METHOD STATEMENT FOR

Aluminum HVAC Duct Installation

Project No: (.....)

REVISION HISTORY	ISSUE DATE	DESCRIPTION	REVIEW / STATUS

PREPARED BY:	REVIEWED BY:	APPROVED BY:
QA QC ENGINEER	SR. PROJECTS ENGINEER	MAINTENANCE MANAGER

Table of Contents

1. PURPOSE

This method statement covers the duct installation of Aluminium ductwork on a facility, construction, and commercial/industrial projects.

2. SCOPE OF APPLICATION

This methodology and procedure explain and provide the technical guidelines to ensure HVAC Aluminium ducting installation has been installed as per contract requirements. 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:

2.1. Inspecting the materials on site as per approved materials submittal before installation on the project site.

2.2. Inspection for the installation as per the approved Method Statement approved drawings and approved test plans and checklists.

2.3. Preparing test forms for testing on site and updating the results.

2.4. Issuing inspection requests within 24 hrs. before the actual inspection and QC to sign off the checklist after completion of the work before raising inspection for the consultant.

2.5. Responsible for the assurance of Quality control, method statement, and inspection test plan.

2.6. Controlling the shop drawings flow on-site.

3. HEALTH & SAFETY MEASURES AND PRECAUTIONS

Before commencing any work, the team shall strictly follow the Client's Health & Safety recommendations for handling and use of the materials. Make sure that all involved personnel shall be aware well of the same. The general safety guidelines are given below:

3.1. Ensure the work area is safe & clean.

3.2. All employees shall adopt safe working practices.

3.3. Safety equipment PPE (Safety helmet, safety shoes, coveralls, gloves, goggles, face mask as applicable) is to be always worn.

3.4. When working at a high level, the appropriate safety harness shall be used and secured whilst working-extra care shall be taken whilst using tools at a high level to prevent dropping.

3.5. Ensure sufficient lighting is available during testing.

3.6. Report all accidents no matter how small to the Safety Officer on duty.

3.7. Proper access to the labor and equipment shall be provided for the works.
3.8. All machinery shall be checked for maintenance records.
3.9. The site shall be cleaned of all debris, steel waste, nails, etc.
3.10. Toolbox talks are to be conducted before the commencement of testing works.
3.11. Close supervision of safety requirements shall be provided.
3.12. All necessary barriers, signage lighting, etc., are to be provided and maintained.
3.13. All employees working on the site shall be trained in the Client's PTW.
3.14. Awareness of plant Emergency evacuation procedures.
3.15. Only the required materials will be lifted into the platform and the number of people working on height will be observed as per requirements.
3.16. The main access to the working platforms will be via proprietary stairs.
3.17. Lifting equipment will be inspected and registered within a time frame. Inspection must be shown on lifting equipment by color tagging.
3.18. Safety measures will be strictly implemented on-site while lifting materials at height.

4. REFERENCES

The following is the list of other reference documents that are necessary to follow for the HVAC duct installation works:

4.1. Contract Specifications
4.2. Approved shop drawings
4.3. SMACNA – HVAC Duct Construction Standard – Metal and Flexible
4.4. Inspection and Test Plan
4.5. Project Safety HSE Plan
4.6. The Project Quality Plan PQP
4.7. Project Logistics Plan
4.8. Management System Procedures
4.9. Job Safety & Environmental Analysis JSEA
4.10. Related International standards (ASME, ASTM – A653A, 653M, and ASHRAE standard)

The following is the list of necessary resources including tools to perform the installation work properly.

4.11. Riveter
4.12. Sheet Metal Shear (straight, left, and right)
4.13. Shearing Tools
4.14. Hammer
4.15. Electric Drill
4.16. Screwdriver
4.17. Punching Tools
4.18. Mallet

4.19. Grinder
4.20. Adjustable Wrench
4.21. Sealant gun
4.22. Monkey Wrench
4.23. Vice Grip
4.24. Vice clam
4.25. Steel square
4.26. Plumb Bob
4.27. Spanner set
4.28. Duct stretcher
4.29. Spirit level
4.30. Philip screw
4.31. Accordion type riveter
4.32. Measurement Devices

The minimum PPE on site for each worker will be:

4.33. Hard hat
4.34. Safety boots
4.35. High-visibility vest
4.36. Gloves
4.37. Goggles/Glasses

5. MATERIAL DELIVERY, HANDLING, AND STORAGE

5.1. All the ductwork material and its associated material supplied will be packed for protection against damage during handling, transport, storage, and installation.
5.2. Make sure that the material is delivered to the site store in self-supporting framed units.
5.3. The duct material will be stacked as loose with all material parallel (nested).
5.4. The material will be stored in a clean and closed store for protection and according to the engineer's and manufacturer’s recommendation.
5.5. Duct material will be stored in the closed shaded area and should be stacked properly with an allowable height of 2 meters, and covered with PVC sheets and plywood placed below the duct so that the duct does not rest directly on the slab.

6. PRE-CONSTRUCTION REQUIREMENTS

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

6.1. what the day’s work is for the gang and individuals

6.2. a planned sequence of work
6.3. plant requirements
6.4. materials requirements
6.5. trades handing over / handing back
6.6. other trades and their work in the vicinity
6.7. The daily briefing shall also seek feedback on Health and Safety issues and any near misses or accidents reported or not yet reported.

7. CHECKING OF DUCTWORK BEFORE ASSEMBLY

7.1. 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 the approved material submittal.
7.2. Check that all duct accessories such as stiffness, turning vanes, flanges, dampers, sleeves, etc. are following the correct size and in good condition.
7.3. The duct metal sheet tolerances will be based on the following SMACNA standard to comply with HVAC duct construction standards for fabrication and installation of metal ductwork.
7.4. Check dimensions are correct. Where dimensions are shown on the drawing these are internal
7.5. Dimensional tolerances are ±2 mm
7.6. Check that the duct sections and fittings are free from any defects or holes
7.7. Check that the ducting is clean. Clean if necessary.
7.8. Check if the stem ducting materials are as per the approved material submittal.
7.9. Ensure that the correct type of joint is used
7.10. Seal the joint using an approved sealant
7.11. All accessories and supports also shall be of Aluminium as per specification.

Duct Pressure Class (Static Pressure Table)

Duct Classes	Duct Pressure Classes		Operating Pressure (WG)
	(in.)	(Pa)	
C			
C			
C			
C			
B			
A			
A			

8. METHOD OF ALUMINIUM DUCT INSTALLATION

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

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

8.3. 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.

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

8.5. 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.

8.6. Fix support in position following the approved schedule for supports spacing and supports and inserts have to be installed before the lifting of ducts.

8.7. Cross-Linked Closed Cell Polyolefin Foam Duct Insulation is installed above the supports to avoid any possibility of insulation damage.

9. ENSURE THERE ARE NO OBSTRUCTIONS TO THE DUCTWORK.

9.1. 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.

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

9.3. All fabricated ducts at the site whether laying on the ground, hanging from the ceiling, or inside shafts will be properly protected from damage.

9.4. Use approved flexible duct connectors to connect the duct to equipment (AHUs, FCU, and fans).

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

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

9.7. All Riveting, and bolting of joints and branches are to be done as per standards.

10. CONNECTION TO HVAC EQUIPMENT AND OUTLETS

Flexible Duct Connector

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

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

10.3. Seal using duct sealant as necessary.

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

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

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

11. FLEXIBLE DUCT INSTALLATION

11.1. Cut a length of flex duct that fits the setup of a web page with little to no leftovers.

11.2. Stretch the flex duct among the two factors of attachment so that the duct doesn't sag.

11.3. Prevent and safeguard the duct from excessive bending, causing the duct's width to narrow more than the standard width of the duct anywhere along its length.

11.4. Attach the flex duct to the duct fitting with at least one foot of the duct around the fitting.

11.5. Keep the flex duct in an area with the aid of wrapping duct tape around the connection a minimum of two times.

11.6. Install a metallic clamp across the connection and observe the paste around the rims of the clamp.

11.7. Replace the jacket of the flex duct using pulling its insulation over the connection.

11.8. Tape the jacket into the vicinity with at least two layers of duct tape.

11.9. Connect terminal units to supply ducts directly or with maximum 1500-millimeter lengths of flexible duct.

11.10. Do not use flexible ducts to change directions.

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

11.12. Connect flexible ducts to metal ducts with draw bands.

11.13. Using standard approved supporting to the flexible duct at regular intervals.

11.14. Installation of HVAC Ducts in Partition Penetrations.

12. NON-FIRE-RATED PARTITION PENETRATIONS

12.1. Where ducts bypass via indoor partitions and outside partitions and are seen, cover spaces among production openings and ducts or duct insulation with sheet metal flanges of the equal metal thickness as ducts.

12.2. Overlap openings on four sides by using at least 38mm.

12.3. Make positive that the flanges at the wall are also of aluminum.

13. FIRE-RATED PARTITION PENETRATIONS

13.1. Where ducts bypass through indoor partitions and outside partitions, install appropriately rated fireplace dampers, sleeves, and fireplace-stopping sealant.

13.2. For full information concerning Duct Dampers and add-ons talk to the “Dampers and Accessories” approach statement for dampers setup.

14. INSTALLATION OF ACCESS DOORS IN DUCT INSTALLATION WORK

Install duct access doorways to permit examining, adjusting, and keeping add-ons and terminal units as follows:

On both sides of the duct

14.1. Downstream from volume dampers, turning vanes, and

14.2. Adjacent to fire or smoke dampers, providing access to reset or reinstall fusible links.

14.3. Adjacent to the fireplace or smoke dampers, supplying access to reset or reinstall fusible links.

14.4. 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)[mm]	H (W)[mm]
AD-1	One-Hand or Inspection Access.			
AD-2	Two-Hand Access			
AD-3	Head and Hand Access			
AD-4	Head and Shoulders Access			
AD-5	Body Access			
AD-6	Cleaning Access			
AD-7	Cleaning Access			

15. MANPOWER RESOURCING

S. N.	Position	Number of Employees
1	Site Supervisor	1
2	Site worker	2
	Total	3

16.APPENDICES (AS APPLICABLE)

16.1.Risk Assessment (Attached)