



health

Department:
Health
PROVINCE OF KWAZULU-NATAL

NEWTOWN A CHC: CONVERSION OF NEWTOWN CHC TO A LARGE CLINIC
SCHEDULE OF MECHANICAL EQUIPMENTY FOR THE HVAC EQUIPMENT

Rev 1 – TENDER
December 2023



NEWTOWN CHC – CONVERSION TO A LARGE CLINIC
SCHEDULE OF MECHANICAL EQUIPMENT FOR THE HVAC INSTALLATION

HVAC Systems

1.1 AIR CONDITIONING PACKAGED AND SPLIT SYSTEM

Ref	Description	Manufacturer / Ref ^[1]	Spec	Electrical	Controls	Notes
PU /01	Packaged Rooftop Unit - Units shall be on backup power		22.4kW TC, 24kW TH	380V/3/50Hz 8.18kW	Location : 29°4'06"S 30°55'59"E (Inanda CHC) Altitude : 94 m Outside Summer Ambient : 28°C db / 20°C wb Outside Winter Ambient : 2°C db	
PU /02	Packaged Rooftop Unit		33.5kW TC, 35kW TH	380V/3/50Hz 13.64kW	Humidity : 50 – 60% RH Inside Design Conditions (Air Cond) : 22°C db ±2°C (Summer) : 22°C db ±2°C (Winter)	
PU /03	Packaged Rooftop Unit		56kW TC, 57.5kW TH	380V/3/50Hz 18.15kW	<ul style="list-style-type: none"> • The packaged units shall be factory-assembled units with only final duct connections, power supply, sensor wiring and drain connection required on site. • The rooftop packaged unit must be reversible heat pump systems with the ability to cool or heat depending on the room requirements. • The Unit supply air fan shall be fitted with a VSD. A pressure differential sensor shall be fitted over the filters that is connected to the VSD. The VSD will keep the pressure constant by ramping the fan speed up or down depending on the ducting system pressure. The modulating dampers will vary the supply air volume and the Unit must adjust accordingly. The supply air fan will be EC-type plug fans fitted on a fan wall and must have the ability to be changed while the unit is operational. • The packaged unit shall be housed in sturdy weatherproof casings constructed from rustproofed galvanised steel panels powder coated for outdoor use. All parts of the structure shall be fastened with corrosion resistant crews and bolts. Unit to have outdoor coil guard. • The units shall each have a minimum of two highly efficient scroll compressors and be able to operate even when one of the compressors is out of order. • The compressor shall be of highly efficient hermetic scroll type and equipped with inverter control capable of changing the speed in accordance with the cooling or heating load requirement. The compressors shall be equipped with internal overload protection and crankcase heaters as standard. Compressors shall be on soft start. • High efficiency filtration systems – Primary, Secondary and HEPA filtration. • The unit shall have fresh air control with CO₂ Sensors. • Supply and Return air sensor control. • The noise level shall not be more than 70 dB (A) at normal operation measured horizontally 1 m away and 1.5 m above ground. The outdoor unit shall be equipped with a night quiet mode. • A Roof Top Unit controller shall be installed and shall have the following functionality: <ul style="list-style-type: none"> ○ Supply and return temperature & humidity monitoring. ○ Temperature adjustments (up or down) and shall be lockable. ○ Fault/error warnings. ○ Dirty filter warning. ○ Turning units “on/off”. 	

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Ref	Description	Manufacturer / Ref ^[1]	Spec	Electrical	Controls	Notes
AC/01	4 way split cassette unit		2.2 kW TC, 8 kW TH	220V/1/50Hz 0.95kW	Controlled by means of hard-wired controllers. Mounted adjacent the light switch position in the respective rooms. The Wall mounted controllers shall have the following features: <ul style="list-style-type: none"> • Temperature control setpoint • Temperature display and up and down adjustments • Fault or error warning • Turning on and off unit 	Unit must have a condensate drain lift pump. Fresh air supplied direct to the unit. c/w electronic control valves to control flow or refrigerant. The fans shall be of the multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation. The address of the indoor unit shall be set automatically in case of individual and group control.
AC/02	4 way split cassette unit		3.6 kW TC, 8 kW TH	220V/1/50Hz 1.2kW		
AC/03	4 way split cassette unit		4.6 kW TC, 8 kW TH	220V/1/50Hz 1.6kW		
AC/04	Wall mounted split unit		5.0 kW TC, 8 kW TH	220V/1/50Hz 1.8kW		
AC/05	4 way split cassette unit		5.6 kW TC, 2.5 kW TH	220V/1/50Hz 2.1kW		
AC/06	4 way split cassette unit		6.3 kW TC, 6.8 kW TH	220V/1/50Hz 0.86kW		
AC/07 - Units shall be on backup power	Under ceiling split AC unit - (Cooling Only) - Unit shall be on backup power		7.2 kW TC, 8kW TH	220V/1/50Hz 2.86kW	Controlled by means of hard-wired controllers. Mounted adjacent the light switch position in the respective rooms. The Wall mounted controllers shall have the following features: <ul style="list-style-type: none"> • Temperature control setpoint • Temperature display and up and down adjustments • Fault or error warning • Turning on and off unit 	Unit must have a condensate drain lift pump. Fresh air supplied direct to the unit c/w electronic control valves to control flow or refrigerant The fans shall be of the multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation. The address of the indoor unit shall be set automatically in case of individual and group control.
WU/01(AC/06 on drawing schedule)	Wall mounted split AC unit (Cooling Only) - Units shall be on backup power		3.6 kW Cooling Only Unit	220V/1/50Hz 0.86kW	Controlled by means of hard-wired controllers. Mounted adjacent the light switch position in the respective rooms.	Unit must have a condensate drain lift pump. Fresh air supplied direct to the unit. c/w electronic control valves to control flow or refrigerant. The fans shall be of the multi blade type and statically and dynamically balanced to ensure low noise and vibration free operation. The address of the indoor unit shall be set automatically in case of individual and group control.
CC/01	Control unit and panel for AC system				Wired remote type. Shall be used to maintain correct room temperatures. Units shall be equipped with a self-diagnostic and logging system for easy and quick maintenance and service.	Controller will be all mounted and hard wired back to unit. Controller will have an interactive touch screen.

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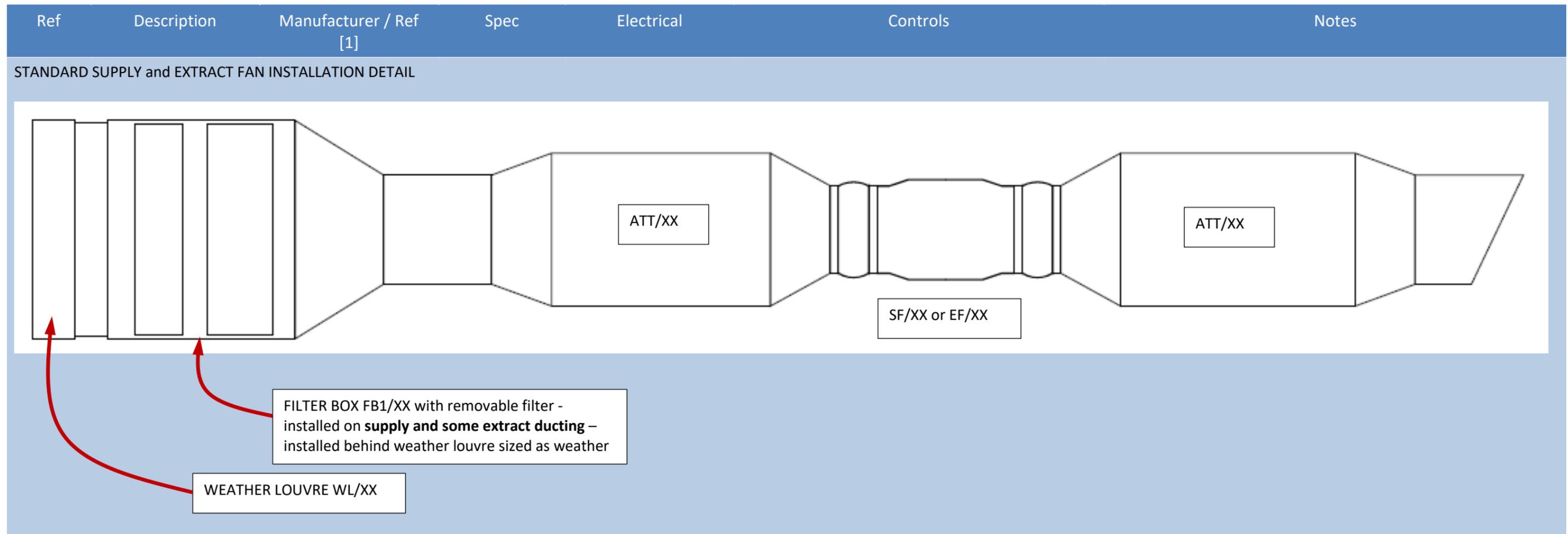
1.2 FANS

Ref	Description	Manufacturer / Ref [1]	Spec	Electrical	Controls	Notes
EF/01	150mm Dia In Line Extract Fan – Ground Floor		67 l/s @100 Pa	220V/1Ph/50Hz 180W	EC Motor for full variable speed control c/w proprietary controller to control and set speed. Linked to PIR system for on-off control based on occupancy c/w PIR sensors Linked to fire alarm system to switch off in case of fire.	Within the roof monitors, high volume / low pressure / Adjustable pitch axial flow roof fans, including 1.5D sound attenuator, inlet cone with bird mesh plenum box to connect the fan and louver accordingly (with hinged access door for access to louver actuator).
EF/02	250mm Dia In Line Extract Fan – Ground Floor		0.300m ³ /s @120 Pa	220V/1Ph/50Hz 430W	EC Motor for full variable speed control c/w proprietary controller to control and set speed. Linked to PIR system for on-off control based on occupancy c/w PIR sensors Linked to fire alarm system to switch off in case of fire.	EC-motors, high level of efficiency Low SFP values 100% speed controllable Integrated motor protection Acoustic foam for low noise level Potentiometer included for ease of commissioning
EF/03	250mm Dia In Line Extract Fan – First Floor		260 l/s @150Pa	220V/1Ph/50Hz 490W	EC Motor for full variable speed control c/w proprietary controller to control and set speed. Linked to PIR system for on-off control based on occupancy c/w PIR sensors Linked to fire alarm system to switch off in case of fire.	EC-motors, high level of efficiency Low SFP values 100% speed controllable Integrated motor protection Acoustic foam for low noise level Potentiometer included for ease of commissioning
EF/04	455mm Dia In Line Extract Fan – First Floor		1100 l/s @250 Pa	220V/1Ph/50Hz 980W	EC Motor for full variable speed control c/w proprietary controller to control and set speed. Linked to PIR system for on-off control based on occupancy c/w PIR sensors Linked to fire alarm system to switch off in case of fire.	EC-motors, high level of efficiency Low SFP values 100% speed controllable Integrated motor protection Acoustic foam for low noise level Potentiometer included for ease of commissioning

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Ref	Description	Manufacturer / Ref [1]	Spec	Electrical	Controls	Notes
EF/05	550mm Dia In Line Extract Fan – First Floor		1400 l/s @350 Pa	220V/1Ph/50Hz 1.380 kW	EC Motor for full variable speed control c/w proprietary controller to control and set speed. Linked to PIR system for on-off control based on occupancy c/w PIR sensors Linked to fire alarm system to switch off in case of fire.	EC-motors, high level of efficiency Low SFP values 100% speed controllable Integrated motor protection Acoustic foam for low noise level Potentiometer included for ease of commissioning
WEF/01	150mm Dia Wall Mounted Extract Fan – Ground and First Floor		67 l/s @ 50 Pa	220V/1Ph/50Hz 35W, 0.3Amps	2 speed extract fan.	
SF/01	150mm Dia In Line Supply Air Fan – Ground Floor office		50 l/s @100 Pa	220V/1Ph/50Hz 180W	Fresh air fan will be controlled using controller supplied by the manufacturer. Fans will be set to required flow using controller.	
SF/02	200mm Dia In Line Supply Air Fan – First Floor		180/s @150 Pa	220V/1Ph/50Hz 382W	Fresh air fans will be controlled using controller supplied by the manufacturer. Fans will be set to required flow using controller. Fans will be linked to the central AC system controller and will be turned on in the case of the AC system being turned on.	
SF/03	300mm Dia In Line Supply Air Fan – First Floor		360 l/s @200kPa	220V/1Ph/50Hz 550W	Fresh air fans will be controlled using controller supplied by the manufacturer. Fans will be set to required flow using controller. Fans will be linked to the central AC system controller and will be turned on in the case of the AC system being turned on.	
SF/04	1200mm Dia In Line Supply Air Fan – First Floor		1200 l/s @350kPa	400V/3Ph/50Hz 1.05 kW	Fresh air fans will be controlled using controller supplied by the manufacturer. Fans will be set to required flow using controller. Fans will be linked to the central AC system controller and will be turned on in the case of the AC system being turned on.	

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1.3 ANCILLARIES

Ref	Description	Manufacturer / Ref [1]	Spec	Requirements and Notes
ATT/XX	Sound Attenuator		Ductwork Width + 100mm Ductwork Height + 100mm or Ductwork Dia + 100mm Length as required per fan – 1.5 times fan ductwork in 300mm jumps	To minimise noise transmission through ductwork from fans. Located in line in ductwork. Circular ductwork – Podded attenuator. Rectangular ductwork – straight splitter type.
VCD/XX	Volume Control Damper		Size shall be to suite associated duct size	Butterfly type for round ducts, Opposed blade for rectangular ducts.
FD/XX	Fire Damper		Size shall be to suite associated duct size	Shutter type fire damper Curtain to be out of air stream curtain. Rectangular damper to be installed on circular ductwork.

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Ref	Description	Manufacturer / Ref [1]	Spec	Requirements and Notes
FB/XX	Filter Banks			<p>Dual filter banks. The filter banks shall comprise of one bag filter and one pleated filter that can be removed and washed.</p> <p>The filters will be installed in housings such that should the filters be removed, the gap in the ductwork can be closed so the system can keep running.</p> <p>Filter banks will be installed inside the intake louvre and will be the same size as the intake louvre to minimise pressure loss through the filter bank.</p>
AF/01	Primary Air Filter, Pleated Panel – EN779 Classification G4			
AF/02	Secondary Air Filter, Pleated Panel/Bag – EN779 Classification F6			
AF/03	Secondary Air Filter, Pleated Panel/Bag – EN779 Classification F9			
HEPA	H13 & H14– Filter Class EN1822			

1.4 GRILLES AND DIFFUSERS

Ref	Description	Manufacturer / Ref [1]	Spec	Notes
DG/01	Door Grille		500x300mm	Non-vision door grilles Aluminium Installed in door
DG/02	Door Grille		300x300mm	Where door grille installed in a fire door – grille will be painted using intumescent paint to provide fire protection Powered coated to Architects required colour.
SD/01	Supply Air Diffuser		600x600 panel Neck: 250mm dia - Neck: 300mm dia	Aluminium Square plate diffuser with circular supply outlet Diffusers to be suitable for mounting in accessible ceiling grids and areas without ceilings. Adjustable disc valve for air balance. Powered coated to Architects' required colour. 1m flexible duct for final connection – not more than 1m
ED/01	Extract Air Grille		600x600 panel	Aluminium c/w 600x600 plenum with side entry connected to diffuser c/w transition piece from plenum to back of unit ducting Powered coated to Architects required colour
EAV/01	Extract Disc Valves		200Ø 150Ø connection	The combination of fixing collar with bayonet catch and sealing tape provides an optimal seal.

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Ref	Description	Manufacturer / Ref ^[1]	Spec	Notes
EAV/02	Extract Disc Valves		250∅ 200∅ connection	Adjustable disc valve for air balance. To be white
WL/01	Weather Louvre 250 x 250 mm		250 x 250 mm	Aluminium Powder coated or anodised finish as required by Architect. Externally mounted to wall as required with flanged mounting. To be supplied with insect mesh.
WL/02	Weather Louvre 350 x 350 mm		350 x 350 mm	Aluminium Powder coated or anodised finish as required by Architect. Externally mounted to wall as required with flanged mounting. To be supplied with insect mesh.
WL/03	Weather Louvre 400 x 400 mm		400 x 400 mm	Aluminium Powder coated or anodised finish as required by Architect. Externally mounted to wall as required with flanged mounting. To be supplied with insect mesh.
WL/04	Weather Louvre 700 x 600 mm		700 x 600 mm	Aluminium Powder coated or anodised finish as required by Architect. Externally mounted to wall as required with flanged mounting. To be supplied with insect mesh.

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Ductwork, Pipework and Insulation

Ref	Description	Manufacturer / Ref [1]	Spec	Notes
DUCT/01	Galvanised Steel ductwork for normal operation		Rectangular and Circular ductwork	Low pressure galvanised steel ductwork
DUCT/02	Flexible Ductwork			Flexible duct insulation shall be 25 mm nominal thickness fibreglass of 24 kg/m ³ density. The insulation shall encase the flexible duct and shall be sheathed with a moisture barrier having a permeability of not over 0.02 perm. Flexible circular ductwork will be used for the final 1m only (to the valve/grille) of the installation and this distance should be reduced where possible.
DINS/01	Ductwork Insulation		24 kg/m ³ density mineral wool insulation Thickness as per spec and layouts	The insulation shall be glued to the ducting and sealed along all longitudinal and transverse overlapping joints with approved adhesive to provide a vapour seal. The overlapping joints shall be approximately 75 mm wide. The edges of overlaps are to be taped down with self-adhesive aluminium tape no less than 50 mm wide. The insulation shall be strapped with nylon straps at intervals of more than one metre apart. Where necessary, especially at bends, transformation pieces, branches, etc. insulation is to be glued, taped and strapped to ensure that the joints are vapour sealed. All insulation installed externally and in Plant Rooms shall be protected with 0.4 mm thick galvanised steel sheet metal cladding, which shall be applied directly over the insulation. The cladding shall be secured by means of removable and re-usable stainless steel bands every 330 mm. Self-tapping screws will not be accepted. No dents or damage to the sheet metal cladding will be accepted.
ACINS/01	Refrigerant Pipework Insulation		Nitrile Rubber insulation	Various Sizes Thickness 25mm Preformed Pipe Section to suit pipework diameter. DO NOT COMPRESS THE INSULATION WHEN FIXING TO PIPEWORK DO NOT USE CABLE TIES TO FIX INSULATION Use good quality tools—in particular, fresh adhesive, good adhesive brushes, and sharp knives. Apply insulation only when the pipes are clean, dry, and unheated or uncooled. The surface to be insulated must be free of rust. Never stretch insulation when sealing the joints. It is better to compress it slightly. Use pieces of insulation that are at least as long as the section of pipe to be insulated. Always use the insulation that is properly sized for the pipe it is to cover. Do not stretch it over the pipe. Do not crowd insulation-covered pipes. Space pipes far enough apart to allow for the free circulation of air. Air movement is an extra safeguard against surface condensation of cold pipes, especially under hot, humid conditions. All piping insulation must be properly sealed to minimize heat loss and control condensation. On cold lines, open pipe insulation joints may allow the formation of condensation, increasing the potential for or contributing to possible pipe or tubing corrosion. Seal insulation joints as shown in this guide. When using refrigeration piping insulation outdoors, always paint with a recommended finish. Follow the manufacturer's instructions regarding the type of finish, the number of coats required, etc. Allow proper drying times between coats. In double layer work, apply insulation with the side and end joints staggered. Do not compress piping insulation at joists, studs, columns, ducts, hangers, etc. This is important because the insulation will lose thermal efficiency when it is compressed. In cold systems, surface condensation may occur where insulation is compressed.

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DOCUMENT CONTROL

FORM IP180_B



Questions from Tenderers

I have the following queries, under the Mechanical BOQ for package unit:

- Is it a self-contained unit? Or hybrid system? Or Is it plug and play type?
- What are the coil conditions for the packaged unit? Is it 100% fresh air type?
- Whats the altitude?
- Does it require an inlet louvre? size?
- Primary/Secondary filters/Hepa filters? Spec
- Is a Magnehelic gauge required?
- Does it require a VSD?
- Is Static pressure required?
- Controls and electrical panel requirements?

CLIENT : KZN Department of Health
PROJECT NAME : Newtown A Large Clinic **PROJECT No.** : J42013
TITLE OF DOCUMENT : Schedule of HVAC Equipment
ELECTRONIC LOCATION : P:\4320 POWER AND ENERGY\JXXXXX - Newtown CHC\08_Design\04 Schedules\Newtown CHC - Schedule of HVAC Equipment.docx

	Approved By	Reviewed By	Prepared By
Revision 1			Allen Stulumani
DATE 2023/12/06			

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