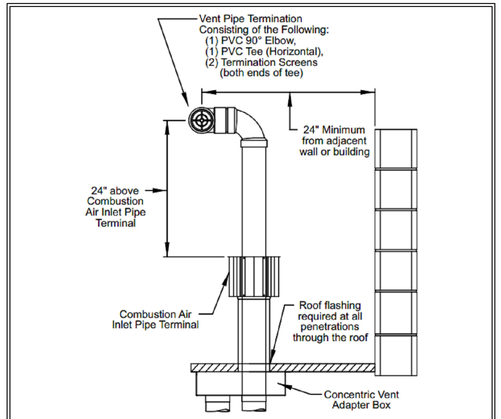


NOTE:

1: INSTALLATION OF VERTICAL VENTING TO FOLLOW MANUFACTURER'S RECOMMENDATION AS ABOVE.

VERTICAL CONCENTRIC VENT KIT DETAIL

SCALE: N.T.S.

GAS UNIT HEATER SCHEDULE

TYPE	LOCATION	MANUFACTURER	MODEL	ELECTRICAL			CFM	GAS INPUT (MBH)	GAS OUTPUT (MBH)	NOTES
				FAN MOTOR HP	FULL LOAD (AMPS)	(V/PH/HZ)				
UHN-3	WEST ROOM	MODINE	PTC135	1/3	6.75	115/1/60	3,020	135	125.5	(SEE NOTES BELOW)
UHN-4	WEST CORNER	MODINE	PTC135	1/3	6.75	115/1/60	3,020	135	125.5	(SEE NOTES BELOW)
UHN-5	SOUTH CORNER	MODINE	PTC135	1/3	6.75	115/1/60	3,020	135	125.5	(SEE NOTES BELOW)
UHN-6	NORTH CORNER	MODINE	PTC135	1/3	6.75	115/1/60	3,020	135	125.5	(SEE NOTES BELOW)
UHN-7	EAST CORNER	MODINE	PTC135	1/3	6.75	115/1/60	3,020	135	125.5	(SEE NOTES BELOW)

NOTES:

1: C/W CONCENTRIC VENT KIT AND ADAPTER BOX
2: C/W CONDENSATE PUMP WHERE NECESSARY TO MEET SITE CONDITIONS
3: C/W ACID NEUTRALIZING KIT
4: REZNOR EQUIVANET MODEL UEAS130

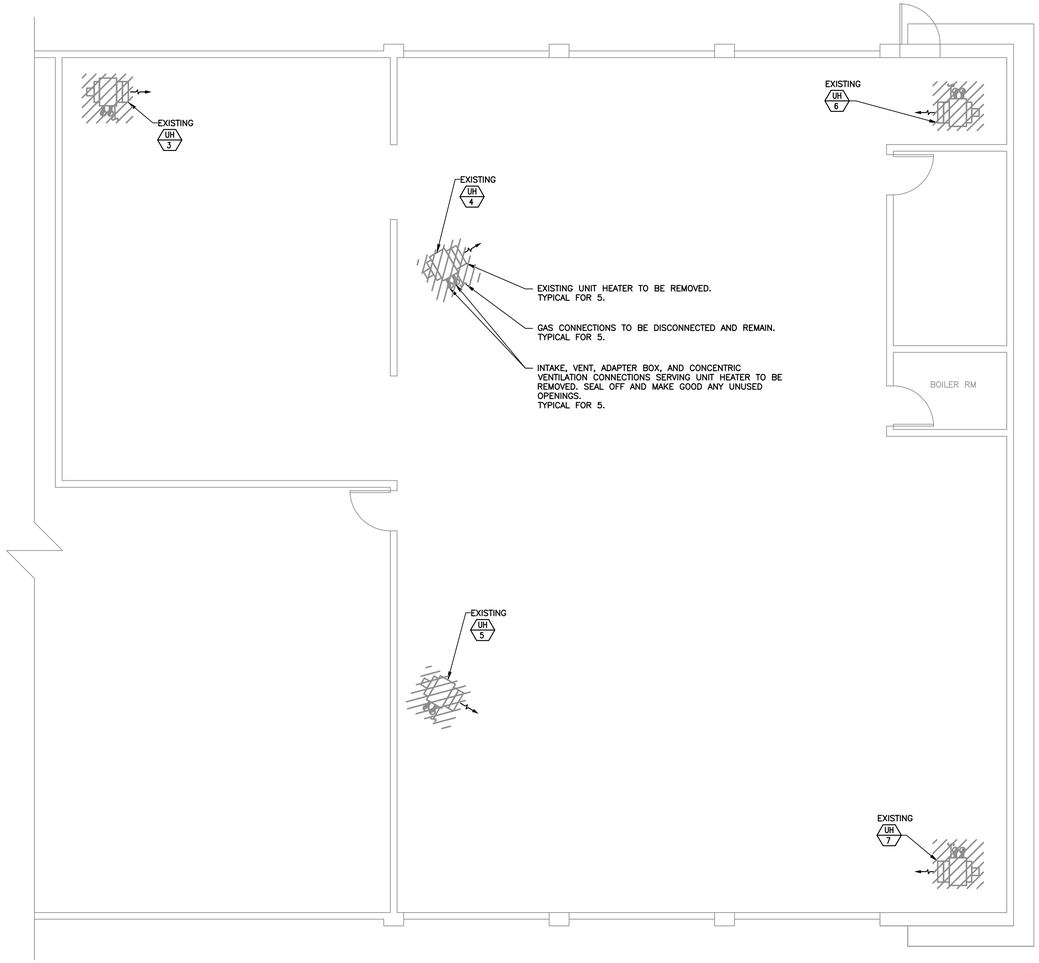
SYMBOL SCHEDULE

SYMBOL	DESCRIPTION
E/A	EXHAUST AIR
O/A	OUTSIDE AIR
R/A	RETURN AIR
S/A	SUPPLY AIR
T	THERMOSTAT
UH 7	EQUIPMENT TAG

DRAWING LIST:

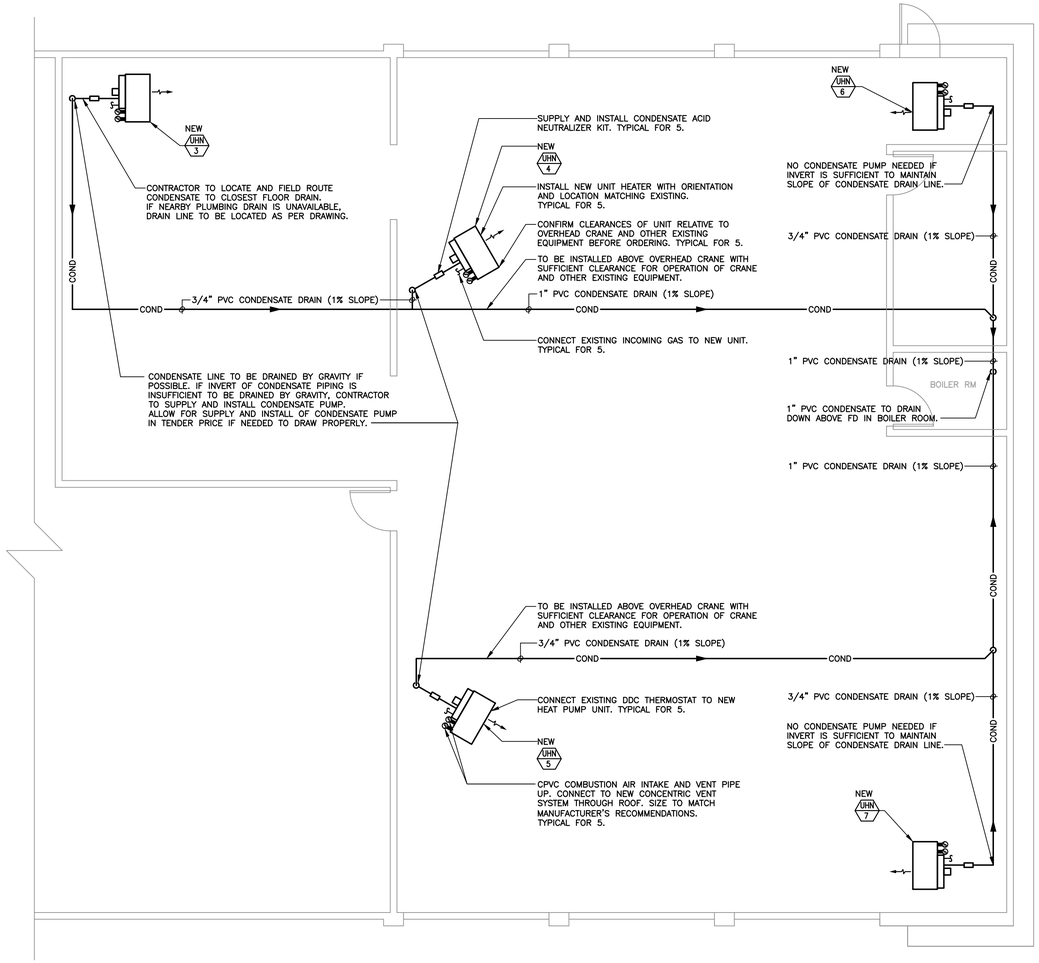
M-01 DEMOLITION AND CONSTRUCTION - HVAC
M-02 SPECIFICATIONS

NO.	ISSUE	DATE
01	ISSUE FOR REVIEW	NOV. 01, 2017
02	ISSUE FOR TENDER	NOV. 02, 2017



DEMOLITION PLAN

N.T.S.



CONSTRUCTION PLAN

N.T.S.

ENGINEERING OPERATIONS BUILDING

GAS UNIT HEATERS UPGRADE

jadewest ENGINEERING CO. LTD.
Professional Mechanical Engineering Services
#201, 15685 - 24th Avenue
South Surrey, B.C. V4A 2J4
Phone: (604) 538-0764 Fax: (604) 538-0765
www.jadewest.com

- TITLE:

DEMOLITION AND RENOVATION - H.V.A.C.

- SCALE: N.T.S.
- DATE: OCT 2017
- DRAWN: JL
- CHECKED: JM
- JOB #: NEWW-99
- DWG. NO.

M-01

SPECIFICATIONS

SCOPE

The work included in this Section shall consist of providing all Materials, labour, tools, and incidentals necessary to install and make ready for owner's use an upgraded/renovated H.V.A.C. system in the New Westminster Engineering Operations Building, Northeast area as called for in these documents including:

- installation of 5 condensing unit heaters with minimum 91% efficiency and associated equipment specified on mechanical drawings.
- installation of combustion and exhaust ductwork and associated equipment specified on mechanical drawings.
- schedule all work to suit building occupants and to minimize disruption to facility. When necessary to minimize disruption work to be performed during unoccupied hours.
- provide all sub-trades necessary to provide for any control work, painting and patching, general construction required, etc to complete project.
- provide for all other work specified in the mechanical drawings and specifications.
- all roof penetrations to be sealed by Design Roofing as sole approved roofing contractor.
- any electrical work necessary to complete system. Contractor to use certified electrician to perform all required electrical work necessary.

RESPONSIBILITY OF BIDDERS

1. Bidders shall examine all drawings and specifications issued and SHALL VISIT THE SITE of the work. Bidders must be familiar with the codes, rules, and regulations (and the local interpretations) in effect at the work site.
2. Give necessary notices, obtain necessary permits and pay fees in order that the work specified in the Contract Documents may be carried out, and furnish any certificates necessary as evidence that the work installed conforms with the law and regulations of authority having jurisdiction.
3. In no instance shall the standard established by the drawings and specifications be reduced by any of the following codes and in no instance will a standard lower than that established by the B.C. Building Code 2012, B.C. Fire Code 2012, ASHRAE 90.1–2010, National Fire Protection Association (NFPA), Worksafe BC, and local ordinances (and local interpretations) be accepted. Any Costs necessary to meet these requirements shall be included in the bid price.
4. Delivery, storage and handling of materials and equipment is the responsibility of the Contractor.
5. All materials removed become the property of the Contractor and must be disposed of in conformance with municipal, provincial, federal and WorkSafe BC requirements. All redundant piping, all excess or demolished construction materials, etc. to be removed from the site prior to completion of project.
6. If conflicts occur between mechanical drawings and applicable codes (or requirements of local authority having jurisdiction), the latter requirements shall govern.
7. Contractor to employ tradesman with valid Provincial Trade Qualification Certificates who perform work that conforms with their certificates.

CONSTRUCTION SUPERVISION

1. During the course of construction, Jade West will conduct field reviews as deemed necessary to confirm compliance with specifications. Contact Jade West to be contacted prior to all normal building inspector reviews, including but not limited to: mechanical rough-ins prior to covering, pre substantial review, and substantial completion. Jade West may choose when to or when not to review depending on project.
2. During the course of construction, Jade West will conduct field reviews as deemed necessary to confirm compliance with specifications.

MECHANICAL PLANS

1. The mechanical plans are intended to be diagrammatic. They are not intended to show every item in its exact location, the exact dimensions, or all the details of the equipment. The contractor shall verify the actual dimensions of the equipment proposed to ensure that the equipment will fit in the available space.
2. Installation shall be within the limitations imposed by the architectural, structural, and electrical requirements, with adequate space for maintenance.
3. Generally, drawings indicate graphically, the dimensions and location of components and equipment. Specifications indicate components, assemblies, and identify quality.
4. Drawings, specifications, diagrams and schedules are complementary, each to the other, and what is required by one, to be binding as if required by all.
5. Should any conflict or discrepancy appear between documents, which leaves doubt as to the intent or meaning, obtain guidance or direction from Consultant.
6. Install piping, conduit or wire conductors not shown or indicated diagrammatically in schematic diagrams, to result in an operational assembly or system.
7. Install components to physically conserve headroom, to minimize furring spaces, or obstructions.
8. Locate devices with primary regard for convenience of operation and usage.
9. Examine all discipline drawings, specifications, and schedules and related Work to ensure that Work can be satisfactorily executed.
10. Conflicts or perceived additional work, beyond work described, notify Consultant.
11. SPECIFICATION GRAMMAR
    - 11.1. Specifications are written in the imperative (command) mode, in an abbreviated form.
    - 11.2. Imperative language of the technical sections is always directed to the Contractor as sole executor of the Contract, unless specifically noted otherwise.
    - 11.3. This form of statement requires the Contractor to perform such action or Work. Perform all requirements of the Contract Documents whether stated imperatively or otherwise.
    - 11.4. Division of the Work among subcontractors, suppliers, or others is solely the Contractor's responsibility. The specification author assumes no responsibility to function or act as an arbiter to establish subcontract scope or limits between sections or divisions of work.

QUESTIONS AND CLARIFICATIONS OF BID DOCUMENTS

1. Bidders shall not rely on any verbal clarification of the drawings or specifications. Any questions or clarifications shall be referred to the engineer at least five (5) working days prior to completion of bidding to allow for issuance of an addendum.

CUTTING AND PATCHING

1. All cutting and patching to be provided as necessary to finish project. Make good all penetrations including dry walling, patching and painting, repairing/replacing ceilings and roof, etc.
2. The Contractor shall be responsible for all drilling necessary for installing hangers, cables, brackets, sleeves, etc. for support of mechanical equipment.
3. Obtain written approval from a Structural Engineer. Retained and paid for by Contractor prior to coring, drilling or cutting structural components. Arrange and pay for scanning of existing structural slab & beams.
4. Refer to Hazardous Materials Abatement Specifications for additional requirements.

DEMOLITION

1. Bidders shall visit site to confirm locations and sizes of existing redundant equipment, piping and venting which shall be removed as part of this contract. The demolition shall be completed by the Mechanical Contractor.

SHOP DRAWINGS

1. Submit PDF copy of shop drawings for all equipment to Jade West.
2. Shop drawings shall be clearly designated as to the intended item with identification as to unit number or other marking to show location, service, and function. Include all equipment weights, electrical information and control information.
3. If Jade West gives notification that such equipment is not satisfactory owing to quality, appearance, capacity or space arrange to supply satisfactory equipment or materials.
4. Any equipment installed without prior acceptance shall be subject to rejection.

DELIVERY, STORAGE, AND HANDLING

1. Accept all equipment, ducts, etc. on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.
2. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.
3. Contractor responsible for safe storage and handling of all equipment, piping, valves, etc until everything is installed, connected, tested, commissioned and project is substantially completed.
4. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

AS-BUILT DRAWINGS

1. Provide one set of As-Built white print drawings on the job site at all times incorporating installation of all equipment, ductwork and controls.
2. These changes are to be transferred to a set of clean prints at the completion of the job, be stamped with "THESE DRAWINGS ARE CERTIFIED AS-BUILT" and be signed and dated including name of Contractor and Authorized Company Signatory. A good quality of drafting must be used or the drawings will be rejected and must be re-done at the contractor's cost.
3. These As-Built prints shall be delivered to the Owner after approval. Copies are to be provided with each maintenance manual.
4. Information from the As-Built drawings will be transferred to AutoCad drawings by the consultant.

WARRANTY

1. All equipment, materials, and workmanship shall be guaranteed for a period of one (1) year, beginning with the date of substantial completion. This warranty shall be in writing and shall include written copies of factory warranties.

STANDARDS OF MATERIALS AND INSULATION

1. Equipment used shall not exceed space limitations in any dimension. Replace any equipment or apparatus which does not meet this Specification at no cost. Assume full responsibility for the expense of redesign and adjustment to other parts of the building when proposing the use of approved equal or alternate equipment.
2. Provide equipment from the following manufacturers. Those manufacturers not listed may be considered as alternatives.
3. All equipment on approved manufacturer's list must be equal in quality and performance to that specified. Equipment not deemed equal to that specified (as determined by the engineer) shall be replaced with the specified model and manufacturer at no cost to the owner. Just because a product is on the approved manufacturer's list, that does not ensure that it is considered equal to that specified. Always allow in the tendered price that of the specified product.

SCHEDULE OF APPROVED MANUFACTURERS

ITEM	APPROVED MANUFACTURERS
Hangers	Anvil, Grinnell, Shur-fit, Unistrut
Controls (DDC)	Reliable Only
Unit Heaters	Modine model PTC135, Reznor model UEAS130

EQUIPMENT AND PIPE HANGERS & SUPPORTS

1. Provide necessary hangers, rods, concrete inserts and supports to properly secure piping and equipment and ensure that required grading is maintained, vibration is minimized, and to provide for movement due to expansion and contraction and to protect against movement due to earthquakes.

CLEANING AND PAINTING

1. Thoroughly clean all equipment and remove all trash, etc. from area. Repair/replace any damaged materials or equipment. Leave entire area and systems in a clean and orderly manner.
2. Repair any marked or damaged equipment by cleaning and/ or painting (as required).
3. General contractor shall provide appropriate dust protection during all construction.

FLASHING

1. Pipes passing through roof shall be flashed, counter flashed and made watertight at the roof with aluminum flashing (or where acceptable, one-piece neoprene flashing to CSA Standard B272) which shall protrude 12"(300 mm) minimum around all floor, roof, and deck drains and securely clamped to the drain body. Any new flashing is to match color of existing building flashing in the vicinity of the work zone.
2. Vent termination flashing caps shall be used.
3. Contractor responsible for installing all equipment, piping and duct-work which penetrate walls, roofs or ceiling as per requirements of roofing contractor/inspector.
4. Mechanical Contractor is responsible to coordinate roof penetrations with Design Roofing in accordance with structural and equipment requirements.

EQUIPMENT MAINTENANCE ACCESS

1. Contractor is responsible for installing all equipment to allow proper and easy for maintenance and all clearances required by code and/or manufacturer's recommendations.
2. If access is limited because of conflict with structure, piping, electrical, other equipment, etc. then contractor to make necessary changes to layout, attachments or equipment to resolve. If filter access supplied with any equipment is unsuitable then contractor to modify supplied filter rack with good quality new filter rack to allow access from necessary orientation. This to be allowed for in contractor's scope of work.

SEISMIC REQUIREMENTS AND VIBRATION ISOLATION

1. Provide Seismic Restraints for all equipment, piping and duct-work to BC Building Code and SMACNA "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems" except as noted below.
2. Seismic restraints are to allow for expansion, contraction, and isolation of equipment.
3. Contractor to retain a B.C. Professional Structural Engineer to review all mechanical equipment for adequacy of seismic restraint of installed systems. Contractor to abide by all recommendations of Structural Engineer.
4. Provide signed & sealed Drawings & Schedules B & C-B by a Seismic Engineer registered with APEGBCfor all Mechanical Equipment & Ductwork.

PIPING

1. Install piping as indicated straight, plumb, parallel to building walls. Piping should be installed so as not to interfere with other trades.
2. Where the installation cannot be performed as shown or specified, resolve at the site, subject to the approval of the Owner.
3. Ensure that continuity of all fire separations is maintained at all piping penetrations of fire separations. Provide fire-stopping and smoke seals as necessary.

NATURAL GAS PIPING

1. Install gas lines to all gas-fired mechanical and plumbing equipment and as indicated on drawings. Provide all necessary pressure regulators, venting, fittings, valves, etc. as required by CAN/CGA-B149.1-10 Gas Code and local authority having jurisdiction, and as indicated on drawings.
2. All natural gas piping shall be identified/painted yellow as per code.

CONTROLS

1. Scope of the work shall include furnishing and complete installation of the equipment covered under this section, with all control devices, wiring, motorized dampers, etc. as specified and as needed to complete the mechanical systems.
2. Provide power supplies for controls and be responsible for all connections and interlocks of controls to motors, starters, etc.
3. Division 16 to provide:
   All power supply wiring, all disconnect switches, magnetic starters (except for those provided with packaged equipment), motor protection switches, etc.
4. Controls contractor to provide all necessary programming and equipment to allow city of New Westminster to access existing server information on building graphic. Ensure that New Westminster staff to be able to monitor and control sensor temperatures and schedules.

TESTING, COMMISSIONING & O&M Manuals

1. Contractor to prepare an Operating and Maintenance Manual in both a hard copy format (in a three ring binder) and a digital copy format (PDF format) including:
   - 1.1. Project information (including names, addresses and phone numbers of contractors, sub-contractors, engineer and major equipment suppliers).
   - 1.2. Maintenance Procedures
   - 1.3. Start-up Reports
   - 1.4. Copy of inspection and approval certificates for electrical and gas
   - 1.5. Schedules, Certificates, warranties and guarantees
   - 1.6. Reviewed Shop Drawings
   - 1.7. Copy of As-Built Drawings
   - 1.8. Schedules (B & C-B) from a Seismic Structural Engineer.

NO.	ISSUE	DATE
01	ISSUE FOR REVIEW	NOV. 01, 2017
02	ISSUE FOR TENDER	NOV. 02, 2017

ENGINEERING OPERATIONS BUILDING
GAS UNIT HEATERS UPGRADE

Jade West ENGINEERING CO. LTD.
Professional Mechanical Engineering Services
#201, 15585 - 24th Avenue
South Surrey, B.C. V4A 2J4
Phone: (604) 538-0764 Fax: (604) 538-0765
www.jadewest.com

TITLE:

SPECIFICATIONS

SCALE: N.T.S.
DATE: OCT 2017
DRAWN: JL
CHECKED: JM
JOB #: NEWW-99
DWG. NO.

M-02