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Key Benefits

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$ **Cut Costs**

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Customer Information

Customer Name	Hensel Phelps
Contact Person	Alex Arnold
Contact Email	aarnold@henselphelps.com
Contact Phone	N/A
Request Type	Proposal
Date Invited	5/27/2025
Date Due	6/30/2025
RFIs Due	6/19/2025

Project Information

Project Name	GBSD Integrated Training Center (ITC)
Location	F.E. Warren AFB, Wyoming
Start Date	5/27/2025
Completion Date	6/30/2025
Budget	N/A
Scope	N/A
Project ID	d9ccf49d-0eba-4852-8c17-c04b44d3fe4a
Project URL	BuildVision Project Link
Solicitation No.	W9128F25RA015
Contract No.	W9128F21D0024

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Project Equipment

Air Handling Units

Equipment Tag	Manufacturer	Model
AHU-1	Trane	
AHU-2	Trane	
AHU-3	Trane	

Notes

Performance based on design altitude of 6,115 ft. Units include filters, ductwork, coils, and vibration isolators.

Energy Recovery Wheels

Equipment Tag	Manufacturer	Model
EW-1		
EW-2		
EW-3		

Notes

Performance based on design altitude of 6,115 ft. Wheels employ supply and exhaust airstreams through energy recovery device.

Water Cooling Coils

Equipment Tag	Manufacturer	Model
WCC-1		
WCC-2		

Notes

Performance based on design altitude of 6,115 ft. Capacity based on 40% propylene glycol.

Heating Water Coils

Equipment Tag	Manufacturer	Model
HC-01		
HC-02		

Notes

Performance based on design altitude of 6,115 ft. Capacity based on 40% propylene glycol.

Suppliers

Air Handling Units

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	As specified	N/A	Specified as basis of design for AHUs on mechanical schedules	**Yes**
Daikin		N/A	Compatible with design requirements, may require minor modifications to ductwork connections	Listed
Carrier		N/A	Compatible with specified requirements, similar footprint and connections	Listed
York		N/A	Suitable alternative with similar features and compatibility	No
Aaon		N/A	Higher quality components, may require additional lead time	No

Energy Recovery Wheels

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	Energy Recovery Wheel	N/A	Specified as basis of design for the project's energy recovery wheels EW-1, EW-2, and EW-3	**Yes**
Semco	Energy Recovery Wheel	N/A	Compatible with project requirements for total energy recovery wheels with minimum sensible efficiency of 71.5-84.2% and total efficiency of 68.4-76.6%	Listed

Greenheck	Energy Recovery Wheel	N/A	Can provide energy recovery wheels that meet the required performance specifications including specified airflows and efficiencies	No
Daikin	Energy Recovery Wheel	N/A	Can provide AHRI 1060 certified energy recovery wheels with similar performance characteristics	No

Water Cooling Coils

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	Water Cooling Coil	N/A	Manufacturer specified for water chillers CH-1 and CH-2, likely also supplies cooling coils	**Yes**
Carrier	Water Cooling Coil	N/A	Compatible with project requirements; industry standard connection sizes	Listed
York/Johnson Controls	Water Cooling Coil	N/A	Compatible with project requirements; may require minor piping adaptations	Listed
Daikin	Water Cooling Coil	N/A	Comparable performance specifications; alternative option	No
Greenheck	Water Cooling Coil	N/A	May require verification of performance at specified conditions	No

Heating Water Coils

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	HC-01, HC-02, HC-03, HC-04	N/A	Specified for hot water heating coils in air handling units with capacities ranging from 79.4 to 283.9 MBh. Performance based on 40% propylene glycol.	**Yes**
Armstrong	Hot Water Coils	N/A	Compatible with specified systems; offers similar performance characteristics for hot water coils with propylene glycol.	Listed

Daikin	Hot Water Coils	N/A	Compatible with specified AHU systems; offers coils with similar temperature ranges and flow rates.	Listed
Carrier	Hot Water Coils	N/A	Compatible with the specified systems; offers similar performance characteristics for hot water heating coils.	No
York	Hot Water Coils	N/A	Compatible with specified systems; can accommodate 40% propylene glycol solutions.	No

BuildVision Recommendations

1. Standardize on Premium Efficiency Motors for Pumps

Rationale: The project specifications (23 21 23) call for premium efficiency motors for pumps larger than integral size. Standardizing on premium efficiency motors for all pumps would reduce energy consumption, decrease operational costs, and support sustainability goals. Premium efficiency motors typically cost 10-15% more initially but offer 2-8% better efficiency with a typical payback period of 2-3 years.
Estimated Impact: Estimated 2-8% reduction in pump energy costs over standard motors, with payback typically within 2-3 years. For a project of this scale with multiple pump systems, this could represent significant long-term operational savings and reduced maintenance costs.
Implementation: 1. Modify procurement specifications to require premium efficiency motors for all pump sizes, including smaller integral pumps. 2. Request equipment vendors provide energy consumption data as part of their submittals. 3. Verify compliance during submittal review phase.
Priority: Medium

2. Procure Variable Frequency Drives for Major Pumps and Air Handling Units

Rationale: Multiple schedules show pumps and AHUs that could benefit from variable frequency drives (VFDs). While specifications mention VFDs in some sections, standardizing their use for all major motors would provide significant energy savings. VFDs allow equipment to operate at reduced speeds during partial load conditions, which is the predominant operating state for HVAC systems.
Estimated Impact: Potential 20-50% energy savings for pump and fan motors, depending on load profiles. With the project's multiple pumps (CHWP-1, CHWP-2A/B, etc.) and AHUs, this could represent tens of thousands of dollars in energy savings over equipment lifetime.
Implementation: 1. Review mechanical equipment schedules to identify all pumps and air handlers above 5 HP. 2. Modify procurement specifications to require VFDs for these units.

3. Include a requirement for harmonic mitigation where necessary. 4. Verify compatibility with building automation system during submittal review.
Priority: High

3. Consolidated Procurement of Air Cooled Chillers

Rationale: The mechanical schedules indicate multiple air-cooled chillers (CH-1, CH-2). Purchasing these units from the same manufacturer as a package can yield substantial procurement savings through volume discounts. Additionally, consolidation simplifies maintenance with common parts inventory and service procedures.
Estimated Impact: Potential 5-10% procurement cost savings through volume purchasing. For chillers that may cost $100,000+ each, this represents significant initial savings. Additional 5-10% savings in maintenance costs through standardized parts and service procedures.
Implementation: 1. Modify procurement approach to solicit bids for chillers as a consolidated package. 2. Specify identical or similar models with the same refrigerant type. 3. Request volume discount pricing from vendors. 4. Ensure delivery schedules align with construction timeline.
Priority: High

4. Implement Strategic Glycol Procurement Plan

Rationale: Specifications show that three glycol feed systems (GMU-1, GMU-2, GMU-3) will be required, each with 40% propylene glycol solution. Procuring glycol in bulk rather than as separate packages for each system would reduce material costs and ensure consistent quality across all systems.
Estimated Impact: Approximately 10-15% savings on glycol procurement costs through bulk purchasing. Ensures consistent glycol quality across all systems, potentially extending equipment life by reducing variability in freeze protection and corrosion inhibition.
Implementation: 1. Calculate total glycol volume needed for all systems. 2. Procure as a single bulk order with appropriate corrosion inhibitors. 3. Verify concentration and quality upon delivery. 4. Coordinate storage and distribution to each system during commissioning.
Priority: Medium

5. Standardize on a Single Control Valve Manufacturer

Rationale: The specifications call for numerous control valves of various sizes across multiple systems. Standardizing on a single manufacturer for all control valves would simplify procurement, reduce spare parts inventory requirements, and ensure consistent operation and maintenance procedures.
Estimated Impact: Potential 5-8% savings on valve procurement through volume purchasing. Reduced maintenance costs and improved reliability through standardized parts and procedures. Simplified training for operations staff.
Implementation: 1. Review valve schedules to identify all control valve requirements. 2. Select a manufacturer with a complete product line covering all required valve types and sizes. 3. Request volume pricing from selected vendors. 4. Verify valve specifications

meet the requirements for each application.
Priority: Medium

6. Implement Standardized Vehicle Exhaust Equipment Package

Rationale: Section 23 35 16.17 10 describes multiple vehicle exhaust fans (EF-01 through EF-08) with identical requirements. Procuring these as a standardized package from a single manufacturer would reduce costs and ensure consistent installation, operation, and maintenance.
Estimated Impact: Estimated 8-12% procurement savings through volume purchasing of identical equipment. Simplified installation and maintenance procedures due to standardization. Reduced spare parts inventory requirements.
Implementation: 1. Bundle vehicle exhaust fans in procurement documents as a single package. 2. Specify identical models for all eight units. 3. Request quantity discount pricing. 4. Coordinate delivery schedule to align with construction sequence.
Priority: Medium

7. Pre-Purchase Critical Long-Lead HVAC Equipment

Rationale: Major HVAC components like chillers, boilers, and custom air handling units typically have long lead times (12-20+ weeks) that can impact project schedules. Pre-purchasing these items can expedite delivery, lock in pricing, and reduce project schedule risks.
Estimated Impact: Potential schedule acceleration of 2-3 months for critical path items. Avoidance of price escalation, which could save 3-5% on equipment costs. Reduced risk of project delays due to equipment availability issues.
Implementation: 1. Identify critical long-lead items (chillers, boilers, custom AHUs). 2. Develop detailed specifications for early procurement. 3. Issue early procurement packages before completion of full construction documents. 4. Coordinate storage requirements if equipment arrives before installation is possible.
Priority: High

8. Coordinate Refrigerant Type Across All HVAC Equipment

Rationale: Specification section 23 64 10 indicates multiple refrigerant-containing equipment (chillers, heat pumps). Standardizing on a single refrigerant type across all equipment would simplify maintenance, reduce specialized tooling requirements, and decrease the types of refrigerant that must be kept on hand for service.
Estimated Impact: Reduced maintenance complexity and costs. Simplified compliance with refrigerant management regulations. Potential for 5-7% savings on long-term refrigerant and service costs through simplified inventory management.
Implementation: 1. Review all refrigerant-containing equipment specifications. 2. Select a single refrigerant type that meets requirements for all applications (e.g., R-410A or R-454B). 3. Modify procurement specifications to require the selected refrigerant. 4. Verify refrigerant selection doesn't negatively impact equipment performance or cost.
Priority: Medium

9. Bundle Fan Coil Unit Procurement

Rationale: The mechanical schedules show numerous fan coil units of varying types and capacities. Procurement efficiency can be gained by bundling these units by type, even across different capacities, from a single manufacturer. This approach will leverage volume discounts while ensuring consistent quality and maintenance procedures.
Estimated Impact: Approximately 8-12% savings on fan coil unit procurement costs. Streamlined installation and commissioning through standardized procedures. Simplified maintenance and reduced spare parts inventory requirements.
Implementation: 1. Group fan coil units by type in procurement documents. 2. Solicit bids from manufacturers who can supply the full range of required capacities. 3. Request tiered volume pricing based on total quantity. 4. Coordinate delivery schedule to align with construction sequence.
Priority: Medium

Conclusion

Key Findings

- Multiple HVAC systems require 40% propylene glycol solution due to the Wyoming climate and high-altitude installation location at F.E. Warren AFB
- Long-lead items such as chillers, boilers, and custom air handling units present schedule risks that should be mitigated through early procurement
- Standardization opportunities exist across multiple equipment categories including pumps, fan coil units, and control valves that could yield 5-15% cost savings
- Energy efficiency measures such as premium efficiency motors and VFDs for major equipment would provide significant operational cost savings over the facility lifecycle

Highest Priority Actions

- Pre-purchase critical long-lead HVAC equipment including chillers and air handling units to prevent schedule delays
- Consolidate procurement of similar equipment types (chillers, fan coil units, exhaust fans) to leverage volume discounts and streamline maintenance
- Standardize on premium efficiency motors and VFDs for all major equipment to reduce energy consumption and operational costs
- Develop a strategic plan for bulk glycol procurement to ensure consistent quality and freeze protection across all systems

Summary

The GBSD Integrated Training Center at F.E. Warren AFB requires careful planning for HVAC equipment procurement to ensure system reliability, efficiency, and compliance with project specifications. The project includes multiple air handling units, energy recovery wheels, chillers, pumps, and specialized components designed for the high-altitude conditions (6,115 ft). Strategic procurement approaches can yield significant cost savings while maintaining the required performance standards for this mission-critical facility.

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