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D10-30GEN GENERAL MECHANICAL REQUIREMENTS

RECORD OF REVISIONS

Rev	Date	Description	POC	OIC
0	06/28/99	Rewritten to become Facility Engineering Manual superseding Mechanical Facilities Engineering Standards, Vol. 6, Manual, Revision 15, dated 6/26/98.	Danny Nguyen, *PM-2*	Dennis McLain, *FWO-FE*
1	05/22/02	Changed FEM to LEM. General revision and addition of endnotes. Replaces subsections 101, 102, 201, 202, 203.2.2, 203.3.1, 203.13, 203.14, 204.22, 204.26 - 204.28, 204.30, 204.31, and 205- 208. Sections 1, 2, 15, 17, and 21 are new.	Tobin H. Oruch, *FWO-SEM*	Kurt Beckman, *FWO-SEM*
2	6/9/04	Deleted material now in Ch 1 Sect Z10 General, and Ch 12 Nuclear. Moved cross-connection, expansion control, freeze protection, process piping, and vessel material to D20. Moved some invoked standards to D20 and D30. Refined equip location, hangers and supports, and other requirements.	Charles DuPrè, *FWO-DECS*	Gurinder Grewal, *FWO-DO*
3	10/27/06	Administrative changes only. Deleted NM M&P Code based on 9/18/06 variance. Organization and contract reference updates from LANS transition. IMP and ISD number changes based on new Conduct of Engineering IMP 341. Master Spec number/title updates. Other administrative changes.	Charles DuPre, *FM&E-DES*	Kirk Christensen, *CENG*
4	9/29/09	Added fume hood and other local exhaust ventilation system labeling requirements. Other minor updates.	Charles DuPre, *ES-DE*	Larry Goen, *CENG*

CONTACT THE MECHANICAL STANDARDS POC

for upkeep, interpretation, and variance issues

Ch. 6, D10-30GEN	**Mechanical POC and Committee**

This document is online at http://engstandards.lanl.gov/

D10-30GEN GENERAL MECHANICAL REQUIREMENTS

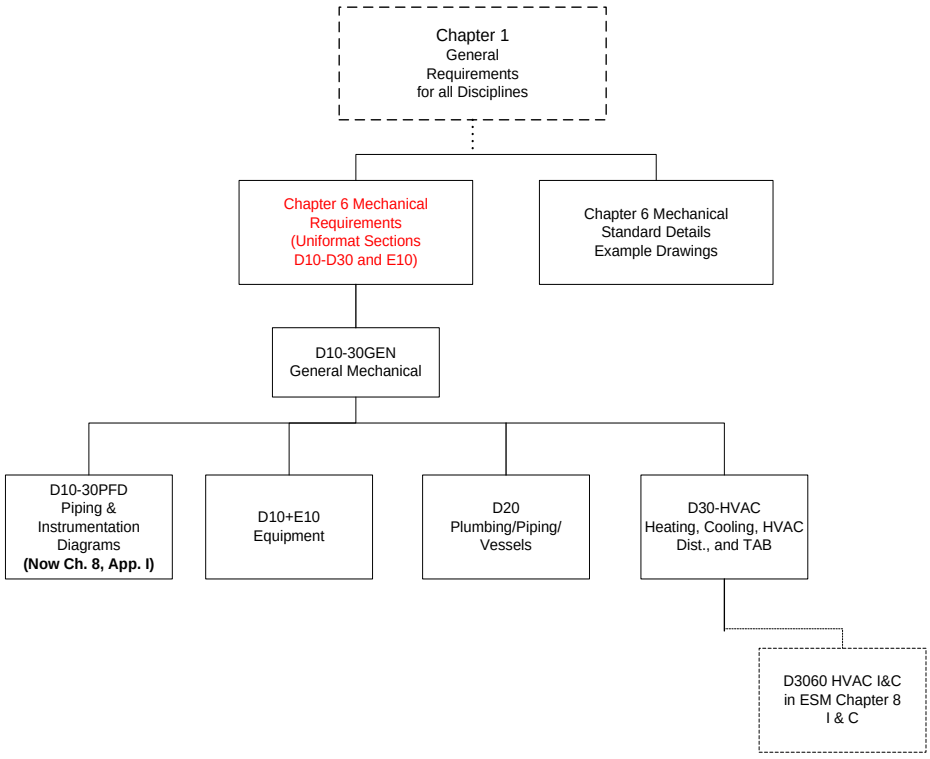
1.0 APPLICATION OF MECHANICAL CHAPTER

1.1 General

The purpose of this chapter of the Engineering Standards Manual (ESM) is to provide mechanical systems that prevent accidents and mitigate consequences; are free from hazard; are efficient, convenient, and adequate for good service; and are maintainable, standardized, and adequate for future expansion. Code requirements are minimum requirements that are augmented by the site-specific requirements in this chapter.

All **facility**-related mechanical design, material, equipment, and installations shall comply with site-specific requirements in this Chapter and Chapter 1 of the ESM, especially Section Z10 requirements and definitions.[1] Requirements in this Chapter that also apply to **programmatic** work are addressed in Section 1.2.

This hierarchy and the organization of this chapter and its relationship to others is depicted below:



[1] LANL P340-1 (becoming PD340), "Conduct of Engineering" is the implementation requirement document for this manual. Refer to the PD 342 Introduction (becoming P 342) for the purpose, scope and applicability of the ESM.

1.2 Programmatic

A. The Mechanical chapter shall be applied to programmatic systems and components as follows:

1. "Programmatic and Facility" or a bold capital "P" following headings in this Chapter indicate that the subsection shall be complied with by all of LANL, including programs.
2. *Guidance: Programmatic personnel should review all topics in the chapter for relevant material when initiating any design task.*
3. *Guidance: All programmatic mechanical installations should be constructed with materials and components meeting either national standards (e.g., ASTM, ASME, AMCA, API, etc.) or Nationally Recognized Testing Laboratory (NRTL) listed equipment and material that is used in accordance with its listing for the intended purpose. In the case of departure from equipment listing parameters or when equipment is not available as NRTL listed, then the situation should be reviewed for the purpose by ESM Mechanical POC and the using organization's Safety Officer/Engineer or Division Leader level manager or designee. Exception: Equipment set-up and used for less than 180 days or that is intentionally destroyed during the experiment, and is constructed and operated by qualified technicians using approved procedures described in formal procedures or Hazard Control Plans.*

2.0 ACRONYMS AND DEFINITIONS

For additional terms refer to ESM Chapter 1 Section Z10.

Acronym	Definition
AHJ	Authority having jurisdiction
BFP	Backflow preventer
ESM	Engineering Standards Manual
LMSM	LANL Master Specification Manual
POC	Point of contact. For the ESM chapter/discipline Technical Committee POCs, see http://www.lanl.gov/orgs/eng/engstandards/POCs.shtml
RPP	reduced-pressure-principle (as in backflow preventer).

3.0 CODES AND STANDARDS REQUIRED (PROGRAMMATIC AND FACILITY)

3.1 General

A. Comply with ESM Introduction and Chapter 1 Section Z10.

3.2 Mechanical and Plumbing Codes

A. Uniform Mechanical and Plumbing Codes (IAPMO/ANSI), edition per ESM Chapter 16 Section IBC-GEN App A - LEBC.

B. Follow the UMC and UPC with Appendices with the following changes:

1. Those UMC and UPC administrative sections addressing permits and fees shall not be followed.[2]
2. UMC Chapter 14, Process Piping, Section 1407.1. Change this section to read as follows:

   Process piping and tubing shall comply with this subsection and shall be designed and installed in accordance with nationally recognized standards, i.e., appropriate B31 codes.[2]

C. Where the above codes refer to the Administration Authority for Mechanical matters, refer to the ESM Mechanical POC.[3]

NOTE: Many national standards that follow are available for LANL at http://library.lanl.gov/infores/stand/

3.3 NFPA (National Fire Protection Association)

A. National Fire Codes and Standards (all except NFPA 5000).

B. *Listing of current NFPA codes and standards are also available at*:
   http://www.nfpa.org/catalog/

4.0 DESIGN DOCUMENTATION

4.1 General

A. Comply with ESM Chapter 1 Section Z10. Documentation shall also include, but is not limited to, the following:

1. Calcs: Note the source of each formula or method used, list all assumptions and exceptions, and define all units. Provide copies of tabulated data used. If a computer program was used (e.g., for HVAC sizing), provide input file on CD.
2. HVAC System Calcs: Heating and cooling loads, ventilation, exhaust and outside air requirements, building pressurization, humidity control when required, duct sizing, and air system pressure drops for equipment selection. Correct calculations for altitude.
3. Piping System Calcs: Flow rates, pipe sizing with friction factors, velocities, expansion/contraction, and system equipment pressure drops for pump selection.
4. Equipment Selection Criteria: Include flow rates, pressure or head requirements, operating temperatures, efficiency, energy consumption, and sound ratings. If manufacturer selection program is used, verify that altitude correction for motor size is properly performed.

[2] Mechanical Technical Committee Meeting 2/28/02 Minutes and ESM Interpretation 2002-01, Rev. 1. B31 codes now required by 10CFR851.
[3] P342, Design Authority

5. Vibration Isolation/Sound Attenuation Measures: List uncorrected and corrected equipment criteria in the design documentation.
6. Plumbing System Calcs: Provide for water supply and drainage fixture unit requirements, roof drainage, and makeup water requirements for mechanical systems.
7. Plumbing and Piping Systems: Riser/schematic diagrams, isometrics, and calcs are required for the following systems: water, waste/vent, natural gas, roof/overflow drains, steam & condensate, and refrigeration. Plans and calcs are required for irrigation systems, gases, and other liquid and vapor systems. (ESM Mechanical POC may allow variance to these requirements.[4])
8. Include copies of catalog sheets showing equipment performance points for all major equipment included in the systems design.
9. Mechanical rooms: provide layout complete with estimated equipment sizes, pipe routing, and sizing to ES-DE for approval prior to design completion[4]

B. Drawing content and format shall comply with the LANL Drafting Standards Manual including its Mechanical and Plumbing sections (*in Section 300*).

5.0 ENERGY CONSERVATION/SUSTAINABLE DESIGN (SD)

A. ESM Chapter 14 Sustainable Design contains the major LANL requirements for SD.

B. When required in above to comply with ASHRAE Standard 90.1 or better:

1. Show compliance relative to ASHRAE Standard 90.1 by an accepted industry computerized analysis tool.
2. Use Table B-17, Building Envelope Requirements, (Appendix B), for LANL climate (e.g., Zone 5B).[5]
3. Provide HVAC equipment that meets the efficiency requirements shown in Section 6.

C. When economizers are specified, use the dry bulb controlled airside type per ASHRAE Standard 90.1, Table 6.3.1.[6]

D. *Guidance: Use Trane System Analyzer software for small systems, conceptual design reports, and engineering studies; use Trace 700 for larger system preliminary and final design. Other programs are listed in Chapter 14.*

Mechanical systems design, materials, and construction are an integral component of sustainable design. Design mechanical systems and specify equipment for compatibility with the building and site aesthetics, electrical systems requirements, and indoor environmental quality requirements to ensure multi-discipline whole-building sustainable design practices are followed.

[4] Dwgs: Sanitary sewer slope lessons learned, medical clinic, 2003. Calcs ensure compliance with building codes.
[5] Table B-17 includes the HDD65 and CDD50 numbers calculated for LANL climate.
[6] Enthalpy controlled airside economizer systems have notoriously high maintenance costs. Also, Los Alamos climate is dry and there are only very minimal time periods that would use the enthalpy system to any advantage.

6.0 EQUIPMENT LOCATION

A. As required by the UMC or UPC, locate equipment such that cooling tower plumes, exhaust, vents, etc., do not enter occupied spaces through outside air intakes.

B. Locate outdoor equipment to minimize noise and sound vibration transmission to the occupied spaces of the building structure it serves -- and adjacent buildings.

1. *Guidance: If equipment must be located in close proximity to a building, it should be placed next to an unoccupied space such as a storage room or mechanical room. Do not locate equipment near occupied sound-sensitive areas of the building or near windows. Also, locating equipment adjacent to other building walls or large objects may reflect the sound back to the sound-sensitive area*.

C. Design systems so that bottom of ductwork or piping, including supports, is not below 7 feet above the finished floor where passage is required.[7]

D. Provide adequate space above suspended ceilings to install and maintain ductwork and equipment and piping. With the exception of VAV boxes, reheat coils, and small individual fan coil units and exhaust fans, do not locate equipment above suspended ceilings without Mechanical POC approval (due to difficulty to access, maintain, inspect, and replace).

1. *Guidance: Locate above ceiling equipment in corridors or above doorways to allow access without moving furniture and office partitions*.

E. Locate roof-mounted mechanical equipment (all parts) a minimum of 10 feet from the edge of roof or inside face of parapet. If the distance is less than 10 feet, specify a 42-inch-high restraint, e.g., guard rails, parapet, screen wall, fall protection anchorage system points, etc.[8] Mechanical POC approval must be obtained prior to installing roof-mounted air heating/cooling equipment (maintenance and roof damage issues).

F. Pads: Provide concrete housekeeping pads (5 inch minimum height[9]) under equipment (e,g, pumps, chillers, compressors) in mechanical rooms and outside on grade. For roof curbs, follow applicable building codes.

G. For additional requirements see ESM Chapter 1 Section Z10.

7.0 EQUIPMENT/PIPING IDENTIFICATION

7.1 General

A. Identify major mechanical equipment in accordance with the nomenclature indicated in Engineering Standards Manual, Chapter 1, Section 200, Equipment & Component Numbering and Labeling.

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[7] 2003 IBC, Section 1208.2 allows 7 feet minimum for halls, kitchen, storage, etc., which is appropriate to use for mechanical rooms.

[8] LANL uses a distance of 10 feet so that fall protection is not required per 29 CFR 1926.501(b)(1), Unprotected sides and edges, based on using 29 CFR 1926.502(g), Controlled access zones, as the definition for how far back from an unprotected side or edge which is 6 feet or more above a lower level. 29 CFR 1926.502(g)(1) (i) states "When control lines are used, they shall be erected not less than 6 feet nor more than 25 feet from the unprotected or leading edge, except when erecting precast concrete members." The additional 4 feet LANL uses allows for a working area around the equipment without encroaching into the controlled access zone.

[9] Allows for post-installed anchor embedment and use of 2x6 for forming.

B. Label mechanical equipment, piping, valves, etc., in accordance with LANL Master Specification 22 0554, Identification for Plumbing, HVAC, and Fire Piping and Equipment.[10]

C. For additional requirements comply with ESM Chapter 1 Section Z10.

7.2 Fume hood and Local Exhaust Ventilation

A. In addition to 7.1, A. above, label fume hoods and other local exhaust ventilation systems with a permanent printed label indicating the exhaust fan that serves it (e.g., "SERVED BY FE-xx").

B. Label exhaust fans that serve fume hoods and other local exhaust ventilation systems with a permanent printed label indicating fan static pressure, RPM, and motor current. The data for these labels is to be supplied by the TAB Subcontractor at completion of start-up.[11]

8.0 HANGERS AND SUPPORTS

A. Support piping and tubing to maintain its alignment and prevent sagging.

B. Comply with LANL Master Specification 22 0529, Hangers and Supports for Plumbing Piping and Equipment.

C. Support ductwork in accordance with SMACNA Duct Construction Standards-Metal and Flexible.

D. If seismic restraints are required, comply with LANL Master Specification 13 4800, *Sound, Vibration and Seismic Control,* and the SMACNA *Seismic Restraint Manual.*

E. ESM Chapter 5, Structural, has additional requirements and guidance.

F. Welded structural fabrications shall have design documents that state the appropriate AWS inspection criteria (*e.g., for D1.1, state either static non-tubular, cyclic (dynamic), or tubular and whether additional inspection beyond visual is required*).

G. Guidance: Refer to the following Manufacturers Standardization Society (MSS) standard practices on pipe hangers and supports:

1. *MSS SP-58 on Materials, Design and Manufacturer*
2. *MSS SP-69 on Selection and Application*
3. *MSS SP-89 on Fabrication and Installation Practices*

9.0 HIGH-VALUE EQUIPMENT PROTECTION [12]

A. Protect extremely high value machines, (e.g., supercomputers, laser labs) from fluid leakage damage.

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[10] LANL P 101-19, Safety Signs, Labels, and Tags; and 2003 IAPMO UPC, Section 601.2.
[11] NFPA 91-2004, A9.2, (9).
[12] Design criteria resulting from lessons learned at Building TA-3-132 (CCF) and Type B Accident Investigation of the Mineral Oil Leak Resulting in Property Damage at the Atlas Facility Los Alamos National Laboratory, New Mexico dated 3/2001 and http://tis.eh.doe.gov/oversight/reports/accidents/typeb/0104lanl/LANLTypeB_oil_spill.pdf

1. Do not locate piping, except fire protection piping, above such equipment.
2. Route necessary piping under the raised floor.
3. Provide adequate drains (with trap primers) to carry water from spills away from the area.
4. Guidance: Provide adequate isolation valves in water lines so leaks can be easily isolated during an emergency.
5. Guidance: Provide water sensors under the raised floor areas.

10.0 INSULATION

A. Comply with ESM Chapter 14 for ductwork and piping insulation.

B. Maximum surface temperature for equipment and piping that could be touched by people either casually or during activities such as maintenance is 140 deg F; insulate as required to achieve this.[13]

C. Insulate piping and duct to prevent condensation if surface temperature is lower than the dew point temperature and water droplets are not acceptable.

D. Refer to LANL Master Specification 22 0713, Plumbing and HVAC Insulation, for additional requirements.

11.0 METERS

A. Building Supply: Potable water, steam, and gas meters are required for new buildings greater than 4000 ft^2 and, for renovations, if more than 50% of the particular mechanical system is upgraded.[14]

B. Specify meters with a digital remote readout and a 4-20 mA signal. Tie meters into the Supervisory Control and Data Acquisition (SCADA) network, the Equipment Surveillance System (ESS), and/or the Building Automation System (BAS; preferred location), if present.

C. When a water meter is required, install inside the building in a heated space to prevent freezing and facilitate maintenance.

D. HVAC Systems: Provide totalizing water meters in the make-up and blowdown lines of all cooling towers and air washers 25,000 cfm and larger.[15]

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[13] ASTM C1055-03 Table X1.2 temperature to prevent possibly irreversible tissue damage. OSHA has no qualitative limit per Interpretation ID 22617 EMRef-21 or http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=22617

[14] This supersedes less stringent requirements in Civil Chapter. Based on DOE O 430.2B CRD 6.D "To the maximum extent practicable, the contractor must install metering for devices that measure consumption of potable water, electricity, steam, and natural gas in each building and other facilities and grounds." Since meters and their maintenance are costly, only metering of these larger buildings is warranted; also, LEED v3 requires actual use reporting. 4000' number based on Utilities calculations for practicality.

[15] Memo from Harvey Decker, ESH-18 (LANL Water Quality Group), dated August 29, 2000 (EMref-5), states: "The NPDES Permit requires flow rates be monitored and reported on Discharge Monitoring Reports (DMRs). In the past this has, for the most part, been either a crude measurement (bucket, watch method) or a visual estimation. This has led to inaccurate reporting of yearly water consumption by the Laboratory and much confusion by Laboratory, State NMED and EPA staff on

E. Refer to the following LANL Standards for additional requirements:

1. Spec Section 23 2500, HVAC Water Treatment (water meter specifications)
2. Spec Section 25 5000, Integrated Automated Facility Controls (water meter specifications)
3. Spec Section 33 1000, Water Utilities (water meter specifications)
4. Mechanical Drawing(s) ST-D2020-1 (building water meter location).
5. Mechanical Drawing(s) ST-D30GEN-1 (cooling tower meter locations).

12.0 PENETRATIONS

A. Provide UL/FM approved through-penetration firestop system when penetrating a fire-rated barrier (e.g., wall, floor, ceiling, or roof). Refer to ESM Fire Protection Chapter for additional requirements.

B. Provide sleeves to protect piping through concrete or masonry exterior or bearing walls. Refer to UPC for specific requirements. [16]

C. Rodent-Proofing: When penetrating an exterior wall, roof, or floor for the passage of pipes, ductwork, etc., seal opening and provide a metal collar securely fastened to the structure.[17]

D. Sound Control: When penetrating walls, floors, and ceilings of occupied spaces for the passage of ducts, pipes, conduits, etc., seal penetrations to reduce sound transmission. Refer to Mechanical Standard Drawing(s) ST-D10-30GEN-3, Sound Control, for additional requirements.

13.0 SEISMIC CONTROL [18]

A. Seismic protection measures may be required, based on the assigned performance category (PC) level.

B. Refer to the following LANL Standards for additional requirements:

1. Engineering Standards Manual, Structural Chapter.
2. LANL Master Specification 13 4800, Sound, Vibration, and Seismic Control.

C. Comply with the SMACNA Seismic Restraint Manual Guidelines for Mechanical Equipment.

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water use at the Laboratory. Water meters both on the inlet and discharge side of cooling towers also fits with the Laboratory's policy on waste minimization and water conservation in that cooling tower efficiency concerning water usage can be more readily tracked and accurate measurements can be reported on the DMRs instead on guesstimates. This could prove invaluable in the future, especially in light of the water supply system transfer to the County of Los Alamos." *(EMref refers to an ESM team system for managing hard-to-find reference hardcopies.)*

[16] 2003 IAPMO/ANSI UPC 1-2003, Section 313.10.

[17] 2003 IAPMO/ANSI UPC 1-2003, Section 313.12.3 (pipes). Appropriate to use for all penetrations.

[18] The UPC (IAPMO) and DOE- STD-1020 require seismic protection based on the assigned PC level. LANL Master Specification 13 4800 provides seismic protection measures for mechanical and electrical equipment. The SMACNA manual provides guidelines for the designer to determine the correct restraints for sheet metal ducts, piping, and conduit.

14.0 SOUND CONTROL [19]

14.1 General

A. Specify that equipment (fans, chillers, VAV terminal units, air handling units, etc.) comply with the sound rating of the applicable standards of the Air Conditioning and Refrigeration Institute (ARI) or the Air Movement and Control Association (AMCA).

B. For mechanical equipment, request sound power (preferred) or sound pressure levels for all eight octave band center frequencies from 63 to 8000 Hz.

C. For sound control materials, specify sound transmission loss (TL) capabilities and sound absorption coefficients, depending on the material. State TL in decibels (dB) and octave band center frequencies for both.

D. Seal penetrations through walls, floors, and ceilings. Refer to Penetrations subsection (above) for requirements.

E. For additional criteria on sound control, follow NEBB publication, "Sound and Vibration Design and Analysis;" ASHRAE Application and Fundamentals Handbooks; and SMACNA HVAC System Duct Design.

F. *Guidance: Consult Industrial Hygiene and Protection Operational Support Group, if a noise survey analysis is required for existing equipment and spaces.*

14.2 Acoustical Design

A. The following is criteria acceptable for mechanical system noise levels in normally occupied spaces during unoccupied times (RC=Room Criterion).[20]

Table D10-30GEN-1

1. Conference Rooms	RC 25 – 35
2. Private Offices	RC 25 – 35
3. Open Plan Offices	RC 30 – 40
4. Public Areas & Corridors	RC 40 – 45
5. Computer/Business Machines	RC 40 – 45
6. Laboratories (with fume hoods)	RC 40 – 50

14.3 Fan Noise

A. Provide manufactured duct silencers only when required attenuation of fan noise cannot be achieved with longer duct runs and duct lining. Refer to Mechanical Chapter, Section D30, Ducts Subsection, for duct lining requirements.

[19] These sections provide good engineering practices in order to select and design mechanical systems with acceptable sound and vibration control. These sections were developed with the assistance of a contracted sound and vibration professional engineer. Tables are taken from the ASHRAE Handbooks.

[20] 2003 ASHRAE Applications Handbook, page 47.29, Table 34.

B. Locate duct silencers as close to equipment as is possible and practical, while not encroaching on the silencer manufacturer's installation instructions. *Guidance: The preferred location for duct silencers is in the Mechanical Equipment Room. When this is not possible or practical, silencers may be located inside or outside of the Mechanical Equipment Room.*

C. Select silencers for the lowest possible static pressure drop, while still providing the specified insertion loss. Specify silencers to have a certified dynamic insertion loss (DIL) in decibels for the critical frequency or frequencies of concern, not less than the calculated requirement.

D. *Guidance: Duct diffuser/silencer type devices are also available for attenuating noise from vane-axial type fans. These are helpful, not only for reducing duct transmitted fan noise, but they also assist in reducing system pressure drop by stabilizing discharge airflow from the fan.*

E. Where conditions prohibit the use of acoustic fill used in conventional silencers, use packless duct silencers. *Guidance: These devices are designed especially for use in facilities handling gasoline, grease, solvents and other hazardous materials*.

14.4 Ductwork

A. Configure ductwork to provide good aerodynamic flow. Do not place volume dampers close to an air outlet. *Guidance: For good design, a volume damper should be no closer than 5 feet from an air outlet.*

B. *Guidance: Refer to ASHRAE Handbooks for guidelines on recommended velocities in duct sections and duct outlets needed to achieve specific acoustic design criteria. In addition, the designer should select air terminal devices based on the published data in the manufacturer's catalog*.

15.0 VIBRATION CONTROL [21]

15.1 General

A. For criteria on vibration and vibration control, refer to the ASHRAE Application and Fundamentals Handbooks and NEBB publication "Sound and Vibration Design and Analysis."

1. Equipment vibration severity rating for vibration on equipment structure or bearing caps shall be "slightly rough" or better per ASHRAE Applications Handbook (*Chapter 47 Figure 40 in 2003*).

15.2 Guidance

A. *Vibration isolation device selection should be based on the driving frequency of the equipment, at its lowest speed, and the natural frequency of the structure on which the equipment is positioned. The vibration isolator should have an actual (not rated) static deflection to provide the required separation between the driving frequency and natural frequency encountered in each case*.

[21] These sections provide good engineering practices in order to select and design mechanical systems with acceptable sound and vibration control. These sections were developed with the assistance of a contracted sound and vibration professional engineer. Tables are taken from the ASHRAE Handbooks.

B. *Floor spring isolators should be open steel springs, laterally stable type. Neoprene isolators or neoprene pads may be used for static deflections up to 0.50 inch.*

C. *For very critical applications, air vibration isolator mounts should be considered.*

D. *Concrete inertia bases may be used under equipment having a high center of gravity and large unbalanced operating forces, i.e., duplex reciprocating compressors, etc.*

E. *It is recommended that resilient neoprene snubbing devices be used with equipment having high unbalanced forces during operation. At least one such device should be installed at the centerline location on each of the four sides of the base.*

16.0 WATER DISCHARGED TO THE ENVIRONMENT AND SANITARY SEWER [22]

A. Obtain LANL Water Quality Group, approval prior to discharging:

1. **Potable** water from flushing/cleaning of potable piping systems, hydrostatic testing, line disinfecting, etc., to the environment or sanitary sewer.
2. **Non-potable** water from equipment drains, blowdowns, overflow piping, flushing/cleaning piping systems, or cleaning cooling towers, etc., to the environment, sanitary sewer, or any National Pollutant Discharge Elimination System (NPDES) permitted outfall.

B. Refer to the LANL Master Specification 01 3545, Water Discharge Requirements, for additional requirements.

[22] Memo from Harvey Decker, ESH-18 (LANL Water Quality Group), dated August 29, 2000 (EMref-5), states: "All discharges of this type are regulated either by the NPDES permit, other sections of the Clean Water Act, the State of New Mexico Water Quality Control Commission Regulations, or all three. This is also true of reporting of discharges to the environment. LANL guidelines are extended for discharges to any of the treatment facilities at LANL and are covered under LIR 404-50-01, LIR 404-00-02, and LIG 404-00-03." Note: Newer documents supersede these. LANL Master Specification 01 3545 provides water discharge requirements and was developed by the LANL Water Quality Group.