WASHINGTON STATE PARKS & RECREATION COMMISSION

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ALI RAAD — MICHAEL LATIMER

SCOTT MERRIMAN — ALFIE ALVARADO-RAMOS

DIANA DUPUIS, DIRECTOR

APPROVED FOR CONSTRUCTION

Mike E. Wenzel 06/05/2025

REGION MANAGER *date*

Kyle Murphy 6/5/2025

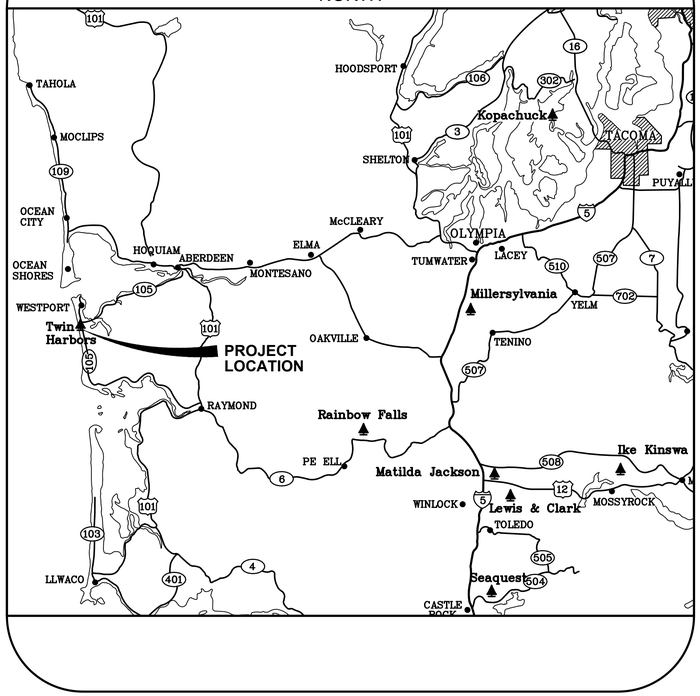
CAPITAL PROGRAM MANAGER *date*

Area Manager: JD NEWMAN

LIFT STATION REPLACEMENT

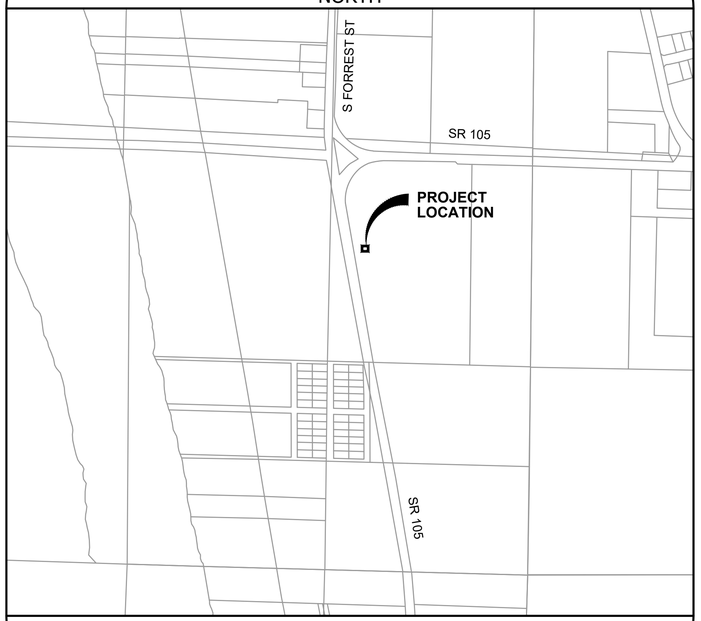
VICINITY MAP

NORTH



PROJECT LOCATION

NORTH



TWIN HARBORS STATE PARK
3110 STATE ROUTE 105, WESTPORT, WA
SEC-24 T-16-N R-12-W
GRAY HARBOR COUNTY TAX PARCEL NUMBER 161224420000

INDEX

PROJECT TEAM

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CAD NO. TEAM.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	TAR	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHEE — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER
4/3/2025
REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

PROJECT TEAM

G-01

SCALE: NONE
AS SHOWN

PARKS FILE# AE 325-036

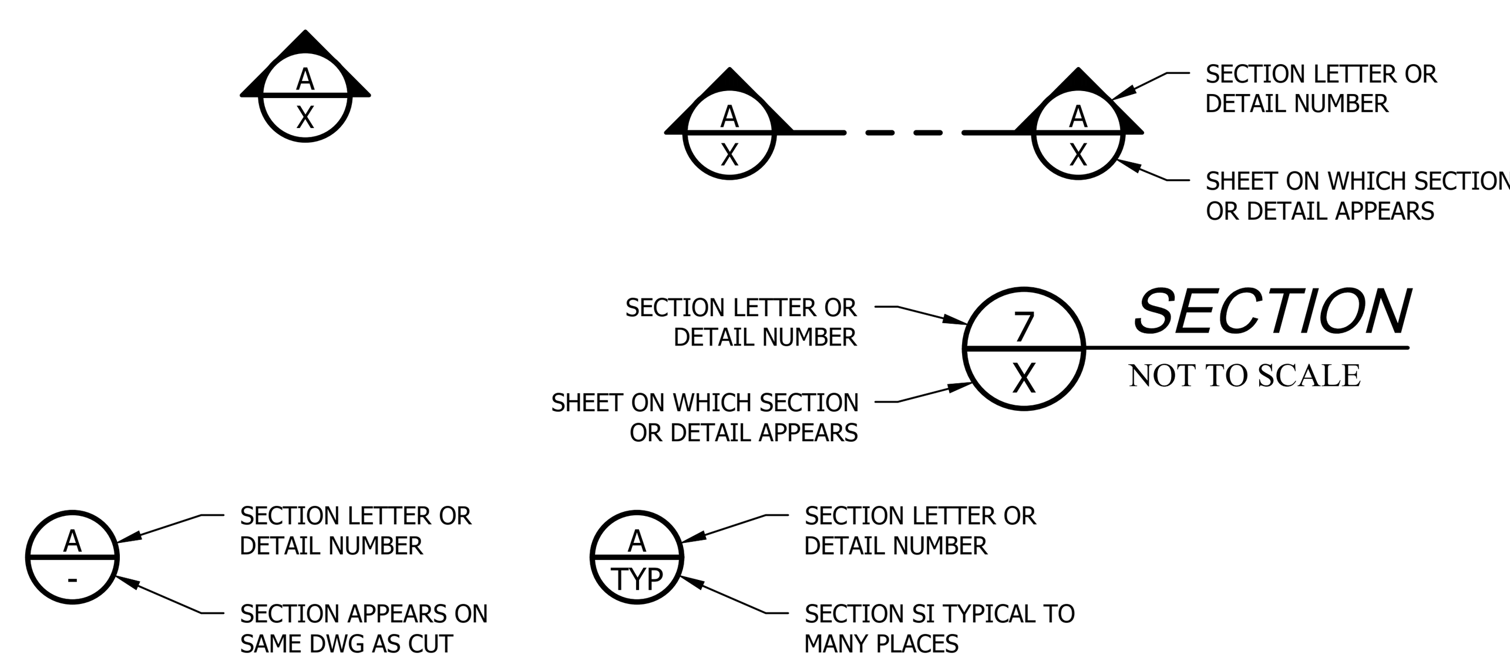
ABBREVIATIONS

AB	ANCHOR BOLT
AC	ASPHALT CONCRETE
ACP	ACOUSTIC PANEL
ADJ	ADJUSTABLE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALTR	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
ASSY	ASSEMBLY
AVE	AVENUE
AWS	AMERICAN WELDING SOCIETY
BFP	BELT FILTER PRESS
BI	BLACK IRON
BLD FLG	BLIND FLANGE
BLDG	BUILDING
BLK	BLOCK
BOD	BOTTOM OF DUCT, BIOCHEMICAL OXYGEN DEMAND
BOW	BOTTOM OF WALL
BTWN	BETWEEN
BVC	BEGIN VERTICAL CURVE
C	CONDUIT
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CL	CLASS
CLAR	CLARIFIER
℄	CENTER LINE
CLR	CLEARANCE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTRACTOR
CONV	CONVEYOR
CPLG	COUPLING
CONTIN	CONTINUED
COP	COPPER
CP	CORNER POST
CTR	CENTER
D	DRAIN
DI	DUCTILE IRON
DIA	DIAMETER
DIR	DIRECTION
DISCH	DISCHARGE
DN	DOWN
DO	DISSOLVED OXYGEN
DP	DIFFERENTIAL PRESSURE
E	EAST
EA	EACH
ECC	ECCENTRIC
EFF	EFFLUENT
EL	ELEVATION
EL	ELBOW
ELEC	ELECTRICAL
EMERG	EMERGENCY
EXIST	EXISTING
EXP	EXPANSION
EW	EACH WAY
EVC	END VERTICAL CURVE
FAB	FABRICATED
FCA	FLANGED COUPLING ADAPTER
FD	FLOOR DRAIN
FIG	FIGURE
FIN	FINISHED
FL	FLANGE
FL	FLOW LINE
FLEX	FLEXIBLE
FLR	FLOOR
FPM	FEET PER MINUTE
FT	FEET
FT^2	SQUARE FEET
FO	FIBER OPTIC
GA	GAUGE
GALV	GALVANIZED
GEN	GENERAL
GI	GALVANIZED IRON
GOVT	GOVERNMENT
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GRD	GRADE
GRV	GROOVED PIPE OR COUPLING
GV	GATE VALVE
GWB	GYPSUM WALL BOARD
H	HEIGHT
HEX	HEXAGONAL
HDG	HOT DIP GALVANIZE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HR	HOUR
HDPE	HIGH DENSITY POLYETHYLENE
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
INF	INFLUENT
INV	INVERT
J BOX	JUNCTION BOX
L	LENGTH
LB	POUND
LB/HR	POUNDS PER HOUR
LF	LINEAR FEET
MAG	MAGNETIC
MAX	MAXIMUM
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MFGR, MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MG/L	MILLIGRAM PER LITER
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MO	MID ORDINATE
N	NORTH
No.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P	POWER
PE	PLAIN END
PERF	PERFORATED
PL	PLATE
PLYWD	PLYWOOD
POT	POTABLE
PRV	PRESSURE REDUCING VALVE
PS	PUMP STATION, PRIMARY SLUDGE, PIPE SUPPORT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
QT	QUARTER
QUAD	QUADRANT
RAS	RETURN ACTIVATED SLUDGE
RD	ROOF DRAIN
RED	REDUCER
REJ	RUBBER EXPANSION JOINT
REINF	REINFORCE
REQD	REQUIRED
RESTL	REINFORCING STEEL
RM	ROOM
RO	ROUGH OPENING
RS	RAW SEWAGE
R/W	RIGHT-OF-WAY
S	SOUTH,
SC	SCUM
SCH	SCHEDULE
SF	SQUARE FEET
SHT	SHEET
SL	SLOPE
SL	SLUDGE
SOC	SOCKET
SP	STATIC PRESSURE
SPECS	SPECIFICATIONS
SQ	SQUARE
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STRG	STRONG
T	TELEMETRY
TAPD	TAPERED
TB	TOP AND BOTTOM
TC	TOP OF CURB
TDH	TOTAL DYNAMIC HEAD
TEL	TELEPHONE
THK	THICK
THRD	THREADED
THRU	THROUGH
TK	TANK
TOC	TOP OF CONCRETE
TOW	TOP OF WALL
TS	TOTAL SOLIDS
TYP	TYPICAL
VC	VERTICAL CURVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VS	VOLATILE SOLIDS
W	WIDTH, WEST
W/	WITH
WAS	WASTE ACTIVATED SLUDGE
WD	WIDE
W/O	WITHOUT
WS	WATER SURFACE
WWM	WELDED WIRE MESH
WWF	WELDED WIRE FABRIC

GENERAL SYMBOLS

1/4" FT	SLOPE 1/4" PER FOOT
	FLOW DIRECTION (AIR, WATER)
	OPENING
	GROUND
	ASPHALT SECTION
	CONCRETE SECTION
	WATER SURFACE
	ELEVATION REFERENCE POINT
	LEGEND/NOTE CALL OUTS
	PIPE SUPPORT
	ELECTRICAL MAST
	SQUARE SECTION
	PIPE SECTION
@	SPACING CENTER ON CENTER
	SIZE OF DEFORMED BAR
Ø	DIAMETER
	RECTANGULAR SECTION
∠	ANGLE
W	WIDE-FLANGE SHAPE
C	CHANNEL
PL	PLATE
℄	CENTER LINE

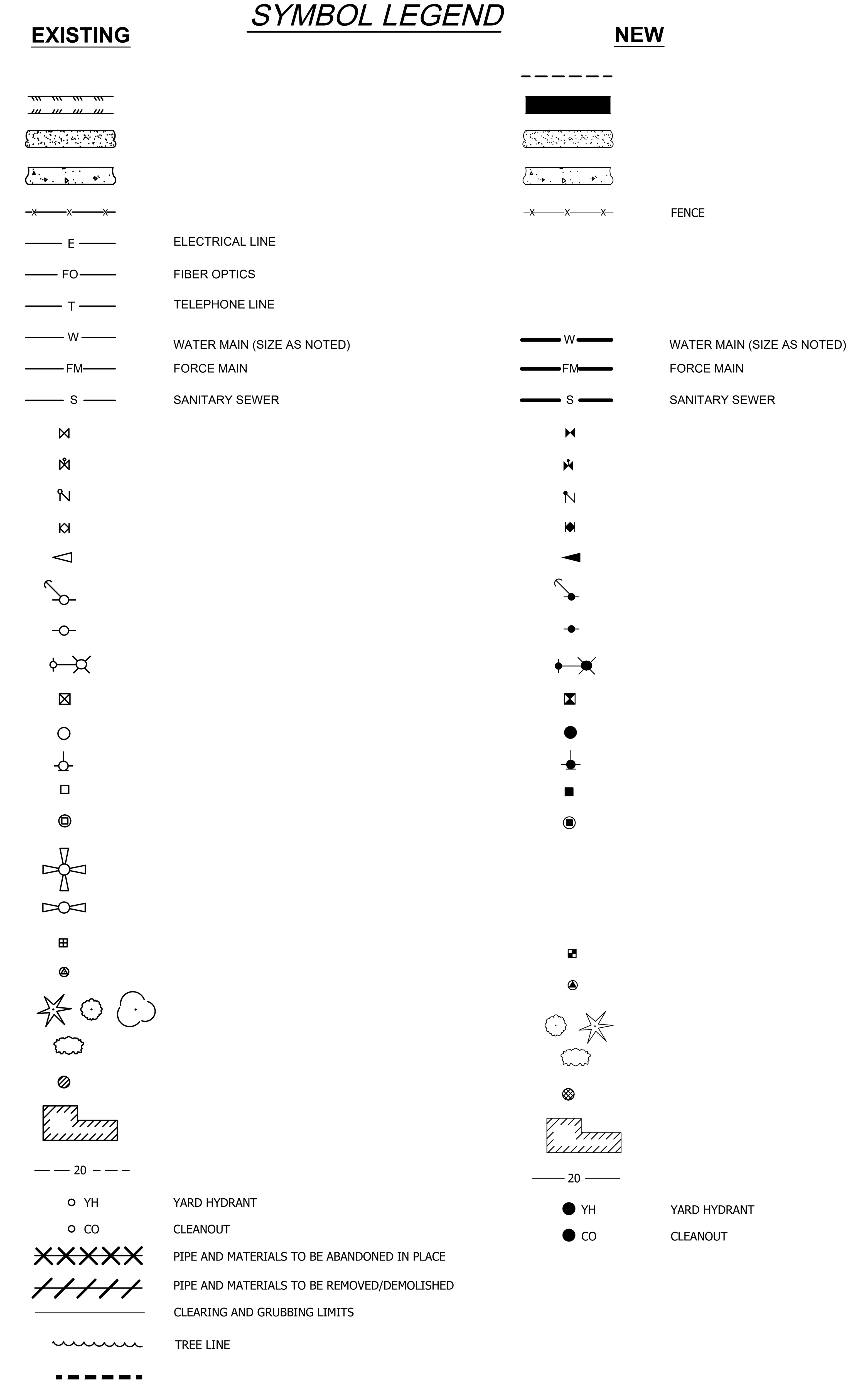
EXAMPLE OF SECTION NUMBERING SYSTEM AND PLAN/DRAWING TITLES



GENERAL NOTES :

1. IN GENERAL, EXISTING STRUCTURES AND FACILITIES ARE NOTED AS "EXISTING" AND ARE SHOWN IN LIGHT LINE WEIGHTS OR AS SCREENED BACKGROUND. NEW CONSTRUCTION, STRUCTURES, FACILITIES, AND FEATURES ARE SHOWN IN HEAVY LINE WEIGHTS.
2. MANY OF THE SYMBOLS SHOWN ON THIS LEGEND ARE USED ONLY WHERE THEY PROVIDE CLARITY AND ARE NOT NECESSARILY USED IN ALL APPLICATIONS. SOME CONTRACT DRAWINGS MAY HAVE ADDITIONAL LEGENDS APPLICABLE FOR THAT SPECIFIC DRAWING. SYMBOLS SHOWN ON SPECIFIC DRAWINGS GOVERN.
3. THE CONTRACTOR SHALL VERIFY ALL PLANIMETRIC FEATURES AND DIMENSIONS PRIOR TO STARTING WORK AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. ALL DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS REFER TO THE HORIZONTAL AND VERTICAL PROJECTED PLANES, UNLESS OTHERWISE INDICATED.
5. EXISTING UNDERGROUND UTILITY INFORMATION AS SHOWN ON THOSE PLANS HAS BEEN PROVIDED BY THE INDIVIDUAL UTILITY COMPANIES. LOCATIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. PROTECT EXISTING MONITORING WELLS.
6. REFER TO SHEET G-2 FOR SURVEY CONTROL.
7. FOR ADDITIONAL ABBREVIATIONS AND SYMBOLS, SEE SHEETS M-1 AND E-1.
8. PROTECTION OF THE ENVIRONMENT: NO CONSTRUCTION RELATED ACTIVITY SHALL CONTRIBUTE TO THE DEGRADATION OF THE ENVIRONMENT, ALLOW MATERIAL TO ENTER SURFACE OR GROUND WATERS, OR ALLOW PARTICULATE EMISSIONS TO THE ATMOSPHERE, WHICH EXCEED STATE OR FEDERAL STANDARDS. ANY ACTIONS THAT POTENTIALLY ALLOW A DISCHARGE TO STATE WATERS MUST HAVE PRIOR APPROVAL OF THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

SYMBOL LEGEND



SHEET 3 OF 40

CAD NO. G_LEGEND.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
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GAVIN A. BUSHEE, STATE OF WASHINGTON, 21013505, REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

ABBREVIATIONS, SYMBOL LEGEND, NUMBERING SYSTEM, AND GENERAL NOTES

G-02

SCALE: AS SHOWN

PARKS FILE# AE 325-036

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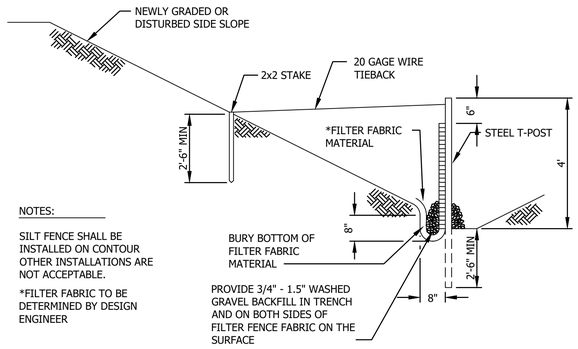
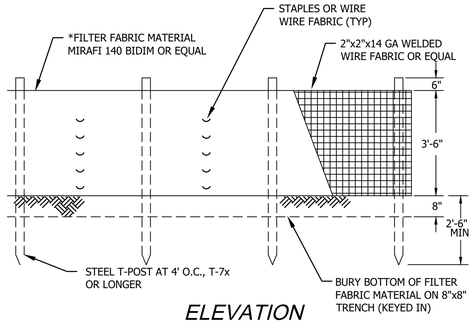


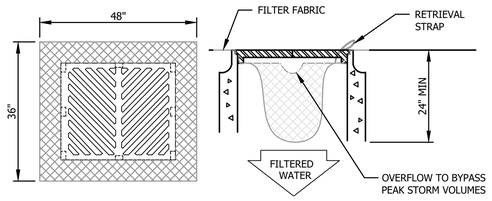
TYPICAL CROSS SECTION



ELEVATION

1 TYP SILTATION FENCE

NOT TO SCALE



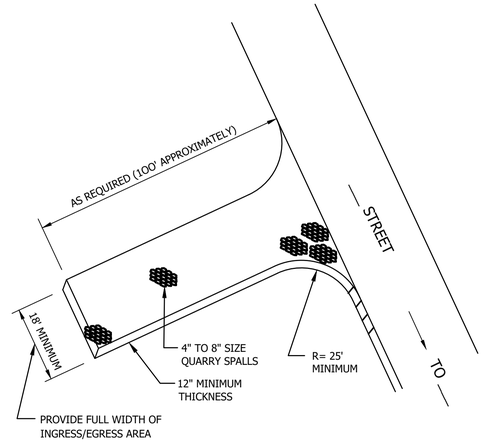
PLAN PROFILE

NOTES:

1. REMOVE CATCH BASIN GRATING.
2. CLEAN DIRT AND DEBRIS FROM GRATING LEDGE.
3. LAY THE CATCH BASIN INSERT INSIDE THE BASIN
4. REPLACE THE GRATING, PINCHING THE INSERT FABRIC BETWEEN THE GRATING AND THE CATCH BASIN FRAME.
5. CUT OFF THE EXCESS FABRIC. A 3 TO 5 INCH WIDE STRIP OF FABRIC SHALL BE LEFT AROUND THE OUTSIDE OF THE GRATING

2 TYP FILTER FABRIC CATCH BASIN INSERT FOR SEDIMENT ONLY

NOT TO SCALE



3 TYP TEMPORARY CONSTRUCTION ENTRANCE

NOT TO SCALE

CAD NO. G_DET.DWG

	DATE	APP.	INT.	REVISIONS	NO.

ACTION	BY	DATE
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GAVIN A. BUSHING — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

TESC DETAILS AND NOTES

G-03

SCALE: AS SHOWN

PARKS FILE# AE 325-036

GENERAL NOTES:

1. CONTRACTOR SHALL SUBMIT TO AND RECEIVE APPROVAL FROM OWNER A CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PRIOR TO GROUND DISTURBANCE, IN ACCORDANCE WITH SPEC SECTION 02370.
2. ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLANS SHALL BE CLEARLY FLAGGED IN THE FIELD AND OBSERVED DURING CONSTRUCTION.
3. ALL REQUIRED TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) FACILITIES SHALL BE CONSTRUCTED AND IN OPERATION PRIOR TO ANY LAND CLEARING AND/OR OTHER CONSTRUCTION TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE EROSION CONTROL FACILITIES WITH THE CITY PRIOR TO ANY LAND CLEARING AND/OR CONSTRUCTION. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTORY CONDITION AS DETERMINED BY THE CITY, UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT, AND ADDITIONS TO THE EROSION AND SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4. THE EROSION AND SEDIMENTATION CONTROL SYSTEM FACILITIES DEPICTED ON THESE PLANS ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, TESC FACILITIES WILL BE NECESSARY TO ENSURE COMPLETE SILTATION CONTROL ON THE SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE CONTRACTOR TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY CONTRACTOR'S ACTIVITIES AND TO PROVIDE ADDITIONAL TESC FACILITIES, OVER AND ABOVE THE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.
5. ANY DISTURBED AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 30 DAYS OR MORE, SHALL BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER INCLUSIVE. SEEDING MAY PROCEED OUTSIDE THE SPECIFIED TIME PERIOD WHENEVER IT IS IN THE INTEREST OF THE CONTRACTOR BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT APPROVED BY THE CITY.
6. IN CASE EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTIES, ALL CONSTRUCTION WORK WITHIN THE PROJECT LIMITS THAT WILL FURTHER AGGRAVATE THE SITUATION MUST CEASE, AND THE CONTRACTOR SHALL IMMEDIATELY COMMENCE RESTORATION METHODS. RESTORATION ACTIVITY SHALL CONTINUE UNTIL SUCH TIME AS THE AFFECTED PROPERTY OWNER IS SATISFIED.
7. NO TEMPORARY OR PERMANENT STOCKPILING OF MATERIALS OR EQUIPMENT SHALL OCCUR WITHIN CRITICAL AREAS OR ASSOCIATED BUFFERS, OR THE CRITICAL ROOT ZONE FOR VEGETATION PROPOSED FOR RETENTION.
8. WHERE POSSIBLE, MAINTAIN NATURAL VEGETATION FOR SILT CONTROL.
9. TEMPORARY SILTATION CONTROL AND DETENTION PONDS SHALL BE CONSTRUCTED BY PLACING GRAVEL FILLED BURLAP SACKS.
10. FILTER FABRIC FENCES OR GRAVEL SACKS SHALL BE LOCATED AS INDICATED ON THE PLANS OR AS OTHERWISE NEEDED.
11. TO PROVIDE EROSION CONTROL ON STEEP AND NEWLY GRADED SLOPES, CONTRACTOR SHALL INSTALL AN EROSION CONTROL BLANKET OR CLEAR PLASTIC SHEET IMMEDIATELY AFTER GRADING SLOPES AND THE APPLICATION OF SEEDING.
12. ALL TEMPORARY EROSION CONTROL STRUCTURES SHALL BE MAINTAINED IN SATISFACTORY CONDITION UNTIL CONSTRUCTION IS COMPLETED AND SURFACE RESTORATION HAS BEEN COMPLETED.
13. RETURN SILTATION CONTROL AREAS TO ORIGINAL GROUND CONDITIONS UNLESS OTHERWISE NOTED.

TEMPORARY COVER PRACTICES:

1. DISTURBED AREAS THAT ARE TO REMAIN WITHOUT PERMANENT COVER FOR MORE THAN 30 DAYS, SHALL BE STABILIZED BY SEEDING, MULCHING AND MATTING, OR COVERED WITH BLACK PLASTIC SHEETING TO PREVENT EROSION.

FILTER FENCE:

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 30 INCHES (WHERE PHYSICALLY POSSIBLE).
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 8 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THE TRENCH SHALL BE CONSTRUCTED TO FOLLOW THE CONTOUR.
4. WHEN SILT FILM FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING TIE WIRES, HOG RINGS, OR HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
5. SILT FILM FILTER FABRIC SHALL BE WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES. OTHER TYPES OF FABRIC MAY BE STAPLED TO THE FENCE.
6. WHEN EXTRA-STRENGTH OR MONOFILAMENT FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC SHALL BE STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF FILTER FENCE NOTE 5 APPLYING. EXTRA CARE SHALL BE USED WHEN JOINING OR OVERLAPPING THESE STIFFER FABRICS.
7. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED. RETAINED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF, OR MULCHED AND SEEDED IF APPROVED BY THE CITY.

FILTER FENCE MAINTENANCE:

1. INSPECT IMMEDIATELY AFTER EACH RAINFALL, AND AT LEAST DAILY DURING SIGNIFICANT RAINFALL (0.25" IN 24 HRS). PROMPTLY REPAIR DAMAGED TESC FACILITIES AS NECESSARY.
2. SEDIMENT SHALL BE REMOVED WHEN IT REACHES APPROXIMATELY ONE THIRD THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED.
3. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE FILTER FENCE IS NO LONGER REQUIRED SHALL BE REMOVED AND LEGALLY DISPOSED, OR DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED, IF APPROVED BY THE CITY.

STABILIZATION AND REMOVAL:

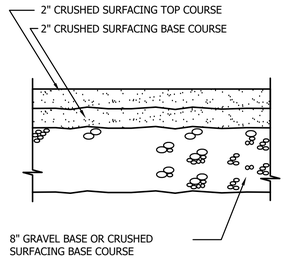
1. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY "BEST MANAGEMENT PRACTICES" ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.

HYDROSEEDING:

1. CONSTRUCTION ACCEPTANCE: ACCEPTANCE BY THE CITY WILL BE SUBJECT TO A WELL-ESTABLISHED GROUND COVE THE REQUIREMENT OF THE APPROVED CONSTRUCTION PLANS.
2. ALL DISTURBED AREAS SHALL BE SEEDED PER PROJECT SPECIFICATIONS TO MINIMIZE EROSION. GRASS SEEDING SH AN APPROVED HYDROSEEDER OR AS OTHERWISE APPROVED BY THE CITY.
3. PREPARATION OF SURFACE: ALL AREAS TO BE SEEDED SHALL BE CULTIVATED TO THE SATISFACTION OF THE CITY. T ACCOMPLISHED BY DISKING, RAKING, HARROWING OR OTHER ACCEPTABLE MEANS.
4. FERTILIZER: SHALL BE APPLIED AT 500# PER ACRE OF 10-20-20 (10 POUNDS PER 870 SQUARE FEET) OR EQUIVALENT

CLEAR PLASTIC COVERINGS:

1. CLEAR PLASTIC COVERINGS SHALL HAVE A MINIMUM THICKNESS OF 6 MIL AND MEET THE REQUIREMENTS OF WSDO 9-14.5.
2. COVERING SHALL BE INSTALLED ON EXPOSED SLOPES SUBJECT TO EROSION AND MAINTAINED TIGHTLY IN PLACE BY OR TIRES OR ROPES WITH A MAXIMUM 10 FOOT GRID SPACING IN ALL DIRECTIONS. ALL SEAMS SHALL BE TAPED OR FULL LENGTH AND THERE SHALL BE AT LEAST A 1 TO 2 FOOT OVERLAP OF ALL SEAMS. SEAMS SHOULD THEN BE ROLL TIED.
3. COVERING SHALL BE INSTALLED IMMEDIATELY ON AREAS SEEDED BETWEEN OCTOBER 1 TO APRIL 30 AND REMAIN U FIRMLY ESTABLISHED.
4. WHEN THE COVERING IS USED ON UNSEEDED SLOPES, IT SHALL BE LEFT IN PLACE UNTIL THE NEXT SEEDING PERIO
5. SHEETING SHALL BE KEYED IN TO THE GROUND AT THE TOP OF THE SLOPE TO PREVENT SURFACE FLOW BENEATH T PREVENT MIGRATION OF SHEETING.
6. SHEETING SHALL BE REMOVED AS SOON AS IS POSSIBLE ONCE VEGETATION IS WELL ESTABLISHED TO PREVENT BUR VEGETATION.
7. CHECK SHEETING REGULARLY FOR RIPS AND PLACES WHERE THE PLASTIC MAY BE DISLODGED. CONTACT BETWEEN THE GROUND SHALL ALWAYS BE MAINTAINED. ANY AIR BUBBLES FOUND SHOULD BE REMOVED IMMEDIATELY OR TH DURING THE NEXT WINDY PERIOD. RE-ANCHOR OR REPLACE THE PLASTIC AS NECESSARY.

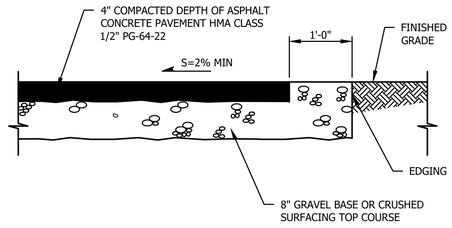


NOTES:

1. SEE SHEETS G-19 AND G-20 FOR FINISHED GRADE ELEVATION.

1 TYP — CRUSHED SURFACING PAVEMENT DETAIL

NOT TO SCALE

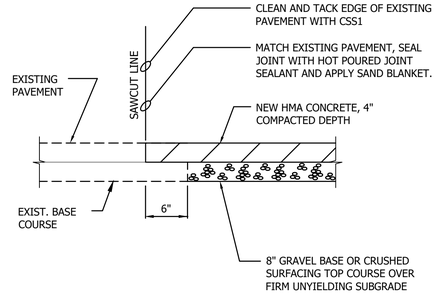


NOTES:

1. SEE SHEETS G-19 AND G-20 FOR FINISHED GRADE ELEVATION AND ROAD LAYOUT.
2. WHERE PAVEMENT SECTION IS PLACED OVER EXISTING ASPHALT, THE EXISTING ASPHALT SHALL BE REMOVED AND REPLACED BY THE PAVEMENT SECTION

2 TYP — ASPHALT PAVEMENT DETAIL

NOT TO SCALE

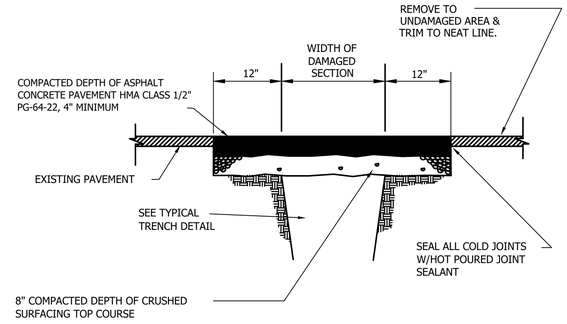


NOTES:

1. ALL JOINTS SHALL BE FULL DEPTH SAW CUT.
2. ALL CATCH BASINS, VALVES AND OTHER APPURTENANCES SHALL BE TACK COATED WITH AN ASPHALT EMULSION PRIOR TO THE APPLICATION OF ASPHALT CONCRETE.
3. COMPACTED ASPHALT CONCRETE SHALL NOT EXTEND MORE THAN 1/4" ABOVE THE EXISTING SURFACE.

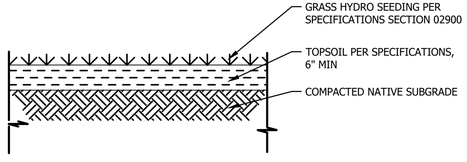
3 TYP — ASPHALT BUTT JOINT DETAIL

NOT TO SCALE



4 TYP — ASPHALT PAVEMENT RESTORATION

NOT TO SCALE

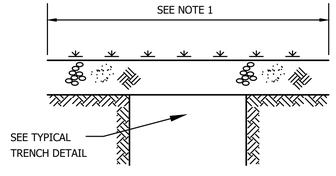


NOTE:

LEVEL DISTURBED AREAS PRIOR TO HYDROSEEDING AND ADD IMPORTED TOPSOIL RAKED IN WITH EXISTING SOIL.

5 TYP — GRASS SURFACING DETAIL

NOT TO SCALE



NOTES:

1. WIDTH SHALL BE TO LIMITS DISTURBED BY CONSTRUCTION ACTIVITIES.
2. LEVEL DISTURBED AREAS PRIOR TO HYDROSEEDING AND ADD 2" IMPORTED TOPSOIL RAKED IN WITH EXISTING SOIL.

6 TYP — GRASS SURFACE RESTORATION DETAIL

NOT TO SCALE

SHEET 5 OF 40

CAD NO. G_DET.DWG

REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	MAN	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHMAN — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

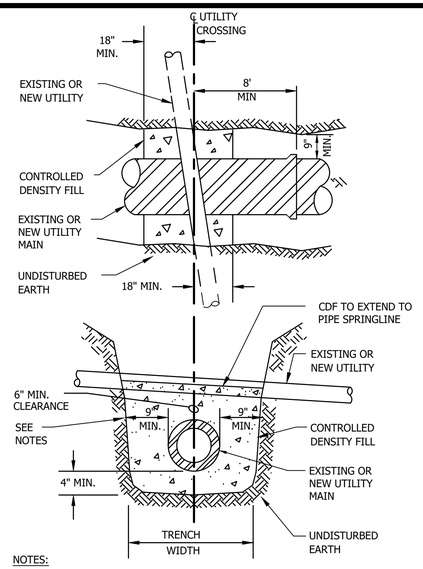
LIFT STATION REPLACEMENT

PAVING DETAILS AND RESTORATION

G-04

SCALE: AS SHOWN

PARKS FILE# AE 325-036

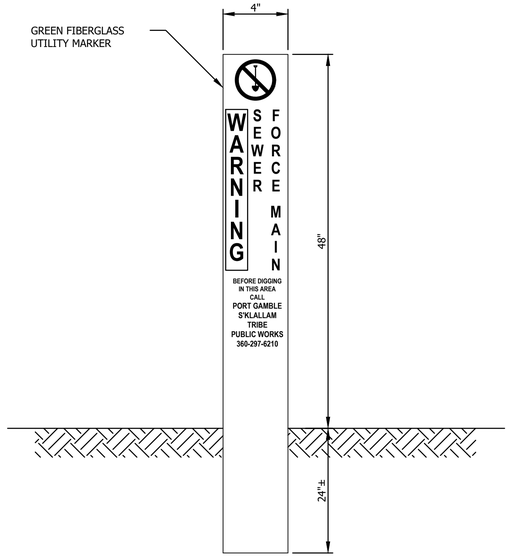


NOTES:

1. CONTRACTOR SHALL PROVIDE CDF PIPE ENCASEMENT AT ALL EXISTING UTILITY CROSSINGS (EXCEPT WATER LINES, SEE NOTE 2) IN THE EVENT THAT A 12" SEPARATION CANNOT BE PROVIDED.
2. INSTALL 4" HDPE FORCE MAIN WITH MINIMUM 18" VERTICAL CLEARANCE BETWEEN CROWN OF FORCE MAIIN AND INVERT OF WATER LINES.

1 TYP — CONTROLLED DENSITY FILL (CDF) ENCASEMENT

NOT TO SCALE

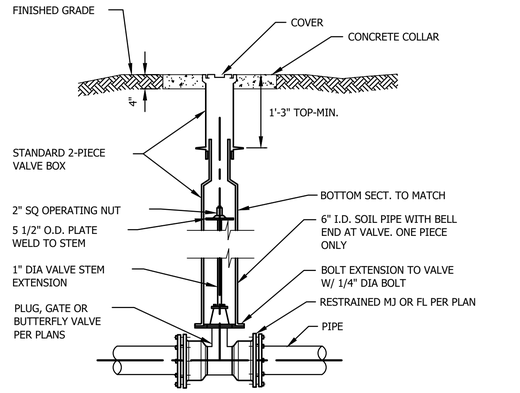


NOTE:

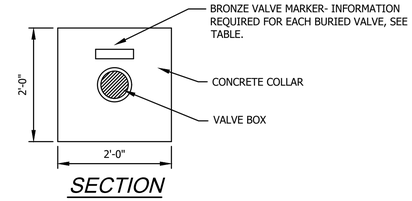
1. UTILITY MARKER TO EXTEND 48" ABOVE GROUND SURFACE, BE GREEN IN COLOR, AND BE 4" WIDE.
2. ALL LETTERING TO BE WHITE, EXCEPT THAT THE WORD, "WARNING", MAY BE BLACK.

2 TYP — SEWER FORCE MAIN MARKER DETAIL

NOT TO SCALE



PLAN



SECTION

3 TYP — TYPICAL VALVE BOX DETAIL

NOT TO SCALE

SHEET 6 OF 40

CAD NO. G_DET.DWG

	DATE	APP.	INT.	REVISIONS	NO.

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	MAN	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHING — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

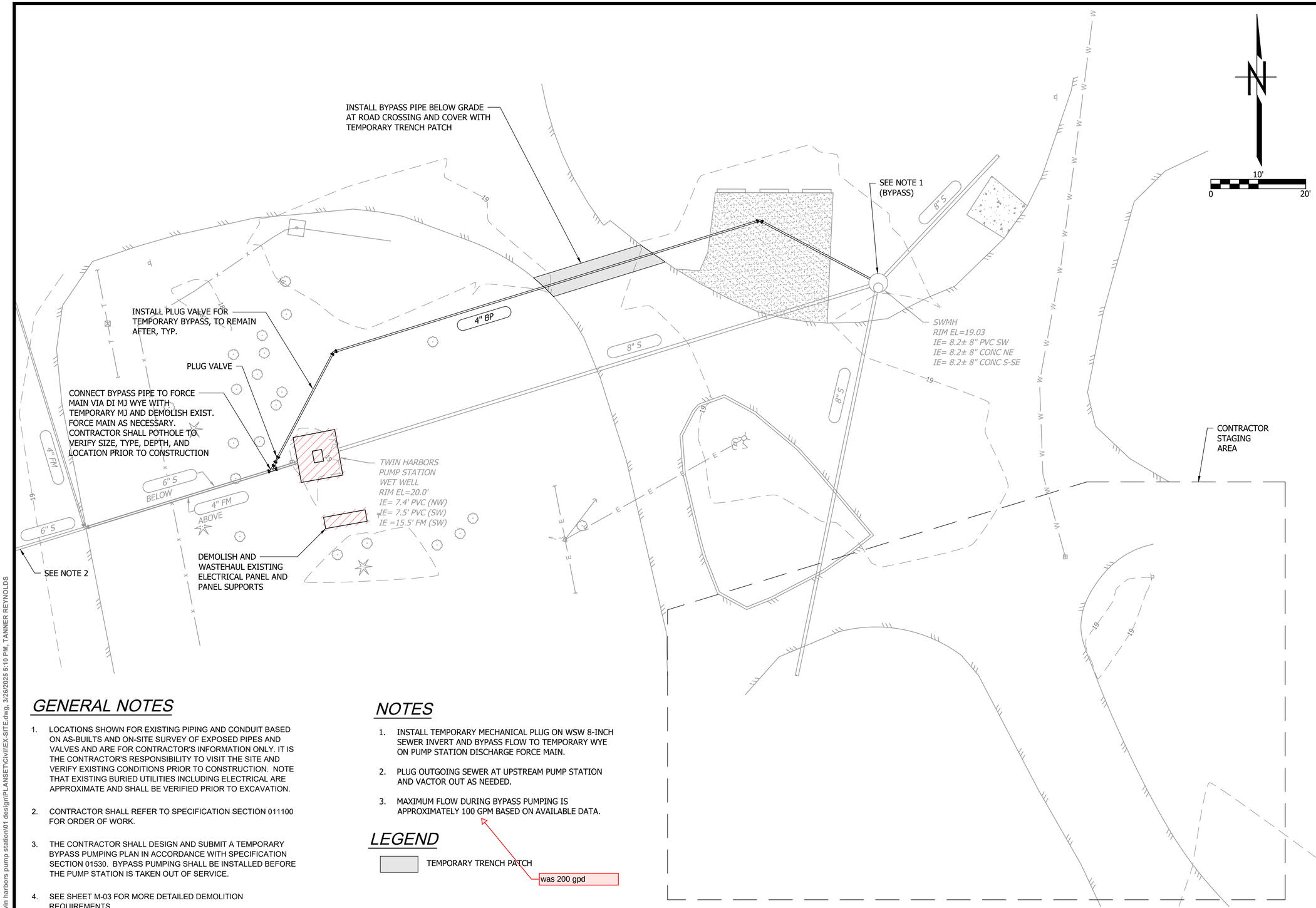
MISCELLANEOUS DETAILS

G-05

SCALE: AS SHOWN

PARKS FILE# AE 325-036

M:\WSPARKS\123578.00 twin harbors pump station\01 design\PLANSET\General\G_DET.dwg, 4/3/2025 12:44 PM, TANNER REYNOLDS



GENERAL NOTES

1. LOCATIONS SHOWN FOR EXISTING PIPING AND CONDUIT BASED ON AS-BUILTS AND ON-SITE SURVEY OF EXPOSED PIPES AND VALVES AND ARE FOR CONTRACTOR'S INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE AND VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION. NOTE THAT EXISTING BURIED UTILITIES INCLUDING ELECTRICAL ARE APPROXIMATE AND SHALL BE VERIFIED PRIOR TO EXCAVATION.
2. CONTRACTOR SHALL REFER TO SPECIFICATION SECTION 011100 FOR ORDER OF WORK.
3. THE CONTRACTOR SHALL DESIGN AND SUBMIT A TEMPORARY BYPASS PUMPING PLAN IN ACCORDANCE WITH SPECIFICATION SECTION 01530. BYPASS PUMPING SHALL BE INSTALLED BEFORE THE PUMP STATION IS TAKEN OUT OF SERVICE.
4. SEE SHEET M-03 FOR MORE DETAILED DEMOLITION REQUIREMENTS.
5. DEMOLISH EXISTING FORCE MAIN AS REQUIRED FOR CONSTRUCTION OF NEW VALVE VAULT AND INSTALLATION OF BYPASS PUMPING.

NOTES

1. INSTALL TEMPORARY MECHANICAL PLUG ON WSW 8-INCH SEWER INVERT AND BYPASS FLOW TO TEMPORARY WYE ON PUMP STATION DISCHARGE FORCE MAIN.
2. PLUG OUTGOING SEWER AT UPSTREAM PUMP STATION AND VACTOR OUT AS NEEDED.
3. MAXIMUM FLOW DURING BYPASS PUMPING IS APPROXIMATELY 100 GPM BASED ON AVAILABLE DATA.

LEGEND

TEMPORARY TRENCH PATCH

was 200 gpd

SHEET 7 OF 40

m:\WSPARKS\123578.00 twin harbors pump station\01 design\PLANSET\Civil\EX-SITE.dwg, 3/26/2025 5:10 PM, TANNER REYNOLDS

CAD NO. EX-SITE.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	TAR	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHEE — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

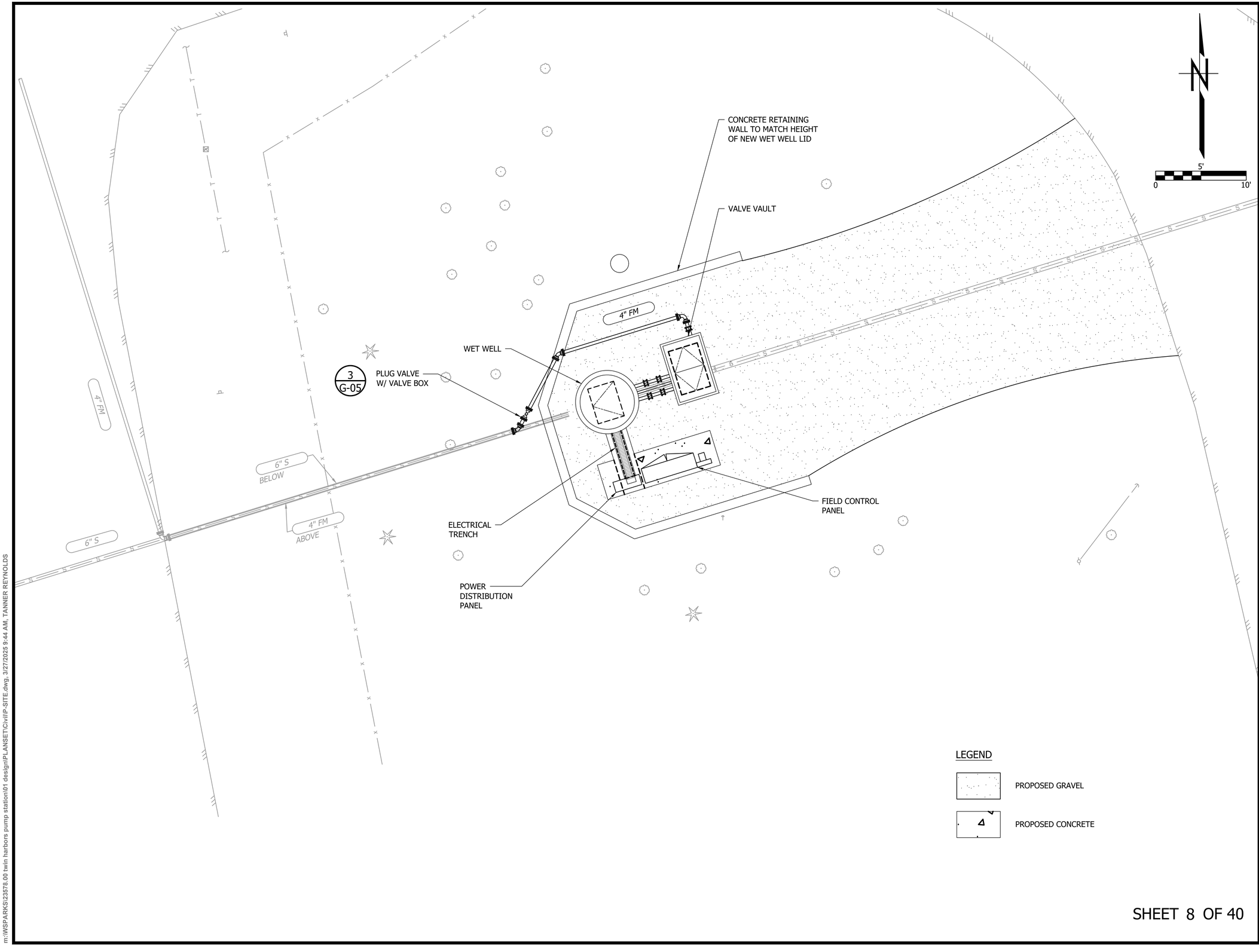
EXISTING SITE, BYPASS PUMPING, AND DEMOLITION PLANS

G-06

SCALE: NOTED

AS SHOWN

PARKS FILE# AE 325-036



SHEET 8 OF 40

m:\WSPARKS\23578.00 twin harbors pump station\01 design\PLANSET\Civil\P-SITE.dwg, 3/27/2025 9:44 AM, TANNER REYNOLDS

CAD NO. P-SITE.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	TAR	03/03/25
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CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHMAN — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

PROPOSED SITE PLAN

G-07

SCALE: NOTED
AS SHOWN

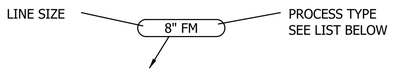
PARKS FILE# AE 325-036

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		EXISTING PIPE
		NEW PIPE
		WELDED
		FLANGED
		MECHANICAL JOINT
		FLANGED COUPLING ADAPTER
		FLEXIBLE COUPLING
		FIELD FLANGE/ADAPTOR FLANGE
		RESTRAINED FLEXIBLE COUPLING
		BLIND FLANGE
		CHECK VALVE
		GATE VALVE
		PLUG VALVE
		BUTTERFLY VALVE
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		ELBOW, 45°
		ELBOW, 90°
		ELBOW UP
		ELBOW DOWN
		TEE
		TEE UP
		TEE DOWN
		WYE

PROCESS PIPING / EQUIPMENT IDENTIFICATIONS

PROCESS PIPING



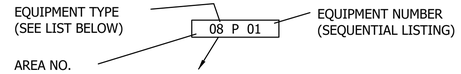
PROCESS PIPING

D	DRAIN
FM	FORCE MAIN
S	SANITARY SEWER

VALVES

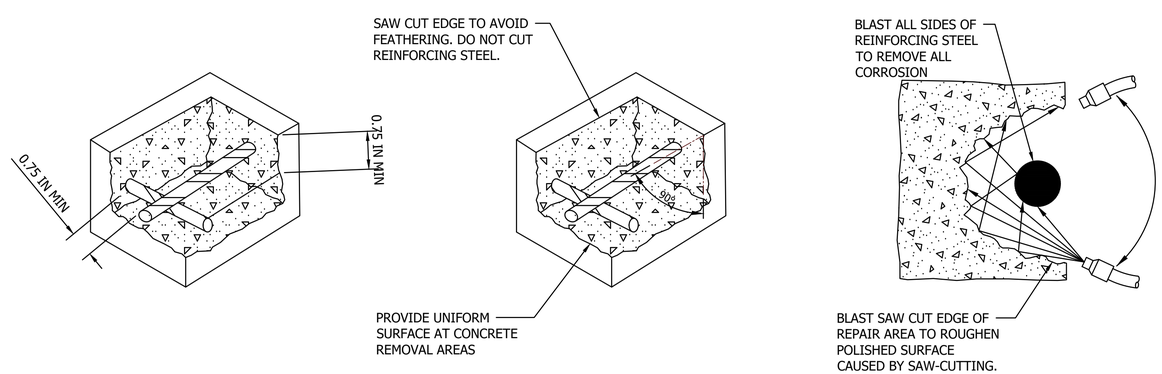
CV	CHECK VALVE
GV	GATE VALVE
PV	PLUG VALVE

EQUIPMENT



EQUIPMENT

P	PUMP



NOTES:

1. COMPLETELY REMOVE CONCRETE (UNDERCUT) FROM AROUND CORRODED REINFORCING STEEL.
2. CONCRETE SHALL BE REMOVED A MINIMUM OF 6 INCHES LATERALLY BEYOND UNSOUND CONCRETE.
3. REPAIR AREAS SHALL BE SQUARE OR RECTANGULAR SHAPE WITH SQUARE CORNERS.
4. IF IMPACT BREAKERS ARE USED, A 15 LB MAX BREAKER SIZE IS ALLOWED.
5. CONCRETE SURFACE AND REINFORCING STEEL SHALL BE CLEARED BY OIL-FREE ABRASIVE BLASTING OR HIGH-PRESSURE WATER BLASTING TO REMOVE DIRT, OIL, CEMENT FINES (SLURRY), OR ANY MATERIAL THAT MAY INTERFERE WITH THE BOND OF THE REPAIR MATERIAL.
6. THIS DETAIL REFERENCES ICRI GUIDELINE NO. 310.112-2008, ALL REQUIREMENTS OF THE GUIDELINE SHALL BE FOLLOWED.
7. FILL PER SECTION 033900 WITH SIKATOP 122 PLUS FOR HORIZONTAL SURFACE OR 123 PLUS FOR VERTICAL AND OVERHEAD SURFACES.

1 TYP *CONCRETE REPAIR SURFACE PREPARATION*
NOT TO SCALE

CAD NO. M_DET.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
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CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHEE — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

04/11/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

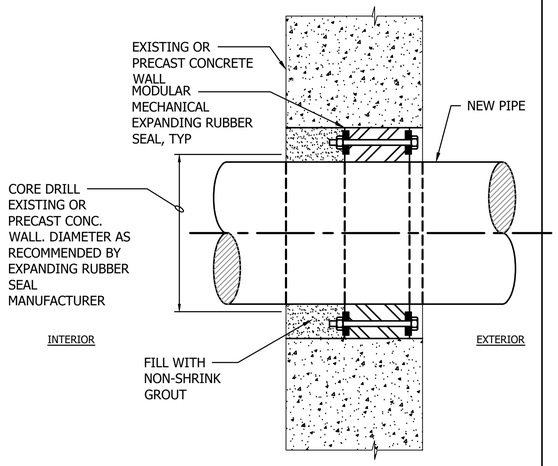
LIFT STATION REPLACEMENT

MECHANICAL DETAILS

M-01

SCALE: AS SHOWN

PARKS FILE# AE 325-036

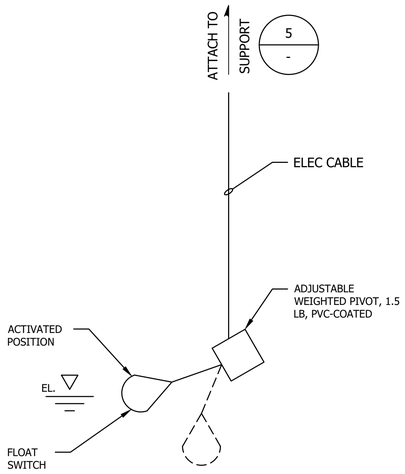


NOTE:

1. MODULAR MECHANICAL EXPANDING RUBBER SEAL SHALL BE EQUIPPED WITH 316 STAINLESS HARDWARE.

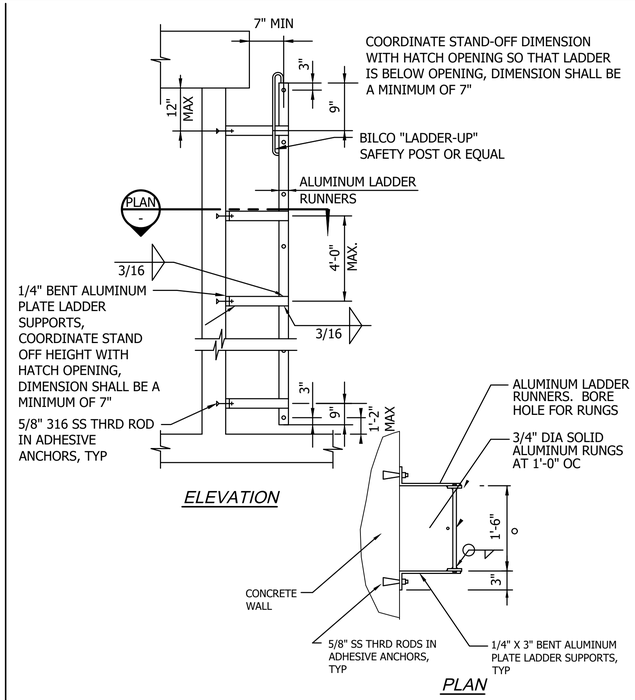
1 TYP PIPE PENETRATION THROUGH EXISTING AND PRECAST CONCRETE WALLS

NOT TO SCALE



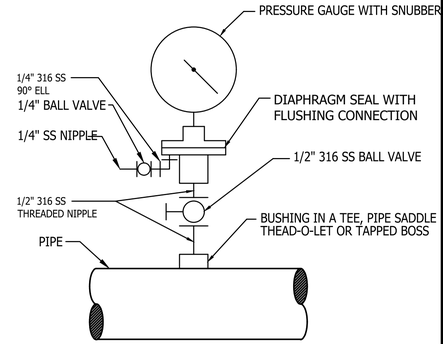
2 TYP HIGH LEVEL FLOAT DETAIL

NOT TO SCALE



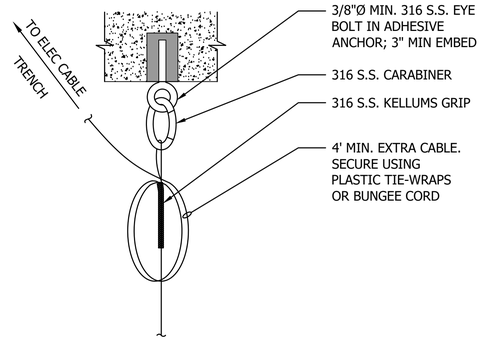
3 TYP LADDER DETAIL

NOT TO SCALE



4 TYP PRESSURE GAUGE (LIQUID SERVICE) DETAIL

NOT TO SCALE

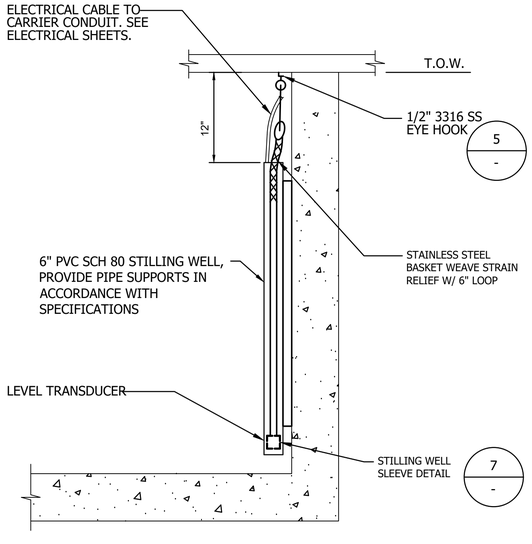


NOTES:

1. PROVIDE ONE SUPPORT FOR EACH LEVEL TRANSDUCER & FLOAT SWITCH, WITHIN 8" OF HATCH OPENING U.N.O.

5 TYP WET WELL LEVEL CABLE SUPPORT DETAIL

NOT TO SCALE

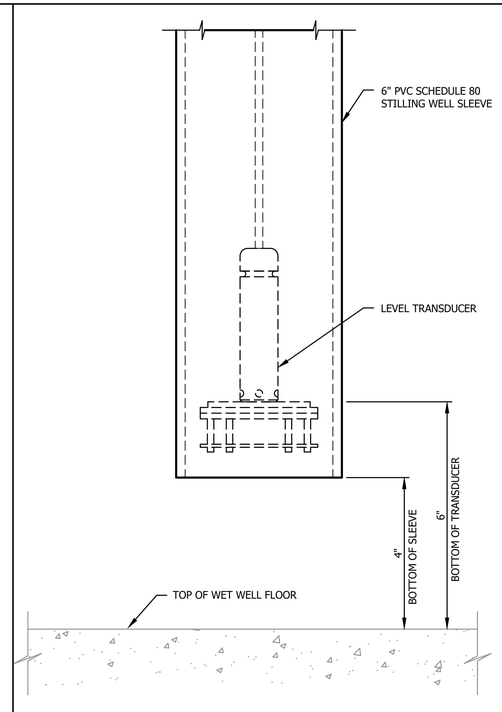


NOTE:

TOP OPENING OF STILLING WELL SHALL BE ACCESSIBLE FROM HATCH TO PLACE AND SERVICE LEVEL TRANSDUCER.

6 TYP LEVEL TRANSDUCER MOUNTING DETAIL

NOT TO SCALE



7 TYP STILLING WELL SLEEVE

NOT TO SCALE

SHEET 10 OF 40

CAD NO. M_DET.DWG

	DATE	APP.	INT.	REVISIONS	NO.

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	TAR	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHING — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

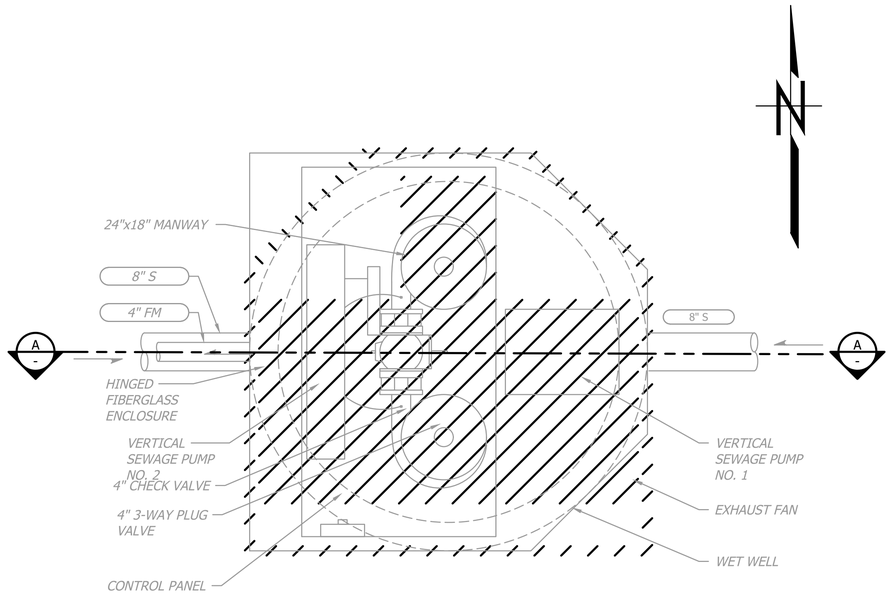
LIFT STATION REPLACEMENT

MECHANICAL DETAILS

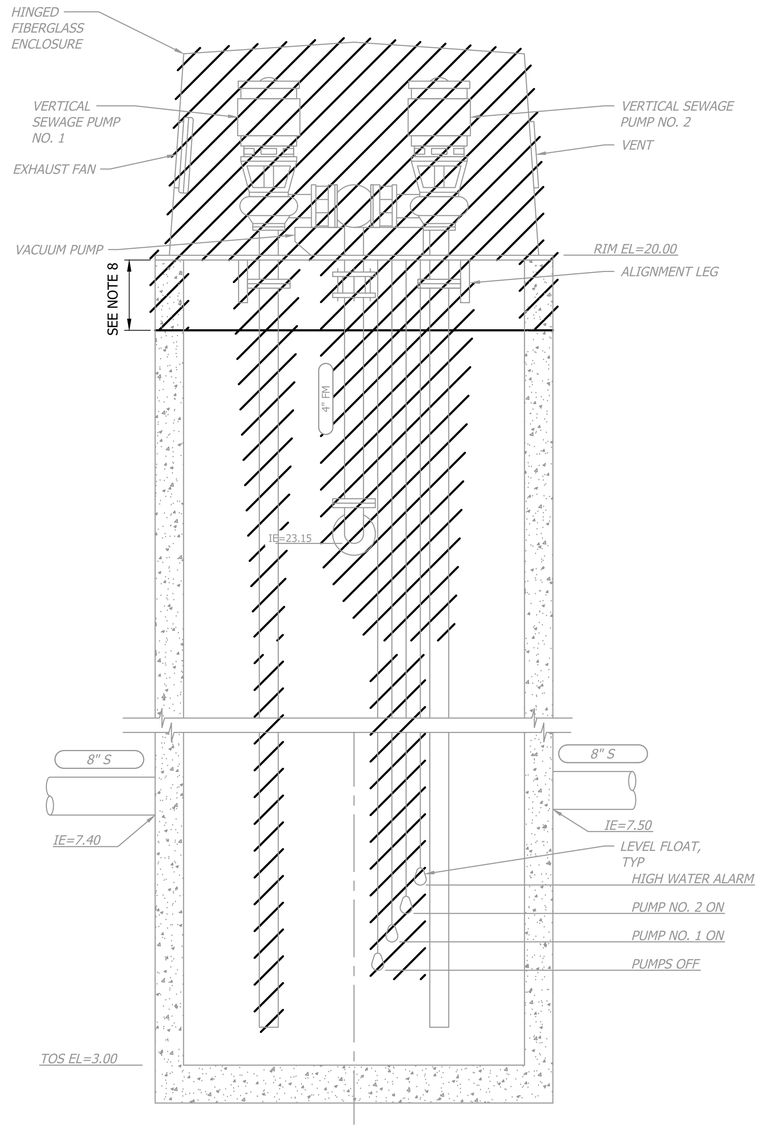
M-02

SCALE: AS SHOWN

PARKS FILE# AE 325-036



PLAN
SCALE: 3/4"=1'-0"



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

NOTE:

PUMPING EQUIPMENT AND SUCTION PIPES ROTATED 90-DEG FOR CLARITY.

NOTES:

1. CONTRACTOR TO VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO BEGINNING WORK. REFER TO SPECS FOR ORDER OF WORK. THE TEMPORARY BYPASS PUMPING SYSTEM SHALL BE INSTALLED PRIOR TO BEGINNING DEMOLITION WORK.
2. CUT ALL PIPE PENETRATIONS EXCEPT 8-INCH INFLUENT SEWERS OFF ON INSIDE OF WALL, GRIND TO A MINIMUM OF 1/2-INCH BELOW THE REMAINING CONCRETE SURFACE AND PLUG PIPE WITH NON-SHRINK GROUT AND REPAIR SURFACE IN ACCORDANCE WITH MANHOLE COATING SYSTEM MANUFACTURER'S RECOMMENDATIONS.
3. CUT MANHOLE STEPS OFF ON INSIDE OF WALL, GRIND TO A MINIMUM OF 1/2-INCH BELOW THE REMAINING CONCRETE SURFACE AND PLUG PIPE WITH NON-SHRINK GROUT AND REPAIR SURFACE IN ACCORDANCE WITH MANHOLE COATING SYSTEM MANUFACTURER'S RECOMMENDATIONS.
4. CUT ALL PIPE SUPPORTS AND ANCHOR BOLTS OFF ON INSIDE OF WALL, GRIND TO A MINIMUM OF 1/2-INCH BELOW THE REMAINING CONCRETE SURFACE AND PLUG PIPE WITH NON-SHRINK GROUT AND REPAIR SURFACE IN ACCORDANCE WITH MANHOLE COATING SYSTEM MANUFACTURER'S RECOMMENDATIONS.
5. COMPLETELY DEMOLISH AND WASTEHAUL TOP SLAB OF WET WELL AND FIBERGLASS ENCLOSURE.
6. THE CONTRACTOR SHALL DESIGN AND SUBMIT A TEMPORARY BYPASS PUMPING PLAN IN ACCORDANCE WITH SPECIFICATION SECTION 011100. BYPASS PLAN SHALL BE APPROVED AND IMPLEMENTED BEFORE TAKING THE PUMP STATION OUT OF SERVICE.
7. SAWCUT BARREL SECTION OF EXISTING MANHOLE. COORDINATE ELEVATION OF CUT WITH NEW TOP SLAB THICKNESS AND TOP OF SLAB ELEVATION.

1' 0 2'

SHEET 11 OF 40

CAD NO. M_DEMO.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	MAN	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHMAN STATE OF WASHINGTON 21013505 REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

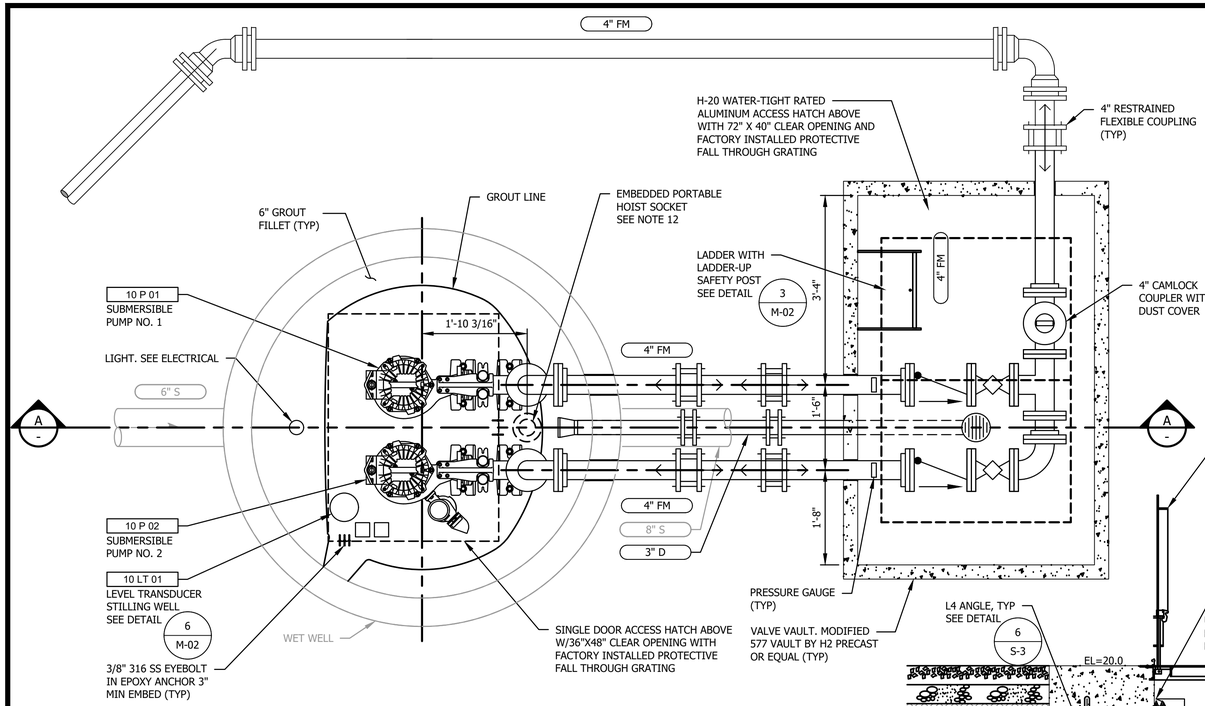
EXISTING PUMP STATION DEMOLITION PLAN AND SECTION

M-03

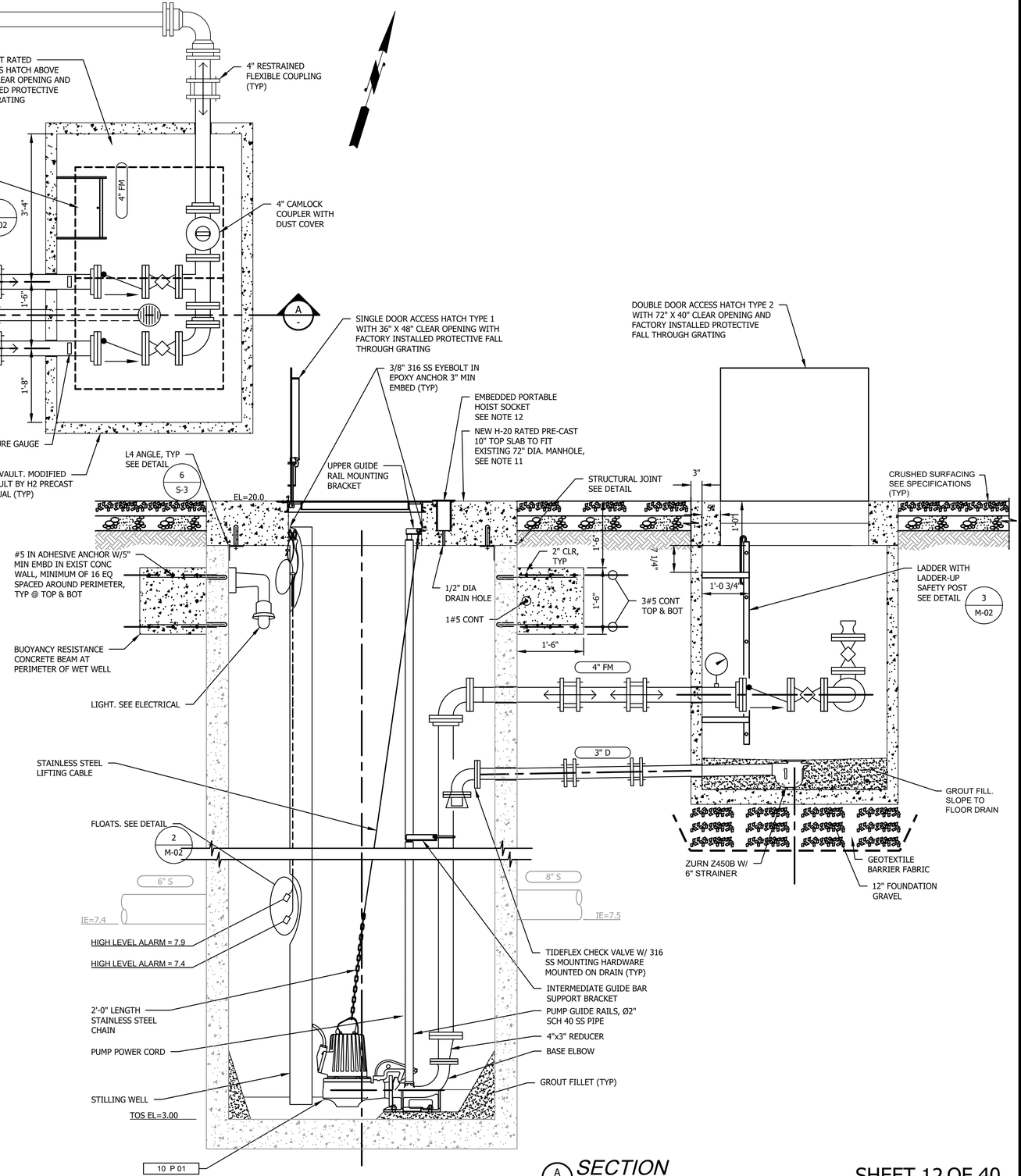
SCALE: NOTED
AS SHOWN

PARKS FILE# AE 325-036

m:\WSPARKS\23578.00 twin harbors pump station\01 design\PLANSET\Mechanical\M_DEMO.dwg, 3/26/2025 5:12 PM, TANNER REYNOLDS



PLAN
SCALE: 3/4"=1'-0"



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

WET WELL OPERATING LEVELS	
DESCRIPTION	ELEVATION
10 P 01 HIGH LEVEL ALARM	7.9
10 P 02 HIGH LEVEL ALARM	7.4
LAG PUMP ON	6.9
LEAD PUMP ON	6.4
LAG PUMP OFF	5.4
LEAD PUMP OFF	4.9
LOW LEVEL ALARM	4

NOTES:

1. RETAINING WALL NOT SHOWN FOR CLARITY.
2. PIPE SUPPORTS SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATION SECTION 15066.
3. GROUT PUMP BASE ELBOW AND WET WELL GROUT FILLET IN ACCORDANCE WITH MFR'S RECOMMENDATIONS.
4. ALL DUCTILE IRON JOINTS AND COUPLINGS SHALL BE RESTRAINED.
5. ALL PIPE PENETRATIONS SHALL BE PER SPECIFICATION SECTION 402300.
6. INSTALL PRESSURE GAUGE PER SPECIFICATION SECTION 407313.
7. CLEAN OUT AND PREPARE SURFACE OF MANHOLE PRIOR TO COATING.
8. COAT INSIDE OF WET WELL IN ACCORDANCE WITH SPECIFICATION SECTION 099000.
9. PERFORM CONCRETE RESTORATION ON INTERIOR SURFACE OF MANHOLE IN ACCORDANCE WITH SPECIFICATION SECTION 03930.
10. 4" FL GATE VALVE WITH 4" BLIND FLANGE TAPPED AND FITTED WITH 2" QUICK-CONNECT ADAPTER COUPLING. FURNISH QUICK-CONNECT 2" DUST CAP.
11. SEE STRUCTURAL AND ELECTRICAL SHEETS FOR ADDITIONAL DETAILS SHOWING ELECTRICAL PENETRATIONS.
12. FURNISH AND INSTALL 316 SS EMBEDDED HOIST SOCKET 1.85-FT EAST OF N-S CENTERLINE OF WET WELL LID ALONG E-W CENTERLINE.

CAD NO. M_MOD.DWG

	DATE	APP.	INT.	REVISIONS	NO.

ACTION	BY	DATE
DESIGNED	GAB	08/13/24
DRAWN	MAN	03/03/25
CHECKED (FIELD)	GAB	03/03/25
CHECKED (HDQTS.)	HFD	03/14/25

GAVIN A. BUSHMAN — STATE OF WASHINGTON — 21013505 — REGISTERED PROFESSIONAL ENGINEER

4/3/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

PUMP STATION MODIFICATIONS PLAN AND SECTION

M-04

SCALE: AS SHOWN

PARKS FILE# AE 325-036

SHEET 12 OF 40

GENERAL STRUCTURAL NOTES

GENERAL
THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY. USE DETAIL MARKED "TYPICAL" WHEREVER APPLICABLE. CHANGES, OMISSIONS OR SUBSTITUTIONS ARE NOT PERMITTED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. REFER TO THE SPECIFICATIONS FOR FURTHER REQUIREMENTS. DO NOT SCALE THE DRAWINGS.

ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE.

THE DESIGN, ADEQUACY AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC., IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND HAS NOT BEEN CONSIDERED BY THE ENGINEER OF RECORD. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE PRIOR TO ITS COMPLETION. THE CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING TO PROVIDE STABILITY PRIOR TO THE COMPLETION OF THE STRUCTURE.

THE GENERAL NOTES APPLY TO ALL STRUCTURES UNLESS NOTED OTHERWISE (U.N.O.). LOCATION AND SIZE OF ANCHOR BOLTS FOR SPECIFIC EQUIPMENT SHALL BE SPECIFIED BY THE VENDOR. CONTRACTOR SHALL COORDINATE LOCATIONS OF STRUCTURAL OPENINGS, PENETRATIONS AND EMBEDDED ITEMS WITH THE MECHANICAL, ARCHITECTURAL, ELECTRICAL, PLUMBING AND VENTILATION SECTIONS OF THE DRAWINGS AND WITH SUPPLIERS AND SUBCONTRACTORS AS MAY BE REQUIRED.

SPECIAL INSPECTION & TESTING
SPECIAL INSPECTIONS SHALL MEET THE REQUIREMENTS OF IBC CHAPTER 17.
OBSERVE THE WORK ASSIGNED FOR CONFORMANCE WITH APPROVED DRAWINGS AND SPECIFICATIONS.

FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL AND ENGINEER. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION; THEN, IF NOT CORRECTED, TO THE BUILDING OFFICIAL AND ENGINEER. SUBMIT A FINAL REPORT STATING THE WORK WAS IN CONFORMANCE WITH THE APPROVED DRAWINGS AND SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF IBC.

SPECIAL INSPECTION REQUIRED:
STEEL: IN ACCORDANCE WITH SECTION 1705.2 AND TABLE 1705.2.3
CONCRETE: IN ACCORDANCE WITH SECTION 1705.3 AND TABLE 1705.3
SOIL: IN ACCORDANCE WITH SECTION 1705.6 AND TABLE 1705.6

SHOP DRAWINGS
SHOP DRAWINGS, WHERE REQUIRED, SHALL BE CHECKED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTING FOR ENGINEER REVIEW. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW OF DESIGN INTENT, PRIOR TO FABRICATION. GENERAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF DIMENSIONS AND DETAILS FOR EACH SUBCONTRACTOR.

DESIGN LOADS
ROOF SNOW LOAD:
DESIGN SNOW LOAD,Ps..... 25 PSF
GROUND SNOW LOAD,Pg..... 25 PSF
SNOW EXPOSURE FACTOR, Ce..... 0.9
SNOW LOAD IMPORTANCE FACTOR, Is..... 1.1
THERMAL FACTOR, Ct..... 1.0

ROOF LIVE LOAD:, Lr..... 20 PSF
FLOOR LIVE LOAD:, Lf..... 125 PSF

WIND DESIGN DATA:
ULTIMATE WIND SPEED (3-SECOND GUST), Vult..... 120 MPH
NOMINAL WIND SPEED, Vasd..... 93 MPH
RISK CATEGORY..... III
WIND EXPOSURE..... B

EARTHQUAKE DESIGN DATA
MAPPED SPECTRAL RESPONSE
ACCELERATIONS
Ss..... 1.524 G
S1..... 0.741 G
SITE CLASS..... D
SPECTRAL RESPONSE COEFFICIENT
Sds..... 1.219 G
SdI..... 0.84 G
SEISMIC IMPORTANCE FACTOR, Ie..... 1.25
RISK CATEGORY..... III
SEISMIC DESIGN CATEGORY..... D
BASIC SEISMIC-FORCE-RESISTING SYSTEM(S)..... STEEL ORDINARY CANTILEVERED COLUMN SYSTEM
DESIGN BASE SHEAR..... 1.15 KIPS
SEISMIC RESPONSE COEFFICIENT(S), Cs..... 1.219 KIPS
RESPONSE MODIFICATION FACTOR(S), R..... 1.25
ANALYSIS PROCEDURE USED..... EQUIVALENT LATERAL FORCE ANALYSIS

ALLOWABLE BEARING PRESSURE:.....2000 PSF (PRESUMED PER IBC)

ABOVE ARE ASSUMED PER DATA PROVIDED,
CONTRACTOR MUST VERIFY IN FIELD.

EXTEND ALL EXTERIOR FOOTINGS 2'-0" MINIMUM BELOW FINISHED GRADE. UNO (UNLESS NOTED OTHERWISE), BOTTOM OF ALL FOOTINGS TO BEAR ON 12" OF CRUSHED SURFACING BASE COURSE (CSBC) OVER NATIVE, INORGANIC, UNDISTURBED SOIL. NO FOOTING SHALL BEAR HIGHER THAN 1 VERTICAL TO 1.5 HORIZONTAL SLOPE ABOVE ANY EXCAVATION, EXISTING OR PLANNED. CONTRACTOR SHALL PROVIDE TEMPORARY SHORING TO PREVENT MOVEMENT OF WALLS IF BACKFILL IS PLACED BEFORE FLOOR SYSTEM IS IN PLACE. THERE SHALL BE 95% COMPACTION (ASTM D1557 MODIFIED PROCTOR DENSITY) OF ALL BACKFILL SOIL UNDER SLABS ON GRADE.

CAST-IN-PLACE CONCRETE
CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES:
28-DAY STRENGTH f'c=4,000 PSI
AIR ENTRAINMENT: 5%-7%
MAXIMUM SLUMP: 3" FOR SLABS FOOTINGS, 4" FOR WALLS, COLUMNS AND BEAMS. CONSTRUCTION TO BE IN ACCORDANCE WITH ACI 318.

SUBMIT MIX DESIGN FOR REVIEW AND PROVIDE NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD FOR ALL CONCRETE WITH MAXIMUM W/C=0.45.

REINFORCING STEEL
WELDED WIRE FABRIC (W.W.F.): ASTM A82 AND A185
DEFORMED BARS: ASTM A615, GRADE 60 (GRADE 40 FOR #3).
UNLESS OTHERWISE NOTED ON THESE DRAWINGS, MINIMUM CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS:
CONCRETE CAST AGAINST SOIL=3".
FORMED CONCRETE AGAINST SOIL=2".
WALLS, COLUMNS AND BEAMS EXPOSED TO WATER, SEWAGE & WEATHER=2".
WALLS, COLUMNS AND BEAMS DRY CONDITION=1 1/2".

PROVIDE 2-#5 MIN. U.N.O. TRIM BARS AROUND ALL OPENINGS IN CONCRETE WALLS OR SLAB EXTENDING 2'-6" PAST CORNERS, TYP. AT TIME OF CONCRETE PLACEMENT, REINFORCING SHALL BE FREE OF MUD, OIL, OR OTHER NONMETALLIC COATINGS THAT MAY DECREASE BOND.

WELDING OF REINFORCING BARS SHALL CONFORM TO ANSI/AWS D1.4.
WHERE PERMITTED, LOW HYDROGEN WELDING RODS SHALL BE USED FOR ALL WELDING OF REINFORCING BARS. SPECIAL INSPECTION IS REQUIRED FOR ALL FIELD WELDING.

SUBMIT SHOP DRAWINGS OF REINFORCING STEEL FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 AND 318 (LATEST EDITION).

STRUCTURAL STEEL AND MISCELLANEOUS METALS
"W" SHAPES: ASTM A992, Fy=50 KSI.
"HP" SHAPES: ASTM A572, Fy=50, KSI.
CHANNELS, ANGLES, PLATES, AND BARS: ASTM A36, Fy=36 KSI.
PIPE: ASTM A53 OR A501, Fy=35 KSI MINIMUM.
TUBING: ASTM A500, GRADE B, Fy=46 KSI.

ALL BOLTS FOR CONNECTIONS IN SUBMERGED CONDITION SHALL BE: ASTM F593C OR F593D STAINLESS STEEL (SS) BOLTS. ALL OTHERS SHALL BE GALVANIZED ASTM F3125 GRADE A325 BOLTS HIGH STRENGTH BOLTS (H.S.B.), U.N.O. AS ASTM A307 MACHINE BOLTS (M.B.). WHERE HIGH STRENGTH BOLTS ARE USED, THEY SHALL BE INSTALLED WITH LOAD INDICATOR DEVICES (LOAD INDICATOR WASHERS OR SNAP-OFF HEADS).

ADHESIVE ANCHORS: HILTI HIT-RE 500 V3 OR APPROVED EQUAL, U.N.O. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

HEADED ANCHOR STUDS (H.A.S.): ASTM A108, Fy=50 KSI, END WELDED PER MANUFACTURER'S RECOMMENDATIONS.
ALL ANCHOR BOLTS AND THREADED RODS: ASTM F1554, U.N.O., ASTM A193 GRADE B8 WHERE STAINLESS STEEL IS NOTED. ALL ANCHOR BOLTS MUST BE ACCURATELY PLACED IN THEIR FINAL LOCATION PRIOR TO POURING CONCRETE, "WET STICKING" OF ANCHOR BOLTS IS NOT ALLOWED.

WELDING ELECTRODES OR WIRES: AWS A5.1 OR A5.5, E70XX; AWS A5.17, E70S-X; AWS A5.20, E7XT-X.
FOR ALL SHOP WELDS AND FIELD WELDS OF ALL LATERAL RESISTING ELEMENTS, ELECTRODES SHALL BE E7O WITH A MINIMUM SPECIFIED CVN OF 20 FT-LBS AT -20 DEGREES FAHRENHEIT. ALL WELDS SHALL BE 3/16" MINIMUM U.N.O.

ERECTION AND FABRICATION IN ACCORDANCE WITH AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS." WELDING SHALL CONFORM TO AWS "STRUCTURAL WELDING CODE - STEEL". ALL WELDING SHALL BE PERFORMED BY AWS/WABO CERTIFIED WELDERS.

ALL COLUMNS AND BEAMS TO BE FROM UNSPLICED LENGTHS U.N.O. ON THE DRAWINGS. SUBMIT SHOP DRAWINGS SHOWING SIZES, DIMENSIONS AND REQUIRED CONNECTION DETAILS FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION.

CAD NO. S_STND.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	ZK	06/17/24
DRAWN	RAH	06/17/24
CHECKED (FIELD)	MJB	06/17/24
CHECKED (HDQTS.)	MJB	06/17/24

MYRON J. BASDEN
STATE OF WASHINGTON
46334
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER
3/27/2025
REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

GENERAL STRUCTURAL NOTES

S-1

SCALE:
AS SHOWN

PARKS FILE# AE 325-036

SPECIAL INSPECTION SCHEDULE

VERIFICATION AND INSPECTION	CI	PI	REMARKS/REFERENCES
CONCRETE:			
REINFORCING STEEL INCLUDING PLACEMENT	-	X	ACI 318: CH 20, 25.2, 25.3, 26.6.1-26.6.3
ANCHOR RODS, EMBEDDED BOLTS AND INSERTS	X	-	PRIOR TO AND DURING PLACEMENT OF CONCRETE
USE OF REQUIRED DESIGN MIX	-	X	ACI 318: CH. 19, 26.4.3, 26.4.4
CONCRETE SLUMP, AIR CONTENT, TEMPERATURE AND TEST SPECIMENS	X	-	WHILE MAKING SPECIMENS FOR STRENGTH TESTS
CONCRETE AND SHOTCRETE PLACEMENT	X	-	ACI 318: 26.5
CONCRETE CURING	-	X	ACI 318: 26.5.3-26.5.5
CONCRETE FORMWORK FOR SHAPE, LOCATIONS AND DIMENSIONS	-	X	ACI 318: 26.11.1.2(6)
STEEL:			
MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:			
MANUFACTURER'S CERTIFICATE	-	X	
INSPECTION OF HIGH-STRENGTH BOLTING:	-	X	AISC 360, SECTION N5.6
MATERIAL VERIFICATION OF STRUCTURAL STEEL AND COLD-FORMED STEEL DECK:	-	X	
IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS	-	X	AISC 360, N5.7
INSPECTION OF WELDING:			SHOP AND FIELD
COMPLETE AND PARTIAL PENETRATION GROOVE WELDS	X	-	AWS D1.1
MULTIPASS, SINGLE-PASS FILLET WELDS > 5/16", PLUG AND SLOT WELDS	X	-	AWS D1.1
SINGLE-PASS FILLET WELDS < 5/16", FLOOR AND ROOF DECK WELDS	-	X	AWS D1.3
REINFORCING STEEL	X	-	AWS D1.4, ACI 318: SECTION 26.6.4
SOILS:			
VERIFY DESIGN BEARING CAPACITY	-	X	
VERIFY EXCAVATIONS	-	X	
CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS	-	X	
USE OF MATERIALS, DENSITIES AND LIFT THICKNESSES	X	-	DURING PLACEMENT AND COMPACTION
OBSERVE SUBGRADE AND SITE PREPARED PROPERLY	-	X	PRIOR TO PLACEMENT OF COMPACTED FILL

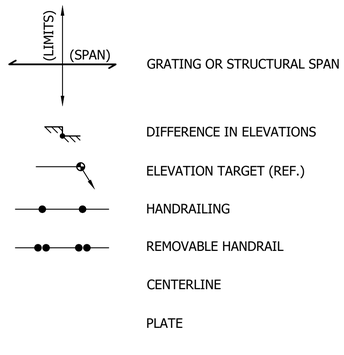
INSPECTION SCHEDULE NOTES

1. ITEMS MARKED WITH AN "X" REQUIRE INSPECTION BY A SPECIAL INSPECTOR APPROVED BY THE BUILDING OFFICIAL.
2. ITEMS MARKED "NA" ARE NOT APPLICABLE TO THIS PROJECT.
3. CI = CONTINUOUS INSPECTION DURING PROGRESS OF WORK BY SPECIAL INSPECTOR.
4. PI = PERIODIC INSPECTION BY SPECIAL INSPECTOR AS REQUIRED TO CONFIRM CONFORMANCE OF WORK.
5. TESTING AND INSPECTION REPORTS SHALL BE SUBMITTED TO THE ENGINEER, BUILDING OFFICIAL AND CONTRACTOR.
6. OWNER WILL CONTRACT FOR SPECIAL INSPECTION SERVICES.

SUPPLEMENTAL STRUCTURAL ABBREVIATIONS:

ABV	ABOVE	EN	EDGE NAIL	NS	NEAR SIDE
AFF	ABOVE FINISH FLOOR	ENG	ENGINEER	OH	OVERHANG
ADD'L	ADDITIONAL	EQ	EQUAL	ORNT	ORIENTATE (ION)
ADJ	ADJACENT	ES	EACH SIDE	PAR	PARALLEL
AL	ALUMINUM	EXIST	EXISTING MEMBER	P/C	PRECAST CONCRETE
APPRX	APPROXIMATE	EXT	EXTERIOR	PERP	PERPENDICULAR
ARCH	ARCHITECTURAL	FFE	FINISHED FLOOR ELEVATION	PSL	PARALLEL STRAND LUMBER
@	AT	FN	FACE NAIL	PT	PRESSURE TREAT(ED)
BEL	BELOW	FND	FOUNDATION	P/T	POST TENSIONED
BF	BRACED FRAME	FO	FACE OF	QTY	QUANTITY
BM	BEAM	FRM'G	FRAMING	REF	REFERENCE
BN	BOUNDRY NAIL	FS	FAR SIDE	REINF	REINFORCEMENT
BNDRY	BOUNDRY	FTG	FOOTING	SHT	SHEET
BO	BOTTOM OF	GA	GAUGE	SHTG	SHEATHING
BOS	BOTTOM OF SLAB	GB	GRADE BEAM	SIM	SIMILAR
BOT	BOTTOM	GLB	GLUE-LAMINATED BEAM	SKW	SKEW(ED)
BRDG	BRIDGE(ING)	HAS	HEADER ANCHOR STUDS	SPC	SPACING
BRG	BEARING	HDR	HEADER	SS	STAINLESS STEEL
CAM	CAMBER(ED)	HF	HEM-FIR	STGR	STAGGER
CANT	CANTILEVER(ED)	HGR	HANGER	STIFF	STIFFENER
CDF	CONTROLLED DENSITY FILL	HSB	HIGH STRENGTH BOLT (A325 UNO)	STIRR	STIRRUP
CG	CENTER OF GRAVITY	HSS	HOLLOW STRUCTURAL STEEL	STRUC	STRUCTURE(AL)
CIP	CAST IN PLACE	IBC	INTERNATIONAL BUILDING CODE	SYM	SYMMETRICAL
CJ	CONTROL JOINT	IF	INSIDE FACE	T	TOP
CJP	COMPLETE JOINT PENETRATION	INT	INTERIOR	T&G	TONGUE AND GROOVE
COL	COLUMN	JST	JOIST	TMPRY	TEMPORARY
CONST	CONSTRUCTION	K	KIPS (1000 POUNDS)	TN	TOE NAIL
CONT	CONTINUOUS	LAT	LATERAL	TO	TOP OF
CTSK	COUNTERSINK	LDGR	LEDGER	TOS	TOP OF SLAB
D	DEPTH	LLH	LONG LEG HORIZONTAL	TRANS	TRANSVERSE
d	PENNY (NAILS)	LLV	LONG LEG VERTICAL	TYP	TYPICAL
DBL	DOUBLE	LS	LAG SCREW	UNO	UNLESS NOTED OTHERWISE
DF	DOUGLAS FIR	LSL	LAMINATED STRAND LUMBER	VFY	VERIFY
DIAG	DIAGONAL	LT WT	LIGHT WEIGHT	WHS	WELDED HEADED STUD
DIAPH	DIAPHRAGM	LVL	LAMINATED VENEER LUMBER	WP	WORK POINT
do	DITTO (DO OVER)	MAS	MASONRY	WS	WESTERN SPECIES
DWG	DRAWING	MAT'L	MATERIAL	WTS	WELDED THREADED STUD
DWL	DOWEL	MB	MACHINE BOLT (A307)	X-STG	EXTRA STRONG
EA	EACH	MFR	MANUFACTURER	XX-STG	DOUBLE EXTRA STRONG
EF	EACH FACE	MRF	MOMENT RESISTING FRAME		
EJ	EXPANSION JOINT	MTL	METAL		
EMBD	EMBED(MENT)	(N)	NEW MEMBER		

STRUCTURAL LEGEND



GRATING OR STRUCTURAL SPAN

DIFFERENCE IN ELEVATIONS

ELEVATION TARGET (REF.)

HANDRAILING

REMOVABLE HANDRAIL

CENTERLINE

PLATE

SHEET 14 OF 40

CAD NO. S_STND.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	ZK	06/17/24
DRAWN	RAH	06/17/24
CHECKED (FIELD)	MJB	06/17/24
CHECKED (HDQTS.)	MJB	06/17/24

3/27/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

SPECIAL INSPECTION SCHEDULE, SUPPLEMENTAL STRUCTURAL ABBREVIATIONS, AND STRUCTURAL LEGEND

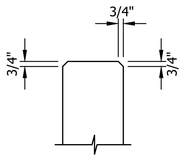
S-2

SCALE: AS SHOWN

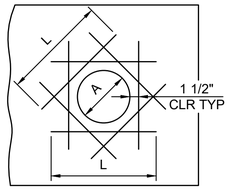
PARKS FILE# AE 325-036

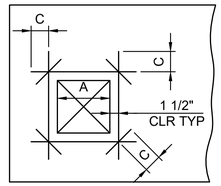
REINF	LAP
#4	2'-4"
#5	3'-0"
#6	3'-6"
#7	4'-3"
#8	4'-10"
#9	5'-3"
#10	6'-6"
#11	8'-0"

1 - TYP LAP SCHEDULE
NOT TO SCALE



2 - TYP CHAMFER DETAIL
NOT TO SCALE



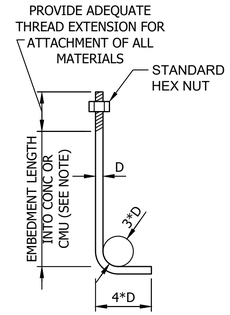


TYPE I **TYPE II**

	TYPE I		TYPE II	
OPENING SIZE (A)	MINIMUM BAR LENGTH (L)	BAR SIZE	(C)	BAR SIZE
0" - 12"	3' - 9"	#5	1' - 0"	MATCH VERTICAL BARS OR LARGEST BAR IN SLABS OR WALKWAYS
13" - 18"	4' - 9"	#6	1' - 3"	
19" - 24"	6' - 9"	MATCH VERTICAL BARS OR LARGEST BAR IN SLABS OR WALKWAYS	2' - 6"	
25" - 36"	7' - 9"		2' - 6"	
36" →	8' - 9"		2' - 6"	

NOTE:
1. ALL BARS, EACH FACE. USE THESE BAR SIZES UNLESS OTHERWISE NOTED.

3 - TYP PENETRATION REINFORCING DETAIL
NOT TO SCALE

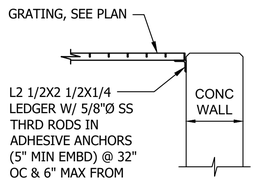


BOLT DIA. "D"	MINIMUM EMBEDMENT	
	ANCHOR BOLTS IN HORIZ SURFACE	ANCHOR BOLTS IN VERT SURFACE
1/2"	8"	7"
5/8"	8"	7"
3/4"	12"	7"
7/8"	12"	8"
1"	14"	9"
1 1/8"	14"	10"

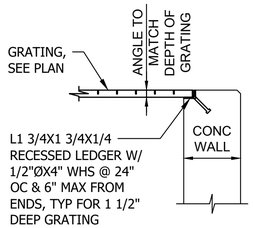
NOTE:

ANCHOR BOLT EMBEDMENT IN VERTICAL SURFACE APPLIES TO CONCRETE ONLY.

4 - TYP ANCHOR BOLT DETAIL
NOT TO SCALE



LEDGER CONDITION

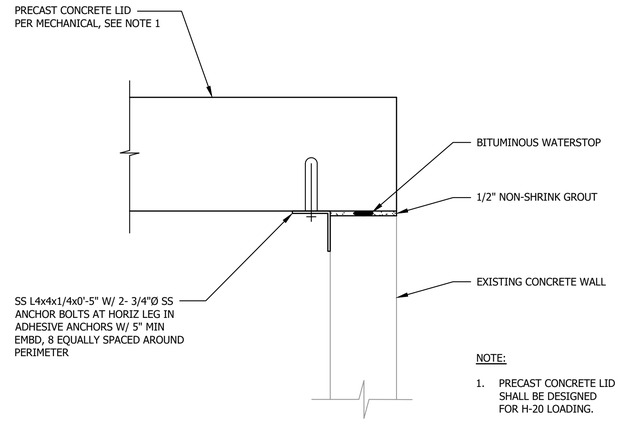


RECESSED LEDGER CONDITION

NOTES:

1. NUMBER OF FASTENERS REQUIRED PER GRATING SECTION SHALL BE SPECIFIED BY THE GRATING MANUFACTURER, WITH A MINIMUM OF 2 FASTENERS EACH BEARING END PER SECTION.
2. "PLATE FASTENER" CONNECTION SHALL BE OPTIONAL UNLESS NOTED OTHERWISE ON THE PLANS.
3. MAX SPACING BETWEEN REMOVABLE SECTIONS SHALL BE 1".

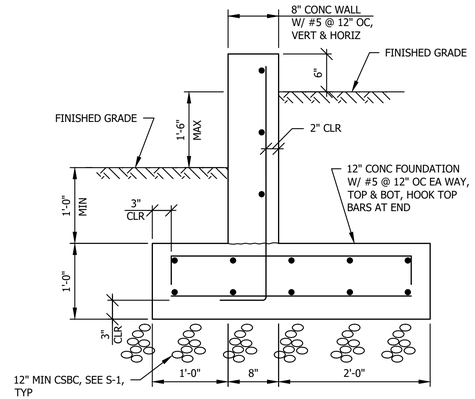
5 - GRATING CONNECTION DETAIL
SCALE: 3/4"=1'-0"



NOTE:

1. PRECAST CONCRETE LID SHALL BE DESIGNED FOR H-20 LOADING.

6 - WET WELL LID TO WALL CONNECTION DETAIL
SCALE: 1 1/2"=1'-0"



7 - TYP CONCRETE RETAINING WALL DETAIL
SCALE: 1"=1'-0"

CAD NO. S_STND.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	ZK	06/17/24
DRAWN	RAH	06/17/24
CHECKED (FIELD)	MJB	06/17/24
CHECKED (HDQTS.)	MJB	06/17/24

3/27/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

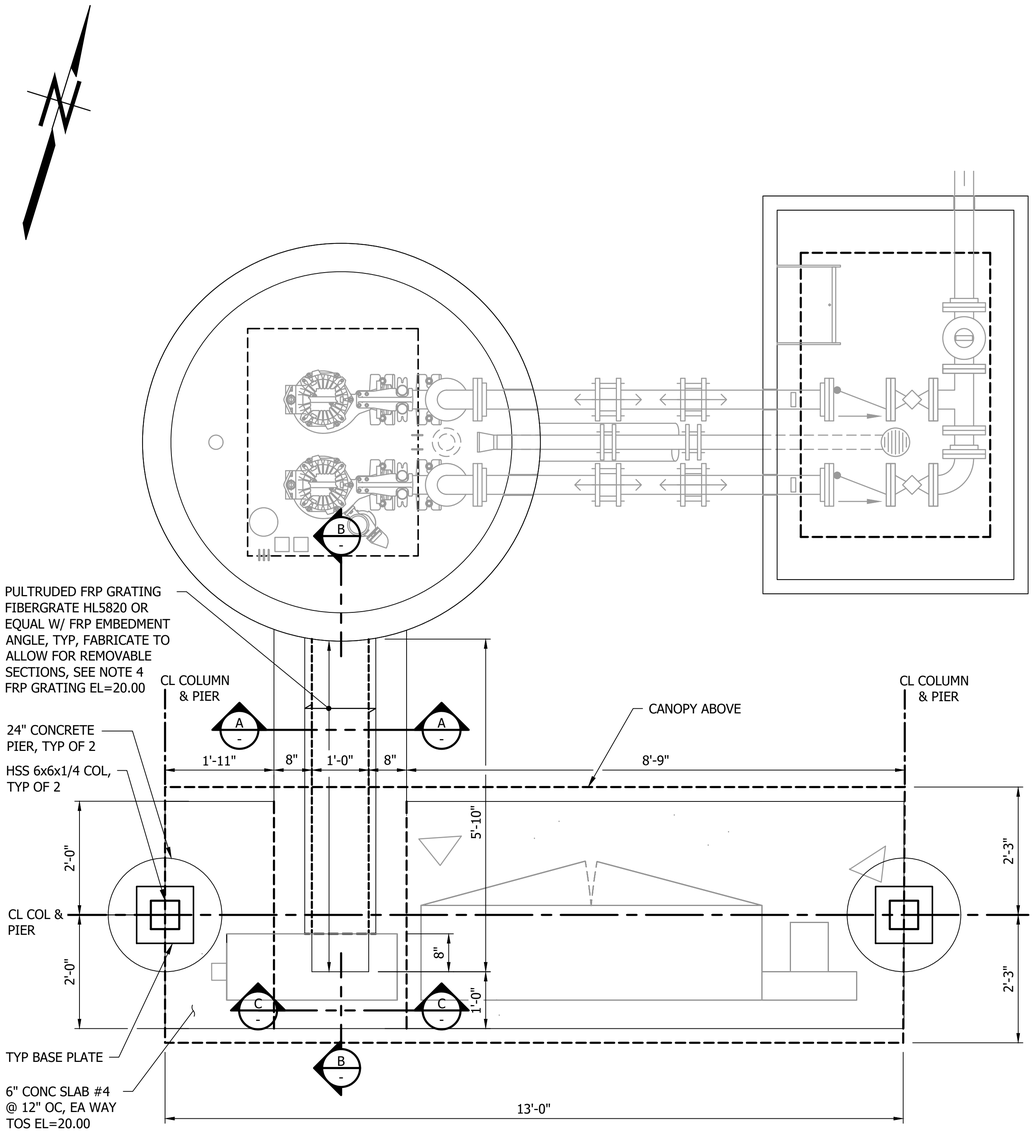
LIFT STATION REPLACEMENT

TYPICAL DETAILS

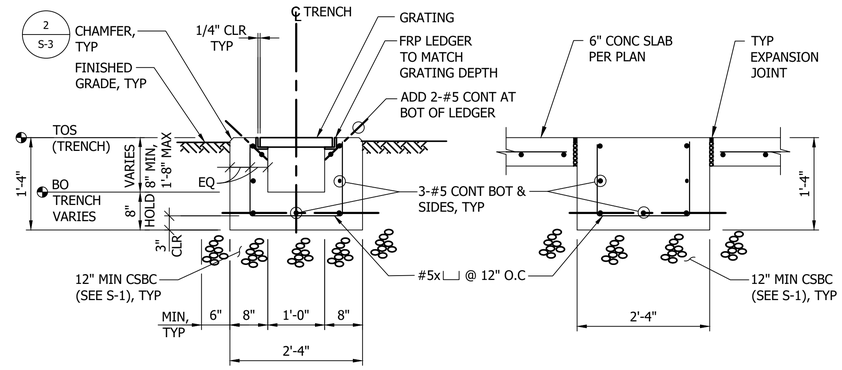
S-3

SCALE: AS SHOWN

PARKS FILE# AE 325-036

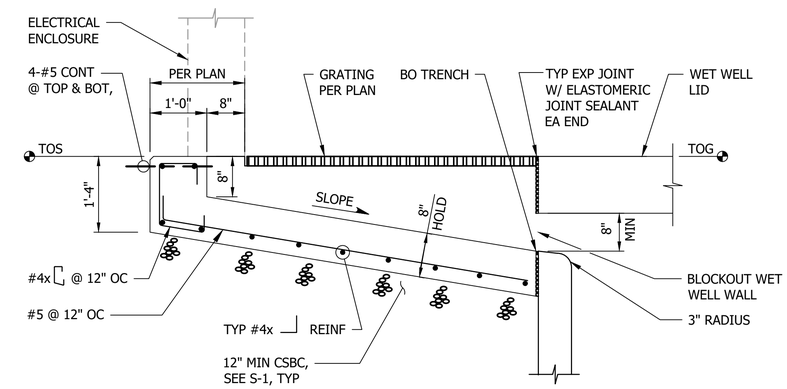


1 - FOUNDATION PLAN
3/4"=1'-0"



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

C - SECTION
3/4"=1'-0"



B - SECTION
3/4"=1'-0"

NOTES:
1. SEE SHEETS S-1 THROUGH S-3 FOR GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.
2. DIMENSIONS SHOWN ON THE STRUCTURAL PLANS ARE FOR GENERAL INFORMATION ONLY AND MUST BE VERIFIED BY THE CONTRACTOR BEFORE START OF CONSTRUCTION. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
3. NOT ALL PENETRATIONS MAY BE SHOWN. CONTRACTOR SHALL VERIFY NUMBER, SIZE, AND LOCATIONS OF ALL OPENINGS WITH MECHANICAL AND ELECTRICAL DRAWINGS.
4. GRATING SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES: 2" LOAD BARS AT 1.5 INCHES ON CENTER, WEIGHT OF 8.7 LBS PER SQUARE FOOT, A=9.2 IN2/FT, I=3.12 IN4/FT, AND S=3.12 IN3/FT.

CAD NO. S_BLDG.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	ZK	06/17/24
DRAWN	RAH	06/17/24
CHECKED (FIELD)	MJB	06/17/24
CHECKED (HDQTS.)	MJB	06/17/24

3/27/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

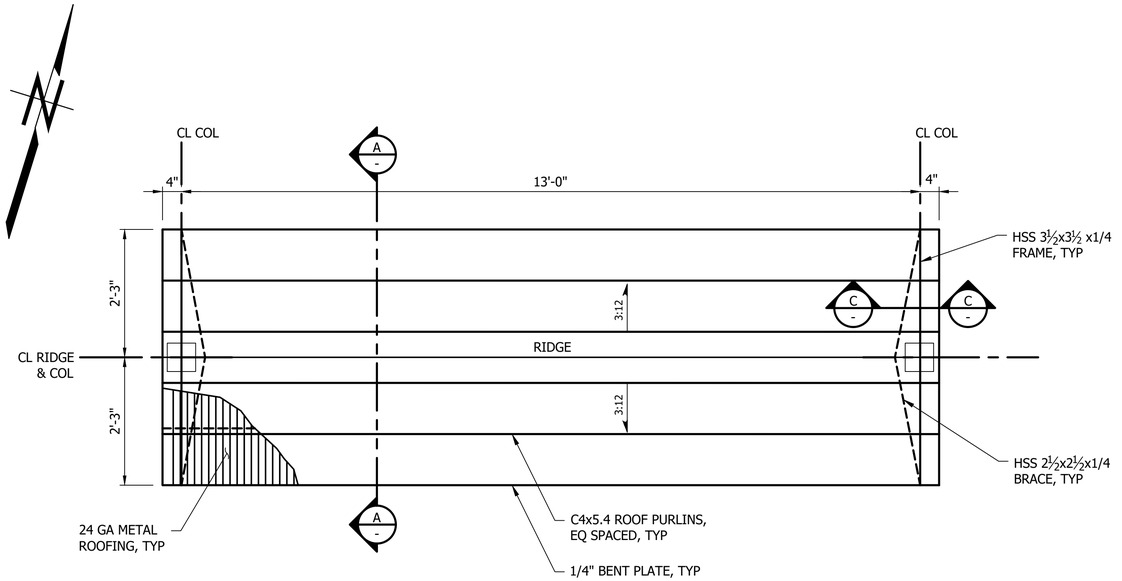
LIFT STATION REPLACEMENT

FOUNDATION PLAN AND DETAILS

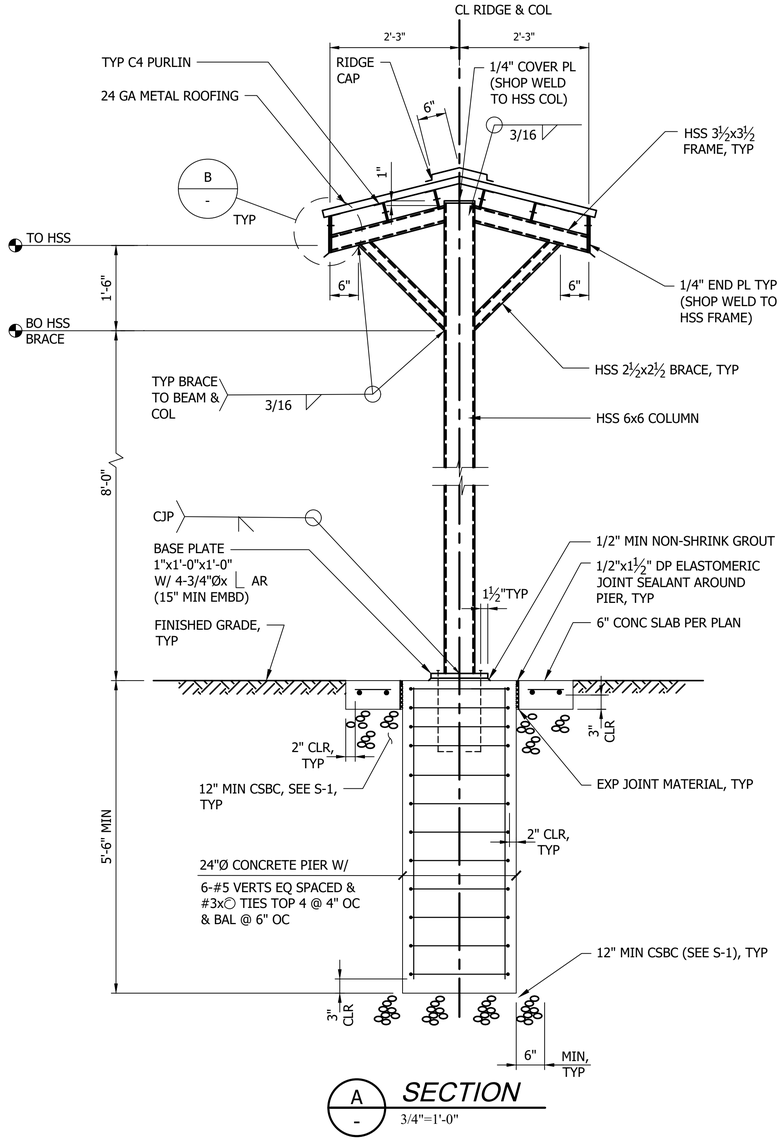
S-4

SCALE: AS SHOWN

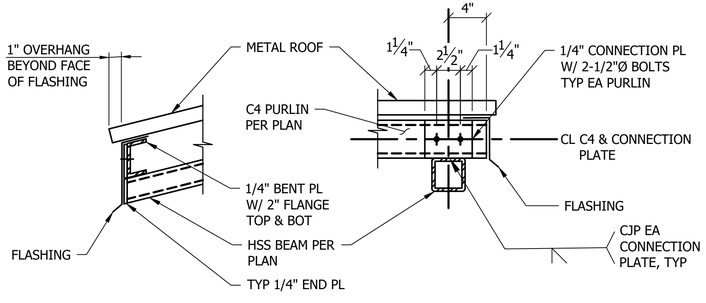
PARKS FILE# AE 325-036



1 - *ROOF FRAMING PLAN*
3/4"=1'-0"



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



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

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

NOTES:
1. SEE SHEETS S-1 THROUGH S-3 FOR GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.
2. DIMENSIONS SHOWN ON THE STRUCTURAL PLANS ARE FOR GENERAL INFORMATION ONLY AND MUST BE VERIFIED BY THE CONTRACTOR BEFORE START OF CONSTRUCTION. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
3. ALL STEEL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.

CAD NO. S_BLDG.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	ZK	06/17/24
DRAWN	RAH	06/17/24
CHECKED (FIELD)	MJB	06/17/24
CHECKED (HDQTS.)	MJB	06/17/24

3/27/2025

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

ROOF FRAMING PLAN, SECTION, AND DETAIL

S-5

SCALE: AS SHOWN

PARKS FILE# AE 325-036

ABBREVIATIONS

A	AMPERE (AMP)
AC	ALTERNATING CURRENT
AF	BREAKER FRAME SIZE (IN AMPS)
AI	ANALOG INPUT
AIC	AMPERES-INTERRUPTING CAPACITY
AL	ALUMINUM
AM	AMMETER
AO	ANALOG OUTPUT
AT	BREAKER TRIP (SETTING IN AMPS)
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BKR	BREAKER
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CST	CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DISCRETE INPUT
DIST	DISTRIBUTION
DO	DISCRETE OUTPUT
DTWV	DISCHARGE-TO-WASTE VALVE
EIOM	EXTENDED I/O MODULE
ETC	ELAPSED TIME/COUNTER METER
ETM	ELAPSED TIME METER
ENCL	ENCLOSURE
EXIST	EXISTING
FDR	FEEDER
FLA	FULL LOAD AMPS
FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
FY	FLOW COMPUTATION
G	GROUND CONDUCTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
H	HORN
HA	HAND-AUTO
HIM	HUMAN INTERFACE MODULE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
JCXXX	JUNCTION BOX, CONTROL
JPXXX	JUNCTION BOX, POWER
JSXXX	JUNCTION BOX, SIGNAL
kA	KILOAMPERES
kAIC	KILOAMPERES-INTERRUPTING CAPACITY
KCM	THOUSAND CIRCULAR MILLS
kV	KILOVOLT
kVA	KILOVOLT-AMPERE
kVAh	KILOVOLT-AMPERE HOUR
kVAR	KILOVAR (REACTIVE KILOVOLT-AMPERE)
KVARh	KILOVAR-HOUR
kW	KILOWATT
kWh	KILOWATT-HOUR
LA	LIGHTNING ARRESTOR
LAN	LOCAL AREA NETWORK
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
LINE	POWER LINE/POWER BLOCK
LV	LOW VOLTAGE
M	MAGNETIC CONTACTOR
mA	MILLIAMPERES
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILLS
MCP	MOTOR CIRCUIT PROTECTOR
MOV	METAL OXIDE VARISTOR
MS	MOTOR STARTER
MSDS	MOTOR SAFETY DISCONNECT SWITCH
MTS	MANUAL TRANSFER SWITCH
MTU	MASTER TELEMETRY UNIT
mV	MILLIVOLT
MW	MEGAWATT
N	NEUTRAL CONDUCTOR
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOC.
NESC	NATIONAL ELECTRICAL SAFETY CODE
NFPA	NATIONAL FIRE PROTECTION AGENCY
OCPD	OVERCURRENT PROTECTION DEVICE
OE	OVERHEAD ELECTRIC
OIU	OPERATOR INTERFACE UNIT
OL	OVERLOAD, THERMAL
OLR	OVERLOAD RELAY
P	POLE
PF	POWER FACTOR
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROL
PMR	PHASE MONITOR RELAY
PMU	POWER MONITOR UNIT
POT	POTENTIOMETER
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
PVC-RGS	PVC COATED RGS
RGS	RIGID GALVANIZED STEEL CONDUIT
RVSS	REDUCED-VOLTAGE SOFT START
RTU	REMOTE TELEMETRY UNIT
s	SECOND
SHD	SHIELDED
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
SUSE	SUITABLE FOR USE AS A SERVICE ENTRANCE
TB	TERMINAL BLOCK
TDAD	TIME DELAY AFTER DE-ENERGIZATION
TDAE	TIME DELAY AFTER ENERGIZATION
TQS	TORQUE SWITCH
TP	TWISTED PAIR
TSP	TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIAD
TT	TWISTED TRIAD
T/M	THERMAL MAGNETIC
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
VMR	VOLTAGE MONITORING RELAY
W	WATT
WAN	WIDE AREA NETWORK
Wh	WATT-HOUR
WP	WEATHER PROOF
XFMR	POWER TRANSFORMER

SYMBOL LEGEND

PLAN SYMBOLS

- CONDUIT DOWN
- CONDUIT UP
- CONDUIT STUB UP/END CAP
- DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- COMMUNICATION OUTLET
- TELEPHONE OUTLET
- SPECIAL OUTLET
- SIMPLEX RECEPTACLE
- DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE (HIDDEN)
- QUAD RECEPTACLE
- QUAD RECEPTACLE (HIDDEN)
- FLOOR MOUNTED RECEPTACLE
- OR — LED LIGHT POLES (SINGLE, DUAL)
- #12 AWG GROUND CONDUCTOR
- #12 AWG NEUTRAL CONDUCTOR
- #12 AWG BRANCH CONDUCTOR
- CROSSMARKS INDICATE QUANTITY AND USE OF CONDUCTORS
- SEAL OFF
- (X) MOTOR X = HORSE POWER
- (XX) XX = CV CHECK VALVE; FE FLOW ELEMENT; FI FLOW INDICATOR; FIT FLOW INDICATOR/TRANSMITTER; FS FLOW SWITCH; FT FLOW TRANSMITTER; HD HEAT DETECTOR; IS INTRUSION SWITCH; J JUNCTION BOX; L LIMIT SWITCH; LE LEVEL ELEMENT; LI LEVEL INDICATOR; LIT LEVEL INDICATOR/TRANSMITTER; LS LEVEL SWITCH/FLOAT; LT LEVEL TRANSDUCER; MDT MOTION DETECTOR; MFM MAGNETIC FLOW METER; MOV MOTOR OPERATED VALVE; PC PHOTO CELL; PE PRESSURE ELEMENT; PI PRESSURE INDICATOR; PIT PRESSURE INDICATOR TRANSMITTER; PS PRESSURE SWITCH; PT PRESSURE TRANSMITTER; SD SMOKE DETECTOR; SV SOLENOID VALVE; T THERMOSTAT

ELEMENTARY WIRING DIAGRAM SYMBOLS

- CONNECTION POINT
- TERMINAL POINT
- SCREW TERMINAL
- MOUNTED ON OUTER DOOR
- MOUNTED ON INNER DOOR
- LOCKABLE DEVICE
- NC CONTACT
- NC CONTACTOR
- NO CONTACT
- NO CONTACTOR
- SS SOLID STATE CONTACTOR
- (ALT) ALTERNATING RELAY
- (CR) CONTROL RELAY
- (C) CONTACTOR
- (C BP) "BYPASS" CONTACTOR
- (C IC) "ISOLATION" CONTACTOR
- (C SS) SOLID STATE CONTACT RELAY
- (M) MOTOR RELAY
- (TR) TIME DELAY RELAY (TDAE)
- (TR) TIME DELAY RELAY (TDAD)
- LIGHT EMITTING DIODE OR DIODE
- (X) LIGHT FIXTURE; X = REFERENCE LIGHTING SCHEDULE IF APPLICABLE
- L (A) "PUSH TO TEST" LED PILOT LIGHT; A = AMBER, B = BLUE, G = GREEN, R = RED, W = WHITE
- OFF ON XO OR OFF ON OX — SELECTOR SWITCHES
- OFF HAND AUTO XOO OR OFF HAND AUTO XOO; OXO; OOX — HAND-OFF-AUTO SWITCHES

- GFCI DUPLEX OUTLET
- DUPLEX OUTLET
- FUSE
- FUSED SWITCH W/ LED
- N.O. TOGGLE SPST SWITCH
- N.C. TOGGLE SPST SWITCH
- N.O. TEMPERATURE SWITCH
- N.C. TEMPERATURE SWITCH
- N.O. PRESSURE SWITCH
- N.C. PRESSURE SWITCH
- N.O. LIMIT SWITCH
- N.C. LIMIT SWITCH
- N.O. FLOW SWITCH
- N.C. FLOW SWITCH
- N.O. FLOAT SWITCH
- N.C. FLOAT SWITCH
- N.O. DIFFERENTIAL PRESSURE SWITCH
- N.C. DIFFERENTIAL PRESSURE SWITCH
- N.O. PUSHBUTTON
- N.C. PUSHBUTTON
- N.O. MUSHROOM PUSHBUTTON
- N.C. MUSHROOM PUSHBUTTON
- TDAE, N.O., TIME DELAY CLOSE, INSTANTANEOUS RE-OPEN
- TDAE, N.C., TIME DELAY OPEN, INSTANTANEOUS RE-CLOSE
- TDAD, N.O., INSTANTANEOUS CLOSE, TIME DELAY RE-OPEN
- TDAD, N.C., INSTANTANEOUS OPEN, TIME DELAY RE-CLOSE
- GROUND EQUIPMENT/CHASSIS
- GROUND, ISOLATED
- SOLENOID VALVE COIL
- METAL OXIDE VARISTOR (MOV)
- TRANSFORMER WINDING/REACTOR/CHOKE

ONE LINE SYMBOLS

- CAPACITOR
- REACTOR/CHOKE
- M — CIRCUIT BREAKER, MAGNETIC ONLY
- T/M — CIRCUIT BREAKER, THERMAL-MAGNETIC
- CONNECTION POINT
- CONTACTOR
- CURRENT TRANSFORMER
- FUSE
- FUSIBLE DISCONNECT
- AM — ANALOG AMMETER
- THERMAL OVERLOAD RELAY
- GROUND EQUIPMENT/CHASSIS
- S/N — SOLID NEUTRAL
- TRANSFORMER

GENERAL SYMBOLS

- XXXXX — CONDUIT
- XX XXXX XX — TAG LABEL
- GFCI — GFCI PANELBOARD CIRCUIT
- X — AREA ID TAG
- DEMOLITION (DEMO)

LINETYPES

- EXPOSED CONDUIT
- UNDERGROUND (BURIED) CONDUIT
- GROUNDING ELECTRODE CONDUCTORS
- EMBEDDED CONDUIT (WALLS, CONCRETE, ETC.)

NOTE: UNLESS NOTED OTHERWISE.

NOTE:
THIS IS A GENERAL LEDGER SHEET.
ALL SYMBOLS MAY NOT APPLY.

GENERAL ELECTRICAL NOTES:

SITE AND BUILDING PLANS:

1. CONDUIT ROUTING IS SHOWN FOR CLARITY. ACTUAL ROUTING MAY BE MORE DIRECT AND IS LEFT TO THE CONTRACTOR FOLLOWING SPECIFICATIONS 16130. NON-ELECTRICAL BURIED PIPING HAS ROUTING PRIORITY OVER ELECTRICAL BURIALS.
2. ALL TRENCHING SHALL BE PER ELECTRICAL TRENCHING DETAIL, REFERENCE ED-SHEETS.
3. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO PROTECT EXISTING UTILITIES.
4. THROUGHOUT THIS DOCUMENT, THE TERMS "DEMO" AND "DEMOLISH" MEAN TO REMOVE, THEN WASTEHAUL OR RETURN TO THE OWNER, PER THE OWNER'S DIRECTION.
5. THROUGHOUT THIS DOCUMENT, THE TERMS "PROVIDE" AND "INSTALL" MEAN TO PROVIDE AND INSTALL.

GENERAL CONTROL PANEL NOTES:

1. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE CONTROL PANEL DETAILS, THE FOLLOWING NOTES APPLY.

1.1 ALL ENCLOSURES SHALL BE PROVIDED WITH AN ENGRAVED NAMEPLATE CORRESPONDING TO THE ASSOCIATED TAG ID NUMBER AND TAG DESCRIPTION.

TAG DESCRIPTION — 1/4" TEXT
[TAG NUMBER] — 3/16" TEXT

NOTE: MOTOR STARTER NAMEPLATES SHALL BE BLACK WITH WHITE LETTERING, REFERENCE MCC PANEL DOOR NAMEPLATE SCHEDULE.

1.2 WHERE PANELS CONTAIN POWER FROM MULTIPLE SOURCES, PROVIDE A YELLOW SAFETY STICKER, APPROXIMATELY 2" x 3", AS SHOWN BELOW.

CAUTION

THIS DEVICE IS POWERED FROM SEVERAL SOURCES

THE DISCONNECT SWITCH WILL NOT SHUT OFF ALL SOURCES OF ELECTRICAL ENERGY

READING ELECTRICAL SHEETS:

ELEMENTARY DIAGRAMS:

1. ELEMENTARY DIAGRAMS ARE SHOWN IN LADDER LOGIC FORM WITH LINE NUMBERS FORMATTED AS:

   SS.LL WHERE SS = SHEET NUMBER AND LL = LINE NUMBER

2. RELAY COIL "TYPES" ARE INDICATED INSIDE THE COIL SYMBOL AS PER THE SYMBOL SCHEDULE ON THIS SHEET. THE COIL NUMBER IS OF THE FORMAT:

   TTSS.LL.AA WHERE TT = RELAY TYPE (PER SYMBOL SCHEDULE); SS.LL = AS DESCRIBED ABOVE; AA = ASSOCIATION WITH A DRIVE, CONTROLLER, CONTROL PANEL, ETC.

3. RELAY CONTACTS ARE NUMBERED IN ASSOCIATION WITH THEIR COILS FOLLOWED BY "-X" WHERE X IS THE CONTACT POLE NUMBER.

   EXAMPLE: RELAY CONTACTS FOR A DPDT RELAY

POLE NUMBER	N.O. CONTACT REFERENCE	N.C. CONTACT REFERENCE
1:	12.40	NA\
2:	13.04	13.05\

   LINE NUMBER / SHEET NUMBER

   N.O. = NORMALLY OPEN CONTACT
   N.C. = NORMALLY CLOSED CONTACT.

4. CONTACTS AND ANALOG SIGNALS CONNECTED TO PLC I/O ARE FORMATTED AS:

   *RR:SS:CC WHERE * DENOTES A PLC I/O CONNECTION; RR = PLC RACK NUMBER; SS = RACK SLOT NUMBER; CC = SLOT CHANNEL NUMBER

   *TT:CC WHERE * DENOTES A PLC I/O CONNECTION; TT = I/O TYPE: AI = ANALOG INPUT, AO = ANALOG OUTPUT, DI = DIGITAL INPUT, DO = DIGITAL OUTPUT; CC = EMBEDDED CHANNEL NUMBER

PLCS:

1. REFERENCE CONTROL PANEL SPECIFICATION 16940.
2. WIRE ALL PLC ANALOG AND DIGITAL INPUTS AND OUTPUTS, WHETHER ASSIGNED OR SPARE, TO TERMINAL GROUPS PER SPECIFICATION.
3. ALL PLC DIGITAL OUTPUTS SHALL BE BUFFERED THROUGH INTERPOSING RELAYS. SPARE OUTPUTS, AND OUTPUTS ASSIGNED OUTSIDE THE PANEL, SHALL BE CONNECTED TO A FUSED TERMINAL PAIR.
4. N.O. OR N.C. CONTACTS FORMATTED AS *RR:SS:CC ARE DERIVED FROM PLC DIGITAL OUTPUT BUFFER RELAYS. THE RELAY CONTACT INDICATOR *RR:SS:CC INDICATES THE RELAY'S ASSOCIATED PLC DIGITAL OUTPUT RACK, SLOT, AND CHANNEL.

PULLBOX/VAULT/OUTDOOR INSTALLATIONS:

1. ALL MOUNTING FASTENERS (NUTS, BOLTS SCREWS, WASHERS, ETC.) SHALL BE 316 STAINLESS STEEL.
2. ALL MOUNTING BRACKETS AND BRACING SHALL BE 316L STAINLESS STEEL.
3. ALL EXPOSED PORTIONS OF CONDUITS SHALL BE PVC-COATED RGS UNLESS SPECIFICALLY NOTED OTHERWISE.
4. CONSTRUCTION PRIORITY SHALL BE TO ENTER THE BOTTOM OF ENCLOSURES. ALL CONNECTION INTO ENCLOSURES SHALL BE WATERTIGHT. WHERE SIDE OR TOP ENTRY IS USED CONNECTIONS SHALL BE MADE USING MYERS-TYPE HUBS. REFERENCE SPECIFICATION 16130.
5. ENCLOSURE SHALL INCLUDE WELDED MOUNTING TABS. HOLES SHALL NOT BE DRILLED THROUGH ENCLOSURE SURFACES FOR MOUNTING PURPOSE.

CABLE AND CONDUIT NOTES:

1. REFERENCE SPECIFICATION 16120 FOR CONDUCTORS, INSTRUMENTATION, COMMUNICATION, AND OTHER SPECIAL CABLES AND CONDUCTORS.
2. REFERENCE SPECIFICATION 16130 FOR RACEWAYS, BOXES, AND JUNCTION BOX TYPES, AND HANDHOLE, PULLBOX, AND VAULT CONDUIT INSTALLATION METHODS.
3. CONDUIT NUMBERS ARE FORMATTED AS:

   TAANN(S) WHERE: T = TYPE (P=POWER; C=CONTROL; S=SIGNAL/INSTRUMENTATION); AA= AREA NUMBER (01-99); NN= CONDUIT IN THE AREA (01-99); S = SPARE CONDUIT (~ "TILDE")

   (P0319~) = AREA 03 POWER CONDUIT NO. 19, SPARE
   (C0112) = AREA 01 CONTROL CONDUIT NO. 12
   (S0521~) = AREA 05 SIGNAL CONDUIT NO. 21, SPARE

4. CABLE AND CONDUIT SCHEDULES:

   4.1. THE CABLE AND CONDUIT SCHEDULE PROVIDES CONDUIT NUMBER, SOURCE, DESTINATION, AND SIZE AS WELL AS CONDUCTOR AND CABLE REQUIREMENTS. REFERENCE SPECIFICATION 16130 FOR CONDUIT COMPOSITION AND COATING.

   4.2. CONDUITS MARKED WITH "* n" (WHERE n = 1, 2, OR 3) SHALL BE 100% CONTINUOUS PER SPECIFICATION 16130.

   SPECIFICALLY, CONDUITS MARKED WITH:

   "* 1" NOT USED.

   "* 2" NOT USED.

   "* 3" DENOTE INSTRUMENTATION CIRCUITS THAT ARE NOT INTRINSICALLY SAFE. IF THESE CONDUITS ENTER A PULLBOX, THEN THEY MUST CONNECT TO A "TYPE 3" J-BOX INSIDE THE PULLBOX.

CAD NO. E_SYM_ABBR.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	JRN	03/20/25
DRAWN	DCK	03/20/25
CHECKED (FIELD)		03/20/25
CHECKED (HDQTS.)		03/20/25

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

ABBREVIATIONS AND GENERAL NOTES

E-01

SCALE: AS SHOWN

PARKS FILE# AE 325-036

SHEET LIST

SHEET	SHEET DESCRIPTION
E-01	ABBREVIATIONS AND GENERAL NOTES
E-02	SHEET AND TAG LISTS, LIGHTING AND CLASSIFIED AREAS SCHEDULES
E-03	CONTROL PANEL SCHEDULE
E-04	ELECTRICAL SITE PLAN
E-05	ONE LINE DIAGRAM
E-06	GROUNDING ONE LINE DIAGRAM
E-07	PANELBOARD SCHED. SPECS AND LOAD DISTRIBUTION
E-08	POWER DISTRIBUTION PANEL [10 PDP 01] ELEVATIONS
E-09	MOTOR STARTER NOTES
E-10A	MOTOR STARTER ELEMENTARY WIRING DIAGRAM
E-10B	MOTOR STARTER ELEMENTARY WIRING DIAGRAM
E-11	CONTROL PANEL ELEMENTARY WIRING DIAGRAM
E-12	CONTROL PANEL ELEMENTARY WIRING DIAGRAM
E-13	CONTROL PANEL ELEMENTARY WIRING DIAGRAM
E-14	CONTROL PANEL ELEMENTARY WIRING DIAGRAM
E-15	WET WELL INTERFACE CONTROL PANEL
E-16	WET WELL INTERFACE CONNECTION DIAGRAM
E-17	PLC I/O TABLES
E-18	PLC I/O TABLES
EC-01	CABLE AND CONDUIT SCHEDULE
ED-01	ELECTRICAL DETAILS
ED-02	ELECTRICAL DETAILS
ED-03	ELECTRICAL DETAILS

DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
10 ANT 01	ANTENNA	NEW
10 BAT 01	BATTERY, PRIMARY CONTROL	NEW
10 BAT 02	BATTERY, SECONDARY CONTROL	NEW
10 CP 01	CONTROL PANEL, PLC	NEW
10 CREC 01	CONVENIENCE RECEPTACLE, [01 CP 01]	NEW
10 CREC 02	PROCESS RECEPTACLE, [01 CP 01]	NEW
10 CREC 03	CONVENIENCE RECEPTACLE, [01 PDP 01]	NEW
10 DCM 01	DECOUPLING DIODE MODULE, 24 VDC BUS	NEW
10 DCU 01	DC UPS CONTROLLER, 24 - 24/12 VDC, 10 A, PRIMARY CONTROL	NEW
10 DCU 02	DC UPS CONTROLLER, 24 - 24/12 VDC, 10 A, SECONDARY CONTROL	NEW
10 DET 01	DETECTOR, THERMAL/SEAL LEAK, PUMP NO. 1 MOTOR STARTER	NEW
10 DET 02	DETECTOR, THERMAL/SEAL LEAK, PUMP NO. 2 MOTOR STARTER	NEW
10 ESW 01	ETHERNET SWITCH	NEW
10 FCP 01	FIELD CONTROL PANEL, WET WELL INTERFACE	NEW
10 GRDB 01	GENERATOR RECEPTACLE, BREAKER	NEW
10 GREC 01	GENERATOR RECEPTACLE	NEW
10 HTR 01	PANEL HEATER, [01 PDP 01]	NEW
10 HTR 02	PANEL HEATER, [01 FCP 01]	NEW
10 ISBA 01	INTRINSICALLY SAFE BARRIER, ANALOG, FOR [01 LT 01]	NEW
10 ISBD 01	INTRINSICALLY SAFE BARRIER, DIGITAL, PUMP NO. 1 HIGH LEVEL FLOAT	NEW
10 ISBD 02	INTRINSICALLY SAFE BARRIER, DIGITAL, PUMP NO. 2 HIGH LEVEL FLOAT	NEW
10 ISW 01	INTRUSION SWITCH, POWER DISTRIBUTION PANEL	NEW
10 ISW 02	INTRUSION SWITCH, FIELD CONTROL PANEL	NEW
10 LS 01	HIGH LEVEL FLOAT, PUMP NO. 1	NEW
10 LS 02	HIGH LEVEL FLOAT, PUMP NO. 2	NEW

DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE
10 LT 01	LEVEL TRANSDUCER NO. 1	NEW
10 MB 01	UTILITY METER BASE	EXISTING
10 MCP 01	MOTOR CONTROL PANEL	NEW
10 MPRS 01	MOTOR PLUG-RECEPTACLE SET, PUMP NO. 1 MOTOR	NEW
10 MPRS 02	MOTOR PLUG-RECEPTACLE SET, PUMP NO. 2 MOTOR	NEW
10 MS 01	MOTOR STARTER, PUMP NO. 1 MOTOR	NEW
10 MS 02	MOTOR STARTER, PUMP NO. 2 MOTOR	NEW
10 MTR 01	MOTOR, PUMP NO. 1	NEW
10 MTR 02	MOTOR, PUMP NO. 2	NEW
10 MTS 01	MANUAL TRANSFER SWITCH	NEW
10 OIU 01	OPERATOR INTERFACE UNIT	NEW
10 PB 01	PANELBOARD, 240/120 V, 3 PH	NEW
10 PDP 01	POWER DISTRIBUTION PANEL	NEW
10 PPLT 01	POLE LIGHT	NEW
10 PS 01	POWER SUPPLY, 24 VDC, 10 A, PRIMARY PROCESS CONTROL	NEW
10 PS 02	POWER SUPPLY, 24 VDC, 10 A, SECONDARY PROCESS CONTROL	NEW
10 RAD 01	RADIO, TELEMETRY	NEW
10 SDB 01	SERVICE DISCONNECT BREAKER (SUSE)	NEW
10 SPD 01	SURGE PROTECTIVE DEVICE	NEW
10 SPDC 01	SURGE PROTECTION DEVICE CONROL, PRIMARY POWER	NEW
10 SPDC 02	SURGE PROTECTION DEVICE CONTROL, SECONDARY POWER	NEW
10 SS 01	SELECTOR SWITCH	NEW
10 UT 01	UTILITY TRANSFORMER, 240/120 VAC	NEW
10 WGTR 01	WIRE GUTTER, INSIDE [01 PDP 01]	NEW

SCHEDULE OF CLASSIFIED AREAS

LOCATION	CLASSIFICATION	EXTENT OF ENVELOPE
WET WELL	CLASS I, DIVISION 1	CLASS I, DIVISION 1 WITHIN THE WET WELL AND WITHIN A 3-FOOT RADIUS FROM THE VENT'S OPENING.
WET WELL	CLASS I, DIVISION 2	CLASS I, DIVISION 2 WITHIN A 5-FOOT RADIUS FROM THE VENT OPENING AND EXTENDING 3 FEET HORIZONTALLY FROM ALL SIDES OF THE ACCES HATCH OPENING AND 1.5 FEET HIGH, REFEENCE SHEET ED-03.
VALVE FAULT	CLASS I, DIVISION 2	WITHIN THE VAULT ENCLOSED SPACE

LIGHTING SCHEDULE

MNUEMONIC	TECHNOLOGY	APPLICATION	EM *	DESCRIPTION	MANUFACTURER		INPUT (VA)	VOLTAGE	COMMENTS
					NAME	SERIES NO.			
L1	LED	WET WELL	NO	EXPLOSION PROOF, WET APPLICATION GLOBE WITH GUARD.	EATON	EVLEDW701	37	120 VAC, 1 PH	FACTORY-SEALED, CLASS I, DIVISION 1, GROUPS C & D. NEMA 4X/IP66, 3000K. 82 CRI. PENDANT, WALL MOUNT.
L2	LED	POLE LIGHT [XX PPLT 01]	NO	RECTANGULAR, WEATHERPROOF DOWN LIGHT.	RAB LIGHTING	ALED4T78N	79	120 VAC, 1 PH	6673 LUMENS, 4000 K, BRONZE, TYPE II DISTRIBUTION, NO PHOTOCELL.
P	---	LIGHT POLE	---	ALUMINUM, SQUARE, STRAIGHT.	LITHONIA LIGHTING	SSA	---	---	NOT HINGED, 20-FOOT MOUNTING HEIGHT, 6" BASE, 6" TOP TENON, SATIN BRUSH, BLACK; RATED 130 MPH.

ELECTRICAL WORK SUMMARY:

THIS SUMMARY OF ELECTRICAL WORK IS INCLUDED AS A COURTESY AND IS INTENDED TO PROVIDE A GENERAL UNDERSTANDING OF ELECTRICAL DESIGN INTENT AND MAJOR ELECTRICAL CONSTRUCTION TASKS. IT IS NOT PROVIDED AS A COMPLETE LIST OF WORK AND SHALL NOT BE USED FOR BIDDING PURPOSES. REFER TO ALL PLANS AND SPECIFICATIONS.

1. THIS PROJECT DEMOLISHES AN EXISTING LIFT STATION AND REPLACES IT WITH NEW.
2. EXISTING UTILITY SERVICE WILL BE REUSED.
3. PROGRAMMING IS SOLE SOURCED TO TECHNICAL SYSTEMS INCORPORATED (TSI)

SHEET LIST, DEVICE TAG LIST, LIGHTING AND CLASSIFIED AREAS SCHEDULES

CAD NO. E_SYM_ABBR.DWG

NO.	REVISIONS	INT.	APP.	DATE

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JASON R. NEWQUIST STATE OF WASHINGTON 45311 REGISTERED PROFESSIONAL ENGINEER 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

SHEET AND TAG LISTS, LIGHTING AND CLASSIFIED AREAS SCHEDULES

E-02

SCALE: AS SHOWN

PARKS FILE# AE 325-036

CONTROL PANEL SCHEDULE

TAG NO.	DESCRIPTION	RATING	MATERIAL	FINISH	MINIMUM SIZE (INCHES) HEIGHT	WIDTH	DEPTH	TYPE A	TYPE B	HEATER	MOUNTING METHOD	NOTES/COMMENTS
10 CP 01	CONTROL PANEL, PLC	NEMA 3R	CARBON STEEL	STANDARD FINISH	42	30	12	X			WALL MOUNTED INSIDE [10 PDP 01]	
10 FCP 01	FIELD CONTROL PANEL, WET WELL INTERFACE	NEMA 4X	STAINLESS STEEL, 304		36	36	12		X	X	PER MOUNTING DETAIL ON PLANS	
10 MCP 01	MOTOR CONTROL PANEL	NEMA 3R	CARBON STEEL	STANDARD FINISH	48	24	10	X			WALL MOUNTED INSIDE [10 PDP 01]	WALL MOUNTED INSIDE [10 PDP 01]
10 PDP 01	POWER DISTRIBUTION PANEL	NEMA 3R	STAINLESS STEEL, 304		90	72	20		X	X	FREE-STANDING, ON HOUSEKEEPING PAD	GASKET BETWEEN STEEL AND CONCRETE PER ED SHEETS

TAG DESCRIPTION
"[" TAG NUMBER "]"

DETAIL A

CAUTION

THIS DEVICE IS POWERED
FROM SEVERAL SOURCES

THE DISCONNECT SWITCH WILL
NOT SHUT OFF ALL SOURCES
OF ELECTRICAL ENERGY

DETAIL B

CONTROL PANEL SCHEDULE NOTES:

GENERAL CONTROL PANEL NOTES:

1. THE "CONTROL PANEL SCHEDULE" INCLUDES MOTOR SAFETY DISCONNECT SWITCHES IN MANUFACTURE ENCLOSURES PLUS ELECTRICAL PANELS FABRICATED BY THE CONTRACTOR. REFERENCE SPECIFICATIONS FOR JUNCTION AND DEVICE BOXES.
2. IN GENERAL, "TYPE A" MOUNTING REQUIREMENTS APPLY TO INDOOR PANELS AND "TYPE B" APPLIES TO PANELS MOUNTED OUTDOORS. IF THE PLANS SHOW A PANEL NOT INCLUDED IN THIS LIST, AND NOT SPECIFICALLY CALLED OUT IN A DETAIL, THEN BID THE PANEL AS TYPE B.
3. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE CONTROL PANEL DETAILS, THE FOLLOWING NOTES APPLY:
   a. FOR WALL MOUNTING METHODS, REFERENCE TYPE A OR TYPE B REQUIREMENTS.
   b. PANELS LISTED AS "TYPE A" SHALL FOLLOW THE "REQUIREMENTS FOR TYPE A PANELS" LISTED TO THE RIGHT. LIKEWISE, "TYPE B" PANELS SHALL FOLLOW THE "REQUIREMENTS FOR TYPE B PANELS".
   c. ALL ENCLOSURES SHALL BE PROVIDED WITH AN ENGRAVED NAMEPLATE CORRESPONDING TO THE ASSOCIATED TAG ID NUMBER AND TAG DESCRIPTION (SEE DETAIL A). INCLUDE THE SQUARE BRACKETS [ ] AROUND THE TAG NUMBER.
   d. ALL PANELS MOUNTED TO VIBRATING EQUIPMENT SHALL BE CONNECTED WITH LFMC CONDUIT.
   e. FOR FREE-STANDING PANELS MOUNTED ON RISER FEET, THE RISER FEET SHALL BE OF THE SAME MATERIAL AND FINISH AS THE PANEL.
   f. WHERE PANELS CONTAIN POWER FROM MULTIPLE SOURCES, PROVIDE A YELLOW SAFETY STICKER, APPROXIMATELY 2" x 3" (SEE DETAIL B).

CONTROL PANELS WITH INNER DOORS:

1. INNER DOORS SHALL BE WHITE POWDER-COATED 10-GAUGE STEEL WITH A CONTINUOUS HINGE ON THE OPPOSITE SIDE OF THE ENCLOSURE DOOR (DOORS SHALL OPEN IN OPPOSITE DIRECTIONS). SUPPORT MECHANISMS SHALL BE OF SUFFICIENT STRENGTH TO ASSURE THAT THERE IS NO BENDING, SAGGING, OR SLIDING OF THE DOOR. THE DOOR SHALL BE FABRICATED TO STAY ALIGNED AT ALL TIMES. THE DOOR SHALL LATCH WITHOUT HAVING TO BE LIFTED.
2. THE INNER DOOR AND ENCLOSURE DOORS SHALL EACH BE CAPABLE OF 100 DEGREE FREE AND UNENCUMBERED MOVEMENT (MINIMUM).
3. INNER DOORS SHALL BE PROVIDED WITH A LATCHING CLASP THAT IS EASY TO LINE UP AND SAFE TO OPERATE. REMOVABLE OR LOOSE TYPES OF DOOR HARDWARE SHALL NOT BE ALLOWED.

REQUIREMENTS FOR TYPE A PANELS:

1. ALL MOUNTING HARDWARE SHALL BE GALVANIZED OR STAINLESS STEEL.
2. PANELS MOUNTED ON INTERIOR WALLS SHALL BE SUPPORTED TO THE WALL WITH 1/2-INCH (MINIMUM) GALVANIZED STEEL UNISTRUT.

REQUIREMENTS FOR TYPE B PANELS:

1. ALL MOUNTING FASTENERS (NUTS, BOLTS SCREWS, WASHERS, ETC.) SHALL BE 316 STAINLESS STEEL.
2. ALL MOUNTING BRACKETS AND BRACING SHALL BE 316L STAINLESS STEEL.
3. PANELS MOUNTED ON EXTERIOR WALLS SHALL BE SUPPORTED TO THE WALL WITH 1/2-INCH (MINIMUM) 316L STAINLESS STEEL UNISTRUT.
4. ALL EXPOSED PORTIONS OF CONDUITS ENTERING CONTROL PANELS SHALL BE PVC-COATED RGS.
5. ALL CONNECTIONS INTO ENCLOSURES SHALL BE WATERTIGHT, MADE ONLY FROM THE BOTTOM, USING MEYER-TYPE HUBS.
6. DEVICES MOUNTED ON THE CONTROL PANEL DOOR SHALL BE OUTDOOR RATED.
7. PANELS LARGER THAN 24"H x 24"W SHALL BE PROVIDED WITH PAD-LOCKABLE 3-POINT LATCH DOOR(S).
8. PANELS WITH DOUBLE DOORS SHALL BE A RIGHT-HAND, 3-POINT LATCHING DOOR OVER A LEFT-HAND UNLATCHED DOOR. FRONT CENTER POSTS ARE NOT ALLOWED.
9. FREE-STANDING PANELS SHALL INCLUDE DOOR CATCHES ON THE BOTTOM OF THE HINGED SIDES TO HOLD THE DOORS IN THE OPEN POSITION.
10. PANELS SHALL BE PROVIDED WITH A DRIP SHIELD MATCHING THE METALLURGY AND FINISH OF THE ENCLOSURE.
11. DEVICES MOUNTED TO THE TOPS OF ENCLOSURES SUCH AS ANTENNAS, STROBE LIGHTS, AND ETC. SHALL BE PROVIDED WITH GASKETS AND SEALS THAT ARE IMMUNE TO ULTRAVIOLET LIGHT, FREEZING, WATER, AND BIOLOGICAL GROWTH.
12. PROVIDE A 120 VAC INTERIOR PANEL HEATER FOR CONTROL PANELS MARKED AS "HEATER".
13. PANELS SHALL BE PROVIDED WITH AN INTRUSION SWITCH THAT IS ELECTRICALLY "OPEN" WHEN THE DOOR IS OPEN.

CAD NO. E_SYM_ABBR.DWG

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JASON R. NEWQUIST
STATE OF WASHINGTON
45311
REGISTERED
PROFESSIONAL ENGINEER
3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

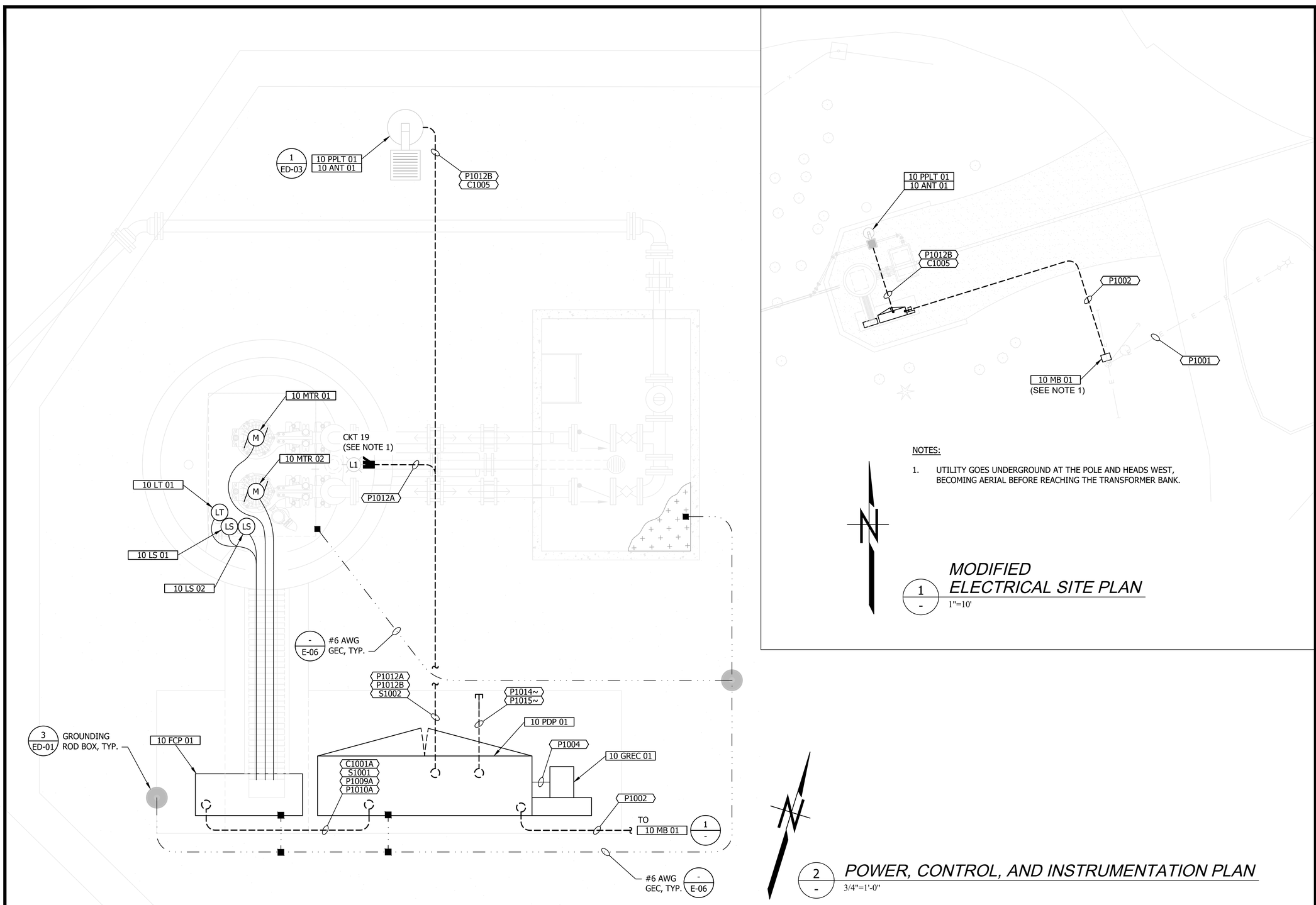
LIFT STATION REPLACEMENT

CONTROL PANEL SCHEDULE

E-03

SCALE: AS SHOWN

PARKS FILE# AE 325-036



NOTES:

1. UTILITY GOES UNDERGROUND AT THE POLE AND HEADS WEST, BECOMING AERIAL BEFORE REACHING THE TRANSFORMER BANK.

1 / - *MODIFIED ELECTRICAL SITE PLAN*
1"=10'

2 / - *POWER, CONTROL, AND INSTRUMENTATION PLAN*
3/4"=1'-0"

NOTES:

1. MOUNT THE EXPLOSION PROOF LIGHT FIXTURE AS SHOWN IN THE MECHANICAL WET WELL SECTION A ON SHEET M-04.

SHEET 21 OF 40

CAD NO. E_BLDG.DWG

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WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

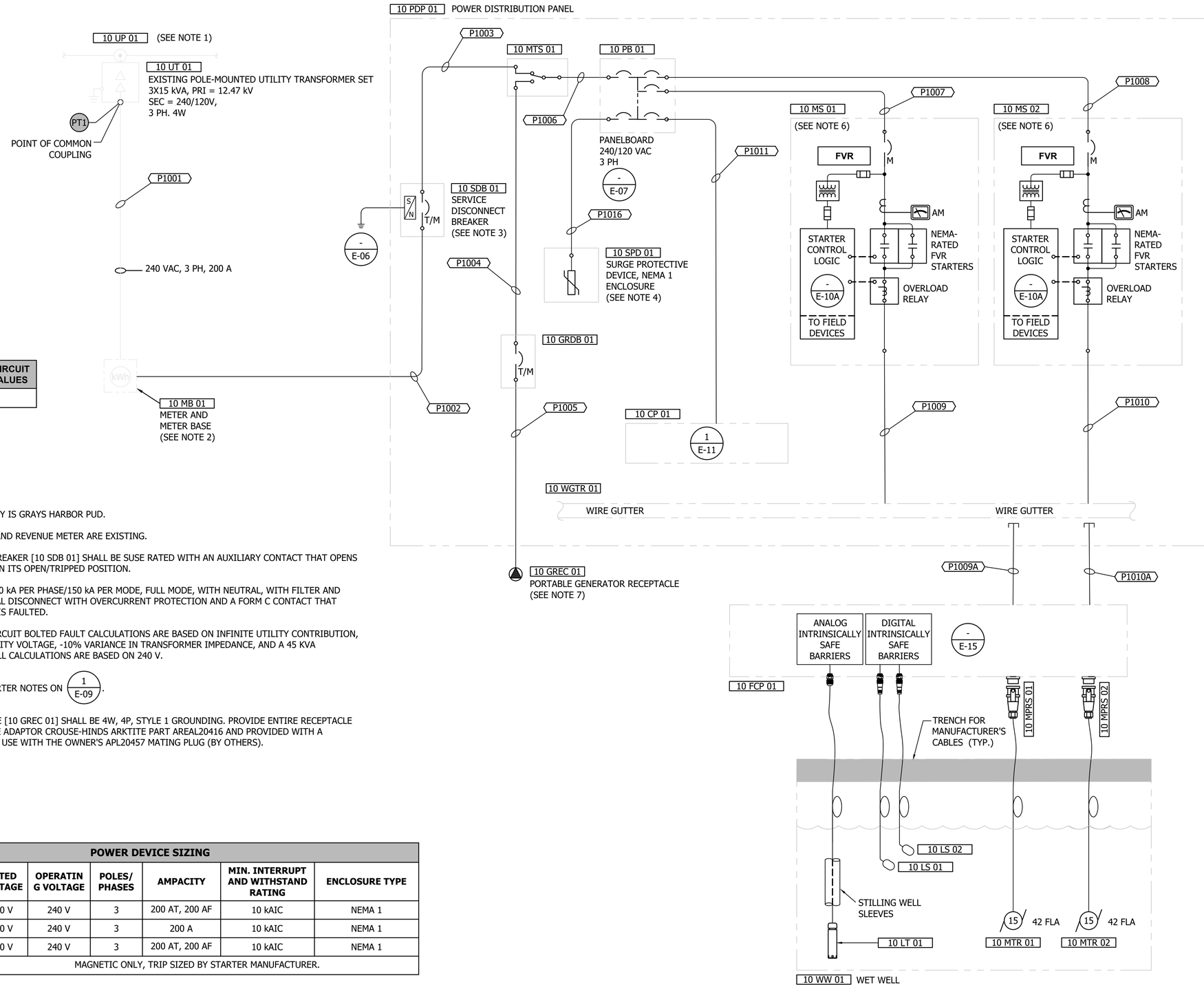
ELECTRICAL SITE PLAN

E-04

SCALE: AS SHOWN

PARKS FILE# AE 325-036

M:\WSPARKS\23578.00 Twin Harbors Pump Station\01 Design\PLANSET\Electrical\E_BLDG.DWG, 3/25/2025 11:52 AM, DAVID KLATT



BOLTED FAULT TABLE

FAULT POINT	3 PHASE SHORT CIRCUIT BOLTED FAULT VALUES
PT1	8.3 kAIC

(SEE NOTE 5)

NOTES:

1. POWER UTILITY COMPANY IS GRAYS HARBOR PUD.
2. CURRENT SENSING CTs AND REVENUE METER ARE EXISTING.
3. SERVICE DISCONNECT BREAKER [10 SDB 01] SHALL BE SUSE RATED WITH AN AUXILIARY CONTACT THAT OPENS WHEN THE BREAKER IS IN ITS OPEN/TRIPPED POSITION.
4. [10 SPD 01] SHALL BE 300 kA PER PHASE/150 kA PER MODE, FULL MODE, WITH NEUTRAL, WITH FILTER AND SHALL INCLUDE INTERNAL DISCONNECT WITH OVERCURRENT PROTECTION AND A FORM C CONTACT THAT OPENS WHEN THE UNIT IS FAULTED.
5. THREE PHASE SHORT CIRCUIT BOLTED FAULT CALCULATIONS ARE BASED ON INFINITE UTILITY CONTRIBUTION, +10% VARIANCE IN UTILITY VOLTAGE, -10% VARIANCE IN TRANSFORMER IMPEDANCE, AND A 45 KVA TRANSFORMER BANK. ALL CALCULATIONS ARE BASED ON 240 V.
6. REFERENCE MOTOR STARTER NOTES ON 1/E-09.
7. GENERATOR RECEPTACLE [10 GREC 01] SHALL BE 4W, 4P, STYLE 1 GROUNDING. PROVIDE ENTIRE RECEPTACLE ASSEMBLED WITH ANGLE ADAPTOR CROUSE-HINDS ARKTITE PART AREAL20416 AND PROVIDED WITH A LOCKABLE END CAP. FOR USE WITH THE OWNER'S APL20457 MATING PLUG (BY OTHERS).

POWER DEVICE SIZING

TAG NUMBER	RATED VOLTAGE	OPERATING VOLTAGE	POLES/ PHASES	AMPACITY	MIN. INTERRUPT AND WITHSTAND RATING	ENCLOSURE TYPE
10 GRDB 01	250 V	240 V	3	200 AT, 200 AF	10 kAIC	NEMA 1
10 MTS 01	250 V	240 V	3	200 A	10 kAIC	NEMA 1
10 SDB 01	250 V	240 V	3	200 AT, 200 AF	10 kAIC	NEMA 1
10 MS 01, 02	MAGNETIC ONLY, TRIP SIZED BY STARTER MANUFACTURER.					

CAD NO. E_OLD.DWG

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	INT.
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JASON R. NEWQUIST STATE OF WASHINGTON 45311 REGISTERED PROFESSIONAL ENGINEER 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

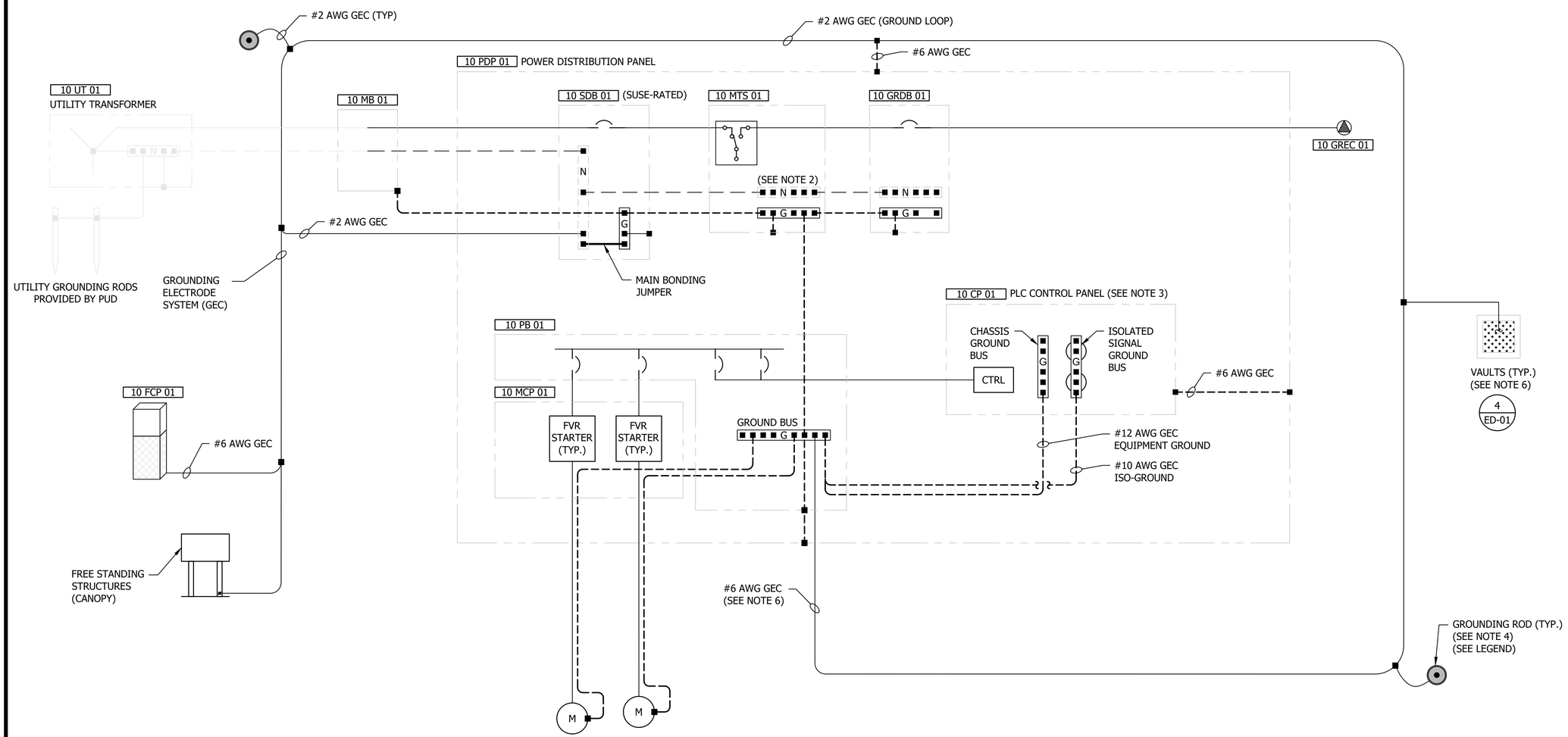
LIFT STATION REPLACEMENT

ONE LINE DIAGRAM

E-05

SCALE: AS SHOWN

PARKS FILE# AE 325-036



NOTES:

1. REFERENCE SPECIFICATION 16060.
2. NEUTRALS ARE NOT SWITCHED IN THE MTS UNIT.
3. THE ISOLATED GROUND BUS IN [10 CP 01] IS NOT CONNECTED TO [10 CP 01] CHASSIS GROUND BUS, BUT THEY ARE AT THE SAME POTENTIAL.
4. DRIVE 10' X 3/4" GROUND RODS AT TWO CORNERS OF THE PROJECT SITE AS SHOWN ON THE POWER, CONTROL, AND INSTRUMENTATION PLAN (2 / E-04). CONNECT TO GROUND LOOP WITH #2 BARE COPPER GECs BURIED AT A DEPTH OF 30" MINIMUM. GROUND ROD CONNECTIONS SHALL BE ACCESSIBLE FROM WITHIN GROUND BOXES (3 / ED-01).
5. BARE GROUND WIRES EMERGING FROM CONCRETE SHALL BE PROTECTED WITH PVC SCHEDULE 40 CONDUIT SLEEVES PER (2 / ED-01).
6. RUN ADDITIONAL #6 AWG BARE COPPER GECs BETWEEN THE GROUND LOOP AND EACH POWER DISTRIBUTION PANEL AND EACH VAULT.

GROUNDING LEGEND	
———	POWER CONDUCTORS
— — —	NEUTRAL CONDUCTORS
- - - - -	EQUIPMENT GROUND CONDUCTORS
———	GROUNDING ELECTRODE CONDUCTORS (GEC)
——	GROUNDING ELECTRODE TAP
■ ■ N ■ ■	NEUTRAL BUS
■ ■ G ■ ■	GROUND BUS
	GROUNDING ROD BOX W/ 10' X ¾" GROUNDING ROD

1 / - GROUNDING ONE LINE DIAGRAM

SHEET 23 OF 40

CAD NO. E_OLD.DWG

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WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

GROUNDING ONE LINE DIAGRAM

E-06

SCALE: AS SHOWN

PARKS FILE# AE 325-036

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PANELBOARD [10 PB 01] SCHEDULE

CKT. NO.	DIRECTORY	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	LOAD TYPE	BKR AMPS	BUS	BKR AMPS	LOAD TYPE	PHASE A VA	PHASE A A	PHASE B VA	PHASE B A	PHASE C VA	PHASE C A	DIRECTORY	CKT. NO.	
1	[10 MS 01], MOTOR STARTER, PUMP NO. 1 MOTOR	5,577	42.0					M	3/60	A	3/60	M	5,577	42.0					[10 MS 02], MOTOR STARTER, PUMP NO. 2 MOTOR	2	
3	[10 MS 01], MOTOR STARTER, PUMP NO. 1 MOTOR			5,577	42.0			M	|	B	|	M			5,577	42.0			[10 MS 02], MOTOR STARTER, PUMP NO. 2 MOTOR	4	
5	[10 MS 01], MOTOR STARTER, PUMP NO. 1 MOTOR					5,577	42.0	M	|	C	|	M					5,577	42.0	[10 MS 02], MOTOR STARTER, PUMP NO. 2 MOTOR	6	
7	[10 CP 01], CONTROL PANEL, PLC	600	5.0					Z	1/20	A	1/20	Z	600	5.0					[10 CP 01], CONTROL PANEL, PLC	8	
9	COVERED SPACE			-	-			Z	---	B	---	Z			-	-			COVERED SPACE	10	
11	[10 CREC 03], CONVENIENCE RECEPTACLE, [01 PDP 01]					180	1.5	R	1/20	C	1/20	Z					600	5.0	[10 CP 01], CONTROL PANEL, PLC	12	
13	[10 PPLT 01], POLE LIGHT	250	2.1					L	1/20	A	1/20	Z	-	-					SPARE BREAKER	14	GFCI
15	COVERED SPACE			-	-			Z	---	B	---	Z			-	-			COVERED SPACE	16	
17	[10 PDP 01], POWER DISTRIBUTION PANEL					350	2.9	Z	1/20	C	1/20	Z					-	-	SPARE BREAKER	18	GFCI
19	WET WELL LIGHT	37	0.3					L	1/20	A	1/20	Z	-	-					SPARE BREAKER	20	
	SUM OF PHASE LOADS	6,464	49.4	5,577	42.0	6,107	46.4						6,177	47.0	5,577	42.0	6,177	47.0	**SUM OF PHASE LOADS**		

[10 PB 01] ELECTRICAL AND CONSTRUCTION SPECIFICATIONS:

CONFIGURATION:	240/120 VAC, 3 PH, 60 Hz
POWER BUS:	200 A, COPPER
NEUTRAL BUS:	200 A (100% OF POWER BUS), ISOLATED FROM GROUND, SOLDERLESS CONNECTIONS
GROUND BUS:	PROVIDE PER UL 67
BUS BRACING:	10 kAIC, MINIMUM
MAIN BREAKER:	150 AT, 150 AF, 3 PH, 3 P, 10 kAIC, MOLDED CASE, VERTICAL MOUNTING
DISTRIBUTION BREAKERS:	STAB-TYPE, 10 kAIC, MINIMUM
GROUND BONDING:	SUITABLE FOR SERVICE ENTRY
ENCLOSURE:	NEMA 1
NUMBER OF CIRCUITS:	20
UNCOMMITTED CIRCUITS:	FILL WITH SPARE 10 kAIC BREAKERS AS SHOWN IN THE SCHEDULE
POWER DERIVED FROM:	[10 UT 01], UTILITY TRANSFORMER, 240/120 VAC
BUS BREAKERS:	3 POLE BREAKERS, 2x 60 A, 10 kAIC
	1 POLE BREAKERS, 10x 20 A, 10 kAIC

LEGEND:

GFCI DENOTES GFCI PANELBOARD CIRCUIT BREAKER.

NOTES:

1. THE CONTRACTOR SHALL PROVIDE A TYPED PANELBOARD SCHEDULE FOR ALL ACTUAL LOAD ASSIGNMENTS.
2. PROVIDE WARNING LABEL(S) INDICATING HIGH LEG ON PHASE B.

LOAD DISTRIBUTION:	AMPS	VA	%
BY PHASE:			
TOTAL LOAD, PHASE A:	96.4 A	12,642 VA	35.2%
TOTAL LOAD, PHASE B:	84.0 A	11,155 VA	30.7%
TOTAL LOAD, PHASE C:	93.4 A	12,285 VA	34.1%
BY LOAD TYPE:			
TOTAL LIGHTING (L):		287 VA	0.8%
TOTAL MOTOR (M):		33,464 VA	92.7%
TOTAL HVAC (H):		0 VA	0.0%
TOTAL RECEPTACLE (R):		180 VA	0.5%
TOTAL OTHER (Z):		2,150 VA	6.0%
TOTAL CONNECTED LOAD:		**36.08 kVA**	**100.0%**
TOTAL CALCULATED (NEC) LOAD:		**40.34 kVA**	

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JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

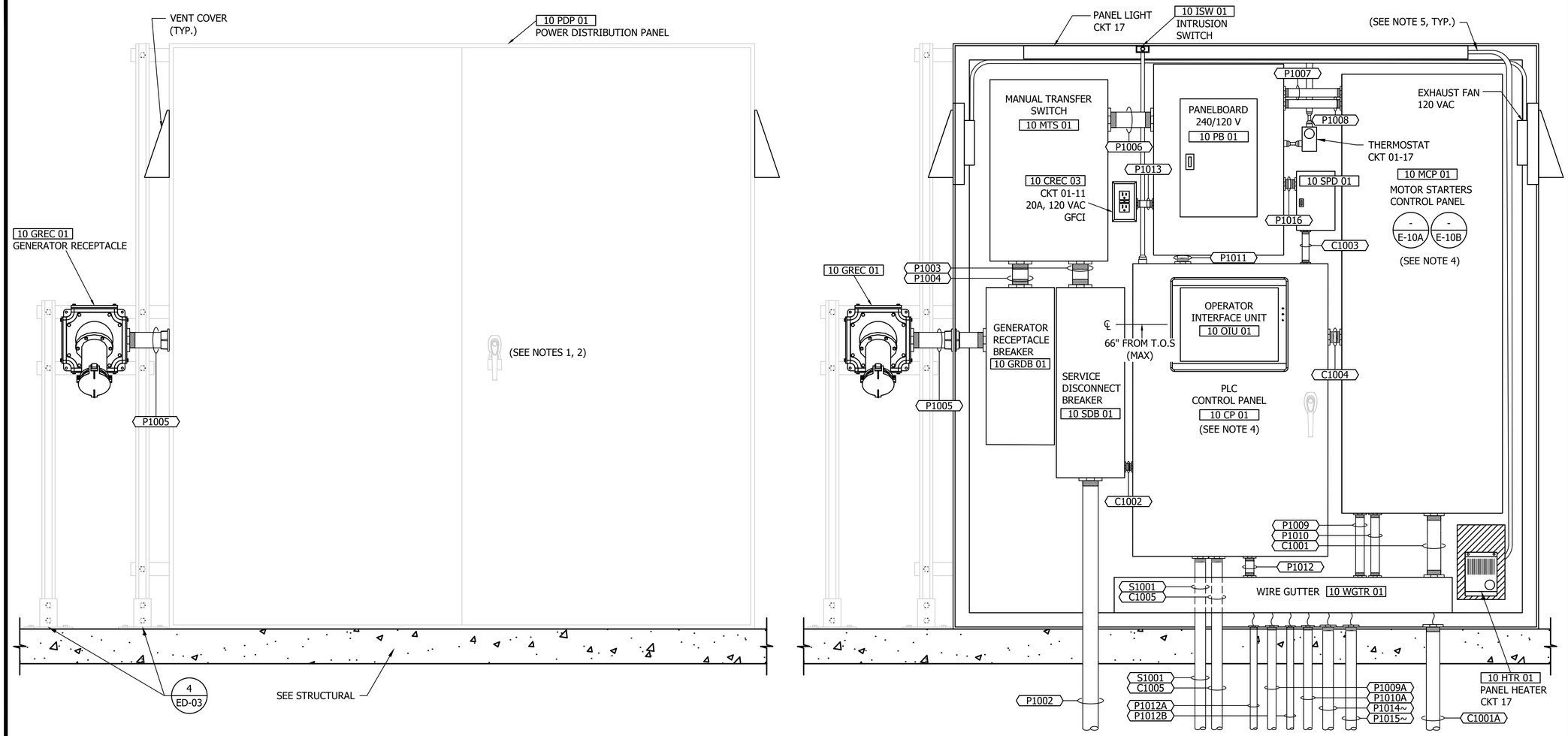
LIFT STATION REPLACEMENT

PANELBOARD SCHED. SPECS AND LOAD DISTRIBUTION

E-07

SCALE: AS SHOWN

PARKS FILE# AE 325-036



EXTERIOR

INTERIOR

NOTES:

1. SEE CONTROL PANEL SCHEDULE AND NOTES ON SHEET E-03.
2. ALL EXTERNAL CONDUITS SHALL BE PVC-COATED RGS. WIRES BETWEEN INTERNAL AND EXTERNAL RACEWAYS WILL BE EXPOSED FOR THE SHORT DISTANCE BETWEEN THE BOTTOM PENETRATION AND THE WIRE GUTTER.
3. DEVICE LOCATIONS ON THIS SHEET SHOW A LAYOUT INTENT. DEVICES MAY BE PLACED OTHERWISE AS REQUIRED FOR BEST FIT AND ACCESS BY THE OPERATOR.
4. PILOT LIGHTS , PUSH BUTTONS AND CONVENIENCE RECEPTACLES ARE NOT SHOWN HERE. REFERENCE SHEET E-11 FOR PLC CONTROL PANEL [10 CP 01] LAYOUT REQUIREMENTS, E-10B FOR STARTER LAYOUT.
5. COOLING FANS, PANEL LIGHT, PANEL HEATER, AND INTRUSION SWITCH SHALL BE NEATLY WIRED WITH SO CORD, BUNDLED AND STRAPPED. PANEL ADHESIVE CABLE HOLDERS ARE NOT ALLOWED. DRILL AND TAP CABLE HOLDERS.

1 / - *POWER DISTRIBUTION PANEL [10 PDP 01] ELEVATIONS*

SHEET 25 OF 40

CAD NO. E_PMCPEL.DWG

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TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

POWER DISTRIBUTION PANEL [10 PDP 01] ELEVATIONS

E-08

SCALE: AS SHOWN

PARKS FILE# AE 325-036

MOTOR STARTER GENERAL NOTES:

G.1. REFERENCE MOTOR STARTER AND CONTROL PANEL SPECIFICATIONS.

G.2. METAL OXIDE VARISTORS SHALL PARALLEL EACH 120 VAC CONTROL RELAY, TIMER COIL, AND SOLENOID VALVE. REVERSE-BIASED DIODES SHALL PARALLEL EACH 24 VDC CONTROL RELAY.

G.3. ALL PILOT LIGHTS SHALL BE PUSH-TO-TEST LED STYLE.

G.4. THE "POWER-UP DELAY" TIMER DISABLES THE DRIVE FOLLOWING A POWER UP TO ALLOW DRIVES TO CHARGE UP, REBOOT, AND STABILIZE BEFORE BEING PLACED INTO OPERATION. THESE DELAYS ARE OFFSET BETWEEN DRIVES TO ELIMINATE THE POSSIBILITY OF STARTING MULTIPLE MOTORS SIMULTANEOUSLY WHEN POWERED UP IN "HAND".

G.5. PROVIDE AN ELECTRO-MECHANICAL ELAPSED TIME METER AND MOTOR START COUNTER ON A SINGLE METER PER SPECIFICATION.

G.6. SIZE STARTER CONTROL TRANSFORMERS TO HANDLE ALL DRIVE/STARTER CONTROL DEVICES AS PER REFERENCED ELEMENTARY WIRING DIAGRAMS PLUS 25%. UPSIZE FOR REMOTE PANEL HEATERS, PILOT LIGHTS, SOLENOID VALVES, INTRINSICALLY SAFE BARRIERS, COOLING FANS, AND ETC. WHERE APPLICABLE.

G.7. ALL MOTOR STARTER CONTROLLERS SHALL BE CONFIGURED TO RESET FROM A DOOR-MOUNTED STANDARD PUSHBUTTON - NOT FROM A MANUFACTURER'S CONTROL MODULE. PROVIDE A SEPARATE RESET PUSHBUTTON ON THE STARTER DOOR FOR THIS PURPOSE.

G.8. PANEL MANUFACTURER SHALL SIZE AND SET MOTOR STARTER BREAKERS AND MOTOR OVERLOAD PROTECTION DEVICES BASED ON NEC AND MOTOR MANUFACTURER'S REQUIREMENTS.

SHADED DEVICES ON MOTOR STARTER ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE STARTER.

———— REFERS TO 120 VAC CONTROL WIRING
— — — REFERS TO 24 VDC CONTROL WIRING

FVR SPECIFIC NOTES:

F.1. STARTER MAIN CONTACTORS SHALL BE STANDARD NEMA CONTACTOR SIZES (NEMA SIZE 1 MINIMUM).

F.2. REFERENCE OVERLOAD RELAY NOTES, OL.n.

F.3. MOTOR STARTER BREAKERS SHALL BE MAGNETIC ONLY AND SHALL INCLUDE AN AUXILIARY CONTACT THAT OPENS WHEN THE BREAKER IS TRIPPED OR MANUALLY OPENED.

F.4. FRONT PANEL DIAL-TYPE AMMETERS SHALL BE PROVIDED FOR EACH FVR STARTER.

OVERLOAD RELAYS, NETWORKED:

OL.1 THE OVERLOAD RELAY SHALL BE NETWORK COMPATIBLE WITH THE MAIN PROCESS PLC. THE STARTER MANUFACTURER SHALL PROVIDE ALL HARDWARE, CABLING, AND PROGRAMMING REQUIRED TO MONITOR AND TRIP THE STARTER ON THE FOLLOWING CONDITIONS:

TRIP ON:	MONITOR ALSO:
THERMAL OVERLOAD	STALL
PHASE LOSS	UNDERLOADED
PHASE ROTATION	AVERAGE CURRENT
UNDERVOLTAGE (L-L)	AVERAGE VOLTAGE
OVERVOLTAGE (L-L)	REAL POWER (kW)
CURRENT IMBALANCE	APPARENT POWER (kVA)

ALL LISTED STATUS AND EVENTS SHALL BE AVAILABLE OVER THE NETWORK.

OL.2 THE OVERLOAD RELAY SHALL INCLUDE A "CALL TO RUN", A "FAULT", AND A "STARTER OK" OUTPUT CONFIGURED AS SHOWN ON THE "INTERNAL CONTROL LOGIC DETAIL" DIAGRAMS ASSOCIATED WITH EACH STARTER.

OL.3 THE OVERLOAD RELAYS SHOWN IN THESE MOTOR ELEMENTARY WIRING DIAGRAMS ARE TYPICAL AND MAY NOT REPRESENT ALL APPROVED MANUFACTURERS. SELECTED MANUFACTURERS SHALL SUBMIT ELECTRICAL WIRING DIAGRAMS SHOWING DETAILED CONNECTIONS THAT FOLLOW THE DESIGN INTENT AND OPERATION OF THOSE SHOWN HEREIN. MODIFICATIONS OR COMPROMISES TO THE DESIGN FUNCTION WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

OL.4 OVERLOAD RELAYS SHALL BE CONFIGURED TO RESET FROM TEMPORARY CLOSURE OF A DOOR-MOUNTED PUSHBUTTON, NOT FROM MANUFACTURER'S DOOR-MOUNTED CONTROL MODULES. PROVIDE A RESET PUSHBUTTON ON THE STARTER DOOR PER SPECIFICATION.

OL.5 IF REQUIRED, EXTENDED I/O MODULES SHALL PLUG DIRECTLY INTO THE OVERLOAD RELAYS. SEPARATE POWER AND ETHERNET CONNECTIONS SHALL NOT BE REQUIRED.

FOR SUBMERSIBLE PUMPS WITH INTRINSICALLY SAFE HIGH-LEVEL FLOATS:

IN.1. WET WELL HIGH-LEVEL FLOAT SWITCHES ARE CONNECTED FROM THE WET WELL TO THEIR ASSOCIATED STARTERS THROUGH INTRINSICALLY SAFE BARRIERS. THESE BARRIERS ARE POWERED FROM THEIR SPECIFIC MOTOR STARTERS BUT MOUNTED IN A REMOTE CONTROL PANEL. NO INTRINSIC CIRCUITS SHALL EXIST INSIDE THE MOTOR STARTERS.

IN.2. THE HIGH-LEVEL FLOAT SWITCHES WILL FORCE THEIR ASSOCIATED MOTORS TO START IMMEDIATELY ON WATER RISING TO THE SWITCH TRIP LEVEL, AND WILL MAINTAIN PUMP OPERATION FOR A TIME-DELAYED PERIOD AFTER THE LEVEL HAS FALLEN BELOW THE FLOAT'S TRIP POINT.

FOR SUBMERSIBLE PUMPS WITH MINI-CAS CONTROLLERS:

S.1. MOTOR OVERTEMP AND LEAKAGE DETECTION IS DESIGNED USING A 120 VAC FLYGT MINI-CAS II.

S.2. THE MOTOR STARTER MANUFACTURER SHALL PROVIDE AND WIRE THE DETECTOR SOCKET. THE MOTOR MANUFACTURER SHALL PROVIDE THE DETECTOR. THE CONTRACTOR IS RESPONSIBLE FOR CHANGES IN DESIGN, INSTALLATION, AND DOCUMENTATION IF OTHER MANUFACTURER OR METHODS ARE USED. DESIGN CHANGES SHALL BE APPROVED BY ENGINEERING.

S.3. SET DETECTOR FOR AUTO RESET ON OVERTEMP AND SEAL LEAK. SET ASSOCIATED MOTOR STARTER LOGIC TO DISABLE THE PUMP ON MOTOR OVERTEMP AND/OR CONTROLLER ALARM AND/OR REMOVAL OF CONTROLLER.

CAD NO. E_MSEWD.DWG

NO.	REVISIONS	INT.	APP.	DATE

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JASON R. NEWQUIST STATE OF WASHINGTON 45311 REGISTERED PROFESSIONAL ENGINEER 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

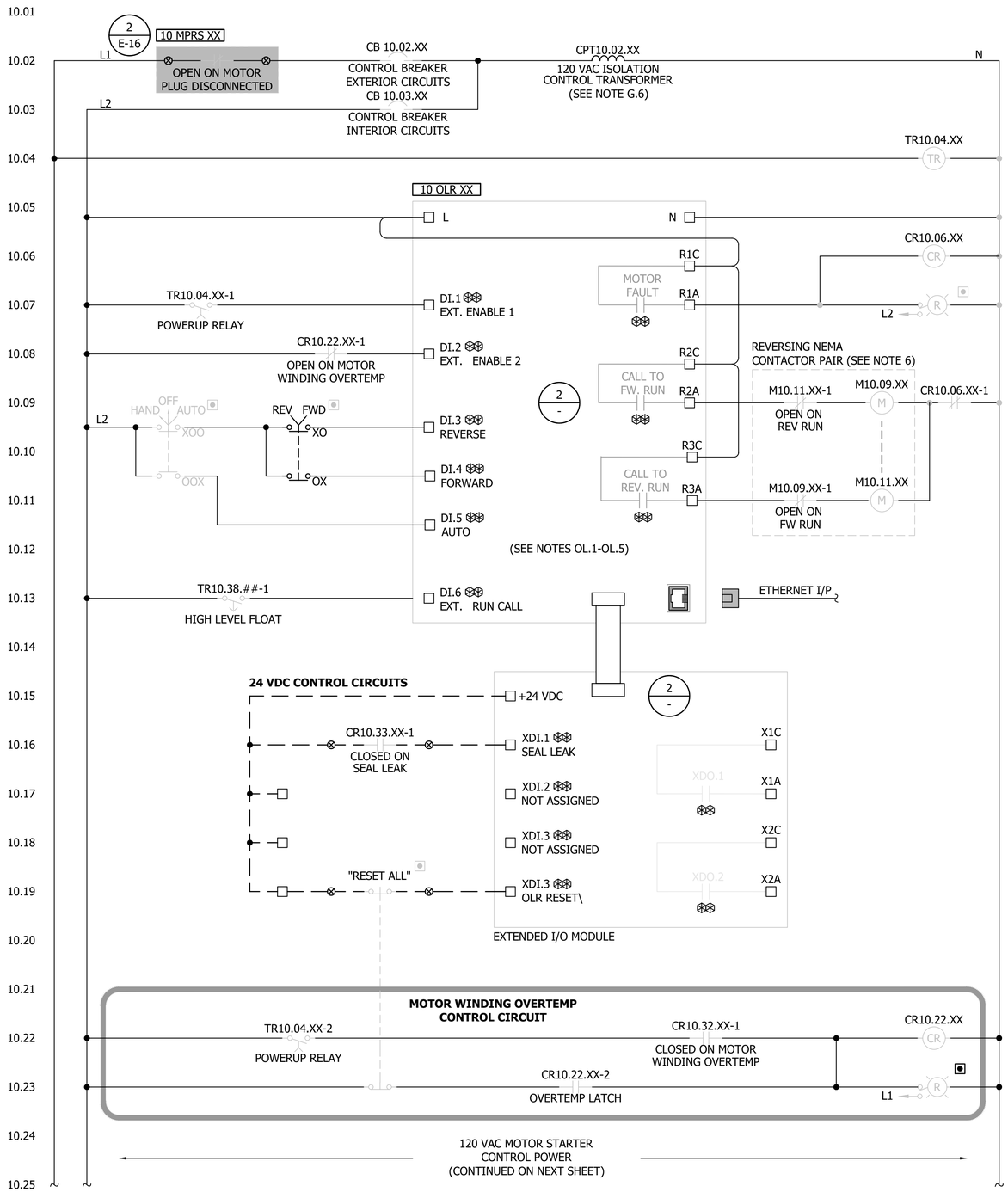
LIFT STATION REPLACEMENT

MOTOR STARTER NOTES

E-09

SCALE: AS SHOWN

PARKS FILE# AE 325-036



1 - *MOTOR STARTERS ELEMENTARY WIRING DIAGRAM - PART A*

XX = 01 FOR PUMP NO. 1
XX = 02 FOR PUMP NO. 2

RELAY CONTACT ASSIGNMENTS

1: 10.07 NA\ 2: 10.22 NA\	POWER-UP DELAY TIMER	DELAY STARTER OPERATION FOLLOWING A POWERUP (SEE TIMER TABLE AND NOTE G.4)
1: NA 10.09\ 2: NA NA\	MOTOR FAULT EXTENSION RELAY	"MOTOR FAULT" STATUS INDICATOR ACTIVE ON MOTOR FAULT CONDITIONS (SEE NOTE G.3)
1: NA 10.11\ 2: 10.27 NA\	"FORWARD" POWER CONTACTOR	ACTIVE ON MOTOR COMMANDED TO RUN FORWARD. APPLIES FULL VOLTAGE POWER DIRECTLY TO MOTOR. (SEE NOTE F.1)
1: NA 10.09\ 2: 10.28 NA\	"REVERSE" POWER CONTACTOR	ACTIVE ON MOTOR COMMANDED TO RUN IN REVERSE. APPLIES FULL VOLTAGE POWER DIRECTLY TO MOTOR. (SEE NOTE F.1)
1: NA 10.08\ 2: 10.23 NA\	MOTOR WINDING OVERTEMP RELAY	LATCHED ON MOTOR OVERTEMP. MANUAL RESET TO CLEAR. "MOTOR OVERTEMP" STATUS INDICATOR (SEE NOTE G.3)

NOTES:

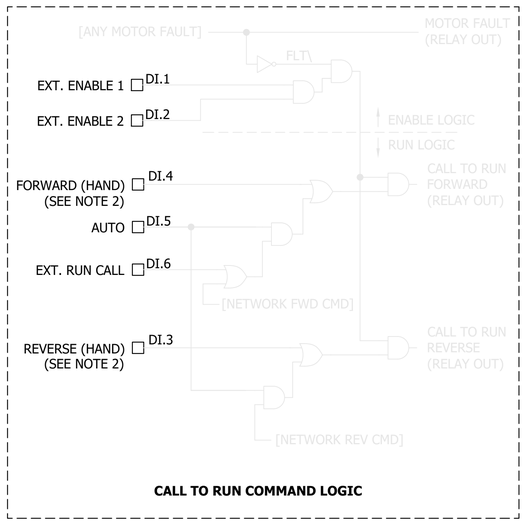
1. REFERENCE SPECIFICATION 16420.
2. REFERENCE MOTOR STARTER NOTES ON - / E-09 WHERE:

   F.n = FVR NOTES,
   G.n = GENERAL NOTES,
   OL.n = OVERLOAD RELAY NOTES,
   S.n = SUBMERSIBLE PUMP NOTES.
   IN.n = INTRINSICALLY SAFE
3. REFERENCE NEXT SHEET FOR DOOR PANEL LAYOUTS.
4. ALL PHYSICAL RELAYS AND TIMERS SHALL BE PROVIDED AS SHOWN.
5. 120 VAC POWER TO PANEL HEATER [10 HTR 02] INSIDE FIELD CONTROL PANEL [10 FCP 01] IS POWERED FROM MOTOR STARTER [10 MS 01] ONLY.
6. REVERSING NEMA 2 MOTOR CONTACTORS CONSIST OF TWO CONTACTORS THAT ARE MECHANICALLY AND ELECTRICALLY INTERLOCKED TO PREVENT ENERGIZATION OF BOTH CONTACTORS SIMULTANEOUSLY.

❁ = INPUTS AND OUTPUTS TO BE SENSED BY THE PLC OVER THE NETWORK.

TIMER TABLE

TIMER	FUNCTION	TYPE	AKA	INITIAL SETTING
TR01.04.01	POWER-UP DELAY	TDAE	ON DELAY	2 SECONDS
TR01.04.02	POWER-UP DELAY	TDAE	ON DELAY	3 SECONDS
TR01.40.01	HIGH LEVEL SHUT-OFF DELAY, PUMP NO. 1	TDAD	OFF DELAY	8 MINUTES
TR01.40.02	HIGH LEVEL SHUT-OFF DELAY, PUMP NO. 2	TDAD	OFF DELAY	10 MINUTES



CALL TO RUN COMMAND LOGIC

NOTES:

1. CONFIGURE THE STARTER'S RUN COMMAND LOGIC IS SHOWN ABOVE. THIS FUNCTIONALITY MUST BE DEMONSTRATED DURING SHOP WITNESS TESTING.
2. "REV"/"FW" AND "AUTO" CONDITIONS ARE MUTUALLY EXCLUSIVE.
3. PLC "VALID COMMUNICATION" STATUS IS DERIVED FROM WITHIN THE OVERLOAD RELAY.

2 - *FVR INTERNAL CONTROL LOGIC DETAIL*

RUN COMMAND AND "READY" STATUS

MOTOR STARTER REFERENCE TABLE

YY	TAG	DESCRIPTION
01	[10 MS 01]	MOTOR STARTER, PUMP NO. 1
02	[10 MS 02]	MOTOR STARTER, PUMP NO. 2

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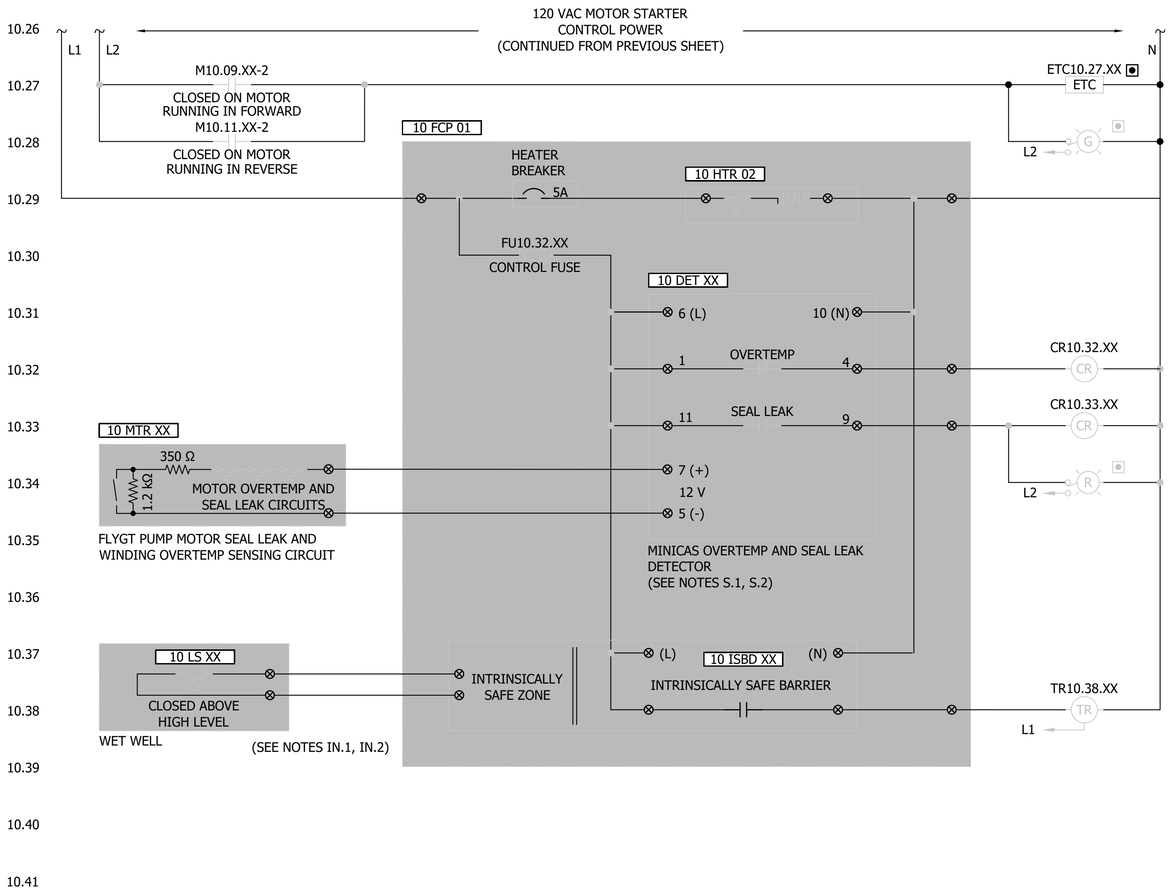
LIFT STATION REPLACEMENT

MOTOR STARTER ELEMENTARY WIRING DIAGRAM

E-10A

SCALE: AS SHOWN

PARKS FILE# AE 325-036



RELAY CONTACT ASSIGNMENTS

ELAPSED TIME/COUNTER METER
(SEE NOTE G.5)

"MOTOR RUNNING" STATUS INDICATOR
ACTIVE ON MOTOR RUNNING
CONDITIONS
(SEE NOTE G.3)

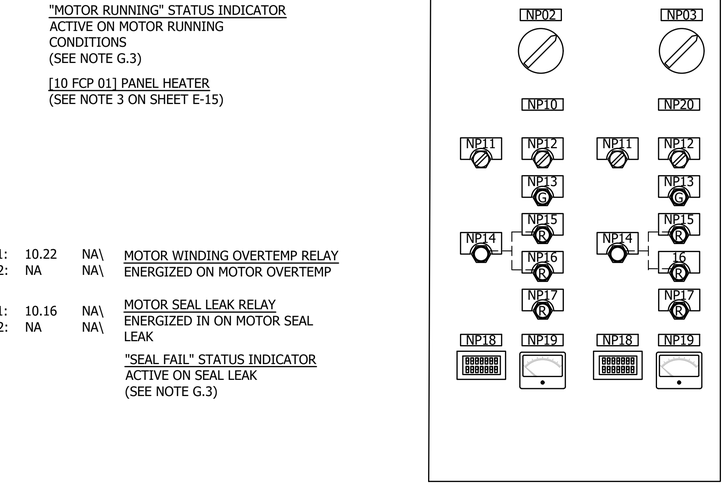
[10 FCP 01] PANEL HEATER
(SEE NOTE 3 ON SHEET E-15)

1: 10.22 NA\ MOTOR WINDING OVERTEMP RELAY
2: NA NA\ ENERGIZED ON MOTOR OVERTEMP

1: 10.16 NA\ MOTOR SEAL LEAK RELAY
2: NA NA\ ENERGIZED IN ON MOTOR SEAL LEAK

"SEAL FAIL" STATUS INDICATOR
ACTIVE ON SEAL LEAK
(SEE NOTE G.3)

1: 10.13 NA\ HIGH LEVEL SWITCH TIMER
2: 10.40 NA\ ENERGIZED IN ON ASSOCIATED HIGH LEVEL FLOAT SWITCH
(SEE TIMER TABLE)



TR10.38.XX-2
HIGH LEVEL FLOAT
MOTORS NO. 1 AND NO. 2 HIGH LEVEL FLOAT SIGNALS TO PLC (LINES 13.03, 13.04)

MOTOR STARTER NAMEPLATE SCHEDULE

ITEM NUMBER	NAMEPLATE ENGRAVING
NP02	PUMP NO. 1, BREAKER
NP03	PUMP NO. 2, BREAKER
NP10	PUMP NO. 1
NP11	HAND - OFF - AUTO
NP12	REVERSE - FORWARD
NP13	MOTOR RUNNING (PILOT, GREEN)
NP14	RESET ALL
NP15	MOTOR FAULT (PILOT, RED)
NP16	MOTOR OVERTEMP (PILOT, RED)
NP17	SEAL FAIL (PILOT, RED)
NP18	ELAPSE TIME/COUNTER METER
NP19	ANALOG AMMETER
NP20	PUMP NO. 2

NOTES:

1. STARTER BREAKERS SHALL BE LOCKABLE IN THE OPEN POSITION AND SHALL BE PROVIDED WITH A DOOR LATCHING MECHANISM THAT ALLOWS THE DOOR TO OPEN UNDER POWER WITH A SPECIAL TOOL. PROVIDE AN AUXILIARY CONTACT ON BREAKERS THAT IS OPEN WHEN THE BREAKER IS OPEN AND CLOSED WHEN THE BREAKER IS CLOSED.
2. THESE DETAILS ARE INTENDED TO SHOW A GENERAL LAYOUT OF DEVICES EXPECTED ON THE STARTER DOORS AND ARE NOT INTENDED TO REPRESENT ACTUAL STARTER OR STARTER DOOR SIZES.
3. PROVIDE AN ARC FLASH WARNING LABEL ON THE DOOR.

1 - *WET WELL PUMPS, MOTOR STARTERS [10 MS 01], [10 MS 02] ELEMENTARY WIRING DIAGRAM - PART B*

FVR, NETWORK CONTROLLED

XX = 01 FOR PUMP NO. 1
XX = 02 FOR PUMP NO. 2

2 - *MOTOR STARTER DOOR DETAIL*

CAD NO. E_MSEWD.DWG

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TWIN HARBORS STATE PARK

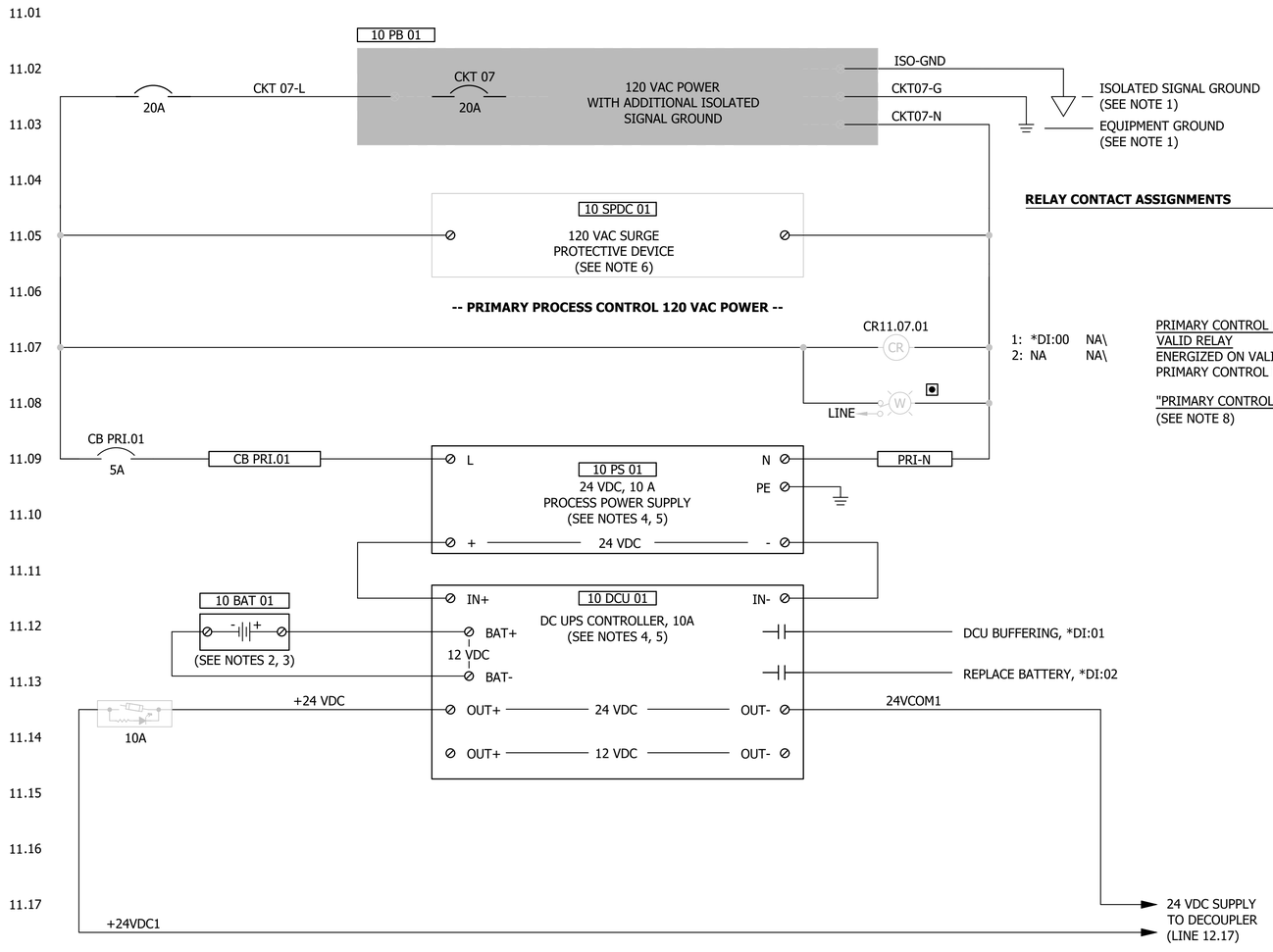
LIFT STATION REPLACEMENT

MOTOR STARTER ELEMENTARY WIRING DIAGRAM

E-10B

SCALE: AS SHOWN

PARKS FILE# AE 325-036

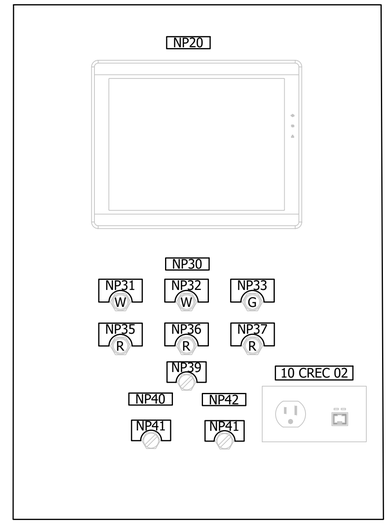


RELAY CONTACT ASSIGNMENTS

1: *DI:00 NA\
2: NA NA\

PRIMARY CONTROL POWER
VALID RELAY
ENERGIZED ON VALID 120 VAC
PRIMARY CONTROL POWER

"PRIMARY CONTROL POWER VALID" PILOT
(SEE NOTE 8)



PLC CONTROL PANEL NAMEPLATE SCHEDULE

ITEM NUMBER	NAMEPLATE ENGRAVING
NP20	OPERATOR INTERFACE UNIT
NP30	SITE CONTROLS
NP31	PRIMARY CONTROL POWER VALID (PILOT, WHITE)
NP32	SECONDARY CONTROL POWER VALID (PILOT, WHITE)
NP33	24 VDC SYSTEM POWER VALID (PILOT, GREEN)
NP35	HIGH ALARM (PILOT, RED)
NP36	LOW ALARM (PILOT, RED)
NP37	PLC FAIL ALARM (PILOT, RED)
NP39	PUMP 1 - ALT - PUMP 2
NP40	POLE LIGHT LIGHT SWITCH
NP41	ON - OFF
NP42	WET WELL LIGHT SWITCH

1 - PLC CONTROL PANEL [10 CP 01] ELEMENTARY WIRING DIAGRAM

POWER SUPPLY AND DISTRIBUTION (DUAL SUPPLY, SINGLE POWER SOURCE)

2 - PLC CONTROL PANEL [10 CP 01] DOOR SCHEDULE

SHADED DEVICES ON CONTROL PANEL ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE PANEL.

NOTES:

1. PROVIDE A DEDICATED GROUND STRIP FOR ANALOG INPUT AND OUTPUT SHIELDS. THIS GROUND IS DERIVED FROM THE GROUND BUS OF PANELBOARD [10 PB 01] AND IS RUN SEPARATELY TO [10 CP 01] THROUGH A #10 AWG STRANDED COPPER CONDUCTOR WITH GREEN INSULATION. SIGNAL GROUNDS IN [10 CP 01] ARE ISOLATED FROM CHASSIS\EQUIPMENT GROUND BUT ARE AT THE SAME POTENTIAL.
2. THIS CIRCUIT USES REDUNDANT BATTERY-BACKED, 10 A, 24 VDC, DC UPS SYSTEMS TO ESTABLISH 24 VDC SYSTEM CONTROL POWER. ALL CONTROLS OPERATE AT 24 VDC.
3. THE INTEGRATOR SHALL CALCULATE AND SIZE BOTH BACK-UP BATTERIES FOR 6 HOURS (MINIMUM) OF 24 VDC POWER, WITH ALL CONNECTED LOADS ACTIVE. THESE CALCULATIONS SHALL BE PRESENTED TO ENGINEERING DURING SUBMITTAL.
4. ALL POWER SUPPLIES, CONVERTERS, AND UPS DEVICES SHALL BE INDUSTRIAL, PACKAGED, MANUFACTURED, UL-LISTED, DIN-RAIL DEVICES. CUSTOM-BUILT CIRCUIT BOARDS AND LOOSE ELECTRONIC DEVICES SHALL NOT BE ALLOWED. EXCEPTION: PANEL TEMPERATURE CIRCUIT.
5. THIS 24 VDC POWER SYSTEM IS DESIGNED AROUND THE FOLLOWING DEVICES:
   a. [10 PS 01, 02], 120 VAC/24 VDC, 10A, POWER SUPPLY — PULS #QS10.241
   b. [10 DCU 01, 02], 24 VDC-24/12 VDC, 10A, DC-UPS CONTROLLER — PULS #UB10.245
   c. [10 DCM 01], 1X 10A, 60 VDC MAX. DECOUPLING DIODE MODULE — PULS #YR2.DIODE

   THESE UNITS MAY BE REPLACED WITH "OR EQUAL" DEVICES.
6. CONTROL POWER SURGE PROTECTIVE DEVICES SHALL BE 120 VAC, 40 kA, 1" WIDE, DIN-RAIL; COOPER BUSSMANN #BSPM1120S2G OR EQUIVALENT.
7. ALL 120 VAC RELAYS SHALL BE PROTECTED WITH MOVs. ALL 24 VDC RELAYS SHALL BE PROTECTED WITH REVERSE-BIASED SURGE PROTECTION DIODES.
8. ALL PILOT LIGHTS IN [10 CP 01] SHALL BE LED PUSH-TO-TEST TYPE.
9. FUSED DIGITAL I/O DISTRIBUTION SHOWN HERE REPRESENTS THE REQUIREMENT FOR GENERAL DIGITAL I/O POWER DISTRIBUTION. FUSE DIGITAL I/O PER SPECIFICATION 16940.
10. FUSED ANALOG I/O DISTRIBUTION SHOWN HERE REPRESENTS THE REQUIREMENT FOR GENERAL ANALOG I/O POWER DISTRIBUTION. FUSE ANALOG I/O PER SPECIFICATION 16940.
11. FUSED 24 VDC SPARE CONTROL POWER DISTRIBUTION SHOWN HERE REPRESENTS A GENERAL REQUIREMENT. PROVIDE 4 SPARE FUSED TERMINAL BLOCKS WITH AN ASSOCIATED 24VCOM TERMINAL MOUNTED ADJACENT TO EACH FUSE.
12. PROVIDE A 10A BREAKER AT THE OUTPUT OF [10 DCM 01]. DO NOT PROVIDE A SINGLE FUSE.

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TWIN HARBORS STATE PARK

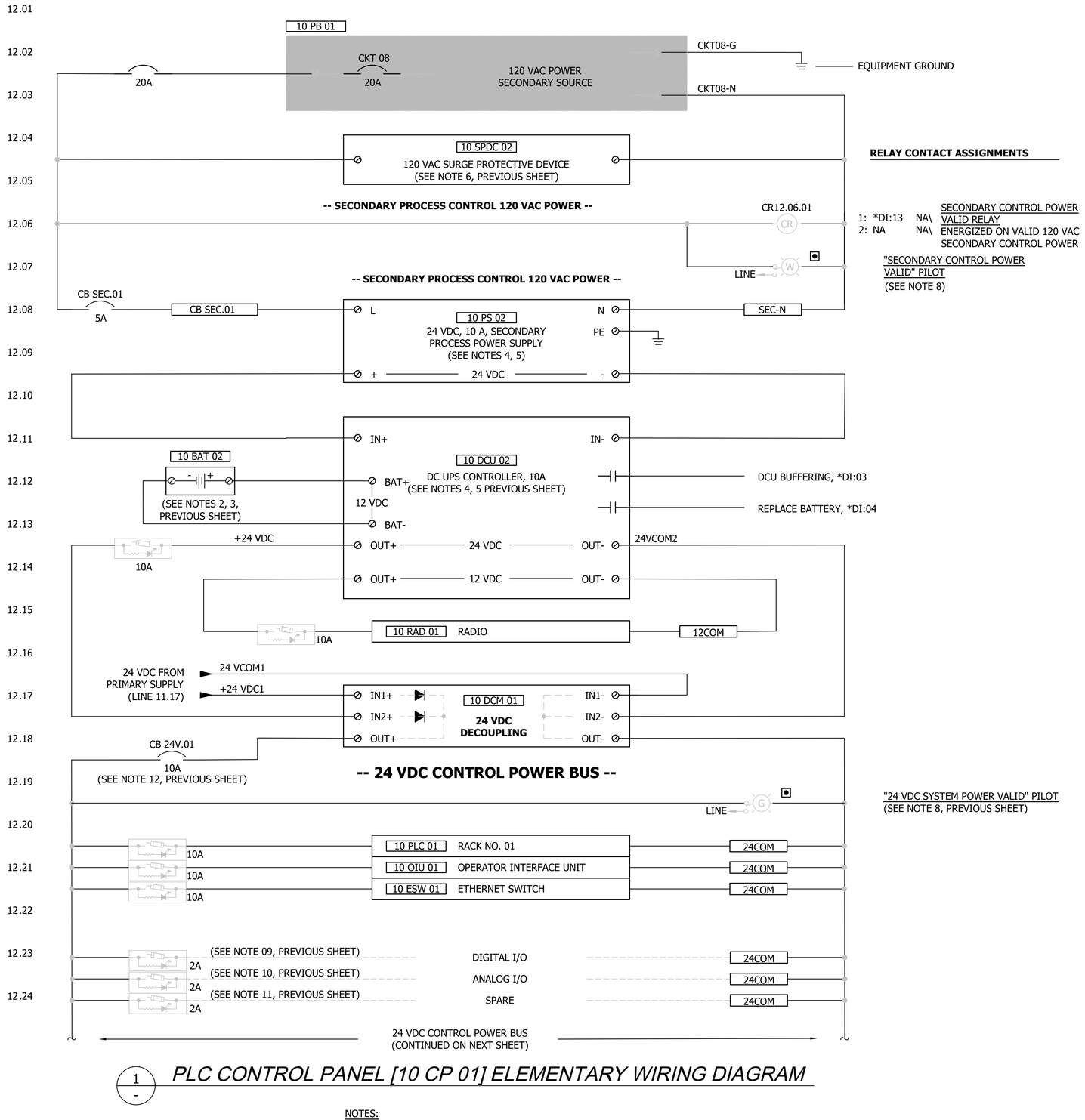
LIFT STATION REPLACEMENT

CONTROL PANEL ELEMENTARY WIRING DIAGRAM

E-11

SCALE: AS SHOWN

PARKS FILE# AE 325-036



RELAY CONTACT ASSIGNMENTS

1: *DI:13 NA\ SECONDARY CONTROL POWER VALID RELAY
2: NA NA\ ENERGIZED ON VALID 120 VAC SECONDARY CONTROL POWER

"SECONDARY CONTROL POWER VALID" PILOT
(SEE NOTE 8)

"24 VDC SYSTEM POWER VALID" PILOT
(SEE NOTE 8, PREVIOUS SHEET)

1 - PLC CONTROL PANEL [10 CP 01] ELEMENTARY WIRING DIAGRAM

NOTES:

1. SEE NOTES ON PREVIOUS SHEET.

PUMP CONTROL LOGIC:

(REFERENCE SHEETS E-09, E-10A, AND E-10B)

1. GENERAL:
   - 1.1 THE PUMP MOTORS WILL NEVER OPERATE IF THEIR OVERLOAD RELAY SENSES A FAILED OR FAULTED CONDITION OR AN EXTERNALLY SENSED OVERTEMP. ALL OPERATING SCENARIOS BELOW REQUIRE THAT THE STARTERS ARE NOT IN THE "FAILED" OR "FAULTED" CONDITION.
   - 1.2 A MOTOR WILL NEVER RUN IF IT IS FAULTED ON:
     - 1.2.1 THERMAL OVERLOAD
     - 1.2.2 PHASE LOSS, PHASE FAILURE, OR PHASE ROTATION ERROR
     - 1.2.3 UNDER OR OVERVOLTAGE
     - 1.2.4 CURRENT IMBALANCE
     - 1.2.5 MOTOR OVERTEMP (AS SENSED BY THE MINICAS DETECTOR)
   - 1.3 THERE ARE TWO WAYS TO OPERATE THE PUMPS IF THEIR STARTER HOA SWITCHES ARE IN "AUTO":
     - 1.3.1 UNDER PLC CONTROL (PRIMARY METHOD, NETWORK CONNECTED TO THE STARTERS) AND
     - 1.3.2 UNDER BACKUP LOGIC CONTROL (HARD-WIRED FROM ASSIGNED HIGH LEVEL FLOAT).

   NOTE: A SEAL LEAK WILL CREATE AN ALARM CONDITION, BUT IT WILL NOT DISABLE ITS ASSOCIATED MOTOR.
2. THE STARTER'S HOA (HAND - OFF - AUTO) SWITCH LOGIC:
   - 2.1 IN "AUTO", BOTH THE PLC AND THE BACKUP LOGIC ARE ABLE TO CALL THE PUMP.
   - 2.2 IN "OFF", THE PUMP CANNOT RUN, REGARDLESS OF THE CALLS FROM THE PLC, OR BACKUP LOGIC. AT NO TIME WILL THE PLC OR BACKUP LOGIC HAVE CONTROL OVER THE PUMP WHEN THE STARTER'S HOA SWITCH IS IN THE "OFF" POSITION.
   - 2.3 IN "HAND", THE PUMP WILL EITHER RUN IN THE "FORWARD" OR "REVERSE" DIRECTION DEPENDING ON THE POSITION OF THE "REVERSE - FORWARD" SELECTOR SWITCH DESCRIBED BELOW. AT NO TIME WILL THE PLC OR BACKUP LOGIC HAVE CONTROL OVER THE PUMP WHEN THE STARTER'S HOA SWITCH IS IN THE "HAND" POSITION.
3. THE STARTER'S "REVERSE - FORWARD" SWITCH LOGIC:
   - 3.1 WITH THE HOA SWITCH IN "HAND", THEN THE MOTOR WILL RUN IN THE FORWARD DIRECTION IF THE "REVERSE - FORWARD" SWITCH IN "FORWARD".
   - 3.2 WITH THE HOA SWITCH IN "HAND", THEN THE MOTOR WILL RUN IN THE REVERSE DIRECTION IF THE "REVERSE - FORWARD" SWITCH IN "REVERSE".
4. PLC CONTROL:
   - 4.1 THE PLC IS THE PRIMARY PUMP CONTROLLER AND CONTROLS THE PUMPS AT ALL TIMES.

     EXCEPTIONS:
     - 4.1.1 ON "PLC FAILURE".
     - 4.1.2 ON COMMUNICATION FAILURE BETWEEN THE PLC AND THE MOTOR STARTERS.
   - 4.2 THE PLC CAN BE PROGRAMMED TO RUN THE PUMPS IN FORWARD OR REVERSE.
   - 4.3 THE PLC CAN ONLY CONTROL THE PUMPS WHEN THEIR ASSOCIATED HOA SWITCHES ARE IN "AUTO".
5. BACKUP LOGIC CONTROL:
   - 5.1 BACKUP LOGIC IS CONTROLLED BY WET WELL FLOATS [10 LS 01] AND [10 LS 02]. THESE FLOATS SHALL FORCE THEIR ASSOCIATED PUMPS ([10 MTR 01] AND [10 MTR 02] RESPECTIVELY) TO RUN IF THEIR HOA SWITCHES ARE IN THE "AUTO" POSITION. THE FLOATS ARE CONNECTED TO THE MOTOR STARTER LOGIC THROUGH TDAD TIMERS. IN THIS MANNER THE PUMPS ARE INSTANTLY STARTED ON HIGH FLOAT LEVEL AND WILL CONTINUE TO RUN FOR A TIMED DURATION AFTER THE LEVEL DROPS BELOW THE FLOAT LEVEL
6. SELECTOR SWITCH:
   - 6.1 [01 SS 01]: "PUMP 1 - ALT - PUMP 2" (PUMP NO. 1 - ALTERNATE - PUMP NO. 2)
     - 6.1.1 THIS SWITCH IS USED ONLY BY THE PLC.
     - 6.1.2 WHEN IN "PUMP 1", THEN ONLY PUMP NO. 1 WILL BE CALLED AS THE LEAD PUMP.
     - 6.1.3 WHEN IN "PUMP 2", THEN ONLY PUMP NO. 2 WILL BE CALLED AS THE LEAD PUMP.
     - 6.1.4 WHEN IN "ALT", THEN THE RELAY LOGIC WILL ALTERNATE LEAD PUMP CONTROL BETWEEN PUMPS 1 AND 2.

SHADED DEVICES ON CONTROL PANEL ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE PANEL.

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JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 3/25/25

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WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

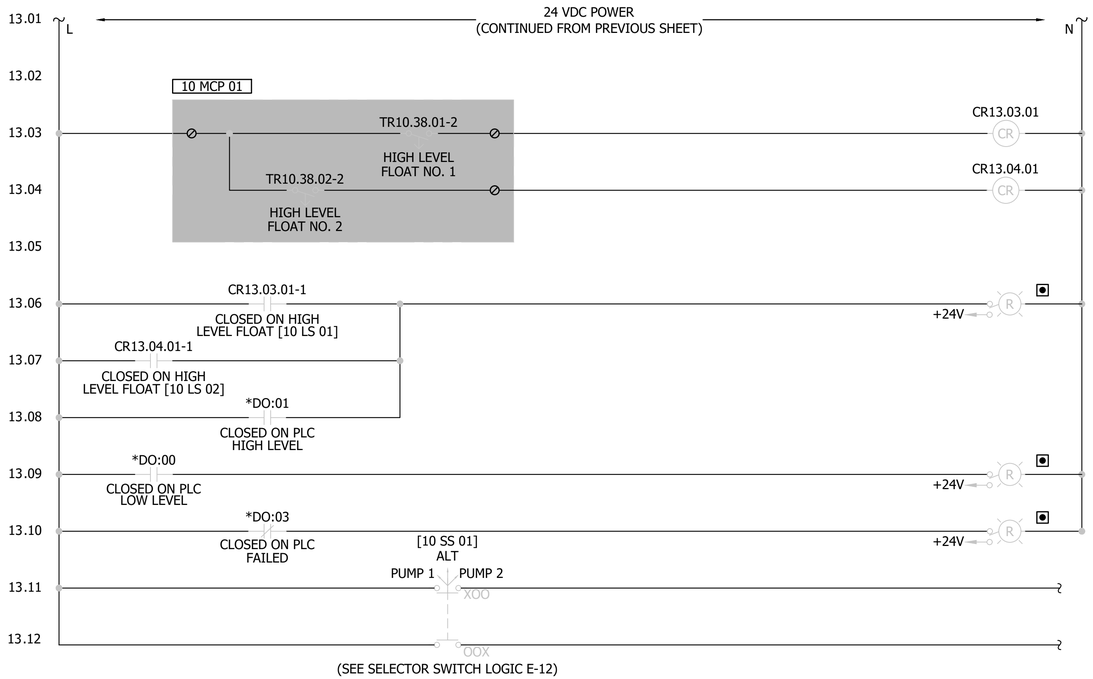
LIFT STATION REPLACEMENT

CONTROL PANEL ELEMENTARY WIRING DIAGRAM

E-12

SCALE: AS SHOWN

PARKS FILE# AE 325-036



RELAY CONTACT ASSIGNMENTS

1: *DI:11 NA\
2: 13.06 NA\
HIGH LEVEL FLOAT [10 LS 01] RELAY
ENERGIZED ON HIGH LEVEL SENSED FROM
[10 LS 01]. REMAINS ENERGIZED UNTIL TIMER TIMES OUT.

1: *DI:12 NA\
2: 13.07 NA\
HIGH LEVEL FLOAT [10 LS 02] RELAY
ENERGIZED ON HIGH LEVEL SENSED FROM
[10 LS 02]. REMAINS ENERGIZED UNTIL TIMER TIMES OUT.

"HIGH LEVEL" STATUS INDICATOR

"LOW LEVEL" STATUS INDICATOR

"PLC FAIL" STATUS INDICATOR

*DI:09 PUMP 1 ONLY MODE

*DI:10 PUMP 2 ONLY MODE

1 - PLC CONTROL PANEL [10 CP 01] ELEMENTARY WIRING DIAGRAM

RELAY BACK-UP LOGIC

NOTES:

1. SEE NOTES E-11.

SHADED DEVICES ON CONTROL PANEL ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE PANEL.

SHEET 31 OF 40

CAD NO. E_CPEWD.DWG

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TWIN HARBORS STATE PARK

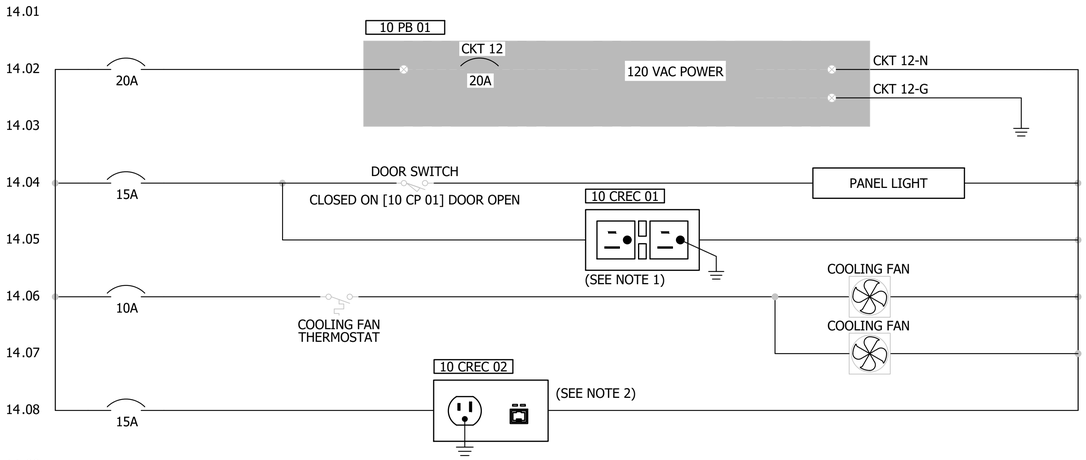
LIFT STATION REPLACEMENT

CONTROL PANEL ELEMENTARY WIRING DIAGRAM

E-13

SCALE: AS SHOWN

PARKS FILE# AE 325-036



DOOR-ACTIVATED PANEL LIGHT FOR [10 CP 01]

GFCI CONVENIENCE RECEPTACLE FOR [10 CP 01]

EXHAUST COOLING FANS FOR [10 CP 01]

RECEPTACLE, PROCESS DEVICES

NOTES:

1. [10 CREC 01] SHALL BE A 15A, WHITE, DIN-RAIL, GFCI RECEPTACLE.
2. [10 CREC 02] SHALL INCLUDE 1X RJ45 ETHERNET PORT PLUS 1X SIMPLEX RECEPTACLE IN A UL TYPE 4 THRU-VIEW WINDOW (GRACEPORT #P-R2-F3R0 OR EQUAL) AND SHALL BE MOUNTED ON THE RIGHT SIDE OF [10 CP 01] PER DETAIL 2, SHEET E-11.

SHADED DEVICES ON CONTROL PANEL ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE PANEL.

PLC CONTROL PANEL [10 CP 01] ANCILLARY CIRCUIT ELEMENTARY WIRING DIAGRAM

1 / -

ANCILLARY CIRCUIT

SHEET 32 OF 40

CAD NO. E_CPEWD.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	JRN	03/20/25
DRAWN	DCK	03/20/25
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JASON R. NEWQUIST STATE OF WASHINGTON 45311 REGISTERED PROFESSIONAL ENGINEER 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

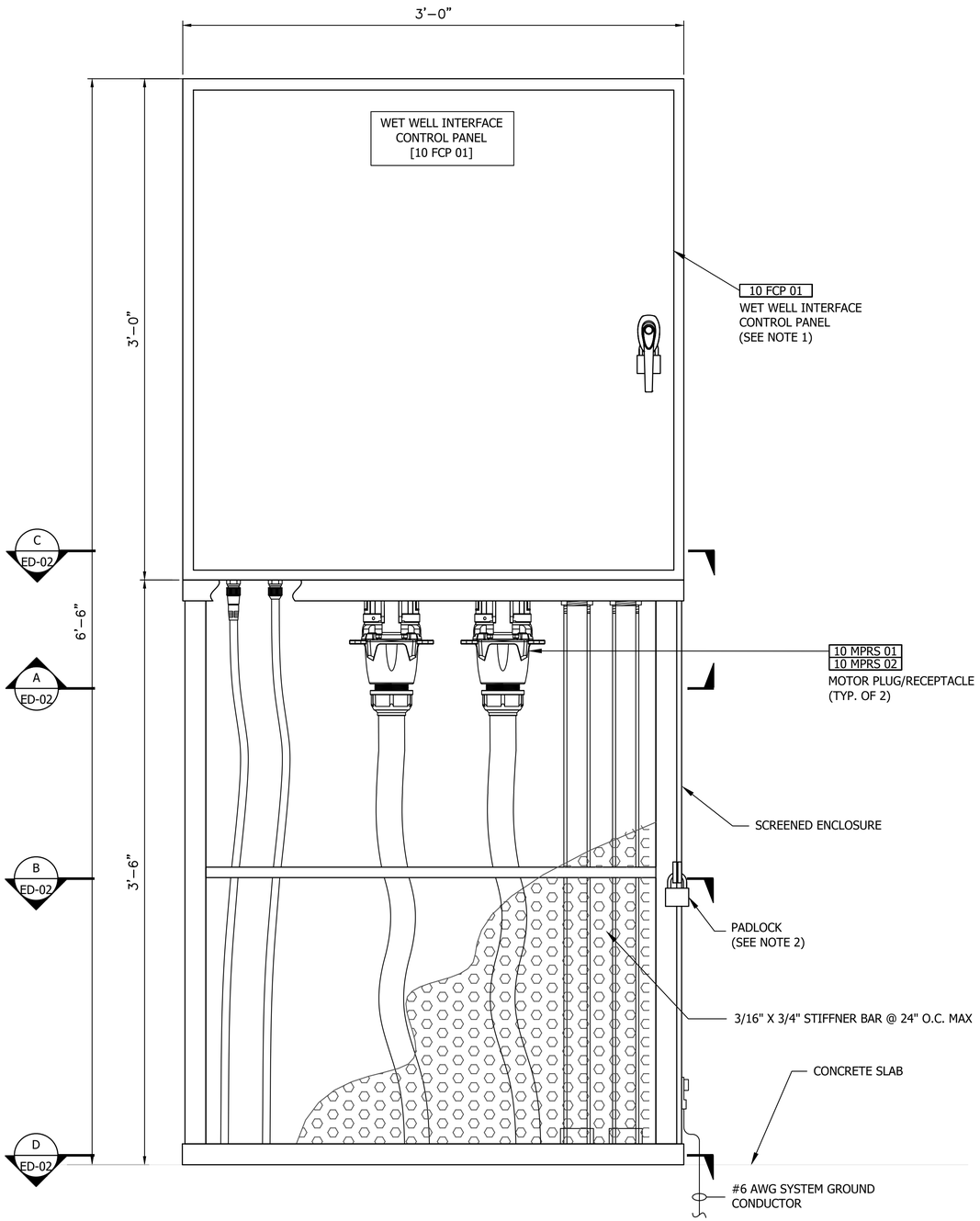
LIFT STATION REPLACEMENT

CONTROL PANEL ELEMENTARY WIRING DIAGRAM

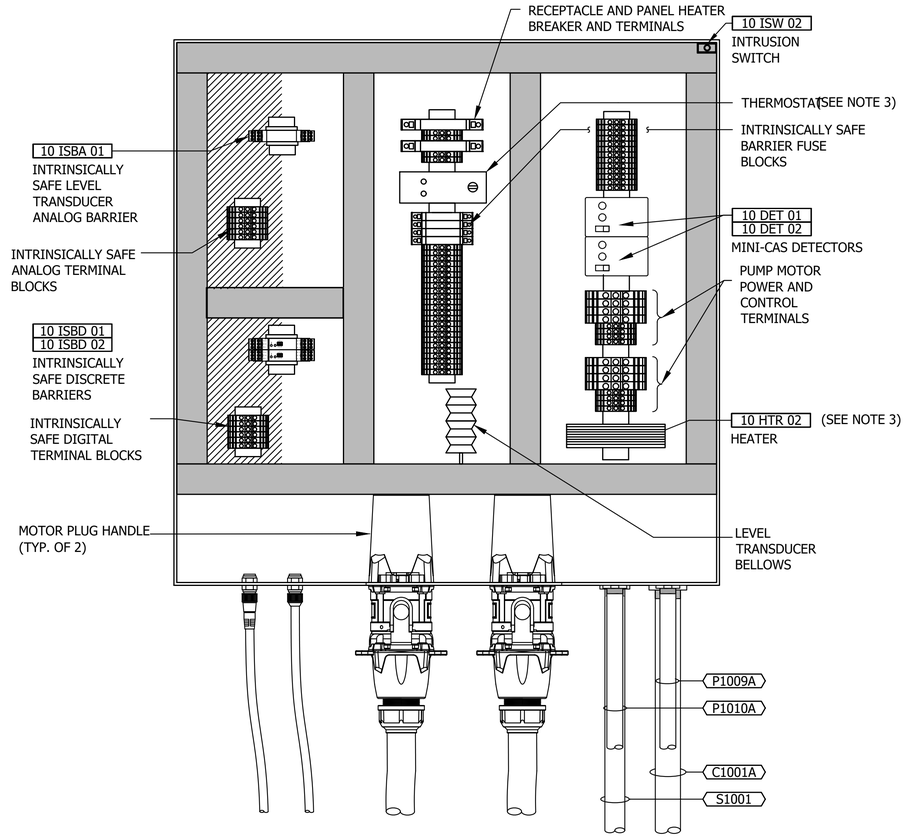
E-14

SCALE: AS SHOWN

PARKS FILE# AE 325-036



1 - WET WELL INTERFACE CONTROL PANEL [10 FCP 01] EXTERIOR ELEVATION



2 - WET WELL INTERFACE CONTROL PANEL [10 FCP 01] INTERIOR ELEVATION

SHEET NOTES:

1. FIELD CONTROL PANEL SHALL BE 36"H X 36"W X 12"D, 12-GAUGE, 304L STAINLESS STEEL, NEMA 4X GASKETED, WITH LEFT-HAND PAD LOCKABLE 3 POINT HATCH DOOR. PROVIDE DOOR CATCH ON THE HINGED SIDE TO HOLD THE DOOR OPEN.
2. PROVIDE PADLOCKS WITH COMMON KEY FOR THE CONTROL PANEL AND THE SUPPORT STRUCTURE.
3. CONTROL PANEL HEATER [10 HTR 02] IS SEMICONDUCTOR TYPE, 30 W, 120 VAC; HOFFMAN #D-AH301. TEMPERATURE CONTROL THERMOSTAT IS 120 VAC, NORMALLY CLOSED, QUICK ACTING; HOFFMAN #A-TEMNC.

INTRINSICALLY SAFE AREA

SHEET 33 OF 40

CAD NO. E_FPCD.DWG

NO.	REVISIONS	INT.	APP.	DATE

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DESIGNED	JRN	03/20/25
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TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

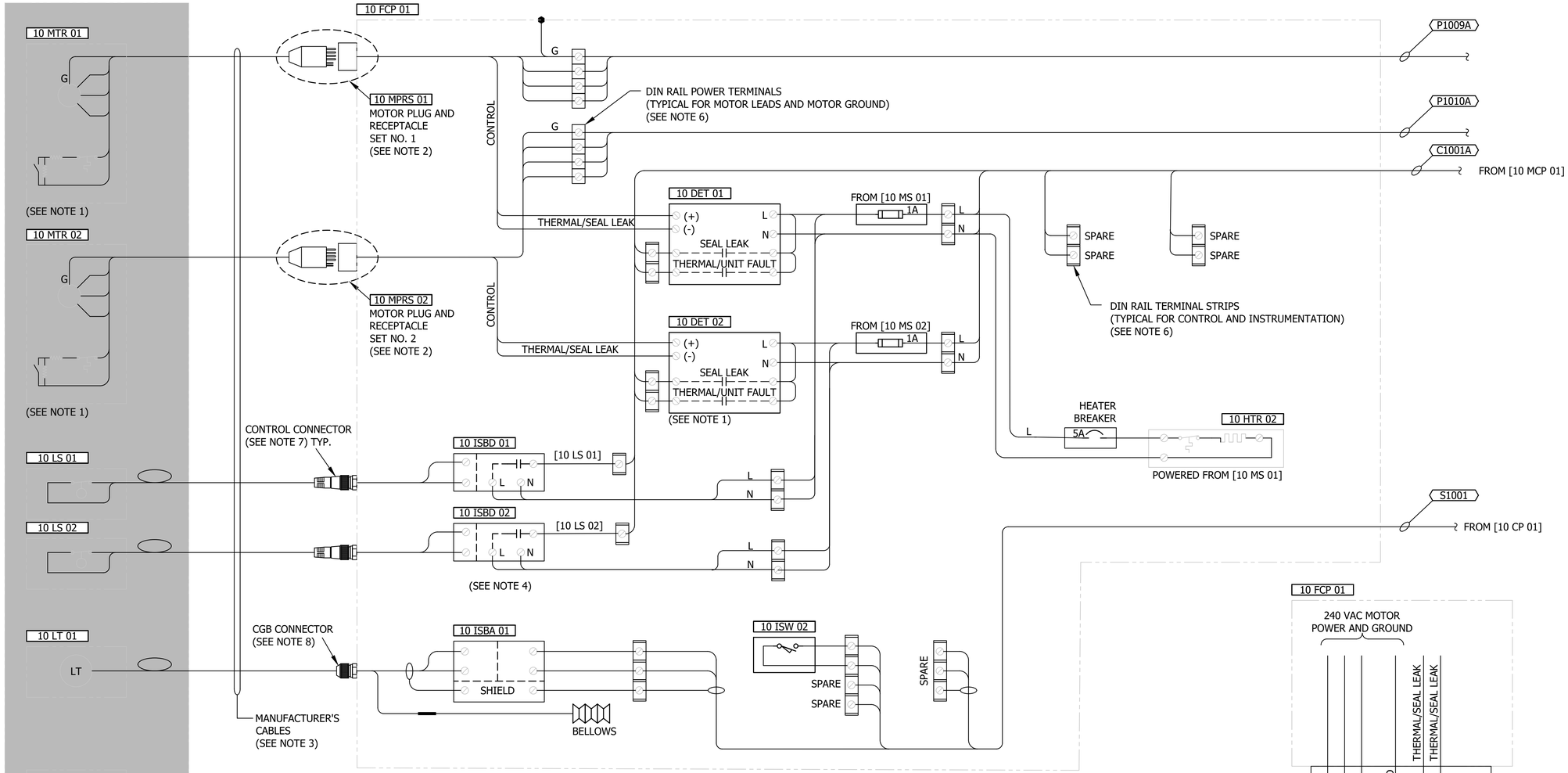
WET WELL INTERFACE CONTROL PANEL

E-15

SCALE: AS SHOWN

PARKS FILE# AE 325-036

M:\WSPARKS\23578.00 Twin Harbors Pump Station\01 Design\PLANSET\Electrical\E_FPCD.dwg, 3/25/2025 11:52 AM, DAVID KLATT

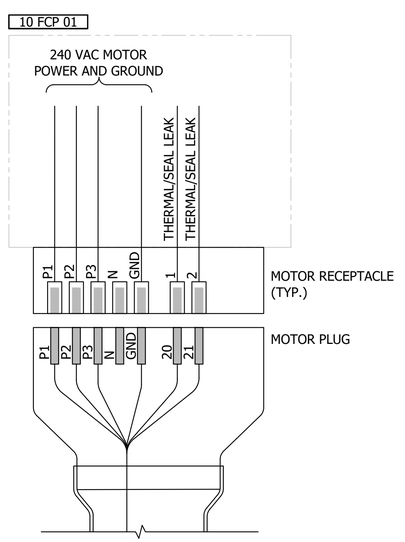


SHADED AREAS ON THIS SHEET REPRESENT CLASSIFIED ZONES

NOTES:

1. BOTH THERMAL AND SEAL LEAK DETECTION ARE SENSED. THIS SYSTEM IS DESIGNED AROUND FLYGT PUMPS WITH 120 VAC MINI-CAS DETECTORS.
   - 1.1. PROVIDE AND WIRE FLYGT MINI-CAS SOCKETS INSIDE [10 FCP 01] FOR BOTH MOTORS. THE MINI-CAS DETECTORS SHALL BE PROVIDED BY THE PUMP MANUFACTURER. THE CONTRACTOR IS RESPONSIBLE FOR CHANGES IN DESIGN, INSTALLATION, AND DOCUMENTATION IF OTHER MANUFACTURER OR METHODS ARE USED. DESIGN CHANGES SHALL BE APPROVED BY ENGINEERING.
   - 1.2. SET ASSOCIATED MOTOR STARTER LOGIC TO DISABLE THE PUMP ON MOTOR OVERTEMP AND/OR CONTROLLER ALARM AND/OR REMOVAL OF THE CONTROLLER.
2. TERMINATE THE MOTOR MANUFACTURER'S POWER/CONTROL CABLES IN A 240 V, 3 PHASE, 60 A, NEMA 3R, IP5R/IP55, DISCONNECTING PLUG AND RECEPTACLE SET (MELTRIC DECONTACTOR SERIES, MODEL NO. DSN60, OR EQUAL). THE PLUG AND RECEPTACLE SHALL INCLUDE 3 MOTOR LEAD POWER PINS, A GROUND PIN, A NEUTRAL PIN, AND 2 CONTROL PINS (AUXILIARY CONTACTS) AND SHALL BE UL LISTED. CONNECT AS SHOWN IN DETAIL 2.
3. PROVIDE MANUFACTURER'S CABLES IN SUFFICIENT LENGTH TO REACH ENCLOSURE [10 FCP 01] WITH 10' MINIMUM COILED LENGTH IN THE WET WELL.
4. PROVIDE INTRINSICALLY SAFE BARRIERS INSIDE [10 FCP 01] FOR LEVEL SWITCHES [10 LS 01] AND [10 LS 02] AND LEVEL TRANSDUCER [10 LT 01].
5. RUN #6 AWG BARE COPPER GEC TO WET WELL. GROUND THE HATCH LID WITH A #6 AWG EQUIVALENT GROUND BRAID.
6. PROVIDE TERMINAL BLOCKS AND TERMINAL STRIPS INSIDE [10 FCP 01] FOR ALL EXTERNAL CONNECTIONS BETWEEN [10 FCP 01] AND OTHER PANELS.
7. FOR FLOAT LEVEL SWITCHES [10 LS 01] AND [10 LS 02] PROVIDE 316 STAINLESS STEEL CONTROL RECEPTACLE/DROP CORD CONNECTOR SETS; RECEPTACLE = TURCK #P-RKFV SERIES; DROP CORD SET = TURCK #P-RSM SERIES.
8. FOR LEVEL TRANSDUCER [10 LT 01] PROVIDE 316 STAINLESS STEEL CGB CABLE CONNECTOR. THIS CABLE MUST PASS THROUGH THE ENCLOSURE WITH THE PRESSURE SENSING TUBE.

1 - WET WELL INTERFACE ENCLOSURE [10 FCP 01] CONNECTION DIAGRAM



NOTES:

1. USE TWO AUXILIARY CONTACTS PINS 1 (20) AND 2 (21) FOR THERMAL AND SEAL LEAK DETECTION.

2 - MOTOR PLUG/RECEPTACLE CONNECTION DIAGRAM TO [10 MPRS 01] AND [10 MPRS 02]

SHEET 34 OF 40

CAD NO. E_FPCD.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	JRN	03/20/25
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JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

WET WELL INTERFACE CONNECTION DIAGRAM

E-16

SCALE: AS SHOWN

PARKS FILE# AE 325-036

ANALOG INPUT CARD, 4 CHANNEL, ISOLATED, 16-BIT, 4-20 mA				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	00:00	10 LT 01	LEVEL TRANSDUCER NO. 1	WET WELL LEVEL 0-35 FT.
1	00:01	- - - -	HOT SPARE	
2	00:02	- - - -	HOT SPARE	
3	00:03	- - - -	HOT SPARE	

EXTENDED - PLC I/O TABLES

DIGITAL INPUT - INTEGRATED				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	DI:00	10 CP 01	CONTROL PANEL, PLC	TRUE = PRIMARY CONTROL POWER VALID
1	DI:01	10 DCU 01	DC UPS CONTROLLER, 24 - 24/12 VDC, 10 A, PRIMARY CONTROL	TRUE = PRIMARY DCU BUFFERING
2	DI:02	10 DCU 01	DC UPS CONTROLLER, 24 - 24/12 VDC, 10 A, PRIMARY CONTROL	TRUE = REPLACE BATTERY [10 BAT 01]
3	DI:03	10 DCU 02	DC UPS CONTROLLER, 24 - 24/12 VDC, 10 A, SECONDARY CONTROL	TRUE = SECONDARY DCU BUFFERING
4	DI:04	10 DCU 02	DC UPS CONTROLLER, 24 - 24/12 VDC, 10 A, SECONDARY CONTROL	TRUE = REPLACE BATTERY [10 BAT 02]
5	DI:05	10 SDB 01	SERVICE DISCONNECT BREAKER (SUSE)	TRUE = BREAKER CLOSED
6	DI:06	10 SPD 01	SURGE PROTECTIVE DEVICE	TRUE = TRANSIENT FAULT
7	DI:07	10 ISW 01	INTRUSION SWITCH, POWER DISTRIBUTION PANEL	TRUE = DOOR SECURE
8	DI:08	10 ISW 02	INTRUSION SWITCH, FIELD CONTROL PANEL	TRUE = DOOR SECURE
9	DI:09	10 SS 01	SELECTOR SWITCH, PUMP 1 - ALT - PUMP 2	TRUE = SWITCH IN PUMP 1 ONLY MODE
10	DI:10	10 SS 01	SELECTOR SWITCH, PUMP 1 - ALT - PUMP 2	TRUE = SWITCH IN PUMP 2 ONLY MODE
11	DI:11	10 LS 01	HIGH FLOAT SWITCH NO. 1	TRUE = HIGH LEVEL
12	DI:12	10 LS 02	HIGH FLOAT SWITCH NO. 2	TRUE = HIGH LEVEL
13	DI:13	10 CP 01	CONTROL PANEL, PLC	TRUE = SECONDARY CONTROL POWER VALID
14	DI:14	- - - -	HOT SPARE	
15	DI:15	- - - -	HOT SPARE	

DIGITAL OUTPUT - INTEGRATED				
CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	DO:00	10 CP 01	CONTROL PANEL, PLC	TRUE = PLC LOW LEVEL ALARM OUTPUT (PILOT)
1	DO:01	10 CP 01	CONTROL PANEL, PLC	TRUE = PLC HIGH LEVEL ALARM OUTPUT (PILOT)
2	DO:02	- - - -	HOT SPARE	
3	DO:03	10 CP 01	CONTROL PANEL, PLC	TRUE = PLC VALID, FALSE = PLC FAIL
4	DO:04	- - - -	HOT SPARE	
5	DO:05	- - - -	HOT SPARE	
6	DO:06	- - - -	HOT SPARE	

INTEGRATED - PLC I/O

PLC I/O TABLES

CAD NO. E_PLCIO.DWG

NO.	REVISIONS	INT.	APP.	DATE

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TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

PLC I/O TABLES

E-17

SCALE: AS SHOWN

PARKS FILE# AE 325-036

NETWORKED DIGITAL INPUT

NO.	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION	SOURCE*
0	10 CP 01	CONTROL PANEL, MASTER PLC	TRUE = 120 VAC PRIMARY CONTROL POWER VALID	PLC
1	10 DCU 01	DC UPS, 24 VDC, 10 A, PRIMARY	TRUE = PRIMARY DCU BUFFERING	PLC
2	10 DCU 01	DC UPS, 24 VDC, 10 A, PRIMARY	TRUE = REPLACE PRIMARY BATTERY	PLC
3	10 DCU 02	DC UPS, 24 VDC, 10 A, SECONDARY	TRUE = SECONDARY DCU BUFFERING	PLC
4	10 DCU 02	DC UPS, 24 VDC, 10 A, SECONDARY	TRUE = REPLACE SECONDARY BATTERY	PLC
5	10 ISW 01	INTRUSION SWITCH, [10 PDP 01]	TRUE = DOOR CLOSED; FALSE = DOOR OPEN	PLC
6	10 ISW 02	INTRUSION SWITCH, [10 FCP 01]	TRUE = DOOR CLOSED; FALSE = DOOR OPEN	PLC
7	10 LS 01	HIGH FLOAT SWITCH NO. 1	TRUE = HIGH LEVEL	PLC
8	10 LS 02	HIGH FLOAT SWITCH NO. 2	TRUE = HIGH LEVEL	PLC
9	10 SS 01	SELECTOR SWITCH, PUMP 1 - ALT - PUMP 2	TRUE = SWITCH IN PUMP 1 ONLY MODE	PLC
10	10 SS 01	SELECTOR SWITCH, PUMP 1 - ALT - PUMP 2	TRUE = SWITCH IN PUMP 2 ONLY MODE	PLC
11	10 CP 01	CONTROL PANEL, MASTER PLC	TRUE = 120 VAC SECONDARY CONTROL POWER VALID	PLC
12	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = THERMAL OVERLOAD	LAN
13	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = PHASE LOSS	LAN
14	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = PHASE ROTATION	LAN
15	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = PHASE FAILURE	LAN
16	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = VOLTAGE UNBALANCE	LAN
17	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = CURRENT UNBALANCE	LAN
18	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = FROA SWITCH IN "FORWARD"	LAN
19	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = FROA SWITCH IN "REVERSE"	LAN
20	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = FROA SWITCH IN "AUTO"	LAN
21	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MOTOR OVERTEMP	LAN
22	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MOTOR UNDERLOAD	LAN
23	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MOTOR STALLED	LAN
24	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = SEAL LEAK	LAN
25	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MANUAL STARTER "RESET" PUSHBUTTON	LAN
26	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MOTOR RUNNING	LAN
27	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = OLR FAULT	LAN
28	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MPRS PLUGGED IN	LAN
29	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = THERMAL OVERLOAD	LAN
30	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = PHASE LOSS	LAN
31	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = PHASE ROTATION	LAN
32	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = PHASE FAILURE	LAN
33	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = VOLTAGE UNBALANCE	LAN
34	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = CURRENT UNBALANCE	LAN
35	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = FROA SWITCH IN "FORWARD"	LAN
36	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = FROA SWITCH IN "REVERSE"	LAN
37	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = FROA SWITCH IN "AUTO"	LAN
38	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MOTOR OVERTEMP	LAN
39	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MOTOR UNDERLOAD	LAN
40	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MOTOR STALLED	LAN
41	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = SEAL LEAK	LAN
42	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MANUAL STARTER "RESET" PUSHBUTTON	LAN
43	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MOTOR RUNNING	LAN
44	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = OLR FAULT	LAN
45	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MPRS PLUGGED IN	LAN

NETWORKED DIGITAL OUTPUT

NO.	TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION	SOURCE*
0	10 MS 01	MOTOR STARTER, PUMP NO. 1	TRUE = MOTOR RUN COMMAND	LAN
1	10 MS 02	MOTOR STARTER, PUMP NO. 2	TRUE = MOTOR RUN COMMAND	LAN
2	10 CP 01	CONTROL PANEL, MASTER PLC	TRUE = PLC COMM. VALID, FALSE = PLC COMM. FAIL	PLC
3	10 CP 01	CONTROL PANEL, MASTER PLC	TRUE = PLC VALID, FALSE = PLC FAIL	PLC
4	10 CP 01	CONTROL PANEL, MASTER PLC	TRUE = LOW LEVEL (PILOT)	PLC

NETWORKED ANALOG INPUT

CHANNEL		TAG NUMBER	TAG DESCRIPTION	I/O FUNCTION
NO.	ADDRESS			
0	AI:00	10 MS 01	MOTOR STARTER, PUMP NO. 1	MOTOR CURRENT
1	AI:01	10 MS 02	MOTOR STARTER, PUMP NO. 2	MOTOR CURRENT

DATA AVAILABLE ON THE NETWORK

* SOURCE PLC = SIGNAL PLACED ON THE NETWORK FROM THE PLC.
LAN = SIGNAL COMMUNICATED DIRECTLY ONTO THE LOCAL NETWORK.

PLC I/O TABLES

CAD NO. E_PLCIO.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	JRN	03/20/25
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WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

PLC I/O TABLES

E-18

SCALE: AS SHOWN

PARKS FILE# AE 325-036

POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	E-1	NOTES
P1001	[10 UT 01], UTILITY TRANSFORMER, 240/120 VAC	[10 MB 01], UTILITY METER BASE	EXISTING			REUSE COMBINATION OF EXISTING AERIAL AND BELOW GRADE
P1002	[10 MB 01], UTILITY METER BASE	[10 SDB 01], SERVICE DISCONNECT BREAKER (SUSE)	2"	3X #4/0 AWG XHHW-2; 1X #6 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G		
P1003	[10 SDB 01], SERVICE DISCONNECT BREAKER (SUSE)	[10 MTS 01], MANUAL TRANSFER SWITCH	2"	3X #4/0 AWG XHHW-2; 1X #4 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G		
P1004	[10 MTS 01], MANUAL TRANSFER SWITCH	[10 GRDB 01], GENERATOR RECEPTACLE, BREAKER	2"	3X #4/0 AWG XHHW-2; 1X #4 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G		
P1005	[10 GRDB 01], GENERATOR RECEPTACLE, BREAKER	[10 GREC 01], GENERATOR RECEPTACLE	2"	3X #4/0 AWG XHHW-2; 1X #4 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G		
P1006	[10 MTS 01], MANUAL TRANSFER SWITCH	[10 PB 01], PANELBOARD, 240/120 V, 3 PH	2"	3X #4/0 AWG XHHW-2; 1X #4 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G		
P1007	[10 PB 01], PANELBOARD, 240/120 V, 3 PH	[10 MCP 01], MOTOR CONTROL PANEL	1"	3X #6 AWG XHHW-2; 1X #10 AWG XHHW-2 N; 1X #10 AWG XHHW-2 G		
P1008	[10 PB 01], PANELBOARD, 240/120 V, 3 PH	[10 MCP 01], MOTOR CONTROL PANEL	1"	3X #6 AWG XHHW-2; 1X #10 AWG XHHW-2 N; 1X #10 AWG XHHW-2 G		MAINTAIN PHYSICAL SEPARATION OF MOTOR STARTER FEEDER CIRCUITS. DO NOT COMBINE WITH P1007.
P1009	[10 MCP 01], MOTOR CONTROL PANEL	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	1"	3X #6 AWG XHHW-2; 1X #10 AWG XHHW-2 G		
P1009A	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	[10 FCP 01], FIELD CONTROL PANEL, WET WELL INTERFACE	1"	3X #6 AWG XHHW-2; 1X #10 AWG XHHW-2 G		
P1010	[10 MCP 01], MOTOR CONTROL PANEL	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	1"	3X #6 AWG XHHW-2; 1X #10 AWG XHHW-2 G		
P1010A	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	[10 FCP 01], FIELD CONTROL PANEL, WET WELL INTERFACE	1"	3X #6 AWG XHHW-2; 1X #10 AWG XHHW-2 G		
P1011	[10 PB 01], PANELBOARD, 240/120 V, 3 PH	[10 CP 01], CONTROL PANEL, PLC	3/4"	4X #12 AWG XHHW-2; 4X #12 AWG XHHW-2 N; 1X #10 AWG XHHW-2 G; 1X #12 AWG XHHW-2 G		INCLUDES 1 SPARE HOT+NEU, INCLUDES #10 ISO GROUND
P1012	[10 CP 01], CONTROL PANEL, PLC	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	3/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G		
P1012A	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	WET WELL LIGHT	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G		
P1012B	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	[10 PPLT 01], POLE LIGHT	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G		
P1013	[10 PB 01], PANELBOARD, 240/120 V, 3 PH	[10 CREC 03], CONVENIENCE RECEPTACLE, [01 PDP 01]	1/2"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G		
P1014~	[10 PDP 01], POWER DISTRIBUTION PANEL	STUB OUT 2' BEYOND SLAB AND CAP BELOW GRADE	1"	PULL WIRE		SPARE CONDUIT.
P1015~	[10 PDP 01], POWER DISTRIBUTION PANEL	STUB OUT 2' BEYOND SLAB AND CAP BELOW GRADE	1"	PULL WIRE		SPARE CONDUIT.
P1016	[10 PB 01], PANELBOARD, 240/120 V, 3 PH	[10 SPD 01], SURGE PROTECTIVE DEVICE	1/2"	MANUFACTURER'S CABLE		DO NOT EXTEND MANUFACTURER'S LEADS

CONTROL CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	E-1	NOTES
C1001	[10 MCP 01], MOTOR CONTROL PANEL	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	1-1/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G; 14X #14 AWG XHHW-2		CONTROL POWER AND FROM STARTERS +2 SPARE PER STARTER. INCLUDES FLOAT SWITCHES.
C1001A	[10 WGTR 01], WIRE GUTTER, INSIDE [01 PDP 01]	[10 FCP 01], FIELD CONTROL PANEL, WET WELL INTERFACE	1-1/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G; 14X #14 AWG XHHW-2		
C1002	[10 CP 01], CONTROL PANEL, PLC	[10 SDB 01], SERVICE DISCONNECT BREAKER (SUSE)	1/2"	2X #14 AWG XHHW-2		TRIPPED SIGNAL
C1003	[10 CP 01], CONTROL PANEL, PLC	[10 SPD 01], SURGE PROTECTIVE DEVICE	1/2"	2X #14 AWG XHHW-2		FAULT SIGNAL
C1004	[10 MCP 01], MOTOR CONTROL PANEL	[10 CP 01], CONTROL PANEL, PLC	1"	4X #14 AWG XHHW-2; 2X 8-C, 4-TP, #23 AWG, CAT6		HIGH LEVEL FLOATS ALARM SIGNALS, NETWORK CABLE TO STARTERS
C1005	[10 CP 01], CONTROL PANEL, PLC	[10 ANT 01], ANTENNA	1-1/4"	MANUFACTURER'S RECOMMENDED CABLE		

INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	E-1	NOTES
S1001	[10 CP 01], CONTROL PANEL, PLC	[10 FCP 01], FIELD CONTROL PANEL, WET WELL INTERFACE	1"	4X #14 AWG XHHW-2; 2X 2-C, 1-TP, #18 AWG, OS	* 3	LEVEL AND INTRUSION, INCLUDES SPARES.

CABLE AND CONDUIT SCHEDULES

CAD NO. E_CCS.DWG

NO.	REVISIONS	INT.	APP.	DATE

ACTION	BY	DATE
DESIGNED	JRN	03/20/25
DRAWN	DCK	03/20/25
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CHECKED (HDQTS.)		03/20/25

JASON R. NEWQUIST STATE OF WASHINGTON 45311 REGISTERED PROFESSIONAL ENGINEER 3/25/25

REGISTERED STAMP

WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

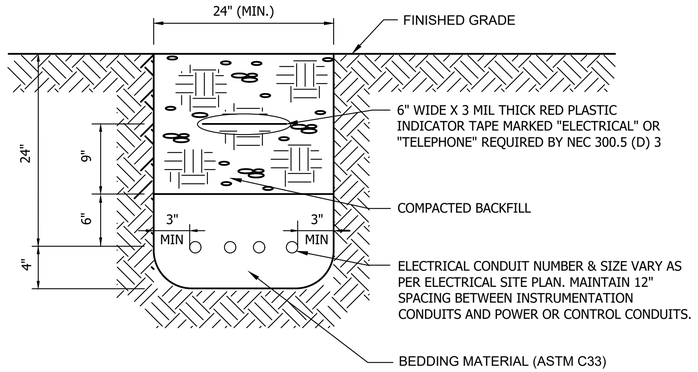
LIFT STATION REPLACEMENT

CABLE AND CONDUIT SCHEDULE

EC-01

SCALE: AS SHOWN

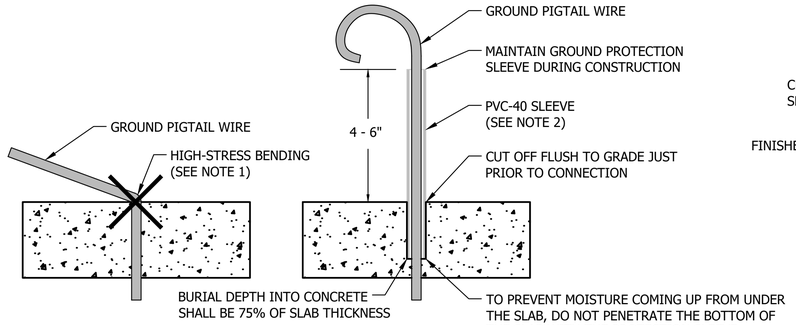
PARKS FILE# AE 325-036



NOTE:

1. SPACING BETWEEN CONDUITS AND OTHER UTILITIES SHALL BE IN COMPLIANCE WITH THE UTILITIES OR 24 INCHES MINIMUM, WHICHEVER IS THE GREATER.

1 TYP — ELECTRICAL TRENCHING DETAIL

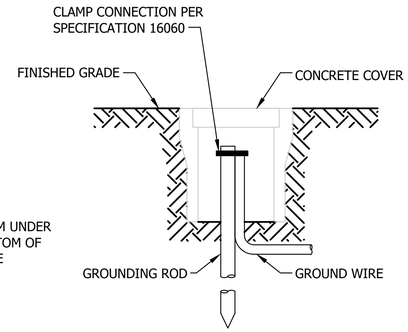


DETAIL A *DETAIL B*

NOTES:

1. BARE COPPER GROUND WIRES SHALL NOT PENETRATE DIRECTLY OUT OF CONCRETE FLOORS. CONSTRUCTION ACTIVITIES CAN CAUSE TIGHT WIRE BENDING AND POSSIBLE GROUND WIRE DEGRADATION. DETAIL "A" IS NOT ACCEPTABLE.
2. PROTECT THE GROUND PIGTAIL DURING CONSTRUCTION WITH A PVC-40 SLEEVE INSTALLED AS DESCRIBED IN DETAIL "B".
3. JUST PRIOR TO SETTING EQUIPMENT OVER, OR MAKING THE FINAL CONNECTION OF THE GROUND WIRE, CUT OFF THE SLEEVE FLUSH TO THE FLOOR TAKING CARE NOT TO CUT INTO THE GROUND WIRE.

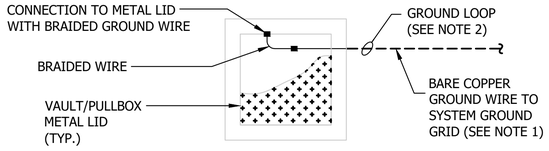
2 TYP — GROUND PIGTAIL ELECTRICAL TRENCHING DETAIL



NOTES:

1. GROUND ROD BOX SHALL BE FOGTITE GROUND ROD BOX WITH ROAD RATING EQUAL TO THE DEVICE OR STRUCTURE IT SUPPORTS (H20 MINIMUM).

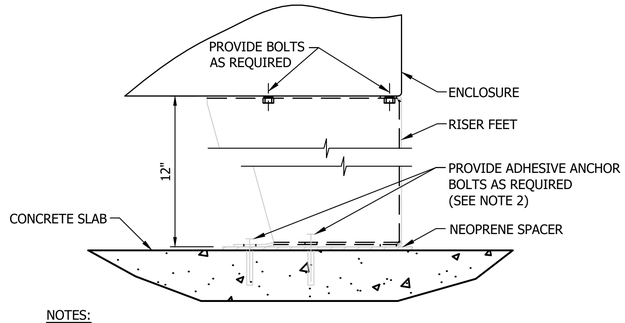
3 TYP — GROUND ROD BOX DETAIL



NOTES:

1. PROVIDE AND SIZE GROUND CONDUCTOR FROM SYSTEM GROUND DISTRIBUTION PER 1/E-06.
2. GROUND ALL METAL COMPONENTS AS PER "VAULT AND PULLBOX GROUNDING" IN SPECIFICATION 16060.
3. ALL GROUND CONDUCTORS SHALL BE STRANDED WITH THE EXCEPTION OF THE FLEXIBLE BRAIDED GROUND CONDUCTOR TO THE METAL HATCH LIDS.

4 TYP — METAL LID GROUNDING DETAIL



NOTES:

1. PROVIDE A 1/8" NEOPRENE SPACER BETWEEN THE ENCLOSURE BASE PLATE AND THE CONCRETE SURFACE. OVERSIZE THE SPACER BY 1/4" ON ALL SIDES. EPOXY THE SPACER TO THE BOTTOM OF THE BASE PLATE PRIOR TO INSTALLATION.
2. ANCHOR BOLTS AND HARDWARE SHALL BE 1/2"Ø 316L STAINLESS STEEL WITH 4" EMBEDMENT.

5 TYP — FREE-STANDING ENCLOSURE RISER FEET MOUNTING DETAIL

CAD NO. E_DET.DWG

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WASHINGTON STATE PARKS AND RECREATION COMMISSION

TWIN HARBORS STATE PARK

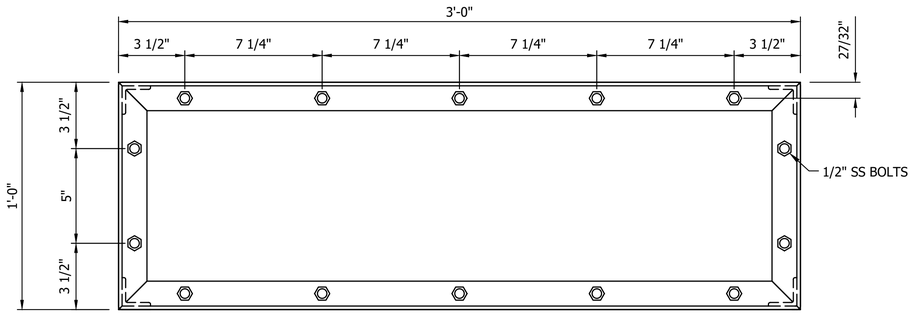
LIFT STATION REPLACEMENT

ELECTRICAL DETAILS

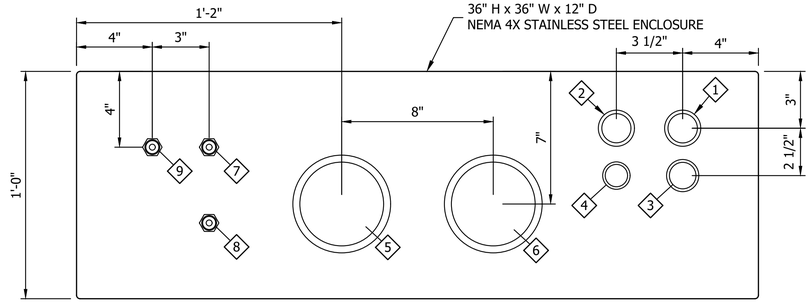
ED-01

SCALE: AS SHOWN

PARKS FILE# AE 325-036

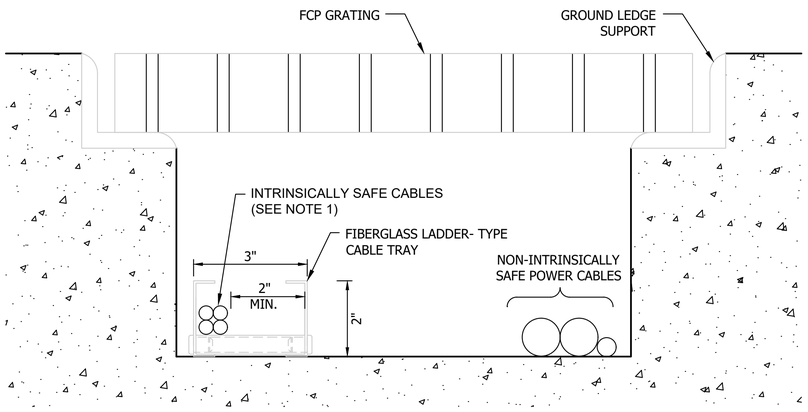


A / E-15 [10 FCP 01] ENCLOSURE AND SCREENED CAGE TOP VIEW

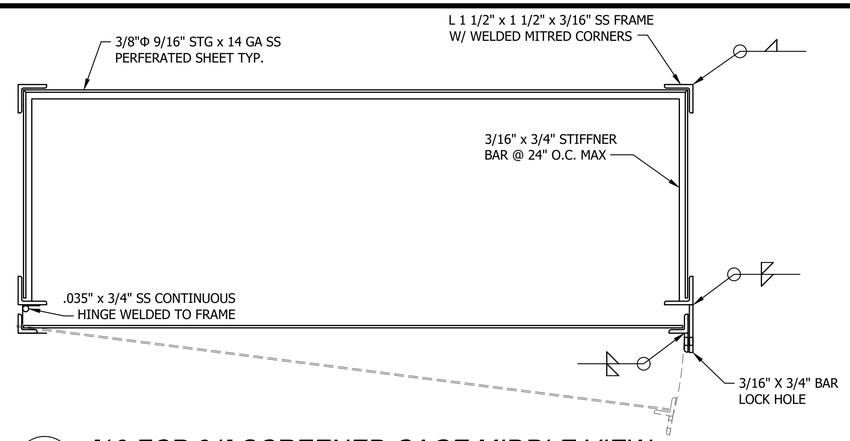


X =	1	POWER	POWER CONDUIT FROM [10 PDP 01]	8	CABLEHIGH LEVEL FLOAT CABLE NO. 2 [10 LS 02]
	2	POWER	POWER CONDUIT FROM [10 PDP 01]	9	CABLELEVEL TRANSDUCER CABLE NO. 1 [10 LT 01]
	3	CONTROL	CONTROL CONDUIT FROM [10 PDP 01]		
	4	SIGNAL	INSTRUMENTATION CONDUIT FROM [10 CP 01]		
	5	CABLEMOTOR RECEPTACLE [10 MPRS 01]			
	6	CABLEMOTOR RECEPTACLE [10 MPRS 02]			
	7	CABLEHIGH LEVEL FLOAT CABLE NO. 1 [10 LS 01]			

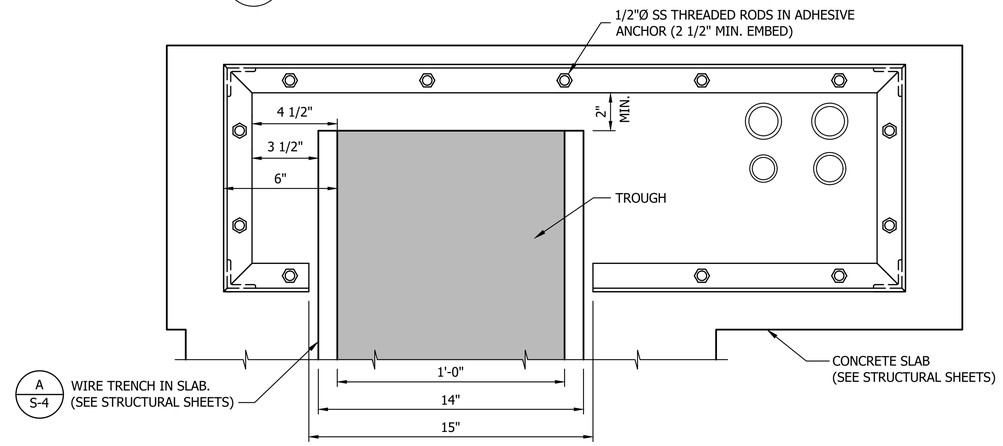
C / E-15 [10 FCP 01] ENCLOSURE BOTTOM PENETRATIONS



1 / TYP 12" WIRE TRENCH AND CABLE TRAY SECTION



B / E-15 [10 FCP 01] SCREENED CAGE MIDDLE VIEW



D / E-15 [10 FCP 01] SCREENED CAGE BOTTOM VIEW TRENCH AND CONDUIT PLACEMENT

NOTES:

1. SEPARATE AND SECURE INTRINSICALLY SAFE CABLES PER NEC 504.30(A).
2. FOR STRUCTURAL DESIGN INFORMATION SEE S-SHEETS.

SHEET 39 OF 40

CAD NO. E_DET.DWG

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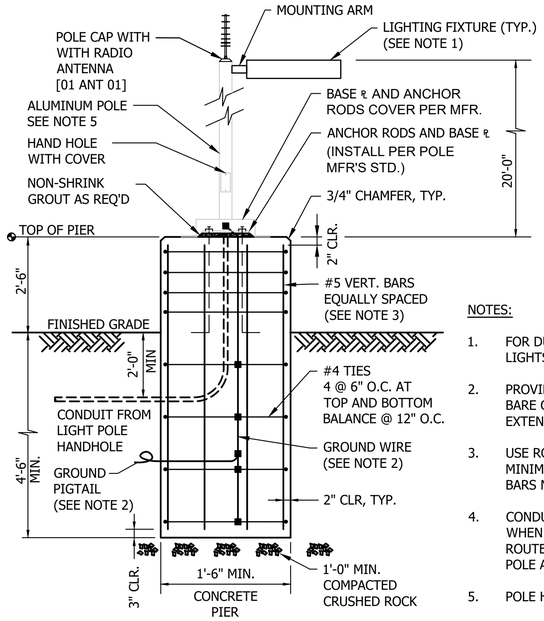
LIFT STATION REPLACEMENT

ELECTRICAL DETAILS

ED-02

SCALE: AS SHOWN

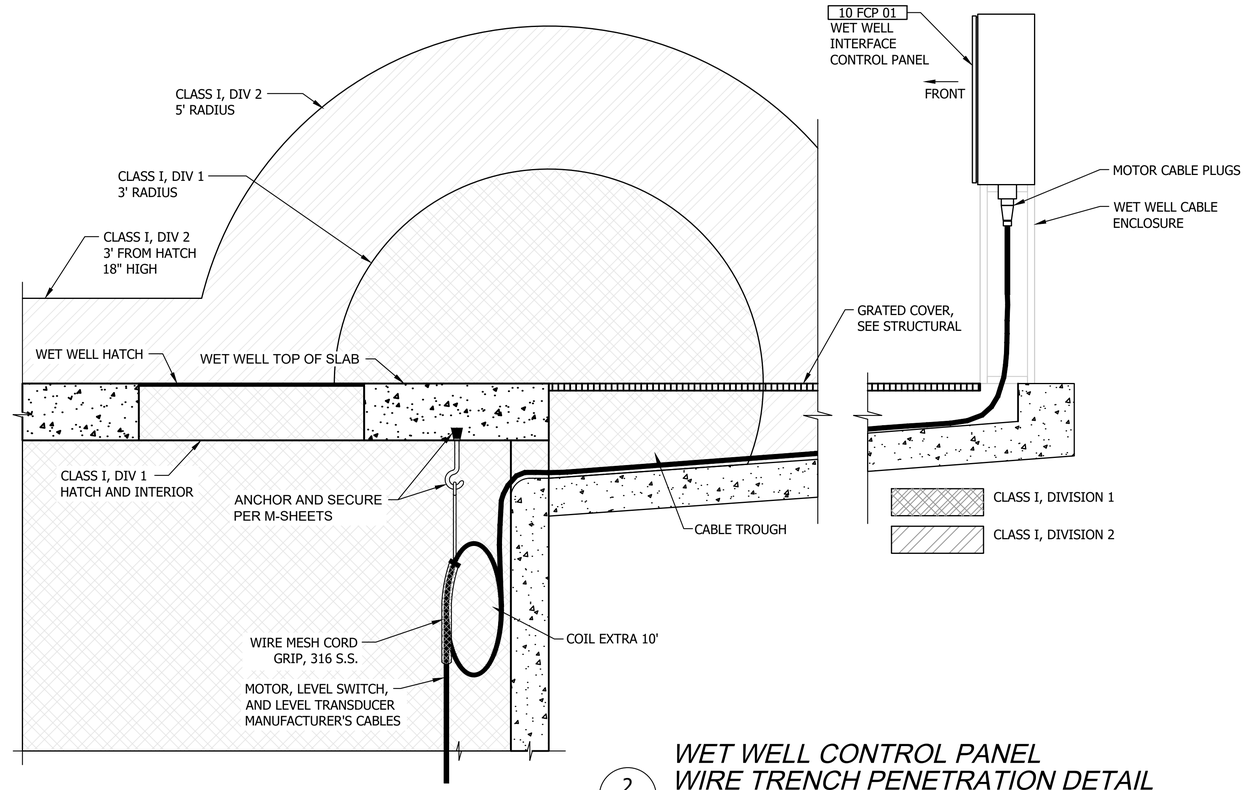
PARKS FILE# AE 325-036



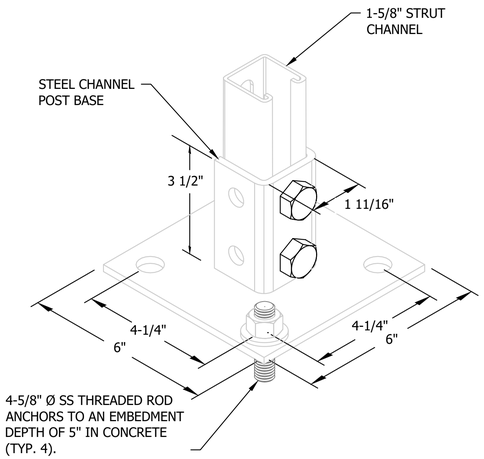
NOTES:

1. FOR DUAL-FIXTURE LIGHT POLES, OFFSET LIGHTS BY 180 DEGREES.
2. PROVIDE CONCRETE PIER WITH #4 AWG BARE COPPER GROUND WIRE WITH 24" EXTENSION FROM SIDE OF PIER.
3. USE ROUND PIER WITH 6 VERTICAL BARS MINIMUM OR SQUARE PIER WITH 8 VERTICAL BARS MINIMUM.
4. CONDUIT S0104 SHALL BE GROUNDED LFMC WHEN IT TRANSITIONS INTO THE POLE. ROUTE S0104 THROUGH THE CENTER OF THE POLE AND SECURE PER NEC.
5. POLE HEIGHT SHALL BE 30'-0".

1 TYP *POLE LIGHT DETAIL*



2 TYP *WET WELL CONTROL PANEL WIRE TRENCH PENETRATION DETAIL*



NOTES:

1. ALL METAL SHALL BE 316 STAINLESS STEEL

3 TYP *POST BASE DETAIL AND SECTION*

CAD NO. E_DET.DWG		
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		APP.
		INT.
		REVISIONS
		NO.

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TWIN HARBORS STATE PARK

LIFT STATION REPLACEMENT

ELECTRICAL DETAILS

ED-03

SCALE: AS SHOWN

PARKS FILE# AE 325-036

SHEET 40 OF 40

M:\WSPARKS\23578.00 Twin Harbors Pump Station\01 Design\PLANSET\Electrical\E_DET.dwg, 3/25/2025 11:52 AM, DAVID KLATT