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| **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 |