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Customer Information

Customer Name	Philadelphia Phillies
Contact Person	Ken Rienstra
Contact Email	krienstra@lfdiscoll.com
Contact Phone	N/A
ContractType	Proposal
RequestType	Proposal
DateInvited	5/15/2025
DateDue	5/28/2025

Project Information

Project Name	Citizens Bank Park - Right Field Club
Location	One Citizens Bank Way, Philadelphia, PA 19148
Start Date	N/A
Completion Date	N/A
Budget	N/A
Scope	Furnish and install air-cooled rotary-screw water chiller as specified in technical specifications
Project ID	20240795
Project URL	BuildVision Project Link
Architect	EwingCole
ArchitectProjectNumber	20240795
EngineerOfRecord	EwingCole
ConstructionManager	LF Driscoll

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Project Equipment

Air-Cooled, Rotary-Screw Water Chiller

Equipment Tag	Manufacturer	Model
CH-4	York	YVAA0456

Notes

Chiller shall operate using R-513A refrigerant. Unit shall include twin screw compressors, direct expansion type evaporator, air-cooled condenser, and integral pump module.

Suppliers

Air-Cooled, Rotary-Screw Water Chiller

Manufacturer	Model	Representative	Compatibility Notes	BoD
York	YVAA0456	N/A	Basis of Design	Yes
York	YVAA0456	Gil-Bar Industries	Basis of design specified in project documents. Provides specified 350 ton capacity, energy efficiency of 1.05 kW/ton, and includes required features such as VFDs and integral pump module with dual pumps.	No

Air-Cooled, Rotary-Screw Water Chiller (Alternatives)

Manufacturer	Model	Representative	Compatibility Notes	BoD
Trane	RTAC Series	N/A	Basis of Design	Yes
Trane	RTAC Series	Trane	Helical rotary screw compressor technology with comparable efficiency ratings. Available with VFD options, dual refrigerant circuits, and can be configured with similar pump packages to match specifications.	No

Carrier	30XA Series	Carrier	AquaForce series offers similar capacity range and can be configured with VFDs and integrated hydronic packages to match specifications. Screw compressor technology with good part-load performance.	No
Daikin	AGZ Series	Daikin	Pathfinder series offers high efficiency with VFD-driven screw compressors. Can be configured with similar pump packages and dual-circuit design for redundancy.	No
Aermec	NRB Series	Highmark	European manufacturer with growing US presence. NRB series offers high efficiency and quiet operation with screw compressors. Available with integrated hydronic packages.	No
McQuay/Daikin	AWS Series	Daikin	AWS series offers good efficiency with semi-hermetic screw compressors. Available with VFD options and dual-circuit design for redundancy.	No

Design Notes

Air-Cooled Chiller System

Technical Observations:

- Chiller is specified with R-513A refrigerant, which is an environmentally-friendly HFO blend with a GWP of 631, significantly lower than traditional HFC refrigerants.
- The specified efficiency of 1.05 kW/ton exceeds ASHRAE 90.1 minimum requirements for this size air-cooled chiller.
- Dual pump configuration (one active, one spare) with VFDs provides N+1 redundancy and energy-efficient variable flow operation.
- Twin screw compressor design with dual refrigerant circuits enables excellent part-load efficiency and redundancy if one circuit requires service.
- Ultra-low harmonic VFDs on compressors minimize electrical system harmonics while providing improved part-load efficiency and soft-start capability.
- FSNTL vibration isolation specified is appropriate for equipment installed outdoors on dunnage to prevent vibration transmission to the structure.

Concerns:

- Verify chiller location provides adequate clearance around the unit (minimum 6 feet on all sides) for proper airflow and maintenance access per manufacturer requirements.
- Ensure structural dunnage is designed for the 882.4 MCA electrical requirement and properly coordinated with dual point electrical connections.
- Verify sound levels are compatible with stadium environment, especially during events. Consider location relative to seating areas and possible need for additional sound attenuation.
- Confirm chiller maintenance access routes are adequate for future component replacement (e.g., motor or compressor).
- Ensure the BAS integration protocols are compatible with the existing stadium systems for seamless monitoring and control.

Opportunities:

- Consider adding cellular remote monitoring capability for real-time performance tracking and predictive maintenance.
- Explore possibility of demand-response programming to reduce energy costs during peak rate periods.
- Evaluate winter operation requirements and consider adding glycol if needed for freeze protection.
- Document baseline performance metrics at commissioning for future reference and performance verification.
- Consider equipment sound enclosures if noise levels are a concern for the stadium environment.

BuildVision Recommendations

1. Conduct a thorough site survey to verify available space, clearances, and structural capacity for the chiller installation.

Rationale: The York YVAA0456 air-cooled chiller requires significant clearance (minimum 6 feet on all sides) for proper airflow and service access. The structural support must also be adequate for the operating weight of approximately 22,000 lbs plus the weight of water and piping.

Estimated Impact: Prevents costly modifications during installation, ensures proper equipment operation and serviceability, and avoids potential airflow restrictions that could reduce capacity and efficiency.

Implementation: Coordinate with the design team to verify site conditions, clearances, and structural capacity before finalizing equipment selection. Develop detailed installation plans that include service access requirements.

Priority: High

2. Coordinate electrical requirements with a focus on dual point power connections and harmonics mitigation.

Rationale: The specified chiller requires significant electrical capacity (MCA of 882.4 amps) with dual point power connections. Ultra-low harmonic VFDs require specific electrical coordination to ensure proper operation and compliance with IEEE-519 harmonic distortion limits.

Estimated Impact: Ensures proper electrical service without delays, prevents potential harmonic issues that could affect other stadium systems, and avoids costly electrical modifications during installation.

Implementation: Work with electrical engineer to verify service capacity, coordinate breaker sizes and wiring requirements for dual point connections, and document harmonic mitigation strategy.

Priority: High

3. Develop a detailed BAS integration plan that includes points list, control sequences, and communication protocols.

Rationale: Modern chillers with advanced controls require proper integration with building automation systems for optimal operation. The chiller has robust onboard controls that need proper interface with the stadium's existing BAS.

Estimated Impact: Enables proactive monitoring, optimized system operation, improved energy efficiency, and facilitates remote troubleshooting capabilities.

Implementation: Request detailed points list from manufacturer, coordinate with BAS contractor on communication protocols (BACnet, Modbus, etc.), and develop comprehensive control sequences for normal and emergency operation.

Priority: Medium

4. Conduct a sound analysis and develop mitigation strategy if needed.

Rationale: In a stadium environment, equipment noise could impact the fan experience during events. The York YVAA chiller produces approximately 85-90 dBA at 30 feet, which could be significant depending on proximity to occupied areas.

Estimated Impact: Prevents potential noise complaints, ensures compliance with local sound ordinances, and maintains optimal fan experience during stadium events.

Implementation: Perform sound analysis based on equipment location relative to seating areas, evaluate need for additional sound attenuation measures, and implement appropriate solutions such as sound barriers or acoustic treatment.

Priority: Medium

5. Develop a comprehensive commissioning and water treatment plan.

Rationale: Proper commissioning and water treatment are critical for ensuring long-term reliability and efficiency of the chiller system. The integrated pump module requires specific commissioning procedures to ensure proper flow rates and system performance.

Estimated Impact: Extends equipment life, maintains efficiency, prevents premature component failure, and establishes performance baseline for future reference.

Implementation: Engage manufacturer's startup technician, develop detailed commissioning plan that includes performance verification at various load conditions, and implement a comprehensive water treatment program specific to this application.

Priority: Medium

Conclusion

Key Findings

- The specified chiller uses environmentally-friendly R-513A refrigerant with low global warming potential.
- Energy efficiency of 1.05 kW/ton meets or exceeds energy code requirements.
- Dual compressors and dual pumps provide system redundancy for critical applications.
- VFDs on both compressors and pumps will provide improved part-load efficiency and energy savings.
- Proper vibration isolation and electrical service coordination are critical considerations for successful installation.

Highest Priority Actions

- Verify physical dimensions and site conditions for proper equipment fit and clearances.
- Confirm electrical service capacity and coordination with dual point power connection.
- Ensure proper vibration isolation installation according to specifications.
- Coordinate BMS integration requirements with controls contractor.

Summary

The specified York YVAA0456 air-cooled rotary screw chiller is well-suited for the Citizens Bank Park Right Field Club application, providing 350 tons of cooling capacity with good energy efficiency. The unit includes features that enhance reliability (dual compressors, dual pumps), energy efficiency (VFDs on compressors and pumps), and serviceability. Several viable alternatives from reputable manufacturers (Trane, Carrier, Daikin) could also meet the project requirements with proper verification of specifications.



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