



Pump Station Startup Checklist

April 5, 2017

The following Pump Station Startup Checklist is intended to assist the contractor and to clarify the Sacramento Area Sewer District (SASD) requirements for acceptance of newly constructed and reconstruction of an existing Pump Station. SASD has divided the checklist into four phases, based upon the activities and personnel involved:

- **Phase 1 Pre-demonstration:** to ensure that the contractor has installed the equipment correctly and that each manufacturer has field-verified their specific devices do indeed meet the criteria for the required warranties. This phase is completed by the contractor, observed by the inspector, and (except for the specific FAT items) confirmed by the design engineer. SASD has some limited involvement.
- **Phase 2 Demonstration:** Demonstrate that all of the equipment is installed and operates correctly as an integrated system, and prepares the station for the continuous 10-day test. This phase is primarily the responsibility of the contractor (and subs).
- **Phase 3 Operational Testing and Startup:** Provides for a 10 day fresh water test, which will mimic the stations realistic operation. The 10 day test shall be defined as 240 hours of continual operation without any failure of the system and its components. The test also provides the appropriate break-in of the pumps, verification of the SCADA system, comms, plumbing and mechanicals, power systems, etc. Station specific SASD Training is also provided in this Phase. The successful completion of this phase will then transfer access and operational control to SASD. Upon successful completion of Phase 3, the contractor shall schedule with SASD, an appointment for the transfer of access, operations and the acceptance of live flows into the new station. Please note, that this transfer must be scheduled between Tuesday and Thursday only. In addition, all Field Inspections by SASD, as required by each Phase, shall also be scheduled between Tuesday and Thursday.
- **Phase 4 Acceptance:** Ensures that appropriate signatures, approvals and documentation is provided to SASD.

Note 1:

Note that each phase must be completed and signed off prior to the start of the next phase, including review and approval from SASD and the Engineer of Record, EOR, of all the required Submittals, Reports etc. for each Phase as listed.

Note 2:

Every item that is included on the Checklist, for each Phase, must be completed and accepted prior to advancing to the next Phase. This may also include any site specific items that may not be included on the Checklist, but are part of the design and plans. The Contractor, Design Engineer (or field representative), and CMID inspector need to initial as each item is completed. A SASD representative will initial in the SASD block when confirmed. SASD's Project Manager will sign on the bottom line once the entire checklist has been completed, and the project will then move to the next phase.

Note 3:

A Project binder containing the original checklist, certificates, test results, and other pertinent information must be kept onsite and accessible to all SASD personnel at all times.

Facilities Startup: Phase 1 (Pre-Demonstration) Checklist Page 1 (To be completed prior to start of Phase 2)		Contractor	Design Engineer	Inspector	SASD	
Facility: _____						
Design Engineer: _____						
Inspector: _____						
Permits	Building Permit					
	Authority to construct					
	Permit to Operate					
	Easements submitted to SASD					
	Access Permit					
Field Installation/testing	All wiring terminated, tagged, and installed					
	Protective devices coordinated per Study					
	Permanent utility power installed - Record # of Phases & Actual Voltage.					
	Permanent water service pressure tested and installed					
	All grounding systems installed and tested					
	All conduits tagged and installed					
	All pneumatic lines installed and tested					
	All equipment installed per approved seismic calculations					
	Generator and load bank installed					
	Site Lighting installed - permanent wiring and power w/ photocell adjusted.					
	Switchboard, MCC, ATS, PLC, bubbler installed					
	Building or canopy, including lighting (interior and exterior) installed					
	All installed equipment labeled					
	Cathodic protection installed					
	Factory acceptance test: witnessed	Switchboard				
		Automatic or manual transfer switch				
		Motor control center				
		PLC cabinet				
	Factory acceptance test: non - witnessed:	Pumps				
		Standby generator and load bank and transfer switch as applicable				
	On-Site pump test by manufacturer					
	On-Site hoist system test by manufacturer as applicable					
	Captive air bell leak test					
	Manufacturer's & NETA quality control on switchboard/MCC					
	Field Cable insulation tested					
	On-Site generator and load bank test by manufacturer					
	Building systems	HVAC				
		Plumbing				
		Electrical				
Lighting						
Storm drain						

Facilities Startup: Phase 1 (Pre-Demonstration) Checklist Page 2 (To be completed prior to start of Phase 2)				Contractor	Design Engineer	Inspector	SASD
Facility: _____							
Design Engineer: _____				Inspector: _____			
Elevation Verification	Elevation:		Plan	Actual			
	Wet well floor						
	Inflow inlet invert						
	Captive air bell						
	Bubbler tube / Pressure transducer						
	Pump inlet						
	Low Manhole						
Wet well rim							
Approved Submittals	Manufacturers statement of installation						
	Accurate as-builts, Full size (matching existing conditions):	Loop drawings					
		Interconnect drawings					
		Mechanical site drawing					
		Civil site drawing					
		Electrical site drawing					
	Instrument calibration certifications						
	Protective devices coordination study by professional electrical engineer						
	Wire pull sheets and conduit schedule						
	Certified cable insulation resistance test results by a NETA testing firm						
	Certified grounding system test results by a NETA testing firm						
	Switchboard and MCC testing results by a NETA testing firm						
	Witnessed factory acceptance test on all control & electrical equipment ** Include FAT, PL						
	Factory acceptance test results for pump						
	Factory acceptance test results for generator						
	Certified on-site generator test, including noise level at property line: _____ dB						
	O & M manuals (include all approved submittals)						
Test procedures for Phase 2							
** FAT Punch List items, complete & certified. prior to delivery to site							

SASD Project Manager Phase 1 Checklist Approval: _____

Facilities Startup: Phase 2 (Demonstration) Checklist (To be completed prior to start of Phase 3) All Phase 2 tests require two week notice to SASD			Contractor	SASD
Facility: _____ Design Engineer: _____ Inspector: _____				
Remote Telemetry Unit	Verify Installation and Hookup, connectors and conduits			
	Antenna Alignment (Contractor provides bucket truck)			
	Communications Programming and Testing			
	I/O Test Modem			
	Captive air bell calibration (attach calibration record)			
5 point verification of the pressure transducer (attach calibration record)				
System Demo	Pumping Systems	Pull pumps and inspect		
		Guide rails		
		Crane as applicable		
		Inspect wet well		
		Clean water recirculated		
	Generator, load bank & fuel tank, transfer switch, District, 5 cycles			
	Switchboard/MCC, cabinet lighting, heaters, cooling fans, all functions.			
	Instrumentation			
	Crane, as applicable			
	Security System/Fire Alarm including cabinets and other as applicable.			
FM Tested/approved, wet well to 1st accessible joint, Off-site				
Assets Input	Service Request submitted for pumps, CARV, force main			
	Service Request submitted for station - new asset.			
General Walkthrough	CMID Punch list Completed	Inspector's Initials		
		SASD Asset Management Initials		
Approved Submittals	Test Plans for Phase 3 (mimicking operational conditions)			
	Final O&M manuals (3 copies with one copy at station) - provide O&M manual CAD files (MCC & SCADA)			
	Final As-Built Drawings			

SASD Project Manager Phase 2 Checklist Approval: _____

Facilities Startup: Phase 3 (Operational Testing & Startup) Checklist (To be completed prior to start of Phase 4)		Contractor	Inspector	SASD	
Facility: _____ Design Engineer: _____					
Inspector: _____					
1. 10 Day Fresh Water Test	Level change Start of Test: WW/HL & LL Alarms verified, 4 cycles each.				
	Pump cycling				
	Daily checks AM and PM daily checks, Cont. and District, Recorded.				
	Holding tank, all hoses, fgs, valves, etc. secure, no leaks.				
	Pull pumps, check oil, impeller, volute, etc. (at start and completion of test)				
	Run pumps off of generator power				
	Site specific:	Site lighting, SCADA, Alarms, etc. active			
		Site security: WW access secured/locked, fencing, gates			
		Cabinet heaters, fans, etc., record outside temps.			
	SASD Phase III Punchlist Generated				
	SASD Phase III Punchlist Completed				
Start date: _____ Stop date: _____					
2. Contractor Provided Training	Pumping Systems				
	Generator as applicable, load bank & fuel tank, transfer switch, identify phase at generator.				
	Switchboard/MCC				
	Instrumentation				
	Crane as applicable				
	Security Systems				
	Fire Alarm				
	Other Sytems as applicable				
3. Station Cleanup	Remove re-circulation system, test plates, etc, after fresh water test				
	Remove all contractor equipment from site/asset area.				
	SASD Operations and Maintenance Letter Issued (cc: M&O)				
	Final Station cleanup				
	Final Punchlist generated. Must be completed prior to Step 4				
4. Connect to Sewer	Verify downstream systems operational and connected	Plugs removed (verify) & allow sewage into facility			
		Valves open			
		Forced main operational, tested, signed off			
	Abandon items as applicable. Arrange access via SASD Rep.				
5. Make Facility Operational	Replace contractor lock with District locks, No Cont. Access w/o Rep.				
	SCADA turned on				
	SASD M&O ready to accept maintenance & operations of station				
	Notify SASD M&O				
	Notify SASD USA Group				

SASD Project Manager Phase 3 Checklist Approval: _____

