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Key Benefits

T **Save Time**

Automate RFQs and reduce manual work by up to 50%

$ **Cut Costs**

Negotiate directly with suppliers for better deals

→ **Streamlined Sourcing**

Take BuildVision's structured data and send it to suppliers at BuildVision.io

Customer Information

Customer Name	Gilbane Building Company
Contact Person	Gregory Garvin
Contact Email	ggarvin@gilbaneco.com
Contact Phone	N/A

Project Information

Project Name	RI DCYF: New Female Youth Residential Facility
Location	160 Main Street, Exeter, RI 02822
Start Date	6/17/2024
Completion Date	N/A
Budget	N/A
Scope	HVAC Systems Installation
Project ID	fffe0884-e5d2-4f6d-9c91-7a96d6cbf65f
Project URL	BuildVision Project Link

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Project Equipment

Air-to-Air Energy Recovery Equipment

Equipment Tag	Manufacturer	Model
ERV-101	Aldes	E1800L-FI-N
ERV-102	Aldes	E1800L-FI-N
ERV-103	Aldes	E1800L-FI-N
ERV-104	Aldes	E1800L-FI-N
ERV-105	Aldes	E1800L-FI-N
ERV-201	Aldes	E1800L-FI-N
ERV-301	Aldes	E1800L-FI-N
ERV-302	Aldes	E1800L-FI-N
ERV-401	Aldes	E1800L-FI-N
ERV-501	Aldes	E1000L-FI-N
ERV-601	Aldes	E1800L-FI-N

Notes

High latent transfer static core energy recovery units. AHRI certified. Insulated wall construction. Supply and exhaust blower motors. MERV 13 intake filters, MERV 8 exhaust filters. Units ERV-101 through ERV-105 run continuously 24/7. Other units have occupied and unoccupied modes per owner's hours of operation.

Variable Refrigerant Flow Systems

Equipment Tag	Manufacturer	Model
AH-101	Mitsubishi Electric	PVFY-P018AM4-E1A
AH-102	Mitsubishi Electric	PVFY-P012AM4-E1A
AH-103	Mitsubishi Electric	PVFY-P012AM4-E1A
AH-104	Mitsubishi Electric	PEFY-P008MA-E4A
AH-105	Mitsubishi Electric	PEFY-P012MA-E4A
AH-106	Mitsubishi Electric	PEFY-P008MA-E4A
AH-107	Mitsubishi Electric	PVFY-P012AM4-E1A
AH-108	Mitsubishi Electric	PVFY-P012AM4-E1A
AH-109	Mitsubishi Electric	PVFY-P018AM4-E1A
AH-201	Mitsubishi Electric	PEFY-P024MA-E4A
AH-202	Mitsubishi Electric	PEFY-P006MA-E4A
AH-203	Mitsubishi Electric	PEFY-P012MA-E4A
AH-204	Mitsubishi Electric	PEFY-P006MA-E4A
AH-205	Mitsubishi Electric	PEFY-P012MA-E4A
AH-206	Mitsubishi Electric	PEFY-P015MA-E4A

AH-207	Mitsubishi Electric	PEFY-P012MA-E4A
AH-208	Mitsubishi Electric	PEFY-P008MA-E4A
AH-209	Mitsubishi Electric	PEFY-P018MA-E4A
AH-210	Mitsubishi Electric	PEFY-P012MA-E4A
AH-211	Mitsubishi Electric	PEFY-P015MA-E4A
AH-301	Mitsubishi Electric	PVFY-P024AM4-E1A
AH-302	Mitsubishi Electric	PVFY-P018AM4-E1A
AH-303	Mitsubishi Electric	PVFY-P024AM4-E1A
AH-304	Mitsubishi Electric	PVFY-P018AM4-E1A
AH-305	Mitsubishi Electric	PVFY-P008AM4-E1A
AH-306	Mitsubishi Electric	PVFY-P030AM4-E1A
AH-307	Mitsubishi Electric	PEFY-P006MA-E4A
AH-308	Mitsubishi Electric	PEFY-P006MA-E4A
AH-309	Mitsubishi Electric	PVFY-P018AM4-E1A
AH-401	Mitsubishi Electric	PEFY-P012MA144A4
AH-402	Mitsubishi Electric	PEFY-P012MA144A4
AH-403	Mitsubishi Electric	PEFY-P008MA144A
AH-404	Mitsubishi Electric	PVFY-P048M141A
AH-405	Mitsubishi Electric	PVFY-P048M141A
AH-406	Mitsubishi Electric	PEFY-P006MA144A
AH-407	Mitsubishi Electric	PEFY-P006MA144A
AH-408	Mitsubishi Electric	PEFY-P008MA144A
AH-501	Mitsubishi Electric	PEFY-P012MA144A4
AH-502	Mitsubishi Electric	PEFY-P015MA144A
AH-503	Mitsubishi Electric	PEFY-P012MA144A4
AH-504	Mitsubishi Electric	PEFY-P018MA144A
AH-505	Mitsubishi Electric	PEFY-P012MA144A4
AH-506	Mitsubishi Electric	PEFY-P015MA144A
AH-601	Mitsubishi Electric	PVFY-P036M141A
AH-602	Mitsubishi Electric	PVFY-P036M141A
AH-603	Mitsubishi Electric	PVFY-P036M141A
AH-604	Mitsubishi Electric	PVFY-P036M141A

Notes

VRF air handlers connected to water-source heat pumps. BACnet integration with facility management system. Includes both vertical air handlers (PVFY models) and ceiling-concealed ducted air handlers (PEFY models).

VRF Branch Selectors

Equipment Tag	Manufacturer	Model
BC-101	Mitsubishi Electric	CMB-P1012NU-JA1

BC-201	Mitsubishi Electric	CMB-P1012NU-JA1
BC-301	Mitsubishi Electric	CMB-P1012NU-JA1
BC-401	Mitsubishi Electric	CMB-P1012NU-JA1
BC-501	Mitsubishi Electric	CMB-P108NU-J1

Notes

Branch circuit controllers for VRF system. Allow simultaneous heating and cooling operation. Connected to water-source heat pumps.

Water-Source Heat Pumps

Equipment Tag	Manufacturer	Model
WHP-1	Mitsubishi Electric	PQRY-P120TLMU-A1
WHP-2	Mitsubishi Electric	PQRY-P144TLMU-A1
WHP-3	Mitsubishi Electric	PQRY-P144TLMU-A1
WHP-4	Mitsubishi Electric	PQRY-P144TLMU-A1
WHP-5	Mitsubishi Electric	PQRY-P72TLMU-A1
WHP-6	Mitsubishi Electric	PQRY-P144TLMU-A1

Notes

Ground water source heat pump systems with heat recovery. All systems tie into a new touch screen central controller with BACnet interface.

In-Line Centrifugal Hydronic Pumps

Equipment Tag	Manufacturer	Model
VCP-1	Taco Comfort Solutions	VR20L
VCP-2	Taco Comfort Solutions	VR20M
VCP-3	Taco Comfort Solutions	VR20M
VCP-4	Taco Comfort Solutions	VR20M
VCP-5	Taco Comfort Solutions	VR20L
VCP-6	Taco Comfort Solutions	VR20M
DCP-1	Taco Comfort Solutions	VR15M
DCP-2	Taco Comfort Solutions	VR15M

Notes

In-line variable speed circulators with ECM motors for water-source heat pump circulation. 40% propylene glycol at 50°F. Connection to building management system via BACnet.

Base-Mounted, Centrifugal Hydronic Pumps

Equipment Tag	Manufacturer	Model
GTP-1	Taco Comfort Solutions	SKY3009D-1760-5.00
GTP-2	Taco Comfort Solutions	SKY3009D-1760-5.00

Notes

Vertical in-line pumps for geothermal well field. All iron construction. ANSI B16.1 Class 125. VFD motors to maintain loop temperature. Lead/lag operation between GTP-1 and GTP-2.

Automatic Condensate Pump Units

Equipment Tag	Manufacturer	Model
CP-1	Little Giant	VCL-14ULS

Notes

Commercial grade automatic condensate pump. 6' power cord. Safety switch for equipment shut down. Integral check valve. Plenum rated UL listed.

Suppliers

Air-to-Air Energy Recovery Equipment

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Aldes		N/A		Basis of Design	**Yes**
Aldes		N/A		Basis of Design	No
Greenheck	ERV Series	N/A		Equivalent performance specifications. Verify physical dimensions and connection locations.	No
RenewAire	EV Series	N/A		Verify recovery effectiveness and physical dimensions.	No
Ventacity	VS Series	N/A		Equivalent performance. Verify controls compatibility with BMS.	No

Variable Refrigerant Flow Systems

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Mitsubishi	Electric	N/A		Basis of Design	**Yes**
Mitsubishi	Electric	N/A		Basis of Design	No
Trane	TVR Series	N/A		Equivalent performance specifications. Verify physical dimensions, connection locations, and refrigerant piping requirements.	No
Daikin	VRV Series	N/A		Verify controls compatibility with BMS and refrigerant piping requirements.	No

Water-Source Heat Pumps

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Mitsubishi	Electric	N/A		Basis of Design	**Yes**
Mitsubishi	Electric	N/A		Basis of Design	No
Trane	Water-Source VRF Series	N/A		Equivalent performance specifications. Verify physical dimensions, connection locations, and refrigerant piping requirements.	No
Daikin	VRV-W Series	N/A		Verify controls compatibility with BMS and refrigerant piping requirements.	No

VRF Branch Selectors

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Mitsubishi	Electric	N/A		Basis of Design	**Yes**
Mitsubishi	Electric	N/A		Basis of Design	No
Trane	Refrigerant Distribution Units	N/A		Verify compatibility with VRF system and refrigerant piping requirements.	No
Daikin	BS Units	N/A		Verify compatibility with VRF system and refrigerant piping requirements.	No

In-Line Centrifugal Hydronic Pumps

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Taco	Comfort Solutions	N/A		Basis of Design	**Yes**
Taco	Comfort Solutions	N/A		Basis of Design	No
Bell & Gossett	ecocirc XL Series	N/A		Equivalent performance. Verify physical dimensions and connection locations.	No
Grundfos	Magna3 Series	N/A		Verify ECM motor compatibility and BACnet connectivity.	No
Armstrong	IVS Series	N/A		Equivalent performance. Verify physical dimensions.	No
Wilo	Stratos MAXO Series	N/A		Verify controls compatibility and physical dimensions.	No

Base-Mounted, Centrifugal Hydronic Pumps

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Taco	Comfort Solutions	N/A		Basis of Design	**Yes**
Taco	Comfort Solutions	N/A		Basis of Design	No
Bell & Gossett	e-1510 Series	N/A		Equivalent performance. Verify physical dimensions and connection locations.	No
Armstrong	Design Envelope Series	N/A		Verify VFD compatibility and BACnet connectivity.	No
Grundfos	TP Series	N/A		Verify physical dimensions and impeller size.	No

Automatic Condensate Pump Units

Note: Cost differences are AI-estimated percentages relative to Basis of Design and are not based on actual project data. Always obtain accurate quotes from vendors directly via buildvision.io.

Manufacturer	Model	Representativ	AI Est. Cost D	Compatibility Notes	BoD
Little	Giant	N/A		Basis of Design	**Yes**
Little	Giant	N/A		Basis of Design	No
Diversitech	CP-Series	N/A		Equivalent performance. Verify UL listing for plenum applications.	No
Hartell	A Series	N/A		Verify safety switch compatibility and tank volume.	No
DiversiTech	ClearVue Series	N/A		Verify physical dimensions and safety switch compatibility.	No

Design Notes

Variable Refrigerant Flow (VRF) System

Technical Observations:

- Water-source heat pumps connected to geothermal well field
- Simultaneous heating and cooling capability
- BACnet integration with facility management system
- Individual zone control with wall-mounted controllers
- Refrigerant leak detection system in mechanical room

Concerns:

- Manufacturer-certified installation required for warranty
- Proper commissioning and startup procedures essential
- Refrigerant piping must follow manufacturer guidelines

Opportunities:

- High efficiency operation with water-source heat recovery
- Reduced mechanical space requirements
- Individual zone temperature control

Geothermal Ground Source Water System

Technical Observations:

- Closed loop system with 40% propylene glycol solution
- Ground loop temperature maintained between 52-54°F
- Redundant pumping system with lead/lag operation
- Variable speed pumping with VFD control

Concerns:

- System must be properly flushed and purged before operation
- Glycol maintenance program required
- Proper flow balancing critical for system performance

Opportunities:

- Stable year-round ground temperatures optimize heat pump efficiency
- Reduced maintenance compared to air-cooled systems
- Extended equipment life expectancy

Energy Recovery Ventilation

Technical Observations:

- High latent transfer static core energy recovery units
- MERV 13 intake filters and MERV 8 exhaust filters
- Occupied/unoccupied scheduling capability
- ERV-101 for resident spaces runs continuously

Concerns:

- Unit accessibility for filter changes and maintenance
- Proper condensate management during defrost cycles
- Coordination of controls with BMS

Opportunities:

- Significant energy savings from heat recovery
- Improved indoor air quality with high efficiency filtration
- Dedicated outdoor air for each building zone

BuildVision Recommendations

1. Implement comprehensive testing and balancing of the VRF and geothermal systems

Rationale: Proper system balancing is critical for optimal performance of water-source VRF systems and will ensure designed flow rates are achieved at all heat pumps
Estimated Impact: Properly balanced systems can result in 10-15% energy savings and prevent issues with insufficient flow through heat exchangers
Implementation: Engage a certified balancing contractor with experience in VRF systems. Coordinate with VRF manufacturer's representative during balancing process.
Priority: High

2. Provide comprehensive training for facility staff on VRF system operation and maintenance

Rationale: VRF systems require specific maintenance procedures and operational knowledge for optimal performance
Estimated Impact: Proper staff training will extend equipment life, reduce service calls, and maintain system efficiency
Implementation: Schedule multiple training sessions with the VRF manufacturer's technical representative. Document all training and provide comprehensive O and M manuals.
Priority: High

3. Implement glycol monitoring and maintenance program

Rationale: Maintaining proper glycol concentration and pH is essential for system longevity and performance
Estimated Impact: Regular glycol testing and maintenance prevents corrosion, ensures freeze protection, and extends equipment life
Implementation: Establish quarterly glycol testing schedule and maintain logs of concentration, pH, and inhibitor levels
Priority: Medium

4. Create detailed sequence of operations documentation with seasonal changeover procedures

Rationale: Complex VRF systems benefit from clear operational procedures, particularly for seasonal transitions
Estimated Impact: Proper sequences ensure optimal performance year-round and prevent operational issues during transition seasons
Implementation: Work with controls contractor and VRF manufacturer to document detailed sequences for all operating modes
Priority: Medium

5. Verify refrigerant leak detection system installation and testing

Rationale: Proper refrigerant monitoring is required by code and essential for safety in mechanical rooms with VRF equipment
Estimated Impact: Ensures building safety and code compliance
Implementation: Coordinate with mechanical contractor and controls contractor to verify proper installation, calibration, and testing of refrigerant monitoring system and emergency ventilation response
Priority: High

Conclusion

Key Findings

- Water-source VRF system provides efficient simultaneous heating and cooling capability
- Energy recovery ventilators with high-efficiency filtration improve indoor air quality and reduce energy consumption
- Ground source water loop provides stable operating temperatures for optimal heat pump efficiency
- Full BACnet integration with building management system allows for comprehensive monitoring and control

- Variable speed pumping optimizes system efficiency at partial loads

Highest Priority Actions

- Ensure VRF manufacturer provides certified startup, commissioning, and staff training
- Implement comprehensive testing and balancing of VRF and geothermal systems
- Verify proper installation and testing of refrigerant leak detection system
- Establish glycol monitoring and maintenance program
- Create detailed sequence of operations documentation for facility staff

Summary

The HVAC system for the RI DCYF New Female Youth Residential Facility utilizes a ground source water-cooled variable refrigerant flow (VRF) system with energy recovery ventilation. This design provides high efficiency operation, individual zone control, and excellent indoor air quality. The system is designed for reliability with redundant pumping and comprehensive controls integration.

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