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Control How You Source Building Systems

Directly access suppliers and automate sourcing, procurement, and financing—all from one platform

Key Benefits

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	Villanova University
Contact Person	Not Specified
Contact Email	N/A
Contact Phone	N/A
Architect	Blackney Hayes Architects
EngineerOfRecord	PSquared Consulting Engineers
Contractor	Not Specified

Project Information

Project Name	Villanova University - Founders Hall HVAC Renovation
Location	Founders Hall, 610 King of Prussia Road, Wayne, PA 19087
Start Date	N/A
Completion Date	N/A
Budget	N/A
Scope	HVAC system installation/renovation including makeup air units, water-source heat pumps, cooling tower, dedicated outdoor air system, and variable refrigerant flow system
Project ID	Founders Hall HVAC System
Project URL	N/A
DesignStage	Issued for Bid
DesignDate	May 5, 2025

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Project Equipment

Packaged, Outdoor, Heating-Only Makeup-Air Units

Equipment Tag	Manufacturer	Model
MUA-1	CaptiveAire	A2D-250-20B
MUA-2	CaptiveAire	A2D-250-20B
MUA-3	CaptiveAire	A2D-250-20B

Notes

Low lead time (<10 weeks), specification section 23 73 23

Automatic Condensate Pump Units

Equipment Tag	Manufacturer	Model
CP-239	Blue Diamond Pumps Inc.	X87-721 MANULUC

Notes

Low lead time (<10 weeks), specification section 23 05 33

HVAC Fans

Equipment Tag	Manufacturer	Model
EF-1	CaptiveAire	USDH-RM
EF-2	CaptiveAire	USDH-RM
EF-3	CaptiveAire	DLX260-TA
EF-5	PennBarry	DX-38

Notes

Low lead time (<10 weeks), specification section 23 34 23

In-Line Centrifugal Hydronic Pumps

Equipment Tag	Manufacturer	Model
P-3A	Bell & Gossett	E-80
P-3B	Bell & Gossett	E-80

Notes

Medium lead time (10-20 weeks), specification section 23 21 23

Base-Mounted, Centrifugal Hydronic Pumps

Equipment Tag	Manufacturer	Model
P-6A	Bell & Gossett	E-1510
P-6B	Bell & Gossett	E-1510

Notes

Medium lead time (10-20 weeks), specification section 23 21 23

Water-Source Heat Pumps

Equipment Tag	Manufacturer	Model
WSHP-1	Trane	EXRK009
WSHP-2	Trane	EXRK012
WSHP-3	Trane	EXRK012
WSHP-4	Trane	EXRK020
WSHP-5	Trane	EXRK030
WSHP-6	Trane	EXRK035
WSHP-7	Trane	EXRK042
WSHP-8	Trane	EXRK042
WSHP-9	Trane	EXRK055

Notes

Medium lead time (10-20 weeks), specification section 23 81 29, prefabrication coordination advised

Closed-Circuit, Forced-Draft Cooling Towers

Equipment Tag	Manufacturer	Model
CT-1	EVAPCO	ATWB 7-7-9

Notes

High lead time (>20 weeks), specification section 23 65 33, high-cost driver, ensure early release

Radiators

Equipment Tag	Manufacturer	Model
CUH-1	Sterling HVAC	MODEL RW SIZE 02
CUH-2	Sterling HVAC	MODEL F SIZE 02

Notes

Low lead time (<10 weeks), specification section 23 83 19

Dedicated Outdoor-Air Units

Equipment Tag	Manufacturer	Model
DOAS-1	Trane	OADG030C3-DAB1GB600

Notes

Medium lead time (10-20 weeks), specification section 23 73 13, high-cost driver, ensure early release

Packaged Rooftop Air-Conditioning Units

Equipment Tag	Manufacturer	Model
RTU-4	Trane	YCH420D4P

Notes

Medium lead time (10-20 weeks), specification section 23 74 13

Variable Refrigerant Flow Systems

Equipment Tag	Manufacturer	Model
AC-239	Mitsubishi Electric (Including Trane Products)	PKA-AK24NL
CU-239	Mitsubishi Electric (Including Trane Products)	PUY-AH24NL

Notes

High lead time (>20 weeks), specification section 23 81 26, verify controls integration

Suppliers

Packaged, Outdoor, Heating-Only Makeup-Air Units

Manufacturer	Model	Representative	Compatibility Notes	BoD
CaptiveAire	A2D Series	N/A	Basis of Design	Yes

CaptiveAire	A2D Series	CaptiveAire Systems	Base model specified in design documents	No
Greenheck	MSX Series	Greenheck Representative	Compatible alternative, verify footprint and gas connection locations	No
Modine	Hot Dawg Series	Modine Representative	May require modifications to ductwork connections and controls interface	No

Automatic Condensate Pump Units

Manufacturer	Model	Representative	Compatibility Notes	BoD
Blue	Diamond Pumps Inc. X87-721 MANULUC	N/A	Basis of Design	Yes
Blue Diamond Pumps Inc.	X87-721 MANULUC	Blue Diamond Pumps Representative	Base model specified in design documents	No
Little Giant	VCMA Series	Little Giant Representative	Widely available alternative, verify power requirements and capacity	No

HVAC Fans

Manufacturer	Model	Representative	Compatibility Notes	BoD
CaptiveAire	USDH-RM/DLX Series	N/A	Basis of Design	Yes
CaptiveAire	USDH-RM/DLX Series	CaptiveAire Systems	Base model specified for EF-1, EF-2, EF-3	No
PennBarry	DX Series	PennBarry Representative	Base model specified for EF-5	No
Greenheck	SQ/SP Series	Greenheck Representative	Compatible alternative, verify dimensions and electrical requirements	No

Hydronic Pumps

Manufacturer	Model	Representative	Compatibility Notes	BoD
Bell	& Gossett E-80/E-1510 Series	N/A	Basis of Design	Yes
Bell & Gossett	E-80/E-1510 Series	Bell & Gossett Representative	Base models specified in design documents	No
Taco	FI/KS Series	Taco Representative	Compatible alternative, confirm pump curves and electrical characteristics	No
Grundfos	TP/HS Series	Grundfos Representative	Premium efficiency models available, confirm flange dimensions and compatibility	No

Water-Source Heat Pumps

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	EXRK Series	N/A	Basis of Design	Yes
Trane	EXRK Series	Trane Technologies	Base models specified in design documents	No
Daikin	SmartSource Series	Daikin Representative	Verify dimensions, connection locations, and control compatibility	No
ClimateMaster	Tranquility Series	ClimateMaster Representative	May require different control interface, verify dimensions and connection points	No

Closed-Circuit, Forced-Draft Cooling Towers

Manufacturer	Model	Representative	Compatibility Notes	BoD
EVAPCO	ATWB Series	N/A	Basis of Design	Yes
EVAPCO	ATWB Series	EVAPCO Representative	Base model specified in design documents	No
Baltimore Aircoil Company (BAC)	FXV Series	BAC Representative	Premium alternative, verify footprint, connection locations, and structural requirements	No

SPX Cooling Technologies (Marley)	NC Series	SPX/Marley Representative	Verify physical dimensions, structural requirements, and water treatment compatibility	No
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Radiators

Manufacturer	Model	Representative	Compatibility Notes	BoD
Sterling	HVAC RW/F Series	N/A	Basis of Design	Yes
Sterling HVAC	RW/F Series	Sterling HVAC Representative	Base models specified in design documents	No
Rittling	Cabinet Unit Heaters	Rittling Representative	Compatible alternative, verify dimensions and connection points	No

Dedicated Outdoor-Air Units and Rooftop Units

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	OADG/YCH Series	N/A	Basis of Design	Yes
Trane	OADG/YCH Series	Trane Technologies	Base models specified in design documents	No
Daikin	Rebel/Rooftop Series	Daikin Representative	Verify dimensions, weight, connection points, and controls compatibility	No
Carrier	62X/48HC Series	Carrier Representative	Compatible alternative, verify footprint, connection locations, and controls	No

Variable Refrigerant Flow Systems

Manufacturer	Model	Representative	Compatibility Notes	BoD
Mitsubishi	Electric PKA/PUY Series	N/A	Basis of Design	Yes
Mitsubishi Electric	PKA/PUY Series	Mitsubishi Electric Representative	Base models specified in design documents	No
Daikin	VRV System	Daikin Representative	May require reconfiguration of refrigerant piping and controls	No

LG Electronics	Multi V Series	LG HVAC Representative	Verify compatibility with building management system and refrigerant line sizing	No
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Design Notes

Hydronic System

Technical Observations:

- Cooling tower (CT-1) is high-cost driver; requires early release
- Bell & Gossett pumps include both inline (E-80) and base-mounted (E-1510) types
- Water-source heat pump loop requires careful coordination with piping systems

Concerns:

- Cooling tower specification section not clearly matched in Division 23 table of contents
- Ensure that seismic and winterization accessories are specified for cooling tower
- Pumps listed include both inline and base-mounted types; ensure specification section 23 21 23 covers both types and installation baseplates

Opportunities:

- Water treatment system coordination can be optimized between cooling tower and heat pump loop
- Potential for value engineering on pump redundancy configuration
- Consider variable flow pumping strategies for energy savings

Airside System

Technical Observations:

- DOAS is high-cost driver; requires early release
- System includes a mix of CaptiveAire and PennBarry fans
- DOAS and RTU both from Trane - potential for package discount

Concerns:

- Check redundancy in air handling, particularly with energy recovery provisions between DOAS and RTU
- Multiple fan manufacturers may complicate maintenance and parts inventory
- Verify control system coordination between all airside components

Opportunities:

- Standardize on single fan manufacturer where possible
- Consider energy recovery options between exhaust fans and makeup air units
- Prefabrication potential for ductwork systems to reduce field labor

DX System

Technical Observations:

- VRF system uses Mitsubishi products that include Trane integration
- System includes both water-source heat pumps and VRF technology

Concerns:

- Lead times for Mitsubishi and Trane VRF components can be long—high risk
- Specification 23 81 26 (VRF) covers Mitsubishi but spec basis-of-design form not located
- Control system coordination with Trane VRF and BMS not explicitly cross-referenced; high risk for submittal delay or integration gaps
- Confirm warranty path and controls compatibility

Opportunities:

- Early pre-purchase of VRF equipment to mitigate lead time risks
- Coordinate controls integration during early submittal phase
- Consider commissioning agent involvement during controls integration

BuildVision Recommendations

1. Early procurement of high-risk, long lead-time items

Rationale: Cooling tower (EVAPCO ATWB), DOAS (Trane), and VRF components (Mitsubishi) all have lead times exceeding 20 weeks and are critical to the project schedule.

Estimated Impact: Reduction of project schedule risk by 4-6 weeks, avoiding costly temporary solutions

Implementation: Issue early purchase orders for cooling tower, DOAS, and VRF equipment after expedited submittal review

Priority: High

2. Comprehensive controls coordination meeting

Rationale: Multiple system types (hydronic, airside, VRF) with different manufacturers will require careful integration with the building automation system.

Estimated Impact: Reduction of commissioning duration by 2-3 weeks and minimization of change orders related to controls integration

Implementation: Schedule pre-submittal controls coordination meeting with all equipment vendors, controls contractor, and engineer

Priority: High

3. WSHP prefabrication strategy

Rationale: Nine water-source heat pumps with similar configurations present an opportunity for prefabrication and standardized installation.

Estimated Impact: Labor savings of 15-20% on WSHP installation, improved quality control, and reduced field coordination issues

Implementation: Develop prefabrication drawings for WSHP installations including piping assemblies, supports, and connection details

Priority: Medium

4. Review and verify specification coverage

Rationale: Several discrepancies noted in specification references, particularly for cooling tower, VRF, and pumps.

Estimated Impact: Elimination of RFIs and potential change orders related to unclear specifications

Implementation: Conduct comprehensive specification review and submit consolidated RFI for all identified gaps

Priority: Medium

5. Prioritized submittal schedule

Rationale: Complex project with multiple equipment types requires strategic approach to submittal process.

Estimated Impact: Streamlined approval process for critical path items, reducing overall procurement timeline by 2-3 weeks

Implementation: Develop tiered submittal schedule with priority for cooling tower, DOAS, VRF, and controls integration

Priority: High

6. Alternative VRF manufacturer evaluation

Rationale: Mitsubishi VRF components have long lead times and relatively high cost compared to alternatives.

Estimated Impact: Potential cost savings of 5-10% on VRF components and possible lead time reduction of 2-4 weeks

Implementation: Evaluate Daikin or LG as alternative VRF suppliers, focusing on controls compatibility and performance specifications

Priority: Medium

Conclusion

Key Findings

- High-risk equipment with extended lead times (cooling tower, DOAS, VRF) requires expedited procurement
- Multiple system types (hydronic, airside, VRF) with different manufacturers present controls integration challenges
- Specifications contain several gaps or discrepancies that should be addressed via RFIs
- Water-source heat pump quantity provides opportunity for prefabrication efficiency
- Alternative manufacturers for VRF components may offer cost and schedule advantages

Highest Priority Actions

- Develop expedited submittal and procurement plan for long-lead equipment (cooling tower, DOAS, VRF)
- Schedule comprehensive controls coordination meeting with all stakeholders
- Submit consolidated RFI addressing specification gaps and discrepancies
- Evaluate alternative VRF manufacturers for potential cost and schedule benefits
- Develop WSHP prefabrication strategy to improve installation efficiency

Summary

The Villanova University Founders Hall HVAC renovation project presents a complex mix of hydronic, airside, and DX systems that will require careful coordination during procurement, installation, and commissioning. The critical path items, including the cooling tower, DOAS, and VRF components, have significant lead times and should be prioritized for early procurement. Controls integration across multiple system types represents a high-risk area that demands focused attention early in the project lifecycle. Several opportunities exist for cost and schedule optimization, particularly in the areas of prefabrication, alternative manufacturer evaluation, and strategically sequenced submittals.



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