

**PURPOSE STATEMENT**

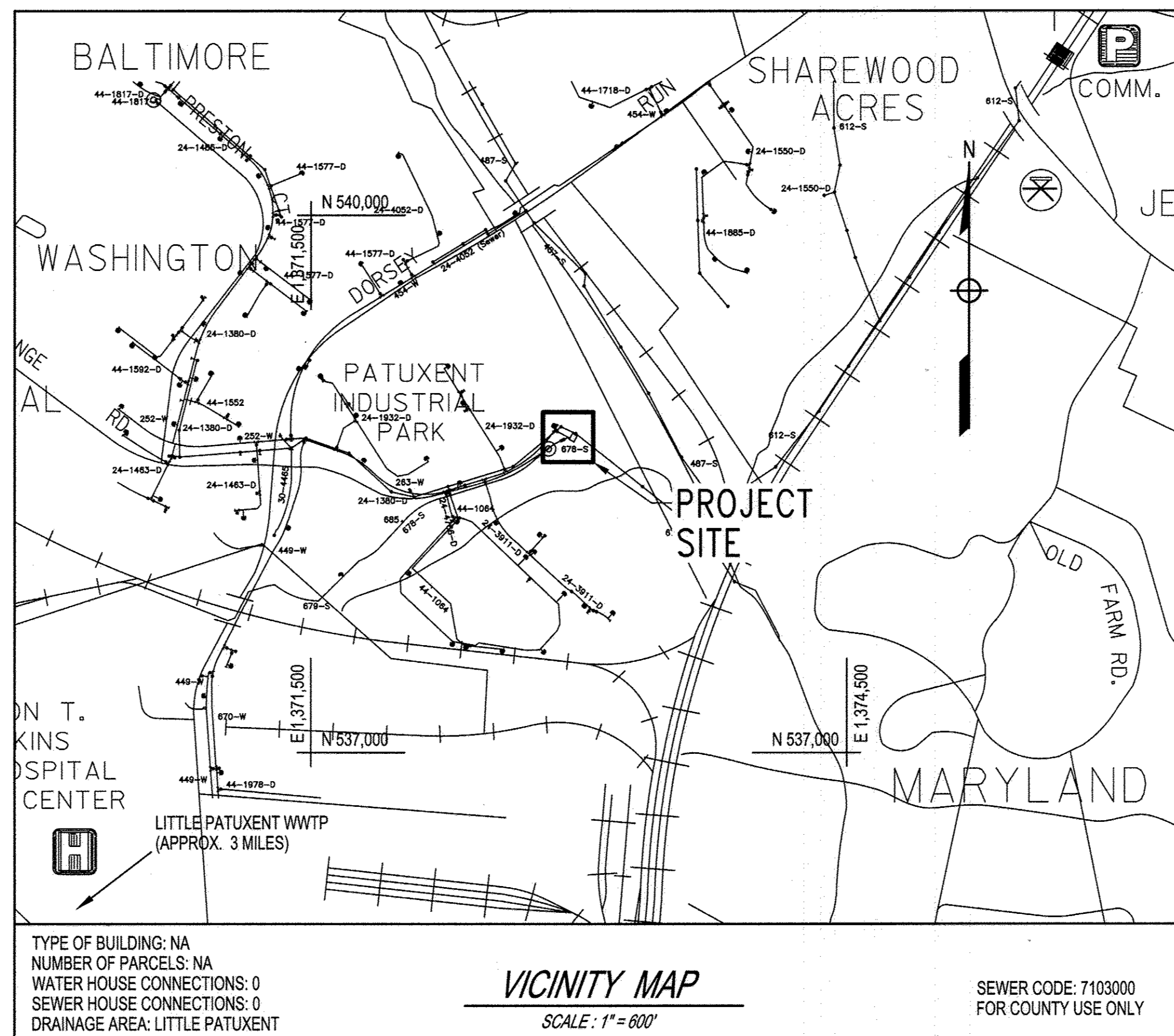
THE PURPOSE OF THIS PROJECT IS TO UPGRADE STATION CAPACITY TO 8.05 MGD. THE SCOPE OF WORK TO BE DONE UNDER THIS CONTRACT CONSISTS OF THE FURNISHING OF ALL MATERIALS AND THE CONSTRUCTION, COMPLETE IN PLACE OF THE DORSEY RUN WASTEWATER PUMPING STATION UPGRADE, INCLUDING, BUT IS NOT LIMITED TO, NEW WASTEWATER PUMPING UNITS; NEW STATION PIPING AND VALVES; NEW VARIABLE FREQUENCY DRIVES (VFDS); NEW GENERATOR; NEW HVAC AND APPURTENANCES; NEW ELECTRICAL WORK; NEW CONTROLS; SITE IMPROVEMENTS; MANHOLE MODIFICATIONS; NEW PAVING; ARCHITECTURAL WORK INCLUDING ROOFING, DOORS AND LOUVERS; MISCELLANEOUS STRUCTURAL AND INCIDENTAL ITEMS OF WORK AS SHOWN.

# DORSEY RUN WASTEWATER PUMPING STATION UPGRADE

## CAPITAL PROJECT NO. S6286 CONTRACT NO. 20-4996 HOWARD COUNTY, MARYLAND

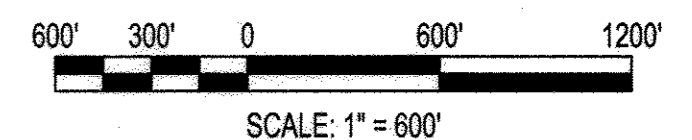
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DIRECTIONS: TAKE ROUTE 175 EAST FROM I-95, TRAVEL EAST ON ROUTE 175 TO ROUTE 1, TAKE ROUTE 1 SOUTH TO PATUXENT RANGE ROAD, TRAVEL EAST ON PATUXENT RANGE ROAD AND CROSS DORSEY RUN ROAD, CONTINUE UNTIL YOU REACH THE END OF PATUXENT RANGE ROAD.

"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 24478, EXPIRATION DATE: 10/28/2019."



DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

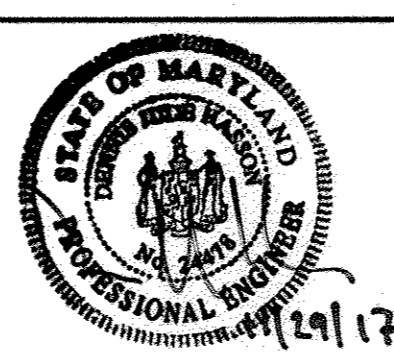
*[Signature]* 12/4/17  
DIRECTOR OF PUBLIC WORKS  
DATE

*[Signature]* 12/4/17  
CHIEF, BUREAU OF UTILITIES  
DATE

*[Signature]* 12/11/17  
CHIEF, BUREAU OF ENGINEERING  
DATE

*[Signature]* 12/14/17  
CHIEF, UTILITY DESIGN DIVISION  
DATE

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES:	FJB/LAQ				
DRN:	FJB				
CHK:	DJH				
DATE:	NOV. 2017				
BY:		NO.		REVISION	DATE


TITLE SHEET, VICINITY MAP  
AND  
INDEX OF DRAWINGS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

G-1  
SCALE AS SHOWN  
SHEET 1 OF 46



**GENERAL NOTES:**

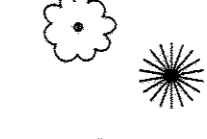
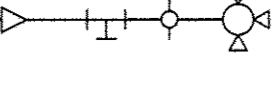




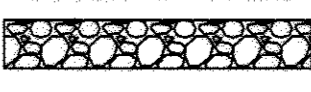
- APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED FROM MARCH THROUGH SEPTEMBER 2016 BY WHITMAN, REQUARDT & ASSOCIATES, LLP.
- HORIZONTAL AND VERTICAL SURVEY CONTROLS:  
THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE COORDINATE SYSTEM NAD '83/91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. DG01 THROUGH DG08 AND 43EC. ALL VERTICAL CONTROLS ARE BASED ON NAVD '88. VERTICAL CONTROLS ARE AS INDICATED ON THE DRAWINGS.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12". CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF POLES.
- CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH HOWARD COUNTY VOLUME IV DESIGN MANUAL. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL  AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
- CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS.  
  

AT&T .....	1-800-252-1133
BGE (CONTRACTOR SERVICES) .....	410-637-8713
BGE (EMERGENCY) .....	410-685-0123
BUREAU OF UTILITIES .....	410-313-4900
COLONIAL PIPELINE CO. ....	410-795-1390
MISS UTILITY .....	1-800-257-7777
STATE HIGHWAY ADMINISTRATION .....	410-531-5533
VERIZON .....	1-800-743-0033/410-224-9210
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. CONTRACTOR SHALL REMOVE TREES, STUMPS, AND ROOTS AS NECESSARY TO PERFORM THE WORK. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS ITEMS.
- THE CONTRACTOR SHALL REMOVE TREES, STUMPS, AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410) 313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(a) OF THE HOWARD COUNTY CODE.
- STOCKPILE SPOILS FROM TRENCHING OPERATIONS ON THE UPHILL SIDE OF THE TRENCH, EXCEPT DO NOT STORE OR WASTE ANY SPOILS WITHIN 100-YEAR FLOOD PLAIN. ALL EXCESS MATERIALS SHALL BE REMOVED BY CONTRACTOR.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LINES, GRADES AND ELEVATIONS, AND CUT SHEETS SHALL BE PREPARED BASED ON THE LINES AND GRADES SHOWN ON THE CONTRACT DRAWINGS.
- THE CONTRACTOR SHALL PROVIDE A MAINTENANCE OF TRAFFIC PLAN, WHERE NECESSARY FOR APPROVAL PRIOR TO INSTALLATION OF SANITARY SEWER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING STAGING AND STOCKPILE AREAS.
- SEWER FLOWS SHALL NOT BE INTRODUCED TO THE NEW SEWER PIPE UNTIL DIRECTED BY THE COUNTY. REFER TO THE SEQUENCE OF CONSTRUCTION.

**ABBREVIATIONS**

DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION
AMERICAN CONCRETE INSTITUTE	ACI	NATIONAL PIPE THREAD	NPT
ALTERNATE	ALT	NON-REINFORCED CIRCULAR CONCRETE PIPE	NRCP
ALUMINUM ALLOY	AA	NOT TO SCALE	NTS
ALUMINIZED CORRUGATED METAL PIPE	ACMP	ON CENTER	O/C
AREA OF STEEL	A	OUTSIDE DIAMETER	OD
AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS	AASHTO	OVERALL	OA
AMERICAN SOCIETY OF TESTING AND MATERIALS	ASTM	PRESTRESSED CONCRETE CYLINDER PIPE	PCCP
AMERICAN WIRE GAUGE	AWG	POLYTHYLENE PRE-COATED CORRUGATED STEEL PIPE	PESCP
AMERICAN WATER WORKS ASSOCIATION	AWWA	PRESSURE REDUCING VALVE	PRV
BITUMINOUS COATED CORRUGATED METAL PIPE	BCCMP	POUNDS PER SQUARE INCH	PSI
CAST IRON	CI	POLYVINYL CHLORIDE	PVC
CENTER TO CENTER	C/C	RADIUS	R.
CURB AND GUTTER	C&G	REINFORCED CONCRETE	R.C.
CENTERLINE	CL	REINFORCED CONCRETE ARCH PIPE	RCAP
CLEAR	CLR	REINFORCED CIRCULAR CONCRETE PIPE	RCCP
CLEARANCE	CL	REINFORCED CONCRETE ELLIPTICAL PIPE	RCEP
CONCRETE	CONC	REINFORCED CONCRETE PIPE	RCP
COUNTERSINK	CSK	REINFORCEMENT	REINF
CUBIC	CU	RIGHT OF WAY	R/W
CUBIC YARD	CY	STABILIZED CONSTRUCTION ENTRANCE	SCE
DRY FILM THICKNESS	DFT	SCHEDULE	SCH
DEGREE	°	MARYLAND STATE HIGHWAY ADMINISTRATION	SHA
DIAMETER	DIA	SEWER HOUSE CONNECTION	SHC
DIAMETER	Ø	STEEL PIPE	SP
DIAGONAL	DIAG	STRUCTURAL PLATE PIPE	SPP
DUCTILE IRON	DI	SQUARE	SQ
DUCTILE IRON PIPE	DIP	STAINLESS STEEL	SS
DEPARTMENT OF PUBLIC WORKS	DPW	STORM WATER MANAGEMENT	SWM
EACH WAY	EW	TERMINAL	TERM
EXISTING	EX	TYPICAL	TYP
EXPANSION	EXP	VOLTS	V
FEET	FT	COEFFICIENT OF FRICTION BETWEEN FILL MATERIAL AND SIDES OF TRENCH	μ
FEET	'	SQUARE MEMBER	□
GRADED AGGREGATE BASE	GAB	C SHAPED MEMBER	▤
GALVANIZED	GALV		
GAUGE	GA		
HIGH DENSITY POLYTHYLENE	HDPE		
HOT MIX ASPHALT	HMA		
INSIDE DIAMETER	ID		
INCH	IN.		
INCH	"		
JOINT	JT		
RATIO OF ACTIVE LATERAL UNIT PRESSURE TO VERTICAL UNIT PRESSURE	K		
POUNDS	LBS		
LINEAR FOOT	LF		
MANHOLE	MH		
MAXIMUM	MAX		
MECHANICAL	MECH		
MECHANICAL JOINT	MJ		
MILLIMETERS	MIL		
MINIMUM	MIN		
NUMBER	NO.		
NUMBER	#		

**LEGEND**


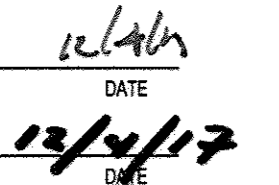
EXISTING	PROPOSED	DESCRIPTION
---	---	CONTOUR LINES - INTERMEDIATE INDEX
---400---	---	
=====	=====	CURB AND GUTTER
---	---	SIGN
---	---	TREELINE
	---	TREE - DECIDUOUS EVERGREEN
-----S-----S-	=====	SANITARY SEWER MAIN
-----FM-----FM-	=====	SANITARY SEWER FORCE MAIN
-----S-(S)	=====	SANITARY SEWER MANHOLE
	---	WATER REDUCER, TEE, VALVE & FIRE HYDRANT
-----W-----W-	=====	WATER AND NON-POTABLE WATER MAIN
-----D-----D-	=====	STORM DRAIN
-----G-----G-⊙	---	GAS MAIN AND MANHOLE
---E---E---E	---	ELECTRICAL CONDUIT AND MANHOLE
---T---T---T	---	TELEPHONE CONDUIT AND MANHOLE
---CTV---	---	CABLE TELEVISION
---X---	---	FENCE WIRE
---//---	---	FENCE WOOD
---	===== LOD	LIMIT OF DISTURBANCE
---	===== SF	SILT FENCE
---	===== SSF	SUPER SILT FENCE
---	---	100 YEAR FLOOD PLAIN
---	---	WATERS OF THE UNITED STATES
---	---	WETLAND BOUNDARY
---	---	WETLAND BUFFER
---	---	STREAM BANK 100 FOOT BUFFER
---		TRaverse POINT
---	B8-XX 	BORING LOCATION AND NUMBER
---	TP-XX 	TEST PIT HOLE
---		BENCHMARK
---	---	PROPERTY LINE
---	---	PERMANENT EASEMENT
---	---	TEMPORARY CONSTRUCTION EASEMENT
---	---	NEW PAVEMENT LIMITS
---		RIP RAP
---	---	EXISTING PIPE OR MANHOLE TO BE REMOVED

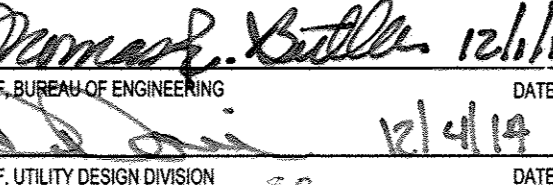
**SANITARY SEWER NOTES:**

- ALL SEWER MAINS SHALL BE D.I.P. OR P.V.C. UNLESS OTHERWISE NOTED.
- FORCE MAIN SHALL BE D.I.P. ONLY.
- MANHOLES SHOWN WITH 12" AND 16" WALLS ARE FOR BRICK MANHOLES ONLY.
- MANHOLES DESIGNATED W.T. IN PLAN AND PROFILE SHALL HAVE WATERTIGHT FRAME AND COVER, STANDARD DETAIL G5.52. WHERE WATERTIGHT MANHOLE FRAMES AND COVERS ARE USED, SET TOP OF FRAME 1'-6" ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- HOUSE(S) WITH THE SYMBOL "C.N.S." INDICATES THAT THE CELLAR CANNOT BE SERVED.
- SANITARY SEWER AND FORCEMAIN SHALL BE DUCTILE IRON CLASS 54, PROTECTO LINED UNLESS OTHERWISE NOTED.
- MANHOLES SHALL BE 5'-0" DIAMETER PER HOWARD COUNTY STANDARD DETAIL G-5.11, UNLESS OTHERWISE CALLED OUT ON THE PLANS. AN INTERMEDIATE LANDING IS TO BE PROVIDED AT MANHOLE JOINT CLOSEST TO MID-DEPTH FOR ALL MANHOLES GREATER THAN 18 FEET IN DEPTH AND AT 10 FOOT INTERVALS FROM THE TOP WHEN MANHOLE DEPTH EXCEEDS 25 FEET. THE INTERMEDIATE LANDING SHALL BE PER HOWARD COUNTY STANDARD DETAIL G-5.16.
- THE CONTRACTOR SHALL MAKE THE NECESSARY CONNECTIONS TO EXISTING AND PROPOSED MANHOLES USING MECHANICALLY WEDGED-IN-PLACE TYPE CONNECTIONS SUCH AS LINK-SEAL AS MANUFACTURED BY THUNDER LINE CORPORATION, Z-LOK SP AS MANUFACTURED BY A-LOK PRODUCTS, INC. OR KOR-N-SEAL AS MANUFACTURED BY NATIONAL POLLUTION CONTROL SYSTEMS, INC. ALL METAL PARTS, I.E. BOLTS, STRAPS, ETC. SHALL BE STAINLESS STEEL.
- THE CONTRACTOR IS RESPONSIBLE FOR PREVENTION OF SPILLAGE OF RAW WASTEWATER, AND SHALL HAVE MEANS AT HIS DISPOSAL (BY PASS PUMP SYSTEM, ETC.) TO USE AS NECESSARY.
- PROVIDE PIPE JOINT 5-FEET FROM THE FACE OF EACH SIDE OF ALL PROPOSED MANHOLES.

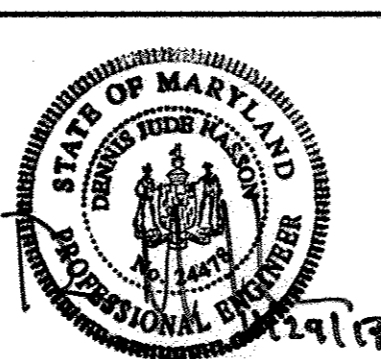
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

 DIRECTOR, PUBLIC WORKS  
 CHIEF, BUREAU OF UTILITIES

 12/11/17  
CHIEF, UTILITY DESIGN DIVISION

  
**Whitman, Requardt & Associates, LLP**  
801 South Caroline Street, Baltimore, Maryland 21231



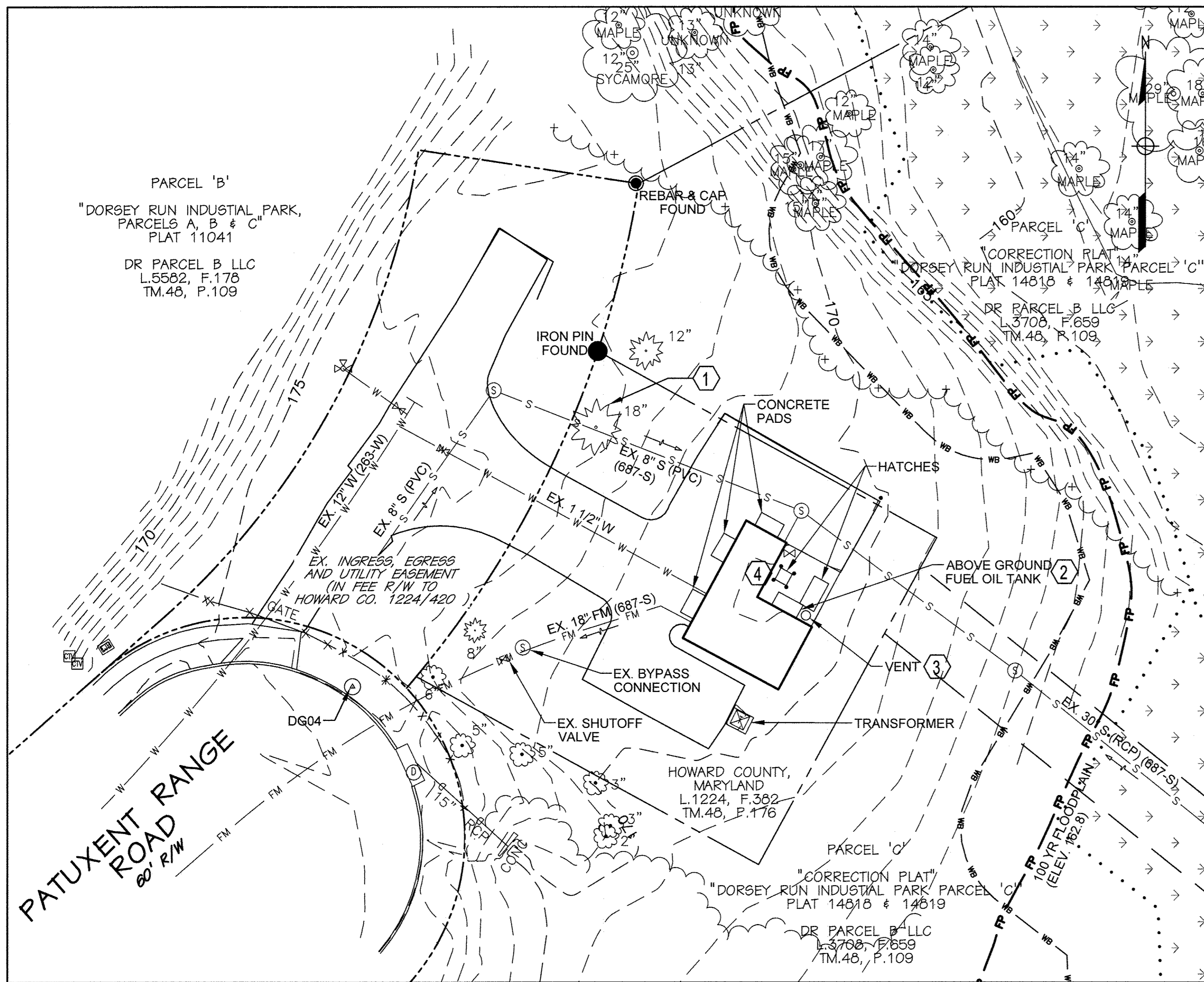
DES: FJB				
DRN: GWG				
CHK: WFH				
DATE: NOV. 2017				
BY	NO.	REVISION	DATE	

CIVIL GENERAL NOTES,  
ABBREVIATIONS, AND LEGEND

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

C-1  
SCALE  
NONE  
SHEET  
2 OF 46





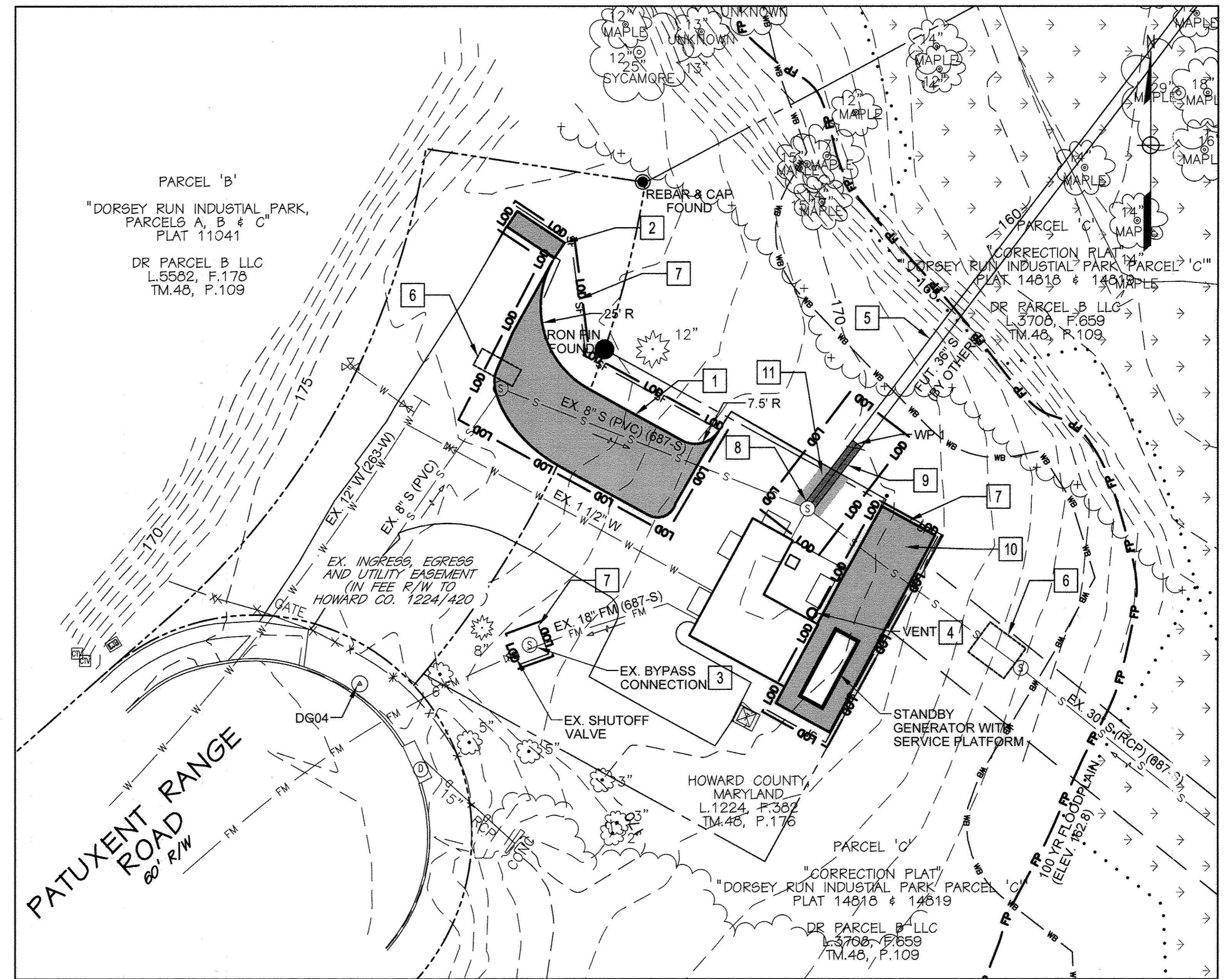
**DEMOLITION PLAN**  
SCALE: 1" = 20'

**(X) DEMOLITION NOTES:**

1. REMOVE EX. TREE.
2. REMOVE ABOVE GROUND FUEL TANK.
3. REMOVE 30" DIAMETER WETWELL VENT.
4. REMOVE EX. EQUIPMENT REMOVAL HATCH. SEE STRUCTURAL DETAILS.

**SURVEY CONTROLS**

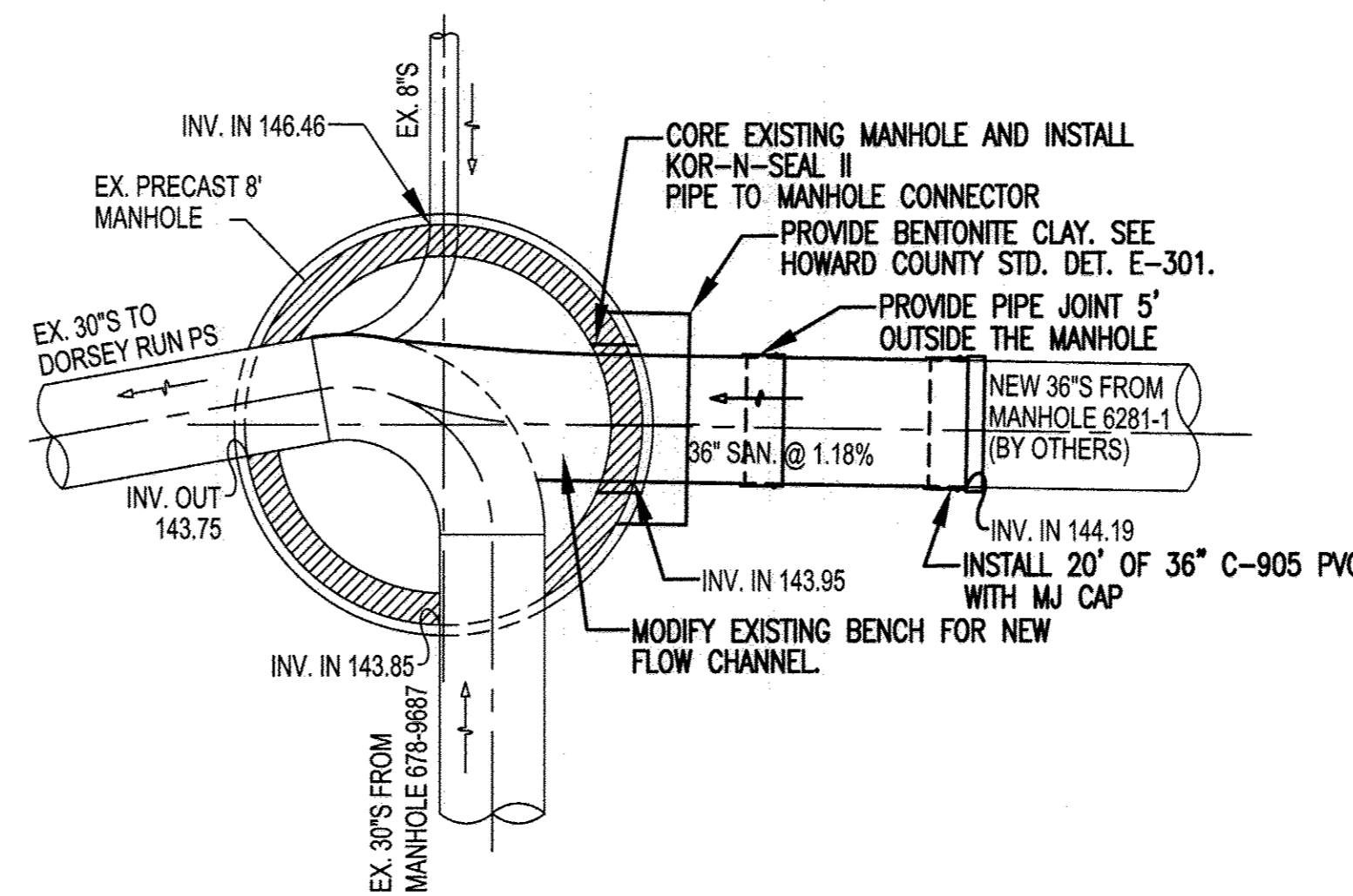
POINT	DESC.	NORTHING	EASTING	ELEV.
DG04	BENCHMARK	538,737.10	1,372,858.45	174.38
WP 1	SEWER CAP	538,801.63	1,372,992.79	-



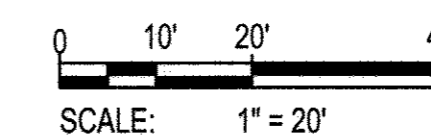
**SITE PLAN**  
SCALE: 1" = 20'

**(X) CONSTRUCTION NOTES:**

1. EXPAND PUMP STATION ACCESS DRIVE 22 FT. USING PAVING SECTION P-2. SEE HOWARD COUNTY STD. DET. R-2.01.
2. EXTEND EXISTING ACCESS ROAD 5 FT. USING PAVING SECTION P-2. SEE HOWARD COUNTY STD. DET. R-2.01.
3. EXISTING BYPASS VAULT IMPROVEMENTS. SEE MECHANICAL FOR DETAILS.
4. INSTALL 30" DIAMETER FRP WETWELL VENT. SEE MECHANICAL FOR DETAILS.
5. PROPOSED SEWER BY OTHERS.
6. POTENTIAL BYPASS PUMPING STAGING AREA.
7. INSTALL SILT FENCE. SEE MDE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL STD. DET. E-1.
8. CORE EXISTING MANHOLE AND MODIFY EXISTING CHANNEL FOR NEW 36" CONNECTION. SEE DET. THIS DWG.
9. INSTALL 20' OF 36" C-905 PVC WITH MJ CAP FOR FUTURE CONNECTION BY OTHERS. PROVIDE CERTIFIED SURVEY OF INVERTS.
10. PROVIDE 16'x60' PAVING EXTENSION FOR ACCESS AROUND GENERATOR USING PAVING SECTION P-2. SEE HOWARD COUNTY STD. DET. R-2.01.
11. RESTORE THE PAVEMENT DISTURBED DURING THE CONNECTION TO THE EXISTING MANHOLE AND INSTALLATION OF SEWER MAIN AS NECESSARY USING PAVING SECTION P-2. SEE HOWARD COUNTY STD. DET. R-2.01.



**EXISTING TIE-IN**  
SCALE: N.T.S.



"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 24478, EXPIRATION DATE: 10/28/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Thomas E. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING

*Chris Bluff* 12/1/17  
CHIEF, BUREAU OF UTILITIES

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

STATE OF MARYLAND  
PROFESSIONAL ENGINEER

DES: FJB			
DRN: GWG			
CHK: WFH			
DATE: NOV. 2017			
BY	NO.	REVISION	DATE

CIVIL DEMOLITION AND SITE PLAN

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

C-2  
SCALE AS SHOWN  
SHEET 3 OF 46



**ARCHITECTURAL - ABBREVIATIONS**

ABV	ABOVE
AC	AIR CONDITIONING (CONDITIONER)
AD	ACCESS DOOR (OR PANEL)
ADA	AAMERICAN WITH DISABILITIES ACT
ADD	ADDENDUM
ADJ	ADJACENT
AES	ABOVE EXISTING SLAB
AF	ACCESS FLOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
ALUM	ALUMINUM
APC	ACOUSTICAL PANEL CEILING (LAY-IN)
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASB	ASBESTOS
ASP	ASPHALT
ATC	ACOUSTICAL TILE CEILING (CONCEALED SUSPENSION)
AWP	ACOUSTICAL WALL PANEL
BB	BULLETIN BOARD (GLASS COVERD)
BC	BOTTOM OF CURB
BD	BOARD
BEN	BENCH
BETW	BETWEEN
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOT	BOTTOM
BR	BRICK
BR/S	BACKER ROD AND SEALANT
C	CONDUIT
C/C	CENTER TO CENTER
CAB	CABINET
CARP	CARPET
CARPT	CARPET TILE
CB	CHALK BOARD
CEM	CEMENT
CER	CERAMIC
CG	CORNER GUARD
CH	CEILING HEIGHT
CI	CAST IRON
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLOS	CLOSET
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEAR OPENING
COL	COLUMN
COMP	COMPACTED
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CONV	CONVECTOR
CR	COLD ROLLED
CSK	COUNTERSUNK
CSPE	CHLOROSULFONATED POLYETHYLENE ELASTOMER
CT	CERAMIC TILE
CTR	COUNTER
CW	COLD WATER
CX	CONNECT TO EXISTING
D	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIR	DIRECTORY
DN	DOWN
DO	DOOR OPENING
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
E	EAST
EA	EACH
EF	EACH FACE
EFS	EXTERIOR FINISH SYSTEM
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EJ	EXPANSION JOINT

**ARCHITECTURAL - ABBREVIATIONS**

EL	ELEVATION
ELEC	ELECTRIC OR ELECTRICAL
ELEV	ELEVATOR
EM	ENTRY MAT
EP	ETHYLENE PROPYLENE-BASED (SINGLE PLY ROOFING)
EPB	ELECTRIC PANEL BOX
EPDM	ETHYLENE-PROPYLENE-DIENE MEMBRANE
EPS	EXPANDED POLYSTYRENE
EPX	EPOXY
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE
EUH	ELECTRIC UNIT HEATER
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EWCA	ELECTRIC WATER COOLER - ACCESSIBLE
EXIST	EXISTING
EXP	EXPANSION OR EXPOSED
EXT	EXTERIOR
F	FILLER
FC	FAN COIL UNIT
FD	FLOOR DRAIN OR FIRE DAMPER
FDR	FOLDING DOOR (WOOD OR FABRIC)
FE	FIRE EXTINGUISHER ON BRACKET
FEC	FIRE EXTINGUISHER CABINET
FH	FLAT HEAD
FIN	FINISH OR FINISHED
FIRE T	FIRE TREATED
FIX	FIXTURE
FL	FLASHING
FLM	FULL LENGTH MIRROR
FLR	FLOOR
FR	FIRE RATED
FRC	FIBER-REINFORCED COATING
FS	FOLDING SHELF
FSS	FOLDING SHOWER SEAT
FT	FOOT OR FEET
FTG	FOOTING
FWP	FABRIC-WRAPPED PANEL (FABRICATED TACKABLE ACOUSTICAL PANEL)
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GEN	GENERAL
GL	GLASS
GLM	GLASS UNIT MASONRY (GLASS BLOCK)
GMU	GLAZED MASONRY UNIT
GP	GYPSTUM PLASTER
GRD	GROUND
GRT	GROUT
GVP	GYPSTUM VENEER PLASTER
GYPB	GYPSTUM BOARD (WALL OR CEILING)
GYPBS	GYPSTUM BOARD SHAFT-WALL ASSEMBLY
H	HEAD
HB	HORIZONTAL BLIND
HDW	HARDWARE
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HOT WATER
ID	INSIDE DIAMETER
IN	INCH
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
J	JAMB
JC	JANITOR'S CLOSET
JT	JOINT
KIT	KITCHEN
L	LINTEL
LAB	LABORATORY
LAV	LAVATORY
LG	LONG
LIN	LINOLEUM FLOOR COVERING
LLV	LONG LEG VERTICAL
LOC	LOCATION

**ARCHITECTURAL - ABBREVIATIONS**

LOCK	LOCKER
LP	LOW POINT
LT	LIGHT
LTG	LIGHTING
LV	LOUVER
M	MIRROR OR MEN
MACH	MACHINE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MC	MEDICINE CABINET
MDF	MEDIUM DENSITY FIBERBOARD
MECH	MECHANICAL
MET	METAL
MFB	MINERAL FIBER BLANKET
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MK	MARK
MO	MASONRY OPENING
MP	METAL PANEL
MR	MOP RACK
MTD	MOUNTED
MTL	METAL
N	NORTH
NA	NOT APPLICABLE
ND	SANITARY NAPKIN DISPENSER
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFF	OFFICE
OH	OVERHEAD COILING DOOR
OHG	OVERHEAD COILING GRILLE
OP	OPERABLE PANEL PARTITION (HUNG FROM OVERHEAD TRACK)
OPNG	OPENING
OPP	OPPOSITE
OZ	OUNCE
PAV	PAVER TILE
PC	PIECE
PF	PLASTIC FABRICATION
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PREFAB	PREFABRICATED
PREST	PRESSURE TREATED
PT	PAINT
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
QTY	QUANTITY
R	RISER OR RADIUS
RB	RESILIENT WALL BASE AND ACCESSORIES (VINYL BASE RUBBER BASE TREADS NOSINGS EDGINGS)
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN OR ROUND
REBAR	REINFORCING BAR
REINF	REINFORCED OR REINFORCING
REQ	REQUIRED
REQ'D	REQUIRED
RESF	RESINOUS FLOORING
RET	RETURN
REV	REVISION
RF	RESILIENT FLOORING (VINYL RUBBER VINYL COMPOSITION SHEET FLOORING)
RH	ROBE HOOK
RM	ROOM
RO	ROUGH OPENING
RV	ROOF VENT
RWR	RECESSED WASTE RECEPTACLE
RX	REMOVE EXISTING
S	SILL, SOUTH OR SINGLE
SC	SPECIAL COATING (OTHER THAN PAINT SYSTEMS)
SCH	SCHEDULE OR SCHEDULED
SCR	SHOWER CURTAIN ROD
SD	SOAP DISPENSER OR STORM DRAIN
SECT	SECTION
SF	SQUARE FOOT

**ARCHITECTURAL - ABBREVIATIONS**

SFT	STRUCTURAL FACING TILE
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SJ	STEEL JOIST
SND	SANITARY NAPKIN DISPOSAL
SOD	SECTIONAL OVERHEAD DOOR (STEEL ALUMINUM PLASTIC PANEL)
SP	STAND PIPE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL OR SERVICE SINK
SSM	SOLID SURFACING MATERIAL
STAT	STATIONARY
STL	STEEL
STRUCT	STRUCTURAL OR STRUCTURE
SUSP	SUSPENDED
SWR	SURFACE-MOUNTED WASTE RECEPTACLE
SYS	SYSTEM
T	TILE
T&B	TOP & BOTTOM
T&G	TONGUE & GROOVE
TC	TOP OF CURB
TCD	TOILET SEAT COVER DISPENSER
TEL	TELEPHONE
TER	TERRAZZO
TH	THICK
TO	TOP OF
TOB	TOWEL BAR
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TOILET PARTITION (WATER CLOSET URINAL SHOWER SCREEN)
TPD	TOILET PAPER DISPENSER
TR	TREAD
TYP	TYPICAL
U	UNIT
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
V	VENT
VB	VERTICAL BLIND
VDB	VISUAL DISPLAY BOARD (HINGED CONFERENCE UNIT)
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VP	VAPOR BARRIER
VS	VERTICAL STANDPIPE
W	WOMEN, WIDTH, WEST OR WOVEN
W/	WITH
WC	WATER CLOSET OR WALL COVERING (VINYL OR TEXTILE WALL COVERING WALL PAPER)
WD	WOOD
WH	WEEP HOLE
WHT	WHITE
WO	WINDOW OPENING
WP	WATERPROOF OR WORKING POINT
WR	WATER RESISTANT OR WASTE RECEPTACLE
WT	WEIGHT
WWF	WOVEN WIRE FABRIC
YD	YARD
YR	YEAR

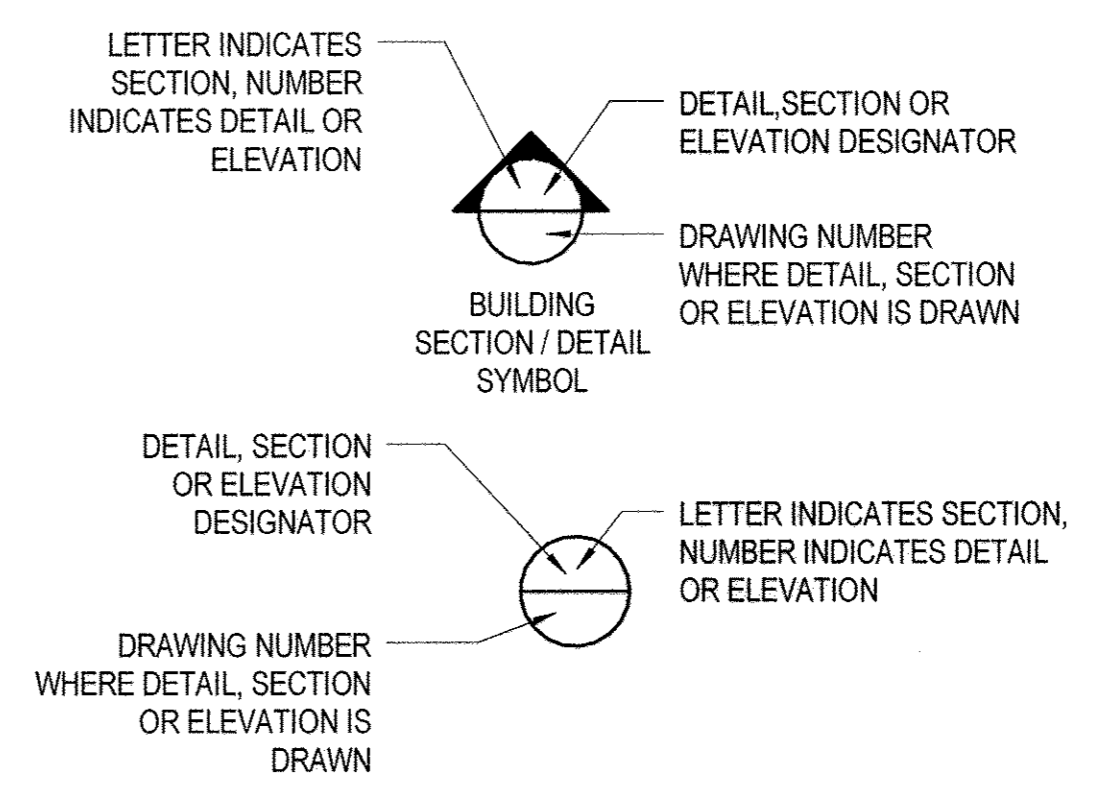
**MATERIALS LEGEND**

	BRICK		EXISTING CONSTRUCTION TO REMAIN
	CONCRETE MASONRY UNITS		EXISTING CONSTRUCTION TO BE REMOVED AND DISPOSED OF
	STRUCTURAL CLAY UNITS		NEW CONSTRUCTION
	GYPSTUM BOARD PARTITIONS		CENTERLINE
	WOOD-FINISH GRADE		CENTERLINE
	WOOD BLOCKING		CENTERLINE
	RIGID WALL/ PERIMETER INSULATION		BULKHEAD OR BEYOND
	RIGID ROOF INSULATION		
	BATT INSULATION		
	CONCRETE		
	POROUS FILL		
	EARTH		
	METAL PATTERN		

**SYMBOLS LEGEND**

	DOOR NUMBER SYMBOL
	LOUVER NUMBER SYMBOL
	WINDOW NUMBER SYMBOL
	ROOM NAME
	ROOM NUMBER SYMBOL
	WALL SECTION SYMBOL
	BUILDING SECTION SYMBOL
	SHEET KEYNOTE - DEMOLITION
	SHEET KEYNOTE - NEW CONSTRUCTION
	REVISION
	NORTH ARROW (CONSTRUCTION NORTH)
	PARTITION TYPE DESIGNATOR
	PARTITION TYPE VARIANT
	PARTITION TYPE
	RATING OF WALL NUMBER DESIGNATES HOUR
	View Name TITLE SYMBOL
	View Name TITLE AND DETAIL REFERENCE SYMBOL

**TITLE AND SECTION / DETAIL REFERENCE SYMBOL**



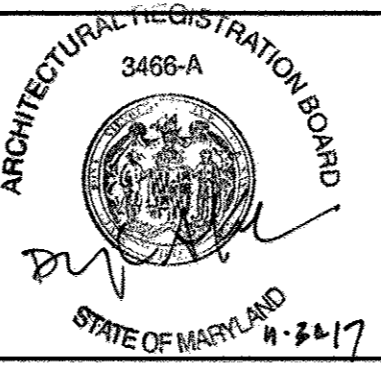
"PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 3466-A, EXPIRATION DATE: 11/24/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Thomas E. Butler* 12/16/17  
CHIEF, BUREAU OF ENGINEERING

*Thomas E. Butler* 12/16/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: RK	
DRN: NLE	
CHK: DAK	
DATE: NOV. 2017	
BY	NO.
REVISIONS	DATE

LEGEND, ABBREVIATIONS AND NOTES

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

A-1

SCALE AS SHOWN

SHEET 4 OF 46

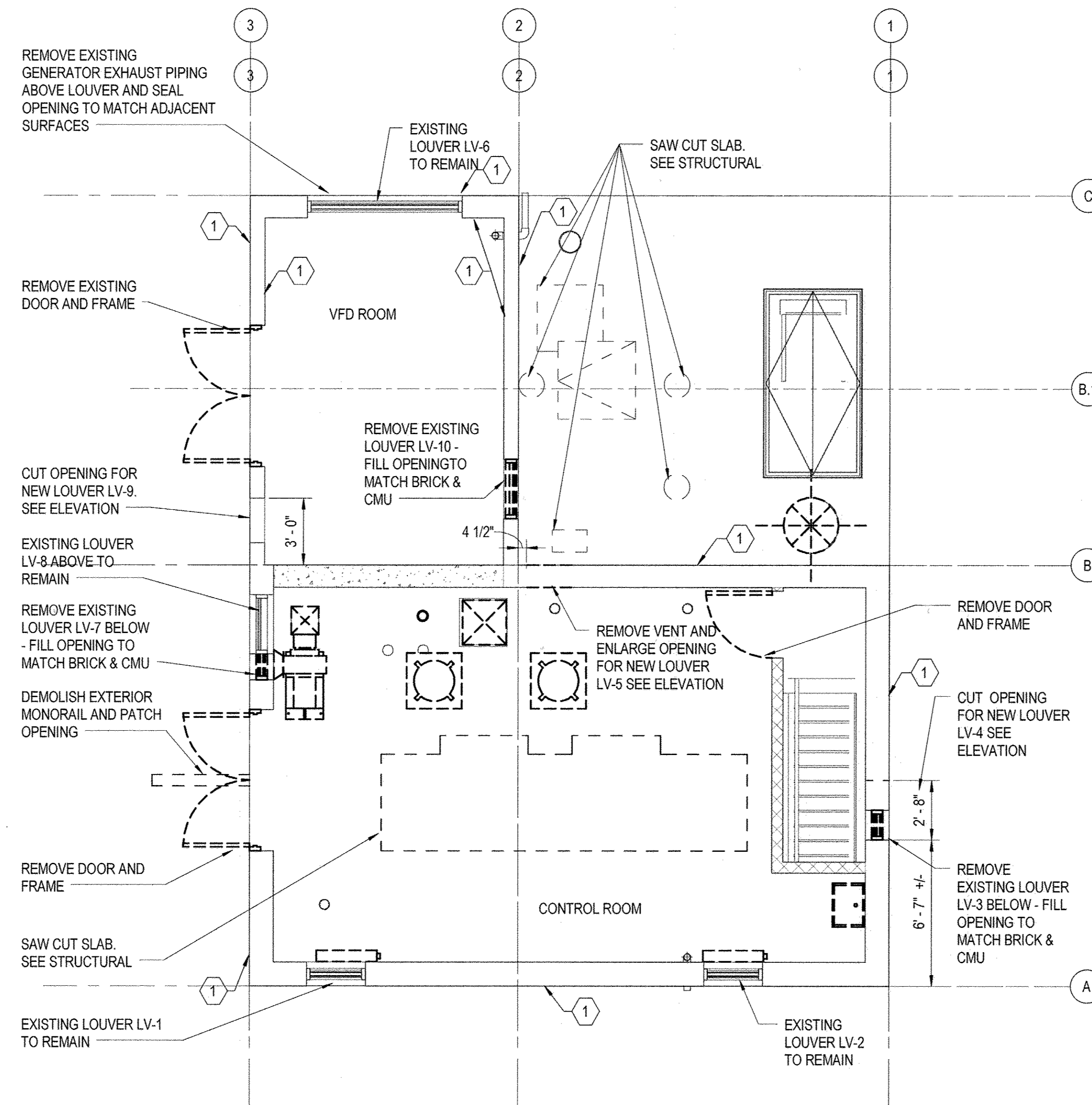
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**SHEET KEYNOTES**

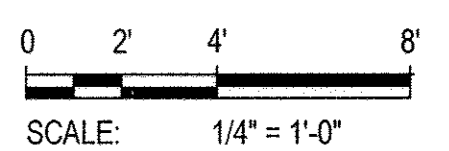
① WASH WALLS BOTH INTERIOR AND EXTERIOR, AND INTERIOR FLOOR, WITH A HOT WATER AND DETERGENT SOLUTION AND A MANUAL SCRUB BRUSH. RINSE WITH CLEAN WATER AND LET DRY.

**LEGEND**

--- WORK TO BE REMOVED, LIMIT OF DEMOLITION



① 1ST FLOOR DEMOLITION PLAN @ EL. 172'-0"   
 SCALE: 1/4" = 1'-0"  
 REF: A-5



A-2

"PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 3466-A, EXPIRATION DATE: 11/24/2019."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 [Signatures and dates for Director and Chief of Utility Design Division]

**WRA**  
 Whitman, Reardon & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231



DES: RK	BY	NO.	REVISIONS	DATE
DRN: NLE				
CHK: DAK				
DATE: NOV. 2017				

FIRST FLOOR DEMOLITION PLAN

DORSEY RUN WASTEWATER PUMPING STATION  
 UPGRADES  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996  
 ELECTION DISTRICT 6  
 HOWARD COUNTY, MARYLAND

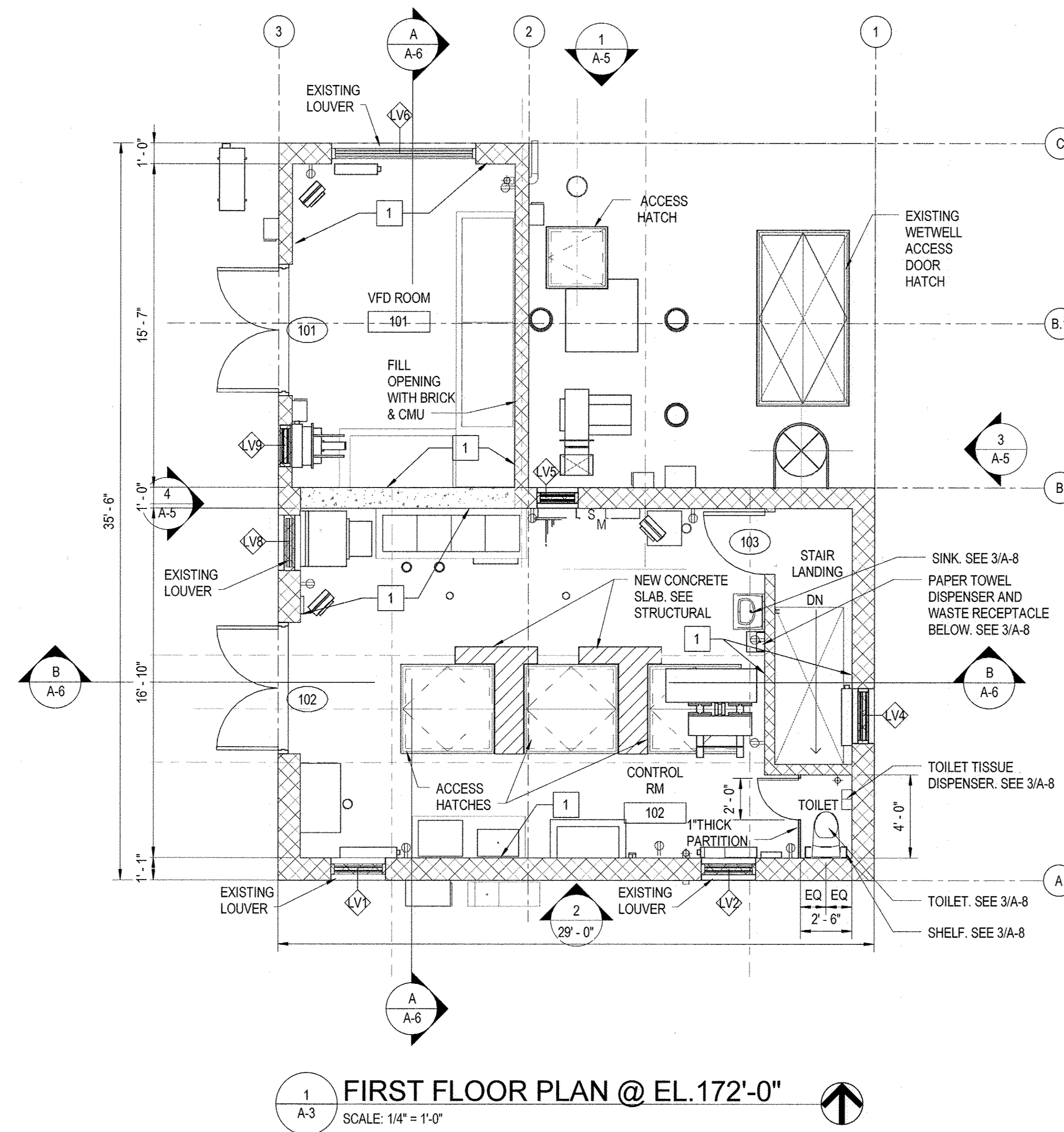
SCALE AS SHOWN  
 SHEET 5 OF 46

11/30/2017 2:26:47 PM



SHEET KEYNOTES

1 PAINT WALLS ONLY



1 FIRST FLOOR PLAN @ EL. 172'-0"  
A-3 SCALE: 1/4" = 1'-0"



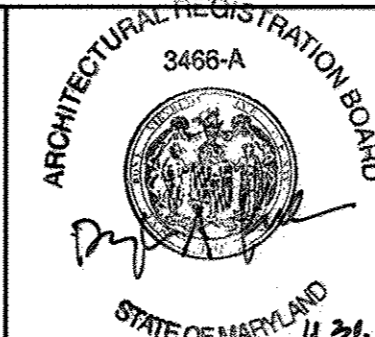
"PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 3466-A, EXPIRATION DATE: 11/24/2019."

11/30/2017 2:26:48 PM

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HOWARD COUNTY, MARYLAND.

*[Signatures]*  
DIRECTOR OF PUBLIC WORKS DATE: 12/1/17  
CHIEF, BUREAU OF ENGINEERING DATE: 12/1/17  
CHIEF, UTILITY DESIGN DIVISION DATE: 12/4/17

**WRA**  
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801 South Caroline Street, Baltimore, Maryland 21231



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DATE: NOV. 2017	BY	NO.	REVISIONS	DATE

FIRST FLOOR PLAN

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

A-3

SCALE AS SHOWN

SHEET

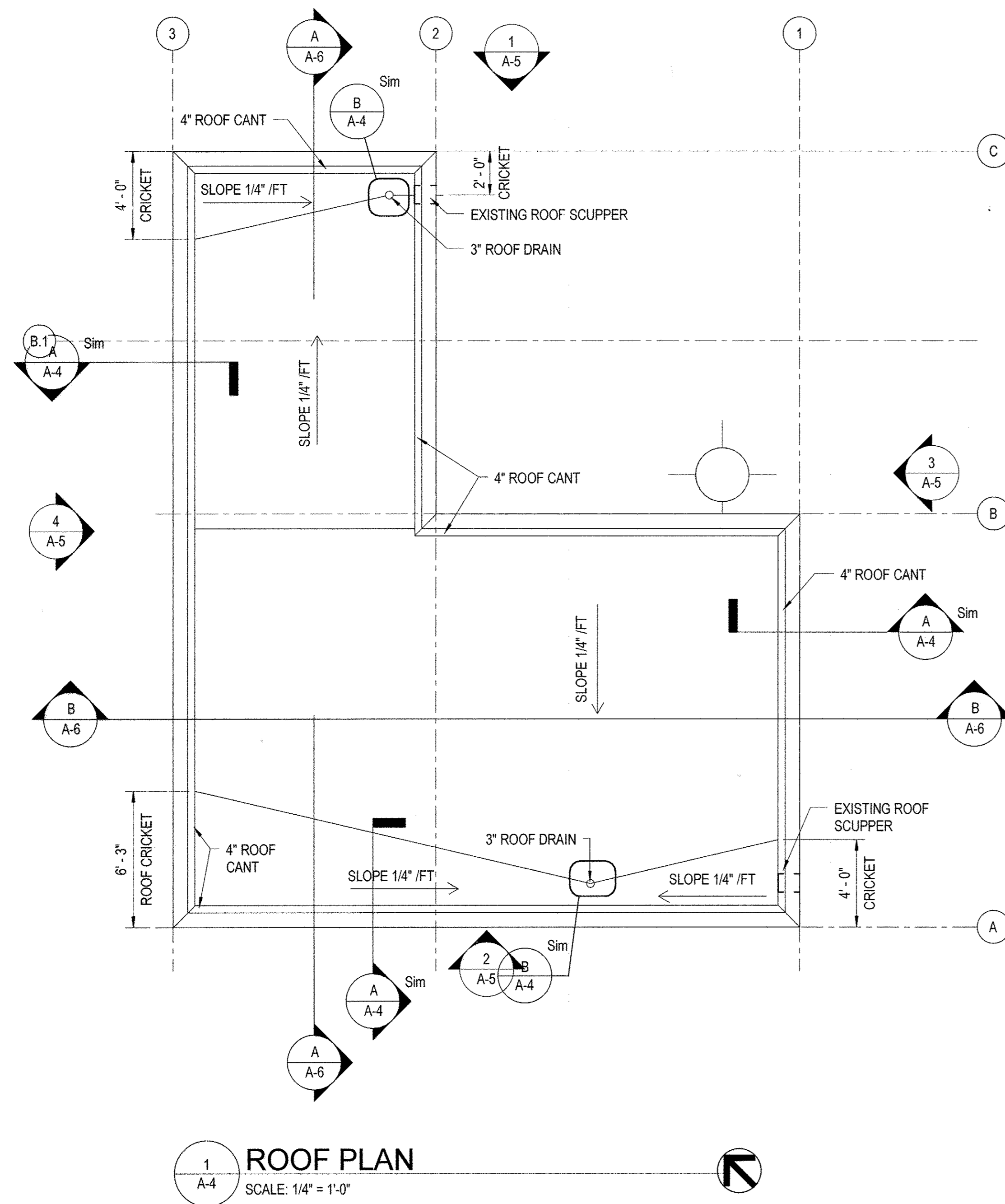
6 OF 46

**GENERAL SHEET NOTES**

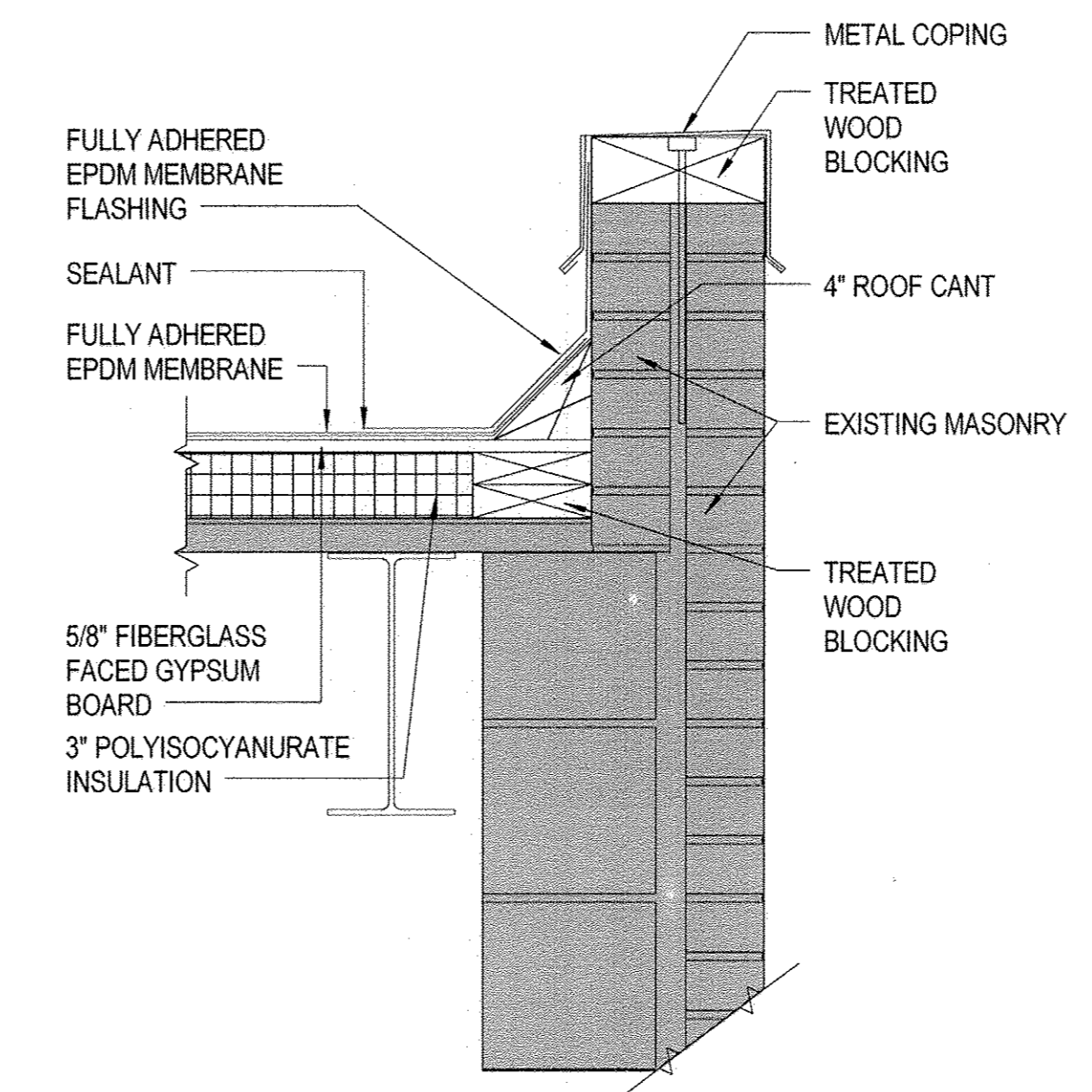
1. REMOVE AND DISPOSE EXISTING EPDM ROOF MEMBRANE, ROOF INSULATION AND BLOCKING. REMOVE AND DISPOSE EXISTING ALUMINUM COPING COVER.
2. PROVIDE NEW BLOCKING, 3 INCH POLYISOCYANURATE INSULATION, 5/8 INCH FIBERGLASS FACED GYPSUM BOARD (DENS-DECK), AND 60 MIL, FULLY ADHERED EPDM MEMBRANE. RE-USE EXISTING ROOF DRAINS AND DRAINAGE PIPE. EXISTING ROOF STRUCTURE AND DECK ARE BELIEVED TO SLOPE AT 2 PERCENT. PROVIDE CRICKETING TO DIRECT WATER TO DRAINS.
3. PROVIDE NEW FLASHING BOOTS FOR ANY PIPES PENETRATING THE ROOF SURFACE.
4. PROVIDE NEW BLOCKING AND COPING COVER TO MATCH EXISTING. IF BLOCKING IS SOUND AND COUNTY REPRESENTATIVE CONCURS, BLOCKING MAY BE MAINTAINED AND A CREDIT GIVEN BACK TO THE OWNER.

**LEGEND**

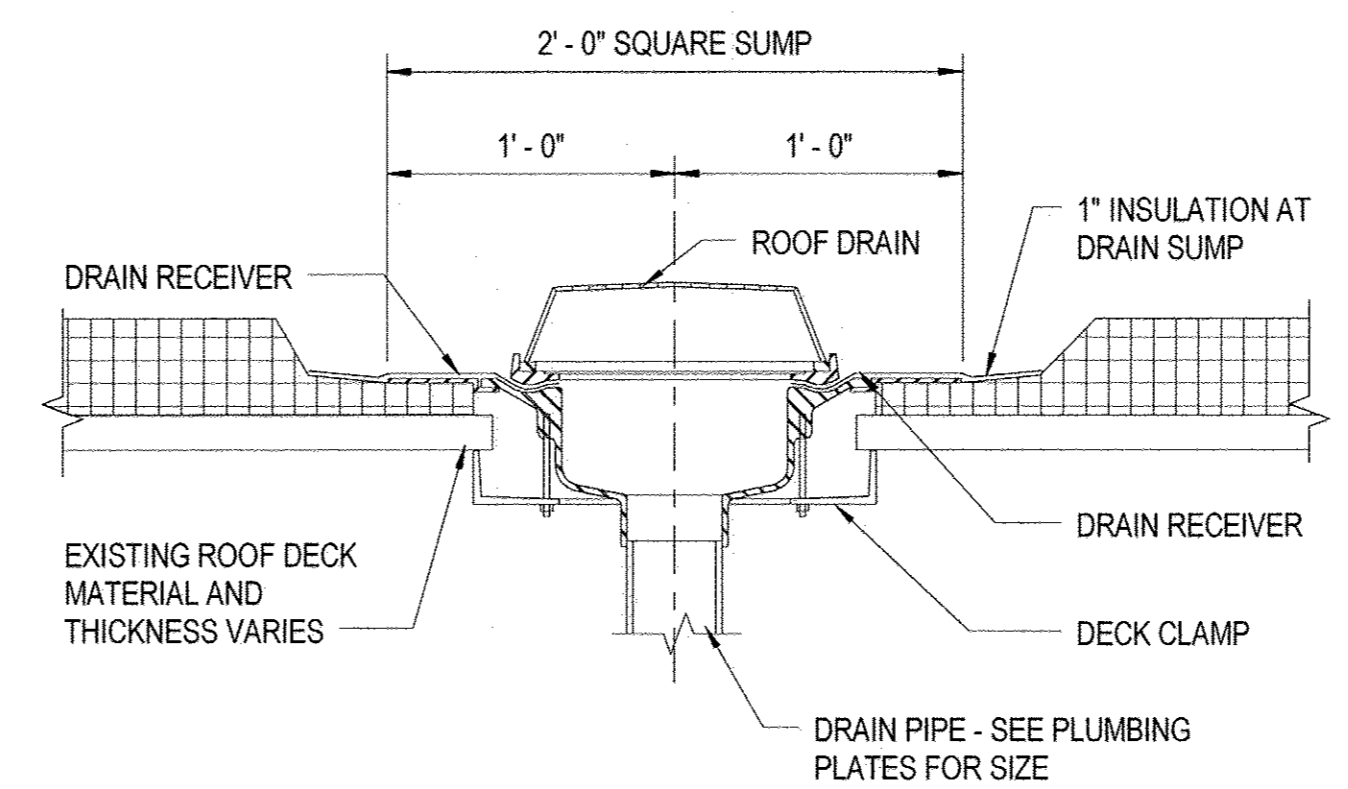
 EXISTING CONSTRUCTION TO REMAIN



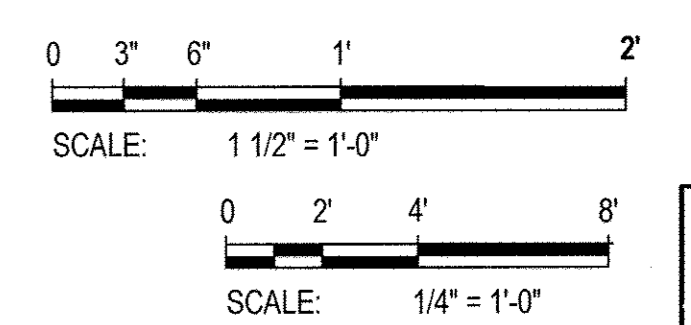
**1 ROOF PLAN**  
SCALE: 1/4" = 1'-0"



**A ROOF PARAPET SECTION**  
SCALE: 1 1/2" = 1'-0"  
REF: A-4



**B ROOF DRAIN DETAIL**  
SCALE: 1 1/2" = 1'-0"  
REF: A-4

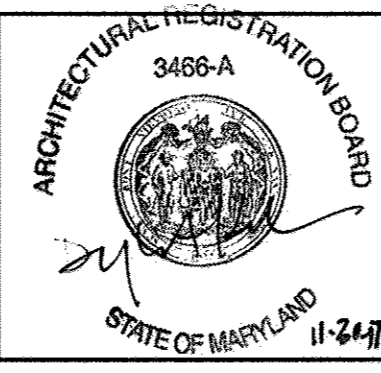


"PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 3466-A, EXPIRATION DATE: 11/24/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James E. Butler* 12/17/17  
CHIEF, BUREAU OF ENGINEERING

*Whitman, Requardt & Associates, LLP*  
801 South Caroline Street, Baltimore, Maryland 21231



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CHK: DAK				
DATE: NOV. 2017				

ROOF PLAN

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

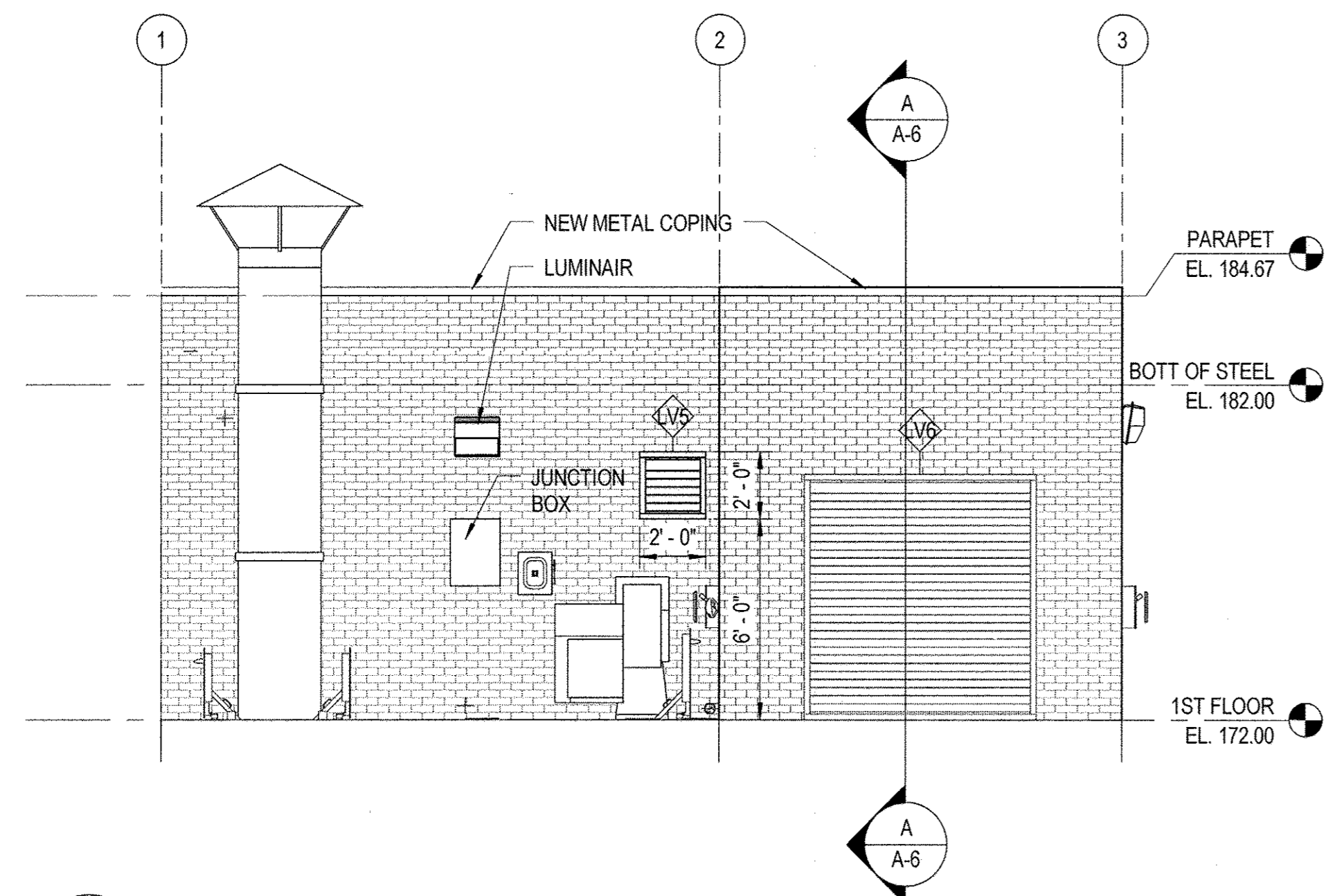
**A-4**

SCALE AS SHOWN

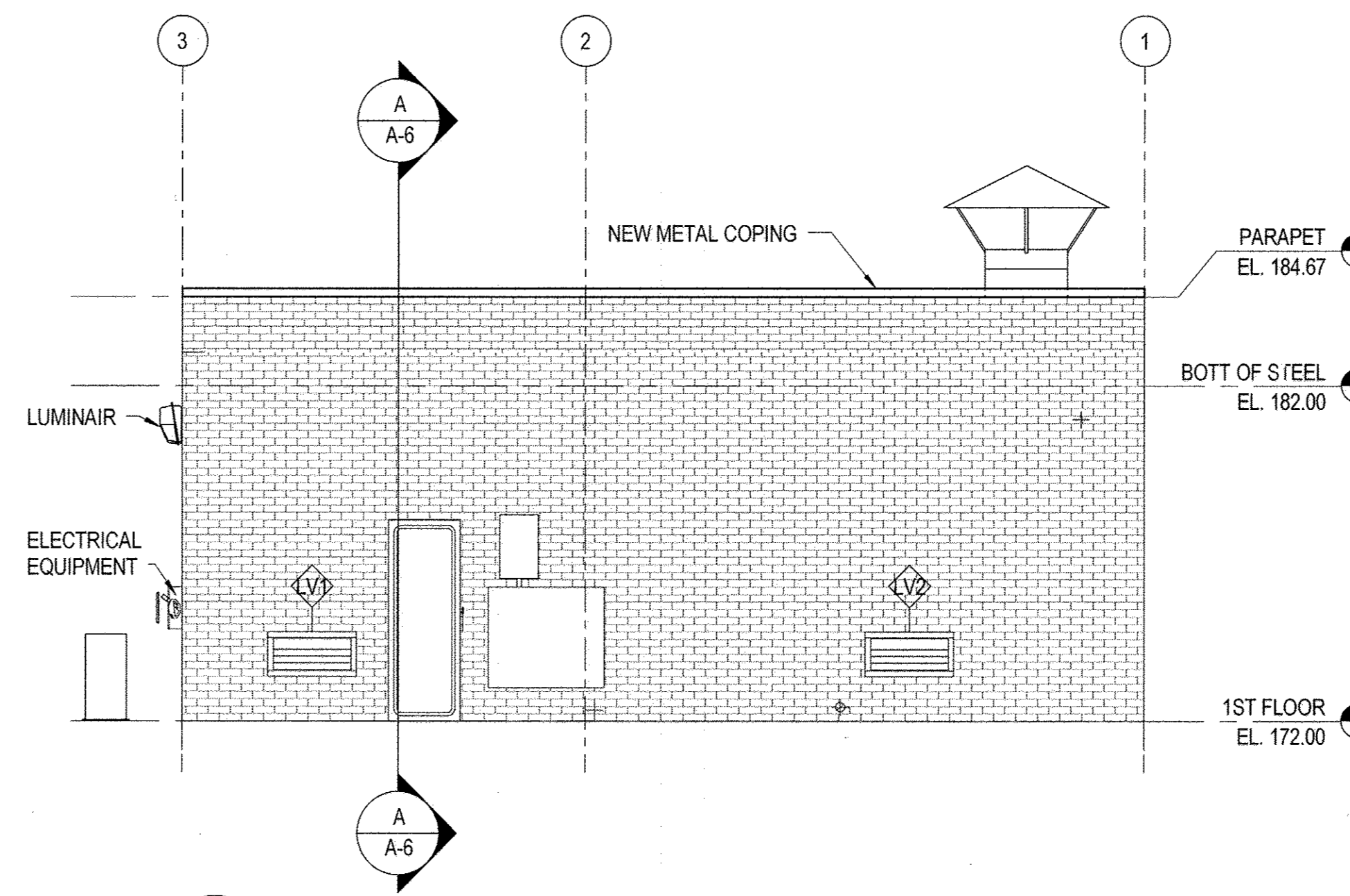
SHEET 7 OF 46

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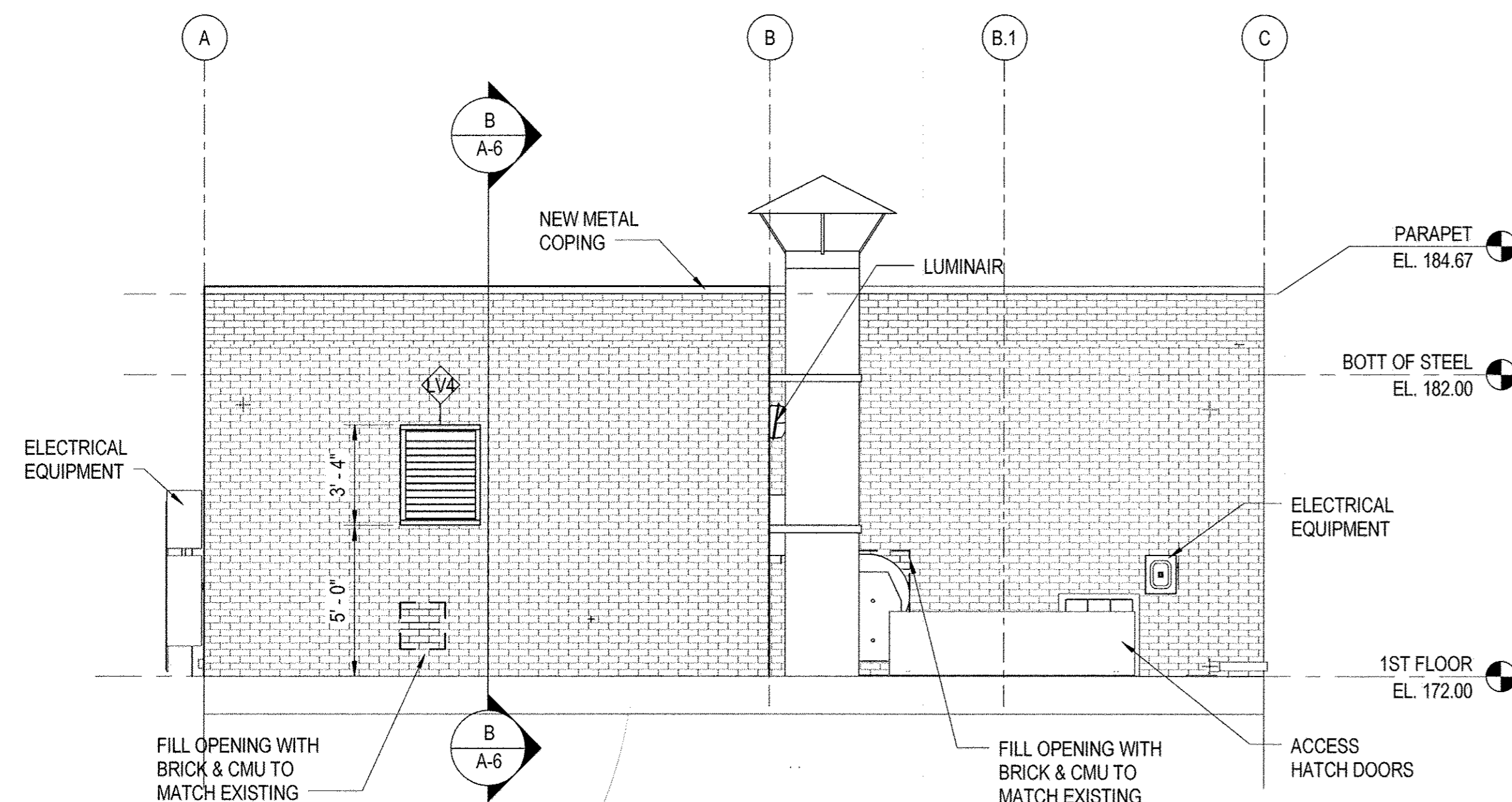




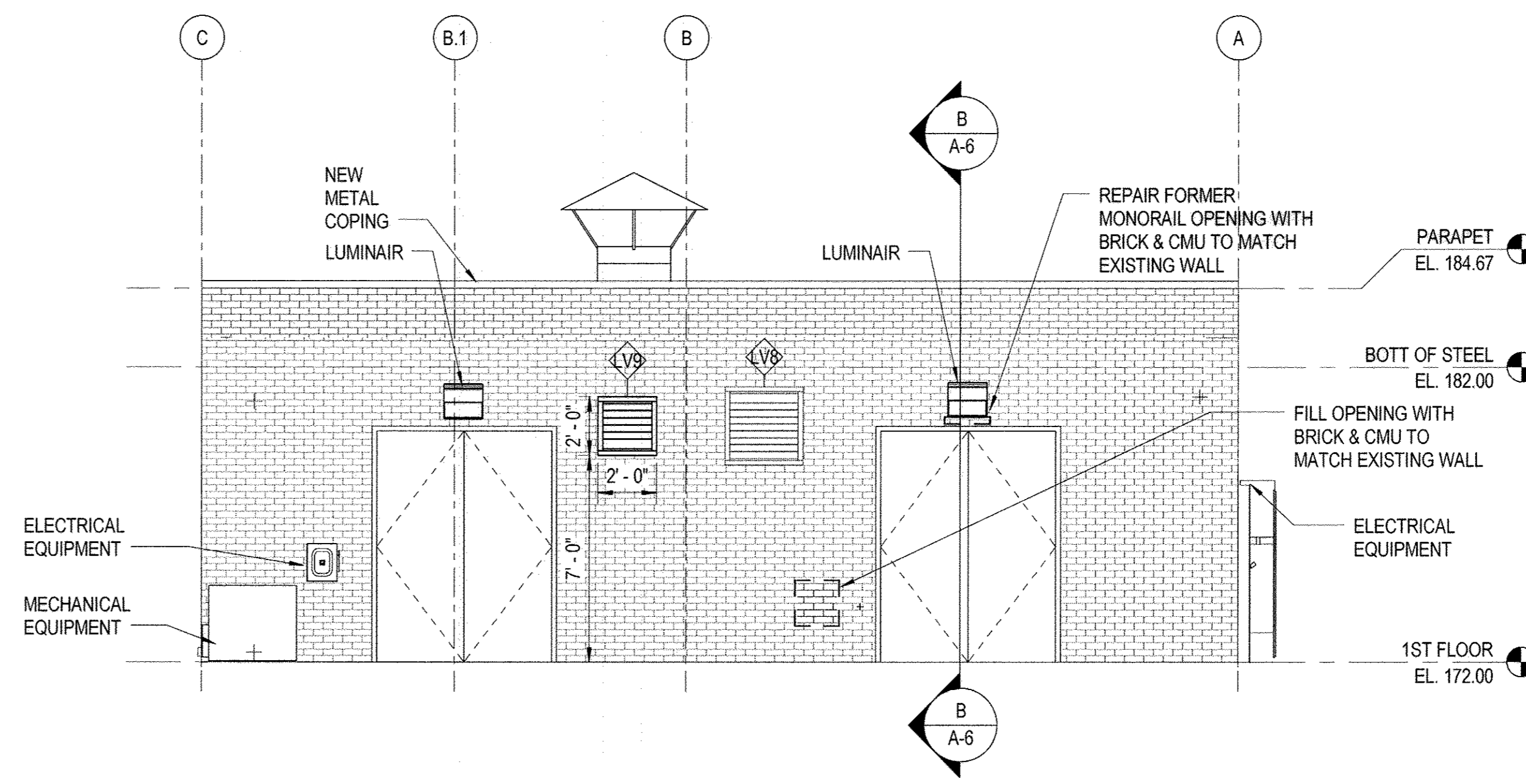
1 NORTH ELEVATION  
A-5  
SCALE: 1/4" = 1'-0"  
REF: A-3



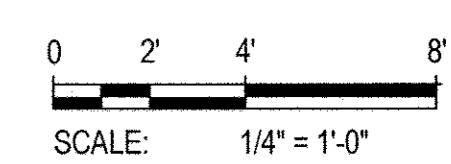
2 SOUTH ELEVATION  
A-5  
SCALE: 1/4" = 1'-0"  
REF: A-3



3 EAST ELEVATION  
A-5  
SCALE: 1/4" = 1'-0"  
REF: A-3



4 WEST ELEVATION  
A-5  
SCALE: 1/4" = 1'-0"  
REF: A-3



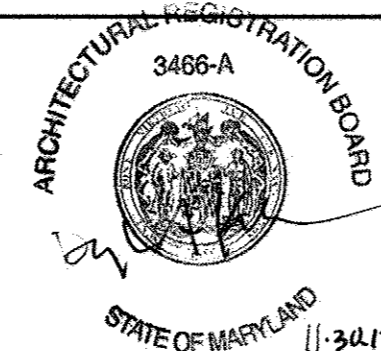
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James M. ...* 12/14/17  
DIRECTOR OF PUBLIC WORKS  
*Thomas E. ...* 12/14/17  
CHIEF BUREAU OF ENGINEERING  
*...* 12-14-17  
CHIEF, BUREAU OF UTILITIES  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: RK			
DRN: NLE			
CHK: DAK			
DATE: NOV. 2017			
BY	NO.	REVISIONS	DATE

BUILDING ELEVATIONS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

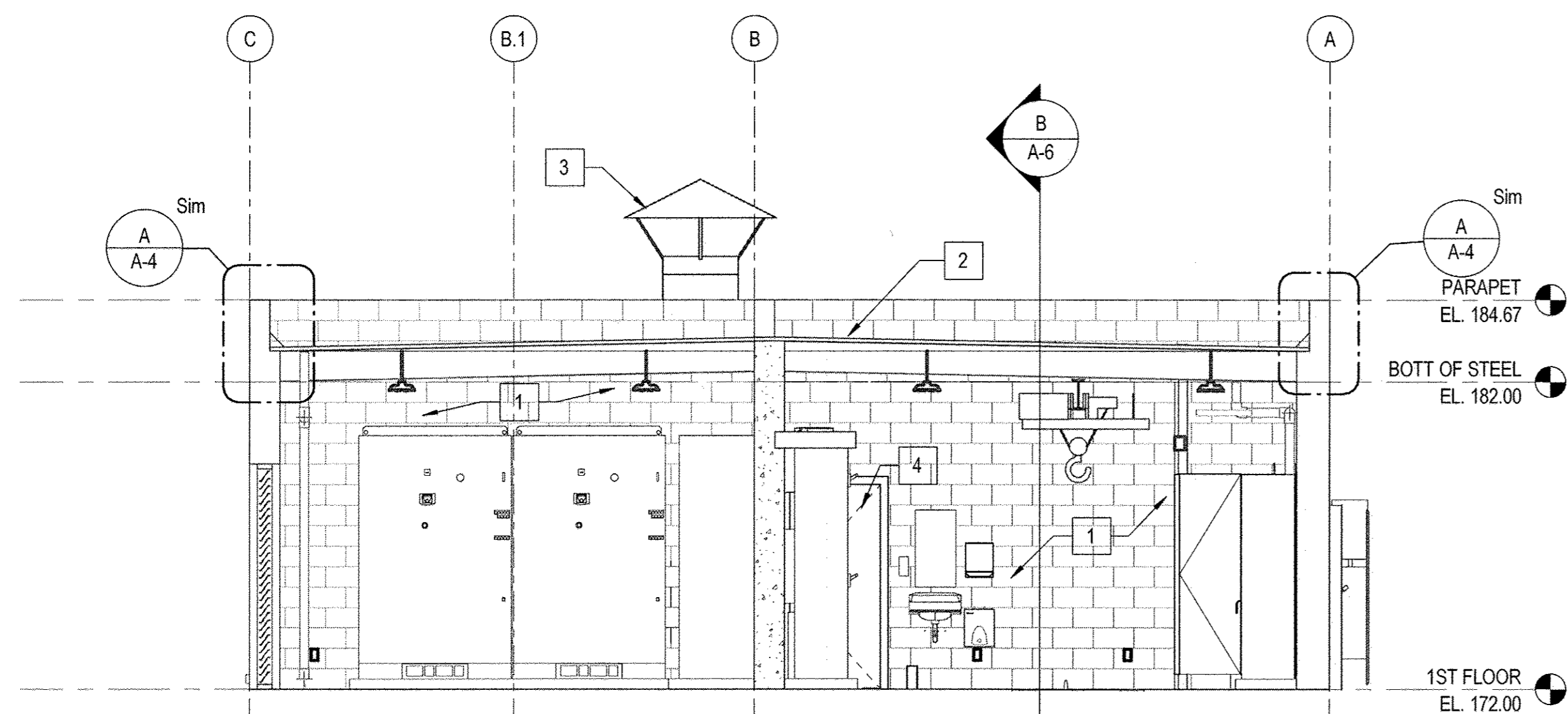
ELECTION DISTRICT 6 HOWARD COUNTY, MARYLAND

A-5  
SCALE AS SHOWN  
SHEET 8 OF 46

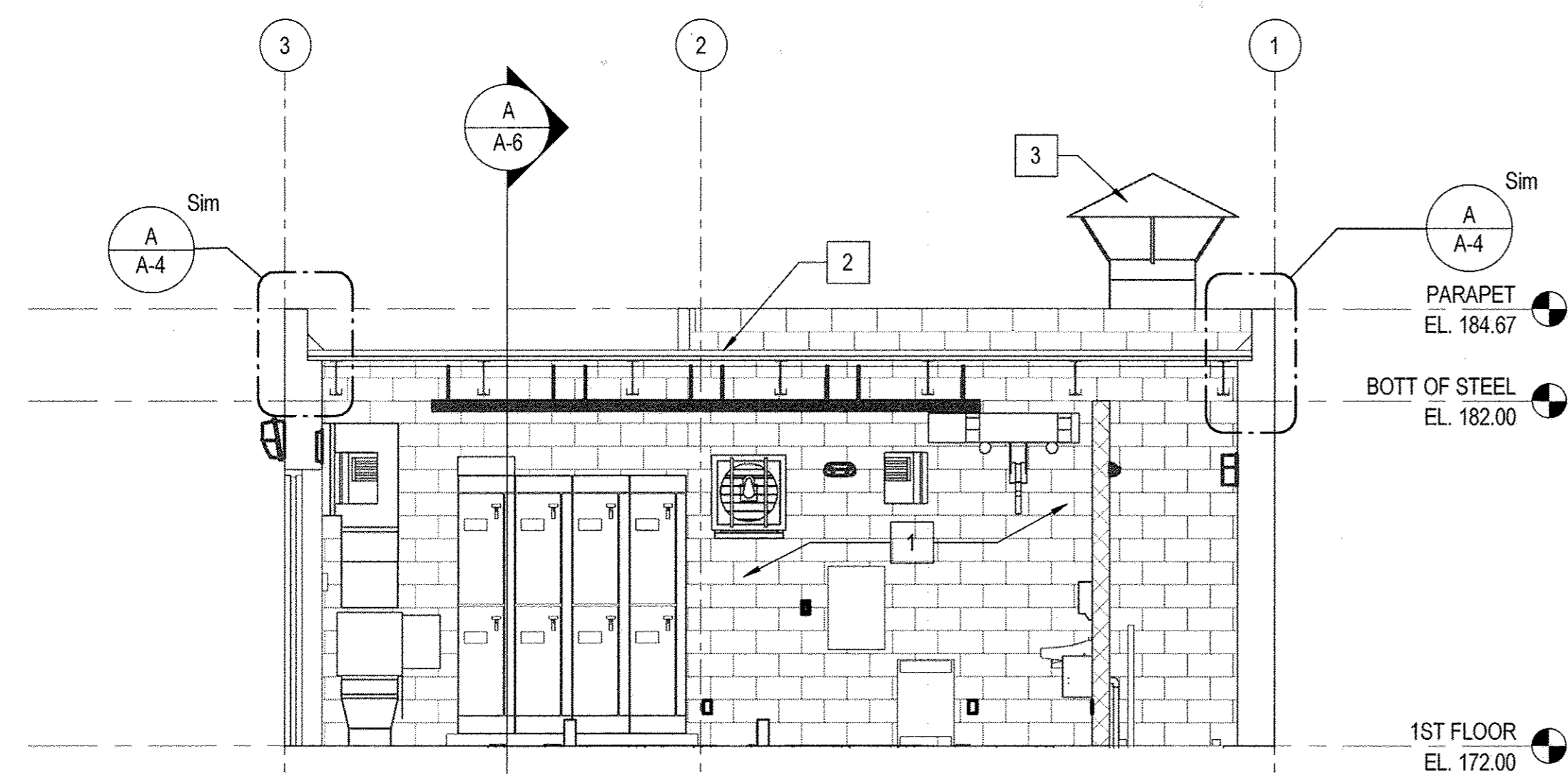


**SHEET KEYNOTES**

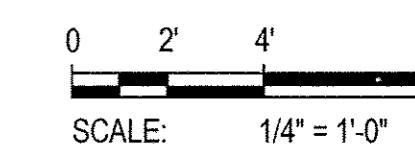
- 1 CLEAN EXISTING WALLS AND FLOORS. WASH WALLS WITH HOT WATER AND DETERGENT AND RINSE THOROUGHLY. PAINT WALLS.
- 2 REMOVE AND DISPOSE EXISTING ROOFING AND INSULATION. PROVIDE NEW ROOF INSULATION AND EPDM MEMBRANE.
- 3 VENTILATOR STACK
- 4 REMOVE EXISTING DOOR AND FRAME. PROVIDE NEW FIBERGLASS DOOR, FRAME AND HARDWARE.



**SECTION A - A**  
SCALE: 1/4" = 1'-0"  
REF: A-3



**SECTION B - B**  
SCALE: 1/4" = 1'-0"  
REF: A-3



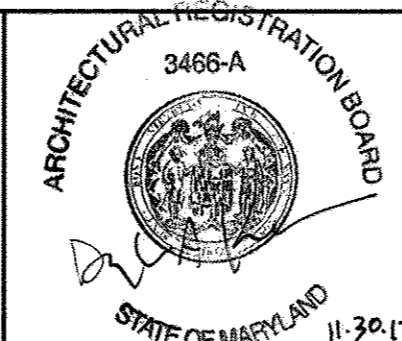
"PROFESSIONAL CERTIFICATION. I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 3466-A, EXPIRATION DATE: 11/24/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James E. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING  
DATE

*Thomas E. Butler* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION  
DATE

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: RK					
DRN: NLE					
CHK: DAK					
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE	

BUILDING SECTIONS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

A-6

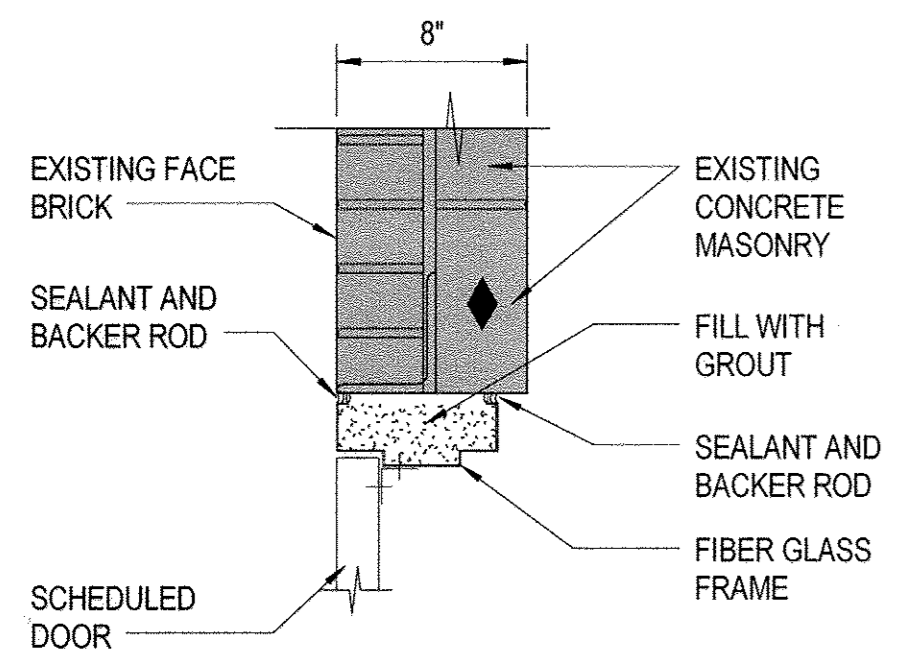
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SHEET 9 OF 46

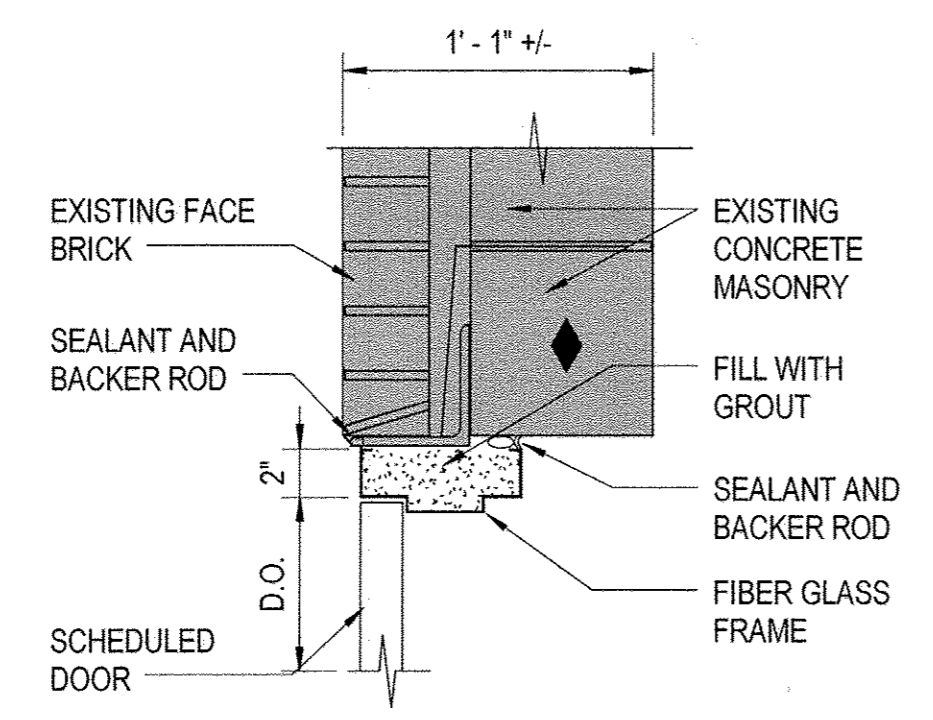
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ARCHITECTURAL - DOOR SCHEDULE

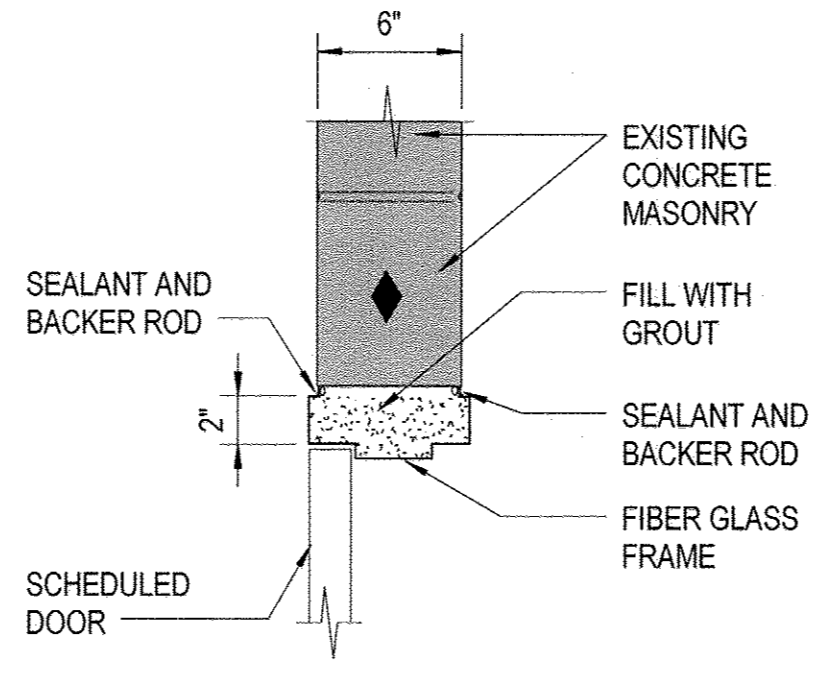
DOOR NUMBER	DOOR				FRAMES							FIRE RATING	LINTEL	COMMENTS	FINISH	
	WIDTH	HEIGHT	ROOM NAME	TYPE	TYPE	MATERIAL	HEAD	JAMB	SILL	DOOR	FRAME					
101	6' - 0"	7' - 10"	VFD ROOM	B	FIBER GLASS	F-2	FIBER GLASS	H-1	J-1	S-1	-	EXISTING			MFR	MFR
102	6' - 0"	7' - 10"	CONTROL RM	B	FIBER GLASS	F-2	FIBER GLASS	H-2	J-2	S-1	-	EXISTING			MFR	MFR
103	3' - 0"	6' - 8"	CONTROL RM	A	FIBER GLASS	F-1	FIBER GLASS	H-3	J-3	S-2	-	EXISTING			MFR	MFR
*	2' - 0"	6' - 6"	CONTROL RM	-										TOILET PARTITION DOOR		



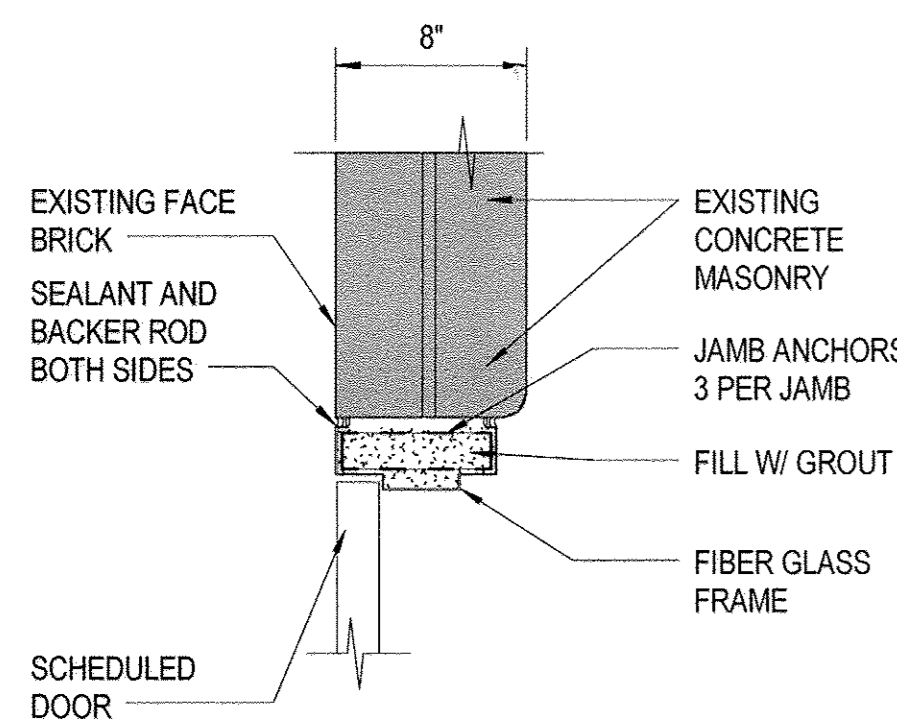
HEADER H-1



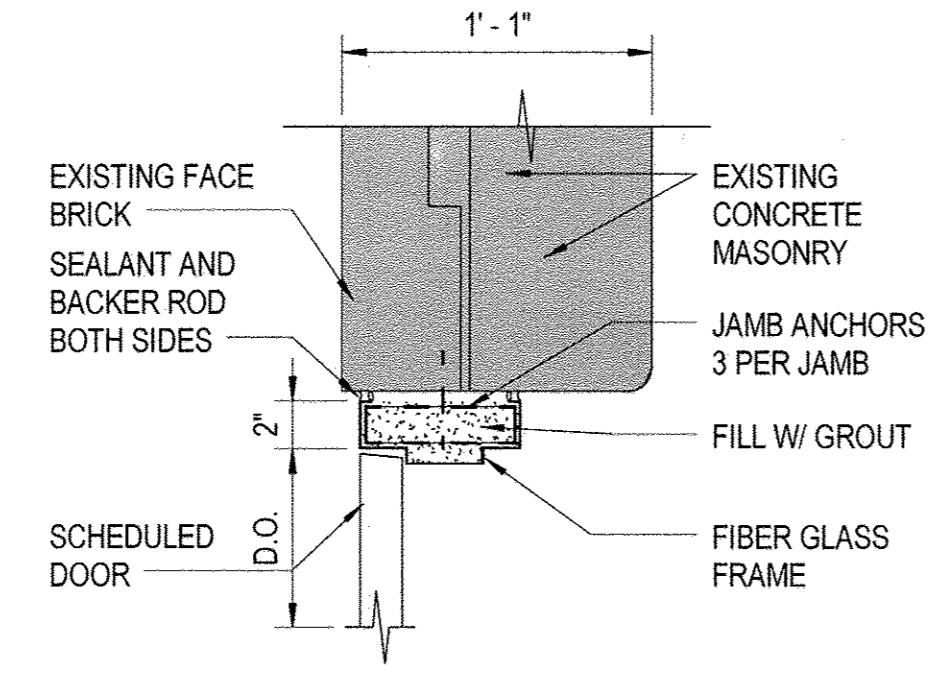
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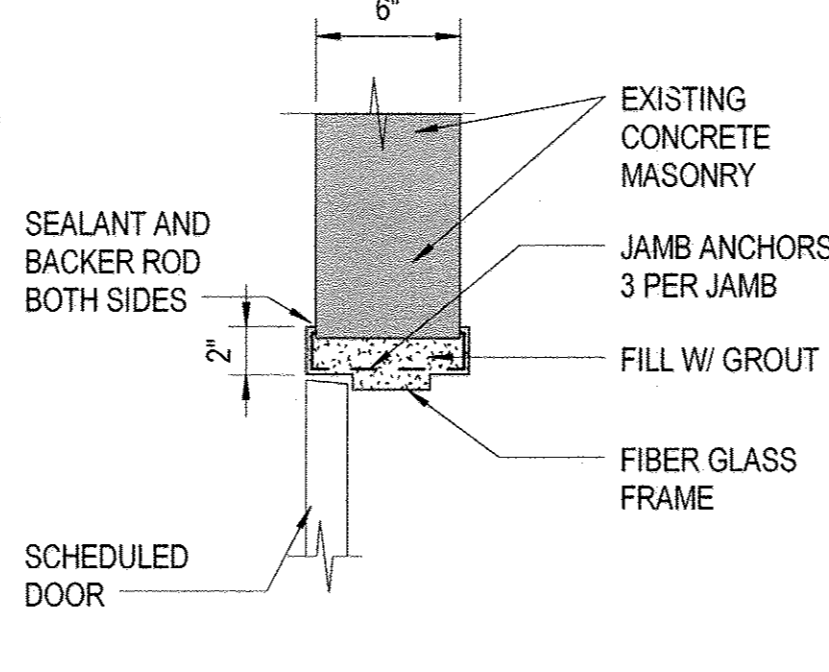
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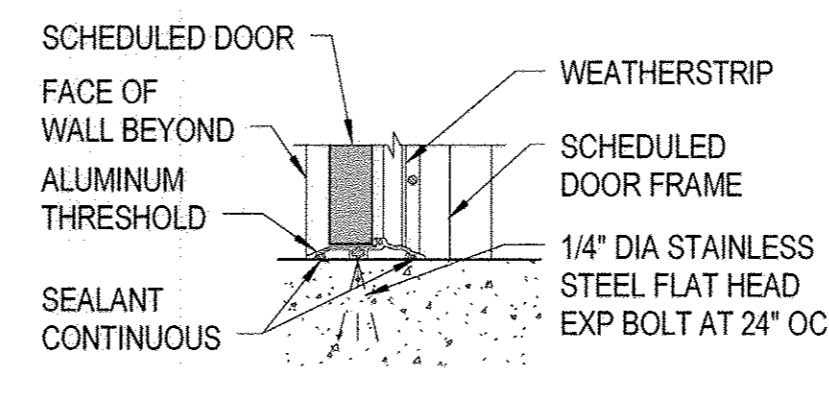
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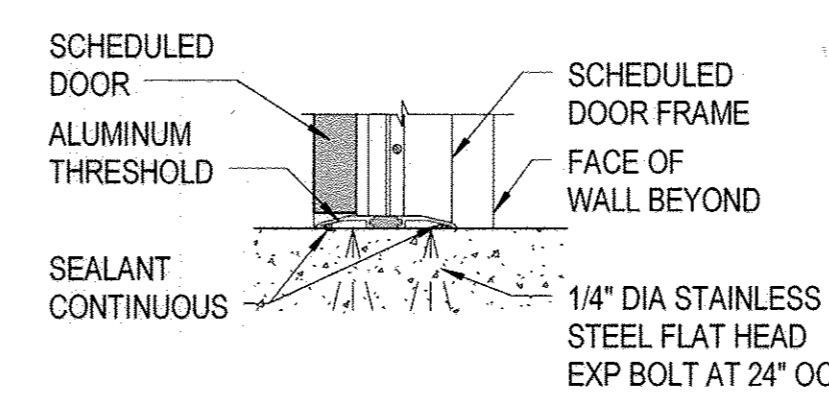
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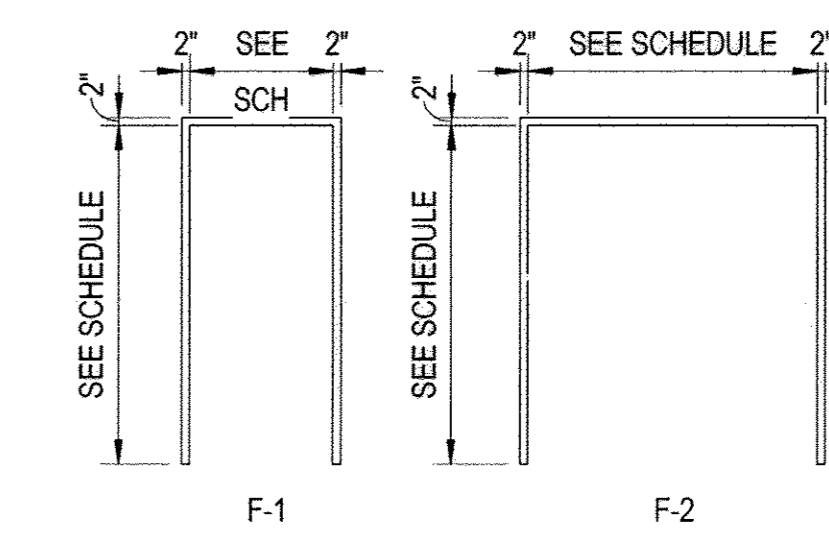
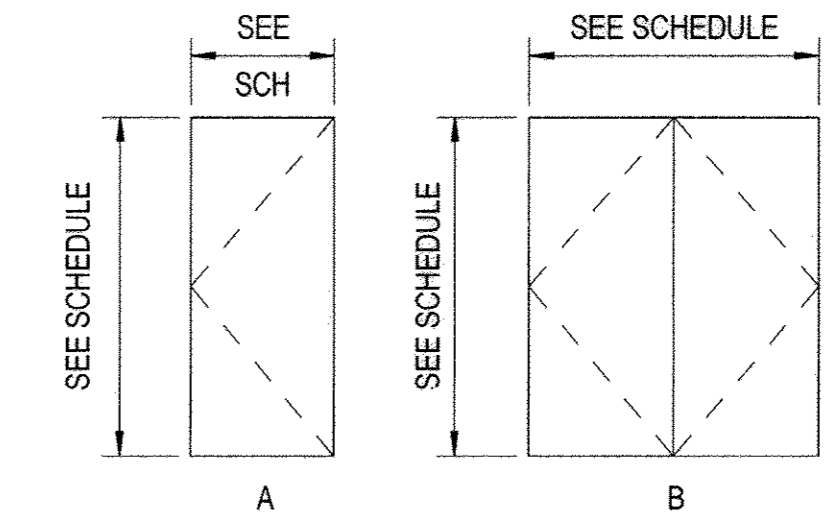
JAMB J-3



4 DOOR SILL S-1  
SCALE: 3/8" = 1'-0"  
REF: A-7



5 DOOR SILL S-2  
SCALE: 1/2" = 1'-0"  
REF: A-3, A-7



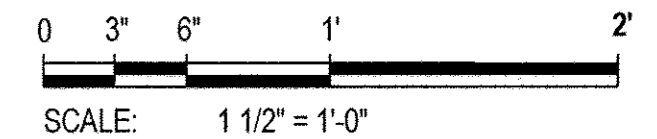
6 DOOR AND FRAME TYPES  
SCALE: 1/4" = 1'-0"  
REF: A-7

1 DOOR DETAIL 1  
SCALE: 1 1/2" = 1'-0"  
REF: A-3, A-7

2 DOOR DETAIL 2  
SCALE: 1 1/2" = 1'-0"  
REF: A-3, A-7

3 DOOR DETAIL 3  
SCALE: 1 1/2" = 1'-0"  
REF: A-3, A-7

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A-7

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*John J. [Signature]* 12/14/17  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*Thomas P. [Signature]* 12/14/17  
CHIEF, BUREAU OF ENGINEERING  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

ARCHITECTURAL REGISTRATION BOARD  
STATE OF MARYLAND  
3466-A  
11-24-17

DES: RK	BY	NO.	REVISIONS	DATE
DRN: NLE				
CHK: DAK				
DATE: NOV. 2017				

DOOR SCHEDULE AND DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN  
SHEET 10 OF 46

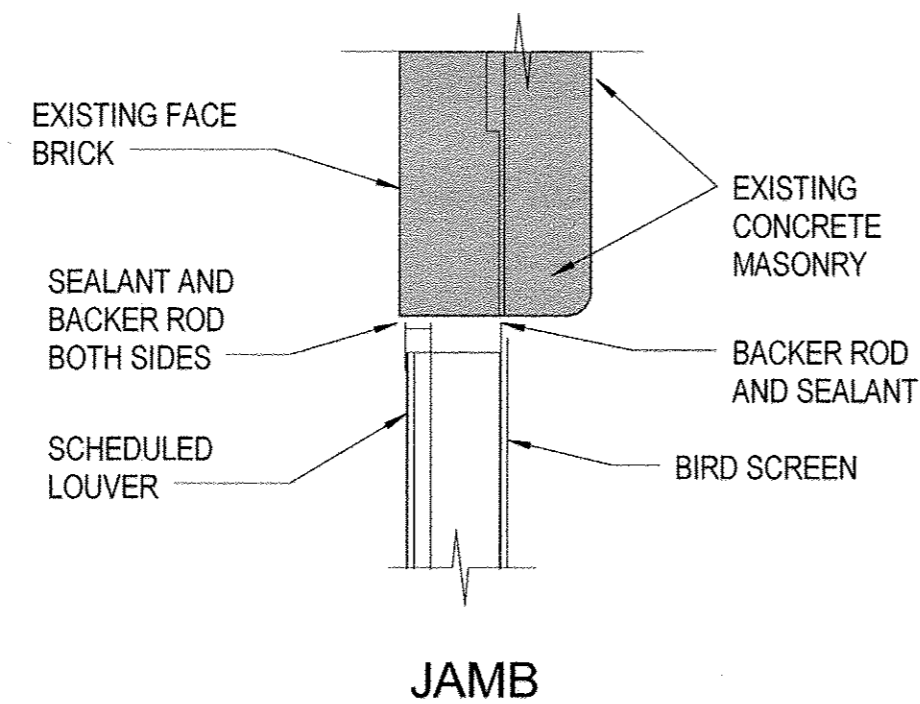
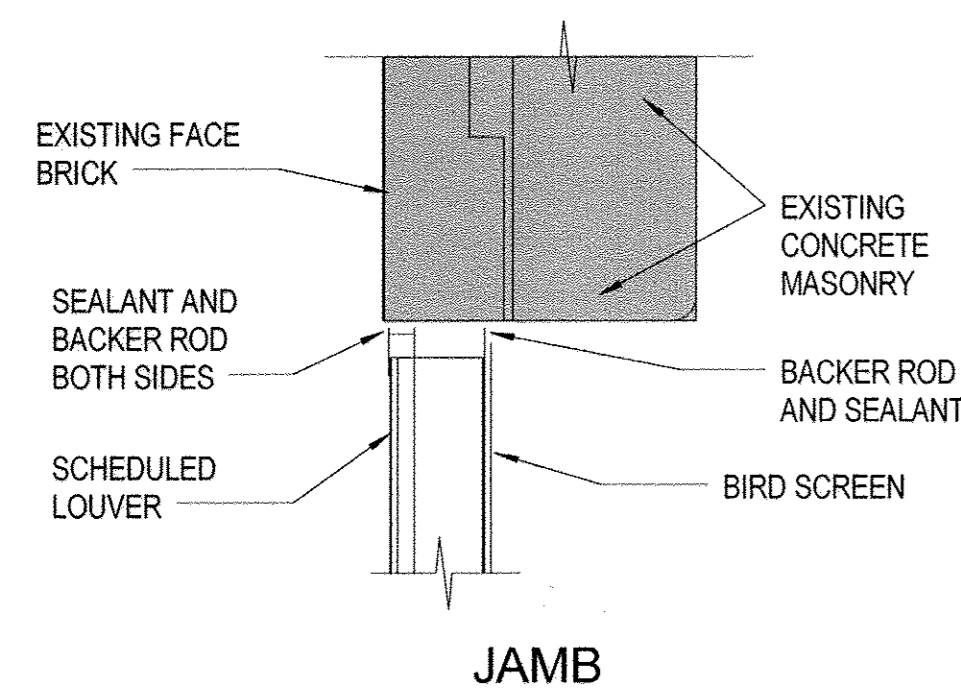
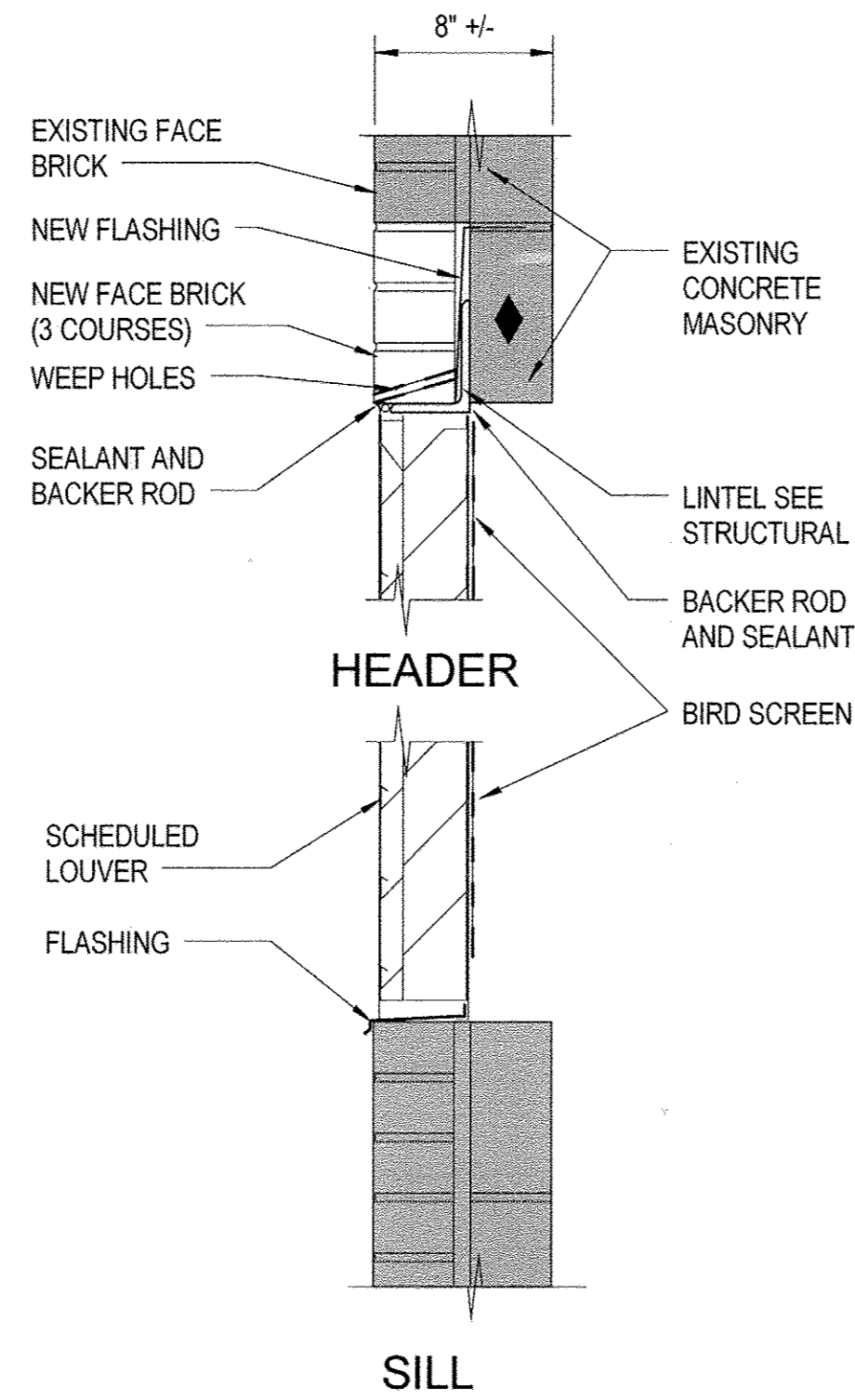
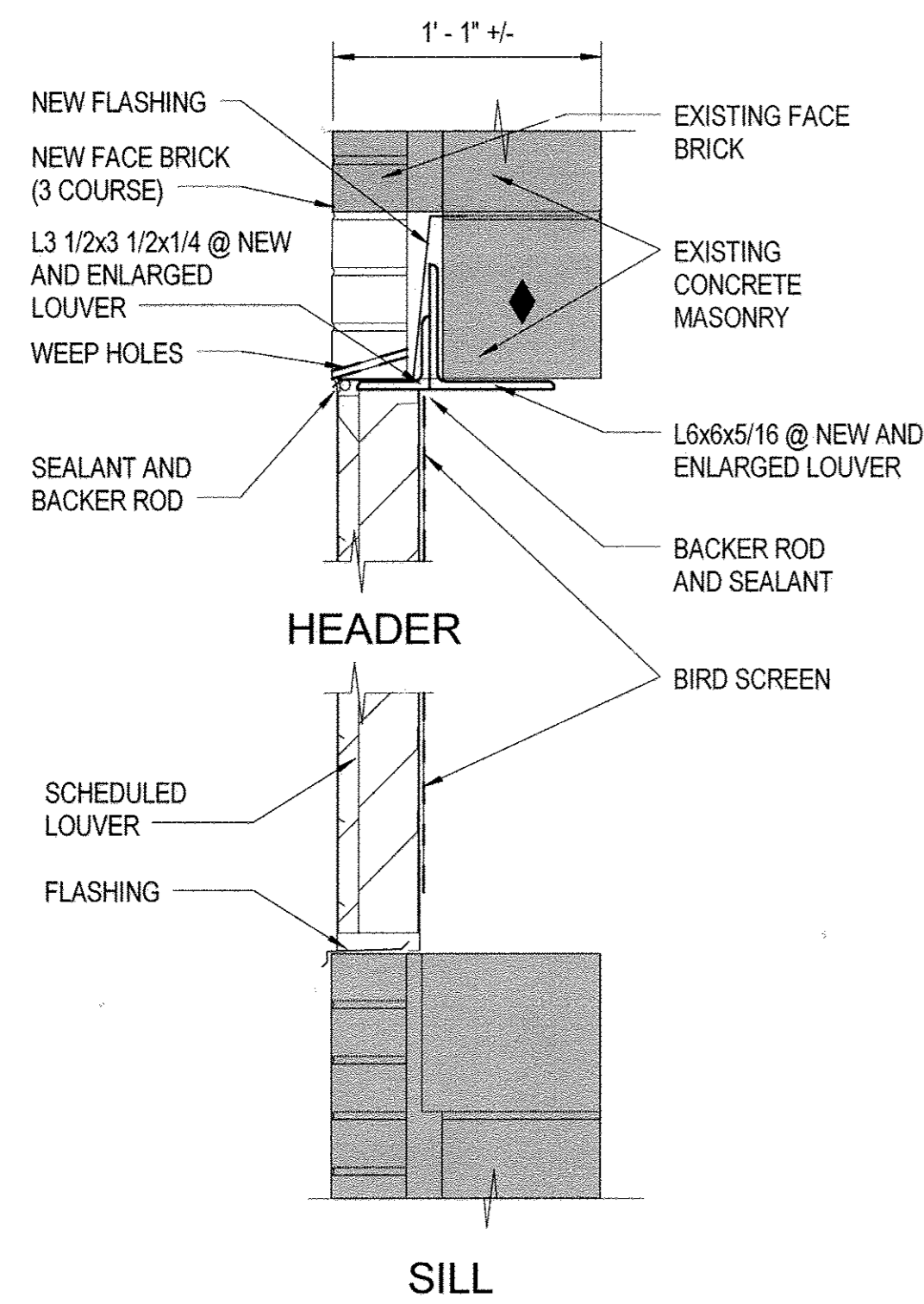
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ARCHITECTURAL - LOUVER SCHEDULE			
Mark	Length	Unconnected Height	Comments
LV1	2' - 8"	1' - 4"	EXISTING TO REMAIN
LV2	2' - 8"	1' - 4"	EXISTING TO REMAIN
LV4	2' - 8"	3' - 4"	NEW
LV5	2' - 0"	2' - 0"	NEW ENLARGED LOUVER IN LIEU OF EXISTING LOUVER
LV6	7' - 0"	7' - 4"	EXISTING TO REMAIN
LV8	2' - 8"	2' - 8"	EXISTING TO REMAIN
LV9	2' - 0"	2' - 0"	NEW

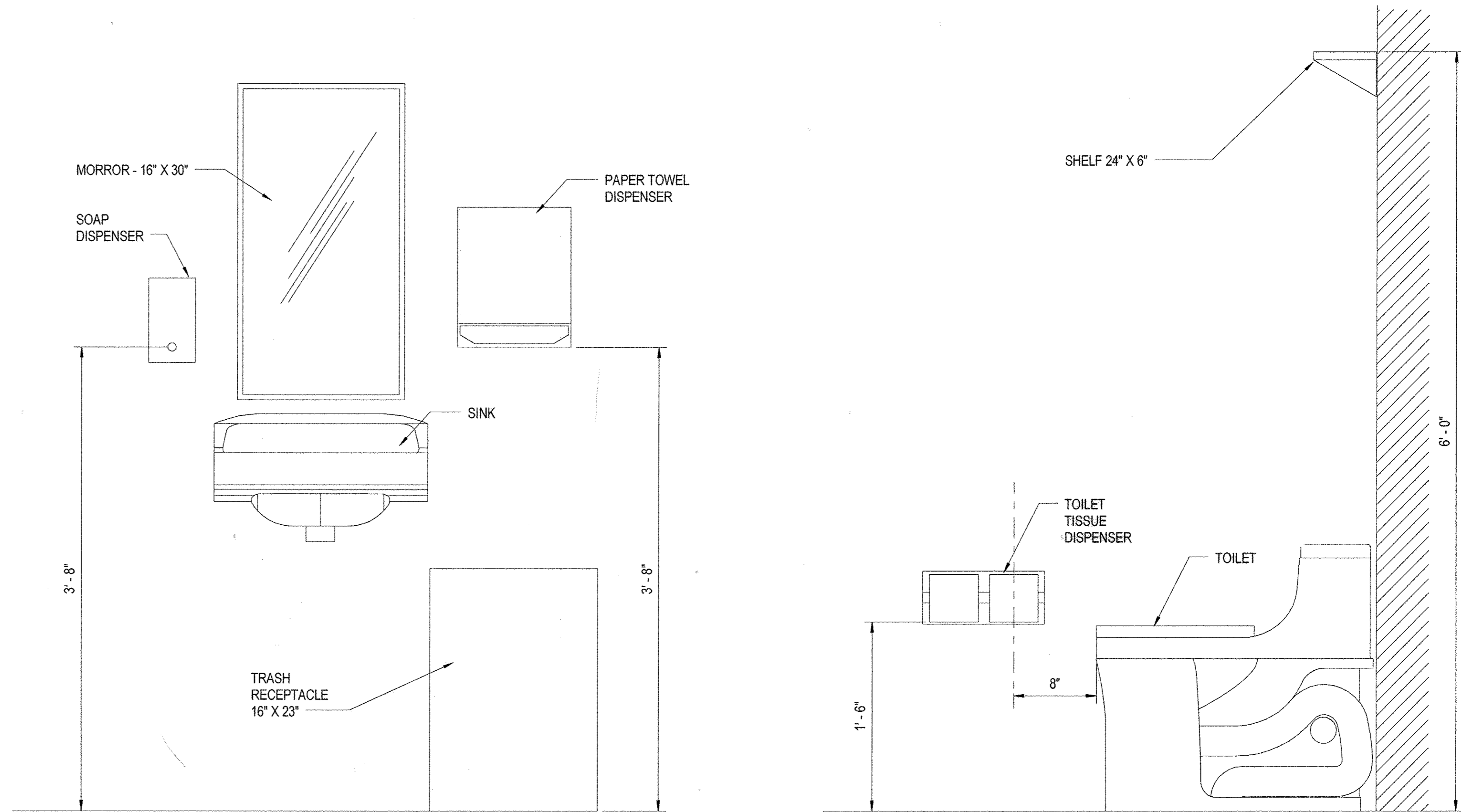
NOTE: LOUVER LV3 & LV7 - EXISTING TO BE REMOVED

ARCHITECTURAL - ROOM FINISH SCHEDULE										
ROOM NUMBER	ROOM NAME	FLOOR FINISH	BASE FINISH	WALL FINISH				CEILING		COMMENTS
				NORTH	SOUTH	EAST	WEST	FINISH	HEIGHT	
101	VFD ROOM	ETR	ETR	PAINT	PAINT	PAINT	PAINT		0' - 0"	
102	CONTROL RM	ETR	ETR	PAINT	PAINT	PAINT	PAINT		10' - 0"	
103	STAIR LANDING	ETR	ETR	PAINT	PAINT	PAINT	PAINT		10' - 0"	

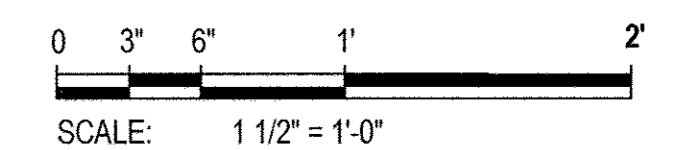


1  
A-8  
LOUVER DETAIL 1  
SCALE: 1 1/2" = 1'-0"  
REF: A-3, A-8

2  
A-8  
LOUVER DETAIL 2  
SCALE: 1 1/2" = 1'-0"  
REF: A-3, A-8



3  
A-8  
TOILET ACCESORIES MOUNTING HEIGHT  
SCALE: 1 1/2" = 1'-0"



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.  
*James E. Buller* 12/16/17  
12-17-17  
12/17/17

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

ARCHITECTURAL REGISTRATION BOARD  
3466-A  
STATE OF MARYLAND  
4-30-17

DES: RK  
DRN: NLE  
CHK: DAK  
DATE: NOV. 2017  
BY NO. REVISIONS DATE

LOUVER, FINISH SCHEDULES AND DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADES  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

A-8  
SCALE AS SHOWN  
SHEET  
11 OF 46



# GENERAL STRUCTURAL NOTES

## GENERAL:

- FIELD VERIFY ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS FOR EXISTING STRUCTURES. NOTIFY THE ENGINEER OF ALL DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
- DO NOT DAMAGE EXISTING CONSTRUCTION TO REMAIN.
- COORDINATE ALL ACTIVITIES, INCLUDING THOSE OF SUBCONTRACTORS, WITH THE COUNTY'S ACTIVITIES.
- THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT-RELATED FLOOR AND WALL OPENINGS, ARE DEPENDENT ON THE ACTUAL EQUIPMENT FURNISHED. VERIFY AND COORDINATE ALL SUCH ITEMS. DO NOT ALTER DIMENSIONS ON THESE DRAWINGS WITHOUT APPROVAL OF THE ENGINEER. STRUCTURAL DRAWINGS MAY NOT SHOW ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS REQUIRED. REFER TO DRAWINGS BY OTHER DISCIPLINES.
- THE DRAWINGS SHOW THE FINAL CONDITION OF THE STRUCTURE. PROVIDE MEANS TO STABILIZE THE STRUCTURES DURING ALL TEMPORARY CONDITIONS.
- SAWCUT PERIMETER OF CONCRETE DEMOLITION 1" PRIOR TO DEMOLITION.

## CONCRETE:

- PROVIDE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI AT 28 DAYS.
- DETAIL AND CONSTRUCT REINFORCED CONCRETE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE."
- DETAIL REINFORCING STEEL IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE SP-66, "ACI DETAILING MANUAL," WHICH INCLUDES ACI 315, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."
- PROVIDE REINFORCING STEEL CONFORMING TO ASTM A 615, GRADE 60, DEFORMED BARS.
- PROVIDE WELDED WIRE FABRIC CONFORMING TO ASTM A 1064.
- UNLESS NOTED OTHERWISE ON THE DRAWINGS, PROVIDE CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS:
  - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH OR OPEN GRADED COARSE AGGREGATE: 3"
  - CONCRETE EXPOSED TO EARTH, PROCESS LIQUID, OR WEATHER: 2"
  - ALL OTHER CONCRETE: 1-1/2"
- SUBMIT REINFORCING STEEL DETAILS (SHOP DRAWINGS) AND RECEIVE APPROVAL BEFORE PROCEEDING WITH FABRICATION.
- CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" UNLESS OTHERWISE NOTED.
- DETAIL ALL SPLICES AND STANDARD HOOKS FOR REINFORCING BARS NOT DIMENSIONED ON THE DRAWINGS AS TABULATED ON S-2.
- PLACE CONCRETE BETWEEN INDICATED AND APPROVED JOINTS, ALLOWING A MINIMUM ELAPSED PERIOD OF 48 HOURS BETWEEN ADJACENT PLACEMENTS.
- PROVIDE JOINTS AS DETAILED ON THE DRAWINGS, AND ON APPROVED SHOP DRAWINGS. NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED EXCEPT BY WRITTEN AUTHORIZATION FROM THE ENGINEER. APPROVED ADDITIONAL JOINTS SHALL NOT RESULT IN ADDITIONAL EXPENSE TO THE COUNTY.
- WHERE A BEAM FRAMES INTO A WALL, IF A CONSTRUCTION JOINT IS NOT INDICATED AT THE BOTTOM OF THE BEAM, PROVIDE A POCKET IN THE WALL FOR BEAM BEARING. DEPTH OF THE POCKET SHALL BE THE FULL THICKNESS OF THE WALL. OVERSIZE BLOCKOUTS AS REQUIRED TO ACCOMMODATE WATERSTOPS WHERE WATERSTOPS ARE REQUIRED.
- WHERE A SLAB IS SLOPED (TOP AND/OR BOTTOM), PROVIDE SLOPED REINFORCING PARALLEL TO THE SLOPING CONCRETE SURFACE.
- PROVIDE 6" PVC WATERSTOPS AT CONSTRUCTION JOINTS EXPOSED TO EARTH OR PROCESS LIQUID. PROVIDE SWELLABLE TYPE WATERSTOPS ONLY WHERE INDICATED ON THE CONTRACT DRAWINGS.
- SIZE AND LOCATE ANCHOR BOLTS AND EQUIPMENT PADS OR PEDESTALS TO SUIT EQUIPMENT FURNISHED.
- REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS AND EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUIT, ETC. THAT WILL BE INCORPORATED INTO CONCRETE WORK.
- REPAIR CONCRETE WHICH IS DAMAGED DURING THE COURSE OF DEMOLITION OR CONSTRUCTION IN ACCORDANCE WITH SPECIFICATION SECTION 03700.

## STRUCTURAL STEEL:

- FABRICATE AND ERECT STRUCTURAL STEEL CONFORMING TO THE REQUIREMENTS OF AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), "STEEL CONSTRUCTION MANUAL".
- SUBMIT SHOP DRAWINGS AND RECEIVE APPROVAL BEFORE PROCEEDING WITH FABRICATION.
- PROVIDE STRUCTURAL STEEL WIDE-FLANGE SHAPES CONFORMING TO ASTM A992, HSS MEMBERS CONFORMING TO ASTM A500, PIPE CONFORMING TO ASTM A53 GRADE B, AND ALL OTHER MEMBERS CONFORMING TO ASTM A36 UNLESS OTHERWISE NOTED.
- PROVIDE HIGH STRENGTH BOLTS CONFORMING TO ASTM F3125, GRADE A325. PROVIDE ALL BOLTED CONNECTIONS WITH COMPRESSIBLE-WASHER-TYPE DIRECT-TENSION INDICATORS CONFORMING TO ASTM F959.
- WELD IN COMPLIANCE WITH AMERICAN WELDING SOCIETY AWS D1.1, "STRUCTURAL WELDING CODE."
- WELD ALL CONNECTIONS WITH CLASS E-70 SERIES ELECTRODES, AND WELD IN COMPLIANCE WITH THE AMERICAN WELDING SOCIETY AWS D1.1, "STRUCTURAL WELDING CODE".
- MILL BOTTOM OF ALL COLUMNS AND FINISH TOP OF ALL BASE PLATES IN ACCORDANCE WITH AISC SPECIFICATIONS. WELD BASE PLATES TO BOTTOM OF COLUMNS.
- ALL STRUCTURAL STEEL AND CONNECTIONS SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A123, AND A153.
- REFER TO MECHANICAL DRAWINGS FOR LOCATION OF STRUCTURAL STEEL PIPE SUPPORTS SHOWN ON S-2.

## ALUMINUM:

- FABRICATE ALL STRUCTURAL ALUMINUM IN ACCORDANCE WITH THE SPECIFICATIONS OF THE ALUMINUM ASSOCIATION (AA) AD11-2015, "ALUMINUM DESIGN MANUAL".
- WELD ALL ALUMINUM IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS) D1.2, "STRUCTURAL WELDING CODE - ALUMINUM".
- PROVIDE ALLOY AND TEMPER 6061-T6 FOR STRUCTURAL ALUMINUM.
- I-BEAM SHAPES SHALL BE ALUMINUM ASSOCIATION (AA) STANDARD I-BEAMS.
- COAT ALL ALUMINUM IN CONTACT WITH CONCRETE AND OTHER DISIMILAR METALS WITH BITUMINOUS PAINT ON THE CONTACT SURFACE.
- PROVIDE TYPE 316 STAINLESS STEEL BOLTS FOR CONNECTING ALUMINUM MEMBERS.
- ANGLES USED TO CONNECT ALUMINUM I-BEAM SHAPES SHALL BE ALUMINUM ANGLES.

## ADHESIVE ANCHORS:

- THE ADHESIVE ANCHOR SYSTEM USED FOR POST INSTALLED ANCHORAGE TO CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY PUBLISHED ACI 308.4, "ACCEPTANCE CRITERIA FOR QUALIFICATION OF POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE AND COMMENTARY." EACH ADHESIVE ANCHOR SYSTEM MUST SATISFY THE STRENGTH REQUIREMENTS FOR ITS USE. BULK-MIXED ADHESIVES ARE NOT PERMITTED. ADHESIVE ANCHORAGE DESIGN IS IN ACCORDANCE WITH APPENDIX D OF ACI 318-08, FOR ALL OTHER INFORMATION SEE SPECIFICATION SECTION 05510. ADHESIVE ANCHORS IN CONCRETE SHALL BE QUALIFIED FOR USE IN CRACKED CONCRETE IN ACCORDANCE WITH ACI 308.4. THE FOLLOWING ANCHOR SYSTEMS, OR APPROVED EQUALS, SHALL BE USED:
  - ANCHORAGE TO CONCRETE
    - HILTI HIT-HY 200 WITH TYPE 316 STAINLESS STEEL HILTI HIT-Z-R ROD OR HAS-R THREADED ROD.
  - ANCHORAGE TO CONCRETE MASONRY
    - HILTI HIT-HY 70 MASONRY ADHESIVE ANCHORING SYSTEM WITH TYPE 316 STAINLESS STEEL HILTI HAS-R THREADED ROD.
    - PROVIDE MESH SLEEVE AT HOLLOW MASONRY LOCATIONS.
- CONCRETE AT THE TIME OF ADHESIVE ANCHOR INSTALLATION SHALL HAVE A MINIMUM AGE OF 21 DAYS.
- INSTALL ADHESIVE ANCHORS WITH A MINIMUM EDGE DISTANCE OF 3 INCHES TO ANY FREE EDGE OF CONCRETE.
- INSTALL ADHESIVE ANCHORS WITH TRAINED QUALIFIED PERSONNEL. INSTALL ADHESIVE ANCHORS IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.
- PROVIDE THOROUGHLY CLEANED ANCHOR HOLES PRIOR TO ADHESIVE INJECTION, AS REQUIRED BY THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. PROTECT DRILLED AND CLEANED ANCHOR HOLES FROM CONTAMINATION UNTIL THE ADHESIVE IS INSTALLED.
- PROVIDE ANCHORS CLEAN, OIL-FREE, AND FREE OF LOOSE RUST, PAINT, OR OTHER COATINGS.
- PROVIDE INSTALLED ADHESIVE ANCHORS SECURELY FIXED IN-PLACE TO PREVENT DISPLACEMENT WHILE THE ADHESIVE CURES.
- ARRANGE FOR AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. THE ENGINEER MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.
- PERSONNEL INSTALLING HORIZONTAL OR OVERHEAD ANCHORS SHALL BE QUALIFIED PER SPECIFICATION SECTION 05510.

## GRATING:

- FABRICATE ALL GRATING IN ACCORDANCE WITH THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM), "METAL BAR GRATING MANUAL" (ANSI/NAAMM MBG531-09).
- ALL GRATING SHALL BE ALUMINUM, ALLOY 6061, CONFORMING TO ASTM B221, AND HAVE A SERRATED SURFACE.
- PROVIDE GRATING DEPTH AS INDICATED ON THE DRAWINGS.
- PROVIDE GRATING CAPABLE OF CARRYING THE LOADS INDICATED ON THIS SHEET, AND WITH A MAXIMUM DEFLECTION OF 1/4".
- BAND OUTSIDE EDGES OF ALL GRATING AND ALL OPENINGS IN GRATING USING BARS OF THE SAME DEPTH AS THE BEARING BARS.

## CODES AND STANDARDS:

- INTERNATIONAL BUILDING CODE IBC (2015) INCLUDING THE MODIFICATIONS MADE BY HOWARD COUNTY.
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC 325) "STEEL CONSTRUCTION MANUAL - FOURTEENTH EDITION."
- AMERICAN CONCRETE INSTITUTE ACI 318 (2014), "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE."
- AMERICAN CONCRETE INSTITUTE ACI 350 (2006), "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."
- AMERICAN CONCRETE INSTITUTE ACI-530/ ASCE 5/ TMS 402, (2013) "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES."
- ALUMINUM ASSOCIATION "ALUMINUM DESIGN MANUAL" (2015).
- AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE 7 (2010), "MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES."
- AMERICAN WELDING SOCIETY AWS D1.1, "STRUCTURAL WELDING CODE - STEEL."
- AMERICAN WELDING SOCIETY AWS D1.2, "STRUCTURAL WELDING CODE - ALUMINUM."

## DESIGN LOADS:

ALL LOADS INDICATED BELOW ARE UNFACTORED

- BUILDING RISK CATEGORY: III
- DEAD LOADS:
  - STRUCTURES: ACTUAL WEIGHT
  - WEIGHT OF SOIL - 100 PCF FOR RESISTING UPLIFT
  - WEIGHT OF SOIL - 120 PCF FOR DEAD LOAD
- LIVE LOADS:
  - OPERATING LEVEL SLAB: ACTUAL WEIGHT OF EQUIPMENT OR 250 PSF, WHICHEVER IS GREATER.
  - PLATFORMS AND STAIRS: 100 PSF
  - GUARDRAIL - 200 LBS AT EACH POST OR 50 PLF ALONG THE TOP RAIL, WHICHEVER IS GREATER.
- ROOF LIVE LOAD: 30 PSF
- ROOF SNOW LOAD:
  - GROUND SNOW LOAD (Pg): 25 PSF.
  - EXPOSURE FACTOR (Ce): 0.9
  - THERMAL FACTOR (Ct): 1.2
  - SNOW LOAD IMPORTANCE FACTOR (I): 1.1
  - FLAT ROOF LOAD (Pf): 0.7 (Is) (Ce) (Ct) (Pg) : 20.8 PSF
  - Pf,min : 20 (Is) : 22 PSF
  - ADDITIONAL SNOW LOAD DUE TO SNOW DRIFT AND SLIDING SNOW PER ASCE 7-10 HAS BEEN CONSIDERED WHERE APPLICABLE.
- MONORAIL LOADS:
  - MONORAIL CAPACITY: 3 TONS
  - VERTICAL LOAD WITH IMPACT FACTOR: 8.7 KIPS

# STRUCTURAL ABBREVIATIONS

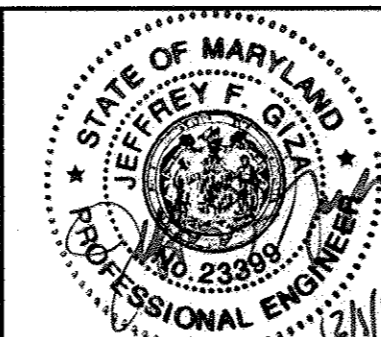
ABV	ABOVE	JT	JOINT
ADDL	ADDITIONAL	LF	LINEAR FOOT
ADJ	ADJACENT	LLH	LONG LEG HORIZONTAL
AGGR	AGGREGATE	LLV	LONG LEG VERTICAL
ALT	ALTERNATE		
ALUM	ALUMINUM	MATL	MATERIAL
APPROX	APPROXIMATE	MAX	MAXIMUM
ARCH	ARCHITECT	MECH	MECHANICAL
		MEP	MECHANICAL, ELECTRICAL, PLUMBING
BLDG	BUILDING	MIN	MINIMUM
BLKHD	BULKHEAD	MIRR	MIRROR
BM	BEAM	MISC	MISCELLANEOUS
BRG	BEARING		
BOT	BOTTOM	NF	NEAR FACE
BOS	BOTTOM OF STEEL	NIC	NOT IN CONTRACT
BRG	BEARING	NO	NUMBER
CAP	CAPACITY	NOM	NOMINAL
CERT	CERTIFY, CERTIFIED	NS	NEAR SIDE
CHFR	CHAMFER	NTS	NOT TO SCALE
CHKD	CHECKERED		
CLR	CLEAR	OC	ON CENTER
CIP	CAST-IN-PLACE	OD	OUTSIDE DIAMETER
COL	COLUMN	OPNG	OPENING
CMU	CONCRETE MASONRY UNIT	OPP	OPPOSITE
COL	COLUMN		
CONC	CONCRETE	PART	PARTIAL
CONSTR JT	CONSTRUCTION JOINT	PAT	PATTERN
CONT	CONTINUE, CONTINUOUS	PREF	PREFERENCE
CONN	CONNECT, CONNECTION	PREFAB	PREFABRICATED
CONSTR	CONSTRUCTION	PT	POST TENSIONED/PRESSURE TREATED
CP	CONCRETE PIPE	PVC	POLYVINYL CHLORIDE
CTR	CENTER		
CTRL JT	CONTROL JOINT	R	RADIUS
CU FT	CUBIC FEET	RD	ROOF DRAIN
CU IN	CUBIC INCH	REBAR	REINFORCING STEEL BAR
CU YD	CUBIC YARD	REINF	REINFORCE/REINFORCEMENT/REINFORCING
CI	CAST IRON	REF	REFERENCE
		REQD	REQUIRE/REQUIRED
DEG	DEGREES	REV	REVISION
DEMO	DEMOLITION/DEMOLISH	RO	ROUGH OPENING
DET	DETAIL		
DIA	DIAMETER	SF	SQUARE FOOT
DIAG	DIAGONAL, DIAGRAM	SIM	SIMILAR
DIM	DIMENSION	SO	SQUARE
DR	DRAIN	SQ IN	SQUARE INCH
DWG	DRAWING	SQ YD	SQUARE YARD(S)
EA	EACH	SS	STAINLESS STEEL
EF	EACH FACE	STD	STANDARD
EL	ELEVATION	STIFF	STIFFENER
ELEC	ELECTRIC, ELECTRICAL	SYM	SYMBOL
ELEV	ELEVATOR	SYMM	SYMMETRICAL
ENCL	ENCLOSURE		
ENGR	ENGINEER	T&B	TOP AND BOTTOM
EQ	EQUAL	TEMP	TEMPORARY
EQUIP	EQUIPMENT	THRU	THROUGH
EQUIV	EQUIVALENT	TO	TOP OF
EW	EACH WAY	TOC	TOP OF CONCRETE
EXIST	EXISTING	TOF	TOP OF FOOTING
EXP	EXPANSION	TOS	TOP OF STEEL
EXP JT	EXPANSION JOINT	TOW	TOP OF WALL
EXST	EXISTING	TYP	TYPICAL
EXT	EXTERIOR		
		UGND	UNDERGROUND
FD	FLOOR DRAIN	UNEX	UNEXCAVATED
FNDN	FOUNDATION	UNFIN	UNFINISHED
FF	FAR FACE	UNOT	UNLESS OTHERWISE NOTED
FS	FAR SIDE	UTIL	UTILITY
FT	FOOT/FEET		
FTG	FOOTING	VENT	VENTILATION
GA	GAGE	VERT	VERTICAL
GALV	GALVANIZE/GALVANIZED	VIF	VERIFY IN FIELD
		VOL	VOLUME
HORIZ	HORIZONTAL	WP	WORKING POINT
HT	HEIGHT	WWF	WELDED WIRE FABRIC
		WWW	WELDED WIRE MESH
ID	INSIDE DIAMETER	X-BRACE	CROSS BRACE
IF	INSIDE FACE	X-SECT	CROSS SECTION
INV	INVERT		
ISO	ISOMETRIC		

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 23399, EXPIRATION DATE: 8/25/2018."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James J. ...* 12/4/17  
DIRECTOR OF PUBLIC WORKS  
*Thomas P. ...* 12-4-19  
CHIEF, BUREAU OF UTILITIES  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: NAV			
DRN: AAB			
CHK: TJC			
DATE: NOV. 2017	BY	NO.	REVISIONS

GENERAL STRUCTURAL NOTES,  
LOADS, CODES, AND ABBREVIATIONS

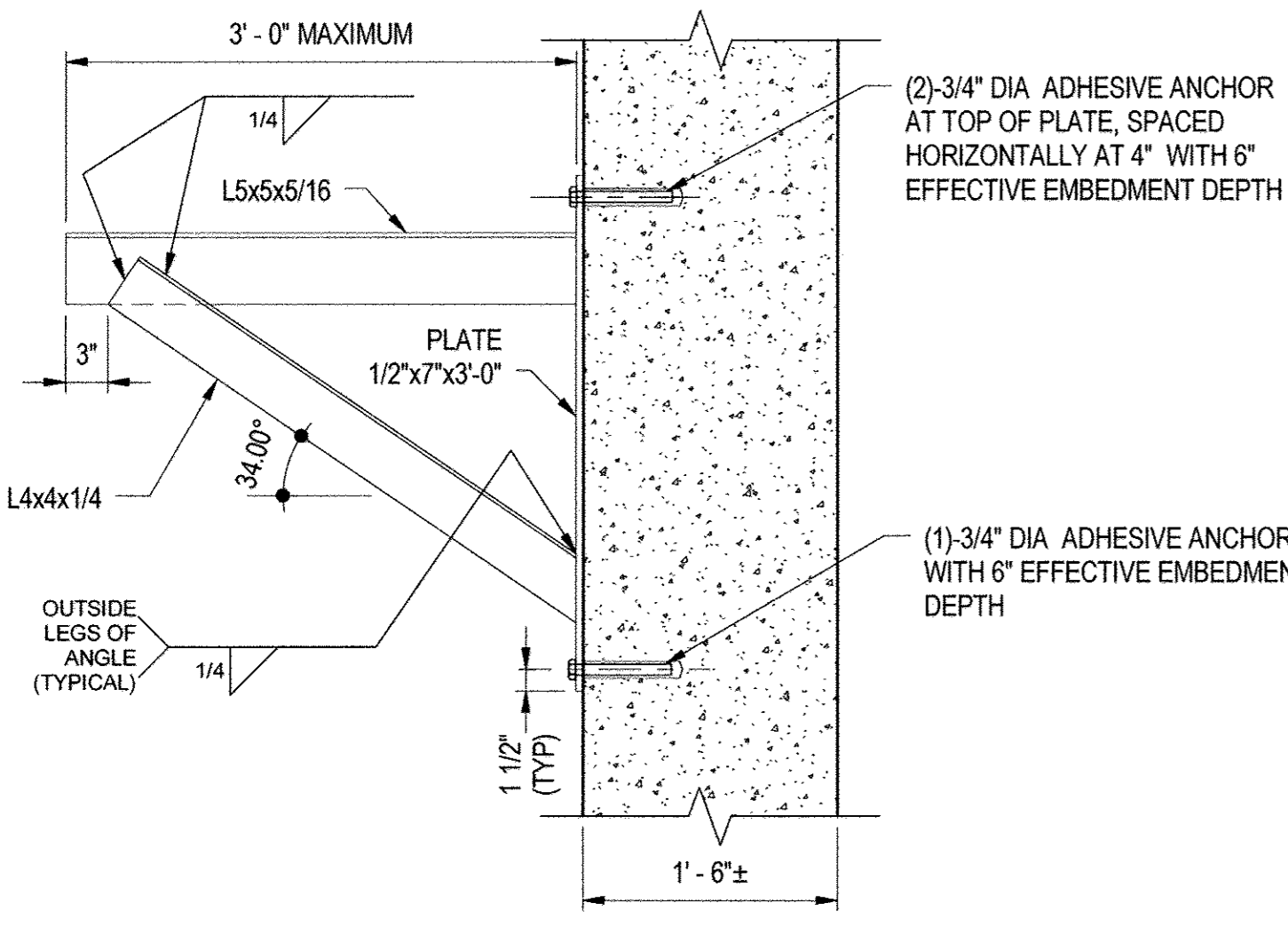
DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

S-1  
SCALE AS SHOWN  
SHEET  
12 OF 46

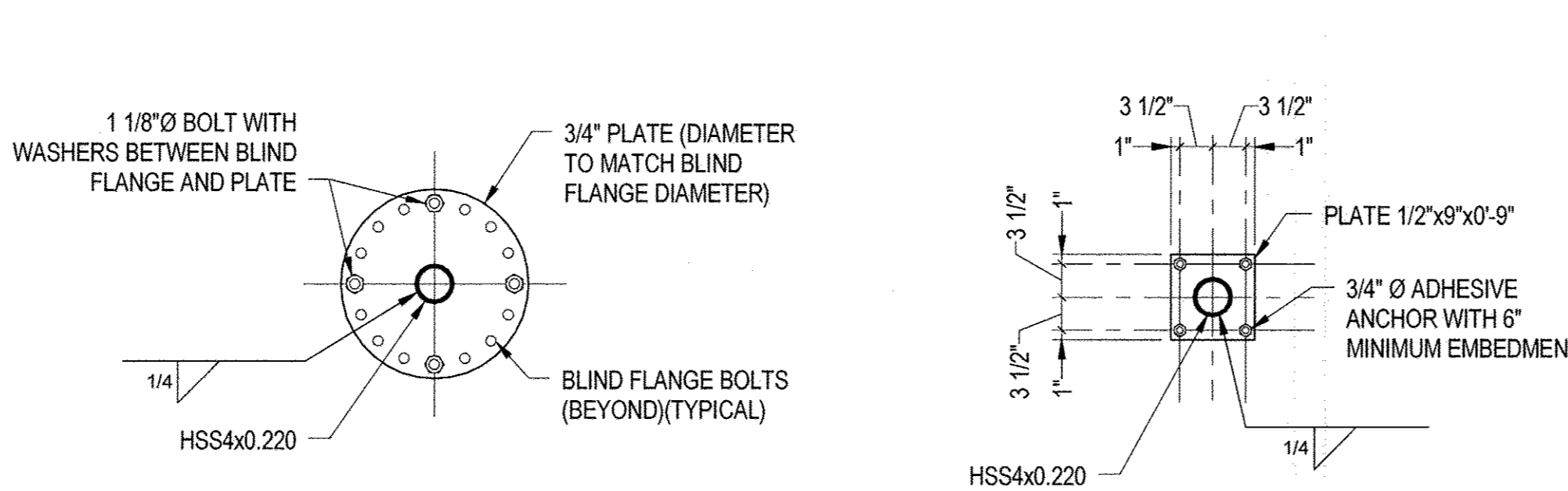
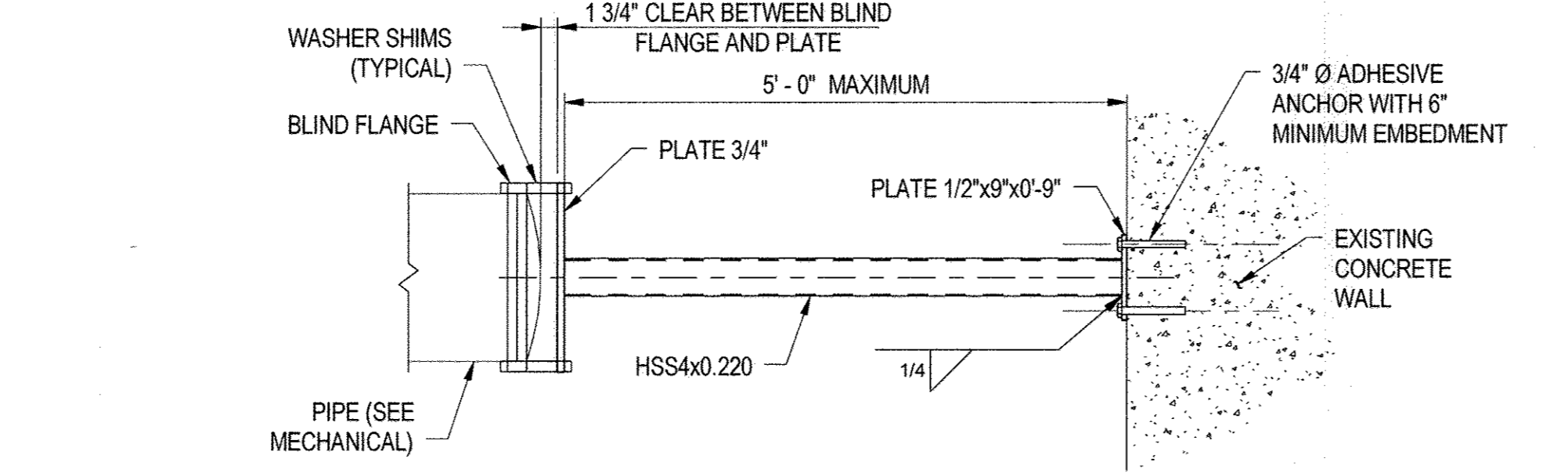




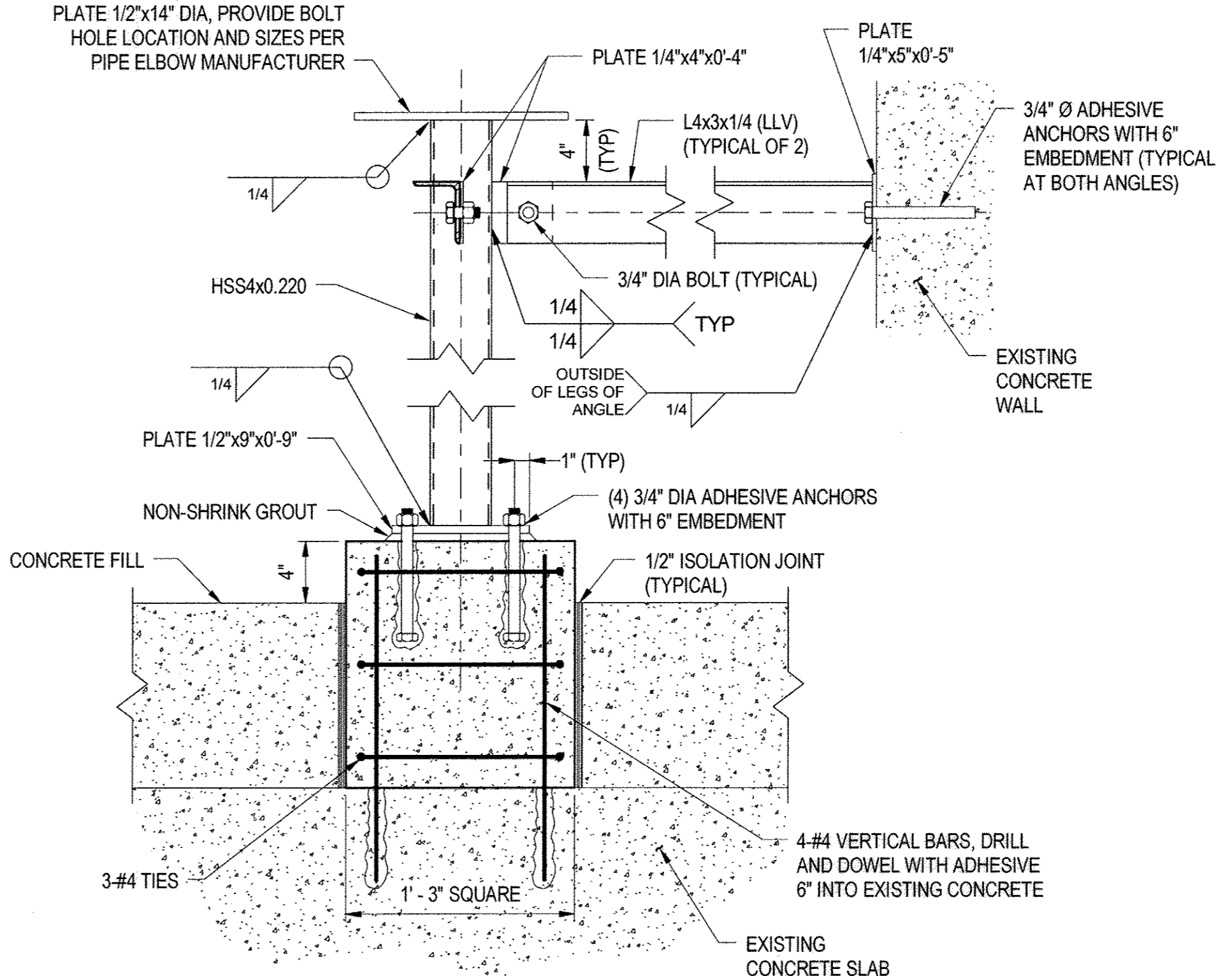




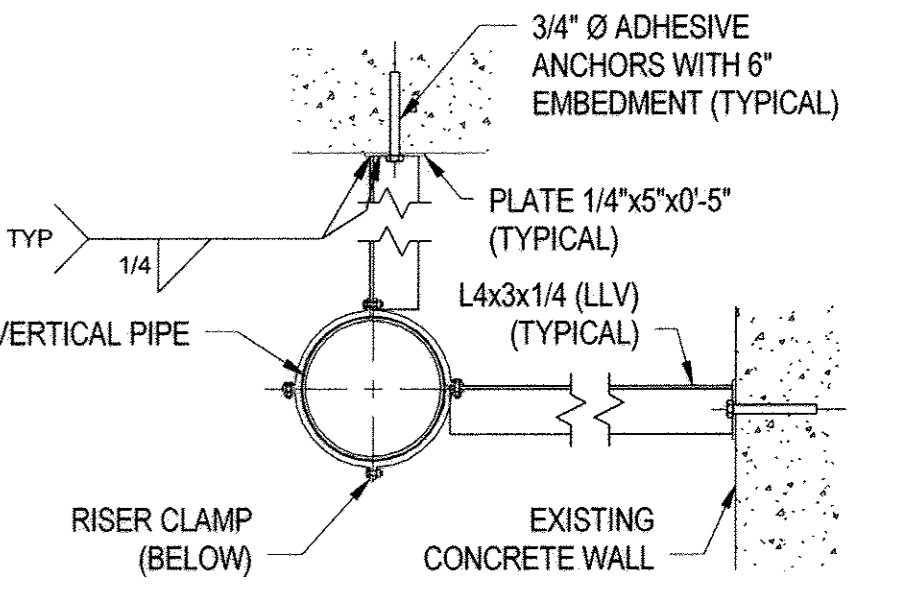
**PIPE SUPPORT TYPE 1**  
NO SCALE



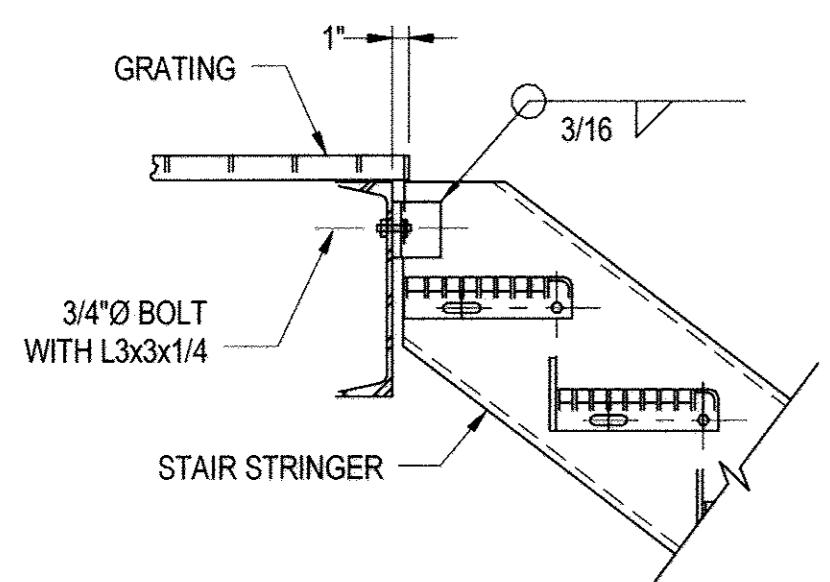
**PIPE SUPPORT TYPE 2**  
NO SCALE



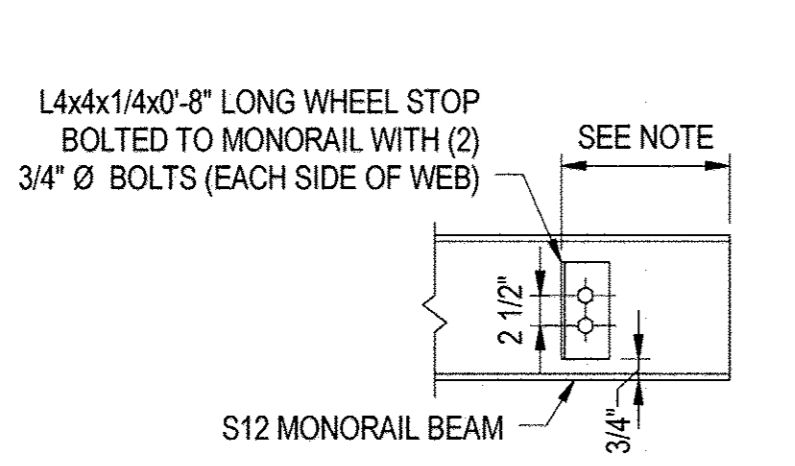
**PIPE SUPPORT TYPE 3**  
NO SCALE



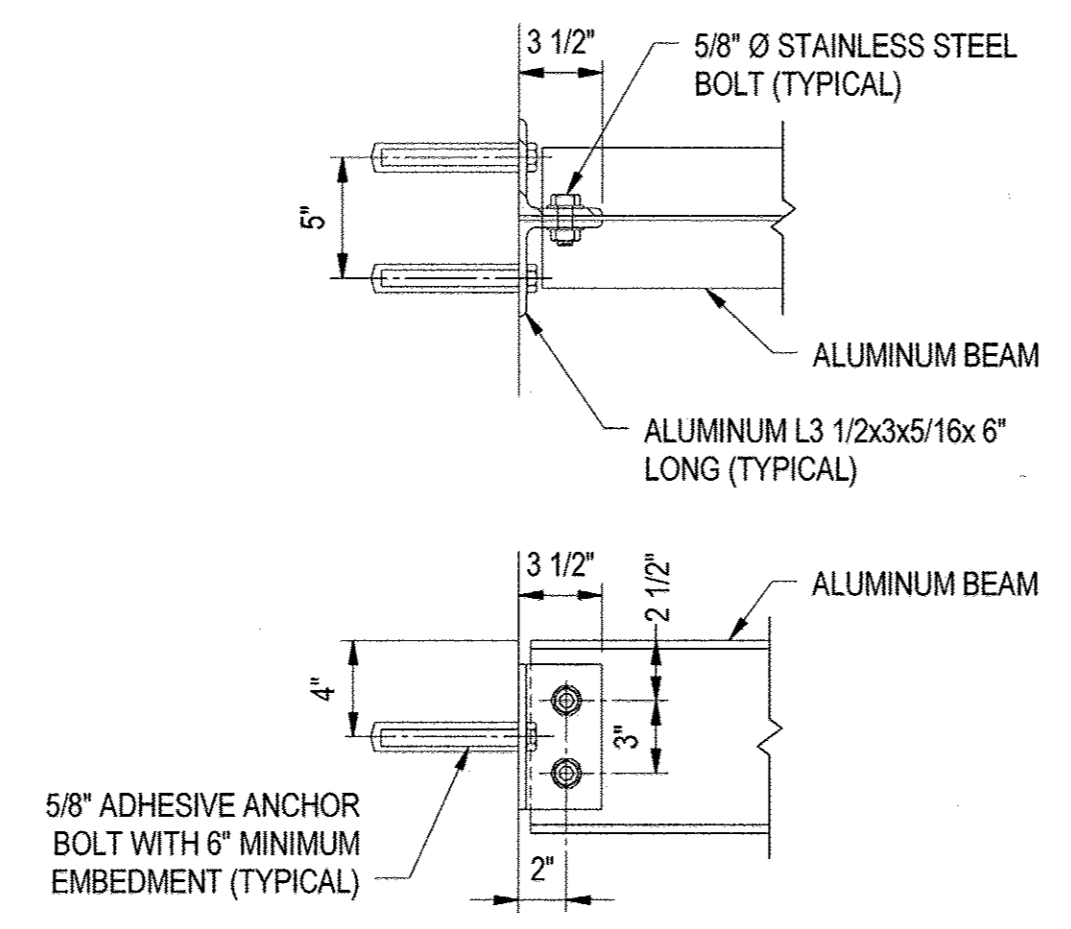
**PIPE SUPPORT TYPE 4**  
NO SCALE



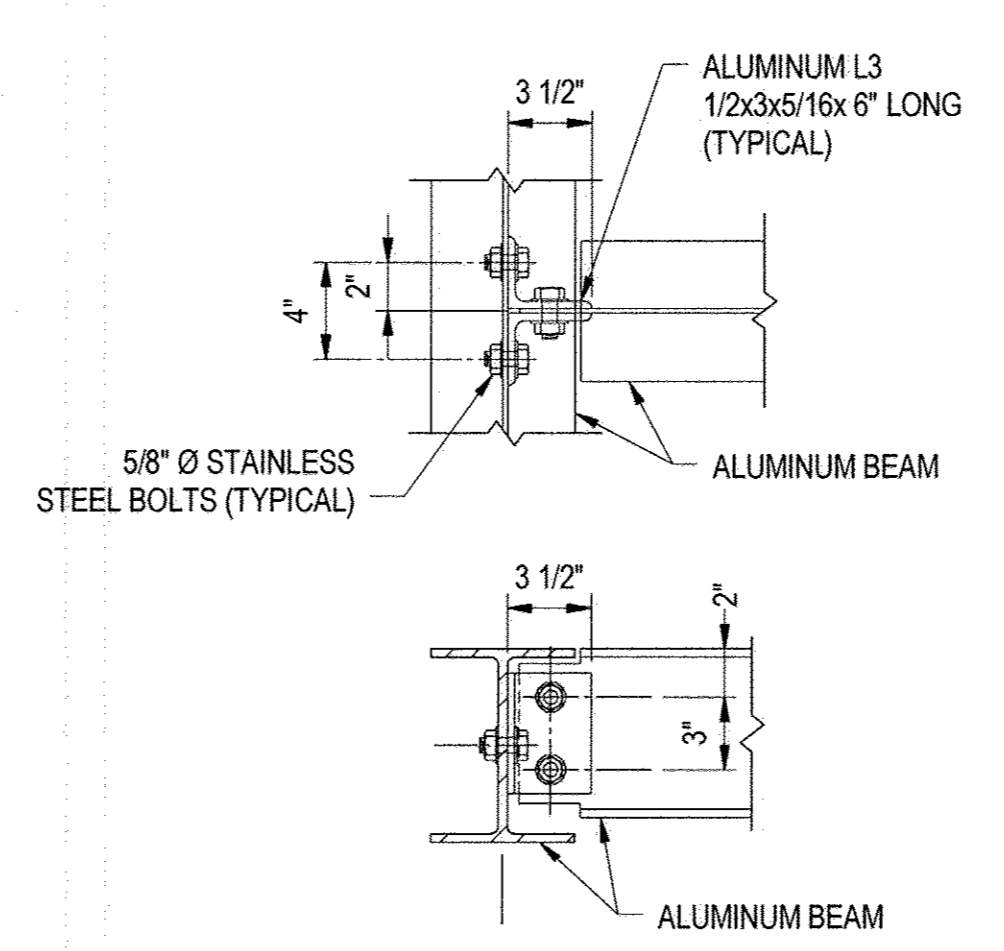
**TYPICAL METAL GRATING STAIR CONNECTION DETAIL-ALUMINUM**  
NO SCALE



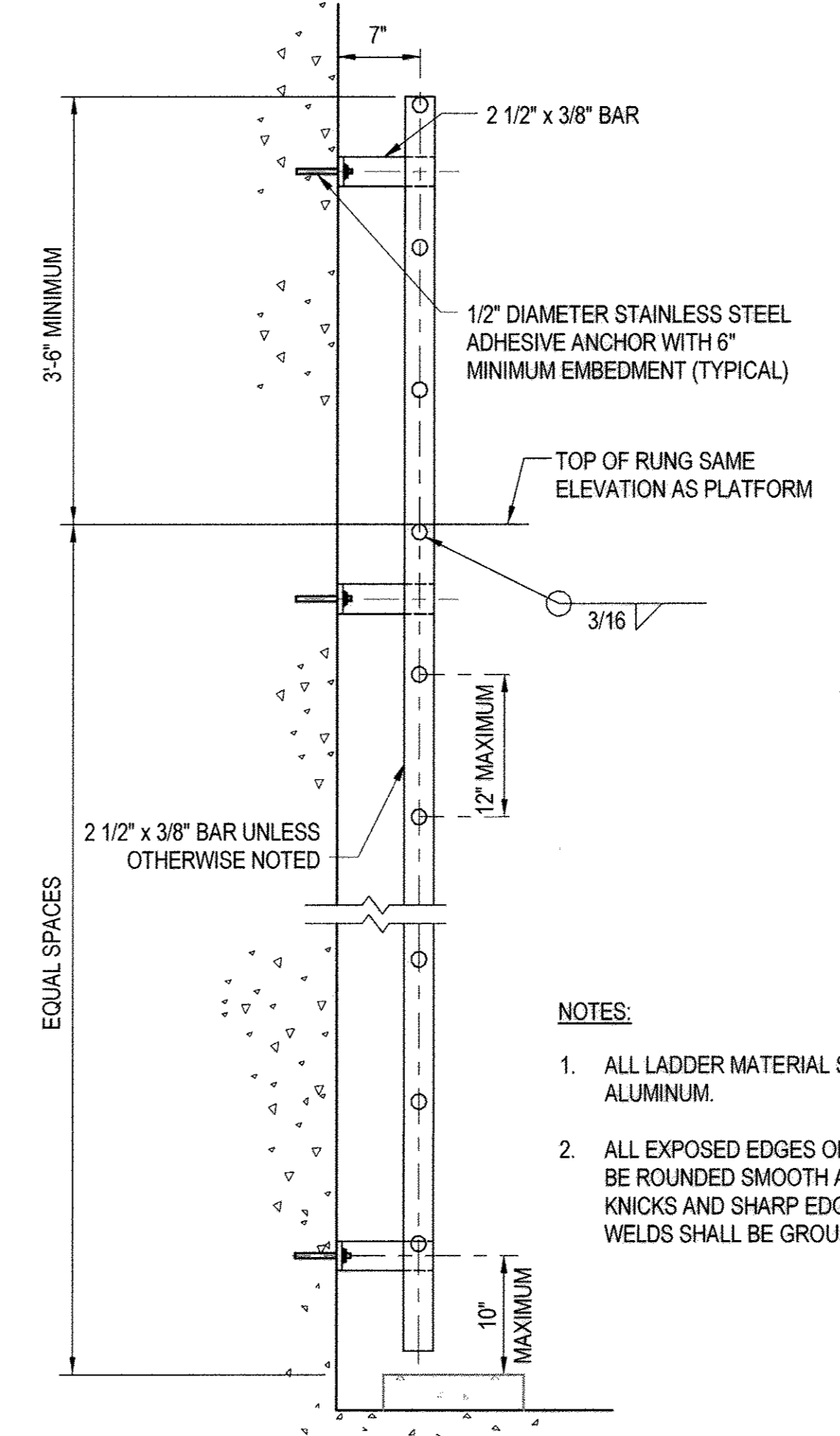
**TYPICAL MONORAIL WHEEL STOP DETAIL**  
NO SCALE



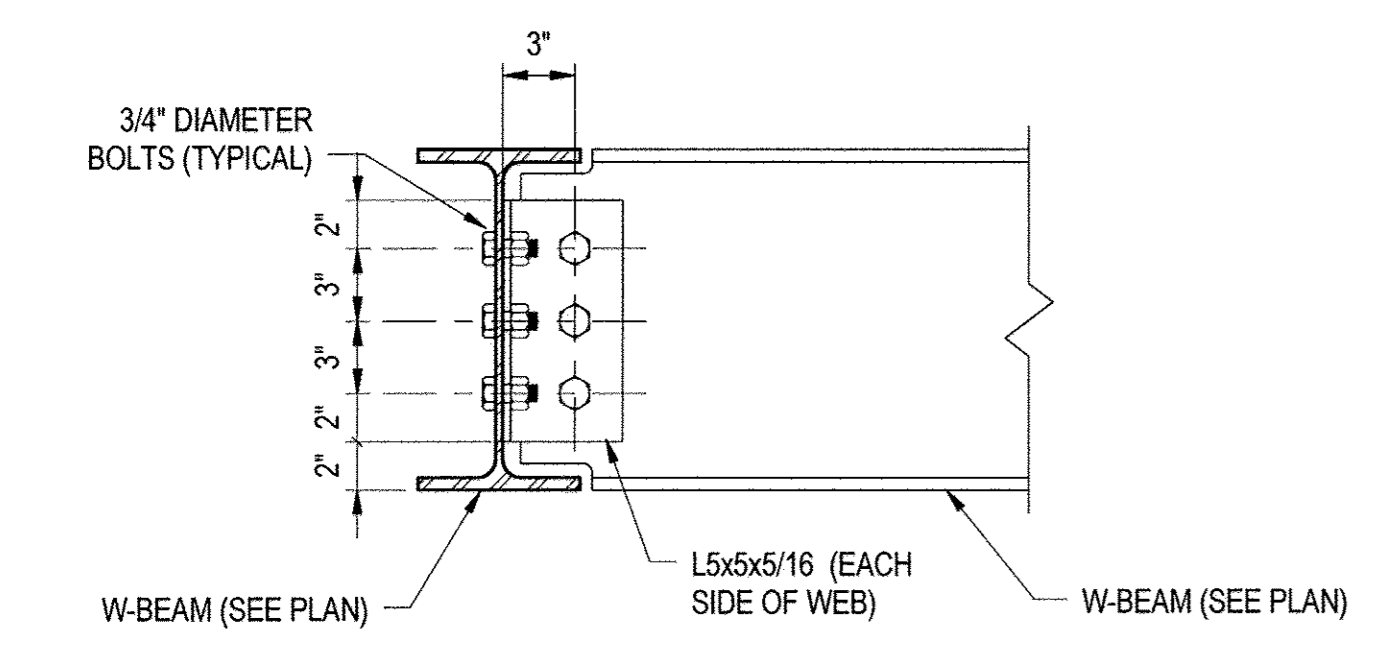
**TYPICAL ALUMINUM BEAM TO WALL CONNECTION**  
NO SCALE



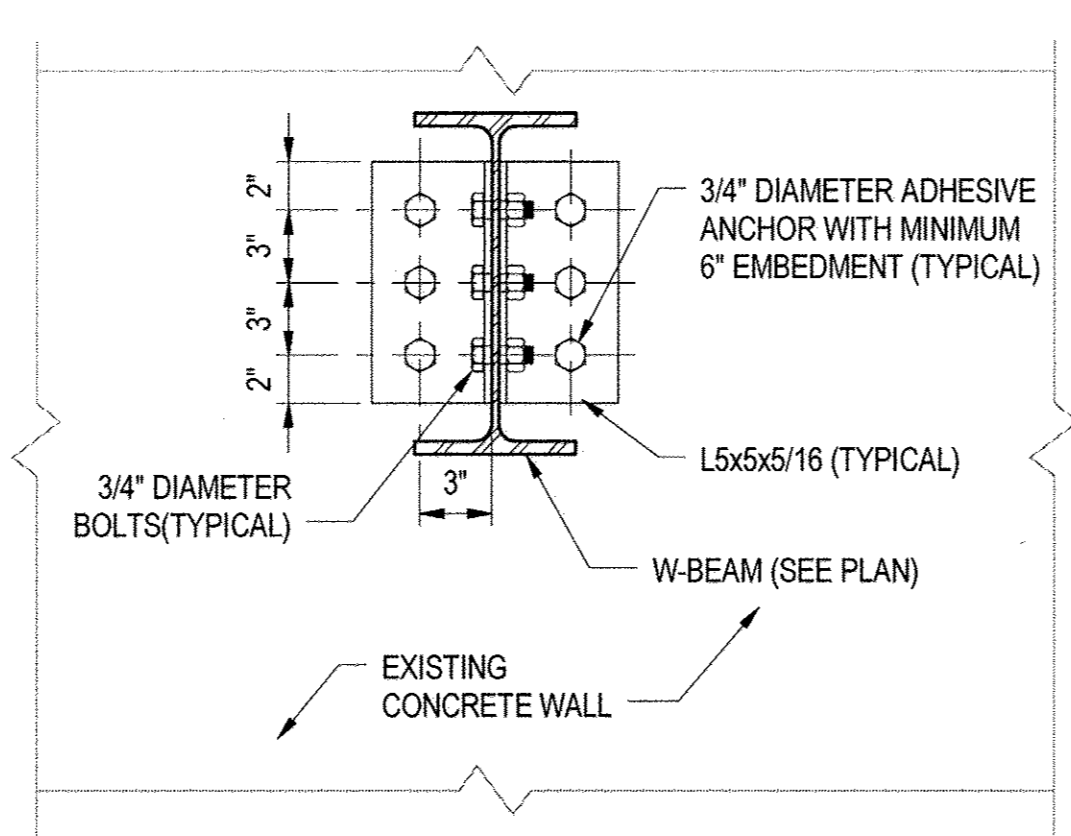
**TYPICAL ALUMINUM BEAM TO BEAM CONNECTION**  
NO SCALE



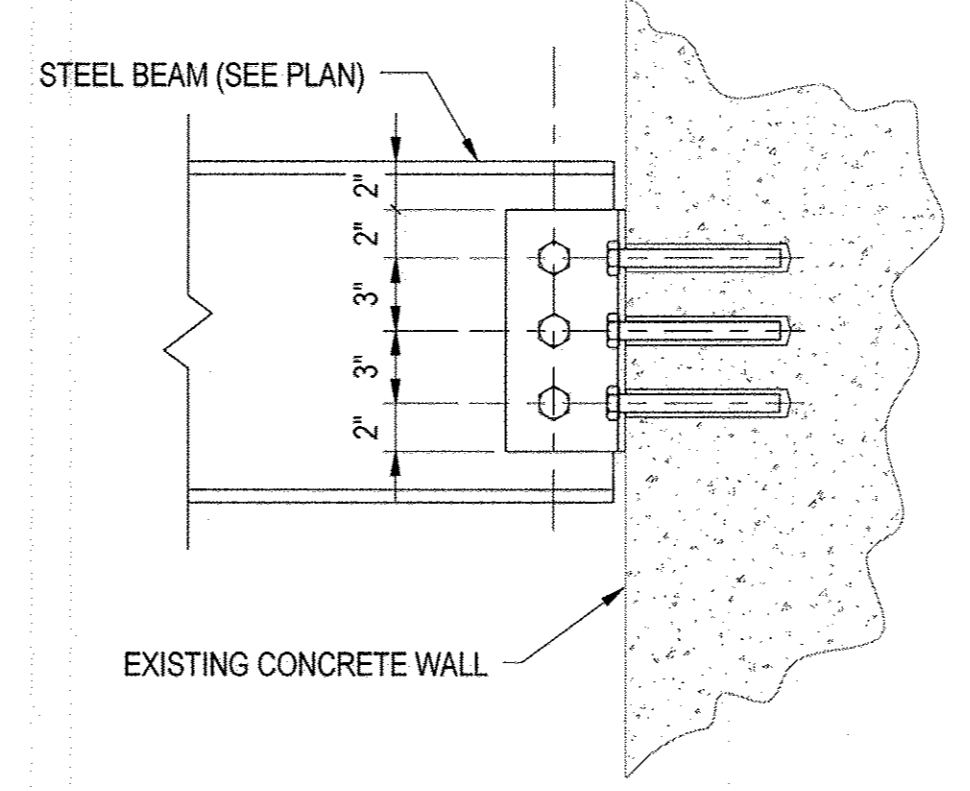
**TYPICAL LADDER DETAILS AT PLATFORMS**  
NOT TO SCALE



**TYPICAL STEEL BEAM TO BEAM CONNECTION DETAIL**  
NO SCALE



**TYPICAL STEEL BEAM TO CONCRETE WALL CONNECTION DETAILS**  
NO SCALE



**TYPICAL STEEL BEAM TO CONCRETE WALL CONNECTION DETAILS**  
NO SCALE

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 23399, EXPIRATION DATE: 8/25/2018."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.  
11/29/2017 2:59:41 PM

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

STATE OF MARYLAND  
JEFFREY F. BISHOP  
PROFESSIONAL ENGINEER

DES: NAV	BY	NO.	REVISIONS	DATE
DRN: CJS				
CHK: TJC				
DATE: NOV. 2017				

TYPICAL STRUCTURAL DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

S-3  
SCALE AS SHOWN  
SHEET 14 OF 46



**GENERAL NOTES:**

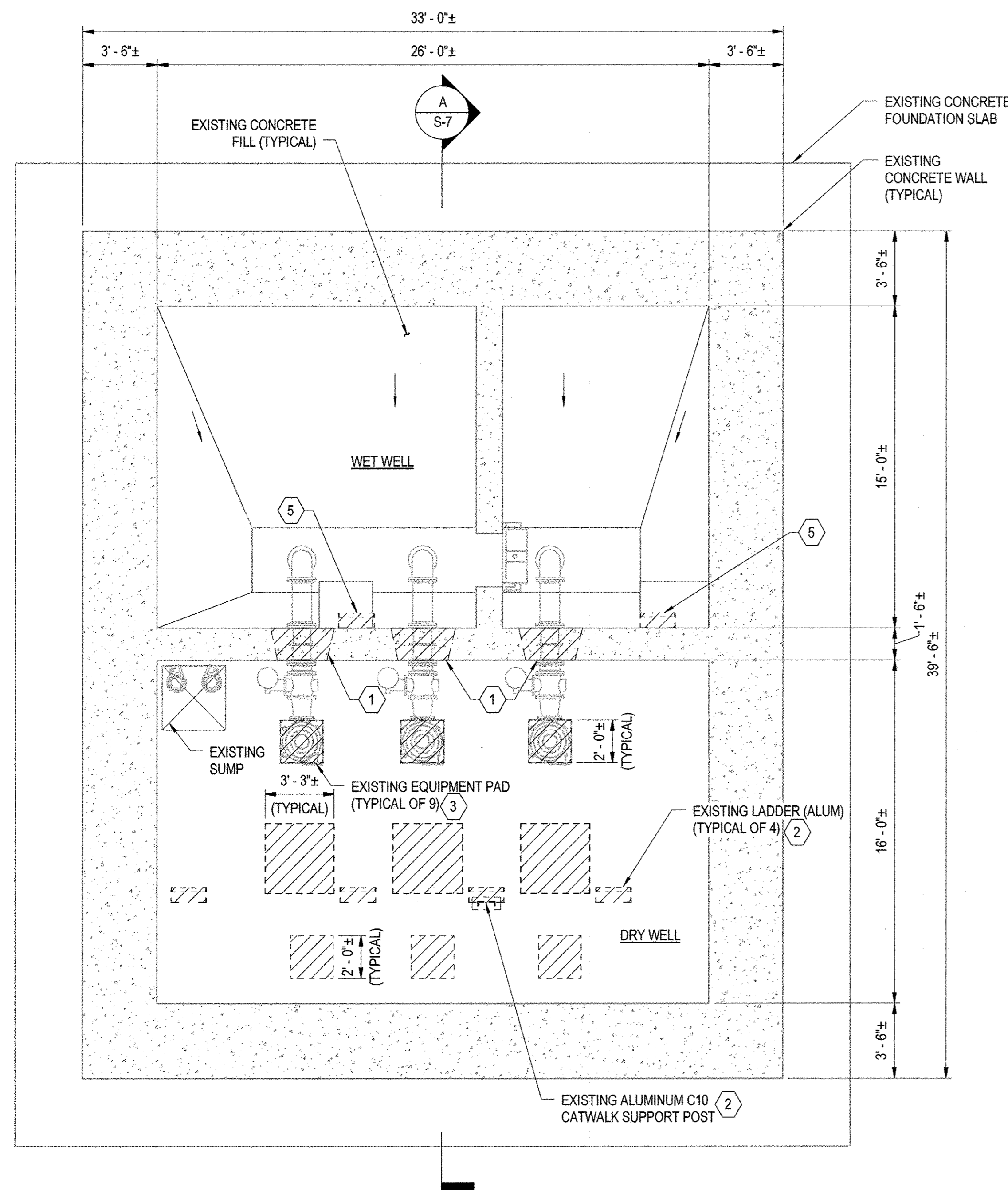
1. REFER TO SHEET S-1 FOR GENERAL STRUCTURAL NOTES, LOADS, CODES, AND ABBREVIATIONS.
2. REFER TO SHEET S-2 AND S-3 FOR TYPICAL STRUCTURAL DETAILS.
3. DURING ALL DEMOLITION WORK, DO NOT SAW CUT OR OTHERWISE DAMAGE ADJACENT BEAMS, WALLS, OR OTHER STRUCTURES.
4. VERIFY ALL DIMENSIONS INDICATED ON THIS PLAN IN THE FIELD. COORDINATE LOCATIONS AND SIZES OF ALL OPENINGS, SUPPORTS, ETC. WITH ACTUAL EQUIPMENT PROVIDED AND OTHER DECIPLES' DRAWINGS.
5. UNLESS OTHERWISE NOTED, REMOVE EMBEDDED ITEMS AND REBAR LEFT BEHIND FROM DEMOLITION 1" INTO THE CONCRETE FACE AND REPAIR WITH POLYMER MODIFIED REPAIR MORTAR.

**DEMOLITION NOTES:**

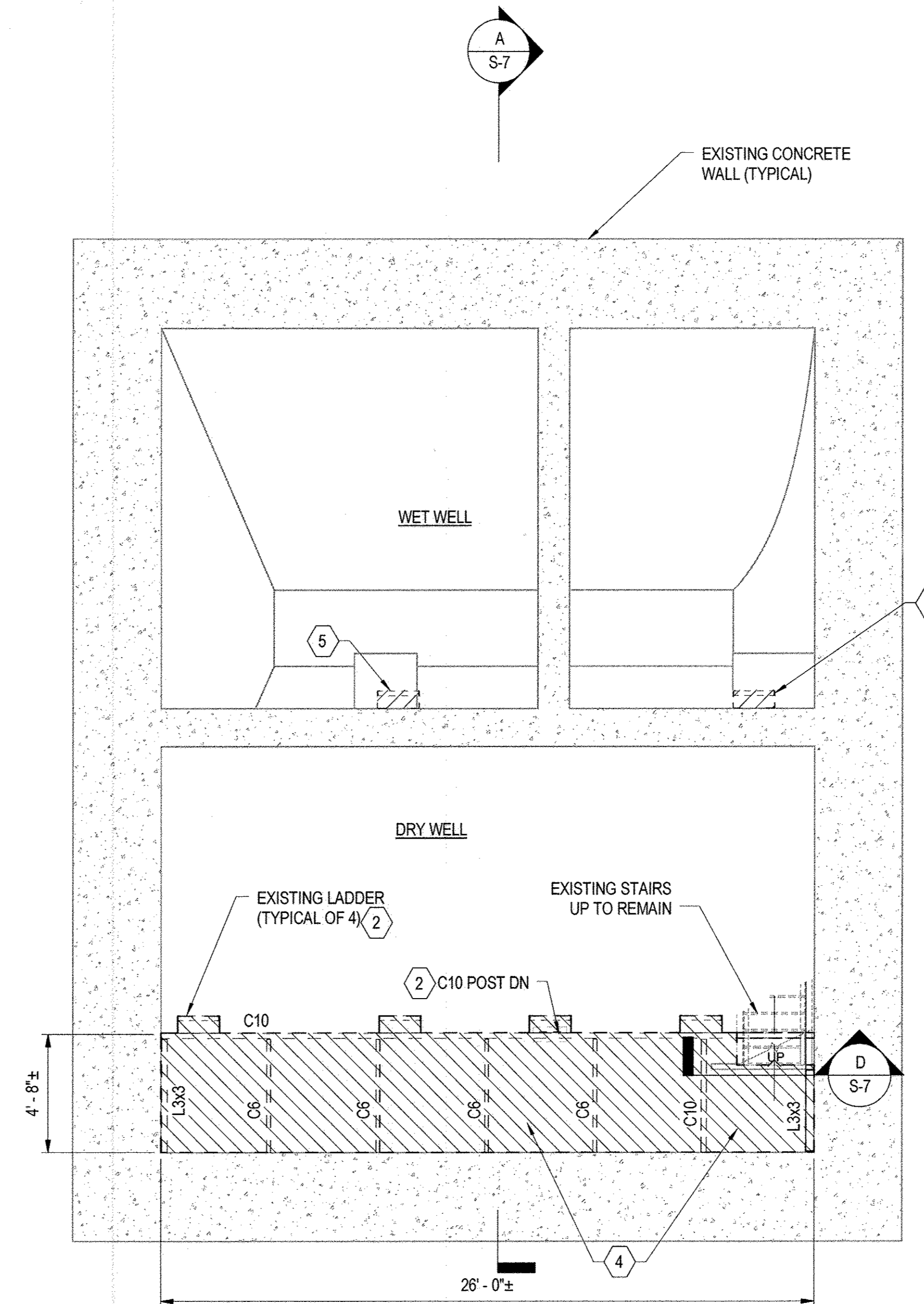
1. SAWCUT PERIMETER 1" AND DEMOLISH CONCRETE WALL AND CASTING PER TYPICAL DETAILS.
2. DEMOLISH EXISTING LADDERS, ALUMINUM CHANNEL POST, AND GROUT BASE TO TOP OF EXISTING FOUNDATION SLAB.
3. DEMOLISH EXISTING CONCRETE PUMP AND PIPE PADS TO TOP OF EXISTING FOUNDATION SLAB.
4. DEMOLISH EXISTING ALUMINUM GRATING, AND EXISTING ALUMINUM BEAMS AS INDICATED. PROVIDE TEMPORARY SUPPORT FOR EXISTING STAIRS AND BEAM TO REMAIN.
5. DEMOLISH EXISTING ALUMINUM LADDERS IN WET WELL.

**SHEET LEGEND:**

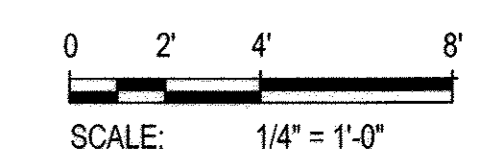
 INDICATED AREAS OR COMPONENTS TO BE DEMOLISHED



1 S-4 LOWER LEVEL PLAN - DEMOLITION  
SCALE: 1/4" = 1'-0"



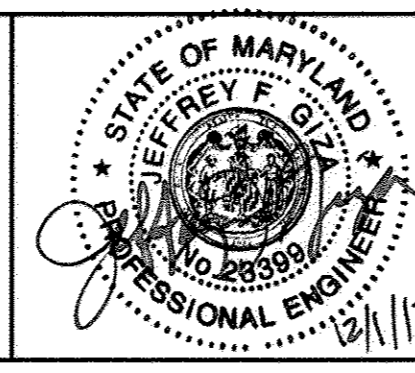
2 S-4 INTERMEDIATE LEVEL @ EL 140.5± PLAN - DEMOLITION  
SCALE: 1/4" = 1'-0"



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.  
11/29/2017 2:59:43 PM

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

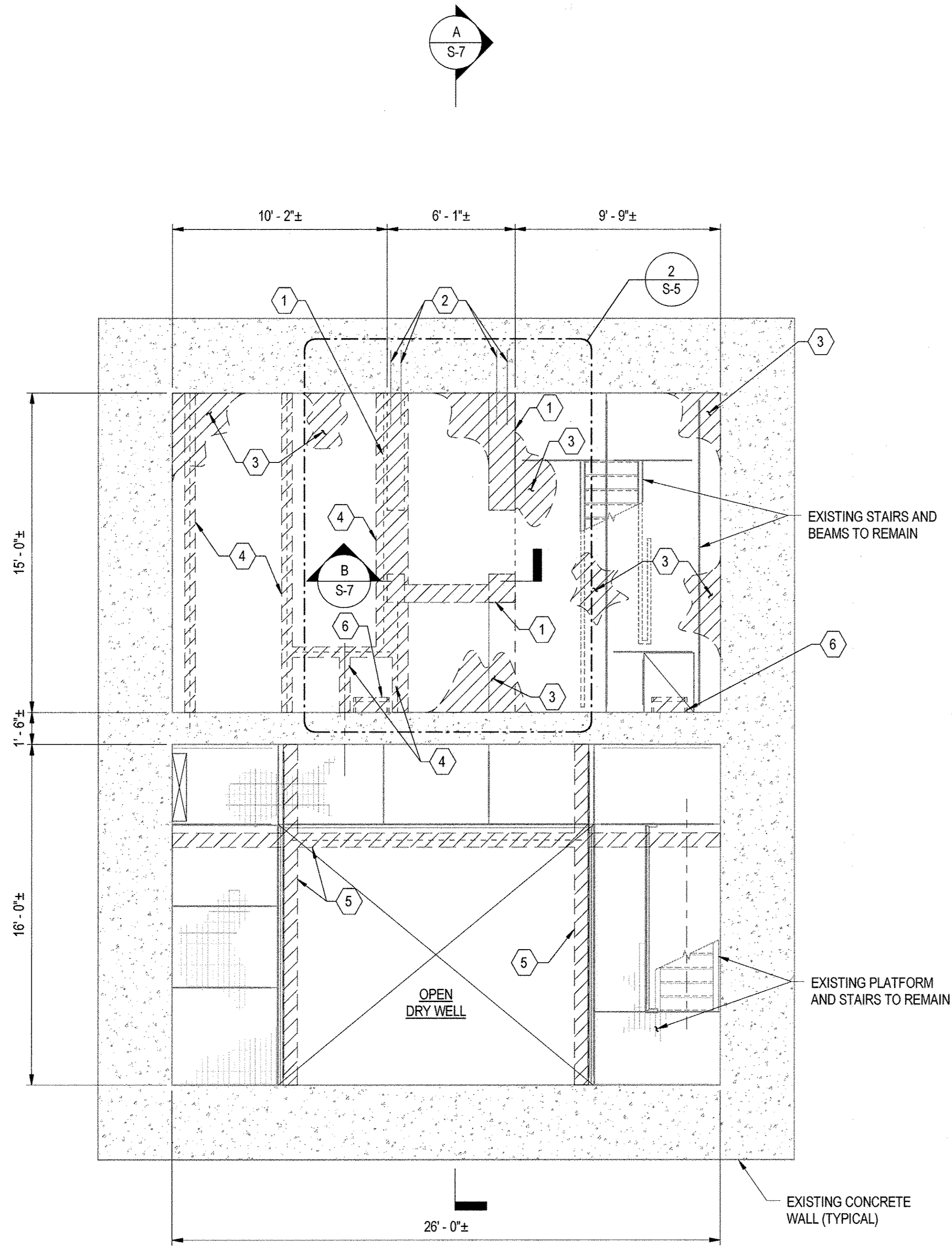


DES: NAV				
DRN: AAB				
CHK: TJC				
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE

PLANS - DEMOLITION

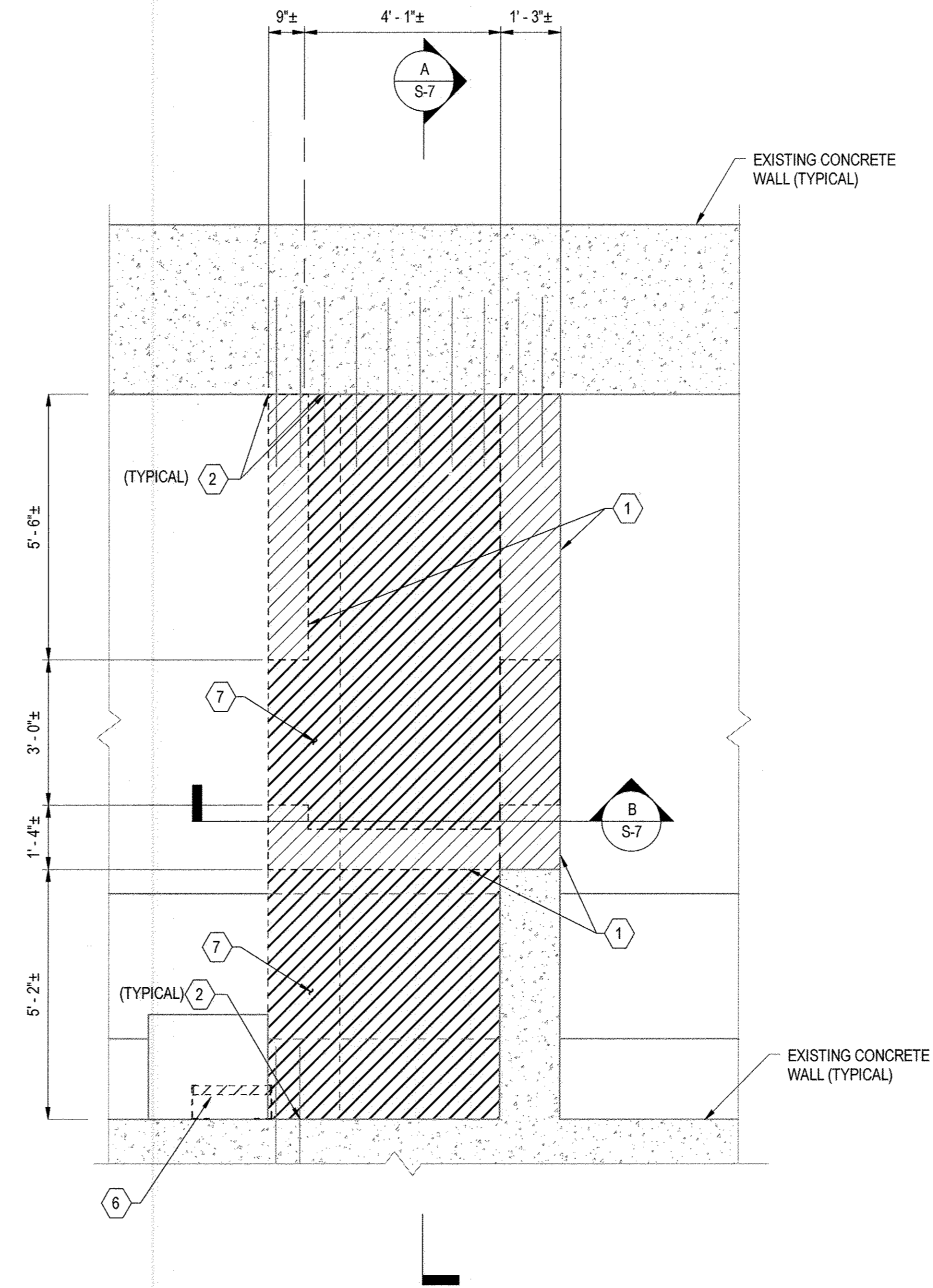
DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

S-4  
SCALE AS SHOWN  
SHEET 15 OF 46



1  
S-5  
INTERMEDIATE LEVEL @ EL 151.00'± PLAN - DEMOLITION

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



2  
S-5  
INTERMEDIATE LEVEL @ EL 145.00' PART PLAN - DEMOLITION

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

**GENERAL NOTES:**

1. REFER TO SHEET S-1 FOR GENERAL STRUCTURAL NOTES, LOADS, CODES, AND ABBREVIATIONS.
2. REFER TO SHEET S-2 AND S-3 FOR TYPICAL STRUCTURAL DETAILS.
3. DURING ALL DEMOLITION WORK, DO NOT SAW CUT OR OTHERWISE DAMAGE ADJACENT BEAMS, WALLS, OR OTHER STRUCTURES.
4. VERIFY ALL DIMENSIONS INDICATED ON THIS PLAN IN THE FIELD. COORDINATE LOCATIONS AND SIZES OF ALL OPENINGS, SUPPORTS, ETC. WITH ACTUAL EQUIPMENT PROVIDED AND OTHER DECISIONS' DRAWINGS.
5. UNLESS OTHERWISE NOTED, REMOVE EMBEDDED ITEMS AND REBAR LEFT BEHIND FROM DEMOLITION 1" INTO THE CONCRETE FACE AND REPAIR WITH POLYMER MODIFIED REPAIR MORTAR.

**DEMOLITION NOTES:**

1. DEMOLISH EXISTING REINFORCED CONCRETE WALL.
2. HAND CHIP AROUND EXISTING REBAR DOWELS IN WALL, BEAM, AND SLAB OF INFLUENT CHANNEL. KEEP REBAR DOWEL LENGTH REQUIRED TO LAP SPLICE WITH NEW REINFORCING.
3. DEMOLISH ALL EXISTING ALUMINUM GRATING AT INTERMEDIATE LEVEL.
4. DEMOLISH EXISTING ALUMINUM BEAMS AS INDICATED.
5. DEMOLISH EXISTING STEEL STEADY BEARING BEAMS, CLIP ANGLES, AND EMBEDDED CONNECTIONS, MINIMUM 1" BENEATH CONCRETE (TYPICAL OF 3 LEVELS IN DRY WELL).
6. DEMOLISH EXISTING LADDERS IN WET WELL.
7. DEMOLISH EXISTING REINFORCED CONCRETE SLAB AND BEAM

**SHEET LEGEND:**

INDICATED AREAS OR COMPONENTS TO BE DEMOLISHED



"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 23399, EXPIRATION DATE: 8/25/2018."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James P. Butler* 12/17/17  
DIRECTOR OF PUBLIC WORKS  
DATE

*Thomas P. Butler* 12/17/17  
CHIEF ENGINEER  
DATE

*Whitman, Requardt & Associates, LLP*  
801 South Caroline Street, Baltimore, Maryland 21231

*Jeffrey F. Gild*  
STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
LICENSE NO. 23399

DES: NAV				
DRN: CJS				
CHK: TJC				
DATE: NOV. 2017				
BY	NO.	REVISIONS		DATE

PLANS - DEMOLITION

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

S-5  
SCALE AS SHOWN  
SHEET 16 OF 46

11/29/2017 2:59:44 PM



**GENERAL NOTES:**

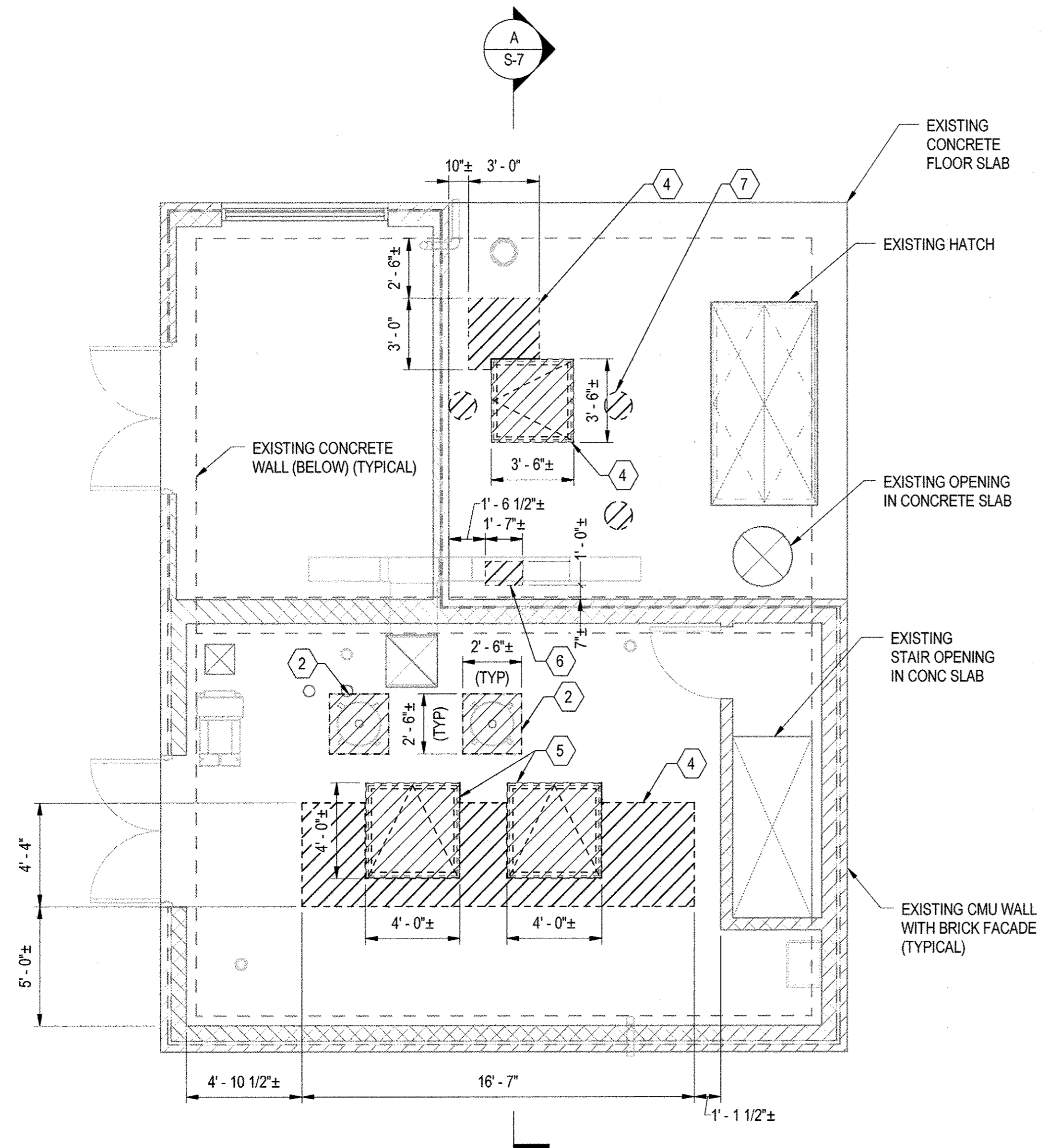
1. REFER TO SHEET S-1 FOR GENERAL STRUCTURAL NOTES, LOADS, CODES, AND ABBREVIATIONS.
2. REFER TO SHEET S-2 AND S-3 FOR TYPICAL STRUCTURAL DETAILS.
3. DURING ALL DEMOLITION WORK, DO NOT SAW CUT OR OTHERWISE DAMAGE ADJACENT BEAMS, WALLS, OR OTHER STRUCTURES.
4. VERIFY ALL DIMENSIONS INDICATED ON THIS PLAN IN THE FIELD. COORDINATE LOCATIONS AND SIZES OF ALL OPENINGS, SUPPORTS, ETC. WITH ACTUAL EQUIPMENT PROVIDED AND OTHER DECIPLES' DRAWINGS.
5. UNLESS OTHERWISE NOTED, REMOVE EMBEDDED ITEMS AND REBAR LEFT BEHIND FROM DEMOLITION 1" INTO THE CONCRETE FACE AND REPAIR WITH POLYMER MODIFIED REPAIR MORTAR.

**DEMOLITION NOTES:**

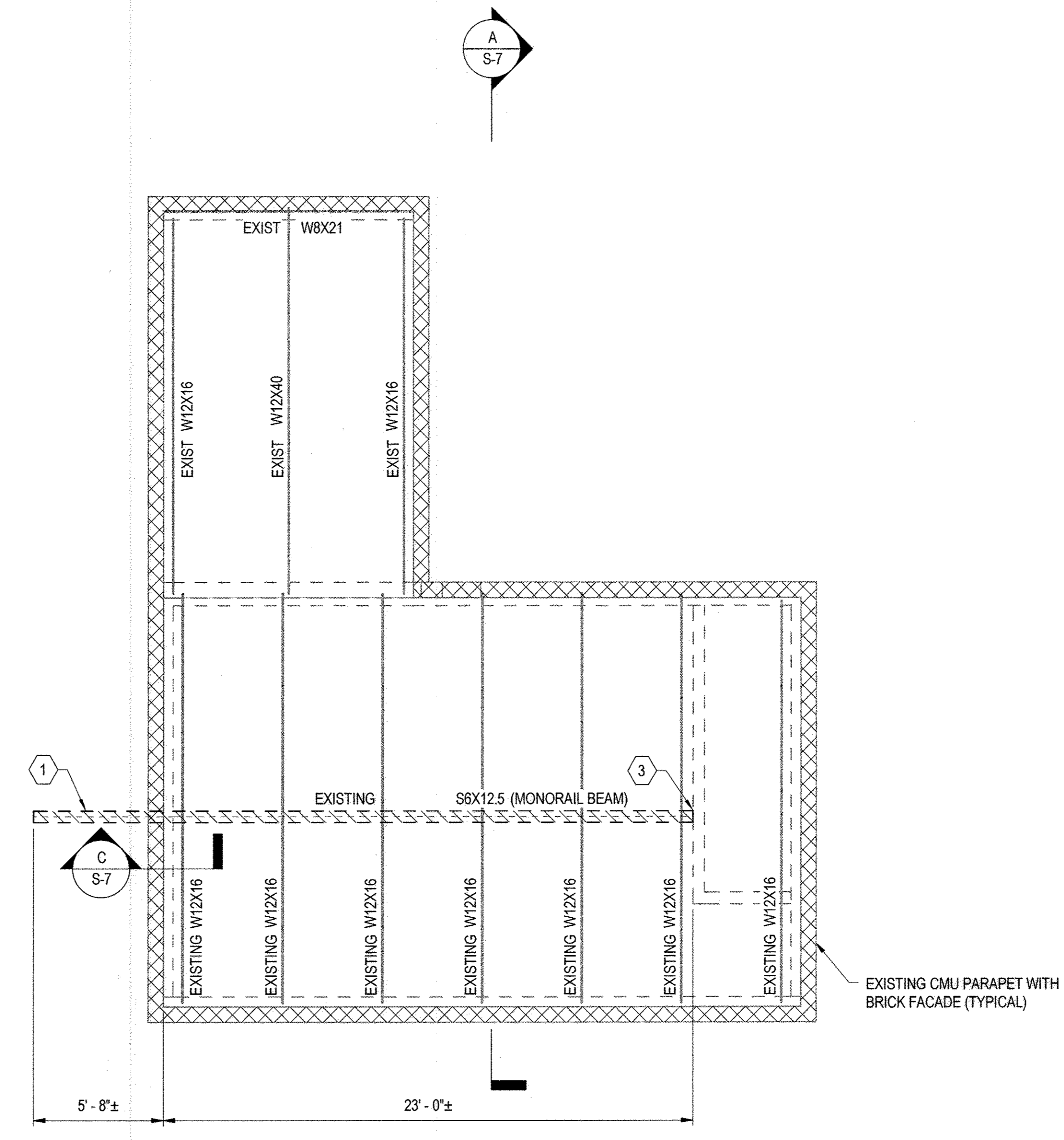
- 1 DEMOLISH EXISTING S6X12.5 MONORAIL BEAM. UNBOLT FROM EXISTING ROOF FRAMING TO REMAIN.
- 2 DEMOLISH EXISTING 4"± THICK CONCRETE PUMP MOTOR PAD TO 1" BELOW TOP OF OPERATING LEVEL SLAB. REPAIR CONCRETE PER SPECIFICATIONS
- 3 DEMOLISH EXISTING MONORAIL BEAM FLUSH WITH CMU WALL. COAT EXPOSED STEEL WITH CORROSION INHIBITOR.
- 4 COORDINATE DEMOLITION OF SLAB WITH LOCATION OF NEW HATCHES AND OTHER PUMPS OR GRINDERS BELOW. SAWCUT 1" AROUND ENTIRE PERIMETER OF EXISTING CONCRETE SLAB TO BE DEMOLISHED IN ORDER TO PROVIDE SQUARE CORNERS OF NEW OPENINGS. PROVIDE FACES OF NEW HATCH OPENING AS SMOOTH AS POSSIBLE AND DIMENSIONS WITHIN TOLERANCES SPECIFIED BY HATCH MANUFACTURER. TEMPORARILY SUPPORT EXISTING CONCRETE SLAB PRIOR TO DEMOLITION AND UNTIL NEW CONSTRUCTION IS COMPLETE. OR INSTALL NEW BEAMS AND DRYPACK NONSHRINK GROUT PRIOR TO DEMOLITION. APPLY SIKA ARMATEC 160 EPOCEM, OR APPROVED EQUAL, TO EXISTING REBAR EXPOSED DURING DEMOLITION.
- 5 DEMOLISH EXISTING HATCH. CHIP OUT HATCH FRAME AND PATCH WITH POLYMER MODIFIED REPAIR MORTAR.
- 6 DEMOLISH CONCRETE SLAB FOR NEW DUCT. COORDINATE LOCATION AND SIZE WITH MECHANICAL DRAWINGS.
- 7 OPENING FOR SLIDE GATE OPERATOR. COORDINATE WITH MECHANICAL DRAWINGS.

**SHEET LEGEND:**

 INDICATED AREAS OR COMPONENTS TO BE DEMOLISHED



**1 GRADE LEVEL PLAN - DEMOLITION**  
 S-6 SCALE: 1/4" = 1'-0"

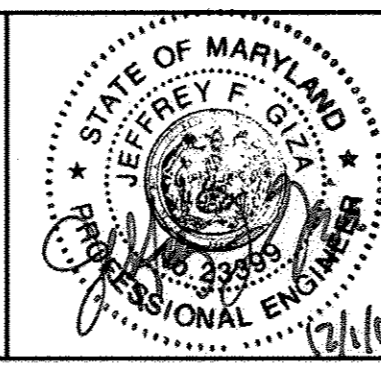


**2 ROOF FRAMING PLAN - DEMOLITION**  
 S-6 SCALE: 1/4" = 1'-0"

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DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 Director of Public Works: *James S. Butler* 12/4/17  
 Chief, Bureau of Utilities: *James S. Butler* 12-4-17

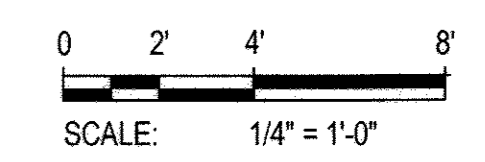
**WRA**  
 Whitman, Requardt & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231



DES: NAV				
DRN: CJS				
CHK: TJC				
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE

PLANS - DEMOLITION

DORSEY RUN WASTEWATER PUMPING STATION  
 UPGRADE  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996  
 ELECTION DISTRICT 6  
 HOWARD COUNTY, MARYLAND



**S-6**  
 SCALE AS SHOWN  
 SHEET 17 OF 46

11/29/2017 2:59:45 PM

**GENERAL NOTES:**

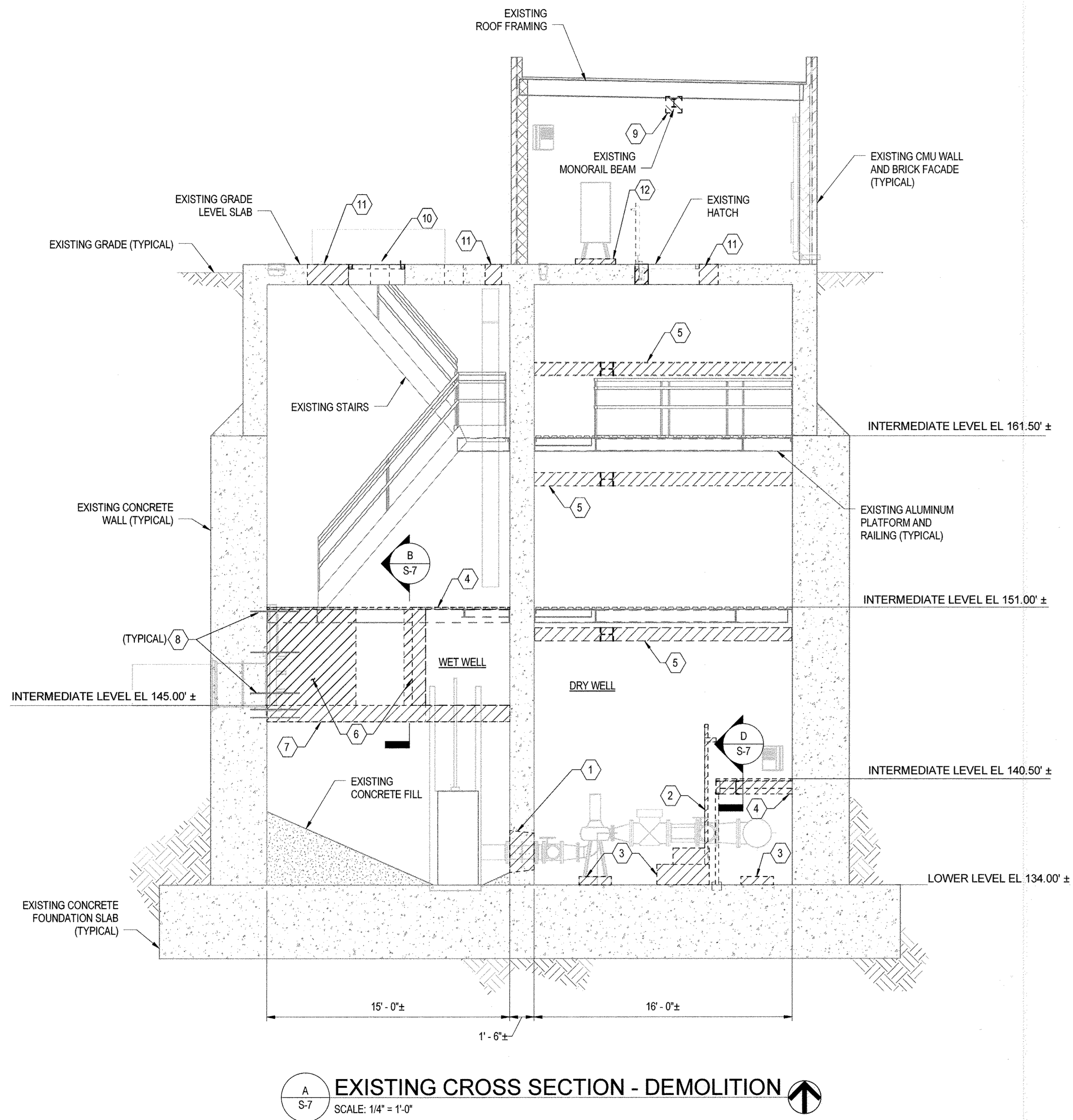
- REFER TO SHEET S-1 FOR GENERAL STRUCTURAL NOTES, LOADS, CODES, AND ABBREVIATIONS.
- REFER TO SHEET S-2 AND S-3 FOR TYPICAL STRUCTURAL DETAILS.
- DURING ALL DEMOLITION WORK, DO NOT SAW CUT OR OTHERWISE DAMAGE ADJACENT BEAMS, WALLS, OR OTHER STRUCTURES.
- VERIFY ALL DIMENSIONS INDICATED ON THIS PLAN IN THE FIELD. COORDINATE LOCATIONS AND SIZES OF ALL OPENINGS, SUPPORTS, ETC. WITH ACTUAL EQUIPMENT PROVIDED AND OTHER DECISIONS' DRAWINGS.
- UNLESS OTHERWISE NOTED, REMOVE EMBEDDED ITEMS AND REBAR LEFT BEHIND FROM DEMOLITION 1" INTO THE CONCRETE FACE AND REPAIR WITH POLYMER MODIFIED REPAIR MORTAR.

**DEMOLITION NOTES:**

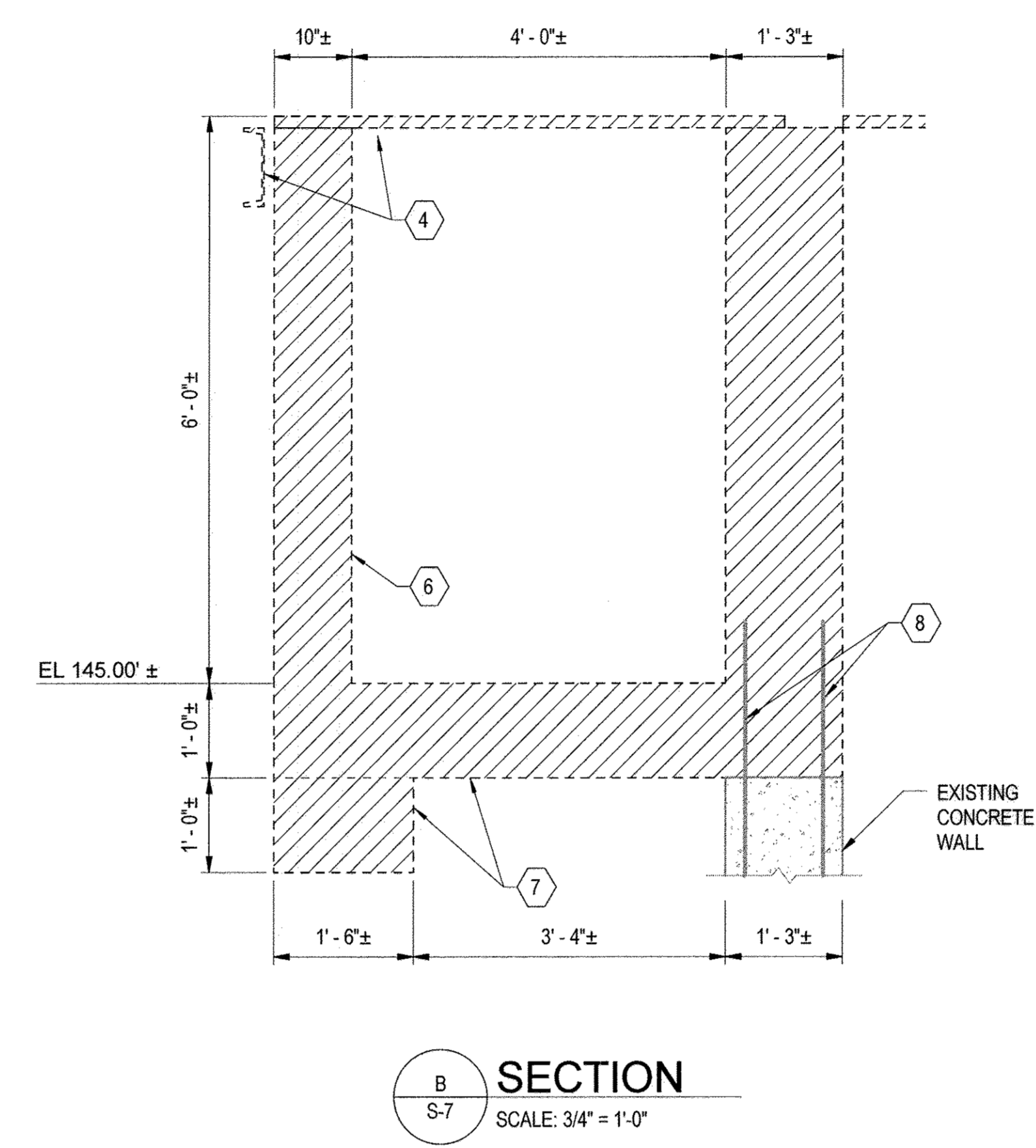
- SAWCUT PERIMETER 1" AND DEMOLISH CONCRETE WALL AND CASTING PER TYPICAL DETAILS.
- DEMOLISH EXISTING LADDERS, ALUMINUM CHANNEL POST, AND GROUT BASE TO TOP OF EXISTING FOUNDATION SLAB.
- DEMOLISH EXISTING CONCRETE PUMP AND PIPE PADS TO TOP OF EXISTING FOUNDATION SLAB.
- DEMOLISH EXISTING ALUMINUM GRATING, BEAMS, AND ANGLES.
- DEMOLISH EXISTING STEEL STEADY BEARING BEAMS AND CLIP ANGLE (TYPICAL OF 3 LEVELS IN DRY WELL).
- DEMOLISH EXISTING REINFORCED CONCRETE WALL.
- DEMOLISH EXISTING REINFORCED CONCRETE SLAB AND BEAM.
- HAND CHIP AROUND EXISTING REINFORCING AND KEEP LENGTH REQUIRED TO SPLICE WITH NEW REINFORCING.
- DEMOLISH EXISTING S6x12.5 MONORAIL BEAM. UNBOLT FROM EXISTING ROOF FRAMING TO REMAIN.
- DEMOLISH EXISTING HATCH. CHIP OUT HATCH FRAME AND PATCH WITH POLYMER MODIFIED REPAIR MORTAR.
- SAWCUT 1" AROUND ENTIRE PERIMETER OF EXISTING CONCRETE SLAB TO BE DEMOLISHED IN ORDER TO PROVIDE SQUARE CORNERS OF NEW OPENINGS. PROVIDE FACES OF NEW HATCH OPENING AS SMOOTH AS POSSIBLE AND DIMENSIONS WITHIN TOLERANCES SPECIFIED BY HATCH MANUFACTURER. TEMPORARILY SUPPORT EXISTING CONCRETE SLAB PRIOR TO DEMOLITION AND UNTIL NEW CONSTRUCTION IS COMPLETE, OR INSTALL NEW BEAMS AND DRYPACK NONSHRINK GROUT PRIOR TO DEMOLITION. APPLY SIKA ARMADEC 160 EPOCEM, OR APPROVED EQUAL, TO EXISTING REBAR EXPOSED DURING DEMOLITION.
- DEMOLISH EXISTING 4"± THICK CONCRETE PUMP MOTOR PAD TO 1" BELOW TOP OF OPERATING LEVEL SLAB. REPAIR CONCRETE PER SPECIFICATIONS

**SHEET LEGEND:**

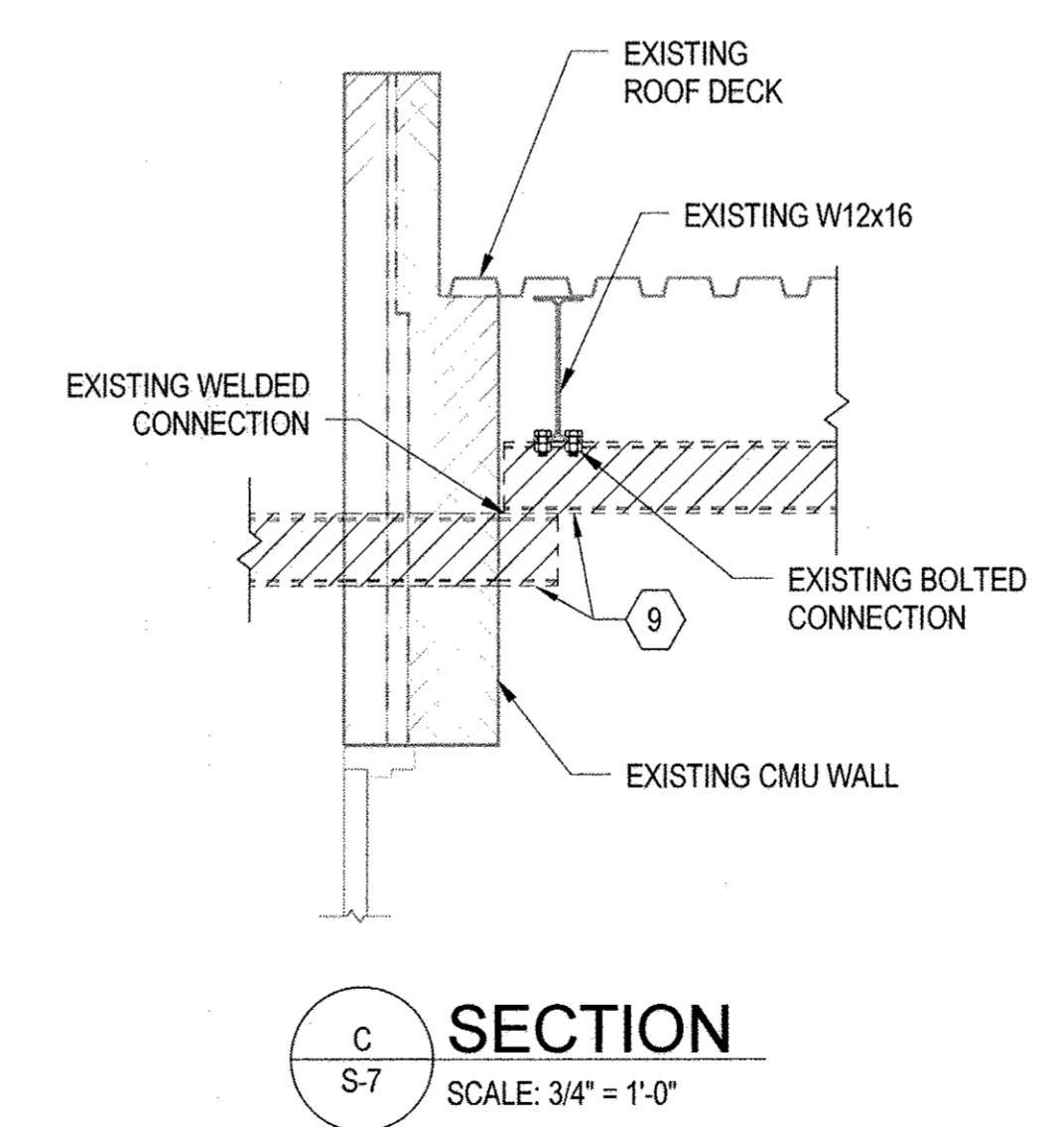
INDICATED AREAS OR COMPONENTS TO BE DEMOLISHED



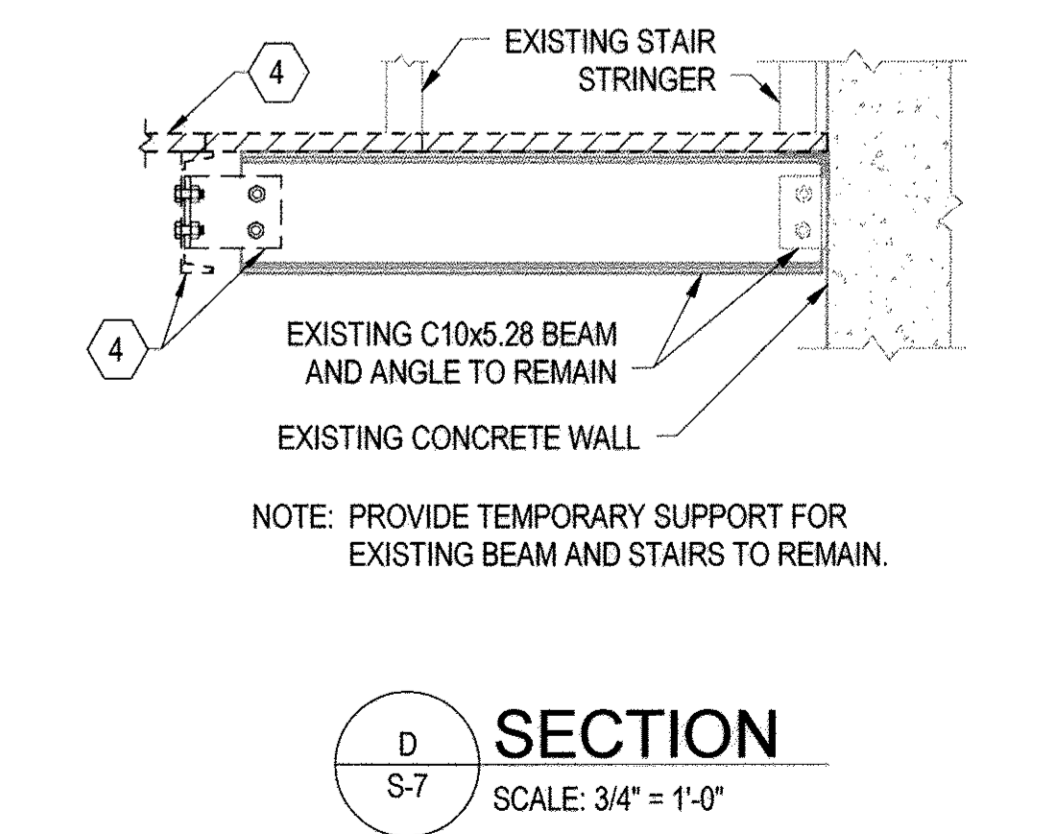
**A** EXISTING CROSS SECTION - DEMOLITION  
SCALE: 1/4" = 1'-0"



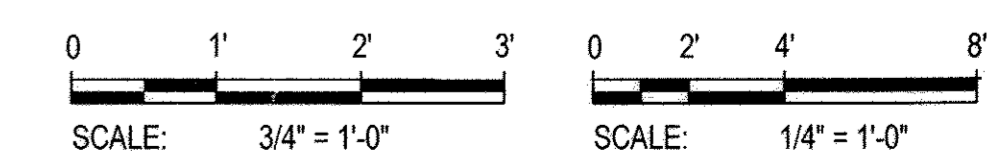
**B** SECTION  
SCALE: 3/4" = 1'-0"



**C** SECTION  
SCALE: 3/4" = 1'-0"



**D** SECTION  
SCALE: 3/4" = 1'-0"



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.  
*James E. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING  
*Thomas E. Butler* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



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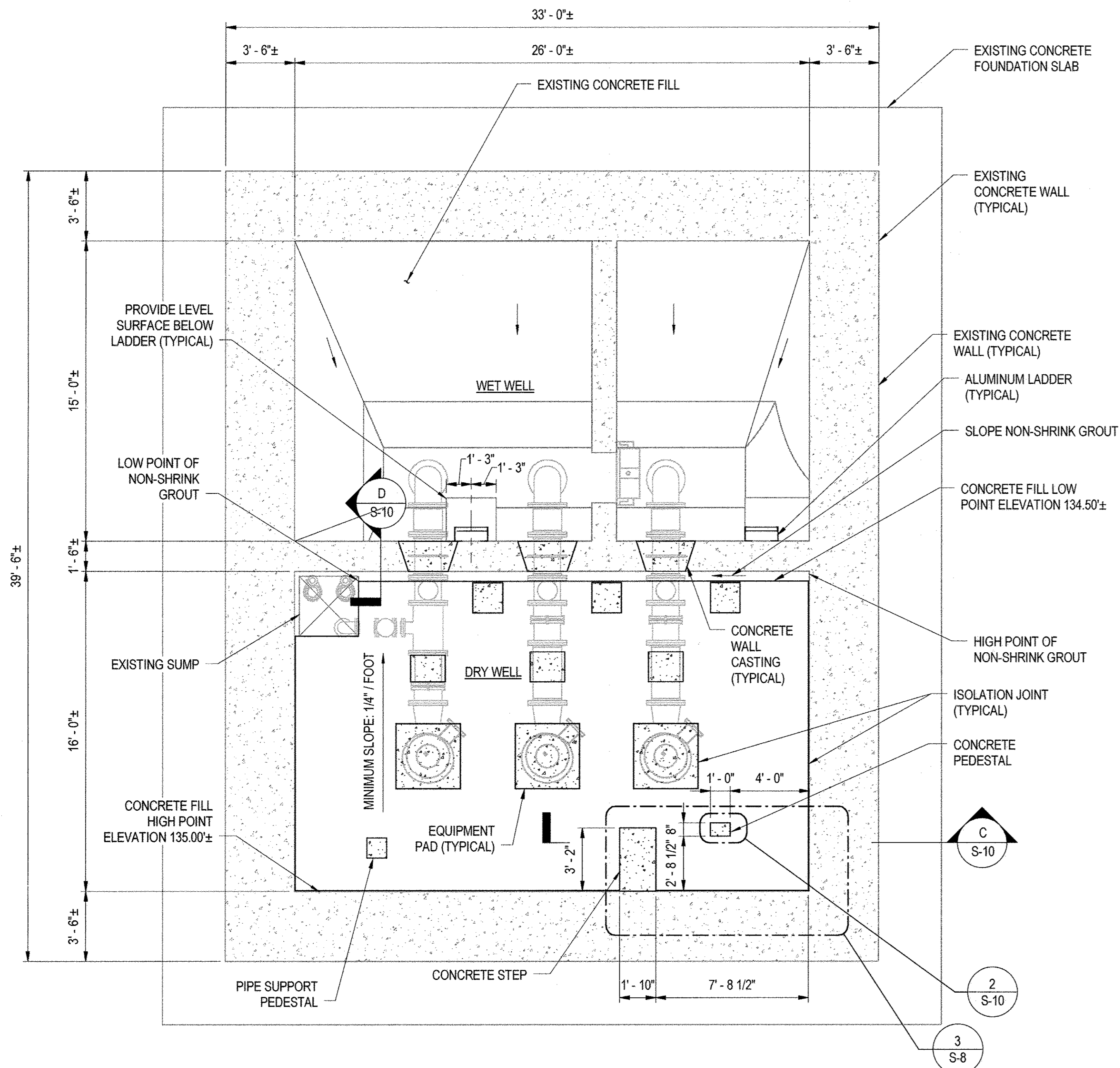
SECTIONS - DEMOLITION

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

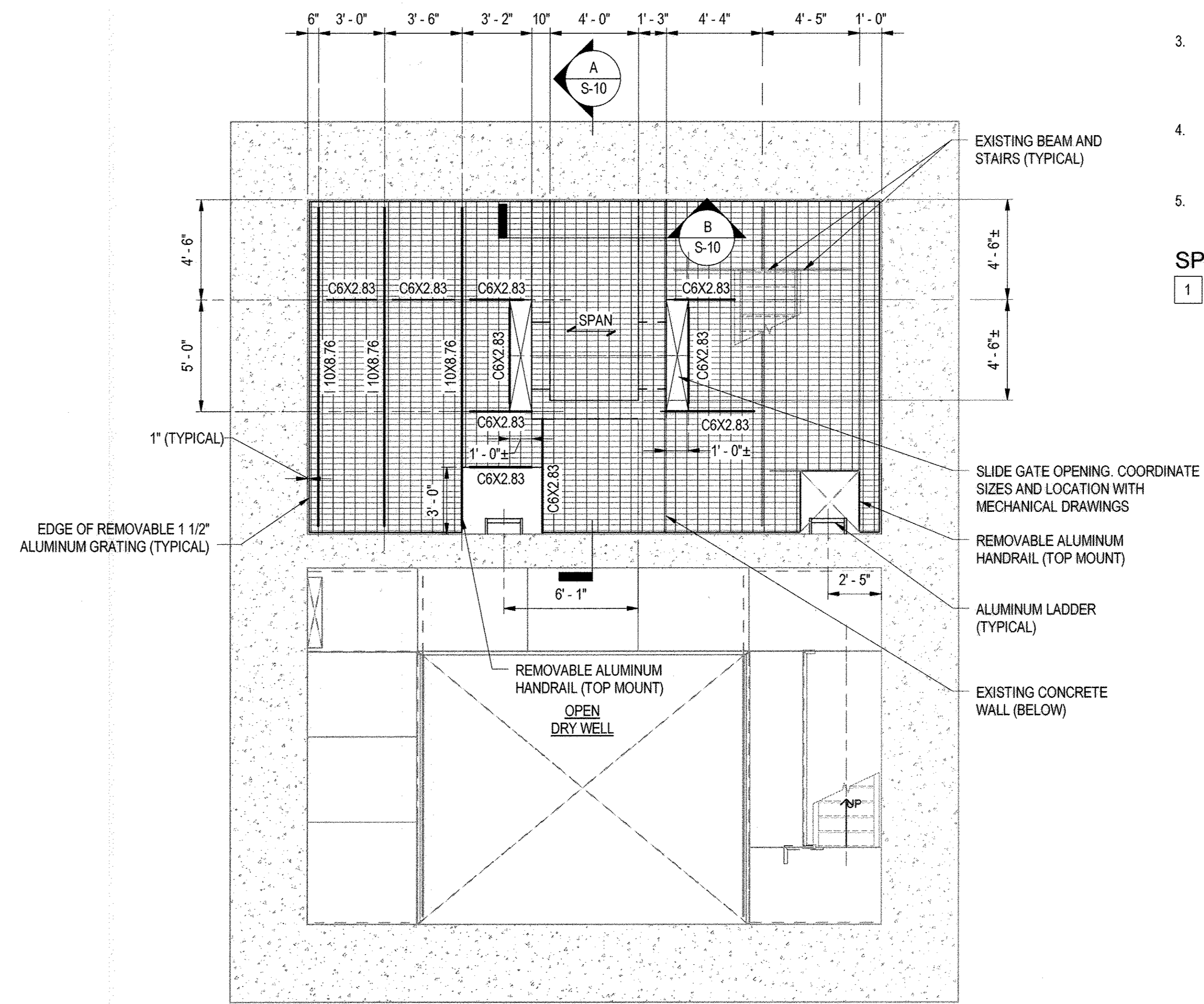
S-7  
SCALE AS SHOWN  
SHEET 18 OF 46

11/29/2017 2:59:46 PM

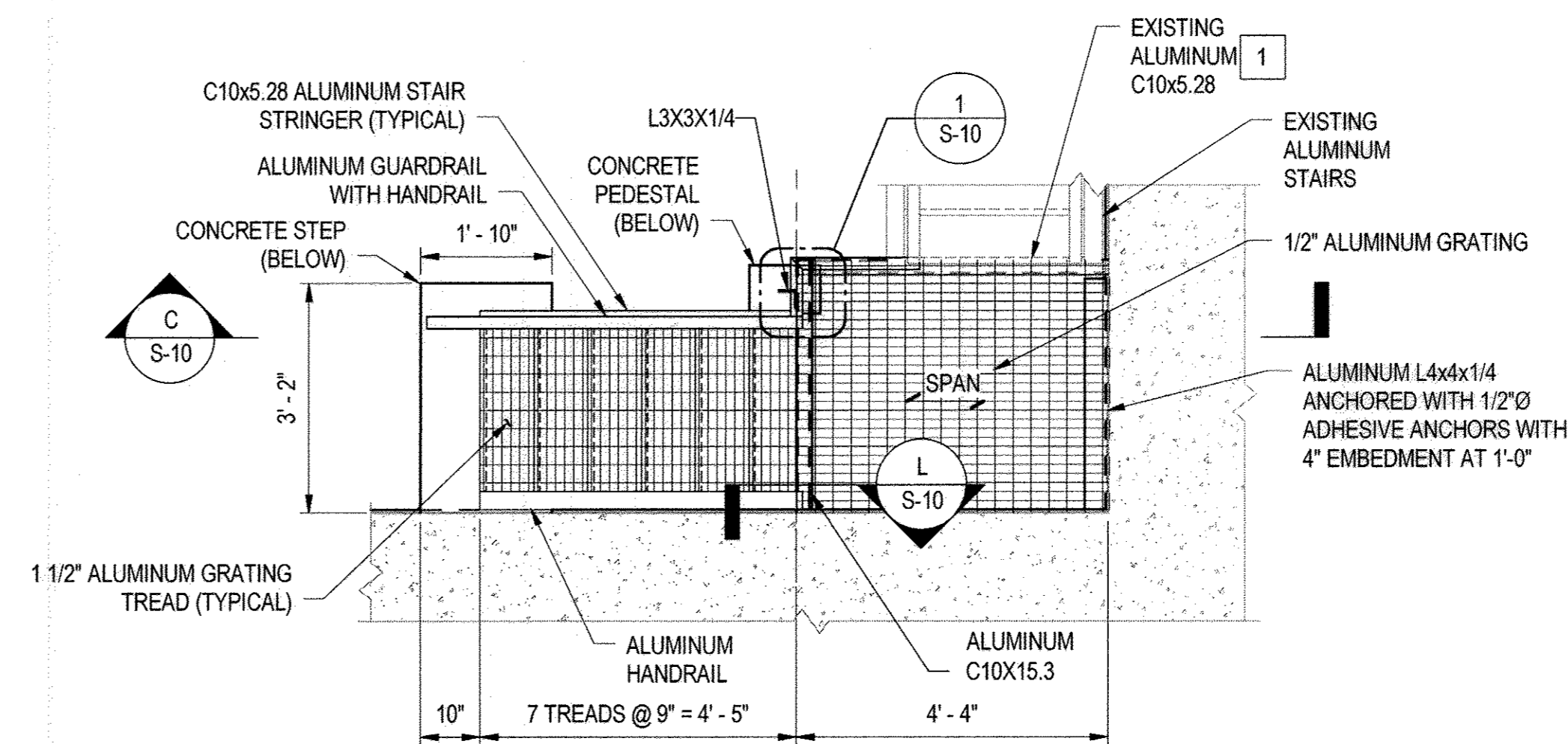




1 LOWER LEVEL PLAN - NEW WORK  
 S-8 SCALE: 1/4" = 1'-0"



2 INTERMEDIATE LEVEL @ EL 151.0± PLAN - NEW WORK  
 S-8 SCALE: 1/4" = 1'-0"



3 ENLARGED PLAN AT EL 140.50±  
 S-8 SCALE: 1/2" = 1'-0"

- GENERAL NOTES:**
- REFER TO SHEET S-1 FOR GENERAL STRUCTURAL NOTES, LOADS, CODES, AND ABBREVIATIONS.
  - REFER TO SHEETS S-2 AND S-3 FOR TYPICAL STRUCTURAL DETAILS.
  - VERIFY ALL DIMENSIONS INDICATED ON THIS PLAN IN THE FIELD. COORDINATE LOCATIONS AND SIZES OF ALL OPENINGS, SUPPORTS, ETC. WITH ACTUAL EQUIPMENT PROVIDED AND OTHER DISCIPLINES' DRAWINGS.
  - PROVIDE 12" THICK CONCRETE FILL AT HIGH POINT AND 6" AT LOW POINT. PROVIDE PLASTIC SHEET BETWEEN CONCRETE FILL AND EXISTING SLAB.
  - PROVIDE 1/2" ISOLATION JOINT WITH JOINT SEALANT AROUND PERIMETER OF CONCRETE FILL AND AT CONCRETE PADS, STEPS, SUPPORTS, PEDESTALS, ETC.
- SPECIFIC NOTES:**
- EXISTING C10 BEAM AND CLIP ANGLE REMAIN. TEMPORARILY SUPPORT BEAM AND STAIRS ABOVE UNTIL PERMANENT SUPPORTS ARE INSTALLED.

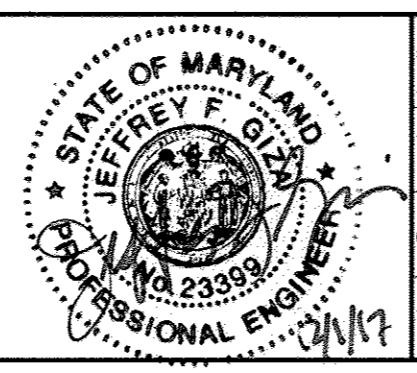
"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 23399, EXPIRATION DATE: 8/25/2018."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.

*James E. Butler* 12/16/17  
 CHIEF, BUREAU OF ENGINEERING

*Thomas E. Butler* 12/16/17  
 CHIEF, UTILITY DESIGN DIVISION

**WRA**  
 Whitman, Reardon & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231



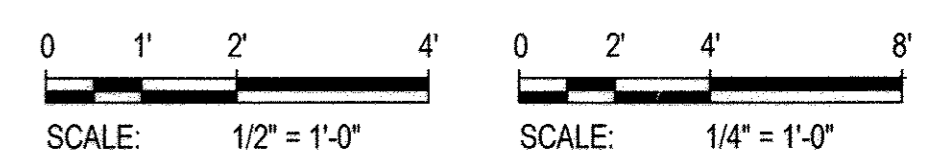
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DRN: CJS			
CHK: TJC			
DATE: NOV. 2017			
BY	NO.	REVISIONS	DATE

PLANS - NEW WORK

DORSEY RUN WASTEWATER PUMPING STATION  
 UPGRADE  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND



S-8  
 SCALE AS SHOWN  
 SHEET 19 OF 46

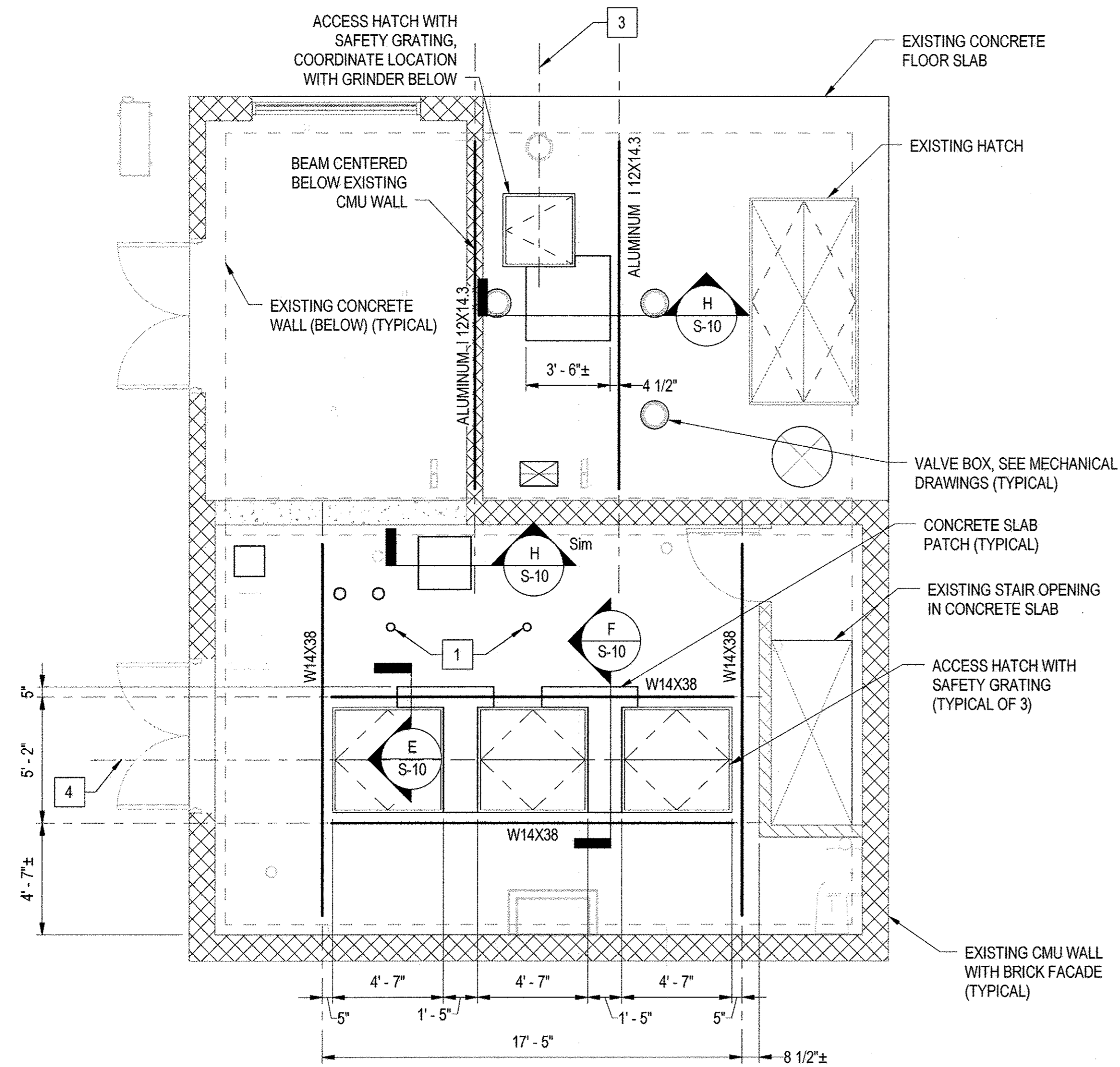
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**GENERAL NOTES:**

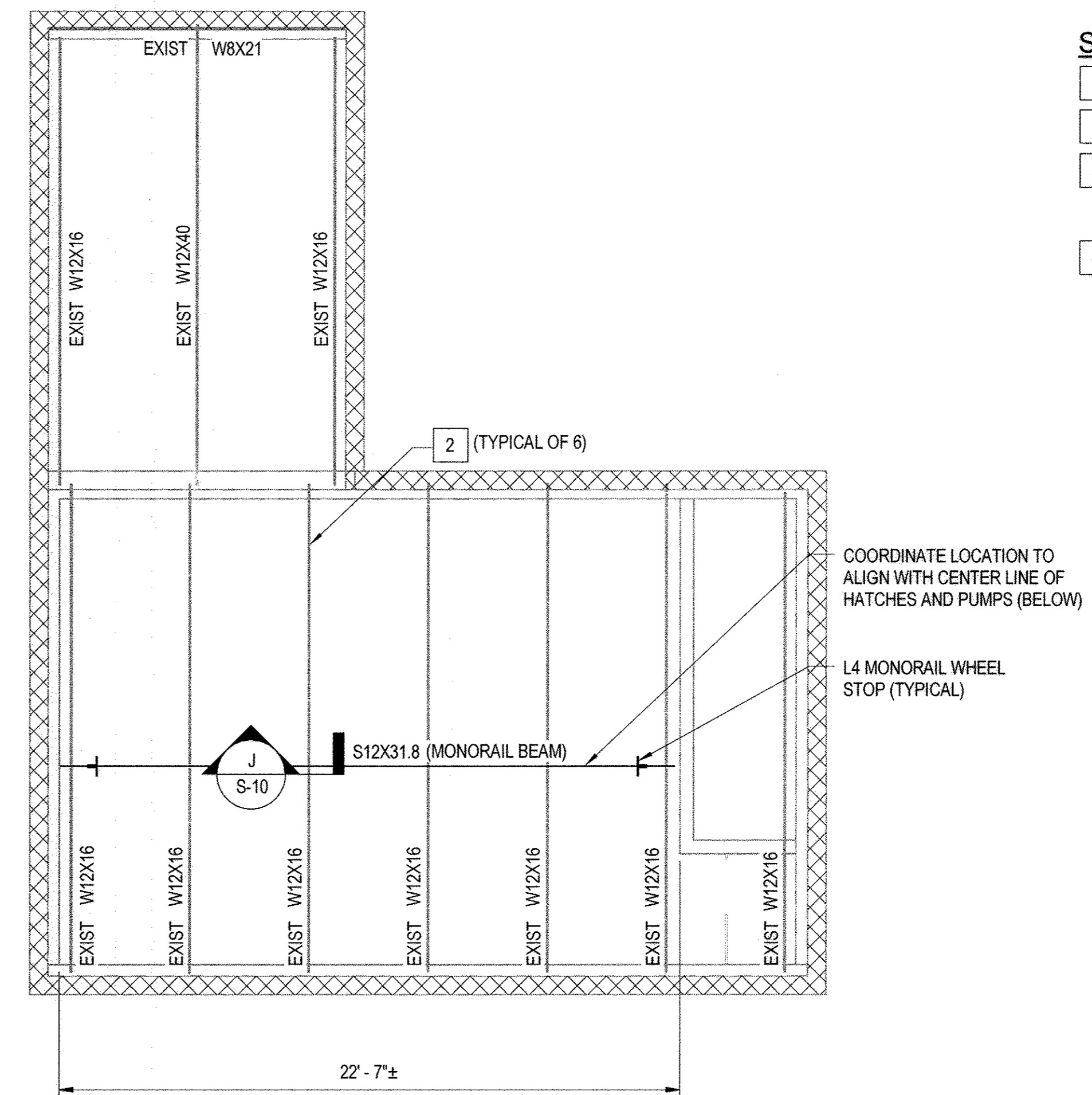
- REFER TO SHEET S-1 FOR GENERAL STRUCTURAL NOTES, LOADS, CODES, AND ABBREVIATIONS.
- REFER TO SHEETS S-2 AND S-3 FOR TYPICAL STRUCTURAL DETAILS.
- VERIFY ALL DIMENSIONS INDICATED ON THIS PLAN IN THE FIELD. COORDINATE LOCATIONS AND SIZES OF ALL OPENINGS, SUPPORTS, ETC. WITH ACTUAL EQUIPMENT PROVIDED.
- PROVIDE CONCRETE FILLED EXISTING PENETRATIONS FLUSH WITH TOP OF EXISTING CONCRETE MATCH FINISHED SURFACE OF ADJACENT CONCRETE.
- COORDINATE LOCATION OF MONORAIL WHEEL STOPS TO PREVENT CONTACT BETWEEN TROLLEY OR PUMP, AND ANY STRUCTURAL ELEMENT. SUBMIT LOCATION PRIOR TO FABRICATION FOR APPROVAL.

**SPECIFIC NOTES:**

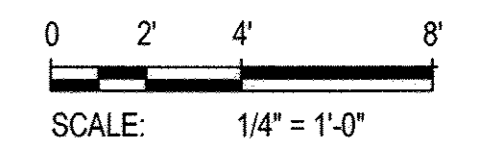
- PATCH EXISTING OPENINGS WITH CONCRETE.
- REINFORCE EACH EXISTING ROOF BEAM PER J/S-10.
- COORDINATE LOCATION OF HATCH TO ALIGN CENTERLINE OF NEW HATCH WITH CENTERLINE OF NEW GRINDER (BELOW) SHOWN ON MECHANICAL DRAWINGS.
- COORDINATE LOCATION OF HATCHES TO ALIGN HATCH CENTERLINES WITH CENTERLINE OF PUMPS BELOW.



1  
S-9  
GRADE LEVEL PLAN - NEW WORK  
SCALE: 1/4" = 1'-0"



2  
S-9  
ROOF FRAMING PLAN - NEW WORK  
SCALE: 1/4" = 1'-0"



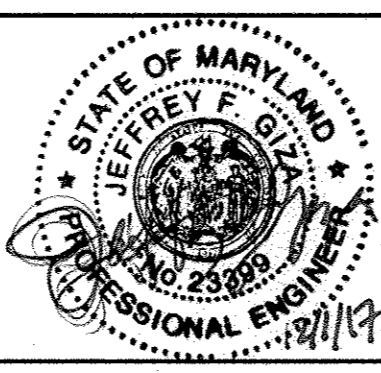
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DATE

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DES: NAV					
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PLANS - NEW WORK

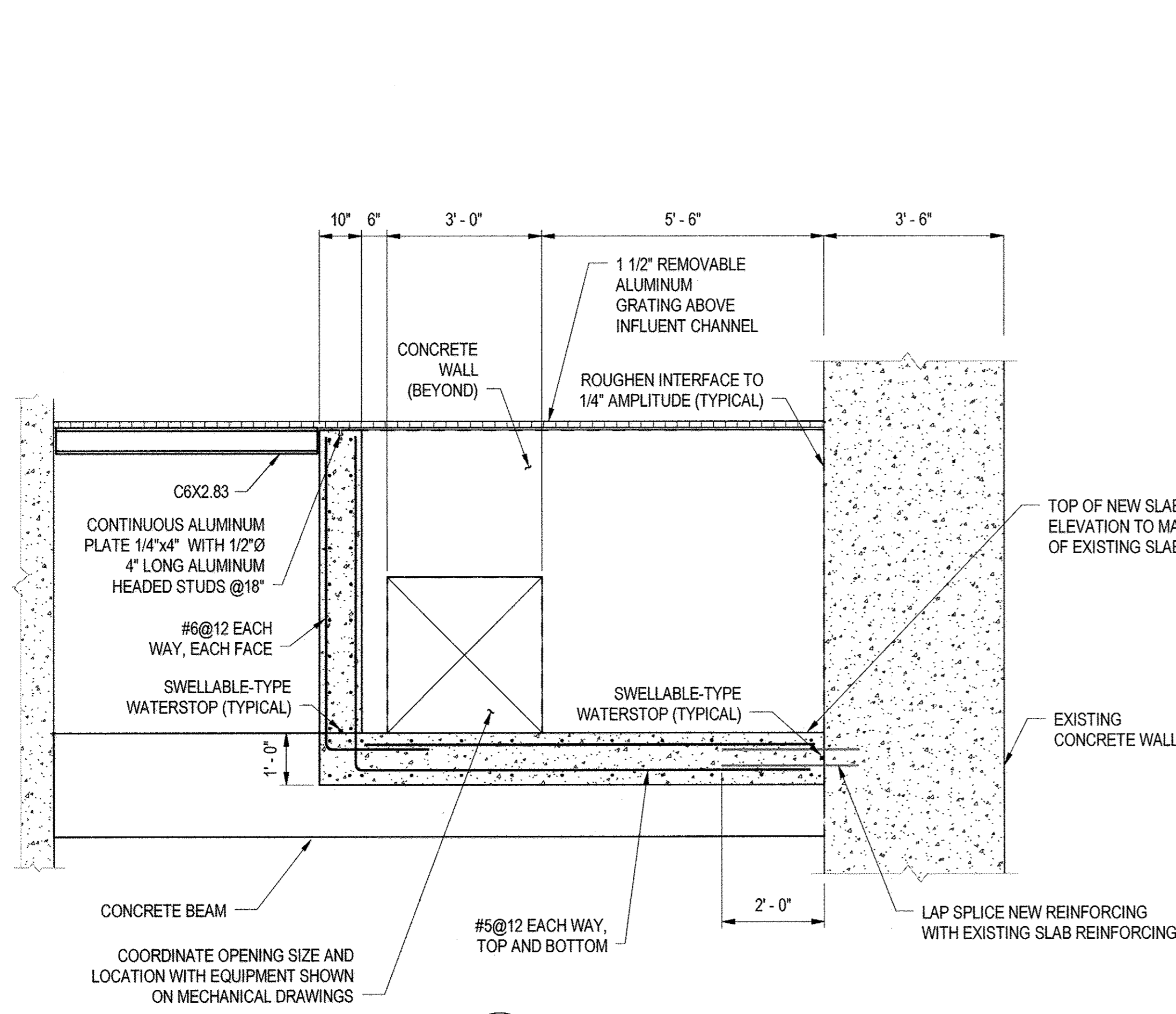
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UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

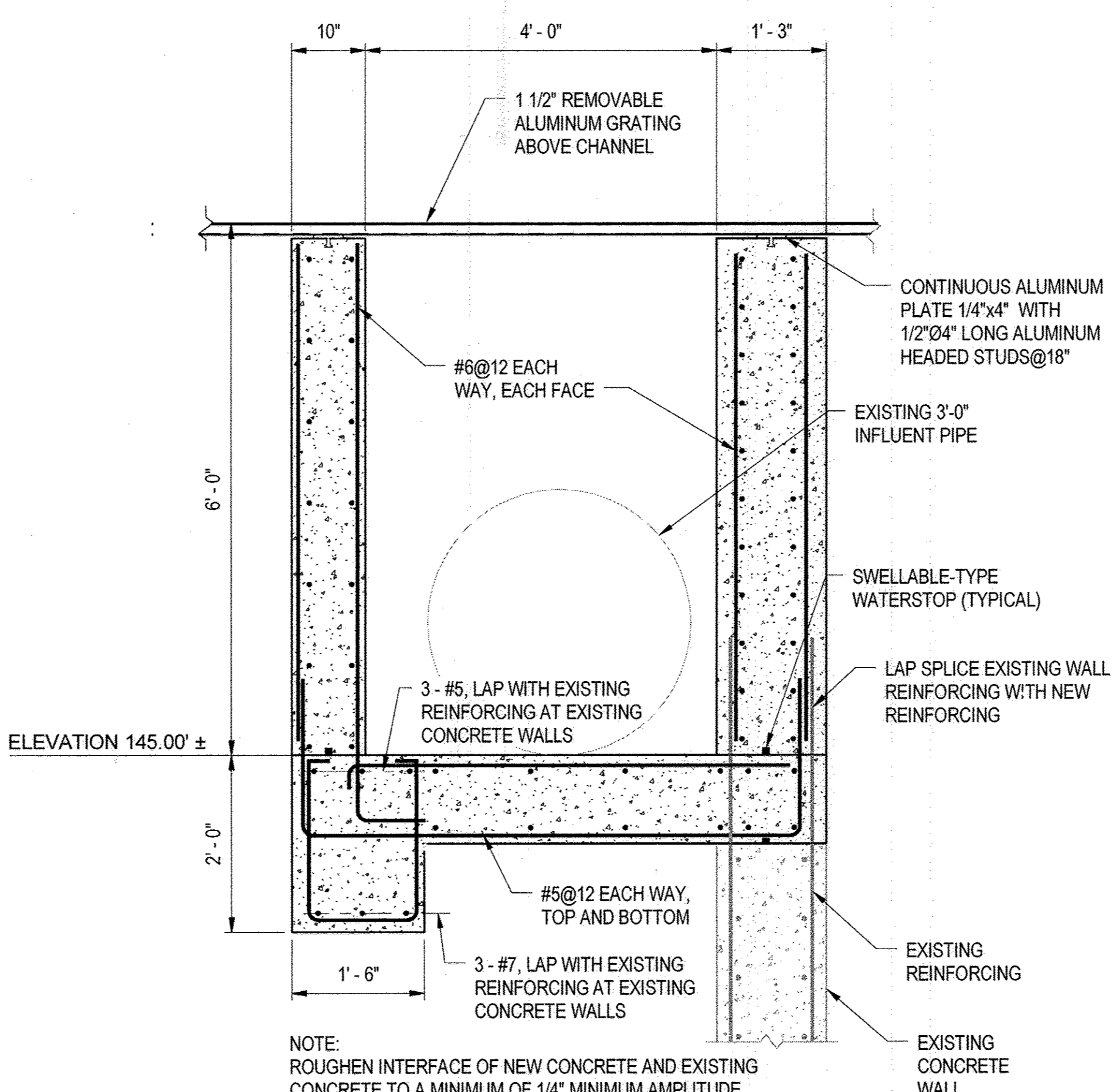
S-9  
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SHEET 20 OF 46

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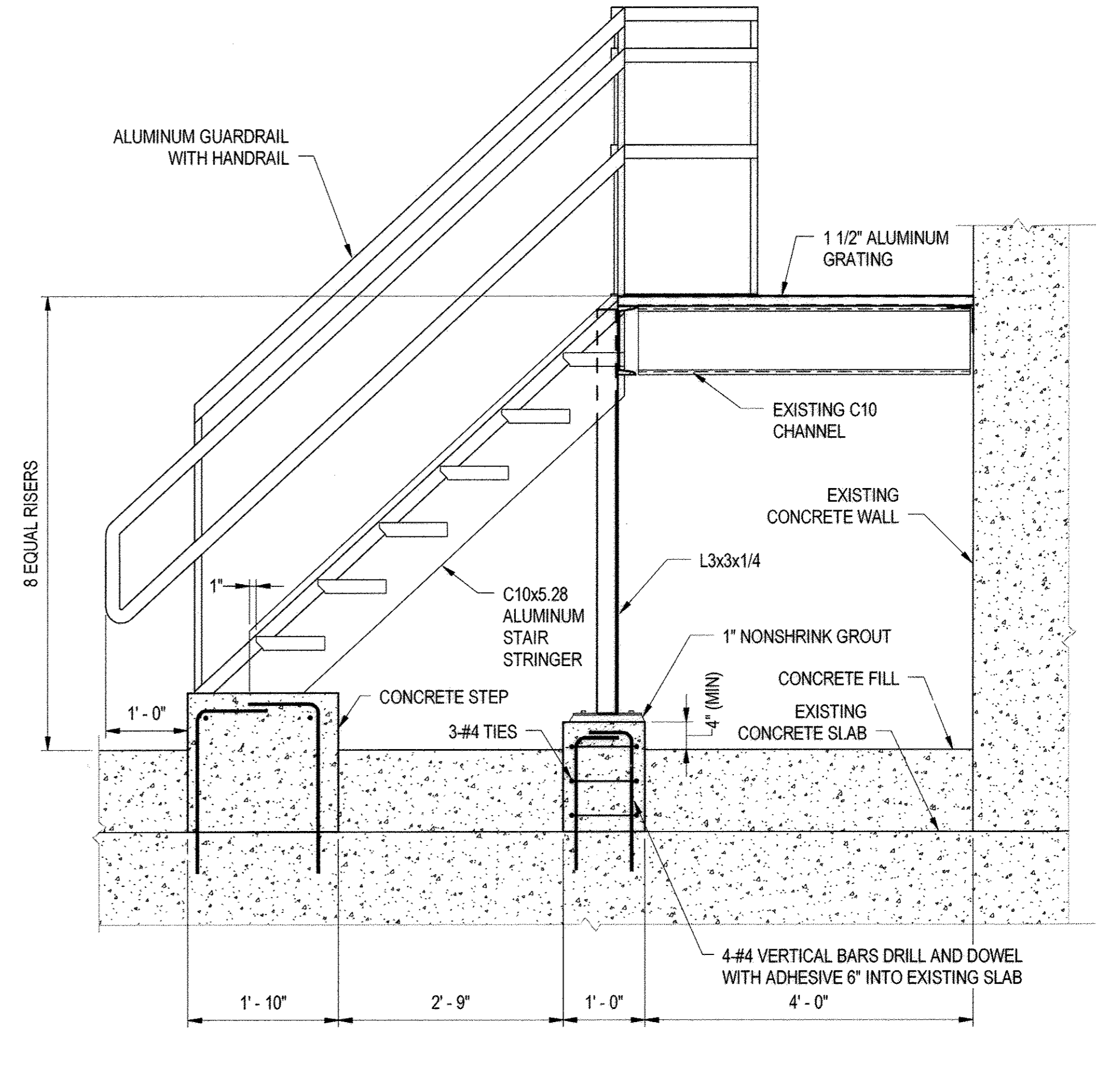




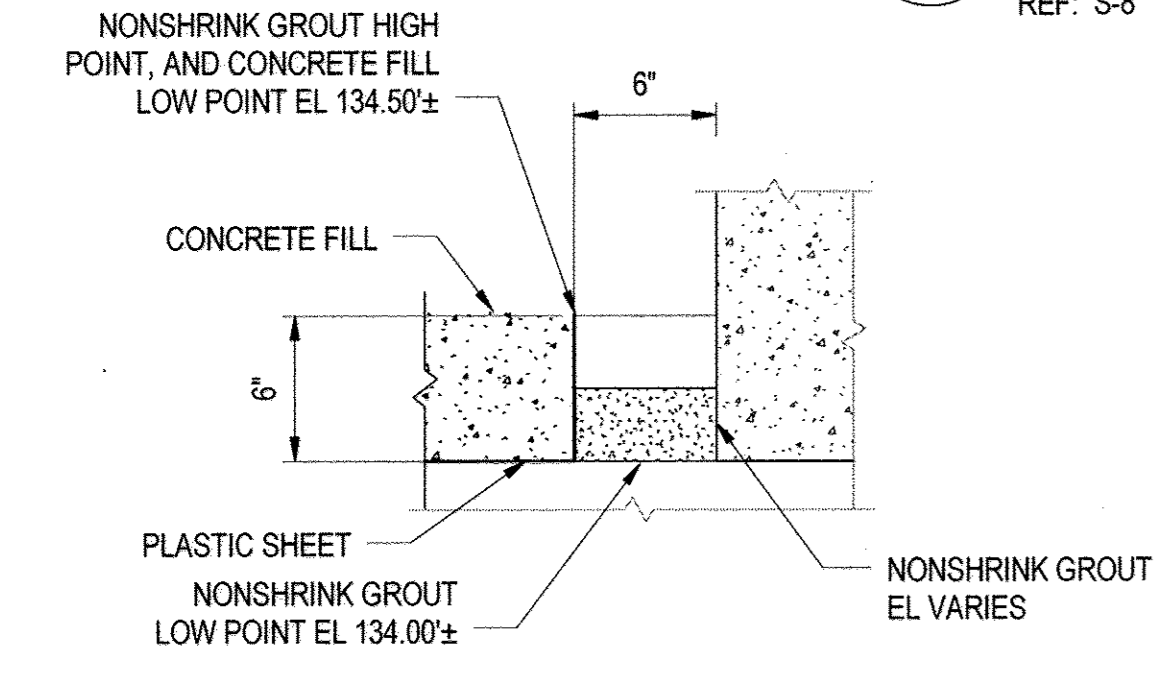
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S-10  
SCALE: 1/2" = 1'-0"  
REF: S-8



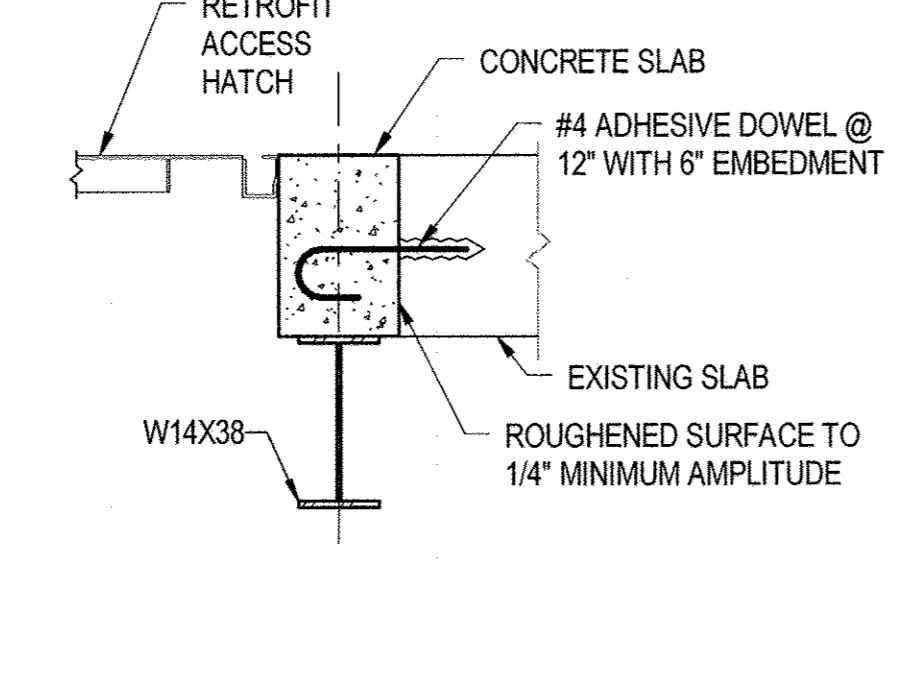
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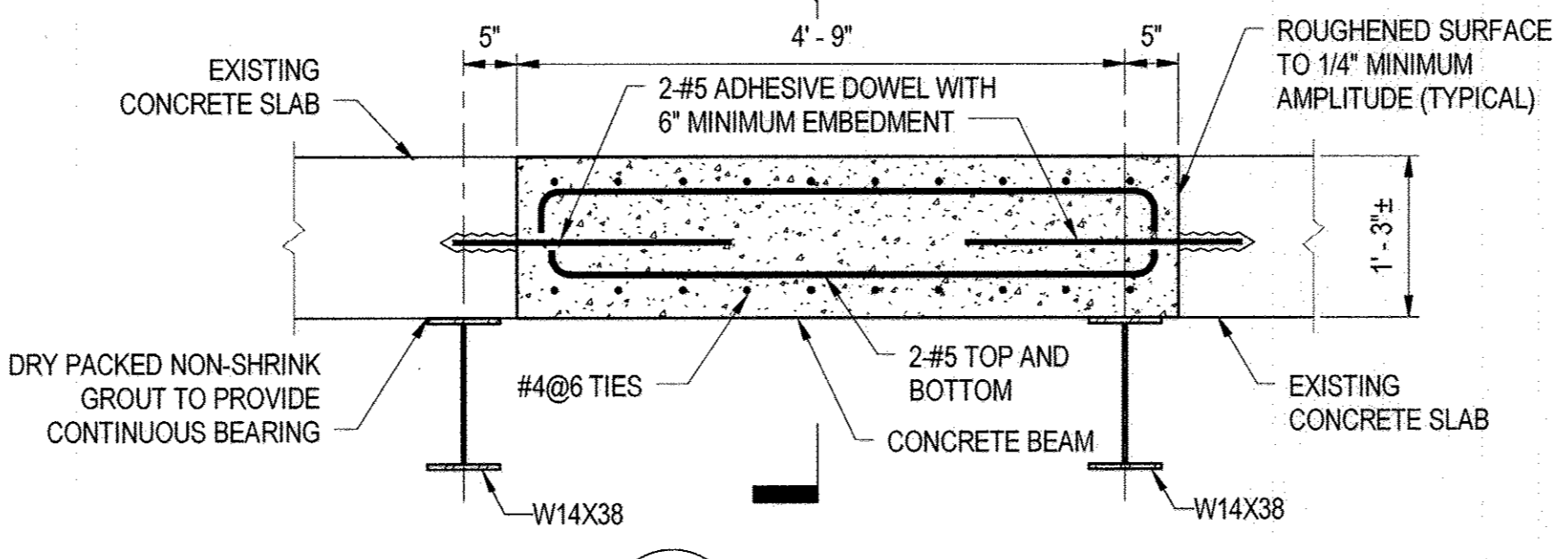
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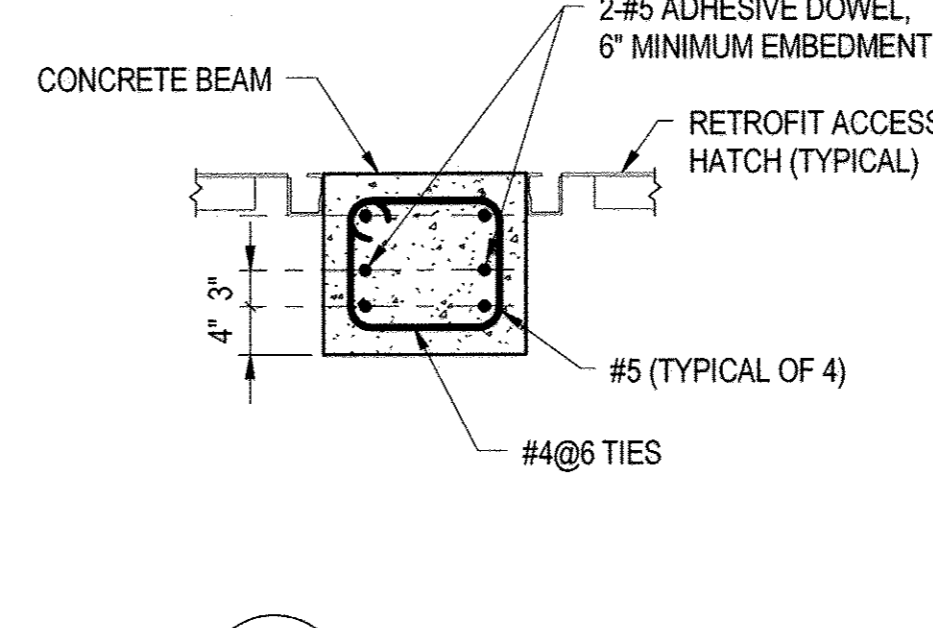
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S-10  
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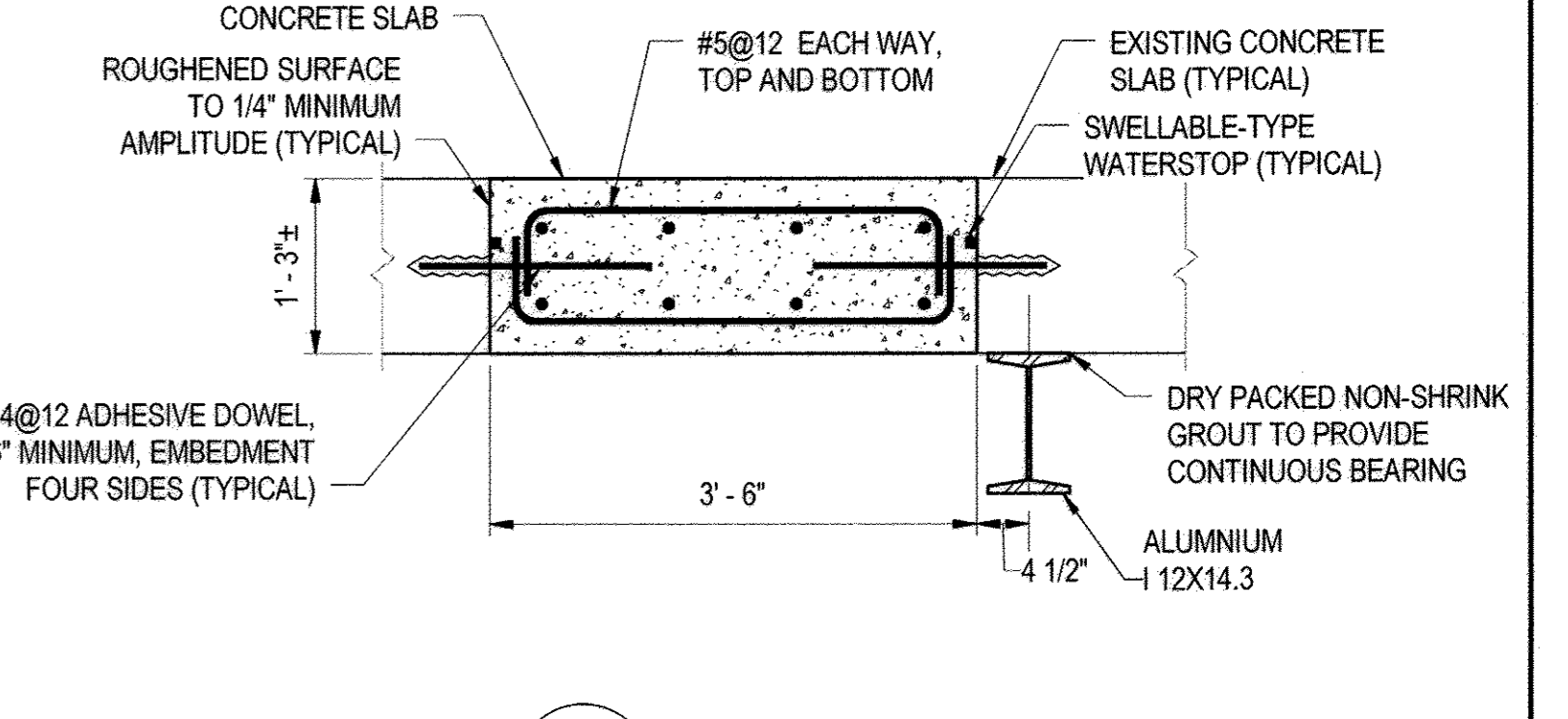
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S-10  
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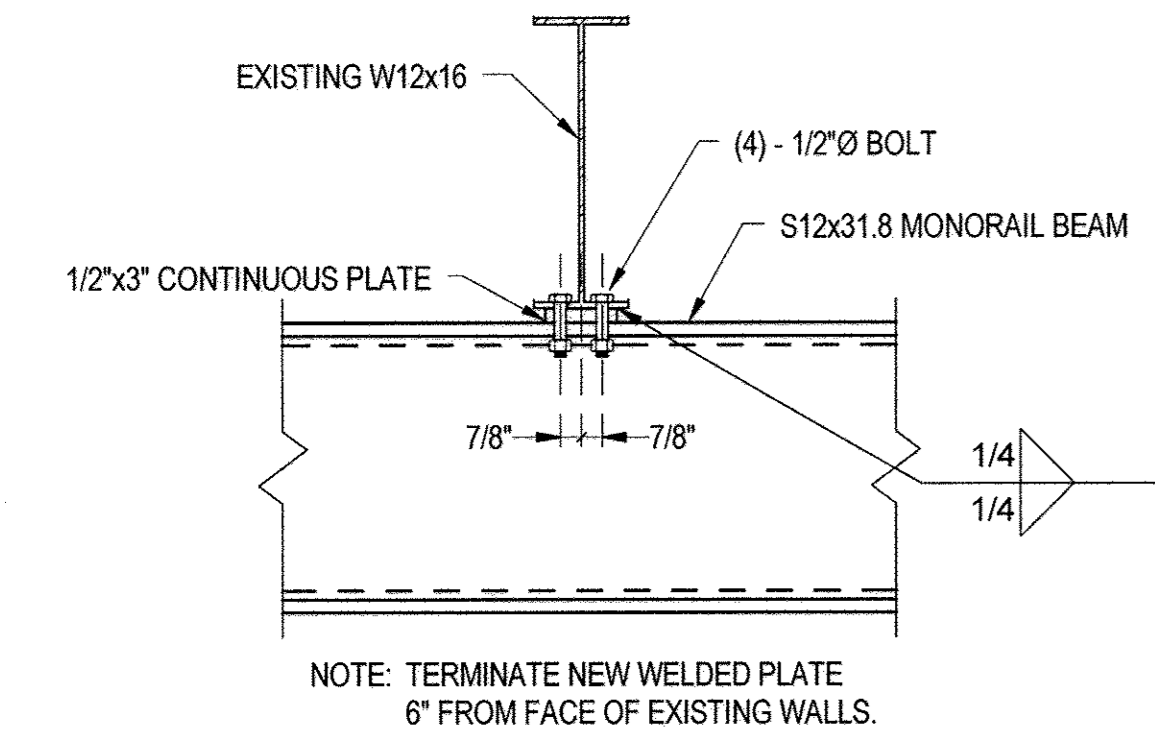
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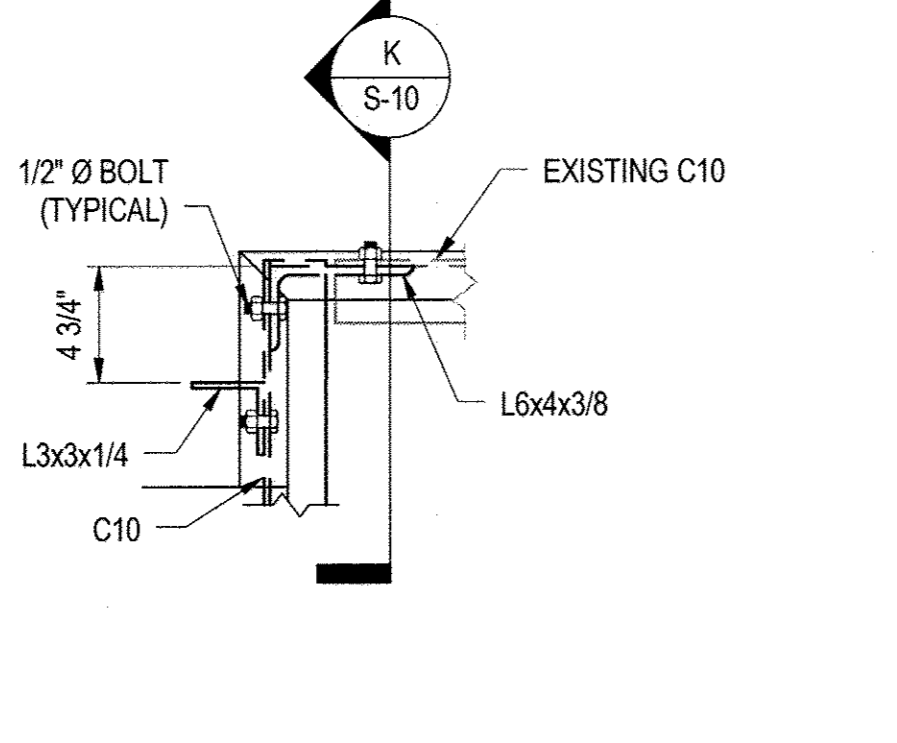
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S-10  
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REF: S-10



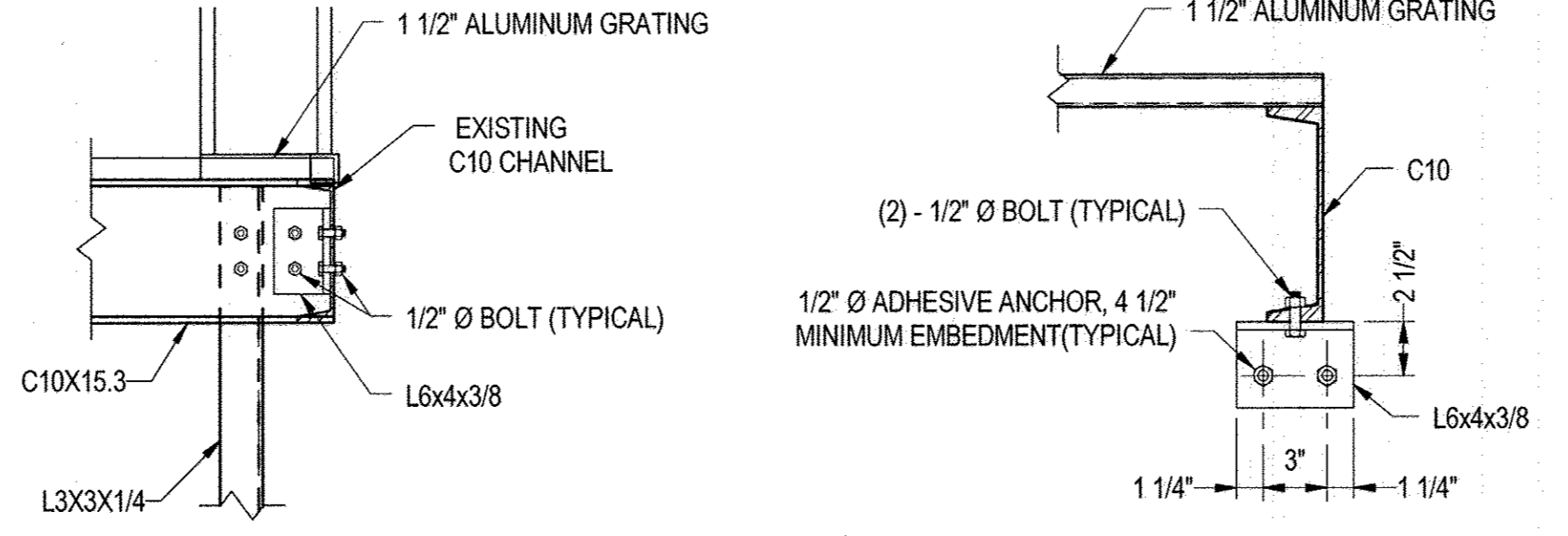
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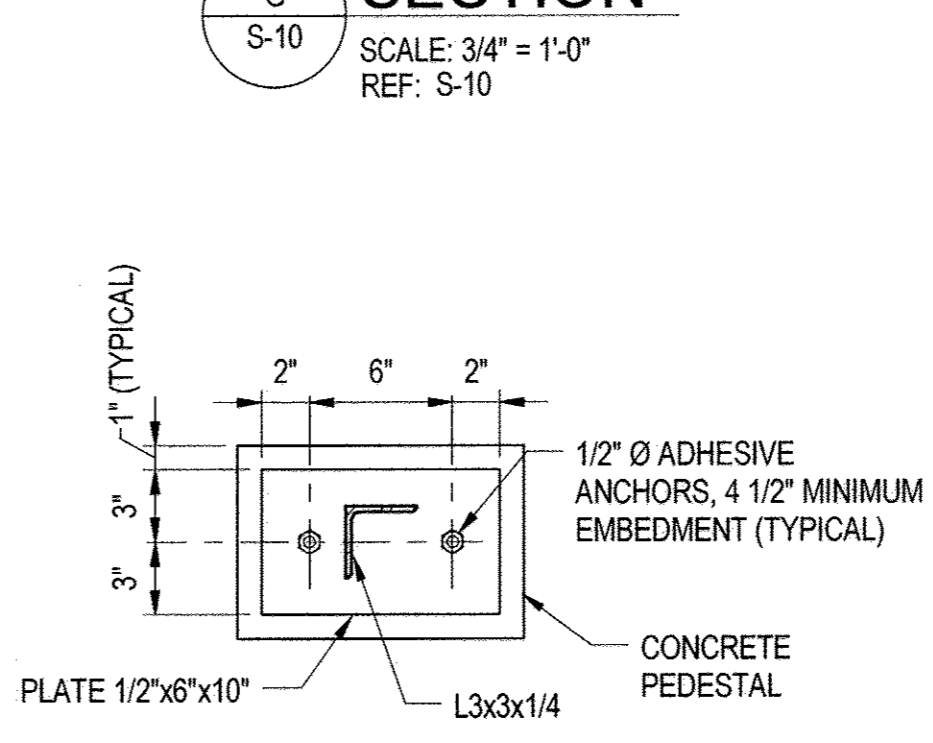
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S-10  
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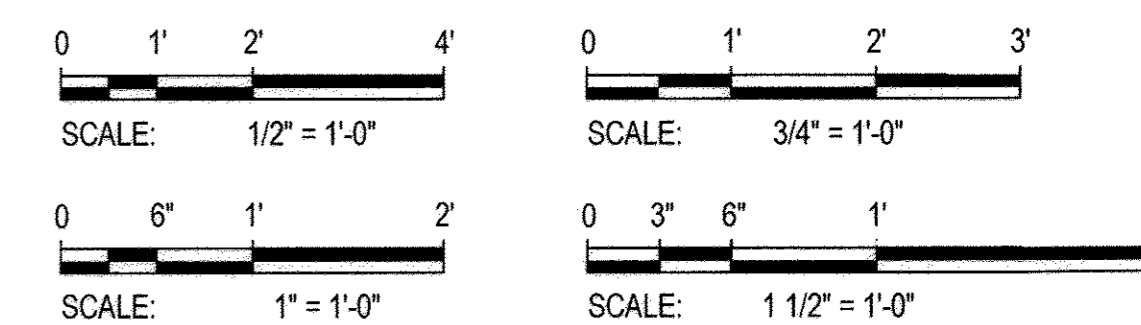
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S-10  
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REF: S-8



**L SECTION**  
S-10  
SCALE: 1 1/2" = 1'-0"  
REF: S-8



**2 DETAIL**  
S-10  
SCALE: 1 1/2" = 1'-0"  
REF: S-8



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Director of Public Works*  
11/29/2017 2:59:50 PM

*Chief, Bureau of Utilities*  
11/29/17

*Chief, Utility Design Division*  
12/1/17

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

STATE OF MARYLAND  
JEFFREY F. BIRD  
PROFESSIONAL ENGINEER  
NO. 23399

DES: NAV				
DRN: CJS				
CHK: TJC				
DATE: NOV. 2017	BY: NO.	REVISIONS	DATE	

SECTIONS AND DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

**S-10**  
SCALE AS SHOWN  
SHEET  
21 OF 46



**GENERAL ABBREVIATIONS**

ABBREVIATION	DESCRIPTION
ACFM	ACTUAL CUBIC FEET PER MINUTE
ADF	AVERAGE DAILY FLOW
AFF	ABOVE FINISHED FLOOR
ARV	AIR RELEASE VALVE
ASTM	AMERICAN STANDARD FOR TESTING MATERIALS
B	BELT DRIVE
BDD	BACK DRAFT DAMPER
CE	CENTRIFUGAL
CI	CAST IRON
CL	CENTER LINE
CP	CONTROL PANEL
D	DIRECT DRIVE
DEG	DEGREES
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DN	DOWN
EL	ELEVATION
ES	EMERGENCY SHOWER
EX	EXISTING
FD	FLOOR DRAIN
FF	FINISHED FLOOR
F.C.	FLUSHING CONNECTION
FLG	FLANGE
FM	FORCE MAIN
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MIN
FPS	FEET PER SECOND
FT	FEET
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
H/P	HIGH POINT
HWL	HIGH WATER LEVEL
HZ	HERTZ
IA	INLINE AXIAL
ID	INSIDE DIAMETER
INV	INVERT
KW	KILOWATT
LB/LBS	POUNDS/POUNDS
LBS/HR	POUNDS PER HOUR
LF	LINEAR FEET
LWL	LOW WATER LEVEL
MAX	MAXIMUM
MGD	MILLION GALLONS PER DAY
MIN	MINIMUM
MJ	MECHANICAL JOINT
MOD	MOTOR OPERATED DAMPER
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NRS	NON RISING STEM
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
OD	OUTSIDE DIAMETER
P	PROPELLOR
PE	PLAIN END
PHF	PEAK HOURLY FLOW
PPD	POUND PER DAY
PPM	PARTS PER MILLION
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
RJ	RESTRAINED JOINT
RPM	REVOLUTIONS PER MINUTE
RVSS	REDUCED VOLTAGE SOLID STATE
SCH	SCHEDULE
SHT	SHEET
S.P.	STATIC PRESSURE
S.S.	STAINLESS STEEL
TDH	TOTAL DYNAMICA HEAD
TYP.	TYPICAL
VFD	VARIABLE FREQUENCY DRIVE
VS	VARIABLE SPEED
WL	WATER LEVEL

**PROCESS EQUIPMENT IDENTIFIERS**

IDENTIFIER	DESCRIPTION
BFP	BACKFLOW PREVENTER
CO	CLEAN OUT
EF	EXHAUST FAN
EUH	ELECTRIC UNIT HEATER
ICG	INFLUENT CHANNEL GRINDER
HB	HOSE BIBB
NFWH	NON FREEZE WALL HYDRANT
SF	SUPPLY FAN
SLG	SLIDE GATE
RSP	RAW SEWAGE PUMP
VTR	VENT THROUGH ROOF

**FLOW STREAM IDENTIFIERS**

IDENTIFIER	DESCRIPTION
CW	CITY WATER (POTABLE)
D	DRAIN
HW	HOT WATER

**PIPING SYMBOLS**

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		WELDED JOINT
		GROOVED JOINT
		FLANGED JOINT
		MECHANICAL JOINT
		SCREWED JOINT
N/A		HUB & SPIGOT JOINT (RUBBER GASKET)
		GROVED END ADAPTER FLANGE
		FLANGE COUPLING ADAPTER
		FLEXIBLE COUPLING
		METAL BELLOWS EXP JOINT
		ELASTOMER BELLOWS EXP JOINT
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		REDUCING BUSHING
		UNION
		CAP
		ELBOW, 90 DEGREE
		CROSS
		TEE
		ELBOW, 45 DEGREE
		LATERAL
		PIPE GUIDE / SLEEVE
		WATERSTOP
		WATERSTOP OR THRUST COLLAR AS INDICATED ON PLANS OR SECTIONS
		WALL CASTING WITH VARIOUS CONNECTIONS TYPES AS INDICATED ON PLANS OR SECTIONS

**PIPING SYMBOLS**

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		FLUSHING CONNECTION
N/A		FLEXIBLE HOSE
N/A		FLOW ARROW
N/A		WYE STRAINER
N/A		INSULATED PIPING

**VALVE SYMBOLS**

DOUBLE LINE	SINGLE LINE	DESCRIPTION
		GATE
		BUTTERFLY
		GLOBE
		BALL
		VEE-BALL
		ECCENTRIC PLUG
		NEEDLE
		DIAPHRAGM
		PINCH
		SWING CHECK
		BALL CHECK
		VALVE PNEUMATIC ACTUATOR
		VALVE ELECTRIC MOTOR ACTUATOR
		VALVE SOLENOID ACTUATOR
		VALVE HYDRAULIC ACTUATOR
		SOLENOID VALVE, 2 WAY
		SOLENOID VALVE, 3 WAY
		PRESSURE RELIEF
		AIR AND/OR VACUUM RELEASE
		PRESSURE CONTROL OR REDUCING
		MULTI-PORT VALVE, ARROWS INDICATE FLOW PATTERN. SEATING PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
		TELESCOPING
		ANGLE GATE
		BACK PRESSURE
		CORPORATION COCK

**GENERAL SYMBOLS**

SYMBOL	DESCRIPTION
	CENTRIFUGAL PUMP
	WATER SURFACE MARKER
	SLIDE GATE

**FIELD INSTRUMENT SYMBOLS**

SYMBOL	DESCRIPTION
	MAGNETIC FLOWMETER
	RADAR LEVEL SENSOR
	ULTRASONIC LEVEL SENSOR
	CAPACITANCE LEVEL SENSOR
	FLOAT SWITCH
	PRESSURE GAUGE
	PRESSURE GAUGE WITH DIAPHRAGM SEAL
	PRESSURE GAUGE AND TRANSDUCER OR SWITCH WITH DIAPHRAGM SEAL
	ANNULAR PRESSURE SEAL WITH GAUGE
	ANNULAR PRESSURE SEAL WITH GAUGE AND TRANSDUCER OR SWITCH

**GENERAL NOTES**

- MECHANICAL DRAWINGS SHOW BUILDING NORTH ARROW WHICH IS RELATIVE TO EACH STRUCTURE. SEE CIVIL DRAWINGS FOR TRUE AND PLANT NORTH.
- REFER TO SEQUENCE OF CONSTRUCTION FOR STAGED INSTALLATION OF WORK AND SCHEDULING REQUIREMENTS.
- COORDINATE ALL SHUTDOWNS AND SEQUENCING WITH THE OWNER.
- OWNER SHALL MAINTAIN AND OPERATE EXISTING EQUIPMENT. CONTRACTOR SHALL NOT OPERATE EXISTING VALVES OR EQUIPMENT.
- UNLESS OTHERWISE NOTED, ITEMS ARE NEW UNLESS CALLED OUT AS EXISTING.
- COORDINATE ALL WORK TO AVOID EQUIPMENT CLEARANCE CONFLICTS. STRUCTURE ELEVATIONS PROVIDED FOR CLARITY. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR FF ELEVATIONS AND FLOOR SLOPE.
- SEE STRUCTURAL DRAWINGS FOR CONCRETE PIPE ENCASEMENT DETAILS.
- SEE STRUCTURAL DRAWINGS FOR CONCRETE PIPE SUPPORT AND PEDESTAL DETAILS.
- COORDINATE ALL PENETRATIONS WITH OTHER DISCIPLINES. ALL PENETRATIONS SHALL BE WATER TIGHT.
- COORDINATE HATCH LOCATION, GRATING, AND CLEAR OPENINGS TO SUIT EQUIPMENT REMOVAL.
- UNLESS OTHERWISE NOTED, ALL PIPING PASSING THRU FLOORS AND WALLS SHALL BE SLEEVED AND SEALED WITH A SEGMENTED RUBBER MECHANICAL SLEEVE SEAL ON BOTH SIDES. SLEEVES AND SEALS SHALL BE MADE WATERTIGHT. SLEEVES SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
- UNLESS OTHERWISE NOTED, WALL CASTINGS SHALL HAVE A WATERSTOP POSITIONED IN THE CENTER OF THE WALL OR FLOOR. SEE TYPICAL DETAILS FOR CASTING CONFIGURATION. CASTINGS SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
- PIPING CONNECTIONS 3 INCH AND SMALLER HAVE BEEN SCHEMATICALLY SHOWN ON PLAN AND SECTION DRAWINGS. PROVIDE PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE SCHEMATICS. PROVIDE ALL NECESSARY FITTINGS TO MAKE CONNECTIONS.
- SCHEMATIC DRAWINGS SHOW PROCESS CONNECTIONS AND NOT SPATIAL ORIENTATION.
- ALL EXPANSION JOINTS, FLANGE ADAPTERS AND FLEXIBLE COUPLINGS SHALL HAVE TIE-RODS AS SHOWN ON TYPICAL DETAILS.
- UNLESS OTHERWISE NOTED, ECCENTRIC REDUCERS SHALL BE INSTALLED FLAT SIDE ON TOP.
- UNLESS OTHERWISE NOTED, ALL DUCTILE IRON PIPING INTERNAL TO FACILITY (IES) SHALL HAVE FLANGED CONNECTIONS.
- VALVES ARE NORMALLY OPEN (N.O.) UNLESS NOTED AS NORMALLY CLOSED (N.C.).
- COORDINATE THE LOCATION OF THE VALVE SUPPORTS SO THAT ACCESS TO THE VALVE BEARINGS IS NOT RESTRICTED.
- UNLESS OTHERWISE NOTED, ALL EQUIPMENT SHALL BE PROVIDED WITH A MINIMUM 4-INCH CONCRETE HOUSEKEEPING PAD SIZED TO SUIT EQUIPMENT. SUPPORTS AND HANGERS ARE ONLY SHOWN WHERE SPECIFIC TYPES OR LOCATIONS ARE REQUIRED. ADDITIONAL SUPPORTS AND HANGERS SHALL BE REQUIRED AS SPECIFIED.
- UNLESS OTHERWISE NOTED, MINIMUM SLOPE FOR DRAINS SHALL BE 1/4 INCH PER LINEAR FOOT.
- THE SIZE OF THE PIPE CONNECTIONS AT THE PROCESS EQUIPMENT ARE SHOWN TO DEMONSTRATE INTENT. SIZES MAY VARY FROM WHAT IS SHOWN. COORDINATE THE SIZE OF CONNECTIONS TO ALL APPROVED PROCESS EQUIPMENT.
- PROVIDE PROCESS PIPING DRAINS WHERE INDICATED AND AT THE FOLLOWING: LOW POINTS; FLOW METERS AND BETWEEN PUMP SUCTION AND DISCHARGE ISOLATION VALVES. PUMP DRAINS SHALL BE ON THE SUCTION SIDE OF CENTRIFUGAL PUMPS.
- METAL FABRICATIONS WITH BURS, SHARP EDGES OR POSE A HAZARD SHALL BE MADE DULL/BLUNT OR SHALL BE PROVIDED WITH AN APPROPRIATE COVERING THAT SHALL MITIGATE AND DRAW ATTENTION TO THE HAZARD.
- ALL PIPING EXCEPT FOR THE FLANGES SHALL BE PAINTED IN ACCORDANCE WITH HIGH PERFORMANCE COATING, SPECIFICATION SECTION 09960. ALL VALVES SHALL BE INSTALLED WITH FACTORY FINISH.

**LEGEND**

- FLOW STREAM IDENTIFIER
- EXISTING
- DEMOLITION
- NEW MECHANICAL WORK

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Lawrence J. ...* 12/16/17  
DIRECTOR OF PUBLIC WORKS  
*Thomas E. ...* 12/14/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
DAVID M. KEUNG  
12/14/17

DES: LAQ			
DRN: LAQ			
CHK: DCC			
DATE: NOV. 2017			
BY	NO.	REVISIONS	DATE

MECHANICAL GENERAL NOTES,  
ABBREVIATIONS AND LEGEND

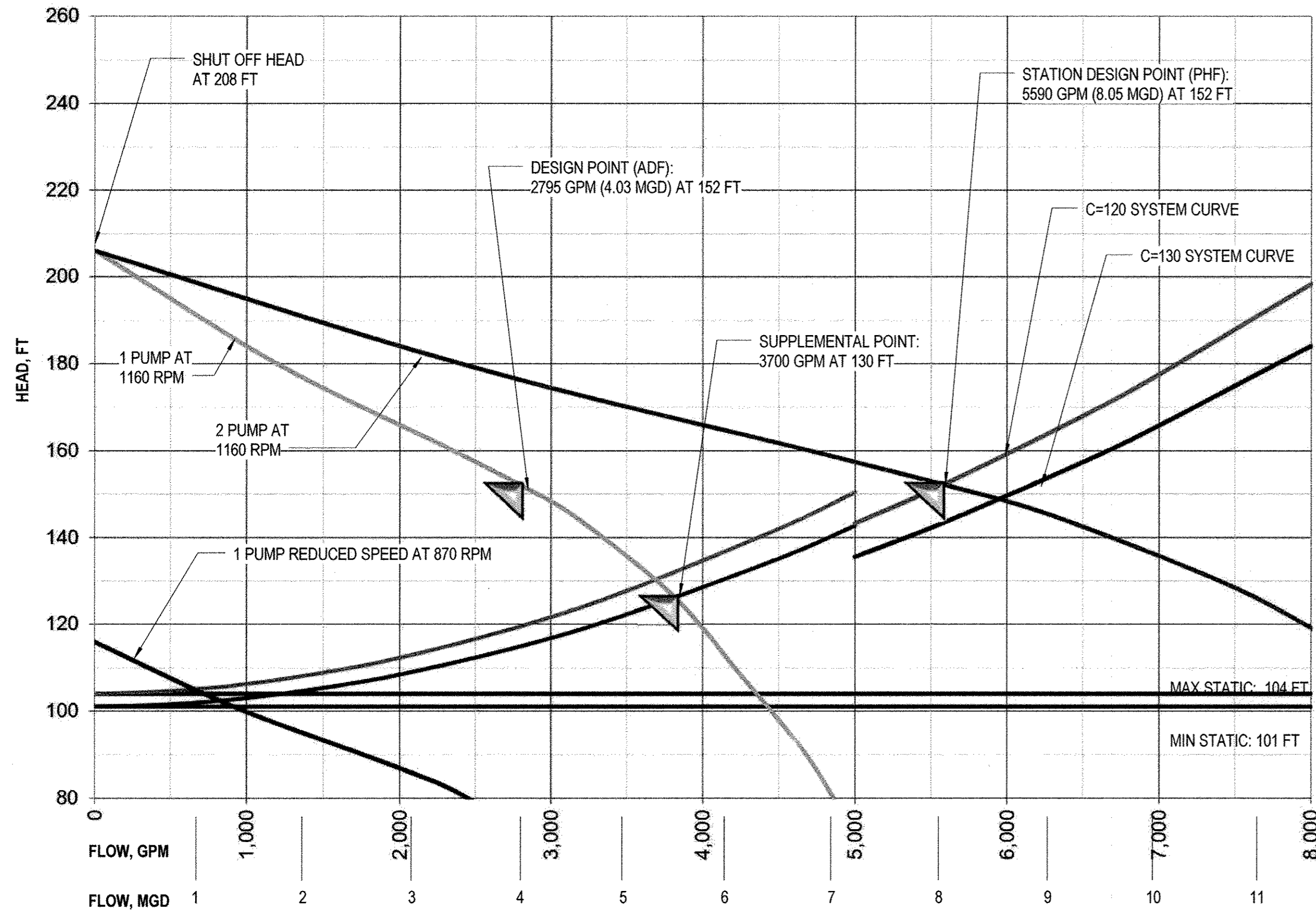
DORSEY RUN WASTEWATER PUMPING STATION  
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CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6 HOWARD COUNTY, MARYLAND

M-1  
SCALE AS SHOWN  
SHEET  
22 OF 46

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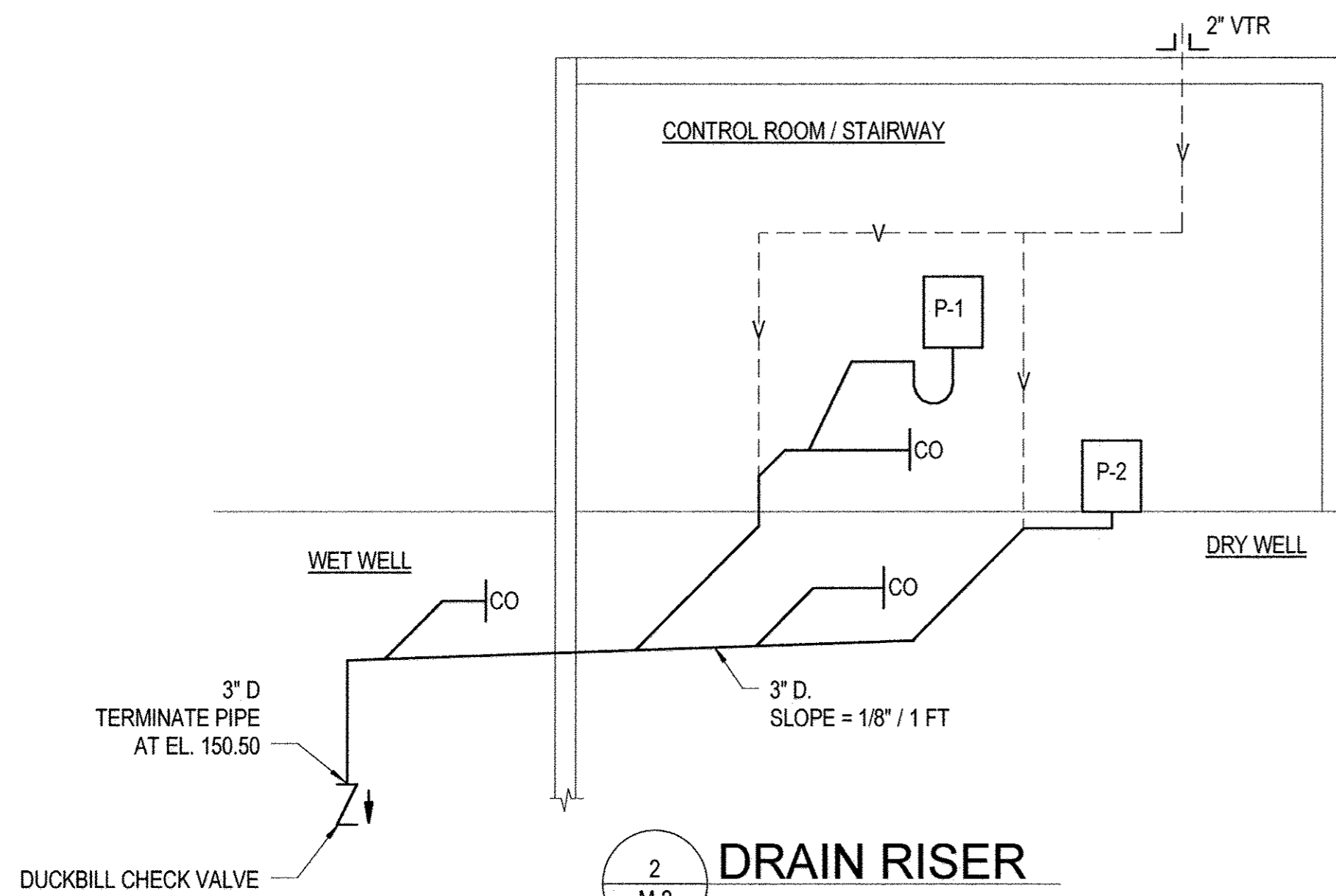




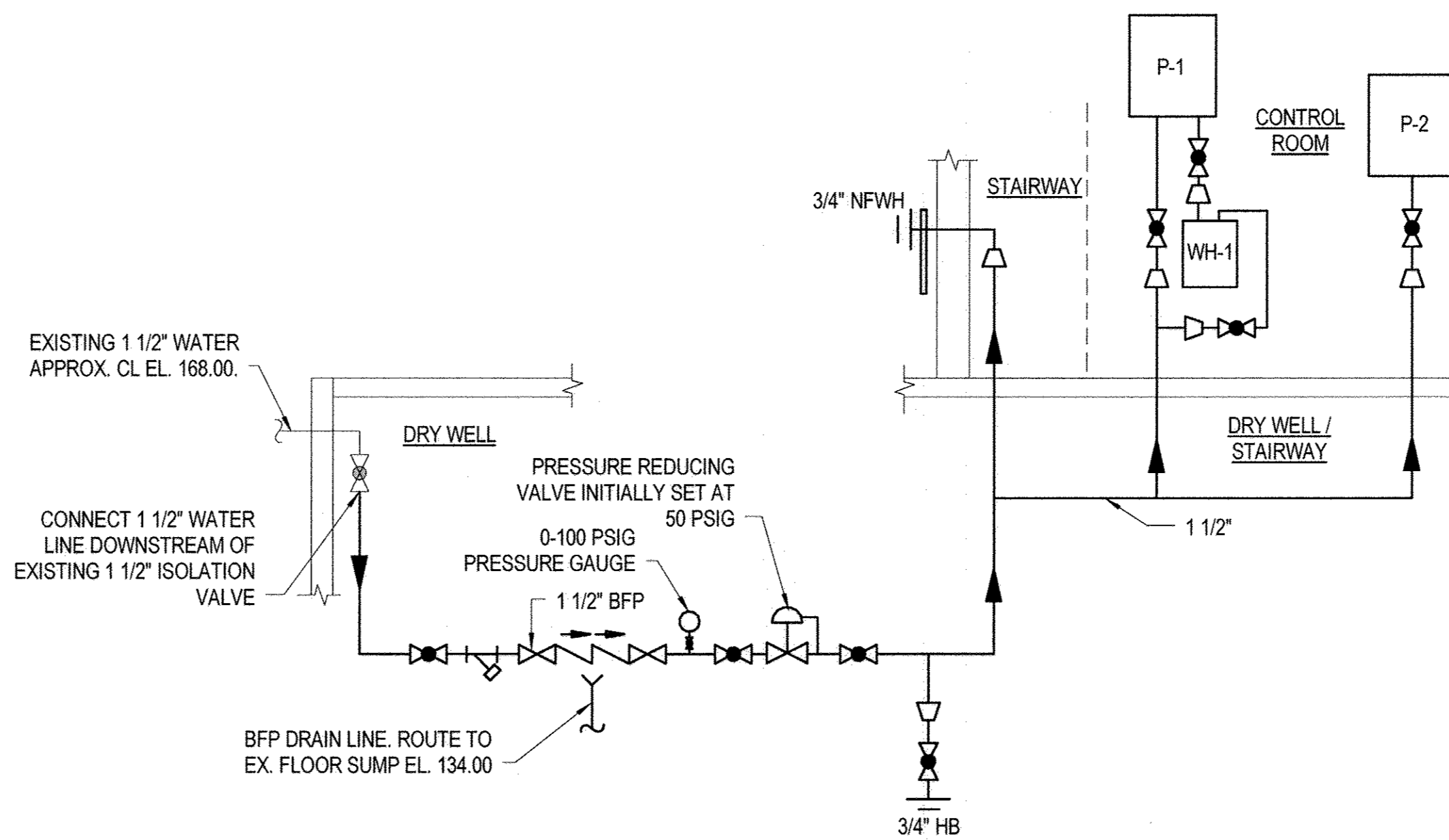
**PUMP CRITERIA**

TOTAL NUMBER OF PUMPS	3	SUPPLEMENTARY POINT CAPACITY	3700 GPM
NUMBER OF PUMPS OPERATING	2	SUPPLEMENTARY POINT TOTAL HEAD	130 FT
DESIGN POINT RPM	1160 RPM	SUPPLEMENTARY POINT EFFICIENCY (MIN)	80%
HP (MAX)	200 HP	SUPPLEMENTARY POINT NPSHR (MAX)	20 FT
SHUT OFF HEAD (MIN)	200 FT		
DESIGN POINT CAPACITY	2795 GPM	REDUCED SPEED POINT CAPACITY	670 GPM
DESIGN POINT TOTAL HEAD	152 FT	REDUCED SPEED POINT TOTAL HEAD	106 FT
DESIGN POINT EFFICIENCY (MIN)	80%	REDUCED SPEED RPM	870 RPM
DESIGN POINT NPSHR (MAX)	18 FT		

**1 PUMP AND SYSTEM CURVES**  
M-2 SCALE: NOT TO SCALE



**2 DRAIN RISER**  
M-2 SCALE: NOT TO SCALE



**3 POTABLE / NON-POTABLE WATER SCHEMATIC**  
M-2 SCALE: NOT TO SCALE

GATE LOCATION	HEIGHT (IN)	WIDTH (IN)	SELF CONTAINED Y/N	SEATING HEAD (FT)	UNSEATING HEAD (FT)	BOTTOM TYPE	WALL THIMBLE TYPE	OPERATOR TYPE	POWER REQUIREMENTS	REMARKS
SLG-1	36"	36"	No	6	6	FLUSH BOTTOM	EXISTING FLG X MJ	MANUAL	-	CONNECT TO EXISTING VALVE BOX w/ U-JOINTS AS NEEDED
SLG-2	36"	36"	Yes	6	6	STANDARD	WALL MOUNTED	MANUAL	-	VALVE BOX, EXTENSION STEM W/ U-JOINTS
SLG-3	36"	36"	Yes	6	6	STANDARD	WALL MOUNTED	MANUAL	-	VALVE BOX, EXTENSION STEM W/ U-JOINTS
SLG-4	69"	30"	Yes	17	17	FLUSH BOTTOM	WALL MOUNTED	MANUAL	-	VALVE BOX, EXTENSION STEM W/ U-JOINTS, CONTRACTOR SHALL FIELD VERIFY THE SLIDE GATE SIZE.

INDOOR UNIT						OUTSIDE UNIT						REMARKS	
AREA SERVED	UNIT I.D.	COOLING TOTAL BTUH	HEATING TOTAL BTUH	ELECTRICAL CHARACTERISTICS VOLTS/PH/Hz	TYPE	UNIT I.D.	MIN SEER	REFRIG	COOLING CAP. BTUH	HEATING CAP. BTUH	ELECTRICAL CHARACTERISTICS VOLTS/PH/Hz		COOLING AMBIENT TEMP DEG F
VFD ROOM	CU-1	34200	-	230/1/60	WALL MOUNTED	AC-1	14	R410A	34200	-	230/1/60	95	-

(1) CONTRACTOR COORDINATE INDOOR UNIT INTERNAL STATIC PRESSURE FORMULATION AND REQUIRED HORSEPOWER.  
(2) CONDITIONS: 75°F DB WITH 40% RH. COORDINATE COIL REQUIREMENTS WITH AIR HANDLER COMPONENTS.

UNIT I.D.	SERVICE	TYPE	DRIVE	TOTAL CAPACITY CFM	TOTAL S.P. IN W.C.	MAX. FAN RPM	ELECTRICAL CHARACTERISTICS			MAX MOTOR HP	DAMPER	(LOCATION, CLASSIFICATIONS, ETC)
							V	PH	Hz			
EF-1	EXHAUST	P	B	1000 CFM	0.18 in-wg	1392	115	1	60	0.5	BDD	CONTROL ROOM, NEMA 12
EF-2	EXHAUST	IA	B	2500 CFM	0.90 in-wg	2154	460	3	60	1	BDD	CONTROL ROOM, NEMA 12
SF-1	SUPPLY	P	B	1000 CFM	0.27 in-wg	1392	460	3	60	0.5	MOD	VFD ROOM, NEMA 12
SF-2	SUPPLY	CE	B	6045 CFM	1.37 in-wg	2826	460	3	60	7.5	-	EXTERIOR ON WET WELL SLAB, NEMA 7, W/ SOLID STATE STARTER (RVSS)

UNIT I.D.	KW	AMPS	ELECTRICAL CHARACTERISTICS			THERMOSTAT INTEGRAL (I) OR REMOTE WALL (R)	REMARKS
			V	PH	Hz		
EUH-1	4	5.1	480	3	60	I	
EUH-2	5	6.3	480	3	60	I	
EUH-3	5	6.3	480	3	60	I	
EUH-4	4	5.1	480	3	60	I	CORROSION RESISTANT

FIXTURE	DESCRIPTION	CW	HW	VENT	SAN	REMARKS
P-1	LAVATORY	3/8"	3/8"	1 1/4"	1 1/4"	
P-2	TOILET	3/8"	N/A	2 1/8"	2 1/8"	

UNIT ID	CAPACITY	CLOSE HEADROOM	CROSS MOUNTED	MIN LIFT HEIGHT	NO. OF LIFT SPEEDS	MAX LIFT SPEED	NO. OF TROLLEY SPEEDS	MAX HP	VOLTS/ PHASE
MRH-1	3 TONS	YES	NO	46 FT	SINGLE	32 FPM	SINGLE	10	460/3

UNIT I.D.	TYPE	FOR TANK TYPES		VOLTS/ PHASE	KW	AMPS	REMARKS (LOCATION, CLASSIFICATION, ETC.)
		GAL	NO. OF HEATING ELEMENT				
WH-1	MINI TANK	2.5	1	120 / 1	1.4	12	FLOOR MOUNTED, PLUG-IN TYPE

UNIT I.D.	FLOW (GPM)	TDH (FT)	HP	RPM	ELECTRICAL VOLT/PH/Hz	REMARKS (LOCATION, ETC.)
SP-1	63	19	0.5	3450	115/1/60	DRY WELL
SP-2	63	19	0.5	3450	115/1/60	DRY WELL

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Raymond W. ...* 12-14-12  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*Thomas S. ...* 12/14/12  
CHIEF, BUREAU OF ENGINEERING  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: LAQ			
DRN: LAQ			
CHK: DCC			
DATE: NOV. 2017	BY	NO.	REVISIONS

PUMPING STATION SYSTEM CURVES, SCHEDULES AND SCHEMATICS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

M-2

SCALE AS SHOWN

SHEET

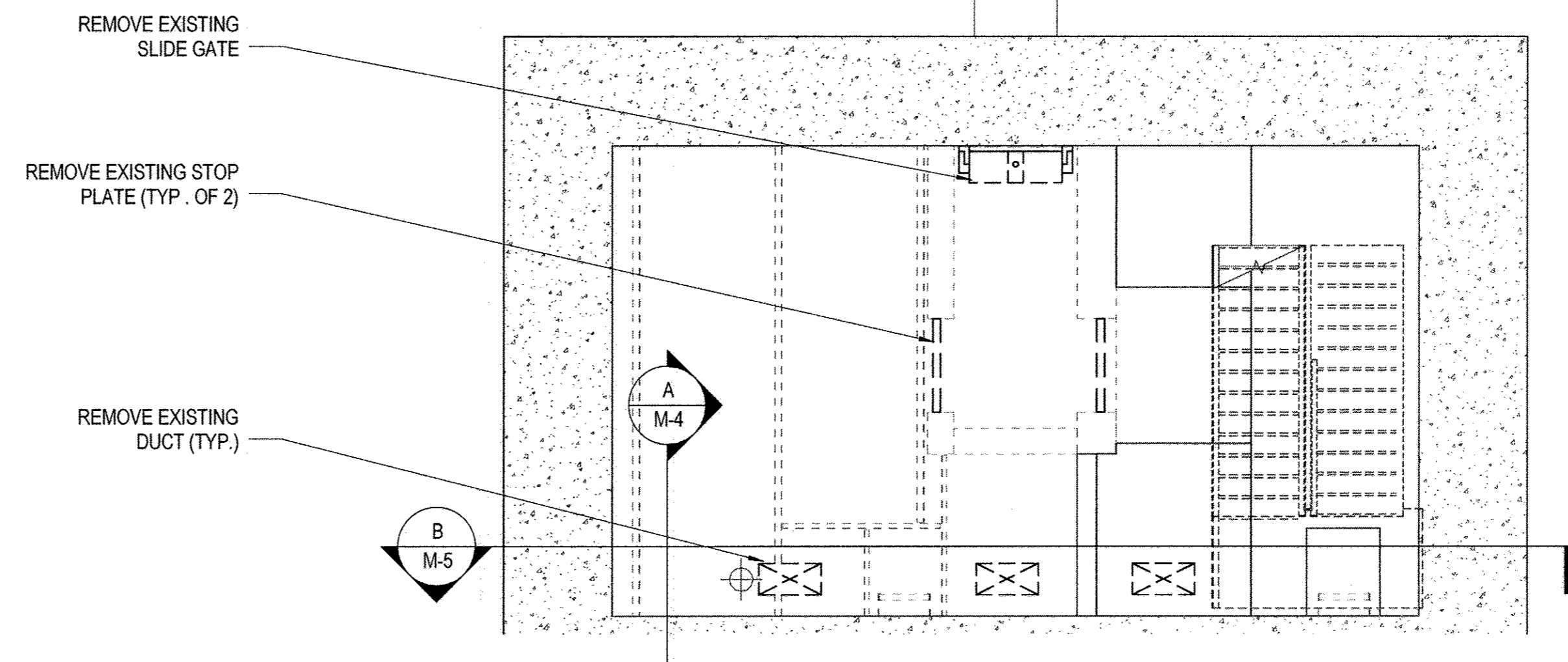
23 OF 46

11/29/2017 2:52:32 PM

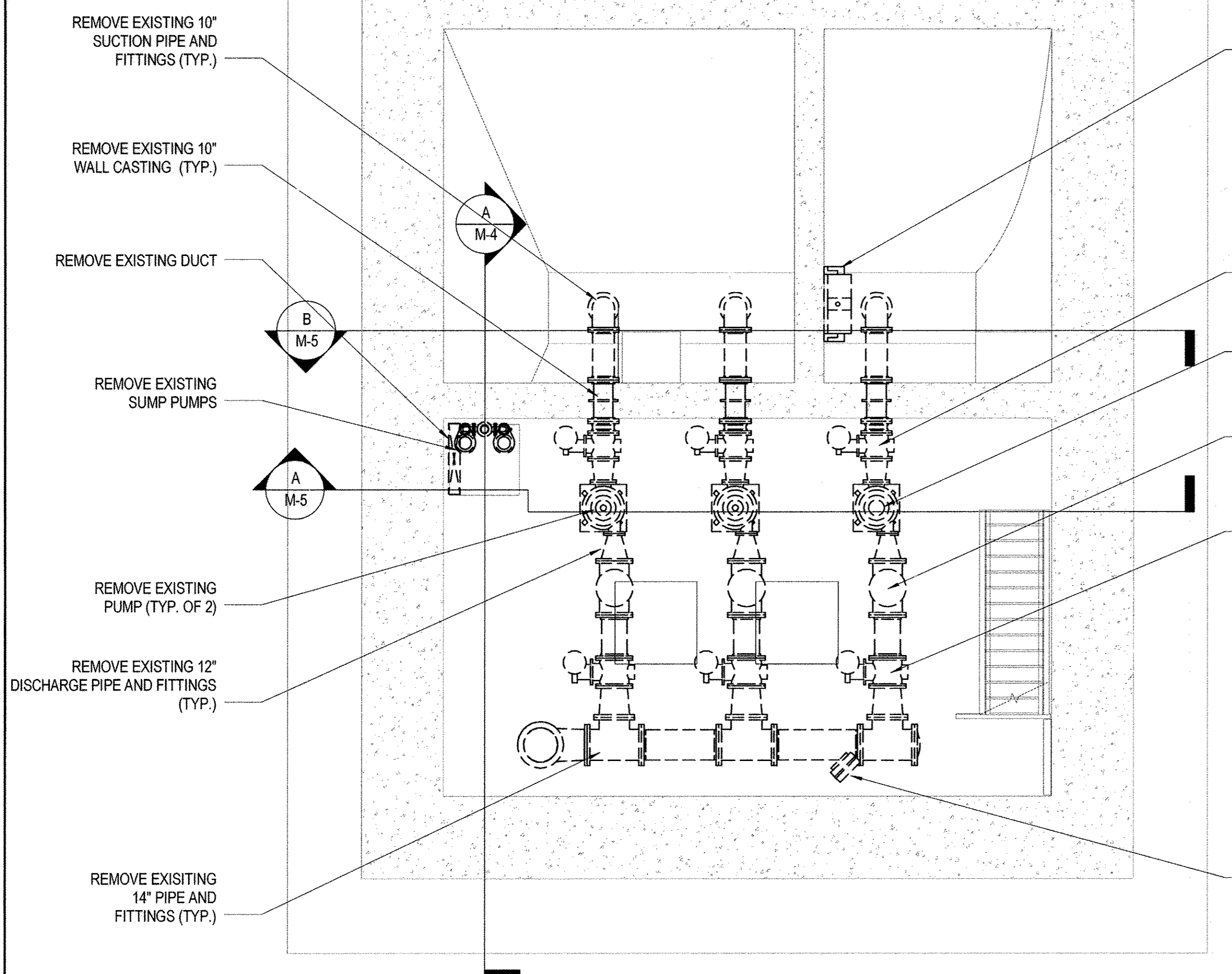


**SPECIFIC NOTES**

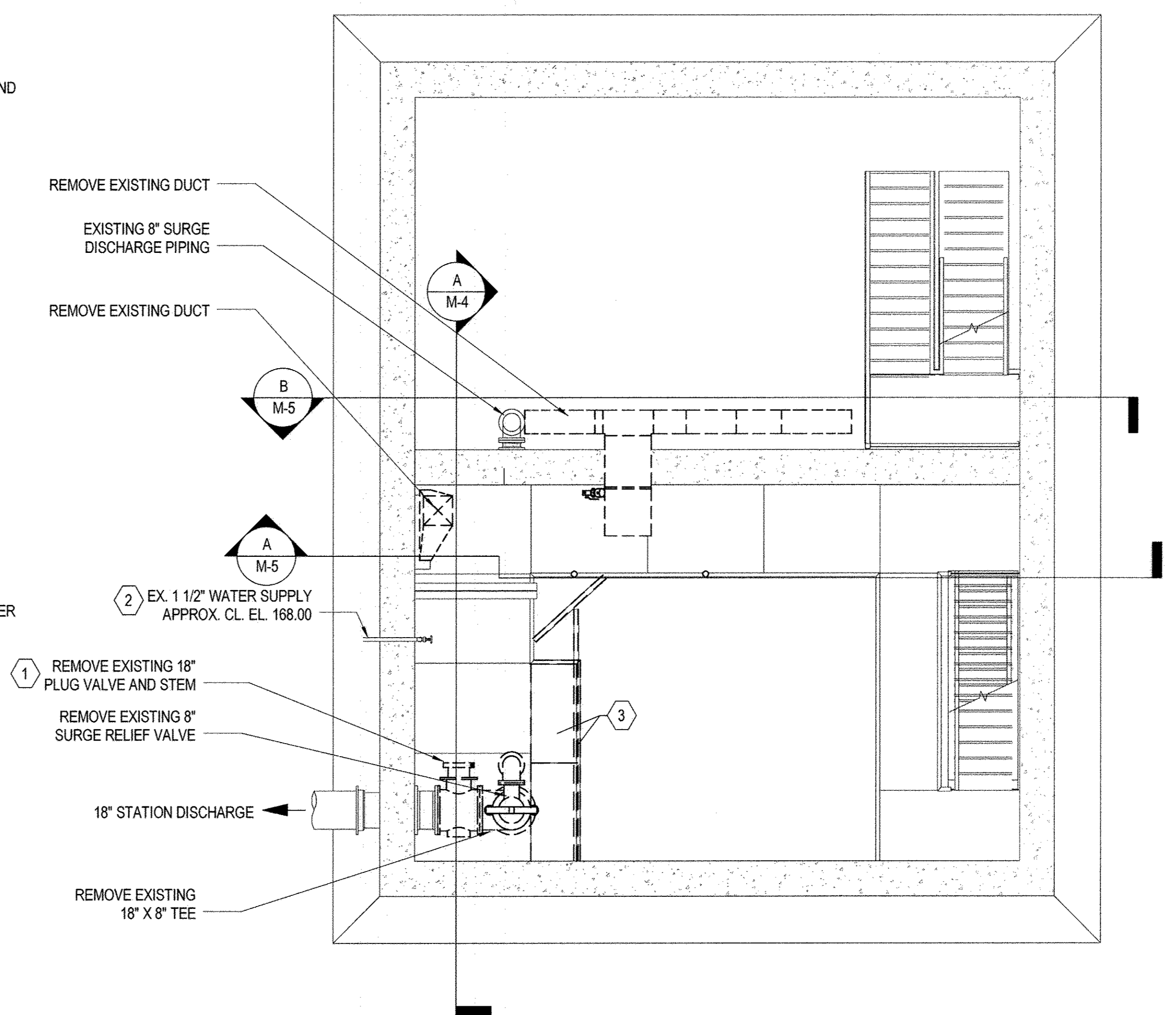
1. CONTRACTOR SHALL VERIFY THE FUNCTIONAL OF THE REMOVED PLUG VALVE. IF THE VALVE IS FUNCTIONAL, VALVE SHALL BE RETURNED TO THE COUNTY.
2. CONTRACTOR SHALL REMOVE ALL THE EXISTING POTABLE / NON-POTABLE WATER PIPES, VALVES AND FITTINGS DOWNSTREAM OF THE EXISTING INCOMING ISOLATION VALVE.
3. REMOVE EXISTING ALUMINUM GRATING, BEAMS AND GUARDRAIL. REATTACH EXISTING ALUMINUM GUARDRAIL TO FACE OF EXISTING C10 BEAM TO REMAIN. MODIFY GUARDRAIL AND PROVIDE NEW COMPONENTS AS NECESSARY TO ACHIEVE CONTINUITY.



**2 INTERMEDIATE LEVEL @ EL. 151.00 PLAN - DEMOLITION**  
SCALE: 1/4" = 1'-0"

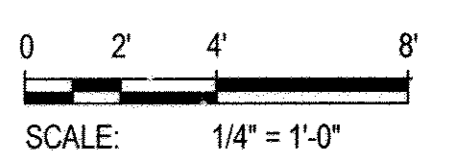


**1 LOWER LEVEL PLAN - DEMOLITION**  
SCALE: 1/4" = 1'-0"



**3 INTERMEDIATE LEVEL @ EL. 161.50 PLAN - DEMOLITION**  
SCALE: 1/4" = 1'-0"

**GRAPHIC SCALE**



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James P. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING

*James P. Butler* 12-1-17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: LAQ				
DRN: LAQ				
CHK: DCC				
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE

PUMPING STATION LOWER LEVEL  
AND INTERMEDIATE PLANS -  
DEMOLITION

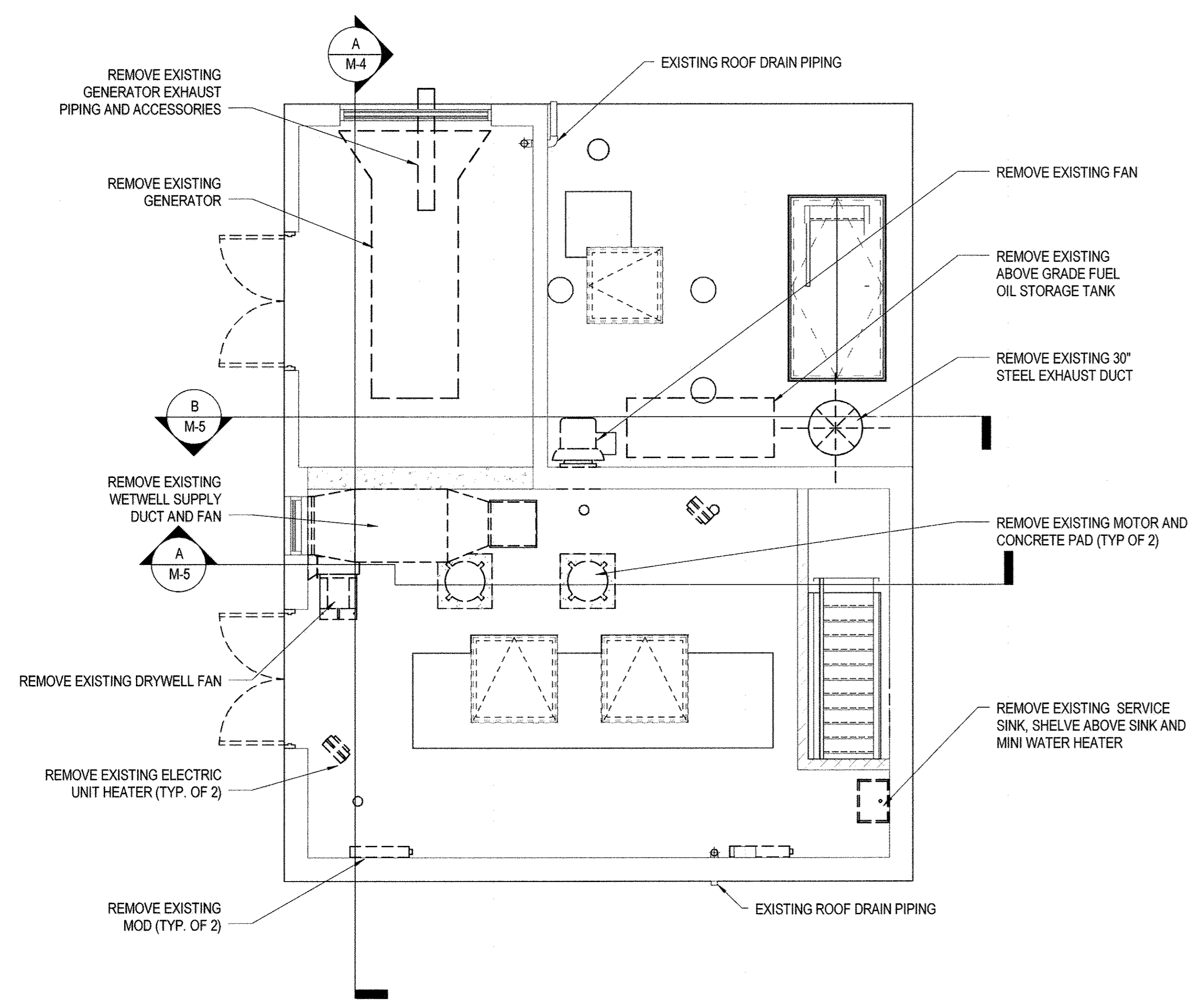
DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

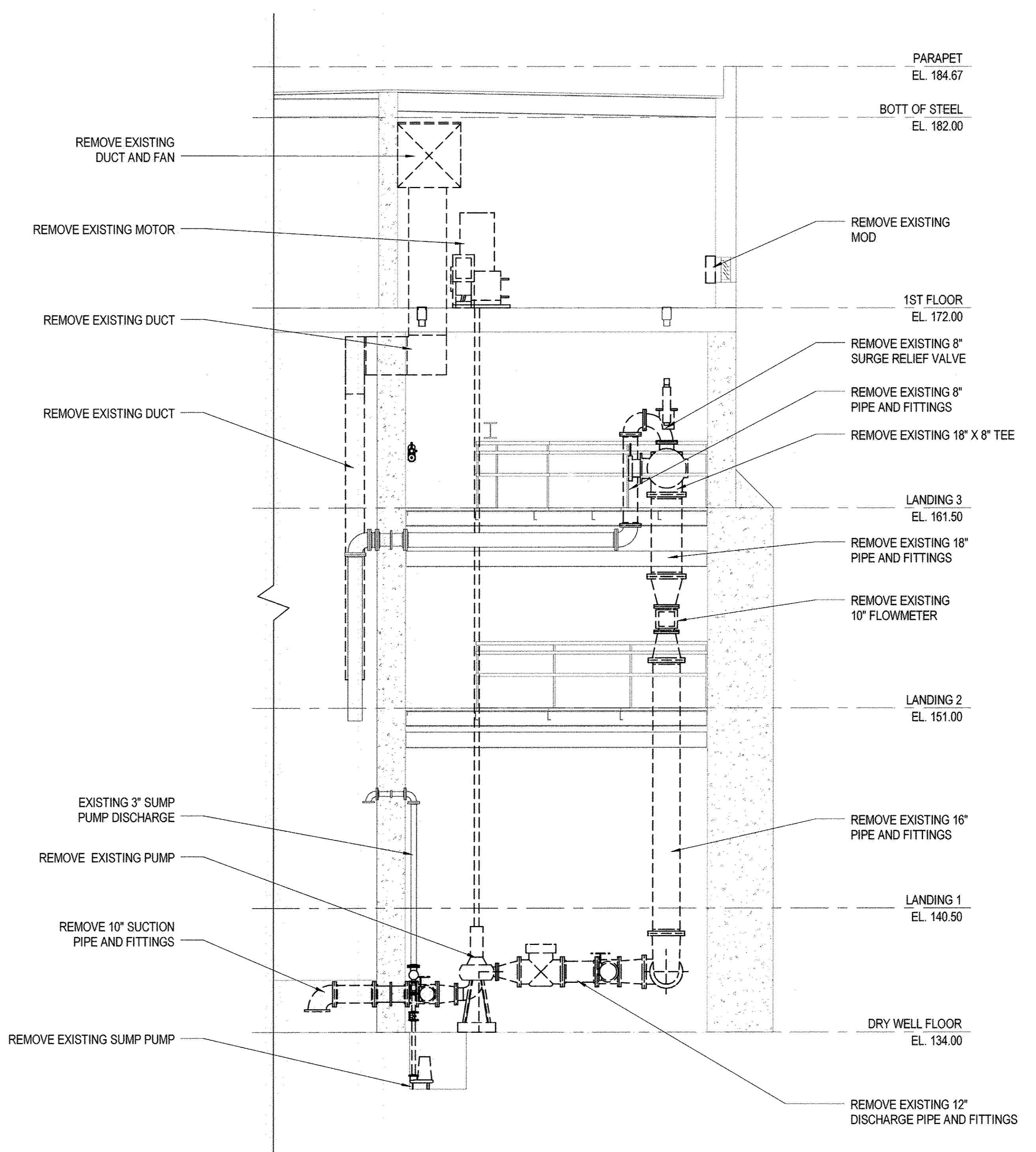
M-3  
SCALE AS SHOWN  
SHEET 24 OF 46

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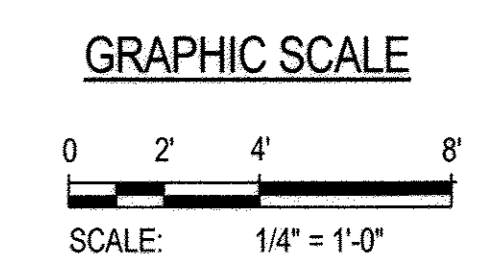




1 M-4 GRADE LEVEL PLAN - DEMOLITION  
SCALE: 1/4" = 1'-0"



A M-4 SECTION - DEMOLITION  
SCALE: 1/4" = 1'-0"  
REF: M-3



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Thomas F. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING  
DATE

*WRA*  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

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PUMPING STATION GRADE LEVEL  
PLAN AND SECTION - DEMOLITION

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

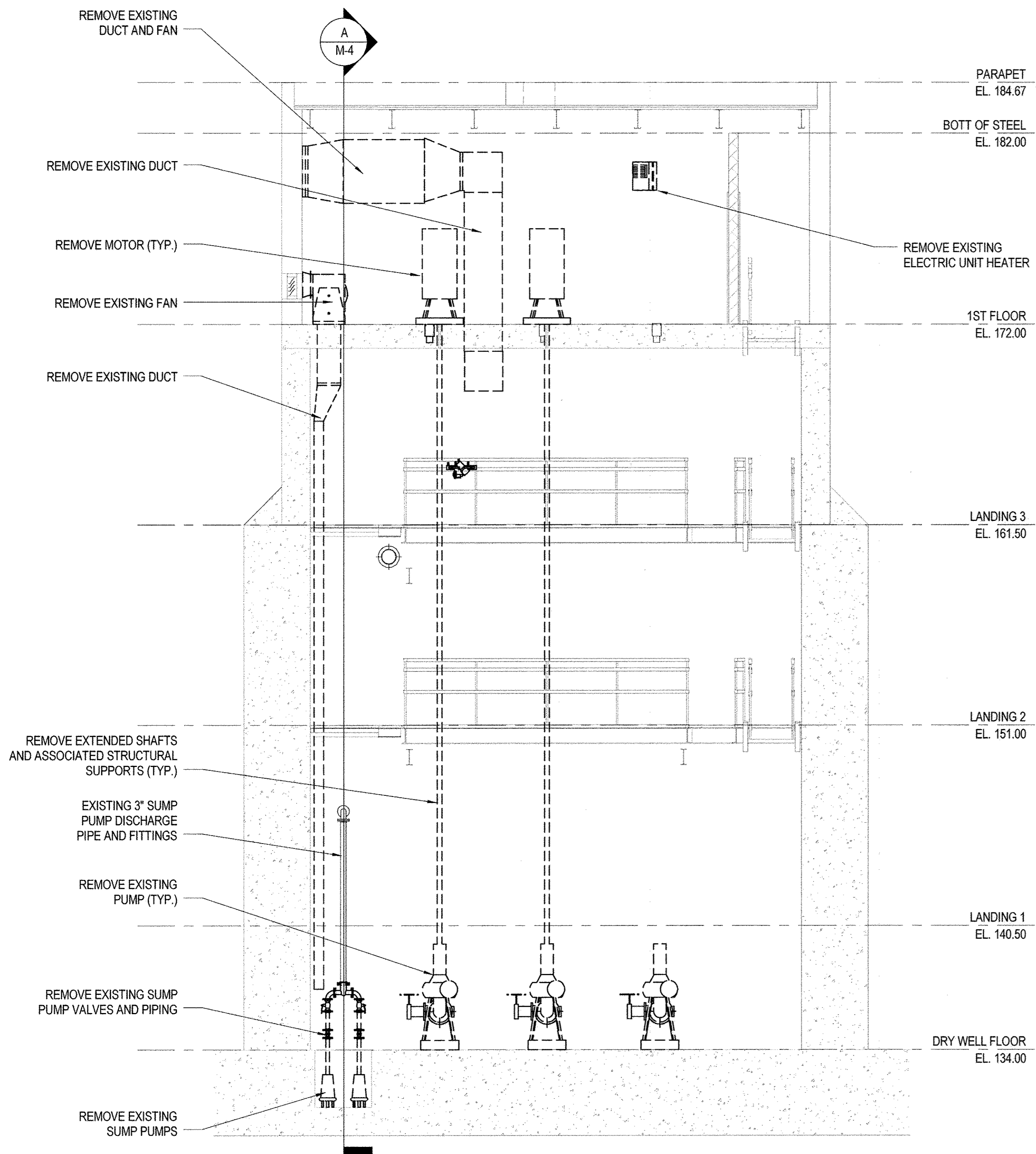
HOWARD COUNTY, MARYLAND

M-4

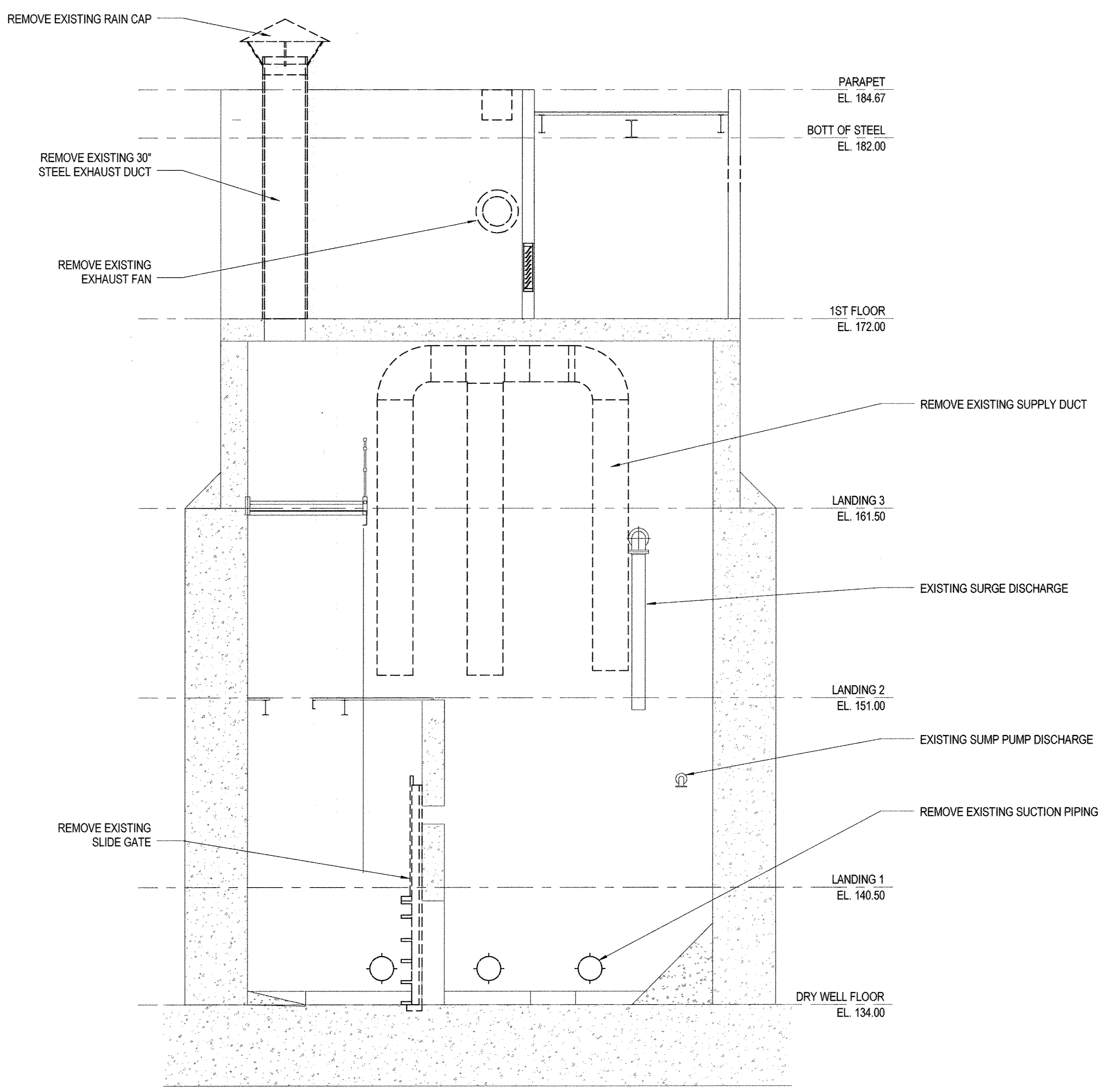
SCALE AS SHOWN

SHEET 25 OF 46

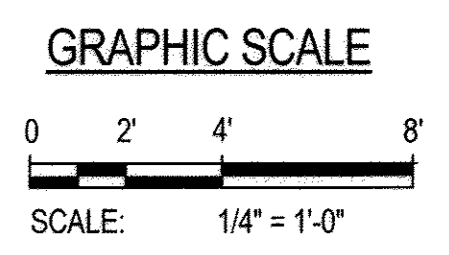




**A SECTION - DEMOLITION**  
 SCALE: 1/4" = 1'-0"  
 REF: M-3



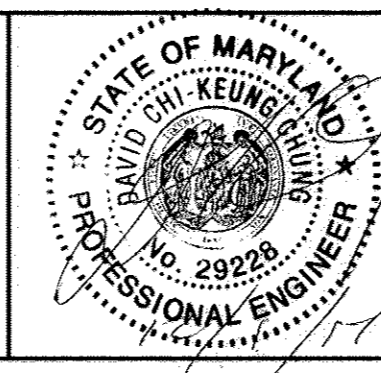
**B SECTION - DEMOLITION**  
 SCALE: 1/4" = 1'-0"  
 REF: M-3



"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 Director of Public Works: [Signature] DATE: 12/1/17  
 Chief, Bureau of Utilities: [Signature] DATE: 12/4/17

**WRA**  
 Whitman, Requardt & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231



DES: LAQ					
DRN: LAQ					
CHK: DCC					
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE	

**PUMPING STATION SECTIONS - DEMOLITION**

**DORSEY RUN WASTEWATER PUMPING STATION UPGRADE**  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996  
 ELECTION DISTRICT 6  
 HOWARD COUNTY, MARYLAND

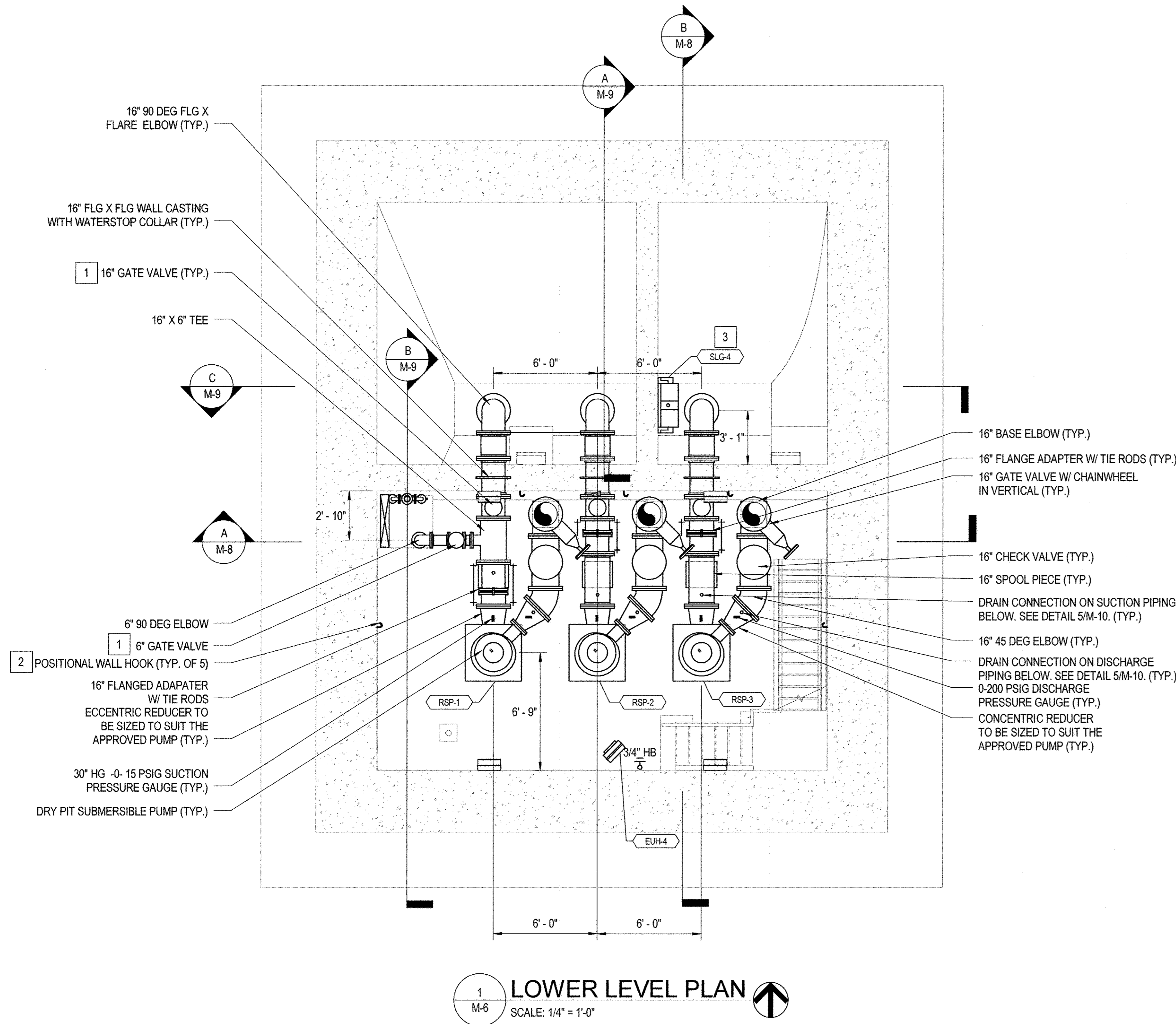
**M-5**  
 SCALE AS SHOWN  
 SHEET 26 OF 48

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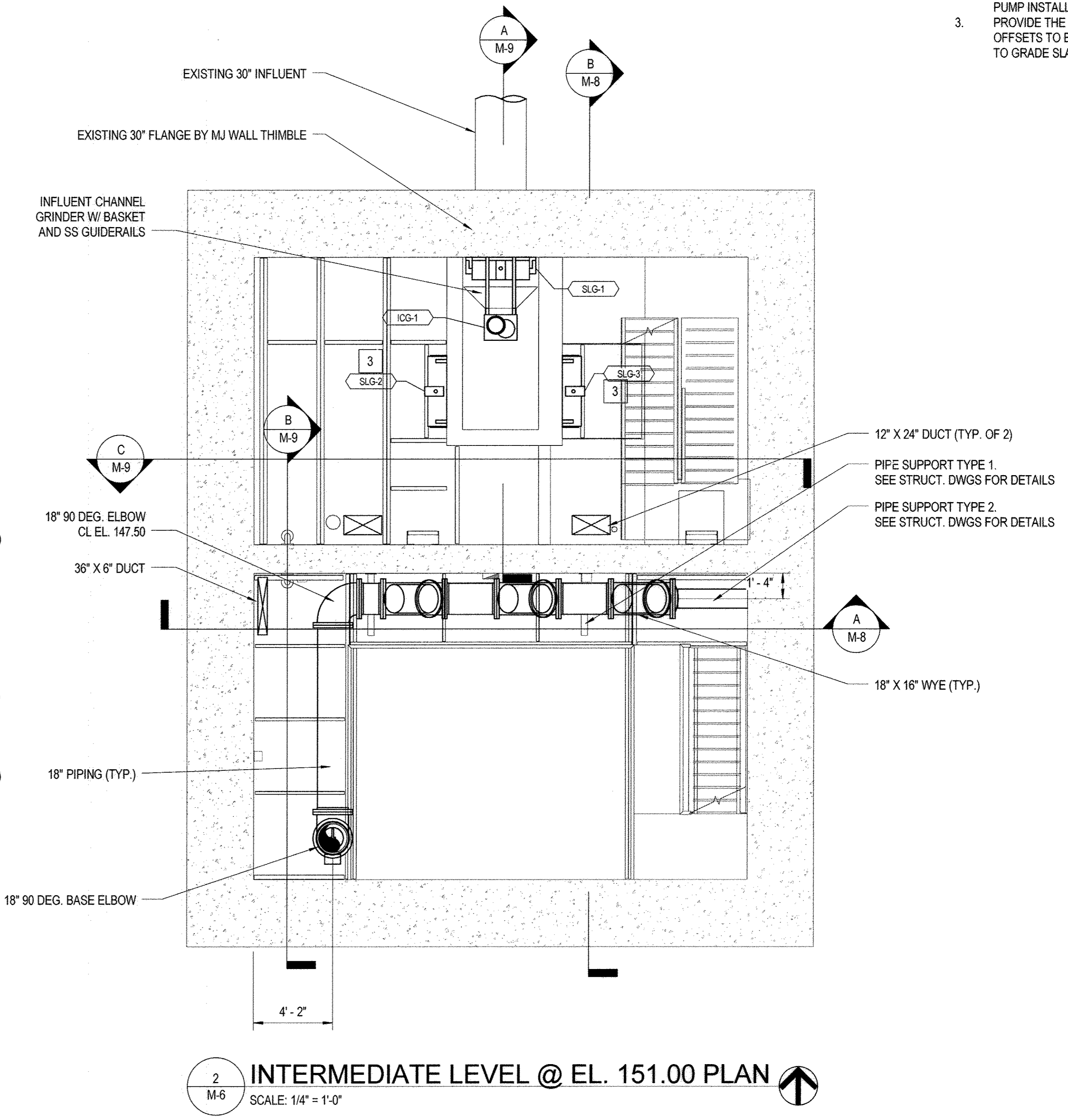


**SPECIFIC NOTES:**

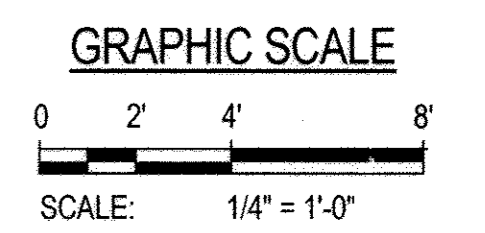
1. VALVE WITH EXTENSION STEM TO CONTROL ROOM LEVEL. PROVIDE THE NECESSARY U-JOINTS AND OFFSETS TO EXTEND STEM TO CONTROL ROOM LEVEL.
2. ELEVATION OF THE POSITIONAL WALL HOOK SHALL BE COORDINATE WITH THE SELECTED PUMP INSTALLATION IN THE DRY WELL.
3. PROVIDE THE STEM SUPPORTS, U-JOINTS AND OFFSETS TO EXTEND SLUICE GATE STEMS UP TO GRADE SLAB FLOOR BOX OPERATOR.



**1 LOWER LEVEL PLAN**  
 M-6 SCALE: 1/4" = 1'-0"



**2 INTERMEDIATE LEVEL @ EL. 151.00 PLAN**  
 M-6 SCALE: 1/4" = 1'-0"



"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019"

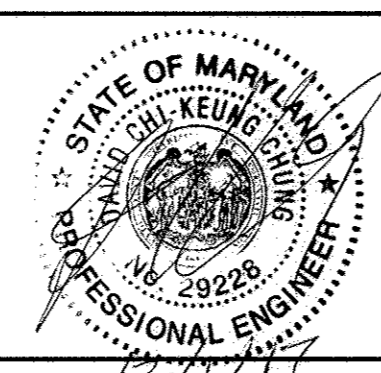
DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.

*Signature* 12/16/17  
 DIRECTOR OF PUBLIC WORKS

*Signature* 12/16/17  
 CHIEF, BUREAU OF ENGINEERING

*Signature* 12/16/17  
 CHIEF, UTILITY DESIGN DIVISION

**WRA**  
 Whitman, Requardt & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231



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DATE: NOV. 2017	BY	NO.	REVISIONS

**PUMPING STATION LOWER LEVEL AND INTERMEDIATE PLANS**

**DORSEY RUN WASTEWATER PUMPING STATION UPGRADE**  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
 HOWARD COUNTY, MARYLAND

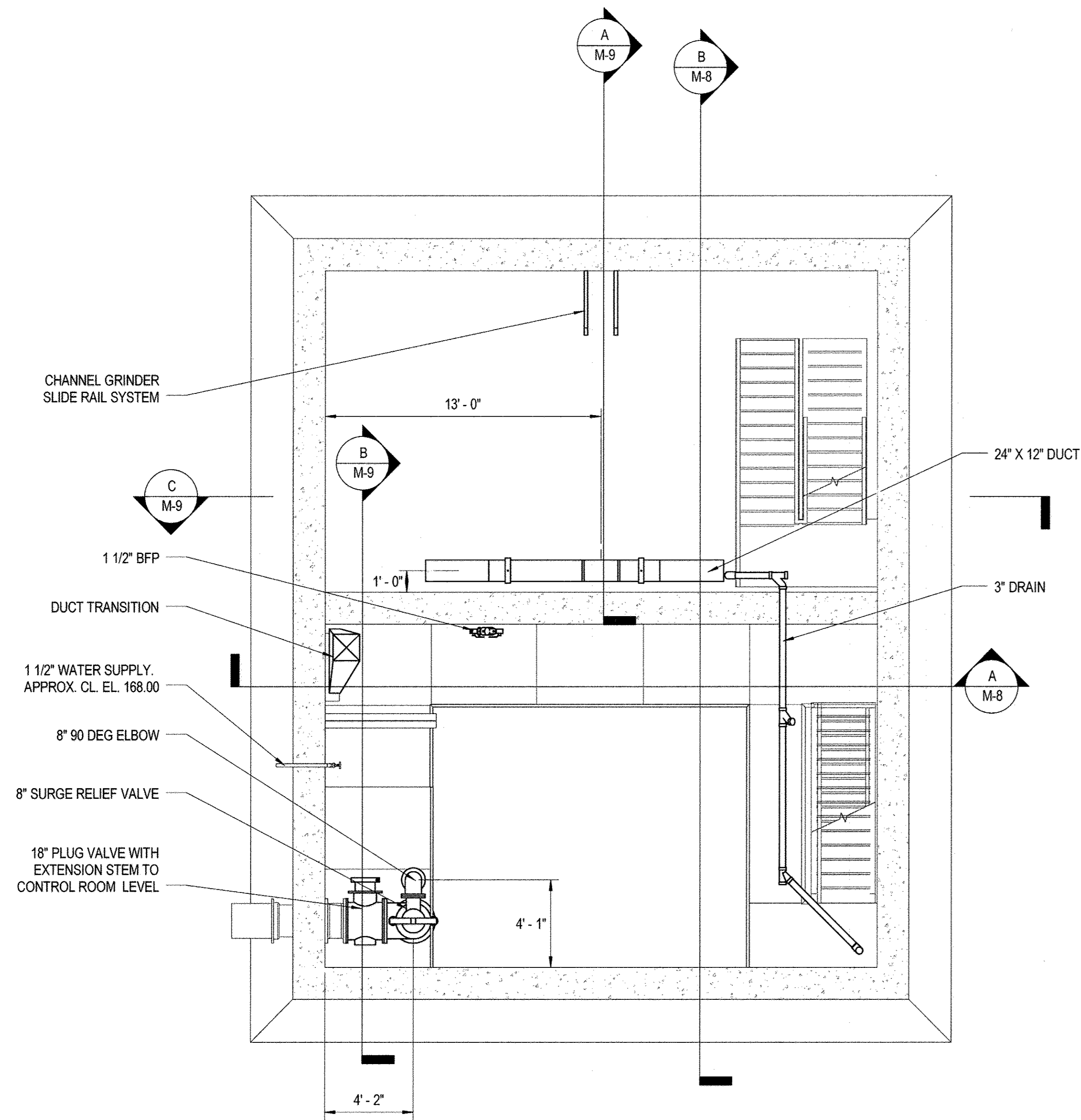
**M-6**  
 SCALE AS SHOWN  
 SHEET 27 OF 46

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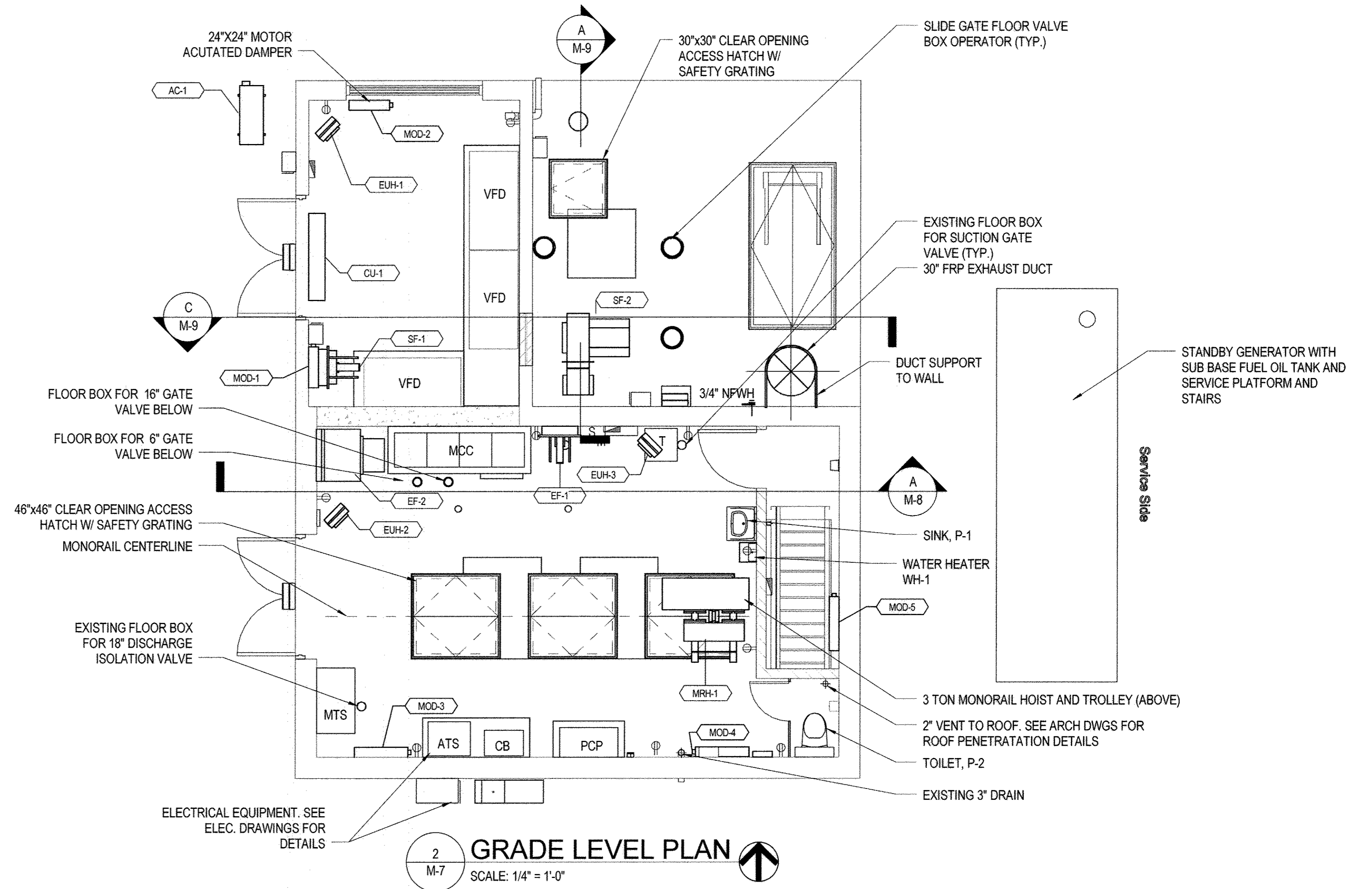


**X SPECIFIC NOTES:**

1. VALVE WITH EXTENSION STEM TO CONTROL ROOM LEVEL

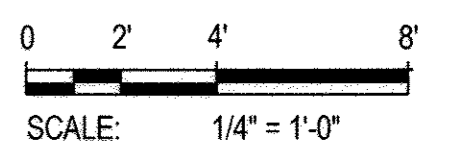


**1 INTERMEDIATE LEVEL PLAN @ EL. 161.50 PLAN**  
SCALE: 1/4" = 1'-0"



**2 GRADE LEVEL PLAN**  
SCALE: 1/4" = 1'-0"

**GRAPHIC SCALE**



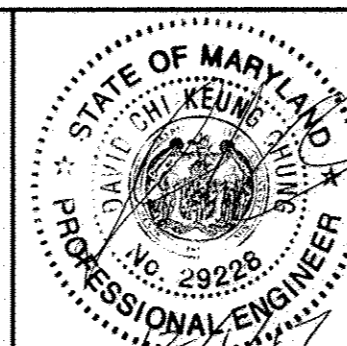
"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James J. Butler* 12/1/17  
DIRECTOR OF PUBLIC WORKS  
DATE

*Thomas J. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING  
DATE

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



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DRN: LAQ				
CHK: DCC				
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE

PUMPING STATION INTERMEDIATE  
AND GRADE LEVEL PLANS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

M-7

SCALE AS SHOWN

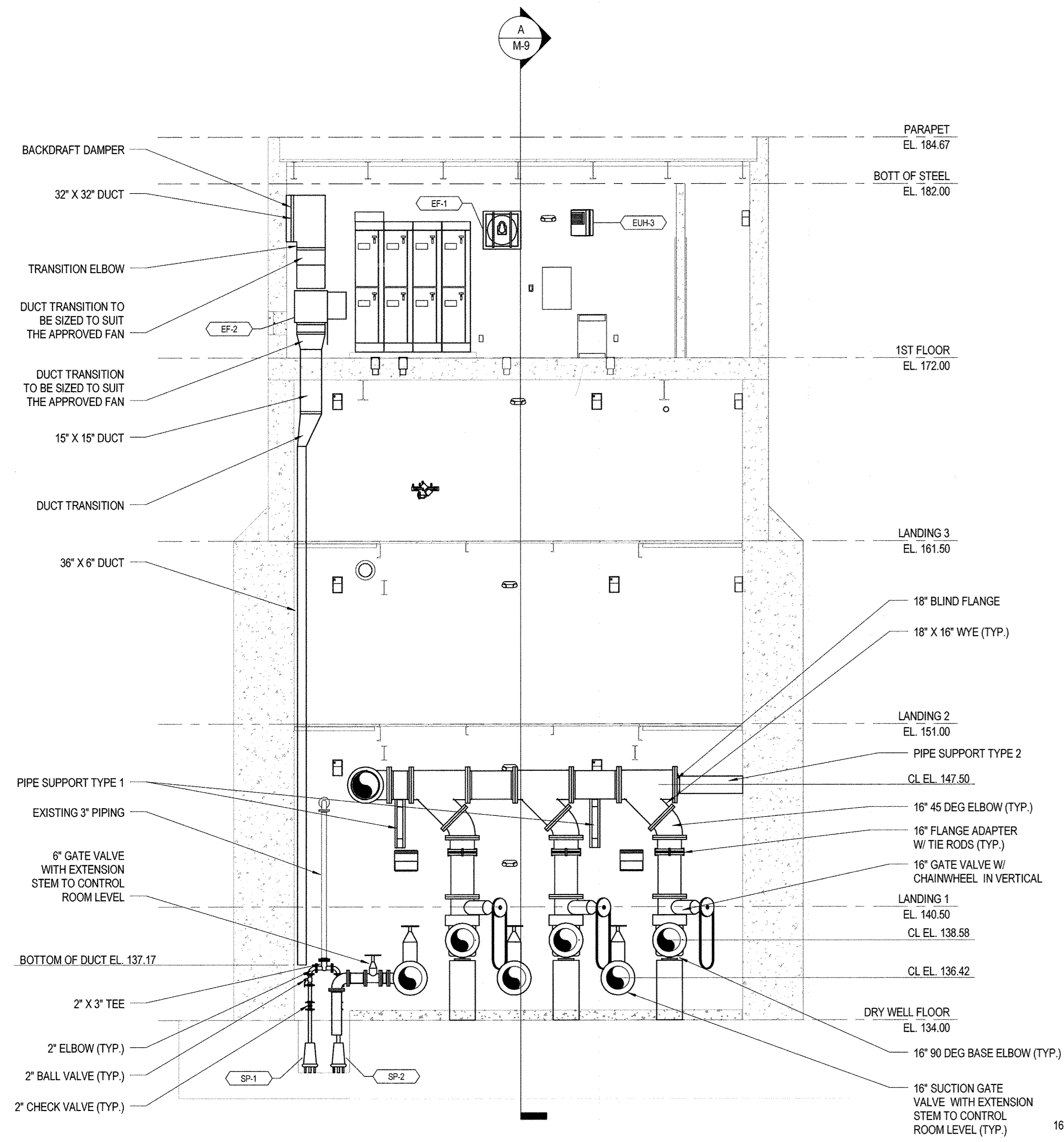
SHEET

28 OF 46

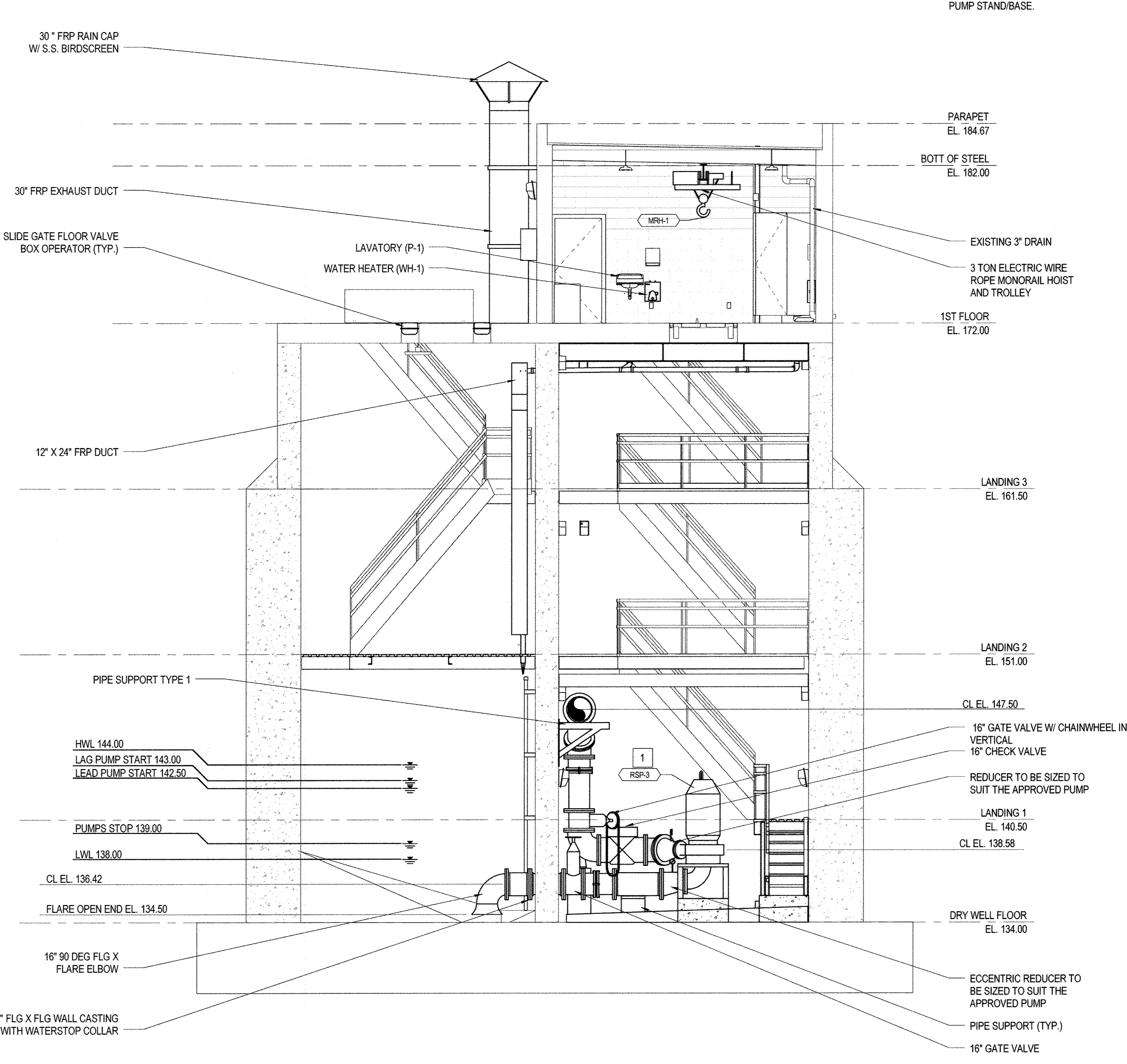
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**X** **SPECIFIC NOTES:**

- CONTRACTOR SHALL COORDINATE THE CONCRETE PEDESTAL WITH MANUFACTURERS PUMP STAND/BASE.

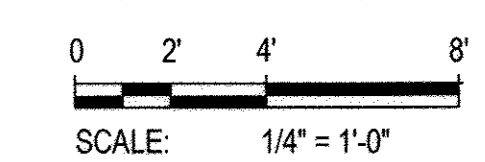


**A**  
SECTION  
M-9  
SCALE: 1/4" = 1'-0"  
REF: M-6



**B**  
SECTION  
M-8  
SCALE: 1/4" = 1'-0"  
REF: M-6

**GRAPHIC SCALE**



"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Director* 12/1/17  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*Chief Engineer* 12/1/17  
CHIEF, BUREAU OF ENGINEERING  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



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			DATE

**PUMPING STATION SECTIONS**

**DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996**

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

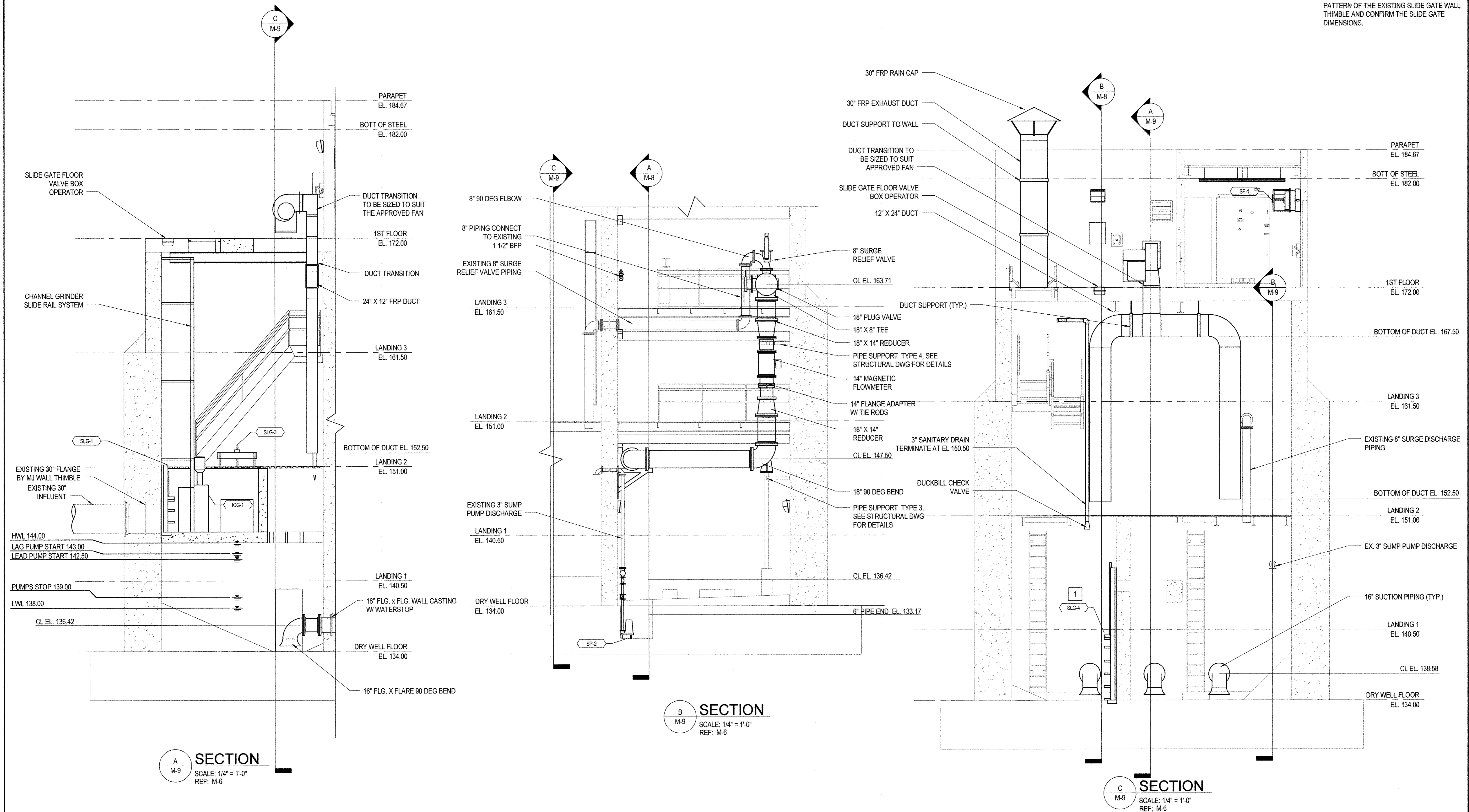
**M-8**  
SCALE AS SHOWN  
SHEET 29 OF 46

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**X SPECIFIC NOTES:**

- CONTRACTOR SHALL VERIFY THE BOLT PATTERN OF THE EXISTING SLIDE GATE WALL THIMBLE AND CONFIRM THE SLIDE GATE DIMENSIONS.

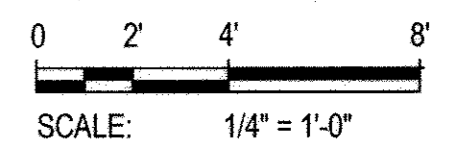


**A**  
SECTION  
SCALE: 1/4" = 1'-0"  
REF: M-6

**B**  
SECTION  
SCALE: 1/4" = 1'-0"  
REF: M-6

**C**  
SECTION  
SCALE: 1/4" = 1'-0"  
REF: M-6

**GRAPHIC SCALE**



"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019."

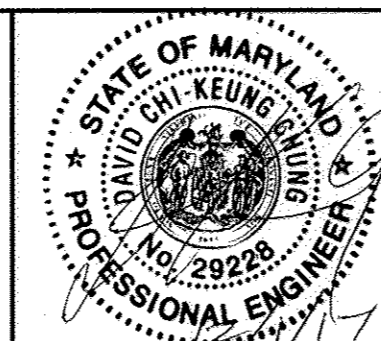
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*[Signature]* 12/1/17  
DIRECTOR OF PUBLIC WORKS

*[Signature]* 12/1/17  
CHIEF, BUREAU OF ENGINEERING

*[Signature]* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



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DATE: NOV. 2017	BY	NO.	REVISIONS
			DATE

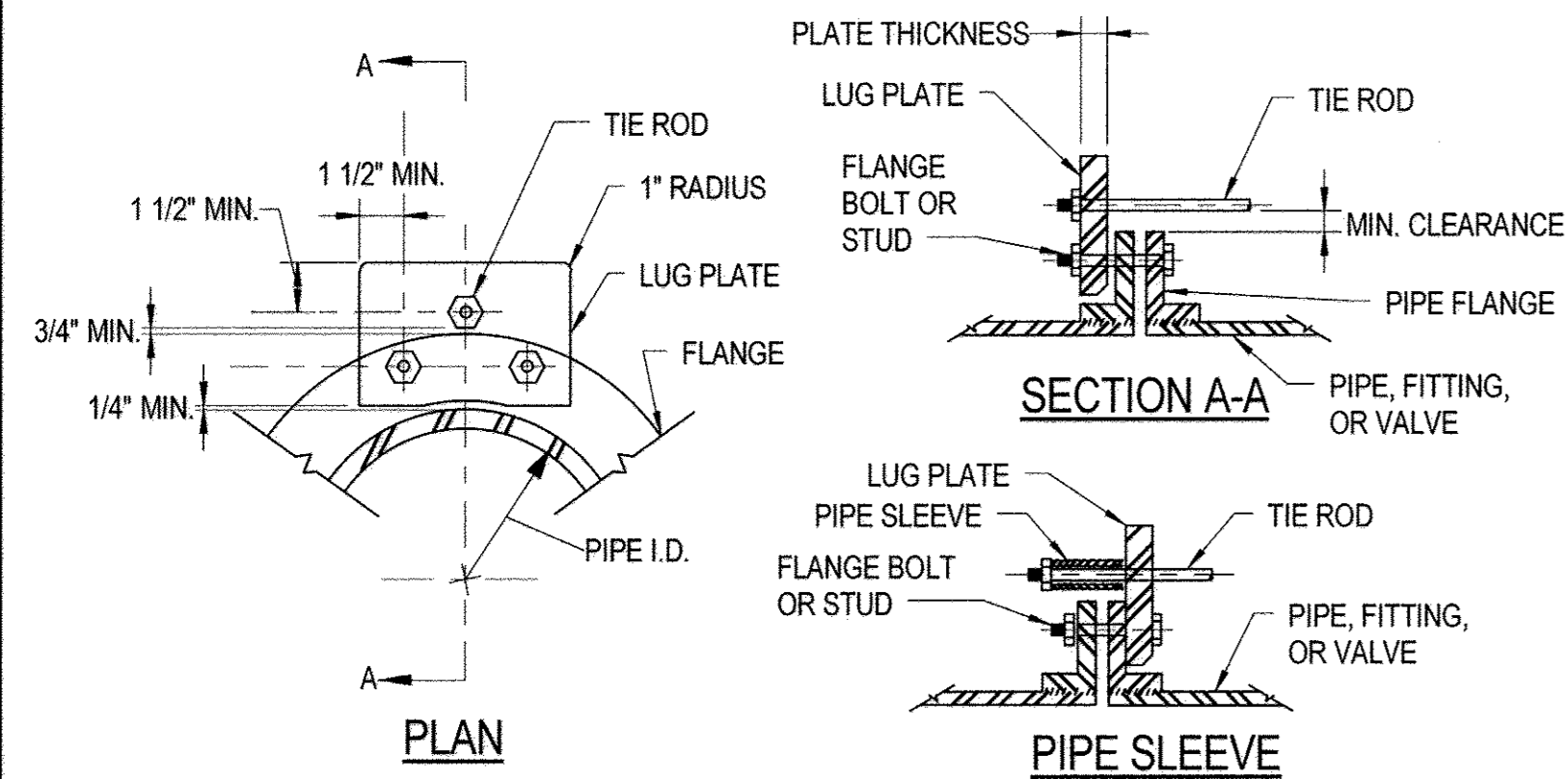
**PUMPING STATION SECTIONS**

**DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996**

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

**M-9**  
SCALE AS SHOWN  
SHEET 30 OF 46

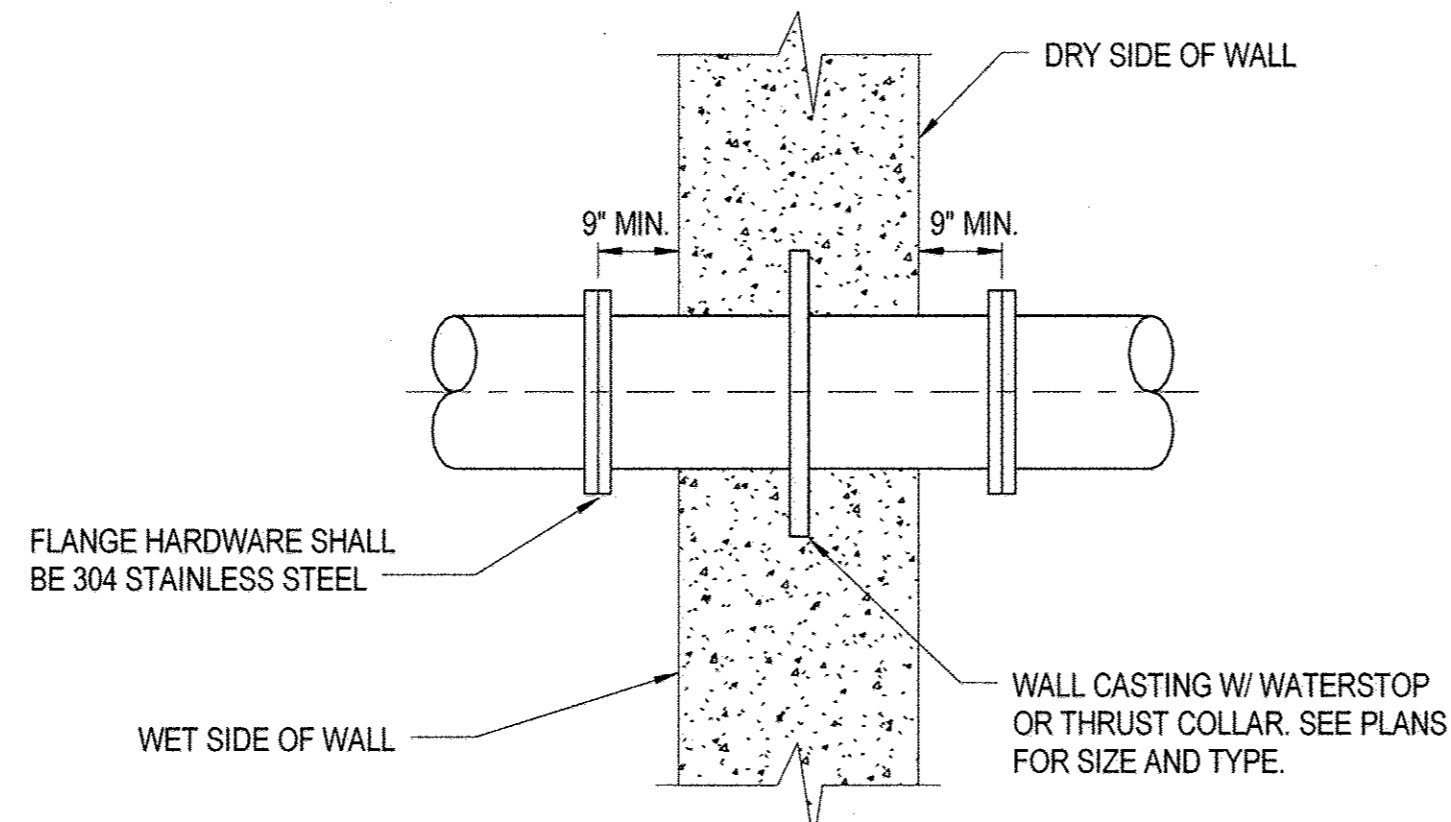
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- NOTES:**
- ONE FLANGE CONNECTION IS SHOWN FOR CLARITY. DETAIL IS TYPICAL FOR BOTH FLANGES.
  - IF PLATE IS REQUIRED TO BE MOUNTED ON REVERSE SIDE OF THE TIE ROD SO THAT THE MAXIMUM CLEARANCE BETWEEN THE SLEEVE AND THE FLANGE CAN BE MAINTAINED.
  - FLANGE SURFACE IN CONTACT WITH LUG PLATE SHALL BE GROUND SMOOTH TO CLEAR THE CASTING IRREGULARITY AND EMBOSSED LETTERING. CONTACT SURFACE OF LUG PLATE SHALL BE MACHINED TO A ONE DEGREE TAPER FOR PIPE DIAMETERS 12-INCH AND LARGER.
  - MATERIALS SHALL BE AS FOLLOWS:  
 ROD MATERIAL - ASTM A193, GRADE B7  
 PLATE MATERIAL - ASTM A36  
 SLEEVE MATERIAL - SCHEDULE 40 STEEL PIPE

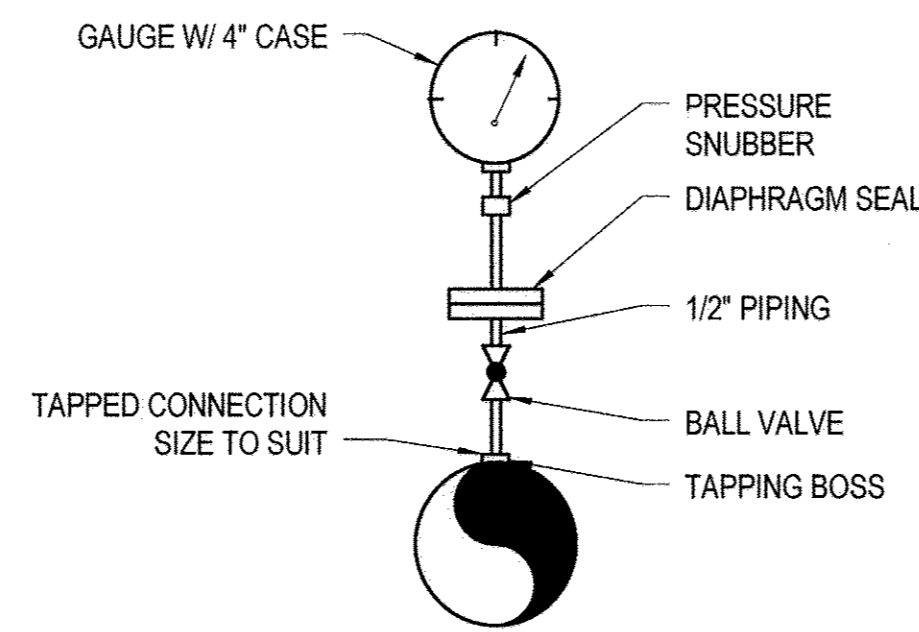
PIPE SIZE	NUMBER OF RODS	DIAMETER OF RODS	PLATE THICKNESS	PIPE SLEEVE (IF REQUIRED)	DESIGN PRESSURE PSI
4"	2	3/4"	1"	7/8"	150
6"	2	3/4"	1"	7/8"	150
8"	2	3/4"	1"	7/8"	150
10"	2	3/4"	1"	7/8"	150
12"	4	3/4"	1"	7/8"	150
14"	4	3/4"	1"	7/8"	150
16"	4	7/8"	1"	1"	150
18"	4	7/8"	1"	1"	150

**1 TYPICAL TIE ROD DETAIL**  
 M-10 SCALE: NOT TO SCALE



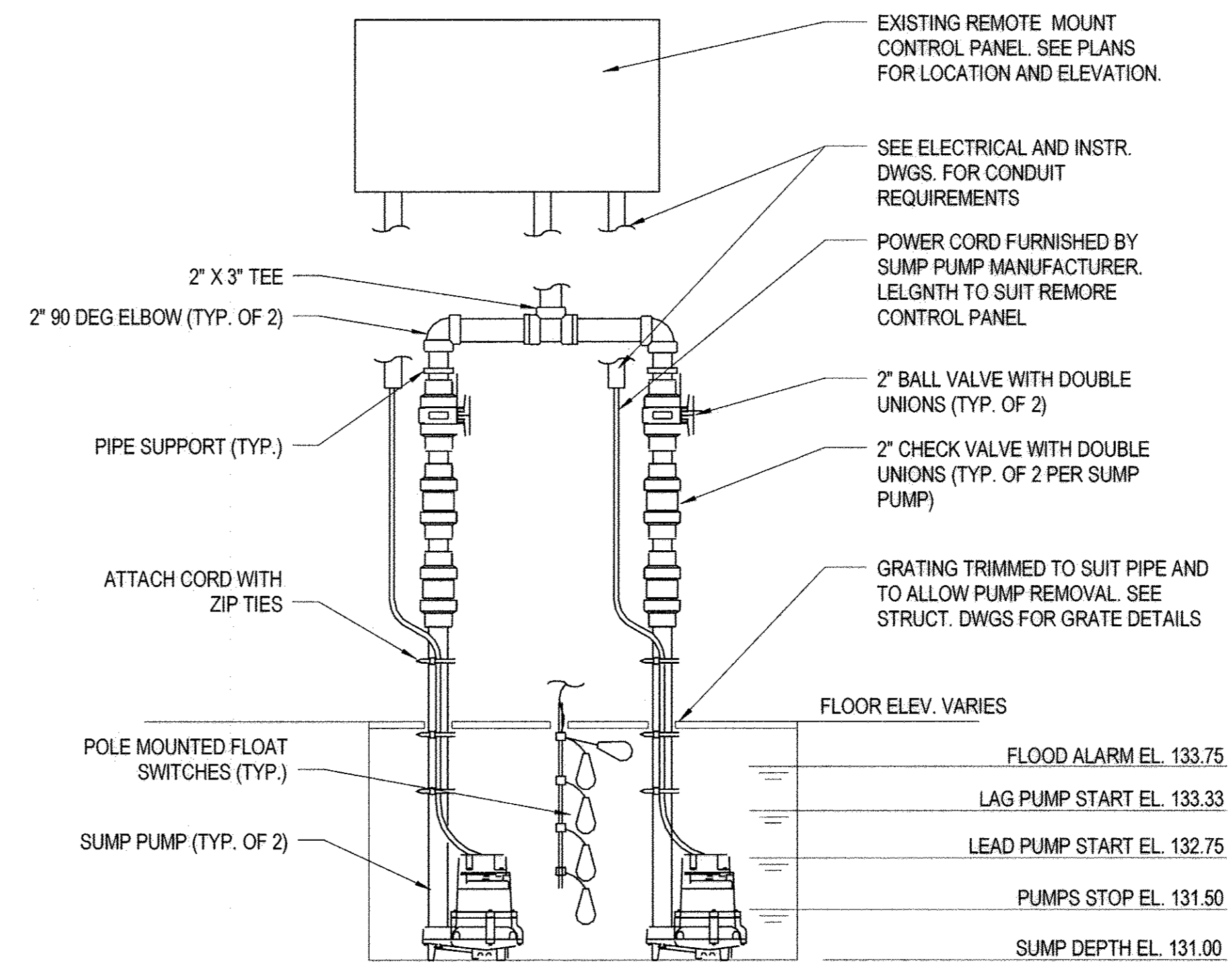
- NOTES:**
- WATERSTOPS SHALL BE CENTERED IN WALL.

**2 TYPICAL WALL CASTING DETAIL**  
 M-10 SCALE: NOT TO SCALE



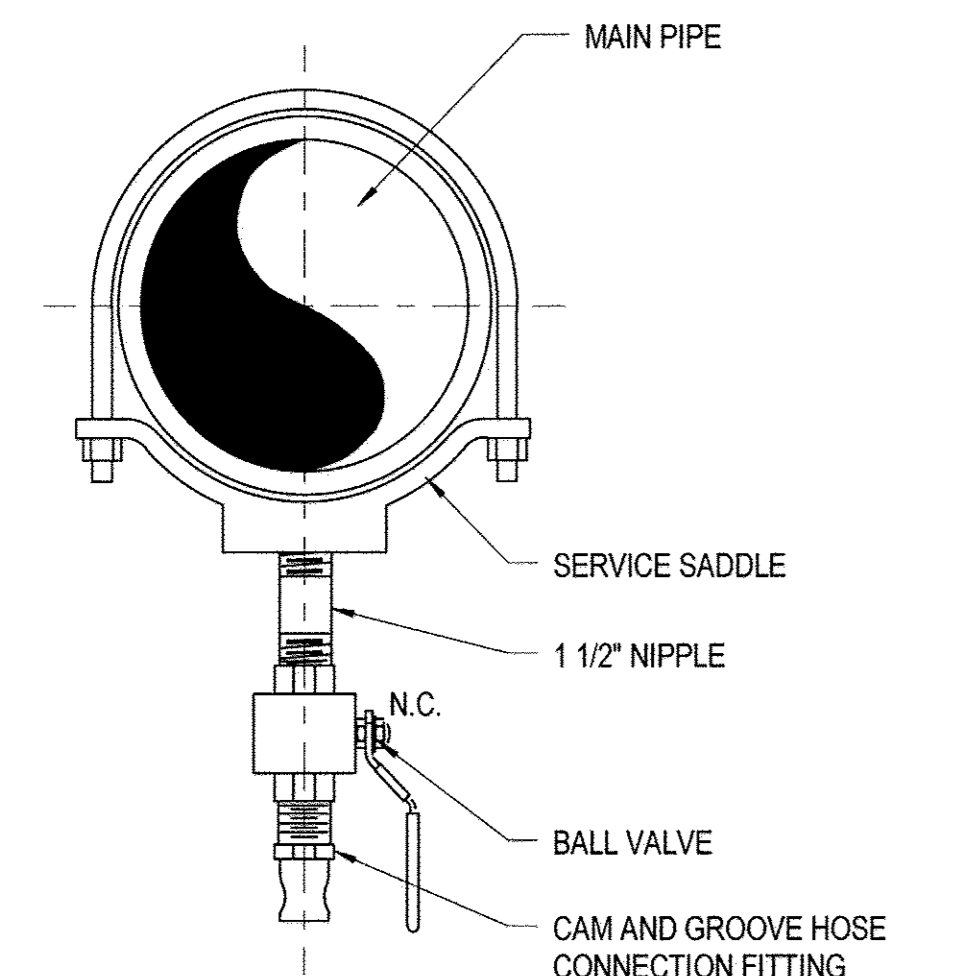
- NOTES:**
- SERVICE SADDLE MAY BE USED IN LIEU OF TAPPING BOSS.
  - SEE PLANS AND SCHEMATICS FOR QUANTITIES AND RANGES.

**3 PRESSURE GAUGE WITH DIAPHRAGM SEAL**  
 M-10 SCALE: NOT TO SCALE

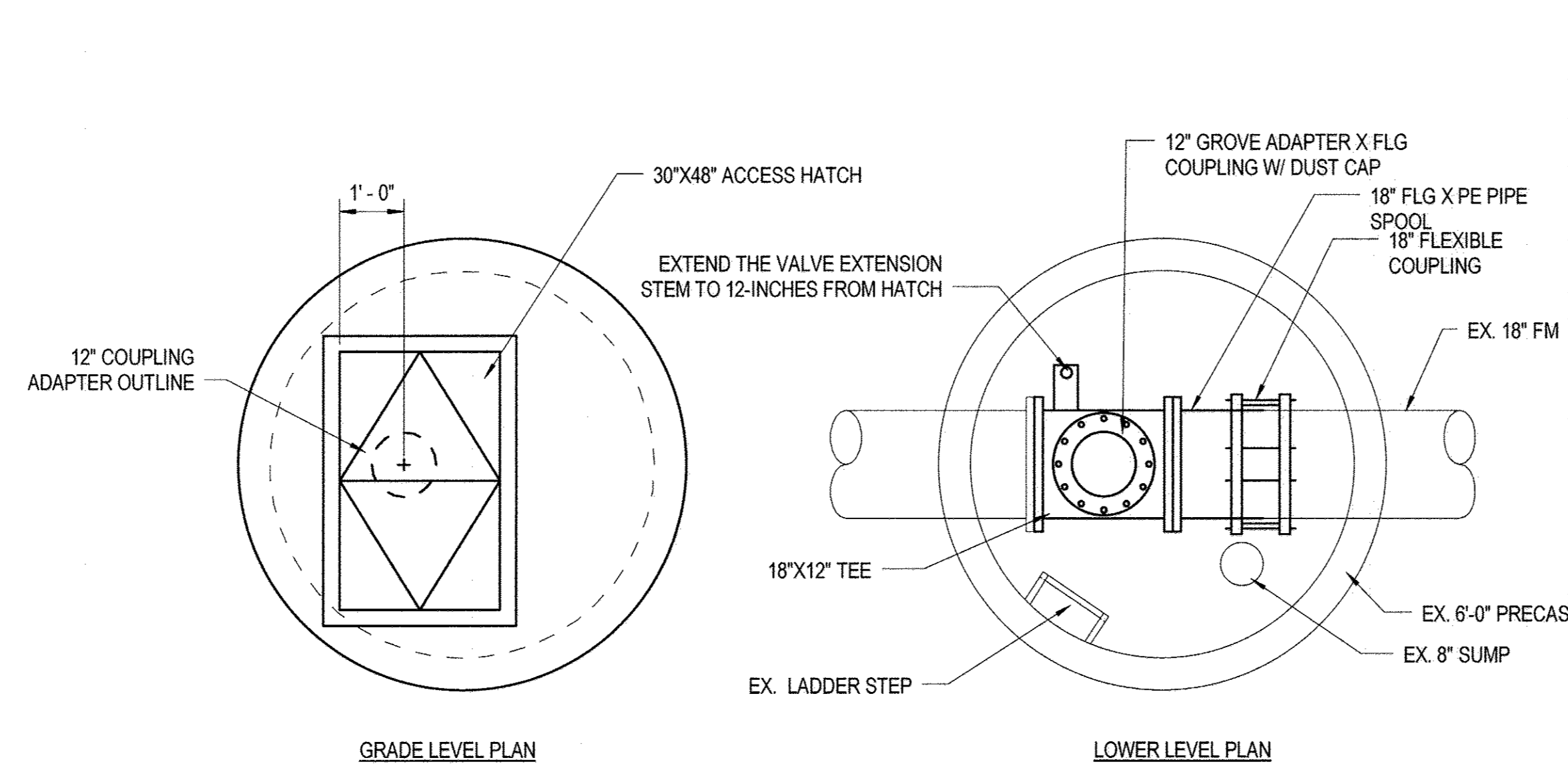


- NOTES:**
- PIPE SUPPORTS SHALL NOT BE USED BETWEEN BALL VALVE AND PUMP TO ALLOW FOR COMPONENT REMOVAL. PROVIDE BUSHING AS NECESSARY TO CONNECT PUMPS TO 2\"/>

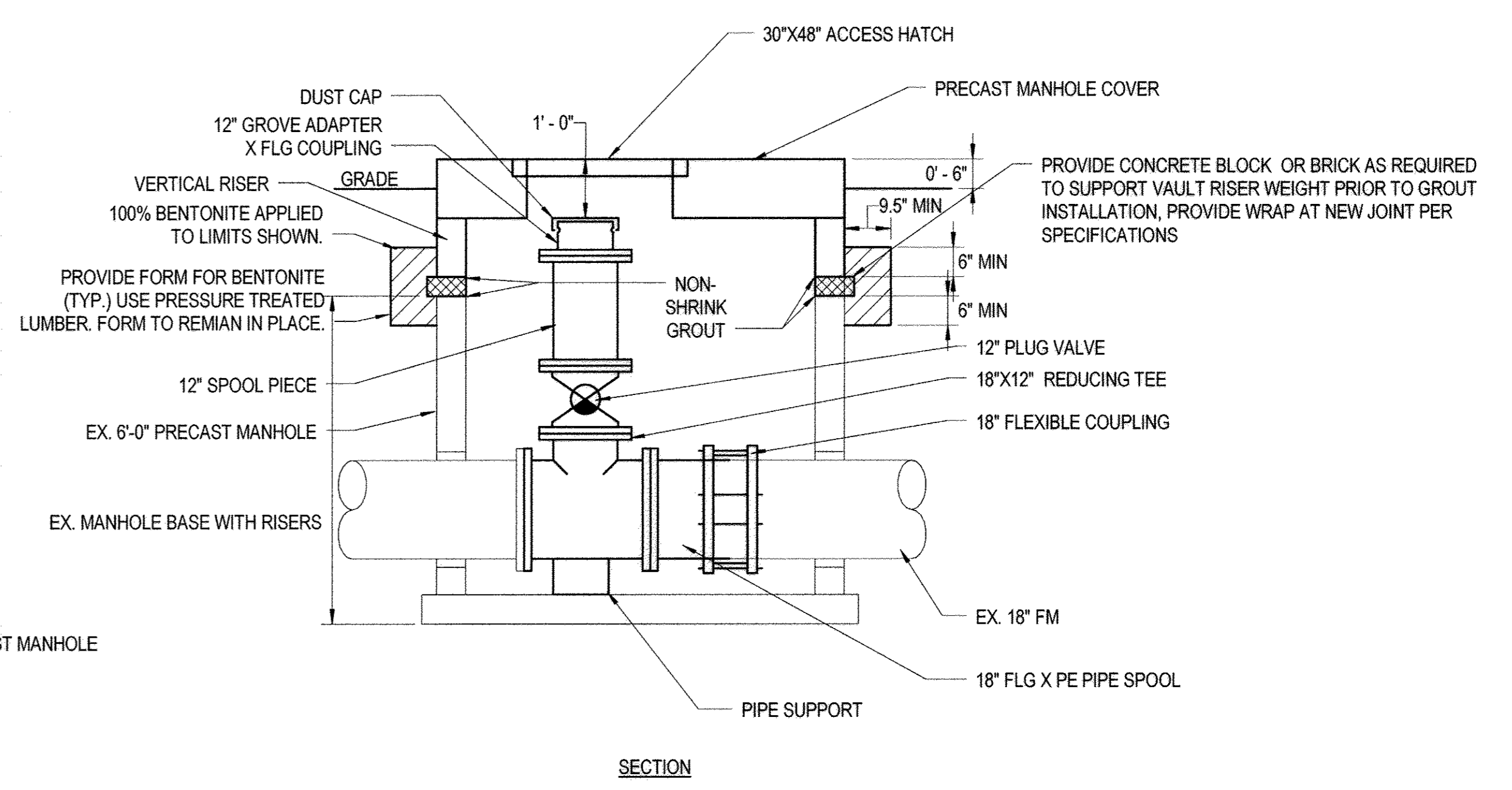
**4 DUPLEX SUMP PUMP DETAIL**  
 M-10 SCALE: NOT TO SCALE



**5 TYPICAL LINE DRAIN DETAIL**  
 M-10 SCALE: NOT TO SCALE



**6 BYPASS CONNECTION PLAN**  
 M-10 SCALE: NOT TO SCALE



"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019."

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 Director of Public Works: [Signature] 12/14/17  
 Chief, Bureau of Utilities: [Signature] 11-17  
 Chief, Utility Design Division: [Signature] 12/14/17

**WRA**  
 Whitman, Reardon & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231

STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 No. 29228

DES: LAQ				
DRN: LAQ				
CHK: DCC				
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE

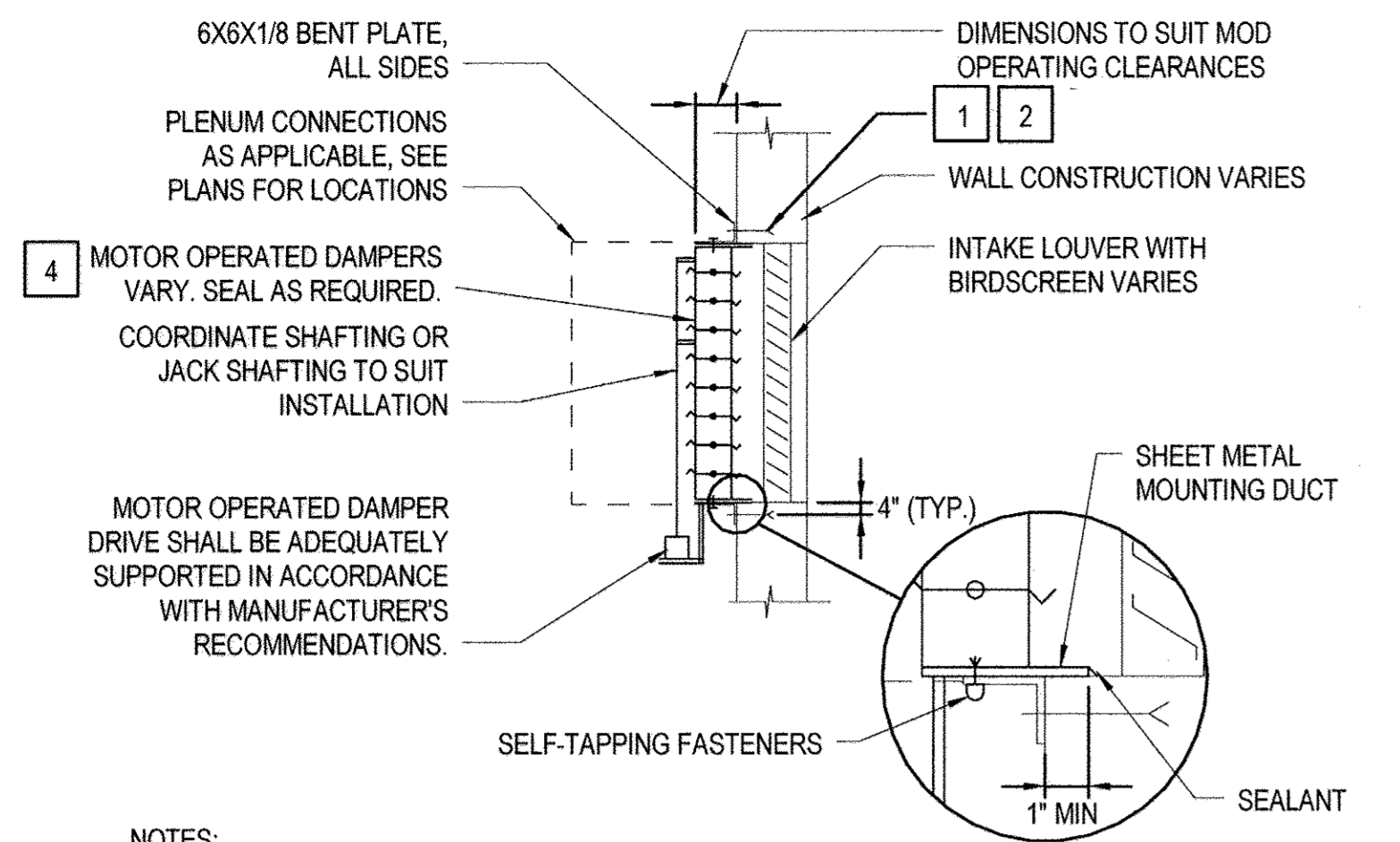
DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
 UPGRADE  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996  
 ELECTION DISTRICT 6  
 HOWARD COUNTY, MARYLAND

M-10  
 SCALE AS SHOWN  
 SHEET 31 OF 46

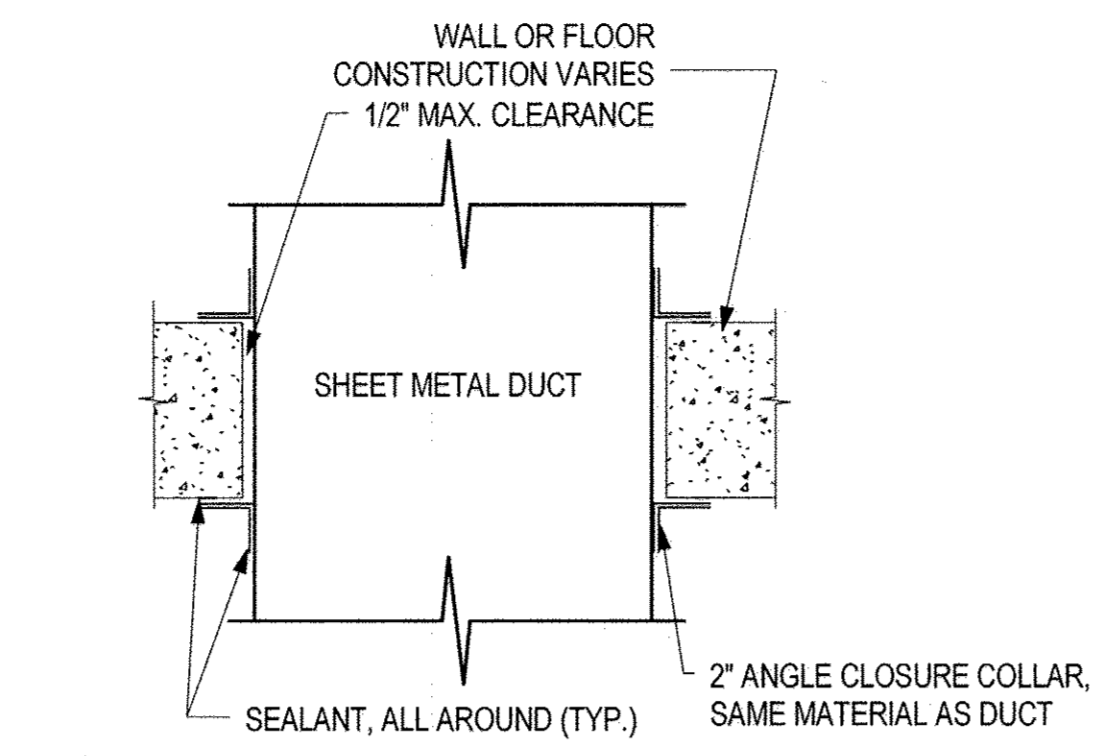
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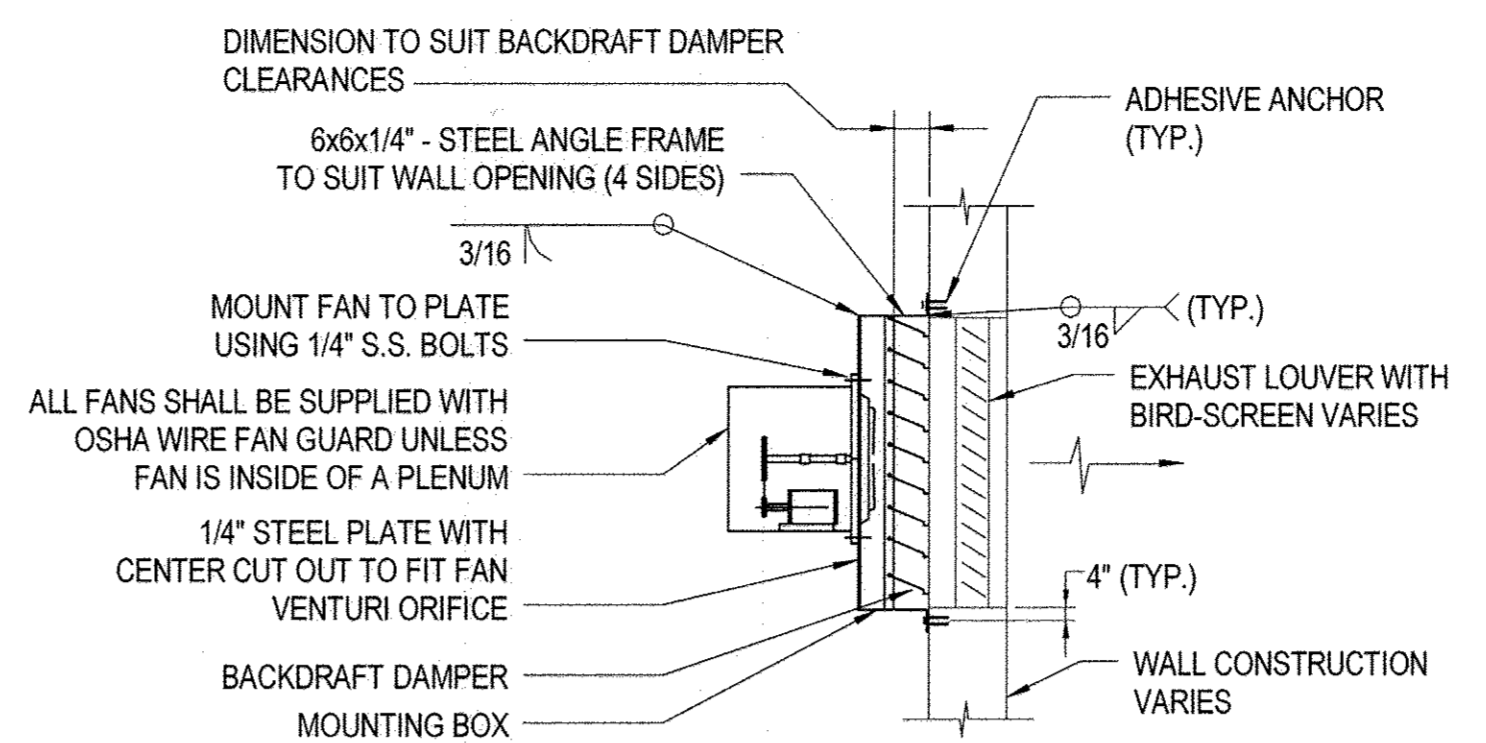


- NOTES:**
1. MOUNTING DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION FOR 4" STATIC PRESSURE CLASS, REGARDLESS OF OPERATING PRESSURE.
  2. DAMPER, DUCT, AND MOUNTING ANGLE SHALL BE CONSTRUCTED OF THE SAME MATERIAL.
  3. DAMPER DRIVE LOCATION SHOWN IS GENERAL ARRANGEMENT DRIVE LOCATION SHALL BE ADJUSTED AS NECESSARY TO AVOID INTERFERENCE WITH OTHER EQUIPMENT AND WALKWAYS.

**1**  
M-11  
**TYPICAL INTAKE DETAIL**  
SCALE: NOT TO SCALE

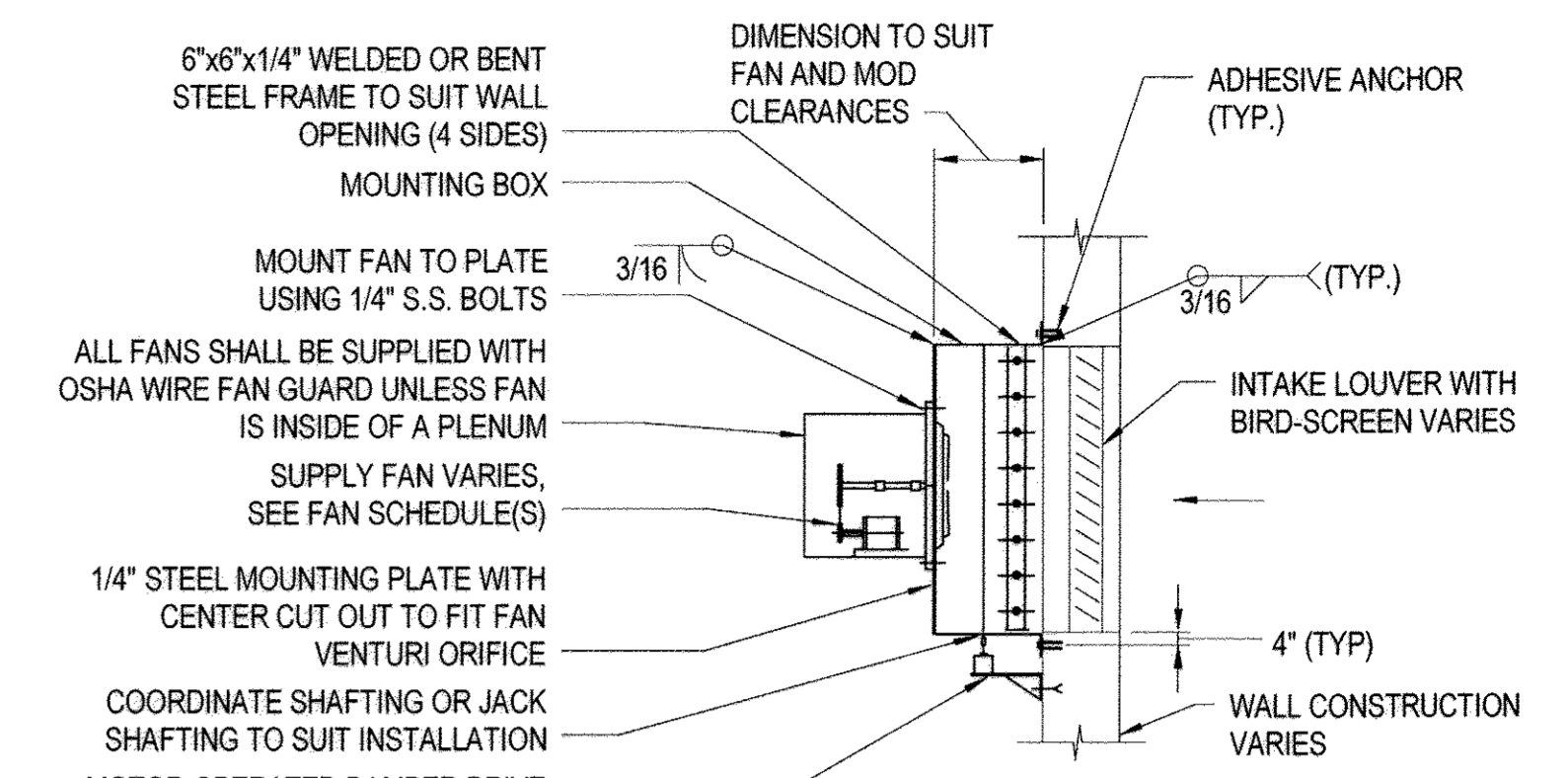


**2**  
M-11  
**DUCT PENETRATION DETAIL**  
SCALE: NOT TO SCALE



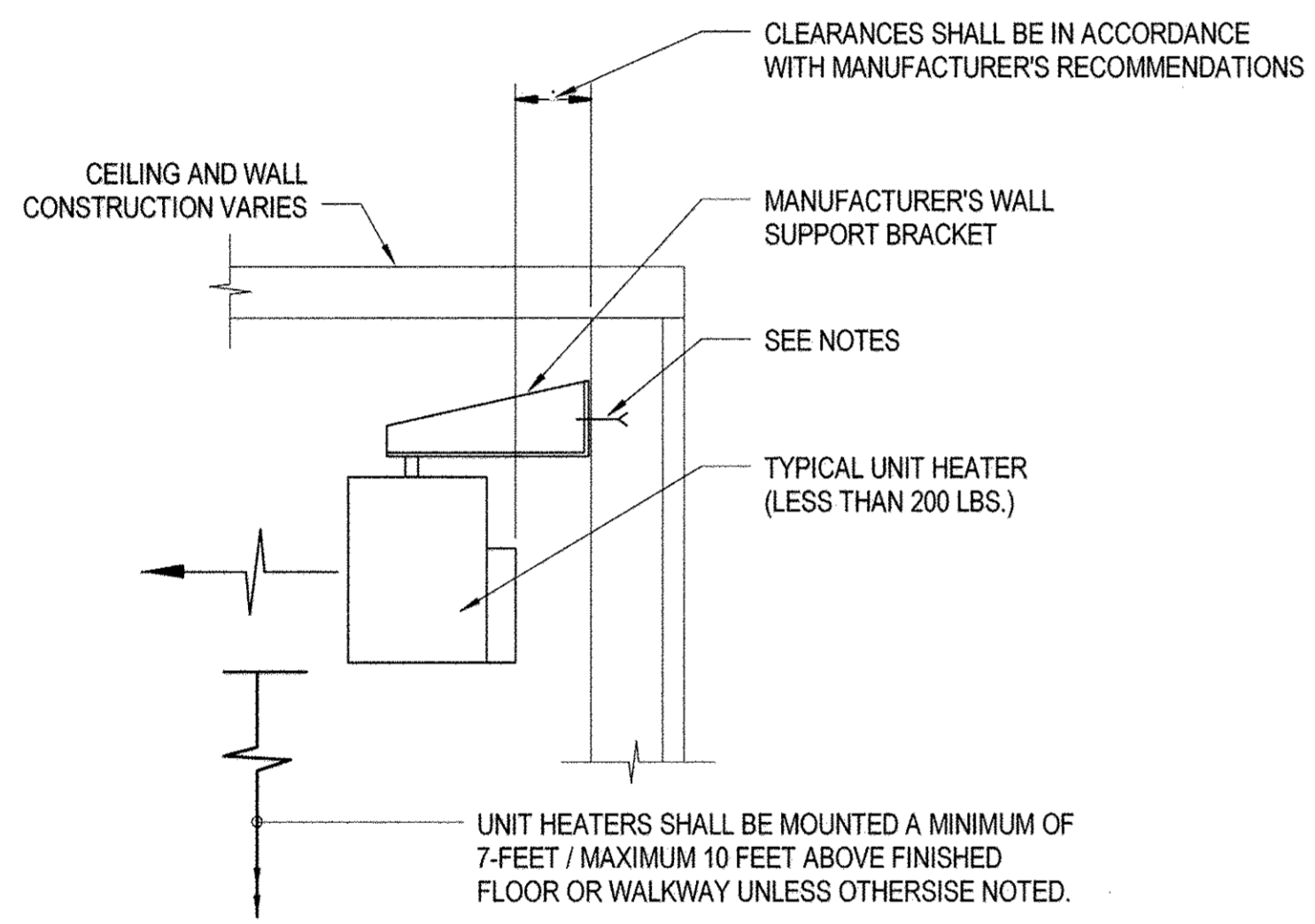
- NOTES:**
1. FRAME AND PLATE SHALL BE HOT DIP GALVANIZED AFTER FABRICATIONS.
  2. ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS UNLESS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS. WHERE MULTIPLE FANS SHARE A LOUVER, THE BACKDRAFT DAMPERS SHALL BE PARTITIONED FOR EACH RESPECTIVE FAN. SEAL AS REQUIRED.

**3**  
M-11  
**TYPICAL EXHAUST FAN DETAIL**  
SCALE: NOT TO SCALE



- NOTES:**
1. FRAME AND PLATE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
  2. ALL DAMPERS SHALL MATCH IN NOMINAL SIZE WITH THEIR RESPECTIVE LOUVERS UNLESS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS. WHERE MULTIPLE FANS SHARE A LOUVER, MOTOR OPERATED DAMPERS SHALL BE PARTITIONED FOR EACH RESPECTIVE FAN. SEAL AS REQUIRED.

**4**  
M-11  
**TYPICAL SUPPLY FAN DETAIL**  
SCALE: NOT TO SCALE



- NOTES:**
1. FOR BLOCK WALL ANCHORING USE ADHESIVE ANCHOR FOR HOLLOW MASONRY, S.S. WITH 6-INCH EMBEDMENT SPACED AT 12-INCHES ON-CENTER.
  2. FOR CONCRETE WALL ANCHORING USE 1/2-INCH DIA. ADHESIVE ANCHORS WITH 6-INCH EMBEDMENT SPACED AT 12-INCHES ON CENTER.

**5**  
M-11  
**TYPICAL WALL MOUNT UNIT HEATER DETAIL**  
SCALE: NOT TO SCALE

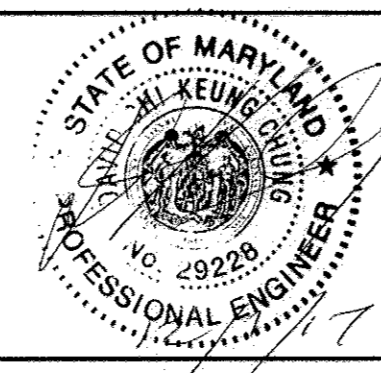
"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 29228, EXPIRATION DATE: 06/17/2019."

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*[Signature]* 12/15/17  
DIRECTOR, PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*[Signature]* 12/14/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES: LAQ					
DRN: LAQ					
CHK: DCC					
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE	

DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

M-11  
SCALE AS SHOWN  
SHEET  
32 OF 46

11/29/2017 2:52:49 PM

**GENERAL NOTES:**

- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH ELECTRIC POWER UTILITY COMPANY.
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST EDITION OF NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES, RULES AND REGULATIONS.
- ALL CONDUITS AND EQUIPMENT SHALL BE INSTALLED, WIRED AND GROUNDED IN ACCORDANCE WITH THE LATEST RULES AND REGULATIONS OF NATIONAL ELECTRICAL CODE (NEC) AND LOCAL CODES.
- CONDUIT RUNS ARE SHOWN DIAGRAMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH OTHER EQUIPMENT. EXPOSED CONDUITS SHALL BE RUN ON THE WALLS HORIZONTALLY AND VERTICALLY.
- CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTION TO EQUIPMENT. CONDUIT ENDS SHALL BE SUITABLY SEALED TO PREVENT TRANSGRESS OF MOISTURE THROUGH CONDUITS FROM ONE EQUIPMENT TO OTHER.
- CONDUITS AND WIRES SHALL BE SIZED IN ACCORDANCE WITH NEC UON. MINIMUM CONDUIT SIZE SHALL BE 3/4" UON, AND MINIMUM WIRE SIZE SHALL BE #12AWG UON FOR POWER CIRCUITS.
- CONDUITS INSTALLED EXPOSED ON EXTERIOR/INTERIOR OF BUILDING SHALL BE GRS.
- WALL AND FLOOR PENETRATIONS FOR ELECTRICAL CONDUITS SHALL BE CORE DRILLED. PROVIDE SEGMENTED RUBBER COMPRESSION SEALS ON BOTH SIDES.
- PROVIDE ALL REQUIRED PULL AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS. ALL JUNCTION AND PULL BOXES SHALL BE LABELED WITH THEIR VOLTAGE AND USAGE.
- FINAL LOCATION FOR ALL ELECTRICAL EQUIPMENT, INCLUDING RECEPTACLES, JUNCTION BOXES FOR SPECIFIED EQUIPMENT, LIGHTING FIXTURES, SWITCHES, ETC. SHALL BE APPROVED BY THE OWNER PRIOR TO INSTALLATION.
- THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS ARE BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS APPROVED BY THE COUNTY MAY BE MADE BY THE CONTRACTOR AT HIS EXPENSE TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED.
- ALL ALARM INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
- ALL ELECTRICAL EQUIPMENT INSTALLED AGAINST CONCRETE OR MASONRY WALLS SHALL BE INSTALLED WITH 1/4" SPACERS BETWEEN THE EQUIPMENT AND THE MOUNTING SURFACE. SPACERS SHALL BE STAINLESS STEEL, PVC, OR NYLON.
- ELECTRICAL ENCLOSURES LOCATED OUTDOORS SHALL BE WEATHERPROOF NEMA 4X, UON.
- THE CIRCUIT NUMBERS ARE FOR IDENTIFICATION PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS AND CORRECTLY PHASING CIRCUITS IN PANELBOARDS.
- ALL ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE AS NOTED ON PLANS.
- FOR ALL EQUIPMENT SHOWN FOR DEMOLITION, REMOVE ALL ASSOCIATED RACEWAY, WIRING, SWITCHES, AND PULL BOXES FROM SOURCE PANEL TO EQUIPMENT.
- ALL CONDUIT TERMINATIONS IN PULL BOXES OR EQUIPMENT SHALL BE MADE USING "MEYERS HUBS" FOR EQUIPMENT RATED OTHER THAN NEMA 1 OR 11.
- REFER TO "I" DRAWINGS FOR ADDITIONAL REQUIREMENTS FOR ELECTRICAL CONDUITS AND CONDUCTORS.
- REFER INSTRUMENTATION DRAWINGS FOR STARTERS AND COMBINATION STARTERS DETAILS.
- ELECTRICAL ITEMS IN HEAVY LINE WEIGHT ARE NEW, UON. ELECTRICAL ITEMS IN LIGHT LINE WEIGHT ARE EXISTING TO REMAIN. ELECTRICAL ITEMS IN DASHED LINETYPE ARE EXISTING TO BE REMOVED, UON.
- NEW PUMPS ARE DESIGNED TO OPERATE TWO AT A TIME (LEAD AND LAG) AND ONE STANDBY.
- ALL ELECTRICAL EQUIPMENT, SYSTEMS, AND COMPONENTS IN THE WET WELL SHALL COMPLY WITH THE NEC CODE REQUIREMENTS FOR CLASS 1, DIVISION 1, GROUP D LOCATIONS.

**LEGEND:**

EXISTING	NEW	
		COMBINATION STARTER, SIZE AS NOTED
		JUNCTION BOX
		VARIABLE FREQUENCY DRIVE (VFD)
		SOLID STATE REDUCED VOLTAGE STARTER
		MOTOR; HP AS NOTED
		THERMOSTAT
		POWER MONITOR, MONITORS PHASE VOLTAGE CURRENT, KVA, KW, KVAR
		GROUND
		FUSE
		POTENTIAL TRANSFORMER
		CURRENT TRANSFORMER
		CONDUIT SURFACE MOUNTED
		ELECTRIC GROUND GRID DIRECT BURIED
		CONDUIT UNDER FLOOR SLAB OR EMBEDDED, STUB-UP ENDS AT 4" AFF
		CIRCUIT BREAKER
		WALL SWITCH 20A, 125V, 1800VA WITH MANUAL OVERRIDE AND MULTI-TECHNOLOGY OCCUPANCY SENSOR COMPATIBLE WITH LUMINAIRE. PROVIDE SS FACE PLATE, MH 4'-0" AFF
		MANUAL STARTER WITH HOA SWITCH, COMPATIBLE WITH MOTOR
		DISCONNECT SWITCH NON-FUSED, 30A, 3P, 480V, NEMA-4 ENCLOSURE, UON
		DUPLEX GFI RECEPTACLE 20A, 125V, GROUND FAULT CIRCUIT INTERRUPTER/WEATHER PROOF, MH 4'-0" AFF
		DUPLEX RECEPTACLE 20A, 125V, NEMA 5-20R, MH 1'-6" AFF
		SIMPLEX RECEPTACLE, SPECIAL PURPOSE, VERIFY CONFIGURATION, MH 1'-6" AFF
		ELECTRIC UNIT HEATER - EUH
		ELECTRICAL HOMERUNS TO PANELBOARD/SWITCHBOARD
		EXISTING ELECTRICAL MANHOLE
		FLUORESCENT STRIP, INDUSTRIAL TYPE
		WALL MOUNTED EXTERIOR LUMINAIRE
		MAGNETIC STARTER FVNR, NEMA SIZE AS INDICATED, WITH HOA SWITCH AND MOTOR CIRCUIT PROTECTOR

**ELECTRICAL ABBREVIATIONS:**

A, AMP	AMPERE	MAX	MAXIMUM
AC	ALTERNATING CURRENT	MCC	MOTOR CONTROL CENTER
AF	AMPERE FRAME	MCCB	MOLDED CASE CIRCUIT BREAKER
AFF	ABOVE FINISHED FLOOR	MCP	MOTOR CIRCUIT PROTECTOR
AIC	AMPS INTERRUPTING CAPACITY	MIN	MINIMUM
AT	AMPERE TRIP	MG	MECHANICAL GRINDER
ATS	AUTOMATIC TRANSFER SWITCH	MH	MANHOLE, MOUNTING HEIGHT
		MOT	MOTOR
		MP	METERING PUMP
		MTS	MANUAL TRANSFER SWITCH
		N	NEUTRAL
		NEC	NATIONAL ELECTRICAL CODE
		NO/NC	NORMALLY OPEN/ NORMALLY CLOSED
		P	POLE
		PB	PULL BOX
		PCP	PUMP CONTROL PANEL
		PNL	PANEL
		PWR	POWER
		PVC	POLYVINYL CHLORIDE
		REC/RECP	RECEPTACLE
		RMC	RIGID METAL CONDUIT
		RTU	REMOTE TERMINAL UNIT
		RWP	RECLAIMED WATER PUMP
		SCH	SCHEDULE
		SF	SUPPLY FAN
		SGMO	SLUICE GATE MOTOR OPERATOR
		SP	SUMP PUMP
		SPCP	SUMP PUMP CONTROL PANEL
		SPD	SURGE PROTECTION DEVICE
		SS	STAINLESS STEEL
		SSRV	SOLID STATE REDUCED VOLTAGE STARTER
		TSP	TWISTED SHIELDED PAIR
		TTB	TELEPHONE TERMINAL BOARD
		TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
		TYP	TYPICAL
		UG	UNDERGROUND
		UON	UNLESS OTHERWISE NOTED
		V	VOLTS
		VA	VOLT AMPERE
		VCP	VENTILATION CONTROL PANEL
		VFD	VARIABLE FREQUENCY DRIVE
		W	WATTS
		WP	WEATHER PROOF
		XFMR	TRANSFORMER

**LIGHTING FIXTURE SCHEDULE**

TYPE	MANUFACTURER	CATALOG NO.	LAMP				MOUNTING	REMARKS
			TYPE	NO.	WATT	VOLT		
A	HUBBEL OR EQUAL	NRG-312LU-5K-BZ	LED	12	18	120	WALL PACK	FULL POLYCARBONATE VANDAL RESISTANT CAST ALUMINUM
C	LITHONIA OR EQUAL	MSL-4L-120-LP835	LED	-	29	120	SUSPENDED	PROVIDE STEEL CHANNEL FOR FIXTURE MOUNTING AND SUSPEND CHANNEL FROM STRUCTURE ABOVE. PROVIDE RIGID SUPPORT
D	HUBBEL OR EQUAL	KHL-36L-120V-86-5K-5M-P ENDANT/WALL-3/4"-TN	LED	36	86	120	PENDANT/ WALL	105 LUMENS/WATT TAN COLOR. MOUNTING AS REQUIRED, EXPLOSION PROOF
E	LITHONIA OR EQUAL	LE-S-1-R-120V-ELN	LED	-	1.3	120	UNIVERSAL	BATTERY PACK WITH CHARGER, TEST SWITCH
F	LITHONIA OR EQUAL	TWH-LED-30C-1000-50K-T 3M-120V	LED	30	104	120	WALL	DARK BRONZE, ACRYLIC LENS
G	LITHONIA OR EQUAL	ELM 2 LED	LED	2	-	120	UNIVERSAL	WALL MOUNT EMERGENCY LIGHT WITH NI-CAD BATTERY
H	COLUMBIA OR EQUAL	CWM2 35MWMS FRFA EU	LED	-	17	120	WALL	WALL MOUNT LED LIGHT. MOUNT 8' AFF. UON.

**NOTES:**

- MOUNTING HEIGHT FOR PENDANT IS FROM FINISHED FLOOR TO BOTTOM OF FIXTURE.



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Thomas E. Butler* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

*12/1/17*  
DATE

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



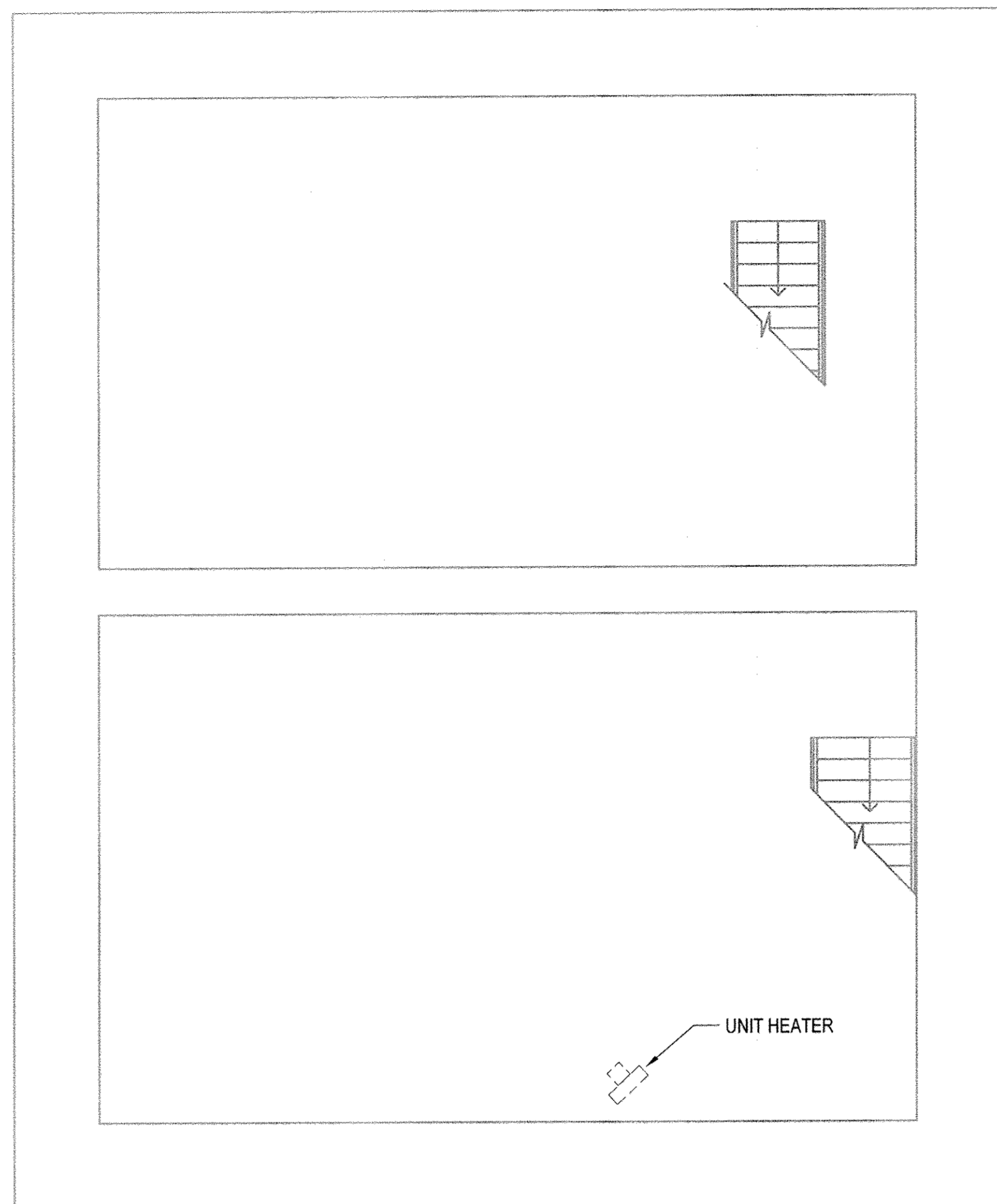
DES: ROK  
DRN: VL/OM  
CHK: AKM  
DATE: NOV 2017

ELECTRICAL LEGEND,  
NOTES & ABBREVIATIONS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

E-1  
SCALE  
NONE  
SHEET  
33 OF 46

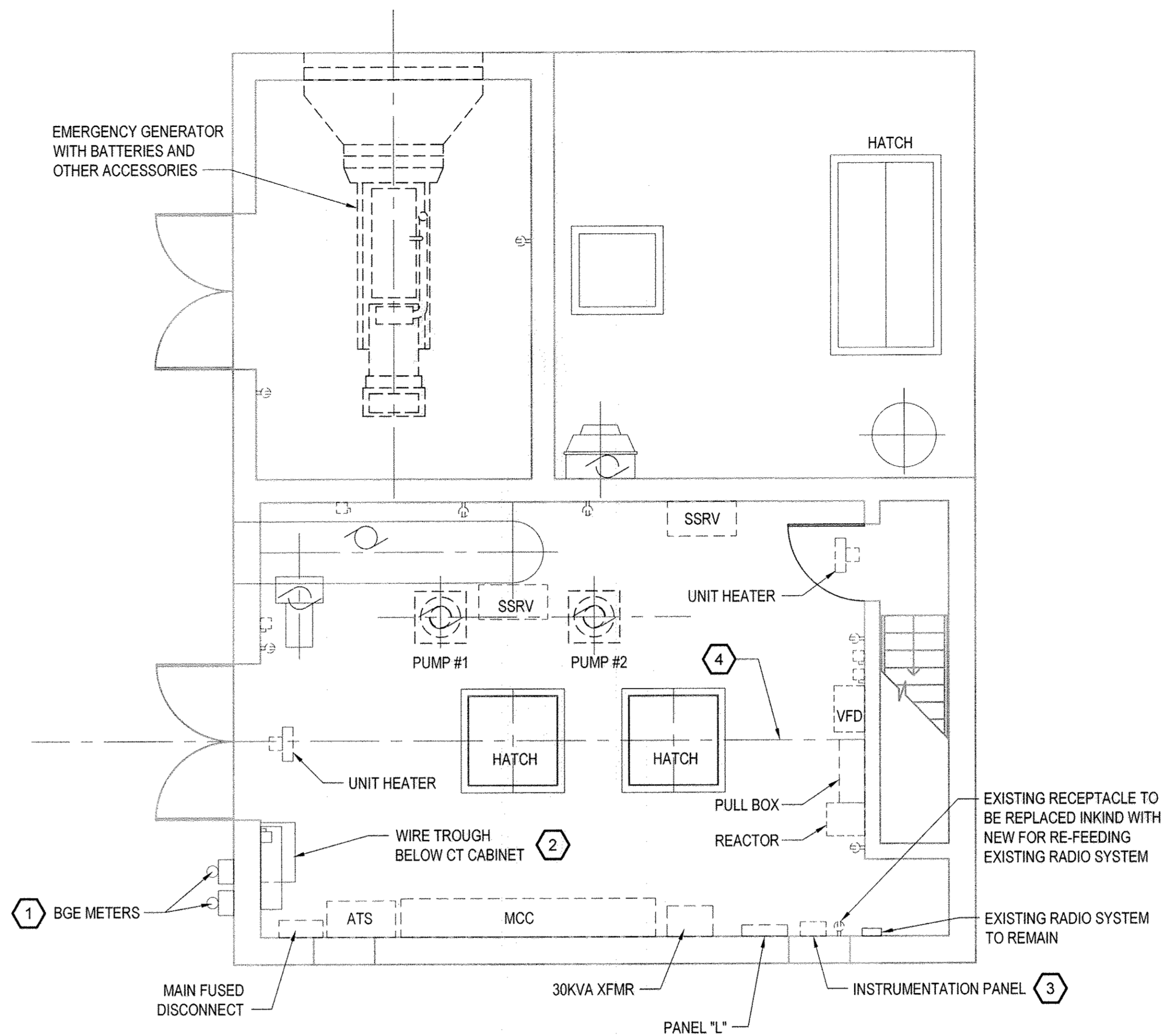




2  
E-2

**INTERMEDIATE LEVEL @ EL. 151  
POWER PLAN - DEMOLITION**

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



1  
E-2

**GRADE LEVEL POWER PLAN - DEMOLITION**

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

- DEMOLITION NOTES:**
1. REMOVE EXISTING ELECTRIC METERS. COORINATE WITH BGE.
  2. REMOVE EXISTING CT CABINETS. SHALL BE COORDINATED WITH BGE.
  3. INSTRUMENTATION PANEL AND TELEMETRY SYSTEM TO BE DEMOLISHED AND RETURNED TO THE COUNTY.
  4. REMOVE ALL ELECTRICAL CONNECTIONS, DISCONNECT, RACEWAY AND WIRING FROM SOURCE PANEL FOR MONORAIL HOIST BEING REMOVED.

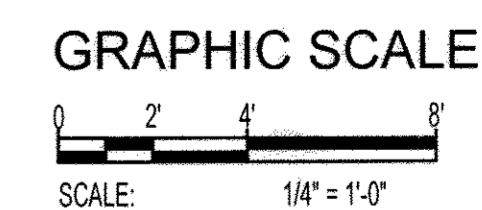
**LEGEND:**

----- DEMOLITION

————— EXISTING TO REMAIN



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E-2

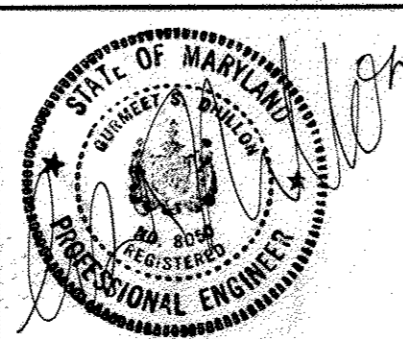
DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*[Signature]* 12/1/17  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 12/1/17  
CHIEF, BUREAU OF UTILITIES DATE

**WRA**

**Whitman, Requardt & Associates, LLP**  
801 South Caroline Street, Baltimore, Maryland 21231



DES:	RDK			
DRN:	VL/OM			
CHK:	RDK			
DATE:	NOV. 2017			
BY:	NO.	REVISION	DATE	

**PUMPING STATION  
POWER DEMOLITION PLAN**

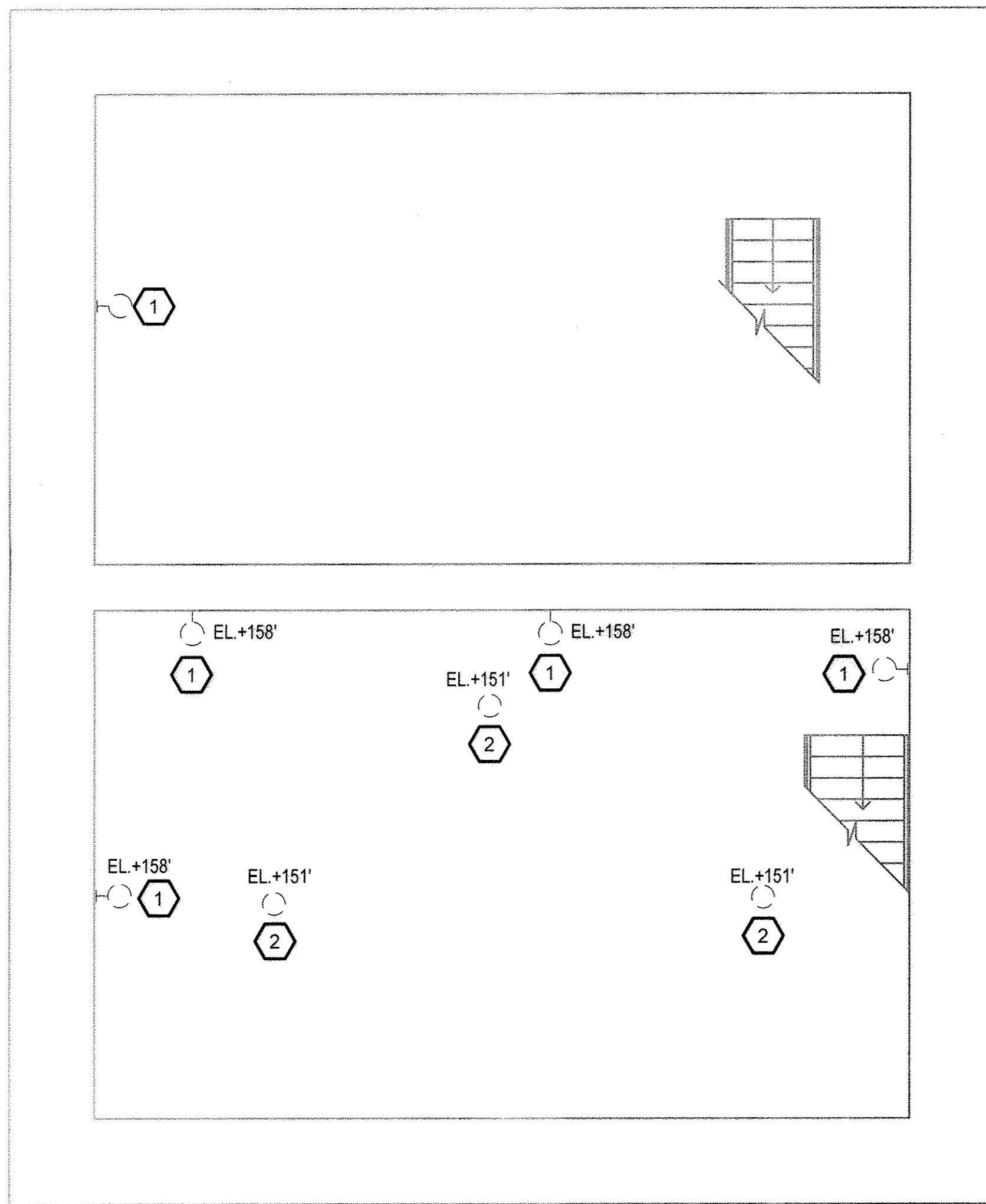
**DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE**  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

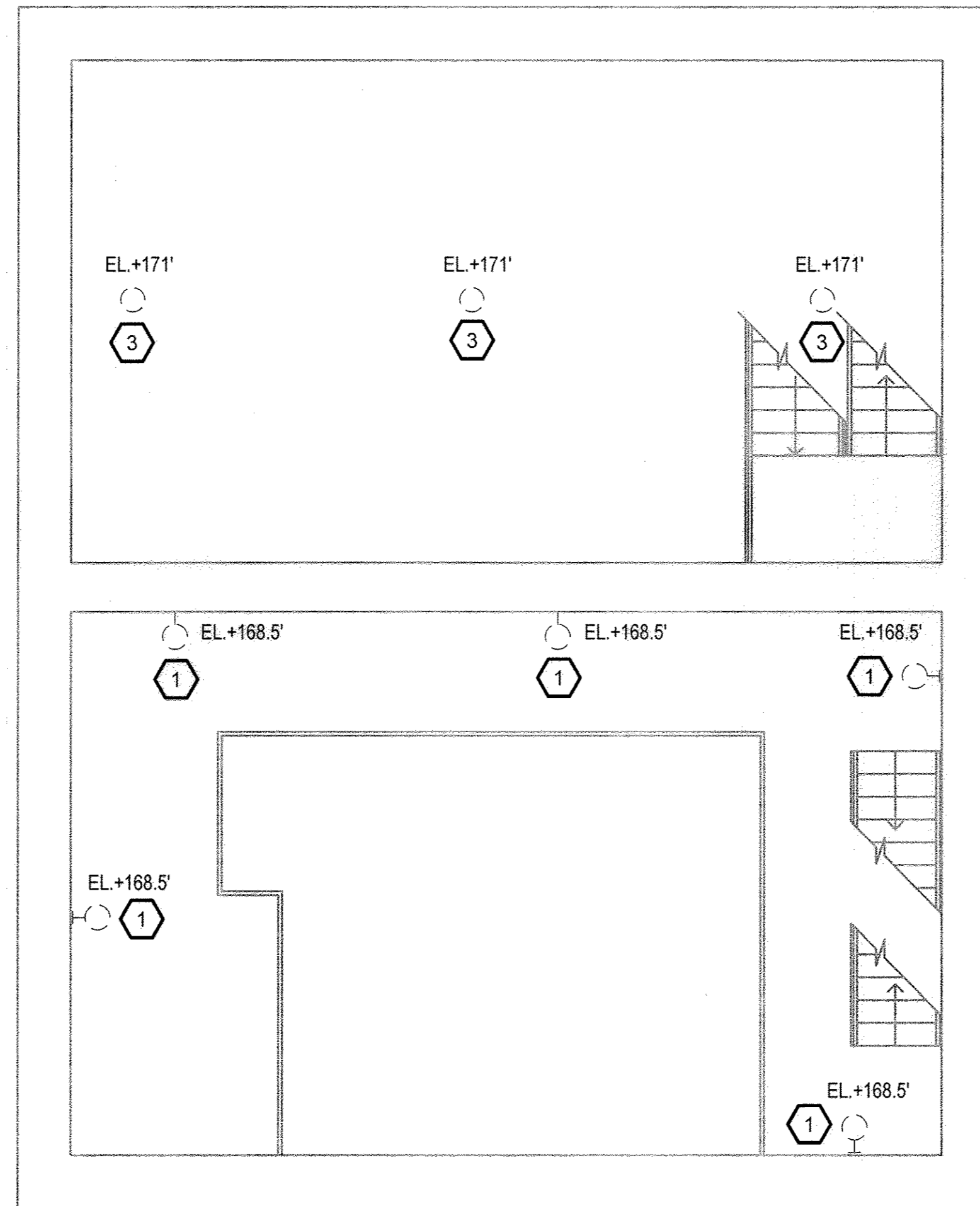
SHEET 34 OF 46



1  
E-3

**INTERMEDIATE LEVEL @ EL.151**  
**LIGHTING PLAN - DEMOLITION**

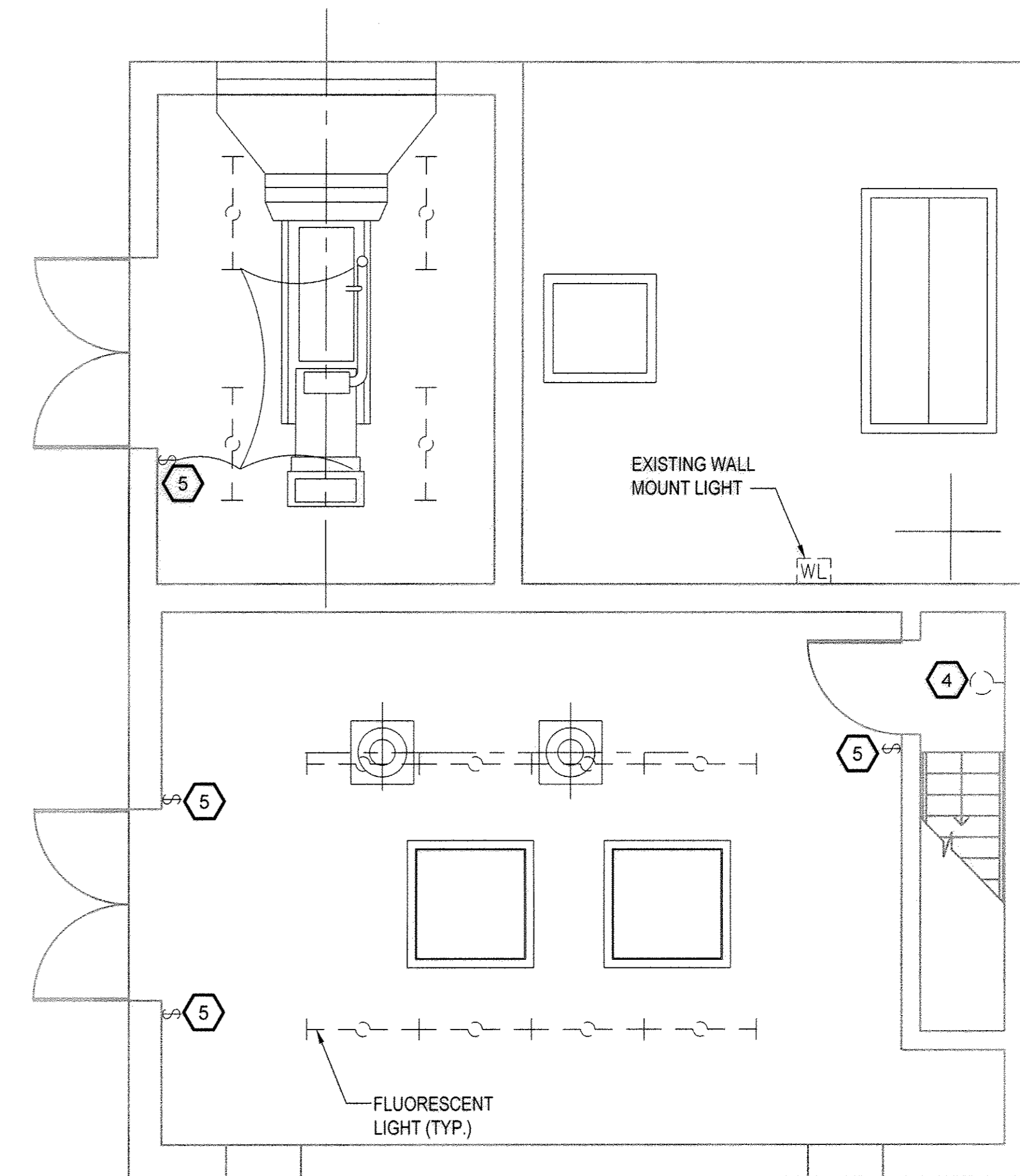
SCALE: 1/4" = 1'-0"



2  
E-3

**INTERMEDIATE LEVEL @ EL.161.50**  
**LIGHTING PLAN - DEMOLITION**

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



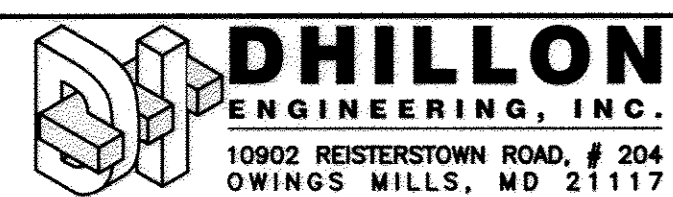
3  
E-3

**GRADE LEVEL**  
**LIGHTING PLAN - DEMOLITION**

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

**(X) DEMOLITION NOTES:**

1. EXISTING EXPLOSION PROOF 70W HP LUMINAIRE TO BE REMOVED (TYPICAL).
2. EXISTING EXPLOSION PROOF 150W HP LUMINAIRE TO BE REMOVED.
3. EXISTING EXPLOSION PROOF 250W HP LUMINAIRE TO BE REMOVED.
4. EXISTING EXPLOSION PROOF 70W HPS LUMINAIRE ABOVE STAIR LANDING TO BE REMOVED.
5. EXISTING LIGHTING SWITCH TO BE REMOVED.



PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 8050, EXPIRATION DATE: 08/19/19

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*[Signature]* 12/16/17  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 12/14/17  
CHIEF, UTILITY DESIGN DIVISION DATE



**Whitman, Requardt & Associates, LLP**  
801 South Caroline Street, Baltimore, Maryland 21231



DES:	RDK
DRN:	VL/OM
CHK:	AKM
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DATE:	

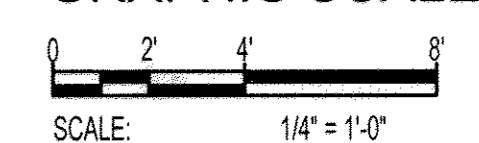
PUMPING STATION  
LIGHTING DEMOLITION PLAN

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

GRAPHIC SCALE



E-3

SCALE  
AS  
SHOWN

SHEET  
35 OF 46





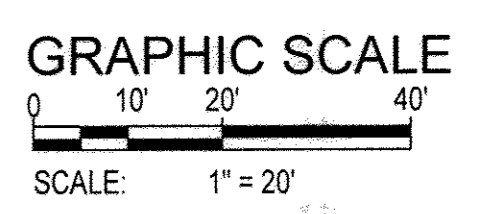
**[X] SPECIFIC NOTES:**

1. 4-4" PVC SCH-40, 36" UNDERGROUND CONCRETE ENCASED MEETING BGE REQUIREMENTS. ONE OF 4-4" CONDUITS IS A SPARE. PROVIDE CAP ON SPARE CONDUIT.

**1** ELECTRICAL SITE PLAN  
 E-4 SCALE: 1" = 20'



"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 8050, EXPIRATION DATE: 08/19/19"



**E-4**  
 SCALE AS SHOWN  
 SHEET 36 OF 46

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND.  
 [Signatures and dates for Bureau of Utilities and Utility Design Division]

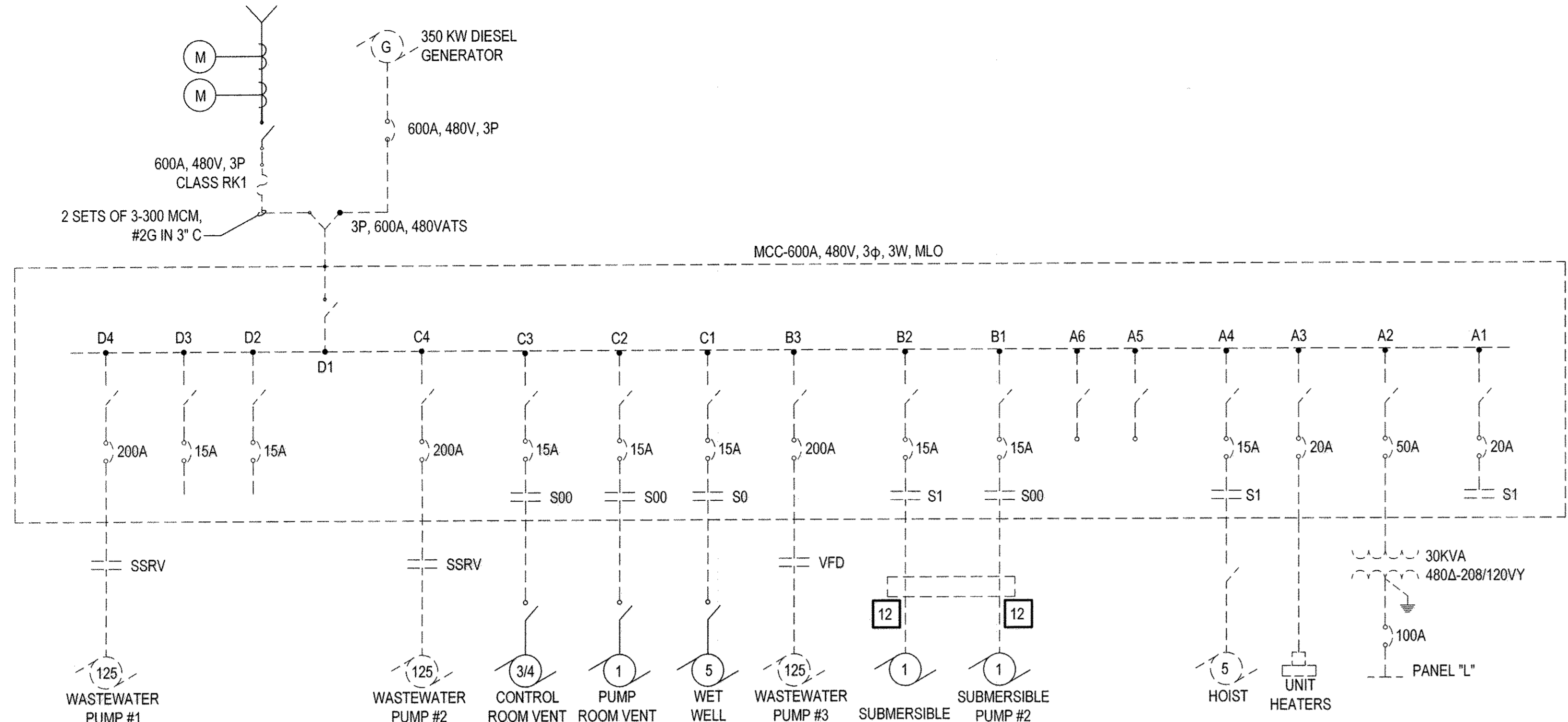
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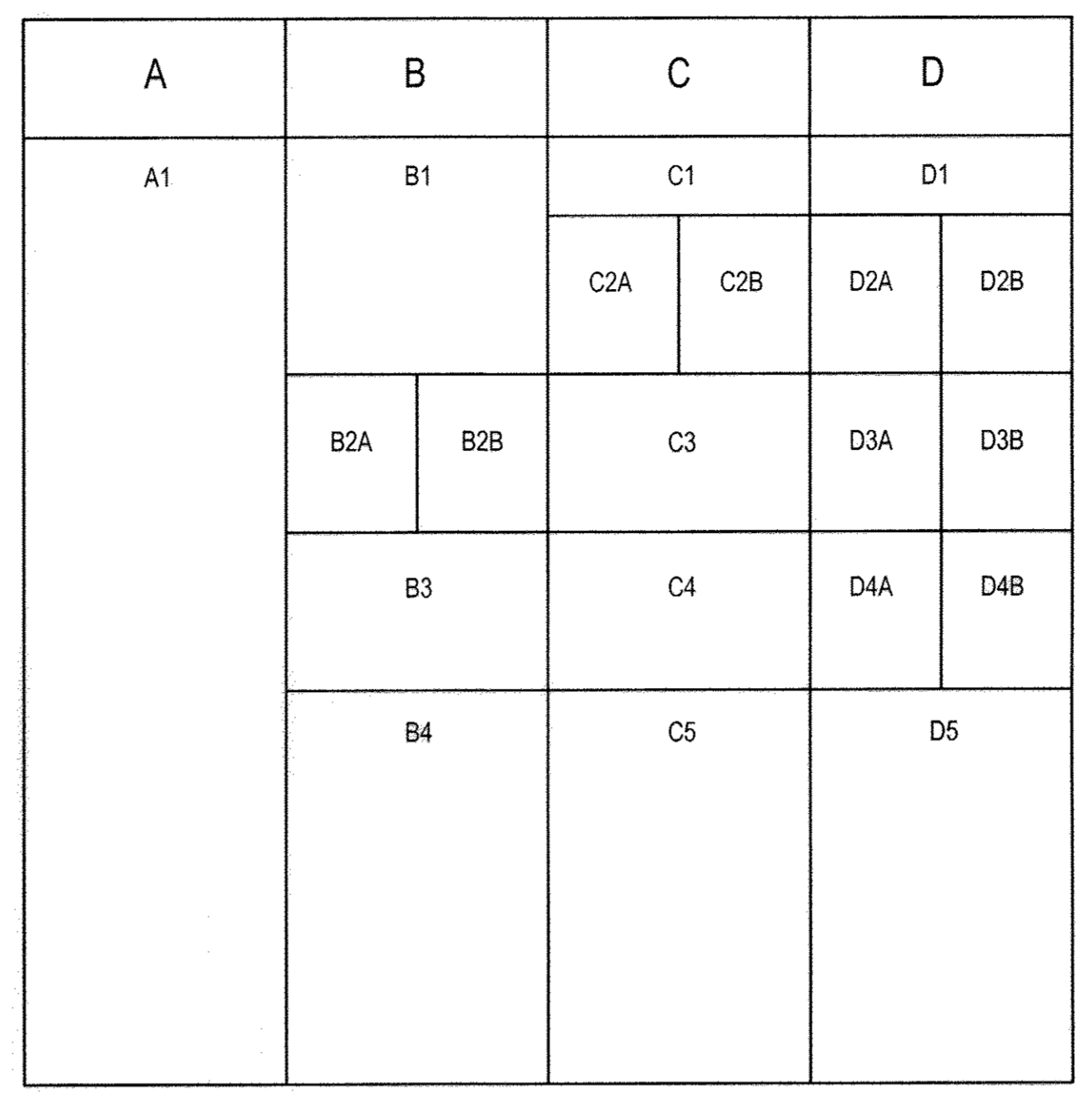
DES:	RDK				
DRN:	VL/OM				
CHK:	RDK				
DATE:	NOV 2017				
BY:	NO.	REVISION	DATE	BGV SCALE MAP NO.	BLOCK NO.

**ELECTRICAL SITE PLAN**

**DORSEY RUN WASTEWATER PUMPING STATION UPGRADE**  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996  
 ELECTION DISTRICT 6 HOWARD COUNTY, MARYLAND

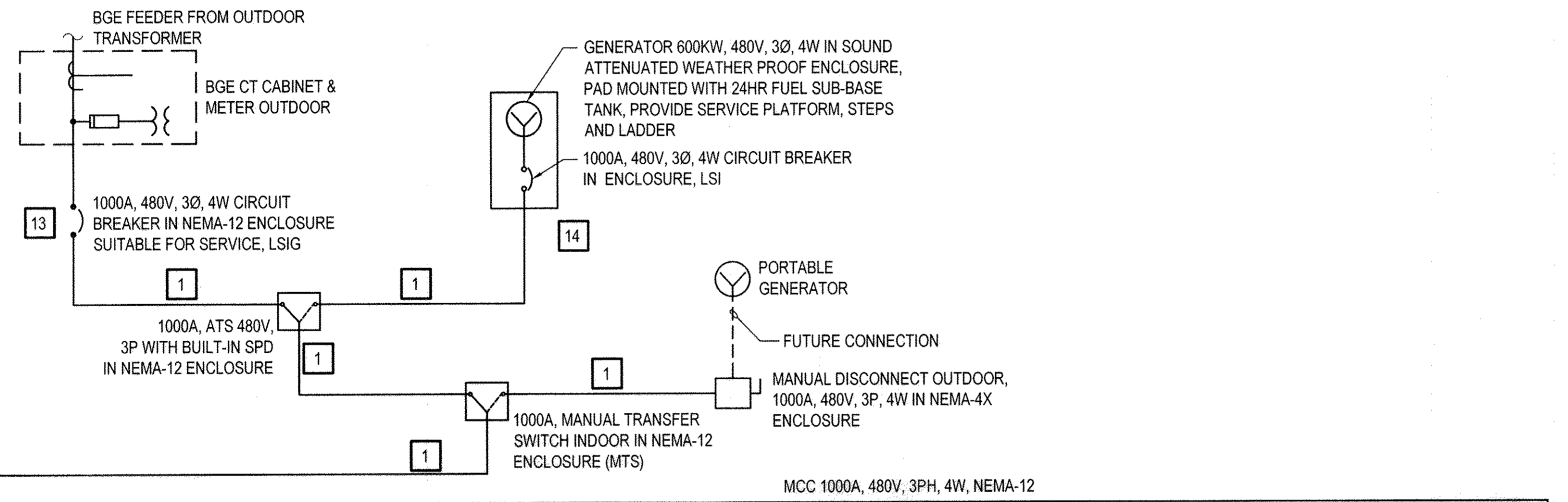


1 POWER ONE-LINE DIAGRAM - DEMOLITION  
SCALE: NTS



MCC ELEVATION - NEW WORK  
SCALE: 1" = 1'-0"

- SPECIFIC NOTES:**
- 3 SETS OF (4-400 KCMIL & 4/0 G IN 3" C).
  - PROVIDE LOCKABLE BREAKER IN OPEN POSITION.
  - 30A, 480V, 3P DISCONNECT IN NEMA-4X ENCLOSURE, 4' AFF.
  - 30A, 480V, 3P DISCONNECT IN NEMA-12 ENCLOSURE, 4' AFF.
  - CHANNEL GRINDER CONTROL PANEL BY PROCESS CONTRACTOR.
  - 3#12 & #12G IN 3/4"C.
  - 3-400 KCMIL & #2G IN 3 1/2"C RGS.
  - 4#3 & #8G IN 1 1/2"C.
  - 3#8 & #10G IN 1"C.
  - 3#12 & #12G IN 3/4" RGS CONDUIT. PROVIDE EXPLOSION PROOF SEALS PER NEC REQUIREMENT.
  - 3#12 & #12G IN 3/4" RGS CONDUIT.
  - CONNECTED THRU EXISTING PUMP CONTROL PANEL BEING REMOVED.
  - PROVIDE GROUND FAULT PROTECTION ON MAIN BREAKER.
  - PROVIDE GROUND FAULT INDICATION AT MCC ENCLOSURE.
  - SEE INSTRUMENTATION DRAWINGS FOR FAN CONTROL SCHEMATIC REQUIREMENT.



2 POWER ONE-LINE DIAGRAM - NEW WORK  
SCALE: NTS

MCC SCHEDULE											
MOTOR CONTROL CENTER		MCC		HORIZONTAL BUS		1000A		VERTICAL BUS		600A	
MAIN OC DEVICES		MLO		VOLTS		480V		WIRES		4	
ENCL. NEMA		12		PHASES		3		MIN. AIC		65KA	
LOCATION		CONTROL ROOM									
CIRCUIT NO	SERVES	LOAD		PROTECTION			MOTOR STARTER		REMARKS		
		HP/KW	FLA	P	SIZE	DEVICE	TYPE	NEMA SIZE		CONTROL	
A1	MAIN LUGS	-	-	-	-	-	-	-	-	-	
B1	SUPPLY FAN SF-2	7.5	11	3	25	MCP	SSRV	1	HOA, NO/NC, LIGHTS, XFMR	-	
B2A	MONORAIL HOIST & TROLLEY	8	11	3	25	CB	-	-	-	-	
B2B	EUH-2	5	6.3	3	15	CB	-	-	-	-	
B3	SPARE	-	-	3	15	CB	FVNR	1	HOA, NO/NC, LIGHTS, XFMR	-	
B4	RSP-1	200	240	3	500	CB	VFD & SSRV	-	VFD	-	
C1	SPARE	-	-	3	20	CB	-	-	-	-	
C2A	PANEL "L" 100A	-	-	3	50	CB	-	-	-	-	
C2B	EUH-3	5	6.3	3	15	CB	-	-	-	-	
C3	EXHAUST FAN EF-2	1	2.1	3	7	MCP	FVNR	1	HOA, NO/NC, LIGHTS, XFMR	-	
C4	SUPPLY FAN SF-1	1/2	1.1	3	3	MCP	FVNR	1	HOA, NO/NC, LIGHTS, XFMR	-	
C5	RSP-2	200	240	3	500	CB	VFD & SSRV	-	VFD	-	
D1	SPARE	-	-	-	20	CB	-	-	-	-	
D2A	GRINDER ICG-1	5	7.6	3	15	CB	-	-	-	CONNECT TO CONTROL PANEL AS PER MANUFACTURER'S REQUIREMENT	
D2B	EUH-4	5	6.3	3	15	CB	-	-	-	-	
D3A	SPARE	-	-	3	15	CB	-	-	-	-	
D3B	SPARE	-	-	-	20	CB	-	-	-	-	
D4A	EUH-1	4	5.1	3	15	CB	-	-	-	-	
D4B	SPARE	-	-	3	15	CB	-	-	-	-	
D5	RSP-3	200	240	3	500	CB	VFD & SSRV	-	VFD	-	



"PROFESSIONAL CERTIFICATION, I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 8050, EXPIRATION DATE: 08/19/19"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*[Signature]* 12/16/17  
DIRECTOR OF PUBLIC WORKS DATE

*[Signature]* 12/11/17  
CHIEF, BUREAU OF ENGINEERS DATE

*[Signature]* 12/11/17  
CHIEF, UTILITY DESIGN DIVISION DATE

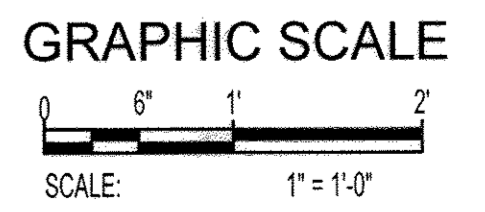


DES: RDK			
DRN: VL/OM			
CHK: RDK			
DATE: NOV. 2017			
BY	NO	REVISION	DATE

PUMPING STATION  
POWER ONE-LINE DIAGRAM

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND



E-5  
SCALE AS SHOWN  
SHEET 37 OF 46

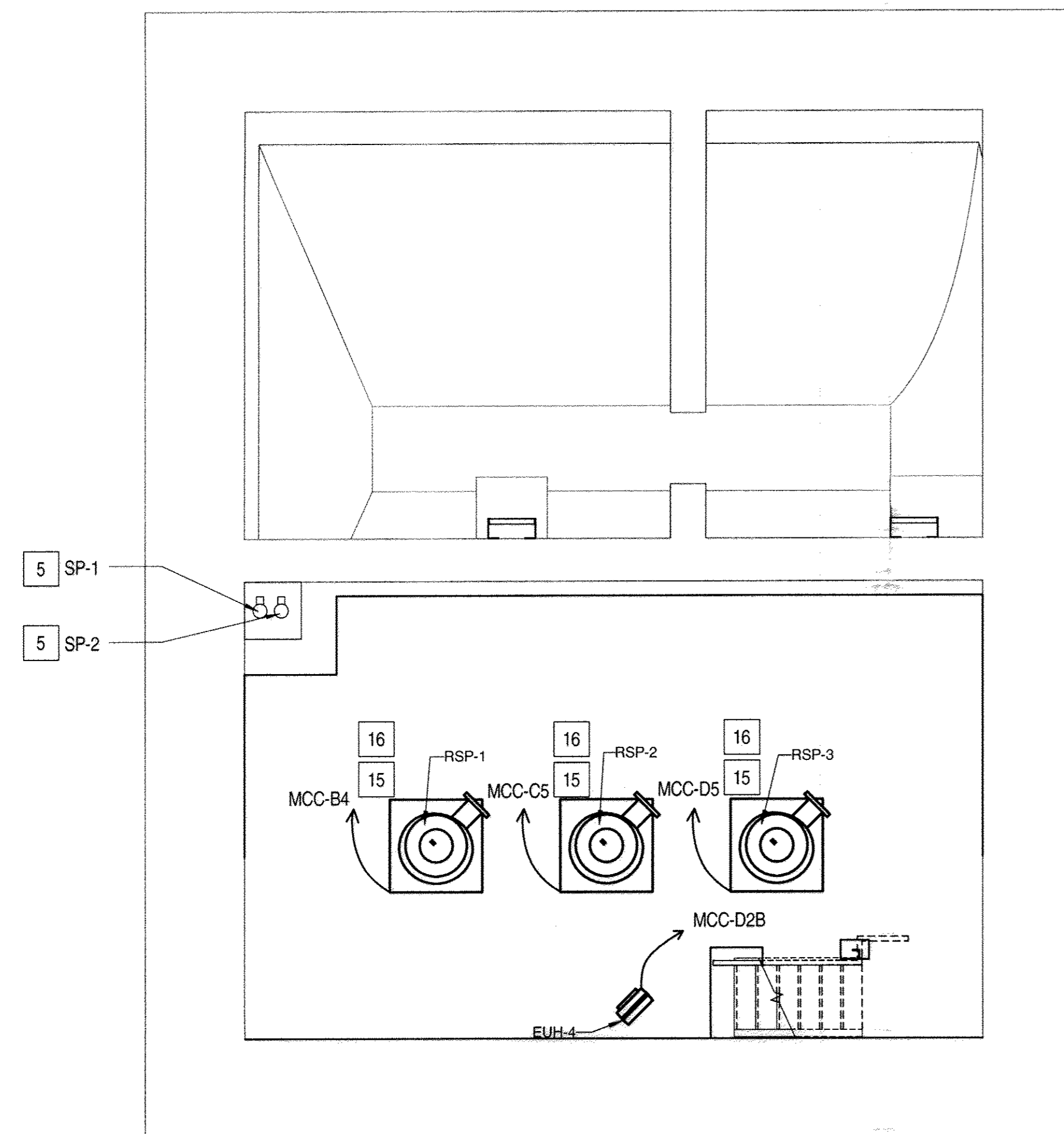


**GENERAL NOTES :**

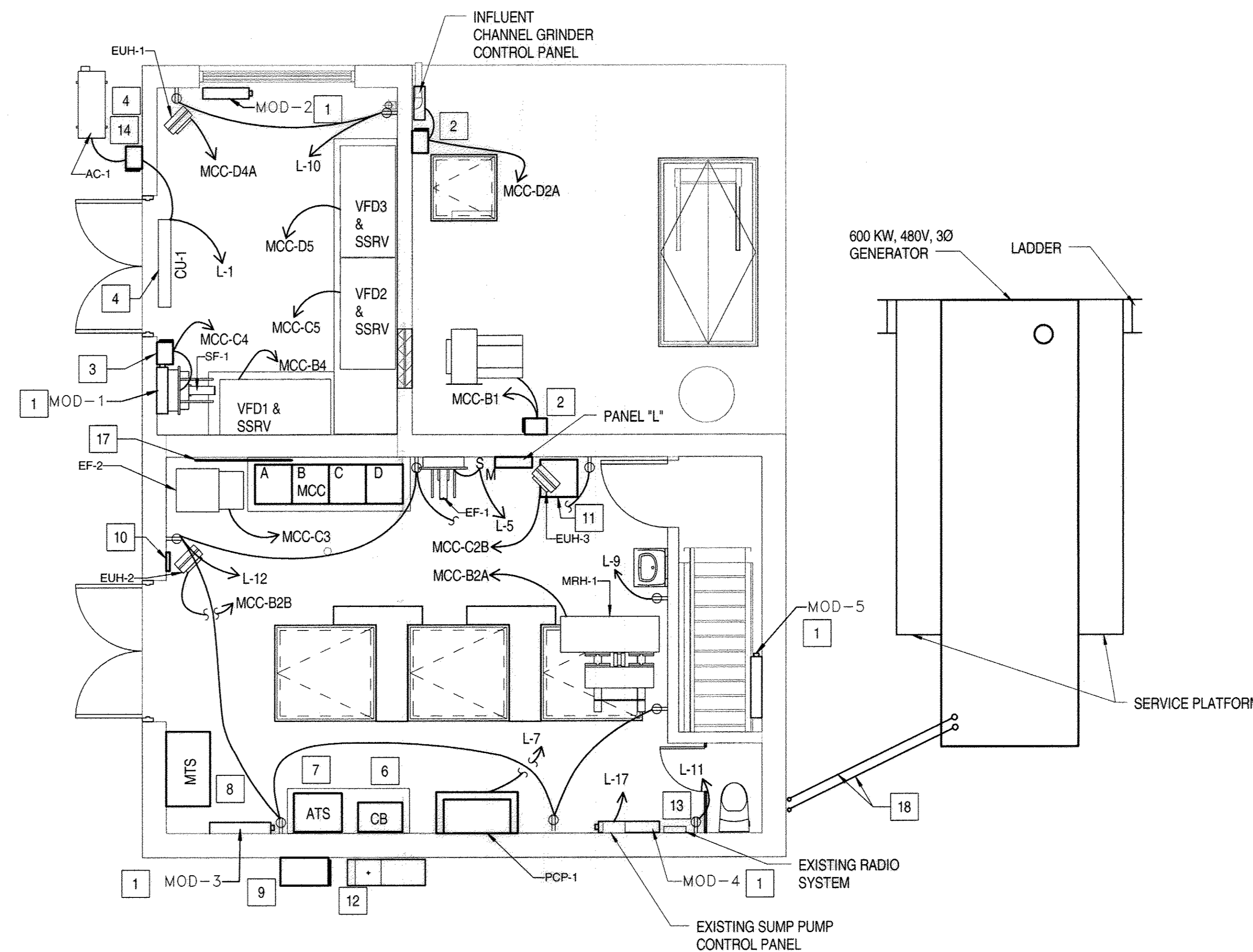
- 1 COORDINATE WITH BGE FOR CONNECTION REQUIREMENTS TO UPGRADE THE ELECTRICAL SERVICE FROM 600A TO 1000A.
- 2 SEE DWG E-5 FOR POWER ONE-LINE DIAGRAM NEW WORK.

**X SPECIFIC NOTES :**

- 1 CONNECT DAMPER AS PER INSTRUMENTATION DRAWING.
- 2 30A, 3P, 480V DISCONNECT IN NEMA-4X ENCLOSURE, 4'-0" A.F.F. LOCKABLE IN OPEN AND CLOSED POSITIONS.
- 3 30A, 3P, 480V DISCONNECT IN NEMA-12 ENCLOSURE, 4'-0" A.F.F.
- 4 CONNECT CU-1 TO AC-1 AS PER MANUFACTURERS REQUIREMENTS.
- 5 CONNECT SUMP PUMPS SP-1 & SP-2 TO EXISTING PUMP CONTROL PANEL IN CONTROL ROOM. USE 2#12 & #12G IN 3/4" C.
- 6 1000A, 480V, 3P CIRCUIT BREAKER IN NEMA-12 ENCLOSURE.
- 7 1000A, 480V, 3P ATS WITH BUILT IN SPD IN NEMA-12 ENCLOSURE.
- 8 1000A, 480V, 3P MANUAL TRANSFER SWITCH IN NEMA-12 ENCLOSURE.
- 9 1000A, 480V, 3P DISCONNECT IN NEMA-4X, 316 STAINLESS STEEL ENCLOSURE. INSTALL LUG KIT TO CONNECT FUTURE PORTABLE GENERATOR CABLES, MINIMUM 3-400 KCMIL CABLES PER PHASE.
- 10 GENERATOR ANNUNCIATOR.
- 11 DRY TYPE TRANSFORMER 30KVA, 480V - 208V/ 120V 3 PH, 4W, FLOOR MOUNT.
- 12 CT CABINET, BGE APPROVED. PROVIDE AND INSTALL CT CABINET AND METER SOCKET PER BGE REQUIREMENTS. METER BY BGE.
- 13 REPLACE EXISTING RECEPTACLE WITH NEW INKIND AND CONNECT EXISTING RADIO SYSTEM AS BEFORE.
- 14 30A, 2P, 208V DISCONNECT IN NEMA-4X ENCLOSURE, 4'-0" A.F.F. LOCKABLE IN OPEN AND CLOSED POSITIONS.
- 15 RACEWAY AND WIRING TO MCC THRU VFD, SEE DWG E-5.
- 16 PROVIDE SIGN ON PUMP "DISCONNECT IN MCC".
- 17 MAIN COPPER GROUND BAR.
- 18 GENERATOR CONDUITS 3-3" PVC SCH 40 & 1-1" FOR ANNUNCIATOR CABLES 30" U/G DIRECT BURIED. SEE ONE-LINE DIAGRAM.



**1 LOWER LEVEL POWER PLAN**  
E-6 SCALE: 1/4" = 1'-0"



**2 GRADE LEVEL POWER PLAN**  
E-6 SCALE: 1/4" = 1'-0"



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James P. Butler* 12/1/17  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas F. Butler* 12/1/17  
CHIEF, BUREAU OF ENGINEERING DATE

*Chris Bluff* 12-2-17  
CHIEF, BUREAU OF UTILITIES DATE

*[Signature]* 12/1/19  
CHIEF, UTILITY DESIGN DIVISION DATE

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



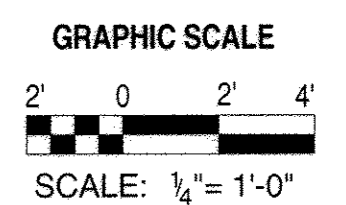
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DRN: OM	
CHK: AKM	
DATE: NOV. 2017	
BY NO.	
REVISIONS	
DATE	

PUMPING STATION POWER PLANS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

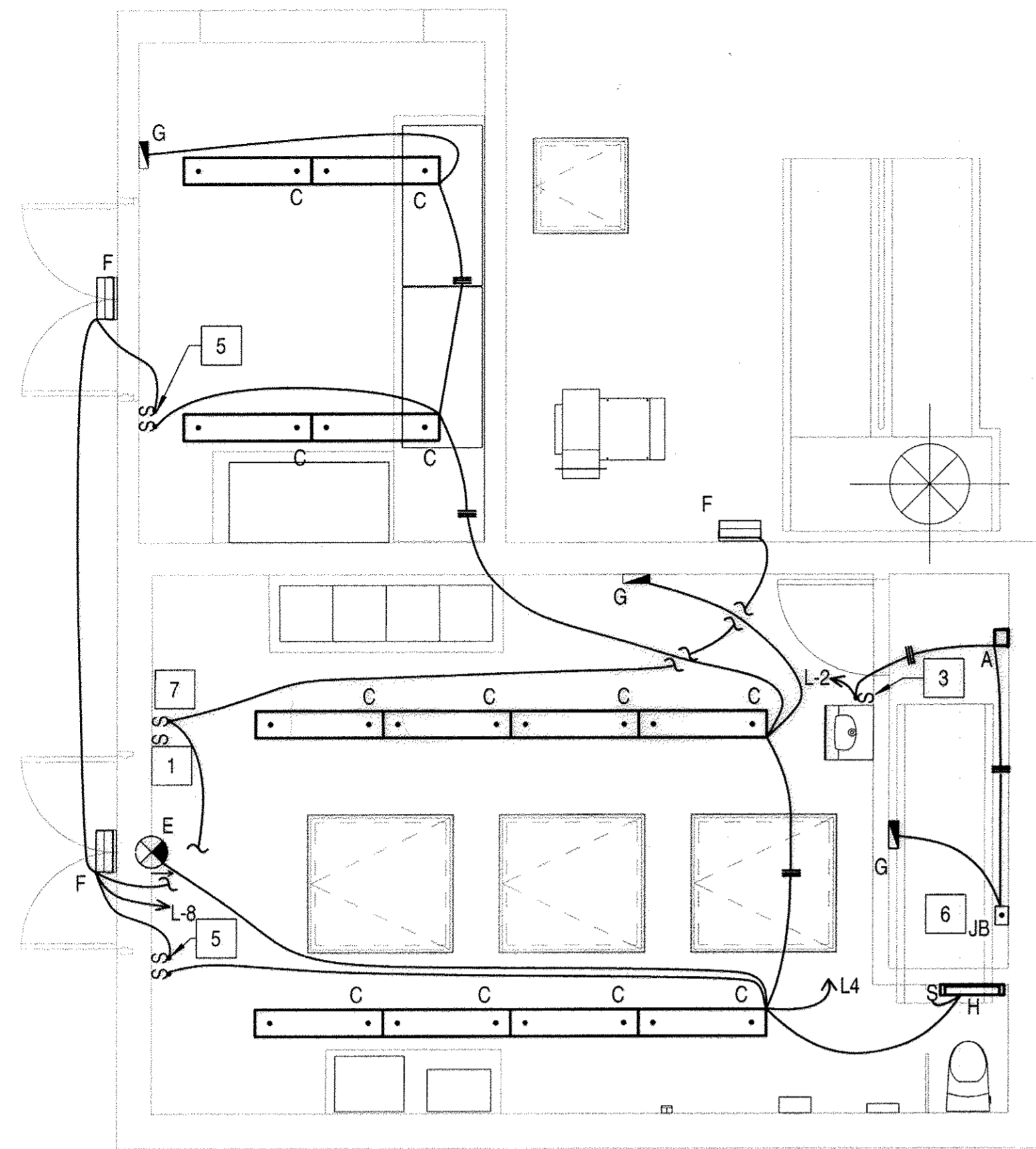


E-6

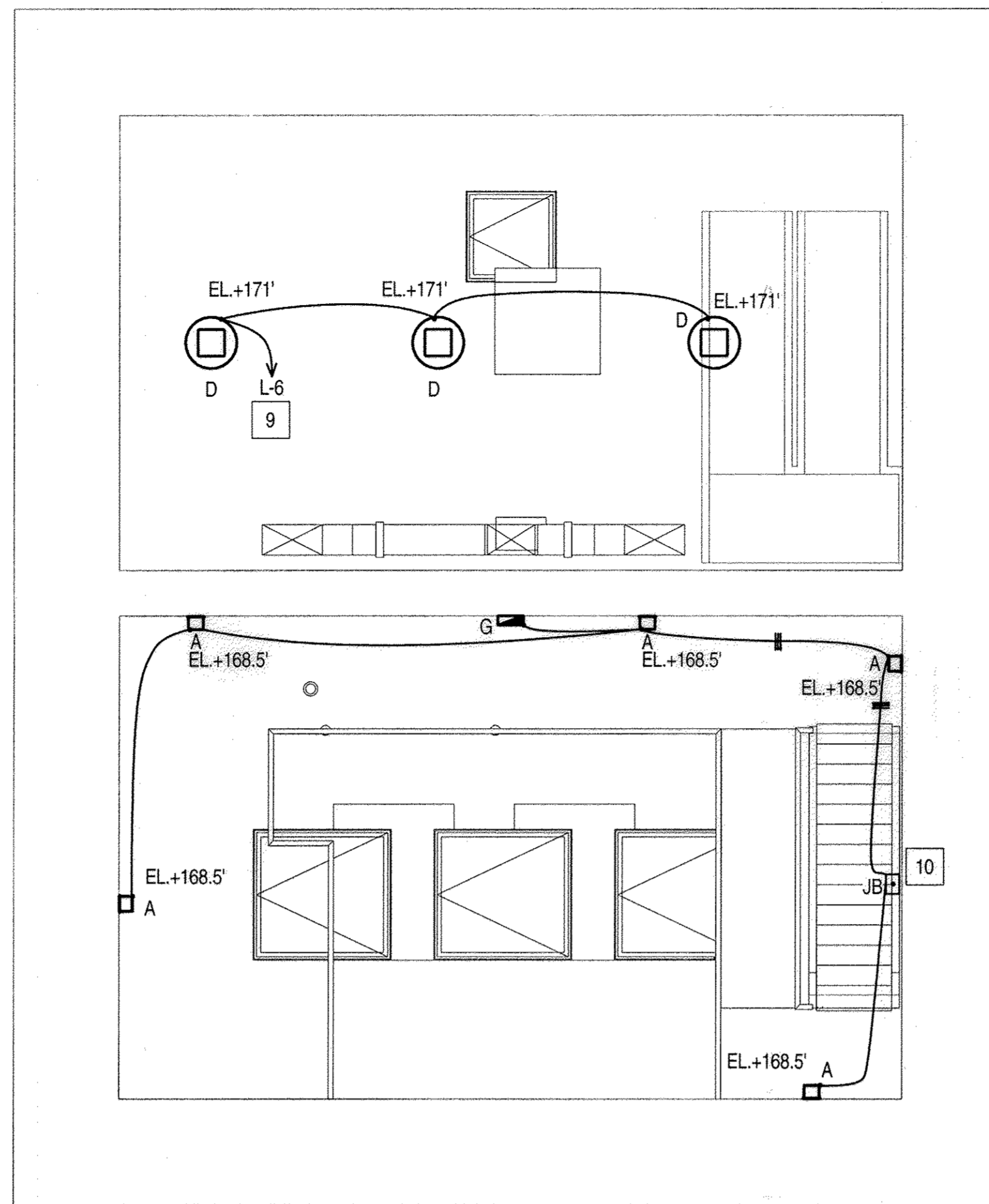
SCALE AS SHOWN

SHEET 38 OF 46

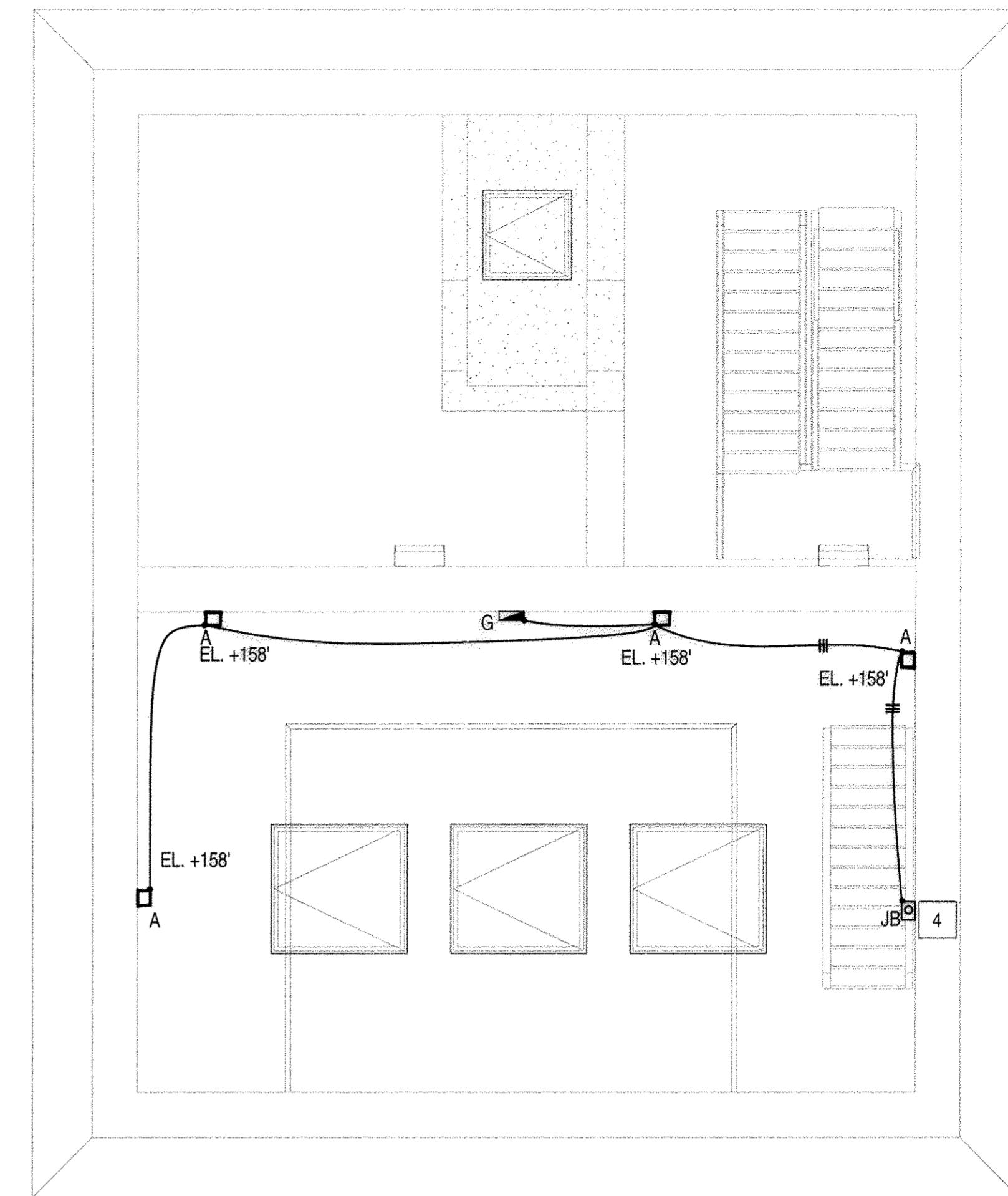
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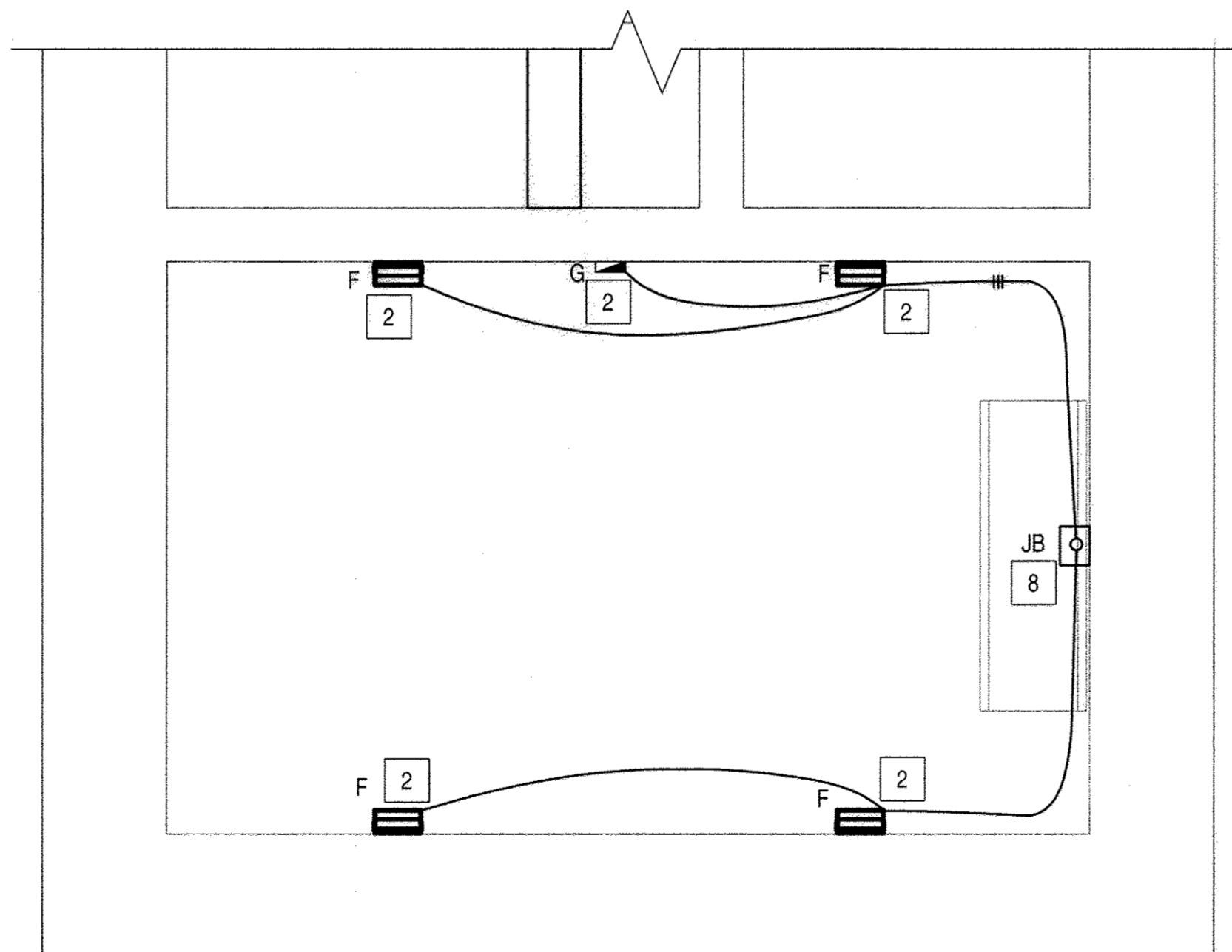
1 GRADE LEVEL LIGHTING PLAN  
E-7 SCALE: 1/4" = 1'-0"



2 INTERMEDIATE LEVEL @ EL. 161.50 LIGHTING PLAN  
E-7 SCALE: 1/4" = 1'-0"

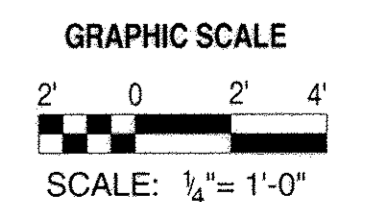


3 INTERMEDIATE LEVEL @ EL. 151.00 LIGHTING PLAN  
E-7 SCALE: 1/4" = 1'-0"



4 LOWER LEVEL LIGHTING PLAN  
E-7 SCALE: 1/4" = 1'-0"

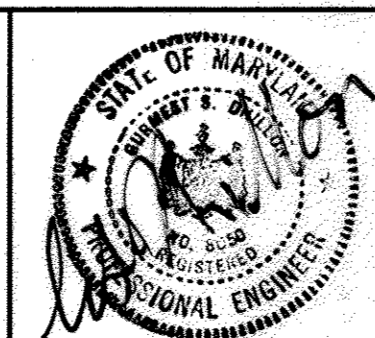
- X SPECIFIC NOTES:**
- PROVIDE TIMER SWITCH WITH SS FACE PLATE AND MAX. 24 HOUR SETTING. PROVIDE PILOT LIGHT TO INDICATE "ON" STATUS OF TYPE D LUMINAIRES LOCATED IN WET WELL. SEE NOTE 9 BELOW LABEL SWITCH "LIGHTS WET WELL".
  - MOUNT LUMINAIRE 9' AFF.
  - PROVIDE TIMER SWITCH WITH SS FACE PLATE AND MAX. 24 HOUR SETTING. PROVIDE PILOT LIGHT TO INDICATE "ON" STATUS OF DRY WELL LUMINAIRES.
  - RACEWAY AND WIRING UPTO JB INTERMEDIATE LEVEL 161.5' AND DOWN TO JB LOWER LEVEL.
  - LABEL SWITCH "LIGHT OUTSIDE".
  - RACEWAY AND WIRING DOWN TO JB INTERMEDIATE LEVEL 161.5'.
  - LABEL SWITCH "LIGHT OUTSIDE WET WELL".
  - RACEWAY AND WIRING UPTO JUNCTION BOX INTERMEDIATE LEVEL 151'.
  - ALL WIRING IN WET WELL AREA SHALL BE SUITABLE FOR CLASS I DIVISION 1, GROUP D OF NEC. PROVIDE EXPLOSION PROOF SEALS IN RGS CONDUIT. CONTROL LIGHTS THRU SWITCH IN CONTROL ROOM. SEE NOTE 1 ABOVE.
  - RACEWAY AND WIRING FROM GRADE LEVEL AND DOWN TO INTERMEDIATE LEVEL 151'.



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James E. Butler* 12/11/17  
12-1-13  
12/1/17



DES: RG	
DRN: VL/OM	
CHK: RDK	
DATE: NOV. 2017	
BY NO.	REVISIONS
	DATE

PUMPING STATION LIGHTING PLANS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

E-7  
SCALE AS SHOWN  
SHEET 39 OF 46

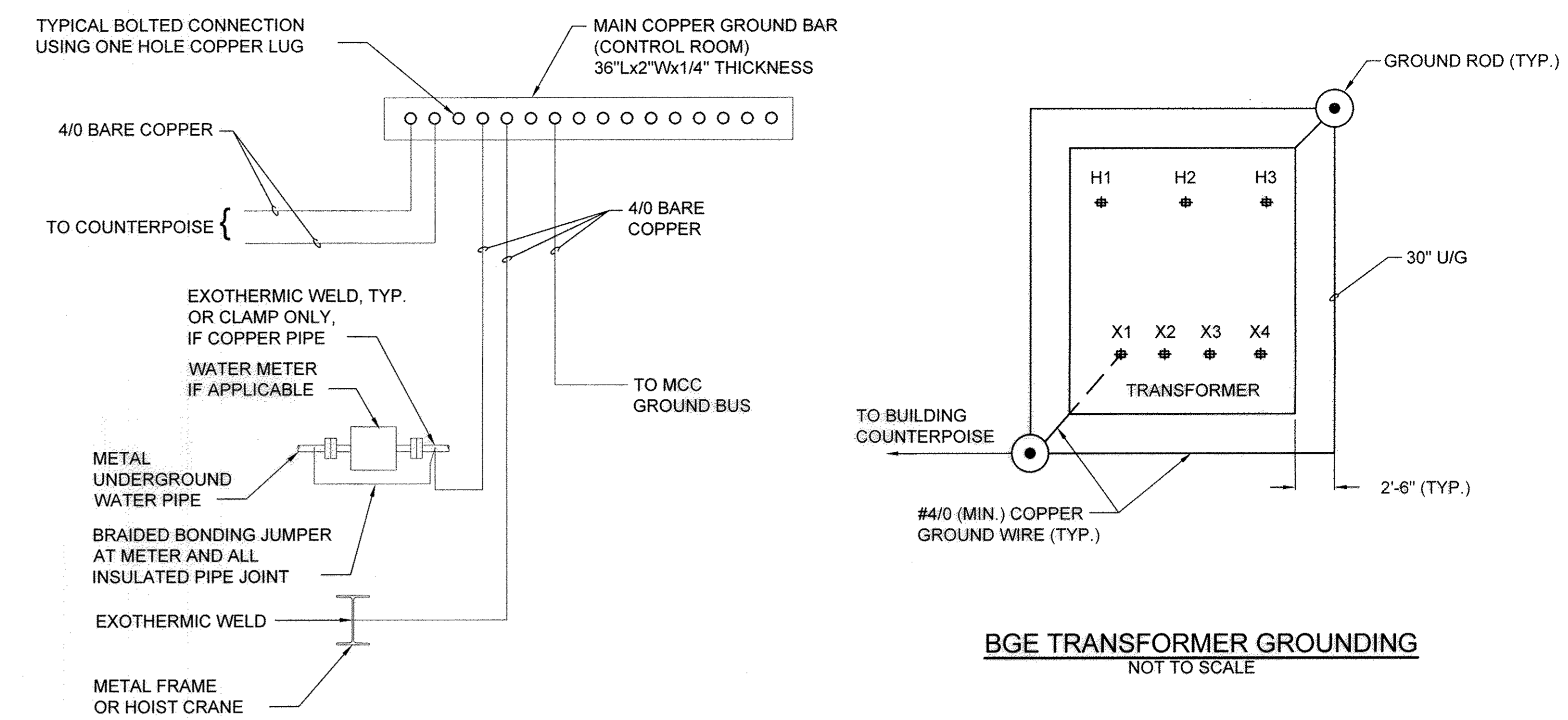
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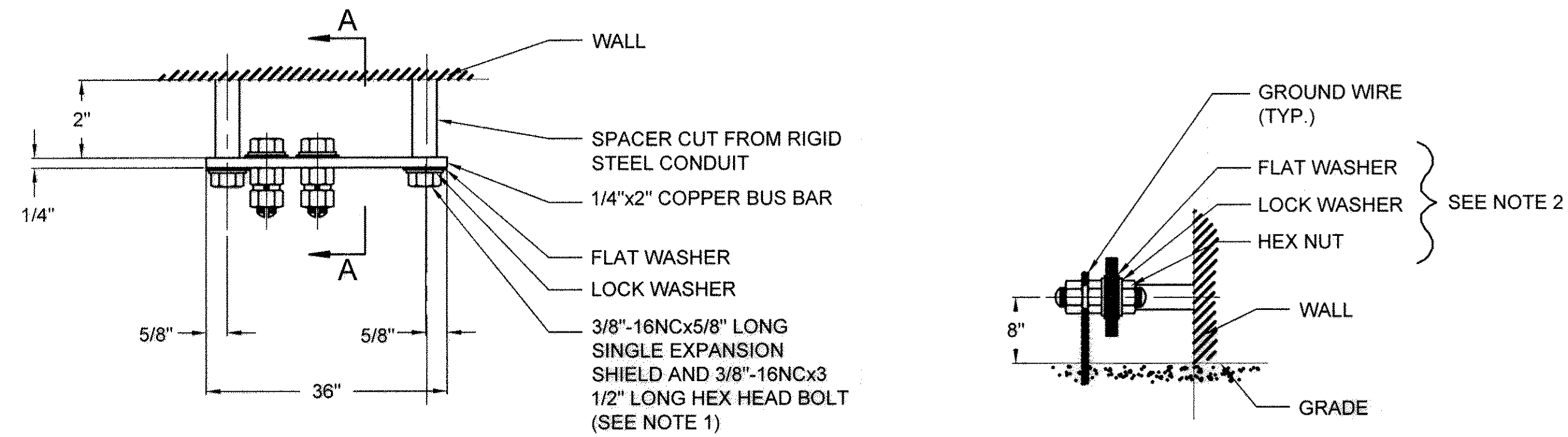
PANEL SCHEDULE																			
PANELBOARD: "L"		BUS RATING		100A		PHASE		3		MAIN OC DEVICE		100A, 3P							
MIN. AIC		10 KA		VOLTS		120/208V		WIRE		4		BRANCH CKT. DEVICE		BOLT ON					
ENCL. NEMA		12		MOUNTING		SURFACE		SOLID NEUTRAL WITH GROUND BUS											
LOCATION		CONTROL ROOM																	
CKT NO	DESCRIPTION	LOAD (VA)	COND.	WIRE	WIRE	C.B.	C.B.	WIRE	WIRE	COND.	LOAD (VA)	DESCRIPTION	CKT NO						
1	CONDENSING UNIT CU-1	115	3/4"	#12	2#12	100	15	2	1	20	100	2#12 #12 3/4"	616	LIGHTS DRY WELL AND STAIRS	2				
3	-	115	3/4"	-	-	-	-	-	1	20	100	2#12 #12 3/4"	360	LIGHTS CONTROL AND VFD ROOM	4				
5	EF-1 (1/4 HP)	696	3/4"	#12	2#12	100	15	1	1	20	100	2#12 #12 3/4"	344	LIGHTS WET WELL AREA	6				
7	PUMP CONTROL PANEL PCP-1	1200	3/4"	#12	2#12	100	20	1	1	20	100	2#12 #12 3/4"	312	LIGHTS OUTDOOR	8				
9	WATER HEATER	1400	3/4"	#12	2#12	100	20	1	1	20	100	2#12 #12 3/4"	360	RECEPTACLES VFD ROOM	10				
11	RADIO SYSTEM RECEPTACLE	300	3/4"	#12	2#12	100	20	1	1	20	100	2#12 #12 3/4"	1080	RECEPTACLES CONTROL ROOM	12				
13	GENERATOR JACKET HEATER	1000	3/4"	#12	2#12	100	20	2	1	20	100	2#12 #12 3/4"	250	GENERATOR BATTERY CHANGER	14				
15	-	1000	3/4"	#12	2#12	-	-	-	1	20	100	-	-	SPARE	16				
17	EXISTING SUMP PUMP CONTROL PANEL	-	-	-	-	100	20	1	1	20	100	-	-	SPARE	18				
19	SPARE	-	-	-	-	100	20	1	1	20	100	-	-	SPARE	20				
21	SPACE	-	-	-	-	-	-	-	-	-	-	-	-	SPACE	22				
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24				
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26				
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28				
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30				

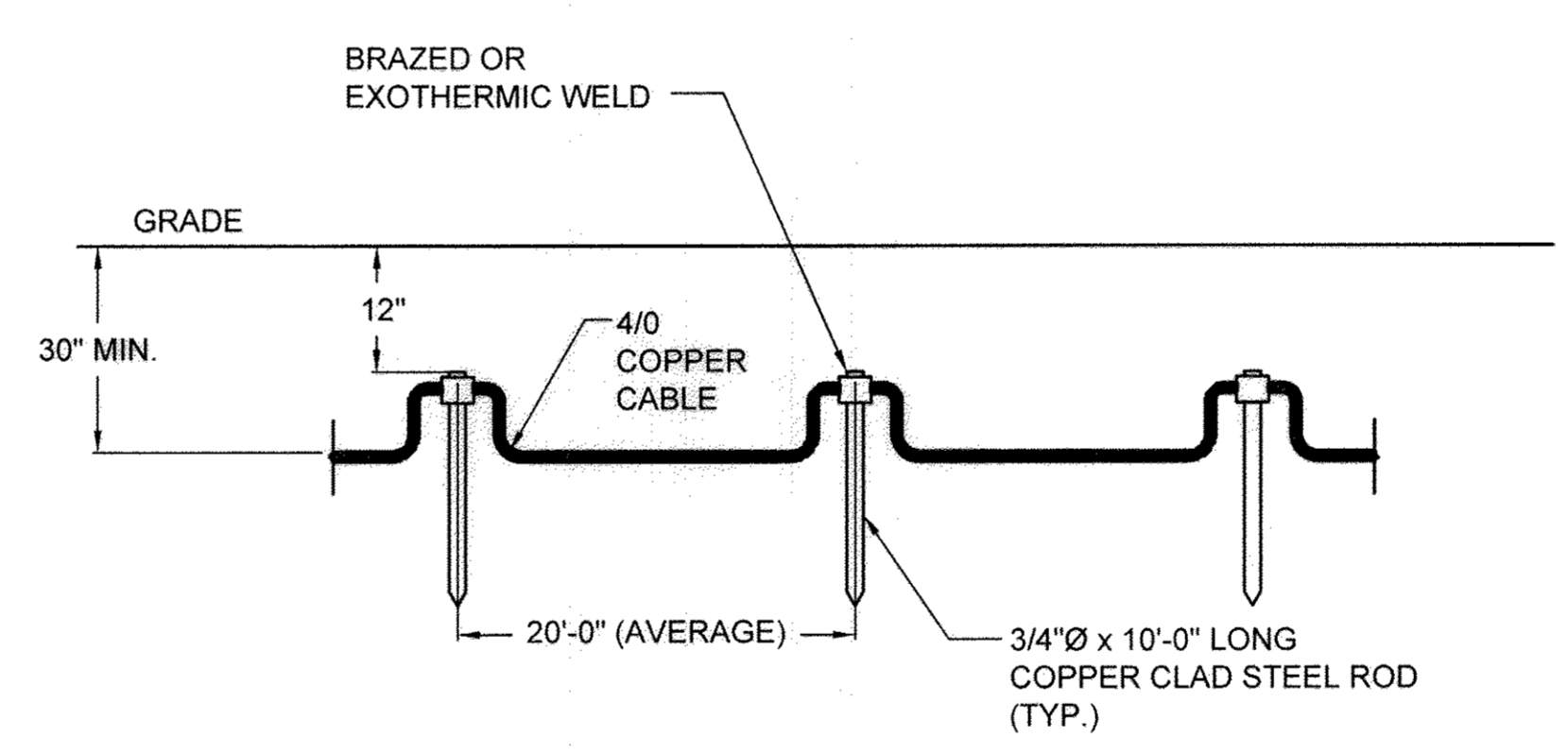
CONNECTED LOAD PHASE	A=	3493	REMARKS: COPPER BUSING
	B=	3235	
	C=	2420	
TOTAL CONNECTED VA:		9148	
TOTAL CONNECTED AMPS:		25.39	



TYPICAL BUILDING GROUND ELECTRODE SYSTEM DETAIL  
NOT TO SCALE



GROUNDING BAR DETAILS  
NOT TO SCALE



GROUNDING ROD INSTALLATION DETAIL  
NOT TO SCALE

- GENERAL NOTES:**
- UTILITY COMPANY PAD MOUNT TRANSFORMER. COORDINATE WITH BGE.
  - UTILITY COMPANY FEEDER. CONTACT UTILITY COMPANY FOR THEIR FEEDER REQUIREMENT AND PROVIDE RACEWAY ACCORDINGLY. COORDINATE WITH BGE.
  - OUTDOOR WEATHER PROOF CT CABINET 1000A, 480V, 3PH, 4W. PROVIDE CONCRETE PAD AS PER UTILITY COMPANY REQUIREMENT. ALSO PROVIDE METER SOCKET FOR UTILITY COMPANY METER. COORDINATE WITH BGE.



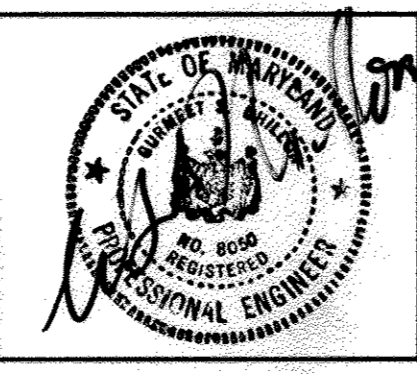
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James D. ...* 12/1/17  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*Thomas S. ...* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



DES:	RDK				
DRN:	VL/OM				
CHK:	RDK				
DATE:	NOV. 2017				
BY:	NO.	REVISION	DATE	800 SCALE MAP NO.	BLOCK NO.

ELECTRICAL PANEL SCHEDULE  
AND GROUNDING DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996  
ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

E-8  
SCALE AS SHOWN  
SHEET 40 OF 46



**ABBREVIATIONS**

- AI = ANALOG INPUT
- AO = ANALOG OUTPUT
- AUTO = AUTOMATIC
- ATS = AUTOMATIC TRANSFER SWITCH
- B.O.U. = BUREAU OF UTILITIES
- BP = BOOSTER PUMP
- CBP = COUNTY BOOSTER PUMP
- CIM = COMMUNICATION INTERFACE MODULE
- CPT = CONTROL POWER TRANSFORMER
- DI = DISCRETE INPUT
- DO = DISCRETE OUTPUT
- DPDT = DOUBLE POLE-DOUBLE THROW
- ETM = ELAPSE TIME METER
- ETR = EXISTING TO REMAIN
- HMI = HUMAN MACHINE INTERFACE
- I/O = INPUT/OUTPUT
- ISB = INTRINSICALLY SAFE BARRIER
- ISBR = INTRINSICALLY SAFE BARRIER RELAY
- MPR = MOTOR PROTECTION RELAY
- MOD = MOTOR OPERATED DAMPER
- OIT = OPERATOR INTERFACE TERMINAL
- PLC = PROGRAMMABLE LOGIC CONTROLLER
- PVCC = PVC COATED
- RTU = REMOTE TELEMETRY UNIT
- SPD = SURGE PROTECTIVE DEVICE
- SSRV = SOLID STATE REDUCED VOLTAGE
- TEMP = TEMPERATURE
- TSP = TWISTED SHIELDED PAIR
- TYP = TYPICAL
- VAC = VOLTS/ALTERNATING CURRENT
- VDC = VOLTS/DIRECT CURRENT
- VFD = VARIABLE FREQUENCY DRIVE

**INSTRUMENT, EQUIPMENT AND CONTROL DEVICE EXAMPLES**

- FE = FLOW ELEMENT
- FIT = FLOW INDICATING TRANSMITTER
- PE = PRESSURE ELEMENT
- PIT = PRESSURE INDICATING TRANSMITTER
- TSH = TEMPERATURE SWITCH HIGHT
- TSL = TEMPERATURE SWITCH LOW
- ZSC = POSITION SWITCH CLOSED
- ZSO = POSITION SWITCH OPEN
- FS = FLOW SWITCH
- LSL = LEVEL SWITCH LOW
- LSH = LEVEL SWITCH HIGH

**PROCESS AND INSTRUMENTATION SYMBOLS**

- FIELD MOUNTED DEVICE
- PANEL MOUNTED DEVICE
- INDICATING LAMP - X INDICATES LENS COLOR  
R = RED, A = AMBER  
G = GREEN, W = WHITE
- ABC - LETTERS INDICATE FUNCTION ACCORDING TO ISA SCHEDULE: 123 DIGITS IDENTIFY ASSOCIATED EQUIPMENT (SEE LOOP IDENTIFICATION SCHEDULE)
- SELECTOR SWITCH (MAINTAINED CONTACTS)  
XXX = H/O/A : HAND-OFF-AUTO  
L/L/S : LEAD-LAG-STANDBY
- INTERLOCK-PLC LOGIC OR HARDWIRED AS SHOWN ON DRAWINGS:

**SIGNAL LINE TYPES**

- COMMUNICATION SIGNAL
- PLC I/O SIGNAL
- ELECTRICAL SIGNAL

**SIGNAL INTERFACE**

- ANALOG INPUT
- ANALOG OUTPUT
- DISCRETE INPUT
- DISCRETE OUTPUT

**PLAN SYMBOLS**

- HOME RUN CONDUIT/CABLE
- JUNCTION BOX
- CONTROL ENCLOSURE
- TELEPHONE NETWORK INTERFACE CONNECTION
- THERMOSTAT
- THERMOSTAT, HIGH TEMP.
- FREEZESTAT

**ELEMENTARY WIRING SYMBOLS**

- CONTROL RELAY
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- FUSE
- CIRCUIT BREAKER
- SELECTOR SWITCH  
XOO= REPRESENT THE NUMBER OF SWITCH POSITIONS
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- EMERGENCY STOP PUSH BUTTON
- PUSH-TO-TEST PILOT LIGHT  
R=RED, G=GREEN, A=AMBER, W=WHITE
- PLC OUTPUT VIA INTERPOSING RELAY
- MOTOR
- TERMINAL BLOCK
- THERMOSTAT CLOSE ON RISING/TEMPERATURE
- NORMALLY OPEN LIMIT SWITCH
- NORMALLY OPEN TIMED CLOSED CONTACT
- NORMALLY CLOSE CONTACT TIMED OPEN
- FLOAT SWITCH
- MANUAL MOTOR STARTER WITH OVERLOAD AND SELECTOR SWITCH
- GROUND

**INSTRUMENTATION IDENTIFICATION SCHEDULE**

FIRST LETTER		SUCCEEDING LETTER		
VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS	ALARM		AUTOMATIC
B	BREAKER	USER'S CHOICE	CLOSE OR STOP	BYPASS
C	COMMUNICATIONS		CONTROL	
D	DENSITY		OPEN OR START	
E	VOLTAGE (EMF)	PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	FAIL	FAIL	FAIL
G	GAUGING	GLASS		LOCAL/MANUAL/HAND
H	HAND			HIGH OR OPEN
I	CURRENT	INDICATE		INTERMEDIATE
J	POWER			
K	TIME		CONTROL STATION	
L	LEVEL			LOW OR CLOSE
M	MOTOR		MOTOR	MIDDLE
N	USER'S CHOICE	INPUT	FORWARD	ON OR OPERATE
O			OFF	OVERLOAD
P	PRESSURE	POINT (TEST)	POSITION	
Q	QUANTITY OR EVENT		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY	RECORD OR PRINT	REMOTE	RUN
S	SPEED OR FREQUENCY	SWITCH	SWITCH	STOP
T	TEMPERATURE		TRANSMIT	
U	MULTIVARIABLE	MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY		VALVE OR DAMPER	VFD / VALVE
W	WEIGHT OR FORCE	WELL		
X	MOD, LIGHT OR VALVE	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	INTERLOCK		RELAY OR COMPUTE	RESET
Z	POSITION		DRIVE OR ACTUATOR	

**GENERAL NOTES**

1. ALL WORK SHOWN SHALL BE NEW UNLESS OTHERWISE NOTED AS EXISTING.
2. SEE ELECTRICAL DRAWINGS FOR POWER DISTRIBUTION, DISCONNECT REQUIREMENTS, EQUIPMENT LOCATIONS AND FEEDER REQUIREMENTS. MOTOR STARTER ELEMENTARIES SHOWN ARE INTENDED TO DEPICT THE GENERAL CONTROLS REQUIREMENT FOR THAT PARTICULAR PIECE OF EQUIPMENT AND DO NOT NECESSARILY INDICATE ALL THE REQUIREMENTS OF THE MOTOR STARTER. SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SPECIFIC MOTOR STARTER REQUIREMENTS.
3. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS AND POWER REQUIREMENTS. CONTRACTOR SHALL COORDINATE EQUIPMENT LOCATIONS SUCH AS NOT TO CAUSE INTERFERENCE WITH NEW AND/OR EXISTING EQUIPMENT.
4. ENCLOSURE DIMENSIONS SHOWN ARE MINIMUM REQUIREMENTS. ENCLOSURES SHALL BE SIZED TO ACCOMMODATE EQUIPMENT, CONTROLS AND COMPONENTS AS SHOWN, SPECIFIED AND REQUIRED FOR AN OPERABLE SYSTEM.
5. CIRCUITS SHOWN SHALL BE INSTALLED 3/4" CONDUITS UNLESS INDICATED OTHERWISE
6. ALL PENETRATIONS THROUGH EXISTING SOLID CONCRETE STRUCTURES WHERE SLEEVES HAVE NOT BEEN PROVIDED SHALL BE CORE DRILLED AND SIZED TO ACCEPT MECHANICAL LINK SEALS. THROUGH NON-FIRE RATED WALLS, CORE HOLES AND SEAL AROUND CONDUIT WITH NON-SHRINK GROUT. THROUGH EXTERIOR WALL, SEAL WATERTIGHT WITH SILICONE MASONRY SEALANT.
7. ALL DISCRETE OUTPUTS FROM THE PUMP CONTROLLERS SHALL BE PROVIDED WITH INTERPOSING RELAYS.
8. AREAS DESIGNATED AS HAZARDOUS LOCATIONS ARE SPECIFIED AND/OR SHOWN ON THE CONTRACT DRAWINGS. WORK INSTALLED IN AREAS DESIGNATED AS CLASS I, GROUP D, DIVISION 1 OR CLASS I, GROUP D, DIVISION 2 HAZARDOUS LOCATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 500 OF THE NATIONAL ELECTRIC CODE. THE LIMITS FOR CLASS I, GROUP D, DIVISION 1 HAZARDOUS LOCATIONS SHALL EXTEND BEYOND THE ENCLOSED AREA FOR A 3' ENVELOPE OUTSIDE EXTERIOR DOORS, ACCESS HATCHES, AND OTHER OPENINGS. THE LIMITS FOR DIVISION 2 HAZARDOUS LOCATIONS FOR OUTDOOR TANKS AND BASINS SHALL EXTEND 18" ABOVE THE MAXIMUM WATER SURFACE ELEVATION AND ABOVE TANK WALLS AND SHALL INCLUDE AN 18" HIGH ENVELOPE AROUND A 10' PERIMETER OF THE TANK OR BASIN.

**GENERAL CIRCUIT/CONDUIT TAG IDENTIFICATION**

TAG	CONDUIT SIZE	CONDUCTORS	NOTES
C-X (Y)	3/4" (X=2 THRU 18) 1" (X=19 THRU 30) 2" (X=31 THRU 100)	X-#14, 1-#12G	(Y) DENOTES ADDITIONAL SPARES
P-X (Y)	3/4" (X=2 THRU 14) 1" (X=15 THRU 24) 2" (X=25 THRU 80)	X-#12, 1-#12G	(Y) DENOTES ADDITIONAL SPARES
TSP-X (Y)	3/4" (X=1,2) 1" (X=3,4) 2" (X=5 THRU 16)	X-#18 TWISTED SHIELDED PAIR	(Y) DENOTES ADDITIONAL SPARES
RTD-X (Y)	3/4" (X=1,2) 1" (X=3,4) 2" (X=5 THRU 16)	X-#22 3-WIRE RTD CABLE	(Y) DENOTES ADDITIONAL SPARES
AC-X (Y)	2" (X=1,2)	X-ANTENNA CABLE	(Y) DENOTES ADDITIONAL SPARES
M-X	CONDUIT SIZE AS REQUIRED	X-MANUFACTURER SUPPLIED CABLE	CABLE AS PROVIDED OR RECOMMENDED BY EQUIPMENT MANUFACTURER. COORDINATE CONDUIT AND INSTALLATION REQUIREMENTS WITH MANUFACTURER.
FO-X	1" (X=2-18) 2" (X=18-48)	X-# OF MULTIMODE FIBER OPTIC STRANDS	COORDINATE CONDUIT AND INSTALLATION REQUIREMENTS WITH F.O. CABLE MANUFACTURE CABLE SIZES AND BEND RADIUS REQUIREMENTS
TEL-X	CONDUIT SIZE AS REQUIRED	TELEPHONE LINE IN ACCORDANCE WITH EXISTING COUNTY BRIDGE CONNECTIONS. COORDINATE TELEPHONE LINE WITH VERIZON AND COUNTY B.O.U., AS REQUIRED.	
TOTAL CONDUCTORS REQUIRED = X + Y			

**LOOP NUMBER IDENTIFICATION SCHEDULE**

1. THE FIRST DIGIT WILL EQUATE TO THE TYPE OF EQUIPMENT. EACH TYPE OF EQUIPMENT AND ITS ASSOCIATED DEVICE WILL HAVE A SEPERATE IDENTIFIER THAT EQUATES TO THE FOLLOWING CODES:
 

1	PUMPMOTOR
2	VALVE/SLUICE GATE
3	CLASSIFIER/WASHER
4	EXHAUST/SUPPLY FANDAMPER/LOUVER
5	TANK
6	GENERATOR
7	BAR SCREEN/GRINDER
8	MISC. DEVICE (ATS, PANELS, ETC.)
9	ANALOG AND DISCRETE INSTRUMENTS
2. SECOND AND THIRD NUMBERS EQUATE TO A SEQUENTIAL NUMBERING OF THE TYPES OF DEVICE. EX. LSL-101, LSH-101. IF A PROCESS AREA HAS TWO SETS OF THE SAME TYPE OF DEVICE THE SECOND NUMBER SHALL BE INCREMENTED ACCORDINGLY. EX. LSH-101, LSH-111.
3. A LETTER SUFFIX CAN BE DDED IF REQUIRED TO DEIFFERENTIATE BETWEEN DIFFERENT BUT SIMILAR POINTS. EX. LSH-101A.

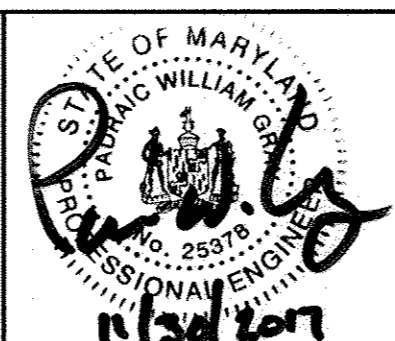
"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 25378, EXPIRATION DATE: 7/14/2018"

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James P. Butler* 12/1/17  
DIRECTOR OF PUBLIC WORKS  
CHIEF, BUREAU OF UTILITIES

*Thomas E. Butler* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Requardt & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



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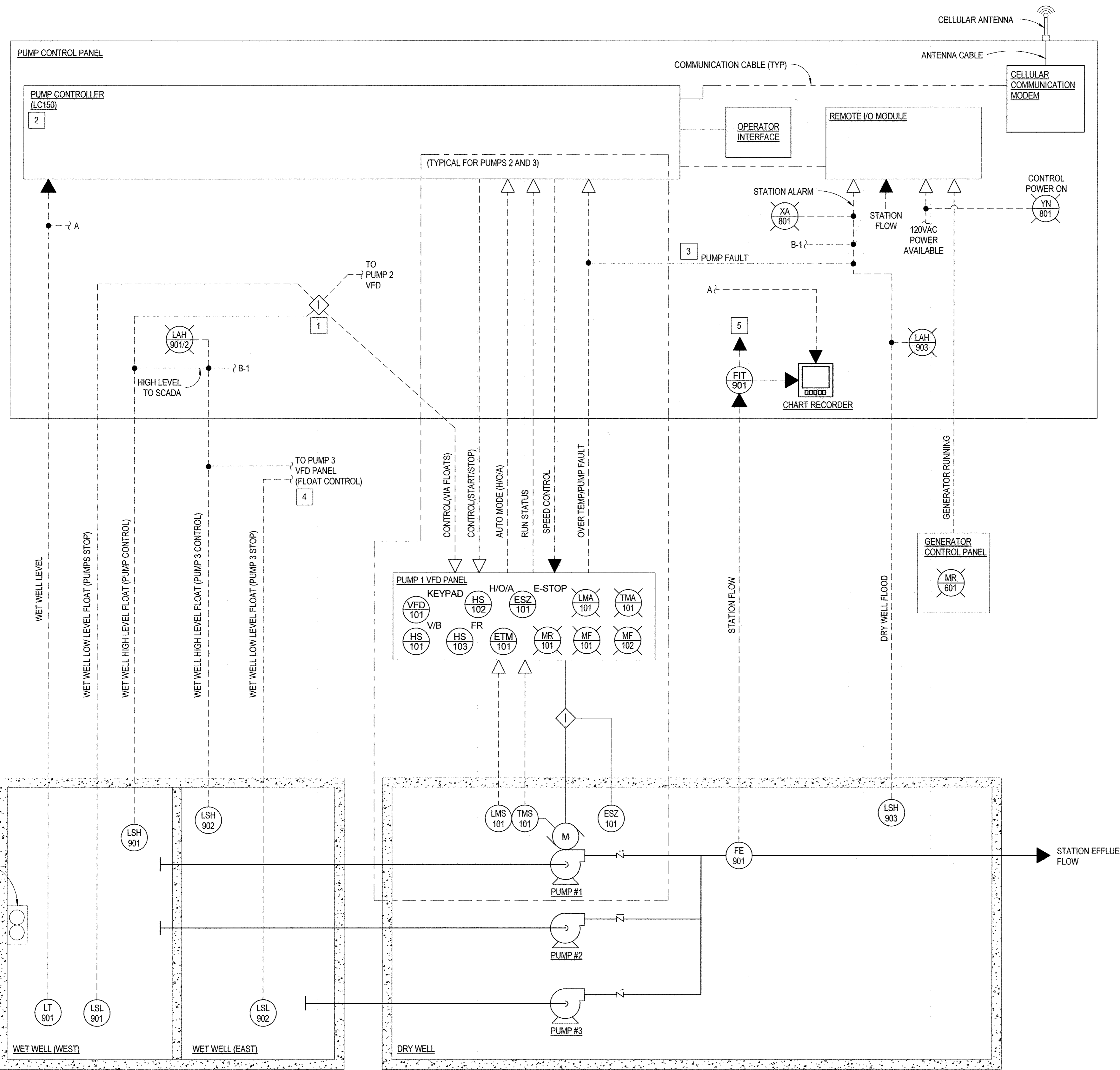
**INSTRUMENTATION GENERAL NOTES, ABBREVIATIONS, AND LEGEND**

**DORSEY RUN WASTEWATER PUMPING STATION UPGRADE**  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

11/30/2017 7:54:37 AM





**GENERAL NOTES:**

1. UNLESS OTHERWISE INDICATED, EACH SIGNAL BROUGHT FROM THE FIELD TO THE PUMP CONTROL PANEL SHALL BE PROVIDED WITH AN INTERPOSING RELAY TO ISOLATE THE DEVICE FROM THE PANEL CONTROL POWER, WHERE APPLICABLE.
2. SIGNALS SHOWN TO THE SCADA SYSTEM SHALL BE VIA THE CELLULAR NETWORK CONNECTION TO THE COUNTY'S CENTRAL MONITORING SYSTEM.

**X SPECIFIC NOTES:**

1. HARDWIRED PUMP ALTERNATION RELAY TO PROVIDE LEAD/LAG CONTROL FOR PUMPS 1 AND 2 IN THE WEST WET WELL.
2. 120 VAC POWER CIRCUIT REQUIRED FROM THE ELECTRICAL POWER PANEL. SEE ELECTRICAL DRAWINGS FOR PANEL DETAILS AND CIRCUIT IDENTIFICATION.
3. TYPICAL PUMP FAULT SIGNAL FROM EACH PUMP TO THE "STATION ALARM" SCADA SIGNAL.
4. PUMP 3 (EAST WET WELL) LEVEL FLOATS SHALL BE HARDWIRED TO PUMP 3 VFD PANELS RELAY LOGIC ONLY. LSH-901 "HIGH LEVEL/PUMP START" SHALL BE SET AT A HIGHER ELEVATION THAN LSH-902. SEE MECHANICAL DRAWINGS FOR FLOAT ELEVATION SETTINGS.
5. FLOW SIGNAL TO REMOTE I/O MODULE.

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

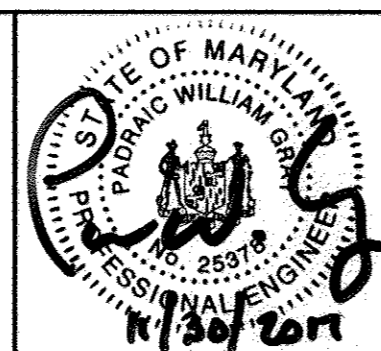
*James H. ...* 12/1/17  
DIRECTOR OF PUBLIC WORKS DATE

*Thomas R. ...* 12/1/17  
CHIEF BUREAU OF ENGINEERING DATE

*...* 12-1-17  
CHIEF, BUREAU OF UTILITIES DATE

*...* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION DATE

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



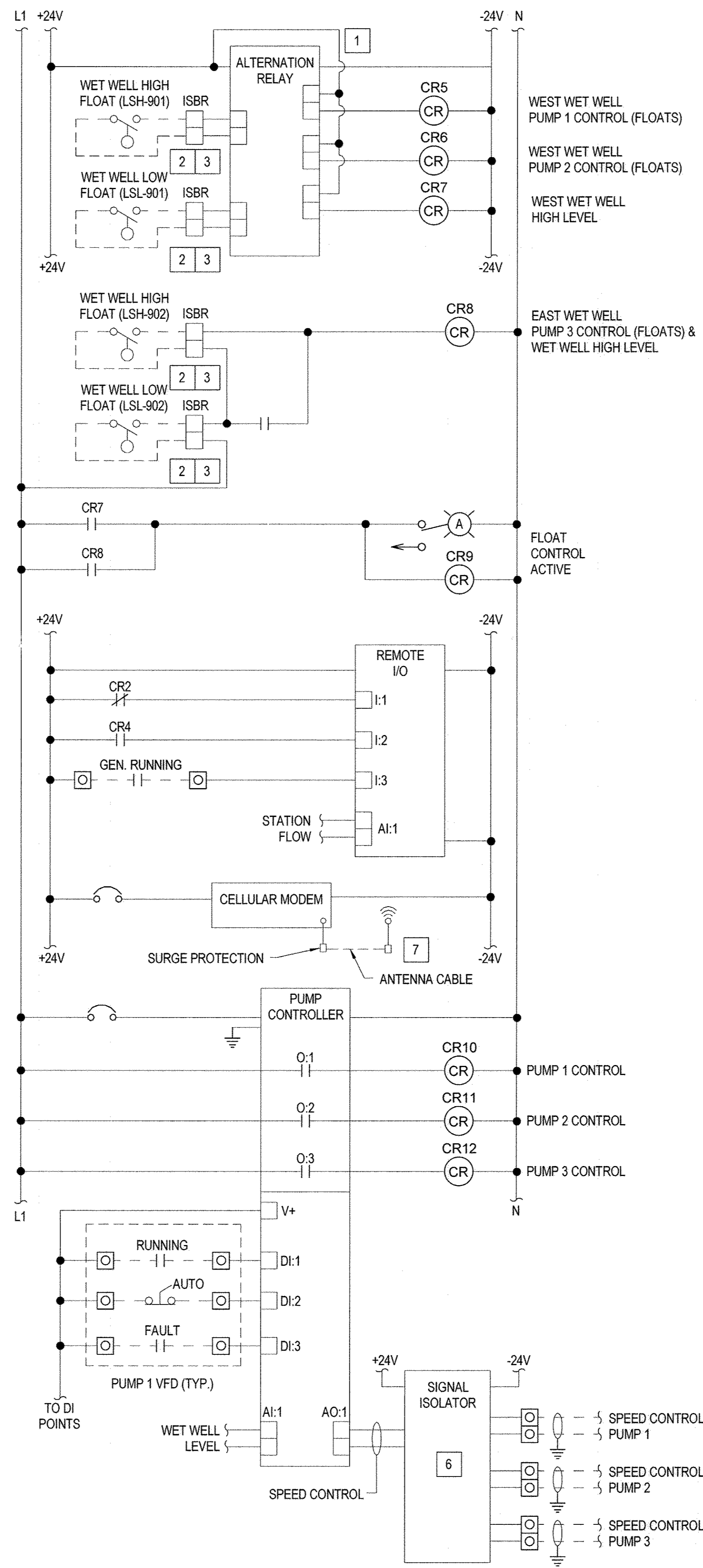
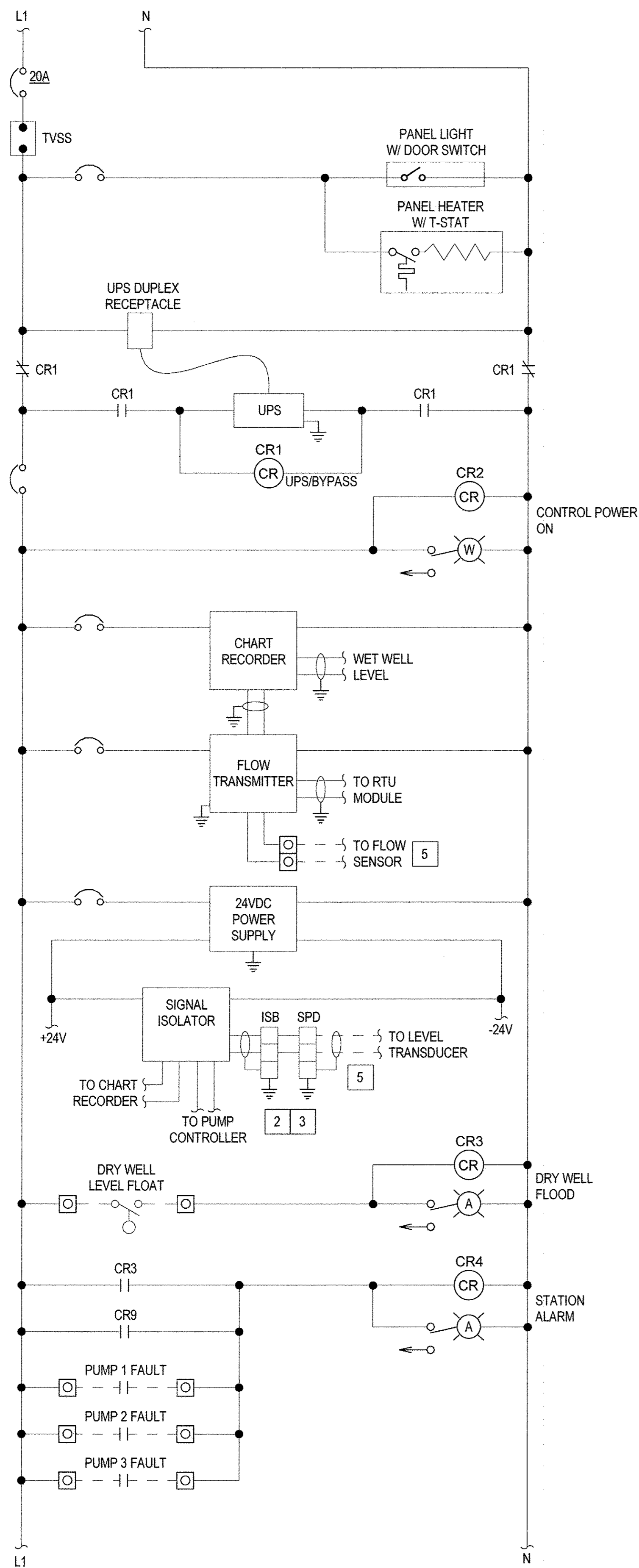
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CHK: PWG			
DATE: NOV. 2017	BY	NO.	REVISIONS
			DATE

PROCESS AND INSTRUMENTATION  
DIAGRAM

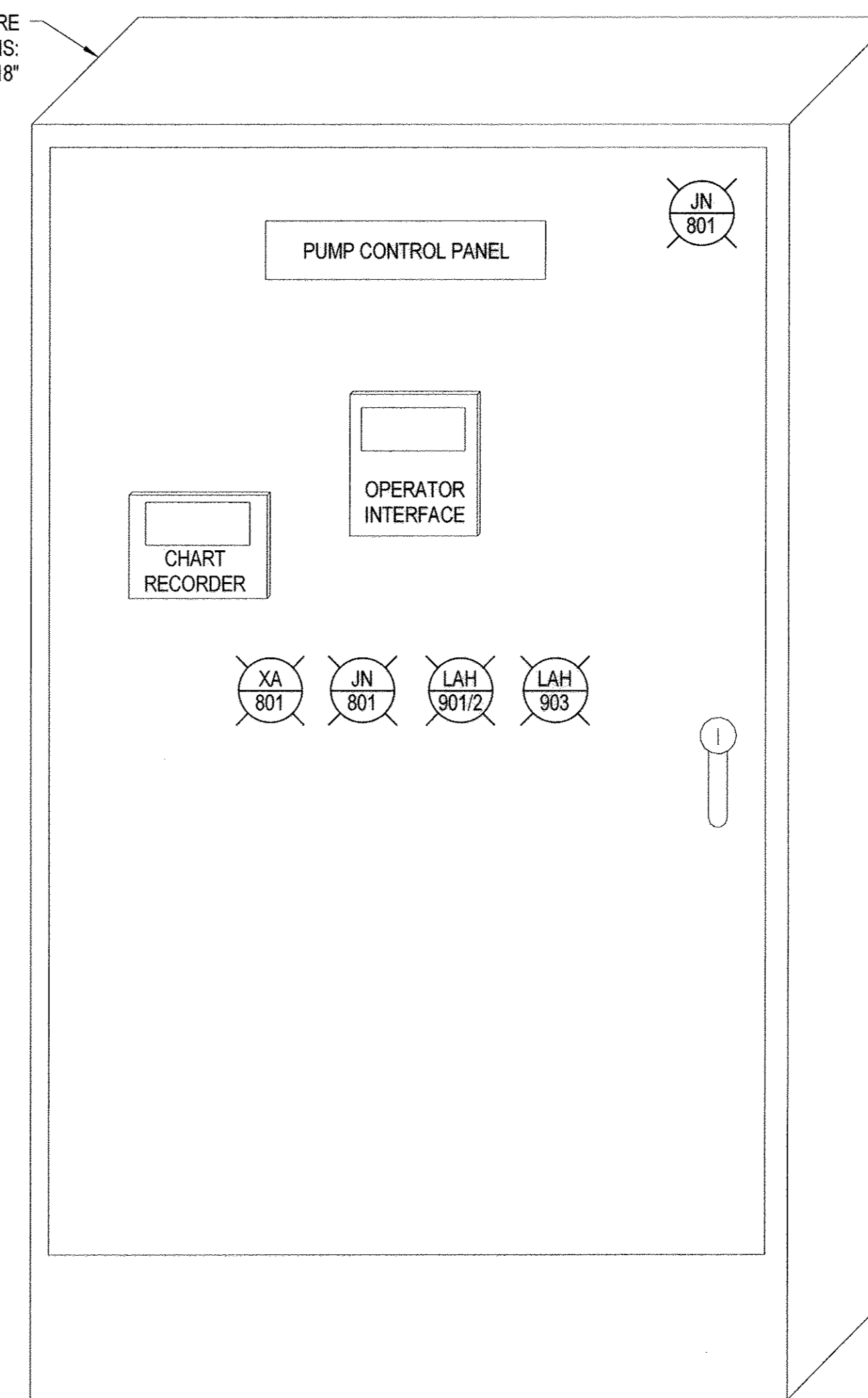
DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

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NEMA 12 ENCLOSURE  
APPROX. DIMENSIONS:  
60" x 36" x 18"



**GENERAL NOTES:**

- REFER TO ELECTRICAL DRAWINGS FOR PANELBOARD CIRCUITS.
- LABEL ALL EQUIPMENT WITHIN THE CONTROL PANEL INCLUDING TERMINAL BLOCKS, RELAYS AND CIRCUIT BREAKERS WITH ASSOCIATED CIRCUIT OR ID NUMBER.

**SPECIFIC NOTES:**

- FLOAT CONTROLLER AND ALTERNATION RELAY TO PROVIDE LEAD/LAG CONTROL FOR PUMPS 1 AND 2 AND HIGH LEVEL ALARM INDICATION. ALL INTRINSICALLY SAFE BARRIER RELAYS SHALL BE MOUNTED IN THE SAME LOCATION WITHIN THE PUMP CONTROL PANEL AND SHALL BE PHYSICALLY SEPARATED BY A METAL BARRIER FROM CONTROL PANEL COMPONENTS. PROVIDE PERMANENT NAMEPLATE IN ACCORDANCE WITH UL-698A AT LOCATION INDICATING: "INTRINSICALLY SAFE RELAYS AND CIRCUITRY"
- INTRINSICALLY SAFE WIRING CIRCUITS SHALL ENTER THE CONTROL PANEL AT THE SAME LOCATION, SHALL BE PHYSICALLY SEPARATED FROM ALL OTHER PANEL WIRING BY A MINIMUM OF 2" AND SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE NEC AND UL-698A REQUIREMENTS. PROVIDE POWER AND GROUNDING IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- FLOW TRANSMITTER LOCATED IN THE PUMP CONTROL PANEL. MANUFACTURERS CABLE, PROVIDE VAPOR TIGHT SEALS AT POINT WHERE INDIVIDUAL CONDUCTORS ARE SEPARATED FROM THE SHEATH.
- PROVIDE QUANTITY AND/OR TYPE OF SIGNAL ISOLATOR TO PROVIDE A 4-20mA SPEED SIGNAL TO ALL PUMP VFD'S. PROVIDE LOOP POWER FOR ALL SIGNALS AS REQUIRED.
- EXTERNAL MOUNTED ANTENNA

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

Director of Public Works: *[Signature]* 12/16/17  
 Chief, Bureau of Utilities: *[Signature]* 12-11/17  
 Chief, Utility Design Division: *[Signature]* 12/14/17

**WRA**  
 Whitman, Reardon & Associates, LLP  
 801 South Caroline Street, Baltimore, Maryland 21231

OF MARYLAND  
 WILLIAM W. WHITMAN  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 25378  
 EXPIRES 7/14/2018

DES: GAH			
DRN: GAH			
CHK: PWG			
DATE: NOV. 2017	BY: NO.	REVISIONS	DATE

PUMP CONTROL PANEL

DORSEY RUN WASTEWATER PUMPING STATION  
 UPGRADE  
 CAPITAL PROJECT NO. S6286  
 CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

I-3

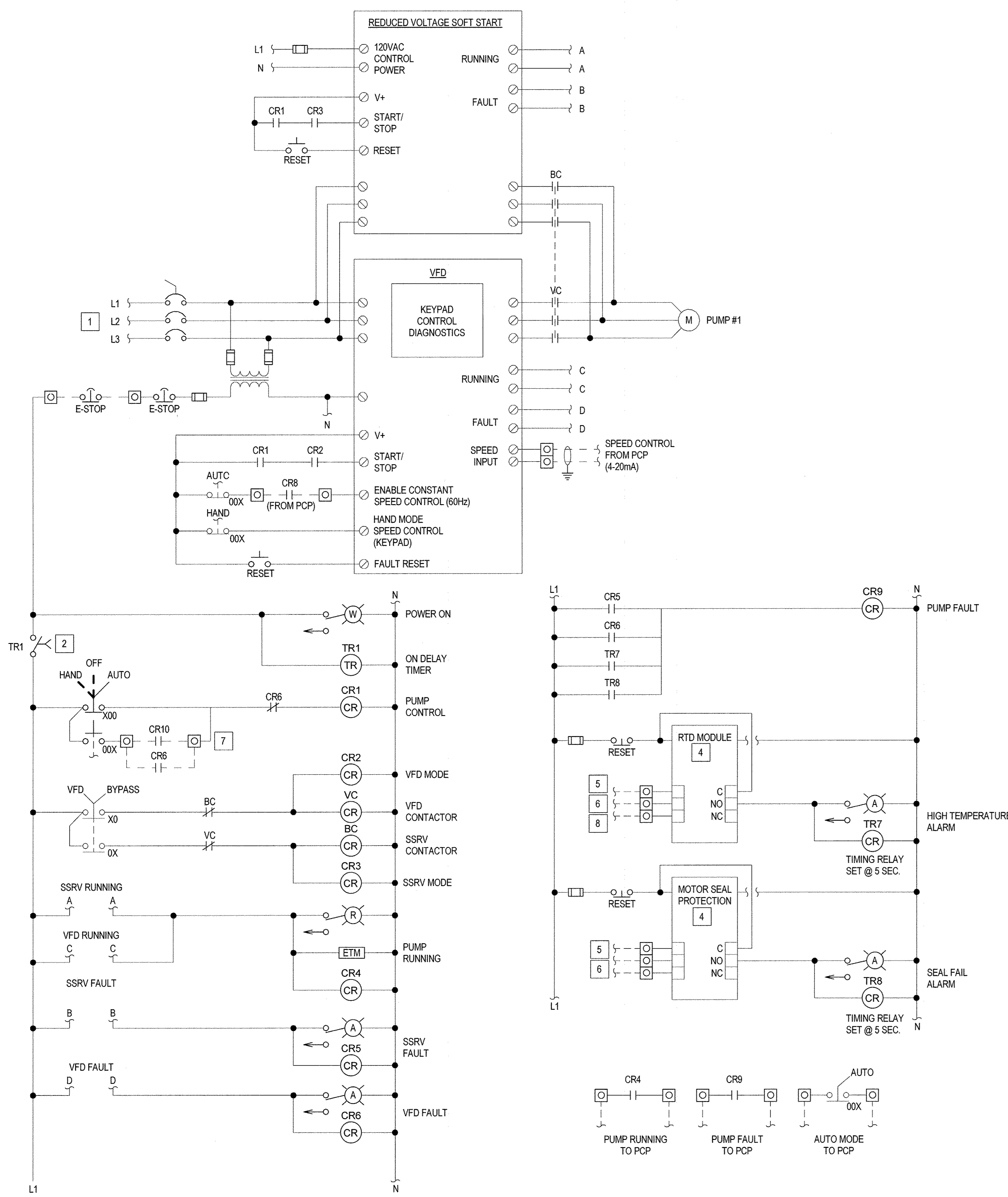
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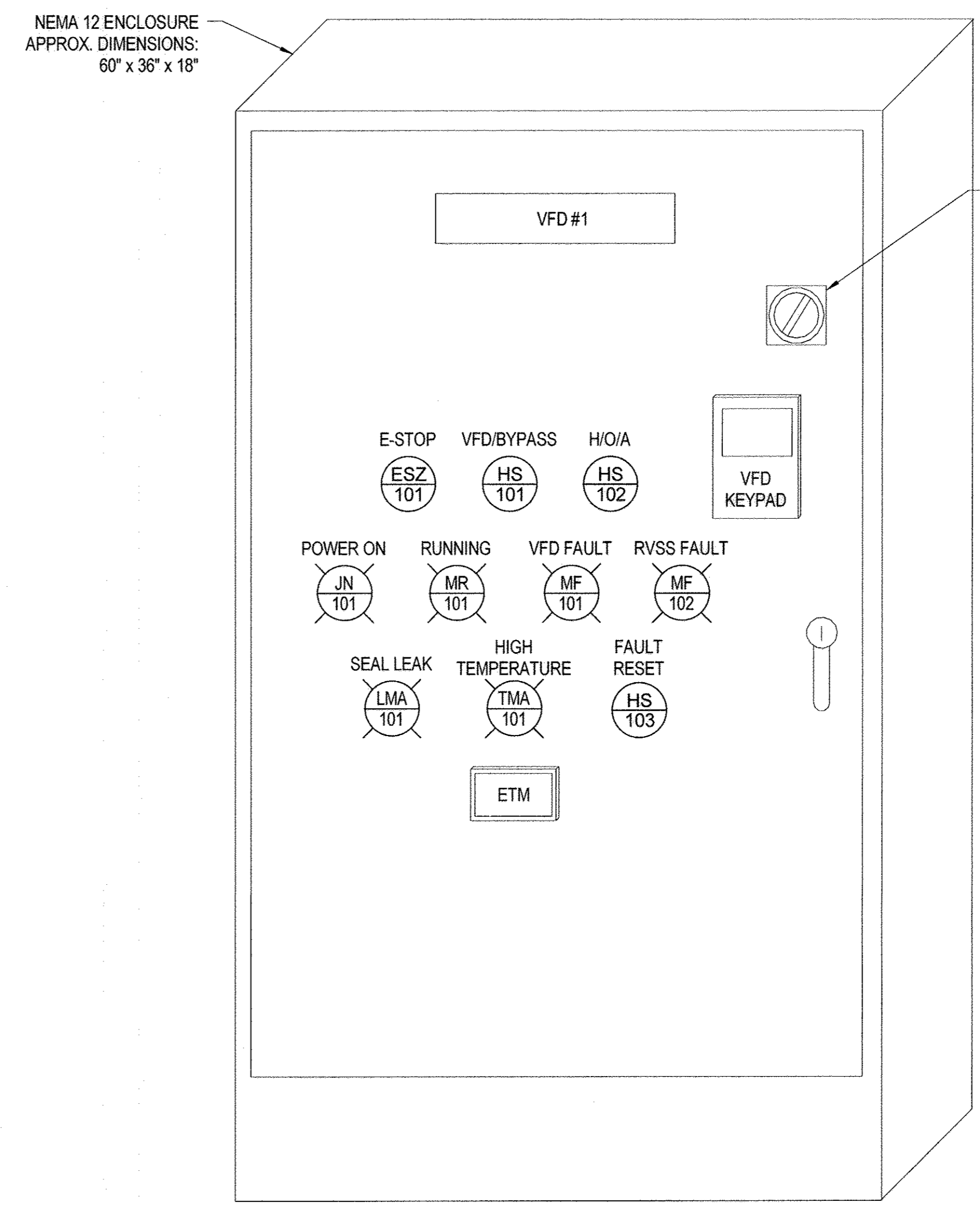
43 OF 46

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- GENERAL NOTES:**
- REFER TO ELECTRICAL DRAWINGS FOR MCC CIRCUITS.
  - LABEL ALL EQUIPMENT WITHIN THE CONTROL PANEL INCLUDING TERMINAL BLOCKS, RELAYS AND CIRCUIT BREAKERS WITH ASSOCIATED CIRCUIT OR ID NUMBER.
- SPECIFIC NOTES:**
- VFD POWER MAIN CIRCUIT BREAKER.
  - SET AT 10 SEC. FOR PUMP #1, 20 SEC. FOR PUMP #2, 30 SEC. FOR PUMP #3.
  - MOTOR PROTECTION RELAY SHALL BE FURNISHED BY THE PUMP MANUFACTURER AND SHALL BE COMPATIBLE WITH THE PUMP MOTOR PROTECTION DEVICES. PUMP MANUFACTURER SHALL FURNISH RELAY TO THE VFD SUPPLIER FOR INSTALLATION IN THE VFD ENCLOSURE. COORDINATE WITH THE PROTECTION RELAY SUPPLIER FOR POWER SUPPLY REQUIREMENTS.
  - MOTOR SENSOR FURNISHED WITH AND LOCATED AT MOTOR. SENSORS ARE FACTORY CONNECTED TO CONTROL CABLE WITH THE PUMP.
  - PROVIDE SHIELDED CABLE FOR CONNECTION AT PRETECTION RELAY. CONNECT SHIELDS ON CONDUCTORS POER MANUFACTURER RECOMMENDATIONS.
  - CONTACTS SHOWN ARE FOR PUMP #1 ONLY.
  - RTD SENSOR INPUTS FROM THE PUMP/MOTOR. NOT ALL SENSORS SHOWN FOR CLARRITY. PROVIDE TYPE AND QUANTITY AS REQUIRED IN THE SPECIFICATIONS.



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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*12/17*  
11-1-12

*12/17*  
12/17

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VFD CONTROL DIAGRAM

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

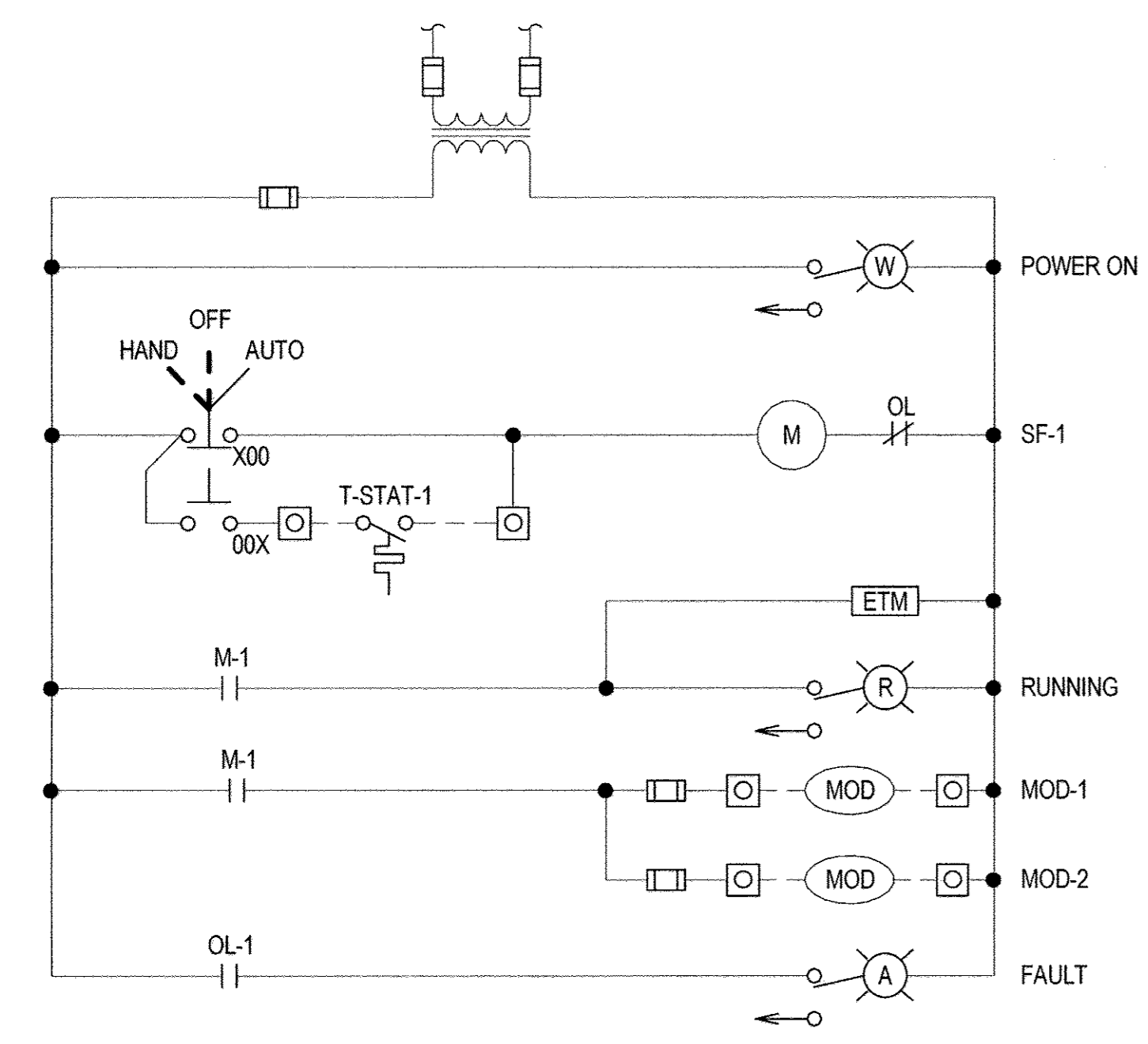
HOWARD COUNTY, MARYLAND

I-4

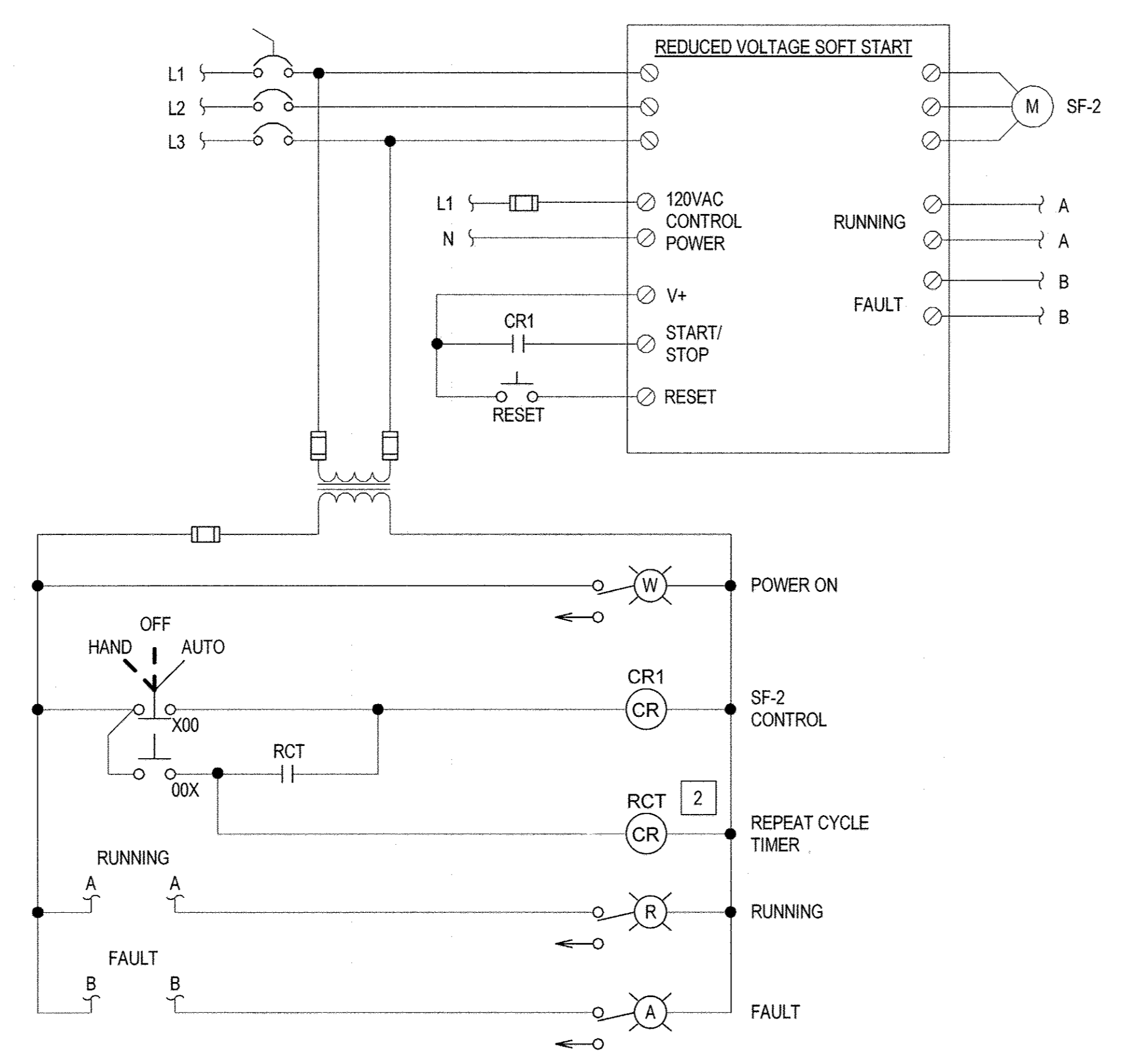
SCALE AS SHOWN

SHEET 44 OF 46

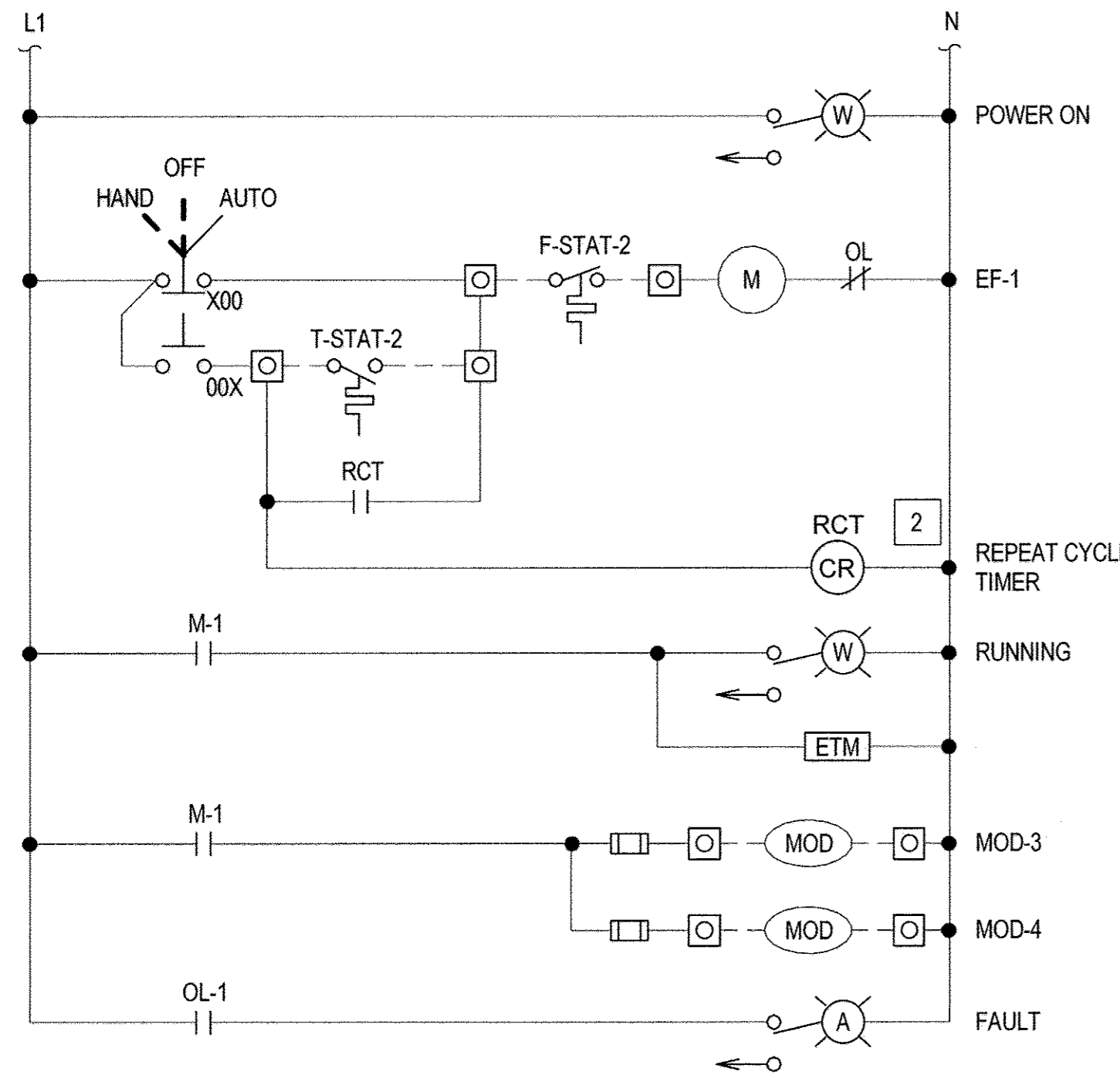
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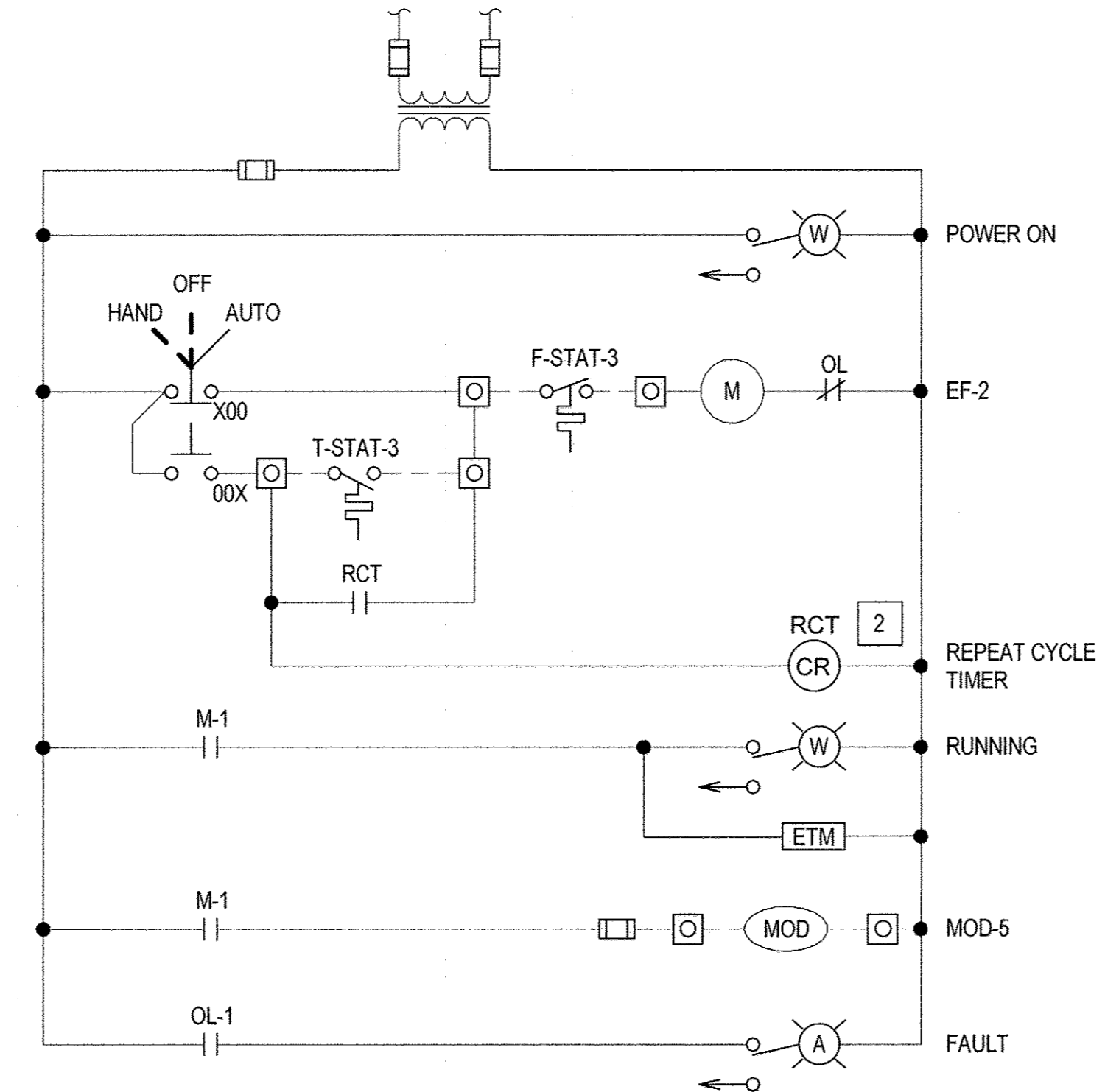
1 SF-1 VFD ROOM  
SCALE: 12" = 1'-0"



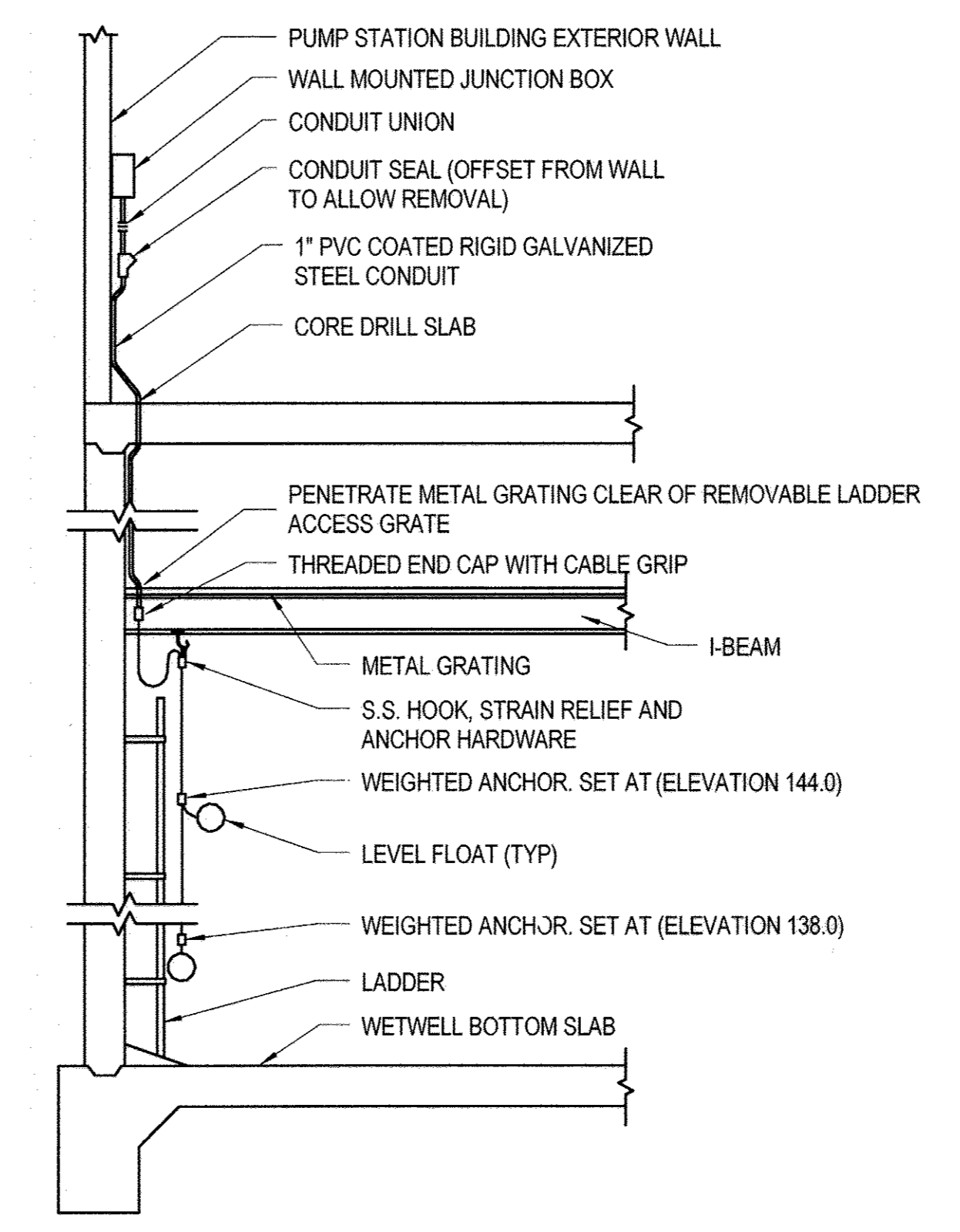
2 SF-2 WET WELL  
SCALE: 12" = 1'-0"



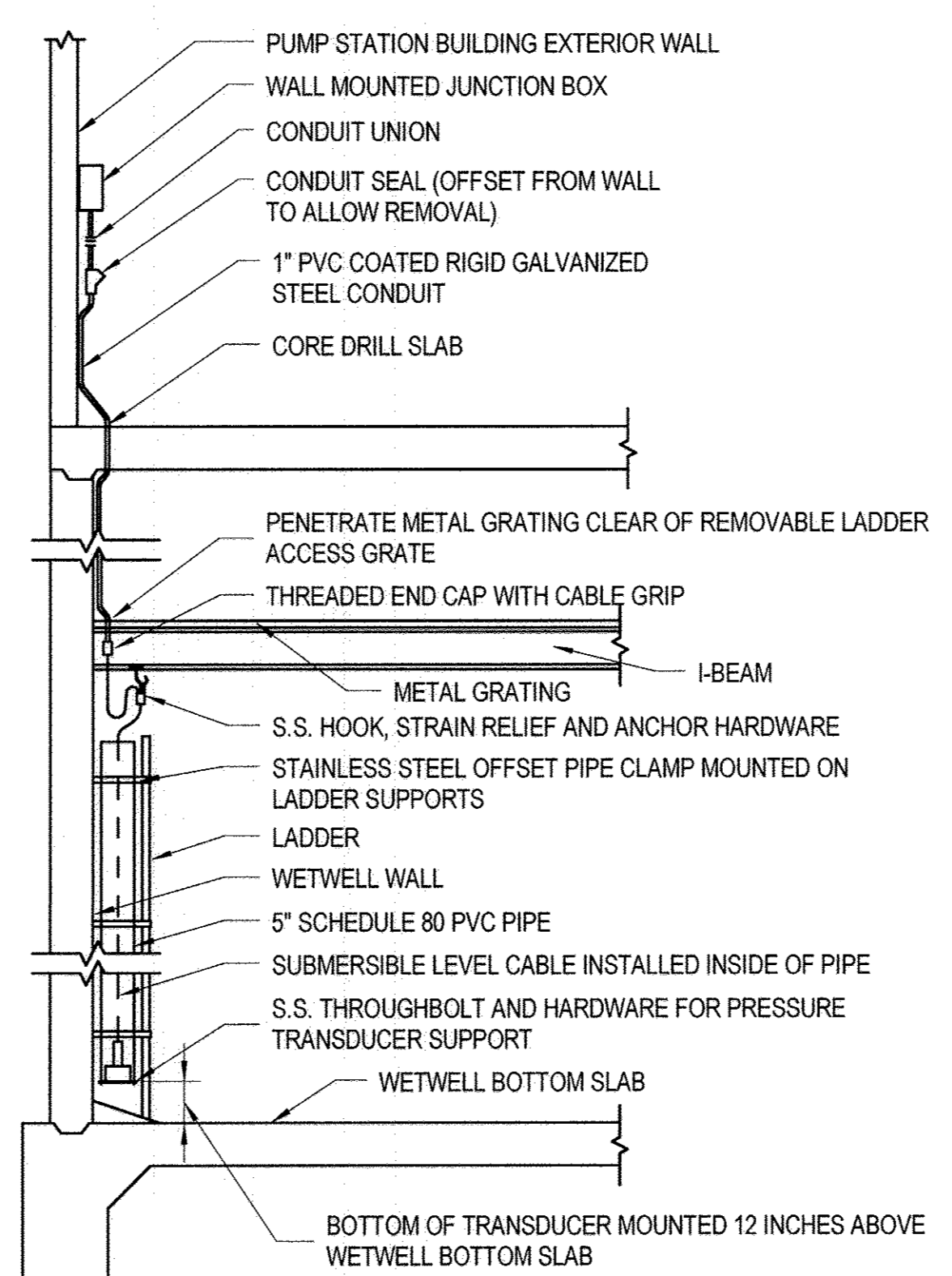
3 EF-1 CONTROL ROOM  
SCALE: 12" = 1'-0"



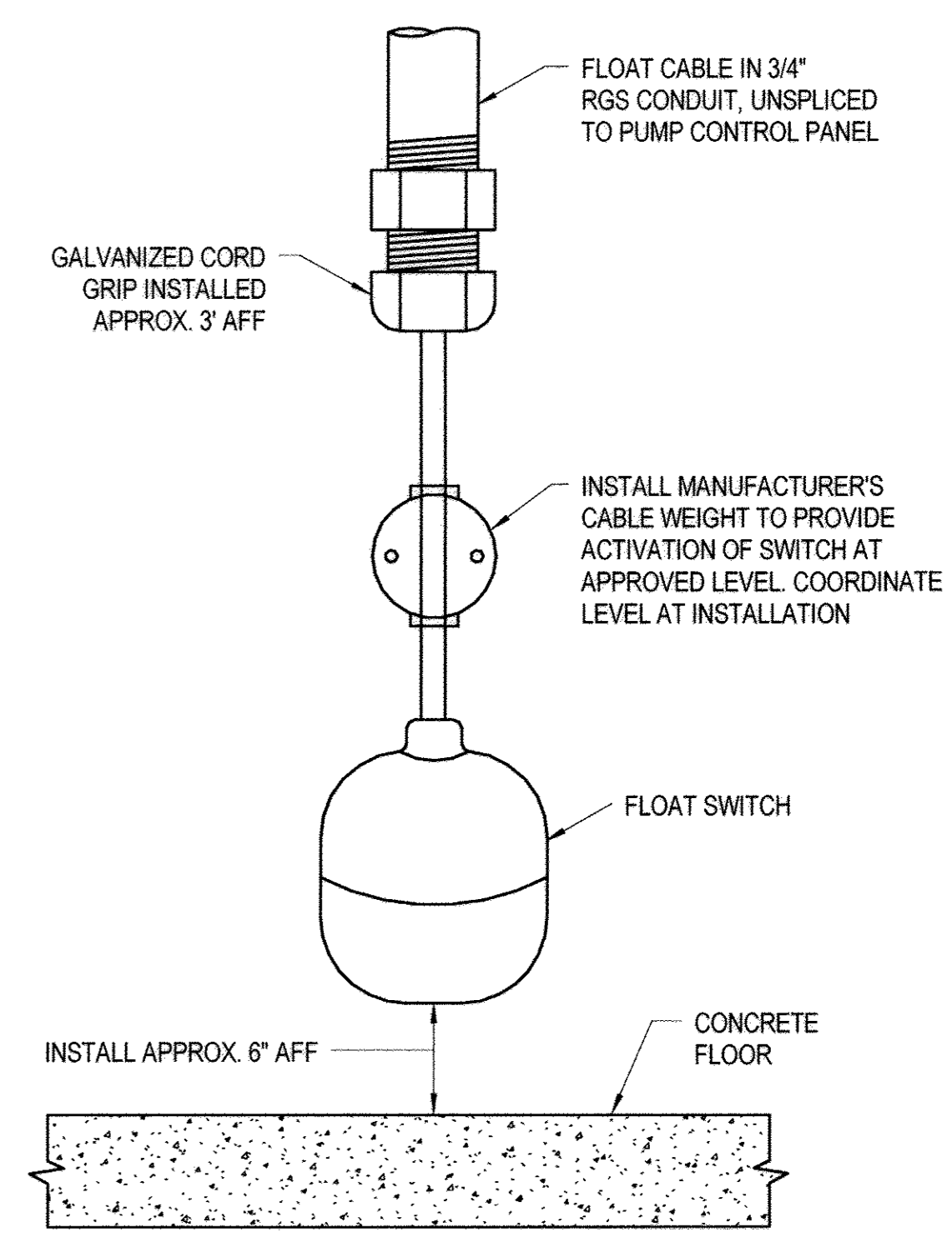
4 EF-2 CONTROL ROOM  
SCALE: 12" = 1'-0"



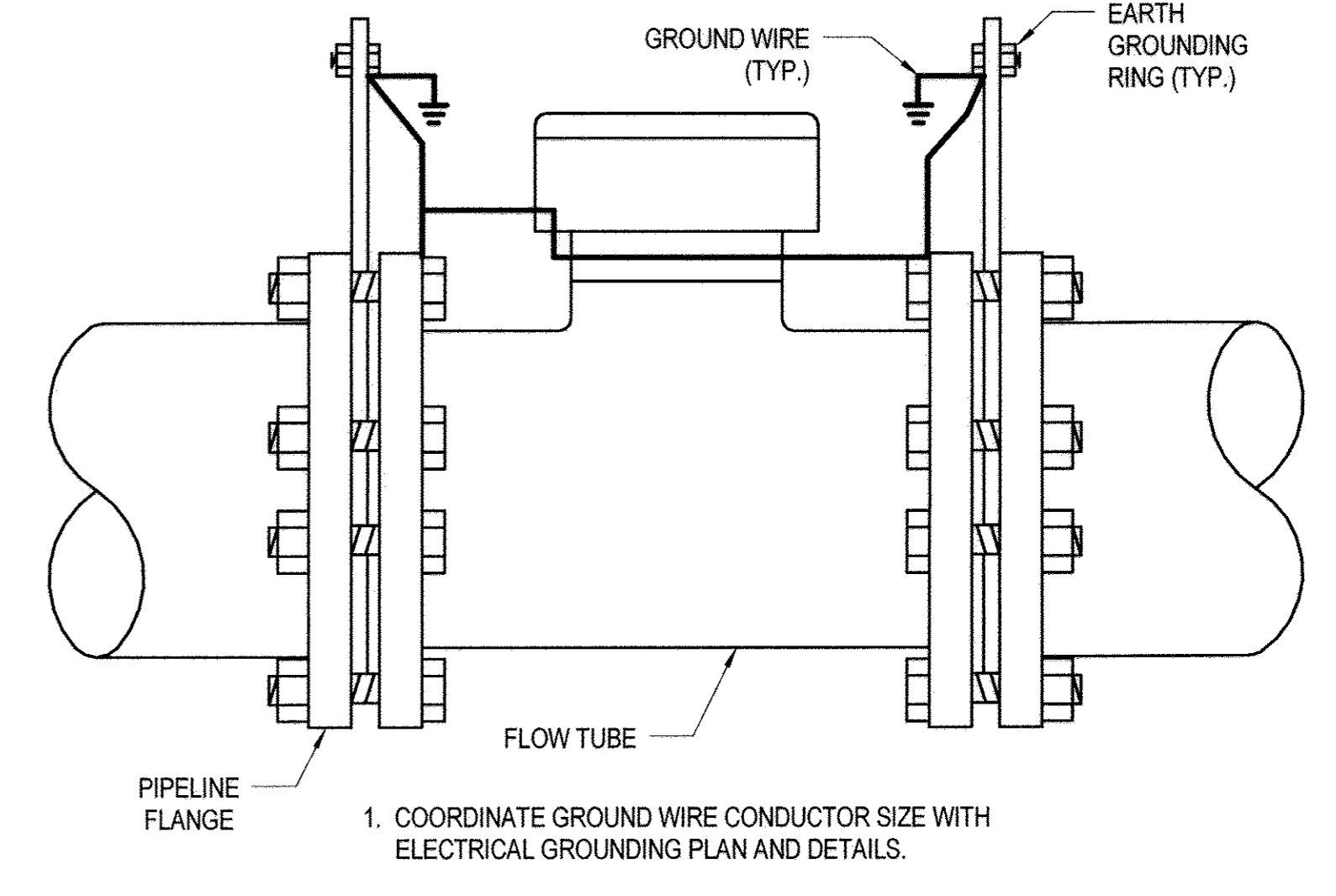
5 LEVEL FLOAT INSTALLATION DETAIL  
SCALE: NOT TO SCALE



6 LEVEL TRANSDUCER INSTALLATION DETAIL  
SCALE: NOT TO SCALE



7 FLOOD SENSOR MOUNTING DETAIL  
SCALE: NOT TO SCALE



8 FLOW METER GROUNDING RING  
SCALE: NOT TO SCALE

- GENERAL NOTES:**
- REFER TO ELECTRICAL DRAWINGS FOR MCC, PANELBOARD AND CIRCUIT DETAILS.
  - CONTROL WIRING SHOWN FOR SF-1, SF-2 AND EF-2 IS TO BE LOCATED IN THE MCC. REFER TO THE ELECTRICAL DRAWINGS FOR MCC AND BUCKET LAYOUT AND SCHEDULE.
  - CONTROL WIRING SHOWN FOR EF-1 IS TO BE LOCATED IN THE EF-1 MOTOR STARTER PANEL. REFER TO THE ELECTRICAL DRAWINGS FOR ADDITIONAL DETAILS.
  - SIZE CPT'S FOR TOTAL CONNECTED LOADS. COORDINATE POWER REQUIREMENTS WITH MANUFACTURER.

- SPECIFIC NOTES:**
- THERMOSTAT TO BE SET AT A HIGH TEMPERATURE SETPOINT TO PREVENT THE FAN FROM RUNNING WHEN THE AIR CONDITIONING IS IN OPERATION. FAN IS INTENDED TO PROVIDE EMERGENCY COOLING ONLY.
  - 0-60 MIN. REPEAT CYCLE TIMER. INITIALLY SET AT 10 MIN. COORDINATE FINAL CYCLE TIME SETTINGS AT STARTUP WITH THE OWNER AND ENGINEER.

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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*James D. [Signature]* 12/1/17  
DIRECTOR OF PUBLIC WORKS

*Thomas E. [Signature]* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
No. 25378  
1/30/2017

DES: GAH					
DRN: GAH					
CHK: PWG					
DATE: NOV. 2017	BY	NO.	REVISIONS	DATE	

MISCELLANEOUS CONTROL DIAGRAMS AND DETAILS

DORSEY RUN WASTEWATER PUMPING STATION  
UPGRADE  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6

HOWARD COUNTY, MARYLAND

I-5  
SCALE AS SHOWN  
SHEET 45 OF 46

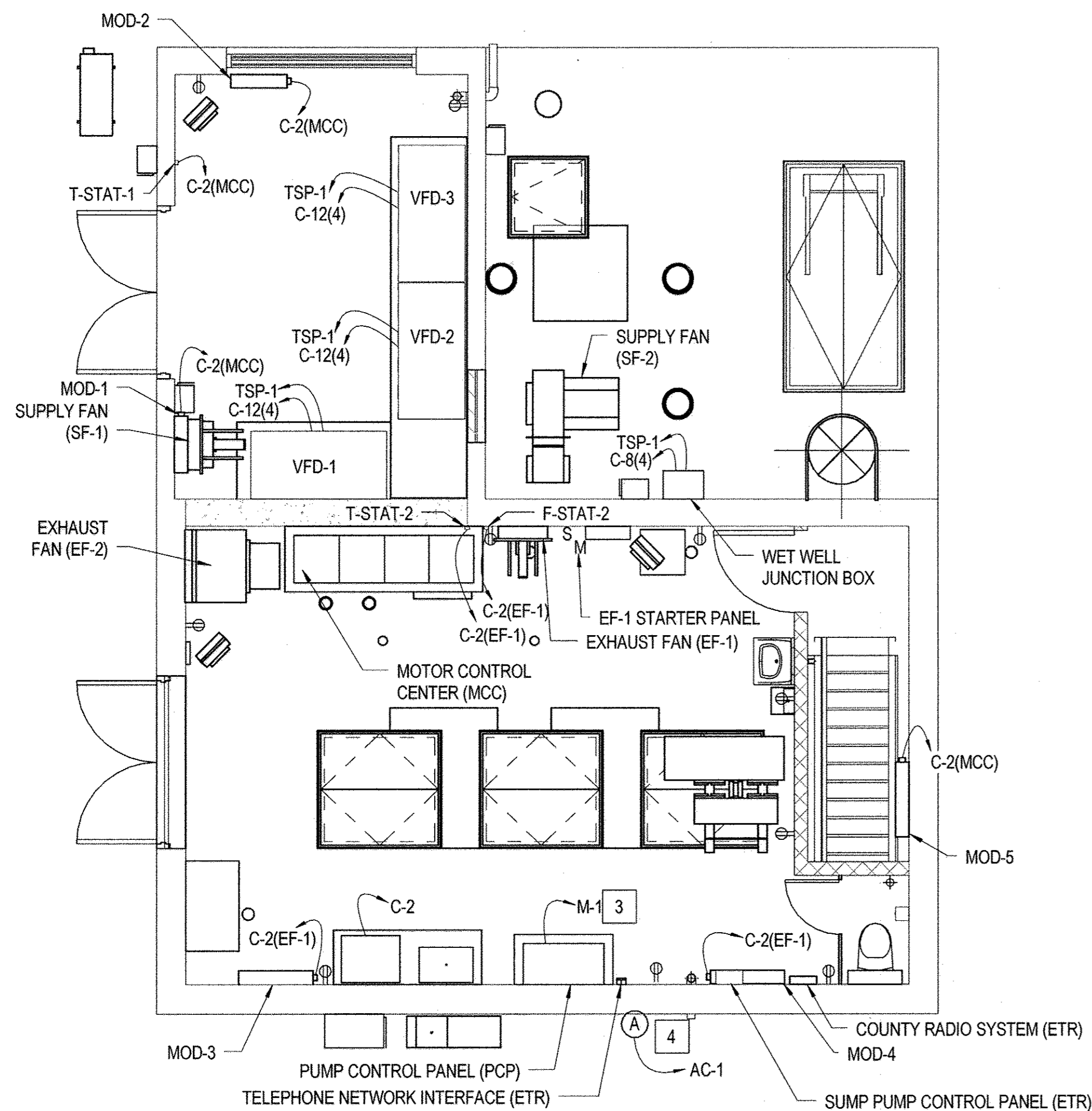


**GENERAL NOTES:**

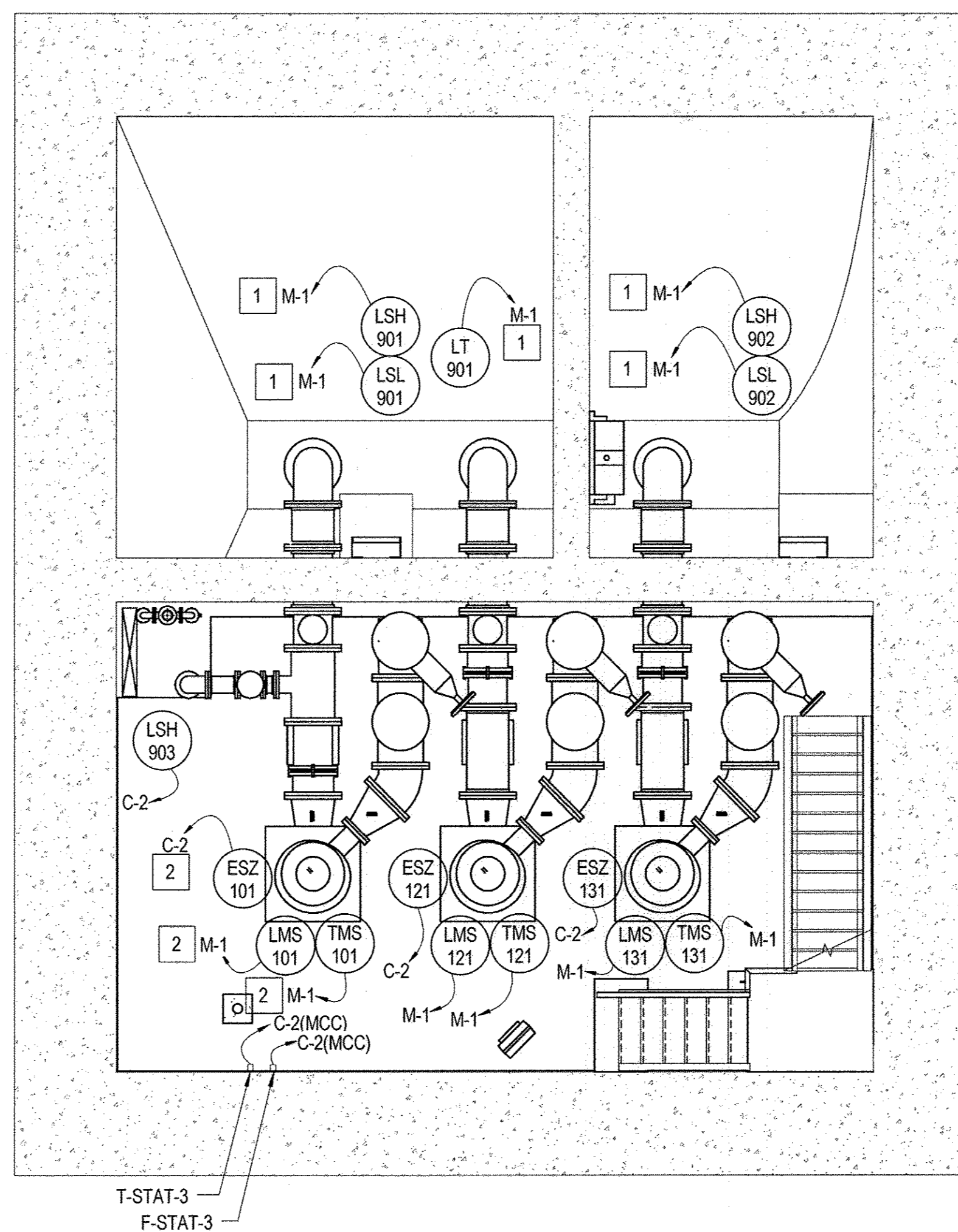
1. ALL CONDUITS SHOWN ARE TO BE ROUTED TO THE PCP UNLESS OTHERWISE NOTED.
2. PROVIDE LABELS ON CONDUIT INDICATING "INTRINSICALLY SAFE CIRCUITS"
3. PROVIDE CABLE SEALS WHERE CABLE ENTERS ENCLOSURES IN HAZARDOUS AREAS IN ACCORDANCE WITH NEC REQUIREMENTS.
4. PROVIDE CONDUIT SEAL FITTINGS SUITABLE FOR CLASS I, DIV. 1 HAZARDOUS LOCATIONS WHERE CONDUITS ENTER AND LEAVE THE WET WELL.

**X SPECIFIC NOTES:**

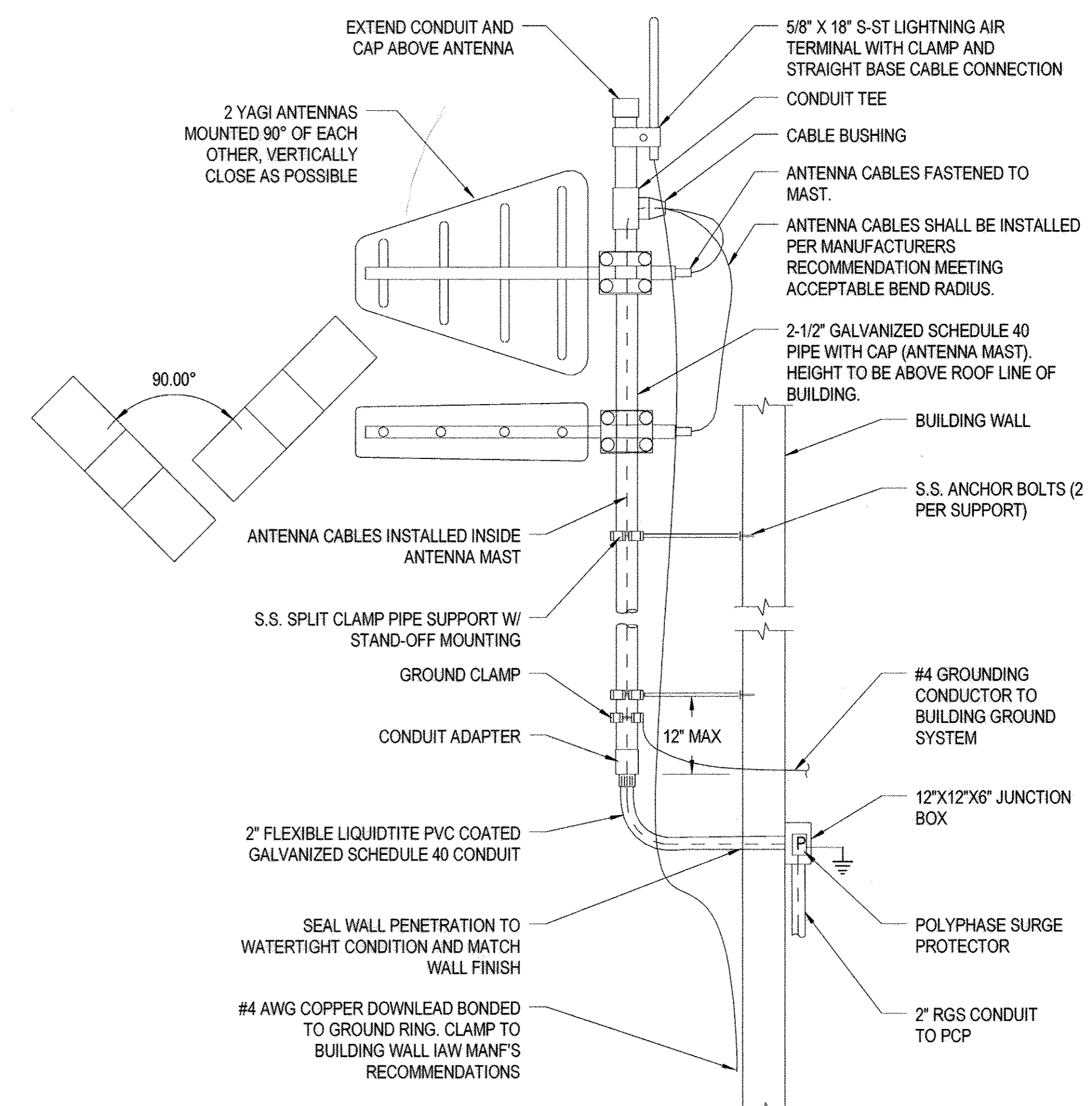
1. TO WET WELL JUNCTION BOX. ANALOG AND DISCRETE SIGNALS SHALL BE RUN IN SEPARATE CONDUITS AND SHALL BE ISOLATED FROM ONE ANOTHER WITHIN THE JUNCTION BOX.
2. TO RESPECTIVE VFD ENCLOSURE. TYPICAL FOR ALL PUMP E-STOPS, SEAL LEAK AND TEMPERATURE SENSORS.
3. FLOW METER MANUFACTURERS INTEGRAL CABLE TO MAGNETIC FLOW METER LOCATED ON THE INTERMEDIATE LEVEL. SEE MECHANICAL DRAWINGS FOR METER LOCATION.
4. EXTERIOR MOUNTED ANTENNA



**1 1ST FLOOR INSTRUMENTATION PLAN**  
SCALE: 1/4" = 1'-0"



**2 LOWER LEVEL INSTRUMENTATION PLAN**  
SCALE: 1/4" = 1'-0"



**DETAIL NOTES:**

1. CONTRACTOR SHALL CONFIRM AND COORDINATE WITH OWNER PRIOR TO INSTALLATION OF ANTENNA MOUNTING SUPPORT AS REQUIRED.
2. CONTRACTOR SHALL COORDINATE ANTENNA CABLE LENGTH AS REQUIRED FOR ONE CONTINUOUS RUN
3. PROVIDE PIPE SUPPORT EVERY 24" IN BETWEEN TOP AND BOTTOM SUPPORTS
4. CONTRACTOR SHALL COORDINATE ANTENNA MOUNTING HEIGHT TO COMMUNICATE WITH EXISTING SCADA SYSTEM
5. CONTRACTOR SHALL PROVIDE ANTENNA INSTALLATION SUCH THAT IT CAN WITHSTAND THE WIND VELOCITY FOR THE LOCATION AS INDICATED BY APPLICABLE CODES

**3 ANTENNA INSTALLATION DETAIL**  
SCALE: NOT TO SCALE

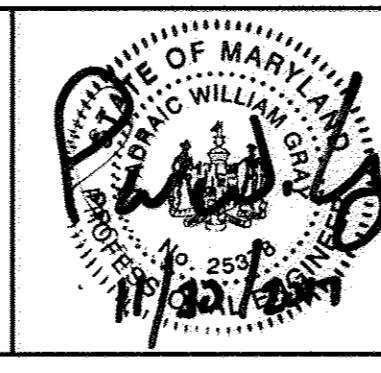
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DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND.

*Thomas E. Butler* 12/1/17  
CHIEF, BUREAU OF UTILITIES

*Thomas E. Butler* 12/1/17  
CHIEF, UTILITY DESIGN DIVISION

**WRA**  
Whitman, Reardon & Associates, LLP  
801 South Caroline Street, Baltimore, Maryland 21231



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**INSTRUMENTATION LOWER AND GRADE LEVEL PLANS**

**DORSEY RUN WASTEWATER PUMPING STATION UPGRADE**  
CAPITAL PROJECT NO. S6286  
CONTRACT NO. 20-4996

ELECTION DISTRICT 6  
HOWARD COUNTY, MARYLAND

I-6  
SCALE AS SHOWN  
SHEET 46 OF 46

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