Addendum 2 for RFB 945100-01

Project Name: DOC ASP Front Admin Building Entry Porch Repairs
RFP#945100-01
DAS Project #: 9451.00
Date: 3/25/2025

Addendum #02: Meeting Minutes, Sign In Sheets, Testing Reports and Substitution Request

1. **Meeting Minutes and Sign-In Sheets from Mandatory Pre-Bid Meetings.**
    a. Find attached minutes and Sign-In Sheets from March 18th and March 20th mandatory meetings.

2. **Common questions asked during Pre-Bid Meetings**
    a. What was the project budget?
        i. (Project Construction Budget is $309,500. Equipment is not included and already figured.)
    b. Are line sets included from Mechanical Sales?
        i. (NO, line sets are not provided by Mechanical Sales. Specification 23 2300 included refrigerant piping and specialties and does not indicate these are provided by others.)
    c. What is the thickness of the walls to drill into mechanical room.
        i. (Detail 3/M201 indicates a wall thickness of approximately 4')
    d. Is Pro Press ok on the line sets
        i. (Per specification 23 2300, section 2.01, piping 1'3/8" and under can use mechanical press connections for refrigerant piping. Per 23 2100, section 2.02 C&D, mechanical press connection is allowed on copper hydronic piping.)
    e. Can the electrical for the exterior condensing unit be spliced at the pull box rather than re-feed?
        i. (Per Keynote 3, E203, the feeder is to be removed back to the source. Per Keynote 7, E203, new wire is to be extended from breaker to the condensing unit.)
    f. What warranty concerns is there with tearing down/disassembling the unit procured from Mechanical Sales?
        i. (Per Mechanical Sales, there are no issues with warranty, and they will check out the unit during startup. Contractor is responsible for any disassembly or reassembly.)

3. **Terracon Hazardous Testing Report**
    a. See attached Asbestos and Lead Paint Survey Report dated March 19th, 2025 from Terracon.

b. DAS will coordinate with bidder and perform remediation of Asbestos containing material prior to construction.

4. Substitution Requests Received

a. The following manufacturers are approved for this project, provided the materials and systems meet the requirements of these Contract Documents. This approval does not waive any requirements or conditions of the Contract Documents for any material, system or manufacturer.

Section No.	**Product**	**Manufacturer**
23 0548	Flexible Connectors FC2	American Wheatly
23 2100	Strainers	American Wheatly
23 2123	In-Line Pump	Wilo
26 2923	Variable Frequency Drives	Invertek Drives

END OF ADDENDUM

State of Iowa - Department of Administrative Services
109 SE 13th St.
Des Moines, Iowa 50319
P: (515) 281-7260

Project: 9451.00 DOC ASP LUA A/C Replacement
406 N High Street
Anamosa, Iowa 52205

RFB Mandatory Pre-Bid Meeting #01 & #02 Minutes: Meeting #1

Meeting Date	Mar 18, 2025	**Meeting Time**	11:00 AM - 12:00 PM Central Time (US & Canada)
Meeting Location	Anamosa State Penitentiary		
Overview	Meeting to allow prospective bidders to visit the site, when possible, and learn more about the project. Meeting #01 - 3/18/2025 at 11:00am Meeting #02 - 3/20/2025 at 11:00am		
Notes			
Attachments	ASP LUA AC - Sign In Sheet 1 & 2.pdf, RFB 945100-01 Project Manual .pdf, 20250214_IDAS-Anamosa-ASP AC Replacement_100% Bid Set Drawings.pdf, 20250214_IDAS-Anamosa-ASP AC Replacement_100% Bid Set Specifications.pdf		

Scheduled Attendees

Name	Company	Phone Number	Email	Attendance
Boyd Hoyt	Anamosa State Penitentiary	P: (319) 251-7793	boyd.hoyt@iowa.gov	Present
Lisa Oswald	Anamosa State Penitentiary	P: (319) 251-7809	lisa.oswald@iowa.gov	Present
Tony DeLouis	IMEG Consultants Corp	P: (515) 344-4303	tony.e.delouis@imegcorp.com	
Mike McCarty	IMEG Consultants Corp	P: (858) 368-3418	michael.j.mccarty@imegcorp.com	Conference
Ted Chumbley	McGough Construction	P: (515) 639-3853	ted.chumbley@mcgough.com	Present
Adam Douglas	McGough Construction		adam.douglas@mcgough.com	
Noah Thelen	McGough Construction	P: (515) 639-3853	noah.thelen@mcgough.com	Present
Brandon Adams	State of Iowa - Department of Administrative Services		brandon.adams@iowa.gov	Present

Introduction

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
1.1	1	Introductions				Open
	Description Attendees					
	Official Documented Meeting Minutes See attached sign-in sheet for details Meeting #01: - McGough - DAS - ASP - Universal Climate Control - Nelson Electric					

Meeting #02:
- McGough
- DAS
- ASP
- Climate Engineers
- D&S Sheetmetal
- Tricon
- Foster Kraus
- PipePros Inc
- Foreman Construction
- Waldinger

Project Overview

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
2.1	1	Project Description				Open

Description
Removal and replacement of the LUA Air Handling Unit and Exterior Condensing Unit at Anamosa State Penitentiary, Anamosa, Iowa 52205. Contractor to receive delivery and unload, inspect and install on site. DAS is procuring the equipment directly with Daikin & Mechanical Sales. Bidders must supply equipment to unload and set units on site, ASP will have room to store equipment until install. Install of unit will need to be hauled in parts by hand due to space requirements and no elevator/freight elevator into space. Routing will be reviewed on site with ASP.

Coordination with ASP is required to perform work on site and gain access to Living Unit, areas of demolition include patching and repairing existing building components in occupied space.

Mandatory site visit required to bid, Bidder to fill certificate of site visit and submit with bid.

- **Base bid**: Bid Package #01: Complete, Removal and Replacement of the LUA Air Handling Unit and Exterior Condensing Unit.
- **Alternates**: None
- **Unit prices**: None

Official Documented Meeting Minutes
Discussed project scope of work and details about how equipment will need to be hauled into facility by hand since there is no elevator or equipment to assist.

System Works will be performing the commissioning of the equipment. They will perform startup of the AC in spring.

Mechanical Sales is procuring the equipment from DAS. Tim Grossman from Des Moines is working with IMEG and DAS.

Exterior wall construction is 4' thick.

Local controls only on the equipment, ASP is working on contracting out controls to re-construct the BAS system.

Pro Press Tools OK for construction.

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
2.2	1	Project Schedule				Open

Description

- **Contract(s) Issued**: April 07-April 23rd
- **Submittals**: April-May 2025
- **Construction**: September 2025
- **Closeout**: October-November 2025

A pull-plan session will be held with the successful bid package contractors to finalize the construction schedule.

State Holidays: New Year's Day, Martin Luther King Day, Memorial Day, 4th of July, Labor Day, Veterans Day, Thanksgiving and day after Thanksgiving, Christmas Day

Official Documented Meeting Minutes
Unit will be procured by DAS and estimated lead-times show a August/September delivery. ASP is turning over to radiant heating so unit can be decommissioned in September.

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
2.3	1	Site Rules				Open

Description

- Onsite supervision by Prime Contractor is required at all times when work by that contractor or their subcontractors/suppliers is taking place.
- Contractors shall provide daily logs for each day they are on site.
- Construction progress meeting will be established once construction starts.
- It is of the utmost importance to show respect and courtesy to all staff at all times.
- Clean all debris, materials, and bring all finishes back to existing conditions in the area they were working in prior to moving to the next area.
- No smoking, vaping or smokeless tobacco use onsite.
- Hot Work Permits need to be filled out and keep current throughout project. ASP has standard hot work form to be used.
- Clothing Requirements, no RED shirts or Navy Blue/Jean jackets since this is the color of inmates.

- Temporary facilities by prime.
- Noon Count Times (12:00pm-12:45pm) no entrance or exit will be allowed, includes the sally port and material/truck deliveries.
- Tool control - Contractor shall provide all equipment and tools for Contractor's own cleanup. Clean up shall be done at end of every shift or more frequently if required for the Contractor to perform their work, for other Contractors to perform their work, as required by the Owner's operations, and at the discretion of the Construction Manager.
    - Workers will be required to bring a list of tools they will be taking inside the facility. These tools will be inventoried going into the facility and again when the worker is leaving the facility. All tools will be accounted for throughout the day.
    - All tools brought in will need to be with crews at all time and not left unattended.
    - Any broken blades or bits will be required to be held onto and present at tool checkout.
- Cell phones - Cell phones, weapons, and cameras/camcorders are not allowed inside the facility.
    - ASP to confirm if the Foreman will be allowed to have one cell phone.
- Background checks
    - Must be performed on all on site employees, including sub-contractors.
    - The Contractor hereby explicitly authorizes the Iowa DAS to conduct criminal history and/or other background investigation(s) of the Contractor, its officers, supervisory personnel, employees, and other staff retained by the Contractor or their sub-contractors for the performance of the contract.
    - A State of Iowa record check request form will be provided at the pre-construction meeting of successful bidder.
- In addition to background checks all contractors who will be working onsite will need to take the PREA test which can be found here: https://docs.google.com/presentation/d/1_8IcvvpMCYdqasseVuOxzY2ISqjS3RUi6Oups7t6-zA/pub?start=false&loop=false&delayms=3000&slide=id.p
- Work hours: 7am - 4pm, Monday through Friday unless arrangements are made in advance.
- View Specification 01 1200 - Contract Summary for more information.

Official Documented Meeting Minutes
Delivery of equipment will be sent to outside the facility in a warehouse. Unit can be disassembled or adjusted prior to bringing into facility to be staged near the building (Tool Shop/Maintenance Shop). Work performed inside facility will require check in for tools and equipment.

Working hours preferred will be 6:45-2:45. later will be OK but no work past 4:00pm and time to check in / out needs to be considered.

ASP staff will be escorting the workers too and from site.

RFB Overview

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.1	1	Bid Submission				Open

Description

- Bids are due ***02:00PM, Tuesday April 1st, 2025***
- The Bid shall be submitted to the Issuing Officer through the IMPACS Electronic Procurement System.
    - Link and information is in the project manual
    - Contractors will need to register prior to bidding
    - Bidders will need to register regardless of whether it has already done business with the State of Iowa.
    - Bidders should complete the registration process and ensure the ability to log in as soon as possible to ensure Bids can be submitted on the due date.
    - Please make sure the electronic documents submitted contain any required signatures. Digital signatures will be accepted.
- Bid Opening will be held via conference call on ***03:00PM, Tuesday April 1st, 2025***
- Contractor shall reference section 00 0116 for the bid submittal checklist
    - Bid Proposal Information
    - Non Discrimination Clause Information
    - Contractor Targeted Small Business Enterprise Pre-Bid Contract Information
    - Bid Security – 5% of total Bid amount
- Apparent low bidder will be required to submit subcontractor/supplier list 48hrs after the bid opening

Official Documented Meeting Minutes
IMPACS will be used for submissions, Site Visit forms to be attached with Bidding.

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.2	1	Bid Schedule				Open

Description

- Questions/Substitutions Due in Writing to Construction.Procurement@iowa.gov: ***02:00PM, Tuesday March 25th, 2025***
- Addendum Issued: ***Week of March 24th, 2025, following questions***
- Bids Due: ***02:00PM, Tuesday April 1st, 2025***
- Tentative NOI Issued: ***April 2nd, 2025-April 4th, 2025 following review of bids.***

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.3	1	Administrative Details				Open

Description

- Contractors will sign a modified ConsensusDocs 802. Example in the project manual.
- Project-specific Certificate of Insurance must be provided prior to contract execution. Follow example in the project manual and limits in the 802.
- Project-specific P&P bonds must be provided prior to contract execution.
- Successful contractor must turn in their list of subcontractors and suppliers within 48 hours of the bid.
- DAS will provide tax exempt certificates upon request.
- Procore will be used for all project management, at no cost to the trade contractor.
    - Submittals, Invoicing, RFIs, ASIs, PRs, RFQs
    - Contracts, Change Orders and Certificates of Substantial and Final Completion will also use Docusign
- Contractor Schedule of Values shall be broken out as specified in the project manual.

- SOV must contain a closeout line item for at least 1% of the total contract value.
- This line item can only be invoiced once the certificate of final completion has been signed by all parties.

Official Documented Meeting Minutes
Subcontractor and Supplier list needed with submission of bid or within 48 hours of bid per state law.

P&P Bonds and COI needed prior to signing of 802 Agreement.

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
3.4	1	Pre-Bid Site Visits				Open

Description
Review staging and routing into Mechanical Room.

Official Documented Meeting Minutes
Team reviewed routing and measured doorway openings on site.

Questions

No.	Mtg Origin	Title	Assignment	Due Date	Priority	Status
4.1	1	Questions				Open

Description
Submit all questions in writing to construction.procurement@iowa.gov.

Official Documented Meeting Minutes
Questions asked during meetings;

1. What was the project budget? (Project Construction Budget is $309,500. Equipment is not included and already figured.)
2. Are line sets included from Mechanical Sales? (NO)
3. What is the thickness of the walls to drill into mechanical room. (Assumed 4 feet thick as noted on drawings)
4. Is Pro Press ok on the line sets (Pro Press is ok up to 1 3/8")
5. Can the electrical for the exterior condensing unit be spliced at the pull box rather than re-feed? (the entire branch circuit is being enlarged to accommodate the larger condenser unit and it is assumed the existing circuit is insufficient to handle the increased ampacity so the entire circuit is to be replaced.)
6. What warranty concerns is there with tearing down/disassembling the unit procured from Mechanical Sales? (Tim Grossman with mechanical sales informed that Mechanical Sales will check the unit when completing start up. Its the responsibility of the contractor to reassemble. No issues with warranty, Daikin will honor the warranty.)

Sign In Sheet

Meeting #01 3/18/25

Noah Thelen	McGough	Noah.thelen@McGough
B.J. Kasuga	IMEG	william.j.kasuga@imegcorp.com
Scot Geisler	Universal Climate Control	sgeisler@ucchvac.com
Lisa Oswald	ASP	lisa.oswald2@iowa.gov
Boyd Hoyt	ASP	
Heath Engelbart	Nelson Electric	Heathe@Nelsonelectric.com
Brandon Adams	DAS	Brandon.adams@iowa.gov

Meeting #02
3/20/25

Sign in Sheet — ASP LUA A/E

Noah Thelen	McGough	Noah.thelen@mcgough.com
Ted Chumbley	McGough	ted.chumbley@mcgough.com
Boone McDermott	Climate engineers	Bmcdermott@Climate-engr.com
TOM GROMMON	D+S SHEETMETAL	TGROMMON@DS-SHEETMETAL.COM
JEFF FRICK	TRICON	TRICONCG.COM
Denny Meyer	Fosters Krans	dennym@fosterskrans.com
Boyd Hoyt	ASP	
Josh Frank	PipePro Inc	jfrank@pipeproinc.com
Josh Ague	PipePro Inc	jague@pipeproinc.com
DARIN FOREMAN	FOREMAN CONSTRUCTION	DARIN@FOREMANCONSTRUCT.COM
Brandon Adams	DAS	brandon.adams@iowa.gov
John Lokenvitz	WALDINGER	
Josh Martin	Waldinger	josh.martin@waldinger.com

Limited Asbestos and Lead Paint Survey Report

9451.00 ASP-IA DOC – Anamosa Penitentiary LUA A/C Replacement

Anamosa State Penitentiary (ASP)

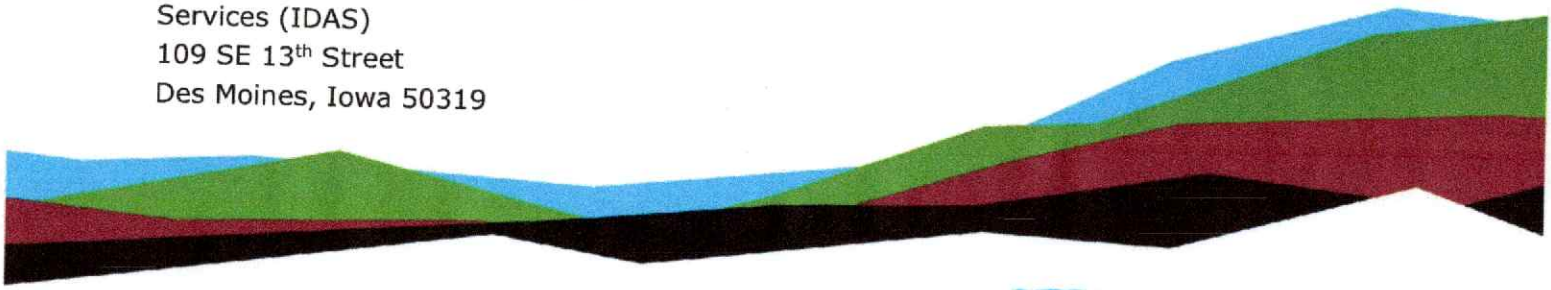
406 N High Street

Anamosa, Iowa 52205

March 19, 2025 | Report Number: 06257019

Prepared for:

Iowa Department of Administrative Services (IDAS)
109 SE 13th Street
Des Moines, Iowa 50319



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March 19, 2025

Iowa Department of Administrative Services (IDAS)
109 SE 13th Street
Des Moines, Iowa 50319

Attn: Mr. Brandon Adams
P: 515-725-1273
E: brandon.adams@iowa.gov

Re: Limited Asbestos and Lead Paint Survey Report
9451.00 ASP-IA DOC – Anamosa State Penitentiary LUA A/C Replacement
Anamosa State Penitentiary (ASP)
406 N High Street
Anamosa, IA 52205
Terracon Project No. 06257019

Dear Mr. Adams:

Terracon Consultants, Inc. (Terracon) is pleased to submit this limited asbestos and lead paint survey report to the Iowa Department of Administrative Services (IDAS or Client) for the above-referenced project. The purpose of this report is to present the results of the asbestos and lead paint sampling performed on March 3 and 10, 2025, at 406 North High Street, Anamosa, Iowa in anticipation of the above referenced project. This survey was conducted in general accordance with Terracon's Proposal (P06257019) dated February 12, 2025, and IDAS Contract DP-9451.00.

Asbestos was identified in residual thermal system insulation in the LUA mechanical room. Additionally, lead was identified in the blue paint chip sample collected from the Mechanical Room air handler. Please refer to the attached survey report for additional details.

Terracon appreciates the opportunity to provide this service to IDAS. If you have questions regarding this report, please contact Jordan at (319) 363-8298.

Sincerely,
Terracon Consultants, Inc.

Jordan Smith
Staff Scientist

Rush Bowers, CIH, CSP
Senior Industrial Hygiene Consultant

Table of Contents

Appendices

1.0 Project Overview

1.1 Project Objective

Terracon Consultants, Inc. (Terracon) conducted a limited asbestos and lead paint survey of the Anamosa State Penitentiary (ASP) in the Living Unit A (LUA) mechanical room and associated exterior condensing unit. The survey was limited to select areas that are to be disturbed during planned replacement of the interior air handler and exterior condenser as generally depicted in the IMEG plan *9451.00 DOC ASP LUA A/C Replacement* (Plans) dated December 12, 2024. The survey was conducted by Mr. Wyatt Heisterkamp, State of Iowa-licensed asbestos inspector, in general accordance with the Terracon Proposal (P06257019) dated February 12, 2025. Utilities in the mechanical room and LUA were live at the time of the survey.

We understand the asbestos survey was requested in support of planned air handler and exterior condensing unit replacement activities in the LUA Mechanical Room, and to satisfy requirements of the United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 61, Subpart M, the National Emission Standards for Hazardous Air Pollutants (NESHAP). Terracon also understands that the intent of the assessment is to assist the client with communicating the presence, location, and quantity of asbestos-containing material (ACM) to employees, vendors, and contractors working in the building in order to meet the requirements of the Occupational Safety and Health Administration (OSHA) communication of hazard requirements found at 29 CFR 1926.1101. The purpose of this survey was to sample and identify suspect ACM and provide information regarding the identity, location, condition, and approximate quantities of ACM in the areas surveyed.

In addition to the asbestos survey efforts, a lead paint survey was requested for the painted surfaces in the mechanical room and on the condensing unit. The purpose of the paint survey was to assess for the presence of lead in coatings on materials that may be affected by repairs, evaluate the potential for airborne exposure to workers involved in renovation activities, and assess for the presence of lead coated materials that that may require special handling for removal and disposal.

1.2 Reliance

This report is for the exclusive use of IDAS and the ASP. Reliance by any other party is prohibited without written authorization of Terracon and IDAS. Reliance on this report by IDAS and all authorized parties is subject to the terms, conditions, and limitations stated in the signed agreement for services and this report.

2.0 Survey Area Description

The survey area generally consisted of the following areas as referenced in the *Plans*:

- LUA Mechanical Room
- Exterior condenser unit adjoining LUA Mechanical Room

Finishes and construction of the general survey areas consisted of concrete masonry unit (CMU) block walls and concrete ceilings, limestone walls on the exterior, and heating, ventilating, and air conditioning (HVAC) utilities. See Appendix C, Exhibit 1 for general locations of the survey area.

3.0 Field Activities

The survey was conducted by Mr. Wyatt Heisterkamp, state of Iowa licensed asbestos inspector (license number 24-12275) on March 3, 2025. A copy of his asbestos inspector license is included in Appendix E. The asbestos survey was conducted in accordance with the sample collection protocols established in USEPA 40 CFR 763.86, Sampling. A summary of survey activities is provided below.

3.1 Asbestos Survey

3.1.1 Asbestos Visual Inspection

Survey activities were initiated with visual observation of select portions of the mechanical room, specifically focusing on the HVAC and condensing unit (exterior). A homogeneous area (HA) consists of a material that appears similar throughout in terms of color and texture with consideration given to the date of application.

Although reasonable effort was made to survey accessible suspect materials, additional suspect but unsampled materials could be located in the subsurface, or in other concealed areas or areas where investigation was not feasible without significant damage and/or excavation.

3.1.2 Asbestos Visual Assessment

A physical assessment of each HA of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the USEPA as a material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

3.1.3 Asbestos Sample Collection

Based on the results of the visual observation, bulk samples of suspect ACM were collected in accordance with the sampling protocols outlined in 40 CFR 763.86 – Sampling. Samples of suspect materials were collected from randomly selected locations in each HA. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker. The selection of sample locations and frequency of sampling were based on Terracon's observations and the assumption that like materials in the same area are homogenous in content.

It should be emphasized that ACMs could be present in inaccessible areas such as walls, voids, or other concealed areas, and areas beyond the limitations of this survey. In the event that materials are discovered during the project that have not been characterized, they should be sampled prior to disturbance to determine if they contain asbestos or they can be assumed to contain asbestos and appropriately abated.

Terracon collected 12 bulk samples from four HAs of suspect ACM in the survey area. A complete list of sampled materials is included in Table 1 in Appendix A, and as part of the chain of custody (COC) presented in Appendix B.

3.1.4 Asbestos Sample Analysis

Bulk samples were submitted under COC to EMSL Analytical, Inc. (EMSL) in Indianapolis, Indiana for analysis by polarized light microscopy (PLM) with dispersion staining techniques in accordance with USEPA's *Method for the Determination of Asbestos in Bulk Building Materials* (600/R-93-116). The asbestos content, if present, was determined by microscopic visual estimation. EMSL is National Voluntary Laboratory Accreditation Program (NVLAP) accredited (lab code 200188-0). EMSL separated multilayered samples into individual layers; the laboratory analyzed a total of 12 individual layers from samples collected from survey area.

EMSL's laboratory analytical report and the COC are included in Appendix B.

3.2 Paint Survey

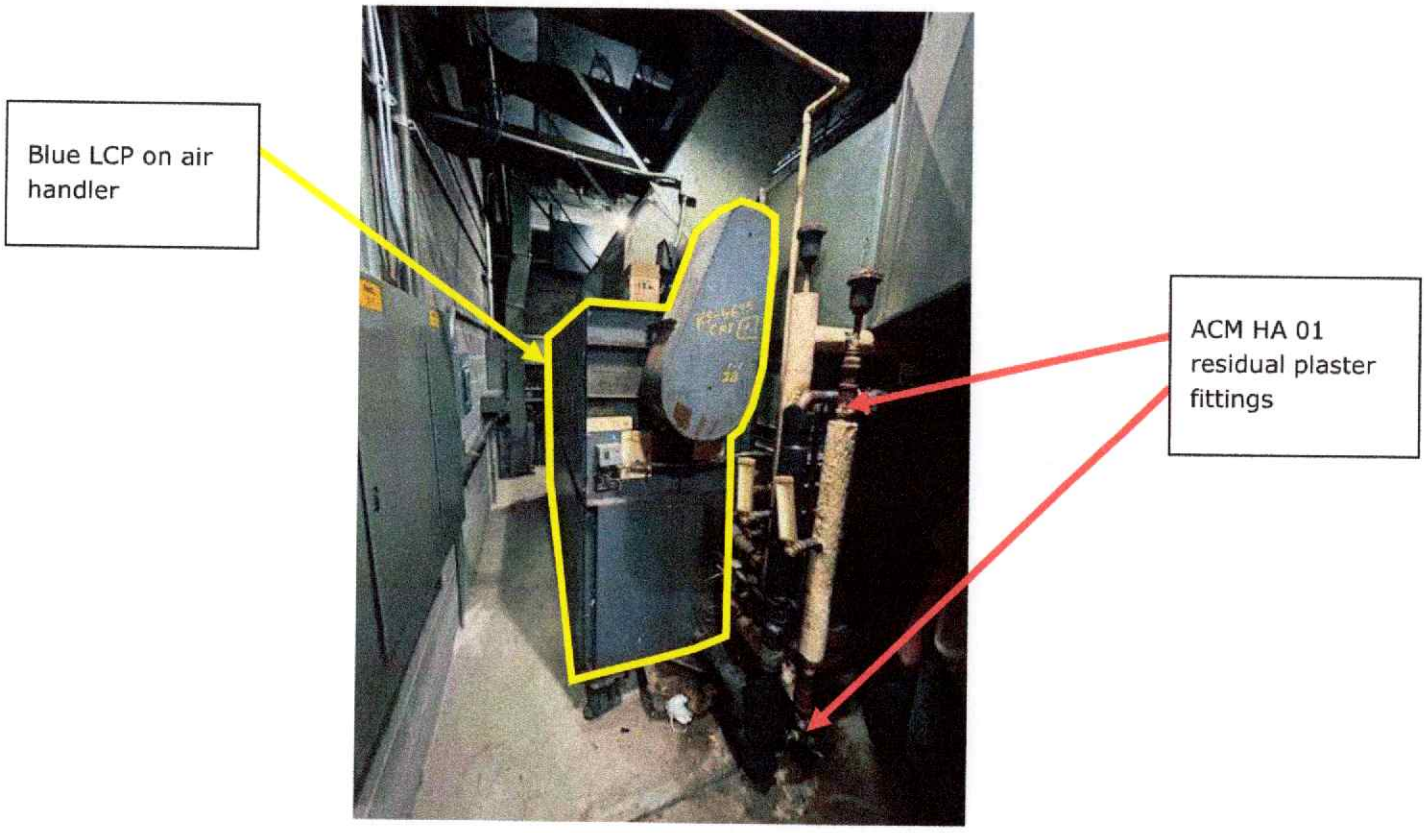
The paint survey portion of the survey was completed by Mr. Wyatt Heisterkamp concurrently with the asbestos survey. Mr. Jordan Smith returned on March 10, 2025, to sample the blue paint from the air handler unit that was unable to be analyzed from the initial sample due to insufficient sample volume.

Terracon collected two bulk paint samples from painted substrates likely to be impacted by the project. Terracon utilized a wood chisel, and a write-on, sealable sample bag to collect paint chips from the archway grates. The sample was delivered under COC to EMSL for analysis of lead by USEPA SW-846 Methods 3050B *Acid Digestion of Sediments, Sludges,*

and Soils and 7000B *Flame Atomic Absorption Spectrophotometry*. EMSL is ELLAP accredited (lab code 157245).

4.0 Findings and Recommendations

The analytical laboratory reported a concentration of 3% Chrysotile asbestos in the samples of residual plaster ("mudded")fittings associated with the LUA Mechanical Room HVAC unit. The material was not observed in large quantities or in one piece. It appeared as though most of the material had been removed, but small amounts of residual material remained. Additionally, lead was reported in the blue paint sample collected from the air handler unit. The photo below provided by McGough shows the approximate location of the residual plaster fittings and blue paint[1].



Residual mudded fittings

Table 1 in Appendix A provides a description of the asbestos samples collected as part of this project, and Table 2 provides a description of the paint chip samples collected. EMSL's laboratory analytical report and the COC are included in Appendix B.

[1] There is additional LCP on the air handling equipment to the south of the air handling unit pictured.

The residual asbestos-containing plaster fittings should be removed by a state of Iowa licensed asbestos abatement contractor prior to any renovation work that may disturb it. If additional but unsampled suspect ACMs are discovered during repair activities, the materials must be assumed to contain asbestos and treated as such unless sampled by an accredited inspector and laboratory analysis determines otherwise. Also, per state regulations, please be aware that the owner and/or operator must notify the Iowa Department of Natural Resources (IDNR) 10 business days prior to demolition or renovation (of load bearing members) activities.

Contractors should be notified of the presence of lead in the blue paint on the air handler so that they may make appropriate decisions about protecting their employees from lead exposure. The limited paint sampling is not to be construed as a comprehensive paint survey and is based upon observations obtained from a limited and targeted assessment. The painting history of any given location in an older building often will vary from point to point due to factors including variability in paints used, paint film thickness, variable retention of older paint layers before repainting, demolition or installation of walls during renovations, and unknown historic non-homogenous painting schemes. As such, a given color and building component combination that is currently apparent often will not provide consistent testing results for lead. The information contained herein is limited to the specific areas assessed within or in proximity to the sample location. This survey is not considered to be comprehensive in nature and the results are not intended to be used to determine lead hazards, develop abatement plans, or prepare detailed cost estimates for abatement.

OSHA 29 CFR 1926.62 Subpart D, Lead, applies to all construction work where an employee may be occupationally exposed to lead. All work related to construction, alteration, or repair (including painting and decorating) is included. The lead standard applies to any detectable concentration of lead in paint, as even small concentration of lead can result in unacceptable employee exposures depending upon the method of removal and other workplace conditions. The employer must communicate information concerning lead hazards and communicating information concerning hazards and appropriate protective measures to employees, including training. Where lead is present, it should be assumed that workers will be exposed to lead above the action level and personal protective measures (based on the type of disturbance) should be implemented until an exposure assessment is completed.

If plans are modified, resulting in disturbance to painted surfaces not sampled that would potentially generate paint dust, additional assessment may be required to assess potential worker exposure to lead. OSHA lead-safe work practices, during renovation, painting, and construction activities should be utilized.

If waste materials containing lead are generated, they may be regulated as hazardous waste. Lead waste from renovation activities, such as debris, paint chips, dust, and sludges, that exhibit the toxicity characteristic must be managed and disposed of as hazardous waste under the Resource Conservation and Recovery Act (RCRA), except whole-building

demolition debris. The hazardous waste criterion for lead wastes is established under RCRA, Subtitle C, as 5.0 milligrams per liter (mg/L) measured by the Toxicity Characteristic Leaching Procedure (TCLP).

5.0 Limitations and General Comments

Reasonable efforts to access suspect materials within known areas of restricted access. The Client should understand the limitations associated with this survey.

This survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our survey of the project area. The information contained in this report is relevant to the date on which this survey was performed and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by IDAS and ASP. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information that may have been used in the preparation of this report. No warranty, express or implied is made.

Appendix A: Table 1 – Asbestos Sample Summary

Terracon

Table 1
Asbestos Sample Summary

HA[2] #	Sample ID	Material Description	Material Location	Sample Location	Total Asbestos Percentage and Type	NESHAP Category[3]	Condition[4]	Estimated Quantity[5]/Notes
01	01-MJ5-01	Residual mudded fittings on hot water pipes	Hot water pipe joints	Bottom of southern-most pipe T joint 5.5' high	3% Chrysotile	Friable	Good	5 fittings
	01- MJ5-02			Bottom of southern-most pipe below threshold 2.5' high	3% Chrysotile			
	01-MJ5-03			Just above fiberglass TSI of northern-most pipe 6' high	3% Chrysotile			
02	02-MA2-04	CMU block walls	LUA Mechanical Room walls	8' east of entrance door 2' high 3.5 blocks	None-detected (ND)	NA	Good	NA
	02-MA2-05			52 blocks high 3 blocks south top right corner room northeast wall	ND			
	02-MA2-06			10' east of entrance door 10" north 3" down from electrical box	ND			
03	03-MA4-07	Grout associated with HA-02	LUA Mechanical Room walls	8' east of entrance door 2' high 3.5 blocks high	ND	NA	Good	NA
	03-MA4-08			East wall 3 blocks high 3 blocks S top right corner from northeast Wall	ND			

[2] HA indicates homogenous area

NA = Not applicable to materials containing no asbestos

[4] Good (little or no visible damage or deterioration, or showing only very limited damage or deterioration); Damaged (area of damage is less than 10% if evenly distributed, or less than 25% if localized); Significantly Damaged (area of damage is greater than 10% evenly distributed, or greater than 25% if localized)

[5] Estimated quantities are based on a cursory field evaluation and actual quantities may vary significantly, especially if ACMs are present in hidden and/or inaccessible areas not evaluated as part of this survey.

Terracon

Table 2
Paint Sample Summary

Sample ID	Material Description	Material Location	Sample Location	Lead Concentration (% weight)
Pb-1R[6]	Blue paint	Air handler	North side of air handler	1.2 % wt
Pb-2	Red paint	Exterior condenser	Northwest corner of condenser	<0.028 % wt

[6] Original sample had insufficient amount of material to be analyzed. Sample recollected on March 10, 2025.

Appendix B: Laboratory Analytical Report and COC

EMSL Analytical, Inc.
6340 CastlePlace Dr. Indianapolis, IN 46250
Tel/Fax: (317) 803-2997 / (317) 803-3047
http://www.EMSL.com / indianapolislab@emsl.com

EMSL Order: 162502689
Customer ID: ACON77
Customer PO: 06257019
Project ID:

Attention: Jordan Smith
Terracon Consultants, Inc.
2640 12th Street Southwest
Cedar Rapids, IA 52404

Phone: (319) 366-8321
Fax: (319) 366-0032
Received Date: 03/04/2025 9:36 AM
Analysis Date: 03/04/2025
Collected Date:

Project: 06257019 ASP A/C Replacement 406 N High Street

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
01-MJ5-01 *162502689-0001*	Bottom of souther most pipe T joint 5.5 high - Hot Water Pipe Joints	White/Rust Non-Fibrous Homogeneous		97% Non-fibrous (Other)	**3% Chrysotile**
			HA: 01		
01-MJ5-02 *162502689-0002*	Bottom of southern most pipe below threshold 2.5 high - Hot Water Pipe Joints	White/Rust Non-Fibrous Homogeneous		97% Non-fibrous (Other)	**3% Chrysotile**
			HA: 01		
01-MJ5-03 *162502689-0003*	Just above fiberglass TSI of north most pipe 6' high - Hot Water Pipe Joints	White/Rust Non-Fibrous Homogeneous		97% Non-fibrous (Other)	**3% Chrysotile**
			HA: 01		
02-MA2-04 *162502689-0004*	8' east of entrance door 2' high 3.5 blocks - Walls of AC Room	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 02		
02-MA2-05 *162502689-0005*	52 blocks high 3 blocks south top right corner room NE Wall - Walls of AC Room	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 02		
02-MA2-06 *162502689-0006*	10' E of entrance door 10" N 3" down from electrical box - Walls of AC Room	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 02		
03-MA4-07 *162502689-0007*	8' East of entrance door 2' high 3.5 blocks high - Walls of AC Room	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 03		
03-MA4-08 *162502689-0008*	E wall 3 blocks high 3 blocks S top right corner from NE Wall - Walls of AC Room	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 03		
03-MA4-09 *162502689-0009*	10'E of entrance door 10" N 6" high from electrical box - Walls of AC Room	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 03		
04-MA3-10 *162502689-0010*	5' high E Exterior Wall; NE Corner of 4th pillar of N - Exterior of Builder	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 04		

Report amended: 03/04/2025 14:22:18 Replaces initial report from: 03/04/2025 12:57:18 Reason Code: Client-Change to Appearance

EMSL Analytical, Inc.
6340 CastlePlace Dr. Indianapolis, IN 46250
Tel/Fax: (317) 803-2997 / (317) 803-3047
http://www.EMSL.com / indianapolislab@emsl.com

EMSL Order:	162502689
Customer ID:	ACON77
Customer PO:	06257019
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
04-MA3-11 *162502689-0011*	2' down 6" S of N bottom corner of window N of 4th pillar - Exterior of Builder	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 04		
04-MA3-12 *162502689-0012*	5' high, S corner of short pillar N of 4th pillar - Exterior of Builder	Gray Non-Fibrous Homogeneous		20% Quartz 80% Non-fibrous (Other)	None Detected
			HA: 04		

Analyst(s)
Maggie Hayden (8)
Sean O'Donnell (4)

Melissa Newkirk
Asbestos Laboratory Manager
or Other Approved Signatory

Report amended: 03/04/2025 14:22:18 Replaces initial report from: 03/04/2025 12:57:18 Reason Code: Client-Change to Appearance

EMSL Analytical, Inc.

6340 Castleplace Drive, Indianapolis, IN, 46250
Telephone: 317.803.2997 Fax:317.803.3047
www.emsl.com

EMSL Order ID: 162552548
LIMS Reference ID: CD52548
EMSL Customer ID: ACON77

Attention: Jordan Smith
Terracon Consultants, Inc. [ACON77]
2640 12th Street Southwest
Cedar Rapids, IA 52404
(319) 366-8321
jordan.smith@terracon.com

Project Name: ASP LUA A/C/06257019
Customer PO:
EMSL Sales Rep: Jason McDonald
Received: 03/04/2025 09:36
Reported: 03/07/2025 08:31

Analytical Results

Analyte	Results	RL	Weight(g)	Prep Date & Tech	Prep Method	Analysis Date & Analyst	Analytical Method	Q	DF
Client Sample ID: PB2/NW corner of exterior AC condensor									
Matrix: Chips									
								Date Sampled: 03/03/25	
								LIMS Reference ID: CD52548-02	
Lead	<0.028 % wt	0.028 % wt	0.0574	03/05/25 CG	SW-846 3050B	03/05/25 CG	SW 846-7000B		1
Sample Comments:									

EMSL Analytical, Inc.

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Telephone: 317.803.2997 Fax:317.803.3047
www.emsl.com

EMSL Order ID: 162552548
LIMS Reference ID: CD52548
EMSL Customer ID: ACON77

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(319) 366-8321
jordan.smith@terracon.com

Project Name: ASP LUA A/C/06257019
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EMSL Sales Rep: Jason McDonald
Received: 03/04/2025 09:36
Reported: 03/07/2025 08:31

Work Order Case Narrative

Insufficient mass for sample #1; unable to perform analysis.

EMSL Analytical, Inc.

6340 Castleplace Drive, Indianapolis, IN, 46250
Telephone: 317.803.2997 Fax:317.803.3047
www.emsl.com

EMSL Order ID: 162552548
LIMS Reference ID: CD52548
EMSL Customer ID: ACON77

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Cedar Rapids, IA 52404
(319) 366-8321
jordan.smith@terracon.com

Project Name: ASP LUA A/C/06257019
Customer PO:
EMSL Sales Rep: Jason McDonald
Received: 03/04/2025 09:36
Reported: 03/07/2025 08:31

Certified Analyses included in this Report

Analyte	Certifications
SW 846-7000B in Chips	
Lead	16-OHDOH,16-AIHA ELLAP

List of Certifications

Code	Description	Number	Expires
16-MO	Missouri Drinking Water	10180	03/31/2026
16-NYDOH	New York Potable Water, Metals Solid and Hazardous Waste - Asbestos	12130	04/01/2025
16-AIHA ELLAP	EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LLC ELLAP Accredited	157245	06/01/2025
16-AIHA IHLAP	EMSL Analytical, Inc. Indianapolis, IN AIHA-LAP, LLC IHLAP Accredited	157245	06/01/2025
16-CA ELAP	California Metals in DW, Chemistry and Bulk Asbestos in Hazardous Waste	2575	06/30/2025
16-A2LA Food	A2LA Food Microbiology	2845.11	01/31/2026
16-A2LA Chemistry	A2LA Environmental and Chemistry	2845.25	01/31/2026
16-IN Metals/Asbestos	Indiana Lead and Metals and Asbestos in Drinking Water	C-49-09	12/31/2026
16-OHDOH	Ohio - Lead in Paint Chips, Wipes, Soil and Air	E10040	05/03/2025
16-FLDOH	Florida Asbestos and Metals in Drinking Water, PCBs	E871170	06/30/2025
16-NJDEP	New Jersey Metals, Organics and Inorganics in DW PCBs	IN002	06/30/2025
16-IN Colilert/HPC	Indiana Colilert and HPC	M-49-06	12/31/2026

Please see the specific Field of Testing (FOT) on www.emsl.com <http://www.emsl.com> for a complete listing of parameters for which EMSL is certified.

Notes and Definitions

Item	Definition
(Dig)	For metals analysis, sample was digested.
[2C]	Reported from the second channel in dual column analysis.
DA	Direct Analysis
DF	Dilution Factor
MDL	Method Detection Limit.
ND	Analyte was NOT DETECTED at or above the detection limit.
NR	Spike/Surrogate showed no recovery.
Q	Qualifier
RL	Reporting Limit
Wet	Sample is not dry weight corrected.

Measurement of uncertainty and any applicable definitions of method modifications are available upon request. Per EPA NLLAP policy, sample results are not blank corrected.

EMSL Analytical, Inc.

6340 Castleplace Drive, Indianapolis, IN, 46250
Telephone: 317.803.2997 Fax:317.803.3047
www.emsl.com

EMSL Order ID: 162552780
LIMS Reference ID: CD52780
EMSL Customer ID: ACON77

Attention: Jordan Smith
Terracon Consultants, Inc. [ACON77]
2640 12th Street Southwest
Cedar Rapids, IA 52404
(319) 366-8321
jordan.smith@terracon.com

Project Name: ASP LUA A-C/06257018
Customer PO:
EMSL Sales Rep: Jason McDonald
Received: 03/11/2025 10:20
Reported: 03/11/2025 13:21

Analytical Results

Analyte	Results	RL	Weight(g)	Prep Date & Tech	Prep Method	Analysis Date & Analyst	Analytical Method	Q	DF
Client Sample ID: Pb-1R/LUA A-C Air Handler									
Matrix: Chips									
								Date Sampled: 03/10/25	
								LIMS Reference ID: CD52780-01	
Lead	1.2 % wt	0.062 % wt	0.2571	03/11/25 ET	SW-846 3050B	03/11/25 CG	SW 846-7000B		10
Sample Comments:									

EMSL Analytical, Inc.

6340 Castleplace Drive, Indianapolis, IN, 46250
Telephone: 317.803.2997 Fax:317.803.3047
www.emsl.com

EMSL Order ID: 162552780
LIMS Reference ID: CD52780
EMSL Customer ID: ACON77

Attention: Jordan Smith
Terracon Consultants, Inc. [ACON77]
2640 12th Street Southwest
Cedar Rapids, IA 52404
(319) 366-8321
jordan.smith@terracon.com

Project Name: ASP LUA A-C/06257018

Customer PO:
EMSL Sales Rep: Jason McDonald
Received: 03/11/2025 10:20
Reported: 03/11/2025 13:21

Aleksandrea Kuchenbrod

Aleks Kuchenbrod Laboratory Manager or other approved signatory

Analysis following EMSL SOP for the Determination of Environmental Lead by FLAA. The laboratory has a reporting limit of 0.0064% by wt., based upon a minimum sample weight of 0.25g submitted to the lab, and is not responsible for any result or reporting limit provided in mg/cm2 since it is dependent upon an area value provided by non-lab personnel. A "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty and definitions of modifications are available upon request. Results in this report are not blank corrected unless specified.

Appendix C: Exhibit 1 – Site Diagram

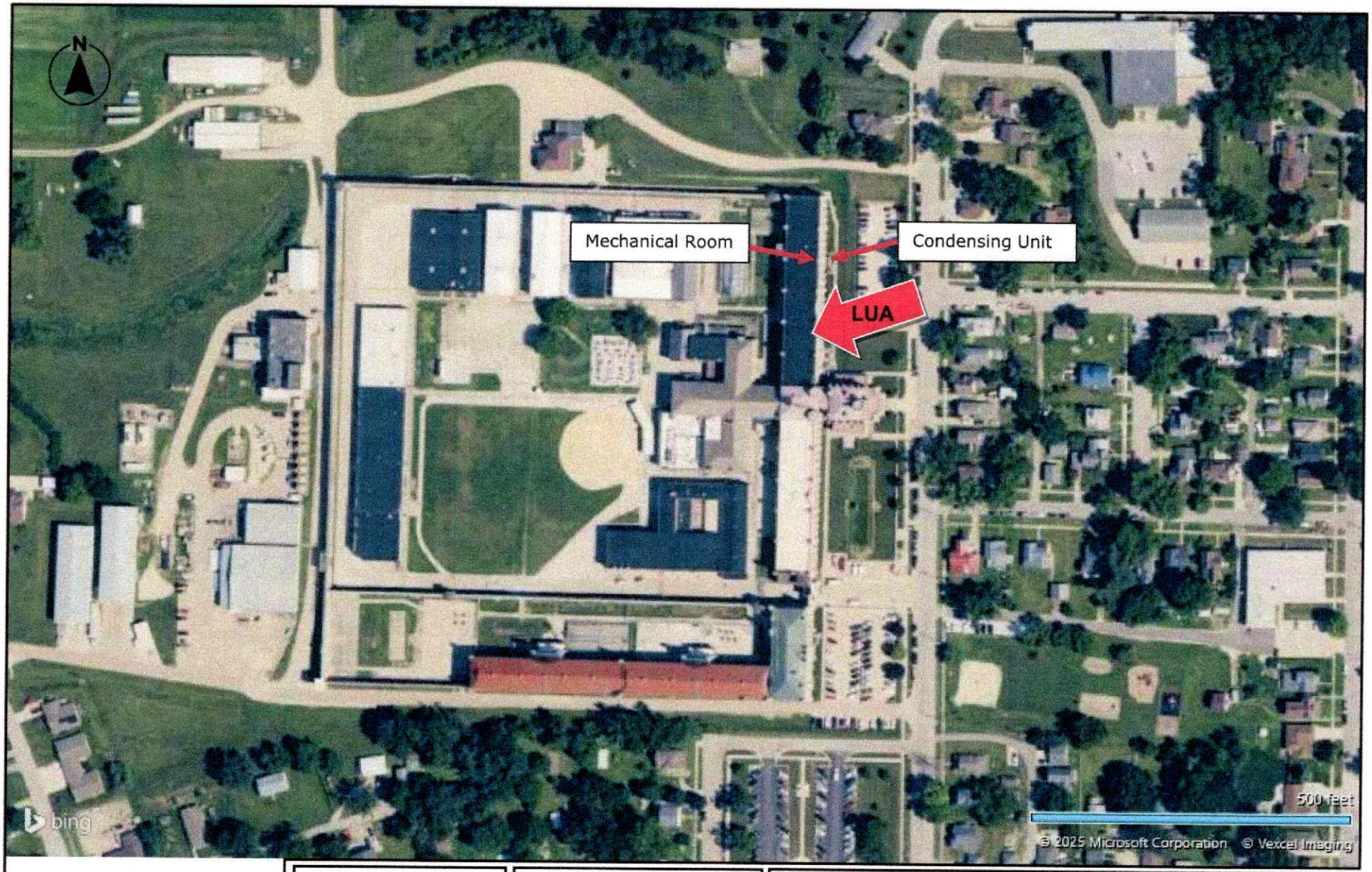


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project No.	06257019
Scale:	AS SHOWN
Client:	Iowa Department of
Date:	March 2025

Terracon
2640 12th St SW
Cedar Rapids, IA 52404-3440

SITE DIAGRAM

ASP LUA A-C Replacement Survey
406 N Hight Street
Anamosa, IA

Exhibit
1

Appendix D: Regulatory Overview

Asbestos Regulatory Overview

In Iowa, asbestos activities are regulated by the Iowa Department of Natural Resources (IDNR) and Iowa Workforce Development (IWD), Division of Labor. IDNR regulates asbestos fiber emissions under Iowa Administrative Code 567 Chapter 23 (IAC 567–23) and asbestos-containing waste disposal under IAC 567–109. IWD regulates occupational exposure to asbestos under IAC 875–10 and asbestos removal and encapsulation activities under IAC 875–155.

IAC 567–23.1(3) adopts the United States Environmental Protection Agency's (USEPA) asbestos NESHAP (40 Code of Federal Regulations (CFR) Part 61, Subpart M) by reference. Subpart M regulates asbestos fiber emissions and asbestos waste disposal practices. It also requires the identification and classification of existing building materials prior to renovation or renovation activity. Under NESHAP, asbestos-containing building materials are classified as friable, Category I nonfriable, or Category II nonfriable ACM. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Category I nonfriable ACM includes packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos. Category II nonfriable ACM are any materials other than Category I nonfriable materials that contain more than 1% asbestos.

Regulated ACM (RACM) must be removed before renovation or renovation activities that will disturb the materials. RACM includes:

- Friable ACM;
- Category I nonfriable ACM that has become friable or will be subjected to drilling, sanding, grinding, cutting, or abrading; and
- Category II nonfriable ACM that could be crumbled, pulverized, or reduced to powder during renovation or renovation activities.

The owner or operator must provide the IDNR and IWD with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities. Removal of RACM must be conducted by an Iowa-permitted asbestos abatement contractor.

IAC 875–155 Asbestos Removal and Encapsulation requires that any asbestos-related activity conducted in a public building be performed by personnel licensed or permitted by the IWD. Inspections for ACM must be conducted by IWD-licensed inspectors. Asbestos abatement must be performed by IWD-permitted asbestos abatement contractors. Management plans developed for the in-place management of asbestos-containing materials must be developed by an IWD-licensed management planner. When an abatement project design is prepared, it must be prepared by an IWD-licensed project designer.

IAC 875–10 adopts the Occupational Safety and Health Administration (OSHA) Asbestos standard for construction (29 CFR 1926.1101) by reference. The OSHA standard requires that employee exposure to airborne asbestos fibers be maintained below the permissible exposure limits (PEL) of 0.1 asbestos fiber per cubic centimeter of air (0.1 f/cc) as an 8-hour time-weighted average and 1.0 f/cc as a 30-minute excursion. The OSHA standard classifies construction and maintenance activities that could disturb ACM and specifies work practices and precautions that employers must follow when engaging in each class of regulated work.

Appendix E: Inspector License

WYATT HEISTERKAMP

DOB: 03-07-2001

Issued: 03-07-2001

This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
[illegible]	[illegible]	[illegible]

[illegible]

Asbestos

[illegible]
Larry Johnson, Jr.
Labor Commissioner

SUBSTITUTION REQUEST FORM

Project: DOC ASP LUA A/C Replacement

Substitution Request Number: 2

From: Drew Cross

To: IMEG Corp.

Date: 03/18/2025

A/E Project Number: 24006748.00

Re:

Specification Title: Hydronic Piping, Specialties

Description:

Section: 23 2100, 23 0548 Page: 3-4, 4

Article/Paragraph: 2.03A 2.05B 2.06B, 2.05B

Proposed Substitution: Hydronics

Manufacturer: American Wheatley Address: 2701 W Concord ST. Broken Arrow, OK 74012 Phone: (866) 204-5229

Trade Name: Model No.:

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☒ More than 10 years old

Differences between proposed substitution and specified product:

None

☒ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item:

VHF Sales, Inc. does not provide the specified items

Similar Installation:

Project: WRC Decentralization Phase 3 Architect: Cameron L. Manley

Address: 1251 334th St, Woodward, IA 50276 Owner: Iowa Department of Administrative Services

Date Installed: 9/20/2025

Proposed substitution affects other parts of Work: ☒ No ☐ Yes; explain

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Drew Cross

Signed by: Drew Cross

Firm: VHF Sales, Inc.

Address: 2655 SE Enterprise Drive, Grimes, IA 50111

Telephone: (515) 986-3671

Attachments:

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
☒ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Michael J. McCarty

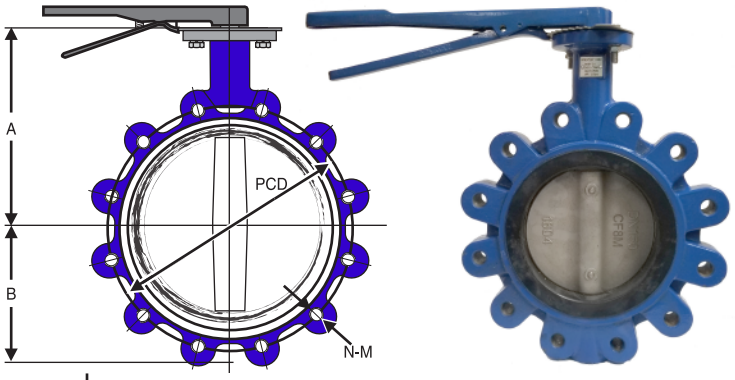
Digitally signed by Mike McCarty, PE
Date: 2025.03.24 08:11:44-05'00'

Date: March 24, 2025

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☒ A/E ☐

Buttefly Valves - Provide ball valves as specified.
.See other files for other products that were submitted in combine substitution request.

250lb Lug Style Butterfly Valve



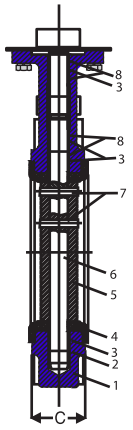
Features:

American Wheatley Butterfly Valves are designed for commercial and industrial applications up to 250 PSI.

- EPDM Seat
- Meets MSS-SP-67& API 609
- 250# WOG rated
- Maximum 225°F operating temperature (250°F intermittent)
- Seat to flange seal eliminates the need for flange gaskets
- Designed for direct actuator mounting with ISO 5211 mounting
- Available with 10 position lever handle or gear operator

Optional Features:

- PTFE, BUNA, and Viton seat



Materials of Construction

No.	Part Name	Materials
1	Body	Ductile Iron
2	Bushing	PTFE
3	O-Ring	EPDM
4	Seat	EPDM
5	Disc	316 Stainless Steel CF8M
6	Shaft	410 SS
7	Pin	SS316
8	Bushing	PTFE

PART NUMBER	SIZE	TOP TO CENTER LINE A (IN.)	CENTER LINE TO BASE B (IN.)	WIDTH C (IN.)	FLANGE BOLT TO BOLT CENTER DIA (IN.)	BOLT HOLE DIA (IN.)	WEIGHT LBS.
BFV-020L-250L	2”	6 1/3”	3 5/32”	1 5/8”	5”	8 5/8” - 11” UNC	17
BFV-025L-250L	2 1/2”	6 7/8”	3 1/2”	1 3/4”	5 7/8”	8 3/4” - 10” UNC	18
BFV-030L-250L	3”	7 1/8”	3 3/4”	1 3/4”	6 5/8”	8 3/4” - 10” UNC	20
BFV-040L-250L	4”	7 7/8”	4 1/2”	2”	7 7/8”	8 3/4” - 10” UNC	31
BFV-050L-250L	5”	8 1/8”	5”	2 5/32””	9 1/4”	8 3/4” - 10” UNC	35
BFV-060L-250L	6”	8 7/8”	5 1/2”	2 5/32”	10 5/8”	12 3/4” - 10” UNC	42
BFV-080L-250L	8”	10 1/4”	6 7/8”	2 1/3”	13”	12 7/8” - 10” UNC	66
BFV-100L-250L	10”	11 1/2”	8”	2 5/8”	15 1/4”	16” - 1” UNC	121
BFV-120L-250L	12”	13 1/4”	9 1/2”	3”	17 3/4”	16” - 1 1/8” UNC	138
BFV-080L-250G	8”	10 1/4”	6 7/8”	2 1/3”	13”	12 7/8” - 10” UNC	76
BFV-100L-250G	10”	11 1/2”	8”	2 5/8”	15 1/4”	16” - 1” UNC	129
BFV-120L-250G	12”	13 1/4”	9 1/2”	3”	17 3/4”	16” - 1 1/8” UNC	148

All packaging materials, thread protectors, plastic plugs and caps must be removed before installation.
Dimensions are subject to change without notice, please confirm actual dimensions with factory at time of order.

JOB NAME _____
LOCATION _____
_____
_____
CONTRACTOR _____
CONTRACTOR P.O. NO. _____

ITEMS	QUANTITY

American WHEATLEY HVAC PRODUCTS®
A GFP COMPANY
2701 W. Concord Street
Broken Arrow, OK 74012
Toll Free: 866-204-5229
PH: 918-317-0401
FAX: 918-317-0407
www.wheatleyhvac.com
e-mail: sales@globalflowproducts.com

SUBSTITUTION REQUEST FORM

Project: DOC ASP LUA A/C Replacement

Substitution Request Number: 2

From: Drew Cross

To: IMEG Corp.

Date: 03/18/2025

A/E Project Number: 24006748.00

Re:

Specification Title: Hydronic Piping, Specialties

Description:

Section: 23 2100, 23 0548 Page: 3-4, 4

Article/Paragraph: 2.03A 2.05B 2.06B, 2.05B

Proposed Substitution: Hydronics

Manufacturer: American Wheatley Address: 2701 W Concord ST. Broken Arrow, OK 74012 Phone: (866) 204-5229

Trade Name: Model No.:

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☒ More than 10 years old

Differences between proposed substitution and specified product:

None

☒ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item:

VHF Sales, Inc. does not provide the specified items

Similar Installation:

Project: WRC Decentralization Phase 3 Architect: Cameron L. Manley

Address: 1251 334th St, Woodward, IA 50276 Owner: Iowa Department of Administrative Services

Date Installed: 9/20/2025

Proposed substitution affects other parts of Work: ☒ No ☐ Yes; explain

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Drew Cross

Signed by: Drew Cross

Firm: VHF Sales, Inc.

Address: 2655 SE Enterprise Drive, Grimes, IA 50111

Telephone: (515) 986-3671

Attachments:

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
- ☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
- ☒ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: Michael J. McCarty

Digitally signed by Mike McCarty, PE
Date: 2025.03.21 16:36:44-05'00'

Date: March 21, 2025

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☒ A/E ☐ _____

Check Valve - product shall be screwed or soldered and bronze construction with horizontal swing.

See other files for other products that were submitted in combine substitution request.

American WHEATLEY HVAC PRODUCTS®

Flanged
Globe Style Non Slam Check Valve

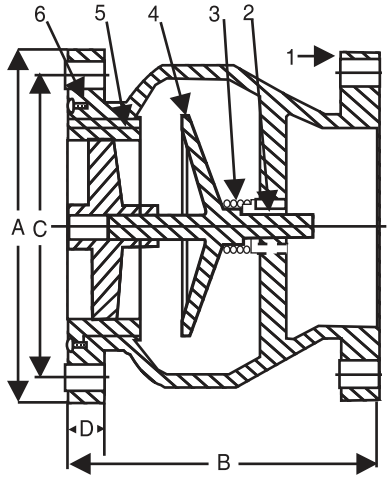
Engineered for silent operation, low head loss - plus....

Features:

- Designed to eliminate water hammer
- Low Pressure loss
- Provides maximum efficiency
- Compact design flange face to flange face
- Valve activated at low psi, 1/4 - 1/2
- Sizes 2” - 16”

Optional Features:

- Trim Material
- Additional materials and pressure classifications available
- Larger sizes POA



ANSI CLASS 125

PART NUMBER	SIZE	A	B	C	D	WEIGHT (lbs.)	BOLT SIZE	NO. OF BOLTS
SGB020	2”	6”	5 1/4”	4 3/4”	13/16”	17	5/8”	4
SGB025	2 1/2”	7”	5 1/2”	5 1/2”	11/16”	23	5/8”	4
SGB030	3”	7 1/2”	6”	6”	15/16”	30	5/8”	4
SGB040	4”	9”	7 1/4”	7 1/2”	15/16”	42	5/8”	8
SGB050	5”	10”	8 1/2”	8 1/2”	15/16”	53	3/4”	8
SGB060	6”	11”	9 3/4”	9 1/2”	1”	75	3/4”	8
SGB080	8”	13 1/2”	12 1/2”	11 3/4”	1 1/8”	134	3/4	8
SGB100	10”	16”	15 1/2”	14 1/4”	1 13/16”	177	7/8”	12
SGB120	12”	19”	14 1/4”	17”	1 1/4”	276	1”	12
SGB140	14”	21”	15 3/4”	18 3/4”	1 3/8”	407	1”	12
SGB160	16”	25 3/4”	17 5/8”	21 1/4”	1 7/16”	567	1”	16

ANSI CLASS 250

PART NUMBER	SIZE	A	B	C	D	WEIGHT (lbs.)	BOLT SIZE	NO. OF BOLTS
SGB020	2”	6 1/2”	5 1/4”	4 3/4”	5/8”	17	3/4”	8
SGB025	2 1/2”	7 1/2”	5 1/2”	5 7/8”	1”	23	3/4”	8
SGB030	3”	8 1/4”	6”	6 5/8”	1 1/8”	30	3/4”	8
SGB040	4”	10”	7 1/4”	7 7/8”	1 1/4”	41	3/4”	8
SGB050	5”	11”	8 1/2”	9 1/4”	1 3/8”	57	3/4”	8
SGB060	6”	12 1/2”	9 3/4”	10 5/8”	1 7/16”	76	3/4”	12
SGB080	8”	15”	12 1/2”	13”	1 5/8”	134	7/8”	12
SGB100	10”	17 1/2”	15 1/2”	15 1/4”	1 7/8”	177	1”	16
SGB120	12”	20 1/2”	14 1/4”	17 3/4”	2”	276	1 1/8”	16

Bill of Materials

Part No.	Part Name	Material
1	Body	Cast Iron
2	Seat	Bronze
3	Plug	Bronze
4	Spring	Stainless Steel
5	Bushing	Bronze
6	Screw	Stainless Steel

All packaging materials, thread protectors, plastic plugs and caps must be removed before installation.

Dimensions are subject to change without notice, please confirm actual dimensions with factory at time of order.

JOB NAME _____
LOCATION _____
_____
_____
CONTRACTOR _____
CONTRACTOR P.O. NO. _____

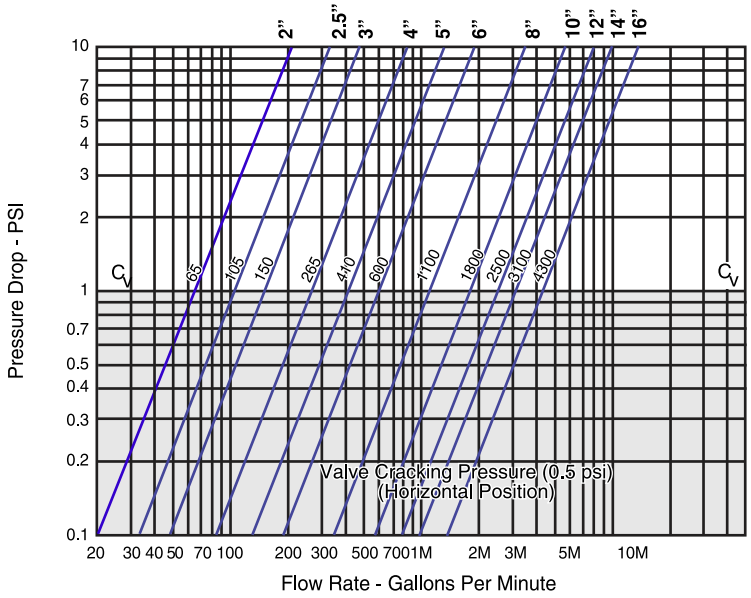
ITEMS	QUANTITY

American WHEATLEY HVAC PRODUCTS®
A GFP COMPANY
2701 W. Concord Street
Broken Arrow, OK 74012
Toll Free: 866-204-5229
PH: 918-317-0401
FAX: 918-317-0407
www.wheatleyhvac.com
e-mail: sales@globalflowproducts.com

Recommended Maximum GPM per Valve Size/Flow Velocity of 10 F.P.S.

2”	100 GPM
2 1/2”	150 GPM
3”	225 GPM
4”	400 GPM
5	625 GPM
6	900 GPM
8”	1600 GPM
10”	2500 GPM
12”	3500 GPM
14”	4250 GPM
16”	5500 GPM

Pressure Drop Chart



American WHEATLEY HVAC PRODUCTS® A GFP COMPANY

2701 W. Concord Street, Broken Arrow, OK 74012
Toll Free: 866-204-5229 PH: 918-317-0401
Fax: 918-317-0407
www.wheatleyhvac.com e-mail: sales@globalflowproducts.com

SUBSTITUTION REQUEST FORM

Project: DOC ASP LUA A/C Replacement

Substitution Request Number: 2

From: Drew Cross

To: IMEG Corp.

Date: 03/18/2025

A/E Project Number: 24006748.00

Re:

Specification Title: Hydronic Piping, Specialties

Description:

Section: 23 2100, 23 0548 Page: 3-4, 4

Article/Paragraph: 2.03A 2.05B 2.06B, 2.05B

Proposed Substitution: Hydronics

Manufacturer: American Wheatley Address: 2701 W Concord ST. Broken Arrow, OK 74012 Phone: (866) 204-5229

Trade Name: Model No.:

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☒ More than 10 years old

Differences between proposed substitution and specified product:

None

☒ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item:

VHF Sales, Inc. does not provide the specified items

Similar Installation:

Project: WRC Decentralization Phase 3 Architect: Cameron L. Manley

Address: 1251 334th St, Woodward, IA 50276 Owner: Iowa Department of Administrative Services

Date Installed: 9/20/2025

Proposed substitution affects other parts of Work: ☒ No ☐ Yes; explain

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Drew Cross

Signed by: Drew Cross

Firm: VHF Sales, Inc.

Address: 2655 SE Enterprise Drive, Grimes, IA 50111

Telephone: (515) 986-3671

Attachments:

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
- ☒ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: Michael J. McCarty

Digitally signed by Mike McCarty, PE
Date: 2025.03.21 16:39:29-05'00'

Date: March 21, 2025

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☒ A/E ☐ _____

Flexible Connectors - Confirm product is rated at 100 psi at 800F.

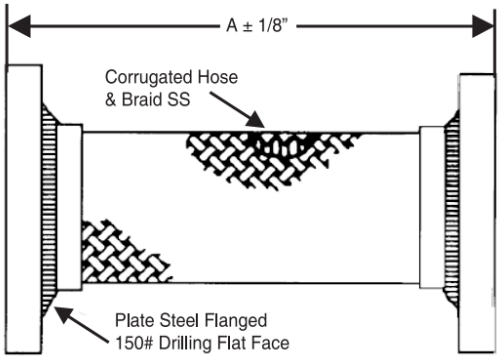
See other files for other products that were submitted in combine substitution request.

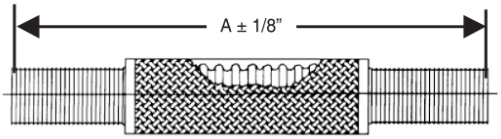
AMERICAN WHEATLEY

STAINLESS STEEL PUMP CONNECTORS

Features:

- Constructed of stainless steel annular corrugated metal surrounded with a woven wire braid of high tensile stainless steel
- High pressure and temperature capabilities
- Absorbs pump variation and noise
- Reduces piping stress due to minor misalignment and pressure variations





TEMP ° F	CORRECTION FACTORS
70	1.00
200	.94
300	.88
400	.83
500	.78
600	.74

All packaging materials, thread protectors, plastic plugs and caps must be removed before installation. Dimensions are subject to change without notice, please confirm actual dimensions with factory at time of order.

MODEL NO	PIPE SIZE X LENGTH (A)	PRESSURE @ 70° F
MINI LENGTH: FLANGED ENDS		
SS0209	2 x 9	350
SS2590	2 1/2 x 9	275
SS0309	3 x 9	275
SS0409	4 x 9	230
SS0511	5 x 11	265
SS0611	6 x 11	240
SS0812	8 x 12	185
SS1013	10 x 13	165
SS1214	12 x 14	155
SS1414	14 x 14	150
LONG LENGTH: FLANGED ENDS		
SM0210	2 x 10	350
SM2510	2 1/2 x 10 1/4	275
SM0310	3 x 10 5/8	275
SM0411	4 x 11 3/4	230
SM0513	5 x 13 5/8	265
SM0614	6 x 14 1/4	240
SM0815	8 x 15 3/8	185
SM1017	10 x 17 3/4	165
SM1218	12 x 18 3/8	155
SM1420	14 x 20	150
EXTENDED LENGTH: FLANGED ENDS		
SL0212	2 x 12	350
SL2512	2 1/2 x 12	275
SL0314	3 x 14	275
SL0416	4 x 16	230
SL0518	5 x 18	265
SL0620	6 x 20	240
SL0822	8 x 22	185
SL1024	10 x 24	165
SL1226	12 x 26	155
SL1428	14 x 28	150
STANDARD LENGTH: THREATED ENDS		
ST0510	1/2 x 10	750
ST7510	3/4 x 10	750
ST0110	1 x 10	650
ST1210	1 1/4 x 10	550
ST1510	1 1/2 x 10	500
ST0214	2 x 14	475
ST2516	2 1/2 x 16	375
ST0316	3 x 16	325

*RATINGS FOR CONSTANT PRESSURE. USE 1/2 OF RATINGS FOR PULSATING PRESSURES AND 1/6 OF RATINGS FOR SURGE PRESSURES.

FOR TEMPERATURES ABOVE 70°F, MULTIPLY PRESSURE SHOWN AT 70°F BY CORRECTION FACTOR OF REQUIRED TEMPERATURES.

2701 W. Concord Street
Broken Arrow, Ok 74012
Toll Free: 866-204-5229 | PH: 918-317-0401
americanwheatley.com | sales@americanwheatley.com

SUBSTITUTION REQUEST FORM

Project: DOC ASP LUA A/C Replacement

Substitution Request Number: 2

From: Drew Cross

To: IMEG Corp.

Date: 03/18/2025

A/E Project Number: 24006748.00

Re:

Specification Title: Hydronic Piping, Specialties

Description:

Section: 23 2100, 23 0548 Page: 3-4, 4

Article/Paragraph: 2.03A 2.05B 2.06B, 2.05B

Proposed Substitution: Hydronics

Manufacturer: American Wheatley Address: 2701 W Concord ST. Broken Arrow, OK 74012 Phone: (866) 204-5229

Trade Name: Model No.:

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☒ More than 10 years old

Differences between proposed substitution and specified product:

None

☒ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item:

VHF Sales, Inc. does not provide the specified items

Similar Installation:

Project: WRC Decentralization Phase 3 Architect: Cameron L. Manley

Address: 1251 334th St, Woodward, IA 50276 Owner: Iowa Department of Administrative Services

Date Installed: 9/20/2025

Proposed substitution affects other parts of Work: ☒ No ☐ Yes; explain

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
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- Proposed substitution does not affect dimensions and functional clearances.
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- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Drew Cross

Signed by: Drew Cross

Firm: VHF Sales, Inc.

Address: 2655 SE Enterprise Drive, Grimes, IA 50111

Telephone: (515) 986-3671

Attachments:

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
- ☒ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: Michael J. McCarty

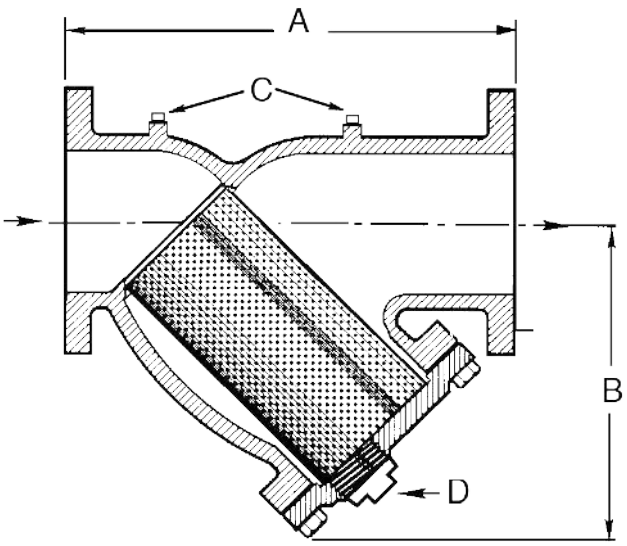
Digitally signed by Mike McCarty, PE
Date: 2025.03.21 16:37:20-05'00'

Date: March 21, 2025

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☒ A/E ☐ _____

Strainer is acceptable. See other files for other products that were submitted in combine substitution request.

Y-Type Flanged Strainer Model YF



Dimensional Data (In Inches)

Model	Size	A	B	C NPT Pressure Gauge	D NPT Blowoff	Screen Removal	Weight (Lbs.)
YF0200	2	8 7/8	5 1/4	1/2	1	7	36
YF0250	2 1/2	10 3/4	5 3/4	1/2	1	9 3/4	48
YF0300	3	11 1/2	6 1/2	1/2	1	10	86
YF0400	4	13 5/8	8	1/2	1	12	106
YF0500	5	16 3/8	10 1/2	1/2	1 1/2	17	156
YF0600	6	18 1/2	12	1/2	1 1/2	20	201
YF0800	8	21 1/2	14 1/2	1/2	1 1/2	22 3/4	321
YF1000	10	26	18	1/2	2	28	370
YF1200	12	30	20 1/2	1/2	2	30	621
YF1400	14	37 3/8	27 1/8	1/2	2	36 1/2	992
YF1600	16	42 1/2	31 1/16	1/2	2	42	1367
YF 1800	18	45 1/4	32 3/4	1/2	2	43	1676
YF 2000	20	50 1/4	36 1/8	1/2	2	44	1764
YF2400	24	57 3/32	40 5/32	1/2	2	68	2535

Operating Pressure & Temperature

Steam	125 PSI @ 350°F
Liquid	200 PSI @ 150°F

Bill of Materials

Part Name	Material
Cover	Cast Iron ASTM A126 Class B*
Gasket	Graphite & Steel
Screen	Stainless Steel - Type 304*
Body	Cast iron ASTM A126 Class B
Bolts	Steel ASTM A307

Standard Screens

Service	Sizes	Screen Openings	Screen Material
Steam & Liquid	2"-3" 4"- 20"	.045 (3/64") .125 (1/8")	Stainless Steel-304

Screen Materials available in various perforation sizes and materials of construction.

All sizes come complete with flanged blow off cover, gasket and plug.

Dimensions are subject to change without notice, please confirm actual dimensions with factory at time of order.

JOB NAME_____
LOCATION_____
_____
_____
CONTRACTOR_____
CONTRACTOR P.O. NO._____

ITEMS	QUANTITY

American WHEATLEY HVAC PRODUCTS®
A GFP COMPANY
1005 E. Houston
Broken Arrow, OK 74012
Toll Free: 866-204-5229
PH: 918-317-0401
FAX: 918-317-0407
www.wheatleyhvac.com
e-mail: sales@globalflowproducts.com

SUBSTITUTION REQUEST FORM

Project: DOC ASP LUA A/C Replacement

Substitution Request Number: 1

From: Drew Cross

To: IMEG Corp.

Date: 03/07/2025

A/E Project Number: 24006748.00

Re:

Specification Title: Variable Frequency Drives

Description:

Section: 26 2923 Page: 2

Article/Paragraph: 2.01A

Proposed Substitution: Invertek Optidrive Eco HVAC

Manufacturer: Invertek Address: 1226 American Way, Libertyville IL, 60048 Phone: 847-549-3669

Trade Name: HVAC

Model No.: Optidrive Eco HVAC ODV-3

History: ☐ New product ☐ 2-5 years old ☒ 5-10 yrs old ☐ More than 10 years old

Differences between proposed substitution and specified product:

None

☒ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item:

VHF Sales, Inc. does not provide the specified items

Similar Installation:

Project: Muscatine County Jail

Architect:

Address: 400 Walnut St.
Muscatine, IA 52761

Owner: Muscatine County

Date Installed: 1/08/2025

Proposed substitution affects other parts of Work: ☒ No ☐ Yes; explain

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
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- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Drew Cross

Signed by: Drew Cross

Firm: VHF Sales, Inc.

Address: 2655 SE Enterprise Drive, Grimes, IA 50111

Telephone: (515) 986-3671

Attachments:

A/E's REVIEW AND ACTION

☒ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Digitally signed by Tony Edward DeLouis PE Date: 2025.03.24 07:39:54-05'00'

Date: March, 21, 2025

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☒ A/E ☐ _____

Invertek Drives.com

Member of Sumitomo Drive Technologies

HVAC Building Services

eco OPTIDRIVE™

AC Variable Speed Drive

HVAC BUILDING SERVICES

Energy efficient fan & pump control

0.75kW – 250kW / 1HP – 400HP

200 – 600V Single & 3 Phase Input

eco OPTIDRIVE™

AC Variable Speed Drive

0.75 – 250kW / 1 – 400HP
200 – 600V Single & 3 Phase Input

Fire Mode

ASHRAE BACnet MS/TP built-in as standard

BTL BACnet Testing Laboratories

Internal EMC Filter

Energy Efficient
Fan & Pump Control

- AC Induction (IM) Motors
- AC Permanent Magnet (PM) Motors
- Brushless DC (BLDC) Motors
- Synchronous Reluctance (SynRM) Motors

Take Control of Your Environment

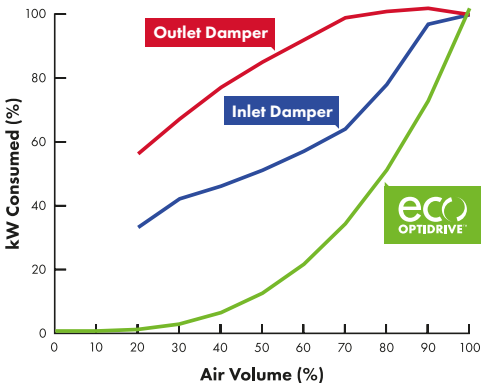
Modern building ventilation and air conditioning systems are designed to provide optimum climatic conditions for occupants throughout the whole year. As such, they must be designed to operate equally well during the hottest part of the day, with maximum sunlight, through to the colder night time and winter periods. Building designers must take account of these extremes and select components and systems capable of providing the required level of occupant comfort under all conditions. This results in systems operating the majority of the time at less than maximum capacity, which can mean reduced efficiency and wasted energy.

Optidrive Eco HVAC provides a perfect solution to the needs of designers looking to optimise the performance of fans and pumps used in HVAC applications, allowing them to operate with maximum efficiency under all conditions. Invertek Drives' philosophy to provide innovative products with easy to use, energy efficient features ensures that time, cost and energy savings are maximised at all times, resulting in the shortest possible payback period – the time taken to recover the initial product and installation costs through financial savings achieved through installing Optidrive Eco HVAC drives.

For simple installation into your buildings management system all Optidrive Eco HVAC drives are provided with both BACnet and Modbus RTU as standard across the product range.

Instant Power Savings

The graph below shows a comparison between the efficiency of various methods which can be used to control the airflow produced by a fan.



From the data, it can be clearly seen that using methods such as dampers to restrict the airflow is much less efficient than controlling the speed of the fan using an Optidrive Eco HVAC.

IP20

IP55 / NEMA 12

IP66 / NEMA 4X

Energy Savings Calculator

Estimate your potential energy savings, CO_2 emissions and financial savings

www.invertekdrives.com/calculator

Download on the App Store | GET IT ON Google Play

Save Energy, Cut CO_2

Save Energy

Accurate speed control of fans and pumps provides the most energy efficient control method

Energy optimisation function minimises energy usage in real time under partial load conditions

Sleep & wake functions ensure operation only when required

Save Money

Advanced on-board features remove the need for peripheral equipment

Intelligent maintenance interval timing allows programmable maintenance reminders, avoiding costly downtime

Automatic load monitoring provides an early warning of potential faults, such as belt failures or blocked filters

Save Time

Built in keypad and OLED text display provides intuitive operation

Simple parameter structure with carefully selected default values reduce commissioning time

Practical design allows easy access to power and control terminals without specialist tools

Key Features

ECO Vector Motor Control

Standard Induction Motors

- Permanent Magnet AC Motors
- Brushless DC Motors
- Synchronous Reluctance Motors

Energy Optimised Design

Internal EMC Filter

Low Noise Operation

Improved Fan Efficiency

Unique Eco Vector Sensorless Control

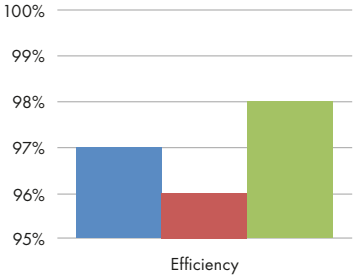
Optidrive Eco HVAC uses advanced motor control, designed to provide the most energy efficient motor control possible. Operation with standard IM Motors, Permanent Magnet or Synchronous Reluctance motors is possible, all without requiring any feedback device or optional modules – simply change parameters to suit the connected motor, autotune and operate!

Eco Vector continuously adjusts in real time to provide the most efficient operating conditions for the load, typically reducing energy consumption by 2 – 3% compared to standard AC drives – providing similar long term costs savings to selecting a higher efficiency motor.

Energy Optimised Design

Optidrive Eco HVAC up to frame size 5 are designed with film capacitors, replacing the traditional electrolytic capacitors used in the DC link. Film capacitors have lower losses, and also remove the need for AC, DC or swinging chokes, improving overall drive efficiency. Efficiency is improved by up to 4% compared to standard AC drives, whilst also reducing supply current total harmonic distortion (iTHD), improving the Real Power Factor and reducing total input current, leading to cost savings on installation through reduced cable and fuse ratings and smaller supply transformer rating.

Improved Efficiency, Reduced Lifetime Costs: e.g. for a 37kW load, operating 10 hours per day, 5 days per week, 50 weeks per year, improving the efficiency by just 1% will provide an energy saving > 900kWh per year.



Typical efficiency comparison for Optidrive Eco HVAC vs other AC variable speed drives

- Standard AC Variable Speed Drive
- AC Variable Speed Drive + 4% Line Choke
- Optidrive Eco HVAC

Dedicated to HVAC Applications

Take control of your environment

Building Comfort

Energy Efficient Air Handling

Creating comfortable building environments without high energy costs

Where do the energy savings come from?

Air conditioning can use a significant amount of energy. In some cases it could even double energy consumption, not to mention the resultant increase in a company's carbon footprint.

Don't produce more airflow than you need!

Typically the air conditioning systems in buildings are designed for maximum occupancy and peak outside ambient. This means that for the majority of time there is large scope for running the systems at reduced speed and significant money to be saved with variable speed drives.

Optidrive Eco HVAC can vary the output of your air conditioning system to meet the varying demands throughout the day.

Variable Speed Control for Pumps

Optidrive Eco HVAC provides the ideal pump control solution for chiller, circulation and cooling pumps.

Energy efficient control for HVAC systems

Building Safety Systems

Stairwell Pressurisation

Stairwell (escape route) pressurisation systems are being extensively employed in large buildings and complexes to help ensure the safe evacuation of occupants during a fire. Variable speed drives are playing an increasing role in maintaining pressures (of approximately 50 Pa) within these critical areas. Here Optidrive Eco HVAC is used to provide a smoke free escape by accurately maintaining the air pressure along that route.

Pressures must be maintained at a high enough level that a door opened between the fire floor and the escape route does not result in smoke entering the escape route. Equally, as doors and vents are opened along the escape route allowing air to escape the Optidrive and stairwell pressurisation system must increase output so that the required pressure is accurately maintained.

Fume Extraction

Many buildings now incorporate dedicated smoke management and extraction systems designed to safety exact smoke in the event of a fire, these systems are designed to localise and extract smoke such that the rest of the building remains smoke free and can be evacuated safely. Here the Optidrive's Fire Mode function is critical in maintaining continued operation of the smoke extraction system for the longest permissible period.

For applications such as underground car parks the fans providing fresh air intake are often reversed in the event of a fire to provide smoke extraction. Optidrive Eco HVAC is easily configured for bi-directional fire mode operation.

Fire Override

Fire override mode ignores signals and alarms, keeping the Optidrive Eco HVAC operating for as long as possible.

- This feature is crucial for ensuring smoke extraction from buildings in the event of a fire.
- Selectable logic means that the Optidrive Eco HVAC can be easily configured to the signal produced by your fire management system.
- With an independently set speed for fire mode operation, selectable as either forward or reverse direction, the Optidrive Eco HVAC has the flexibility to match the needs of your fire control system.
- Fire mode operation is indicated clearly on the drive display during periods of fire mode operation.
- Drive output logic can easily be configurable for indicating to external drives that fire mode is active.
- Internal clocks and timers monitoring operation in fire mode, giving clear information on usage.

Drive Features

A compact and robust range of drives dedicated to HVAC

Multi Language Text Display

Installed as standard on all IP55 & IP66 models

- Clear multi-line text display
- Operates –10 to 50°C
- Wide viewing angle, effective in dark and light conditions
- Customisable display
- Multi-language selection

Hand / Auto Keypad

Pluggable terminals

Integrated cable management

Long Life, Dual Ball Bearing Fans

IP66 with optional mains disconnect

Belt Break Detection

Optidrive Eco HVAC can provide immediate warning of broken belt between motor and fan. Due to its simple and flexible configuration the feature can also be used for any loss of load condition, such as broken coupling or other mechanical failure.

Optidrive Eco HVAC monitors the load output profile throughout the speed range and compares it to normal operating conditions (established during commissioning). Sensitivity adjustment means that it is possible to detect the indications of a belt failure (such as belt slipping) prior to complete failure of the belt.

Drive Controlled Bypass

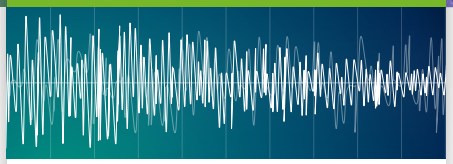
Optidrive Eco HVAC can operate as a bypass controller when installed as part of a bypass circuit. Activation of Bypass mode can be determined intelligently by the Optidrive Eco HVAC drive based on a command from the building management system. Additionally the drive can be set to automatically select bypass mode when entering into a trip condition ensuring minimal disruption to service.

Energy efficient control for HVAC systems

Hand / Auto

Allows manual control to easily be selected in the event of an automatic control system failure or for simplified commissioning / system checks, or when a fast temporary override of the control system is required. Built-in 'Auto Control Selection' allows return to automatic system control just as easily.

Noise Reduction



Quiet Motor Operation

High switching frequency selection (up to 32kHz) ensures motor noise is minimised.

Quiet System Mechanics

Simple skip frequency selection avoids stresses and noise caused by mechanical resonance in ducting or pipework.

Quiet Drive Operation

Long Life Dual Ball Bearing Fans provide quiet operation in addition to extended fan life.

Noise Reduction through Speed Control

Optimising motor speed gives significant energy savings and reduces motor noise.

Reduced Harmonic Current Distortion

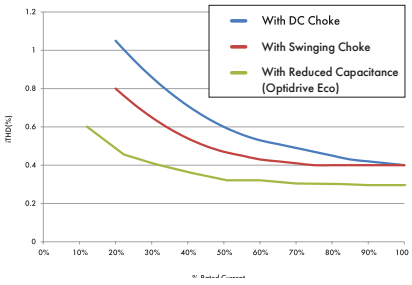
Optidrive Eco HVAC uses innovative design to improve overall efficiency whilst minimising the harmonic distortion levels. All drives designed for 3 phase power supply operation[1] up to frame size 5 utilise film capacitor in the DC link, providing exceptionally low harmonic current distortion without compromising efficiency. Frame size 6 and above include DC chokes and traditional electrolytic capacitors.

Optidrive Eco HVAC product range complies with the requirements of EN61000-3-12.

Optidrive Eco HVAC delivers

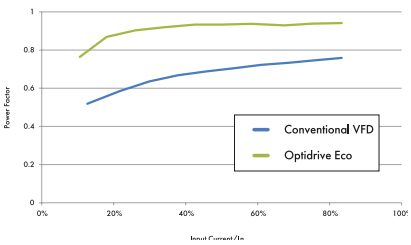
- Improved Efficiency, Reduced Lifetime Costs: e.g. for a 37kW load, operating 10 hours per day, 5 days per week, 50 weeks per year, improving the efficiency by just 1% will provide an energy saving > 900kWh per year
- Improved True Power Factor – No additional charges etc.
- Lower Mains Supply Current

Typical iTHD values at full and part load



It can be clearly seen that the reduced DC link capacitance significantly reduces the total harmonic distortion at full load, and has a much greater benefit at part load compared to a conventional DC choke or swinging choke. This results in reduced overall input current and reduced transformer heating effect.

Power factor comparison



Optidrive Eco offers improved power factor over conventional VFDs under all loads.

[1] 200V and 400V

Options & Accessories

Peripherals to help integrate Optidrive Eco HVAC with your HVAC systems

ASHRAE BACnet MS/TP
built-in as standard

Optistick Smart

Bluetooth®

Rapid Commissioning Tool

- Allows copying, backup and restore of drive parameters
- Provides Bluetooth interface to a PC running OptiTools Studio or the OptiTools Mobile app on a smartphone
- Onboard NFC (Near Field Communication) for rapid data transfer

OPT-3-STICK-IN

Optipad

Remote Keypad & TFT Display

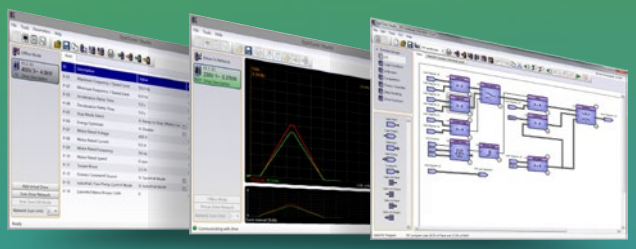
IP55 panel mount operator interface.

- Clear multi-line text display
- Multiple language select
- Customisable displays

OPT-3-OPPAD-IN

Energy efficient control for HVAC systems

OptiTools Studio



Powerful PC Software

Drive commissioning and parameter backup

- Real-time parameter editing
- Drive network communication
- Parameter upload, download and storage
- Simple PLC function programming
- Real-time scope function and data logging
- Real-time data monitoring

Compatible with:

Windows Vista
Windows 7
Windows 8
Windows 8.1
Windows 10

Fieldbus Interfaces

BACnet/IP
OPT-2-BNTIP-IN

PROFIBUS DP
OPT-2-PROFB-IN

DeviceNet
OPT-2-DEVNT-IN

EtherNet/IP
OPT-2-ETHNT-IN

Modbus TCP
OPT-2-MODIP-IN

PROFINET
OPT-2-PFNET-IN

EtherCAT
OPT-2-ETCAT-IN

Plug-in Options

Extended I/O

OPT-2-EXTIO-IN

- Additional 3 Digital Inputs
- Additional Relay Output

Cascade Control

OPT-2-CASCD-IN

Additional 3 Relay Outputs

BACnet MS/TP & Modbus RTU on board as standard

Mains Isolator

Mains Isolator Option

Frame Sizes 2 & 3 can be factory ordered with a built in lockable isolator. An optional bolt on isolator is available for Frame Sizes 4 & 5.

Product Codes:

Frame Size 4 = OPT-2-ISOLO-S4
Frame Size 5 = OPT-2-ISOLO-S5

eco OPTIDRIVE™

Replace # in model code with enclosure/display option

	kW	HP	Amps	Frame Size	Model Code	IP20 Cabinet Mount	IP55 TFT Display	Indoor IP66 Non Switched	Indoor IP66 with Disconnect	Outdoor IP66 Non Switched	Outdoor IP66 with Disconnect
200–240V ± 10% 1 Phase Input	0.75	1	4.3	2	ODV - 3 - 2 2 0043 - 1 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	1.5	2	7	2	ODV - 3 - 2 2 0070 - 1 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	2.2	3	10.5	2	ODV - 3 - 2 2 0105 - 1 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
200–240V ± 10% 3 Phase Input	0.75	1	4.3	2	ODV - 3 - 2 2 0043 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	1.5	2	7	2	ODV - 3 - 2 2 0070 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	2.2	3	10.5	2	ODV - 3 - 2 2 0105 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	4	5	18	3	ODV - 3 - 3 2 0180 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	5.5	7.5	24	3	ODV - 3 - 3 2 0240 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	7.5	10	30	3	ODV - 3 - 3 2 0300 - 3 F 1 #					A-MN	E-MN
	7.5	10	30	4	ODV - 3 - 4 2 0300 - 3 F 1 #	2-MN	N-MN				
	11	15	46	4	ODV - 3 - 4 2 0460 - 3 F 1 #	2-MN	N-MN			A-MN	E-MN
	15	20	61	5	ODV - 3 - 5 2 0610 - 3 F 1 #	2-MN	N-MN				
	18.5	25	72	5	ODV - 3 - 5 2 0720 - 3 F 1 #	2-MN	N-MN				
	22	30	90	5	ODV - 3 - 5 2 0900 - 3 F 1 #	2-MN	N-MN				
	30	40	110	6	ODV - 3 - 6 2 1100 - 3 F 1 #		N-MN				
	30	40	110	6A	ODV - 3 - 6 2 1100 - 3 F 1 #	2-MN					
	37	50	150	6	ODV - 3 - 6 2 1500 - 3 F 1 #		N-MN				
	37	50	150	6A	ODV - 3 - 6 2 1500 - 3 F 1 #	2-MN					
	45	60	180	6	ODV - 3 - 6 2 1800 - 3 F 1 #		N-MN				
	45	60	180	6B	ODV - 3 - 6 2 1800 - 3 F 1 #	2-MN					
	55	75	202	7	ODV - 3 - 7 2 2020 - 3 F 1 #		N-MN				
	75	100	248	7	ODV - 3 - 7 2 2480 - 3 F 1 #		N-MN				
380–480V ± 10% 3 Phase Input	0.75	1	2.2	2	ODV - 3 - 2 4 0022 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	1.5	2	4.1	2	ODV - 3 - 2 4 0041 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	2.2	3	5.8	2	ODV - 3 - 2 4 0058 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	4	5	9.5	2	ODV - 3 - 2 4 0095 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	5.5	7.5	14	2	ODV - 3 - 2 4 0140 - 3 F 1 #					A-MN	E-MN
	5.5	7.5	14	3	ODV - 3 - 3 4 0140 - 3 F 1 #	2-MN		X-TN	D-TN		
	7.5	10	18	3	ODV - 3 - 3 4 0180 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	11	15	24	3	ODV - 3 - 3 4 0240 - 3 F 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	15	20	30	3	ODV - 3 - 3 4 0300 - 3 F 1 #					A-MN	E-MN
	15	20	30	4	ODV - 3 - 4 4 0300 - 3 F 1 #	2-MN	N-MN				
	18.5	25	39	4	ODV - 3 - 4 4 0390 - 3 F 1 #	2-MN	N-MN			A-MN	E-MN
	22	30	46	4	ODV - 3 - 4 4 0460 - 3 F 1 #	2-MN	N-MN			A-MN	E-MN
	30	40	61	5	ODV - 3 - 5 4 0610 - 3 F 1 #	2-MN	N-MN				
	37	50	72	5	ODV - 3 - 5 4 0720 - 3 F 1 #	2-MN	N-MN				
	45	60	90	5	ODV - 3 - 5 4 0900 - 3 F 1 #	2-MN	N-MN				
	55	75	110	6	ODV - 3 - 6 4 1100 - 3 F 1 #		N-MN				
	55	75	110	6A	ODV - 3 - 6 4 1100 - 3 F 1 #	2-MN					
	75	100	150	6	ODV - 3 - 6 4 1500 - 3 F 1 #		N-MN				
	75	100	150	6A	ODV - 3 - 6 4 1500 - 3 F 1 #	2-MN					
	90	150	180	6	ODV - 3 - 6 4 1800 - 3 F 1 #		N-MN				
	90	150	180	6B	ODV - 3 - 6 4 1800 - 3 F 1 #	2-MN					
	110	175	202	6B	ODV - 3 - 6 4 2020 - 3 F 1 #	2-MN					
	110	175	202	7	ODV - 3 - 7 4 2020 - 3 F 1 #		N-MN				
	132	200	240	7	ODV - 3 - 7 4 2400 - 3 F 1 #		N-MN				
	160	250	302	7	ODV - 3 - 7 4 3020 - 3 F 1 #		N-MN				
	200	300	370	8	ODV - 3 - 8 4 3700 - 3 # 1 #	2-MN	N-MN				
	250	400	480	8	ODV - 3 - 8 4 4800 - 3 # 1 #	2-MN	N-MN				
500–600V ± 10% 3 Phase Input	0.75	1	2.1	2	ODV - 3 - 2 6 0021 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	1.5	2	3.1	2	ODV - 3 - 2 6 0031 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	2.2	3	4.1	2	ODV - 3 - 2 6 0041 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	4	5	6.5	2	ODV - 3 - 2 6 0065 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	5.5	7.5	9	2	ODV - 3 - 2 6 0090 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	7.5	10	12	3	ODV - 3 - 3 6 0120 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	11	15	17	3	ODV - 3 - 3 6 0170 - 3 0 1 #	2-MN		X-TN	D-TN	A-MN	E-MN
	15	20	22	3	ODV - 3 - 3 6 0220 - 3 0 1 #	2-MN				A-MN	E-MN
	15	20	22	4	ODV - 3 - 4 6 0220 - 3 0 1 #		N-MN				
	18.5	25	28	4	ODV - 3 - 4 6 0280 - 3 0 1 #	2-MN	N-MN			A-MN	E-MN
	22	30	34	4	ODV - 3 - 4 6 0340 - 3 0 1 #	2-MN	N-MN			A-MN	E-MN
	30	40	43	4	ODV - 3 - 4 6 0430 - 3 0 1 #	2-MN	N-MN			A-MN	E-MN
	37	50	54	5	ODV - 3 - 5 6 0540 - 3 0 1 #	2-MN	N-MN				
	45	60	65	5	ODV - 3 - 5 6 0650 - 3 0 1 #	2-MN	N-MN				
	55	75	78	6	ODV - 3 - 6 6 0780 - 3 0 1 #		N-MN				
	75	100	105	6	ODV - 3 - 6 6 1050 - 3 0 1 #		N-MN				
	90	125	130	6	ODV - 3 - 6 6 1300 - 3 0 1 #		N-MN				
	110	150	150	6	ODV - 3 - 6 6 1500 - 3 0 1 #		N-MN				

EMC Filter

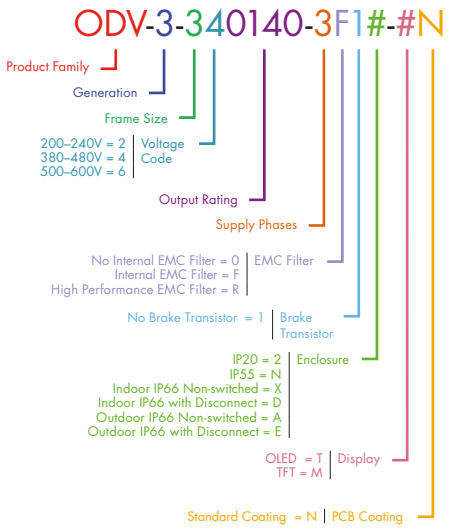
0	No Internal EMC Filter
F	Internal EMC Filter
R	High Performance EMC Filter

Drive Specification

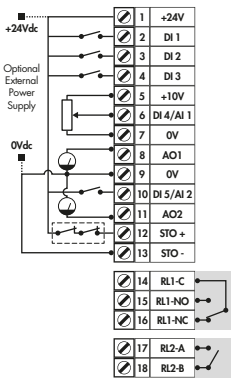
Input Ratings	Supply Voltage	200 – 240V ± 10% 380 – 480V ± 10% 500 – 600V ± 10%
	Supply Frequency	48 – 62Hz
	Displacement Power Factor	> 0.98
	Phase Imbalance	3% Maximum allowed
	Inrush Current	< rated current
	Power Cycles	120 per hour maximum, evenly spaced
Output Ratings	Output Power	230V 1Ph. Input: 0.75–2.2kW (1–3HP) 230V 3Ph. Input: 0.75–75kW (1–100HP) 400V 3Ph. Input: 0.75–250kW 460V 3Ph. Input: 1–400HP 575V 3Ph. Input: 0.75–110kW (1–150HP)
	Overload Capacity	110% for 60 seconds 150% for 15 seconds
	Output Frequency	0 – 250Hz, 0.1Hz resolution
	Typical Efficiency	> 98%
Ambient Conditions	Temperature	Storage: –40 to 60°C Operating: –10 to 50°C
	Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL approved Up to 4000m maximum (non UL)
	Humidity	95% Max, non condensing
	Vibration	Conforms to EN61800-5-1 2007, IEC 60068-2-6
Enclosure	Ingress Protection	IP20, IP55, IP66
Programming	Keypad	Built-in keypad as standard Optional remote mountable keypad
	Display	Built-in multi language text display
	PC	OptiTools Studio
Control Specification	Control Method	Eco Sensorless Vector Open Loop Permanent Magnet Vector Open Loop BLDC Vector Open Loop Synchronous Reluctance Vector
	PWM Frequency	4 – 32kHz Effective
	Stopping Mode	Ramp to stop: User Adjustable 0.1–600 secs Coast to stop
	Braking	AC Flux Braking
	Skip Frequency	Single point, user adjustable
	Setpoint Control	Analog Signal: 0 to 10 Volts / 10 to 0 Volts –10 Volts to +10 Volts 0 to 20mA / 20 to 0mA 4 to 20mA / 20 to 4mA Digital: Motorised Potentiometer (Keypad) Modbus RTU BACnet MS/TP
Fieldbus Connectivity	Built-in	BACnet MS/TP: BACnet Application Specific Controller 9.6 - 76.8 kbps selectable Data Format: 8N1, 8N2, 8O1, 8E1 Modbus RTU: 9.6 - 115.2 kbps selectable Data Format: 8N1, 8N2, 8O1, 8E1
	Optional	BACnet/IP: Plug-in BACnet/IP interface Dual LAN ports Device Level Ring Other: PROFIBUS DP (DPV1) PROFINET IO DeviceNet EtherNet/IP EtherCAT Modbus TCP

I/O Specification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 10mA for Potentiometer
	Programmable Inputs	5 Total as standard (optional additional 3) 3 Digital (optional additional 3) 2 Analog / Digital selectable
	Digital Inputs	Opto - Isolated 8 – 30 Volt DC, internal or external supply Response time < 4ms
	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: < 1% full scale Parameter adjustable scaling and offset
	PTC Input	Motor PTC / Thermistor Input Trip Level : 3kΩ
	Programmable Outputs	2 Total 1 Analog / Digital 1 Relay
	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 5A
	Analog Outputs	0 to 10 Volts / 10 to 0 Volts 0 to 20mA / 20 to 0mA 4 to 20mA / 20 to 4mA
Application Features	PID Control	Internal PID Controller Multi-setpoint Select Standby / Sleep Mode Boost Function
	Fire Mode	Bidirectional Selectable Speed Setpoint (Fixed / PID / Analog / Fieldbus)
	Load Monitoring	High Current Protection (Fan / Bump Blocked) Low Current Protection (Broken Belt / Shaft) Pump Blockage Detection with Cleaning
	Duty / Assist / Standby	Built-in Multi-Pump Support Autotmatic Changeover on Fault Automatic Changeover on Time Fully Redundant
Pump Control Features	Pump Blockage Detection	Pump load monitoring with autotune function, user configurable
	Pump Cleaning	Adjustable Bi-directional Pump Cleaning Cycle operation
	Multi-Pump Control	Control of fixed speed assist pumps (with cascade control module) Control of Duty, Assist and Standby variable speed pumps via internal Master – Slave network
	Pump Stir	Automatic pump stir to prevent sediment build-up
Maintenance & Diagnostics	Fault Memory	Last 4 Trips stored with time stamp
	Data Logging	Logging of data prior to trip for diagnostic purposes : Output Current Drive Temperature DC Bus Voltage
	Maintenance Indicator	Maintenance Indicator with user adjustable maintenance interval Onboard service life monitoring
	Monitoring	Hours Run Meter Resettable & Non-Resettable kWh meters Cooling Fan Run Time
Standards Compliance	Low Voltage Directive	2014/35/EU
	EMC Directive	2014/30/EU
	Additional Conformance	UL, cUL, EAC, RCM
	Harmonic Currents	IEC61000-3-12
	Environmental Conditions	Designed to meet IEC 60721-3-3, in operation: IP20 Drives: 3S2/3C2 IP55 & 66 Drives: 3S3/3C3
	Environmental Class	Conformal Coated PCBs. Suitable for use in the following environments: IP20: 3C2, 3S2 IP55 & IP66: 3C3, 3S3

Model Code Guide



Connection Diagram



Function	Default Setting
24 Volt DC Output, 100mA max / 24 Volt DC Input	
Digital Input 1	Drive Enable
Digital Input 2	Analog/Preset Speed 1 Select
Digital Input 3	Local/Remote Reference Select
+10 Volt Power Supply 5mA	
Analog Input 1	Local Speed Reference
0 Volt	
Analog Output 1	Motor Speed
0 Volt	
Analog Input 2	Remote Speed Reference
Analog Output 2	Motor Current
Safe Torque Off Input	
Safe Torque Off Input	
Output Relay 1	Drive Healthy / Fault
Output Relay 2	Drive Running

NOT TO SCALE

	Size	IP20 2	IP20 3	IP20 4	IP20 5	IP20 6A	IP20 6B	IP20 8	IP66 2	IP66 3	IP66 4	IP55 4	IP55 5	IP55 6	IP55 7	IP55 8
mm	Height	221	261	418	486	614	726	974	257	310	360	450	540	865	1280	1334
mm	Width	110	131	172	233	286	330	444	188	211	240	171	235	330	330	444
mm	Depth	185	205	240	260	320	320	423	182	235	271	252	270	332	358	423
kg	Weight	1.8	3.5	9.2	18.1	32	43	124.5	3.5	6.6	9.5	11.5	23	55	89	TBC

eco OPTIDRIVE™

Invertek Drives.com

Member of Sumitomo Drive Technologies

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Optidrive Eco HVAC

✓ Saving Energy / Reducing CO_2

With large scale increases in global energy costs and the introduction of taxes and legislation relating to the industrial production of CO_2 gases the need to reduce energy consumption and save money has never been greater. Optidrive Eco HVAC can be used with environmental sensors to reduce speed in air handling and pumping applications without compromising the required output of the system.

✓ Easy Installation

Compact and modern design utilising the latest available technology has accumulated in a robust HVAC drive with small dimensions and innovative mounting and cabling features.

✓ Simple Set-up & Rapid Commissioning

Optidrive Eco HVAC was developed from concept for ease of use. A handful of parameters configure the drive for basic HVAC applications. A short, concise product data means the drive is running in seconds. Advanced powerful functionality is equally easily accessible.

✓ Imaginative Enclosure Design

With a selection of IP55 and IP66 enclosures, Optidrive Eco HVAC is well suited to harsh environments, or where cabinet and cabling costs need to be reduced.

✓ Advanced Fan Control Functions

The key HVAC control functionality required for your application is inbuilt into the Optidrive Eco HVAC and packaged to be both quick and simple to activate. Added to this is the drive's own PLC programming flexibility that makes drive functionality virtually limitless.

✓ Options for Flexibility

Optidrive Eco HVAC combines both peripheral and factory built options to ensure you get the right drive, scaled to suit your application. With inbuilt BACnet and Modbus, and a host of communication options the Optidrive can integrate easily into your industrial network of choice.

UK Headquarters, Welshpool

Invertek Drives Ltd is dedicated to the design, manufacture and marketing of electronic variable speed drives. The state of the art UK headquarters houses specialist facilities for research & development, manufacturing and global marketing. The company pledges to implement and operate the ISO 14001 Environmental Management System to enhance environmental performance.

All company operations are accredited to the exacting customer focused ISO 9001:2008 quality standard. The company's products are sold globally in over 80 different countries. Invertek Drives' unique and innovative drives are designed for ease of use and meet with recognised international design standards.

Global HVAC Solutions

Invertek Drives operate at the heart of HVAC systems around the world

USA
National Portrait Gallery climate control

UK
Saving energy in ventilation and boilers

DUBAI
Saving energy in air conditioning systems

SINGAPORE
Energy saving & noise reduction programme

SYSTEM CERTIFICATION ISO 9001 SGS

SYSTEM CERTIFICATION ISO 14001 SGS

www.invertekdrives.com/hvac-building-services

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Fax: +44 (0)1938 556869
Email: sales@invertekdrives.com

RoHS

 8.5-ECOBD-IN V3.02

SUBSTITUTION REQUEST FORM

Project: DOC ASP LUA A/C Replacement

Substitution Request Number: 2

From: Drew Cross

To: IMEG Corp.

Date: 3/18/2025

A/E Project Number: 24006748.00

Re:

Specification Title: HVAC Pumps

Description:

Section: 23 2123 Page: 1

Article/Paragraph: 2.02F

Proposed Substitution: Wilo IPL

Manufacturer: WILO Address: W66N1253 Forward Way, Cedarburg. WI 53012 Phone: 262-204-6600

Trade Name: HVAC

Model No.: Wilo-VeroLine-IPL 1.25

History: ☐ New product ☒ 2-5 years old ☐ 5-10 yrs old ☐ More than 10 years old

Differences between proposed substitution and specified product:

None

☒ Point-by-point comparative data prepared by contractor and attached - REQUIRED BY A/E

Reason for not providing specified item:

VHF Sales, Inc. does not provide the specified items

Similar Installation:

Project: Meskwaki Nation Recreation Center

Architect: Alyssa F. Campbell

Address: 349 Meskwaki Road Tama, Iowa 52339

Owner: Meskwaki Nation

Date Installed: 1/15/2023

Proposed substitution affects other parts of Work: ☒ No ☐ Yes; explain

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

SUBSTITUTION REQUEST FORM

(Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Drew Cross

Signed by: Drew Cross

Firm: VHF Sales, Inc.

Address: 2655 SE Enterprise Drive, Grimes, IA 50111

Telephone: (515) 986-3671

Attachments:

A/E's REVIEW AND ACTION

- ☐ Substitution approved - Make submittals in accordance with Specification Section 01 3300.
- ☒ Substitution approved as noted - Make submittals in accordance with Specification Section 01 3300.
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: Michael J. McCarty

Digitally signed by Mike McCarty, PE
Date: 2025.03.21 16:16:44-05'00'

Date: March 21, 2025

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☒ A/E ☐

Confirm product meets all specification and performance requirements. Document provided doesn't show enough data to show compliance with schedule data for pump but pump curves appear to meet flow and head required.

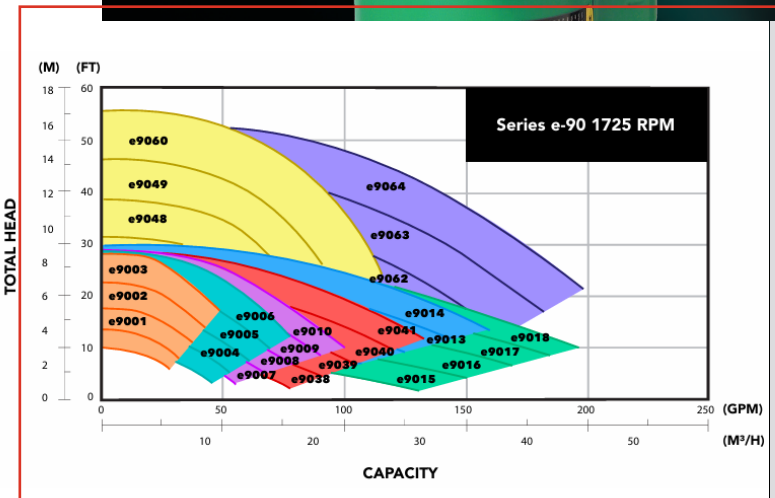
Confirm cast iron casing with 125 psi rating.

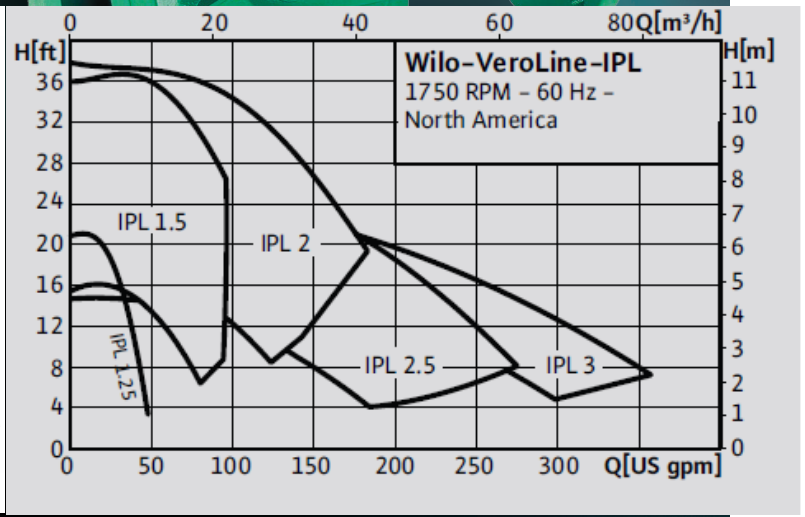
Pumpen Intelligenz.

Inline Centrifugal Circulators

Wilo IPL

Product Brochure





Bell and Gosset E-90 Performance Curve (Left) vs. Wilo-VeroLine-IPL Curve (Right)

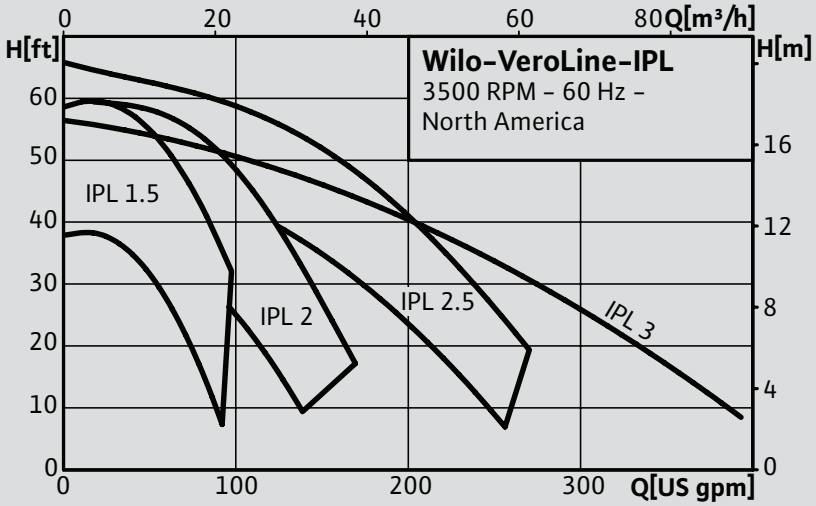
Wilo IPL

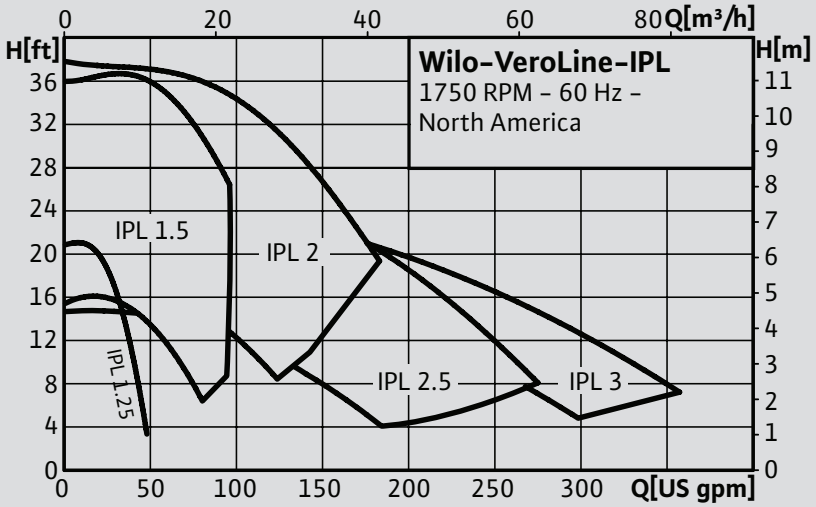
Inline Centrifugal Circulators

Applications Include:

- » **Heating Systems**
- » **Closed Cooling Circuits**
- » **Solar Systems**
- » **A/C Systems**
- » **Industrial Circulation Systems**
- » **Geothermal Systems**

Wilo IPL





Heavy-duty, robust design!

- » Flows up to 400 USGPM
- » Heads up to 56'
- » Pumps water and water/glycol up to 50%
- » Fluid temperature from 14°F to 250°F (-10°C to 120°C)
- » Standard Baldor NEMA frame motors
- » Cataphoresis coating for maximum corrosion protection
- » Standard bellows type mechanical seal
- » 420 SS stub shaft
- » "Easy Read" numbering system
- » ¼" Gauge tappings inlet and outlet
- » All external bolts S.A.E. (Metric-Free)
- » Oversized O-Ring seal between motor stool and volute

WILO USA LLC

Toll-Free: 866-945-6872
Web: www.wilo-usa.com
Email: info@wilo-usa.com

GERMAN QUALITY since 1872.

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