



Smith + Andersen

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MECHANICAL SPECIFICATION

FOR

TORONTO EMERGENCY MANAGEMENT

703 DON MILLS ROAD, 02-03FL TORONTO ON M3C 3N3

THIS SPECIFICATION SHALL BE READ IN CONJUNCTION WITH DRAWINGS:

REFER TO DRAWING LIST ON DRAWING TM-0.1

OUR PROJECT NUMBER:

91002.010.M.001

DATE:

2026-07-23

ISSUED FOR:

TENDER

20 00 00.00 Index

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SCHEDULES

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END OF SECTION

20 05 00.00 General Instructions for Mechanical Sections

1. General

1.1. WORK INCLUDED

- 1.1.1. Conform to the requirements of Division 1, which applies to and forms part of all sections of the Work.
- 1.1.2. The Specification is divided into Sections which are not intended to identify contractual limits between Subcontractors nor between the Contractor and their Subcontractors. The requirements of any one Section apply to all Sections. Refer to other Divisions and Sections to ensure a complete and operational system.
- 1.1.3. Provide mechanical components and accessories which may not be specifically shown on the Drawings or stipulated in the Specifications, but are required to ensure complete and operational systems.

1.2. INTENT

- 1.2.1. Mention in the Specifications or indication on the Drawings of equipment, materials, operation and methods, requires provision of the quality noted, the quantity required, and the systems complete in every respect.
- 1.2.2. The Specifications are an integral part of the accompanying Drawings. Consider any item or subject omitted from one or the other, but which is either mentioned or reasonably implied, as properly and sufficiently specified.
- 1.2.3. Be completely responsible for the acceptable condition and operation of all systems, equipment and components forming part of the installation or directly associated with it. Promptly replace defective material, equipment and part of equipment and repair related damages.

1.3. SECTIONS AFFECTED

- 1.3.1. These instructions apply to and form a part of all Division 20, 21, 22, and 23 Sections referred herein as Mechanical.

1.4. DEFINITIONS

- 1.4.1. Where used on the Drawings or in the Specifications, the following words are given the meanings below.
 - .1 Remove and Reinstall: Detach existing items, prepare them for reuse, and reinstall them where indicated.
 - .2 Existing to Remain: existing items that are not removed and that are not otherwise indicated as being removed, removed and salvaged (turned over to Owner), or removed and reinstalled.
 - .3 Remove and Salvage: detach existing items and turn over to Owner.

1.5. REGULATIONS

- 1.5.1. Perform Work in accordance with codes, rules, regulations, by-laws and requirements of the authorities having jurisdiction.
- 1.5.2. Comply with all guidelines and standards issued by the authorities having jurisdiction.

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- 1.5.3. Where names of codes and standards are referenced on the Contract Documents, comply with the latest in force edition in the jurisdiction of the Place of the Work.
- 1.5.4. Comply with regulations respecting plumbing made under the following legislation except as modified by rules, regulations and by-laws of authorities having jurisdiction:
- .1 Ontario Water Resources Act.
 - .2 Ontario Building Code Part 7.
- 1.5.5. Provide materials and assemblies with flame-spread ratings and smoke developed classifications in conformance with CAN/ULC-S102 "Test for Surface Burning Characteristics of Building Materials and Assemblies." Compliance with ASTM E84 "Surface Burning Characteristics of Building Materials" in lieu of CAN/ULC-S102 is not acceptable.
- 1.5.6. These Specifications are supplementary to the requirements above.
- 1.5.7. Drawings and Specifications should not conflict with the above regulations but where there are apparent discrepancies, notify the Engineer's Representative.
- 1.6. EXAMINATION OF SITE
- 1.6.1. Before submitting Bids, examine the site to determine the conditions which may affect the proposed Work. No claims for extra payment will be considered because of failure to fulfil this condition.
- 1.7. DRAWINGS, CHANGES AND INSTALLATION
- 1.7.1. The Drawings show the general character and scope of the Work and not the exact details of the installation. Install all equipment and systems complete with all accessories required for a complete and operational installation.
- 1.7.2. The location, arrangement and connection of equipment and material as shown on the Drawings represents a close approximation to the intent and requirements of the Work. The right is reserved by the Engineer's Representative to make reasonable changes required to accommodate conditions arising during the progress of the Work, at no additional cost.
- 1.7.3. In order to show more clearly the arrangement of the Work, plans and sections do not show every valve, thermometer, pressure gauge or other system accessory. Refer to the Mechanical Standard Details and to the Specifications to determine the requirements.
- 1.7.4. Install equipment in accordance with the manufacturer's written installation requirements. In the event of conflicts between the Drawings or Specifications and the manufacturer's written installation requirements, notify the Engineer's Representative for resolution.
- 1.7.5. Certain Details indicated on the Drawings are general in nature and specific labelled detail references to each and every occurrence of use are not indicated, however, such details are applicable to every occurrence.
- 1.7.6. The location and size of existing services shown on the Drawings are based on the best available information. Site verify the actual location of existing services before commencing Work. Pay particular attention to underground services.
- 1.7.7. Make changes and modifications necessary to ensure co-ordination and to avoid interference and conflicts with other Trades, or to accommodate existing conditions, at no additional cost.

- 1.7.8. Location of diffusers, grilles, registers, thermostats, sprinklers and all other equipment shown on plans is diagrammatic. Layout of each device in finished areas is critical in terms of symmetry and location. Refer to Architectural Drawings and to Supplemental Instructions in all regards. Revise any Work not installed in the correct location (at the sole discretion of the Engineer's Representative) at no additional cost. Mark-out fully co-ordinated Work with all other trades, in sufficient time for review by Engineer's Representative prior to rough-in. Precisely locate all mechanical and sprinkler services.
- 1.8. INSTALLATION, INTERFERENCE AND SETTING DRAWINGS
- 1.9. BID FORM AND SUBMISSIONS OF BIDS
- 1.9.1. Submit with the bid, all information called for on the Bid Form. Bids not completed in full may, at the discretion of the Owner, be rejected.
- 1.9.2. Where only one name appears in the Specification, include the specified equipment in the Bid.
- 1.9.3. Where two or more names are shown in the Specifications as alternatives or equal to, this Division can select which manufacturer is to be carried, provided the choice is shown on the Bid Form. Where the choice is not indicated, supply the equipment described in the Specification or first named on the Bid Form.
- 1.9.4. The Owner reserves the right to accept or reject any substitution without question.
- 1.9.5. Include the cost of premium time in the Bid price for Work provided during nights, weekends or other times outside normal working hours, necessary to maintain all mechanical services in operation and to meet the Project schedule.
- 1.10. CO-OPERATION WITH ENGINEER'S REPRESENTATIVE
- 1.10.1. To assist in the successful execution of the Project, the Contractor will receive an initial job report that summarizes the expectations of the Engineer's Representative and the Contractor. This job report covers topics such as progress billings, shop drawing requirements, Change Order pricing, the commissioning process, installation drawings, the Specifications, as-built drawings and operations and maintenance manuals, along with a number of other items. This job report is intended to reiterate key items from the Contract Documents and is not intended to impose new requirements.
- 1.10.2. At the appropriate time during construction, submit the applicable documentation listed below. The Engineer's Representative will review the information and identify when the information is complete. The Engineer's Representative's general review letter (required for building occupancy) will only be issued when the information requested below is submitted by the Contractor and deemed to be complete by the Engineer's Representative.
- 1.10.3. For mechanical systems occupancy, provide a PDF copy of the following documents to the Engineer's office for review:
- .1 Air balancing report
 - .2 As built drawings
- 1.10.4. For mechanical systems financial close, provide the following additional documents to the Engineer's office for review:
- .1 Copies of as-built drawings
 - .2 Operating and maintenance manual
 - .3 Warranty letter

1.11. SUBSTANTIAL PERFORMANCE

- 1.11.1. The Owner will not deem the Project "ready for use" as defined in the provincial or territorial lien legislation until the following minimum items are complete:
- .1 Everything required in the clauses above for occupancy.
 - .2 Submission of final, reviewed as-built documentation to the Engineer's Representative and Owner, as outlined in Specification Section 20 05 02.00 – AS-BUILT DRAWINGS. Note that this includes all final balancing reports.

1.12. EXISTING SERVICES AND EQUIPMENT

- 1.12.1. Provide temporary filters, 1 in. thick disposable media type, over all return air openings in the base building HVAC systems that remain in operation during construction. Maintain and replace the temporary filter media as required to prevent construction dust from fouling the base building equipment. Remove same at the completion of construction. Replace filters in all base building air handling equipment i.e., Air Handling Units, Induction Units, Fan Coil Units, etc., after construction is completed.
- 1.12.2. Reuse existing materials and equipment wherever possible. Provide new materials and equipment as required to ensure a complete installation. Package and turn-over to Landlord all existing equipment, materials and associated controls not used in this contract. Include in the bid for all shipping and placement in a designated on-site storage location. Remove any equipment or material not wanted by the Landlord from the site.
- 1.12.3. Schedule all changes and connections to existing services at a time approved by the Engineer's Representative so as to avoid any interruption of such services during normal working hours. If necessary, make changes and connections to existing services outside of normal working hours, without additional cost.
- 1.12.4. Prior to operating any existing or new equipment during any stage of construction, receive written approval from the Landlord and Engineer's Representative.
- 1.12.5. Whenever existing services or equipment are to be removed, remove all associated piping and ducts back to the main, nearest pipe or duct and securely cap or plug open ends in an approved manner. If necessary to facilitate installation of new Work, remove existing services and equipment and then replace without additional cost.
- 1.12.6. Whenever it becomes necessary to relocate existing piping, ducts or equipment to make possible installation of the Work under this Contract, make such relocation without additional cost.
- 1.12.7. Where connections are made to existing services, replace and make good existing insulation.

1.13. INTERRUPTION OF SERVICES

- 1.13.1. Perform all shutdown, draining, filling and chemical treatment for any portion of the existing base building systems to the satisfaction of the Landlord's building operations staff and co-ordinate with the Landlord for time and duration of interruptions. Comply with all of the Landlord's instructions and include for all costs of this Work, including Work performed by the Landlord's Chemical Treatment Supplier, in the bid price.
- 1.13.2. Schedule interruptions of the mechanical services to any part of the building at a time agreeable to the Landlord. Make all necessary arrangements with those concerned and include for any overtime required to ensure that the interruption is held to a minimum.
- 1.13.3. Obtain approval from the Engineer's Representative for testing and operation of major equipment to avoid excessive utility charges. Such testing is to be generally carried out after normal working hours or on weekends.

- 1.13.4. Perform all such overtime Work at no additional cost.
- 1.14. METRIC CONVERSIONS
- 1.14.1. Take particular care with imperial versus SI metric conversions. This applies to all services including, but not limited to, equipment, pipes, ductwork and site services in both new and existing installations.
- 1.14.2. Conform to CAN/CSA-Z234.1 "Metric Practice Guide."
- 1.15. SCHEDULE, ACCESS, PROTECTION AND CLEAN-UP
- 1.15.1. The construction schedule places restrictions on the duration of construction within areas and the duration of shut-down of equipment. Refer to the General Conditions for all requirements.
- 1.15.2. There may be access restrictions to the site (location, time of day, days of week). Refer to Front End Specifications for more information and conform to all requirements stated within.
- 1.15.3. Refer to the security and protection requirements in the General Conditions and conform to all requirements. In particular:
- .1 No open flames without prior written approval of the Owner.
 - .2 No smoking.
 - .3 Keep the site clean at all times.
- 1.16. INTELLECTUAL PROPERTY
- 1.16.1. The Contractor acknowledges, represents, warrants and agrees that the Owner, its Consultants, and the Engineer's Representative are not responsible, and are hereby indemnified against any action as a result of patent infringement made through the review, acceptance, or receipt of materials, equipment, Work, etc. provided by the Contractor or any of their Suppliers or manufacturers in the execution of this Contract.
- 1.17. WARRANTY
- 1.17.1. Except where longer warranty periods are required by other specification sections, provide a one (1) year warranty for the Work, starting at Substantial Performance of the Work.
- 1.17.2. Coordinate the extension of manufacturer warranties to comply with the clause above, based on the duration of construction.
- 1.18. VALUATION OF CHANGES
- 1.18.1. Further to Contract requirements, use the following method in determining the value of a change to the Work, by either Change Order or Change Directive:
- .1 Estimate and acceptance in a lump sum, unless the Engineer's Representative otherwise determines that the method shall be unit prices set out in the Contract.
- 1.18.2. Provide the Engineer's Representative with a detailed cost analysis of the proposed change including:
- .1 Quantity of each material.
 - .2 Unit cost of each material.
 - .3 Labour units based on Mechanical Contractors Association of America (MCAA) Labour Estimating Manual.
 - .4 Labour (hours) involved.

- .5 Suppliers' quotation or credit memo for equipment noted in proposed change, with detailed breakdown.
 - .6 Sub-trade quotations including a complete cost breakdown of the proposed change meeting the requirements of this section.
 - .7 Sub-trade's suppliers' quotation or credit memo for equipment noted in proposed change, with detailed breakdown.
 - .8 Mark-ups, if applicable.
 - .9 Value of GST or HST, as applicable.
 - .10 Proposed change in contract time, if any.
 - .11 S+A proposed change number in every quotation to facilitate record keeping.
- 1.18.3. Comply with requirements of Contract Documents for all materials included in quotations for proposed changes.
- 1.18.4. List material and labour separately for each item/clause of the proposed change, on the detailed cost breakdown.
- 1.18.5. Not be entitled to any additional compensation arising out of changes to the Work other than the amounts determined and agreed to under CCDC 2-2020 GC 6.2.
- 1.18.6. Inform the Surety Company or Companies who have issued any bonds for this Contract, and any Insurers who have insured any part of the Work or operations or who have an interest in this Contract, of all changes in the Contract. Pay all costs of any changes in bonds or insurances required to maintain bonds or insurances in conformance with the requirements of the Contract Documents. Provide Owner immediately with any revised bonds or insurances.
- 1.18.7. Charge special equipment rental rates at cost. Provide an official quotation of the equipment rental with the proposed change quotation as backup, otherwise special equipment rentals will not be accepted by the Owner/Consultant.
- 1.18.8. The maximum percentage fee for mark-ups is as stated in the Division 0/1 specifications or Contract Supplementary Conditions.
- 1.18.9. All changes, change notices, proposed changes, revisions to contract, Supplemental Instructions, Change Directives or any additional costs or deletes to the stipulated lump sum Contract Price are subject to review and scrutiny by a qualified third party or individual.
- 1.18.10. Use material costs based on a discount to nationally available pricing guides (i.e. Trade Service, Allpriser, etc.) to reflect a value with a fair and reasonable markup to the actual cost of the materials purchased from distributors. The Owner and/or Engineer's Representative reserve the right to negotiate material pricing to a value that is fair and reasonable to the Owner. Indicate on the Bid Form or Supplementary Bid Form: which pricing guide is proposed to be used and discount rate compared to list price.
- 1.18.11. Base the hourly labour rate for all changes on a Journeyperson rate as listed on the Bid Form and/or Supplementary Bid Form. The Owner and/or Engineer's Representative reserve the right to renegotiate the labour rate. The hourly labour rate will be inclusive of overhead, markup and profit.
- 1.18.12. At the request of the Owner or the Engineer's Representative, submit a detailed labour cost breakdown showing a breakdown of all adders to the base wage rate to show how the Contractor has come to the proposed hourly rate. The Owner and the Engineer's Representative reserve the right to negotiate the hourly labour rate with the Contractor.
- 1.18.13. When pricing additional work for proposed changes, only price new materials that are required for the proposed change. Where existing materials and/or infrastructure can be re-used for the proposed change, utilize these items in the valuation of the change at no extra cost.

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- 1.18.14. Where a proposed change includes both credits and extras, overhead and permitted mark-ups apply to the net extra or credits, if any, of the entire change.
- 1.18.15. When pricing proposed changes containing both additions and credits, and where no work and/or materials have been installed on site, only price the net new materials and net new labour that are required for the proposed change. Utilize equal per unit labour and material costs for credits and additions.
- 1.18.16. Utilize equal per unit labour and material costs for credits and additions.
- 1.19. STATEMENT OF PRICES
- 1.19.1. To form a basis for progress payments, submit a sample progress draw for the various portions of the work. Provide sample progress draw format matching that shown in the example progress draw below. As part of the sample progress draw, include a breakdown which illustrates all categories shown on the example progress draw which are relevant to the project. Break down the categories to clearly illustrate the value of the material being supplied as the first subcategory and the value of the labour being supplied as the second subcategory, as shown on the example progress draw. Provide further material and labour breakdowns by floor, area, or phase if the project sequencing or schedule focuses on distinct areas, one at a time. The Engineer's Representative reserves the right to request that additional categories be added to the progress draw if the Engineer's Representative feels that doing so will aid in assessing the Contractor's progress on site, thereby expediting Contractor payment. Progress draws not including the categories shown on the example progress draw where relevant to the project and / or not providing separate labour value and separate material value subcategories will be rejected.
- 1.19.2. Ensure that the total price of all portions of the work equals the total price of the work covered under the Mechanical Division. Present cost for as-built drawings and O&M manuals as separate line items as shown below. Present line items from Section 20 08 00.00 – COMMISSIONING as shown below.
- 1.19.3. List and track each of the approved changes on separate lines on the progress draw.
- 1.19.4. Provide progress draw where the amount claimed is for the value, proportionate to the amount of the Contract, of Work performed and Products delivered to the Place of the Work as of the last day of the payment period. Do not include items on the progress draw which don't meet these conditions.

- 2. Products
 - 2.1. NOT USED
 - 3. Execution
 - 3.1. NOT USED
- END OF SECTION

20 05 02.00 As-built drawings

1. General
 - 1.1. WORK INCLUDED
 - 1.1.1. Conform to Section 20 05 00.00 - GENERAL INSTRUCTIONS FOR MECHANICAL SECTIONS.
 - 1.2. RECORD OF REVISIONS ON SITE
 - 1.2.1. Maintain an updated copy of plans and schematics in the digital format for which the Project is provided (i.e. AutoCAD or Autodesk Revit MEP) and be capable to produce documents in Adobe PDF upon request.
 - 1.3. SUBMITTALS
 - 1.3.1. Submit as-built drawings in Revit/CAD format and PDF format for all other areas of the building prior to request for occupancy.
 - 1.4. WARRANTY
 - 1.4.1. Provide a warranty in accordance with the requirements of Section 20 05 00.00 – GENERAL INSTRUCTIONS FOR MECHANICAL SECTIONS.
2. Products
 - 2.1. NOT USED
3. Execution
 - 3.1. DOCUMENTATION REQUIREMENTS
 - 3.1.1. As the Project progresses record all changes and deviations.
 - 3.1.2. Maintain an accurate dimensional record of revisions.
 - 3.1.3. Keep revisions up-to-date during construction including Change Orders, Change Directives, and Supplemental Instructions. Make documentation available for review at all times.
 - 3.1.4. Final as-built documents shall not contain markings or corrections electronically or by hand (i.e. marker, pen, pencil, etc.). Drawings submitted that contain mark-ups will not be accepted.
 - 3.2. SUBMISSION REQUIREMENTS
 - 3.2.1. On completion of the Work, submit the draft documentation indicating all such changes and deviations for review by the Engineer's Representative. Submit all documents in PDF format.
 - 3.2.2. Upon return of the "Reviewed" draft submittal, transfer "as-built" information and any additional submittal comments to the final software submission requirement (i.e. Autodesk AutoCAD or Autodesk Revit MEP).

- .1 Request the acceptable version(s) of the software that may be used. Owner shall confirm the acceptable software version upon receipt of request. If the Owner has no preference, the latest published version shall apply.
 - .2 Conform to the Owner/Engineer's Representative's standards.
 - .3 The Mechanical Contractor may request from the Engineer's Representative the most current electronic documentation (Mechanical Drawings) in AutoCAD. Documents to be forwarded via a secure file transfer. The Engineer's Representative will provide the Drawings one time at no charge. Where the Drawings are requested more than one time throughout the course of the project, a nominal charge of \$500.00 will apply to the second and subsequent requests.
 - .4 Clearly label electronic files with Engineer's Representative and Owner, Contract number, file names and the Drawing number.
- 3.2.3. Submit the documents in PDF along with the submission of the completed electronic source software documentation on an approved electronic storage device for review by the Engineer's Representative.
- 3.2.4. If required, the Engineer's Representative will provide a quotation to this Contractor to transfer "as-built" information from the mark-up documentation to the acceptable software.
- .1 Include a cost of \$400.00 per sheet for the transfer of marked up "as-built" information to AutoCAD and forwarding of the mechanical information by the Engineer's Representative to the Owner.
- 3.2.5. The Project will remain incomplete and monies retained until a satisfactory as-built submission is provided.
- 3.3. AUTOCAD SPECIFIC SUBMISSION REQUIREMENTS
- 3.3.1. Submit a complete list of layer names and brief description of each layer's use with all files.
 - 3.3.2. Submit a complete list of symbol (block) names with a description of each symbol.
 - 3.3.3. Make special effort to ensure that drafting is accurate, i.e. appropriate lines are indeed horizontal and vertical; lines that should intersect do but not over-intersect and that entities are placed on correct layers.
 - 3.3.4. Use the standard fonts available in the software. Do not use custom fonts, shape files, etc.
 - 3.3.5. Provide all drawings in the same scale of measurement and units as issued on Bid Documents.

END OF SECTION

20 08 02.00 Cleaning and Protection

1. General

1.1. WORK INCLUDED

1.1.1. Conform to Section 20 05 00.00 - GENERAL INSTRUCTIONS FOR MECHANICAL SECTIONS.

1.2. WARRANTY

1.2.1. Provide a warranty in accordance with the requirements of Section 20 05 00.00 – GENERAL INSTRUCTIONS FOR MECHANICAL SECTIONS.

2. Products

2.1. NOT USED

3. Execution

3.1. INSTALLATION

3.1.1. Clean thoroughly all fixtures and equipment from grease, dirt, plaster or any other foreign material. Chrome-plated fittings, piping and trim shall be polished upon completion.

3.1.2. Fixtures and equipment shall be properly protected from damage during the construction period and shall be cleaned and polished in accordance with manufacturer's written directions. Motors and equipment bearings shall be protected with plastic sheets, tied or taped in place. Aluminum fin heating or cooling elements shall be protected with cardboard covers.

3.1.3. Any dirt, rubbish, or grease on walls, floors or fixtures accumulated from the Work of the Mechanical Division shall be removed promptly from the premises by this Division.

3.1.4. Any unpainted steel surfaces, installed for longer than one year prior to the completion date, shall be prime coated under this Division.

3.1.5. During construction protect all services and equipment from dirt and debris, by using temporary caps over the open ends of pipes ductwork and equipment connections.

3.1.6. All equipment installed or stored on site shall be maintained in accordance with manufacturer's recommended instructions (i.e. rotate shafts on fans, pumps, etc.).

3.1.7. Refinish and restore to the original condition and appearance all mechanical equipment which has sustained damage to the manufacturer's prime and finish coats of enamel or paint. Materials and work quality shall be equal to the manufacturer's original.

END OF SECTION

23 05 93.26 Testing and Balancing Air Systems

4. General

4.1. WORK INCLUDED

4.1.1. Conform to Section 20 05 00.00 – GENERAL INSTRUCTIONS FOR MECHANICAL SECTIONS.

4.2. QUALITY ASSURANCE

4.2.1. Acceptable balancing companies are limited to the following:

- .1 Refer to building construction manual for landlord approved balancing contractors.

5. Products

5.1. NOT USED

6. Execution

6.1. LEAKAGE TESTING

6.1.1. Duct Pressure Tests

- .1 Perform pressure tests before ductwork is concealed or insulated.
- .2 Follow SMACNA HVAC Air Duct Leakage Test Manual procedures.
- .3 Provide blower and all test equipment.
- .4 Test the percentage of ductwork indicated in the table below. If a test specimen fails to meet the specified air leakage criteria, modify fabrication methods to bring it into compliance and retest until acceptable duct air leakage is demonstrated. If pressure test fails any sample twice, increase percentage of ductwork tested as indicated in the rightmost column of the table below.
- .5 Include as a minimum, 5 transverse joints, typical seams, an access door, 2 branch connections and 1 elbow in test samples.
- .6 Ensure leakage amount does not exceed the allotted amount in the table below for the duct construction pressure class in question.
- .7 Seal any leaks causing noise.
- .8 Leakage Class:

Duct Construction Pressure Class	Rectangular Leakage Class	Round Leakage Class	Amount of Ductwork to be Tested	Percentage of Ductwork to be Tested if Test Fails any Sample Twice
10 in. w.g.	4	2	100 %	N/A
6 in. w.g.	4	2	100 %	N/A
4 in. w.g.	4	2	25 %	50 %

3 in. w.g.	8	4	25 %	50 %
1/2, 1, and 2 in. w.g.	16	8	10 %	20 %

.9 Submit testing report, including leakage calculations, as a submittal complying with the requirements of Section 20 05 03.00 – SHOP DRAWINGS.

- 6.1.2. Do not commence insulation installation until testing report is submitted to Engineer's Representative and is reviewed by Engineer's Representative without requesting a resubmit.
- 6.1.3. Refer to Section 23 31 13.00 - DUCTWORK AND SPECIALTIES for pressure ratings of ductwork and systems.

6.2. SYSTEM BALANCING

- 6.2.1. Balance the complete air system including air volumes and control settings under maximum system pressure drop conditions (filter at replacement condition). Test the entire system for noise, tightness of joints and proper functioning of the system. Make noise tests under minimum system pressure drop conditions (highest air velocities and clean filter conditions). Make necessary alterations and repeat the tests until satisfactory operation is achieved.
- 6.2.2. Adjust minimum outside air controller and adjust return air and exhaust air damper linkages to ensure correct air quantities.
- 6.2.3. Employ one of the qualified Independent Balancing Companies to balance the air systems.
- 6.2.4. The Independent Balancing Company measures and reports upon the air volume at each diffuser, register and grille. Report shall also show the air quantity handled by each fan, the static pressure upstream and downstream of the fan, the fan speed and the motor current. Also to be reported upon are the air flow at outdoor, return and exhaust air dampers under conditions of minimum outdoor air.
- 6.2.5. Provide assistance to the air balancing company and shall provide control settings, new filters, and other incidentals and equipment required for the measurements.
- 6.2.6. Air volumes measured by the balancing company shall be within plus or minus 5% of those shown on Drawings for diffusers, grilles and registers and within 10% for fans.
- 6.2.7. In all cases where measurements by the balancing company show failure to comply with the Drawings and Specifications, engage the balancing company to rebalance the system at no increase to Contract Price.
- 6.2.8. The balancing of the air and water systems shall be performed by the same balancing company.
- 6.2.9. Balancing company to review Mechanical Contractor's proposed access door locations and sizes per Section 20 05 63.00 – ACCESS DOORS AND ACCESSIBILITY and ensure that sufficient access is available.

END OF SECTION