

## 1. MECHANICAL GENERAL REQUIREMENTS

1. This section applies to and is part of all sections of Division 21, 22, 23, and 25. Every section of these Specifications applies equally to all sections.
2. Mechanical Subcontract Price to include all necessary equipment, parts, labour and Plant to complete the Work shown on the Drawings and described in the Specifications and to ensure complete and operational mechanical systems.
3. Drawings are diagrammatic and approximately to scale. Do not scale them. For exact dimensions refer to dimensioned Drawings.
4. Drawings and Specifications establish scope of Work only and are not detailed installation instructions. Follow manufacturer's recommendations and adhere to all applicable Codes, Standards, Regulations and Bylaws, hereafter referred to as Codes.
5. Connect to equipment specified in other sections, installed by other Contractors or The City.
6. The Contract Administrator shall have the final say in matters of interpretation.
7. Use only new Materials under this Contract unless otherwise noted. New Materials shall be free of Asbestos Containing Materials (ACM).
8. Apply for and pay for all required permits, licenses, inspections and fees. Indicate building and mechanical permit numbers on all progress draws. Where no permit was applied for indicate same on progress draw.
9. In the event of conflict between Contract documents and Codes, the more stringent requirement shall be adhered to at no additional cost.
10. All Work shall be executed with good Workmanship, and be guaranteed for one year from Substantial Completion.
11. Only skilled and qualified licensed tradesmen shall perform the Work. Tradesmen to provide proof of registered status as requested.
12. Install mechanical systems in a Workmanlike manner, neat in appearance and to function properly to the satisfaction of the Contract Administrator.
13. Supply access doors, provide rated doors to match fire rating, at all service points for mechanical equipment. Indicate on "as-built Drawings" the location of all access doors.
14. Variable Speed Drives: Equipment electric motor shall be compatible with the variable speed drives when specified.
15. The Mechanical Subcontractor is responsible to carefully examine conditions at the intended place of Work. Verify all services, connection points, and all access openings to permit installation of new equipment.
16. Openings shall be coordinated with the Contractor. Opening sizes to be kept to a minimum. Patching of openings shall be the responsibility of the trades normally engaged in installing the finishing Materials (i.e. Drywall, brick, etc.). Openings with potential to compromise the structure shall be approved by the Contract Administrator prior to starting the opening. The Contractor shall contact the Contract Administrator for instructions prior to cutting or coring. **Contractor is to scan structure before making openings.**
17. Mechanical Subcontractor shall submit shop Drawings for review by the Contract Administrator prior to commencing Work. Shop Drawings shall be specific to the equipment and Materials for this project. Changes to location and arrangement shall be reviewed prior to installation. Review of shop Drawings by the Contract Administrator is for the sole purpose of

ascertaining conformance to design intent. The Mechanical Subcontractor retains responsibility for all aspects of installation, performance and coordination.

18. Shop Drawing Procedures are as follows:
  1. General:
    1. Submittal routing shall be established at the beginning of each project.
    2. A transmittal listing each item of equipment shall accompany each submission.
    3. Contractor and Mechanical or Electrical Subcontractor must review, approve and stamp submittals prior to sending to Contract Administrator for review. Submittals without Contractor stamps will not be reviewed.
    4. Equipment must be labeled appropriately. Each item of equipment must bear the identifier used on the Drawings, i.e. EF-1, RTU-3, etc.
    5. Data sheets must clearly indicate model and options being utilized. All information that does not apply must be crossed off.
    6. Allow for Contract Administrator to take ten (10) Working days to respond to all requests.
    7. Where products have applied for and received equal approvals, proof of this shall be submitted with Shop Drawings.
  2. Electronic Submissions (.pdf only):
    1. Send electronic shop drawing submittals Contract Administrator.
  3. Hard Copy Submissions:
    1. A minimum of four (4) hard copies must be provided: MCW will retain one (1) copy, provide additional copies when requested.
19. Mechanical Subcontractor shall maintain accurate "as-built" Drawings on Site and shall present for review at each Site review. The Contract Administrator will not perform final inspections nor certify for occupancy until the "as-built" Drawings have been received, reviewed and accepted. Submit these record drawings in AutoCAD 2010 or newer format for review at the completion of the project. Note that changes to architectural and structural floor plans must be included. The Contract Administrator will not perform final inspections nor certify for occupancy until the "as-built" drawings have been received, reviewed and accepted. After acceptance of "as-built" drawings by the Contract Administrator, provide one (1) complete set on CD-ROM and three (3) sets of prints.
20. Engineering Site Reviews: Contractor's Work shall be periodically reviewed by the Contract Administrator for determining general quality of installation. Guidance will be offered as to interpretation of Contract documents and to assist in performing the mechanical installation. Inspections, reviews and directives issued in no way relieve the Contractor, his agents, employees or subtrades from contractual obligations, conformance to codes or safe and recognized practices.
21. Operating and Maintenance Manuals: At the completion of Work submit three (3) hard covered loose leaf binders showing all major components divided by trade sections. Manuals shall be complete with all instructions for operation, maintenance and replacement parts as required. Include performance curves, detailed Drawings, part lists, supplier information and any other pertinent data. Include copies of reviewed shop Drawings, Contract Administrator contact information, Contractor and Subcontractor information. Include copies of valve tag lists, all inspection certificates, and balancing reports. The Contract Administrator will not perform final inspections nor certify for occupancy until the O&M Manuals are received, reviewed and approved.
  1. Provide manufacturers start-up reports and letters of certification that the following equipment and systems are started, commissioned and Working correctly:
    1. Controls
    2. Air moving equipment
    3. Pumps
    4. Boilers

5. Heat recovery ventilators
  6. Plumbing fixtures, mixing valves and brass.
  7. Water Treatment
22. Provide one (1) set of special tools required to service equipment as recommended by manufacturer. Provide a receipt signed by The City representative for each tool in each copy of the O&M Manual.
  23. Provide one (1) set of spare filters for each filter bank.
  24. Prior to requesting any Substantial Performance Site review, all aspects of the mechanical systems shall be complete and operational. Testing and balancing shall be complete along with valve and equipment identification, equipment startups.
  25. Each of the Contractors shall instruct The City's Operating Staff on the operation, maintenance, and adjustment of equipment and/or system that they have installed or set. Provide sign off sheets for training indicating who was trained and number of hours of training.
  26. Work in Existing Building:
    1. The Contractor shall maintain the facility fully operational during the entire construction period, except as noted below.
    2. The Contractor shall develop a plan for phasing and staging of Work and adhere to that program, and comply with instructions necessary to maintain the building in operation, including, if necessary, performing some of the Work outside of The City's normal operating hours.
    3. A request to disrupt existing services shall be made to The City's representative at least three Working days before the shutdown of any system that might affect others, and consent shall be obtained for each shutdown, which shall be as short as possible.
    4. Any removed material and/or equipment shall belong to The City when The City does not want this material or equipment it shall be removed from the Site and disposed of by the Contractor.
  27. Use of Equipment before occupancy by The City:
    1. The Contractor may operate equipment for testing and balancing only. The use of equipment for any other purpose must be approved by The City in writing prior to use. Approval must indicate who is paying for utilities used.
    2. Any equipment that is placed in use for any reason prior to the beginning of the guarantee period shall be cleaned and provide with whatever maintenance and repair is required so that its condition is equal to that of new equipment, or it shall be replaced, at no cost to The City.
  28. Prior to final inspection or certification provide the following:
    - Fire damper certification
    - Copies of manufacturer's startup or certification reports
    - TAB reports.
    - Distribution system pressure test reports.
    - Training sign off sheets.
    - Receipts or transmittals indicating The City has received all special tools, spare sets of filters and spare.
  29. Mechanical Subcontractor is to review and approve all requests for information (RFI's) from Subcontractors and Contractor is to review and approve all mechanical RFI's prior to submittal to ensure information is not already included in Contract Documents or cannot be reasonably inferred from Contract Documents.

30. Contractor is to review and approve all mechanical change pricing and credits prior to submitting to Contract Administrator, approval to state that the Contractor believes the pricing is fair and reasonable.
31. Mechanical change pricing will only be reviewed if it includes a complete breakdown of items of material, labour hours, labour rates and markups. This review period will start when the information indicated above is received.
32. Mechanical progress claims will only be reviewed if they provide a complete breakdown by trade and sub trade and list all major equipment complete with costs.

**1. MECHANICAL DEFINITIONS**

1. The term "Mechanical Subcontractor" refers to the successful bidder engaged to perform the mechanical installation and coordinate all sub trades engaged by the "Contractor".
2. The terms, "supply", "install", and "provide" shall mean to supply install, coordinate, and connect to ensure a fully functional mechanical system, tested and complete in every way, unless otherwise noted.
3. **"Drawings" and "Specifications" are complementary to each other. What is called for by one shall be binding to both. "Contract Documents" refers to both Drawings and specification**