2. To: (Receiving Organization)  
3. Frm: (Originating Organization)  
4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: W-112/SWD/FDNW  
7. Purchase Order No.: N/A
8. Originator Remarks: THIS EDT RELEASES THE HVAC TESTING, ADJUSTING AND BALANCING REPORTS FOR ALL OF PROJECT W-112 BUILDINGS.
9. Equip./Component No.: N/A
10. System/Bldg./Facility: 2404, 2620 W & 2740 W
13. Permit/Permit Application No.: N/A
14. Required Response Date: December 4, 1996

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(See Approval Designator for required signatures)

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18. Signature of EDT Originator  
19. Authorized Representative Date for Receiving Organization  
20. Design Authority/ Cognizant Manager  
21. Dqe Approval (if required)  
   Ctrl. No.  
   [ ] Approved  
   [ ] Approved w/comments  
   [ ] Disapproved w/comments  

BD-7400-172-2 (05/96) GEF097
ACCEPTANCE TEST REPORT FOR THE HVAC TESTING, ADJUSTING AND BALANCING COMPLETED ON PROJECT W-112 FOR ALL BUILDINGS

Eric G. Erpenbeck
Fluor Daniel Northwest, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 612244  UC: 510
Org Code: 8KD30  Charge Code: A1202
B&R Code: 39EW31302  Total Pages: 63

Key Words: HP 1 & 2, HP 1-4, Exhaust Fans, Roof Ventilators

Abstract: This documents the successful testing, adjusting and balancing conducted on Project W-112 HVAC system for all buildings and HVAC equipment installed on the project.

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Approved for Public Release

A-6400-073 (10/95) GEF321
PROJECT W-112, ENHANCED RADIOACTIVE AND MIXED WASTE STORAGE FACILITY

WHC-SD-W112-ATR-007

HVAC TESTING, ADJUSTING, AND BALANCING REPORTS

FOR 2404 WA, WB, WC, 2620 W AND 2740 W.
W-112 ENHANCED RADIOACTIVE & MIXED WASTE STORAGE PHASE V

Testing, Adjusting and Balancing Report

Submitted By:
NIAC Engineering Services Corp.
1314 South Central Avenue, Suite 200
Kent, Washington 98032
(206) 850-9003

November, 1996

WHC-SD-W112-ATR-007, REV 0
W-112 ENHANCED RADIOACTIVE & MIXED WASTE STORAGE PHASE V
200 WEST AREA
HANFORD, WA

TESTING, ADJUSTING AND BALANCING REPORT
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CERTIFIED TEST, ADJUST, AND BALANCE REPORT

DATE November, 1996

PROJECT W-112 Enhanced Radioactive & Mixed Waste Storage Phase V

ADDRESS 200 West Area
Hanford, Washington

ARCHITECT Garco Construction
Spokane, Washington

ENGINEER L & S Associates
Spokane, Washington

HVAC CONTRACTOR Apollo Sheet Metal Inc.
Kennewick, Washington

NEBB TAB FIRM National Indoor Air Care Corporation (NIAC)

ADDRESS 1314 South Central Avenue, Suite 200
Kent, Washington 98032
(206) 850-9003

WHC-SD-WI12-ATR-007, REV 0
THE DATA PRESENTED IN THIS REPORT IS AN EXACT RECORD OF SYSTEM PERFORMANCE AND WAS OBTAINED IN ACCORDANCE WITH NEBB STANDARD PROCEDURES. ANY VARIANCES FROM DESIGN QUANTITIES WHICH EXCEED NEBB TOLERANCES ARE NOTED THROUGHOUT THIS REPORT.

THE AIR DISTRIBUTION SYSTEMS HAVE BEEN TESTED & BALANCED AND FINAL ADJUSTMENTS HAVE BEEN MADE IN ACCORDANCE WITH NEBB "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS" AND THE PROJECT SPECIFICATIONS.

NEBB TAB FIRM __National Indoor Air Care Corporation (NIAC)__

REG. NO. 2950 CERTIFIED BY David A. Fernandes (Air TAB Supervisor) DATE 11/20/96

THE HYDRONIC DISTRIBUTION SYSTEMS HAVE BEEN TESTED & BALANCED AND FINAL ADJUSTMENTS HAVE BEEN MADE IN ACCORDANCE WITH NEBB "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS" AND THE PROJECT SPECIFICATIONS.

NEBB TAB FIRM __N/A__

REG. NO. _______ CERTIFIED BY ______________________________ DATE ________

(Hydronic TAB Supervisor)

SUBMITTED & CERTIFIED BY:

NEBB TAB FIRM __National Indoor Air Care Corporation (NIAC)__

TAB SUPERVISOR ____________________________

REG. NO. 2950 SIGNATURE ____________________________

DATE 11/20/96 CERTIFICATION EXPIRATION DATE 12/97

WHC-SD-W112-ATR-007, REV 0
## INSTRUMENTATION

**Project: W-112 ENHANCED RADIOACTIVE & MIXED WASTE STORAGE PHASE V**

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NIAC Corporation

PROJECT: SWOC MAINTENANCE SUPPORT FACILITY (DB-3)  DATE: 01/10/97

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- EF-3 (BLDG. 2620 W.) .......... 10
- EF-5 (BLDG. 2620 W.) .......... 11
- EF-6 (BLDG. 2620 W.) .......... 12
- EF-7 (BLDG. 2620 W.) .......... 13
# A.C. UNIT TEST

**Project:** MIXED WASTE STORAGE (DB-3)  
**Location:** BLDG. 2620 W.

**SYSTEM:** AC-1  
**DATE:** 11/14/96

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**NOTES:**

WHC-SD-W112-ATR-007, REV 0
### A.C. UNIT TEST

**Project:** MIXED WASTE STORAGE (PE-3)

**Location:** BLDG. 2620 W.

**SYSTEM:** HP-1

**MANUFACTURER:** TRANE

**MODEL:** YCH075C4BA

**SERIAL #:** N/A

**TYPE:** FC

**EQUIP. LOC.:** NORTH EXT. OF BLDG. AREA SERVED: N. SEC. BLDG. 2620 W

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**MOTOR DATA:** MFG.

**MATATHON ELECTRIC**

**FRAME 56-70**

**SERVICE FACTOR:** 1.5

**BHP** N/A

**CONDITIONS:**

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| MOTOR (VOLTS/PHASE) | | |
|---------------------| | |
| 480 | 3 | N/A | N/A |

**MOTOR AMPS**

| 2.1 | 2.1 | 2.1 | N/A | N/A | N/A | N/A |

**DRIVE MANUFACTURER**

**BROWNING**

**MOTOR SHEAVE**

1VL34

**SHAFT** 5/8"

**FAN SHEAVE**

5.125" O.D.

**SHAFT** 3/4"

**DRIVE BELTS**

A46

**CENTERS 18"+0"-2"**

---

**NOTES:**

WHC-SD-W112-ATR-007, REV 0
### AIR DISTRIBUTION TEST DATA

**Project:** MIXED WASTE STORAGE (D-3)  
**Location:** BLDG. 2620 W.  
**SYSTEM/SEQ:** HP-1 DIST. /001  
**PARENT SHEET:** HP-1

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**DATE:** 11/14/96  
**PAGE:** 3
### AIR DISTRIBUTION TEST DATA

**Project:** MIXED WASTE STORAGE (DG-3)

**Location:** BLDG. 2620 W.

**SYSTEM/SEQ:** HP-1 DIST. /002

**PARENT SHEET:** HP-1

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National Indoor Air Care, Corporation

A.C. UNIT TEST

Project: MIXED WASTE STORAGE (DB-2)
Location: BLDG. 2620 W.

SYSTEM: HP-2

| MANUFACTURER: TRANE | MODEL: YCH090C40BBA |
| SERIAL #: N/A | TYPE: FC |
| EQUIP. LOC.: NORTH EXT. OF BLDG. AREA SERVED: S. SEC. BLDG. 2620W. |

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| MOTOR DATA: MFG. | MARATHON EXECTRIC | FRAME 56HZ-80 |
| SERVICE FACTOR | 1.15 | BHP N/A |
| CONDITIONS: | SPECIFIED | INITIAL | FINAL |
| MOTOR (HP/RPM) | 2.0 | 1725 | N/A | N/A | N/A | N/A |
| MOTOR (VOLTS/PHASE) | 480 | 3 | N/A | N/A | N/A | N/A |
| MOTOR AMPS | 3.1 | 3.1 | 3.1 | N/A | N/A | N/A | N/A | N/A |

| DRIVE MANUFACTURER | BROWNING |
| MOTOR SHEAVE | 1VL40 | SHAFT 7/8" |
| FAN SHEAVE | 5.125" O.D. | SHAFT 3/4" |
| DRIVE BELTS | A46 | CENTERS 18"+2"-2" |

NOTES:

WHC-SD-W112-ATR-007, REV 0
# National Indoor Air Care, Corporation

**AIR DISTRIBUTION TEST DATA**

**Project:** MIXED WASTE STORAGE (P6-3)

**Location:** BLDG. 2620 W.

**SYSTEM/SEQ:** HP-2 DIST. /001

**PARENT SHEET:** HP-2

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NIAC Corporation

EXHAUST FAN SHEET: (NEW)

Project: SWOC MAINTENANCE SUPPORT FACILITY (DB-3)
Location: BLDG. 2620 W.

SYSTEM: EF-1

MANUFACTURER: BREIDERT
EQUIP. LOC.: CEILING
AREA SERVED: WOMANS BATHROOM

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<td>330 330</td>
<td>330 330</td>
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<tr>
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<td>OUTLETS</td>
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<tr>
<td>SP W.C. (EXT/TOT)</td>
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<td>N/A N/A</td>
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<tr>
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MOTOR DATA: MFG. N/A FRAME N/A *
SERVICE FACTOR N/A BHP N/A *
STARTER HEATERS N/A *

CONDITIONS:

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<td>N/A</td>
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| MOTOR (VOLTS/PHASE) | 120 | 1 | N/A | N/A |
| MOTOR AMPS | N/A | N/A | N/A | N/A | N/A |

NOTES: * DATA NOT AVAILABLE AND/OR NOT ACCESSIBLE.
NIAC Corporation

EXHAUST FAN SHEET (NEW)

Project: SWOC MAINTENANCE SUPPORT FACILITY (DB-3)
Location: BLDG. 2620 W.

SYSTEM: EF-2

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DRIVE MANUFACTURER: DIRECT DRIVE

NOTES: * DATA NOT AVAILABLE AND/OR NOT ACCESSIBLE.

WAC-50-W11Z-ATR-007, REV.0
NIAC Corporation

EXHAUST FAN SHEET (NEW)

Project: SWOC MAINTENANCE SUPPORT FACILITY (DB-3)
Location: BLDG. 2620 W.

SYSTEM: EF-3

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<td>N/A</td>
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DRIVE MANUFACTURER: DIRECT DRIVE

NOTES: * DATA NOT AVAILABLE AND/OR NOT ACCESSABLE.
### Exhaust Fan Sheet

**Project:** SWOC MAINTENANCE SUPPORT FACILITY (DB-3)
**Location:** BLDG. 2620 W.
**System:** EF-5

**Manufacturer:** BREIDERT  
**Equip. Loc.:** WEST OUTSIDE WALL  
**Area Served:** ROOM 107

## Fan Data

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<td>N/A</td>
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## Motor Data

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## Conditions

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**Drive Manufacturer:** DIRECT DRIVE

**Notes:**
- * Data not available and/or not accessible.
- ** Direct drive fan. Motor has no speed adjustment.
**NIAC Corporation**

**EXHAUST FAN SHEET (NEW)**

**Project:** SWOC MAINTENANCE SUPPORT FACILITY (DB-3)

**Location:** BLDG. 2620 W.

**SYSTEM:** EF-6

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**CONDITIONS:**

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| DRIVE MANUFACTURER | DIRECT DRIVE |

**NOTES:** * DATA NOT AVAILABLE AND/OR ACCESSIBLE.*

***RE-BALANCED BY APOLLO on 1/10/97***

**WHC-SD-W112-ATR-007, REV 0**
**WIAC Corporation**

**EXHAUST FAN SHEET. (NEW)**

**Project:** SWOC MAINTENANCE SUPPORT FACILITY (DB-3)  
**Location:** BLDG. 2620 W.  
**SYSTEM:** EF-7

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<td>N/A</td>
<td>N/A</td>
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<td>MOTOR (VOLTS/PHASE)</td>
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**NOTES:**  
* DATA NOT AVAILABLE AND/OR ACCESSIBLE.  
** DIRECT DRIVE FAN. MOTOR HAS NO SPEED ADJUSTMENT AVAILABLE.
NIAC Corporation

PROJECT: LONG TERM DRUM STORAGE BUILDINGS (DB-1)  DATE: 01/10/97

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NIAC-SD-W112-ATR-007, REV 0
**Project:** MIXED WASTE STORAGE (D6-i)  
**Location:** BLDG. 2404-WA  
**SYSTEM:** EP-1(WA)  

**MANUFACTURER:** BREIDERT  
**MODEL:** UBX-42  
**SERIAL #:** N/A  
**TYPE:** PROPELLER  
**EQUIP. LOC.:** ROOF  
**AREA SERVED:** BLDG. 2404(WA)  

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**MANUFACTURER:** BREIDERT  
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**TYPE:** PROPELLER  
**EQUIP. LOC.:** ROOF  
**AREA SERVED:** BLDG. 2404(WA)
**National Indoor Air Care, Corporation**

**EXHAUST FAN SHEET (NEW)**

**Project:** MIXED WASTE STORAGE  
**Location:** BLDG. 2404-WB  
**SYSTEM:** EF-1(WB)  
**DATE:** 11/14/96

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**DRIVE MANUFACTURER:** DIRECT DRIVE

**NOTES:**
**Project:** MIXED WASTE STORAGE  
**Location:** BLDG. 2404-WC  
**SYSTEM:** EF-1(WC)  

**MANUFACTURER:** BREIDERT  
**MODEL:** UBX-42  
**SERIAL #:** N/A  
**TYPE:** PROPELLER  
**EQUIP. LOC.:** ROOF  
**AREA SERVED:** BLDG. 2404(WC)

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**DRIVE MANUFACTURER:** DIRECT DRIVE

**NOTES:** (1) DATA INACCESSIBLE OR UNAVAILABLE
National Indoor Air Care, Corporation

EXHAUST FAN SHEET (NEW)

Project: MIXED WASTE STORAGE
Location: BLDG. 2404-WA
SYSTEM: EF-2(WA)

MANUFACTURER: BREIDERT
SERIAL #: N/A
EQUIP. LOC.: ROOF

MODEL: UBX-42
TYPE: PROPELLER
AREA SERVED: BLDG. 2404(WA)

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DRIVE MANUFACTURER: DIRECT DRIVE

NOTES:

WHC-SD-W112-ATR-007, REV 0
Project: MIXED WASTE STORAGE  
Location: BLDG. 2404-WB  
SYSTEM: EF-2(WB)

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| DRIVE MANUFACTURER | DIRECT DRIVE |

NOTES:

WHC-SD-W112-ATR-007, REV 0
**EXHAUST FAN SHEET (NEW)**

**Project:** MIXED WASTE STORAGE  
**Location:** BLDG. 2404-WC  
**SYSTEM:** EF-2(WC)  
**DATE:** 11/14/96

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| DRIVE MANUFACTURER | DIRECT DRIVE |

**NOTES:** (1) DATA INACCESSIBLE OR UNAVAILABLE
**Project:** MIXED WASTE STORAGE (PB-1)

**Location:** BLDG. 2404-WA

**SYSTEM:** EF-3(WA)

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**DRIVE MANUFACTURER** | **DIRECT DRIVE**

**NOTES:** (1) DATA INACCESSIBLE OR UNAVAILABLE
EXHAUST FAN SHEET (NEW)

Project: MIXED WASTE STORAGE  
Location: BLDG. 2404-WB  
SYSTEM: EF-3(WB)

MANUFACTURER: BREIDERT  
MODEL: CCXD 6125  
SERIAL #: N/A  
TYPE: CENTRIFUGAL ROOF EX.  
EQUIP. LOC.: ROOF OF MECH. ROOM  
AREA SERVED: BLDG. 2404(WB)

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NOTES: (1) DATA INACCESSIBLE OR UNAVAILABLE

WHC-SD-W112-ATR-007, REV 0
Project: MIXED WASTE STORAGE  
Location: BLDG. 2404-WC  
SYSTEM: EF-3(WC)

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NOTES: (1) DATA INACCESSIBLE OR UNAVAILABLE
Project: Department of Energy - Hanford
for Garco Construction
Date: July 1, 1996
Project Mgr: John Hryciuk

Contents

Project Submittals

1. Start & Test Reports for EF 1, 2 and 3
2. Start and test Reports for HVAC Units
   - HP-1
   - HP-2
   - HP-3
   - HP-4
Department of Energy - Hanford

1

Exhaust Fans
Start & Test Report
Exhaust Fan Start & Test Report

Project: DOE Hanford - for Garco Construction
Date: 5/28/96
Unit ID: EF-1

**Nameplate Information**

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**Electrical Data**

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**Site Inspection**

| Duct Connections:      | all connections complete and sealed |
| Disconnect:            | NA                                  |
| Controls:              | Wall switch provided by Div 16      |
| Hangers & Support:     | complete                            |
| Isolation:             | internal motor isolation - duct flex collars |
| Electrical Connections:| complete                            |
| Utility Outlet:        | NA                                  |

**Air Side Components**

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**Notes**

Unit is operating properly at this time. Air balance is good.
Exhaust Fan Start & Test Report

<table>
<thead>
<tr>
<th>Project:</th>
<th>DOE Hanford - for Garco Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>5/28/96</td>
</tr>
<tr>
<td>Unit ID:</td>
<td>EF-2</td>
</tr>
</tbody>
</table>

Nameplate Information

<table>
<thead>
<tr>
<th>Mfg:</th>
<th>Jenn Exhaust Fan - Roof Mounted</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN:</td>
<td>BCRD100A</td>
</tr>
<tr>
<td>SN:</td>
<td>95EO538701</td>
</tr>
<tr>
<td>Area:</td>
<td>Men's Restroom</td>
</tr>
<tr>
<td>Accessories:</td>
<td>None</td>
</tr>
</tbody>
</table>

Electrical Data

<table>
<thead>
<tr>
<th>Unit Voltage:</th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>115/60/1</td>
<td>115/60/1</td>
<td></td>
</tr>
<tr>
<td>Fan FLA:</td>
<td>0.75</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Site Inspection

<table>
<thead>
<tr>
<th>Duct Connections:</th>
<th>all connections complete and sealed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disconnect:</td>
<td>NA</td>
</tr>
<tr>
<td>Controls:</td>
<td>Wall switch provided by Div 16</td>
</tr>
<tr>
<td>Hangers &amp; Support:</td>
<td>complete</td>
</tr>
<tr>
<td>Isolation:</td>
<td>internal motor isolation - duct flex collars</td>
</tr>
<tr>
<td>Electrical Connections:</td>
<td>complete</td>
</tr>
<tr>
<td>Utility Outlet:</td>
<td>NA</td>
</tr>
</tbody>
</table>

Air Side Components

<table>
<thead>
<tr>
<th>Exhaust CFM:</th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>490</td>
<td></td>
</tr>
<tr>
<td>Return SP:</td>
<td>0.088</td>
<td></td>
</tr>
<tr>
<td>Total SP:</td>
<td>0.088</td>
<td></td>
</tr>
</tbody>
</table>

Notes

Unit is operating properly at this time. Air balance is good.
## Air Balance Report

<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Design CFM</th>
<th>First Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men's #1</td>
<td>EG</td>
<td>250</td>
<td>235</td>
<td></td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>Men's #2</td>
<td>EG</td>
<td>250</td>
<td>255</td>
<td></td>
<td></td>
<td>102%</td>
</tr>
<tr>
<td>Total Exhaust</td>
<td>500</td>
<td>490</td>
<td></td>
<td></td>
<td></td>
<td>98%</td>
</tr>
</tbody>
</table>
Exhaust Fan Start & Test Report

Project: DOE Hanford - for Garco Construction  
Date: 5/28/96  
Unit ID: EF-3

Nameplate Information

<table>
<thead>
<tr>
<th>Mfg:</th>
<th>Jenn Exhaust Fan - Roof Mounted</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN:</td>
<td>BCRD100A</td>
</tr>
<tr>
<td>SN:</td>
<td>95EO538701</td>
</tr>
<tr>
<td>Area:</td>
<td>Momens Restroom</td>
</tr>
<tr>
<td>Accessories:</td>
<td>None</td>
</tr>
</tbody>
</table>

Electrical Data

<table>
<thead>
<tr>
<th>Unit Voltage:</th>
<th>115/60/1</th>
<th>115/60/1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan FLA:</td>
<td>0.75</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Site Inspection

| Duct Connections: | all connections complete and sealed |
| Disconnect:       | NA                                   |
| Controls:         | Wall switch provided by Div 16       |
| Hangers & Support:| complete                             |
| Isolation:        | internal motor isolation - duct flex collars |
| Electrical Connections: | complete |
| Utility Outlet:   | NA                                   |

Air Side Components

<table>
<thead>
<tr>
<th>Exhaust CFM:</th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500</td>
<td>510</td>
</tr>
<tr>
<td>Return SP:</td>
<td></td>
<td>0.088</td>
</tr>
<tr>
<td>Total SP:</td>
<td></td>
<td>0.088</td>
</tr>
</tbody>
</table>

Notes

Unit is operating properly at this time. Air balance is good.
<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Design CFM</th>
<th>First Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women's #1</td>
<td>EG</td>
<td>250</td>
<td></td>
<td>265</td>
<td></td>
<td>106%</td>
</tr>
<tr>
<td>Women's #2</td>
<td>EG</td>
<td>250</td>
<td></td>
<td>245</td>
<td></td>
<td>98%</td>
</tr>
<tr>
<td>Total Exhaust</td>
<td></td>
<td>500</td>
<td></td>
<td>510</td>
<td></td>
<td>102%</td>
</tr>
</tbody>
</table>
HVAC Units
Start & Test Report
Rock Island Sheet Metal
# HVAC System Start & Test Report

<table>
<thead>
<tr>
<th>Project:</th>
<th>DOE Hanford - for Garco Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>5/28/96</td>
</tr>
<tr>
<td>Unit ID:</td>
<td>HP-1</td>
</tr>
</tbody>
</table>

## Nameplate Information

<table>
<thead>
<tr>
<th>Mfg:</th>
<th>York Heat Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN:</td>
<td>B3CH090A46ECA</td>
</tr>
<tr>
<td>SN:</td>
<td>NBEM022046</td>
</tr>
<tr>
<td>Area:</td>
<td>East Section</td>
</tr>
<tr>
<td>Accessories:</td>
<td>Economizer, two VAV Boxes</td>
</tr>
</tbody>
</table>

## Internal Components

<table>
<thead>
<tr>
<th>Refer Type:</th>
<th>R-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piping Inspected:</td>
<td>Yes - Ok at this time</td>
</tr>
<tr>
<td>Wiring Inspected:</td>
<td>Yes - OK at this time</td>
</tr>
</tbody>
</table>

## Electrical Data

<table>
<thead>
<tr>
<th></th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Voltage:</td>
<td>460/60/3</td>
<td>460/60/3</td>
</tr>
<tr>
<td>Compressor FLA:</td>
<td>10.0</td>
<td>6.1</td>
</tr>
<tr>
<td>Compressor RLA:</td>
<td>62.0</td>
<td>NA</td>
</tr>
<tr>
<td>Indoor Fan FLA:</td>
<td>3.3</td>
<td>3.1</td>
</tr>
<tr>
<td>Condenser fan FLA:</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Aux Heater Kw:</td>
<td>13.6</td>
<td>13.6</td>
</tr>
<tr>
<td>Aux Htr FLA:</td>
<td>65.4</td>
<td>57.1</td>
</tr>
<tr>
<td>Return Fan FLA:</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Other (Specify):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DX System

<table>
<thead>
<tr>
<th></th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction Pressure:</td>
<td>55#</td>
<td>36°F</td>
</tr>
<tr>
<td>Liquid Pressure:</td>
<td>175#</td>
<td>72°F</td>
</tr>
<tr>
<td>Subcooling:</td>
<td></td>
<td>20°F</td>
</tr>
<tr>
<td>Superheat:</td>
<td></td>
<td>6°F</td>
</tr>
<tr>
<td>DX Coil Cooling TD:</td>
<td></td>
<td>20°F</td>
</tr>
<tr>
<td>DX Coil Heating TD:</td>
<td></td>
<td>29°F</td>
</tr>
<tr>
<td>Cond Coil Cooling TD:</td>
<td></td>
<td>16°F</td>
</tr>
<tr>
<td>Cond Coil Heating TD:</td>
<td></td>
<td>18°F</td>
</tr>
</tbody>
</table>

Site Inspection

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct Connections:</td>
<td>all connections complete and sealed</td>
</tr>
<tr>
<td>Condensate Drain:</td>
<td>done</td>
</tr>
<tr>
<td>Disconnect:</td>
<td>done</td>
</tr>
<tr>
<td>Controls:</td>
<td>complete</td>
</tr>
<tr>
<td>Hangers &amp; Support:</td>
<td>complete</td>
</tr>
<tr>
<td>Economizer:</td>
<td>installed and operating correctly at this time</td>
</tr>
<tr>
<td>Seismic:</td>
<td>NA</td>
</tr>
<tr>
<td>Isolation:</td>
<td>internal motor isolation - duct flex collars</td>
</tr>
<tr>
<td>Electrical Connections:</td>
<td>complete</td>
</tr>
<tr>
<td>Utility Outlet:</td>
<td>NA</td>
</tr>
<tr>
<td>Smoke Detectors:</td>
<td>installed and tested</td>
</tr>
<tr>
<td>Other (Specify):</td>
<td></td>
</tr>
</tbody>
</table>

Air Side Components

<table>
<thead>
<tr>
<th></th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply CFM:</td>
<td>2360</td>
<td>2250</td>
</tr>
<tr>
<td>Return CFM:</td>
<td>1950</td>
<td>1800</td>
</tr>
<tr>
<td>Ventilation CFM (OSA):</td>
<td>450</td>
<td>512</td>
</tr>
<tr>
<td>Supply SP:</td>
<td>0.179</td>
<td></td>
</tr>
<tr>
<td>Return SP:</td>
<td>0.169</td>
<td></td>
</tr>
<tr>
<td>Total SP: (External)</td>
<td>0.348</td>
<td></td>
</tr>
<tr>
<td>Aux Heat Coil TD:</td>
<td>38°F</td>
<td></td>
</tr>
<tr>
<td>Hydronic Coil TD:</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Other Specify:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit is operating properly at this time. Air balance is good.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testing witnessed by Gary C Rogstad - ICF Kaiser</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WHC-SD-W112-ATR-007, REV 0. 45
## Air Balance Report

<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Design CFM</th>
<th>First Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CD</td>
<td>200</td>
<td>186</td>
<td>101%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CD</td>
<td>80</td>
<td>81</td>
<td>93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CD</td>
<td>120</td>
<td>112</td>
<td>93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CD</td>
<td>120</td>
<td>119</td>
<td>97%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CD</td>
<td>120</td>
<td>119</td>
<td>97%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>CD</td>
<td>200</td>
<td>208</td>
<td>104%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>CD</td>
<td>135</td>
<td>122</td>
<td>90%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CD</td>
<td>135</td>
<td>124</td>
<td>92%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CD</td>
<td>425</td>
<td>397</td>
<td>93%</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>CD</td>
<td>400</td>
<td>392</td>
<td>96%</td>
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<td></td>
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<tr>
<td>11</td>
<td>CD</td>
<td>425</td>
<td>390</td>
<td>92%</td>
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</tbody>
</table>

**Total Supply**

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2360</td>
<td>2250</td>
<td></td>
<td>95%</td>
<td></td>
</tr>
</tbody>
</table>

**R-1**

|        |          | 1950       | 1800          |               | 92%           |      |

**OSA**

|        | Intake   | 450        | 512           |               | 114%          |      |

**Total Return**

|        |          | 2400       | 2312          |               | 96%           |      |
### HVAC System Start & Test Report

<table>
<thead>
<tr>
<th>Project:</th>
<th>DOE Hanford - for Garco Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>5/28/96</td>
</tr>
<tr>
<td>Unit ID:</td>
<td>HP-2</td>
</tr>
</tbody>
</table>

#### Nameplate Information

<table>
<thead>
<tr>
<th>Mfg:</th>
<th>York Heat Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN:</td>
<td>B3CH090A46ECA</td>
</tr>
<tr>
<td>SN:</td>
<td>NDEM040526</td>
</tr>
<tr>
<td>Area:</td>
<td>Center Section</td>
</tr>
<tr>
<td>Accessories:</td>
<td>Economizer, 2 remote sensors, one VAV Box</td>
</tr>
</tbody>
</table>

#### Internal Components

<table>
<thead>
<tr>
<th>Refer Type:</th>
<th>R-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piping Inspected:</td>
<td>Yes - Ok at this time</td>
</tr>
<tr>
<td>Wiring Inspected:</td>
<td>Yes - OK at this time</td>
</tr>
</tbody>
</table>

#### Electrical Data

<table>
<thead>
<tr>
<th></th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Voltage:</td>
<td>460/60/3</td>
<td>460/60/3</td>
</tr>
<tr>
<td>Compressor FLA:</td>
<td>7.10</td>
<td>6.60</td>
</tr>
<tr>
<td>Compressor RLA:</td>
<td>64.0</td>
<td>NA</td>
</tr>
<tr>
<td>Indoor Fan FLA:</td>
<td>2.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Condenser fan FLA:</td>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Aux Heater Kw:</td>
<td>18.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Aux Htr FLA:</td>
<td>85.5</td>
<td>78.6</td>
</tr>
<tr>
<td>Return Fan FLA:</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Other (Specify):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### DX System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction Pressure:</td>
<td>61#</td>
<td>38°F</td>
</tr>
<tr>
<td>Liquid Pressure:</td>
<td>182#</td>
<td>75°F</td>
</tr>
<tr>
<td>Subcooling:</td>
<td></td>
<td>20°F</td>
</tr>
<tr>
<td>Superheat:</td>
<td></td>
<td>3°F</td>
</tr>
<tr>
<td>DX Coil Cooling TD:</td>
<td></td>
<td>16°F</td>
</tr>
<tr>
<td>DX Coil Heating TD:</td>
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<td>22°F</td>
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<tr>
<td>Cond Coil Cooling TD:</td>
<td></td>
<td>18°F</td>
</tr>
<tr>
<td>Cond Coil Heating TD:</td>
<td></td>
<td>21°F</td>
</tr>
</tbody>
</table>

### Site Inspection

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct Connections:</td>
<td>all connections complete and sealed</td>
</tr>
<tr>
<td>Condensate Drain:</td>
<td>done</td>
</tr>
<tr>
<td>Disconnect:</td>
<td>done</td>
</tr>
<tr>
<td>Controls:</td>
<td>complete</td>
</tr>
<tr>
<td>Hangers &amp; Support:</td>
<td>complete</td>
</tr>
<tr>
<td>Economizer:</td>
<td>installed and operating correctly at this time</td>
</tr>
<tr>
<td>Seismic:</td>
<td>NA</td>
</tr>
<tr>
<td>Isolation:</td>
<td>internal motor isolation - duct flex collars</td>
</tr>
<tr>
<td>Electrical Connections:</td>
<td>complete</td>
</tr>
<tr>
<td>Utility Outlet:</td>
<td>NA</td>
</tr>
<tr>
<td>Smoke Detectors:</td>
<td>installed and tested</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
</tr>
</tbody>
</table>

### Air Side Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply CFM:</td>
<td>2975</td>
<td>2932</td>
</tr>
<tr>
<td>Return CFM:</td>
<td>2700</td>
<td>2620</td>
</tr>
<tr>
<td>Ventilation CFM (OSA):</td>
<td>300</td>
<td>320</td>
</tr>
<tr>
<td>Supply SP:</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Return SP:</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Total SP:  <strong>External</strong></td>
<td></td>
<td>0.12</td>
</tr>
<tr>
<td>Aux Heat Coil TD:</td>
<td></td>
<td>40°F</td>
</tr>
<tr>
<td>Hydronic Coil TD:</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>Other Specify:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Notes

| Unit is operating properly at this time. Air balance is good. |
| Testing witnessed by Gary C Rogstad - ICF Kaiser |
## Air Balance Report

<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Design CFM</th>
<th>First Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CD</td>
<td>300</td>
<td>325</td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>CD</td>
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<td>220</td>
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<tr>
<td>3</td>
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</tr>
<tr>
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<td>335</td>
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<tr>
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<td>7</td>
<td>CD</td>
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<td>290</td>
<td></td>
<td></td>
<td>114%</td>
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<tr>
<td>8</td>
<td>CD</td>
<td>345</td>
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<tr>
<td>10</td>
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<td>375</td>
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<tr>
<td>11</td>
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<td>250</td>
<td>225</td>
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**Total Supply**  
2975  2932  99%

<table>
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<tr>
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<th>Design CFM</th>
<th>First Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
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</thead>
<tbody>
<tr>
<td>R-1</td>
<td>RAG</td>
<td>1400</td>
<td>1343</td>
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<td>R-2</td>
<td>RAG</td>
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<td>1277</td>
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<tr>
<td>OSA</td>
<td>Intake</td>
<td>300</td>
<td>320</td>
<td></td>
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<td>107%</td>
</tr>
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**Total Return**  
3000  2940  98%

WHC-SD-W112-ATR-007, REV 0.  51
## HVAC System Start & Test Report

<table>
<thead>
<tr>
<th>Project:</th>
<th>DOE Hanford - for Garco Construction</th>
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### Nameplate Information

<table>
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<th>York Heat Pump</th>
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</thead>
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<tr>
<td>MN:</td>
<td>B3CH090A46ECA</td>
</tr>
<tr>
<td>SN:</td>
<td>NHDM076106</td>
</tr>
<tr>
<td>Area:</td>
<td>South Section</td>
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<td>Accessories:</td>
<td>Economizer</td>
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### Internal Components

<table>
<thead>
<tr>
<th>Refer Type:</th>
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</thead>
<tbody>
<tr>
<td>Piping Inspected:</td>
<td>Yes - Ok at this time</td>
</tr>
<tr>
<td>Wiring Inspected:</td>
<td>Yes - OK at this time</td>
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### Electrical Data

<table>
<thead>
<tr>
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<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Voltage:</td>
<td>460/60/3</td>
<td>460/60/3</td>
</tr>
<tr>
<td>Compressor FLA:</td>
<td>10.0</td>
<td>9.1</td>
</tr>
<tr>
<td>Compressor RLA:</td>
<td>62.0</td>
<td>NA</td>
</tr>
<tr>
<td>Indoor Fan FLA:</td>
<td>3.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Condenser fan FLA:</td>
<td>1.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Aux Heater Kw:</td>
<td>13.6</td>
<td>13.6</td>
</tr>
<tr>
<td>Aux Htr FLA:</td>
<td>65.4</td>
<td>57.1</td>
</tr>
<tr>
<td>Return Fan FLA:</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Other (Specify):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## DX System

<table>
<thead>
<tr>
<th></th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction Pressure:</td>
<td>56#</td>
<td>36°F</td>
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<tr>
<td>Liquid Pressure:</td>
<td>172#</td>
<td>80°F</td>
</tr>
<tr>
<td>Subcooling:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Superheat:</td>
<td></td>
<td>10°F</td>
</tr>
<tr>
<td>DX Coil Cooling TD:</td>
<td></td>
<td>16°F</td>
</tr>
<tr>
<td>DX Coil Heating TD:</td>
<td></td>
<td>22°F</td>
</tr>
<tr>
<td>Cond Coil Cooling TD:</td>
<td></td>
<td>16°F</td>
</tr>
<tr>
<td>Cond Coil Heating TD:</td>
<td></td>
<td>21°F</td>
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## Site Inspection

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Duct Connections</td>
<td>all connections complete and sealed</td>
</tr>
<tr>
<td>Condensate Drain</td>
<td>done</td>
</tr>
<tr>
<td>Disconnect</td>
<td>done</td>
</tr>
<tr>
<td>Controls</td>
<td>complete</td>
</tr>
<tr>
<td>Hangers &amp; Support</td>
<td>complete</td>
</tr>
<tr>
<td>Economizer</td>
<td>installed and operating correctly at this time</td>
</tr>
<tr>
<td>Seismic</td>
<td>NA</td>
</tr>
<tr>
<td>Isolation</td>
<td>internal motor isolation - duct flex collars</td>
</tr>
<tr>
<td>Electrical Connections</td>
<td>complete</td>
</tr>
<tr>
<td>Utility Outlet</td>
<td>NA</td>
</tr>
<tr>
<td>Smoke Detectors</td>
<td>installed and tested</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td></td>
</tr>
</tbody>
</table>

## Air Side Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply CFM:</td>
<td>1990</td>
<td>2020</td>
</tr>
<tr>
<td>Return CFM:</td>
<td>1600</td>
<td>1566</td>
</tr>
<tr>
<td>Ventilation CFM (OSA):</td>
<td>400</td>
<td>460</td>
</tr>
<tr>
<td>Supply SP:</td>
<td></td>
<td>0.089</td>
</tr>
<tr>
<td>Return SP:</td>
<td></td>
<td>0.07</td>
</tr>
<tr>
<td>Total SP: (External)</td>
<td></td>
<td>0.159</td>
</tr>
<tr>
<td>Aux Heat Coil TD:</td>
<td></td>
<td>42°F</td>
</tr>
<tr>
<td>Hydronic Coil TD:</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>Other Specify:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WHC-SD-W112-ATR-007, REV. 0
Notes

Unit is operating properly at this time. Air balance is good.

Testing witnessed by Gary C Rogstad - ICF Kaiser
## Air Balance Report

<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Design CFM</th>
<th>First Back Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CD</td>
<td>285</td>
<td></td>
<td>300</td>
<td>105%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CD</td>
<td>285</td>
<td>295</td>
<td>300</td>
<td>105%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CD</td>
<td>285</td>
<td></td>
<td>300</td>
<td>105%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CD</td>
<td>285</td>
<td>280</td>
<td>280</td>
<td>98%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CD</td>
<td>280</td>
<td></td>
<td>280</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>CD</td>
<td>285</td>
<td>290</td>
<td>290</td>
<td>102%</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>CD</td>
<td>285</td>
<td></td>
<td>275</td>
<td>96%</td>
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</table>

**Total Supply**

<table>
<thead>
<tr>
<th>Design CFM</th>
<th>First Back Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>2020</td>
<td>102%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **R-1**
  - RAG
  - Design CFM: 1600
  - First Back Balance: 1566
  - Second Back Balance: 98%

- **OSA Intake**
  - Design CFM: 400
  - First Back Balance: 460
  - Second Back Balance: 115%

- **Total Return**
  - Design CFM: 2000
  - First Back Balance: 2026
  - Second Back Balance: 101%
Department of Energy - Hanford

HP-4
**HVAC System Start & Test Report**

<table>
<thead>
<tr>
<th>Project:</th>
<th>DOE Hanford - for Garco Construction</th>
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<tr>
<td>Unit ID:</td>
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**Nameplate Information**

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<th>Mfg:</th>
<th>York Heat Pump</th>
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<tbody>
<tr>
<td>MN:</td>
<td>B3CH090A46ECA</td>
</tr>
<tr>
<td>SN:</td>
<td>NHDM076108</td>
</tr>
<tr>
<td>Area:</td>
<td>West Section</td>
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<tr>
<td>Accessories:</td>
<td>Economizer, 1 VAV Box, 2 remote sensors</td>
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</table>

**Internal Components**

<table>
<thead>
<tr>
<th>Refer Type:</th>
<th>R-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piping Inspected:</td>
<td>Yes - OK at this time</td>
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<tr>
<td>Wiring Inspected:</td>
<td>Yes - OK at this time</td>
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</tbody>
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**Electrical Data**

<table>
<thead>
<tr>
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<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Voltage:</td>
<td>460/60/3</td>
<td>460/60/3</td>
</tr>
<tr>
<td>Compressor FLA:</td>
<td>10.0</td>
<td>8.7</td>
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<tr>
<td>Compressor RLA:</td>
<td>62.0</td>
<td>NA</td>
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<tr>
<td>Indoor Fan FLA:</td>
<td>3.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Condenser fan FLA:</td>
<td>1.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Aux Heater Kw:</td>
<td>13.6</td>
<td>13.6</td>
</tr>
<tr>
<td>Aux Htr FLA:</td>
<td>65.4</td>
<td>57.1</td>
</tr>
<tr>
<td>Return Fan FLA:</td>
<td>NA</td>
<td>NA</td>
</tr>
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</table>

- Other (Specify): - - - - -
DX System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pressure</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction Pressure:</td>
<td>52#</td>
<td>34°F</td>
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<tr>
<td>Liquid Pressure:</td>
<td>185#</td>
<td>73°F</td>
</tr>
<tr>
<td>Subcooling:</td>
<td></td>
<td>22°F</td>
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<tr>
<td>Superheat:</td>
<td></td>
<td>4°F</td>
</tr>
<tr>
<td>DX Coil Cooling TD:</td>
<td></td>
<td>18°F</td>
</tr>
<tr>
<td>DX Coil Heating TD:</td>
<td></td>
<td>26°F</td>
</tr>
<tr>
<td>Cond Coil Cooling TD:</td>
<td></td>
<td>28°F</td>
</tr>
<tr>
<td>Cond Coil Heating TD:</td>
<td></td>
<td>24°F</td>
</tr>
</tbody>
</table>

Site Inspection

- Duct Connections: all connections complete and sealed
- Condensate Drain: done
- Disconnect: done
- Controls: complete
- Hangers & Support: complete
- Economizer: installed and operating correctly at this time
- Seismic: NA
- Isolation: internal motor isolation - duct flex collars
- Electrical Connections: complete
- Utility Outlet: NA
- Smoke Detectors: installed and tested
- Other (Specify): -

Air Side Components

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply CFM:</td>
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<td>2286</td>
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<tr>
<td>Return CFM:</td>
<td>2100</td>
<td>1960</td>
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<tr>
<td>Ventilation CFM (OSA):</td>
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</tr>
<tr>
<td>Supply SP:</td>
<td>0.089</td>
<td></td>
</tr>
<tr>
<td>Return SP:</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Total SP: ((\text{Ext}_Q))</td>
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<td>0.159</td>
</tr>
<tr>
<td>Aux Heat Coil TD:</td>
<td></td>
<td>42°F</td>
</tr>
<tr>
<td>Hydronic Coil TD:</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>Other Specify:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Unit is operating properly at this time. Air balance is good.

Testing witnessed by Gary C Rogstad - ICF Kaiser
## Air Balance Report

<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Design CFM</th>
<th>First Balance</th>
<th>Second Balance</th>
<th>Final Balance</th>
<th>Pct</th>
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<tbody>
<tr>
<td>1</td>
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<td>160</td>
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<td>80%</td>
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<td>4</td>
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<td>160</td>
<td>100%</td>
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<td>183</td>
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</tr>
<tr>
<td>7</td>
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<td>193</td>
<td>193</td>
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<td>8</td>
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<td>CD</td>
<td>425</td>
<td>410</td>
<td>410</td>
<td>410</td>
<td>96%</td>
</tr>
</tbody>
</table>

**Total Supply**

- **CFM**: 2390
- **Balance**: 2286
- **Pct**: 96%

### R-1

- **Type**: RAG
- **CFM**: 2100
- **Balance**: 1960
- **Pct**: 93%

### OSA

- **Intake**: 300
- **Balance**: 326
- **Pct**: 109%

**Total Return**

- **CFM**: 2400
- **Balance**: 2286
- **Pct**: 95%
Appendix A

W-112 Volumetric Calculation
For 2404 Series Ventilation System
VOLUMETRIC CALCULATION:

Design Basis: Require 4 air changes/hour for each building.

KNOWNS:

Actual lowest flow rate was measured in 2404 WB at 16,137 CFM.
Design Value Specified is 16,700 CFM
Building Dimensions Are: 120' Wide by 180' Long with a 20' eve height
There are two exhaust fans per building

CALCULATION

\[ V_b = \text{Volume of Building} \]
\[ V_{fan} = \text{Actual Volumetric Flow Rate of Fan} \]

\[ V_b = 120 \times 180 \times 20 = 432,000 \text{ CF in 1 volumetric air change} \]

Assume both fans in WB are 16,137 to be conservative:

\[ V_{fan} = (16,137 \text{ CFM}) \times (2 \text{ Fans}) \times (60 \text{ min/hr}) = 1,936,440 \text{ CF/Hr} \]

To calculate the number of Air Changes Per Hour, you simply divide \( V_{fan}/V_b \)

\[ \text{Air Changes Per Hour} = V_{fan}/V_b = 1,936,440 \text{ CF/Hr}/432,000 \text{ CF} = 4.49 \text{ changes/hr} \]

A minimum of 4.5 air changes per hour will be provided which exceed the design basis.

Since all fans inside of the W-112 buildings are equal to or higher than 16,137 as noted in the report, the fans installed exceed the design requirement of 4 air changes/hr. Furthermore this calculation ignores the volume of the building being filled with drums.