Method Statement for Installation of Aluminium HVAC Duct

Below is a brief method statement that covers the duct installation of Aluminium ductwork on a construction project.

This procedure defines the method used to ensure HVAC aluminium ducting installation has been carried out as per contract requirements and best industry practices.

The procedure gives details of how the work will be carried out and what health and safety issues and controls are involved.

Project quality control engineers shall be responsible for but not limited to the following important activities:

1. Inspecting the materials on site as per approved materials submittal prior to installation on project site.
2. Inspection for the installation as per approved Method Statement, approved drawings and approved test plans and checklists.
3. Preparing test forms for testing on site and updating the results.
4. Issuing inspection request within 24 hrs before the actual inspection and QC to sign off the check list after final completion of the work before raising inspection for consultant.
5. Responsible for the assurance of Quality control, method statement and inspection test plan.
6. Controlling the shop drawings flow on site.

Health & Safety Measures and Precautions

- Only the required materials will be lifted into the platform and number of person working on height will be observed as per requirements.
- The main access to the working platforms will be via proprietary stairs.
- Lifting equipment will be inspected and registered on a time frame. Inspection must be shown on lifting equipment by colour tagging.
- Safety measures will be strictly implemented on site while lifting of materials on height.

Other References

Below is list of other reference documents that are necessary to follow for the HVAC duct installation works.

- Contract Specifications.
- Approved shop drawings.

- SMACNA – HVAC Duct Construction Standard –Metal and Flexible.
- DW 142 / 144 and CIBSE B3.
- Inspection and Test Plan
- Project Safety HSE Plan
- The Project Quality Plan PQP
- Project Logistics Plan
- Management System Procedures
- Job Safety & Environmental Analysis JSEA
- Related International standard (ASME, ASTM –A653A, 653M and ASHRAE standard)

Below is list of necessary resources including tools to perform the installation work in proper manner:

- Riveter
- Sheet Metal Shear (straight, left and right)
- Shearing Tools
- Hammer
- Electric Drill
- Screw Driver
- Punching Tools
- Mallet
- Grinder
- Adjustable Wrench
- Sealant gun
- Monkey Wrench
- Vice Grip
- Vice clamp
- Steel square
- Plumb Bob
- Spanner set
- Duct stretcher
- Spirit level
- Philip screw
- Accordion type riveter
- Measurement Devices

The minimum Personal Protective Equipment (PPE) on site for each worker will be:

1. Hard hat
2. Safety boots
3. High-visibility vest
4. Gloves
5. Goggles/Glasses

Material Delivery, Handling and Storage

- All the ductwork material and its associated material supplied will be packed for protection against damage during handling, transport, storage and installation.

- Make sure that the material is delivered to the site store in self-supporting framed units.
- The duct material will be stacked as loose with all material parallel (nested).

- Material will be stored in clean and closed store for protection and according to the engineers and manufacturer's recommendation.

- Duct material will stored in closed shaded area and should be stacked properly with allowable height of 2 meters, and covered with PVC sheets and plywood's placed below the duct so that the duct not rest directly on the slab.

Pre-Construction Requirements

A Pre-construction conference will take place to brief all workforce on this method statement. All operatives will attend the Project Safety induction prior to commencing work on site. As a minimum a daily briefing will explain and discuss:

- What the day's work is for the group and individuals.

- Planned sequence of work.

- Plant requirements.

- Materials requirements.

- Trades handing over / handing back.

- Other trades and their work in the vicinity

The daily briefing shall also seek feedback on Health and Safety issues and any near misses or accidents reported or not yet reported.

Checking of Ductwork Prior Assembly

- Check that all the ductwork is tagged and that the correctly tagged sections are available for the job. Confirm metal duct sheet is as per approved material submittal.

- Check that all duct accessories such as stiffness, turning vanes, flanges, dampers, sleeves etc. are in accordance with the correct size and good condition.

- The duct metal sheets tolerances will be based on the following SMACNA standard comply with HVAC duct construction standards for fabrication and installation of metal ductwork.

1. Check dimensions are correct. Where dimensions are shown on the drawing these are internal.

2. Dimensional tolerances are ±2 mm.

3. Check that the duct sections and fittings are free from any defects or holes.

4. Check that the ducting is clean. Clean if necessary.

5. Check if the stem ducting materials are as per the approved material submittal.

6. Ensure that the correct type of joint is used.

7. Seal joint using an approved sealant.

8. All accessories and supports also shall be of aluminium as per specification.

Method of Aluminium Duct Installation

- Determine the position of the ductworks support and mark out on the soffit, marking allowance for insulation thickness and cladding where applicable.

- Marking out and installation of supports will require the operatives to work at height. Make sure that work platforms are safe and suitable for purpose. Use podium steps and mobile tower scaffolds in the project areas below height of 3 meter.

- Any work over 3 meters will require a heavy duty scaffold. Heavy duty scaffold will be erected by 3rd party scaffold company; general scaffold will be inspected and provided green tag.

- Potable electrical equipment's used at site power drill, drop saw, grinder and extension leads are all to be in perfect condition and not damaged. Power drill will be used to make the holes and screw fittings into the soffit and walls. Personnel using potable electrical equipment shall wear adequate PPE including but not limited to safety glasses hearing protection dust musk and gloves.

- Drill the hole in the concrete for the anchor fixing using the appropriate size drill bit as recommended by the anchor fixing manufacturer, and approved calculations.

- Fix support in position with accordance with the approved schedule for supports spacing and Supports and insert shave to be installed prior to lifting of ducts.

- Cross-Linked Closed Cell Polyolefin Foam Duct Insulation is installed above the supports to avoid any possibility of the insulation damage. Thickness to be as per duct weight.

Ensure there are no obstructions to the ductwork:

- The components of ductwork will be lifted manually or mechanically as weight dictates into support and aligned with the preceding length of installed ductwork, ensuring that all levels and dimensions are correct as per approved construction drawings.

- Ensure supports are installed vertically and horizontally aligned to the ductwork.

- All fabricated duct at site whether laying in the ground, hanged from ceiling, or inside shafts will be properly protected from damages.

- Use approved flexible duct connectors to connect the duct to equipment's (AHU's, FCU's and fans).

- Increase the duct sizes accordingly if there is acoustic insulation inside.

- Clean all the ducts properly and cover to ensure full cleanliness all the time.

- All Riveting, Bolting of joints and branches to be done asper standards.

Connection to HVAC Equipment and Outlets

Flexible Duct Connector

- Cut a length of flexible equal to 1.5 times the perimeter of the ductwork.

- Pop – rivet as necessary in centers of 100 mm.

- Seal using duct sealant as necessary.

- Ensure that the equipment and the ductwork are aligned. A maximum misalignment of 30 mm is permitted as per ASHRAE tolerances.

- Install flexible connectors immediately adjacent to equipment in ducts associated with fans and motorized equipment supported by vibration isolators.

- For fans developing static pressures of 1250 Pa and higher, cover flexible connectors with loaded vinyl sheet held in place with metal straps.

Flexible Duct Installation

- Cut a length of flex duct that fits the installation site with little to none left over.

- Stretch the flex duct between the two points of attachment so that the duct doesn't sag. Prevent the duct from bending too much, causing the duct's width to narrow more than the standard width of the duct anywhere along its length.

- Attach the flex duct to the duct fitting with at least 1 foot of the duct around the fitting. Keep the flex duct in place by wrapping duct tape around the connection at least twice. Place a metal clamp around the connection and apply paste around the edges of the clamp.

- Replace the jacket of the flex duct by pulling its insulation over the connection.

- Tape the jacket into place with at least two layers of duct tape.

- Connect terminal units to supply ducts directly or with maximum 1500-mm lengths of flexible duct. Do not use flexible ducts to change directions.

- Make connection of diffusers to low pressure ducts with maximum 1500-mm lengths of flexible duct clamped or strapped in place.

- Connect flexible ducts to metal ducts with draw bands.

- Using standard approved supporting to flexible duct at regular interval.

Installation of HVAC Ducts in Partition Penetrations

Non-Fire-Rated Partition Penetrations:

Where ducts pass through interior partitions and exterior walls and are visible, conceal spaces between construction openings and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts. Overlap openings on 4 sides by at least 38mm. make sure that the flanges on wall are also of the aluminium.

Fire-Rated Partition Penetrations:

Where ducts pass through interior partitions and exterior walls, install appropriately rated fire dampers, sleeves, and fire-stopping sealant.

Installation of Access Doors in Duct Installation work

Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units as follows:

- On both sides of duct
- Downstream from volume dampers, turning vanes, and
- Adjacent to fire or smoke dampers, providing access to reset or reinstall fusible links.
- To interior of ducts for cleaning; before and after each change in direction, at maximum 15-m
- On sides of ducts where adequate clearance is

Install the following sizes for duct-mounting, rectangular access doors:

Access Door Type	Description	Access Door Size (mm)	Duct Size W(H) X H(W) (mm)	
AD-1	One-Hand or Inspection Access	200 x 125	Upto 250	Upto 250
AD-2	Two-Hand Access	300 x 150	300 to 500	250 to 500
AD-3	Head and Hand Access	450 x 250	500 to 1000	500 to 750
AD-4	Head and Shoulders Access	550 x 350	1000 to 1400	750 to 1000
AD-5	Body Access	600 x 600	Above 1400	Above 1000
AD-6	Cleaning Access	450 x 300	For all ducts size below 1000 mm height	
AD-7	Cleaning Access	600 x 600	For all ducts size below 1000 mm height	