

Report By:

National TAB
1329 E. KEMPER ROAD
SUITE 4210
CINCINNATI, OH 45246



Report: TAB REPORT
Function: Test, Adjust, & Balance
Date: 04/10/2024

PROJECT
BUILD-A-BEAR (ROSEVILLE, CA)

1173 Galleria Blvd

Roseville, CA 95678

Client

B&M Builders, Inc.

National TAB

Project: BUILD-A-BEAR (ROSEVILLE, CA)

Table Of Contents

Section	Page #
Certification	3
Equipment Calibrations	4
Abbreviations	5
GRD Layout	6
Diffuser Supply (GRD)	7



CERTIFICATION

PROJECT: BUILD-A-BEAR (ROSEVILLE, CA)

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB *Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems*. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.

The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB-Southeast

REGISTRATION NO: 3755

CERTIFIED BY: J. Scott Springer 23312

DATE: 3/15/2024

The hydronic distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB-Southeast

REGISTRATION NO: 3086

CERTIFIED BY: J. Scott Springer 23312

DATE:

Submitted and Certified by:

NEBB TAB FIRM: National TAB-Southeast

TAB PROFESSIONAL: J. Scott Springer

SIGNATURE:

REGISTRATION NO: 3755 (NTAB) / 23312

CERTIFICATION EXP: 12/31/2024





National TAB

Testing, Adjusting, and Balancing Equipment



Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	Shortridge ADM-860C S/N M19547	10/17/2023	10/16/2024
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Shortridge ADM-860C S/N M19548	10/17/2023	10/16/2024
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 3 % +/- 7 cfm	Shortridge Flow Hood	10/17/2023	10/16/2024
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 5028	10/20/2023	10/19/2024
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 1075	10/20/2023	10/19/2024
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/20/2023	10/19/2024
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 4011	10/20/2023	10/19/2024
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper ATKINS - SRH77A S/N 090315046	10/20/2023	10/19/2024
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/16/2023	10/15/2024
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/16/2023	10/15/2024
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Dwyer TAC-L - S/N S1100123	10/16/2023	10/15/2024
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
DALT	DUCT LEAKAGE	-10"- +10" wc	±1% of reading +/- 0.004" wc	Kanomax DALT 6900 S/N: 080439	5/2023	5/2024

Abbreviation List

A = Area (ft ²)	S.F. = Service Factor
AHU = Air Handling Unit	SF = Supply Fan
A _k = Effective Area	SP = Static Pressure
BHP = Brake Horsepower (IP) HP	SR = Supply Register
Btu = British Thermal Unit	T = Temperature
Btu/h = Btuh = BTUH = BTU/Hour	T _{ma} = Mixed Air Temperature
CL = Center Distance (used in belt formula)	T _{oa} = Outside Air Temperature
CD = Ceiling Diffuser	T _{ra} = Return Air Temperature
CF = Correction Factor	H = Head (in wc, ft wc, psi)
CFM = Volumetric Flow: Cubic Feet Per Minute	h = Enthalpy
CO ₂ = Carbon Dioxide	HP = Horsepower
CO = Carbon Monoxide	hr = Hour
C _v = Flow Constant	K _v = Flow constant (SI)
d = Diameter (in.) IP	kW = Kilowatt = 1000 Watts
Δ = Difference or Change (Final - Initial)	LAT = Leaving Air Temperature
DB = Dry Bulb	lb = Pounds
EA = Exhaust Air	LWT = Leaving Water Temperature
EAT = Entering Air Temperature	ma = Mixed Air
EF = Exhaust Fan	MIN = Minimum
Eff = Efficiency	MAX = Maximum
EG = Exhaust Grille	N/A = Not Applicable
ESP = External Static Pressure	NA = No Access
EWT = Entering Water Temperature	NL = Not Listed
°F = Degrees Fahrenheit, °F	NPSHA = Net Positive Suction Head Available
FPB = Fan Powered Box	NS = Not Specified
FLA = Full Load Amps	OA = Outside Air
fpm = Feet per Minute (fpm)	OAT = Outside Air Temperature
ft = Foot	PD = Sheave Pitch Diameter
gal = Gallons	P.D. = Pressure Drop
GPM = Gallons Per Minute (GPM)	PF = Power Factor
h = Enthalpy (BTU/lb dry air)	SG = Supply Grille
P = Pressure	SR = Supply Register
ppm = parts per million	TP = Total Pressure
psi = Pounds Per Square Inch	T _{ra} = Return Air Temperature
psid = PSI Differential	TS = Tip Speed (fpm) IP, (m/s) SI
r = Radius (in)	TSP = Total Static Pressure
% _{ra} = % of Return Air	V = Velocity
RA = Return Air	VAV = Variable Air Volume
RAT = Return Air Temperature	VD = Volume Damper
RF = Return Fan	VFD = Variable Frequency Drive
RG = Return Grille	W = Watt
RH = Relative Humidity	WB = Wet Bulb
RPM = Revolutions Per Minute	wg = wc = water gauge = water column
RTU = Roof Top Unit	WHP = Water Horsepower (IP)
SA = Supply Air	ω = Humidity Ratio

KEYNOTE SYMBOLS: (1), (2), (3)

1. ALL EXISTING PROVISIONS IN THIS AREA TO REMAIN. CLEAN AND REFURBISH EQUIPMENT AND DISPOSES FOR FULL AND COMPLETE OPERATION.
2. RELOCATE EXISTING THERMOSTAT TO LOCATION SHOWN.
3. EXISTING SUPPLY DIFFUSER TO REMAIN. CLEAN AND REFURBISH TO LIKE NEW CONDITION. BALANCE SUPPLY DIFFUSER TO 300 CFM.
4. RELOCATE EXISTING RETURN GRILLE TO LOCATION SHOWN. CLEAN AND REFURBISH TO LIKE NEW CONDITION. BALANCE RETURN GRILLE TO 300 CFM.
5. LOCATE BOTTOM OF RETURN GRILLE AT LEAST 12" 4" AFF.
6. FURNISH AND INSTALL APPROPRIATE DUCT TRANSITION TO VAV TERMINAL.

3 MECHANICAL KEYNOTES
SCALE: N/A

- A. ALL PIPING AND HEADS SHALL BE INSTALLED PER LATEST EDITION OF NFPA 13. HEAD SPACING SHALL BE BASED UPON THE ORDINARY HAZARD SCHEDULE. ALL SPRINKLER PIPING SHALL BE SCHEDULE 40 BLACK IRON. SCHEDULE 10 PIPING IS PERMISSIBLE IF ACCEPTABLE TO THE LANDLORD. HYDRAULICALLY CALCULATE SYSTEM AND SUBMIT COPIES OF THE CALCULATIONS TO THE AUTHORITY HAVING JURISDICTION AND THE LANDLORD.
- B. PREPARE SHOP DRAWINGS FOR SUBMITTAL TO THE AUTHORITY HAVING JURISDICTION AND THE LANDLORD BEFORE FABRICATION.
- C. TWO COPIES OF THE APPROVED SHOP DRAWINGS SHALL BE SUBMITTED TO THE OWNER AND THE LANDLORD PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- D. PROVIDE FOR INSPECTION TESTING AND APPROVAL BY THE AUTHORITY HAVING JURISDICTION AND THE STATE INSPECTION BUREAU AS REQUIRED.
- E. PROVIDE SIGNED CERTIFICATE OF COMPLETION COPIES TO BE GIVEN TO OWNER'S REPRESENTATIVE, INSURANCE REPRESENTATIVE, AND PROJECT OFFICE.
- F. HOLD ALL SPRINKLER LINES AS HIGH AS POSSIBLE TO MAINTAIN 18" CLEARANCE ABOVE STOCK SHELVING.
- G. SPRINKLER HEADS IN SALES AREA SHALL BE CONCEALED TYPE WITH WHITE COVER PLATES. UPRIGHT PENDANT HEADS SHALL BE USED IN ALL AREAS WITHOUT A CEILING. PENDANT HEADS WITH EXCLUSION PLATES SHALL BE USED IN ALL STOCKROOM AREAS/RESTROOMS WITH LAY-IN OR GYPSUM BOARD CEILINGS. SPRINKLER HEAD TEMPERATURE RATINGS SHALL BE 165°F IN SALES AND STOCK AREAS AND 212°F IN DISPLAY WINDOWS AND LIGHTING FIXTURE CANOPIES OR AS REQUIRED BY LANDLORD'S INSURANCE AGENCY AND LOCAL AUTHORITIES. SPRINKLER HEADS SHALL BE QUICK RESPONSE TYPE. ALL SEMI-RECESSED AND CONCEALED HEADS SHALL BE WHITE.
- H. VISIT THE SITE AND VERIFY ALL EXISTING CONDITIONS WHICH WILL AFFECT THE WORK. PROVIDE ALL REQUIRED PIPING AND OR REVISIONS TO PIPING AS NEEDED FOR A COMPLETE SPRINKLER SYSTEM WHICH IS APPROVED AND ACCEPTED BY LOCAL AUTHORITIES.
- I. SPRINKLER SHOP DRAWINGS UNDER SEPARATE COVER. SUPPLY SPRINKLER SHOP DRAWINGS AND APPLY TO BUILDING DEPARTMENT (REQUIREMENTS).
- J. LANDLORD DESIGNATED CONTRACTOR TO REFORM ALL SPRINKLER MODIFICATIONS. SYSTEM MODIFICATIONS SHALL BE SCHEDULED IN ADVANCE WITH THE LANDLORD'S FIELD REPRESENTATIVE. THE SPRINKLER SYSTEM SHALL BE FULLY CHARGED AND OPERATIONAL.
- K. ALL FIRE PROTECTION AND SPRINKLER SYSTEM WORK SHALL BE IN ACCORDANCE WITH AIAA'S INSURANCE AGENCY REQUIREMENTS, NFPA, STATE, COUNTY AND LOCAL FIRE MARSHAL.

2 FIRE PROTECTION SPECIFICATIONS
SCALE: N/A

NOTE

EXISTING CONDITIONS WERE TAKEN FROM SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CONTRACTOR SHALL CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.

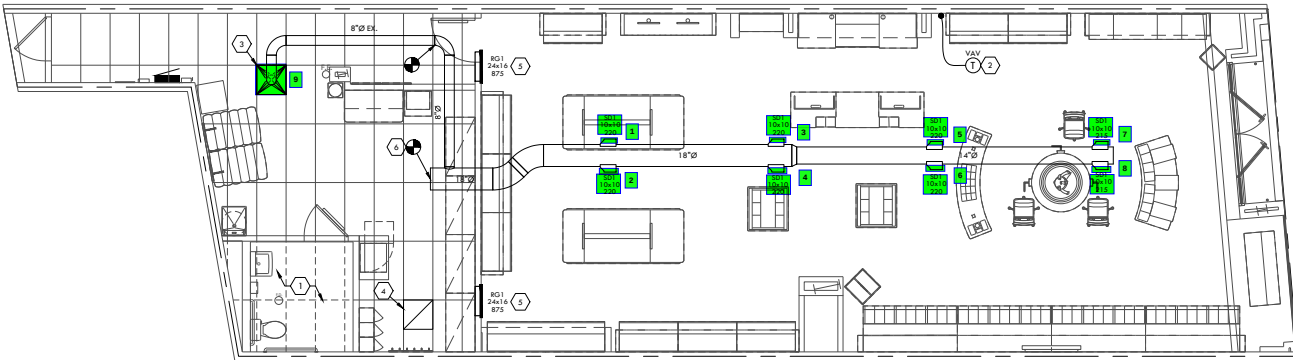
ALL HVAC EQUIPMENT AND CONTROLS MUST BE LOCATED FOR PROPER ACCESS FOR MAINTENANCE AND REPAIR. WHETHER INSTALLATION IS EXISTING OR NEW. EXISTING EQUIPMENT AND CONTROLS SHALL BE RELOCATED BY THIS CONTRACTOR IF REQUIRED.

1. ALL OF THE MECHANICAL WORK IS NOT NECESSARILY SHOWN OR NOTED ON THESE DRAWINGS. THE CONTRACTORS SHALL VISIT THE JOB SITE AND VERIFY ALL EXISTING CONDITIONS RELATED TO THEIR WORK BEFORE BIDDING. NOTIFY THE OWNER OF ANY DISCREPANCIES. THOSE ITEMS NOT SHOWN OR NOTED BUT WHICH ARE DEEMED NECESSARY FOR REMOVAL OR RELOCATION BY OWNER'S REPRESENTATIVE SHALL BE PART OF THIS CONTRACT.
2. THE SUBMISSION OF PROPOSALS SHALL BE CONSIDERED EVIDENCE THAT THE CONTRACTORS HAVE VISITED THE SITE. NO EXTRA PAYMENTS WILL BE ALLOWED THESE CONTRACTORS CLAIM FOR EXTRA WORK MADE NECESSARY BY THEIR FAILURE TO VISIT THE SITE.
3. GUARANTEE ALL EQUIPMENT AND MATERIAL INSTALLED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND REPAIR OR REPLACE WITHOUT COST TO THE OWNER ANY EQUIPMENT WHICH IS DEFECTIVE, OR IMPROPERLY INSTALLED. IN ADDITION, ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO THE BUILDING AND ITS CONTENTS OR OTHER EQUIPMENT CAUSED BY DEFECTS OR IMPROPER INSTALLATION OF EQUIPMENT OR MATERIALS INSTALLED UNDER THIS PORTION OF THE WORK.
4. ALL WORK SHALL BE COMPLETED AND INSTALLED ACCORDING TO STATE AND OR LOCAL CODES, AND ALL LANDLORD CRITERIA.
5. PAY FOR ALL REQUIRED PERMITS AND INSPECTIONS AND PROVIDE A CERTIFICATE OF INSPECTION.
6. REVIEW ALL LANDLORD REQUIREMENTS AND INSTALL ALL MATERIALS AND EQUIPMENT AS DIRECTED BY THE LANDLORD'S REPRESENTATIVE AND AS REQUIRED BY THE LEASE DOCUMENTS. VERIFY THE REQUIREMENTS BEFORE SUBMITTING A BID.
7. VERIFY THE SIZE, LOCATION AND CONDITION OF THE EXISTING DUCTWORK, EQUIPMENT AND CONTROLS THAT ARE TO REMAIN. NOTIFY THE OWNER OF ANY DISCREPANCIES. REPLACE EXISTING COMPONENTS IF INADEQUATE FOR THE NEW REQUIREMENTS OR INOPERABLE. COORDINATE REPLACEMENT COMPONENT SPECIFICATIONS WITH THE LANDLORD'S FIELD REPRESENTATIVE.
8. FIVE (5) COPIES OF ALL SHOP OR EQUIPMENT DRAWINGS SHALL BE SUBMITTED TO THE OWNER. THESE DRAWINGS SHALL BE CLEARLY MARKED INDICATING WHICH ITEMS ARE TO BE SUPPLIED AND SHALL STATE CAPACITIES, SIZES, REQUIRED INSPECTION LABELS AND GENERAL DESCRIPTION OF ALL EQUIPMENT AND FIXTURES.
9. ALL AIR INTAKES AND EXHAUSTS NEED TO BE SEPARATED BY A MINIMUM OF 10'-0".
10. NO COMPONENTS MAY BE ABANDONED IN PLACE WITHOUT PERMISSION FROM THE OWNER. ALL COMPONENTS THAT ARE NOT REUSED MUST BE REMOVED.
11. VERIFY ALL CLEARANCES AROUND NEW AND EXISTING EQUIPMENT.
12. CAP ALL UNUSED PIPING LINES ASSOCIATED WITH LEASED SPACE AS REQUIRED BY LANDLORD AND LOCAL AUTHORITY HAVING JURISDICTION.
13. FURNISH AND INSTALL BACKFLOW PREVENTER IF REQUIRED BY AUTHORITY HAVING JURISDICTION OR LANDLORD.
14. FURNISH AND INSTALL ALL MECHANICAL EQUIPMENT AND OR AIR DEVICES AS SCHEDULED ON THE DRAWINGS. BIDS SHALL BE BASED ON THE EQUIPMENT SPECIFIED AND NO SUBSTITUTIONS WILL BE ACCEPTED.
15. FURNISH AND INSTALL ALL SYSTEMS OF HVAC CONTROL (TO INCLUDE CONTROL WIRING) TO PROVIDE A COMPLETE SYSTEM.
16. FLEX DUCTWORK SHALL NOT EXCEED 3'-0" IN LENGTH.
17. A CERTIFIED AIR BALANCE REPORT IS TO BE PROVIDED TO THE LANDLORD PRIOR TO STORE OPENING.
18. REMOVE ALL EXISTING MECHANICAL EQUIPMENT, DUCTWORK, PLUMBING FIXTURES, PIPING, SYSTEMS, ETC., NOT BEING REUSED. DO NOT ABANDON.
19. THE G.C. SHALL HAVE EXISTING SANITARY WASTE LINE INSPECTED BY CAMERA, TO LEASE LINE, PRIOR TO COMMENCING NEW WORK. RECORDING OF INSPECTION SHALL BE FURNISHED TO OWNER ALONG WITH ANY FINDINGS ADVISING REPAIR OR CLEARANCE OF ANY OBSERVED OBSTRUCTIONS OF THE EXISTING PIPE PRIOR TO ROUGH-IN INSPECTION.
20. ALL HVAC SYSTEMS AND EQUIPMENT CAPACITIES HAVE BEEN DESIGNED TO NOT EXCEED CALCULATION LOADS.
21. ALL DUCTS AND PIPINGS SHALL BE SEALED BASED ON STATIC PRESSURE AND LOCATION.
22. HVAC CONTROL SYSTEMS SHALL BE TESTED TO INSURE PROPER OPERATION, CALIBRATION, AND ADJUSTMENT OF CONTROLS.
23. PROVIDE R-6 MINIMUM INSULATION WRAP ON ALL CONCEALED DUCTWORK. PROVIDE R-4.2 MINIMUM INTERNAL DUCT LINER ON ALL EXPOSED SPIRAL DUCTWORK. PROVIDE R-6 MINIMUM INTERNAL DUCT LINER ON ALL EXPOSED RECTANGULAR DUCTWORK. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE DIMENSIONS, SHEET METAL SIZES SHALL INCREASE ACCORDINGLY. PROVIDE R-2 MINIMUM INSULATION ON ALL DUCTWORK INSTALLED IN UNCONDITIONED SPACES. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

7 GENERAL NOTES
SCALE: N/A

6 LEGEND
SCALE: N/A

MECHANICAL SYMBOLS LEGEND	
	THERMOSTAT / HUMIDISTAT
	VOLUME DAMPER
	FIRE DAMPER
	CEILING SUPPLY AIR DIFFUSER
	CEILING RETURN AIR GRILLE
	SIDEWALL AIR DIFFUSER OR GRILLE
	NEW DUCTWORK
	EXISTING DUCTWORK
	CONDENSATE DRAIN
	GAS PIPING
	PIPE TURNING DOWN
	PIPE TURNING UP
	BALL VALVE
	CONNECTION OF NEW TO EXISTING
	CHECK VALVE
	GAS COCK
	STRAINER
	ABOVE FINISHED FLOOR
	EXISTING TO REMAIN
	AIR SERVICE #
	S - SUPPLY
	R - RETURN
	E - EXHAUST
FIRE PROTECTION SYMBOLS LEGEND	
	EXISTING SPRINKLER HEAD
	ORICHROME PENDANT SPRINKLER HEAD
	UPRIGHT SPRINKLER HEAD
	CONCEALED SPRINKLER HEAD
	SIDEWALL SPRINKLER HEAD
PLUMBING SYMBOLS LEGEND	
	COLD WATER
	HOT WATER
	SANITARY DRAIN
	SANITARY VENT
	VENT THROUGH ROOF
	PLUMBING TRAP
	CLEAN OUT



20 MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

Artifex
design studio
architects

Artifex Design Studio, Inc.
278 Germania Drive
St Louis, MO 63011
p. 314-390-1945

COPYRIGHT © 2022
Artifex Design Studio, Inc.

PROFESSIONAL SEAL

CONSULTANTS
Mech. Engineer of Record
Charles C. Freeman, P.E.
11880 COLLEGE BLVD. STE 475
OVERLAND PARK, KS 66210
P 913 322 5150
PENG 232.0049

PROJECT TITLE
BUILD-A-BEAR WORKSHOP
GALLERIA AT ROSEVILLE
1175 GALLERIA BLVD
ROSEVILLE, CA 95678



No. Date Revision Description
BY: TJW/GG/TP
DATE: 09/08/23
PROJ. NO. 23010
SHEET TITLE:

MECHANICAL
FLOOR PLAN

SHEET NO.
M1.0

National TAB

Project: BUILD-A-BEAR (ROSEVILLE, CA)



Diffuser Supply (GRD)

ASSETS/

Asset							
Asset Name	Location	Type	Size	DESIGN CFM	CFM(1)	FINAL CFM	% to design
SGRD1	WORK SHOP	SD1	10X10	220	177	211	95.9
SGRD2	WORK SHOP	SD1	10X10	220	195	217	98.6
SGRD3	WORK SHOP	SD1	10X10	220	254	227	103.2
SGRD4	WORK SHOP	SD1	10X10	220	247	221	100.5
SGRD5	WORK SHOP	SD1	10X10	220	257	231	105.0
SGRD6	WORK SHOP	SD1	10X10	220	269	219	99.5
SGRD7	WORK SHOP	SD1	10X10	215	231	212	98.6
SGRD8	WORK SHOP	SD1	10X10	215	198	203	94.4
SGRD9	BOH	EX	8	200	159	184	92.0
Total				1950	1987	1925	98.72%

Completed By: Zack Eismin on 03/14/2024