



Commissioning Checklist

07 Aug 2019 / Project Westfield / Manila

Complete

Score	124 / 160 (77.5%)	Flagged items	36	Actions	2
Site conducted	Manila				
Project Name	Project Westfield				
Location	2370 Westfield Ave., Schaumburg CT 06107				
Prepared by	Jonalyn Collier				
Conducted on	7 Aug 2019 13:47 PST				

Flagged items & Actions	36 flagged, 2 actions
Flagged items	36 flagged, 2 actions
Commissioning Checklist / HVAC System / Installation / Cabinet and General Installation	
Vibration isolation equipment installed & released from shipping locks	Fail
not released yet	
Commissioning Checklist / HVAC System / Installation / Cabinet and General Installation	
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)	Fail
	
Photo 4	
To do Assignee: Juhlian Pimping Priority: High Due: 7 Aug 2019 16:00 PST Created by: SafetyCulture Staff	
Replace pressure gauge Wrong pressure gauge! Replace this ASAP	
Commissioning Checklist / HVAC System / Installation / Fans and Dampers	
Supply fan area clean	Fail
Commissioning Checklist / HVAC System / Installation / Fans and Dampers	
Supply fan and motor properly lubricated	Fail
Commissioning Checklist / HVAC System / Installation / Fans and Dampers	
Return/exhaust fan area clean	Fail
Commissioning Checklist / HVAC System / Installation / Fans and Dampers	
Return/exhaust fan and motor lube lines installed and lubed	Fail
Commissioning Checklist / HVAC System / Installation / Fans and Dampers	
Filters installed and replacement type and efficiency permanently affixed to housing--construction filters removed	Fail
Commissioning Checklist / HVAC System / Installation / Compressor and Condenser	
Correct oil level (check site glass during operation)	Fail
Commissioning Checklist / HVAC System / Installation / Compressor and Condenser	
Compressors and piping were leak tested, as required	Fail
Commissioning Checklist / HVAC System / Installation / Compressor and Condenser	
Pressure leakage tests completed	Fail

Installation of system and balancing devices will allow balancing to be done per specified NEBB or AABC procedures & contract docs

Fail

Commissioning Checklist / HVAC System / Operation

No unusual noise or vibration in supply and exhaust fans

Fail

Commissioning Checklist / HVAC System / Operation

Measure line to line voltage imbalance for 1/3 of the compressors: Compressor 1 Phase: (%Imbalance = $100 \times (\text{avg.} - \text{lowest}) / \text{avg.}$) Record all three-phase voltages. Imbalance less than 2%?

No



Photo 9

To do | Assignee: Howie Mann | Priority: High | Due: 7 Aug 2019 16:00 PST | Created by: SafetyCulture Staff

Verify electrical commissioning

Too much voltage imbalance at 11%

Commissioning Checklist / HVAC System / Operation

Valves verified to not be leaking through coils when closed at normal operating pressure (follow procedure in Calibration and Leak-by Test Procedures).

Fail

Commissioning Checklist / Pumping System / Installation / General Installation

Pump and motor lubricated

Fail

Commissioning Checklist / Pumping System / Installation / General Installation

Piping (immediately around pump, see full piping checklist)

Fail

Commissioning Checklist / Pumping System / Installation / General Installation

No leaks in pipe fittings and accessories at pump?

Fail

Commissioning Checklist / Pumping System / Installation / General Installation

Strainers in place and cleaned out

Fail

Commissioning Checklist / Pumping System / Installation / Electrical and Controls

Electrical connections tight

Fail

Commissioning Checklist / Pumping System / Installation / Electrical and Controls

Motor overloads calibrated

Fail

Commissioning Checklist / Pumping System / Installation / VFD

Pressure or other controlling sensor properly located and per drawings and calibrated

Fail

Commissioning Checklist / Pumping System / Installation / VFD	
Internal settings designating the application are correct	Fail
Commissioning Checklist / Pumping System / Installation / VFD	
Input of motor FLA represents 105% to 115% of motor FLA rating	Fail
Commissioning Checklist / Pumping System / Installation / VFD	
Appropriate Volts vs Hz curve is being used; energy saver on?	Fail
Commissioning Checklist / Pumping System / Installation / VFD	
Unit is programmed with written programming record available	Fail
Commissioning Checklist / Pumping System / Installation / VFD	
VFD kW demand at panel matches BAS readout	Fail
Commissioning Checklist / Pumping System / Installation / Testing, Adjusting and Balancing (TAB)	
Installation of system and balancing devices will allow balancing to be done per specified NEBB or AABC procedures & contract docs	Fail
Commissioning Checklist / Pumping System / Installation / Testing, Adjusting and Balancing (TAB)	
Internal settings designating the application are correct	Fail
Commissioning Checklist / Pumping System / Operation	
No unusual noise or vibration	Fail
Commissioning Checklist / Pumping System / Operation	
No leaking apparent around fittings	Fail
Commissioning Checklist / Pumping System / Operation	
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.) Record imbalance of each pump. Imbalance less than 2%?	No
Commissioning Checklist / Pumping System / Operation	
Record full load running amps for each pump. FL amps x factor (Max amps). Running less than max?	No
Commissioning Checklist / Piping System / Installation / Piping	
Strainers in place and clean	Fail
Commissioning Checklist / Piping System / Installation / Piping	
Piping system properly flushed and cleaned and temporary piping removed (report attached)	Fail
Commissioning Checklist / Piping System / Installation / Piping	
No leaking apparent around fittings	Fail

No leaks

Fail

Other actions

0 actions

Commissioning Checklist	36 flagged, 2 actions, 124 / 160 (77.5%)
HVAC System	14 flagged, 2 actions, 65 / 79 (82.28%)
Installation	11 flagged, 1 action, 50 / 61 (81.97%)
Cabinet and General Installation	2 flagged, 1 action, 8 / 10 (80%)
Permanent labels affixed, including for fans	Pass
  Photo 1 Photo 2	
Casing condition good: no dents, leaks, door gaskets installed	Pass
 Photo 3	
Access doors close tightly - no leaks	Pass
Boot between duct and unit tight and in good condition	Pass
Vibration isolation equipment installed & released from shipping locks not released yet	Fail
Maintenance access acceptable for unit and components	Pass
Sound attenuation installed	Pass
Thermal insulation properly installed and according to specification	Pass
Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.)  Photo 4	Fail
To do Assignee: Juhlian Pimping Priority: High Due: 7 Aug 2019 16:00 PST Created by: SafetyCulture Staff	
Replace pressure gauge Wrong pressure gauge! Replace this ASAP	

Clean up of equipment completed per contract documents	Pass
Filters installed and replacement type and efficiency permanently affixed to housing	N/A
Piping and Coils	7 / 7 (100%)
No leaking apparent around refrigerant fittings	Pass
 	
Photo 5 Photo 6	
All coils are clean and fins are in good condition	Pass
	
Photo 7	
All condensate drain pans clean and slope to drain per spec	Pass
OSAT, MAT, SAT, RAT sensors properly located and secure (related OSAT sensor shielded)	Pass
Sensors calibrated (See calibration section below)	Pass
If split system, refrigerant piping in good condition and suction insulated	Pass
P/T plugs and isolation valves installed per drawings	Pass
Fans and Dampers	5 flagged, 9 / 14 (64.29%)
Supply fan and motor alignment appear correct	Pass
Supply fan belt tension & condition good	Pass
Supply fan protective shrouds for belts in place and secure	Pass
Supply fan area clean	Fail
Supply fan and motor properly lubricated	Fail
Return/exhaust fan and motor aligned	Pass
Return/exhaust fan belt tension & condition good	Pass
Return/exhaust fan protective shrouds for belts in place and secure	Pass

Return/exhaust fan area clean	Fail
Return/exhaust fan and motor lube lines installed and lubed	Fail
Filters installed and replacement type and efficiency permanently affixed to housing--construction filters removed	Fail
Filter pressure differential measuring device installed and functional (magnahelic, inclined manometer, etc.)	Pass
All dampers close tightly	Pass
All damper linkages have minimum play	Pass
Motors: premium efficiency verified, if specified?	N/A
Compressor and Condenser	3 flagged, 13 / 16 (81.25%)
Refrigerant sight glass clear of bubbles (if OSAT > 70F)	Pass
Moisture indicator shows no moisture	Pass
Correct oil level (check site glass during operation)	Fail
Compressors and piping were leak tested, as required	Fail
Crankcase heater on when unit is off	Pass
Condenser coils clean and in good condition (air cooled)	Pass
Adequate clearance for airflow around condenser	Pass
Ducts (preliminary check)	Pass
Sound attenuators installed	Pass
Duct joint sealant properly installed	Pass
No apparent severe duct restrictions	Pass
Turning vanes in square elbows as per drawings	Pass
OSA intakes located away from pollutant sources & exhaust outlets	Pass
Pressure leakage tests completed	Fail
Branch duct control dampers operable	Pass

Balancing dampers installed as per drawings and TAB's site visit	Pass
Electrical and Controls	11 / 11 (100%)
Power disconnects in place and labeled	Pass
All electric connections tight	Pass
Proper grounding installed for components and unit	Pass
Safeties in place and operable	Pass
Current overload heaters installed and correct size	Pass
Auxiliary heaters installed	Pass
Sensors calibrated (see section below)	Pass
All building control system interlocks hooked up with packaged controls and functional	Pass
Enthalpy control and sensor properly installed (if applicable)	N/A
Related thermostats are installed	Pass
 Photo 8	
Related building automation system points are installed	Pass
All control devices and wiring complete	Pass
Testing, Adjusting and Balancing (TAB)	1 flagged, 2 / 3 (66.67%)
Installation of system and balancing devices will allow balancing to be done per specified NEBB or AABC procedures & contract docs	Fail
Safeties installed and safe operating ranges are established	Pass
If unit is started and will be running during construction: have quality filters on RA grills, etc. to minimize dirt in the ductwork and coils and in any finished areas. Verify moisture migration is not a problem due to improper pressures between spaces.	Pass
Operation	3 flagged, 1 action, 15 / 18 (83.33%)

Supply fan rotation correct	Pass
Return / exhaust fan rotation correct	Pass
No unusual noise or vibration in supply and exhaust fans	Fail
Condenser fan rotation correct (air cooled)	Pass
Condenser fan acceptable noise and vibration (air cooled)	Pass
Measure line to line voltage imbalance for 1/3 of the compressors: Compressor 1 Phase: ($\% \text{Imbalance} = 100 \times (\text{avg.} - \text{lowest}) / \text{avg.}$) Record all three-phase voltages. Imbalance less than 2%?	No



Photo 9

To do | Assignee: Howie Mann | Priority: High | Due: 7 Aug 2019 16:00 PST | Created by: SafetyCulture Staff

Verify electrical commissioning

Too much voltage imbalance at 11%

Compressor 2 Phase: ($\% \text{Imbalance} = 100 \times (\text{avg.} - \text{lowest}) / \text{avg.}$) Record all three-phase voltages. Imbalance less than 2%?	Yes
Record full load running amps for each compressor. Running less than max?	Yes
Record full load running amps for each condenser fan. Running less than max?	Yes
Fans > 5 hp Phase Checks: ($\% \text{ imbalance} = 100 \times (\text{avg.} - \text{lowest}) / \text{avg.}$) Imbalance less than 2%?	Yes
Inlet vanes aligned in housing, actuator spanned, modulate smoothly and proportional to input signal and EMS readout.	Pass
All dampers (OSA, RA, EA, etc.) stroke fully without binding and spans calibrated and BAS reading site verified (follow procedure in Calibration and Leak-by Test Procedures).	Pass
Valves stroke fully and easily and spanning is calibrated (follow procedure in Calibration and Leak-by Test Procedures).	Pass
Valves verified to not be leaking through coils when closed at normal operating pressure (follow procedure in	Fail

Calibration and Leak-by Test Procedures).	
The HOA switch properly activates and deactivates the unit	Pass
Safeties installed and safe operating ranges for this equipment provided to the commissioning agent	Pass
Specified sequences of operation and operating schedules have been implemented with all variations documented	Pass
Specified point-to-point checks have been completed and documentation record submitted for this system	Pass
Pumping System	18 flagged, 27 / 45 (60%)
Installation	14 flagged, 23 / 37 (62.16%)
General Installation	4 flagged, 10 / 14 (71.43%)
Label permanently affixed	Pass
Pumps installed in place and properly grouted, bases filled	Pass
Vibration isolation devices installed and functional	Pass
Factory alignment checked and appears correct	Pass
Field alignment, if required, completed	N/A
Seismic anchoring installed	Pass
Temperature and pressure gauges and sensors installed	Pass
Pump and motor lubricated	Fail
Piping (immediately around pump, see full piping checklist)	Fail
Pipe fittings completed and piping properly supported	Pass
No leaks in pipe fittings and accessories at pump?	Fail
Piping and pump properly insulated	Pass
Strainers in place and cleaned out	Fail
Piping system properly flushed	Pass
Valves properly tagged	Pass

Electrical and Controls	2 flagged, 4 / 6 (66.67%)
Disconnect switches in place and labeled	Pass
Electrical connections tight	Fail
Proper grounding installed for components and unit	Pass
Motor overloads calibrated	Fail
Control system interlocks hooked up and functional	Pass
Control devices, tubing and wiring complete	Pass
VFD	6 flagged, 8 / 14 (57.14%)
VFD powered up and wired to controlled equipment	Pass
VFD interlocked to control system	Pass
Pressure or other controlling sensor properly located and per drawings and calibrated	Fail
Controller location not subject to excessive temperatures	Pass
Controller location not subject to excessive moisture or dirt	Pass
Controller size matches motor size	Pass
Internal settings designating the application are correct	Fail
Input of motor FLA represents 105% to 115% of motor FLA rating	Fail
Appropriate Volts vs Hz curve is being used; energy saver on?	Fail
Accel and decel times are around 10-50 seconds, except for	Pass
special applications. Actual decel = Actual accel =	Pass
Upper frequency limit set at 100%, unless explained otherwise	Pass
Unit is programmed with written programming record available	Fail
VFD kW demand at panel matches BAS readout	Fail

Testing, Adjusting and Balancing (TAB)	2 flagged, 1 / 3 (33.33%)
Installation of system and balancing devices will allow balancing to be done per specified NEBB or AABC procedures & contract docs	Fail
Startup report completed with this checklist attached	N/A
Safety controls tested, calibrated and safe operating ranges for this equipment provided to the commissioning agent	Pass
Internal settings designating the application are correct	Fail
Operation	4 flagged, 4 / 8 (50%)
The HOA switch properly activates and deactivates the unit under manual and automatic control.	Pass
Pump rotation verified correct	Pass
No unusual noise or vibration	Fail
No leaking apparent around fittings	Fail
Measure line to line voltage phase imbalance for each pump: (%Imbalance = 100 x (avg. - lowest) / avg.) Record imbalance of each pump. Imbalance less than 2%?	No
Record full load running amps for each pump. FL amps x factor (Max amps). Running less than max?	No
Specified sequences of operation and operating schedules have been implemented with variations documented	Pass
Specified point-to-point checks have been completed and documentation record submitted for this system	Pass
Piping System	4 flagged, 25 / 29 (86.21%)
Installation	4 flagged, 25 / 29 (86.21%)
Piping	3 flagged, 16 / 19 (84.21%)
Pipe fittings complete and pipes properly supported allowing for thermal expansion and contraction and building expansion joints.	Pass
Pipe joints properly installed	Pass
Required seismic anchoring installed	Pass

Pipes properly labeled	Pass
Pipes properly insulated	Pass
Piping properly sloped	Pass
Proper construction isolation	Pass
Strainers in place and clean	Fail
Isolation valves and balancing valves installed	Pass
Test ports (P/T) installed near all control sensors and as per spec	Pass
Piping system properly flushed and cleaned and temporary piping removed (report attached)	Fail
10% of strainers and Owner-selected low-point drains opened and witnessed by Owner to be clean. (List points checked below).	N/A
Piping hydrostatic pressure test completed according to contract documents (report attached)	N/A
No leaking apparent around fittings	Fail
ASME pressure vessel data sheet or certification tag posted and inspection complete for each expansion tank and storage tank	Pass
Expansion tanks verified to not be air bound and system completely full of water. System purged of air.	Pass
Air vents and bleeds at high points of systems functional	Pass
Water hammer arrestors installed and tested	Pass
Backflow preventer proper location	Pass
Adequate depth of bury for service piping	Pass
Cross connection protection	Pass
Valves	1 flagged, 7 / 8 (87.5%)
Valve tags permanently affixed	Pass
Valves installed in proper direction	Pass

Pressure reducing valves set at proper pressure	Pass
No leaks	Fail
Flexible connections at equipment installed	Pass
Dielectric fittings for dissimilar metals installed	Pass
Vibration Isolation installed	Pass
Fire-rated pipe penetrations installed properly	Pass
Valves that require a positive shut-off are verified to not be leaking when closed at normal operating pressure.	N/A
Sensors and Gages	1 / 1 (100%)
Temperature, pressure and flow gages and sensors installed.	Pass
Testing, Adjusting and Balancing (TAB)	1 / 1 (100%)
Installation of system and balancing devices allowed balancing to be completed following specified NEBB or AABC procedures and contract documents	Pass
Lighting System and Controls	7 / 7 (100%)
Installation	7 / 7 (100%)
Lighting Fixtures and Switches	5 / 5 (100%)
Light switches are located per plans	Pass
Light switches are labeled with proper ID to match drawings or field changes	Pass
Light switch is controlling the fixtures in the area indicated on design drawings	Pass
Fixtures are properly supported for seismic zone	Pass
Verify proper lamp type is installed in each fixture to match fixture schedule and specifications	Pass
Lighting Controls	2 / 2 (100%)
Lighting control is installed per manufacturer recommendations (attached recommendations to this checklist)	Pass

Lighting control is calibrated per manufacturer checklist

Pass

Completion

Additional Comments

See assigned corrective actions (address lubrication and calibration issues)

Inspector Name & Signature



Jonalyn Collier
7 Aug 2019 15:27 PST

Installer Name & Signature



Rafael Fretzch, Stronghold Systems, Inc.
7 Aug 2019 15:26 PST

Contractor Name & Signature



Benjamin Minas, Minas Construction Co.
7 Aug 2019 15:28 PST

Media summary



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9