



<b>CLIENT:</b> SEATTLE PUBLIC UTILITIES		<b>DATE:</b>
<b>PROJECT:</b> PS 73 IMPROVEMENTS	<b>SYSTEM:</b> PUMP STATION - ALL EQUIPMENT	<b>REPORT BY:</b>

**Note to Designer: Revise Equipment Tags for project specific values**

EQUIPMENT LIST		
EQUIPMENT DESCRIPTION	EQUIPMENT TAG	NOTES
<input type="checkbox"/> Service Cabinet	SCAB-7300	
<input type="checkbox"/> Meter and Meter Base	KWM-7300	
<input type="checkbox"/> 200A Service Disconnect	DS-7300	
<input type="checkbox"/> Automatic Transfer Switch	ATS-7300	
<input type="checkbox"/> Standby Generator (80 KW)	EG-7300	
<input type="checkbox"/> Motor Control Center	MCC-7300	
<input type="checkbox"/> Distribution Transformer	XFMR-7301	
<input type="checkbox"/> Distribution Panelboard	PNL-7301	
<input type="checkbox"/> 3-Phase Power Monitor Relay	3PH-RELAY	
<input type="checkbox"/> MELTRIC Disconnects	RCPT-7301 RCPT-7302	
<input type="checkbox"/> Jog Forward Switches	JSW-P1 JSW-P2	
<input type="checkbox"/> Pump Motors	MTR-7301 MTR-7302	
<input type="checkbox"/> Pumps	P-7301 P-7302	
<input type="checkbox"/> Motor Starters (Softstarters)	RVSS-7301 RVSS-7302	
<input type="checkbox"/> Dry Well Sump Pump	P-7300	
<input type="checkbox"/> Dry Well Supply Fan	SF-7310	
<input type="checkbox"/> Dry Well Exhaust Fan	EF-7311	
<input type="checkbox"/> Wet Well Supply Fan	SF-7320	
<input type="checkbox"/> Wet Well Exhaust Fan	EF-7321	
<input type="checkbox"/> Dry Well Low Air Flow Switch (Supply)	FSL-7310	
<input type="checkbox"/> Dry Well Low Air Flow Switch (Exhaust)	FSL-7311	
<input type="checkbox"/> Low Air Flow Strobe Lighting	QAL-7300	
<input type="checkbox"/> Current Switches (Sump Pump, Dry Well Supply Fan, Wet Well Supply Fan, Dry Well Exhaust Fan, Wet Well Exhaust Fan)	IS-7300 IS-7310 IS-7320 IS-7311 IS-7321	
<input type="checkbox"/> Intrinsic Safety Barrier	JB-7301	



<input type="checkbox"/>	Wet Well Level Switches (2)	LSH-7301 LSHH-7302	
<input type="checkbox"/>	Dry Well Level Switch	LSHH-7303	
<input type="checkbox"/>	Wet Well Pressure Transducers (2)	PE/PT-7301 PE/PT-7302	
<input type="checkbox"/>	Magnetic Flow Meter	FE/FIT-7301	
<input type="checkbox"/>	Pump 1 Check Valve	CHV-7301	
<input type="checkbox"/>	Pump 2 Check Valve	CHV-7302	
<input type="checkbox"/>	Sump Pump Check Valve	CHV-7300	
<input type="checkbox"/>	Pump 1 Suction Gate Valve	GV-7301	
<input type="checkbox"/>	Pump 2 Suction Gate Valve	GV-7302	
<input type="checkbox"/>	Pump 1 Discharge Gate Valve	GV-7303	
<input type="checkbox"/>	Pump 2 Discharge Gate Valve	GV-7304	
<input type="checkbox"/>	Force Main Gate Valve	GV-7305	
<input type="checkbox"/>	Bypass Gate Valve	GV-7306	
<input type="checkbox"/>	Force Main Isolation Gate Valve	GV-7307	
<input type="checkbox"/>	Gas Detector LEL	AIT/AE-7301	
<input type="checkbox"/>	Gas Detector Petroleum	AIT/AE-7302	
<input type="checkbox"/>	Wet/Dry Well and Emergency Lighting	LTG73-A LTG73-B LTG73-C	
<input type="checkbox"/>	Dry Well Receptacles	Outlets	
<input type="checkbox"/>	Network Interface Unit (Century Link CKT)	NIU-7300	
<input type="checkbox"/>	SCADA Panel	MCP-7300	
<input type="checkbox"/>	Draw Down Testing		



<b>TESTING PROCEDURES</b>		
SERVICE CABINET (SCAB-7300) METER AND METER BASE (KWM-7300) SERVICE DISCONNECT (DS-7300) AUTOMATIC TRANSFER SWITCH (ATS-7300) STANDBY GENERATOR (EG-7300)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify cabinet installation fit and tolerances	SCAB-7300	
<input type="checkbox"/> Verify cabinet doors open, close, and seal	SCAB-7300	
<input type="checkbox"/> Verify cabinet penetrations sealed per plan	SCAB-7300	
<input type="checkbox"/> Verify meter and meter base installed and energized and setup by SCL	KWM-7300	
<input type="checkbox"/> Verify disconnect install and cycle min 3 times to verify mains power disconnected	DS-7300	
<input type="checkbox"/> Verify transfer switch installed per plan and verify operability by cycling switch 3 times and verify mains power disrupted.	ATS-7300	
<input type="checkbox"/> Startup generator and verify system integrated and signals reading on HMI Note: Entire facility will be tested on generator power during System Testing phase.	EG-7300	

<b>TESTING PROCEDURES</b>		
MOTOR CONTROL CENTER (MCC-7300) DISTRIBUTION PANEL (PNL-7301) DISTRIBUTION PANEL TRANSFORMER (XFMR-7301) PHASE FAIL RELAY (3PH-RELAY)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify installation fit and tolerances	MCC-7300	
<input type="checkbox"/> Verify Doors open, close, and seal	MCC-7300	
<input type="checkbox"/> Verify penetrations sealed per plan	MCC-7300	
<input type="checkbox"/> Verify MCC, transformer, and distribution panel powered off mains power	MCC-7300 PNL-7301 XFMR-7301	
<input type="checkbox"/> Cycle all breaks min 3 times	MCC-7300 PNL-7301 XFMR-7301	
<input type="checkbox"/> Simulate / force phase fail condition and verify that relay trips, motors disconnect, and alarm indication on HMI. Verify relay reset when simulation/forcing removed.	3PH-RELAY	



**EQUIPMENT ACCEPTANCE TESTING (EAT)**

<b>TESTING PROCEDURES</b>		
MOTOR DISCONNECTS (RCPT-7301/02)		
<b>ACTIVITY</b>	<b>EQUIPMEN T TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify wiring and terminations per plan	RCPT-7301/02	
<input type="checkbox"/> Verify operations (Plug and unplug 3 times) and verify pump out of service indication when disconnected	RCPT-7301/02	

<b>TESTING PROCEDURES</b>		
JOG FORWARD SWITCHES (JSW-7301/02) MOTORS (MTR-7301/02) PUMPS (P-7301/02)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify wet well free of construction debris	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Inspect pump installation to ensure that it is installed per manufacturers and Contract Document requirements (bolt torque, grout pad, piping connections are tight, etc.)	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Check all piping and make sure there are no leaks in the system.	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Check alignment of pump and driver	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Verify functionality of HOA switch	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> "Bump" motor to check rotation with Jog Forward Switch	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Inspect all rotating parts. Should turn freely by hand	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Ensure pump is primed and that no air pockets are present within the pump	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Ensure all guards are in place per manufacturer's requirements	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Start motor and verify performance	MTR-7301/02 P-7301/02 JSW-7301/02	
<input type="checkbox"/> Re-check alignment between pump and driver	MTR-7301/02 P-7301/02 JSW-7301/02	



<b>TESTING PROCEDURES</b>		
MOTOR STARTERS (RVSS-7301/02)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify that all studies and 3 <sup>rd</sup> party testing complete and documentation submitted	RVSS-7301 RVSS-7302	
<input type="checkbox"/> Verify wiring and terminations per plan	RVSS-7301 RVSS-7302	
<input type="checkbox"/> Energize panels and verify ready for operation	RVSS-7301 RVSS-7302	
<input type="checkbox"/> Verify that Soft Starters programmed and manufacturers services completed	RVSS-7301 RVSS-7302	
<input type="checkbox"/> Start pump and verify soft starter ramp	RVSS-7301 RVSS-7302	

<b>TESTING PROCEDURES</b>		
SUMP PUMP (P-7300) SUMP PUMP CHECK VALVE (CHV-7300)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify sump free of construction debris	P-7300	
<input type="checkbox"/> Inspect pump installation to ensure that it is installed per contract	P-7300	
<input type="checkbox"/> Check all piping and make sure there are no leaks in the system.	P-7300	
<input type="checkbox"/> Fill sump	P-7300	
<input type="checkbox"/> Verify functionality (Lift float and pump out sump) and verify that check valves hold backflow	P-7300 CHV-7300	

<b>TESTING PROCEDURES</b>		
<b>VENTILATION SYSTEM</b> DRY WELL SUPPLY FAN (SF-7310, DRY WELL EXHAUST FAN (EF-7311) WET WELL SUPPLY FAN (SF-7320), WET WELL EXHAUST FAN (EF-7321) DRY WELL LOW AIR FLOW SWITCHES (FSL-7310, FSL-7311) LOW AIR FLOW STROBES (QAL-7300)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/> Verify electrical connections per contract	SF-7310 EF-7311 SF-7320 EF-7321 FSL-7310 FSL-7311 QAL-7300	
<input type="checkbox"/> Verify 3 <sup>rd</sup> party testing and balancing complete, and flow switch calibration complete and documentation submitted	SF-7310 EF-7311 SF-7320	



		EF-7321 FSL-7310 FSL-7311 QAL-7300	
<input type="checkbox"/>	Run fans (Dry Well Supply, Dry Well Exhaust, Wet Well Supply, and Wet Well Exhaust at normal operating speed for duration of testing)	SF-7310 EF-7311 SF-7320 EF-7321	
<input type="checkbox"/>	Turn off Dry Well Supply fan and confirm flow switch engages and strobe engages	FSL-7310 QAL-7300	
<input type="checkbox"/>	Turn off Dry Well Exhaust fan and confirm flow switch engages and strobe engages	FSL-7311 QAL-7300	

<b>TESTING PROCEDURES</b>		
<b>CURRENT SWITCHES (IS-73XX)</b>		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Verify electrical connections per contract	IS-7300 IS-7320 IS-7310 IS-7321 IS-7311
<input type="checkbox"/>	Verify normally open operation for: <ul style="list-style-type: none"> <li>- Sump Pump</li> <li>- Wet Well Supply Fan Running</li> <li>- Dry Well Supply Fan Running</li> <li>- Wet Well Exhaust Fan Running</li> <li>- Dry Well Exhaust Fan Running</li> </ul>	IS-7300 IS-7320 IS-7310 IS-7321 IS-7311

<b>TESTING PROCEDURES</b>		
<b>INSTRUMENTS</b>		
<b>STAFF GAGE</b>		
<b>INTRINSIC SAFETY BARRIER (JB-7301)</b>		
<b>LEVEL SWITCHES (LSH-7301, LSHH-7302, LSHH-7303)</b>		
<b>PRESSURE TRANSDUCERS (PE/PT-7301, PE/PT 7302)</b>		
<b>FLOW METER (FE/FIT-7301)</b>		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Verify Staff Gage installed with zero reference at bottom of wet well sump	N/A
<input type="checkbox"/>	Verify instruments terminated through intrinsic safety barrier	JB-7301
<input type="checkbox"/>	Wet Well Level HI float trip set per contract (Lift and verify against staff gage)	LSH-7301
<input type="checkbox"/>	Wet Well Level HI HI (Overflow) float trip set per contract (Lift and verify against staff gage)	LSHH-7302
<input type="checkbox"/>	Dry Well Level HI HI (Flood) float trip set at 1.5" AFF (Lift and verify with tape)	LSHH-7303



<input type="checkbox"/>	Pressure Transducer 1 installed at 0.5' in wet well (Verify against staff gage) and calibration input into SCADA	PE/PT-7301	
<input type="checkbox"/>	Pressure Transducer 2 installed at 0.5' in wet well (Verify against staff gage) and calibration input into SCADA	PE/PT-7302	
<input type="checkbox"/>	Verify flow meter installed per contract	FE/FIT-7301	
<input type="checkbox"/>	Operate pumping system and verify flow measured and indicated correctly	FE/FIT-7301	

<b>TESTING PROCEDURES</b>			
<b>VALVES</b>			
<b>ACTIVITY</b>		<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Pump 1 Suction Gate Valve (Open and close)	GV-7301	
<input type="checkbox"/>	Pump 2 Suction Gate Valve (Open and close)	GV-7302	
<input type="checkbox"/>	Pump 1 Discharge Gate Valve (Open and close)	GV-7303	
<input type="checkbox"/>	Pump 2 Discharge Gate Valve (Open and close)	GV-7304	
<input type="checkbox"/>	Force Main Gate Valve (Open and close)	GV-7305	
<input type="checkbox"/>	Bypass Gate Valve (Open and close)	GV-7306	
<input type="checkbox"/>	Bypass Camlock (Visually inspect)	N/A	
<input type="checkbox"/>	Pump 1 Check Valve (Verify operations, open/close, during pumping)	CHV-7301	
<input type="checkbox"/>	Pump 2 Check Valve (Verify operations, open/close, during pumping)	CHV-7302	
<input type="checkbox"/>	Sump Pump Check Valve (Verify operations during pumping)	CHV-7300	

<b>TESTING PROCEDURES</b>			
<b>LEL GAS DETECTOR PANEL (AE/AIT-7301) PETROLEUM GAS DETECTOR PANEL (AE/AIT-7302)</b>			
<b>ACTIVITY</b>		<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Verify LEL Gas Detector installed per contract		
<input type="checkbox"/>	Verify LEL Gas Detector pre-programmed self-tests completed		
<input type="checkbox"/>	Verify LEL Gas Detector calibration/verification test completed with test gas		
<input type="checkbox"/>	Add LEL test gas to sample tube intake in wet well. Verify alarm indication.		
<input type="checkbox"/>	Verify Petroleum Gas Detector installed per contract		
<input type="checkbox"/>	Verify Petroleum Gas Detector pre-programmed self-tests completed		



<input type="checkbox"/>	Verify Petroleum Gas Detector calibration/verification test completed with test gas		
<input type="checkbox"/>	Add Petroleum test gas to sample tube intake in wet well. Verify alarm indication.		

<b>TESTING PROCEDURES</b>		
DRY WELL LIGHTING (LTG73-A) WET WELL LIGHTING (LTG73-B) EMERGENCY LIGHTING (LTG73-C) DRY WELL RECEPTACLES (Outlets)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Verify dry well lighting fixtures installed per contract and function	LTG73-A
<input type="checkbox"/>	Verify wet well lighting fixtures installed per contract and function	LTG73-B
<input type="checkbox"/>	Verify emergency self-luminous signs installed per contract and function with lights off	LTG73-C
<input type="checkbox"/>	Verify receptacles installed per contract and test each with load	Outlets

<b>TESTING PROCEDURES</b>		
NETWORK INTERFACE UNIT ( NIU-7300) AND ETHERNET SWITCH		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Verify installation NIU and ethernet switch	NIU7300
<input type="checkbox"/>	Verify network connection and communications between SCADA panel and OCC	NIU7300
<input type="checkbox"/>	Verify SCADA pushed any program updates to SCADA panel.	NIU7300

<b>TESTING PROCEDURES</b>		
SCADA PANEL (MCP-7300)		
<b>ACTIVITY</b>	<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
<input type="checkbox"/>	Verify Wet Well Level HI float indication on HMI (Lift float)	MCP-7300
<input type="checkbox"/>	Verify Wet Well Level HI HI float indication on HMI (Lift float)	MCP-7300
<input type="checkbox"/>	Verify Wet Well Level 1 indication on HMI (Watch and verify pressure transducer level varies with wet well level)	MCP-7300
<input type="checkbox"/>	Verify Wet Well Level 2 indication on HMI (Watch and verify pressure transducer level varies with wet well level)	MCP-7300





<input type="checkbox"/>	Verify LEL level indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify LEL High level indication on HMI (test gas or simulate from unit)	MCP-7300	
<input type="checkbox"/>	Verify LEL sensor fault indication on HMI (simulate from unit)	MCP-7300	
<input type="checkbox"/>	Verify Sample Pump Loss of Flow indication on HMI (cover sample tube)	MCP-7300	
<input type="checkbox"/>	Verify Petroleum level indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Petroleum High level indication on HMI (test gas or simulate from unit)	MCP-7300	
<input type="checkbox"/>	Verify Petroleum sensor fault indication on HMI (simulate from unit)	MCP-7300	
<input type="checkbox"/>	Verify Dry Well HI level indication on HMI (lift float)	MCP-7300	
<input type="checkbox"/>	Verify Pump 1 Motor Power indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Pump 1 Overload indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Pump 1 Motor Disconnect indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Pump 1 Running indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Pump 1 HOA indication on HMI	MCP-7300	??
<input type="checkbox"/>	Verify Pump 2 Motor Power indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Pump 2 Overload indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Pump 2 Motor Disconnect indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Pump 2 Running indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Pump 2 HOA indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Phase Fail indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Flow meter reading and flow totalization indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Sump Pump run indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Wet Well Supply Fan run indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Dry Well Supply Fan run indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Wet Well Exhaust Fan run indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify Dry Well Exhaust Fan run indication on HMI	MCP-7300	
<input type="checkbox"/>	Verify ATS position indication	MCP-7300	
<input type="checkbox"/>	Verify ATS emergency position indication	MCP-7300	
<input type="checkbox"/>	Verify generator remote start indication	MCP-7300	
<input type="checkbox"/>	Verify generator run indication	MCP-7300	
<input type="checkbox"/>	Verify generator fail indication (simulate)	MCP-7300	
<input type="checkbox"/>	Verify generator low fuel indication (simulate)	MCP-7300	



<input type="checkbox"/>	Verify generator in auto indication	MCP-7300	
<input type="checkbox"/>	Verify Dry Well Supply Fan Air Low Flow indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Dry Well Exhaust Fan Air Low Flow indication on HMI (simulate)	MCP-7300	
<input type="checkbox"/>	Verify Replace SCADA battery alarm indication on HMI (simulate)	MCP-7300	

<b>PUMP DRAW DOWN TESTING</b>			
<b>ACTIVITY</b>		<b>EQUIPMENT TAG</b>	<b>COMPLIANT / NOTES</b>
	<b>Pump Draw Down Testing (Use Potable Water)</b>	P-7301	
<input type="checkbox"/>	Keep influent valve closed	P-7301	
<input type="checkbox"/>	Fill Wet Well (Potable Water)	P-7301	
<input type="checkbox"/>	Run Pump 1	P-7301	
<input type="checkbox"/>	Record time of pump run and flow meter reading half way through pump run: - Total Time: - Q (Mid Point):	P-7301	
<input type="checkbox"/>	Fill Wet Well (Potable Water)	P-7302	
<input type="checkbox"/>	Run Pump 2	P-7302	
<input type="checkbox"/>	Record time of pump run and flow meter reading half way through pump run: - Total Time: - Q (Mid Point):	P-7302	
<input type="checkbox"/>	Fill Wet Well (Potable Water)	P-7301 P-7302	
<input type="checkbox"/>	Run Pump 1 and 2 in Tandem		
<input type="checkbox"/>	Record time of pump run from Hi Level Float to Pump Off Level. - Total Time:	P-7301 P-7302	



<b>SEATTLE PUBLIC UTILITIES</b>		<b>DATE:</b>
<b>PROJECT:</b>  PS 73 IMPROVEMENTS	<b>EQUIPMENT/SYSTEM:</b>  PUMP STATION: ALL EQUIPMENT	<b>REPORT BY:</b>

APPROVAL

Facility has passed the Equipment Acceptance Testing phase of commissioning and is ready for the Systems Acceptance Testing phase of commissioning.

CxA \_\_\_\_\_

Date \_\_\_\_\_