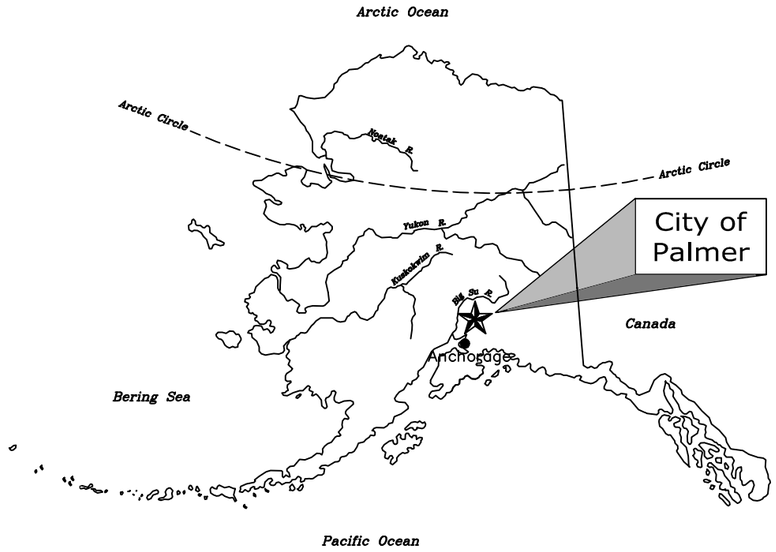
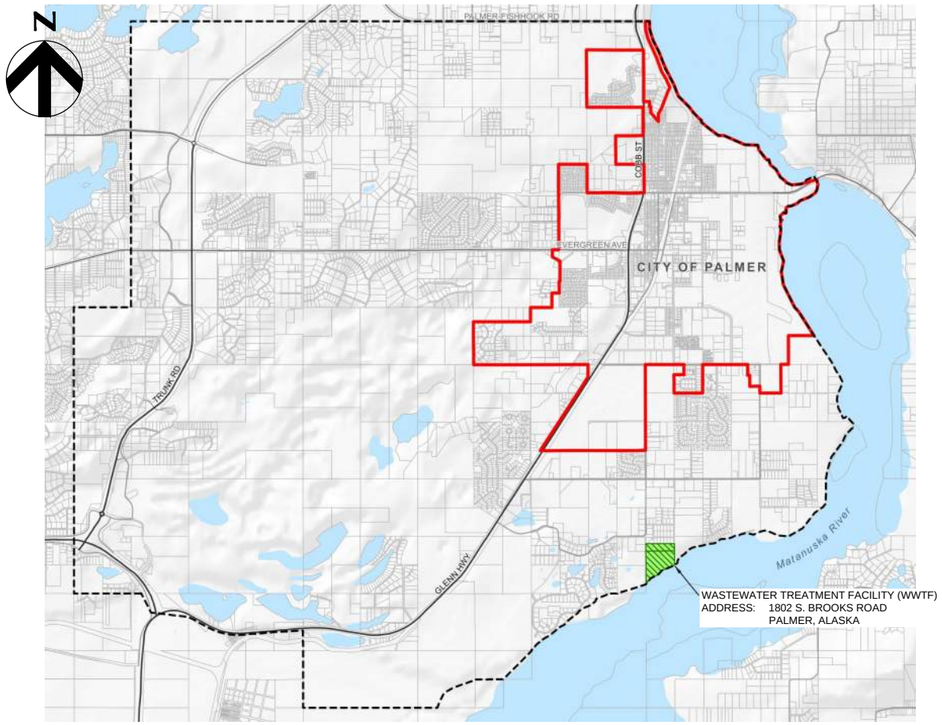


CITY OF PALMER

WASTEWATER TREATMENT FACILITY IMPROVEMENTS PROJECT PHASE 2

2021

ISSUED FOR BID



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	800Y705	TYPICAL CONTROL WIRING SCHEMATIC

CRW ENGINEERING GROUP, LLC

HDR

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
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STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA — 49TH — JONATHAN RYAN MOYERS — No. CE-12718 — REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER — "Alaska at its Best!"

City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL INDEX

0 1" 2"

FILENAME 000G001.dwg
SCALE SCALE

SHEET
000G001

A/C	AIR CONDITIONING	CHFR	CHAMFER	ENCL	ENCLOSURE	GYP	GYPSUM HARDBOARD	LTNG	LIGHTING	PERP	PERPENDICULAR	SF	SQUARE FOOT, SILT FENCE	VIN	VINYL
A/E	ARCHITECT/ENGINEER	CHH	COMMUNICATION HANDHOLE	ENGR	ENGINEER			LV	LOW VOLTAGE	PF	POWER FACTOR	SG	SHEET GLASS, SEALANT GROOVE	VOL	VOLUME
A	AMPERE	CI	CURB INLET	ENTR	ENTRANCE			LVL	LAMINATED VENEER LUMBER	PFMU	PREFACED MASONRY UNIT	SH	SHOWER	VPC	VERTICAL POINT OF CURVATURE
AB	ANCHOR BOLT	CIP	CAST-IN-PLACE	EOP	EDGE OF PAVEMENT	H	HIGH	LVR	LOUVER	PH	PHASE	SHT	SHEET	VPI	VERTICAL POINT OF INTERSECTION
ABAN	ABANDON	CIPD	CONCRETE INTERLOCKING PAVER BALLAST	EQ	EQUAL	HHE	STANDARD HOOK ONE END (90 DEG), UNO	LW	LIGHTWEIGHT	PI	POINT OF INTERSECTION	SHTG	SHEATHING	VPT	VERTICAL POINT OF TANGENCY
ABC	AGGREGATE BASE COURSE	CIRC	CIRCULATION, CIRCULAR	EQUIP	EQUIPMENT	H2E	STANDARD HOOK TWO ENDS (90 DEG), UNO	LWC	LIGHTWEIGHT CONCRETE	PKG	PACKAGE	SIL	SILENCE	VS	VERSUS, VAPOR SEAL
ABT	ABOUT	CJ	CONSTRUCTION JOINT	EQUIV	EQUIVALENT	HAS	HEADED ANCHOR STUD	LWL	LOW WATER LEVEL	PL	PLATE, PROPERTY LINE, PRECAST LINTEL	SIM	SIMILAR	VTR	VENT THROUGH ROOF
AC	ALTERNATING CURRENT	CJP	COMPLETE JOINT PENETRATION	ES	EACH SIDE, EQUAL SPACE,	HB	HOSE BIBB			PLAS	PLASTER	SJ	SLAB JOINT	VWC	VINYL WALL COVERING
ACK	ACKNOWLEDGE	CKT	CIRCUIT	ESEW	EMERGENCY SHOWER AND EYE WASH	HBD	HARDBOARD			PLAT	PLATFORM	SL	SLOPE, STEEL LINTEL, SNOW LOAD		
ACP	ACOUSTIC CEILING PANEL,	CL	CENTERLINE, CLASS, CLOSE	EST	ESTIMATE	HC	HANDICAPPED, HOLLOW CORE,	MA	MIXED AIR	PLBG	PLUMBING	SLTD	SLOTTED		
	ASPHALTIC CONCRETE PAVEMENT	CLG	CEILING	EW	EACH WAY, EMERGENCY EYE/FACE WASH		HORIZONTAL CURVE,	MACH	MACHINED	PLF	POUNDS PER LINEAR FOOT	SLV	SLEEVE	W/	WITH
ACST	ACOUSTIC	CLKG	CAULKING	EWC	ELECTRIC WATER COOLER		HORIZONTAL CENTERLINE	MAINT	MAINTENANCE	PNEU	PNEUMATIC	SMLS	SEAMLESS	W/O	WITHOUT
AD	ADDENDUM, AREA DRAIN	CLR	CLEAR	EWEF	EACH WAY, EACH FACE	HD	HEAD, HOT DIP	MAN	MANUAL	POL	POLISH	SOG	SLAB ON GRADE	W	WATT, WEST, WIDE, WINDOW, WIRE
ADDL	ADDITIONAL	CLSM	CONTROLLED LOW-STRENGTH MATERIAL	EWTB	EACH WAY,TOP AND BOTTOM	HDR	HEADER	MATL	MATERIAL	POS	POSITIVE, POSITION	SP	SOUNDPROOF, STANDPIPE	WB	WOOD BASE
ADH	ADHESIVE	CMH	COMMUNICATION MANHOLE	EXC	EXCAVATION	HDW	HARDWARE	MAX	MAXIMUM	PP	POLYPROPYLENE, POWER POLE	SPA	SPACING	WC	WATER CLOSET, WATER COLUMN
ADJ	ADJUSTABLE, ADJACENT	CMP	CORRUGATED METAL PIPE	EXH	EXHAUST	HEX	HEXAGONAL	MB	MACHINE BOLT	PRC	POINT OF REVERSE CURVATURE	SPEC	SPECIFICATION	WD	WOOD, WIDTH
AF	AMP FRAME, AMP FUSE	CMU	CONCRETE MASONRY UNIT	EXP	EXPANSION, EXPOSED	HGR	HANGER	MBR	MEMBER	PREF	PREFINISHED	SPLY	SUPPLY	WF	WIDE FLANGE, WASH FOUNTAIN
AFF	ABOVE FINISH FLOOR	CO	CLEANOUT, CONCRETE OPENING	EXIST	EXISTING	HH	HANDHOLE	MC	MECHANICAL CONTRACTOR,	PREFAB	PREFABRICATED	SPST	SINGLE POLE SINGLE THROW	WG	WIRE GLASS, WATER GAGE
AFG	ABOVE FINISH GRADE	COL	COLUMN	EXT	EXTERIOR, EXTERNAL, EXTENSION	HID	HIGH-INTENSITY DISCHARGE		MECHANICAL COUPLING,	PRELIM	PRELIMINARY	SPT	SET POINT	WH	WALL HYDRANT, WEEP HOLE
AGGR	AGGREGATE	COMB	COMBINATION			HM	HOLLOW METAL		MOMENT CONNECTION	PREP	PREPARE	SQ	SQUARE	WI	WROUGHT IRON
AI	AREA INLET, ANALOG INPUT	COMM	COMMUNICATION			HORIZ	HORIZONTAL	MCB	METAL CORNER BEAD	PRES	PRESSURE	SR	SHORT RADIUS	WL	WATER LEVEL
AIC	AMPS INTERRUPTING CAPACITY	COMP	COMPOSITION, COMPRESSIBLE, COMPOSITE	F TO F	FACE TO FACE	HP	HIGH POINT, HORSEPOWER	MCJ	MASONRY CONTROL JOINT	PRI	PRIMARY	SS	SERVICE SINK	WLD	WELDED
ALIG	ALIGNMENT	CON	CONCENTRIC	F&B	FACE AND BYPASS	HPC	HORIZONTAL POINT OF CURVATURE	MDMJ	MODIFIED DOUBLE MECHANICAL JOINT	PROJ	PROJECTION	SSMH	SANITARY SEWER MANHOLE	WM	WIRE MESH
ALT	ALTERNATE, ALTITUDE	CONC	CONCRETE	FAB	FABRICATE	HPS	HIGH-PRESSURE SODIUM	MECH	MECHANICAL	PROP	PROPERTY, PROPOSED	SST	STAINLESS STEEL	WP	WEATHERPROOF, WORKING POINT
ALUM	ALUMINUM	CONN	CONNECTION	FB	FLOOR BEAM	HPT	HORIZONTAL POINT OF TANGENCY	MED	MEDIUM	PROT	PROTECTION	ST	STREET, STORMWATER	WS	WATERSTOP, WATER SURFACE
AM	ACOUSTICAL MATERIAL	CONST	CONSTRUCTION	FBD	FIBERBOARD	HR	HOSE REEL, HOUR	MFR	MANUFACTURER	PS	PIPE SUPPORT	STA	STATION	WSCT	WAINSCOT
AMB	AMBIENT	CONT	CONTINUOUS	FBG	FIBERGLASS	HS	HEADED STUD, HIGH STRENGTH	MH	MANHOLE, METAL HALIDE	PSF	POUNDS PER SQUARE FOOT	STD	STANDARD	WT	WEIGHT, WATER TIGHT
ANC	ANCHOR	COOR	COORDINATE	FBM	BOARD FOOT MEASURE	HSS	HOLLOW STRUCTURAL SHAPE	MIN	MINIMUM	PSI	POUNDS PER SQUARE INCH	STIF	STIFFENER	WTHP	WATERPROOF, WORKING POINT
AO	ANALOG OUTPUT	CORR	CORROSIVE, CORRUGATED	FBO	FURNISHED BY OWNER	HT	HEIGHT	MIR	MIRROR	PSIA	POUNDS PER SQUARE INCH ABSOLUTE	STIR	STIRRUP	WWF	WELDED WIRE FABRIC
AP	ACCESS PANEL	CP	CHECKER PLATE, CONTROL POINT	FC	FLUSHING CONNECTION	HTG	HEATING	MISC	MISCELLANEOUS	PSIG	POUNDS PER SQUARE INCH GAGE	STL	STEEL		
APPRX	APPROXIMATE	CPLG	COUPLING	FCA	FLANGED COUPLING ADAPTER	HV	HIGH VOLTAGE	MJ	MECHANICAL JOINT	PST	PRESTRESSED	STOR	STORAGE		
APVD	APPROVED	CRL	CORROSION-RESISTANT LINING	FD	FLOOR DRAIN	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	ML	MASONRY LINTEL	PT	POINT, POINT OF TANGENCY	STR	STRUCTURAL, STRAIGHT	XP	EXPLOSION-PROOF
ARCH	ARCHITECTURAL	CSC	COMPRESSION SLEEVE COUPLING	FDC	FLEXIBLE DUCT CONNECTION	HWD	HARDWOOD	MLO	MAIN LUGS ONLY	PTN	PARTITION	SUB	SUBSTITUTE	XS	EXTRA STRONG
ASSY	ASSEMBLY	CSK	COUNTERSINK	FDR	FEEDER	HWL	HIGH WATER LEVEL	MMB	MEMBRANE	PVC	POLYVINYL CHLORIDE,	SUC	SUCTION	XSECT	CROSS SECTION
AT	ACOUSTICAL TILE, AMP TRIP	CSS	CLINIC SERVICE SINK	FDTN	FOUNDATION	HYD	HYDRAULIC	MO	MASONRY OPENING		POINT OF VERTICAL CURVE	SUSP	SUSPENDED	XXS	DOUBLE EXTRA STRONG
ATC	ACOUSTICAL TILE CEILING	CT	CERAMIC TILE	FE	FLANGED END	HZ	HERTZ, CYCLES PER SECOND	MOD	MODULAR, MODIFY	PVMT	PAVEMENT	SY	SQUARE YARD		
ATM	ATMOSPHERE	CTJ	CONTRACTION JOINT	FEC	FIRE EXTINGUISHER CABINET			MON	MONUMENT	PVT	POINT OF VERTICAL TANGENCY	SYM	SYMBOL		
AUTO	AUTOMATIC	CTR	CENTER	FES	FLARED END SECTION	ID	INSIDE DIAMETER,	MPT	MALE PIPE THREAD	PWD	PLYWOOD	SYMM	SYMMETRICAL	YH	YARD HYDRANT
AUX	AUXILIARY	CTRL	CONTROL	FEXT	FIRE EXTINGUISHER		INTERIOR DIMENSION	MRGWB	MOISTURE-RESISTANT	PWJ	PLYWOOD WEB JOIST	SYN	SYNTHETIC	YS	YIELD STRENGTH
AVE	AVENUE	CVT	CULVERT	FF	FAR FACE, FACTORY FINISH, FLAT FACE	IE	INVERT ELEVATION, FOR EXAMPLE	MS	MOP SINK	PZ	PIEZOMETER	SYS	SYSTEM		
AVG	AVERAGE	CU	COPPER, CUBIC	FG	FINISHED GRADE	IF	INSIDE FACE	MSL	MEAN SEA LEVEL						
AWG	AMERICAN WIRE GAGE	CW	CLOCKWISE	FH	FIRE HYDRANT	IH	INTAKE HOOD	MT	MOUNT	Q	RATE OF FLOW	T&B	TOP AND BOTTOM		
AWT	ACOUSTICAL WALL TILE	CY	CUBIC YARD	FIG	FIGURE	IMP	IMPACT	MU	MASONRY UNIT	QT	QUARRY TILE	T&G	TONGUE AND GROOVE		
				FIN	FINISH	IN	INCH	MULL	MULLION	QTR	QUARTER	T	TILE, TREAD, TOP		
		d	PENNY (NAIL MEASURE)	FJT	FLUSH JOINT	INC	INCLUDE, INCANDESCENT	MV	MEDIUM VOLTAGE	QTY	QUANTITY	TA	TOILET ACCESSORY, TEMPERED AIR		
B	BOTTOM	D	DEEP, DIFFUSER, DRAIN	FL	FLOW, FLOW LINE	INF	INLFUENT	MW	MONITORING WELL	QUAL	QUALITY	TAN	TANGENT		
B TO B	BACK TO BACK	DB	DUCT BANK, DECIBEL, DRY BULB	FLEX	FLEXIBLE	INSTR	INSTRUMENTATION					TBM	TEMPORARY BENCHMARK		
BAL	BALANCE	DBA	DEFORMED BAR ANCHOR	FLG	FLANGE	INSUL	INSULATION	N	NORTH, NEUTRAL	R&R	REMOVE AND REPLACE	TCE	TEMPORARY CONSTRUCTION EASEMENT		
BBD	BULLETIN BOARD	DBL	DOUBLE	FLOR	FLOURESCENT	INT	INTERIOR, INTERSECTION	NA	NOT APPLICABLE	R&S	REMOVE AND SALVAGE	TD	TANK DRAIN		
BC	BASE CABINET, BOTTOM CHORD.	DC	DIRECT CURRENT	FLR	FLOOR	INTR	INTERMEDIATE, INTERIOR	NAT	NATURAL, NATIONAL	R	RADIUS, REGISTER, RISER	TEF	TROWELED EPOXY FLOORING		
BD	BOARD	DEG	DEGREE	FLS	FLASHING, FLUSH	INV	INVERT	NC	NORMALLY CLOSED	RA	RETURN AIR	TEMP	TEMPORARY, TEMPERATURE		
BE	BOTH ENDS, BELL END	DEG C	DEGREE CENTIGRADE	FNDN	FOUNDATION	IPS	IRON PIPE SIZE	NEG	NEGATIVE	RB	RESILIENT BASE, ROCK BERM	THD	THREAD		
BF	BOTH FACES, BOTTOM FACE,	DEG F	DEGREE FAHRENHEIT	FN	FENCE	IPT	INTERNAL PIPE THREAD	NF	NEAR FACE, NON-FUSED	RCPT	RECEPTACLE	THK	THICK		
BITUM	BITUMINOUS	DEMO	DEMOLITION	FO	FINISHED OPENING, FIBER OPTIC	IR	INSIDE RADIUS, IRON ROD	NIC	NOT IN CONTRACT	RD	ROOF DRAIN	THRESH	THRESHOLD		
BKG	BACKING	DEP	DEPRESSED	FOB	FLAT ON BOTTOM	IRR	IRRIGATION	NO	NORMALLY OPEN, NUMBER	REC	RECESS	TKBD	TACK BOARD		
BL	BASE LINE	DEPT	DEPARTMENT	FOC	FACE OF CONCRETE, FACE OF CURB	ISO	ISOMETRIC	NOM	NOMINAL	RECD	RECEIVED	TOB	TOP OF BOLT, TOP OF BANK,		
BLDG	BUILDING	DET	DETAIL	FOF	FACE OF FINISH			NPS	NOMINAL PIPE SIZE	RECT	RECTANGULAR		TOP OF BEAM, TOP OF BERM		
BLK	BLOCK	DI	DROP INLET, DUCTILE IRON,	FOM	FACE OF MASONRY	JB	JUNCTION BOX	NPT	NATIONAL PIPE THREAD	RED	REDUCER	TOC	TOP OF CURB, TOP OF CONCRETE		
BLKG	BLOCKING		DIGITAL INPUT	FOS	FACE OF STUDS	JCT	JUNCTION	NS	NEAR SIDE	REF	REFERENCE	TOD	TOP OF DUCT		
BM	BENCHMARK, BEAM	DIA	DIAMETER	FOT	FLAT ON TOP	JF	JOINT FILLER	NTS	NOT TO SCALE	REINF	REINFORCING	TOF	TOP OF FOOTING		
BOC	BACK OF CURB, BOTTOM OF CONCRETE	DIAG	DIAGONAL, DIAGRAM	FPT	FEMALE PIPE THREAD	JST	JOIST	NWL	NORMAL WATER LEVEL	REM	REMOVE	TOG	TOP OF GRATING		
BOD	BOTTOM OF DUCT	DIFF	DIFFERENTIAL, DIFFERENCE	FR	FRAME	JT	JOINT			REQD	REQUIRED	TOL	TOLERANCE, TOP OF LEDGER		
BOG	BOTTOM OF GRILLE	DIM	DIMENSION	FRP	FIBERGLASS REINFORCED PLASTIC					RESIL	RESILIENT	TOM	TOP OF MASONRY		
BOL	BOTTOM OF LOUVER, BOLLARD	DISCH	DISCHARGE	FRTM	FIRE RETARDANT TREATED MATERIAL			O TO O	OUT TO OUT	RET	RETAINING, RETURN	TOP	TOP OF PLATE		
BOP	BOTTOM OF PIPE	DIST	DISTANCE, DISTRIBUTION	FS	FLOOR SINK, FAR SIDE	K	KIP	OA	OUTSIDE AIR, OVERALL	REV	REVISION, REVERSE	TOPO	TOPOGRAPHY		
BOR	BOTTOM OF REGISTER	DIV	DIVISION	FT	FEET, FOOT	KB	KNEE BRACE	OC	ON CENTER	RF	RESILIENT FLOORING	TOS	TOP OF SLAB,		
BOT	BOTTOM	DL	DEAD LOAD	FTG	FOOTING, FITTING	KCMIL	THOUSAND CIRCULAR MILS	OCPD	OVER CURRENT PROTECTION DEVICE	RFG	ROOFING		TOP OF STEEL, TOE OF SLOPE		
BOU	BOTTOM OF UNIT	DMJ	DOUBLE MECHANICAL JOINT	FUR	FURRED, FURRING	KD	KNOCK DOWN	OD	OUTSIDE DIAMETER	RFL	REFLECTED, REFLECTOR	TOW	TOP OF WALL, TOP OF WEIR		
BP	BASE PLATE	DMPF	DAMP PROOFING	FURN	FURNITURE, FURNISH	KO	KNOCK OUT	OED	OPEN END DUCT	RGH	ROUGH	TP	TOILET PARTITION, TELEPHONE POLE,		
BRG	BEARING	DN	DOWN	FUT	FUTURE	KSI	KIPS PER SQUARE INCH	OF	OUTSIDE FACE, OFFICE FURNISHING	RGS	RIGID GALVANIZED STEEL		TOE PLATE, TRAP PRIMER		
BRGP	BEARING PLATE	DO	DISSOLVED OXYGEN, DIGITAL OUTPUT,	FV	FACE VELOCITY	KW	KILOWATT	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED	RGS-PVC	PVC COATED RGS	TPD	TOILET PAPER DISPENSER		
BRKT	BRACKET		DITTO	FW	FIELD WELD, FIRE WALL			OFOI	OWNER FURNISHED OWNER INSTALLED	RH	RELIEF HOOD, RIGHT HAND, RELATIVE HUMIDITY	TPG	TOPPING, THROUGH PLATE GIRDER		
BS	BOTH SIDES	DP	DEPTH	FWD	FORWARD			OG	ORIGINAL GROUND	RL	REQUIRED LAP	TPV	THERMOPLASTIC VULCANIZATE	GENERAL NOTES:	
BTM	BOTTOM	DPDT	DOUBLE POLE, DOUBLE THROW	FEW	FURNISHED WITH EQUIPMENT	L	ANGLE, LENGTH, LAVATORY, LINTEL	OH	OVERHEAD	RLFA	RELIEF AIR	TR	TRANSOM	1. THESE ABBREVIATIONS APPLY TO THE ENTIRE	
BTU	BRITISH THERMAL UNIT	DPST	DOUBLE POLE, SINGLE THROW	FXTR	FIXTURE	LAD	LADDER	OPNG	OPENING	RND	ROUND	TRANS	TRANSITION	SET OF CONTRACT DRAWINGS.	
BTW	BETWEEN	DS	DOWN SPOUT			LAM	LAMINATE	OPP	OPPOSITE	RNG	RUNNING	TRD	TRENCH DRAIN		
BTWLD	BUTT WELD	DT	DOUBLE TEE, DRIP TRAP ASSEMBLY			LATL	LATERAL	OPT	OPTIONAL	RO	ROUGH OPENING	TYP	TYPICAL	2. LISTING OF ABBREVIATIONS DOES NOT IMPLY	
BU	BELL UP, BUILT-UP	DUP	DUPLICATE	G	GRILLE, GROUND	LB	LAG BOLT, POUND	OR	OUTSIDE RADIUS	ROW	RIGHT-OF-WAY			THAT ALL ABBREVIATIONS ARE USED IN	
BUR	BUILT-UP ROOFING	DWG	DRAWING	GA	GAGE (METAL THICKNESS)	LCTB	LIQUID CHALK AND TACK BOARD	ORD	OVERFLOW ROOF DRAIN	RPM	REVOLUTIONS PER MINUTE	U	URINAL	THE CONTRACT DRAWINGS.	
BW	BOTH WAYS	DWL	DOWEL	GAL	GALLON	LDG	LANDING	ORIG	ORIGINAL	RR	RAILROAD	UG	UNDERGROUND		
BYP	BYPASS	DWR	DRAWER	GALV	GALVANIZED	LDR	LEADER	OVFL	OVERFLOW	RSP	ROCK SLOPE PROTECTION	ULT	ULTIMATE	3. ABBREVIATIONS SHOWN ON THIS SHEET	
				GB	GRAB BAR, BRADE BREAK	LE	LIFTING EYE	OVHG	OVERHANG	RT	RIGHT	UNFN	UNFINISHED	INCLUDEVARIATIONS OF A WORD. FOR	
		E	EAST	GC	GROOVED COUPLING	LF	LINEAR FOOT	OZ	OUNCE	RVT	RESILIENT VINYL TILE	UNO	UNLESS NOTED OTHERWISE	EXAMPLE, "MOD" MAY MEAN MODIFY OR	
C TO C	CENTER TO CENTER	EA	EACH, EXHAUST AIR	GD	GUARD	LG	LONG			RY	READY	UTIL	UTILITY	MODIFICATION; "INC" MAY MEAN INCLUDED OR	
C&G	CURB AND GUTTER	EC	ELECTRICAL CONTRACTOR	GEN	GENERAL	LH	LEFT HAND							INCLUDING AND "REINF" MAY MEAN EITHER	
C	CHANNEL SHAPE, CENTIGRADE, CONDUIT	ECC	ECCENTRIC	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	LIN	LINEAR	P	PAINT					REINFORCEOR REINFORCING.	
CAB	CABINET	ED	EQUIPMENT DRAIN	GFMU	GROUND FACE MASONRY UNIT	LIQ	LIQUID	PA	PUBLIC ADDRESS	S	SOUTH, SINK	V	VENT, VELOCITY, VOLT		
CAP	CAPACITY	EDB	ELECTRICAL DUCT BANK	GG	GUTTER GRADE	LL	LIVE LOAD	PAR	PARALLEL, PARAPET	SA	SUPPLY AIR	VA	VOLT AMPERE	4. SEE INSTRUMENTATION LEGEND SHEET FOR	
CAT	CATALOG, CATALOGIORY	EE	EACH END	GJ	GROOVED JOINT	LLH	LONG LEG HORIZONTAL	PB	PANIC BAR, PULL BOX	SAMU	SOUND-ABSORBING MASONRY UNIT	VAC	VACUUM	PROJECT-SPECIFIC EQUIPMENT SYMBOLS,	
CAV	CAVITY	EF	EACH FACE	GL	GLASS	LLV	LONG LEG VERTICAL	PBD	PARTICLE BOARD	SAN	SANITARY	VAR	VARNISH, VARIABLE,	EQUIPMENT ABBREVIATIONS, AND PIPING	
CB	CATCH BASIN	EFF	EFFLUENT, EFFICIENCY	GLB	GLASS BLOCK, GLULAM BEAM	LMLU	LIQUID MARKER LECTURE UNIT	PC	POINT OF CURVE, PIECE, PRECAST	SB	SPLASH BLOCK	VB	VAPOR BARRIER, VINYL BASE, VALVE BOX	SYSTEM ABBREVIATIONS.	
CCB	CONCRETE BLOCK	EHH	ELECTRICAL HANDHOLE	GND	GROUND	LNG	LONGITUDINAL	PCC	POINT OF COMPOUND CURVATURE	SC	SOLID CORE	VC	VERTICAL CURVE		
CCW	COUNTER CLOCKWISE	EIFS	EXTERIOR INSULATION & FINISH SYSTEM	GP	GUY POLE	LOC	LOCATION	PCL	PRIMARY CLARIFIER	SCH	SCHEDULE	VCP	VITRIFIED CLAY PIPE		
CDF	CONTROLLED-DENSITY FILL	EJ	EXPANSION JOINT	GR	GRADE	LP	LOW POINT	PCF	POUNDS PER CUBIC FOOT	SCL	SECONDARY CLARIFIER	VCT	VINYL COMPOSITION TILE,		
CE	CONCRETE EDGE	EL	ELBOW, ELEVATION	GRTG	GRATING	LPS	LOW-PRESSURE SODIUM	PCT	PERCENT	SCHEM	SCHEMATIC	VEL	VELOCITY		
CER	CERAMIC	ELEC	ELECTRICAL	GSB	GYPSUM SHEATHING BOARD	LR	LONG RADIUS	PE	PLAIN END	SCN	SCREEN		VENTILATION		
CF	CUBIC FEET (FOOT)	EMBD	EMBEDDED	GT	GREASE TRAP	LT	LEFT	PED	PEDESTAL	SE	STEEL/ALUMINUM EDGE	VERT	VERTICAL		
CFL	COUNTER FLASHING	EMBED	EMBEDMENT	GVL	GRAVEL	LTD	LIMITED	PEN	PENETRATION	SEC	SECONDARY, SECONDS	VERTS	VERTICAL REINFORCING		
CHBD	CHALKBOARD	EMER	EMERGENCY	GW	GUY WIRE	LTG	LIGHTING	PERF	PERFORATED	SECT	SECTION	VG	VERTICAL GRAIN		
CHD	CHORD	EMH	ELECTRICAL MANHOLE	GWB	GYPSUM WALLBOARD	LTL	LINTEL	PERM	PERMANENT	SEP	SEPARATE	VIF	VERIFY IN FIELD		

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49TH JONATHAN RYAN MOYERS No. CE-12718 REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER "Alaska at its Best!"

City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL ABBREVIATIONS

0 1" 2"

FILENAME 000G002.dwg
SCALE SCALE

SHEET 000G002

SITE PLAN SYMBOLOGY

- EMBANKMENT SLOPE
- 50.5 — CONTOUR
- VEGETATION (SIZE)
- CO — CLEANOUT
- MH — MANHOLE
- MW — MONITORING WELL
- PZ — PIEZOMETER
- CB — STORM DRAIN CATCH BASIN
- UV — UTILITY VAULT
- PP — POWER POLE
- TP — TELEPHONE POLE
- FH — FIRE HYDRANT
- YH-X — YARD HYDRANT
- 75.5 — EXISTING SPOT ELEVATION
- 75.8 — FINISHED SPOT ELEVATION
- CP-X — HORIZONTAL CONTROL POINT
- BENCHMARK
- TH-"X" — IDENTIFICATION AND APPROXIMATE LOCATION OF SOIL TEST HOLE
- DOWNGUY
- EXTERIOR PAD MOUNTED TRANSFORMER
- POLE - MOUNTED TRANSFORMER
- Y — ELECTRICAL HANDHOLE OR MANHOLE Y - MHX OR HHX, WHERE X INDICATES SEQUENCE NUMBER

NOTES:

1. UTILITIES THAT ARE SUSPENDED ABOVE GRADE ARE DESIGNATED BY THE PREFIX "OH" (OVERHEAD).

- T — TELEPHONE LINE
- E — ELECTRIC LINE
- F — FIBER OPTIC
- C — COMMUNICATION
- HANDRAIL AND GUARDRAIL
- PIPELINE
- LARGE PIPELINE
- UTILITY BENEATH STRUCTURE
- RAILROAD
- DRAINAGE FLOW
- NATURAL WATERWAY
- X — X — CHAIN LINK FENCE
- X — X — FIELD FENCE
- PROPERTY LINE
- CENTERLINE
- RB — ROCK BERM
- SF — SILT FENCE
- EASEMENT
- LIMITS OF CONSTRUCTION
- RIGHT OF WAY

MATERIALS IN PLAN/SECTION

- ACOUSTICAL CEILING TILE (SECTION)
- ASPHALT (PLAN OR SMALL-SCALE SECTION)
- ASPHALT (LARGE-SCALE SECTION)
- BATT INSULATION (SECTION)
- BRICK MASONRY (PLAN AND/OR SECTION)
- CHECKERED PLATE (PLAN)
- CONCRETE (PLAN AND/OR SECTION)
- CONCRETE MASONRY (PLAN AND/OR SECTION)
- DEMOLITION (PLAN AND/OR SECTION)
- EARTH (SECTION)
- FILTER POINT MAT (PLAN)
- FINISHED WOOD (SECTION)
- GLULAM LUMBER (SECTION)
- GRANULAR FILL (SECTION)
- GRATING (SECTION)
- GRATING (PLAN)
- GROUT (SECTION)
- GYPSUM BOARD (SECTION)
- METAL (SECTION)
- ORIENTED STRAND BOARD (SECTION)
- PARTICLE BOARD (SECTION)
- PLYWOOD (LARGE-SCALE SECTION)
- PLYWOOD (SMALL-SCALE SECTION)
- PRECAST CONCRETE (PLAN AND/OR SECTION)
- RIGID INSULATION (SECTION)
- RIPRAP (PLAN AND/OR SECTION)
- SAND (SECTION)
- SOD (SECTION)
- WEEP JOINT MORTAR PROTECTION SYSTEM (SECTION)
- WOOD - CONTINUOUS (SECTION)
- WOOD BLOCKING (SECTION)
- STRUCTURAL FILL (SECTION)

GENERAL SYMBOLOGY

PLAN
1/4"=1'-0"

PLAN TITLE

SECTION CUT MARKER
- X / XXX
- SECTION LETTER
- FLAG INDICATES DIRECTION OF SECTION CUT
- SHEET WHERE SECTION IS LOCATED *

SECTION
3/8"=1'-0"

SECTION TITLE
- X / XXX
- SECTION LETTER
- SHEET WHERE SECTION VIEW IS FIRST CUT *

DETAIL MARKER
- X / XXX
- DETAIL NUMBER
- SHEET WHERE DETAIL IS LOCATED *

FOR REFERENCING DETAILS INCLUDED IN DRAWING SET.

STANDARD DETAIL MARKER
- 40 05 00-16

1. FOR REFERENCING STANDARD DETAILS BOUND IN VOLUME 4 OF 4.
2. ALL DESIGN DETAILS ARE TYPICAL AND MUST BE USED IF DESIGN DETAIL DESIGNATION IS NOT SHOWN.
3. THE TERM STANDARD DETAIL, OR A FORM OF IT, IS SYNONYMOUS WITH DESIGN DETAIL AND REFERS TO THE DESIGN DETAILS FOUND IN THIS SET OF CONTRACT DOCUMENTS.
4. THE DESIGN DETAILS REPRESENT THE CHARACTER AND NATURE OF THE WORK REQUIRED THROUGHOUT THE PROJECT. ALL ASSOCIATED WORK SHALL BE IN ACCORDANCE WITH THE DESIGN DETAILS SHOWN WHETHER THE DETAILS ARE SPECIFICALLY REFERENCED OR NOT.

DETAIL
3/8"=1'-0"

DETAIL TITLE
- # / XXX
- DETAIL NUMBER
- SHEET WHERE DETAIL VIEW IS FIRST CUT *

SINGLE ELEVATION OR PHOTO MARKER
- X / XXX
- ELEVATION NUMBER
- ARROW INDICATES POINT OF VIEW
- SHEET WHERE ELEVATION IS LOCATED *

MULTIPLE ELEVATION OR PHOTO MARKER
- A / B / C / D, X / XXX
- ELEVATION NUMBER
- ARROW INDICATES POINT OF VIEW ELEVATION
- INDICATES SHEET WHERE ELEVATION IS LOCATED

ELEVATION
3/8"=1'-0"

ELEVATION TITLE
- # / XXX
- ELEVATION IDENTIFICATION NUMBER
- SHEET WHERE DETAIL VIEW IS FIRST CUT *

* FOR COMMON DETAILS AND SECTIONS OR DETAILS THAT ARE CUT OR CALLED OUT ON MULTIPLE SHEETS, THE SHEET NUMBER IS REPLACED BY A DASH (-).

ARCHITECTURAL
- TARGET ELEVATION
- ROOM NAME / XXXX — ROOM NUMBER
- X / XXXXX — DOOR NUMBER
- A — COLUMN GRID LINE
- X — WALL TYPE
- X — WINDOW TYPE
- X — LOUVER
- X — ACCESSORY, FURNITURE, AND MISCELLANEOUS EQUIPMENT IDENTIFIER

KEY NOTE DESIGNATION
- # — KEY NOTE NUMBER

MATCHLINE

SEE SHEET XX FOR CONTINUATION

GENERAL LINE SYMBOLOGY

- 4-HOUR FIRE RATED WALL
- 3-HOUR FIRE RATED WALL
- 2-HOUR FIRE RATED WALL
- 1-HOUR FIRE RATED WALL
- COLUMN GRID LINE/CENTERLINE

SHEET NAMING CONVENTION

AREA DESIGNATION

000	GENERAL
000	CIVIL
100	HEADWORKS
200	PRIMARY TREATMENT AND MBBR
300	SECONDARY TREATMENT
400	WAS/RAS
500	CONTROL BUILDING/CHEMCIAL SYSTEMS
600	UV DISINFECTION AND EFFLUENT PUMPING
800	PROCESS AND INSTRUMENTATION DIAGRAMS

DISCIPLINE DESIGNATION & DISCIPLINE ORDER

G	GENERAL
C	CIVIL
X	DEMOLITION
D	PROCESS
S	STRUCTURAL
A	ARCHITECTURAL
M	MECHANICAL (HVAC)
P	PLUMBING
E	ELECTRICAL
Y	INSTRUMENTATION & CONTROL

DRAWING TYPE DESIGNATION

0	GENERAL
1	PLANS
2	ELEVATIONS
3	SECTIONS
4	LARGE SCALE VIEWS
5	DETAILS
6	DIAGRAMS
7	SCHEDULES

SHEET NUMBERING

SERIES DESIGNATION	DISCIPLINE DESIGNATION	DRAWING TYPE DESIGNATION	SEQUENCE NUMBER
300	D	1	01

THIS EXAMPLE= PRIMARY TREATMENT, PROCESS, PLAN VIEW, SHEET 01

GENERAL NOTES:

1. THIS IS A STANDARD SHEET SHOWING COMMON SYMBOLOGY. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.
3. SEE SHEET 000G004 FOR EQUIPMENT AND PIPING ABBREVIATIONS.

CRW ENGINEERING GROUP, LLC

HDR

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
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WWTF
Improvements Project
Phase 2

GENERAL LEGENDS, SYMBOLS, AND NOTES

0 — 1" — 2"

FILENAME 000G003.dwg
SCALE NONE

SHEET 000G003

PIPING ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
W1/PW	POTABLE CITY WATER.
W2	POTABLE WATER - WELL
AL	ALUM
ALP	AIR LOW PRESSURE - AERATION AIR
CD	CHEMICAL DRAIN
CLDI	CEMENT LINED DUCTILE IRON
CO	CONDENSATE
CVT	CHEMICAL VENT
D	DRAIN
DF	DEFOAMING AGENT
EFF	PLANT EFFLUENT
HPA	HIGH PRESSURE AIR
HW	HOT WATER
IA	INSTRUMENT AIR
ML	MIXED LIQUOR
NG	NATURAL GAS
NPW	NON POTABLE WATER
OF	OVERFLOW
PCW	POTABLE COLD WATER
PD	PUMPED DRAINAGE
PLI	PLANT INFLUENT
POL	POLYMER
POS	POLYMER SOLUTION
PW	PLANT WATER
RAS	RETURN ACTIVATED SLUDGE
RS	RAW SEWAGE
SAN	SANITARY SEWER
SCUM	SECONDARY SCUM
SE	SECONDARY EFFLUENT
SHY	SODIUM HYDROXIDE (CAUSTIC)
SI	SECONDARY INFLUENT
SMP	SAMPLE
SPARE	SPARE
STW	STORMWATER
SW	SEAL WATER
TD	TANK DRAIN
TW	TEMPERED WATER
V	VENT
WAS	WASTE ACTIVATED SLUDGE

EQUIPMENT ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
AC	AIR COMPRESSOR
A/C	AIR CONDITIONER(ING)
ACU	AIR CONDITIONING UNIT
ACCU	AIR COOLED CONDENSING UNIT
AD	ANAEROBIC DIGESTER
AEX	AIR EXTRACTOR
AG	AERATION GRID
AHU	AIR HANDLING UNIT
AR	AIR RECEIVER
ARD	AIR RECEIVER DRYER
ARV	AIR RELEASE/VACUUM RELEASE VALVE
BCV	BALL CHECK VALVE
BFP	BACK FLOW PREVENTER
BFT	BULK FERRIC TANK
BFV	BUTTERFLY VALVE
BLR	BLOWER
BPRV	BACK PRESSURE REGULATING VALVE
BV	BALL VALVE
CBA	COARSE BUBBLE AERATOR
CC	CALIBRATION COLUMN/COOLING COIL
CDP	CHEMICAL DRAIN PUMP
CF	CABINET FAN
CHL	CHILLER
CL	CHLORINATOR
CM	CHEMICAL MIXER
CMP	CHEMICAL METERING PUMP
CST	SEDIMENT TRAP
CV	CONTROL VALVE OR CHECK VALVE
DIV	DIAPHRAGM VALVE
DP	DRAIN PUMP
DV	DIVERSION VALVE
EF	EXHAUST FAN
EG	ENGINE GENERATOR
ERV	ENERGY RECOVERY VENTILATOR
ESEW	EMERGENCY SHOWER / EYEWASH
EUH	ELECTRICAL UNIT HEATER
EV	EVAPORATOR
FD	FERMENTER MECHANISM
FLT	FILTER
FM	FLOW METER
FT	FLAME TRAP
FTA	FLAME TRAP ASSEMBLY
GLV	GLOBE VALVE
GUH	GAS UNIT HEATER
GV	GATE VALVE
GW	GRIT WASHER
HAT	HATCH
HBC	HOIST - BRIDGE CRANE TYPE
HEX	HEAT EXCHANGER
HLP	HEAT LOOP CIRCULATION PUMP
HMR	HOIST - MONORAIL TYPE
HP	HEAT PUMP
HWB	HOT WATER BOILER
HWBP	HOT WATER BOILER PUMP
HWC	HOT WATER COIL
HWDH	HOT WATER DUCT HEATER
HWH	HOT WATER HEATER
HWUH	HOT WATER UNIT HEATER
IS	INFLUENT SCREEN
ISB	INTRINSICALLY SAFE BARRIER
ISR	INTRINSICALLY SAFE RELAY
KGV	KNIFE GATE VALVE
LBU	LIVE BIN UNLOADER

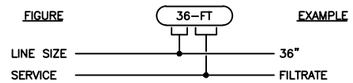
LCP	LOCAL CONTROL PANEL
LV	LOUVER
MCC	MOTOR CONTROL CENTER
MIX	AERATION BASIN MIXER
M	MOTOR
MOV	MOTOR OPERATED VALVE
MUU	MAKE UP AIR UNIT
OCF	ODOR CONTROL FAN
OCU	ODOR CONTROL UNIT
OS	ODOR SCRUBBER
OTF	OUTFALL
P	PUMP
PBS	POLYMER BLENDING SYSTEM
PCD	PRIMARY CLARIFIER DRIVE
PCV	PRESSURE CONTROL VALVE
PDI	PRESSURE DIFFERENTIAL
PMP	POLYMER METERING PUMP
PNV	PINCH VALVE
PRV	PRESSURE REGULATING/RELIEF VALVE
PU	PRESSURIZATION UNIT
PV	PLUG VALVE
PWP	PLANT WATER PUMP
RASP	RETURN ACTIVATED SLUDGE PUMP
RHC	REHEAT COIL
RSP	RAW SEWAGE PUMP
SCD	SECONDARY CLARIFIER MECHANISM
SCP	SCUM PUMP
SDG	SLIDE GATE
SF	SUPPLY FAN
SG	SLUDGE GRINDER
SH	SPACE HEATER
SKY	SKYLIGHT
SM	SLUDGE MIXER/STATIC MIXER
SP	SAMPLE VALVE
SS	SURGE SUPPRESSOR
ST	SEPTAGE TANK
STG	STOP GATE WATER
STR	STRAINER
SUG	SLUICE GATE
SUP	SUMP PUMP
SV	SOLENOID VALVE
SWC	SCREENINGS WASHER COMPACTOR
SWGR	ELECTRICAL SWITCHGEAR
SWP	SURFACE WASH PUMP
T	THERMOSTAT/TANK
TAC	TERMINAL AIR CONDITIONERS
TCV	TEMPERATURE CONTROL VALVE
TS	TELESCOPING VALVE
TT	TEMPERATURE TRANSMITTER
UH	UNIT HEATER
UV	ULTRAVIOLET DISINFECTION
UVB	UV DISINFECTION BANK
UVHC	UV HYDRAULIC CENTER
UVPD	UV POWER DISTRIBUTION CENTER
UVSC	UV SYSTEM CONTROL
VFD	VARIABLE FREQUENCY DRIVE
WASP	WASTE ACTIVATED SLUDGE PUMP
WC	WASHER COMPACTOR
WG	WEIR GATE
WH	WATER HEATER
XFMR	TRANSFORMER
XT	HEAT RESERVOIR SYSTEM EXPANSION TANK
YH	YARD HYDRANT

PROCESS AREAS

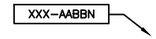
PROCESS AREA	PROCESS DESCRIPTION
01	INFLUENT BUILDING
02	BLOWER BUILDING
03	EFFLUENT BUILDING
04	LAB BUILDING
05	CONTROL BUILDING
11	INFLUENT PUMPING
12	INFLUENT SCREENINGS
21	MBBR AIR HEADER
22	BOD CELL 1
23	AMMONIA CELL 1
24	AMMONIA CELL 2
25	MBBR EFFLUENT CHANNEL
26	SECONDARY DISTRIBUTION BOX
31	BLOWERS
32	SECONDARY CLARIFIERS
33	SECONDARY SCUM PUMPING
34	WAS PUMPING
35	DEWATERING PUMPING
41	UV DISINFECTION
42	PLANT EFFLUENT
43	PLANT WATER
51	LAGOON 1
52	LAGOON 2
53	LAGOON 3
71	DEFOAMING AGENT
72	ALUM
73	POLYMER
74	CAUSTIC/ALKALINITY

IDENTIFICATION SYMBOLOGY

PIPING IDENTIFICATION



EQUIPMENT IDENTIFICATION



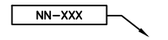
XXX: EQUIPMENT TYPE
(ACCORDING TO ISA 5.31 – SEE TABLE)

AA: PROCESS AREA

BB: INSTRUMENT OR EQUIPMENT GROUP

N: SUFFIX FOR DEVICE NUMBER

VALVE IDENTIFICATION



NN: VALVE SIZE

XXX: EQUIPMENT TYPE
(ACCORDING TO ISA 5.31 – SEE TABLE)

CRW ENGINEERING GROUP, LLC

HDR

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A	JUNE 2021	ISSUED FOR BID

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Phase 2

GENERAL
PIPING AND EQUIPMENT ABBREVIATIONS, PROCESS AREAS AND INDENTIFICATION SYMBOLOGY

0 1" 2"

FILENAME 000G004.dwg
SCALE SCALE

SHEET
000G004

ABBREVIATIONS	
(E)	EXISTING
(N)	NEW
AB	ANCHOR BOLT
ALT	ALTERNATE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ALLOWABLE STRESS DESIGN
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
BM	BEAM
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DECK
BOF	BOTTOM OF FOUNDATION
BOS	BOTTOM OF STEEL
BOT	BOTTOM
C&C	COMPONENTS AND CLADDING
CFS	COLD-FORMED STEEL
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMP	COMPRESSIVE
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
DET	DETAIL
DF	DOUGLAS-FIR
DIA	DIAMETER
DIM(S)	DIMENSION(S)
DL	DEAD LOAD
DN	DOWN
DWG(S)	DRAWING(S)
EA	EACH
EJ	EXPANSION JOINT
EQ	EQUAL
EQUIP	EQUIPMENT
ESR	EVALUATION SERVICE REPORT
EW	EACH WAY
FFE	FINISHED FLOOR ELEVATION
FPSF	FROST PROTECTED SHALLOW FOUNDATION
FS	FROST SUSCEPTIBLE
FT	FOOT OR FEET
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
GLB	GLUE-LAMINATED BEAM
GP	GUSSET PLATE
GR	GRADE
GSN	GENERAL STRUCTURAL NOTES
HF	HEM-FIR
HOR	HORIZONTAL
HS	HIGH STRENGTH
HSS	HOLLOW STRUCTURAL SECTION
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
IEBC	INTERNATIONAL EXISTING BUILDING CODE
IN	INCH
JT	JOINT
K	KIP (1000 POUNDS)
KSI	KIPS PER SQUARE INCH
LBS	POUNDS
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LRFD	LOAD AND RESISTANCE FACTOR DESIGN
LWC	LIGHT WEIGHT CONCRETE
MAX	MAXIMUM

ABBREVIATIONS	
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MIN	MINIMUM
MRF	MANUFACTURER
MT	MAGNETIC PARTICLE TESTING
N/A	NOT APPLICABLE
NWC	NORMAL WEIGHT CONCRETE
OC	ON CENTER
OPP	OPPOSITE (MIRRORED)
PAF	POWDER ACTUATED FASTENER
PC	PILE CAP
PCC	PRECAST CONCRETE
PEMB	PRE-ENGINEERED METAL BUILDING
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
R	RADIUS
REINF	REINFORCED/REINFORCING
RT	RADIOGRAPHIC TESTING
SC	SLIP CRITICAL
SCH	SCHEDULE
SDI	STEEL DECK INSTITUTE
SEC	SECOND
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SIP	STRUCTURAL INSULATED PANEL
SLH	SHORT LEG HORIZONTAL
SLRS	SEISMIC LOAD RESISTING SYSTEM
SLV	SHORT LEG VERTICAL
SOG	SLAB ON GRADE
SP	SPACE
SPF	SPRUCE-PINE-FIR
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STR	STRUCTURAL
SUP	SUPPORT
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
TG	TRUSS GIRDER
THK	THICK OR THICKNESS
THRD	THREADED
TL	TOTAL LOAD
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOD	TOP OF DECK
TOF	TOP OF FOUNDATION
TOM	TOP OF MASONRY
TOP	TOP OF PLATE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UT	ULTRASONIC TESTING
VERT	VERTICAL
VSC2	VERCO SIDELAP CONNECTION
W/	WITH
W/C	WATER-TO-CEMENT
W/O	WITHOUT
WP	WORKING POINT
WPS('S)	WELDING PROCEDURE SPECIFICATION(S)
WSP	WOOD STRUCTURAL PANEL
WWF	WELDED WIRE FABRIC

SYMBOLS

DETAIL NUMBER / SHEET NUMBER — DETAIL CUT/CALLOUT

SECTION NUMBER / SHEET NUMBER — SECTION CUT

ELEVATION NUMBER / SHEET NUMBER — ELEVATION

IMAGE NUMBER / SHEET NUMBER — IMAGE REFERENCE

KEYNOTE

CONCRETE WALL, UNO

STEEL STUD WALL, UNO

WOOD STUD WALL, UNO

CJ — WALL CONTROL JOINT

WATER SURFACE LEVEL, VERIFY WITH CIVIL AND PROCESS DRAWINGS

DIRECTION OF SLOPE

CHANGE IN ELEVATION OR SLAB DEPRESSION

RIGID (MOMENT) CONNECTION

BEAM SPLICE

(15") — CIRCULAR OPENING IN BEAM

(15") — RECTANGULAR OPENING IN BEAM WEB

BRACED FRAME MEMBER

(12) — NUMBER OF HEADED STUDS ON COMPOSITE STEEL BEAM

<-2 1/2"> — TOP OF STEEL ELEVATION RELATIVE TO BOTTOM OF DECK ELEVATION

[D] — DROPPED BEAM

[F] — FLUSH BEAM

INDICATES NUMBER OF ROWS OF BOLTS AT CONNECTION IF MORE THAN ONE ROW OF BOLTS OCCURS

(c=1/2") — BEAM CAMBER SIZE

SPOT ELEVATION

℄ — CENTER LINE

Ø — DIAMETER

OPENING

MECHANICAL EQUIPMENT

SPAN DIRECTION

REVISION SYMBOL

MATERIALS & STRENGTH

CONCRETE

ITEMS	MIN COMP STRENGTH	MAX W/C RATIO	AIR ENTRAINMENT	SLUMP
FOUNDATIONS	4,500 PSI	0.42	---	1 - 3 IN
SLAB ON GRADE	4,500 PSI	0.42	---	1 - 4 IN

STRUCTURAL STEEL

ITEMS	ASTM	GRADE	MIN YIELD STRESS, Fy	REMARKS
WIDE-FLANGE	A992	---	50 KSI	---
SQUARE HSS	A500	C	50 KSI	---
ROUND HSS	A500	B	42 KSI	---
CHANNELS	A36	---	36 KSI	---
ANGLES	A36	---	36 KSI	---
PIPES	A53	B	35 KSI	---
PLATES, UNO	A36	---	36 KSI	---
BASE PLATES	A572	---	50 KSI	---
THREADED RODS	A36	---	36 KSI	---
THREADED RODS	F593	316	65 KSI	SS
COMMON BOLTS	A307	A	---	---
COMMON BOLTS	A304	---	---	SS
HIGH STRENGTH BOLTS	A325	---	---	---
WASHERS	F436	---	---	---
NUTS	A563	---	---	---
ANCHOR RODS	F1554	55	---	---
HEADED STUDS	A108	---	---	3/4"Ø UNO

NON-SHRINK GROUT

ITEMS	MIN COMP STRENGTH	PRODUCT	REMARKS
DRYPACK	7,000 PSI	FIVE STAR, SIKA 212 OR EQUIVALENT	---

REINFORCING STEEL

ITEMS	ASTM	GRADE	MIN YIELD STRESS, Fy	REMARKS
REBAR, #3	A615	40	40 KSI	---
REBAR, #4 - #9	A615	60	60 KSI	---
REBAR, WELDABLE	A706	60	60 KSI	---
WELDED WIRE FABRIC	A185	60	60 KSI	---

LIGHT GAUGE STEEL

ITEMS	TYPE	ASTM	GRADE	REMARKS
STEEL DECK	1 1/2"	A525	GR. 50	G60
STEEL STUDS, 20 - 18 GA	PER PLANS	A653	GR. 33	G60
STEEL STUDS, 16 - 12 GA	PER PLANS	A653	GR. 50	G60

WOOD

ITEMS	SIZE	SPECIES	GRADE	SPACING
ALL FRAMING	---	DF	#2	---

PLYWOOD SHEATHING

ITEMS	THICKNESS	SPAN INDEX RATIO	EDGE ATTACHMENT	FIELD ATTACHMENT
ROOF	5/8"	32/16	10d AT 6" OC	10d AT 12" OC
FLOOR*	3/4" T&G	48/24	10d AT 6" OC	10d AT 10" OC
WALL**	7/16"	24/0	8d AT 6" OC	8d AT 12" OC

*USE RING SHANK NAILS AND GLUE SHEATHING TO FRAMING WITH AN APA AFG-01 QUALIFIED GLUE.
**AT SHEAR WALL SEE SHEAR WALL SCHEDULE FOR SHEATHING THICKNESS AND ATTACHMENT.

POWDER ACTUATED FASTENERS

ITEMS	SHANK DIAMETER	PRODUCT	REMARKS
POWDER ACTUATED FASTENER	0.157 IN	HILTI X-U P8	ICC ESR-2269

POST INSTALLED ANCHORS

ITEMS	BASE MATERIAL	CONNECTOR	PRODUCT	REMARKS
EPOXY ANCHOR	CONCRETE	THREADED ROD	HIT-HY 200-R ADHESIVE (HILTI)	ICC ESR-3187
EXPANSION ANCHOR	CONCRETE	---	KWIK BOLT TZ (HILTI)	ICC ESR-1917
SCREW ANCHOR	CONCRETE	---	KWIK HUS-EZ (HILTI)	ICC ESR-3027

DESIGN CRITERIA

DESIGN CODES AND STANDARDS

IBC-12: INTERNATIONAL BUILDING CODE, WITH LOCAL AMENDMENTS
CONCRETE TANKS AND VAULTS: AMERICAN CONCRETE INSTITUTE (ACI) 350-2006, "CODE REQUIREMENTS FOR ENVIROMENTAL CONCRETE STRUCTURES."
ASCE/SEI 7-10: MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
ACI 318-14: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
ANSI/AISC 360-10: SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

RISK CATEGORY	III

DESIGN LIVE LOADS

LOCATION	UNIFORM PSF	CONCENTRATED LBS	REMARKS
ROOFS, UNO	40*	---	---
FLOORS, UNO	250	---	HEAVY STORAGE, AT-GRADE SLAB
EQUIPMENT PLATFORM AND CAUSTIC ROOM LID	125	---	LIGHT STORAGE
TANK COVERS AND LIDS	20*	---	---

DESIGN SNOW LOADS	
GROUND SNOW LOAD, Pg	50 PSF
SNOW IMPORTANCE FACTOR, Is	1.1
SNOW EXPOSURE FACTOR, Ce	1.0
SNOW THERMAL FACTOR, Ct (WARM)	1.0
SNOW THERMAL FACTOR, Ct (COLD)	1.2
FLAT-ROOF SNOW LOAD, Pf (UNO)	40 PSF
FLAT-ROOF SNOW LOAD, Pf (TANK COVERS AND LIDS)	50 PSF
DESIGN WIND LOADS	
BASINC WIND SPEED (3-SECOND GUST)	130 MPH
EXPOSURE CATEGORY	C
TOPOGRAPHIC FACTOR, Kzt	1.0
DESIGN SEISMIC LOADS	
SEISMIC IMPORTANCE FACTOR, Ie	1.25
SITE CLASS	D
MAPPED SPECTRAL RESPONSE, SMS / SM1	1.50g / 1.051g
DESIGN SPECTRAL RESPONSE, SDS / SD1	1.00g / 0.701g
SEISMIC DESIGN CATEGORY, SDC	D
PEAK GROUND ACCELERATION, PGA	0.59G
EARTHWORK	
ALLOWABLE BEARING PRESSURE (BELOW GROUND SURFACE)	3,000 PSF
ALLOWABLE BEARING PRESSURE (CLARIFIERS AND VAULTS)	10,000 PSF
1/3 INCREASE FOR SHORT-TERM LOADS	YES
MIN FOOTING DEPTH BELOW FINISHED GRADE:	
HEATED EXTERIOR FOOTINGS	42 IN
UNHEATED EXTERIOR FOOTINGS ON NFS SOILS	60 IN

LOADING SCENARIOS

CONCRETE AND CLARIFIER WALL & SLAB DESIGN IS BASED ON THE FOLLOWING INDIVIDUAL LOADING SECNARIOS:

1. HYDROSTATIC TESTING OF TANKS FILLED WITH WATER TO TOPS OF WALL PRIOR TO BACKFILLING (NO SEISMIC LOADS).
2. EMPTY TANK BACKFILLED TO TOPS OF WALLS AND SEISMIC LOADS.
3. TANKS FILLED WITH WATER TO OPERATIONAL LEVELS AND SEISMIC LOADS.
4. AASHTO H-20 WHEEL LOADING NOT CLOSER THAN 4-FEET FROM EXTERIOR TANK WALLS (ADDITIONAL TO LOADING SCENARIOS 2 & 3).

SPECIAL INSPECTION

THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO INSPECT THE CONSTRUCTION FOR THE FOLLOWING WORK ITEMS.

CATEGORY	DESCRIPTION	INSPECTION / REFERENCE	FREQUENCY OF INSPECTION DURING TASK LISTED
SOILS	VERIFY MATERIAL IS SUITABLE FOR BEARING	IBC 1705.6, ITEM 1	PERIODIC
	VERIFY EXCAVATION ARE TO PROPER DEPTH	IBC 1705.6, ITEM 2	PERIODIC
	EVALUATION OF IN-PLACE DENSITY	IBC 1705.6, ITEM 3	PERIODIC
	FILL PLACEMENT	IBC 1705.6, ITEM 4	CONTINUOUS
	VERIFY SITE HAVE BEEN PRAPARED PROPERLY	IBC 1705.6, ITEM 5	PERIODIC
STRUCTURAL STEEL	BOLTS, NUTS AND WASHERS	AISC 360, Table N5.6-1, 2 & 3	OBSERVE
	INSPECTION OF BOLTING	AISC 360, Table N5.6-1, 2 & 3	PERFORM
	STRUCTURAL STEEL	AISC 360, Chapter N	OBSERVE
	WELD FILLER MATERIAL	AISC 360, Table N5.4-1, 2 & 3	OBSERVE
	INSPECTION OF WELDING	AISC 360, Table N5.4-1, 2 & 3	PERFORM
CONCRETE	REINFORCING STEEL	IBC 1705.3, ITEM 1	PERIODIC
	ANCHOR RODS AND BOLTS IN CONCRETE	IBC 1705.3, ITEM 3	PERIODIC
	POST-INSTALLED ANCHORS	IBC 1705.3, ITEM 4	CONTINUOUS
	VERIFY DESIGN MIX	IBC 1705.3, ITEM 5	PERIODIC
	CONCRETE TESTING	IBC 1705.3, ITEM 6	PERIODIC
	APPLICATION TECHNIQUES	IBC 1705.3, ITEM 7	CONTINUOUS
	CURING TEMPERATURE AND TECHNIQUES	IBC 1705.3, ITEM 8	PERIODIC
	FORMWORK SHAPE AND LOCATION	IBC 1705.3, ITEM 12	PERIODIC
WOOD	DIAPHRAGM AND SHEAR WALL FASTENINGS	IBC 1705.11.2	PERIODIC
	CHORD AND COLLECTOR FASTENINGS	IBC 1705.11.2	PERIODIC
	WALL ANCHORING	IBC 1705.11.2	PERIODIC
	TENSION AND COMPRESSION BRACING	IBC 1705.11.2	PERIODIC

CRW ENGINEERING GROUP, LLC

HDR

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA — 49 TH — Jon H. Hermon — SE-14181 — 05/27/21 — REGISTERED STRUCTURAL ENGINEER

CITY OF PALMER — "Alaska at its Best!" — 1921

City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL STRUCTURAL NOTES

0 1" 2"

FILENAME 000G005.dwg
SCALE AS NOTED

SHEET
000G005

STRUCTURAL NOTES

THE FOLLOWING NOTES APPLY UNLESS NOTED OTHERWISE:

GENERAL

THE STRUCTURAL ENGINEER HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND/OR CONSTRUCTION REVIEW SERVICES RELATED TO THE CONTRACTOR SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES FOR THE CONTRACTOR TO PERFORM HIS WORK. THE UNDERTAKING OF PERIODIC SITE VISITS BY THE ENGINEER SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION NOR MAKE THEM RESPONSIBLE FOR PROVIDING A SAFE PLACE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR, SUBCONTRACTORS, SUPPLIERS OR THEIR EMPLOYEES, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.

DRAWINGS INDICATE STRUCTURE IN FINAL FORM CAPABLE OF SUPPORTING DESIGN LOADS. PROVIDE TEMPORARY SUPPORT DURING CONSTRUCTION AS REQUIRED, UNTIL STRUCTURAL ELEMENTS ARE PERMANENTLY INSTALLED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES AND SEQUENCES OF PROCEDURES REQUIRED TO PERFORM THE WORK.

CONSTRUCTION MATERIALS SHALL BE DISTRIBUTED APPROPRIATELY IF PLACED ON FRAMED CONSTRUCTION. LOADS SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.

DO NOT SCALE DRAWINGS.

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STRUCTURAL ENGINEER IN WRITING OF ANY DISCREPANCIES.

COORDINATE DIMENSIONS, OPENINGS, EMBEDDED ITEMS AND CONDITIONS WITH ARCHITECTURAL, CIVIL, MECHANICAL AND ELECTRICAL CONTRACT DOCUMENTS AND TRADES PRIOR TO CONSTRUCTION. NOT ALL ITEMS ARE INDICATED ON STRUCTURAL CONTRACT DOCUMENTS. NOTIFY STRUCTURAL ENGINEER IN WRITING OF ANY AND ALL DISCREPANCIES.

ALL DETAILS ARE TYPICAL. INCORPORATE INTO PROJECT AT APPROPRIATE LOCATIONS WHETHER SPECIFICALLY INDICATED OR NOT.

SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE THE NOTES, DRAWINGS, AND/OR SPECIFICATIONS DIFFER, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.

REFER TO CIVIL DRAWINGS FOR EXTERIOR SLABS AND WALLS.

CONTRACTOR SHALL ALLOW A MINIMUM GAP OF 1-INCH BETWEEN THE TOP OF NON-BEARING PARTITIONS AND JOISTS OR TRUSSES ABOVE AND ALLOW JOISTS OR TRUSSES TO DEFLECT UNDER LIVE LOADS WITHOUT TOUCHING THE NON-BEARING PARTITIONS.

NOTIFY STRUCTURAL ENGINEER OF ALL FIELD CHANGES PRIOR TO INSTALLATION.

THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF RED-LINE DRAWINGS ON SITE REFLECTING ALL DESIGN CHANGES TO THE ORIGINAL CONTRACT DOCUMENTS.

FOUNDATIONS AND EARTHWORK

FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY SHANNON & WILSON, INC. JOB NO. 32-1-02475-003.

FOOTINGS AND SLABS ON GRADE SHALL BEAR ON FIRM, UNDISTURBED SUBGRADE AND/OR COMPACTED, STRUCTURAL FILL IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DO NOT PLACE BACKFILL AGAINST BASEMENT WALLS UNTIL STRUCTURE AT TOP OF WALL IS PERMANENTLY ATTACHED AND CONCRETE STRENGTH HAS REACHED 75% OF f'_c DO NOT EXCEED 10" DIFFERENTIAL IN FILL LEVEL ON OPPOSITE SIDES OF FOUNDATION WALLS.

PROVIDE POSITIVE DRAINAGE SLOPES, BOTH DURING AND AFTER CONSTRUCTION, FOR SURFACE AND ROOF RUNOFF, MINIMUM 10'-0" FROM BUILDING FOUNDATIONS.

REINFORCED CAST IN PLACE CONCRETE

CONCRETE WORK SHALL CONFORM TO ACI-350 AND ACI-301. CEMENT SHALL CONFORM TO ASTM C150, TYPE I OR II. AGGREGATE SHALL CONFORM TO ASTM C33.

DETAILING PER APPLICABLE ACI DETAILING MANUAL, UNO.

SIZE, SPACING AND MINIMUM LAP SPLICES OF REINFORCING STEEL SHALL BE PROVIDED AS SHOWN IN CONTRACT DOCUMENTS.

REINFORCEMENT SPACINGS INDICATED ON THE DRAWINGS AND DETAILS ARE GIVEN AS A MAXIMUM ON CENTER.

CONTRACTOR SHALL ACCURATELY PLACE, LOCATE, SECURE AND/OR SUPPORT ALL REINFORCING BARS, ANCHOR BOLTS/RODS, EMBEDDED ITEMS, AND WELDED WIRE FABRIC PRIOR TO PLACING CONCRETE. CONTRACTOR SHALL USE GALVANIZED METAL CHAIRS, SPACERS, DOBIES OR HANGERS FOR THE CLEAR CONCRETE COVERAGES.

TACK WELDING OF REINFORCING BARS SHALL NOT BE ALLOWED WITHOUT PRIOR REVIEW OF THE PROCEDURE WITH THE STRUCTURAL ENGINEER.

REINFORCING HOOPS SHALL BE PROVIDED WITH CLASS B BAR LAPS REQUIRED FOR THE SPECIFIC BAR SIZE.

LAPS IN WELDED WIRE FABRIC SHALL NOT BE LESS THAN THE SPACING OF CROSS WIRES PLUS 2 INCHES.

STRUCTURAL STEEL

ALL STRUCTURAL STEEL CONSTRUCTION SHALL CONFORM WITH APPLICABLE AISC HANDBOOK.

BEAMS, COLUMNS AND BRACES SHALL NOT BE SPLICED WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ERECTION AIDS INCLUDING ERECTION ANGLES AND LIFT HOLES.

ALL BEAMS SHALL BE ERECTED WITH NATURAL OR INDUCED CAMBER UPWARDS. CAMBER INDICATED ON CONTRACT DOCUMENT SHALL BE DELIVERED TO THE JOB SITE. CONTRACTOR SHALL CONSIDER CAMBER LOSS DUE TO SHIPPING AND HANDLING.

ALL STEEL TO STEEL BOLTED CONNECTIONS SHALL BE WITH HIGH STRENGTH BOLTS, UNO. MIN OF (2) BOLTS PER CONNECTION.

ALL STRUCTURAL STEEL SHALL BE SURFACE SHALL BE HOT-DIP GALVANIZED, UNO.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PRIOR TO FABRICATION. SHOP DRAWINGS SHALL INCLUDE PIECE MARKS, ERECTION PLANS SHOWING BEAM SIZES AND DETAILS WITH CORRESPONDING CONTRACTOR DOCUMENT INDICATORS. SHOP DRAWINGS SHALL MAKE A DISTINCTION BETWEEN SHOP WELDS AND FIELD WELDS.

STRUCTURAL STEEL WELDING

ALL STRUCTURAL WELDING SHALL BE PRE-QUALIFIED AND CONFORM TO AISC AND AWS SPECIFICATIONS.

ALL WELDING SHALL BE IN ACCORDANCE WITH THE APPLICABLE AWS CODE. USE E70 SERIES LOW HYDROGEN ELECTRODES STORED AND MAINTAINED IN DRY CONDITION.

ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS HAVING CURRENT CERTIFICATES AND EXPERIENCE IN THE TYPE OF WELD BEING PERFORMED. WELDING CERTIFICATES SHALL BE THOSE ISSUED BY AN ACCEPTED TEST AGENCY.

ALL CJP GROOVE WELDS SHALL HAVE FILLER MATERIAL THAT HAS A MINIMUM CHARPY-V-NOTCH TOUGHNESS OF 20 FT-LB AT -20 °F AND 40 FT-LB AT 70 °F. CONTRACTOR SHALL SUBMIT WELDER QUALIFICATIONS AND PROCEDURE QUALIFICATIONS. WHERE NOT SHOWN, USE MINIMUM WELD SIZE PER AISC AND AWS.

STRUCTURAL CONSTRUCTION DRAWINGS DO NOT DISTINGUISH BETWEEN SHOP WELDS AND FIELD WELDS. THE CONTRACTOR SHALL COORDINATE WELDING DESIGNATIONS BETWEEN FABRICATOR AND ERECTOR. ALL STEEL SHOP DRAWINGS SHALL MAKE DISTINCTION BETWEEN SHOP WELDS AND FIELD WELDS.

STEEL DECK

STEEL DECKING SHALL BE MANUFACTURED AND INSTALLED PER STEEL DECK INSTITUTE SPECIFICATIONS. ICC CERTIFICATION REQUIRED. G60 GALVANIZED FINISH ON ALL DECKING.

STEEL TRUSSES

STEEL JOISTS SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE STEEL JOIST INSTITUTE "STANDARD SPECIFICATIONS "AND" CODE OF STANDARD PRACTICES".

NON-SHRINK GROUT

DRY-PACK NON-SHRINK GROUT SHALL BE INSTALLED UNDER BEARING PLATES BEFORE FRAMING MEMBERS ARE INSTALLED. AT COLUMNS, CONTRACTOR SHALL INSTALL DRY-PACK UNDER BASE PLATES AFTER COLUMN HAS BEEN PLUMBED BUT PRIOR TO FLOOR OR ROOF INSTALLATION.

COLD-FORMED STEEL FRAMING

ALL COLD-FORMED AND LIGHT GAGE STEEL FRAMING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE.

POST-INSTALLED ANCHORS

POST-INSTALLED ANCHOR EMBEDMENT SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS. ALL POST-INSTALLED ANCHORS AND DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS INCLUDING DRILL BIT SIZE, HOLE DEPTH AND CLEANING, MINIMUM EMBEDMENT, EDGE DISTANCES, MATERIAL PLACEMENT, TEMPERATURE AND MOISTURE CONTROL AND FINAL TORQUING REQUIREMENTS.

CONTRACTOR MAY NOT USE SUBSTITUTES FOR POST-INSTALLED ANCHORS WITHOUT PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER.

NO REINFORCING BARS SHALL BE CUT TO INSTALL ANCHORS. ALL DEFECTIVE ANCHOR HOLES SHALL BE GROUTED WITH EPOXY ADHESIVE AND A NEW HOLE DRILLED A MINIMUM OF (3) BOLT DIAMETERS AWAY.

SPECIAL INSPECTION OF POST-INSTALLED ANCHORS IS REQUIRED.

ROUGH CARPENTRY AND PLYWOOD

ALL FRAMING SHALL BE PROVIDED IN ACCORDANCE WITH IBC CHAPTER 23. FRAMING LUMBER SHALL COMPLY WITH THE APPLICABLE NDS CODE.

MAXIMUM MOISTURE CONTENT OF LUMBER SHALL NOT EXCEED 19 PERCENT.

ALL SAWN LUMBER SHALL BE STAMPED WITH THE GRADE MARK OF AN APPROVED LUMBER GRADING AGENCY.

ALL LUMBER IN CONTACT WITH CONCRETE SHALL BE PRESERVATIVE-TREATED WOOD STAMPED BY AN APPROVED AGENCY. ALL UNTREATED LUMBER SHALL BE ISOLATED FROM DIRECT CONTACT WITH CONCRETE OR MASONRY WITH ICE AND WATER SHIELD.

ALL PLYWOOD SHALL CONFORM TO PS-1 OR APA PRP-108, SHALL HAVE AN EXTERIOR OR EXPOSURE 1 CLASSIFICATION AND SHALL BEAR THE STAMP OF AN APPROVED TESTING AGENCY.

PLYWOOD SHALL BE INSTALLED WITH FACE GRAIN ORIENTED PERPENDICULAR TO SUPPORTS, STAGGER JOINTS. PLYWOOD NAILING SHALL BE PROVIDED ON ALL BOUNDARIES, EDGES AND INTERMEDIATE SUPPORTS.

METAL FRAMING CONNECTORS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INCORPORATED, OR OTHER APPROVED EQUIVALENT MANUFACTURER. ALL NAIL/SCREW HOLES IN CONNECTORS SHALL BE FILLED WITH NAILS/SCREWS OF THE LARGEST SIZE INDICATED IN THE MANUFACTURER'S CATALOG UNO.

METAL FRAMING CONNECTORS AND FASTENERS IN CONTRACT WITH PRESERVATIVE-TREATED WOOD SHALL BE GALVANIZED OR STAINLESS STEEL.

BARRIER MEMBRANE FOR METAL FRAMING CONNECTORS SHALL BE USED FOR SEPARATING CONNECTORS FROM PRESERVATIVE-TREATED WOOD AND BE CROSS-LAMINATED HDPE HAVING A MINIMUM THICKNESS OF 25 MILS. BARRIER MEMBRANE SHALL BE SPECIFICALLY MANUFACTURED FOR THE PURPOSE OF PROVIDING SEPARATION BETWEEN STEEL COMPONENTS AND WOOD TREATED WITH COPPER-BASED PRESERVATIVES SUCH AS ACQ AND CA-C. THE MEMBRANE BARRIER MATERIAL SHALL HAVE RUBBERIZED ASPHALT ADHESIVE WITH A PAPER RELEASE LINER.

NAILING SHALL CONFORM TO TABLE 2304.9.1 OF THE IBC. ALL NAILS SHALL BE COMMON SIZE IN ACCORDANCE WITH ASTM F1667.

STRUCTURAL SHOP DRAWINGS AND PRODUCT DATA SUBMITTALS

SUBMIT SHOP DRAWINGS AND/OR PRODUCT DATA FOR THE FOLLOWING ITEMS, PRIOR TO FABRICATION:

CONCRETE MATERIALS
CONCRETE REINFORCING STEEL
STRUCTURAL STEEL FRAMING
STEEL STAIRS AND LADDERS
STEEL DECK
STEEL TRUSSES
STRUCTURAL COLD-FORMED STEEL FRAMING
PRE-ENGINEERED BUILDING SYSTEMS
CLARIFIER EQUIPMENT, INLET PIPING AND ASSOCIATED STRUCTURE INCLUDING ANCHORAGE TO
    CONCRETE TANK FOUNDATION AND STEEL ROOF STRUCTURE
ALUMINUM COVERS AND ASSOCIATED SUPPOT STRUCTURE AND CONNECTION TO CONCRETE TANKS
ANCHORAGE OF SCREENS, WEIRS, VALVES AND GATES AND ASSOCIATED OPERATORS, AND
    MANUFACTURER-SUPPLIED PIPING SUPPORTS
NON-STRUCTURAL COMPONENTS AND ATTACHMENTS
OTHER STRUCTURAL COMPONENTS SPECIFIED OR SHOWN AS BEING DESIGNED AND DETAILED BY
    OTHERS

CONTRACTOR SHALL REVIEW AND STAMP SUBMITTALS PRIOR TO SUBMISSION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS PLACED PRIOR TO RECEIPT OF REVIEWED SHOP DRAWINGS. CONTRACTOR SHALL ALLOW A MINIMUM OF (10) WORKING DAYS FOR REVIEW.

CONTRACT DOCUMENTS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS. THE MANUFACTURER OR FABRICATOR SHALL CLOUD ANY CHANGES, SUBSTITUTIONS AND/OR DEVIATIONS FROM THE CONTRACT DOCUMENTS. ANY CHANGES, SUBSTITUTIONS AND/OR DEVIATIONS THAT ARE NOT CLOUDED OR FLAGGED SHALL NOT BE CONSIDERED ALLOWED AFTER THE ENGINEER'S REVIEW UNO.

THE ENGINEER'S REVIEW IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS AND COMPLETENESS SHALL REST WITH THE CONTRACTOR. SHOP DRAWINGS WILL BE RETURNED FOR RESUBMITTAL IF SIGNIFICANT ERRORS ARE FOUND DURING REVIEW.

THE SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. SHOP DRAWINGS PROCESSED BY THE ENGINEER SHALL NOT BE CONSIDERED CHANGE ORDERS. ITEMS THAT ARE OMITTED OR SHOWN INCORRECTLY AND THAT ARE NOT FLAGGED BY THE ENGINEER ARE NOT TO BE CONSIDERED CHANGES TO CONTRACT DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONSTRUCT ITEMS ACCORDING TO THE CONTRACT DOCUMENTS. SHOULD A DISCREPANCY EXIST BETWEEN THE PROCESSED SHOP DRAWINGS AND THE CONTRACT DOCUMENTS, THE CONTRACT DOCUMENTS SHALL GOVERN.

THE ENGINEER RESERVES THE RIGHT TO MAKE CHANGES TO THE CONTRACT DOCUMENTS, AT ANY TIME BEFORE OR AFTER SHOP DRAWING REVIEW.

FOR HARD COPY SUBMITTALS, PROVIDE NO MORE THAN FOUR SETS FOR REVIEW (ONE COPY TO BE RETAINED BY THE ENGINEER OF RECORD). FOR ELECTRONIC SUBMITTALS, PROVIDE PDF FILES ONLY. ALL SUBMITTALS WITH A REQUESTED REVIEW TIME OF LESS THAN (10) WORKING DAYS MAY BE RETURNED WITHOUT REVIEW AT THE ENGINEER'S DISCRETION.

DEFERRED STRUCTURAL SUBMITTALS

THE FOLLOWING ITEMS ARE DESIGNED AND DETAILED BY THE CONTRACTOR USING THE LOADING AND CRITERIA SHOWN IN THE CONTRACT DOCUMENTS. DEFERRED SUBMITTALS SHALL INCLUDE CALCULATIONS AND DRAWINGS STAMPED BY AN ALASKA REGISTERED ENGINEER AND ARE TO BE SUBMITTED TO THE CONTRACTING OFFICER PRIOR TO FABRICATION:

MECHANICAL UNIT SEISMIC RESTRAINT
ROOFING ATTACHMENT
CONCRETE MATERIALS
CONCRETE REINFORCING STEEL
STRUCTURAL STEEL FRAMING
STEEL STAIRS AND LADDERS
STEEL DECK
STEEL TRUSSES
STRUCTURAL COLD-FORMED STEEL FRAMING
PRE-ENGINEERED BUILDING SYSTEMS
CLARIFIER EQUIPMENT, INLET PIPING AND ASSOCIATED STRUCTURE INCLUDING ANCHORAGE TO
    CONCRETE TANK FOUNDATION AND STEEL ROOF STRUCTURE
ALUMINUM COVERS AND ASSOCIATED SUPPOT STRUCTURE AND CONNECTION TO CONCRETE TANKS
ANCHORAGE OF SCREENS, WEIRS, VALVES AND GATES AND ASSOCIATED OPERATORS, AND
    MANUFACTURER-SUPPLIED PIPING SUPPORTS
NON-STRUCTURAL COMPONENTS AND ATTACHMENTS
OTHER STRUCTURAL COMPONENTS SPECIFIED OR SHOWN AS BEING DESIGNED AND DETAILED BY
    OTHERS

REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL FOR OTHER DEFERRED SUBMITTALS.

DEFERRAL OF ANY SUBMITTAL ITEMS SHALL HAVE PRIOR APPROVAL OF THE BUILDING OFFICIAL. THE ARCHITECT OR ENGINEER OF RECORD SHALL LIST THE DEFERRED SUBMITTALS ON THE CONTRACT DOCUMENTS AND THE CONTRACTOR SHALL SUBMIT THE DEFERRED SUBMITTAL DOCUMENTS FOR REVIEW BY THE BUILDING OFFICIAL.

SUBMITTAL DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE CONTRACTING OFFICIAL OR ENGINEER OF RECORD A MINIMUM OF 30 DAYS PRIOR TO FABRICATION. THE DOCUMENTS SHALL BE REVIEWED FOR GENERAL CONFORMANCE WITH THE DRAWINGS. A COPY OF THE DEFERRED SUBMITTAL DOCUMENTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THEIR DESIGN AND SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.

SPECIAL STRUCTURAL INSPECTIONS AND TESTING

THE OWNER (OR REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT) SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PROVIDE INSPECTION AND TESTING DURING CONSTRUCTION OF THE TYPES OF WORK REQUIRING SPECIAL INSPECTION AS INDICATED ON THE DRAWINGS.

EACH SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL AND STRUCTURAL ENGINEER OF RECORD, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR

THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS.

THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL AND TO THE ENGINEER OR ARCHITECT OF RECORD. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS DONE IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN IF UNCORRECTED, TO THE ENGINEER OR ARCHITECT OF RECORD AND THE BUILDING OFFICIAL.

UPON COMPLETION OF THE ASSIGNED WORK, THE SPECIAL INSPECTOR SHALL COMPLETE AND SIGN THE APPROPRIATE FORMS CERTIFYING THAT, TO THE BEST OF THEIR KNOWLEDGE, THE WORK IS IN CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.

DEFINITIONS

CONTINUOUS SPECIAL INSPECTION: CONTINUOUS SPECIAL INSPECTION IS THE FULL TIME OBSERVATION OF THE WORK BY THE SPECIAL INSPECTOR PRESENT IN THE WORK AREA WHENEVER WORK IS BEING PERFORMED. PERFORM CONTINUOUS SPECIAL INSPECTION WHERE SPECIFIED AS INDICATED IN THE SPECIAL INSPECTION TABLES.

PERIODIC SPECIAL INSPECTION: PERIODIC SPECIAL INSPECTION IS THE INTERMITTENT OBSERVATION OF THE WORK BY A SPECIAL INSPECTOR PRESENT IN THE WORK AREA WHILE WORK IS BEING PERFORMED. THE INTERMITTENT OBSERVATION PERIODS SHALL BE AT TIME OF SIGNIFICANT WORK, RECURRENT OVER THE COMPLETE WORK PERIOD AND TOTAL AT LEAST 25 PERCENT OF THE TOTAL WORK TIME FOR A GIVEN TASK. PERFORM PERIODIC SPECIAL INSPECTION WHERE SPECIFIED FOR ITEMS AS INDICATED IN THE SPECIAL INSPECTION TABLES.

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49TH Jon H. Hermon SE-14161 05/27/21 REGISTERED STRUCTURAL ENGINEER

CITY OF PALMER "Alaska at its Best!"

City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL STRUCTURAL LEGEND AND ABBREVIATION

0 1" 2"

FILENAME 000G006.dwg
SCALE AS NOTED

SHEET **000G006**

PIPING SYMBOLOGY

VALVES

SINGLE LINE	DOUBLE LINE	ISOLATION
		BALL VALVE
		BUTTERFLY VALVE
		DIAPHRAGM VALVE
		GATE VALVE
		GLOBE VALVE
		KNIFE GATE VALVE
		NEEDLE VALVE
		PINCH VALVE
		PLUG VALVE
		THREE–WAY BALL VALVE
		THREE–WAY PLUG VALVE

		CONTROL
		BALL CHECK VALVE
		CHECK VALVE
		DOUBLE–DISK CHECK VALVE
		CONE VALVE
OR	OR	PRESSURE RELIEF VALVE
		PRESSURE–REDUCING VALVE
X	X	AIR RELEASE VACUUM VALVE A = AIR RELEASE VAC = VACUUM
		PRESSURE–REGULATING VALVE
		3–WAY CONTROL VALVE

MISCELLANEOUS

- BACKFLOW PREVENTER
- M — WATER METER
- VARIABLE AREA METER
- UNION
- WYE–STRAINER
- PENETRATION THROUGH STRUCTURE
- FLEXIBLE HOSE OR TUBING
- FLEXIBLE PIPING CONNECTION
- LINE SIZE CHANGE (CONCENTRIC REDUCER)
- LINE SIZE CHANGE (ECCENTRIC REDUCER)
- LINE TURNING DOWN
- LINE TURNING UP
- BLIND FLANGE
- PIPE BREAK

NOTE:
MISCELLANEOUS SYMBOLOGY SHOWN IS FOR SINGLE–LINE PIPING. DOUBLE–LINE PIPING SYMBOLS ARE SIMILAR.

MISCELLANEOUS

- PIPE JOINT (SEE SPECS FOR REQUIREMENTS)
- COMPRESSION SLEEVE TYPE COUPLING
- FLANGED COUPLING ADAPTER (FCA)
- FLEXIBLE CONNECTION
- HARNESSED MECHANICAL COUPLING
- PRESSURE GAGE (W/COCK)
- TRAP
- QUICK DISCONNECT CAM & GROOVE COUPLING
- CAP OR PLUG
- CO — INTERIOR CLEANOUT
- HB–X — HOSE VALVE, HOSE BIBB, OR FLUSHING CONNECTION
- HR–X — HOSE RACK
- FD–X — FLOOR DRAIN
- X = TYPE DESIGNATED IN SPECIFICATIONS
- PIPE IN SECTION
- BU — BELL UP (PLAN)
- BU — BELL UP (SECTION OR SCHEMATIC)
- D — DRAIN (SECTION OR SCHEMATIC)
- ATA — AIR TOOL ASSEMBLY
- AVS — AUTOMATIC VALVE STATION
- PRS — PRESSURE–REDUCING STATION

PLUMBING SYMBOLOGY

- -------VT-------- VENT (VT)
- POTABLE WATER, COLD (PWC)
- POTABLE WATER, HOT (PWH)

MISCELLANEOUS SYMBOLOGY

- MIST ELIMINATOR
- ACTIVATED CARBON OR CHEMICAL FILTER
- CENTRIFUGAL PUMP
- SPRAY NOZZLE/HUMIDIFIER

HVAC SYMBOLOGY

- 24x18 — SUPPLY AIR OR OUTSIDE AIR DUCT UP (SECTION CUT, FIRST DIMENSION DUCT WIDTH)
- SUPPLY AIR OR OUTSIDE AIR DUCT DOWN (NO SECTION CUT)
- RETURN AIR DUCT UP (SECTION CUT)
- RETURN AIR DUCT DOWN (NO SECTION CUT)
- EXHAUST AIR DUCT UP (NO SECTION CUT)
- EXHAUST AIR DUCT DOWN (NO SECTION CUT)
- ROUND ELBOW UP
- ROUND ELBOW DOWN
- TRANSITION – DOUBLE SIDED
- TRANSITION – ONE SIDED
- TRANSITION – RECTANGULAR TO ROUND DUCT
- STANDARD BRANCH – FOR SUPPLY AIR W/EXTRACTOR AND RETURN AIR W/O EXTRACTOR
- ELBOW – W/TURNING VANE (RECTANGULAR)
- ELBOW – W/TURNING VANES (RECTANGULAR), SMOOTH RADIUS
- GOOSENECK HOOD (COWL)
- 18x24 — RECTANGULAR DUCT OR OPENING SIZE – FIRST NUMBER INDICATES SIZE OF SIDE SHOWN
- 18" DIA — ROUND DUCT SIZE
- R OR D — RECTANGULAR DUCT INCLINE – RISE OR DROP IN RESPECT TO THE AIR FLOW
- R OR D — ROUND DUCT INCLINE – RISE OR DROP IN RESPECT TO THE AIR FLOW
- 18x24 — HIDDEN DUCT
- T 9'–10" B 9'–0" / 18x10 — DUCT ELEVATION TAG ABOVE FINISH FLOOR
- PRESSURE/TEMPERATURE TEST PLUG (PETE PLUG OR EQUAL)
- SA — SOUND ATTENUATOR
- SD SD — SPLITTER DAMPER
- VD, BDD — VD = VOLUME DAMPER, BDD = BACKDRAFT DAMPER
- M — MOTOR OPERATED DAMPER
- FIRE DAMPER
- SMOKE DAMPER
- SMOKE AND FIRE DAMPER

- FLEXIBLE CONNECTION
- FLEXIBLE DUCT
- ACOUSTICAL LINING – DUCT DIMENSIONS FOR NET FREE AREA
- SIZE / CFM — SUPPLY AIR REGISTER OR GRILLE – W/DUCT–MOUNTED EXTRACTOR
- SIZE / CFM — EXHAUST AIR OR RETURN AIR REGISTER OR GRILLE
- SIZE / CFM — EXHAUST AIR OR RETURN AIR REGISTER OR GRILLE
- SIZE / CFM — SUPPLY AIR ASSEMBLY SQUARE DIFFUSER
- SIZE / CFM — SUPPLY AIR ASSEMBLY ROUND DIFFUSER
- WALL LOUVER
- AD PLAN / AD SECTION — ACCESS DOOR
- UC 3/4" — UNDERCUT DOOR 3/4"
- AD — ACCESS DOOR OR ACCESS PANEL IN DUCTWORK
- INTAKE OR RELIEF HOOD
- DOOR GRILLE
- AIR FLOW — BACKDRAFT DAMPER
- EXHAUST ROOF VENTILATOR PROPELLER OR CENTRIFUGAL TYPE
- PROPELLER WALL FAN
- ROOM AIR CONDITIONING UNIT
- INTAKE/EXHAUST LOUVER
- SUPPLY, RETURN OR EXHAUST FAN
- AIR FILTER

HVAC CONTROL SYMBOLOGY

TC	TEMPERATURE CONTROLLER
TT	TEMPERATURE TRANSMITTER
TS	TEMPERATURE SWITCH
T	THERMOSTAT
TI	TEMPERATURE INDICATOR
%	PERCENTAGE TIMER
RC	RECEIVER CONTROLLER
HOA	HAND–OFF–AUTO
MS	MOTOR STARTER
M	DAMPER ACTUATOR
PI	PRESSURE INDICATOR
FRZ	FREEZE STAT
FS	FIRE STAT
DPS	DIFFERENTIAL PRESSURE SWITCH
SD	SMOKE DETECTOR
FS	FLOW SWITCH
PS	PRESSURE SWITCH
– – D – –	TIME DELAY
M	MINIMUM POSITION RELAY
S	SIGNAL
AO	ANALOG OUTPUT
AI	ANALOG INPUT
DO	DIGITAL OUTPUT
DI	DIGITAL INPUT
C	COMMON PORT
S	SIGNAL PORT
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
	BALANCING VALVE
RHC	RESISTANCE HEATING CONTACTOR
TA	TEST–AUTO
TOA	TEST–OFF–AUTO
– – – – – –	ELECTRIC SIGNAL
	PIPING
	BULB–TYPE THERMOSTAT

AIR FLOW SCHEMATIC AND TEMPERATURE CONTROL DIAGRAM SYMBOLOGY

- C / C — CHILLED WATER COOLING COIL
- H / C — HOT WATER HEATING COIL
- EP / R — DIRECT EVAPORATIVE COOLER
- D / X — DIRECT EXPANSION COOLING COIL
- EH / C — ELECTRIC HEATING COIL
- VFD — VFD (VARIABLE FREQUENCY DRIVE)
- H / C CAV — CONSTANT AIR VOLUME BOX WITH REHEAT COIL
- H / C VAV — VARIABLE AIR VOLUME BOX WITH REHEAT COIL

GENERAL NOTES:

1. THIS IS A STANDARD PROCESS, MECHANICAL AND PLUMBING SYMBOLOGY SHEET. ALL SYMBOLS ARE NOT NECESSARILY USED ON THIS PROJECT.
2. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE–EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.
3. SEE INSTRUMENTATION LEGEND SHEET FOR PROJECT–SPECIFIC EQUIPMENT SYMBOLS, EQUIPMENT ABBREVIATIONS, AND PIPING SYSTEM ABBREVIATIONS.

GENERIC PIPING NOTES:

1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
2. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
3. LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. CONTRACTOR SHALL DESIGN SUPPORTS AS SPECIFIED.
4. ALL JOINTS SHALL SHALL BE WATERTIGHT. WALL PIPES SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
5. ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR THE TEST PRESSURES SPECIFIED.
6. SYMBOLS, LEGENDS AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE, NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
7. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED.
8. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
9. WHERE A GROOVED END COUPLING IS SHOWN. IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGES COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINTED TO THE COUPLING ADAPTER.

CRW ENGINEERING GROUP, LLC

HDR

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Improvements Project
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GENERAL MECHANICAL SYMBOLOGY AND NOTES

0 1" 2"

FILENAME 000G007.dwg
SCALE NONE

SHEET 000G007

VALVES

- BALL VALVE
- BUTTERFLY VALVE
- CONE VALVE
- CHECK VALVE
- DOUBLE-DISK CHECK VALVE
- BALL CHECK VALVE
- DIAPHRAGM VALVE
- GATE VALVE
- GLOBE VALVE
- KNIFE GATE VALVE
- NEEDLE VALVE
- PINCH VALVE
- PLUG VALVE
- TELESCOPING VALVE
- THREE-WAY BALL VALVE
- THREE-WAY PLUG VALVE
- PRESSURE-REDUCING VALVE
- PRESSURE-REGULATING VALVE
- THREE-WAY CONTROL VALVE
- OR — PRESSURE-RELIEF VALVE
- AIR-RELEASE VACUUM VALVE (X) — A = AIR RELEASE, VAC = VACUUM
- MUD VALVE
- FLUSHING CONNECTION
- SOLENOID VALVE (S)

MISCELLANEOUS SYMBOLS

- SPRAY NOZZLE
- CALIBRATION COLUMN
- INLINE SILENCER (S)
- INLINE FLOW CONDITIONER
- SLUDGE GRINDER
- Y-TYPE STRAINER
- BASKET STRAINER / FILTER OR COALESCER (F)
- EXPANSION JOINT
- FLEXIBLE HOSE
- FILTER INTAKE
- BREATHER
- AUTOSTRAINER
- RADAR LEVEL SENSOR
- FLUSHING CONNECTION
- DIAPHRAM SEAL
- PULSATION DAMPER / NER
- REDUCER
- STRAINER
- UNION

PUMPS/COMPRESSORS

- CENTRIFUGAL PUMP
- SUBMERSIBLE PUMP
- VERTICAL TURBINE PUMP
- PROGRESSING CAVITY PUMP
- CHEMICAL FEED PUMP
- COMPRESSOR, CENTRIFUGAL
- AIR COMPRESSOR PUMP
- CENTRIFUGAL BLOWER OR FAN

PRIMARY ELEMENT SYMBOLOGY

- THERMAL DISPERSION FLOW ELEMENT
- DOPPLER ULTRASONIC FLOWMETER
- MAGNETIC FLOWMETER (M)
- PROPELLER OR TURBINE METER
- FLUME
- ROTAMETER (FI)
- WEIR
- DIAPHRAGM SEAL
- ANNULAR DIAPHRAGM SEAL
- TEMPERATURE ELEMENT WITH THERMOWELL (TE)
- FLOAT SWITCH
- MOTOR (M)
- ULTRASONIC LEVEL SENSOR
- INSITU ANALYTICAL PROBE
- PRESSURE GAUGE
- SUBMERGED LEVEL SENSOR

LINE TYPES

- PRIMARY PROCESS LINE
- SECONDARY PROCESS LINE
- FUTURE PROCESS LINE
- EXISTING PROCESS LINE
- PROCESS OPEN CHANNEL
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL, ANALOG
- ELECTRIC SIGNAL, DISCRETE
- HYDRAULIC SIGNAL
- SOFTWARE OR DATA LINK
- SIGNAL CONNECTION
- CROSSOVER - NO CONNECTION
- CAPILLARY TUBE
- PACKAGED EQUIPMENT

EQUIPMENT TAG

SEE EQUIPMENT TAGS ON SHEET 000G04

EQUIPMENT FUNCTIONAL IDENTIFICATION

SEE EQUIPMENT ABBREVIATIONS ON SHEET 000G04

VALVE TAG

OPTIONAL VALVE DESIGNATION:
NC = NORMALLY CLOSED
NO = NORMALLY OPEN

NC

OR

SOLID FILL

- NORMALLY CLOSED
- NORMALLY OPEN

GATE SYMBOLS

- SLUICE
- BUTTERFLY
- FLAP
- SHEAR
- SLIDE GATE
- STOP GATE
- WEIR GATE
- MANUAL SLIDE GATE
- MOTORIZED SLIDE GATE (M)

OFF PAGE CONNECTORS

PROCESS STREAM
CONNECTION NUMBER
CONTINUATION DRAWING NUMBER
CS 1 Y-02
FROM THICKENING
PROCESS FROM:
PROCESS ORIGIN

PROCESS STREAM
CONNECTION NUMBER
CONTINUATION DRAWING NUMBER
CS 1 Y-02
TO THICKENING
PROCESS TO:
PROCESS DESTINATION

INSTRUMENT SYMBOLOGY

- XXX / XXXX — FIELD MOUNTED
- MOUNTED ON PANEL FACE
- MOUNTED BEHIND PANEL
- MOUNTED ON AUXILIARY PANEL
- MOUNTED BEHIND AUXILIARY PANEL
- INDICATOR LIGHT
- (I) — INTERLOCK, SEE CONTROL DIAGRAMS OR SPECIFICATIONS
- (FQ) — FLOW TOTALIZER
- (CS) — CONTROL STRATEGY FOR PLC PROGRAMMING DEFINED IN THE SPECIFICATIONS
- SHARED DISPLAY, SHARED PANEL, FIELD MOUNTED
- SHARED DISPLAY, SHARED CONTROL, PRIMARY LOCATION - NORMALLY ACCESSIBLE TO OPERATOR
- PILOT LIGHT
- INSTRUMENT FUNCTIONS SHARING COMMON HOUSING

ACTUATOR SYMBOLOGY

XX OPERATOR ABBREVIATIONS:
M = MOTOR
P = PNEUMATIC (SGL OR DBL)
S = SOLENOID
H = HYDRAULIC

XX: FO = FAIL TO OPEN, FC = FAIL TO CLOSE, FLP = FAIL TO LAST POSITION

- FLOAT OPERATOR
- SPRING-OPPOSED SINGLE-ACTING PNEUMATIC CYLINDER
- DOUBLE-ACTING PNEUMATIC CYLINDER
- PNEUMATIC DIAPHRAGM
- PNEUMATIC DIAPHRAGM WITH POSITIONER

MISC INSTRUMENT SYMBOLOGY

PLC OR REMOTE I/O LEVEL
FIELD LEVEL

- DIGITAL (DISCREET) INPUT
- ANALOG INPUT
- DIGITAL (DISCREET) OUTPUT
- ANALOG OUTPUT

INSTRUMENT IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USERS CHOICE			CONTROL	CLOSED
D	USERS CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME; RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECH. ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

MISCELLANEOUS INSTRUMENTATION ABBREVIATIONS

AI	ANALOG INPUT
AO	ANALOG OUTPUT
CL2	CHLORINE (ANALYZER MODIFIER)
CO	CARBON MONOXIDE (ANALYZER MODIFIER)
CO2	CARBON DIOXIDE (ANALYZER MODIFIER)
COMB	COMBUSTIBLES (ANALYZER MODIFIER)
COND	CONDUCTIVITY (ANALYZER MODIFIER)
CPU	CENTRAL PROCESSING UNIT
DEN	DENSITY (ANALYZER MODIFIER)
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DO	DISSOLVED OXYGEN (ANALYZER MODIFIER)
E/P	VOLTAGE TO PNEUMATIC
H2S	HYDROGEN SULFIDE (ANALYZER MODIFIER)
HCL	HYDROGEN CHLORIDE (ANALYZER MODIFIER)
HF	HARMONIC FILTER
I/O	INPUT/OUTPUT
I/P	CURRENT TO PNEUMATIC
LEL	LOWER EXPLOSION LIMIT
MCC	MOTOR CONTROL CENTER
MV	MANIPULATED VARIABLE
NOX	NITROGEN OXIDE (ANALYZER MODIFIER)
OI	OPERATOR INTERFACE
O2	OXYGEN (ANALYZER MODIFIER)
P&ID	PROCESS AND INSTRUMENTATION DIAGRAM
PV	PROCESS VARIABLE
SP	SET POINT
SS	SUSPENDED SOLIDS (ANALYZER MODIFIER)
TURB	TURBIDITY (ANALYZER MODIFIER)
VFD	VARIABLE FREQUENCY DRIVE
WAN	WIDE AREA NETWORK

CONTROL SWITCH NOTATION ABBREVIATIONS

XXX / XXX

ACK	ACKNOWLEDGE
ESTOP	EMERGENCY STOP
FAIL	FAILURE
FOR	FORWARD-OFF-REVERSE
FR	FORWARD-REVERSE
FS	FAST-SLOW
HA	HAND-AUTO
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
LL	LEAD-LAG
LLS	LEAD-LAG-STANDBY
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
LS	LEAD-STANDBY
MA	MANUAL-AUTO
OAC	OPEN-AUTO-CLOSE
OC	OPEN-CLOSE
OSC	OPEN-STOP-CLOSE
RJ	RUN-JOG
RJR	RUN-JOG-REVERSE
SIL	SILENCE
SS	START-STOP

TYPES OF POWER SUPPLY

A	PLANT COMPRESSED AIR
IA	INSTRUMENTATION AIR
ES	ELECTRIC SUPPLY
NG	NATURAL GAS
HYD	HYDRAULIC

GENERAL NOTES:

1. THIS IS A STANDARD INSTRUMENTATION SYMBOLOGY AND ABBREVIATIONS SHEET. LISTING OF SYMBOLS AND ABBREVIATIONS DOES NOT IMPLY ALL SYMBOLS AND ABBREVIATIONS HAVE BEEN USED ON THIS PROJECT.
2. SEE PROCESS, MECHANICAL AND PLUMBING LEGEND SHEET FOR MISCELLANEOUS PIPING SYMBOLS. SEE 000G004 FOR PIPE TAGS, EQUIPMENT TAGS, PROCESS AREA DESIGNATIONS AND OTHER ABBREVIATIONS.
3. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE.
4. VALVE SYMBOLS SHOWN HERE ARE APPLICABLE ONLY TO INSTRUMENTATION DIAGRAMS. SEE PROCESS, MECHANICAL AND PLUMBING LEGEND SHEET FOR VALVE SYMBOLS USED ELSEWHERE ON THE SHEETS.

CRW ENGINEERING GROUP, LLC
HDR

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CITY OF PALMER "Alaska at its Best!"

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GENERAL
PROCESS INSTRUMENTATION
LEGEND AND NOTES

0 1" 2"

FILENAME 000G008.dwg
SCALE NONE

SHEET 000G008

PLAN SYMBOLS

- 120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5–20R (WALL MOUNT) ALL RECEPTACLES SHALL BE GFCI, WITH WEATHERPROOF COVERS
  - W – WEATHERPROOF
  - X – EXPLOSION PROOF
  - G – GROUND FAULT CIRCUIT INTERRUPTER
- 120V QUAD RECEPTACLE
- 120V 3–PRONG PLUG, TO BE PLUGGED INTO NEAREST RECEPTACLE
- ROLL–UP DOOR CONTROLLER SWITCH
- LOCAL CONTROL PANEL (LCP), SIZE AS SHOWN ON PLANS
- POWER PANEL
- DISCONNECT SWITCH
- (T) THERMOSTAT
- (J) JUNCTION BOX
- (SJ) HEAT TAPE SPLICE JUNCTION BOX
- EK HEAT TAPE END KIT
- (EJ) HEAT TAPE END KIT JUNCTION BOX
- (PJ) HEAT TAPE POWER JUNCTION BOX
- J HEAT TAPE JUNCTION BOX
- FLOAT SWITCH
- (#) PLAN PAGE NOTE
- XX / XX DEVICE TAG SYMBOL
- RATIO / NUM CURRENT TRANSFORMER, RATIO AND NUMBER OF CT'S AS NOTED
- 5A FUSE, SIZED AS NOTED
- INTRUSION SWITCH
- S SOLENOID VALVE
- NEW WIRING/RACEWAY PROVIDE 3/4"C, 3#12 UNLESS OTHERWISE NOTED
- OBJECT BORDER
- HEAT TAPE

PLAN SYMBOLS

- MANUAL TRANSFER SWITCH, RATINGS AS INDICATED
- TWIST LOCK RECEPTACLE
- WALL–MOUNTED ELECTRICAL SWITCH
- X.XX.XX.X WIRE TAG
- XX MOTOR, HORSEPOWER AS NOTED
- TRANSFORMER WITH GROUNDED SECONDARY, KVA SIZE & VOLTAGE RATIO AS INDICATED
- 30A DISCONNECT SWITCH, SIZED AS NOTED
- RATING / FUSE FUSED DISCONNECT SWITCH, SIZED AS NOTED
- AUTOMATIC TRANSFER SWITCH, RATINGS AS INDICATED
- CONDUIT SEALOFF

CONTROL WIRING CONDUIT FILL

MINIMUM TRADE SIZE CONDUIT SIZE SHALL BE 3/4". BELOW LISTED ARE THE MAXIMUM WIRE FILLS ALLOWED FOR THIS PROJECT. CONTRACTOR SHALL PROVIDE SEPARATE RACEWAY SYSTEMS PER THE SPECIFICATIONS AND THIS FILL CHART.

	14 GAUGE XHHW	18 GAUGE TWISTED SHIELDED PAIR
3/4"	8	2
1"	16	4
1 1/4"	32	7
1 1/2"	48	10
2"	72	17

CONTROL & ELECTRICAL WIRING

1. PROVIDE GROUNDING CONDUCTORS IN ALL RACEWAYS IN ACCORDANCE WITH THE NEC.
2. ALL POWER AND LIGHTING WIRING SHALL BE #12 COPPER AWG MINIMUM.
3. ALL DISCRETE CONTROL WIRING SHALL BE #14 COPPER AWG MINIMUM.

FLASH PROTECTION FIELD MARKING

CONTRACTOR TO PROVIDE LABELS ON ALL SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS AND MOTOR CONTROL CENTERS IN ACCORDANCE WITH NEC 110.16 REQUIREMENTS.

LUMINAIRE SCHEDULE

SYMBOL	DESCRIPTION	VOLTS	LAMP WATTS	MANUFACTURER OR APPROVED EQUAL	LOCATION	MOUNTING
	EMERGENCY LIGHTING LED UNIT	120/277	LED 3.6W	LITHONIA #EU2 LED M12	AS SHOWN	WALL 8' AFF
	EXIT & EMERGENCY LIGHTING LED UNIT	120/277	LED 3.6W	LITHONIA #ECR LED M6	EXIT	WALL ABOVE DOOR
	UNDERCABINET LED LIGHTING, SIZE AS REQUIRED	120	LED 10W	SYLVANIA #71722	AS SHOWN	UNDERCABINET
A	2X4 GRID TOFFER, SPECIFICATION GRADE	277	T8 32W	LITHONIA #2VRT G 4 32 VL MVOLT	LAB, TOILET/LOCKER	TROFFER
B	2X4 FLUORESCENT HIGH BAY INDUSTRIAL	277	T8 32W	LITHONIA #IBZ 432	ELECTRICAL ROOM	CHAIN HUNG 10' AFF
C	2X4 FLUORESCENT HIGH BAY INDUSTRIAL	277	T8 32W	LITHONIA #IBZ 432	BLOWERS, LAYOUT AREA	CHAIN HUNG 18' AFF
D	2X4 FLUORESCENT HIGH BAY INDUSTRIAL	277	T8 32W	LITHONIA #IBZ 432	MEZZANINE	CHAIN HUNG AS HIGH AS POSSIBLE
A	1X4 ROUGH SERVICE WET LOCATION INDUSTRIAL	277	T8 32W	LITHONIA #DMW 2 32 MVOLT GEB10IS	CAUSTIC ROOM	CHAIN HUNG 8' AFF
	LED DOWN LIGHTING	120	LED 11W	LITHONIA #REAL6 D6MW ESL 1000L 30K .60SC	ROOM ENTRANCE, PUMP STATION	CEILING
	WALL MOUNT SECURITY LIGHT, PROVIDE WITH WIRE GUARD AND INTEGRAL PHOTOCELL CONTROL	120	LED 48W	LITHONIA #OLAW23 53K 120 PE BZ	CONTROL BLD EXTERIOR	WALL
	AREA LIGHT, 60 LED, 525mA DRIVER, TYPE 5 MEDIUM DISTRIBUTION, 4000K CCT WITH DL MOUNT, PHOTOCELL	277	LED 101W	CREE #ARE–EDG DL 06 E BK 5254 P R 40K	CLARIFIER	IBEAM
	AREA LIGHT, 100 LED, 525mA DRIVER, TYPE 3 MEDIUM DISTRIBUTION, 4000K CCT WITH DL MOUNT, PHOTOCELL	277	LED 171W	CREE #ARE–EDG DL 10 E BK 525 P R 40K	MBBR	SQUARE POLE ON PILE FOUNDATION

GENERAL NOTES

1. ALL RACEWAYS AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF TERMINAL BOXES AND CONDUIT ENTRANCES OF ALL EQUIPMENT AGAINST APPROVED SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
3. REFER TO SPECIFICATIONS FOR REQUIREMENTS RELATED TO FLEXIBLE METALLIC CONDUIT INSTALLATION. ALL LFMC SHALL BE NEW AND FITTINGS SHALL BE EVACUATED.
4. RACEWAY ALIGNMENTS WHERE SHOWN ARE THE INTENDED ROUTING AND CONFIGURATION DESIRED. ROUTING ALONG WALLS AND CEILINGS SHALL BE MADE TO MINIMIZE CROSSING.
5. CONDUIT STUB–UPS SHALL NOT BE MORE THEN 6" FROM THE CENTER LINE OF TERMINAL BOXES.
6. IN THE EVENT OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AND THE ENGINEER SHALL APPROVE PROPOSED CHANGES BEFORE THEY ARE MADE.
7. ALL SURFACE MOUNTED PANELS AND PANELBOARDS ON THE INTERIOR OF EXTERIOR WALLS ABOVE GRADE OR IN OTHER LOCATIONS CONSIDERED DAMP OR WET SUCH AS BELOW GRADE VAULTS SHALL BE MOUNTED SO AS TO MAINTAIN A 1/4 " (MINIMUM) AIR SPACE BETWEEN THE ENCLOSURE AND THE WALL.
8. LOCATION OF PULLBOXES ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION OF PULLBOXES WITH MECHANICAL PIPING AND SHALL BE 6" (MINIMUM) AWAY FROM MECHANICAL PIPING FLOW LINES.
9. THE CONTRACTOR SHALL PROVIDE ADDITIONAL PULLBOXES OR FITTINGS WHERE REQUIRED TO MAKE A WORKABLE INSTALLATION AND MEET CODE.
10. THE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS WHETHER OR NOT THEY ARE REFERENCED ON THE DRAWINGS.
11. ALL CONDUIT RUNS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION AND DEFLECTION TYPE FITTINGS. FOR LOCATIONS OF EXPANSION JOINTS, REFER TO THE STRUCTURAL DRAWINGS.
12. CONNECTIONS BETWEEN RIGID CONDUIT AND MOTOR TERMINAL BOXES OR SIMILAR EQUIPMENT SUBJECT TO VIBRATION SHALL BE FLEXIBLE LIQUID–TIGHT CONDUIT.
13. CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTION TO MOTORS AND OTHER EQUIPMENT.
14. CONDUITS FOR FUTURE EQUIPMENT OR EXTENSION SHALL BE TERMINATED AS SHOWN IN DETAIL OR AS SPECIFIED.
15. SEPARATE POWER, CONTROL AND INSTRUMENTATION WIRING. PROVIDE SEPARATE CONDUIT, PULL AND JUNCTION BOXES. PROVIDE SUITABLE CABLE BARRIER WITHIN PULL OR JUNCTION BOXES WHERE SEPARATION OF WIRING IS NOT SHOWN ON THE DRAWINGS.
16. ALL RECEPTACLES IN OUTDOOR AND ANTICIPATED WET AREAS SHALL BE GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES WITH WEATHERPROOF COVERS.
17. EQUIPMENT LOCKOUTS SHALL BE IN ACCORDANCE WITH OWNER'S REQUIREMENTS AND NEC.
18. SPLICES ARE NOT ALLOWED UNLESS APPROVED IN ADVANCE BY THE ENGINEER. THIS INCLUDES CASES WHERE ADDITIONAL CONDUCTORS MAY BE REQUIRED TO COMPLY.

CRW ENGINEERING GROUP, LLC

HDR

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 48TH — William M. McDonald EE-7679 — 05/27/21 — REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER "Alaska at its Best"

City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL ELECTRICAL LEGEND

0 1" 2"

FILENAME 000G009.dwg
SCALE AS NOTED

SHEET **000G009**

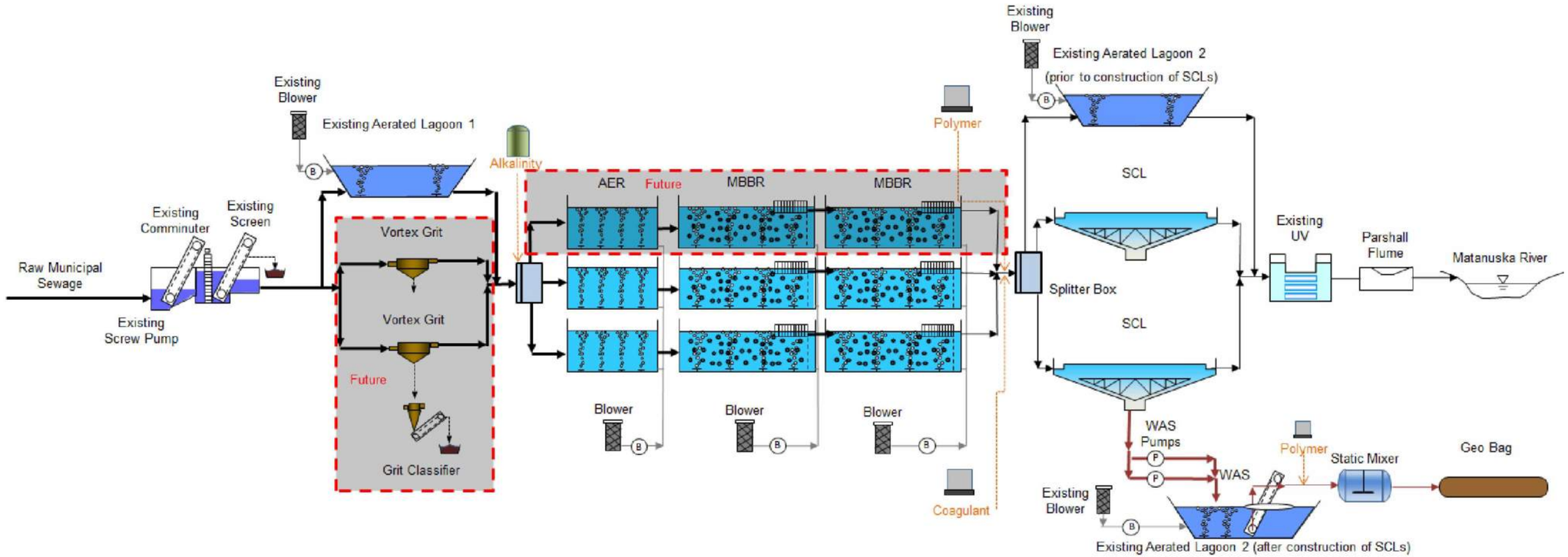
Palmer WasteWater Treatment Facility (Developed based on Plant Data between 01/2011 and 12/2014)			
Facility Design Criteria			
	Startup	**Phase I**	**Phase II**
Flow, mgd			
Average Annual	0.5	1.0	1.5
Peak Month	0.65	1.2	1.8
Peak Day	0.8	1.5	2.2
Peak Hour	1.0	2.0	3.0
Solids, #/day	**Loads (lbs/day)**		
Average Annual	1,018	2,035	3,052
Peak Month	1,632	3,102	4,518
Peak Day	2,676	4,941	7,412
BOD, #/day			
Average Annual	934	1,868	2,802
Peak Month	1,526	2,818	4,228
Peak Day	2,575	4,754	7,131
TKN-N, #/day			
Average Annual	159	310	476
Peak Month	260	479	719
Peak Day	438	808	1,212
NH4-N, #/day			
Average Annual	107	213	319
Peak Month	174	321	482
Peak Day	293	541	812
Influent Pumping (Existing)			
No.		2	2
Type		Inclined Screw	Inclined Screw
Capacity, ea. mgd		4.0	4.0

	Startup	**Phase I**	**Phase II**
Influent Comminutor/Grinder(Existing)			
No.		2	2
Type		Muffin Monster	Muffin Monster
Capacity, ea. mgd		2.0	2.0
Influent Screening (Existing)			
No.		2	2
Type		Inclined Perf Screen	Inclined Perf Screen
Capacity, ea. mgd		2.0	2.0
Lagoon #1 (Existing)			
Type		Aerated (BIOLAC by Parkson)	
Volume, Million Gal		6.3	
Operating Depth, Ft		9.7	
Area, acre		3.8	
Design Detention Time, days		11.6	
Design Loading, #BOD/day		975-1000	
Lagoon #2 (Existing)			
Type		Aerated (BIOLAC by Parkson)	
Volume, Million Gal		6.3	
Operating Depth, Ft		9.7	
Area, acre		3.8	
Design Detention Time, days		11.6	
Design Loading, #BOD/day		975-1000	
Lagoon #3 (Existing)			
Type		Aerated	
Volume, Million Gal		9.7	
Operating Depth, Ft		8.7	

	Startup	**Phase I**	**Phase II**
Area, acre		4.8	
Design Detention Time, days		17.9	
Moving Bed Bioreactor (MBBR) Aeration Basins (BOD Cells)			
Number		2	3
Type	Plug Flow	Plug Flow	Plug Flow
Volume, cft (Total)	40,800	40,800	61,200
Design Loading, #BOD/1000 cft	37	68	68
Aeration	Medium Bubble	Medium Bubble	Medium Bubble
Fill of Biofilm Carriers, %	27	50	60
Moving Bed Bioreactor (MBBR) Aeration Basins (Nitrification Cells)			
Number			6
Type	MLE Plug Flow	MLE Plug Flow	MLE Plug Flow
Geometry LxWxSWD, ft.			
Volume, cft (ea.)	10,800	10,800	10,800
Design Loading, #Ammonia/1000 cft	5	8	8
Aeration	Medium Bubble	Medium Bubble	Medium Bubble
Total Volume (all cells), cft	43,200	43,200	64,800
Fill of Biofilm Carriers, %	27	50	60
Total Media Volume, cft	22,598	41,807	
Total Process Air Requirement (All trains), SCFM	980	1,705	
Total Mixing Air Requirement (All trains), SCFM	3,060	3,060	

	Startup	**Phase I**	**Phase II**
Blowers (Existing)			
Type			
Number		2	
Capacity, cfm (max)		3100 cfm @ 9 psig	
Motor, each		150 hp	
Blowers (New)			
Type		Turbo	
Number		2	
Capacity, cfm (max)		3,100	
Motor, each		200	
Secondary Clarifiers			
Number		2	2
Type		Circular	Circular
Diameter, ft.		55	55
Overflow Rate, gal/sf/day			
Peak Month		253	379
Peak Day		316	463
Peak Month with One Unit Out of Service		505	758
Solids Loading, #/sf/day			
Peak Month		0.6	0.9
Peak Day		1.0	1.5

	Startup	**Phase I**	**Phase II**
Waste Activated Sludge Pumping			
Type		Vortex (torque-flow) pumps	
Number		2	
Capacity, gpm		100 gpm @ 7' (TDH)	
Motor, each		2.5 hp	
Solids, dry #/day			
Annual Average	700	2,300	3,400
Peak Month (Winter)	1,100	3,300	4,900
Peak Month (Summer)	1,000	3,100	4,700
Solids, gal/day @ 0.5%			
Annual Average	17,000	55,000	82,000
Peak Month (Winter)	26,000	79,000	118,000
Peak Month (Summer)	24,000	74,000	113,000
Sludge Stabilization (Existing)			
Type		Aerobic Digestion	
Lagoon #2			
Volume, gal.	6,300,000	6,300,000	6,300,000
Design Detention Time, days	370	110	80
Lagoon #3			
Volume, gal.	9,700,000	9,700,000	9,700,000
Design Detention Time, days	570	180	120
UV Disinfection Channels (Existing)			
Number		2	2
Type		Horizontal	Horizontal
Capacity, MGD		2	2



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INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

CRW ENGINEERING GROUP, LLC

HDR

STATE OF ALASKA 49TH JONATHAN RYAN MOYERS No. CE-12718 REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER "Alaska at its Best!"

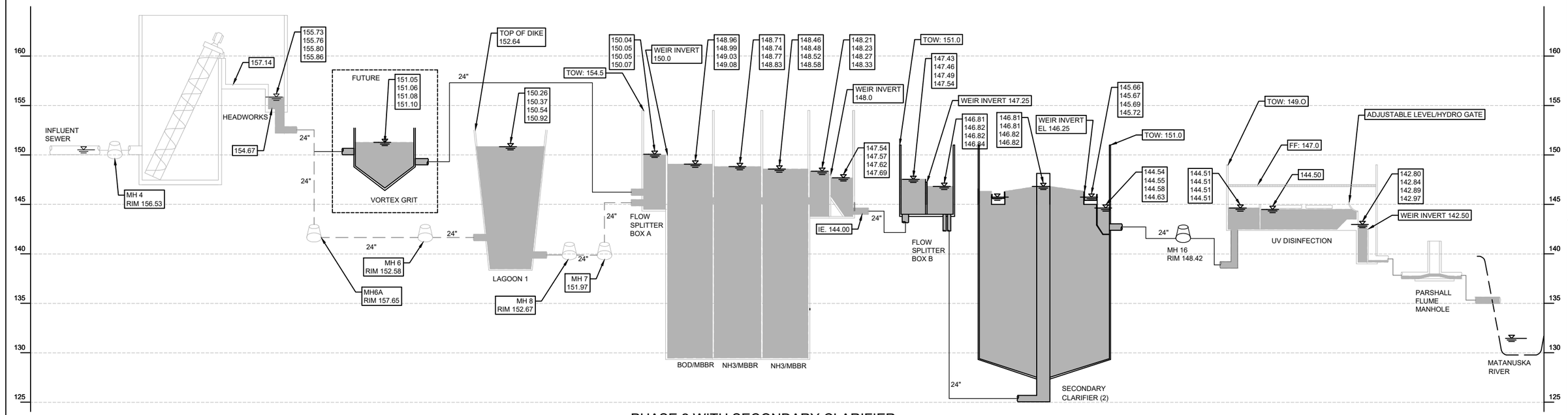
City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL
DESIGN CRITERA AND
PROCESS FLOW DIAGRAM

0 1" 2"

FILENAME 000G010.dwg
SCALE NONE

SHEET
000G010



PHASE 2 WITH SECONDARY CLARIFIER

PHASE 2 SYSTEM FLOWS (MGD)	
AVERAGE ANNUAL	1.00
PEAK MONTH	1.20
PEAK DAY	1.50
PEAK HOUR	2.00

WATER SURFACE ELEVATIONS SHOWN CORRESPOND TO LISTED FLOWS:

149.29 — 1.0 MGD
149.33 — 1.2 MGD
149.38 — 1.5 MGD
149.46 — 2.0 MGD

NOTES:

1. WATER ELEVATIONS SHOWN ASSUME MOST EXTREME POSSIBILITY IN SITUATIONS WHERE TWO OUTCOMES CAN OCCUR.
2. IN CLARIFIER FLOW SCENARIO, SPLITTER BOX B FLOW IS SPLIT BETWEEN TWO (2) WEIRS FIVE (5) FEET IN LENGTH EACH. IN LAGOON FLOW SCENARIO, SPLITTER BOX B FLOW IS DIRECTED OVER ONE (1) WEIR FIVE (5) FEET IN LENGTH.

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STATE OF ALASKA — 49TH — JONATHAN RYAN MOYERS — No. CE-12718 — REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER — "Alaska at its Best!"

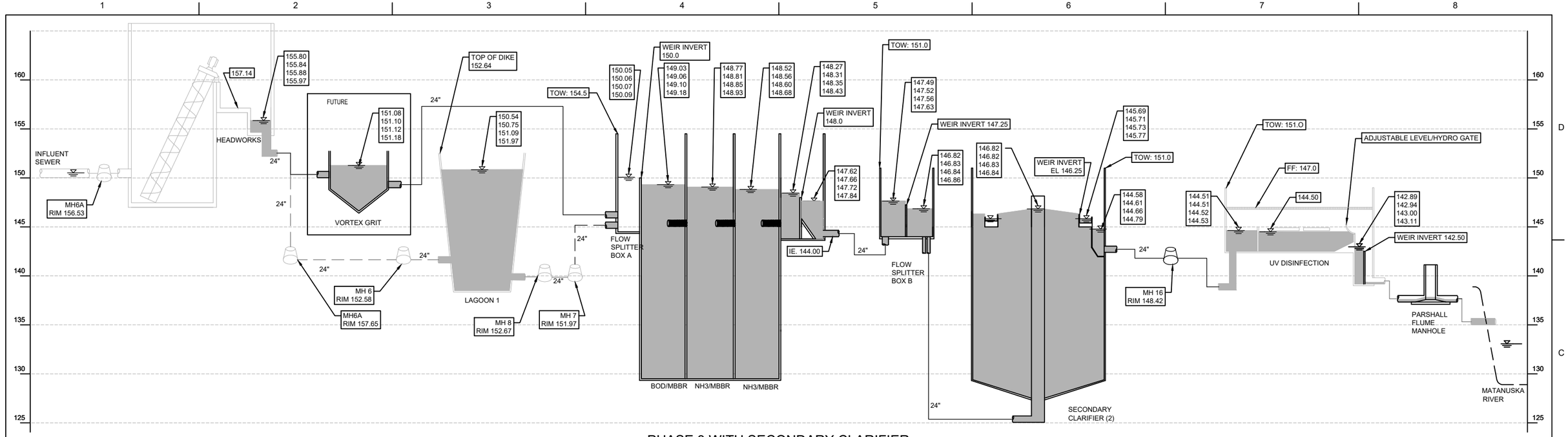
City of Palmer
WWTF
Improvements Project
Phase 2

GENERAL
HYDRAULIC PROFILE
PHASE 2

0 1" 2"

FILENAME 000G011.dwg
SCALE NOT TO SCALE

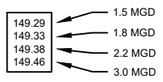
SHEET
000G011



PHASE 3 WITH SECONDARY CLARIFIER

PHASE 3 SYSTEM FLOWS (MGD)	
AVERAGE ANNUAL	1.50
PEAK MONTH	1.80
PEAK DAY	2.20
PEAK HOUR	3.00

WATER SURFACE ELEVATIONS SHOWN CORRESPOND TO LISTED FLOWS:



NOTES:

1. WATER ELEVATIONS SHOWN ASSUME MOST EXTREME POSSIBILITY IN SITUATIONS WHERE TWO OUTCOMES CAN OCCUR.
2. IN CLARIFIER FLOW SCENARIO, SPLITTER BOX B FLOW IS SPLIT BETWEEN TWO (2) WEIRS FIVE (5) FEET IN LENGTH EACH. IN LAGOON FLOW SCENARIO, SPLITTER BOX B FLOW IS DIRECTED OVER ONE (1) WEIR FIVE (5) FEET IN LENGTH.
3. PHASE 2 ASSUMES A THIRD MBBR TRAIN IS CONSTRUCTED TO SPLIT FLOW INTO 3 TRAINS.

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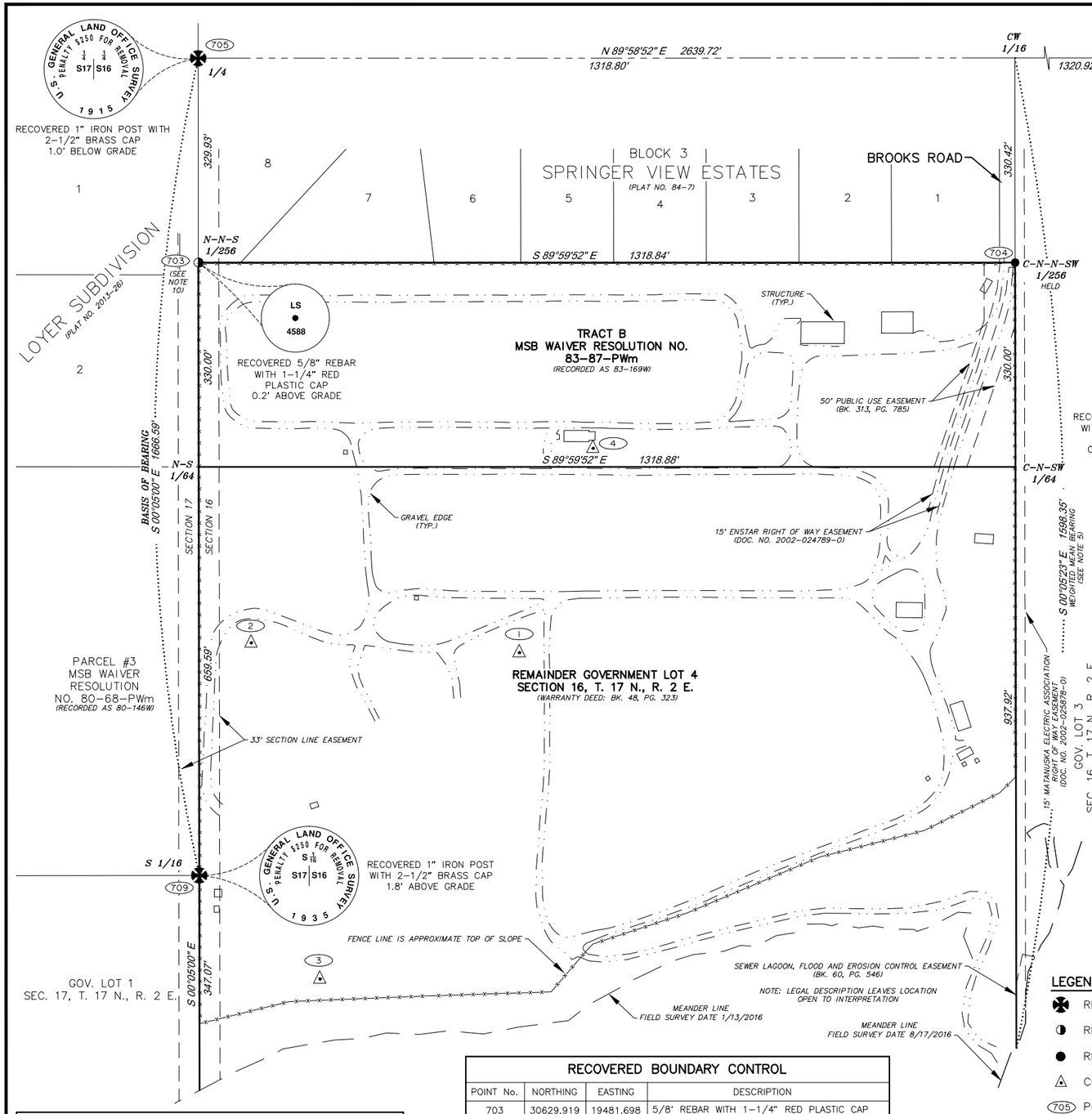
WWTF
Improvements Project
Phase 2

GENERAL
HYDRAULIC PROFILE
PHASE 3

0 1" 2"

FILENAME	000G012.dwg
SCALE	NOT TO SCALE

SHEET
000G012



HORIZONTAL CONTROL STATEMENT

COORDINATE SYSTEM:
THIS PROJECT IS LOCATED ENTIRELY WITHIN THE A LOCAL GRID SURFACE COORDINATED SYSTEM DEVELOPED BY CRW.

BASIS OF COORDINATES:
THE BASIS OF COORDINATES IS NATIONAL GEODETIC CONTROL STATION MSB-GPS-1, A STANDARD 3-1/4" BRASS DISK CRIMPED TO THE TOP OF A 3/4" STAINLESS STEEL ROD, IN A MONUMENT CASE, 0.3' BELOW GRADE, LOCATED APPROXIMATELY 122 FEET EAST-SOUTHEAST FROM THE SOUTHEAST CORNER OF THE NORTHERN WING OF THE MAT-SU BOROUGH BUILDING, WITHIN A CURBED DIVIDING STRIP IN THE PARKING LOT.

SAID STATION HAS PUBLISHED ALASKA STATE PLANE, ZONE 4, NAD83 (2011) COORDINATES EXPRESSED IN U.S. SURVEY FEET OF:

2777622.468 (N) 1795804.297 (E)

SAID STATION HAS LOCAL COORDINATES EXPRESSED IN U.S. SURVEY FEET OF:

44184.163 (N) 21287.390 (E)

BASIS OF BEARING:
THE BASIS OF BEARINGS IS THE RECORD TRUE BEARING OF S 0°05' E, PER THE OFFICIAL GENERAL LAND OFFICE (GLO) PLAT OF TOWNSHIP 17 NORTH, RANGE 2 EAST, SEWARD MERIDIAN, ACCEPTED FEBRUARY 11, 1938, BETWEEN THE RECOVERED ORIGINAL GLO MONUMENTS FOR THE 1/4 CORNER OF SECTIONS 16 AND 17, HEREIN REFERENCE TO POINT NUMBER 705 AND THE SOUTH 1/16 CORNER OF SECTIONS 16 AND 17, HEREIN REFERENCE TO POINT NUMBER 709.

TRANSFORMATION PARAMETERS, HOLDING NGS "MSB-GPS-1", POINT NUMBER 701:
CONVERSION FROM LOCAL FEET TO STATE PLANE, ZONE 4, NAD83 (2011) FEET:
1) SCALE LOCAL COORDINATES BY 0.99991748 ABOUT 44184.163 (N), 21287.390 (E).
2) MOVE LOCAL COORDINATES BY +2733438.305 (N), +1774516.907 (E).
3) ROTATE LOCAL COORDINATES BY -00°48'16.775" ABOUT 277762.468 (N), 1795804.297 (E).

CONVERSION FROM STATE PLANE, ZONE 4, NAD83 (2011) FEET TO LOCAL FEET:
1) SCALE STATE PLANE COORDINATES BY 1.000082527 ABOUT 277762.468 (N), 1795804.297 (E).
2) MOVE STATE PLANE COORDINATES BY -2733438.305 (N), -1774516.907 (E).
3) ROTATE STATE PLANE COORDINATES BY +00°48'16.775" ABOUT 44184.163 (N), 21287.390 (E).

VERTICAL CONTROL STATEMENT

THE VERTICAL CONTROL WAS ESTABLISHED BY STATIC GPS METHODS AND PROCESSED WITH LEICA GEOMATICS OFFICE VERSION 7.0.1.0 SOFTWARE.

DATUM:
THE VERTICAL DATUM EXPRESSED HEREIN IS NAVD88, COMPUTED HOLDING THE PUBLISHED ELLIPSOID HEIGHT OF "MSB-GPS-1" AND GEOID12B. "MSB-GPS-1" HAS AN NAVD88 ORTHOMETRIC HEIGHT OF 245.525 FEET.

NOTES

1) THE FIELD SURVEY SURVEY WAS COMPLETED BY CRW ENGINEERING GROUP, LLC BETWEEN JANUARY 11, 2016 SEPTEMBER 23, 2016.
2) CONTROL STATIONS SET AND BOUNDARY MONUMENTS RECOVERED THIS SURVEY WERE ESTABLISHED WITH STATIC GPS METHODS, UTILIZING DUAL FREQUENCY LEICA GPS RECEIVERS. A LEAST SQUARES NETWORK WAS PROCESSED WITH LEICA GEOMATICS OFFICE VERSION 7.0.1.0 SOFTWARE.
3) PLANIMETRIC & TOPOGRAPHIC FEATURES WERE ACQUIRED WITH REAL TIME KINEMATIC (RTK) SURVEY METHODS BASED ON THE SET CONTROL STATIONS.
4) ALL DIMENSIONS AND COORDINATES SHOWN HEREON ARE LOCAL GROUND EXPRESSED IN U.S. SURVEY FEET, UNLESS OTHERWISE NOTED.
5) THE EAST BOUNDARY OF SUBJECT PARCELS ESTABLISHED BY COMPUTING A MEAN WEIGHTED BEARING BETWEEN THE RETRACED LINE OF SECTIONS 16 AND 17 AND THE RETRACED LINE OF CENTER 1/4 LINE OF SECTION 16. THE 5/8" REBAR RECOVERED AS POINT NUMBER 704 WAS ACCEPTED AS THE C-N-N-SW 1/256 CORNER.
6) THIS SURVEY WAS COMPLETED WITHOUT THE BENEFIT OF A TITLE REPORT, THERE MAY BE ADDITIONAL ENCUMBRANCES ON SUBJECT OR ADJACENT PROPERTIES NOT SHOWN HEREON.
7) THE REMAINED OF GOVERNMENT LOT 4 IS SUBJECT TO A BLANKET RIGHT OF WAY EASEMENT GRANTED TO MATANUSKA ELECTRICAL ASSOCIATION IN BOOK 977 AT PAGE 659 AND AT DOCUMENT NO. 2002-026548-0.
8) TRACT B, WAIVER RESOLUTION NO. 83-87-PWm IS SUBJECT TO A BLANKET RIGHT OF WAY EASEMENT GRANTED TO MATANUSKA ELECTRICAL ASSOCIATION AT DOCUMENT NO. 2002-025876-0.
9) WHETHER LISTED OR NOT, ALL MONUMENTS OR PROPERTY MARKERS, CORNERS, OR ACCESSORIES, WHICH WILL BE DISTURBED OR BURIED, SHALL BE REFERENCED OR RE-ESTABLISHED IN THEIR ORIGINAL POSITION (A.S. 19.10.260) AND RECORDED (A.S. 34.65.040).
10) THE 5/8" REBAR WITH 1-1/4" RED PLASTIC CAP BEARS S 89°59'52" E, 0.22' FROM THE CORNER POSITION REPORTED HEREIN.

LEGEND

- RECOVERED ORIGINAL GLO MONUMENT
- RECOVERED 5/8" REBAR WITH PLASTIC CAP
- RECOVERED 5/8" REBAR
- CONTROL STATION SET BY CRW
- (705) POINT NUMBER IDENTIFIER
- *1/4* GOVERNMENT CORNER IDENTIFIER

SET SURVEY CONTROL STATIONS

POINT No.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	30000.000	20000.000	167.14	5/8" REBAR WITH 2" ALCAP
2	30015.797	19567.028	162.90	5/8" REBAR WITH 2" ALCAP
3	29472.870	19677.904	151.33	5/8" REBAR WITH 2" ALCAP
4	30329.974	20119.036	153.08	1-1/4" BRASS PLUG

RECOVERED BOUNDARY CONTROL

POINT No.	NORTHING	EASTING	DESCRIPTION
703	30629.919	19481.698	5/8" REBAR WITH 1-1/4" RED PLASTIC CAP
704	30629.868	20800.314	5/8" REBAR
705	30959.849	19480.994	1" IRON POST WITH 2-1/2" BRASS CAP (GLO)
706	30960.717	22120.714	5/8" REBAR
707	30685.281	22121.309	1" IRON POST WITH 2-1/2" BRASS CAP (GLO)
708	30571.809	22121.471	5/8" REBAR WITH 1-1/4" YELLOW PLASTIC CAP
709	29640.330	19482.916	5/8" REBAR WITH 1-1/4" YELLOW PLASTIC CAP

RECOVERED SURVEY CONTROL STATIONS

POINT No.	NORTHING	EASTING	ELEVATION	DESCRIPTION
701	44184.163	21287.390	245.525	NGS "MSB-GPS-1"
702	25683.815	8913.239	105.527	NGS "MSB-GPS-4"

RECOVERED NGS MONUMENTS, NOT SHOWN HEREON

701
FOR INFORMATION OR TO REPORT DAMAGE HORIZONTAL CONTROL MARK MSB GPS 1 1985 THE DIRECTOR NATIONAL GEODETIC SURVEY WASHINGTON D.C.

N.G.S. "MSB GPS 1", PID "TT4648" RECOVERED 3-1/4" BRASS DISK IN MON. CASE, 0.3' BELOW GRADE

702
FOR INFORMATION OR TO REPORT DAMAGE HORIZONTAL CONTROL MARK MSB GPS 4 1985 THE DIRECTOR NATIONAL GEODETIC SURVEY WASHINGTON D.C.

N.G.S. "MSB GPS 4", PID "TT4664" RECOVERED 3-1/4" BRASS DISK IN MON. CASE, 0.3' BELOW GRADE

CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
(AECL882-AK

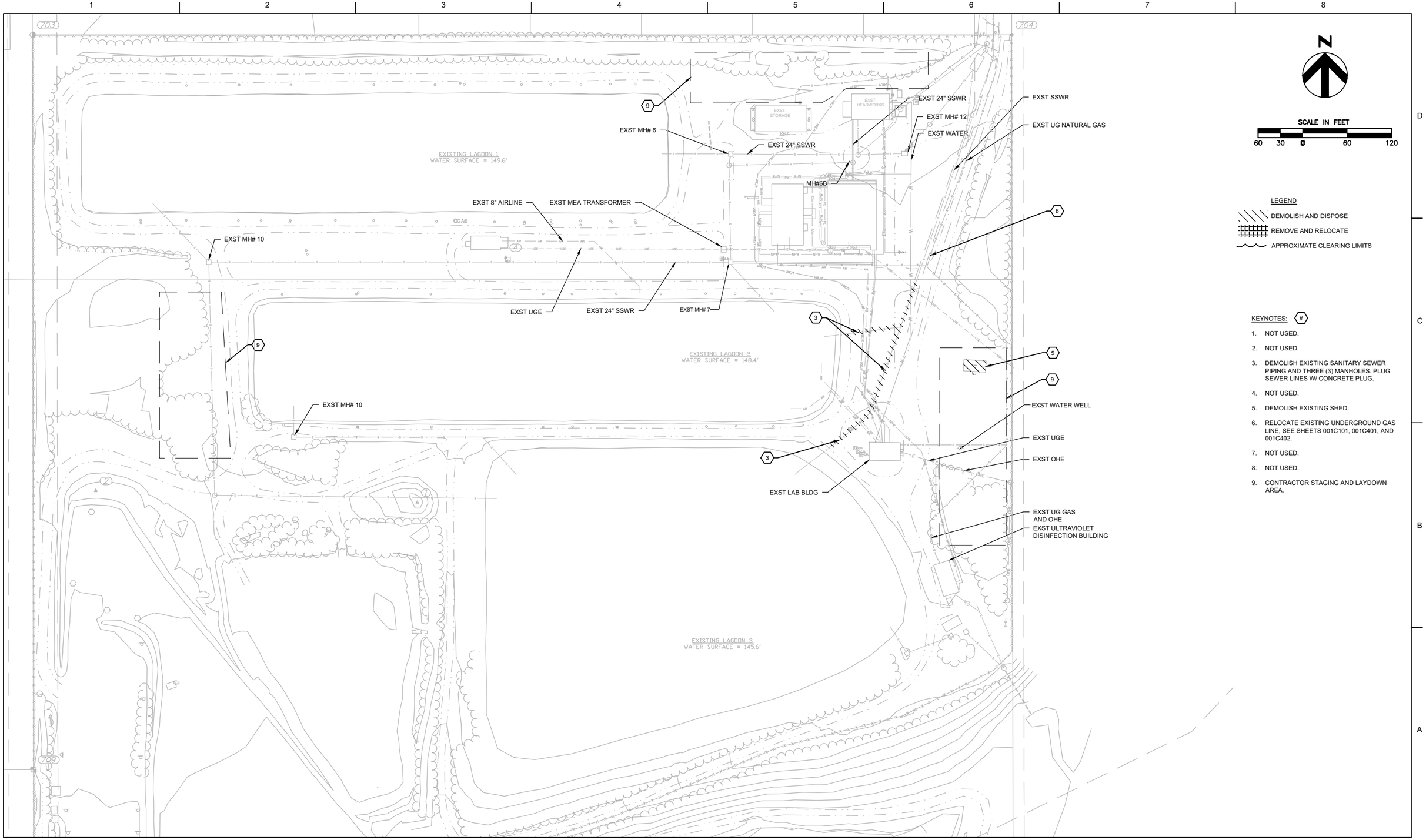
STATE OF ALASKA 49 TH Benjamin J. Hron LS-13010 11/7/16 REGISTERED PROFESSIONAL LAND SURVEYOR

CITY OF PALMER WASTEWATER TREATMENT PLANT FACILITY PLAN UPDATE

DATE:	11/7/2016
SCALE:	1" = 100'
DRAWN:	BJH
CHECKED:	MLJ/AJR
FIELD BOOK:	144

SURVEY CONTROL SHEET

SHEET NO.
000G013



KEYNOTES: (#)

1. NOT USED.
2. NOT USED.
3. DEMOLISH EXISTING SANITARY SEWER PIPING AND THREE (3) MANHOLES. PLUG SEWER LINES W/ CONCRETE PLUG.
4. NOT USED.
5. DEMOLISH EXISTING SHED.
6. RELOCATE EXISTING UNDERGROUND GAS LINE, SEE SHEETS 001C101, 001C401, AND 001C402.
7. NOT USED.
8. NOT USED.
9. CONTRACTOR STAGING AND LAYDOWN AREA.

CRW ENGINEERING GROUP, LLC

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ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA
J. RYAN MOYERS
No. CE-12718
REGISTERED PROFESSIONAL ENGINEER

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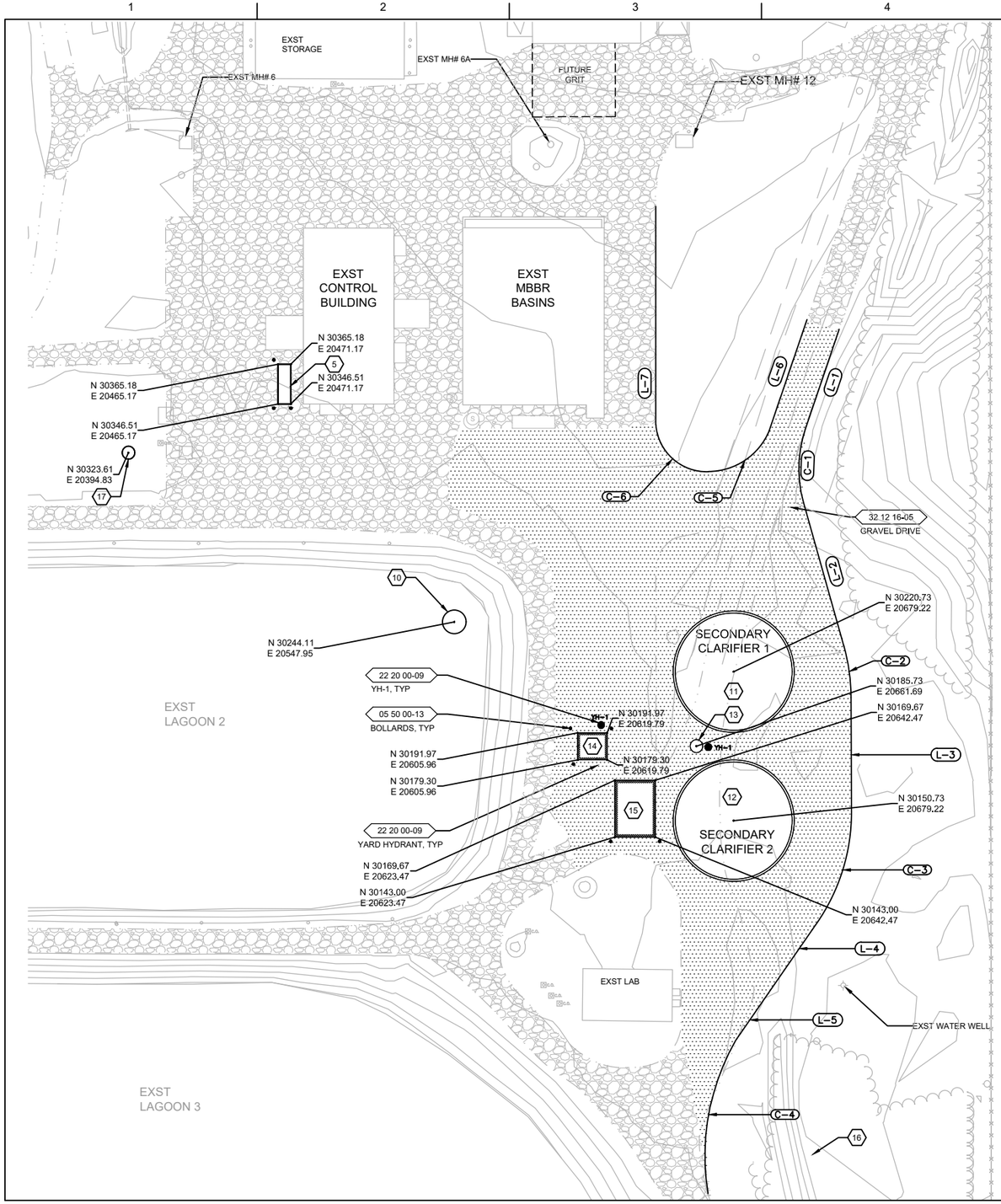
Phase 2

CIVIL
EXISTING SITE, CLEARING LIMITS, AND DEMOLITION PLAN

0 1" 2"

FILENAME 001C001.dwg
SCALE 1" = 60'

SHEET
001C001



N

SCALE IN FEET

30 15 0 30 60

KEY NOTES: (X)

1. NOT USED.
2. NOT USED.
3. NOT USED
4. NOT USED.
5. GENERATOR, PROVIDE 6' X 18'-8" SLAB, SEE DETAIL 2/600S101, SIMILAR.
6. NOT USED.
7. NOT USED.
8. NOT USED.
9. NOT USED.
10. LAGOON 2 OVERFLOW STRUCTURE.
11. SECONDARY CLARIFIER 1.
12. SECONDARY CLARIFIER 2.
13. SCUM PUMP STATION.
14. SECONDARY FLOW SPLITTER.
15. WAS VAULT.
16. MANHOLE #16.
17. MANHOLE #15.

LINE AND CURVE TABLES

NUMBER	START COORDINATES	LENGTH	RADIUS	LINE/CHORD DIRECTION	END COORDINATES
C-1	30334.95 , 20713.03	35.42'	59.00'	S1°30'40"W	30300.07 , 20712.11
C-2	30232.81 , 20731.00	24.58'	91.00'	S7°57'02"E	30208.54 , 20734.39
C-3	30154.86 , 20734.59	55.43'	91.00'	S17°14'16"W	30102.73 , 20718.42
C-4	30047.51 , 20680.20	74.57'	109.53'	S10°14'20"W	29975.54 , 20667.20
C-5	30333.91 , 20695.94	36.50'	31.07'	S56°00'44"W	30314.66 , 20667.38
C-6	30314.66 , 20667.38	36.63'	23.94'	N48°14'02"W	30336.75 , 20642.65
L-1	30381.59 , 20728.83	49.24'	NA	S18°42'39"W	30334.95 , 20713.03
L-2	30300.07 , 20712.11	69.86'	NA	S15°41'18"E	30232.81 , 20731.00
L-3	30208.54 , 20734.39	53.69'	NA	S0°12'46"E	30154.86 , 20734.59
L-4	30102.73 , 20718.42	67.16'	NA	S34°41'18"W	30047.51 , 20680.20
L-5	30102.73 , 20718.42	67.16'	NA	S34°41'18"W	30047.51 , 20680.20
L-6	30333.91 , 20695.94	55.25'	NA	N18°46'53"E	30386.22 , 20713.72
L-7	30336.75 , 20642.65	102.67'	NA	N0°00'00"E	30439.41 , 20642.65

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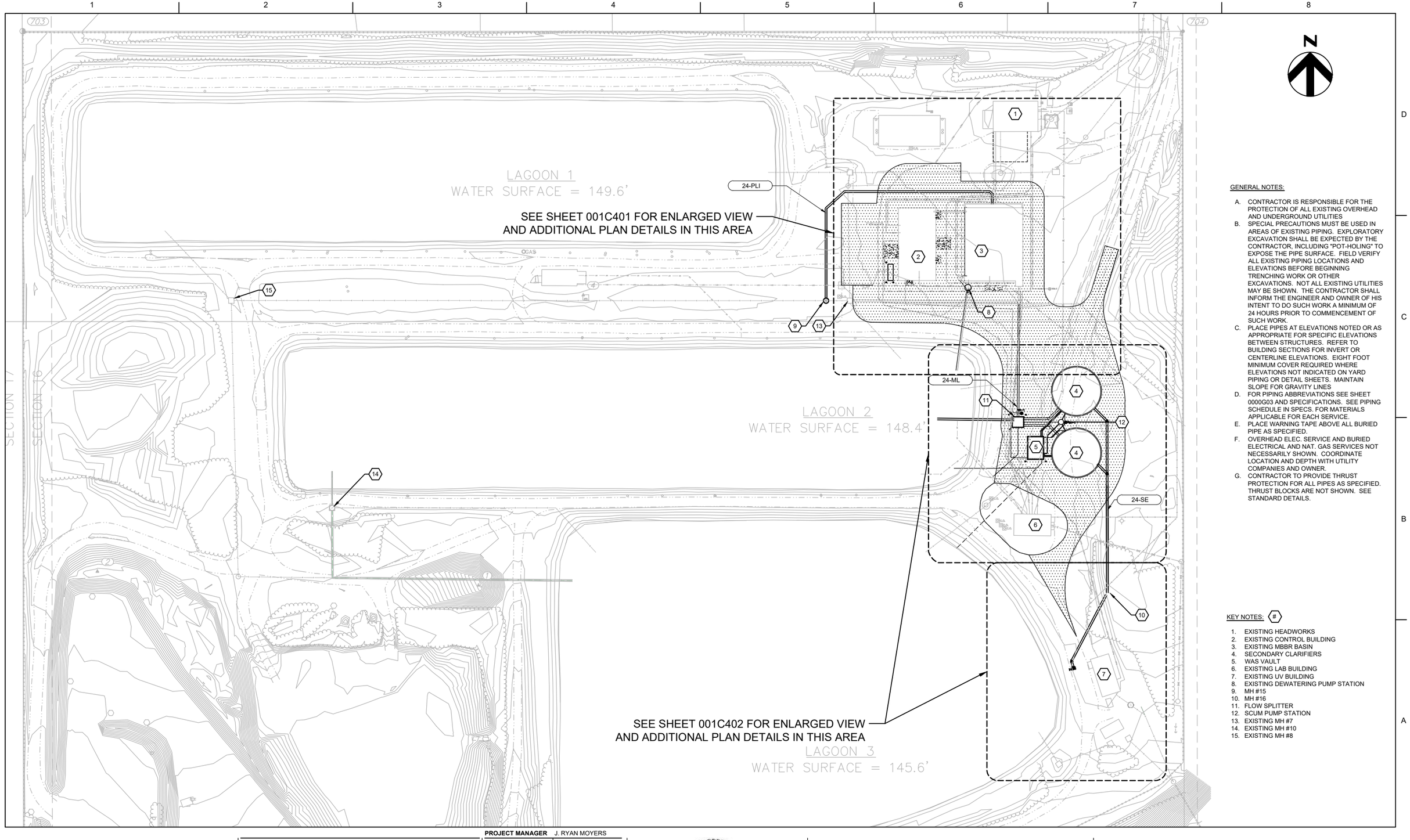
Phase 2

CIVIL
OVERALL SITE LAYOUT PLAN

0 1" 2"

FILENAME 001C002.dwg
SCALE 1" = 30'

SHEET
001C002



GENERAL NOTES:

A. CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES.
B. SPECIAL PRECAUTIONS MUST BE USED IN AREAS OF EXISTING PIPING. EXPLORATORY EXCAVATION SHALL BE EXPECTED BY THE CONTRACTOR, INCLUDING "POT-HOLING" TO EXPOSE THE PIPE SURFACE. FIELD VERIFY ALL EXISTING PIPING LOCATIONS AND ELEVATIONS BEFORE BEGINNING TRENCHING WORK OR OTHER EXCAVATIONS. NOT ALL EXISTING UTILITIES MAY BE SHOWN. THE CONTRACTOR SHALL INFORM THE ENGINEER AND OWNER OF HIS INTENT TO DO SUCH WORK A MINIMUM OF 24 HOURS PRIOR TO COMMENCEMENT OF SUCH WORK.
C. PLACE PIPES AT ELEVATIONS NOTED OR AS APPROPRIATE FOR SPECIFIC ELEVATIONS BETWEEN STRUCTURES. REFER TO BUILDING SECTIONS FOR INVERT OR CENTERLINE ELEVATIONS. EIGHT FOOT MINIMUM COVER REQUIRED WHERE ELEVATIONS NOT INDICATED ON YARD PIPING OR DETAIL SHEETS. MAINTAIN SLOPE FOR GRAVITY LINES
D. FOR PIPING ABBREVIATIONS SEE SHEET 0000G03 AND SPECIFICATIONS. SEE PIPING SCHEDULE IN SPECS. FOR MATERIALS APPLICABLE FOR EACH SERVICE.
E. PLACE WARNING TAPE ABOVE ALL BURIED PIPE AS SPECIFIED.
F. OVERHEAD ELEC. SERVICE AND BURIED ELECTRICAL AND NAT. GAS SERVICES NOT NECESSARILY SHOWN. COORDINATE LOCATION AND DEPTH WITH UTILITY COMPANIES AND OWNER.
G. CONTRACTOR TO PROVIDE THRUST PROTECTION FOR ALL PIPES AS SPECIFIED. THRUST BLOCKS ARE NOT SHOWN. SEE STANDARD DETAILS.

KEY NOTES: (#)

1. EXISTING HEADWORKS
2. EXISTING CONTROL BUILDING
3. EXISTING MBBR BASIN
4. SECONDARY CLARIFIERS
5. WAS VAULT
6. EXISTING LAB BUILDING
7. EXISTING UV BUILDING
8. EXISTING DEWATERING PUMP STATION
9. MH #15
10. MH #16
11. FLOW SPLITTER
12. SCUM PUMP STATION
13. EXISTING MH #7
14. EXISTING MH #10
15. EXISTING MH #8

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PROJECT NUMBER	200435 -...0249258

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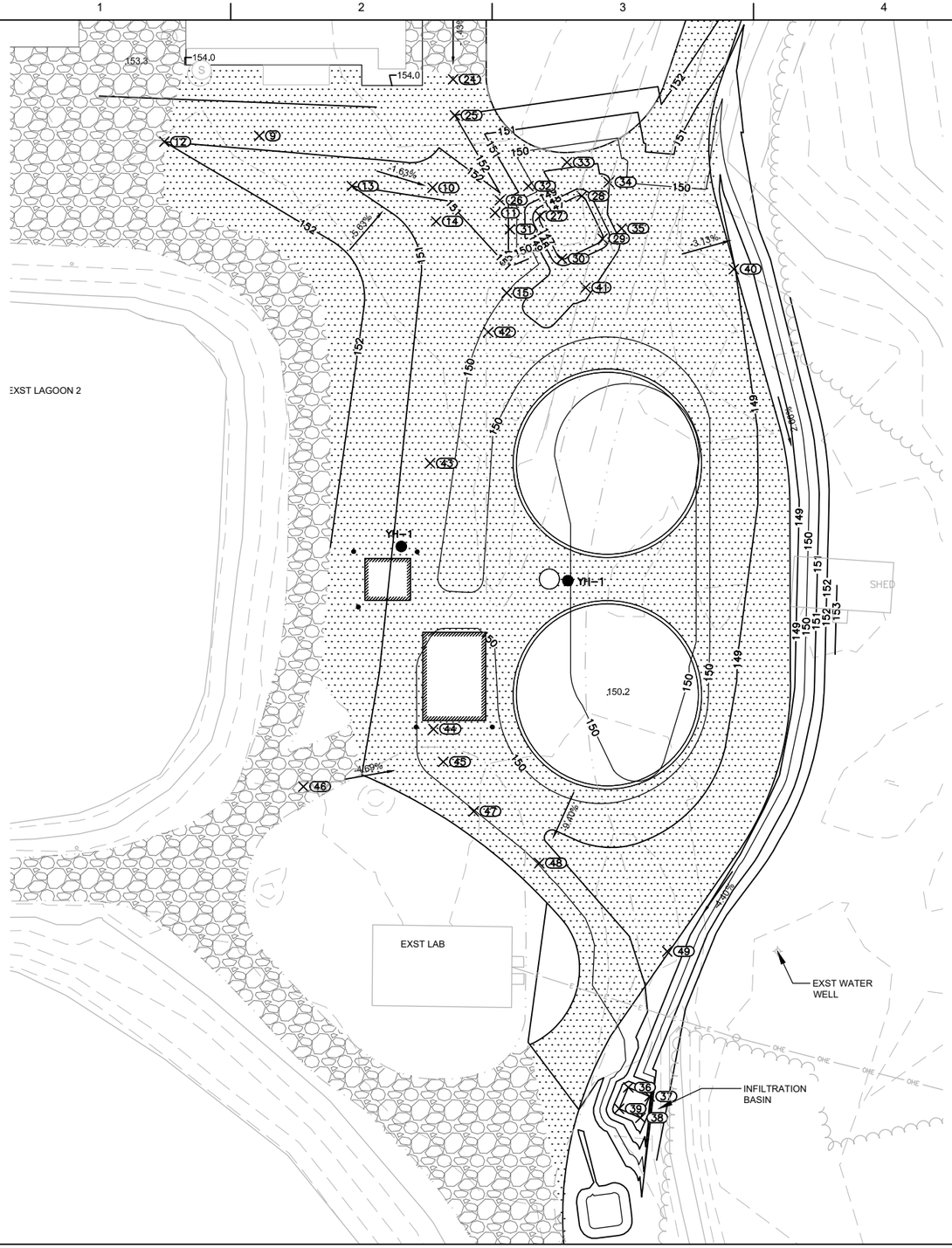
Phase 2

CIVIL
YARD PIPING PLAN

0 1" 2"

FILENAME 001C101.dwg
SCALE 1" = 50'

SHEET
001C101



PALMER WWTF – POINT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
9	30319.7	20574.1	152.0	SW
10	30304.0	20626.4	151.6	SW
11	30296.4	20645.3	151.8	SW
12	30317.9	20545.4	152.0	OL
13	30304.5	20602.1	151.0	OL
14	30293.8	20627.5	150.5	OL
15	30272.2	20648.9	150.0	OL
24	30336.7	20632.6	152.2	SW
25	30325.9	20633.2	152.0	SW
26	30300.2	20646.8	151.8	SW
27	30295.5	20658.9	147.0	INFIL
28	30301.5	20671.5	147.0	INFIL
29	30288.6	20677.8	147.0	INFIL
30	30282.5	20665.5	147.0	INFIL
31	30291.5	20649.9	151.8	INFIL
32	30304.5	20655.4	151.6	INFIL
33	30311.7	20667.1	152.0	INFIL
34	30305.7	20679.7	151.4	INFIL
35	30291.7	20683.6	150.1	INFIL
36	30032.1	20685.6	147.0	INFIL
37	30029.4	20692.0	147.0	INFIL
38	30023.0	20689.3	147.0	INFIL
39	30025.7	20682.8	147.0	INFIL
40	30279.4	20717.5	149.0	SW
41	30273.8	20672.7	149.0	SW
42	30260.4	20643.3	149.1	SW
43	30220.7	20625.7	149.3	SW
44	30140.4	20626.7	149.3	SW
45	30130.5	20629.7	149.3	SW
46	30123.0	20587.4	152.0	SW
47	30115.6	20638.9	149.1	SW
48	30099.9	20658.7	149.1	SW
49	30073.2	20697.4	148.1	SW

N

SCALE IN FEET
20 10 0 20 40

KEYNOTE: (#)

1. PROVIDE GRAVEL SURFACE, SEE STANDARD DETAIL 32 12 16-05. RESTORE EXISTING GRAVEL AREAS DISTURBED DURING CONSTRUCTION TO PRE-CONSTRUCTION CONDITIONS

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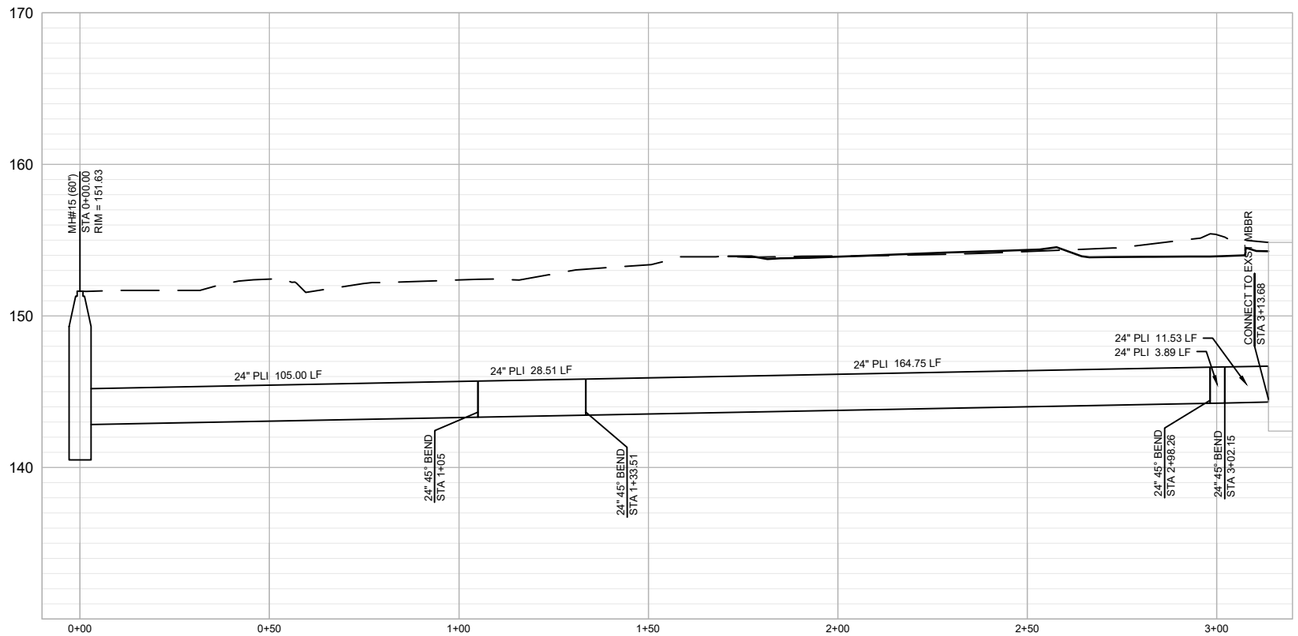
Phase 2

CIVIL
SITE GRADING PLAN

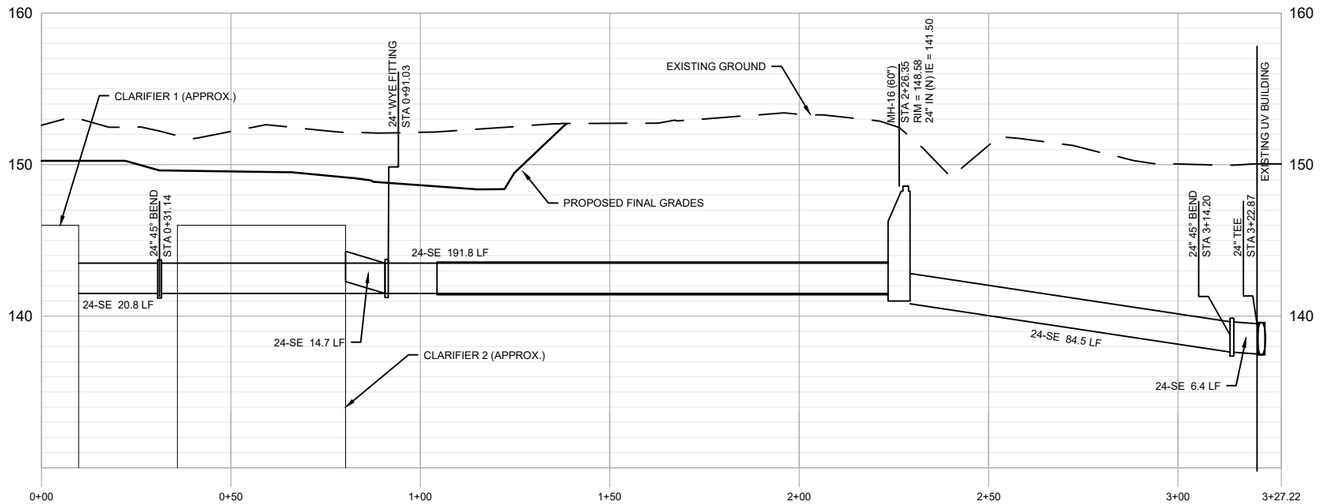
0 1" 2"

FILENAME 001C102.dwg
SCALE 1" = 20'

SHEET
001C102



1 001C401 MH#15 PLANT INFLUENT TO MBBR
AS SHOWN



2 001C402 SECONDARY CLARIFIER EFFLUENT TO UV
AS SHOWN

SCALE IN FEET
20 10 0 20 40

SCALE IN FEET
5 2.5 0 5 10

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STATE OF ALASKA 49TH
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CRW ENGINEERING GROUP, LLC
HDR

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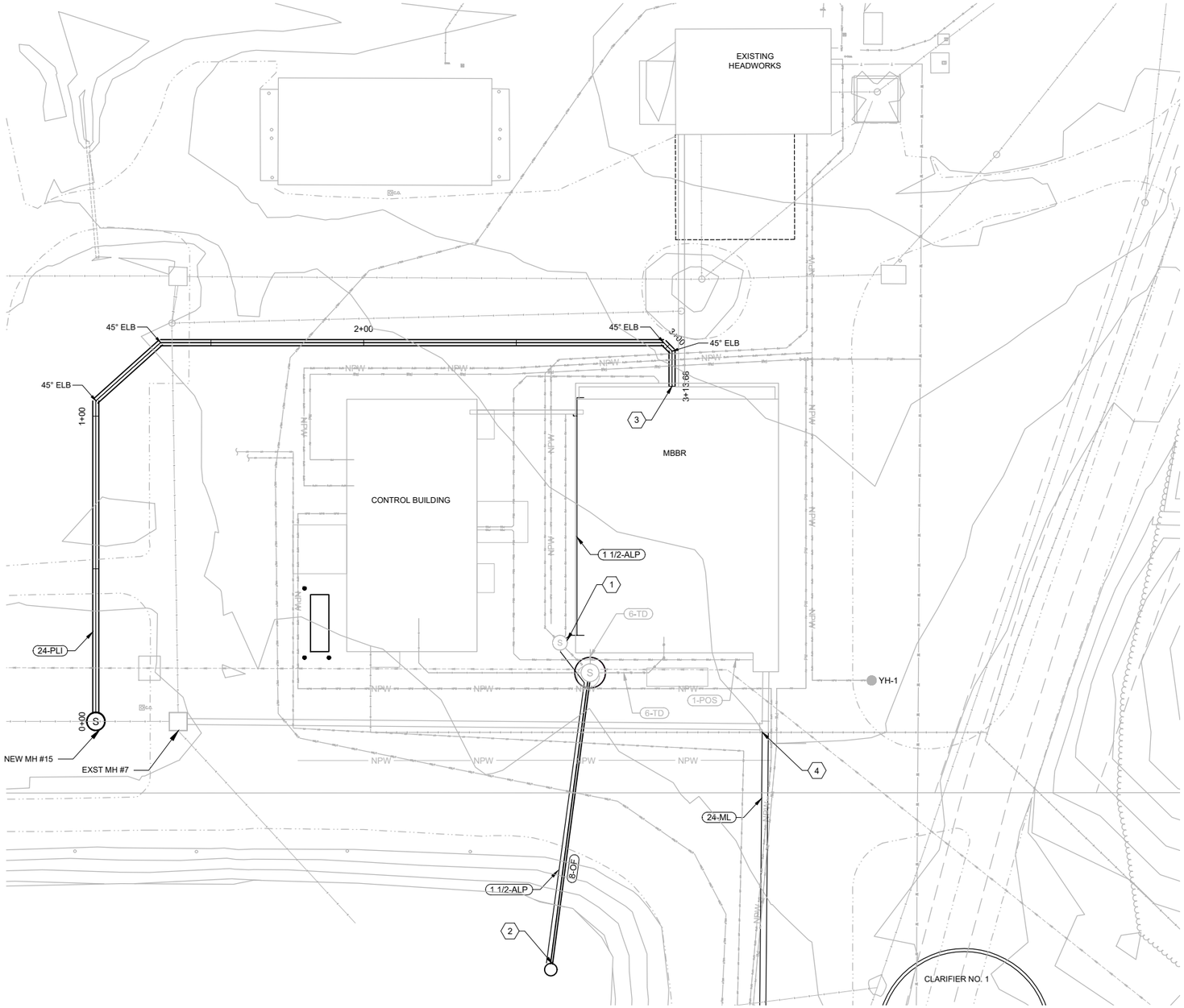
Improvements Project
Phase 2

CIVIL
YARD PIPING PROFILES - I

0 1" 2"

FILENAME 001C301.dwg
SCALE 1" = 60'

SHEET
001C301



ENLARGED PIPING PLAN - MBBR AND CONTROL BUILDING

1" = 20'-0"

N

KEY NOTES: (X)

1. SEE 200D301 FOR CONTINUATION OF 1 1/2-ALP.
2. SEE SHEET 001C507 FOR LAGOON 2 OUTFALL STRUCTURE DETAIL.
3. REMOVE BLIND FLANGE AND CONNECT TO EXISTING 24" WALL PIPE AT MBBR.
4. REMOVE BLIND FLANGE AND CONNECT NEW 24-ML TO EXISTING 24" TEE. DISCONNECT EXISTING 24" LINE TO MH#7 AND PLUG LINE WITH CONCRETE PLUG. INSTALL BLIND FLANGE ON EXISTING 24" TEE ON THE SIDE OUT TO MH#7.

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STATE OF ALASKA 49TH — JONATHAN RYAN MOYERS No. CE-12718 REGISTERED PROFESSIONAL ENGINEER

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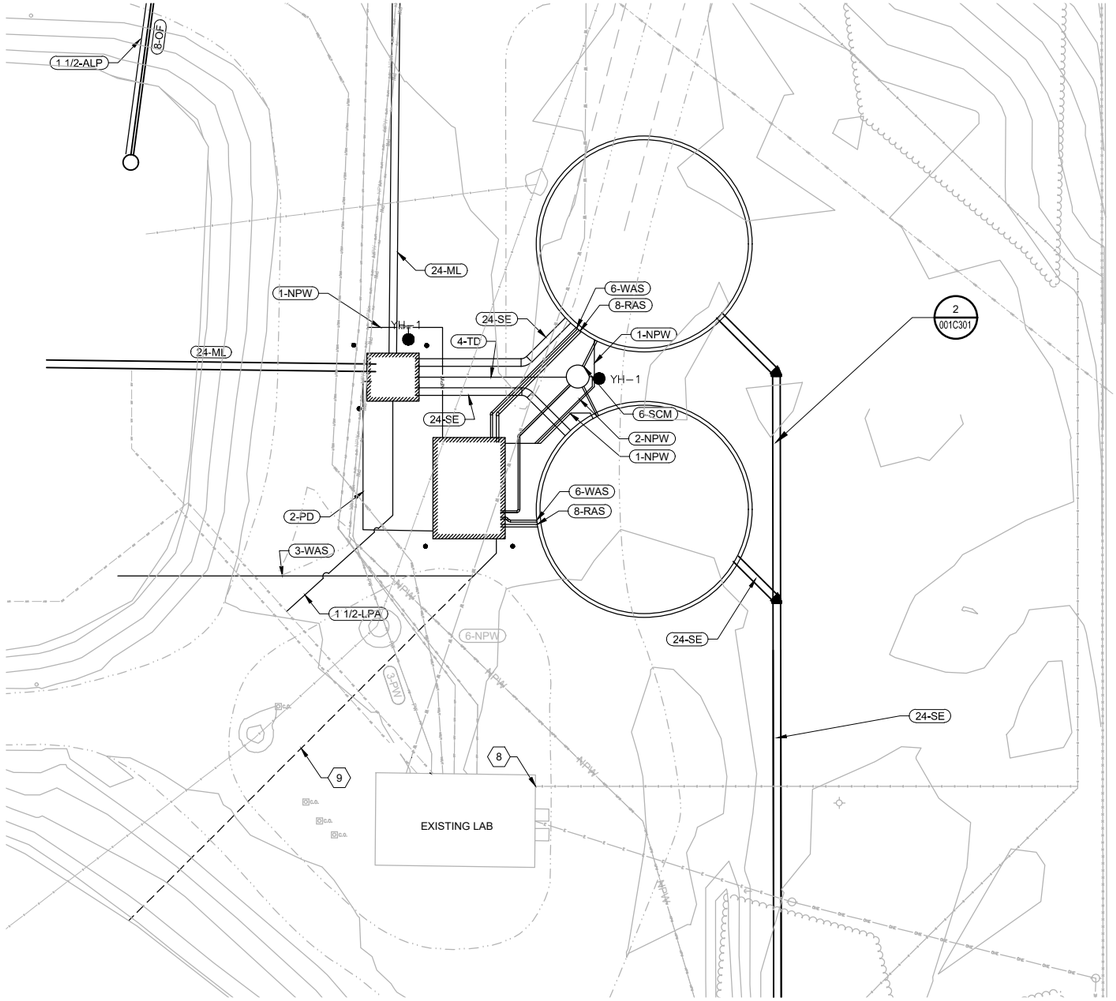
WWTF
Improvements Project
Phase 2

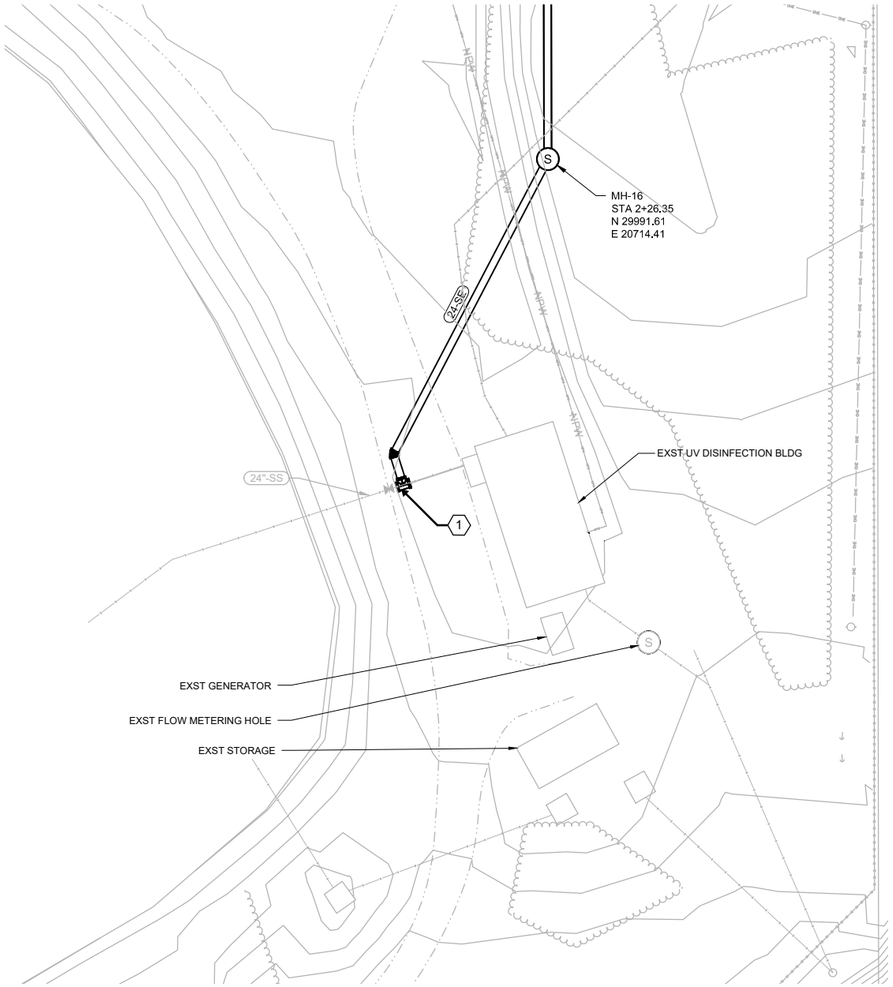
CIVIL
ENLARGED YARD PIPING PLANS - I

0 1" 2"

FILENAME 001C401.dwg
SCALE 1" = 20'

SHEET
001C401





KEY NOTES: (#)

1. REMOVE EXISTING BLIND FLANGE, CONNECT 24-SE TO EXISTING TEE. CONTRACTOR TO FIELD LOCATE AND VERIFY.
2. SEE 001C507 FOR DETAIL.
3. SEE 001C506 FOR DETAIL.
4. SEE 001C506 FOR DETAIL.
5. NOT USED
6. NOT USED
7. SEE STANDARD DETAIL 22 20 00-09.
8. CONTRACTOR SHALL FIELD VERIFY LOCATION AND SIZE OF EXISTING GAS SERVICE TO EXISTING LAB AND PROVIDE NEW CONNECTION FROM RELOCATED GAS SERVICE.
9. INSTALL TEMPORARY 3" HDPE WAS LINE ABOVE GRADE FROM WAS VAULT TO LAGOON 3 TO ALLOW CLARIFIERS TO BE BROUGHT ON-LINE AND OPERATED WHILE LAGOON 2 IS TAKEN OFFLINE TO ALLOW FOR CONSTRUCTION WITHIN THE EXISTING LAGOON.

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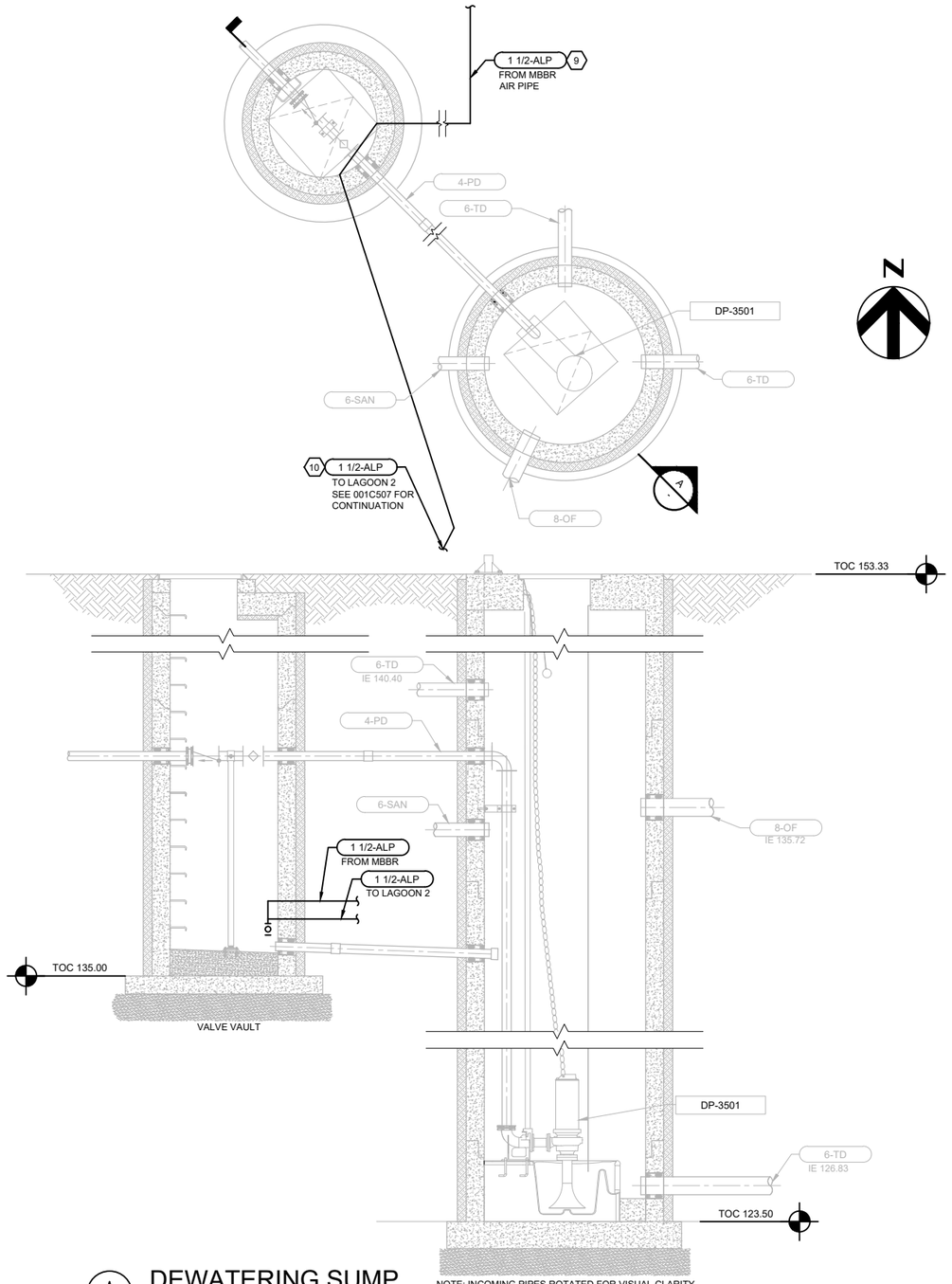
CIVIL
ENLARGED YARD PIPING PLANS - II

0 1" 2"

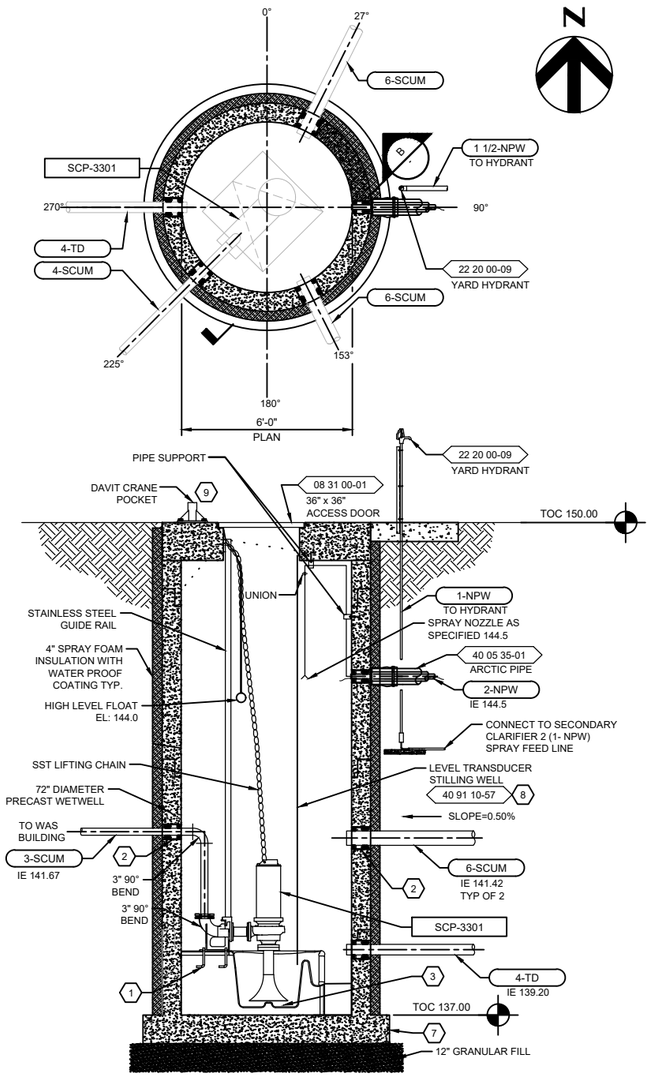
FILENAME 001C402.dwg
SCALE 1" = 20'

SHEET
001C402



NOTE: INCOMING PIPES ROTATED FOR VISUAL CLARITY

A DEWATERING SUMP
3/8" = 1'-0"



NOTE: INCOMING PIPES ROTATED FOR VISUAL CLARITY

B CLARIFIER SCUM PIT
3/8" = 1'-0"

KEYNOTES: (#)

1. SECURE PUMP WITH STAINLESS STEEL ANCHOR BOLTS PER MANUFACTURES RECOMMENDATIONS.
2. MODULAR MECHANICAL SEAL SEE STANDARD DETAIL 40 05 00-27 , SIM.
3. MANUFACTURE SUPPLIED PREFABRICATED PRE ROTATION BASIN, FILL WITH CONCRETE GROUT AS SPECIFIED.
4. PROVIDE 4" MINIMUM FOAM INSULATION AROUND THE PERIMETER OF THE PUMP ASSEMBLY AS SHOWN. SEAL INSULATION WITH A COLD MIX BITUMASTIC IN ORDER TO PREVENT MOISTURE INFILTRATION.
5. ALL EXTERNAL CONCRETE SURFACES SHALL BE COATED FOR WATER PROOFING WITH TREMCO TUFF-N-DRI OCTS. APPLY PER MFR RECOMMENDATIONS TYP VALVE VAULT AND MANHOLE.
6. SEAL JOINTS WITH WRAPPED MANHOLE ENCAPSULATION SYSTEM OR APPROVED EQUAL.
7. PROVIDE MONOLITHIC BASE AND FIRST BARREL SECTION, TYP.
8. POSITION LEVEL SENSOR AT BASE OF PUMP VOLUTE.
9. FOR DAVIT CRANE SEE SPECIFICATION 43 21 00.

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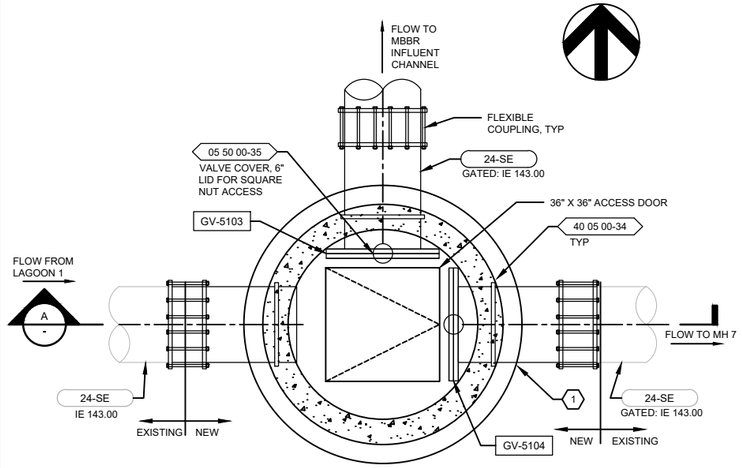
CIVIL
DEWATERING SUMP AND CLARIFIER SCUM PIT
PLANS AND SECTIONS

0 1" 2"

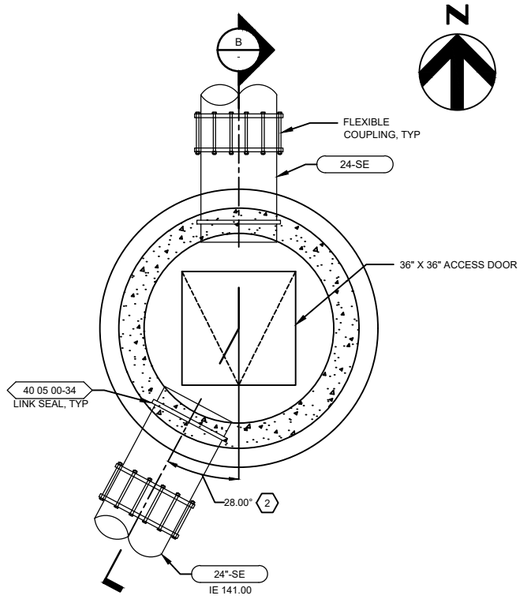
FILENAME 001C404.dwg
SCALE AS SHOWN

SHEET
001C404



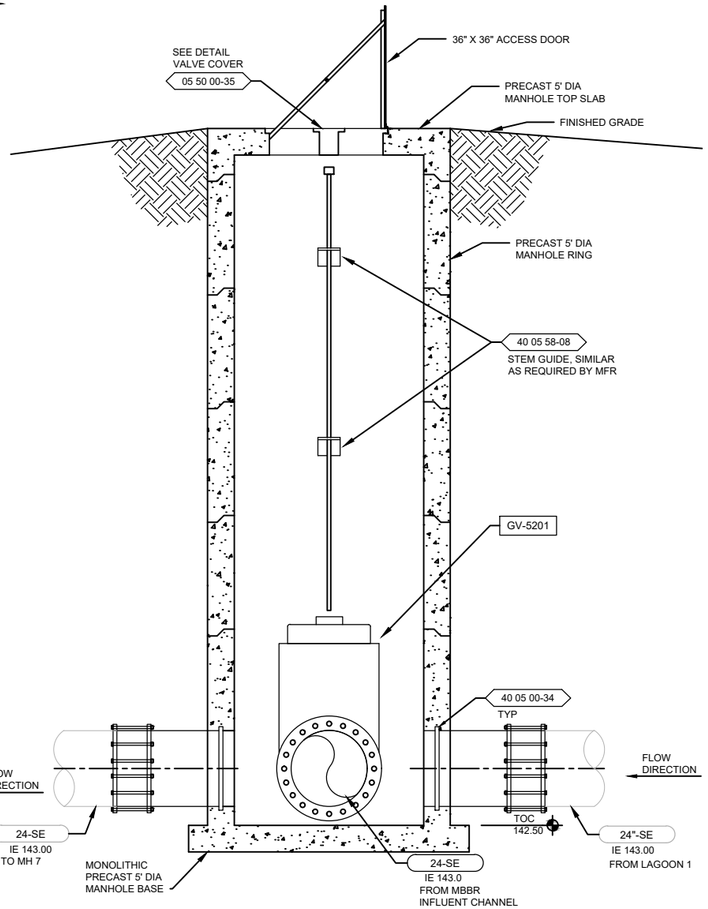
MH #15 PLAN (1)

1/2" = 1'-0"



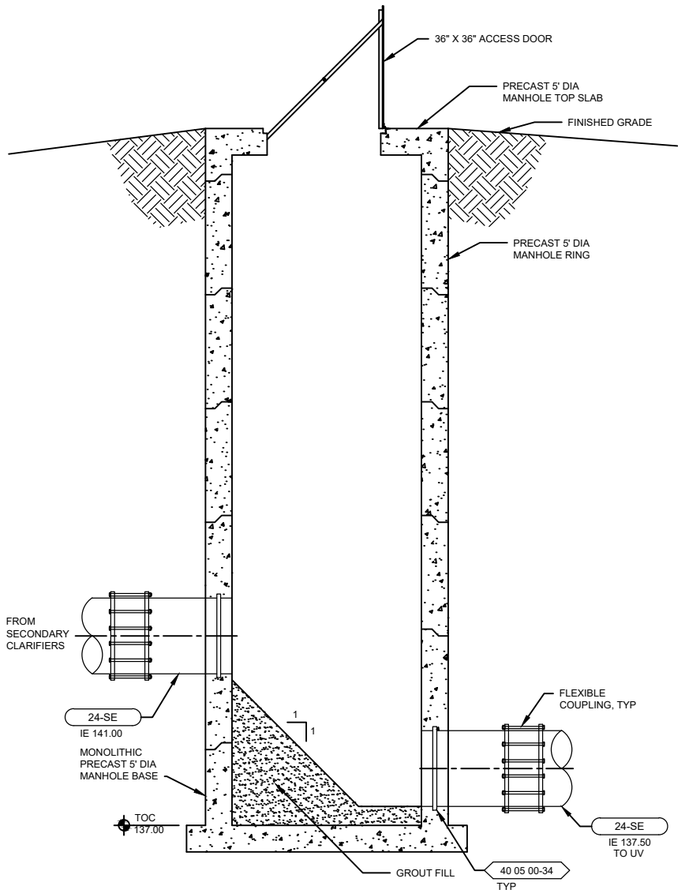
MH #16 PLAN

1/2" = 1'-0"



A MH #15 SECTION

1/2" = 1'-0"



B MH #16 SECTION

1/2" = 1'-0"

KEYNOTES: (X)

1. CUT EXISTING 24-INCH SE, PROVIDE BYPASS PUMPING OR ROUTE EXISTING 24-SE AROUND MANHOLE CONSTRUCTION TO MAINTAIN OPERATION.
2. FIELD VERIFY ANGLE OF 24-SE TO LAGOON 3 DISCHARGE TEE.

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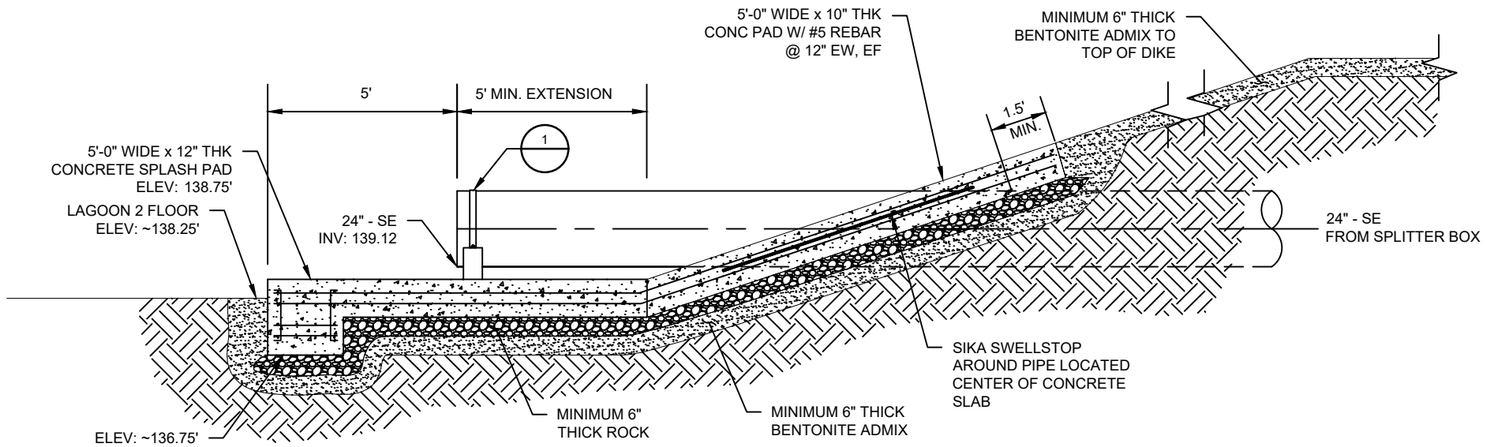
Phase 2

CIVIL
OUTFALL AND SPILLWAY DETAILS
DETAILS - I

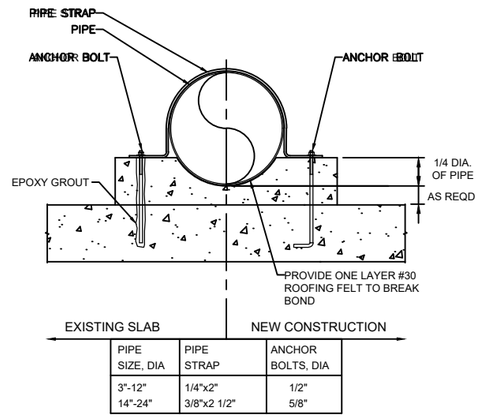
0 1" 2"

FILENAME 001C505.dwg
SCALE NTS

SHEET
001C505

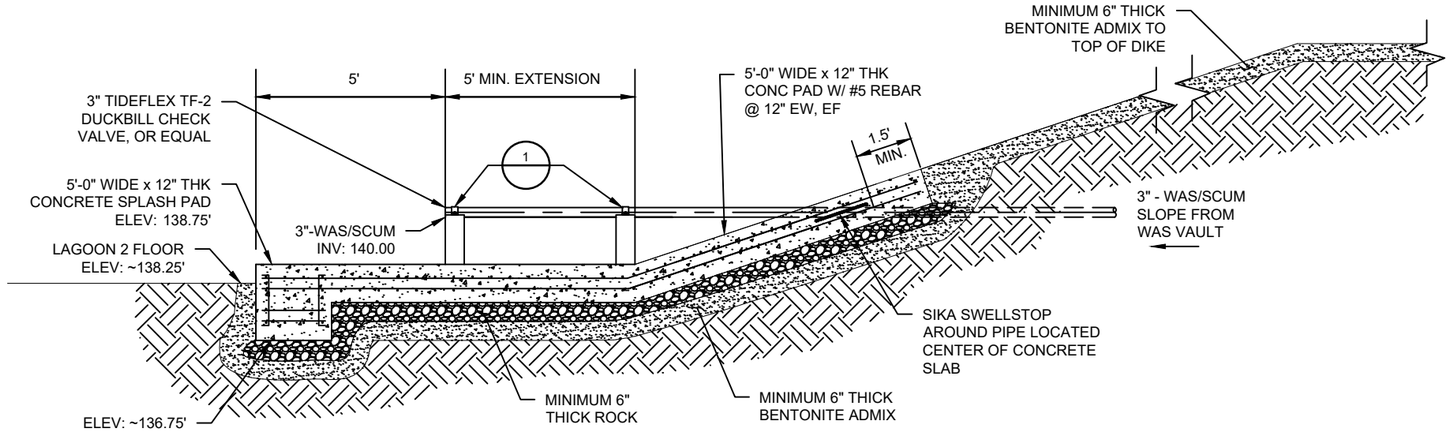


A LAGOON 2 OUTFALL
SCALE: NTS



PIPE SIZE, DIA	PIPE STRAP	ANCHOR BOLTS, DIA
3"-12"	1/4"x2"	1/2"
14"-24"	3/8"x2 1/2"	5/8"

1 PIPE STRAP ANCHOR DETAIL
SCALE: NTS



B LAGOON 2 OUTFALL
SCALE: NTS

CRW ENGINEERING GROUP, LLC
HDR

ISSUE	DATE	DESCRIPTION
A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49TH
JONATHAN RYAN MOYERS
No. CE-12718
REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER
"Alaska at its Best!"

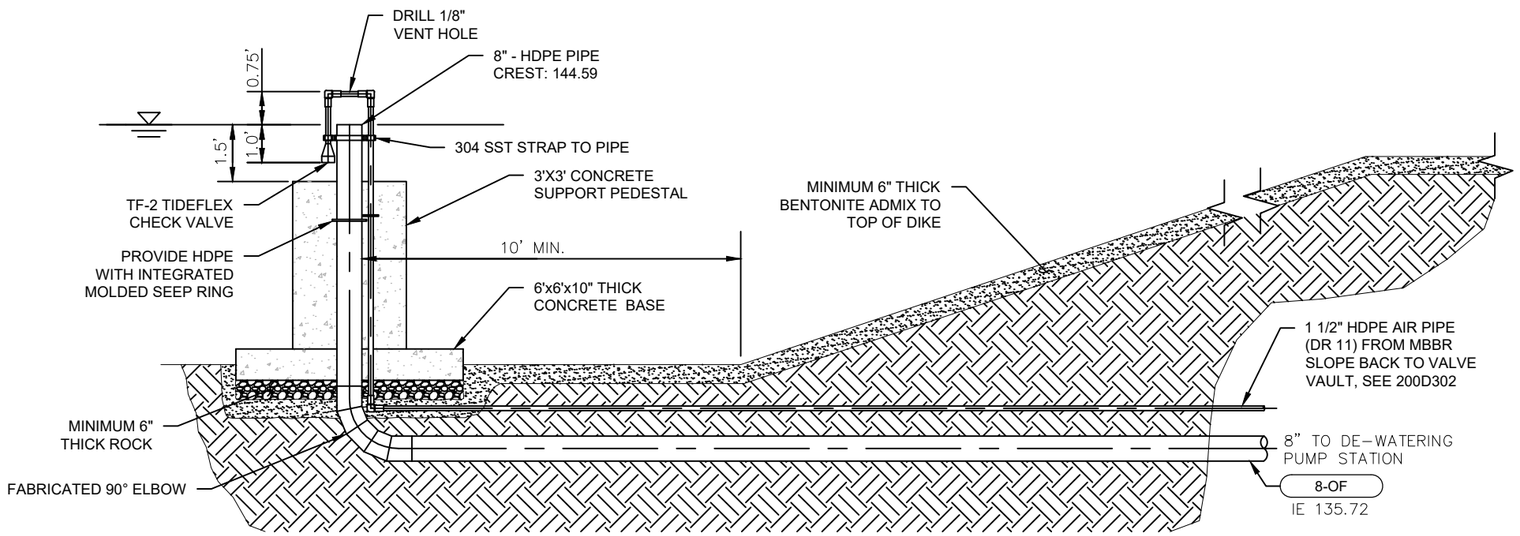
City of Palmer
WWTF
Improvements Project
Phase 2

CIVIL
OUTFALL AND SPILLWAY
DETAILS - II

0 1" 2"

FILENAME 001C506.dwg
SCALE SCALE

SHEET
001C506



1 LAGOON 2 NORTH INTAKE
SCALE: NTS

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INSTRUMENTATION	D. BEST
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STATE OF ALASKA 49TH JONATHAN RYAN MOYERS No. CE-12718 REGISTERED PROFESSIONAL ENGINEER 4/6/21

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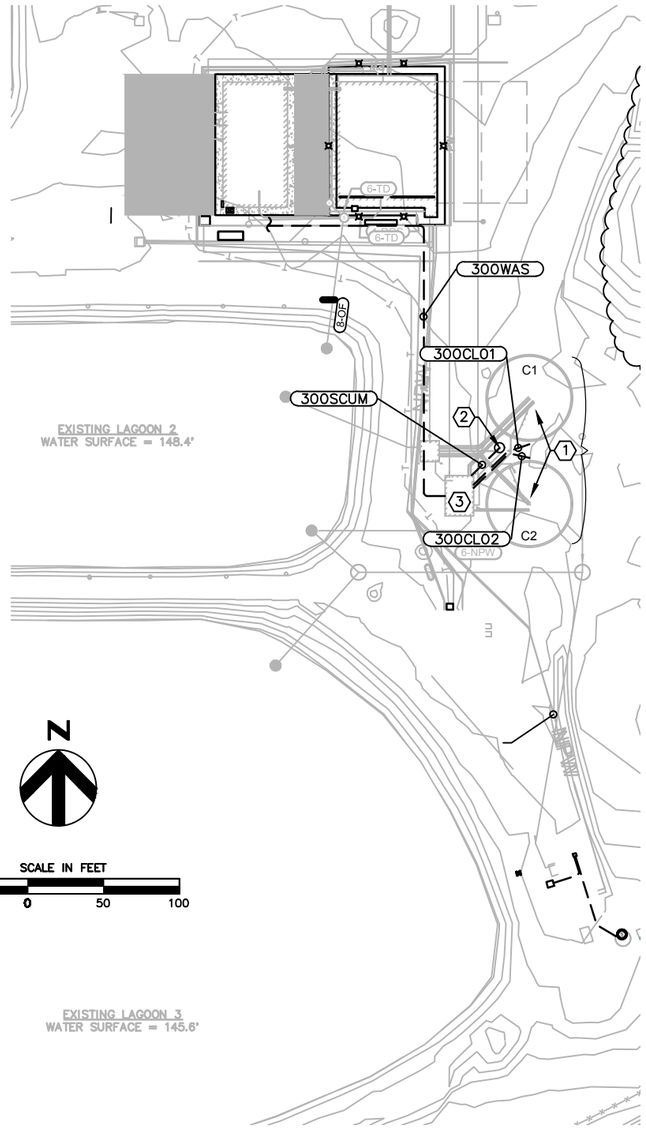
Improvements Project
Phase 2

CIVIL
OUTFALL AND SPILLWAY
DETAILS - III

0 1" 2"

FILENAME	001C507.dwg
SCALE	SCALE

SHEET
001C507

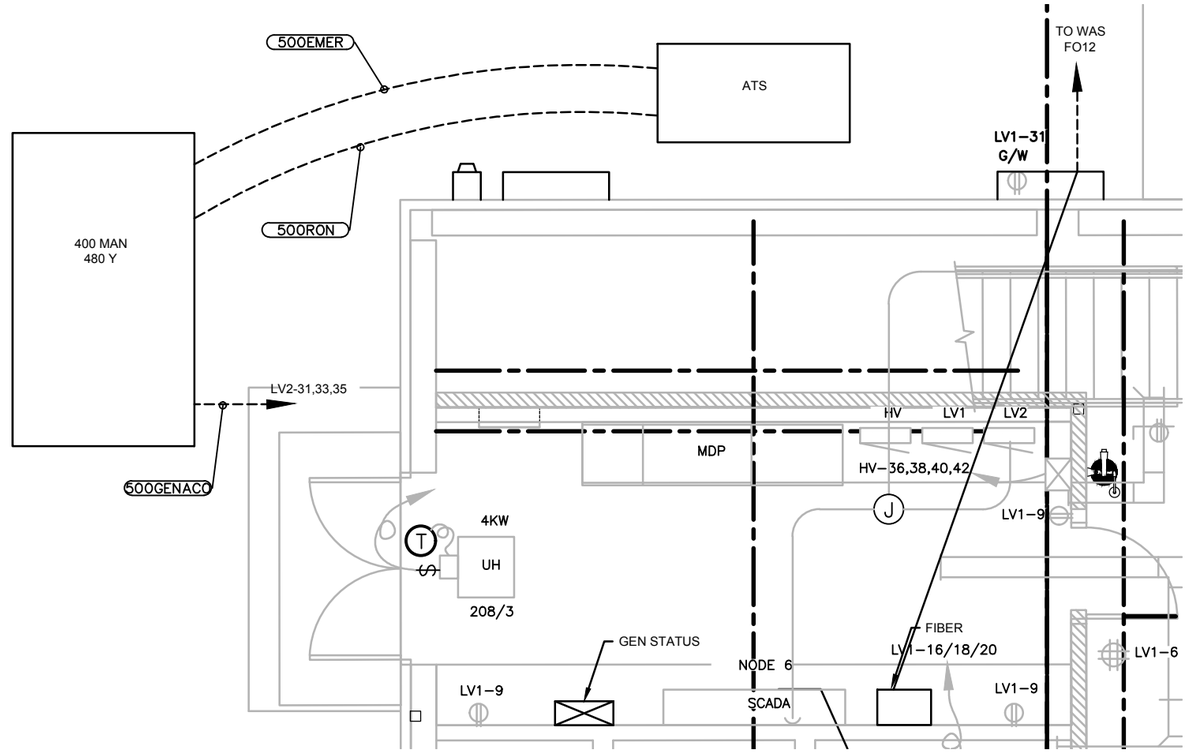


SITE DATA AND FEEDER SCHEDULE

CONDUIT ID		CONDUIT SIZE	CONDUIT TYPE	CONDUCTORS OR CONTENTS	GROUND	CONNECTING AND		COMMENTS
300WAS		2"	HDPE	(4) 1/0 XHHW-2	#4 GRN	MDP	PANEL HVW IN WAS VAULT	480/3 SUPPLY
300SCUM	P	1"	HDPE	(8) #14, (3) #8	#8 GRN	PUMP POWER, PUMP SENSORS	LCP3301 IN WAS VAULT	SENSORS AND POWER LOCATED WITHIN PUMP WIRING CHAMBER
	C	1"	HDPE	(1) #18TSP, (2) #14		LEVEL SWITCH & SENSOR	LCP3301 IN WAS VAULT	
300CL01	P	1"	HDPE	(4) #10	#10 GRN	CLARIFIER DRIVE LCP 3201	CLARIFIER LCP 3201 IN WAS VAULT	
	C	1"	HDPE	(12) #12		CLARIFIER DRIVE STATUS LCP 3201	NODE 7	
300CL02	P	1"	HDPE	(4) #10	#10 GRN	CLARIFIER DRIVE LCP 3202	CLARIFIER LCP 3201 IN WAS VAULT	
	C	1"	HDPE	(12) #12		CLARIFIER DRIVE STATUS LCP 3202	NODE 7	
300CLTS		1"	HDPE	(8) #10	#10 GRN	LVW	CLARIFIER LIGHTS AND RECEPTACLES	EACH CLARIFIER WILL HAVE INDEPENDENT LIGHT AND RECEPTACLE CIRCUITS
S00RUN		1"	HDPE	(4) #12		ATS	GENERATOR	
S00GENACC		1"	HDPE	(7) #10	#10 GRN	ATS	LV2	GENERATOR HEATER, CHARGER AND ACCESSORIES

KEY NOTES: (#)

1. CLARIFIERS. PROVIDE POWER AND LIGHTING. CLASS 1 DIVISION 2 HAZARDOUS LOCATION.
2. SCUM PIT. PROVIDE POWER, DISCONNECTING MEANS, AND INSTRUMENT SUPPORT. CONTROLLER LOCATED IN WAS VAULT. CLASS 1 DIVISION 2 HAZARDOUS LOCATION.
3. WAS VAULT. THIS IS A CLASS 1 DIVISION 2 LOCATION MADE UNCLASSIFIED VIA VENTILATION. VAULT CONTAINS MOTOR STARTERS FOR CLARIFIERS AND SCUM PIT, AS WELL AS THE WAS & SUMP PUMPS IN THE VAULT. PROVIDE POWER, LIGHTING, AND CONTROLS.



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STATE OF ALASKA 49TH — William M. McDonald EE-7879 — REGISTERED PROFESSIONAL ENGINEER

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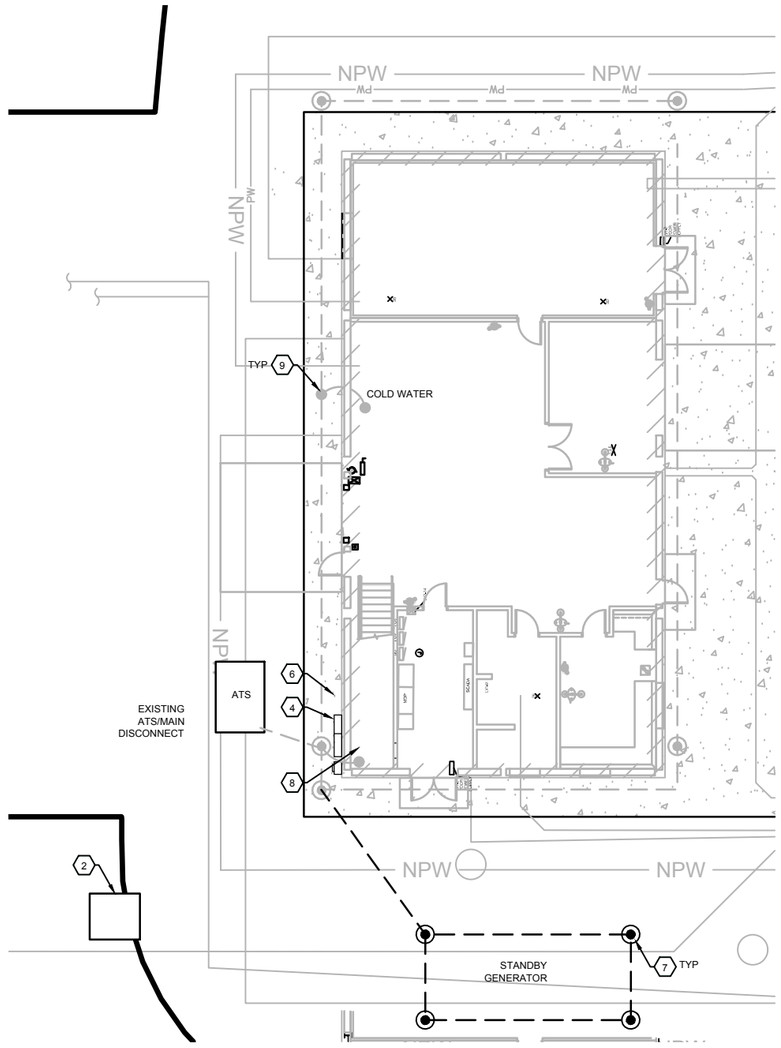
SITE ELECTRICAL PLAN

0 1" 2"

FILENAME 001E100.dwg
SCALE AS NOTED

SHEET 001E100



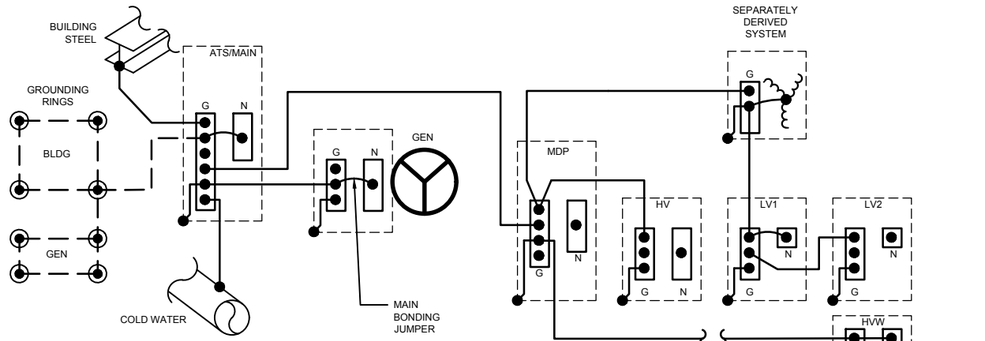
ELECTRICAL SITE GROUNDING PLAN

1" = 10'-0"

N

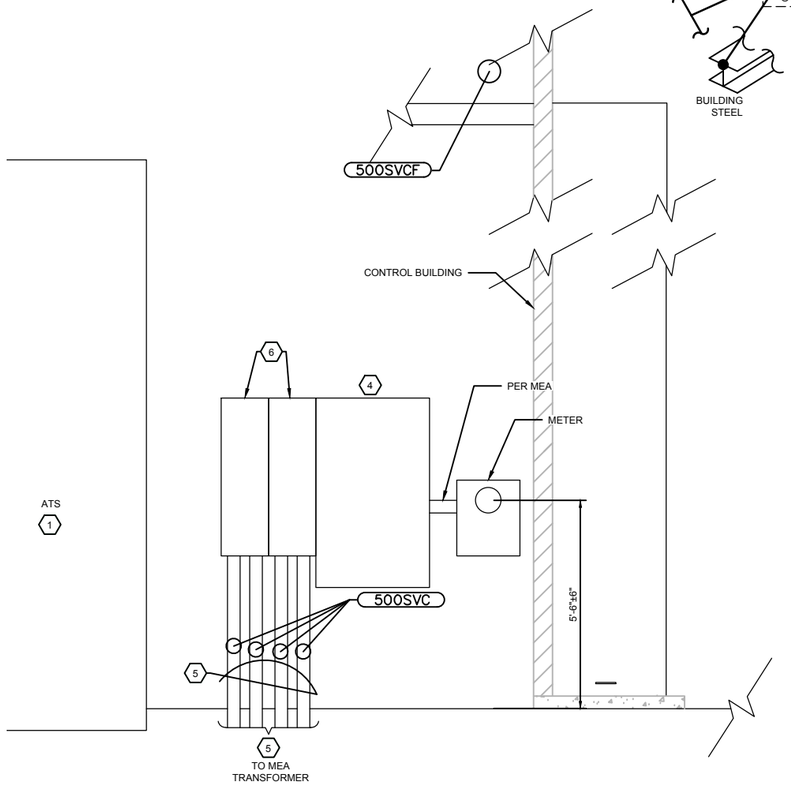
SCALE IN FEET

10 5 0 10 20



2 001E101 GROUNDING PLAN ONE-LINE

NTS



3 001E101 SERVICE ENTRY DETAIL

NTS

KEY NOTES: #

1. ~~PROVIDE AUTOMATIC TRANSFER SWITCH IN WEATHERPROOF ENCLOSURE. SWITCH TO INCLUDE GFCI MAIN BREAKER. PROVIDE SHUNT TRIP FEATURE WITH REMOTE PUSH BUTTON.~~
2. ~~MEA TRANSFORMER.~~
3. ~~500kW, 480Y/277V 3Ø 4 WIRE SELF CONTAINED DIESEL GENERATOR. NFPA 101 RATED FOR EMERGENCY DUTY.~~
4. ~~C.T. ENCLOSURE WITH C.T. MOUNTING BRACKETS~~ AND ISOLATED NEUTRAL BAR.
5. ~~PROVIDE LIQUID TIGHT RISER BURIED TO 36" WITH~~ SWEEP TO HORIZONTAL. PROVIDE QUANTITY AND SIZE PER MEA.
6. ~~C.T. WIRING GUTTER.~~
7. 3/4"X10' COPPER=CLAD GROUND ROD. TYP.
8. ~~(4) 4"C, (4) 350MCM (3H, N), (1) 3/0 BCU (G).~~
9. BONDING POINT. EXOTHERMIC WELDMENT FOR BURIED CONNECTIONS.

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STATE OF ALASKA 49TH — William M. McDonald EE-7879 — REGISTERED PROFESSIONAL ENGINEER

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WWTF
Improvements Project
Phase 2

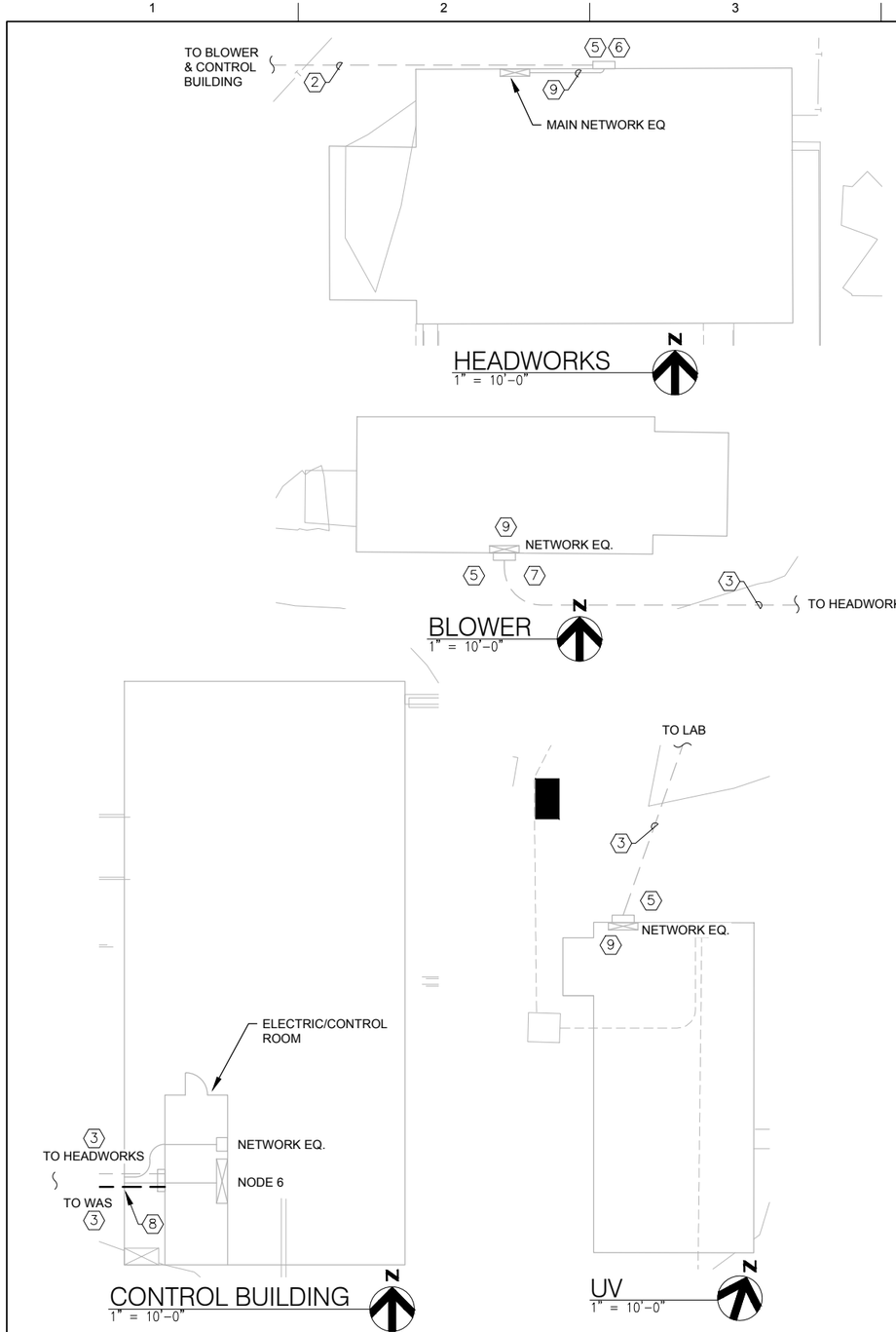
ELECTRICAL SITE
CONTROL BUILDING
ELECTRICAL PLAN

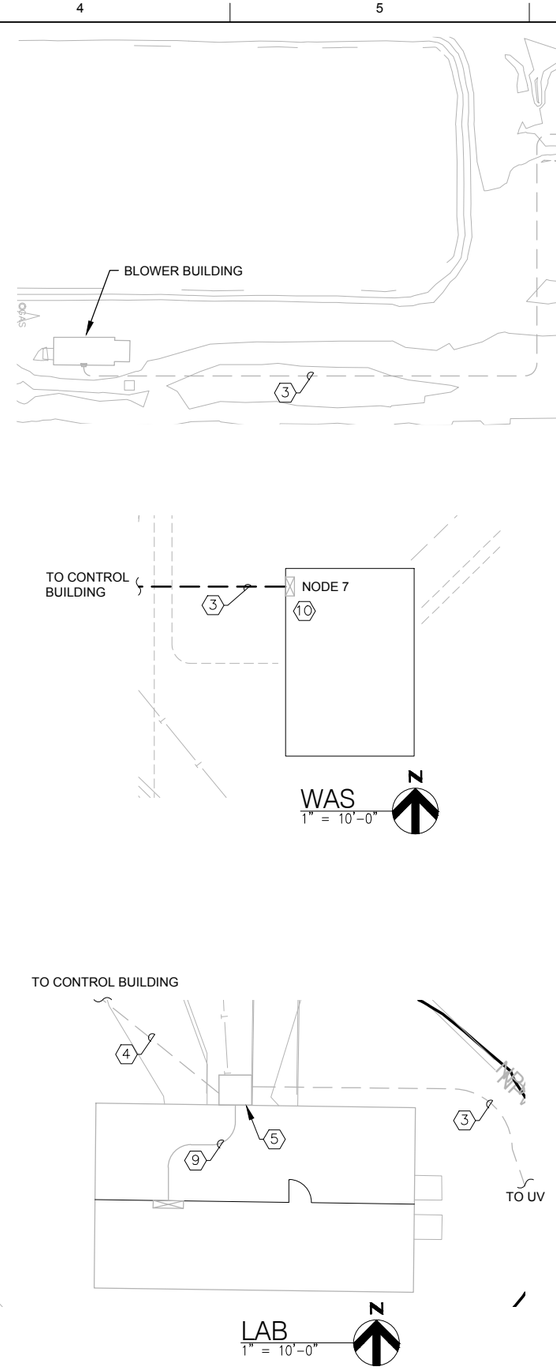
0 1" 2"

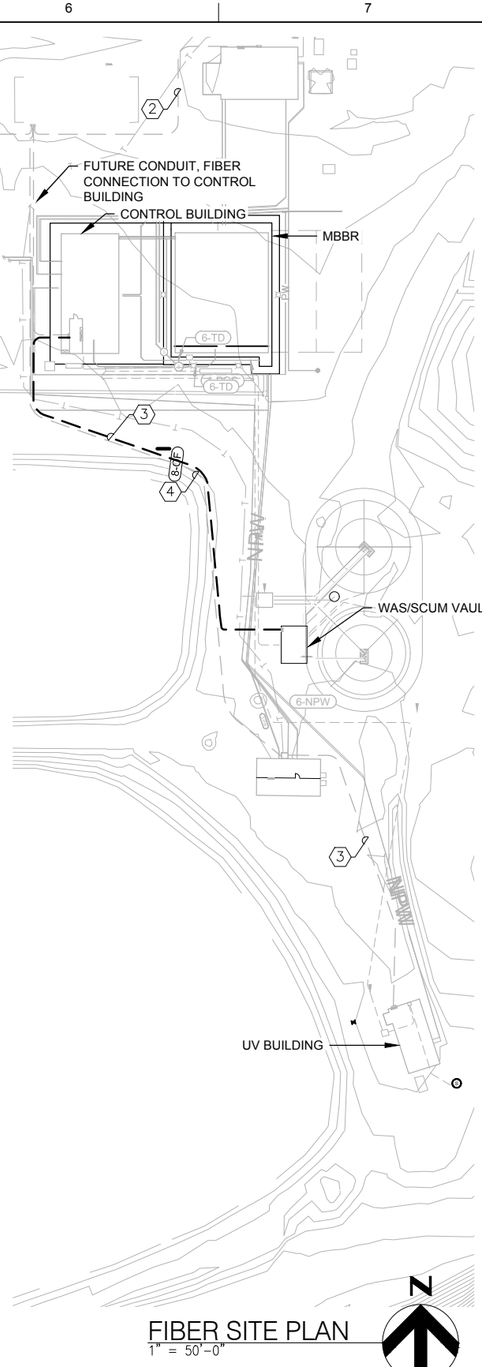
FILENAME 001E101.dwg

SCALE AS NOTED

SHEET 001E101







KEY NOTES: (#)

1. FO = (1) 12PR FIBER OPTIC CABLE
2. (2) 2" C, (2) FO
3. 2" C, (1) FO
4. 2"C, (2) FO
5. EXISTING PULL BOX
6. PROVIDE 48 PORT TERMINATION CABINETS IN NEMA 4X ENCLOSURE ADJACENT TO PULL BOX. TERMINATE ALL STRANDS. EXTEND TO RACK ONLY THOSE ACTIVE FIBERS NEEDED TO REESTABLISH NETWORK.
7. PROVIDE 12 PORT TERMINATION CABINET - SEE NOTE 6.
8. PROVIDE 24 PORT TERMINATION CABINET - SEE NOTE 6.
9. ROUTE JUMPERS VIA EXISTING CONDUIT TO NETWORK PANEL.
10. PROVIDE TERMINATION CABINET WITHIN VAULT. EXTEND PAIR TO NODE 7.

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STATE OF ALASKA 49 TH William M. McDonald EE-7879 05/27/21 REGISTERED PROFESSIONAL ENGINEER

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City of Palmer
WWTF
Improvements Project
Phase 2

ELECTRICAL SITE FIBER OPTIC ROUTING PLAN

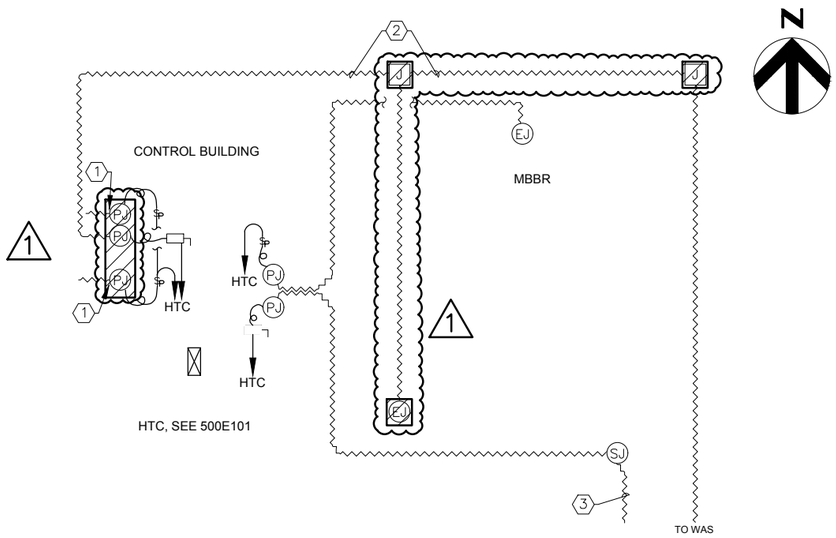
0 1" 2"

FILENAME 001E102.dwg
SCALE AS NOTED

SHEET 001E102

KEY NOTES (#)

1. PROVIDE 5W/FT 277V HEAT TAPE EXTENDING TO LENGTH OF RISER, APPROX 20'
2. PROVIDE 8W/FT 277V "LONG LINE" HEAT TAPE IN ARCTIC PIPE "HAT" CHANNEL
3. PROVIDE "LONG LINE" HEAT TRACE IN 1" PEX WITHIN 6" CARRIER PIPE

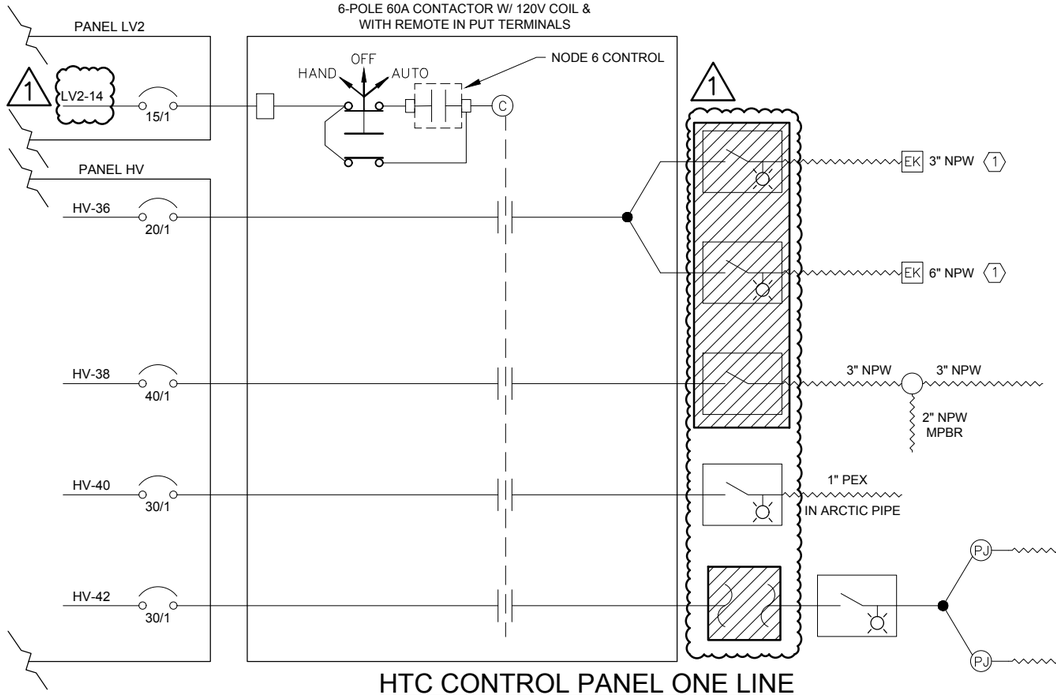


HEAT TRACE PLAN - MBBR AND CONTROL BUILDING

SCALE: 1" = 20'-0"

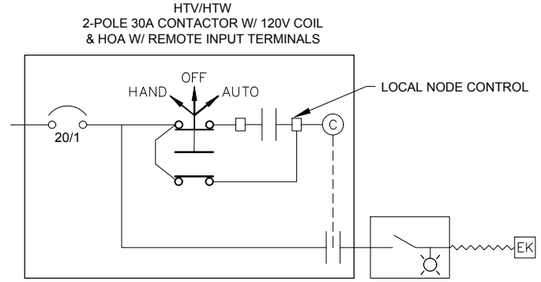
HEAT TRACE PLAN - UV DISINFECTION

SCALE: 1" = 20'-0"



HTC CONTROL PANEL ONE LINE

NTS



HTV/HTW CONTROL PANELS ONE-LINE

NTS

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A	JUNE 2021	ISSUED FOR BID

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CIVIL	R. MOYERS
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MECHANICAL	T. CARSON
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INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49 TH William M. McDonald CE 2070 05/27/21 REGISTERED PROFESSIONAL ENGINEER

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Improvements Project
Phase 2

ELECTRICAL
HEAT TRACE PLANS

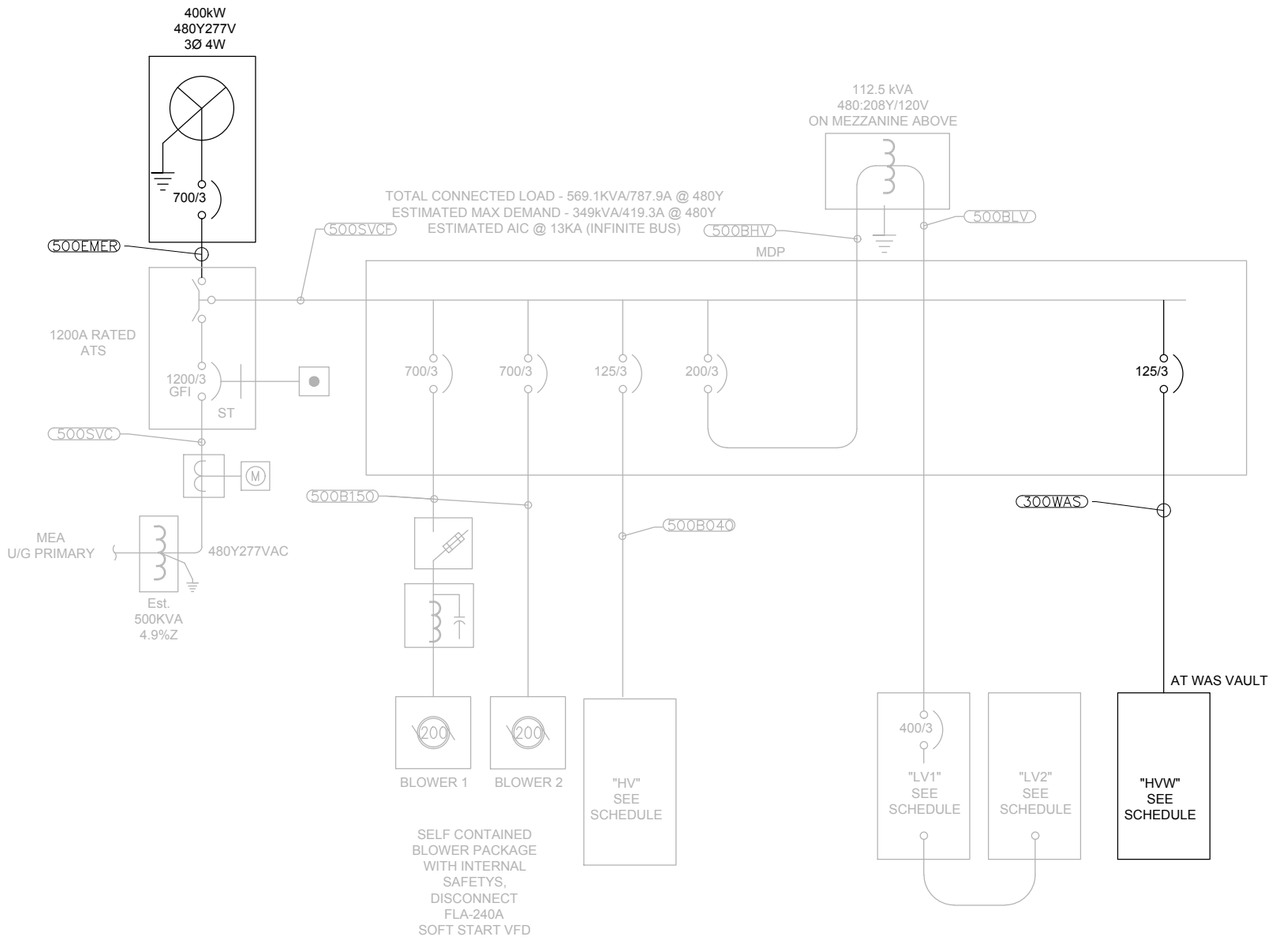
0 1" 2"

FILENAME 001E103.dwg
SCALE 1" = 20'

SHEET
001E103

KEY NOTES: (#)

1. GENERATOR FEEDER CONTROLS
2. WAS VAULT FEEDER



CONTROL BUILDING FEEDER SCHEDULE

CONDUIT ID	CONDUIT # & SIZE	CONDUIT TYPE	CONDUCTORS OR CONTENTS	GROUND	CONNECTING	AND		COMMENTS
500SVC	(4) 2-1/2"	RMC	(4)350 MCM XHHW-2	2/0Cu	CT		ATS	EXISTING
500EMER	**(4) 2-1/2"**	**RMC**	**(4) 250 MCM XHHW-2**	**2/0Cu**	**GENERATOR**		**ATS**	**PROVIDE**
500SVCF	(4) 2-1/2"	RMC	(4) 350 MCM XHHW-2	2/0Cu	MDP		ATS	EXISTING
500B150	2"	RMC/LFMC	(3) 3/0	#4	MCC		BLR3101A/B	EXISTING
500B040	1"	RMC/LFMC	(3) #6	#6	MCC		BLR3101C/D	EXISTING
500LABH	3/4"	RMC/LFMC	(3) #10	#10	MCC		LAB HEATER	EXISTING
500EFAN	3/4"	RMC/LFMC	(3) #12	#12	MCC		ROOFTOP EF	EXISTING
500BHV	2"	RMC/LFMC	(2) 3/0	#4	MCC		112.5 Kva XFMR	EXISTING
500BLV	3"	RMC/LFMC	(4) 500 MCM	# 1/0	112.5kVA XFMR		LVIA MCB	EXISTING

MDP LOAD CALCULATIONS

LOAD	AMPS	Kva	A	B	C	DEM	Max dem
BLOWER 1	240.0	199.3	66.4	66.4	66.4	1	240.0
BLOWER 2	240.0	199.3	66.4	66.4	66.4	0	0.0
HV	88.0	73.1	29.4	25.3	18.4	0.7	61.6
LV	181.0	65.1	23.2	22.9	19.0	0.5	90.5
WAS HV	38.9	32.3	11.8	11.4	9.1	0.7	27.2
Totals =	787.9	569.1	197.3	192.5	179.4		
Assume all continuous	x1.25						
	984.9	A @ 480Y	Provide 1200A service				
Estimated max Demand	419.3	A @ 480Y					

CRW ENGINEERING GROUP, LLC

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STATE OF ALASKA 49 TH
William M. McDonald
EE-7870
05/27/21
REGISTERED PROFESSIONAL ENGINEER

CITY OF PALMER
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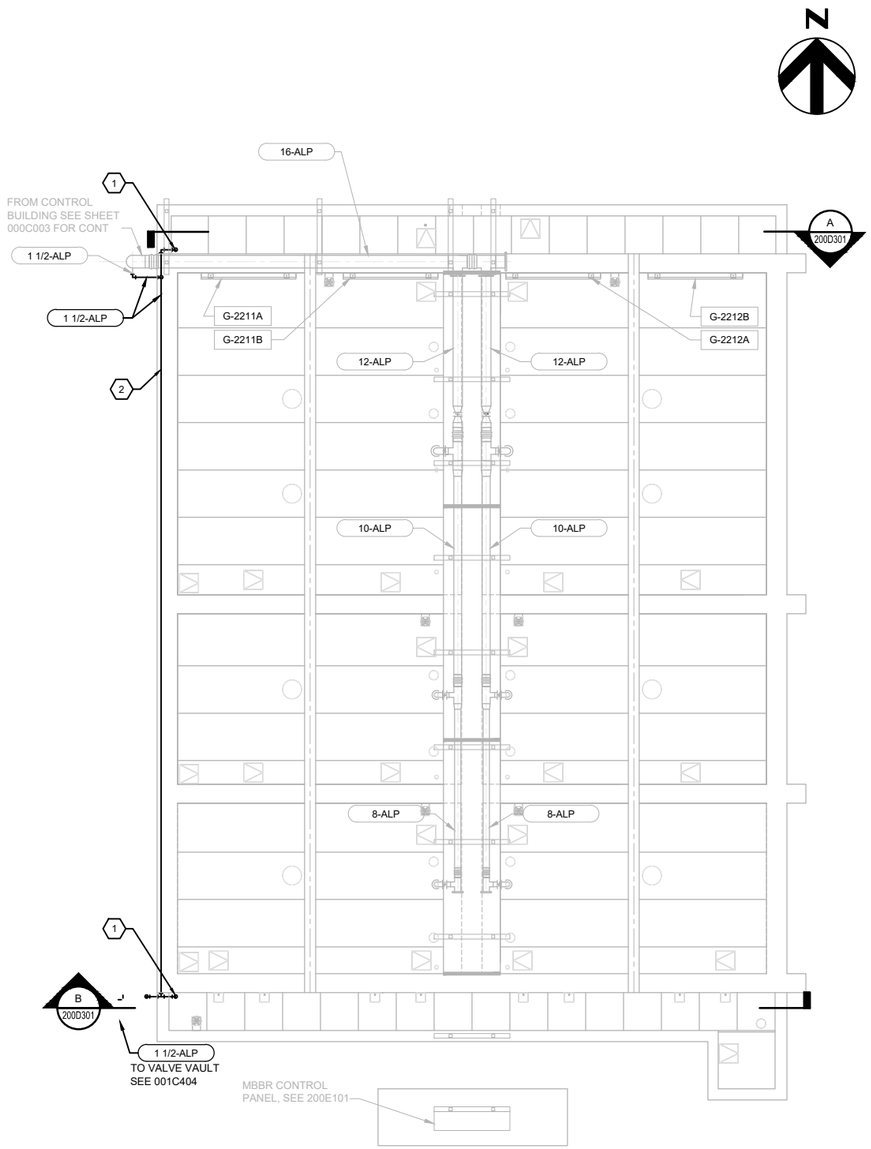
Phase 2

SITE ELECTRICAL
CONTROL BUILDING / WAS
POWER ONE-LINE DIAGRAM

0 1" 2"

FILENAME 001E601.dwg
SCALE AS NOTED

SHEET
001E601



UPPER LEVEL PLAN - BETWEEN 159.00 AND 168.00

1/8" = 1'-0"

KEYNOTES: (X)

1. COORDINATE PIPE PENETRATION OF EXISTING HATCH WITH HATCH MANUFACTURER (CST TEMCOR - (913) 621-37000). FIELD CUT PANEL OPENING SO AS NOT TO CUT HATCH STRUCTURAL MEMBERS. PROVIDE PIPE FLASHING IN ACCORDANCE WITH HATCH MANUFACTURER RECOMMENDATIONS.
2. PROVIDE PIPE SUPPORTS FOR 1-1/2-ALP IN ACCORDANCE WITH DETAIL 40 05 07-13. PROVIDE A PIPE SUPPORT EVERY 10'.

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STATE OF ALASKA 49TH — JONATHAN RYAN MOYERS No. CE-12118 REGISTERED PROFESSIONAL ENGINEER

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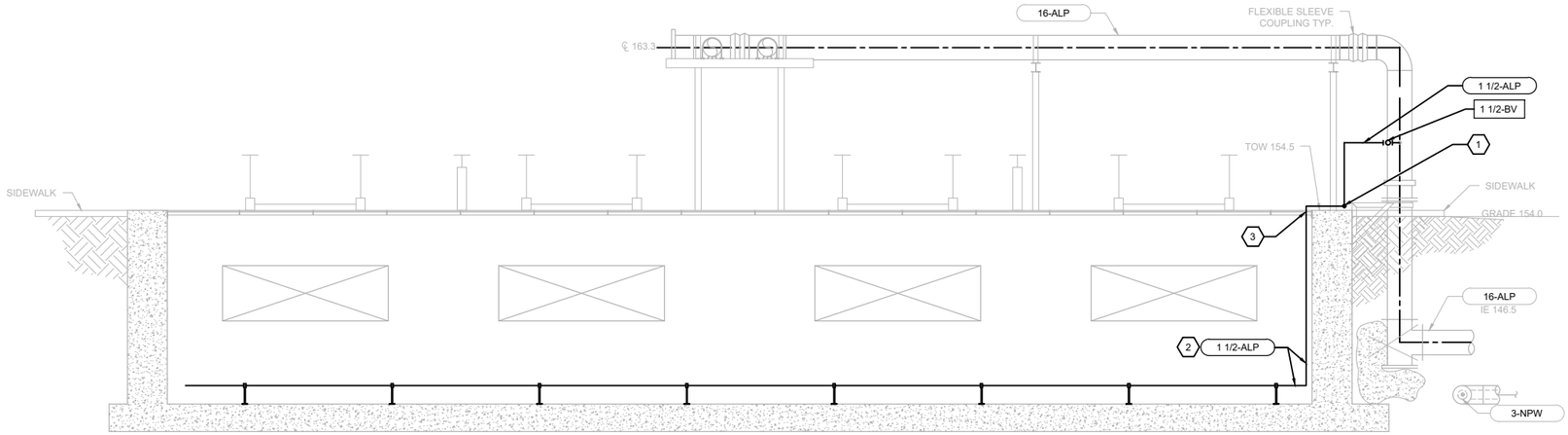
WWTF
Improvements Project
Phase 2

MBBR
PROCESS
UPPER LEVEL PLAN

0 1" 2"

FILENAME 200D102.dwg
SCALE 1/8" = 1'-0"

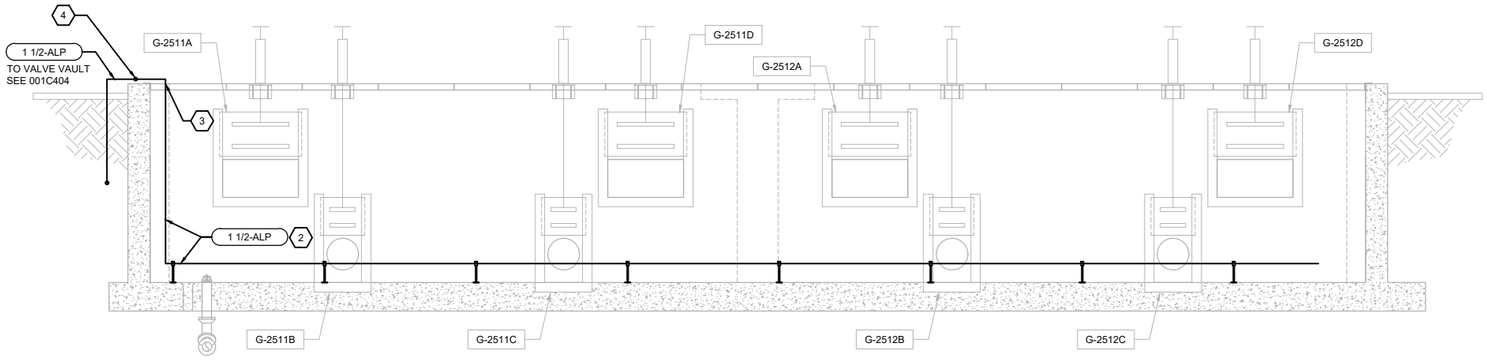
SHEET
200D102



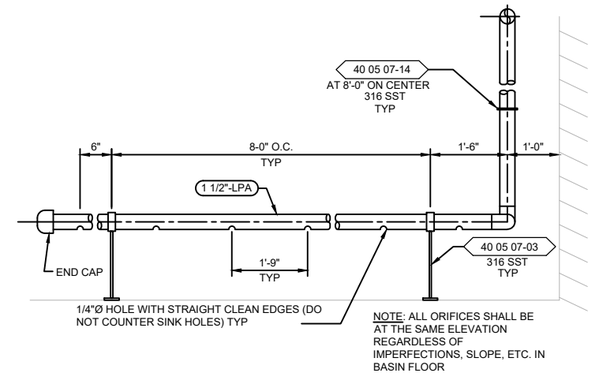
A 200D101 SECTION
1/4"=1'-0"

KEY NOTES: #

1. TEE, ROUTE TO INFLUENT CHANNEL AND EFFLUENT CHANNEL AND VALVE VAULT. SEE SHEET 001C404.
2. SEE DETAIL 1 THIS SHEET.
3. COORDINATE PIPE PENETRATION OF EXISTING HATCH WITH HATCH MANUFACTURER (CST TEMCOR - (913) 621-37000). FIELD CUT PANEL OPENING SO AS NOT TO CUT HATCH STRUCTURAL MEMBERS. PROVIDE PIPE FLASHING IN ACCORDANCE WITH HATCH MANUFACTURER RECOMMENDATIONS.
4. PROVIDE PIPE SUPPORTS FOR 1-1/2-ALP IN ACCORDANCE WITH DETAIL 40 05 07-13. PROVIDE A PIPE SUPPORT EVERY 10'.



B 200D101 SECTION
1/4"=1'-0"



1 - TANK SCOUR AIR DETAIL
NO SCALE

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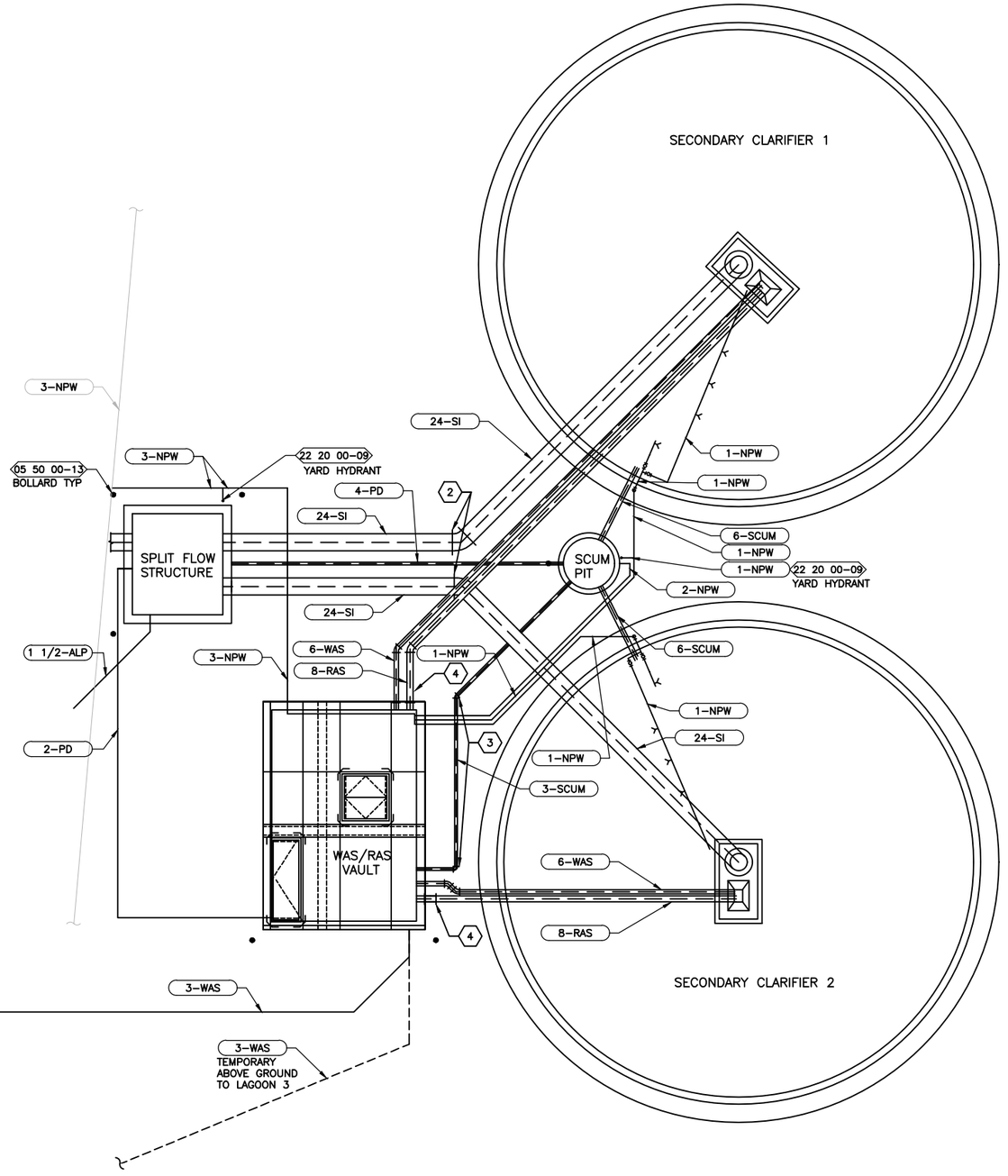
Phase 2

MBBR
PROCESS
SECTIONS AND DETAIL

0 1" 2"

FILENAME 200D301.dwg
SCALE AS NOTED

SHEET
200D301



KEY NOTES: (#)

1. NOT USED.
2. CONTRACTOR SHALL ROLL FITTINGS TO MATCH INVERTS AT FLOW SPLITTER AND SECONDARY CLARIFIERS TYP.
3. CONTRACTOR SHALL ROLL FITTINGS TO MATCH INVERTS AT SCUM PIT AND WAS VAULT.
4. CONTRACTOR SHALL ROLL FITTINGS TO MATCH INVERTS AT SECONDARY CLARIFIERS AND WAS VAULT.

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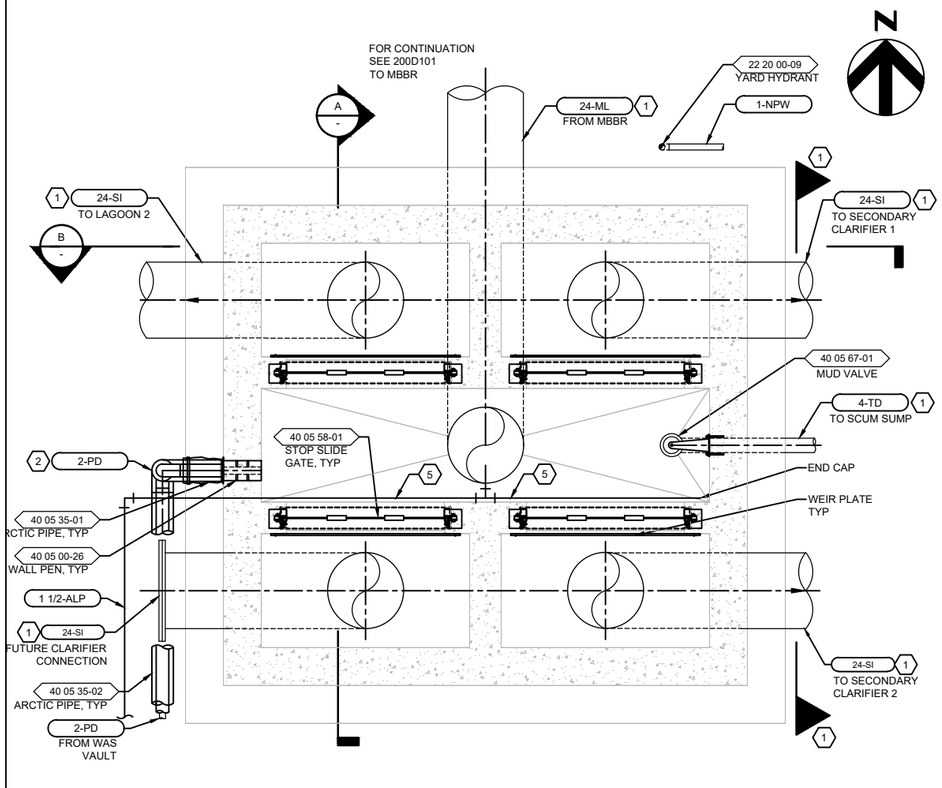
SECONDARY TREATMENT
OVERALL AREA
PLAN

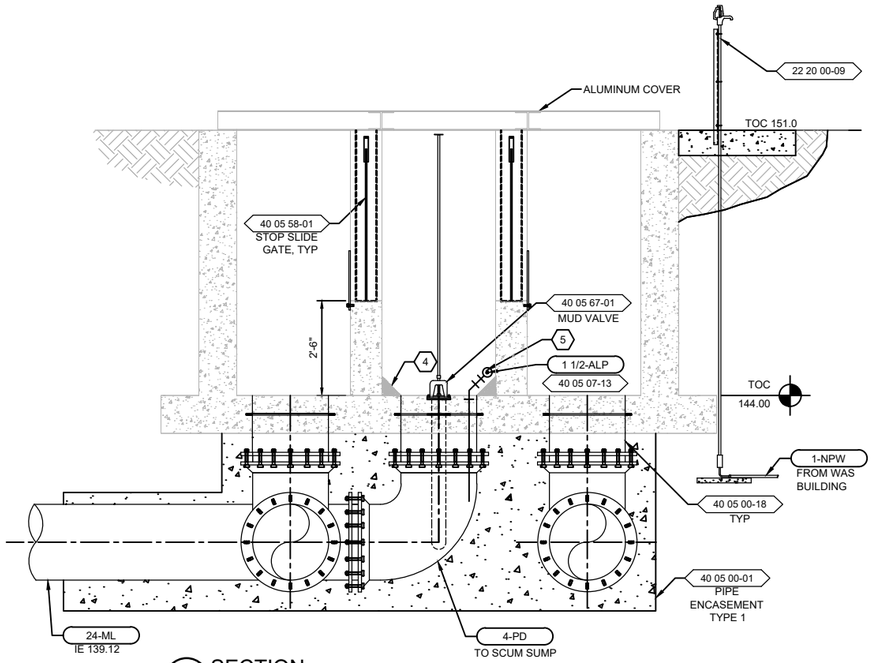
0 1" 2"

FILENAME 300D100.dwg
SCALE 1/8" = 1'-0"

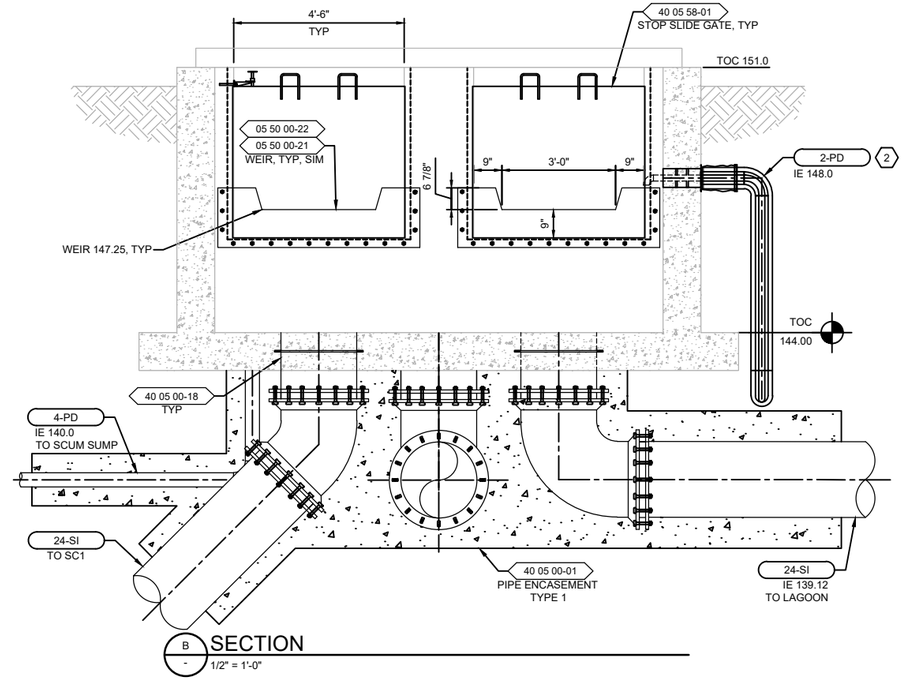
SHEET
300D100



PLAN
1/2" = 1'-0"



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



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

KEYNOTES: (X)

1. SEE SHEET 300D100 AND CIVIL SHEETS FOR CONTINUATION.
2. HEAT TRACE AND INSULATE ABOVE BURIED DEPTH, 144.00.
3. NOT USED.
4. GROUT SLOPE 1:1 TO 24-ML AND MUD VALVE.
5. PROVIDE 1/4"Ø HOLE WITH STRAIGHT CLEAN EDGES (DO NOT COUNTER SINK HOLES) TYP. SPACE HOLES AT 1'-9" TYP

ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
STRUCTURAL	J. HERMON
ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49TH
JONATHAN RYAN MOYERS
No. CE-12718
REGISTERED PROFESSIONAL ENGINEER

CRW ENGINEERING GROUP, LLC
HDR

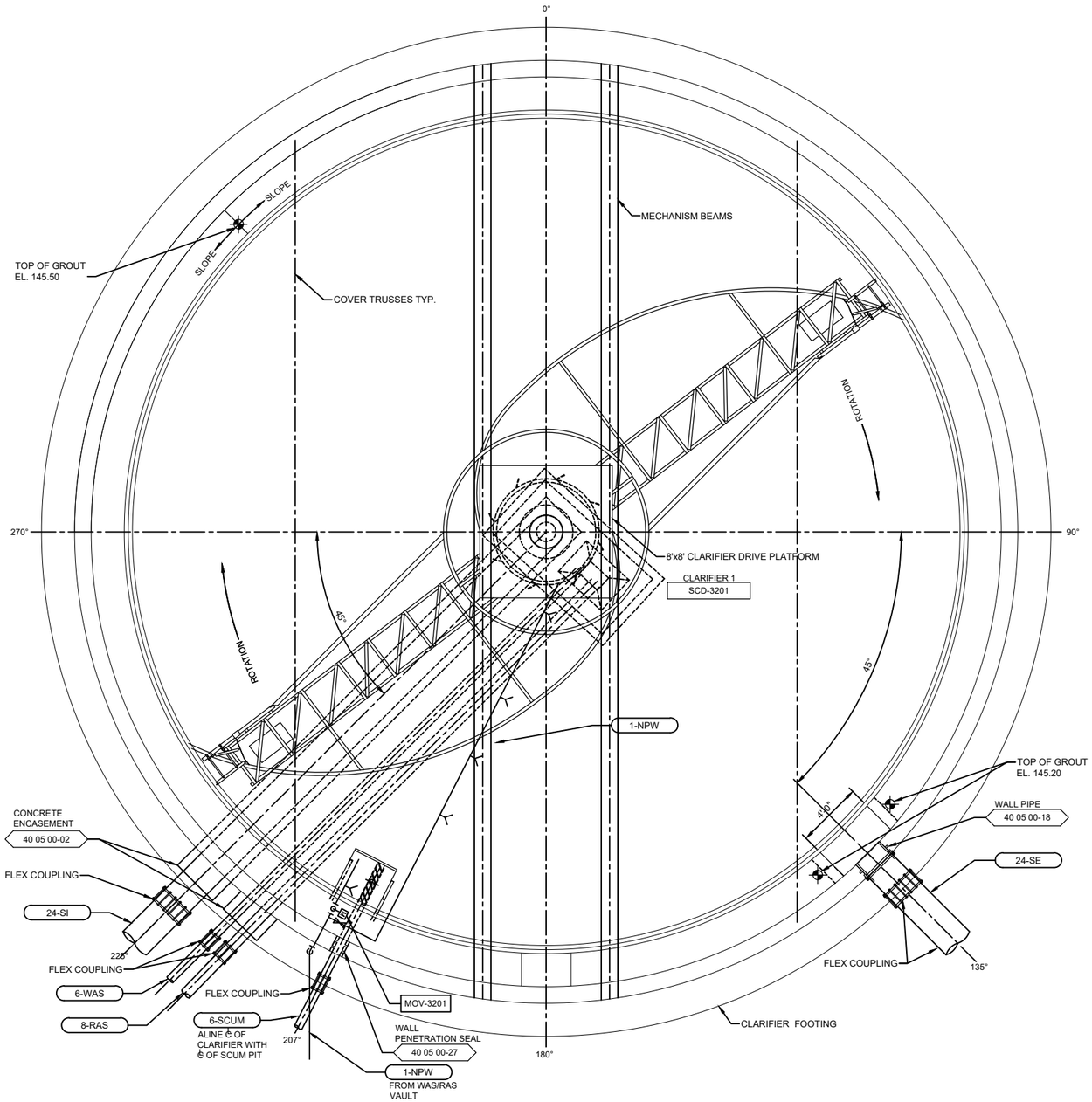
City of Palmer
WWTF
Improvements Project
Phase 2

SECONDARY TREATMENT
SECONDARY FLOW SPLITTER
PROCESS PLAN & SECTIONS

0 1" 2"

FILENAME 300D101.dwg
SCALE 1/2" = 1'-0"

SHEET
300D101



PLAN - CLARIFIER 1

1/4"=1'-0"

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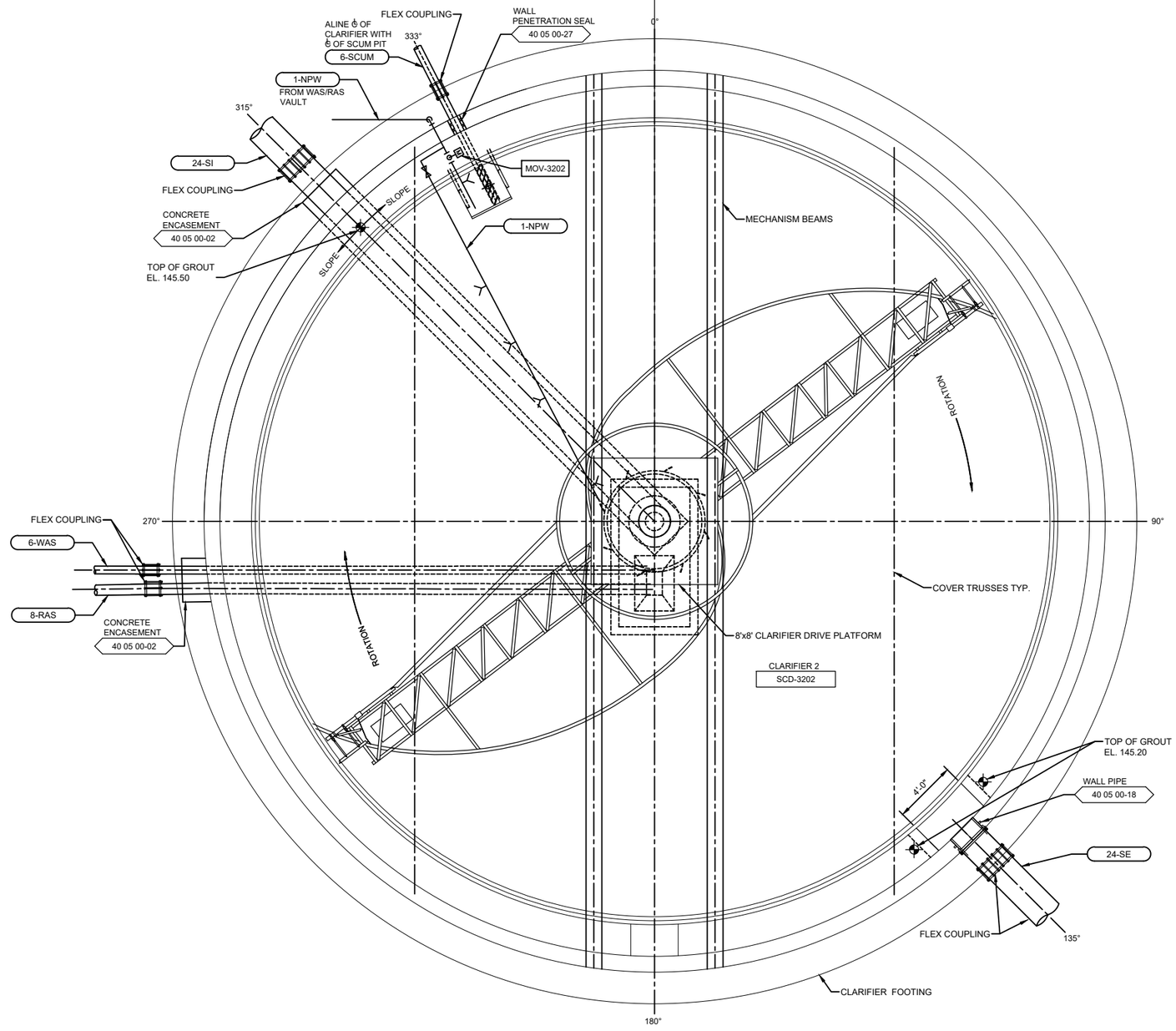
WWTF
Improvements Project
Phase 2

SECONDARY TREATMENT
CLARIFIER NO. 1
PLAN

0 1" 2"

FILENAME 300D102.dwg
SCALE 1/4" = 1'-0"

SHEET **300D102**



PLAN - CLARIFIER 2

1/4"=1'-0"

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INSTRUMENTATION	D. BEST
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STATE OF ALASKA 49TH — JONATHAN RYAN MOYERS No. CE-12718 REGISTERED PROFESSIONAL ENGINEER

City of Palmer
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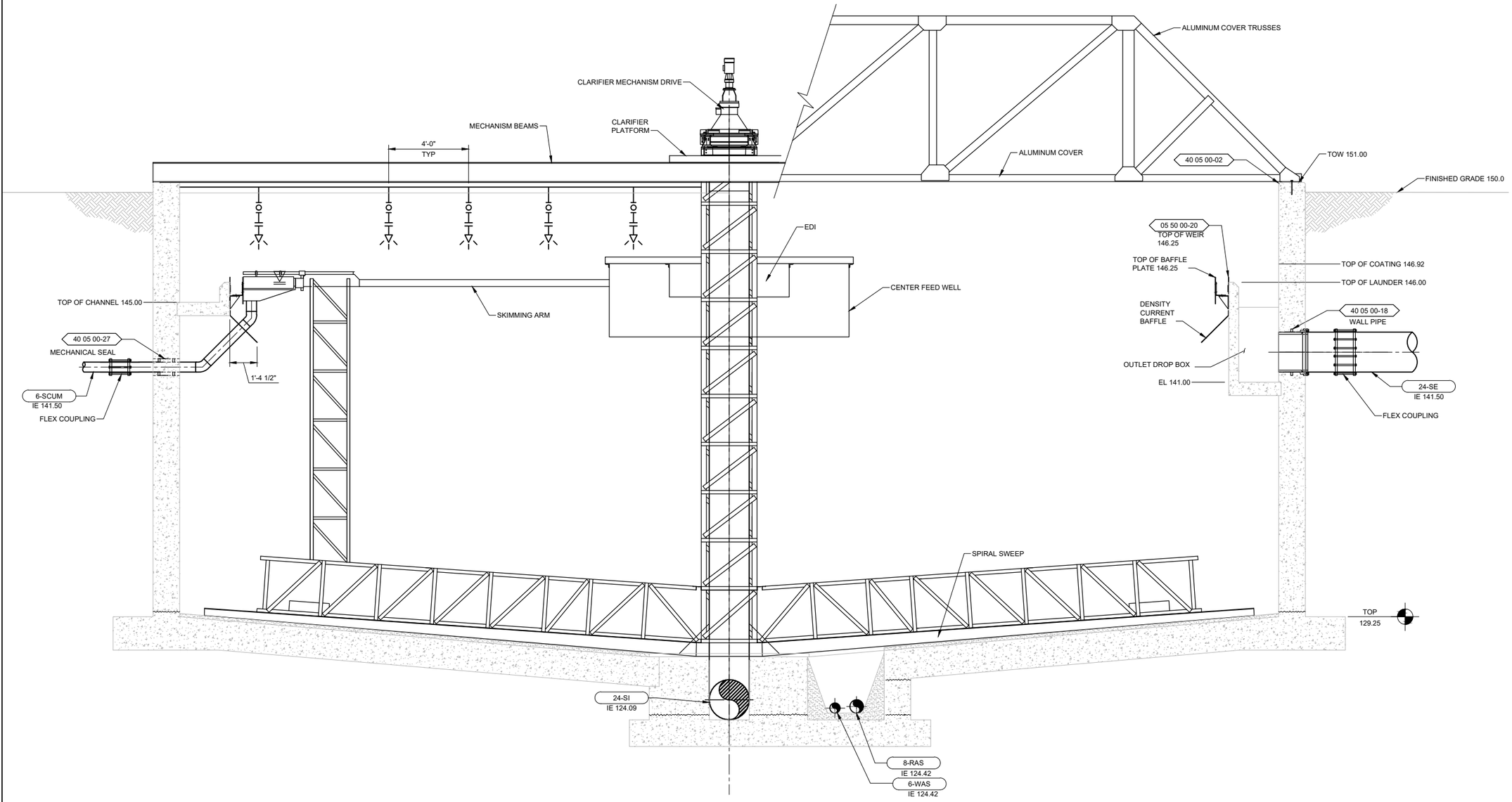
Improvements Project
Phase 2

SECONDARY TREATMENT
CLARIFIER NO. 2
PLAN

0 1" 2"

FILENAME	300D103.dwg
SCALE	1/4" = 1'-0"

SHEET **300D103**



GENERAL ARRANGEMENT SECTION

3/8"=1'-0"

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STATE OF ALASKA 49TH — J. RYAN MOYERS No. CE-12718 — REGISTERED PROFESSIONAL ENGINEER

City of Palmer WWTF Improvements Project Phase 2

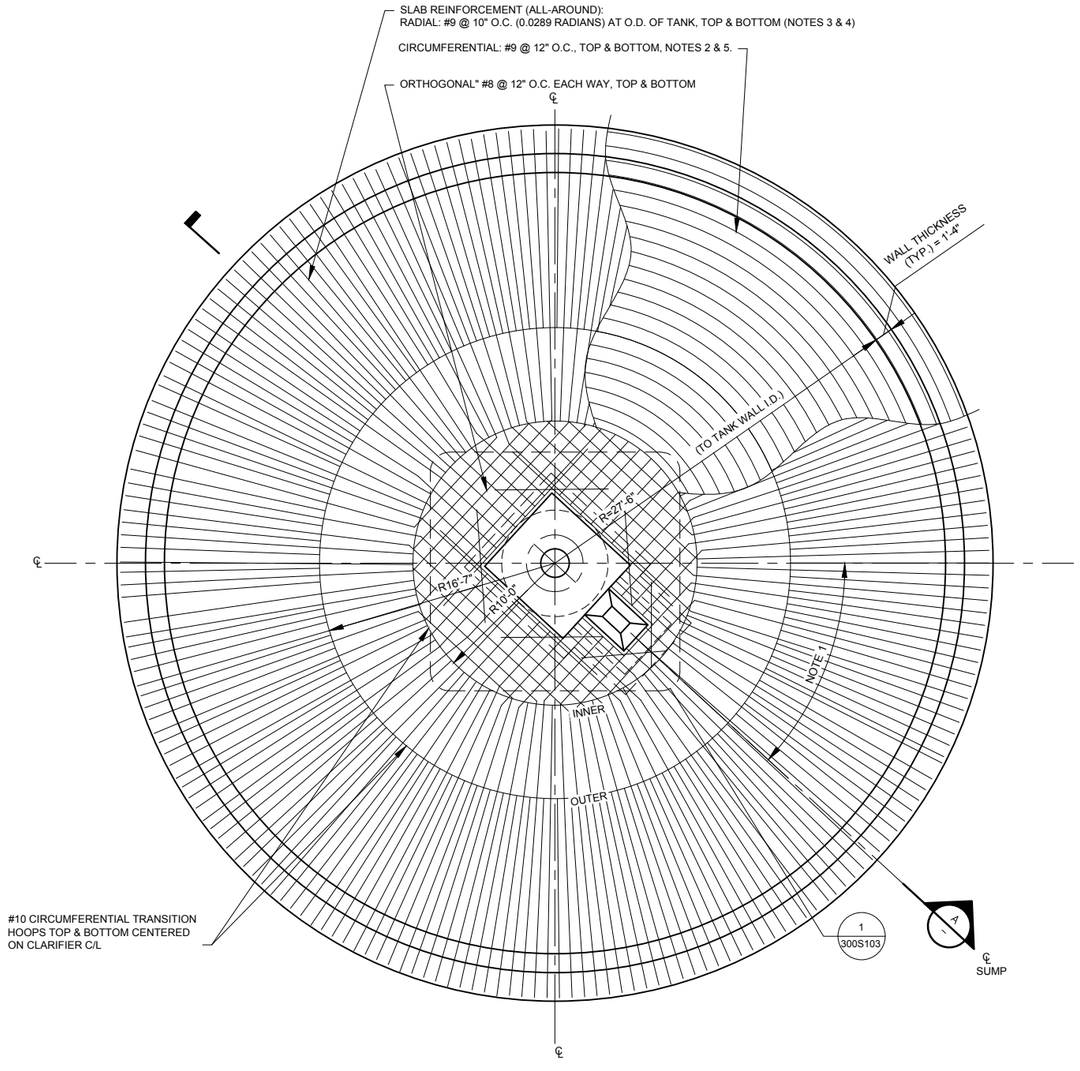
SECONDARY TREATMENT CLARIFIER SECTION

0 1" 2"

FILENAME 300D301.dwg

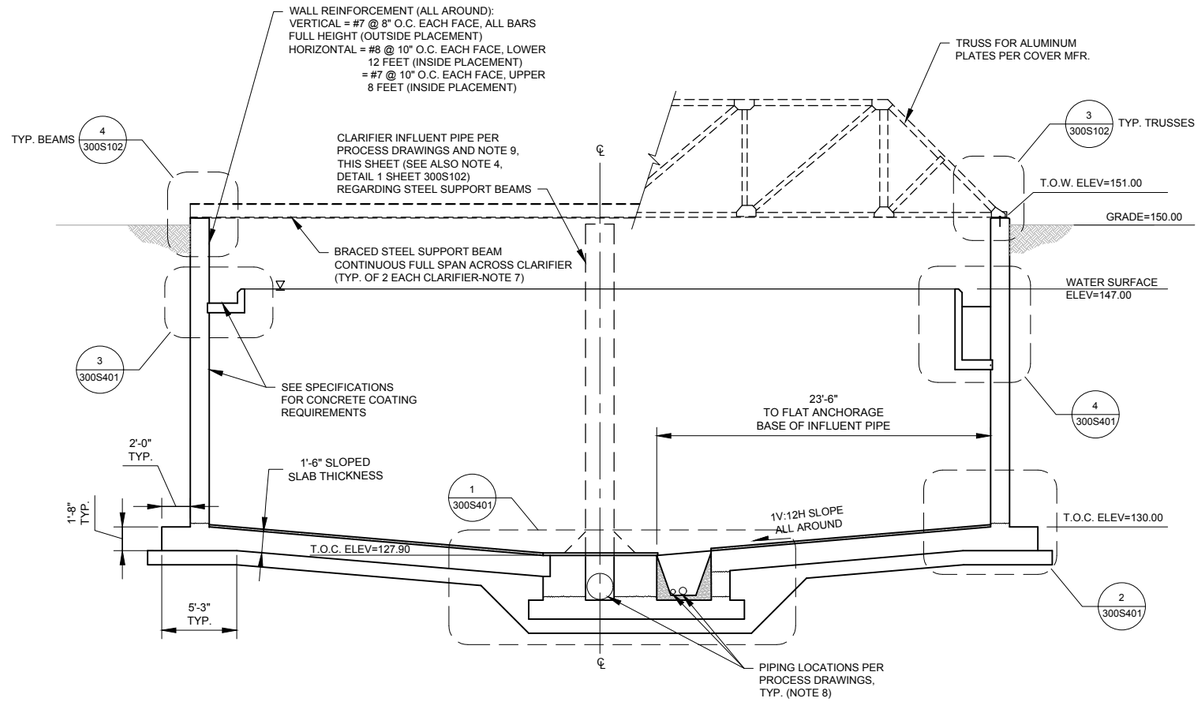
SCALE 3/8" = 1'-0"

SHEET 300D301



CLARIFIER SLAB PLAN (TYP. OF 2)

3/16" = 1'-0"



A CLARIFIER SECTION (TYP. OF 2)

3/16"=1'-0"

NOTES:

1. ORIENT AXIS OF SUMP PER PROCESS LAYOUT, SHEET 300D100.
2. PLACE CIRCUMFERENTIAL REINFORCEMENT INSIDE OF TOP AND BOTTOM RADIAL REINFORCEMENT.
3. TO EXTENT THAT REBAR SPACING REQUIREMENTS ALLOW, MAKE RADIAL STEEL CONTINUOUS WITH ORTHOGONAL STEEL AT INNER TRANSITION HOOP. APPROVED REBAR COUPLERS MAY BE USED TO PROVIDE REBAR CONTINUITY AND RELIEVE REBAR CONGESTION.
4. RADIAL STEEL THAT IS NOT CONTINUOUS SHALL BE TERMINATED AT INNER AND OUTER CIRCUMFERENTIAL TRANSITION HOOPS WITH 90° HOOKS. SEE DETAIL 5, SHEET 300S401.
5. CIRCUMFERENTIAL REINFORCEMENT BAR LAPS SHALL BE MINIMUM 72-INCHES. AND SHALL BE STAGGERED RELATIVE TO ADJACENT PARALLEL HOOPS.
6. MAXIMUM CENTER-TO-CENTER SPACING OF REINFORCED BARS SHALL BE 12".
7. BRACED STEEL SUPPORT BEAMS SHALL BE MILL-FABRICATED WITH A 3" AISC CAMBER AT MID-SPAN. SUPPORT BEAMS, STEEL TUBE BRACES AND STEEL CONNECTIONS SHALL BE SHOP- COATED WITH EPOXY PAINT. COATING SYSTEM SHALL BE RATED FOR FERROUS METALS, WASTEWATER IMMERSION AND ABRASION-RESISTANCE (SEE SPECIFICATIONS).
8. SEE STANDARD DETAIL 40 05 00-18 FOR WALL PIPING CONNECTIONS TO CLARIFIER STRUCTURE.
9. STRUCTURAL DESIGN OF CLARIFIER MECHANISMS, INFLUENT PIPE, ASSOCIATED STRUCTURE AND CONNECTIONS TO FOUNDATION AND SUPPORT BEAMS SHALL BE PROVIDED BY APPROVED CLARIFIER MANUFACTURER.

CRW ENGINEERING GROUP, LLC

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CITY OF PALMER "Alaska at its Best"

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Improvements Project
Phase 2

SECONDARY TREATMENT
STRUCTURAL
PLAN & SECTION

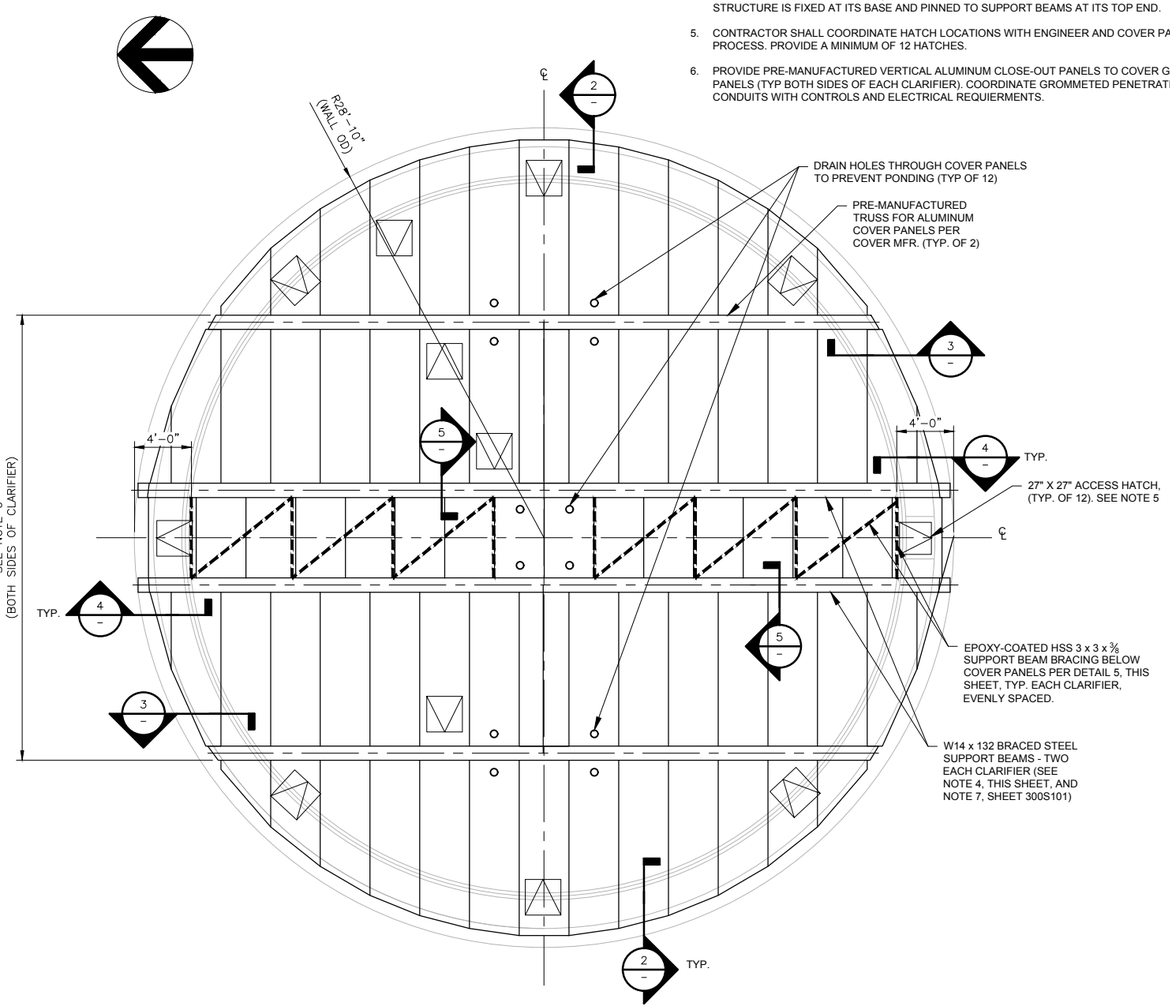
0 1" 2"

FILENAME	300S101.dwg
SCALE	AS NOTED

SHEET **300S101**

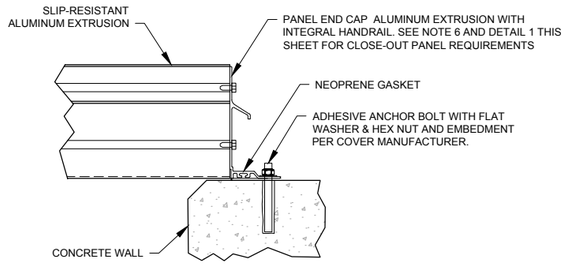
NOTES:

1. ALUMINUM COVER PANEL DESIGN AND CONNECTIONS TO CLARIFIER STRUCTURE SHALL BE PROVIDED BY COVER PANEL MANUFACTURER.
2. IN ADDITION TO SELF-WEIGHT AND OTHER DEAD LOADS, PANELS SHALL BE DESIGNED TO WITHSTAND SPECIFIED LIVE LOADS, BALANCED AND UNBALANCED SNOW LOADS AND WIND LOADS.
3. COVER PANEL CONNECTIONS TO CLARIFIER WALLS SHALL BE DESIGNED TO ALLOW HORIZONTAL DISPLACEMENTS DUE TO TEMPERATURE WITHOUT LOADING CLARIFIER WALLS, AND PREVENT HORIZONTAL WALL DISPLACEMENTS FROM IMPOSING LOADS ON PANELS.
4. BRACED STEEL SUPPORT BEAMS ARE INTENDED TO PROVIDE SUPPORT FOR ALUMINUM COVER PANELS, AS WELL AS LATERAL SUPPORT FOR CLARIFIER INFLUENT PIPE UNDER SEISMIC LOADING. SIZING OF BEAMS IS BASED ON ESTIMATED GRAVITY AND SEISMIC LOADS. CONTRACTOR SHALL SUBMIT SEISMIC LOADS DETERMINED BY APPROVED CLARIFIER MANUFACTURER TO ENGINEER FOR REVIEW AND VERIFICATION OF BEAM DESIGN, IN ADDITION TO CONNECTION DETAILS. FOUNDATION DESIGN ASSUMES THAT CLARIFIER INFLUENT PIPE STRUCTURE IS FIXED AT ITS BASE AND PINNED TO SUPPORT BEAMS AT ITS TOP END.
5. CONTRACTOR SHALL COORDINATE HATCH LOCATIONS WITH ENGINEER AND COVER PANEL MANUFACTURER DURING THE SUBMITTAL PROCESS. PROVIDE A MINIMUM OF 12 HATCHES.
6. PROVIDE PRE-MANUFACTURED VERTICAL ALUMINUM CLOSE-OUT PANELS TO COVER GAP AT EDGES PRODUCED BY SLOPING COVER PANELS (TYP BOTH SIDES OF EACH CLARIFIER). COORDINATE GROMMETED PENETRATIONS THROUGH CLOSE-OUT PANEL FOR WIRING CONDUITS WITH CONTROLS AND ELECTRICAL REQUIERMENTS.



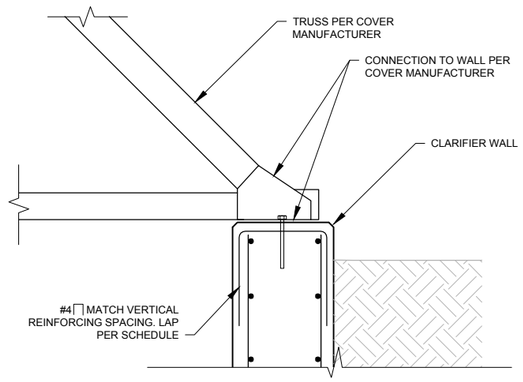
1 - CLARIFIER COVER PANEL PLAN (TYP. OF 2)

3/16" = 1'-0" (FULL SIZE DWG)



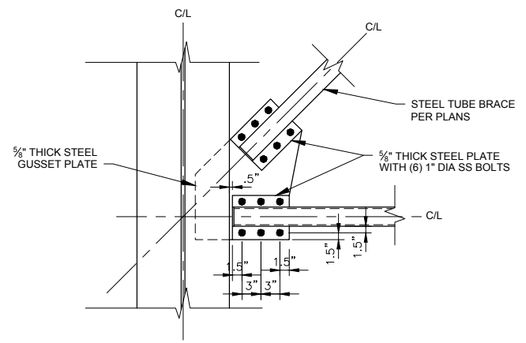
2 - COVER PLAN ATTACHMENT - TYPICAL TOP MOUNT

NTS



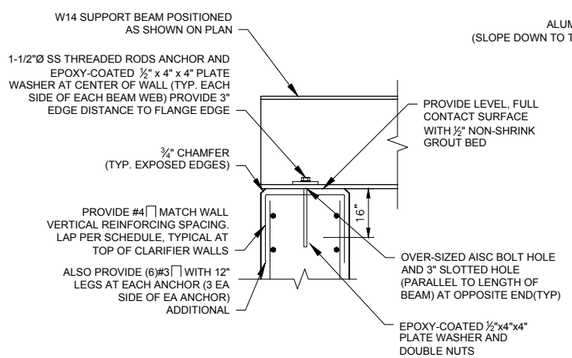
3 - COVER PANEL TRUSS CONNECTION

1 "= 1'-0" (FULL SIZE DWG)



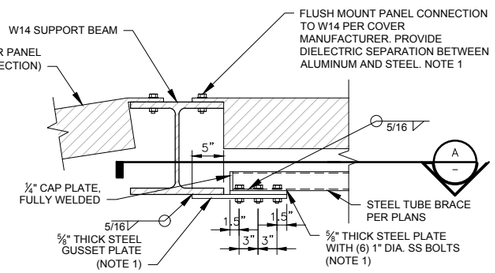
PLAN VIEW A-A

1 "= 1'-0" (FULL SIZE DWG)



4 - TOP OF CLARIFIER WALL SECTION

1 "= 1'-0" (FULL SIZE DWG)



NOTES:

1. SHOP DRILL BOLT HOLES PRIOR TO PAINTING STRUCTURAL STEEL. COORDINATE HOLE LOCATIONS WITH BRACE AND COVER PANEL FABRICATIONS PRIOR TO DRILLING.

5 - COVER PANEL CONNECTION TO BEAM

1 "= 1'-0" (FULL SIZE DWG)

CRW ENGINEERING GROUP, LLC

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CITY OF PALMER "Alaska at its Best!"

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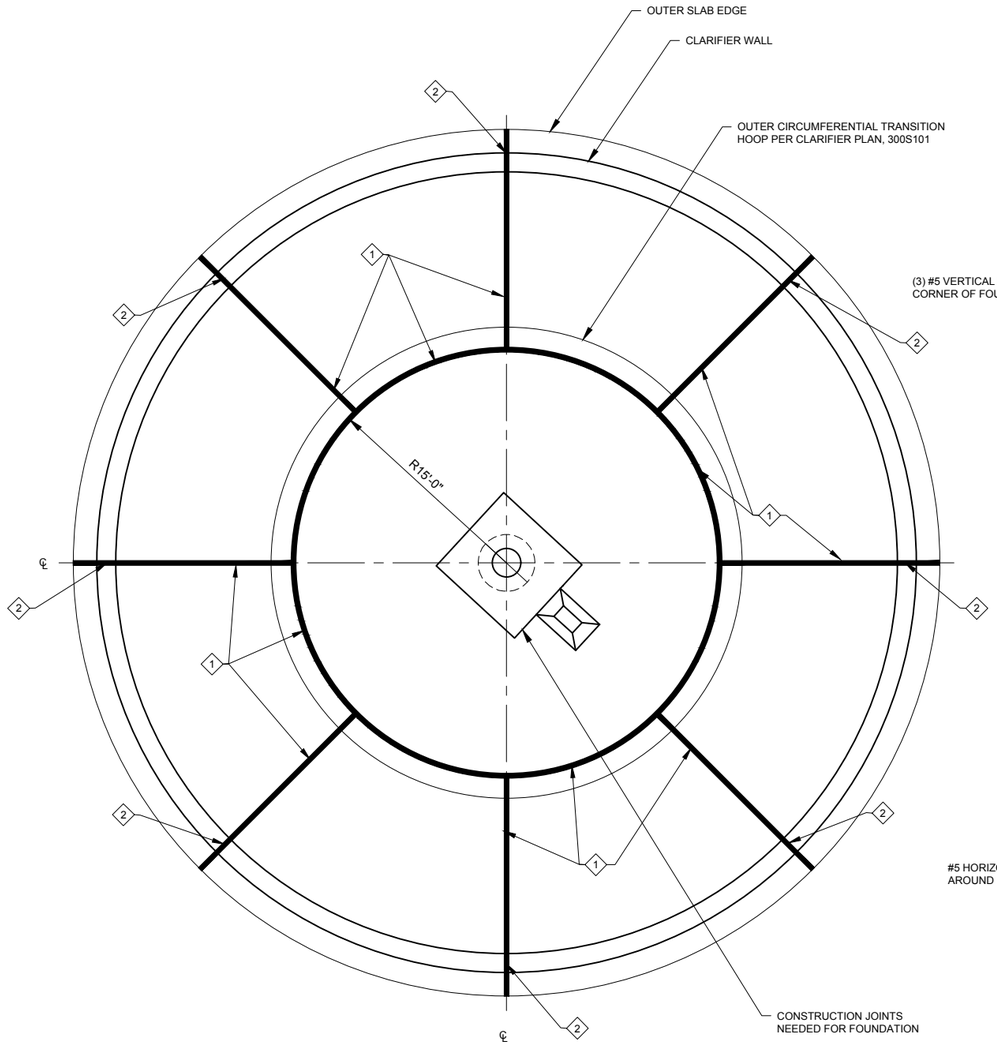
Phase 2

SECONDARY TREATMENT
STRUCTURAL
COVER PLAN

0 1" 2"

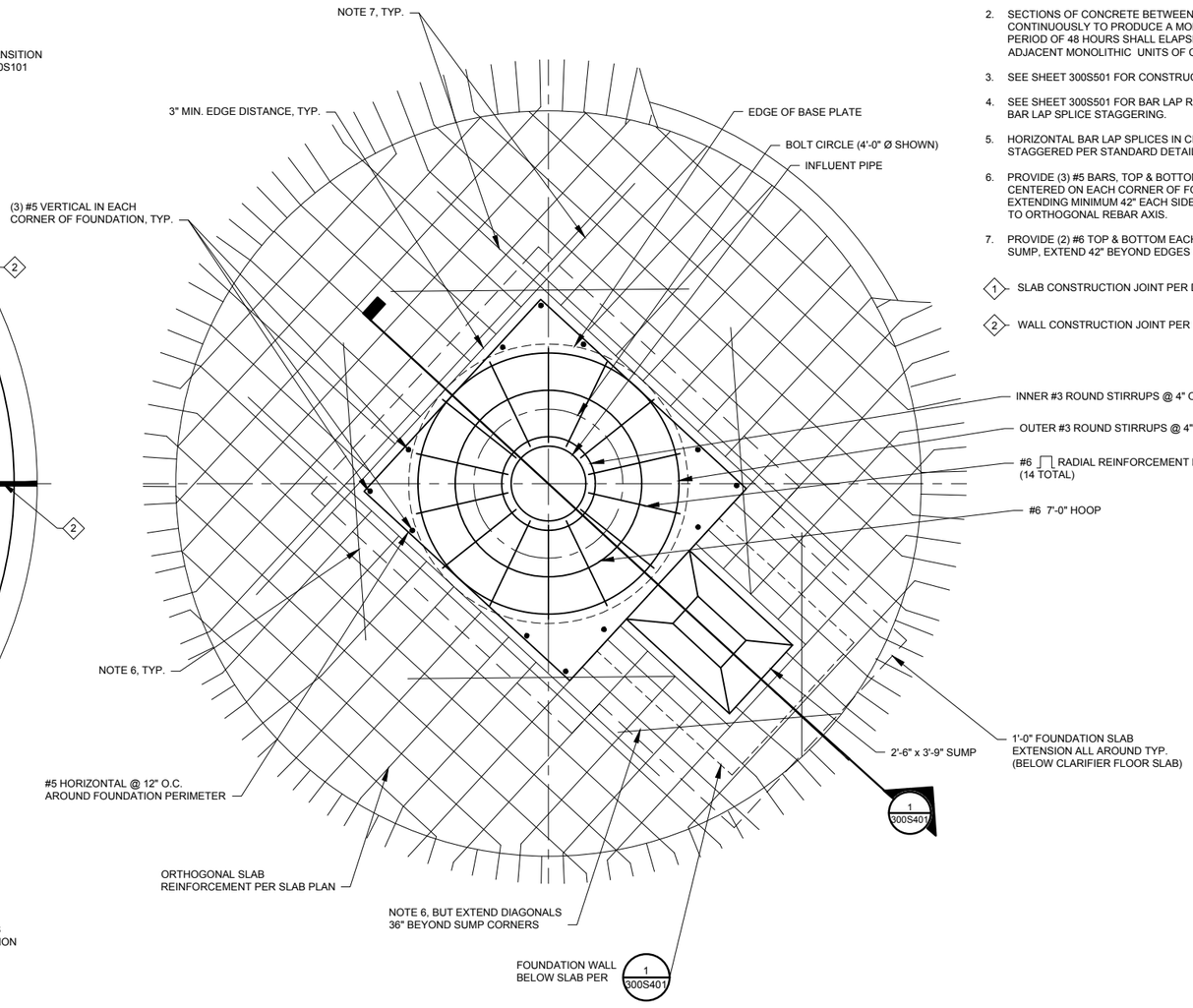
FILENAME 300S102.dwg
SCALE AS NOTED

SHEET
300S102



CLARIFIER CONTROL JOINT PLAN

3/16" = 1'-0" (FULL SIZE DWG)



1 CLARIFIER FOUNDATION PLAN

1/2" =1' -0" (FULL SIZE DWG)

NOTES:

1. THIS DETAIL SHOWS APPROVED LOCATIONS OF CONSTRUCTION JOINTS. THE CONTRACTOR MAY PROPOSE ALTERNATE JOINT LOCATIONS PROVIDED THAT THE JOINT SPACING DOES NOT EXCEED 30'-0" AND THE JOINT LOCATIONS ARE SUBMITTED TO AND APPROVED BY THE ENGINEER SUFFICIENTLY IN ADVANCE OF CONSTRUCTION.
2. SECTIONS OF CONCRETE BETWEEN JOINTS SHALL BE PLACED CONTINUOUSLY TO PRODUCE A MONOLITHIC UNIT. A MINIMUM PERIOD OF 48 HOURS SHALL ELAPSE BETWEEN CASTING OF ADJACENT MONOLITHIC UNITS OF CONCRETE.
3. SEE SHEET 300S501 FOR CONSTRUCTION JOINT DETAILS.
4. SEE SHEET 300S501 FOR BAR LAP REQUIREMENTS AND VERTICAL BAR LAP SPLICE STAGGERING.
5. HORIZONTAL BAR LAP SPLICES IN CLARIFIER WALLS SHALL BE STAGGERED PER STANDARD DETAIL 03 21 00-26.
6. PROVIDE (3) #5 BARS, TOP & BOTTOM, SPACED 2 INCHES APART CENTERED ON EACH CORNER OF FOUNDATION AND SUMP, EXTENDING MINIMUM 42" EACH SIDE OF CORNER, ORIENTED 45° TO ORTHOGONAL REBAR AXIS.
7. PROVIDE (2) #6 TOP & BOTTOM EACH SIDE OF FOUNDATION AND SUMP, EXTEND 42" BEYOND EDGES OF FOUNDATION AND SUMP.

1 SLAB CONSTRUCTION JOINT PER DETAILS, SHEET 300S501.

2 WALL CONSTRUCTION JOINT PER DETAILS, SHEET 300S501.

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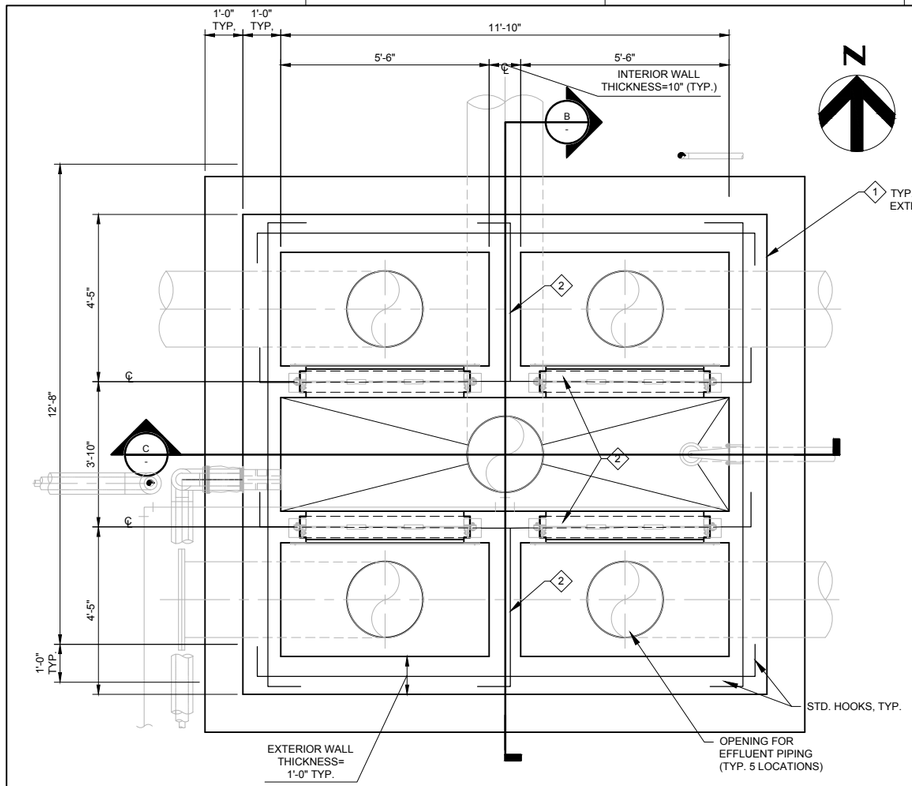
Phase 2

SECONDARY TREATMENT STRUCTURAL CONTROL JOINT PLAN

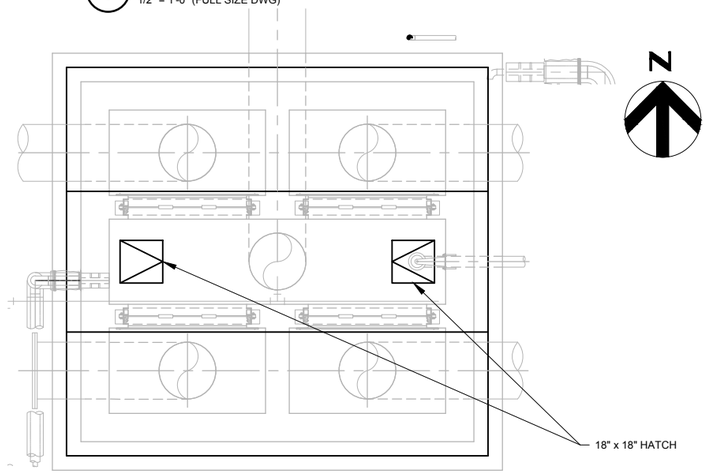
0 1" 2"

FILENAME 300S103.dwg
SCALE AS NOTED

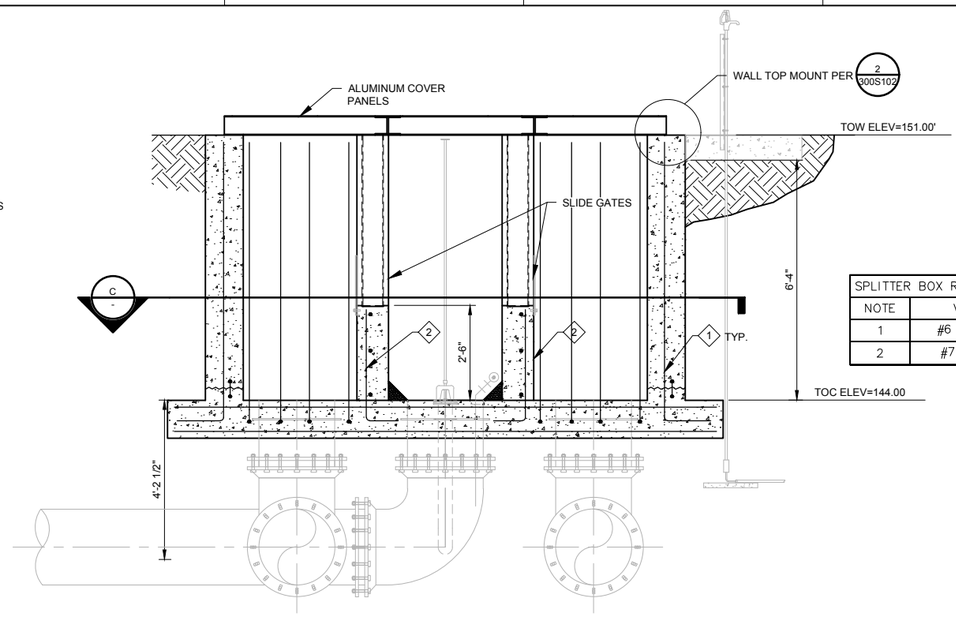
SHEET 300S103



A SPLITTER BOX
1/2" = 1'-0" (FULL SIZE DWG)



1 COVER PANEL PLAN
3/8" = 1'-0" (FULL SIZE DWG)

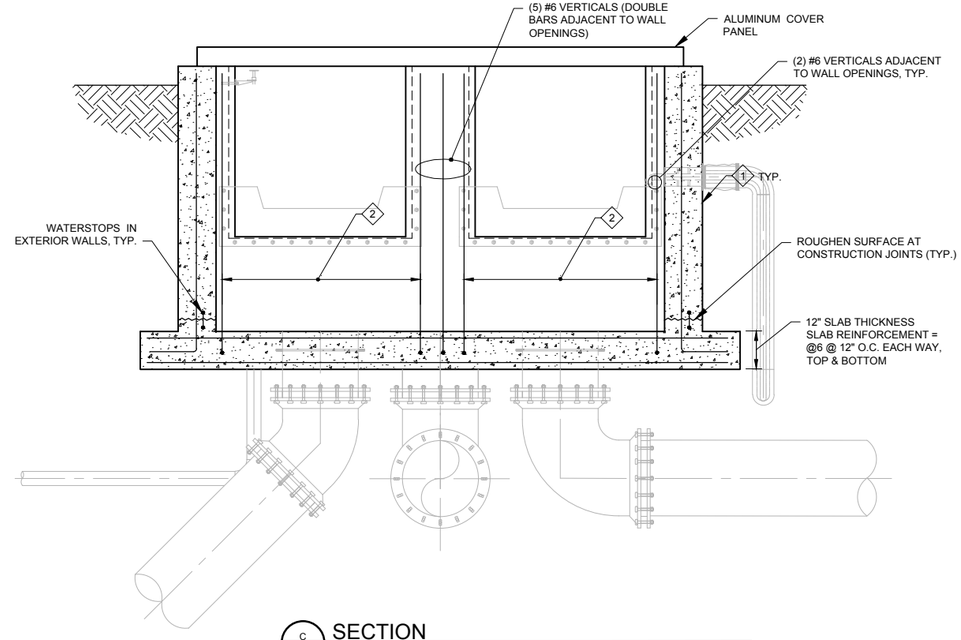


B SECTION
1/2" = 1'-0" (FULL SIZE DWG)

SPLITTER BOX REINFORCEMENT SCHEDULE			
NOTE	VERTICAL	HORIZONTAL	PLACEMENT
1	#6 @ 10" O.C.	#7 @ 10" O.C.	CENTER OF WALL
2	#7 @ 8" O.C.	#5 @ 10" O.C.	NOTE 1

NOTES:

1. EXCEPT WHERE REINFORCEMENT PLACEMENT IS SHOWN OFFSET TO ACCOMMODATE SLIDE GATE INSERT, PLACE REINFORCEMENT IN CENTER OF WALL.



C SECTION
1/2" = 1'-0" (FULL SIZE DWG)

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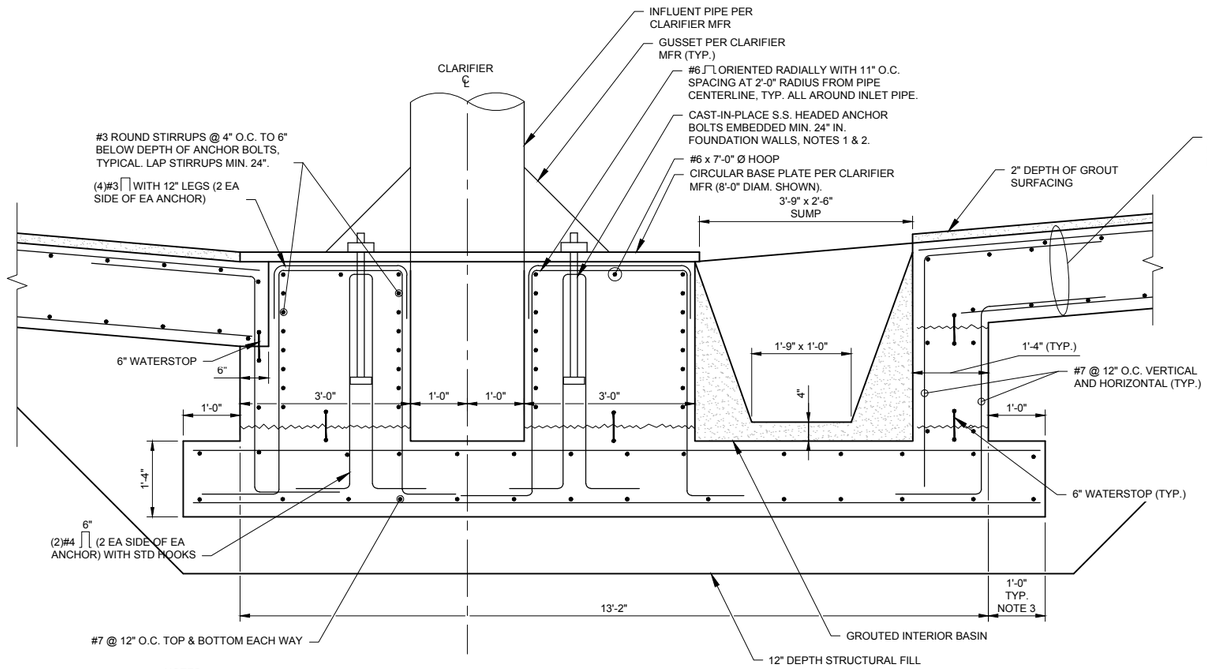
SECONDARY TREATMENT
STRUCTURAL
SECONDARY FLOW SPLITTER
PLAN AND SECTIONS

0 1" 2"

FILENAME 300S104.dwg
SCALE AS NOTED

SHEET
300S104

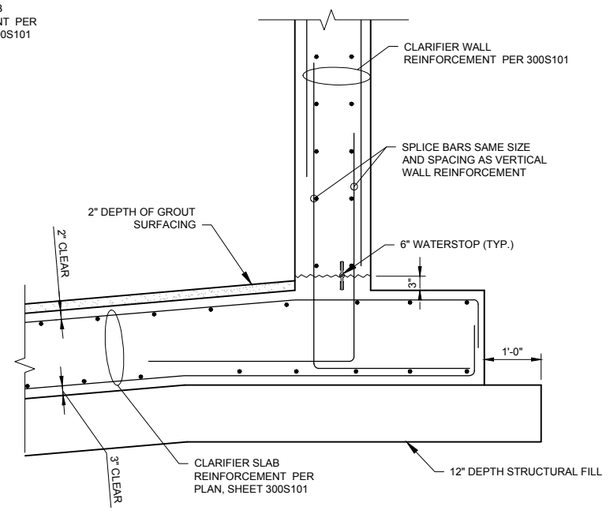


NOTES:

1. THIS FOUNDATION DEPICTS A DESIGN BASED ON ESTIMATED ANCHORAGE LOADS IMPOSED BY CLARIFIER INFLUENT PIPING AND ATTACHED ACCESSORIES. CONTRACTOR SHALL SUBMIT ANCHORAGE LOADS PROVIDED BY APPROVED CLARIFIER MANUFACTURER FOR REVIEW BY ENGINEER TO VERIFY FOUNDATION DESIGN.
2. NUMBER, SIZE AND PATTERN OF BOLTS AND BASE PLATE DESIGN SHALL BE PROVIDED BY APPROVED CLARIFIER MANUFACTURER.
3. SLAB EXTENSION IS TYPICAL ON ALL SIDES OF FOUNDATION AND SUMP.

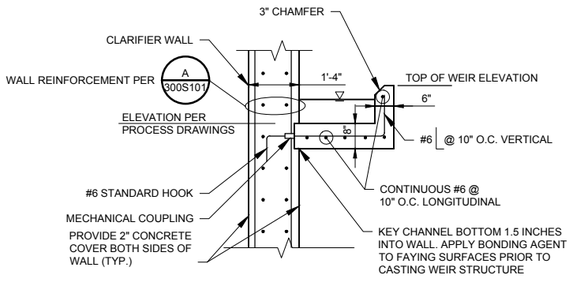
1 - CLARIFIER FOUNDATION SECTION

3/4" = 1'-0" (FULL SIZE DWG)



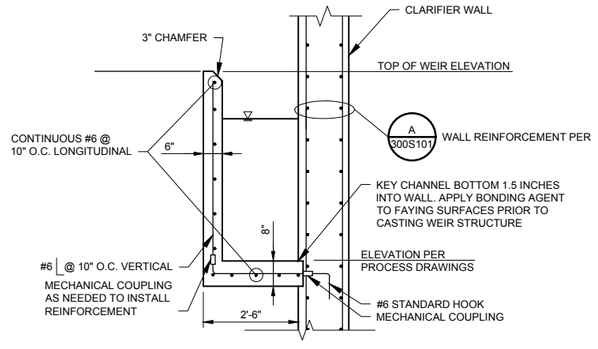
2 - WALL TO SLAB CONNECTION

3/4" =1' -0" (FULL SIZE DWG)



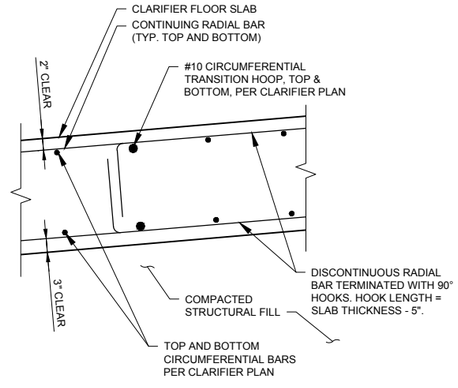
3 - EFFLUENT WEIR SECTION

1/2" = 1'-" (FULL SIZE DWG)



4 - EFFLUENT WEIR SECTION

1/2" =1'-0" (FULL SIZE DWG)



5 - CLARIFIER SLAB REINFORCEMENT SECTION

1" =1'-0" (FULL SIZE DWG)

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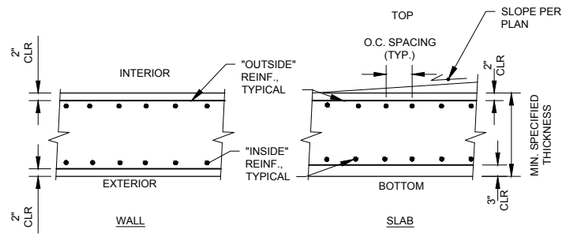
SECONDARY TREATMENT CLARIFIER
MISC. SECTIONS AND DETAILS

0 1" 2"

FILENAME 300S401.dwg
SCALE AS NOTED

SHEET **300S401**



SLOPE ACHIEVED BY POURING AND GRADING TOPPING OVER CURED FLOOR SLAB

NOTES:

1. THIS DETAIL SHOWS TYPICAL CLEAR DISTANCES BETWEEN FACE OF REBAR AND FACE OF CONCRETE FOR CONCRETE VAULTS AND SLAB STRUCTURES. IT ALSO DEFINES "INSIDE" AND "OUTSIDE" TERMINOLOGY TO BE USED WITH THE REINFORCEMENT SCHEDULE. CLEAR DISTANCES SHALL COMPLY WITH THIS DETAIL UNLESS OTHERWISE NOTED OR SPECIFIED.
2. PLACEMENT OF REINFORCEMENT AND GEOMETRY OF BENDS AND STANDARD HOOKS SHALL BE IN ACCORDANCE WITH ACI 350-06.
3. SEE STANDARD DETAIL 03 21 00-04 FOR STANDARD HOOK PLACEMENT REQUIREMENTS.
4. MINIMUM COVER BETWEEN STANDARD HOOKS AND EDGE OF CONCRETE AT WALL FACES AND CORNERS AND SIDES OF SLABS (I.E. "SIDE COVER" PER ACI 12.5.4) SHALL BE 2.5 INCHES.
5. SEE STANDARD DETAILS 03 21 00-28 AND 03 21 00-29 FOR STAGGERING THE PLACEMENT OF REBAR SPLICES IN CONCRETE WALLS.

1 - TYPICAL REINFORCEMENT PLACEMENT

NTS

WALLS AND SLAB

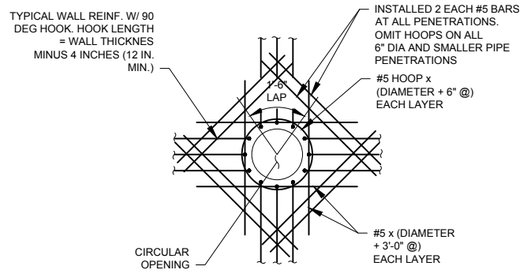
BAR	VERT.	HORIZ.
#3	19"	24"
#4	24"	31"
#5	30"	38"
#6	35"	46"
#7	51"	67"
#8	59"	76"
#9	66"	86"
#10	74"	96"

NOTES:

1. EXCEPT AS OTHERWISE NOTED OR SPECIFIED, LAP LENGTHS SHALL CONFORM TO THIS SCHEDULE.
2. LAP LENGTHS ARE BASED ON ACI 350-06, f'c=4500 PSI, CLASS B.
3. HORIZ WALL AND SLAB TOP REINFORCED LAP LENGTHS ARE SPECIFIED PER "TOP BAR" CRITERIA.
4. WHERE REINF. HAVING DIFFERENT BAR DIAMETERS ARE TO BE SPLICED, LAP LENGTHS SHALL BE BASED ON THE LARGER DIAMETER BAR.

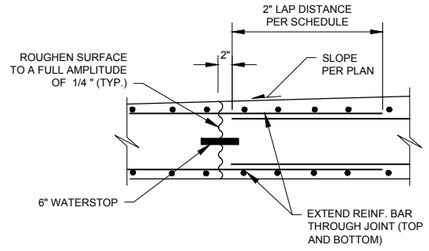
2 - REBAR LAP SCHEDULE

NTS



3 - TYPICAL PIPE PENETRATION REINFORCEMENT DETAIL

NTS

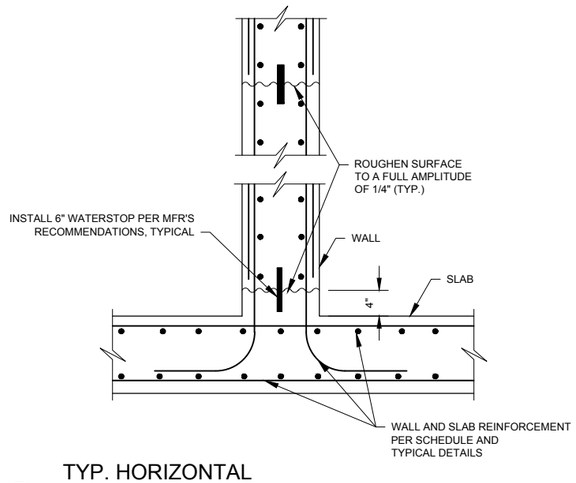


NOTES:

1. WATERSTOP SHALL BE PROTECTED FROM DAMAGE DURING SURFACE ROUGHING.
2. IN LIEU OF SURFACE ROUGHENING, SHEAR KEY MAY BE CASE INTO SLAB PER "ALTERNATE FOR TWO MATS" DETAIL, STANDARD DETAIL 03 31 31-17.

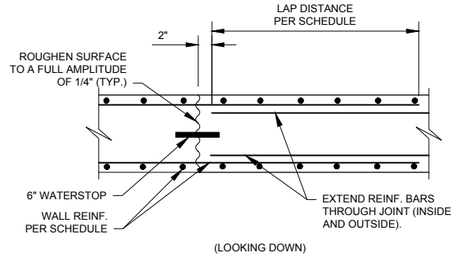
4 - TYP. SLAB CONSTRUCTION JOINT

NTS



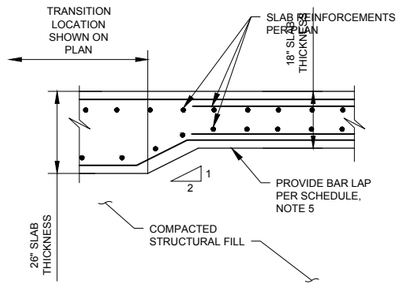
5 - TYP. HORIZONTAL CONSTRUCTION JOINT IN WALL

NTS



6 - TYP. VERTICAL CONSTRUCTION JOINT IN WALL

NTS



7 - SLAB REINFORCEMENT AT SLAB THICKNESS TRANSITION

1/2" = 1'-0" (FULL SIZE DWG)

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A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
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ARCHITECTURAL	M. LAMBERT
PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

CRW ENGINEERING GROUP, LLC

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STATE OF ALASKA 49 TH Jon H. Hermon SE-14161 05/27/21 REGISTERED STRUCTURAL ENGINEER

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Phase 2

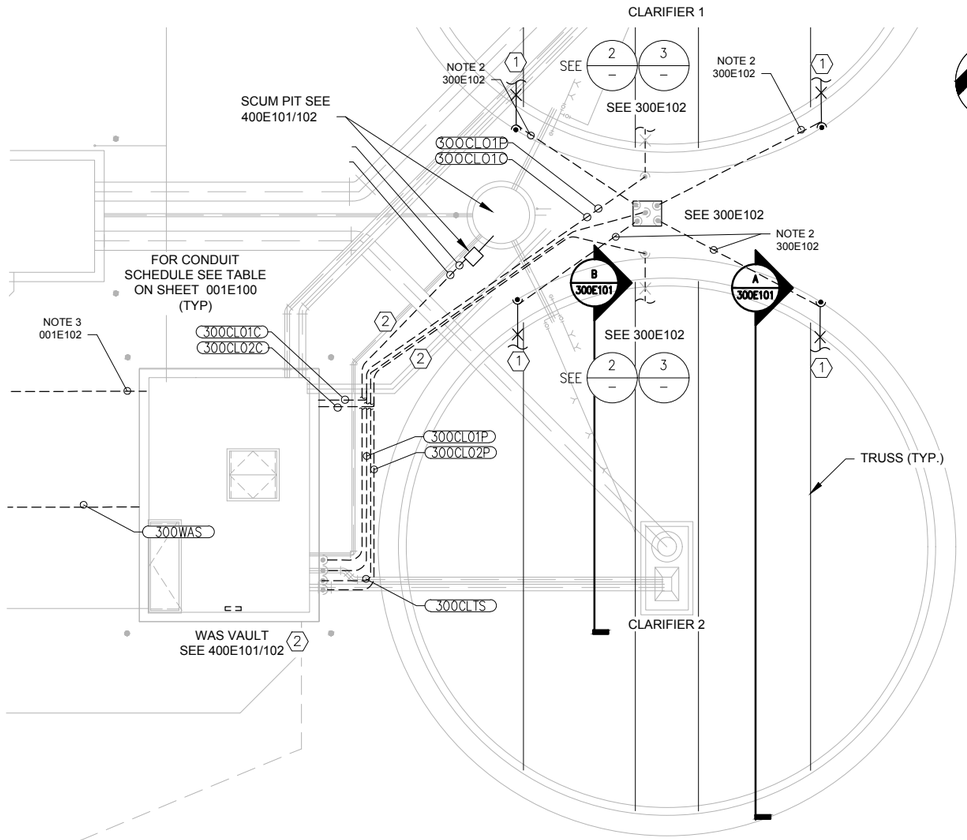
SECONDARY TREATMENT CLARIFIER TYPICAL DETAILS

0 1" 2"

FILENAME 300S501.dwg

SCALE AS NOTED

SHEET 300S501

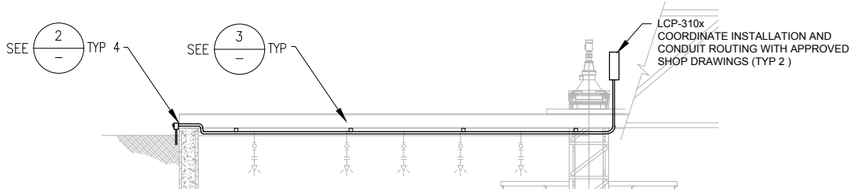


CLARIFIER ELECTRICAL SITE PLAN

1/8"=1'-0"

A / 300E101 CLARIFIER LIGHTING ELEVATION (TYP. 4 TRUSSES)

1/8"=1'-0"

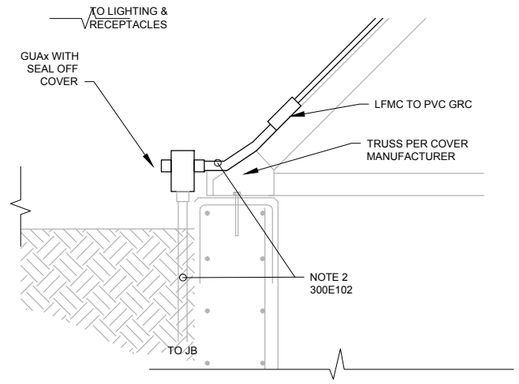


b / 300E101 CLARIFIER DRIVE ELEVATION (TYP. EACH CLARIFIER)

1/8"=1'-0"

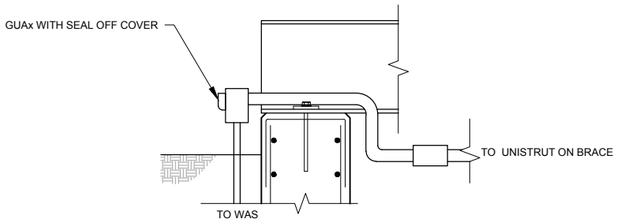
KEY NOTES: (#)

1. SEE 300E102 FOR CONTINUATION OF RECEPTACLE AND LIGHTING
2. 8W/FT LONG LINE HEAT TAPE IN ARCTIC PIPE. 277V RAYCHEM LBTV2 OR EQUAL



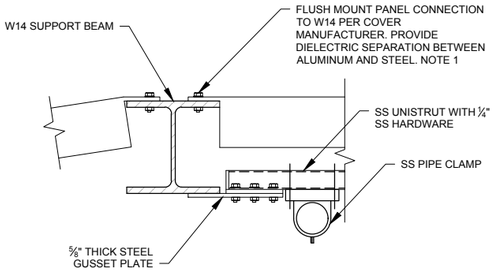
1 COVER PANEL TRUSS CONNECTION

1 "= 1'-0" (FULL SIZE DWG)



2 DRIVE POWER & CONTROL AT CLARIFIERS

1 "= 1'-0" (FULL SIZE DWG)



3 DRIVER POWER & CONTROL SUPPORT AT CLARIFIER

1 "= 1'-0" (FULL SIZE DWG)

NOTES:

1. SHOP DRILL BOLT HOLES PRIOR TO PAINTING STRUCTURAL STEEL. COORDINATE HOLE LOCATIONS WITH BRACE AND COVER PANEL FABRICATIONS PRIOR TO DRILLING.
2. THERE ARE A TOTAL OF TWO CONDUITS FOR EACH CLARIFIER DRIVE OTER. ONE WILL PROVIDE POWER , THE OTHER WILL CARRY DRIVER STATUS AND ALARM BACK TO THE SCADA PANEL
3. DO NOT BLOCK HATCH, IF NO ROOM, RUN ONE COUDUIT ON EAITHER SIDE OF THE HATCH OPENING. SEE 300S102.

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PROCESS	J. WODRICH
MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA — 48 TH — William M. McDonald — EE-7879 — 05/27/21 — REGISTERED PROFESSIONAL ENGINEER

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SECONDARY TREATMENT
CLARIFIER ELECTRICAL PLAN

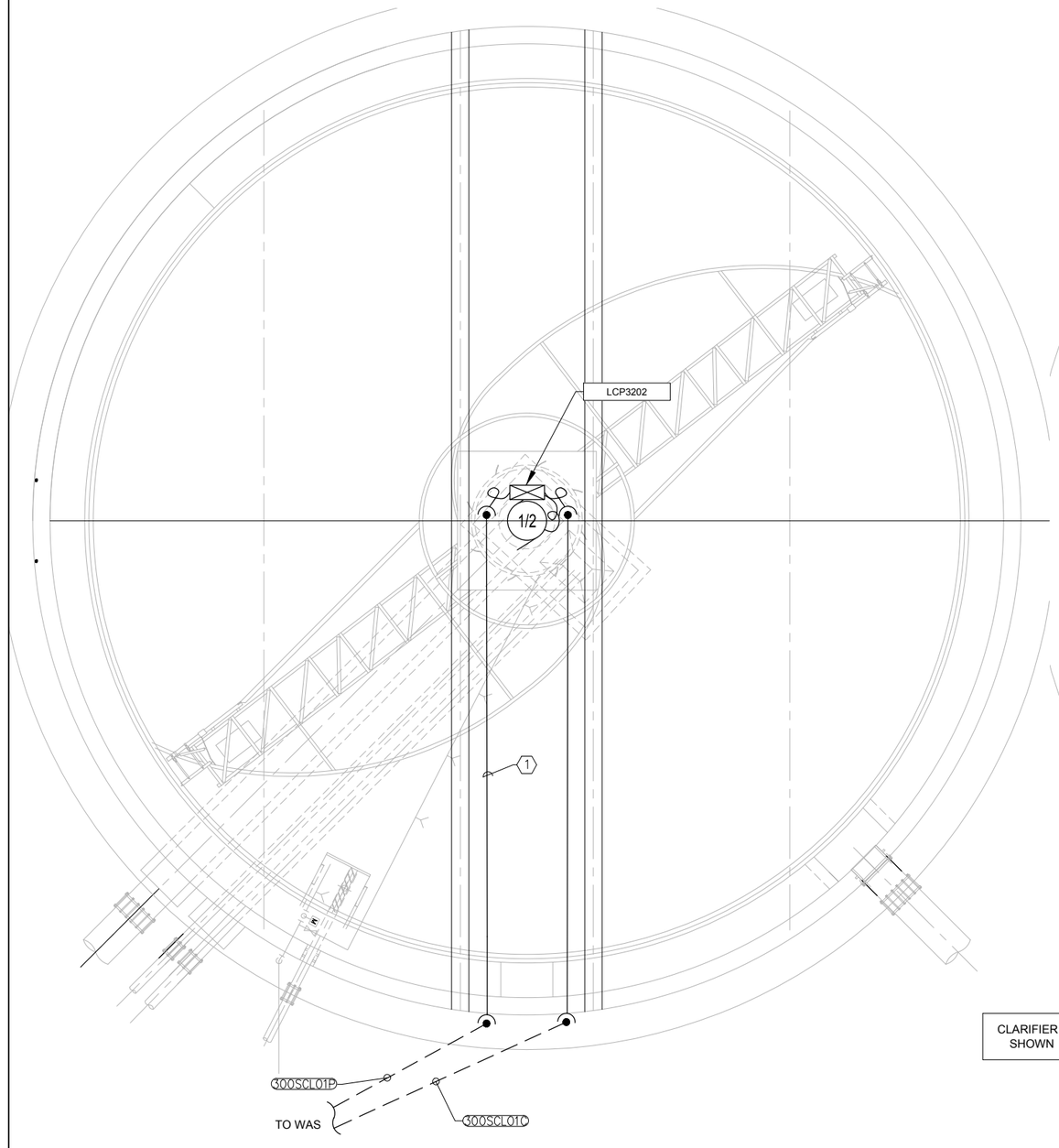
0 1" 2"

FILENAME 300E101.dwg
SCALE AS NOTED

SHEET 300E101

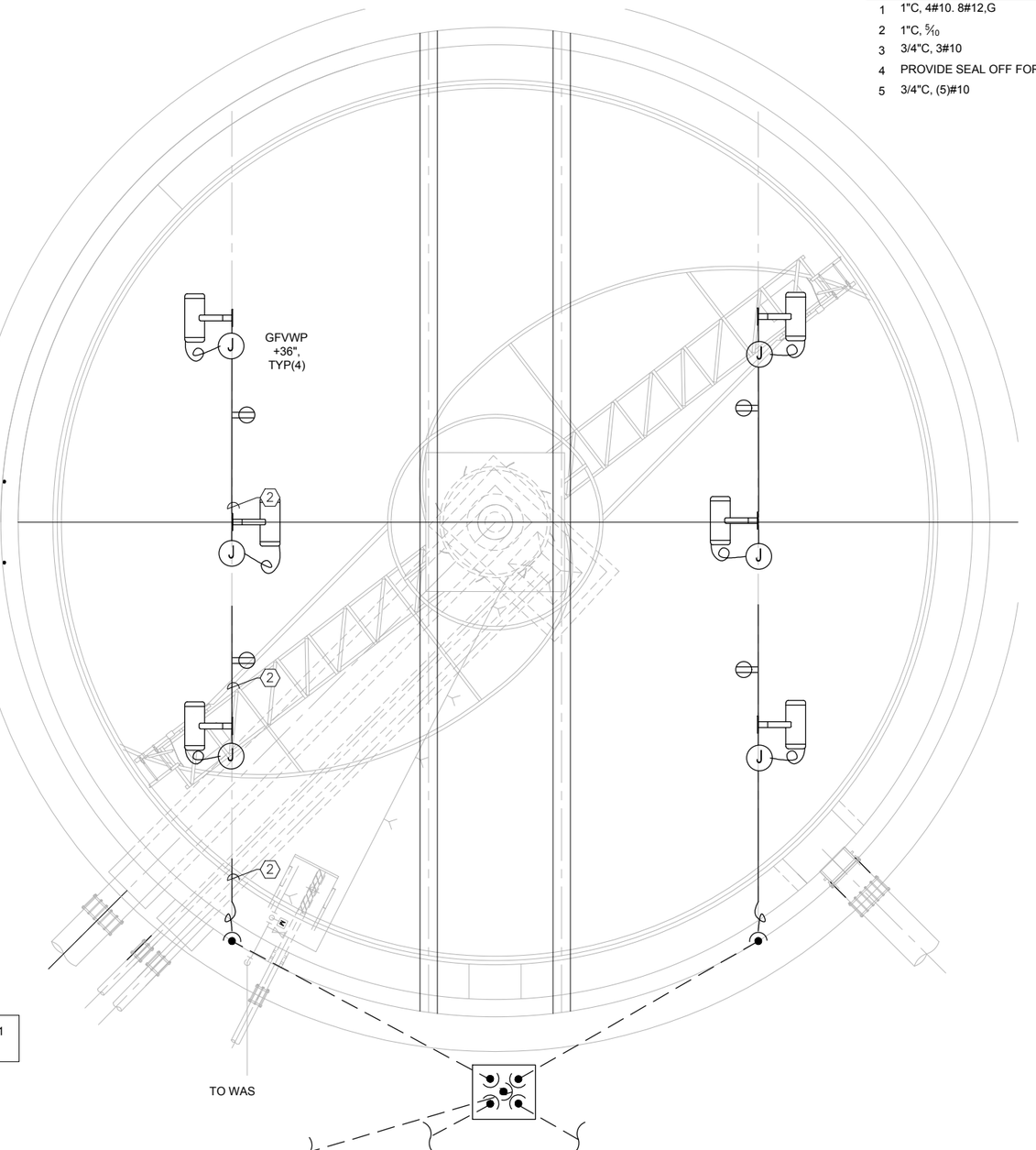
KEY NOTES ⟨#⟩

1 1"C, 4#10. 8#12,G
2 1"C, 5/10
3 3/4"C, 3#10
4 PROVIDE SEAL OFF FOR CONDUIT.
5 3/4"C, (5)#10



CLARIFIER POWER & INSTRUMENTATION PLAN (TYP. 2)
1/4"=1'-0"

CLARIFIER 1 SHOWN



CLARIFIER LIGHTING PLAN (TYP. 2)
1/4"=1'-0"

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A	JUNE 2021	ISSUED FOR BID

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CIVIL	R. MOYERS
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MECHANICAL	T. CARSON
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INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49 TH William M. McDonald EE-7673 05/27/21 REGISTERED PROFESSIONAL ENGINEER

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Phase 2

SECONDARY TREATMENT
SECONDARY CLARIFIER ELECTRICAL PLAN

0 1" 2"

FILENAME 300E102.dwg
SCALE AS NOTED

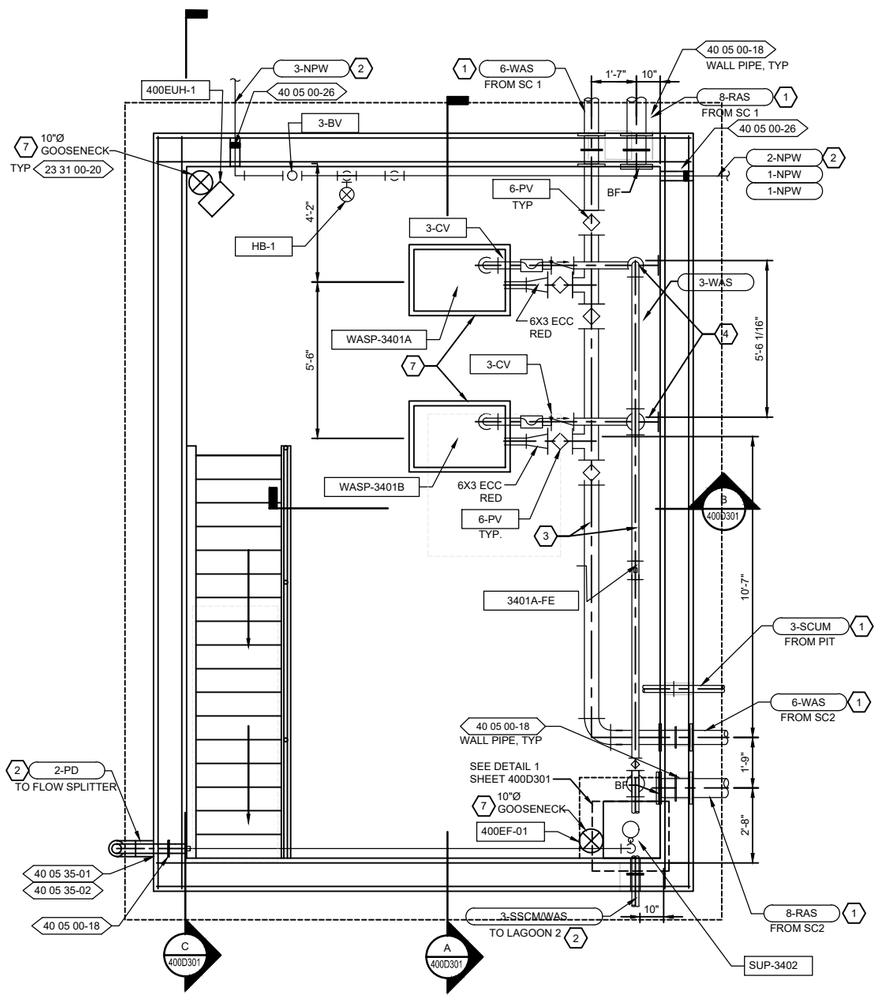
SHEET
300E102

ELECTRIC UNIT HEATER SCHEDULE

MARK	LOCATION	TEMP RISE (°F)	CAP. KW	CFM	THROW (FT.)	MOUNTING	VOLT	PH	BASIS OF DESIGN	NOTES
400EUH-01	WAS/RAS PUMP VAULT	31	15	1450	47	CEILING	480	3	QMARK GUX15004832	2

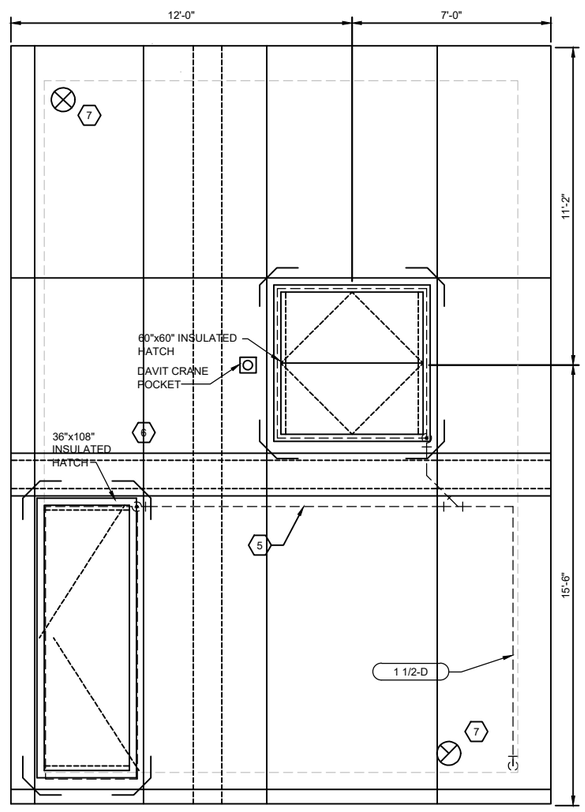
NOTES:

1. BASE BOARD HEATER WITH INTEGRAL THERMOSTAT.
2. CEILING MOUNTED HEATER. MOUNT 8' AFF WITH INTEGRAL THERMOSTAT.
3. CEILING MOUNTED HEATER. INTEGRAL THERMOSTAT.



FLOOR PLAN

3/8" = 1'-0"



TOP PLAN

3/8" = 1'-0"

KEYNOTES: (X)

1. SEE 300D100 FOR CONTINUATION.
2. SEE CIVIL SHEETS FOR CONTINUATION.
3. PIPE SUPPORTS PER 40 05 09-18 SPACED PER SPECIFICATION 40 05 07. TYPICAL.
4. THRUST RESTRAINT PER 40 05 07-02.
5. ROUTE 1 1/2" HATCH DRAIN PIPE TO SUMP.
6. SEE SPECIFICATION 41 22 23.
7. ROUTE 10"Ø GOOSENECK THRU CONCRETE ROOF, SEE STRUCTURAL DWG FOR OPENING REINFORCEMENT DETAIL 40 05 00-20, SIM.

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INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49TH J. RYAN MOYERS No. CE-12718 REGISTERED PROFESSIONAL ENGINEER

City of Palmer
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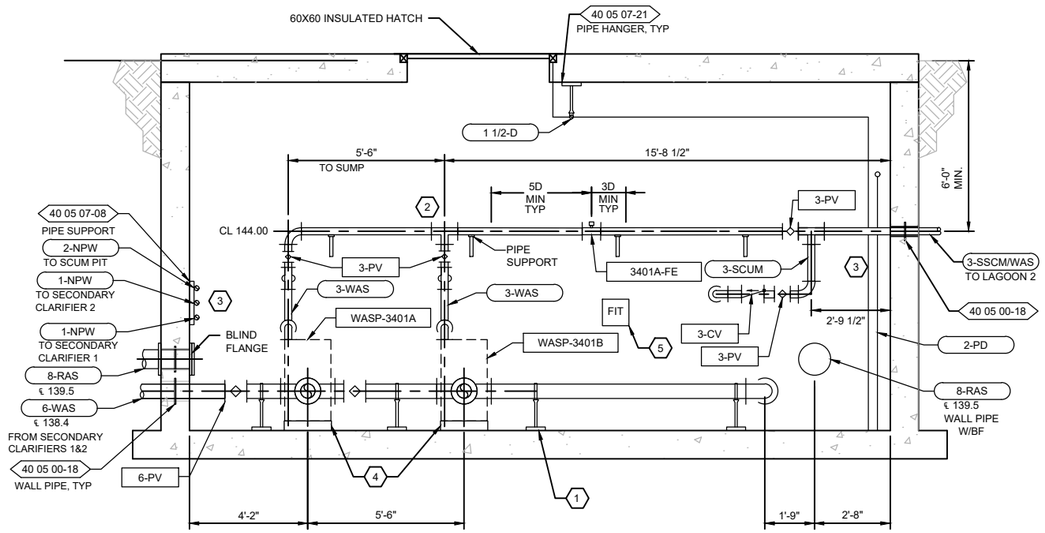
Phase 2

WAS PUMP STATION
PROCESS
PLANS

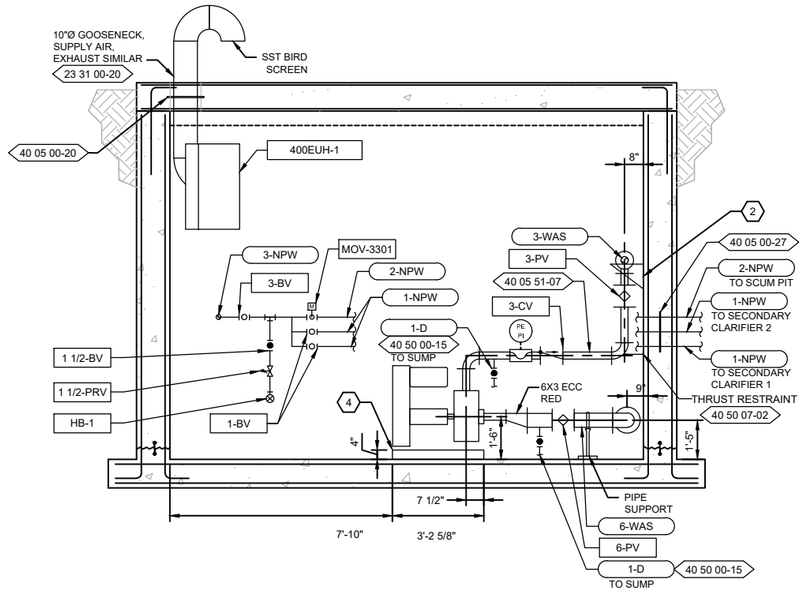
0 1" 2"

FILENAME 400D101.dwg
SCALE 3/8" = 1'-0"

SHEET **400D101**



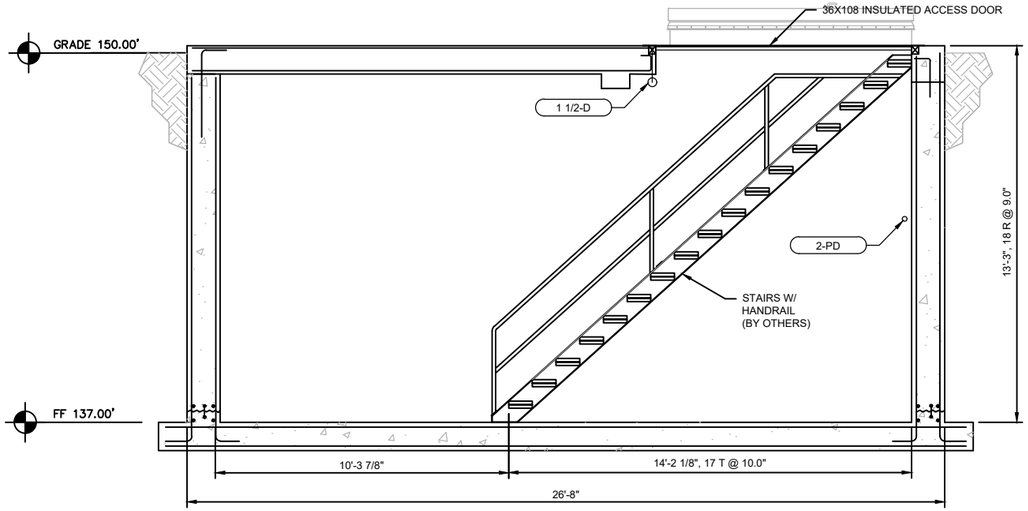
A 400D301 SECTION
3/8" = 1'-0"



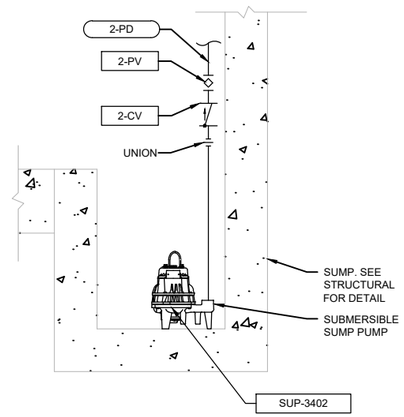
B 400D301 SECTION
3/8" = 1'-0"

KEY NOTES: (X)

1. PIPE SUPPORTS PER 40 05 07-18 SPACED PER SPECIFICATION 40 05 07. TYPICAL.
2. PIPE SUPPORTS PER 40 05 07-05 SPACED PER SPECIFICATION 40 05 07. TYPICAL.
3. PIPE SUPPORTS PER 40 05 07-13 SPACED PER SPECIFICATION 40 05 07. TYPICAL.
4. EQUIPMENT PAD. SEE STANDARD DETAIL 01 61 03-12.
5. MOUNT FIT PANEL 4'-6" AFF.



C 400D301 SECTION
3/8" = 1'-0"



1 400D101 SUMP PUMP DETAIL
NTS

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CIVIL	R. MOYERS
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ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

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JONATHAN RYAN MOYERS
No. CE-12718
REGISTERED PROFESSIONAL ENGINEER

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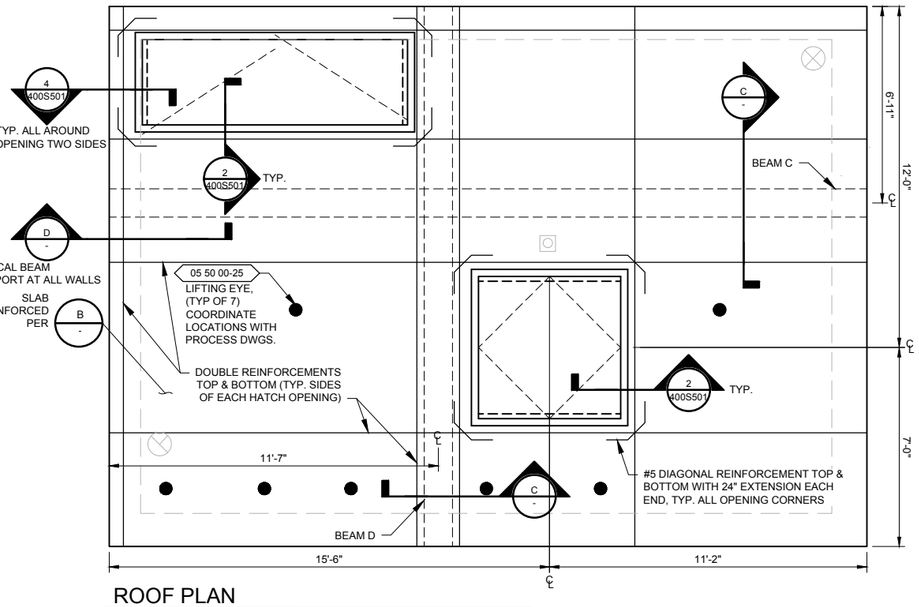
WAS PUMP STATION
PROCESS
SECTIONS

0 1" 2"

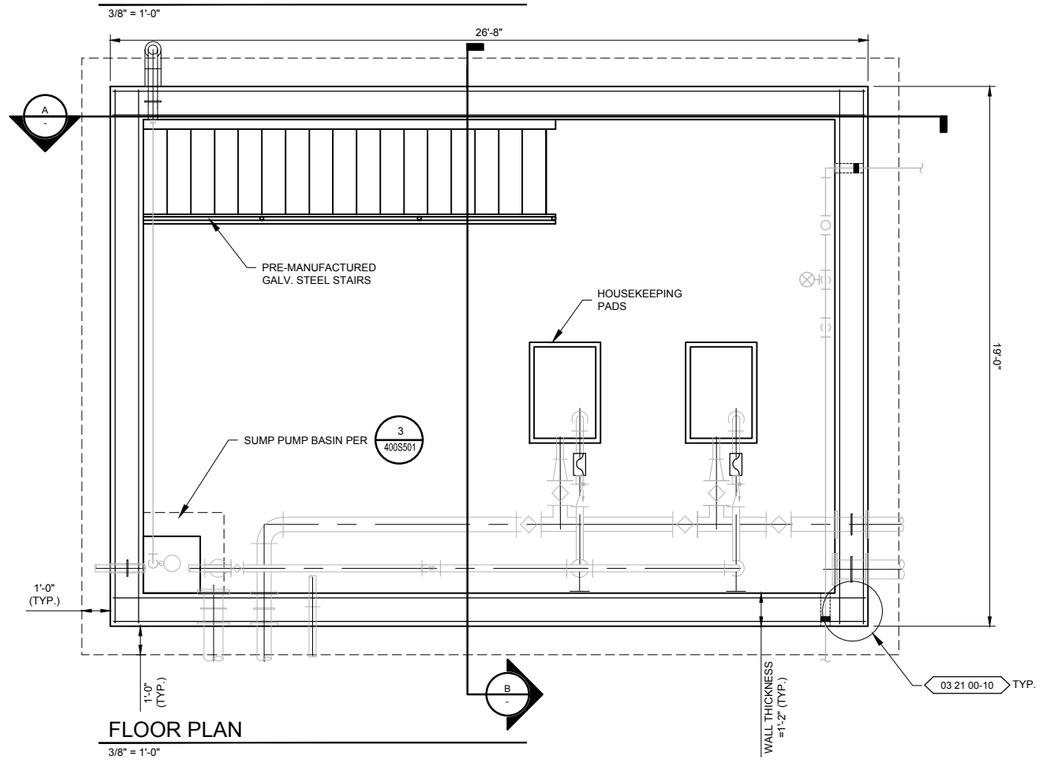
FILENAME 400D301.dwg
SCALE AS NOTED

SHEET
400D301



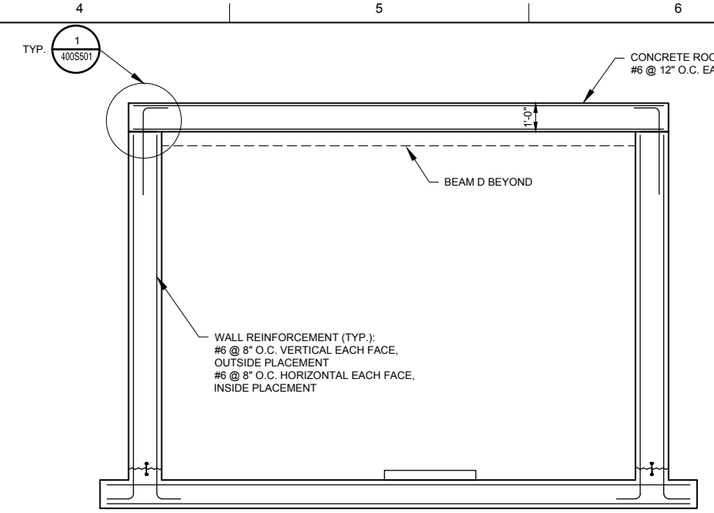
ROOF PLAN

3/8" = 1'-0"



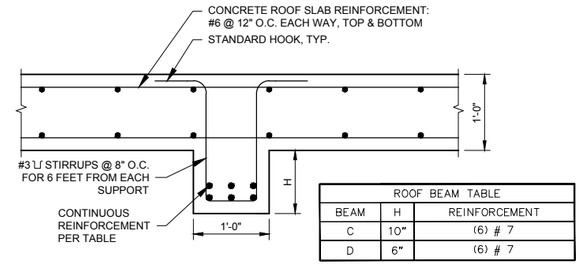
FLOOR PLAN

3/8" = 1'-0"

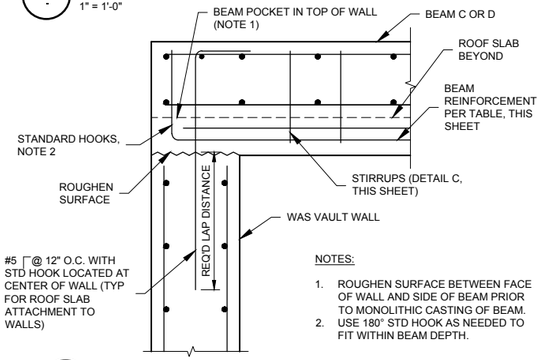


B SECTION

3/8" = 1'-0"



ROOF BEAM TABLE		
BEAM	H	REINFORCEMENT
C	10"	(6) # 7
D	6"	(6) # 7

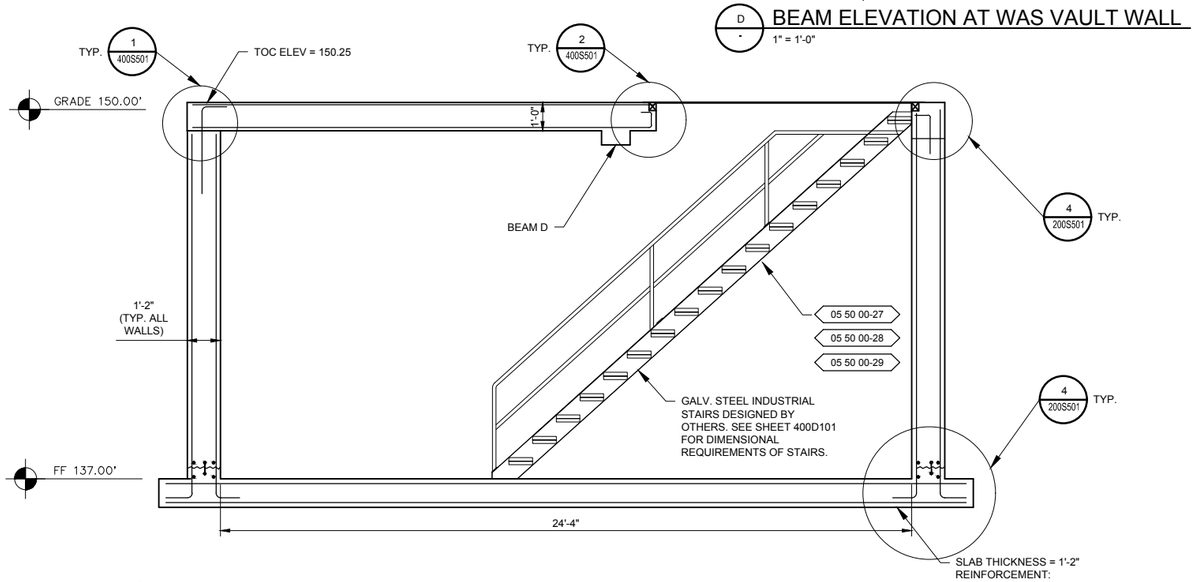


WAS VAULT BEAM CROSS SECTION

1" = 1'-0"

NOTES:

1. ROUGHEN SURFACE BETWEEN FACE OF WALL AND SIDE OF BEAM PRIOR TO MONOLITHIC CASTING OF BEAM.
2. USE 180° STD HOOK AS NEEDED TO FIT WITHIN BEAM DEPTH.



BEAM ELEVATION AT WAS VAULT WALL

1" = 1'-0"

A SECTION

3/8" = 1'-0"

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STATE OF ALASKA 49 TH — Jon H. Hermon SE-14161 05/27/21 REGISTERED STRUCTURAL ENGINEER

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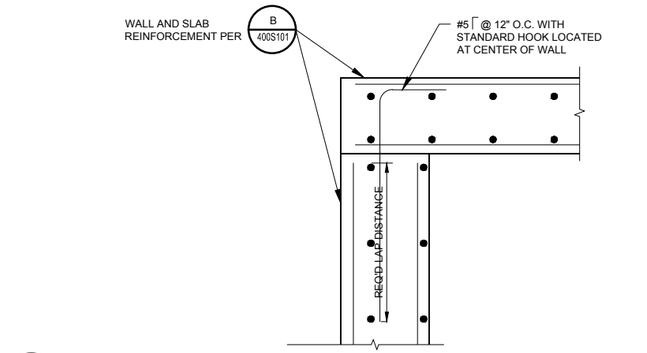
WAS PUMP STATION STRUCTURAL PLANS & SECTIONS

0 1" 2"

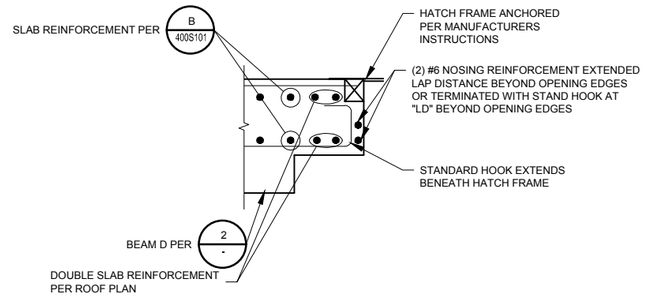
FILENAME 400S101.dwg

SCALE AS NOTED

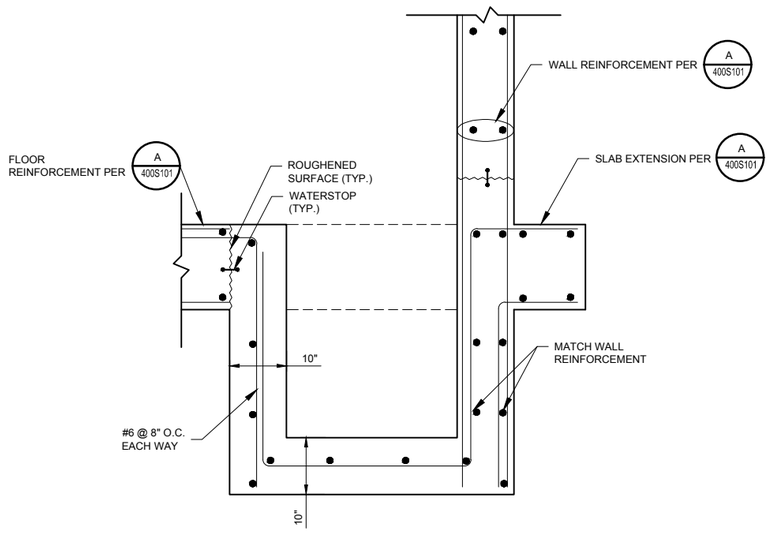
SHEET **400S101**



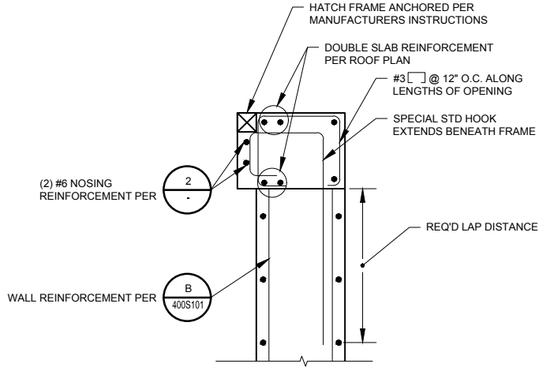
1 - ROOF SLAB AT WALL
1" = 1'-0"



2 - ROOF SLAB AT HATCH FRAME
1" = 1'-0"



3 - SUMP PUMP BASIN SECTION
1/2" = 1'-0"



4 - ROOF SLAB AT HATCH FRAME NEXT TO WALL
1" = 1'-0"

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STATE OF ALASKA
49 TH
Jon H. Hermon
SE-14161
05/27/21
REGISTERED STRUCTURAL ENGINEER

CITY OF PALMER
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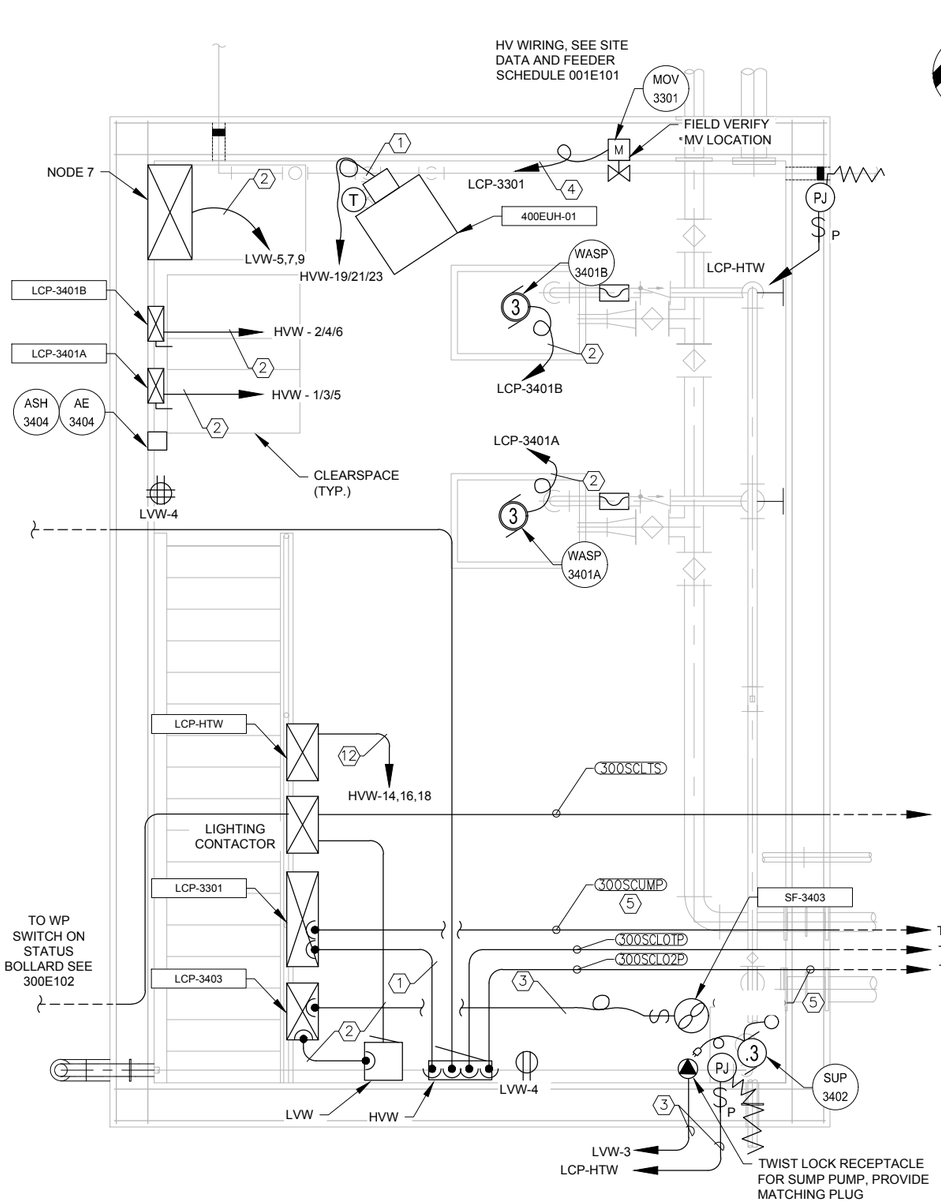
Improvements Project
Phase 2

WAS PUMP STATION STRUCTURAL DETAILS

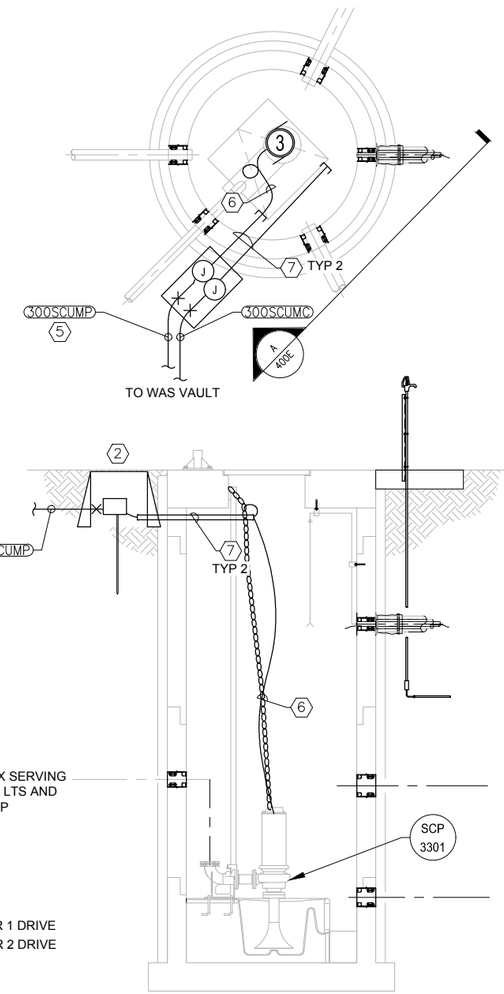
0 1" 2"

FILENAME 400S501.dwg
SCALE AS NOTED

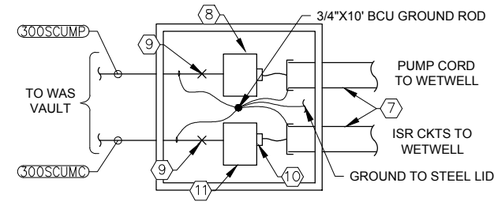
SHEET
400S501



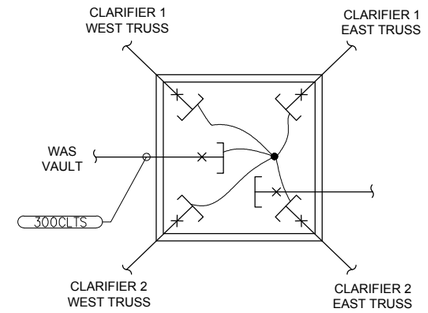
WAS PUMP STATION ELECTRICAL PLAN
1/2"=1'-0"



A 400E CLARIFIER SCUM PIT ELECTRICAL SECTION
3/8"=1'-0"



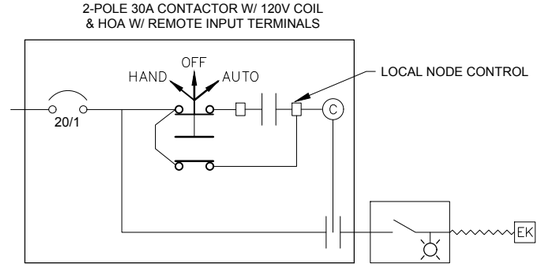
SCUM PIT JUNCTION BOX DETAIL
NTS



LIGHTING/RECEPTACLE JUNCTION BOX DETAIL (TYP 2)
NTS

KEY NOTES (#)

1. 3/4"C, 4#10 (3H, G)
2. 3/4"C, 4#10
3. 3/4"C, 4#12 (H, N, G)
4. 1"C, 7#14 (H, N, G, SIGNALS AS REQUIRED)
5. SEE SCHEDULE ON 001E100
6. PUMP CORD. SECURE AT CONDUIT CHASE WITH RE-ENTERABLE SS STRAIN RELIEF BALE AT WETWELL. PROVIDE CORD GRIP(S) AT J-BOX.
7. 2" PVC COATED RIGID STEEL CHASE WITH BUSHED ENDS. SUPPORT FROM WETWELL CAP USING GALVANIZED STRUT.
8. NEMA 7 RATED SPLICE BOX WITH TERMINAL LUGS (8) FOR PUMP CABLE(S).
9. PROVIDE SEALOFF FITTING
10. TRANSDUCER CABLE IS PART OF UNIT AND IS OPERATED ON INTRINSICALLY SAFE CIRCUIT. PROVIDE CORD GRIP.
11. NEMA 4X SPLICE ENCLOSURE FOR TRANSITION. COORDINATE WITH PUMP SUPPLIER APPROVED SHOP DRAWINGS. IF SEPARATE MOTOR/LEVEL SENSOR CORDS ARE SERVED ON INTRINSICALLY SAFE CIRCUITS, ROUTE SIGNALS VIA THIS SPLICE BOX.
12. 3/4"C, 7#10



HTW CONTROL PANEL ONE LINE
NTS

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A	JUNE 2021	ISSUED FOR BID

PROJECT MANAGER	J. RYAN MOYERS
CIVIL	R. MOYERS
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MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

CRW ENGINEERING GROUP, LLC

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WAS PUMP STATION / SCUM PIT ELECTRICAL PLAN

0 1" 2"

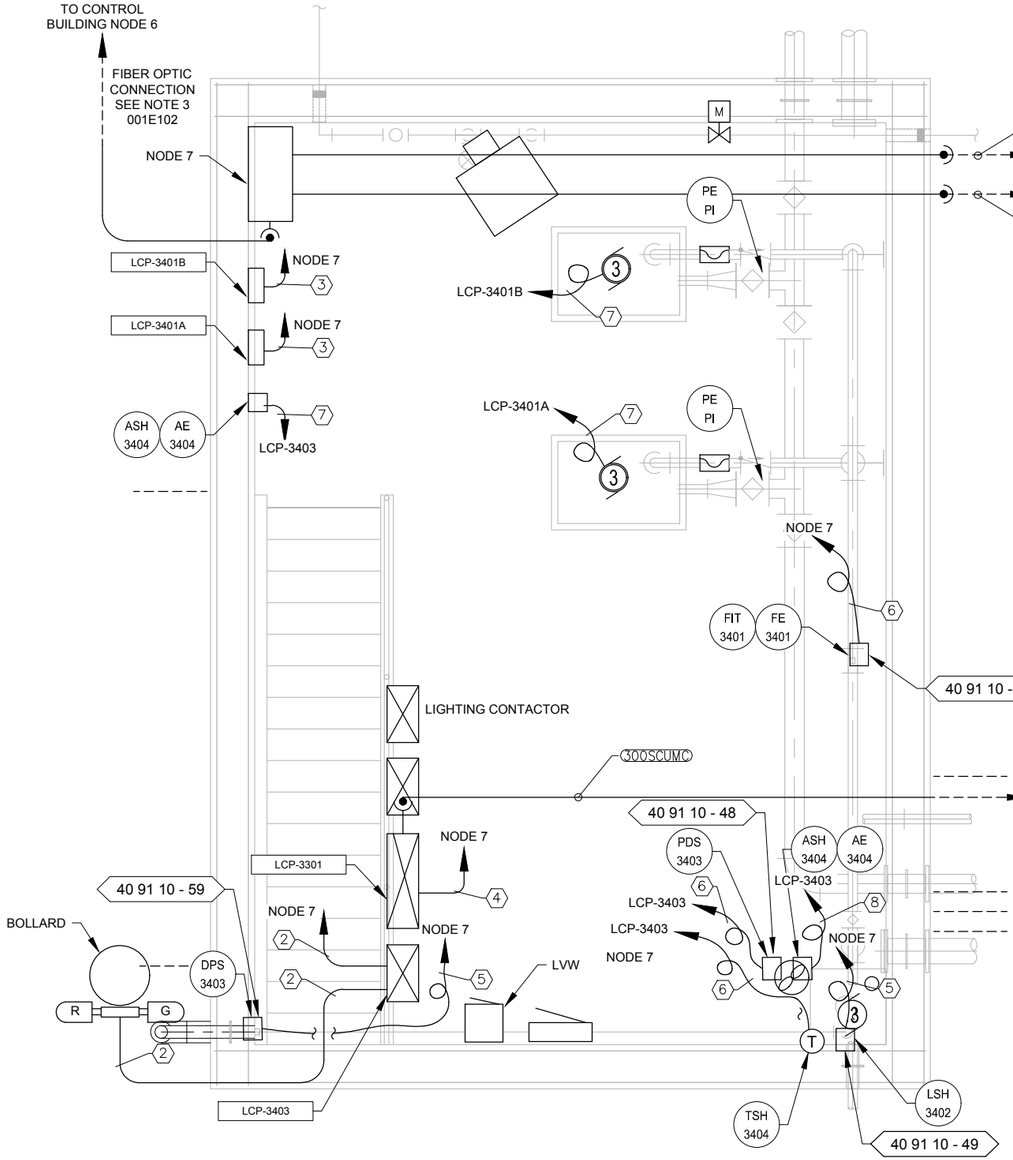
FILENAME 400E101.dwg
SCALE AS NOTED

SHEET **400E101**

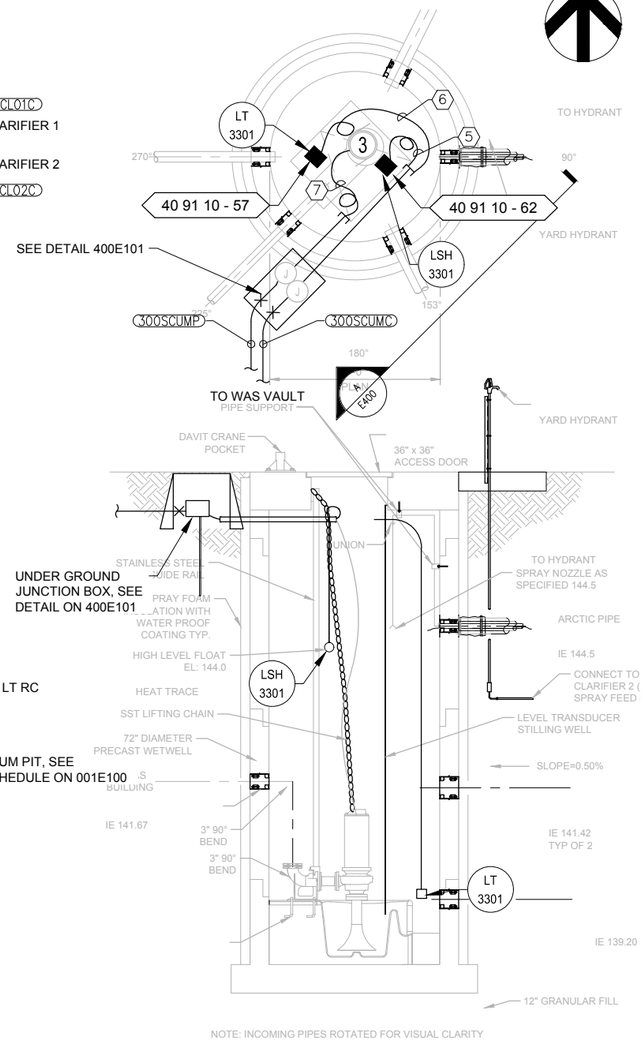
KEY NOTES (#)

1. 3/4"C, 7#14 (6 SIGNAL, G)
2. 3/4"C, 4#12 (N, G, GO, NO-GO)
3. 3/4"C, 5#14 (4 SIGNAL, G)
4. 3/4"C, 6#14 (5 SIGNAL, G)
5. 3/4"C, 2#14 (SIGNAL, G)
6. 3/4"C, 1#18TSP
7. 3/4"C, 4#14 (3 MOTOR SIGNAL, G)
8. 3/4"C, 1#18TSP, 2#14 (DC POWER)
9. SEE TABLE ON 001E100
10. GO-(G), NOGO-(R) - GREEN EDWARDS 105XBRMG120A, RED EDWARDS 105XBRMR120A OR APPROVED EQUAL

GO/NO-GO ELEVATION



WAS PUMP STATION INSTRUMENTATION PLAN
1/2"=1'-0"



A/– CLARIFIER SCUM PIT INSTRUMENTATION SECTION
3/8"=1'-0"

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WAS PUMP STATION / SCUM PIT INSTRUMENTATION PLAN

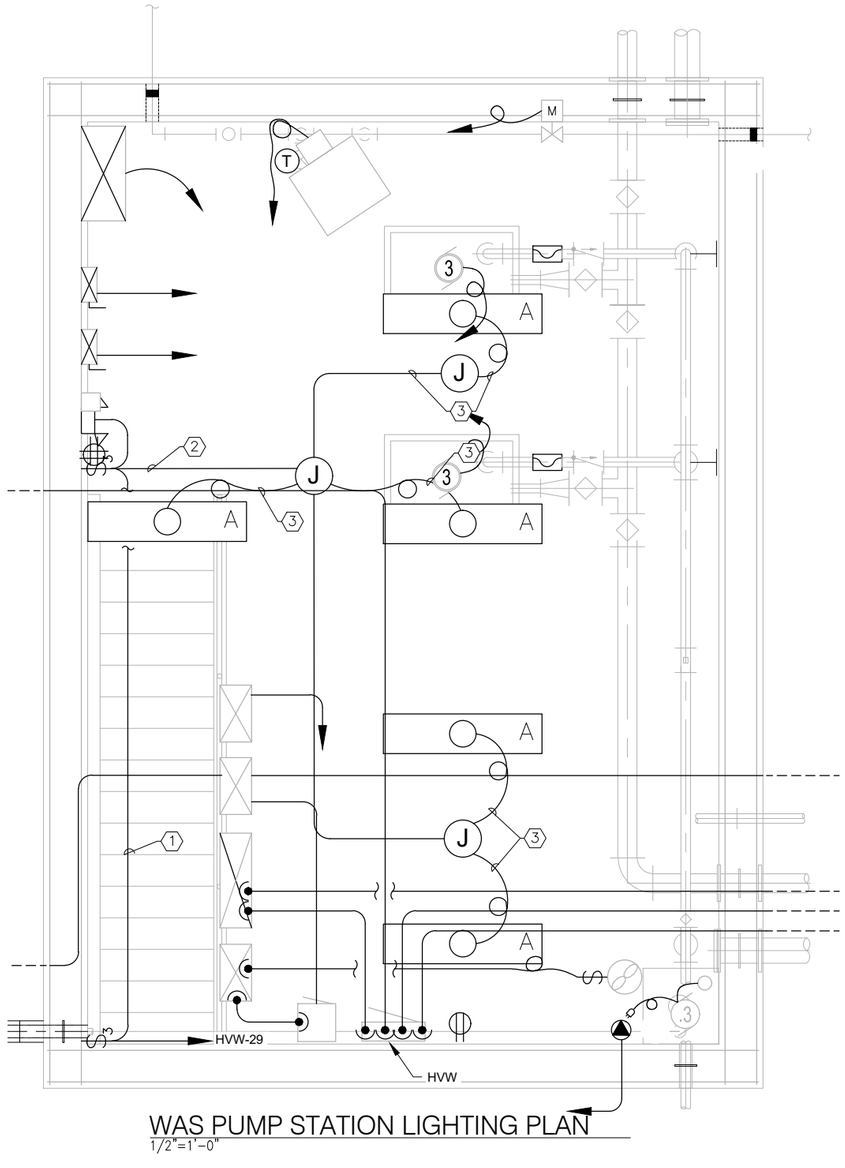
0 1" 2"

FILENAME 400E102.dwg
SCALE AS NOTED

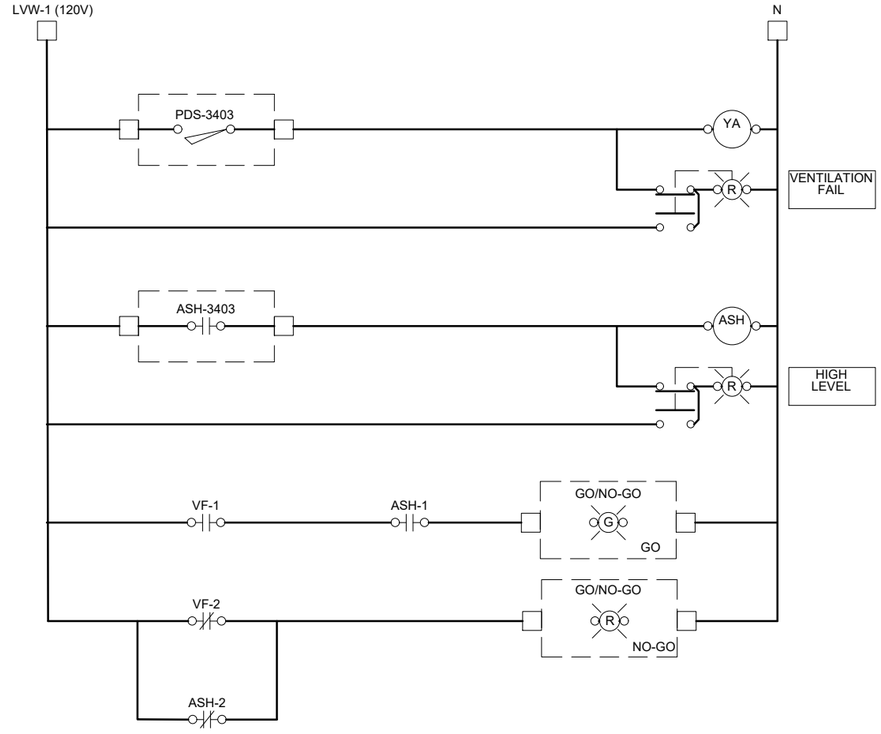
SHEET **400E102**

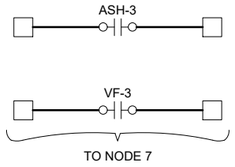
KEY NOTES (#)

1. 3/4"C, 5#12 (H, N, 2 TRAVELER, G)
2. 3/4"C, 4#12 (H, N, SWITCHLEG, G)
3. 3/4"C, 3#12 (N, SWITCHLEG, G)



WAS PUMP STATION LIGHTING PLAN
1/2"=1'-0"





GO/NO-GO SCHEMATIC

RELAY: 3PDT CONTACTS, 120V COIL, DIN RAIL BASE
LIGHTS: 120V, LED, FULL SIZE (30MM)
ENCLOSURE: NON-METALLIC, HINGE DOOR, NEMA 4X, V/L LISTED, CONFORM TO NEPA 78A

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WAS PUMP STATION / SCUM PIT LIGHTING PLAN

0 1" 2"

FILENAME 400E103.dwg
SCALE AS NOTED

SHEET
400E103

PANEL HV SCHEDULE

PANEL HV			480Y277V				3–Phase, 4 Wire		225A MAINS	
CONTROL BLDG: ELECTRIC ROOM			MLO				SURF/NEMA 12		42,000 AIC	
POLE	AMP TRIP	LOAD DESCRIPTION	POLE kVA	A PHASE	B PHASE	C PHASE	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE
1			5.5	8.0			2.5			2
3	25/3	ELECTRIC ROOM HEATER	5.5		8.0		2.5	CAUSTIC 500EUH–05 (7.5kW)	15/3	4
5			5.5			8.0	2.5			6
7			1.0	2.5			1.5	CONTROL BUILDING INTERIOR LTS	20/1	8
9	15/3	ROOFTOP EF (3/4 HP)	1.0		2.0		1.0	CONTROL BUILDING INTERIOR LTS	20/1	10
11			1.0			2.0	1.0	CONTROL BUILDING INTERIOR LTS	20/1	12
13			1.7	1.7						14
15	15/3	DE–WATER PUMP (10HP)	1.7		1.7					16
17			1.7			1.7				18
19				0.0						20
21	15/3	POLYMER SKID (3X2HP)			0.0					22
23						0.0				24
25	100/2	MBBR LCP POWER / LIGHTING PANEL LVM	8.2	8.2						26
27			7.0		7.0					28
29			4.2			4.2				30
31	30/3	HYDROPNEUMATIC SKID (2X5HP)	4.2	4.2						32
33			4.2		4.2					34
35						0.2	0.2	CHEM RISERS HEAT TAPE	20/1*	36
37				4.8			4.8	WAS WATER LINE HEAT TAPE	40/1*	38
39					2.4		2.4	SPLITTER VAULT WATER LINE HEAT TAPE	30/1*	40
41						2.3	2.3	MBBR SPRAY WATER LINES HEAT TAPE	20/1*	42
			29.4	25.3	18.4					

* = Class B Equipment protection ground fault 30mA

TOTAL kVA = 73.1
AMPS = 88.0

PANEL LV2 SCHEDULE

PANEL LV2			208Y120V				3–Phase, 4 Wire		400A MAINS	
CONTROL BLDG: ELECTRIC ROOM			MLO/MCB				SURF/NEMA		10,000 AIC	
POLE	AMP TRIP	LOAD DESCRIPTION	POLE kVA	A PHASE	B PHASE	C PHASE	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE
1			2.2	3.2			1.0	POLYMER BLENDING	20/1	2
3	15/3	STRAINER SKID	2.2		2.3		0.1	CAUSTIC MTRING PUMP 1	15/1	4
5			2.2			2.3	0.1	CAUSTIC MTRING PUMP 2	15/1	6
7	20/1	FUME HOOD 120V CKTS	1.5	1.7			0.2	CAUSTIC WATER SV	15/1	8
9	15/1	FUME HOOD LTS	0.5		0.6		0.1	DEFOAMING AGENT #1	15/1	10
11	20/2	FUME HOOD 208V CKTS	1.0			1.1	0.1	DEFOAMING AGENT #2	15/1	12
13			1.0	1.2			0.2	FIT 4305	15/1	14
15	20/1	FUME HOOD FAN	1.0		1.0		0.0	Node 6 Power	15/1	16
17						0.0	0.0	Node 6 Power	15/1	18
19				0.0					15/2	20
21					0.0				15/2	22
23						0.0			15/2	24
25				0.0					15/2	26
27					0.0				15/2	28
29						0.0			15/3	30
31	20/1	GENERATOR HEATER	0.5	0.5					15/3	32
33	20/1	GENERATOR CHARGER	0.5		0.5				15/3	34
35	20/1	GENERATOR LOUVER	1.5			1.5			15/3	36
37			2.2	2.2						38
39	30/3	POLYMER DOSING AND MIXER	2.2		2.2					40
41			2.2			2.2				42
				8.8	6.6	7.1				

TOTAL kVA = 22.5
AMPS = 62.5

KEY NOTES: ⟨#⟩

1. PANELS LVW AND HVW ARE LOCATED IN THE WAS VAULT. SEE SHEET 400E101.
2. LV2-PROVIDED NEW CIRCUITS IN POLES 31, 33, 35 SERVING GENERATOR LOADS. CONFIRM POWER REQUIREMENTS WITH APPROVED GENERATOR SHOP DRAWINGS.
3 PANELS HVW AND LVW ARE NEW./

PANEL HVW SCHEDULE

HVW			480Y277V				3–PHASE, 4 WIRE		225A MAINS	
WAS VAULT			125A MCB				SURF/NEMA 4		42,000 AIC	
POLE	AMP TRIP	LOAD DESCRIPTION	POLE kVA	A PHASE	B PHASE	C PHASE	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE
1			1.3	2.6			1.3			2
3	15/3	WAS 3401A (3HP) VIA LCP 3401A	1.3		2.6		1.3	WAS 3401B (3HP) VIA LCP 3401B	15/3	4
5			1.3			2.6	1.3			6
7			1.3	1.6			0.3			8
9	15/3	SCP 3301 (3HP) VIA LCP 3301	1.3		1.6		0.3	Secondary Clarifier 1 Motor (1/2HP) VIA LCP 3201	15/3	10
11			1.3			1.6	0.3			12
13			0.3	0.7			0.4	Clarifier NPW Heat Trace	20/1*	14
15	15/3	Secondary Clarifier 2 Motor (1/2HP) VIA LCP 3202	2.3		1.3		1.0	Sump Drain Heat Trace	30/1*	16
17			0.3			1.3	1.0	SCUM Heat Trace	30/1*	18
19			5.0	5.0						20
21	15/3	400EUH01	5.0		5.0					22
23			5.0			5.0				24
25	20/2	LVW Unit Substation 7.5kVA	4.3	4.3						26
27			4.2		4.2					28
29	20/1	LTS	0.7			0.7				30
				14.2	14.7	11.2				

* = Class B Equipment protetion ground fault 30mA

TOTAL kVA = 40.1
AMPS = 48.3

PANEL LVW SCHEDULE

LVW			120/240VAC			1–PHASE, 3 WIRE		80A MAINS	
WAS VAULT			15kVA Unit Substation			SURF/NEMA 3R SS		10,000 AIC	
POLE	AMP TRIP	LOAD DESCRIPTION	POLE kVA	A PHASE	B PHASE	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE
1	15/1	400EF–01 / LCP 3403	0.7	1.2		0.5	LCP WAS	15/1	2
3	15/1	Sump SUP3402	1.0		1.8	0.8	RCP	15/1*	4
5	20/1	Node 7 Power Circuit 1	1.0	2.0		1.0	CLARIFIER 1 LTS	20/1	6
7	20/1	Node 7 Power Circuit 2	1.0		1.7	0.7	CLARIFIER 1 RCP	20/1	8
9	15/1	Node 7 Heater (100W)	0.1	1.1		1.0	CLARIFIER 2 LTS	20/1	10
11					0.7	0.7	CLARIFIER 2 RCP	20/1	12
				4.3	4.2				

*= GFCI CLASS A

TOTAL kVA = 8.5
AMPS = 35.4

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INSTRUMENTATION	D. BEST
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STATE OF ALASKA 48TH William M. McDonald EE-7879 05/27/21 REGISTERED PROFESSIONAL ENGINEER

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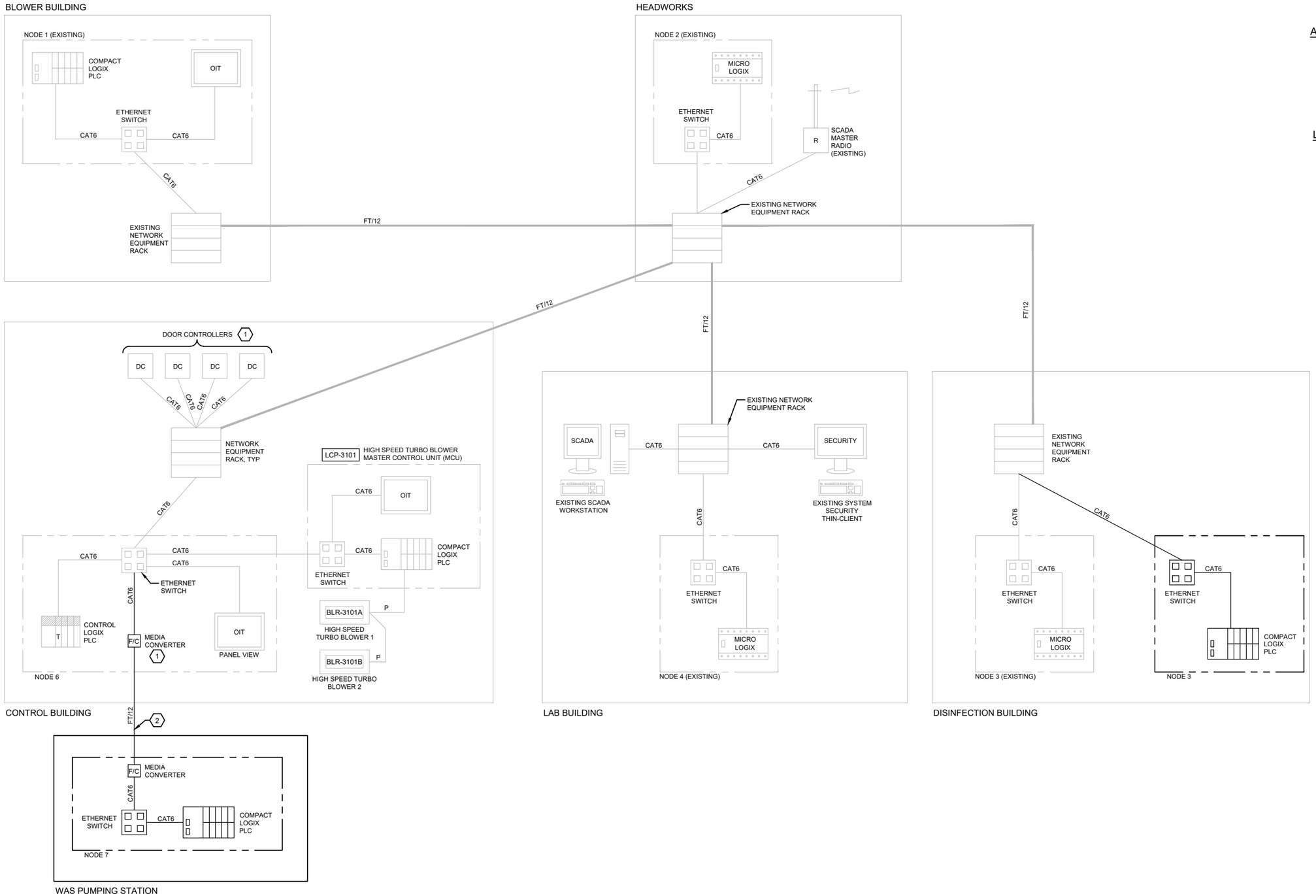
Phase 2

WAS VAULT
PANEL SCHEDULES: HVW & LVW

0 1" 2"

FILENAME 400E601.dwg
SCALE N/A

SHEET
400E601



ABBREVIATIONS:

CAT6	CATEGORY 6 ETHERNET CABLE
FT/12	FIBER OPTIC TRUNK CABLE, 12-STRAND
OIT	OPERATOR INTERFACE TERMINAL
P	PROFIBUS

LEGEND:

PROPOSED

EXISTING

DEMO

KEY NOTES: (X)

1. INSTALL FIBER TO COPPER MEDIA CONVERTOR IN EXISTING PANEL. PROVIDE POWER CONNECTIONS AS REQUIRED. REFERENCE SPEC 40 97 00..
2. TERMINATE FIBER STRANDS WITH LC TYPE CONNECTORS.

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P&ID
CONTROL SYSTEM NETWORK

0 1" 2"

FILENAME 800Y601.dwg

SCALE SCALE

SHEET 800Y601

SCADA LEVEL

PLC LEVEL

FROM PLANT WATER
-

SCREW PUMP
P-1-1

SCREW PUMP
P-1-2

MH4

RS
-

24-RS

12-OF

PD
A 800Y609
DEWATERING PUMP STATION

4-PD

G100

G100

AUGER
M-2-1-2

SV-2-1
S

LS-2-1
LSH

M

GRINDER
M-2-1-1

HOPPER

AUGER
M-2-2-2

SV-2-2
S

LS-2-2
LSH

M

GRINDER
M-2-1-2

HOPPER

FUTURE GRIT

24-PLI

PLI
A 800Y604
TO MBBR BASINS INFLUENT CHANNEL

MH6A

LAGOON NO. 1

MH8

MH15

MH7

G-5103

G-5104

G-5101

24-ML

G-5102

LAGOON 2

MH9
LAGOON 3

PLI
B 800Y604
TO MBBR BASINS INFLUENT CHANNEL

24-ML

ML
B 800Y604
FROM MBBR EFFLUENT CHANNEL

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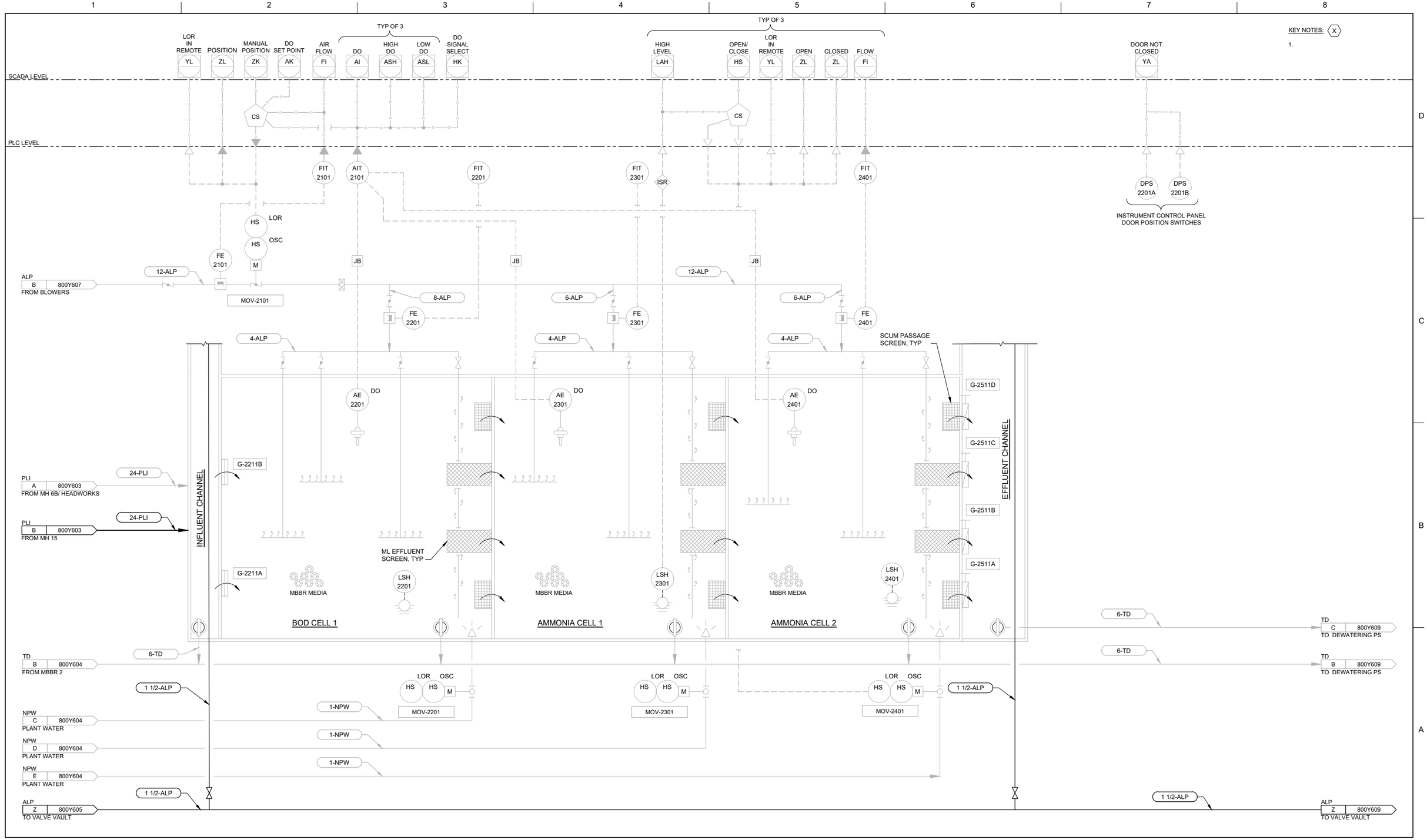
P&ID
HEADWORKS

0 1" 2"

FILENAME 800Y603.dwg
SCALE SCALE

SHEET
800Y603



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P&ID
MBBR BASIN - II

0 1" 2"

FILENAME 800Y605.dwg
SCALE SCALE

SHEET
800Y605

KEY NOTES: (X)

1. TWO TORQUE SWITCHES. HIGH TORQUE AT 100% TORQUE, HIGH - HIGH TORQUE AT 120%.

SCADA LEVEL

PLC LEVEL

TYP OF 2

RUN STATUS YL | FAULT YA | HIGH TORQUE YA | HIGH-HIGH TORQUE YA

LCP-3201

MFR SUPPLIED CONTROL PANEL TYP OF 2

TORQUE WARNING YA | TORQUE ALARM YA | RUNNING YL

HS SS | QI ETM | HS RESET

1/2-SPARE

SPARE G 800Y604 TO MBBR DROP BOX

NPW M 800Y608 FROM CONTROL BUILDING

1-NPW

NPW L 800Y608 FROM CONTROL BUILDING

1-NPW

1-NPW

TQS (1)

M MOV-3201

POS A 800Y611 FROM POLYMER FEED

1-POS

SECONDARY CLARIFIER 1

SCD-3201

6-SCUM

SCUM C 800Y608 TO SCUM PUMP STATION

24-SE

8-RAS

RAS E 800Y608 TO WAS PUMP STATION

24-SI

6-WAS

WAS A 800Y608 TO WAS PUMP STATION

ML A 800Y604 FROM MBBR 1 & 2

24-ML

D A 800Y608 FROM WAS PUMP STATION

2"-PD

G-2604 G-2601

G-2603 G-2602

SECONDARY DISTRIBUTION BOX

TQS (1)

M MOV-3202

SECONDARY CLARIFIER 2

SCD-3202

24-SE

6-SCUM

SCUM D 800Y608 TO SCUM PUMP STATION

8-RAS

RAS F 800Y608 TO WAS PUMP STATION

24-SI

6-WAS

WAS B 800Y608 TO WAS PUMP STATION

24-ML

1 1/2-ALP

FROM EXISTING LAB

24-SE

MH 16

SE H 800Y613 TO UV INFLUENT CHANNEL

24-SE

SE J 800Y613 TO UV INFLUENT CHANNEL

ALP Y 800Y609 FROM VALVE VAULT

1 1/2-ALP

LAGOON NO. 2

MH 10

24-SE

LAGOON NO. 3

8-OF

OF A 800Y609 TO DEWATERING PUMP STATION

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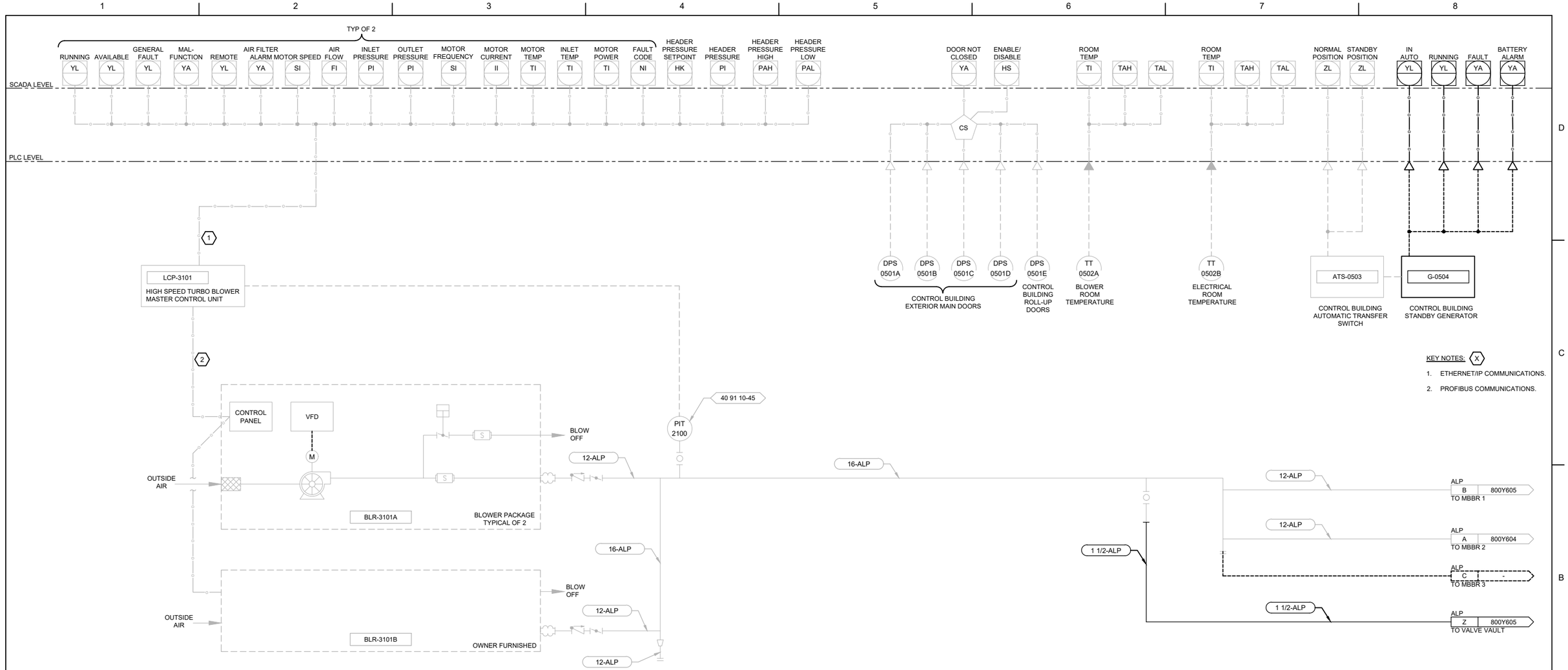
P&ID
SECONDARY CLARIFIERS

0 1" 2"

FILENAME 800Y606.dwg

SCALE SCALE

SHEET 800Y606



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MECHANICAL	T. CARSON
ELECTRICAL	B. McDONALD
INSTRUMENTATION	D. BEST
PROJECT NUMBER	200435 -...0249258

STATE OF ALASKA 49TH DONALD E. BEST No. 117622 REGISTERED PROFESSIONAL ENGINEER
05/27/2021

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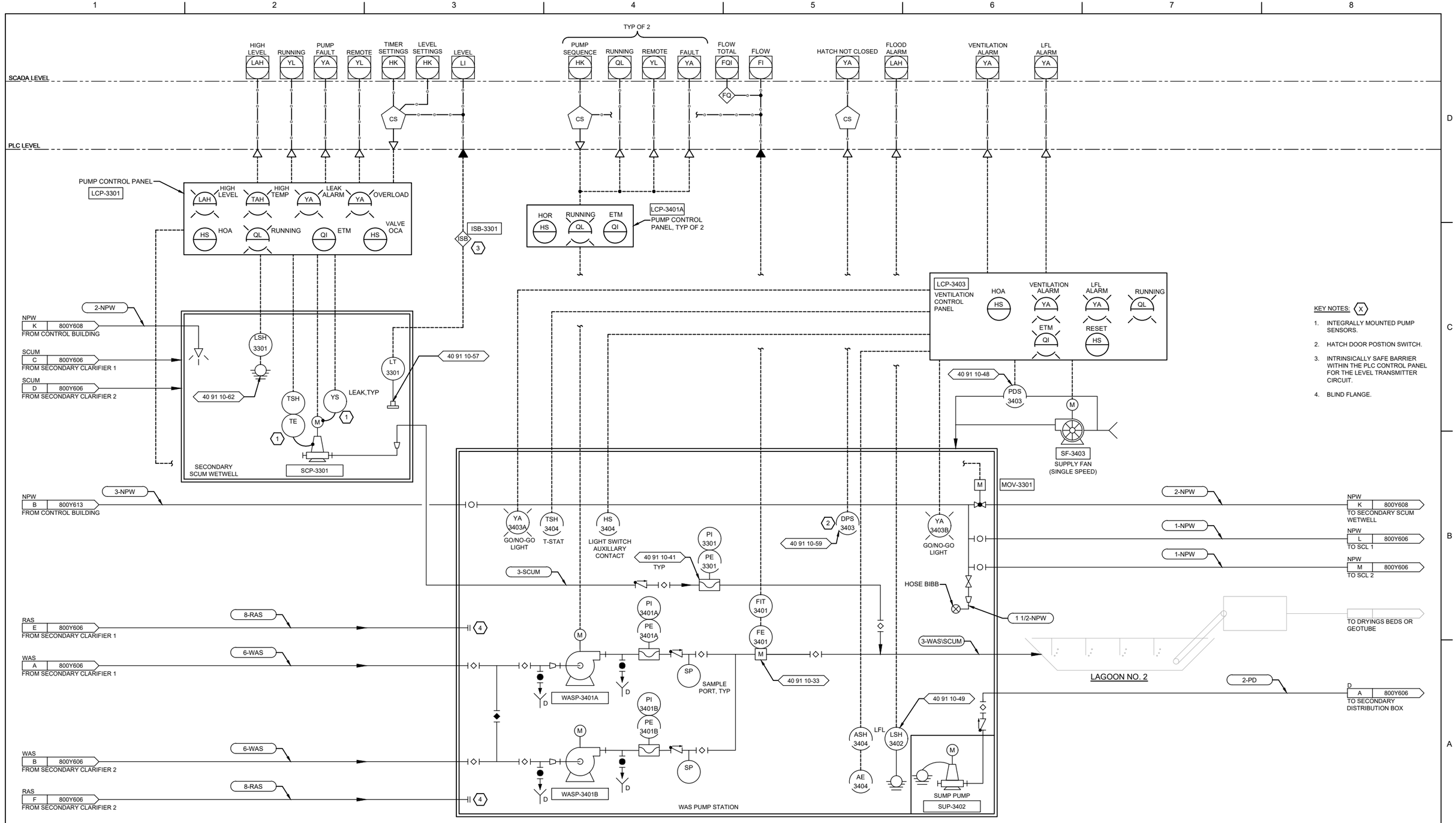
Improvements Project
Phase 2

P&ID
BLOWERS

0 1" 2"

FILENAME 800Y607.dwg
SCALE SCALE

SHEET
800Y607



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No. 117622
REGISTERED PROFESSIONAL ENGINEER
05/27/2021

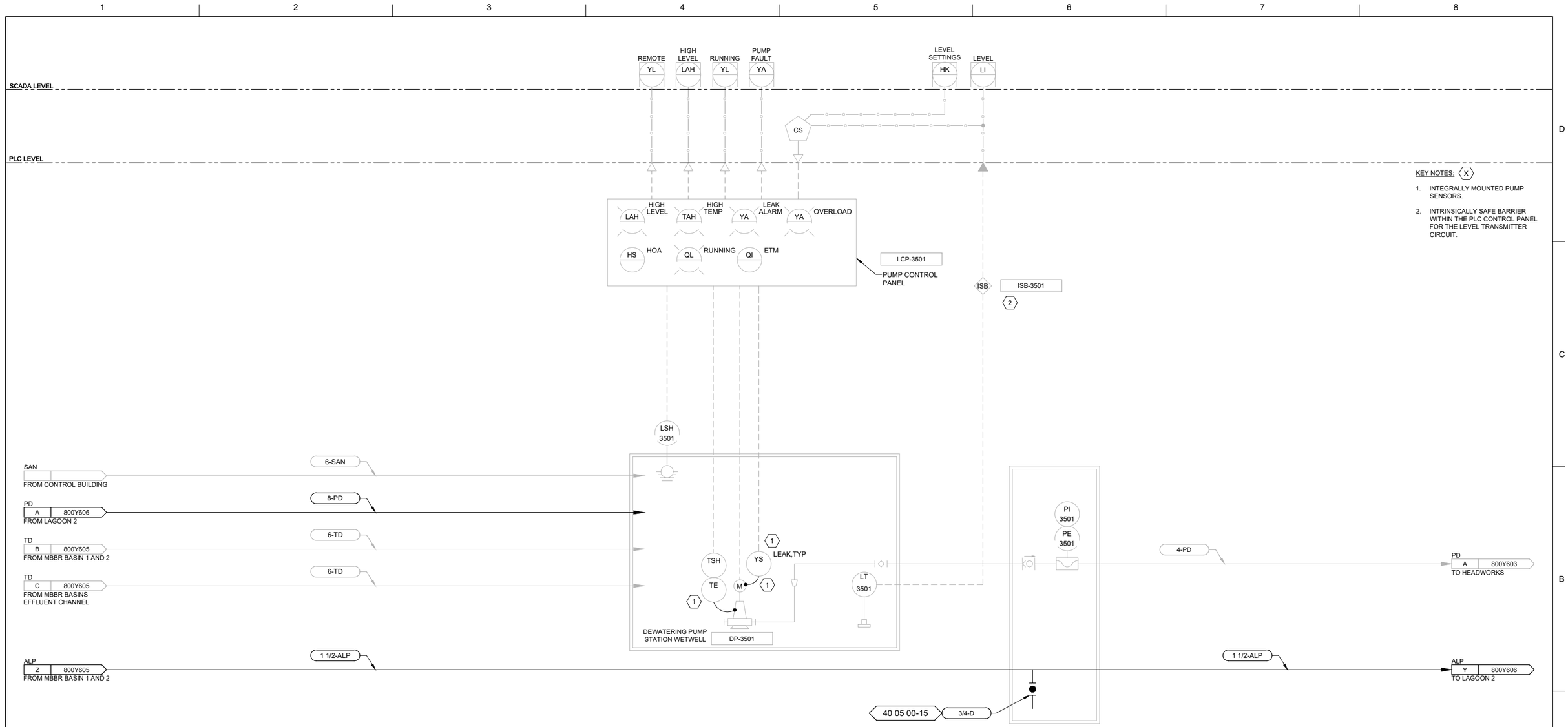
City of Palmer
WWTF
Improvements Project
Phase 2

P&ID
WAS/SCUM PUMP STATION

0 1" 2"

FILENAME 800Y608.dwg
SCALE SCALE

SHEET
800Y608



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City of Palmer
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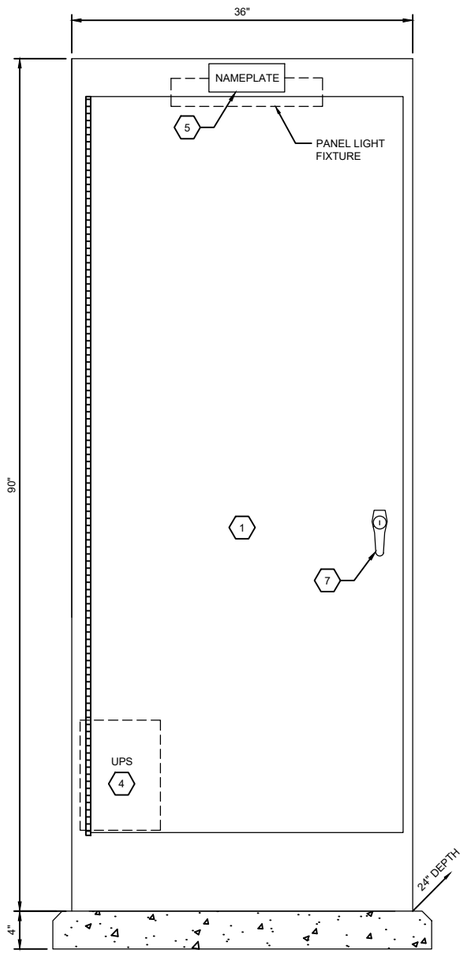
Phase 2

P&ID
DEWATERING PUMP STATION

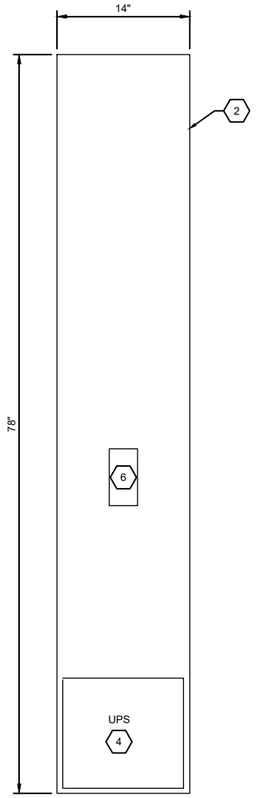
0 1" 2"

FILENAME 800Y609.dwg
SCALE SCALE

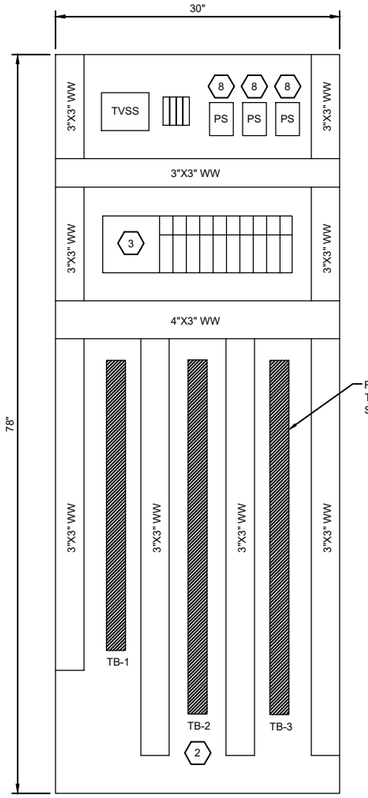
SHEET
800Y609



PANEL FRONT
NO SCALE



INTERIOR LEFT SIDE PANEL
NO SCALE



INTERIOR BACK PANEL
NO SCALE

GENERAL NOTES:

1. CONTROL PANEL FABRICATED ACCORDING TO SPEC 409800.
2. CONTROL AUXILIARIES PER SPEC 409700. NOT ALL REQUIRED COMPONENTS ARE SHOWN ON THIS DRAWING.
3. PANEL POWER DISTRIBUTION REQUIREMENTS AS SHOWN ON THE TYPICAL SCHEMATIC ON SHEET 800Y704.
4. PANEL CONTROL WIRING REQUIREMENTS AS SHOWN ON THE TYPICAL SCHEMATICS ON SHEET 800Y705.
5. SECURE ENCLOSURE TO CONCRETE WITH CONCRETE ANCHORS.
6. PROVIDE CONTROL PANEL WITH DOOR ACTIVATED, LED TYPE LIGHT FIXTURE(S).

KEYNOTES: (#)

1. SINGLE-DOOR, FREE-STANDING, PAINTED STEEL ENCLOSURE, NEMA 4 ENCLOSURE RATING: SAGINAW CONTROL & ENGINEERING (SCE) EL FS ENCLOSURE, OR APPROVED EQUAL.
2. PAINTED STEEL MOUNTING PANEL.
3. PLC HARDWARE PER SPEC 409443.
4. DIN-RAIL MOUNTED UNINTERRUPTIBLE POWER SUPPLY. SEE SPECIFICATION 409700.
5. NAMEPLATE SHALL BE INSCRIBED WITH PANEL TAG NUMBER AND LOCATION.
6. ETHERNET SWITCHES PER SPECIFICATION 409700.
7. DOOR HANDLE WITH 3-POINT LATCH.
8. DUAL REDUNDANT 24VDC POWER SUPPLIES CONNECTED IN PARALLEL USING REDUNDANCY MODULE. POWER SUPPLIES SIZED FOR 1+1 REDUNDANCY.

PLC CONTROL PANELS

TAG NO.	LOCATION
NODE 6	WAS PUMP STATION

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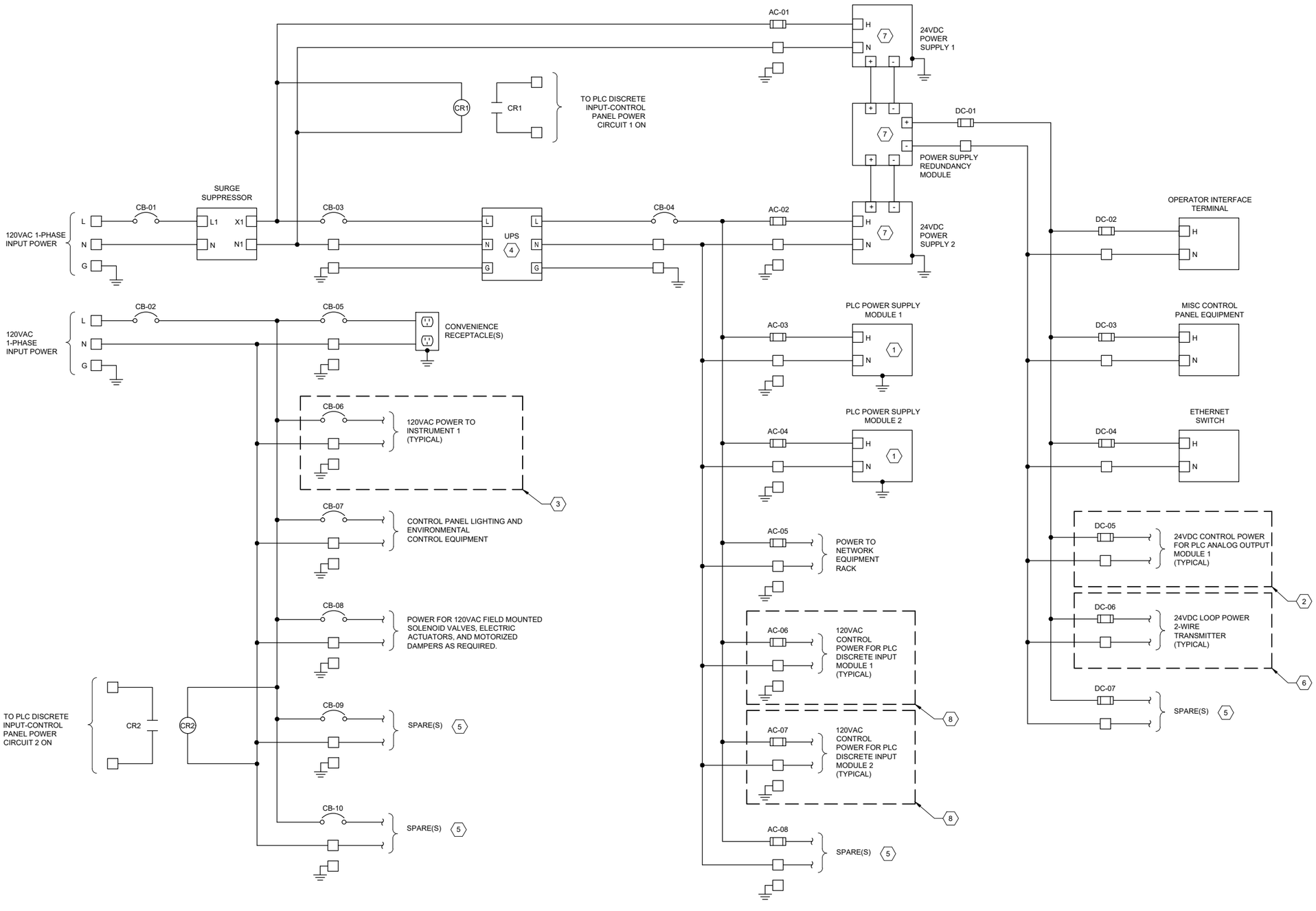
I & C
CONTROL PANELS I

0 1" 2"

FILENAME 800Y701.dwg
SCALE SCALE

SHEET
800Y701



GENERAL NOTES:

1. THIS POWER DISTRIBUTION SCHEMATIC IS TYPICAL AND APPLIES TO THE PLANT PLC CONTROL PANELS INCLUDED IN SPECIFICATION 409800.
2. CONTROL AUXILIARIES PER SPECIFICATION 409700.
3. PROVIDE ADDITIONAL GROUND CONNECTIONS AS REQUIRED.
4. BOND ALL TERMINAL BLOCK RAILS TO PANEL GROUND BUS.
5. CIRCUIT BREAKERS AND FUSES SHALL BE SIZED AS REQUIRED FOR PANEL LOADS AND EQUIPMENT REQUIREMENTS.
6. REFERENCE SPECIFICATION 409110. FOR FIELD INSTRUMENT POWER SUPPLY REQUIREMENTS. FIELD INSTRUMENTS SHALL RECEIVE INPUT POWER FROM ASSOCIATED PLC PANEL AS REQUIRED AND AS SHOWN ON THE ELECTRICAL DRAWINGS.
7. PROVIDE PLC MONITORING OF CONTROL POWER, UPS, DC POWER SUPPLIES AND SURGE SUPPRESSOR. REFER TO PLC INPUT/OUTPUT USAGE TABLE (SPECIFICATION 409443, ATTACHMENT B) FOR SPECIFIC PLC I/O POINTS.

KEYNOTES: (#)

1. TYPICAL FOR EACH PLC POWER SUPPLY MODULE. EACH PLC POWER SUPPLY MODULE SHALL BE INDIVIDUALLY FUSED.
2. TYPICAL FOR EACH PLC ANALOG OUTPUT MODULE. POWER FOR EACH PLC ANALOG OUTPUT MODULE SHALL BE INDIVIDUALLY FUSED.
3. TYPICAL FOR EACH 4-WIRE FIELD INSTRUMENT. EACH 4-WIRE FIELD INSTRUMENT SHALL BE INDIVIDUALLY PROTECTED WITH CIRCUIT BREAKER.
4. DIN-RAIL MOUNTED UNINTERRUPTIBLE POWER SUPPLY. SEE SPECIFICATION 409700.
5. PROVIDE AND INSTALL SPARE CIRCUIT BREAKERS, FUSES AND TERMINAL BLOCKS; 20% SPARES (MINIMUM) OR QUANTITY OF 4 FOR EACH USE, WHICHEVER IS GREATER.
6. TYPICAL FOR EACH 2-WIRE FIELD INSTRUMENT. EACH 2-WIRE FIELD INSTRUMENT SHALL BE INDIVIDUALLY FUSED.
7. HIGH AVAILABILITY POWER SUPPLY SYSTEM WITH 1+1 REDUNDANCY AND REDUNDANCY MODULE.
8. TYPICAL FOR EACH PLC DISCRETE INPUT MODULE. CONTROL POWER FOR EACH PLC DISCRETE INPUT MODULE SHALL BE INDIVIDUALLY FUSED.

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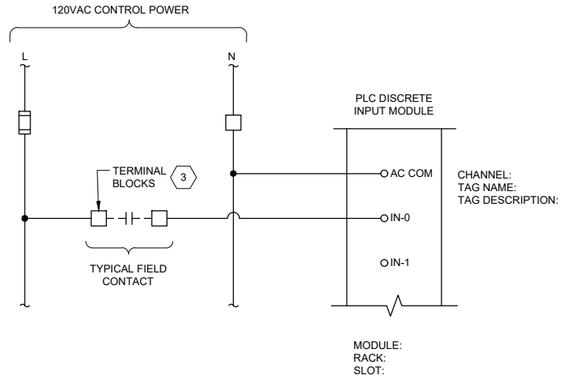
I & C
PLC CONTROL PANEL
TYPICAL POWER DISTRIBUTION SCHEMATIC

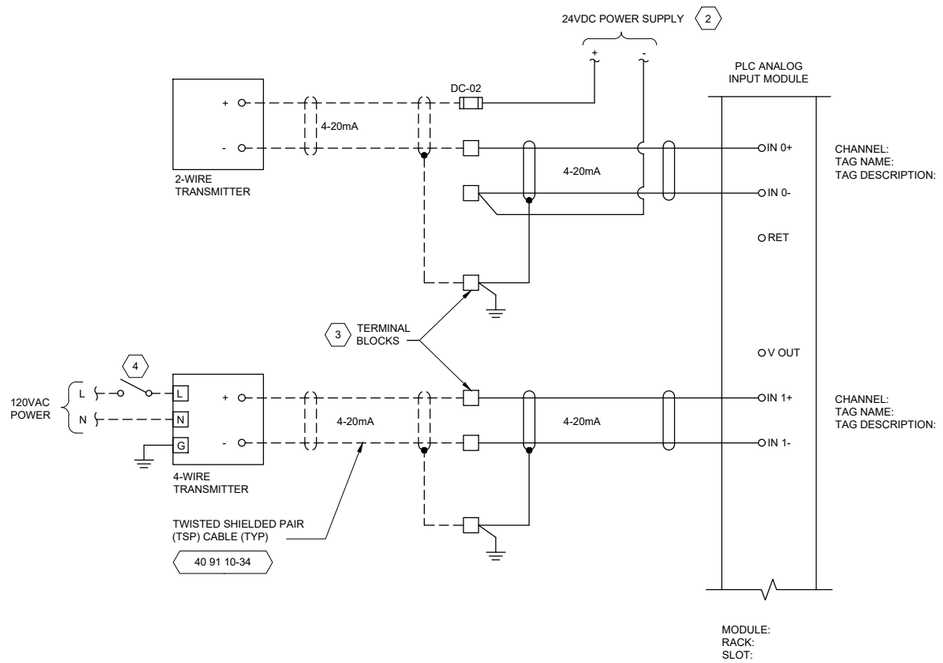
0 1" 2"

FILENAME 800Y704.dwg
SCALE SCALE

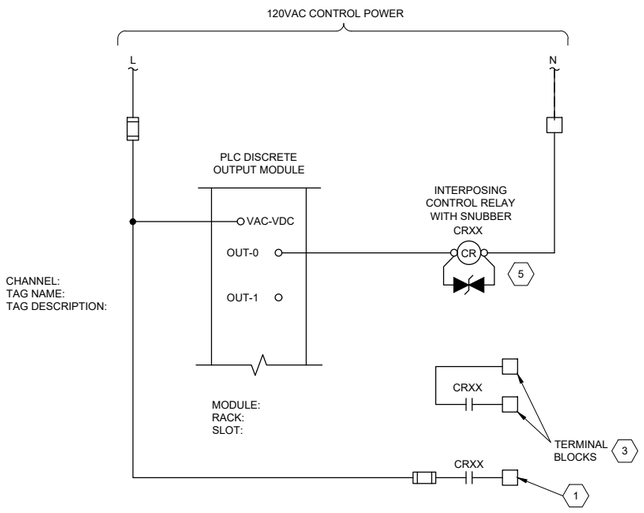
SHEET 800Y704



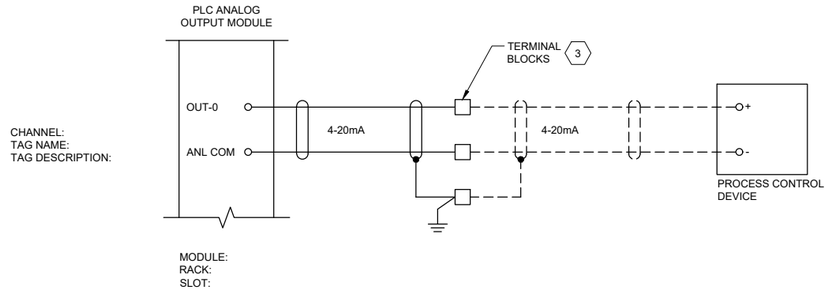
TYPICAL PLC DISCRETE INPUT



TYPICAL PLC ANALOG INPUTS



TYPICAL PLC DISCRETE OUTPUT



TYPICAL PLC ANALOG OUTPUT

GENERAL NOTES:

1. PLC CONTROL PANEL WIRING PER SPECIFICATION 409800.
2. REFER TO PLC INPUT/OUTPUT USAGE TABLE (SPECIFICATION 409443-ATTACHMENT B) FOR SPECIFIC PLC I/O POINTS.
3. INTRINSIC SAFETY RELAYS OR BARRIERS SHALL BE USED AS REQUIRED FOR FIELD INSTRUMENTS OR DEVICES LOCATED IN AREAS CLASSIFIED AS AN EXPLOSION HAZARD. INTRINSIC SAFETY DEVICES SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS. INTRINSICALLY SAFE CIRCUITS SHALL BE INSTALLED AND PHYSICALLY SEPARATED PER THE NEC.

KEYNOTES: (#)

1. VOLTAGE FOR SOLENOID VALVES, ALARM HORNS, AND BEACONS SHALL BE FROM THE PLC CONTROL PANEL.
2. 24VDC SUPPLY IN PANEL. REFER TO SHEET 800Y704.
3. CONTROL PANEL TERMINAL BLOCKS.
4. SINGLE-PHASE, MANUAL SWITCH; SEE DETAIL 409110-35.
5. PROVIDE INTERPOSING CONTROL RELAY FOR EACH PLC DISCRETE OUTPUT, INCLUDING SPARES.

LINE DESIGNATIONS:

- - - - - - FIELD WIRING

——— CONTROL PANEL WIRING

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I & C
PLC CONTROL PANEL
TYPICAL CONTROL WIRING SCHEMATIC

0 1" 2"

FILENAME 800Y705.dwg
SCALE SCALE

SHEET
800Y705