|  |
| --- |
| **LSC PUMP STATION AND RISING MAIN PROJECT** |
| **Item** | **Complete**Yes/No/N.A | **Comments/****Initials** |
| **Management/Documentation** |  |  |
| 1. Verify that all project objectives have been achieved.
 |  |  |
| 1. Verify that all documentation has been provided:
 |
| * 1. O&M Manual & Maintenance Schedules
 |  |  |
| * 1. As-Constructed Drawings (PDF & CAD, numbered and named as per AM2488) and other design documents
 |  |  |
| * 1. QA Documents (including ITPs, authority approvals, electrical safety certificate etc.)
 |  |  |
| * 1. Watershed Datasheets (photos to be provided separate from Word Document)
 |  |  |
| * 1. Photos (Construction, Final Asset and Defect before/after)
 |  |  |
| 1. Verify GTViewer has been updated and is accurate
 |  |  |
| 1. An underground electrical plan (including power supply to switchboard) is to be supplied with the As Constructed information.
 |  |  |
| 1. Verify that Pre-Commissioning Checklist for New Asset – Waste Water Sites (Appendix F of LSC Pump Station Supplementary Manual) has been completed and submitted.
 |  |  |
| 1. Verify that performance testing of pumps has passed.
 |  |  |
| 1. Verify the appropriate training required for Operators to run the asset has been completed.
 |  |  |
| 1. Ensure any new water service tappings are captured in GIS.
 |  |  |
| 1. Hardcopy of O&M Manual folder left in switchboard.
 |  |  |
| 1. SCADA checklist complete. SCADA is working correctly.
 |  |  |
| **Rising Main – General** |  |  |
| 1. Verify that all pipe work has been pressure tested and passed.
 |  |  |
| 1. Have approved products and sizes been used?
 |  |  |
| 1. Have air and scour valves been installed as per the design?
 |  |  |
| 1. Rising mains have reflux valve and sluice valve, scour line to have sluice valve.
 |  |  |
| 1. Verify that all anchorages are constructed to design specifications, including puddle flange anchors on PE mains.
 |  |  |
| 1. Verify that all valves installed in pits can be removed through the available cover opening.
 |  |  |
| 1. Placement of covers to be such that direct removal of valves is achievable by LSC crane truck.
 |  |  |
| 1. Are adequate supports provided in accordance with LSC standard drawings?
 |  |  |
| 1. Verify that epoxy coated DI pipe work has been provided to correct nominal diameter.
 |  |  |
| 1. Verify that the LSC specified coating for all valves has been applied.
 |  |  |
| 1. Verify that the LSC specified coating for the pipe work has been applied.
 |  |  |
| 1. Verify that all padlocks have been placed on above-ground valves.
 |  |  |
| 1. Verify that all valves are in correct position.
 |  |  |
| 1. All pipe work in pits to be DICL or HDPE.
 |  |  |
| 1. Marker posts installed along line of rising main as per standards:
* Change of direction of pipeline
* At fittings along line
* Minimum every 500 metres
* Fitted with correct plaque (provided by LSC)
 |  |  |
| 1. All LSC valves to be clockwise closing.
 |  |  |
| 1. Ensure all valves and spindles are accessible and serviceable (i.e. not hindered by covers, other valves, etc.).
 |  |  |
| 1. Are all LSC valve spindles fitted with a yellow star picket cap and appropriate LSC Valve Tag?
 |  |  |
| 1. All spindles 100-350 mm below finished surface level.
 |  |  |
| 1. Verify spindle extensions are securely fixed to spindles.
 |  |  |
| 1. Spindle shrouds to be straight and vertical, with the spindle centred in the shroud.
 |  |  |
| 1. Valve covers supported and level with natural surface level.
 |  |  |
| **Air Valve Installations** |  |  |
| 1. Location of installations to be agreed in advance with stakeholders. Consideration to be given to working safely in the road reserve and to local customers.
 |  |  |
| 1. Verify SS ball valves are installed on AVs to enable bleeding.
 |  |  |
| 1. Minimum size to be used DN80.
 |  |  |
| 1. Below ground pits:
	* All AVs to be isolatable from surface (Isolation valve spindle terminate just under cover).
	* 750mm working space in pit.
	* Minimum 300mm clearance between flanges and walls.
	* Evidence of engineered design for pre-cast pits (e.g. certificate from pit builder).
	* Precast joints to be watertight.
 |  |  |
| 1. Above-ground cabinets:
	* Air valve orifice to be piped to the floor of the cabinet (e.g. DN50 PVC)
	* Plinth to extend to door swing zone.
	* Door-stays included.
	* Isolation valves to be accessible
 |  |  |
| **Scour Valve Installations** |  |  |
| 1. Scour-tees used.
 |  |  |
| 1. Offtake valves to be on scour-tee.
 |  |  |
| 1. Access for eduction trucks to be considered.
 |  |  |
| 1. Camlock-type arrangement to be used for depths less than 3m.
 |  |  |
| 1. Camlock arrangement:
	* Female DN80mm Camlocks installed.
	* Lever-pins and Camlock caps fitted.
	* Levers to be well-clear of walls when open (e.g. >100mm).
 |  |  |
| **Pump Station – Mechanical** |  |  |
| 1. Verify that the pipe work for the incoming LSC is in accordance with the design drawings.
 |  |  |
| 1. Verify that the valves are clockwise closing.
 |  |  |
| 1. Verify that adequate supports have been provided for the valves in accordance with LSC standard drawings.
 |  |  |
| 1. Verify that adequate supports for vertical pipe work has been provided (i.e. vibration not noticeable when pumps operating).
 |  |  |
| 1. Verify the appropriate flow meter has been used and are constructed to design specifications.
 |  |  |
| 1. Verify that a flap valve has been installed on the valve chamber drain.
 |  |  |
| 1. Verify that all gate valves operate through the full range and are left in the open position.
 |  |  |
| 1. Verify that bleeders have been installed on the NRVs.
 |  |  |
| 1. Are valve extension spindles required (includes penstock)?
 |  |  |
| 1. Verify that epoxy coated DI pipe work has been provided to correct DN.
 |  |  |
| 1. Verify that the specified pressure gauges have been installed in the valve chamber.
 |  |  |
| 1. Verify that the LSC specified coating for pipes and valves has been applied.
 |  |  |
| 1. Verify that the specified bolting system on the flanges has been used.
 |  |  |
| 1. Verify that all valves can be removed through the available cover opening.
 |  |  |
| 1. Verify that uni-flanges have been provided to allow ease of removal of valves in accordance with standard drawings.
 |  |  |
| 1. Verify penstock installed as standard drawings.
 |  |  |
| 1. Verify that the guide rails comply with the standard drawings.
 |  |  |
| 1. Verify that the lifting chain complies with LSC specification.
 |  |  |
| 1. Verify that the Pump footstool has been secured to wet well floor with appropriate chemical anchors.
 |  |  |
| 1. Are wet well washers specified on design drawings? Wet well washers to be provided with Gate valve and regulator.
 |  |  |
| 1. Verify the wet well washers provided meet the LSC specified requirement.
 |  |  |
| 1. Verify eyelets/bullrings on pumps meet LSC needs for routine lifting.
 |  |  |
| 1. Verify that all above-ground pipes are labelled as per AS-1345 and labels are fitted as per LSC specification and Australian standards.
 |  |  |
| 1. Verify that no PVC or PE pipework has been used above-ground.
 |  |  |
| 1. Verify that all fittings are appropriately secured and free from unwanted movement.
 |  |  |
| **Pump Station – Civil** |  |  |
| 1. ERS arrangement and levels as per design. Flaps gates installed, seal and in working order. ERS outlet free.
 |  |  |
| 1. Ensure opening of cabinets present no OHS issue, i.e. not too close to an open MH.
 |  |  |
| 1. Unencumbered accessibility available for crane trucks and tankers to wet well, valve pit and detention tanks for cleaning and maintenance purposes.
 |  |  |
| 1. Concrete slab all one level and incorporating well covers, removable storage area for covers, electrical cabinet and valve pit.
 |  |  |
| 1. Protective bollards have been installed where required (removable where access may be required for maintenance purposes).
 |  |  |
| 1. Lighting provided at SPS site.
 |  |  |
| 1. Station identification plaques made from stainless steel plate 230mm x 80mm, holes in 4 corners for attachment.
 |  |  |
| 1. Access track is as per design and suitable.
 |  |  |
| 1. Lighting pole should be positioned to sufficiently illuminate the wet well and be unobstructed when folded.
 |  |  |
| 1. All wet-area cabinets should be self-draining.
 |  |  |
| 1. Drain points from solenoids should not go through cabinets, they should run to the bottom of the plinth for discharge.
 |  |  |
| 1. Have traffic risks been considered in the placement of assets?
 |  |  |
| 1. Site is free of rust.
 |  |  |
| 1. Switchboard door stays strong enough to withstand high winds.
 |  |  |
| 1. Catenaries installed as per standard drawing (LSC\_STD\_030).
 |  |  |
| **Wet Well, Valve Pit, Detention Tank Common Items** |  |  |
| 1. Is pump-out point installed as per drawings (e.g. 80mm Camlock).
 |  |  |
| 1. Covers installed as per design. 1m clear space (concrete path) around all access points, when lids/covers open.
 |  |  |
| 1. Wet Well, Valve Pit & Detention Tank to be epoxy coated.
 |  |  |
| 1. Gratings designed with consideration for access to instruments, spindles, valves, etc. Consideration for eduction hose access.
 |  |  |
| 1. Davit arm bases are stainless steel and cast into the slab.
 |  |  |
| **Wet Well Specific Items** |  |  |
| 1. Is the drop pipe on the inlet pipework with inspection opening at top and 45 degree directional bend at exit?
 |  |  |
| 1. Sufficient depth to inlet line for non-drowned inlets. Cut in level to inlet >0.8m.
 |  |  |
| 1. Covers placed to be such that direct removal of pumps is achievable by crane truck.
 |  |  |
| 1. Ensure wet well functionally seals.
 |  |  |
| **Valve Pit Specific Items** |  |  |
| 1. Placement of covers to be such that direct removal of valves is achievable by crane truck.
 |  |  |
| 1. Valve pit to be self-draining with flap gate.
 |  |  |
| **Detention Tank Specific Items** |  |  |
| 1. Detention tank isolation valves checked.
 |  |  |
| 1. Detention Tank flap gates functional.
 |  |  |
| 1. Verify that the level sensor is working on SCADA.
 |  |  |
| 1. Verify that the hose/ hydrant connection point is long enough for washing down the detention tank.
 |  |  |
| 1. Verify that there is adequate access to the detention tanks for cleaning purposes.
 |  |  |
| 1. Verify that there is an approved coating on the wall of the tank.
 |  |  |
| **Other Services**  |  |  |
| 1. Verify that the water service has been fitted with an approved back flow prevention device and hose reel in cabinet. Backflow device must be tested and tagged.
 |  |  |
| 1. Verify that all conduits through the top slab have been sealed to prevent odour escaping.
 |  |  |
| 1. Verify that electricity is below ground, not above.
 |  |  |
| 1. Verify that the access track is in accordance with the design drawings.
 |  |  |
| 1. Verify that adequate site drainage has been provided.
 |  |  |
| 1. All disused conduits must be grouted.
 |  |  |
| 1. Verify that all recycled water hoses and lines are purple.
 |  |  |
| 1. Verify hose reel is not painted red.
 |  |  |
| **Electrical Equipment** |  |  |
| 1. Verify that the Electrical equipment are designed and constructed per the LSC Waste Water Pump Station Electrical Design and Construction Specification 02-163.1.
 |  |  |
| 1. Verify that the Electrical equipment installed are per the LSC Electrical Performance Specification AM2714.
 |  |  |
| 1. Verify all Electrical equipment has been tested as per Appendix C – Commissioning Inspection Test Sheet of AM2714.
 |  |  |
| 1. Verify that the Station Identification plaque has been fitted to the electrical cabinet.
 |  |  |
| 1. Verify that the telemetry aerial has adequate protection in accordance with LSC specification.
 |  |  |
| 1. Verify that external lighting over the switchboard has been provided.
 |  |  |
| 1. Verify that the LSC locks fitted to switchboard and operational.
 |  |  |
| 1. Verify that quick link generator connectors provided.
 |  |  |
| 1. All conduits must be foam filled.
 |  |  |
| 1. Plastic fasteners not to be used in areas exposed to UV-light.
 |  |  |
| 1. Cables must not be exposed to UV-light (e.g. within conduit).
 |  |  |
| 1. Cable glands are properly installed and tightened.
 |  |  |
| 1. Cable socks to be fitted to all cables/pump cables.
 |  |  |
| **Concrete** |  |  |
| 1. Verify no leakage through the concrete structure.
 |  |  |
| 1. Verify that all chamfers are provided in accordance with the design drawings.
 |  |  |
| 1. Verify that the below ground concrete structures are dimensionally correct and in accordance with the design drawings.
 |  |  |
| 1. Verify the verticality of the structure is within tolerance in accordance with LSC specifications.
 |  |  |
| 1. Verify that the benching has been provided in accordance with design drawings.
 |  |  |
| 1. Verify that there is no damage to any exposed concrete surface.
 |  |  |
| 1. Verify that the top slab does not affect the drainage of the site.
 |  |  |
| 1. Verify that the concrete slab is flush with the finished surface level.
 |  |  |
| 1. Verify that the surface dimensions of the top slab are in accordance with the design drawings.
 |  |  |
| 1. Verify that the specified coating to the walls has been applied in accordance with the design drawings (extent/coverage).
 |  |  |
| **OH&S** |  |  |
| 1. Has a site safety audit been undertaken by the Safety & Wellbeing team?
 |  |  |
| 1. Verify that no overhead cables restrict access via crane trucks.
 |  |  |
| 1. Verify that ladder access to wet well, valve pit & detention tank meets OH&S requirements.
 |  |  |
| 1. Verify that all ladders are provided with the extension above the FSL.
 |  |  |
| 1. Verify that the ladders have non-slip treads.
 |  |  |
| 1. Have safety cages been specified? Verify that safety cages have been installed in accordance with the design drawings.
 |  |  |
| 1. Verify that adequate distance between wet well opening and switchboard is in accordance with OH&S requirements.
 |  |  |
| 1. Verify all items require ongoing maintenance are maintainable and accessible without the use of any mechanical aid.
 |  |  |
| 1. Verify that adequate set down areas for the covers has been provided in accordance with OH&S requirements.
 |  |  |
| 1. Ensure all ground-mounted objects have appropriate trip protection (e.g. chains, high visibility markers, etc.).
 |  |  |
| **Products & Materials** |  |  |
| 1. Verify that all products incorporated on the project are approved by LSC.
 |  |  |
| 1. Verify that all markings as required by LSC specification are visible on the covers.
 |  |  |
| 1. Verify that the covers and frames are greased in accordance with the manufacturer’s requirements.
 |  |  |
| 1. Verify that the interchangeable multi-part covers have lifting lugs on the beams for removal and covers have clockwise lifting key holes.
 |  |  |
| 1. Lids to be numbered in order of removal sequence.
 |  |  |
| 1. All metals exposed to LSC gases are to be stainless steel 316 or DICL.
 |  |  |
| 1. Fasteners and other metal products outside (exposed to weather/elements) to be GAL or SS.
 |  |  |
| 1. Have critical spares been procured?
 |  |  |
| 1. Fasteners inside LSC environment to be SS or appropriate inert material (e.g. plastic).
 |  |  |
| 1. Verify that grating clamps are Hilti X-FCM type.
 |  |  |
| **Security** |  |  |
| 1. Verify that the security fencing has been installed in accordance with the design drawings.
 |  |  |
| 1. Verify that LSC keyed locks installed.
 |  |  |
| 1. Ensure correct locks are fitted to all cabinet doors, turrets, valve pits, bollards, gates, cages and grates.
 |  |  |
| 1. Verify all cabinets have barrel locks.
 |  |  |
| 1. Abloy locks to be used in all network sites.
 |  |  |
| 1. Ensure sites are keyed alike.
 |  |  |
| 1. Check fencing meets LSC standard.
 |  |  |
| **Restoration** |  |  |
| 1. Verify that all site restorations have been completed (nature strips, tracks, pavements, fences, gates, clearance certificates).
 |  |  |
| 1. Have all NCR/Issues items been resolved (including any raised as a result of ***this*** audit)?
 |  |  |
| 1. All rubbish and decommissioned materials/assets must be removed offsite.
 |  |  |
| 1. Ensure all cabinets and vents are vacuumed and clean.
 |  |  |
| 1. Verify that level listing is in O&M Manual and a laminated copy is attached to switchboard door.
 |  |  |
| 1. Is a laminated 1-page summary required for the site?
 |  |  |
| **If all items are completed, sign off this checklist.** |  |  |
| **Comments** |  |  |

**All Complete**

|  |  |  |
| --- | --- | --- |
| Developer Representative Name: | Signature | Date |
| LSC Representative Name: | Signature | Date |