# UPF INSTALLATION GUIDELINES AND INSPECTION RECORD FOR ABOVEGROUND PIPING

Work Package No.: _____

Task No.: _____



| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | | **REV NUMBER:** | **REMARKS:** | |
| | | | | |
| | | | | |
| **ITEM:** | | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
| **PIPING** | | | | | |
| 1. Fit-up is acceptable; vertical lines are plumb; and horizontal lines are level, except where slope is indicated on the design drawings | | | | | |
| 2. Slopes are as indicated on P & ID's and isometrics drawings | | | | | |
| 3. Pipe size, schedule and type of material is correct | | | | | |
| 4. Flange ratings are correct | | | | | |
| 5. Routing and tie-ins of lines are in the correct location | | | | | |
| 6. Correct type reducers (eccentric or concentric and correct schedule) are located and orientated per specification, standards and design installation drawing | | | | | |
| 7. Branch lines are located correctly on headers | | | | | |
| 8. Reinforcing pads with weep holes, tees, sockolets, weldolets, or welding saddles are used as specified for branch connections. | | | | | |
| 9. Temporary supports provided, if required. | | | | | |
| 10. Vents are installed at high points and drains at low points | | | | | |
| 11. Vents and Drains installed/welded after hydro as required by specifications | | | | | |
| 12. No carbon steel contact with stainless steel components. Note: Check specification and vendor information as carbon steel bolting materials maybe be specified in stainless steel piping systems | | | | | |
| 13. Welding and NDE is in compliance with codes and project specification | | | | | |
| 14. Pipe coating is protected from damage during all handling, transportation or installation operation. | | | | | |
| 15. Piping is free of tape, wire, slings, chainfalls and other installation tools and materials | | | | | |
| 16. Verify internal pipe cleanliness and hand clean pipe during installation process | | | | | |
| **FIELD ENGINEER:** | | | **DATE:** | | |
| **QUALITY CONTROL ENGINEER:** | | | **DATE:** | | |

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | **REV NUMBER:** | | **REMARKS:** | |
| | | | | |
| | | | | |
| **ITEM:** | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
| **VALVES** | | | | |
| 1. Check, globe and control valves are installed with flow in correct direction as indicated on P&ID | | | | |
| 2. Manufacturer's nametag description agrees with stock code number, (if used) description and trim. (Do not rely on warehouse tag). Check casting stamp also | | | | |
| 3. Valves are accessible and operable and chain wheels or extensions are installed and operable, as required | | | | |
| 4. Control Valve Positioners and accessories are accessible | | | | |
| 5. Rising stem valves are free of obstructions and protectors are installed as required | | | | |
| 6. Special packings are installed as required and if repacking is required, a tagging or color code system is used to identify repacked valves | | | | |
| 7. Drains or flushing connections to valve bodies are installed, accessible and operable, as required | | | | |
| 8. By-passes around valves are installed and operable, as required | | | | |
| 9. Valves are internally clean | | | | |
| 10. Temporary Supports provided, if required | | | | |
| 11. Valves have been tested and calibrated prior to installation, if specified | | | | |
| 12. Valve stems are not lower than horizontal unless specifically approved. (Especially stem locations for cryogenic valves) | | | | |
| 13. Lubrication fittings on valves are installed as required | | | | |
| 14. Valve lubrication sticks have been installed if required | | | | |
| 15. Verify valve (open or closed) prior to welding activities per vendor recommendations. | | | | |
| 16. Valves with special bolting requirements (i.e. tapped flanged bolt holes) are installed as required. These materials must be identified on the design drawings and BOM's | | | | |
| **FIELD ENGINEER:** | | | **DATE:** | |
| **QUALITY CONTROL ENGINEER:** | | | **DATE:** | |

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | | **REV NUMBER:** | **REMARKS:** | |
| | | | | |
| | | | | |
| **ITEM:** | | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
| **BOLTS AND STUDS** | | | | | |
| 1. Bolts and studs are not interchanged | | | | | |
| 2. Bolting is appropriate length, diameter, and material | | | | | |
| 3. Verify the thread pitch for 1 inch (25mm) and larger bolting materials | | | | | |
| 4. Thread lubricant is used if required. Take extra caution with stainless steel materials | | | | | |
| 5. Verify types of bolts to be used on high pressure, high temperature flanges or on cryogenic lines. Verification shall include a spot check with a magnet for non-magnetic materials | | | | | |
| 6. All bolts or studs are installed and tight or torqued/tensioned, as required. Studs have minimum one thread past nuts and have equal projection beyond nuts per project specifications (normal is 1-3 exposed threads), unless otherwise specified by project specification | | | | | |
| **GASKETS** | | | | | |
| 1. Gaskets are installed and are the correct type, style, material, size and rating | | | | | |
| 2. Specification changes at equipment block valves are carefully checked for correct gaskets | | | | | |
| 3. All gaskets on blind flanges are checked and verified | | | | | |
| 4. Temporary gaskets may be used at temporary blinds, then line specification gaskets are installed after pulling temporary blinds. Punch list shall specify the right gasket. High pressure ring gaskets shall be verified oval or hex material as installed | | | | | |
| **Remarks:** | | | | | |
| **FIELD ENGINEER:** | | | **DATE:** | |
| **QUALITY CONTROL ENGINEER:** | | | **DATE:** | |

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | | **REV NUMBER:** | **REMARKS:** | |
| | | | | |
| | | | | |

| **ITEM:** | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
|---|---|---|---|---|
| **SMALL PIPING, INCLUDING SMALL PIPE AT PUMPS AND OTHER EQUIPMENT (Package Units)** | | | | |
| 1. Screwed and socket weld fittings of the correct weight and type material are used (watch out for malleable iron vs. forged steel fittings) | | | | |
| 2. Specified pipe thread sealant is used with adequate temperature capability | | | | |
| 3. The gap in socket weld fittings shall be checked as work progresses | | | | |
| 4. Horizontal spans shall be carefully considered in field routing of small pipe in order to eliminate the sagging of the pipe | | | | |
| 5. If a vendor supplies the trim material, ensure the material used meets design and job specifications or there has been an agreed substitution approved by design engineering | | | | |
| 6. Pump trim drawings and vendor prints are checked for location and routing of trim piping. Pumps are usually tagged at each connection, but care shall be taken to see that they are connected properly. Confirm pump drip pans drain are piped to drains as required | | | | |
| 7. Cooling water systems, either individual or series feed, shall be checked carefully for arrangements of piping | | | | |
| 8. Plugs furnished by vendors are checked for compliance with specifications. All equipment openings are checked for requirement of a plug or blind flange. Watch for straight machine threaded plugs instead of tapered pipe plugs | | | | |
| 9. Check pickling requirements | | | | |
| 10. Monitor welding and NDE per specification | | | | |
| 11. Check stress relieving requirements | | | | |
| 12. Check for obstruction preventing access to components for operation and maintenance | | | | |

| | |
|---|---|
| **FIELD ENGINEER:** | **DATE:** |
| **QUALITY CONTROL ENGINEER:** | **DATE:** |

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | | **REV NUMBER:** | **REMARKS:** | |
| | | | | |
| | | | | |

| **ITEM:** | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
|---|---|---|---|---|
| **PIPE SUPPORTS AND EXPANSION JOINTS** | | | | |
| 1. Line is supported properly. Drawings must be checked to confirm that major supports are installed; small lines are most often field supported. | | | | |
| 2. Check clearances for pipe expansion at anchor locations, shoes are properly positioned in relation to support to allow for expansion. | | | | |
| 3. On insulated lines check shoes for correct height and welding. (Some specifications call for stitch welding to pipe; some full weld.) | | | | |
| 4. Alloy lines must be checked carefully for material compatibility. Any additional welded supports or temporary welds may require stress relieving. Clamp types may be used if specifications permit. | | | | |
| 5. Large diameter lines must be checked carefully. Gas lines, with supports not designed for hydro-test, may require temporary supports, or waivers may be obtained for air test. | | | | |
| 6. Lines at pumps and other equipment shall be carefully checked for undue stresses on equipment flanges. Pipe supports are straight and plumb. | | | | |
| 7. Lines shall be checked for allowances for proper expansion. | | | | |
| 8. Bellows type expansion joints shall be checked for test and service pressure, also check that bellows are installed with tie bars correctly oriented and flow is in the correct direction. Shipping restraints shall remain in place until commissioning. | | | | |
| 9. All lines shall be checked for the need of additional supports and guides. | | | | |
| 10. Cold spring is installed as required by design engineering (shall be checked, witnessed, and documented during installation). | | | | |
| 11. Slide plates shall be checked for proper installation. | | | | |
| 12. Shoes or supports are not tack welded where they shall be able to slide. | | | | |

| | |
|---|---|
| **REMARKS:** | |
| **FIELD ENGINEER:** | **DATE:** |
| **QUALITY CONTROL ENGINEER:** | **DATE:** |

# UPF INSTALLATION GUIDELINES AND INSPECTION RECORD FOR ABOVEGROUND PIPING

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | **REV NUMBER:** | | **REMARKS:** | |
| | | | | |
| | | | | |

| **ITEM:** | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
|---|---|---|---|---|
| **SEAL WELDING** | | | | |
| 1. Seal welding is complete as required | | | | |
| 2. Exposed threads are covered by seal weld | | | | |
| 3. No pipe thread sealant or tape is to be used in screwed joints to be seal welded | | | | |
| 4. Specifications are checked for seal welding to equipment. (Some require it and some do not allow it). | | | | |
| **INSULATED LINES** | | | | |
| 1. Long vertical lines may require insulation support clips at specific intervals | | | | |
| 2. Sufficient clearance exists for insulation on steam and hot lines (from conduit, structural steel, platforms and other lines). Check that guides will not foul cladding in operating position | | | | |
| 3. Clearances exist for insulation on equipment and lines | | | | |
| 4. Line mounted instrument support brackets are installed before line is released for insulation | | | | |
| **ALLOY LINES** | | | | |
| 1. Stress relieving is complete, witnessed as required and documentation has been distributed | | | | |
| 2. Materials are the correct type. (Watch for substitutions of various alloys, especially stainless steels - 304, 304L, 310, 316 and 316L). | | | | |
| 3. Valves and gaskets are checked carefully. Stock code description is checked against valve nameplate data and, if necessary to determine valve is correct, against manufacturers catalog number. | | | | |
| 4. Never weld galvanized or zinc rich painted supports to stainless steel lines | | | | |

| | |
|---|---|
| **REMARKS:** | |
| **FIELD ENGINEER:** | **DATE:** |
| **QUALITY CONTROL ENGINEER:** | **DATE:** |

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | | **REV NUMBER:** | **REMARKS:** | |
| | | | | |
| | | | | |

| **ITEM:** | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
|---|---|---|---|---|
| **ORIFICE RUNS** | | | | |
| 1. Orifice runs have the specified straight length of pipe (free of welds) both upstream and downstream of orifice flanges | | | | |
| 2. Orifice taps are oriented in the correct direction. (Most specifications specify vertical for gas and horizontal for liquid) | | | | |
| 3. Jackscrews are installed as required at orifice flanges or flanges with spectacle blinds | | | | |
| 4. Nipples and plugs installed on orifice flanges are as specified. (Some specifications require stainless, XS or XXS nipples) | | | | |
| **MISCELLANEOUS ITEMS** | | | | |
| 1. Lines meet specifications for headroom in walk areas and overhead clearance in drive areas | | | | |
| 2. Relief valves, backflow preventers, and pressure gauges have been checked in calibration shop if required by specifications. Ensure relief valves are calibrated in line with start up schedule and within the correct number days of start up as stated in the specification. | | | | |
| 3. Start up or permanent suction screens are installed in pump and compressor suction lines as required. Check for correct direction of installation | | | | |
| 4. Spectacle blinds, blinds, and spacers are installed as required and are correct thickness | | | | |
| 5. Piping specifications are carried to the point specified before the instrument details take over. Usually the block valves must be per piping specifications | | | | |
| 6. Drip legs with traps and drains are provided at low points in steam lines. | | | | |
| 7. Mud legs or drip legs have clearance for expansion of the main line pipe | | | | |

| | |
|---|---|
| **REMARKS:** | |
| **FIELD ENGINEER:** | **DATE:** |
| **QUALITY CONTROL ENGINEER:** | **DATE:** |

| | | | | |
|---|---|---|---|---|
| **DMC NUMBER:** | | | **DATE:** | |
| **PROJECT NUMBER:** | **PROJECT NAME:** | | | |
| **QUALITY LEVEL:** ☐ **Q** ☐ **RS** ☐ **CC** | | | | |
| **BLDG / AREA:** | **PIPING SYSTEM:** | | **ASME** ☐ **Yes** ☐ **No** | |
| **DESCRIPTION:** | | | | |
| **REFERENCE DOCUMENT NUMBER:** | | **REV NUMBER:** | **REMARKS:** | |
| | | | | |
| | | | | |

| **ITEM:** | **INSP. TYPE** | **N/A** | **FE/DATE** | **QCE/DATE** |
|---|---|---|---|---|
| **MISCELLANEOUS ITEMS (Continued)** | | | | |
| 8. Clearance exists for removal of equipment such as deep well type pumps, motors, tube bundles, basket strainers, thermowells, etc., and that spare equipment can be removed without a total plant shut down | | | | |
| 9. Instruments, i.e. level glass, pressure and temperature gauges, thermowells, etc. are accessible for operation and maintenance | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**COMMENTS:**

| | |
|---|---|
| **FIELD ENGINEER:** | **DATE:** |
| **QUALITY CONTROL ENGINEER:** | **DATE:** |