NOTES :**
1. "AVG" PLANT FLOW CORRESPONDS TO AN AVERAGE DAILY PLANT V FLOW OF 26 MGD.
 2. "PEAK" PLANT FLOW CORRESPONDS TO A PEAK HOURLY PLANT V FLOW OF 51 MGD.
 3. LOCATED IN MEZZANINE LEVEL OF AUXILIARY PUMP STATION.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gallithersburg, Maryland

Robert J. Rectanus Jr. 6/29/00
REG. PROF. ENGR. DATE



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

LAYOUT/OVERVIEW
CIVIL

LIQUID SCHEMATIC

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

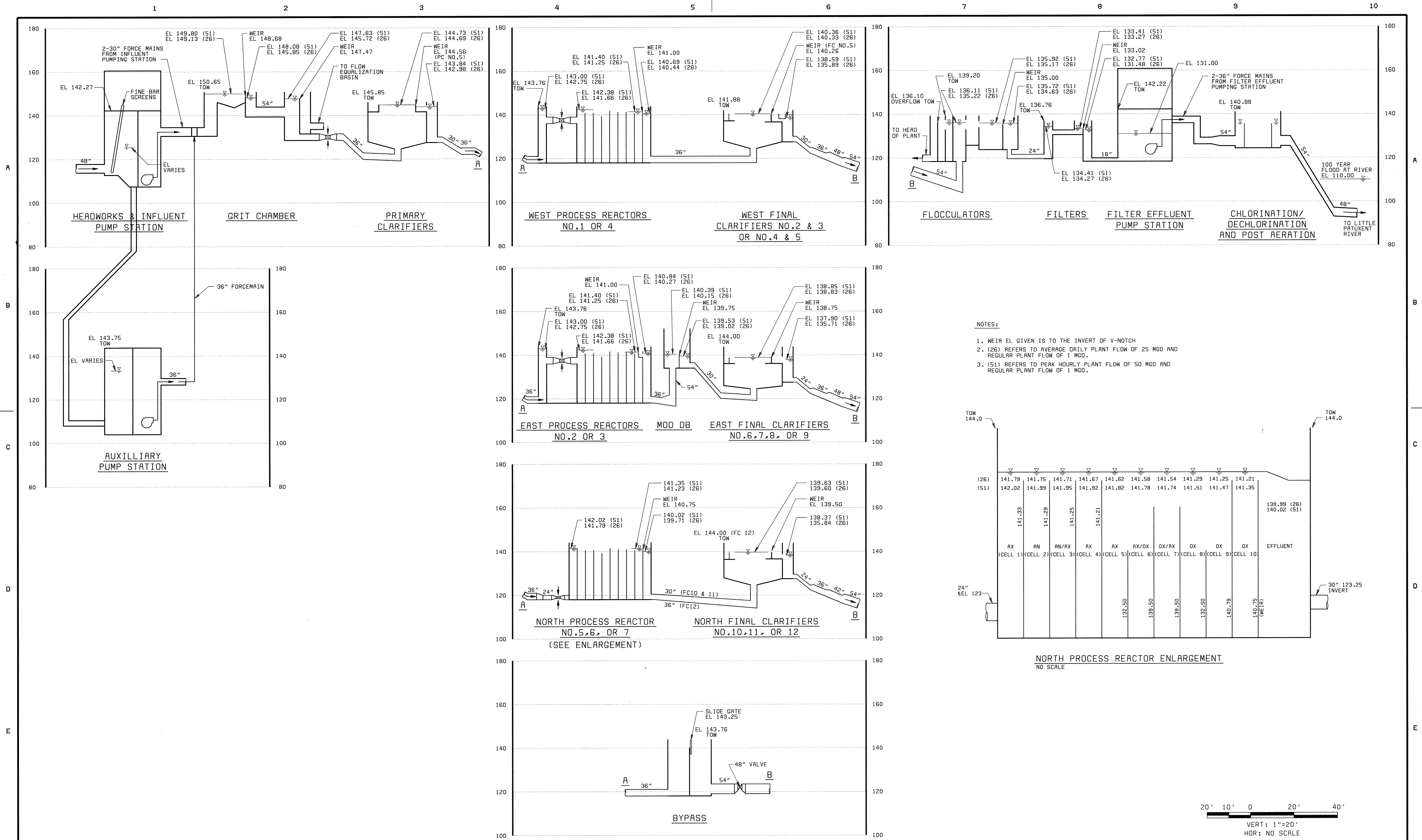
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
8 OF 161

L8



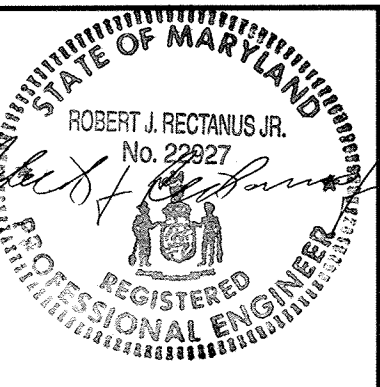
- NOTES:**
- WEIR EL GIVEN IS TO THE INVERT OF V-NOTCH
 - (26) REFERS TO AVERAGE DAILY PLANT FLOW OF 25 MGD AND REGULAR PLANT FLOW OF 1 MGD.
 - (51) REFERS TO PEAK HOURLY PLANT FLOW OF 50 MGD AND REGULAR PLANT FLOW OF 1 MGD.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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

LAYOUT/OVERVIEW
CIVIL

HYDRAULIC PROFILE

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

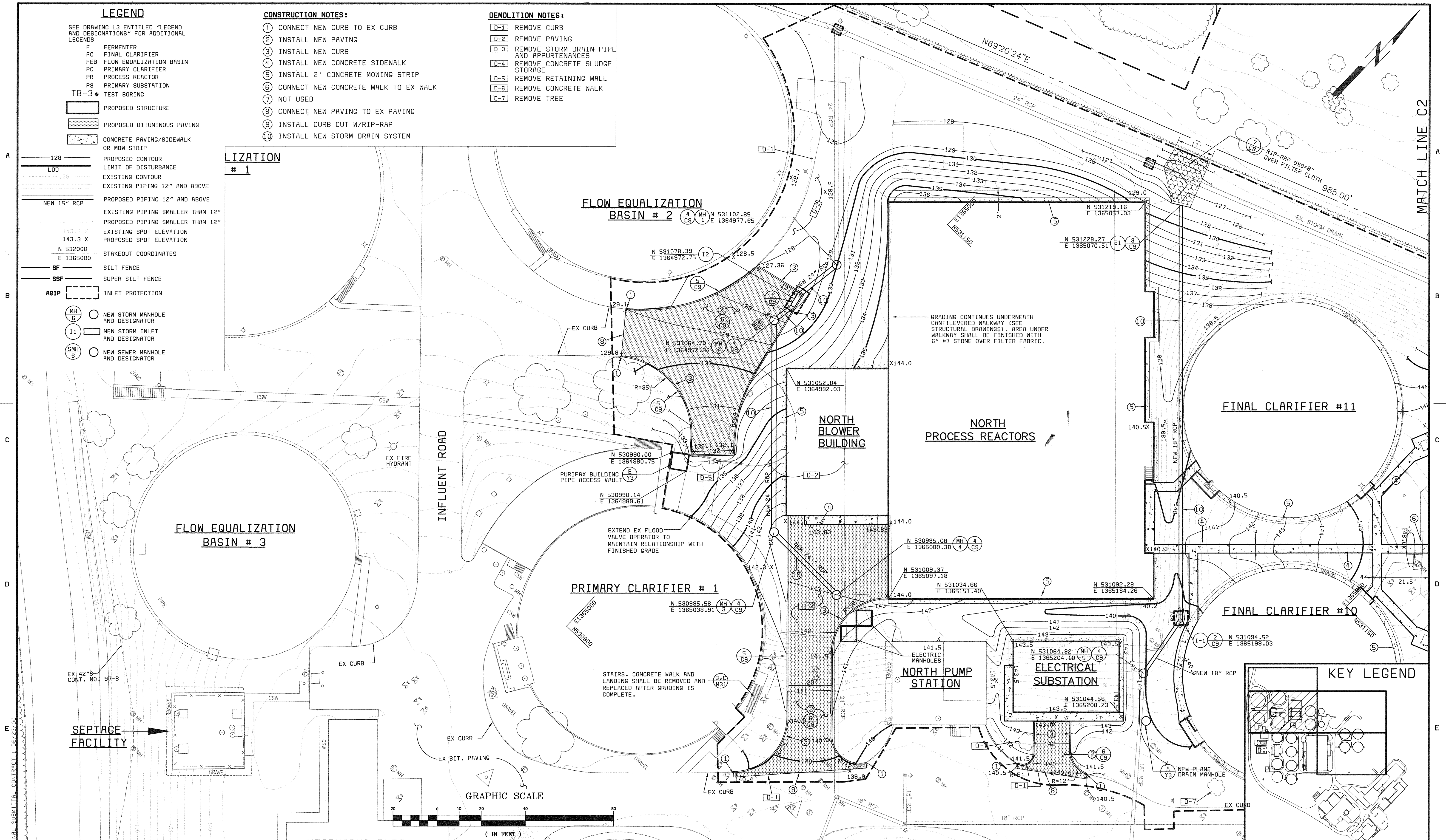
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 9 OF 161

L9



- LEGEND**
- SEE DRAWING L3 ENTITLED "LEGEND AND DESIGNATIONS" FOR ADDITIONAL LEGENDS
- F FERMENTER
 - FC FINAL CLARIFIER
 - FEB FLOW EQUALIZATION BASIN
 - PC PRIMARY CLARIFIER
 - PR PROCESS REACTOR
 - PS PRIMARY SUBSTATION
 - TB-3 TEST BORING
- PROPOSED STRUCTURE
 PROPOSED BITUMINOUS PAVING
 CONCRETE PAVING/SIDEWALK OR MOW STRIP
- PROPOSED CONTOUR
 LIMIT OF DISTURBANCE
 EXISTING CONTOUR
 EXISTING PIPING 12" AND ABOVE
 NEW 15" RCP
 EXISTING PIPING SMALLER THAN 12"
 PROPOSED PIPING SMALLER THAN 12"
 EXISTING SPOT ELEVATION
 PROPOSED SPOT ELEVATION
- 143.3 X
 N 532000
 E 1365000 STAKEOUT COORDINATES
 SF SILT FENCE
 SSF SUPER SILT FENCE
 ACIP INLET PROTECTION
- MH NEW STORM MANHOLE AND DESIGNATOR
 I1 NEW STORM INLET AND DESIGNATOR
 SMH NEW SEWER MANHOLE AND DESIGNATOR

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

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

LIZATION # 1

FLOW EQUALIZATION BASIN # 2

FLOW EQUALIZATION BASIN # 3

PRIMARY CLARIFIER # 1

NORTH BLOWER BUILDING

NORTH PROCESS REACTORS

FINAL CLARIFIER #11

FINAL CLARIFIER #10

ELECTRICAL SUBSTATION

NORTH PUMP STATION

KEY LEGEND

SEPTAGE FACILITY

GRAPHIC SCALE

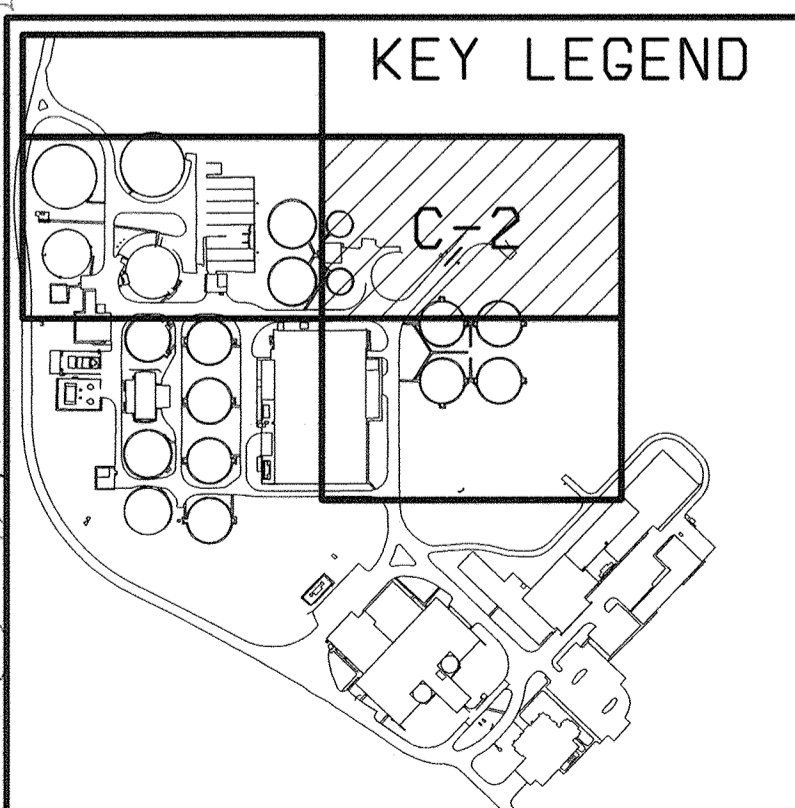
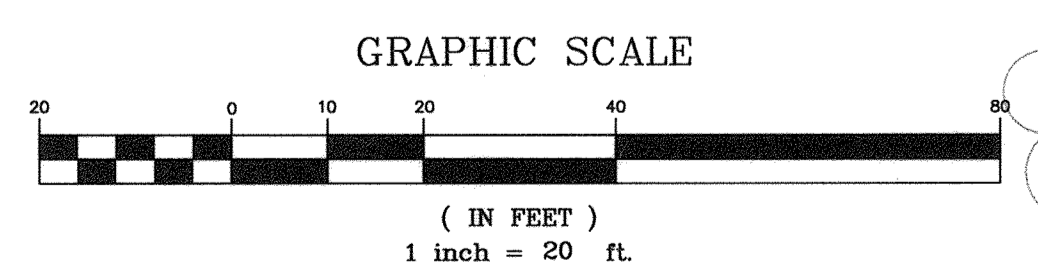
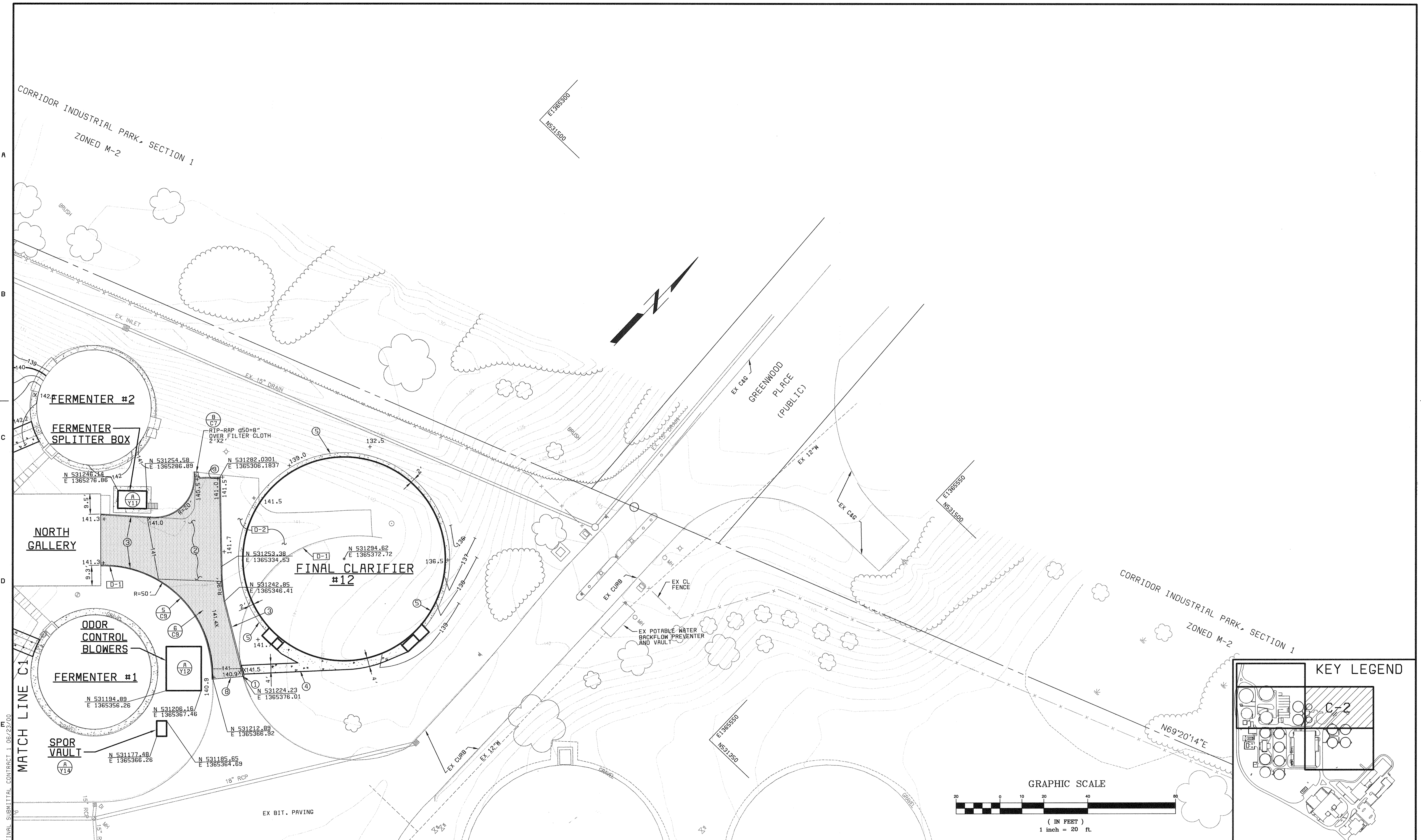
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| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND | AMT A. MORTON THOMAS AND ASSOCIATES, INC. CONSULTING ENGINEERS 12750 TWINBROOK PARKWAY, SUITE 200, ROCKVILLE MD 20852 TEL (301) 881-2545 FAX (301) 881-8814 E-MAIL JBYRNE@AMTEENGINEERING.COM AMT FILE # 98-154 | BLACK & VEATCH LP Gaithersburg, Maryland REG. PROF. ENGR. DATE 6/22/00 | DES: A.R. DRN: R.E.A. CHK: J.B. DATE: 06/23/00 | CIVIL SITE GRADING AND STAKING PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 10 OF 161 C1 |
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FINAL SUBMITTAL CONTRACT 1.06/23/00

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



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

FINAL SUBMITTAL CONTRACT 1.06/23/00

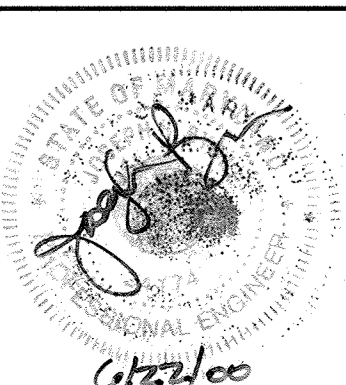
MATCH LINE C1

CHIEF, BUREAU OF UTILITIES DATE

AMT
A. MORTON THOMAS AND ASSOCIATES, INC.
CONSULTING ENGINEERS
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AMT FILE # 98-154

BLACK & VEATCH LLP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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

CIVIL

SITE GRADING AND STAKING PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 11 OF 161

C2

MATCH LINE C6

FLOW EQUALIZATION BASIN # 1

FLOW EQUALIZATION BASIN # 2

FLOW EQUALIZATION BASIN # 3

PRIMARY CLARIFIER # 1

NORTH BLOWER BUILDING

NORTH PROCESS REACTORS

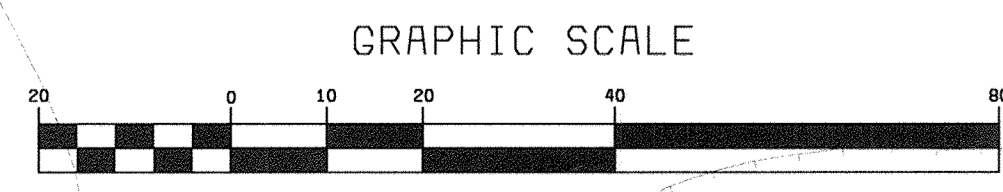
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FINAL CLARIFIER #10

ELECTRICAL SUBSTATION

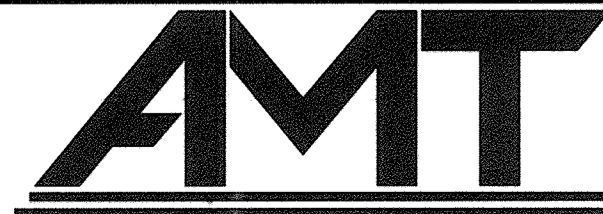
NORTH PUMP STATION

KEY LEGEND



HEADWORKS BLDG

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HOWARD COUNTY, MARYLAND



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AMT FILE # 98-154



BLACK & VEATCH, L.P.
Gaithersburg, Maryland

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



DES: A.R.

DRN: R.E.A.

CHK: J.B.

DATE: 06/23/00

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CIVIL

EROSION AND SEDIMENT CONTROL PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

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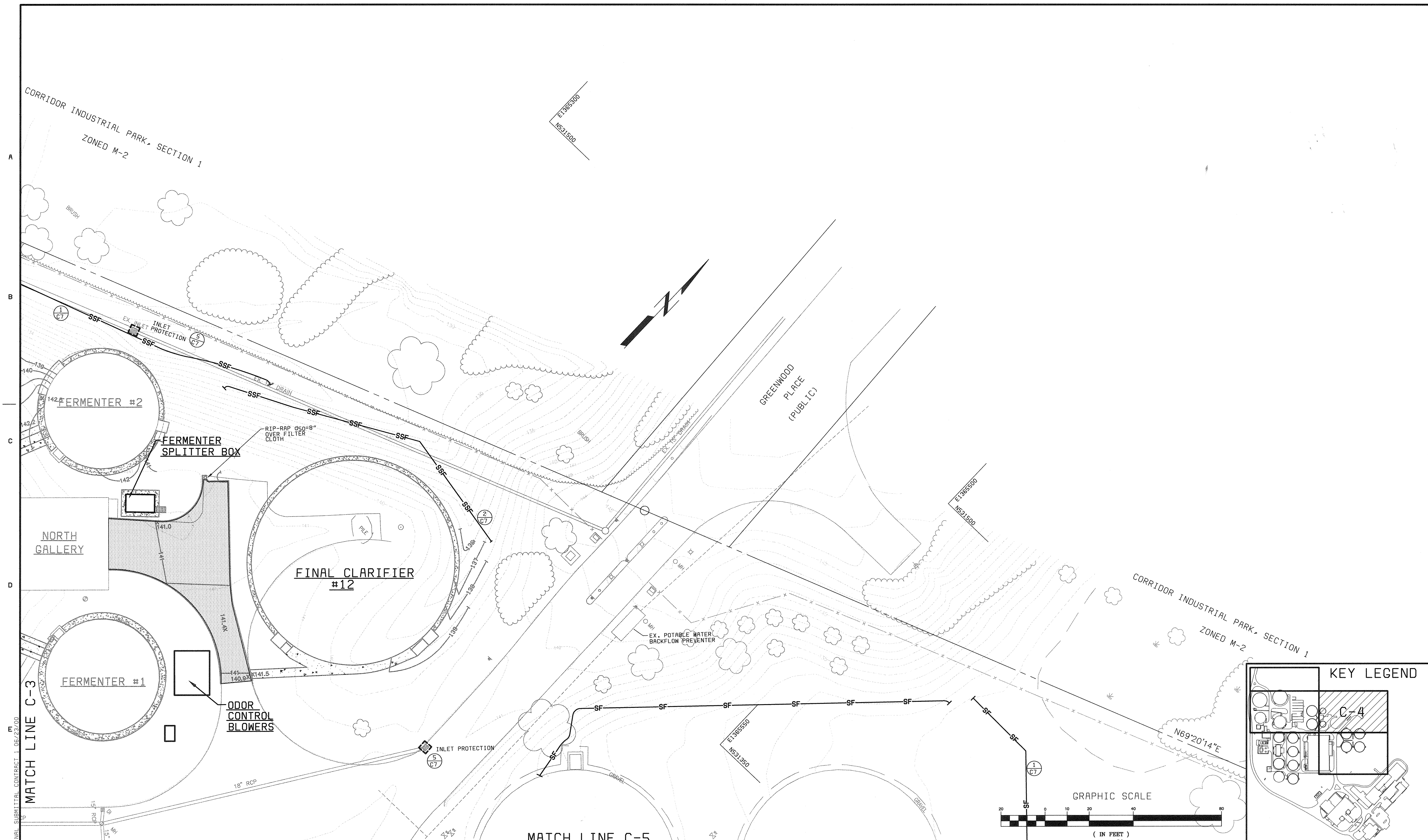
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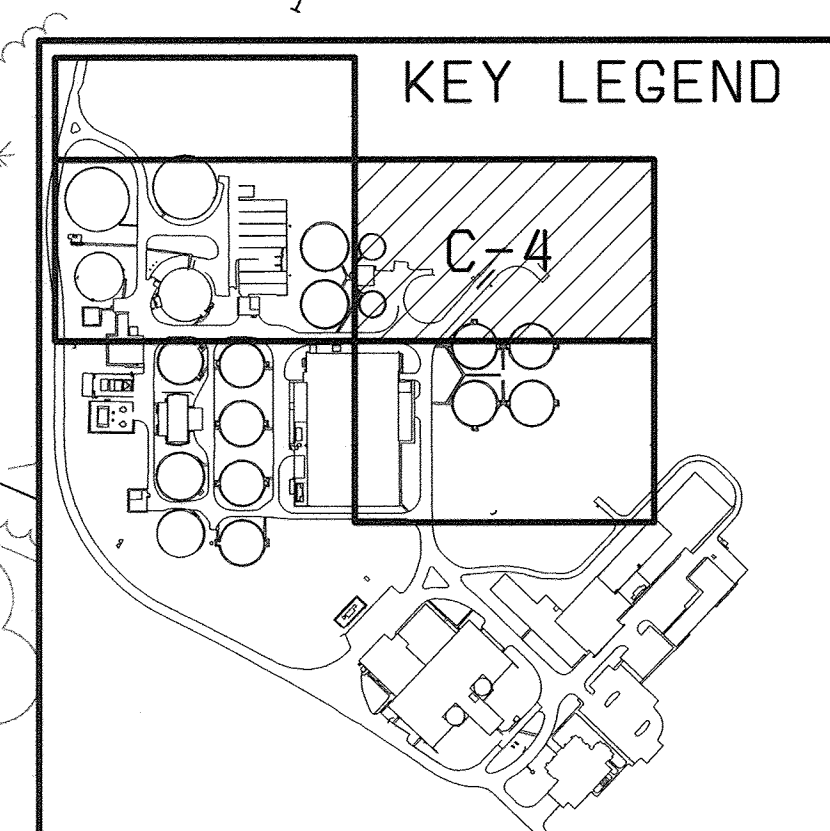
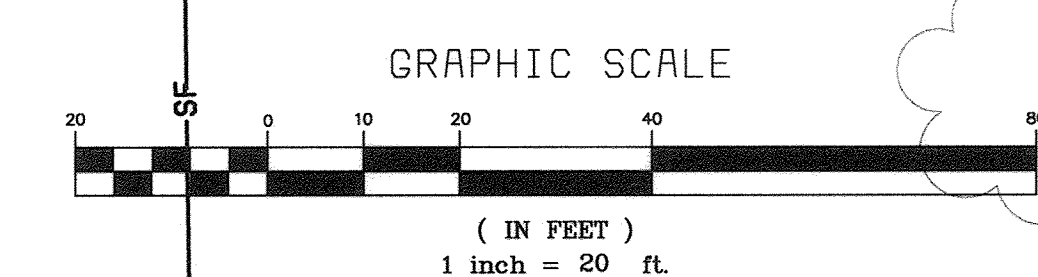
FINAL SUBMITTAL CONTRACT 1.06/23/00

6-29-00
CHIEF, BUREAU OF UTILITIES DATE



FINAL SUBMITTAL CONTRACT 1.06/23/00
MATCH LINE C-3

MATCH LINE C-5



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

6/29/02
R. H. B...
CHIEF, BUREAU OF UTILITIES DATE

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AMT FILE # 98-154

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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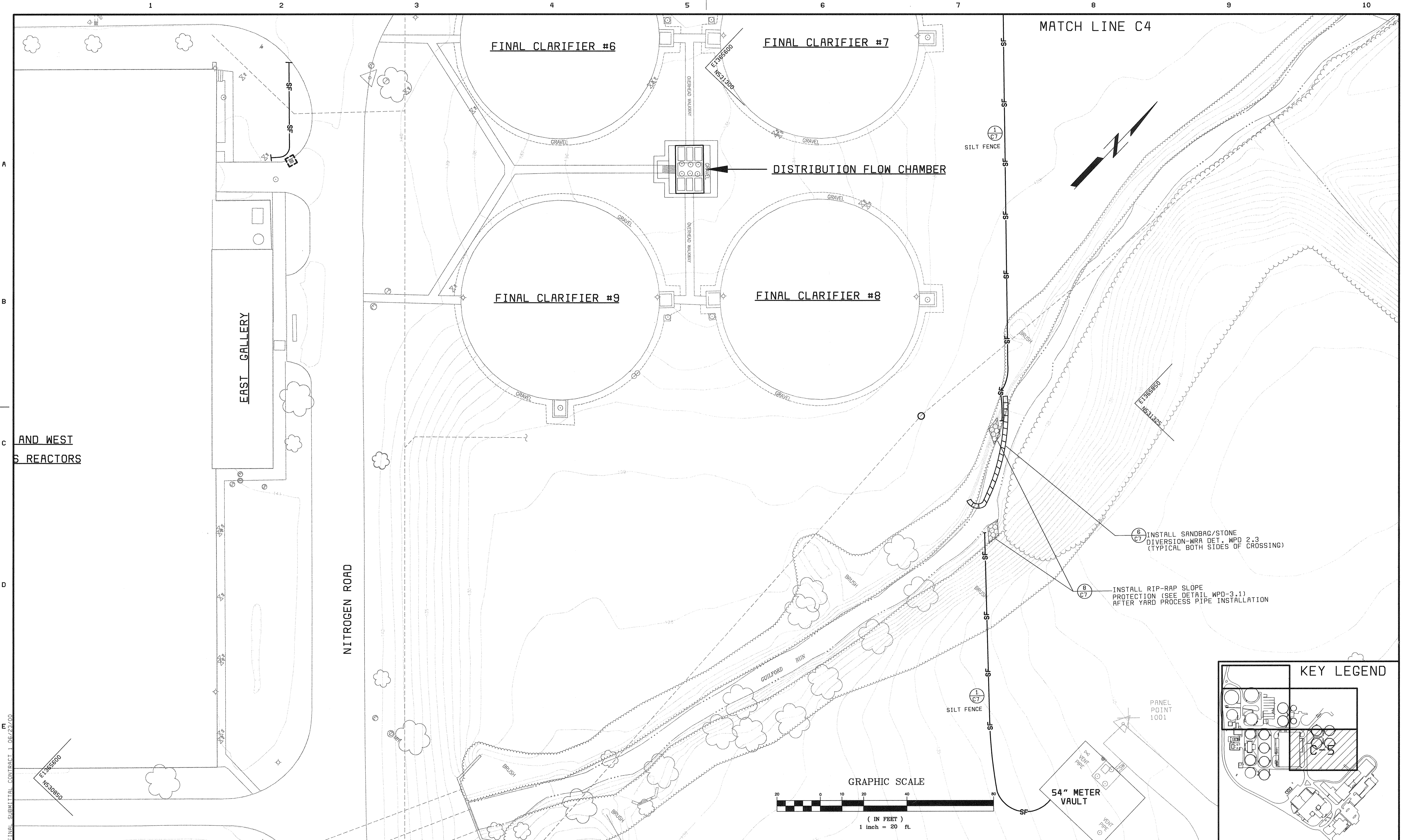
EROSION AND SEDIMENT CONTROL PLAN

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NORTH BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 13 OF 161
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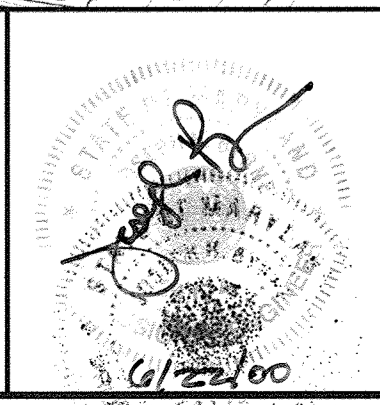


FINAL SUBMITTAL CONTRACT 1-06/23/00
 DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 CHIEF, BUREAU OF UTILITIES DATE

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 CHIEF, BUREAU OF UTILITIES DATE

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 AMT FILE # 96-154

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



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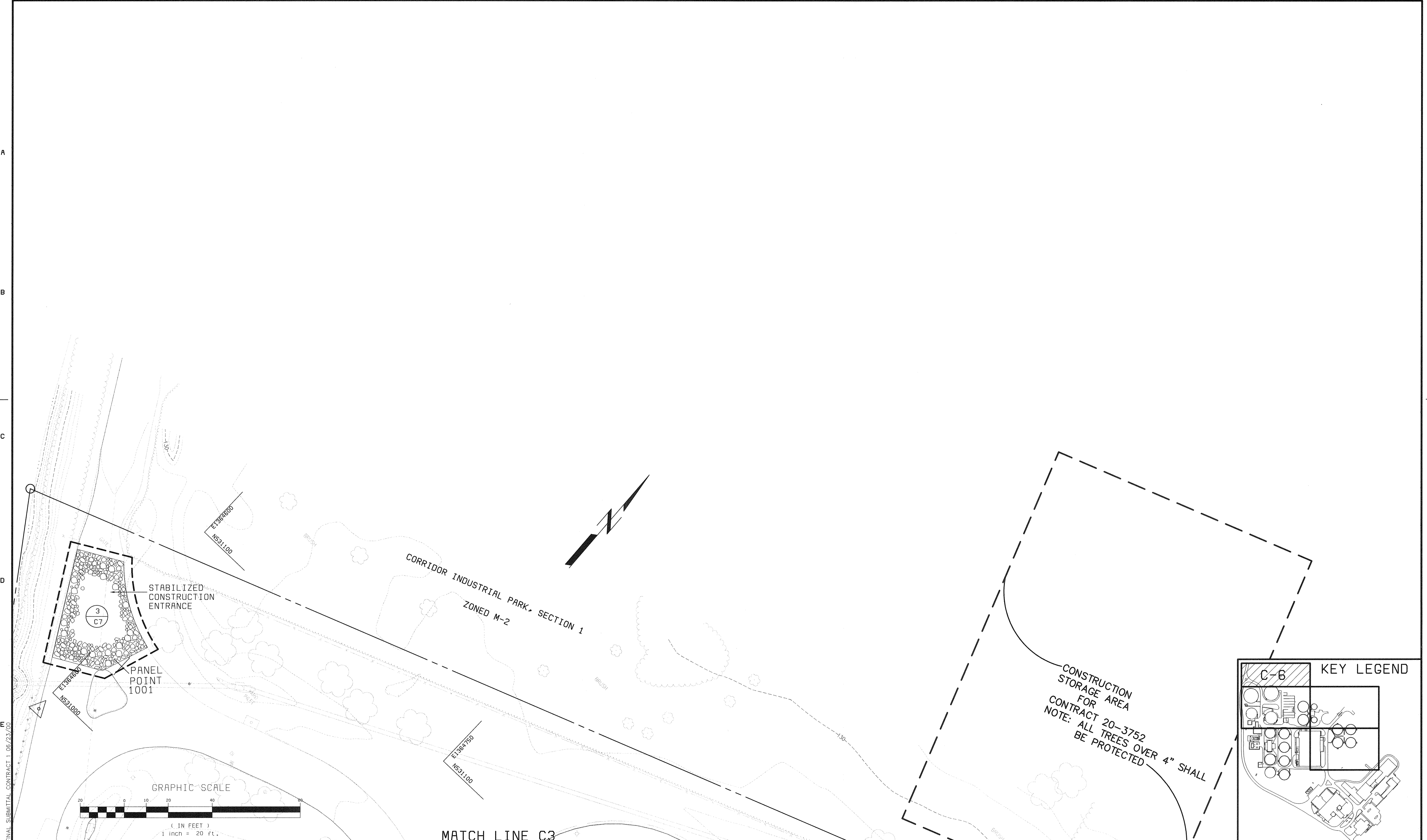
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 EROSION AND SEDIMENT CONTROL PLAN

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

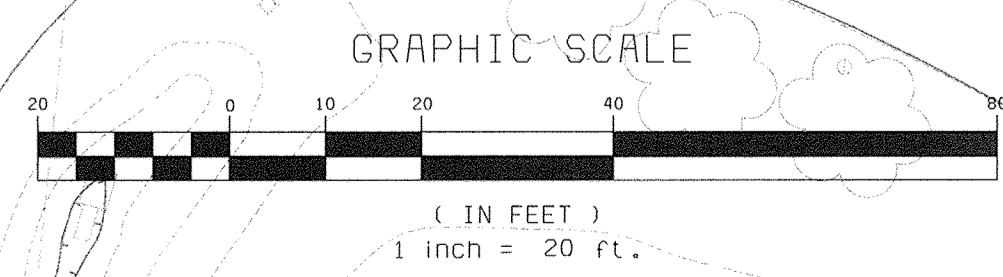
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 SHEET 14 OF 161
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FINAL SUBMITTAL CONTRACT 1.06/23/00



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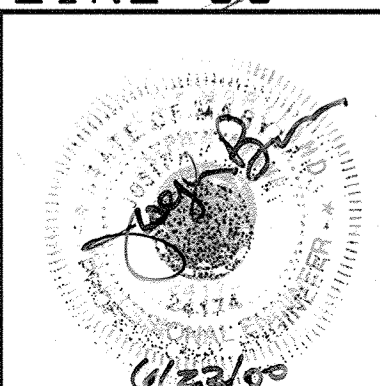
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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Gaithersburg, Maryland

[Signature] 6/22/00
REG. PROF. ENGR DATE



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| DES: A.R. | | | | | | | | | |
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CIVIL

EROSION AND SEDIMENT CONTROL PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

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DETAIL 22 - SILT FENCE

CONSTRUCTION SPECIFICATIONS

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

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

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

DETAIL 33 - SUPER SILT FENCE

CONSTRUCTION SPECIFICATIONS

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

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

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

CONSTRUCTION SPECIFICATION

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

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

DETAIL 23C - CURB INLET PROTECTION

CONSTRUCTION SPECIFICATIONS

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

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

DETAIL 23B - AT GRADE INLET PROTECTION

CONSTRUCTION SPECIFICATIONS

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

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

Sandbag/Stone Diversion

CONSTRUCTION REQUIREMENTS

- All erosion and sediment control devices shall be installed as the first order of work.
- The diversion structure shall be installed from upstream to downstream.
- The height of the diversion structure shall be one half the distance from stream bed to stream bank plus one foot, as indicated on the cross-section view.
- All excavated materials shall be disposed of in a SCD approved disposal area outside the 100-year floodplain unless otherwise approved on the plans by the M&A.
- All diverting of the construction area shall be paved to a dewatering basin prior to re-entering the stream.
- Sheeting shall be overlapped such that the upstream portion covers the downstream portion with at least an 18-inch overlap.
- Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

WATER RESOURCES ADMINISTRATION Sandbag/Stone Diversion Approved On 1/24/00 WPD 2.3

In-Stream Stone Dike

CONSTRUCTION REQUIREMENTS

- Structure to be installed in-stream as first order of business to trap sediment generated during construction activities.
- The top width of the dike is to be from 2-4 feet.
- The distance between the dike and the disturbance is to be determined by flow rate of the streamway.
- Gabion baskets may be used in lieu of small riprap as indicated by alternative section.
- Structure is to remain in place until all disturbed areas have been stabilized in accordance with an approved sediment and erosion control plan.
- Entrapped sediment is to be excavated periodically and disposed of in a SCD approved disposal area outside the 100-year floodplain unless otherwise approved on the plans by the M&A.
- Structure can be removed once approved by inspecting authority.

WATER RESOURCES ADMINISTRATION In-Stream Stone Dike Approved On 1/24/00 WPD 1.2

Riprap

CONSTRUCTION REQUIREMENTS

- The riprap shall consist of protecting slopes and channels from erosion with coverings of stone in accordance with the plans and specifications shown on this drawing.
- Bedding:

| U.S. Standard | U.S. Standard |
|---------------|------------------|
| 1. Bedding | 2. Filter Fabric |
| 1. Bedding | 2. Filter Fabric |
| 1. Bedding | 2. Filter Fabric |
| 1. Bedding | 2. Filter Fabric |
- Filter Fabric: The filter fabric shall be a woven or nonwoven fabric consisting only of continuous chain polymer filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydrocarbons, oils, and not resistant. A one foot layer of 2" washed stone may be used instead of filter fabric.
- Gabion Baskets - Class I gabion baskets shall meet the requirements listed in WPD-2.
- Structure to be installed in-stream as first order of business to trap sediment generated during construction activities.
- The top width of the dike is to be from 2-4 feet.
- The distance between the dike and the disturbance is to be determined by flow rate of the streamway.
- Gabion baskets may be used in lieu of small riprap as indicated by alternative section.
- Structure is to remain in place until all disturbed areas have been stabilized in accordance with an approved sediment and erosion control plan.
- Entrapped sediment is to be excavated periodically and disposed of in a SCD approved disposal area outside the 100-year floodplain unless otherwise approved on the plans by the M&A.
- Structure can be removed once approved by inspecting authority.

WATER RESOURCES ADMINISTRATION Riprap Approved On 1/24/00 WPD 3.1

DETAIL 20B - SUMP PIT

CONSTRUCTION SPECIFICATIONS

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

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

1 2 3 4 5 6 7 8 9 10

HOWARD SOIL CONSERVATION DISTRICT
PERMANENT SEEDING NOTES

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

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

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

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

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

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

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

OPTION 2 -- USE SOD.

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

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

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

TEMPORARY SEEDING NOTES

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

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

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

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

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

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

HOWARD SOIL CONSERVATION DISTRICT
STANDARD SEDIMENT CONTROL NOTES

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

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

SEQUENCE OF CONSTRUCTION ACTIVITIES

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

058472
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FINAL SUBMITTAL CONTRACT # 05/23/00

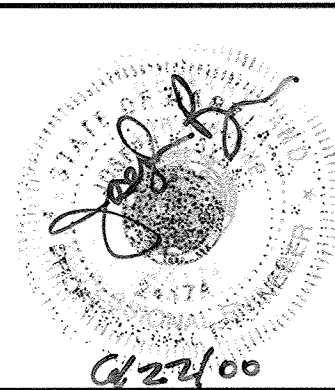
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

John B. ...
CHIEF, BUREAU OF UTILITIES DATE

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

BLACK & VEATCH LP
Gaithersburg, Maryland

[Signature]
REG. PROF. ENGR. DATE



DES: A.R.
DRN: R.E.A.
CHK: J.B.
DATE: 06/23/00

| DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP |
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CIVIL

EROSION AND SEDIMENT CONTROL
NOTES

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

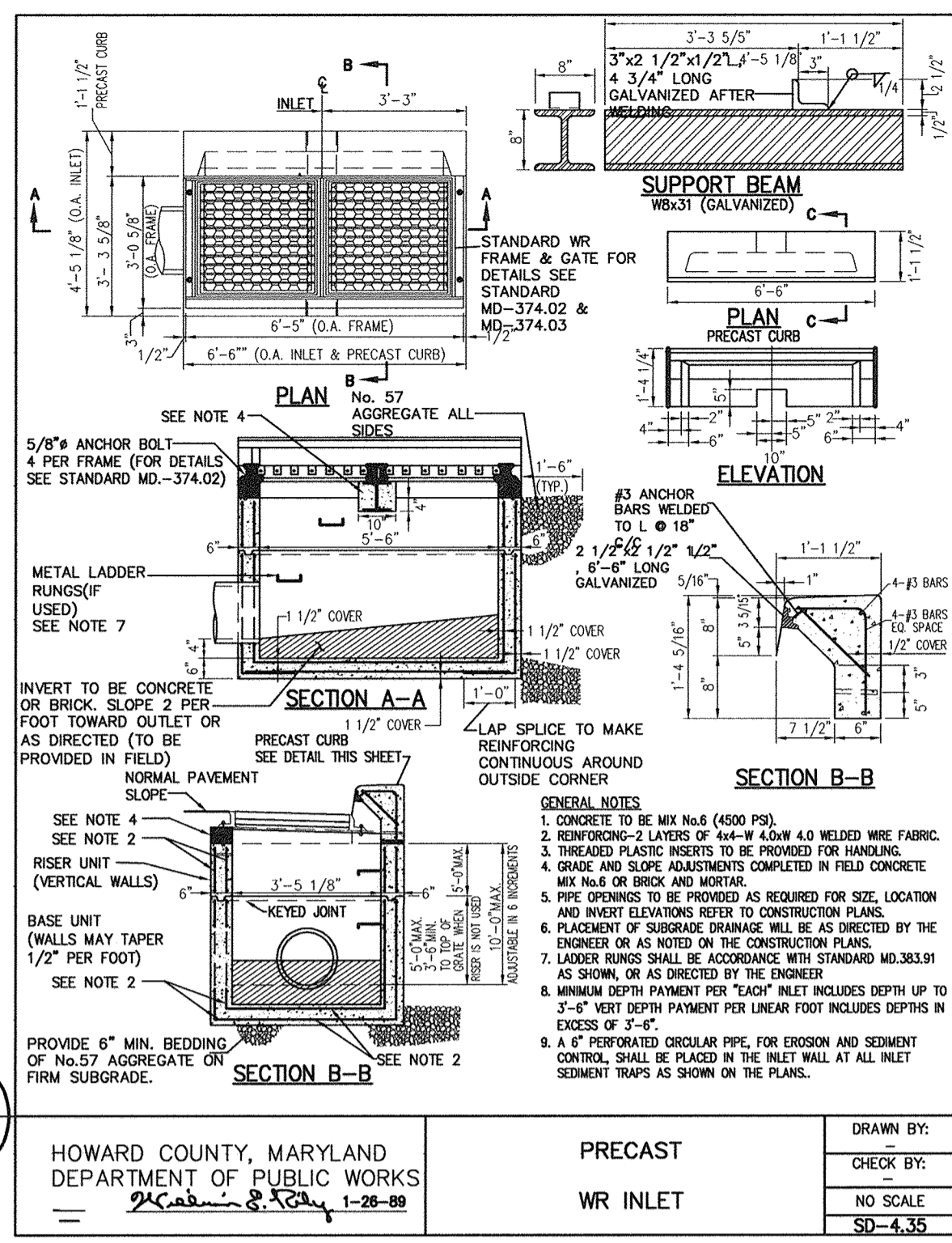
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 17 OF 161

C8

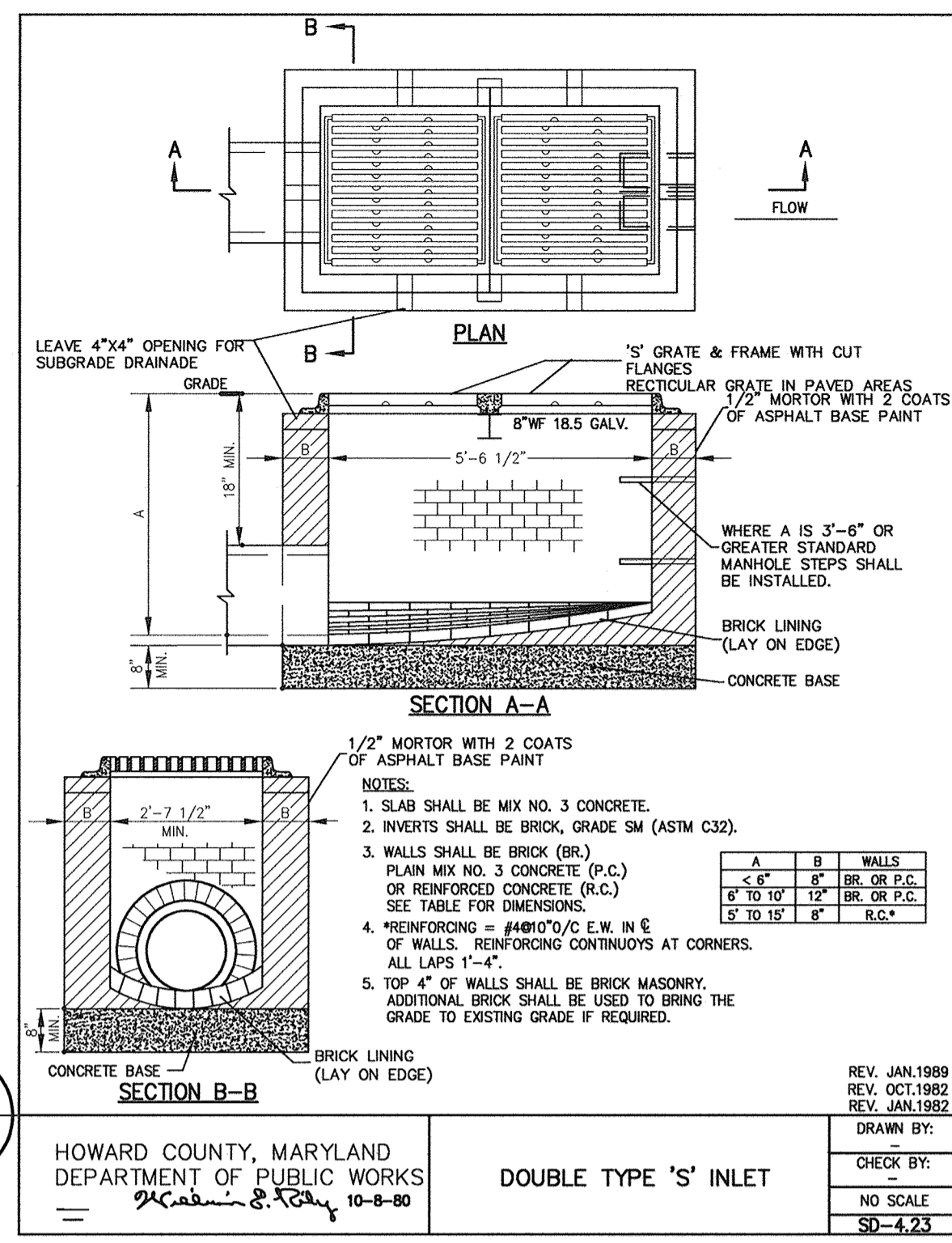


1
C9

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
1-26-89

PRECAST
WR INLET

DRAWN BY:
CHECK BY:
NO SCALE
SD-4.35

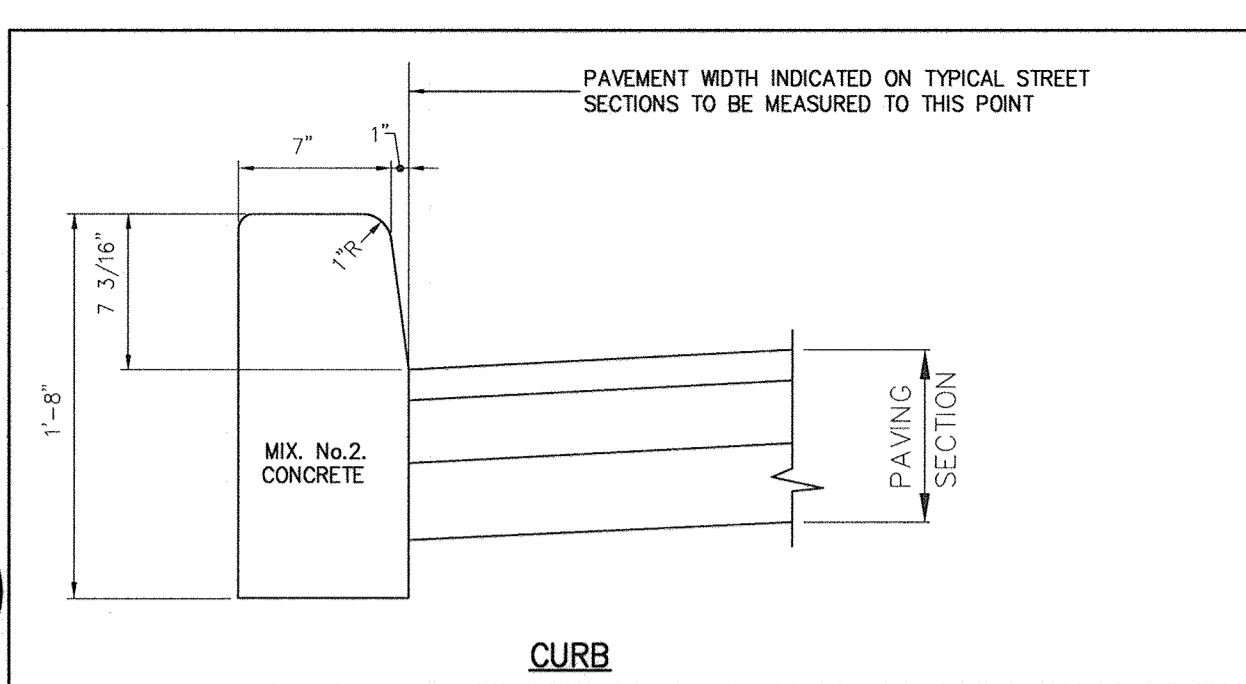


2
C9

HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
10-9-80

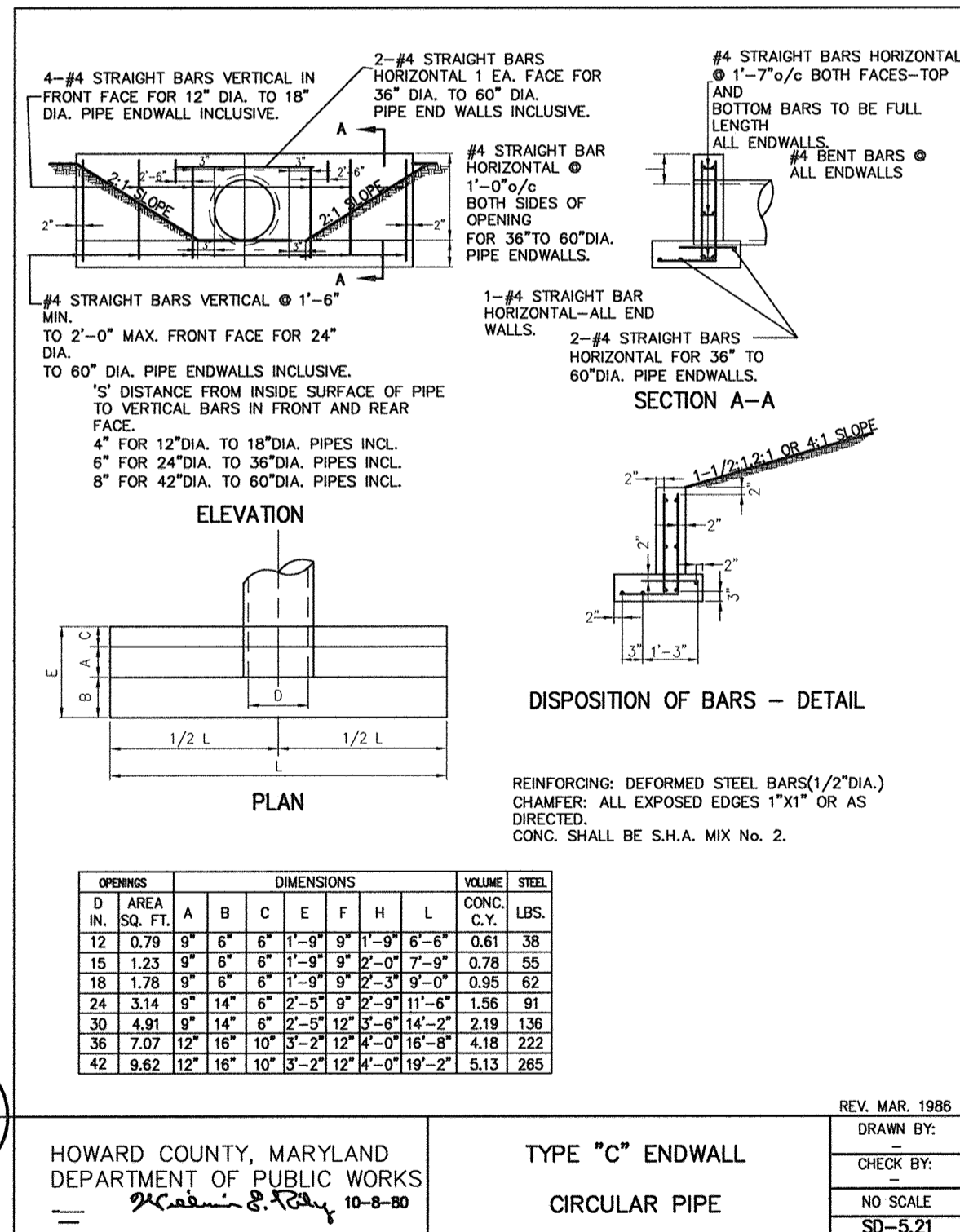
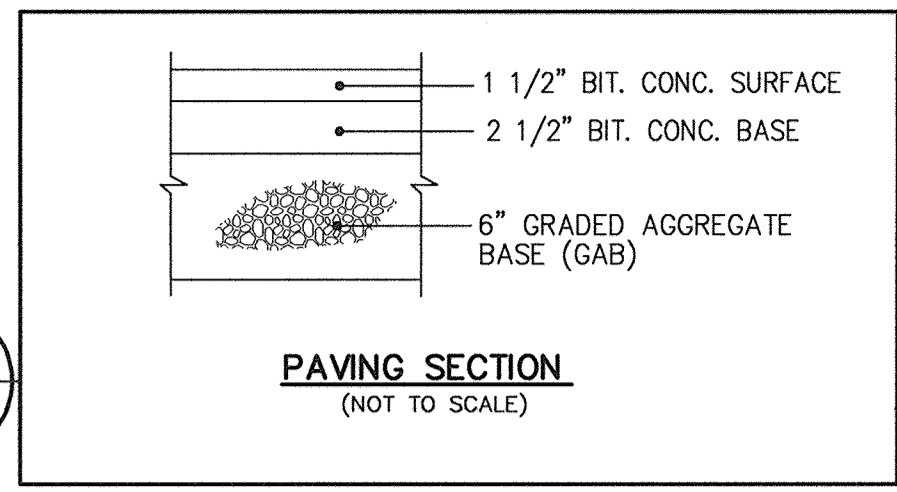
DOUBLE TYPE 'S' INLET

DRAWN BY:
CHECK BY:
NO SCALE
SD-4.23



5
C9

6
C9

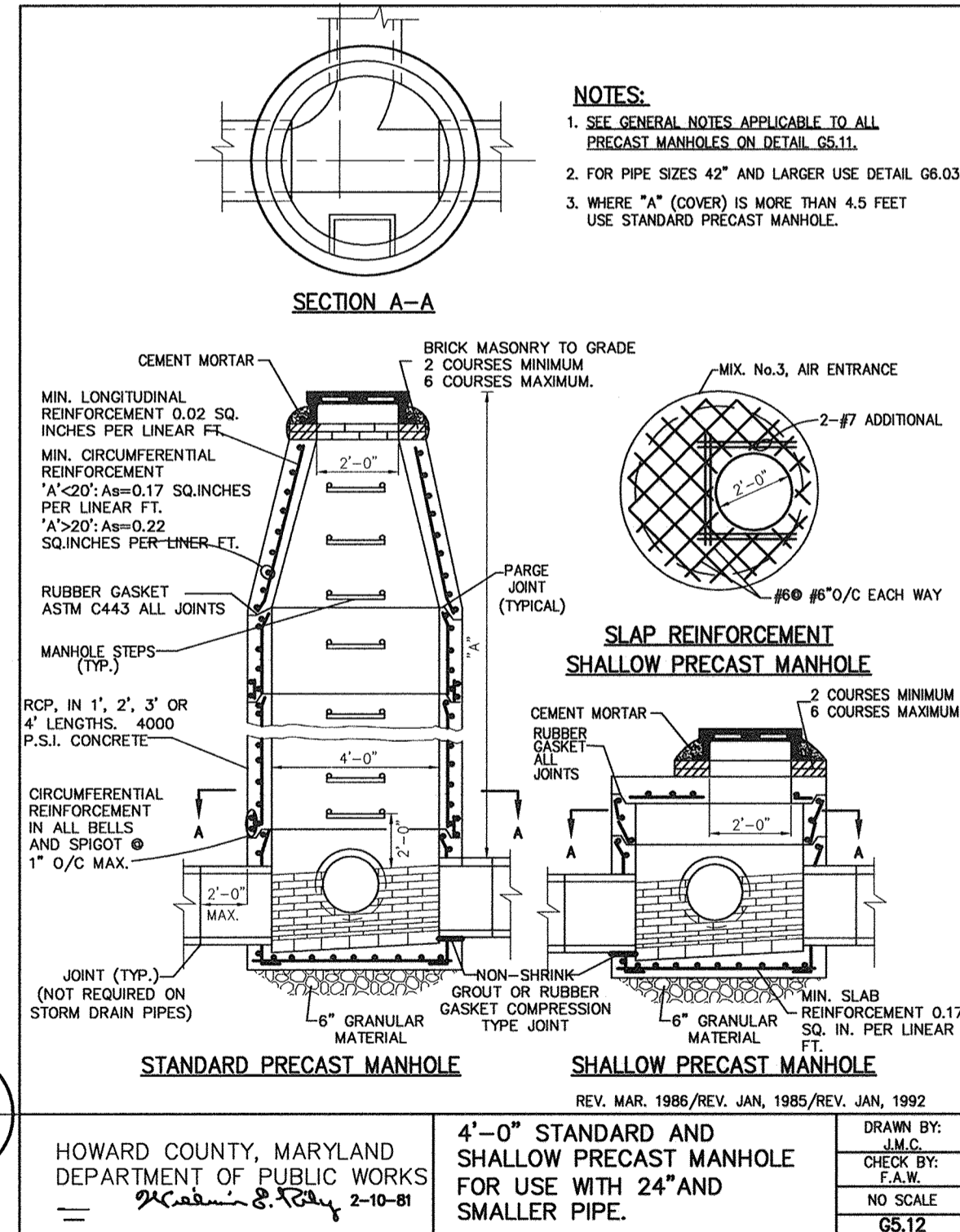


3
C9

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

TYPE "C" ENDWALL
CIRCULAR PIPE

DRAWN BY:
CHECK BY:
NO SCALE
SD-5.21

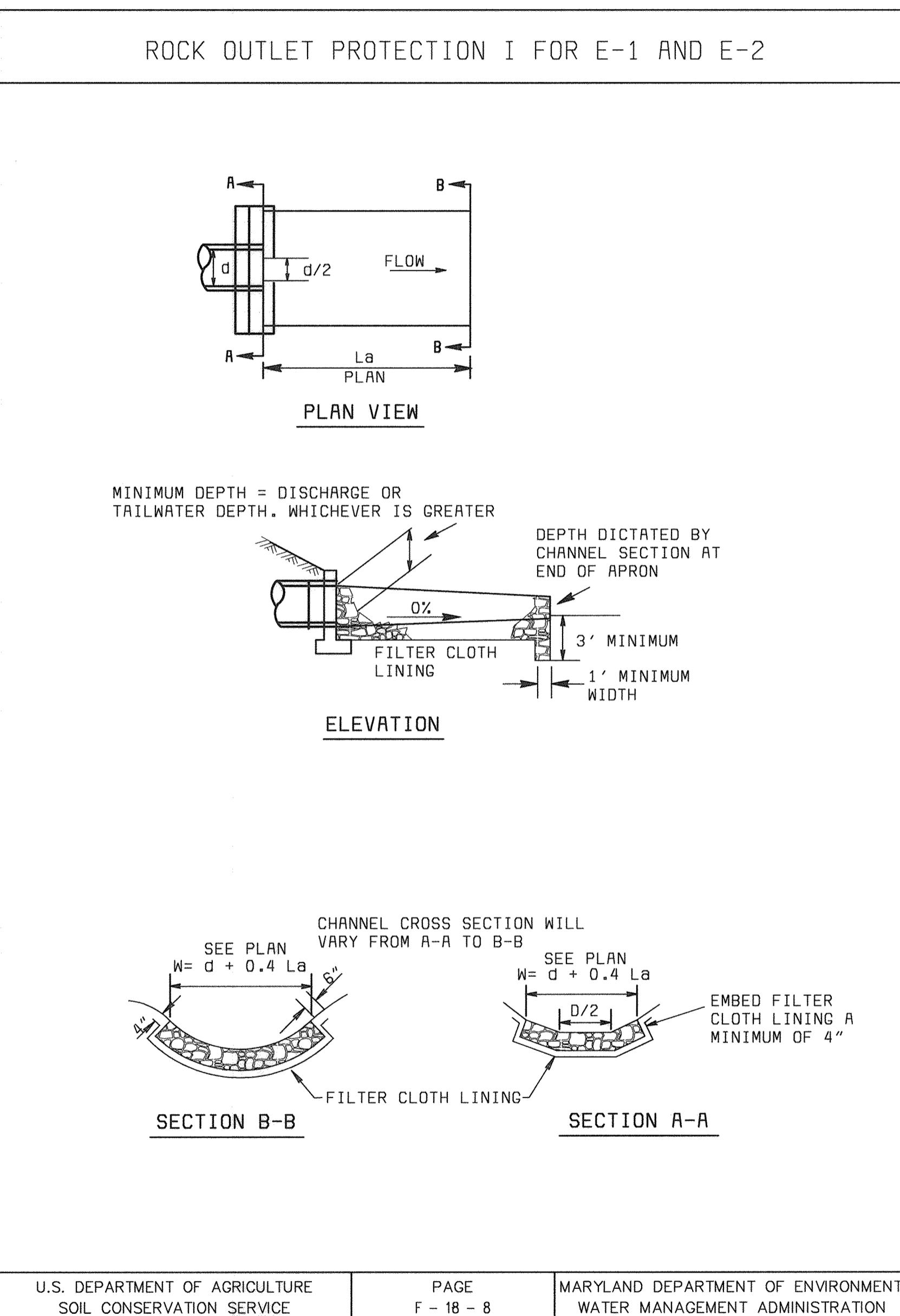


4
C9

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

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

DRAWN BY:
CHECK BY:
NO SCALE
SD-12



7
C9

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

PAGE
F - 18 - 8

MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

FINAL SUBMITTAL CONTRACT L 06/23/00

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Chief, Bureau of Utilities Date

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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

CIVIL

SITE DETAILS

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

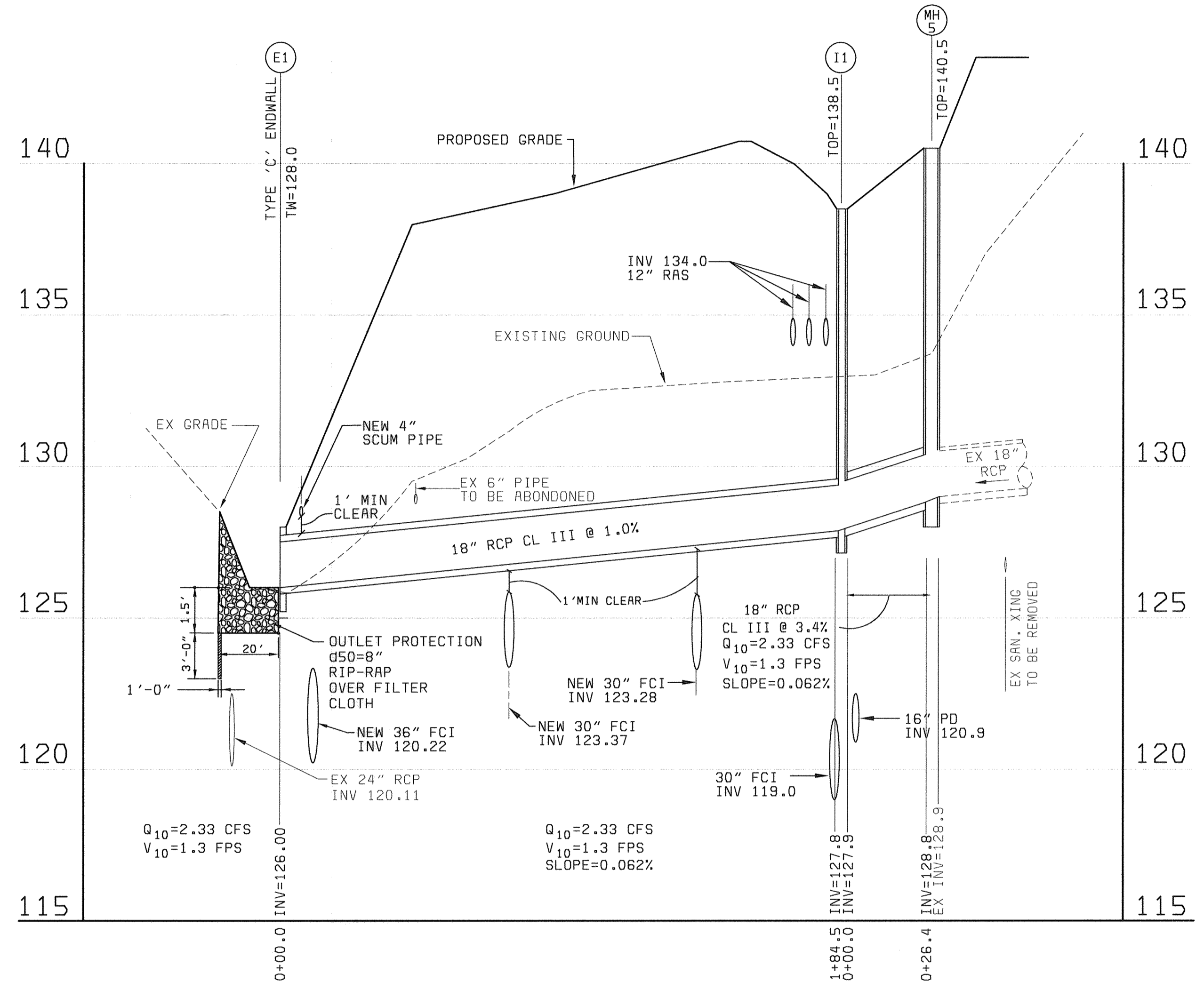
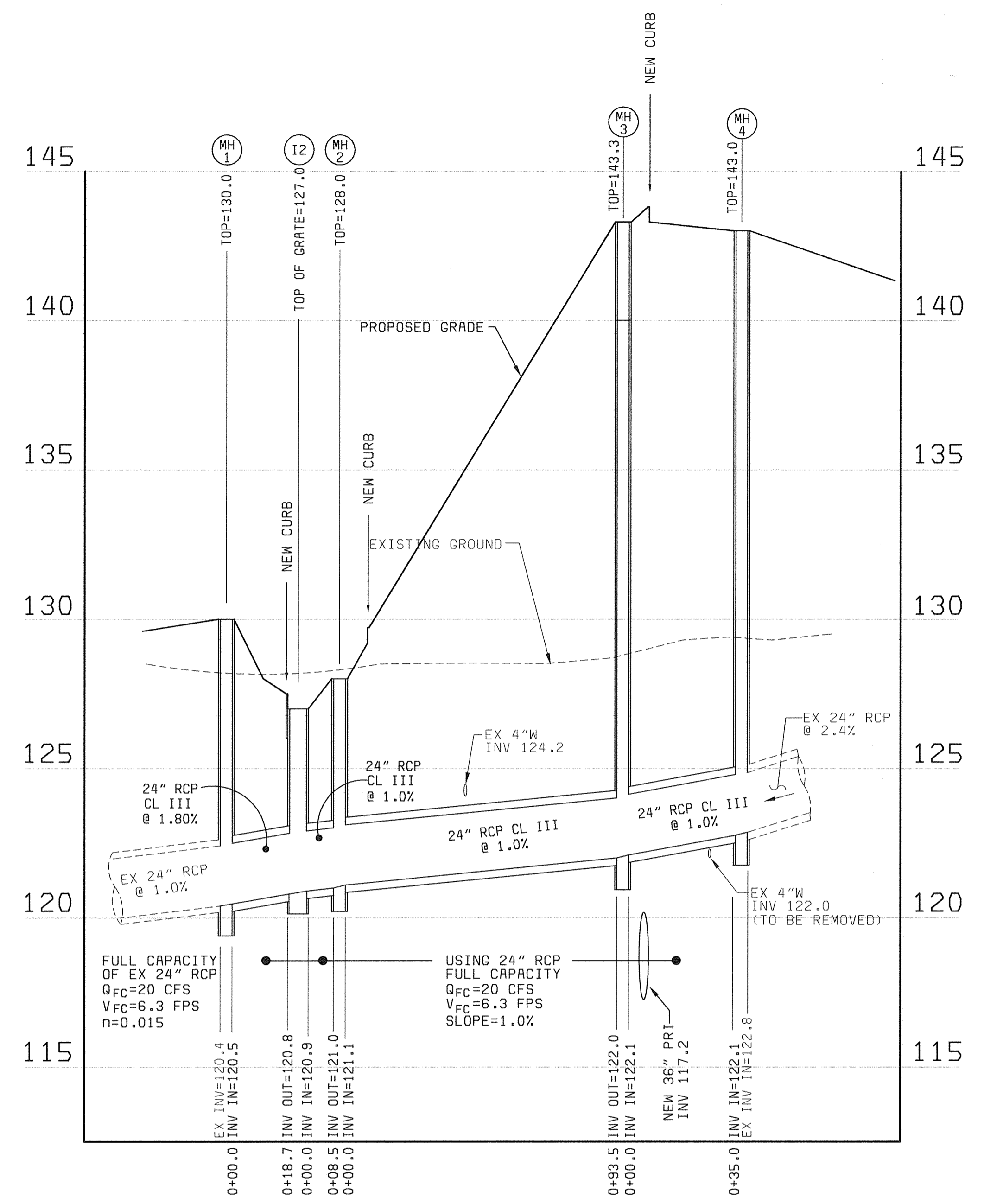
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

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18 OF 161

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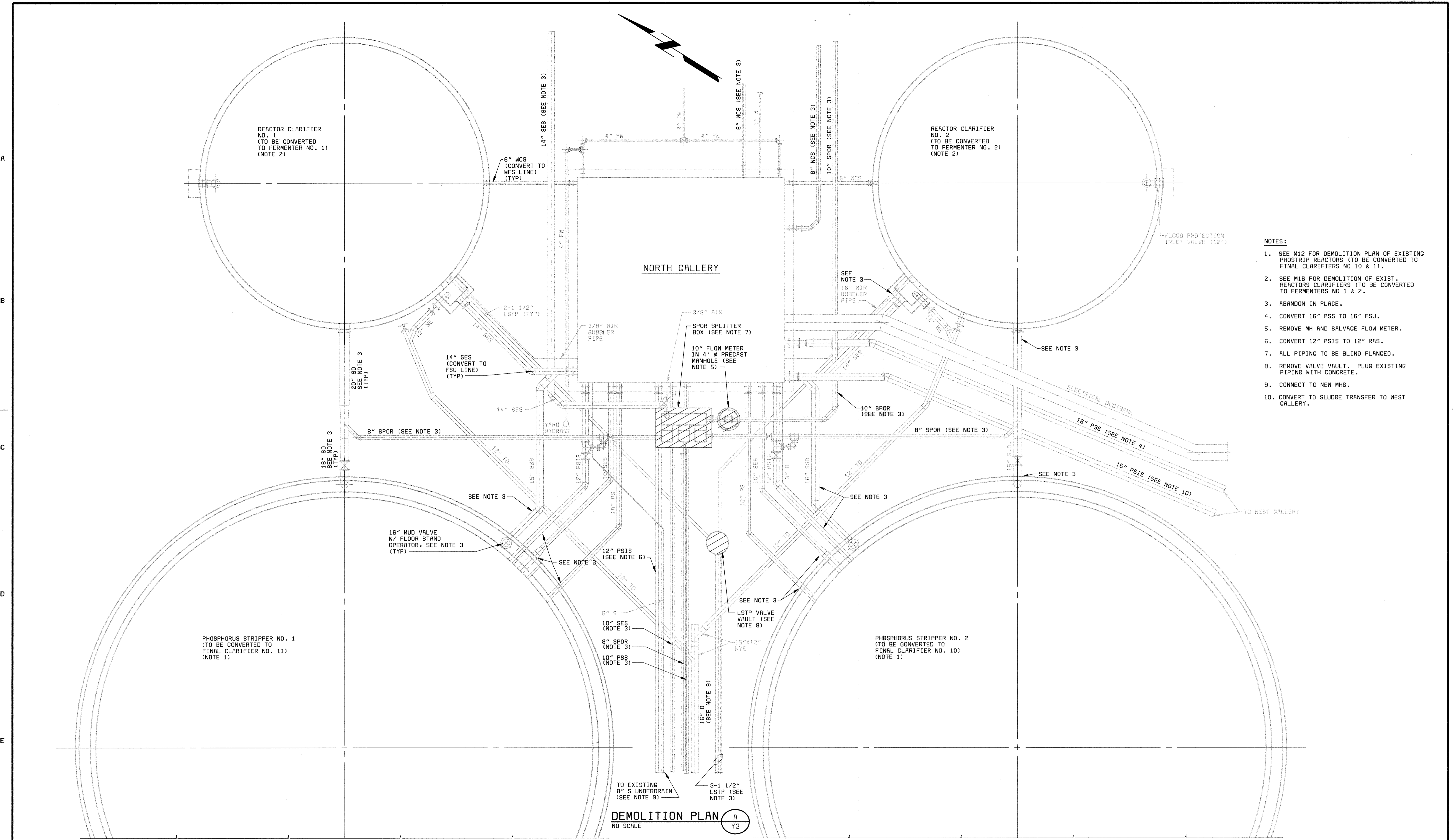


| STRUCTURE SCHEDULE | | | | | |
|--------------------|------------------------|-----------|------------|-----------|-----------------|
| No. | STRUCTURE | INVERT IN | INVERT OUT | TOP ELEV. | REMARKS |
| I1 | INLET (NR FRAME GRATE) | 127.9 | 127.8 | 138.5 | Ho. Co. SD-4.23 |
| I2 | INLET | 120.9 | 120.8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

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

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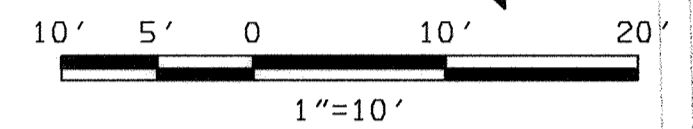
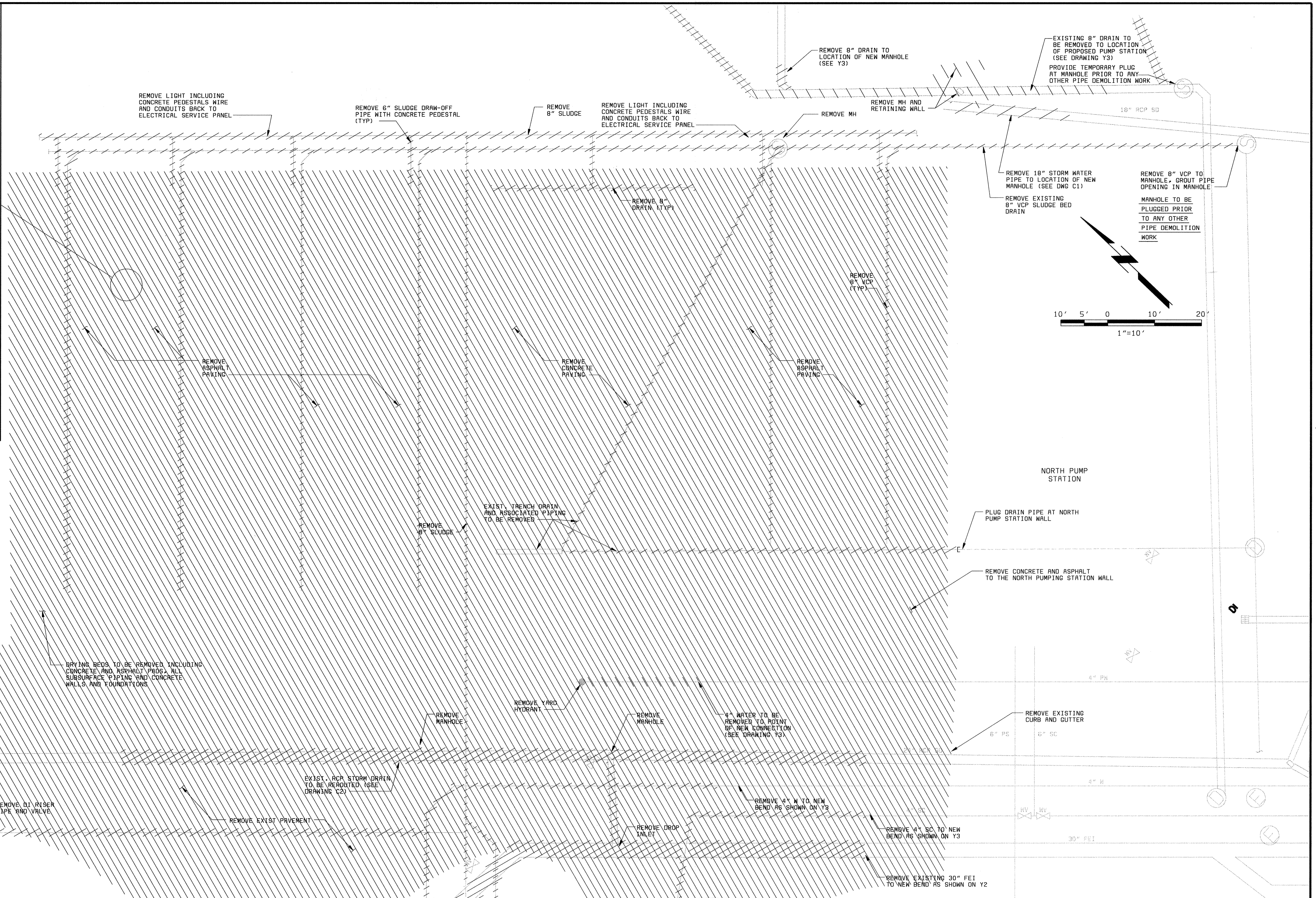
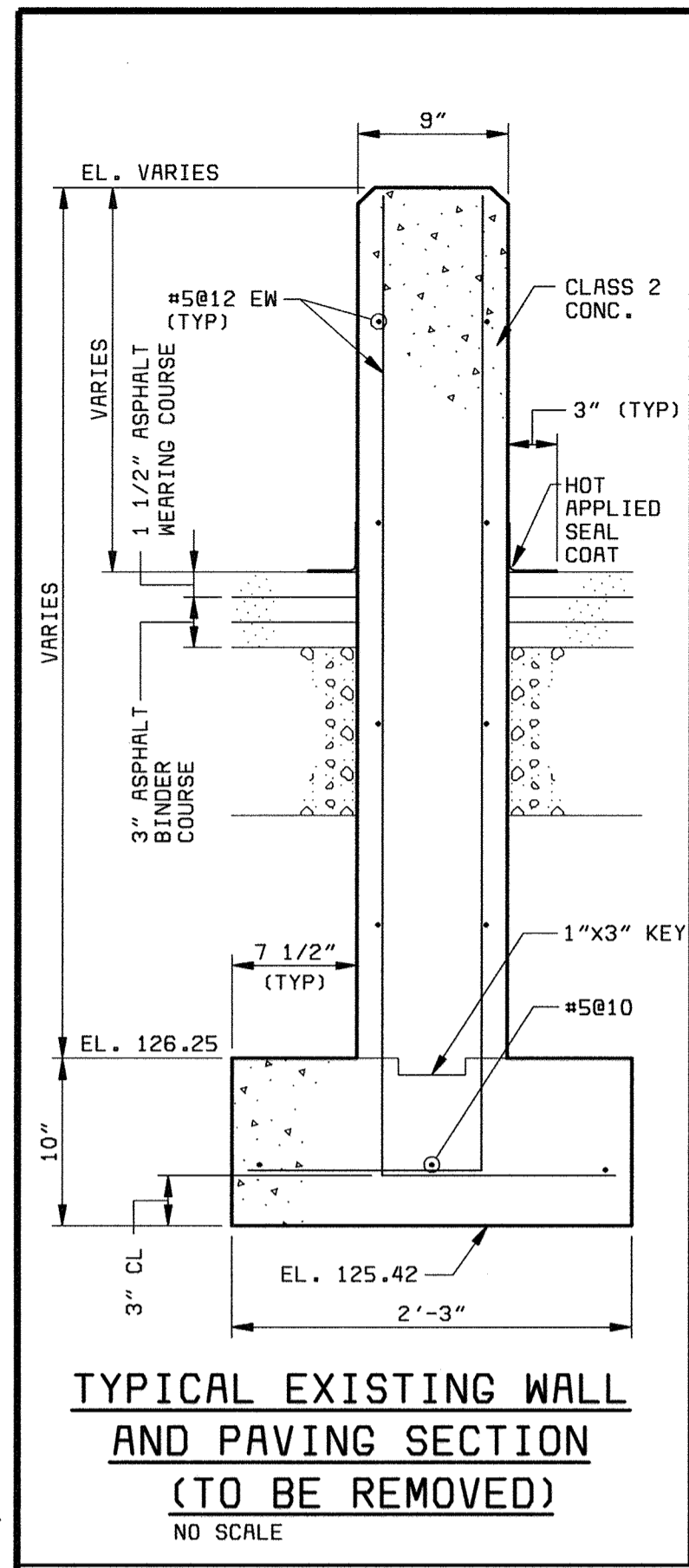
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 ORIGINAL CONTRACT L 06/23/00



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

DEMOLITION PLAN
NO SCALE

| | | | | | | | | | | | | |
|--|---|---|----------|----------|---------------|------|-------------------------------|-----|----|---|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Rectanus Jr. 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH L.P. Gaithersburg, Maryland Robert J. Rectanus Jr. 6/29/00 REG. PROF. ENGR. DATE | ROBERT J. RECTANUS JR. No. 22327 REGISTERED PROFESSIONAL ENGINEER | DES: FKA | | | | | | | YARDWORK YARD PIPING DEMOLITION PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: SLF | CHK: WLK | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | | | CK |

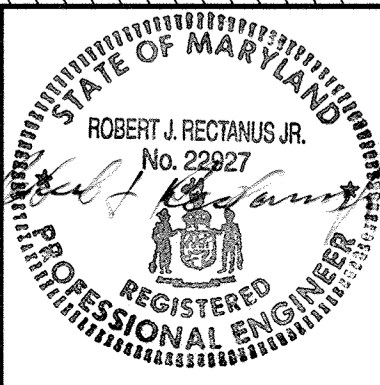


DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

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



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

EXISTING SLUDGE DRYING BEDS
YARDWORK

DEMOLITION PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

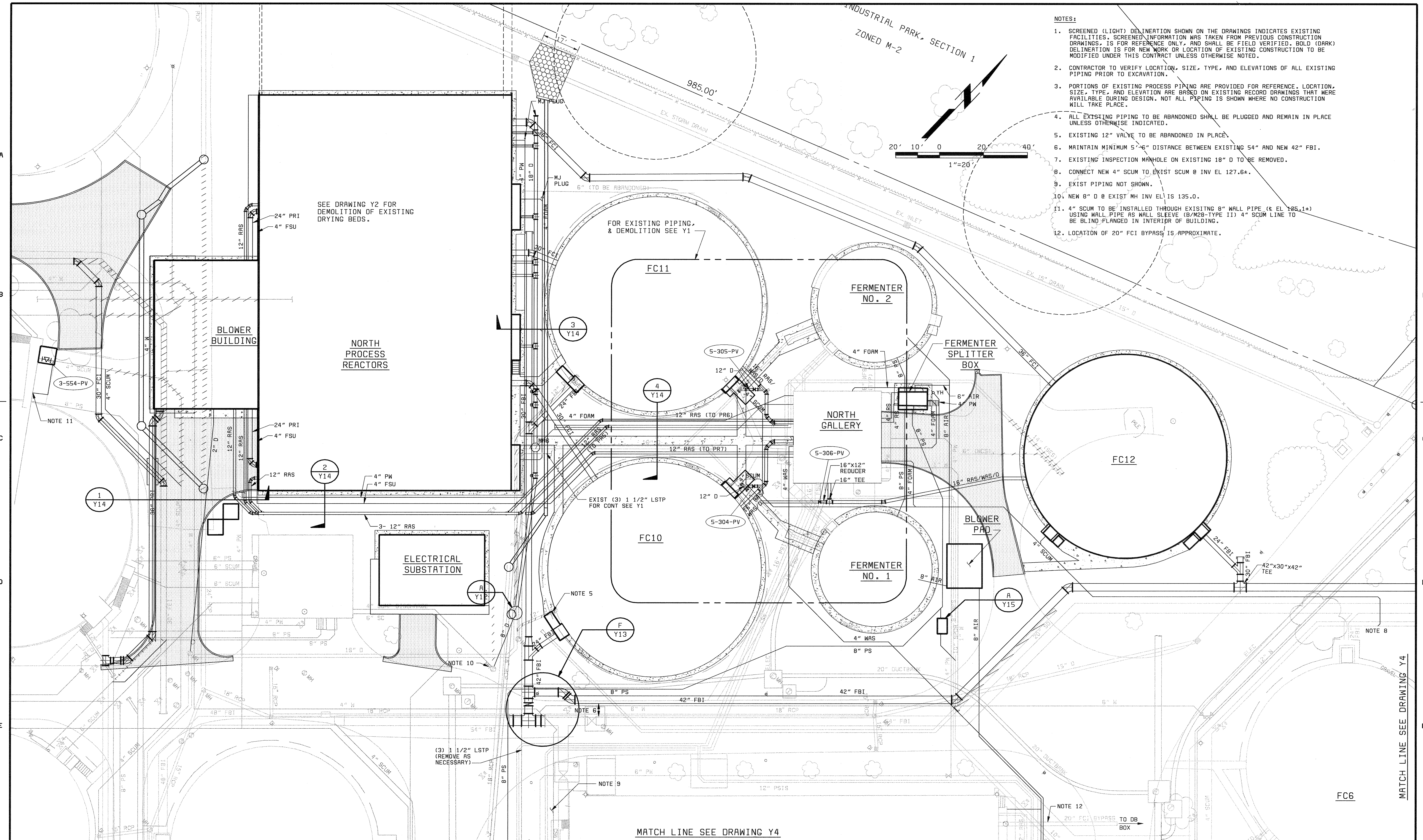
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 21 OF 161

Y2

LP ALL 58472-101-YARD-C-A0000294
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 58472-101-YARD-C-A0000977




- NOTES:**
1. SCREENED (LIGHT) DELINEATION SHOWN ON THE DRAWINGS INDICATES EXISTING FACILITIES. SCREENED INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS, IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED. BOLD (DARK) DELINEATION IS FOR NEW WORK OR LOCATION OF EXISTING CONSTRUCTION TO BE MODIFIED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
 2. CONTRACTOR TO VERIFY LOCATION, SIZE, TYPE, AND ELEVATIONS OF ALL EXISTING PIPING PRIOR TO EXCAVATION.
 3. PORTIONS OF EXISTING PROCESS PIPING ARE PROVIDED FOR REFERENCE. LOCATION, SIZE, TYPE, AND ELEVATION ARE BASED ON EXISTING RECORD DRAWINGS THAT WERE AVAILABLE DURING DESIGN. NOT ALL PIPING IS SHOWN WHERE NO CONSTRUCTION WILL TAKE PLACE.
 4. ALL EXISTING PIPING TO BE ABANDONED SHALL BE PLUGGED AND REMAIN IN PLACE UNLESS OTHERWISE INDICATED.
 5. EXISTING 12" VALVE TO BE ABANDONED IN PLACE.
 6. MAINTAIN MINIMUM 5'-6" DISTANCE BETWEEN EXISTING 54" AND NEW 42" FBI.
 7. EXISTING INSPECTION MANHOLE ON EXISTING 18" D TO BE REMOVED.
 8. CONNECT NEW 4" SCUM TO EXIST SCUM @ INV EL 127.64.
 9. EXIST PIPING NOT SHOWN.
 10. NEW 8" D @ EXIST MH INV EL IS 135.0.
 11. 4" SCUM TO BE INSTALLED THROUGH EXISTING 8" WALL PIPE (E EL 125.14) USING WALL PIPE AS WALL SLEEVE (B/M28-TYPE II) 4" SCUM LINE TO BE BLIND FLANGED IN INTERIOR OF BUILDING.
 12. LOCATION OF 20" FCI BYPASS IS APPROXIMATE.

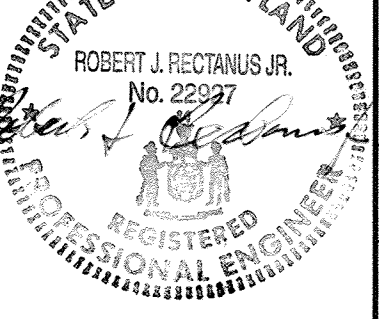
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 58472-101-YARD-C-R0000292

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

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


BLACK & VEATCH LP
 Gaithersburg, Maryland

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

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

 REGISTERED PROFESSIONAL ENGINEER

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

YARDWORK
 CIVIL

 YARD PIPING
 1 OF 2

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

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

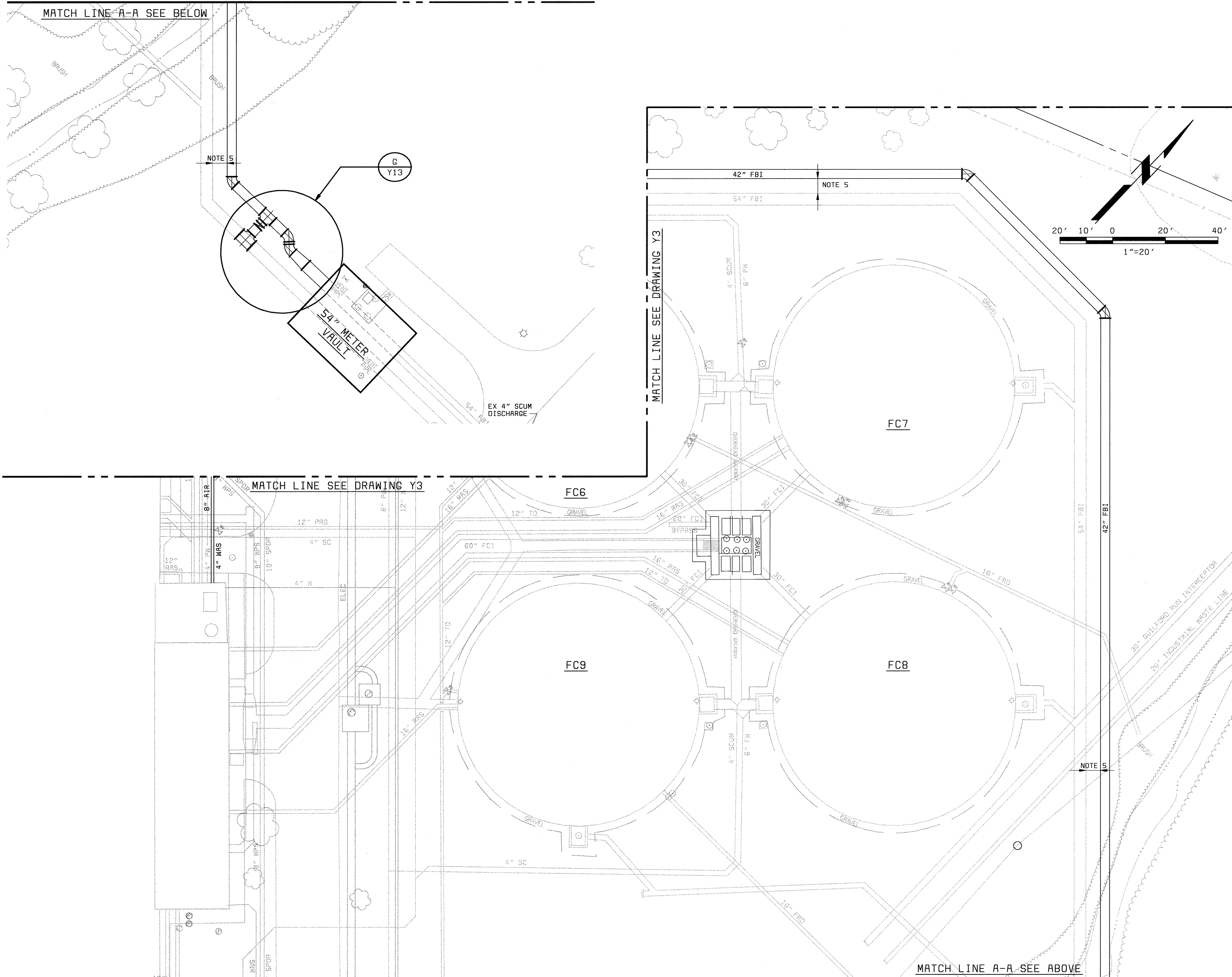
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 22 OF 161


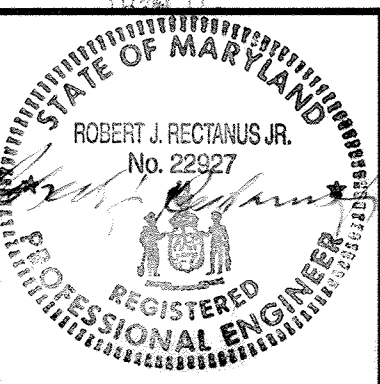
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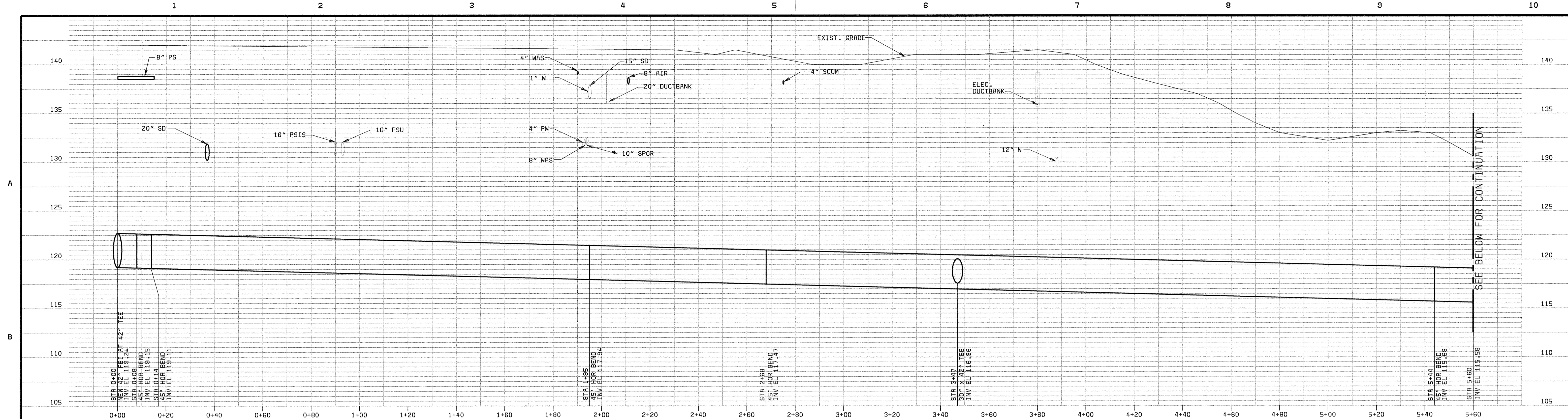
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- NOTES:**
1. SCREENED (LIGHT) DELINEATION SHOWN ON THE DRAWINGS INDICATES EXISTING FACILITIES. SCREENED INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS. IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED. BOLD (DARK) DELINEATION IS FOR NEW WORK OR LOCATION OF EXISTING CONSTRUCTION TO BE MODIFIED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
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 4. ALL EXISTING PIPING TO BE ABANDONED SHALL BE PLUGGED IF NECESSARY AND REMAIN IN PLACE UNLESS OTHERWISE INDICATED.
 5. MAINTAIN MINIMUM 6'-6" BETWEEN EXISTING 54" AND NEW 42" FBI.

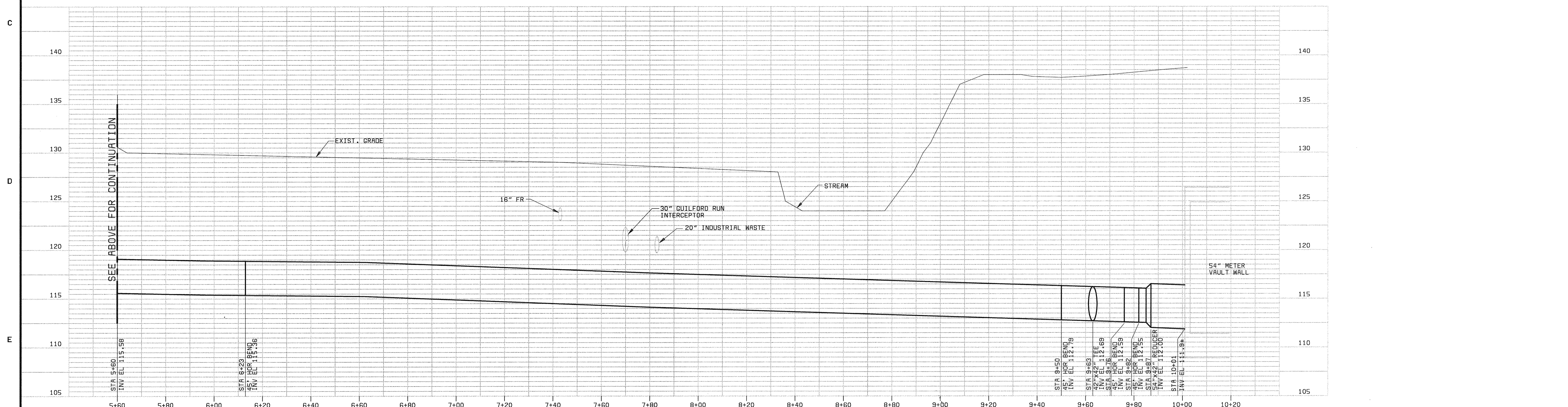


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| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert J. Rectanus, Jr.</i> CHIEF, BUREAU OF UTILITIES DATE |  BLACK & VEATCH Gaithersburg, Maryland <i>Robert J. Rectanus, Jr.</i> REG. PROF. ENGR. DATE |  ROBERT J. RECTANUS, JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER STATE OF MARYLAND | DES: FKA DRN: RLC CHK: WLK DATE: 6/23/00 | YARDWORK CIVIL YARD PIPING 2 OF 2 | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 23 OF 161 Y4 |
| REVISIONS AND RECORD OF ISSUE | | | | NO. BY CK APP | | |



42" FBI PROFILE (STA 0+00 TO 5+60)
(FROM NEW 42" TEE TO 54" METER VAULT)



42" FBI PROFILE (STA 5+60 TO 10+01)
(FROM NEW 42" TEE TO 54" METER VAULT)

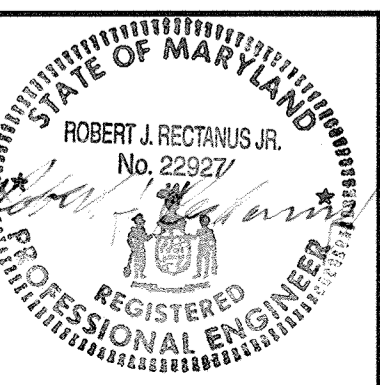
SCALE: HORIZ: 1" = 20'-0"
VERT: 1" = 5'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert Beaman C-21-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH LP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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

YARDWORK
CIVIL

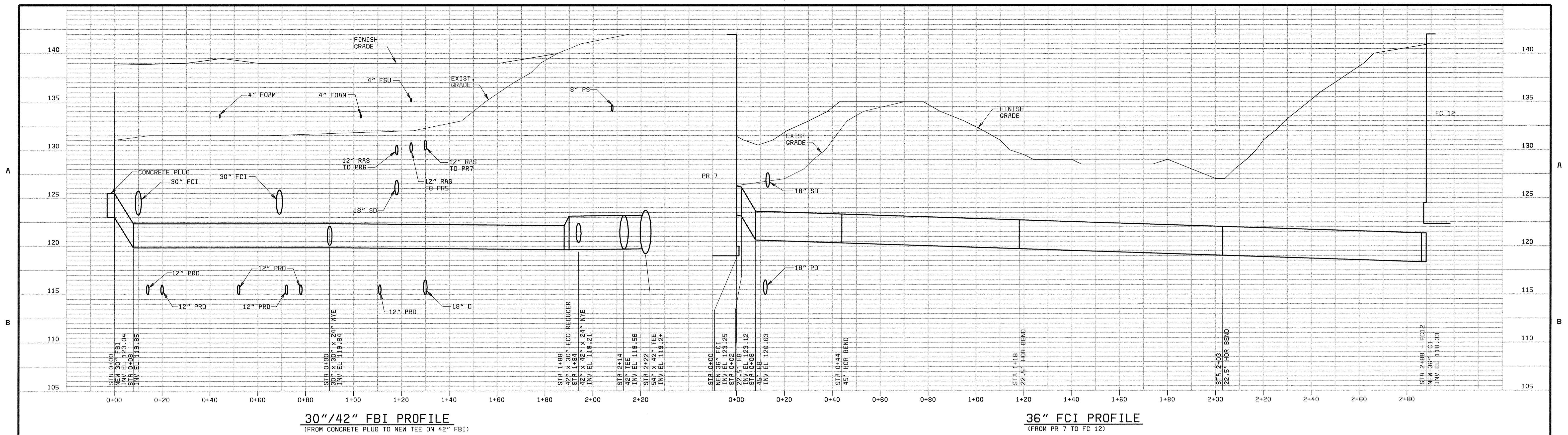
YARD PIPING PROFILES
SHEET 1 OF 4

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

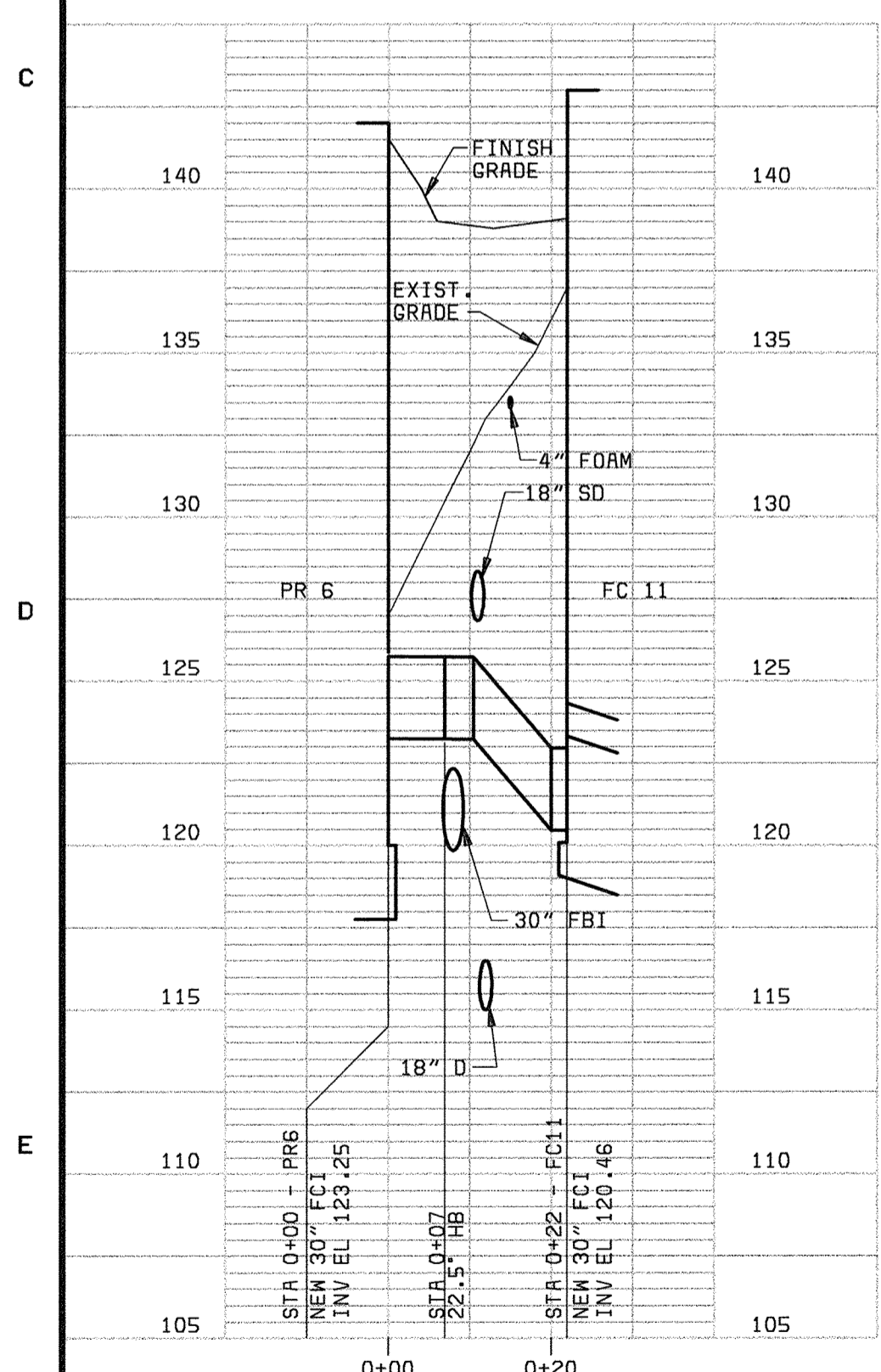
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 24 OF 161
Y5

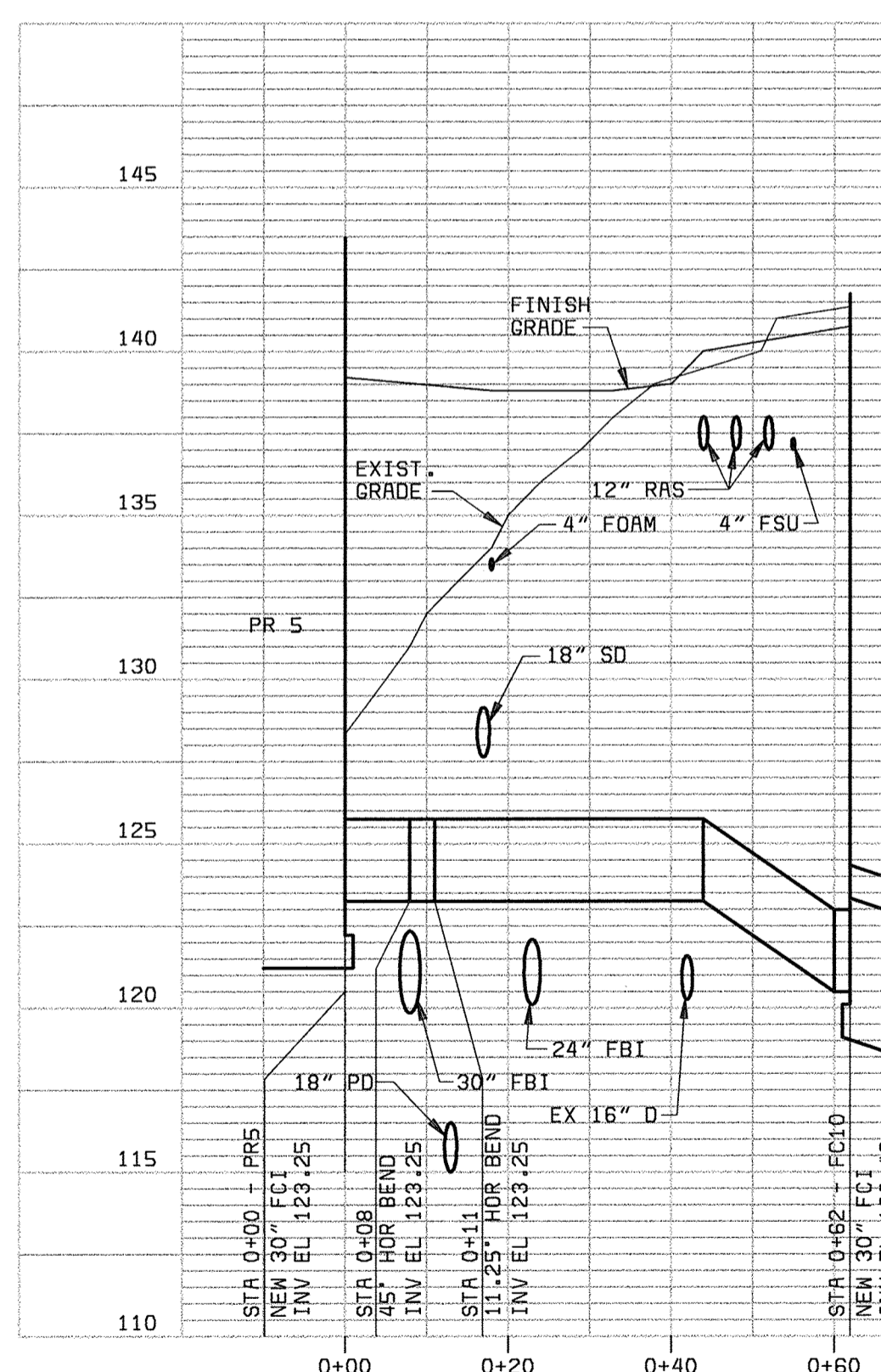


30"/42" FBI PROFILE
(FROM CONCRETE PLUG TO NEW TEE ON 42" FBI)

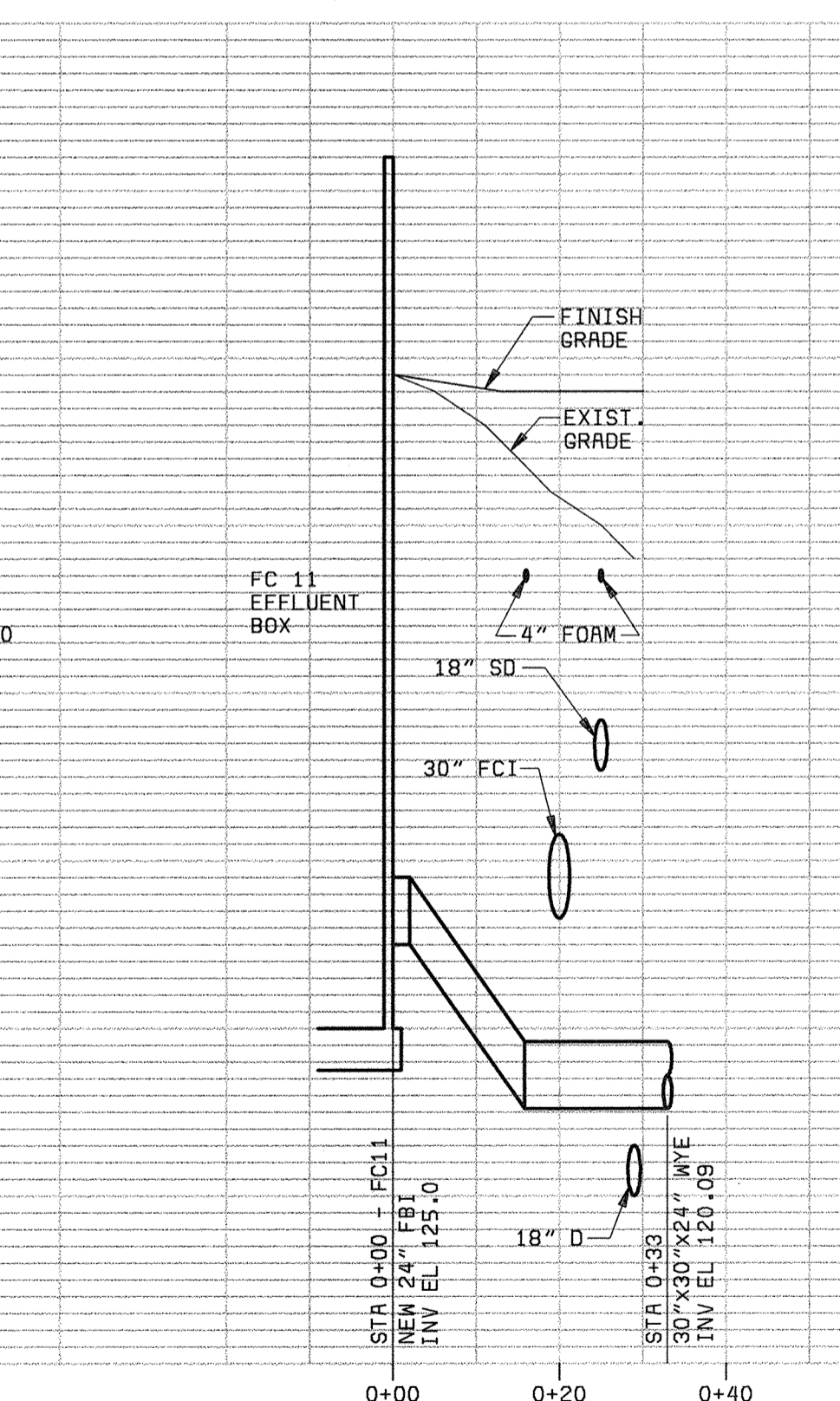
36" FCI PROFILE
(FROM PR 7 TO FC 12)



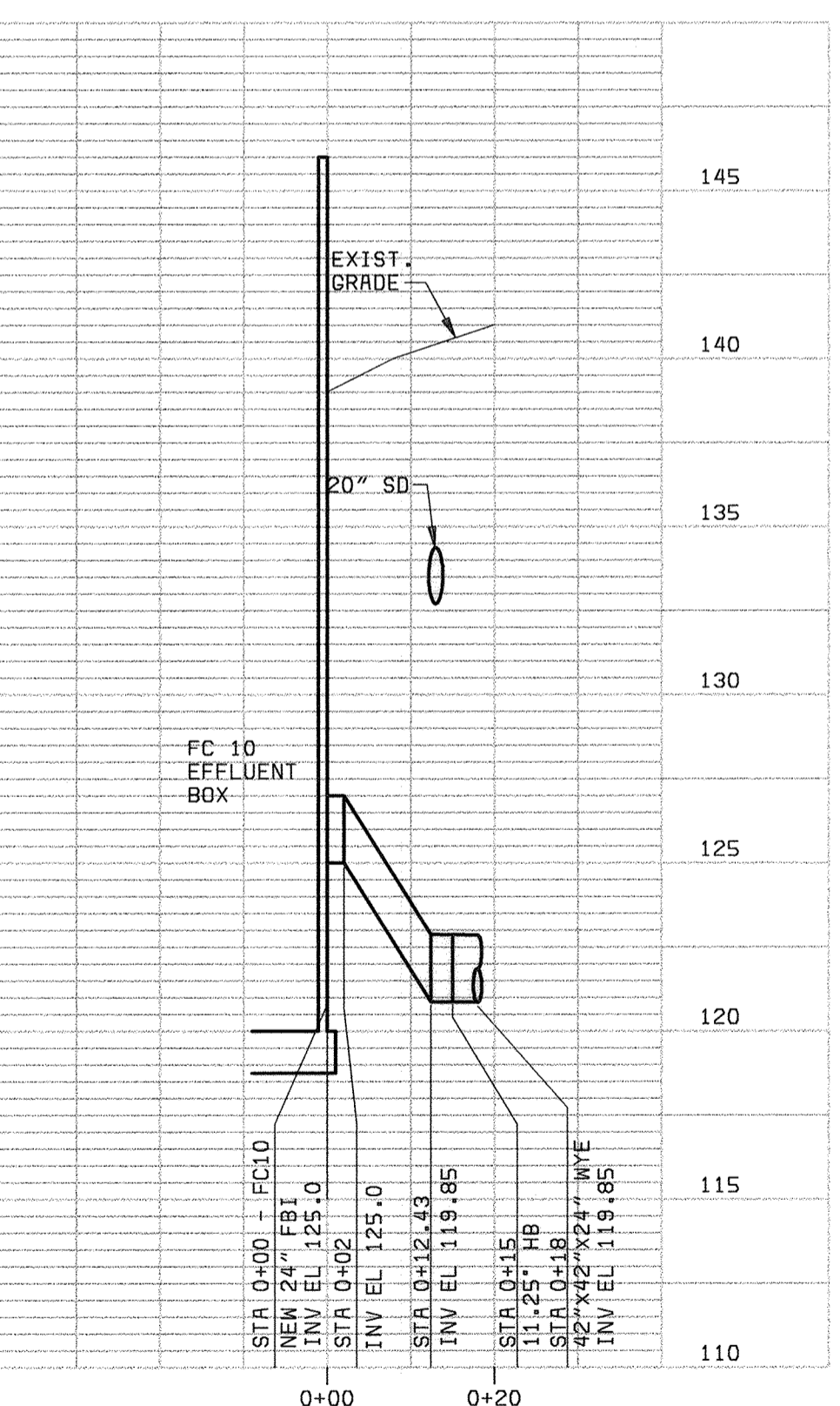
30" FCI PROFILE
(FROM PR 6 TO FC 11)



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



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



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

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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

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

YARDWORK CIVIL

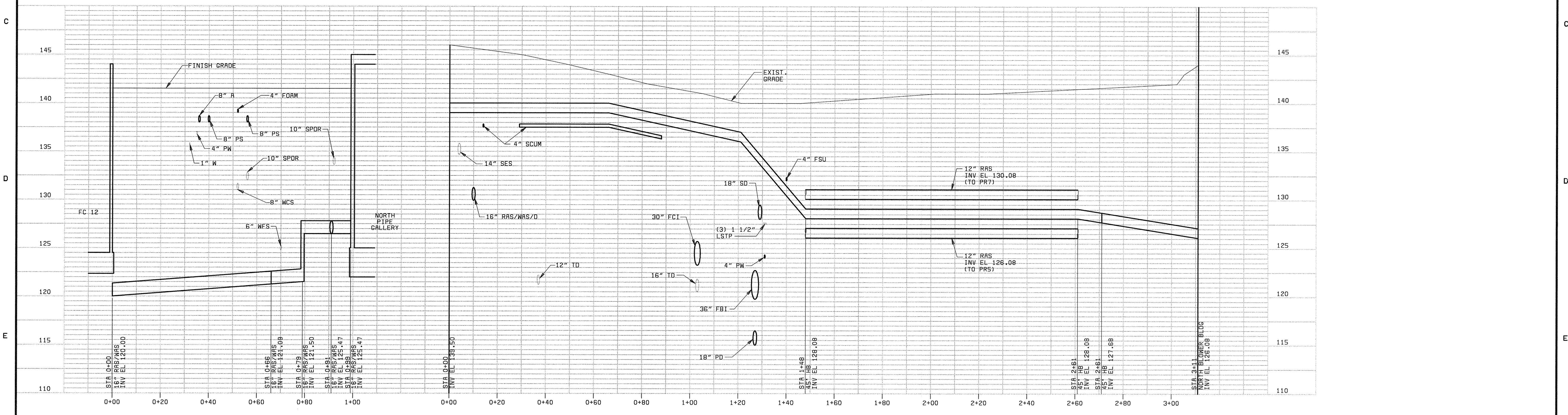
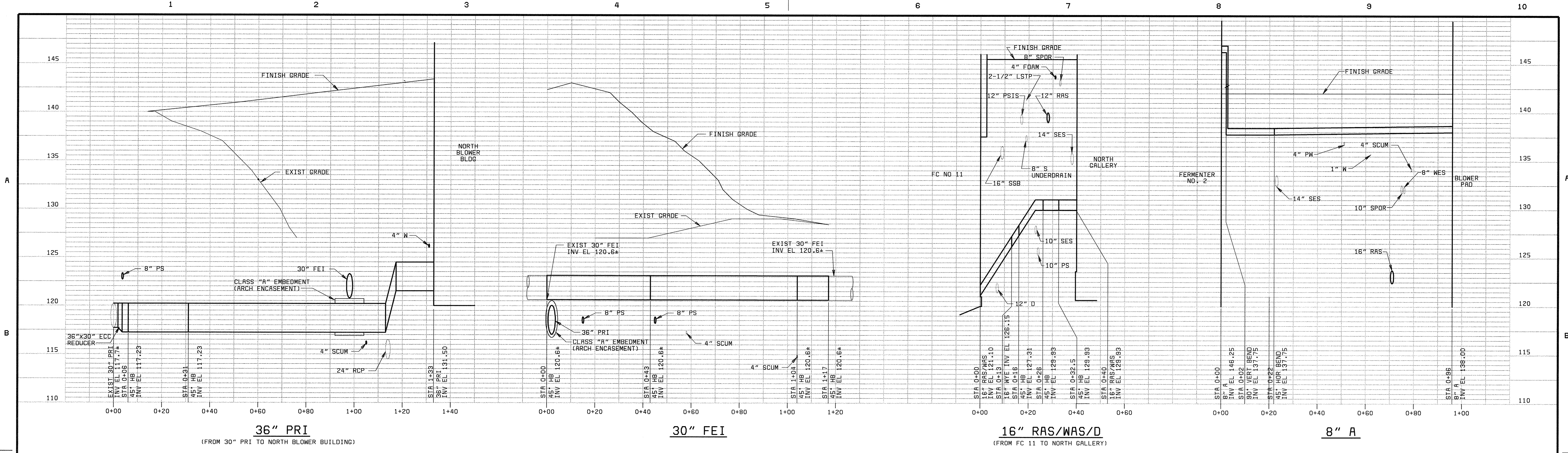
YARD PIPING PROFILES
2 OF 4

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 25 OF 161
Y6



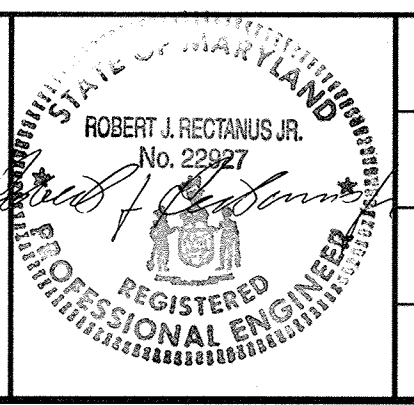
SCALE: HORIZ: 1" = 20'-0"
VERT: 1" = 5'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

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



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

YARDWORK
CIVIL

YARD PIPING PROFILES
SHEET 3 OF 4

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

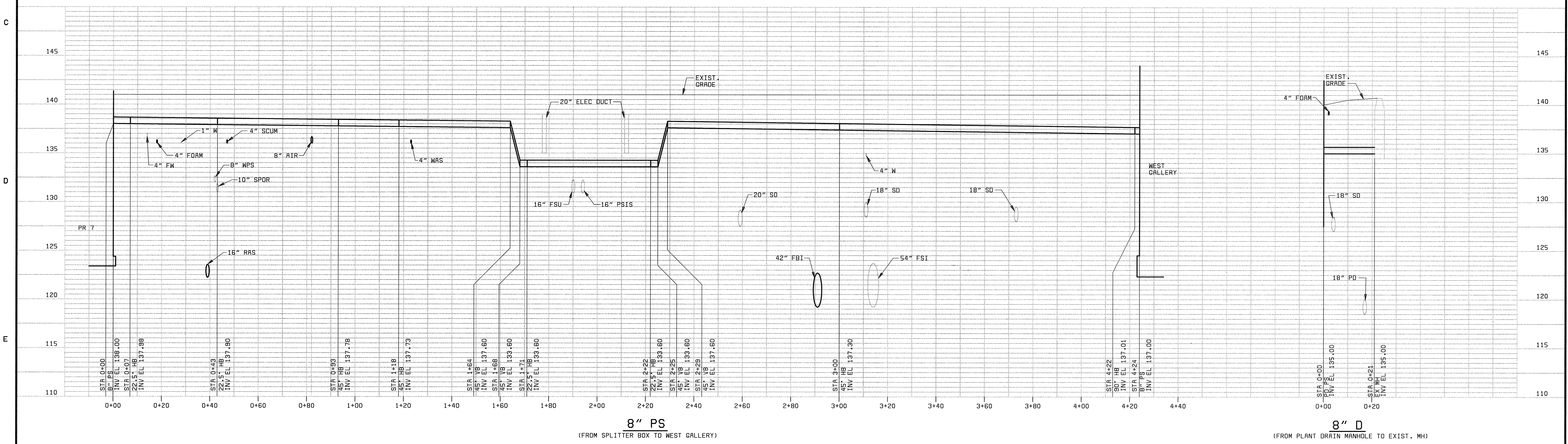
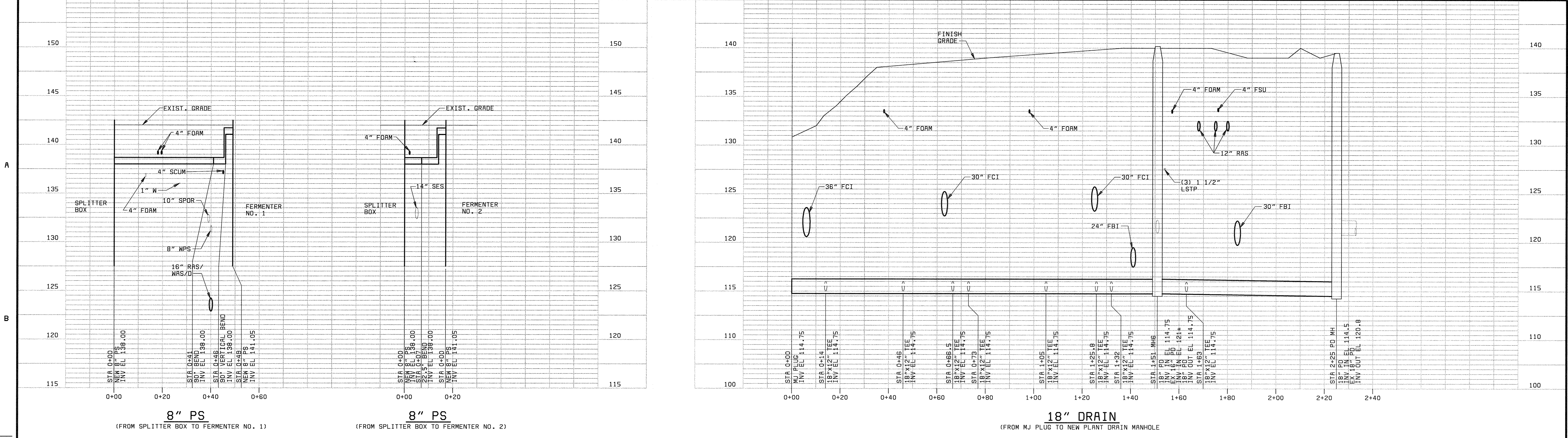
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 26 OF 161

Y7



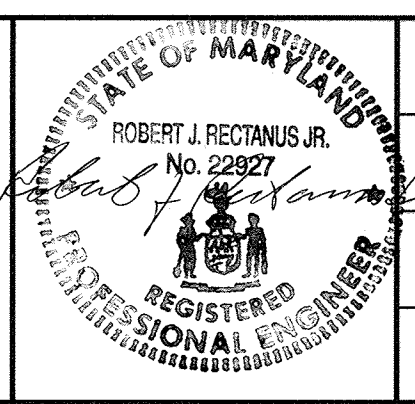
SCALE: HORIZ: 1" = 20'-0"
VERT: 1" = 5'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

Robert J. Rectanus Jr.
REG. PROF. ENGR. DATE: 8/15/00



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

YARDWORK
CIVIL

YARD PIPING PROFILES
4 OF 4

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

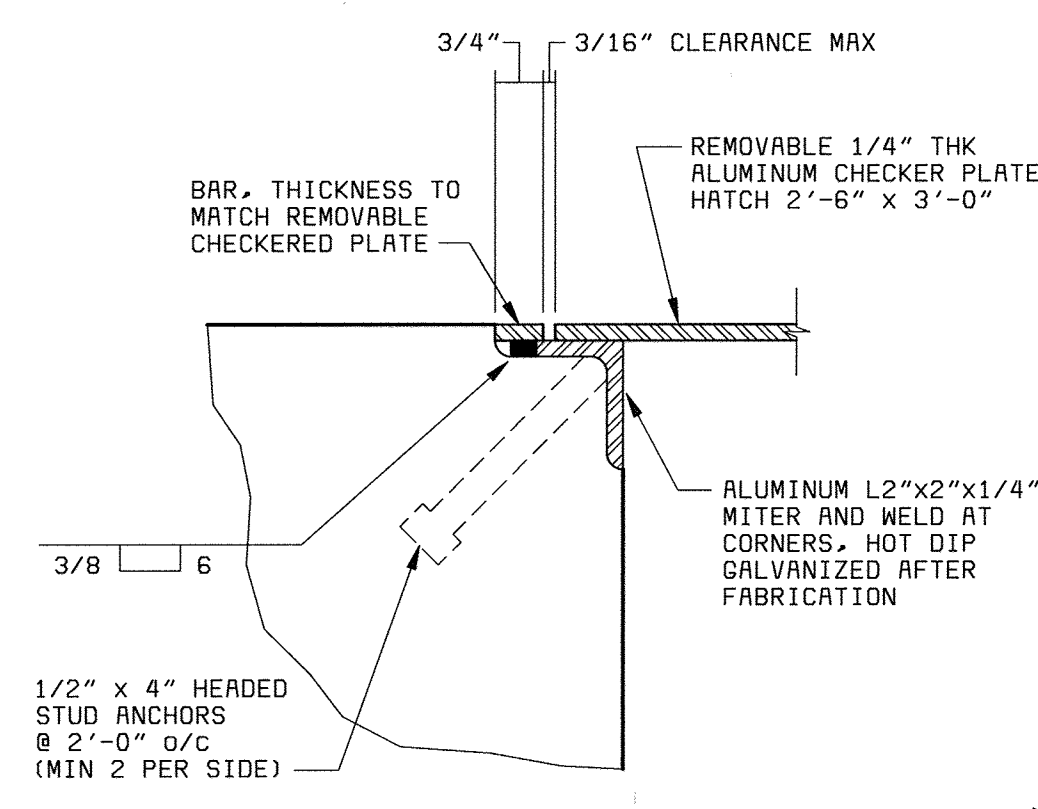
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

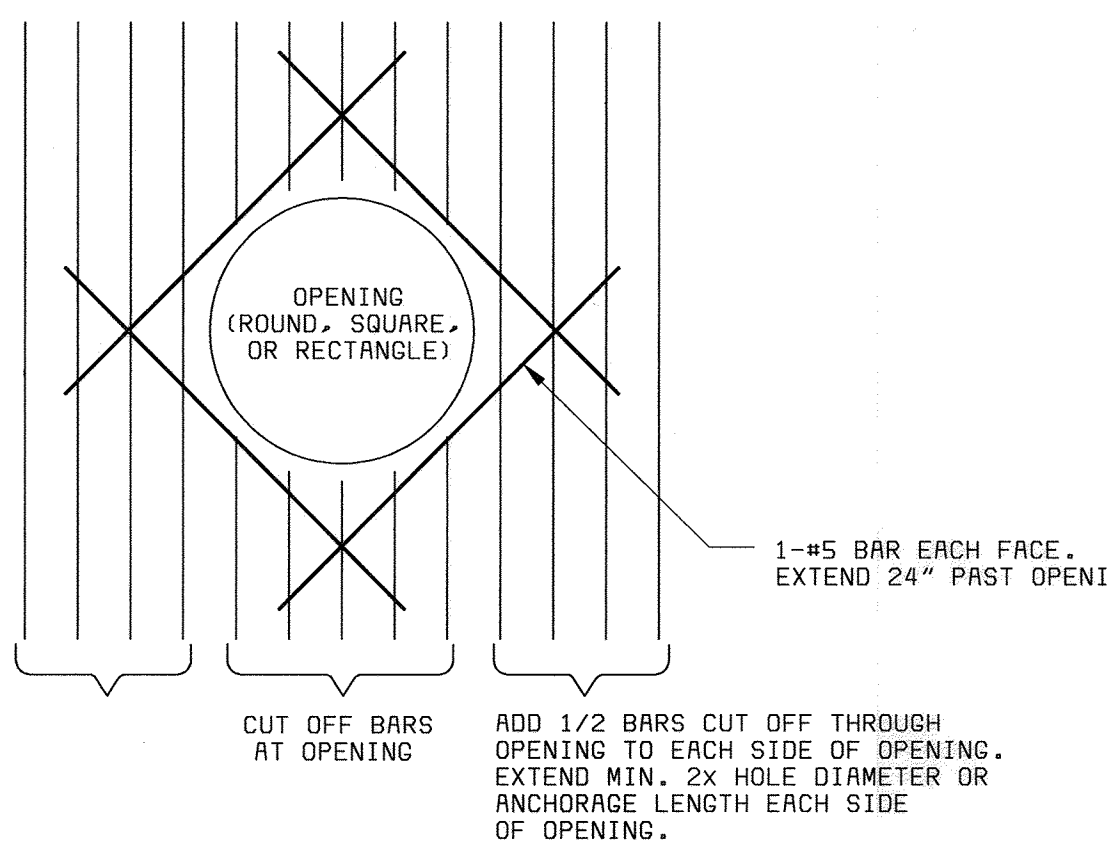
SHEET 27 OF 161

Y8

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

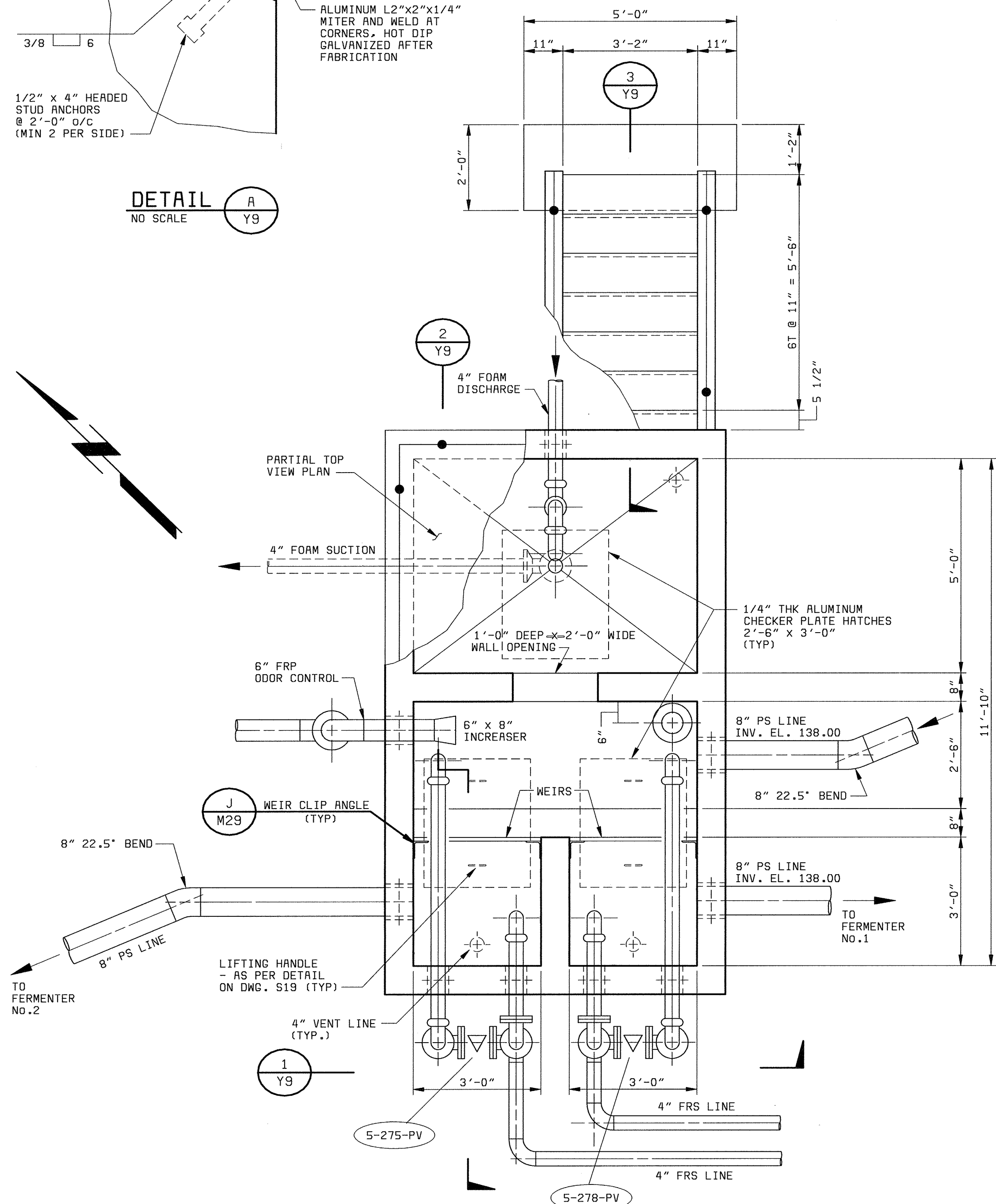


DETAIL A
 NO SCALE
 Y9

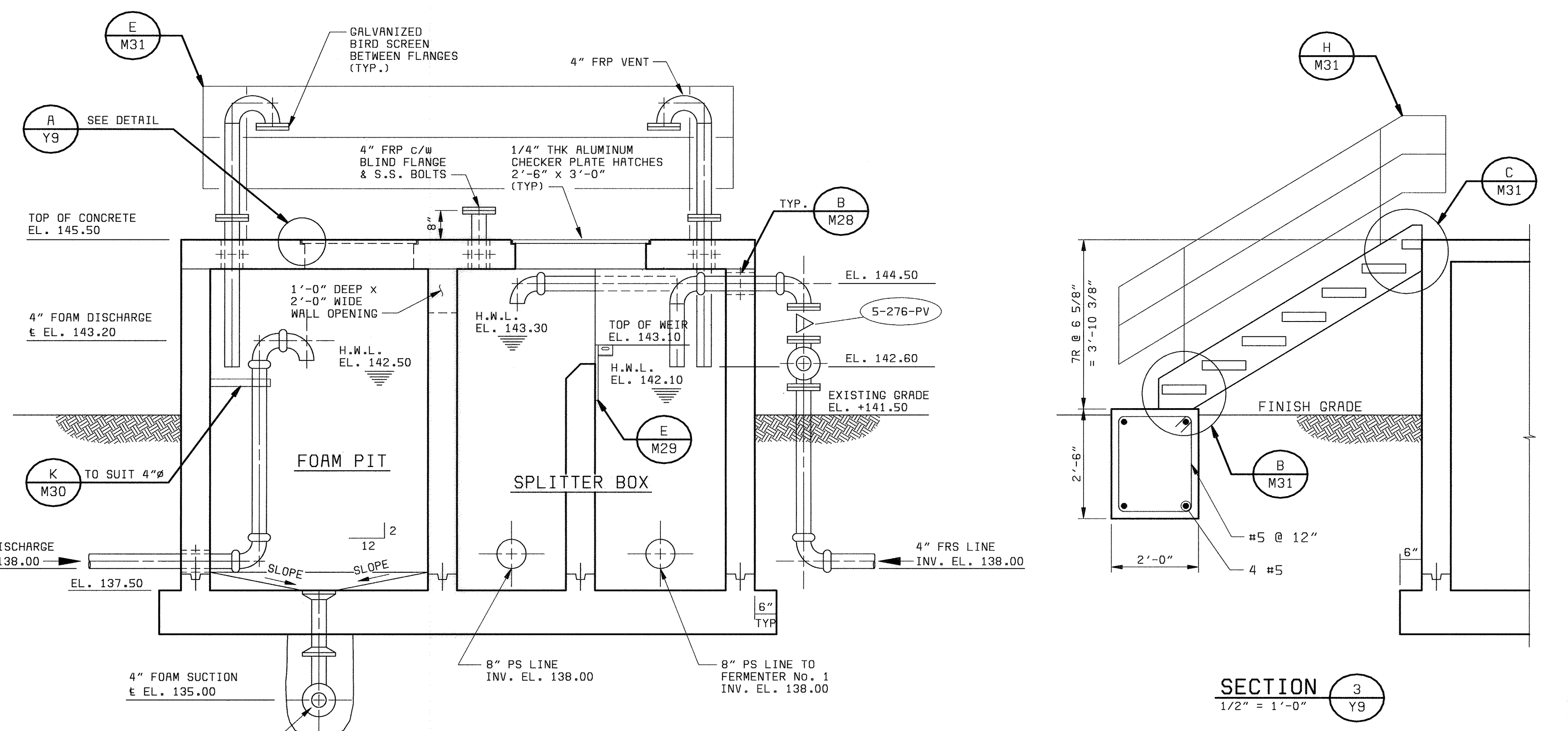


NOTE: -NO ADDITIONAL REINFORCING REQUIRED FOR OPENINGS 6" OR LESS.
 -REINFORCING TYP. BOTH DIRECTIONS.

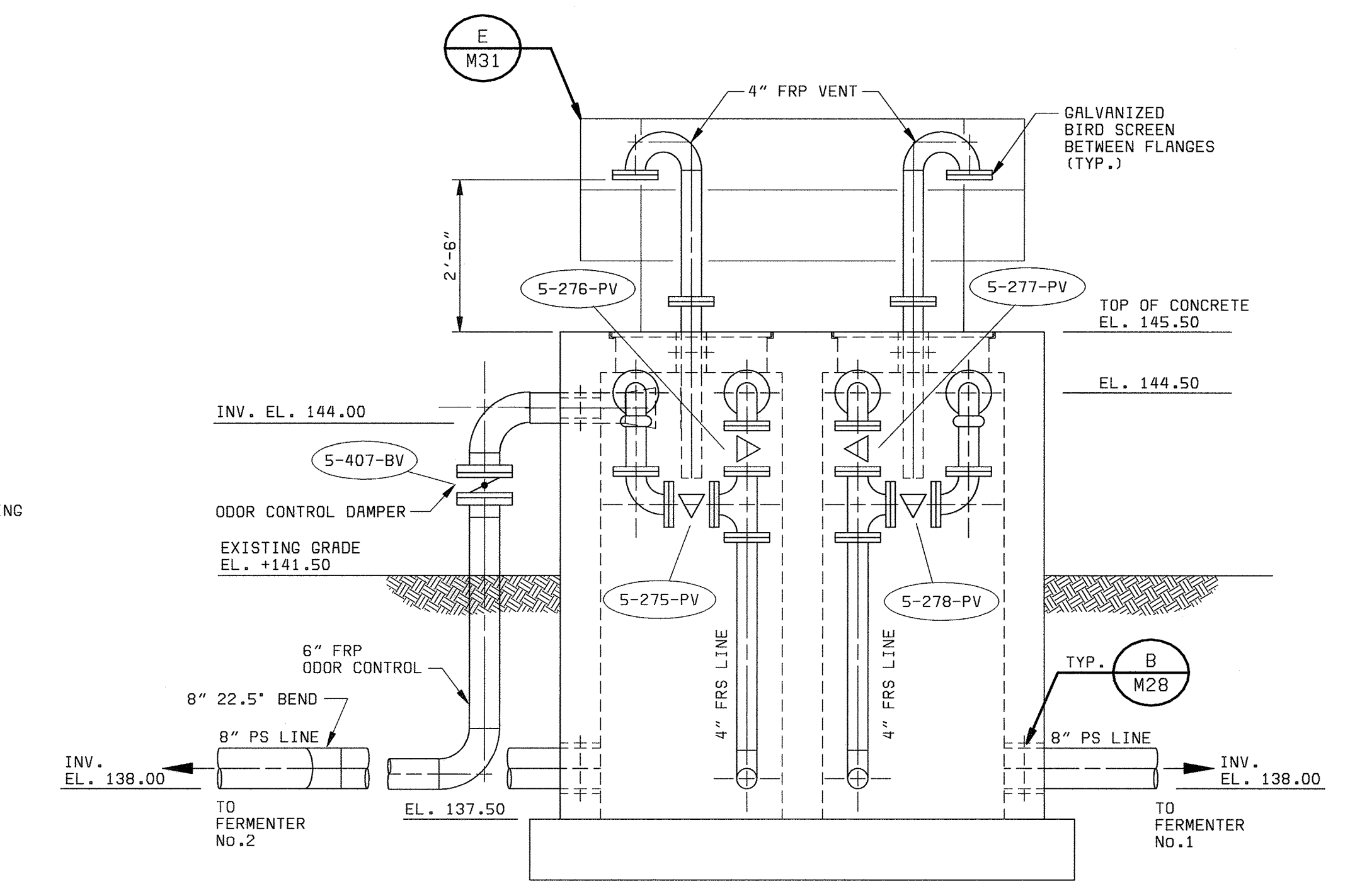
REINFORCEMENT OF OPENINGS IN WALLS & SLABS
 NO SCALE



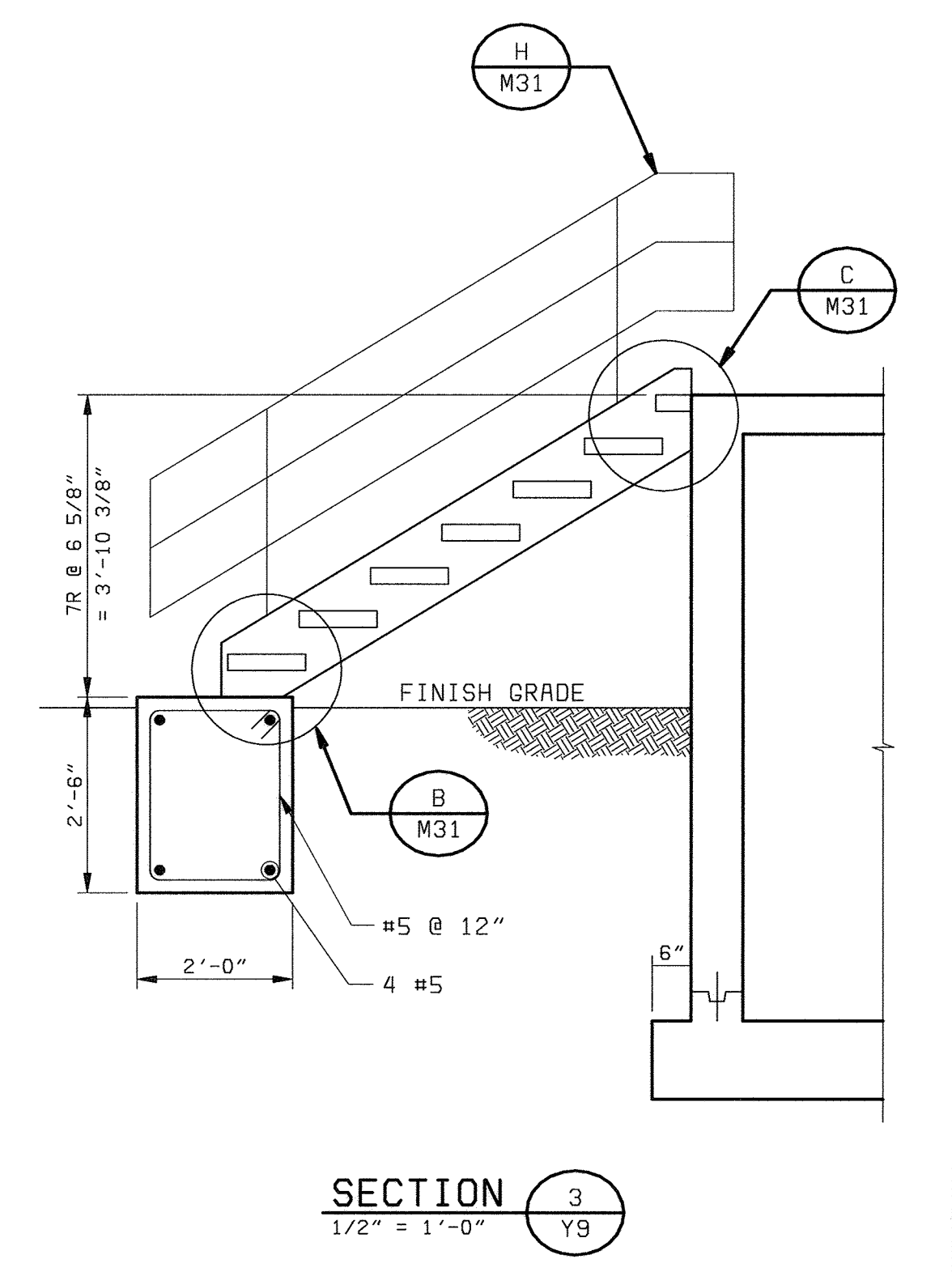
PLAN
 1/2" = 1'-0"



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

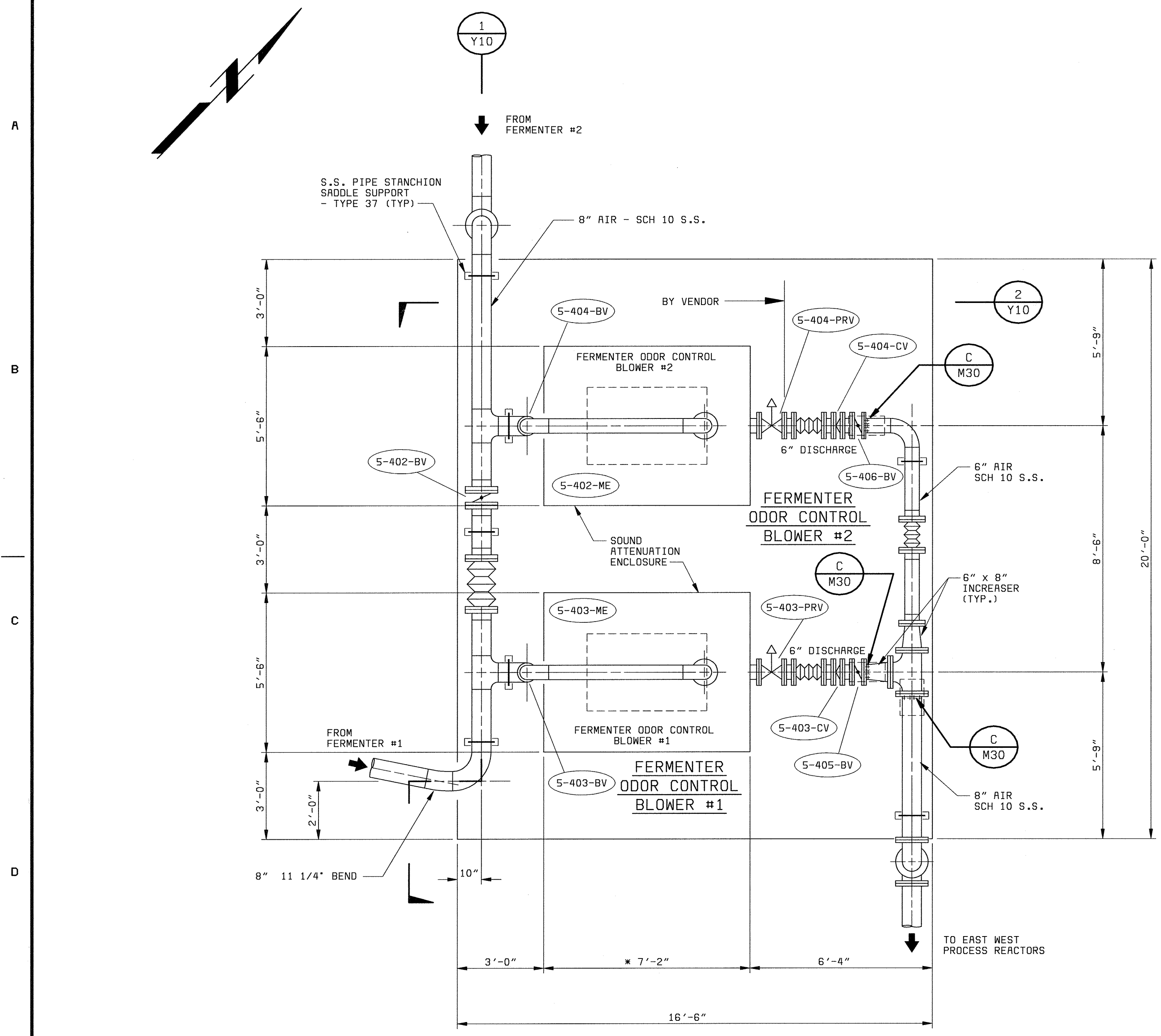


SECTION 1
 1/2" = 1'-0"

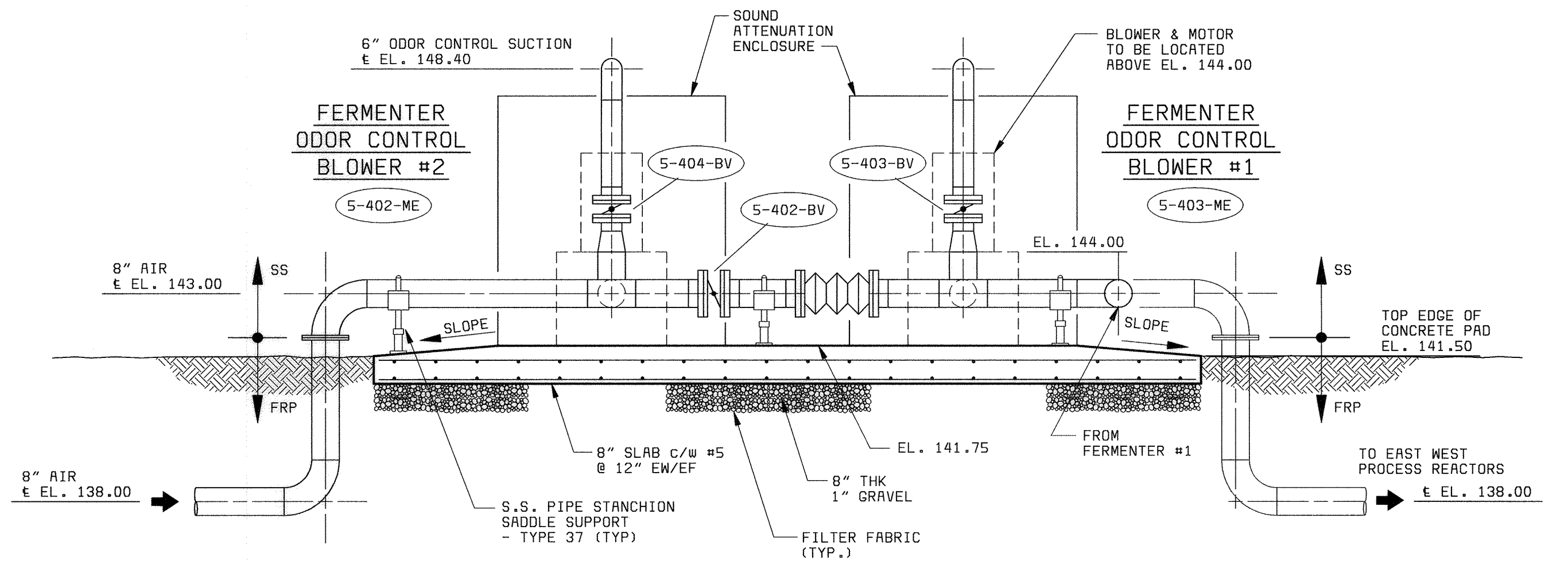


SECTION 3
 1/2" = 1'-0"

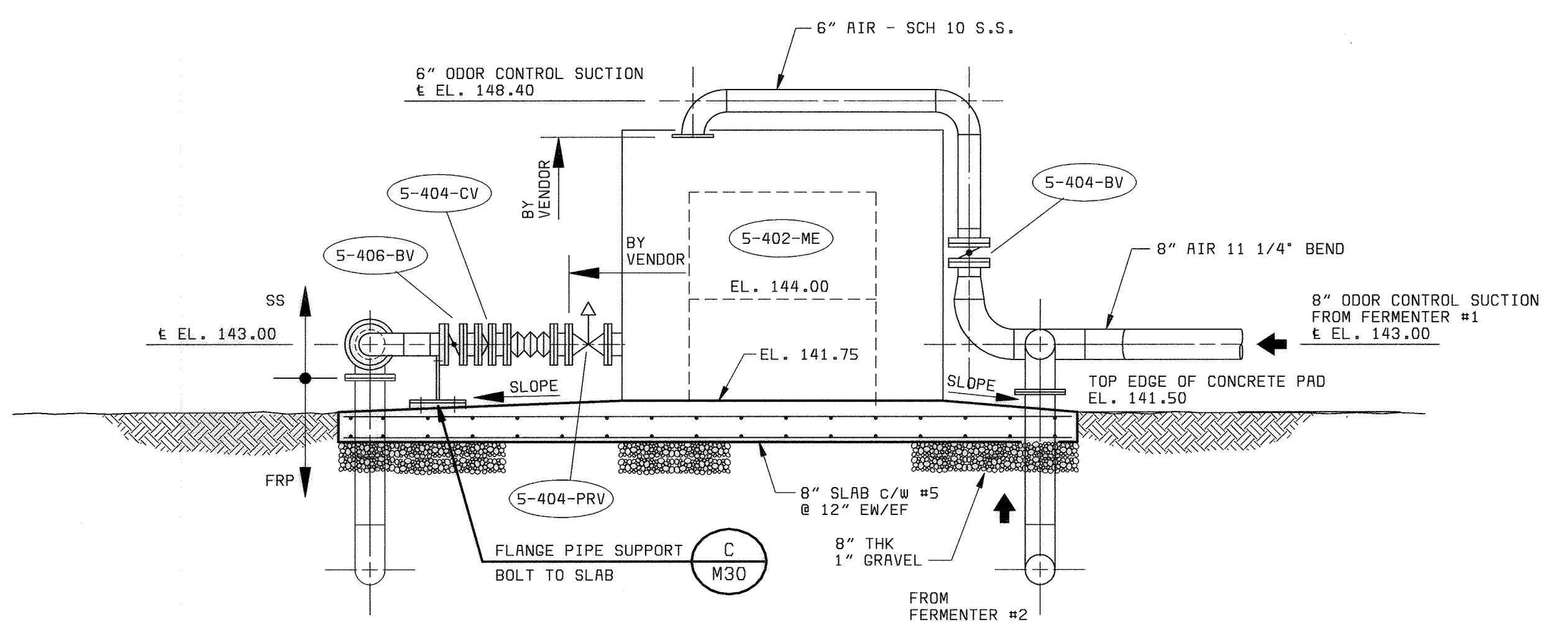
| | | | | | | | | | | | | |
|--|---|---|---------------|------|-------------------------------|-----|----|----|-----|---|---|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrystantec.com Robert H. Baerwin 7-19-07 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH Gaithersburg, Maryland Lawrence R. Tobey July 17, 2000 REG. PROF. ENGR. DATE | Structural Only License # 25128 July 17, 2000 | DES: RVJ | | | | | | | YARDWORK STRUCTURAL/MECHANICAL FERMENTER SPLITTER BOX PLAN & SECTIONS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR PROCESS TRAIN CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: RCF | | | | | | | | | |
| | | | CHK: RVJ | | | | | | | | | Y9 |
| | | | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |



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

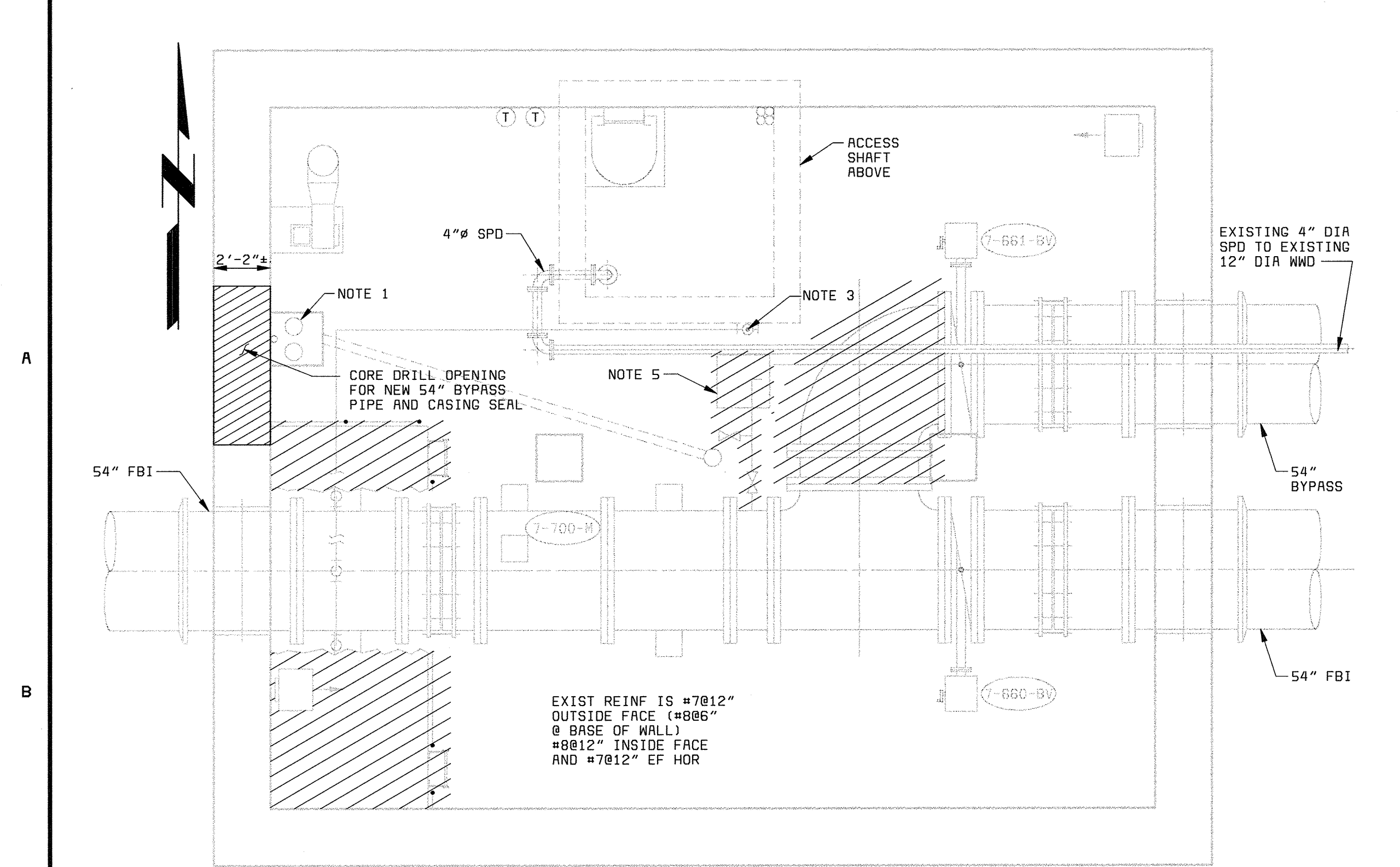


SECTION 1
 3/8" = 1'-0"

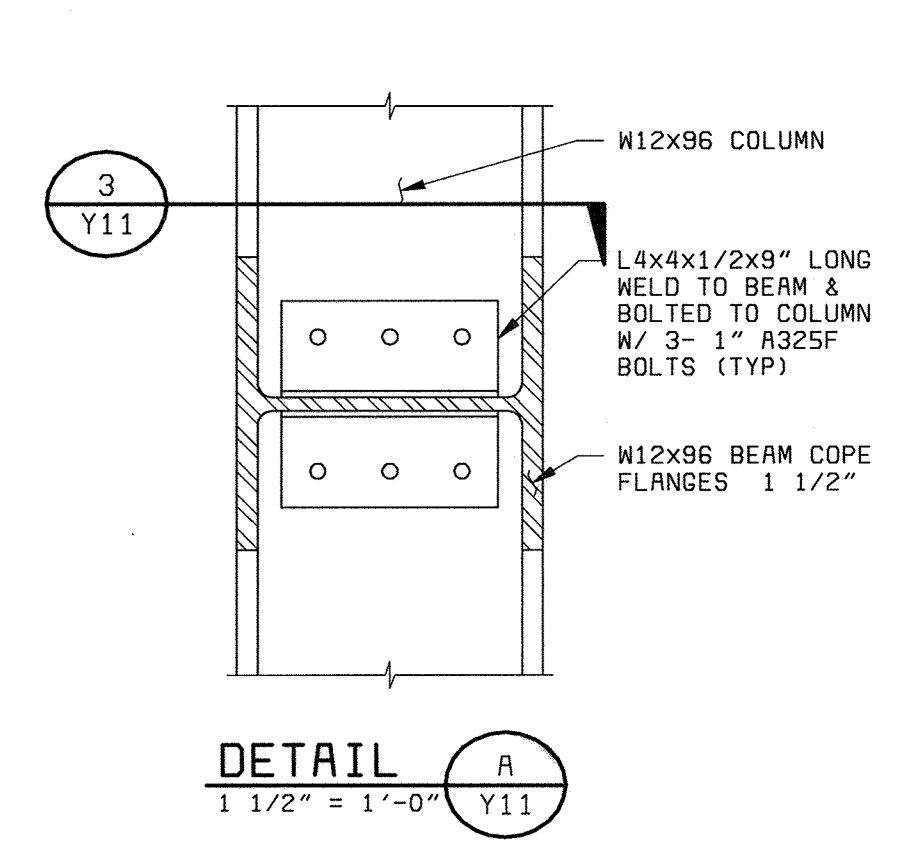


SECTION 2
 3/8" = 1'-0"

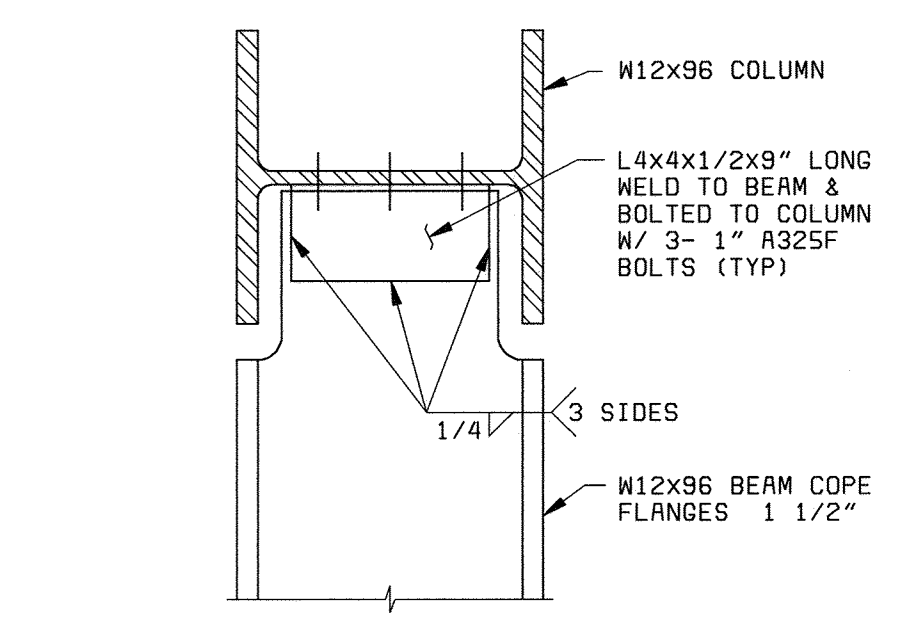
| | | | | | | | | | | | |
|--|--|---------------------|---------------|------|-------------------------------|-----|----|----|---|---|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com Chief, Bureau of Utilities DATE | BLACK & VEATCH Ltd. Gaithersburg, Maryland Lawrence R. Tobey July 17, 2000 REG. PROF. ENGR. DATE | Structural Only | DES: RVJ | | | | | | YARDWORK STRUCTURAL/MECHANICAL ODOR CONTROL FERMENTER BLOWERS PLAN & SECTIONS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR PROCESS TRAIN CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: RCF | | | | | | | | |
| | | | CHK: RVJ | | | | | | | | Y10 |
| | | | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | |



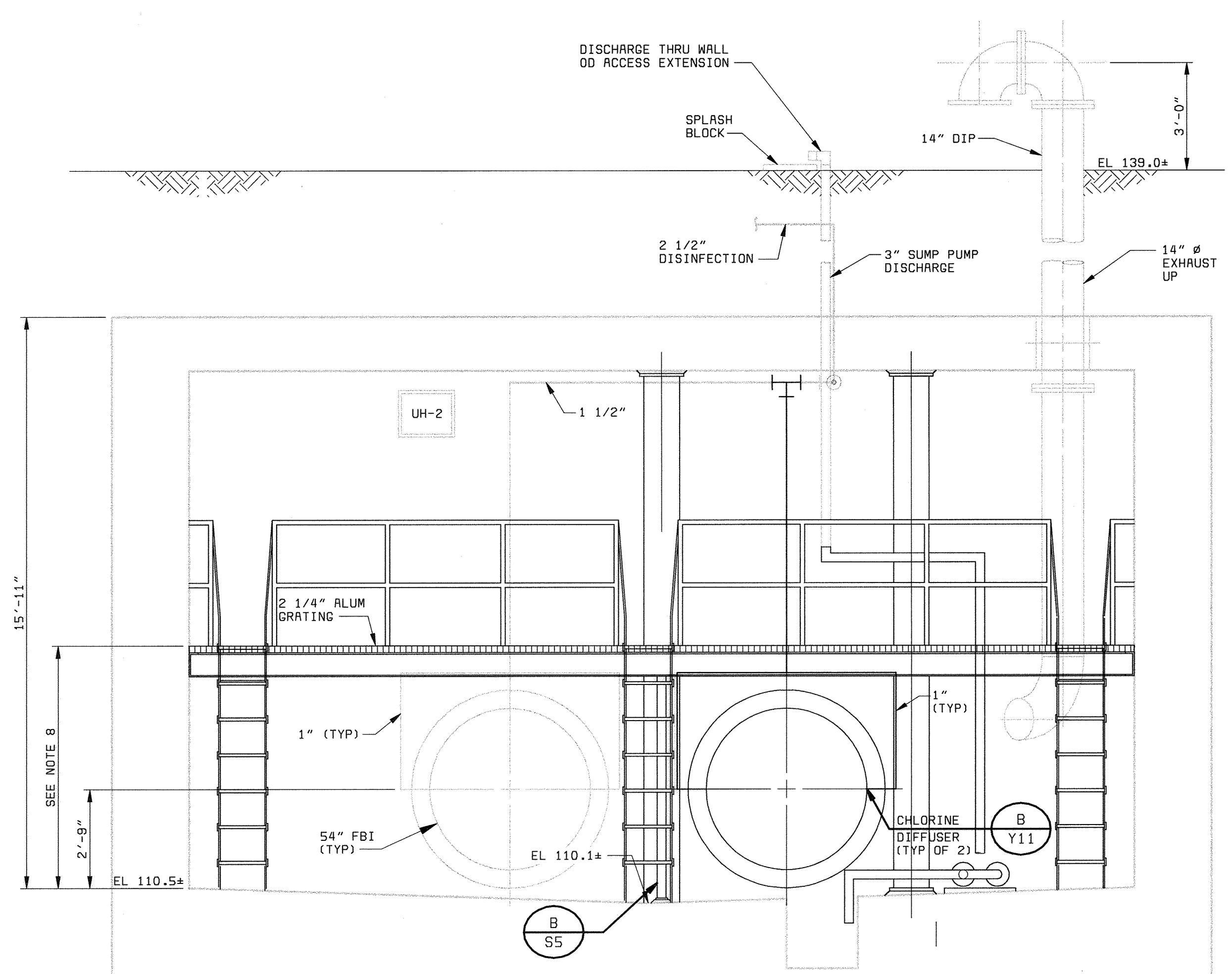
DEMOLITION PLAN
1/4" = 1'-0"



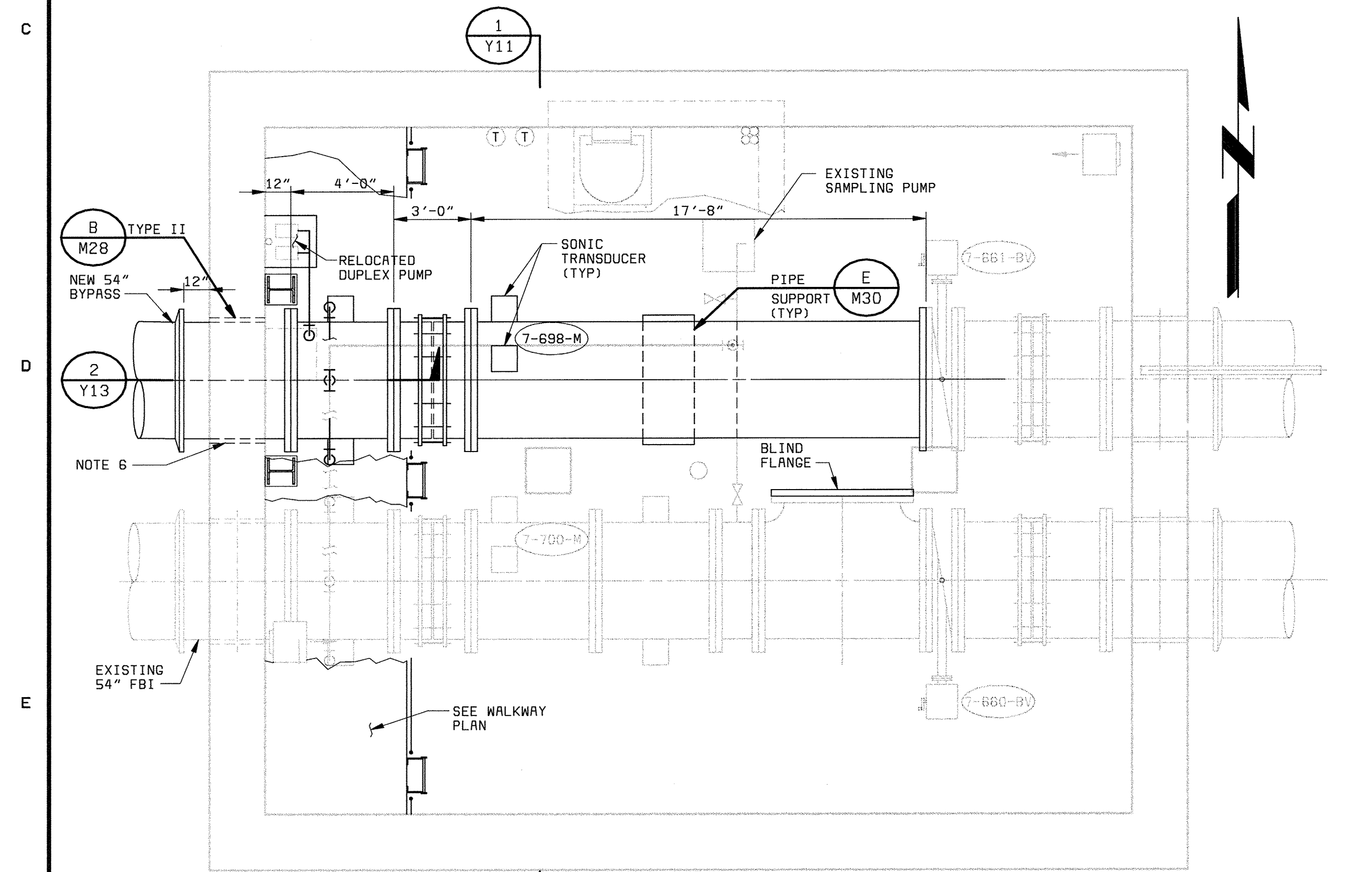
DETAIL A
1 1/2" = 1'-0" Y11



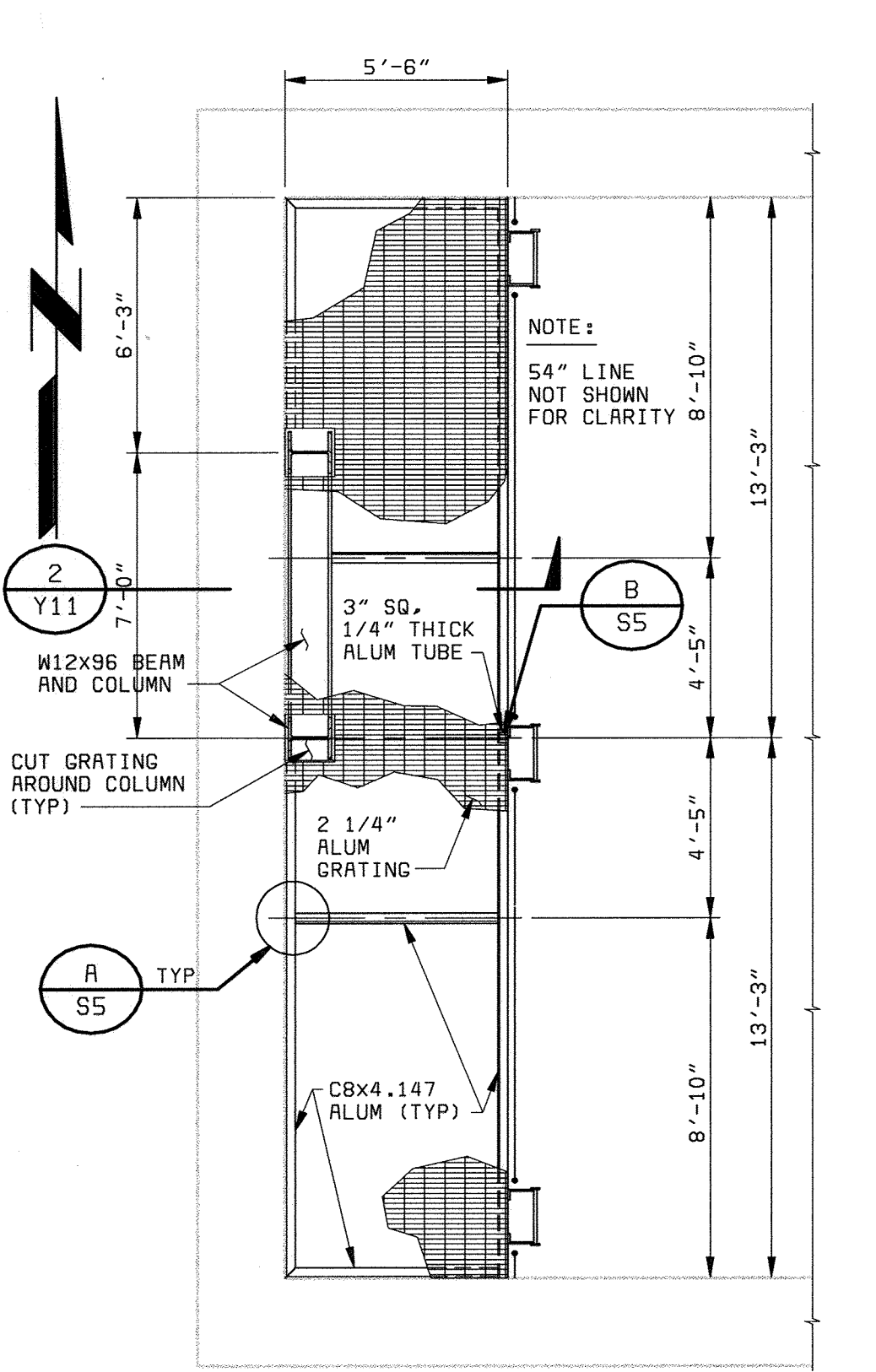
SECTION 3
1 1/2" = 1'-0" Y11



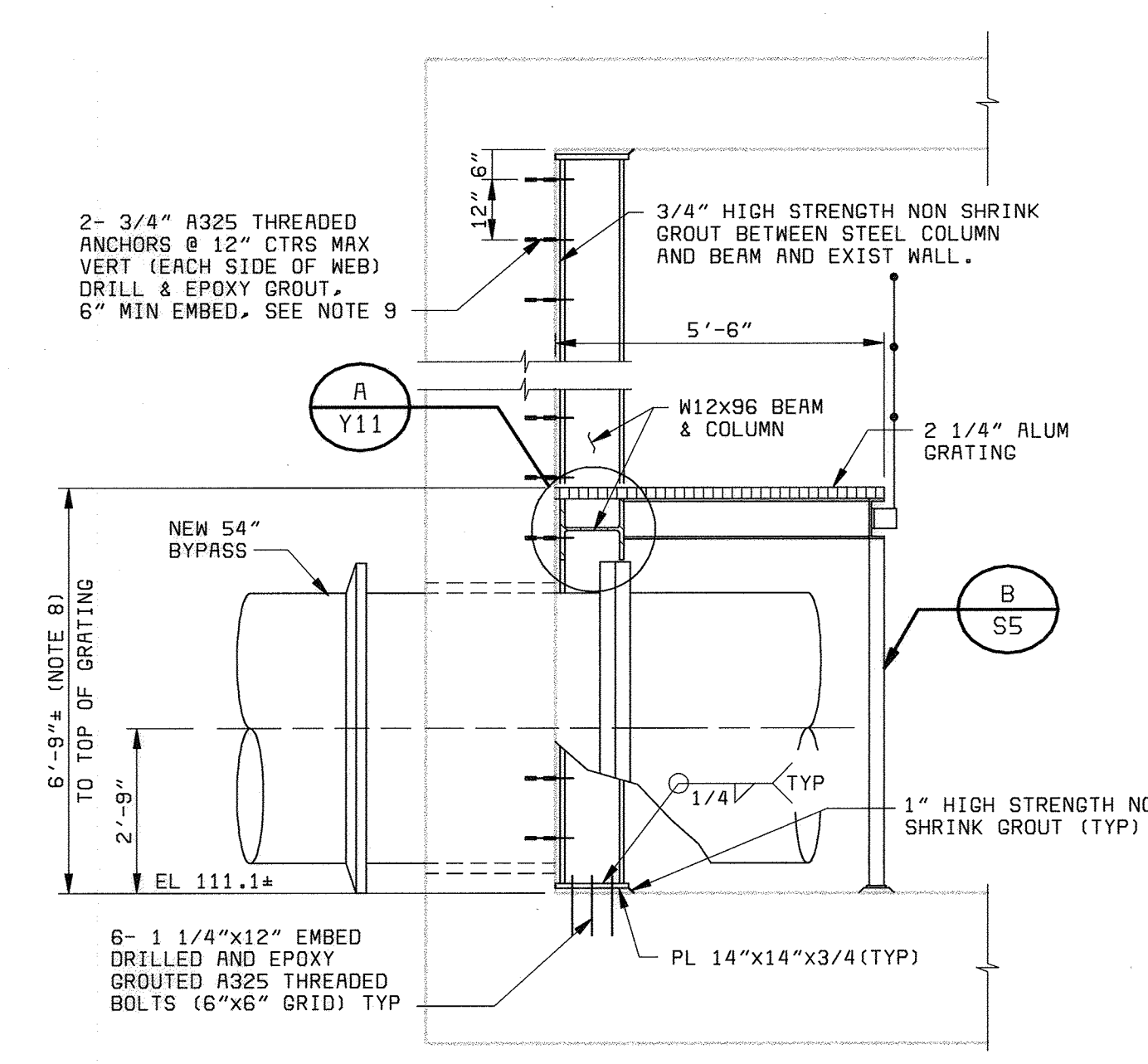
SECTION 1
3/8" = 1'-0" Y11



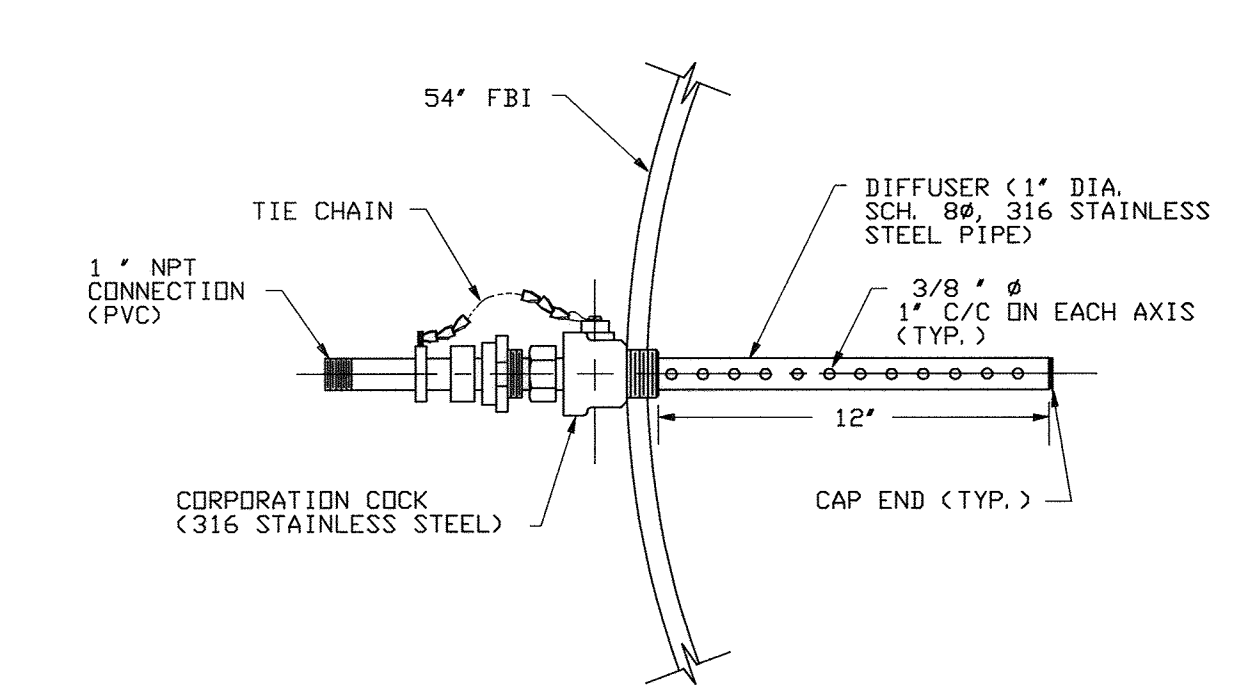
SECTIONAL PLAN
1/4" = 1'-0" Y11



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



SECTION 2
3/8" = 1'-0" Y11



CHLORINE DIFFUSER
3/8" = 1'-0" Y11

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

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

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

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

**54" METER VAULT
YARDWORK**

PLANS, SECTIONS, AND DETAILS

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

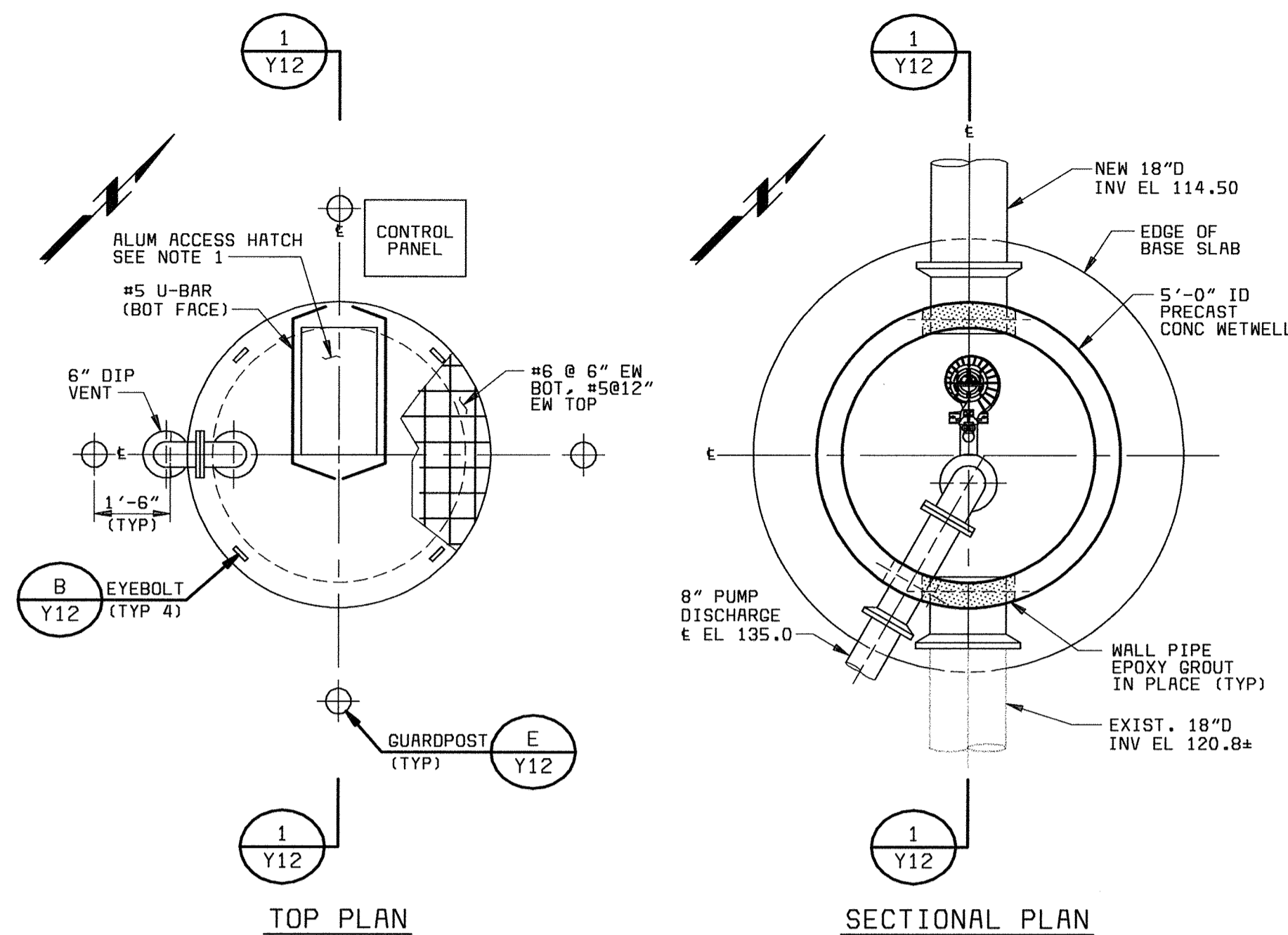
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

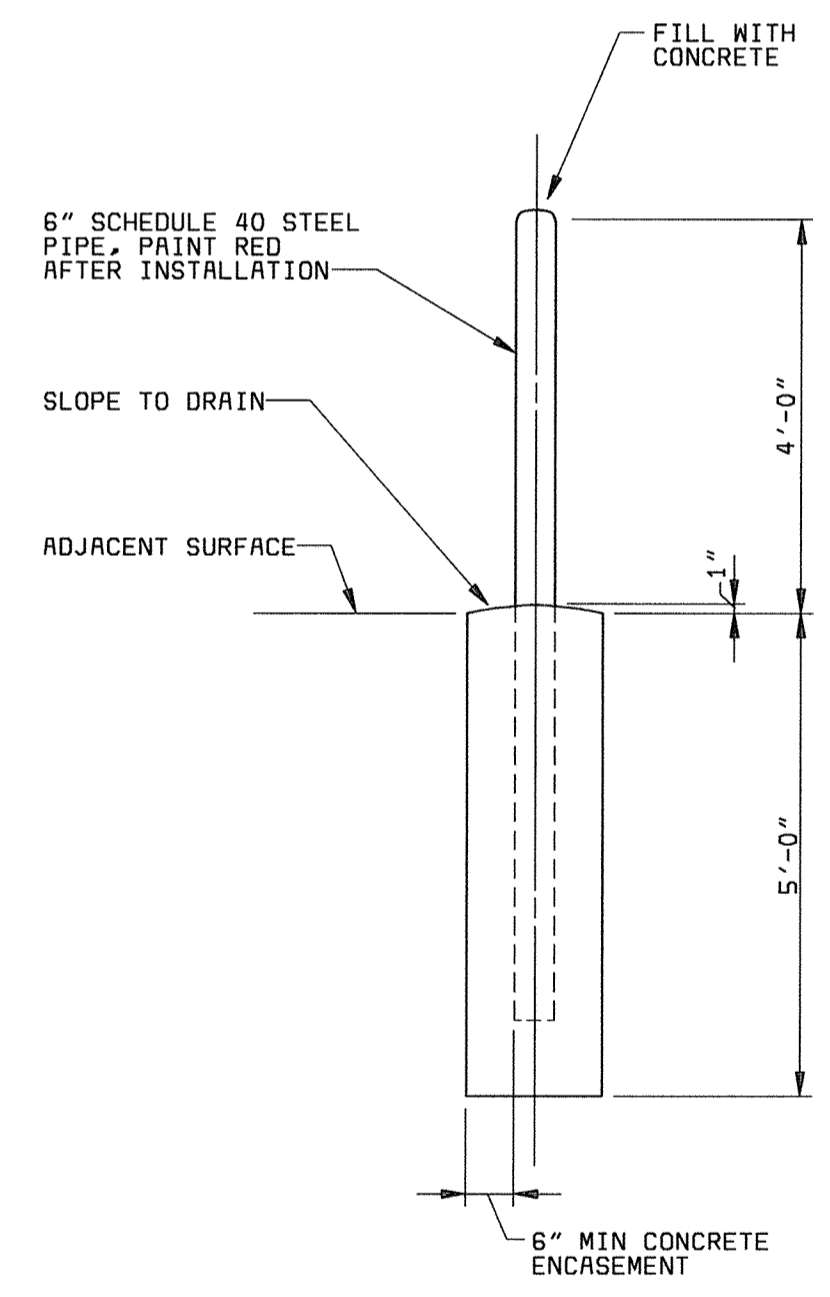
SCALE AS SHOWN

SHEET 30 OF 161

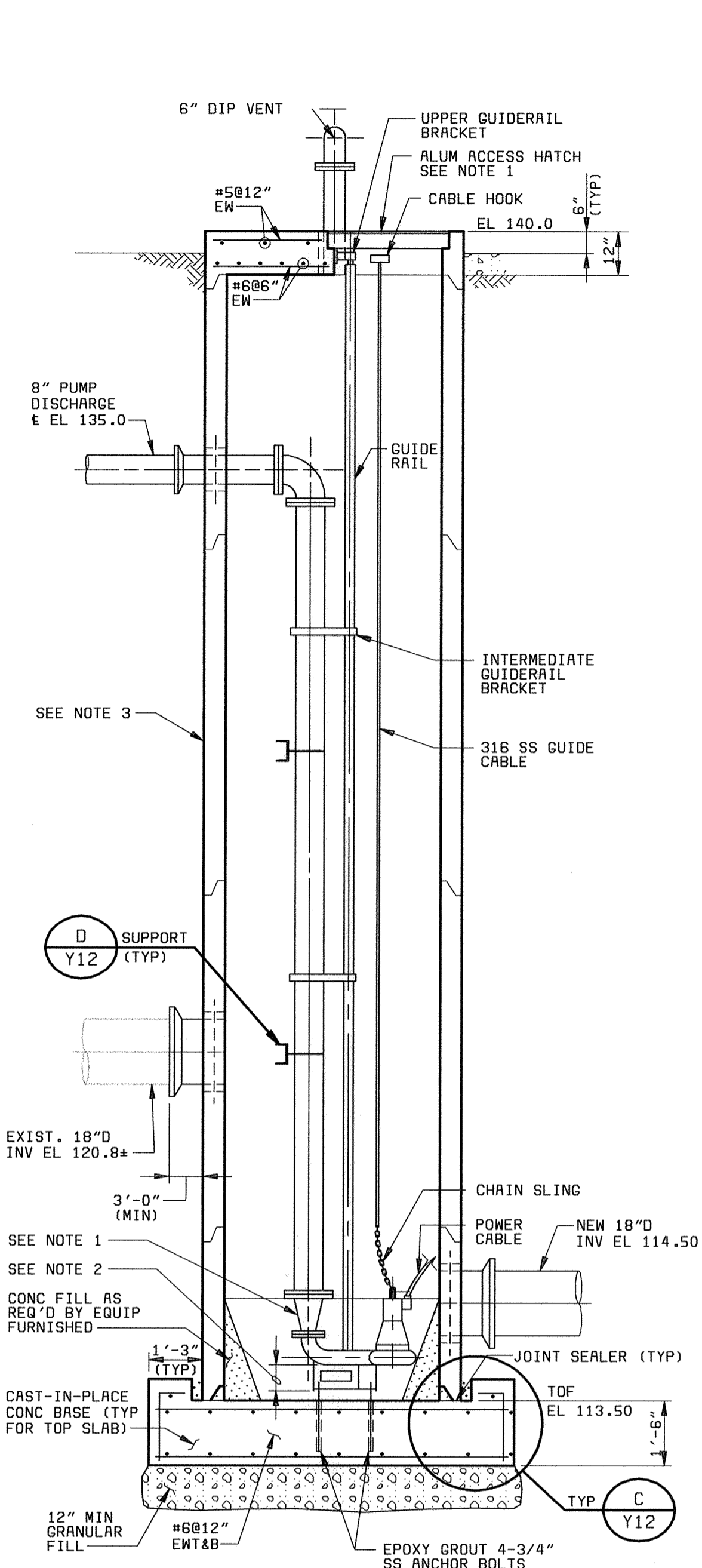
Y11



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

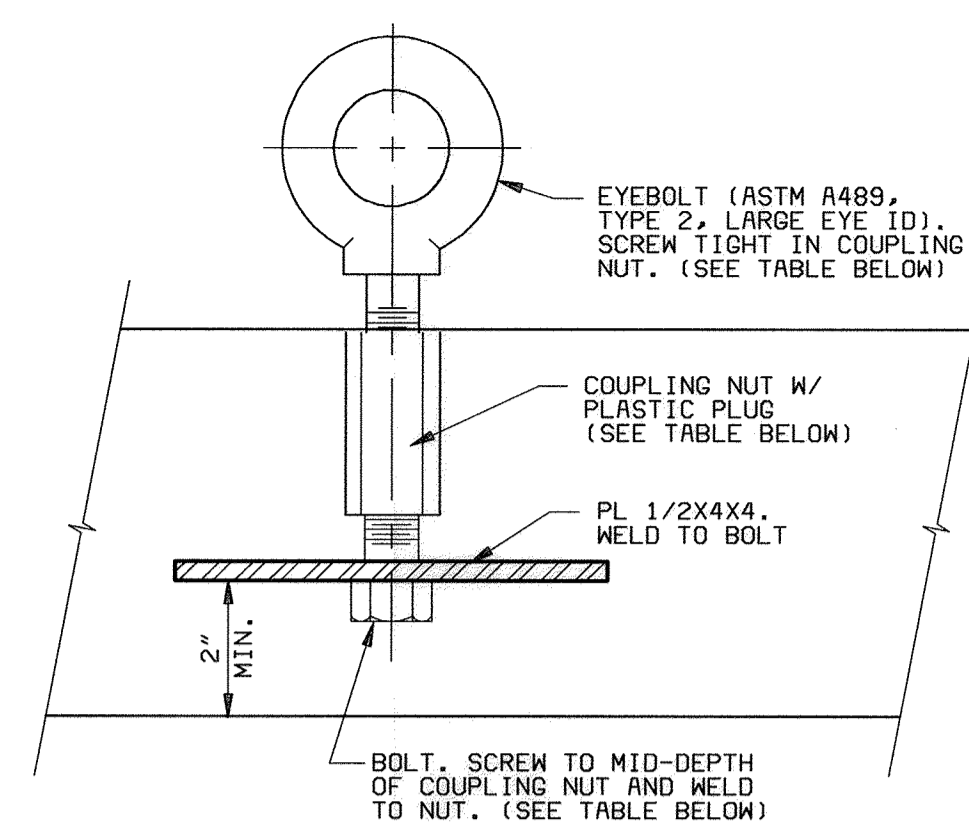


GUARDPOST
NO SCALE



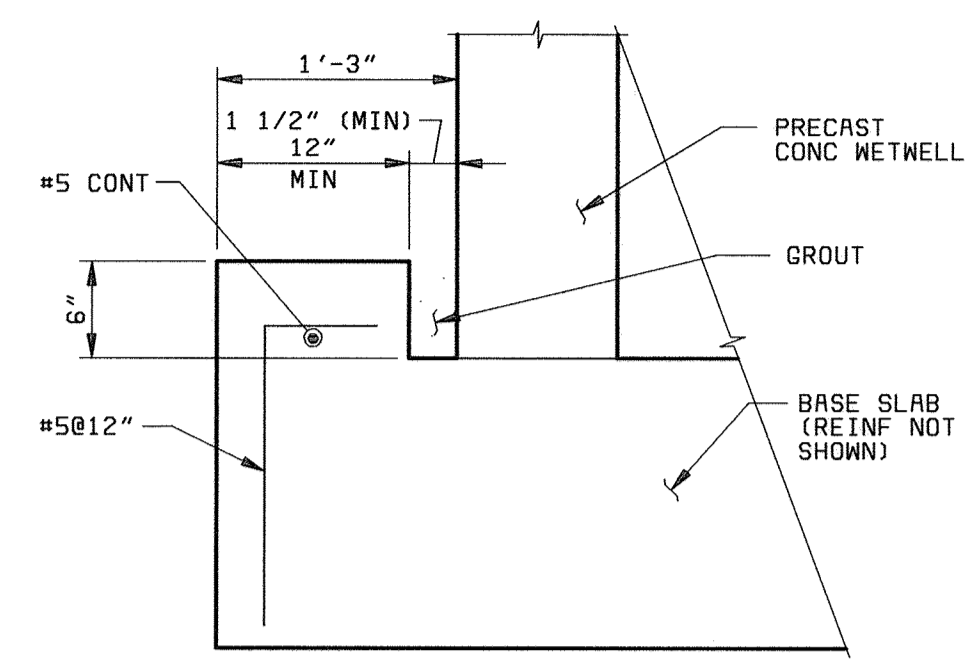
SECTION 1
3/8" = 1'-0"

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

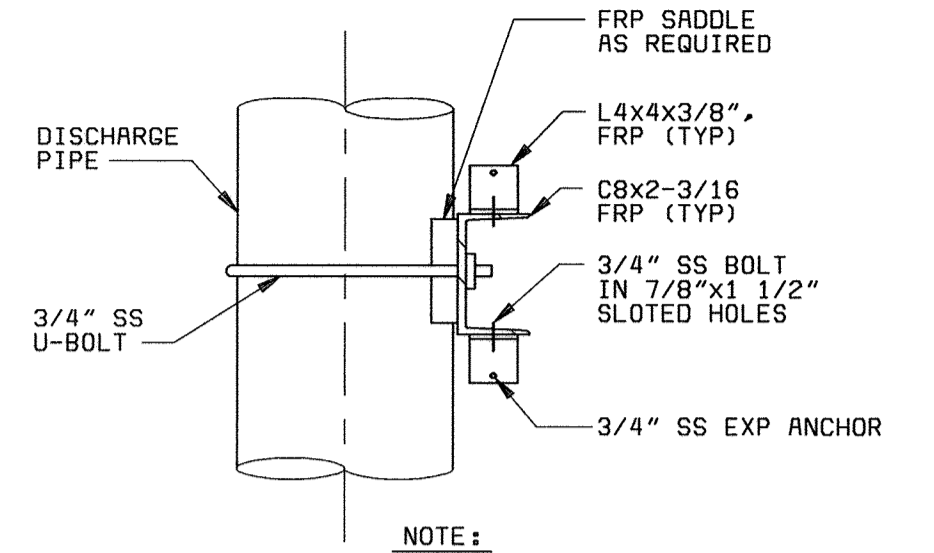


| SAFE WORKING LOAD-POUNDS | BOLT SIZE DIA. x LENGTH (INCH) | PL EMBED. DEPTH (INCH) (MINIMUM) | COUPLING NUT SIZE DIA. x LENGTH (INCH) | EYEBOLT SIZE (INCH) |
|--------------------------|--------------------------------|----------------------------------|--|---------------------|
| 6000 | 3/4 x 5 1/4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

EYEBOLT B
NO SCALE

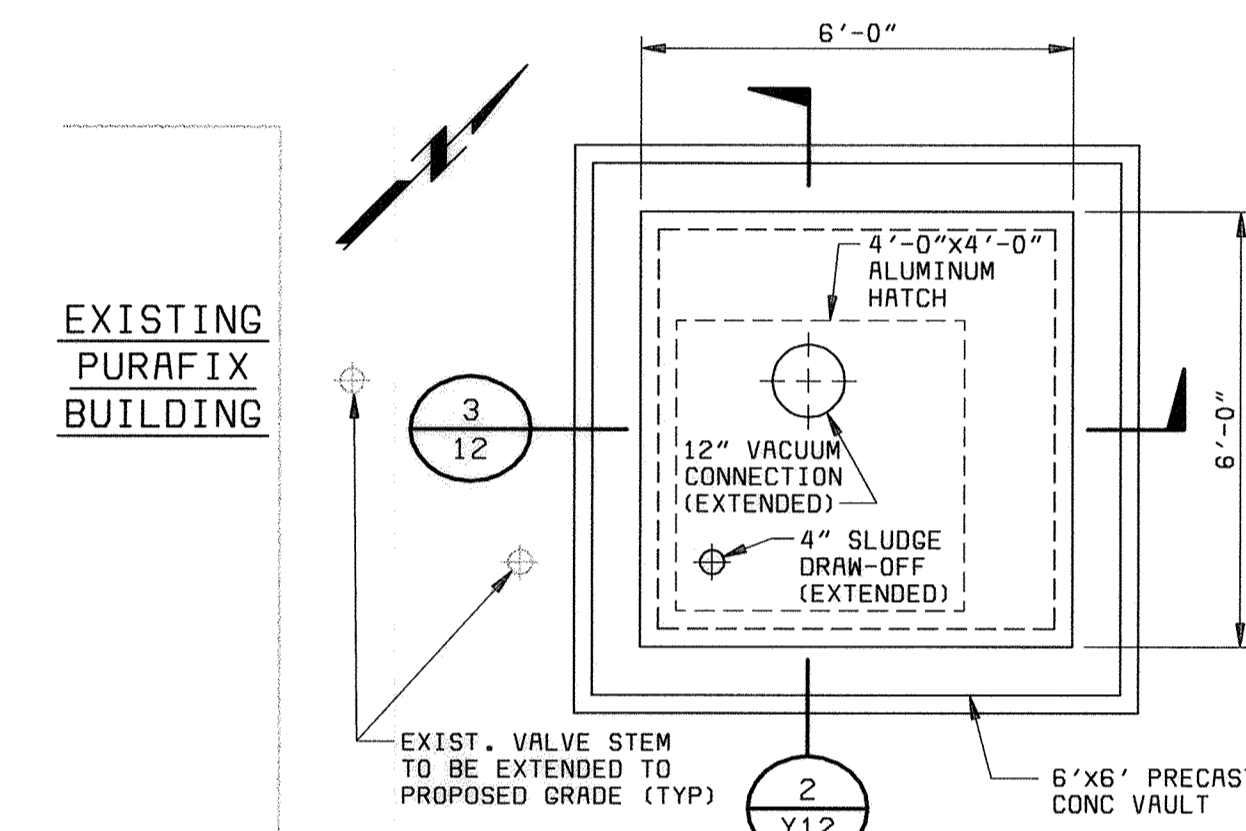


DETAIL C
NO SCALE

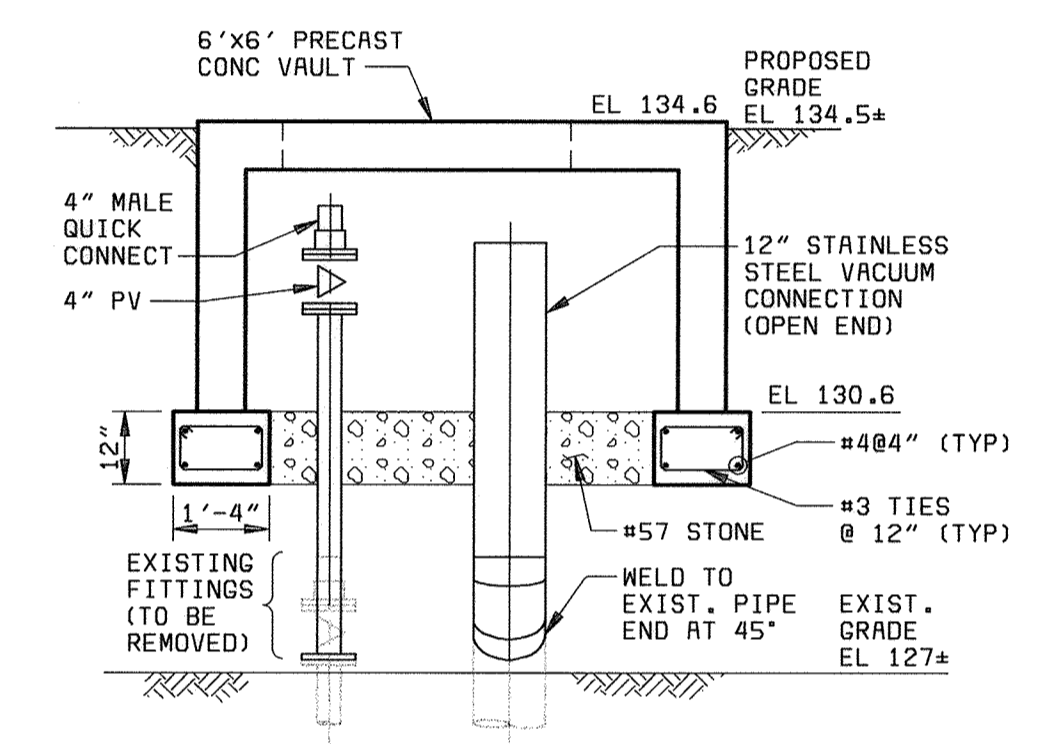


SUPPORT D
NO SCALE

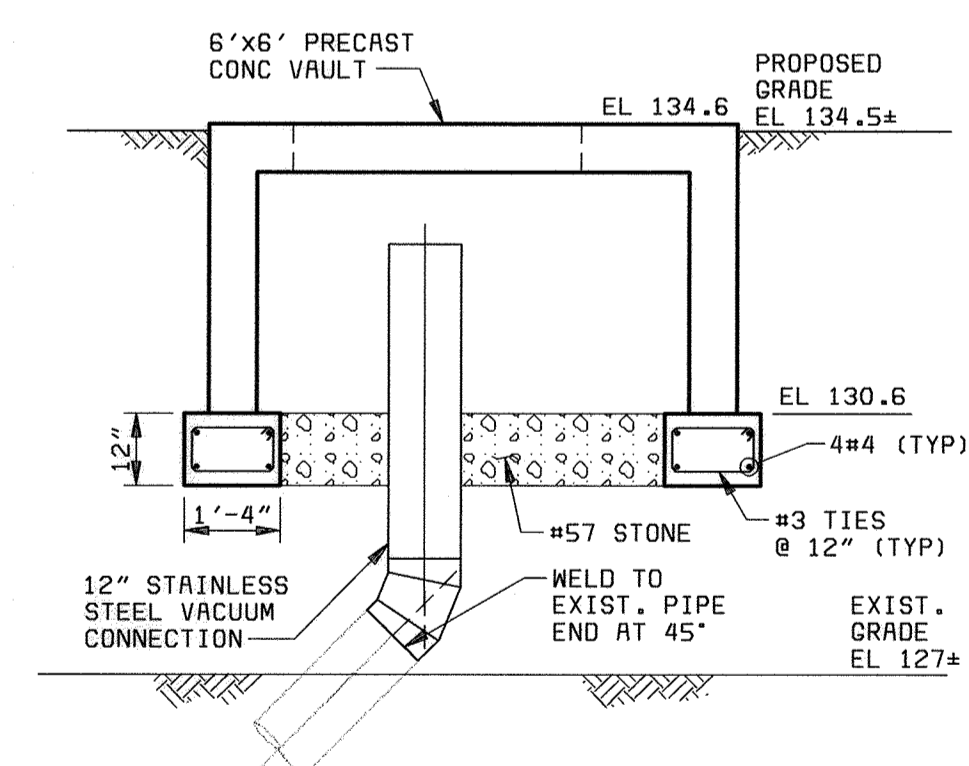
NOTE:
PROVIDE 2 SUPPORTS FOR PUMP DISCHARGE PIPE: 1 AT EL 121.00 AND 1 AT EL 128.50.



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

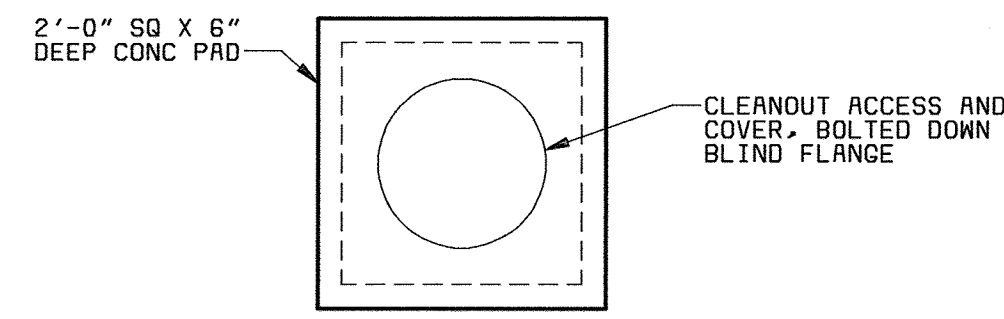


SECTION 2
3/8" = 1'-0"

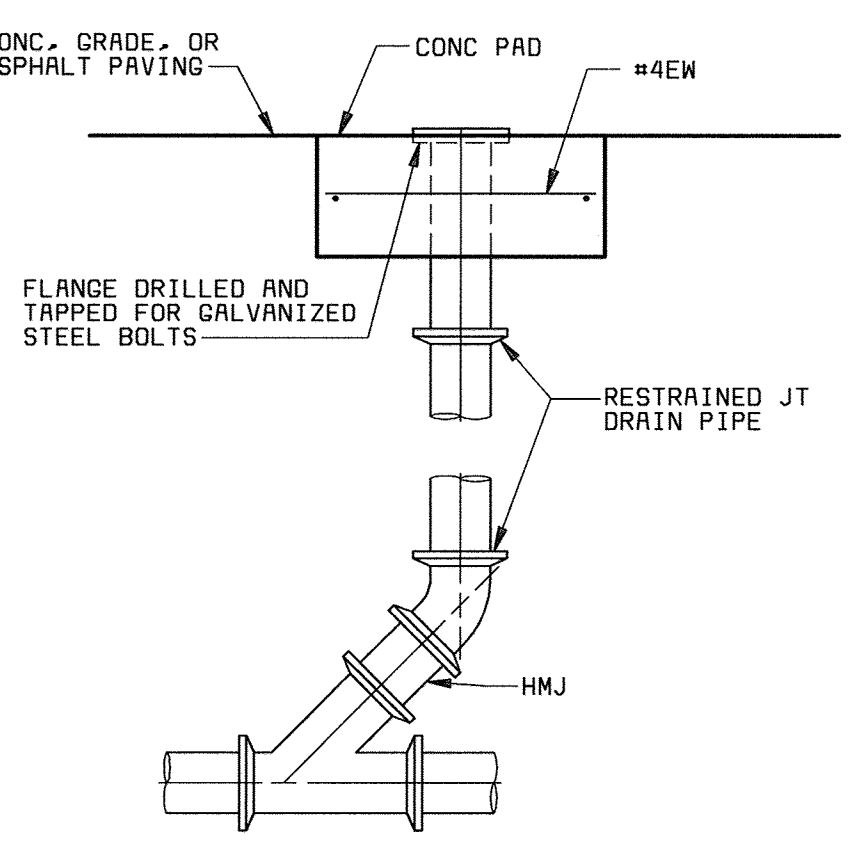


SECTION 3
3/8" = 1'-0"

| | | | | | | | | | | | | | |
|---|---|--------------------------------------|---------------|----------|---------------|-------------------------------|-----|----|----|-----|---|--|-----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Reitan, Jr. CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LLP Gaithersburg, Maryland Robert J. Reitan, Jr. REG. PROF. ENGR. DATE | REGISTERED PROFESSIONAL ENGINEER | DES: FKA, KMH | | | | | | | | YARDWORK CIVIL MISCELLANEOUS DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: RLC | CHK: WLK | DATE: 6/23/00 | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | SHEET 31 OF 161 |

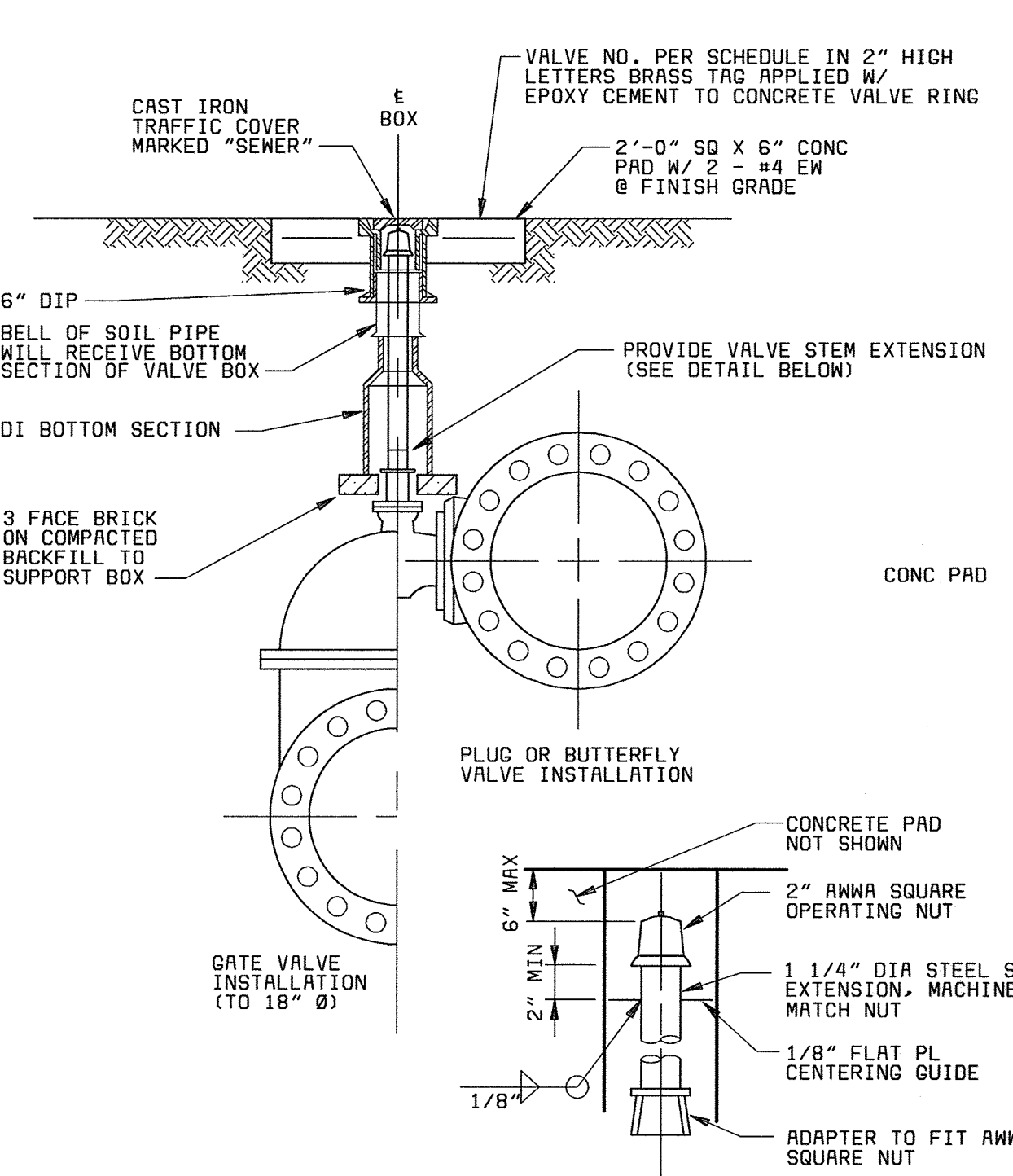


PLAN

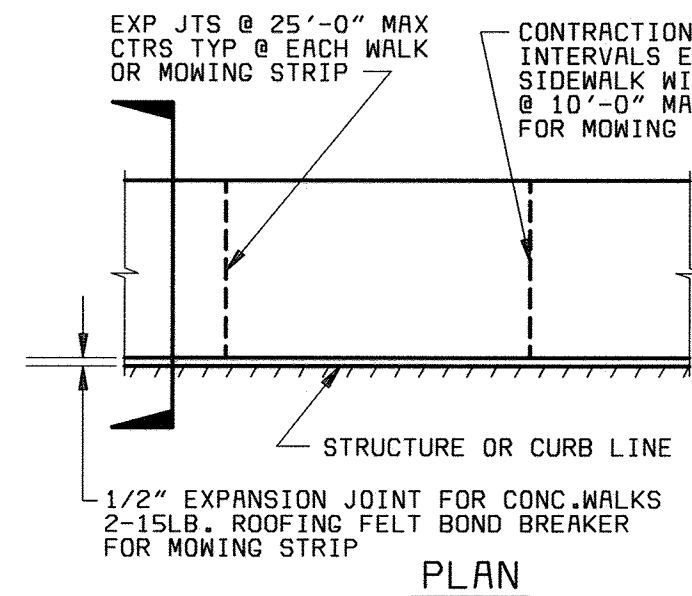


SECTION

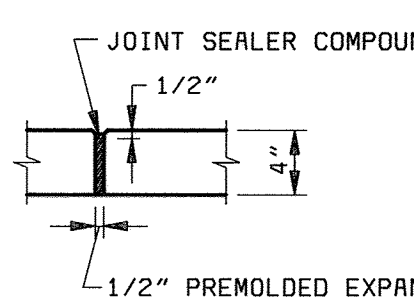
CLEANOUT UP TO GRADE DETAIL (A)
NO SCALE



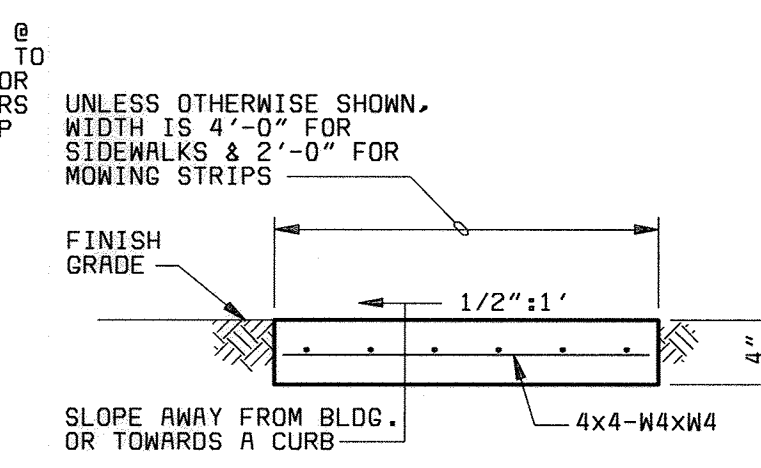
BURIED VALVE INSTALLATION (B)
NO SCALE



PLAN

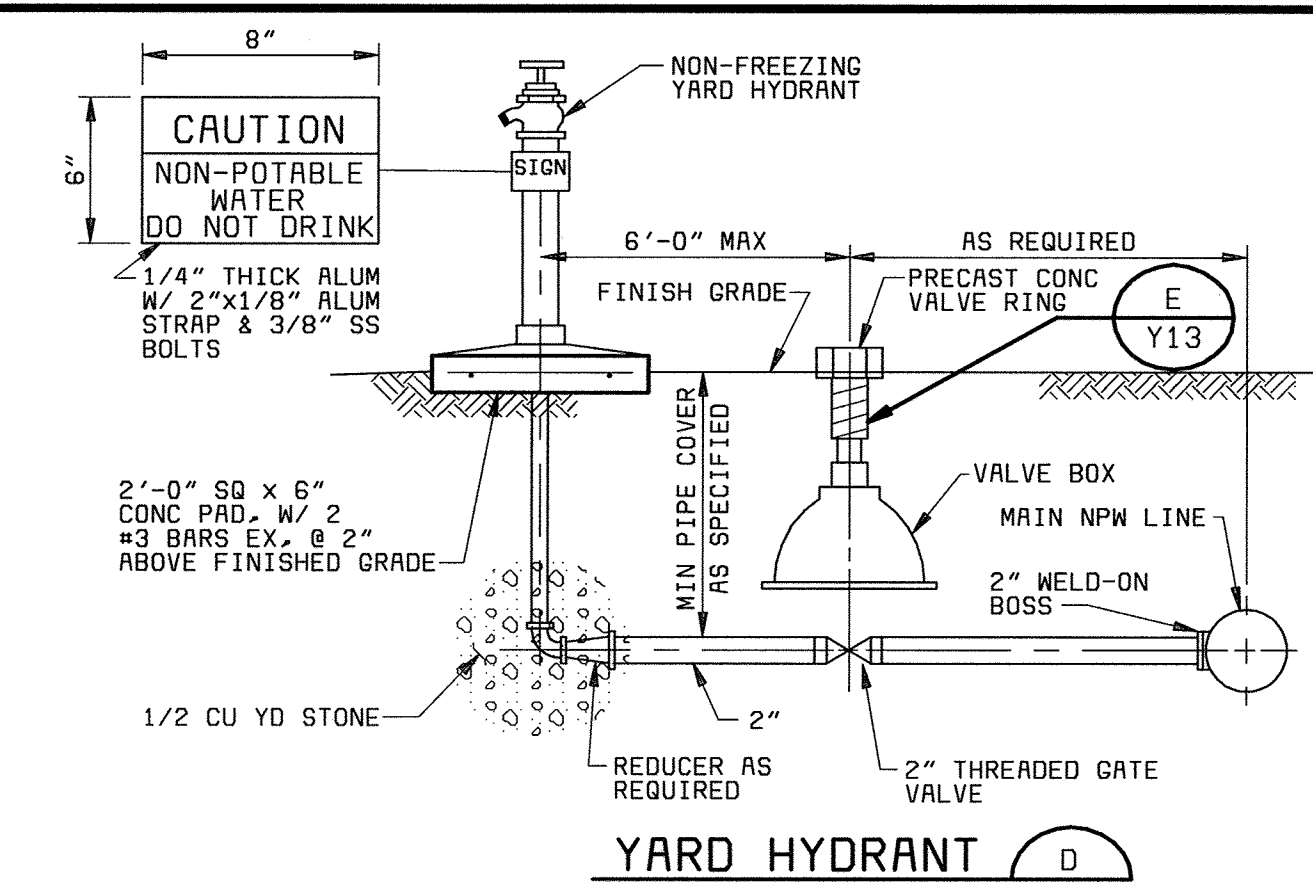


EXPANSION JOINT

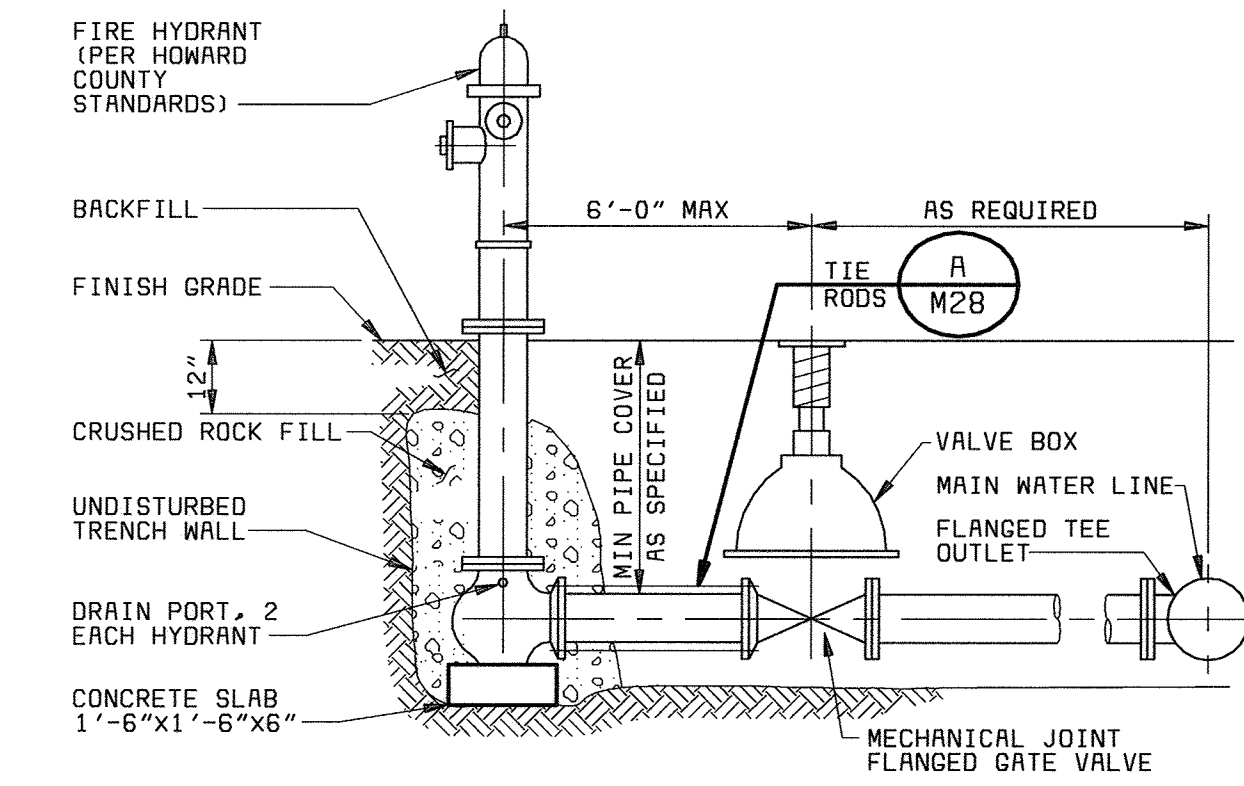


SECTION

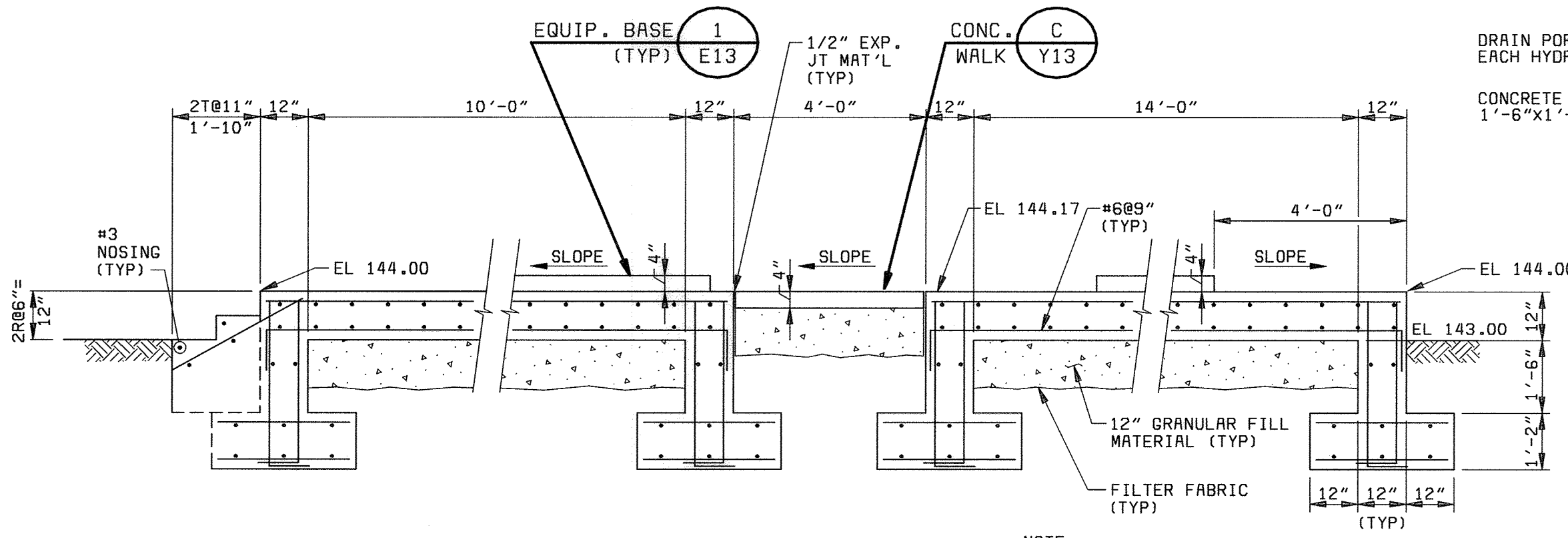
MOWING STRIP AND CONCRETE WALK DETAILS (C)
NO SCALE



YARD HYDRANT (D)

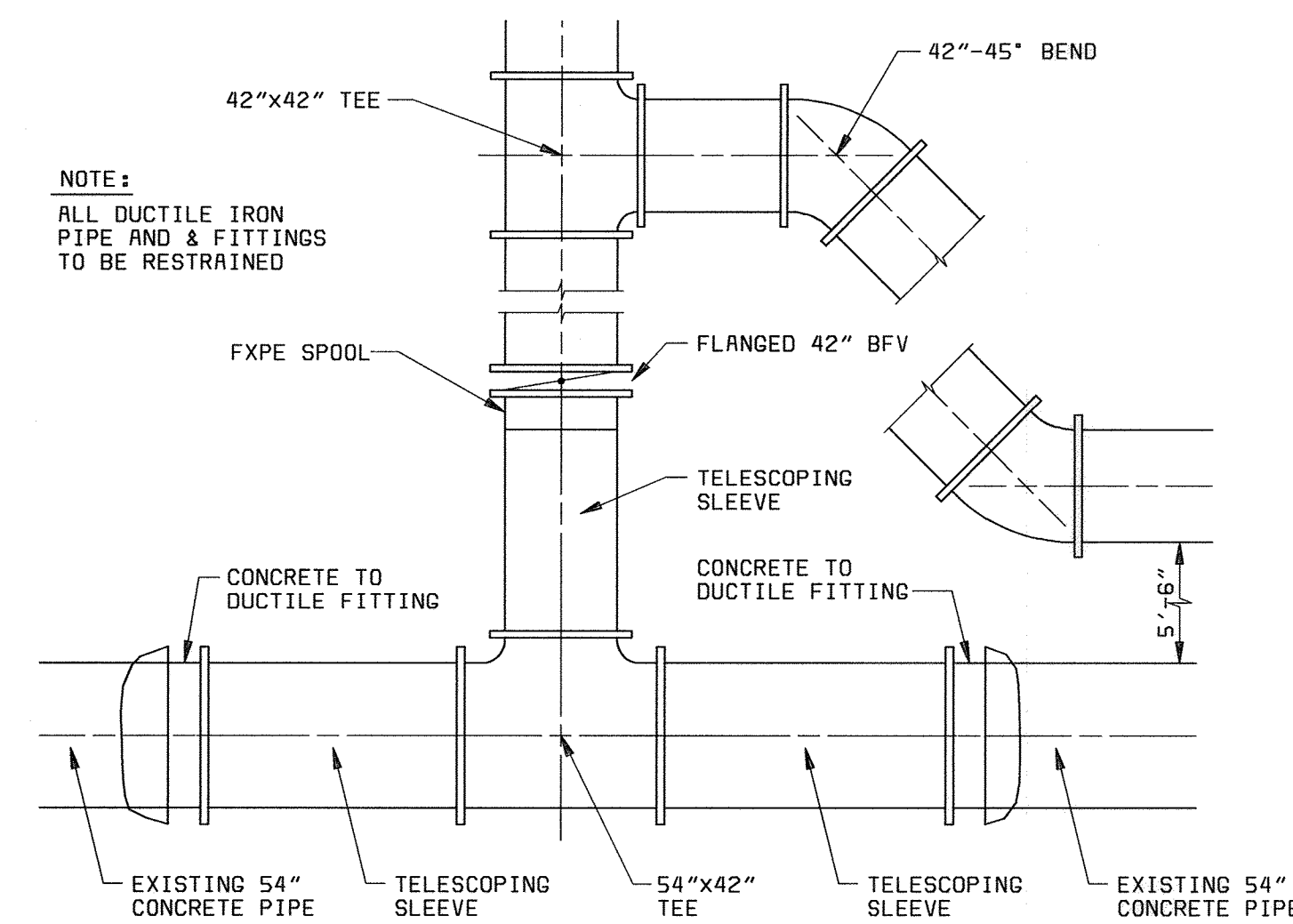


FIRE HYDRANT (E)
NO SCALE

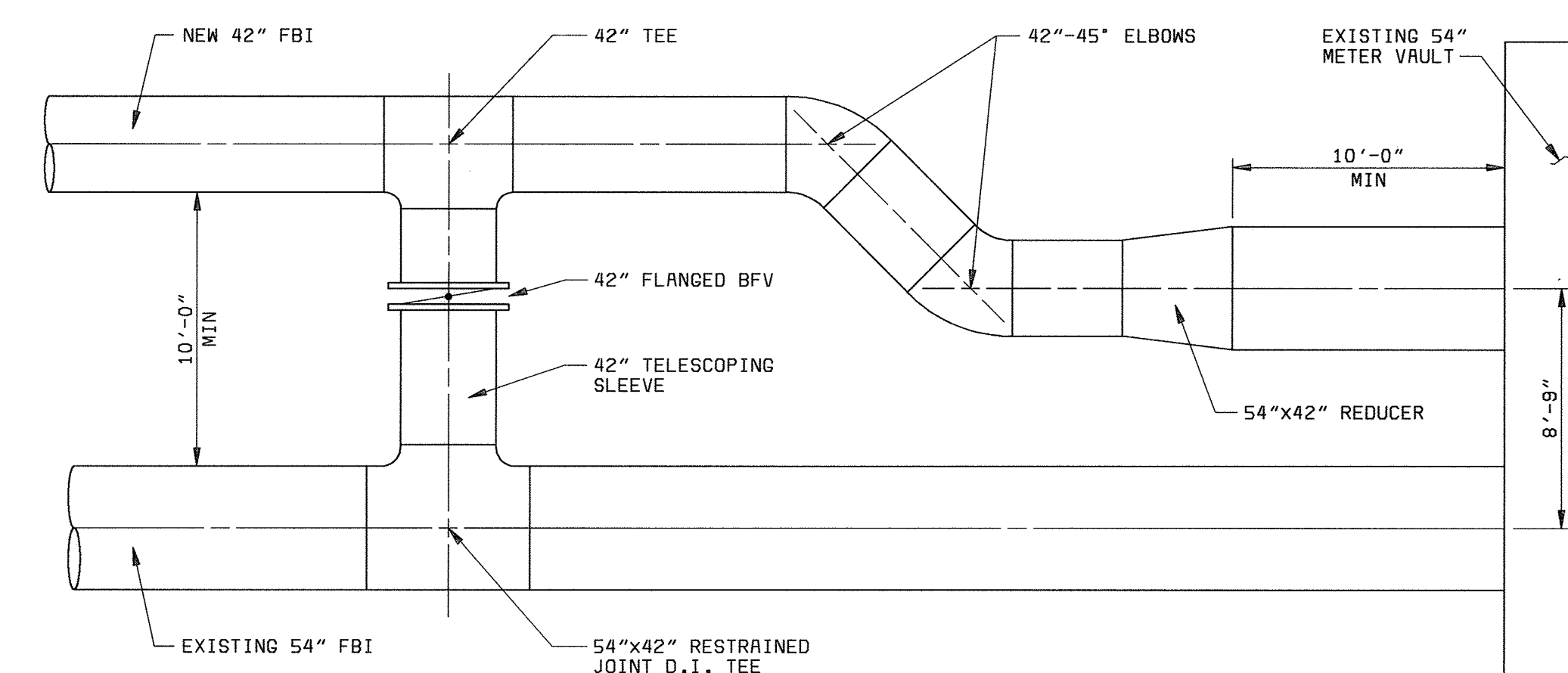


SECTION 1 (Y13)
3/16" = 1'-0"

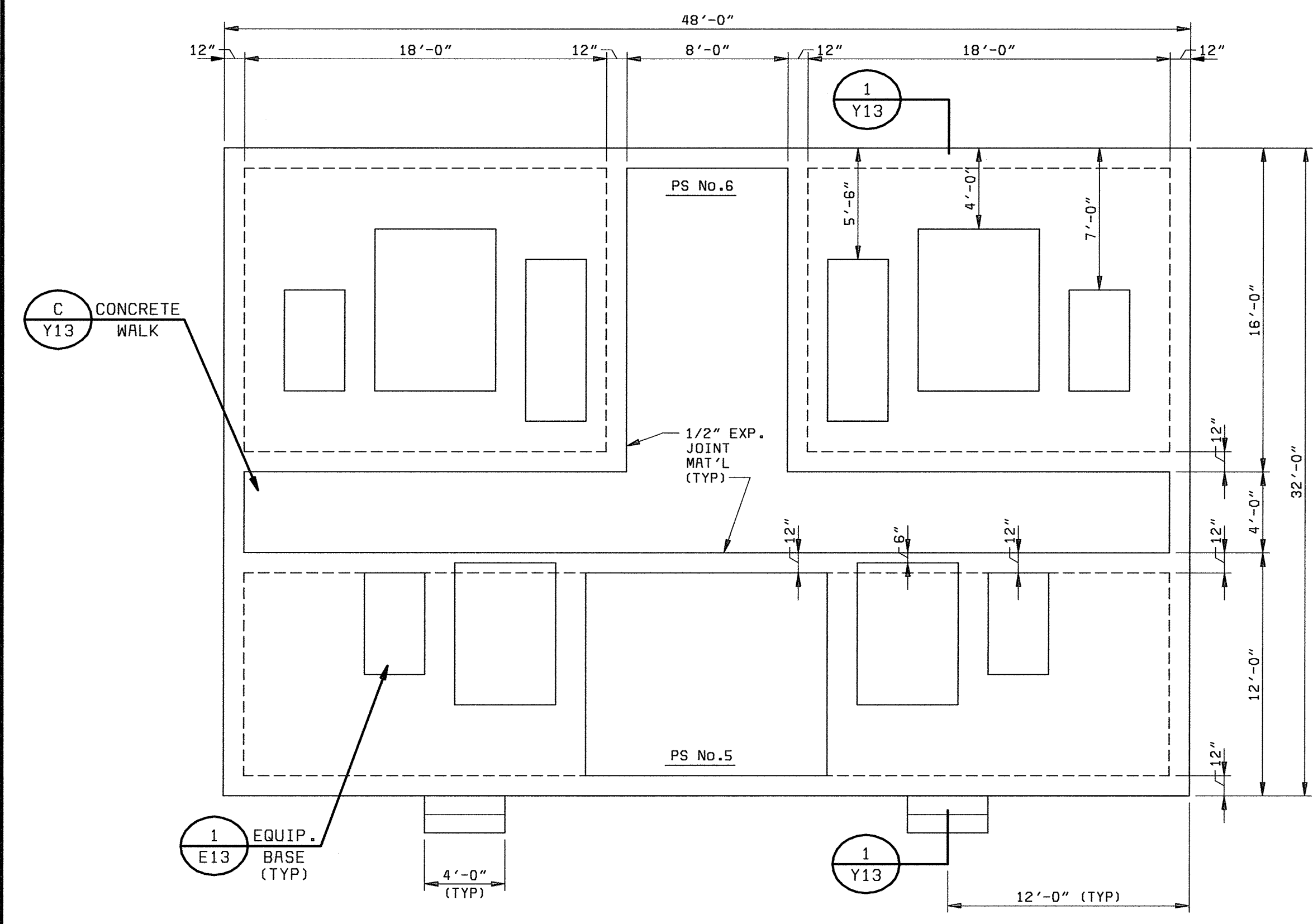
NOTE:
ALL REINF. #5@12" UNLESS OTHERWISE INDICATED



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



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

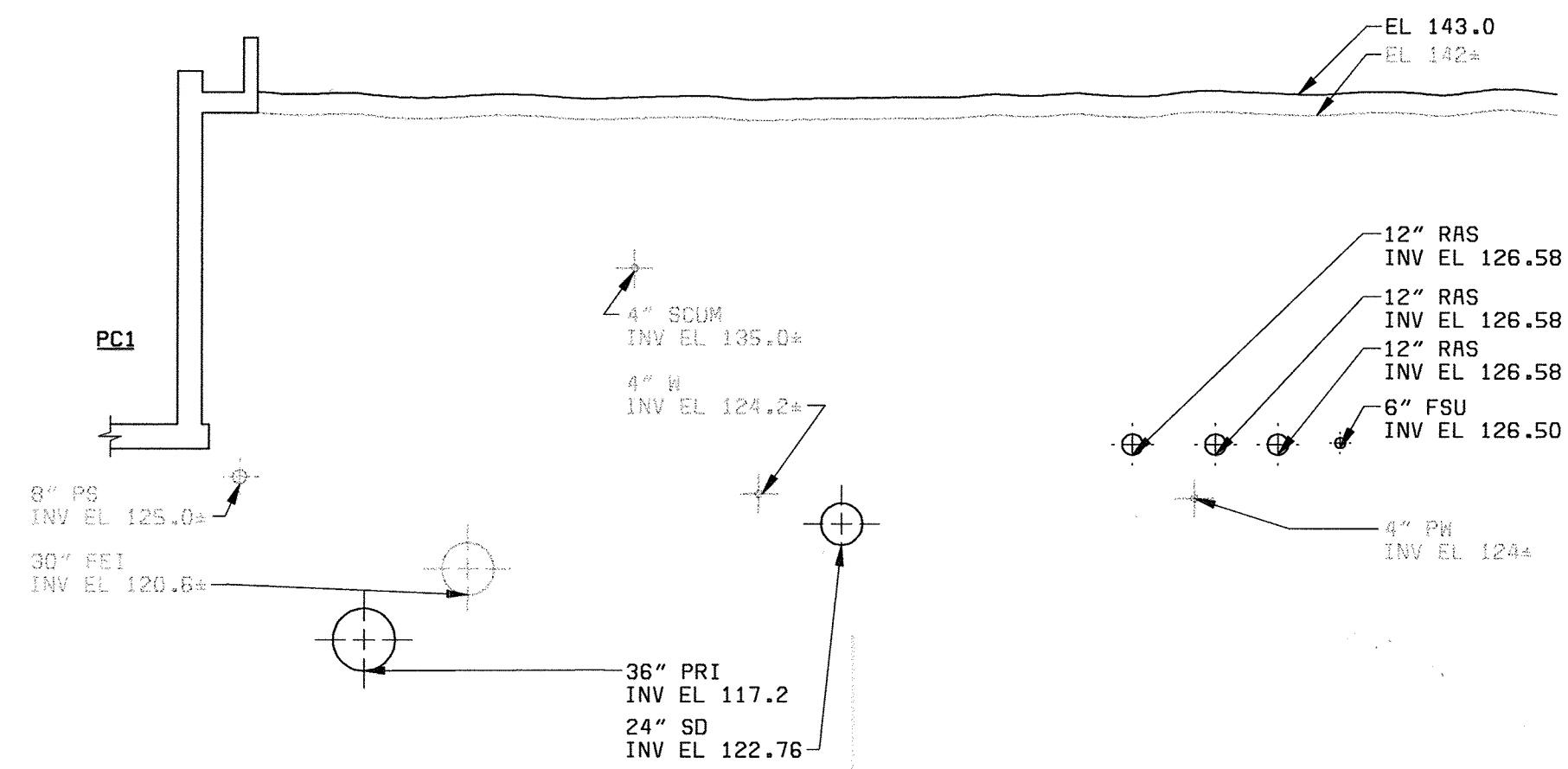


POWER SUBSTATION - No. 5 AND No. 6 PLAN
3/16" = 1'-0"

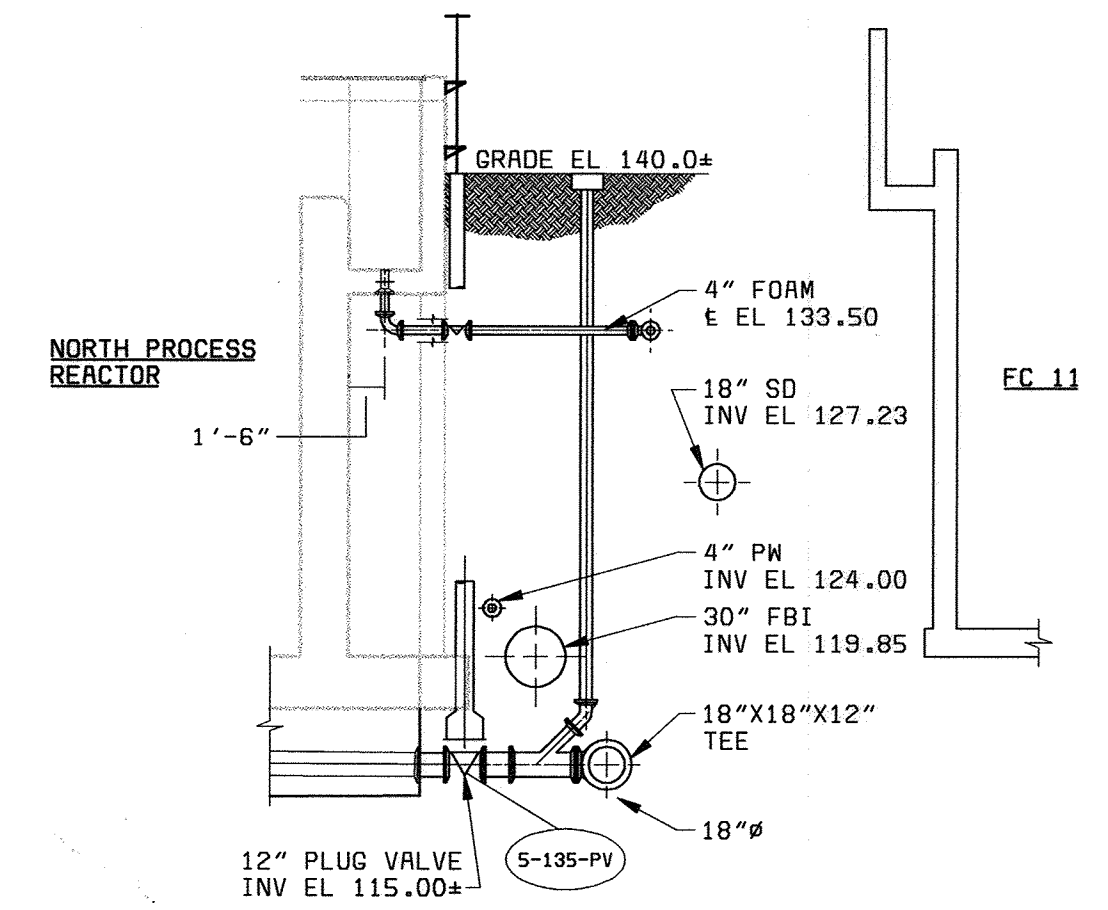
| | | | | | |
|---|---|---|--|--|------------------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert Benjamin 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH, L.P. Gaithersburg, Maryland Robert J. Rectanus, Jr. No. 22927 REGISTERED PROFESSIONAL ENGINEER REG. PROF. ENGR. DATE | DES: FKA DRN: RLC CHK: WLK DATE: 6/23/00 | YARDWORK CIVIL MISCELLANEOUS DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | | | SHEET 32 OF 161 Y13 |

A
B
C
D
E

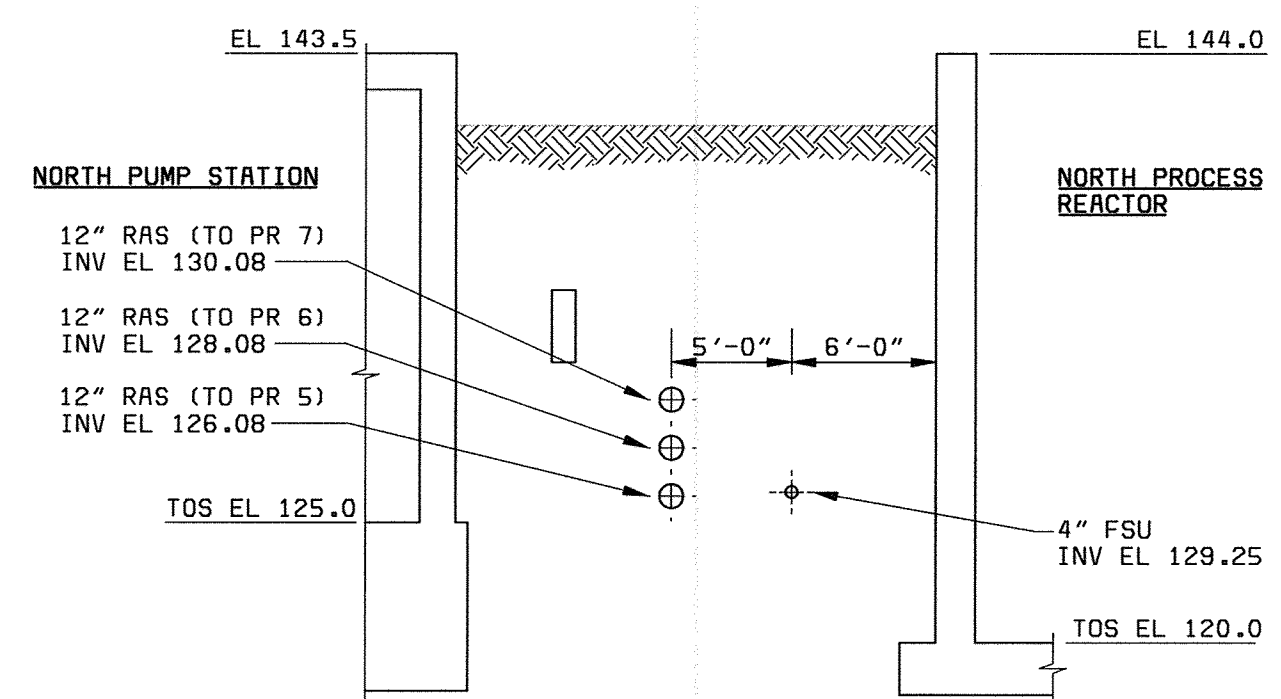
A
B
C
D
E



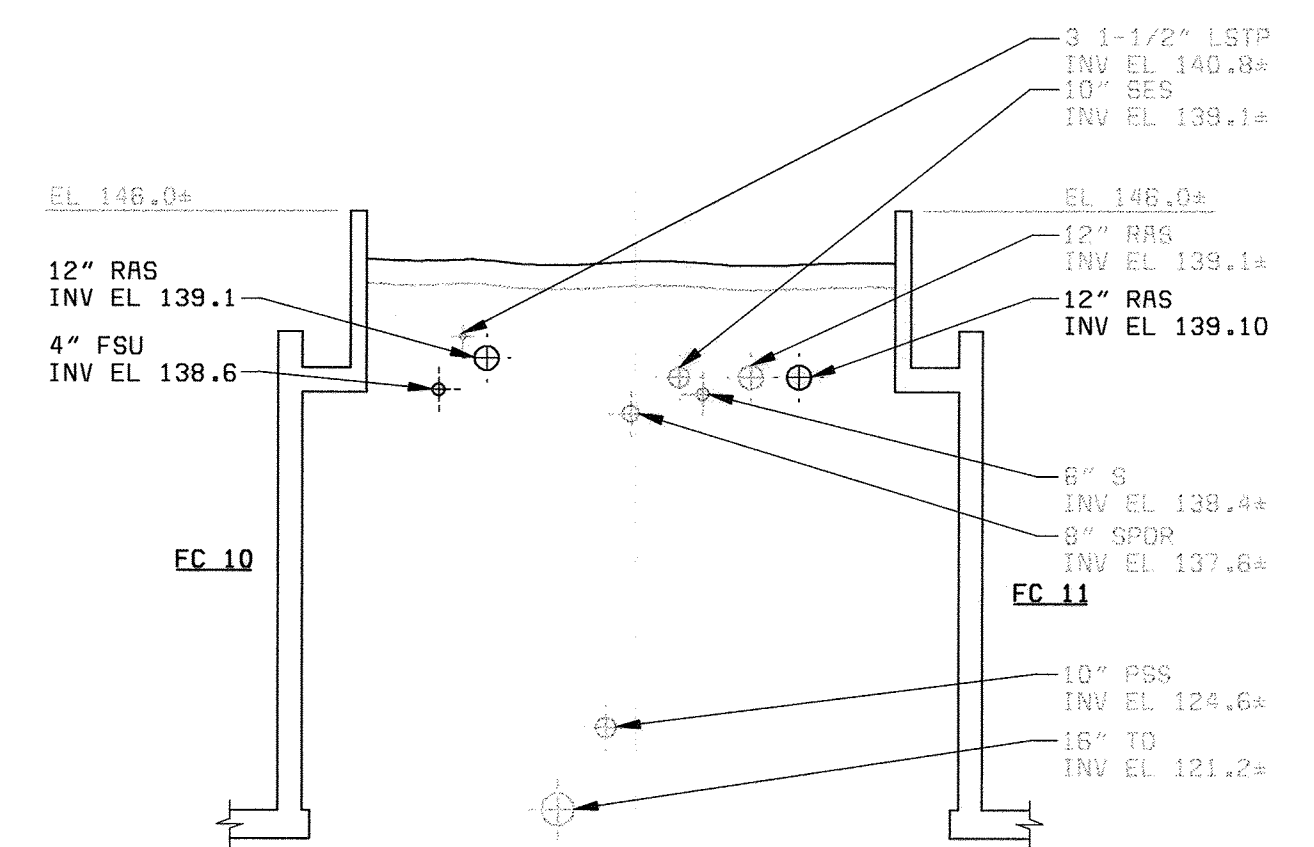
SECTION 1
1/8" = 1'-0" Y14



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



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

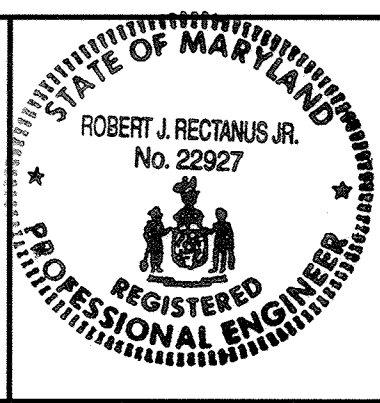


SECTION 4
1/8" = 1'-0" Y14

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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



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

YARDWORK
CIVIL

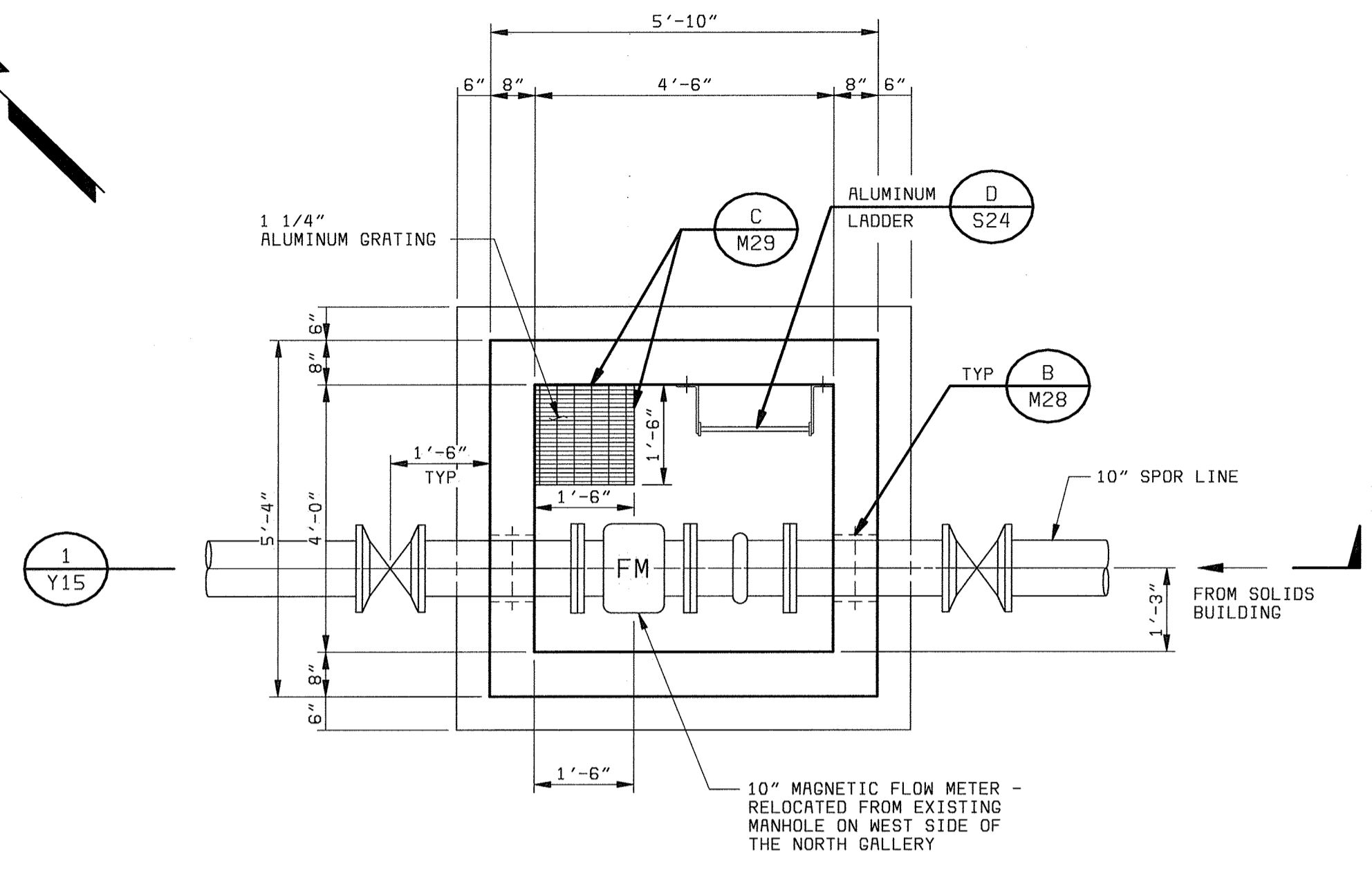
MISCELLANEOUS DETAILS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

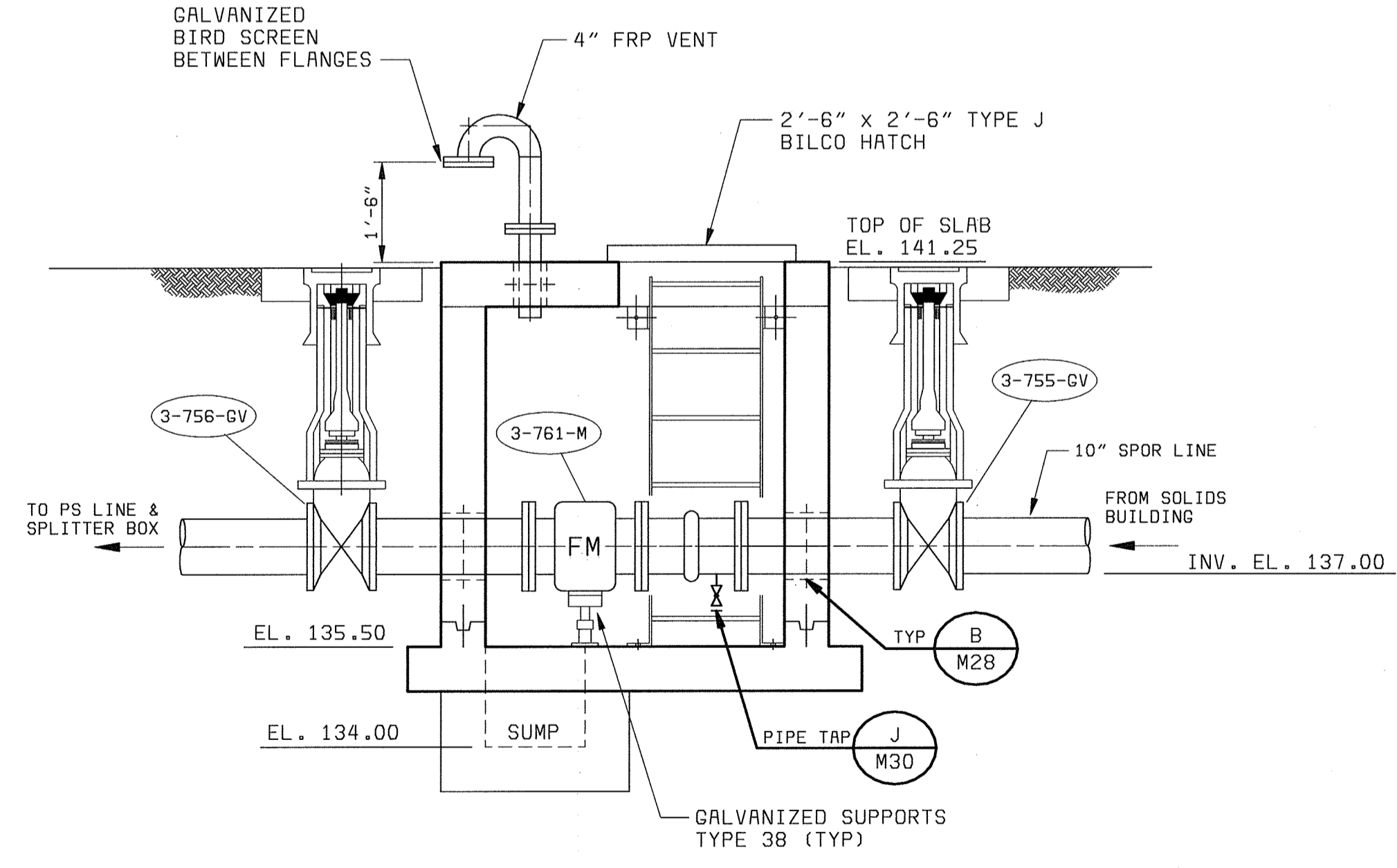
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 33 OF 161
Y14



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

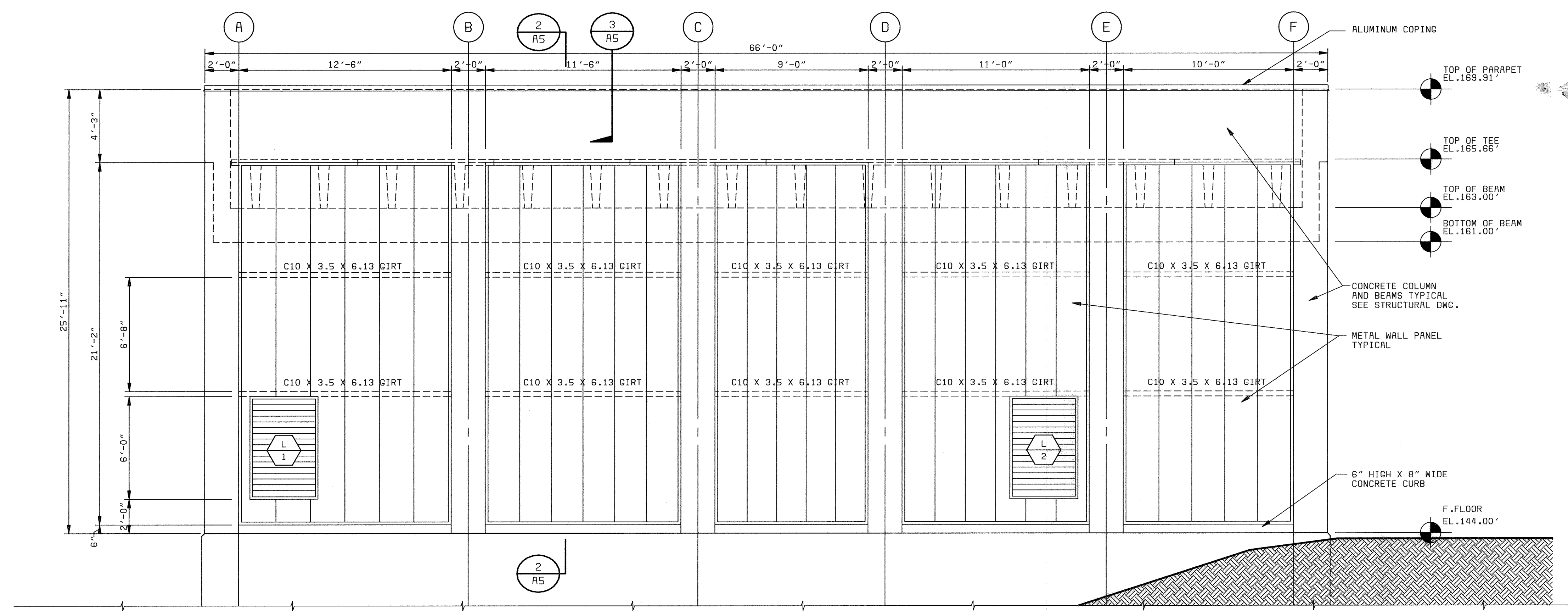
NOTE:
-ALL WALLS & ROOF 8" THICK C/W #5 @12" EW/EF.
-BASE SLAB 12" THICK #5 @12" EW/EF.
-PROVIDE DOWELS FROM BASE SLAB TO MATCH VERTICAL REBAR IN WALL.



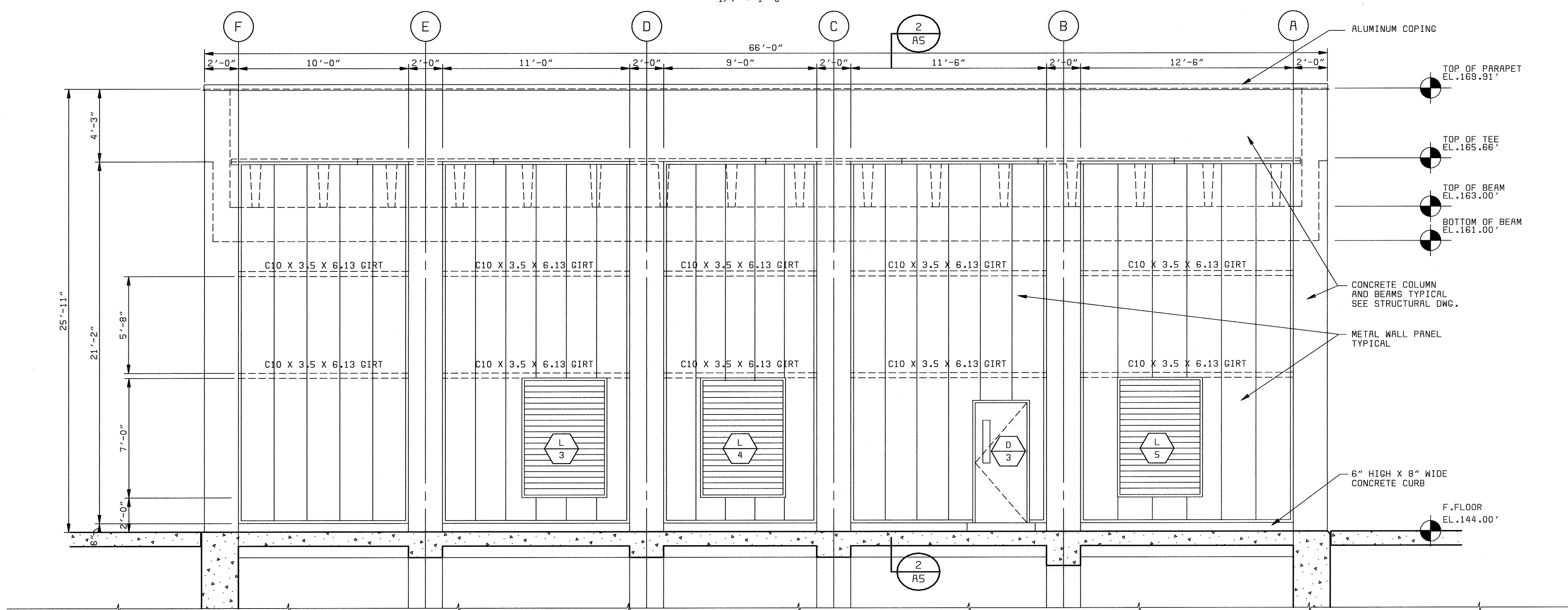
SECTION 1
1/2" = 1'-0"
Y15

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

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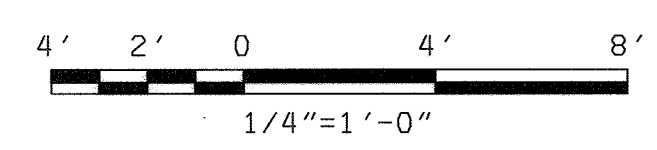


WEST ELEVATION
1/4" = 1'-0"



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

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



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

bbw Architects • Designers • Planners
Bryant Bryant Williams, P.C.
4201 Connecticut Avenue N.W., Suite 500
Washington, D.C. 20008 (202) 244-2108

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

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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

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NORTH BLOWER BUILDING
ARCHITECTURAL

WEST AND EAST ELEVATIONS

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

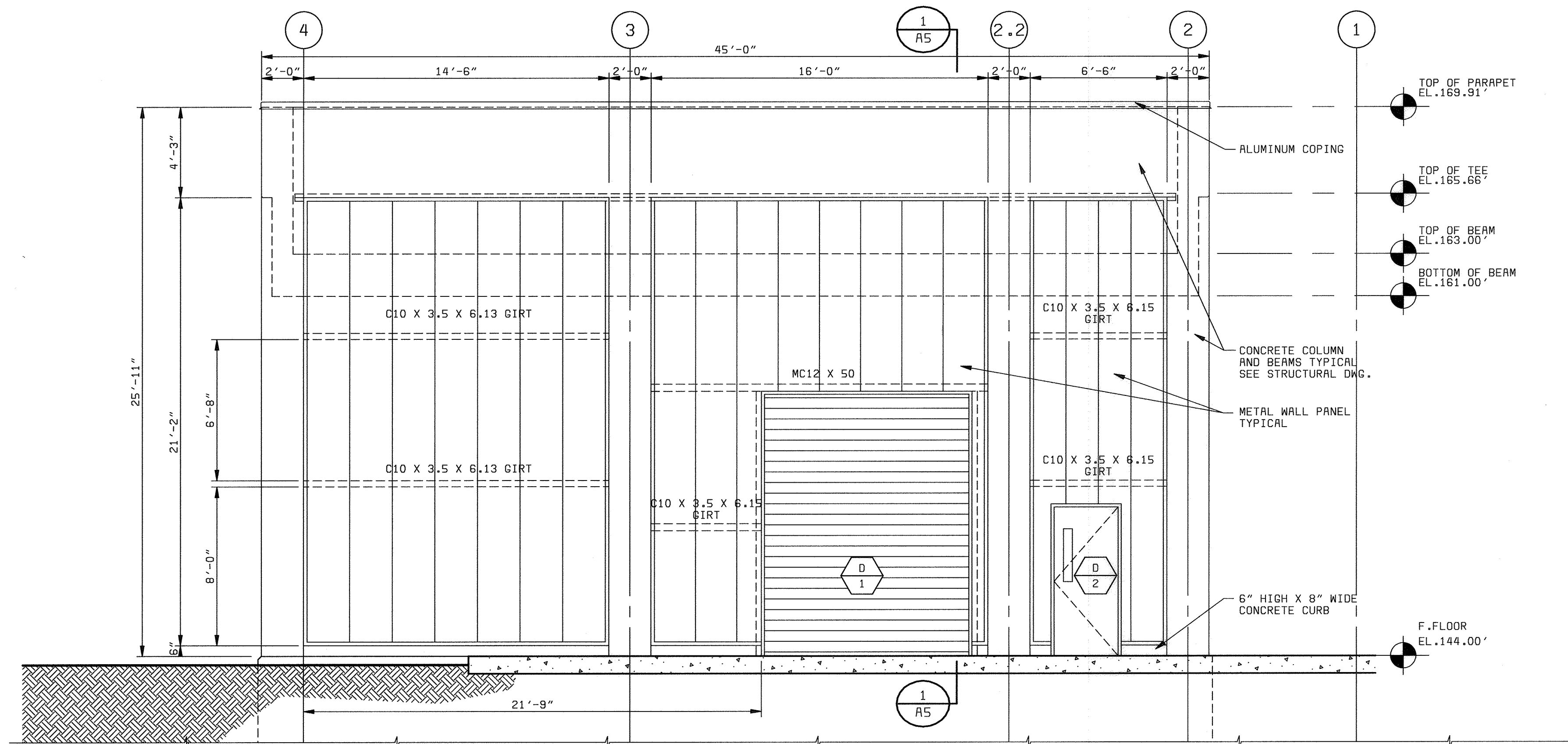
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

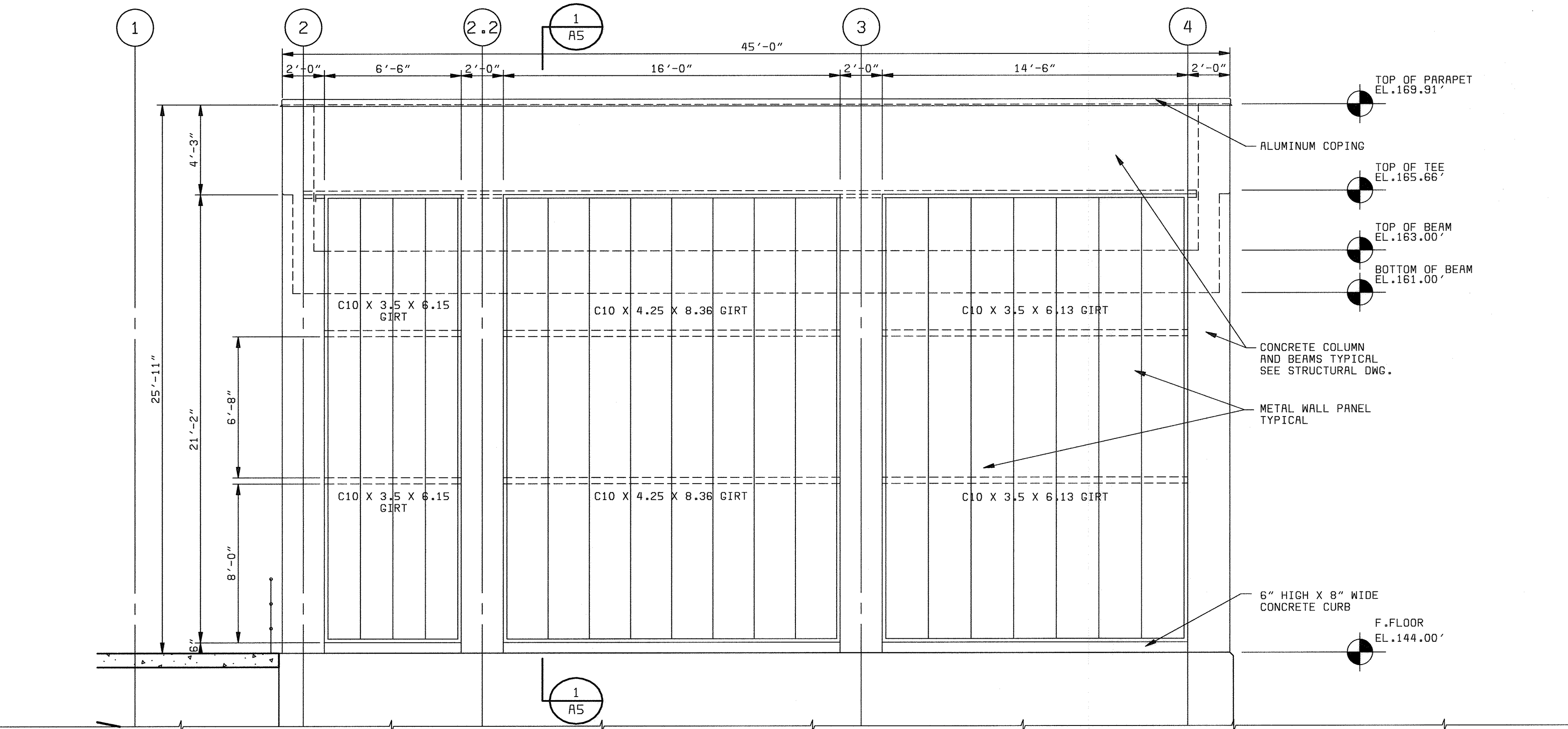
SCALE AS SHOWN

SHEET 35 OF 161

A1



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



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

GENERAL NOTES:

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

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

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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STATE OF MARYLAND

Charles S. Bryant

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

NORTH BLOWER BUILDING
ARCHITECTURAL

SOUTH AND NORTH ELEVATIONS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

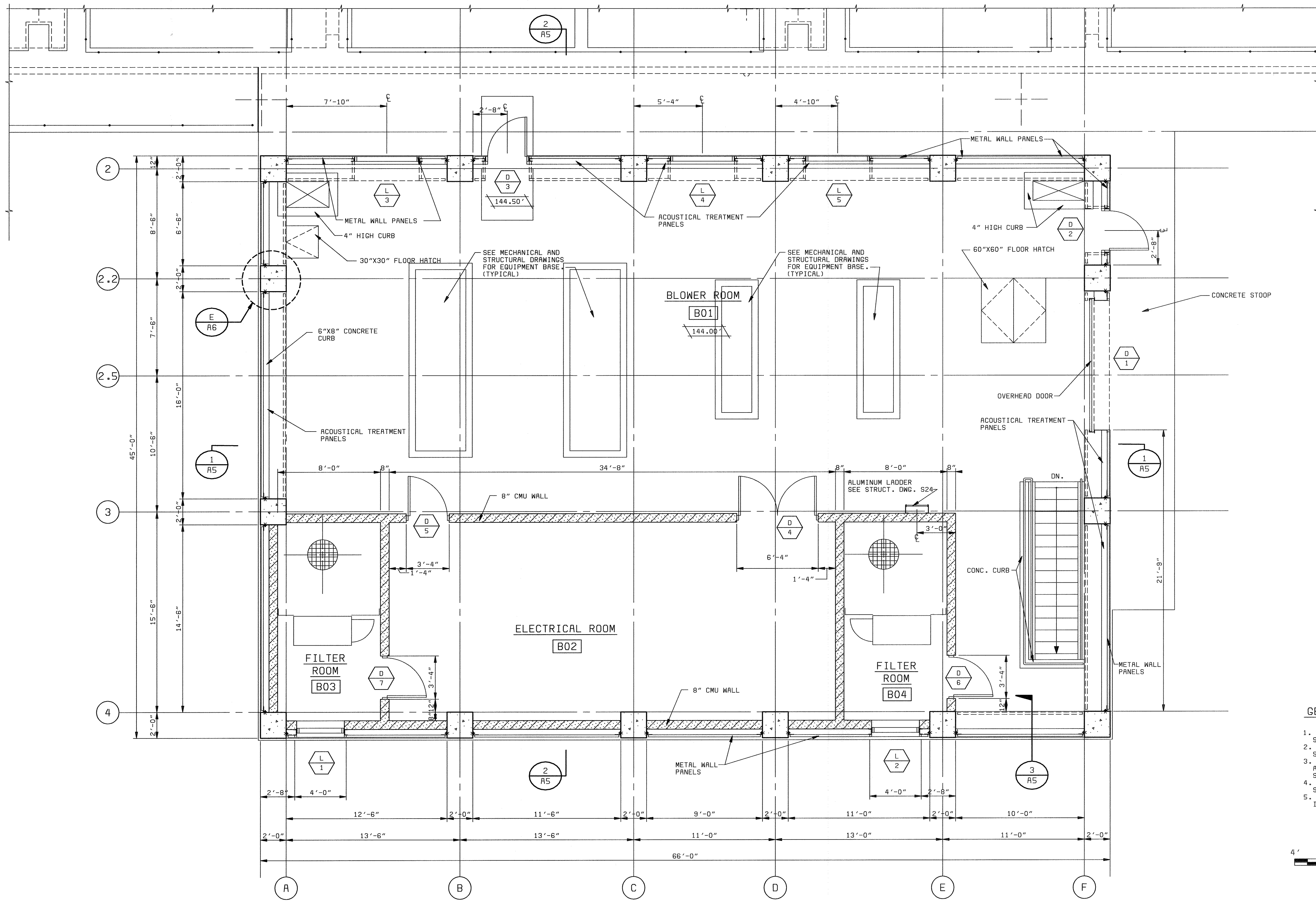
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 36 OF 161

A2

1 2 3 4 5 6 7 8 9 10



GENERAL NOTES:

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

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

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

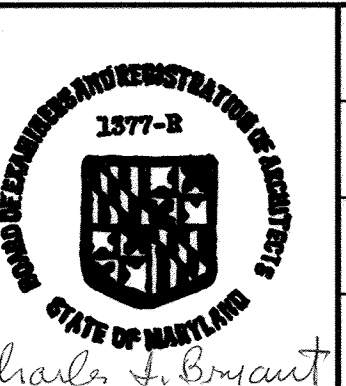
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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

NORTH BLOWER BUILDING
ARCHITECTURAL

OPERATING FLOOR PLAN
ELEVATION 144.00'

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

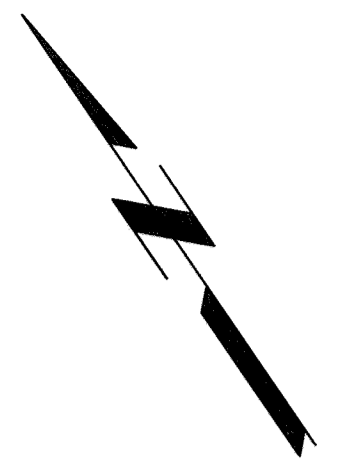
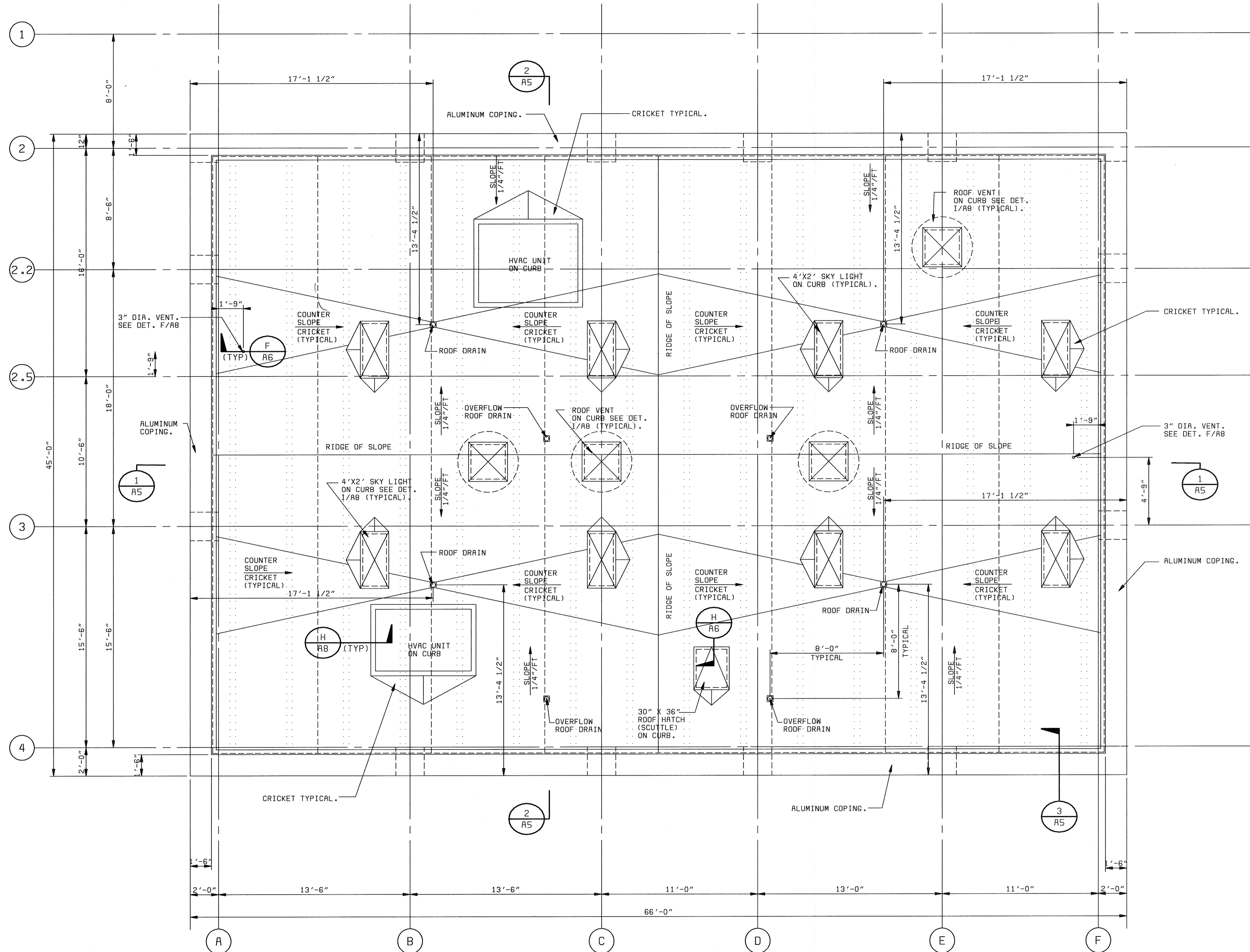
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
37 OF 161

A3

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GENERAL NOTES:

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

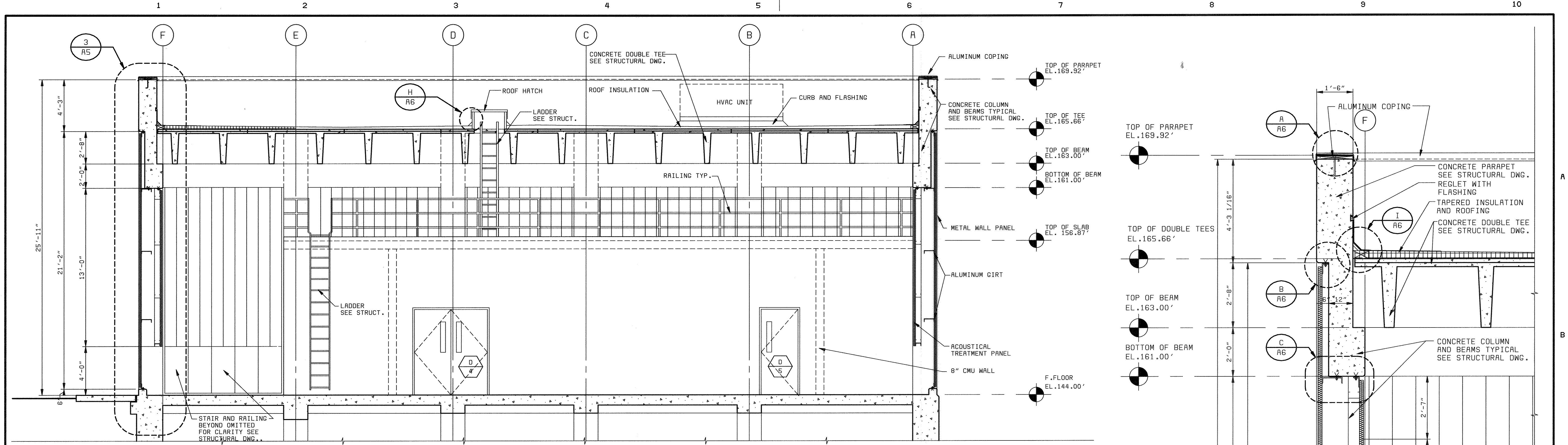
4' 2' 0 4' 8'
1/4" = 1'-0"

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

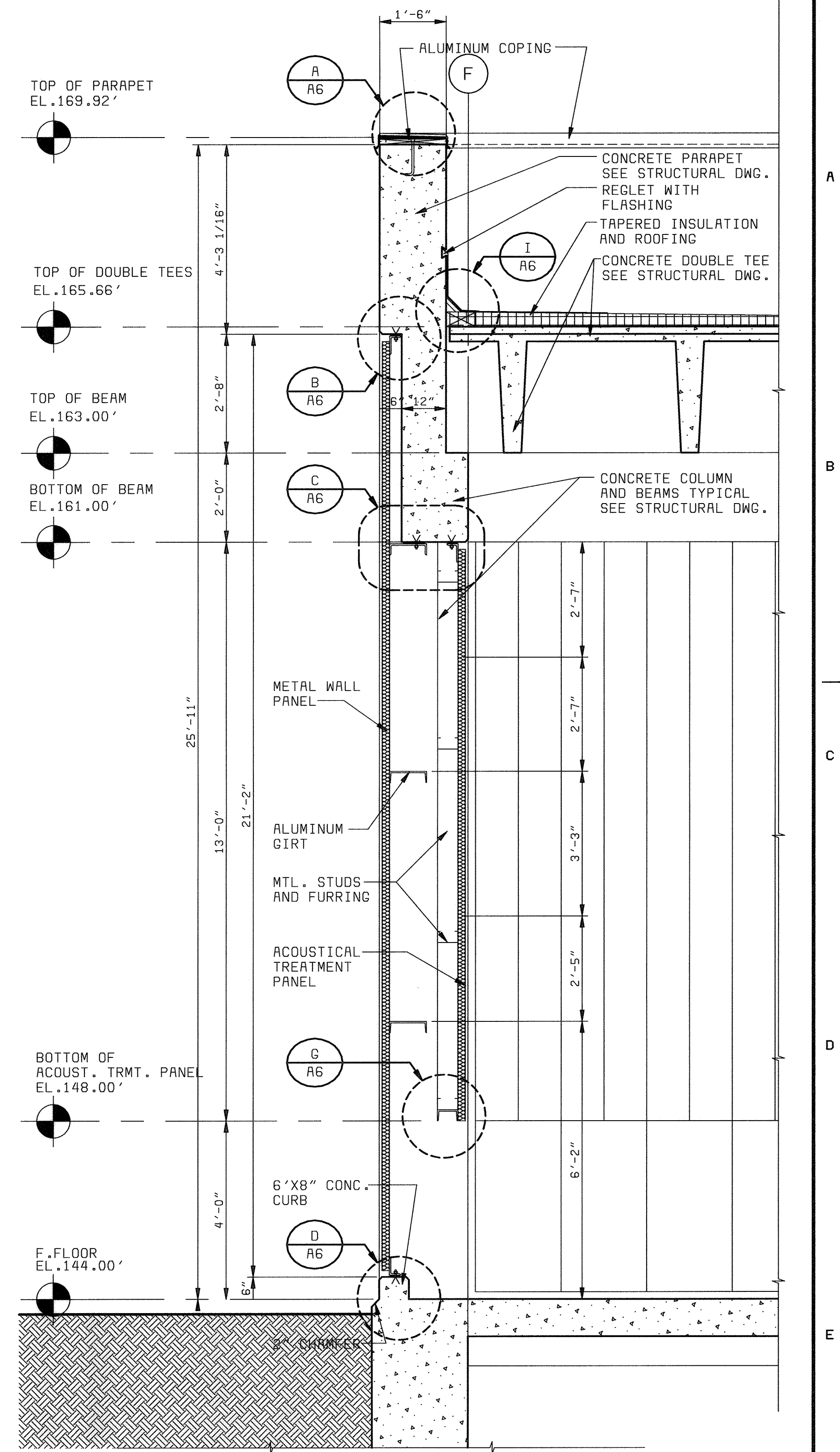
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|---|---|------------------------------|---------------|---|--|-----------------|----|-----|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND bbw Architects • Designers • Planners Bryant Bryant Williams, P.C. 4011 Connecticut Avenue N.W., Suite 500 Washington, D.C. 20008 (202) 244-2100 <i>Ruth Benay</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LP Gaithersburg, Maryland REG. PROF. ENGR. _____ DATE _____ | <i>Charles J. Conant</i> | DES: CH/JS | NORTH BLOWER BUILDING ARCHITECTURAL ROOF PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN | | |
| | | | DRN: JS | | | SHEET 38 OF 161 | | |
| CHK: CH | | | DATE: 6/23/00 | | | A4 | | |
| DATE: 6/23/00 | | | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP |

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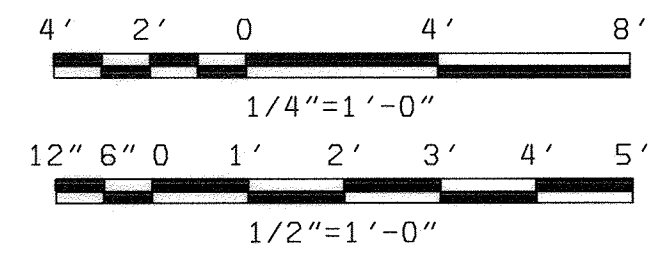
SECTION 1
1/4" = 1'-0" A1, A2, A3 and A4



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

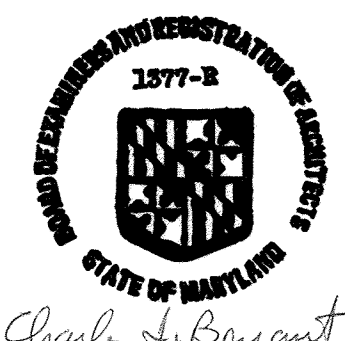
GENERAL NOTES:

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



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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Robert D. ...
CHIEF, BUREAU OF UTILITIES DATE

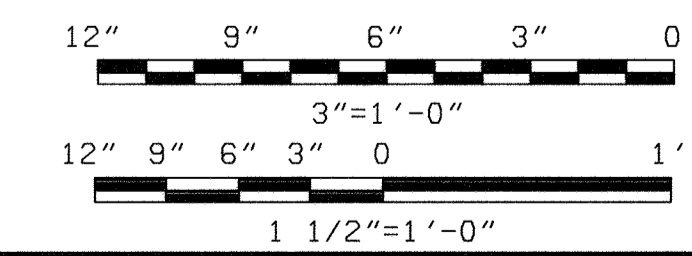
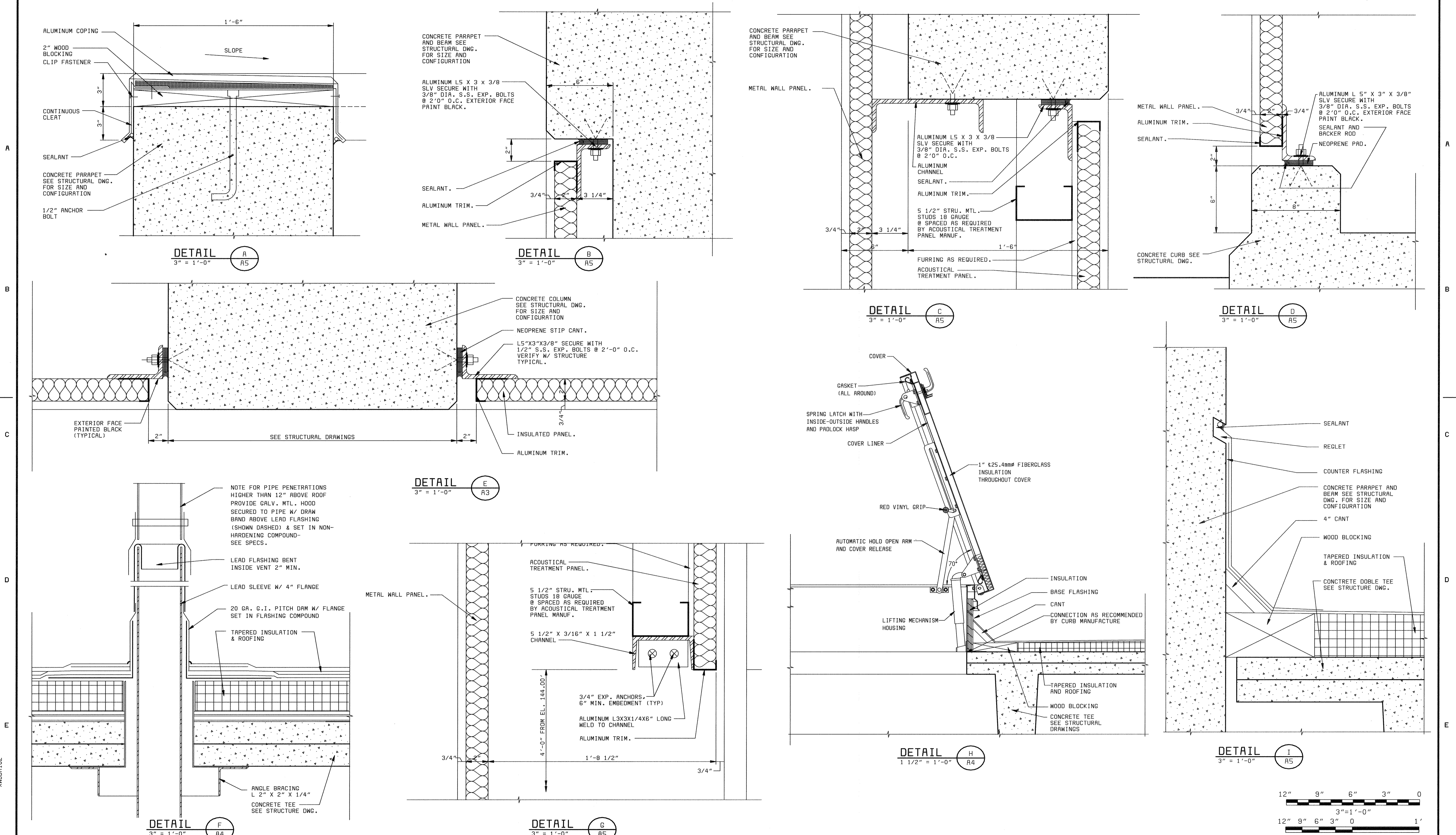


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| DES: CH/JS | DATE: 6/23/00 | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP |
| DRN: JS | | | | | | |
| CHK: CH | | | | | | |
| REG. PROF. ENGR. | DATE | | | | | |

NORTH BLOWER BUILDING
ARCHITECTURAL
BUILDING SECTIONS AND
WALL SECTION

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

SCALE
AS
SHOWN
SHEET
39 OF 161
A5



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

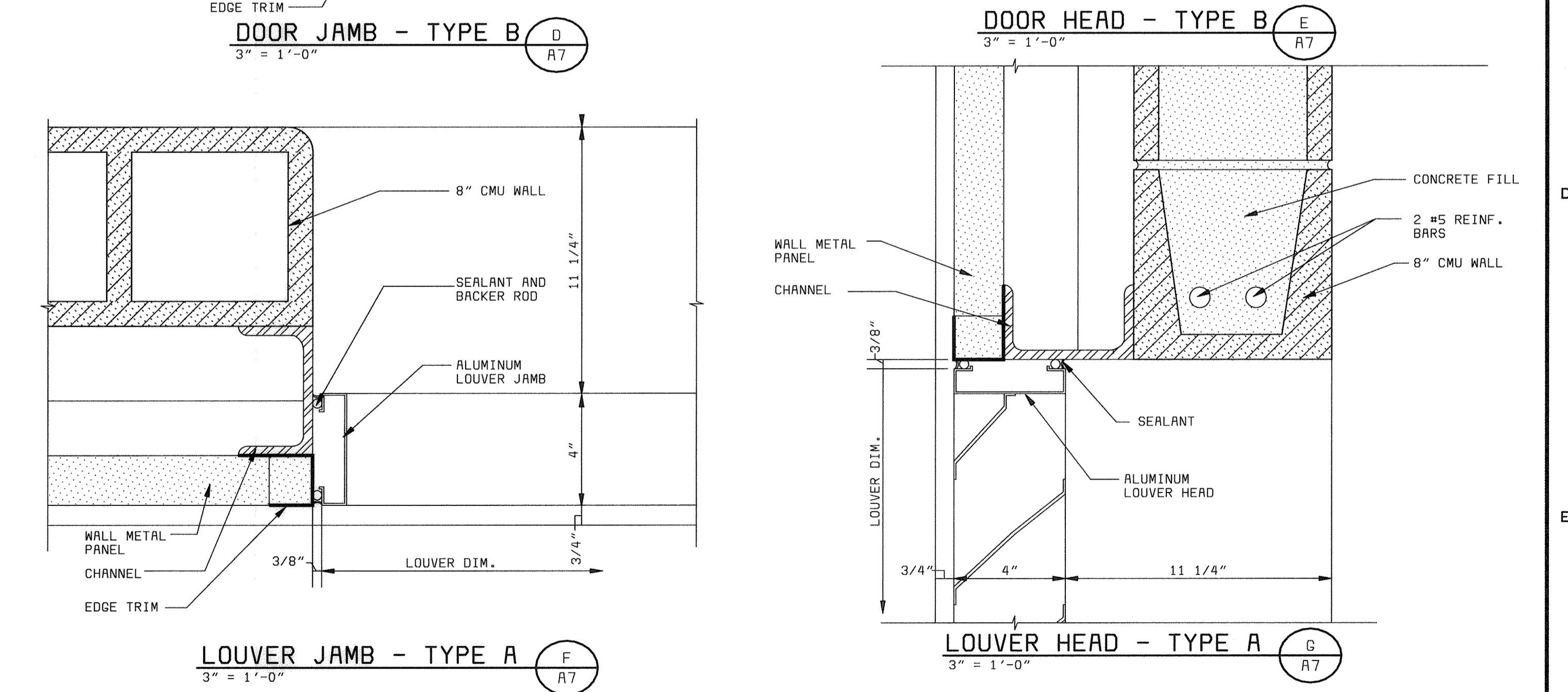
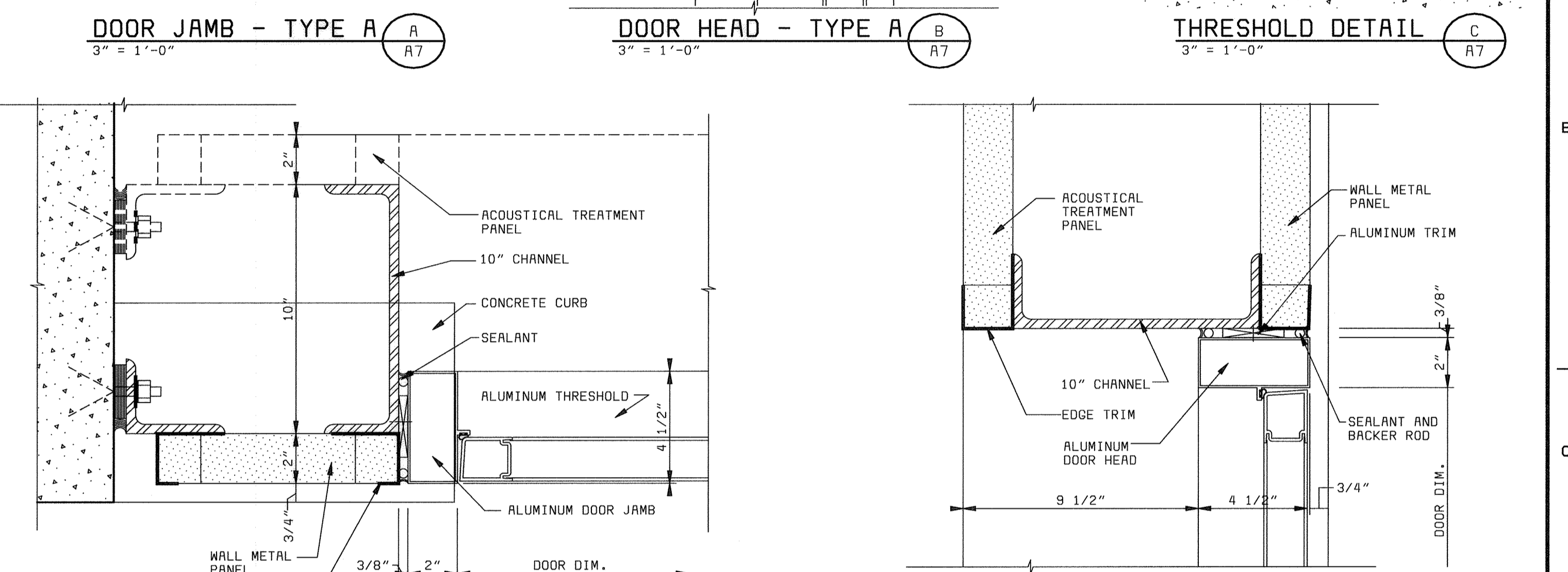
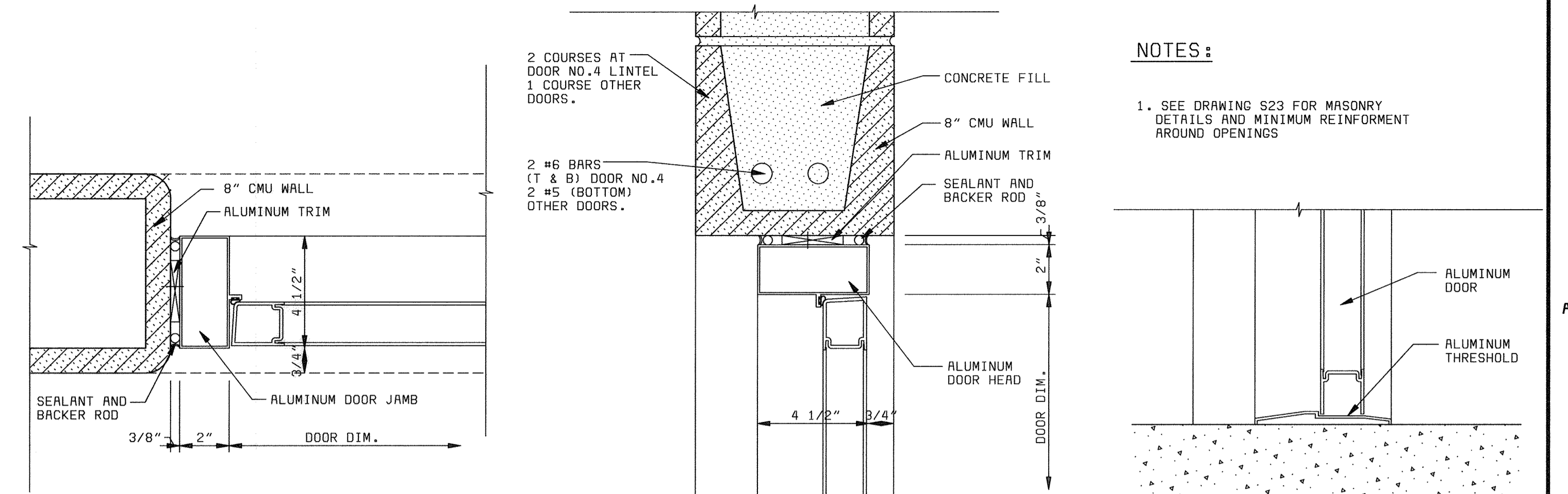
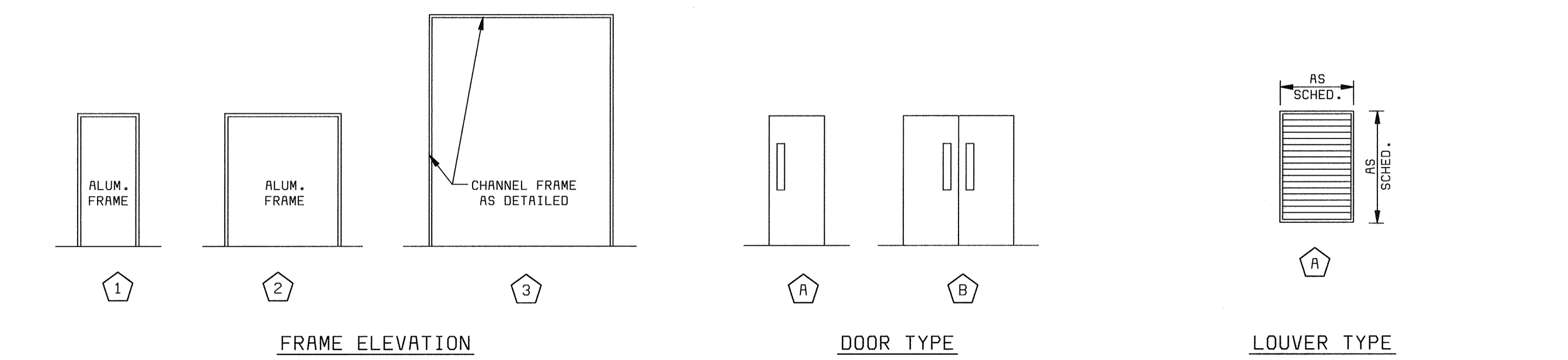
| BUILDING | SPACE NUMBER | SPACE NAME | FLOOR | WALL | CEILING | REMARKS |
|-----------------|--------------|-----------------|--------------------|--|--------------|---------|
| BLOWER BUILDING | B01 | BLOWER ROOM | CONCRETE W/ SEALER | MTL WALL PANEL/ ACST TREATMENT PANEL/CMU-PTD | EXPOSED CONC |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

DOOR SCHEDULE

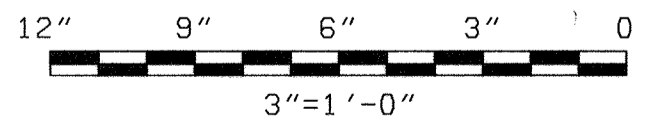
| BUILDING | DOOR NUMBER | DOOR SIZE | | | DOOR TYPE | MATERIAL | FRAME DETAILS | | | FRAME MATERIAL | FRAME ELEV. | REMARKS |
|-----------------|-------------|-----------|--------|--------|---------------|----------|---------------|------|--------|-------------------------------------|-------------|-----------------------------|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

LOUVER SCHEDULE

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

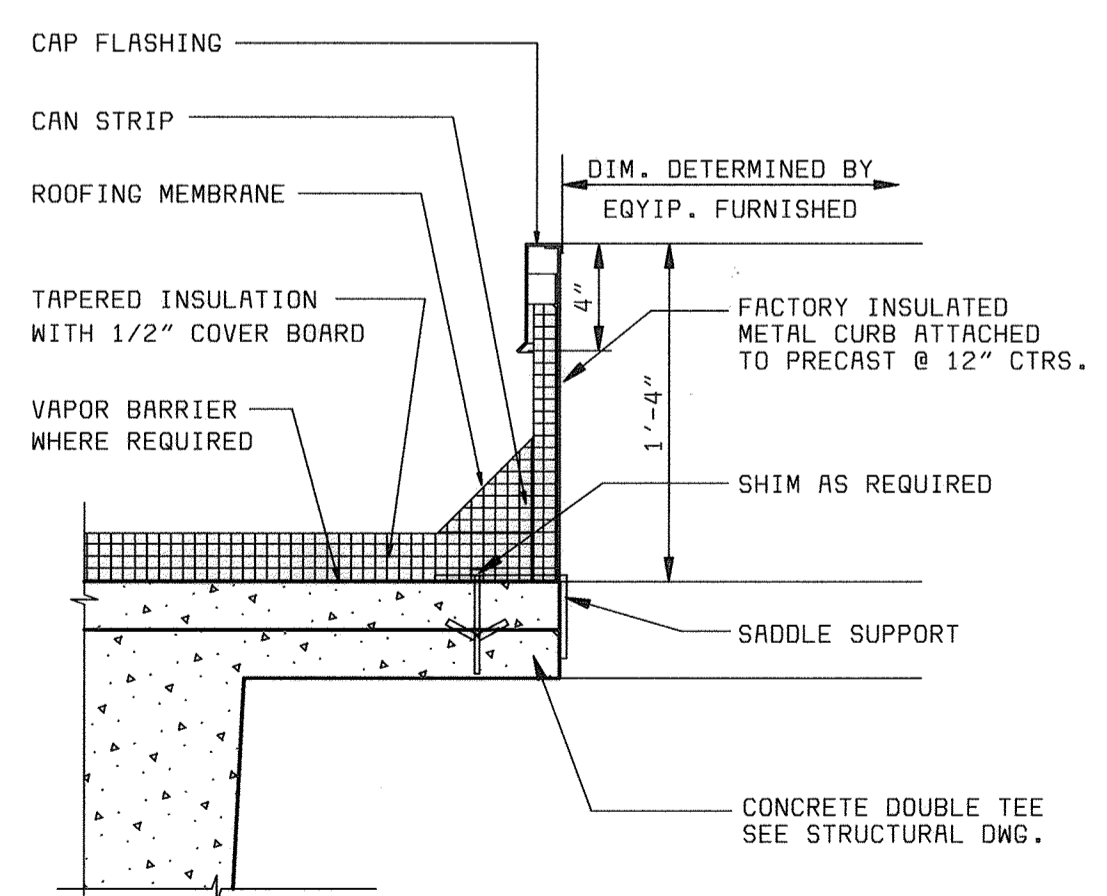
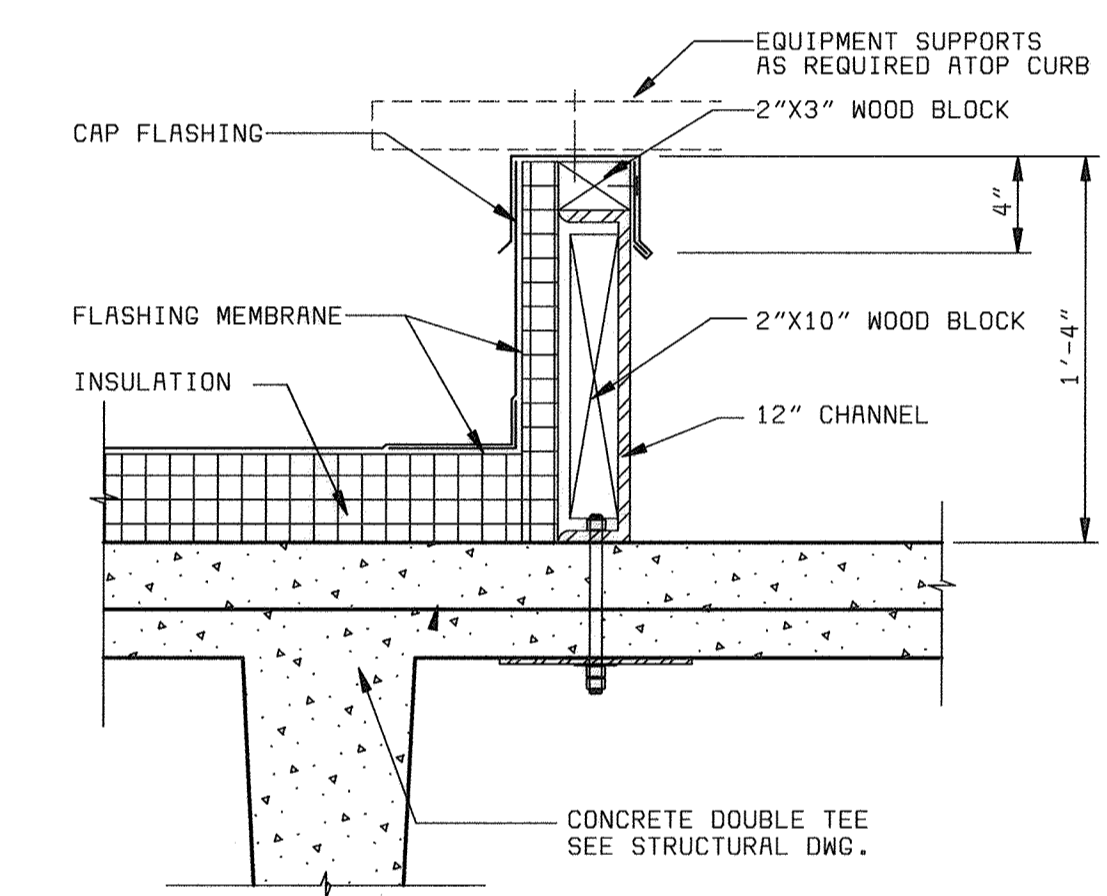
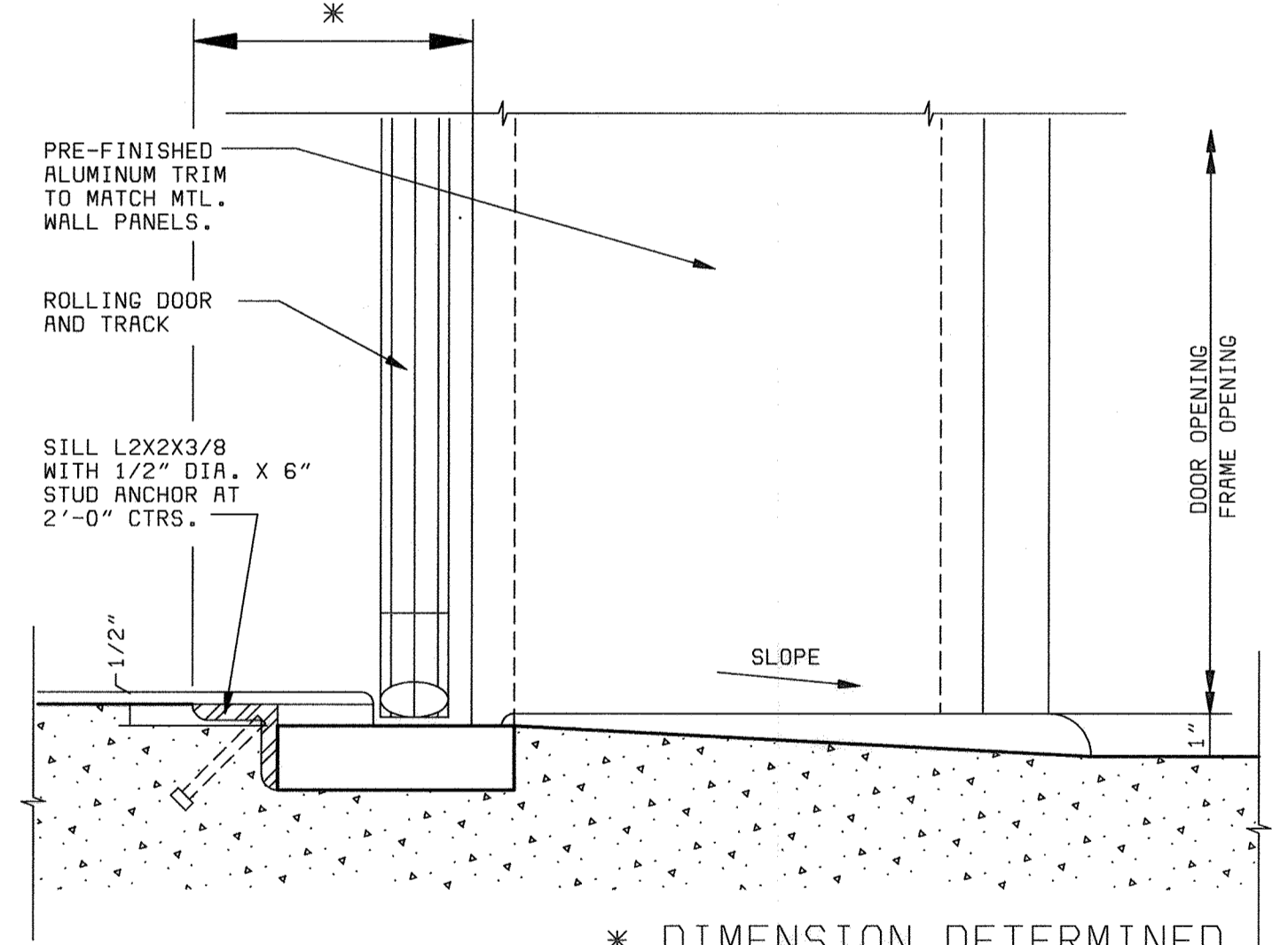
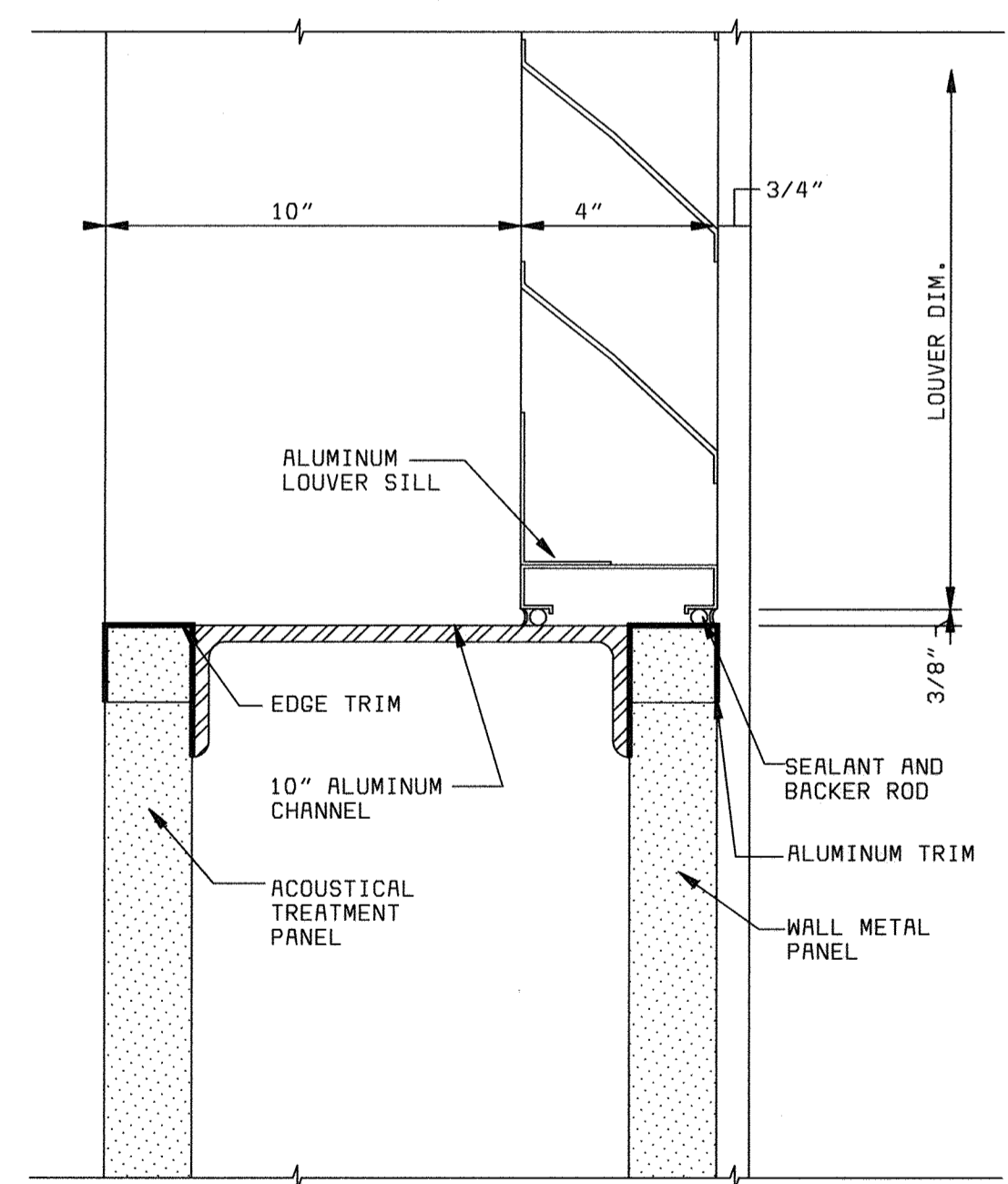
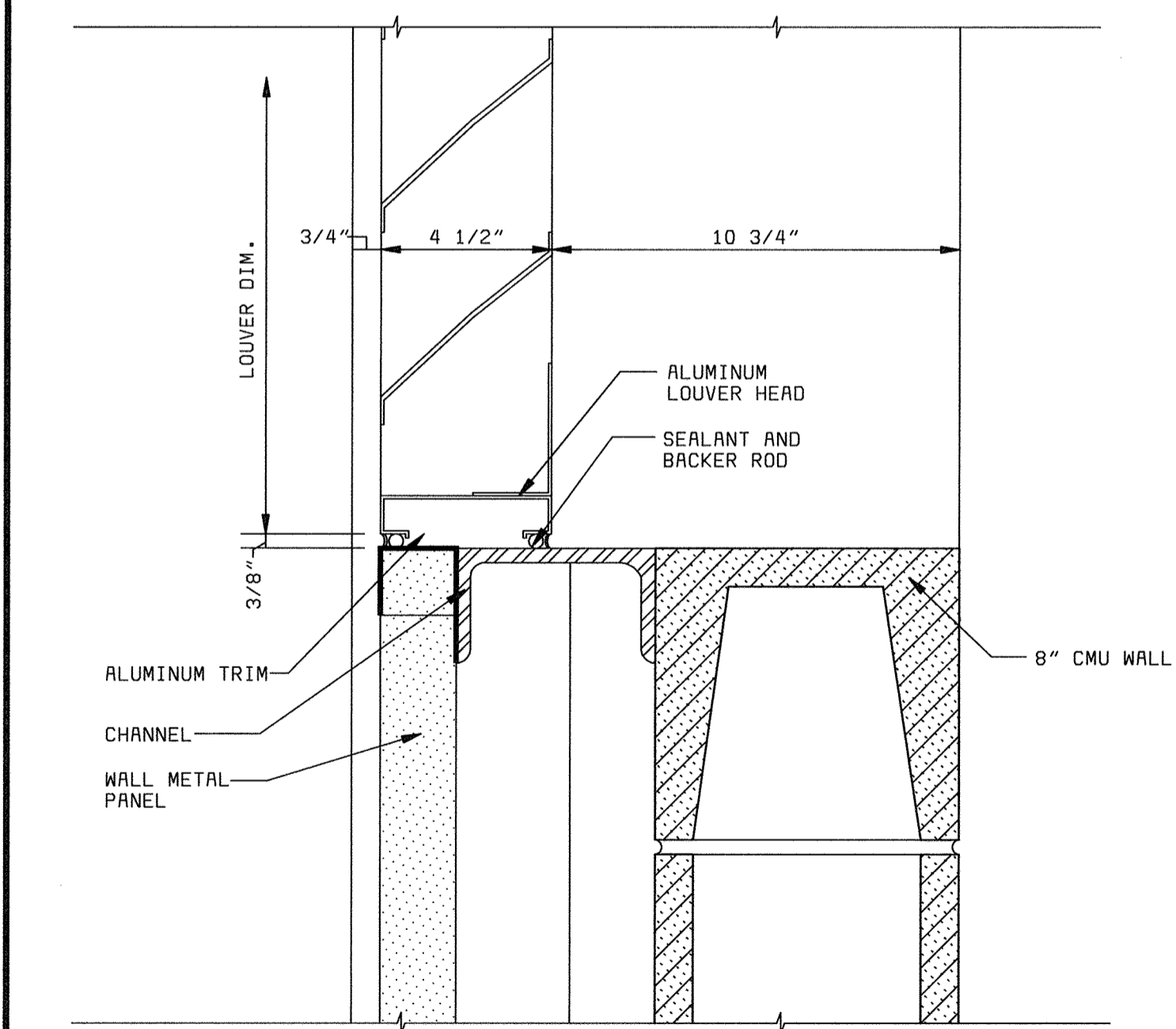
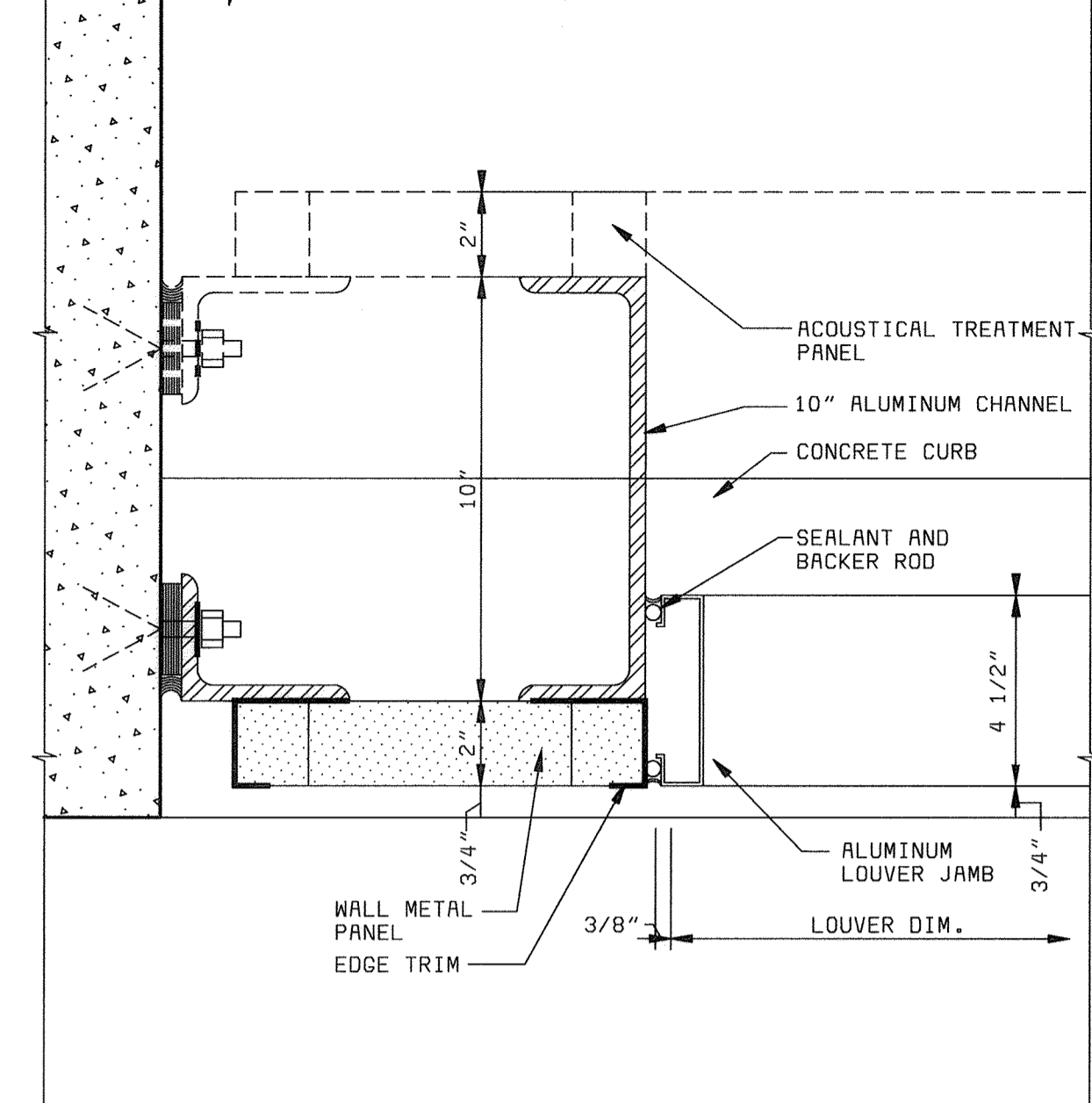
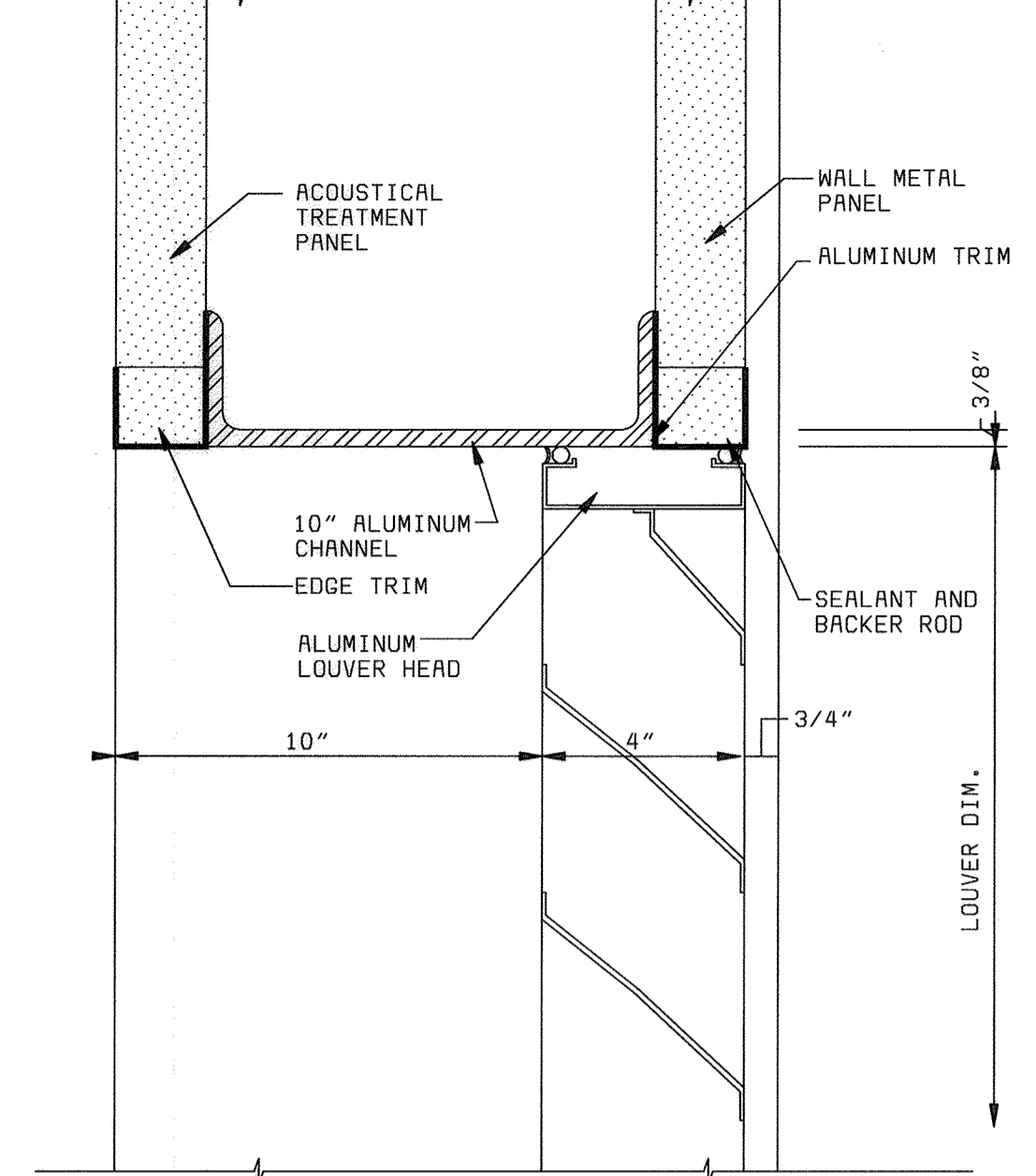
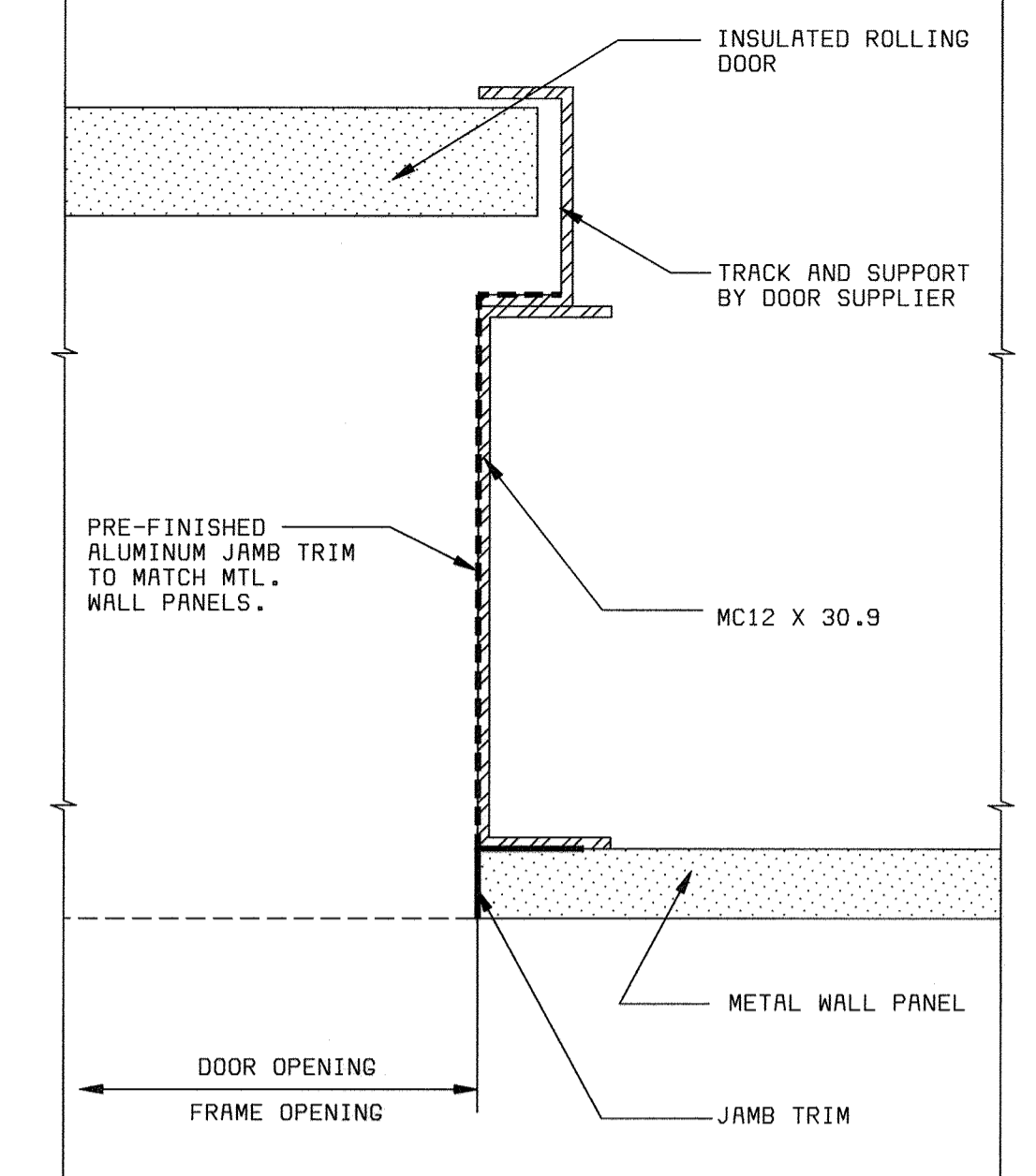
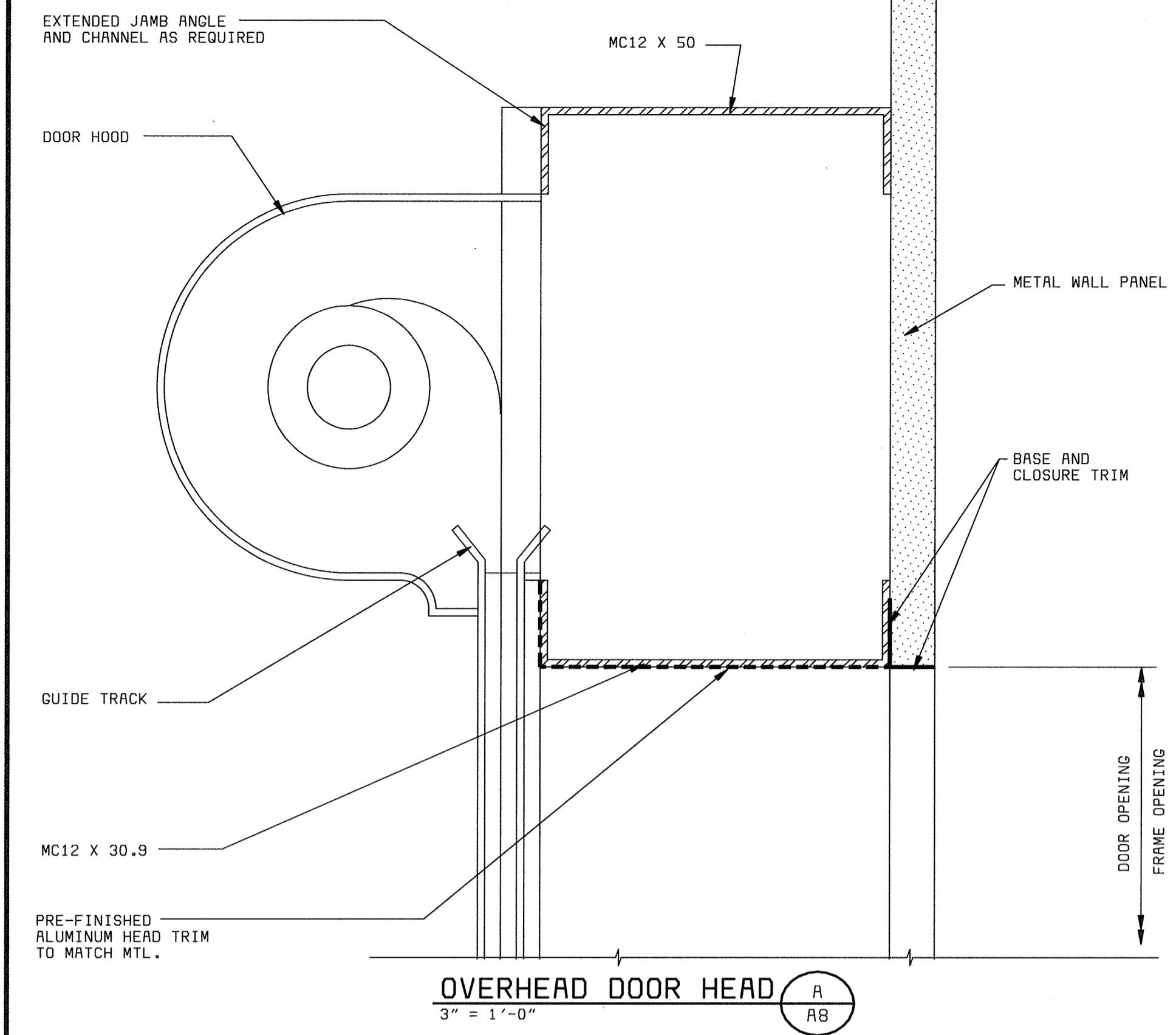


NOTES:
1. SEE DRAWING S23 FOR MASONRY DETAILS AND MINIMUM REINFORMENT AROUND OPENINGS



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DES: JTS
PDS: BTZ

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|--|---|---|--|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND bbw Architects • Designers • Planners Bryant Bryant Williams, P.C. 4001 Connecticut Avenue N.W., Suite 500 Washington, D.C. 20008 (202) 344-2100 <i>Charles S. Bryant</i> REG. PROF. ENGR. DATE | BLACK & VEATCH Gaithersburg, Maryland 1577-3 REGISTERED PROFESSIONAL ENGINEER STATE OF MARYLAND DATE: 6/23/00 | DES: CH/JS DRN: JS CHK: CH DATE: 6/23/00 | NORTH BLOWER BUILDING ARCHITECTURAL SCHEDULES AND DOOR AND LOUVER DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 41 OF 161 A7 |
|--|---|---|--|--|--|



NOTES:

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

12" 9" 6" 3" 0 1'

1 1/2" = 1'-0"

12" 9" 6" 3" 0

3" = 1'-0"

XKLOGO XMBB101

D58472 P058472A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert Beatty 6-24-00
CHIEF, BUREAU OF UTILITIES DATE

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

BLACK & VEATCH LP
Gaithersburg, Maryland

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

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

| DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP |
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NORTH BLOWER BUILDING
ARCHITECTURAL

DOOR AND LOUVER DETAILS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

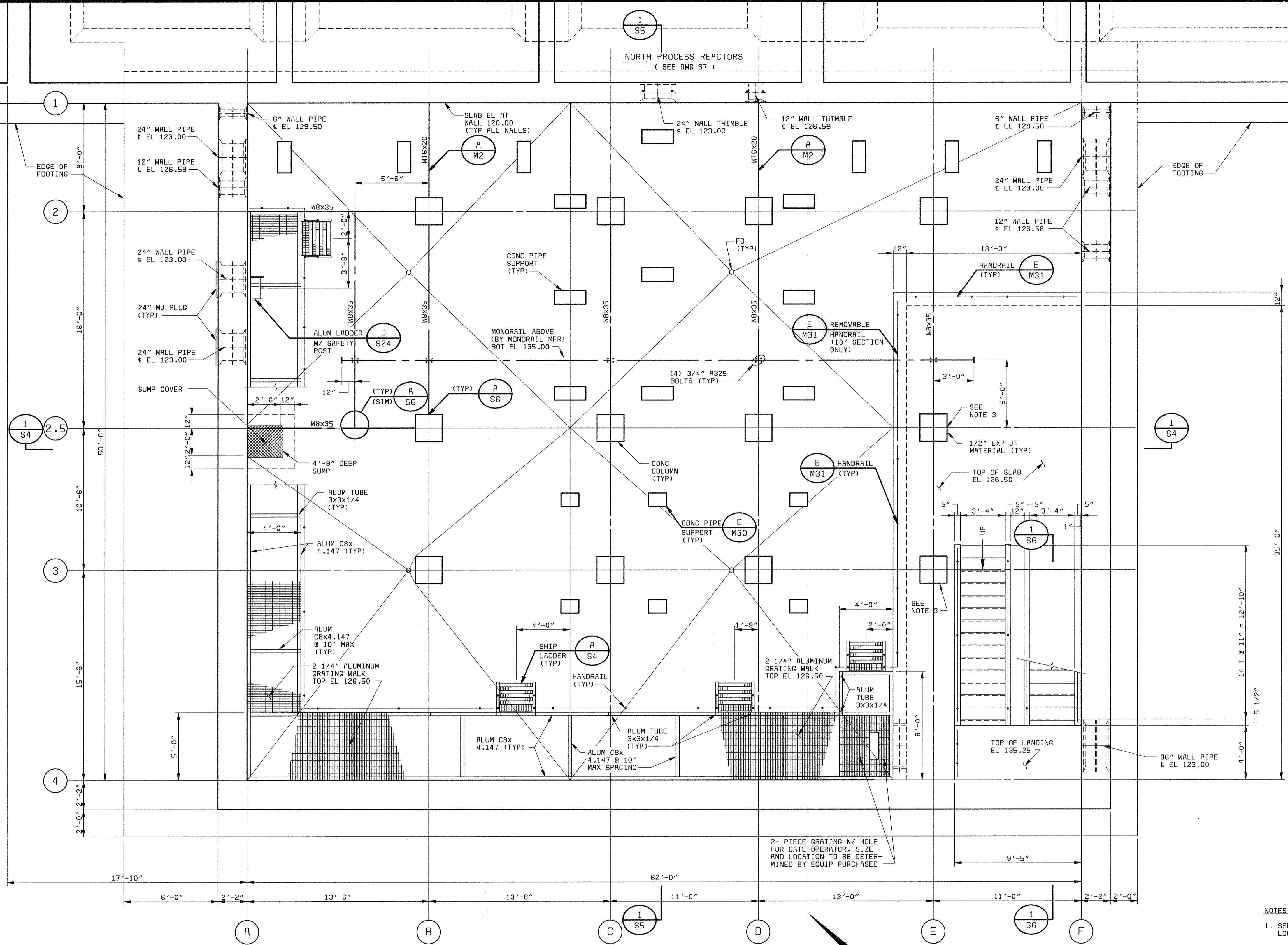
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 42 OF 161

A8

1 2 3 4 5 6 7 8 9 10



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

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

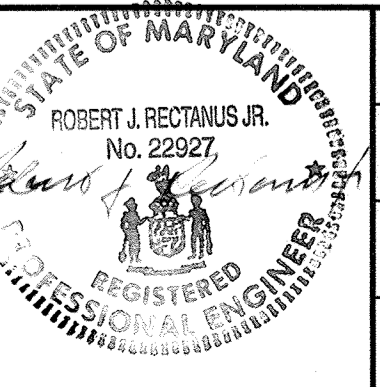
58472-101-PR-N-0000550

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

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



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

NORTH BLOWER BUILDING
STRUCTURAL

SECTIONAL PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

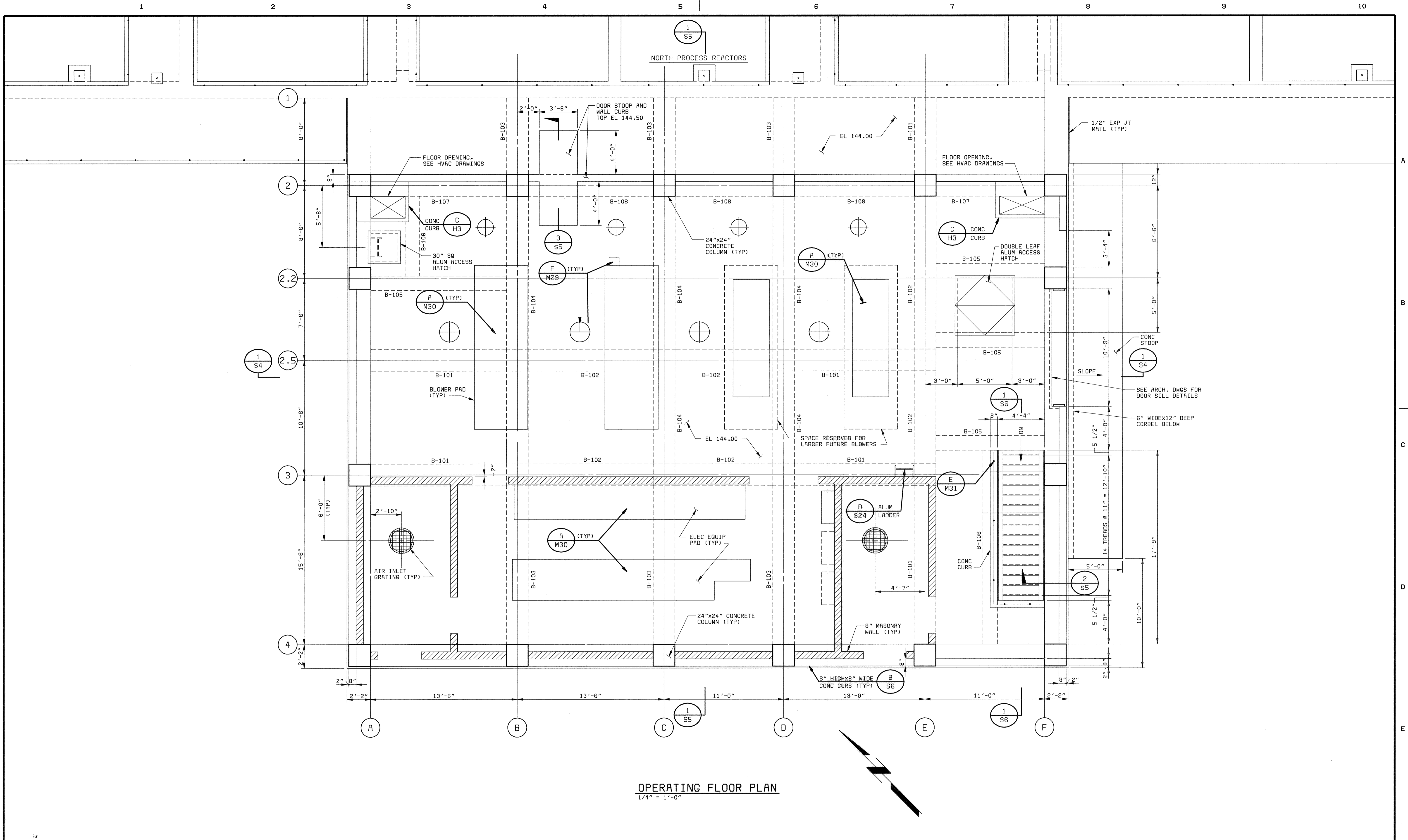
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 43 OF 161

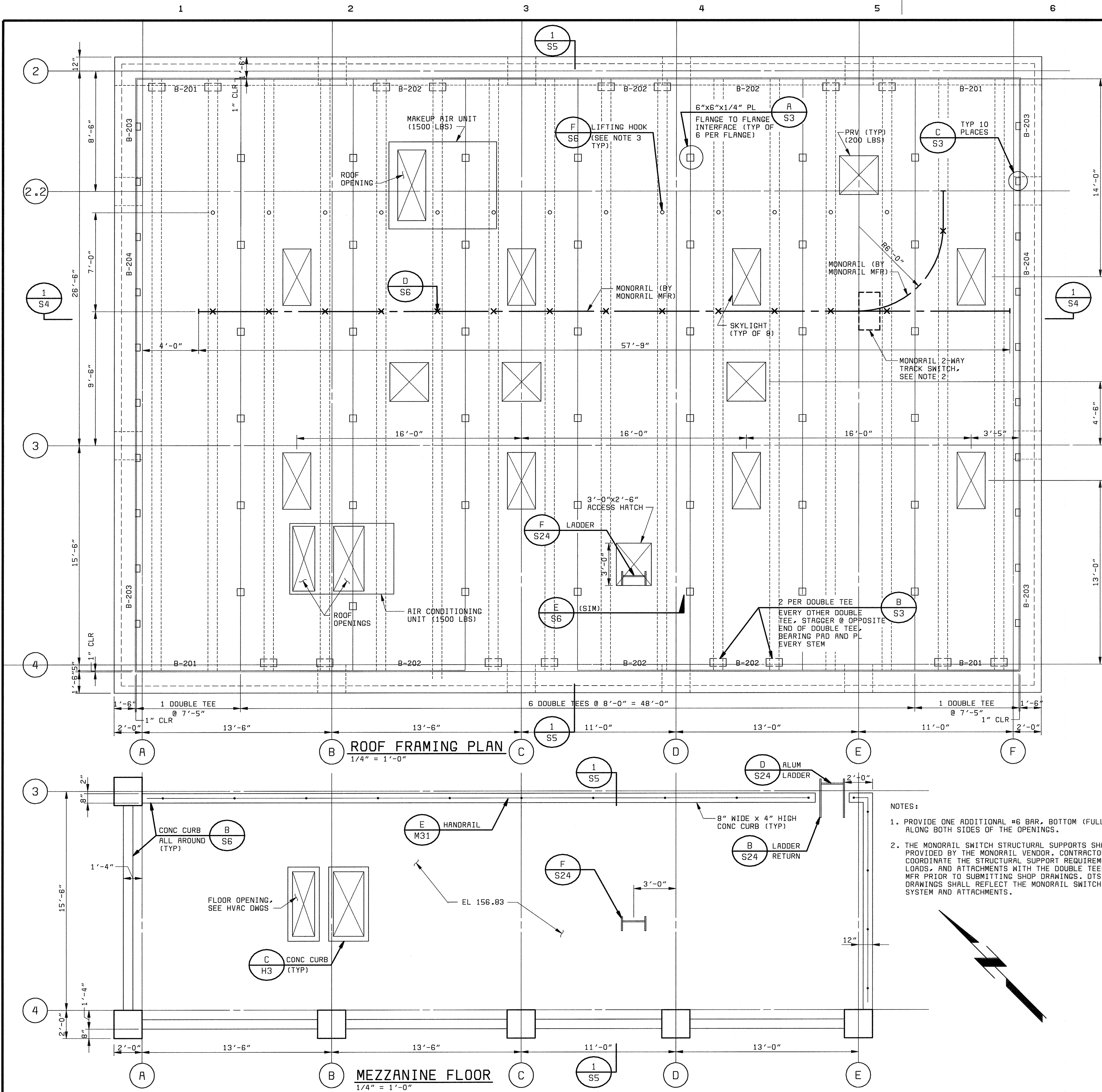
S1

06/27/2000 10:58:17Z



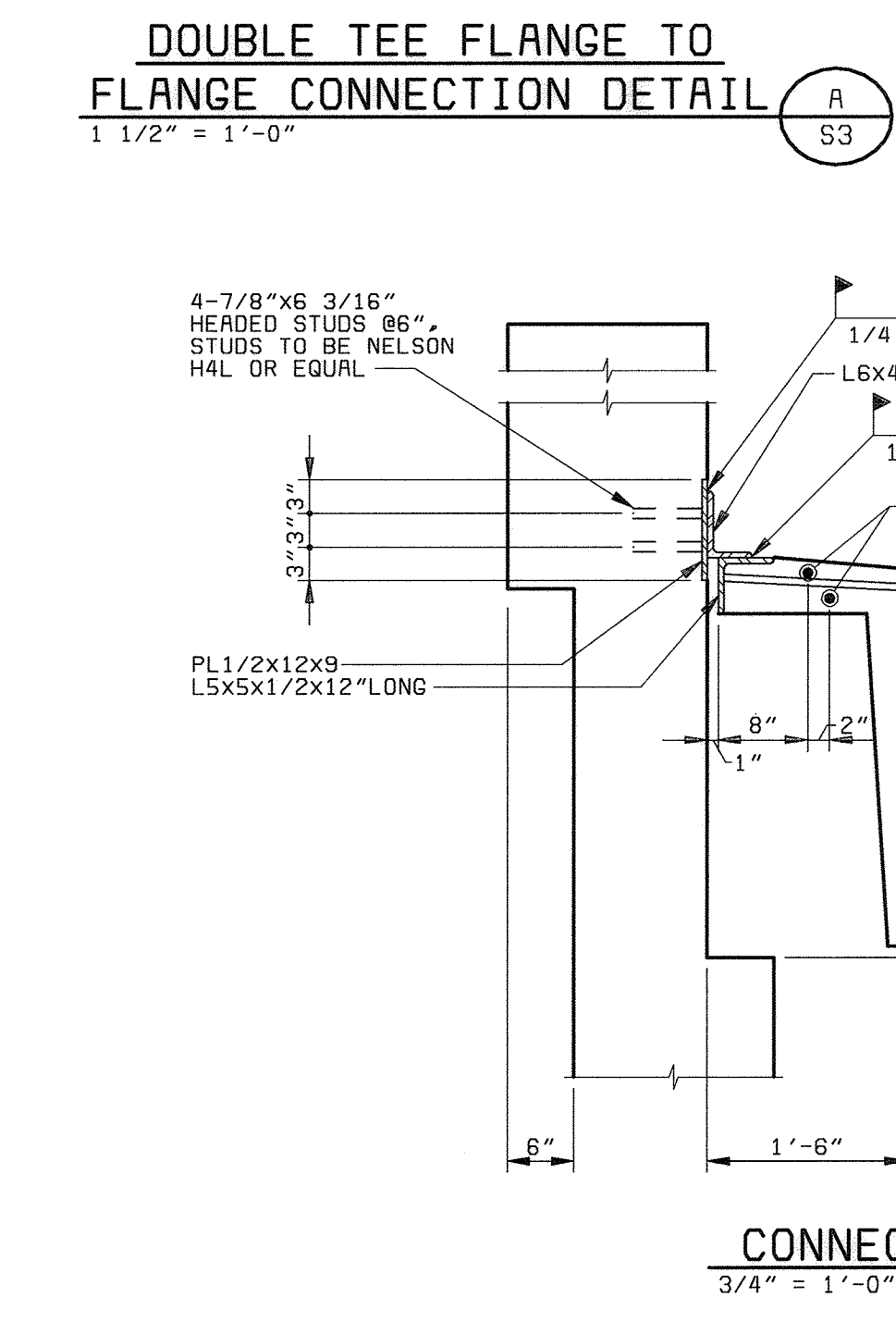
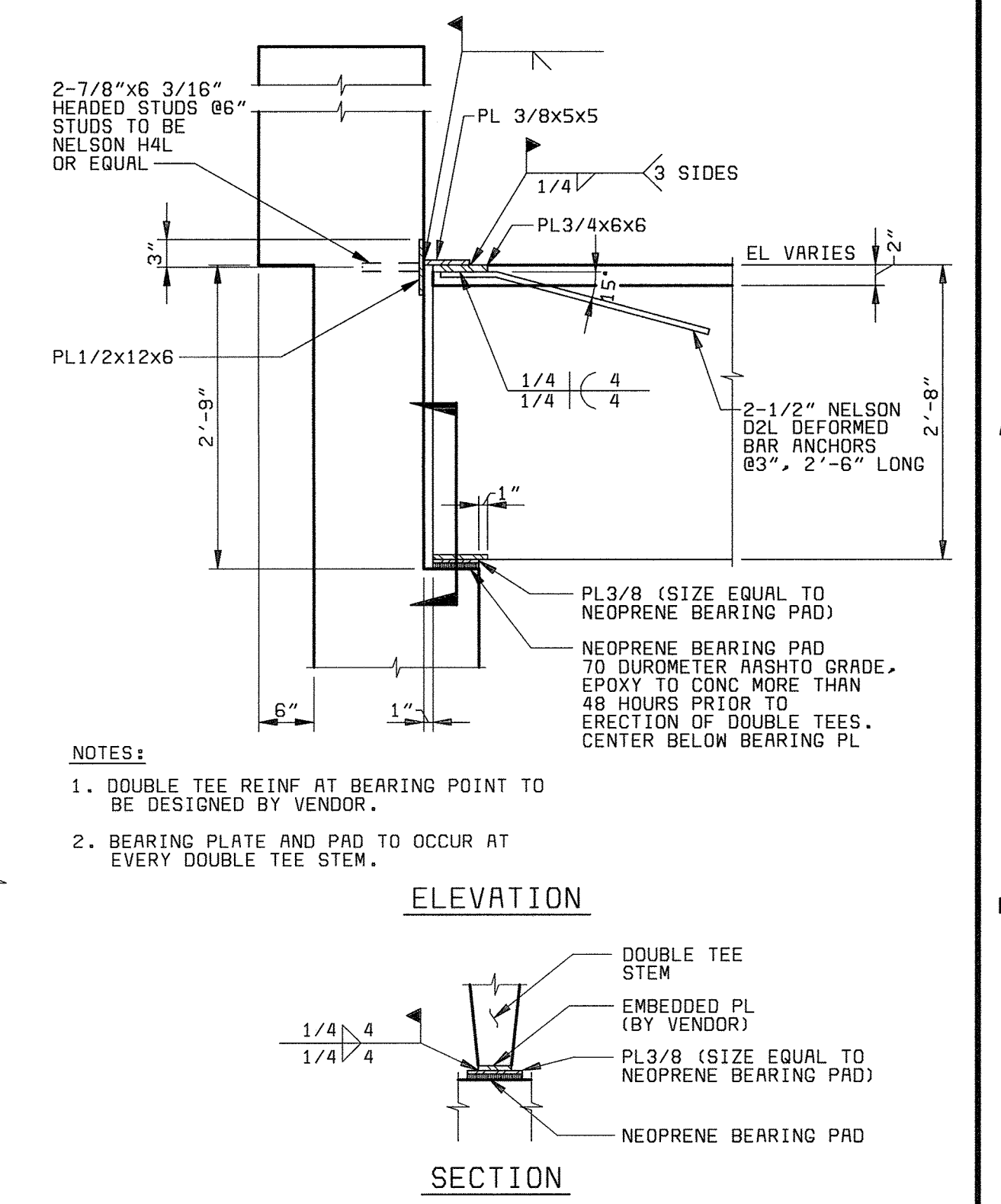
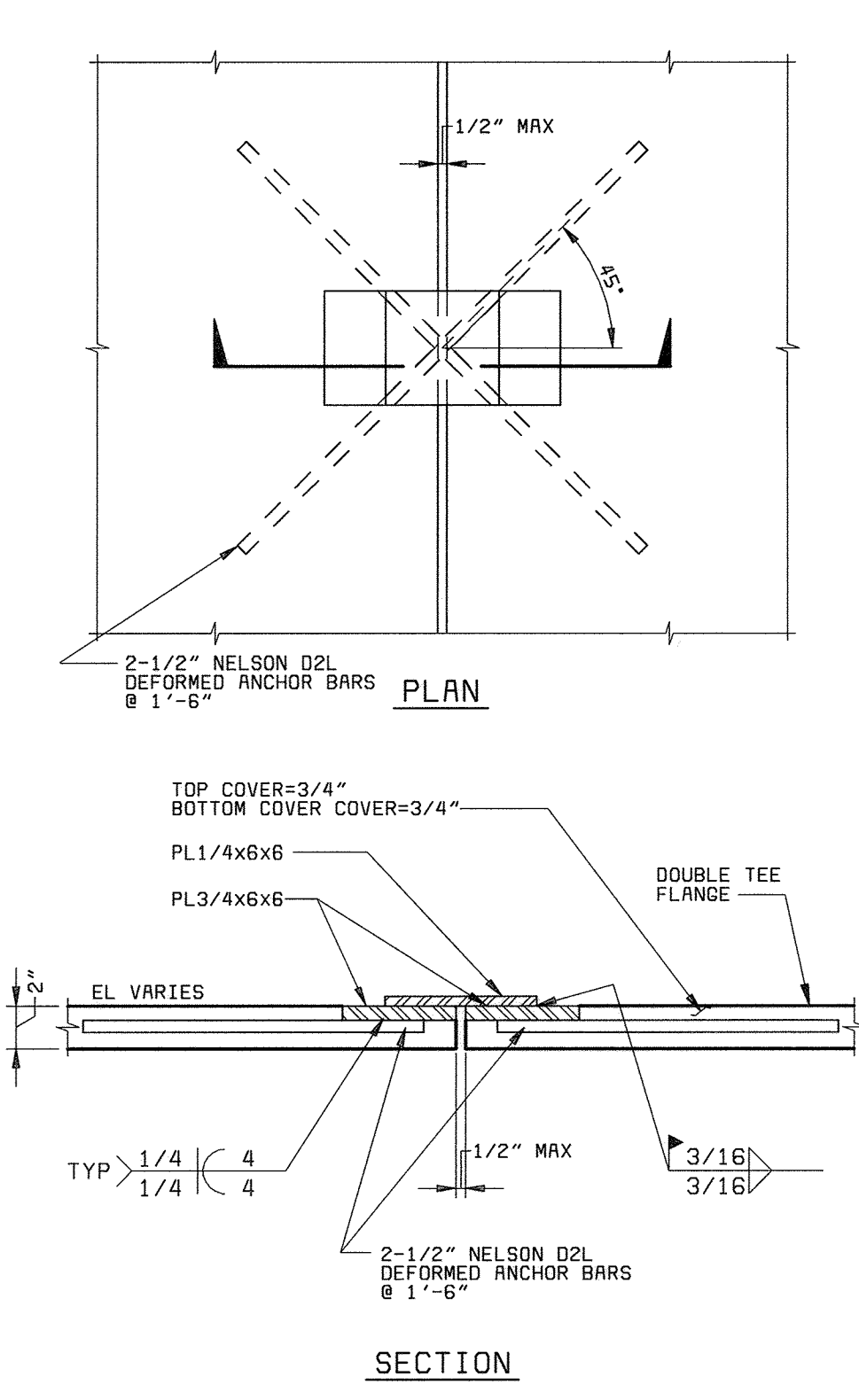
OPERATING FLOOR PLAN
1/4" = 1'-0"

| | | | | | | | | | | | |
|--|--|---|----------|----------|---------------|------|-------------------------------|-----|--|---|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert Berman</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH Gaithersburg, Maryland <i>Edward J. ...</i> 6/26/00 REG. PROF. ENGR. DATE | ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: IFH | | | | | | NORTH BLOWER BUILDING STRUCTURAL OPERATING FLOOR PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: SLF | CHK: NGM | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | | | BY |
| | | | | | | | | | | S2 | |



NOTES:

1. PROVIDE ONE ADDITIONAL #6 BAR, BOTTOM (FULL SPAN) ALONG BOTH SIDES OF THE OPENINGS.
2. THE MONORAIL SWITCH STRUCTURAL SUPPORTS SHALL BE PROVIDED BY THE MONORAIL VENDOR. CONTRACTOR SHALL COORDINATE THE STRUCTURAL SUPPORT REQUIREMENTS, LOADS, AND ATTACHMENTS WITH THE DOUBLE TEES (DTS) MFR PRIOR TO SUBMITTING SHOP DRAWINGS. DTS SHOP DRAWINGS SHALL REFLECT THE MONORAIL SWITCH SUPPORT SYSTEM AND ATTACHMENTS.



DOUBLE TEE NOTES:

1. ALL DOUBLE TEES ARE 32" DEEP WITH 2" TOP FLANGES. TOP SLAB OF DOUBLE TEE TO HAVE MINIMUM STEEL REINFORCEMENT OF 4x4-W2.9xW2.9 WWF.
2. PENETRATIONS SHOWN ON THIS SHEET ARE APPROXIMATE IN NUMBER, LOCATION, AND SIZE. SEE ARCHITECTURAL, HVAC, MECHANICAL, AND PLUMBING DRAWINGS FOR NUMBER, LOCATION, AND SIZE. CONTRACTOR RESPONSIBLE FOR COORDINATION AMONG DISCIPLINES. NO PENETRATIONS AT DOUBLE TEE STEMS.
3. IN ADDITION TO THE REQUIRED LIVE AND DEAD LOADS, DOUBLE TEES SHALL BE DESIGNED FOR THE FOLLOWING LOAD COMBINATIONS:
 (A) DL + LL + LIFTING HOOK LOAD (10,000 LBS)
 (B) DL + LL + LIFTING HOOK LOAD (4,000 LBS) MONORAIL LOADING (13,000 LBS)
 (C) DL + LL + MONORAIL LOADING (13,000 LBS)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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

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

NORTH BLOWER BUILDING
STRUCTURAL

MEZZANINE FLOOR PLAN,
ROOF FRAMING PLAN, AND DETAILS

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

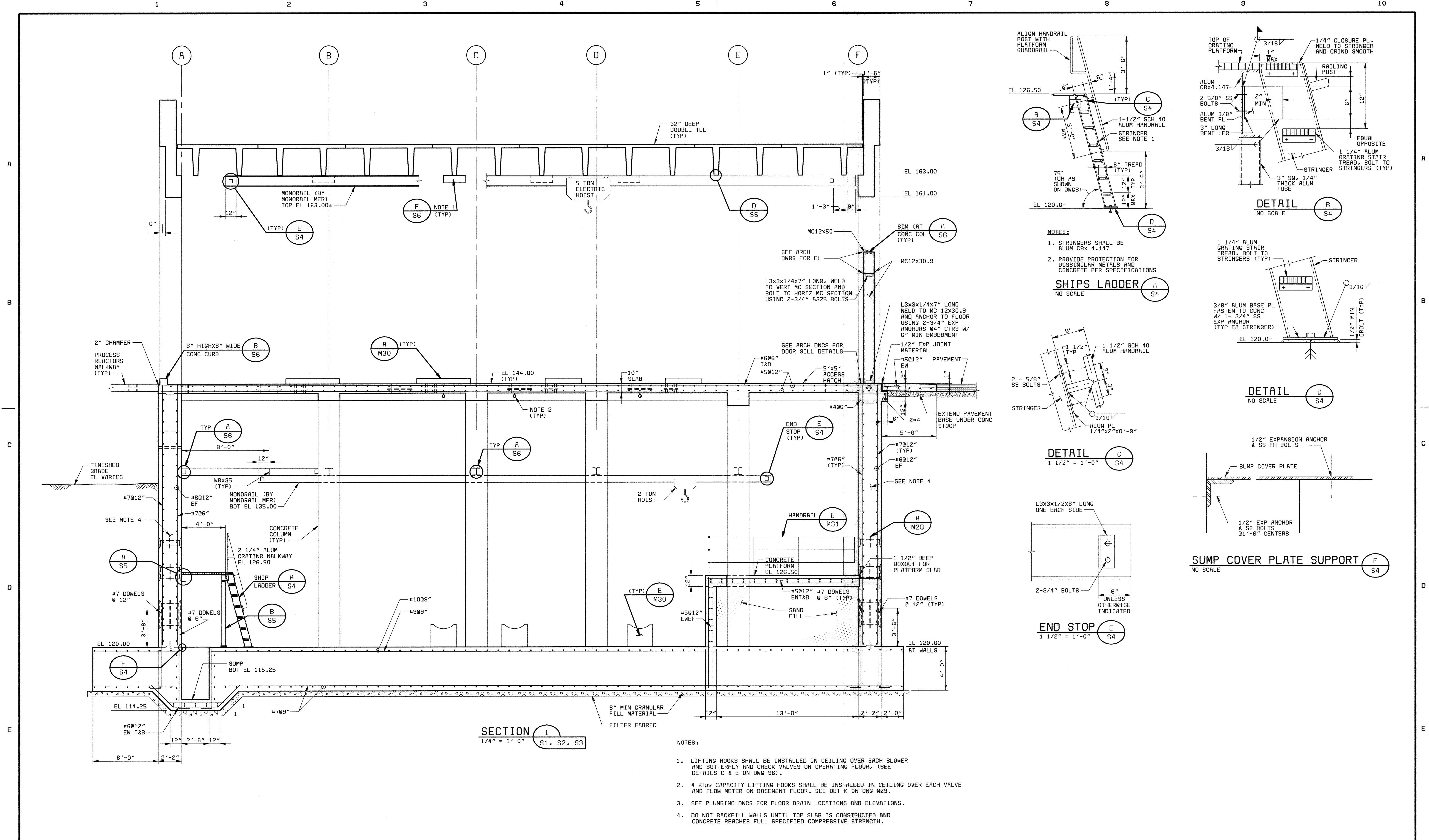
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

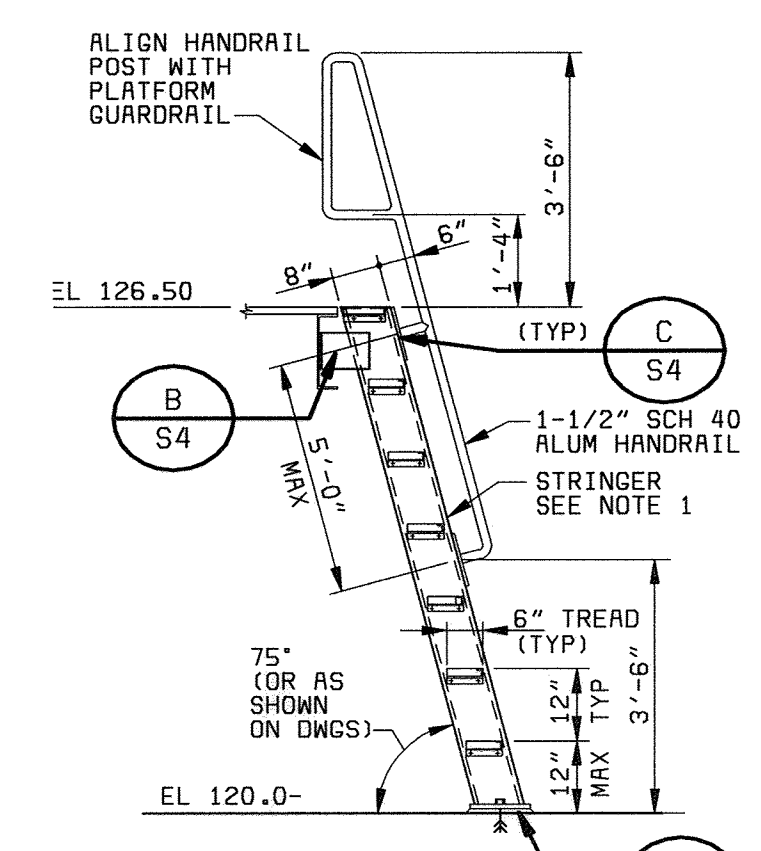
SHEET 45 OF 161

S3

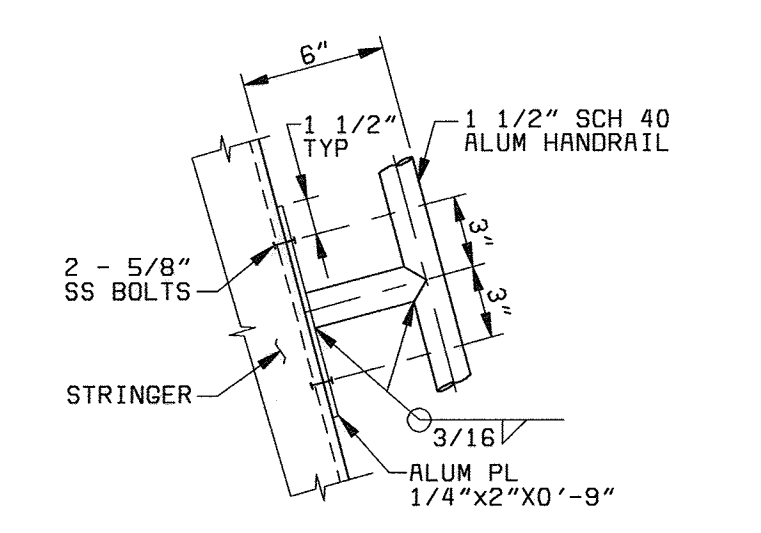


SECTION 1
1/4" = 1'-0" S1, S2, S3

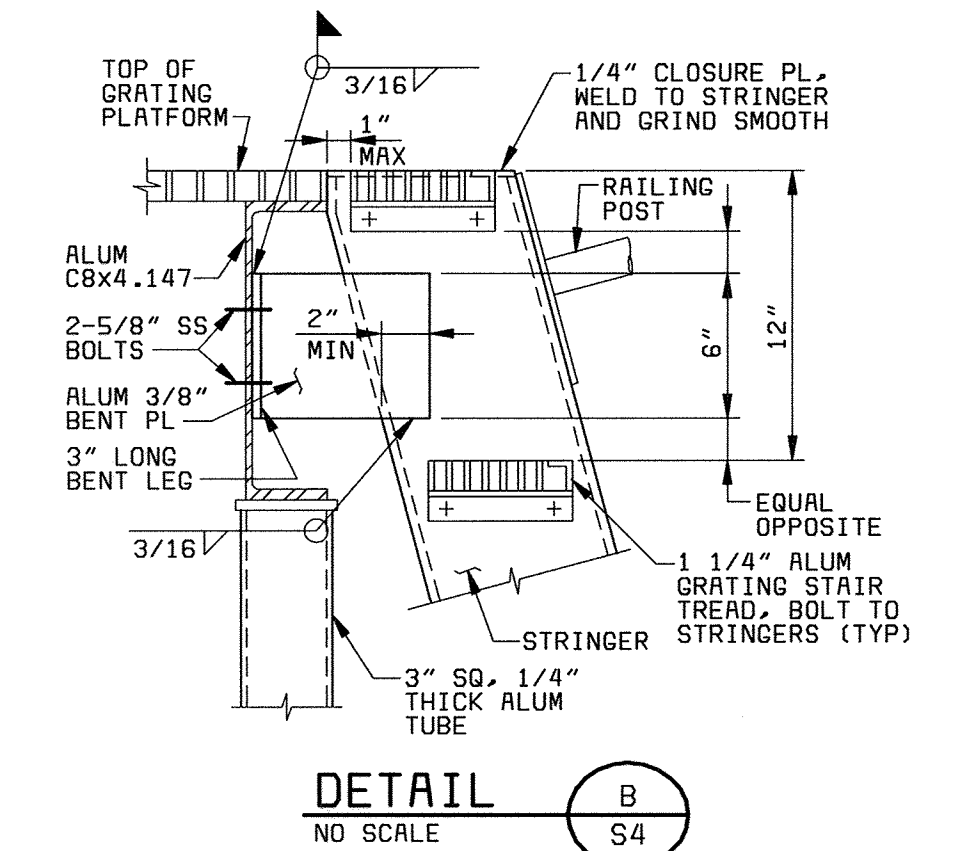
- NOTES:
1. LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH BLOWER AND BUTTERFLY AND CHECK VALVES ON OPERATING FLOOR. (SEE DETAILS C & E ON DWG S6).
 2. 4 KIPS CAPACITY LIFTING HOOKS SHALL BE INSTALLED IN CEILING OVER EACH VALVE AND FLOW METER ON BASEMENT FLOOR. SEE DET K ON DWG M29.
 3. SEE PLUMBING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



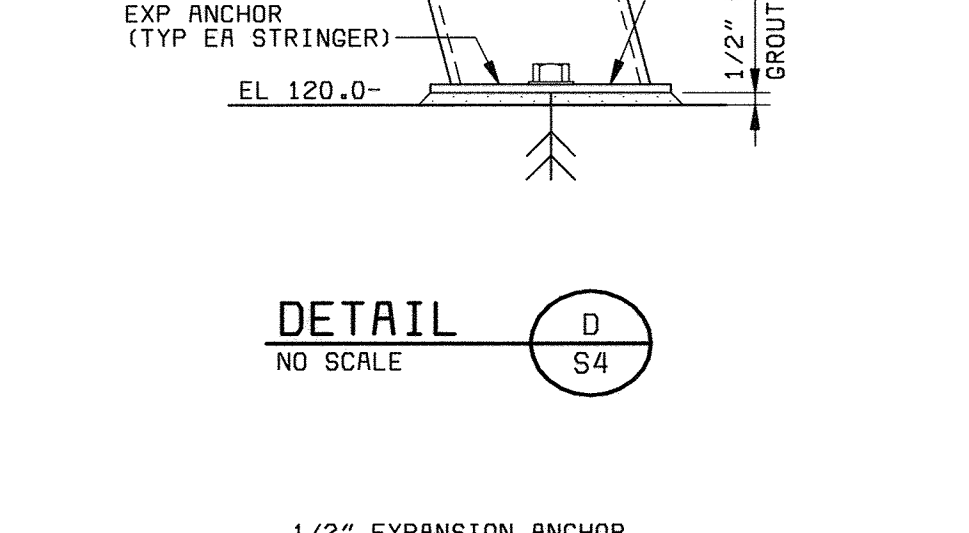
SHIPS LADDER
NO SCALE S4



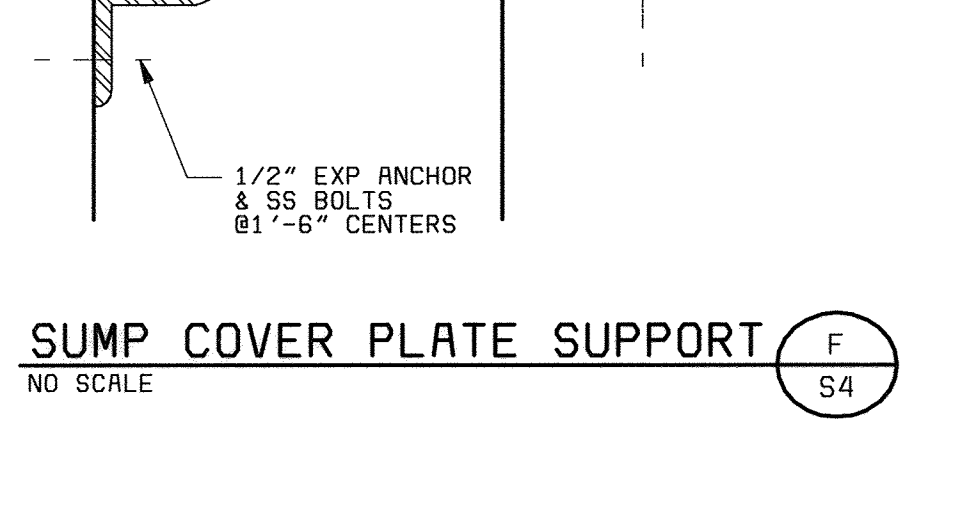
END STOP
1 1/2" = 1'-0" S4



SUMP COVER PLATE SUPPORT
NO SCALE S4

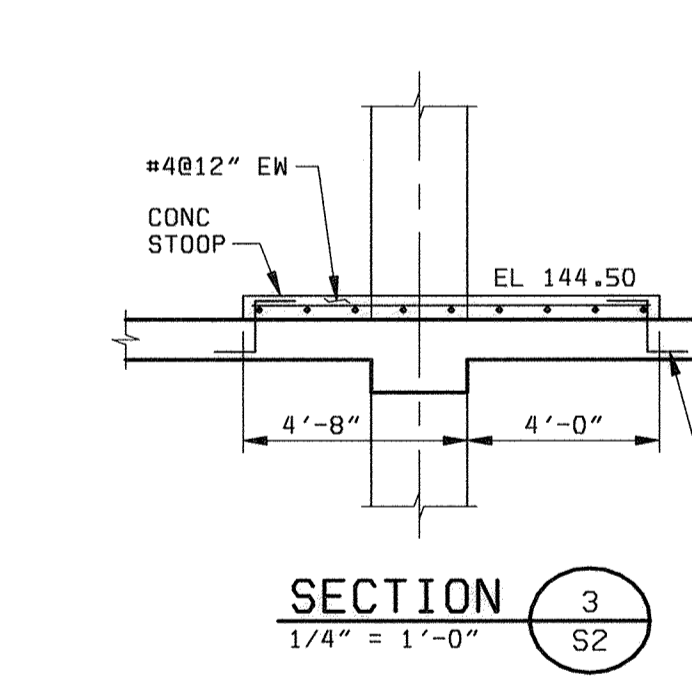
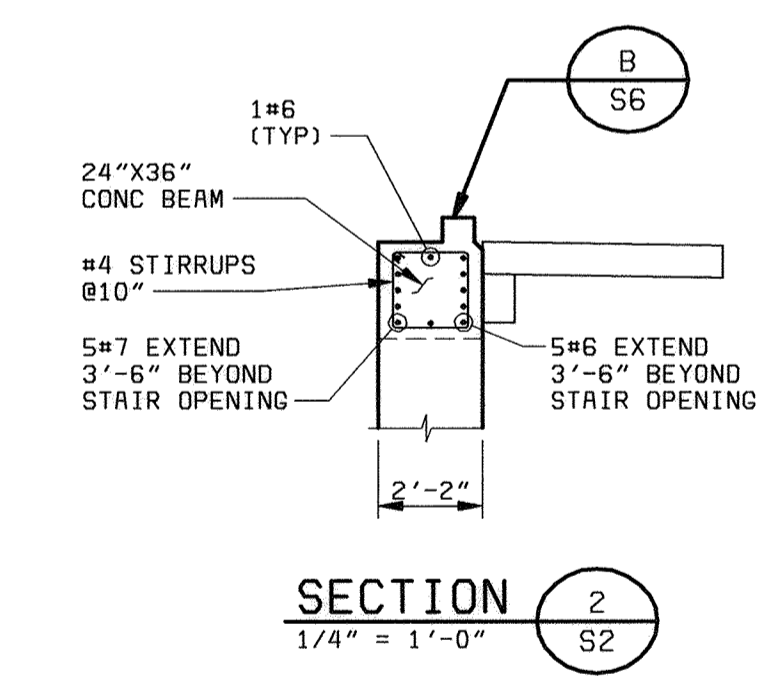
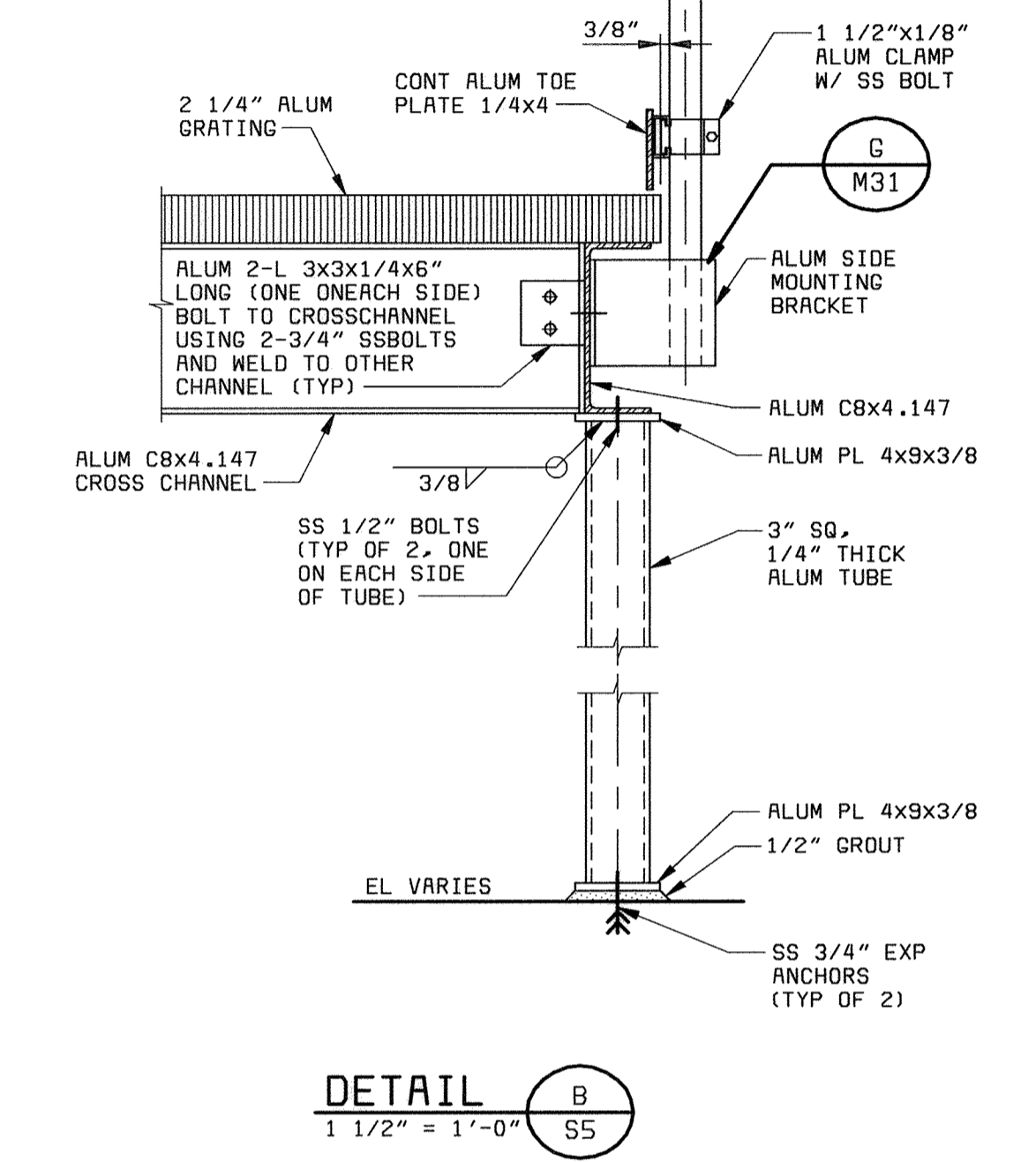
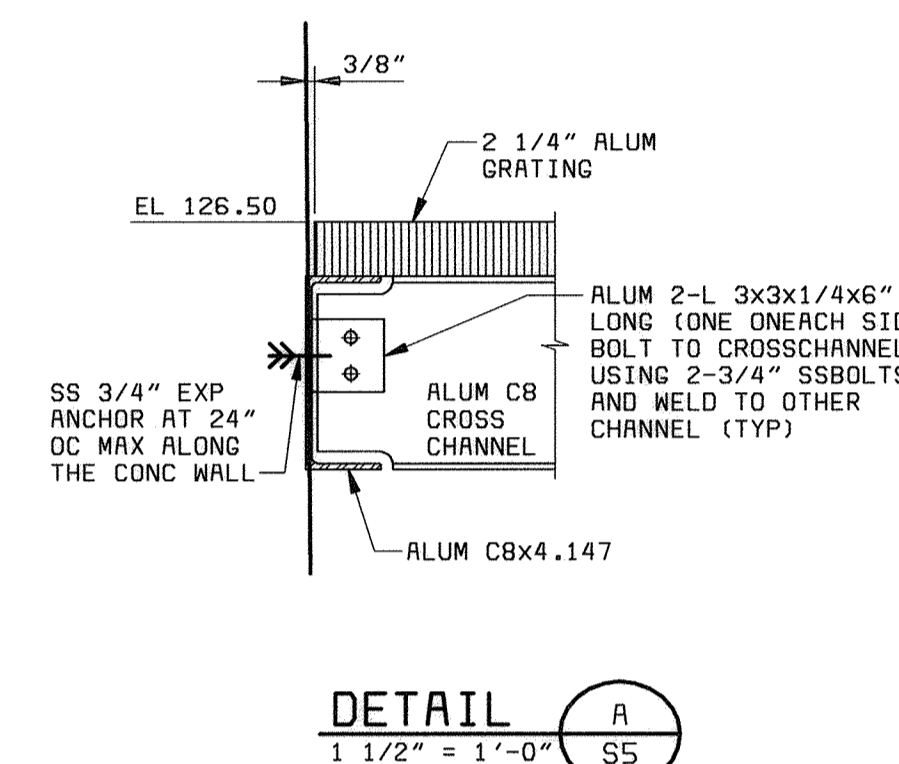
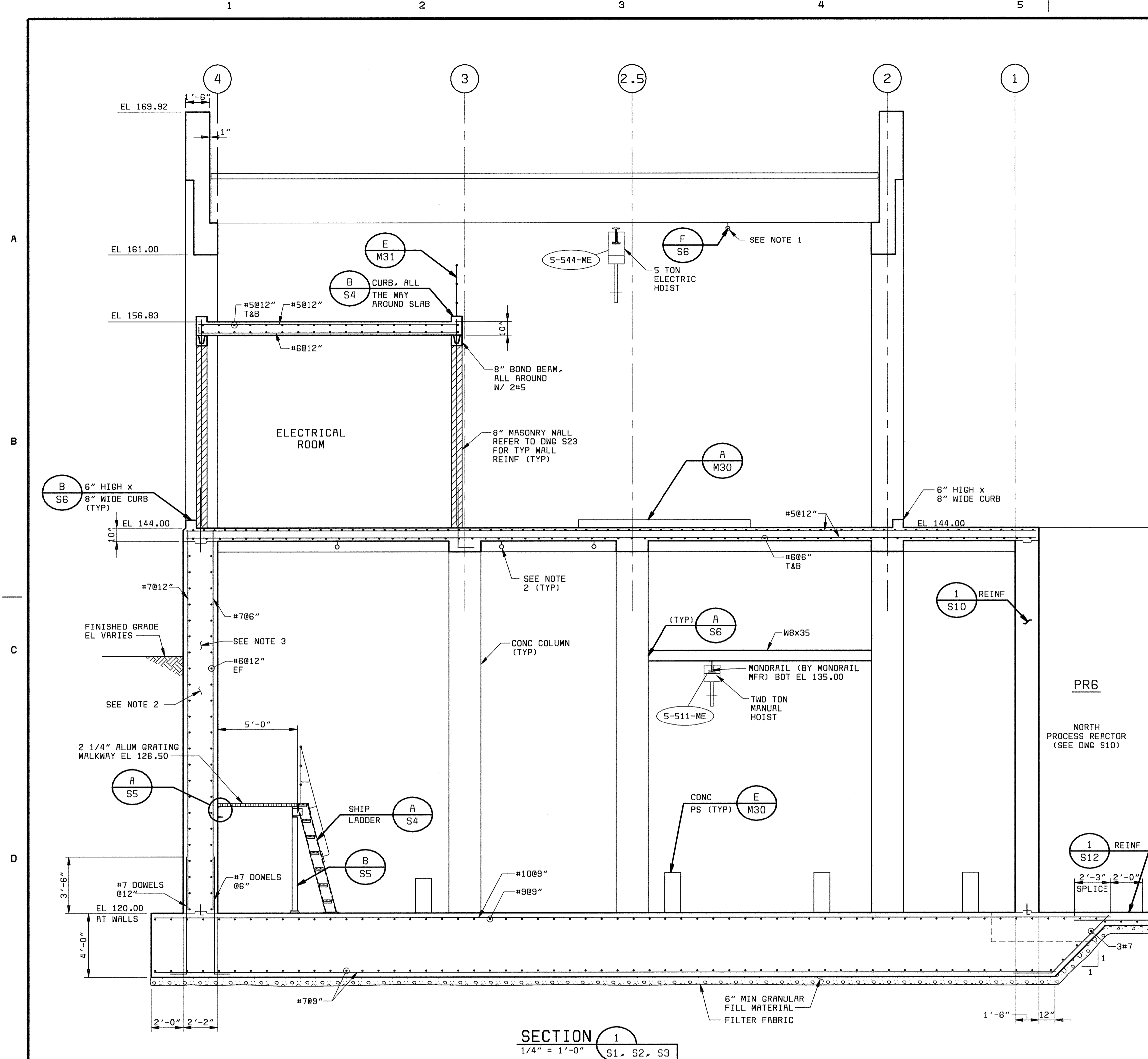


SHIPS LADDER
NO SCALE S4



SUMP COVER PLATE SUPPORT
NO SCALE S4

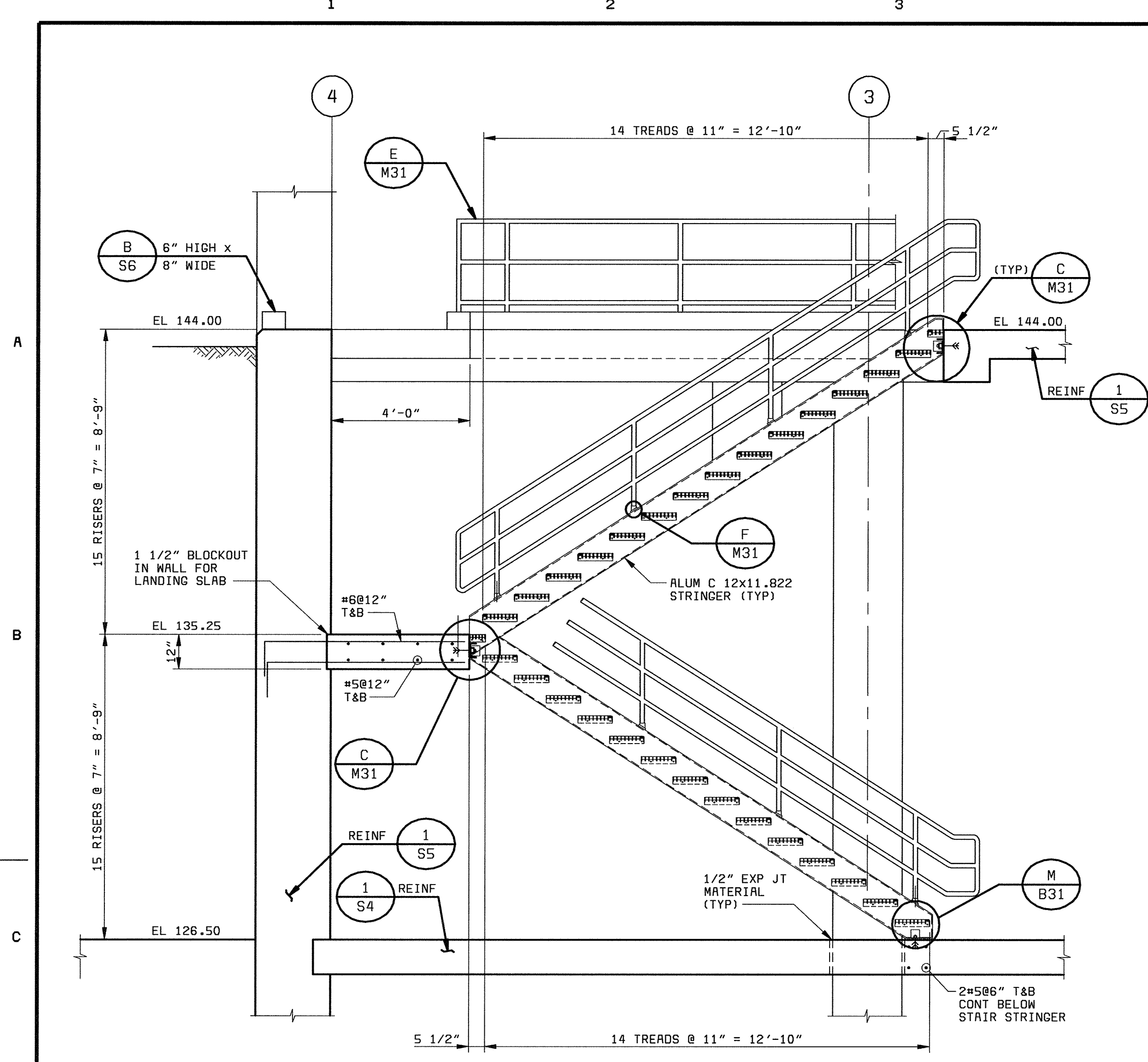
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|---|--|--------------------------------------|---------------|-------------------------------------|---|-------------------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert J. Reitan</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | Gaithersburg, Maryland <i>Robert J. Reitan</i> 6/26/00 REG. PROF. ENGR. DATE | REGISTERED PROFESSIONAL ENGINEER | DES: IFH | NORTH BLOWER BUILDING STRUCTURAL | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION | SCALE AS SHOWN |
| | | | DRN: RLC | | | CONTRACT NO. 20-3752 |
| | | | CHK: NGM | SECTION AND DETAILS | CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 | |
| | | | DATE: 6/23/00 | | | HOWARD COUNTY, MARYLAND |
| | | | DATE | REVISIONS AND RECORD OF ISSUE | | |



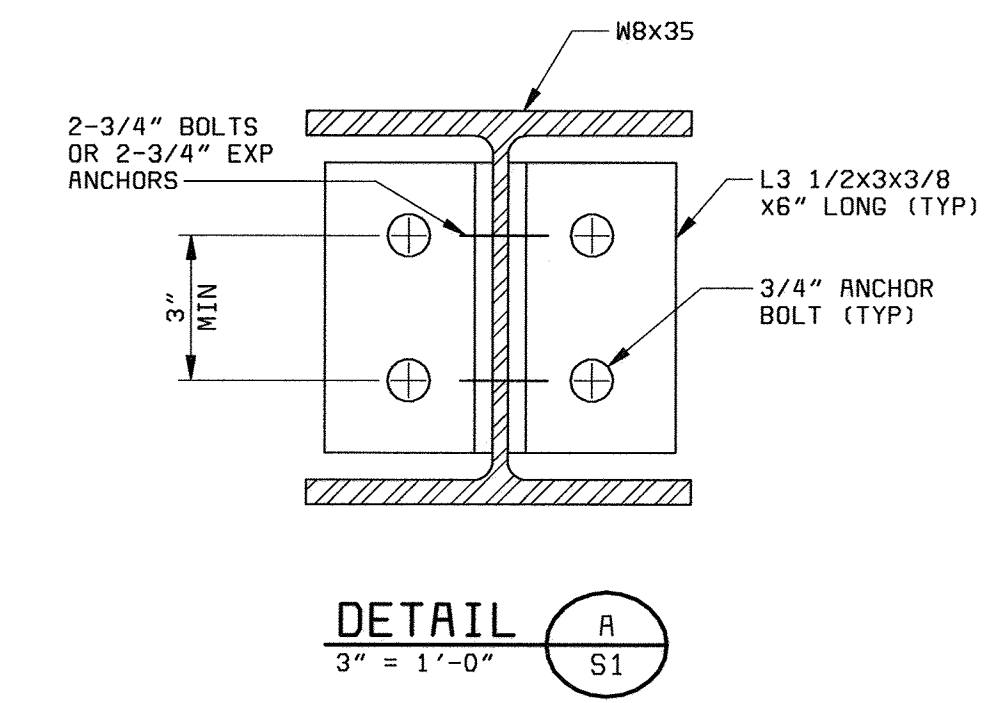
SECTION 1
1/4" = 1'-0"
S1, S2, S3

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

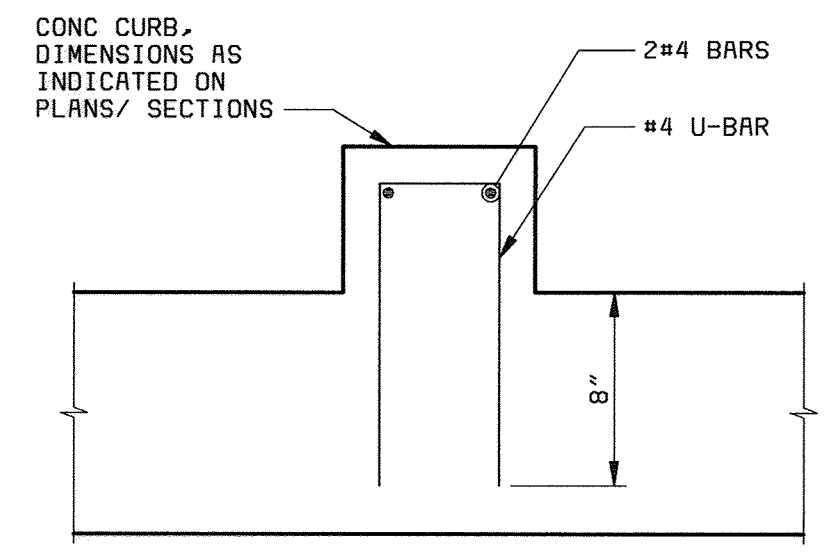
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|--|--|---|---|--|-----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Rectanus Jr. CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LP Gaithersburg, Maryland Robert J. Rectanus Jr. No. 22927 REGISTERED PROFESSIONAL ENGINEER REG. PROF. ENGR. DATE | DES: IFH DRN: RLC CHK: NGM DATE: 6/23/00 | NORTH BLOWER BUILDING STRUCTURAL SECTIONS AND DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | | | SHEET 47 OF 161 |



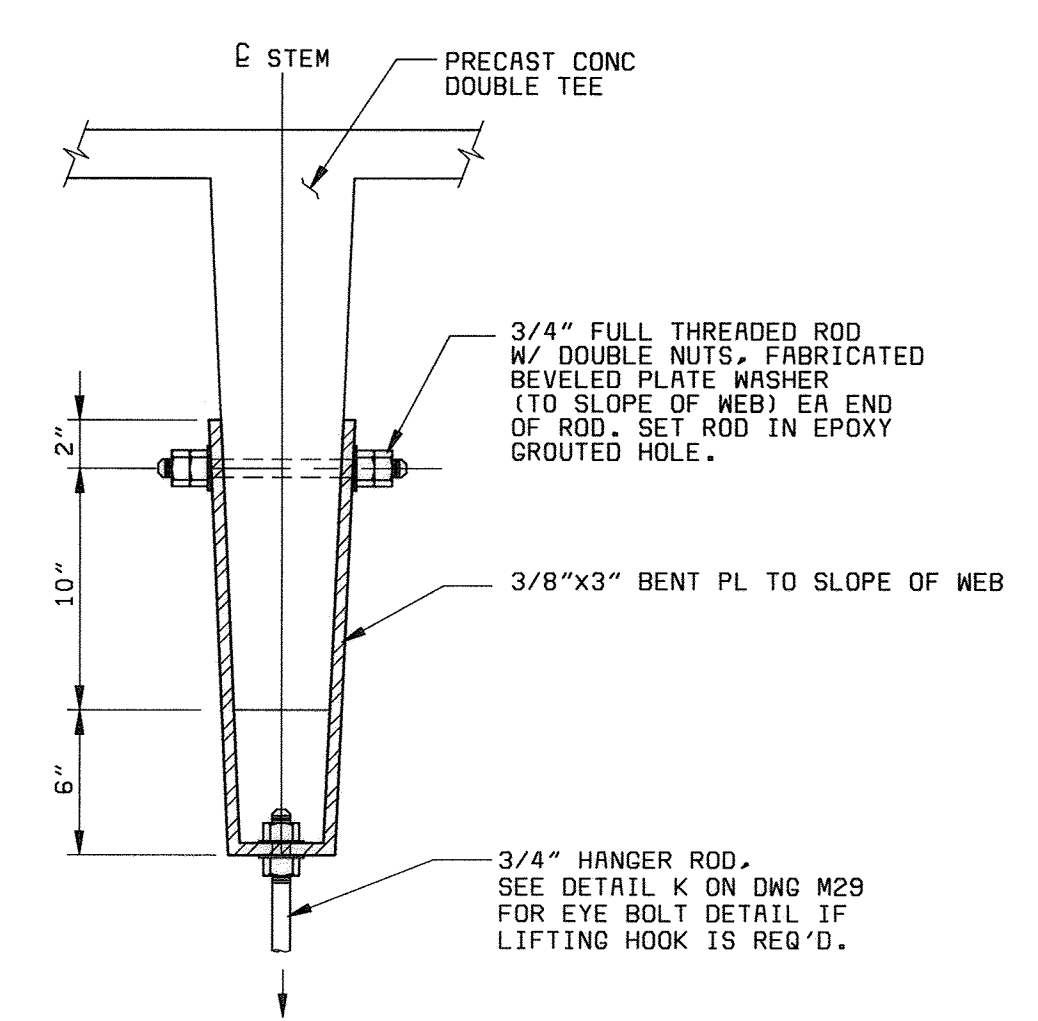
SECTION 1
3/8" = 1'-0"



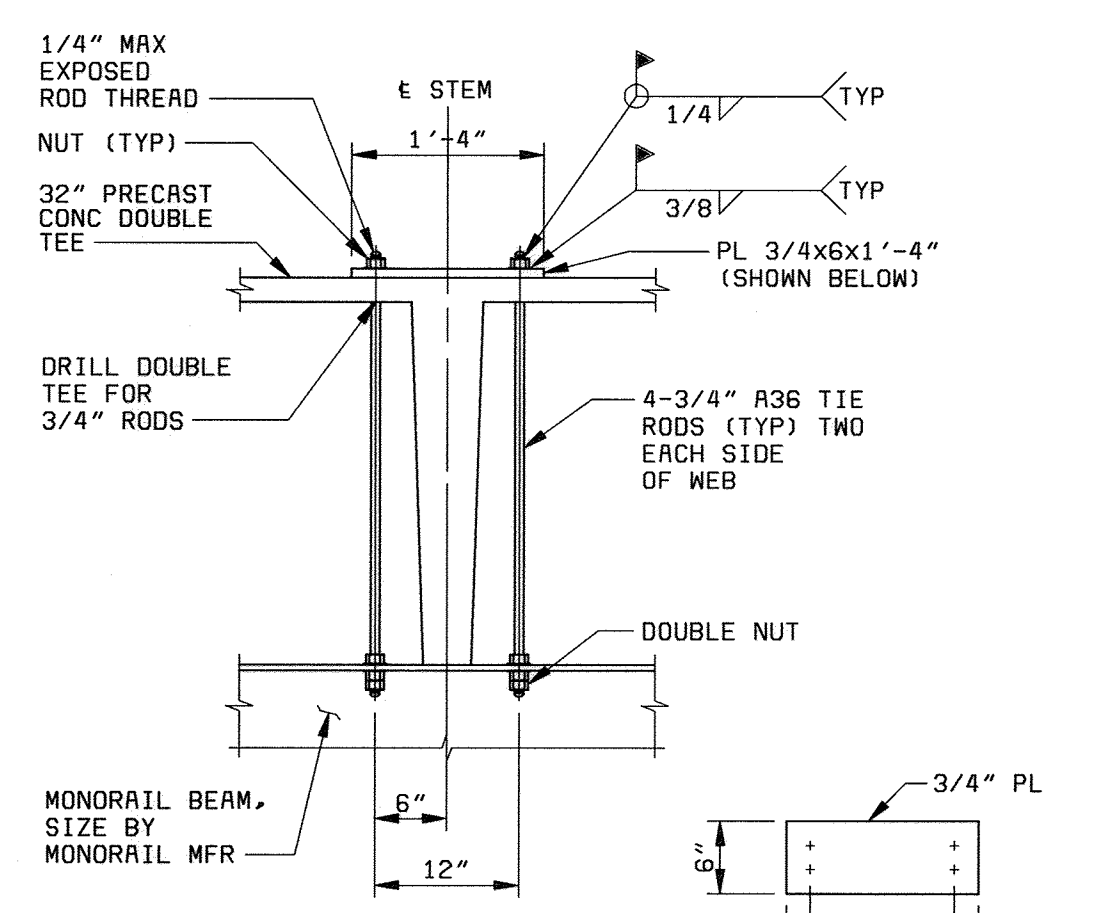
DETAIL A
3" = 1'-0"



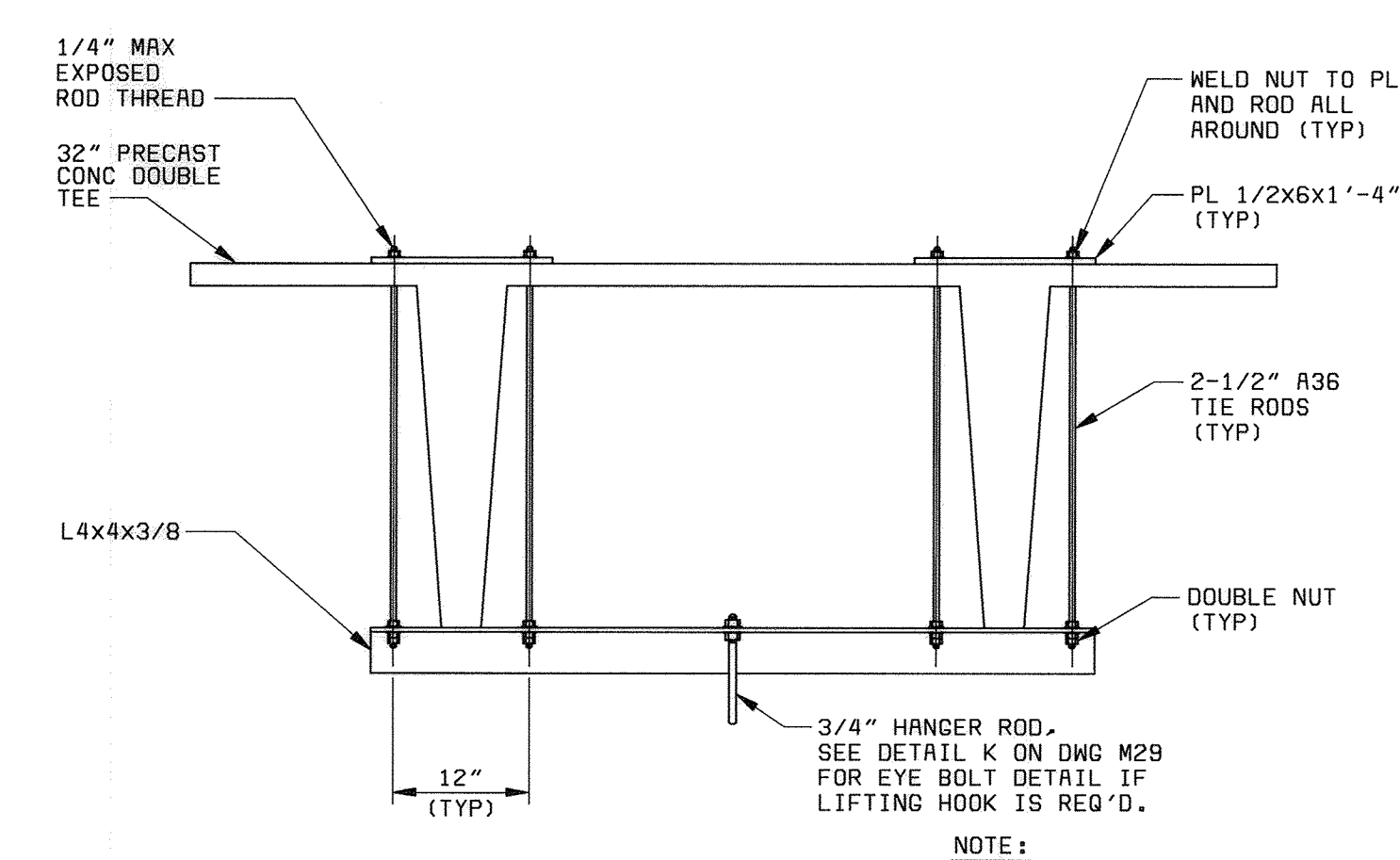
DETAIL B
1 1/2" = 1'-0"



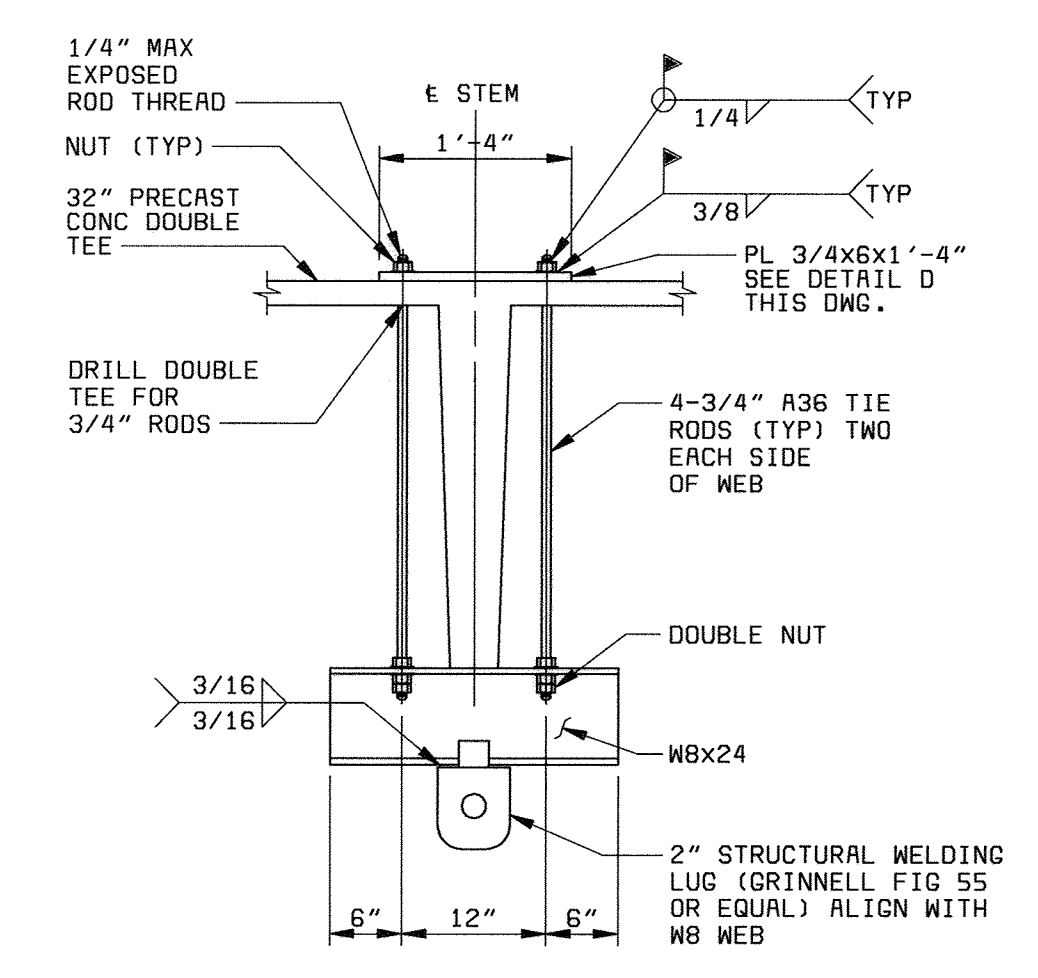
DETAIL C
1 1/2" = 1'-0"



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



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



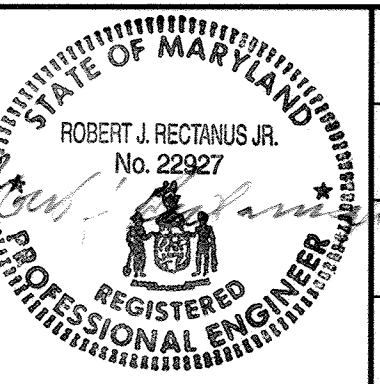
DETAIL F
3/4" = 1'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

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



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| DRN: AJM | | | | | | |
| CHK: NGM | | | | | | |

**NORTH BLOWER BUILDING
STRUCTURAL**

SECTIONS AND DETAILS

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

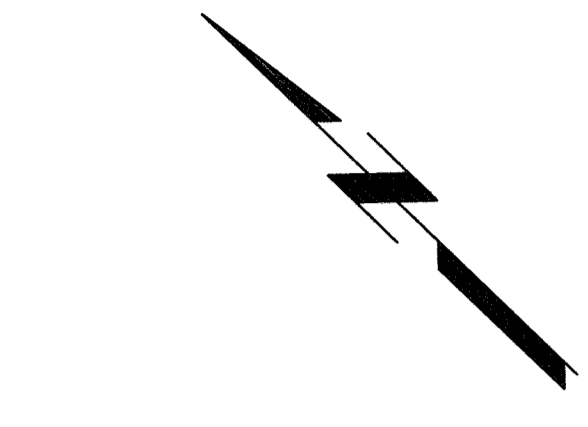
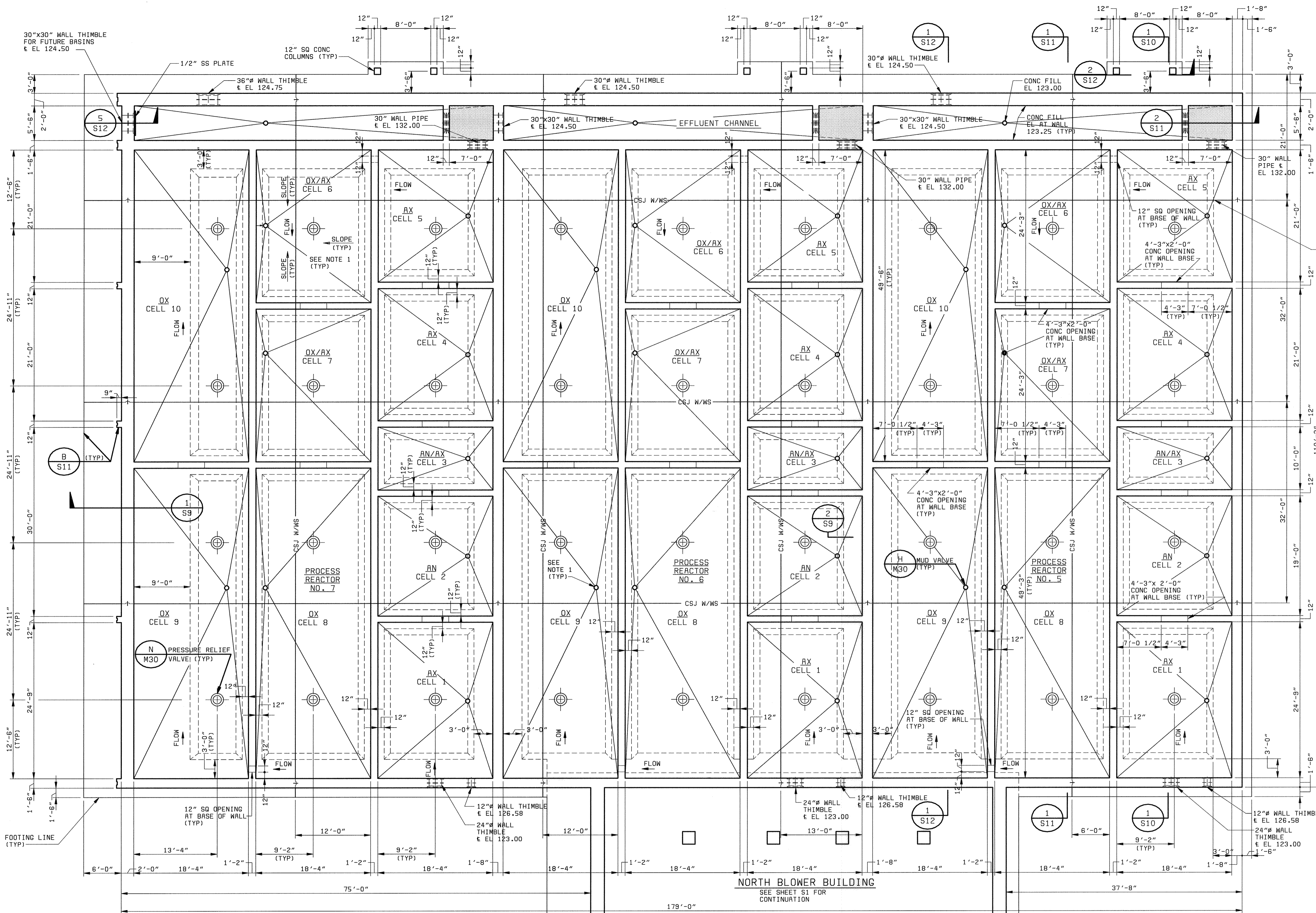
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 48 OF 161

S6



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

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

NORTH BLOWER BUILDING
SEE SHEET S1 FOR CONTINUATION

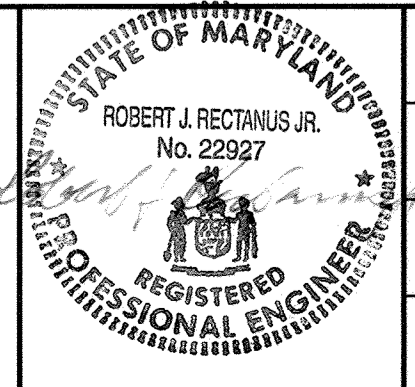
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06/24/02
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

6-29-02
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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| DRN: SLF | | | | | | |
| CHK: NGM | | | | | | |

NORTH PROCESS REACTORS
STRUCTURAL

SECTIONAL PLAN

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

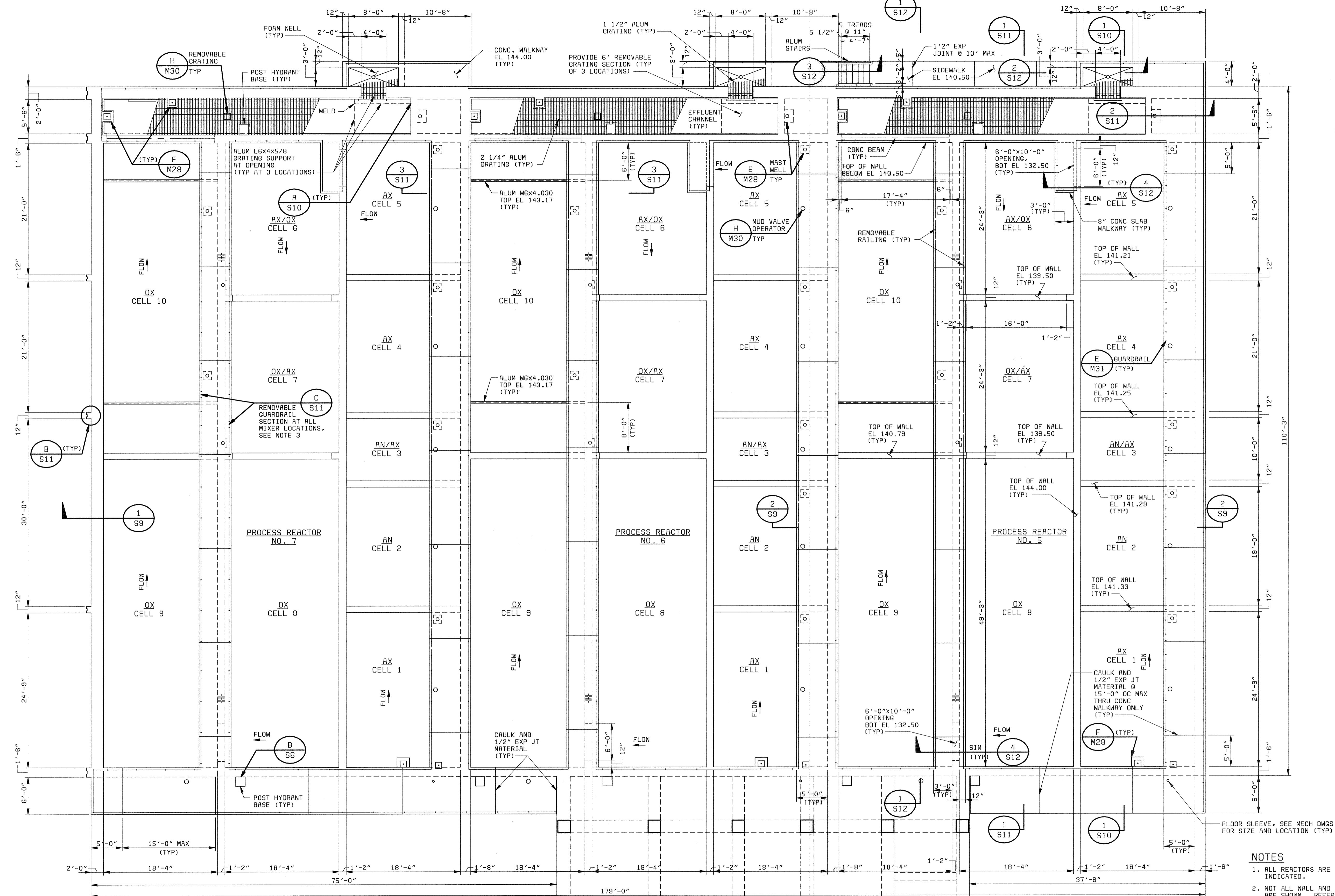
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 49 OF 161

S7



TOP PLAN
1/8" = 1'-0"
NORTH BLOWER BUILDING
SEE SHEET S2 FOR CONTINUATION

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

58472-101-PR-W-R0000550
05/24/20
FDS8472A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Robert J. Rectanus Jr.
REG. PROF. ENGR. DATE

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

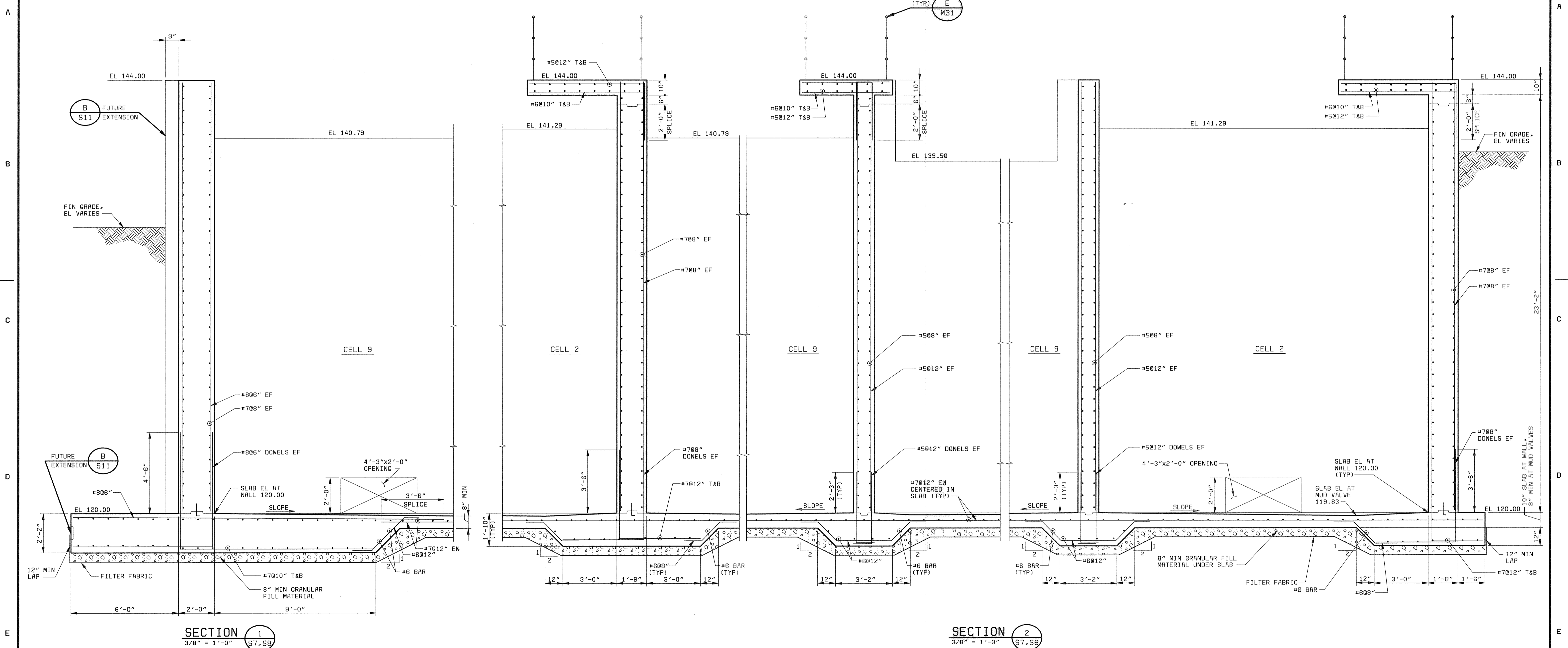
STATE OF MARYLAND
ROBERT J. RECTANUS JR.
No. 22027
REGISTERED PROFESSIONAL ENGINEER

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

NORTH PROCESS REACTORS
STRUCTURAL
TOP PLAN

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

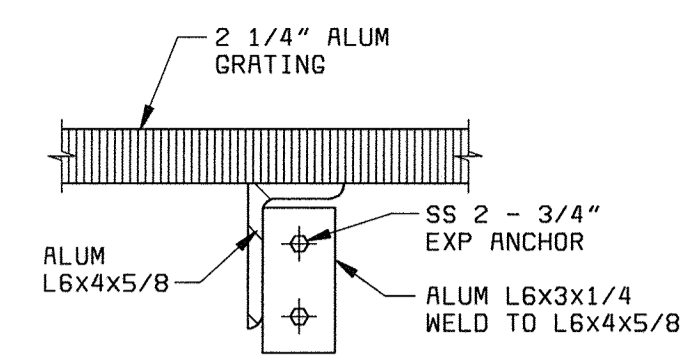
SCALE AS SHOWN
SHEET 50 OF 161
S8



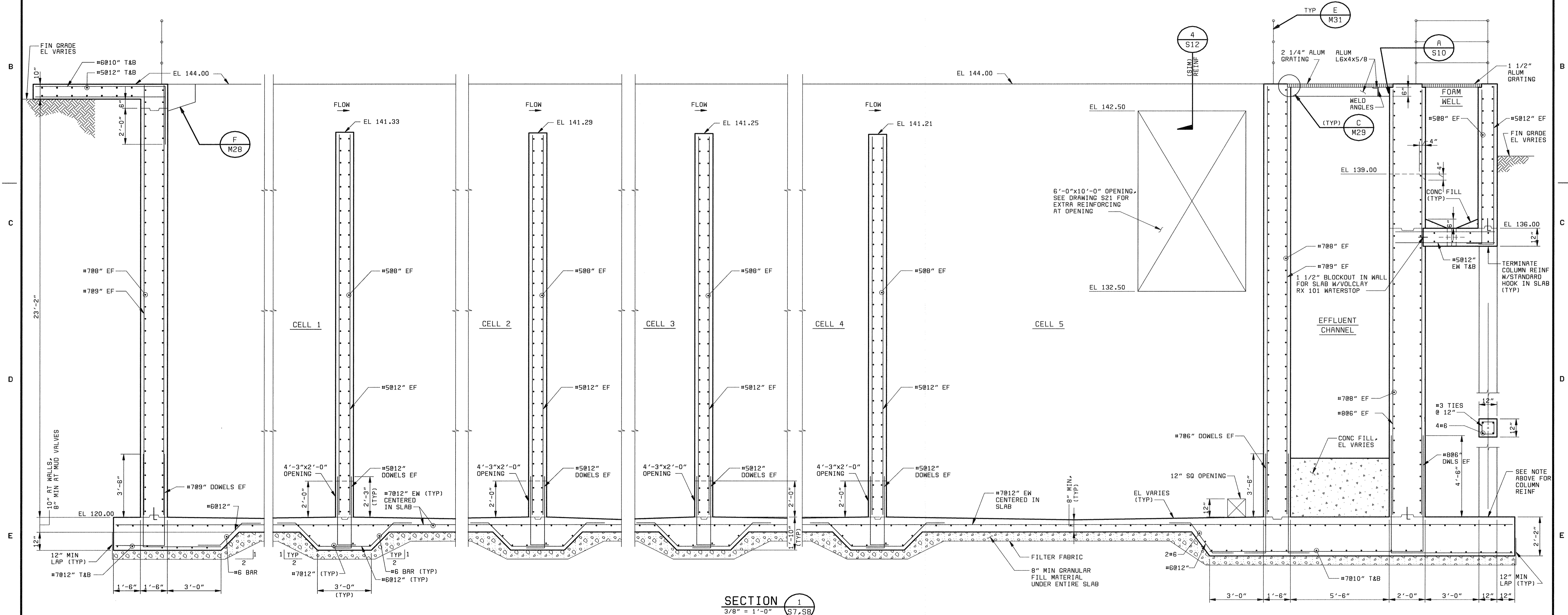
SECTION 1
3/8" = 1'-0" (S7.S8)

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

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



DETAIL A
NO SCALE
S8, S10, S11

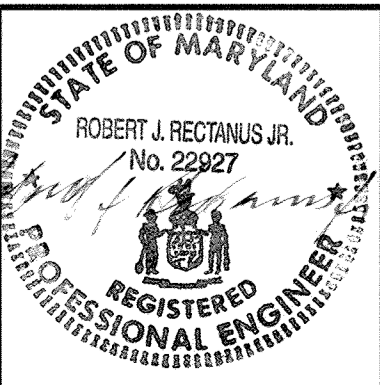


DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

Robert J. Rectanus Jr.
REGISTERED PROFESSIONAL ENGINEER
REG. PROF. ENGR. DATE



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

NORTH PROCESS REACTORS
STRUCTURAL

SECTION

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

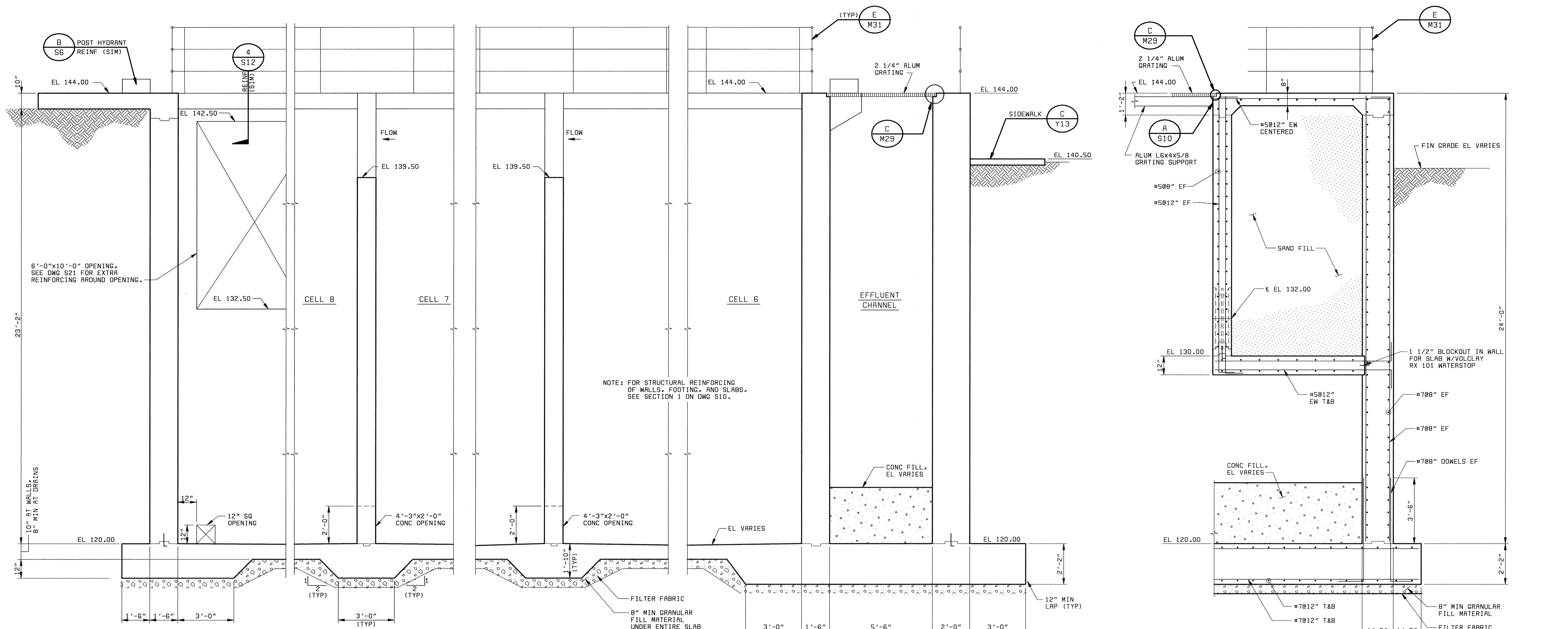
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

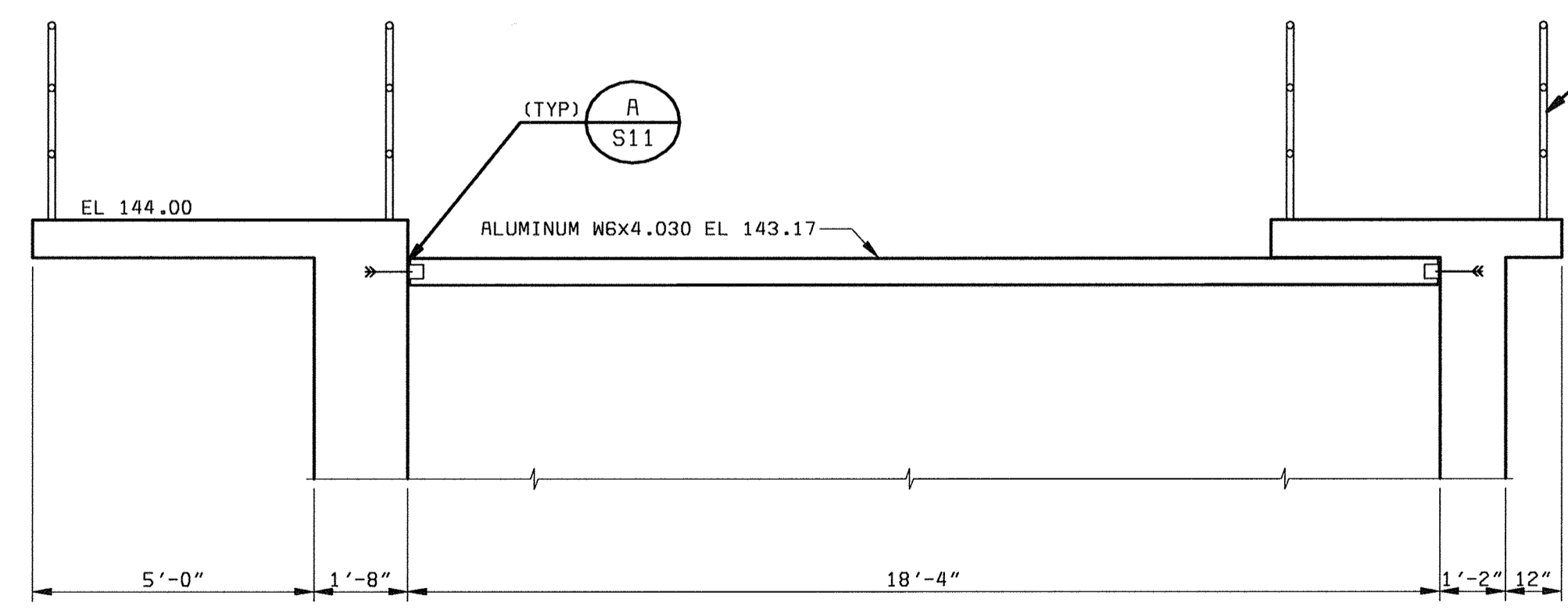
SHEET 52 OF 161

S10

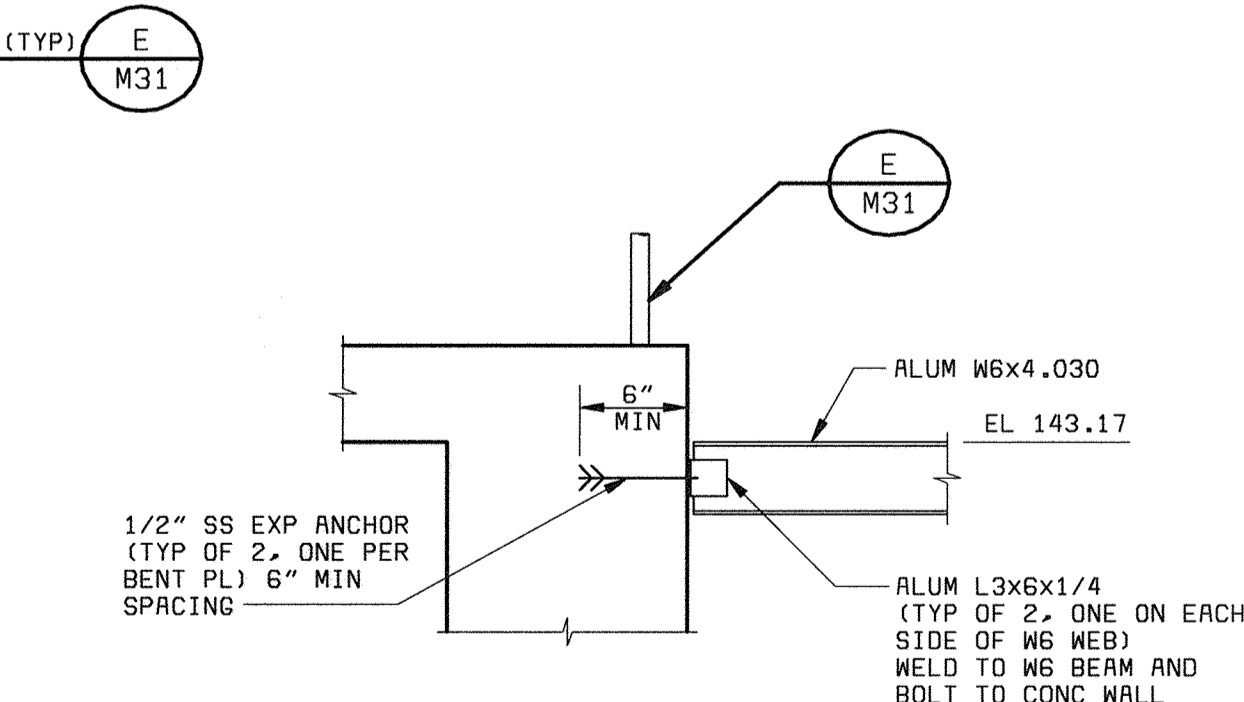


SECTION 1
3/8" = 1'-0"

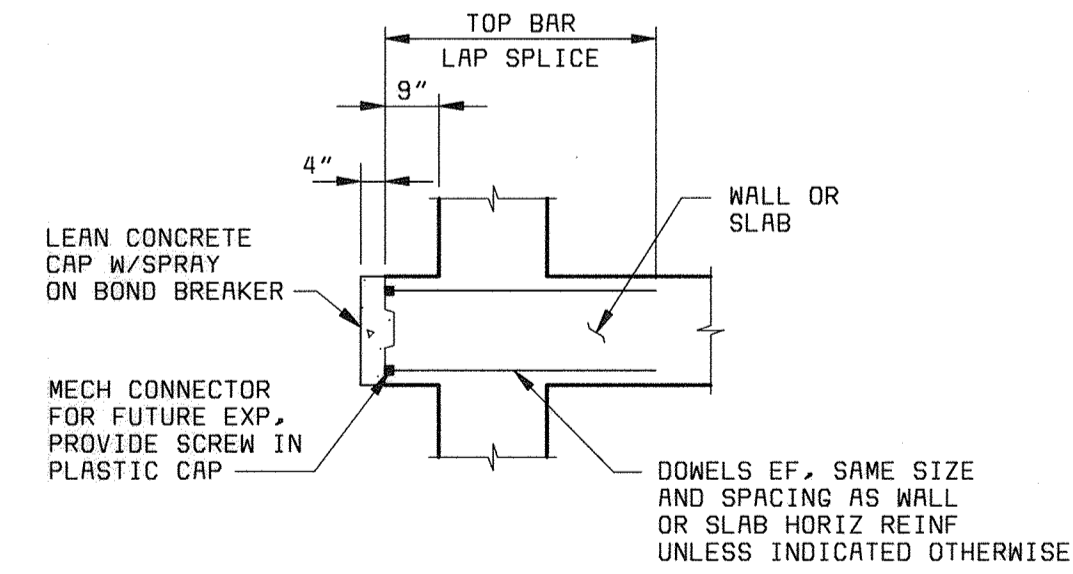
SECTION 2
3/8" = 1'-0"



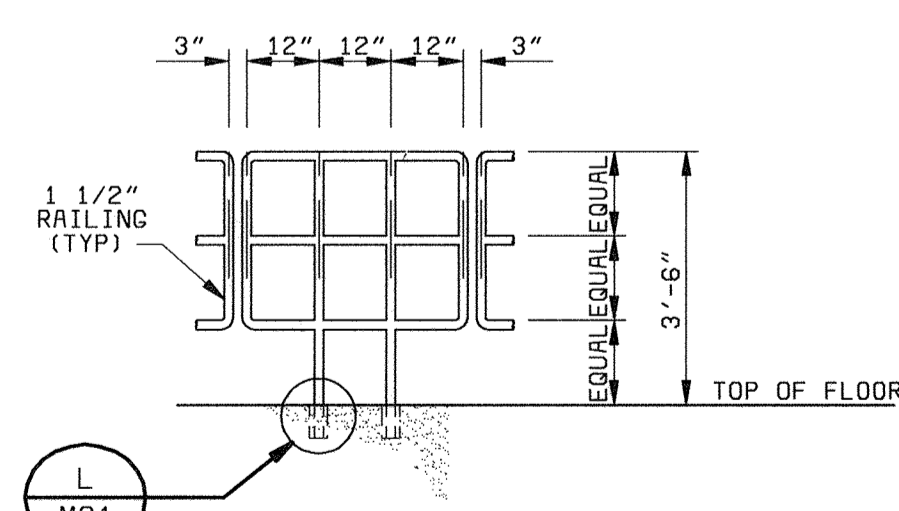
SECTION 3
3/8" = 1'-0"



DETAIL A
NO SCALE

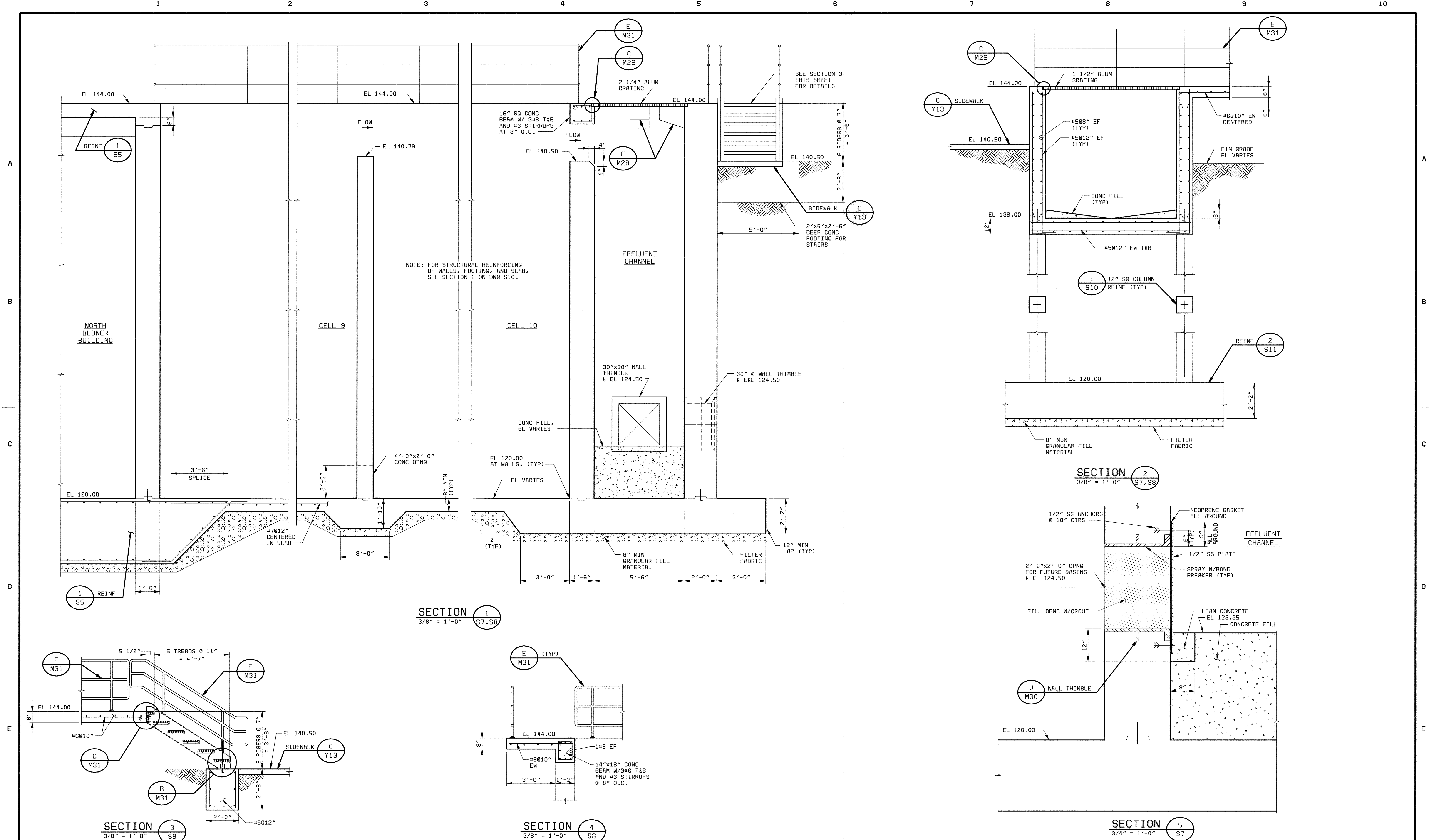


FUTURE EXTENSION B
NO SCALE



REMOVABLE GUARDRAIL C
NO SCALE

| | | | | | | |
|---|---|--|---------------|--------------------------------------|--|-----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert Benjamin 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LP Gaithersburg, Maryland Robert J. Rectanus, Jr. No. 22927 REGISTERED PROFESSIONAL ENGINEER REG. PROF. ENGR. DATE | REGISTERED PROFESSIONAL ENGINEER STATE OF MARYLAND No. 22927 | DES: IFH | NORTH PROCESS REACTORS STRUCTURAL | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: SLF, AJM | | | SHEET 53 OF 161 |
| | | | CHK: NGM | SECTIONS AND DETAILS | | |
| | | | DATE: 6/23/00 | | | S11 |
| | | | | | | |



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

Robert J. Reitan, Jr.
No. 22927
REGISTERED PROFESSIONAL ENGINEER

REG. PROF. ENGR. DATE

DES: IFH
DRN: SLF, AJM
CHK: NCM
DATE: 6/23/00

| DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP. |
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**NORTH PROCESS REACTORS
STRUCTURAL**

SECTIONS AND DETAILS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

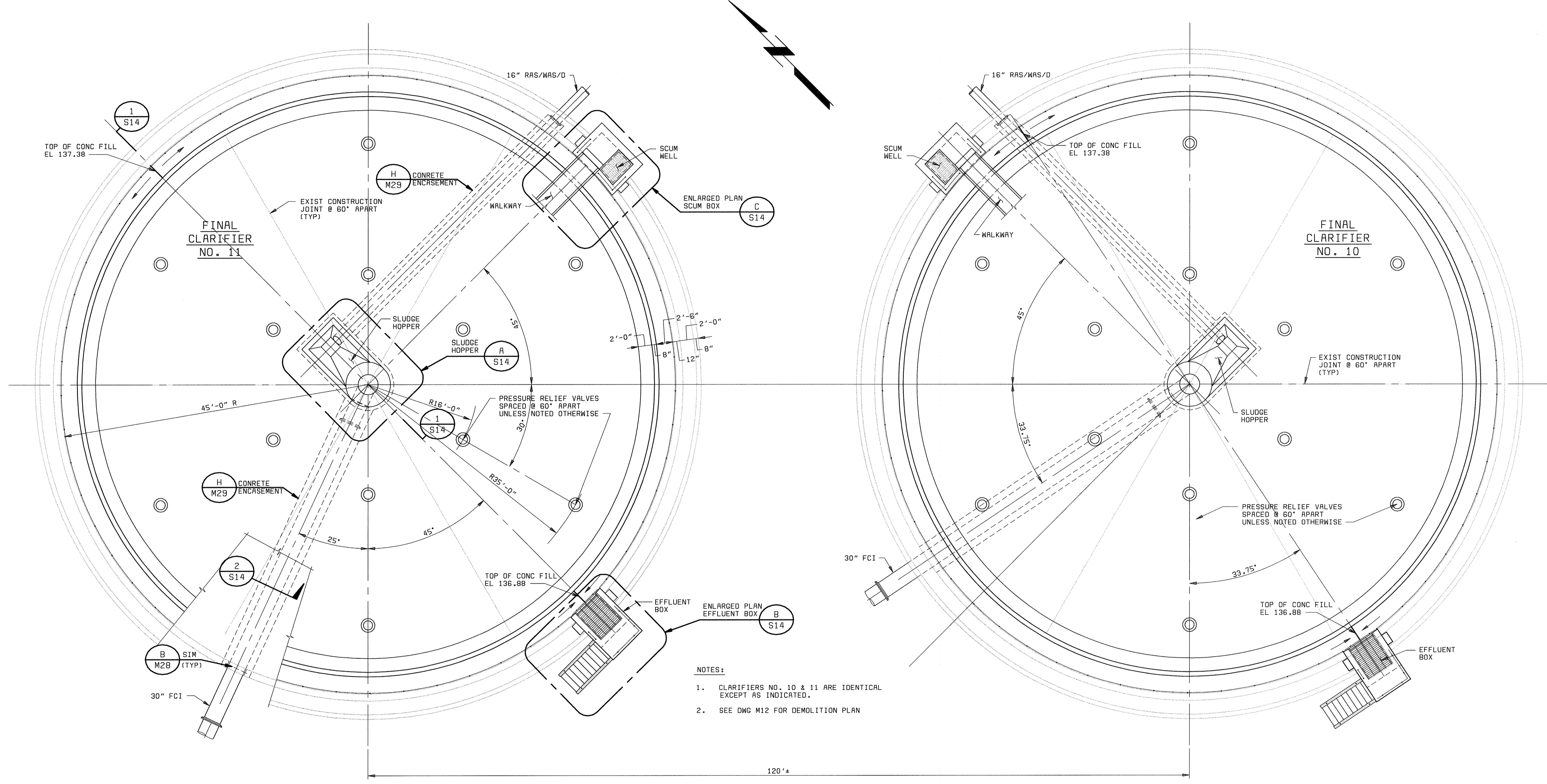
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 54 OF 161

S12

A
B
C
D
E

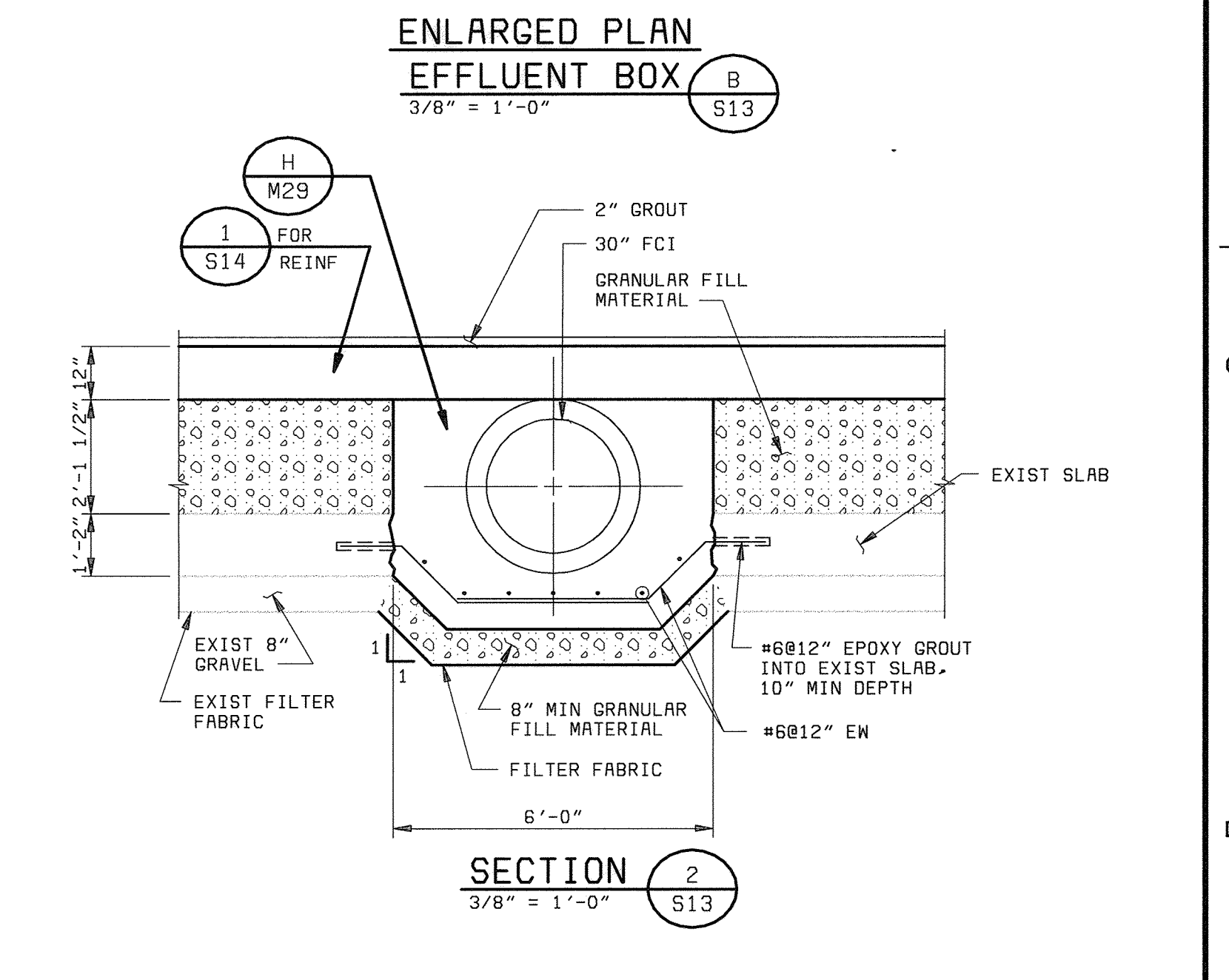
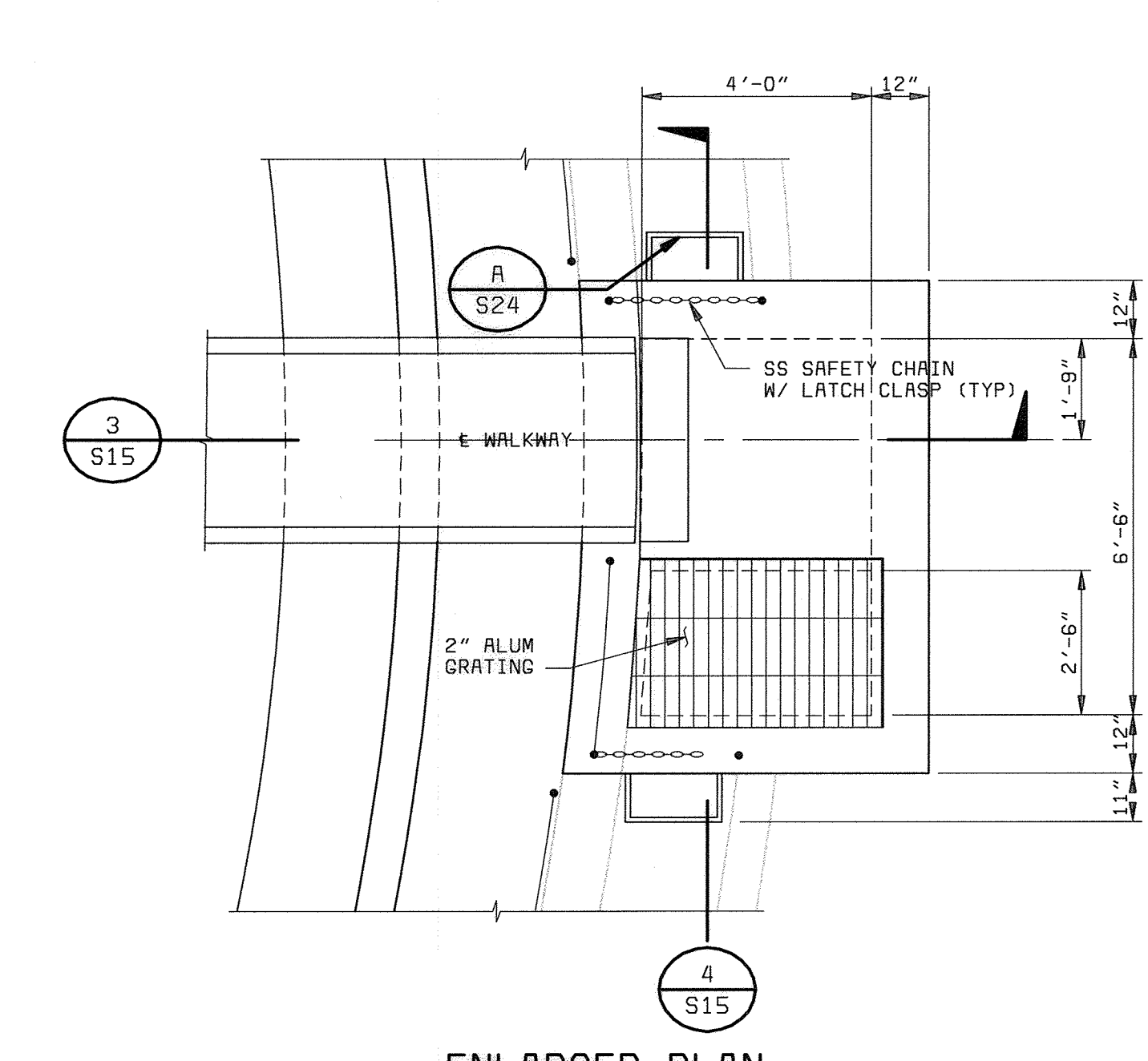
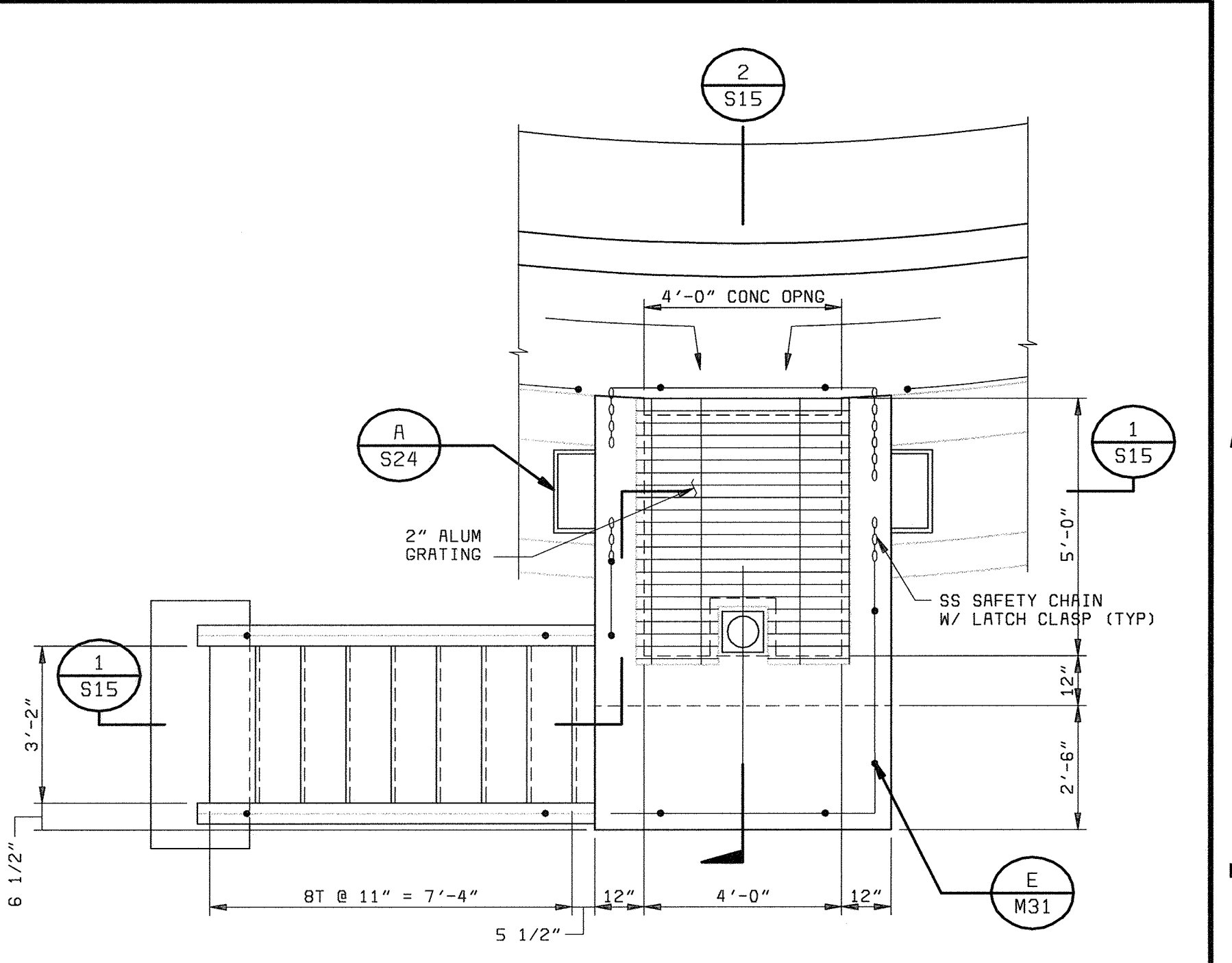
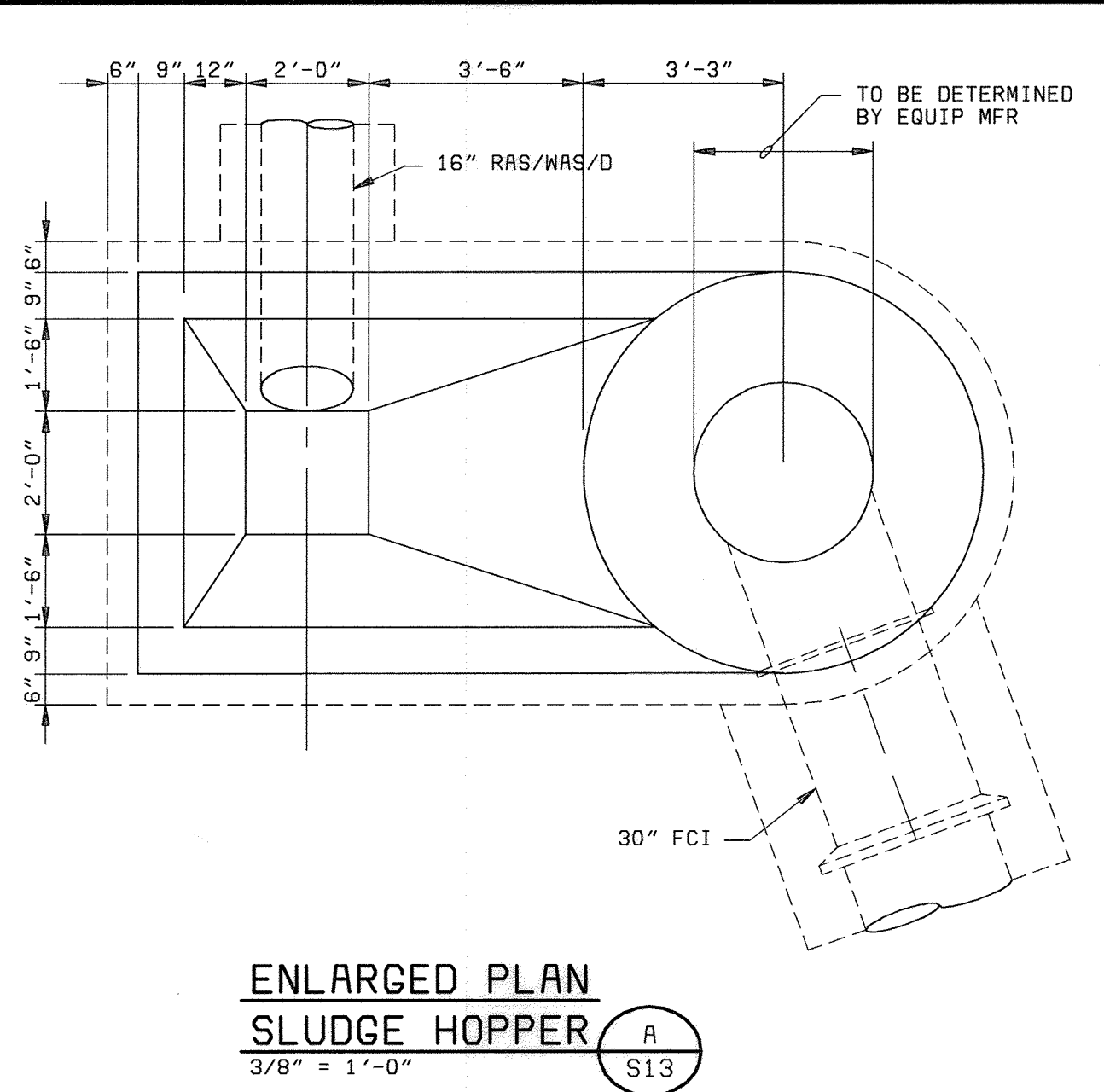
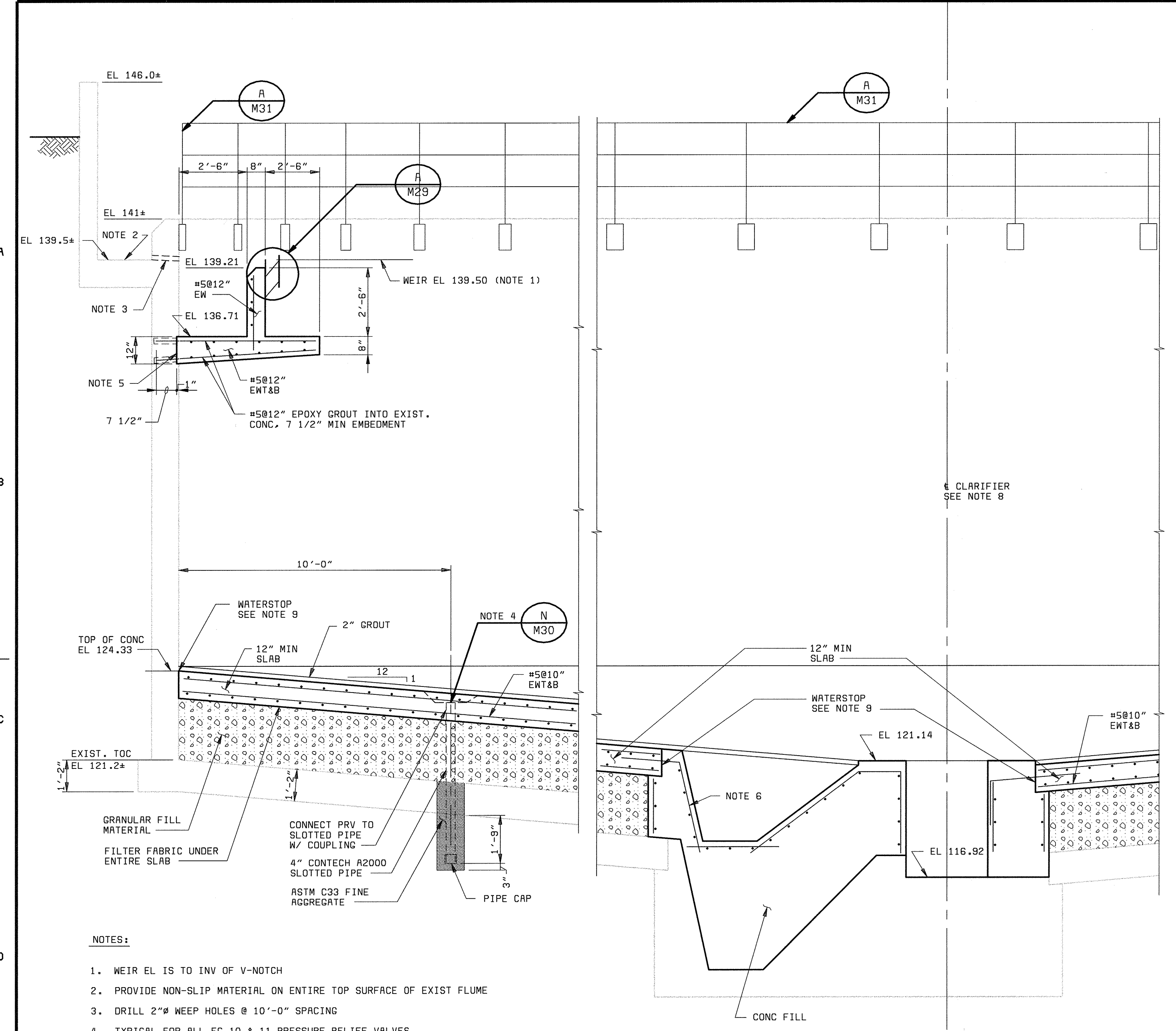


- NOTES:
1. CLARIFIERS NO. 10 & 11 ARE IDENTICAL EXCEPT AS INDICATED.
 2. SEE DWG M12 FOR DEMOLITION PLAN

PLAN
1/8" = 1'-0"

56472-101-FC-S-R0000847 (XVFC11M)
058472-058472A

| | | | | | | | | | | | |
|---|--|--|----------|----------|---------------|--|--|--|--------------------------------------|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert M. Baumgardner CHIEF, BUREAU OF UTILITIES DATE 6-29-00 | BLACK & VEATCH, L.P. Gaithersburg, Maryland Robert J. Rectanus, Jr. REG. PROF. ENGR. DATE 6/23/00 | ROBERT J. RECTANUS, JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: FKA | | | | | | FC 10 & 11 STRUCTURAL PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: RLC | CHK: NGM | DATE: 6/23/00 | | | | | | |
| | | | | | | | | | | REVISIONS AND RECORD OF ISSUE | NO. BY CK APP |



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

58472-101-FC-5-R0000647
58472-101-FC-5-R0000647
58472-101-FC-5-R0000647
58472-101-FC-5-R0000647

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

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

STATE OF MARYLAND
REGISTERED PROFESSIONAL ENGINEER
No. 22927

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

FC 10 & 11
STRUCTURAL

SECTIONS AND DETAILS

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

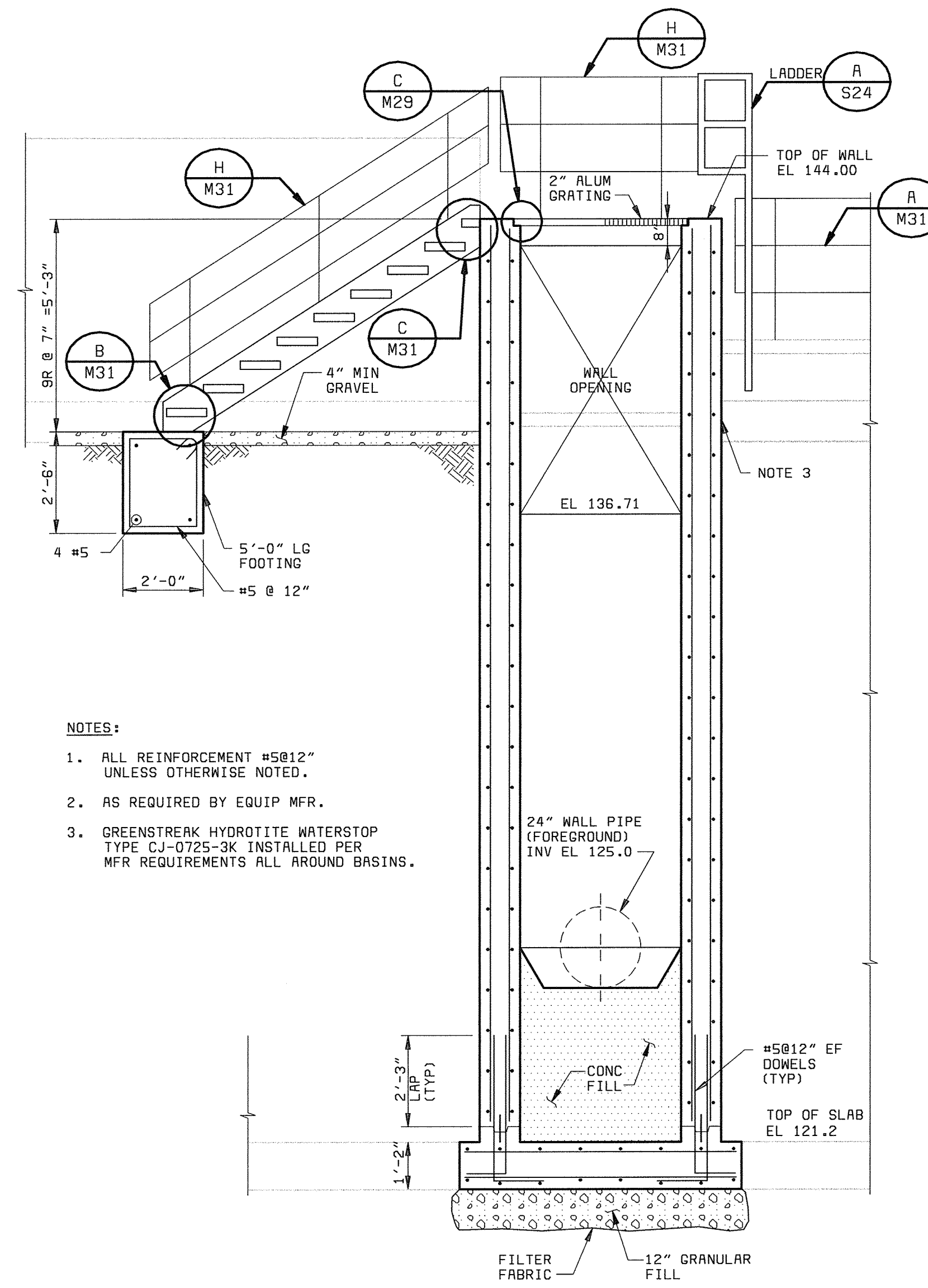
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

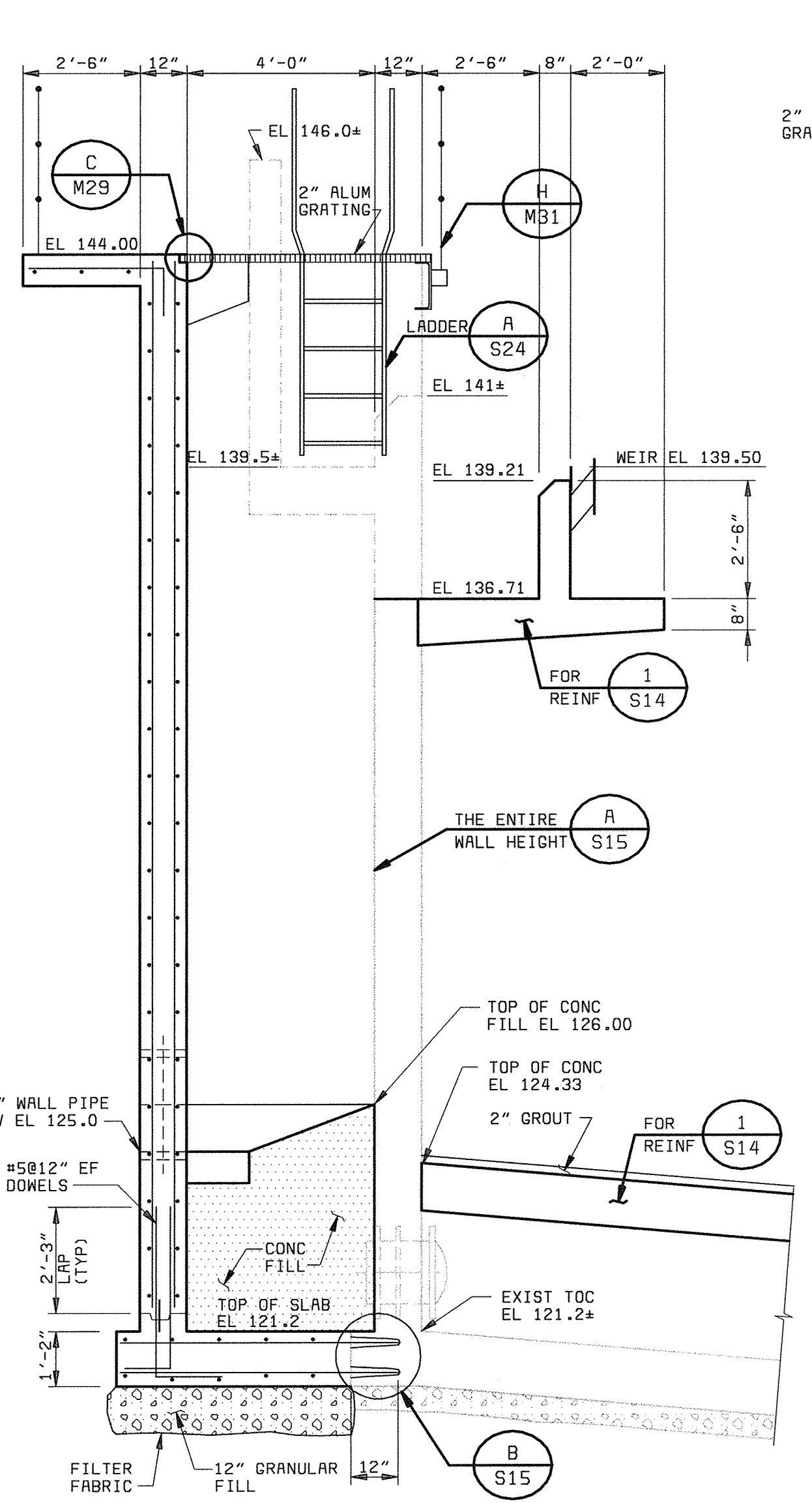
SCALE AS SHOWN

SHEET 56 OF 161

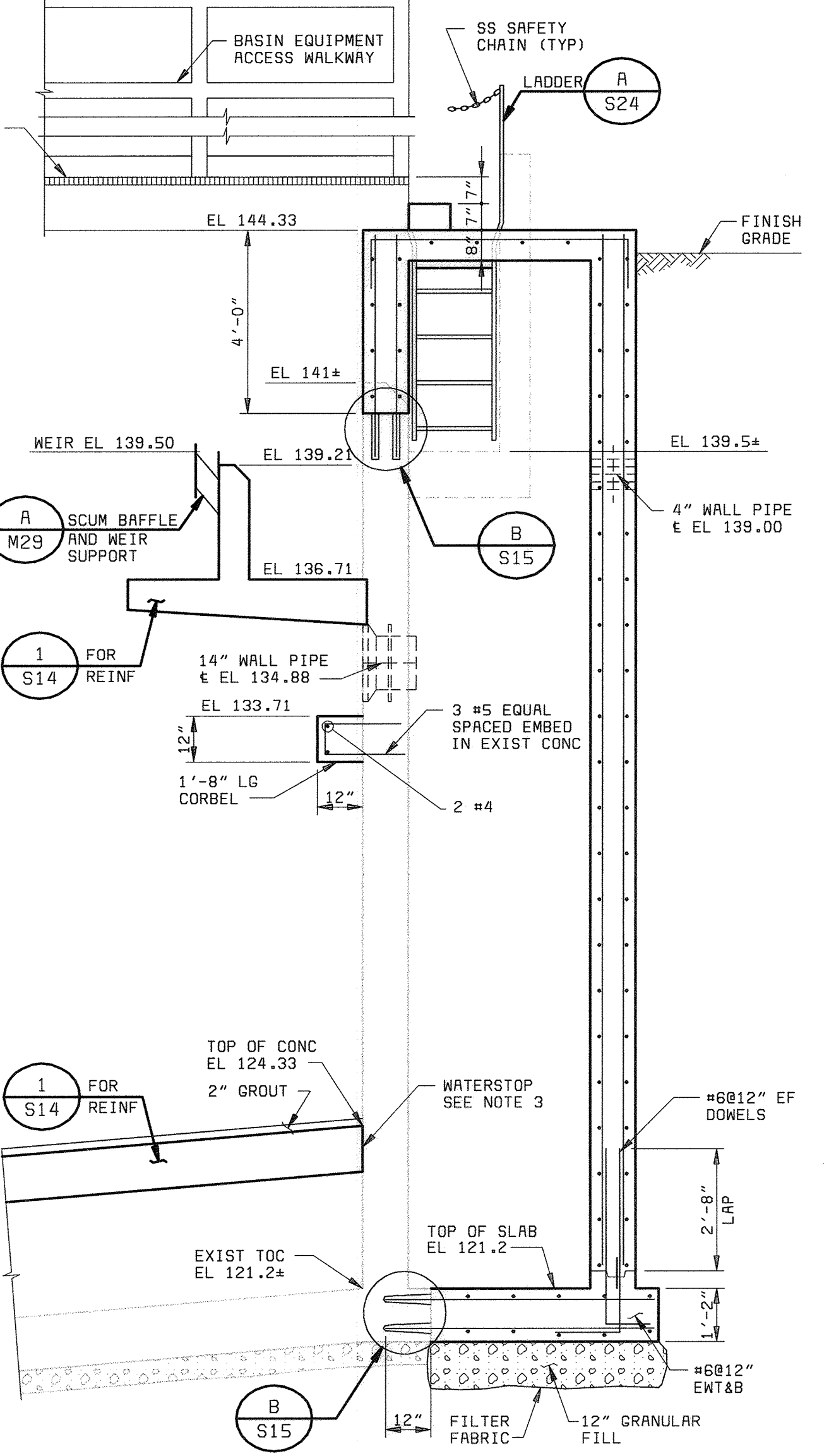
S14



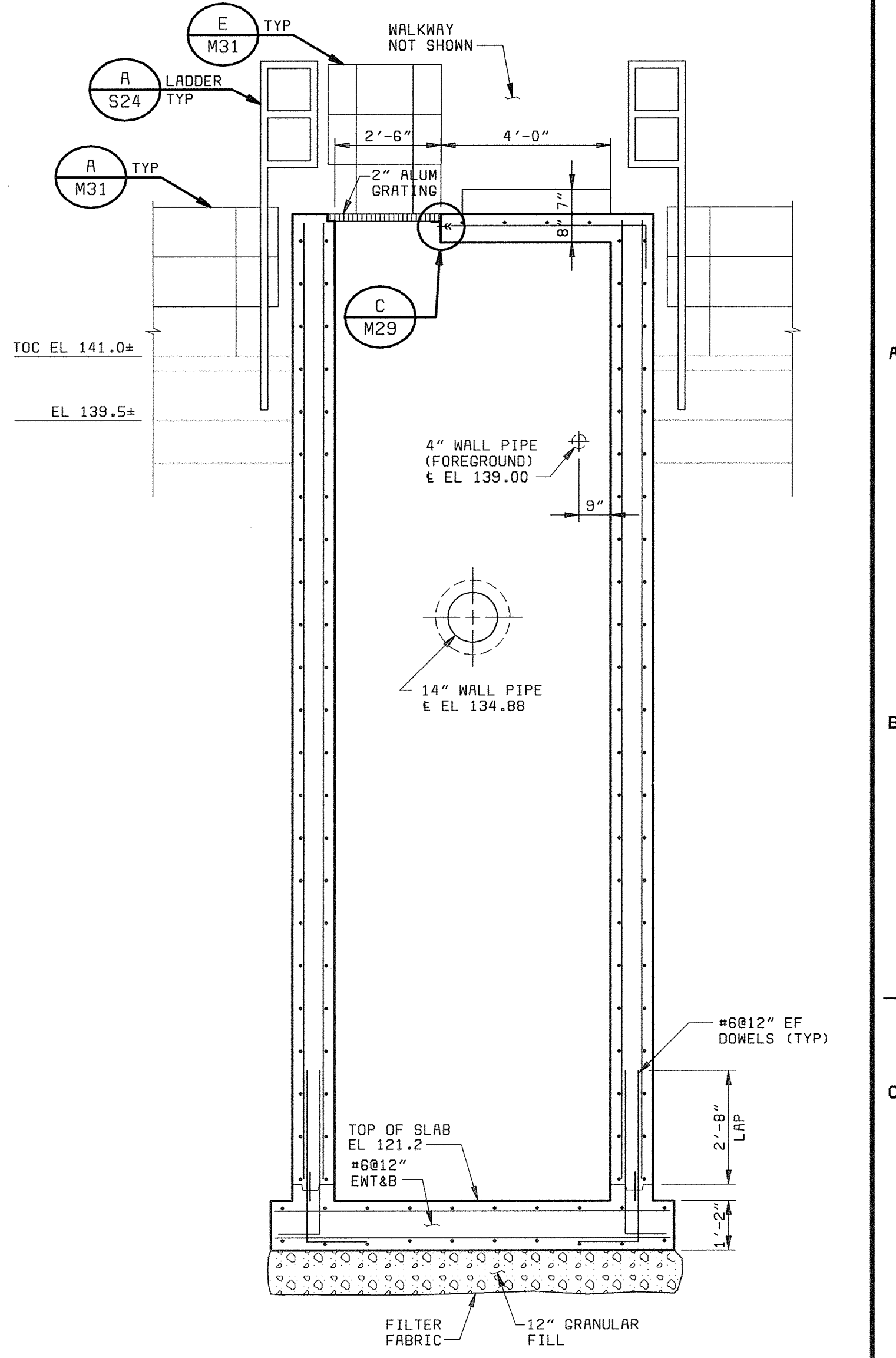
SECTION 1
3/8" = 1'-0" S14



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

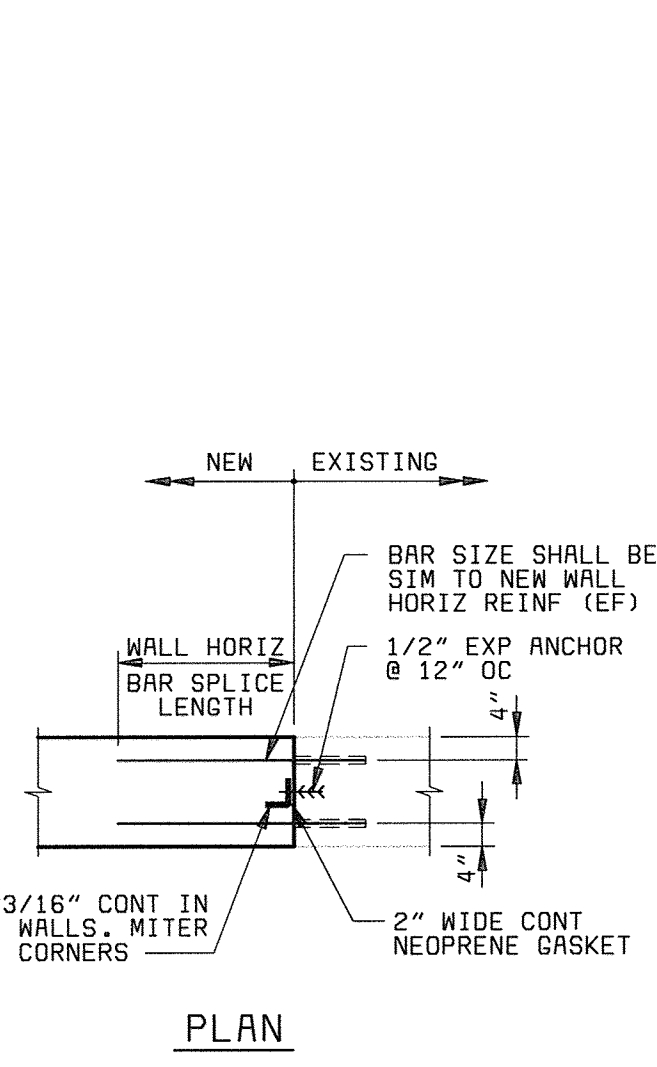


SECTION 3
3/8" = 1'-0" S14

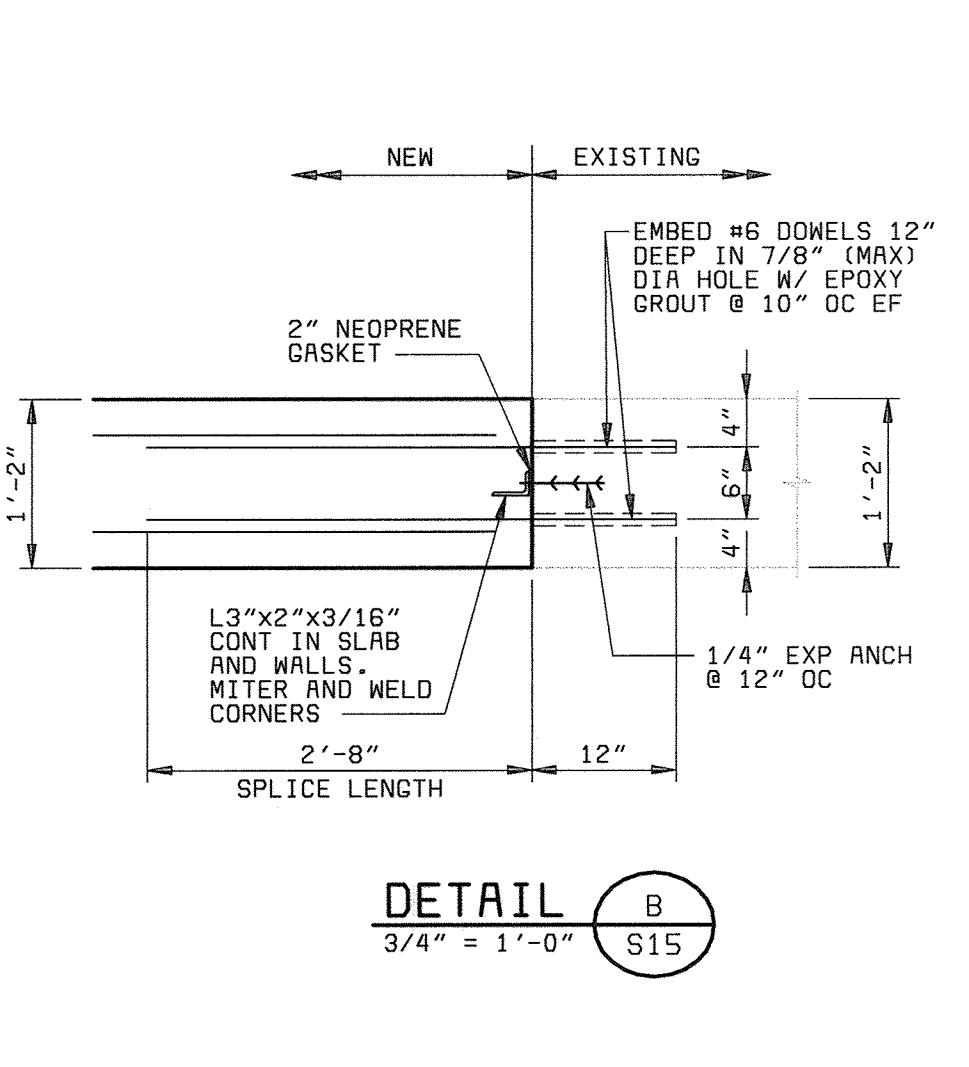
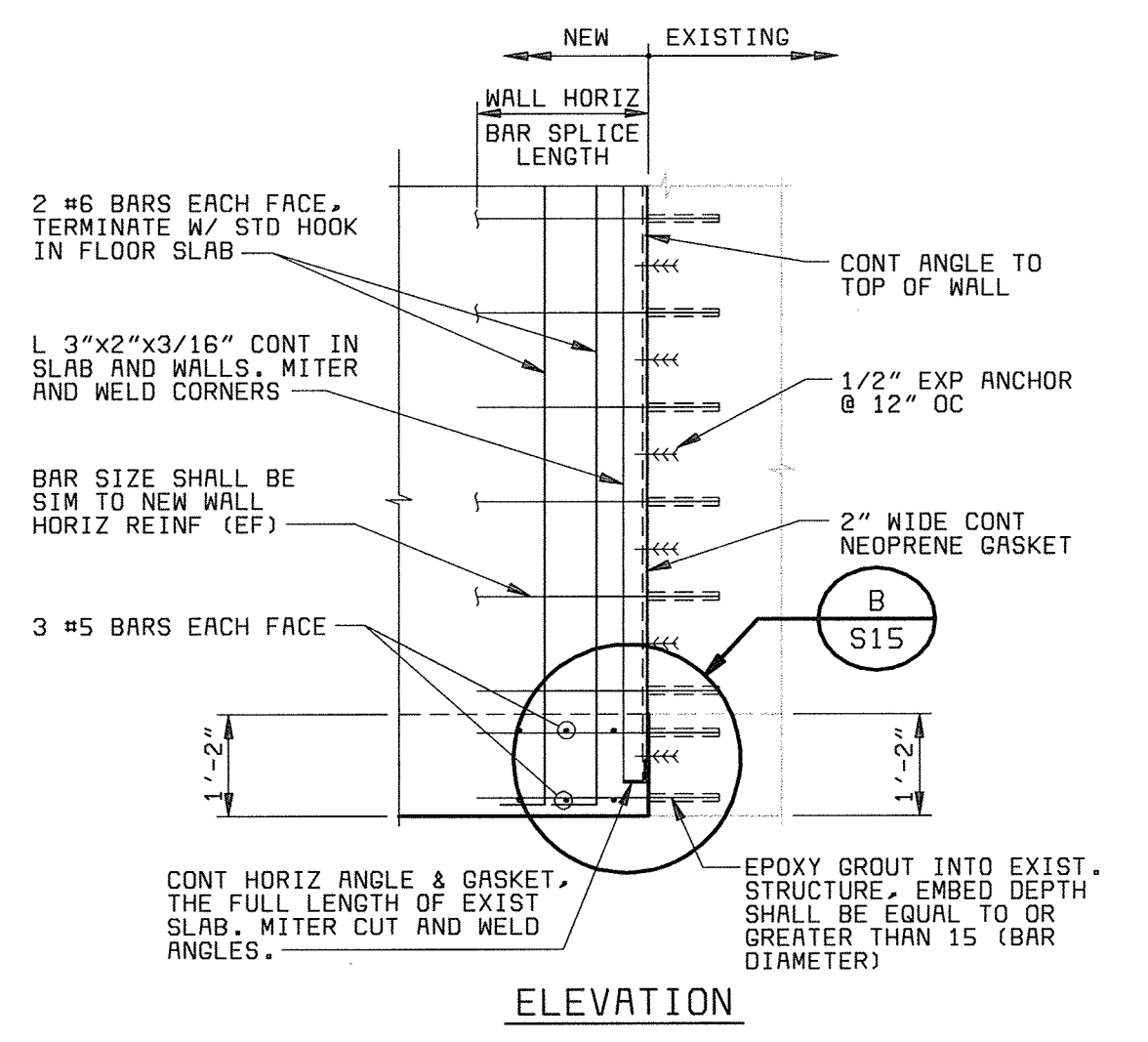


SECTION 4
3/8" = 1'-0" S14

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



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



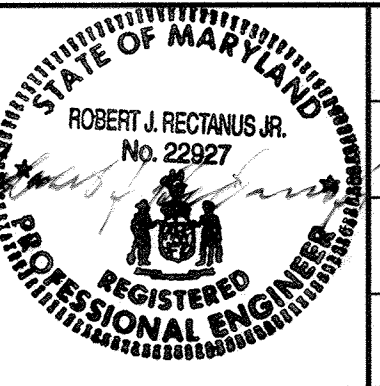
DETAIL B
3/4" = 1'-0" S15

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

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



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

FC 10 & 11
STRUCTURAL

SECTIONS AND DETAILS

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

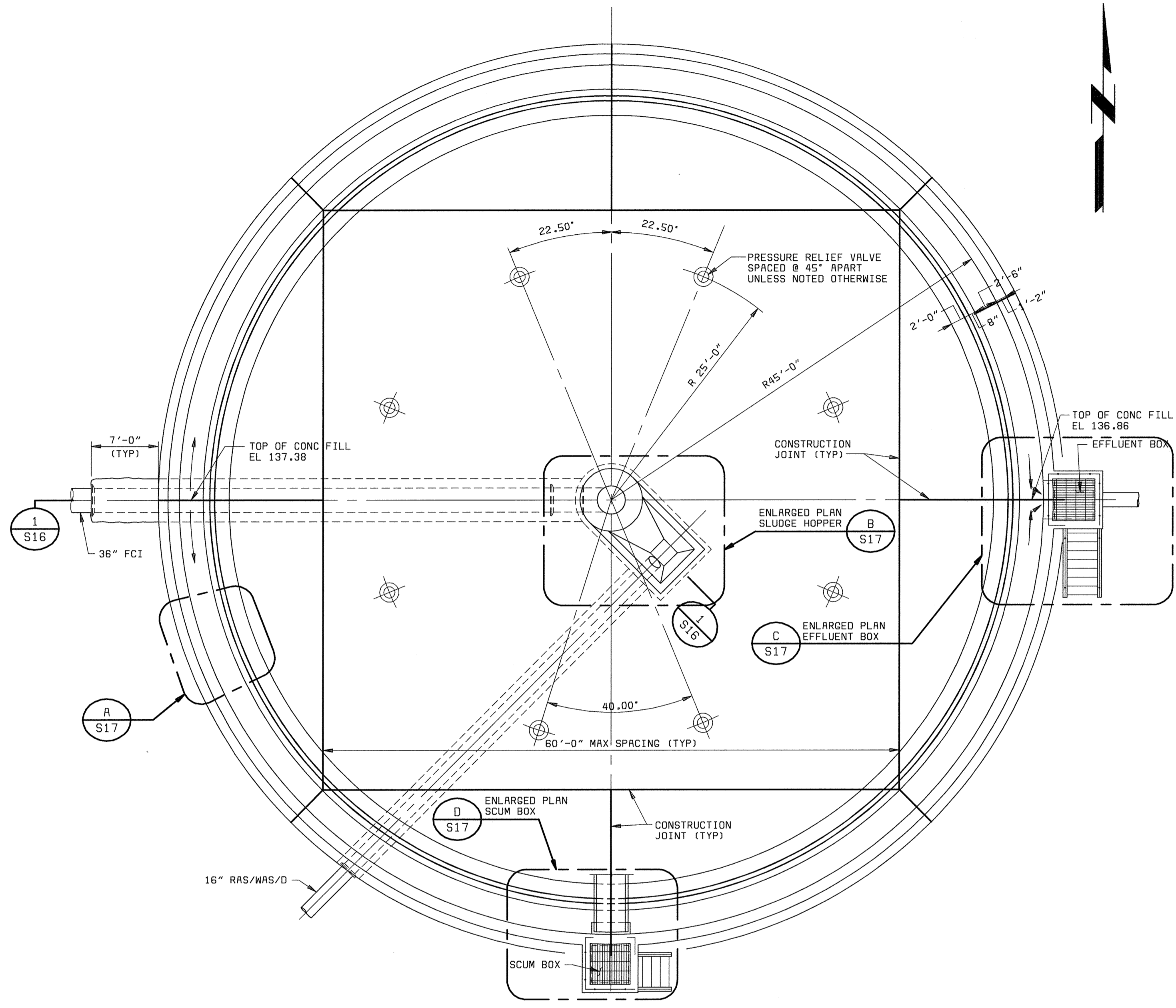
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

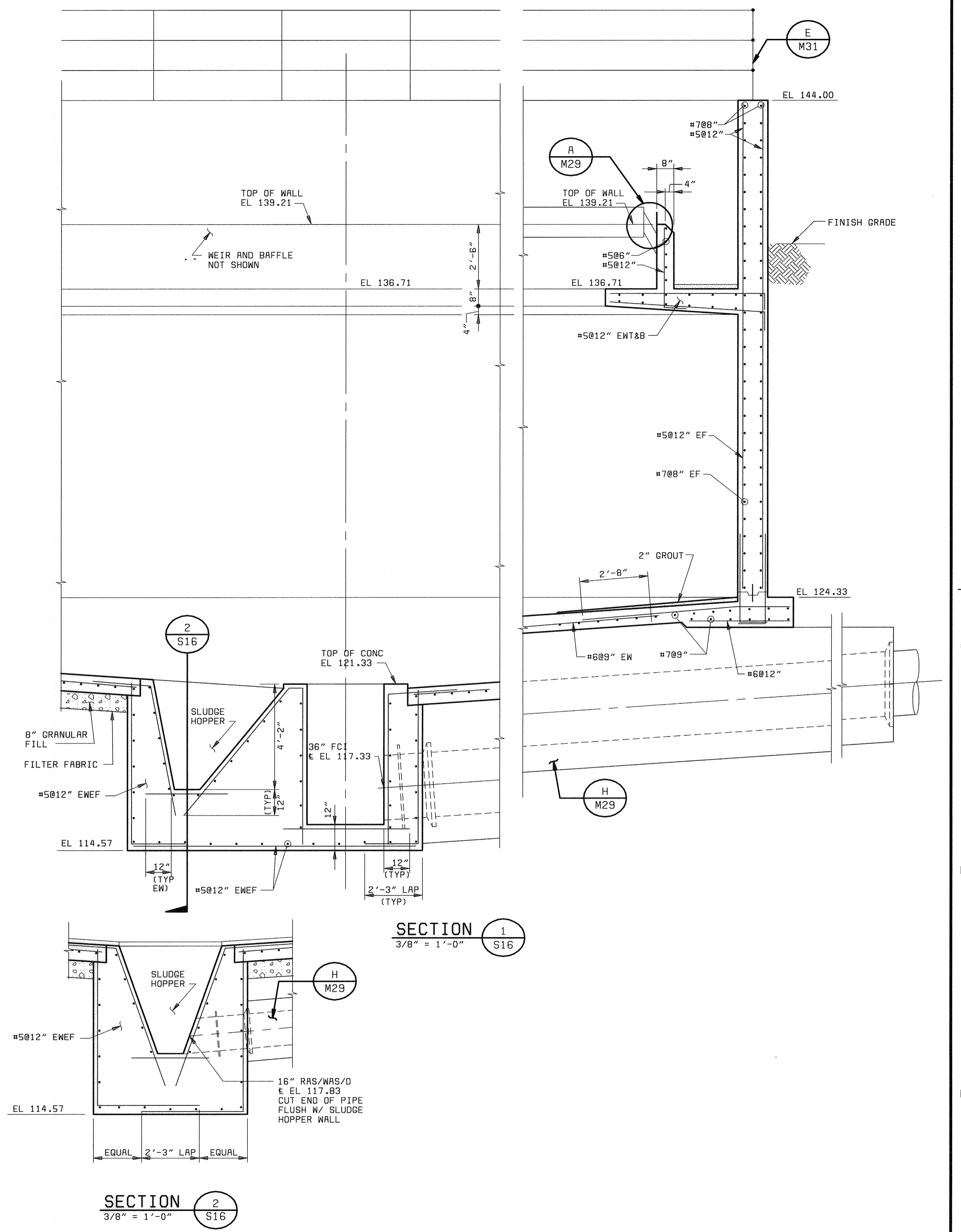
SHEET 57 OF 161

S15



PLAN
1/8" = 1'-0"

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



SECTION 1
3/8" = 1'-0" (S16)

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

58472-101-FC-M-R0000750
F058472A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert Berman 6-23-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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

FC 12
STRUCTURAL

PLAN AND SECTIONS

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

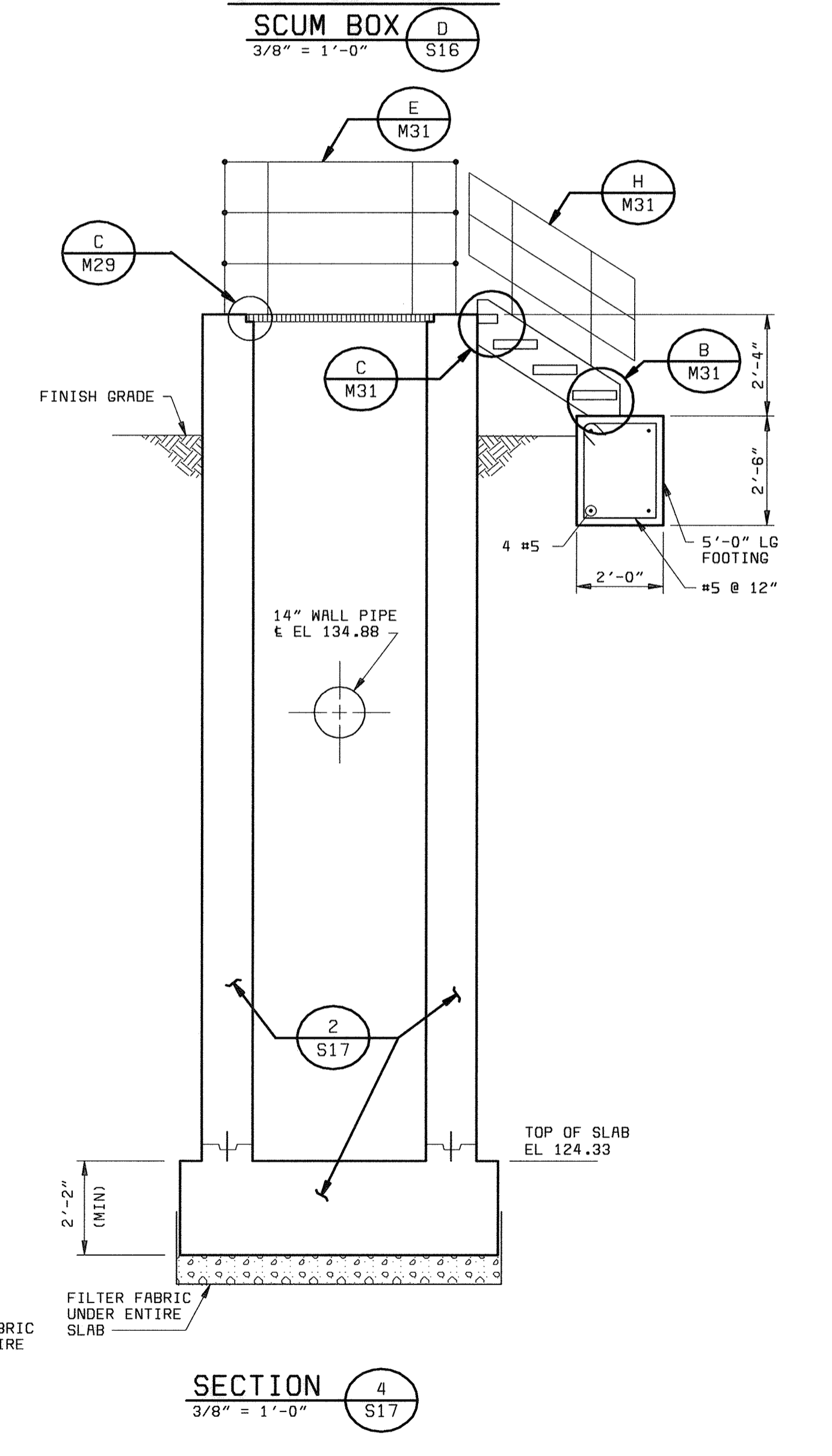
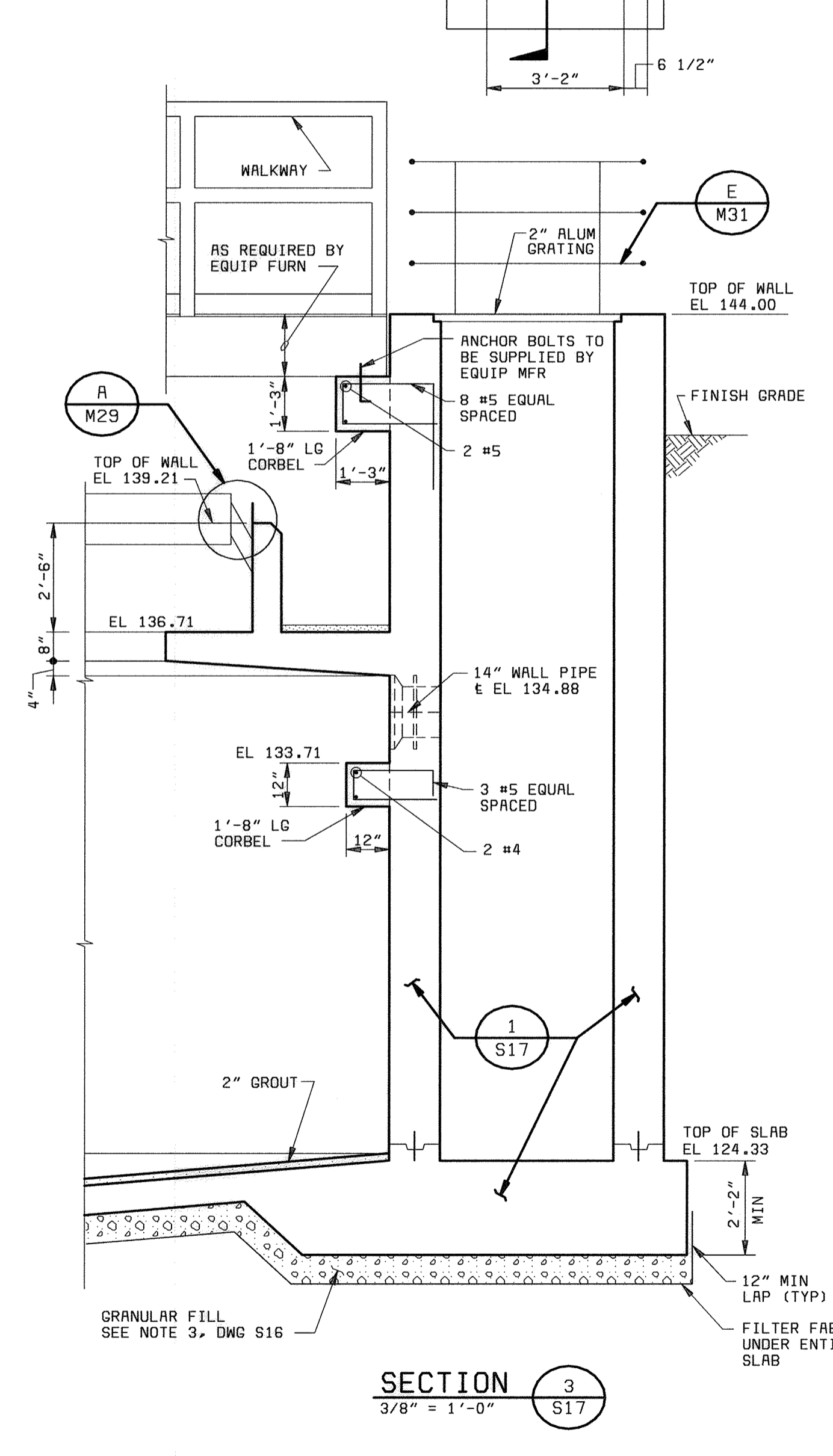
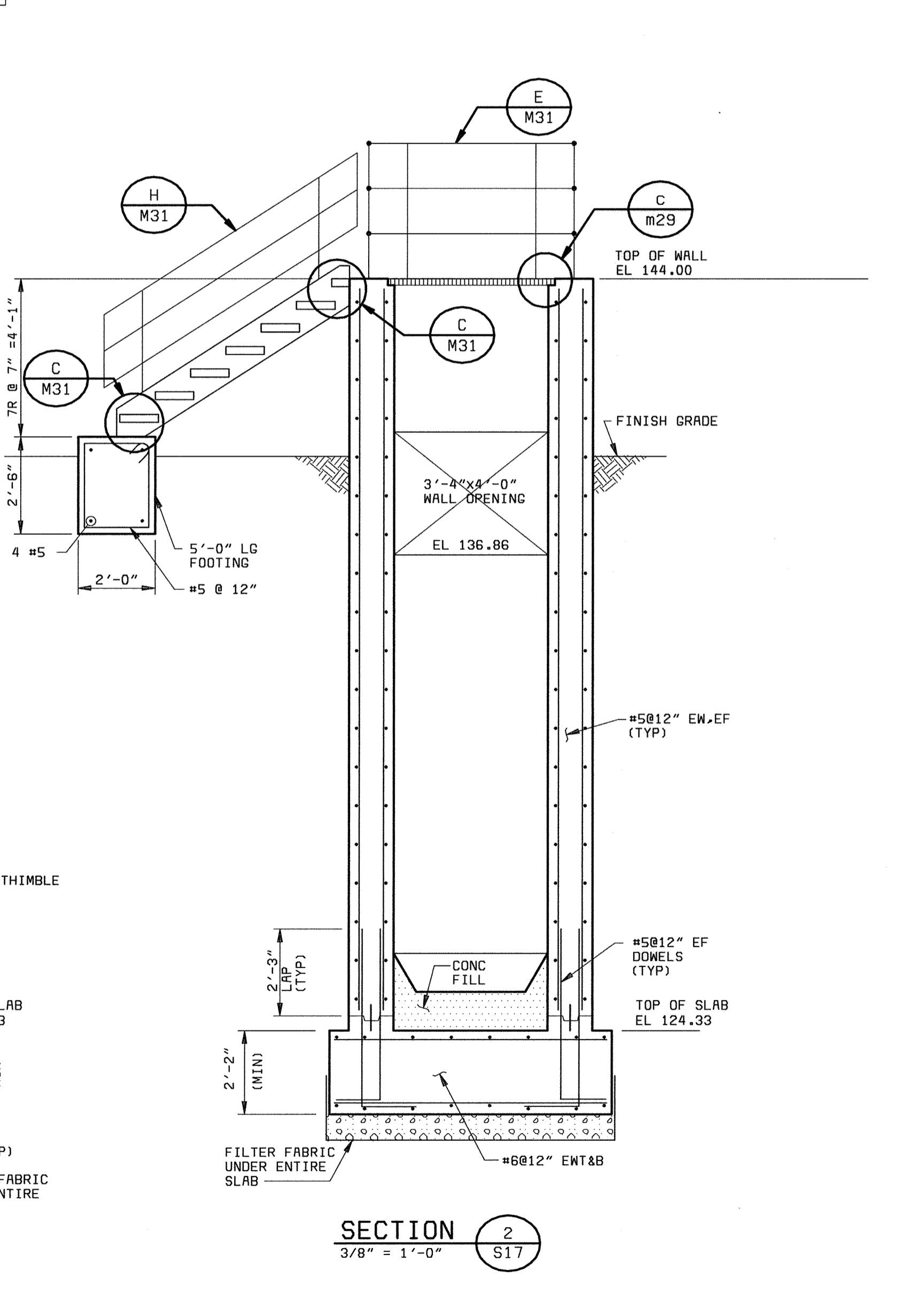
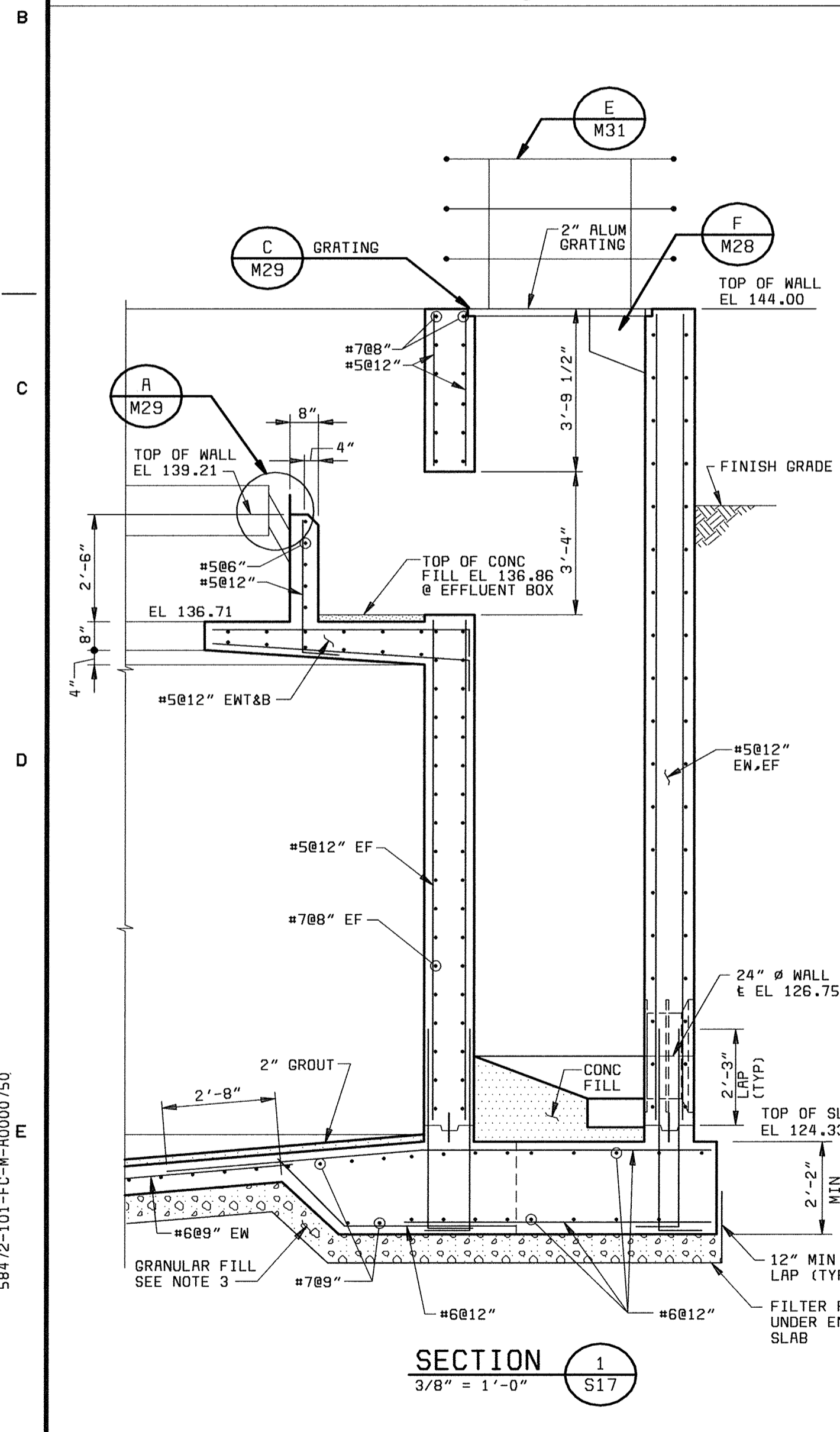
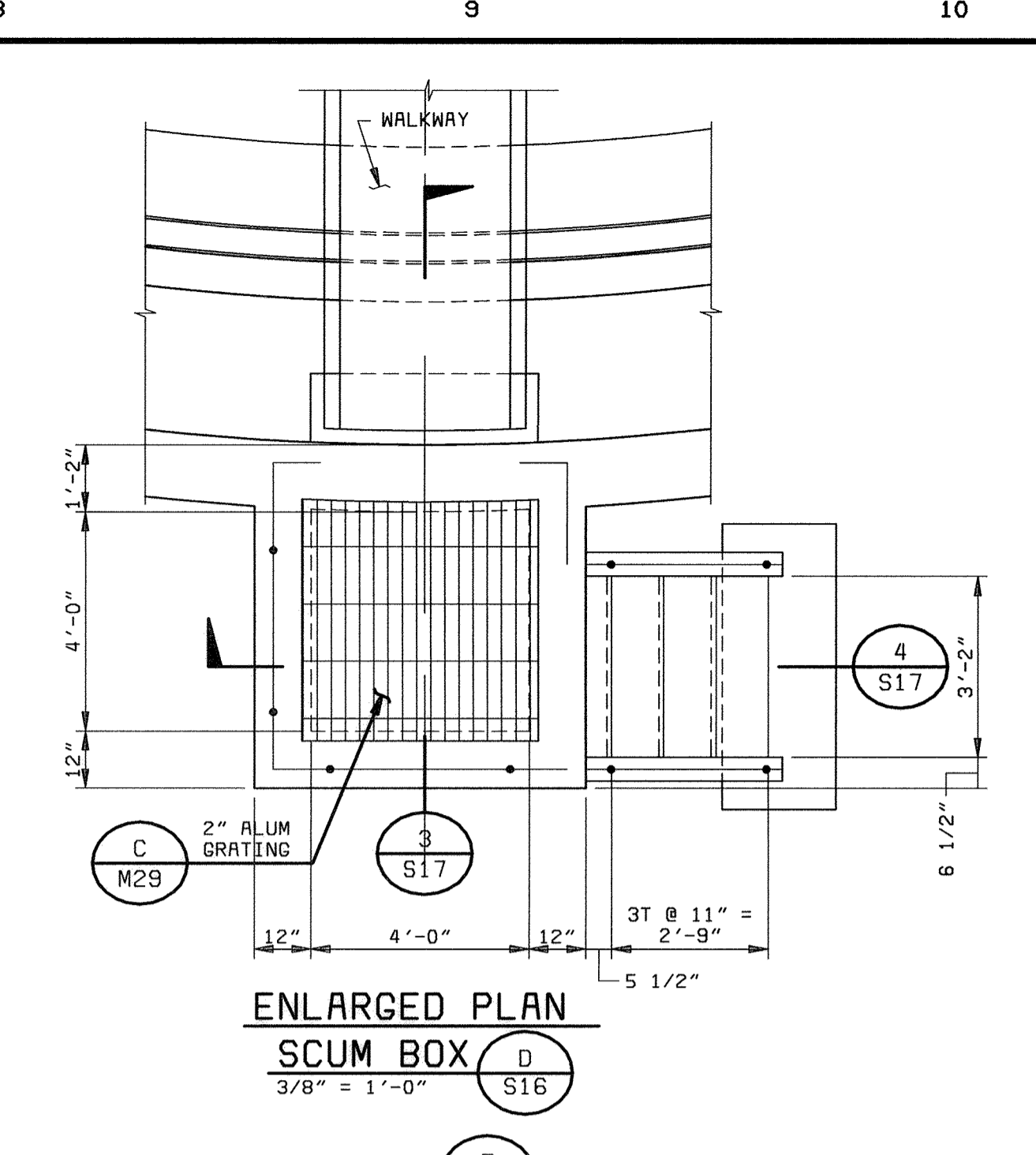
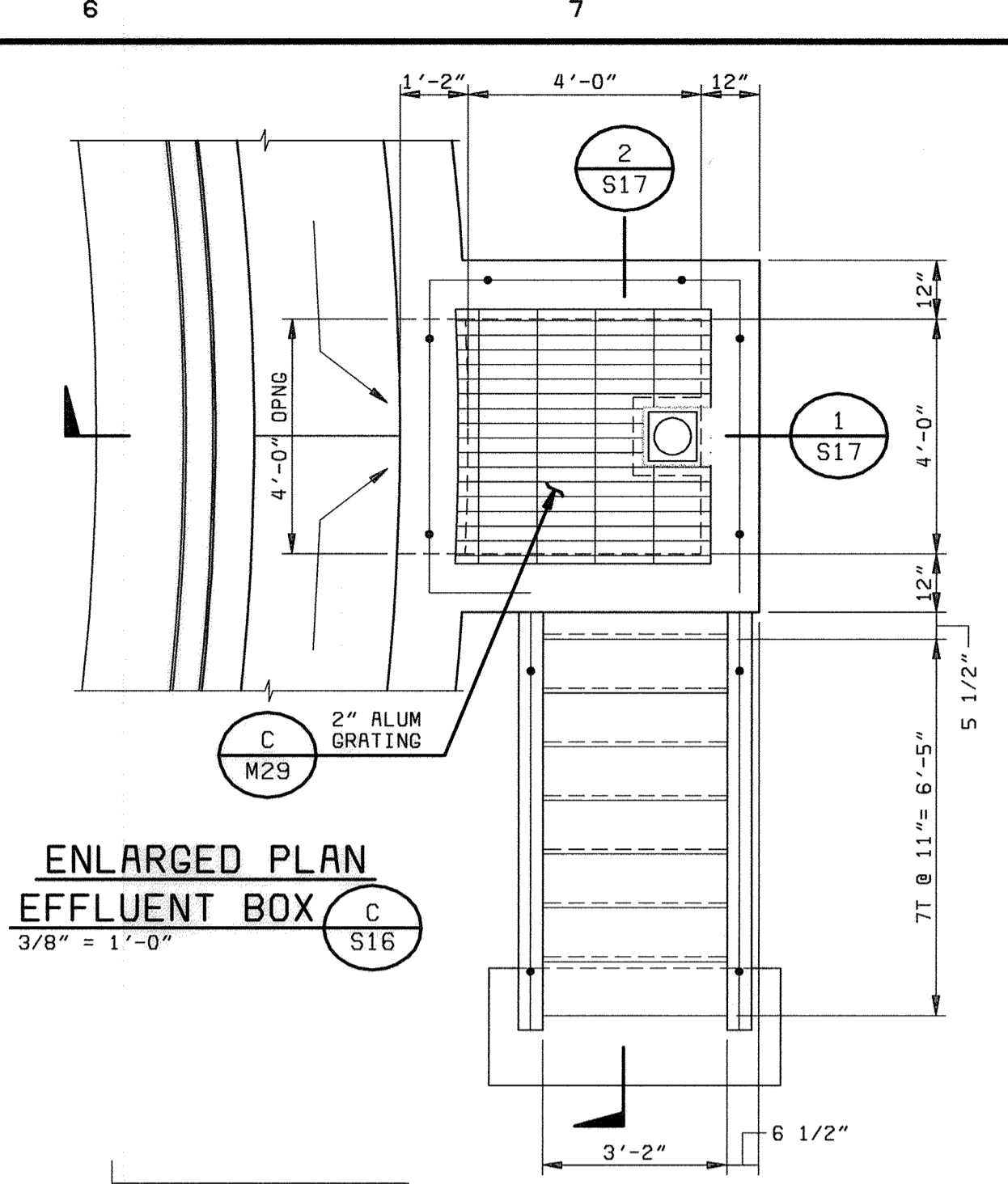
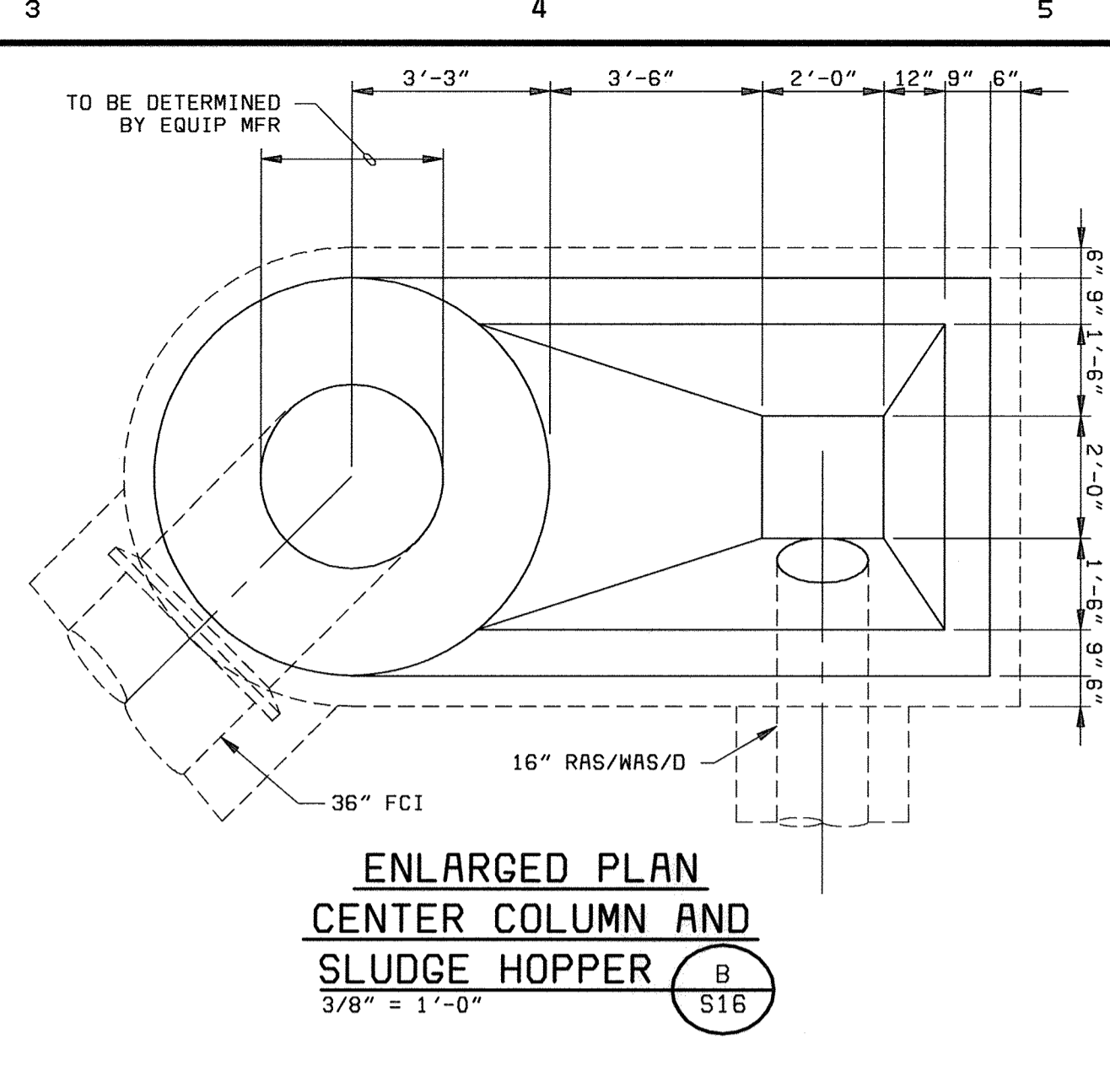
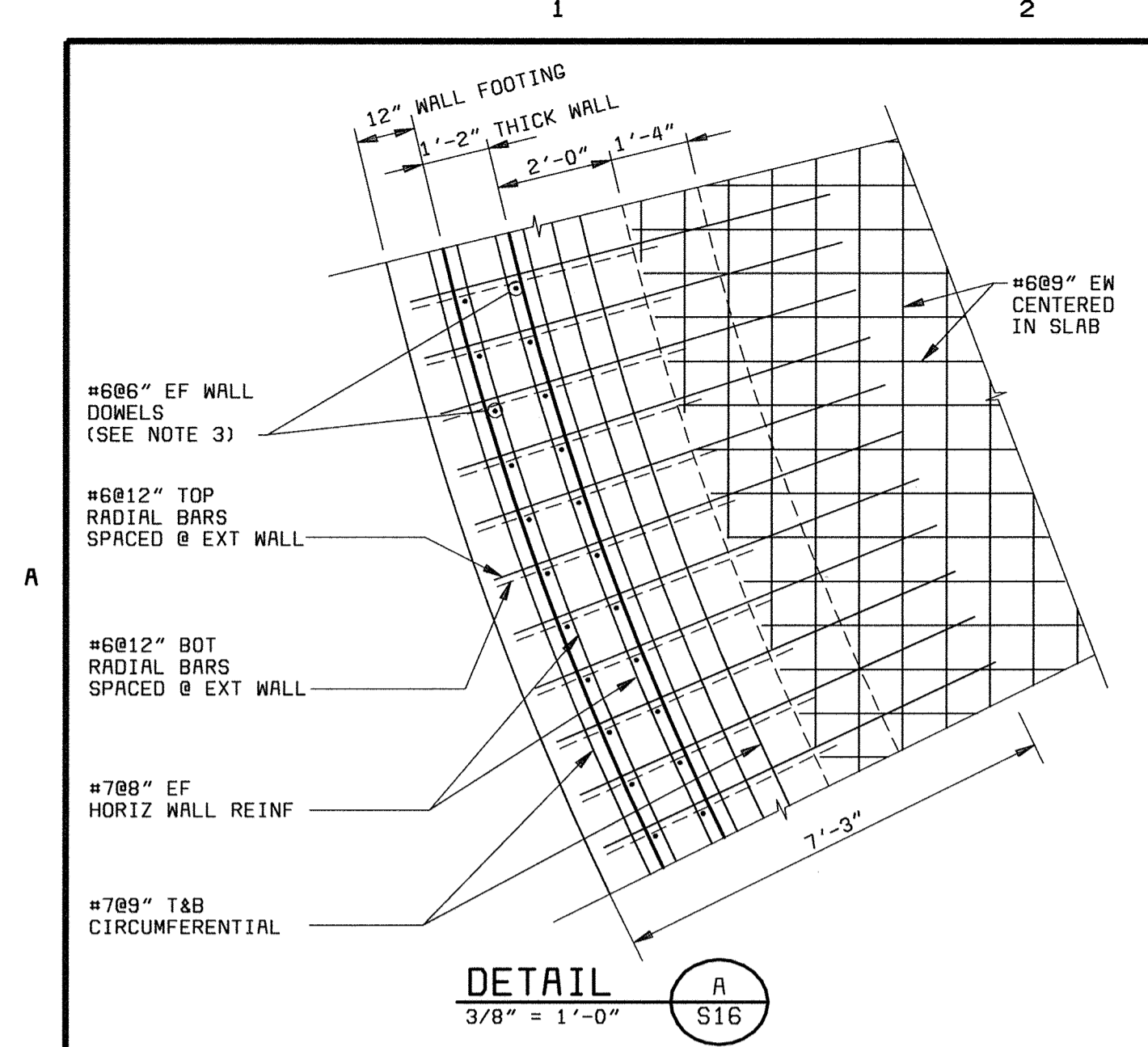
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 58 OF 161

S16



56472-101-FC-S-R0000750

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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

FC 12
STRUCTURAL

PLANS AND SECTIONS

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

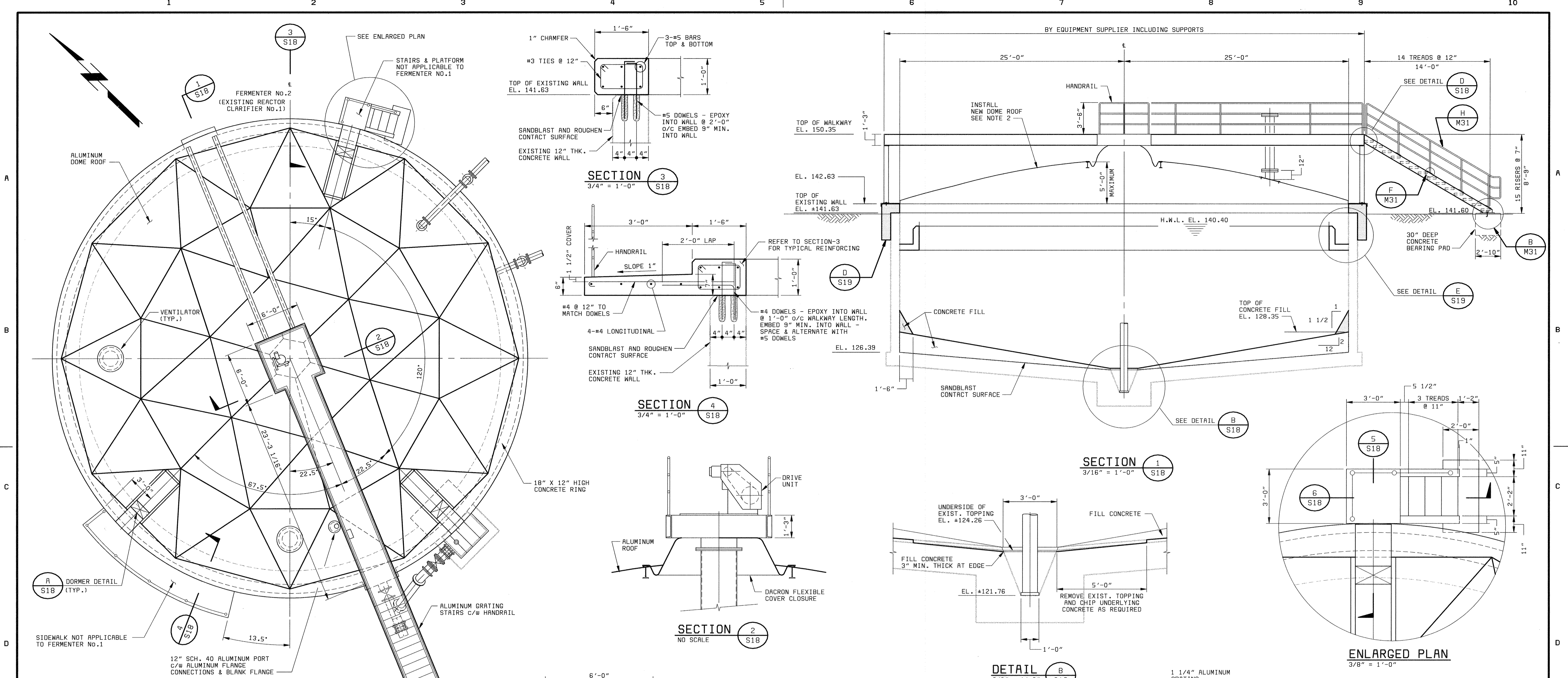
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
59 OF 161

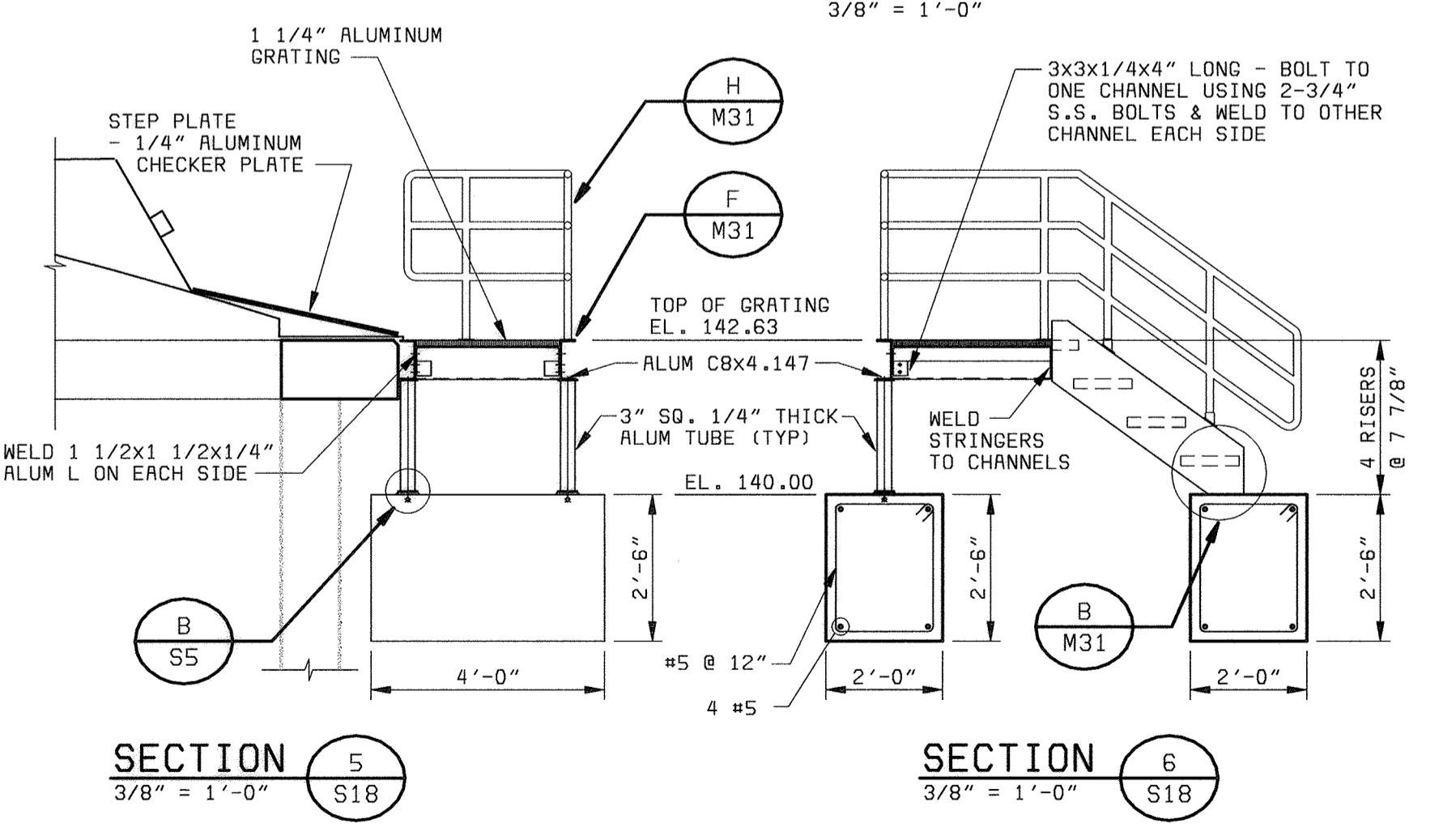
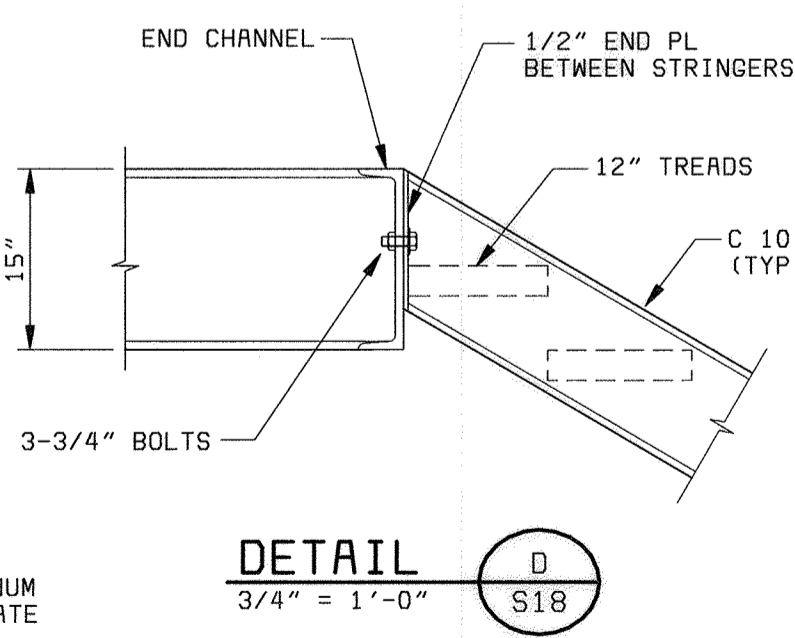
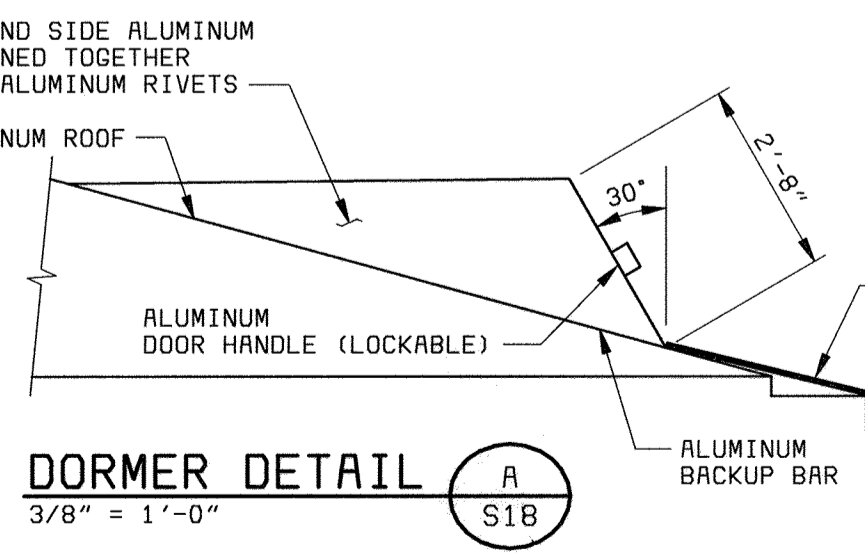
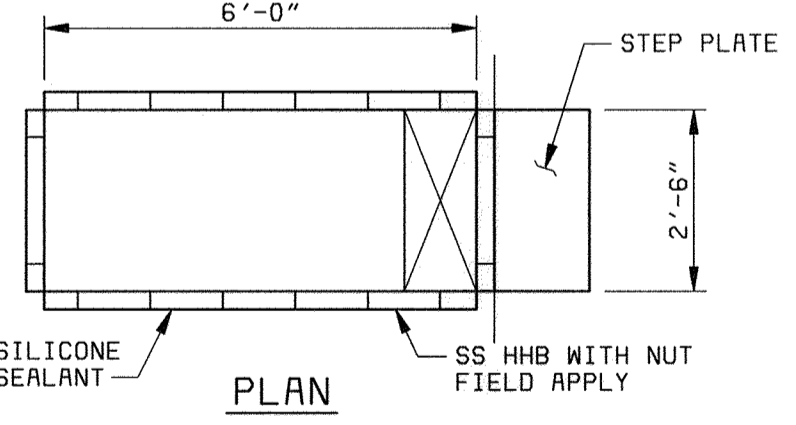
S17



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

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

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



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert M. Bauman 7-19-00
CHIEF, BUREAU OF UTILITIES DATE

Stantec

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

BLACK & VEATCH
Galliersburg, Maryland

Terrence R. Tobey
REG. PROF. ENGR.
July 17, 2000 DATE

Professional Engineer
Terrence R. Tobey
License No. 25136
July 17, 2000

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

FERMENTER STRUCTURAL

ROOF PLAN, SECTION & DETAILS

LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
NORTH BNR PROCESS TRAIN

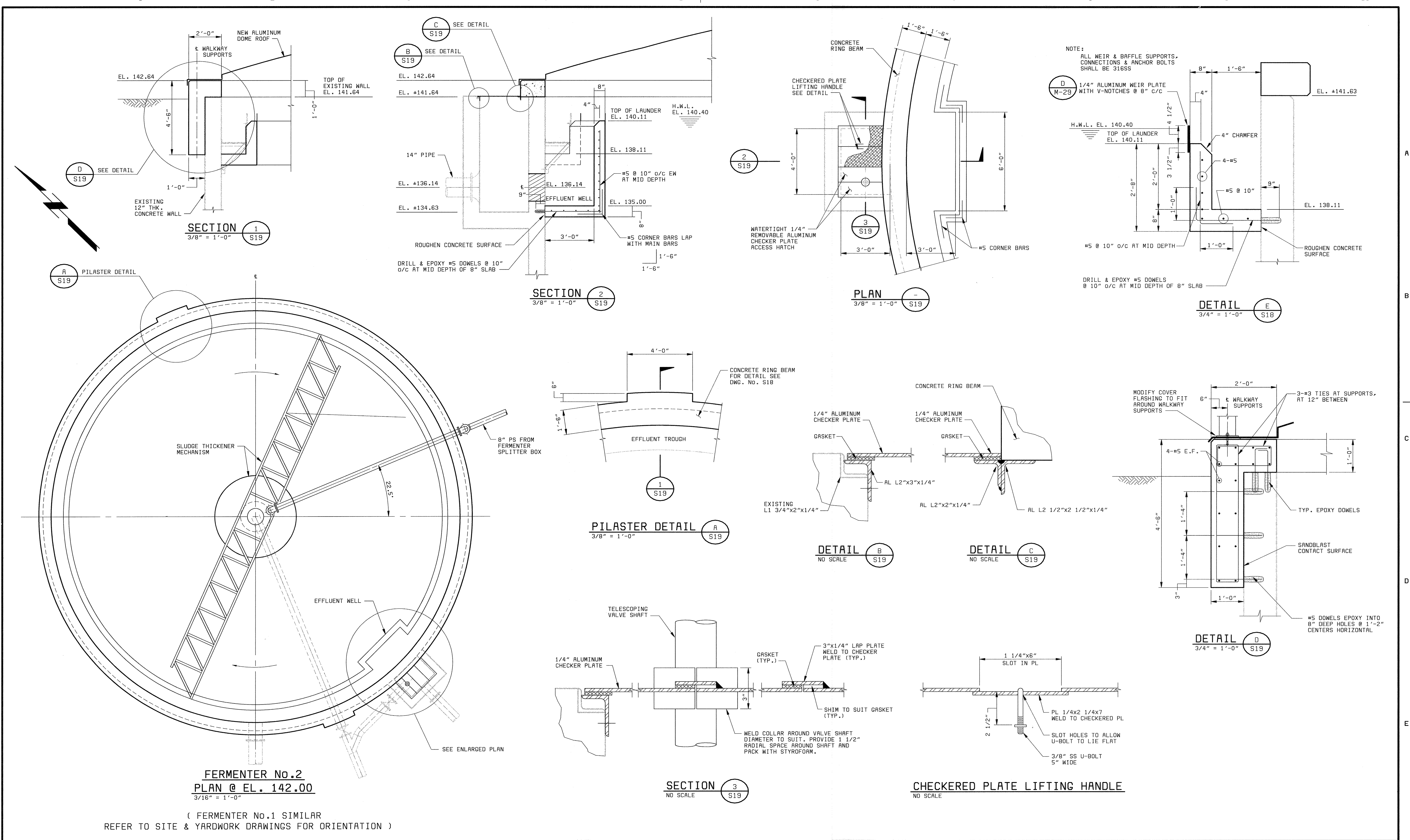
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 60 OF 161

S18



FERMENTER No.2
PLAN @ EL. 142.00
 3/16" = 1'-0"
 (FERMENTER NO.1 SIMILAR
 REFER TO SITE & YARDWORK DRAWINGS FOR ORIENTATION)

| | | | | |
|--|---|---|---|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3W 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com BLACK & VEATCH Gaithersburg, Maryland License # 25132 July 17, 2000 REG. PROF. ENGR. | DES: RVJ DRN: RCF CHK: RVJ DATE: 6/23/00 | FERMENTER STRUCTURAL PLAN, SECTIONS & DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 NORTH BNR PROCESS TRAIN CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 61 OF 161 S19 |
| | REVISIONS AND RECORD OF ISSUE NO. BY CK APP DATE | | | |

STRUCTURAL NOTES

GENERAL

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

CONCRETE

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

REINFORCING STEEL

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

STRUCTURAL STEEL

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

STAINLESS STEEL

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

ALUMINUM

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

MASONRY

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

SOIL AND FOUNDATIONS

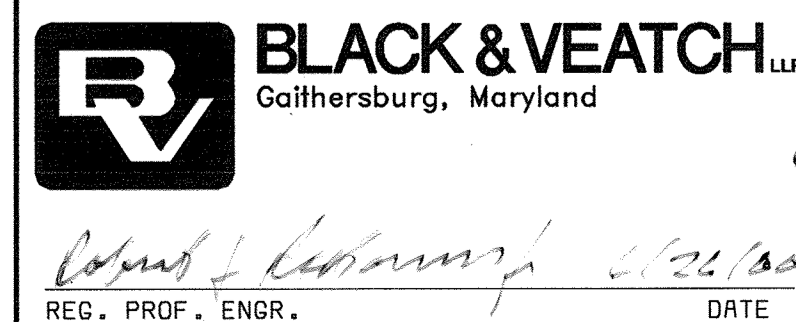
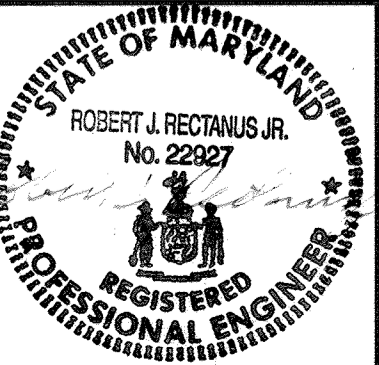
- ALL EARTHWORK AND FOUNDATION CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL REPORT. IN CASE OF A CONFLICT THE REQUIREMENTS OF THE SPECIFICATIONS SHALL COVER.
- TO FACILITATE SCHEDULING, AT LEAST 48 HOURS ADVANCE NOTICE SHOULD BE GIVEN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

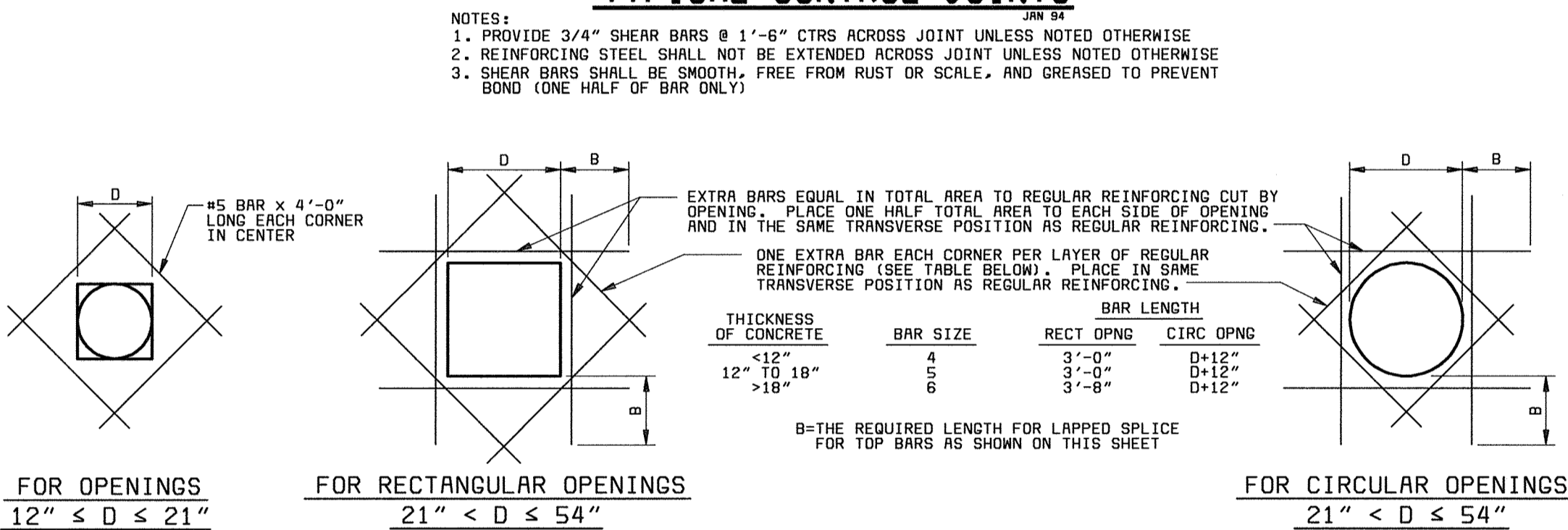
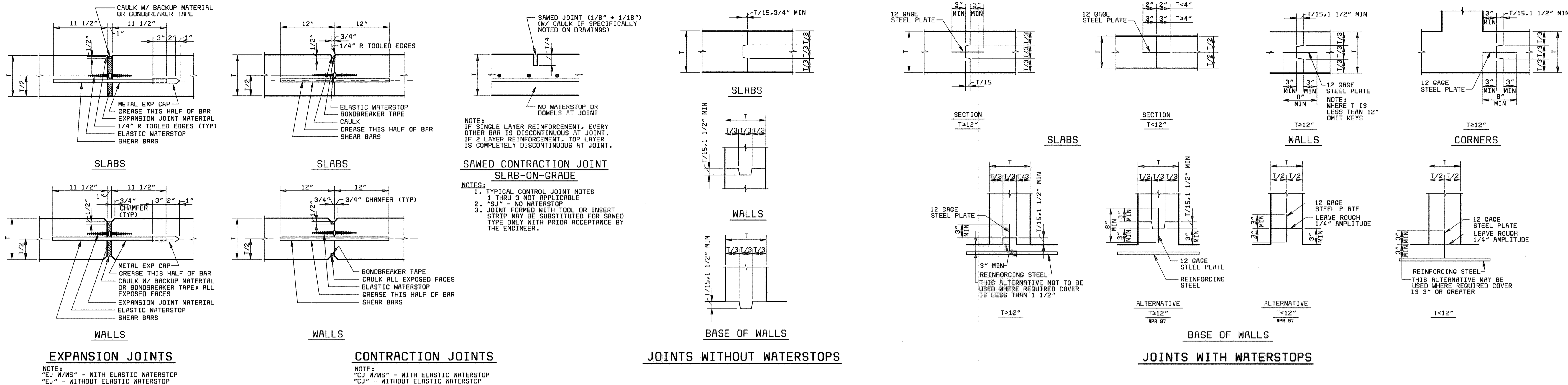
LOADING CRITERIA

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

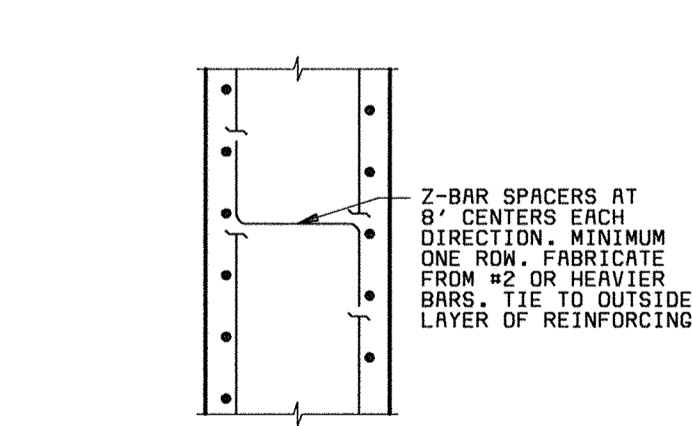
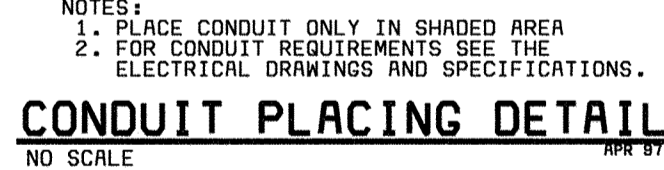
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|--|---|---|---------------|------|-------------------------------|-----|----|----|-----|--|---|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert M. Berger 6-29-00 CHIEF, BUREAU OF UTILITIES DATE |  BLACK & VEATCH <small>LLP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

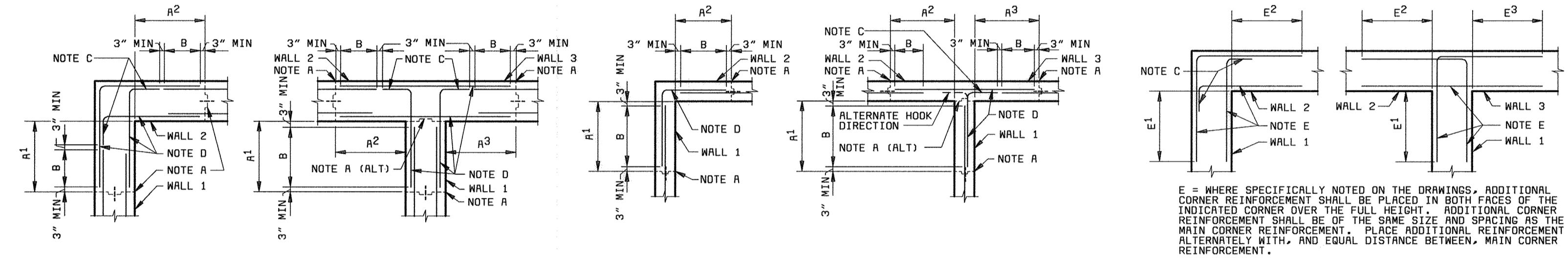


TYPICAL EXTRA REINFORCING AT OPENINGS 12" TO ≤ 54"
 (TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS) JAN 94



JOINTS WITHOUT WATERSTOPS

JOINTS WITH WATERSTOPS



TYPICAL HORIZONTAL CORNER REINFORCING DETAILS
 NO SCALE

(f'c = 4000 PSI)

| | | SPLICE & DEVELOPMENT LENGTHS (UNLESS NOTED OTHERWISE ON THE DRAWINGS) JUN 94 | | | | | | | | | |
|----------|--|---|--------|-------------|--|---------------------------|---|--------|----------|----|----|
| | | BEAMS AND COLUMNS | | | | WALLS, SLABS AND FOOTINGS | | | | | |
| BAR SIZE | LENGTH OF LAPPED SPLICES FOR REIN (INCHES) | LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCEMENT (INCHES) | | HOOKED BARS | LENGTH OF LAPPED SPLICES FOR REIN (INCHES) | | LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCEMENT (INCHES) | | BAR SIZE | | |
| | | *TOP BARS | OTHERS | | *TOP BARS | OTHERS | *TOP BARS | OTHERS | | | |
| 3 | 19 | 16 | 14 | 12 | 6 | 19 | 16 | 14 | 12 | 6 | 3 |
| 4 | 24 | 19 | 19 | 15 | 7 | 24 | 19 | 19 | 15 | 7 | 4 |
| 5 | 31 | 24 | 24 | 18 | 9 | 31 | 24 | 24 | 18 | 9 | 5 |
| 6 | 40 | 31 | 28 | 22 | 10 | 38 | 28 | 28 | 22 | 10 | 6 |
| 7 | 54 | 42 | 33 | 25 | 12 | 54 | 42 | 42 | 32 | 12 | 7 |
| 8 | 71 | 55 | 39 | 30 | 14 | 102 | 78 | 55 | 42 | 14 | 8 |
| 9 | 90 | 70 | 50 | 38 | 15 | 129 | 99 | 69 | 53 | 15 | 9 |
| 10 | 115 | 88 | 63 | 49 | 17 | 163 | 126 | 88 | 68 | 17 | 10 |
| 11 | 141 | 108 | 77 | 60 | 19 | 201 | 154 | 119 | 119 | 19 | 11 |
| 14 | --- | --- | 105 | 81 | 33 | --- | --- | 210 | 162 | 33 | 14 |
| 18 | --- | --- | 155 | 119 | 43 | --- | --- | 309 | 238 | 43 | 18 |

* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
 HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS.
 VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS.
 IN WALLS, SLABS AND FOOTINGS; LAPPED SPLICE LENGTH FOR BARS SIZE 8 THROUGH 11 AND STRAIGHT (NON-HOOKED) END ANCHORAGE DEVELOPMENT LENGTH FOR BAR SIZE 11 (IN TABLE ABOVE) PLACED WITH MORE THAN 2 BAR DIAMETER CLEAR SPACING MAY BE MULTIPLIED BY A FACTOR OF 0.7.
 IN BEAMS, COLUMNS, WALLS, SLABS AND FOOTINGS; LAPPED SPLICE LENGTH AND STRAIGHT (NON-HOOKED) END ANCHORAGE DEVELOPMENT LENGTH FOR BARS SIZE 7 THROUGH 11 (IN THE TABLE ABOVE) PLACED WITH MORE THAN 5 BAR DIAMETER CLEAR SPACING MAY BE MULTIPLIED BY A FACTOR OF 0.8. THE MULTIPLICATION FACTORS OF 0.7 AND 0.8 MAY BE COMBINED ONLY FOR BARS COMMON TO THIS NOTE AND THE NOTE ABOVE.
 LAPPED SPLICES SHALL NOT BE MADE AT POINTS OF MAXIMUM STRESS UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR AS DETERMINED BY THE ENGINEER.

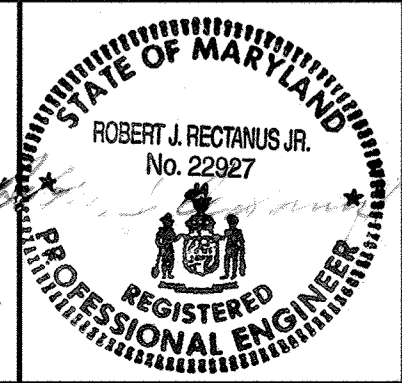
CONCRETE COVER FOR REINFORCEMENT

| LOCATION | MINIMUM COVER |
|---|---------------|
| UNFORMED SURFACES ADJACENT TO EXCAVATION | 3" |
| FORMED OR TOP SURFACES EXPOSED TO WEATHER OR SATURATED AIR, SUBMERGED OR IN CONTACT WITH EARTH, INCLUDING STIRRUPS, TIES OR SPIRALS | 2" |
| OTHER LOCATIONS | |
| BARS IN BEAMS OR GIRDETS, INCLUDING STIRRUPS AND COLUMN SPIRALS OR TIES | 1 1/2" |
| SLABS, WALLS AND JOISTS | |
| #6 AND LARGER | 1 1/2" |
| #5 AND SMALLER | 3/4" |

NOTE:
 TOLERANCES FOR CONCRETE COVER AND THE FABRICATION AND PLACING OF REINFORCEMENT SHALL CONFORM TO ACI 117.

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

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



| | | | | | | | | |
|--------------|------|-------------------------------|-----|----|----|-----|--|--|
| DES: STD | | | | | | | | |
| DRN: RLC | | | | | | | | |
| CHK: NGM | | | | | | | | |
| DATE: 5/5/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | |

GENERAL STRUCTURAL
STANDARD CONCRETE DETAILS

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

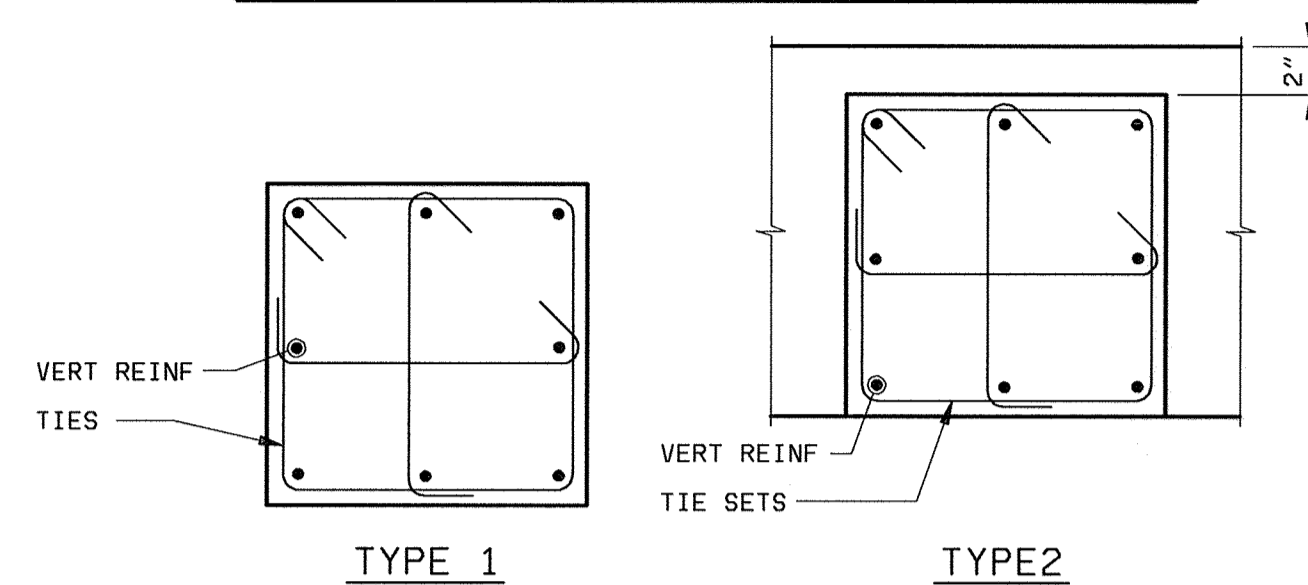
SCALE AS SHOWN
 SHEET 63 OF 161
S21

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

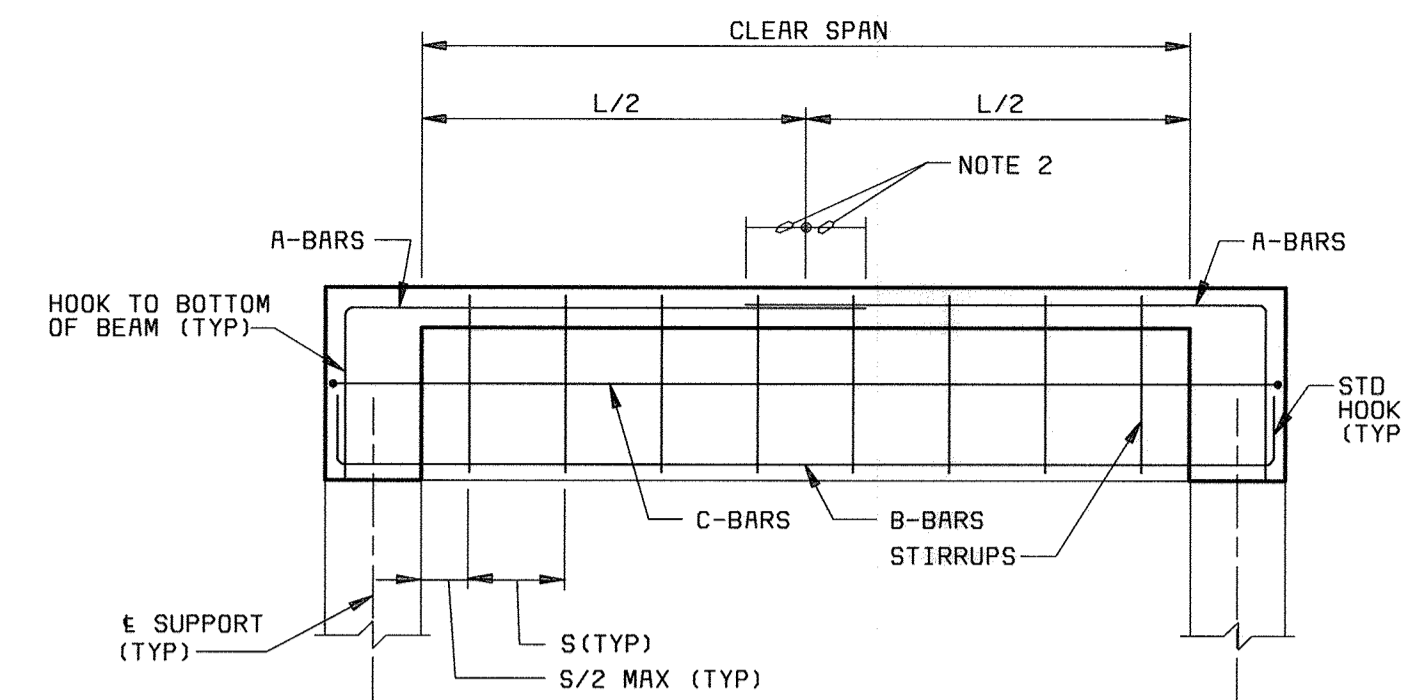
NOTE:

1. FOR TOP OF FDN, SEE PLAN.

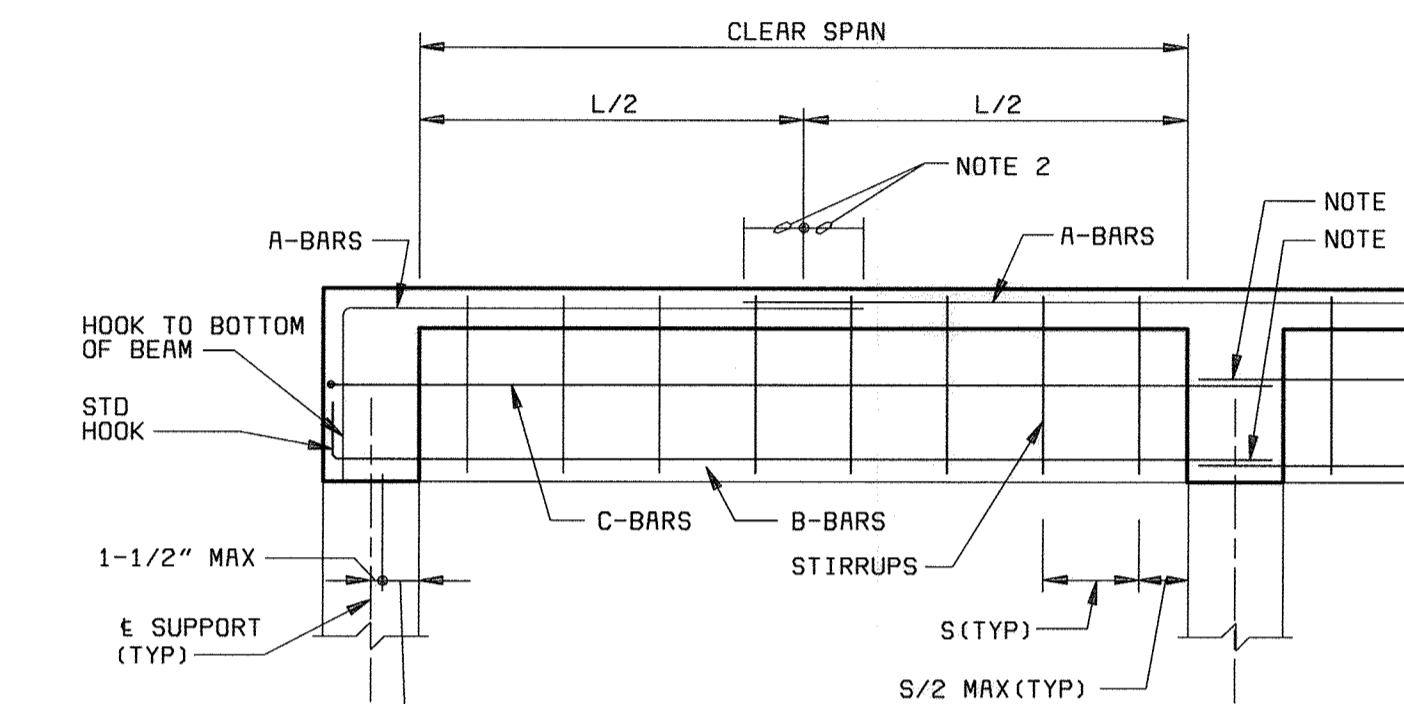
| COLUMN SCHEDULE | | | | | | |
|-----------------|---|-----|-----|-----|-----|---|
| COLUMN ROW | A | B | C | D | E | F |
| BLOWER BUILDING | | | | | | |
| 2 | I | II | II | II | II | I |
| 2.2 | I | | | | | |
| 2.5 | | III | III | III | III | |
| 2.7 | I | | | | | I |
| 3 | | III | III | III | III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



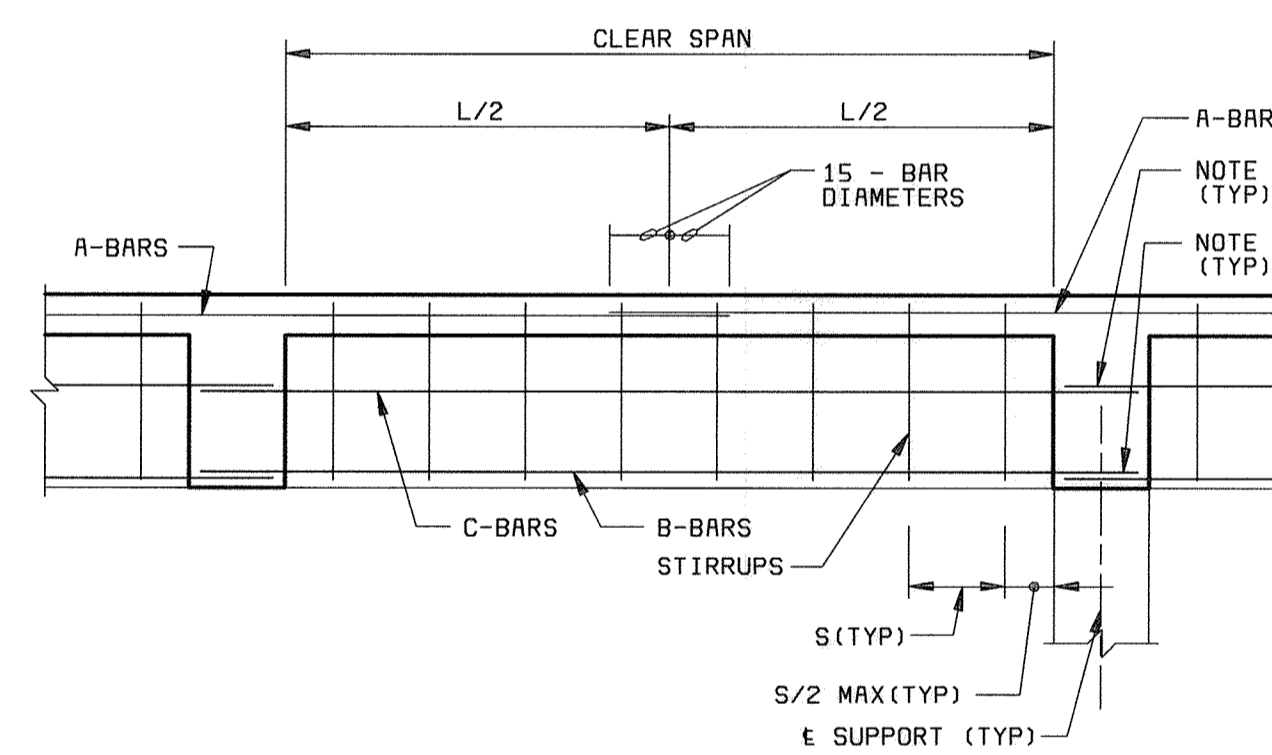
COLUMN SECTION TYPES



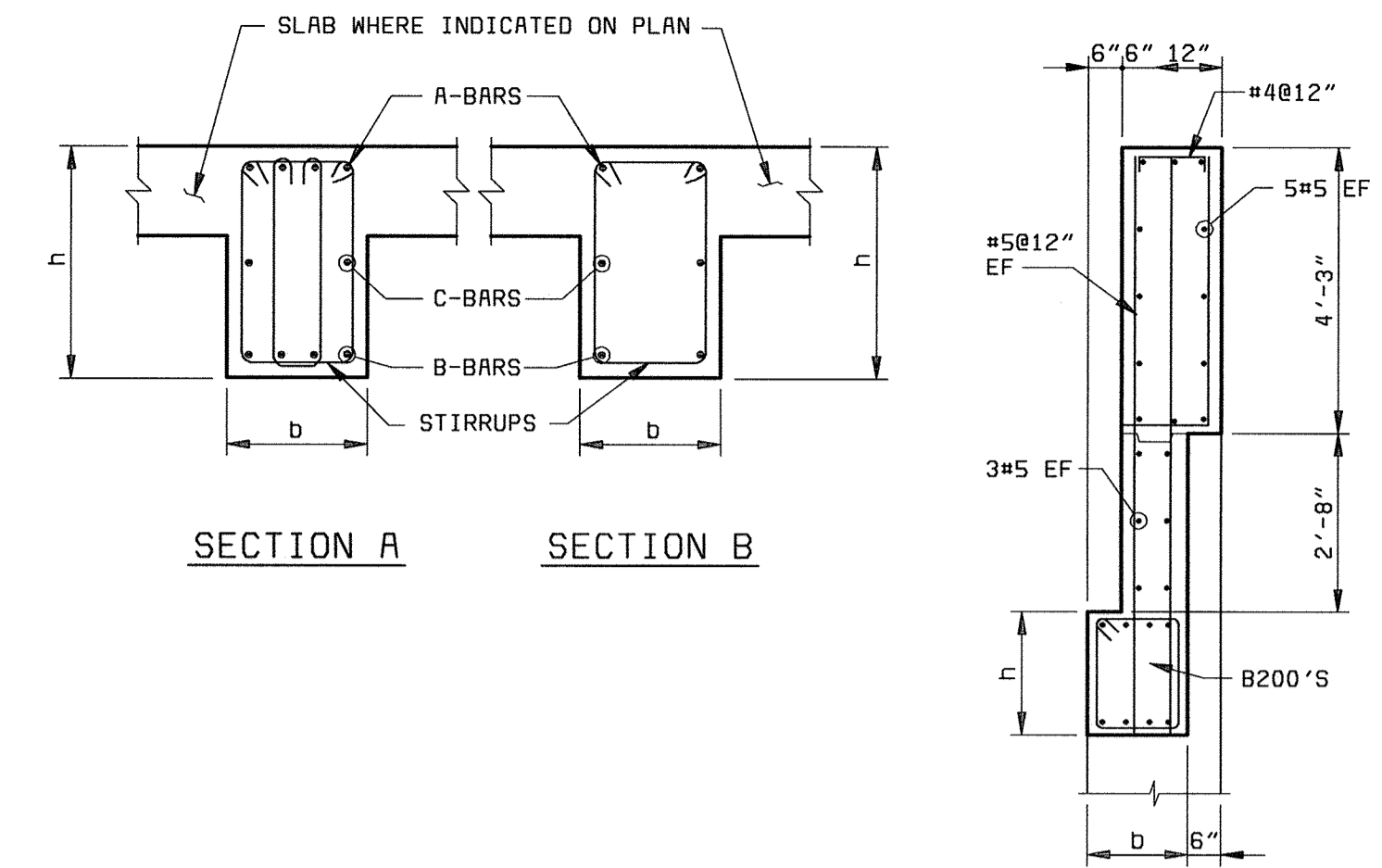
TYPE I



TYPE II



TYPE III



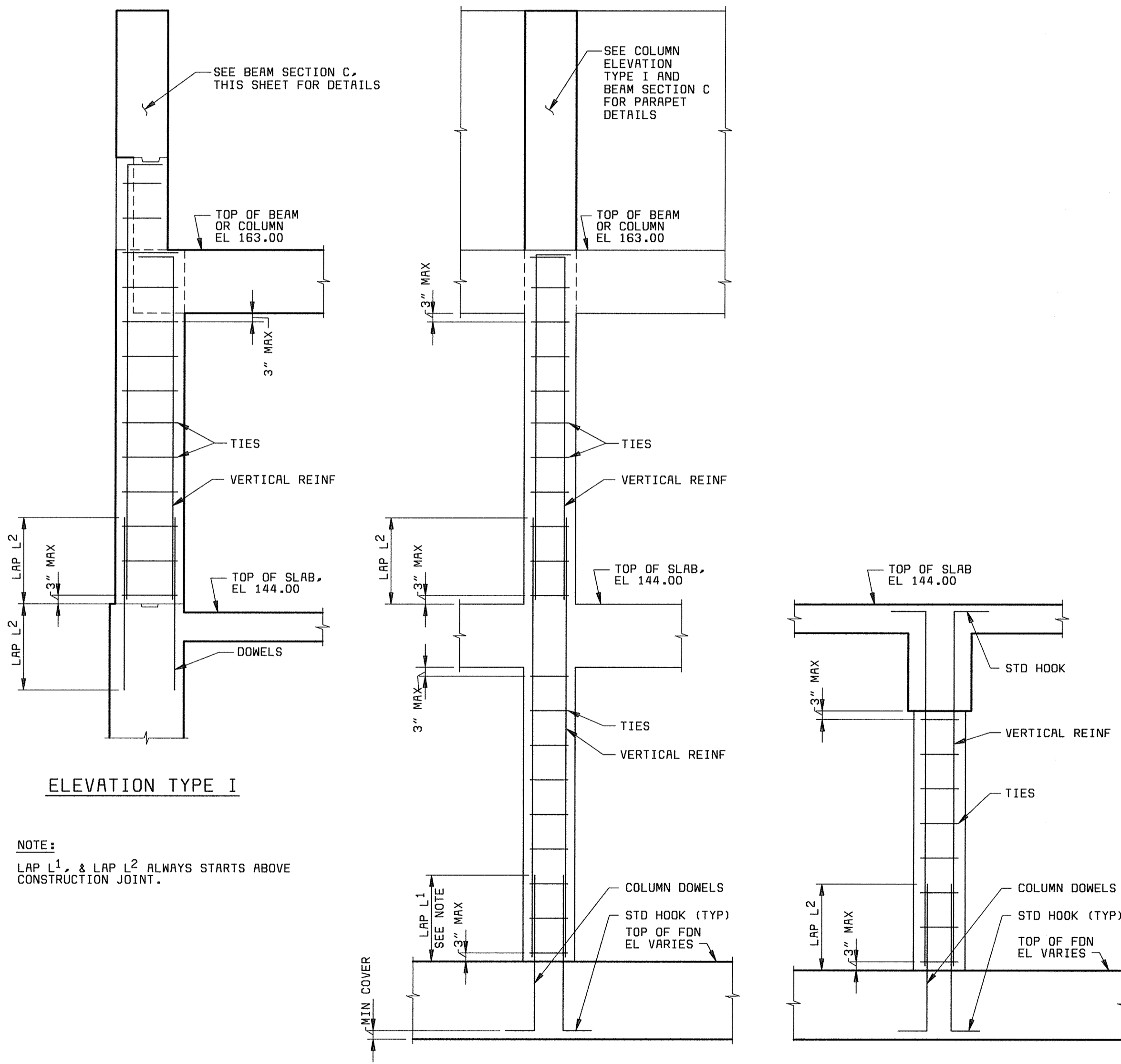
BEAM SECTIONS

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

BEAM NOTES:

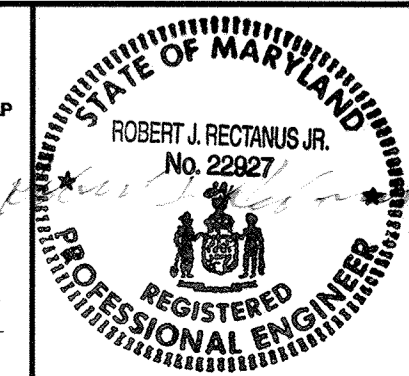
- UNLESS INDICATED OTHERWISE IN BEAM SCHEDULE, CONTINUOUS BOTTOM REINF SHALL HAVE LAP SPLICES CENTERED ON THE CENTERLINE OF THE SUPPORT USING 75% OF THE LAP SPLICE LENGTH INDICATED ON THE STANDARD CONCRETE DETAILS SHEET D-1. USE THE LAP SPLICE REQUIREMENT OF THE SMALLER BOTTOM BAR IF BAR SIZES IN ADJACENT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

BEAM DETAILS
NO SCALE



COLUMN REINFORCEMENT ELEVATIONS
NO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND



DES: IFH

DRN: RLC

CHK: NGM

DATE: 6/23/00

GENERAL
STRUCTURAL

COLUMN AND BEAM SCHEDULES

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
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64 OF 161

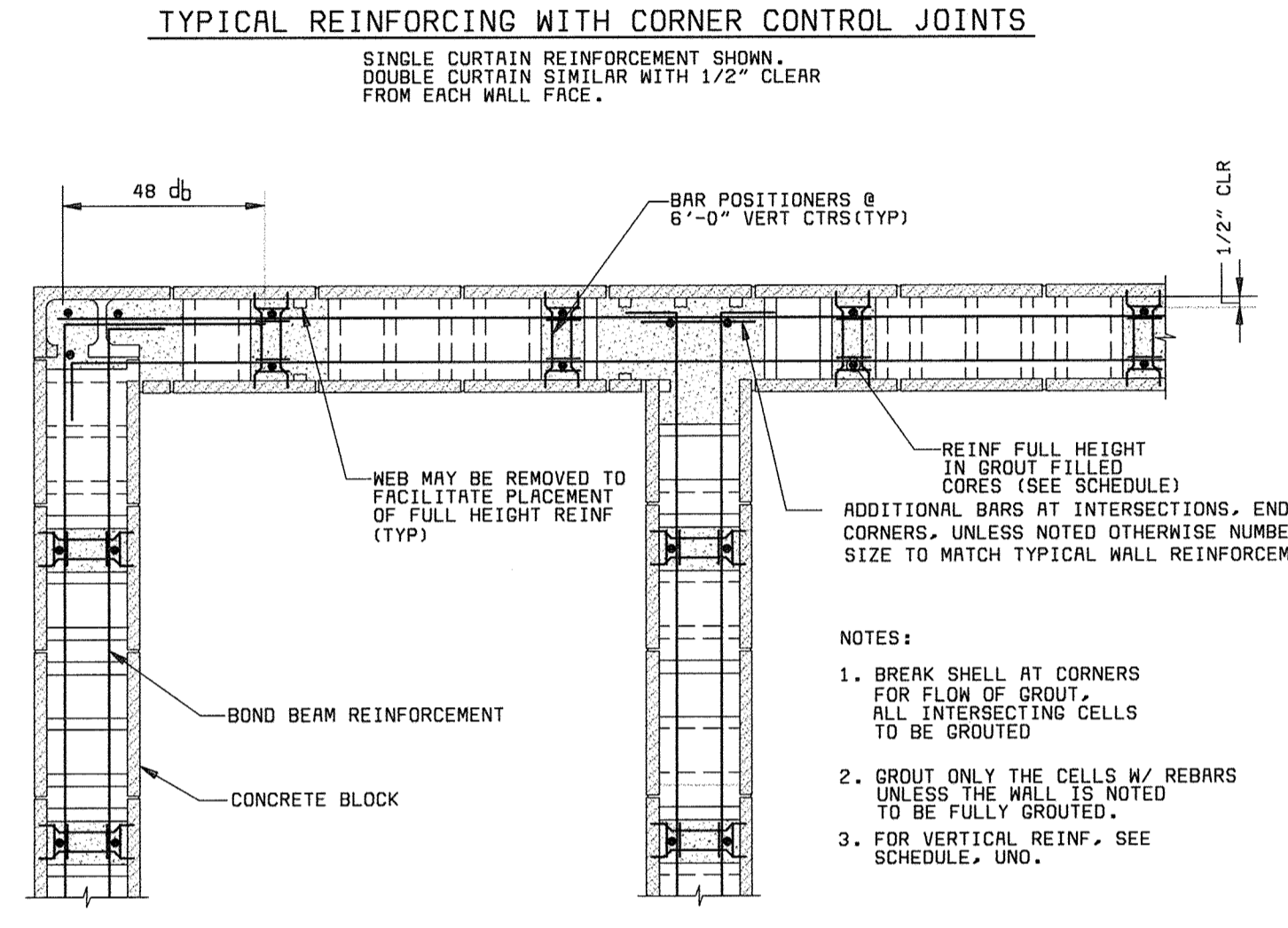
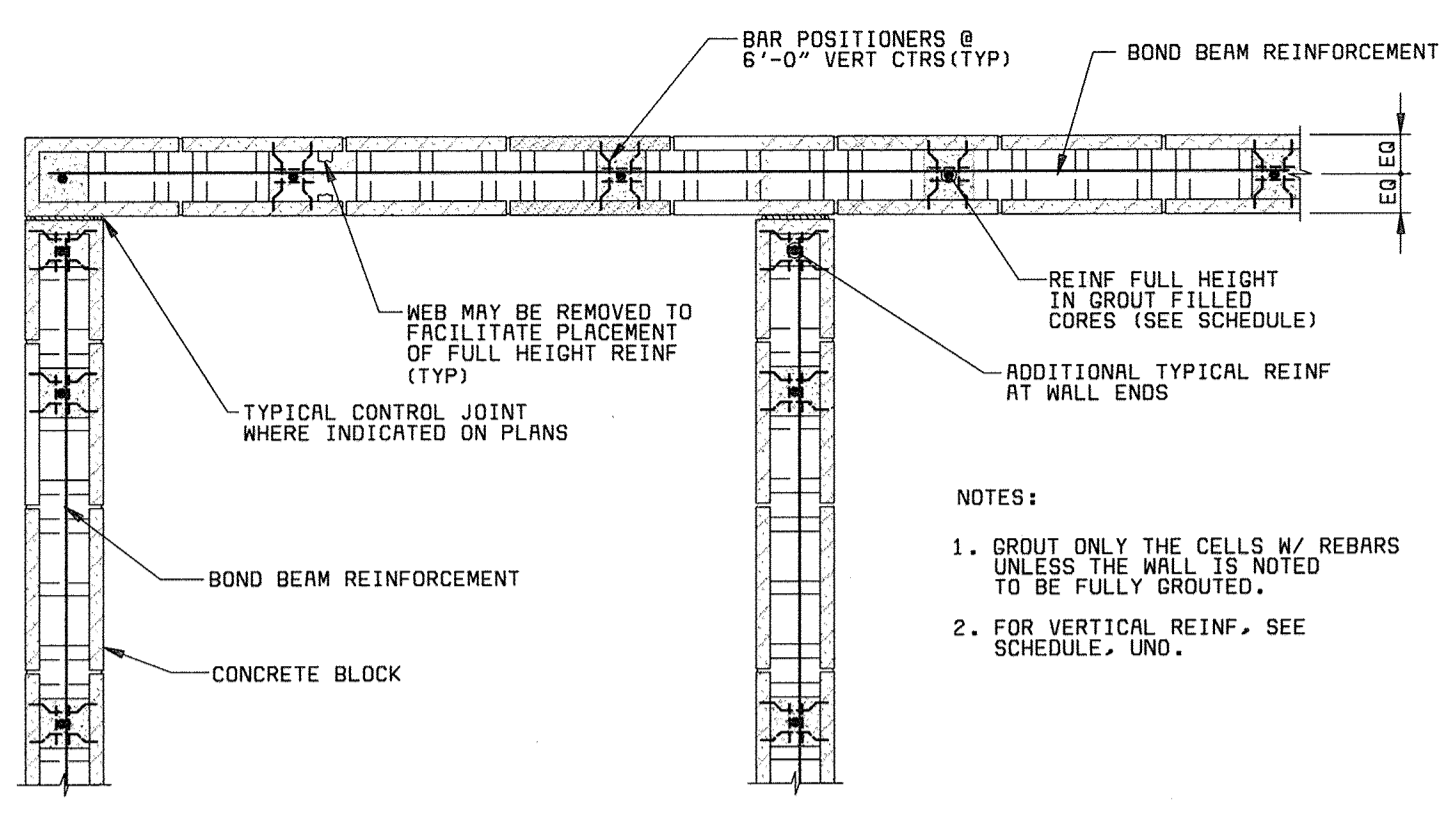
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Robert M. Baizer 6-29-00
CHIEF, BUREAU OF UTILITIES DATE

Wood J. Hederman 6/23/00
REG. PROF. ENGR. DATE

DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP



TYPICAL MASONRY REINFORCING PLANS

3/4" = 1'-0"

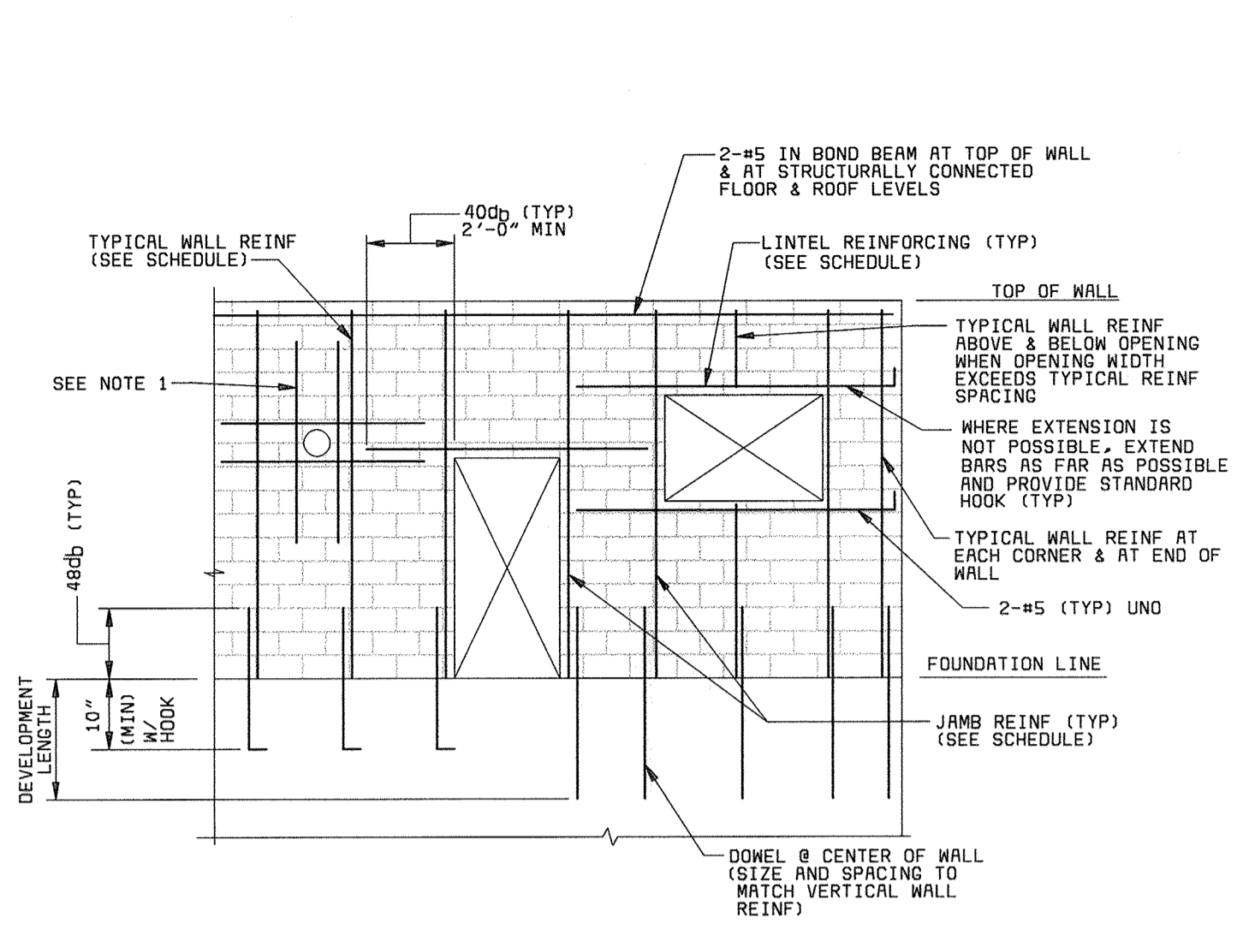
MINIMUM CMU WALL REINFORCING SCHEDULE (NOTE 5)
(SPECIAL INSPECTION REQUIRED)

| WALL SIZE | WALL HEIGHT | VERTICAL REINFORCEMENT | | HORIZONTAL REINFORCEMENT | |
|-----------|-------------|------------------------|---------------|---|---|
| | | EXTERIOR WALL | INTERIOR WALL | EXTERIOR WALL | INTERIOR WALL |
| 12" | ≤16'-0" | #5@48 | #5@48 | CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#6 HORIZONTAL | CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#6 HORIZONTAL |
| | ≤20'-0" | #6@48 | #5@48 | | |
| | ≤22'-0" | #5@48 EF | #5@48 | | |
| | ≤24'-0" | #5@32 EF | #5@48 | | |
| 8" | ≤13'-0" | #5@48 | #5@48 | CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#5 HORIZONTAL | CONTINUOUS BOND BEAMS @ 48" CTRS W/ 2-#5 HORIZONTAL |
| | ≤16'-0" | #5@32 | #5@48 | | |
| | ≤18'-0" | #5@32 EF | #5@48 | | |
| | ≤22'-0" | #6@32 EF | #5@48 | | |

- NOTES:
1. WALL HEIGHT IS DISTANCE FROM BOTTOM OF MASONRY WALL TO THE LOCATION OF TOP LATERAL SUPPORT.
 2. WHERE BARS ARE CALLED OUT EACH FACE (EF), BARS SHALL BE PLACED IN A DOUBLE CURTAIN WITH ONE BAR TOWARD EACH FACE OF THE WALL. OTHERWISE BARS SHALL BE CENTERED IN THE WALL.
 3. AN INTERIOR WALL IS A WALL IN WHICH NO PORTION OF THE WALL IS EXPOSED TO THE EXTERIOR.
 4. AT LOCATIONS WHERE WALLS CANTILEVER ABOVE THE TOP LATERAL SUPPORT, THE WALL HEIGHT FOR THE ABOVE SCHEDULE SHALL BE THE GREATER OF THE HEIGHT IN NOTE 1 OR DOUBLE THE DISTANCE FROM LATERAL SUPPORT TO THE TOP OF THE WALL.
 5. IN ADDITION TO THE SCHEDULED REINFORCEMENT, WALLS SHALL HAVE A CONTINUOUS BOND BEAM WITH AT LEAST 2-#5 BARS AT OR NEAR THE TOP COURSE. SCHEDULED REINFORCEMENT AT OPENINGS, AND ALL OTHER HORIZONTAL AND VERTICAL REINFORCEMENT AS INDICATED ON THE STRUCTURAL AND ARCHITECTURAL DRAWINGS.
 6. SEE THE STRUCTURAL DRAWINGS FOR SPECIAL REINFORCEMENT AND BOUNDARY ELEMENTS IN HIGH STRESS SHEAR WALLS. ALL WALLS SHALL BE REINFORCED WITH THE MINIMUMS ABOVE.

MINIMUM CMU WALL REINFORCING SCHEDULE

NO SCALE



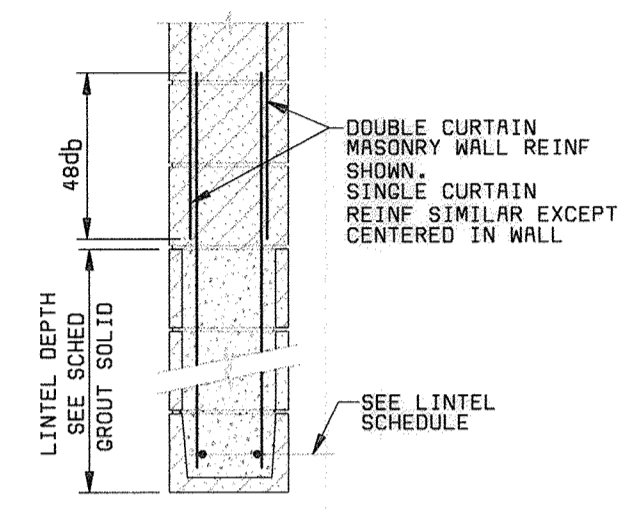
TYPICAL MASONRY LINTEL SECTION AND SCHEDULE

NO SCALE

LINTEL SCHEDULE

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

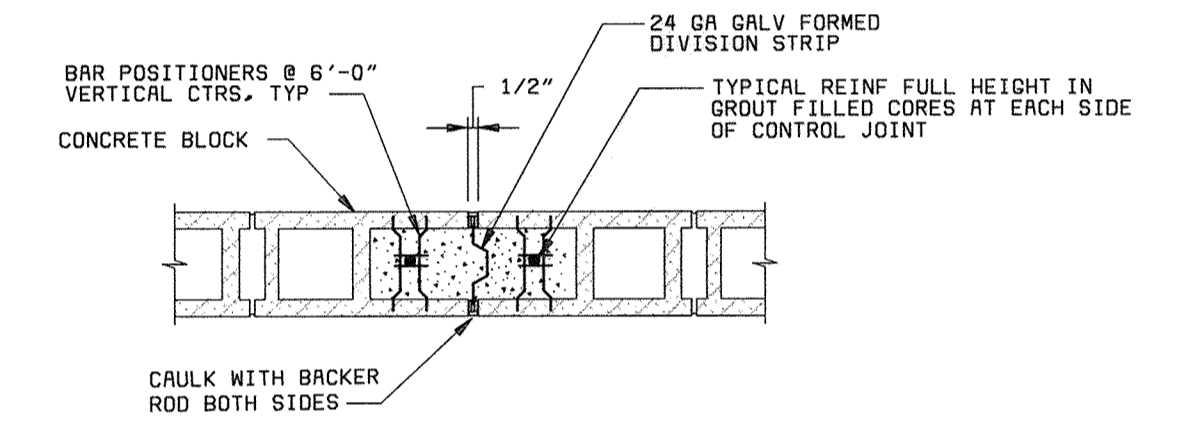
- NOTES:
1. BEAR ALL LINTELS A MINIMUM 2'-0" AT EACH END.
 2. REINFORCE LINTELS AS INDICATED ABOVE UNLESS NOTED OTHERWISE ON THE DRAWINGS.



JAMB REINFORCING SCHEDULE

| WALL SIZE | WALL HEIGHT | OPENING WIDTH | EXTERIOR WALL REINFORCEMENT | INTERIOR WALL REINFORCEMENT |
|-----------|-------------|---------------|-----------------------------|-----------------------------|
| 12" | ≤16'-0" | ≤7'-0" | 1-#5 EF | 1-#5 EF |
| | | ≤12'-0" | 2-#5 EF | 1-#5 EF |
| | | ≤4'-0" | 1-#6 EF | 1-#5 EF |
| | ≤20'-0" | ≤7'-0" | 1-#6 EF | 1-#5 EF |
| | | ≤12'-0" | 3-#6 EF | 1-#5 EF |
| | | ≤4'-0" | 1-#6 EF | 1-#5 EF |
| 8" | ≤22'-0" | ≤7'-0" | 2-#6 EF | 1-#5 EF |
| | | ≤12'-0" | 3-#6 EF | 2-#5 EF |
| | | ≤4'-0" | 2-#6 EF | 1-#5 EF |
| | ≤24'-0" | ≤7'-0" | 2-#7 EF | 1-#5 EF |
| | | ≤12'-0" | 3-#6 EF | 1-#5 EF |
| | | ≤4'-0" | 1-#5 EF | 1-#5 EF |
| ≤13'-0" | ≤7'-0" | 1-#6 EF | 1-#5 EF | |
| | ≤12'-0" | 3-#6 EF | 1-#5 EF | |
| | ≤4'-0" | 1-#6 EF | 1-#5 EF | |
| ≤16'-0" | ≤4'-0" | 1-#6 EF | 1-#5 EF | |
| | ≤7'-0" | 2-#7 EF | 1-#5 EF | |
| | ≤18'-0" | 2-#5 EF | 1-#5 EF | |

- NOTES:
1. WALL HEIGHT IS DISTANCE FROM BOTTOM OF MASONRY WALL TO THE LOCATION OF TOP LATERAL SUPPORT.
 2. THE SCHEDULED REINFORCING SHALL BE PLACED WITH ONE BAR AT EACH FACE OF THE WALL. ONLY ONE PAIR OF BARS SHALL BE PLACED IN EACH CELL.
 3. AN INTERIOR WALL IS A WALL IN WHICH NO PORTION OF THE WALL IS EXPOSED TO THE EXTERIOR.
 4. AT LOCATIONS WHERE WALLS CANTILEVER ABOVE THE TOP LATERAL SUPPORT, THE WALL HEIGHT FOR ABOVE SCHEDULE SHALL BE THE GREATER OF THE HEIGHT IN NOTE 1 OR DOUBLE THE DISTANCE FROM LATERAL SUPPORT TO THE TOP OF THE WALL.
 5. REINFORCE JAMBS AS INDICATED UNLESS NOTED OTHERWISE ON THE DRAWINGS.

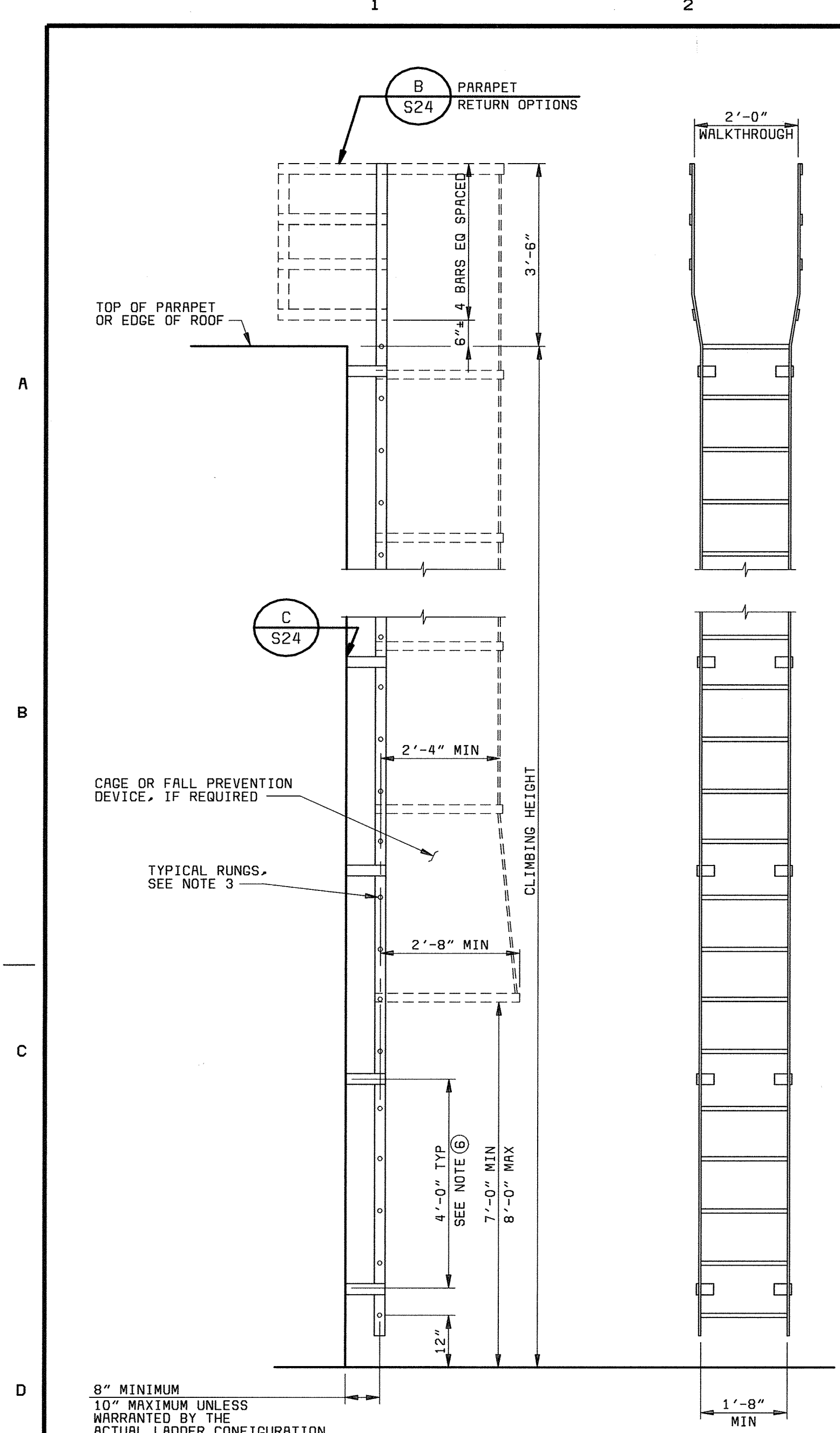


TYPICAL CONCRETE MASONRY CONTROL JOINT

NO SCALE

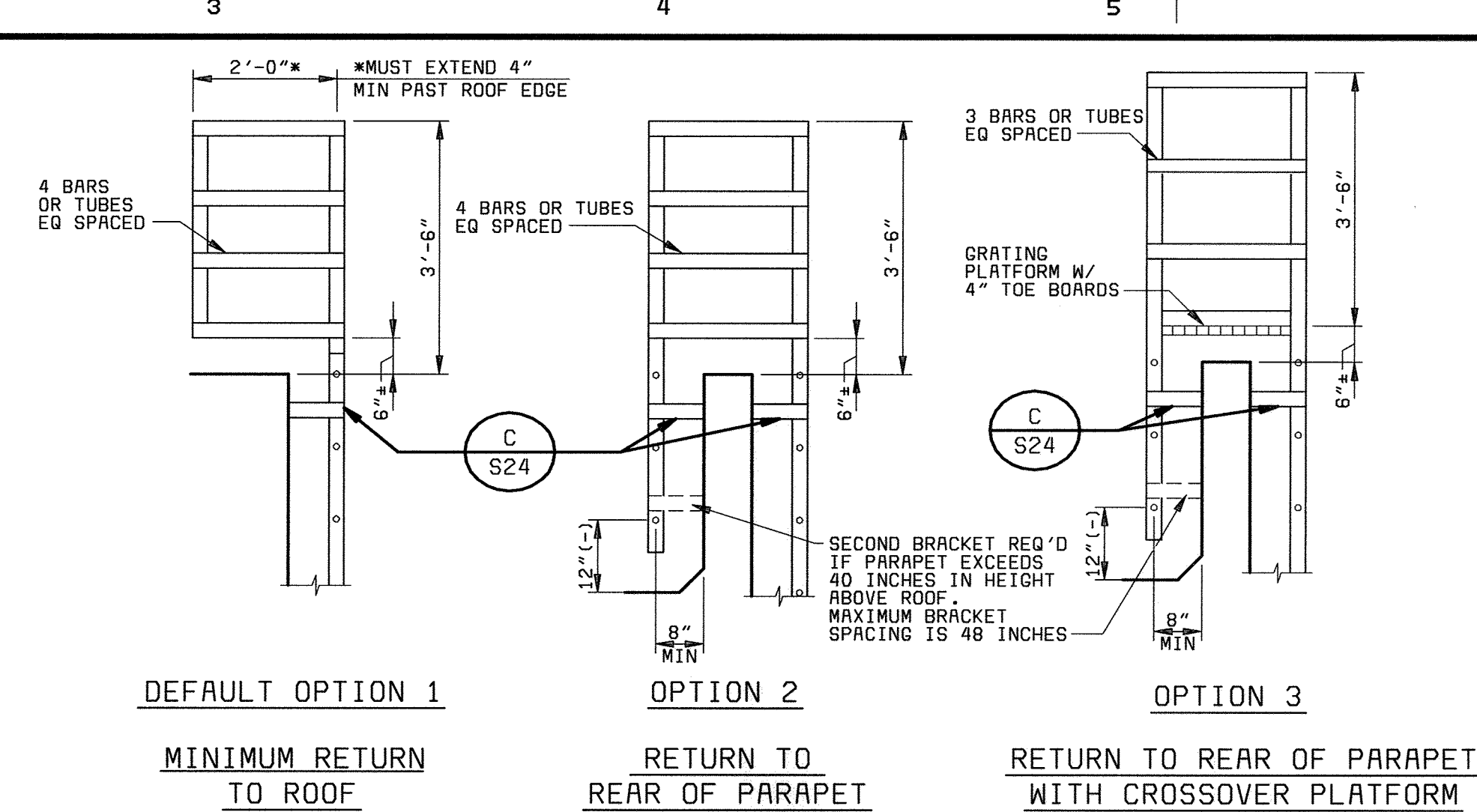
- GENERAL NOTES:
1. THE DETAILS ON THIS SHEET ARE APPLICABLE TO ALL CONCRETE MASONRY CONSTRUCTION. SPECIAL NOTES, SECTIONS AND DETAILS SPECIFICALLY NOTED ON THE DESIGN DRAWINGS SHALL BE APPLICABLE IN LIEU OF THESE TYPICAL DETAILS, EXCEPT THAT REINFORCEMENT SHALL NOT BE LESS THAN THE TYPICAL REINFORCEMENT REQUIRED.
 2. FOR MISCELLANEOUS APPURTENANCES INCLUDING EMBEDMENTS, BRACING, STEEL OR PRECAST LINTELS, VENEER, FLASHING, WEEPS, INSULATION, SEALING, CAULKING AND EMBEDDED PIPE AND ELECTRICAL CONDUIT, SEE THE DESIGN DRAWINGS.
 3. MASONRY SHALL BE CONSTRUCTED WITH SLEEVES AS REQUIRED TO ACCOMMODATE PASSAGE OF PENETRATING PIPING, CONDUIT AND DUCT BANKS INDICATED ON THE CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS.
 4. ϕ DENOTES REINFORCING BAR DIAMETER. UNO DENOTES "UNLESS NOTED OTHERWISE".
 5. SPECIAL INSPECTION IS REQUIRED FOR ALL MASONRY.

| | | | | | | | | | | | | |
|--|--|---|----------|----------|---------------|------|-------------------------------|-----|----|---|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert D. Berger 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LLP Gaithersburg, Maryland REG. PROF. ENGR. DATE | ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: STD | | | | | | | GENERAL STRUCTURAL STANDARD MASONRY DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: B&V | CHK: NGM | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | | | CK |

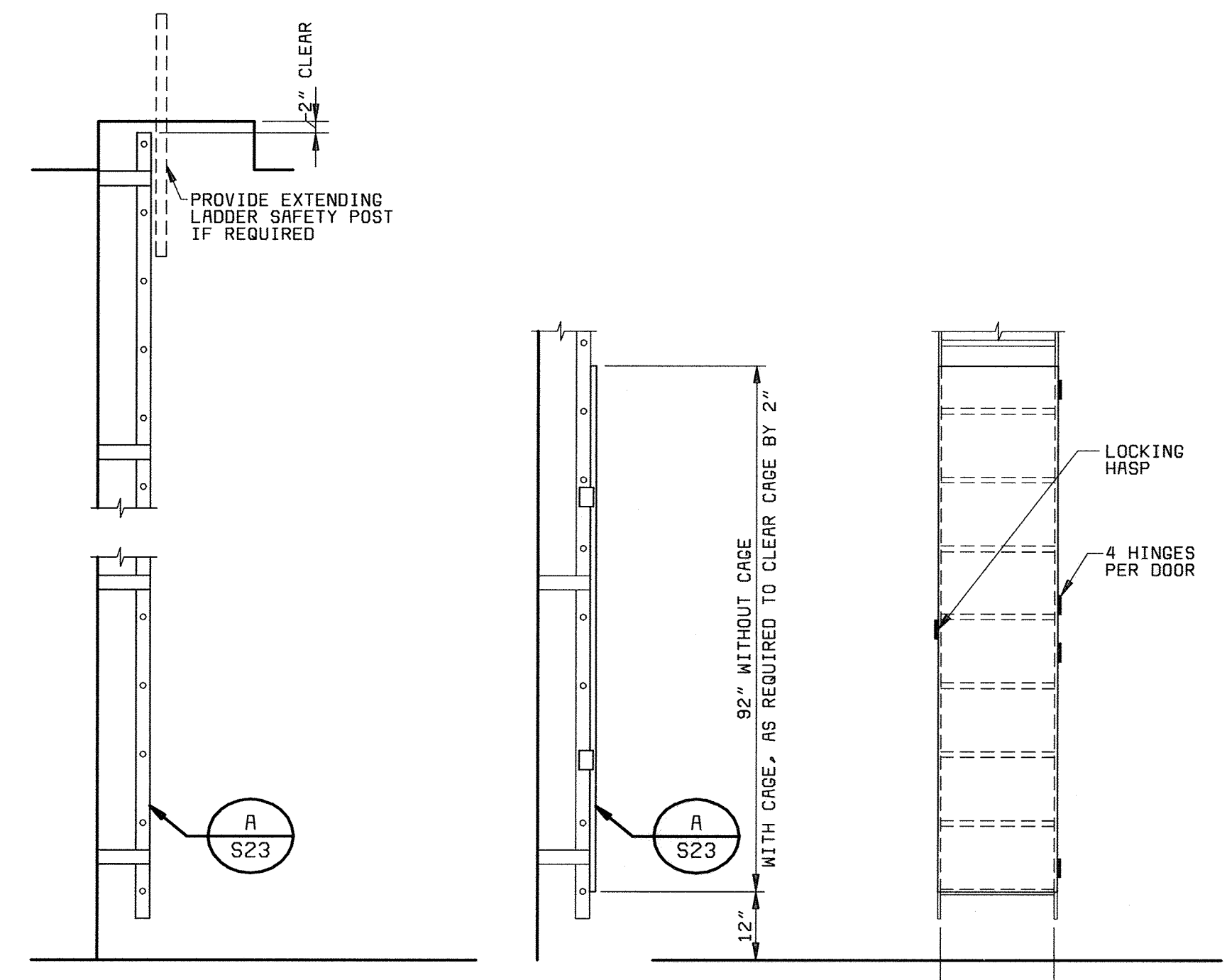


NOTE: A CAGE OR FALL PREVENTION DEVICE, AS REQUIRED, SHALL BE FURNISHED FOR ALL CLIMBING HEIGHTS GREATER THAN 20'-0" FOR CLIMBING HEIGHTS GREATER THAN 30'-0". REST PLATFORMS SHALL BE FURNISHED AS REQUIRED TO LIMIT STRAIGHT CLIMBS TO 30'-0".

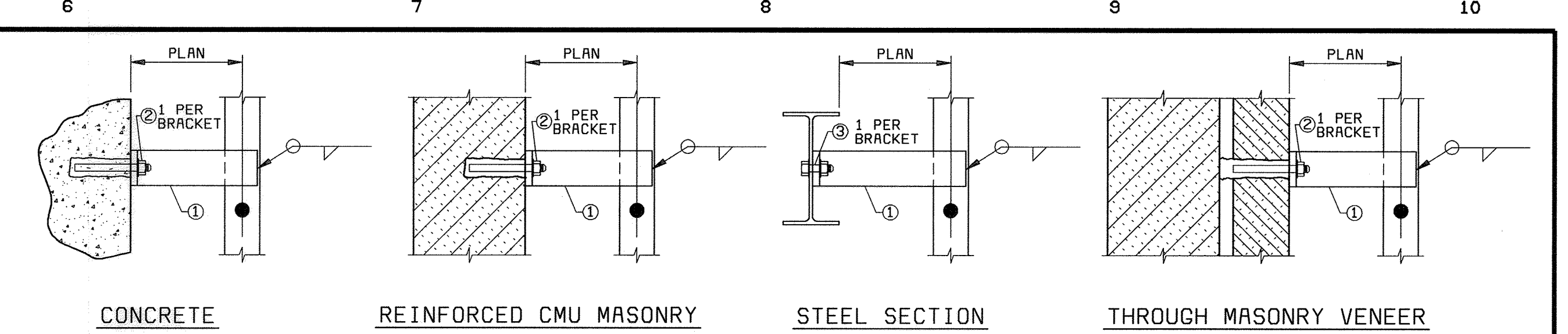
TYPICAL LADDER (A)
1/2" = 1'-0"



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

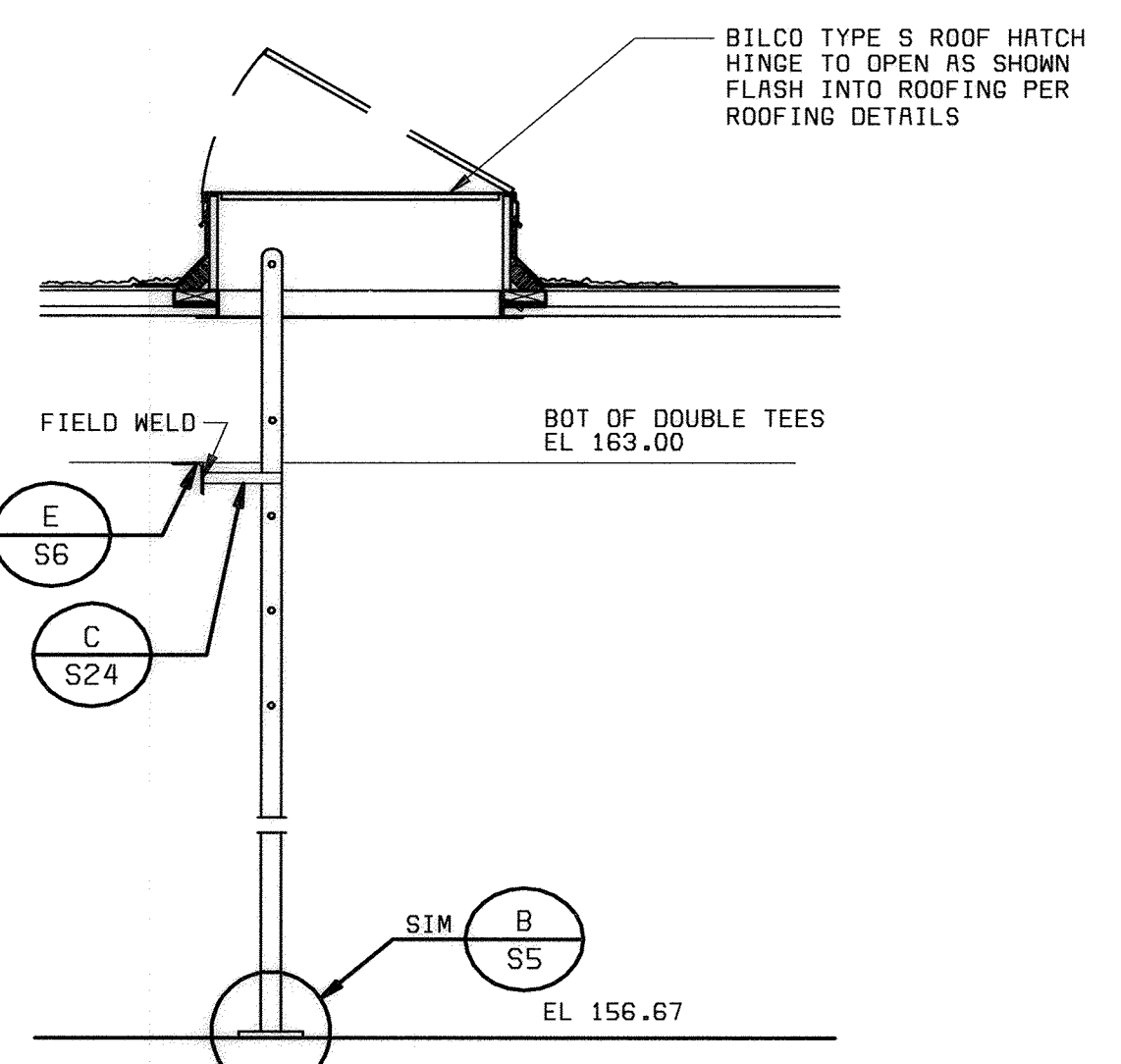


UNDER HATCH (D) 1/2" = 1'-0"
SECURITY DOOR (E) 1/2" = 1'-0"



- ① LADDER BRACKET BY LADDER SUPPLIER, WITH HOLES FOR CONNECTION TO STRUCTURE. ADJUSTABLE BRACKETS SHALL BE PROVIDED WHERE REQUIRED TO COMPENSATE FOR IRREGULAR OR OFFSET WALL SURFACES.
- ② 1/2" STAINLESS STEEL CHEMICALLY CROUTED THREADED ROD ANCHORS, 4" MIN EMBED. USE SCREEN TUBE IF SET IN UNGROUTED CMU, BRICK, OR CLAY TILE.
- ③ IF LADDER IS PAINTED OR GALVANIZED STEEL, USE 3/4" GALVANIZED HIGH STRENGTH STEEL BOLTS WITH COMPATIBLE NUT AND WASHERS. IF LADDER IS STAINLESS STEEL OR ALUMINUM, USE 3/4" STAINLESS STEEL BOLTS WITH COMPATIBLE NUTS AND WASHERS.

TYPICAL LADDER BRACKET CONNECTIONS (C)
NO SCALE



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

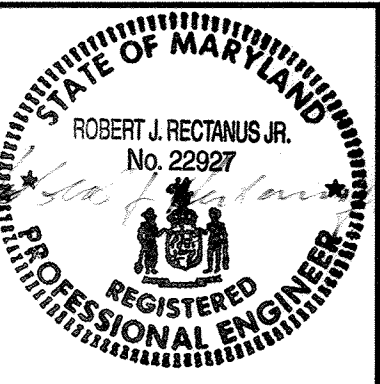
- NOTES:**
1. ALL LADDERS, CAGES AND REST PLATFORMS, COMPLETE WITH GUARDRAILING AND GRATING AS REQUIRED, SHALL BE DESIGNED AND FABRICATED BY THE LADDER SUPPLIER IN CONFORMANCE WITH THE LATEST ISSUE OF OSHA/ANST A14.3, APPLICABLE BUILDING CODE STANDARDS FOR FIXED WALL LADDERS, AND THE REQUIREMENTS OF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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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

GENERAL STRUCTURAL

LADDER DETAILS

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

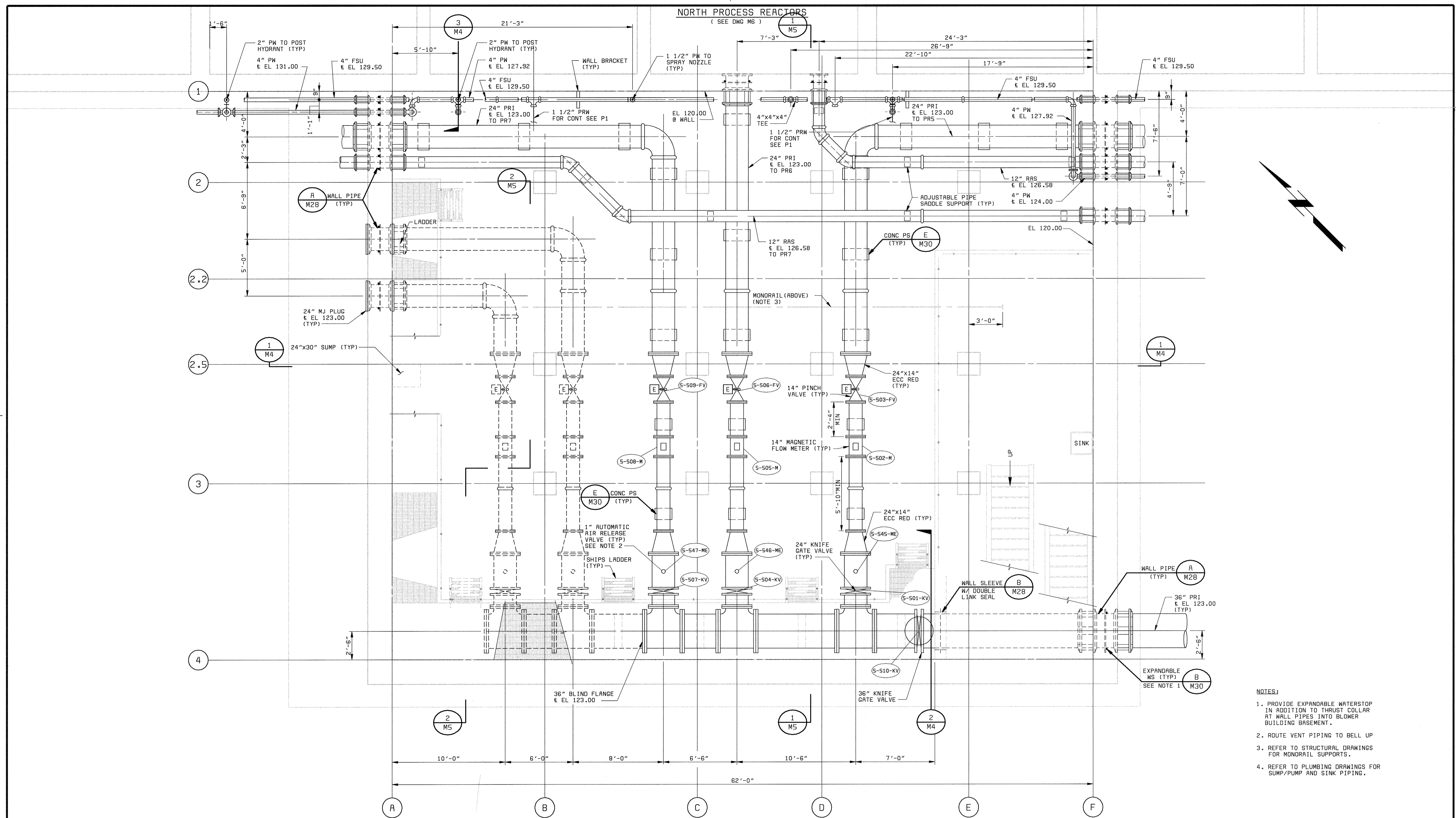
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 66 OF 161

S24



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

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

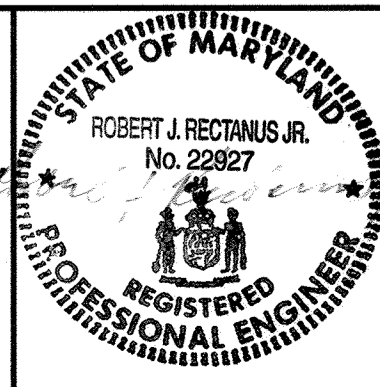
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
GaitHERSburg, Maryland

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



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

**NORTH BLOWER BUILDING
MECHANICAL**

BASEMENT PLAN

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

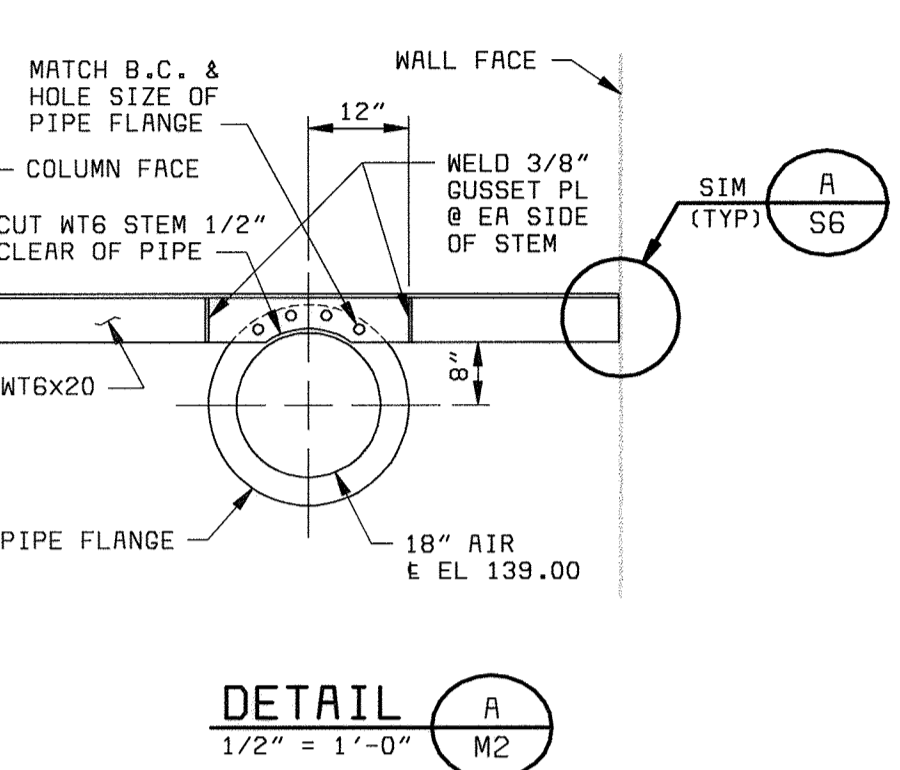
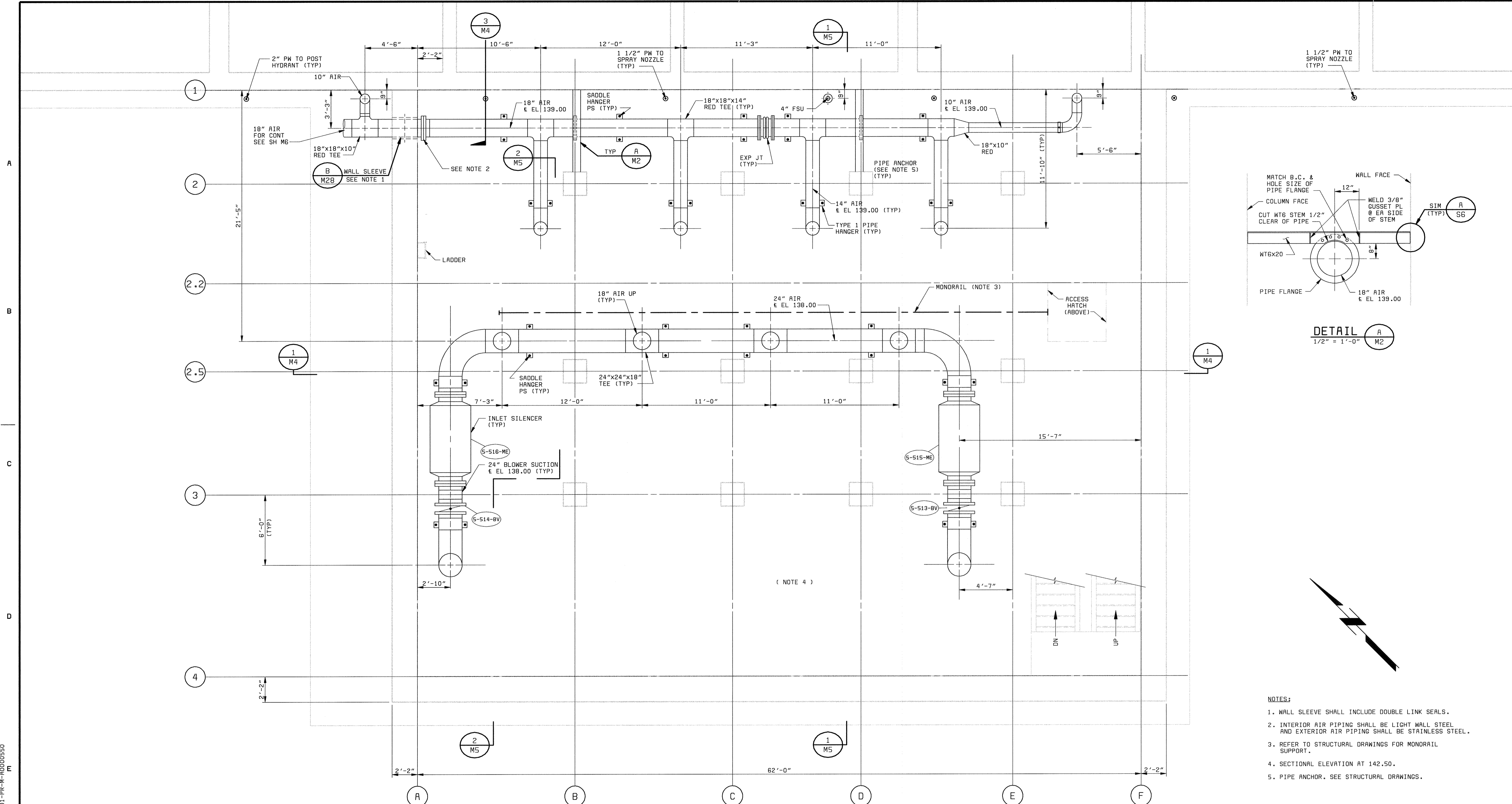
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 67 OF 161

M1



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

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

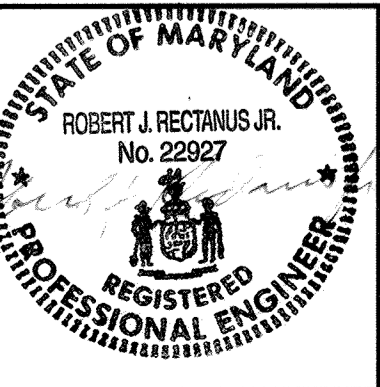
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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

NORTH BLOWER BUILDING
MECHANICAL

SECTIONAL PLAN AND DETAIL

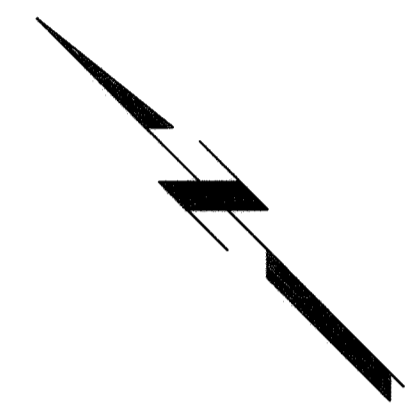
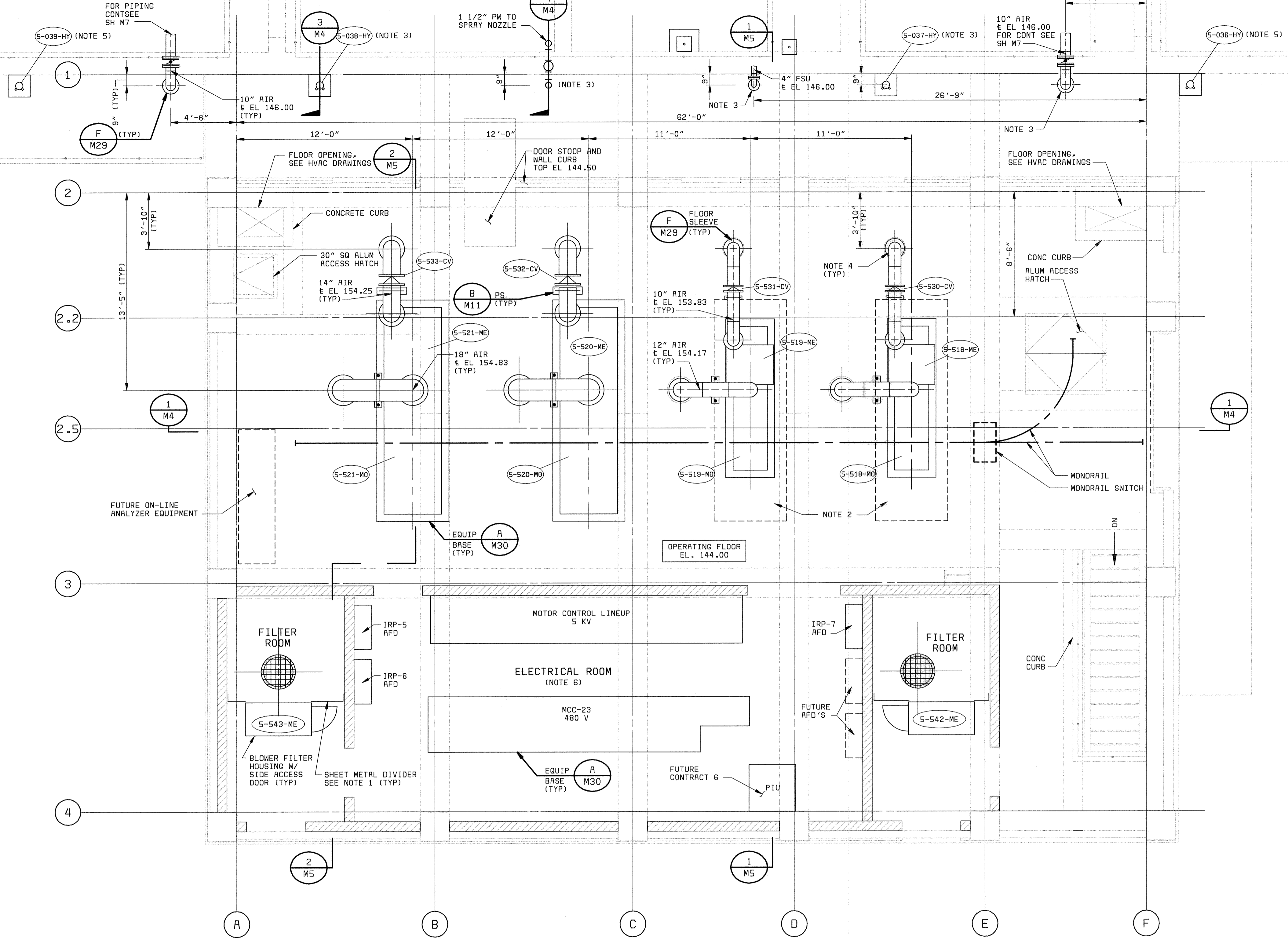
LITTLE PATUXENT WATER RECLAMATION PLANT
ADDITION NO. 6
BNR TREATMENT CAPACITY EXPANSION

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 68 OF 161
M2

NORTH PROCESS REACTORS
(SEE DWG M7)



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

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

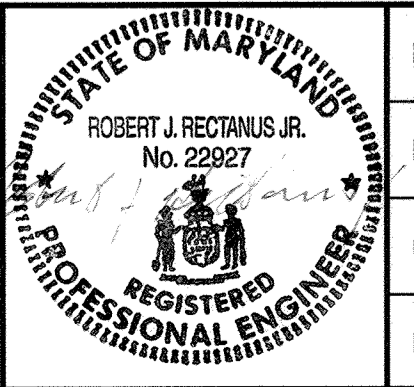
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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

NORTH BLOWER BUILDING
MECHANICAL

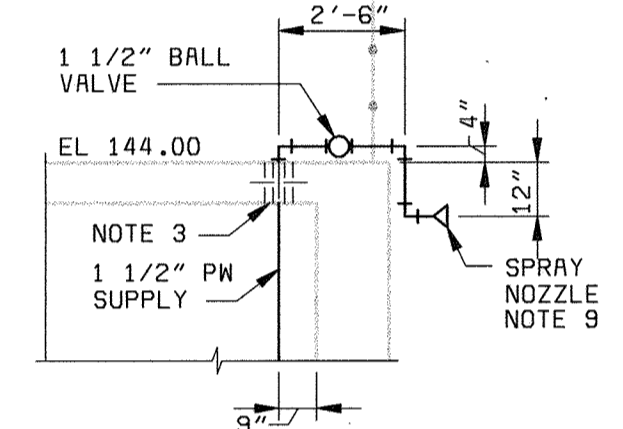
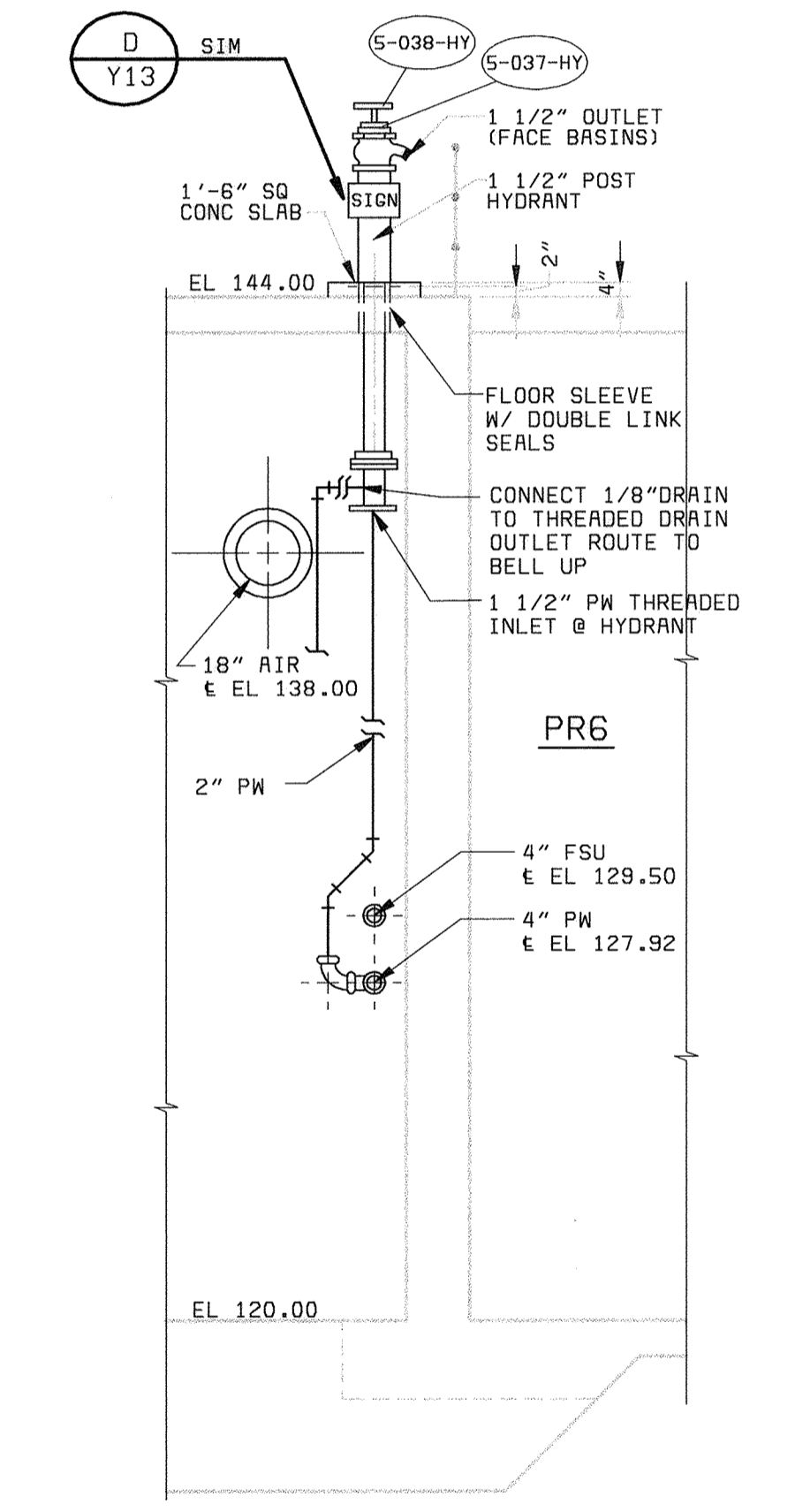
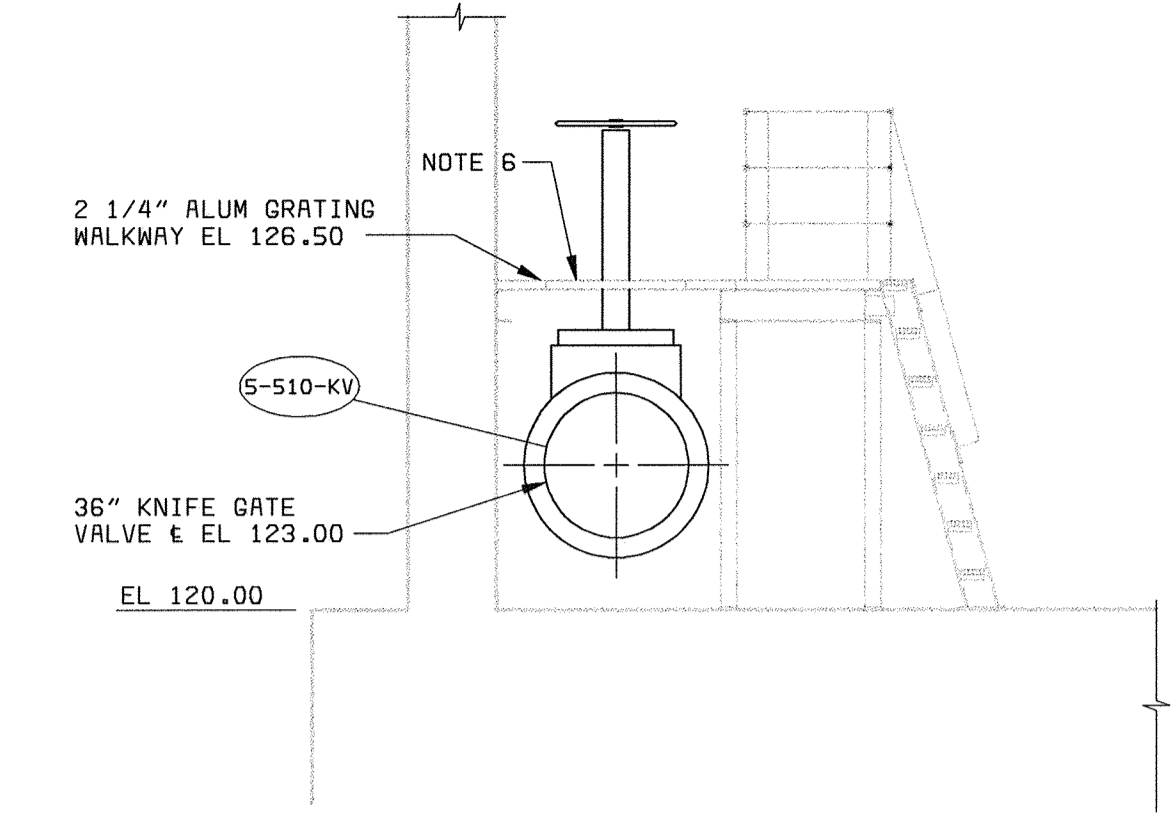
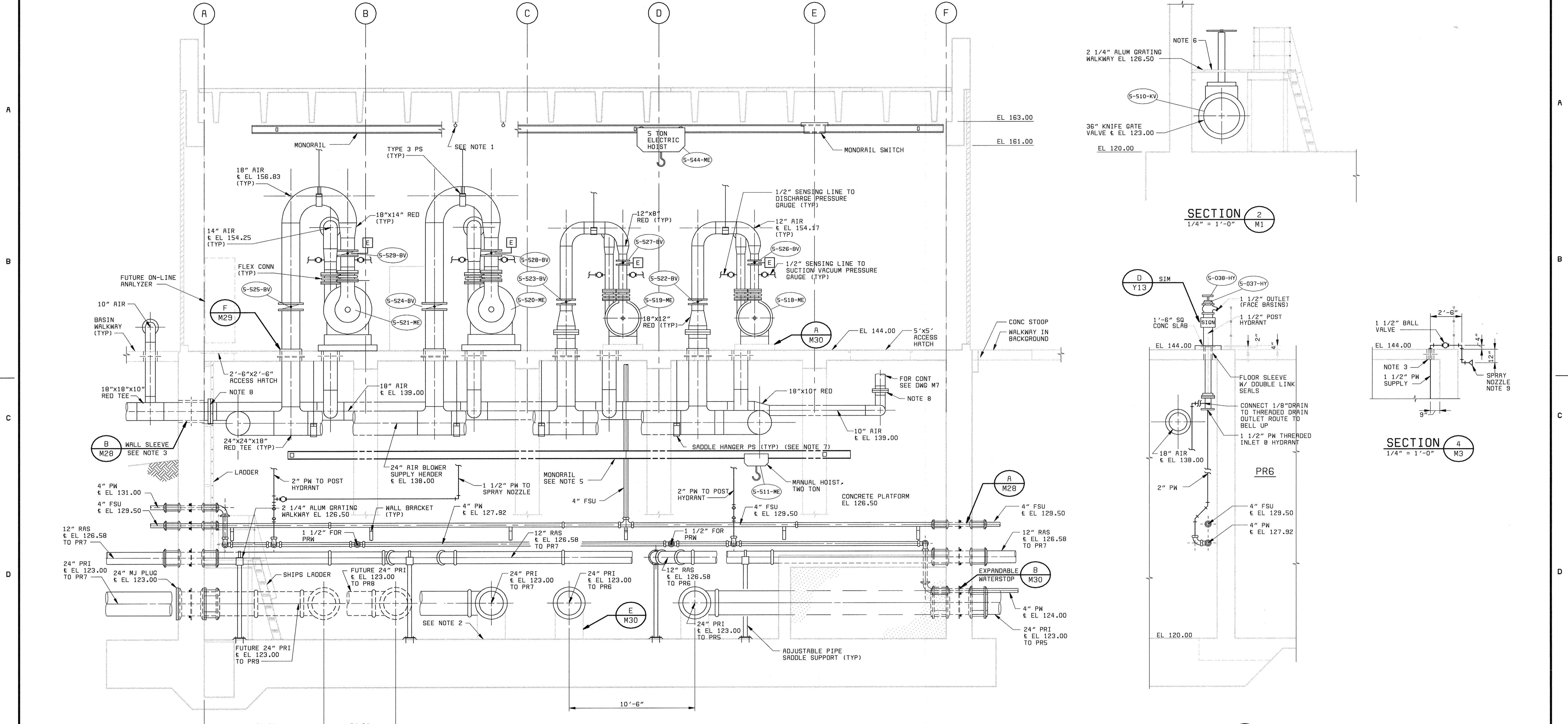
OPERATING FLOOR PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 69 OF 161
M3

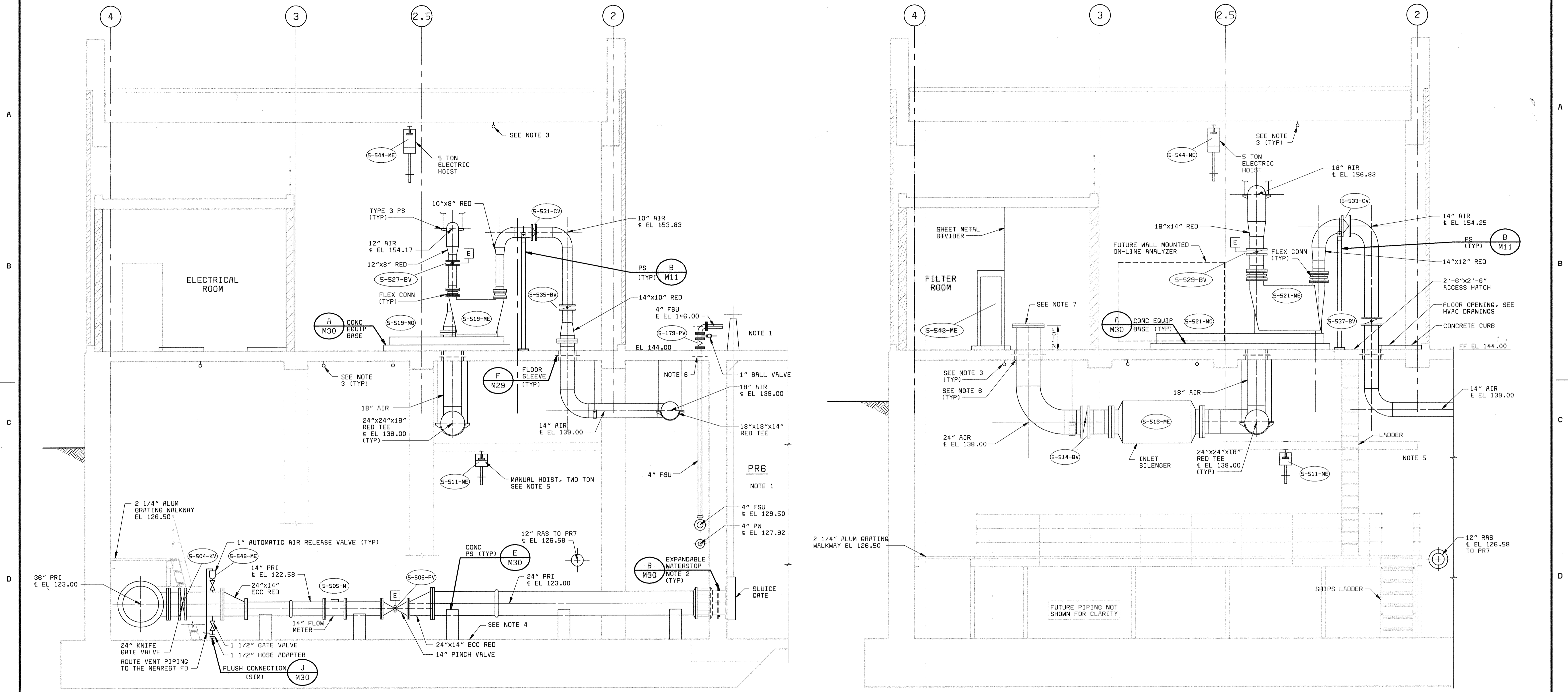


SECTION 1
1/4" = 1'-0" M1, M2, M3

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

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

| | | | | | | | | |
|--|---|---------------|-------------------------------|--|--|---|--|-----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Rectanus Jr. 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH Gaithersburg, Maryland Robert J. Rectanus Jr. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: DWL, BCK | NORTH BLOWER BUILDING | | | LITTLE PATUXENT WATER RECLAMATION PLANT | | SCALE AS SHOWN |
| | | DRN: JRC, VVR | MECHANICAL | | | ADDITION NO. 6 | | SHEET 70 OF 161 |
| | | CHK: WLK | SECTIONS | | | BNR TREATMENT CAPACITY EXPANSION | | |
| | | DATE: 6/23/00 | | | | CAPITAL PROJECT S-6205 | | |
| | | | REVISIONS AND RECORD OF ISSUE | | | CONTRACT NO. 20-3752 | | |
| | | | | | | HOWARD COUNTY, MARYLAND | | M4 |

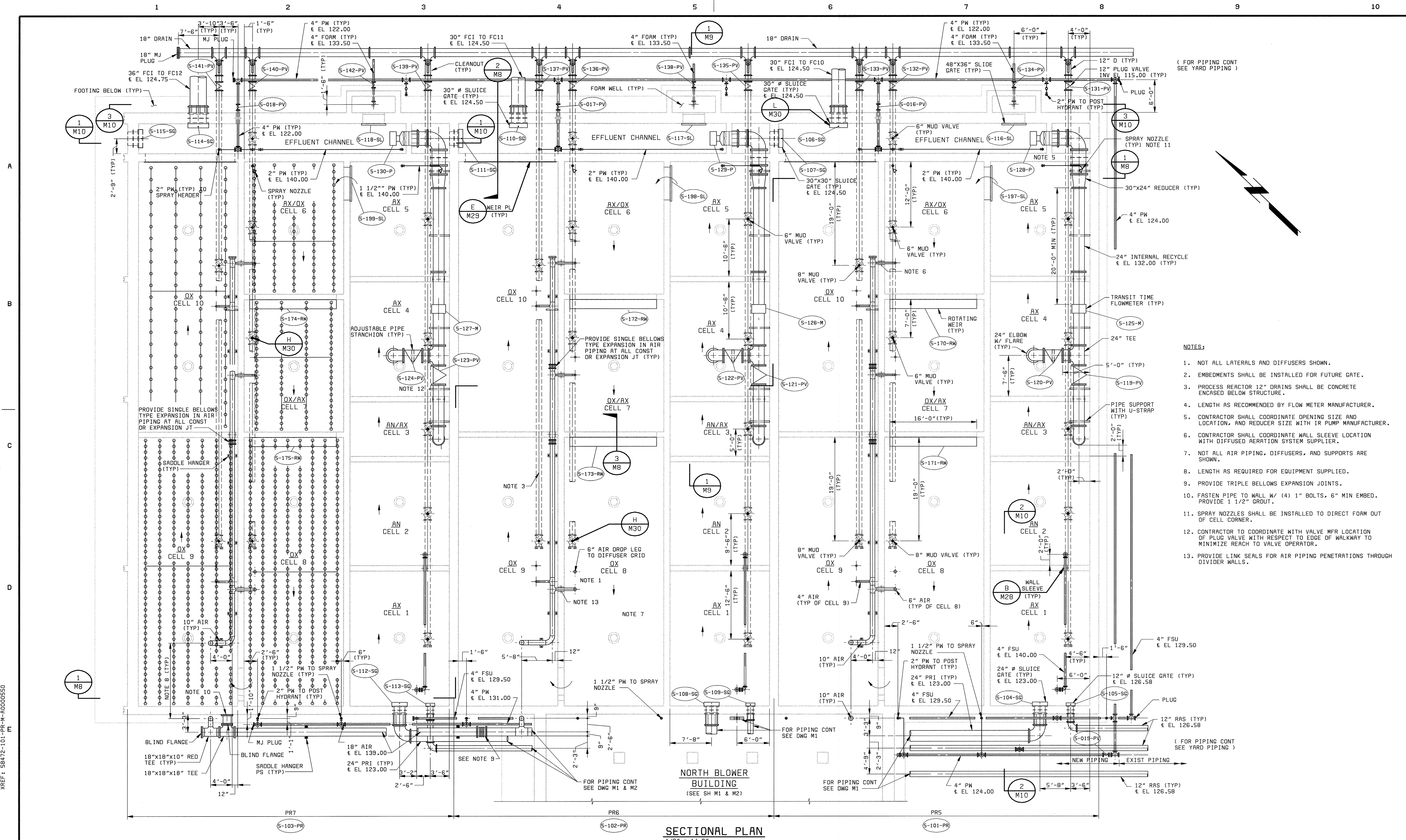


SECTION 1
1/4" = 1'-0" M1, M2, M3

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

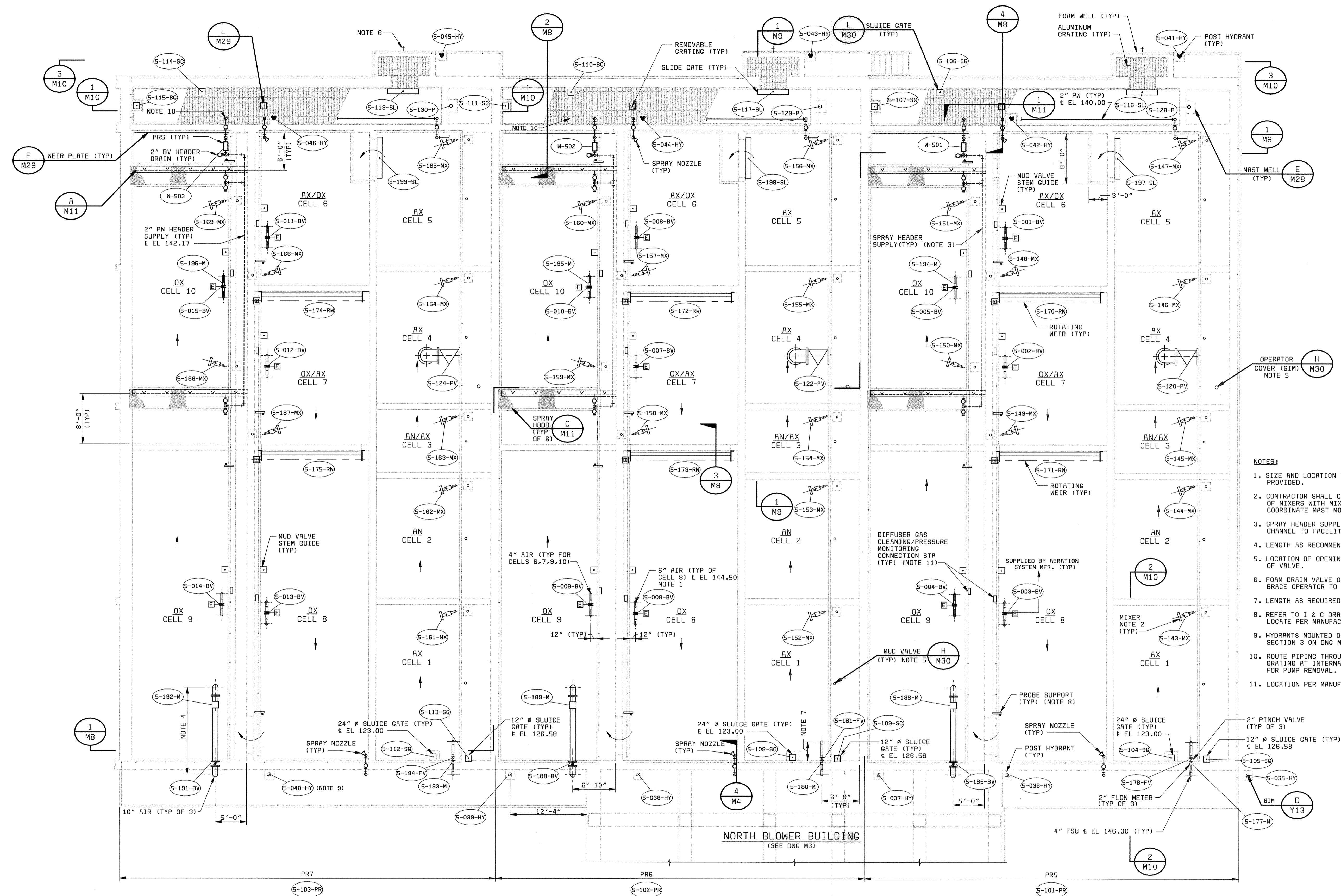
- NOTES:
- FOR PIPING AND BASIN CONTINUATION SEE DRAWING M6 & M7.
 - PROVIDE EXPANDABLE WATERSTOP IN ADDITION TO THRUST COLLAR AT WALL PIPES INTO BLOWER BUILDING BASEMENT.
 - LIFTING HOOKS SHALL BE INSTALLED IN THE CEILING OVER EACH BUTTERFLY AND CHECK VALVES ON OPERATING FLOOR (SEE DET C&E ON S6), AND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

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



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

| | | | | | | | | |
|--|---|---|---------------|----------|---------------|---|---|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Benjamin, Chief, Bureau of Utilities Date | BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. | ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: DMP, BCK | | | NORTH PROCESS REACTORS MECHANICAL SECTIONAL PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: SLF, VVR | CHK: WLK | DATE: 6/23/00 | | | DATE |



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

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

XREF: 58472-101-PR-M-R0000550
D58472
F058472A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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

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

**NORTH PROCESS REACTORS
MECHANICAL**

TOP PLAN

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

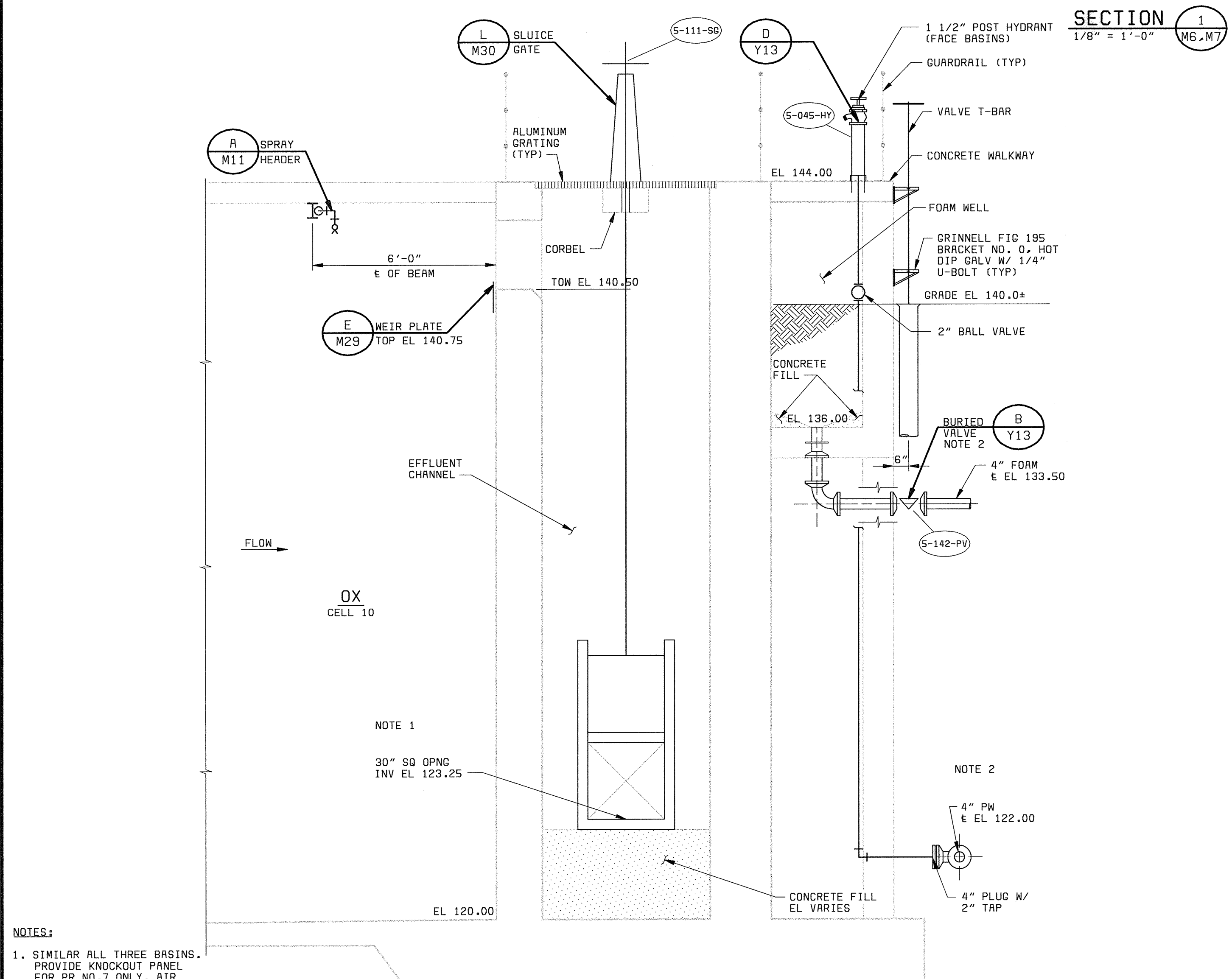
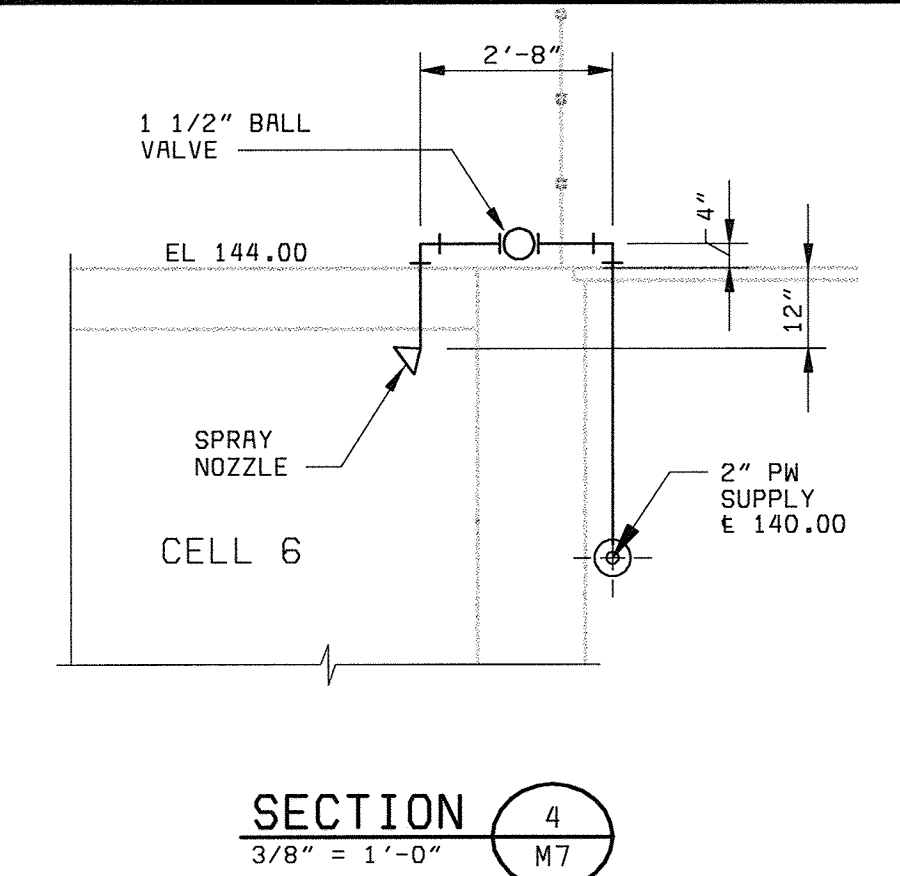
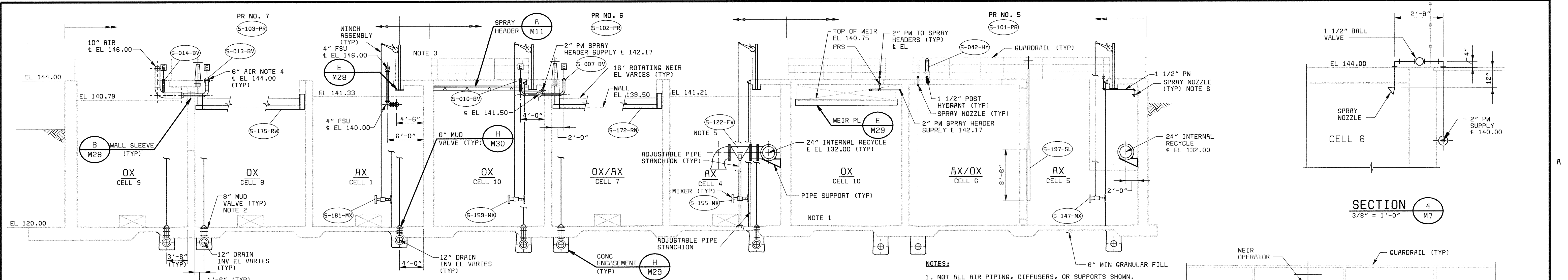
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

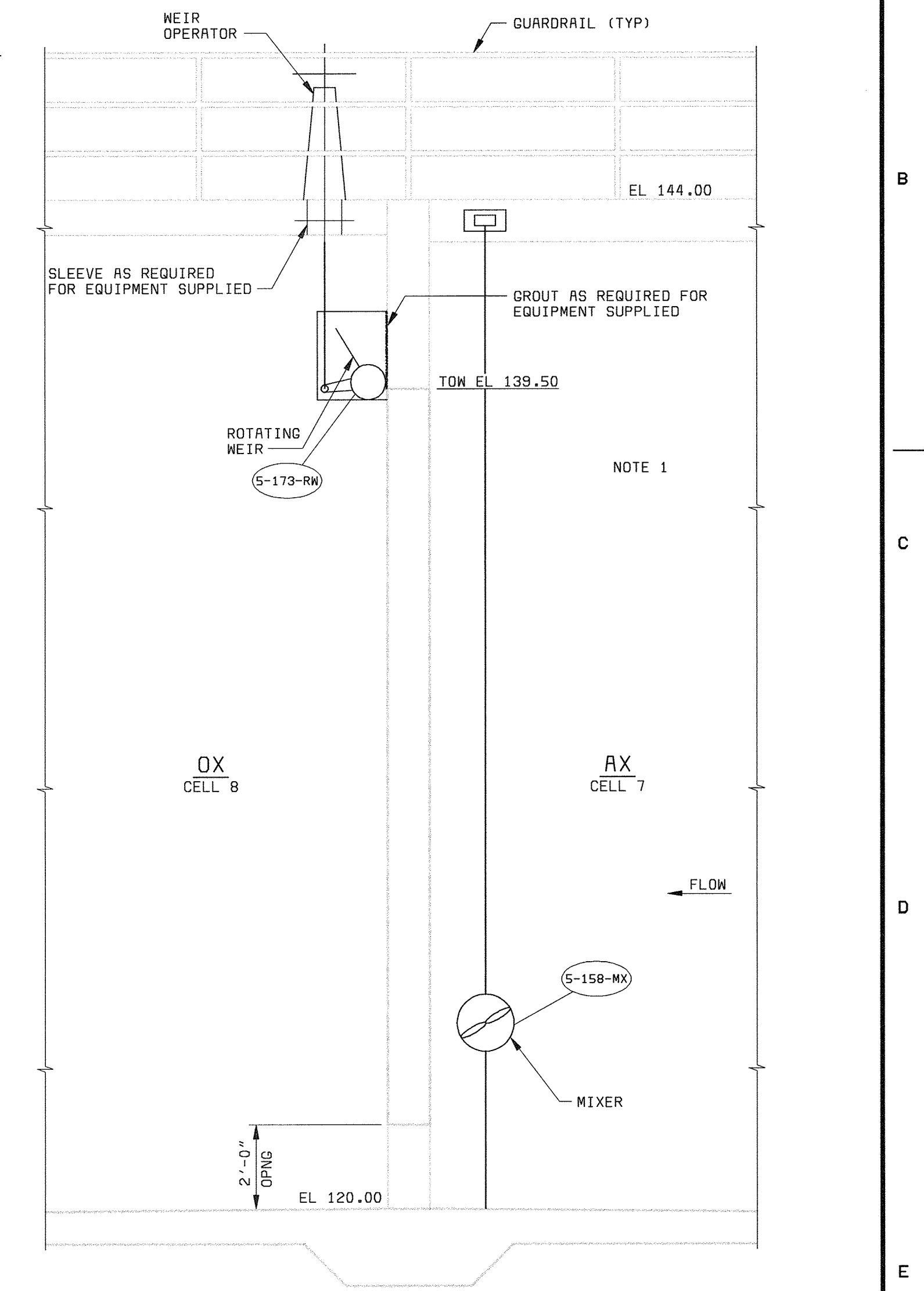
SCALE AS SHOWN

SHEET 73 OF 161

M7



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



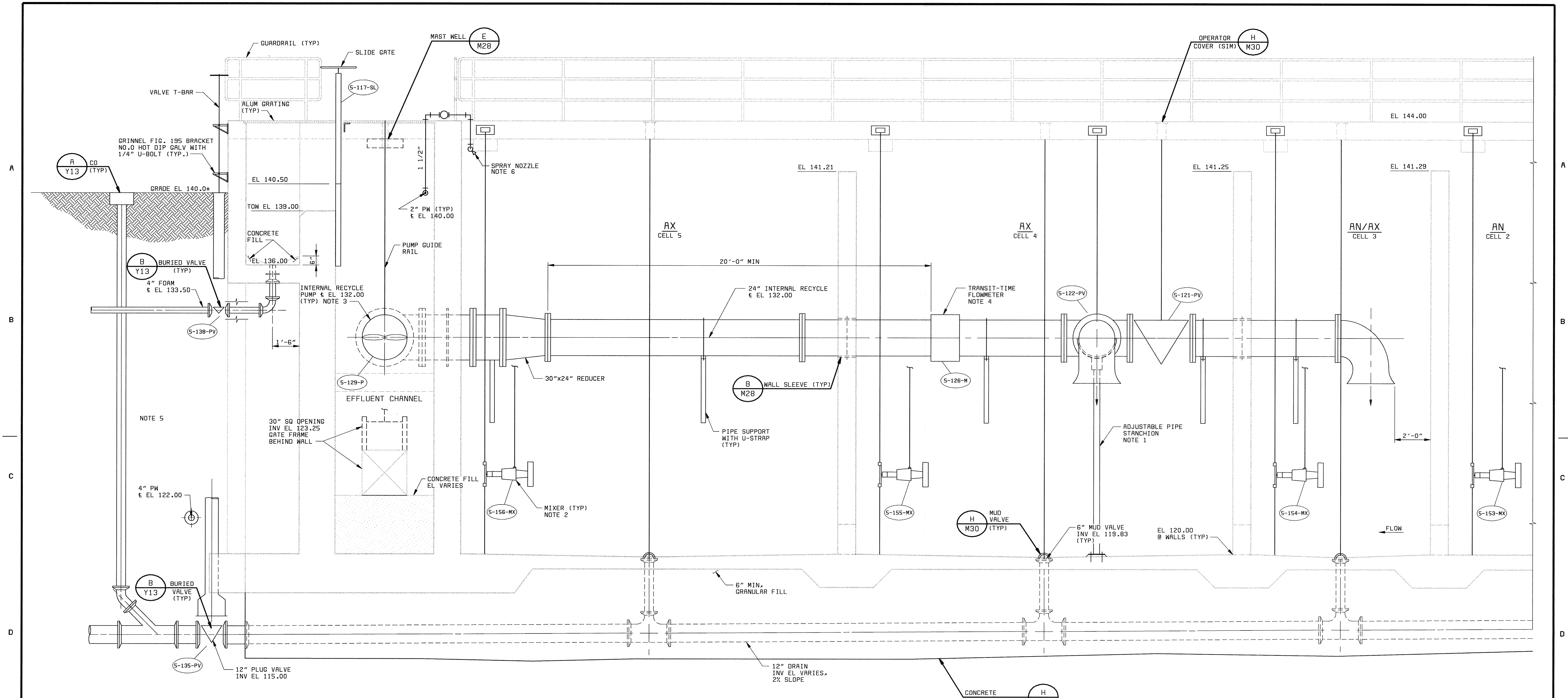
- NOTES:**
1. SIMILAR ALL THREE BASINS. PROVIDE KNOCKOUT PANEL FOR PR NO. 7 ONLY. AIR PIPING, DIFFUSERS, AND SUPPORTS NOT SHOWN.
 2. NOT ALL PIPING SHOWN. REFER TO Y SHEETS.

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

SECTION 2
3/8" = 1'-0"
M6, M7

SECTION 3
3/8" = 1'-0"
M6, M7

| | | | | | | | | |
|--|---|---|--------------|----------|---------------|--|--|-------------------------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert Beniger 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE | ROBERT J. RECTANUS JR. No. 22927 REGISTERED PROFESSIONAL ENGINEER | DES: BCK | | | NORTH PROCESS REACTORS MECHANICAL SECTIONS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: WHS-VVR | CHK: WLK | DATE: 6/23/00 | | | REVISIONS AND RECORD OF ISSUE |



SECTION 1
3/8" = 1'-0" (M6, M7)

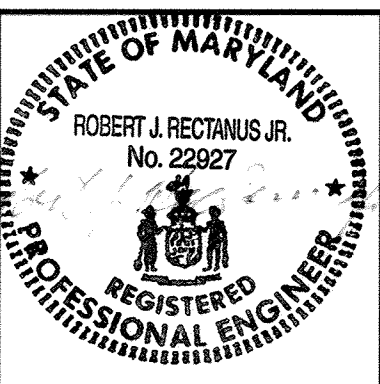
- NOTES:**
1. SIMILAR FOR BASINS PR5, PR6, AND PR7.
 2. CONTRACTOR SHALL COORDINATE LOCATION AND ORIENTATION OF MIXERS WITH MIXER MANUFACTURER. CONTRACTOR SHALL COORDINATE MIXER MOUNTING W/ MIXER MANUFACTURER.
 3. CONTRACTOR SHALL COORDINATE LOCATION AND SIZE OF OPENING WITH INTERNAL RECYCLE PUMP MANUFACTURER.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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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Gaithersburg, Maryland

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REG. PROF. ENGR. DATE



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| CHK: WLK | | | | | | |
| DATE: 6/23/00 | | | | | | |

**NORTH PROCESS REACTORS
MECHANICAL**

SECTION

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

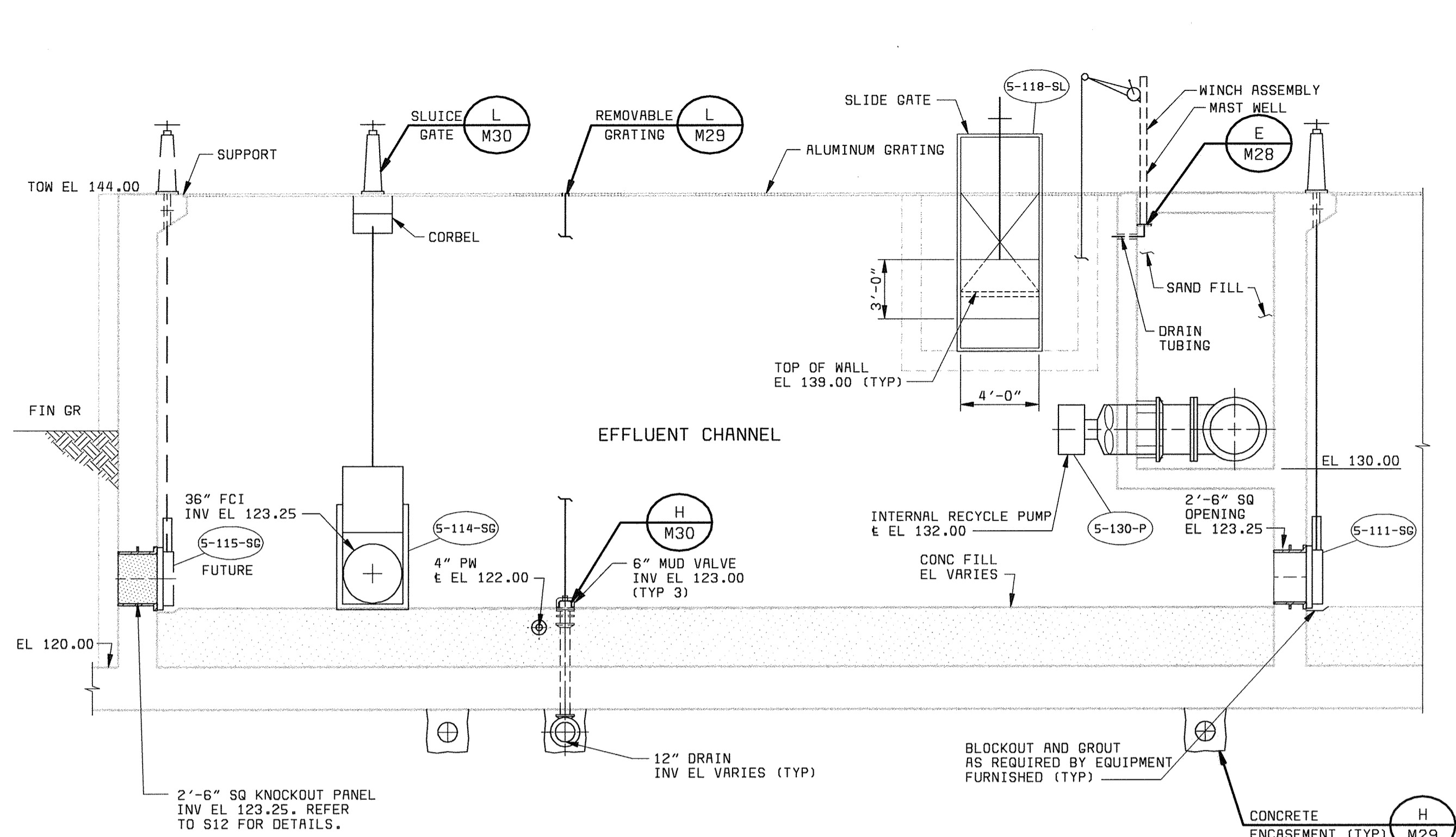
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

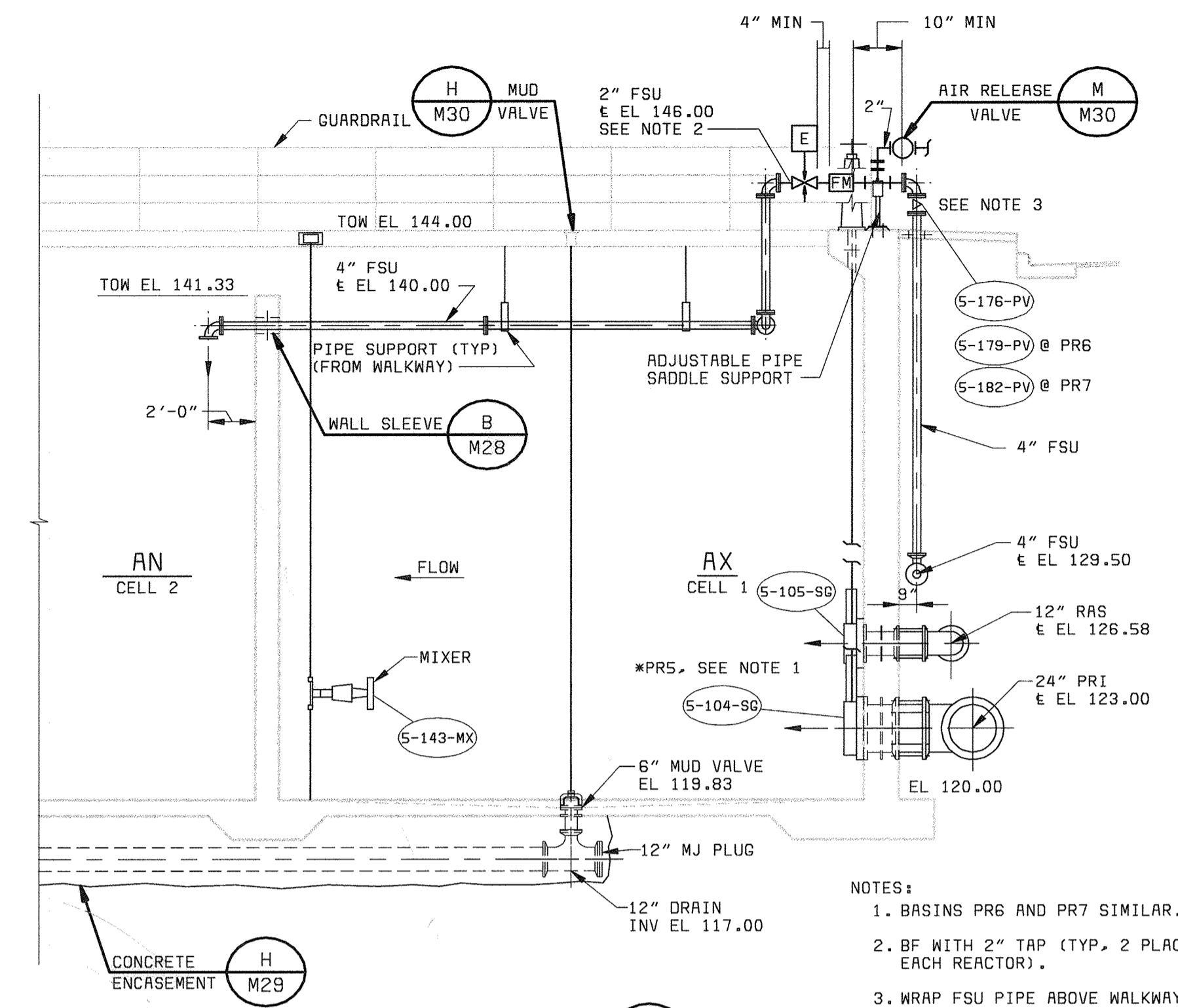
SCALE AS SHOWN

SHEET 75 OF 161

M9

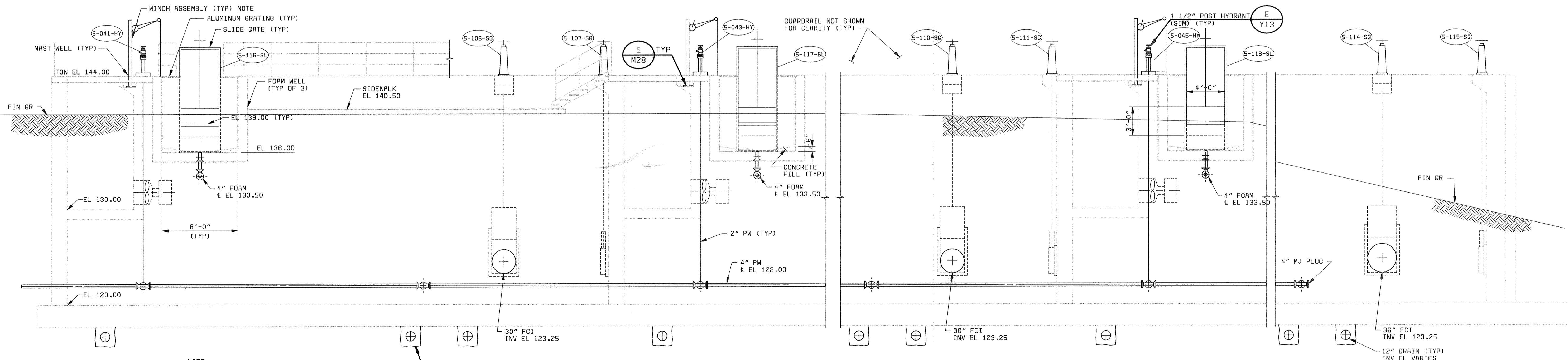


SECTION 1
3/16" = 1'-0" M6, M7



SECTION 2
3/16" = 1'-0" M6, M7

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



SECTION 3
3/16" = 1'-0" M6, M7

NOTE:
ONE ASSEMBLY SHALL BE PROVIDED FOR IR PUMPS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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

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

NORTH PROCESS REACTORS
MECHANICAL

SECTIONS

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

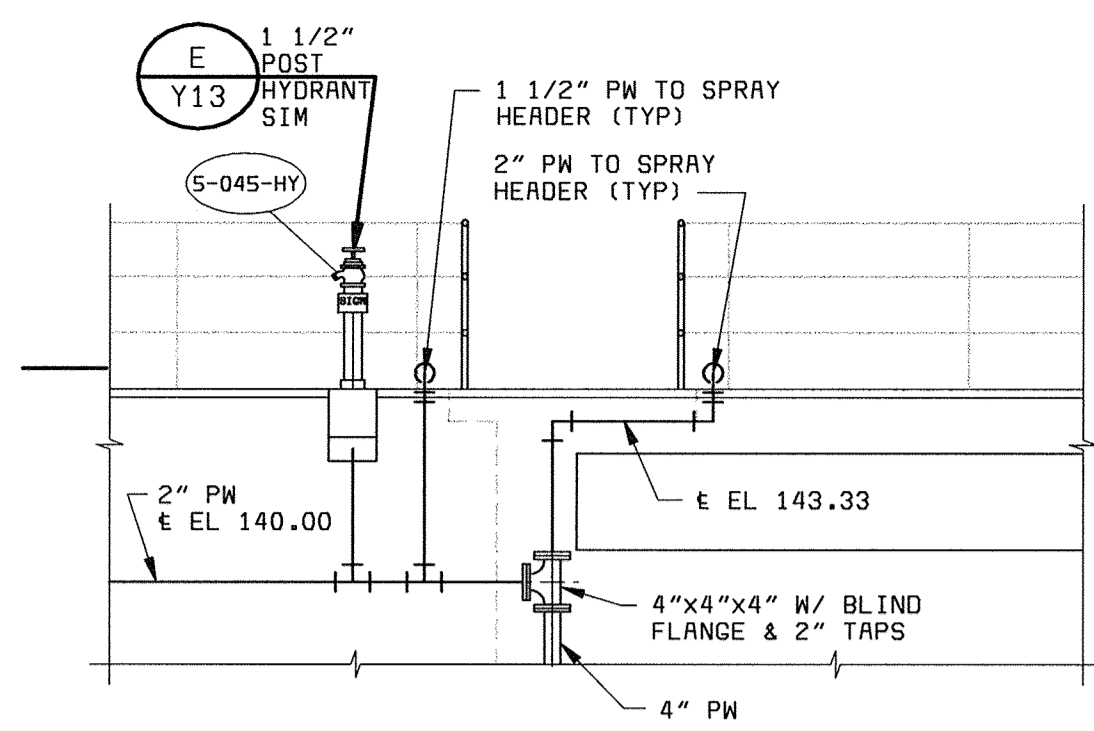
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

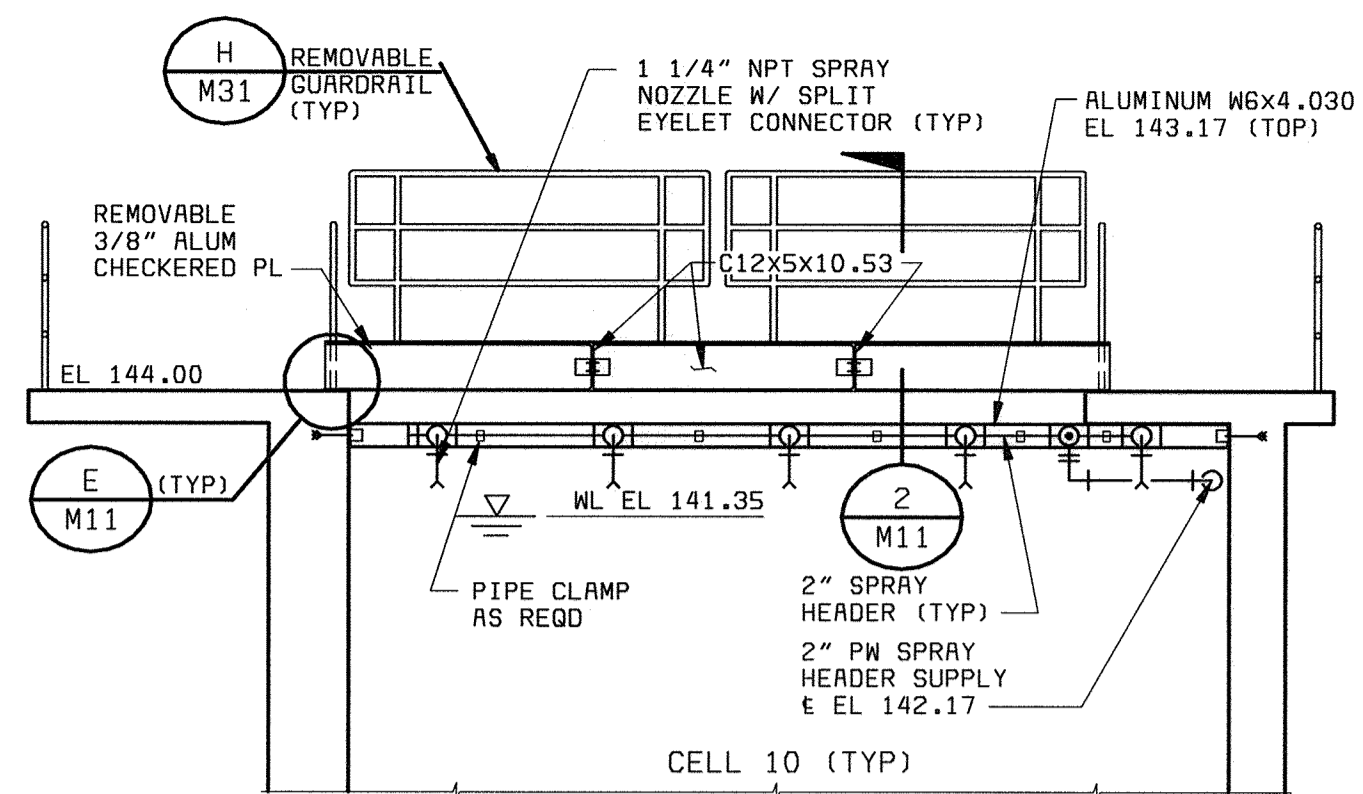
SCALE AS SHOWN

SHEET 76 OF 161

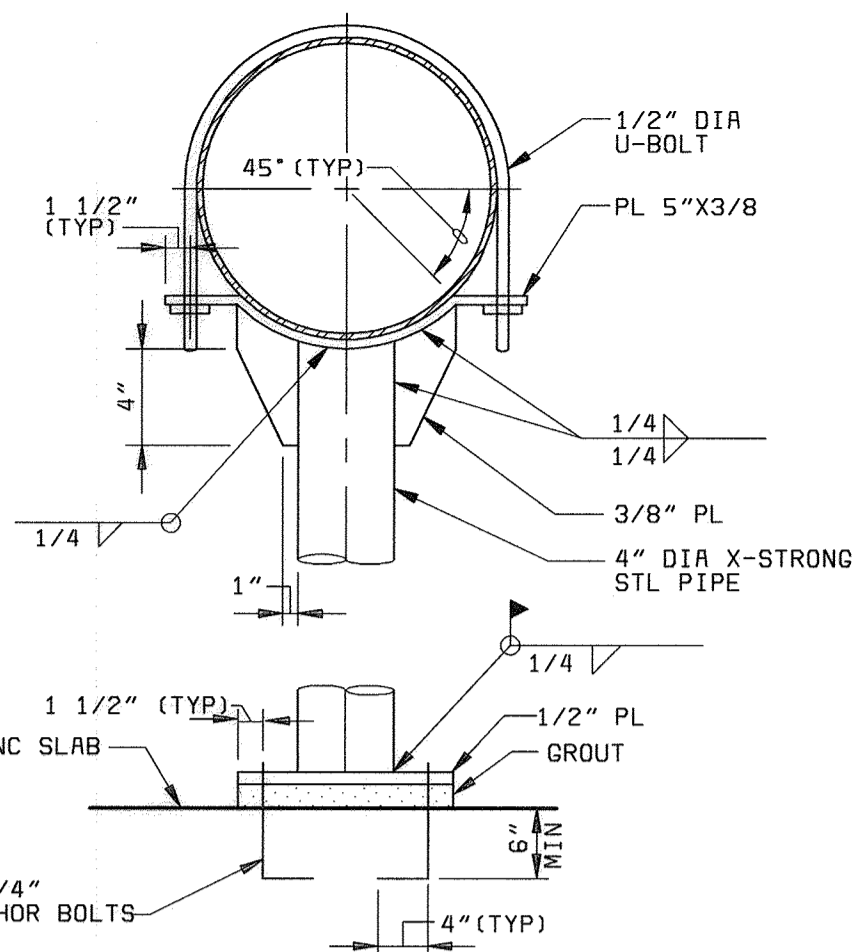
M10



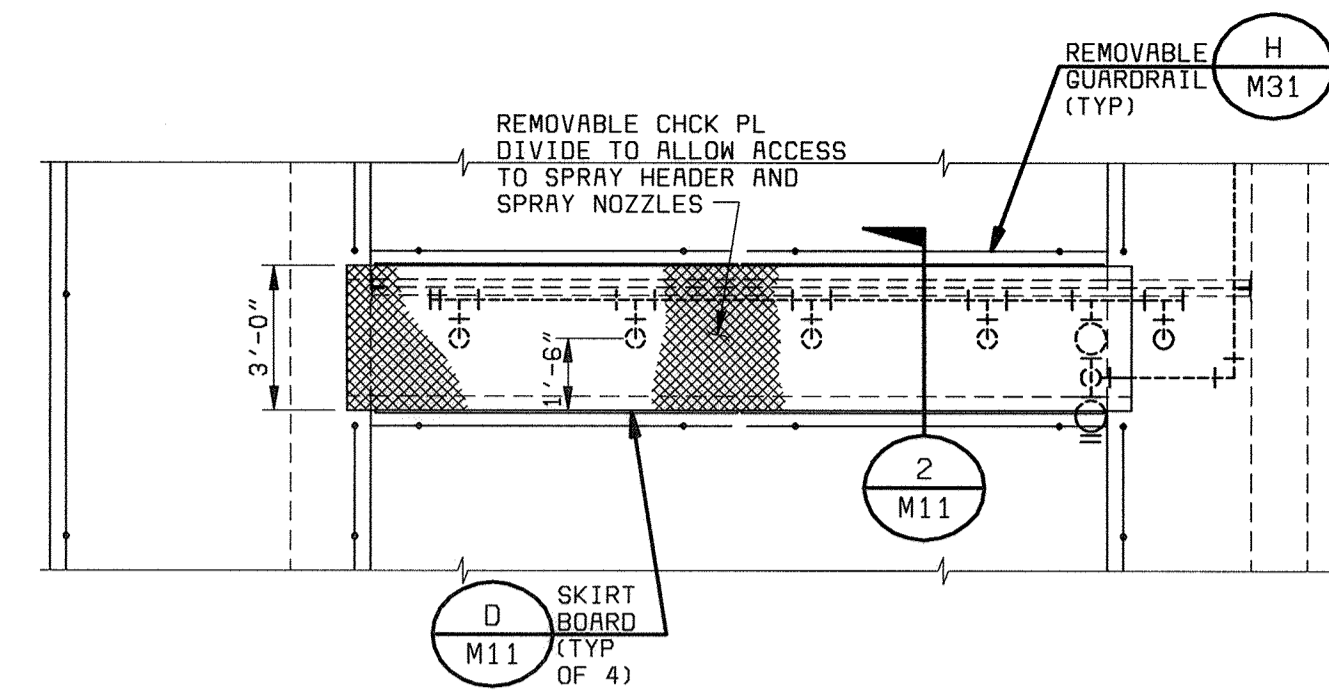
SECTION 1
1/4" = 1'-0" M7



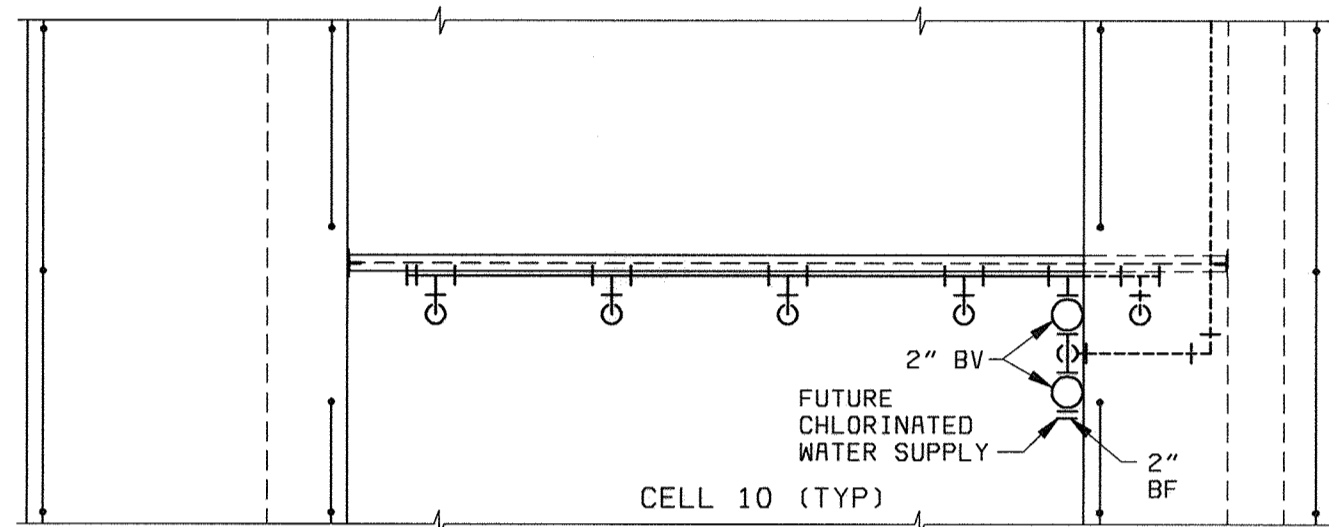
ELEVATION



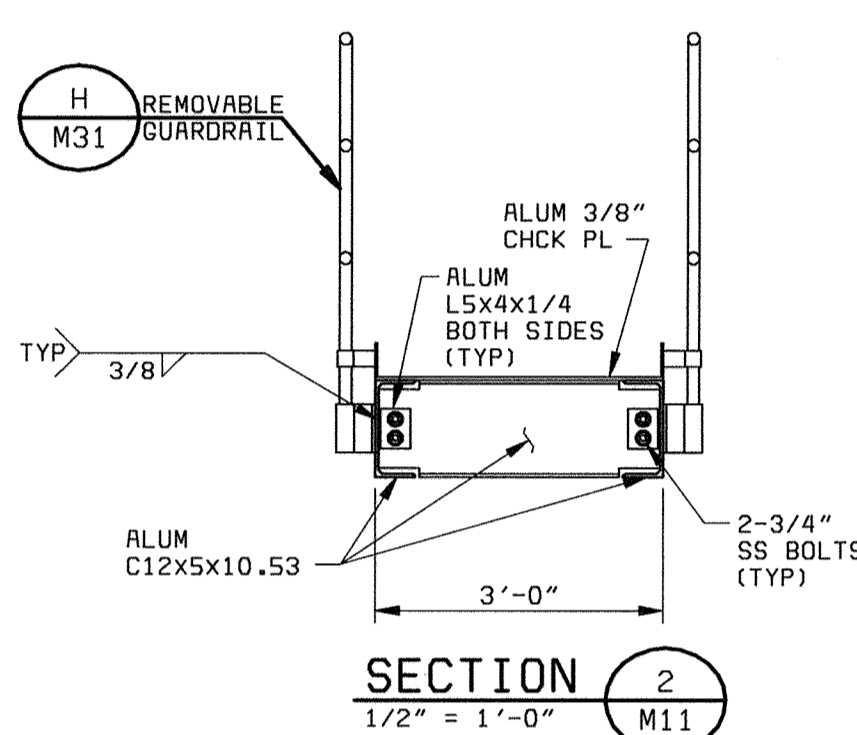
PIPE SUPPORT DETAIL B
NO SCALE



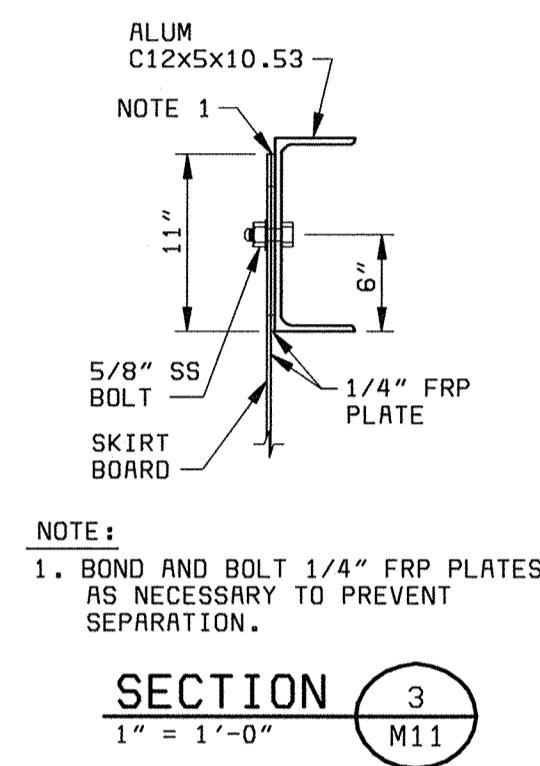
SPRAY HOOD - PLAN C
1/4" = 1'-0" M7



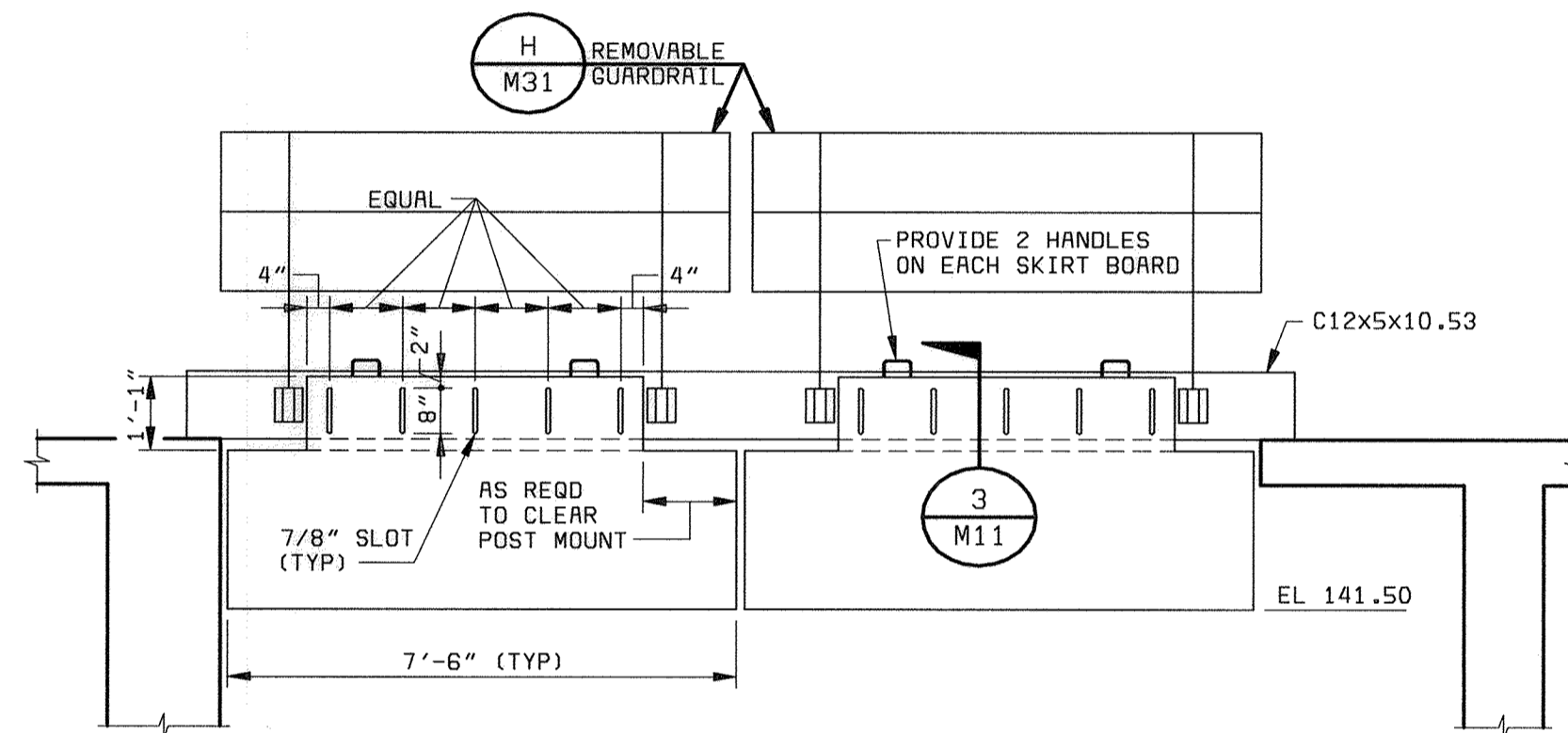
SPRAY HEADER DETAIL A
1/4" = 1'-0" M7, M8



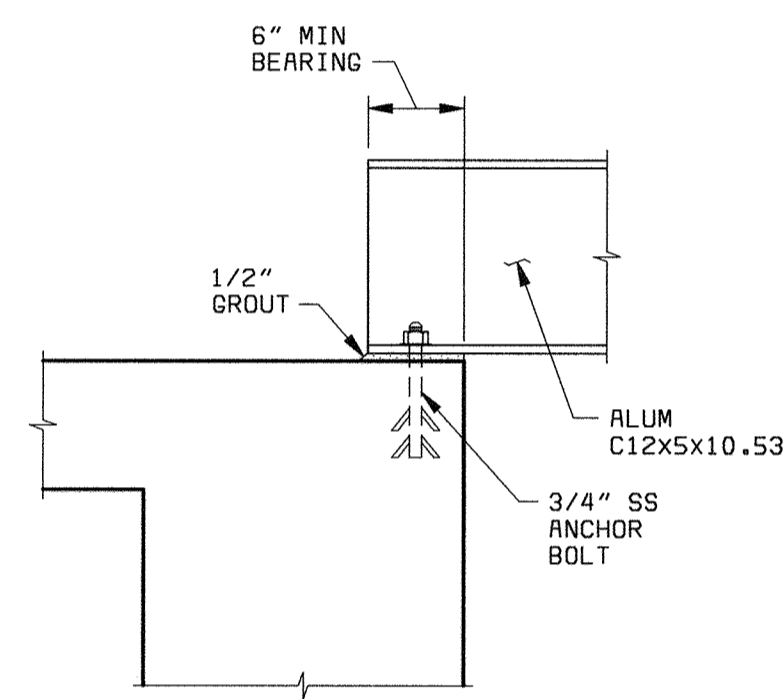
SECTION 2
1/2" = 1'-0" M11



SECTION 3
1" = 1'-0" M11



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



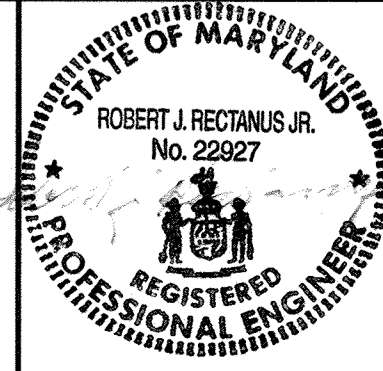
DETAIL E
1" = 1'-0" M11

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert M. Bennett
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH L.P.
Gaithersburg, Maryland

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



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| DRN: VVR, MDD | | | | | | | | |
| CHK: WLK | | | | | | | | |
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**NORTH PROCESS REACTOR
MECHANICAL**

SECTIONS AND DETAILS

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

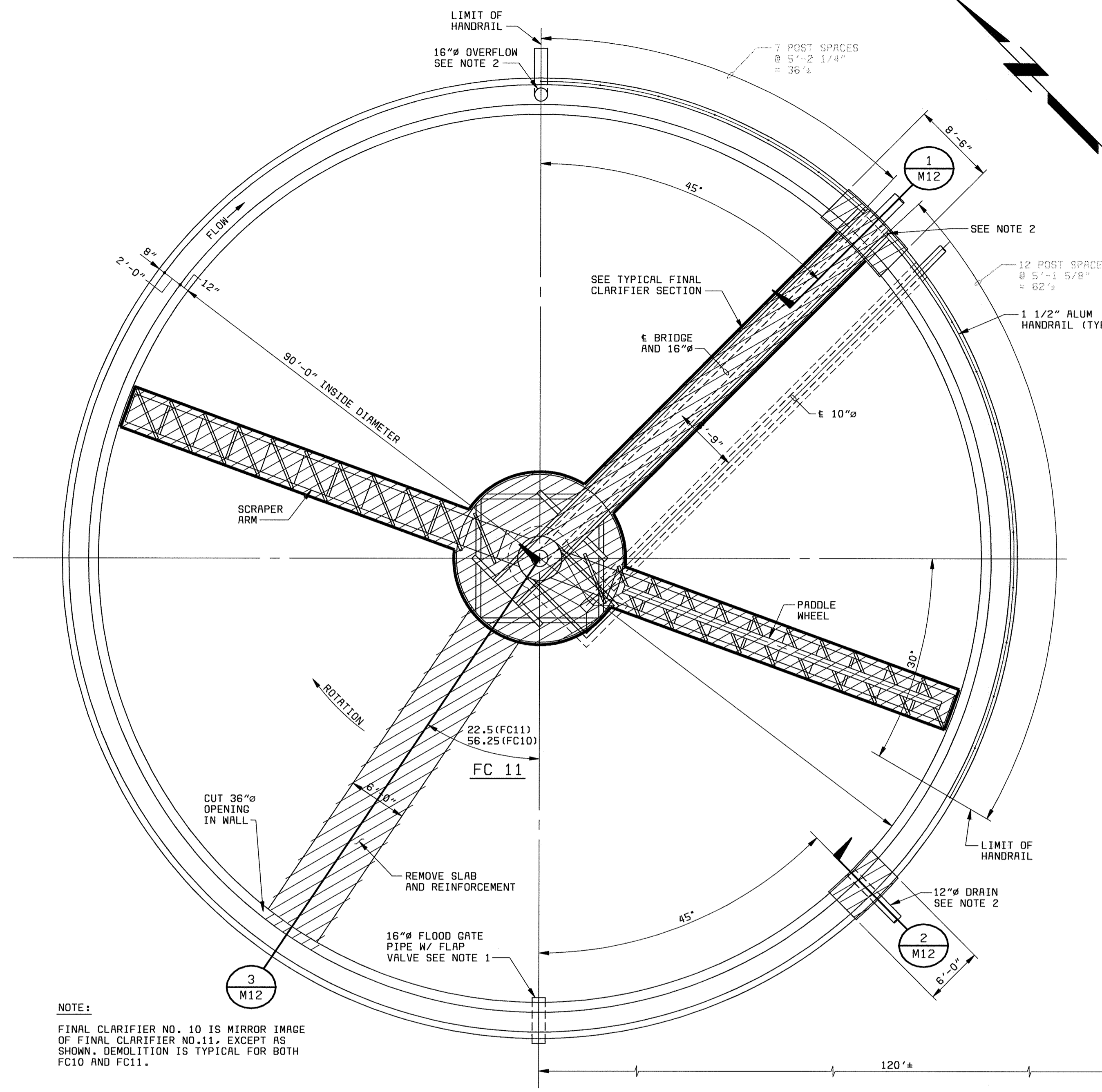
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

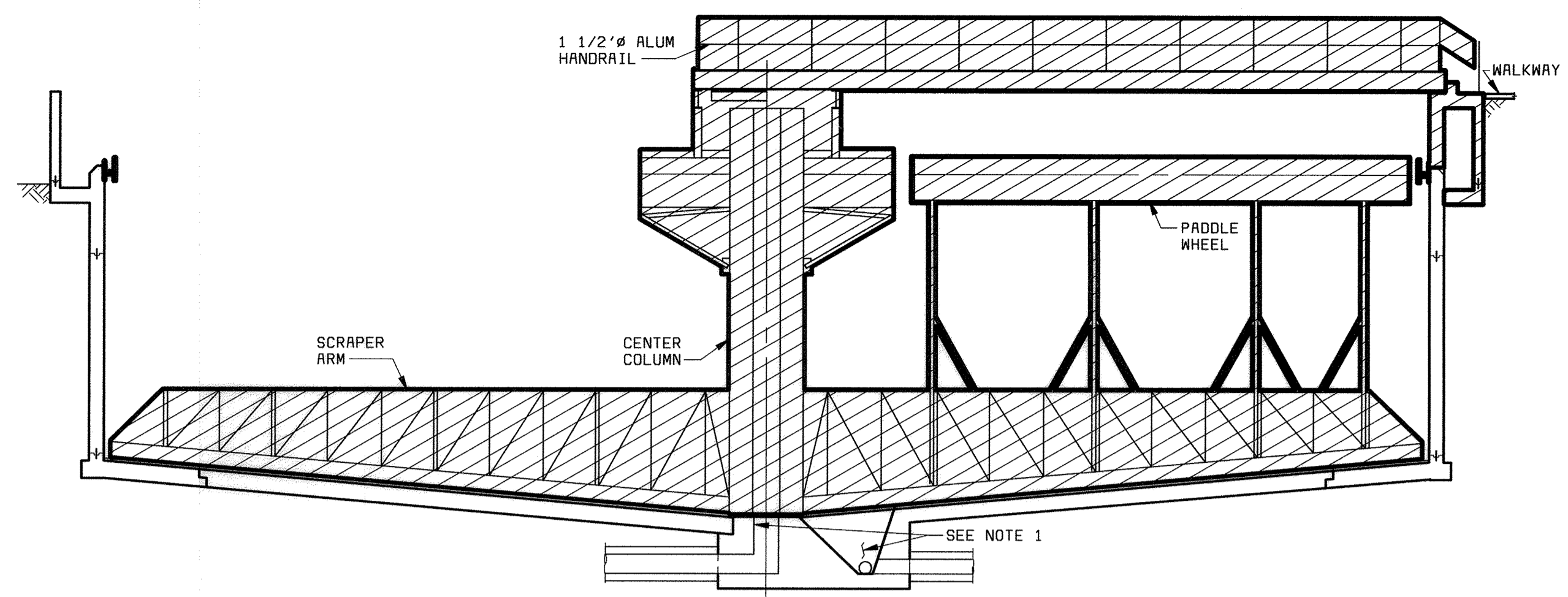
SCALE
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SHEET
77 of 161

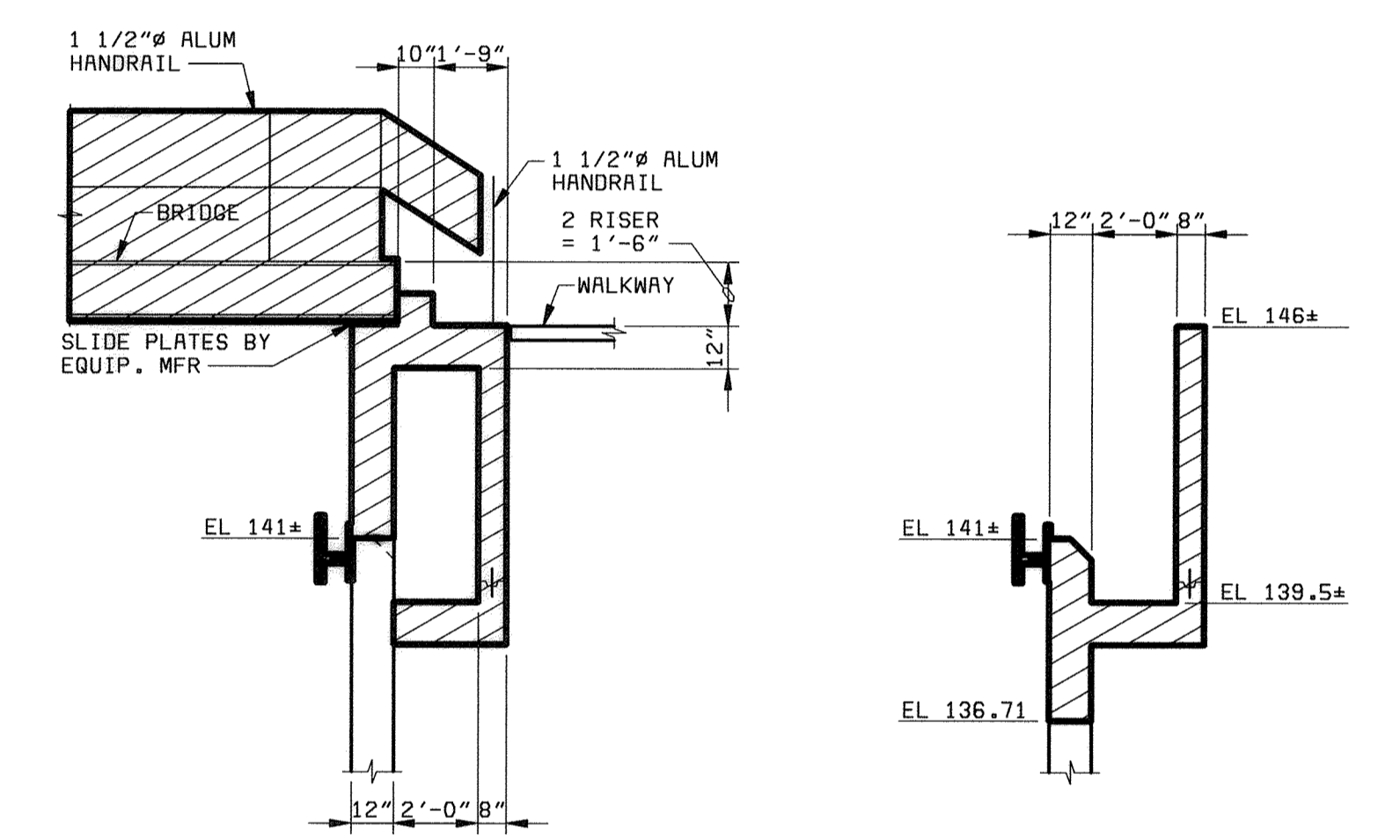
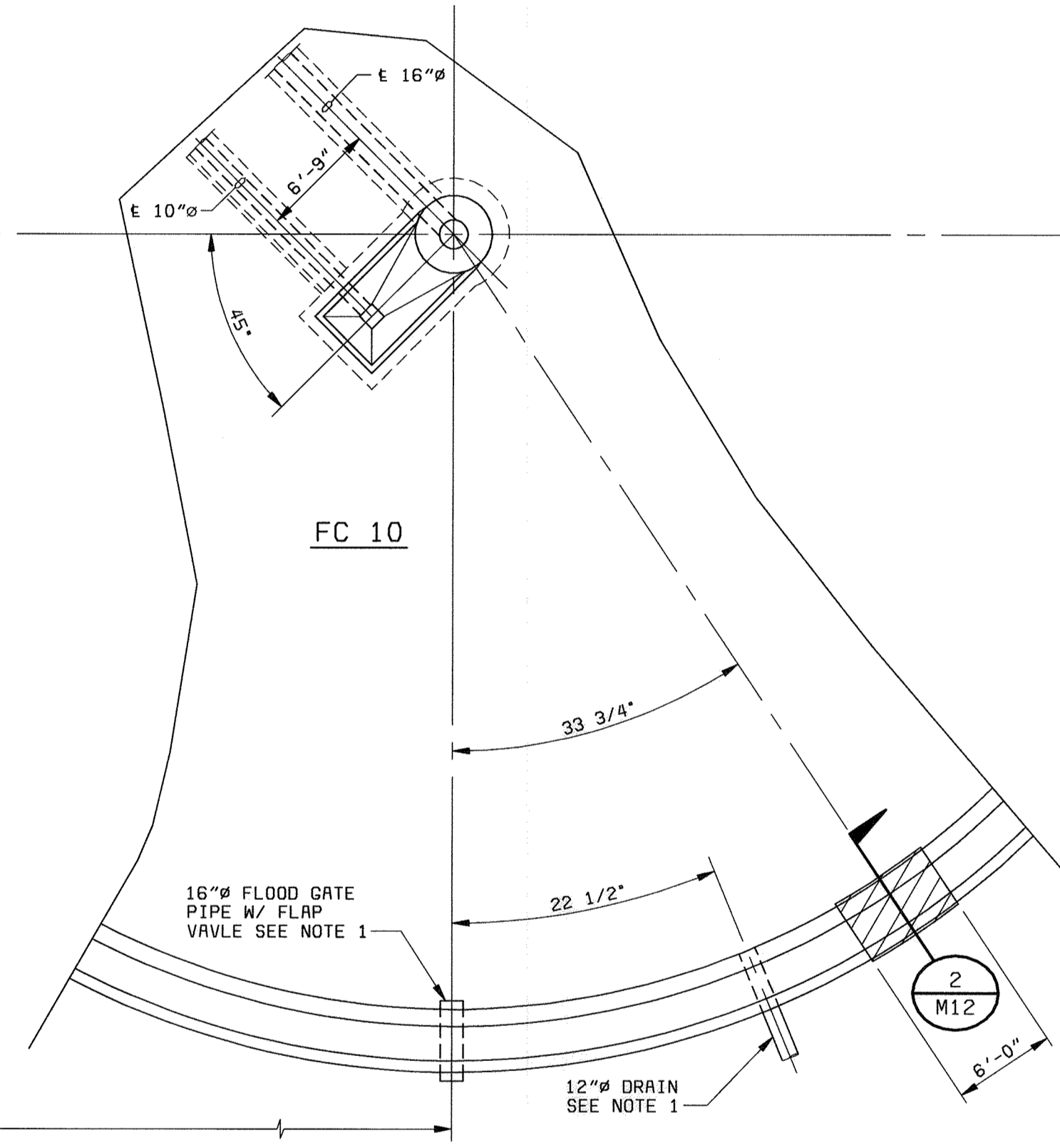
M11



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

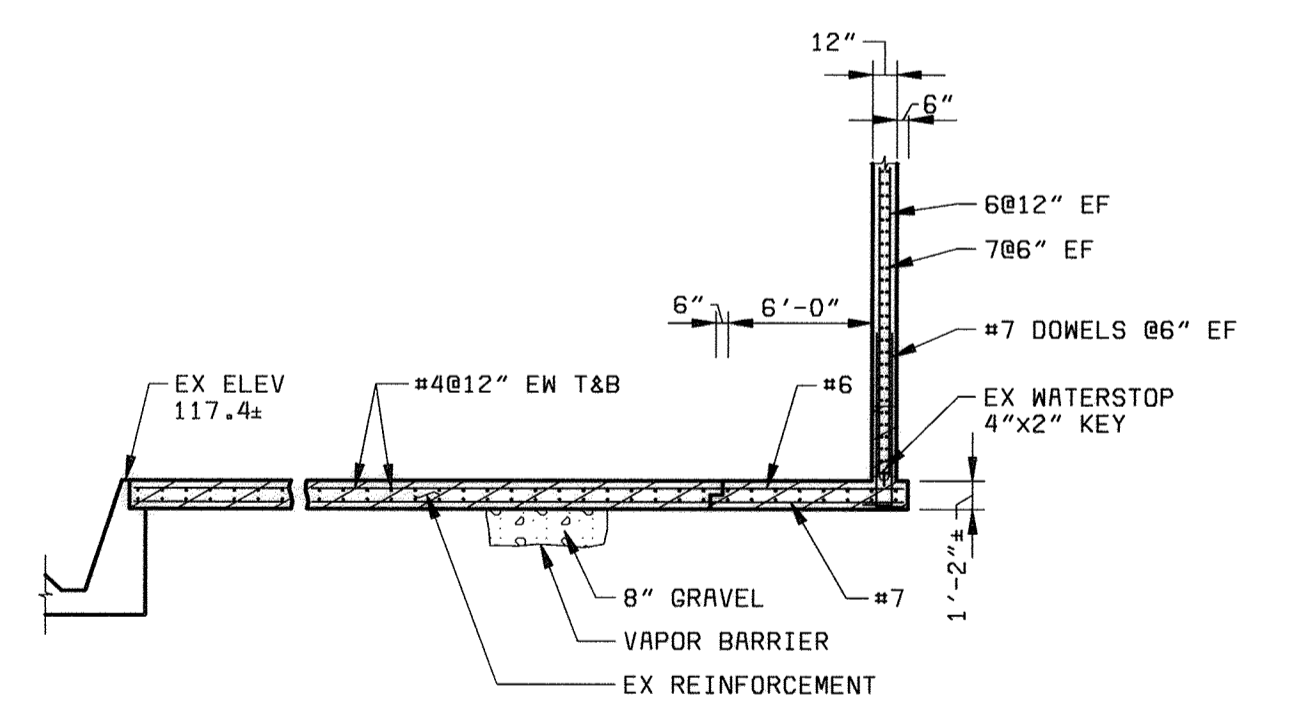


TYPICAL FINAL CLARIFIER SECTION
1/16" = 1'-0"



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

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



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

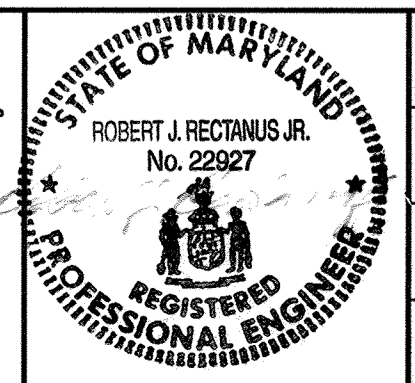
- NOTES:**
1. PLUG WITH CONCRETE AND ABANDON IN PLACE.
 2. EXISTING HANDRAIL TO BE REINSTALLED FOLLOWING CONSTRUCTION OF SCUM BOX.
 3. ALL ELECTRICAL CONDUITS TO BE REMOVED.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

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



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| DES: FKA | | | | | |
| DRN: RLC | | | | | |
| CHK: WLK | | | | | |
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**FC 10 & 11
MECHANICAL**

DEMOLITION PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

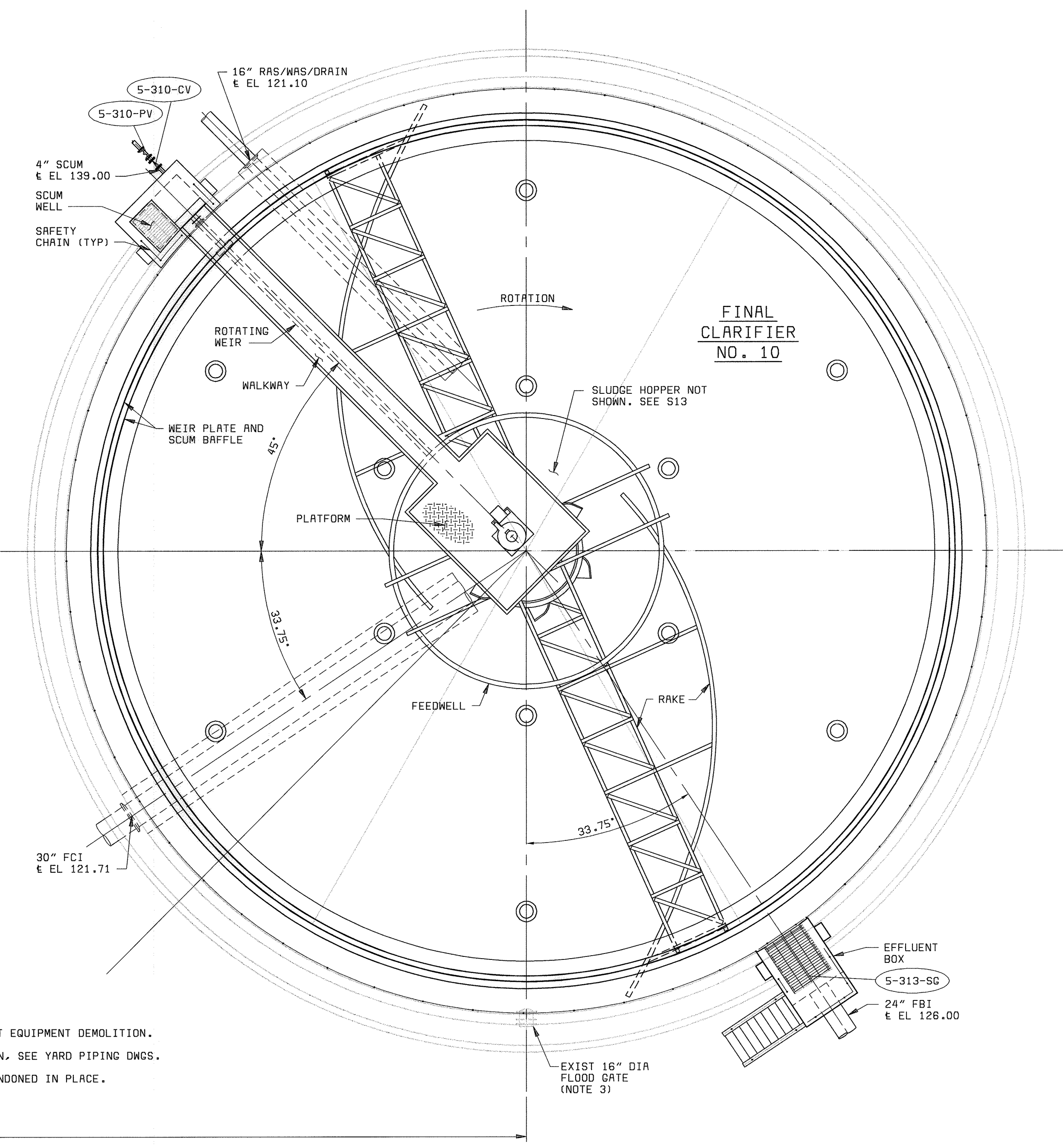
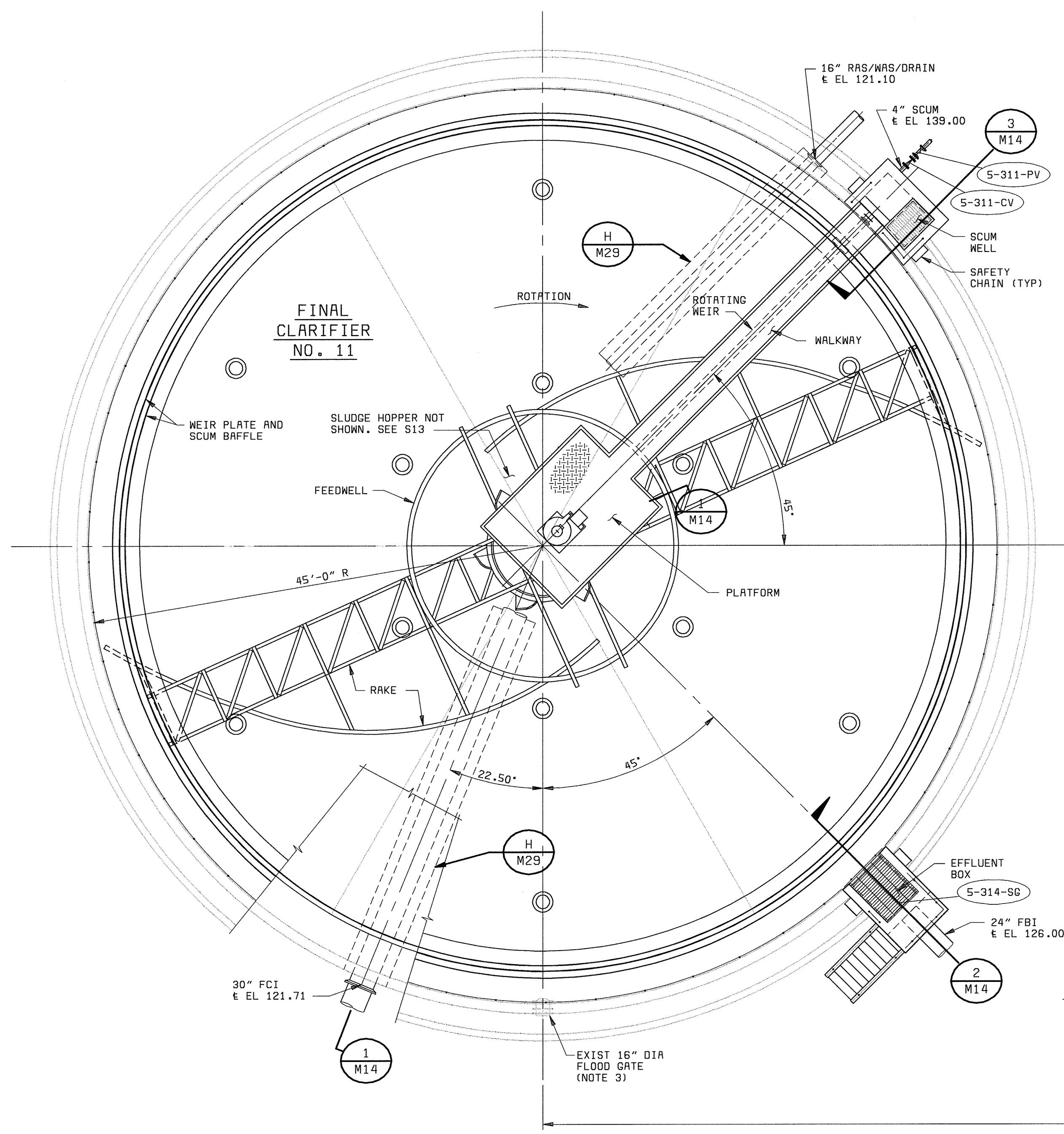
SCALE
AS
SHOWN

SHEET
78 OF 161

M12

A
B
C
D
E

A
B
C
D
E



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

PLAN
1/8" = 1'-0"

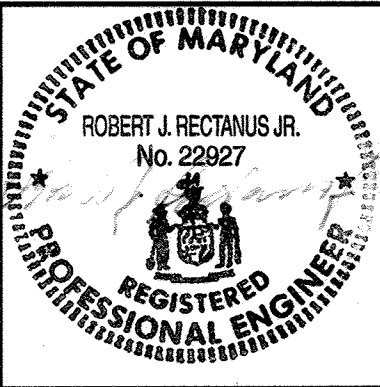
59472-101-FC-M-A0000647 (XVFC11M)
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH L.P.
Gaithersburg, Maryland

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



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| DRN: RLC | | | | | | | | | |
| CHK: WLK | | | | | | | | | |
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FC 10 & 11
MECHANICAL

PLAN

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

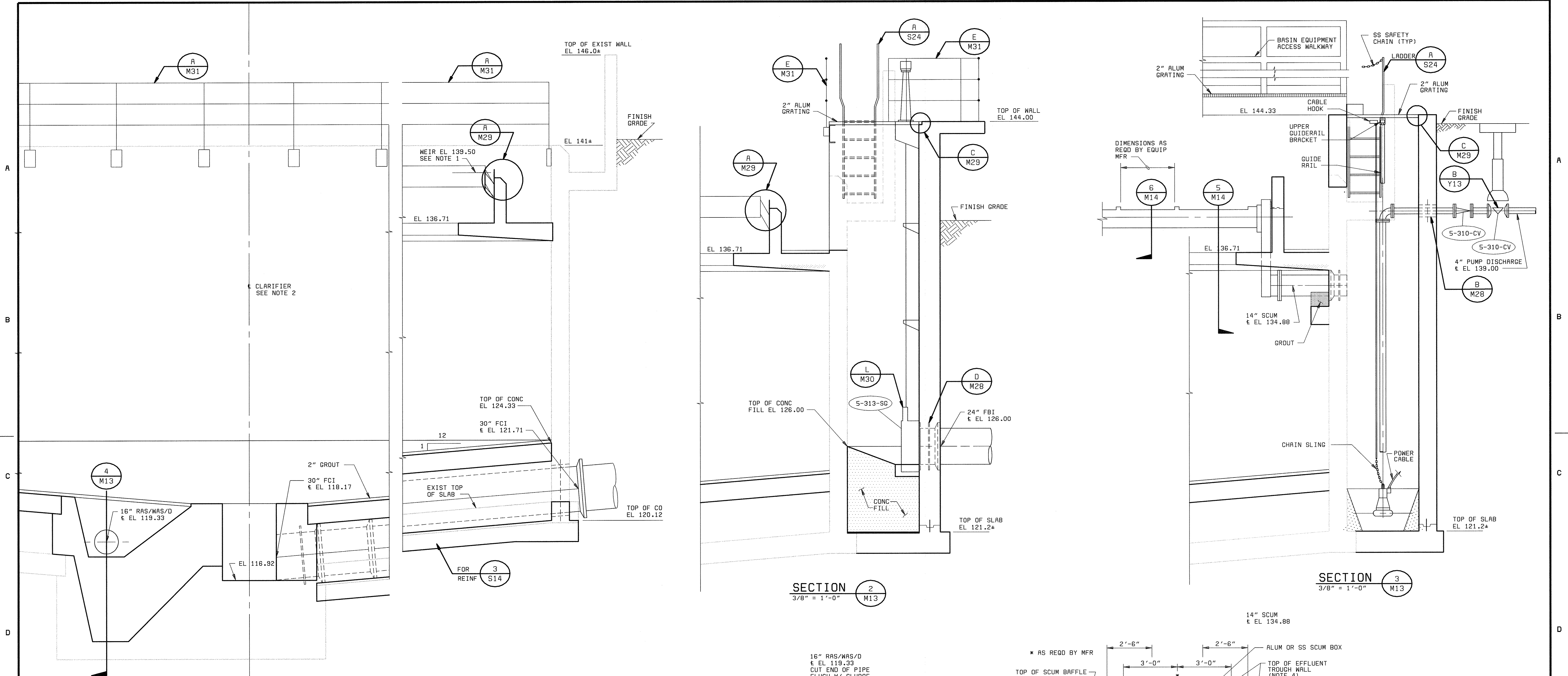
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
79 OF 161

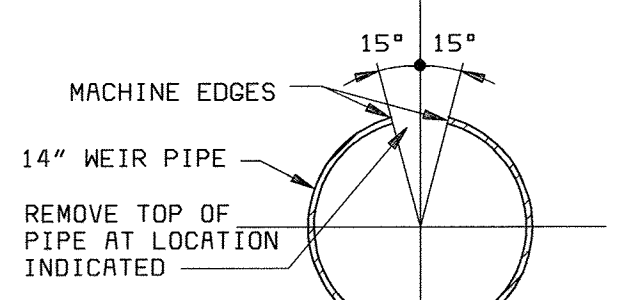
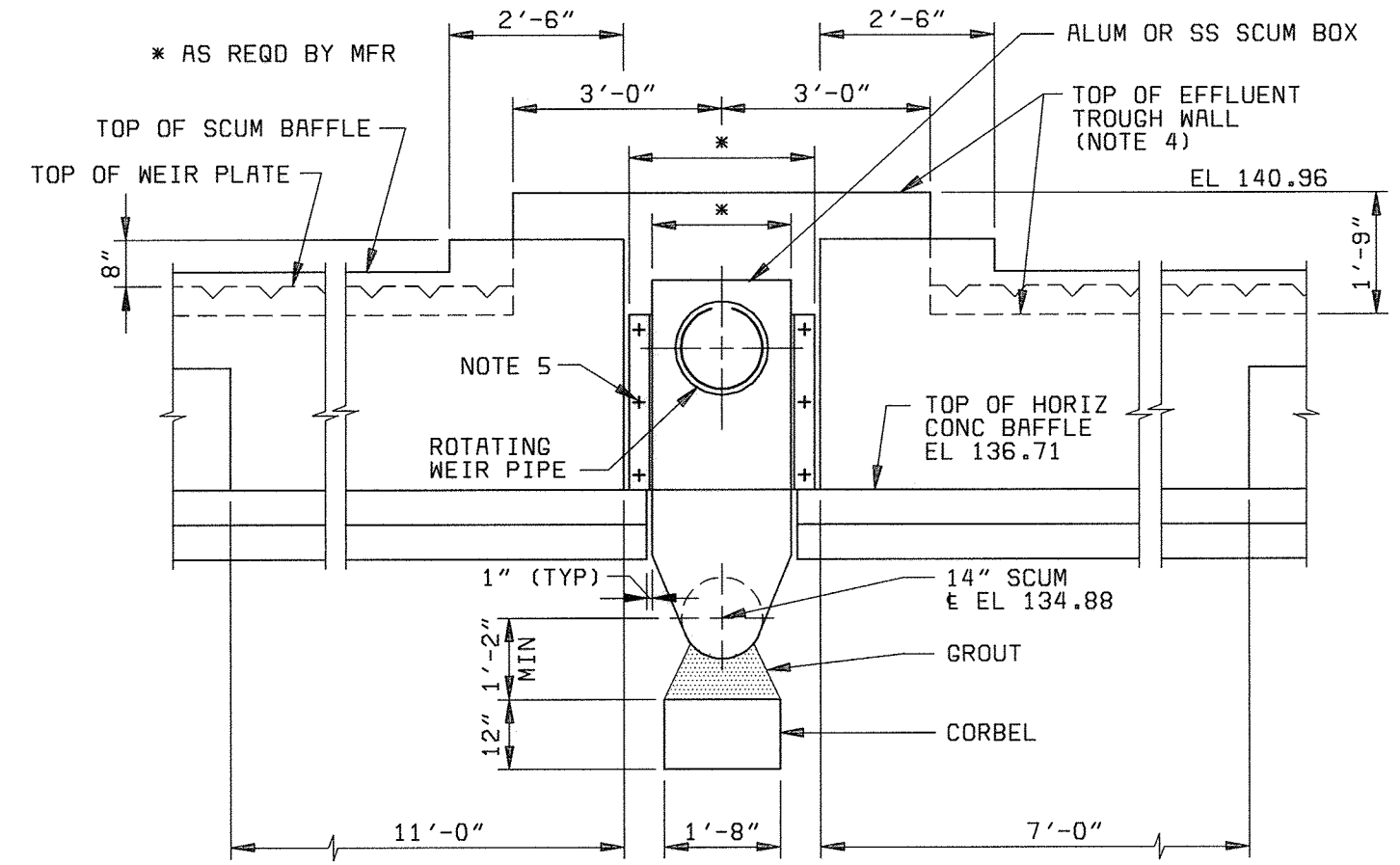
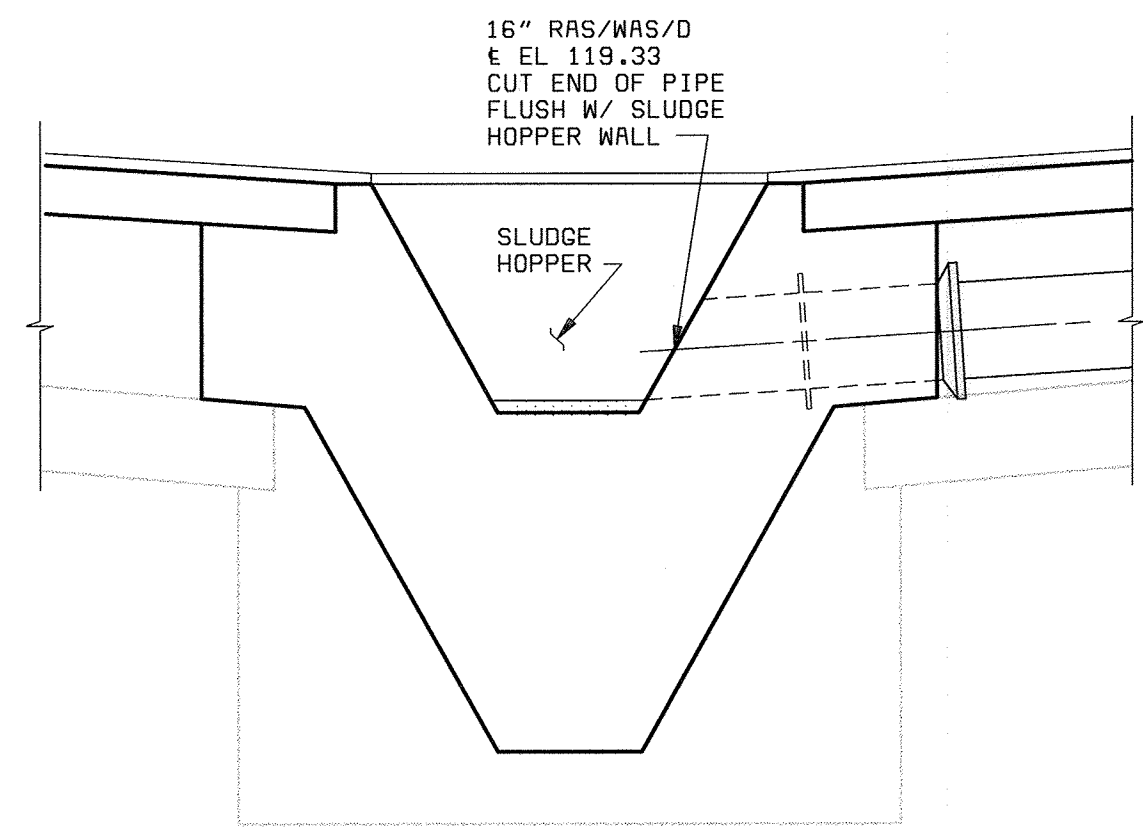
M13



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

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

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



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

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert Benjamin 6-29-00
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BLACK & VEATCH LP
Gaithersburg, Maryland

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

REG. PROF. ENGR. DATE

DES: FKA

DRN: RLC

CHK: WLK

DATE: 6/23/00

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FC 10 & 11
MECHANICAL

SECTIONS

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

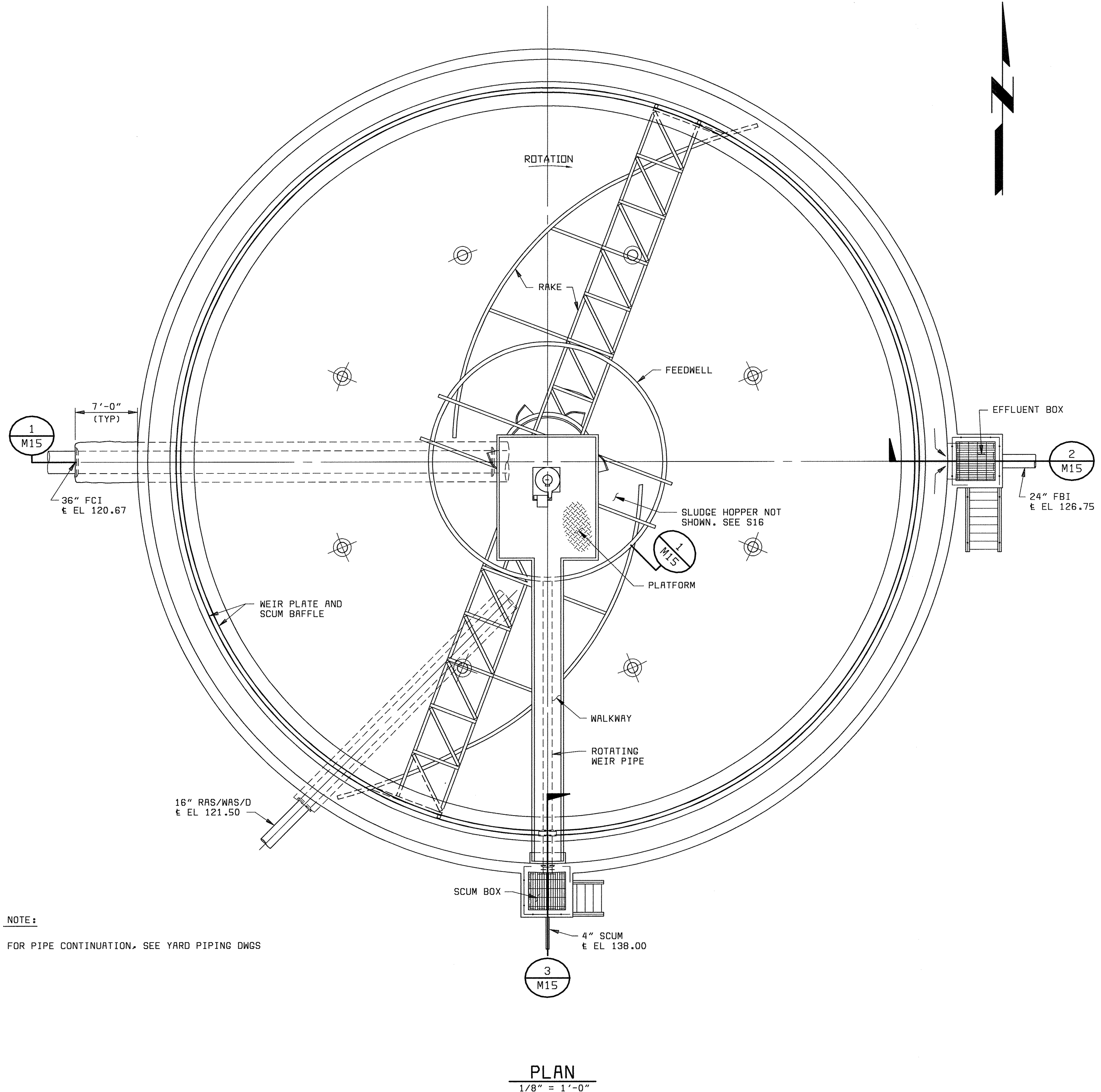
CAPITAL PROJECT S-6205
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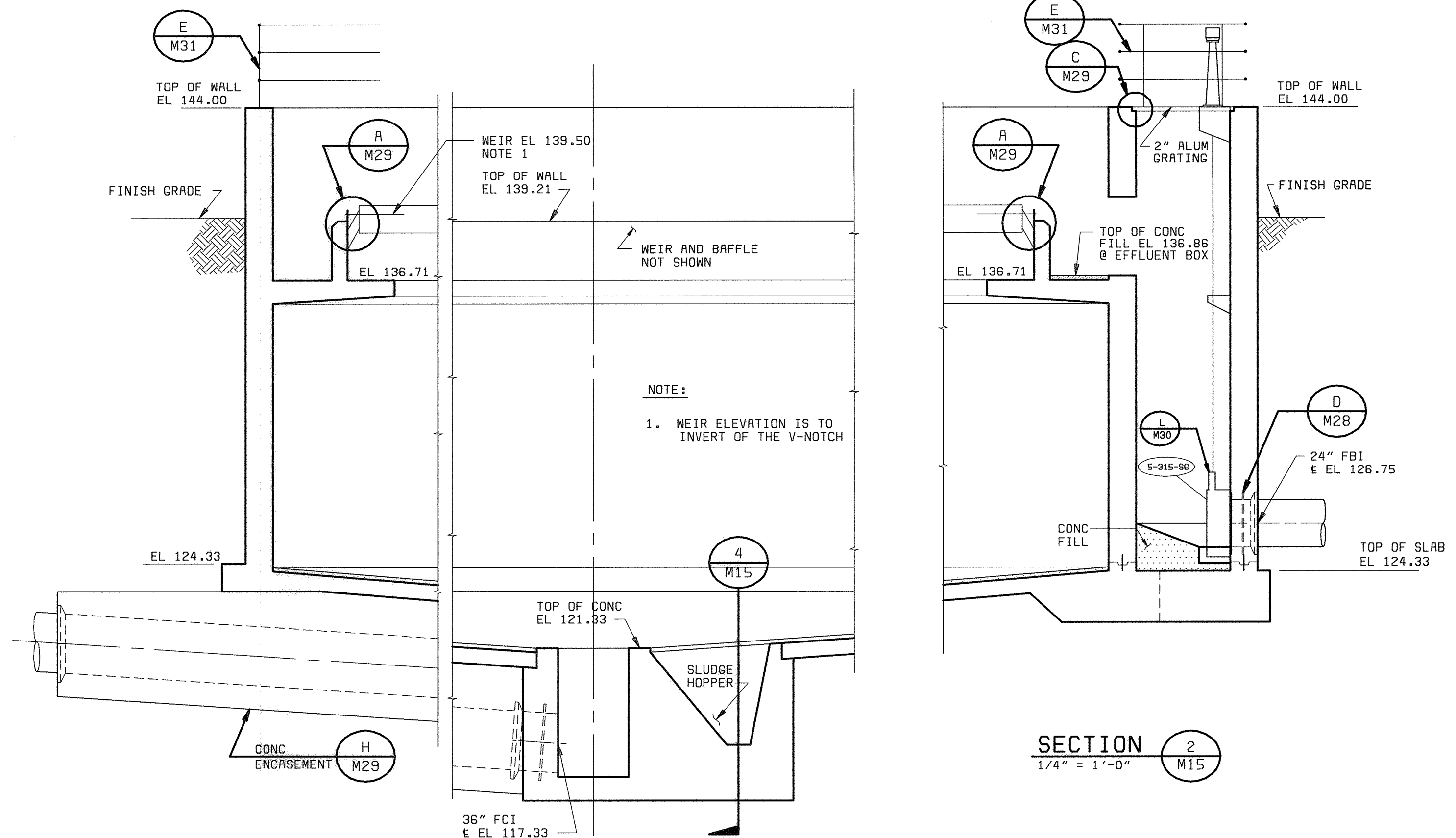
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SHEET 80 OF 161

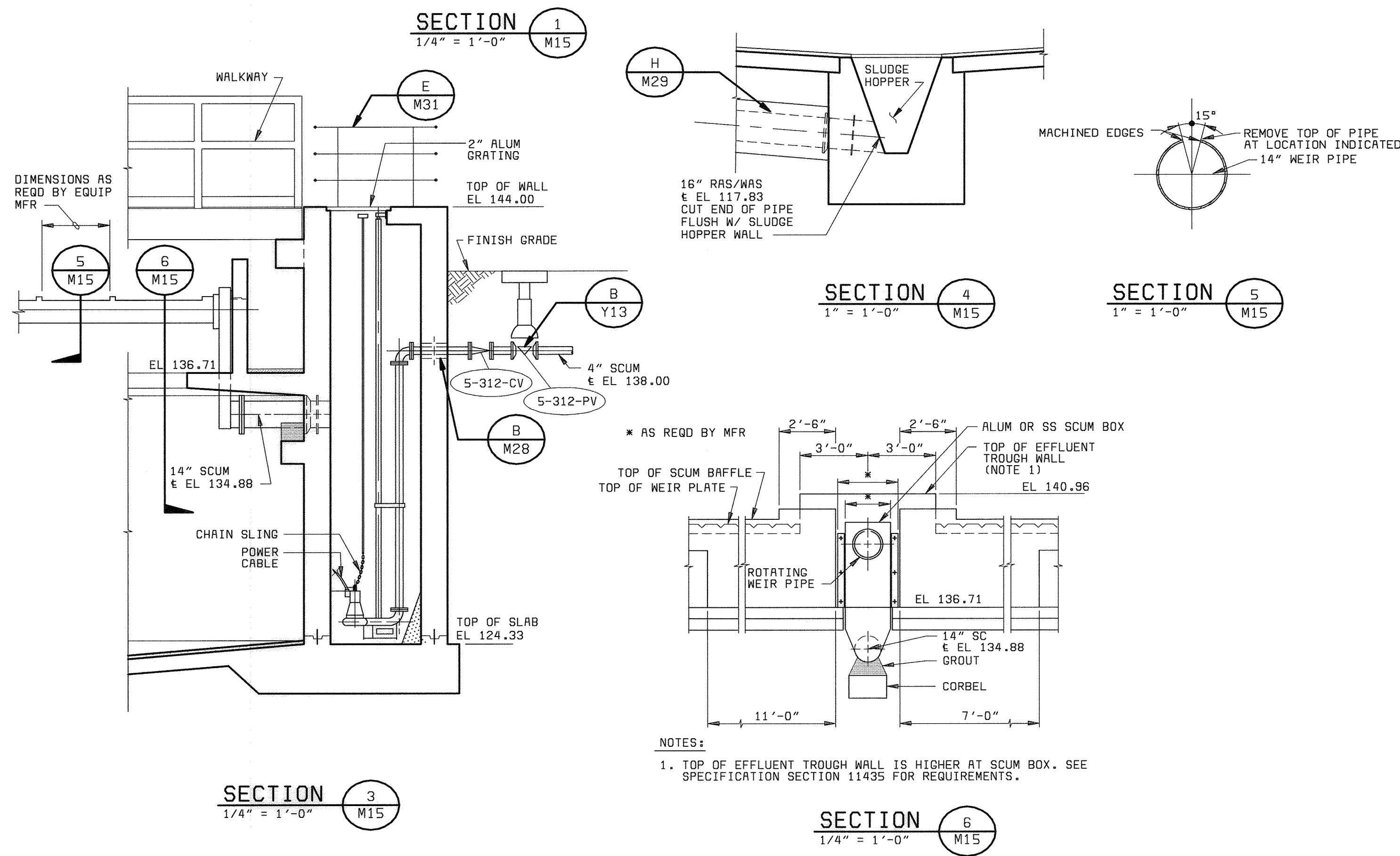
M14



NOTE:
FOR PIPE CONTINUATION, SEE YARD PIPING DWGS



NOTE:
1. WEIR ELEVATION IS TO INVERT OF THE V-NOTCH



NOTES:
1. TOP OF EFFLUENT TROUGH WALL IS HIGHER AT SCUM BOX. SEE SPECIFICATION SECTION 11435 FOR REQUIREMENTS.

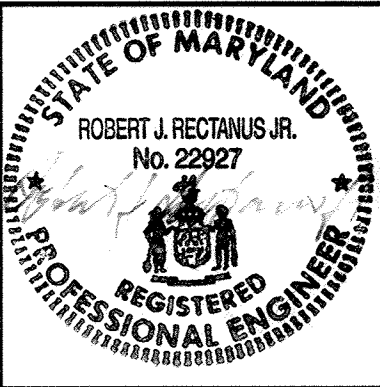
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH L.P.
Gaithersburg, Maryland

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



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| DRN: RLC | | | | | | | | | |
| CHK: WLK | | | | | | | | | |
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FC 12
MECHANICAL

PLAN AND SECTIONS

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

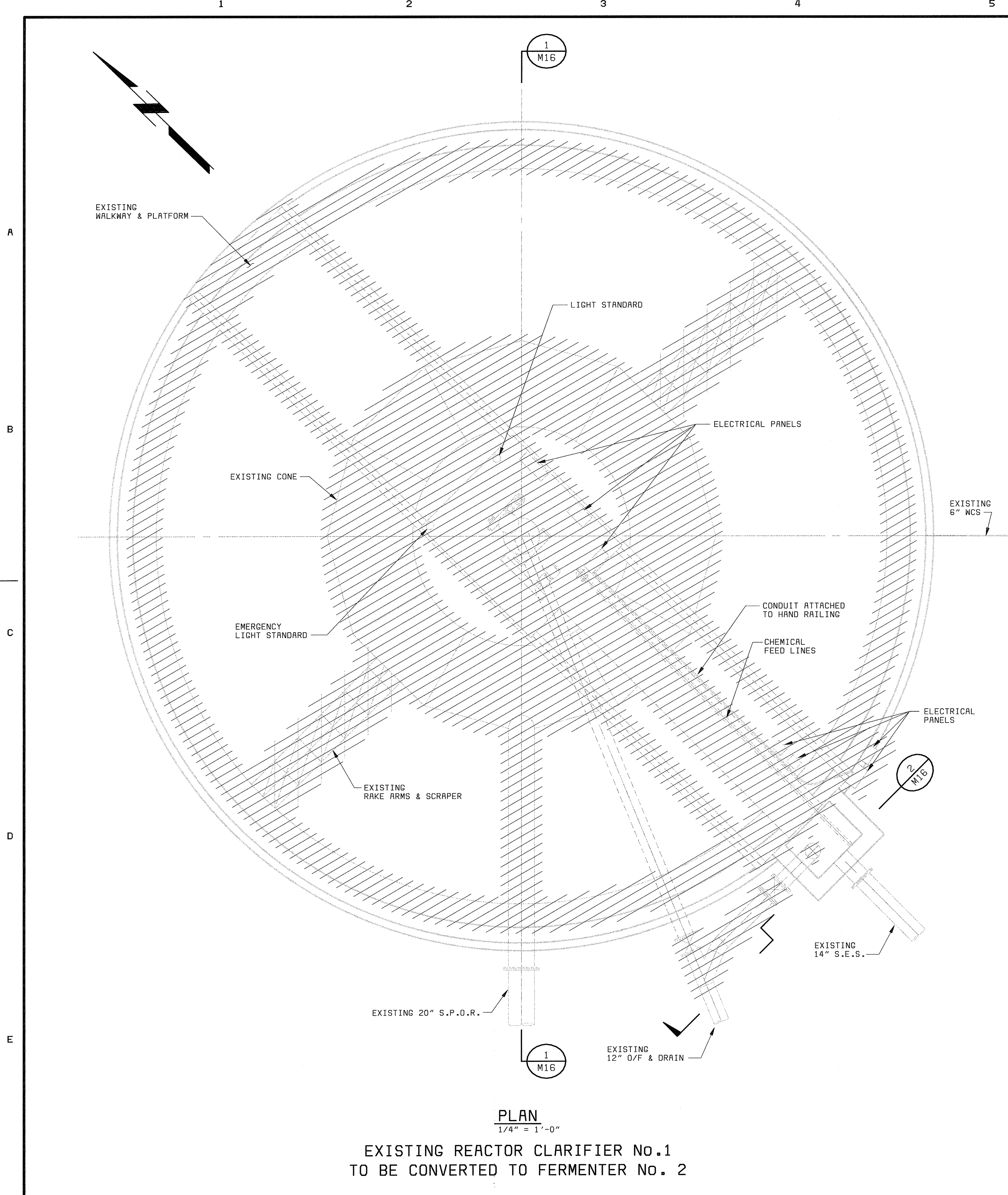
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

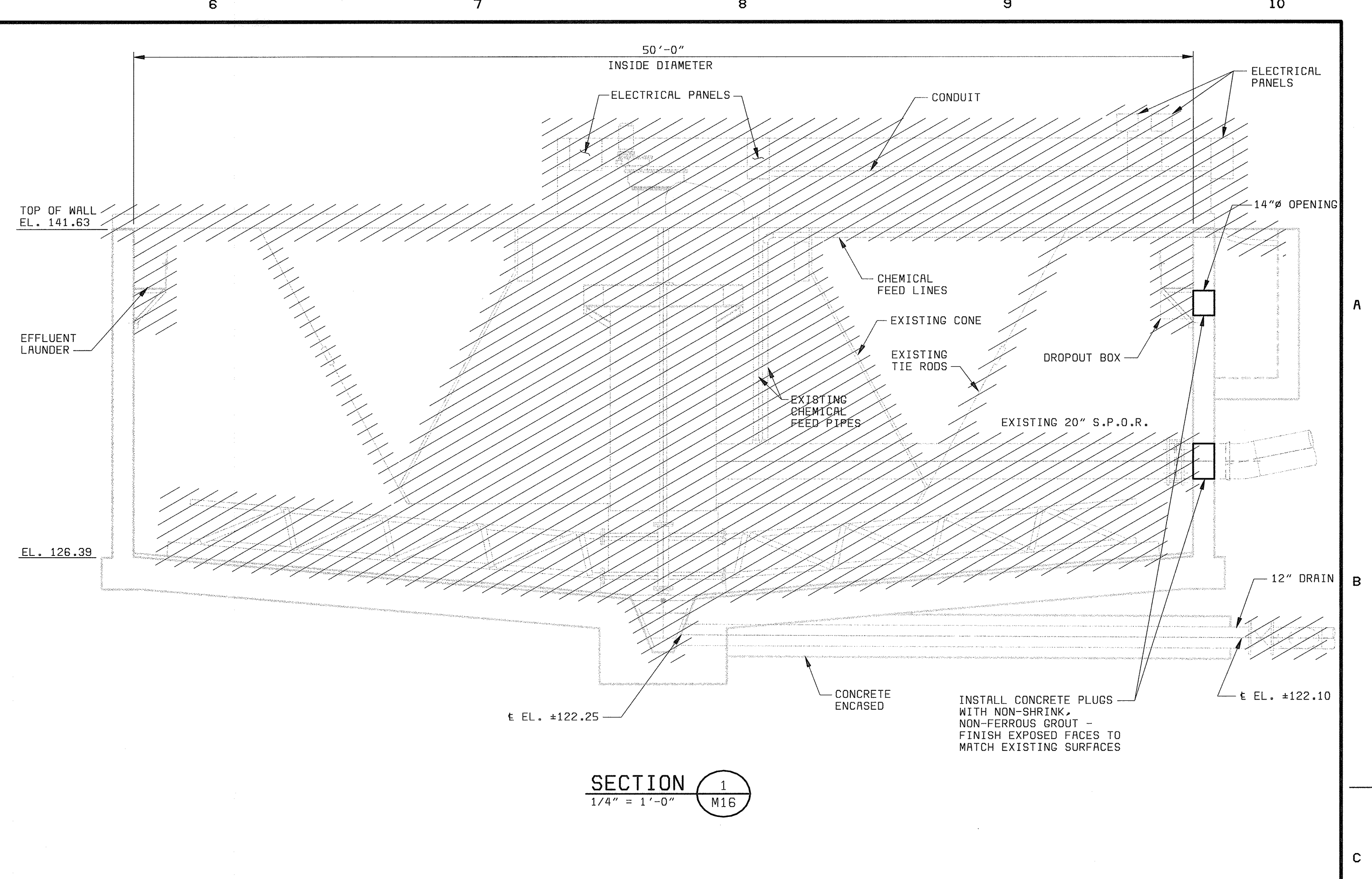
SHEET 81 OF 161

M15

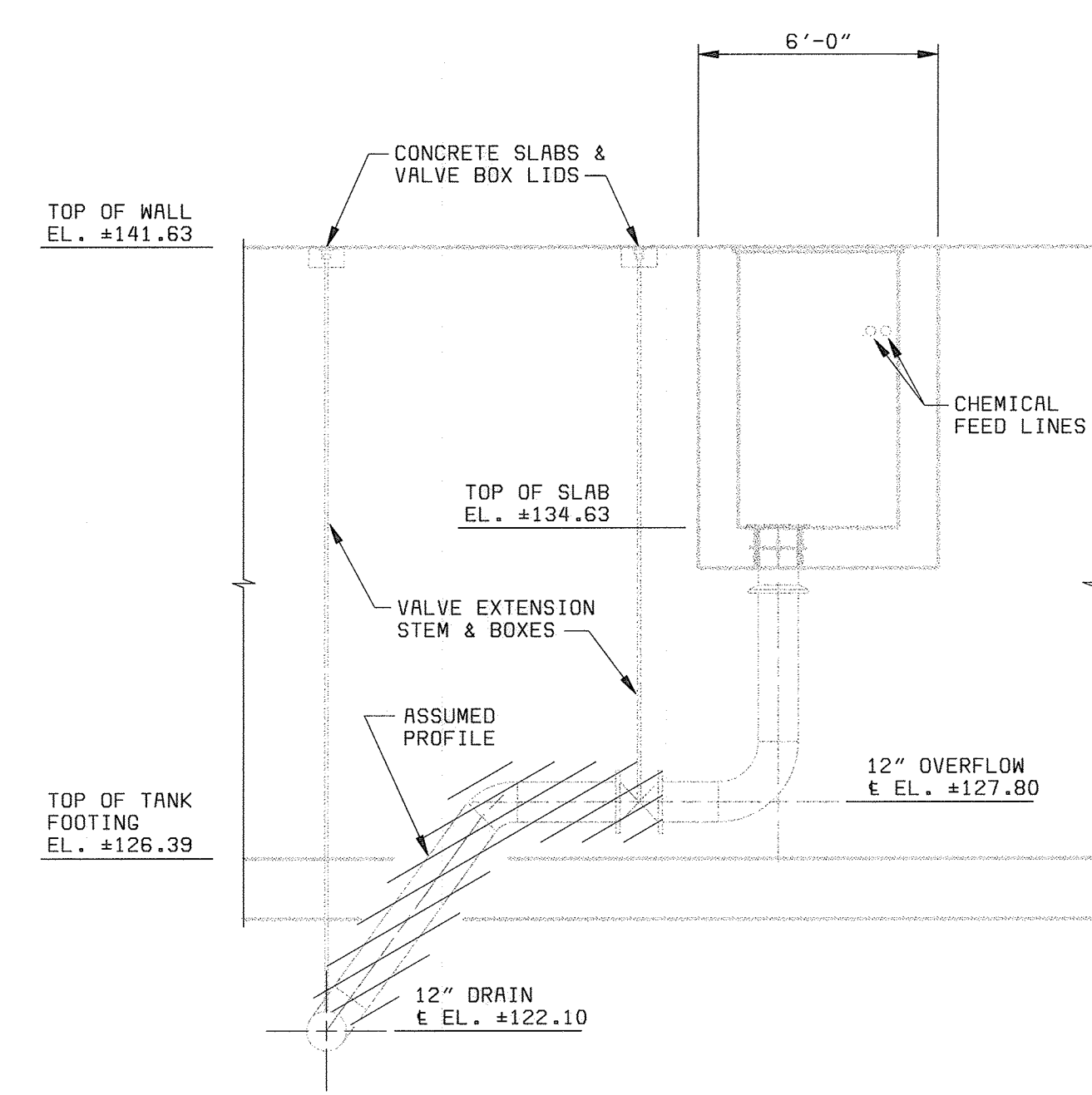


PLAN
1/4" = 1'-0"

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



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



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

LEGEND:

TO BE REMOVED

NOTES:

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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

BLACK & VEATCH, L.P.
Gaithersburg, Maryland

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

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

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| CHK: RVJ | | | | | | | |

FERMENTER MECHANICAL

DEMOLITION PLAN AND SECTION

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

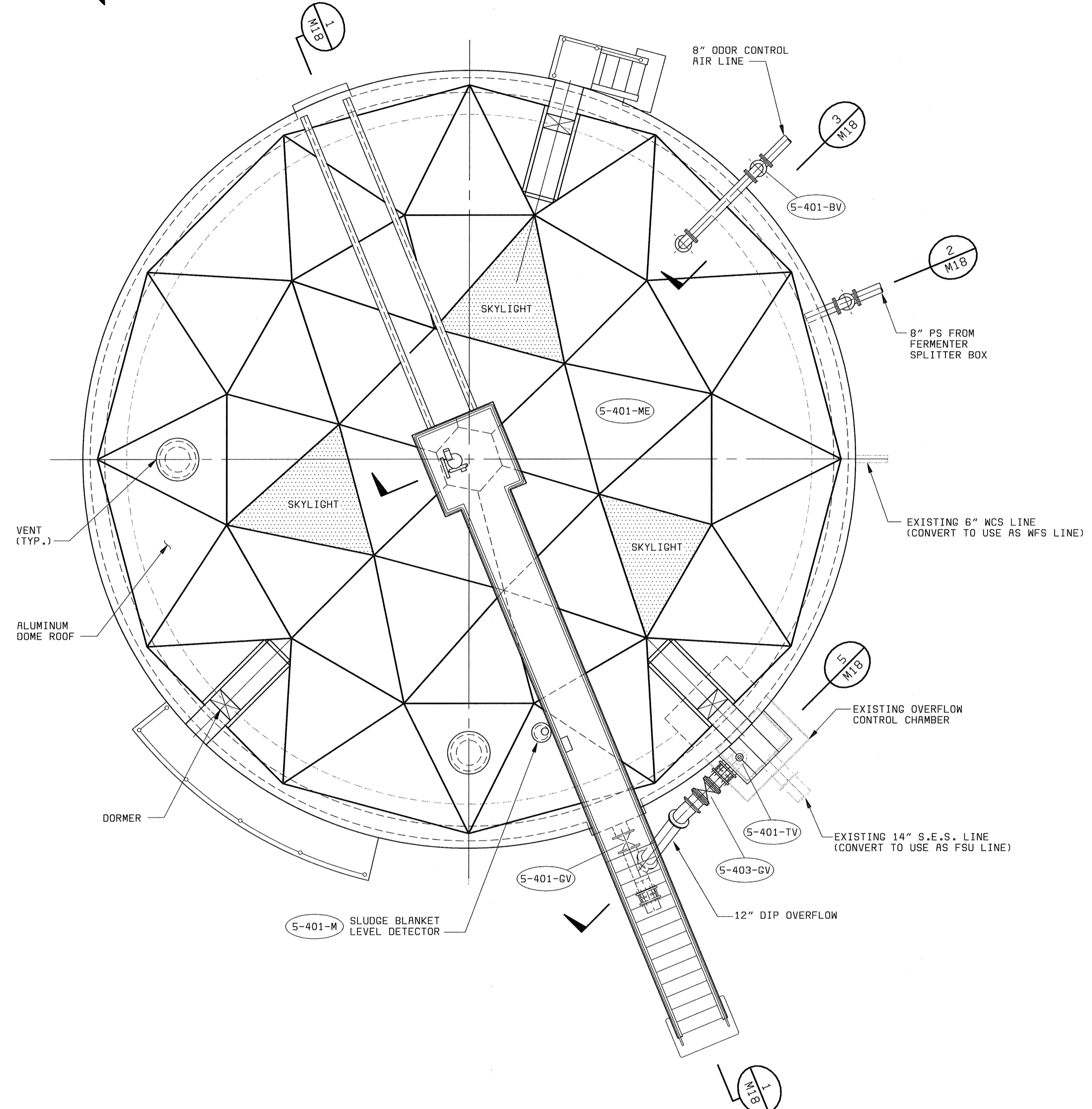
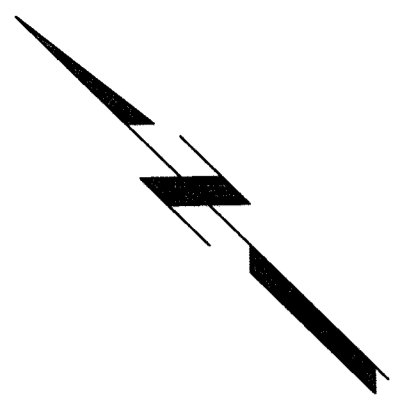
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

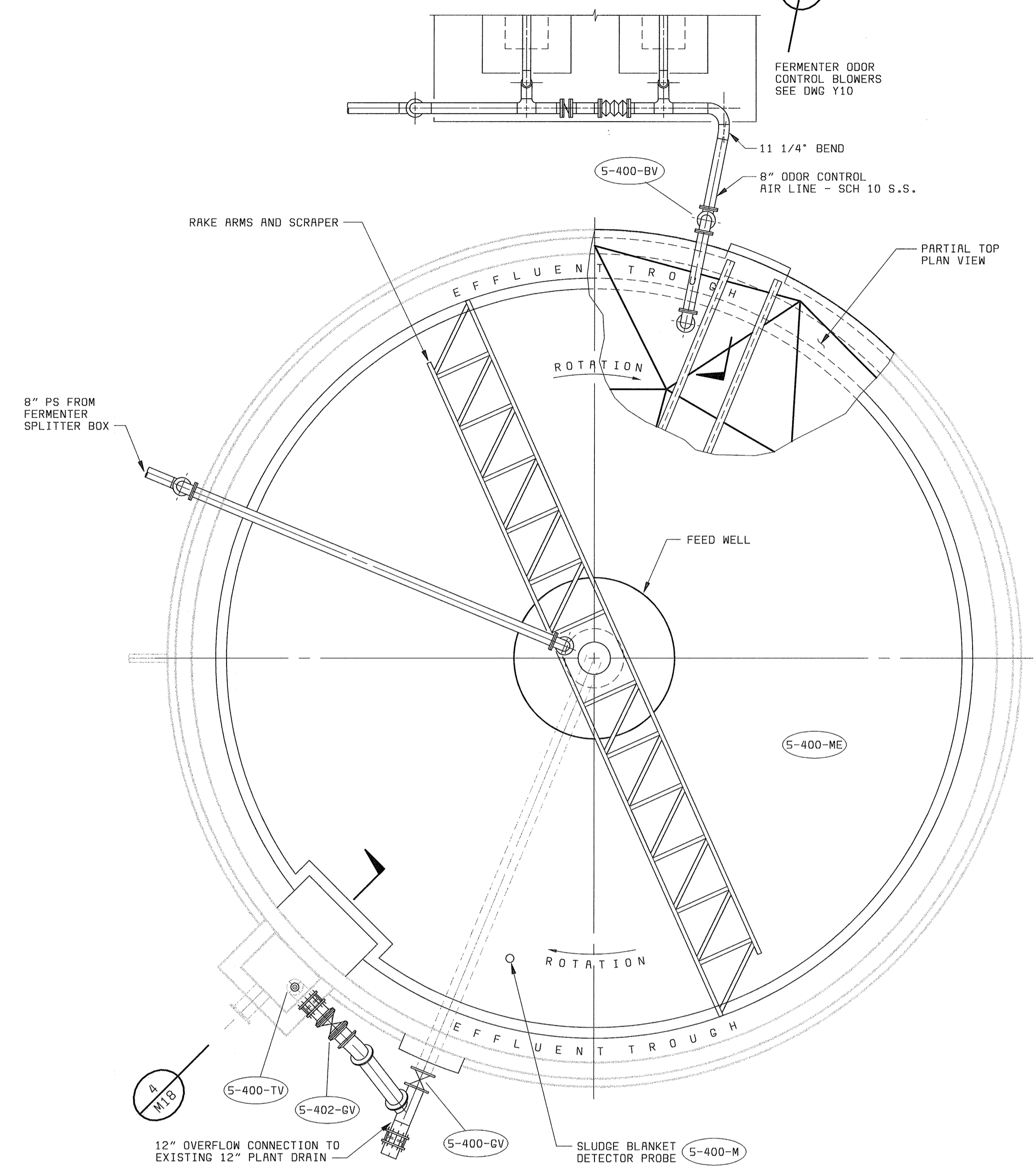
SCALE AS SHOWN

SHEET 82 OF 161

M16



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



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

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

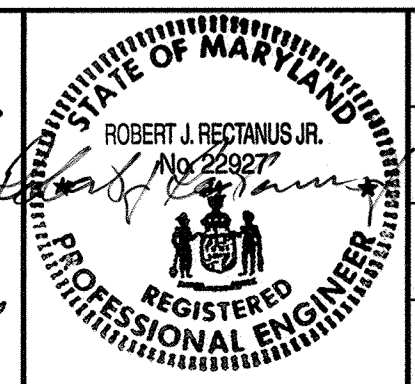


Stantec Consulting Ltd.
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Email: surrey@stantec.com



BLACK & VEATCH, L.P.
Gaithersburg, Maryland

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



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

FERMENTER
MECHANICAL

TOP AND LOWER PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

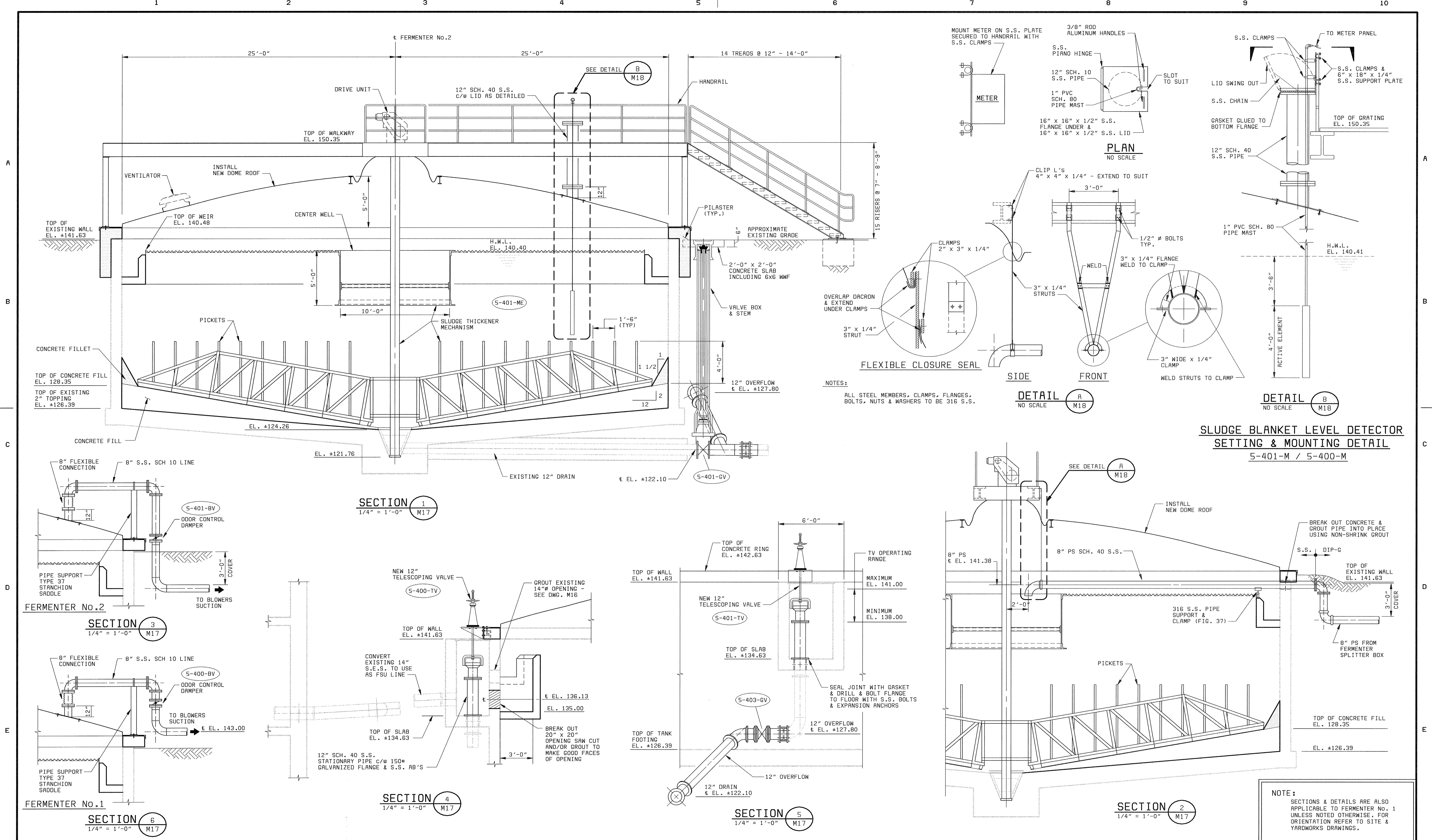
HOWARD COUNTY, MARYLAND

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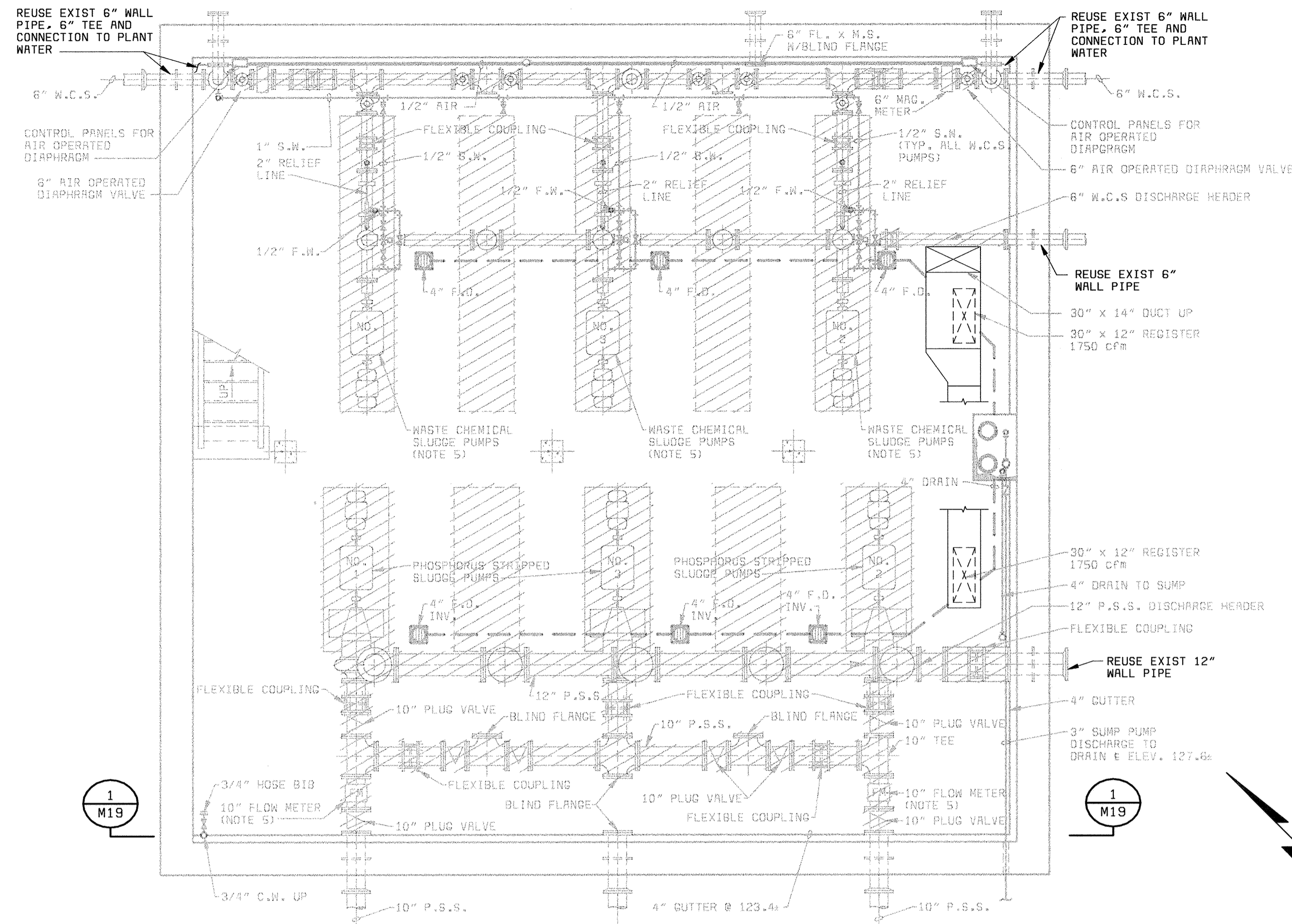
SHEET
83 OF 161

M17

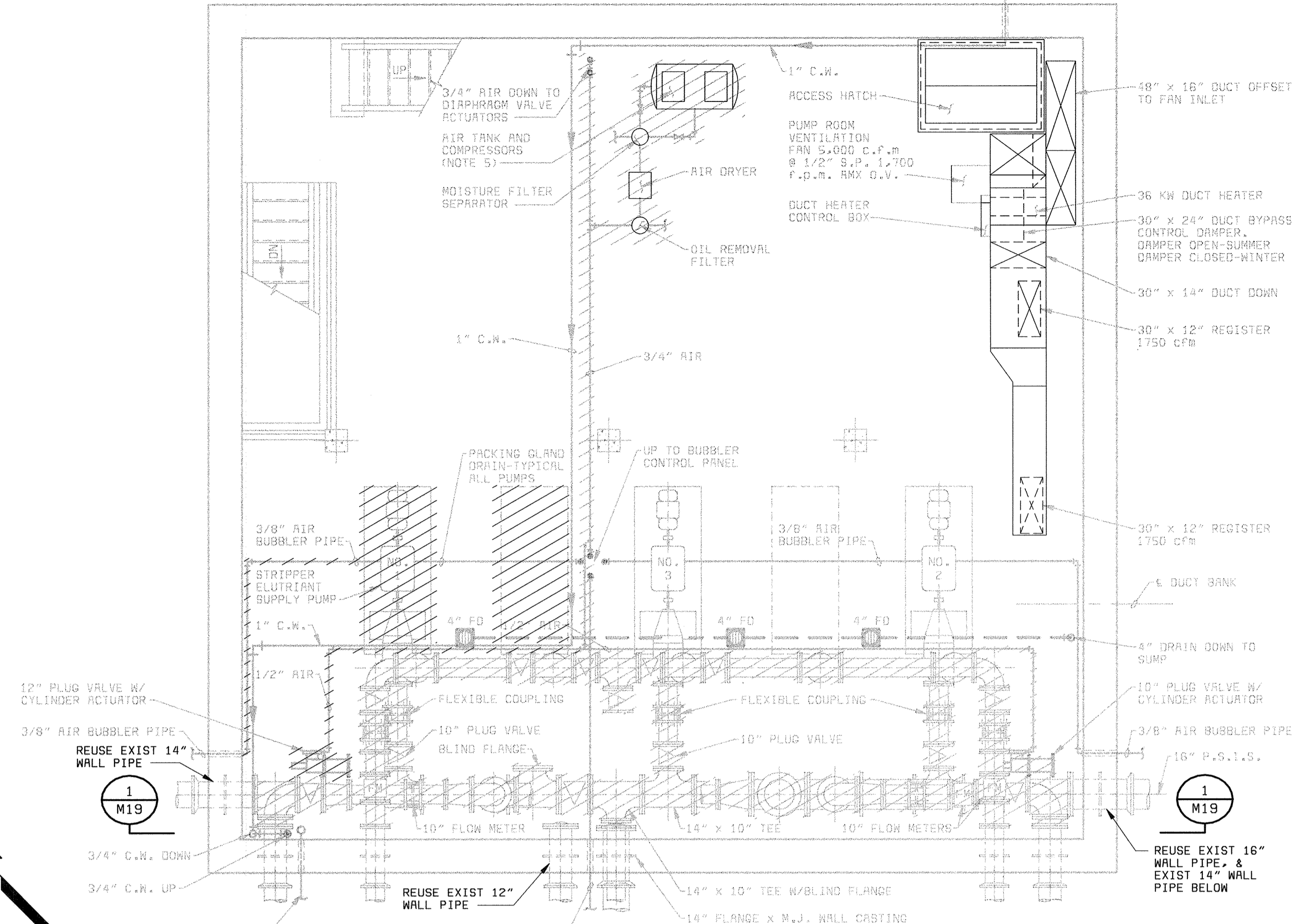
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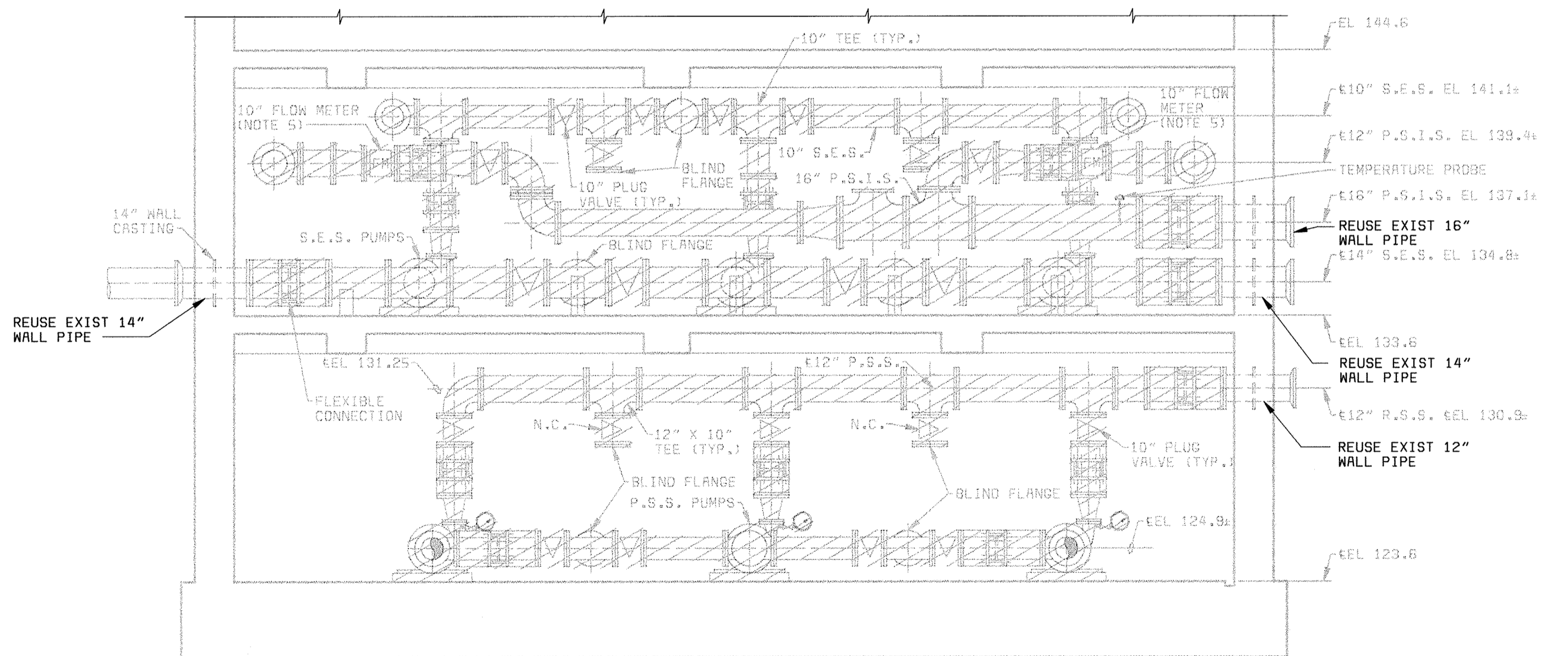
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|--|---|--|--|--|---|---|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Stantec Stantec Consulting Ltd. Suite 1007, 7445-132 St. Surrey, BC V3V 1J8 Ph. (604) 597-0422 Fax (604) 591-1856 Email: surrey@stantec.com | BLACK & VEATCH Gaithersburg, Maryland REGISTERED PROFESSIONAL ENGINEER REG. PROF. ENGR. DATE: 6/26/00 | DES: RVJ DRN: RCF CHK: RVJ DATE: 6/23/00 | REVISIONS AND RECORD OF ISSUE NO. BY CK APP | FERMENTER MECHANICAL SECTIONS & DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 84 OF 161 M18 |
| | | DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Rectanus Jr. 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | | DATE: 6/23/00 | | HOWARD COUNTY, MARYLAND |



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



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

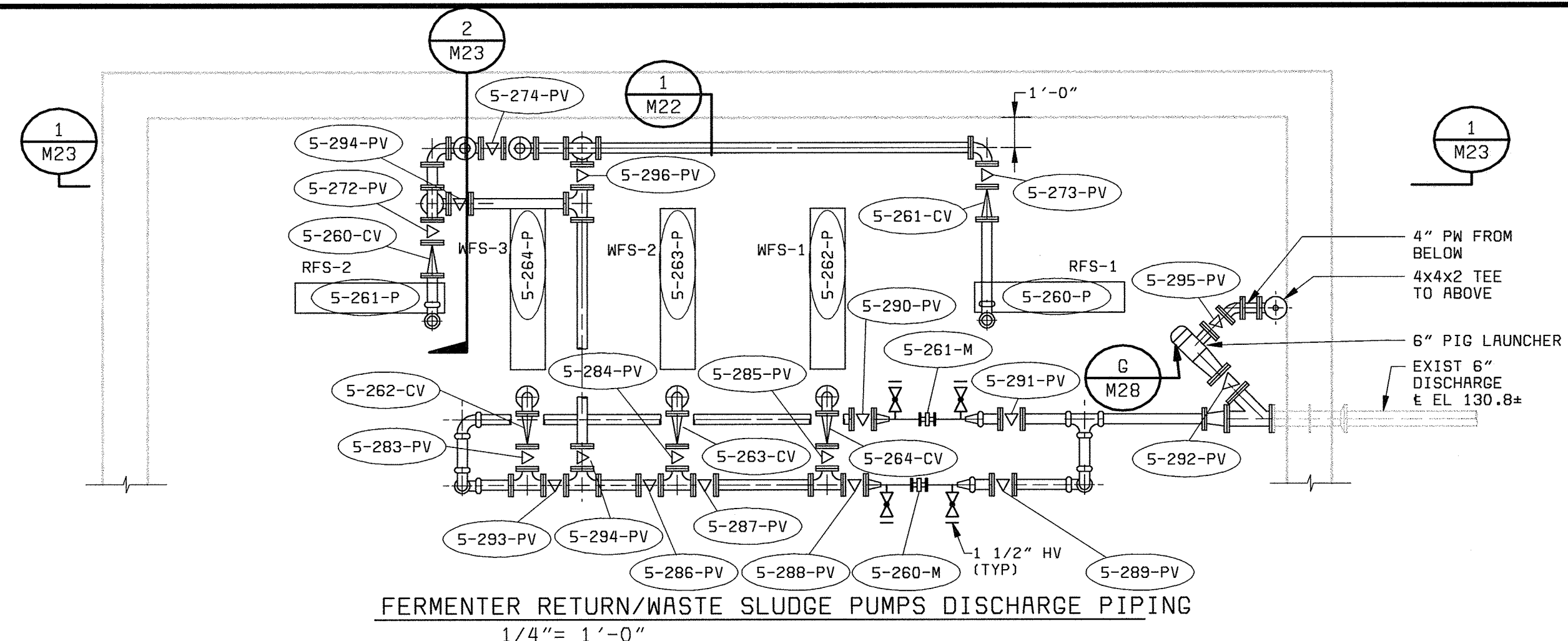


SECTION 1
1/4" = 1'-0"

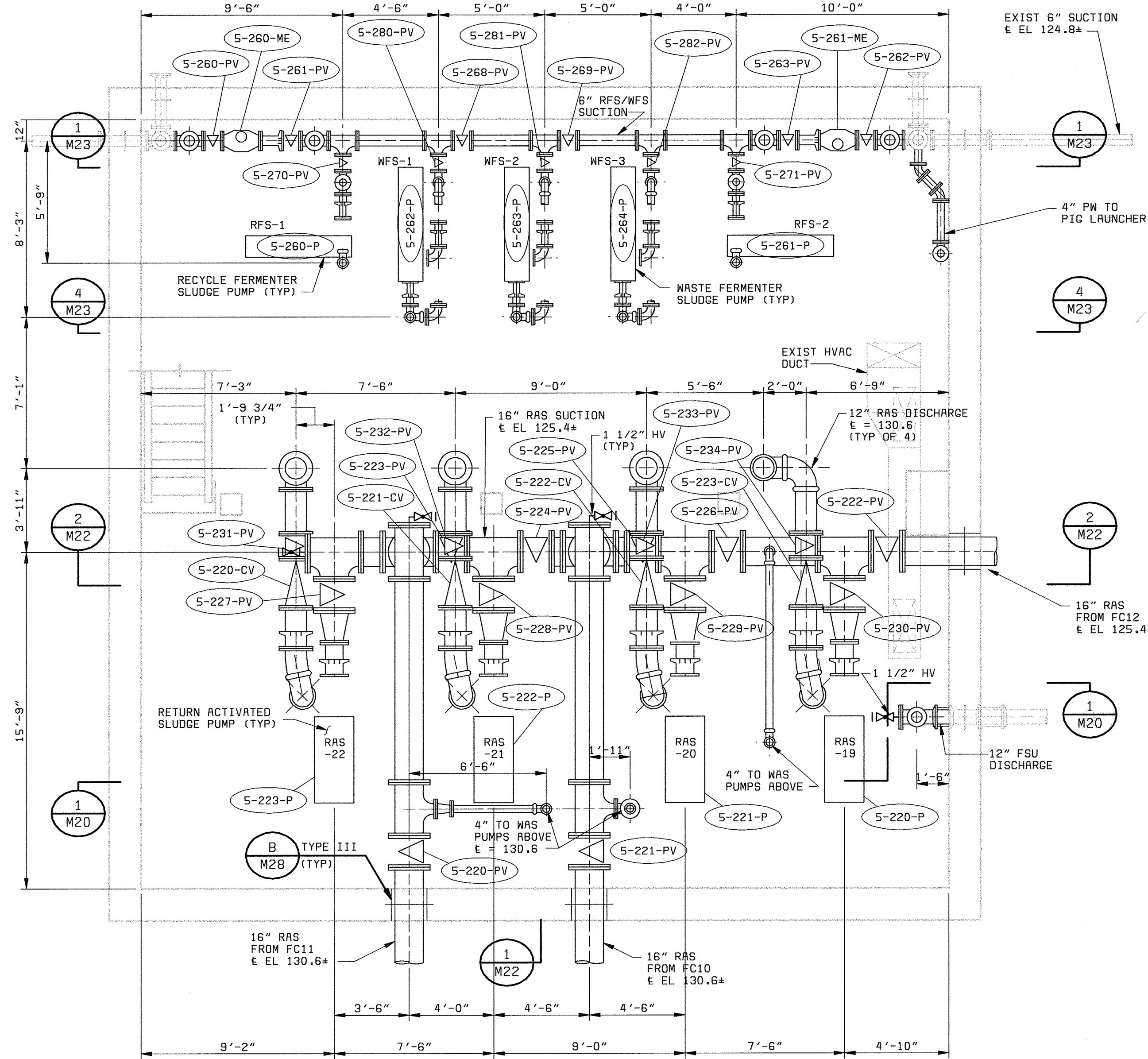
NOTES:

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

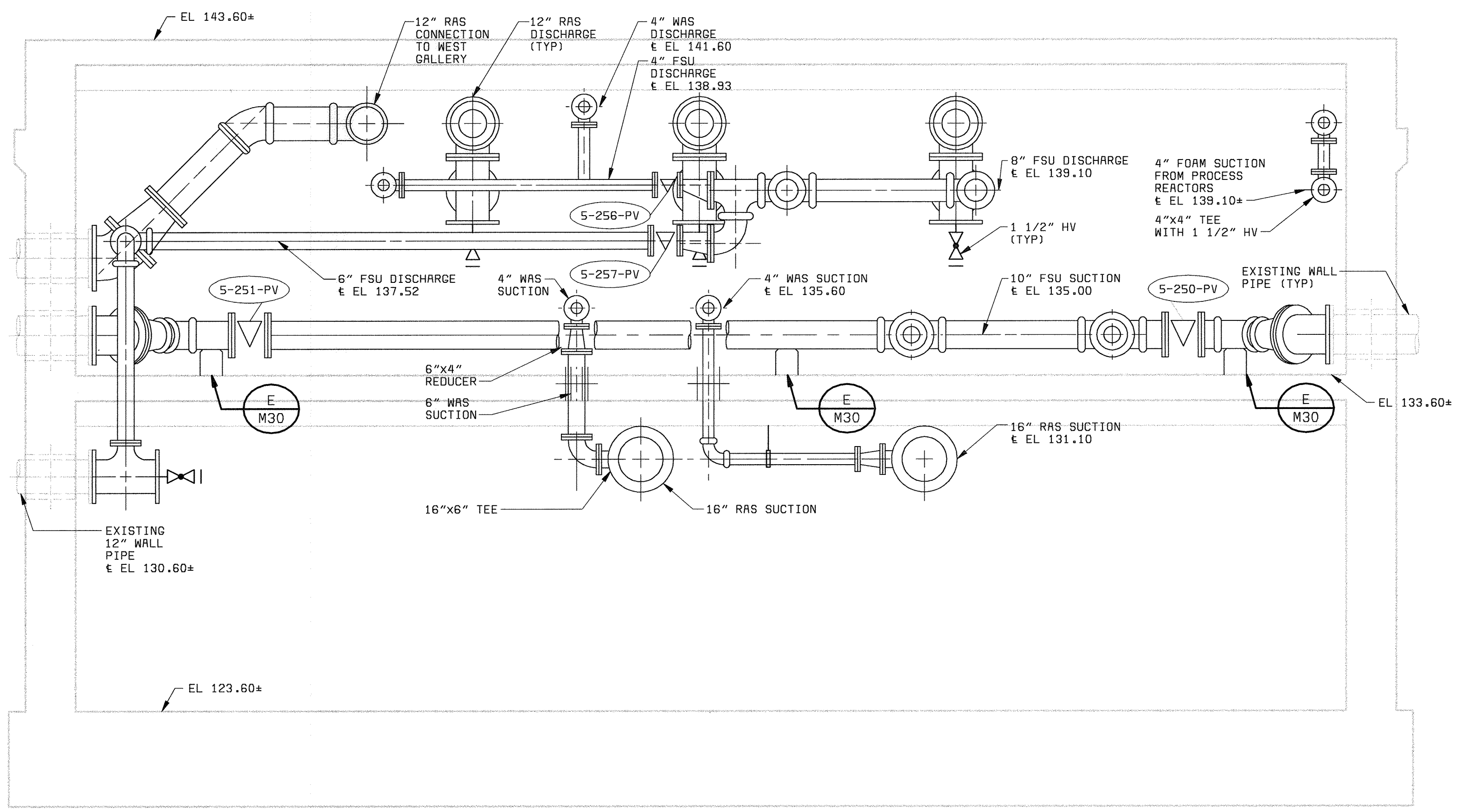
| | | | | | | | | | | | | |
|---|---|--------------------------------------|----------|----------|---------------|--|--|--|--|---|---|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert J. Rectanus</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LP Gaithersburg, Maryland REG. PROF. ENGR. DATE | REGISTERED PROFESSIONAL ENGINEER | DES: KMH | | | | | | | NORTH GALLERY MECHANICAL DEMOLITION PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: ET | CHK: WLK | DATE: 6/23/00 | | | | | | | |
| REVISIONS AND RECORD OF ISSUE | | | | | | | | | | | M19 | |



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



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



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

58472-101-RSPS-M-A0000205
058472
F058472R

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

Robert J. Reitan
REG. PROF. ENGR. DATE

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

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

NORTH GALLERY
MECHANICAL

 PIPING PLANS @ EL 131.00
& EL 137.00

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

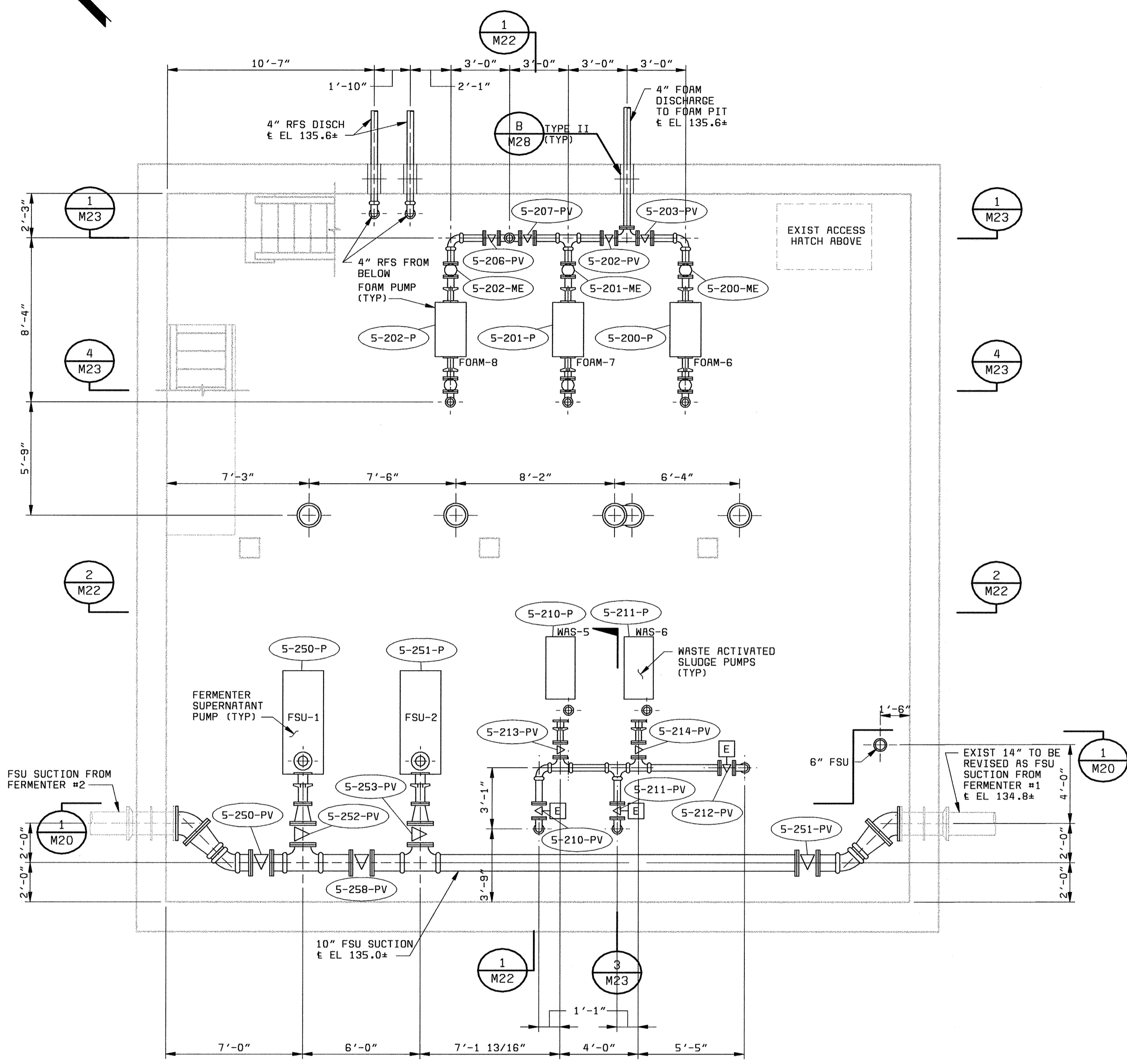
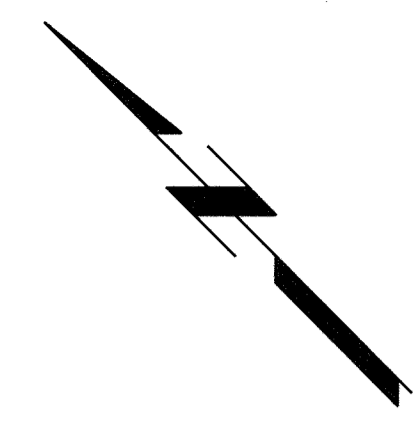
 CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

 HOWARD COUNTY, MARYLAND

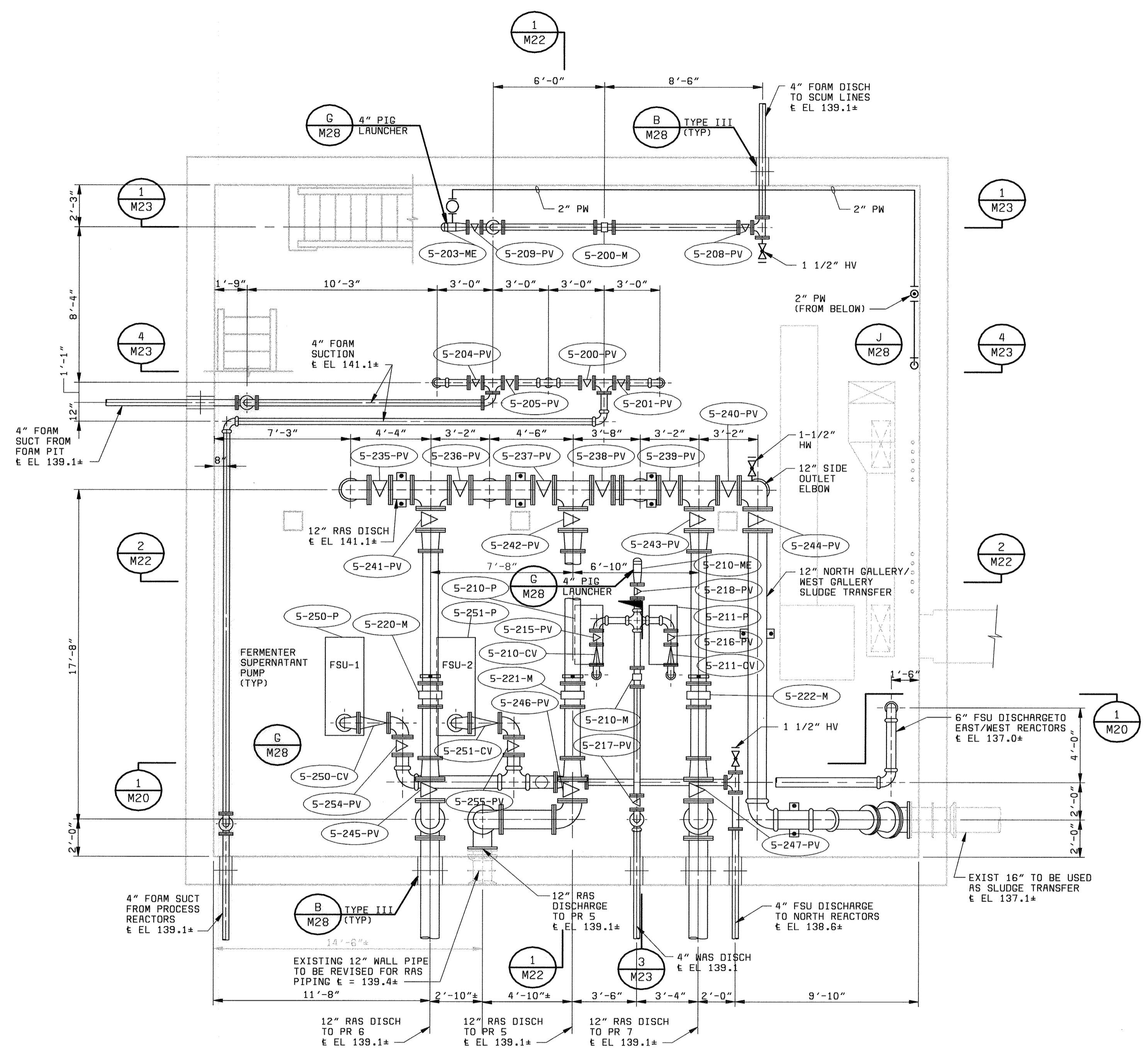
SCALE
AS
SHOWN

 SHEET
86 OF 161

M20



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



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

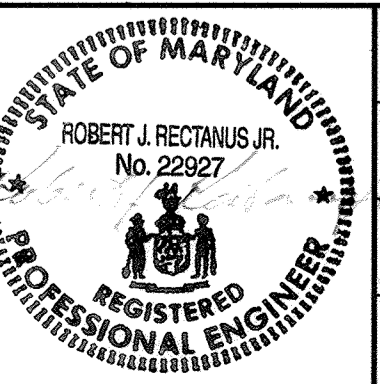
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058472-101-ASPS-M-A0000205

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert B. Berman 6-24-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH LLP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE



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| DRN: SLF | | | | | | |
| CHK: WLK | | | | | | |
| DATE: 6/23/00 | | | | | | |

NORTH GALLERY
MECHANICAL

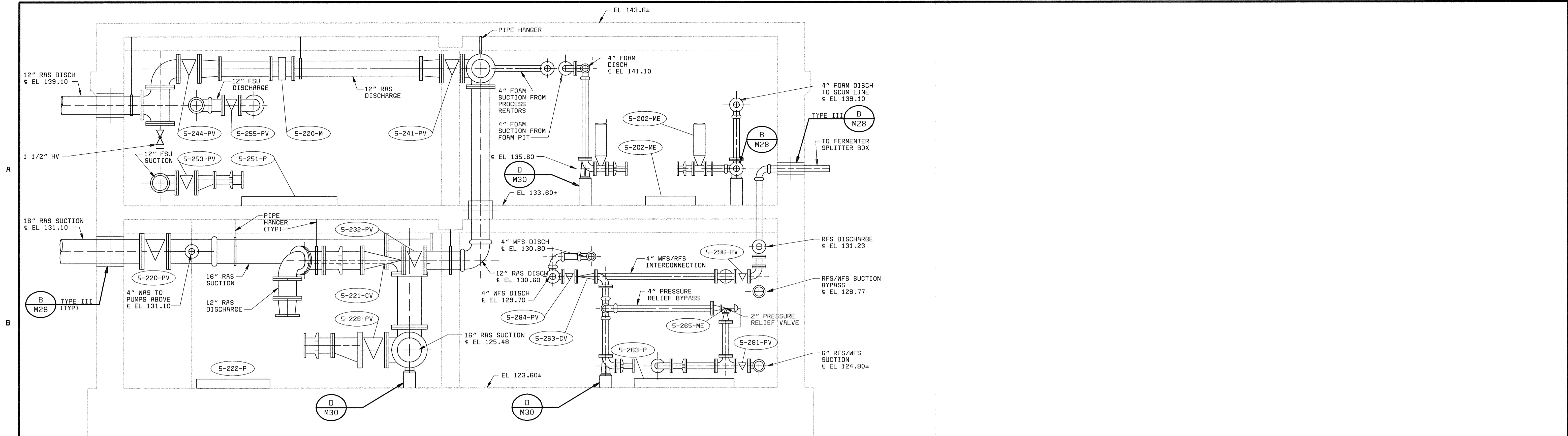
PIPING PLAN @ EL 141.50

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

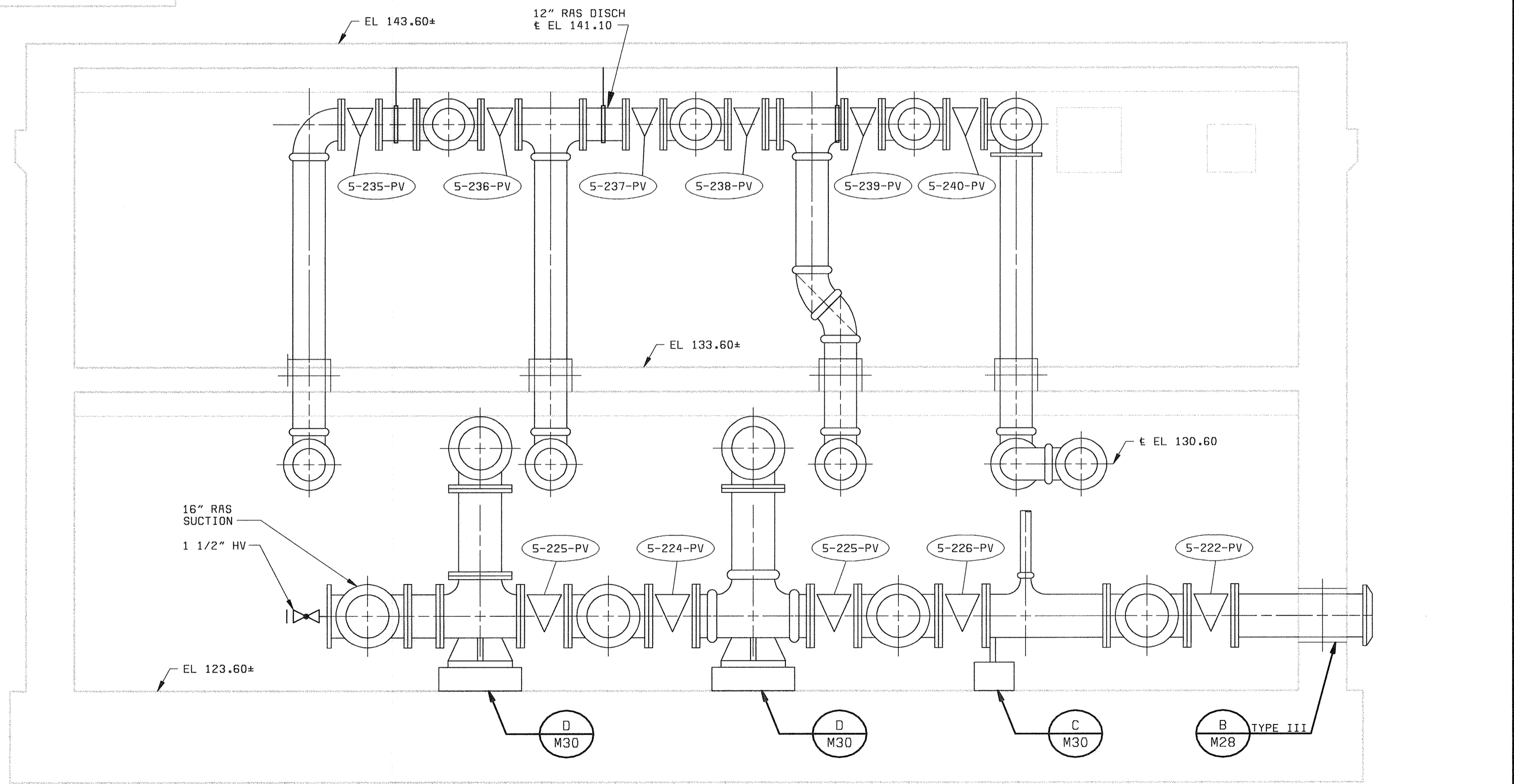
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
SHEET 87 OF 161
M21



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



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

58472-101-RSPS-M-10000205

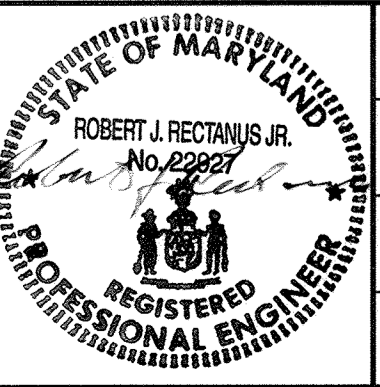
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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| DES: KMH, SLF | | | | | | | | | |
| DRN: SLF | | | | | | | | | |
| CHK: WLK | | | | | | | | | |
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NORTH GALLERY
MECHANICAL

SECTIONS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 88 OF 161

M22

A

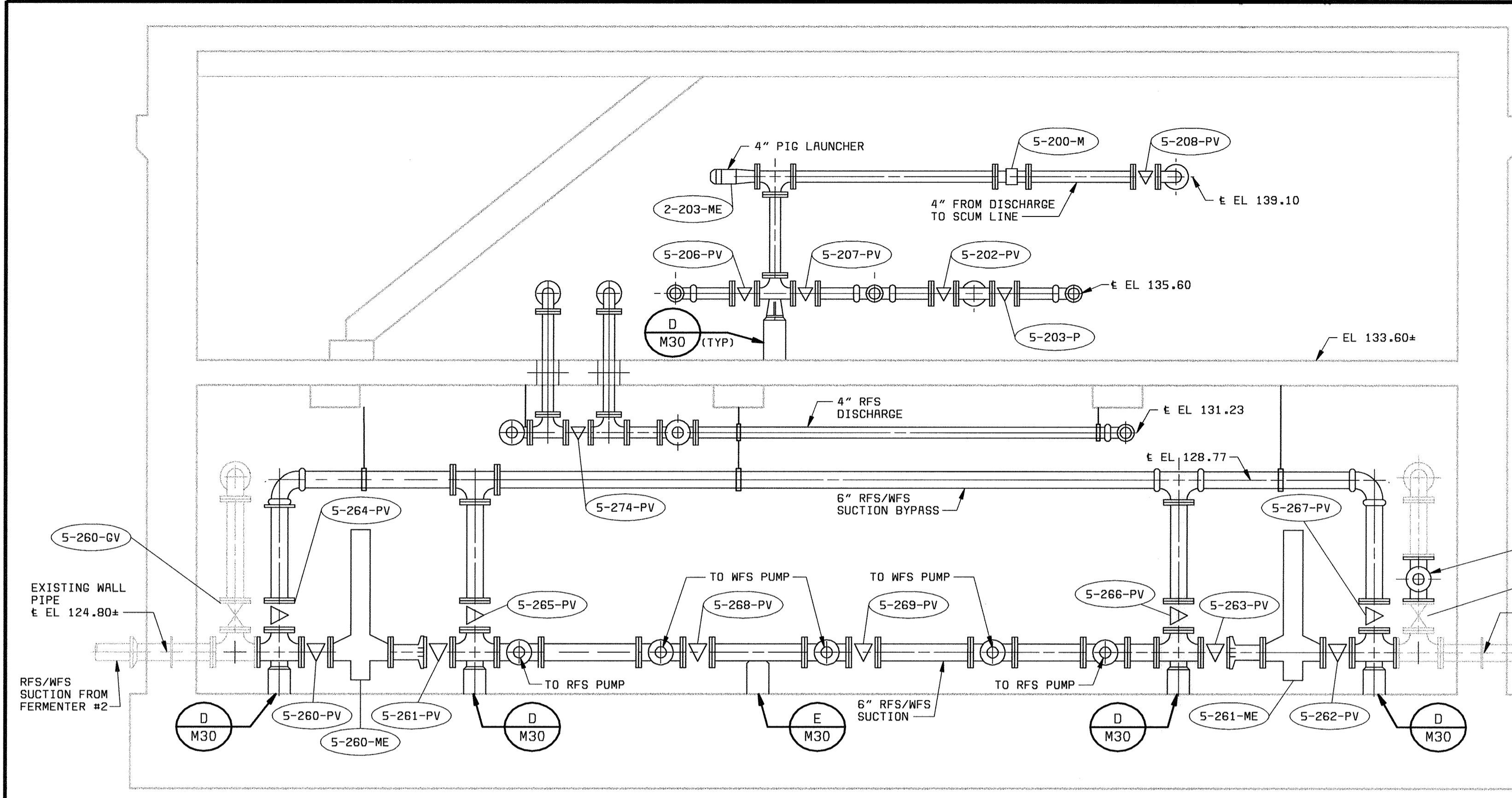
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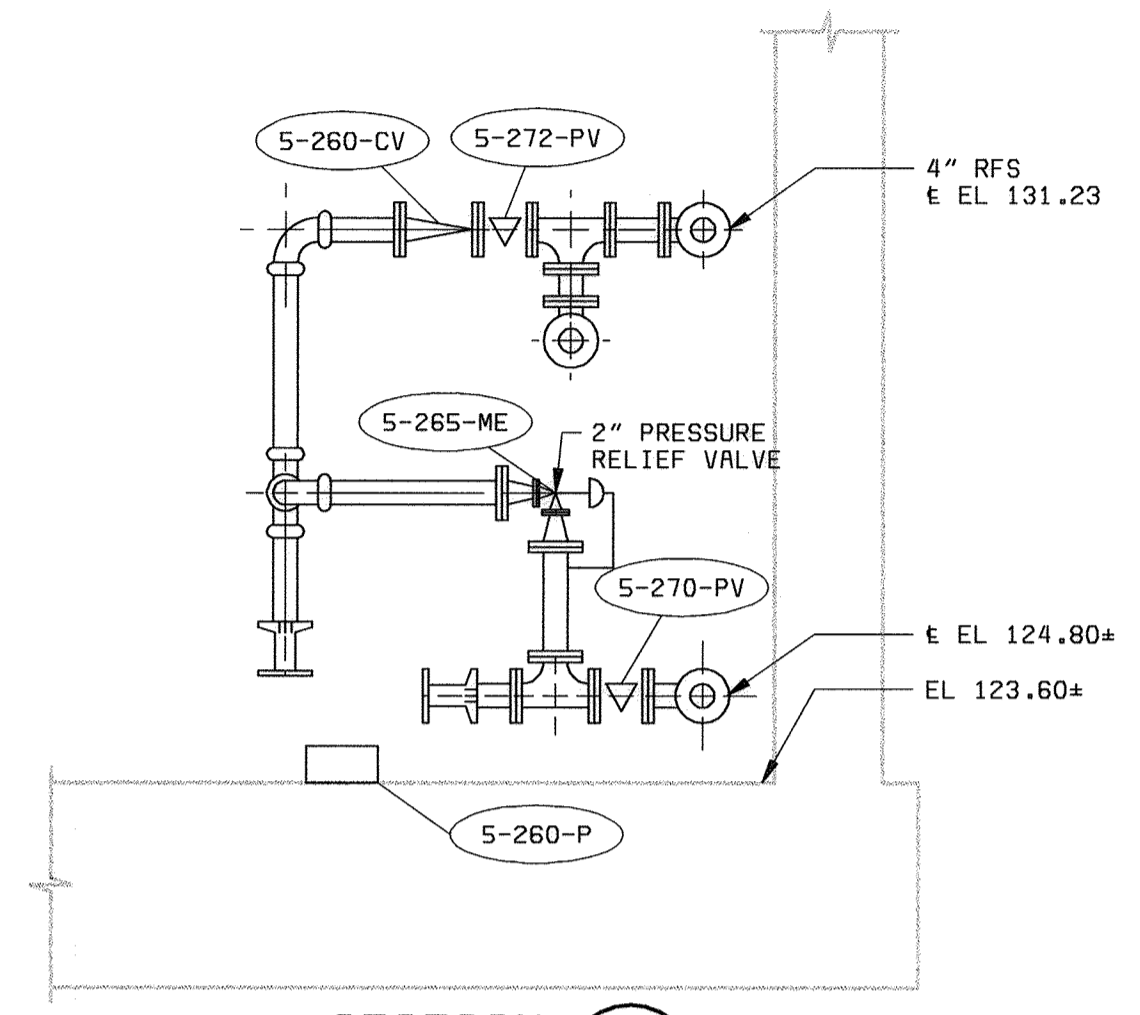
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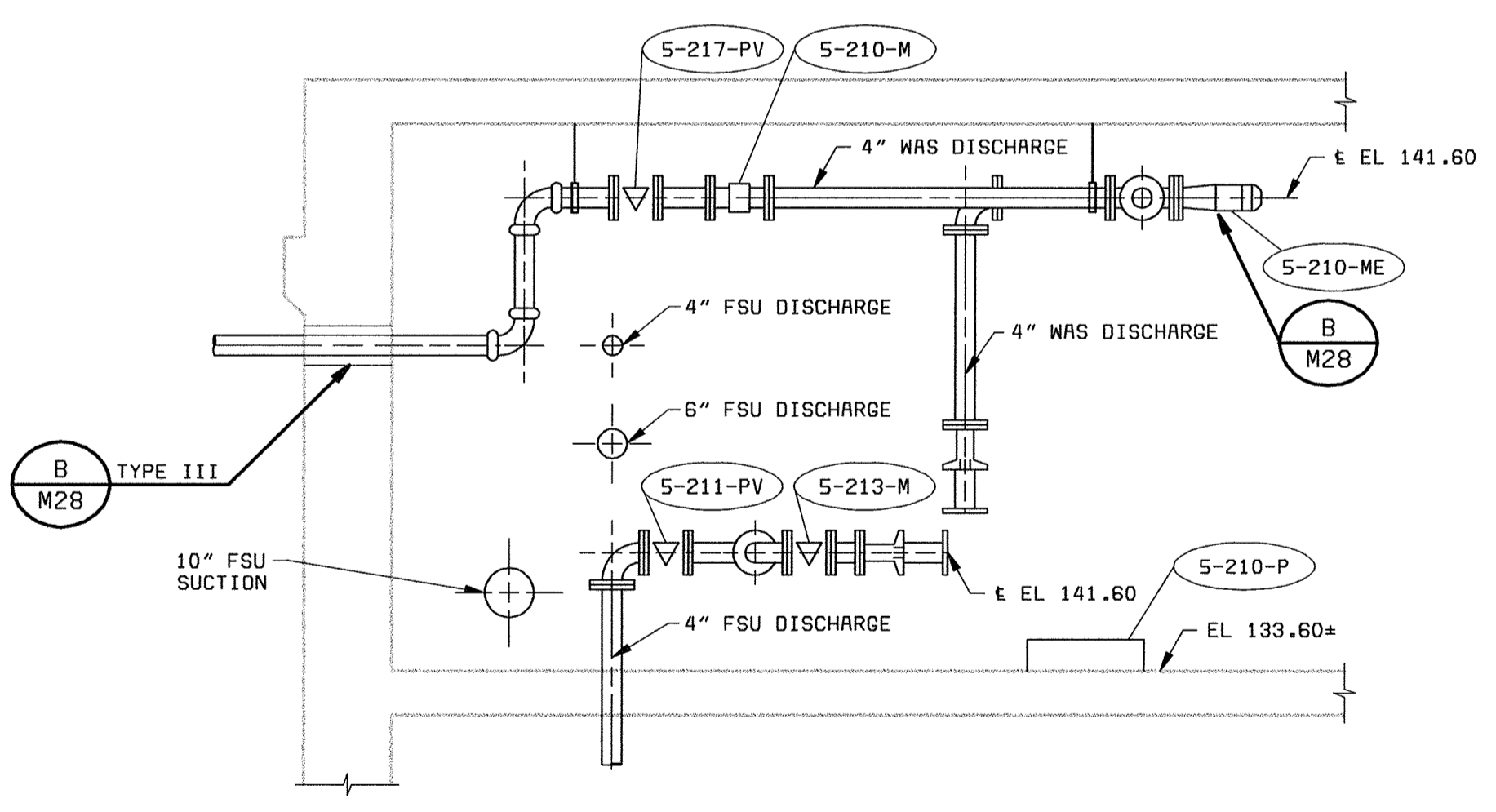
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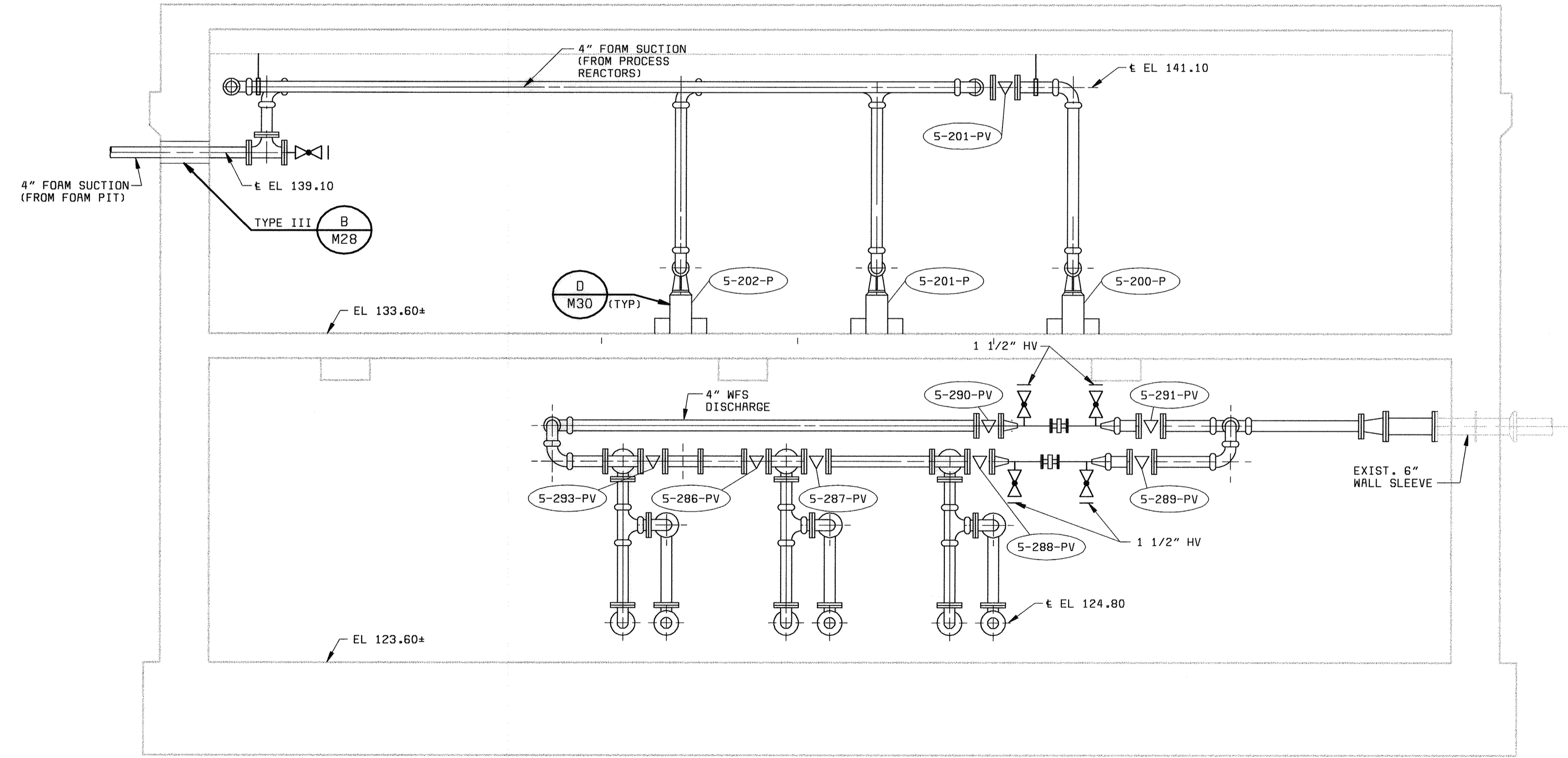
SECTION 1
3/8" = 1'-0" M20, M21



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



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



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

58472-101-RSPS-M-R0000205

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert J. Rectanus
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH LLP
Gaithersburg, Maryland

Robert J. Rectanus
REG. PROF. ENGR. DATE

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

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

**NORTH GALLERY
MECHANICAL**

SECTIONS

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

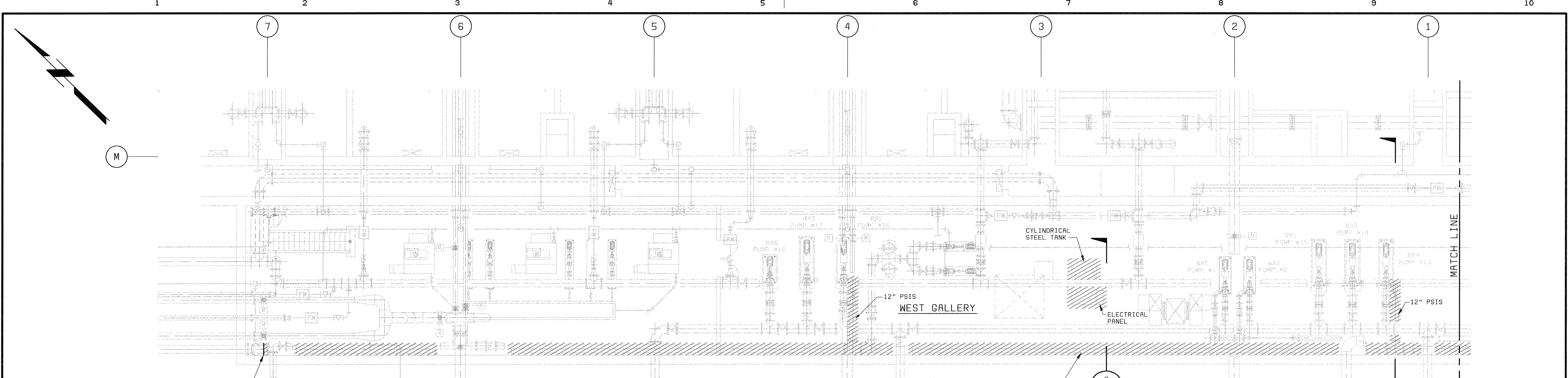
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

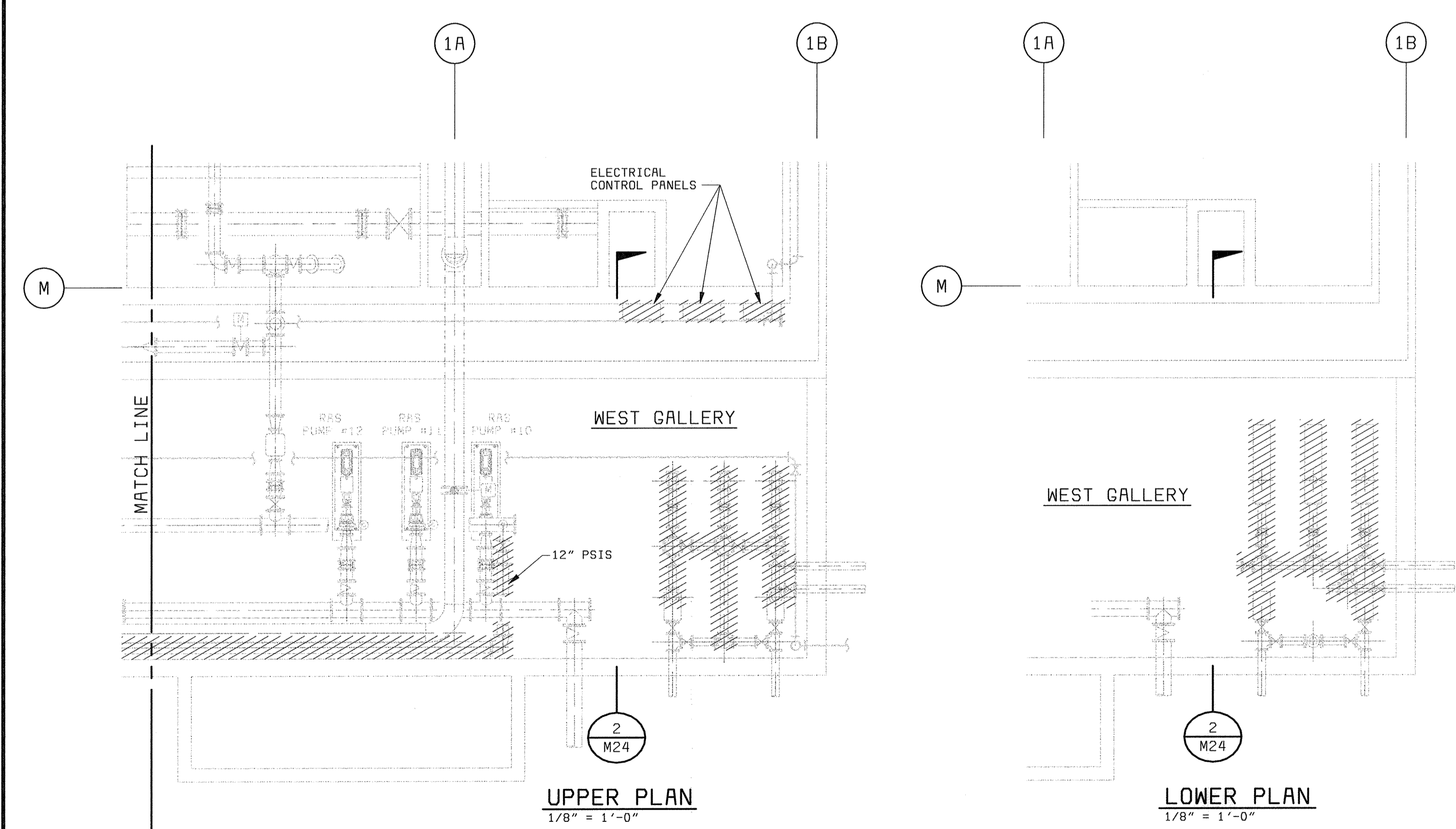
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SHEET 89 OF 161

M23

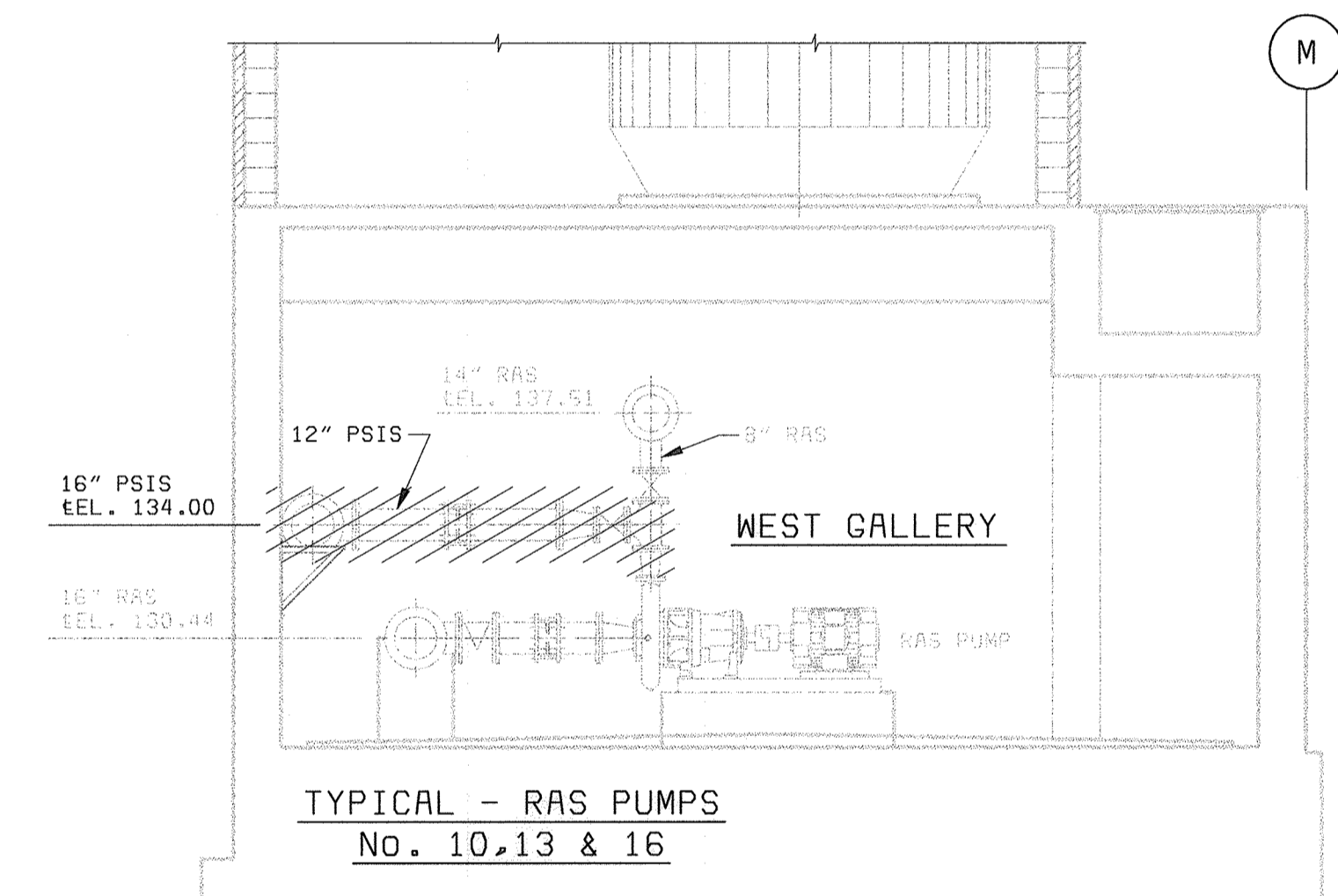


PLAN
1/8" = 1'-0"



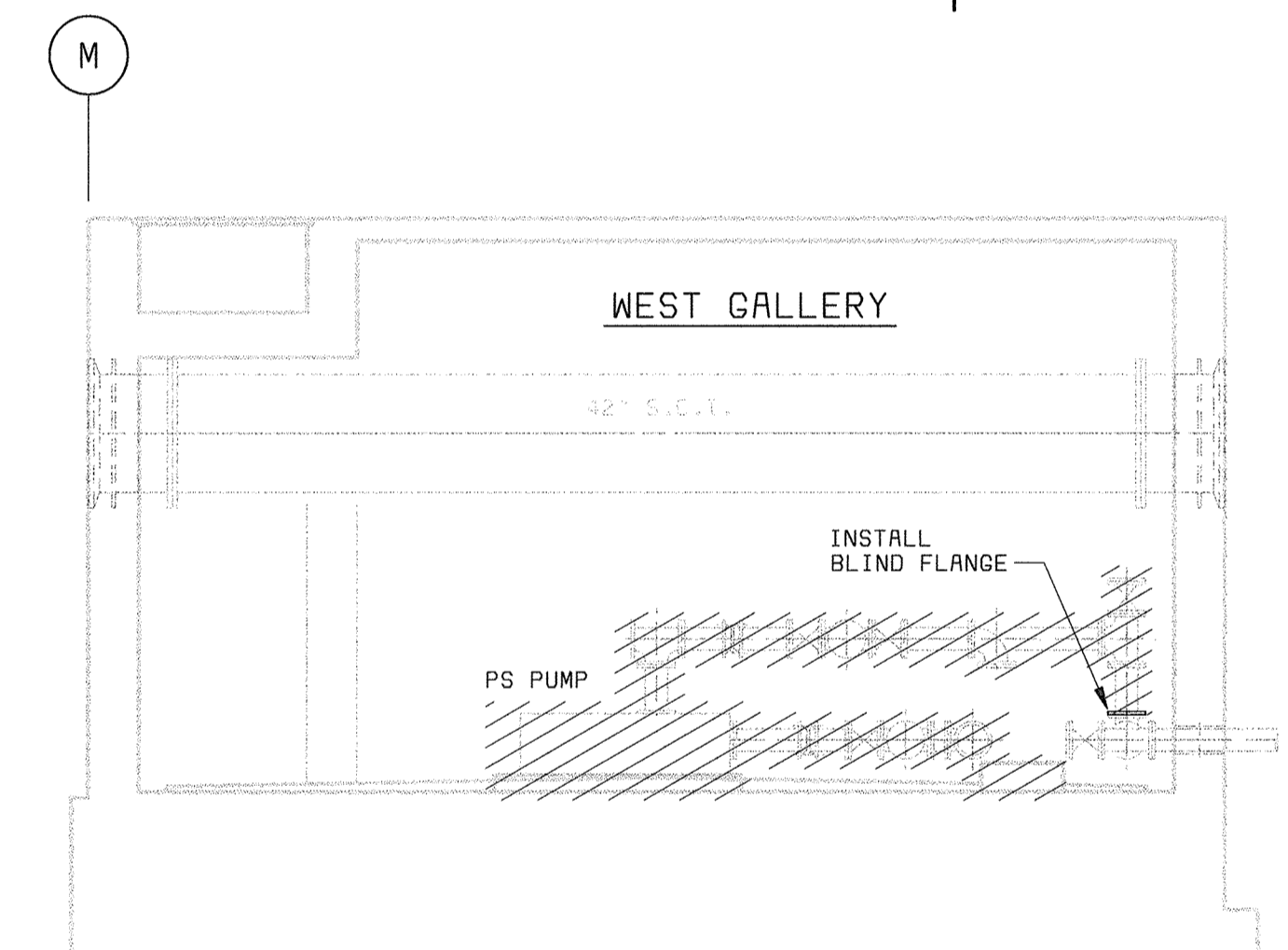
UPPER PLAN
1/8" = 1'-0"

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

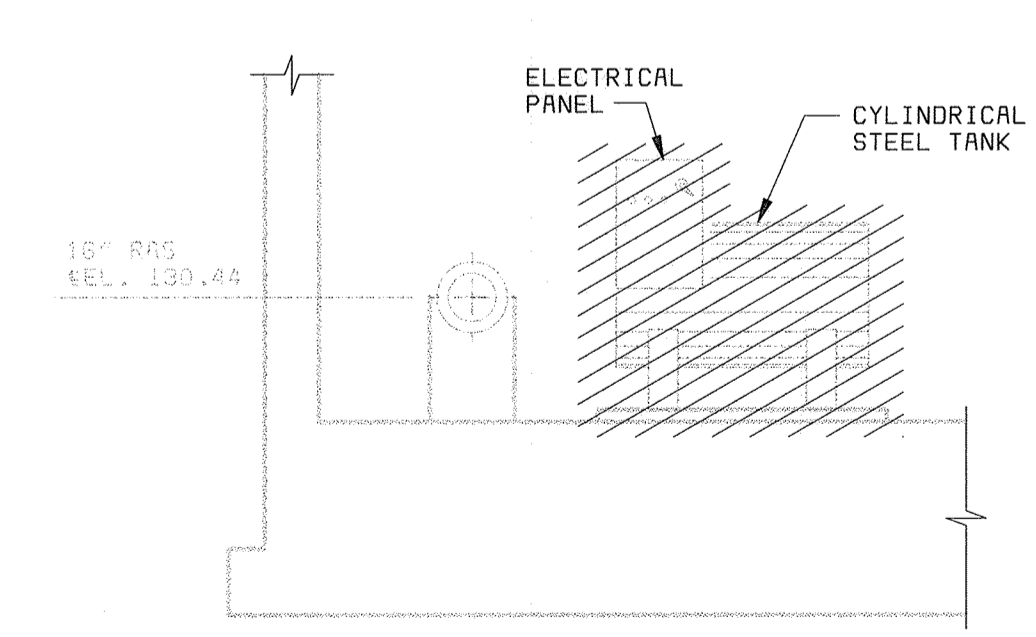


TYPICAL - RAS PUMPS
No. 10, 13 & 16

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

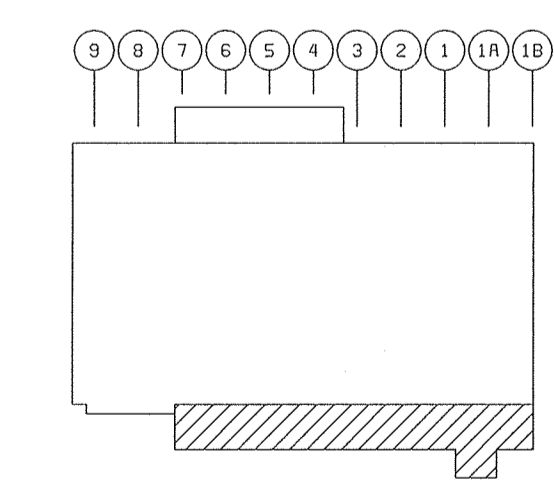


SECTION 2
3/16" = 1'-0" M24



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

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



KEY PLAN
NO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

Stantec

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BLACK & VEATCH
Gaithersburg, Maryland

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

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| DES: RVJ | | | | | | | | | |
| DRN: RCF | | | | | | | | | |
| CHK: RVJ | | | | | | | | | |
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WEST GALLERY MECHANICAL

PIPING DEMOLITION PLAN & SECTION

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

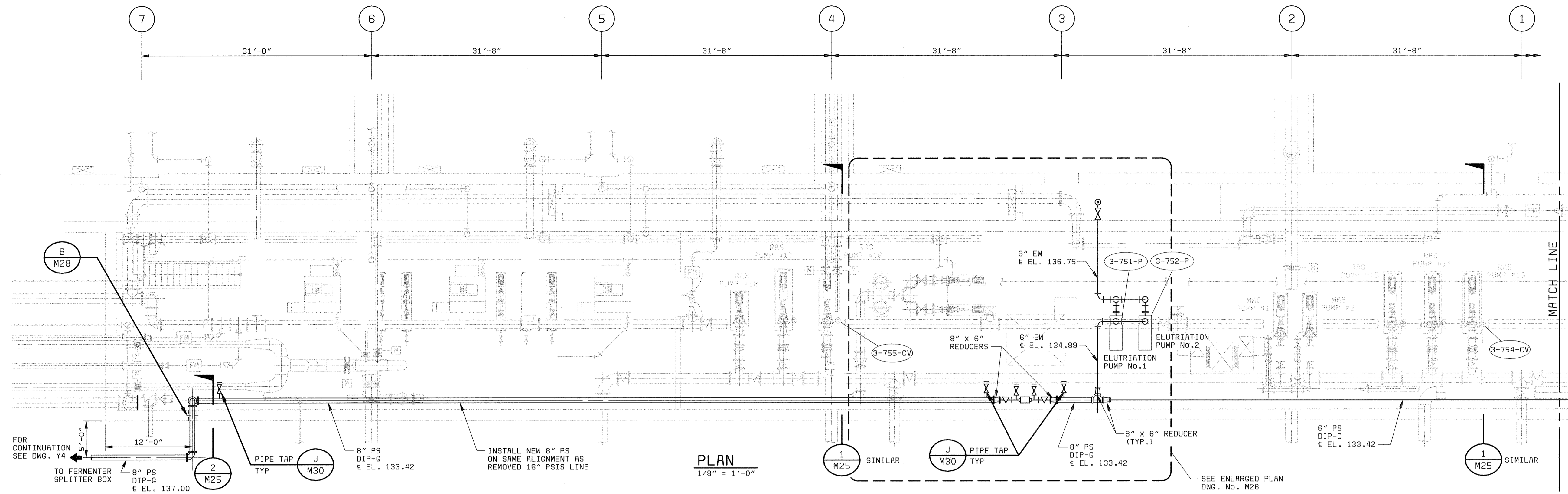
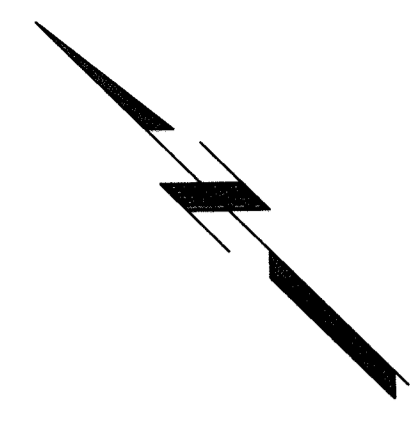
HOWARD COUNTY, MARYLAND

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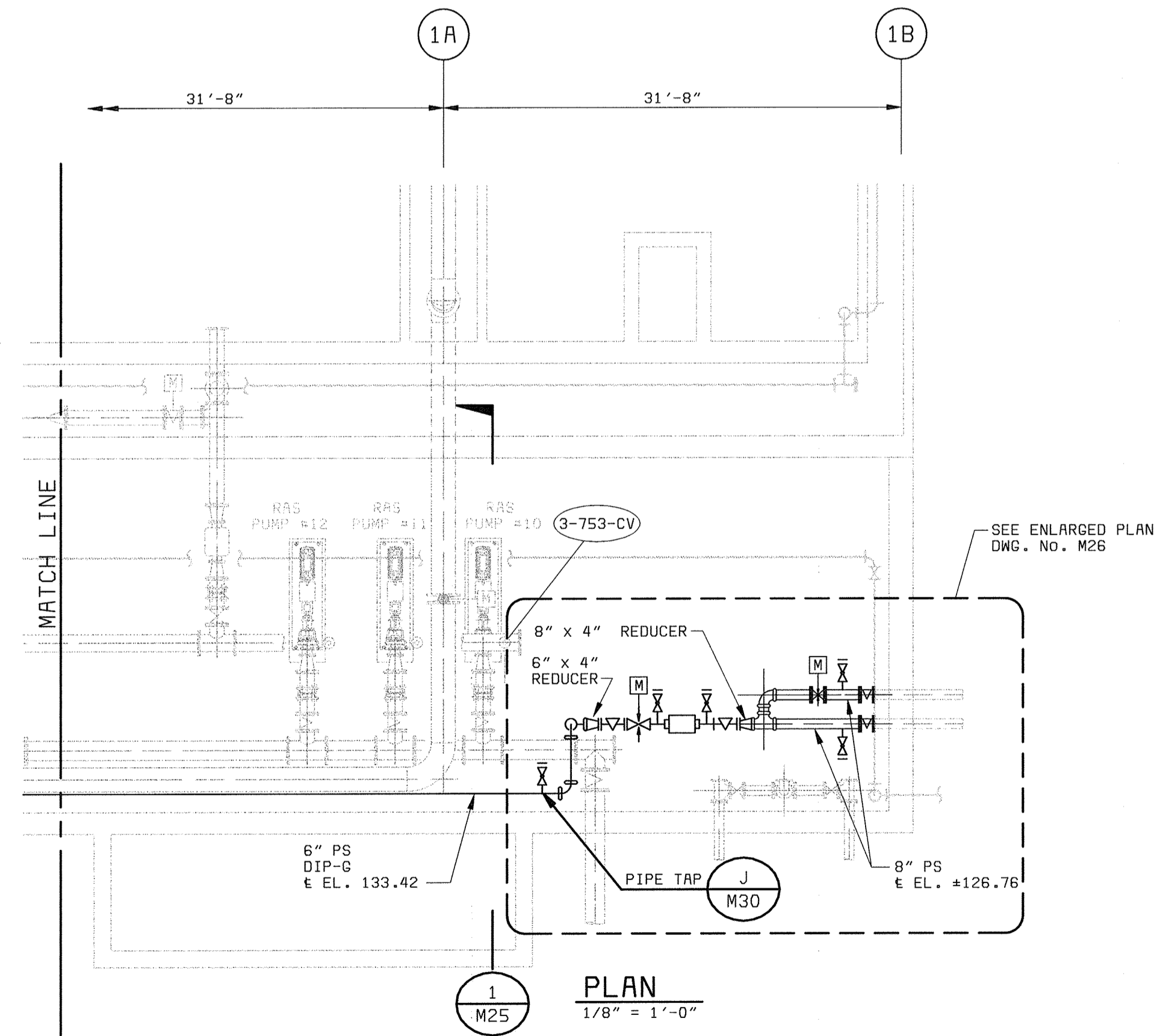
SHEET 90 OF 161

M24

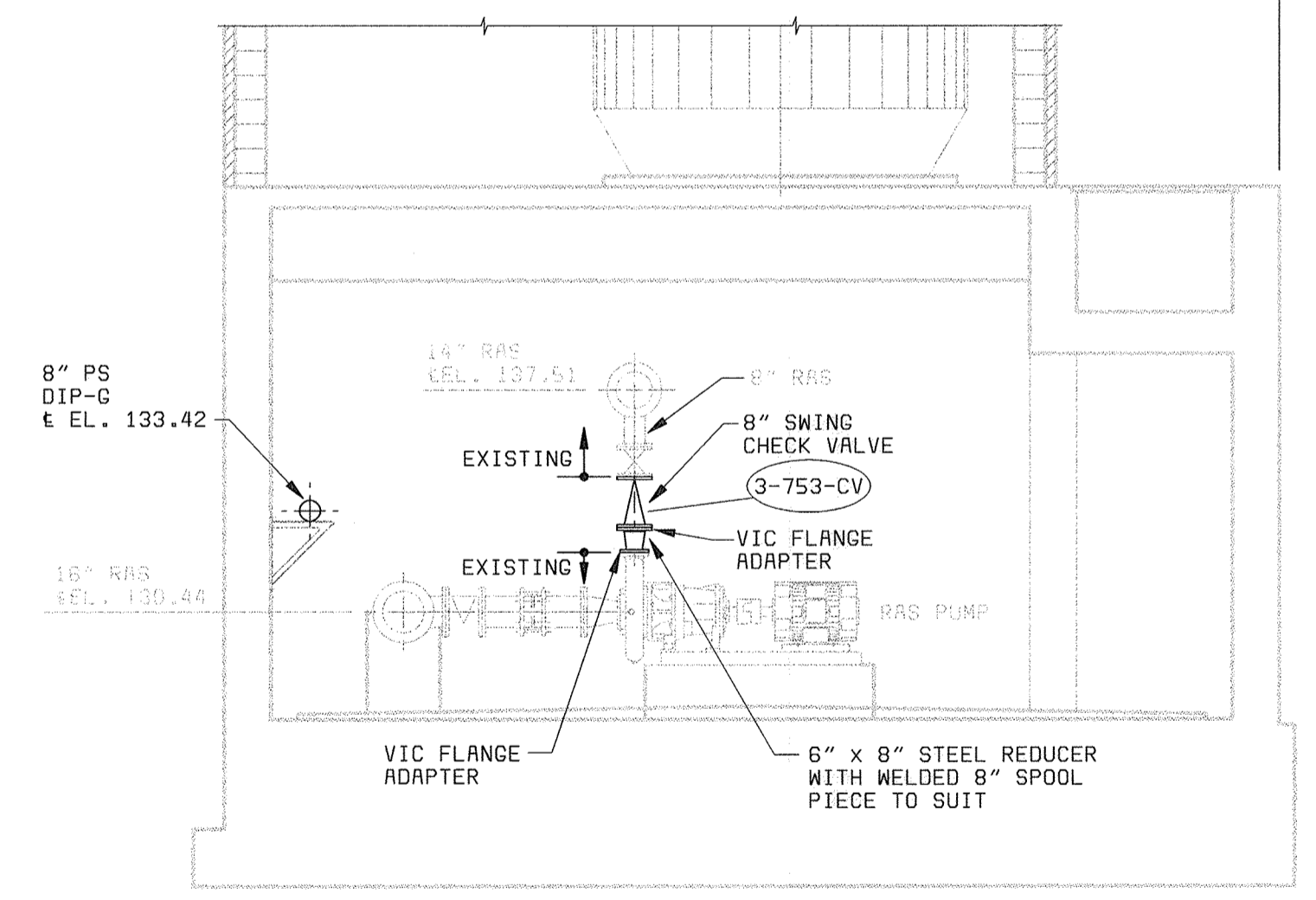
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PLAN
1/8" = 1'-0"

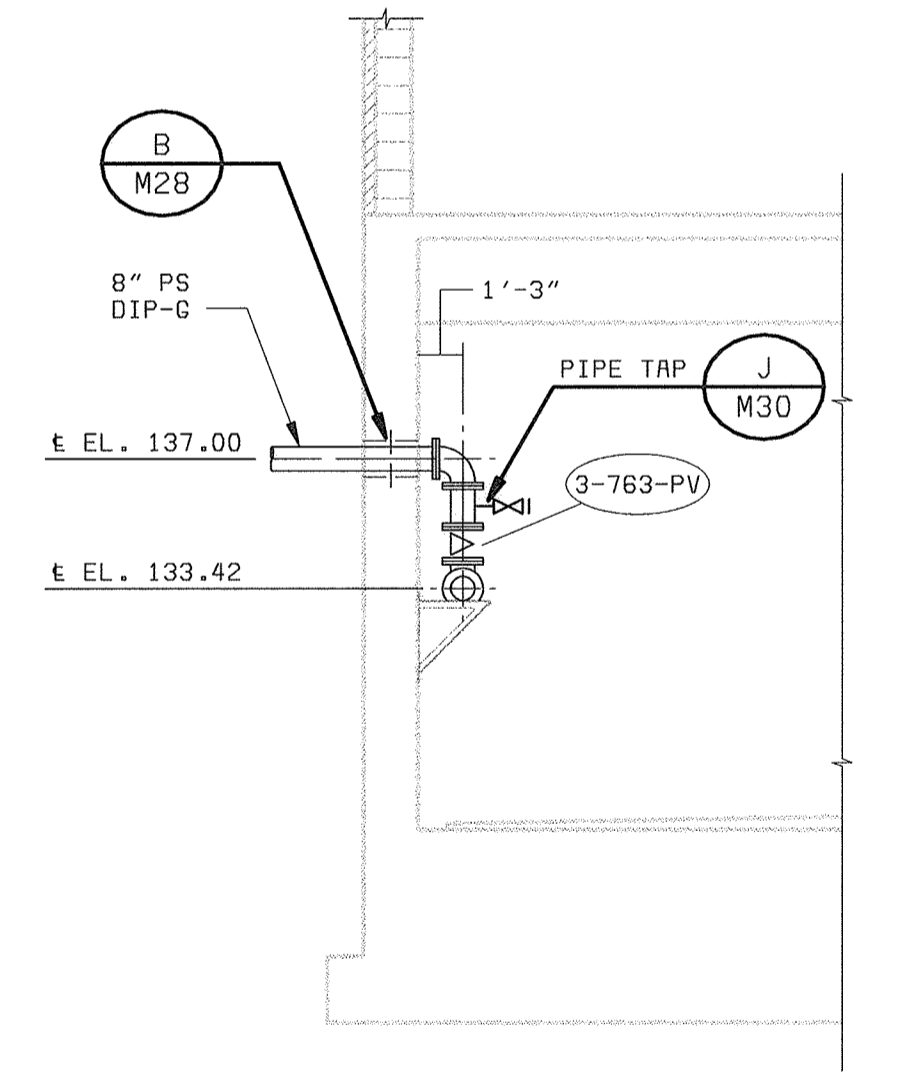


PLAN
1/8" = 1'-0"

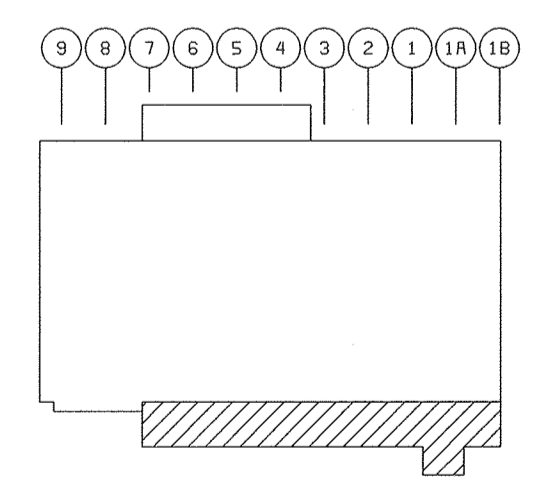


TYPICAL - RAS PUMPS
No. 10, 13 & 16

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



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



KEY PLAN
NO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

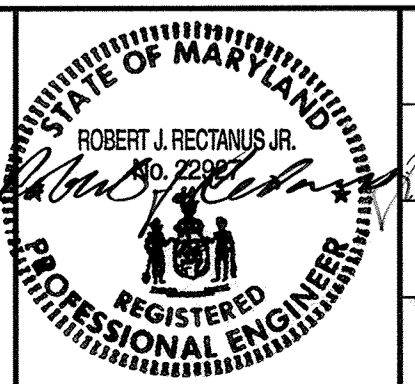
Robert Bauman 6-29-00
CHIEF, BUREAU OF UTILITIES DATE

Stantec

Stantec Consulting Ltd.
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Fax (604) 591-1856
Email: surrey@stantec.com

BLACK & VEATCH
Gaithersburg, Maryland

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



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| DES: RVJ | | | | | | | | | |
| DRN: RCF | | | | | | | | | |
| CHK: RVJ | | | | | | | | | |
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WEST GALLERY MECHANICAL

PLAN

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

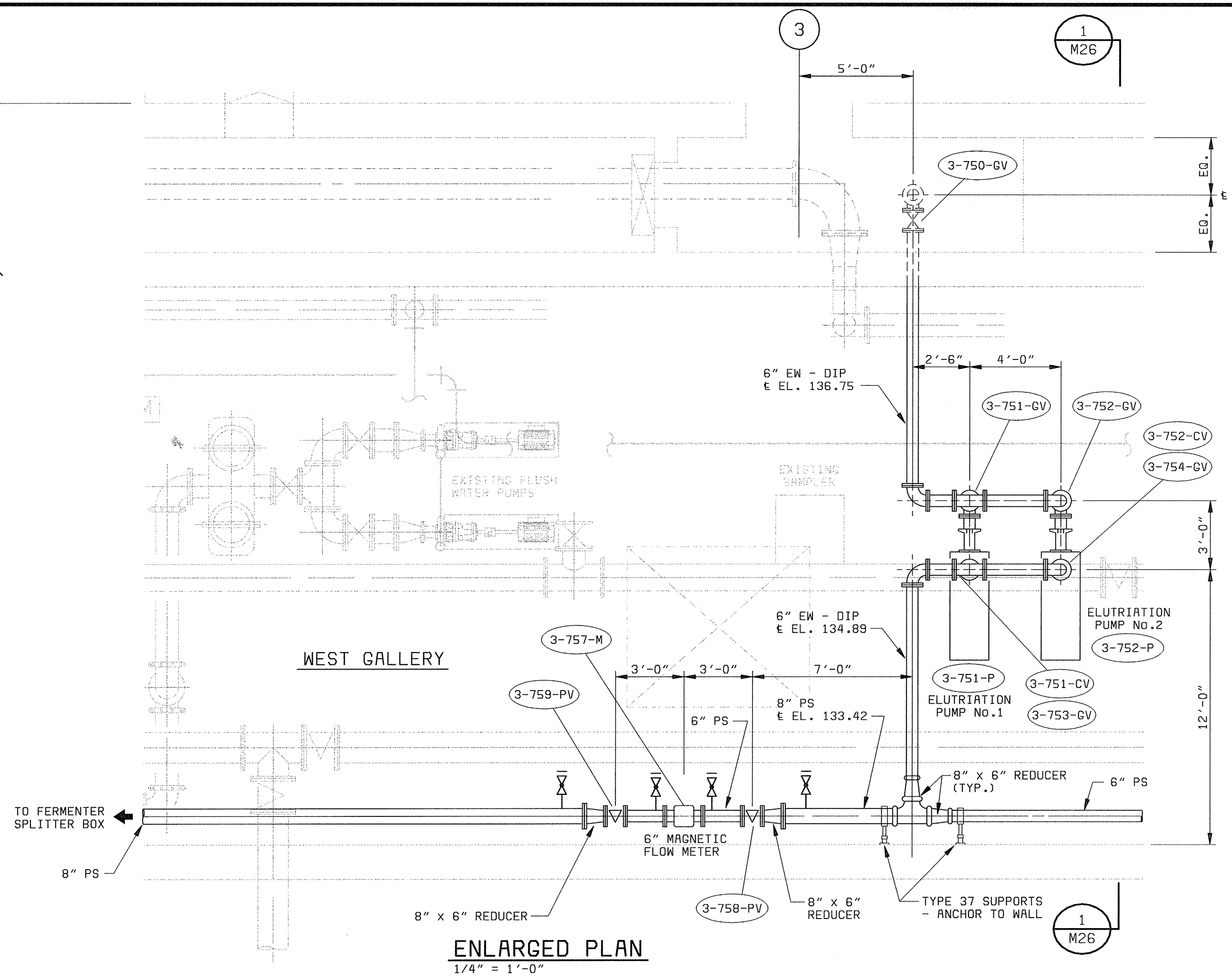
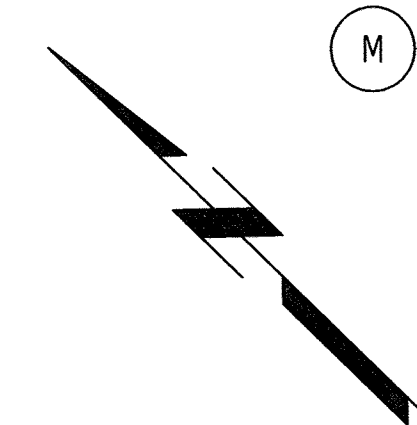
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

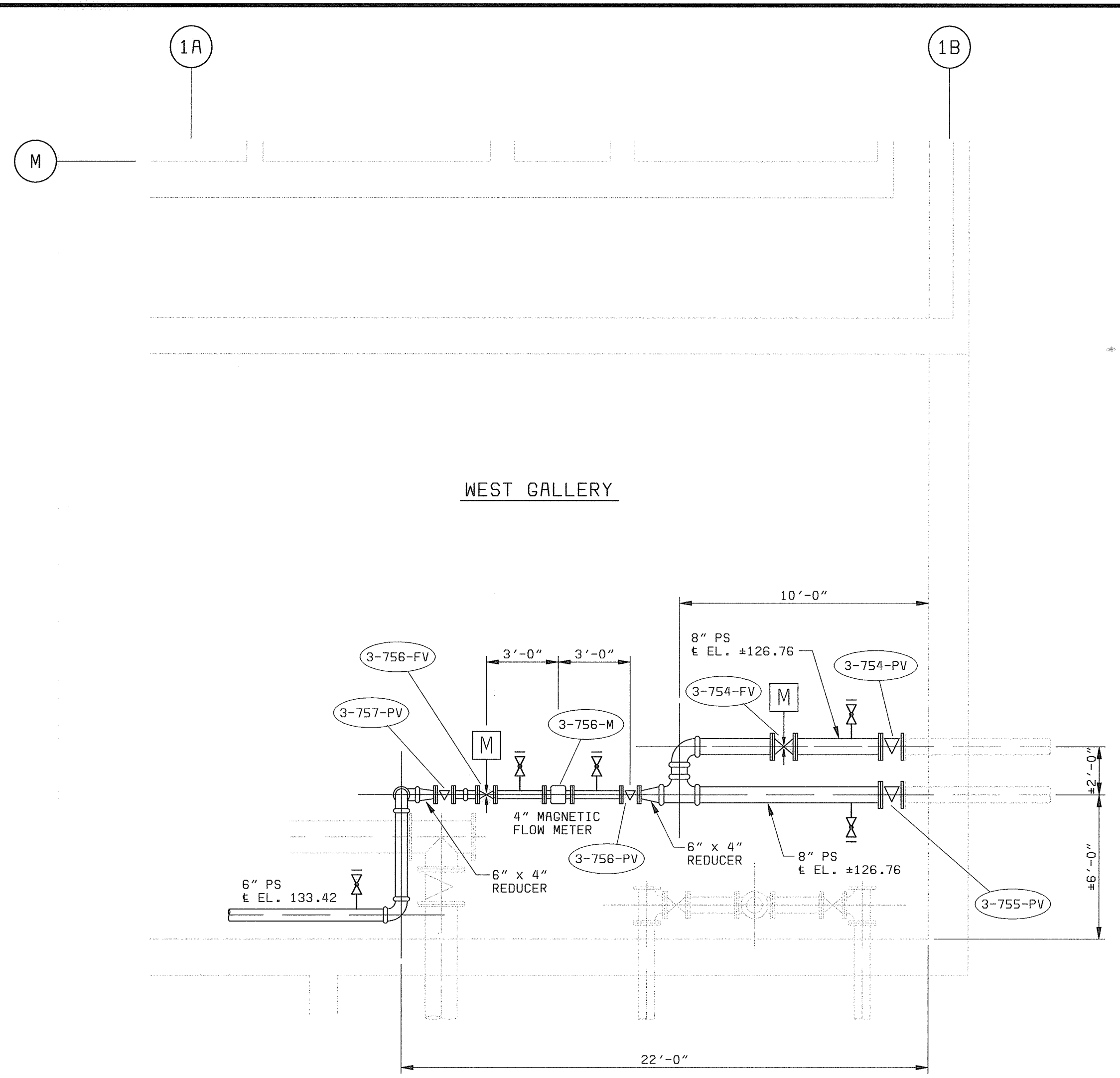
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SHEET 91 OF 161

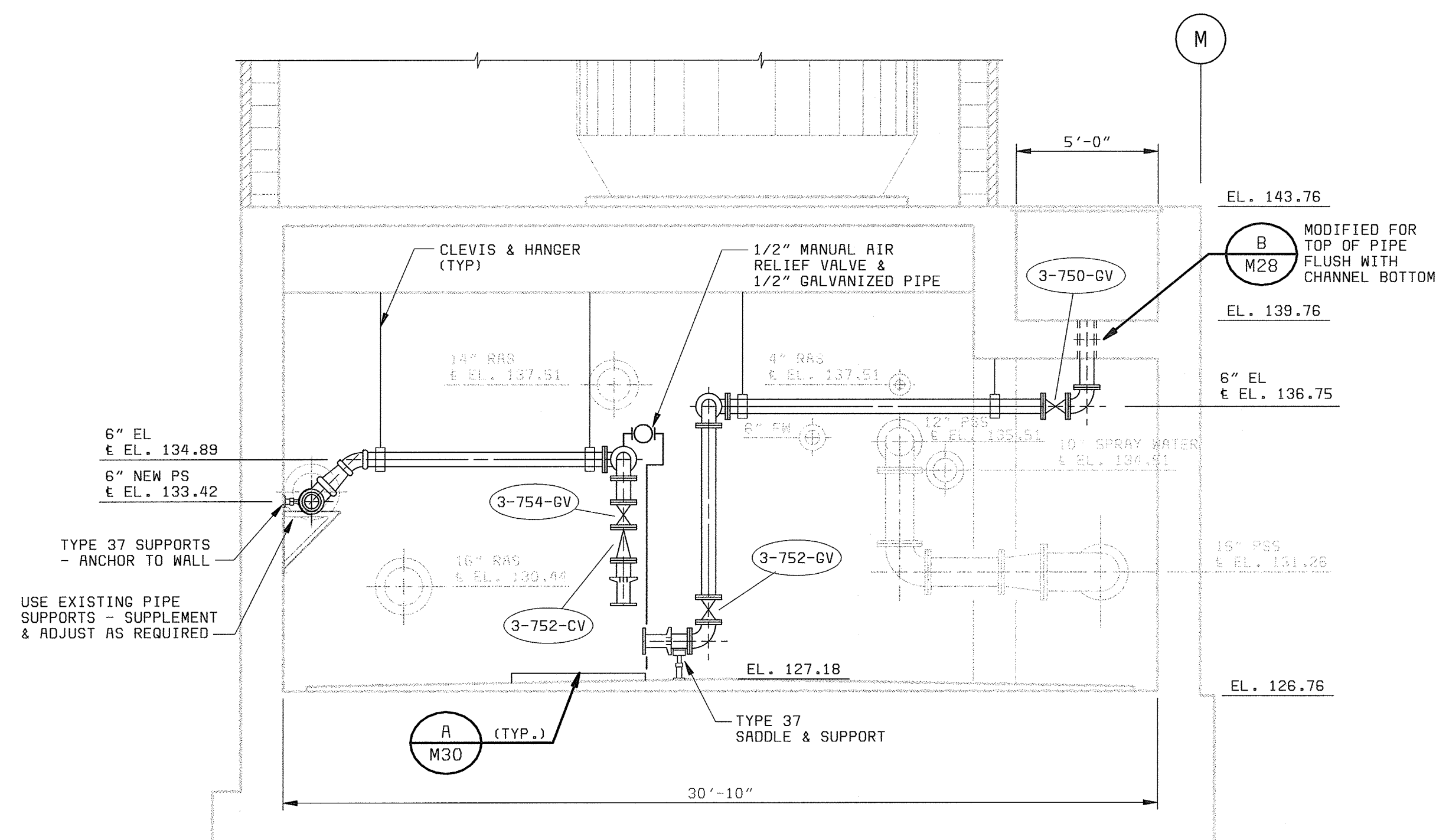
M25



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



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



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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

Stantec Consulting Ltd.
Suite 1007, 7445-132 St.
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Fax (604) 591-1856
Email: surrey@stantec.com

BLACK & VEATCH LLP
Gaithersburg, Maryland

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

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

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WEST GALLERY MECHANICAL

ENLARGED PLANS & SECTION

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

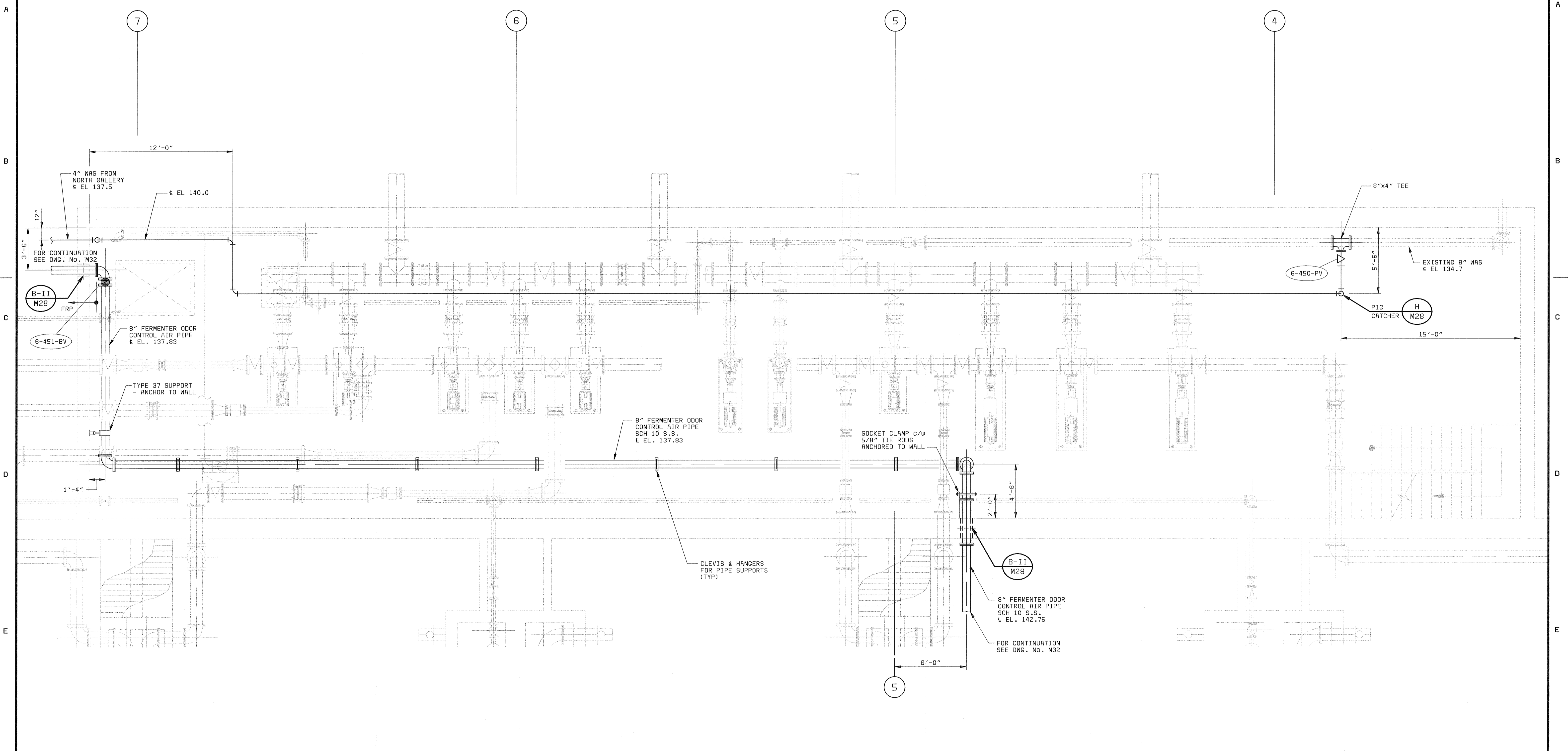
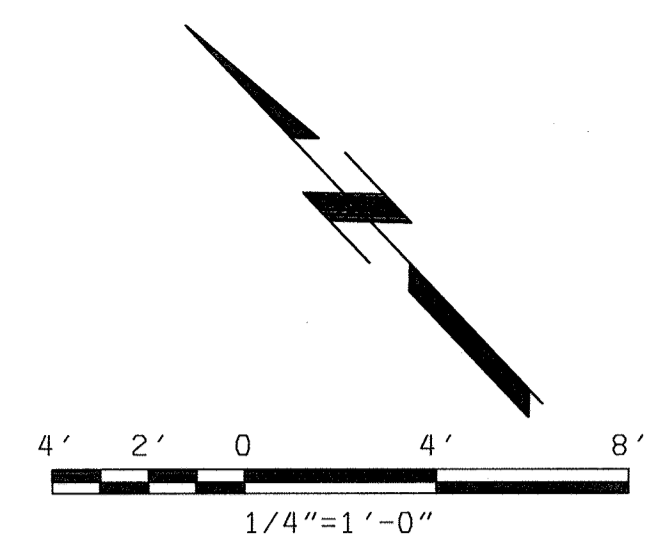
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 92 OF 161

M26


DES: RVJ
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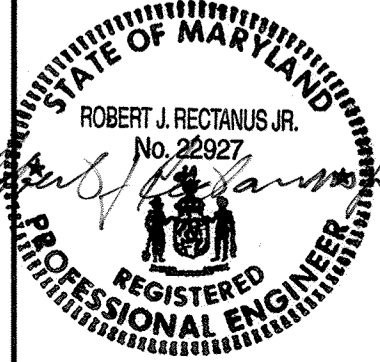
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

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

 **BLACK & VEATCH** LLP
Gaithersburg, Maryland

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



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

**EAST GALLERY
MECHANICAL**

PLAN

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

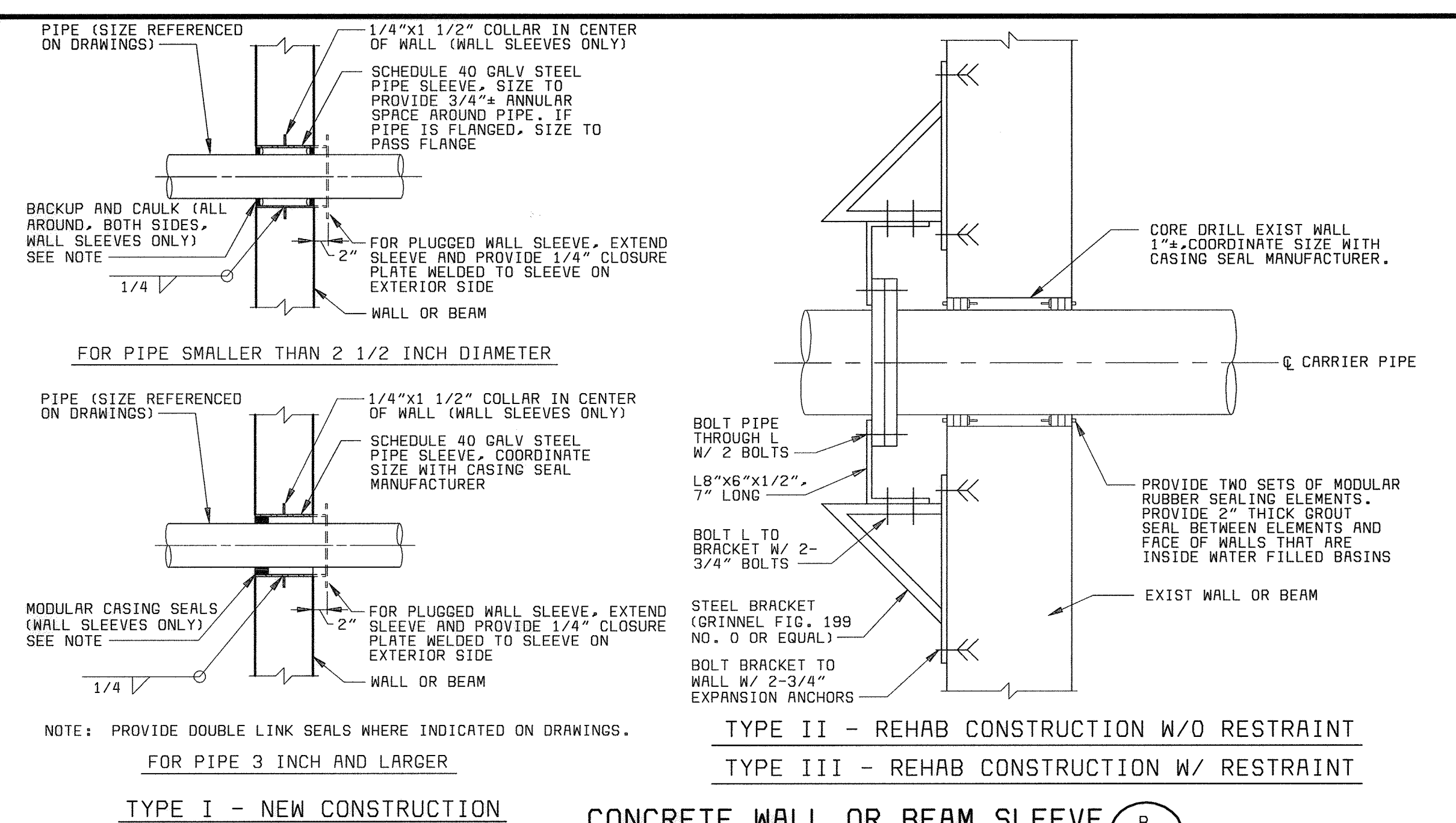
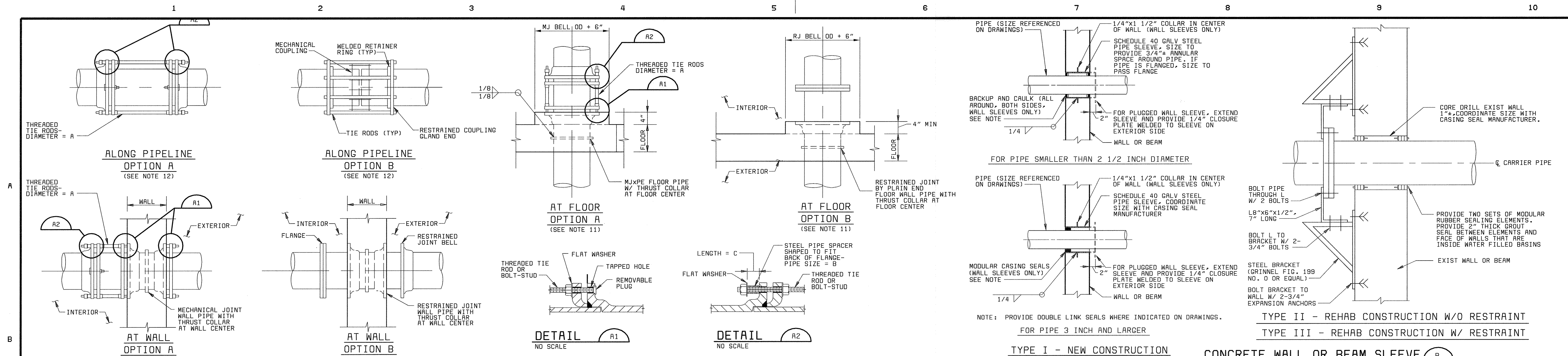
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
93 OF 161

M27



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

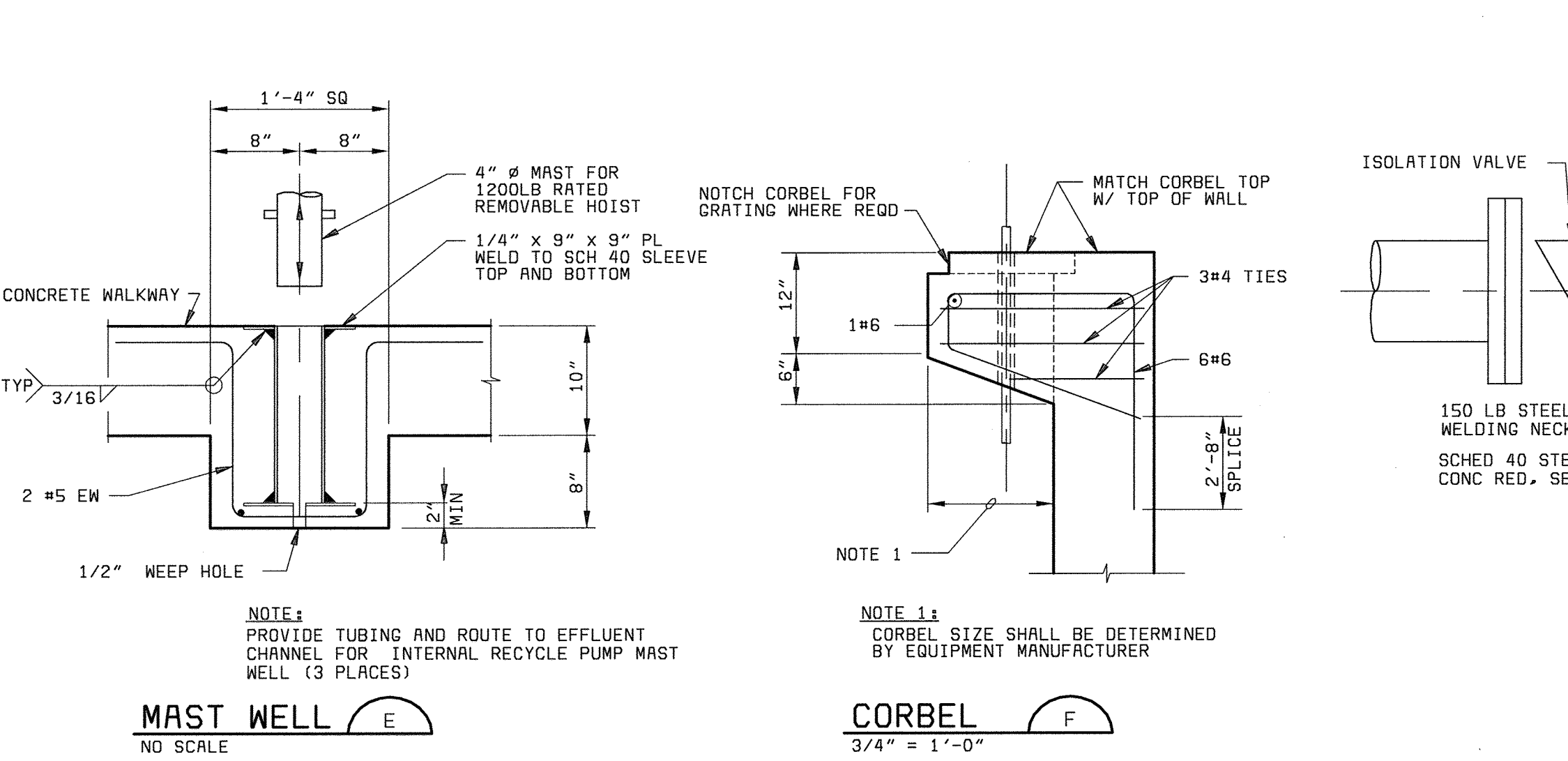
- NOTES:**
- EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON ALL WALL PIPES AND TEE HEAD BOLTS IN OTHER LOCATIONS.
 - WALL PIPE FITTINGS SHALL BE DUCTILE IRON AND SHALL HAVE A PRESSURE RATING NOT LESS THAN 250 PSI.
 - TIE RODS SHALL BE INSTALLED IN PAIRS, DIAMETRICALLY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

WALL SLEEVE TABLE

| PIPE SIZE | SLEEVE SIZE (UNLESS OTHERWISE INDICATED) |
|-----------------|--|
| 1" & SMALLER | 3" (1) |
| 1 1/4" & 1 1/2" | 3 1/2" (1) |
| 2" | 4" (1) |
| 3" | 6" (2) (4) |
| 4" | 6" (2) (4) |
| 6" | 8" (3) (4) |
| 8" & LARGER | PIPE OD+2" (3) (4) |

- (1) SCHEDULE 40 GALV STEEL PIPE
(2) SCHEDULE 20 GALV STEEL PIPE, MINIMUM CLASS 75-TB
(3) 1/4" MINIMUM WALL THICKNESS
(4) IF PIPE IS FLANGED, USE SLEEVE LARGE ENOUGH FOR FLANGE TO PASS THROUGH

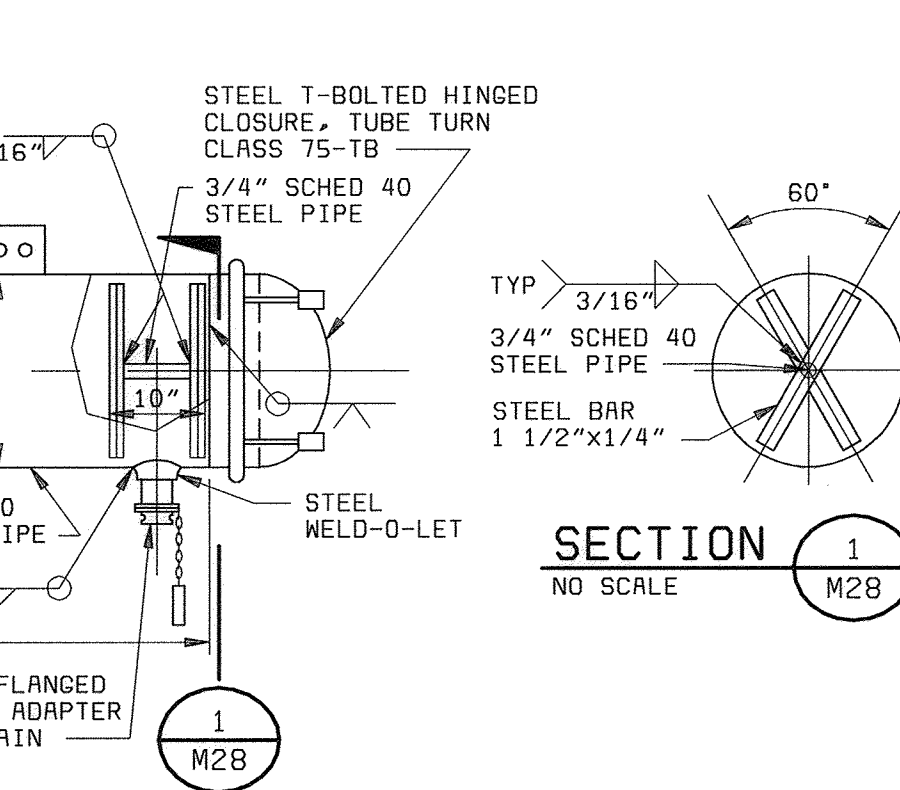
DIP MECHANICAL JOINTS WITH TIE RODS
NO SCALE



MASONRY WALL SLEEVE
NO SCALE



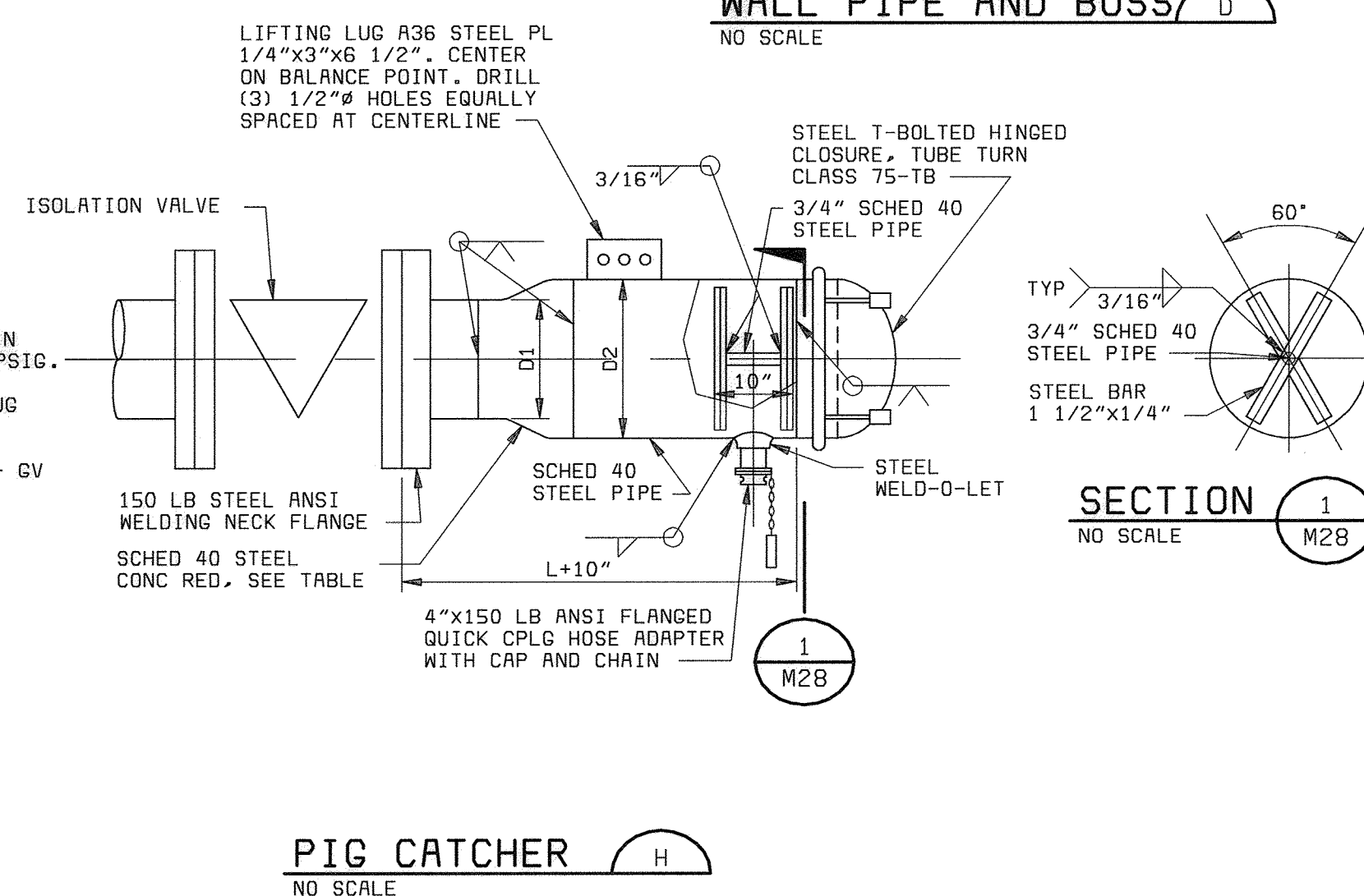
WALL PIPE AND BOSS
NO SCALE



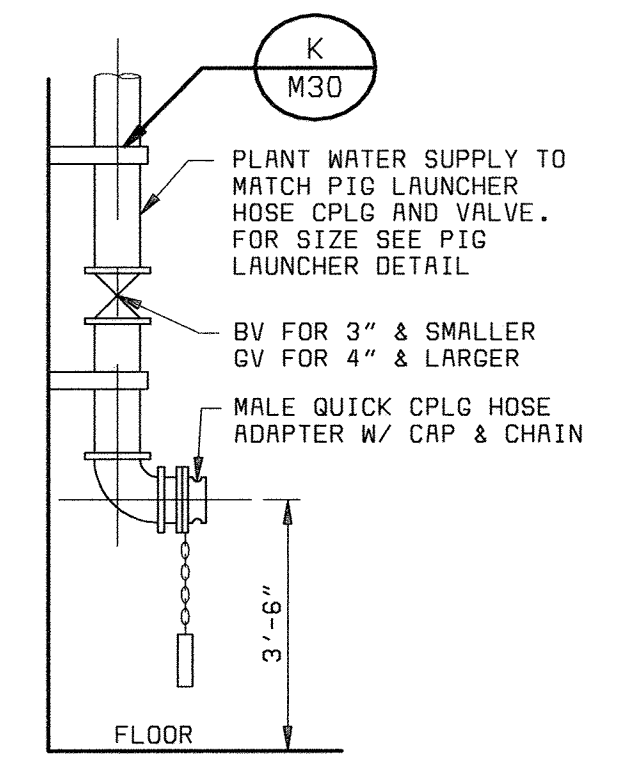
- NOTES:**
- TEST EACH COMPLETED UNIT @ MIN HYDROSTATIC PRESSURE OF 125 PSIG.
 - ISOLATION VALVES SHALL BE PLUG VALVES
 - OTHER VALVES: <3" - BV, >4" - GV

| D1 | D2 | REDUCER SIZE | L | HOSE COUPLING AND VALVE |
|----|-----|--------------|-----|-------------------------|
| 4" | 6" | 6"x4" | 14" | 2" SCD |
| 6" | 8" | 8"x6" | 20" | 3" FLGD |
| 8" | 10" | 10"x8" | 24" | 4" FLGD |

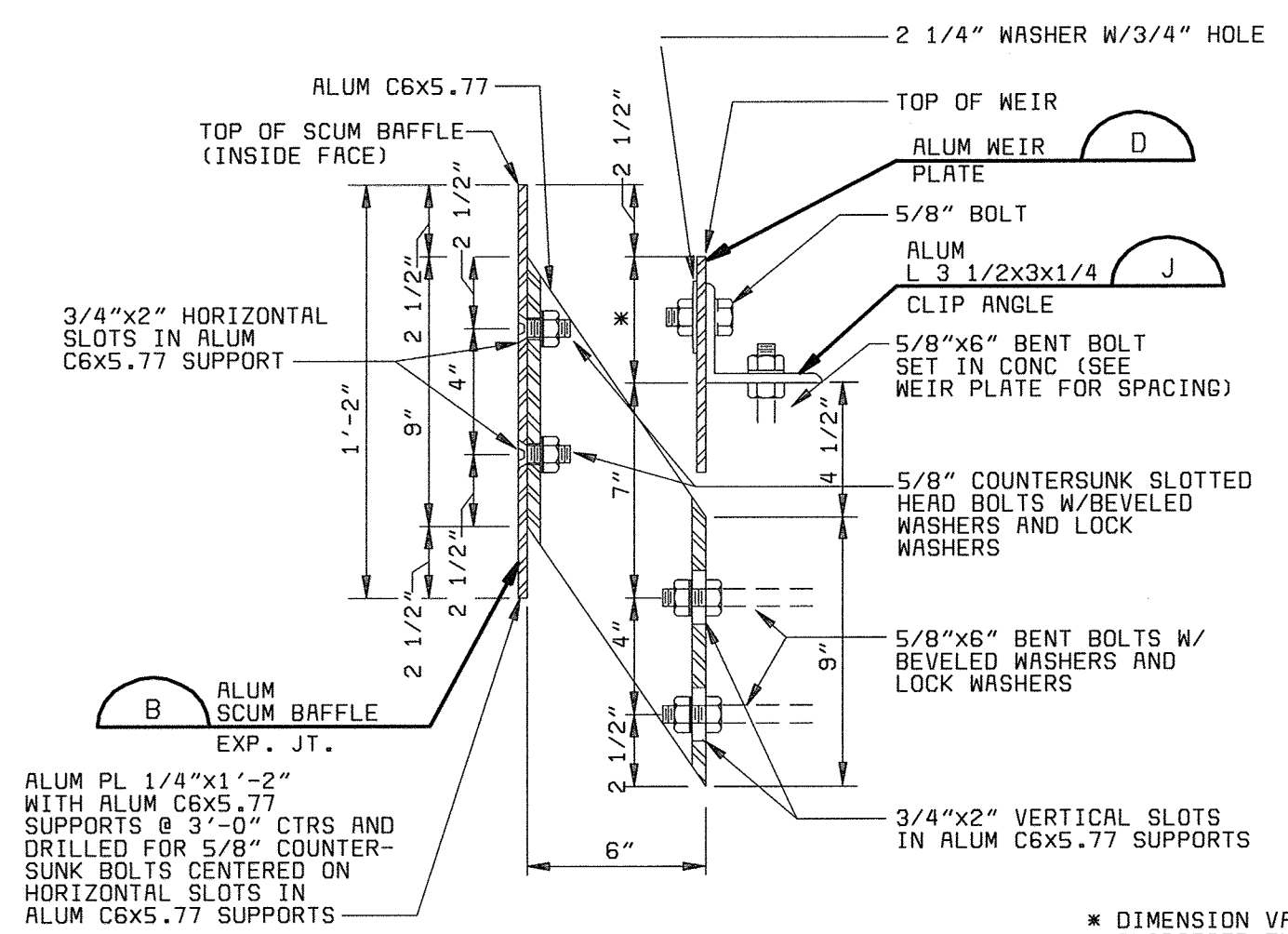
PIG CATCHER
NO SCALE



PIG LAUNCHER WATER SUPPLY
NO SCALE

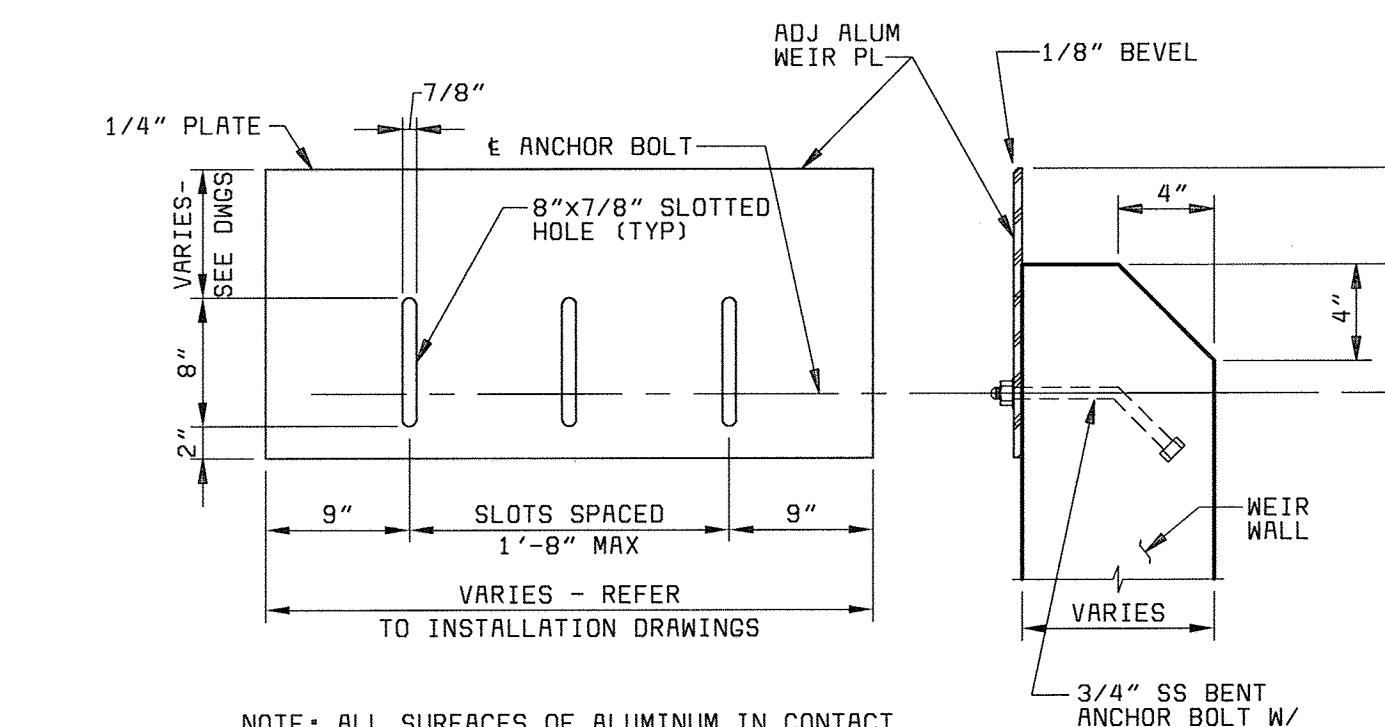


| | | | | | | | | | | | | |
|---|--|--------------------------------------|---------------|----------|---------------|--|--|--|--|---|---|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert J. Rectanus, Jr. CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LLP Gaithersburg, Maryland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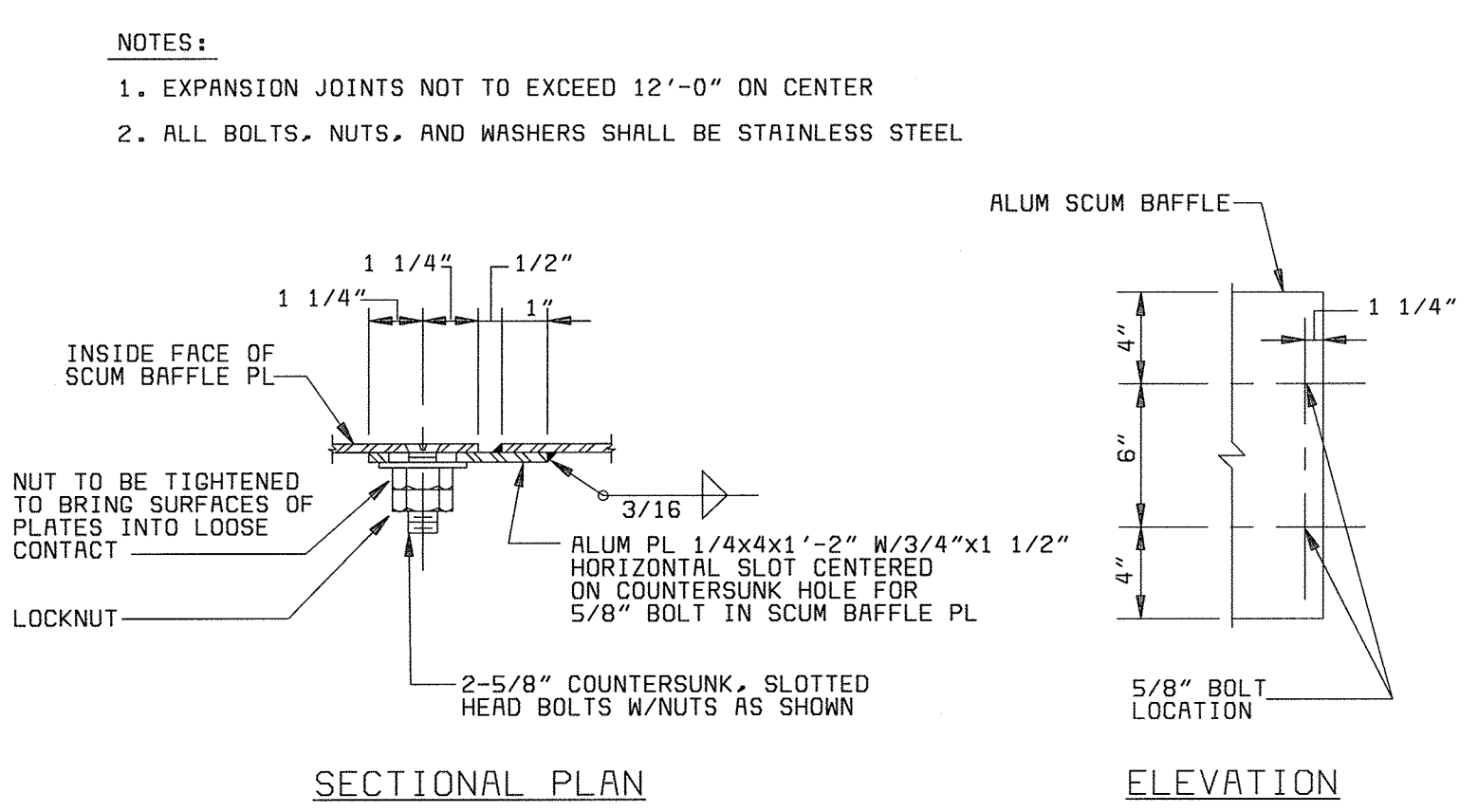


- NOTES:
1. SURFACE OF CONCRETE AND ADJACENT SIDE OF WEIR PLATE TO BE COATED WITH A HEAVY LAYER OF SEALANT PRIOR TO PLACING WEIR PLATE.
 2. ALL BOLTS, NUTS, AND WASHERS TO BE STAINLESS STEEL.
 3. 5/8" EPOXY GROUTED THREADED ROD MAY BE USED IN LIEU OF ANCHOR BOLTS AT CONTRACTORS OPTION.
 4. ALL SURFACES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

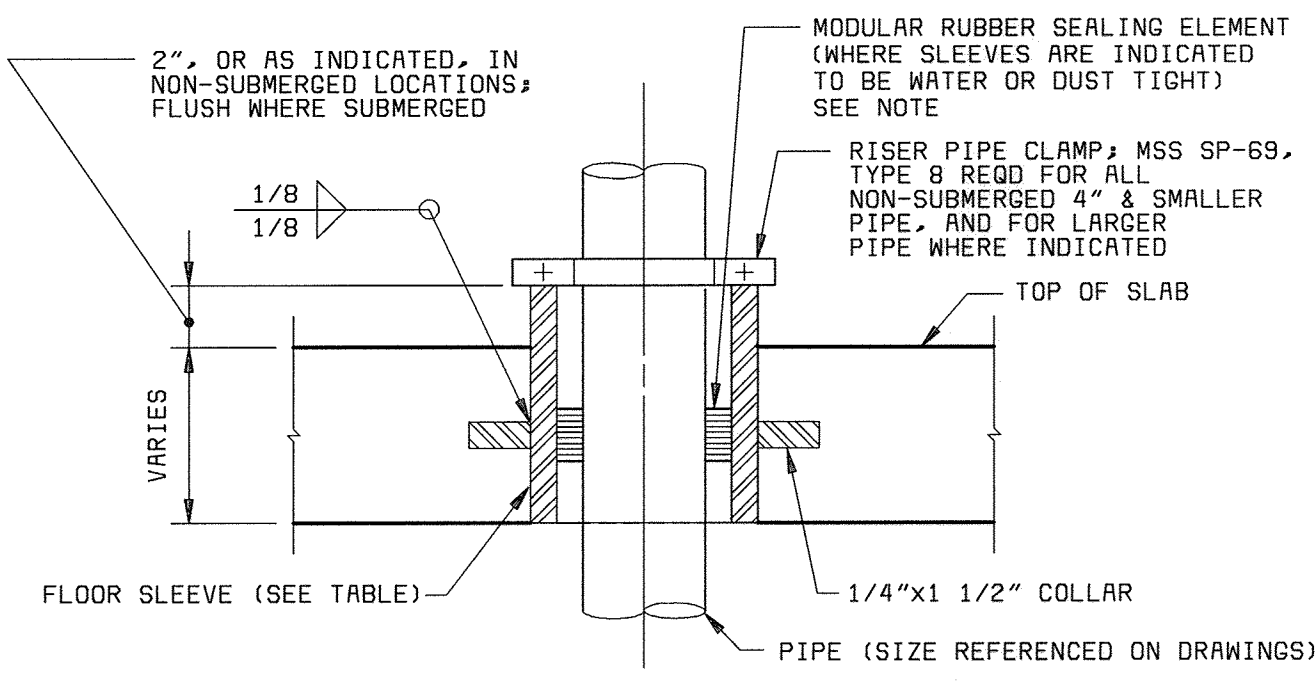
SCUM BAFFLE & WEIR SUPPORT (A)
NO SCALE



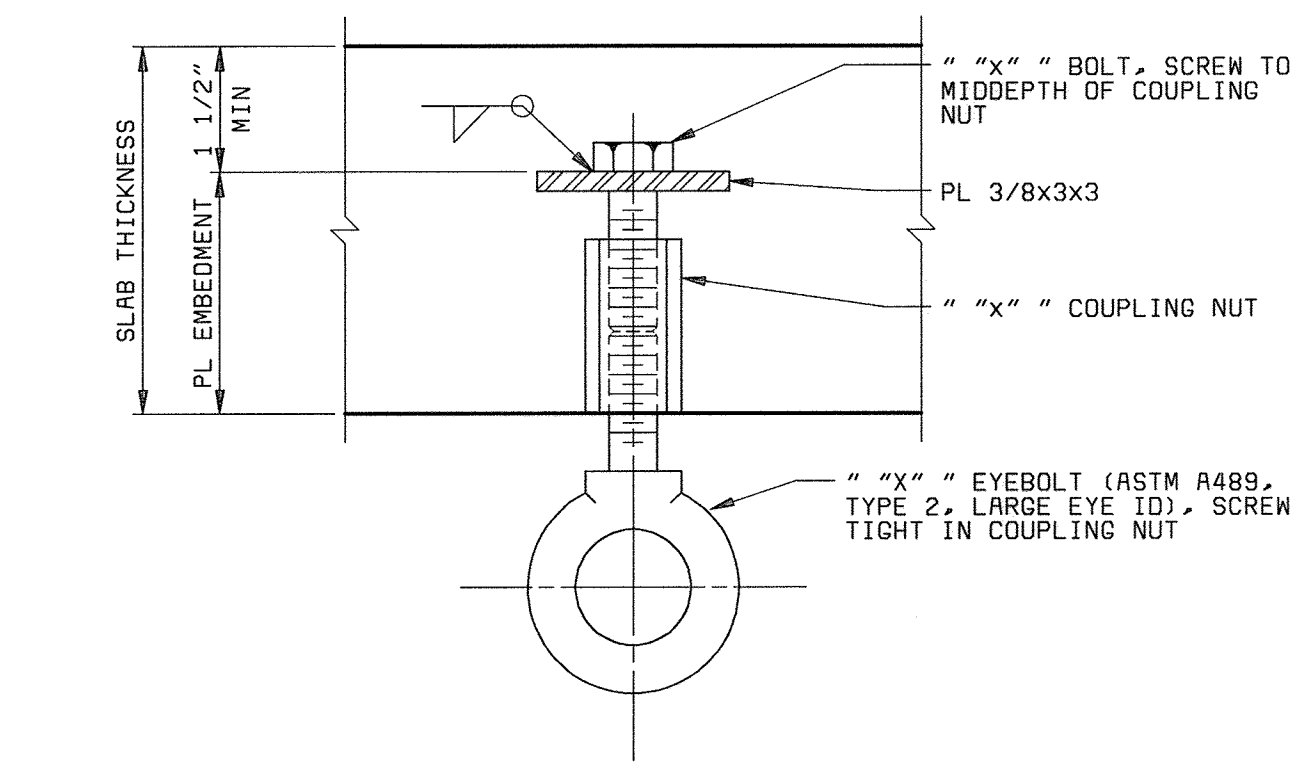
WEIR CLIP ANGLE (J)
NO SCALE



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

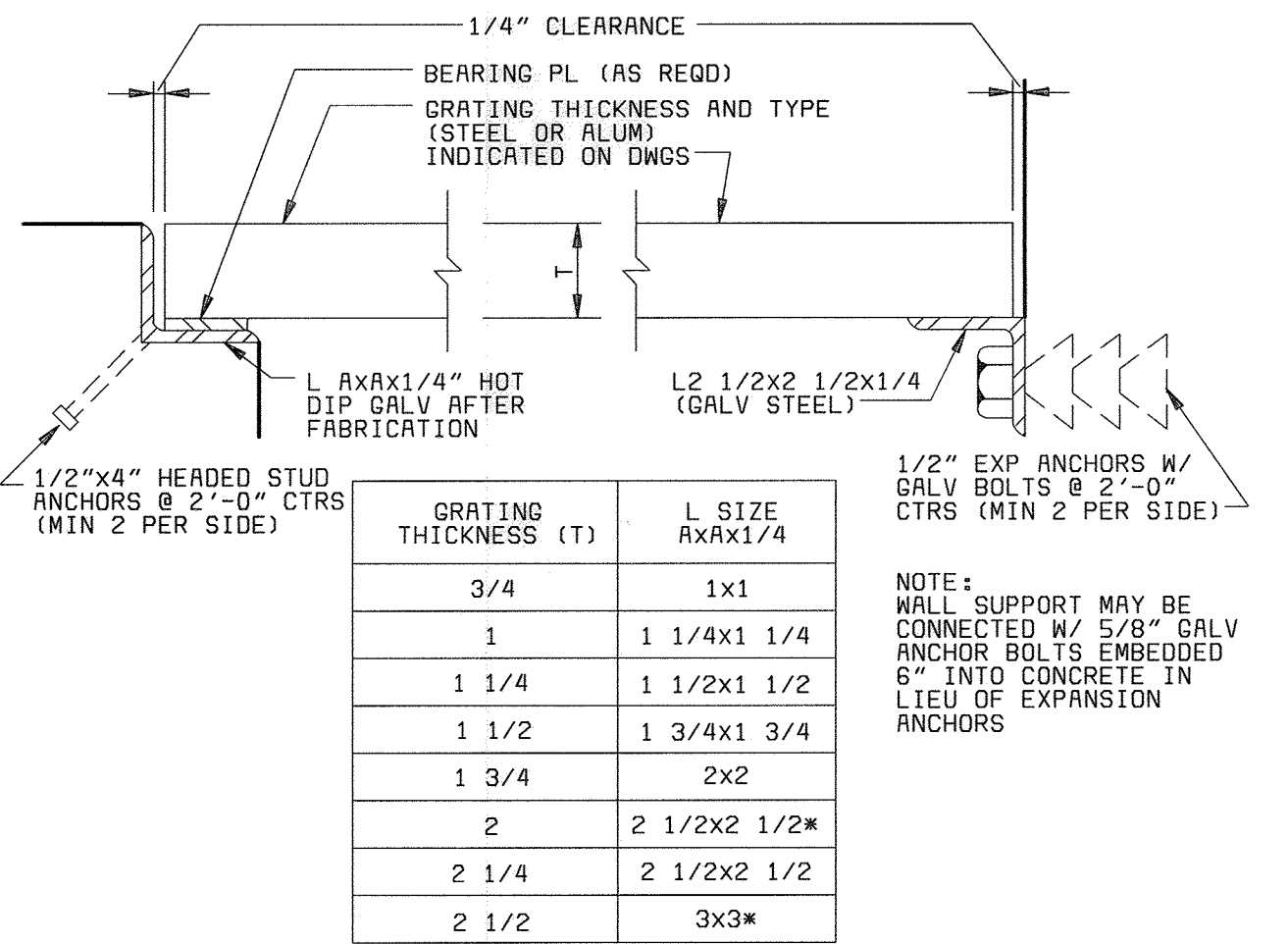


FLOOR SLEEVE NEW CONSTRUCTION (F)
NO SCALE



TYPICAL EYEBOLT (K)
NO SCALE

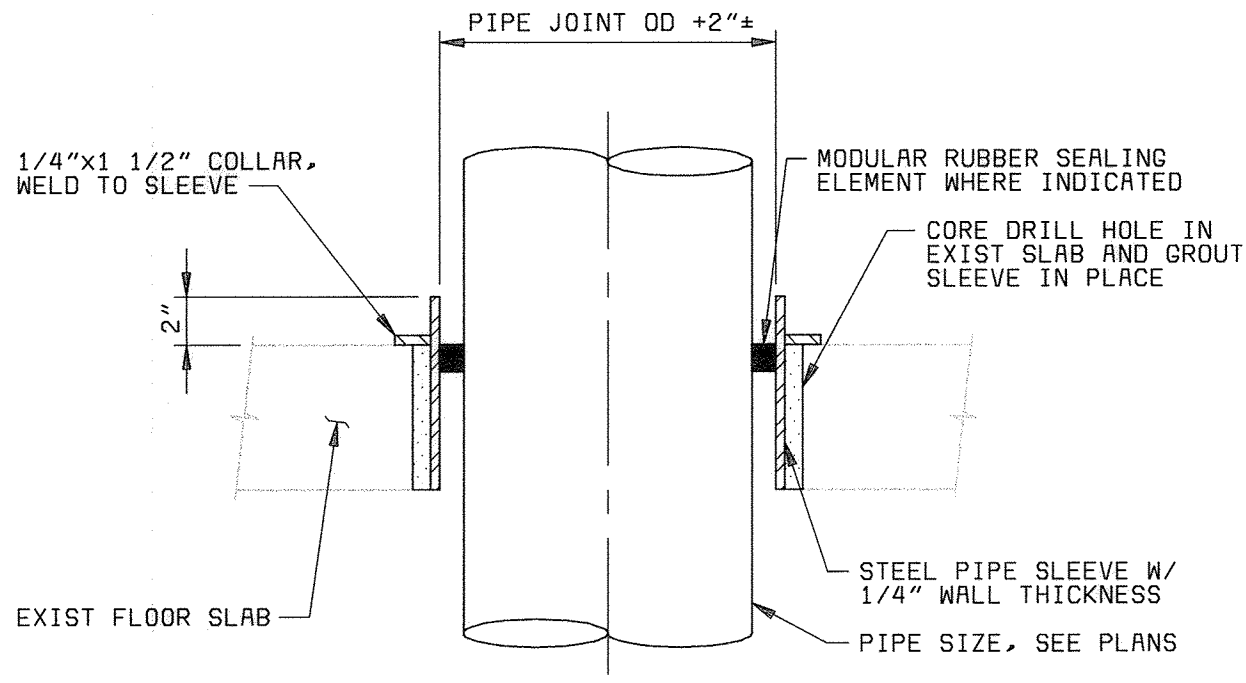
| SAFE WORKING LOAD-POUNDS | BOLT SIZE DIA X LENGTH (IN) | SLAB THICKNESS IN (MINIMUM) | PL EMBED DEPTH IN (MINIMUM) | COUPLING NUT SIZE DIA X LENGTH IN | EYEBOLT SIZE IN |
|--------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------------|-----------------|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



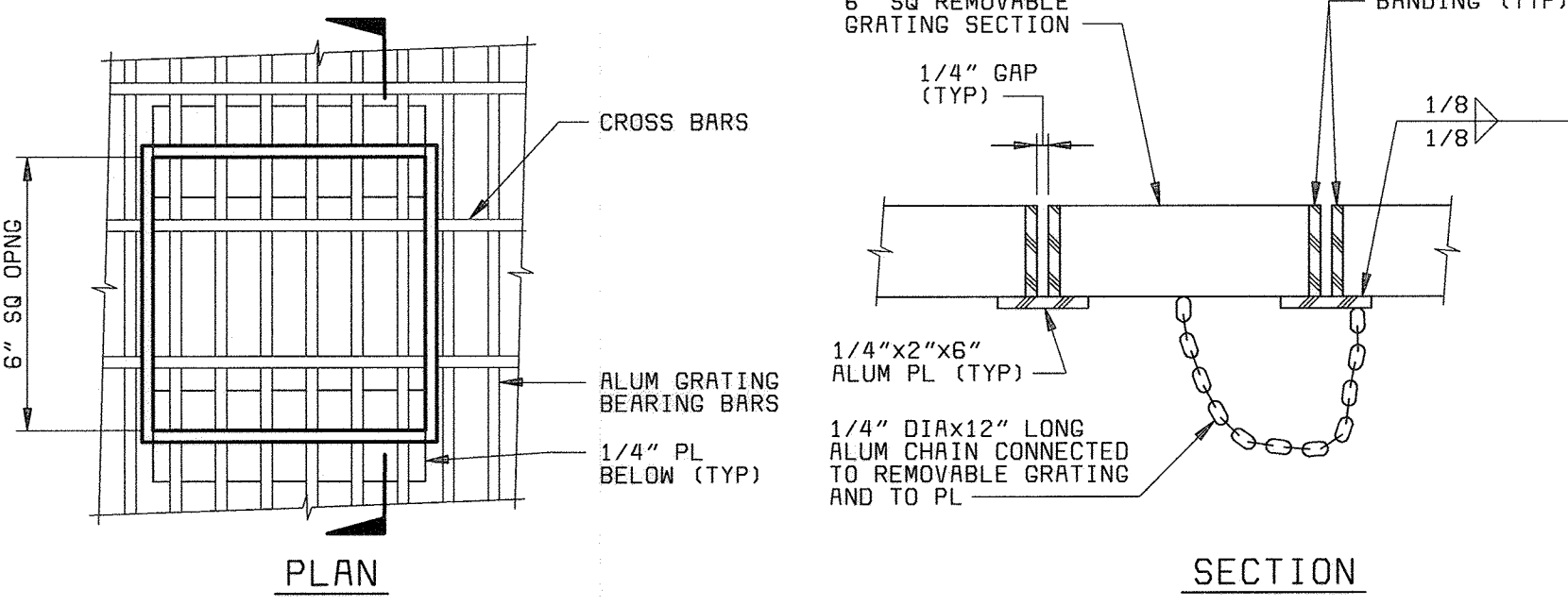
GRATING SUPPORT (C)
NO SCALE

| PIPE SIZE | SLEEVE SIZE (UNLESS INDICATED OTHERWISE) |
|-----------------|--|
| 1" & SMALLER | 3" |
| 1 1/4" & 1 1/2" | 3 1/2" |
| 2" | 4" |
| 3" | 8" |
| 4" | 10" |
| 6" | 12" |
| 8" & LARGER | FLANGE OD+2" |

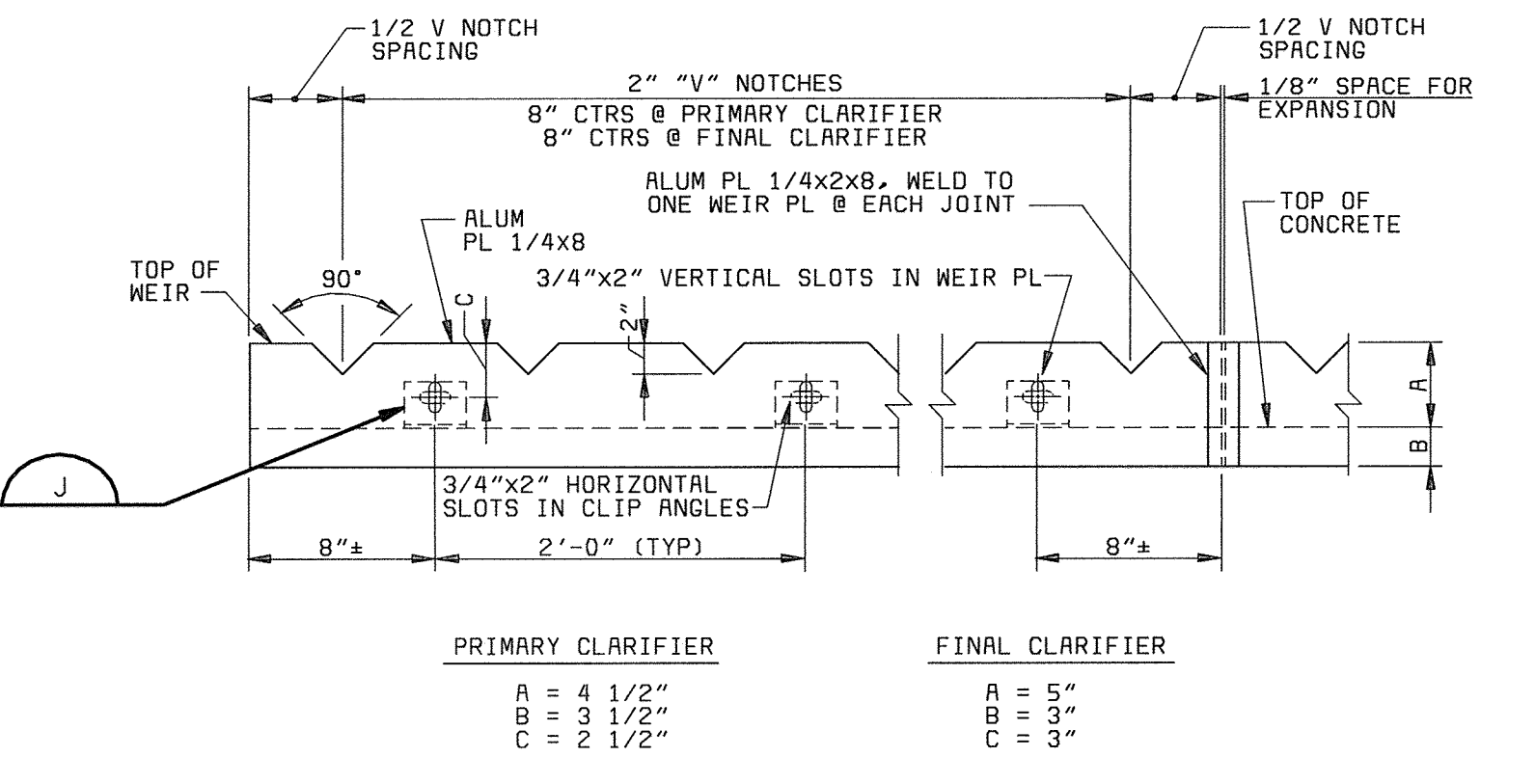
■ SCHEDULE 40 STANDARD STEEL PIPE
■ STEEL PIPE, 1/4" WALL



FLOOR SLEEVE REHAB CONSTRUCTION (G)
NO SCALE

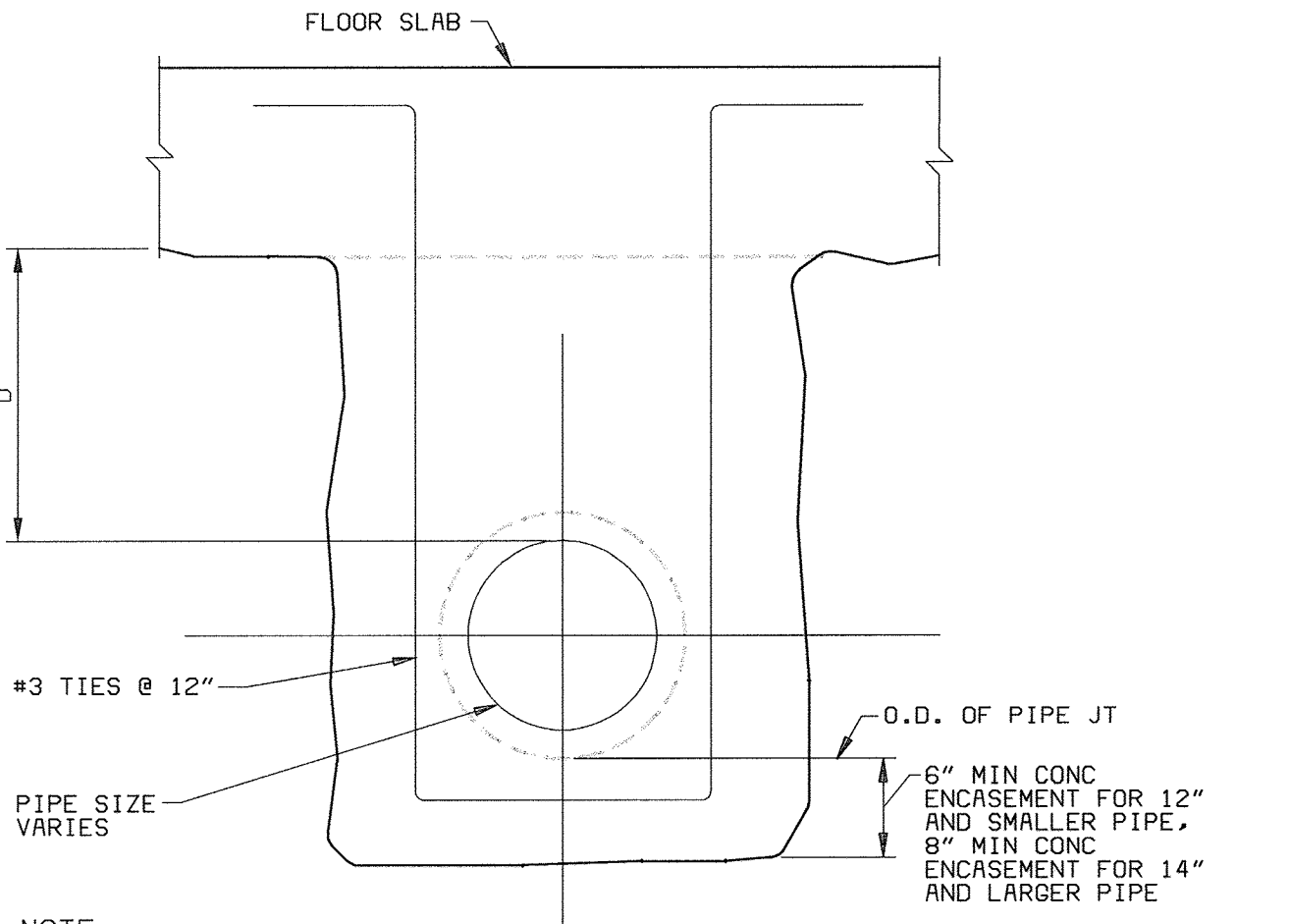


REMOVABLE GRATING DETAIL (L)
NO SCALE



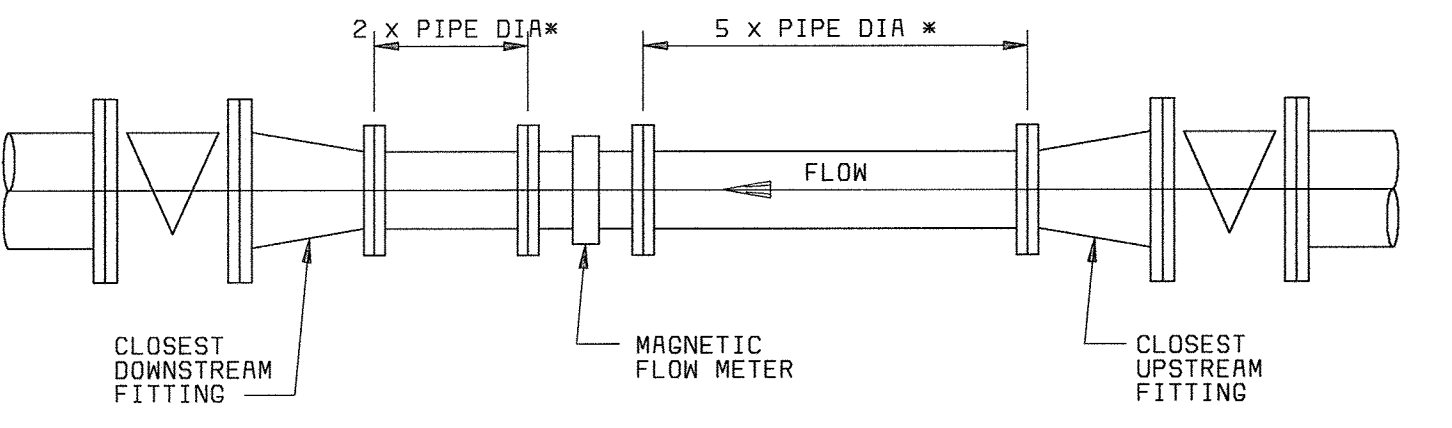
V-NOTCH WEIR PLATE (D)
NO SCALE

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



CONCRETE ENCASEMENT (H)
NO SCALE

- NOTE:
1. IF D IS LESS THAN 1'-6", PROVIDE ENCASEMENT CONTINUOUS TO SLAB. IF D IS GREATER THAN 1'-6", ENCASEMENT MAY BE SEPARATED FROM SLAB UNLESS OTHERWISE INDICATED ON DRAWINGS. FILL VOID BETWEEN TOP OF ENCASEMENT AND BOTTOM OF SLAB WITH COMPACTED GRANULAR MATERIAL.
 2. PROVIDE A BELL AT THE END OF CONCRETE ENCASEMENT WHERE PIPELINE CHANGES FROM AN ENCASED PIPELINE TO A BURIED PIPELINE.



MAGNETIC FLOW METER INSTALLATION (M)
NO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

REG. PROF. ENGR. DATE

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

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

MISCELLANEOUS DETAILS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

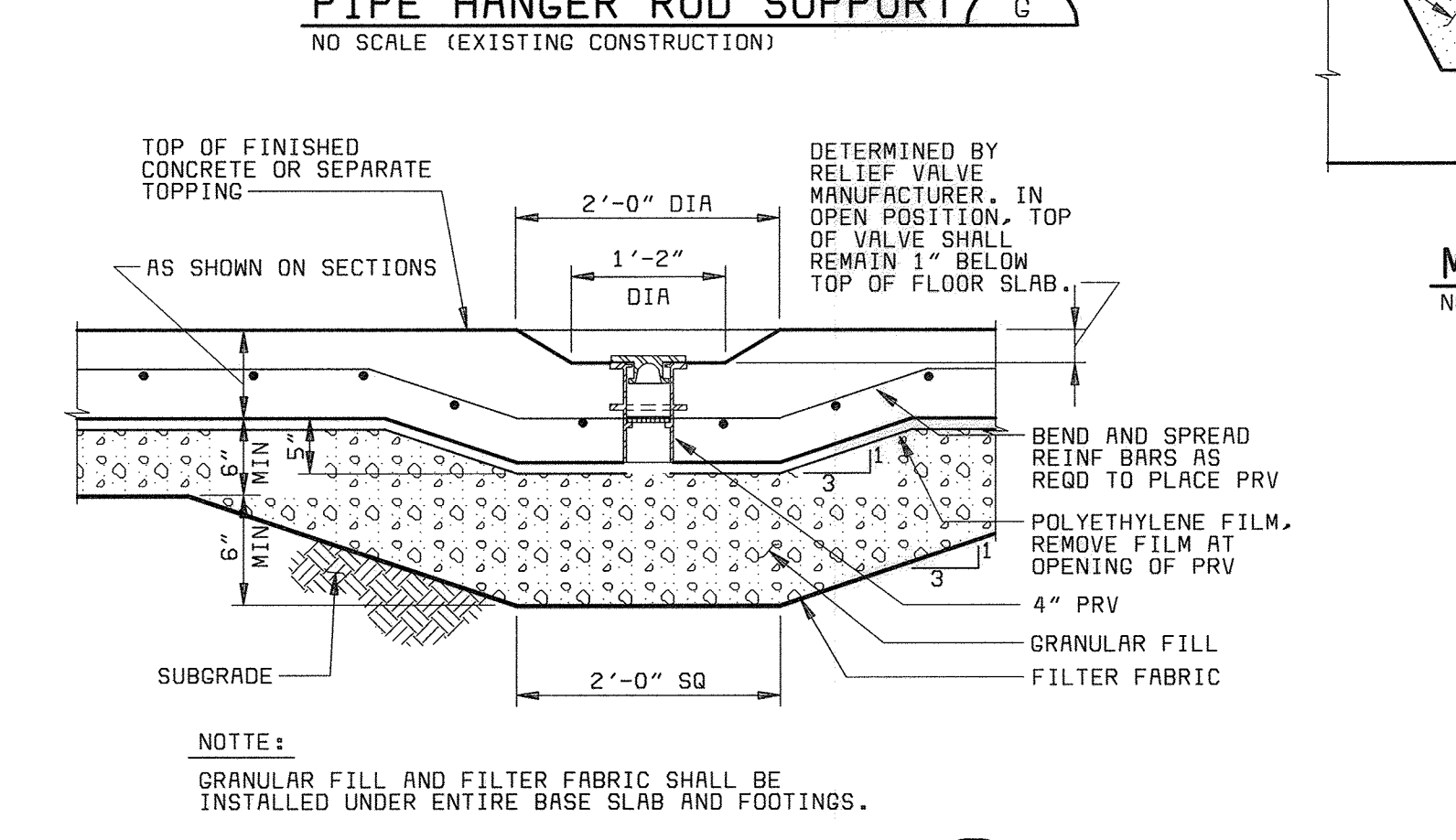
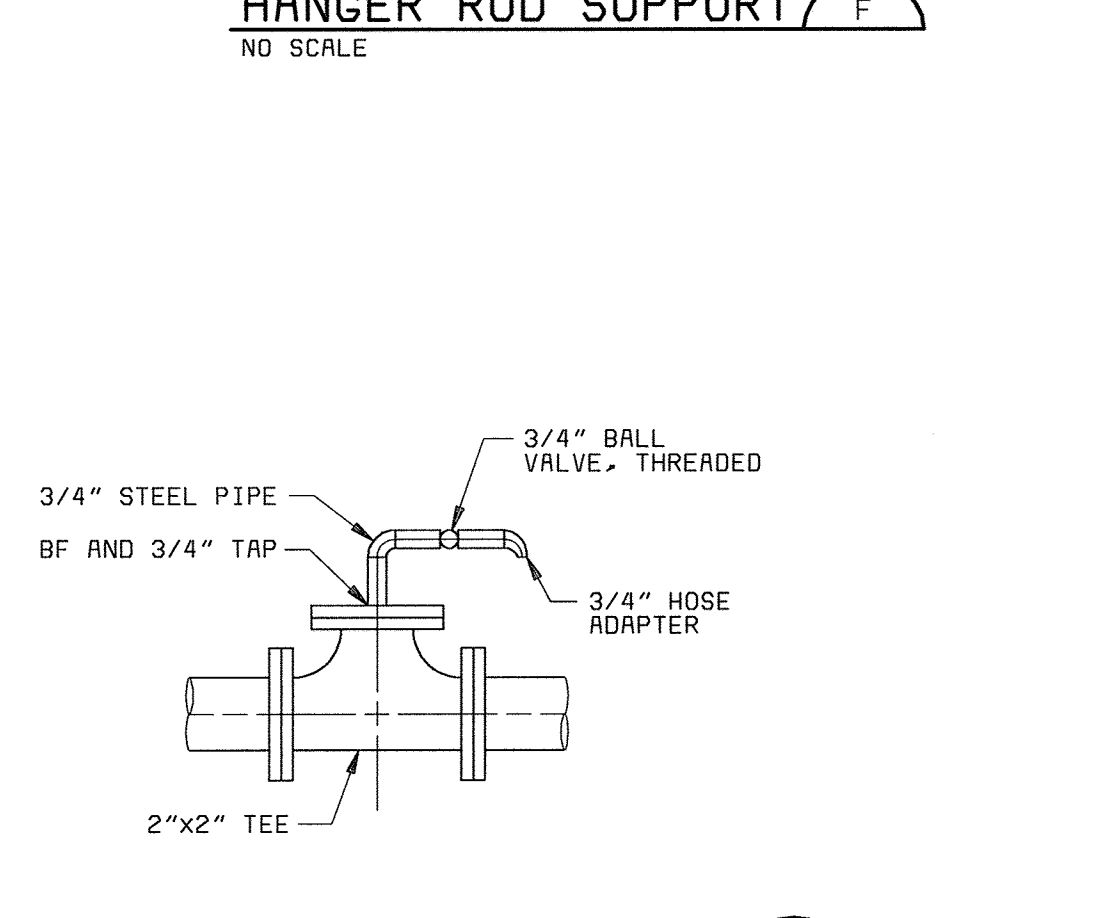
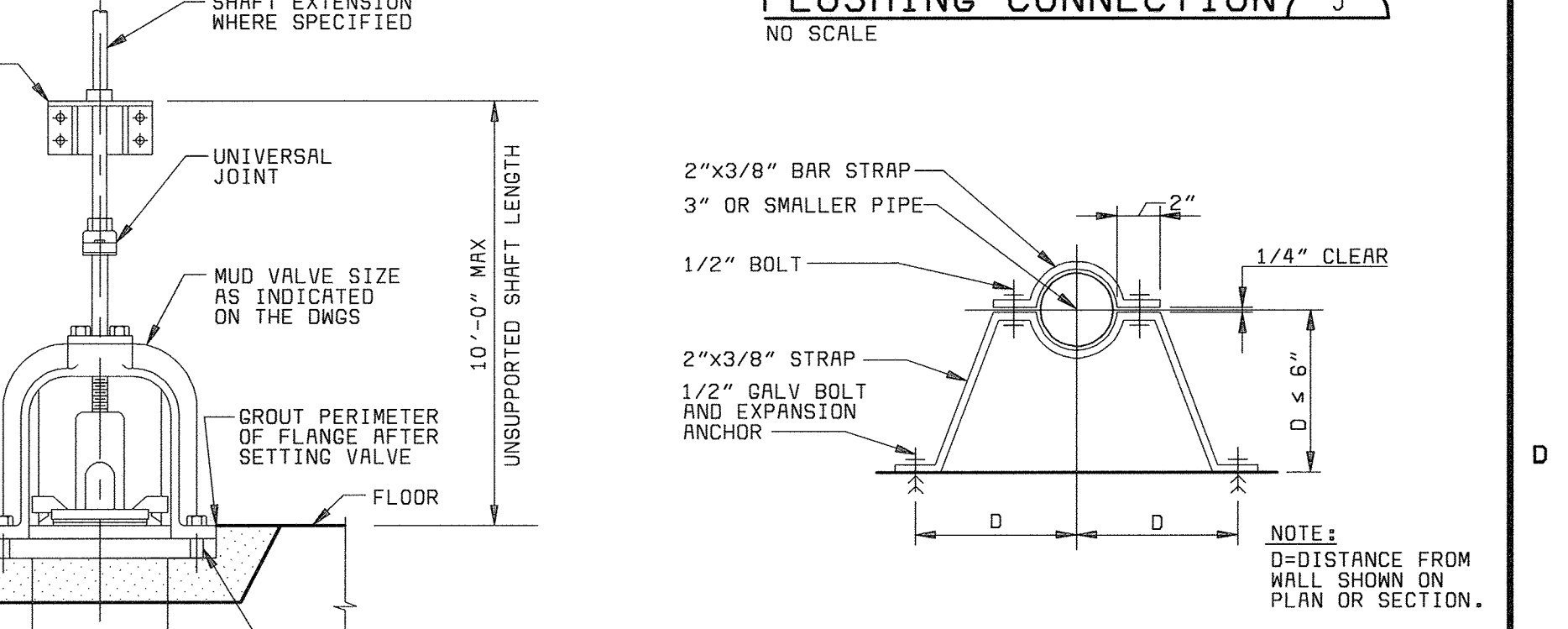
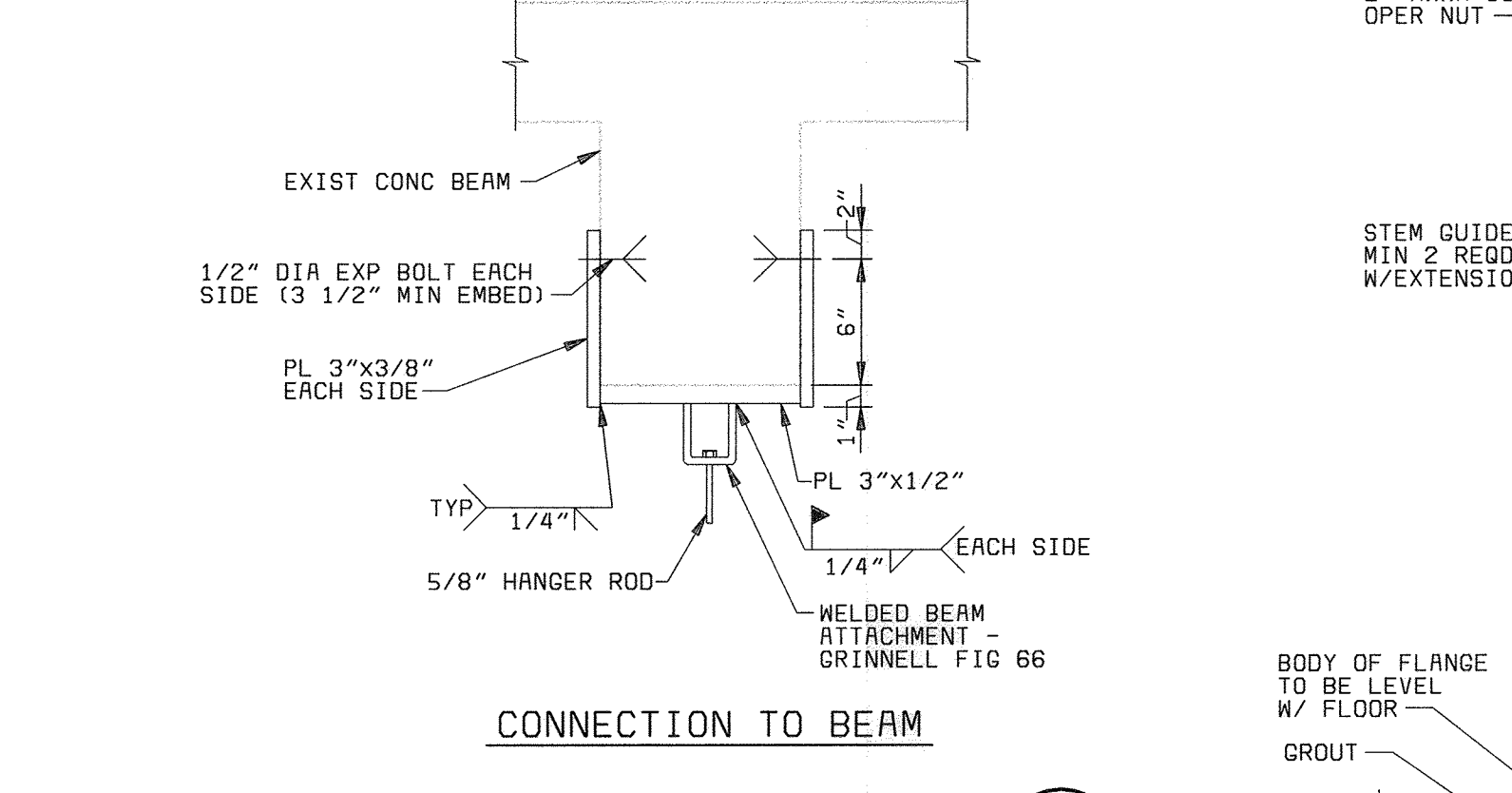
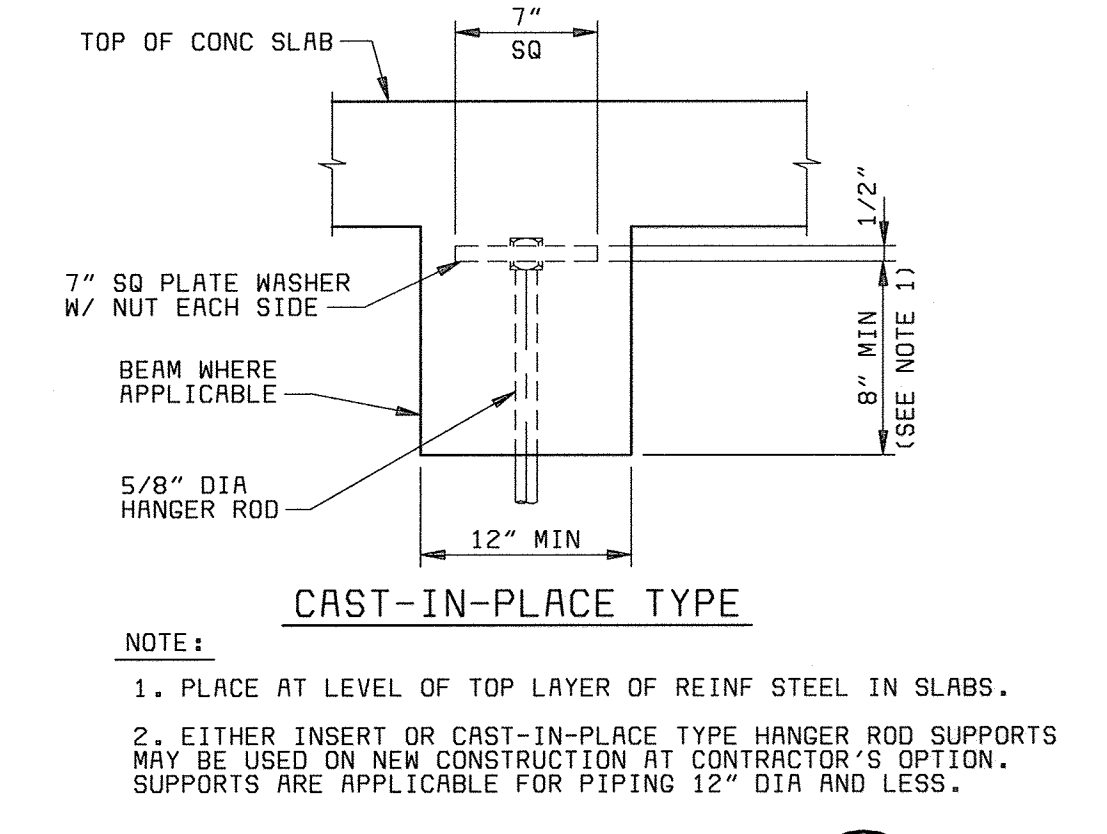
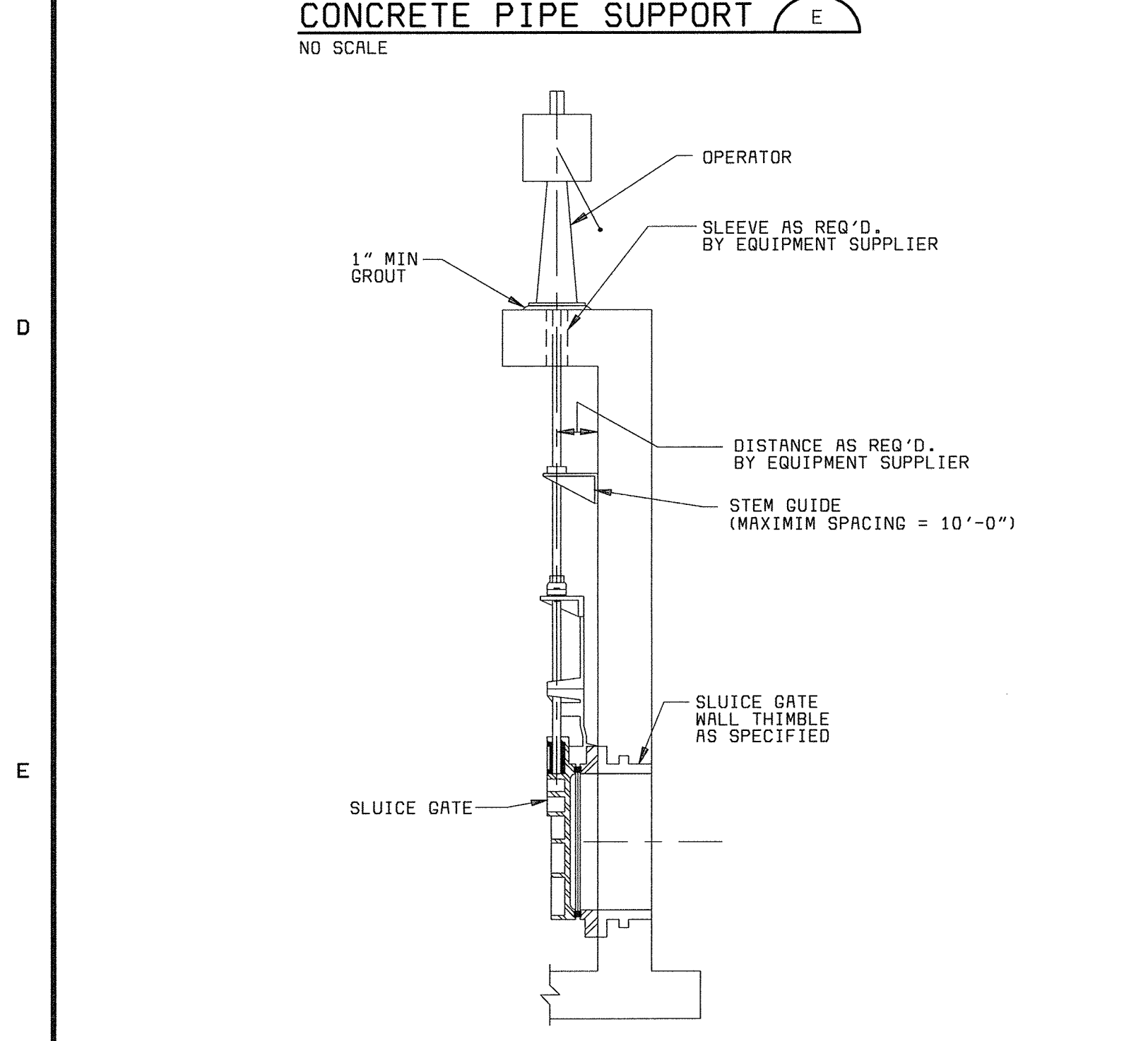
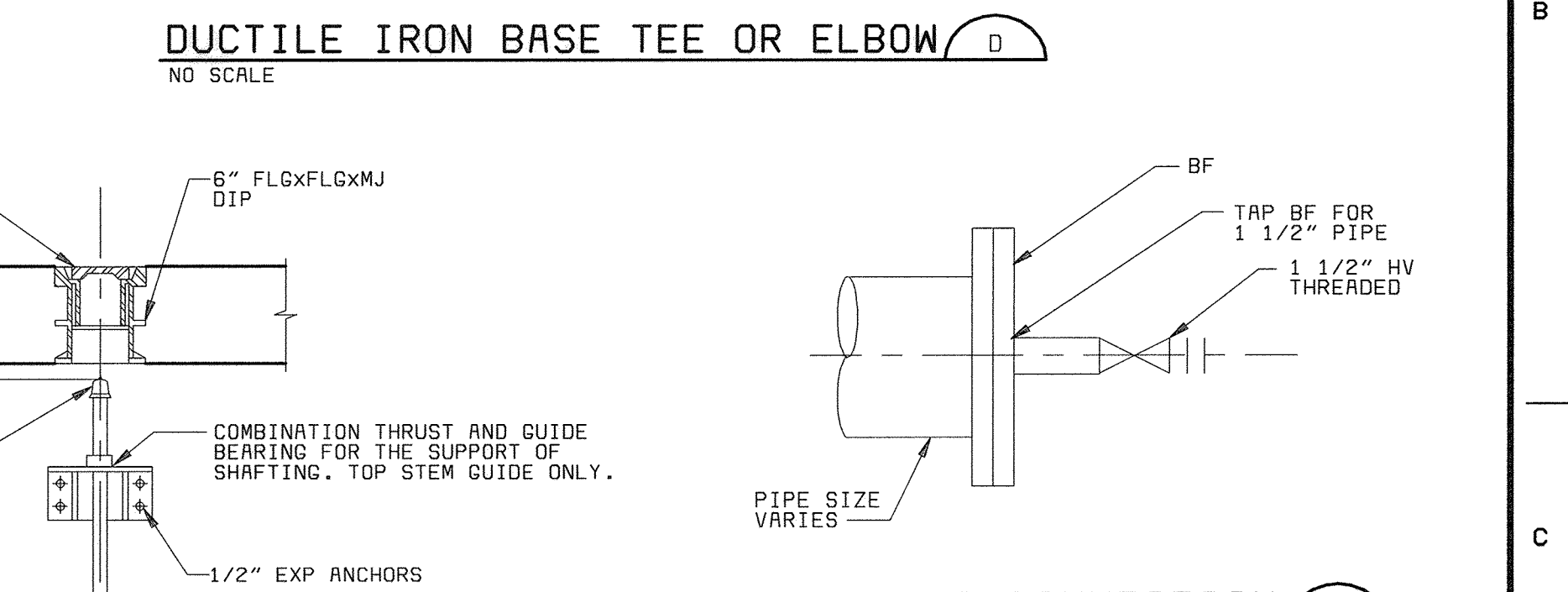
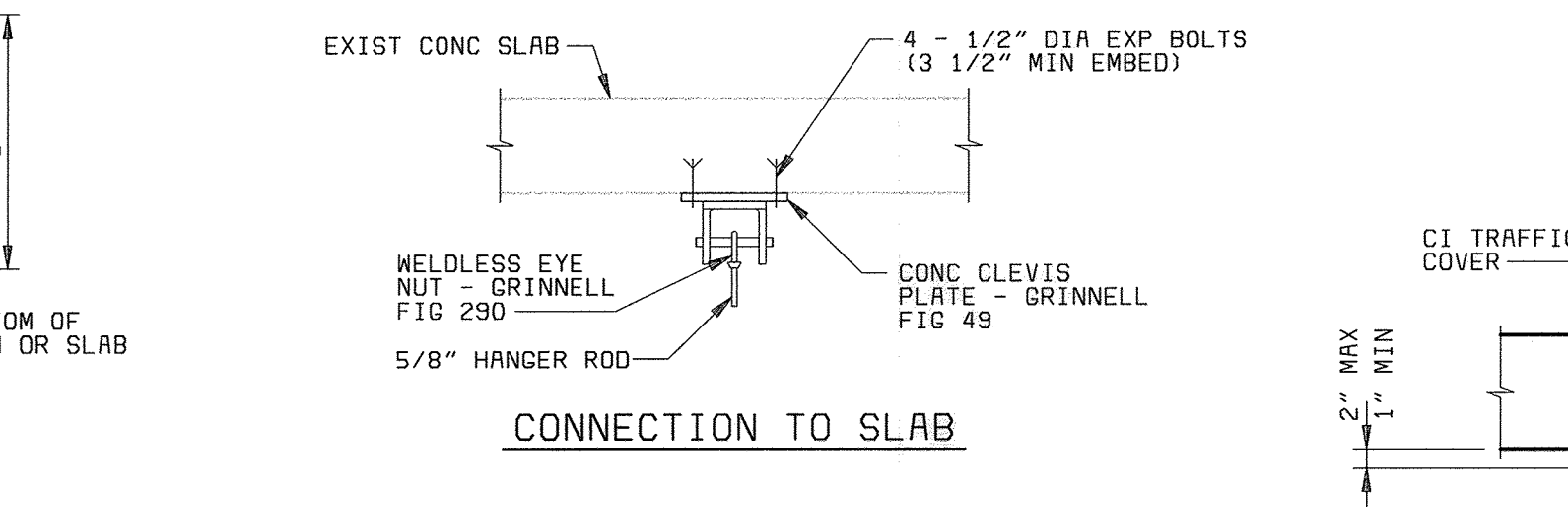
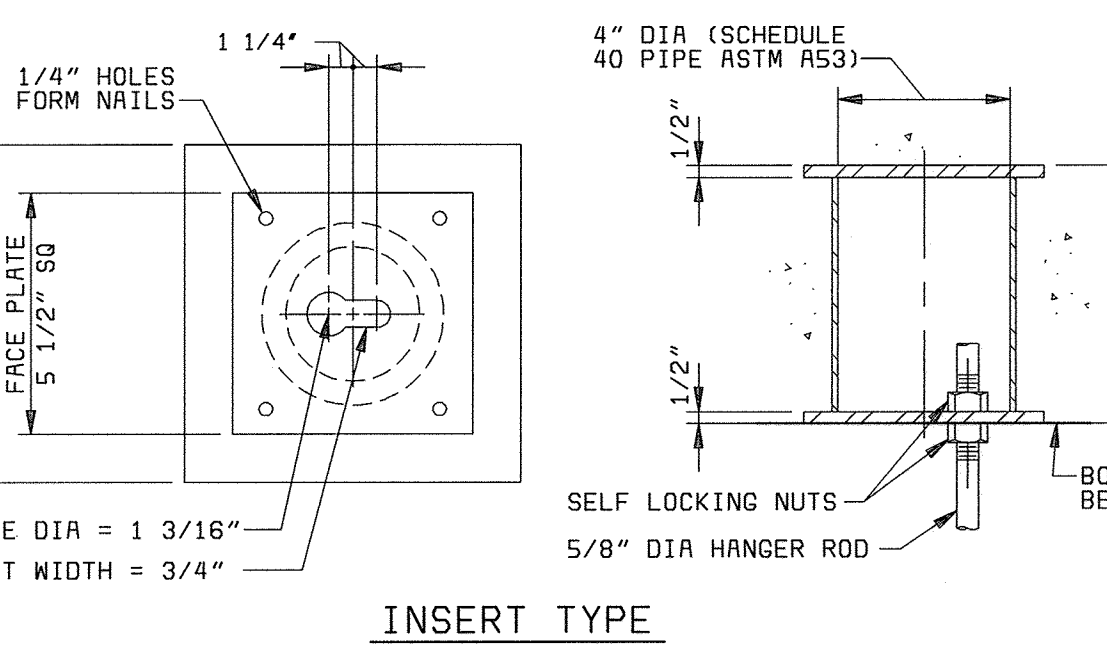
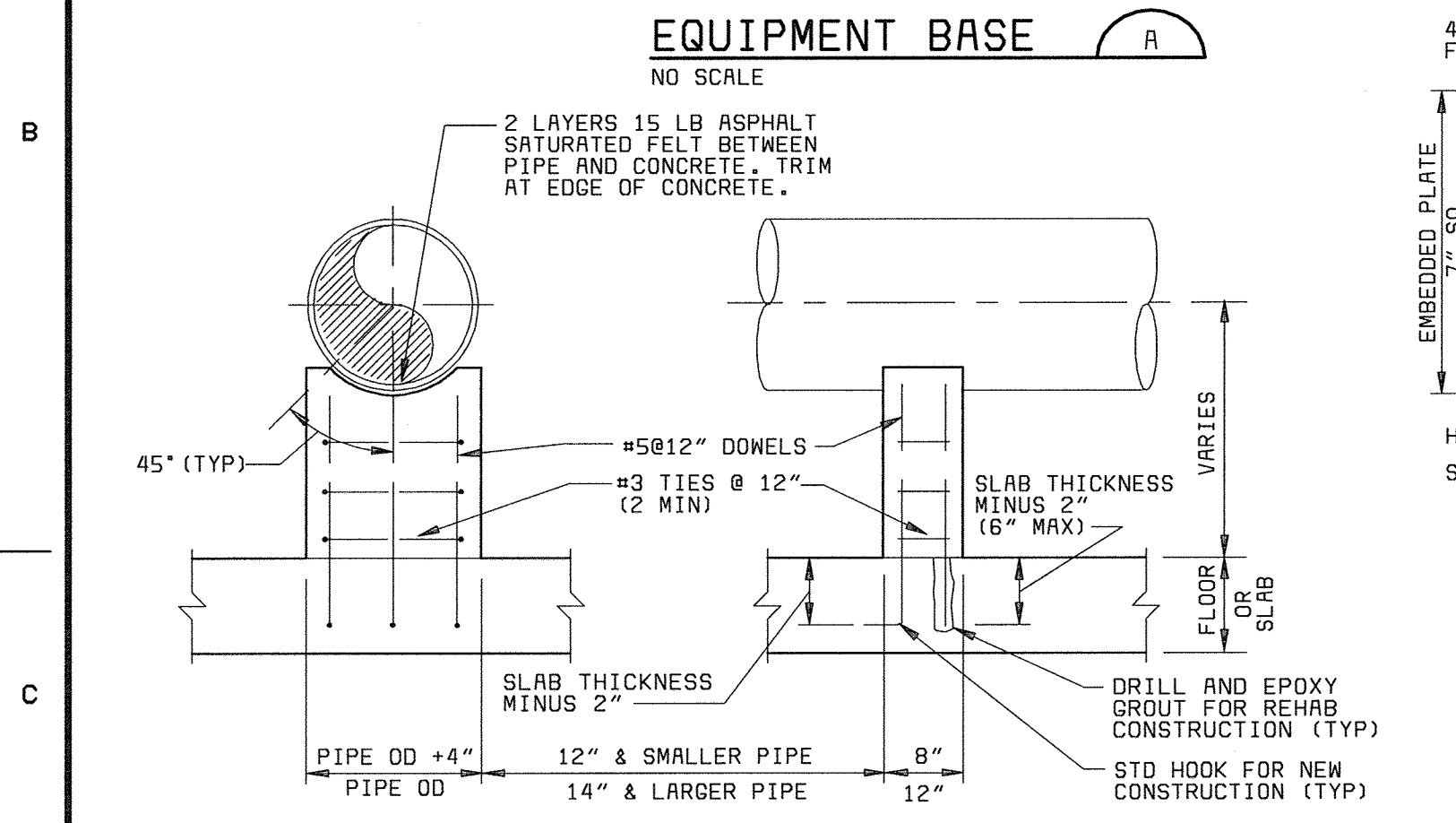
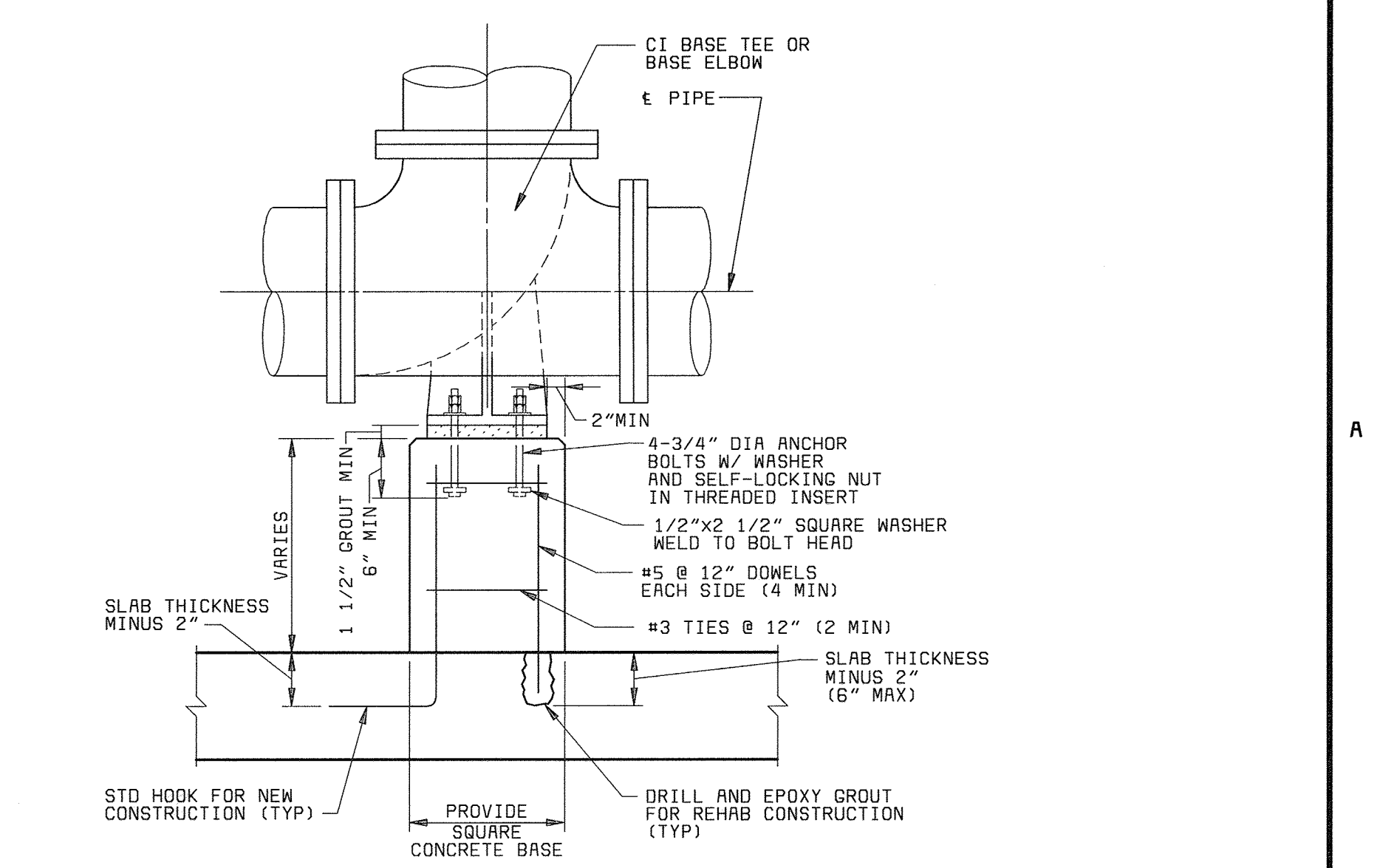
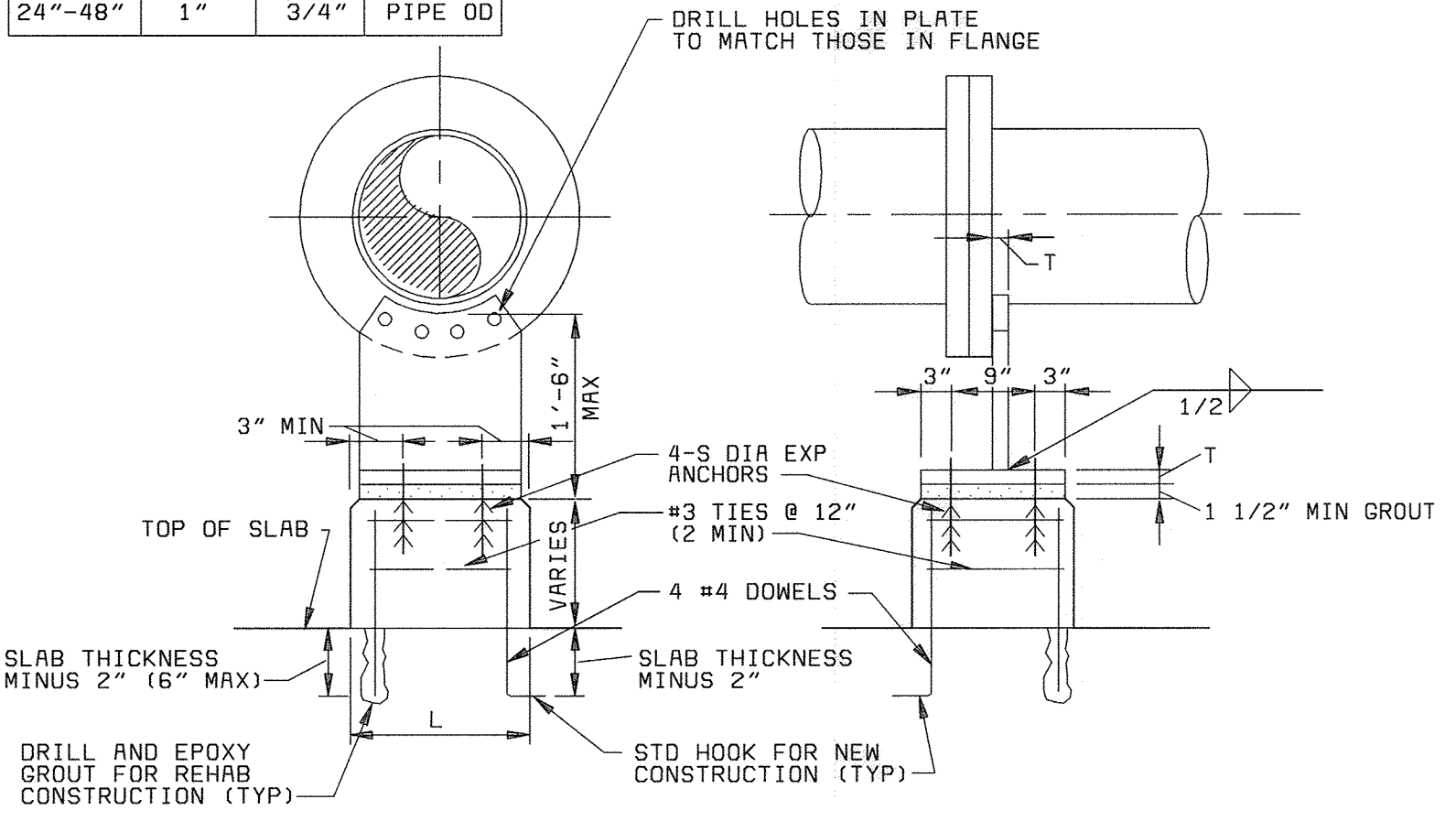
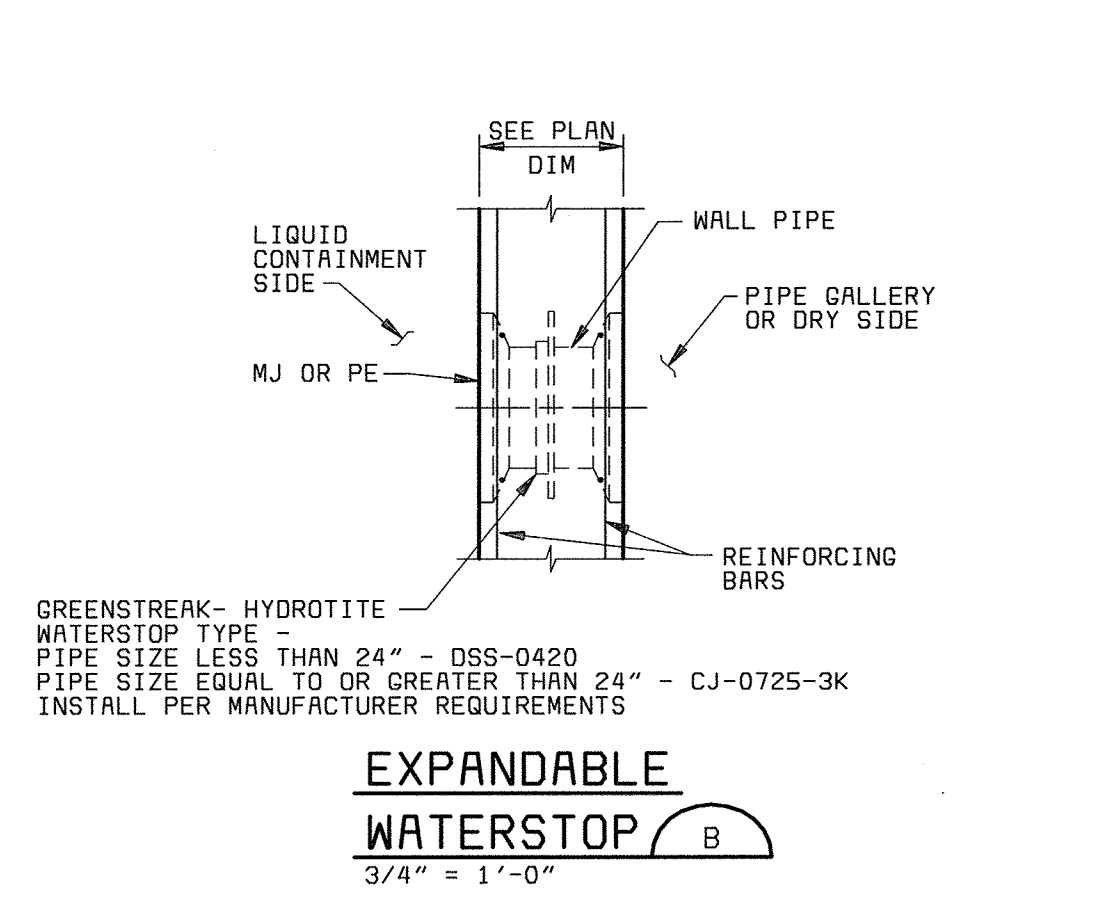
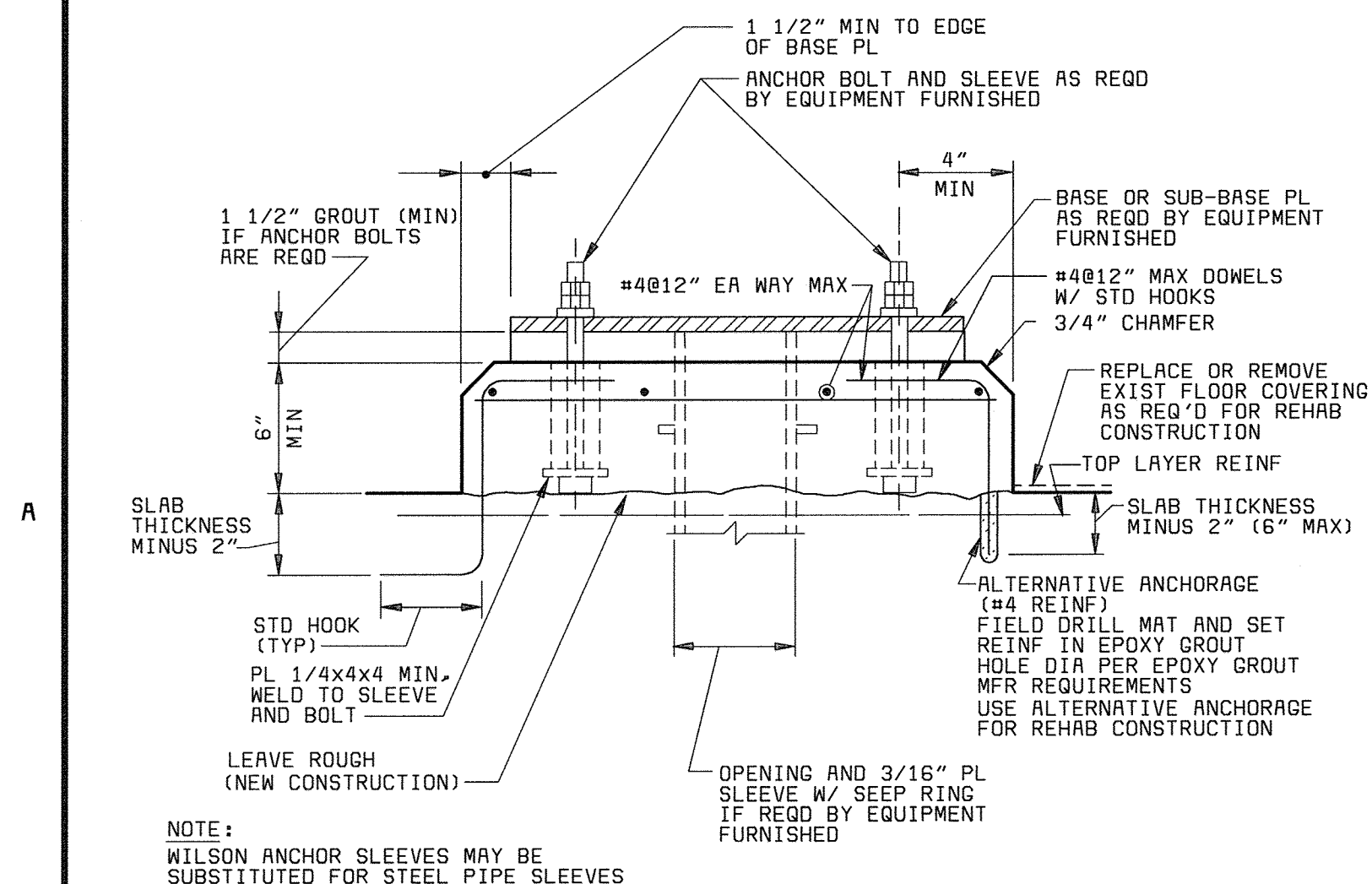
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 95 OF 161

M29

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



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Robert M. Berger 6-29-02
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH LLP
Gaithersburg, Maryland

REC. PROF. ENGR. DATE

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

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

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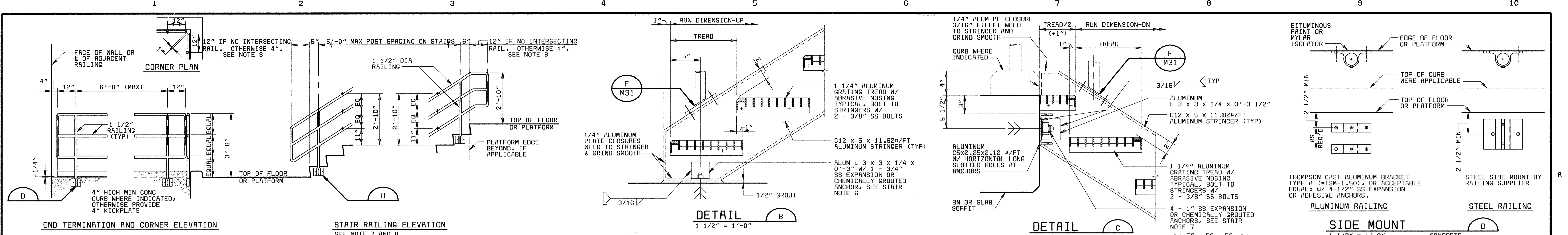
CAPITAL PROJECT S-6205
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HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

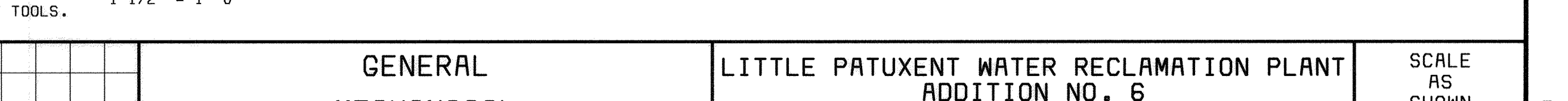
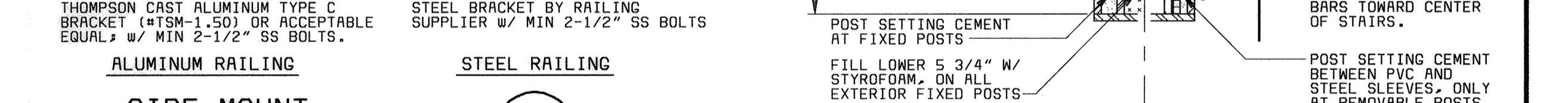
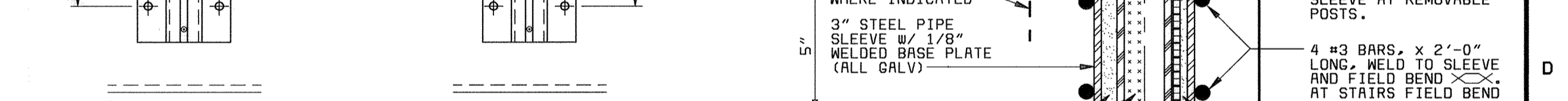
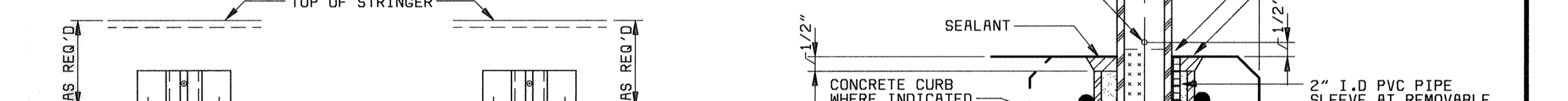
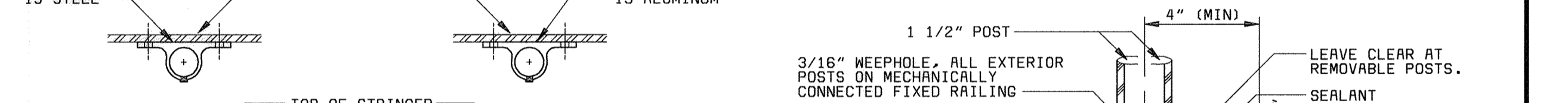
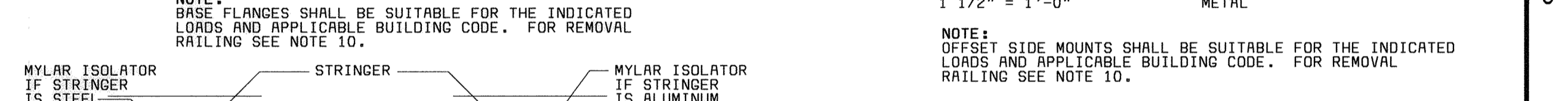
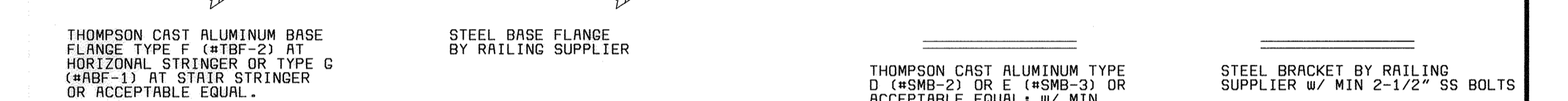
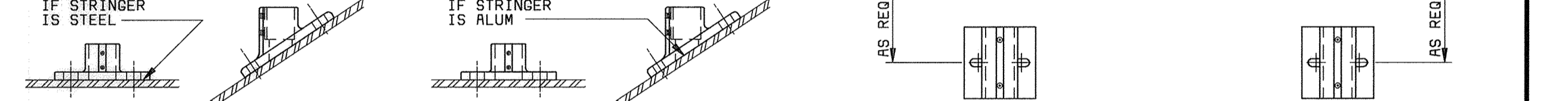
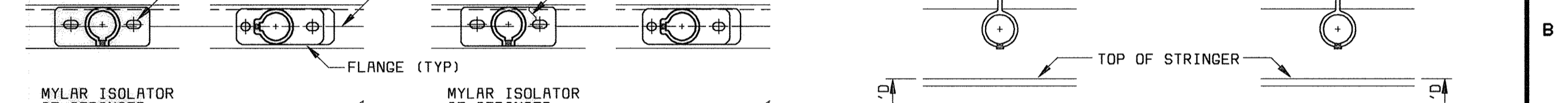
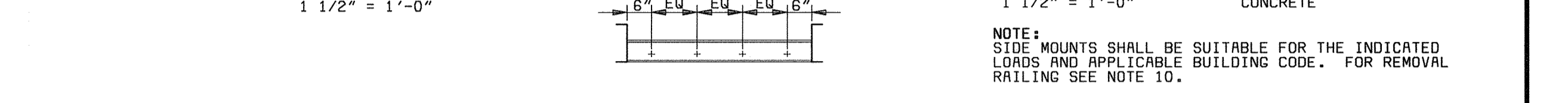
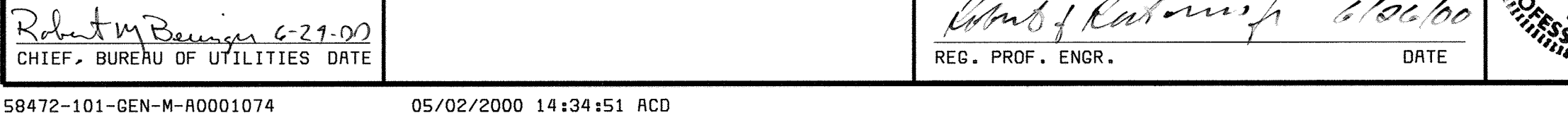
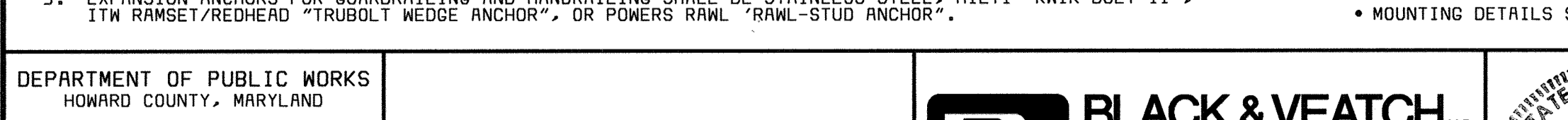
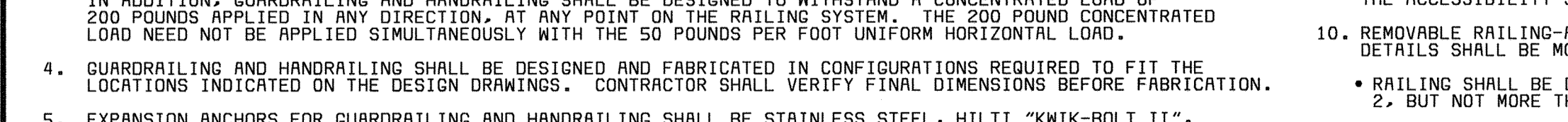
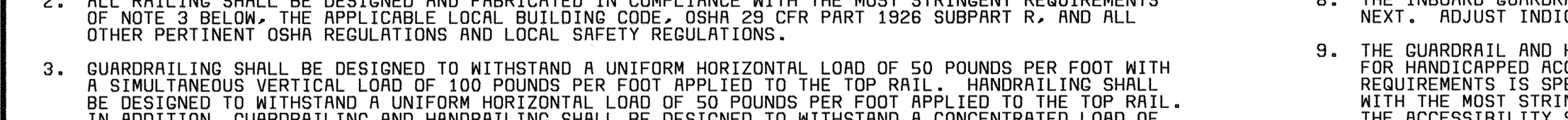
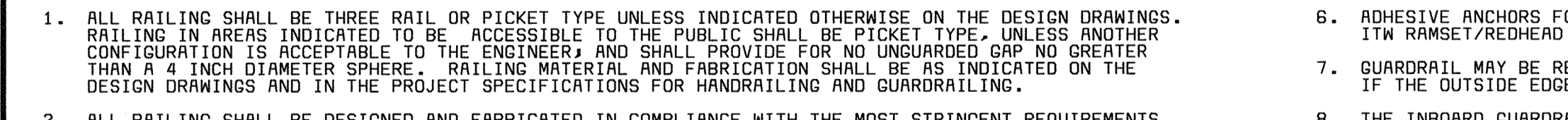
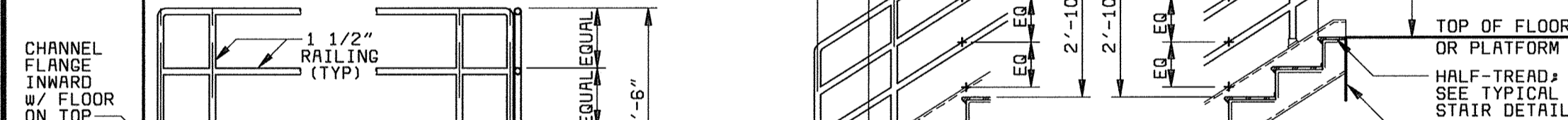
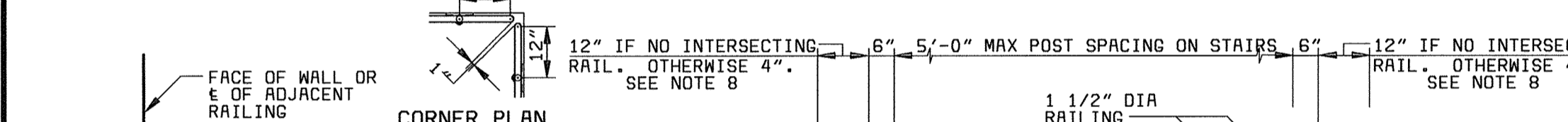
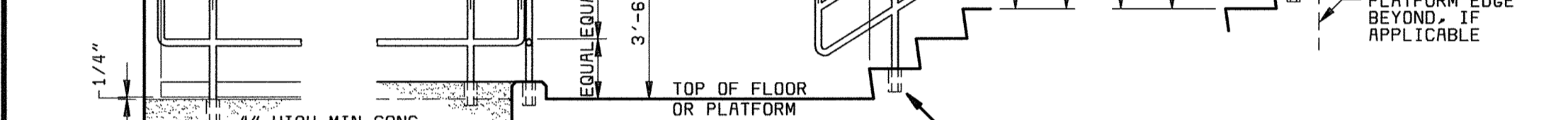
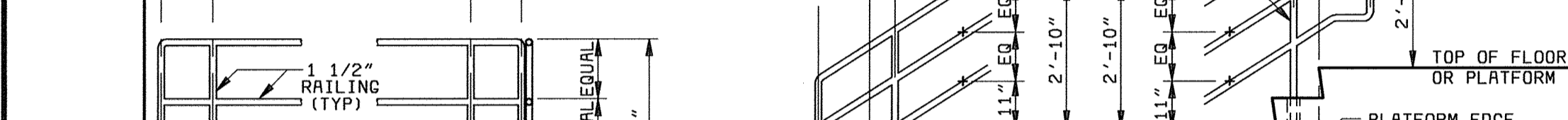
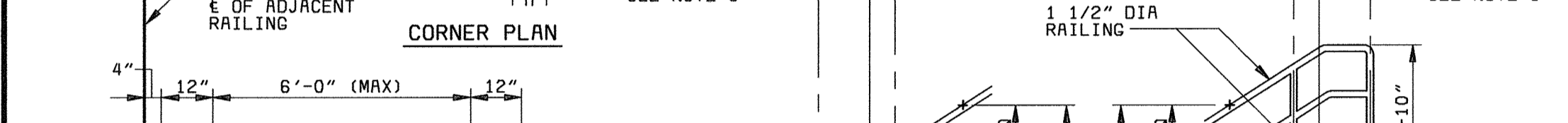
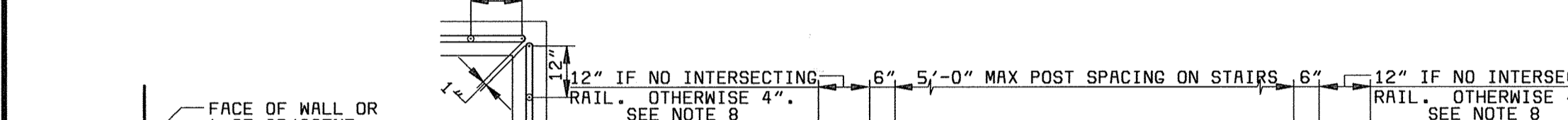
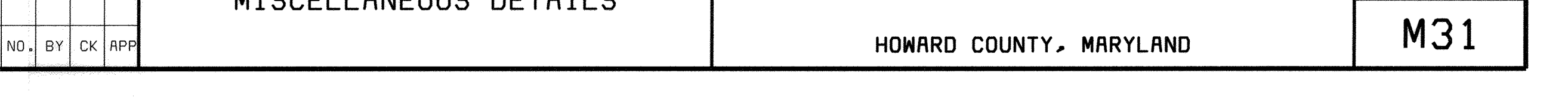
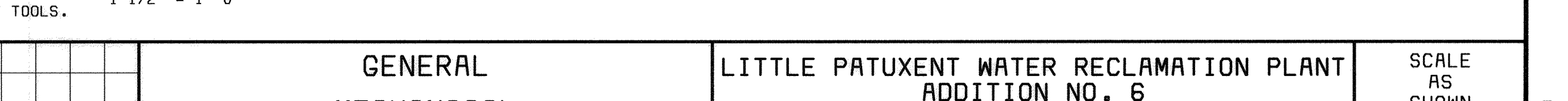
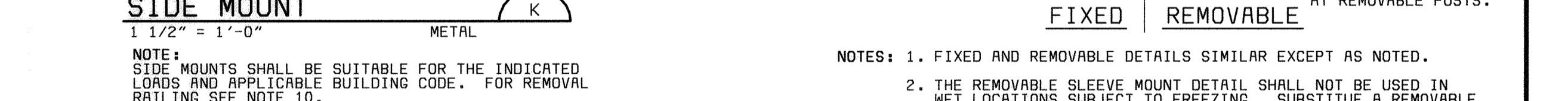
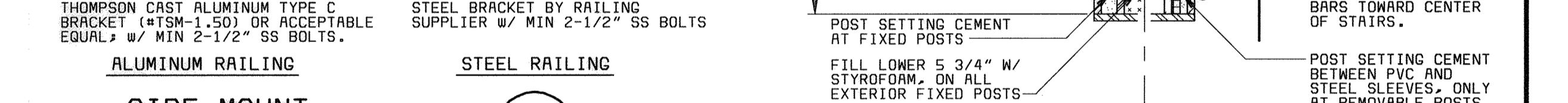
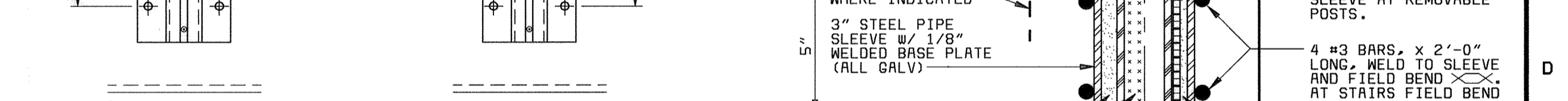
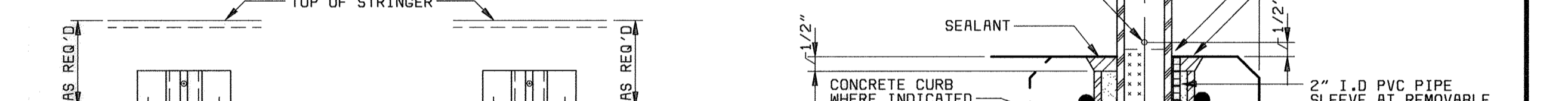
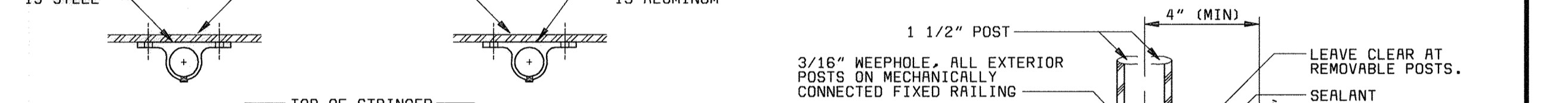
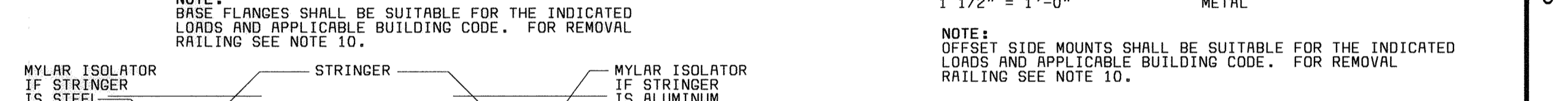
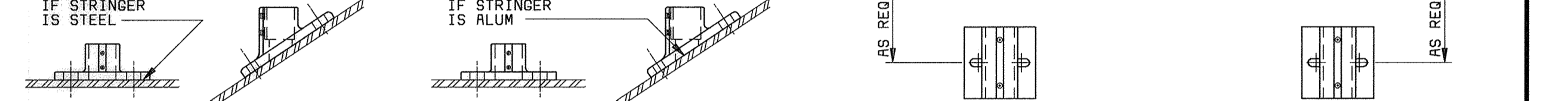
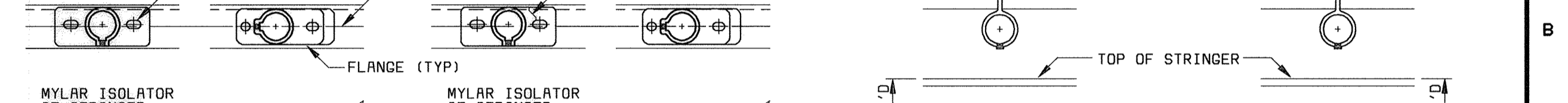
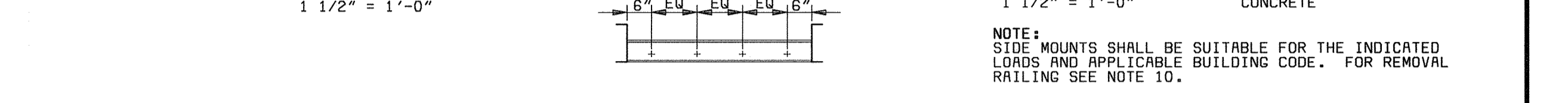
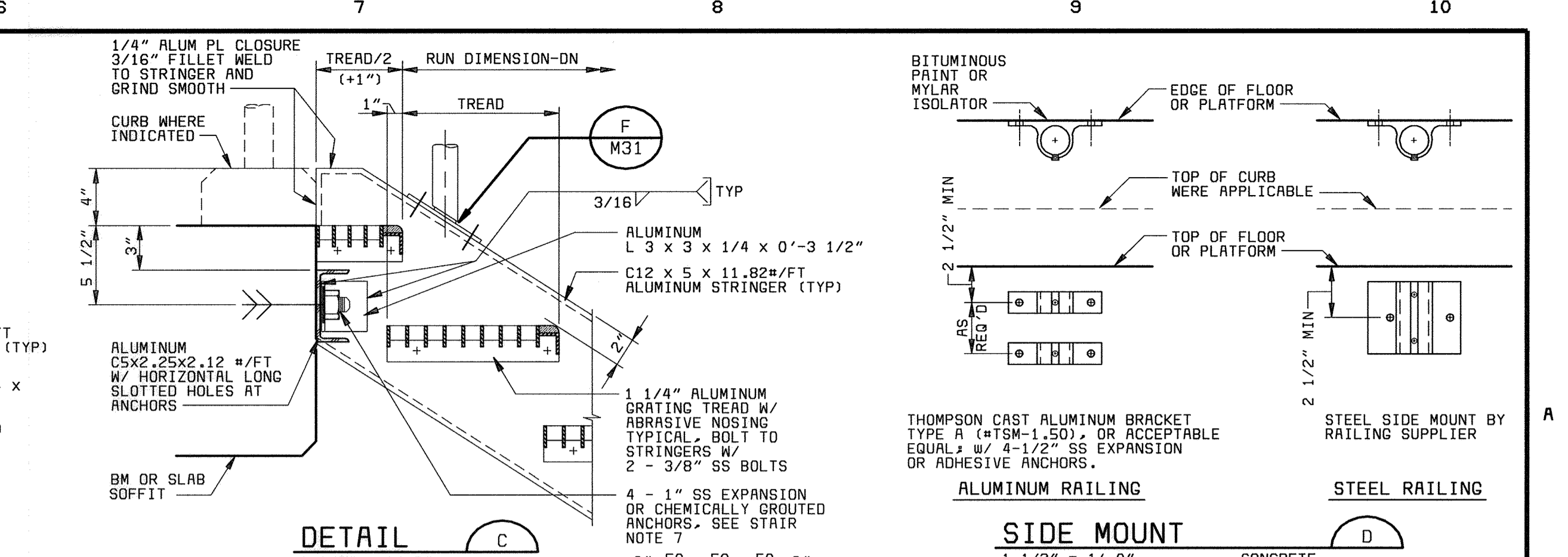
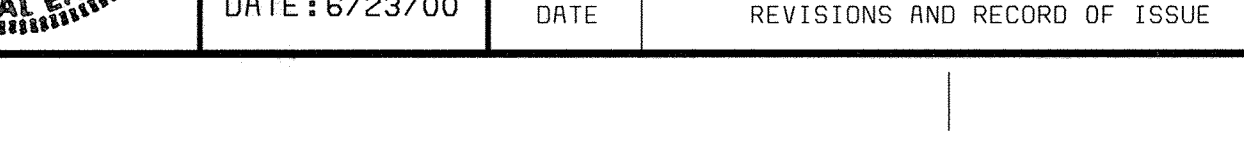
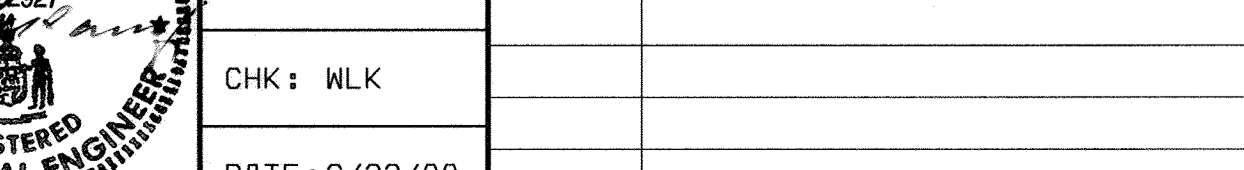
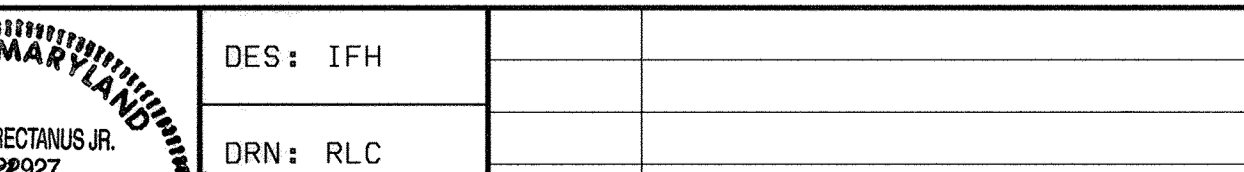
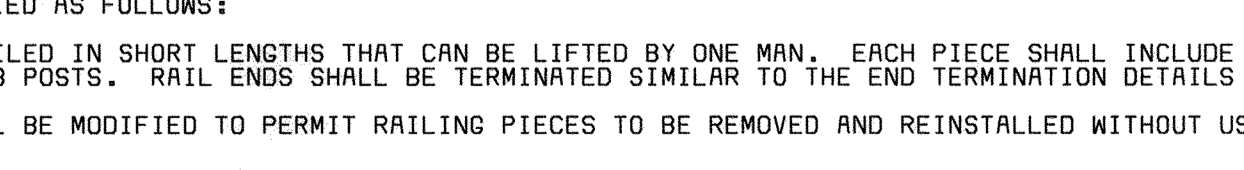
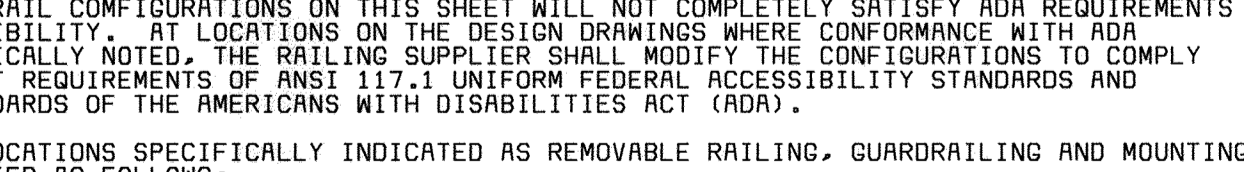
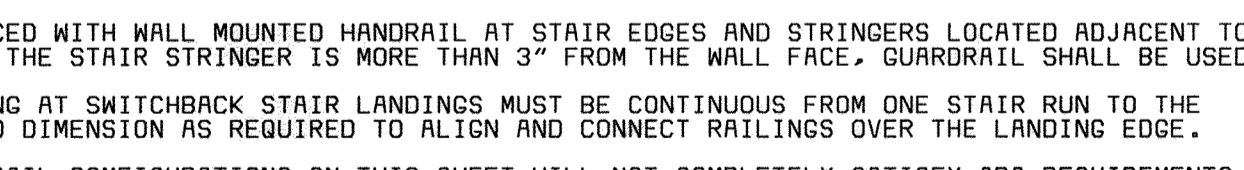
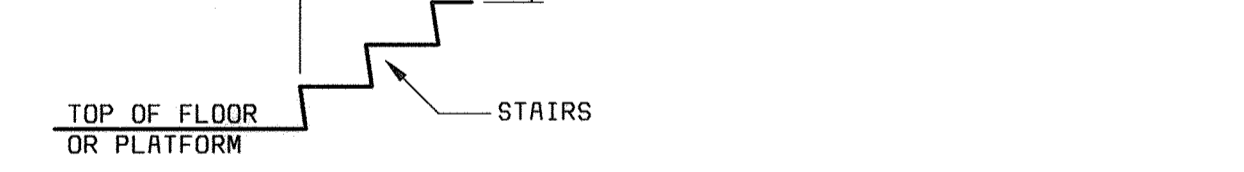
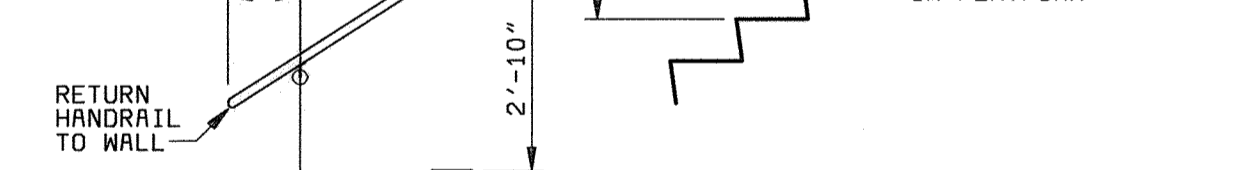
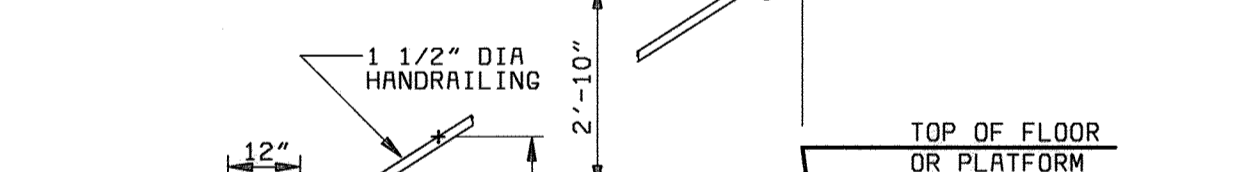
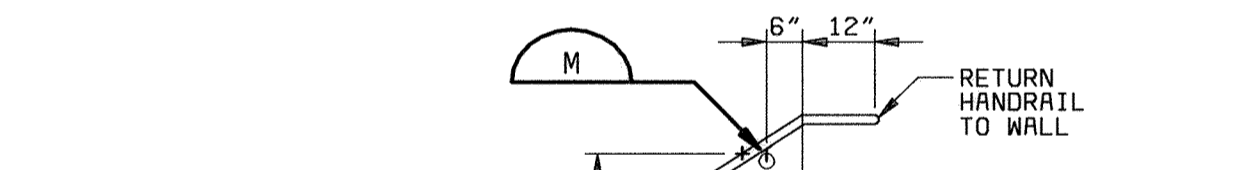
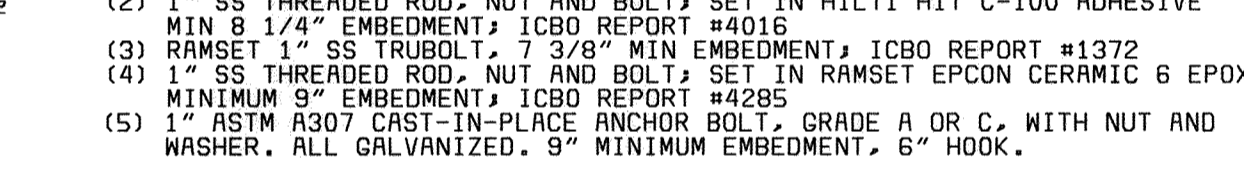
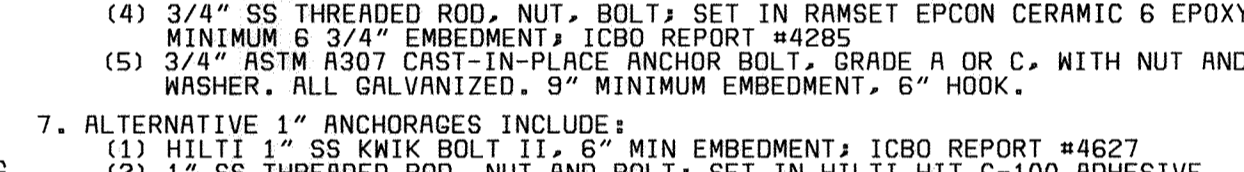
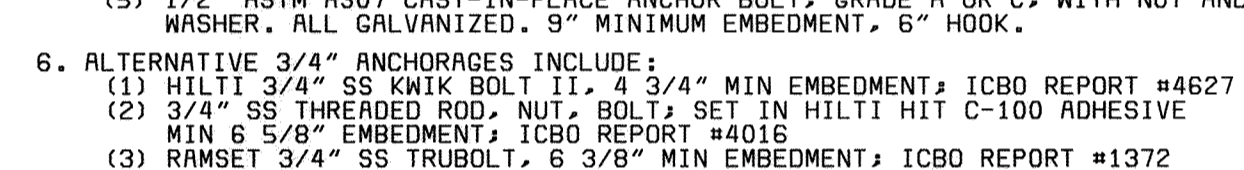
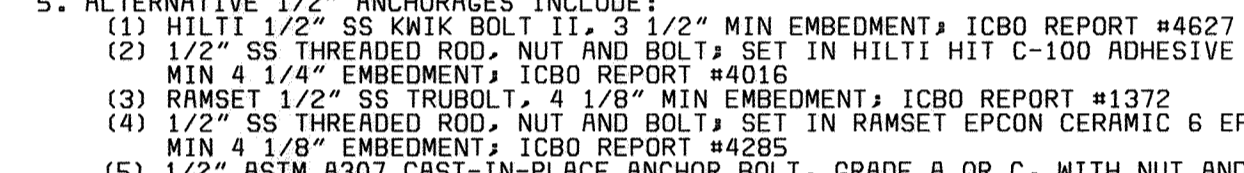
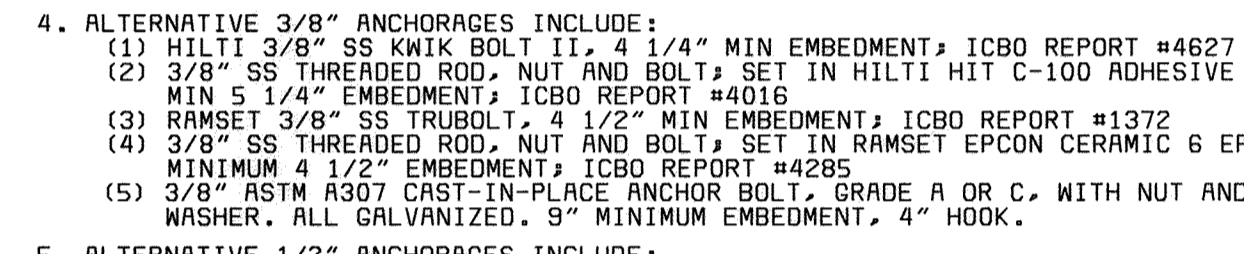
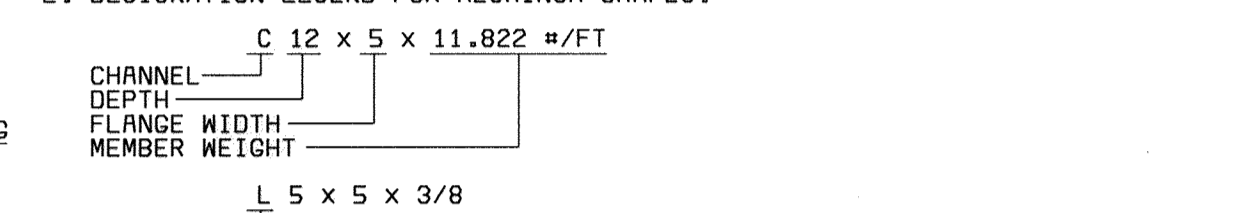
SHEET 96 OF 161

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ALUMINUM GRATING STAIR NOTES:

- ALL MISCELLANEOUS ALUMINUM SHAPES ON THIS SHEET TO BE ROLLED TO ALUMINUM ASSOCIATION STANDARD STRUCTURAL SHAPES.
- DESIGNATION LEGEND FOR ALUMINUM SHAPES:
 CHANNEL C 12 x 5 x 11.822 #/FT
 FLANGE WIDTH MEMBER WEIGHT
 ANGLE L 5 x 5 x 3/8
- WELDS NOT DIMENSIONED ON THE DRAWINGS SHALL BE SIZED TO DEVELOP THE FULL STRENGTH OF THE LEAST STRENGTH COMPONENT OF THE CONNECTION.
- ALTERNATIVE 3/8" ANCHORAGES INCLUDE:
 (1) HILTI 3/8" SS KWIK BOLT II, 4 1/4" MIN EMBEDMENT; ICBO REPORT #4627
 (2) 3/8" SS THREADED ROD, NUT AND BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 5 1/4" EMBEDMENT; ICBO REPORT #4016
 (3) RAMSET 3/8" SS TRUBOLT, 4 1/2" MIN EMBEDMENT; ICBO REPORT #1372
 (4) 3/8" SS THREADED ROD, NUT AND BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 4 1/2" EMBEDMENT; ICBO REPORT #4285
 (5) 3/8" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER, ALL GALVANIZED, 9" MINIMUM EMBEDMENT, 4" HOOK.
- ALTERNATIVE 1/2" ANCHORAGES INCLUDE:
 (1) HILTI 1/2" SS KWIK BOLT II, 3 1/2" MIN EMBEDMENT; ICBO REPORT #4627
 (2) 1/2" SS THREADED ROD, NUT AND BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 4 1/4" EMBEDMENT; ICBO REPORT #4016
 (3) RAMSET 1/2" SS TRUBOLT, 4 1/8" MIN EMBEDMENT; ICBO REPORT #1372
 (4) 1/2" SS THREADED ROD, NUT AND BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MIN 4 1/8" EMBEDMENT; ICBO REPORT #4285
 (5) 1/2" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER, ALL GALVANIZED, 9" MINIMUM EMBEDMENT, 6" HOOK.
- ALTERNATIVE 3/4" ANCHORAGES INCLUDE:
 (1) HILTI 3/4" SS KWIK BOLT II, 4 3/4" MIN EMBEDMENT; ICBO REPORT #4627
 (2) 3/4" SS THREADED ROD, NUT, BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 5 5/8" EMBEDMENT; ICBO REPORT #4016
 (3) RAMSET 3/4" SS TRUBOLT, 6 3/8" MIN EMBEDMENT; ICBO REPORT #1372
 (4) 3/4" SS THREADED ROD, NUT, BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 5" EMBEDMENT; ICBO REPORT #4285
 (5) 3/4" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER, ALL GALVANIZED, 9" MINIMUM EMBEDMENT, 6" HOOK.
- ALTERNATIVE 1" ANCHORAGES INCLUDE:
 (1) HILTI 1" SS KWIK BOLT II, 6" MIN EMBEDMENT; ICBO REPORT #4627
 (2) 1" SS THREADED ROD, NUT AND BOLT; SET IN HILTI HIT C-100 ADHESIVE MIN 6 1/4" EMBEDMENT; ICBO REPORT #4016
 (3) RAMSET 1" SS TRUBOLT, 7 3/8" MIN EMBEDMENT; ICBO REPORT #1372
 (4) 1" SS THREADED ROD, NUT AND BOLT; SET IN RAMSET EPCON CERAMIC 6 EPOXY MINIMUM 6" EMBEDMENT; ICBO REPORT #4285
 (5) 1" ASTM A307 CAST-IN-PLACE ANCHOR BOLT, GRADE A OR C, WITH NUT AND WASHER, ALL GALVANIZED, 9" MINIMUM EMBEDMENT, 6" HOOK.



NOTES:

- ALL RAILING SHALL BE THREE RAIL OR PICKET TYPE UNLESS INDICATED OTHERWISE ON THE DESIGN DRAWINGS. RAILING IN AREAS INDICATED TO BE ACCESSIBLE TO THE PUBLIC SHALL BE PICKET TYPE, UNLESS ANOTHER CONFIGURATION IS ACCEPTABLE TO THE ENGINEER, AND SHALL PROVIDE FOR NO UNGUARDED GAP NO GREATER THAN A 4 INCH DIAMETER SPHERE. RAILING MATERIAL AND FABRICATION SHALL BE AS INDICATED ON THE DESIGN DRAWINGS AND IN THE PROJECT SPECIFICATIONS FOR HANDRAILING AND GUARDRAILINGS.
- ALL RAILING SHALL BE DESIGNED AND FABRICATED IN COMPLIANCE WITH THE MOST STRINGENT REQUIREMENTS OF NOTE 3 BELOW, THE APPLICABLE LOCAL BUILDING CODE, OSHA 29 CFR PART 1926 SUBPART R, AND ALL OTHER PERTINENT OSHA REGULATIONS AND LOCAL SAFETY REGULATIONS.
- GUARDRAILING SHALL BE DESIGNED TO WITHSTAND A UNIFORM HORIZONTAL LOAD OF 50 POUNDS PER FOOT WITH A SIMULTANEOUS VERTICAL LOAD OF 100 POUNDS PER FOOT APPLIED TO THE TOP RAIL. HANDRAILING SHALL BE DESIGNED TO WITHSTAND A UNIFORM HORIZONTAL LOAD OF 50 POUNDS PER FOOT APPLIED TO THE TOP RAIL. IN ADDITION, GUARDRAILING AND HANDRAILING SHALL BE DESIGNED TO WITHSTAND A CONCENTRATED LOAD OF 200 POUNDS APPLIED IN ANY DIRECTION, AT ANY POINT ON THE RAILING SYSTEM. THE 200 POUND CONCENTRATED LOAD NEED NOT BE APPLIED SIMULTANEOUSLY WITH THE 50 POUNDS PER FOOT UNIFORM HORIZONTAL LOAD.
- GUARDRAILING AND HANDRAILING SHALL BE DESIGNED AND FABRICATED IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
- EXPANSION ANCHORS FOR GUARDRAILING AND HANDRAILING SHALL BE STAINLESS STEEL, HILTI "KWIK-BOLT II", ITW RAMSET/REDHEAD "TRUBOLT WEDGE ANCHOR", OR POWERS RAWL "RAWL-STUD ANCHOR".
- ADHESIVE ANCHORS FOR GUARDRAILING AND HANDRAILING SHALL BE STAINLESS STEEL, HILTI "HIT HY 150 SYSTEM" OR ITW RAMSET/REDHEAD "EPOXON CERAMIC 6 SYSTEM", POWERS RAWL "POWER-POST EPOXY INJECTION GEL SYSTEM".
- GUARDRAIL MAY BE REPLACED WITH WALL MOUNTED HANDRAIL AT STAIR EDGES AND STRINGERS LOCATED ADJACENT TO WALLS. IF THE OUTSIDE EDGE OF THE STAIR STRINGER IS MORE THAN 3" FROM THE WALL FACE, GUARDRAIL SHALL BE USED.
- THE INBOARD GUARDRAILING AT SWITCHBACK STAIR LANDINGS MUST BE CONTINUOUS FROM ONE STAIR RUN TO THE NEXT. ADJUST INDICATED DIMENSION AS REQUIRED TO ALIGN AND CONNECT RAILINGS OVER THE LANDING EDGE.
- THE GUARDRAIL AND HANDRAIL CONFIGURATIONS ON THIS SHEET WILL NOT COMPLETELY SATISFY ADA REQUIREMENTS FOR HANDICAPPED ACCESSIBILITY. AT LOCATIONS ON THE DESIGN DRAWINGS WHERE CONFORMANCE WITH ADA REQUIREMENTS IS SPECIFICALLY NOTED, THE RAILING SUPPLIER SHALL MODIFY THE CONFIGURATIONS TO COMPLY WITH THE MOST STRINGENT REQUIREMENTS OF ANSI 117.1 UNIFORM FEDERAL ACCESSIBILITY STANDARDS AND THE ACCESSIBILITY STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
- REMOVABLE RAILING-AT LOCATIONS SPECIFICALLY INDICATED AS REMOVABLE RAILING, GUARDRAILING AND MOUNTING DETAILS SHALL BE MODIFIED AS FOLLOWS:
 - RAILING SHALL BE DETAILED IN SHORT LENGTHS THAT CAN BE LIFTED BY ONE MAN. EACH PIECE SHALL INCLUDE AT LEAST 2, BUT NOT MORE THAN 3 POSTS. RAIL ENDS SHALL BE TERMINATED SIMILAR TO THE END TERMINATION DETAILS THIS SHEET.
 - MOUNTING DETAILS SHALL BE MODIFIED TO PERMIT RAILING PIECES TO BE REMOVED AND REINSTALLED WITHOUT USE OF TOOLS.

NOTE: SIDE MOUNTS SHALL BE SUITABLE FOR THE INDICATED LOADS AND APPLICABLE BUILDING CODE. FOR REMOVAL RAILING SEE NOTE 10.

NOTE: OFFSET SIDE MOUNTS SHALL BE SUITABLE FOR THE INDICATED LOADS AND APPLICABLE BUILDING CODE. FOR REMOVAL RAILING SEE NOTE 10.

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
GaitHERSburg, Maryland

REG. PROF. ENGR. DATE

STATE OF MARYLAND
ROBERT J. RECTANUS JR.
No. 29227
REGISTERED PROFESSIONAL ENGINEER

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

GENERAL MECHANICAL

MISCELLANEOUS DETAILS

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

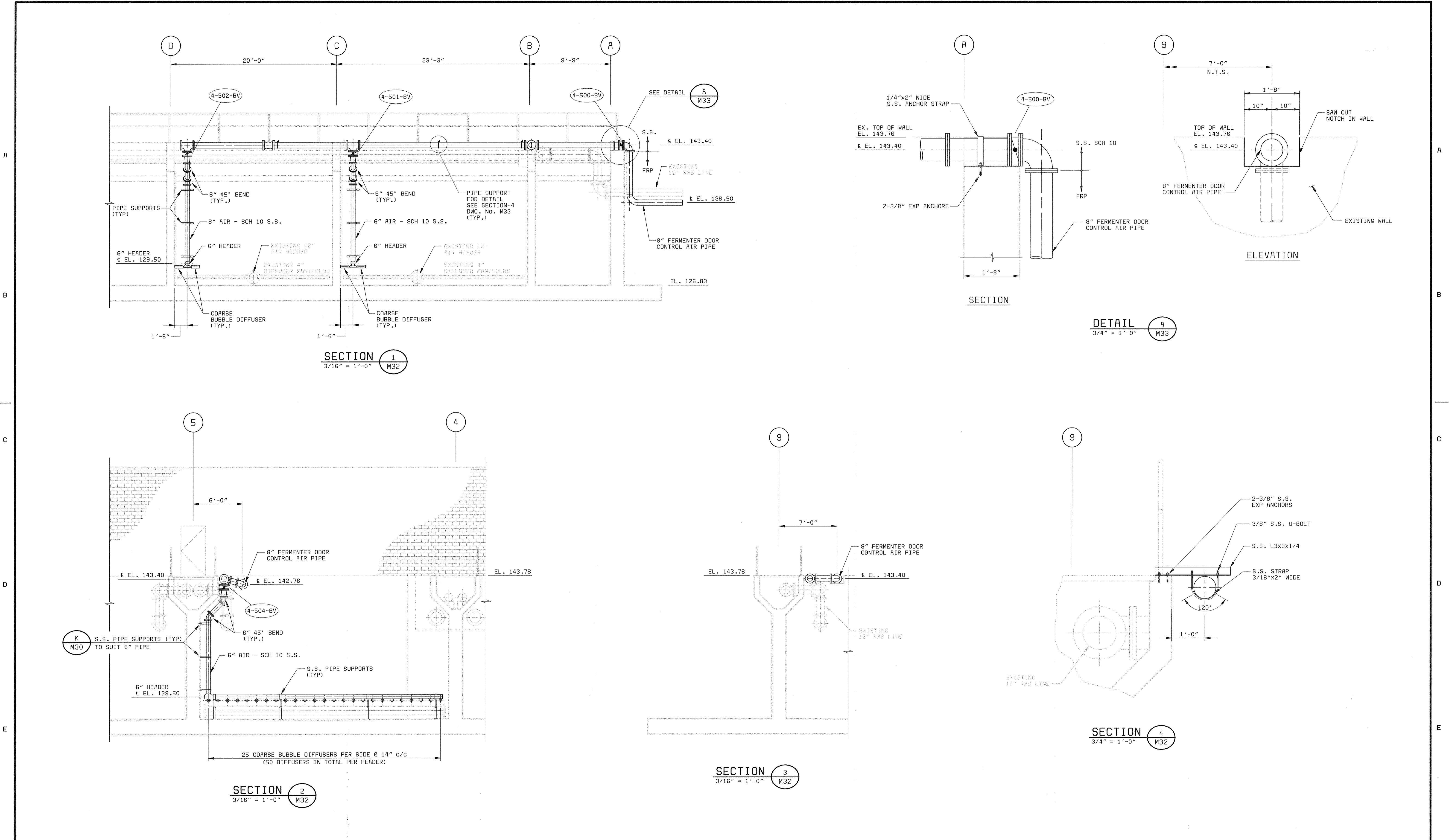
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 97 OF 161

M31



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

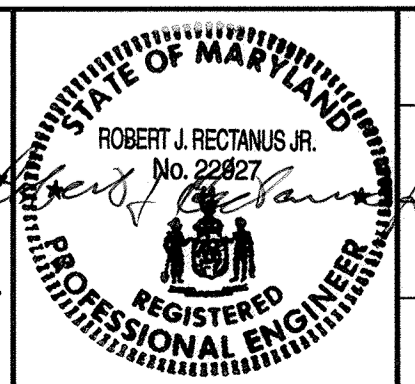
Robert J. Rectanus, Jr.
CHIEF, BUREAU OF UTILITIES DATE

Stantec

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

BLACK & VEATCH LLP
Gaithersburg, Maryland

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



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

EAST-WEST PROCESS REACTOR MECHANICAL

ODOR CONTROL AIR PIPING SECTIONS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 99 OF 161

M33

058472
F058472R

ABBREVIATIONS

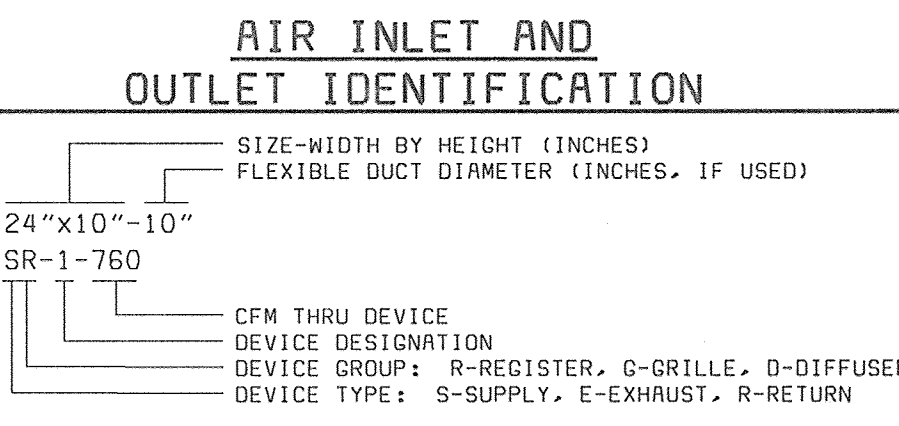
Table of abbreviations for plumbing and HVAC systems, including terms like ALARM, COMPRESSED AIR OUTLET, AIR COMPRESSOR, etc.

GENERAL MECHANICAL NOTES

- 1. THIS IS A GENERAL LEGEND AND ABBREVIATION SHEET FOR PLUMBING AND HVAC DRAWINGS...
2. FOR ROOFTOP EQUIPMENT CURB, FLUES, AND FLASHING DETAILS, SEE ARCHITECTURAL DRAWINGS...
3. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL EQUIPMENT BASE DETAILS...

LEGEND

Legend section containing symbols and descriptions for GENERAL, PIPE FITTINGS, VALVES, HVAC, PLUMBING, SPECIAL, WASTE, ODOR CONTROL, WATER, and FIRE PROTECTION.



DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

BLACK & VEATCH, L.P. Galithersburg, Maryland

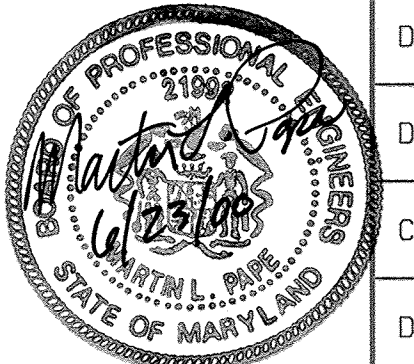
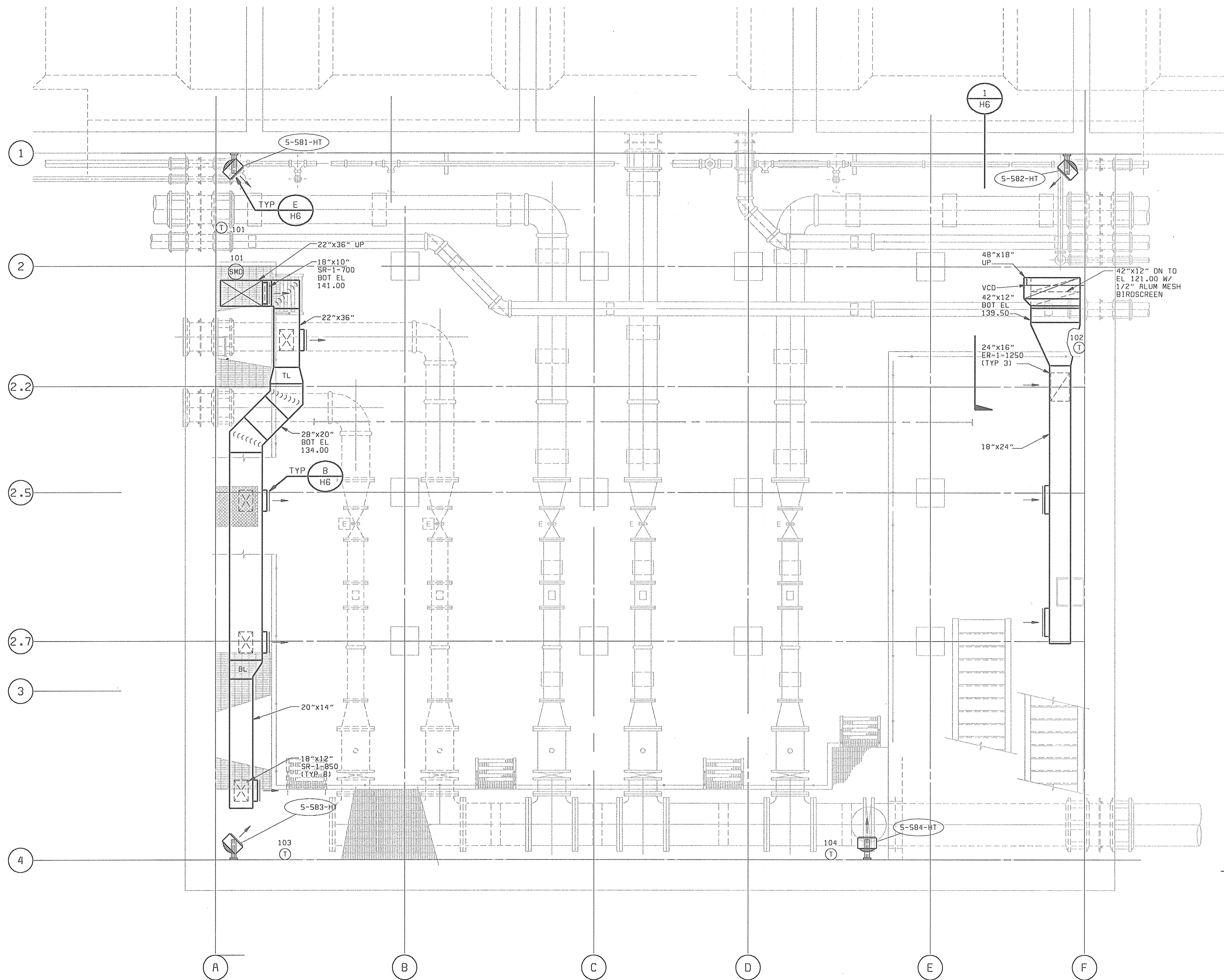
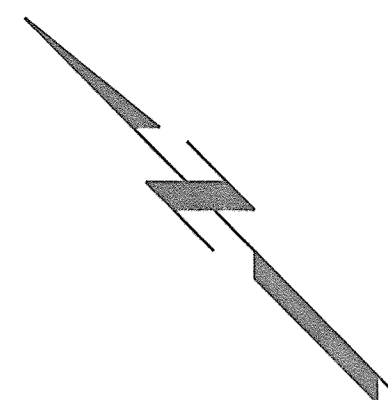


Table with project details: DES: GWP.HX, DRN: BDL.LDW, CHK: JEP, DATE: 6/23/00, and a table for REVISIONS AND RECORD OF ISSUE.

HVAC/PLUMBING NORTH BASIN COMPLEX LEGEND, ABBREVIATIONS, AND GENERAL NOTES

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

SCALE AS SHOWN SHEET 100 of 161 H1



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

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

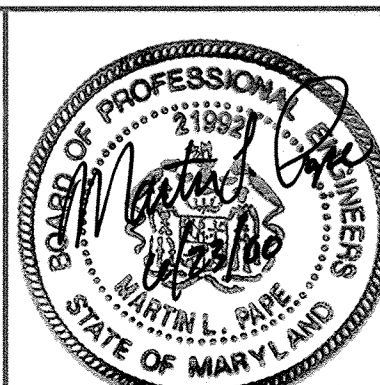
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Robert Benning 6-29-00
 CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
 Goithsburg, Maryland

Martin J. Pope 6/23/00
 REG. PROF. ENGR. DATE



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

HVAC
 NORTH BLOWER BUILDING

BASEMENT PLAN

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

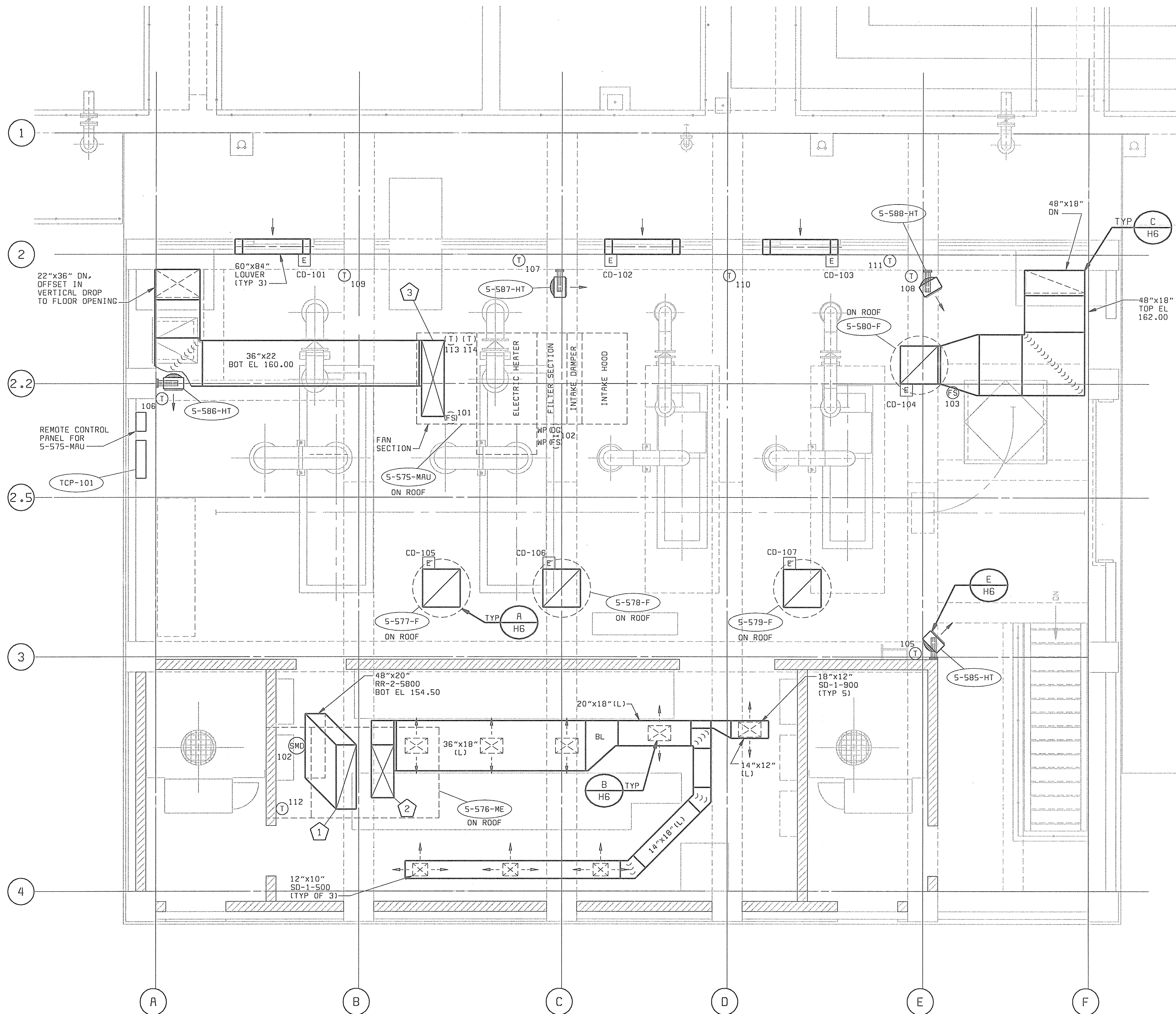
CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
 AS
 SHOWN

SHEET
 101 OF 161

H2



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

GENERAL NOTES:

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

PLAN NOTES:

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

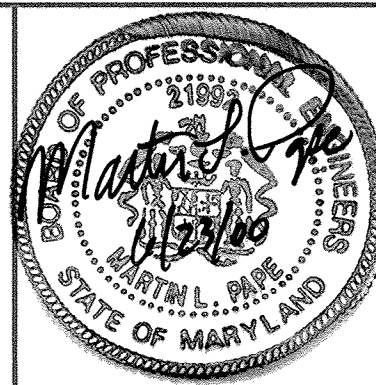
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XREF: 58472-101-PR-R0000550

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

Martin J. Gyo 6/23/00
REG. PROF. ENGR. DATE



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

HVAC
NORTH BLOWER BUILDING

OPERATING FLOOR PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
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102 OF 161

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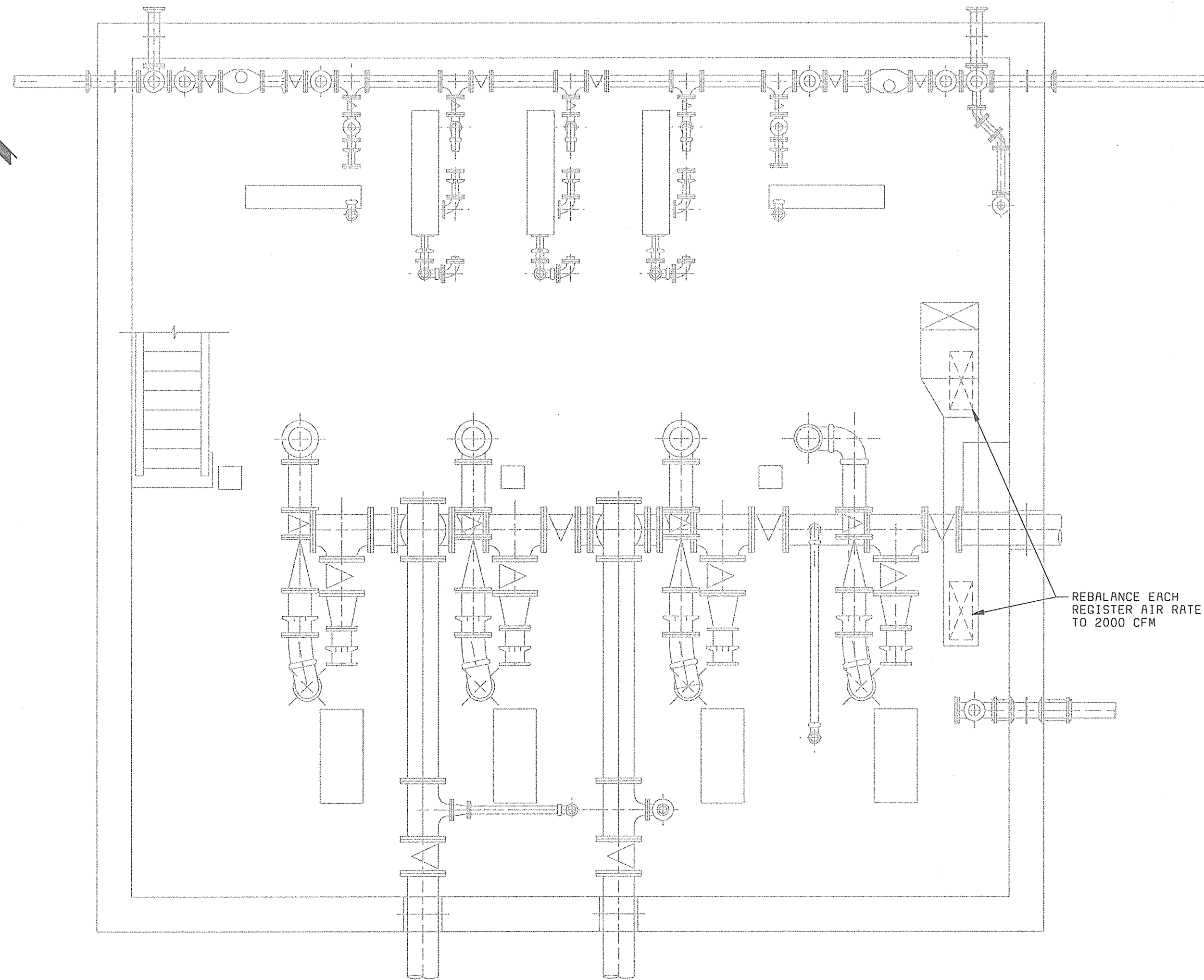
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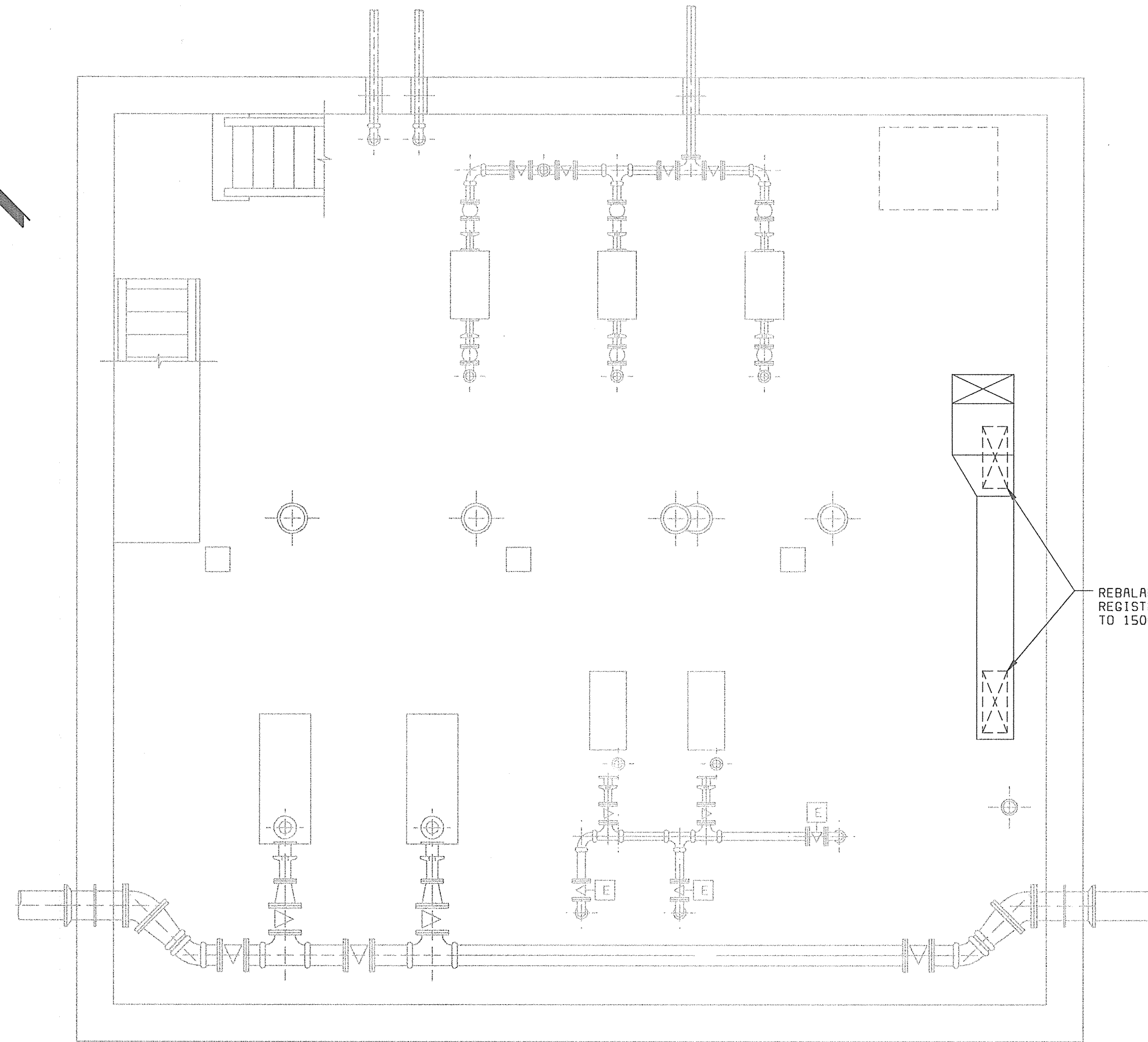
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E

F



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



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

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

06/23/00
 PDSB472R

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
 Gaithersburg, Maryland

Master of Science 6/23/00
 REG. PROF. ENGR. DATE



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

HVAC
 NORTH GALLERY

 LOWER LEVEL FLOOR AND
 UPPER LEVEL FLOOR PLANS

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

 CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

 HOWARD COUNTY, MARYLAND

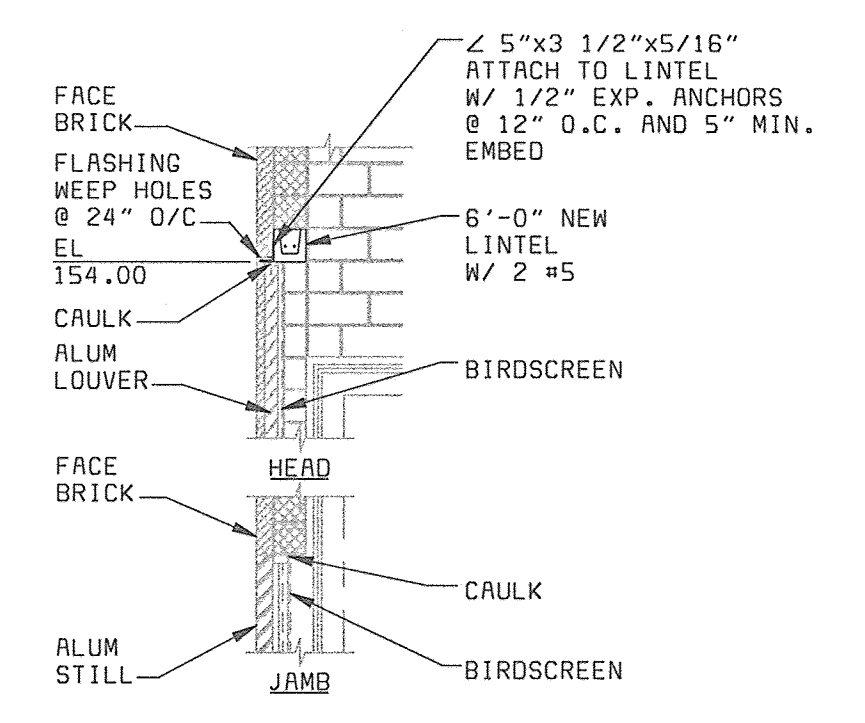
SCALE
 AS
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 SHEET
 103 OF 161

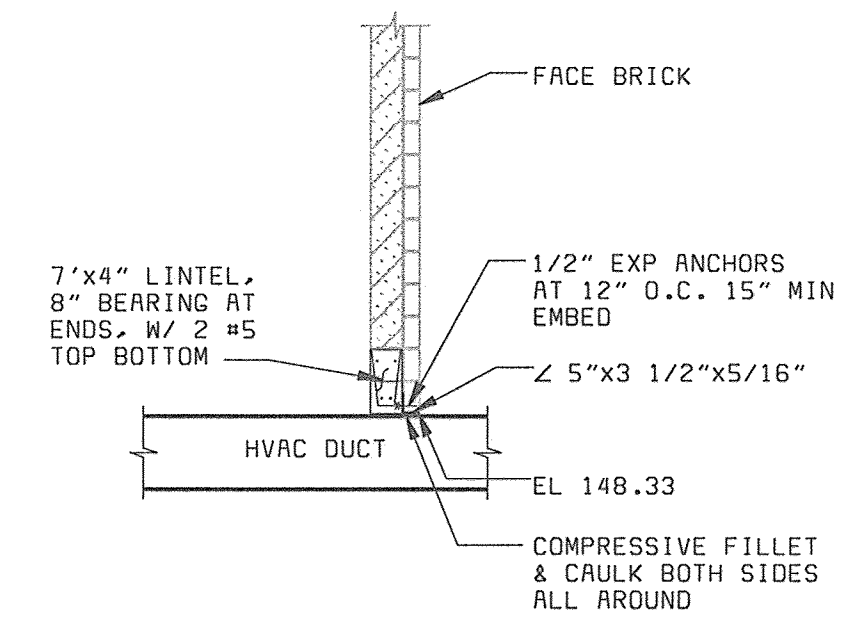
H4

A
B
C
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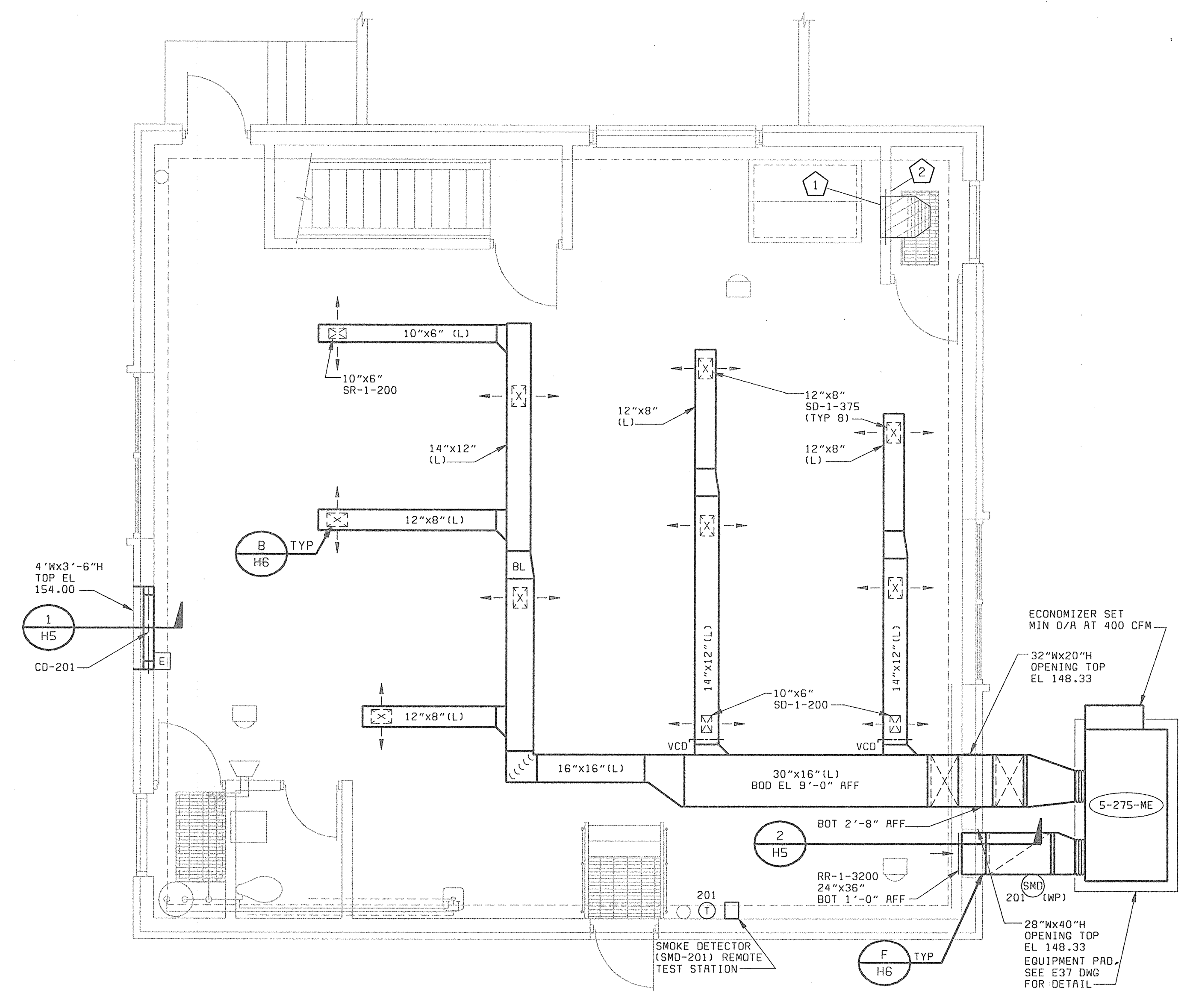
A
B
C
D



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



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



PLAN EL 144.00
1/4" = 1'-0"

GENERAL NOTES:

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

PLAN NOTES:

- 1 REMOVE EXISTING 24"x24" REGISTER, DUCT, DUCT HEATER AND FAN. FILL THE WALL OPENING WITH MASONRY BLOCKS TO MATCH EXISTING WALL.
- 2 6" MASONRY WALL.

XREF: 58472-106-RSPS-E-R0000674

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

Matthew ...
REG. PROF. ENGR. DATE: 6/23/00



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

HVAC
NORTH GALLERY

OPERATING LEVEL

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

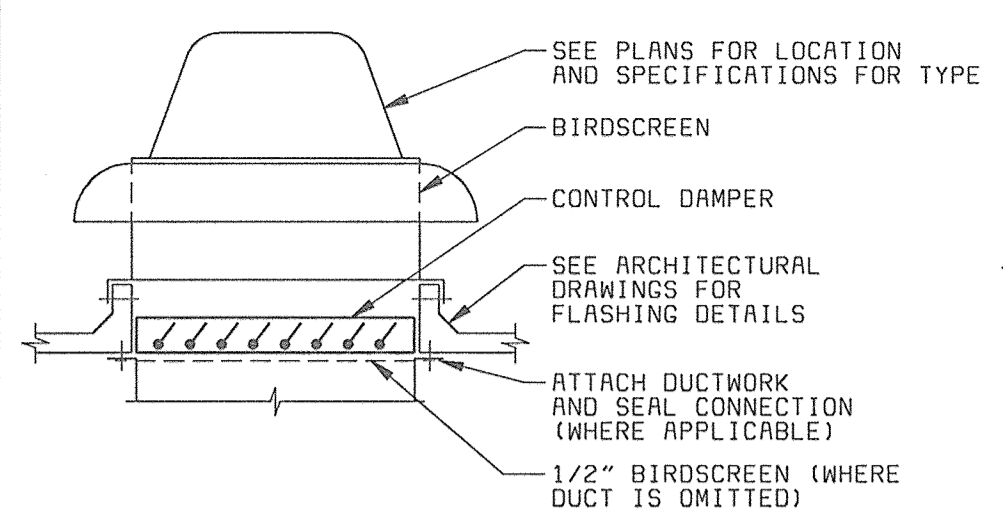
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

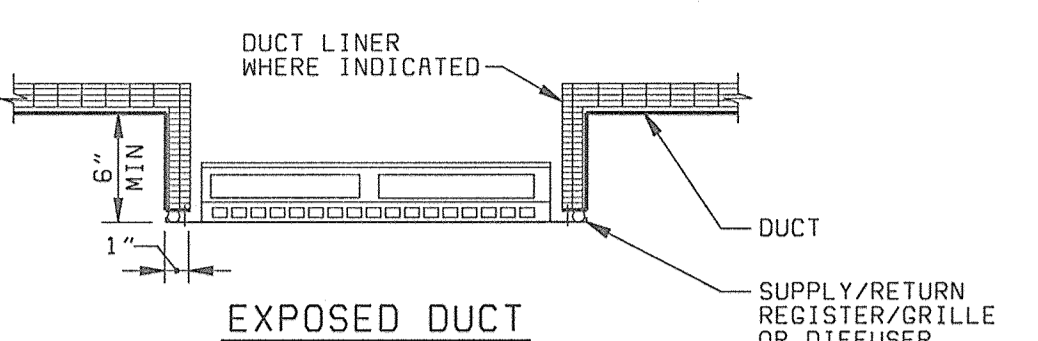
SCALE
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104 OF 161

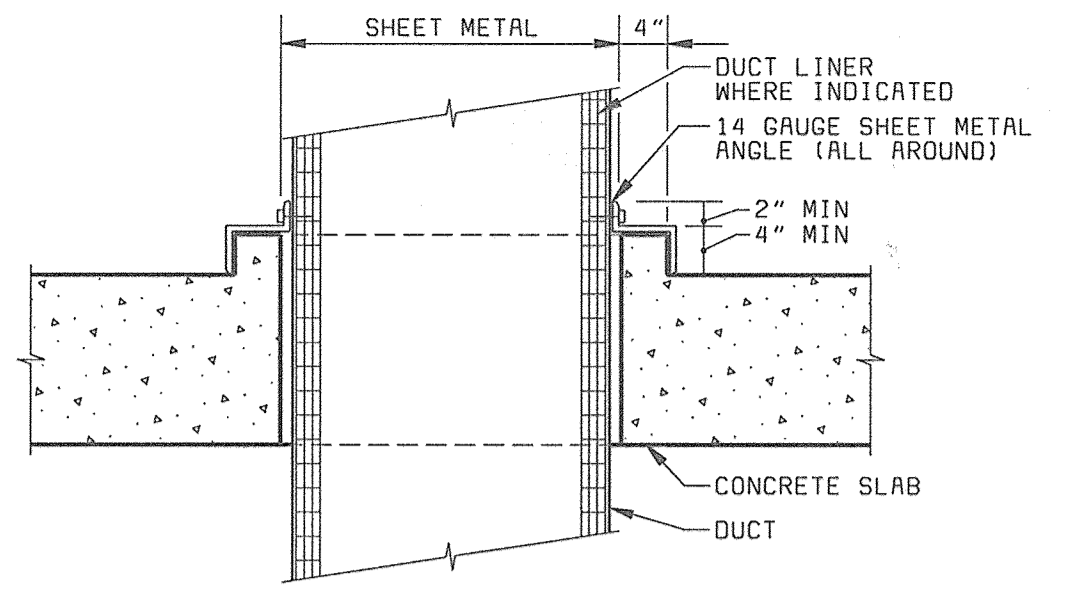
H5



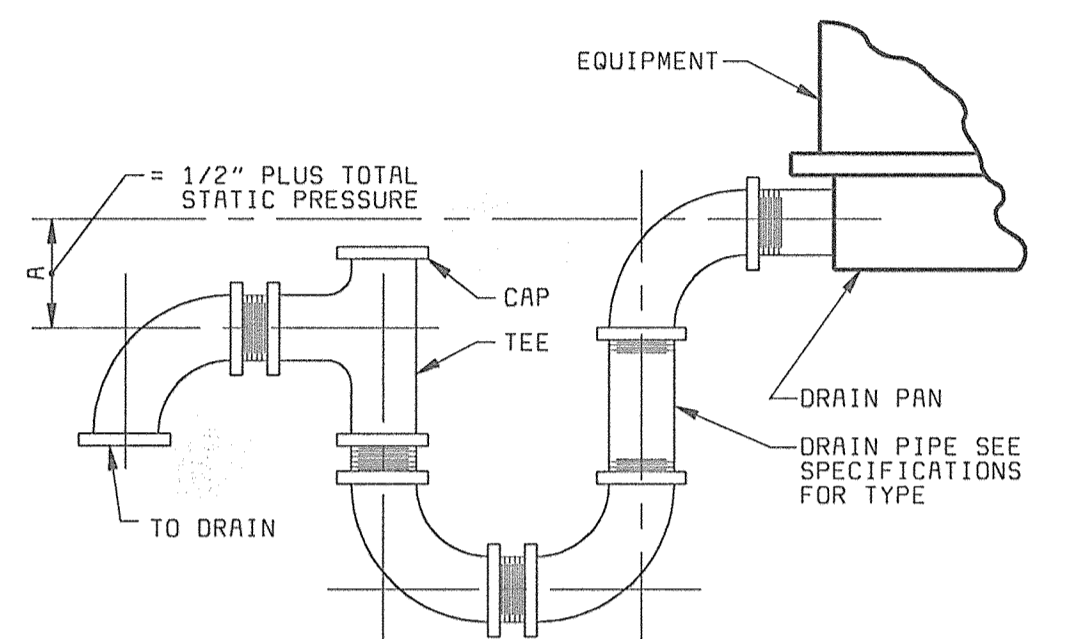
POWER ROOF VENTILATOR (A)
 NO SCALE (H3)



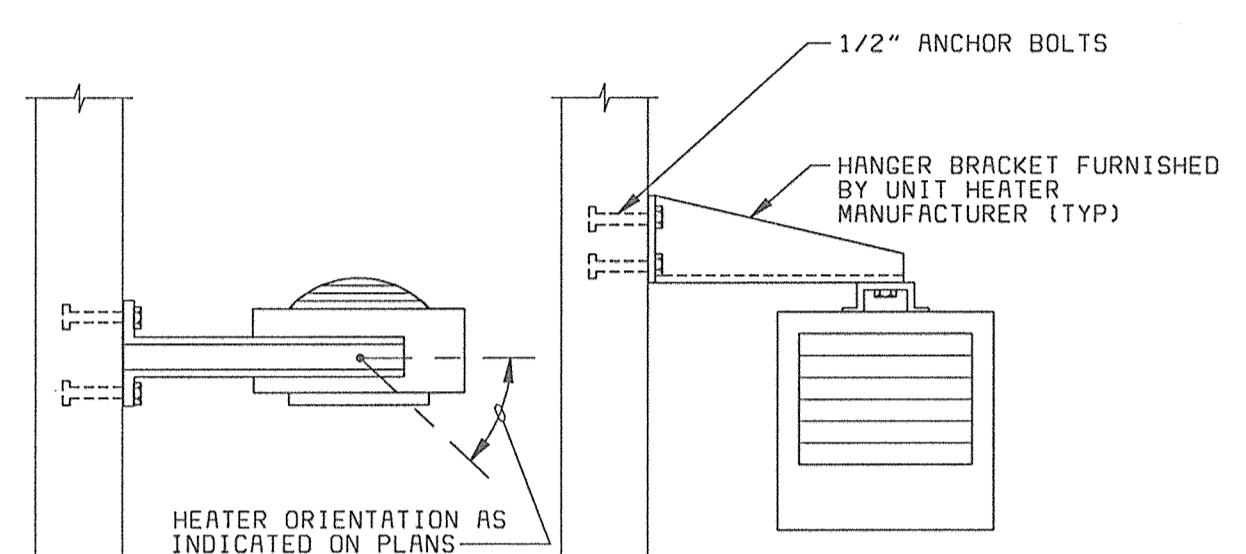
REGISTER/GRILLE (B)
 NO SCALE (H2, H3, H5)



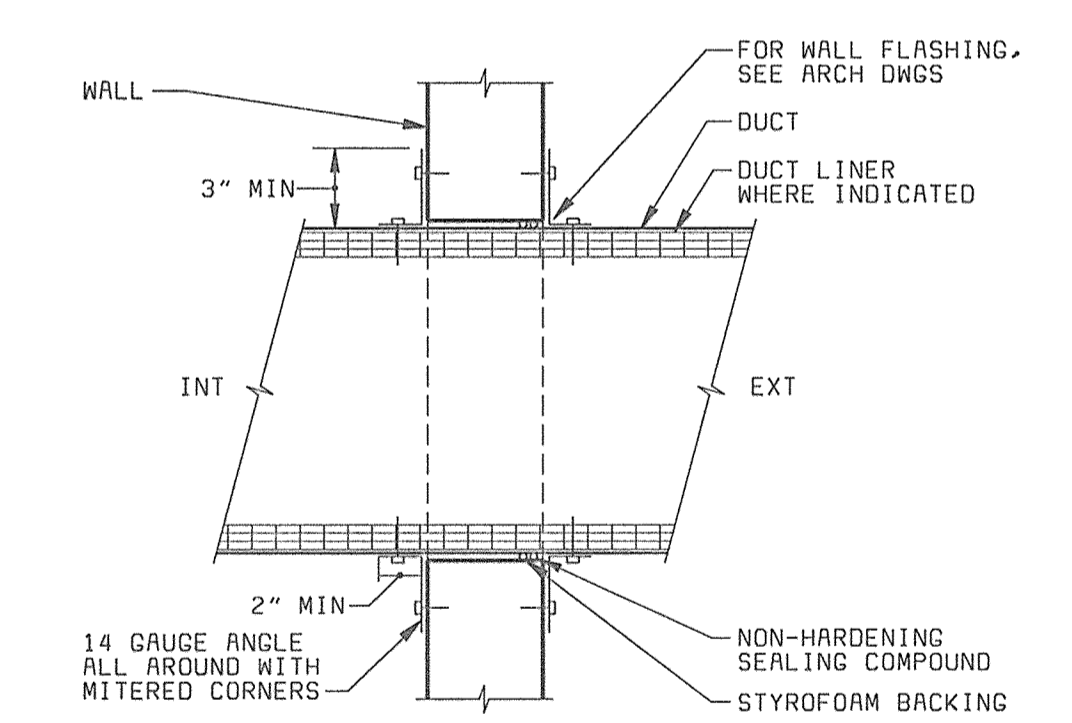
DUCT FLOOR SLEEVE (C)
 NO SCALE (H3)



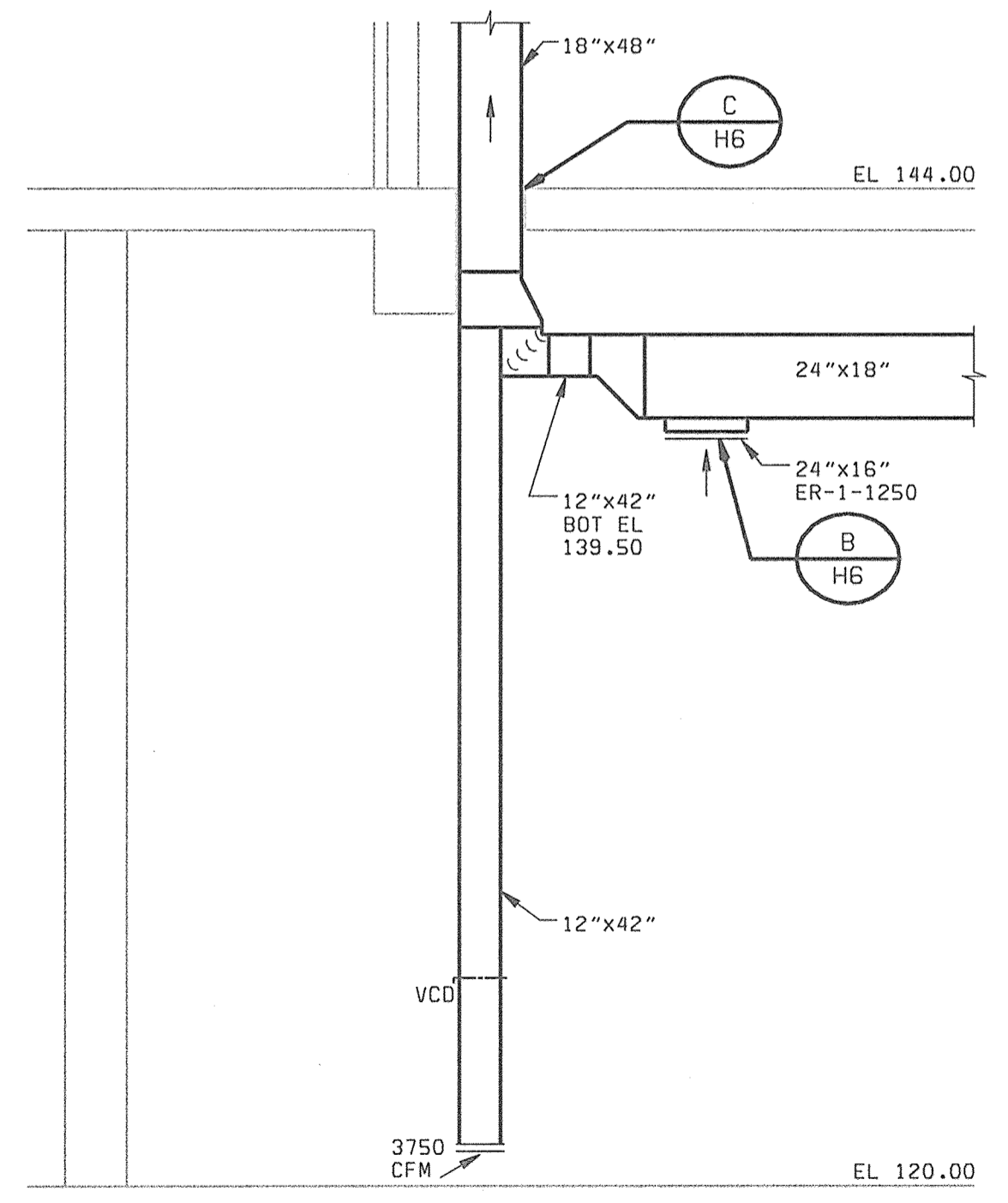
DRAIN PAN TRAP (D)
 NO SCALE (H3, H5)



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



WALL PENETRATION (F)
 NO SCALE (H5)



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

AIR OUTLET & INLET DEVICE SCHEDULE

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

NOTES: 1. EQUIPMENT SCHEDULE MODEL NUMBERS BASED ON TITUS COMPANY
 2. ALL DIFFUSER CORE STYLES ARE 4-WAY UNLESS OTHERWISE INDICATED ON THE PLANS

FAN SCHEDULE

| UNIT NO | LOCATION | AIRFLOW (CFM) | ESP (IN WG) | MOTOR HP | POWER SUPPLY VOLTS/PHASE | MIN WHEEL DIA (IN) | DRIVE | APPROX WT (LBS) | REMARKS |
|---------|-------------|---------------|-------------|----------|--------------------------|--------------------|-------|-----------------|---------|
| 5-577-F | BLOWER BLDG | 9600 | 0.375 | 3 | 480/3 | 30 | B | 210 | 1,3 |
| 5-578-F | BLOWER BLDG | 9600 | 0.375 | 3 | 480/3 | 30 | B | 210 | 1,3 |
| 5-579-F | BLOWER BLDG | 9600 | 0.375 | 3 | 480/3 | 30 | B | 210 | 1,3 |
| 5-580-F | BLOWER BLDG | 7500 | 0.5 | 2 | 480/3 | 30 | B | 210 | 1,3 |

DRIVE NOTES: D - DIRECT
 B - BELT

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

HEATER SCHEDULE

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

MAKEUP AIR UNIT SCHEDULE

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

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

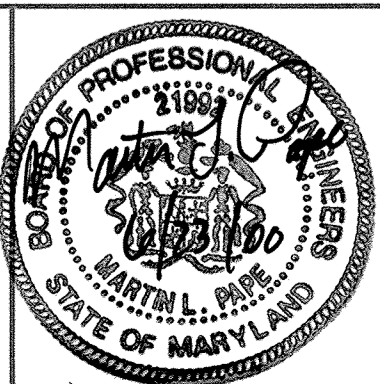
PACKAGED AIR CONDITIONING UNIT SCHEDULE

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

NOTES: 1. OUTDOOR COIL ENTERING AIR TEMPERATURE: COOLING - 95 F
 2. THE EQUIPMENT SHALL HAVE A MINIMUM EFFICIENCY AT THE ARI STANDARD RATING CONDITIONS OF NOT LESS THAN THE FOLLOWING: 9.0 EER
 3. BOTH UNITS SHALL HAVE 2 CAPACITY STEP REDUCTIONS.
 REMARKS: (1) PROVIDE ECONOMIZER PACKAGE WITH DRY BULB CONTROLLER AND POWER EXHAUST (0.75 HP).
 (2) PROVIDE LOW AMBIENT COOLING PACKAGE.
 (3) PROVIDE ECONOMIZER PACKAGE WITH DRY BULB CONTROLLER.

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

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



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

HVAC
NORTH BASIN COMPLEX
DETAILS, SECTION AND SCHEDULES

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

SCALE AS SHOWN
 SHEET 105 OF 161
H6

HVAC - SEQUENCE OF OPERATIONS

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

HVAC SEQUENCE OF OPERATIONS NOTES:

1. CONTROL SWITCH TYPE

THE FOLLOWING CONTROL SWITCH TYPE ABBREVIATIONS SHALL APPLY TO THE SEQUENCE OF OPERATIONS:

- O-O ON-OFF
- O-O-A ON-OFF-AUTO
- UFT UNIT FURNISHED THERMOSTAT
- ECP EQUIPMENT CONTROL PANEL

2. CONTROL SWITCH LOCATION

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

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

3. AUTOMATIC CONTROL

WHEN THE CONTROL SWITCH IS PLACED IN THE AUTO POSITION, THE EQUIPMENT SHALL BE INTERLOCKED WITH THE INDICATED EQUIPMENT OR CONTROLLED BY THE INDICATED CONTROL DEVICE. THE EQUIPMENT SHALL DE-ENERGIZE WHEN THE AUTOMATIC CONTROL INTERLOCK EQUIPMENT IS DE-ENERGIZED.

4. CONTROL DAMPER INTERLOCKS

UNLESS OTHERWISE INDICATED, THE CONTROL DAMPERS SHALL BE PROVEN OPEN BEFORE THE EQUIPMENT IS ALLOWED TO ENERGIZE AND CLOSE WHEN THE EQUIPMENT IS DE-ENERGIZED.

5. NOT USED

6. NOT USED

7. SMOKE DETECTOR INTERLOCK

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

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

8. HIGH FILTER

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

9. VENTILATION FAILURE

A DUCT MOUNTED DIFFERENTIAL PRESSURE SWITCH SHALL ENERGIZE A "VENTILATION FAILURE" INDICATING LIGHT ON THE FACE OF THE CONTROL PANEL TCP-101 WHEN THERE IS A LOSS OF VENTILATION AIRFLOW.

10. THERMOSTATS - ROOM

THE ROOM THERMOSTAT SHALL ENERGIZE THE PIECE OF EQUIPMENT TO MAINTAIN THE ROOM TEMPERATURE SETPOINT.

11. THERMOSTATS - LOW TEMPERATURE

IN THE EVENT THE DISCHARGE AIR FALLS BELOW THE LOW TEMPERATURE THERMOSTAT SETPOINT, THE EQUIPMENT SHALL DE-ENERGIZE AND A "LOW DISCHARGE AIR TEMPERATURE" INDICATING LIGHT ON THE FACE OF CONTROL PANEL TCP-101 SHALL BE ENERGIZED. INDICATION OF "LOW DISCHARGE AIR TEMPERATURE" SHALL BE SENT FROM THE CONTROL PANEL TCP-101 TO THE PLANT CONTROL SYSTEM. AN ADJUSTABLE 0 TO 60 SECOND TIME DELAY RELAY SHALL BE PROVIDED TO PREVENT NUISANCE SHUTDOWNS ON UNIT START UP DURING COLD WEATHER.

12. THERMOSTATS - SUPPLY

THE SUPPLY AIR THERMOSTAT LOCATED IN THE MAKEUP AIR UNIT SHALL MODULATE THE UNIT OUTPUT CAPACITY TO MAINTAIN THE SUPPLY AIR SETPOINT.

13. NOT USED

14. PACKAGED DRY-BULB ECONOMIZER CONTROLS

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

15. NOT USED

16. NOT USED

17. NOT USED

18. NOT USED

19. NOT USED

20. HEATERS

UNIT HEATERS SHALL BE CONTROLLED BY THEIR RESPECTIVE THERMOSTATS.

21. TEMPERATURE CONTROL PANEL

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

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



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

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

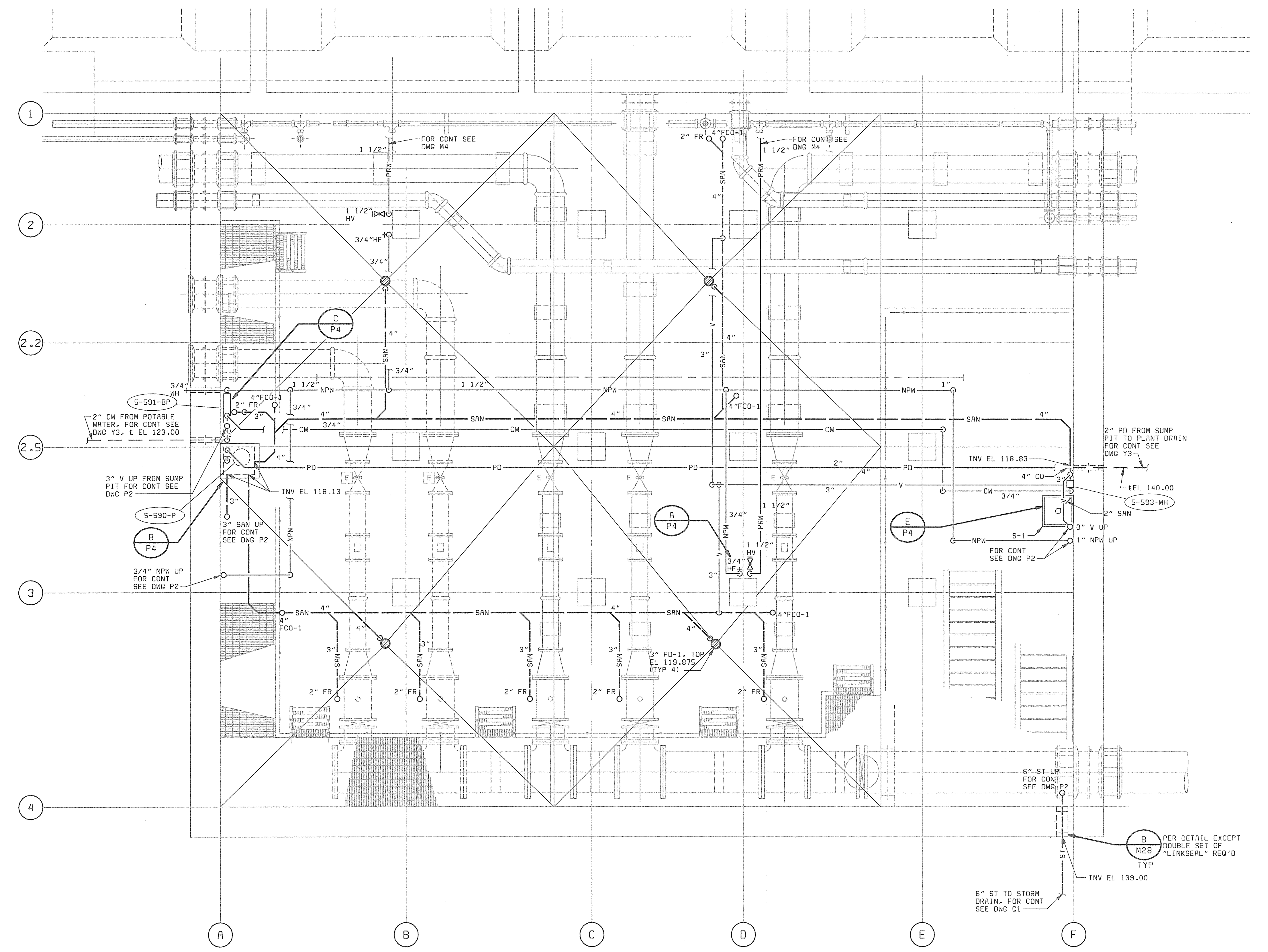
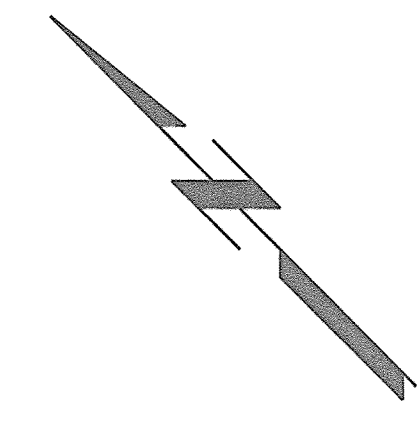
22. THERMOSTAT SETPOINTS

THERMOSTAT SETPOINTS SHALL BE AS FOLLOWS UNLESS INDICATED OTHERWISE.

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



| | | | | | |
|---|--|--|--|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND  BLACK & VEATCH Calithersburg, Maryland  Martin J. P... REG. PROF. ENGR. 6/23/00 | DES: GWP:HX DRN: BDL:LDW CHK: JEP DATE: 6/23/00 | DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP | HVAC NORTH BASIN COMPLEX SEQUENCE OF OPERATION | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 106 OF 161 H7 |
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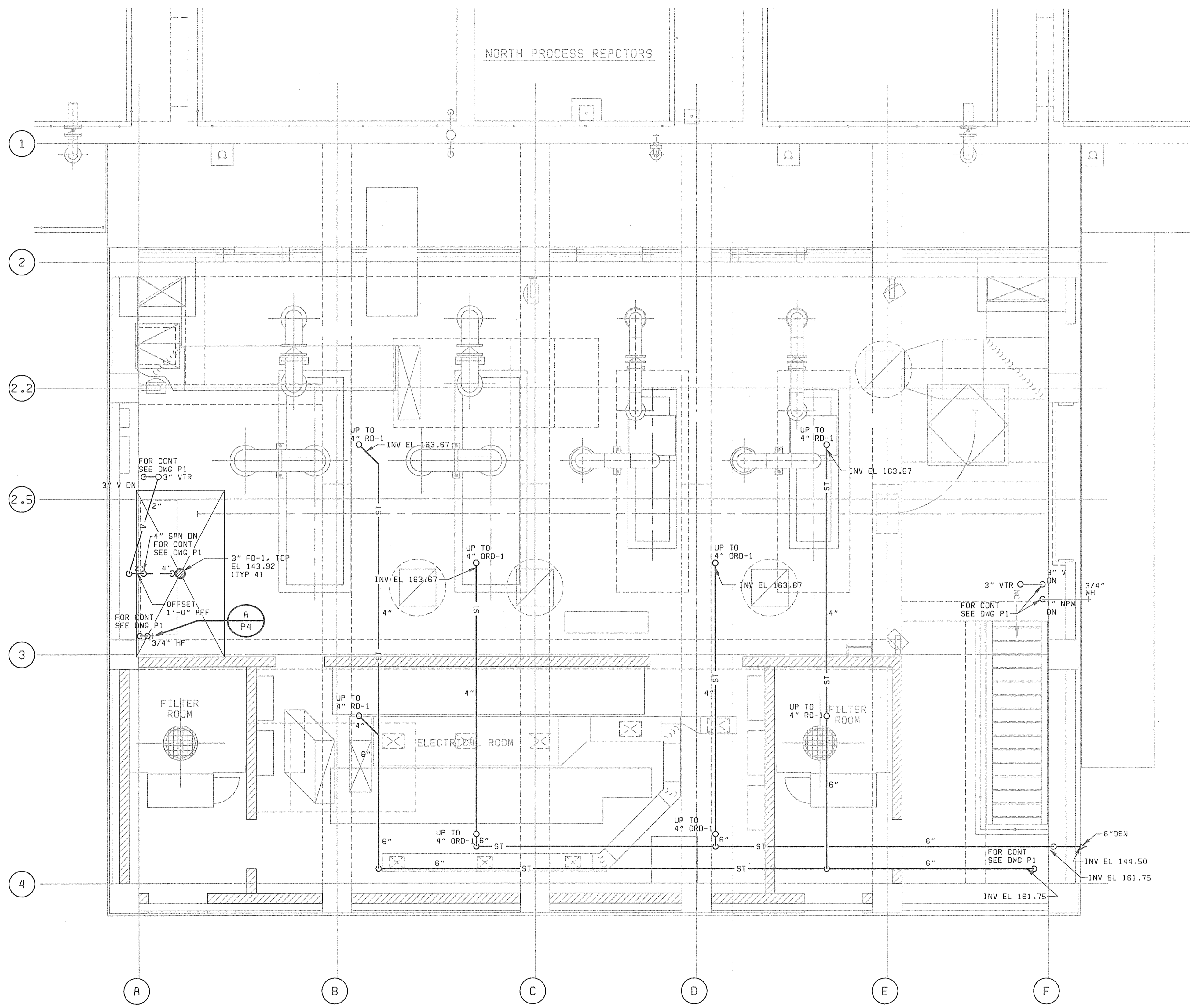
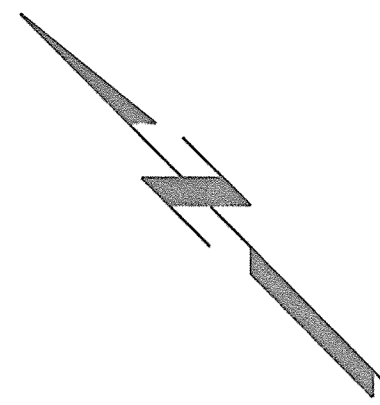
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BASEMENT PLAN
1/4" = 1'-0"

XREF: 58472-104-BB-PR-R0000656
 XREF: 58472-205-BB-PR-R0000556
 XREF: 58472-101-PR-R0000550

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|--|--|---|---|--|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert Berman</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE |  BLACK & VEATCH Galithersburg, Maryland <i>Math Drape</i> REG. PROF. ENGR. DATE 6/23/00 |  | DES: JPC DRN: JPC CHK: DWN DATE: 6/23/00 | PLUMBING NORTH BLOWER BUILDING BASEMENT PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 107 OF 161 P1 |
| REVISIONS AND RECORD OF ISSUE | | | | NO. BY CK APP | | |



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

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

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Robert J. Bannister 6-29-07
 CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
 Gaithersburg, Maryland

Martin J. Pope 6/23/00
 REG. PROF. ENGR. DATE



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

PLUMBING
 NORTH BLOWER BUILDING

OPERATING FLOOR PLAN

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

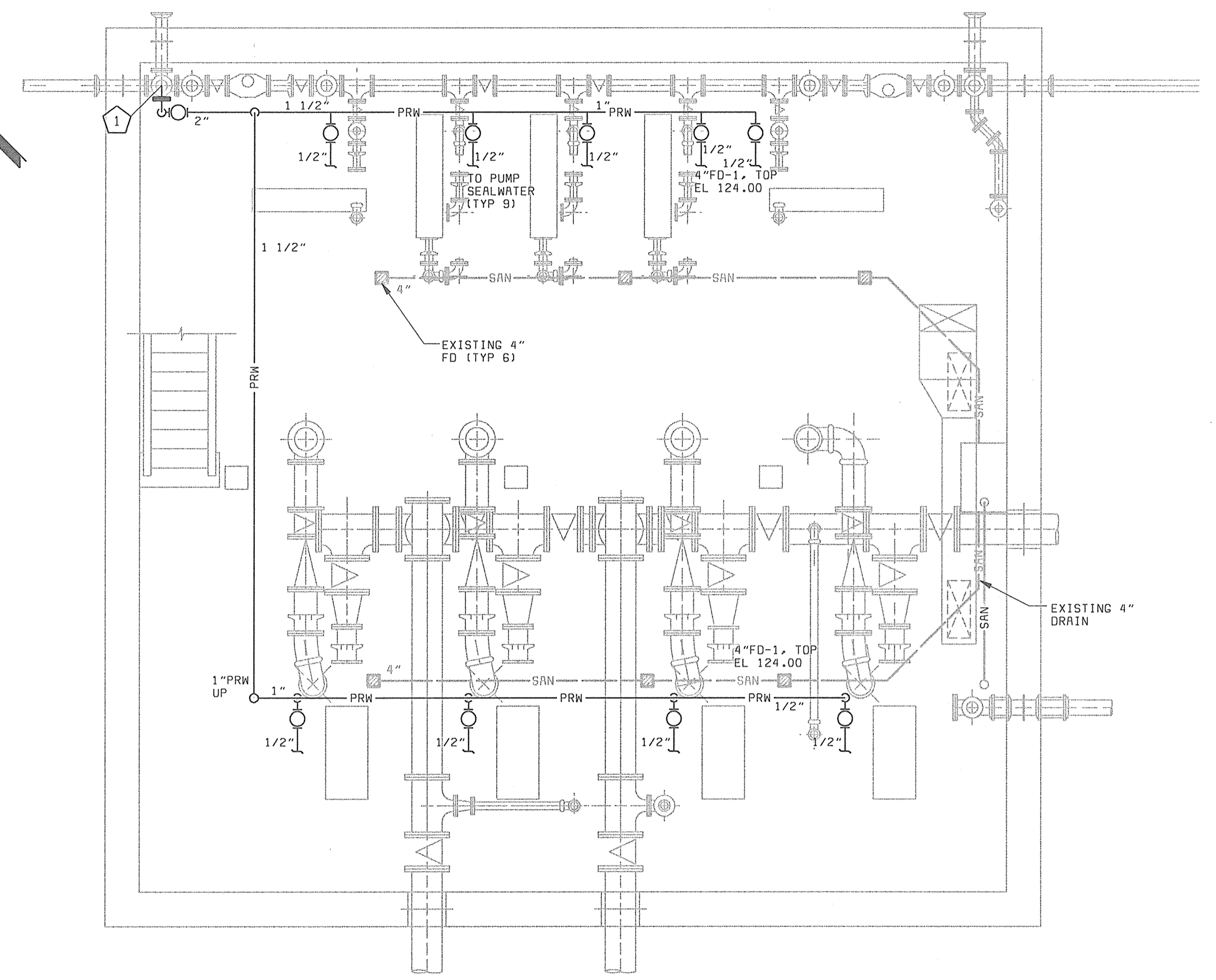
CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

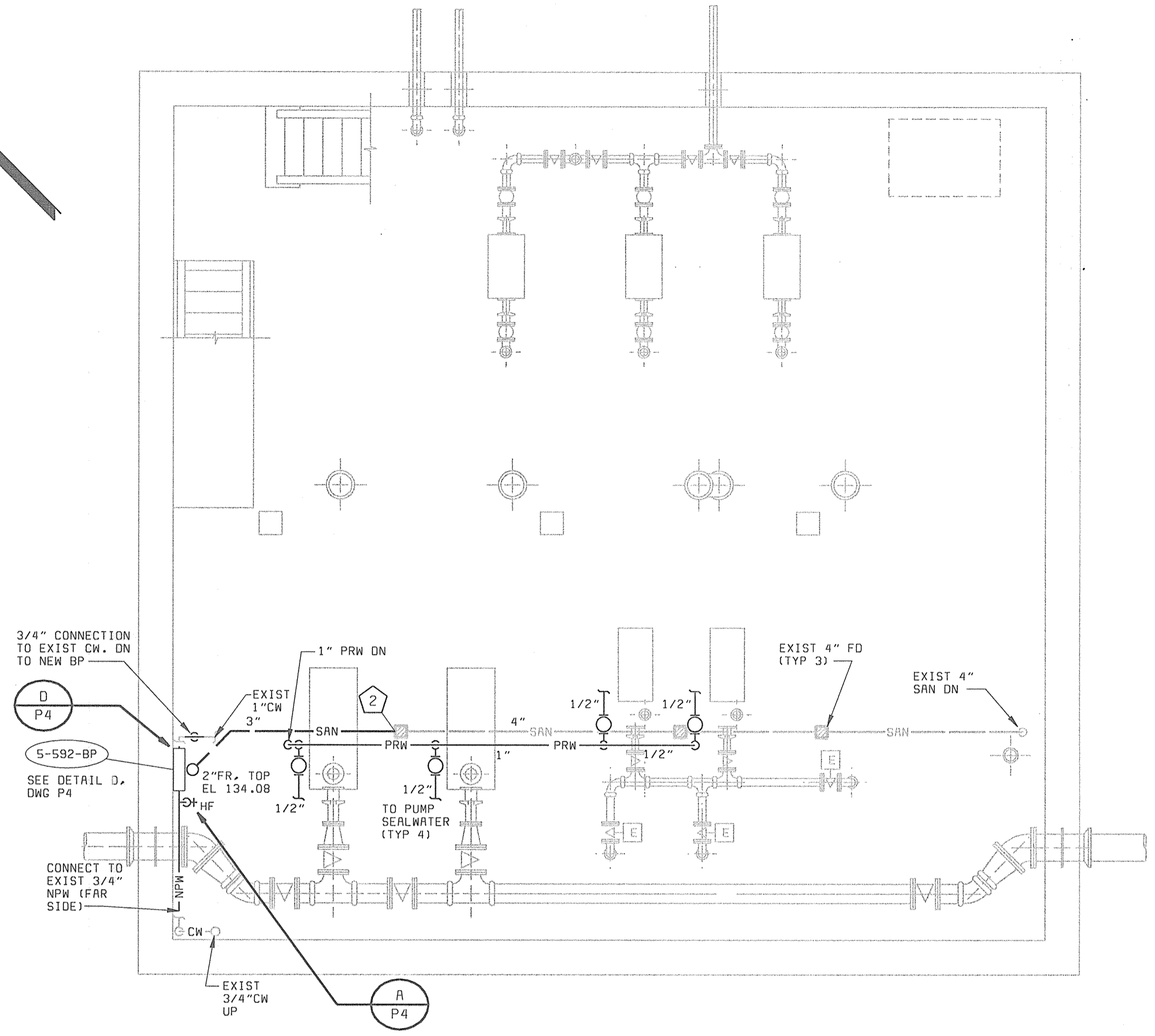
SCALE
 AS
 SHOWN

SHEET
 108 OF 161

P2



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



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

PLAN NOTES:

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

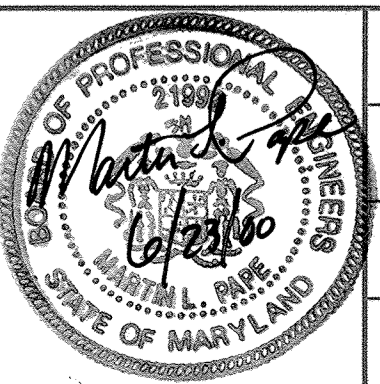
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XREF: 58472-101-ASPS-W-A0000180

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
GaitHERSburg, Maryland

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



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

PLUMBING
NORTH GALLERY

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

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

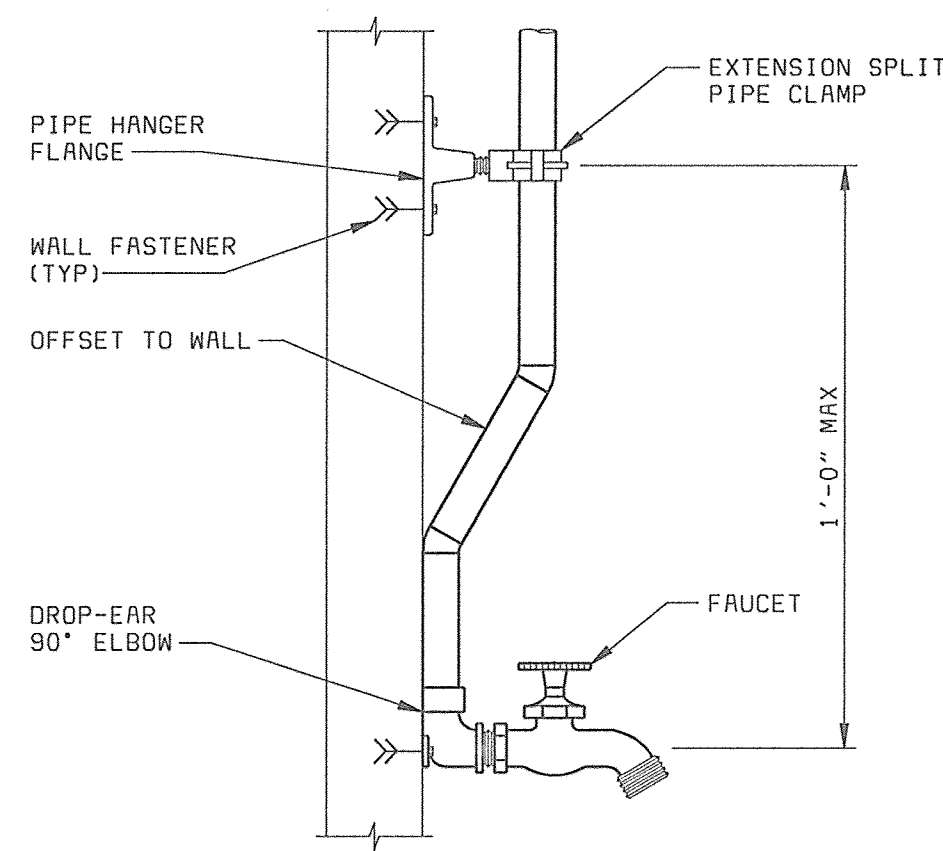
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
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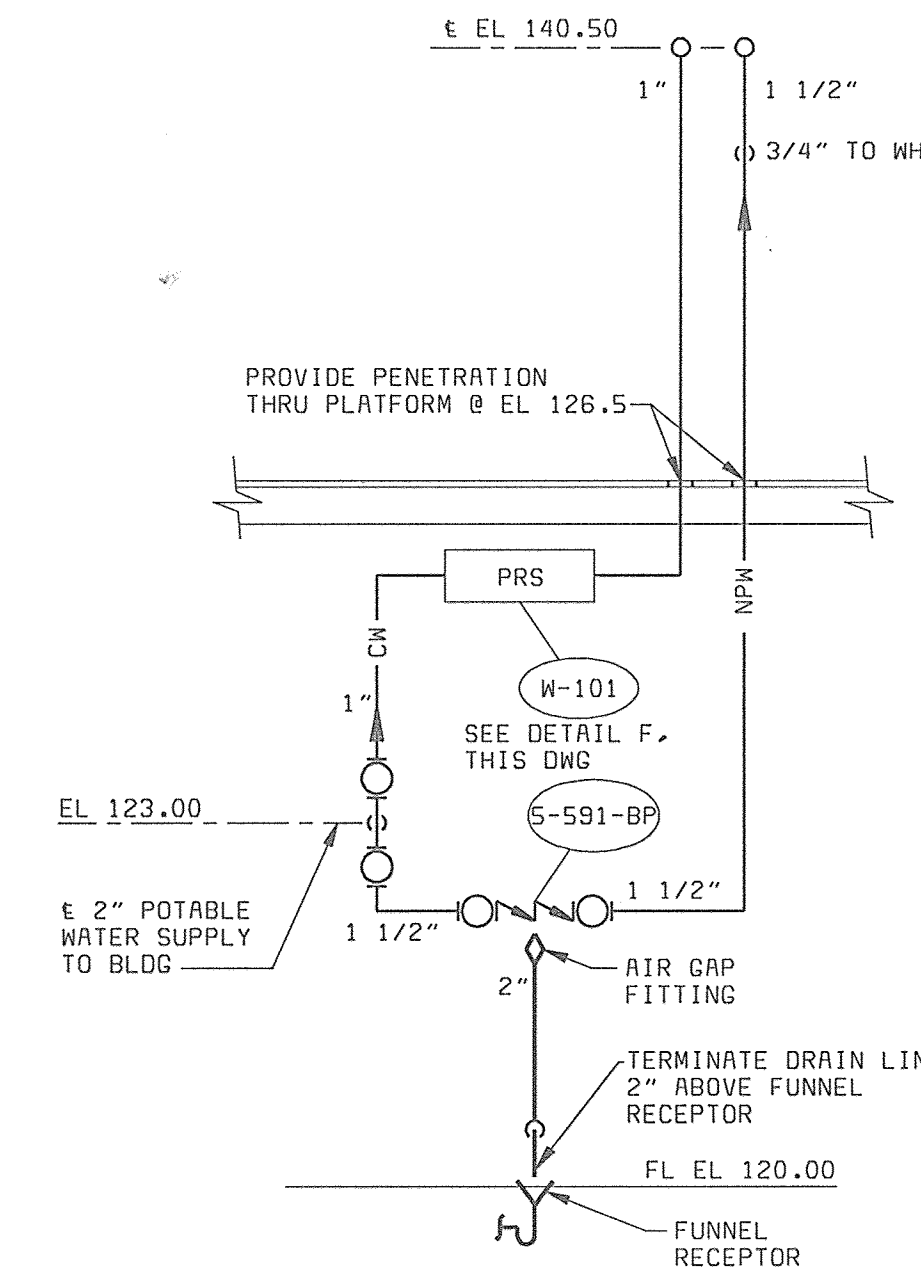
SHEET
109 OF 161

P3



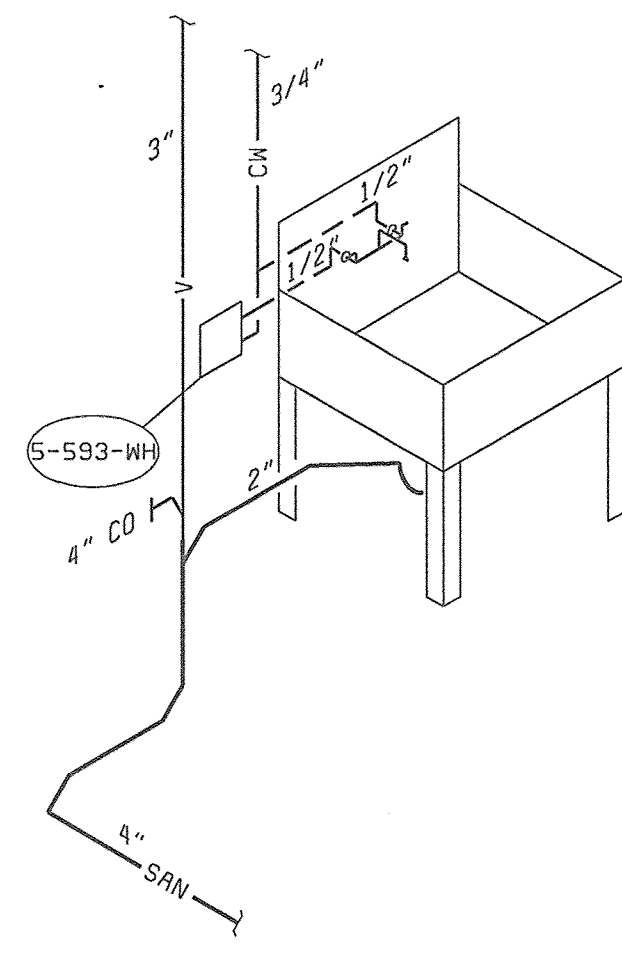
HOSE FAUCET PIPE MOUNTING DETAIL A

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



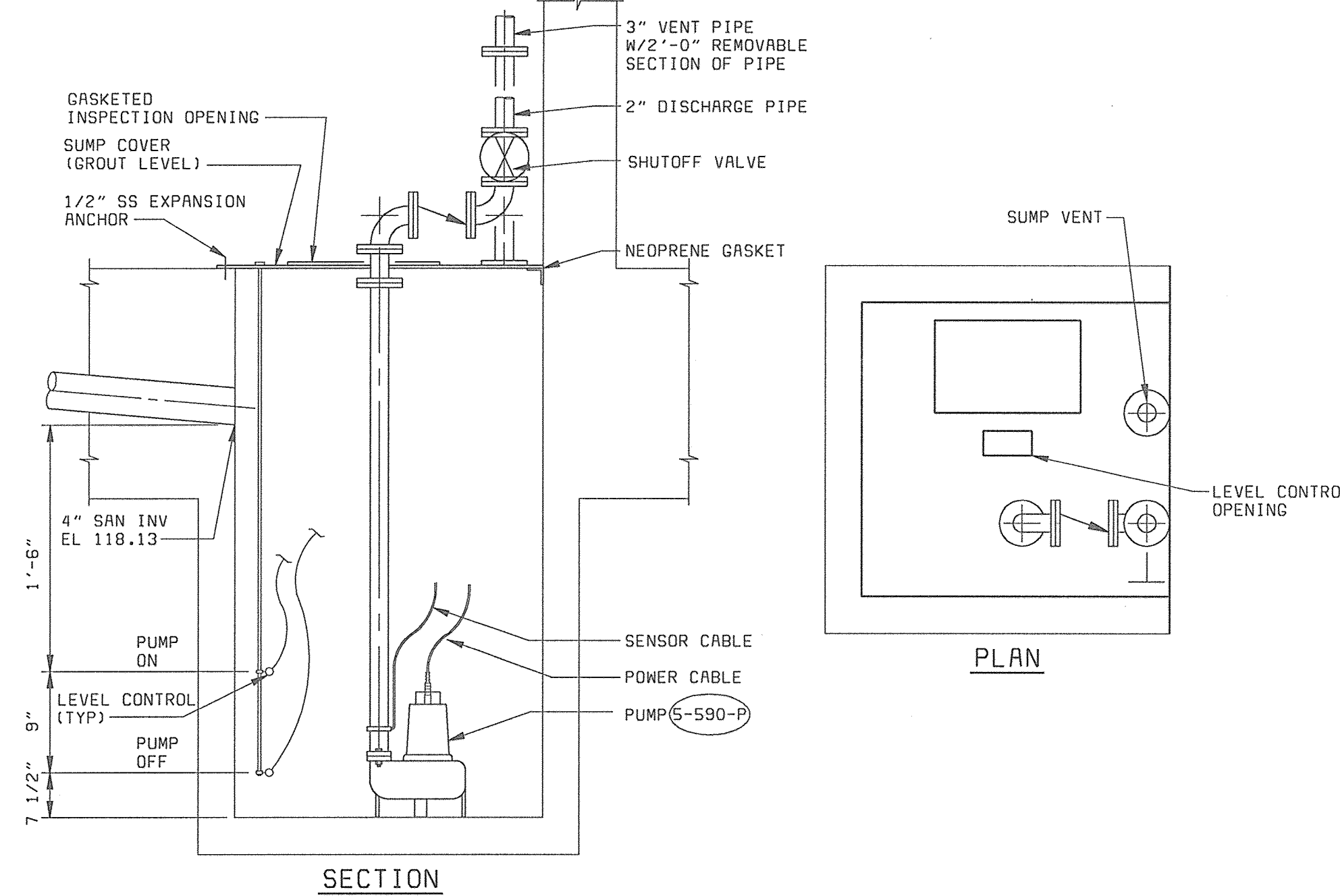
BLOWER BUILDING WATER SUPPLY SCHEMATIC C

NO SCALE



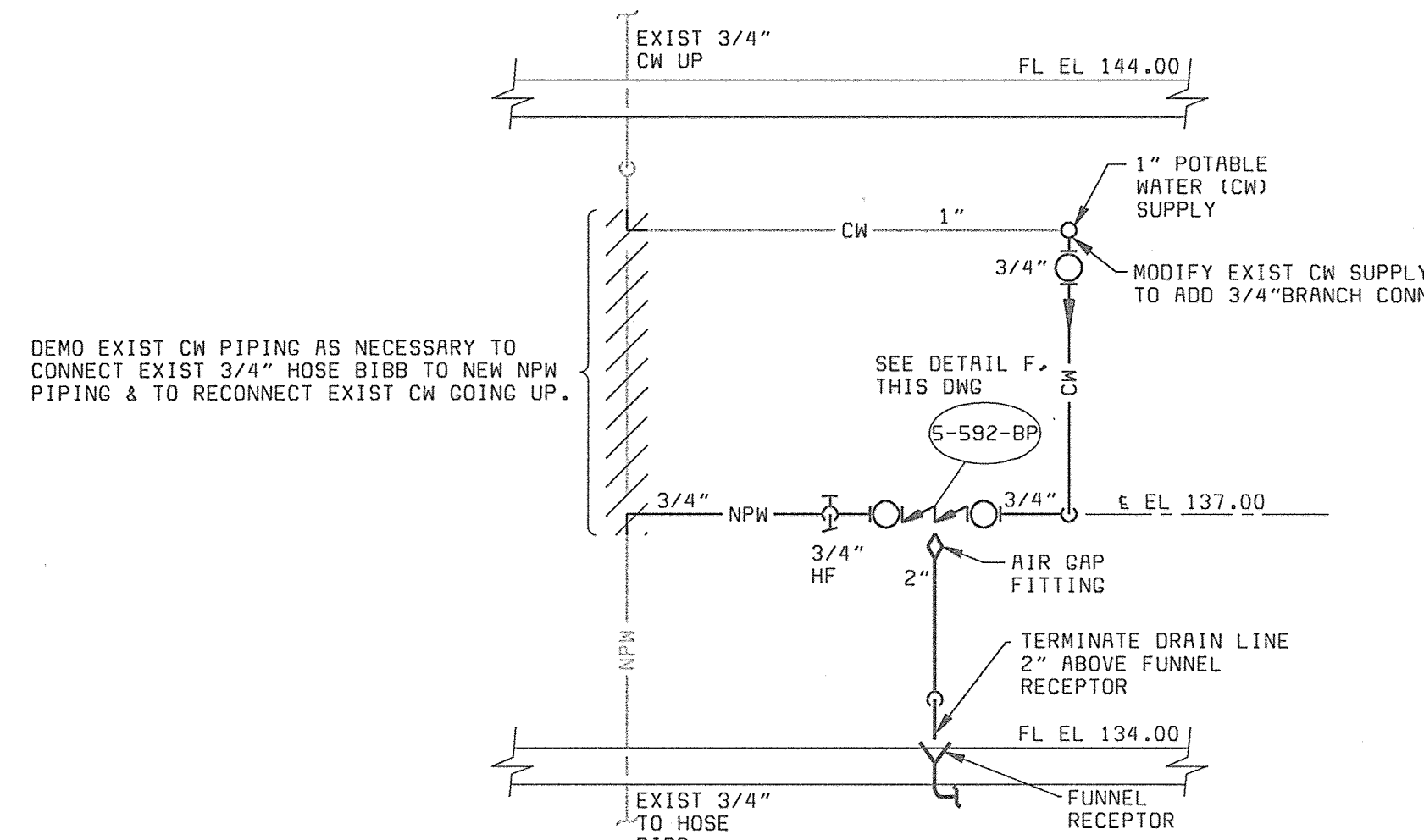
HAND SINK PIPING DETAIL E

NO SCALE



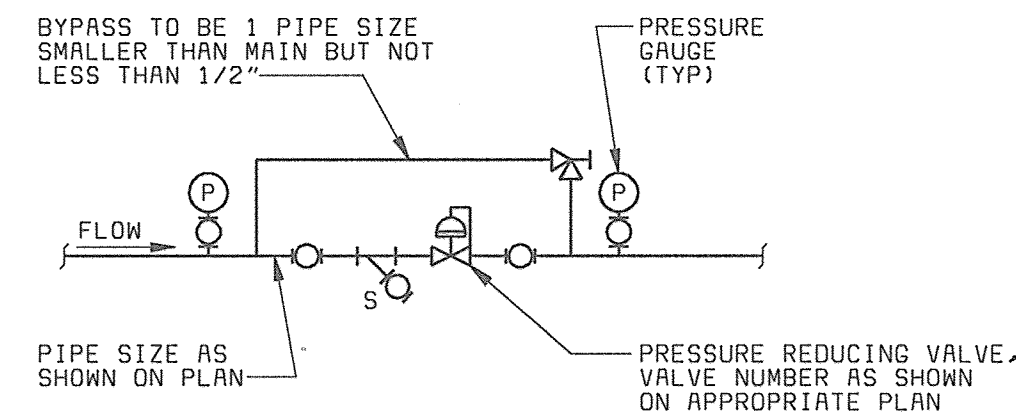
SUMP PUMP DETAIL B

NO SCALE



NON POTABLE WATER SUPPLY SCHEMATIC D

NO SCALE



PRESSURE REDUCING STATION (PRS) DETAIL F

NO SCALE

| PLUMBING FIXTURE AND EQUIPMENT SCHEDULE | | | |
|---|---|---|---------|
| LABEL | DESCRIPTION | MANUFACTURER MODEL | REMARKS |
| S-1 | HAND SINK, 24 X 24 INCHES, SINGLE BOWL, 12 INCHES DEEP, 14 GAUGE STAINLESS STEEL, 2 HOLE PUNCHED, STAINLESS STEEL STRAINER, FLOOR MOUNTED | JUST SINK-SB-124 JUST FAUCET-JS-48-TA1 JUST STRAINER-J-35-BLA-2 | |
| FD-1 | MEDIUM DUTY CAST IRON FLOOR DRAIN, ADJUSTABLE TOP, LOOSE SET CAST IRON GRATE. | SMITH 2310 SERIES | |
| FCO-1 | HEAVY DUTY FLOOR CLEANOUT, SECURED ROUND ADJUSTABLE NICKEL BRONZE TOP. | SMITH 4100 SERIES | |
| RD-1 | CAST IRON PRIMARY ROOF DRAIN. | SMITH 1010-E SERIES | |
| ORD-1 | CAST IRON OVERFLOW ROOF DRAIN | SMITH 1070-E SERIES | |
| 5-593-WH | ELECTRIC INSTANTANEOUS WATER HEATER, 1.0 GPM, 54 F RISE, 8.0 KW, 208 VOLT, 1 PHASE, 60 HZ. | CHRONOMITE-SERIES S-80 | |
| REMARKS: | | | |

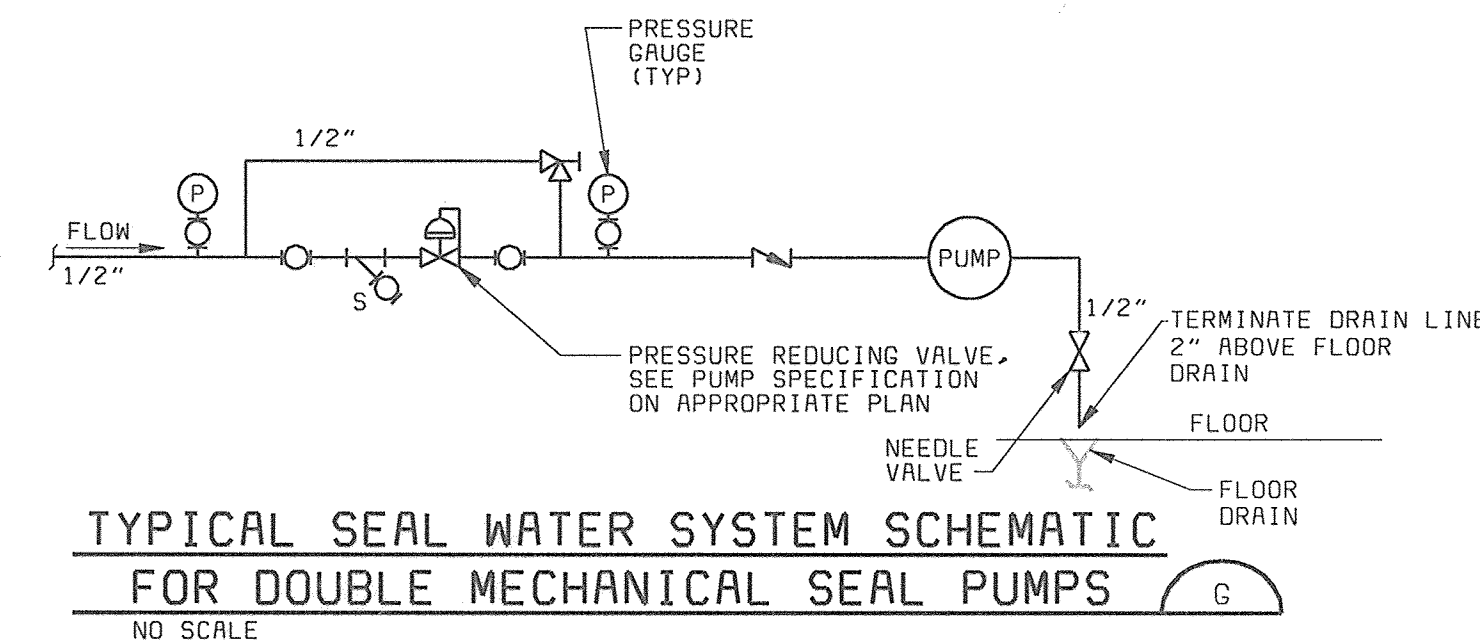
| SUMP AND SEWAGE PUMP SCHEDULE | | | | | | | | | | | | | |
|-------------------------------|-----------------------|-------------------------|----------------|-----------------|-----------------|----------|--------------------------|---------------------|----------------|-----------------|----------------|----------------|---------|
| UNIT NO | LOCATION | TYPE | CAPACITY (GPM) | TOTAL HEAD (FT) | MAX SPEED (RPM) | MOTOR HP | POWER SUPPLY VOLTS/PHASE | DISCHARGE SIZE (IN) | SUMP LEVEL OFF | SUMP LEVEL LEAD | SUMP LEVEL LAG | SUMP LEVEL HWA | REMARKS |
| 5-590-P | NORTH BLOWER BUILDING | SUBMERSIBLE SEWAGE PUMP | 32 | 41 | 1750 | 1 1/2 | 460/3 | 2 | - | - | - | - | 1,2,3 |

REMARKS
 (1) PUMPS - WEIL MODEL 2424
 (2) CONTROL TYPE - 1S
 (3) SUMP COVER AND INSPECTION OPENING

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

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

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

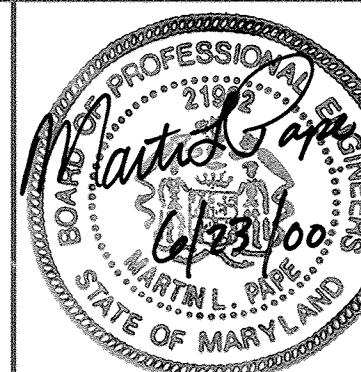


TYPICAL SEAL WATER SYSTEM SCHEMATIC FOR DOUBLE MECHANICAL SEAL PUMPS G

NO SCALE

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

BLACK & VEATCH
 Gaithersburg, Maryland



DES: JPC
 DRN: JPC
 CHK: DWN
 DATE: 6/23/00

| DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP |
|------|-------------------------------|-----|----|----|-----|
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HVAC/PLUMBING
 PLUMBING
 SCHEMATICS, DETAILS,
 AND SCHEDULES

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

CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

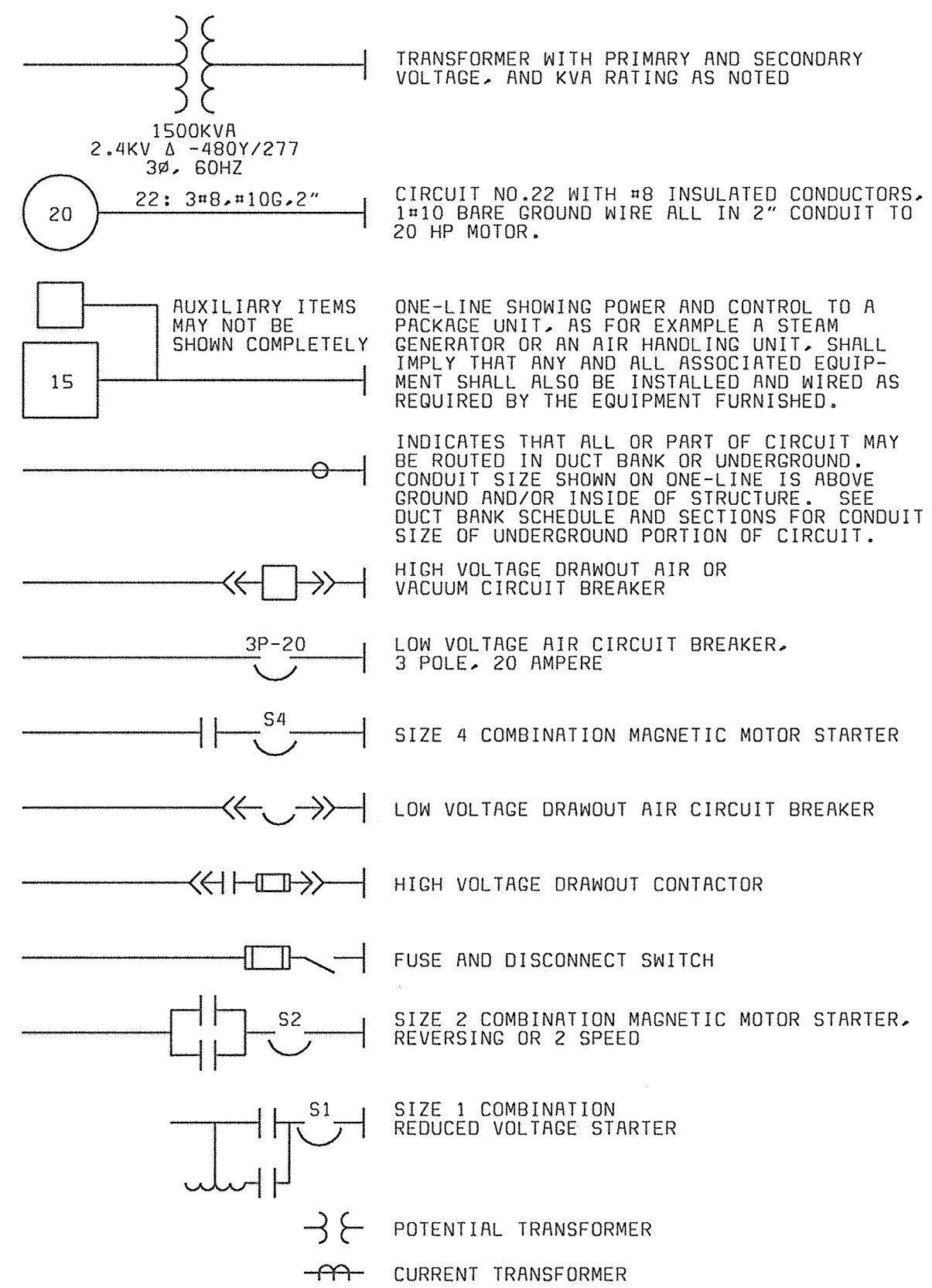
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
 SHEET 110 OF 161
 P4

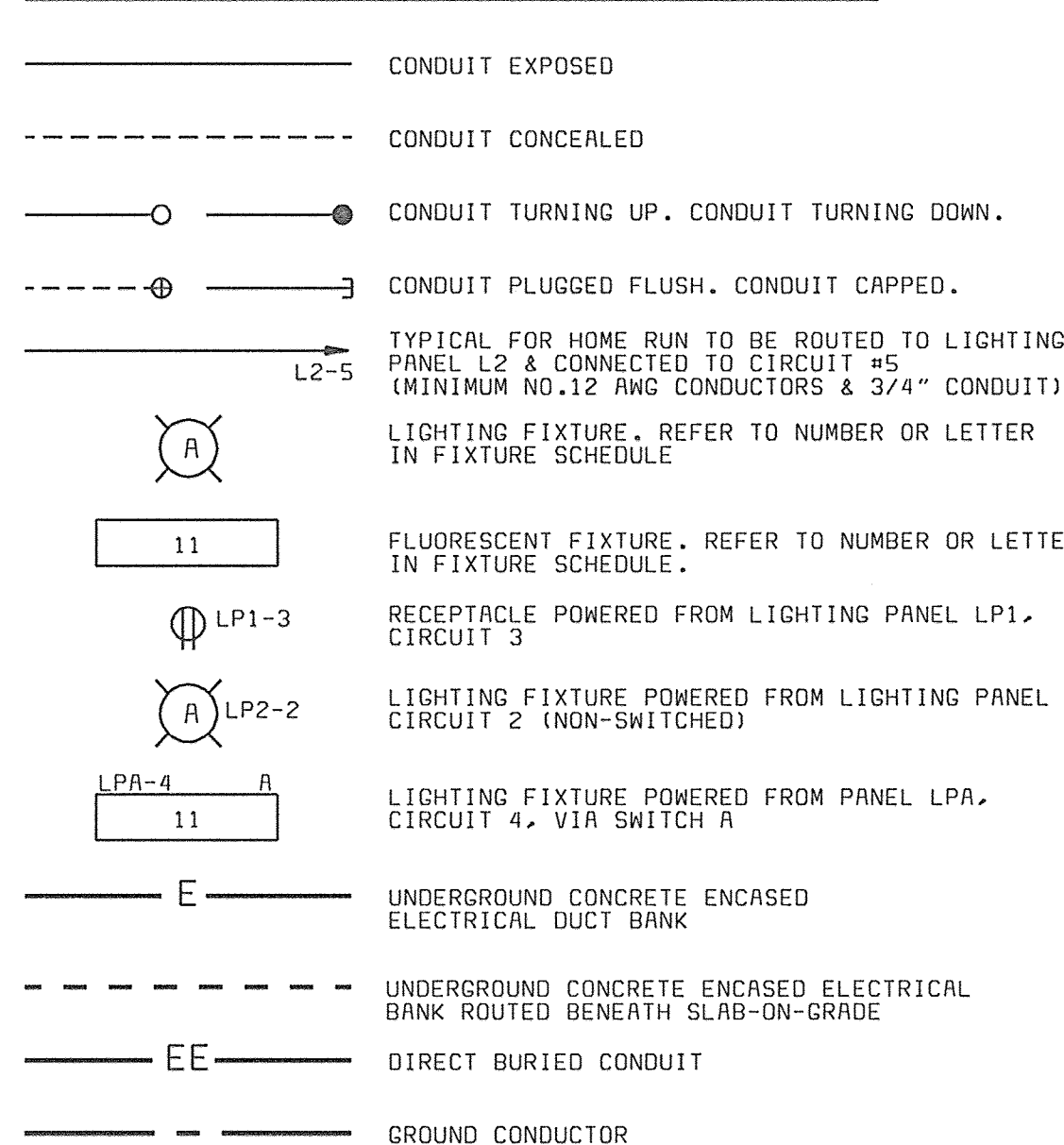
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Robert B. Pope 6-29-00
 CHIEF, BUREAU OF UTILITIES DATE

ONE-LINE DIAGRAM LEGEND



CONDUIT & WIRING INSTALLATION LEGEND



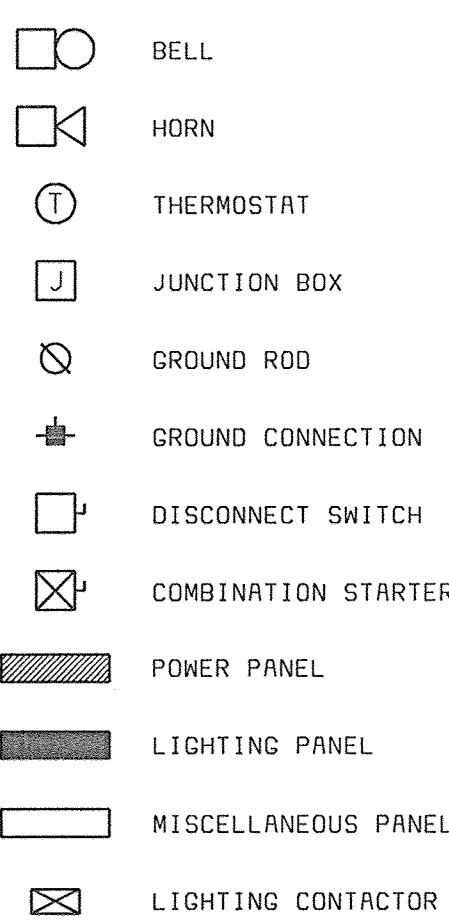
SWITCH & OUTLET SYMBOLS

Table of switch and outlet symbols including single pole switch, two pole switch, three-way switch, four-way switch, momentary switch, weatherproof switch, duplex receptacle, simplex receptacle, range receptacle, twistlock receptacle, 240V 1φ receptacle, 480V 3φ receptacle, duplex floor outlet, telephone outlet, telephone floor outlet, and coaxial cable outlet.

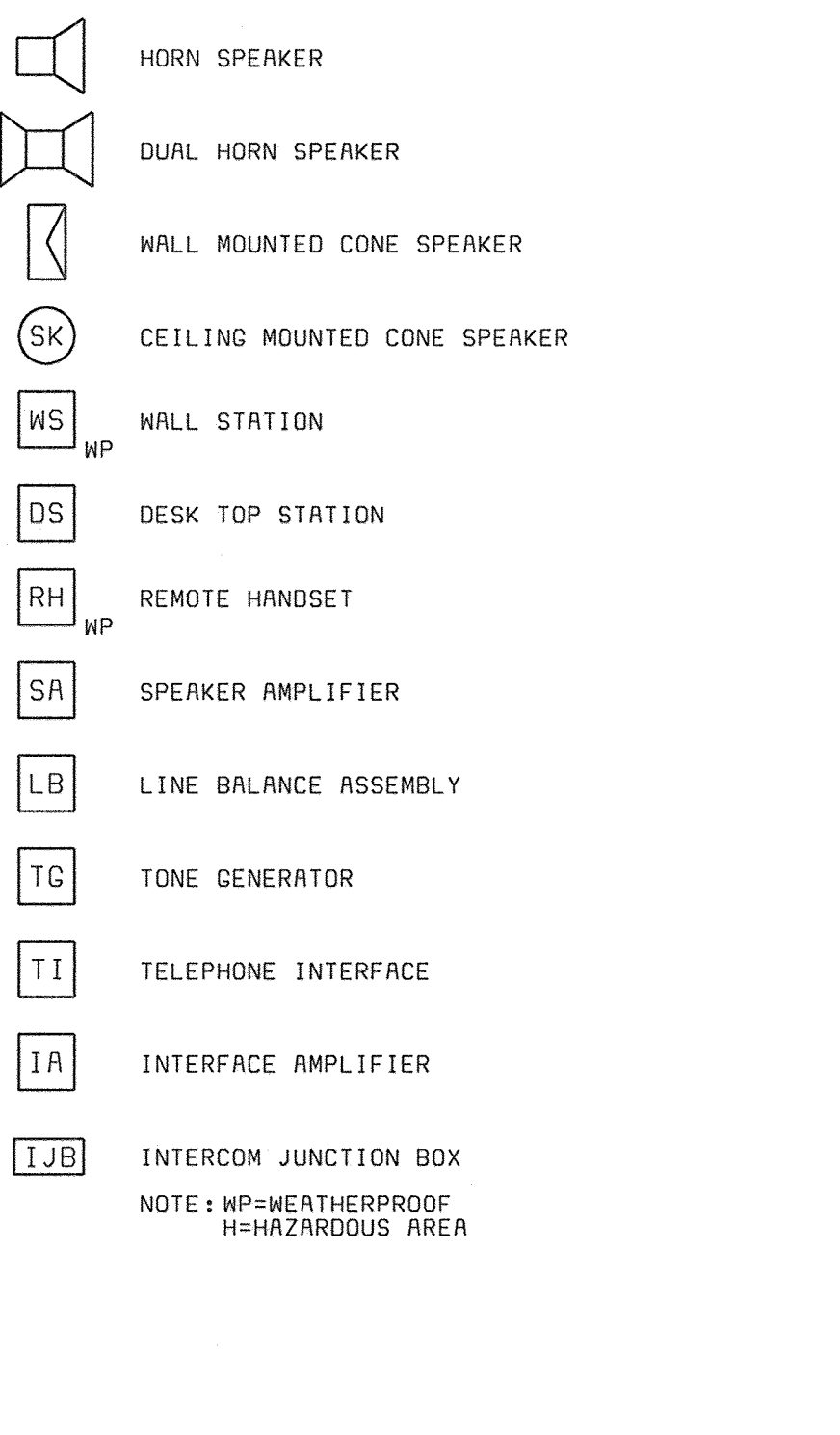
SCHEMATIC SYMBOLS



MISCELLANEOUS SYMBOLS



COMMUNICATION SYMBOLS



ABBREVIATIONS

Table of abbreviations including ACB (Air Circuit Breaker), AM (Ammeter), ANN (Annunciator), AR (Alarm Relay), AS (Ammeter Switch), AT (Ampere Trip), AWG (American Wire Gauge), BC (Battery Charger), BR (Brake), BT (Bearing Temperature), C (Close, Counter or Contactor), CAP (Capacitor), CB (Circuit Breaker), CB-A (Circuit Breaker Auxiliary Contact), CB-B (Circuit Breaker Auxiliary Contact), CD (Control Damper), CI (Cell Interlock), CKT (Circuit), CL2 (Chlorine), COS (Cable Operated Switch), CP (Control Panel), CPT (Control Power Transformer), CR (Current or Control Relay), CS (Control Station), CT (Cycle Timer or Current Transformer), CTC (Cycle Timer Clutch), CTM (Cycle Timer Motor), CTF (Controls Termination Panel), C/C (2 Conductor), C/C (4 Conductor), DC (Direct Current), DI (Door Interlock), DM (Damp Motor or Demand Meter), DPDT (Double Pole Double Throw), DPR (Differential Pressure Regulator), DPS (Differential Pressure Switch), DS (Disconnect Switch), DVLS (Discharge Valve Limit Switch), E (Electric Operator for Control), EC (Empty Conduit), EL (Elevation or Emergency Light), EMH (Electrical Manhole), ER (Electrode Relay), ES (End Switch), ETM (Elapsed Time Meter), EX (Existing), F (Forward), FS (Flow Switch), G (Green or Ground), GD (Ground Detector), GEN (Generator), GF1 (Ground Fault Interrupter), GLS (Geared Limit Switch), H (High or Humidistat), HC (Hot Circuit), HH (Handhole), HMT (High Motor Temperature), HDA (Hand-Off-Auto), HOR (Hand-Off-Remote), HP (Horsepower), HWC (High Water Cutoff), HZ (Hertz), I/O (Input/Output), INST (Instantaneous), J (Junction Box), JB (Junction Box), K (Key Interlock), KV (Kilovolt), KVA (Kilovolt Ampere), KVAR (Kilovar), KW (Kilowatt), KWH (Kilowatt Hour), L (Low, Level), LA (Lightning Arrester), LAN (Local Area Network), LC (Lighting Contactor), LOR (Local-Off-Off), LOR (Local-Off-Remote), LP (Lighting Panel), LS (Limit or Level Switch), LWCO (Low Water Cutoff), M (Magnetic Motor Starter), MA (Milliamper), MCB (Main Circuit Breaker), MCC (Motor Control Center), MCLU (Motor Control Lineup), MCM (Thousand Circular Mil), MD (Moisture Detector), MFM (Magnetic Flow Meter), MFR (Manufacturer), MH (Manhole or Mounting Height), MOV (Motor Operated Valve), MPR (Motor Protection Relay), MS (Manual Motor Starter), MSH (Motor Space Heater), MV (Millivolt), MVA (Mega Volt Ampere), N (Neutral), NC (Normally Closed), NO (Normally Open, Number), O (Open), OCB (Oil Circuit Breaker), OL (Overload), OOA (On-Off-Auto), OOR (On-Off-Remote), P (Primary), PCS (Plant Control System), PB (Push Button or Pull Box), PF (Power Factor Meter), PH (Phase, Chemical Term), PLC (Programmable Logic Controller), PP (Power Panel), PR (Protective Relaying), PRM (Process Reactor #5,6 or 7), PS (Proximity Switch), PPS (Pressure Switch), PT (Potential Transformer), P (Program Timer), 2P (2 Pole), R (Red, Raise, Relay or Reverse), RECP (Receptacle), RES (Resistor), RT (Repeating Timer), RTD (Resistance Type Temp Detector), RTU (Remote Terminal Unit), RVSS (Reduced Voltage Solid State Starter), S2 (Size 2 Starter), S2 (Supervisory Control and Data Acquisition), SH (Space Heater), SN (Solid Neutral), SO (Solenoid Oilier), SP (Single Pole), SPDT (Single Pole Double Throw), SPST (Single Pole Single Throw), SS (Selector Switch), SSM (Solid State Metering), SSS (Solid State Starter), SUPV (Supervisory Control), SV (Solenoid Valve), SWB (Switchboard), SWGR (Switchgear), T (Thermostat, Timer, or Totalizer), TACH (Tachometer), TB (Terminal Block), TC (Timer Clutch), TD (Time Delay Relay), TEMP (Temperature), TM (Timer Motor), TO (Torque), TS (Temperature Switch), TTB (Telephone Terminal Box), UG (Underground), UV (Under Voltage), UPS (Uninterruptible Power Supply), V (Volts), VA (Volt Ampere), VAR (Varmeter), VLS (Valve Limit Switch), VM (Voltmeter), VPI (Valve Position Indicator), VS (Voltmeter Switch), W (White or Watts), WH (Watt Hour Meter), WM (Watt Meter), WP (Weatherproof), X (Auxiliary Relay), XFMR (Transformer), XP (Explosion Proof), Y (Yellow), Z (Auxiliary Relay), ZS (Position Switch), ZSS (Zero Speed Switch), 1-1PR#16S (One, Single Pair, Twisted, Shielded #16 Cable), 3-7/C#14 (Three, Single, Seven Conductor #14 Multiconductor Control Cables).

AREA DESIGNATIONS

Table of area designations including Area Type 1A (Corrosive Chemical Feed and Storage Rooms), Area Type 4 (Indoor Wet Locations), Area Type 7A (Class 1, Division 1 Area), Area Type 7B (Class 1, Division 2, Group C and D), and Area Type 12 (Indoor, Dry, Dirty Area).

GENERAL REQUIREMENTS

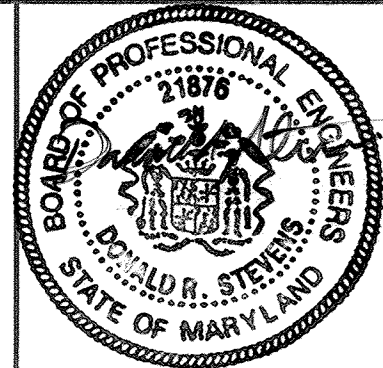
- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATIONS.
2. SPARE WIRES SHALL BE TAPED AND COILED.
3. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
5. LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
6. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC., NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

GENERAL NOTES

- 1. SOLID LINES (————) INDICATE NEW WORK OR EQUIPMENT.
2. SCREENED LINES (-----) INDICATE EXISTING WORK OR EQUIPMENT.
3. DASHED LINES (- - -) INDICATE FUTURE WORK OR EQUIPMENT.
4. REFER TO THE FOLLOWING DRAWING(S) FOR INSTRUMENTATION LEGEND:
5. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
6. INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
A. ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
B. FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
C. SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
D. DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

BLACK & VEATCH, L.P. Gaithersburg, Maryland



DES: GNS

DRN: JCB

CHK: JTF

DATE: 6/23/00

ELECTRICAL

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

SCALE AS SHOWN

SHEET 111 of 161

CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752

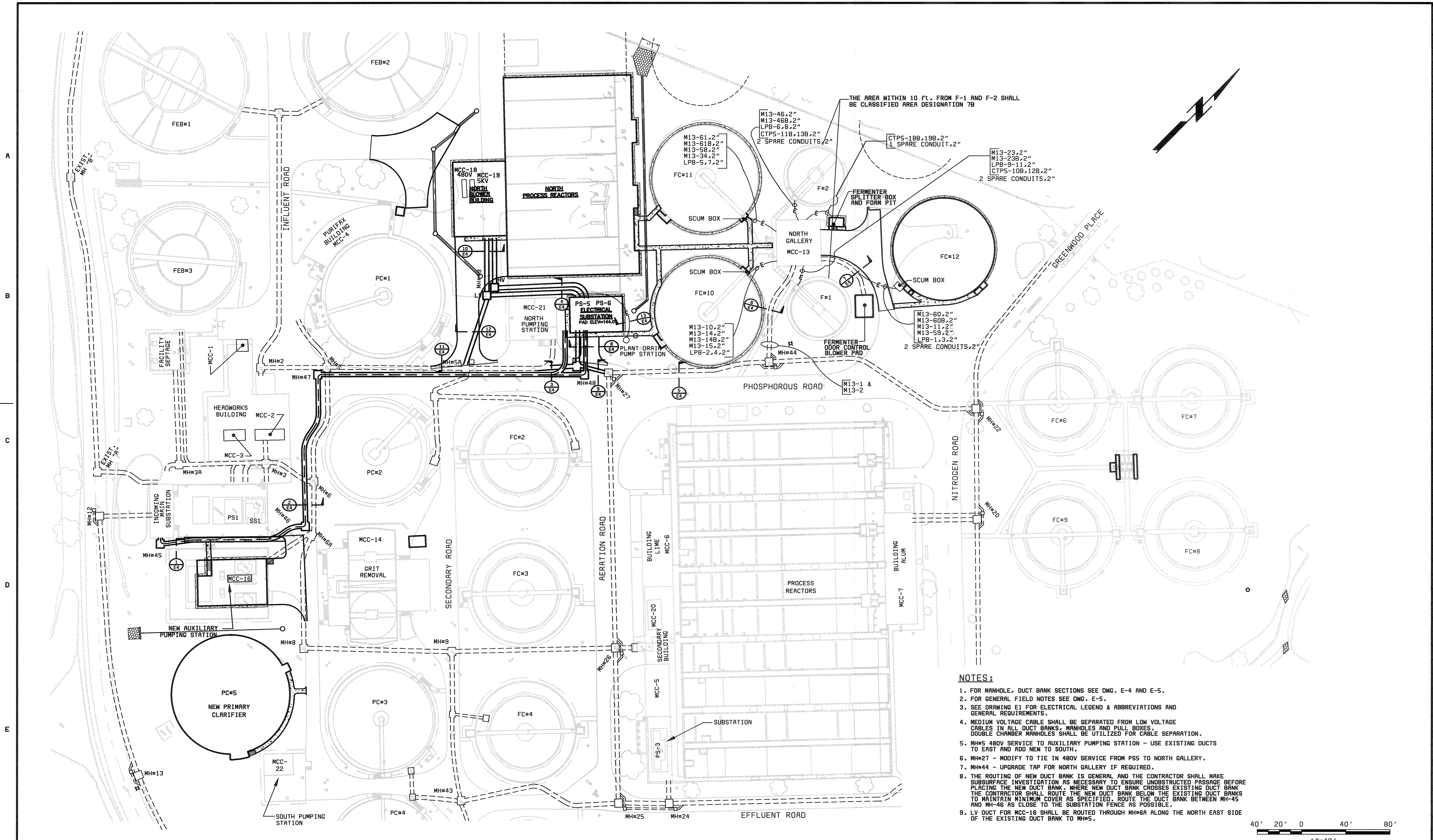
HOWARD COUNTY, MARYLAND

E1

LEGEND AND ABBREVIATIONS

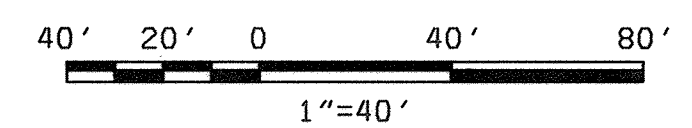
REVISIONS AND RECORD OF ISSUE NO. BY CK APP

DBS:72 PDS:642A



NOTES:

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



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 PLOT DATE: 06/21/2000
 DSB/72
 0586472

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Robert Benjamin 6-21-00
 CHIEF, BUREAU OF UTILITIES DATE

LACH
LACH ELECTRIC CORPORATION
 Baltimore, Maryland
 D. Kukreja 6-21-00
 REG. PROF. ENGR. DATE

BLACK & VEATCH
 Gaithersburg, Maryland

 REG. PROF. ENGR. DATE

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

ELECTRICAL
SITE PLAN
NORTH BNR PROCESS TRAIN

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

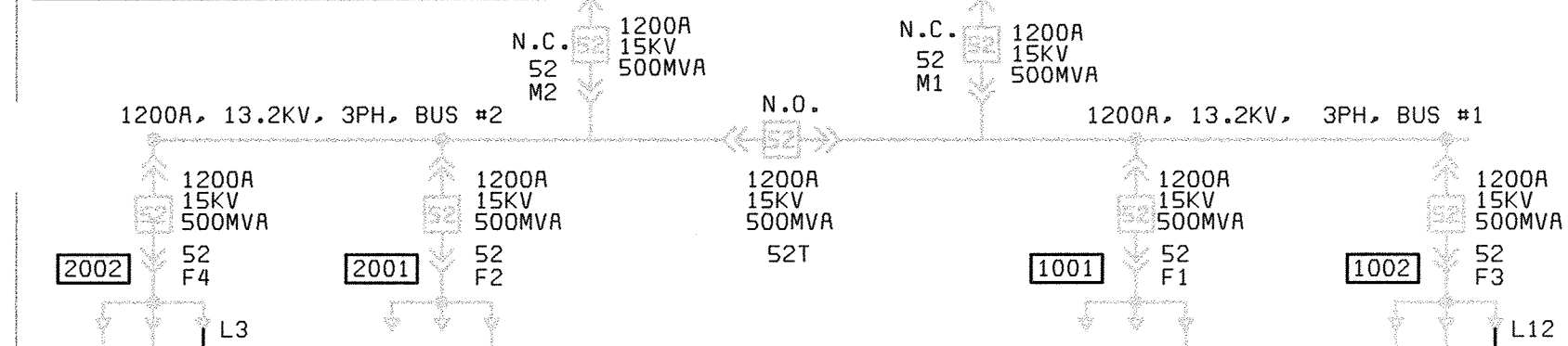
SCALE AS SHOWN
 SHEET 112 OF 161
E2

BALTIMORE GAS & ELECTRIC 13.2 KV

INCOMING SERVICE

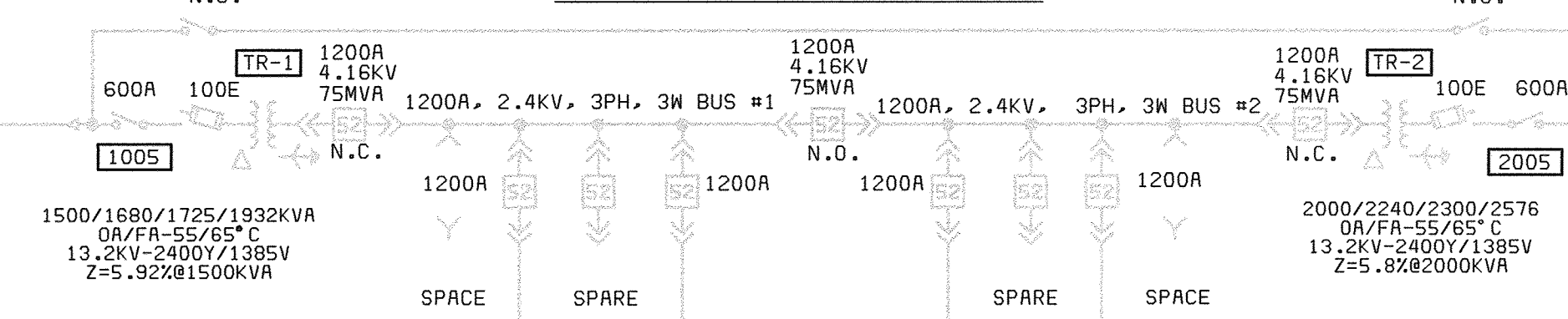
FDR #7680 LAUREL (OH) Isc=2582A FDR #7740 DORSEY RUN (UG) Isc=3678A

13.2KV MAIN SWITCHGEAR

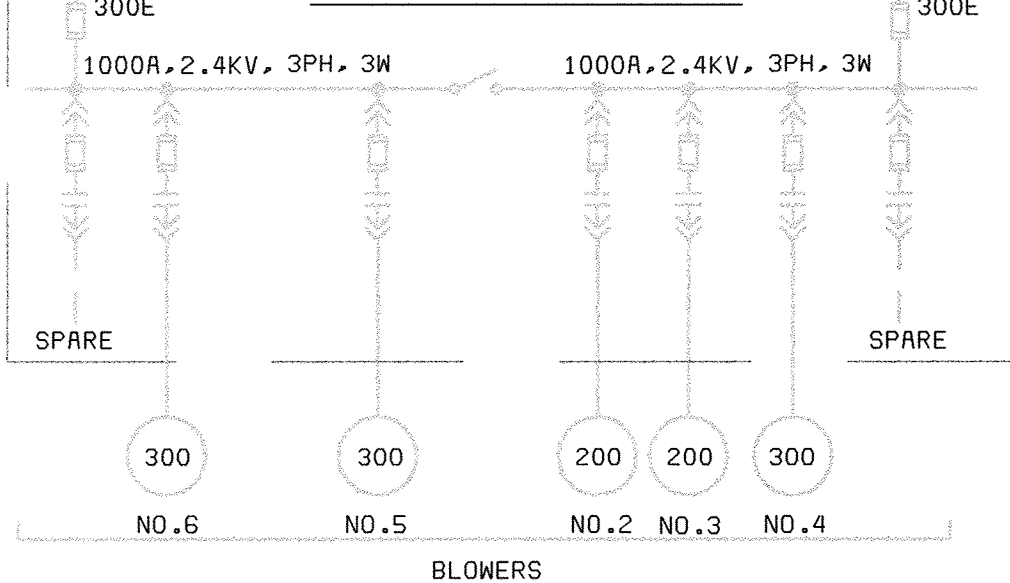


S-1, 3-250Kcmil, (15KV), #2G, 5" S-2, 3-250Kcmil, (15KV), #2G, 5"

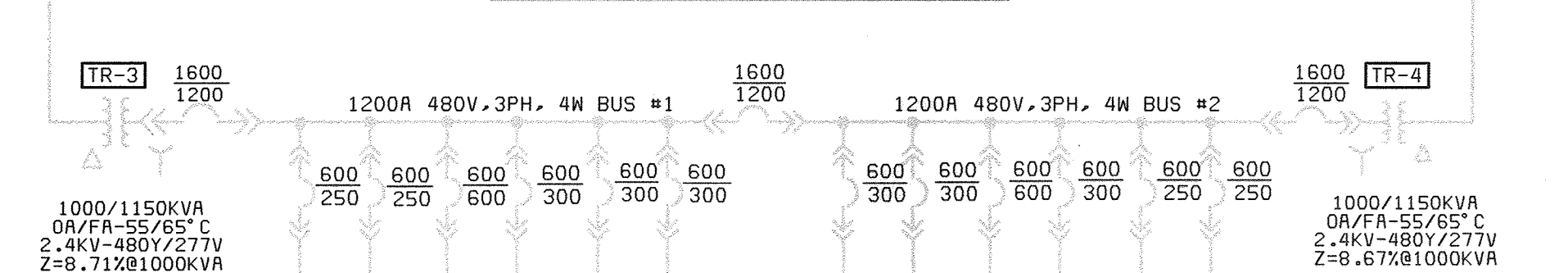
PS1 - BLOWER SUBSTATION



CC3 HEADWORKS BLOWERS



SS1 - HEADWORKS SUBSTATION



MCC 14 GRIT BLDG.

MCC 2 HEADWORKS BUILDING

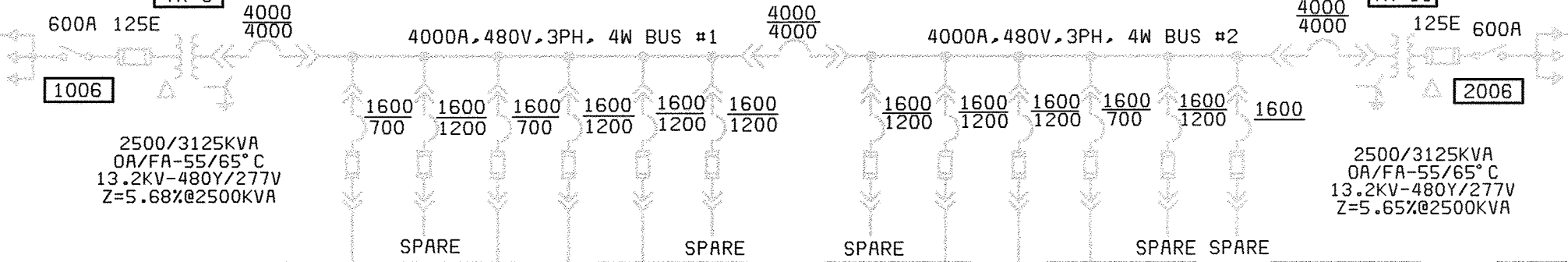
MCC 4 PURIFAX BUILDING (REPLACE)

MCC 22 SOUTH PUMP STATION

MCC 21 NORTH PUMP STATION

MCC 1 SCREEN FACILITY

PS4 - EFFLUENT SUBSTATION



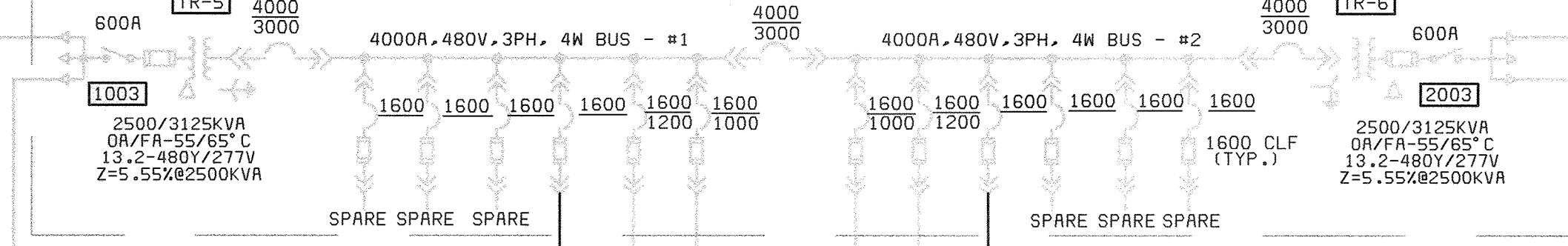
CC8 MAINTENANCE BUILDING

SWBD 1 ADMIN. BLDG. SWITCHBOARD (FEEDS CC17)

CC11 FILTER BUILDING

CC12 CHLORINE BUILDING

PS2 - DEWATERING SUBSTATION



MCC 15 SOLIDS BUILDING (NOT IN CONTRACT)

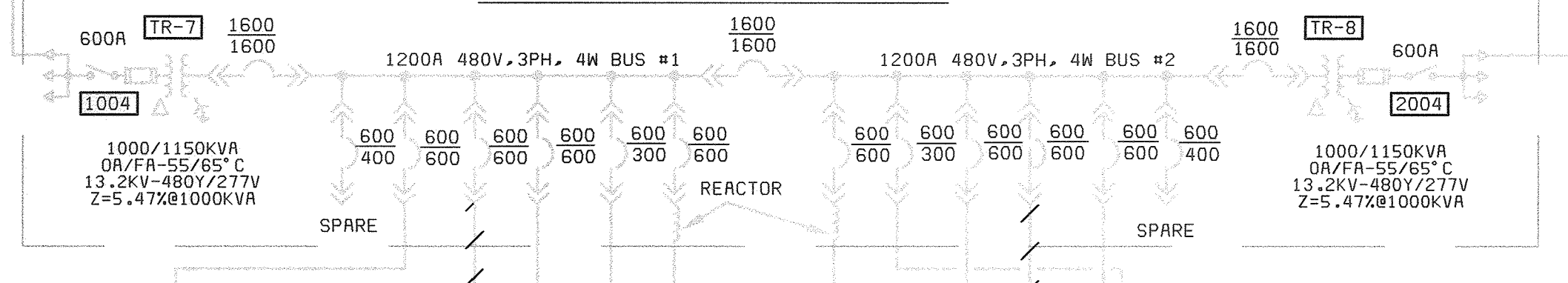
CC9A & CC9B DEWATERING BUILDING

PC1 BLOWERS 1 & 3 POWER CENTER

PC2 BLOWERS 2 & 4 POWER CENTER

CC10A & CC10B DEWATERING BUILDING

PS3 - SECONDARY SUBSTATION



MCC 20 PROCESS REACTORS (NOT IN CONTRACT)

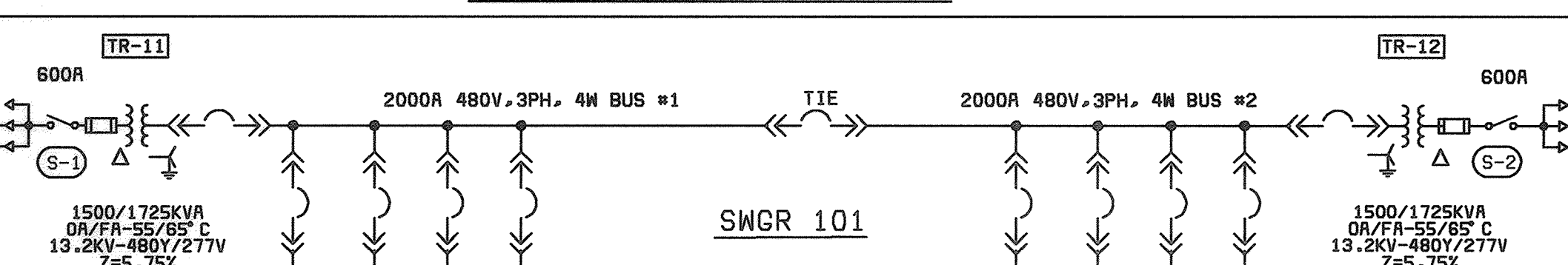
CC7A & CC7B ALUM. BLDG.

CC-5 SECONDARY BLDG.

CC-6 LIME BLDG. REPLACE

CC-13 PHOTOSTRIP BLDG. (SEE DNG. E21)

PS5 AND PS6- NEW ADDITION



MCC 18 NORTH NEW BLOWER BUILDING (SEE DNG.'S E8-E10)

MCC 13 NORTH GALLERY BUILDING (SEE DNG.'S E22-E24)

MCC 16 NEW AUXILIARY PUMPING STATION (NOT IN CONTRACT)

TR-13 2000KVA 0A/FA-85/85°C 13.2KV-480V/2400V Z=5.75%

TO NEW BLOWER BUILDING MCC - 19 (SEE DNG. E11)

TR-14 2000KVA 0A/FA-85/85°C 13.2KV-480V/2400V Z=5.75%

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND

LACH ELECTRIC CORPORATION Baltimore, Maryland

BLACK & VEATCH LLP Gaithersburg, Maryland



DES: L.K.

DRN: M.F.F.

CHK:

DATE: 6/23/00

Table with columns for DATE, REVISIONS AND RECORD OF ISSUE, NO., BY, CK, APP.

ELECTRICAL

POWER DISTRIBUTION FUNCTIONAL DIAGRAM

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

CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 113 OF 161

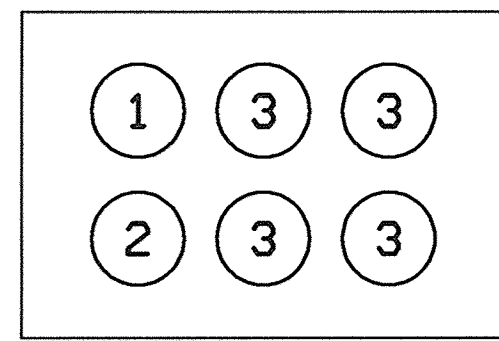
E3

GRID FILE DIR: C:\BLACK&VEATCH\E-3.DWG PLOT DATE: 6/27/2000 05:47Z P058472A

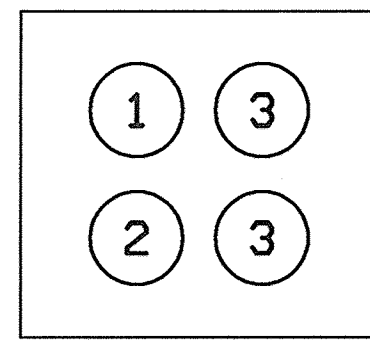
Robert Berman 6-29-00 CHIEF, BUREAU OF UTILITIES DATE

R. Kukreja 6-21-00 REG. PROF. ENGR. DATE

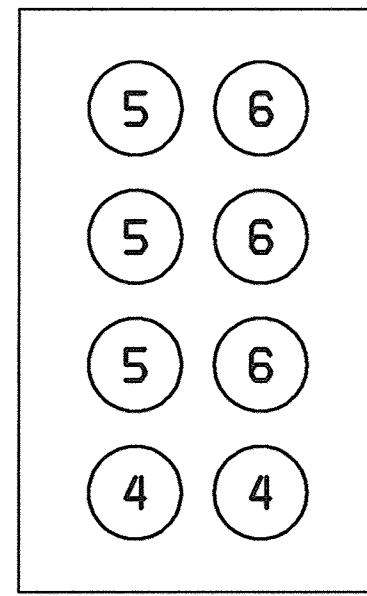
REG. PROF. ENGR. DATE



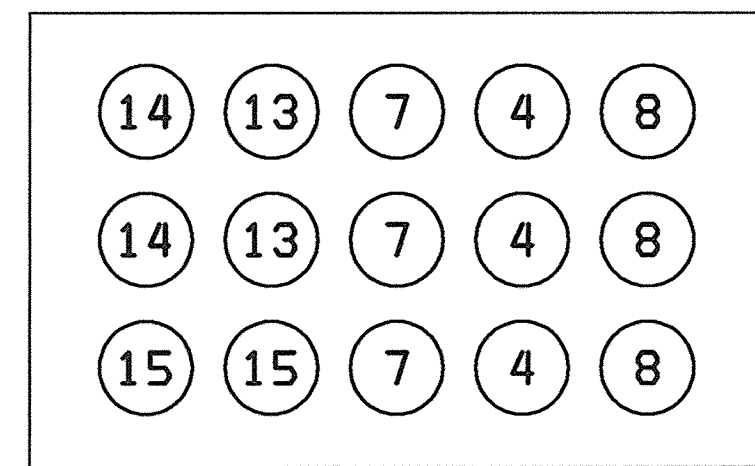
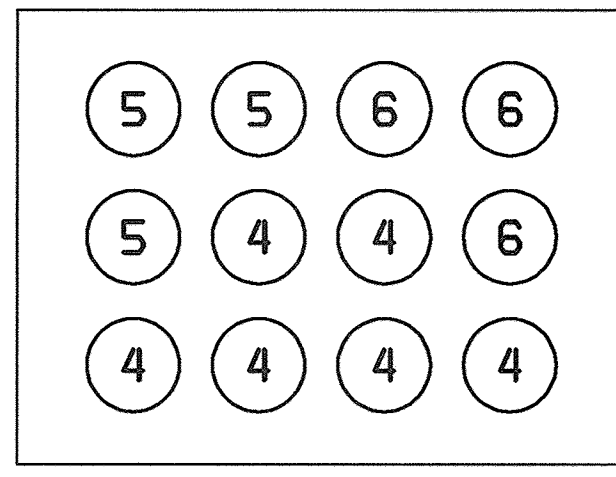
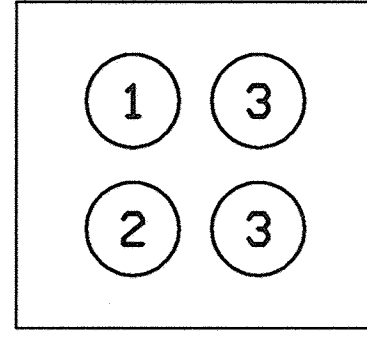
SECTION 1
NO SCALE E2



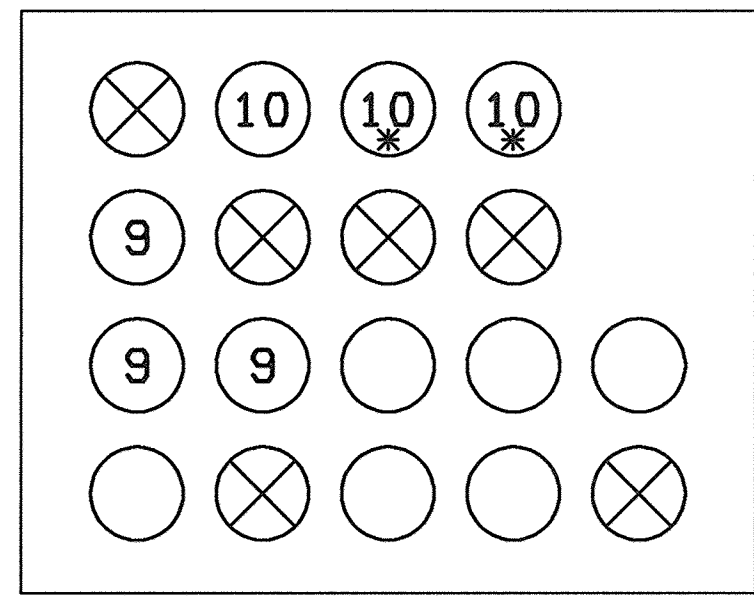
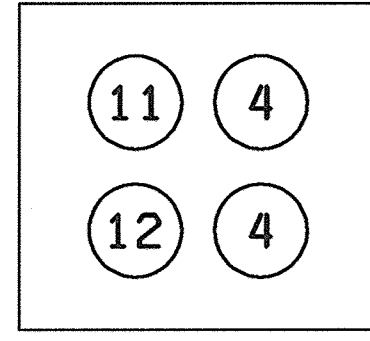
SECTION 2
NO SCALE E2
SEE NOTE 1



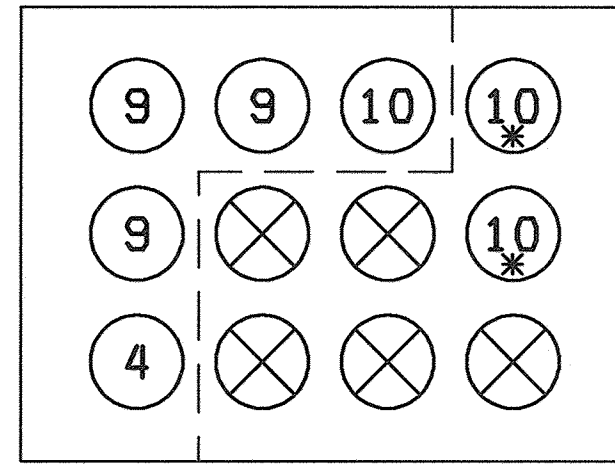
SECTION 3
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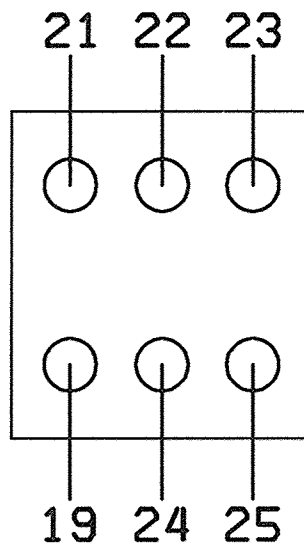
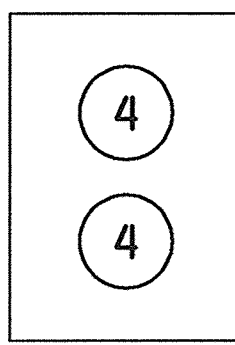
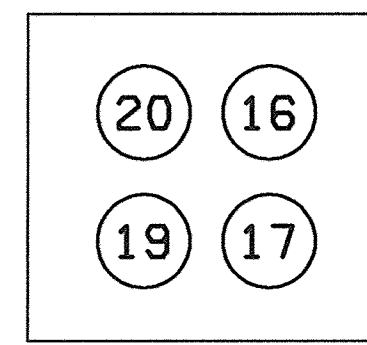
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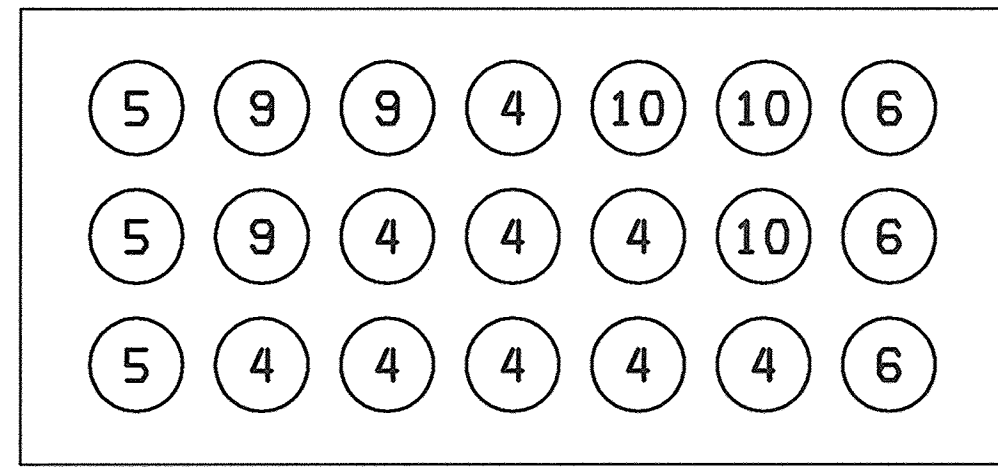
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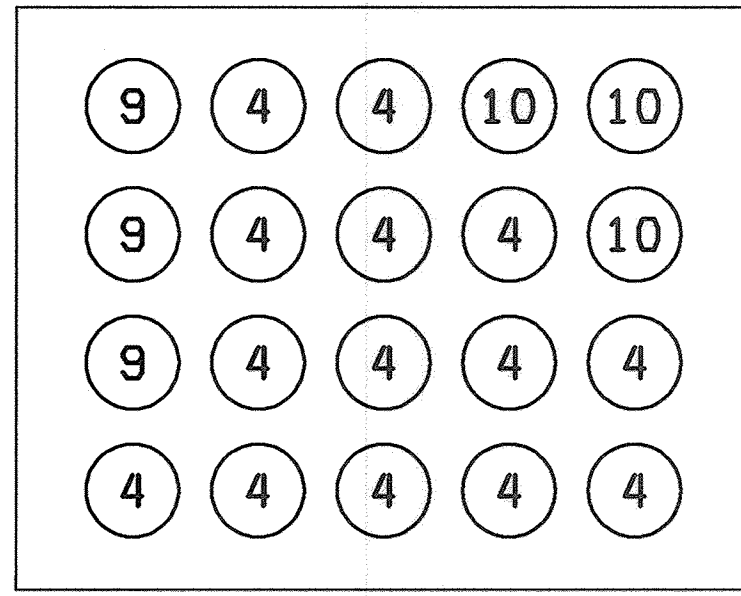
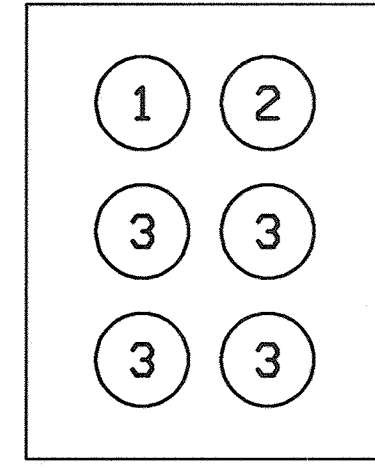
SECTION 6
NO SCALE E2



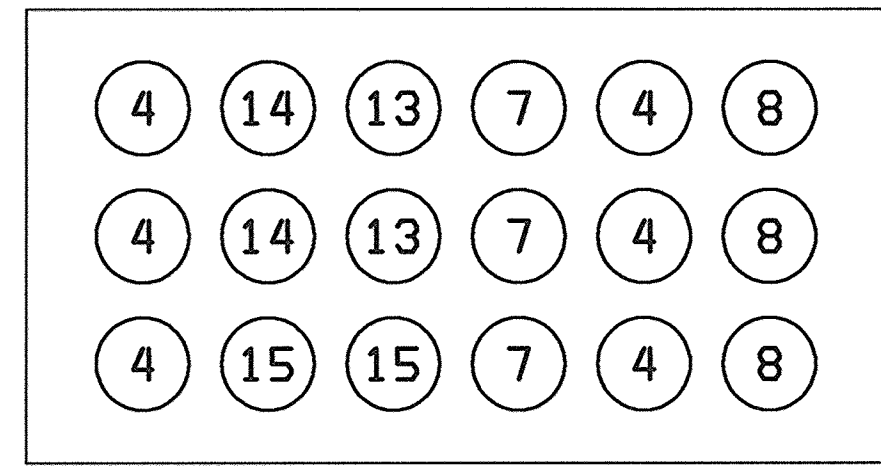
SECTION 7
NO SCALE E2



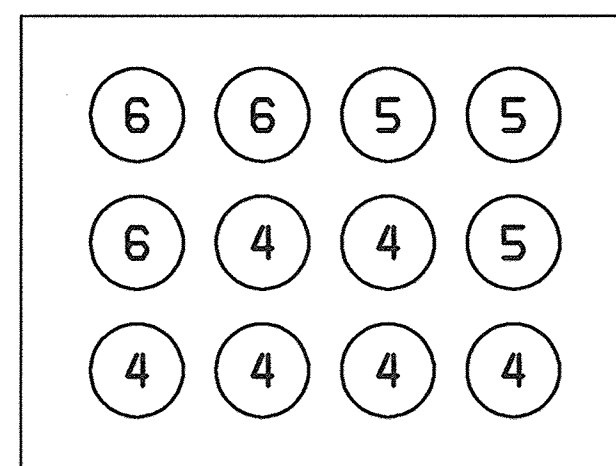
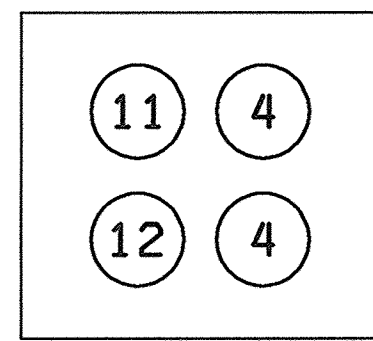
SECTION 8
NO SCALE E2



SECTION 9
NO SCALE E2

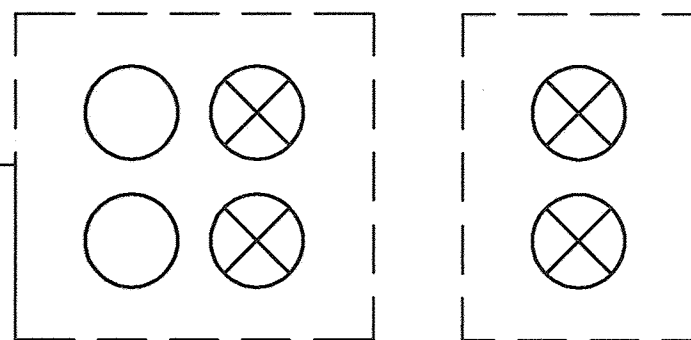


SECTION 10
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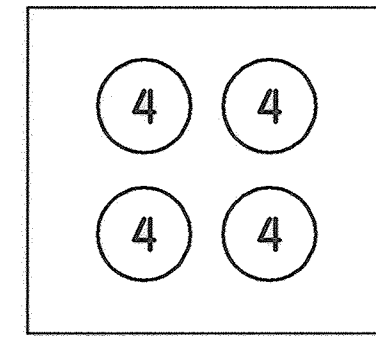


NEW

SECTION 11
NO SCALE E2



EXISTING



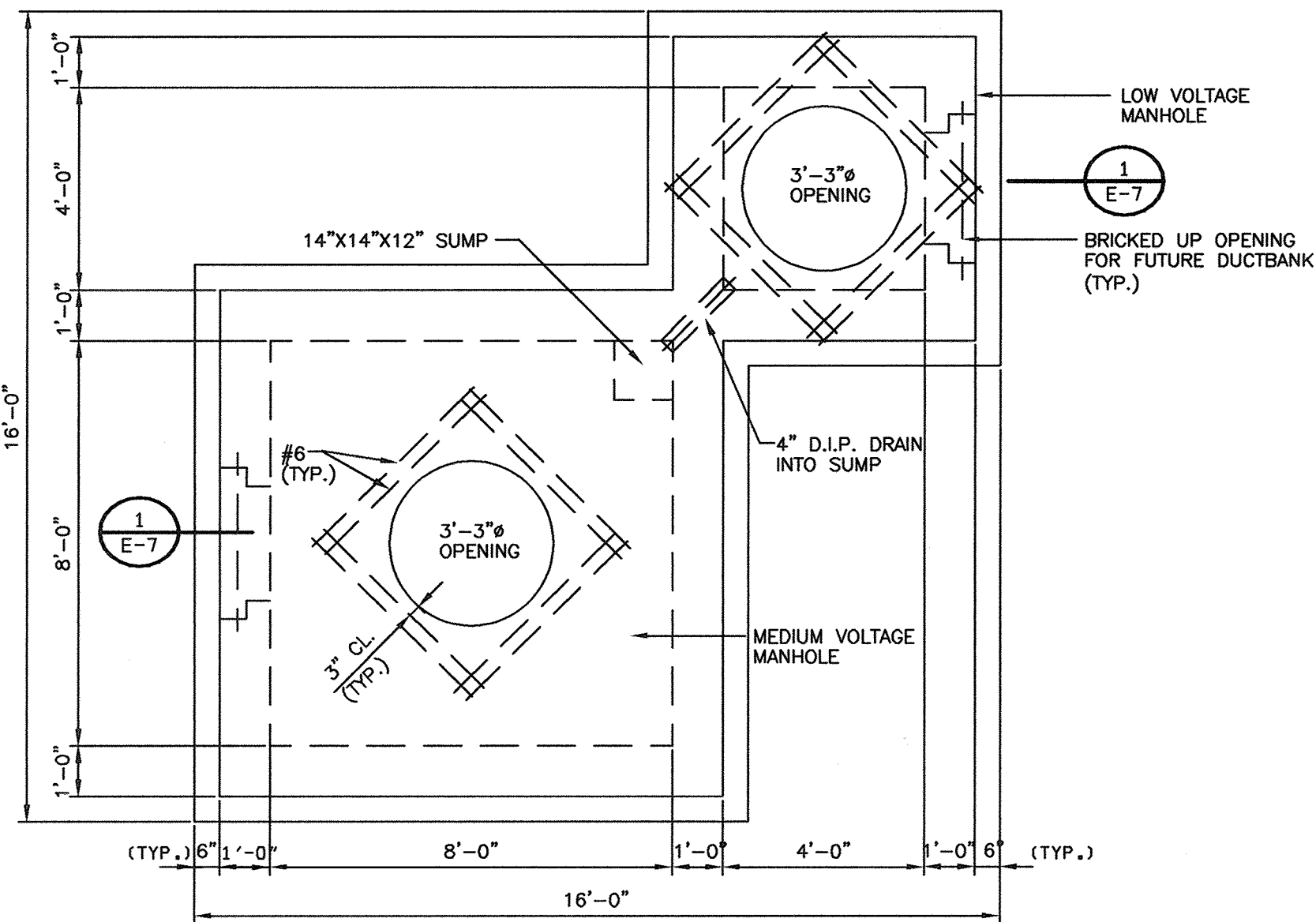
SECTION 12
NO SCALE E2

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

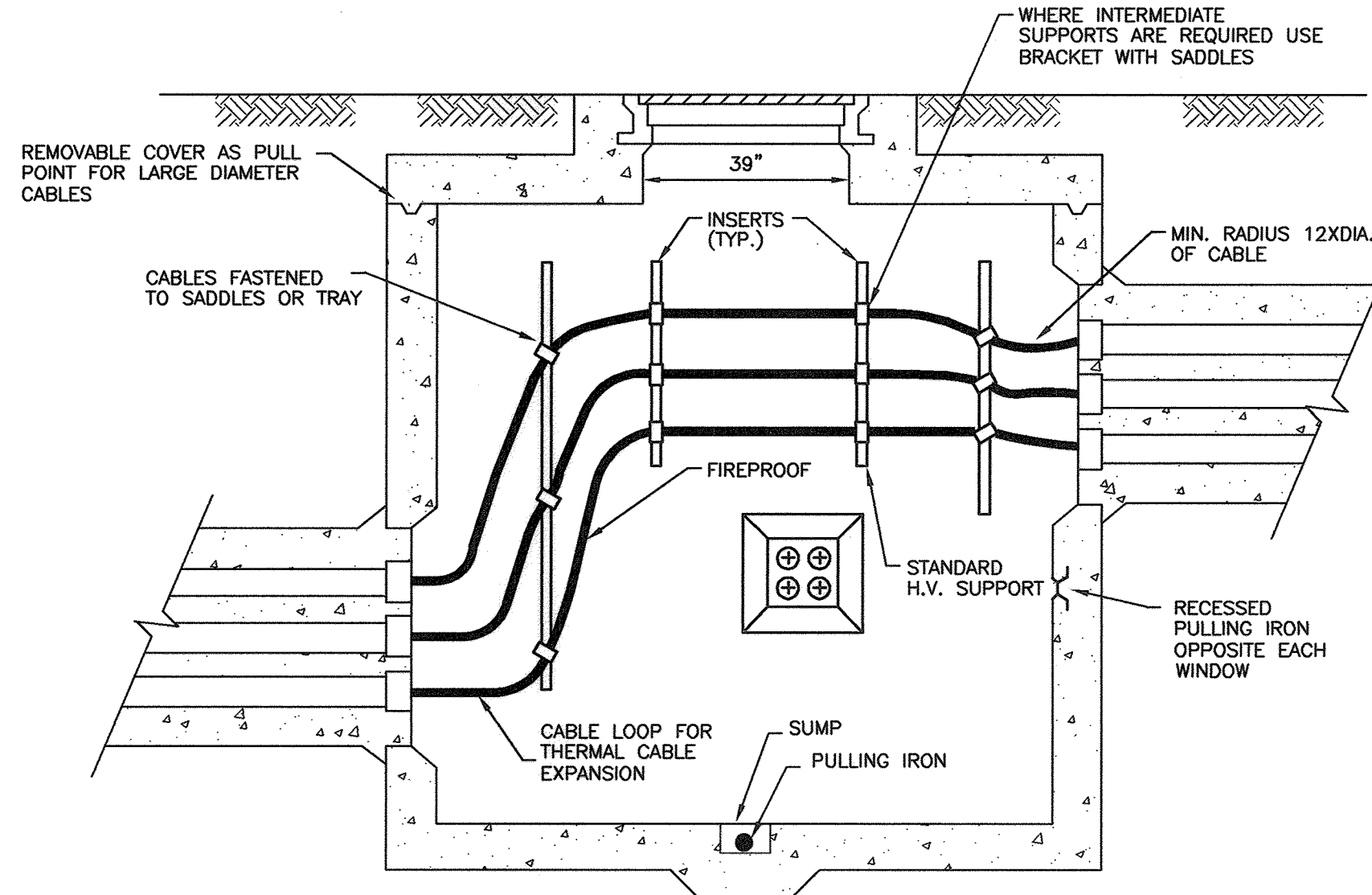
NOTE:
 1. EXISTING DUCTS BETWEEN MH5 AND MH6A ARE NOT SHOWN. MODIFY EXISTING MH5 AND MH6A TO ACCEPT LOW VOLTAGE DUCTS SHOWN IN SECTION 2.
 * REMOVE EXISTING CIRCUIT BACK TO SOURCE AND INSTALL CIRCUITS INDICATED. PLACE PULL CORD IN ANY SEGMENTS LEFT EMPTY.
 ⊗ INDICATES EXISTING OCCUPIED DUCTS AND CIRCUITS TO BE PROTECTED FROM DAMAGE DURING CONSTRUCTION AND INSTALLATION OF NEW CIRCUITS.
 ○ INDICATES EXISTING SPARE DUCTS.

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 PLOT DATE: 06/21/2000
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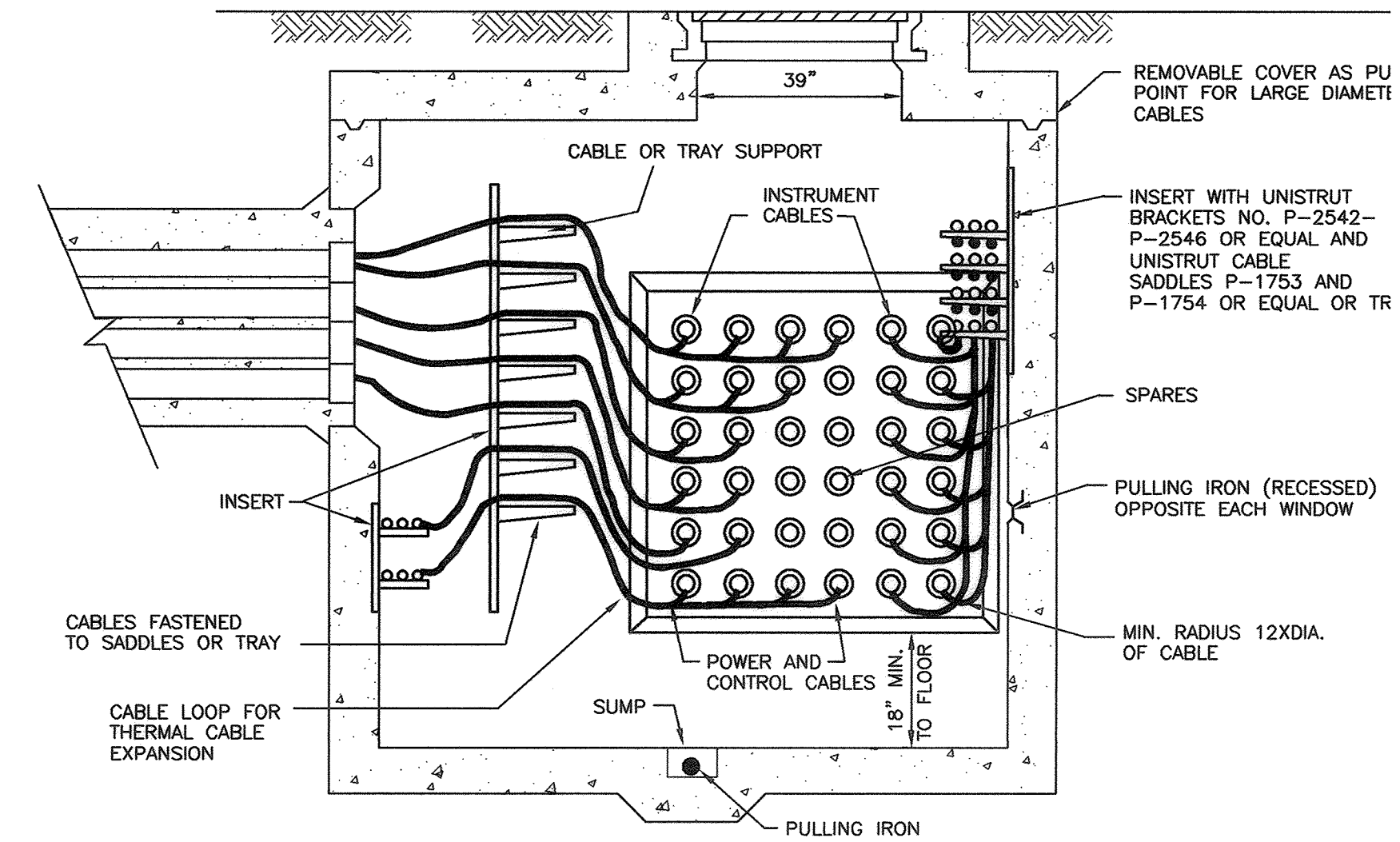
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|---|--|--|--|-------------------------------|--|--|--|---------------|--|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE: 6-21-00 REG. PROF. ENGR. | LACH LACH ELECTRIC CORPORATION Baltimore, Maryland REG. PROF. ENGR. | BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. | STATE OF MARYLAND PROFESSIONAL ENGINEER | DES: L.K. | | | | | ELECTRICAL DUCT BANK SECTIONS DETAILS AND SCHEDULE | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | | DRN: M.F.F. | | | | | | | |
| DATE: 6/23/00 | | | | REVISIONS AND RECORD OF ISSUE | | | | NO. BY CK APP | | E4 | |



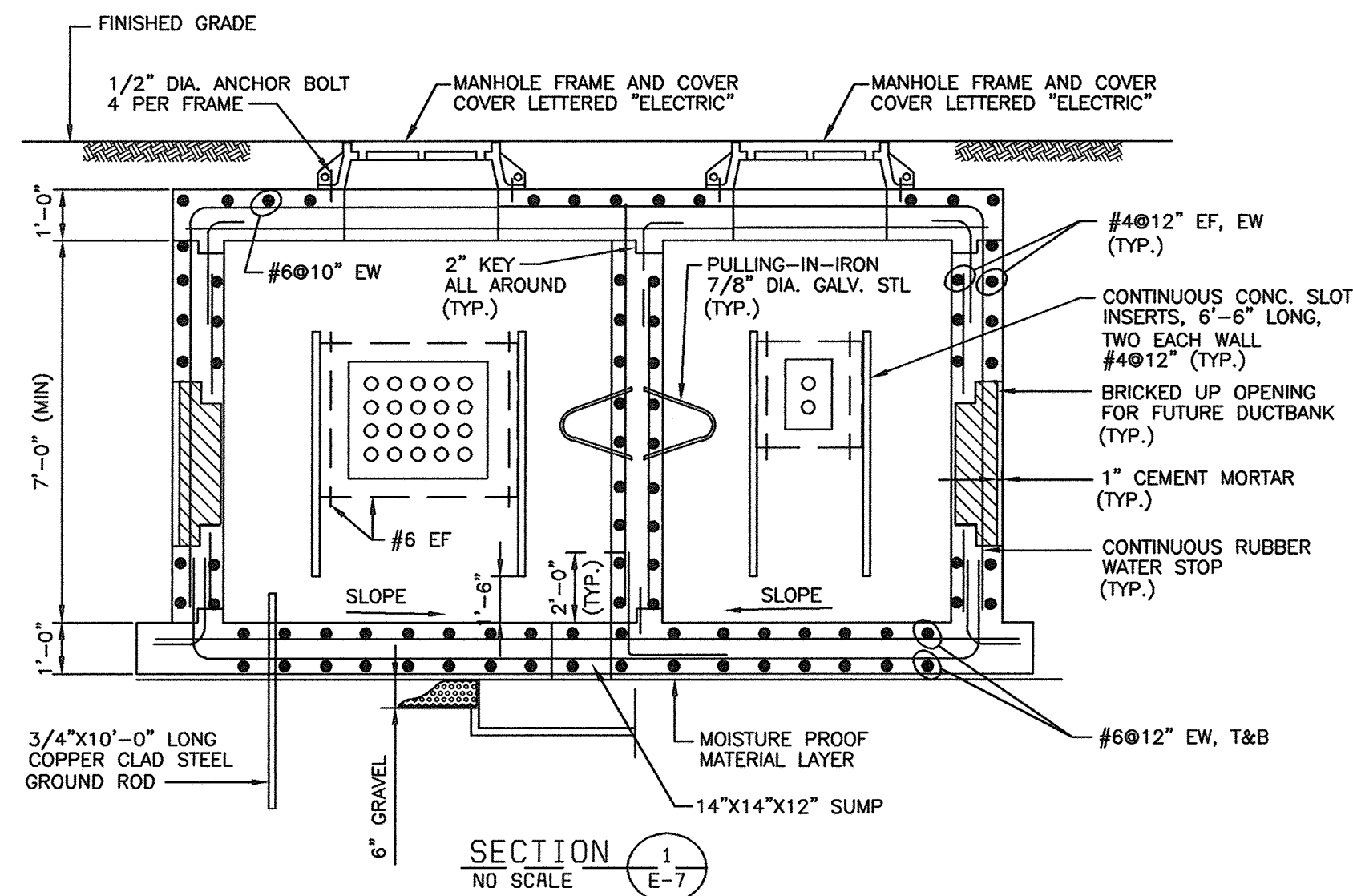
PLAN



PRE-CAST OR CAST IN PLACE MANHOLE MEDIUM VOLTAGE CABLE



TYPICAL PRE-CAST OR CAST IN PLACE MANHOLE LOW VOLTAGE CABLE



TYPICAL MEDIUM VOLTAGE AND LOW VOLTAGE MANHOLE

NOTES

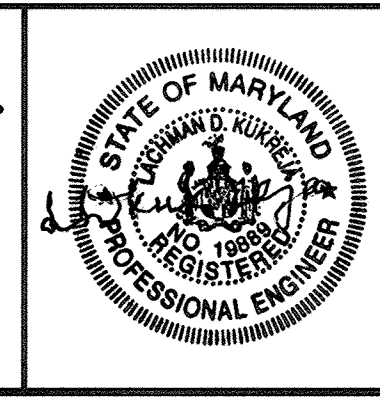
- SEE DRAWING E-1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- ALL CONDUIT AND DUCT BANK ROUTING SHOWN ON SITE PLAN IS INTENDED TO SHOW SCOPE OF WORK. ACTUAL ROUTING SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO EXCAVATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE INSTALLATION SO THAT CROSS OVER OF PIPING IS MINIMIZED, UNLESS SPECIFIED OTHERWISE, PIPING HAS RIGHT-OF-WAY.
- UNDERGROUND CONDUITS SHALL NOT BE LESS THAN 2 INCH IN UNDERGROUND DUCT BANKS AND 1 INCH MINIMUM FOR DIRECT BURIED APPLICATIONS.
- DUCT BANKS INDICATED AS DIRECT-BURIED SHALL BE CONCRETE-ENCASED UNDER ROADWAYS, PARKING AREAS AND OTHER AREAS SUBJECT TO VEHICULAR TRAFFIC.
- UNDERGROUND CONDUIT WITHIN DUCT BANKS SHALL BE POLYVINYL CHLORIDE (PVC) SCHEDULE 40. DUCT ENCASEMENT SHALL EXTEND A MINIMUM OF THREE INCHES BEYOND THE OUTSIDE SURFACES OF THE DUCTS. THE TOP SURFACE OF THE ENCASEMENT SHALL HAVE DUCTBANK MARKING TAPE.
- CONDUITS LEAVING A DUCT BANK BETWEEN MANHOLES TO TERMINATE IN A TRENCH OR OTHER RACEWAY SHALL BE RIGID STEEL GALVANIZED ENCASED IN UNREINFORCED CONCRETE WITH A THREE INCH COVER ALL AROUND.
- PVC STUB-UPS, WHEN REQUIRED, SHALL BE TERMINATED WITH PVC TO THREADED CONDUIT FEMALE ADAPTERS FLUSH WITH THE FLOOR, TOP OF FOUNDATION, ETC.
- CONDUITS SHALL BE ROUTED SO AS TO AVOID RUNNING THROUGH FOUNDATIONS. WHERE SUCH RUNS ARE UNAVOIDABLE, THEY SHALL BE RIGID STEEL CONDUIT.
- AFTER DUCT IS INSTALLED AND AFTER CONCRETE IS PLACED OR TRENCH BACKFILLED, A MANDREL SHALL BE PULLED THROUGH EACH DUCT. THEN EACH DUCT SHALL BE REAMED FREE OF BURRS AND CAREFULLY SWABBED. A 1/8 OR 3/16 INCH DIAMETER POLYPROPYLENE PULL ROPE SHALL BE INSTALLED IN EACH DUCT AND LEFT IN ALL SPARE DUCTS AT THE END OF THE JOB.

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 PLOT DATE: 06/17/2000
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Chief, Bureau of Utilities DATE: 6-29-00
 R. D. Kukreja

LACH
 LACH ELECTRIC CORPORATION
 Baltimore, Maryland
 REG. PROF. ENGR. DATE: 6-21-00
 R. D. Kukreja

BLACK & VEATCH
 Gaithersburg, Maryland
 REG. PROF. ENGR. DATE:



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

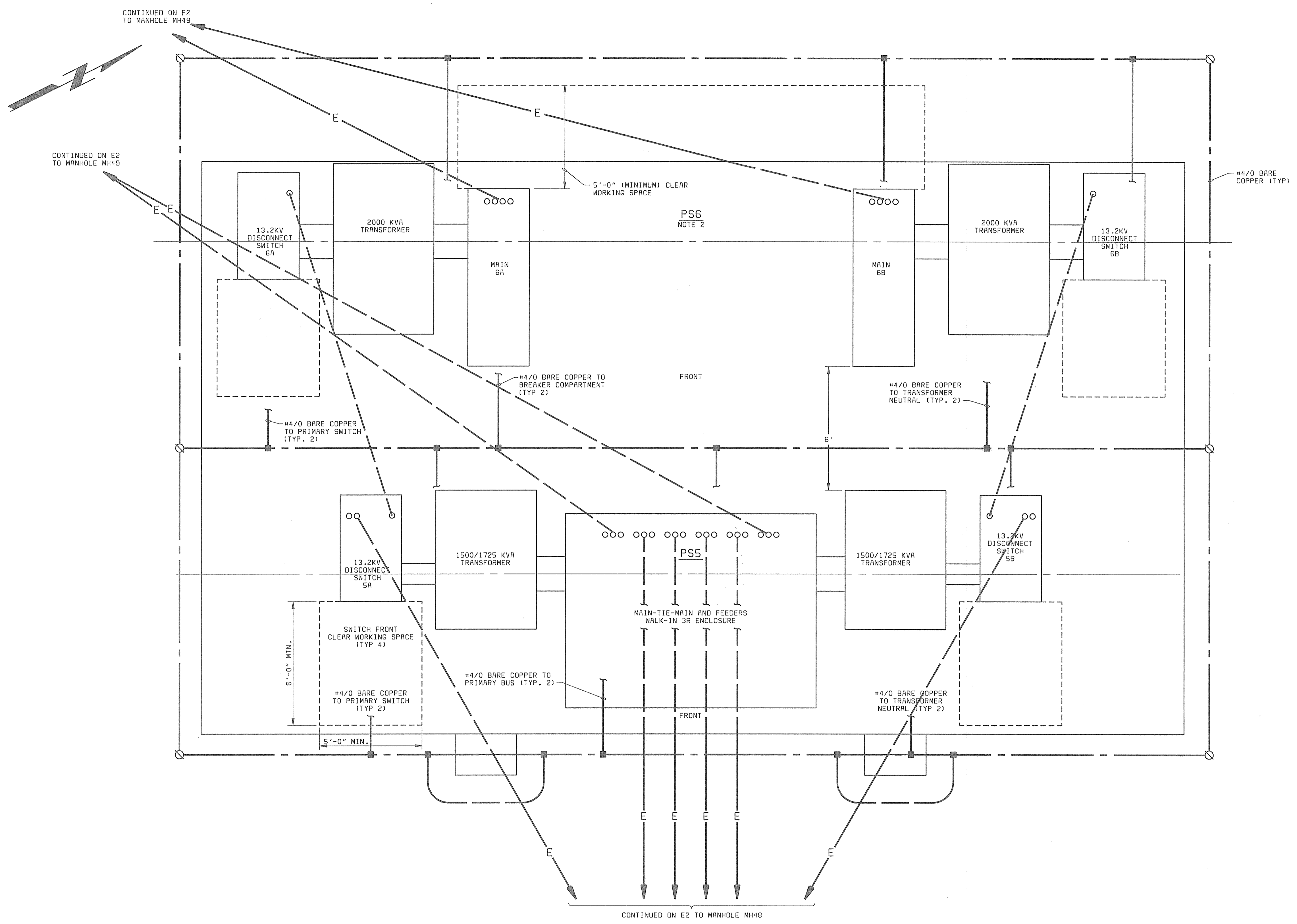
ELECTRICAL
DUCT BANK SECTIONS AND DETAILS

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

SCALE AS SHOWN
 SHEET 115 OF 161
E5

A
B
C
D
E

A
B
C
D
E



- NOTES:**
1. EXACT EQUIPMENT LOCATION MAY VARY FROM THAT SHOWN. CONTRACTOR SHALL ADJUST EQUIPMENT, PADS, CONDUITS, ETC., AS REQUIRED TO PROPERLY INSTALL EQUIPMENT FURNISHED. ALL WORKING SPACES AND CLEARANCES INDICATED SHALL BE MAINTAINED.
 2. SPACING BETWEEN MAIN CIRCUIT BREAKER SECTIONS 6A AND 6B SHALL ALLOW FUTURE ADDITION OF 3 TO 4 CIRCUIT BREAKERS OF MANUFACTURER USED WITHOUT HAVING TO MOVE EQUIPMENT.
 3. DUCT BANKS AND CONDUIT LOCATIONS SHALL BE PROPERLY COORDINATED WITH EQUIPMENT ENTRANCE LOCATIONS. SEE DRAWING E2 FOR DUCT BANK ROUTING, CONDUIT SIZES AND QUANTITIES.
 4. SEE CIVIL/STRUCTURAL PLANS FOR CONCRETE PAD, CURB, SIDEWALK AND OTHER DETAILS.

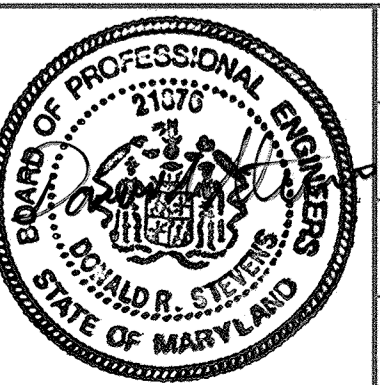
POWER SUBSTATION NO.5 & 6
3/8"=1'-0"

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

David H. ...
REG. PROF. ENGR. DATE



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS-WEB | | | | | |
| DRN: JCB | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

POWER SUBSTATION NO.5 AND NO.6
ELECTRICAL

POWER, LIGHTING & GROUND PLAN

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

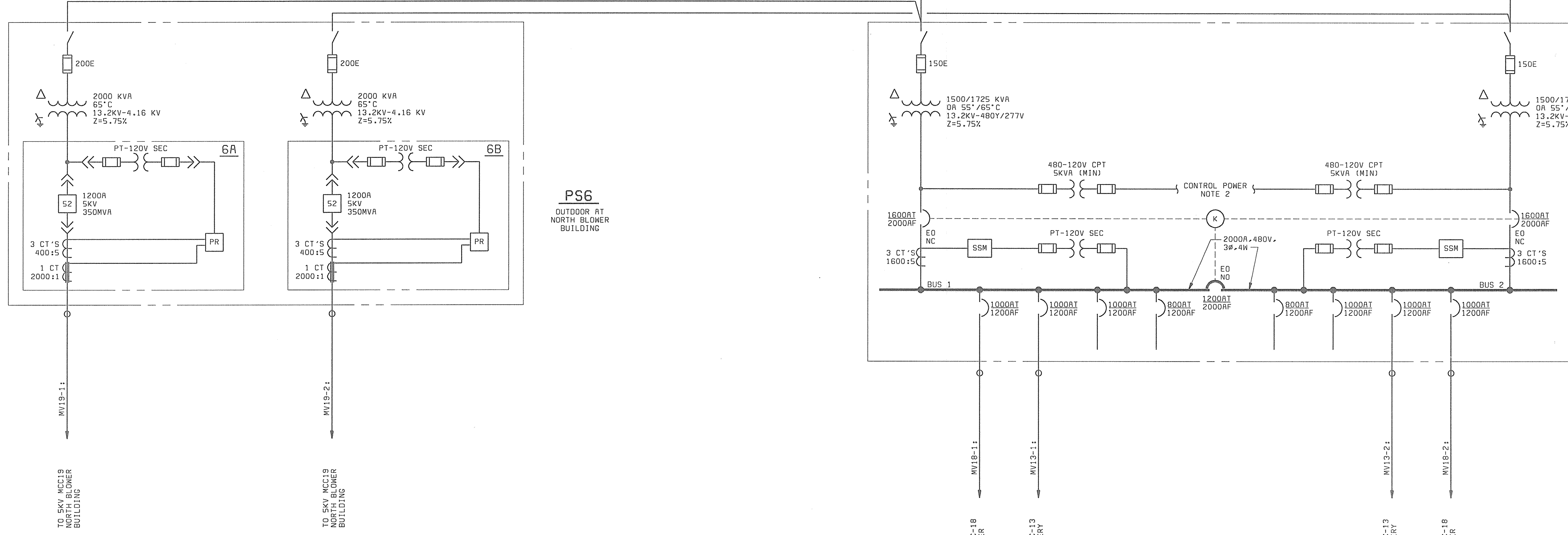
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

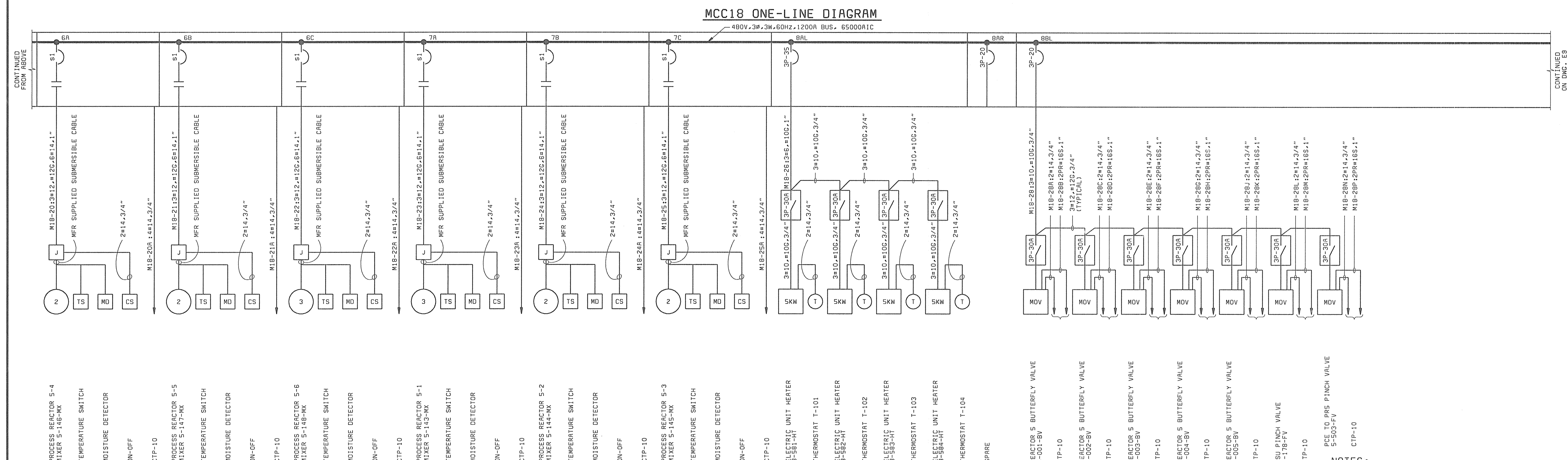
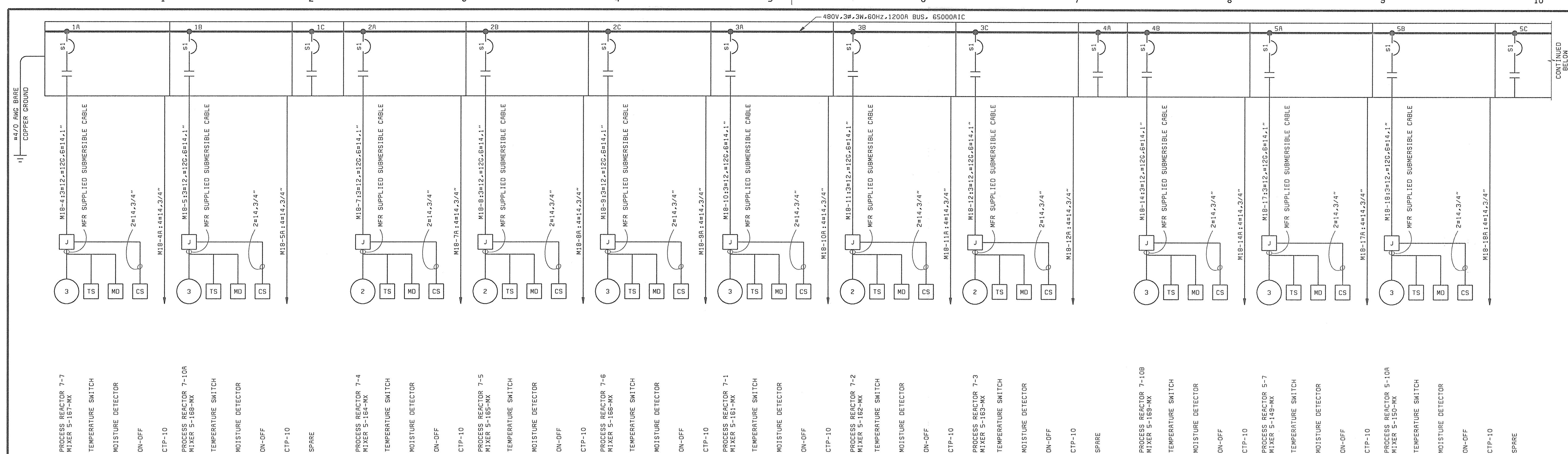
SHEET 116 OF 161

E6



- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 2. CONTROL POWER TRANSFORMERS IN PS5 SHALL PROVIDE 120 VAC. SINGLE-PHASE CONTROL POWER TO PS5, PS6, AND MCC19. CONTRACTOR SHALL CONFIRM SIZE IS SUFFICIENT, OR SIZE AS REQUIRED.

| | | | | | | | | | | | | |
|---|---|--|----------|----------|---------------|------|-------------------------------|-----|----|---|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND Robert Benjamin 6-25-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH LLP Gaithersburg, Maryland David J. Steiner REG. PROF. ENGR. DATE 6/24/00 | DONALD R. STEVENS STATE OF MARYLAND REG. PROF. ENGR. NO. 21876 | DES: GNS | | | | | | | POWER SUBSTATION NO.5 AND NO.6 ELECTRICAL DISTRIBUTION SYSTEM ONE-LINE DIAGRAM | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: JCB | CHK: JTF | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | | | CK |



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

BLACK & VEATCH, LP
Gaithersburg, Maryland

BOARD OF PROFESSIONAL ENGINEERS
HOWARD COUNTY, MARYLAND

DES: GNS.SFP
DRN: JCB
CHK: JTF
DATE: 6/23/00

NORTH BLOWER BUILDING
ELECTRICAL

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

MCC18 ONE-LINE DIAGRAM

SCALE AS SHOWN
SHEET 118 OF 161
E8

DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP

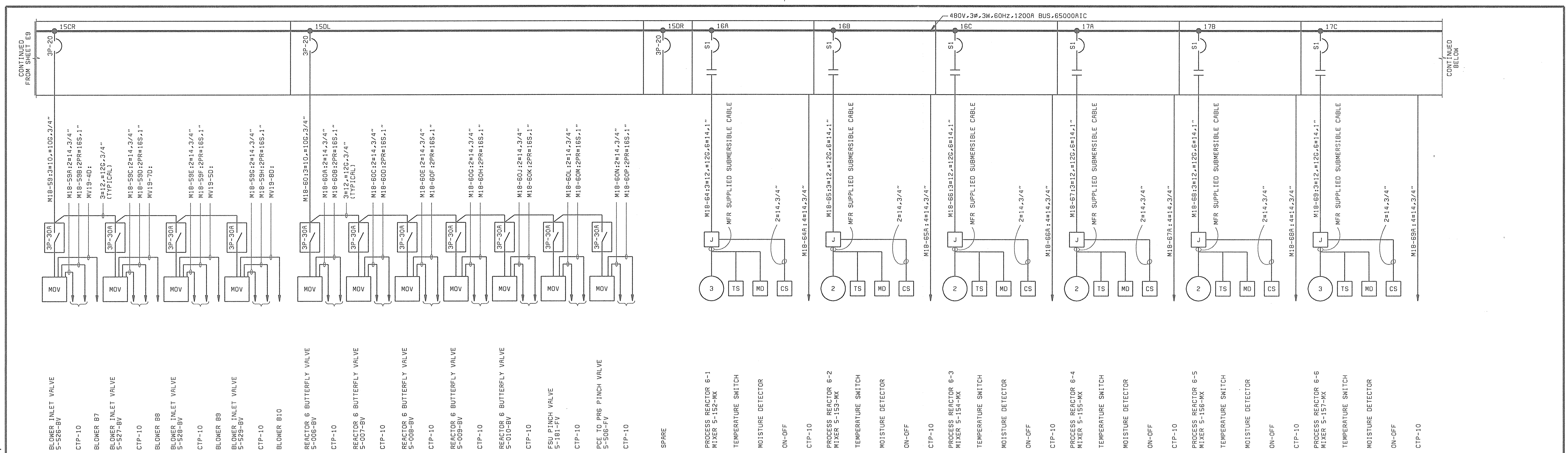
NOTES:
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

CHIEF, BUREAU OF UTILITIES DATE

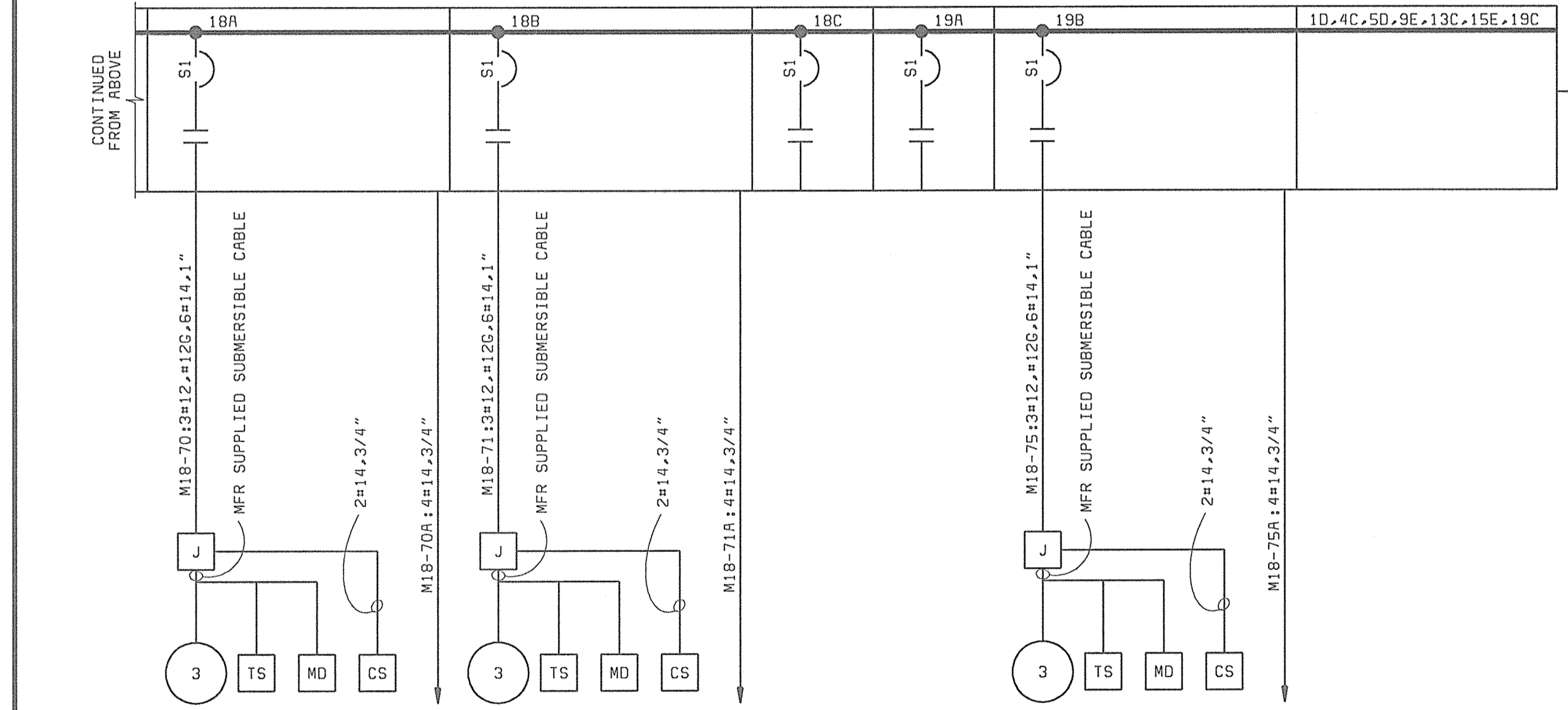
REG. PROF. ENGR. DATE

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

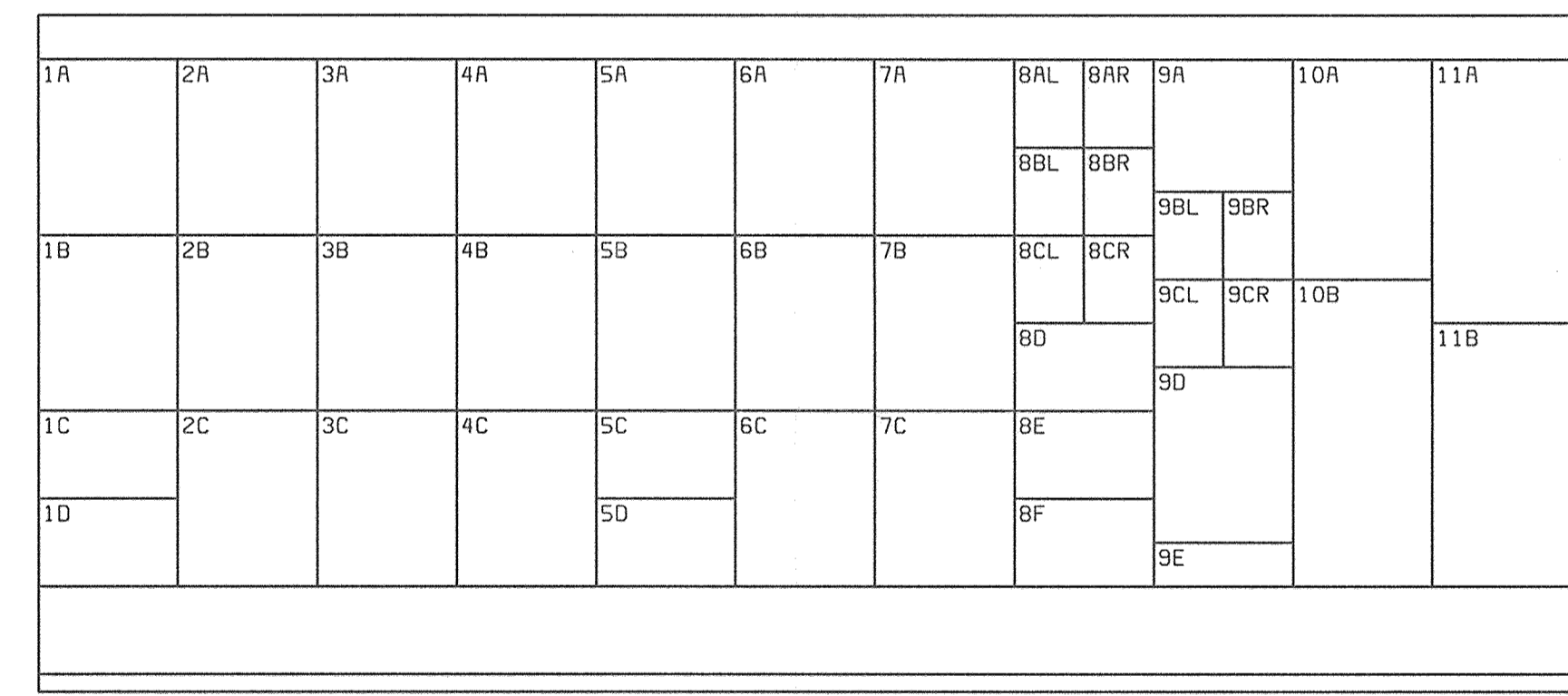
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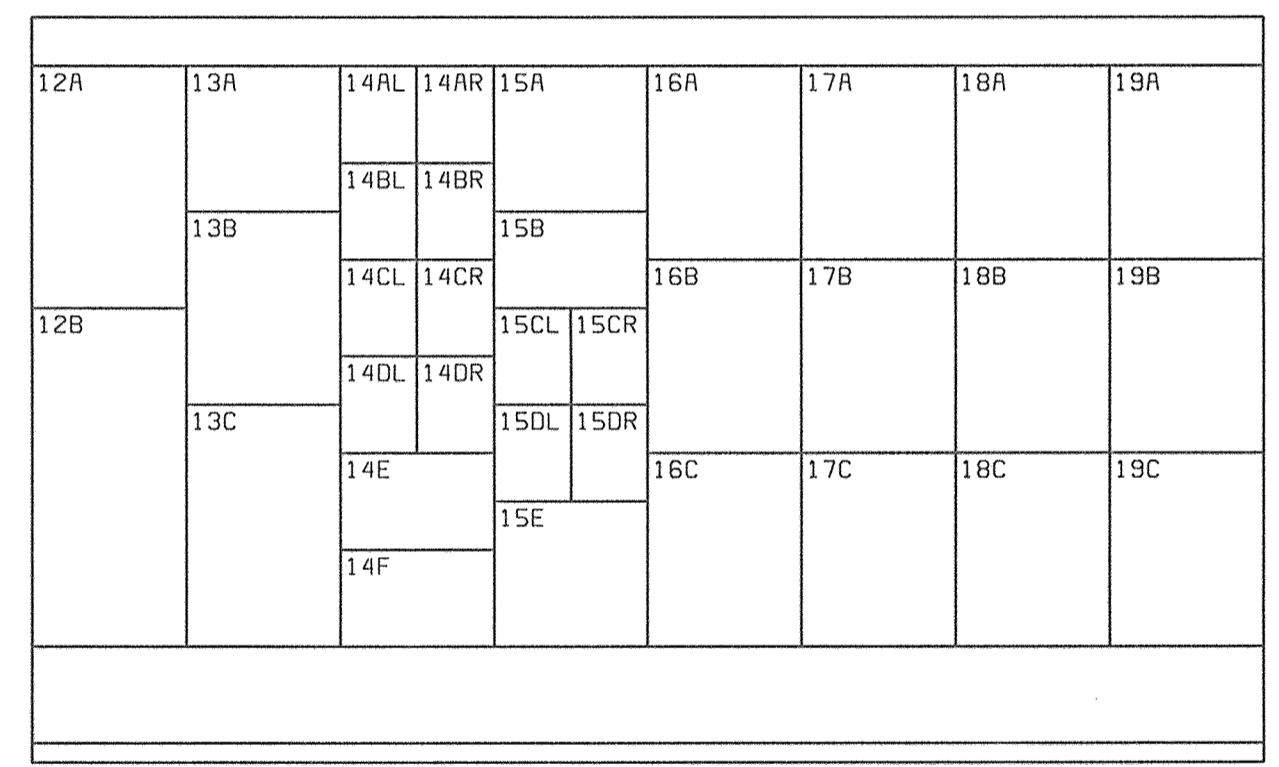
MCC18 ONE-LINE DIAGRAM (CONTINUED)



MCC18 ONE-LINE DIAGRAM (CONTINUED)



MCC18 FRONT ELEVATION - NORTH SIDE
NO SCALE

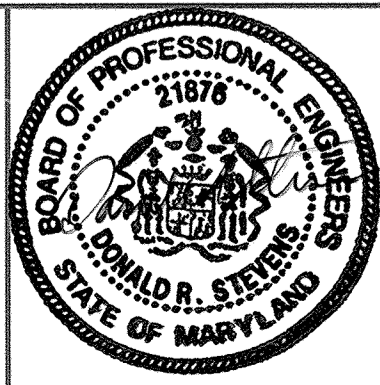


MCC18 FRONT ELEVATION - SOUTH SIDE
NO SCALE

NOTES:
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
R. J. ...
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland
Daniel ...
REG. PROF. ENGR. DATE

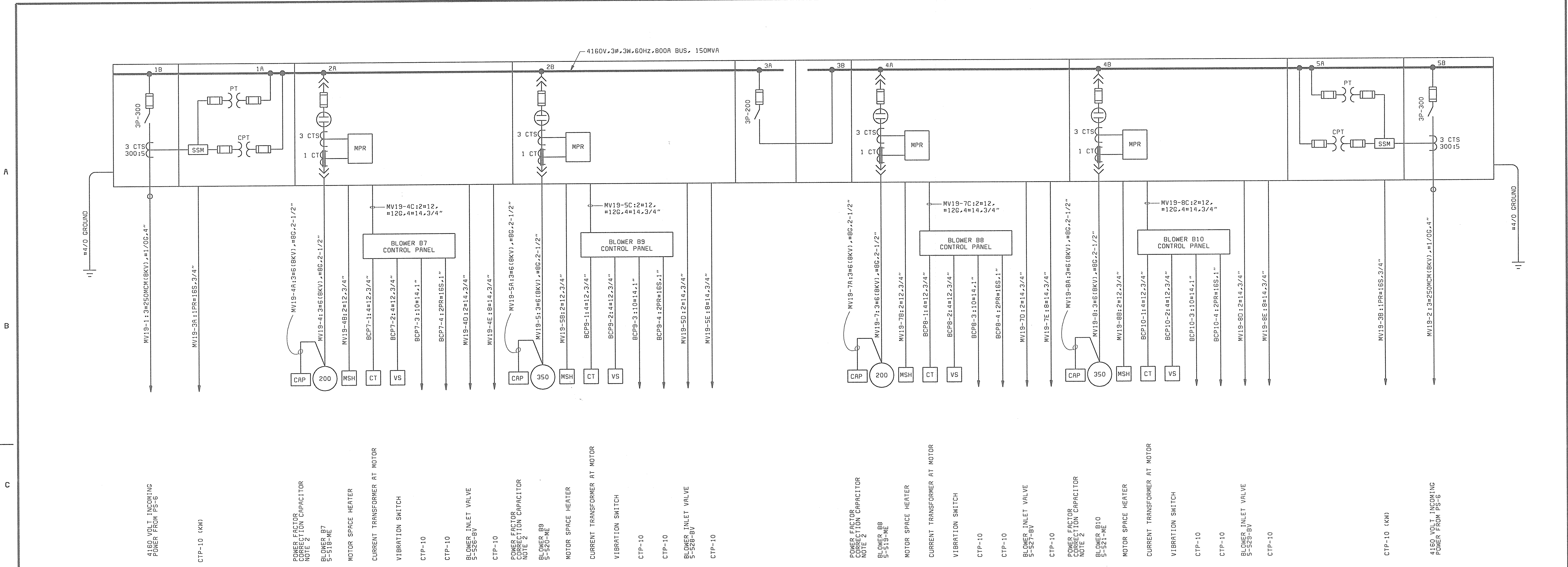


| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: GNS.SFP | | | | | | | | | |
| DRN: JCB | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

NORTH BLOWER BUILDING
ELECTRICAL
MCC18 ONE-LINE DIAGRAM
CONTINUATION

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

SCALE AS SHOWN
SHEET 120 OF 161
E10



MCC19 ONE-LINE DIAGRAM
NORTH BLOWER BUILDING ELECTRICAL ROOM

| | | | | |
|----------------------|-------------------|----------------|--------------------|----------------------|
| 1A | 2A | 3A | 4A | 5A |
| METERING | BLOWER B7 STARTER | BUS TIE SWITCH | BLOWER B8 STARTER | METERING |
| 1B | 2B | 3B | 4B | 5B |
| MAIN INCOMING SWITCH | BLOWER B9 STARTER | SPACE | BLOWER B10 STARTER | MAIN INCOMING SWITCH |

MCC19 FRONT VIEW
NO SCALE

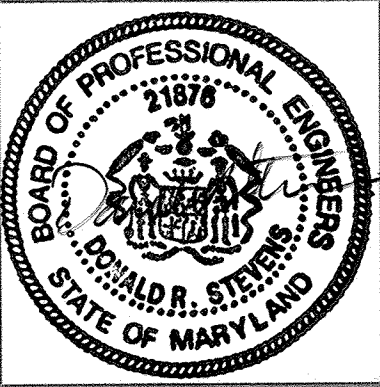
- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - TUNED POWER FACTOR CORRECTION CAPACITOR WILL BE FURNISHED BY AFD SUPPLIER FOR INSTALLATION BY CONTRACTOR.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH L.P.
Gaithersburg, Maryland

Donna ...
REG. PROF. ENGR. DATE



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: GNS,SFP | | | | | | | | | |
| DRN: JCB | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

NORTH BLOWER BUILDING ELECTRICAL

MCC19 ONE-LINE DIAGRAM

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

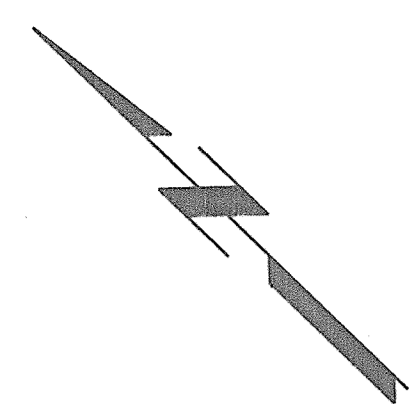
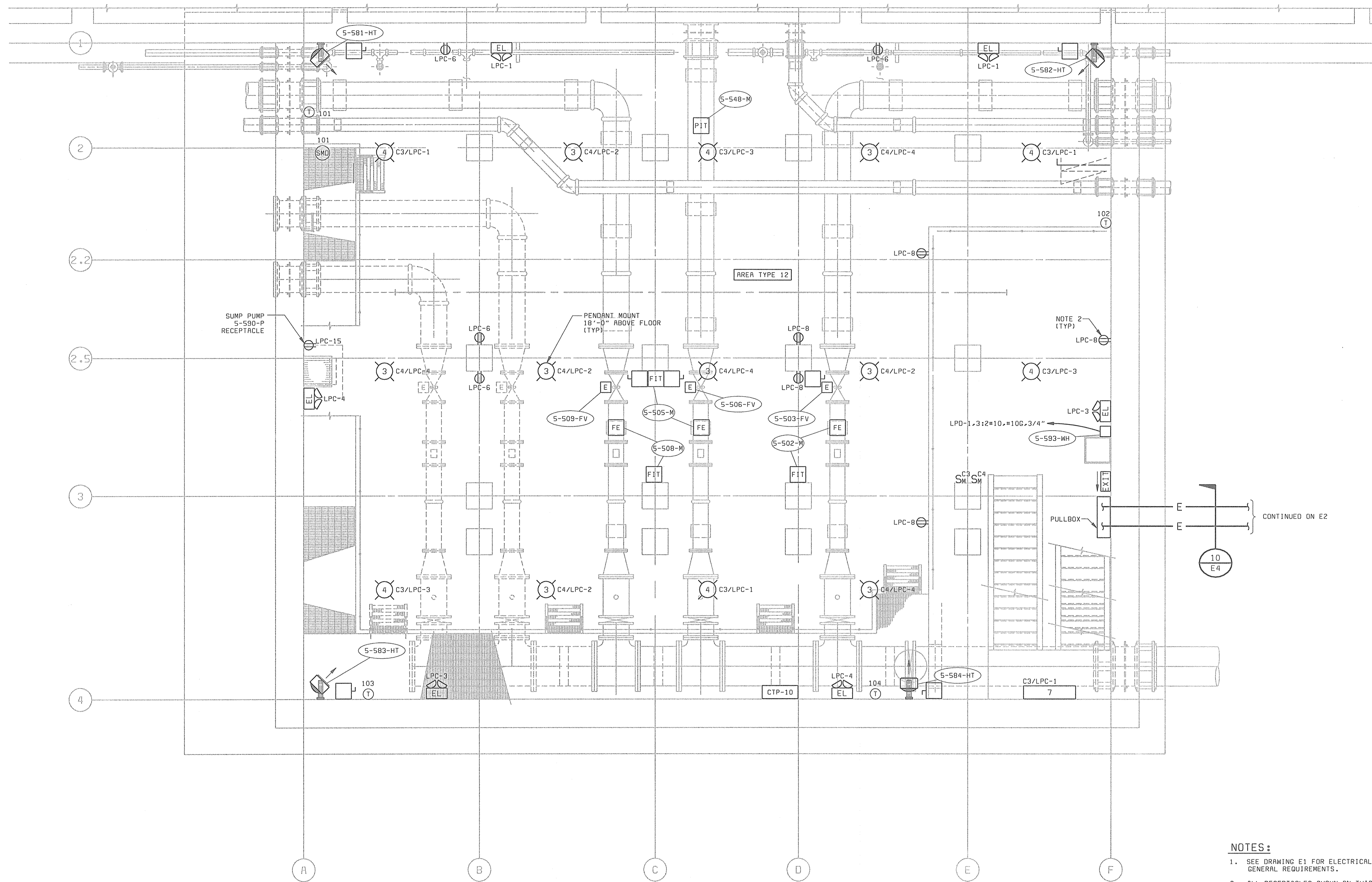
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 121 OF 161

E11



BASEMENT FLOOR - POWER AND LIGHTING PLAN

1/4" = 1'-0"

NOTES:

- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE WP/GFI AND MOUNTED 4'-0" ABOVE FLOOR.

58472-205-BB-PR-A0000556
58472-101-PR-M-A0000550
58472-104-BB-H-A0000556

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Richard Bauman 6-29-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH LP
Gaithersburg, Maryland

David H. ...
REG. PROF. ENGR. DATE 6/23/00



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: SFP,DVH | | | | | | | | | |
| DRN: DVH,ECC | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

**NORTH BLOWER BUILDING
ELECTRICAL**

**BASEMENT FLOOR
POWER AND LIGHTING PLAN**

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

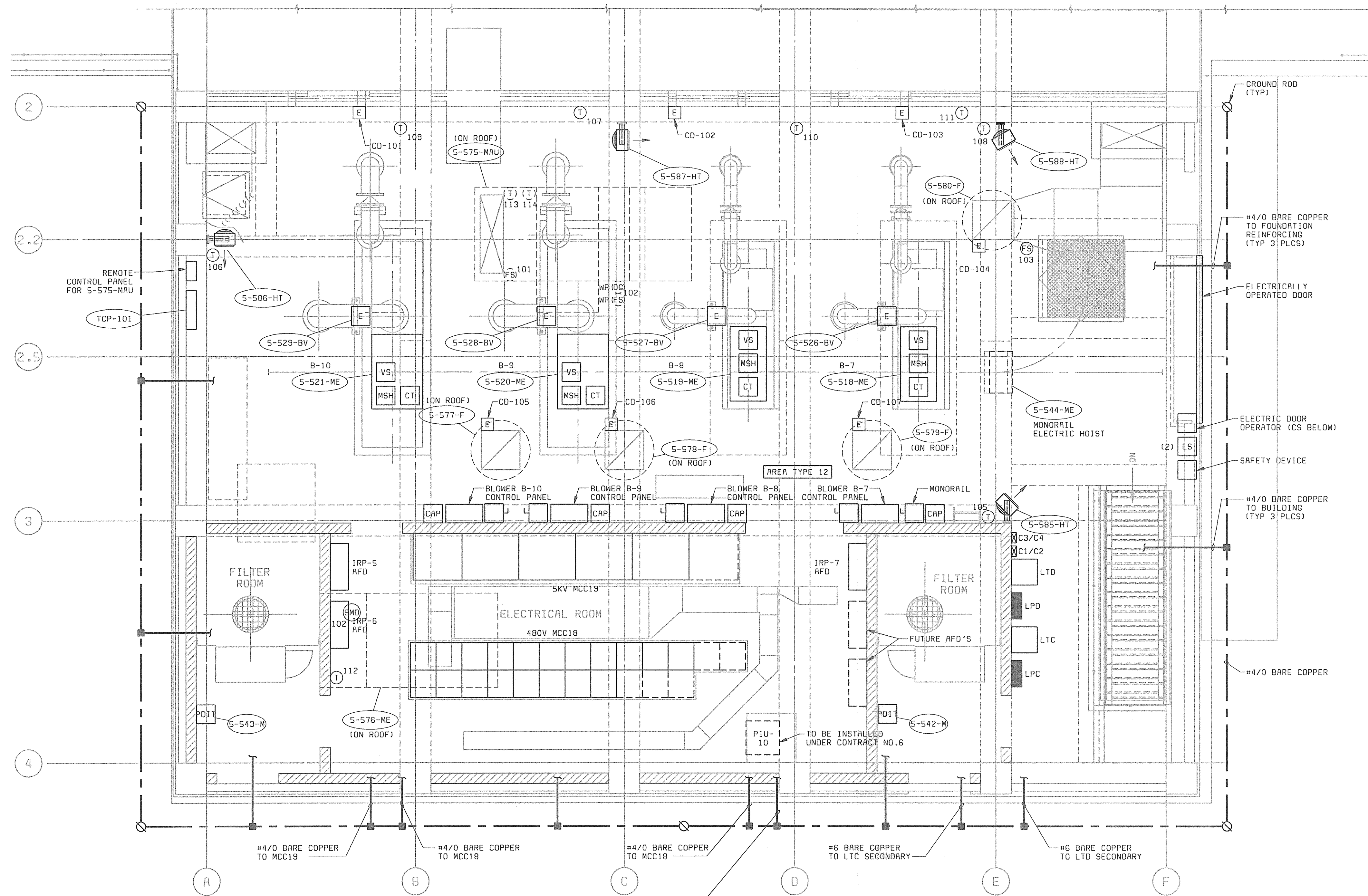
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
122 OF 161

E12



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

NOTES:

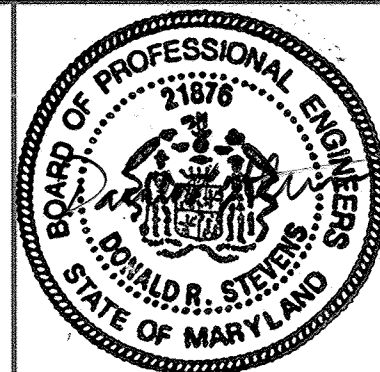
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

58472-205-BB-PR-R0000565
58472-101-PR-M-R0000550
58472-104-BB-H-R0000658

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

BLACK & VEATCH
Gaithersburg, Maryland

David A. Steiner
REG. PROF. ENGR. DATE 6/23/00



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: SFP.DVH | | | | | | | | | |
| DRN: DVH.EEC | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

**NORTH BLOWER BUILDING
ELECTRICAL**

**OPERATING FLOOR
POWER PLAN**

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

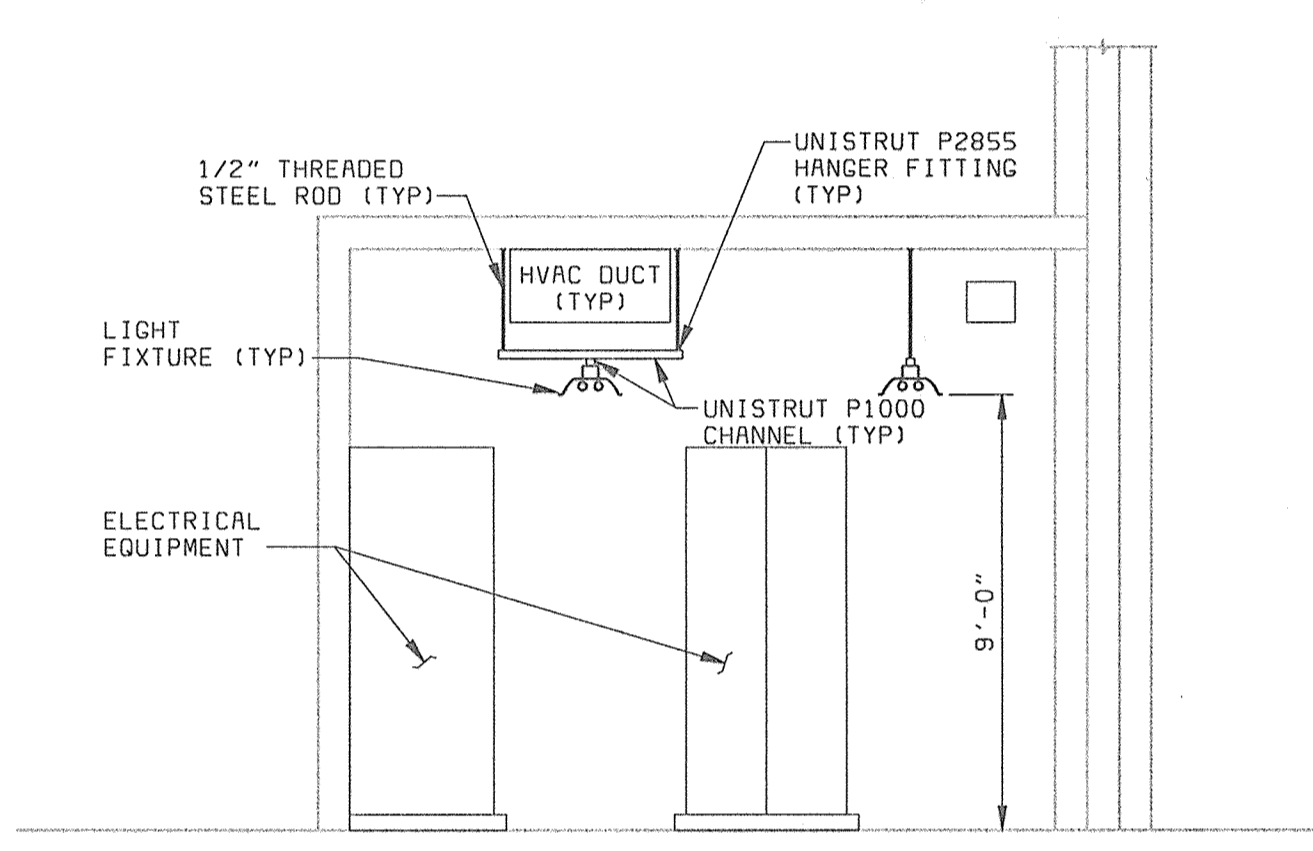
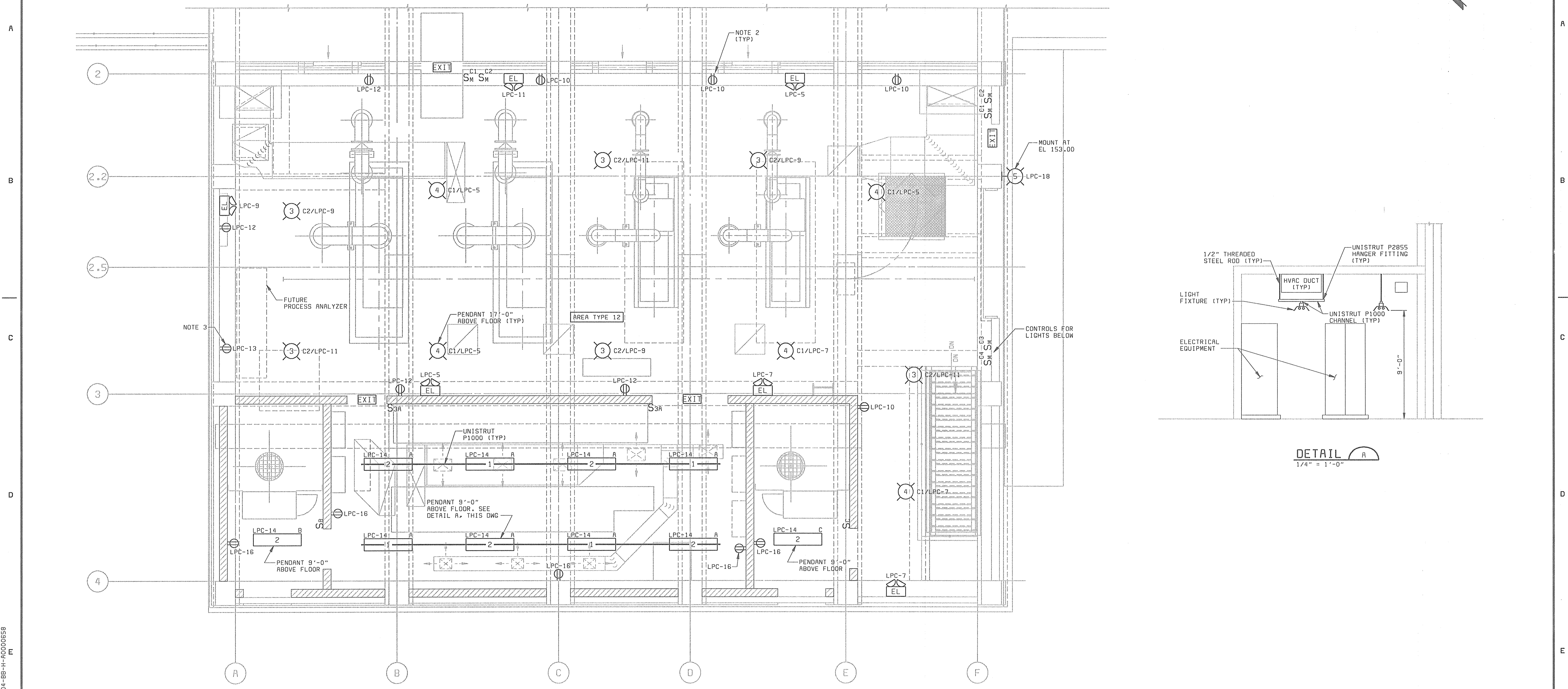
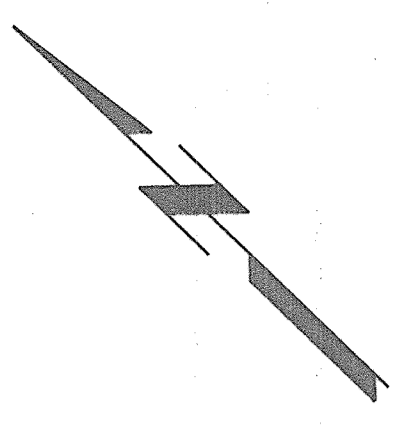
SCALE
AS SHOWN

SHEET
123 OF 161

E13

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

058472
F058472A

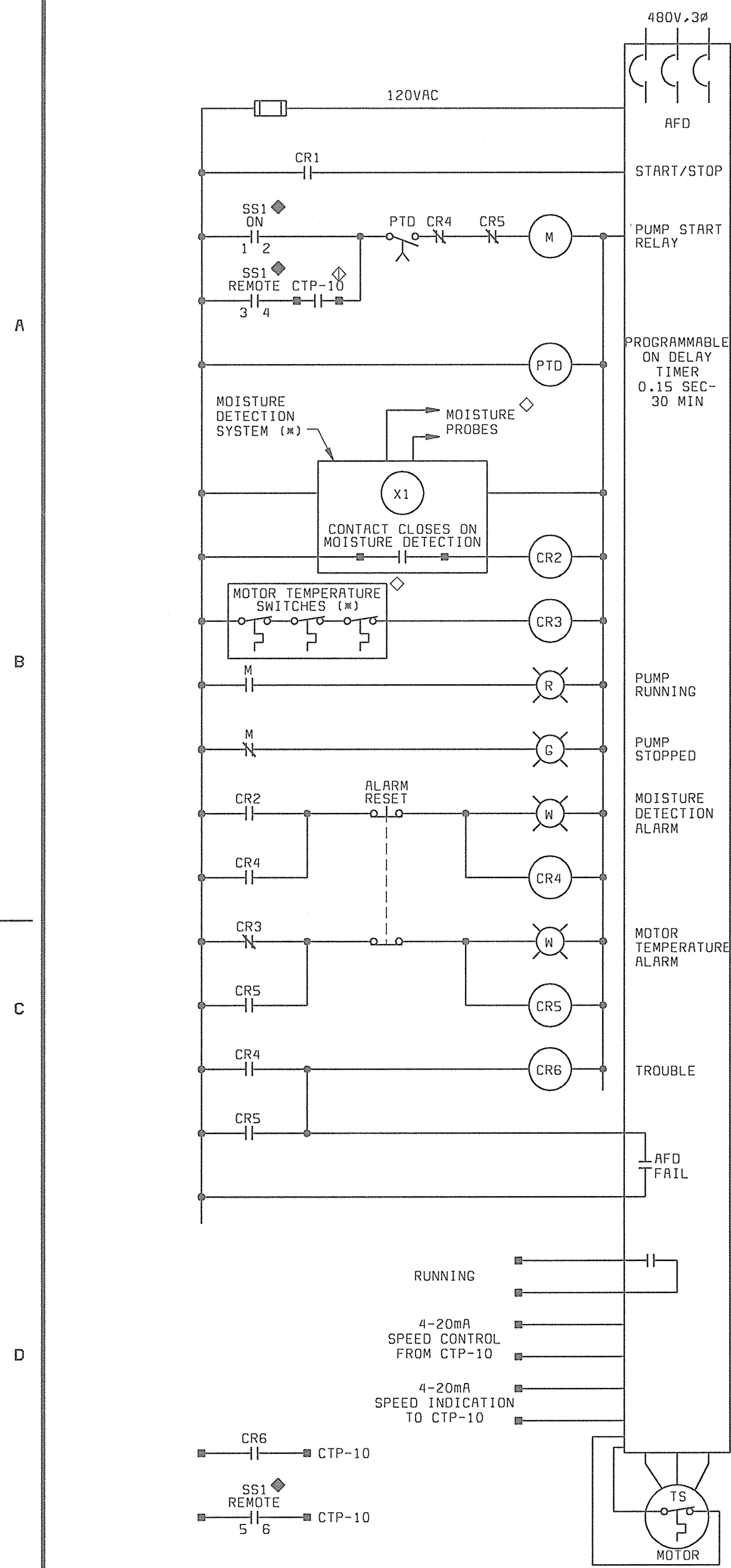


LIGHTING PLAN
1/4" = 1'-0"

- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 2. ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE GFI TYPE.
 3. 20 AMP, 120V RECEPTACLE FOR FUTURE PROCESS ANALYZER.

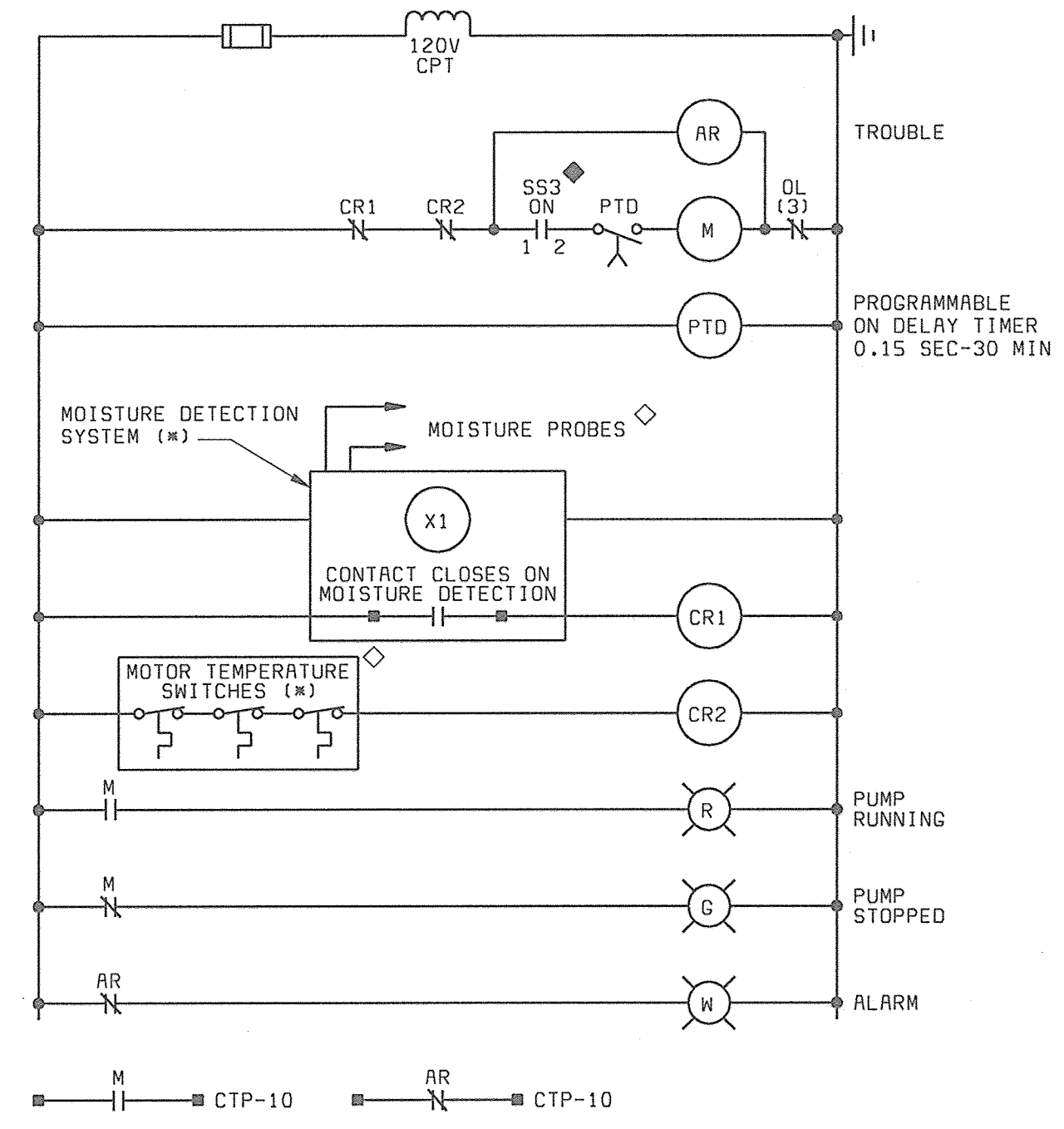
58472-205-BB-PR-A0000565
 58472-101-PR-M-A0000550
 58472-104-BB-H-A0000658
 058472
 F058472A

| | | | | | | |
|---|---|--|---|---|---|---|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert W. Baer</i> C-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH ^{LLP} Gaithersburg, Maryland <i>Daniel A. Allen</i> REG. PROF. ENGR. DATE | DONALD R. STINES BOARD OF PROFESSIONAL ENGINEERS STATE OF MARYLAND | DES: SFP,DVH DRN: DVH,ECC CHK: JTF DATE: 6/23/00 | NORTH BLOWER BUILDING ELECTRICAL OPERATING FLOOR LIGHTING PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 124 OF 161 E14 |
|---|---|--|---|---|---|---|



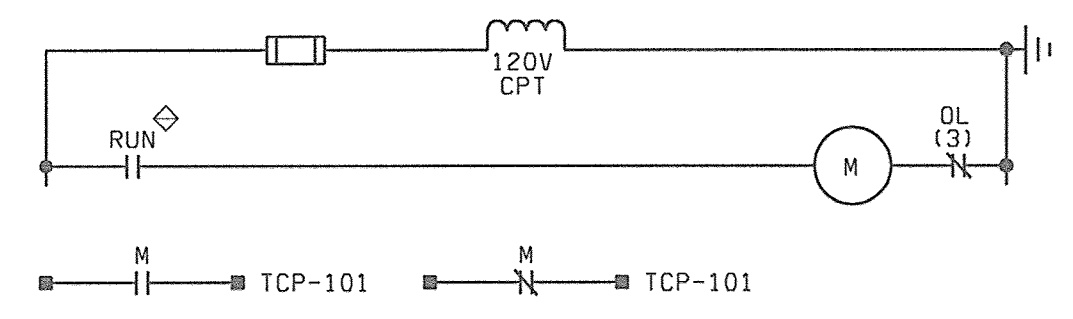
INTERNAL RECYCLE PUMP
5-128-P THROUGH 5-130-P

(*) PROVIDED UNDER SPECIFICATION 11155

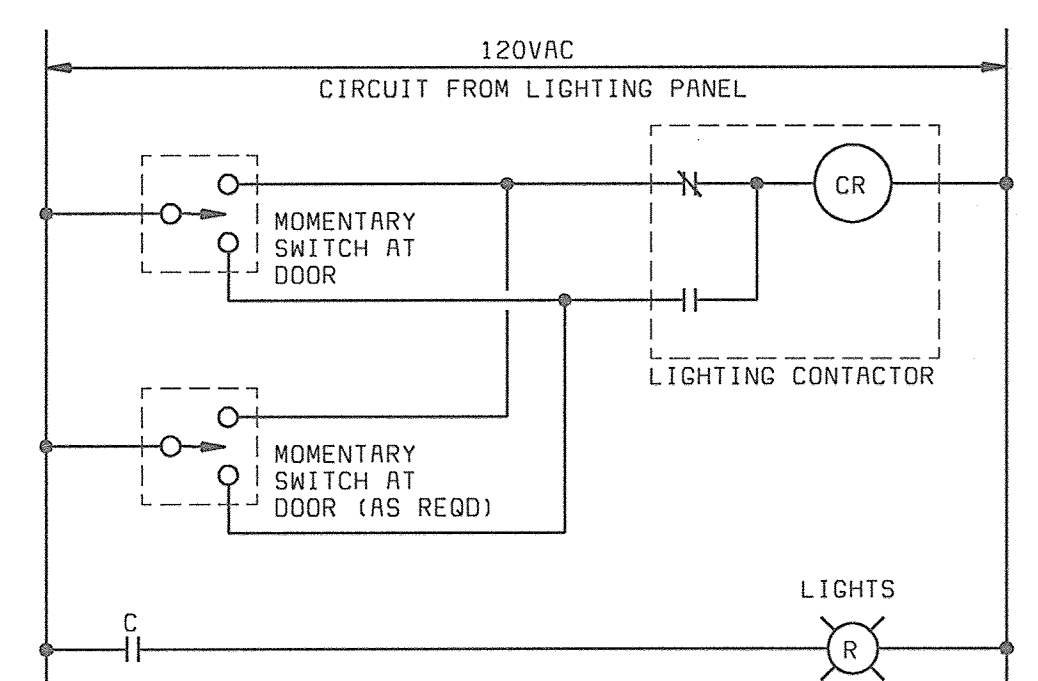


PROCESS REACTOR MIXER 5-143-MX

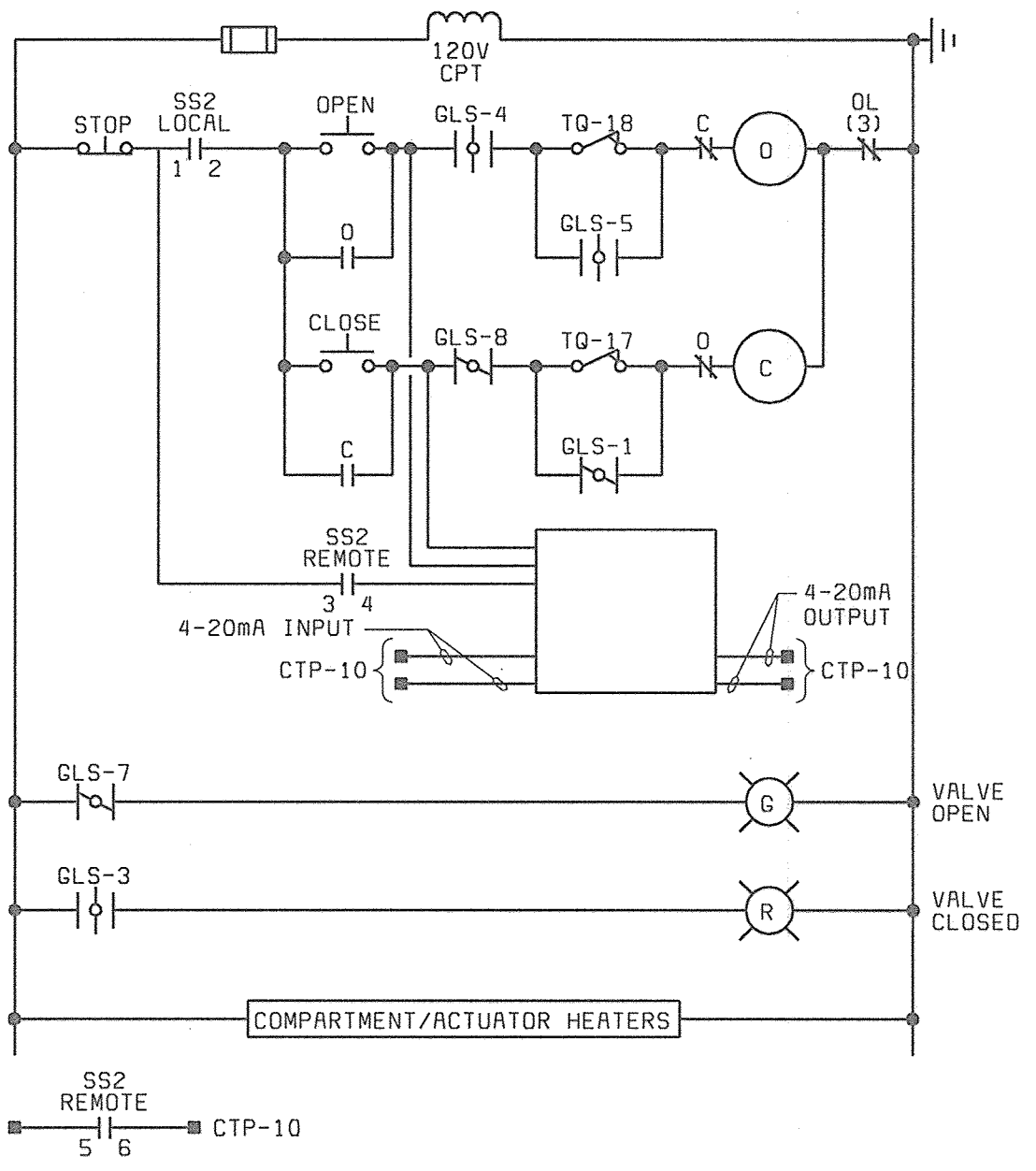
(SIMILAR FOR 5-144 THROUGH 149-MX,
5-152 THROUGH 158-MX,
5-161 THROUGH 167-MX)
(*) PROVIDED UNDER SPECIFICATION SECTION 11515



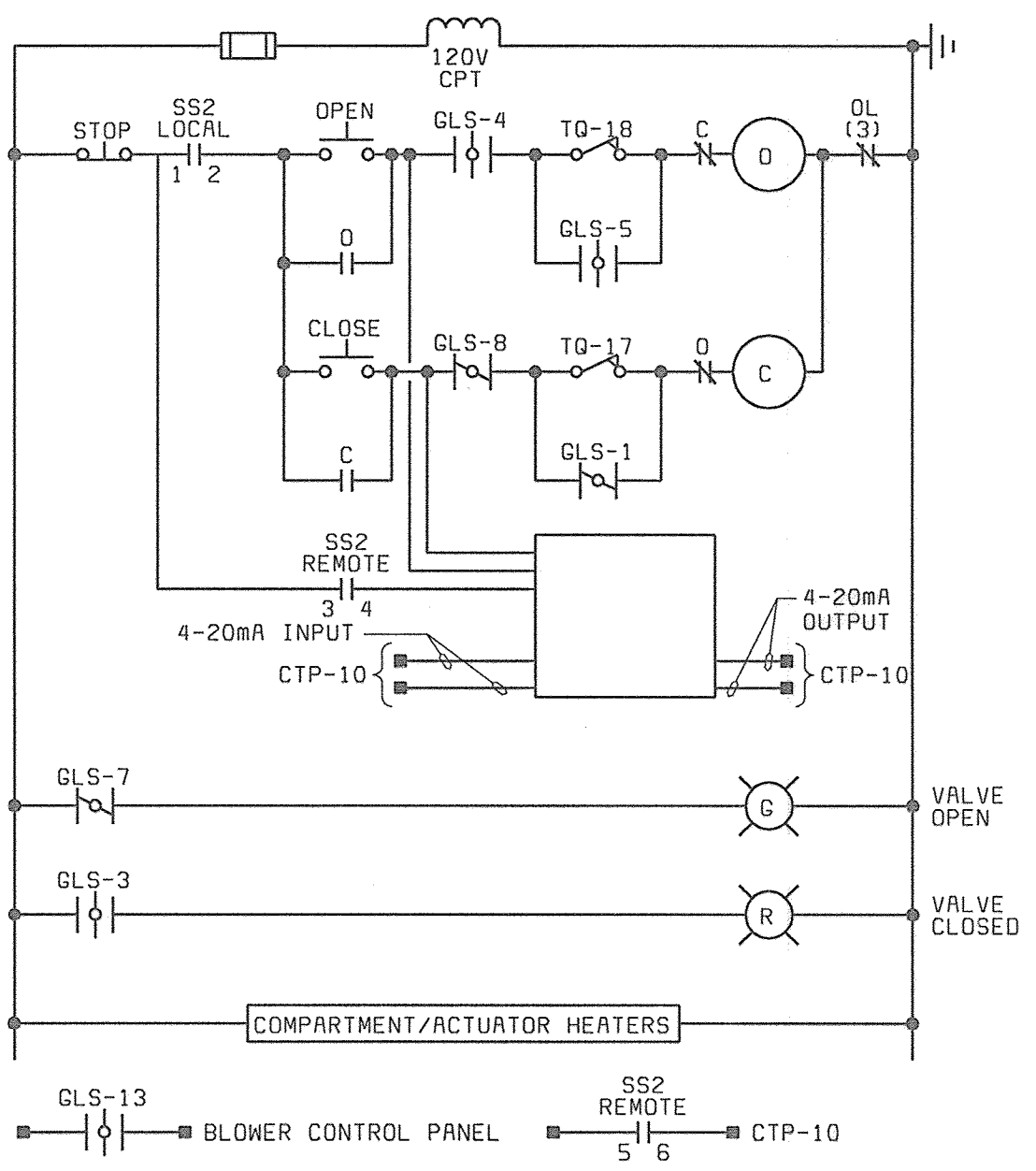
POWER ROOF VENTILATORS
5-577 THROUGH 580-F



LIGHTING CONTROL OR LIGHTING CONTACTORS C1 THROUGH C4



TYPICAL MODULATING VALVE ELECTRIC OPERATOR



BLOWER INLET VALVE ELECTRIC OPERATOR

GENERAL LIMIT SWITCH DEVELOPMENT:

| R/O CONTACT | ACTUATOR POSITION | | | |
|-------------|-------------------|-----------------|------------------------------|--------------------|
| | GLS CONTACT | FULL OPEN (90%) | INTERMEDIATE POSITION (100%) | FULL CLOSED (100%) |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |

TQ/17 OPENS ON HIGH CLOSING TORQUE
TQ/18 OPENS ON HIGH OPENING TORQUE
=CONTACT CLOSED

SWITCH DEVELOPMENTS:

| CONTACTS | POSITION | | |
|----------|----------|-----|--------|
| | ON | OFF | REMOTE |
| 1-2 | X | | |
| 3-4 | | | X |
| 5-6 | | | X |

| CONTACTS | POSITION | | |
|----------|----------|-----|--------|
| | LOCAL | OFF | REMOTE |
| 1-2 | X | | |
| 3-4 | | | X |
| 5-6 | | | X |
| 7-8 | X | | |

| CONTACTS | POSITION | |
|----------|----------|-----|
| | ON | OFF |
| 1-2 | X | |

DEVICE LOCATION LEGEND:

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ CONTROLS TERMINATION PANEL CTP-10 (PIU-10)
- ◇ FROM TCP-101

NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. AFD SCHEMATICS SHOW FUNCTIONAL CONTROL AND INTERLOCKS. NOT ALL DEVICES ON THE DRIVE ARE SHOWN. SEE SPECIFICATION SECTION 16150 FOR ADDITIONAL REQUIREMENTS. ALL DEVICES ARE LOCATED AT THE DRIVES UNLESS OTHERWISE NOTED. SELECTOR SWITCHES AND PUSHBUTTONS AT AFD SHALL BE MOUNTED ON AFD ENCLOSURE FRONT.
3. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
4. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINED IN THE SCHEMATIC SYMBOL LEGEND.
5. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
6. CONTROL SETTINGS, ALARM LIMITS, AND SIMILAR ADJUSTABLE LIMITS ARE INTENDED TO BE FOR INITIAL STARTUP. ADJUSTABLE SETTINGS SHALL BE TESTED AND CHANGED BY THE CONTRACTOR, IF REQUIRED FOR PROPER SEQUENCING AND OPERATION.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

R. J. Bauman 6-29-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

David Stein
REG. PROF. ENGR.
6/23/00
DATE



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: GNS-SFP | | | | | | | | | |
| DRN: JCB | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

NORTH BLOWER BUILDING ELECTRICAL

SCHEMATICS

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

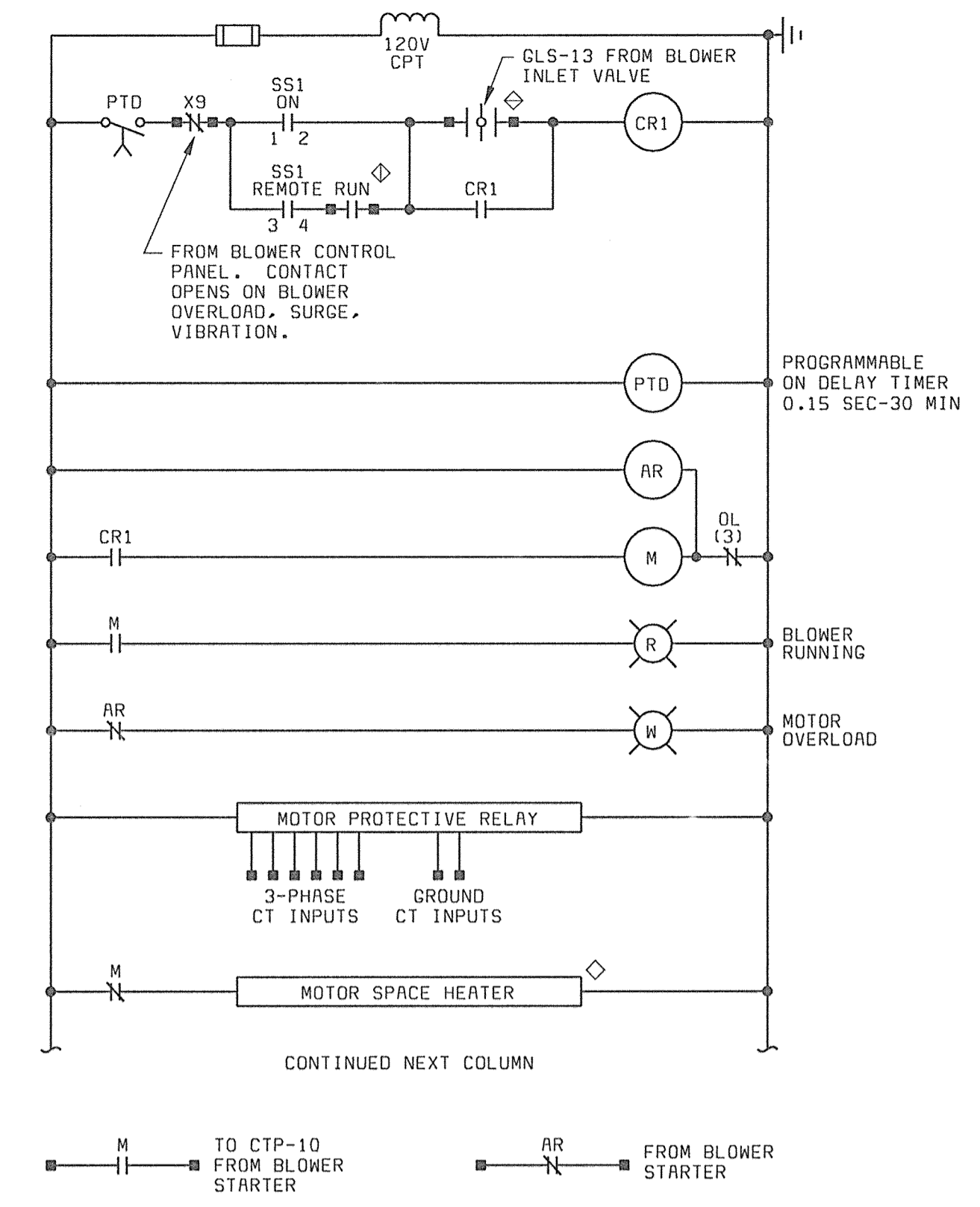
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

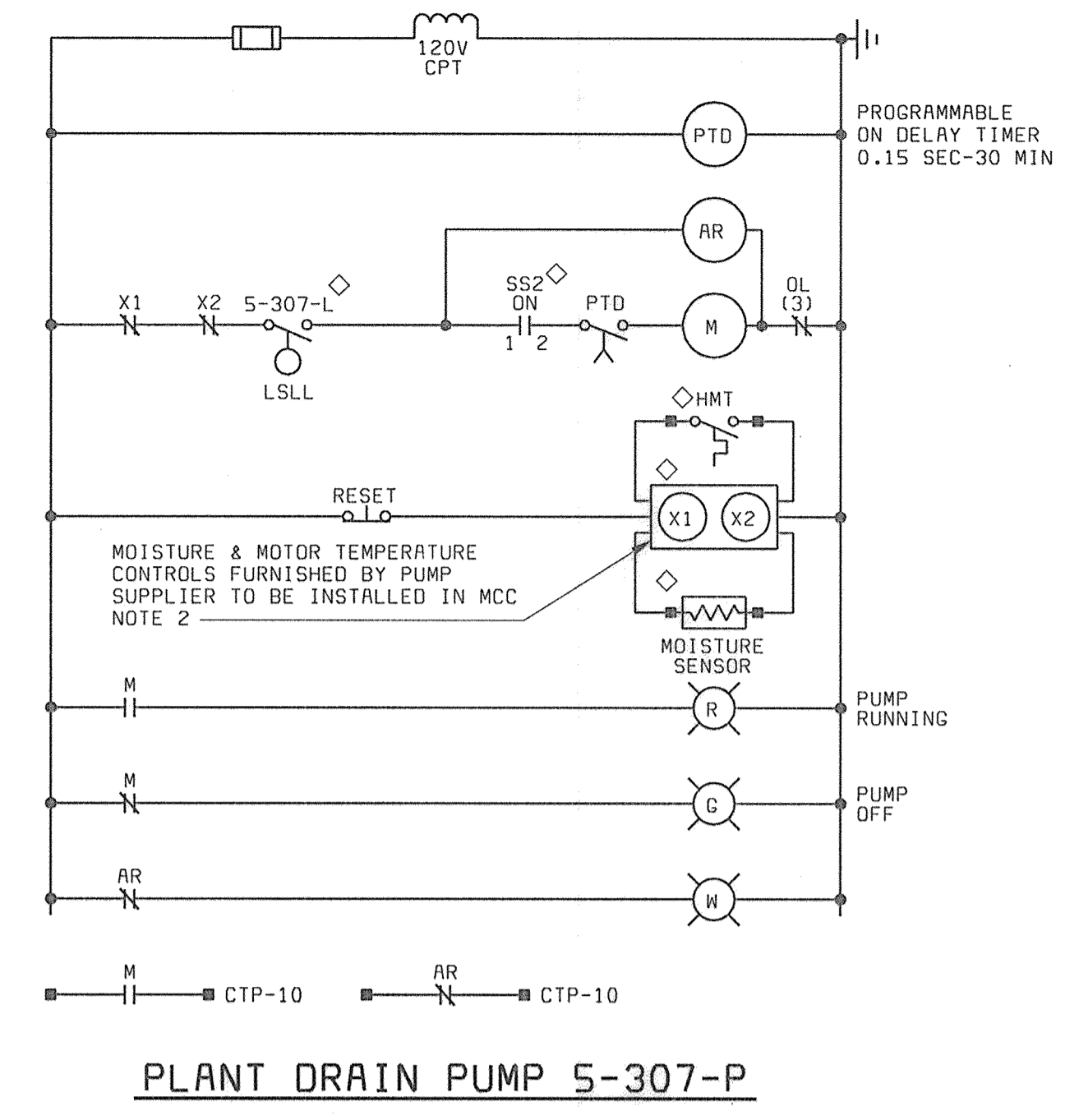
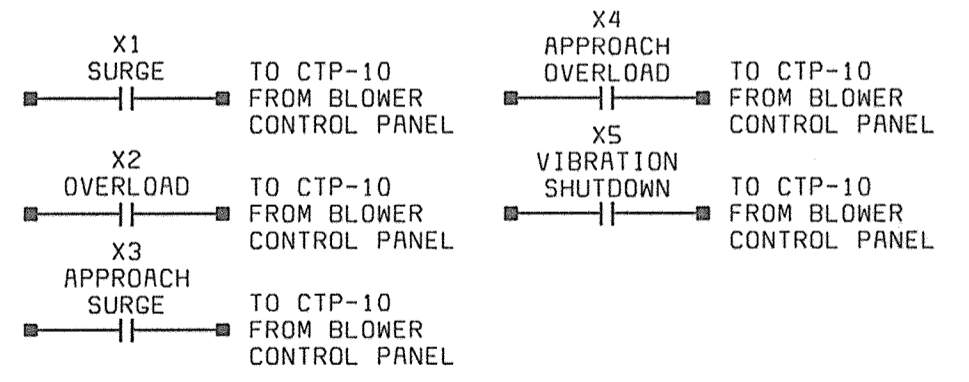
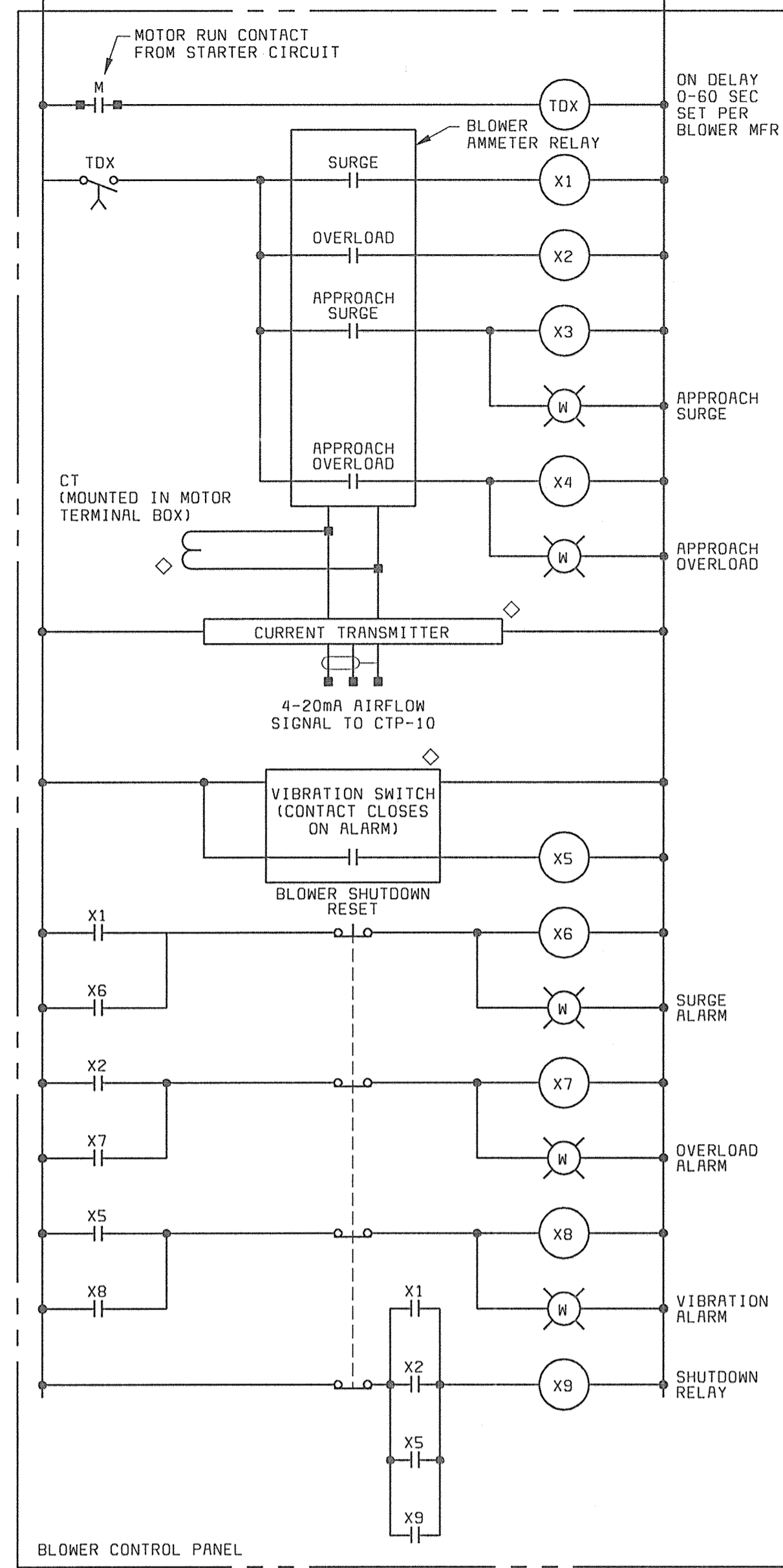
SCALE AS SHOWN

SHEET 125 OF 161
E15

CONTINUED FROM PREVIOUS COLUMN



CONTINUED NEXT COLUMN



PLANT DRAIN PUMP 5-307-P

GEARED LIMIT SWITCH DEVELOPMENT:

| ROW | CONTACT | ACTUATOR POSITION | | |
|-----|---------|-------------------|--------------------------|-----------------------------|
| | | GLS CONTACT | FULL OPEN POSITION (90%) | FULL CLOSED POSITION (100%) |
| 1 | 1 | | | |
| 2 | 2 | | | |
| 3 | 3 | | | |
| 4 | 4 | | | |
| 5 | 5 | | | |
| 6 | 6 | | | |
| 7 | 7 | | | |
| 8 | 8 | | | |
| 9 | 9 | | | |
| 10 | 10 | | | |
| 11 | 11 | | | |
| 12 | 12 | | | |
| 13 | 13 | | | |
| 14 | 14 | | | |
| 15 | 15 | | | |
| 16 | 16 | | | |

TQ/17 OPENS ON HIGH CLOSING TORQUE
TQ/18 OPENS ON HIGH OPENING TORQUE
-CONTACT CLOSED

SWITCH DEVELOPMENTS:

| CONTACTS | POSITION | | |
|----------|----------|-----|--------|
| | ON | OFF | REMOTE |
| 1-2 | X | | |
| 3-4 | | | X |
| 5-6 | | | X |

| CONTACTS | POSITION | | |
|----------|----------|-----|--|
| | ON | OFF | |
| 1-2 | X | | |

DEVICE LOCATION LEGEND:

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ CONTROL TERMINATION PANEL CTP-10 (PIU-10)
- ◇ FROM TCP-101

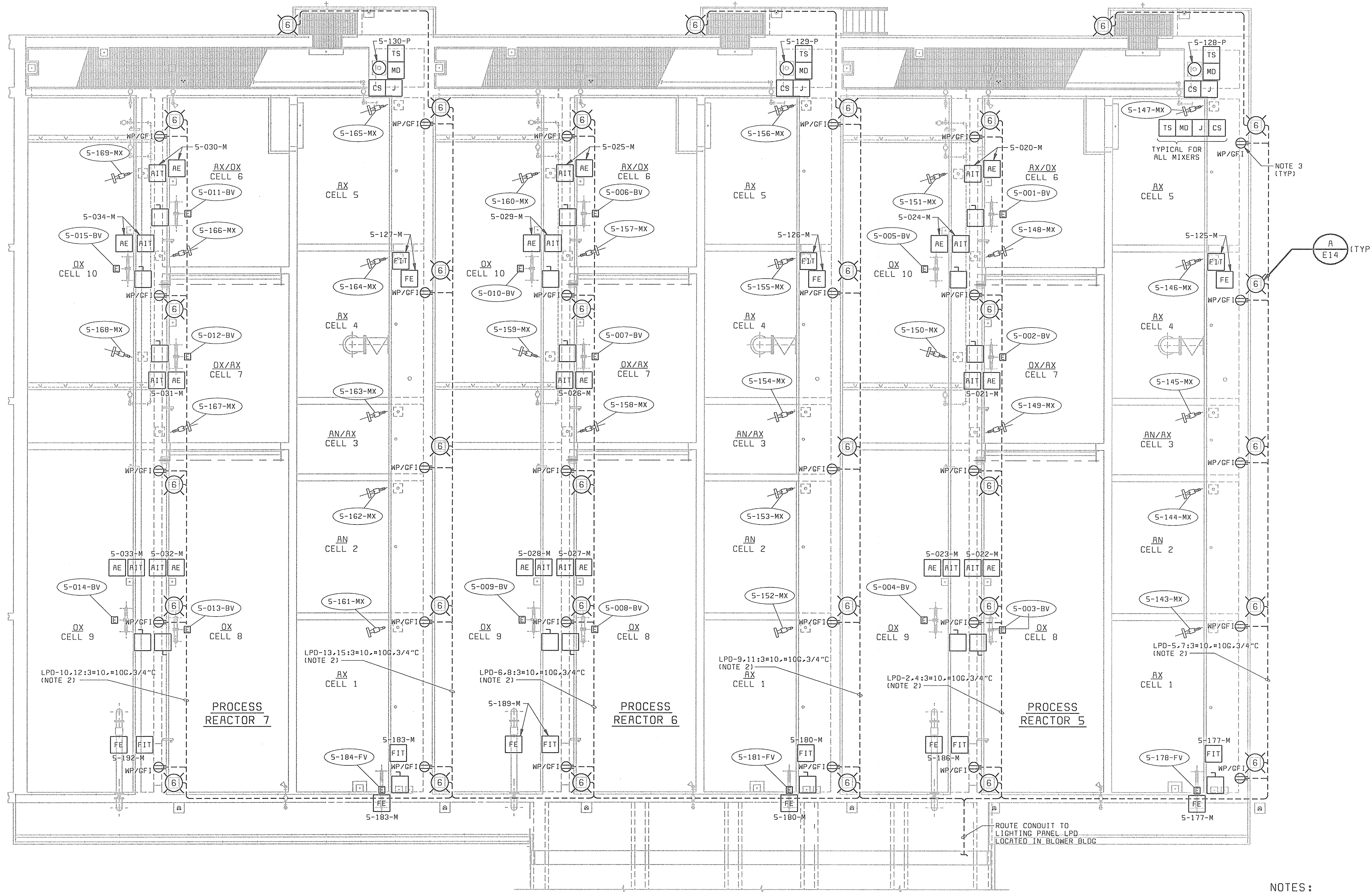
NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. COORDINATE WITH PUMP SUPPLIER PRIOR TO SHOP DRAWING SUBMITTALS. IF 24V POWER SUPPLY IS REQUIRED FOR RELAYING, 120/24V CPT SHALL BE PROVIDED FOR INSTALLATION IN MCC.
3. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
4. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINED IN THE SCHEMATIC SYMBOL LEGEND.
5. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
6. CONTROL SETTINGS, ALARM LIMITS, AND SIMILAR ADJUSTABLE LIMITS ARE INTENDED TO BE FOR INITIAL STARTUP. ADJUSTABLE SETTINGS SHALL BE TESTED AND CHANGED BY THE CONTRACTOR, IF REQUIRED FOR PROPER SEQUENCING AND OPERATION.

BLOWERS 5-518-MO THROUGH 5-521-MO

| | | | | | |
|--|---|---|---|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert Benner</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH ^{LLP} Gaithersburg, Maryland <i>Daniel A. Steiner</i> REG. PROF. ENGR. DATE 6/26/00 | DES: GNS,SFP DRN: JCB CHK: JTF DATE: 6/23/00 | NORTH BLOWER BUILDING ELECTRICAL SCHEMATICS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 126 OF 161 E16 |
|--|---|---|---|--|--|

058472 F058472A



POWER AND LIGHTING PLAN

1/8" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - CIRCUITS LPD-2, LPD-5, LPD-6, LPD-9, LPD-10, LPD-13 ARE FOR LIGHTS. CIRCUITS LPD-4, LPD-7, LPD-8, LPD-11, LPD-12, LPD-15 ARE RECEPTACLES. ALL CONDUITS SHALL BE CONCEALED IN SLAB/WALKWAY CONCRETE.
 - MOUNT RECEPTACLE ON HANDRAIL NEXT TO LIGHT POLE.

59472-101-PP-F-0000172
 59472-101-PP-F-0000550
 59472-101-PP-F-0000172
 59472-101-PP-F-0000550

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

Robert B. ...
 CHIEF, BUREAU OF UTILITIES DATE 6-21-00

BLACK & VEATCH, L.P.
 Gaithersburg, Maryland

David A. ...
 REG. PROF. ENGR. DATE 6/29/00



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: SFP, DVH | | | | | |
| DRN: DVH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

**NORTH PROCESS REACTORS
 ELECTRICAL**

POWER AND LIGHTING PLAN

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

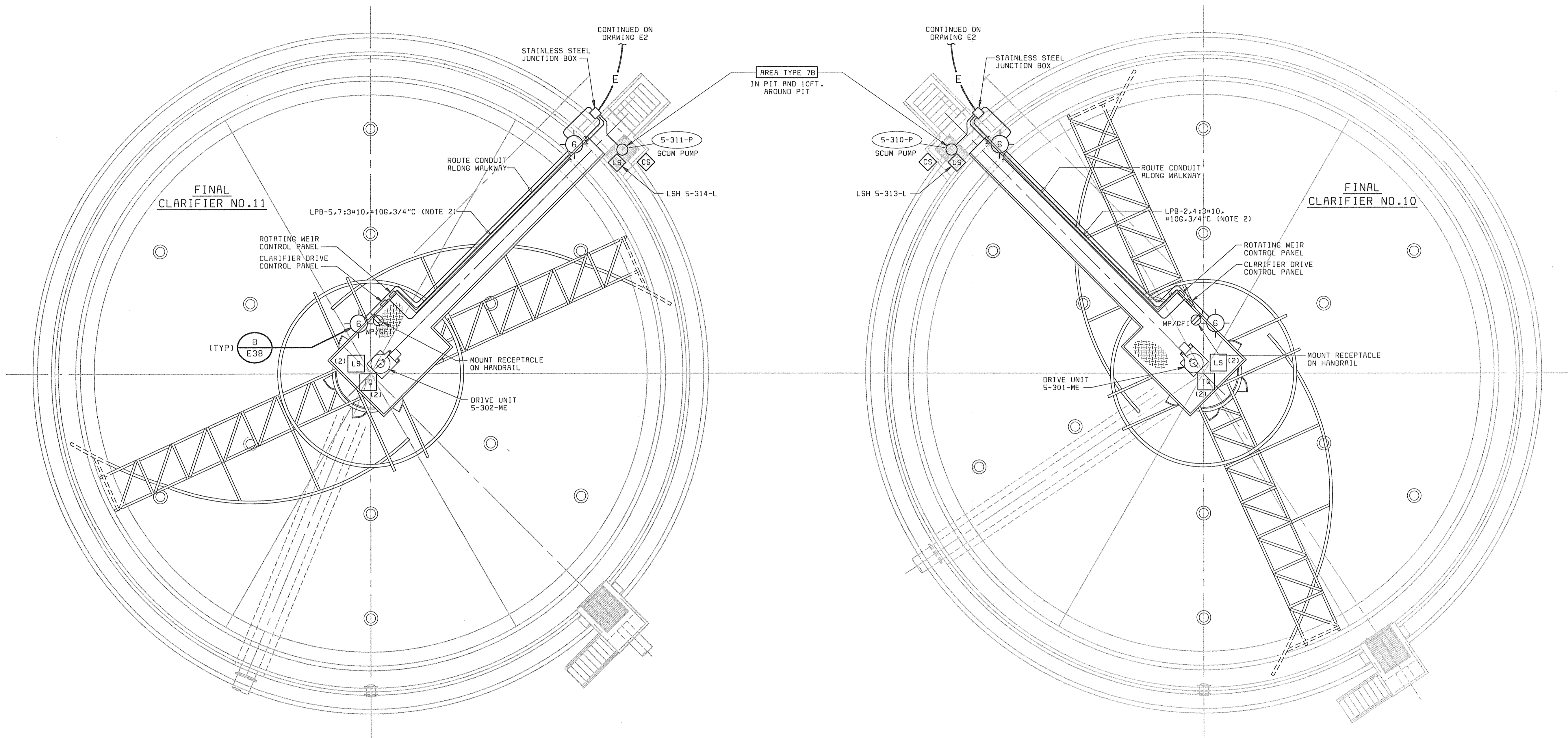
CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
 AS
 SHOWN

SHEET
 127 OF 161

E17



POWER AND LIGHTING PLANS
1/8" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - CIRCUITS LPB-2 & LPB-5 ARE FOR LIGHTS. CIRCUITS LPB-4 & LPB-7 ARE FOR RECEPTACLES.

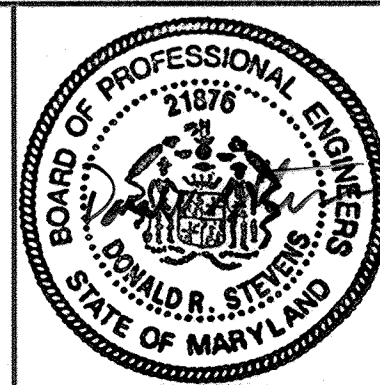
58472-101-FC-M-A0000264
58472-101-FC-M-A0000647

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

Daniel Mann 6/29/00
REG. PROF. ENGR. DATE



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: SFP,DVH | | | | | | | | | |
| DRN: DVH | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/32/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

**FINAL CLARIFIERS
NO. 10 & NO. 11
ELECTRICAL**

POWER AND LIGHTING PLANS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

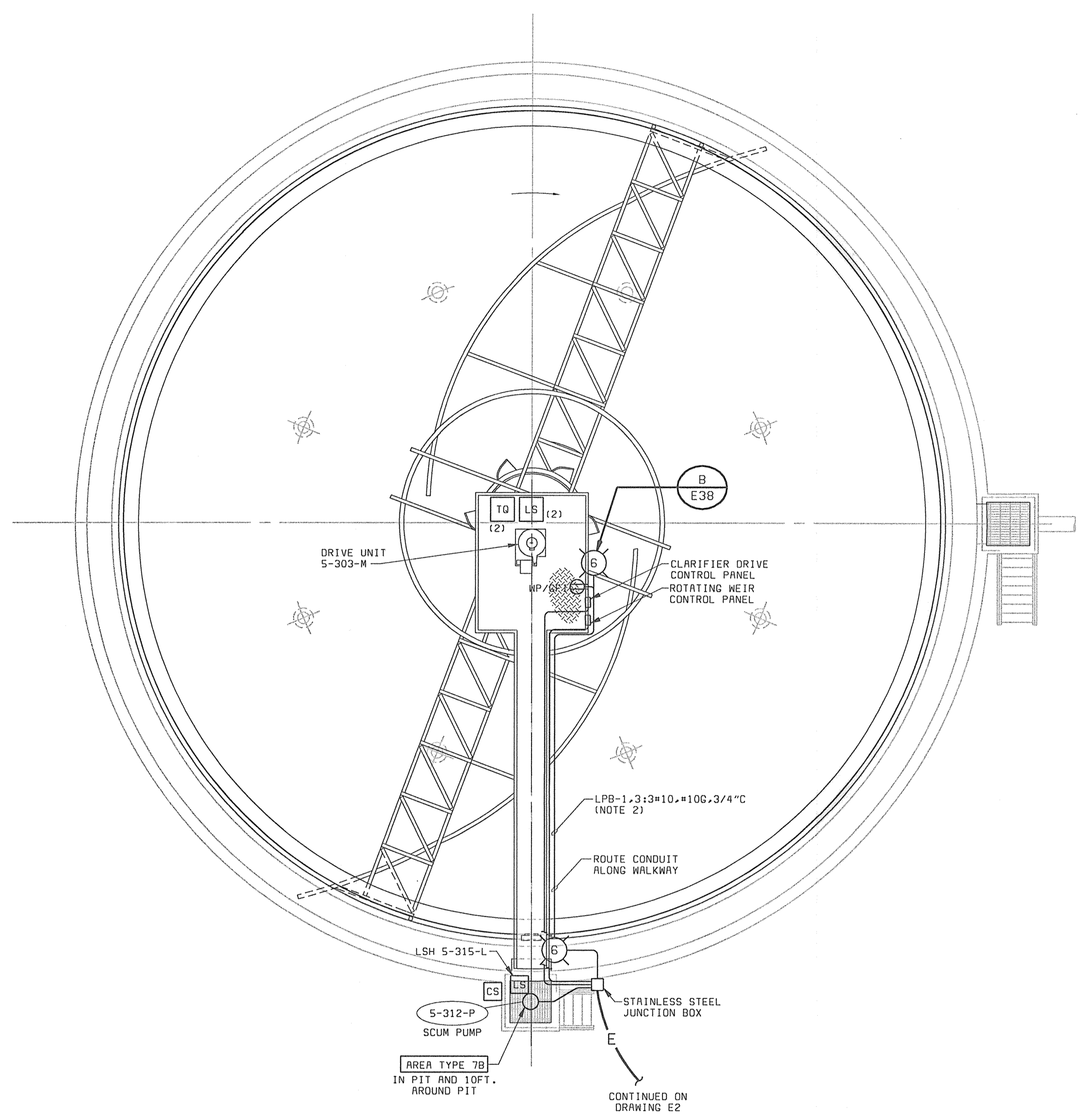
HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
128 OF 161

E18



A
B
C
D
E

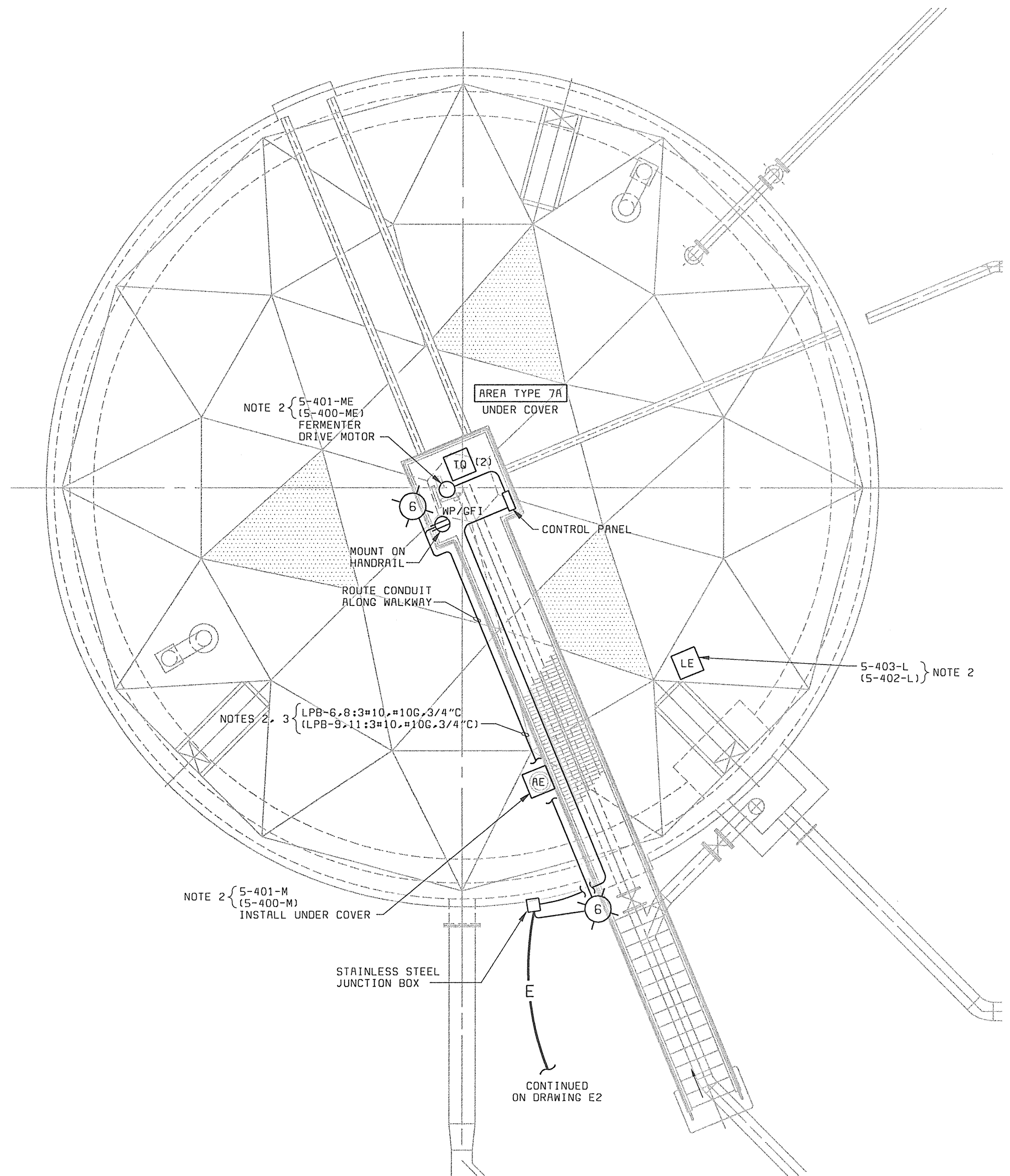


POWER AND LIGHTING PLAN
1/8" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - CIRCUIT LPB-1 IS FOR LIGHTS AND CIRCUIT LPB-3 IS FOR RECEPTACLE.



58472-101-FC-M-A0000178
58472-101-FC-M-A0000750
F
58472
F058472A

| | | | | | | |
|---|--|---|---|---|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert Bennett</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE |  BLACK & VEATCH Gaithersburg, Maryland <i>David Allen</i> 6/24/00 REG. PROF. ENGR. DATE |  | DES: SFP,DVH DRN: DVH CHK: JTF DATE: 6/23/00 DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP | FINAL CLARIFIER NO.12 ELECTRICAL POWER AND LIGHTING PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 129 OF 161 E19 |
|---|--|---|---|---|--|--|



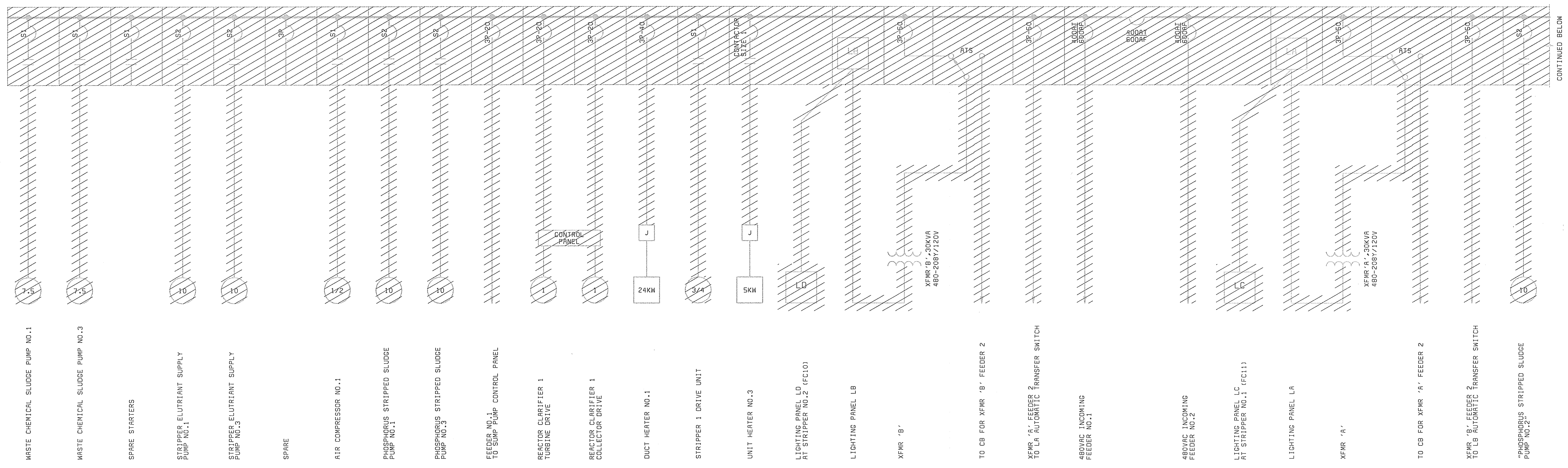
FERMENTER NO.2 - POWER AND LIGHTING PLAN
 3/16" = 1'-0"
 (FERMENTER NO.1 SIMILAR)

- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 2. ITEMS SHOWN IN PARENTHESIS ARE FOR FERMENTER NO.1
 3. CIRCUITS LPB-6 AND LPB-9 ARE FOR LIGHTS. CIRCUITS LPB-8 AND LPB-11 ARE FOR RECEPTACLES.

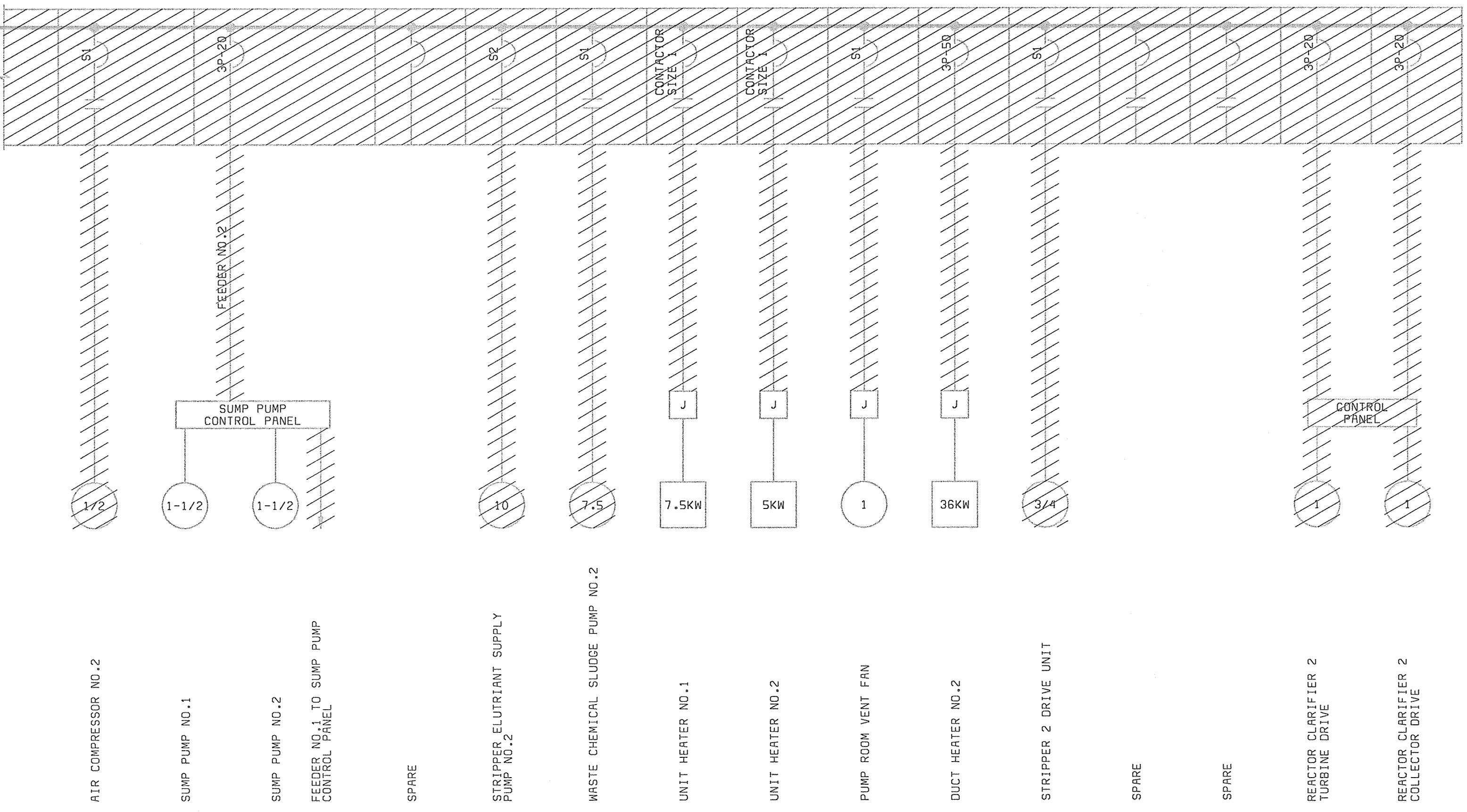
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert B. Boring</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE |  BLACK & VEATCH ^{L.P.} Gaithersburg, Maryland <i>Daniel Stern</i> 6/23/00 REG. PROF. ENGR. DATE |  | DES: RDB, DVH DRN: DVH CHK: JTF DATE: 6/23/00 | FERMENTERS ELECTRICAL POWER AND LIGHTING PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 130 OF 161 E20 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--|---|---|---|-----|----|----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| REVISIONS AND RECORD OF ISSUE | | | | <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>CK</th> <th>APP</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> | | | NO. | BY | CK | APP | | | | | | | | | | | | | | | | |
| NO. | BY | CK | APP | | | | | | | | | | | | | | | | | | | | | | | |
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D58472 F058472A

A
B
C
D
E
F



MCC13 DEMOLITION ONE-LINE DIAGRAM



MCC13 DEMOLITION ONE-LINE DIAGRAM (CONTINUED)

- NOTES:**
- EXISTING MCC CC13 SHALL BE REMOVED AND REPLACED WITH NEW MCC13. LOADS SHOWN AS REMOVED INCLUDE REMOVAL OF CONTROL SYSTEM (SWITCHES, SOLENOIDS, ETC), CAPACITORS, ETC.
 - EXISTING HVAC SYSTEM SHALL REMAIN INTACT, EXCEPT FOR NEW POWER FEEDS FROM THE NEW MCC13 AND NEW LIGHTING PANELS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

Daniel J. Hill
REG. PROF. ENGR. DATE 6/23/00



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS,SFP | | | | | |
| DRN: JCB | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

NORTH GALLERY BUILDING
ELECTRICAL

CC13 DEMOLITION
ONE-LINE DIAGRAM

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

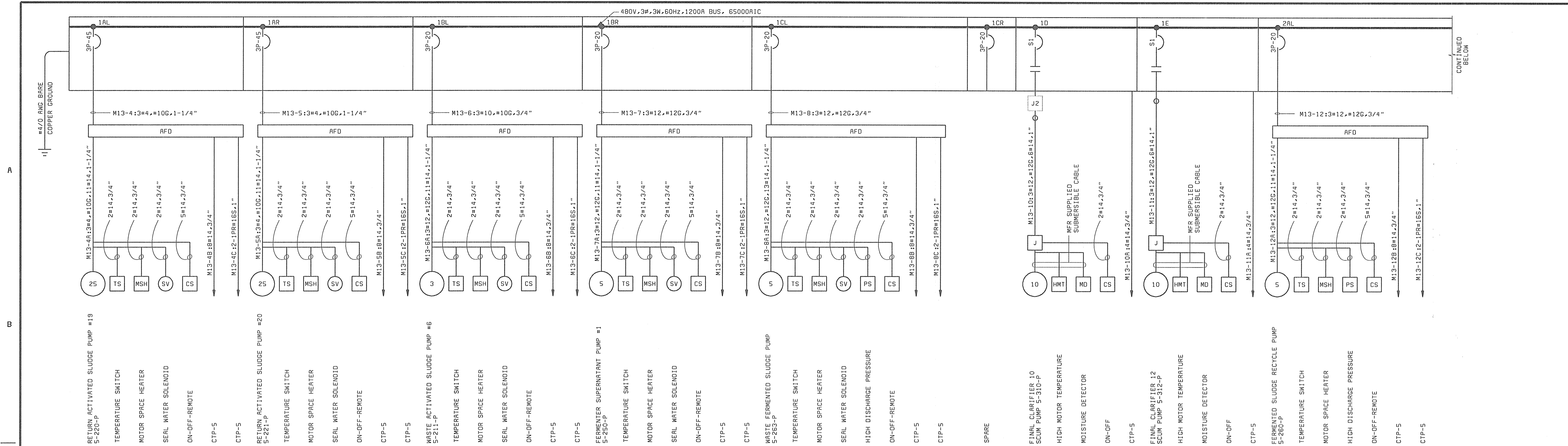
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

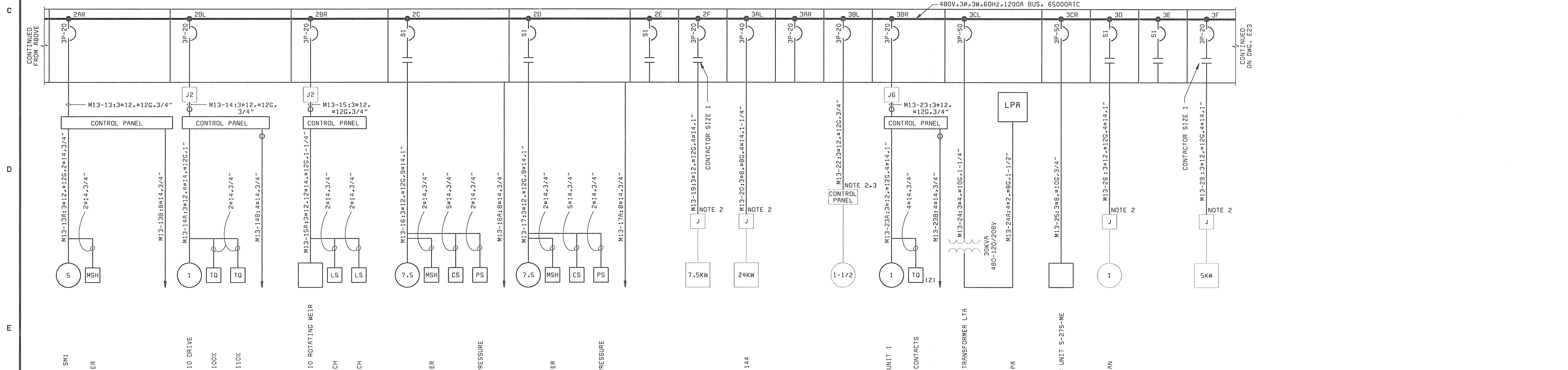
SCALE AS SHOWN

SHEET 131 OF 161

E21



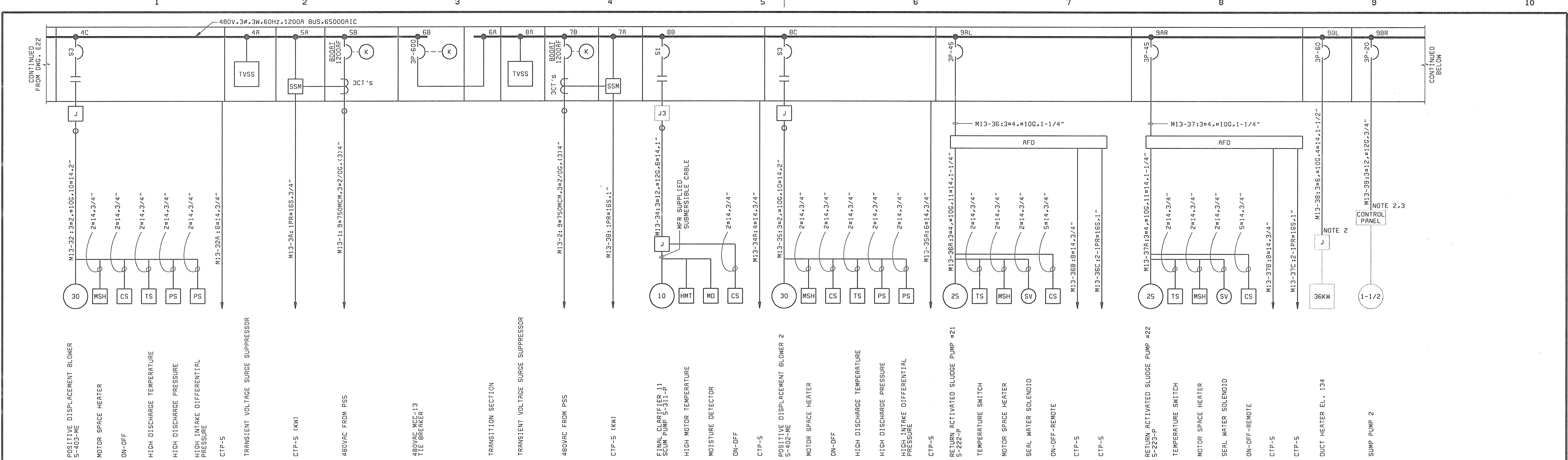
NEW MCC13 ONE-LINE DIAGRAM



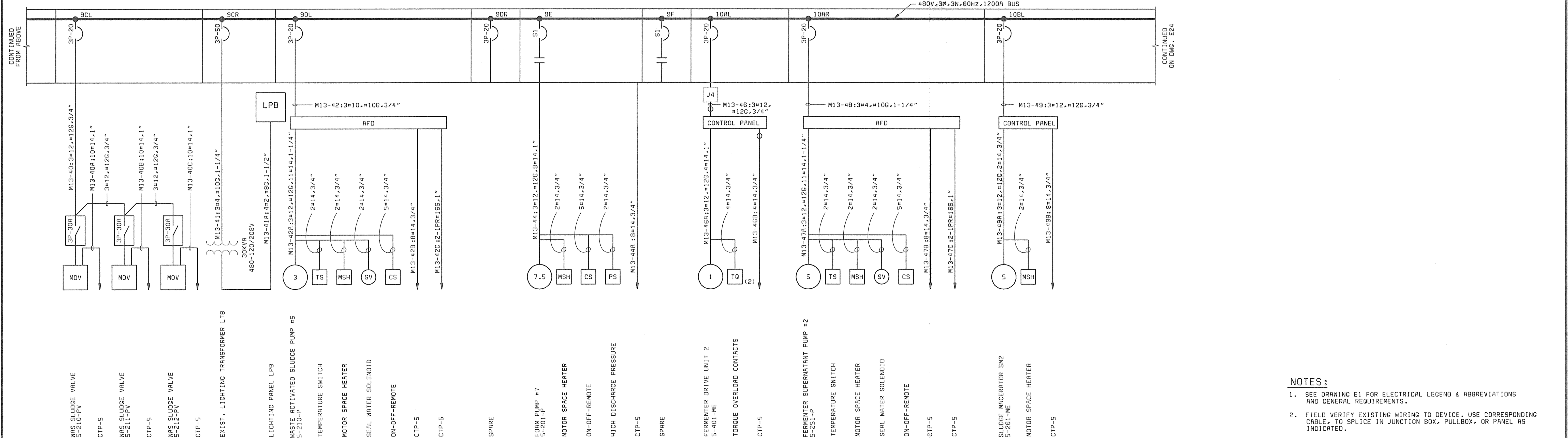
- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - FIELD VERIFY EXISTING WIRING TO DEVICE. USE CORRESPONDING CABLE, TO SPLICE IN JUNCTION BOX, PULLBOX, OR PANEL AS INDICATED.
 - SUMP PUMP 1 AND 2 SHARE THE SAME CONTROL PANEL, WHICH REQUIRES ONE FEED FROM EACH SIDE OF MCC13.

NEW MCC13 ONE-LINE DIAGRAM (CONTINUED)

| | | | | |
|--|---|--|--|---|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE: 6/23/00 | DES: GNS,SFP DRN: DAH CHK: JTF DATE: 6/23/00 | NORTH GALLERY BUILDING ELECTRICAL NEW MCC13 ONE-LINE DIAGRAM | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 132 OF 161 E22 |
| | REVISIONS AND RECORD OF ISSUE NO. BY CK APP | | | |



NEW MCC13 ONE-LINE DIAGRAM (CONTINUED)



NEW MCC13 ONE-LINE DIAGRAM (CONTINUED)

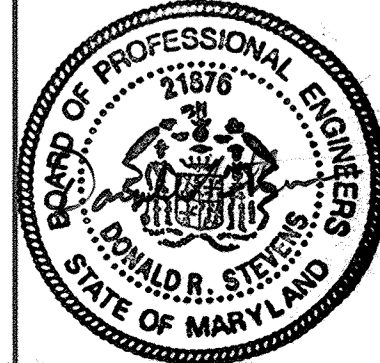
- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - FIELD VERIFY EXISTING WIRING TO DEVICE. USE CORRESPONDING CABLE, TO SPlice IN JUNCTION BOX, PULLBOX, OR PANEL AS INDICATED.
 - SUMP PUMP 1 AND 2 SHARE THE SAME CONTROL PANEL, WHICH REQUIRES ONE FEED FROM EACH SIDE OF MCC13.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Ralph Benjamin 6-29-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

David M. ...
REG. PROF. ENGR. DATE 6/24/00



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS-SFP | | | | | |
| DRN: DAH.EEC | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

NORTH GALLERY BUILDING
ELECTRICAL

NEW MCC13 ONE-LINE DIAGRAM
CONTINUATION

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

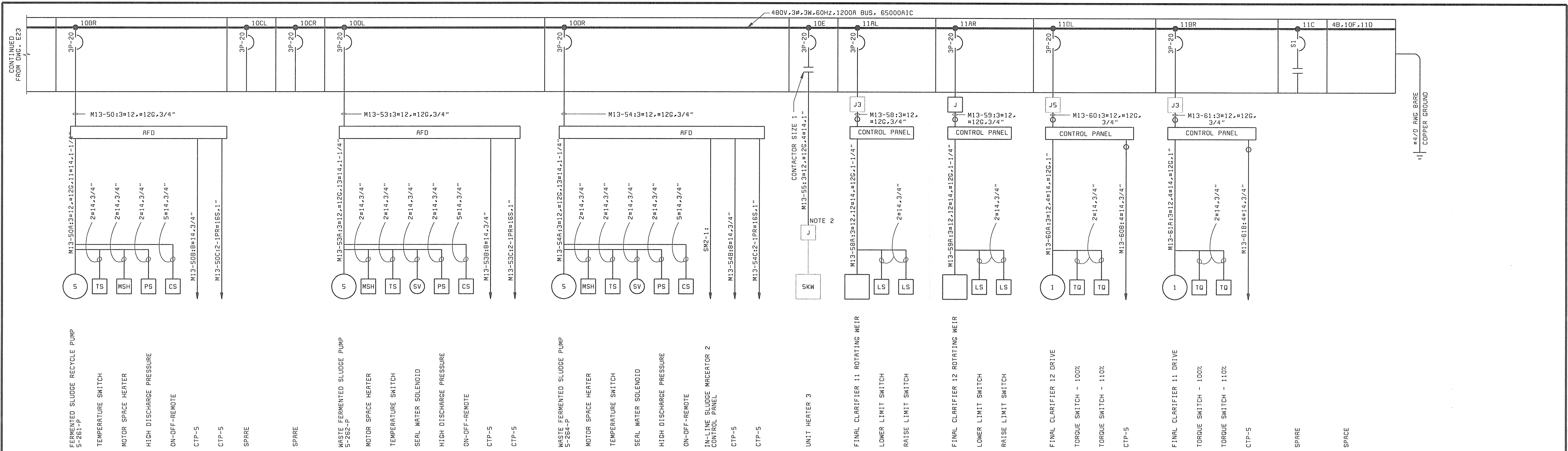
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 133 OF 161

E23



**MCC13 ONE-LINE DIAGRAM
(CONTINUED)**

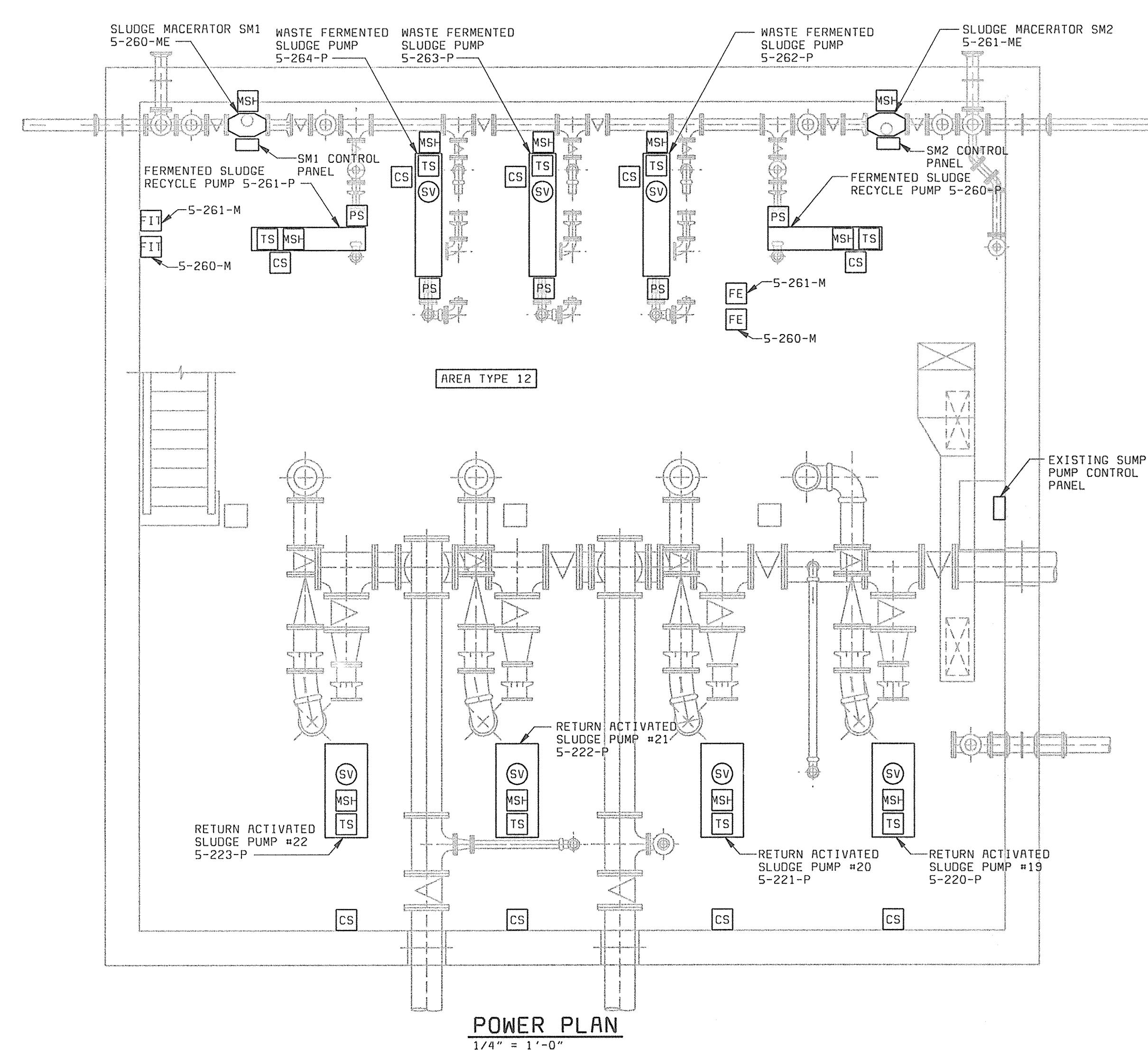
| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|----|----|----|----|----|-----|-----|------|------|------|------|
| 1AL | 1AR | 2AL | 2AR | 3AL | 3AR | 4A | 5A | 6A | 7A | 8A | 9AL | 9AR | 10AL | 10AR | 11AL | 11AR |
| 1BL | 1BR | 2BL | 2BR | 3BL | 3BR | | | | | | 9BL | 9BR | 10BL | 10BR | 11BL | 11BR |
| 1CL | 1CR | 2CL | 2CR | 3CL | 3CR | 4B | 5B | | 7B | 8B | 9CL | 9CR | 10CL | 10CR | 11C | |
| 1D | | 2D | | 3D | | 4C | | 6B | | 8C | 9DL | 9DR | 10DL | 10DR | 11D | |
| | | 2E | | 3E | | | | | | | 9E | | 10E | | | |
| 1E | | 2F | | 3F | | | | | | | 9F | | 10F | | | |

**MCC13 FRONT ELEVATION
NO SCALE**

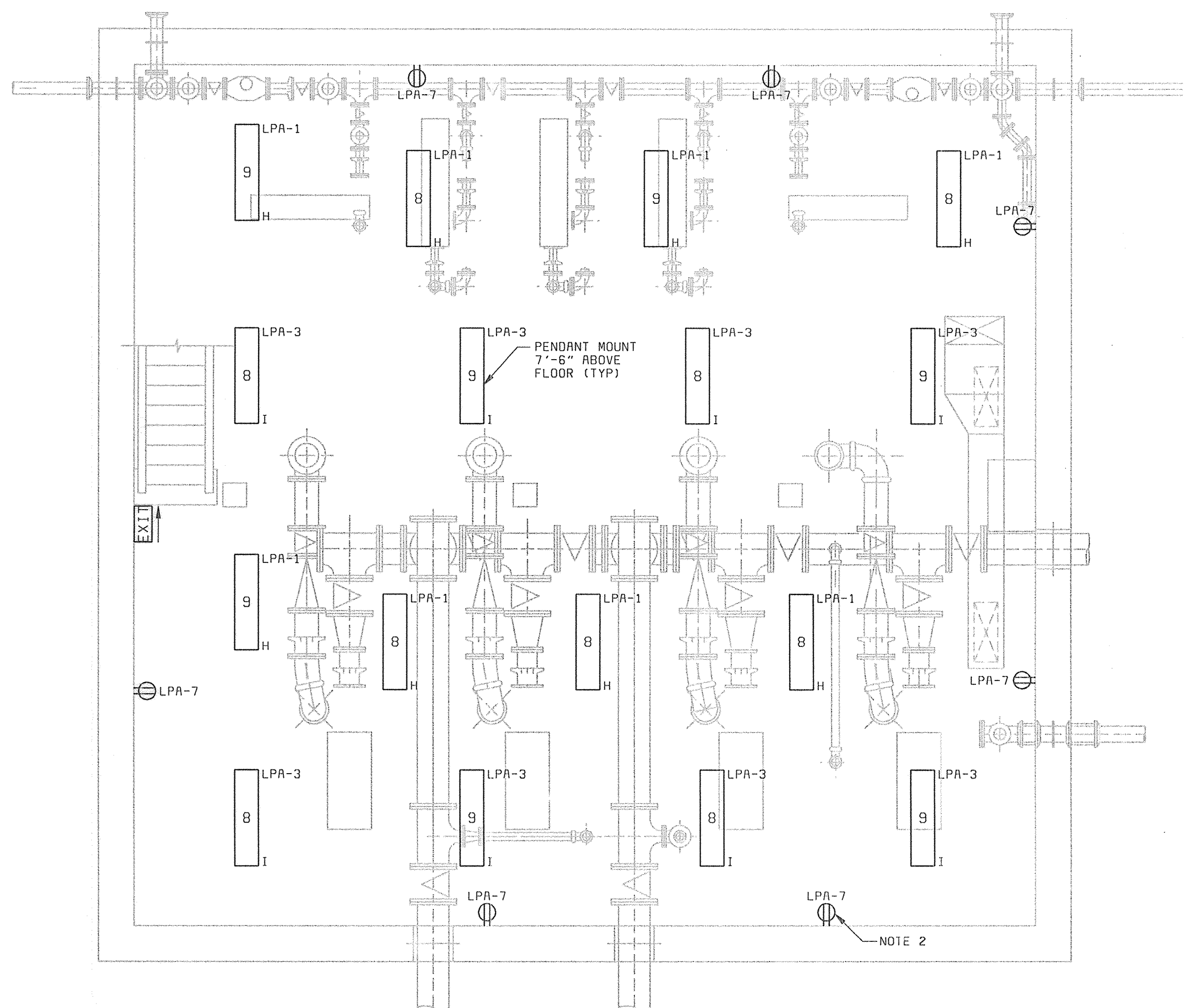
- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - FIELD VERIFY EXISTING WIRING TO DEVICE. USE CORRESPONDING CABLE, TO SPLICE IN JUNCTION BOX, PULLBOX, OR PANEL AS INDICATED.

| | | | | |
|--|---|--|--|--------------------------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE: 6/24/00 | DES: GNS.SFP DRN: OAH.EEC CHK: JTF DATE: 6/23/00 | NORTH GALLERY BUILDING ELECTRICAL NEW MCC13 ONE-LINE DIAGRAM CONTINUATION | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | | SHEET 134 OF 161 E24 |

058472
F058472R
R. H. B... 6-24-00
CHIEF, BUREAU OF UTILITIES DATE



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



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

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE WP/GFI. MOUNT RECEPTACLES 4'-0" ABOVE FLOOR.

56472-101-RSPS-W-R0000205

056472-101-RSPS-W-R0000205

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

Donald R. Steiner
REG. PROF. ENGR. DATE 6/23/00



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS, DVH | | | | | |
| DRN: DVH, DAH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

NORTH GALLERY BUILDING
ELECTRICAL

POWER AND LIGHTING PLANS
EL 124.00

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

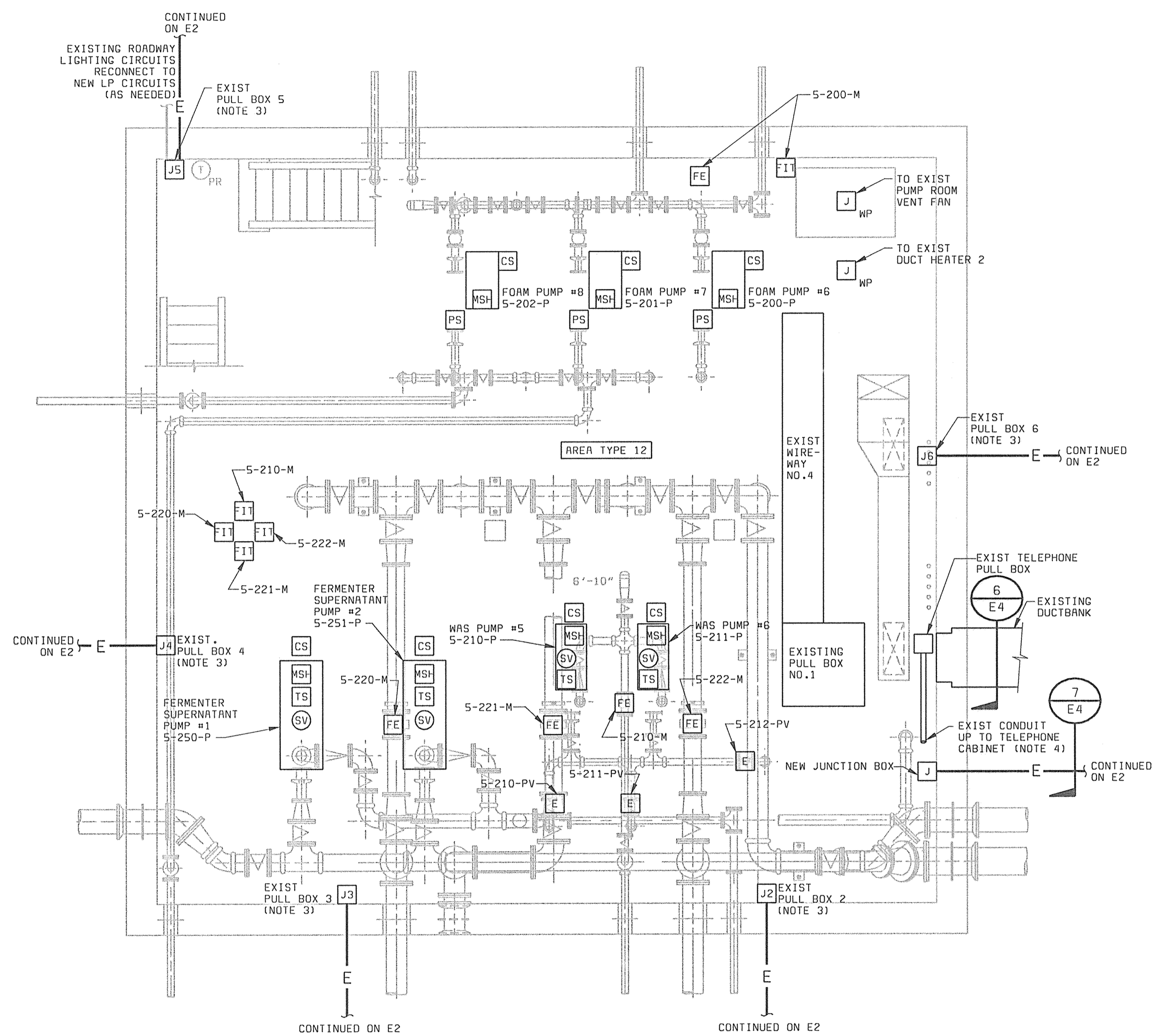
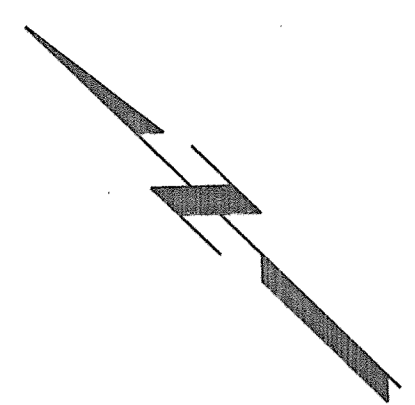
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

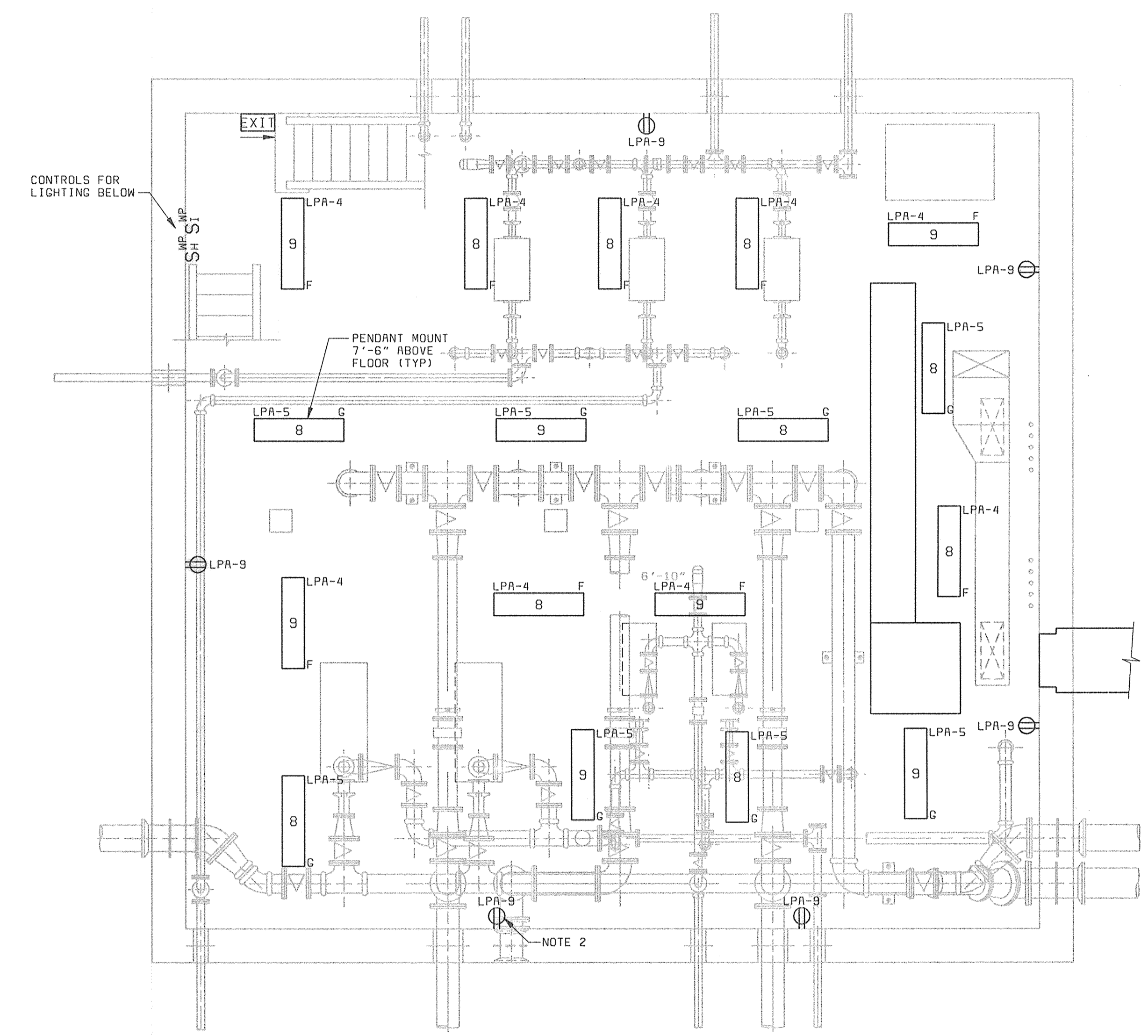
SCALE AS SHOWN

SHEET 135 OF 161

E25



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



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

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE WP/GFI. MOUNT RECEPTACLES 4'-0" ABOVE FLOOR.
 - EXISTING PULL BOXES 1 THROUGH 6 PROVIDE THE REQUIRED CONDUIT WALL PENETRATIONS. USE ONE 2" PENETRATION FROM J2 FOR ALL FC10 LOADS, ONE 2" PENETRATION FOR ALL FC11 LOADS, ONE 3" PENETRATION FROM J6 FOR FERMENTER 1 LOADS, ONE 3" PENETRATION FROM J6 FOR THE POSITIVE DISPLACEMENT BLOWERS, ONE 3" PENETRATION FROM J4 FOR ALL FERMENTER 2 LOADS, AND THE EXISTING EXTRA 2" PENETRATION FROM J5 FOR ALL FC12 LOADS. ALL PENETRATIONS NOT USED SHALL BE STUBBED OUT AND CAPPED.
 - EXISTING CONDUIT TO TELEPHONE CABINET WILL REQUIRE SOME RE-ROUTING TO AVOID INTERFERENCE WITH NEW DUCTWORK INSTALLATION FOR 5-275-ME AT ELEVATION 144.00.

56472-101-RSPS-W-R0000205

D58472 F058472A

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

Paul A. ... 6/28/00
REG. PROF. ENGR. DATE



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS/DVH | | | | | |
| DRN: DVH/DAH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

**NORTH GALLERY BUILDING
ELECTRICAL**

**POWER AND LIGHTING PLANS
EL 134.00**

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

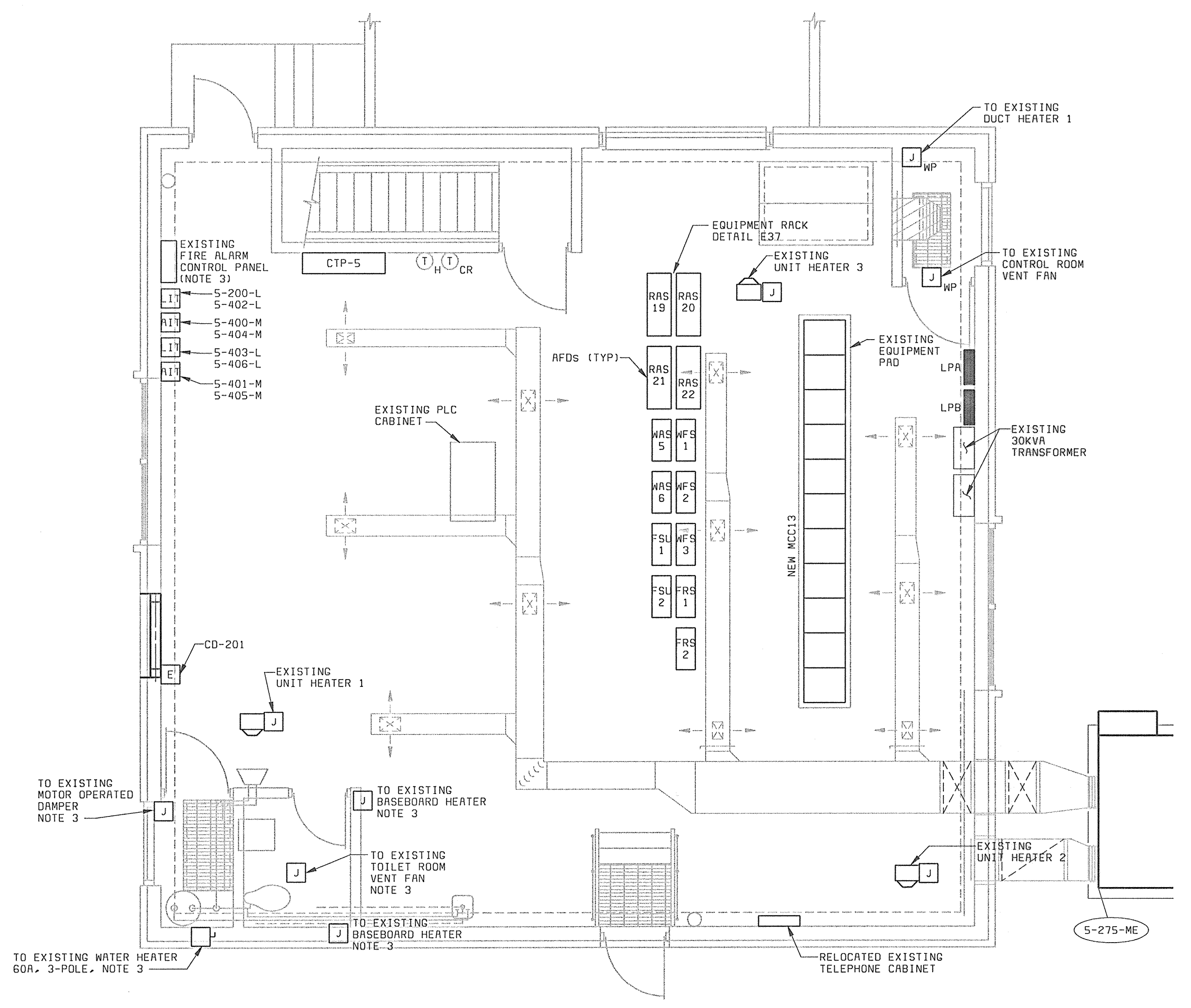
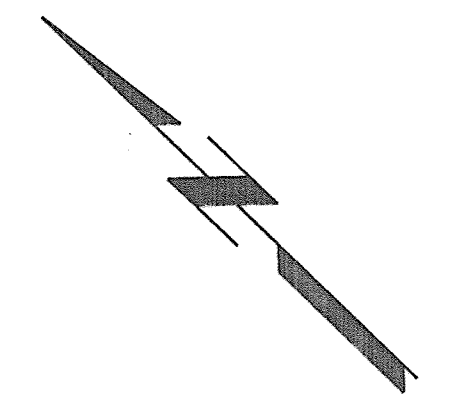
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

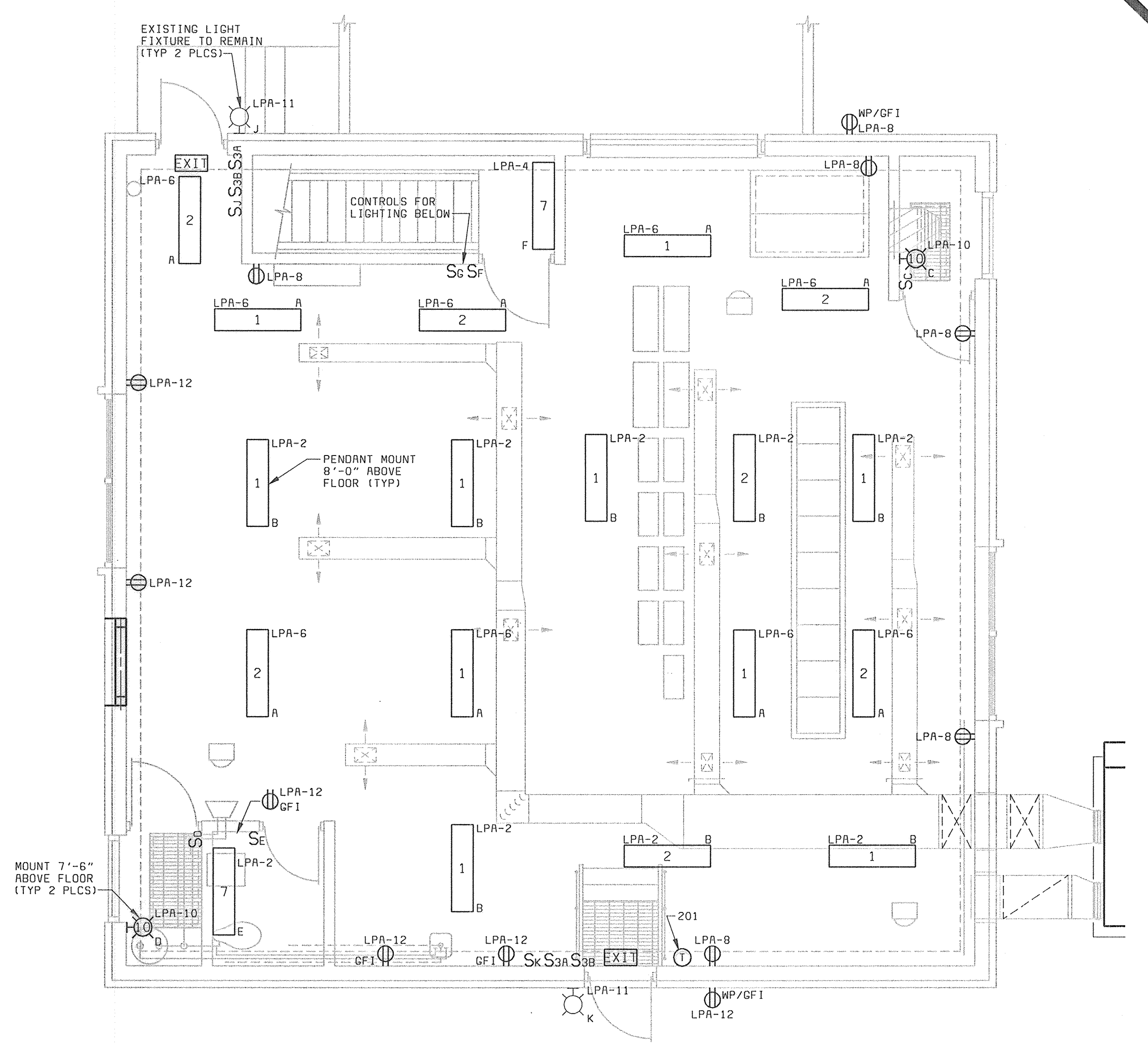
SCALE AS SHOWN

SHEET 136 OF 161

E26



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



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

- NOTES:**
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 2. ALL RECEPTACLES SHOWN ON THIS DRAWING SHALL BE GF1 TYPE.
 3. EXISTING HVAC AND WATER HEATER LOADS, AND FIRE ALARM CONTROL PANEL, SHALL BE PRESERVED AND RE-POWERED FROM NEW ELECTRICAL EQUIPMENT AS REQUIRED.

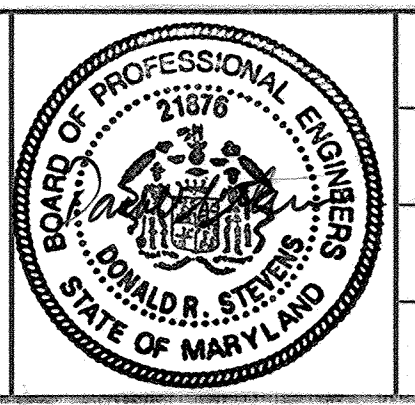
58472-104-ASPS-H-00000700
58472-106-ASPS-S-E-00000674

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Gaithersburg, Maryland

Donald ...
REG. PROF. ENGR. DATE: 6/29/00



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS.DVH | | | | | |
| DRN: DVH.DAH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

**NORTH GALLERY BUILDING
ELECTRICAL**

**POWER AND LIGHTING PLANS
EL 144.00**

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

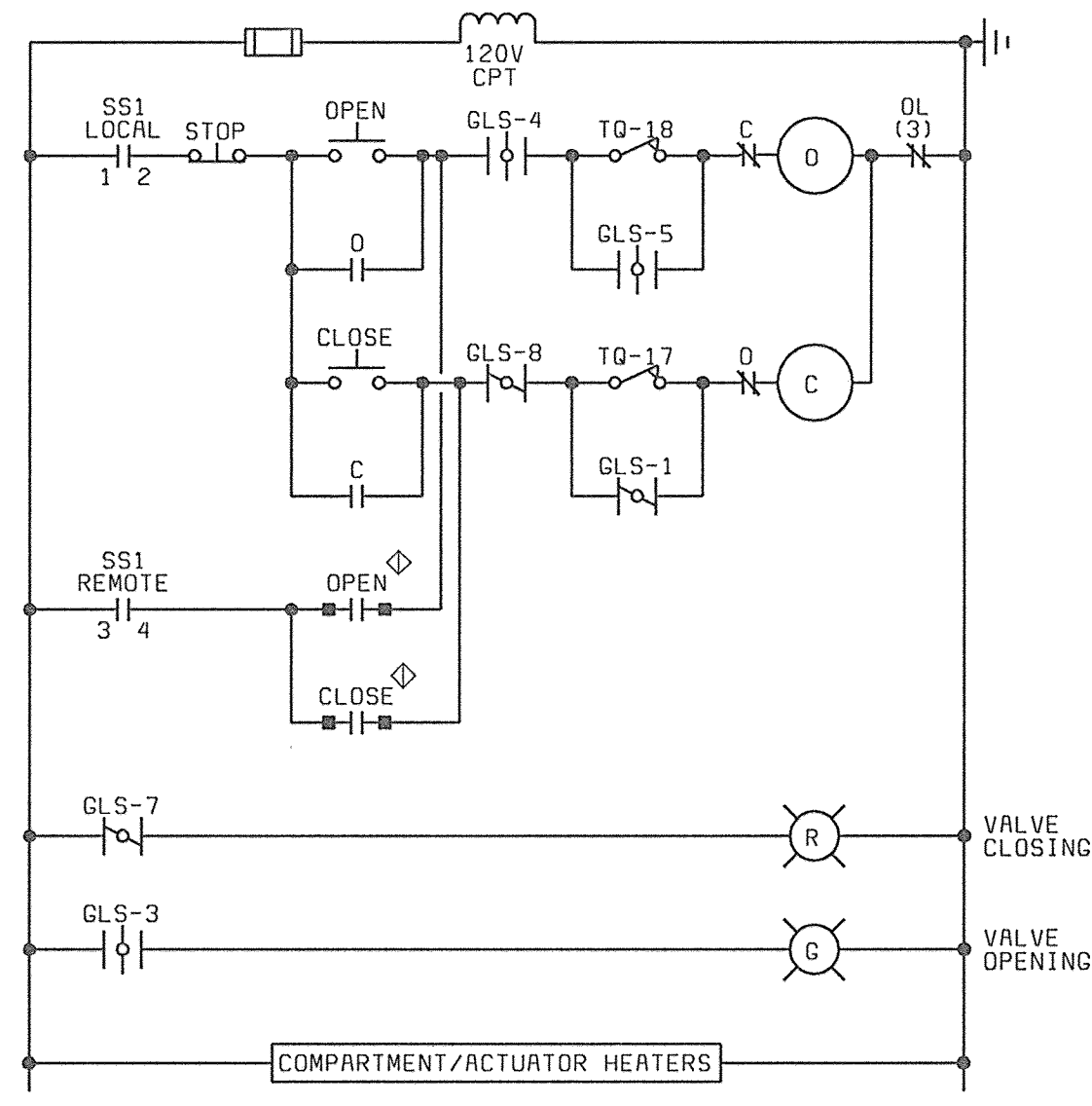
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

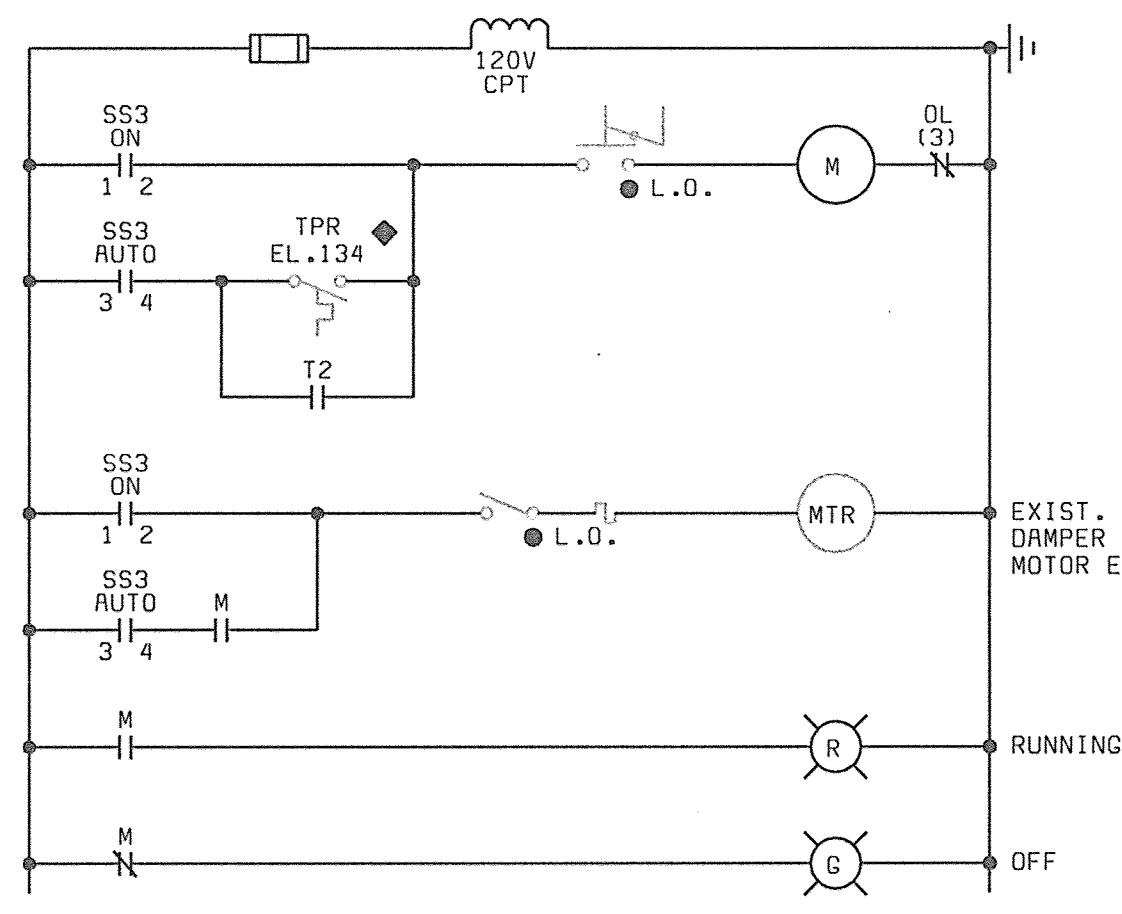
SCALE AS SHOWN

SHEET 137 OF 161

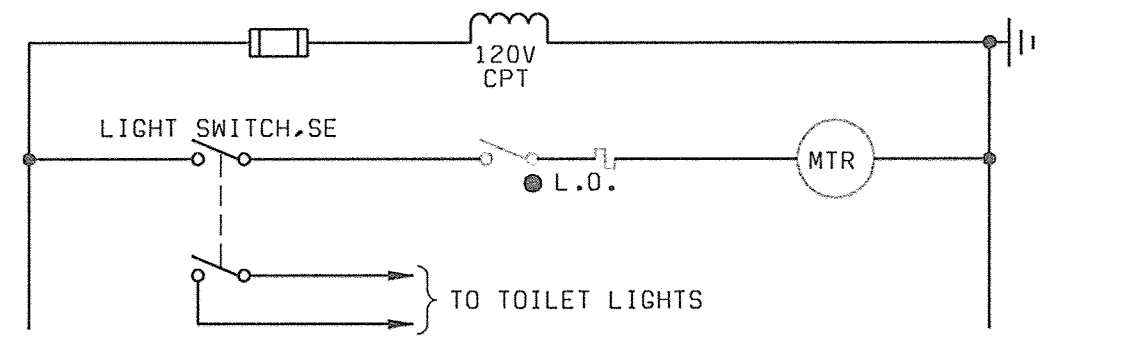
E27



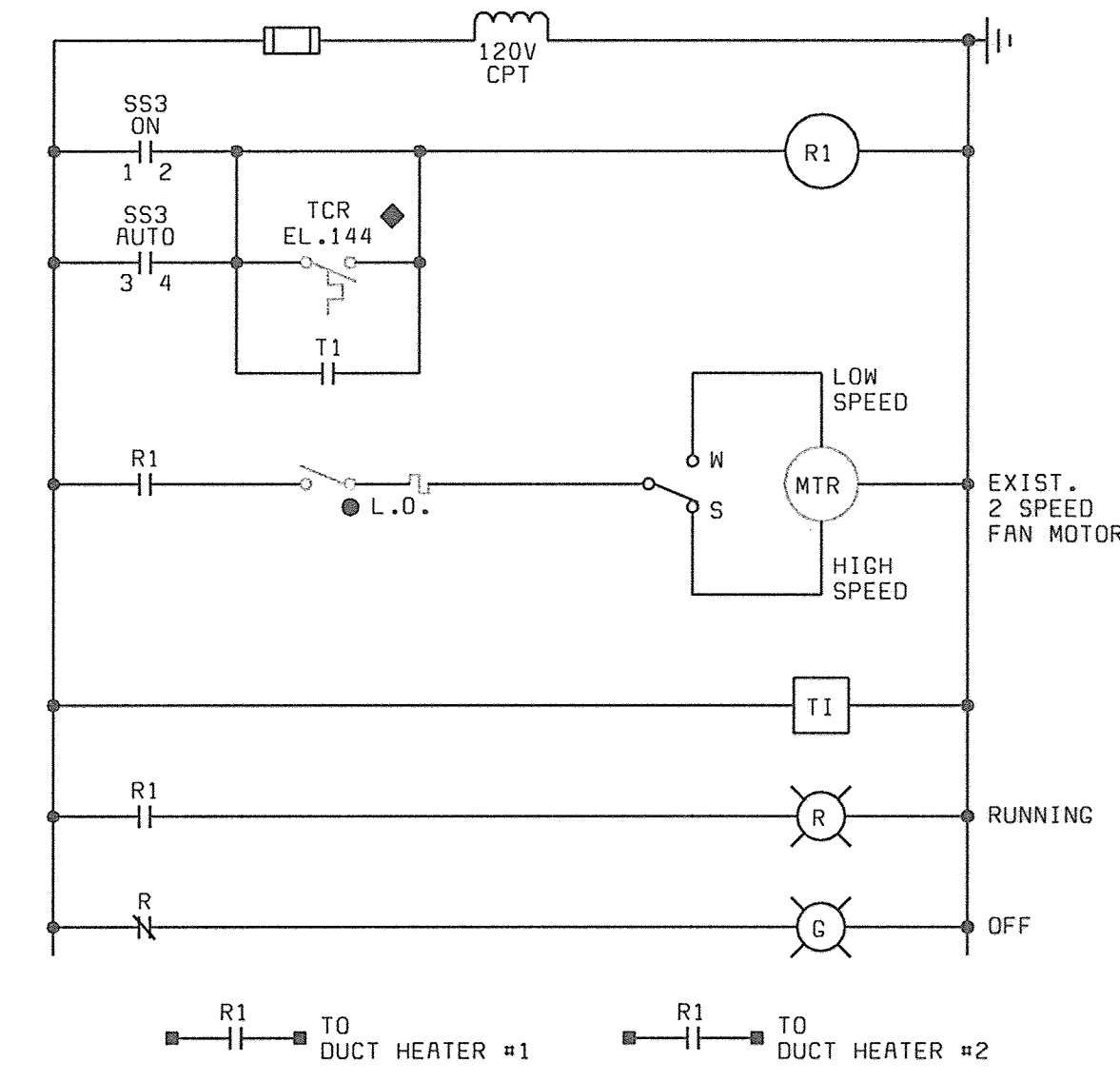
PLUG VALVES
5-210-PV THRU 5-212-PV



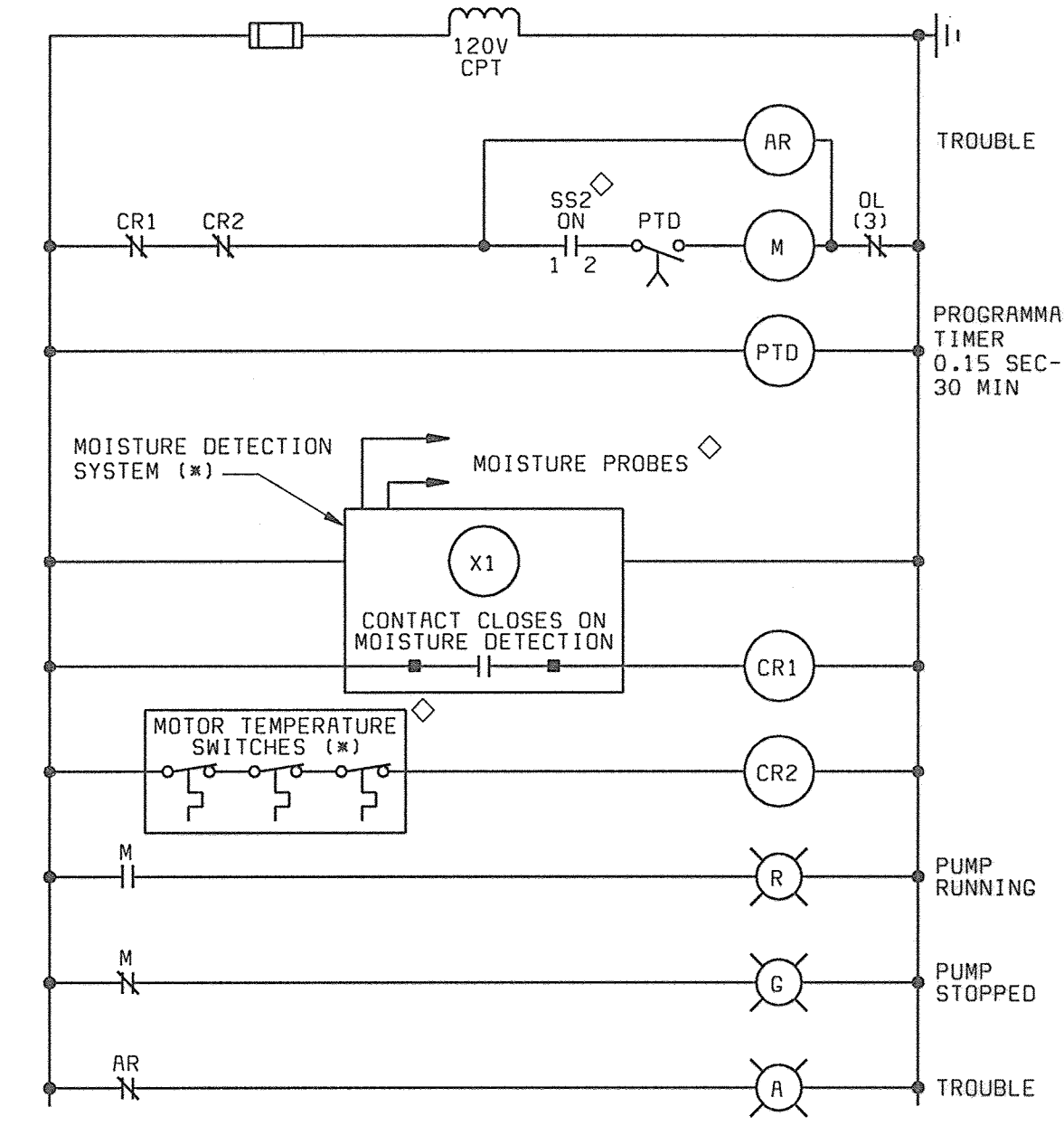
EXIST. PUMP ROOM VENT FAN



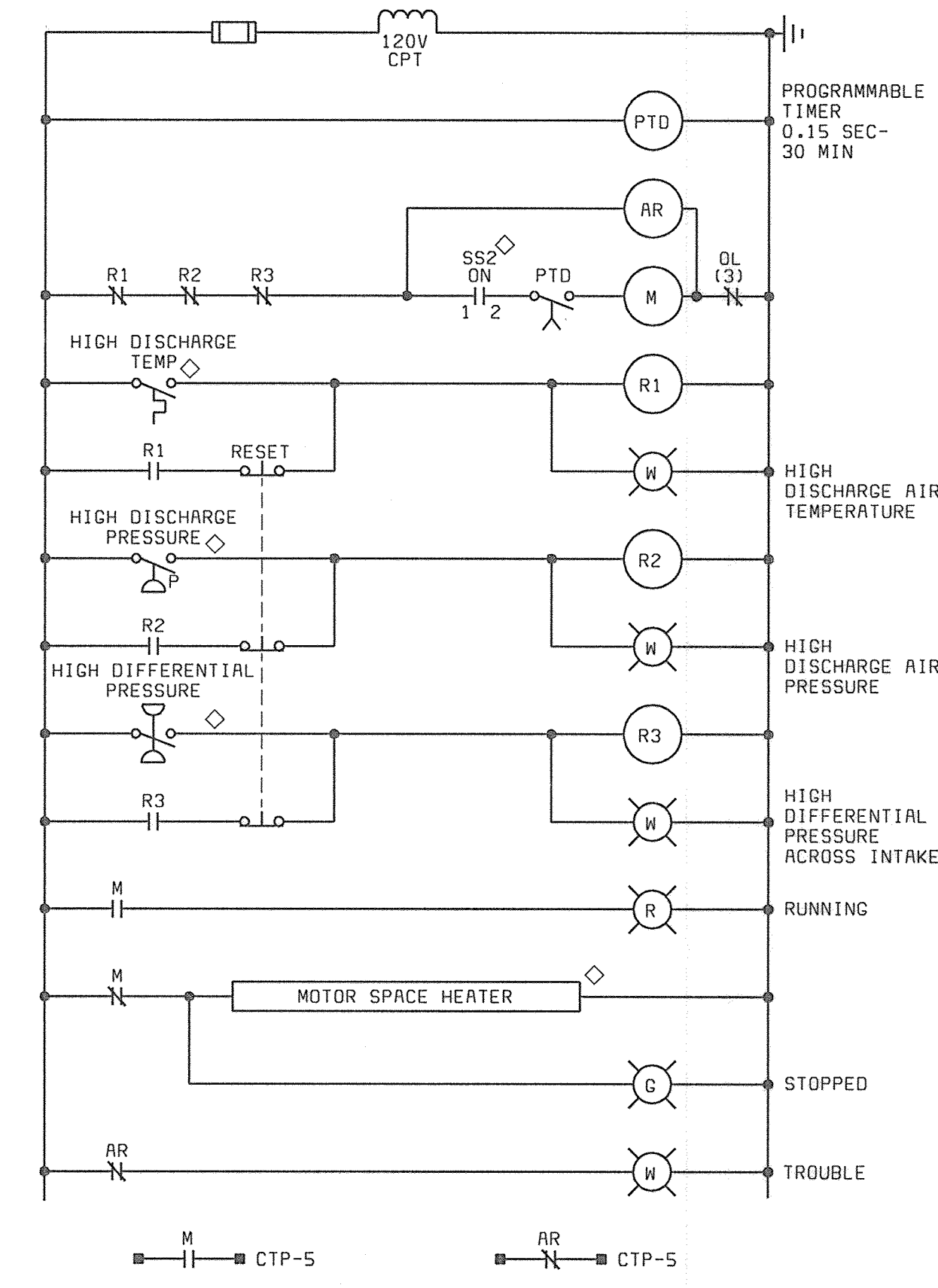
EXIST. TOILET ROOM EXHAUST FAN



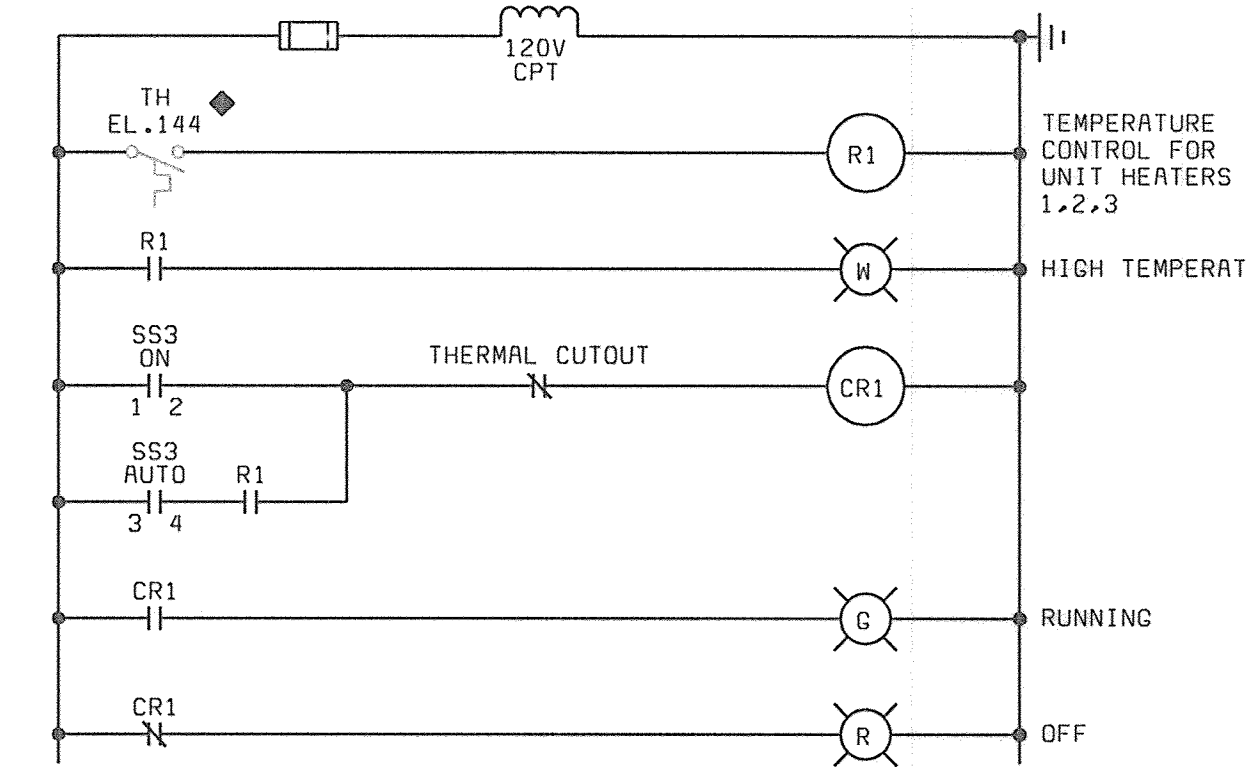
EXIST. CONTROL ROOM VENT FAN



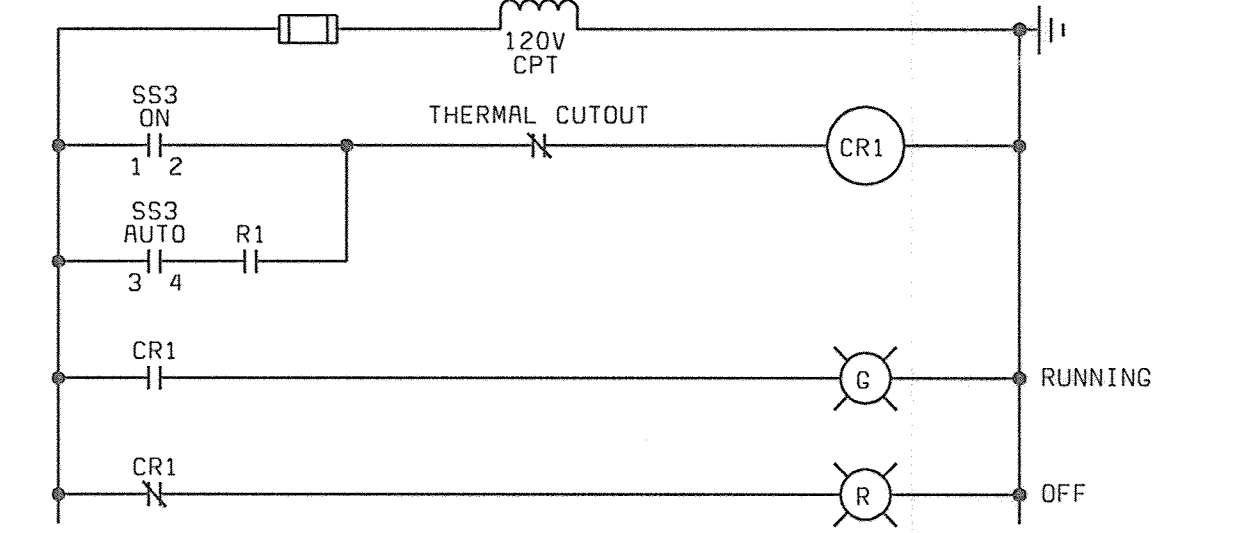
FINAL CLARIFIER SCUM PUMPS
5-310-P THRU 5-312-P
(* PROVIDED UNDER SPECIFICATION SECTION 11150)



POSITIVE DISPLACEMENT BLOWERS
5-402-ME & 5-403-ME



EXIST. UNIT HEATER #1



EXIST. UNIT HEATER #2
(SIMILAR FOR EXIST. UNIT HEATER #3)

GEARED LIMIT SWITCH DEVELOPMENT:

| CONTACT | GLS CONTACT | ACTUATOR POSITION | | |
|---------|-------------|-------------------|-----------------------------|--------------------|
| | | FULL OPEN (0%) | INTERMEDIATE POSITION (90%) | FULL CLOSED (100%) |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |

TQ/17 OPENS ON HIGH CLOSING TORQUE
TQ/18 OPENS ON HIGH OPENING TORQUE
-CONTACT CLOSED

SWITCH DEVELOPMENTS:

| CONTACTS | POSITION | |
|----------|----------|--------|
| | LOCAL | REMOTE |
| 1-2 | X | |
| 3-4 | | X |
| 5-6 | | X |

| CONTACTS | POSITION | | |
|----------|----------|-----|------|
| | ON | OFF | AUTO |
| 1-2 | X | | |
| 3-4 | | X | |
| 5-6 | | | X |

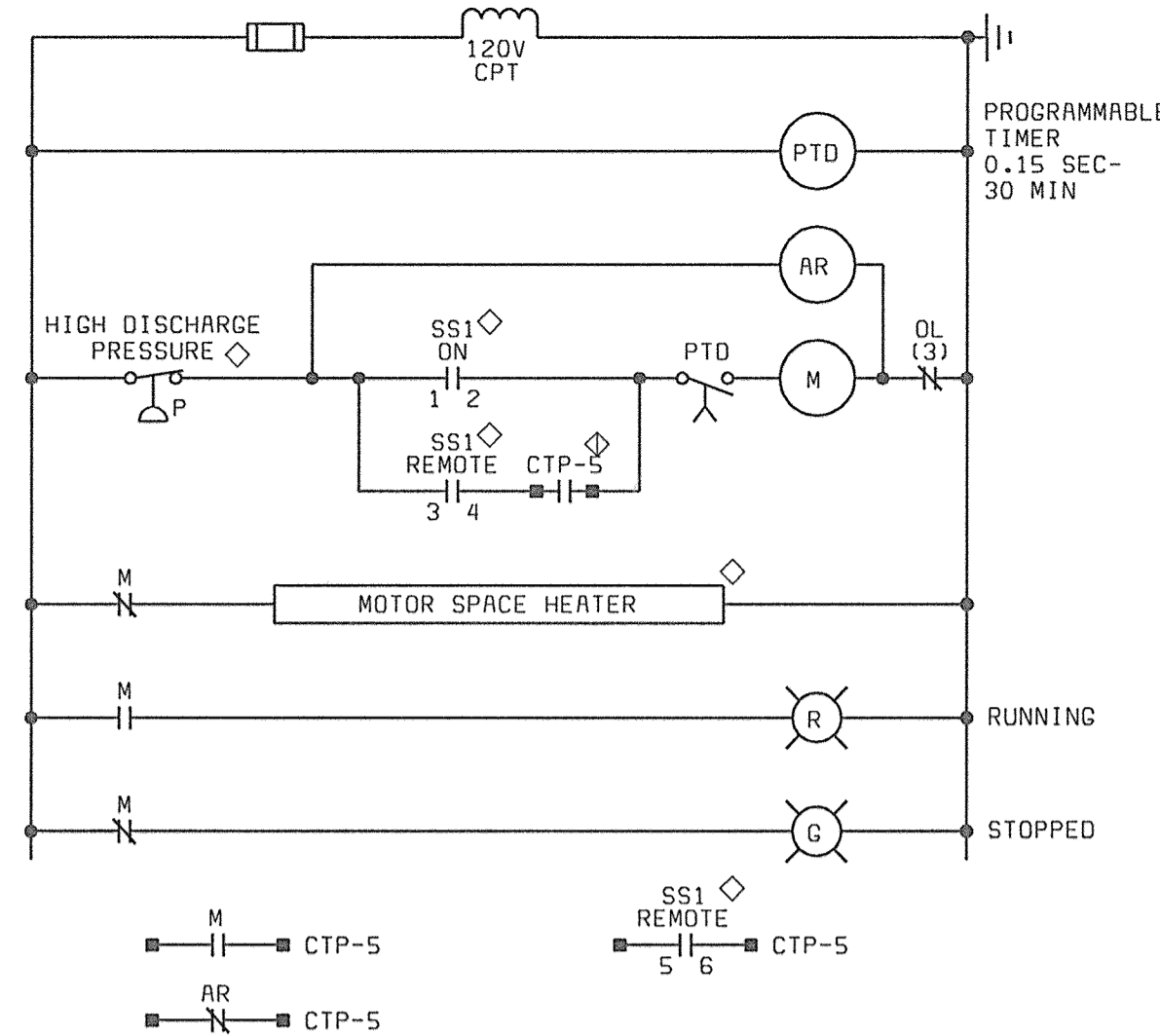
DEVICE LOCATION LEGEND:

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◇ CONTROLS TERMINATION PANEL CTP-5 (FOR PIU-5)
- EXISTING HVAC CONTROLS

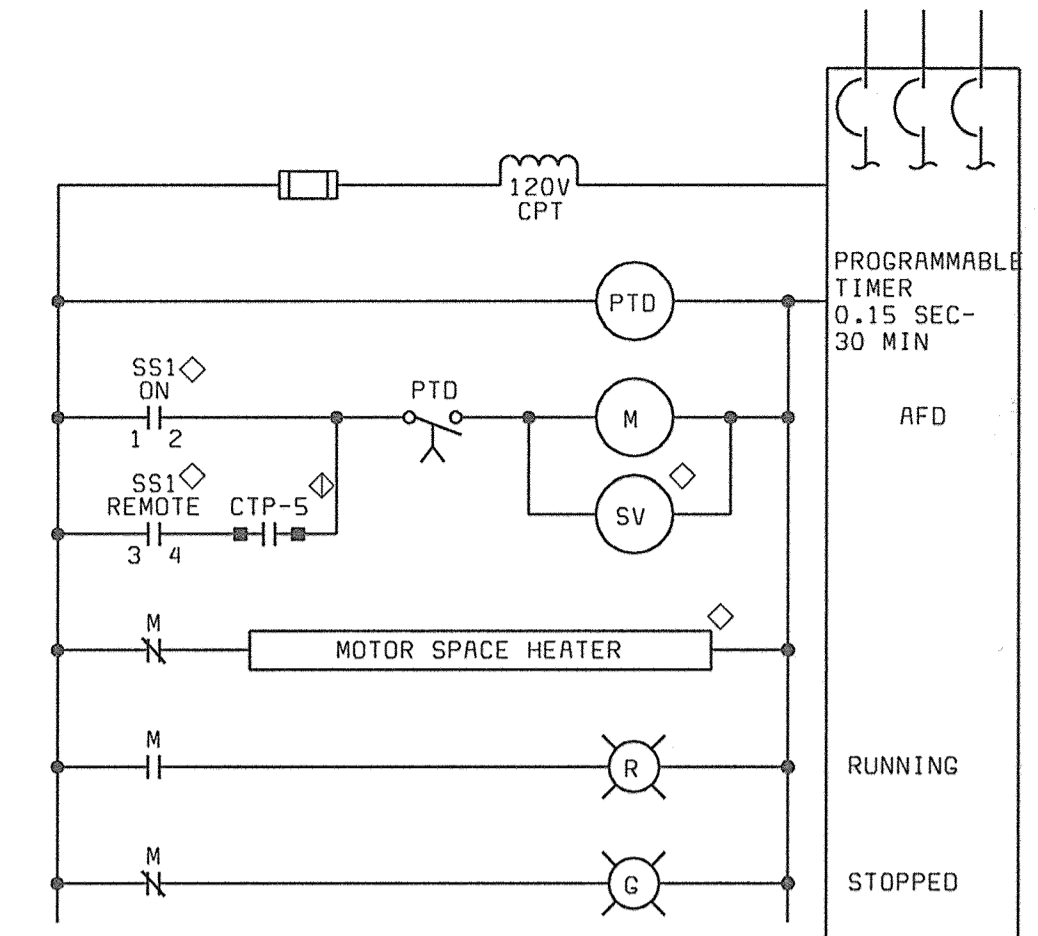
NOTES:

1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATIONS.
3. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINED IN THE SCHEMATIC SYMBOL LEGEND.
4. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
5. CONTROL SETTINGS, ALARM LIMITS, AND SIMILAR ADJUSTABLE LIMITS ARE INTENDED TO BE FOR INITIAL STARTUP. ADJUSTABLE SETTINGS SHALL BE TESTED AND CHANGED BY THE CONTRACTOR, IF REQUIRED FOR PROPER SEQUENCING AND OPERATION.

| | | | | | | |
|--|---|--|---|---|---|---|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert J. ...</i> CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH, LLP Gaithersburg, Maryland <i>David ...</i> REG. PROF. ENGR. DATE | DONALD R. STIERS STATE OF MARYLAND DATE: 6/23/00 | DES: GNS-SFP DRN: MDR CHK: JTF DATE: 6/23/00 | NORTH GALLERY BUILDING ELECTRICAL SCHEMATICS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 138 of 161 E28 |
|--|---|--|---|---|---|---|



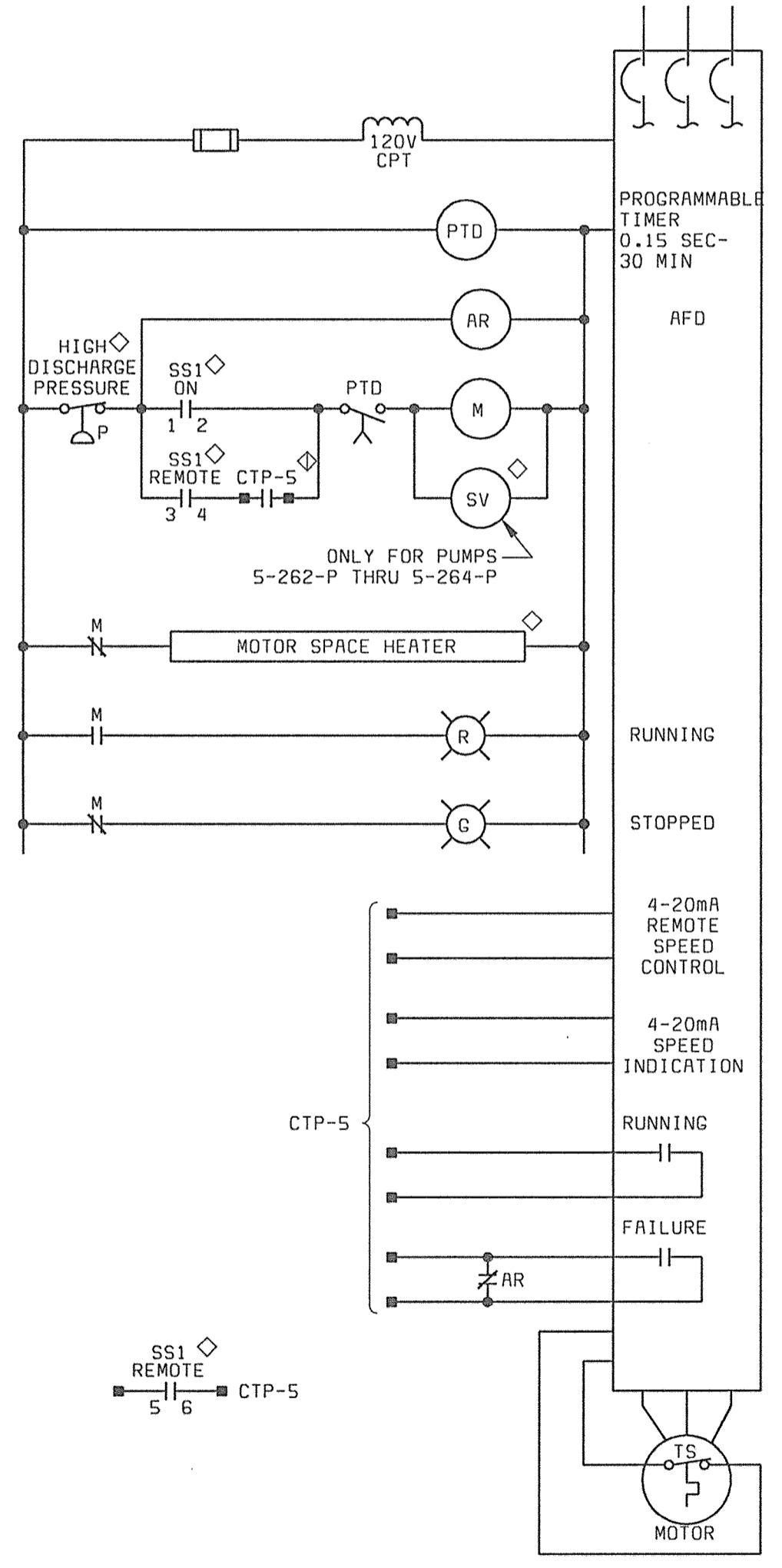
FOAM PUMPS
5-200-P THRU 5-202-P



RETURN ACTIVATED SLUDGE PUMPS
5-220-P THRU 5-223-P

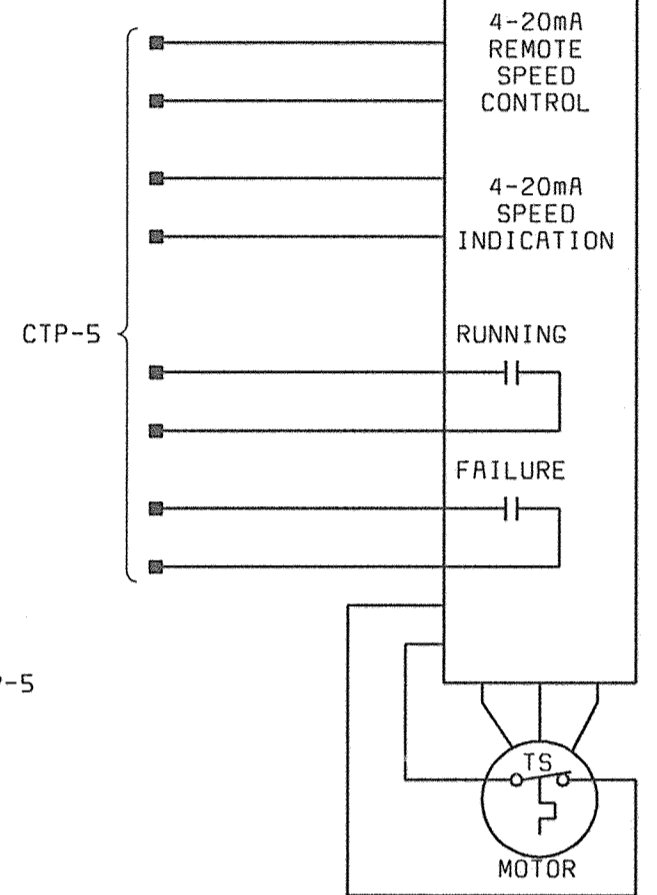
WASTE ACTIVATED SLUDGE PUMPS
5-210-P AND 5-211-P

FERMENTER SUPERNATANT PUMPS
5-250-P AND 5-251-P



WASTE FERMENTED SLUDGE PUMPS
5-262-P THRU 5-264-P

FERMENTED RECYCLE PUMPS
5-260-P AND 5-261-P



SWITCH DEVELOPMENTS:

| CONTACTS | POSITION | | |
|----------|----------|-----|--------|
| | ON | OFF | REMOTE |
| 1-2 | X | | |
| 3-4 | | | X |
| 5-6 | | | X |

DEVICE LOCATION LEGEND:

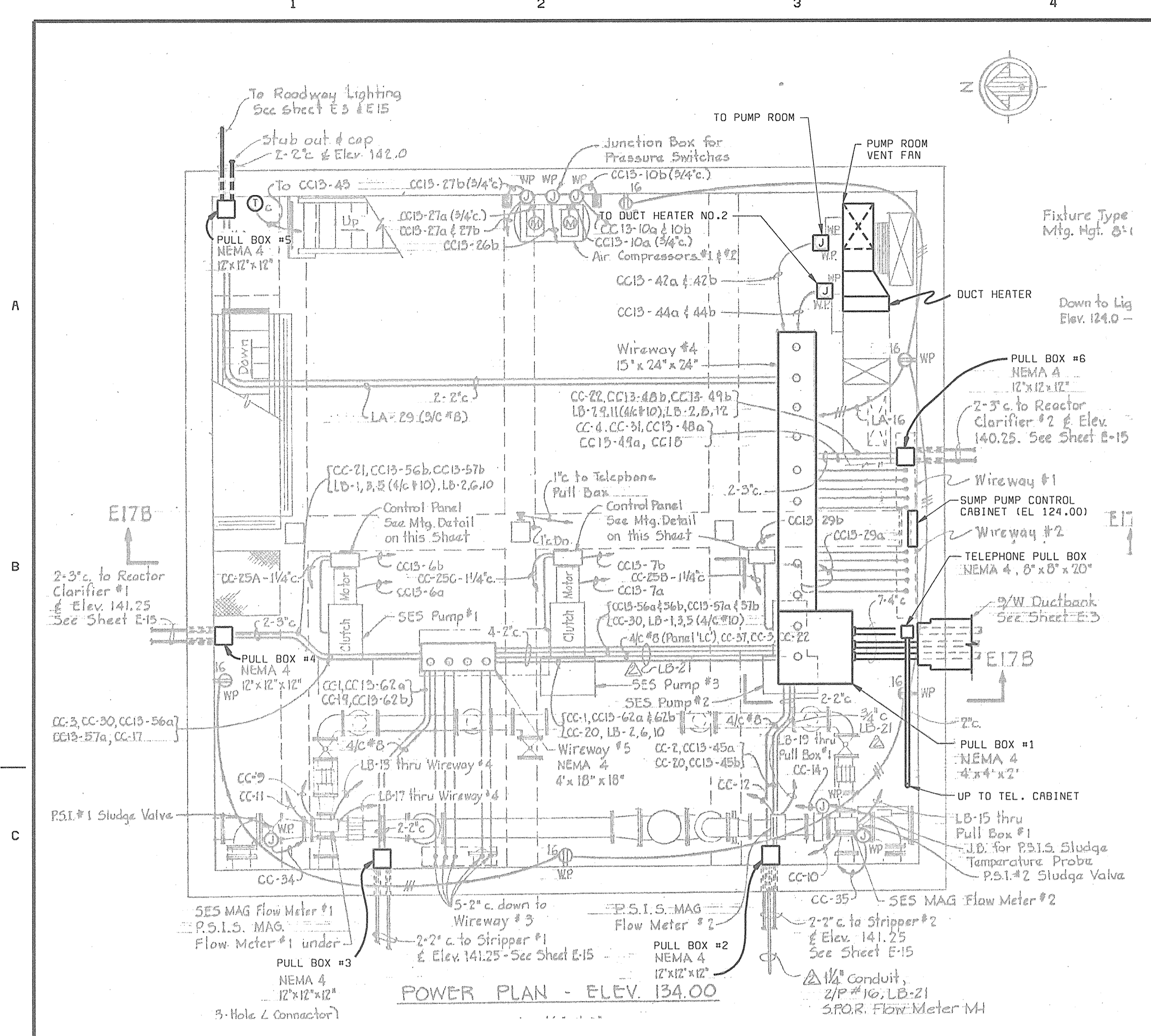
- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT
- ◊ CONTROLS TERMINATION PANEL CTP-5 (FOR PIU-5)

NOTES:

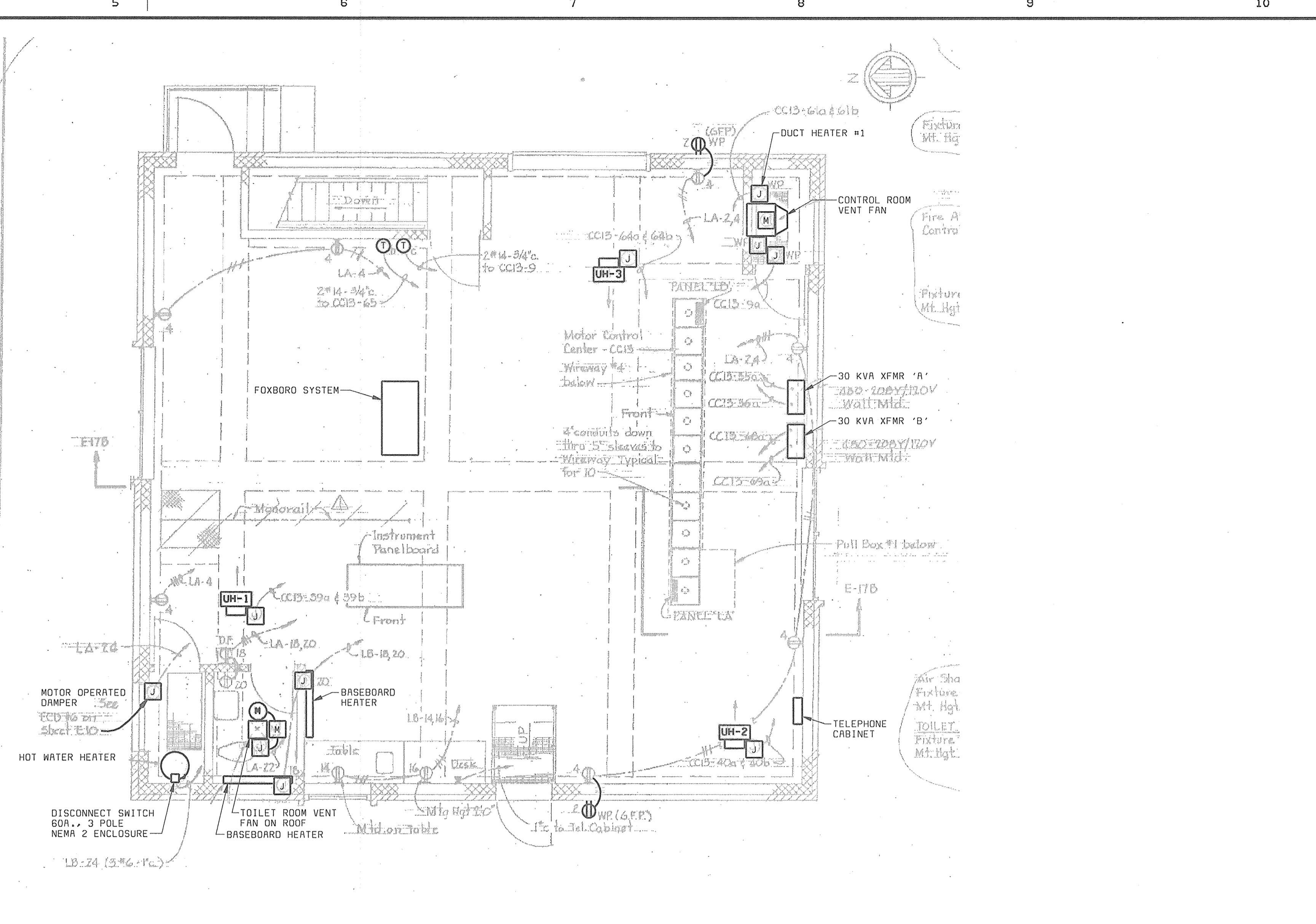
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATION.
3. UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINE IN THE SCHEMATIC SYMBOL LEGEND.
4. RELAY AND TIMER DESIGNATIONS APPLY TO INDIVIDUAL SCHEMATIC ONLY.
5. CONTROL SETTINGS, ALARM LIMITS, AND SIMILAR ADJUSTABLE LIMITS ARE INTENDED TO BE FOR INITIAL STARTUP. ADJUSTABLE SETTINGS SHALL BE TESTED AND CHANGED BY THE CONTRACTOR, IF REQUIRED FOR PROPER SEQUENCING AND OPERATION.
6. AFD SCHEMATICS SHOW FUNCTIONAL CONTROL AND INTERLOCKS, NOT ALL DEVICES ON THE DRIVE ARE SHOWN. SEE SPECIFICATION SECTION 16150 FOR ADDITIONAL REQUIREMENTS. ALL DEVICES ARE LOCATED AT THE DRIVES UNLESS OTHERWISE NOTED. SELECTOR SWITCHES AND PUSH BUTTONS AT AFD SHALL BE MOUNTED ON AFD ENCLOSURE FRONT.

| | | | | | | |
|--|--|---|---|--|--|---|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert J. ...</i> CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH Gaithersburg, Maryland <i>David ...</i> REG. PROF. ENGR. DATE | DONALD R. STIERS STATE OF MARYLAND | DES: GNS DRN: MDR.EEC CHK: JTF DATE: 6/23/00 | NORTH GALLERY BUILDING ELECTRICAL SCHEMATICS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 139 of 161 E29 |
| REVISIONS AND RECORD OF ISSUE | | | | NO. BY CK APP | | |

PDS/ATZ PDS/ATZ



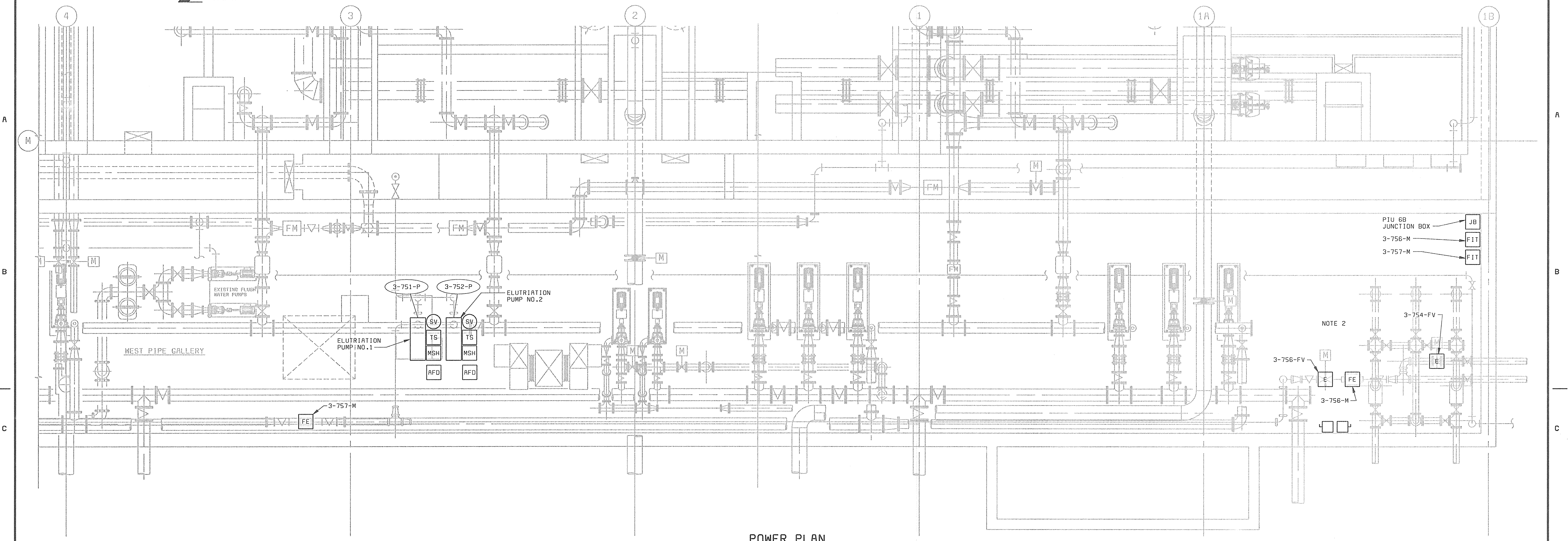
DEMOLITION PLAN - ELEV. 134.00



DEMOLITION PLAN - ELEV. 144.00

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - ALL ITEMS SHOWN IN BOLD ARE TO REMAIN THROUGH THE DEMOLITION TO RECONNECT THE INDICATED EQUIPMENT TO THE NEW ELECTRICAL SYSTEM.

| | | | | |
|--|---|---|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND BLACK & VEATCH Gaithersburg, Maryland Donald R. Steiner REG. PROF. ENGR. DATE: 6/29/00 | DES: GNS DRN: TDR CHK: JTF DATE: 6/23/00 | NORTH GALLERY BUILDING ELECTRICAL DEMOLITION PLAN | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 140 OF 161 E30 |
| | DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP | | | |



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

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - MCC CCS AND PIU 6B ARE IN SECONDARY BUILDING ABOVE.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
Galthersburg, Maryland

Daniel ... 6/23/00
REG. PROF. ENGR. DATE



| | | | | | |
|---------------|------|-------------------------------|-----|----|---------|
| DES: GNS | | | | | |
| DRN: DVH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK /APP |

WEST GALLERY
ELECTRICAL

POWER PLAN

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

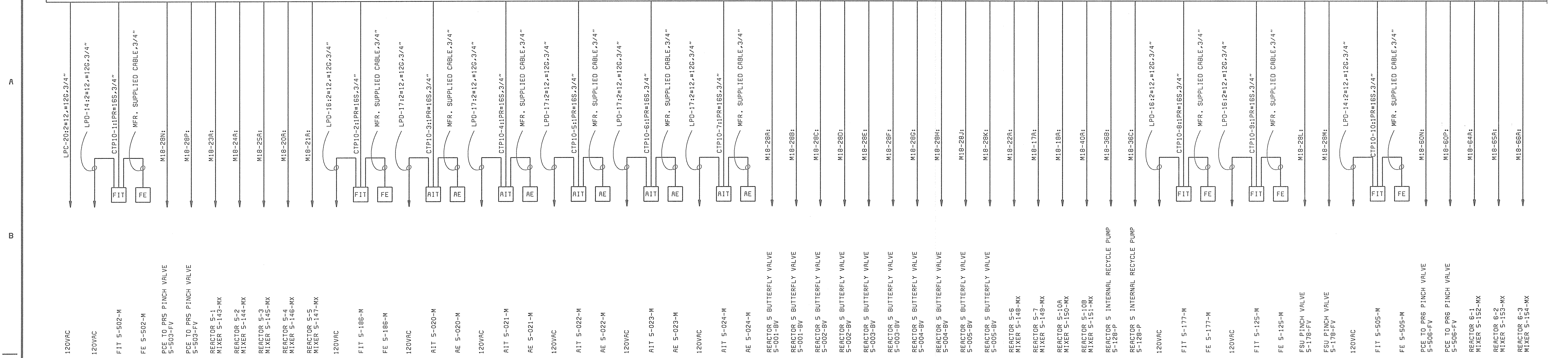
SHEET
141 OF 161

E31

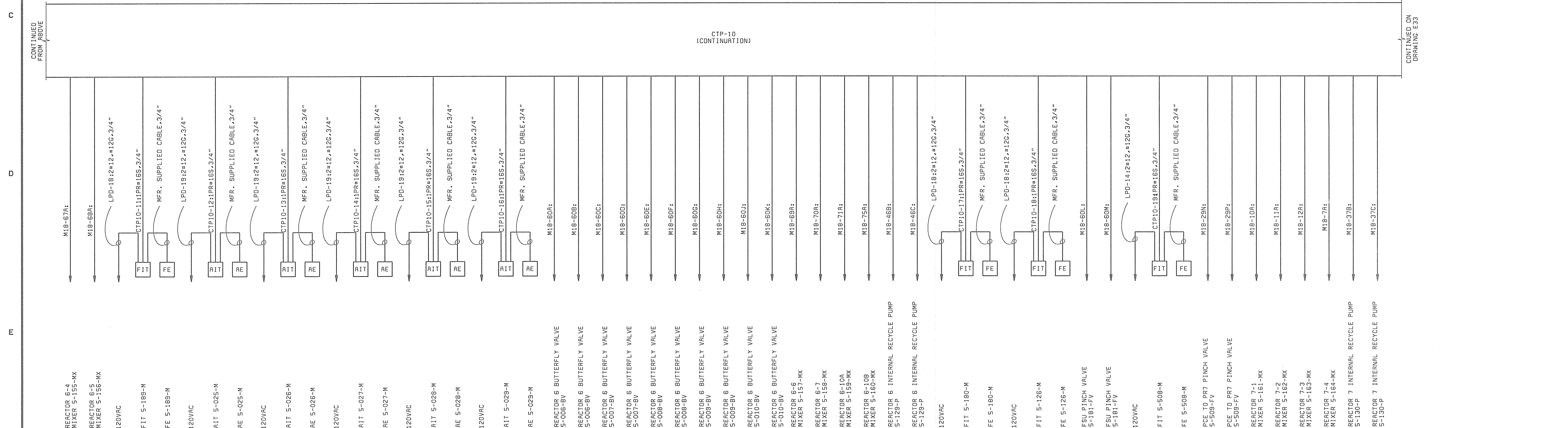
068472
F058472A

CTP-10

CONTINUED BELOW



CTP-10 ONE-LINE DIAGRAM (NBB)



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)

NOTES:
 1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

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

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

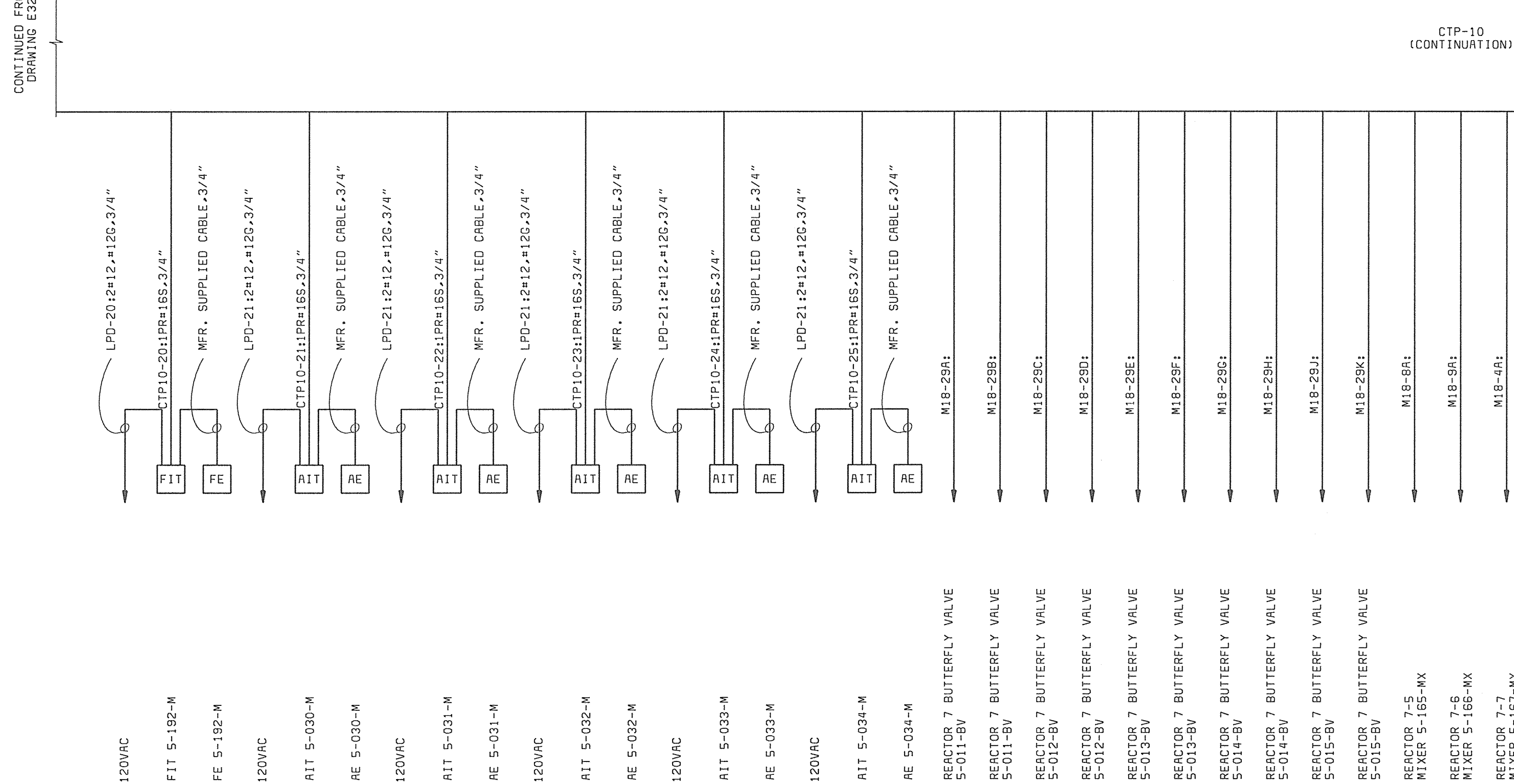


| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: SFP.GNS | | | | | | | | | |
| DRN: TOR | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

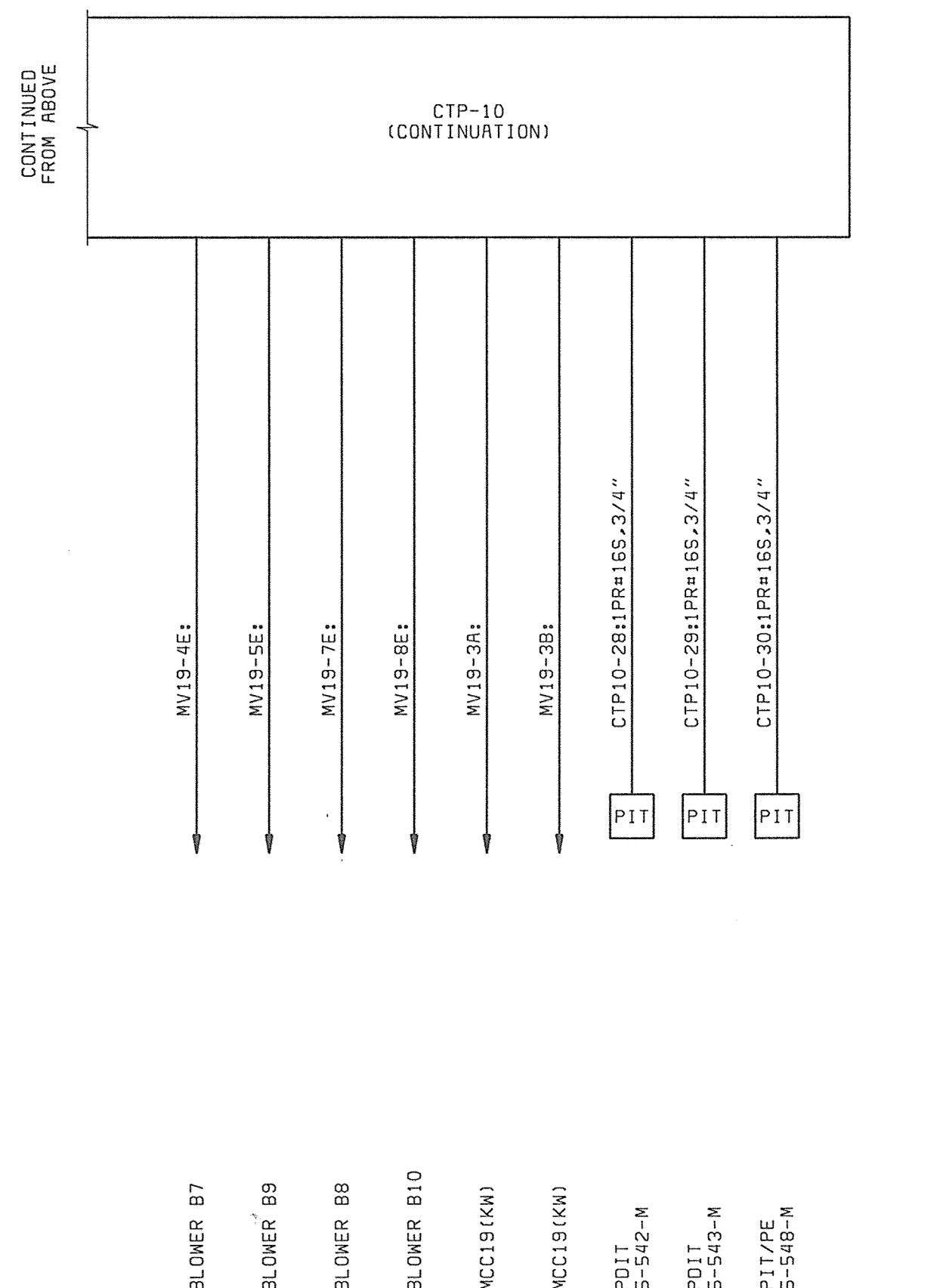
GENERAL ELECTRICAL
 CONTROL SYSTEM SCHEMATIC
 ONE-LINE DIAGRAM
 CTP-10

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

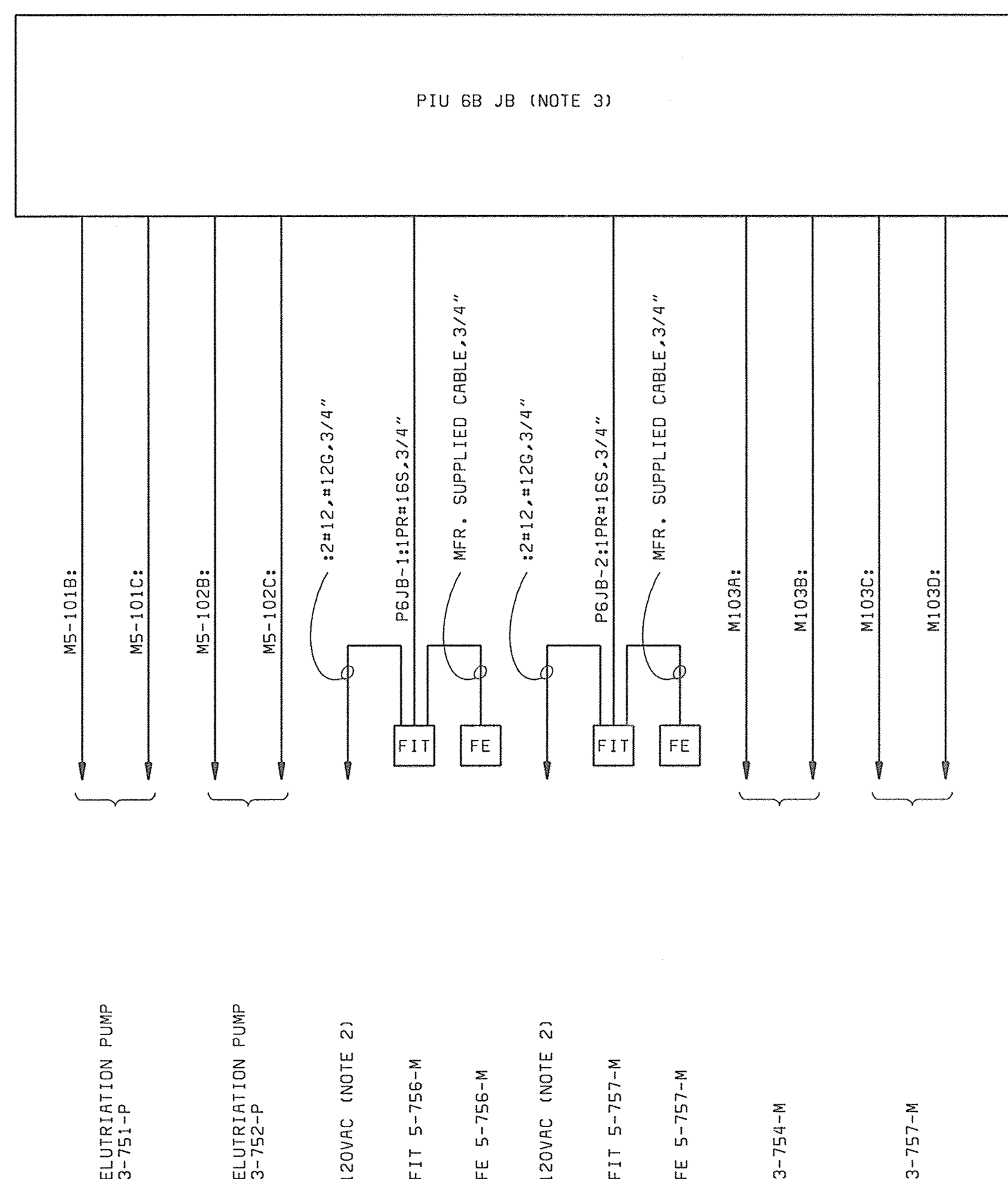
SCALE AS SHOWN
 SHEET 142 OF 161
 E32



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)



CTP-10 ONE-LINE DIAGRAM (NBB) (CONTINUED)



PIU 6B JUNCTION BOX ONE-LINE DIAGRAM (WEST GALLERY)

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - DAISY CHAIN INSTRUMENTS TO EXISTING LIGHTING PANEL CIRCUIT.
 - COIL ENOUGH WIRE INTO JB TO EXTEND TO PIU IN FUTURE CONTRACT.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

BLACK & VEATCH
Gaithersburg, Maryland

David A. Allen
REG. PROF. ENGR.

6/24/00
DATE



| | | | | | |
|---------------|------|-------------------------------|-----|----|----|
| DES: CNS,SFP | | | | | |
| DRN: DAH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK |

GENERAL
ELECTRICAL

CONTROL SYSTEM ONE-LINE DIAGRAM
CTP-10 CONTINUATION
AND WEST GALLERY

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

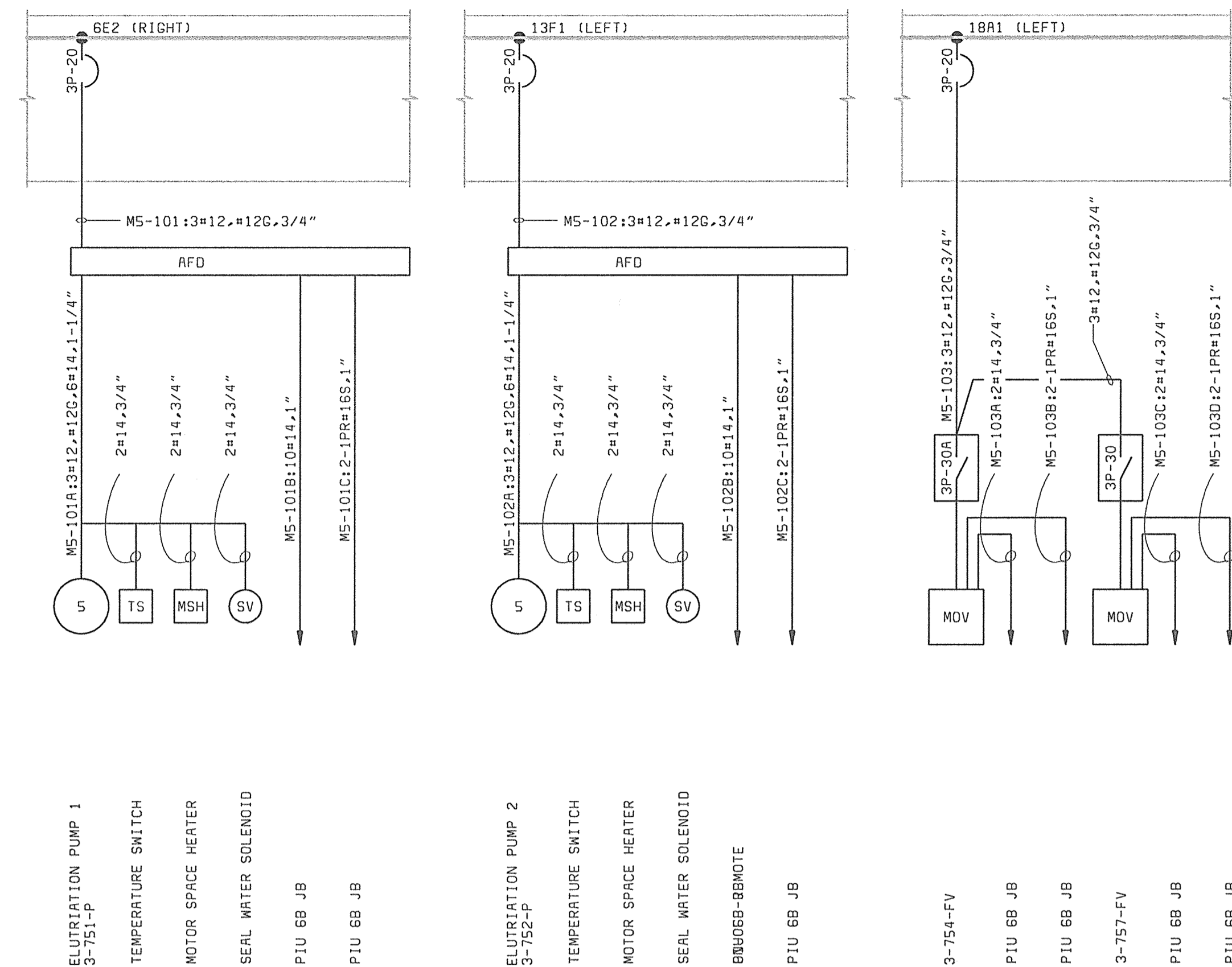
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

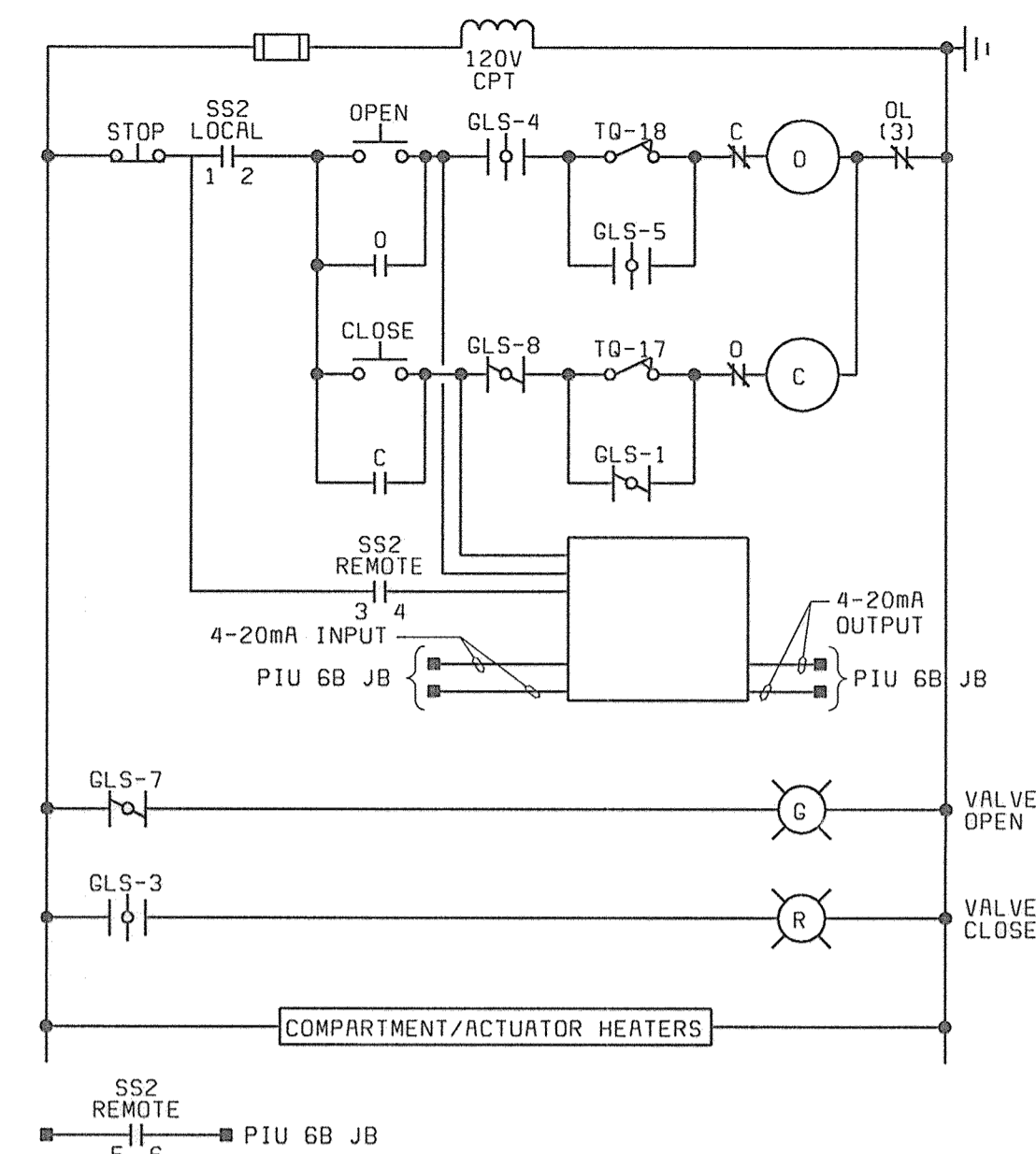
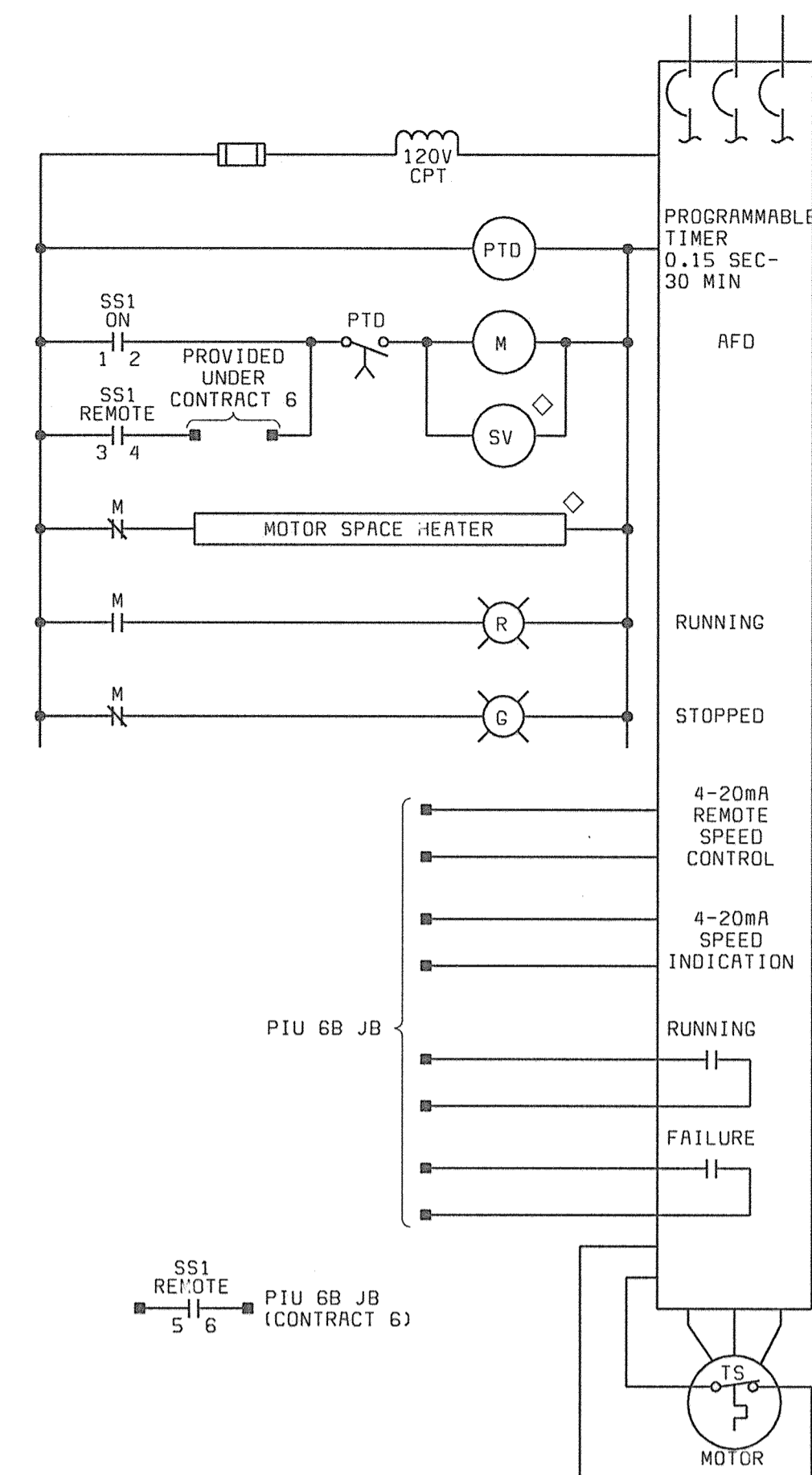
SHEET
143 OF 161

E33



PARTIAL MCC CC5 ONE-LINE DIAGRAM
NOTE 2

ELUTRIATION PUMPS 3-751-P AND 3-752-P



TYPICAL MODULATING VALVE ELECTRIC OPERATOR

GEARED LIMIT SWITCH DEVELOPMENT:

| ROT OR | GLS CONTACT | ACTUATOR POSITION | | |
|--------|-------------|-------------------|-----------------------------|--------------------|
| | | FULL OPEN (0%) | INTERMEDIATE POSITION (90%) | FULL CLOSED (100%) |
| 1 | 1 | | | |
| 1 | 2 | | | |
| 1 | 3 | | | |
| 1 | 4 | | | |
| 1 | 5 | | | |
| 2 | 6 | | | |
| 2 | 7 | | | |
| 2 | 8 | | | |
| 2 | 9 | | | |
| 2 | 10 | | | |
| 3 | 11 | | | |
| 3 | 12 | | | |
| 3 | 13 | | | |
| 3 | 14 | | | |
| 3 | 15 | | | |
| 3 | 16 | | | |

TQ/17 OPENS ON HIGH CLOSING TORQUE
TQ/18 OPENS ON HIGH OPENING TORQUE
=CONTACT CLOSED

SWITCH DEVELOPMENTS:

| CONTACTS | POSITION | | | CONTACTS | POSITION | | |
|----------|----------|-----|--------|----------|----------|--------|--|
| | ON | OFF | REMOTE | | LOCAL | REMOTE | |
| 1-2 | X | | | 1-2 | X | | |
| 3-4 | | | X | 3-4 | | X | |
| 5-6 | | | X | 5-6 | | X | |

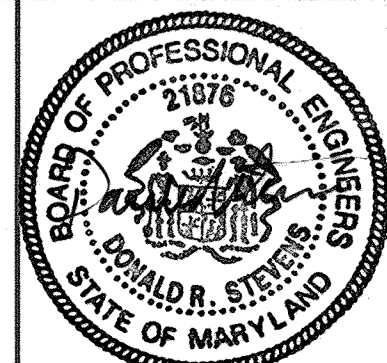
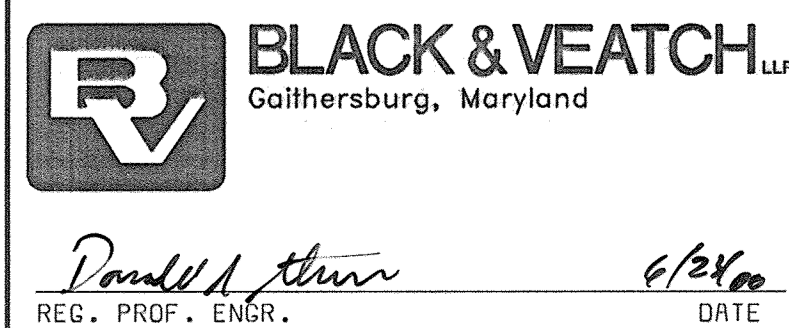
DEVICE LOCATION LEGEND:

- ◇ AT DRIVEN EQUIPMENT
- ◆ REMOTE FROM STARTER AND DRIVEN EQUIPMENT

NOTES:

- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- EXISTING MCC CC5 AND PIU 6B ARE LOCATED IN SECONDARY BUILDING.
- SPARE CONTACTS SHALL BE PROVIDED FOR EACH STARTER AS DESCRIBED IN THE SPECIFICATION.
- UNLESS OTHERWISE NOTED, DEVICES SHOWN ON THIS DRAWING SHALL BE SUPPLIED AS AN INTEGRAL PART OF THE STARTER. DEVICES LOCATED OUTSIDE OR REMOTE FROM THE STARTER SHALL BE IDENTIFIED BY A LOCATION SYMBOL AS DEFINE IN THE SCHEMATIC SYMBOL LEGEND.
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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND



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|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: GNS | | | | | | | | | |
| DRN: DAH.EEC | | | | | | | | | |
| CHK: JTF | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

WEST GALLERY
ELECTRICAL

ONE-LINE AND
SCHEMATIC DIAGRAMS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

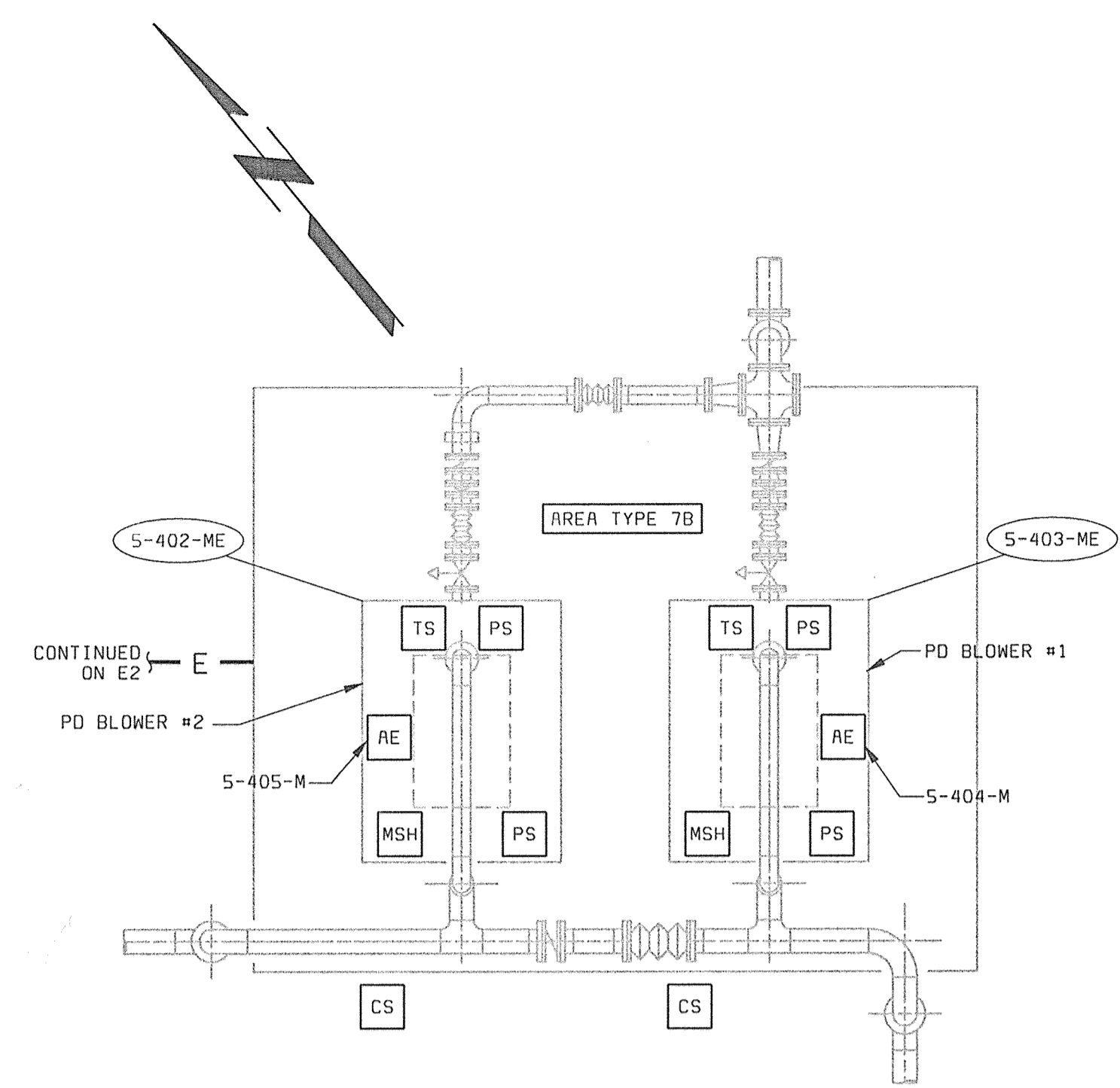
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145 OF 161

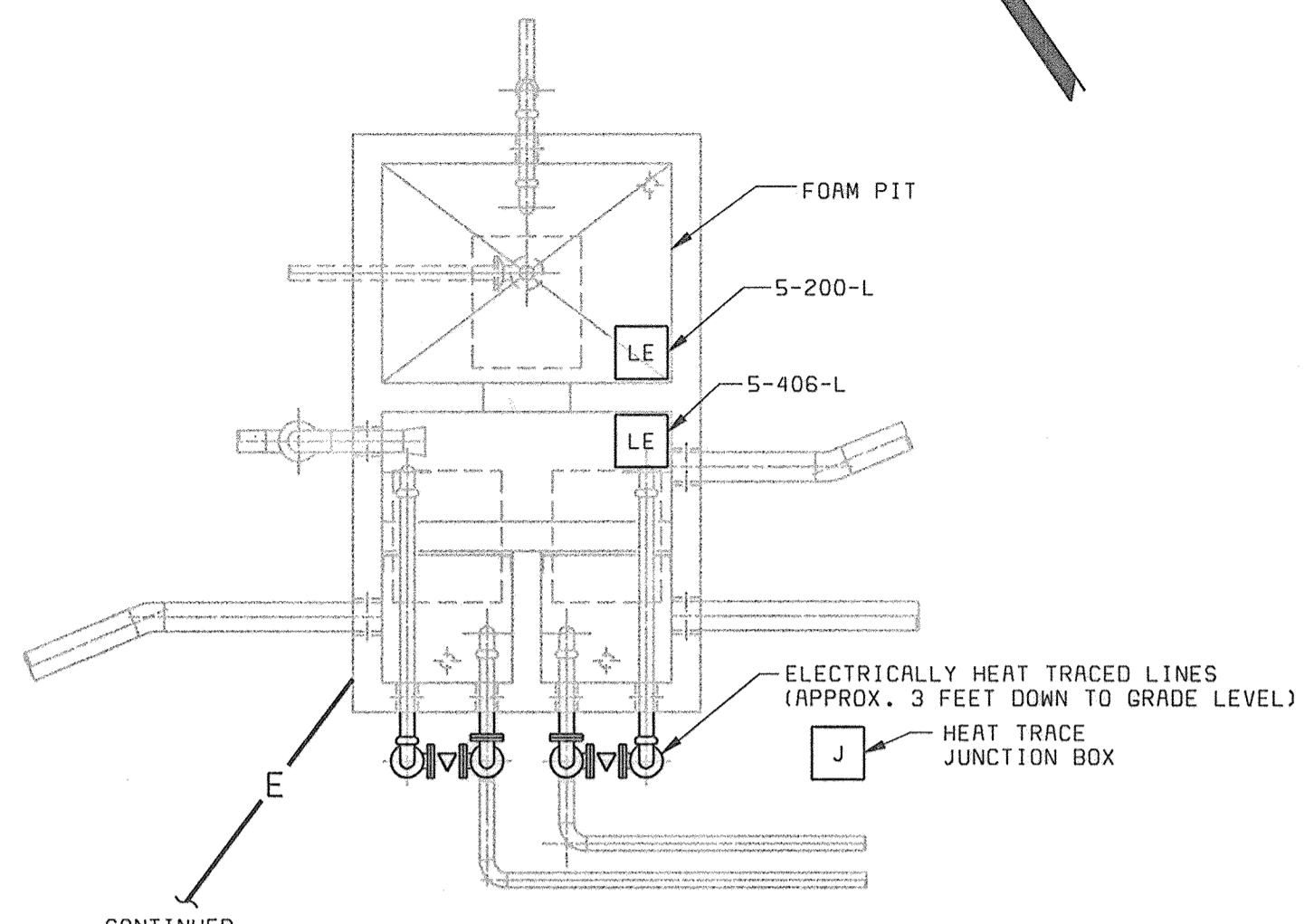
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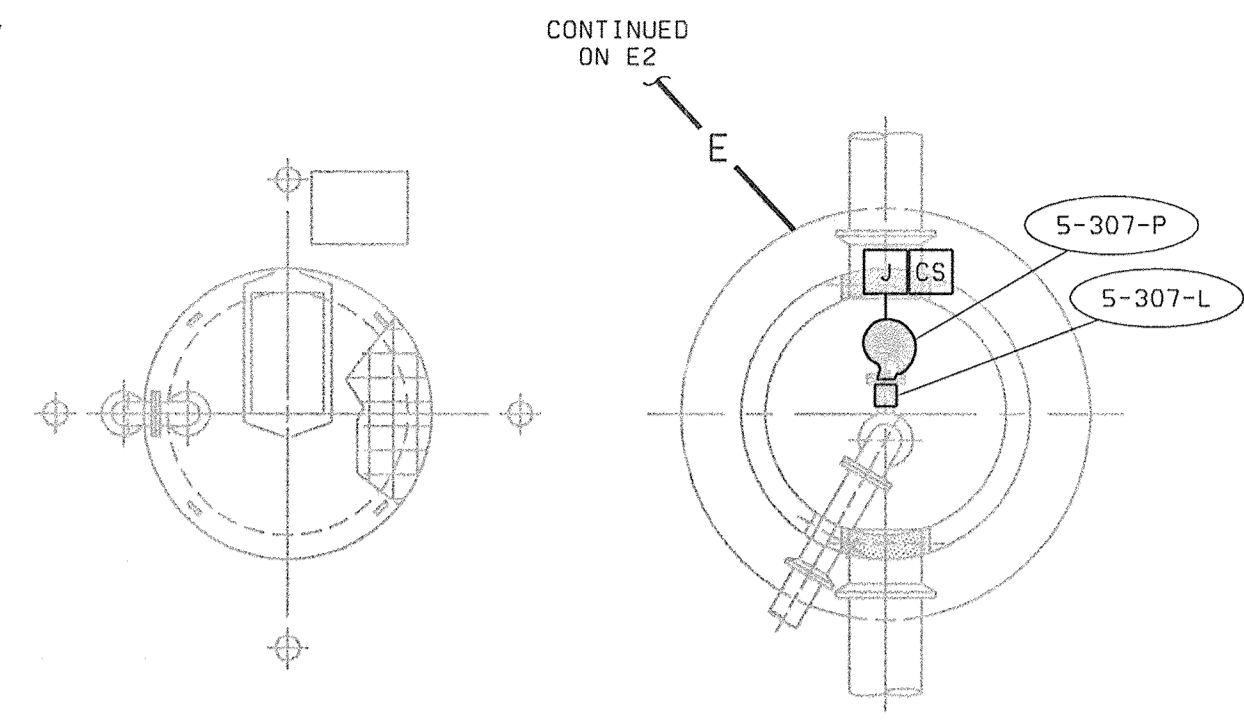
6-29-00
CHIEF, BUREAU OF UTILITIES DATE



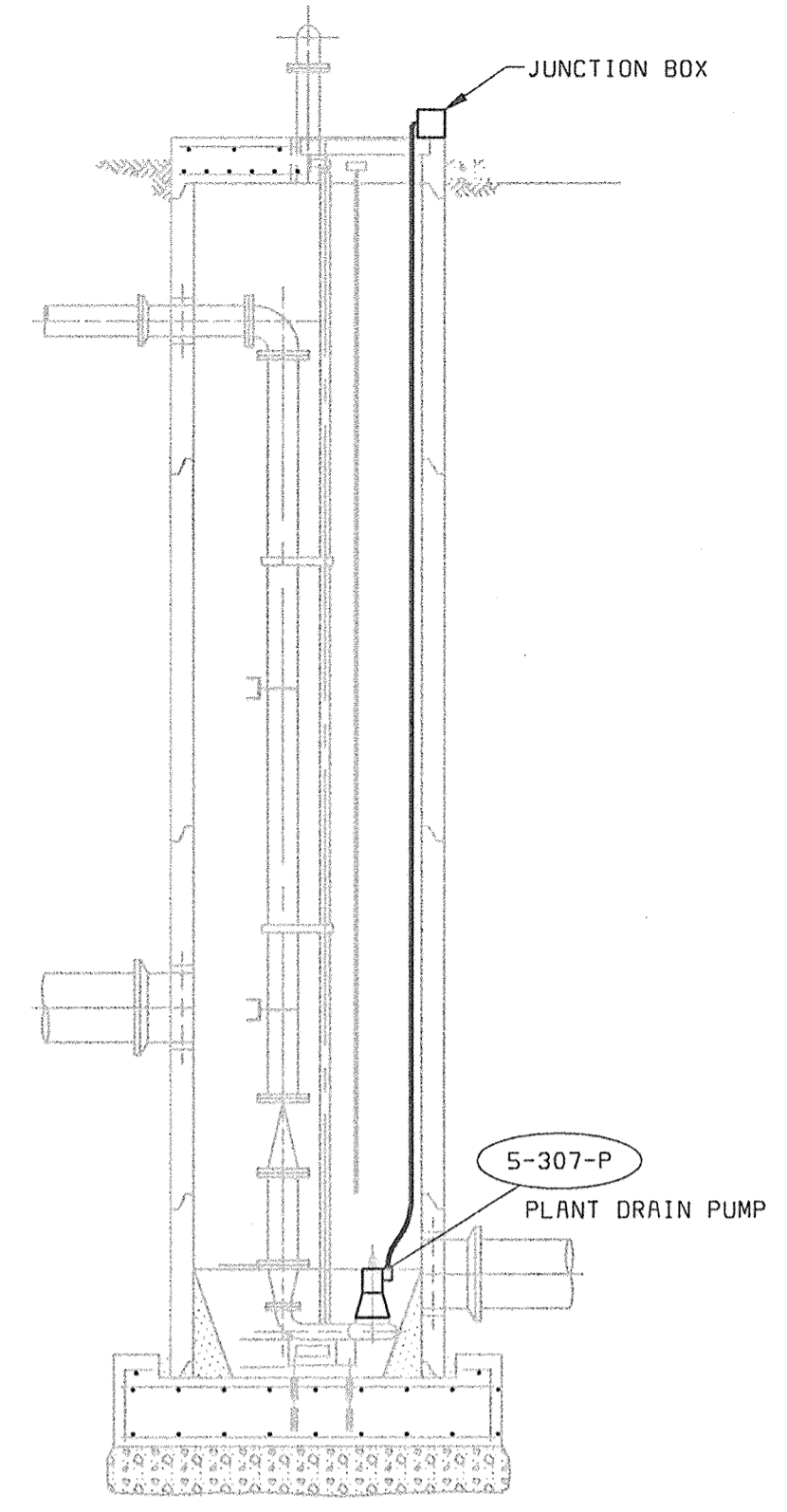
**ODOR CONTROL FERMENTER BLOWERS
POWER PLAN**
1/4" = 1'-0"



**FERMENTER SPLITTER BOX
POWER PLAN**
1/4" = 1'-0"



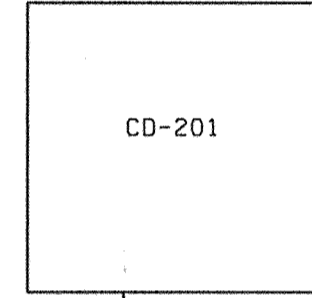
TOP PLAN



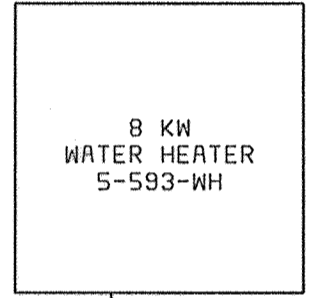
SECTIONAL PLAN



**FIRE ALARM CONTROL
PANEL ONE-LINE**
(NORTH GALLERY BUILDING)

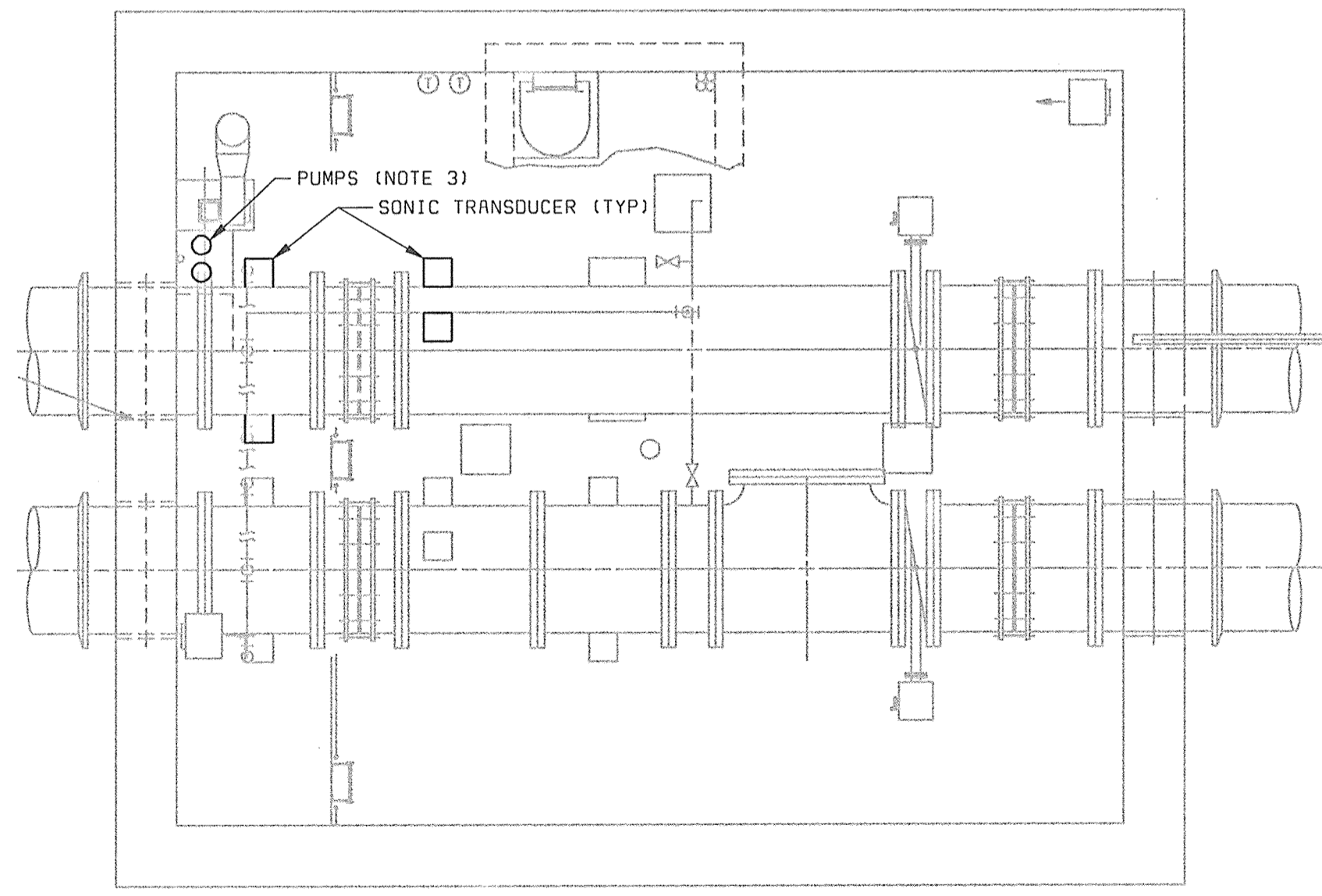


**CONTROL DAMPER
CD-201 ONE-LINE**
(NORTH GALLERY BUILDING)



**WATER HEATER
ONE-LINE**
(NORTH BLOWER BUILDING)

PLANT DRAIN - POWER PLAN
1/4" = 1'-0" NOTE 2



54" METER VAULT - POWER PLAN
3/16" = 1'-0"

- NOTES:**
- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
 - PLANT DRAIN PUMP LOCATED NEAR FC10 AND SOUTHWEST CORNER OF PROCESS REACTORS. REFER TO YARD WORK DRAWINGS FOR DETAILS.
 - PUMPS AND TRANSDUCERS ADDED TO EXISTING 54" METER VAULT TO UTILIZE SAME 120VAC POWER SOURCE AS IS EXISTING IN THIS VAULT.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

David A. Stein 6-29-00
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
GaitHERSburg, Maryland

David A. Stein 6/29/00
REG. PROF. ENGR. DATE



| | | | | | |
|---------------|------|-------------------------------|-----|----|--------|
| DES: GNS | | | | | |
| DRN: DVH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

**GENERAL
ELECTRICAL**

**MISCELLANEOUS PLANS AND
ONE-LINE DIAGRAMS**

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

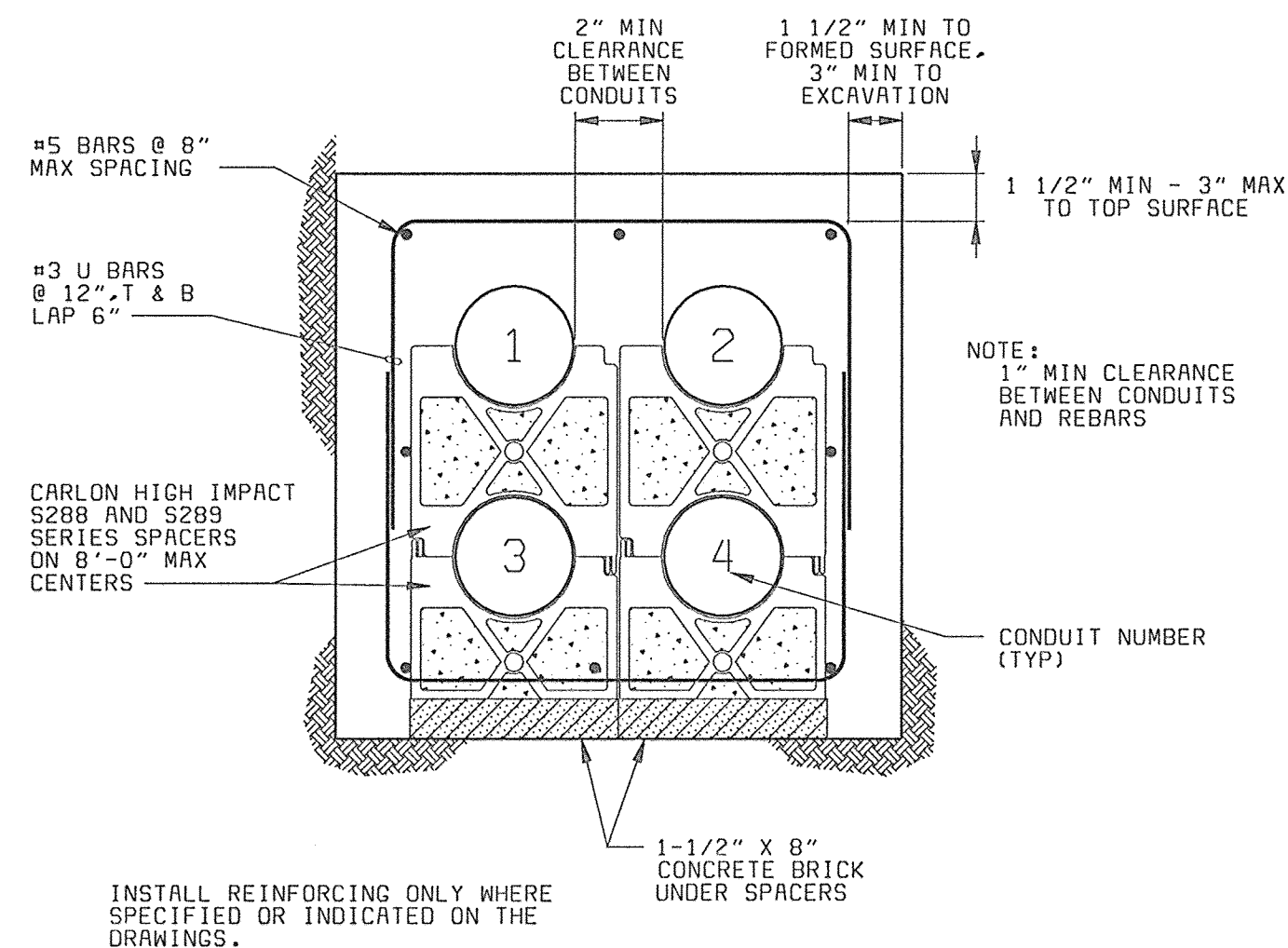
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

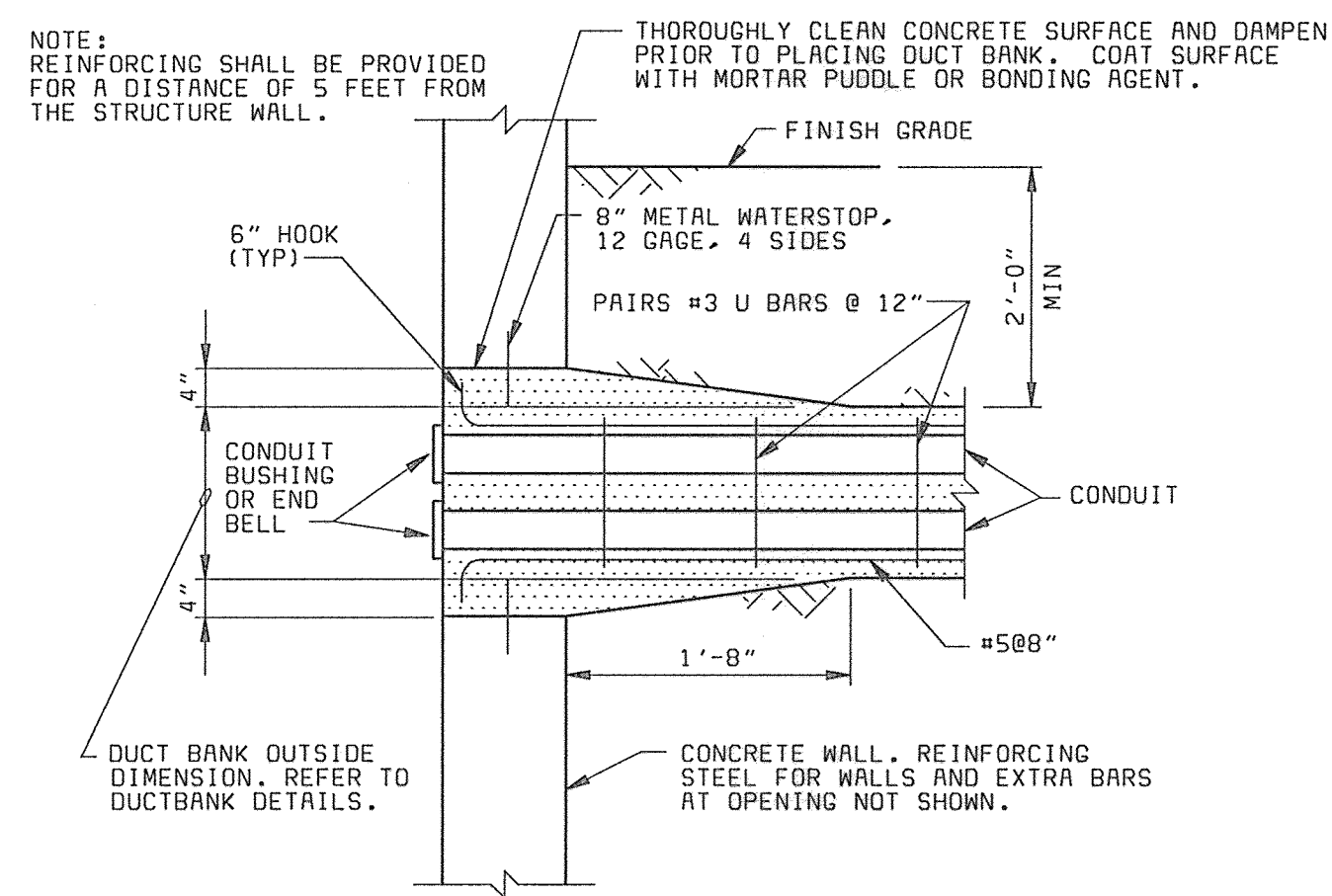
SCALE
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SHEET
146 OF 161

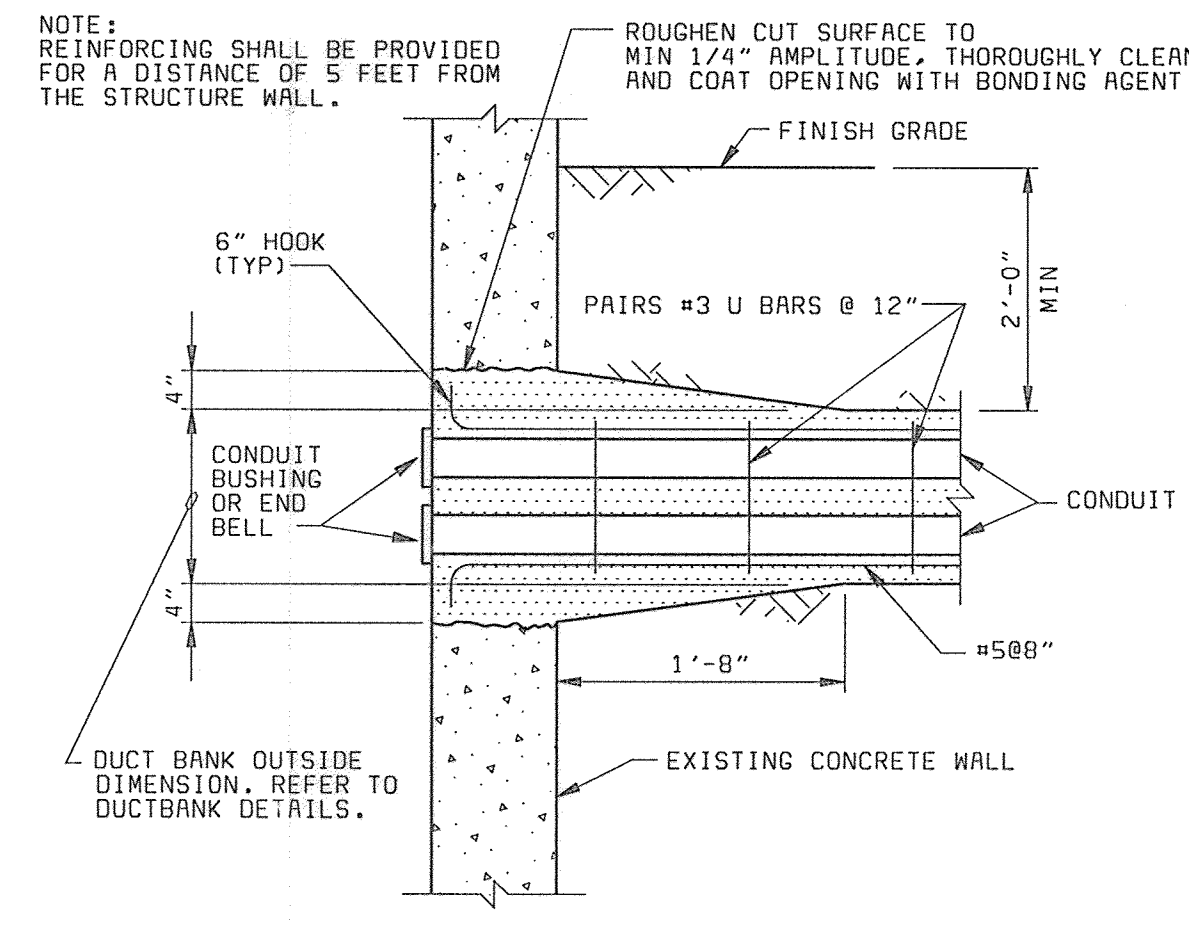
E36



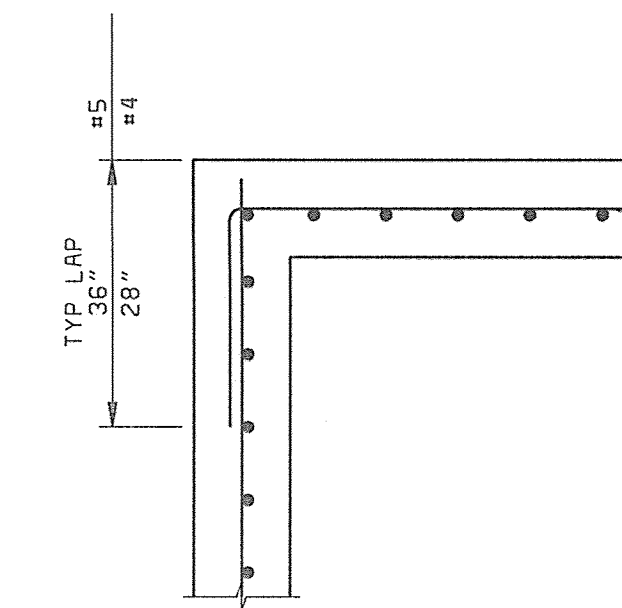
TYPICAL DUCT BANK SECTION
NO SCALE



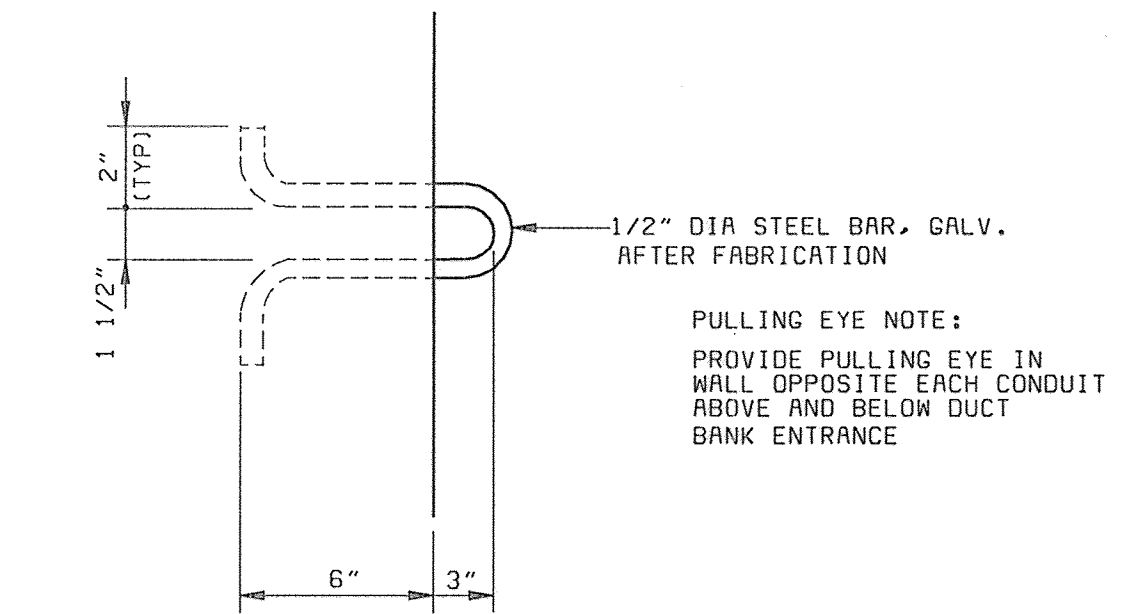
TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL
NO SCALE



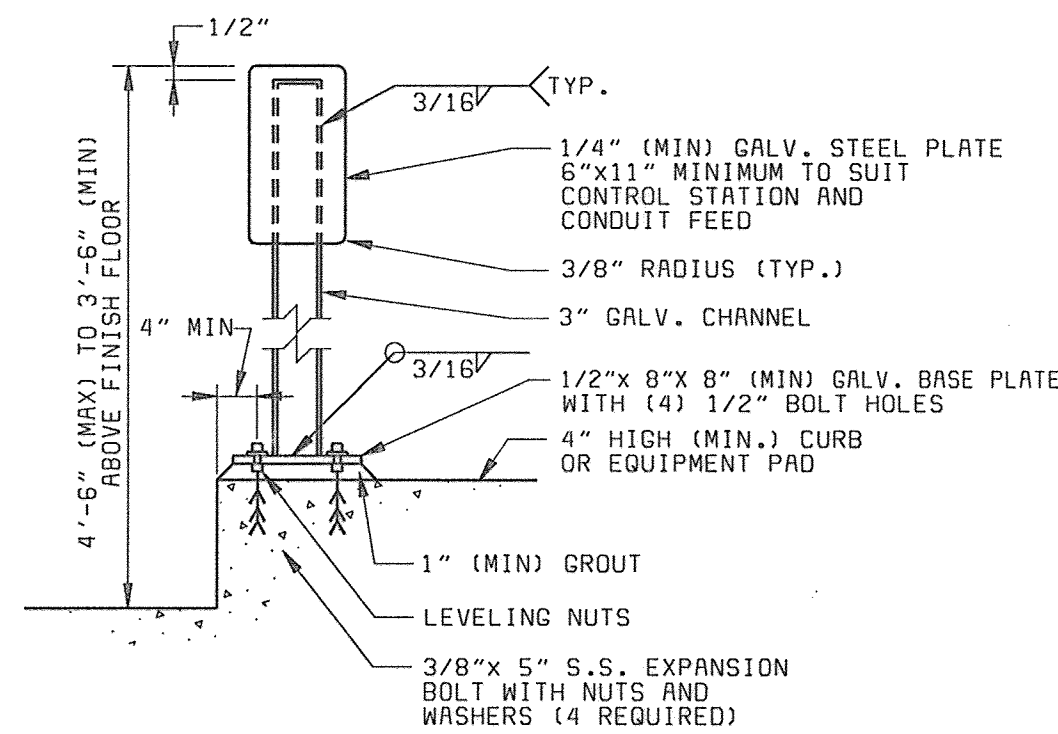
TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL
NO SCALE
NOTE: FOR EXISTING WALL



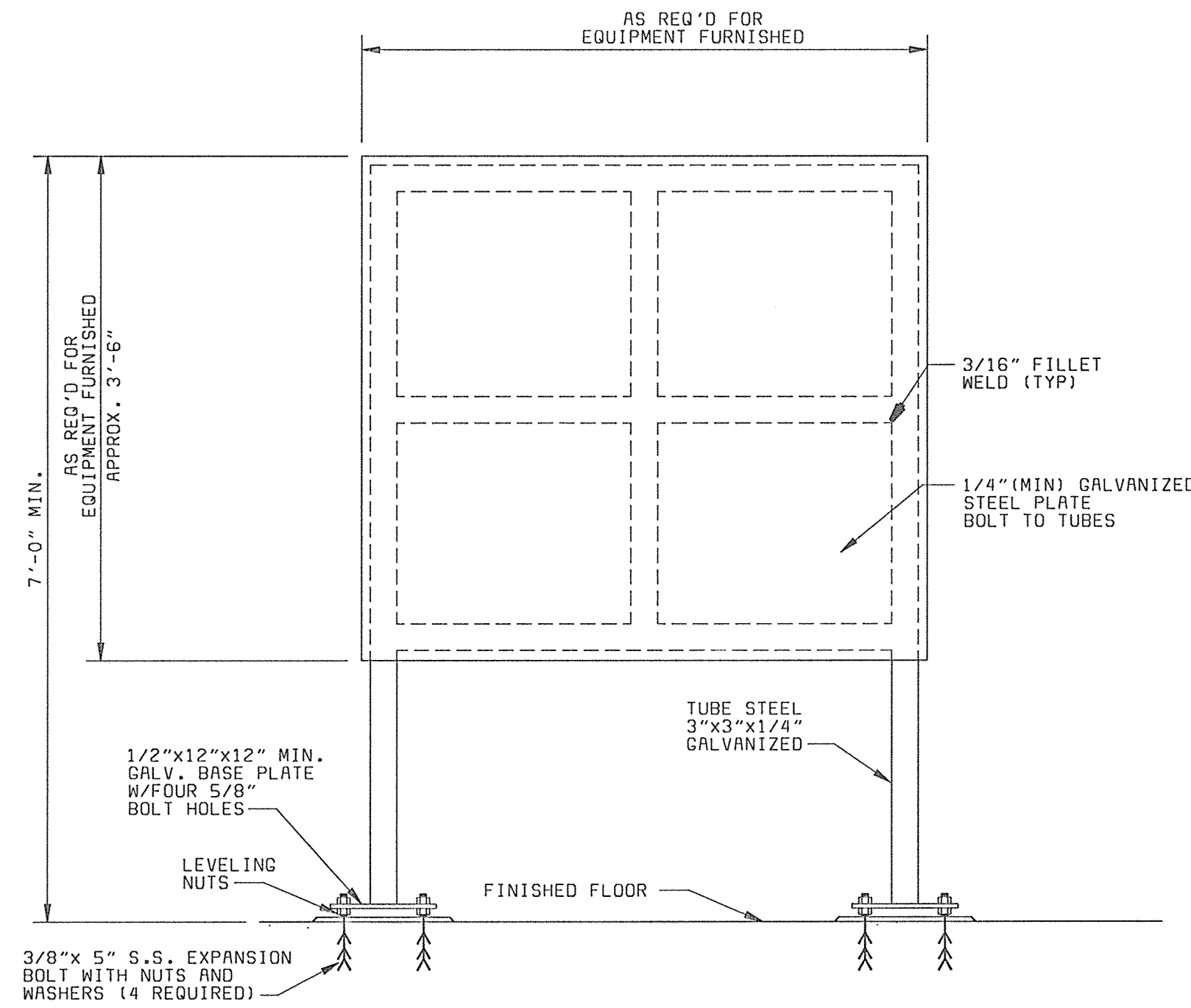
TYPICAL CORNER DETAIL
NO SCALE



PULLING EYE
NO SCALE

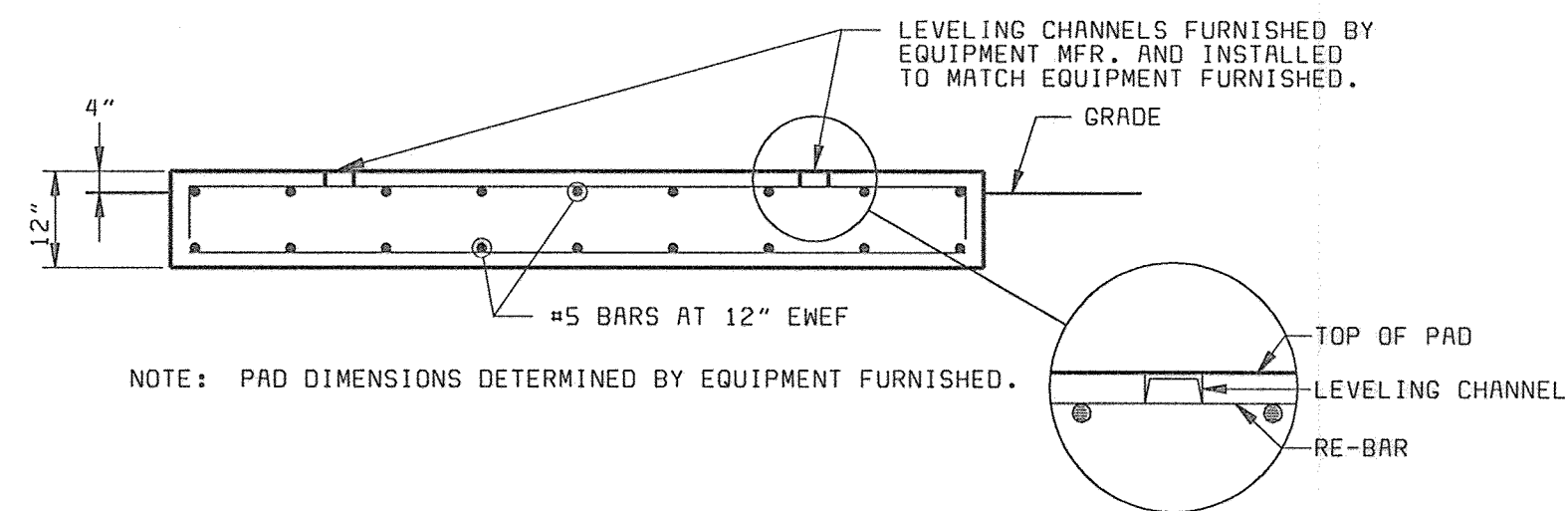


TYPICAL CONTROL STATION MOUNTING DETAIL
NO SCALE

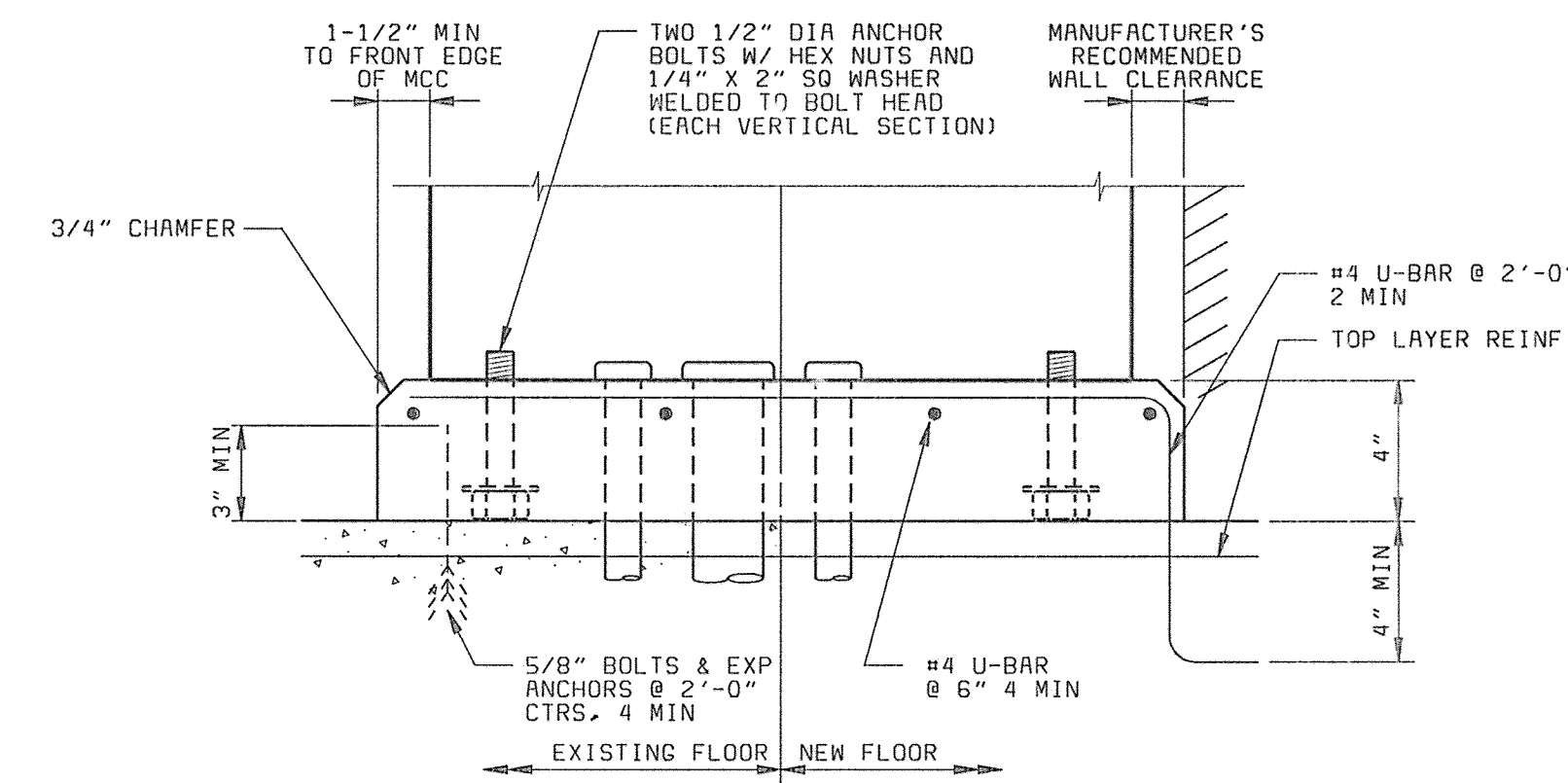


TYPICAL EQUIPMENT RACK MOUNTING DETAIL
NO SCALE

NOTE: FOR SINGLE PANEL LARGER THAN 18"Hx12"Wx8"D OR MULTIPLE PANELS ANY SIZE.



TYPICAL EQUIPMENT PAD DETAIL
NO SCALE



MOTOR CONTROL CENTER BASE
NO SCALE

NOTES:
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

| | | | | |
|--|---|--|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND BLACK & VEATCH Gaithersburg, Maryland REG. PROF. ENGR. DATE: 6/29/00 | DES: SFP DRN: DVH CHK: JTF DATE: 6/23/00 | GENERAL ELECTRICAL MISCELLANEOUS DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 147 OF 161 E37 |
| | CHIEF, BUREAU OF UTILITIES DATE: 6-29-00 [Signature] | REVISIONS AND RECORD OF ISSUE NO. BY CK APP | | |

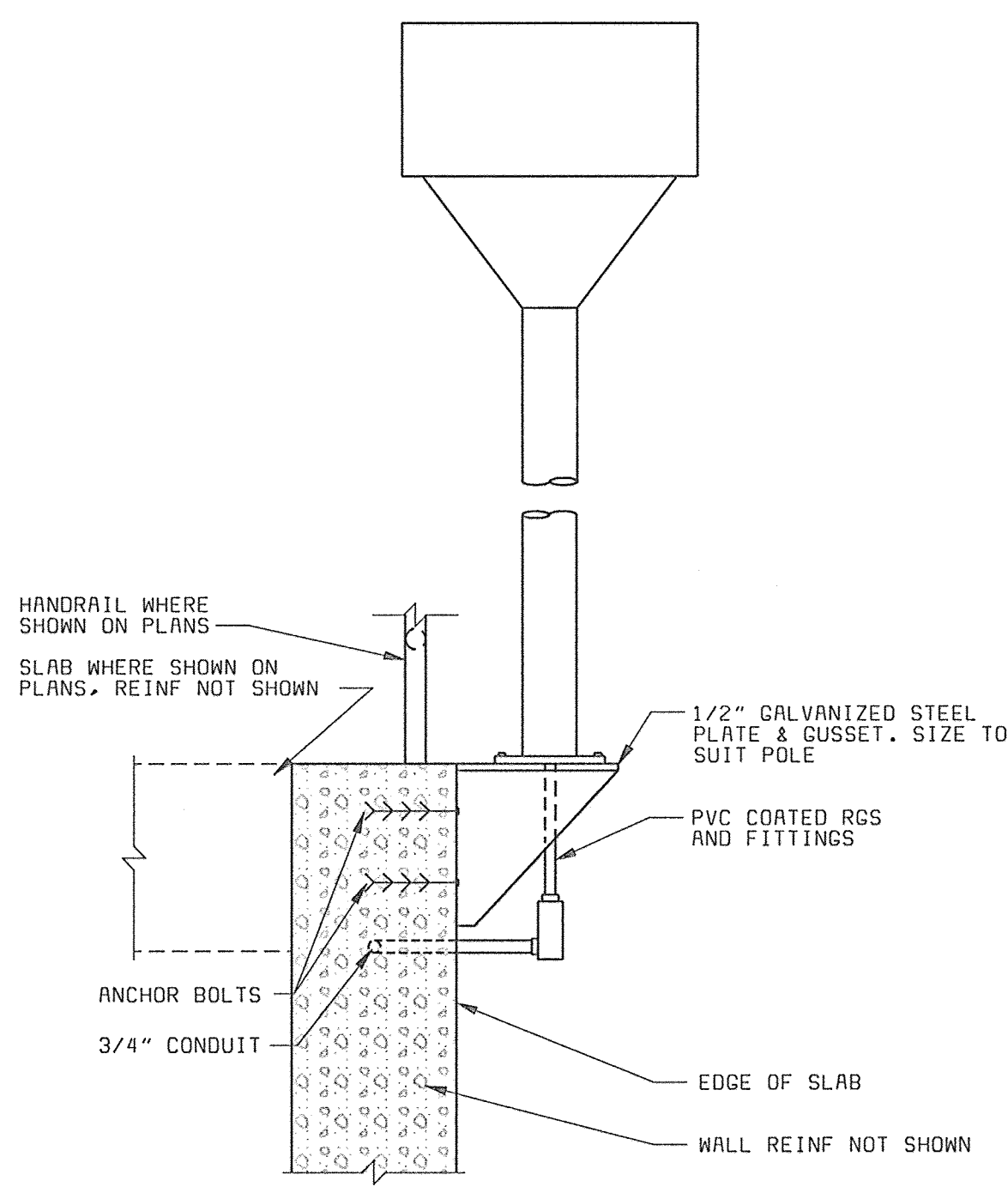
A

B

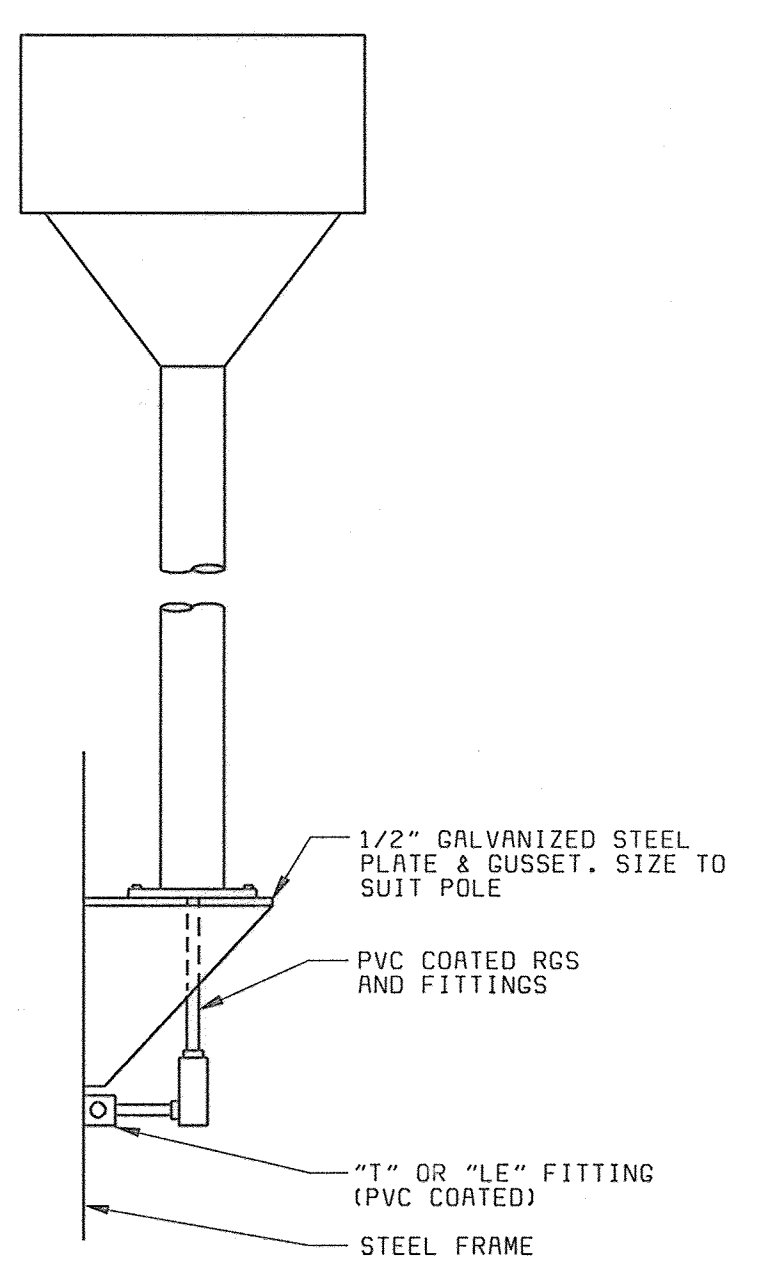
C

D

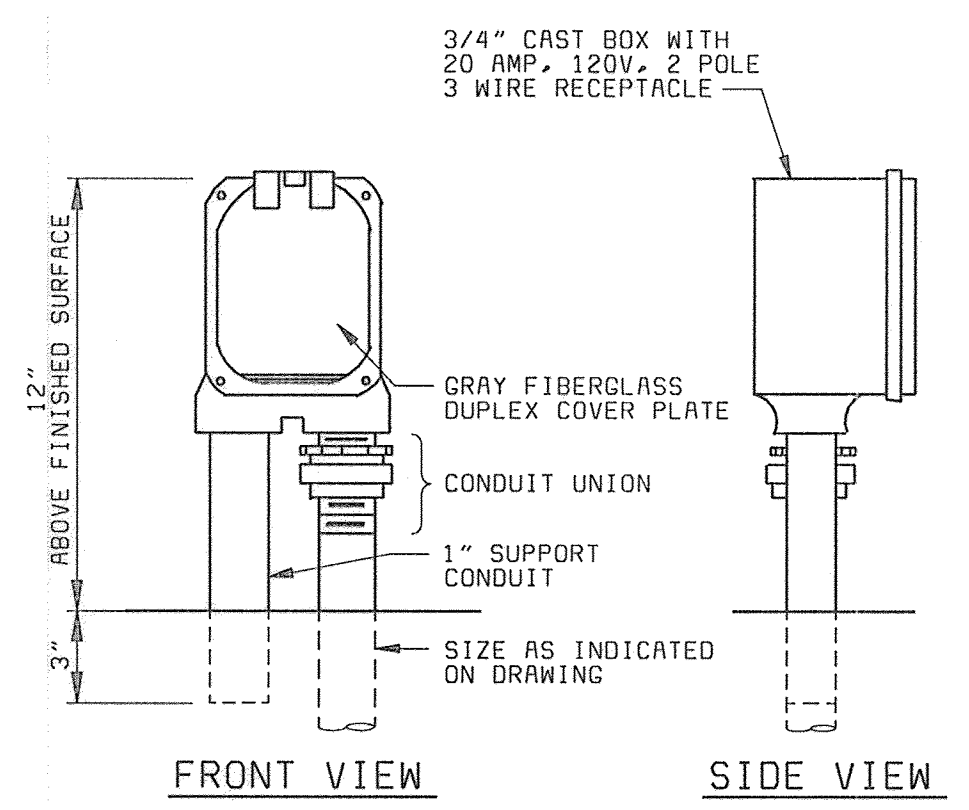
E



**CONCRETE WALKWAY
POLE MOUNTING DETAIL** A
NO SCALE

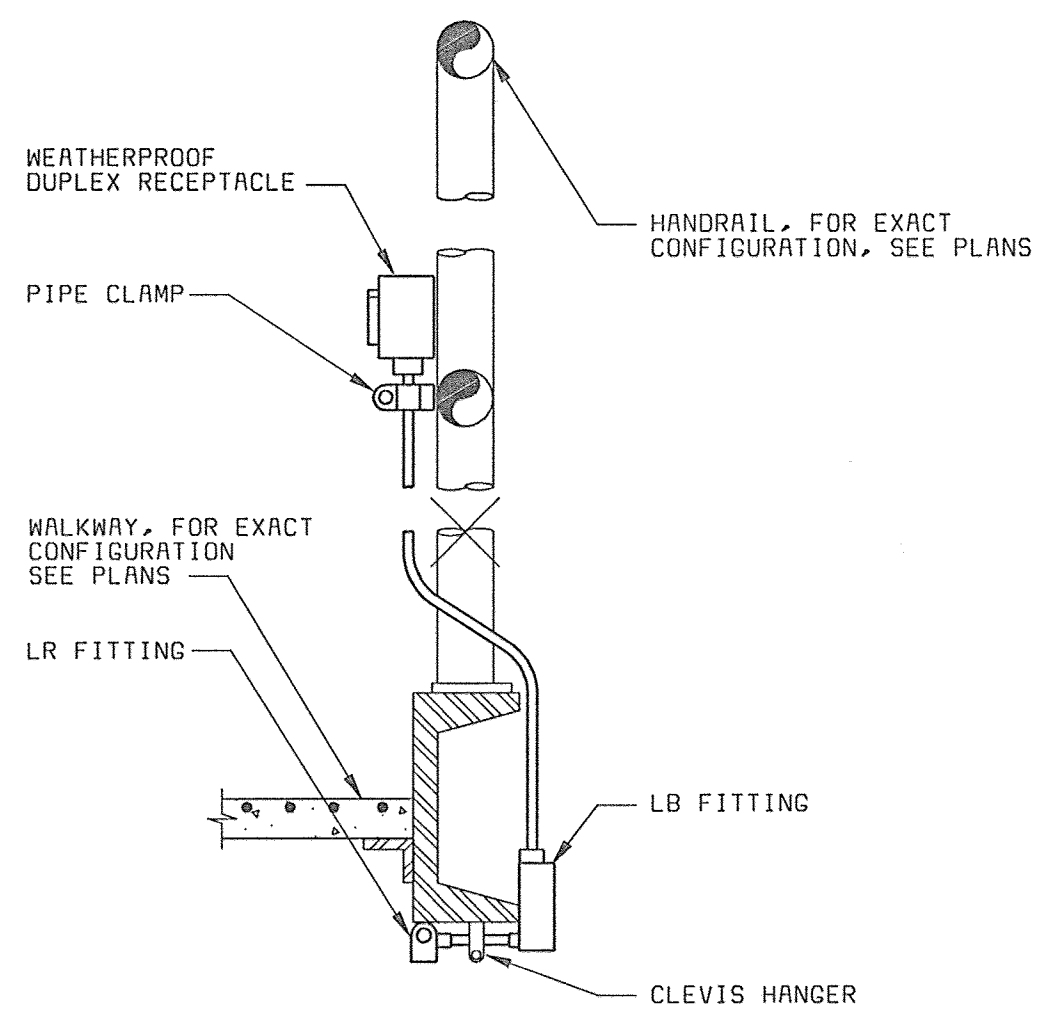


**STEEL WALKWAY POLE
MOUNTING DETAIL** B
NO SCALE

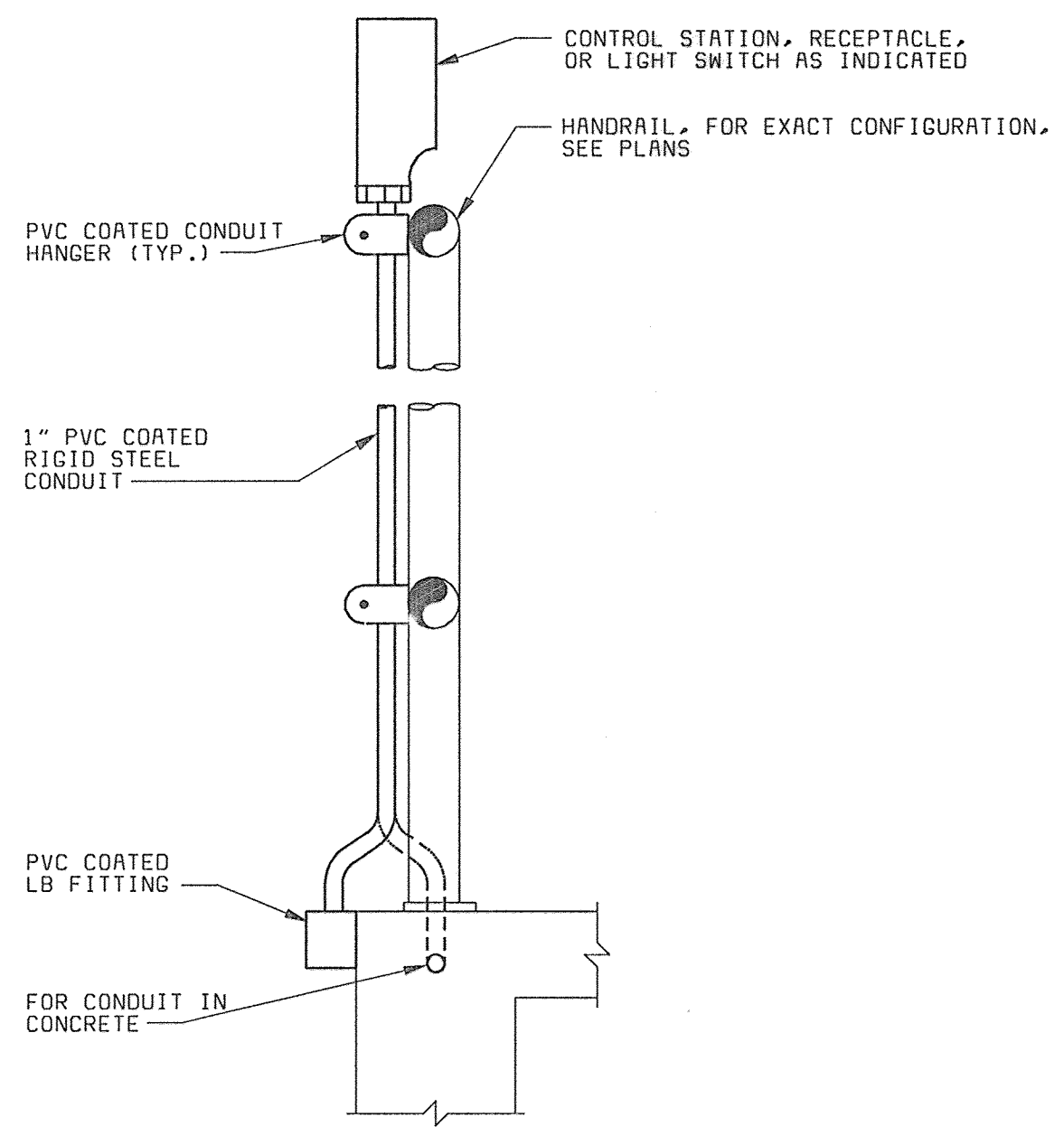


**TYPICAL WEATHERPROOF RECEPTACLE
MOUNTING DETAIL**
NO SCALE

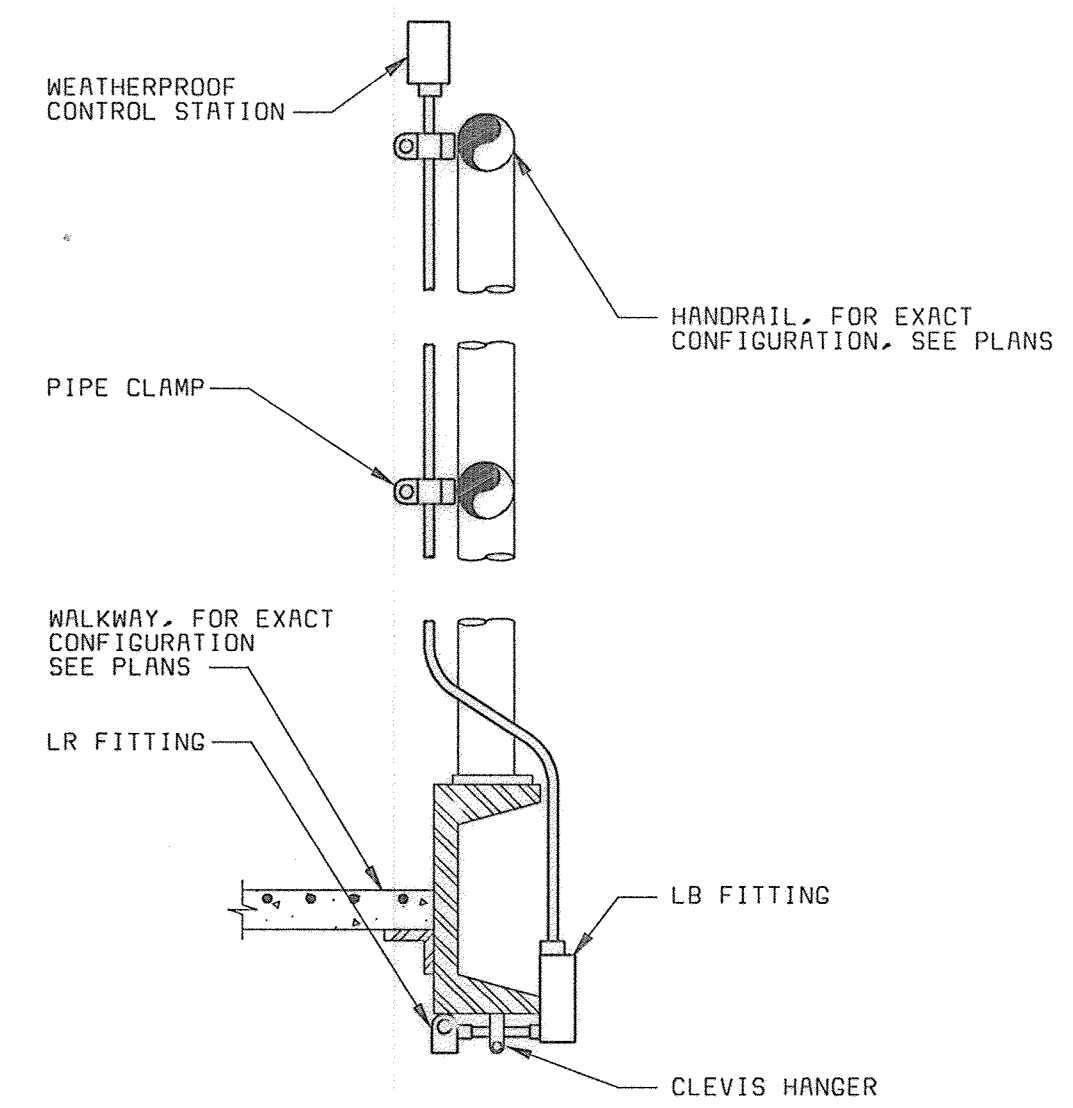
NOTE: ALL EXPOSED CONDUIT SHALL BE PVC COATED RIGID STEEL.



**TYPICAL RECEPTACLE MOUNTING
AT METAL WALKWAY DETAIL**
NO SCALE



**TYPICAL HANDRAIL
MOUNTING DETAIL**
NO SCALE



**TYPICAL CONTROL STATION
MOUNTING AT METAL WALKWAY DETAIL**
NO SCALE

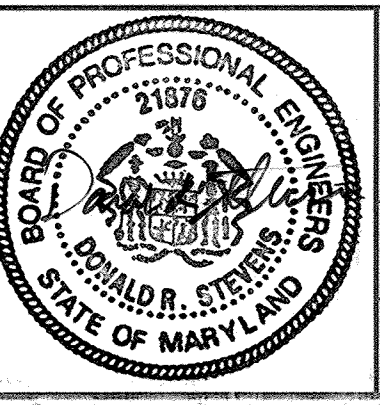
NOTES:
1. SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH LP
Gaithersburg, Maryland

David A. Allen 6/23/00
REG. PROF. ENGR. DATE



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|---------------|------|-------------------------------|-----|----|--------|
| DES: SFP | | | | | |
| DRN: DVH | | | | | |
| CHK: JTF | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK APP |

**GENERAL
ELECTRICAL**

MISCELLANEOUS DETAILS

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE
AS
SHOWN

SHEET
148 OF 161

E38

068472
P058472A

| LIGHTING FIXTURE SCHEDULE | | | | |
|---------------------------|--|--|--|---|
| SYMBOL | LAMP | MTG HGT | DESCRIPTION | MANUFACTURER |
| 1 | F32T8/SP35/RS 2850 LUMENS | AS NOTED ON PLANS | 2-LAMP OPEN INDUSTRIAL FLUORESCENT FIXTURE, 10% UP- LIGHT, WHITE PORCELAIN RE- FLECTOR, ELECTRONIC BALLAST, 120V | LITHONIA #AF10232120GEBPO |
| 2 | F32T8/SP35/RS 2850 LUMENS | AS NOTED ON PLANS | SAME AS FIXTURE NO.1, EXCEPT WITH LITHONIA EMERGENCY BATTERY PACK PS1400-120V 50HZ, 120V | LITHONIA #AF10232120GEBPO- EL14 |
| 3 | MVR175 14,000 LUMENS | AS NOTED ON PLANS | 175 WATT METAL HALIDE FIXTURE, ENCLOSED & GASKETED ALUMINUM HOUSING, DARK BRONZE FINISH, WIDE DISTRIBUTION, POWER HOOK WITH LOOP, CORD AND PLUG, 120V | LITHONIA #TE175ME17W120SF- LCPP-TPH OR PPH DDB |
| 4 | MVR175 14,000 LUMENS & 150W QUARTZ | AS NOTED ON PLANS | SAME AS FIXTURE NO.3, EXCEPT WITH HOT/COLD QUARTZ START OPTION & 150 WATT QUARTZ LAMP, 120V | LITHONIA #TE175ME17W120SF- QRSTO-LCPP-TPH OR PPH DDB |
| 5 | LU100 9500 LUMENS | AS NOTED ON PLANS | 100 WATT HIGH PRESSURE SODIUM, WALL MOUNTED FIXTURE, DARK BRONZE FINISH, PHOTO-ELECTRIC CELL CONTROL, HIGH POWER FACTOR BALLAST, 120V | HUBBELL #PVL-100S-128- PBT-1 |
| 6 | LU100 9500 LUMENS | 10'-0" ALUMINUM ROUND TAPERED POLE | 100 WATT POST-TOP HIGH PRESSURE SODIUM FIXTURE, TYPE 5 SQUARE DISTRIBUTION, GRAY FINISH, PHOTO-ELECTRIC CELL CONTROL, POLE FURNISHED WITH TRANSFORMER BASE, 120V | GENERAL ELECTRIC #P17M10S1A2AMN5GRF WITH #ARTA103S4.0- ASNT POLE |
| 7 | F32T8/SP35/RS 2850 LUMENS | 7'-6" ABOVE FLOOR | 2-LAMP ALL PURPOSE WALL MOUNTED FLUORESCENT FIXTURE, WHITE WHITE OPAL ACRYLIC DIFFUSER, ELECTRONIC BALLAST, LITHONIA EMERGENCY BATTERY PACK PS1400- 120V 50HZ, 120V | LITHONIA #WC232A120GEBEL14 |
| 8 | F32T8/SP35/RS 2850 LUMENS | AS NOTED ON PLANS | 2-LAMP ENCLOSED AND GASKETED FLUORESCENT FIXTURE, HIGH IMPACT ACRYLIC DIFFUSER, ELECTRONIC BALLAST, 120V | HOLOPHANE #ESS04XB8BN042EP11 |
| 9 | F32T8/SP35/RS 2850 LUMENS | AS NOTED ON PLANS | SAME AS FIXTURE NO.8, EXCEPT WITH BODINE B50 EMERGENCY LIGHTING BATTERY PACK, 120V | HOLOPHANE #ESS04XB8BN042EP11- BPAK50 |
| 10 | F26DBX/SP35/ 4P 1800 LUMENS | AS NOTED ON PLANS | 26 WATT COMPACT FLUORESCENT WALL MOUNTED FIXTURE, ENCLOSED & GASKETED, GLOBE & GUARD, ELECTRONIC BALLAST, GREY FINISH, 120V | CANLET #68GFWF26H1G- GHC |
| EXIT | SELF- LUMINOUS | UNIVERSAL MOUNT | SELF-LUMINOUS UNIVERSAL MOUNTED EXIT SIGN, WHITE HOUSING, SINGLE FACE, RED FACEPLATE, 20 YEAR LUMINOUS LIFE | LITHONIA #DSWIR20 |
| EL | 2 HEADS FURNISHED W/ UNIT | 7'-6" ABOVE FLOOR | EMERGENCY LIGHTING UNIT, WALL MOUNTED, SEALED & GASKETED, NEMA 4X ENCLOSURE, TIME DELAY, TWO 25W INCANDESCENT LAMPS, 120V | LITHONIA #ELU4XN-TD- N2512 |

| PANELBOARD: LPA | | BUS: COPPER | MAINS: 3P-100A MAIN BREAKER | |
|--|---|--------------|--|-----|
| SERVICE: 120/208V, 3Ø, 4W, S/N | | RATING: 225A | LOCATION: NORTH GALLERY BUILDING CONTROL ROOM | |
| MOUNTING: SURFACE | | LOAD | | |
| | P | BKR | CKT# | BKR |
| LIGHTS - EL 124.00 | 1 | 20 | 1 | 2 |
| LIGHTS - EL 124.00 | 1 | 20 | 3 | 4 |
| LIGHTS - EL 134.00 | 1 | 20 | 5 | 6 |
| RECP - EL 124.00 | 1 | 20 | 7 | 8 |
| RECP - EL 134.00 | 1 | 20 | 9 | 10 |
| LIGHTS - OUTDOOR (EXISTING) | 1 | 20 | 11 | 12 |
| CONTROL ROOM BASEBOARD HEATERS (EXIST) | 1 | 20 | 13 | 14 |
| CONT RM MOTOR OPERATED DAMPER (EXIST) | 1 | 20 | 15 | 16 |
| CONTROLS TERM. PANEL CTP-5 POWER | 1 | 20 | 17 | 18 |
| FIT 5-210-M, 5-220-M, 5-221-M, 5-222-M, 5-223-M, 5-200-M | 1 | 20 | 19 | 20 |
| LSH 5-313-L, 5-314-L, 5-315-L | 1 | 20 | 21 | 22 |
| SPARE | 1 | 20 | 23 | 24 |
| SPARE | 1 | 20 | 25 | 26 |
| SPARE | 1 | 20 | 27 | 28 |
| SPARE | 1 | 20 | 29 | 30 |
| SPARE | 1 | 20 | 31 | 32 |
| SPARE | 1 | 20 | 33 | 34 |
| SPARE | 1 | 20 | 35 | 36 |
| SPACE | 1 | 37 | 38 | |
| SPACE | 1 | 39 | 40 | |
| SPACE | 1 | 41 | 42 | |

| PANELBOARD: LPB | | BUS: COPPER | MAINS: 3P-100A MAIN BREAKER | |
|-----------------------------------|---|--------------|--|-----|
| SERVICE: 120/208V, 3Ø, 4W, S/N | | RATING: 225A | LOCATION: NORTH GALLERY BUILDING CONTROL ROOM | |
| MOUNTING: SURFACE | | LOAD | | |
| | P | BKR | CKT# | BKR |
| LIGHTS - N. FINAL CLARIFIER NO.12 | 1 | 20 | 1 | 2 |
| RECP - N. FINAL CLARIFIER NO.12 | 1 | 20 | 3 | 4 |
| LIGHTS - N. FINAL CLARIFIER NO.11 | 1 | 20 | 5 | 6 |
| RECP - N. FINAL CLARIFIER NO.11 | 1 | 20 | 7 | 8 |
| LIGHTS - FERMENTER NO.2 | 1 | 20 | 9 | 10 |
| RECP - FERMENTER NO.2 | 1 | 20 | 11 | 12 |
| LIT 5-402-M & 5-403-M | 1 | 20 | 13 | 14 |
| SPARE | 1 | 20 | 15 | 16 |
| SPARE | 1 | 20 | 17 | 18 |
| SPARE | 1 | 20 | 19 | 20 |
| SPARE | 1 | 20 | 21 | 22 |
| SPARE | 1 | 20 | 23 | 24 |
| SPARE | 1 | 20 | 25 | 26 |
| SPARE | 1 | 20 | 27 | 28 |
| SPARE | 1 | 20 | 29 | 30 |
| SPARE | 1 | 20 | 31 | 32 |
| SPARE | 1 | 20 | 33 | 34 |
| SPARE | 1 | 20 | 35 | 36 |
| SPACE | 1 | 37 | 38 | |
| SPACE | 1 | 39 | 40 | |
| SPACE | 1 | 41 | 42 | |

| PANELBOARD: LPC | | BUS: COPPER | MAINS: 3P-100A MAIN BREAKER | |
|------------------------------------|---|--------------|--|-----|
| SERVICE: 120/208V, 3Ø, 4W, S/N | | RATING: 225A | LOCATION: NORTH BLOWER BUILDING ELECTRICAL ROOM | |
| MOUNTING: SURFACE | | LOAD | | |
| | P | BKR | CKT# | BKR |
| LIGHTS - BASEMENT | 1 | 20 | 1 | 2 |
| LIGHTS - BASEMENT | 1 | 20 | 3 | 4 |
| LIGHTS - BLOWER ROOM | 1 | 20 | 5 | 6 |
| LIGHTS - BLOWER ROOM | 1 | 20 | 7 | 8 |
| LIGHTS - BLOWER ROOM | 1 | 20 | 9 | 10 |
| LIGHTS - BLOWER ROOM | 1 | 20 | 11 | 12 |
| FUTURE PROCESS ANALYZER RECP | 1 | 20 | 13 | 14 |
| SUMP PUMP 5-590-P RECP | 1 | 20 | 15 | 16 |
| TCP-101 | 1 | 20 | 17 | 18 |
| REMOTE CONTROL PANEL FOR 5-575-MAU | 1 | 20 | 19 | 20 |
| SPARE | 1 | 20 | 21 | 22 |
| SPARE | 1 | 20 | 23 | 24 |
| SPARE | 1 | 20 | 25 | 26 |
| SPARE | 1 | 20 | 27 | 28 |
| SPARE | 1 | 20 | 29 | 30 |
| SPARE | 1 | 20 | 31 | 32 |
| SPARE | 1 | 20 | 33 | 34 |
| SPARE | 1 | 20 | 35 | 36 |
| SPACE | 1 | 37 | 38 | |
| SPACE | 1 | 39 | 40 | |
| SPACE | 1 | 41 | 42 | |

| PANELBOARD: LPD | | BUS: COPPER | MAINS: 3P-100A MAIN BREAKER | |
|---|---|--------------|--|-----|
| SERVICE: 120/208V, 3Ø, 4W, S/N | | RATING: 225A | LOCATION: NORTH BLOWER BUILDING ELECTRICAL ROOM | |
| MOUNTING: SURFACE | | LOAD | | |
| | P | BKR | CKT# | BKR |
| WATER HEATER - 5-593-WH | 2 | 20 | 1 | 2 |
| - | - | - | 3 | 4 |
| LIGHTS - NORTH PROCESS REACTORS | 1 | 20 | 5 | 6 |
| RECP - NORTH PROCESS REACTORS | 1 | 20 | 7 | 8 |
| LIGHTS - NORTH PROCESS REACTORS | 1 | 20 | 9 | 10 |
| RECP - NORTH PROCESS REACTORS | 1 | 20 | 11 | 12 |
| LIGHTS - NORTH PROCESS REACTORS | 1 | 20 | 13 | 14 |
| RECP - NORTH PROCESS REACTORS | 1 | 20 | 15 | 16 |
| AIT 5-020-M, 5-021-M, 5-022-M, 5-023-M, 5-024-M | 1 | 20 | 17 | 18 |
| AIT 5-025-M, 5-026-M, 5-027-M, 5-028-M, 5-029-M | 1 | 20 | 19 | 20 |
| AIT 5-030-M, 5-031-M, 5-032-M, 5-033-M, 5-034-M | 1 | 20 | 21 | 22 |
| SPARE | 1 | 20 | 23 | 24 |
| SPARE | 1 | 20 | 25 | 26 |
| SPARE | 1 | 20 | 27 | 28 |
| SPARE | 1 | 20 | 29 | 30 |
| SPARE | 1 | 20 | 31 | 32 |
| SPARE | 1 | 20 | 33 | 34 |
| SPARE | 1 | 20 | 35 | 36 |
| SPACE | 1 | 37 | 38 | |
| SPACE | 1 | 39 | 40 | |
| SPACE | 1 | 41 | 42 | |

NOTES:

- SEE DRAWING E1 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- CONTRACTOR SHALL VERIFY EXISTING LOAD IS 3-PHASE, AND SHALL SIZE FEEDERS AS REQUIRED TO POWER.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND



BLACK & VEATCH
Gaithersburg, Maryland



DES: GNS-DVH

DRN: DVH

CHK: JTF

DATE: 6/23/00

DATE REVISIONS AND RECORD OF ISSUE NO. BY CK APP

GENERAL
ELECTRICAL

LIGHTING FIXTURE AND
PANELBOARD SCHEDULES

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

CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

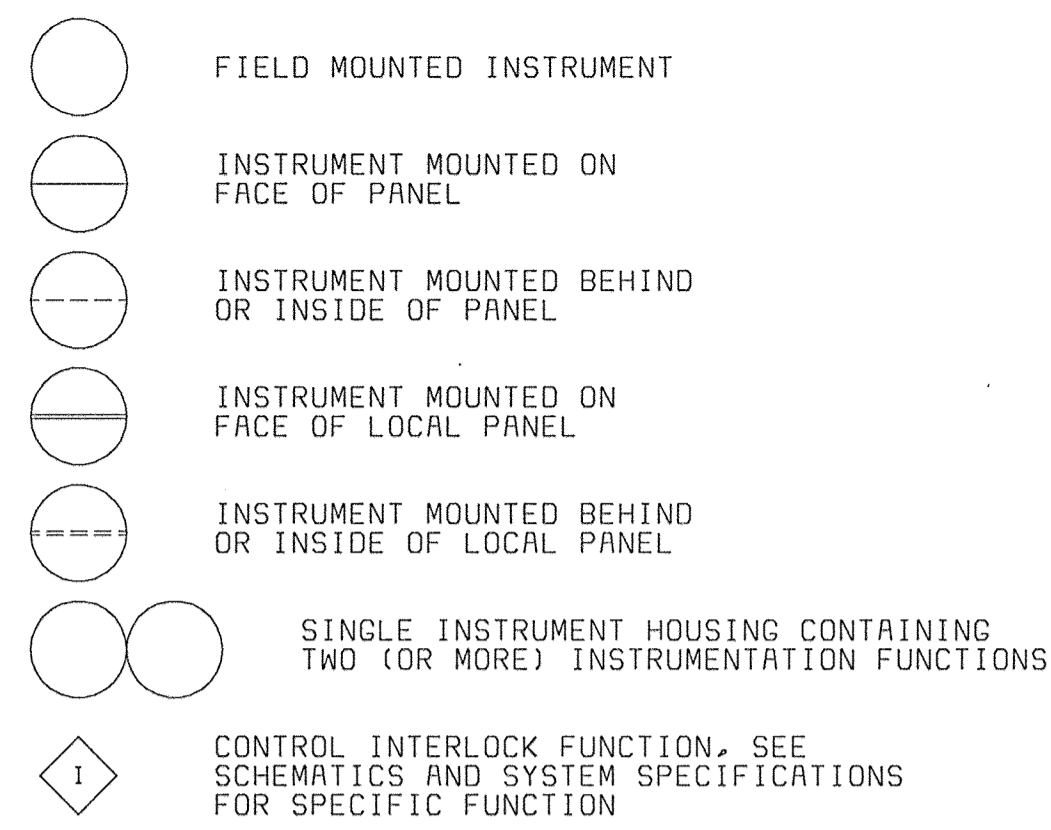
HOWARD COUNTY, MARYLAND

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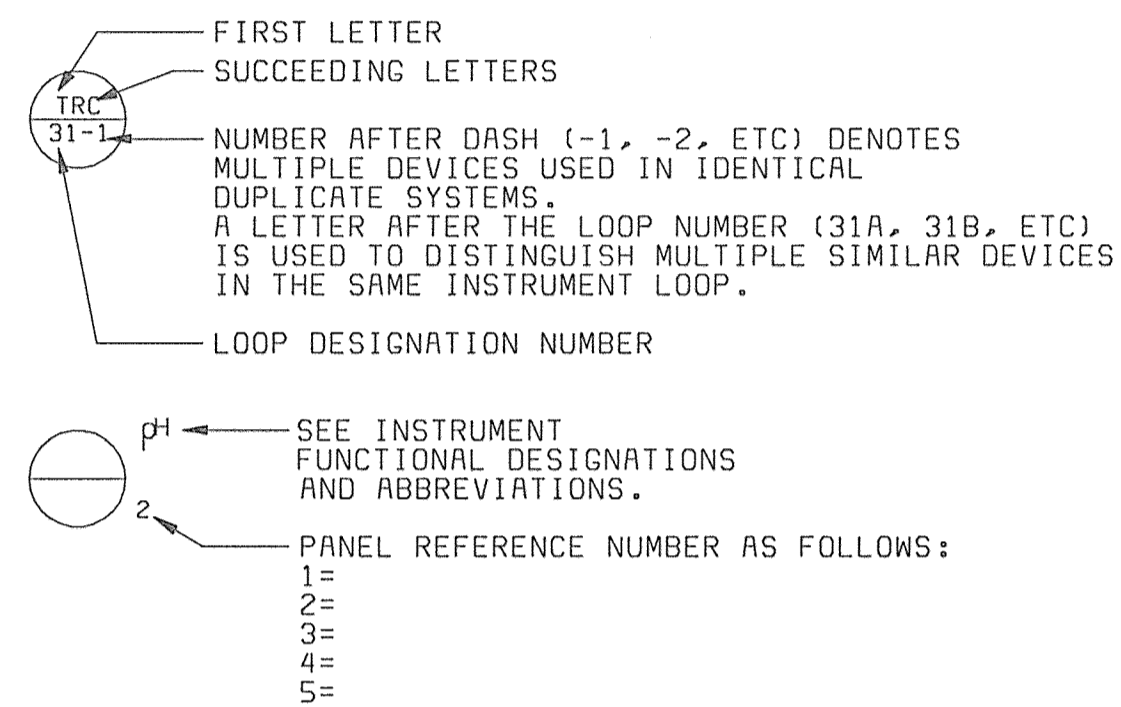
SHEET
149 OF 161

E39

GENERAL INSTRUMENT SYMBOLS



TAG NUMBERS AND ADDITIONAL DESIGNATIONS

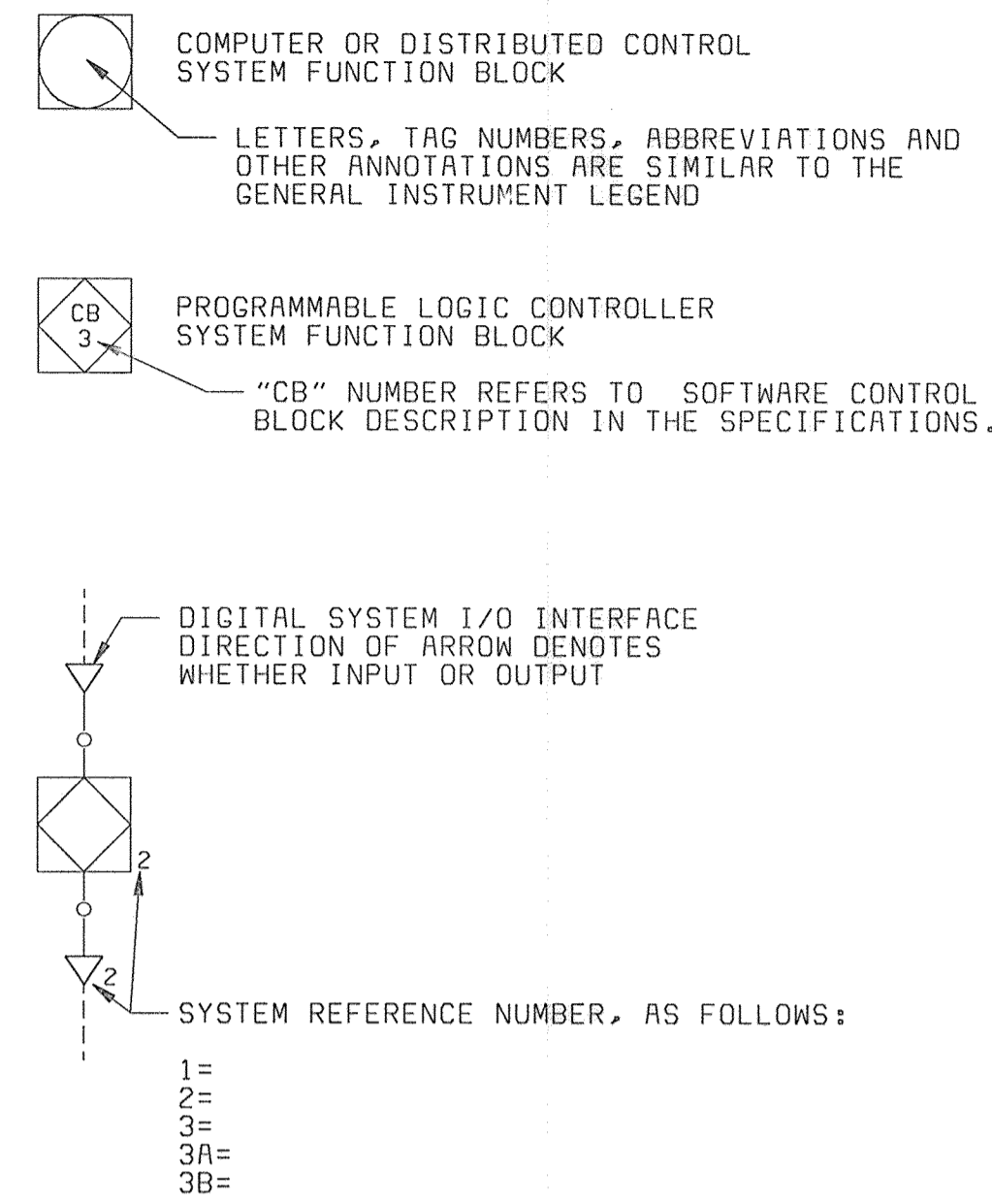


TAG NUMBERS MEANINGS OF IDENTIFICATION LETTERS

| LETTER | FIRST LETTER | | SUCCEEDING LETTERS | | |
|--------|------------------------------------|-----------------------|-----------------------------|---|-------------------------|
| | MEASURED OR INITIATING VARIABLE | MODIFIER | READOUT OR PASSIVE FUNCTION | OUTPUT FUNCTION | MODIFIER |
| A | ANALYSIS | | ALARM | | |
| B | BURNER, COMBUSTION | | USER'S CHOICE | USER'S CHOICE | USER'S CHOICE |
| C | CONDUCTIVITY (ELECTRICAL) | | | CONTROL | |
| D | DENSITY (MASS) OR SPECIFIC GRAVITY | DIFFERENTIAL | | | |
| E | VOLTAGE (EMF) | | PRIMARY ELEMENT | | |
| F | FLOW RATE | RATIO (FRACTION) | | | |
| G | USER'S CHOICE | | GLASS | | |
| H | HAND (MANUALLY INITIATED) | | | | HIGH |
| I | CURRENT (ELECTRICAL) | | INDICATE | | |
| J | POWER | SCAN | | | |
| K | TIME OR TIME-SCHEDULE | TIME RATE OF CHANGE | | CONTROL STATION | |
| L | LEVEL | | LIGHT (PILOT) | | LOW |
| M | MOISTURE OR HUMIDITY | MOMENTARY | | | MIDDLE OR INTER-MEDIATE |
| N | USER'S CHOICE | | USER'S CHOICE | USER'S CHOICE | USER'S CHOICE |
| O | USER'S CHOICE | | ORIFICE (RESTRICTION) | | |
| P | PRESSURE OR VACUUM | | POINT (TEST CONNECTION) | | |
| Q | QUANTITY | INTEGRATE OR TOTALIZE | INTEGRATE OR TOTALIZE | | |
| R | RADIATION | | RECORD OR PRINT | | |
| S | SPEED OR FREQUENCY | SAFETY | | SWITCH | |
| T | TEMPERATURE | | | TRANSMIT | |
| U | MULTIVARIABLE | | MULTIFUNCTION | MULTIFUNCTION | MULTIFUNCTION |
| V | VIBRATION | | | VALVE, DAMPER, OR LOUVER | |
| W | WEIGHT OR FORCE | | WELL | | |
| X | UNCLASSIFIED | | UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED |
| Y | EVENT, STATE, OR PRESENCE | | | RELAY OR COMPUTE | |
| Z | POSITION, DIMENSION | | | DRIVE, ACTUATOR OR UNCLASSIFIED FINAL CONTROL ELEMENT | |

DIGITAL SYSTEMS INTERFACE SYMBOLS

NOTE: REFER TO DETAILED SYSTEM SPECIFICATIONS FOR FUNCTIONAL DESCRIPTION. ALSO SEE I/O SCHEDULES FOR COMPLETE INPUT AND OUTPUT LISTINGS.



FUNCTION DESIGNATIONS AND ABBREVIATIONS

| INSTRUMENT DESIGNATIONS | | TRANSDUCER & CONVERTER DESIGNATION | |
|-------------------------|----------------------------------|------------------------------------|--|
| K | GAIN OR ATTENUATE (INPUT:OUTPUT) | E | VOLTAGE |
| -K | GAIN AND REVERSE | FSK | FREQUENCY SHIFT KEYING |
| Σ | ADD OR SUM (ADD AND SUBTRACT) | H | HYDRAULIC |
| Δ | SUBTRACT (DIFFERENCE) | I | CURRENT |
| √ | EXTRACT SQUARE ROOT | P | PNEUMATIC |
| ÷ | DIVIDE | PD | PULSE DURATION |
| F(X) | CHARACTERIZE SIGNAL | PF | PULSE FREQUENCY |
| > | HIGH-SELECT | R | RESISTANCE (ELECTRICAL) |
| < | LOW-SELECT | | EXAMPLE: I/P = CURRENT TO PNEUMATIC TRANSDUCER |
| X | MULTIPLY | | |
| ∫ | INTEGRATE (TIME INTEGRAL) | | |
| CH ₄ | METHANE | | |
| CL ₂ | CHLORINE RESIDUAL | | |
| CO ₂ | CARBON DIOXIDE | | |
| DO | DISSOLVED OXYGEN | | |
| LEL | LOWER EXPLOSIVE LIMIT | | |
| MCC | MOTOR CONTROL CENTER | | |
| MLSS | MIXED LIQUOR SUSPENDED SOLIDS | | |
| O ₂ | OXYGEN (PURITY) | | |
| pH | pH CELL | | |
| TURB | TURBIDITY | | |

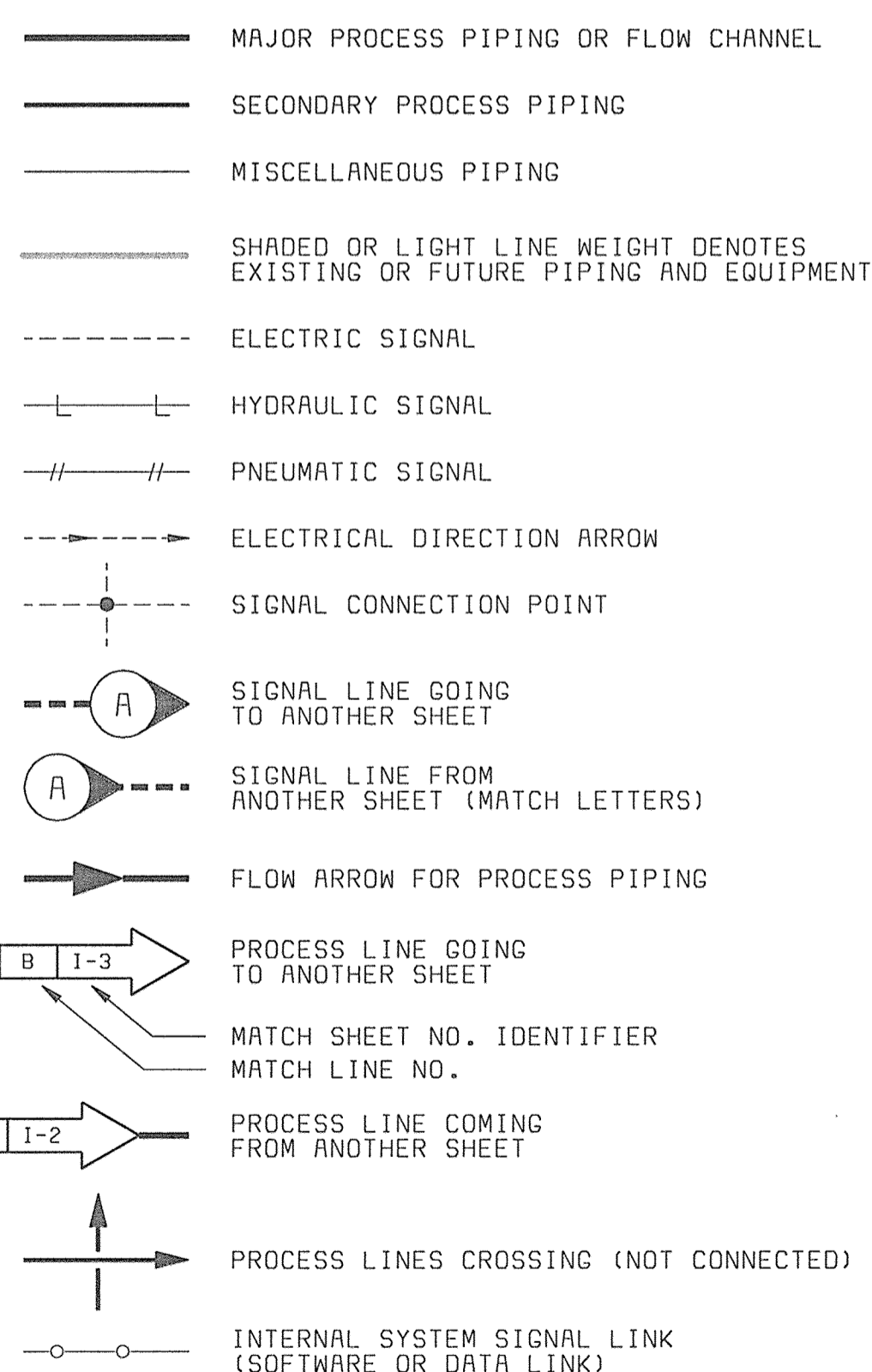
HAND SWITCH DESIGNATIONS

| | |
|-----|-------------------|
| HOA | HAND-OFF-AUTO |
| LR | LOCAL REMOTE |
| OC | OPEN-CLOSE |
| OO | ON-OFF |
| LOR | LOCAL-OFF-REMOTE |
| OOA | ON-OFF-AUTO |
| OCR | OPEN-CLOSE-REMOTE |
| OOR | ON-OFF-REMOTE |

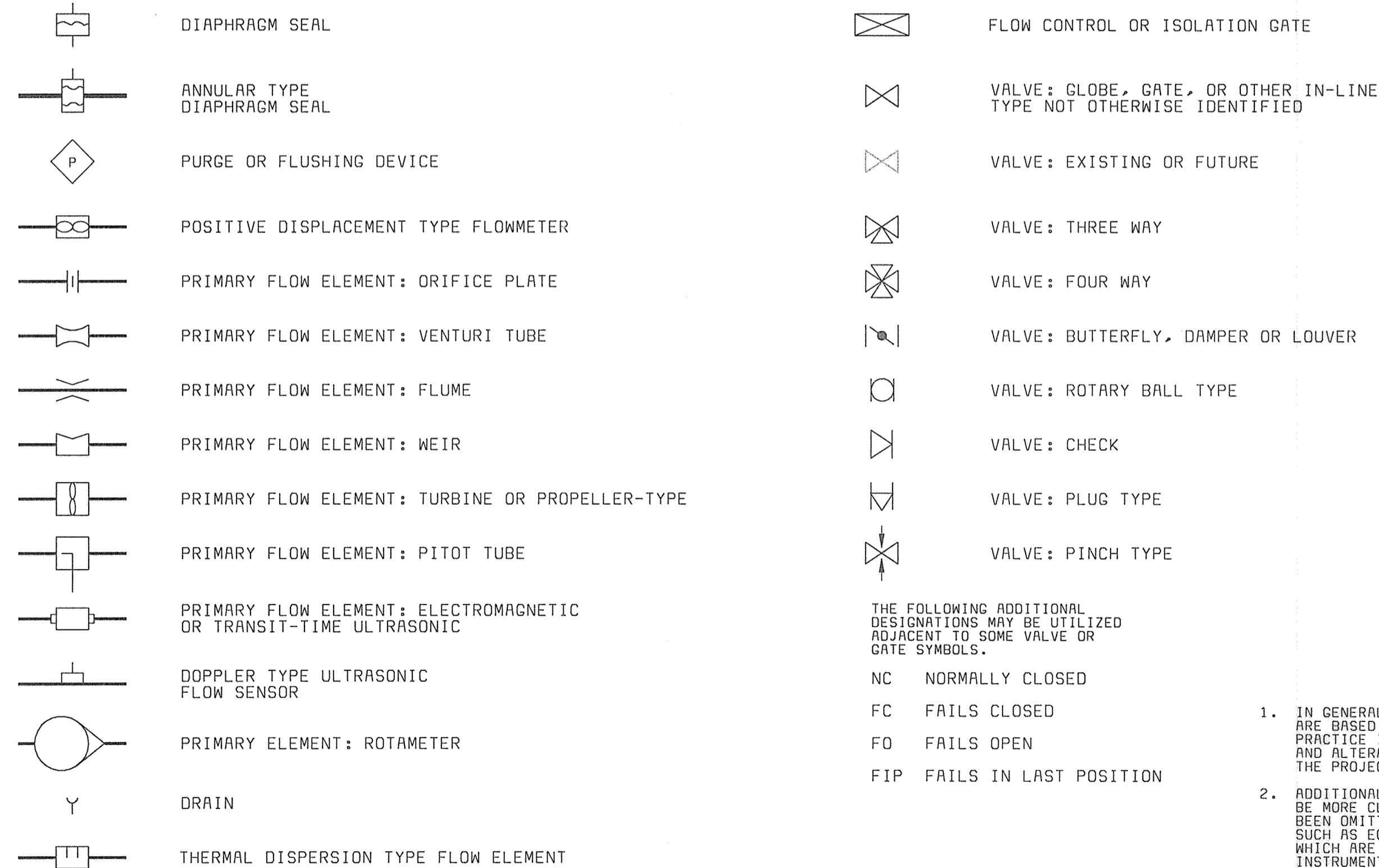
POWER SUPPLY ABBREVIATIONS

| | |
|----|--|
| AS | AIR SUPPLY |
| ES | ELECTRIC SUPPLY |
| GS | GAS SUPPLY |
| HS | HYDRAULIC SUPPLY |
| NS | NITROGEN SUPPLY |
| SS | STEAM SUPPLY |
| WS | WATER SUPPLY |
| AS | POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION. |

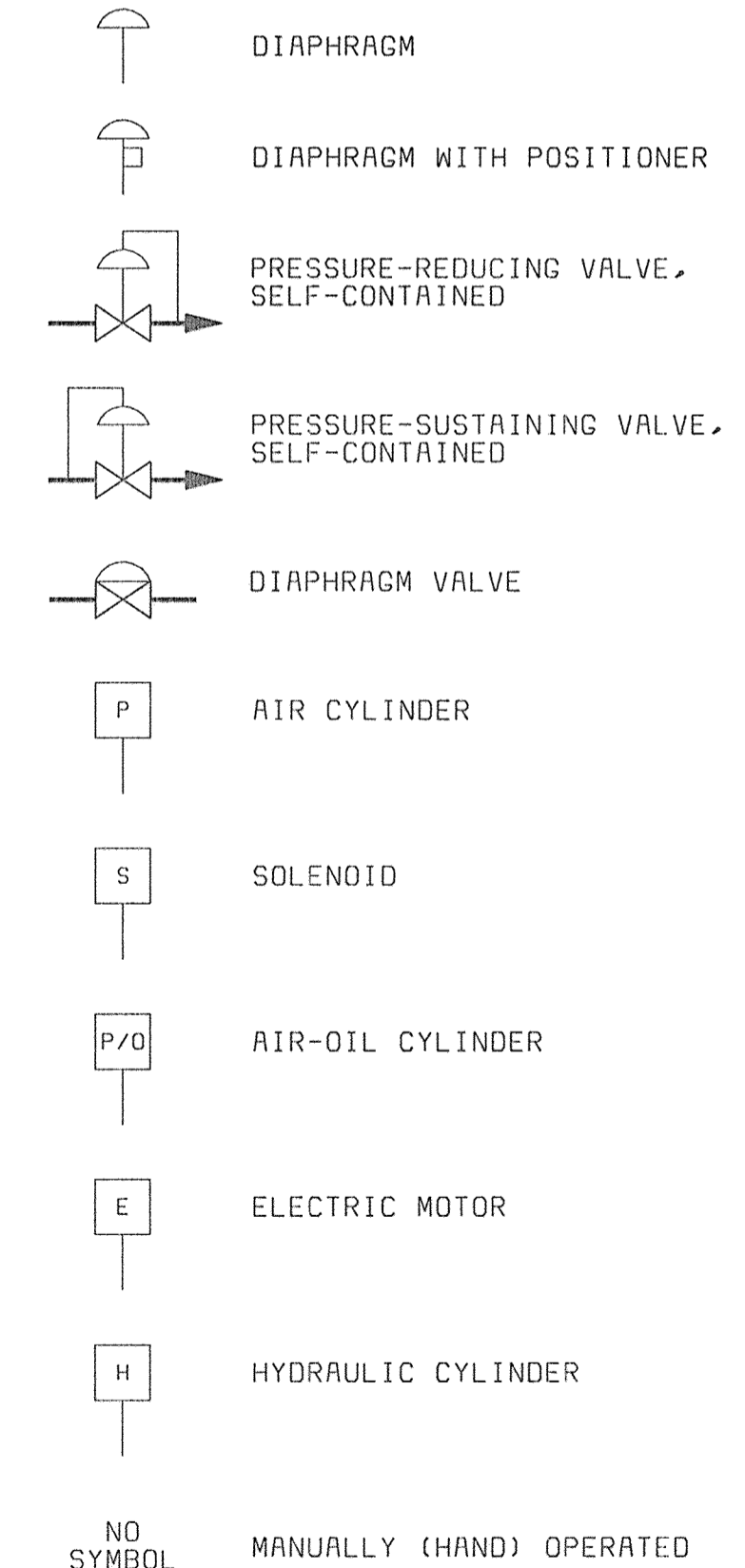
LINE SYMBOLS



PROCESS DEVICE SYMBOLS



VALVE AND GATE ACTUATOR SYMBOLS

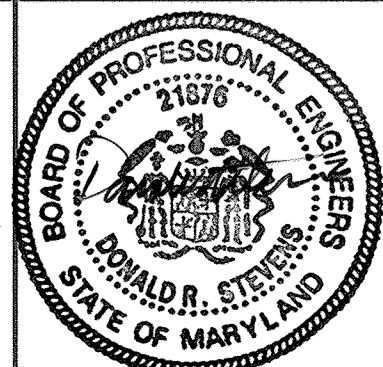


GENERAL NOTES

- IN GENERAL, THE P & ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA, STANDARD PRACTICE ISA-55.1 (1988). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
- ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P & ID DRAWINGS. SOME PROCESS ITEMS, SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS HAVE ALSO BEEN OMITTED.
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- PIPING AND EQUIPMENT LEGEND APPLIES TO P & ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

BLACK & VEATCH
Gallithersburg, Maryland
David A. Miller
REG. PROF. ENGR.
6/24/00
DATE



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

INSTRUMENTATION AND CONTROLS

P&ID
LEGEND AND ABBREVIATIONS

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

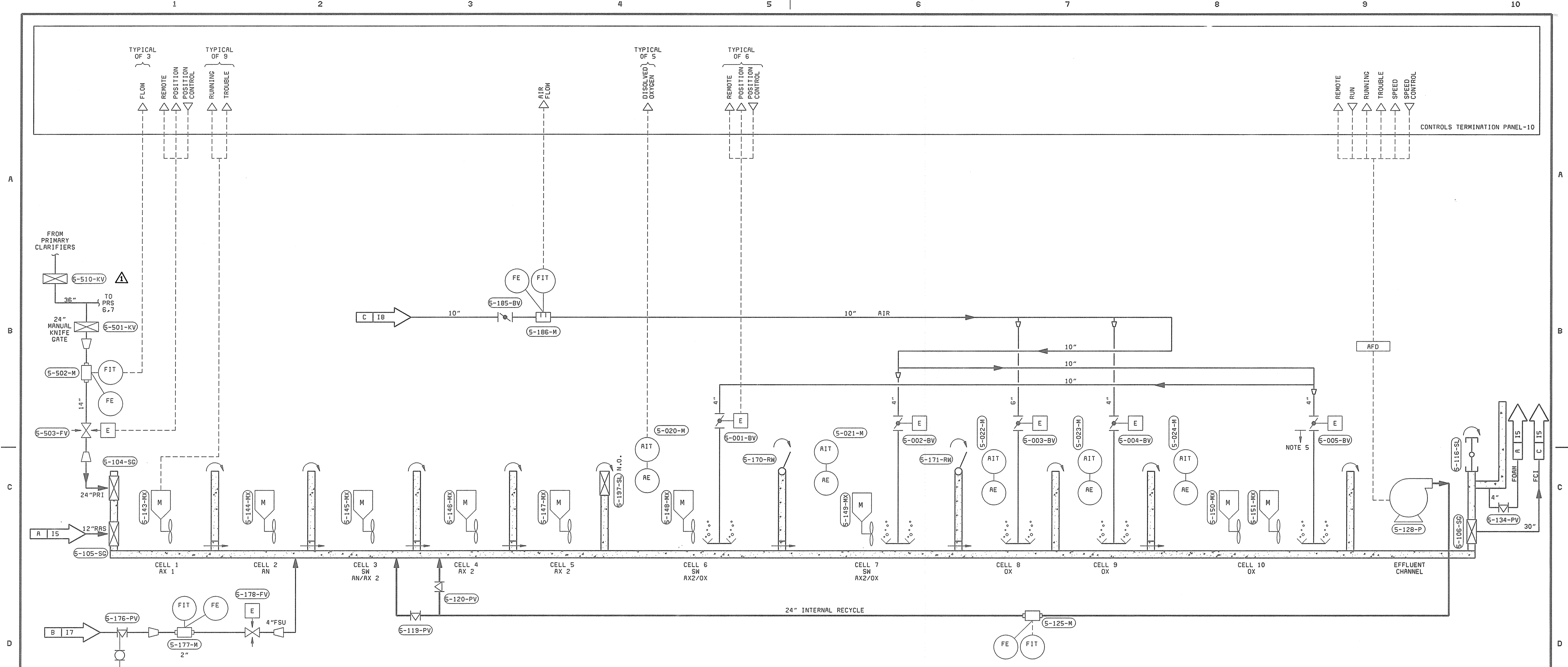
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

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150 OF 161

I 1



**PROCESS REACTOR #5
5-101-PR**

LEGEND:

- PCI PRIMARY CLARIFIER INFLUENT
- RAS RETURN ACTIVATED SLUDGE
- M MOTOR, MIXER
- AX ANOXIC ZONE
- AN ANAEROBIC ZONE
- OX OXIC ZONE
- FSU FERMENTER SUPERNATANT

NOTES:

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
5. PIPING BY DIFFUSER SUPPLIER (TYP.)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

Donald R. Steers
REG. PROF. ENGR. DATE 9-16-00



| | | | |
|---------------|---------|-------------------------------|---------------|
| DES: RSF | 8/16/00 | ADDENDUM NO. 1 | RSF |
| DRN: MDR | | | |
| CHK: AWH | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. BY CK APP |

INSTRUMENTATION

**P & ID
PROCESS REACTOR NO.5**

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

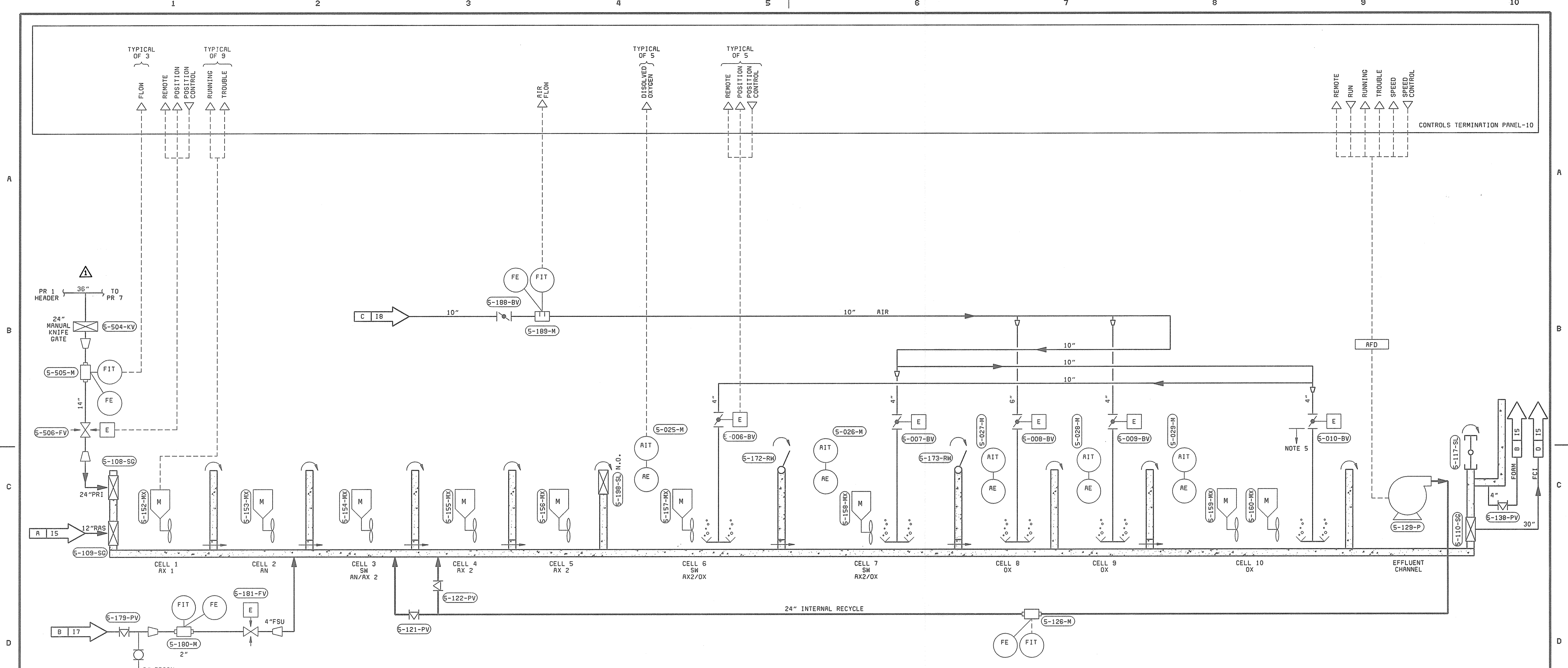
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 151 OF 161

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**PROCESS REACTOR #6
5-102-PR**

LEGEND:

- PRI PRIMARY INFLUENT
- RAS RETURN ACTIVATED SLUDGE
- M MOTOR, MIXER
- AN ANOXIC ZONE
- AN ANAEROBIC ZONE
- OX OXIC ZONE
- FSU FERMENTER SUPERNATANT

NOTES:

1. SE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
5. PIPING BY DIFFUSER SUPPLIER (TYP.)

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
GaitHERSBURG, Maryland

Donald R. Stevens
REG. PROF. ENGR. DATE 8-16-00



| | | | |
|---------------|---------|-------------------------------|---------------|
| DES: RSF | 8/16/00 | ADDENDUM NO. 1 | RSF |
| DRN: DAH | | | |
| CHK: AWH | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. BY CK APP |

INSTRUMENTATION

**P & ID
PROCESS REACTOR NO.6**

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

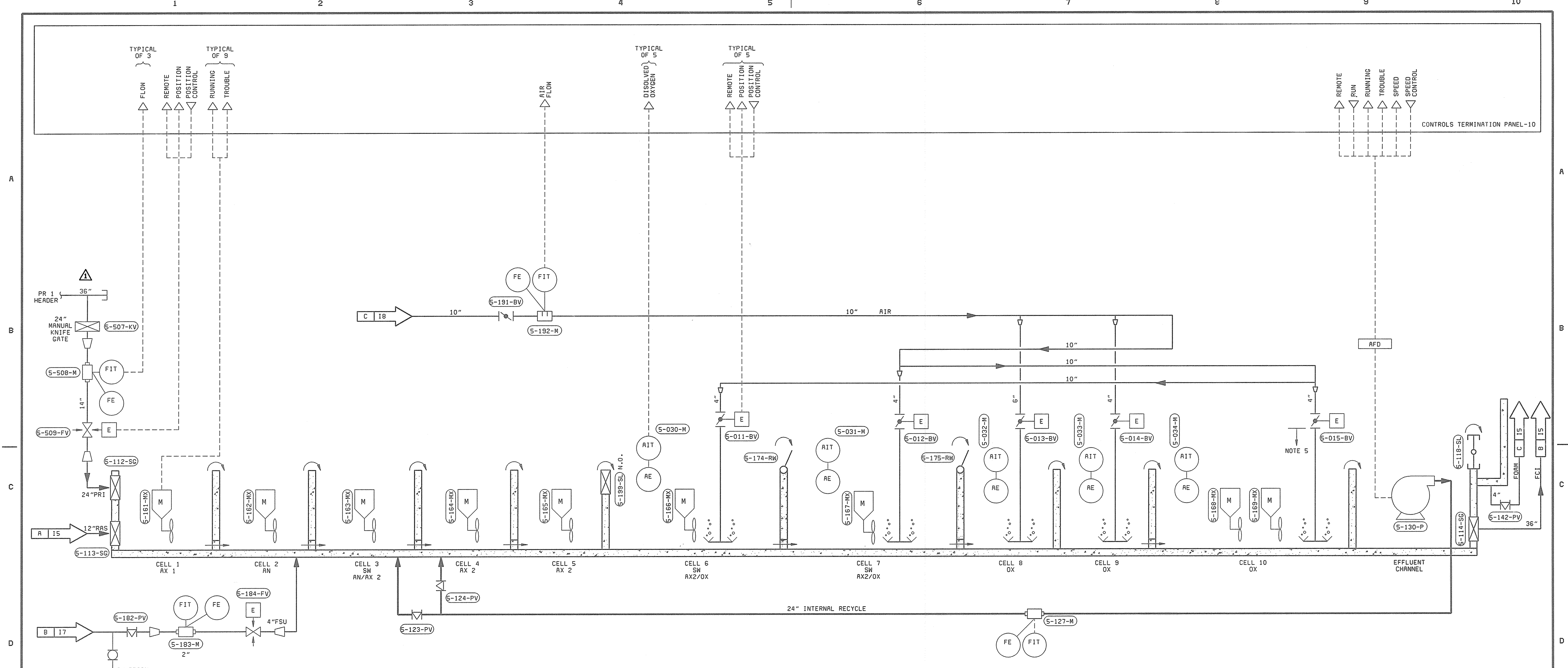
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 152 OF 161

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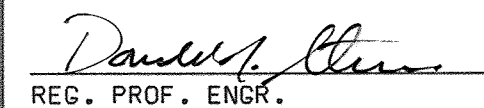
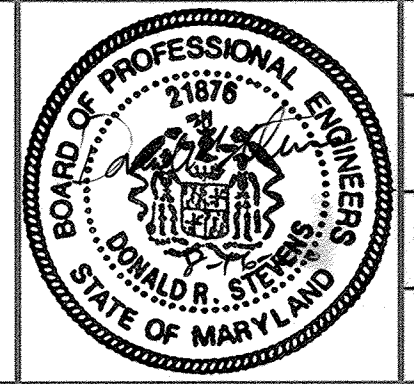
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5-103-PR

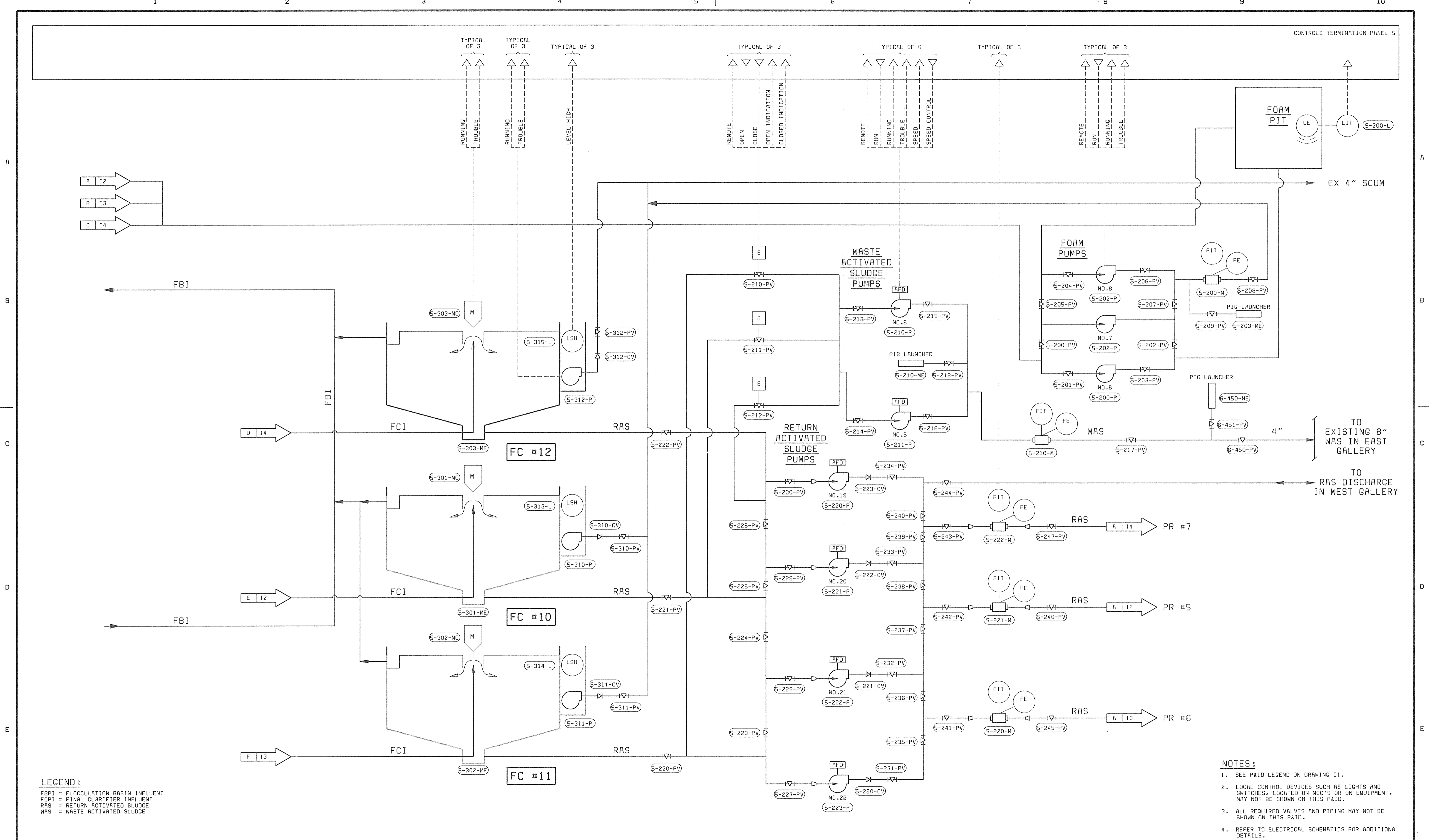
LEGEND:

- PRI PRIMARY INFLUENT
- RAS RETURN ACTIVATED SLUDGE
- M MOTOR, MIXER
- AX ANOXIC ZONE
- AN ANAEROBIC ZONE
- OX OXIC ZONE
- FSU FERMENTER SUPERNATANT

NOTES:

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS P&ID.
4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.
5. PIPING BY DIFFUSER SUPPLIER (TYP.)

| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE |  BLACK & VEATCH ^{LLP} Gaithersburg, Maryland  REG. PROF. ENGR. DATE |  | DES: RSF DRN: MDR CHK: ANH DATE: 6/23/00 | 8/16/00 ADDENDUM NO. 1 REVISIONS AND RECORD OF ISSUE <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>CK</th> <th>APP</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | NO. | BY | CK | APP | | | | | INSTRUMENTATION P & ID PROCESS REACTOR NO.7 | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 153 OF 161 I 4 |
|--|---|---|---|--|-----|----|----|-----|--|--|--|--|--|---|---|
| NO. | BY | CK | APP | | | | | | | | | | | | |
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

6-29-00
 CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
 Galithersburg, Maryland

REG. PROF. ENGR. DATE



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

INSTRUMENTATION AND CONTROLS

**P & ID
 FINAL CLARIFIERS
 NO. 10, 11 AND 12**

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

CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

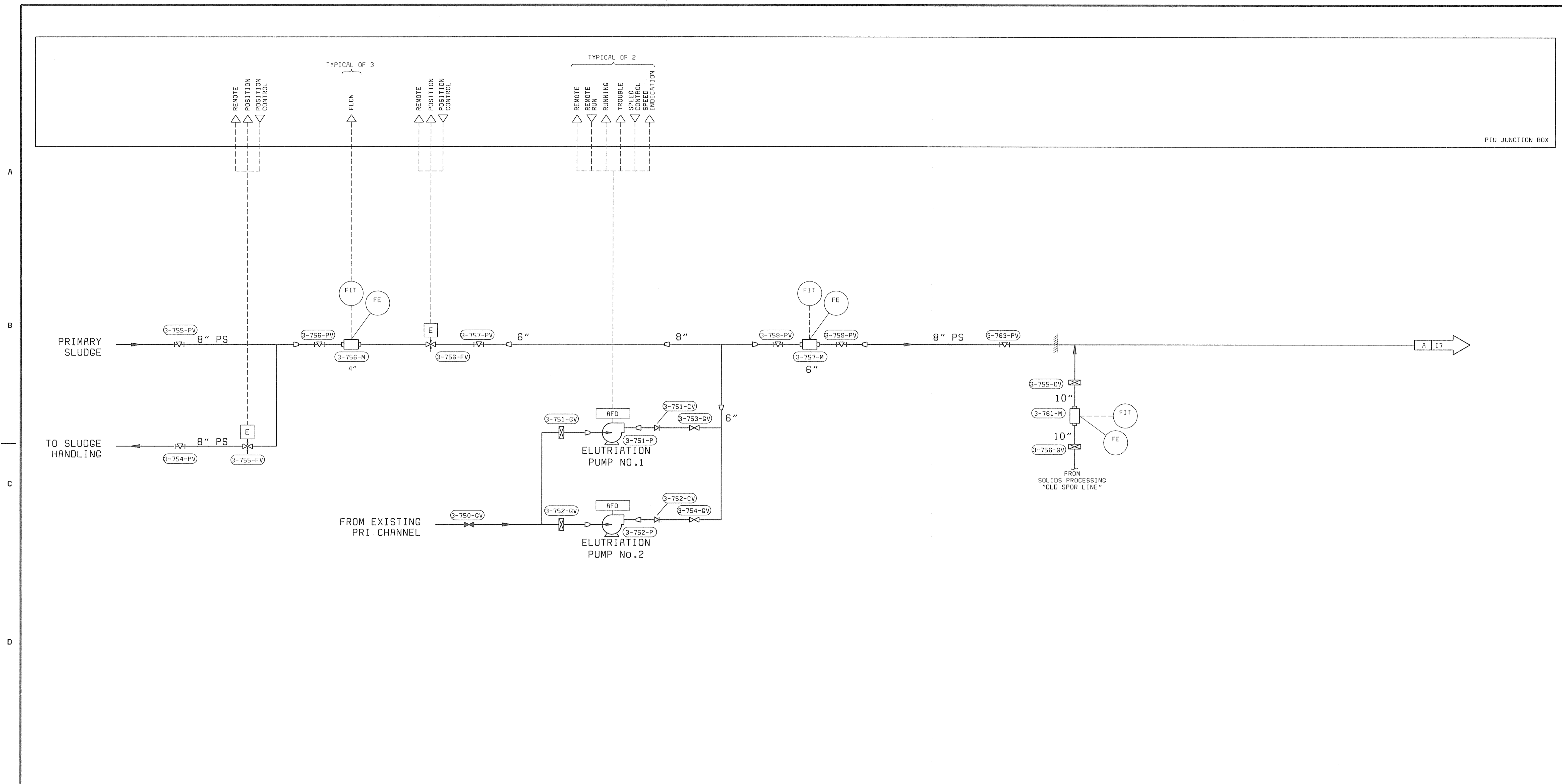
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 154 OF 161

15

056472
 P056472A



LEGEND:
 PS = PRIMARY SLUDGE

NOTES:
 1. SEE P&ID LEGEND ON DRAWING 1-1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
 3. ALL REQUIRED VALVES AND PIPING MAY NOT BE SHOWN ON THIS PID.
 4. REFER TO ELECTRICAL SCHEMATICS FOR ADDITIONAL DETAILS.

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

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

BLACK & VEATCH
 GAITHERSBURG, MARYLAND

David A. ...
 REG. PROF. ENGR. DATE 6/29/00



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: RSF | | | | | | | | | |
| DRN: JGT,DAH | | | | | | | | | |
| CHK: AWH | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

INSTRUMENTATION & CONTROLS

P & ID
 WEST GALLERY

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

CAPITAL PROJECT S-6205
 CONTRACT NO. 20-3752

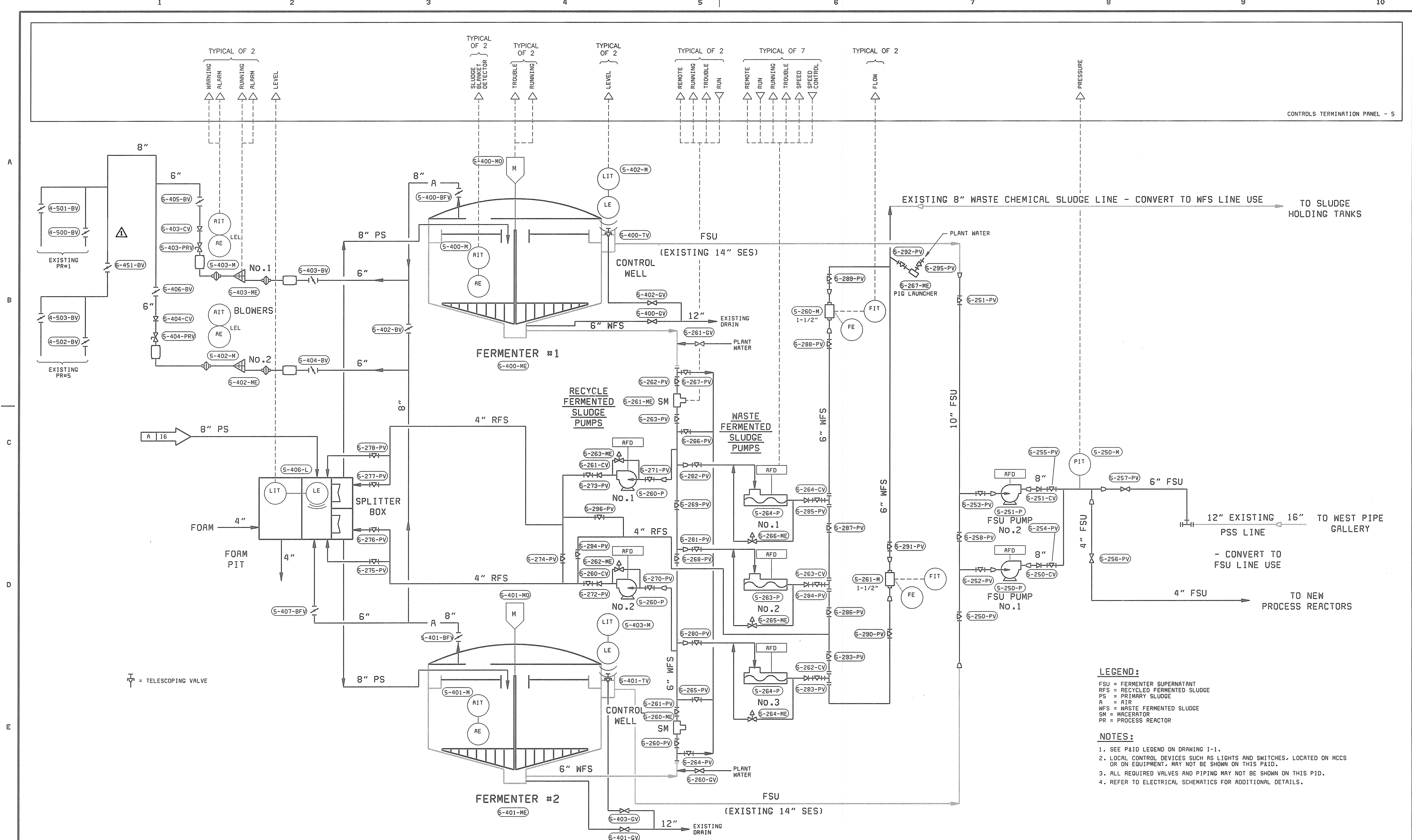
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 155 OF 161

I6

058472
 F058472A



CONTROLS TERMINATION PANEL - 5

LEGEND:
 FSU = FERMENTER SUPERNATANT
 RFS = RECYCLED FERMENTED SLUDGE
 PS = PRIMARY SLUDGE
 A = AIR
 WFS = WASTE FERMENTED SLUDGE
 SM = MACERATOR
 PR = PROCESS REACTOR

NOTES:
 1. SEE P&ID LEGEND ON DRAWING I-1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
 Gaithersburg, Maryland
 REG. PROF. ENGR. DATE 8-16-00

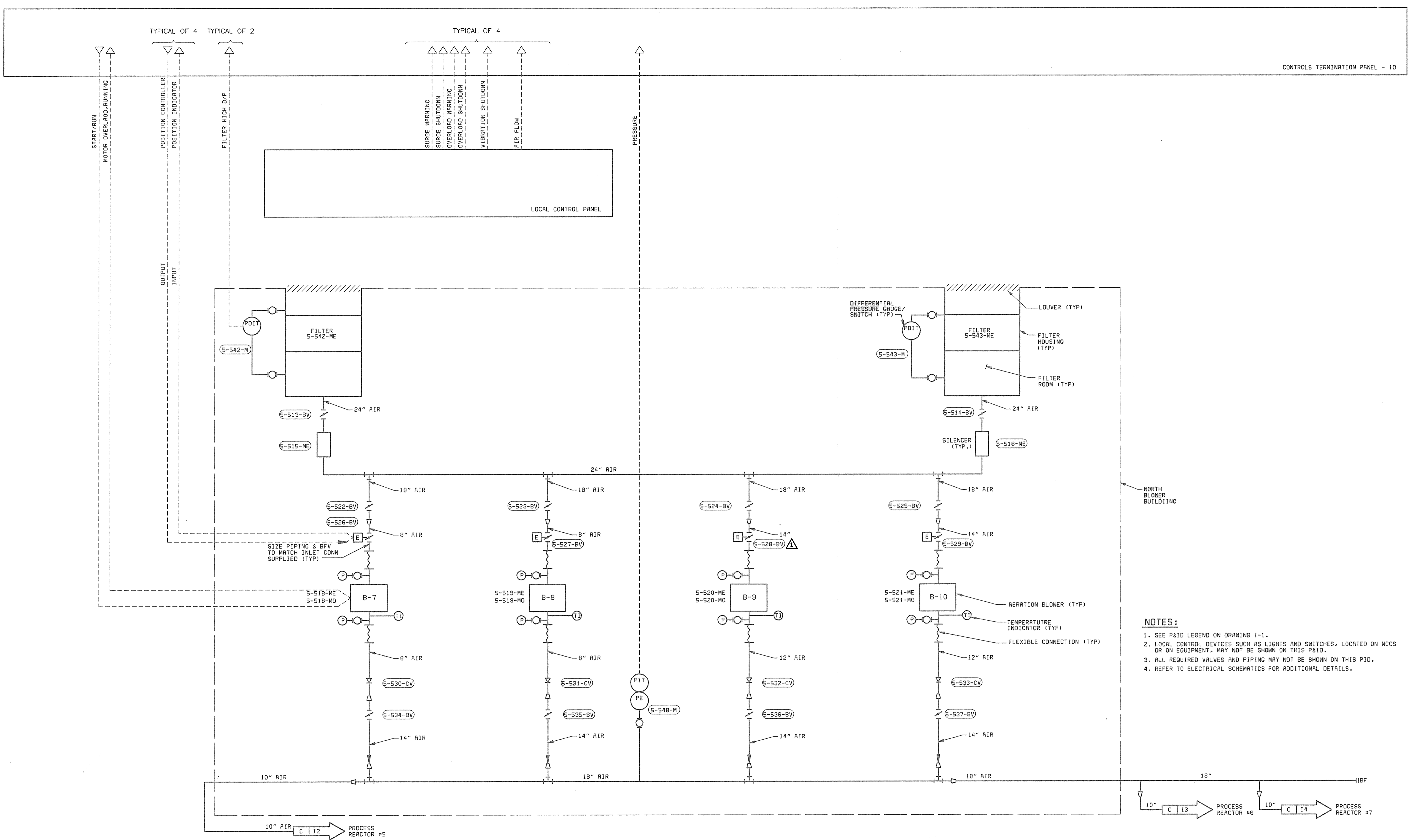


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|---------------|---------|-------------------------------|---------------|
| DES: RSF | 8/16/00 | ADDENDUM NO. 1 | RSF |
| DRN: DAH | | | |
| CHK: RAW | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. BY CK APP |

INSTRUMENTATION & CONTROLS
P & ID
FERMENTER

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

SCALE AS SHOWN
 SHEET 156 OF 161
17



- NOTES:**
1. SEE P&ID LEGEND ON DRAWING I-1.
 2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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| | | | | | | | | | |
|--|--|--|----------|----------|----------------|------|---|--|--|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH ^{LLP} Gaithersburg, Maryland REG. PROF. ENGR. DATE | DONALD H. STEARNS STATE OF MARYLAND | DES: RSF | B/16/00 | ADDENDUM NO. 1 | RSF | INSTRUMENTATION & CONTROLS P & ID NORTH BLOWERS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN SHEET 157 OF 161 18 |
| | | | DRN: JGT | CHK: AMW | DATE: 6/23/00 | DATE | | | |

1

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8

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A

B

C

D

E

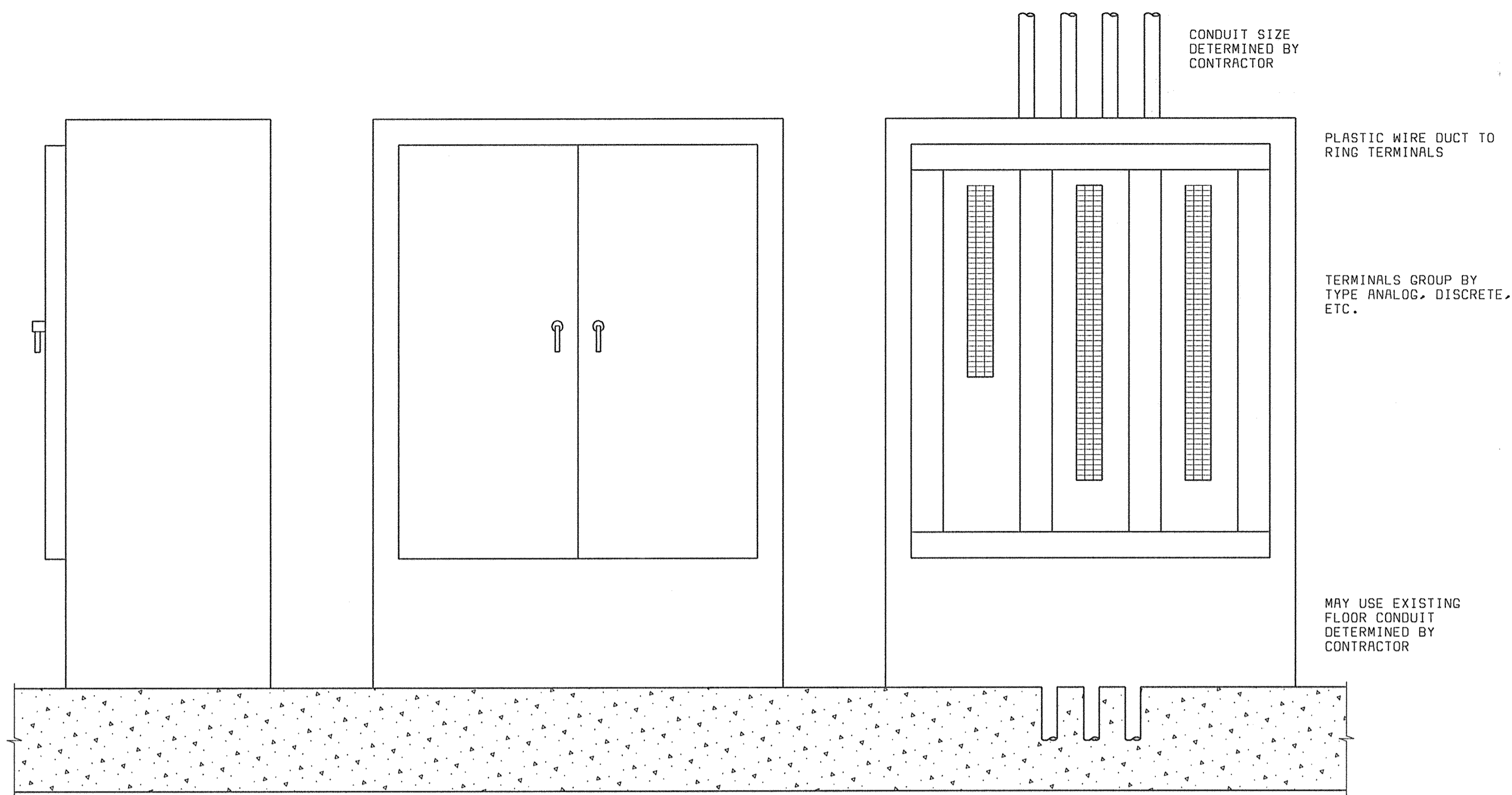
A

B

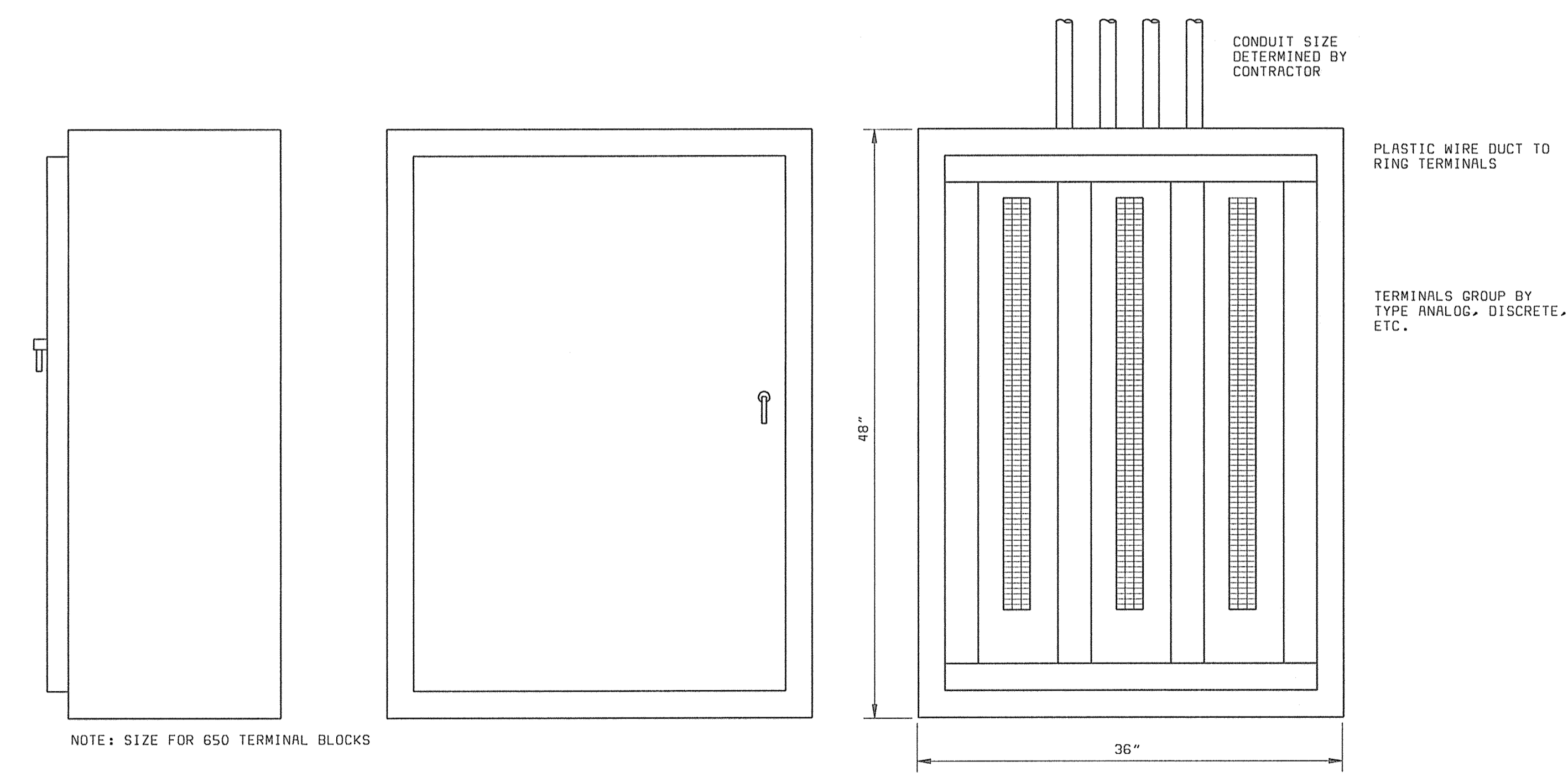
C

D

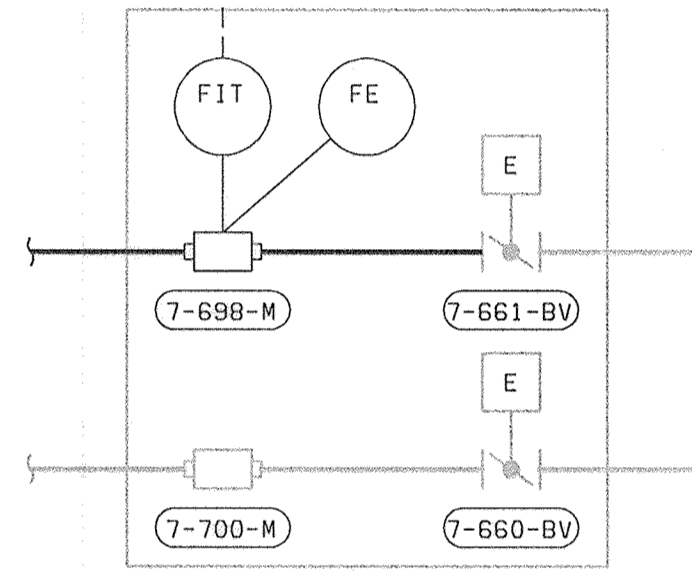
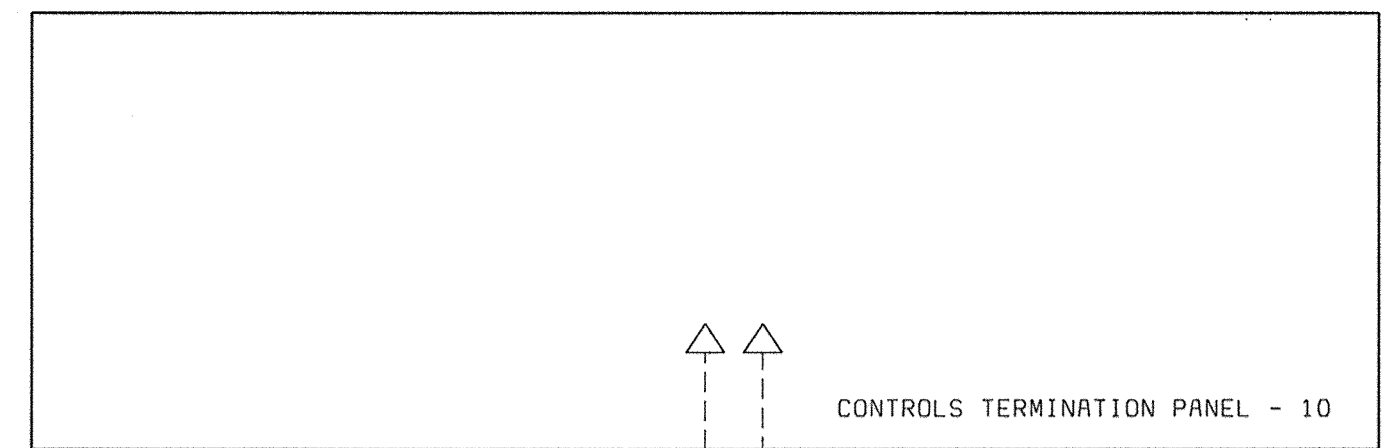
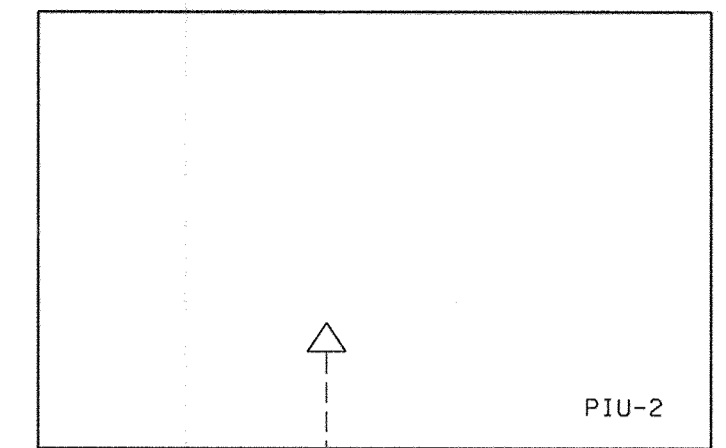
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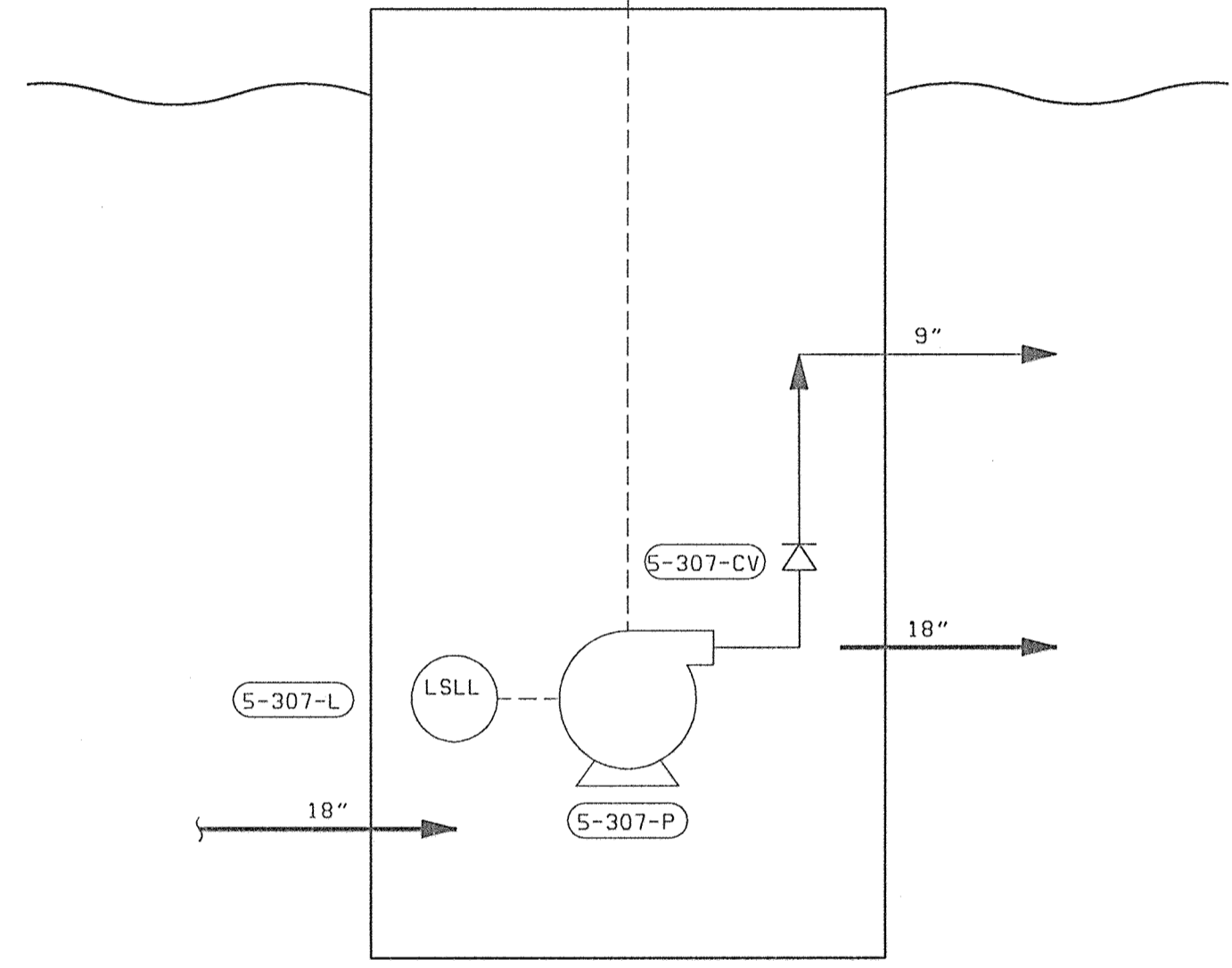
NORTH GALLERY BUILDING
FREE STANDING CONTROL SIGNAL JUNCTION BOX
 NO SCALE



NORTH BLOWER BUILDING & WEST GALLERY
WALL MOUNT CONTROL SIGNAL JUNCTION BOX
 NO SCALE



54" METER VAULT



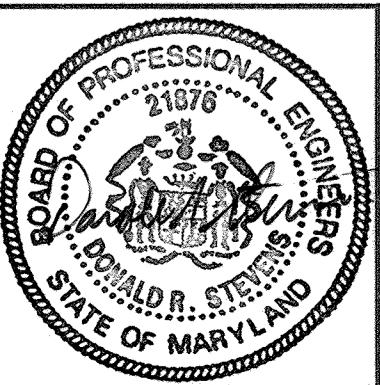
PLANT DRAIN MANHOLE PUMP STATION

NOTES:

1. SEE P&ID LEGEND ON DRAWING I-1.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 DATE: 6-29-00
 CHIEF, BUREAU OF UTILITIES

BLACK & VEATCH LLP
 Gaithersburg, Maryland
 REG. PROF. ENGR.
 DATE: 6/23/00



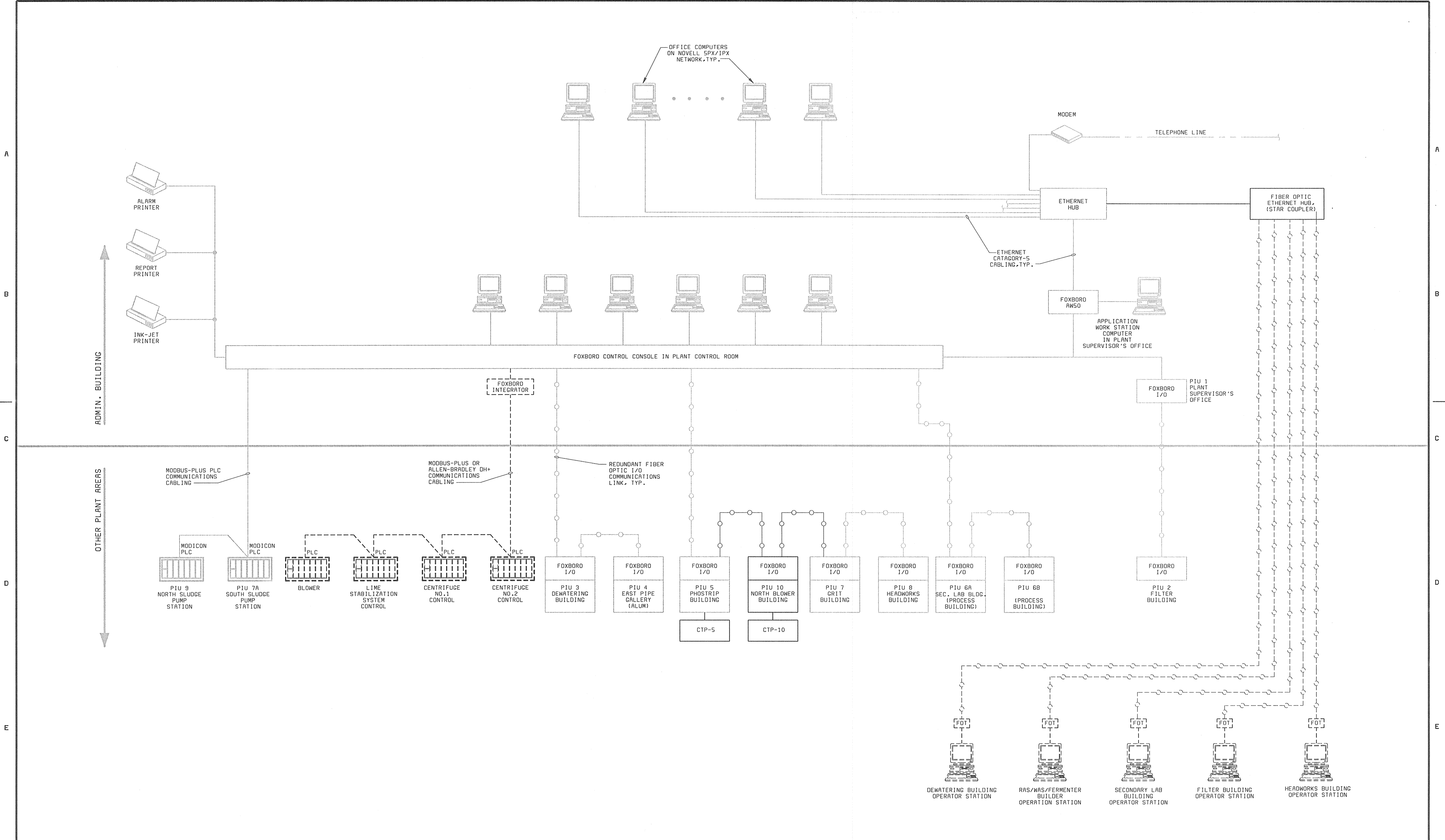
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| DES: RSF | | | | | | | |
| DRN: DAH | | | | | | | |
| CHK: AWH | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | |

INSTRUMENTATION & CONTROLS
P & ID
MISCELLANEOUS

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

SCALE AS SHOWN
 SHEET 158 OF 161
19

058472
 P058472A

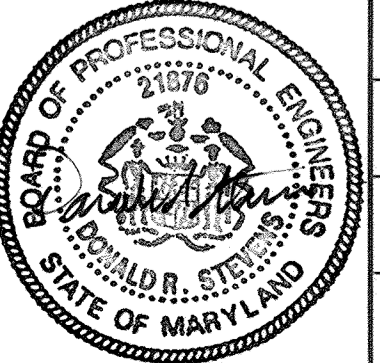


DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

R. J. ... 6-29-01
CHIEF, BUREAU OF UTILITIES DATE

BLACK & VEATCH
Gaithersburg, Maryland

Daniel ... 6/24/00
REG. PROF. ENGR. DATE



| | | | | | | | | | |
|---------------|------|-------------------------------|-----|----|----|-----|--|--|--|
| DES: PWM | | | | | | | | | |
| DRN: DAH | | | | | | | | | |
| CHK: AWH | | | | | | | | | |
| DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | | |

INSTRUMENTATION

P & ID CONTROL BLOCK DIAGRAM

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

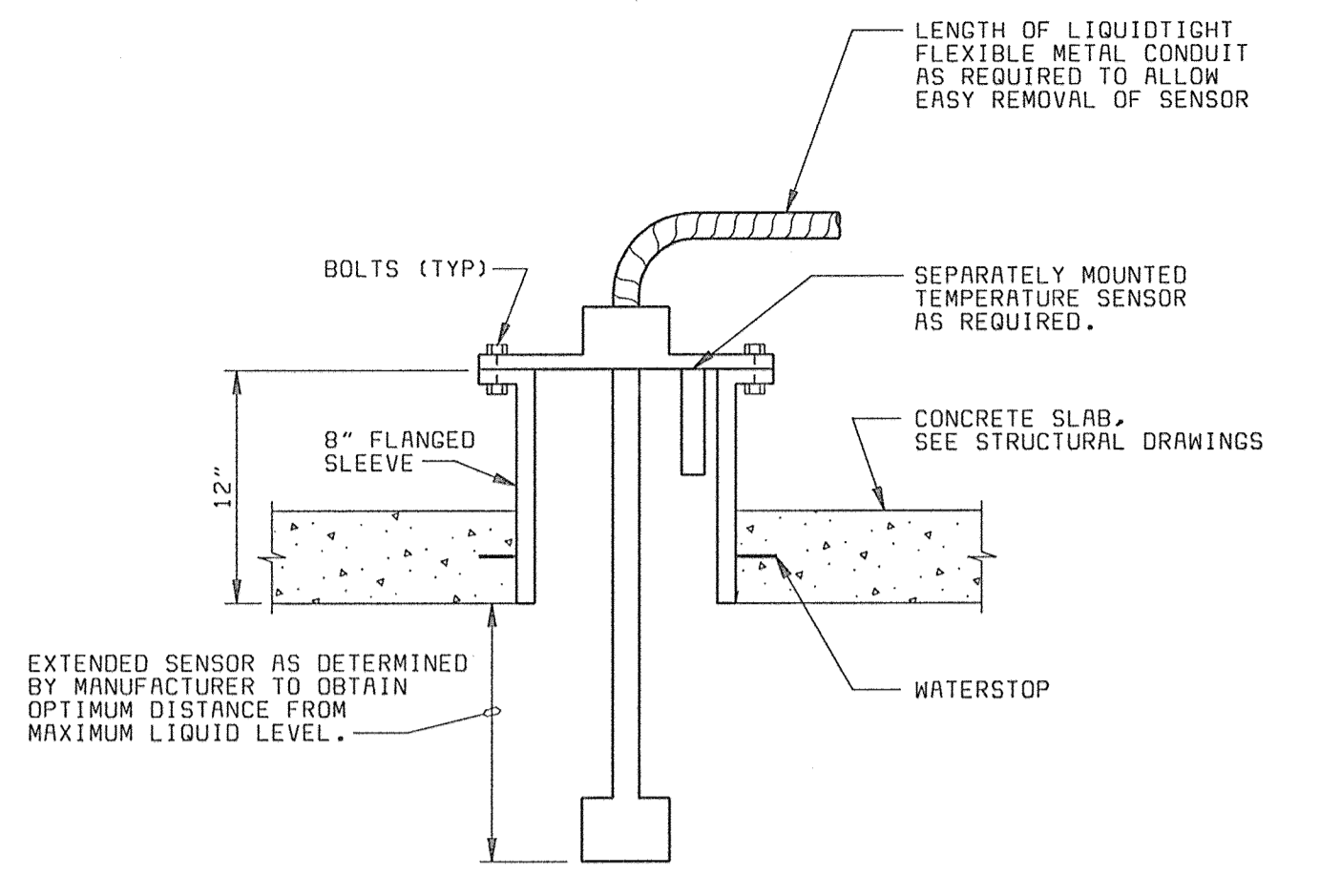
CAPITAL PROJECT S-6205
CONTRACT NO. 20-3752

HOWARD COUNTY, MARYLAND

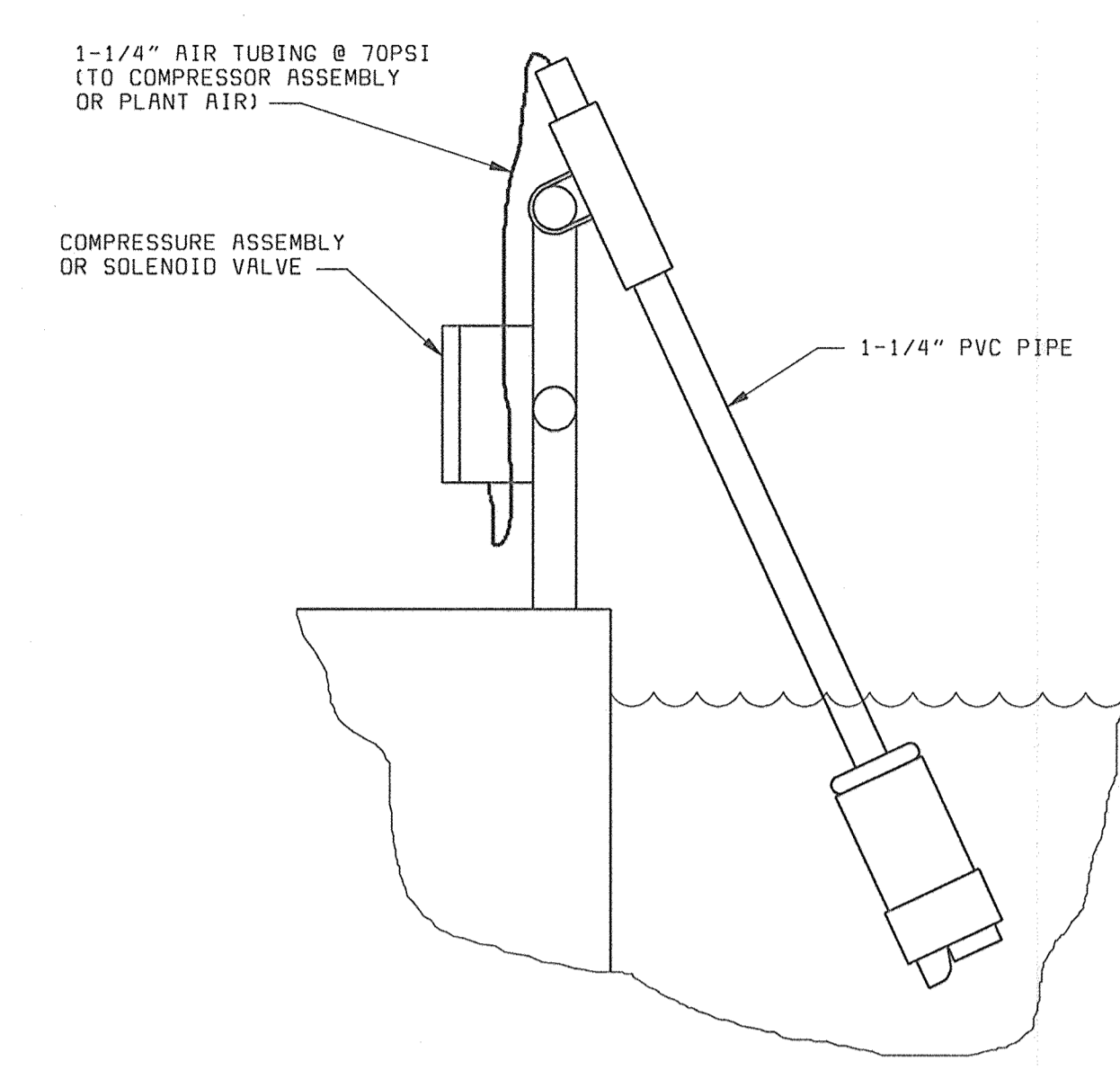
SCALE AS SHOWN

SHEET 159 OF 161

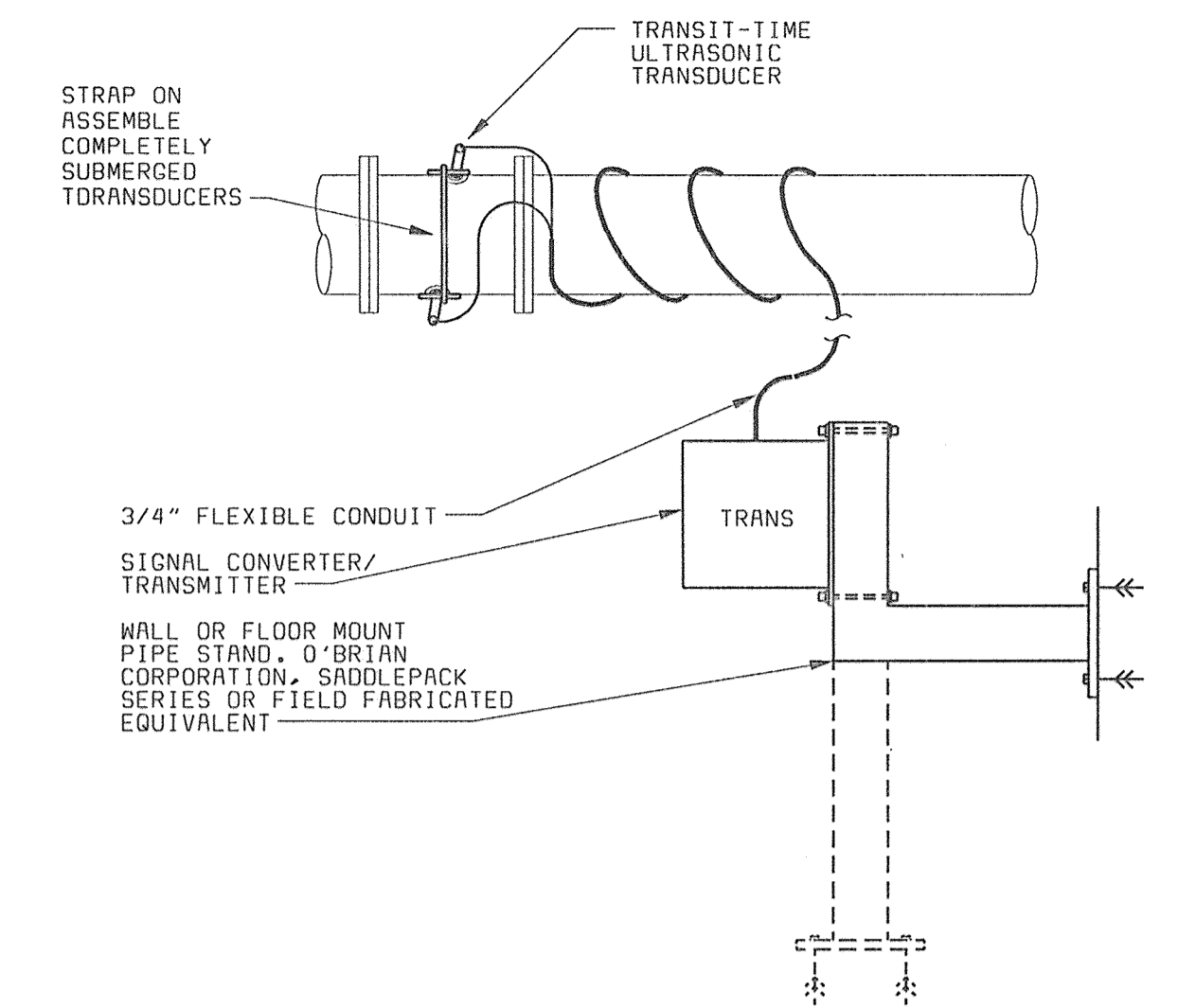
I 10



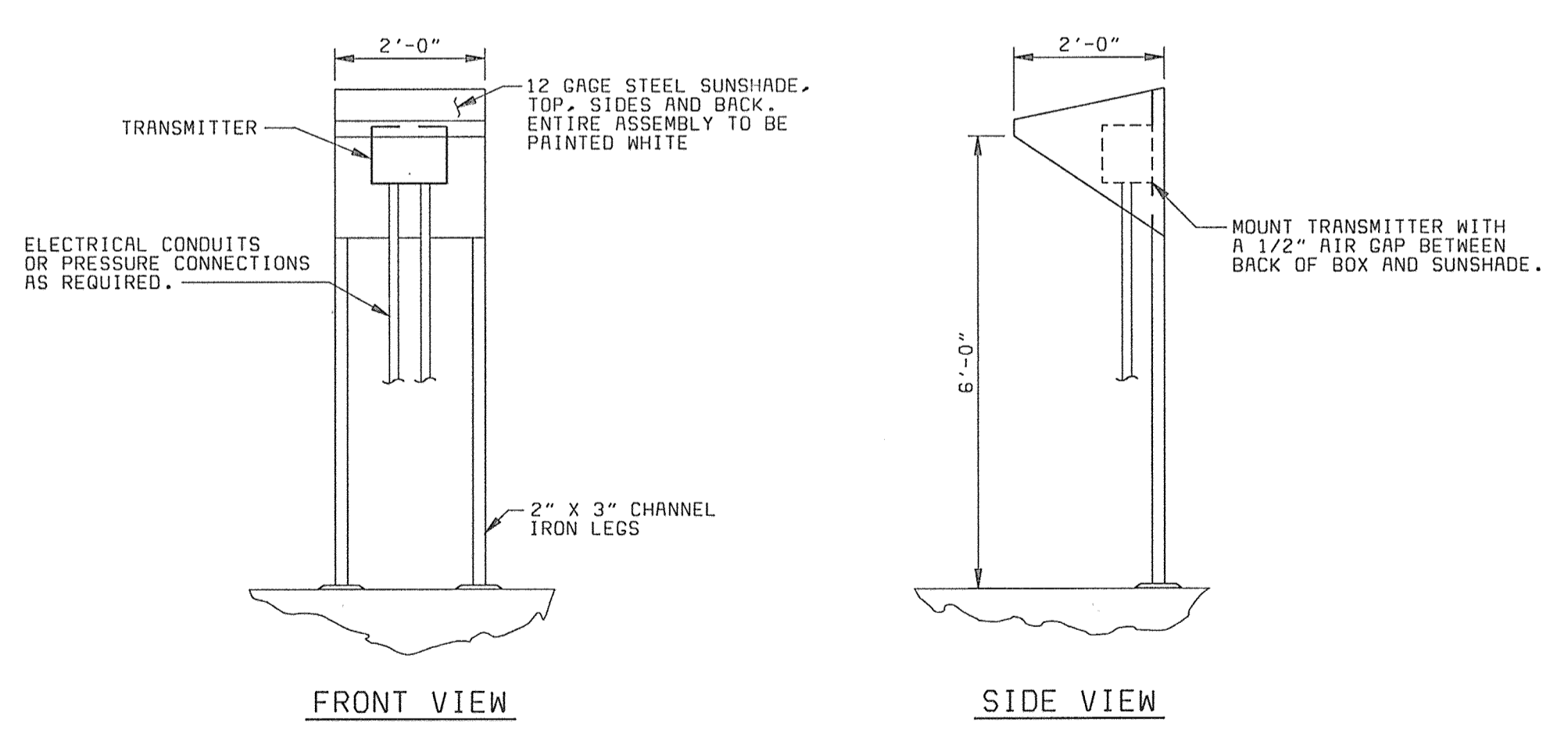
**ULTRASONIC LEVEL SENSOR
INSTALLATION DETAIL**
NO SCALE
TYPICAL FOR:



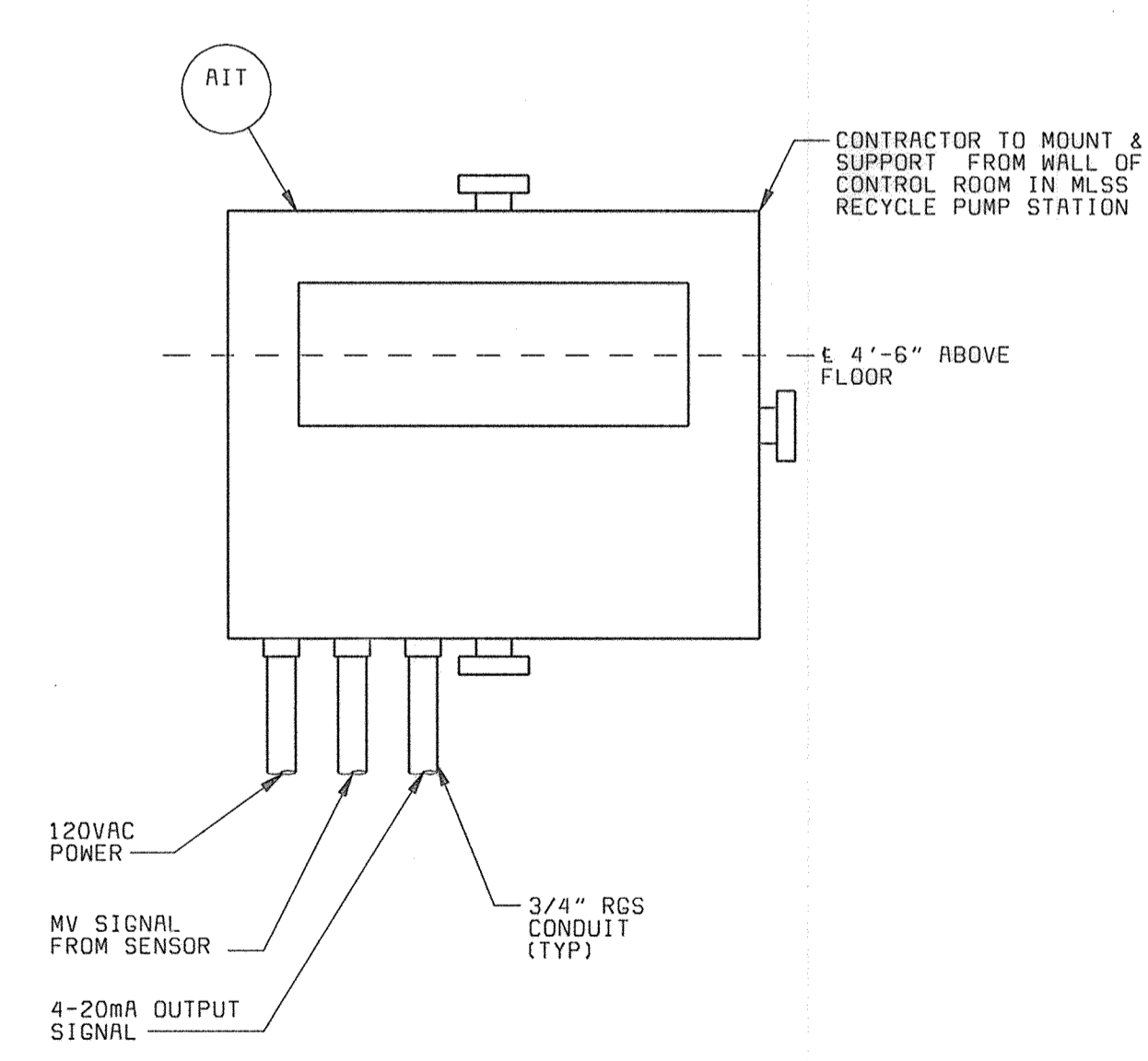
PROCESS REACTOR
NO SCALE



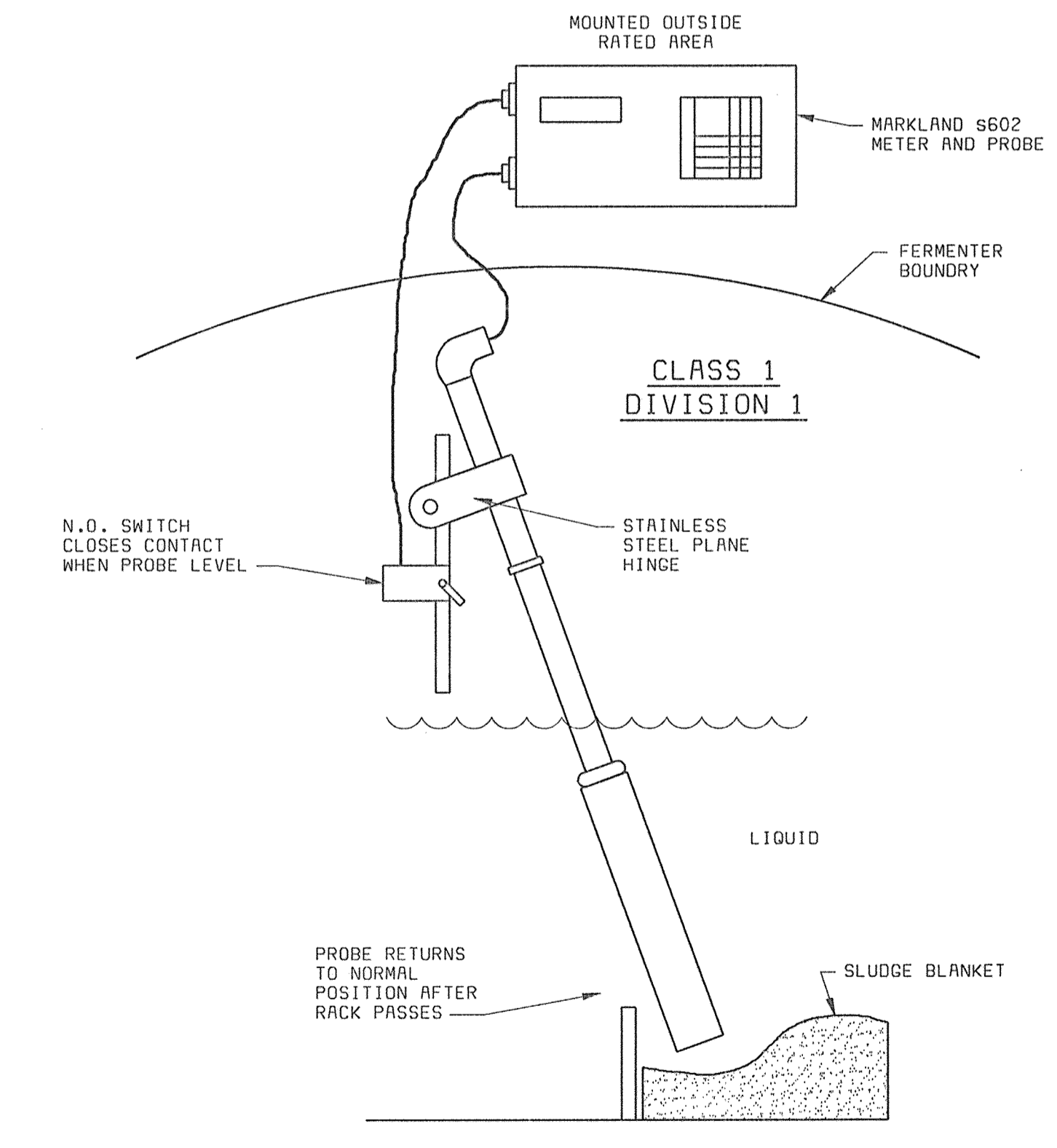
**TRANSIT-TIME ULTRASONIC FLOWMETER
INSTALLATION DETAIL**
NO SCALE



**OUTDOOR TRANSMITTER MOUNT
INSTALLATION DETAIL**
NO SCALE



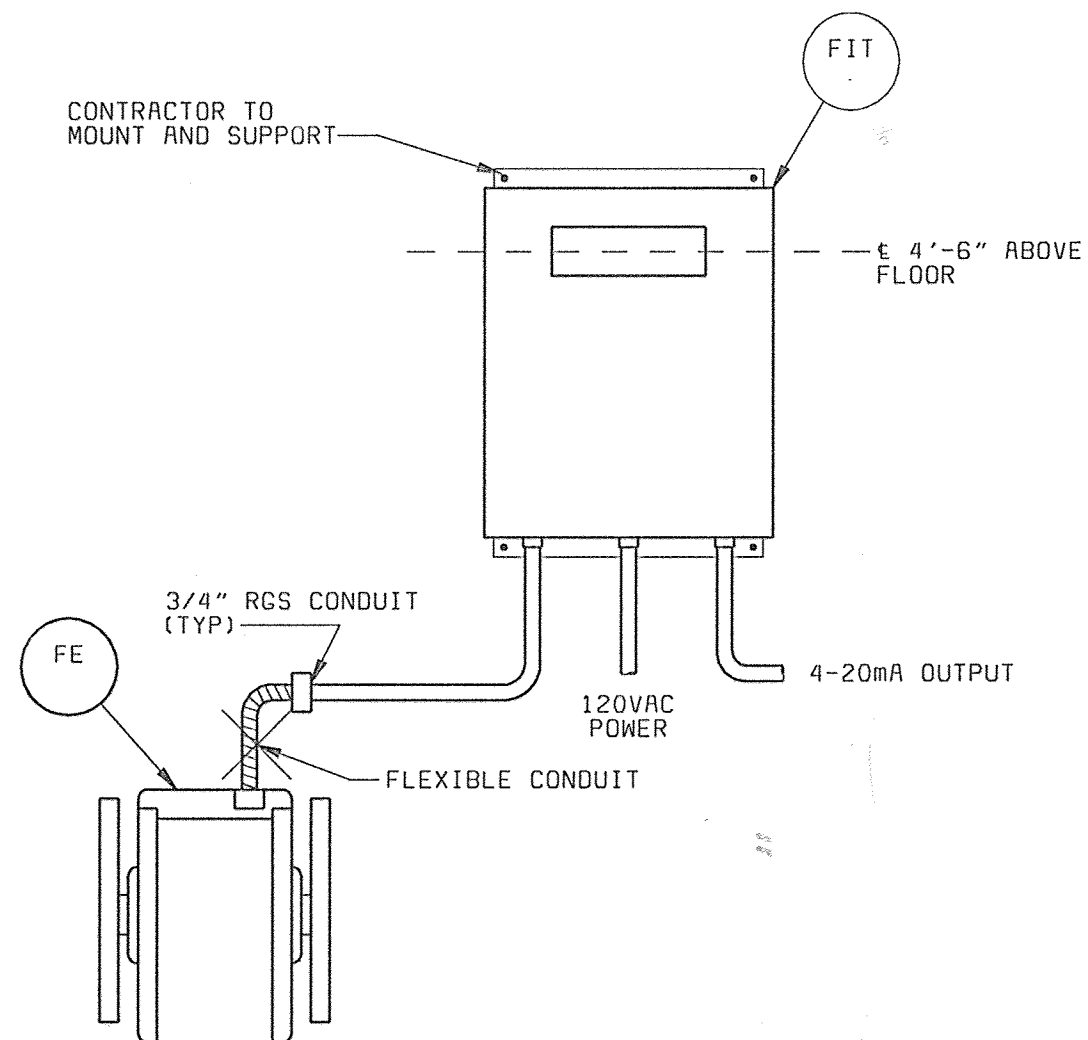
PROCESS REACTOR D.O. TRANSMITTER
NO SCALE



**SLUDGE BLANKET DETECTOR
INSTALLATION DETAIL**
NO SCALE
TYPICAL FOR: S-400-M, 5-401-M

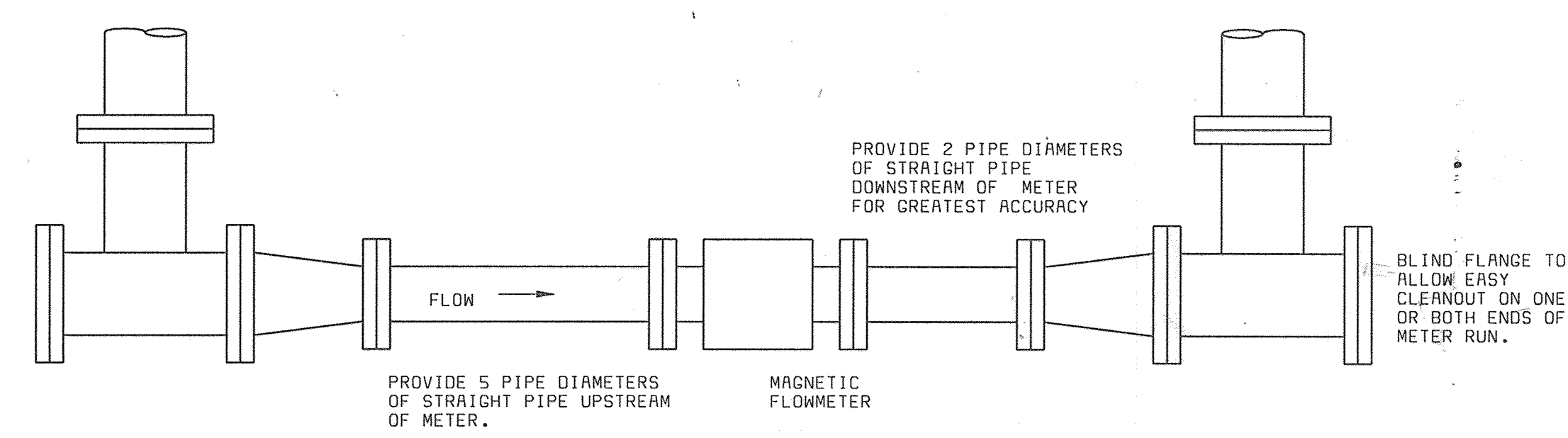
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|---|---|---|----------|----------|---------------|------|-------------------------------|-----|----|---|--|----------------|
| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 6-25-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH, L.P. Gaithersburg, Maryland REG. PROF. ENGR. DATE 6/24/00 | DONALD R. STINES STATE OF MARYLAND | DES: RSF | | | | | | | INSTRUMENTATION P&ID INSTALLATION DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: TOR | CHK: AWH | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | | | CK |

DESIGN: P556472A



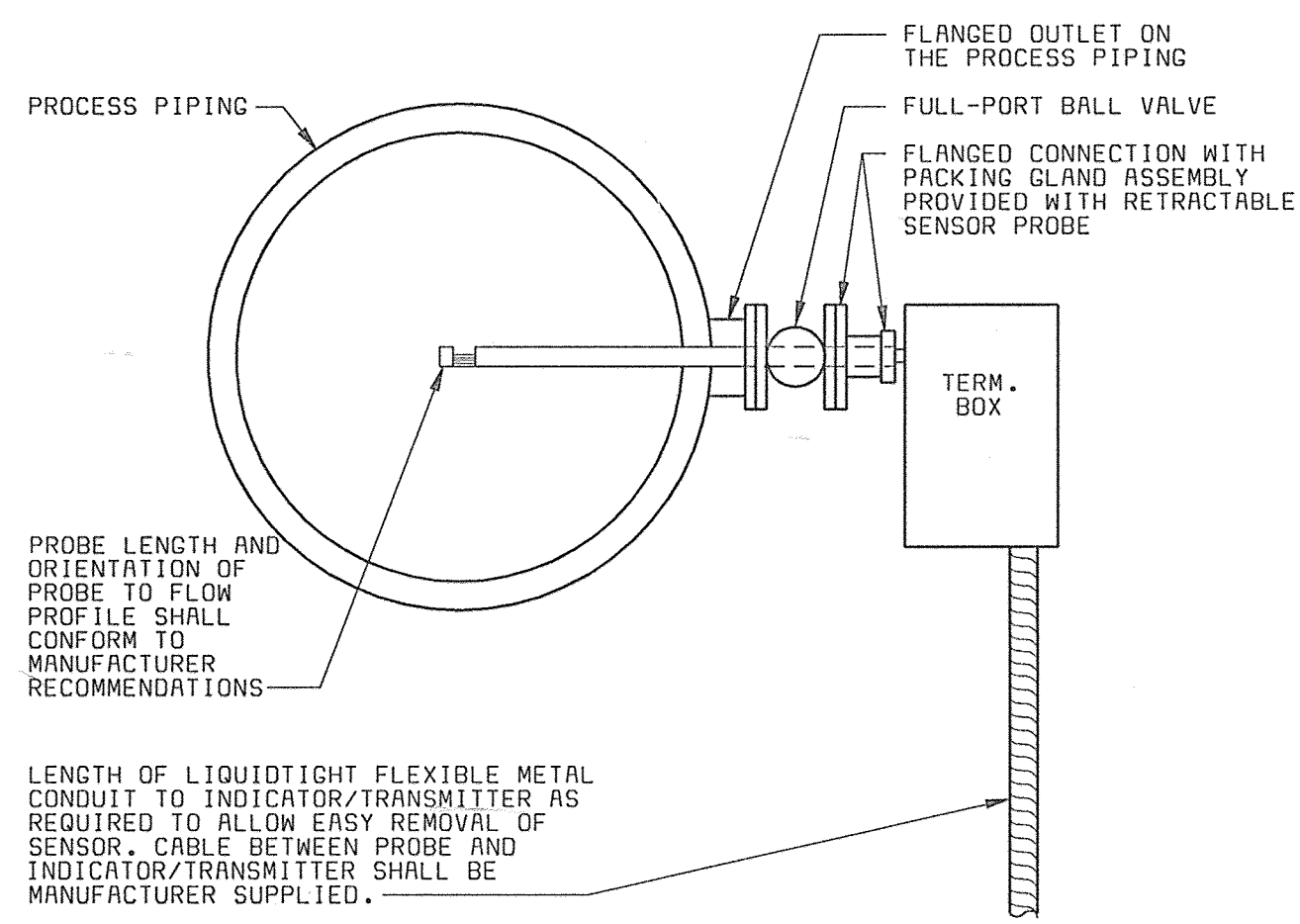
MAGNETIC FLOWMETER INSTALLATION DETAIL

NO SCALE



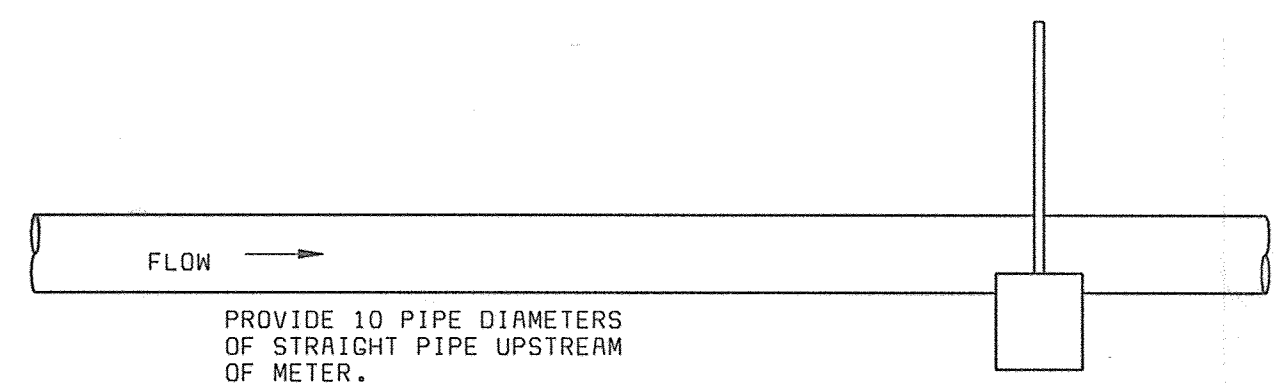
TYPICAL MAGNETIC FLOWMETER INSTALLATION WITH CLEAN-OUTS

NO SCALE



THERMAL DISPERSION FLOWMETER HOT-TAP TYPE SENSOR INSTALLATION DETAIL

NO SCALE
TYPICAL FOR: PROCESS REACTOR AERATION



TYPICAL THERMAL DISPERSION FLOWMETER INSTALLATION DETAIL

NO SCALE

NOTES:

1. SEE P&ID LEGEND ON DRAWING 11.
2. LOCAL CONTROL DEVICES SUCH AS LIGHTS AND SWITCHES, LOCATED ON MCCS OR ON EQUIPMENT, MAY NOT BE SHOWN ON THIS P&ID.
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| DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND <i>Robert W. ...</i> 6-29-00 CHIEF, BUREAU OF UTILITIES DATE | BLACK & VEATCH Gaithersburg, Maryland <i>Donald A. ...</i> 6/24/00 REG. PROF. ENGR. DATE | | DES: RSF | | | | | | INSTRUMENTATION P&ID INSTALLATION DETAILS | LITTLE PATUXENT WATER RECLAMATION PLANT ADDITION NO. 6 BNR TREATMENT CAPACITY EXPANSION CAPITAL PROJECT S-6205 CONTRACT NO. 20-3752 HOWARD COUNTY, MARYLAND | SCALE AS SHOWN |
| | | | DRN: TDR | | | | | | | | |
| | | | CHK: AWH | | | | | | | | I 12 |
| | | | DATE: 6/23/00 | DATE | REVISIONS AND RECORD OF ISSUE | NO. | BY | CK | APP | | |

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