

PART 1 General

1.1 RELATED SECTIONS

- .1 Section 21 05 01, Mechanical General Provisions.
- .2 Section 21 05 05, Basic Materials and Methods.

1.2 APPROVED 'SUBSTITUTES' AND 'ALTERNATES'

- .1 Where a Manufacturer's name, make, model, and/or size is specified, it is for the purpose of setting a standard of quality, performance, capacity, appearance and/or serviceability, and is acceptable without qualification. Manufacturers listed as acceptable 'Substitutes' have been deemed by the Consultant as capable of producing equipment and/or material of comparable quality, performance and approximate dimensions, and can be used in the preparation of the tender. Where no substitutes are indicated, provide the exact make specified or provide the necessary documents for review.
- .2 'Substitute' equipment and material is deemed to be interchangeable with that specified, with little or no revisions required to the design intent and/or other items, equipment or connections.
- .3 'Alternate' equipment and material is deemed to be an acceptable 'Substitute' which will require major revisions to the design intent and/or other items, equipment or connections.
- .4 Requests for approval of additional 'Substitutes' or 'Alternates' must be submitted not less than ten (10) days prior to closing date of the tender, and submissions must bear proof of acceptance by the Consultant if used in the tender. Requests shall include all performance, capacity, appearance, weight, connections, power and wiring requirements, etc required for the Consultant to make a complete evaluation.
- .5 Assume full responsibility for ensuring that, when providing accepted 'Substitutes' and 'Alternates', all space, weight, connections, power and wiring requirements, etc. are considered and adjusted costs are included in the tender. The Mechanical systems have been designed based on the equipment/materials of the specified manufacturer(s). The onus shall be on the Subcontractor (along with his sub-sub-contractor and the supplier) to ensure that 'Substitute' or 'Alternate' equipment/materials will meet the required performance and electrical characteristics, as well as fit properly into the allotted space, including allowance for required access and servicing. Any additional costs incurred as a result of modifications to the system(s) or the room layout, or modifications required by other trades, shall be borne by the Subcontractor (along with his sub-sub-contractor and the supplier) and shall be deemed to be included in the tender price.
- .6 Bidders must base their price on specified manufacturers or approved 'Substitutes'. 'Alternates', when allowed, must be listed separately, with the amount to be added or subtracted for each substitution. If in the preparation of the tender, this Subcontractor neglects to name the manufacturer of an accepted 'Alternate', it will be understood that specified or 'Substitute' equipment will be provided.

- .7 If, in the opinion of the Consultant, 'Substitute' equipment/material submitted for review as Shop Drawings is not satisfactory, satisfactory equipment/material of the specified or an accepted 'Substitute' manufacturer must be re-submitted.
- .8 If, in the opinion of the Consultant, 'Alternate' equipment/material submitted for review as Shop Drawings is not satisfactory, satisfactory equipment/material of the specified or an accepted 'Substitute' manufacturer must be re-submitted.

1.3 APPROVED 'SUBSTITUTES'

- .1 The following is the list of pre-approved 'Substitutes' for HVAC:
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|-----|------------------------------------|----------------|-------------------------------------|-------------------|------------|
| .1 | Access Doors: | Lehage;Milcor; | Acudor; | Mifab; | Bauco |
| .2 | Active Chilled Beams | | TWA; | Titus; | Dadanco |
| .3 | Actuators for Valves and Dampers: | | Belimo | | |
| .4 | Air Cooled DX
Condensing Units: | Keeprite; | Carrier; | Lennox; | |
| | | McQuay; | York; | Engineered Air; | Daikin |
| .5 | Air Filters: | Farr; | AAF; | Continental; | Fantech |
| .6 | Air Purgers & Air Vents: | | Hamlet and Garneau; | Bell and Gossett; | |
| | | | Dole; | Maid-O-Mist; | Armstrong; |
| | | | Braukman; | Taco; | |
| .7 | Back Flow Preventors: | Conbraco; | Beeco; | Febco; | Watts; |
| | | Kunkle; | Taylor; | Consolidated; | |
| | | Fisher; | Singer; | Crosby-Ashton; | |
| | | Boylston; | Lonergan; | Masoneilan; | |
| | | Wilkins; | Zurn; | | |
| .8 | Boilers (Condensing): | Camus; | Bradford White; | Laars; | |
| | | | Advanced Thermal Hydronics (ATH) | | |
| .9 | Chemical Treatment: | Bird Archer; | Calgon; | | |
| | | Dearborne; | Mogul; | Drew Chemical; | |
| .10 | Chimneys: | Metal-Fab; | Ampco; | Cleaver Brooks; | |
| | | Selkirk; | Chiminee; | | |
| .11 | Closed-cell Acoustic Duct Liner: | | K-flex Gray Elastomeric Duct Liner; | | |
| | | | AP Armaflex Elastomeric Insulation | | |
| .12 | Dampers (Backdraft): | Ventex; | Alumavent; | Greenheck | |

- .13 Dampers (Motorized): Alumavent; Tamco
- .14 Dampers (Fire & Smoke): NCA; Nailor; AMI;
- .15 Direct Digital Controls (Building): Johnson Controls
- .16 Electric Duct Coils; Nailor Hart; PM Wright; Price;
Thermolec;
- .17 Energy Recovery Ventilators (ERV): Tempeff
- .18 Expansion Fittings & Loops Flex-Hose
- .19 Expansion Tanks: Taco; Bell & Gossett; Hamlet & Garneau;
Amtrol; Calefactio; Armstrong;
Flexicon; Wessels;
- .20 Fan Coil Units
(Low Hot Water Temp & High Chilled Water Temp): Kampmann
- .21 Fans
(Centrifugal and Axial): Greenheck; Penn; New York Blower;
Twin City; Delhi; Barry Blower;
Fantech; Woods; Cook;
Northern Blower;
- .22 Fans
(Downdraft/Ceiling): Pleasantaire; Banvil; Canarm;
- .23 Fans
(Fume Exhaust Systems): Plymovent; Belnor; Monoxivent;
Nederman;
- .24 Fans
(Washroom and Cabinet): Greenheck; Penn; Reversomatic;
Fantech Broan; Delhi; Cook;
Abreezo; Twin City
- .25 Filter Gauges: Dwyer;
- .26 Fire Stop Flaps: NCA; Nailor; AMI;
- .27 Fume Detection Systems: ACME; CET;
- .28 Glycol Feed Systems: Axiom; Hamlet and Garneau;

.29	Grilles and Diffusers:	Carnes; Titus;	Kreuger; Nailor Hart;	E.H. Price; Hart and Cooley;
.30	Heat Pumps:	Daikin/McQuay;	Trane;	
.31	Humidifiers	Neptronic; Carel		
.32	Hydronic Coils:	Carrier; Trane;	Heatcraft; Daikin/McQuay;	Engineered Air; York;
.33	Hydronic System Accessories:	Bell and Gosset; Spirax/Sarco;	Taco;	Armstrong;
.34	In-floor heating PEX piping & Manifolds:		Watts; Rehau; Inc.	Viega; Uponor; HeatLink Group
.35	Insulation (General):	Manson;	Knauf;	
.36	Level and Flow Switches:	Magnetrol;		
.37	Louvres: Ruskin;	Airolite;	Carnes; Ventex;	Greenheck; Westvent; Penn;
.38	Pot Feeder	Axiom		
.39	Pressure Gauges:	Taylor; Ashcroft; Trerice;	Weiss; Duro; Ametek;	Marshalltown; Lunkenheimer; Marsh; Winters;
.40	Pressure Relief Valves, Pressure Regulating Valves:	Conbraco; Kunkle;Taylor; Fisher; Boylston;	Beeco; Consolidated; Singer; Lonergan;	Febco; Watts; Crosby-Ashton; Masoneilan;
.41	Pumps (Circulating):	Armstrong; Wilco;	Bell and Gossett; Grundfos;	Taco; Darling
.42	Radiant Ceiling Panels:	TWA; Dadanco		
.43	Silencers:	VAW;	Vibro-Acoustics;	Price
.44	Sound and Vibration			

	Isolation:	Vibron; Airmaster; Amber-Booth; Kinetics; Vibro-Acoustics; SVC Industries; California Dynamics;
.45	Special Duct Cleaning:	Power-Vac; Advance Robotic;
.46	Steam System Accessories:	Watson McDaniel; Armstrong;
.47	Strainers:	Armstrong; Crane; Mueller; Sarco; Streamflo; Kitz; Toyo
.48	Thermometers:	Taylor; Weiss; Marshalltown; Ashcroft; Duro; Lunkenheimer; Trece; Ametek; Marsh; Winters;
.49	Unit Heaters (Hydronic):	Engineered Air; Trane; McQuay/Daikin; Rosemex; Modine; Reznor; Beacon-Morris; Vulcan; Rittling
.50	Unit Heaters (Gas Fired):	Modine; Reznor; Sterling; Beacon- Morris;
.51	Vacuum Breakers: Spirax/Sarco;	Febco; Watts; Wilkins;
.52	Valves (General):	Crane; Kitz; Apollo; Newman-Hattersley; Nibco; Toyo; Jenkins; American Valve; Anvil; KVC;
.53	Valves (Ball):	Worcester; TrueLine;;
.54	Valves (Butterfly):	Kitz; Nibco; Jenkins; Newman- Hattersley; Apollo; Dezurik; Keystone; Crane; TrueLine; KVC; Challenger;
.55	Valves (Calibrated & Circuit Balancing):	Bell & Gossett
.56	Valves (Check):	Centerline; Hagen; Mueller; Moyer and Groves; Singer; Dezurik; Crane; Apco; KVC; Uni-chek
.57	Valves (PVC):	Chemline;
.58	Valves (Radiation):	Griswold; Sarco; Red and White; Danfoss; Dahl; ASCO;
.59	Valves (Solenoid):	ASCO;

- .60 Variable Air Volume terminals Titus, Nailor
- .61 Ventilation Specialties: Nailor Hart; Greenheck; Ruskin;
Carnes; Titus; EH Price
- .62 Vibration Isolation: California Dynamics

END OF SECTION