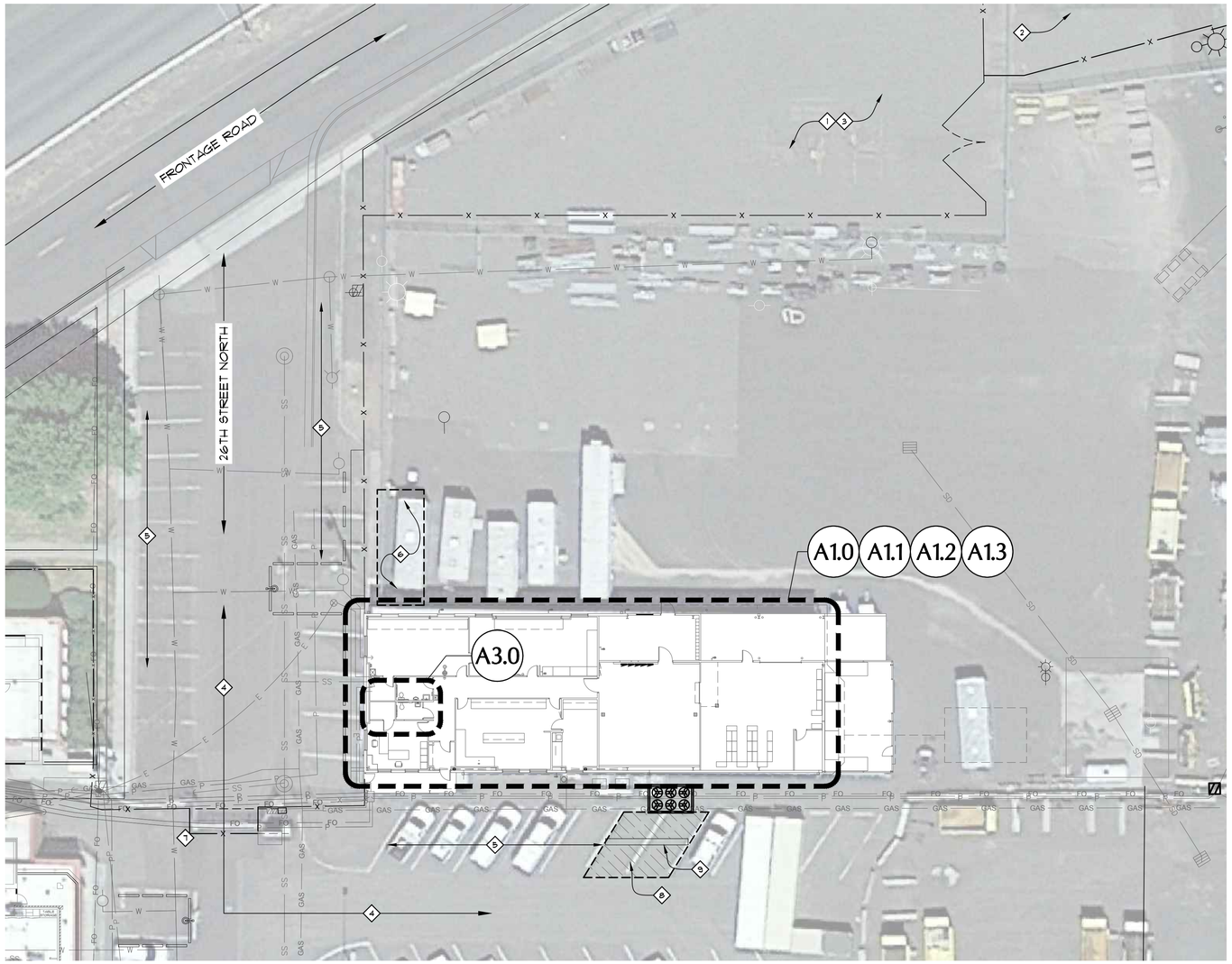


SITE PLAN

SCALE: 1" = 20'-0"

NORTH

INDEX TO DRAWINGS

ARCHITECTURAL

SHEET	DESCRIPTION
G1.0	GENERAL NOTES & PROJECT INFO
G2.0	PHASING PLANS
A1.0	FLOOR PLANS - DEMO & NEW
A1.1	CEILING PLANS - DEMO & NEW
A1.2	ROOF PLAN & ROOF FRAMING PLAN
A2.0	BUILDING ELEVATIONS & SECTIONS
A3.0	SCHEDULES, DOORS & WINDOWS, ENLARGED RESTROOM PLAN, ADA MOUNTING STANDARDS
A4.0	DETAILS, WALL TYPES

STRUCTURAL

SHEET	DESCRIPTION
S1.0	STRUCTURAL PLANS
S2.0	STRUCTURAL DETAILS

MECHANICAL

SHEET	DESCRIPTION
M0.0	MECHANICAL COVER SHEET
M0.1	MECHANICAL COMCHECK
M0.2	LAB EQUIPMENT LAYOUT
M1.0	MECHANICAL DEMOLITION FLOOR PLAN
M1.1	MECHANICAL DEMOLITION ROOF PLAN
M2.0	HVAC NEW WORK FLOOR PLAN
M2.1	EXHAUST NEW WORK FLOOR PLAN
M2.2	MECHANICAL NEW WORK ROOF PLAN
M3.0	HYDRONIC NEW WORK FLOOR PLAN
M4.0	MECHANICAL DETAILS
M4.1	MECHANICAL DETAILS
M4.2	MECHANICAL DETAILS
M4.3	MECHANICAL DETAILS
M4.4	MECHANICAL DETAILS
M4.5	MECHANICAL DETAILS
M5.0	MECHANICAL SCHEDULES
M5.1	MECHANICAL SCHEDULES
M5.2	MECHANICAL SCHEDULES
M6.0	MECHANICAL CONTROLS
M6.1	MECHANICAL CONTROLS
M6.2	MECHANICAL CONTROLS
M6.3	MECHANICAL CONTROLS
M6.4	MECHANICAL CONTROLS
M6.5	MECHANICAL CONTROLS

PLUMBING

SHEET	DESCRIPTION
P1.0	PLUMBING DEMOLITION FOUNDATION PLAN
P1.1	PLUMBING DEMOLITION FLOOR PLAN
P2.0	PLUMBING NEW WORK FOUNDATION PLAN
P2.1	PLUMBING NEW WORK FLOOR PLAN
P2.2	PLUMBING NEW WORK ROOF PLAN
P3.0	PLUMBING DETAILS
P3.1	PLUMBING DETAILS AND SCHEDULES
P4.0	PLUMBING SCHEDULES

ELECTRICAL

SHEET	DESCRIPTION
E0.0	ELECTRICAL COVER SHEET
E1.0	ELECTRICAL COMCHECK
E2.0	ELECTRICAL DEMOLITION PLAN
E2.1	ELECTRICAL LIGHTING PLAN
E2.2	ELECTRICAL POWER PLAN
E2.3	ELECTRICAL SPECIAL SYSTEMS PLAN
E2.4	MECHANICAL POWER PLAN
E3.0	ELECTRICAL DETAILS
E3.1	ELECTRICAL SCHEDULES

CODE ANALYSIS

2606 FRONTAGE ROAD

PROJECT LOCATION:	2606 FRONTAGE RAOD, LEWISTON, ID 83501
BUILDING CODE(S):	IBC 2018 EDITION
OCCUPANCY GROUP (SECTION 302) TYPE OF CONSTRICTION	B & S1 - BUSINESS & STOR. (INCIDENTAL) TYPE V-B, NON SPRINKLED
FIRE WALL SEPARATION (OCCUPANCY)	N/A

ALLOWABLE AREA CALCULATION:

OCCUPANCY	B	S-1	-	
TYPE OF CONSTRUCTION	V-B	V-B	-	
At =	9,000	9,000	-	SF. TABULAR AREA ALLOWED PER FLOOR PER TABLE 503.
NUM. OF FLOORS	2	1	-	
Is =	NOT USED	NOT USED	-	% AREA INCREASE FOR SPRKLR PROTECTION.
P =	415 FT	415 FT	-	PERIMETER OF ENTIRE BUILDING (PER FIRE AREA)
F =	52	52	-	PERIMETER FRONTING ON PUBLIC WAY OR OPEN SPACE (20' OPEN MIN. WIDTH).
W =	30'-0"	30'-0"	-	MIN. WIDTH OF PUBLIC WAY OR OPEN SPACE (FACTOR).
If =	SEE NOTE	SEE NOTE	-	PERCENTAGE AREA INCREASE ALLOWABLE DUE TO FRONTAGE SF. AREA
Aa=	18,000	9,000	-	TOTAL ALLOWABLE SQUARE FOOT AREA PER FLOOR

TOTAL ALLOWABLE FLOOR AREA:

EXISTING BUILDING MAIN FLOOR AREA:	7,090	SF
NEW BUILDING MAIN FLOOR AREA:	410	SF
EXISTING BUILDING MECH ROOM AREA:	230	SF
NEW BUILDING MECH ROOM AREA:	935	SF
	8,665 SF. < 9,000 SF. THEREFORE OK	

NOTE: AREA IS NOT PERMITTED TO EXCEED 9,000 SF. WITHOUT ADDING FIRE SPRINKLERS DUE TO "PUBLIC WAY" FRONTAGE BEING LESS THAN 25% OF TOTAL PERIMETER DISTANCE

ALLOWABLE HEIGHTS

ALLOWED (TABLE 503)	1 STORY MIN. - 40'-0" MAXIMUM
ACTUAL PROPOSED	1 STORY - 21'-2" HEIGHT, SO OK

FIRE RATING REQUIREMENTS

STRUCTURAL FRAME	NONE
BEARING WALLS - EXTERIOR	NONE
NON - BEARING WALLS - EXTERIOR	NONE
BEARING WALLS - INTERIOR	NONE
NON - BEARING WALLS - INTERIOR	NONE
FLOOR AND FLOOR / CEILING	NONE
ROOF AND ROOF / CEILINGS	NONE
OPENINGS IN WALL	NONE
MECHANICAL / ELECTRICAL	FIRE DETECTION (HIGH-PILE STORAGE)
AREA SEPARATION "FIRE WALL"	NONE

CASTELLAW ◆ KOM

ARCHITECTS

1126 MAIN STREET ◆ LEWISTON, IDAHO 83501

(208) 746-0183 ◆ FAX (208) 746-7267

FM-22011 - ITD DISTRICT #2 MATERIALS LAB REMODEL

OWNER

IDAHO TRANSPORTATION DEPARTMENT
P.O. BOX 7129
BOISE, IDAHO 83704-1129
(208) 334-8600
CONTACT: TONY PIRC (HQ FACILITIES)
TRAVIS FREI (HQ CONTRACTING)

LOCAL

ITD DISTRICT#2
2600 FRONTAGE RD
LEWISTON, IDAHO 83501
(208) 669-4545
CONTACT: BUD CONVERSE

CONSTRUCTION MANAGER AS ADVISOR

BENITON CONSTRUCTION
PO BOX 383
MERIDIAN, IDAHO 83680
(208) 884-0027
CONTACT: MATT FORRESTER (PM)
ALAN UHLORN (ESTIMATOR)

ARCHITECT

CASTELLAW KOM ARCHITECTS
1126 MAIN STREET
LEWISTON, IDAHO 83501
(208) 746-0183
CONTACT: GREG CASTELLAW (ARCHITECT)
BEN LARSEN (PROJECT MANAGER)

MECHANICAL ENGINEER

MUSGROVE ENGINEERING
234 S. WHISPERWOOD WAY
BOISE, IDAHO 83709
(208) 384-0585
CONTACT: CHRIS DYKE

ELECTRICAL ENGINEER

MUSGROVE ENGINEERING
234 S. WHISPERWOOD WAY
BOISE, IDAHO 83709
(208) 384-0585
CONTACT: NICK SCHAFER

STRUCTURAL ENGINEER

LOCHSA ENGINEERING
201 N MAPLE GROVE RD,
SUITE 100 - BOISE, ID 83704
(208) 229-7640
CONTACT: CHRIS HOLLADAY

LIST OF ALTERNATES

ALTERNATE 1: NEW RESTROOM
BASE BID: EXISTING JANITOR RM TO REMAIN
ALTERNATE 2: DDC GRAPHICS, ALARMS, & SYSTEM INTEGRATION UPGRADE
BASE BID: STANDALONE CONTROLS
ALTERNATE 3: LIGHTING UPGRADE (SEE ELECTRICAL)
BASE BID: EXISTING LIGHTS TO REMAIN

SPECIAL INSPECTIONS (SECTION 014000)

A. SUB-GRADE INSPECTIONS
B. SOILS BACKFILL AND COMPACTION TESTING
C. REINFORCEMENT STEEL AND PLACEMENT
D. CONCRETE PLACEMENT AND CURING
E. STRUCTURAL STEEL & WELDING

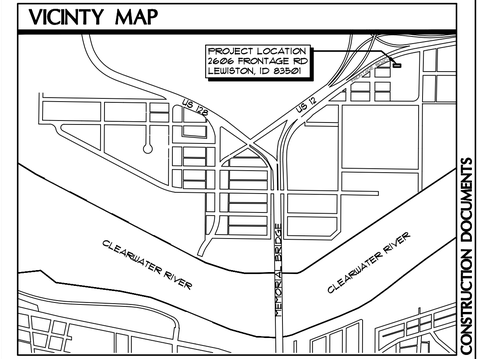
IDOPL (DBS) NOTES

A. THE IDAHO DIVISION OF OCCUPATIONAL & PROFESSIONAL LICENSES (IDOPL), FORMERLY DIVISION OF BUILDING SAFETY (DBS), IS RESPONSIBLE FOR PLAN REVIEW & CONSTRUCTION PERMITS. HOWEVER, PLEASE NOTE THAT ALL PERMITS & INSPECTIONS ARE STILL BEING ADMINISTERED THROUGH DBS's WEBSITE (WWW.DBS.IDAHO.GOV) & NOT DOPL's WEBSITE WWW.DOPL.IDAHO.GOV, UNTIL FURTHER NOTICE.
B. CONTRACTOR TO REQUEST BUILDING PERMITS WITH SPECIFIC BUILDING ADDRESS

DEFERRED DESIGN SCOPE

A. FIRE ALARM SYSTEM (SEE ELECTRICAL)
B. PEMB MODIFICATIONS (SEE SECTION 076000 FOR EXISTING PEMB INFORMATION)

VICINITY MAP



DRAWING FORMAT:

FULL-SIZE DRAWING SIZE	=	22" x 34"
HALF-SIZE DRAWING SIZE	=	11" x 17"

95% CONSTRUCTION DOCUMENTS

SITE LEGEND

- TELEPHONE LINE
- GAS LINE
- ELECTRICAL
- EMPTY CONDUIT (2")
- VENT PIPING
- COMMUNICATIONS
- PROPERTY LINE
- FENCE
- WATER LINE
- SANITARY SEWER
- STORM DRAIN
- SANITARY SEWER MANHOLE
- STORM DRAIN MANHOLE
- GAS METER
- UTILITY POLE
- UTILITY POLE W/ STREET LIGHT

SITE PLAN REFERENCE NOTES

1. **SECURE STAGING AREA**- CONTRACTOR **SECURE** STAGING AREA. COORDINATE EXACT EXTENTS WITH ITD PRIOR TO CONSTRUCTION.
2. **UN-SECURE STAGING AREA**- CONTRACTOR **UN-SECURE** STAGING AREA. COORDINATE EXACT EXTENTS WITH ITD PRIOR TO CONSTRUCTION.
3. **CONTRACTOR PARKING**- CONTRACTOR DESIGNATED PARKING. COORDINATE EXACT EXTENTS WITH ITD PRIOR TO CONSTRUCTION.
4. **TEMPORARY VEHICLE ACCESS**- TEMPORARY VEHICLE ACCESS WAY DESIGNATED BY AGENCY.
5. **ITD PARKING**- ITD DESIGNATED PARKING. COORDINATE EXACT EXTENTS WITH AGENCY PRIOR TO CONSTRUCTION.
6. **EMERGENCY GENERATOR & TPR**- SEE ELECTRICAL FOR NEW EMERGENCY GENERATOR AND TRANSFORMER SCOPE. ELECTRICAL CONTRACTOR TO COORDINATE TRENCHING, BACKFILL, AND ALL SCOPE REQUIRED FOR A COMPLETE INSTALLATION.
7. **(E) GATE FENCE**- (E) FENCE GATE. COORDINATE WITHE AGENCY FOR ACCESS HOURS AND REQUIREMENTS.
8. **ITD PARKING RE-STRIPING**- ITD TO RE-STRIPE AREA
9. **ITD PARKING BARIER**- ITD TO PROVIDE JERSEY BARRIER. COORDINATE WITH MECHANICAL FOR CLEAR SPACE REQUIREMENTS AROUND NEW CHILLER.

GENERAL SITE NOTES

A. COORDINATE WITH DEMO PLANS FOR EXTENT OF SITE RELATED ITEMS TO BE REMOVED AT AREA OF NEW WORK.
B. PROVIDE BARRIERS, FLAG PERSONS, PROTECTED WALK WAYS, FENCING, ETC... AS REQUIRED FOR THE PROTECTION OF THE PUBLIC AT ALL TIMES DURING CONSTRUCTION (DURING AND AFTER HOURS).
C. REMOVED CONSTRUCTION DEBRIS, ETC... NOT BEING REUSED, IS TO BE REMOVED FROM SITE AND DISPOSED OF BY CONTRACTOR OFF SITE.
D. PROTECT EXISTING BUILDING(S), STRUCTURES, VEGETATION, LANDSCAPING, ETC., WHICH ARE TO REMAIN AS REQUIRED. PHOTO DOCUMENTING EXISTING CONDITIONS IS RECOMMENDED PRIOR TO PROCEEDING WITH WORK.
E. ALL DAMAGED LANDSCAPING OR LAWNS DAMAGED DURING CONSTRUCTION ACTIVITIES ARE TO BE RESTORED BY THE CONTRACTOR PRIOR TO SUBSTANTIAL COMPLETION.
F. FIRE DEPARTMENT ACCESS TO THE BUILDING MUST BE MAINTAINED AT ALL TIMES.

GENERAL DEMO NOTES

A. DEMOLITION PLANS ARE SCHEMATIC IN NATURE. EXACT CONDITIONS MAY VARY. IT IS THE CONTRACTORS RESPONSIBILITY TO VISIT THE SITE (OR SEE PHOTOS PER SECTION 025000) PRIOR TO BIDDING TO DETERMINE THE ACTUAL AMOUNT OF DEMOLITION REQUIRED. THE CONTRACTOR IS TO BID ACCORDINGLY. COORDINATE DEMOLITION WORK WITH NEW WORK PRIOR TO BIDDING. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL DEMOLITION REQUIRED TO ACCOMMODATE ALL NEW WORK REQUIRED TO COMPLETE THE PROJECT.
B. PROVIDE ADEQUATE TEMPORARY SUPPORT / BRACING TO EXISTING STRUCTURAL MEMBERS PRIOR TO THE REMOVAL OF ANY ITEMS THAT HAVE AN AFFECT ON THE STRUCTURAL INTEGRITY OF THE BUILDING.
C. OWNER RESERVES ALL RIGHTS TO SALVAGE OR REJECTION OF SALVAGEABLE ITEMS REMOVED UNDER DEMOLITION WORK. COORDINATE WITH OWNER PRIOR TO DISPOSAL.
D. ANY EXISTING ASBESTOS ENCOUNTERED TO BE REMOVED BY OTHERS ("NOT IN CONTRACT.") STOP WORK AND NOTIFY ARCHITECT/AGENCY IMMEDIATELY, IF ASBESTOS IS SUSPECTED.
E. COVER AND PROTECT ALL SALVAGE ITEMS WITH VISQUEEN, AS NECESSARY, TO PROTECT FROM DUST, DEBRIS, AND MOISTURE.
F. ANY ITEMS NOT NOTED ON THE DRAWINGS TO BE 'REMOVED' OR 'SALVAGED' SHALL BE COORDINATED WITH ARCHITECT.
G. COMBUSTIBLE CONSTRUCTION WASTE SHALL BE HAULED OFF PREMISES. NO OPEN BURNING OF ANY TYPE IS ALLOWED. CONTRACTOR TO DISPOSE OF CONSTRUCTION WASTE WITH CONTRACTOR PROVIDED DUMPSTER AND RECYCLE WITH CONTRACTOR PROVIDED CONTAINERS.
H. COORDINATE TIMING OF ALL ROOFING RELATED DEMOLITION WITH INSTALLATION OF NEW ROOFING SYSTEM. CONTRACTOR TO PROTECT BUILDING FROM NATURAL WEATHER EVENTS AS MUCH AS POSSIBLE.
I. COORDINATE TO PROVIDE ALL CUTTING AND PATCHING FOR ALL MEP PENETRATIONS TO MATCH EXISTING FOR UNIFORM AND NEAT APPEARANCE.

GENERAL PROJECT NOTES

A. CONTRACTOR SHALL CHECK ALL DIMENSIONS AND REPORT ALL DISCREPANCIES AND OMISSIONS TO THE ARCHITECT. DIMENSIONS ARE TO BE FIELD VERIFIED WITH EXISTING CONDITIONS. ADJUST DIMENSIONS AS REQUIRED TO MEET THE DESIGN INTENT AND CURRENT CODE REQUIREMENTS.
B. DO NOT SCALE DRAWINGS, ANY DIMENSIONS OR DRAWINGS SHOWN ARE INDICATIVE ONLY AND ARE SUBJECT TO VERIFICATION ONSITE.
C. ALL CONSTRUCTION TO BE TO CURRENT ADOPTED CODES AND REGULATIONS AND ALL MATERIALS TO BE INSTALLED PER MANUFACTURER'S REQ'S.
D. COORDINATE ARCHITECTURAL DRAWINGS WITH MECHANICAL, PLUMBING, ELECTRICAL AND STRUCTURAL.
E. COORD. DRAWINGS FOR WORK NOT IN CONTRACT (NIC).
F. PROVIDE BARRIERS, FLAGMEN, FLASHERS, ETC. FOR THE PROTECTION OF THE PUBLIC WHEN NECESSARY DURING CONSTRUCTION, BOTH DURING & AFTER HOURS.
G. COORDINATE ACCESS TO THE SITE AND CONTRACTOR STAGING AREA WITH THE ARCHITECT AND OWNER.
H. DRAWINGS ARE SCHEMATIC IN NATURE AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO TIE THE PROJECT TOGETHER INTO A COMPLETE WHOLE.
I. COORDINATE ALL NEW FIXTURES, FINISH MATERIALS AND COLORS WITH THE OWNER PRIOR TO INSTALLATION.
J. PROVIDE ADEQUATE TEMP. SUPPORT AND BRACING TO ALL WALLS, COLUMNS, BEAMS, JOISTS, ETC. AS REQ'D UNTIL NEW WORK IS PERMANENTLY INSTALLED.
K. CONSTRUCTION DEBRIS, ETC. NOT TO BE REUSED ARE TO BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR OFF SITE AT AN APPROVED DISPOSAL FACILITY.
L. PROTECT EXISTING BUILDING(S), STRUCTURES, VEGETATION, LANDSCAPING, IRRIGATION, ETC. WHICH ARE TO REMAIN AS REQUIRED. PHOTO DOCUMENTING EXISTING CONDITIONS IS RECOMMENDED PRIOR TO PROCEEDING WITH WORK.
M. PROVIDE BLOCKING IN WALL AS REQUIRED.
N. CONTRACTOR TO VERIFY LOCATIONS OF ALL EXISTING UTILITY RUNS PRIOR TO COMMENCING WORK. UTILITIES SHOWN ON PLANS ARE ASSUMED LOCATIONS PER EXISTING DRAWINGS PROVIDED BY THE OWNER.
O. COORDINATE KEYING REQUIREMENTS WITH OWNER.
P. WHERE **PLUMB.** IS NOTED REFER TO PLUMBING FOR ADD'L INFO AND COORD.
Q. WHERE **HVAC** IS NOTED REFER TO HVAC FOR ADD'L INFO AND COORD.
R. WHERE **ELEC.** IS NOTED REFER TO ELECTRICAL FOR ADD'L INFO, AND COORD.

LICENSED ARCHITECT BEN LARSEN LA-1863 STATE OF IDAHO

REVISIONS

CONSULTANTS ◇

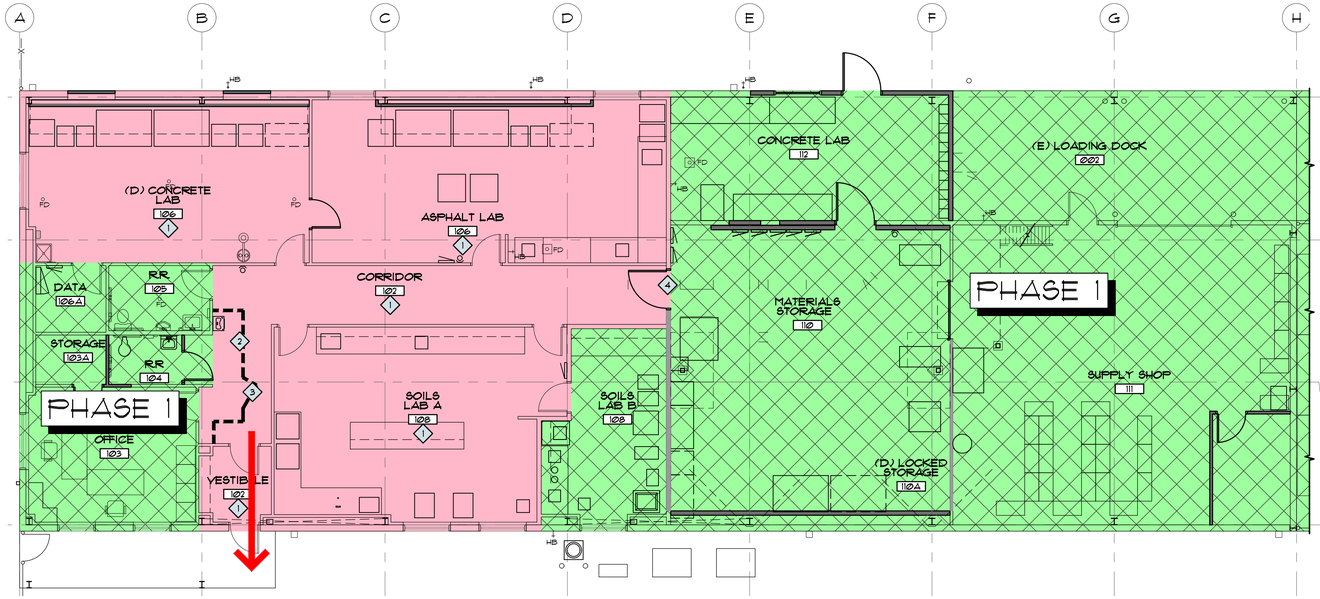
DATE ◇ 01/16/2023
DRAWN ◇ DJG
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CASTELLAW ◆ KOM ◆ ARCHITECTS
1126 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇ ITD # FM-22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
GENERAL NOTES & PROJECT INFO

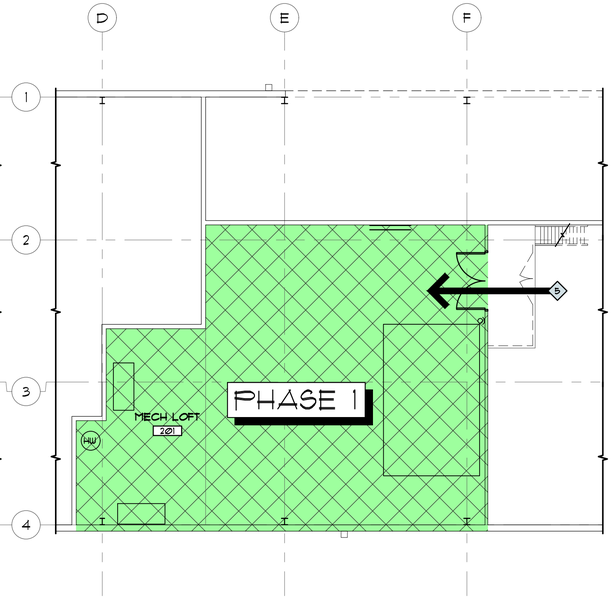
SHEET ◇
G1.0



FLOOR PLAN - MAIN FLOOR (PHASE 1)

SCALE: 1/8" = 1'-0"

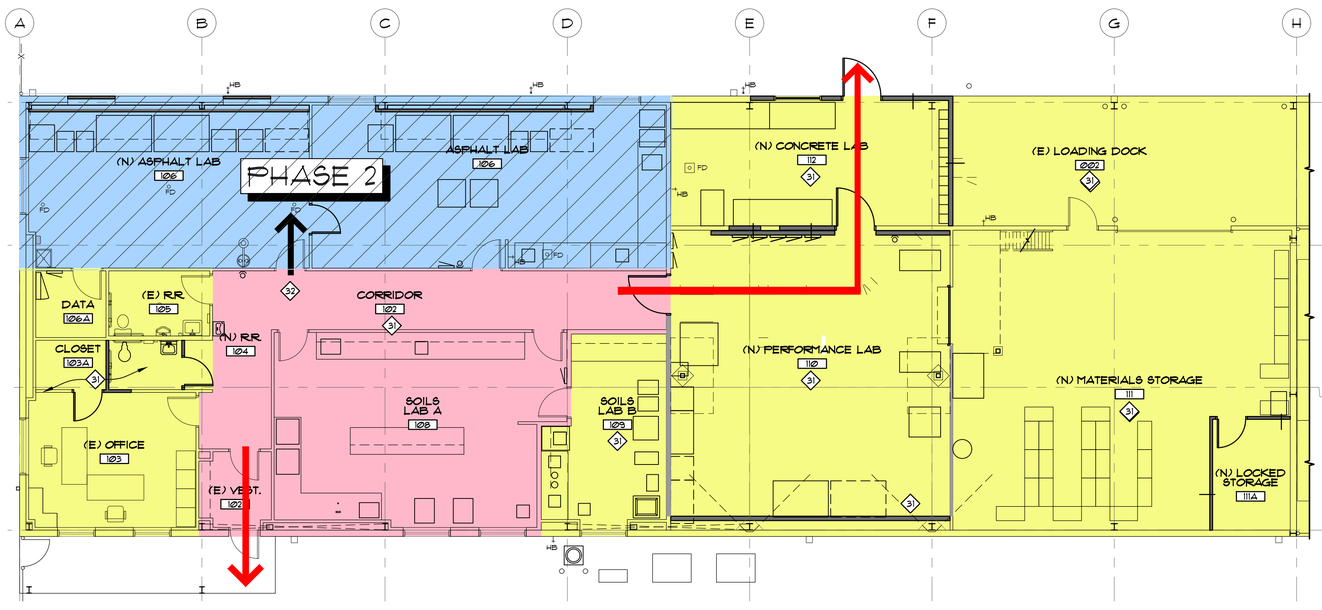
NORTH



FLOOR PLAN - MECH LOFT (PHASE 1)

SCALE: 1/8" = 1'-0"

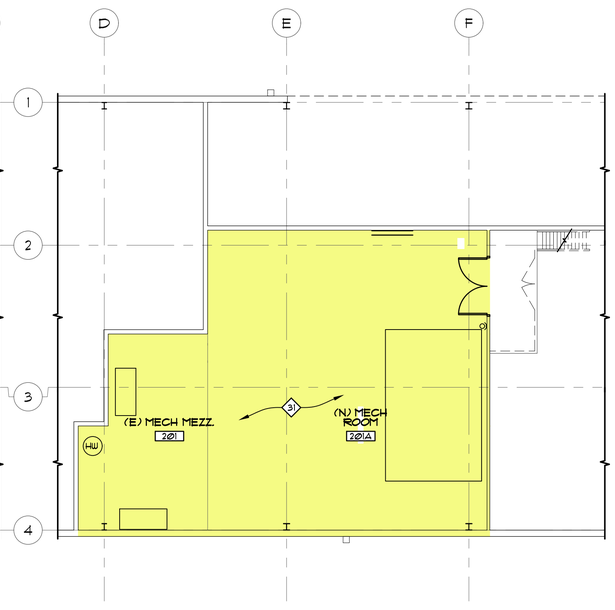
NORTH



FLOOR PLAN - MAIN FLOOR (PHASE 2)

SCALE: 1/8" = 1'-0"

NORTH



FLOOR PLAN - MECH LOFT (PHASE 2)

SCALE: 1/8" = 1'-0"

NORTH

PHASE 1 REFERENCE NOTES

DEMO PLAN REFERENCE NOTES: (1-30)

1. NO WORK- NO WORK THIS OCCUPIED AREA FROM MAY 1 TO OCTOBER 1 OR UNTIL PHASE 1 AREA IS SUBSTANTIALLY COMPLETE AND OCCUPIED.
2. TEMPORARY WALL-
   A. PROVIDE TEMPORARY FRAMED BARRIER PRIOR TO PHASE 1 WORK.
   B. PROVIDE CONTINUOUS SOUND INSULATION IN TEMPORARY FRAMED BARRIER PRIOR TO PHASE 1 WORK.
   C. DEMO EXISTING TEMPORARY FRAMED BARRIER AT PHASE 1 COMPLETION
3. TEMPORARY DOOR
4. CONTRACTOR ACCESS ONLY
5. MECH. EQUIPMENT- ACCESS TO NEW LOFT. ITD TO MOVE SHELVING AND STORAGE AS NEEDED FOR CONTRACTOR TO HAVE ADEQUATE ACCESS TO THIS AREA FOR PLACING NEW AHU SECTIONS IN NEW MECHANICAL ROOM ABOVE (COORDINATE WITH MECHANICAL).

PHASING KEY

- PHASE 1
- PHASE 2
- OCCUPANCY OF EXISTING AREA
- OCCUPANCY OF COMPLETED AREA
- EGRESS EXIT FROM OCCUPIED AREA

NOTE: SEE SECTION 01 10 00 FOR ADDITIONAL INFORMATION

GENERAL PHASING NOTES

A. THIS PHASING PLAN IS SHOWN FOR REFERENCE AND WILL BE COORDINATED WITH AWARDED CONTRACTORS AT PRE-CONSTRUCTION MEETING.

B. IF WORK IS NOT IDENTIFIED AS "SEPARATE CONTRACT" THEN ASSUME THAT BIDDING CONTRACTOR IS RESPONSIBLE FOR WORK.

C. HAZARDOUS MATERIALS ARE NOT ANTICIPATED BUT IF ANY SUSPECTED ASBESTOS CONTAINING MATERIALS (ACM) OR LEAD BASED PAINTS (LBP) ARE DISCOVERED, PLEASE CONTACT ARCHITECT AND OWNER DIRECTLY.

D. CONTRACTOR RESPONSIBLE FOR TEMPORARY OCCUPANCY SEPARATIONS DURING CONSTRUCTION.

E. SEE CONSTRUCTION DOCUMENTS FOR 'SCOPE OF WORK', THIS PLAN PROVIDED FOR REFERENCE ONLY.

PHASE 2 REFERENCE NOTES

FLOOR PLAN REFERENCE NOTES: (31-60)

31. NO WORK-OR WORK COORDINATED WITH OWNER IN ADVANCED.
32. CONTRACTOR ACCESS ONLY

95% CONSTRUCTION DOCUMENTS

CASTELLAW ◆ KOM ◆ ARCHITECTS
1126 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

LICENSED ARCHITECT KEITH A. KOM STATE OF IDAHO

REVISIONS

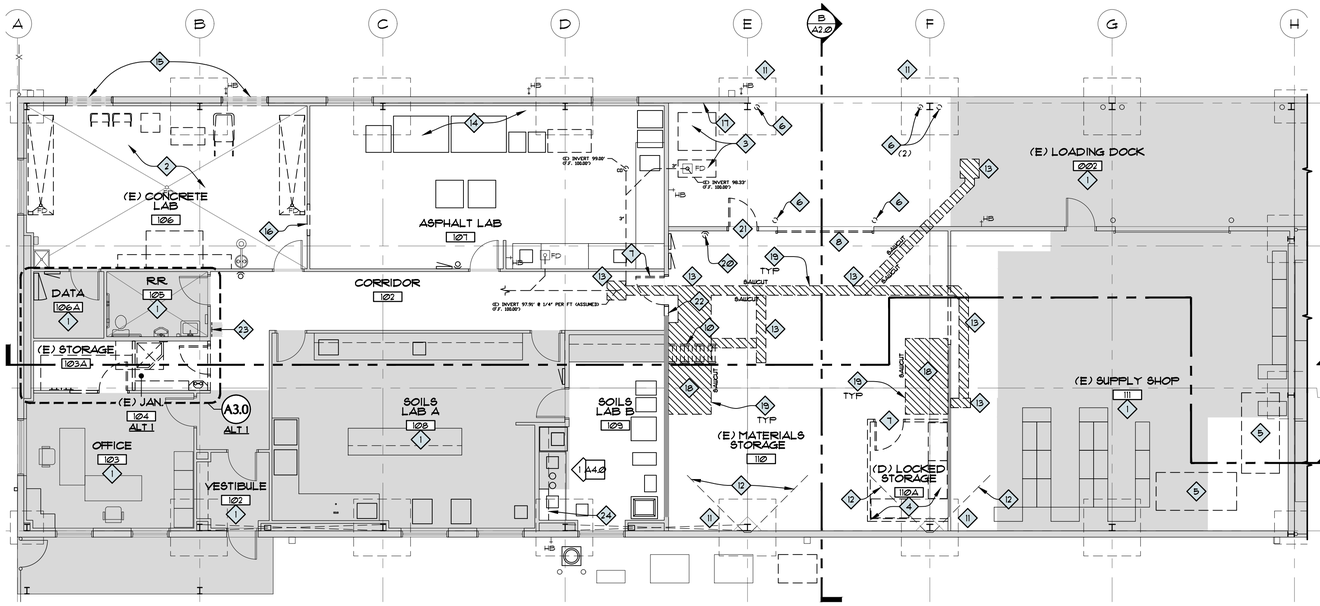
DATE ◇ 01/16/2023
DRAWN ◇ DJG
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CONSULTANTS ◇

PROJECT ◇ ITD # FM-22011
DAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
PHASING PLANS

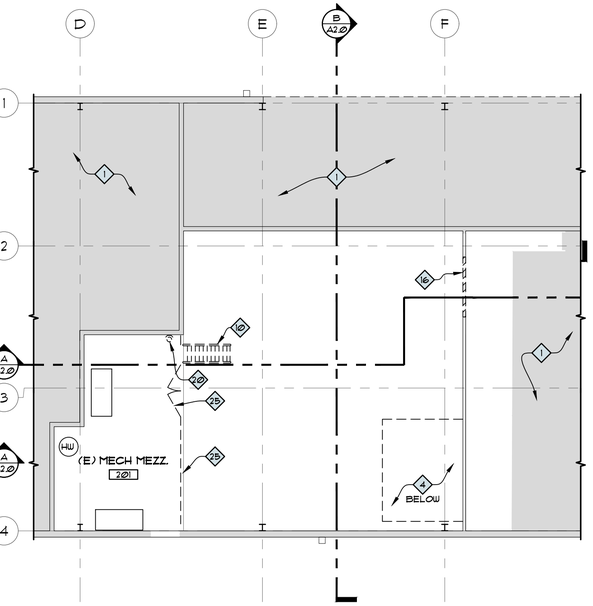
SHEET ◇
G2.0



DEMO PLAN - MAIN FLOOR

SCALE: 1/8" = 1'-0"

NORTH



DEMO PLAN - MECHANICAL LOFT

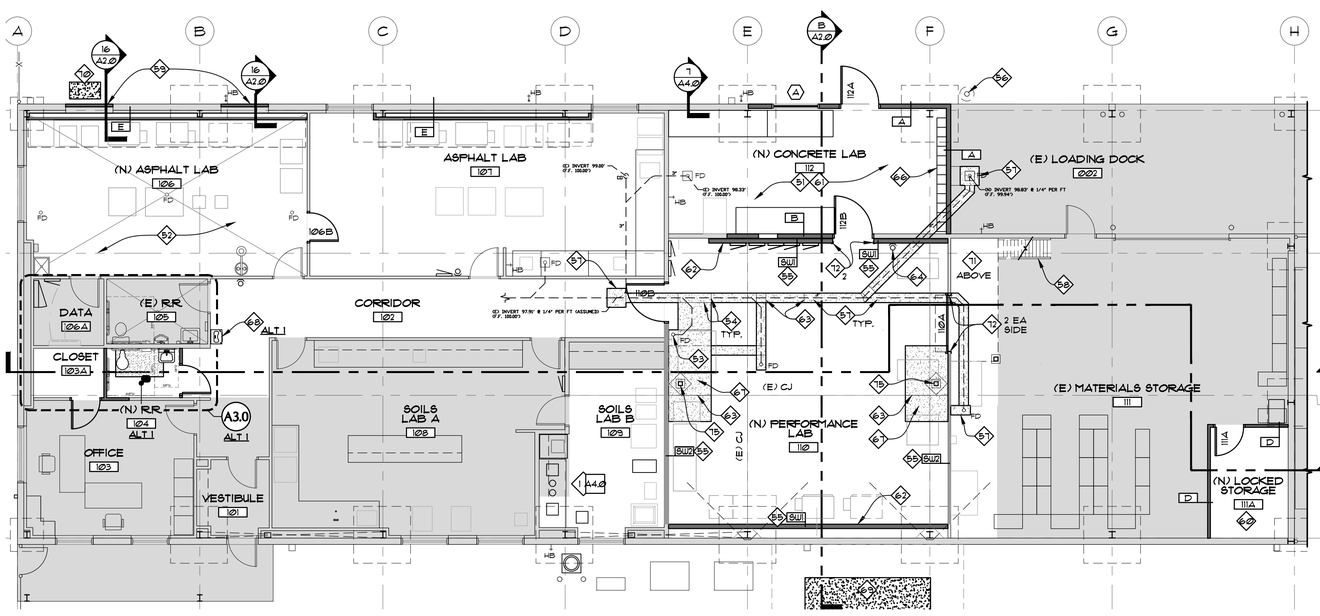
SCALE: 1/8" = 1'-0"

NORTH

DEMO FLOOR PLAN REF NOTES

DEMO PLAN REFERENCE NOTES: (1-50)

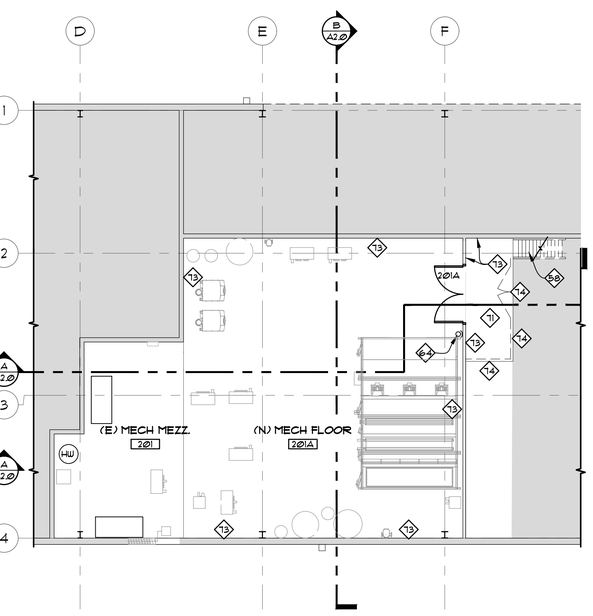
1. NO WORK- NO WORK THIS AREA U.N.O., SHOWN GREY
2. LAB EQUIPMENT- (E) CONCRETE LAB EQUIPMENT TO BE REMOVED AND REINSTALLED BY ITD.
3. LOADING DOCK EQUIPMENT- (E) LOADING DOCK EQUIPMENT TO BE REMOVED BY ITD.
4. LOCKED STORAGE SALVAGE- SALVAGE (E) LOCKED STORAGE IN IT'S ENTIRETY, INCLUDED BUT NOT LIMITED TO WALLS, CEILING, LIGHTING, RAILINGS ETC. CONTRACTOR'S OPTION TO DEMO AND PROVIDE NEW MATERIALS (SOME OR ALL) FOR NEW LOCKED STORAGE LOCATION IF MORE COST-EFFECTIVE.
5. SHELVING- (E) SUPPLY SHOP SHELVING/CABINETS, TO BE REMOVED BY ITD. PREP AREA FOR NEW CONSTRUCTION.
6. BOLLARDS DEMO- SAW CUT (E) CONCRETE BOLLARDS AS CLOSE TO CONCRETE SLAB AS POSSIBLE, GRIND SMOOTH
7. (E) DOOR SALVAGE- SALVAGE (E) DOOR TO BE RELOCATED TO NEW CONCRETE LAB.
8. (E) GARAGE DOOR DEMO- DEMO (E) GARAGE DOOR, TRACK, MOTOR, ETC., IN IT'S ENTIRETY. PREP AREA FOR NEW CONSTRUCTION.
9. NOT USED.
10. SHIPS LADDER SALVAGE- REMOVE (E) SHIPS LADDER, CLEAN AND PREP FOR REINSTALLATION AT NEW LOCATION, SEE NEW FLOOR PLAN.
11. (E) MTL BUILDING- (E) MTL BUILDING COLUMN FOOTING, TAKE CARE TO PROTECT DURING ALL PHASES OF WORK.
12. (E) HAIR PINS- (E) HAIR PIN REINFORCING, TAKE CARE TO PROTECT (E) HAIR PIN REINFORCING BARS IN (E) CONC SLAB.
13. (E) SLAB DEMO- DEMO PORTION OF (E) CONCRETE SLAB & TRENCH FOR (N) PLUMBING, COORDINATE WITH PLUMBING.
14. MECH HOOD (N)- PREP AREA FOR NEW MECHANICAL DUCTING WORK/HOOD, COORDINATE WITH CEILING PLAN ALI AND MECHANICAL PLANS.
15. (E) WINDOW DEMO- DEMO WINDOW (SALVAGE ONE (E) WINDOW TO BE RELOCATED TO NEW CONCRETE LAB.) INFILL TO MATCH (E) PEMB CONSTRUCTION METHOD FOR EXTERIOR.
16. (E) WALL- DEMO PORTION OF EXISTING WALL FOR INSTALLATION OF (N) DOOR, SEE FLOOR PLAN AND SCHEDULE.
17. (E) WALL CLADDING- REMOVE EXISTING METAL WALL PANEL (INTERIOR SIDE) AND INSULATE EXISTING CAVITY BETWEEN EACH WALL GIRT FROM EXISTING FLOOR TO EXISTING ROOF.
18. (E) CONC SLAB DEMO- DEMO PORTION OF EXISTING SLAB, PREP AREA FOR (N) CONCRETE FOOTING, SEE STRUCTURAL.
19. SAW-CUT- PERIMETER OF CONC. DEMO.
20. (E) FIRE EXTINGUISHER- RELOCATE (E) FIRE EXTINGUISHER, SEE PLAN FOR NEW LOCATION
21. (E) DOOR DEMO-DEMO (E) DOOR
22. (E) WALL DEMO- DEMO PORTION OF (E) WALL TO ALLOW INSTALLATION OF NEW DOOR, SEE SCHEDULE
23. ALT 1: (N) DRINKING FOUNTAIN: PREP AREA FOR NEW DRINKING FOUNTAIN. BASEBID: PREP WALL FOR DRINK FOUNTAIN ROUGH IN.
24. (E) CABINET DEMO-DEMO PORTION OF (E) CABINET SEE ELEVATION FOR ADDITIONAL INFORMATION
25. (E) CHAINLINK: REMOVE EXISTING CHAINLINK GUARDRAIL AND GATE, TO BE RELOCATED TO NEW MECHANICAL ROOM LANDING.



FLOOR PLAN - MAIN FLOOR

SCALE: 1/8" = 1'-0"

NORTH



FLOOR PLAN - MECHANICAL LOFT

SCALE: 1/8" = 1'-0"

NORTH

FLOOR PLAN REF NOTES

FLOOR PLAN REFERENCE NOTES: (51-100)

51. CONC LAB EQUIP- CONCRETE LAB EQUIPMENT TO BE REMOVED AND REINSTALLED BY ITD.
52. ASPHALT LAB EQUIP- ASPHALT LAB EQUIPMENT TO BE REMOVED AND REINSTALLED BY ITD.
53. CONC SLAB- 6" CONCRETE SLAB, SLOPE CONCRETE TO (N) FLOOR DRAIN COORDINATE EXTENTS OF SLOPED CONCRETE FOR HAMBURG EQUIPMENT DIRECTLY W/ ITD, SEE DETAIL 3/B2.0
54. CONTROL JOINT- APPROXIMATE LOCATION OF (N) CONCRETE SLAB CONTROL JOINT(S), SEE DETAIL 11/B2.0
55. SHEAR WALL- SEE STRUCTURAL
56. BOLLARD- SEE DETAIL 1/B2.0
57. CONC PATCH- PATCH PACK 6" CONC OVER COMPACTED BASE.
58. SHIPS LADDER REINSTALL- REINSTALL SALVAGED SHIPS LADDER AT NEW LOCATION, COORDINATE WITH STRUCTURAL.
59. WINDOW INFILL- INFILL TO MATCH (E) PEMB CONSTRUCTION SYSTEM. CONTRACTOR'S OPTION TO USE SALVAGE METAL SIDING FROM CONCEALED LOCATION ABOVE NEW CONCRETE LAB ADDITION.
60. LOCKED STORAGE SALVAGE- REINSTALL SALVAGED (E) LOCKED STORAGE IN IT'S ENTIRETY, INCLUDED BUT NOT LIMITED TO WALLS, CEILING, LIGHTING, RAILINGS ETC.
61. NOT USED
62. BEARING WALL- SEE STRUCTURAL.
63. CONTROL JOINT- ALIGN WITH EXISTING CONTROL JOINT.
64. FIRE EXTINGUISHER- INSTALL RELOCATED FIRE EXTINGUISHER.
65. NOT USED
66. ITD LOCKERS- NEW SECURE LOCKERS TO BE PROVIDED AND INSTALLED BY ITD.
67. CONCRETE FOUNDATION- SEE STRUCTURAL.
68. ALT 1- (N) DRINKING FOUNTAIN: INSTALL (N) DRINKING FOUNTAIN. BASE BID: ROUGH IN PLUMBING AND ELECTRICAL FOR FUTURE DRINKING FOUNTAIN, PATCH BACK DRYWALL AS REQUIRED.
69. 6" CONCRETE PAD: NEW 6" CONCRETE PAD FOR CHILLER. APPROXIMATE SIZE IS 13'-6" X 18'-6" (COORDINATE EXACT SIZE WITH MECH.).
70. 4" CONCRETE PAD: NEW 4" CONCRETE PAD FOR CONDENSER. APPROXIMATE SIZE IS 4'-0" X 2'-0" (COORDINATE EXACT SIZE WITH MECH).
71. NEW UTILITY LANDING: SEE STRUCTURAL.
72. CORNER GUARDS: PROVIDE STAINLESS STEEL CORNER GUARDS (TYPE SSCG-2). SEE DOOR DETAILS & SPECS FOR SIZING.
73. WALL BASE: CONT. 6" PLYWOOD WALL-BASE, THIS WALL.
74. CHAINLINK: REINSTALL SALVAGED CHAINLINK POSTS, FABRIC, AND GATES AROUND NEW LANDING.
75. PAINT COLUMNS: SHOP-PRIME AND PAINT EXPOSED STEEL COLUMNS, BASE PLATE, AND ANCHORS.

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT
STATE OF IDAHO

CASTELLAW ◆ KOM ◆ ARCHITECTS
1126 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

REVISIONS

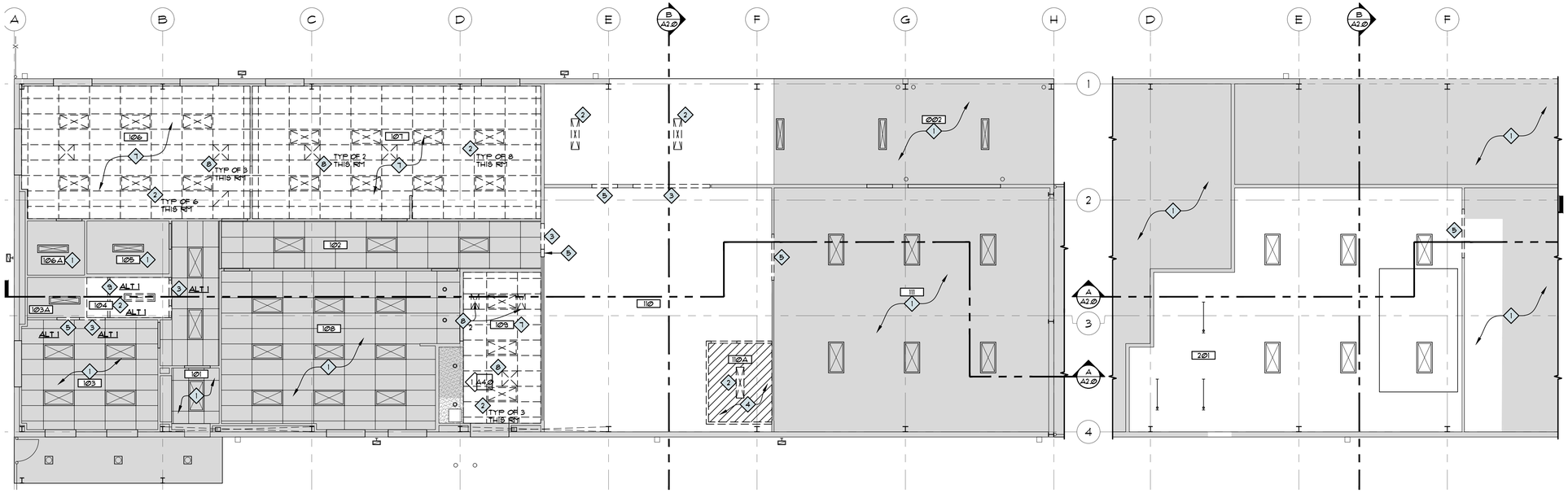
DATE ◇ 01/16/2023
DRAWN ◇ DJG, DMW
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CONSULTANTS ◇

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FM-2201
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, D 83501

DRAWING
FLOOR PLANS - DEMO AND NEW

SHEET ◇
A1.0



DEMO CEILING PLAN - MAIN FLOOR

SCALE: 1/8" = 1'-0"

NORTH

DEMO CEILING PLAN - MECH LOFT

SCALE: 1/8" = 1'-0"

NORTH

DEMO CEILING PLAN REF NOTES

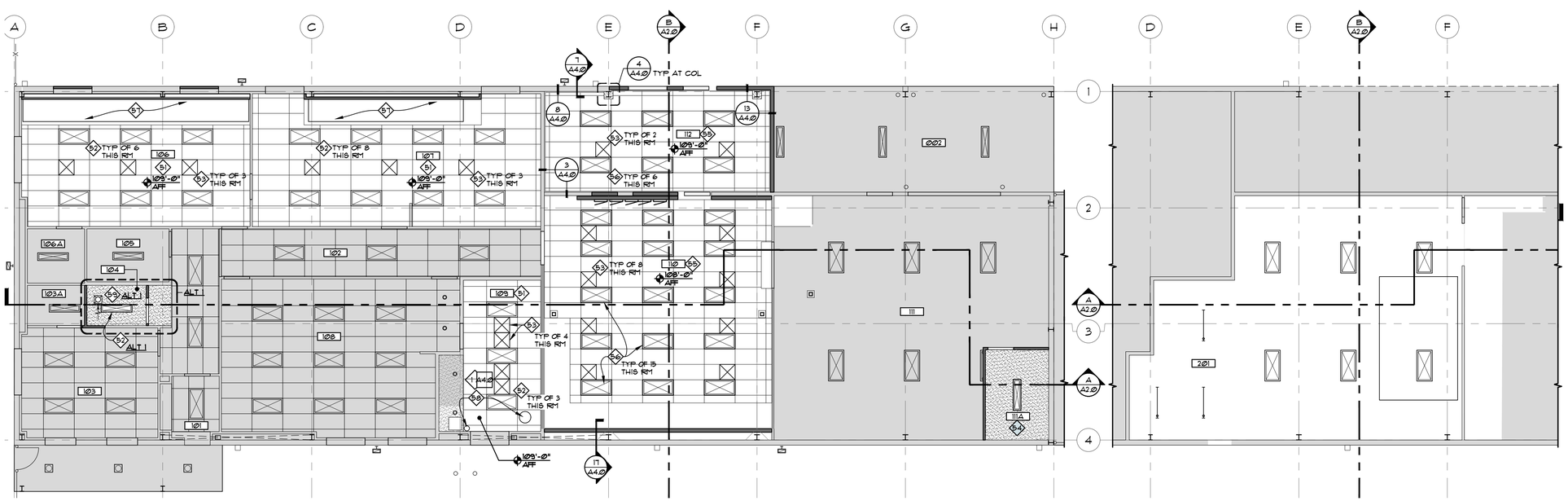
DEMO CEILING PLAN REFERENCE NOTES: (1-50)

1. NO WORK- NO WORK THIS AREA.
2. (E) LIGHT FIXTURE SALVAGE- SALVAGE (E) LIGHT FIXTURE, COORDINATE WITH ELECTRICAL.
3. (E) OVERHEAD DOOR DEMO- DEMO (E) OVERHEAD DOOR IN IT'S ENTIRETY, INCLUDING TRACK, CONTROLS, ELEC., ETC.
4. LOCKED STORAGE SALVAGE- SALVAGE (E) LOCKED STORAGE IN IT'S ENTIRETY, INCLUDED BUT NOT LIMITED TO WALLS, CEILING, LIGHTING, RAILINGS ETC. CONTRACTOR'S OPTION TO DEMO AND PROVIDE NEW MATERIALS (SOME OR ALL) FOR NEW LOCKED STORAGE LOCATION IF MORE COST-EFFECTIVE.
5. (N) DOOR/OPENING- DEMO PORTION OF (E) WALL AS REQUIRED TO TO ACCOMMODATE (N) DOOR/OPENING, SEE FLOOR PLAN A1.0.
6. NOT USED.
7. (E) A.C.T. CEILING DEMO/SALVAGE- DEMO/SALVAGE (E) A.C.T. GRID AND PANELS, PREP FOR REINSTALLATION. COORDINATE WITH NEW CEILING PLAN, THIS SHEET.
8. (E) MECH. DEMO- DEMO (E) MECHANICAL, PREP AREA FOR (N) MECHANICAL WORK. COORDINATE WITH MECHANICAL.
9. (E) GWB CEILING- DEMO (E) GWB CEILING IN PREPARATION FOR NEW EXHAUST FAN DUCTING AND OTHER RESTROOM WORK. MODIFY EXISTING FRAMING FOR NEW WORK.

CEILING KEY

GENERAL DETAILS: SEE 9/A4.0 AND 14/A4.0

- 1'-0"x8'-0" CEILING MOUNTED LIGHT
- 2'-0"x4'-0" TROFFER A.C.T. MOUNTED LIGHT
- MECHANICAL SUPPLY, SEE MECHANICAL
- FA — FIRE ALARM, (PER F.A. VENDOR)
- 2'-0"x4'-0" A.C.T. CEILING GRID
- 5/8" TYPE 'X' GWB CEILING



CEILING PLAN - MAIN FLOOR

SCALE: 1/8" = 1'-0"

NORTH

CEILING PLAN - MECHANICAL LOFT

SCALE: 1/8" = 1'-0"

NORTH

CEILING PLAN REF NOTES

CEILING PLAN REFERENCE NOTES: (51-100)

51. CEILING GRID, REINSTALL/NEW- REINSTALL A.C.T. CEILING GRID AND PANELS.
52. LIGHTING, REINSTALL- REINSTALL LIGHTING, LOCATIONS TO MATCH GRID LAYOUT
53. MECHANICAL SUPPLY/RETURN- MECHANICAL SUPPLY / RETURN, COORDINATE WITH MECHANICAL FOR EXACT LOCATION(S).
54. LOCKED STORAGE, REINSTALL- REINSTALL SALVAGE (E) LOCKED STORAGE IN IT'S ENTIRETY, INCLUDED BUT NOT LIMITED TO WALLS, CEILING, LIGHTING, RAILINGS ETC. CONTRACTOR'S OPTION TO PROVIDE NEW MATERIALS (SOME OR ALL) FOR NEW LOCKED STORAGE LOCATION IF MORE COST-EFFECTIVE THAN USING SALVAGED.
55. (N) CEILING GRID- INSTALL (N) CEILING 2x4 A.C.T. GRID AND PANEL(S).
56. LIGHTING, NEW- NEW 2x4 TROFFER LIGHT(S), INSTALL INTO (N) A.C.T. GRID, COORDINATE WITH ELECTRICAL FOR SWITCH/ CIRCUIT PATHING.
57. MECHANICAL HOOD- (N) MECHANICAL HOOD, COORDINATE WITH MECHANICAL.
58. ACT CEILING, MODIFY- CUT OPENING IN CEILING TILE FOR NEW DUCT (COORDINATE W/ MECHANICAL).
59. GWB CEILING, MODIFY- MODIFY EXISTING FRAMING FOR NEW WORK AND PATCH BACK (E) GWB CEILING, PAINT ALL.

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT PAUL KOM STATE OF IDAHO

REVISIONS

CONSULTANTS ◇

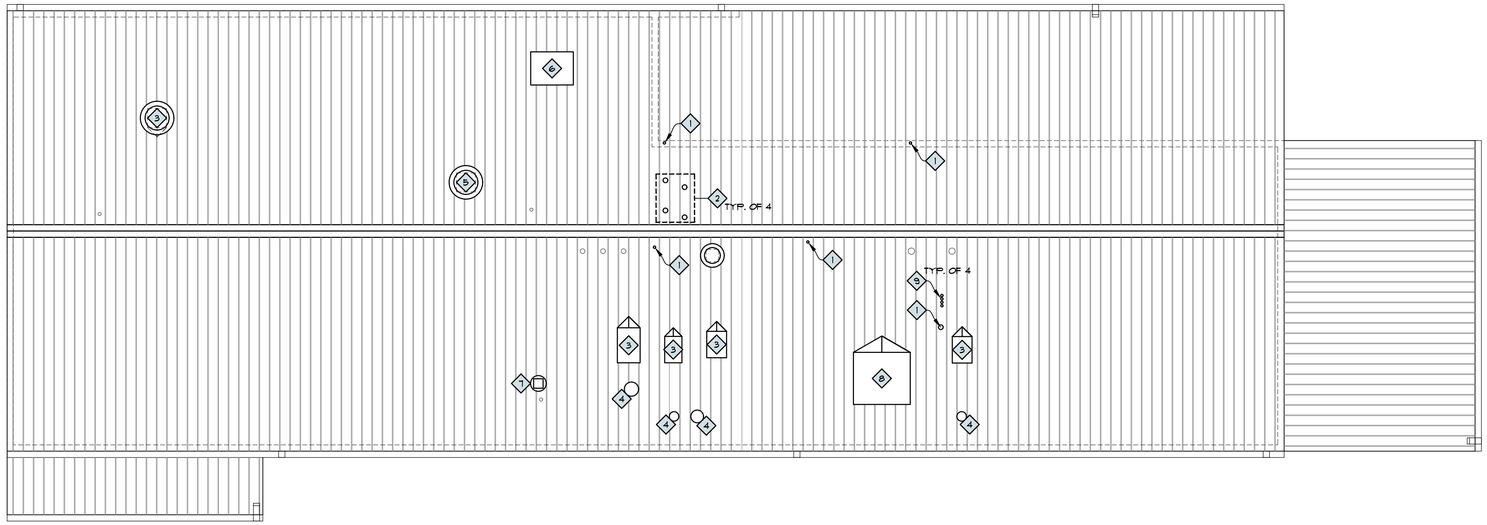
DATE ◇ 01/16/2023
DRAWN ◇ DJG, DMW
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CASTELLAW ◆ KOM ◆ ARCHITECTS
1126 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FAA-2011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
CEILING PLANS:
DEMO AND NEW

SHEET ◇
A1.1



ROOF PLAN

SCALE: 1/8" = 1'-0"

NORTH

ROOF PLAN REFERENCE NOTES

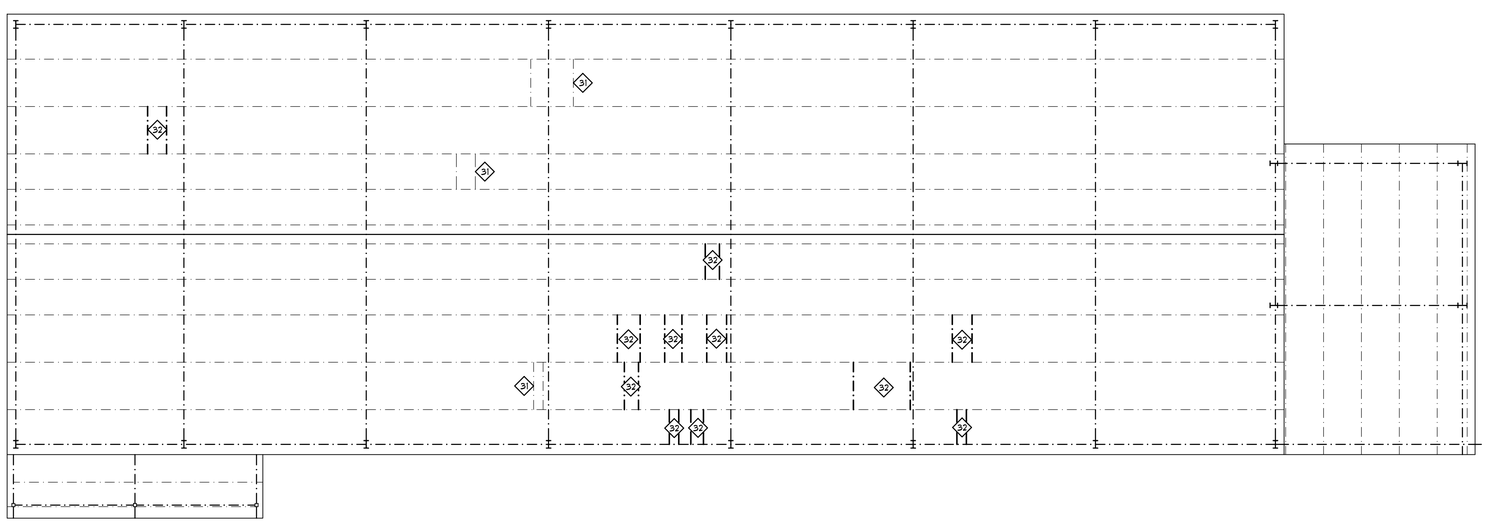
ROOF PLAN REFERENCE NOTES: (1-30)

1. NEW ROOFING BOOT FOR NEW 2" PLUMBING VENT PENETRATIONS.
2. NEW ROOFING BOOT FOR NEW 6" FLUE/VENT PENETRATIONS.
3. NEW ROOFING CRICKET, CURB, AND FLASHING FOR NEW MECHANICAL EQUIPMENT (COORD. W/ MECH.).
4. NEW ROOFING BOOT FOR NEW EXHAUST DUCT PENETRATION.
5. NEW ROOFING CRICKET, CURB, AND FLASHING FOR NEW MECHANICAL EXHAUST FAN AT LOCATION OF DEMOLISHED EXHAUST FAN.
6. CAP & SEAL EXISTING ROOF CURB WHERE ROOF EQUIPMENT IS BEING DEMOLISHED (COORD. W/ MECH).
7. EXISTING EXHAUST FAN TO REMAIN.
8. NEW ROOFING CRICKET, CURB, AND FLASHING FOR NEW MECHANICAL PENTHOUSE (COORD. W/ MECH.).
9. NEW ROOFING BOOT FOR NEW 3" FLUE/VENT PENETRATIONS.

ROOF FRAMING REFERENCE NOTES

ROOF PLAN REFERENCE NOTES: (31-60)

31. EXISTING PEMB FRAMING AT EXISTING EQUIPMENT LOCATION.
32. NEW PEMB FRAMING AT NEW EQUIPMENT LOCATION (DEFERRED DESIGN SUBMITTAL)



ROOF FRAMING PLAN

SCALE: 1/8" = 1'-0"

NORTH

GENERAL ROOF NOTES

A. ALL WOOD NAILERS, BLOCKING, OR PLATES SHALL BE PRESSURE TREATED DOUGLAS FIR OR LARCH.
B. THE TEMPORARY REMOVAL OF BLDG ELEMENTS, EQUIPMENT, ETC. IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL KEEP CONSTRUCTION LOADS ON THE ROOF WITH THE ROOF DESIGN LOAD REQUIREMENTS.
C. WHERE EXISTING CURBS, VENTS, GUY WIRE ANCHORS, ETC. ARE NOT 8" MINIMUM ABOVE FINISH LEVEL OF NEW ROOF SYSTEMS, NOTIFY ARCHITECT.
D. WHERE ABANDONED CURBS & VENTS ARE REMOVED, PROVIDE PATCH MATCHING EXISTING CONDITIONS.
E. ALL ROOF SLOPES SHOWN ARE EXISTING. CONTRACTOR TO FIELD VERIFY ALL SLOPES & PROVIDE POSITIVE SLOPE TO DRAINS.
F. ALL ROOF VENTS, EQUIPMENT, & PENETRATIONS ARE TO BE FLASHED & WEATHER SEALED PER CURRENT NRCA RECOMMENDATIONS.
G. PROVIDE CAULKING/SEALANT AT ALL DISSIMILAR MATERIAL CONNECTIONS.
H. ROOF WARRANTY REQUIREMENTS APPLY TO THIS PROJECT. (SEE SPECIFICATIONS)
I. CONTRACTOR SHALL KEEP ROOF AREAS CLEAN. REMOVE & DISPOSE OF ALL NAILS, SCREWS, TRASH, SCRAP MATERIAL & ALL LOOSE PACKAGING FROM ROOF & GROUNDS DAILY.
J. CONTRACTOR SHALL COORDINATE ACCESS & PROJECT STAGING (PRIOR TO WORK) WITH PROJECT TEAM.
K. CONTRACTOR SHALL REMOVE & DISCARD FLASHINGS AT ALL EXISTING ROOF PENETRATIONS & PREP/CLEAN AS REQUIRED FOR NEW FLASHINGS, UNO.
L. REMOVE ALL EXISTING MASTIC & ANY OTHER ASPHALT MATERIAL FROM ALL PIPES, VENTS, METAL FLASHINGS, & OTHER ITEMS IN THE AREA WHERE NEW ROOF WORK WILL BE PERFORMED, UNO.
M. ANY ACCESS OPENINGS, ROOF MATS, PLATFORMS OR WALKWAYS REQUIRED TO ACCESS FOR SERVICING ROOFTOP EQUIPMENT THAT PLACE USERS WITHIN 10 FT OF A ROOF EDGE SHALL HAVE A PERMANENT GUARD OR RESTRAINING DEVICE IN PLACE TO PREVENT FALLS TO ROOFS OR GRADE BELOW. GUARDS SHALL EXTEND NOT LESS THAN 30 INCHES BEYOND EACH END OF COMPONENT & BE CONSTRUCTED AS TO PREVENT THE PASSAGE OF A SPHERE 21 INCHES IN DIAMETER.
N. MAINTENANCE ACCESS PLATFORMS NOT REQUIRED ON ROOFS WITH A SLOPE OF 3:12 OR LESS.

LICENSED ARCHITECT KOM STATE OF IDAHO

REVISIONS

CONSULTANTS ◇

DATE ◇ 01/16/2023
DRAWN ◇ DJG
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

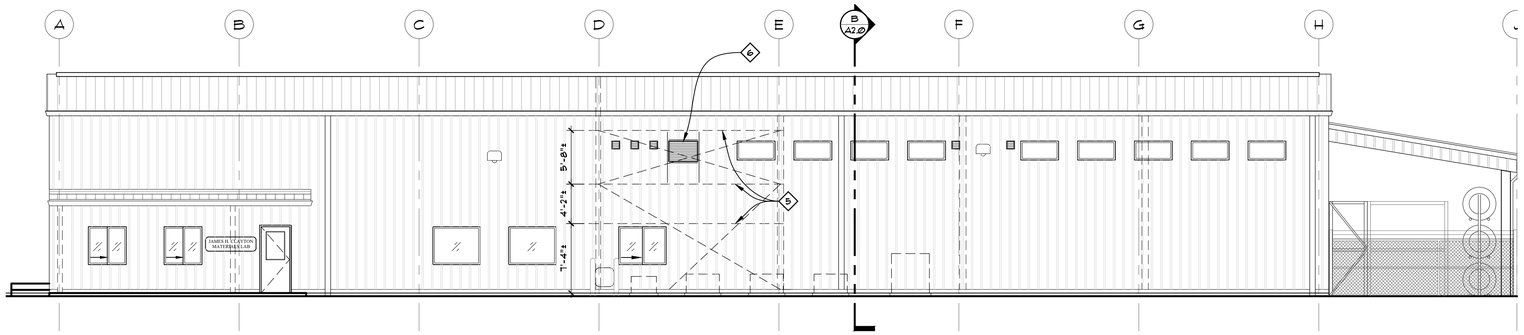
CASTELLAW ◆ KOM ◆ ARCHITECTS
1128 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FM-22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
ROOF PLAN,
ROOF FRAMING PLAN

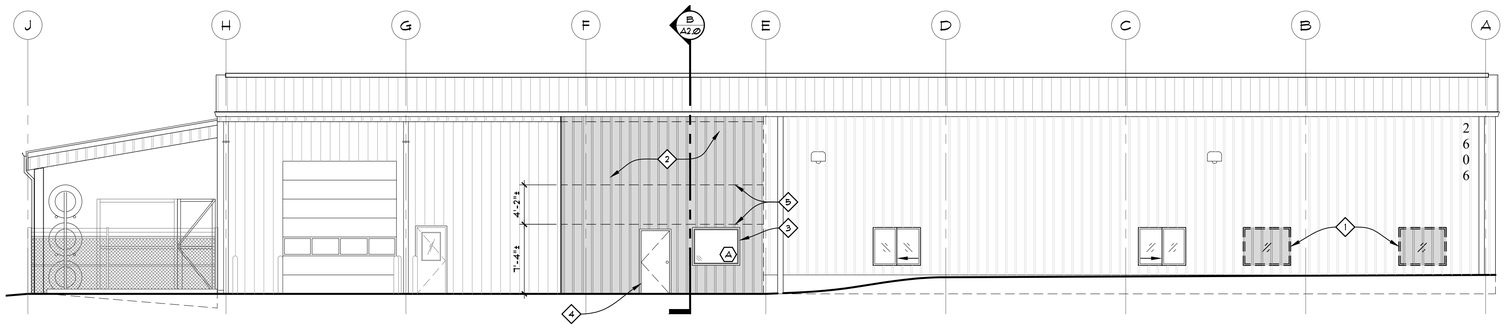
SHEET ◇
A1.2

95% CONSTRUCTION DOCUMENTS



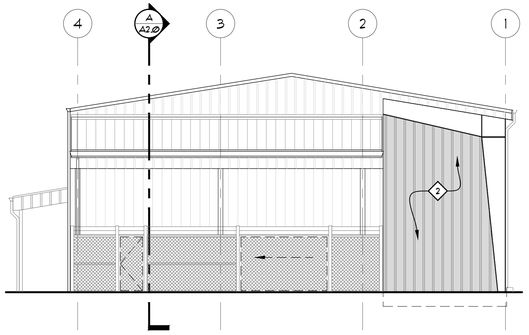
SOUTH ELEVATION

SCALE: 1/8" = 1'-0"



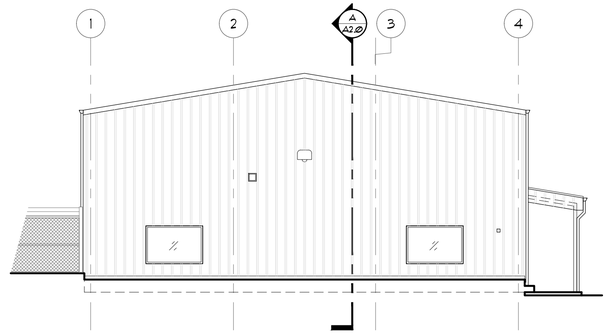
NORTH ELEVATION

SCALE: 1/8" = 1'-0"



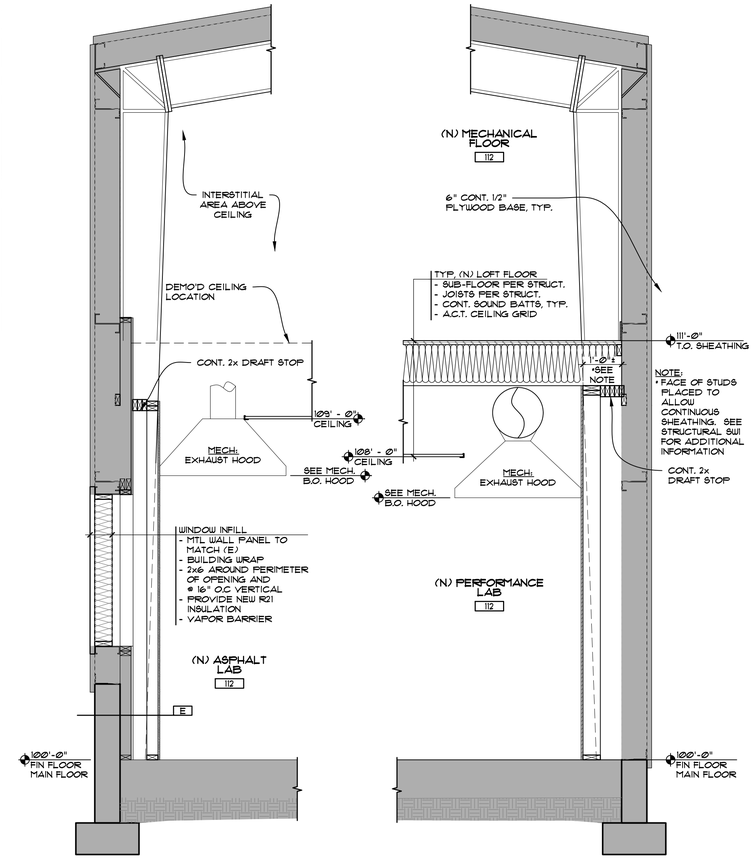
EAST ELEVATION

SCALE: 1/8" = 1'-0"



WEST ELEVATION

SCALE: 1/8" = 1'-0"



16 TYP, (E) LAB WALL SECT

SCALE: 1/2" = 1'-0"

17 MEZZ. BEARING WALL SECT

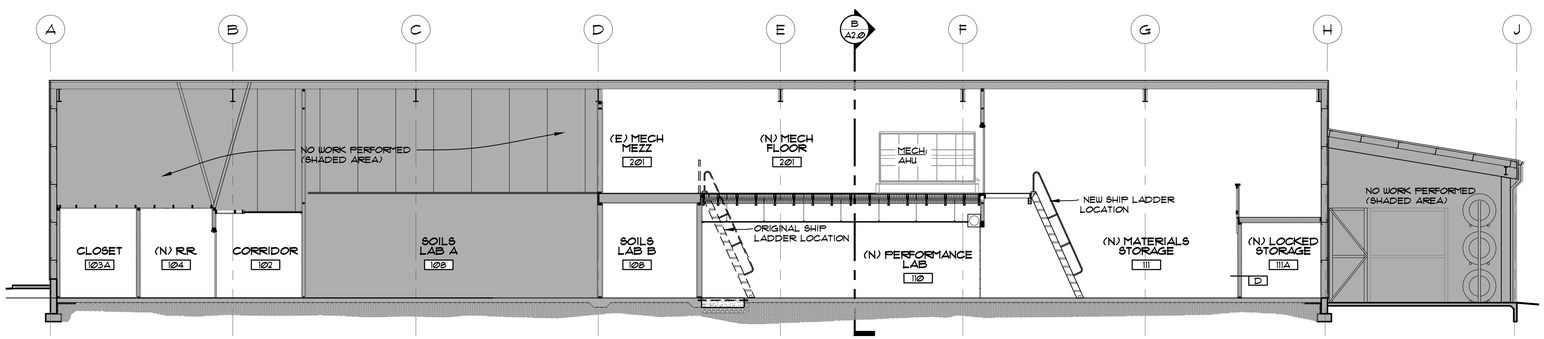
SCALE: 1/2" = 1'-0"

ELEVATION REFERENCE NOTES

REFERENCE NOTES: (1-50)

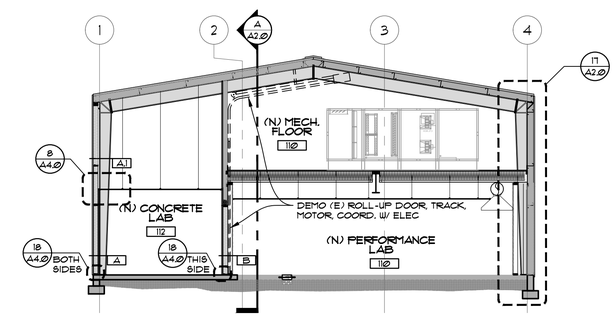
EXISTING BUILDING- NO WORK PERFORMED ON EXISTING SIDING, DOORS, WINDOWS, VENTS, LOUVERS, GUTTERS ETC. UNLESS NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS.

1. INFILL WINDOW- INFILL REMOVED WINDOW OPENING (SHOWN GRAY). REMOVE FASTENERS AND LOOSEN EXISTING PANELS, INSTALL NEW UNDERLAPPING PANEL ON HIGH SIDE AND THEN OVERLAP ON LOW SIDE. CONTRACTOR'S OPTION TO USE SALVAGE METAL SIDING FROM CONCEALED LOCATION ABOVE NEW CONCRETE LAB ADDITION.
2. NEW WALL- NEW WALL PER PLAN (SHOWN GRAY)
3. RELOCATED WINDOW- INSTALL SALVAGED WINDOW SEE PLAN
4. RELOCATED DOOR- INSTALL SALVAGED DOOR SEE PLAN
5. WALL PANEL ATTACHMENT- ALIGN WALL PANEL ATTACHMENT TO MATCH EXISTING SIZE, AND SPACING, LOCATION SHOWN (DASHED LINE) IS APPROXIMATE HEIGHT
6. NEW LOUVER- NEW 35"x24" LOUVER, COORDINATE WITH MECH. PROVIDE VERTICAL 2x FRAMING EACH SIDE BETWEEN WALL HORIZONTAL GIRTS AND AT TOP AND BOTTOM OF LOUVER



SECTION A

SCALE: 1/8" = 1'-0"



SECTION B

SCALE: 1/8" = 1'-0"

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT
STATE OF IDAHO

REVISIONS

DATE ◇ 01/16/2023
DRAWN ◇ DJG, DMW
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CONSULTANTS ◇

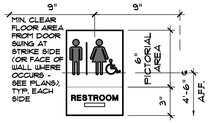
CASTELLAW ◆ KOM ◆ ARCHITECTS

1126 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FM-22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
BUILDING ELEVATIONS, & SECTIONS

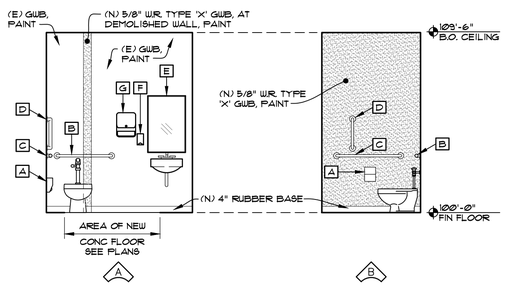
SHEET ◇
A2.0



TYPICAL ADA SIGN DIMENSIONS (U.N.O.)

1 RESTROOM SIGNAGE DETAIL

SCALE: 1 1/2" = 1'-0"



104 RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOOR MATERIAL	BASE MATERIAL	WALLS NORTH MATERIAL	NORTH COLOR	WALLS EAST MATERIAL	EAST COLOR	WALLS SOUTH MATERIAL	SOUTH COLOR	WALLS WEST MATERIAL	WEST COLOR	CEILING MATERIAL	CEILING HEIGHT (AFF.)	CASEWORK	REMARKS
MAIN FLOOR															
101	VESTIBULE	(E) CONC/ SLR	(E) RBR	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) A.C.T.	(E) 9'-0"	--	
102	CORRIDOR	(E) CONC/ SLR	(E) RBR	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) A.C.T.	(E) 9'-0"	--	
103	OFFICE	(E) CPT	(E) RBR	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) A.C.T.	(E) 9'-0"	--	
103A	CLOSET	(E) CPT	(E) RBR	(E) GWB, PT	PI	(N) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	(E) 9'-6"	--	
ALT 1 104	(N) RESTROOM	(E) CONC (N) CONC/SLR	(E) RBR	(E) GWB, PT	PI	(N) GWB, PT	PI	(E) GWB, PT (N) GWB, PT	PI	(N) GWB,PT	PI	(E) GWB, PT (N) GWB, PT	(E) 9'-6" (N) 9'-6"	--	1
105	(E) RESTROOM	(E) CONC/ SLR	(E) RBR	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	(E) 9'-6"	--	
106	(N) ASPHALT LAB	(E) CONC (N) SLR	(E) RBR	(N) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(5) A.C.T.	(N) 9'-0"	--	1
106A	DATA	(E) CONC/ SLR	(E) RBR	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	(E) 9'-6"	--	
107	(E) ASPHALT LAB	(E) CONC (N) SLR	(E) RBR	(E) GWB, PT (N) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(5) A.C.T.	(N) 9'-0"	--	1
108	SOILS LAB A	(E) CONC/ SLR	(E) RBR	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) GWB	--	(E) A.C.T.	(E) 11'-0"	✓	
109	SOILS LAB B	(E) CONC/ SLR (N) SLR	(E) RBR	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(5) A.C.T.	(N) 9'-0"	✓	3
110	(N) PERFORMANCE LAB	(E) CONC /SLR (N) CONC/ SLR	(N) RBR	(E) PLY, PT (N) PLY, PT	PI	(E) PLY, PT (N) PLY, PT	PI	(N) PLY, PT	PI	(E) PLY, PT (N) PLY, PT	PI	(N) A.C.T.	(N) 9'-0"	--	
111	SUPPLY SHOP	(E) CONC/ SLR	--	--	--	--	--	--	--	--	--	(E) VP BR	(E) STRUCTURE	--	3
111A	(N) LOCKED STORAGE	CONC/ SLR	4" RBR	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	PI	(E) GWB, PT	(E) 18'-0"	--	4
112	(N) CONCRETE LAB	CONC/ SLR	SEE DETAIL /A.4	(E) MTL SDG (N) MTL SDG	--	(N) MTL SDG	--	(E) MTL SDG (N) MTL SDG	--	(E) MTL SDG	--	(N) A.C.T.	(N) 9'-0"	--	2
LOFT															
201	(E) MECHANICAL MEZZ	(E) PLY/ STAIN	--	(E) PLY/ VP BR	--	--	--	(E) VP BR	--	(E) PLY/ VP BR	--	(E) VP BR	(E) STRUCTURE	--	
201A	(N) MECHANICAL ROOM	(N) STRUCT-PLY	6" PLY	(E) VP BR	--	(E) VP BR	--	(E) VP BR	--	(E) VP BR	--	(E) VP BR	(E) STRUCTURE	--	

REMARKS:

1. NEW RUBBER BASE AT NEW WALLS (MATCH EXISTING STYLE AND COLOR), TYP.
2. NEW METAL SIDING AT NEW WALLS OR OPENING INFILL PORTIONS OF EXISTING WALLS (MATCH EXISTING STYLE AND COLOR), TYP.
3. SEAL NEW CONCRETE.
4. RELOCATED LOCKED STORAGE, COORDINATE WITH PLANS.

ABBREVIATIONS:

ACT	= ACOUSTIC CEILING TILE	GWB	= GYPSUM WALL BOARD	PLY	= PLYWOOD
AFF	= ABOVE FINISH FLOOR	(N)	= NEW	STRUCT	= STRUCTURAL
CONC.	= CONCRETE	(S)	= SALVAGED/SAVED	SLR	= SEALER
(E)	= EXISTING	RBR	= RUBBER WALL BASE	SUSP	= SUSPENDED
FRP	= FIBER REINF. PLASTIC	PT	= PAINT	VP BR	= VAPOR BARRIER

DOOR SCHEDULE

DOOR NUMBER	ROOM NUMBER	DOOR TYPE	DOOR MATERIAL	DOOR FINISH	DOOR COLOR	SIZE WIDTH	SIZE HEIGHT	SIZE THICKNESS	GLAZING - SEE WINDOW SCHED	LOUVER	HARDWARE SEE 08 71 00	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	FRAME COLOR	FRAME DEPTH	DETAIL HEAD	DETAIL JAMB	DETAIL OTHER	U.L. RATING	REMARKS
MAIN FLOOR																					
103A	103	(E) A	(E) HM	PAINT	P2	3'-0"	7'-0"	1-3/4"	--			(E) A	(E) HM	PAINT	P2	(E)	17/A4.0-SIM	17/A4.0-SIM			
104A	104	(E) A	(E) HM	PAINT	P2	3'-0"	7'-0"	1-3/4"	--			(E) A	(E) HM	PAINT	P2	(E)	17/A4.0-SIM	17/A4.0-SIM			
106B	106	(E) B	(E) HM	PAINT	P2	3'-0"	7'-0"	1-3/4"	--			(E) A	(E) HM	PAINT	P2	(E)	17/A4.0-SIM	17/A4.0-SIM			2
110A	110	PER MANUFACTURER			P2	6'-0"	8'-0"	MFR	--			PER MANUF'R			P2	--	19/A4.0 SIM	19/A4.0			1
110B	110	B	HM	PAINT	P2	4'-0"	7'-0"	1-3/4"	--			A	HM	PAINT	P2	7-3/4"	17/A4.0	17/A4.0			
111A	111A	(E) A	(E) HM	PAINT	P2	3'-0"	7'-0"	1-3/4"	--			(E) A	(E) HM	PAINT	P2	(E)	--	--			2
112A	112	B	HM	PAINT	P2	4'-0"	7'-0"	1-3/4"	1-2			A	HM	PAINT	P2	7-3/4"	6/A4.0	11/A4.0			
112B	112	B	HM	PAINT	P2	4'-0"	7'-0"	1-3/4"	1-3			A	HM	PAINT	P2	5-3/4"	16/A4.0	16/A4.0			
LOFT																					
201A	201A	C	HM	PAINT	P2	6'-0"	7'-0"	1-3/4"	--			A	HM	PAINT	P2	5-3/4"	12/A4.0	12/A4.0			

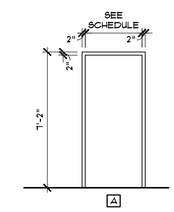
REMARKS:

1. OVERHEAD COILING DOOR.
2. RELOCATED DOOR FROM SALVAGE

ABBREVIATIONS:

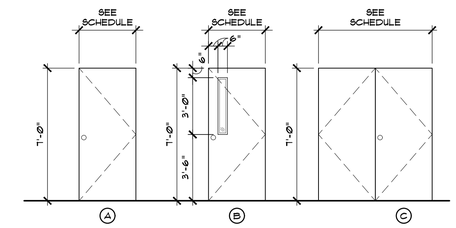
ALUM.	= ALUMINUM			MB	= MEDIUM BRONZE
FACT. FIN.	= FACTORY FINISH			WD	= WOOD
HM	= HOLLOW METAL			CL	= CLEAR

GENERAL NOTE: SEE SECTION 08 71 00 FOR DOOR HARDWARE REQUIREMENTS



DOOR FRAME TYPES

SCALE: 1/4" = 1'-0"



DOOR TYPES

SCALE: 1/4" = 1'-0"

WINDOW SCHEDULE

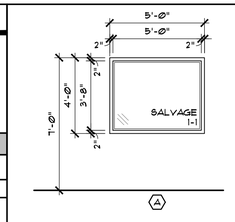
OPENING LETTER	NO. OF UNITS	OPERATION	MATERIAL	FINISH	SIZE / CONFIGURATION (WIDTH x HEIGHT)	GLAZING	HEAD	JAMB	SILL	OTHER	REMARKS
MAIN FLOOR											
A	1	1 FIXED	(E) VINYL	FACT. FIN.	(E) 5'-0" x 4'-0"	1-1	20/A3.0	20/A3.0 - SIM	19/A3.0		1

REMARKS:

1. SALVAGED WINDOW TO BE REINSTALLED AT NEW LOCATION

GLAZING SCHEDULE

1-1 INSULATED GLASS UNITS, LOW E
1-2 SAFETY INSULATED GLASS UNITS, LOW-E
1-3 SAFETY INSULATED GLASS UNITS, CLEAR



WINDOW TYPES

SCALE: 1/4" = 1'-0"

ALT 1: RR DEMO PLAN REF NOTES

NOTES: 1-10

1. MOP SINK- DEMO (E) MOP SINK, SEE PLUMBING.
2. CONC SLAB- DEMO PORTION OF (E) 6" CONCRETE SLAB FOR ACCESS TO PUMPING BELOW.
3. EYE WASH- REMOVE (E) EYE WASH STATION, SEE PLUMB.
4. DOOR AND FRAME- SALVAGE (E) DOOR AND FRAME, CLEAN AND PREP FOR (N) INSTALLATION.
5. SHELVES- DEMO/REMOVE (E) SHELVING,CABINETS, WALL MOUNTED HOOKS, ETC, COORDINATE WITH OWNER.
6. WALL- DEMO PORTION OF (E) WALL, PREP AREA FOR REINSTALLATION OF (E) DOOR.

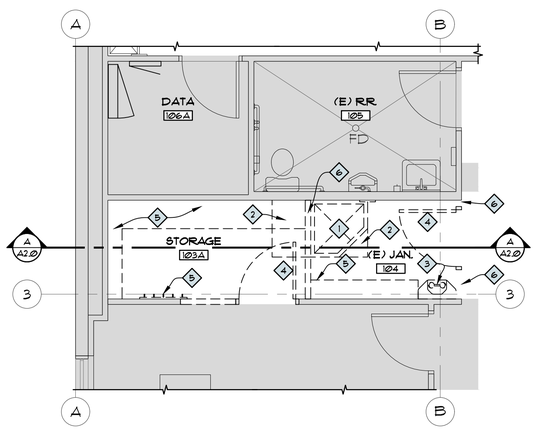
ALT 1: RR FLOOR PLAN REF NOTES

NOTES: 11-20

11. (E) RESTROOM- NO FINISH WORK THIS ROOM.
12. DOOR- REINSTALL (E) DOOR AND FRAME AT (N) LOCATION AND SEE SPEC. SECTION 08 71 00 FOR DOOR HARDWARE REQUIREMENTS.
13. CONC SLAB- (N) 6" CONCRETE SLAB W/ #4 BAR AT 18" O.C. EA WAY. DOWEL AND PIN INTO (E) SLAB.
14. WALL- PATCH AND REPAIR WALL WHERE WALL REMOVED AND FOR DRINKING FOUNTAIN PLUMBING AND ELECTRICAL ACCESS.
15. FLOOR- PATCH AND REPAIR CONCRETE FLOOR WHERE BOTTOM PLATE ANCHORS ARE REMOVED.
16. CORNER GUARD- S.S. CORNER GUARD (S6CG-3.5).
17. END WALL CAP- S.S. END WALL CAP (S6CS-W).
18. RESEAL- RESEAL CONC. SLAB IN IT'S ENTIRETY
19. PLUMBING- NEW LOU-MOUNT DRINKING FOUNTAIN.
20. RESTROOM SIGNAGE- SEE DETAIL 1/A3.0 (THIS PAGE)

ACCESSORY SCH.

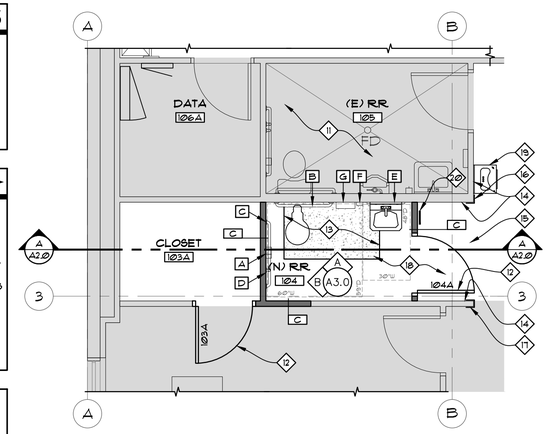
A	TOILET PAPER DISPENSER	D	18" VERTICAL GRAB BAR, PROVIDE SOLID BLOCKING AT WALL
B	36" GRAB BAR, PROVIDE SOLID BLOCKING AT WALL	E	24" x 36" MIRROR
C	42" GRAB BAR, PROVIDE SOLID BLOCKING AT WALL	F	SOAP DISPENSER
		G	PAPER TOWEL DISPENSER



ALT 1: RESTROOM DEMO PLAN

SCALE: 1/4" = 1'-0"

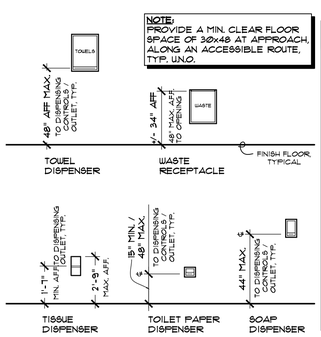
NORTH



ALT 1: RESTROOM FLOOR PLAN

SCALE: 1/4" = 1'-0"

NORTH

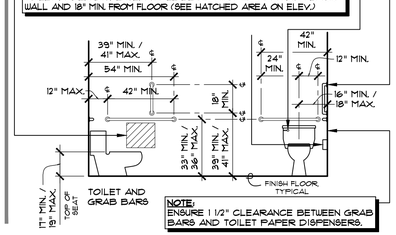


NOTE: PROVIDE A MIN. CLEAR FLOOR SPACE OF 30x48 AT APPROACH, ALONG AN ACCESSIBLE ROUTE, TYP. U.N.O.

NOTE: GRAB BARS ARE TO BE 1 1/4" TO 1 1/2" O.D., MUST BE 1 1/2" MIN. CLEAR TO WALL OR OTHER OBSTRUCTIONS AND MUST NOT ROTATE WITHIN THEIR FITTINGS.

NOTE: PROVIDE FLUSH VALVE HANDLE ON OPEN / TRANSFER SIDE OF TOILET.

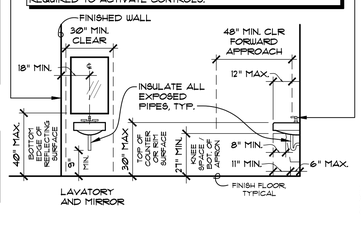
NOTE: TOILET PAPER DISPENSER SHALL BE 24" MIN. / 42" MAX FROM BACK WALL AND 18" MIN. FROM FLOOR (SEE HATCHED AREA ON ELEV.)



NOTE: ENSURE 1 1/2" CLEARANCE BETWEEN GRAB BARS AND TOILET PAPER DISPENSERS.

NOTE: ENSURE 15" MIN. CLEAR FROM WALL TO ℄ OF LAVATORY.

NOTE: FAUCETS MUST BE LEVER TYPE, ELECTRONICALLY ACTIVATED, OR APPROVED SELF-CLOSING VALVES (MIN. 10 SEC. OPEN FLOW), AND BE OPERABLE W/ ONE HAND, NOT REQUIRING TIGHT GRASPING, PINCHING OR TWISTING OF WRIST. 5 LB. MAX. FORCE REQUIRED TO ACTIVATE CONTROLS.

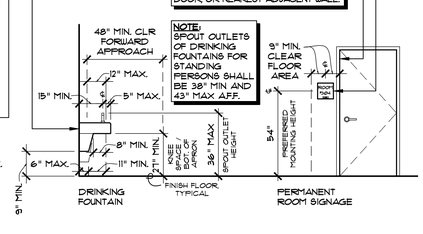


NOTE: PROVIDE A MIN. CLEAR FORWARD APPROACHING FLOOR SPACE OF 30"x48" WITH 12" MAX. EXTENDING UNDER LAVATORY / DRINKING FOUNTAIN TO PIPING AND PLUMBING.

NOTE: TACTILE CHARACTERS (INCLUDING BRAILLE) SHALL BE 48" MIN. AND 60" MAX. TO THE BASELINE OF THE TACTILE CHARACTERS.

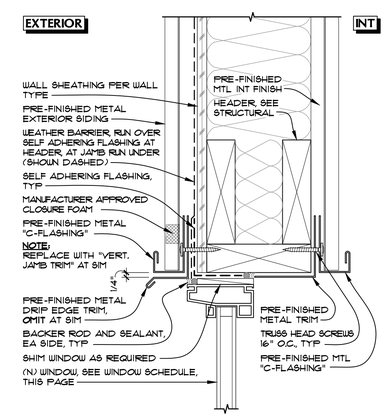
NOTE: MOUNT SIGNS AT LATCH SIDE OF DOOR, OR NEAREST ADJACENT WALL.

NOTE: SPOUT OUTLETS OF DRINKING FOUNTAINS FOR STANDING PERSONS SHALL BE 38" MIN AND 43" MAX A.F.F.



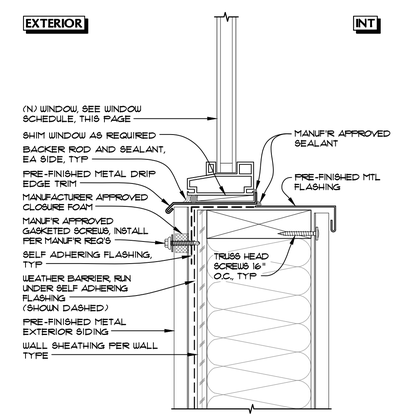
ADA MOUNTING STANDARDS

SCALE: 1/4" = 1'-0"



19 TYP, WINDOW HEADER

SCALE: 3" = 1'-0"



20 TYP, WINDOW SILL

SCALE: 3" = 1'-0"

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT STATE OF IDAHO

REVISIONS

DATE ◇ 01/16/2023
DRAWN ◇ DJG, DMW
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

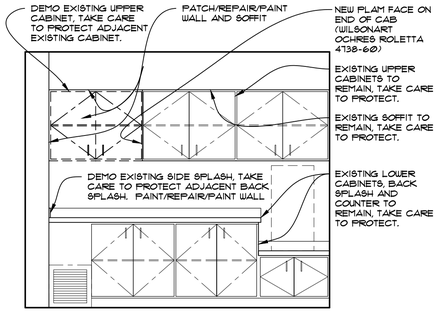
CONSULTANTS ◇

CASTELLAW ◆ KOM ◆ ARCHITECTS
1128 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

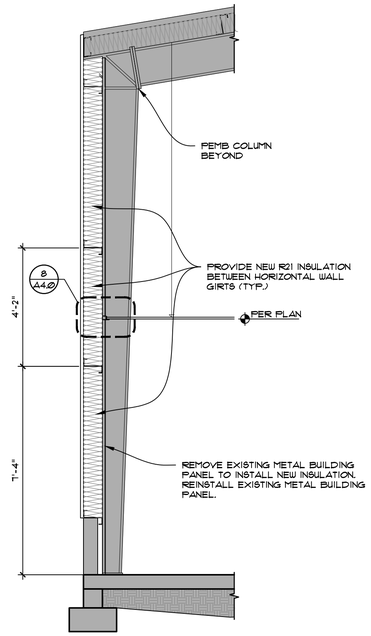
PROJECT ◇ ITD # FM-22011
DAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

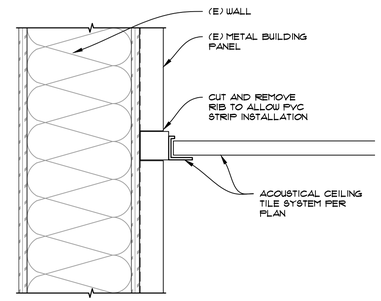
DRAWING
SCHEDULES, DOORS & WINDOWS, ENLARGED RESTROOM PLAN, ADA MOUNTING STANDARDS

SHEET ◇
A3.0

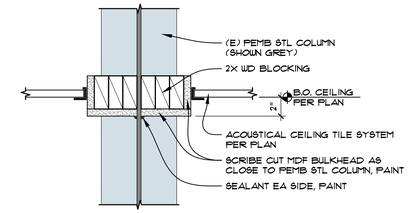


1 CABINET ELEVATION
SCALE: 3/8" = 1'-0"



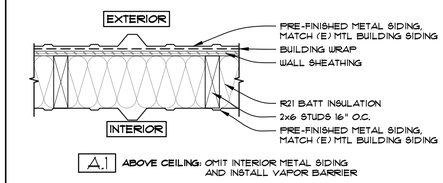


3 CEILING TRANSITION
SCALE: 3" = 1'-0"

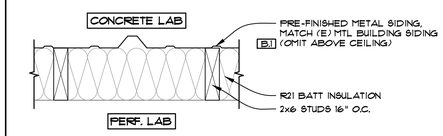


4 PEMB STEEL BULKHEAD
SCALE: 1 1/2" = 1'-0"

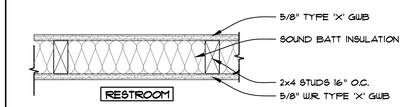
WALL TYPES



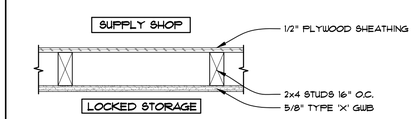
A WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



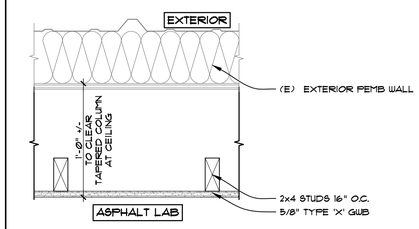
B WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



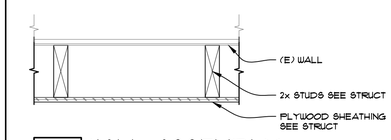
C WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



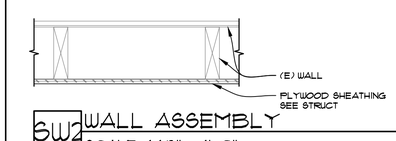
D WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



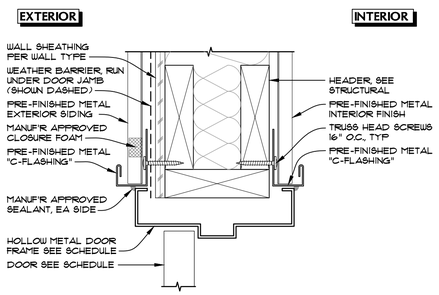
E WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



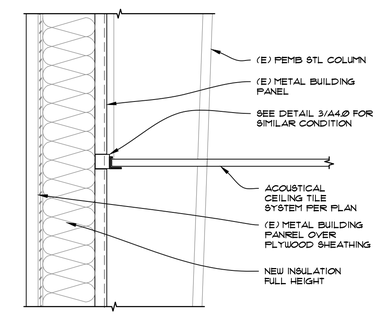
SW1 WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



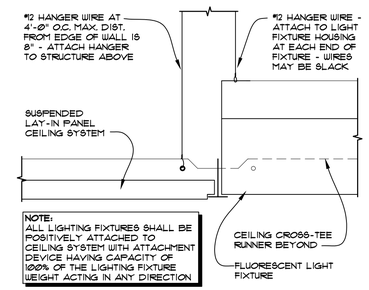
SW2 WALL ASSEMBLY
SCALE: 1 1/2" = 1'-0"



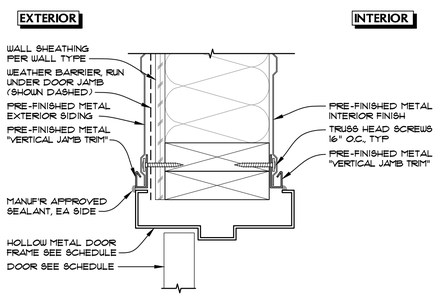
6 EXT. DOOR HEADER
SCALE: 3" = 1'-0"



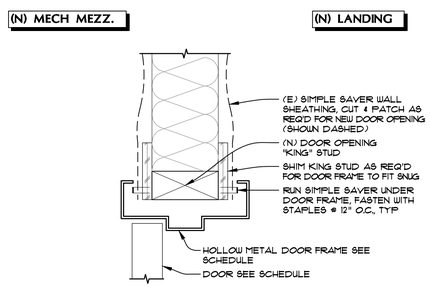
8 CEILING TRANSITION
SCALE: 1 1/2" = 1'-0"



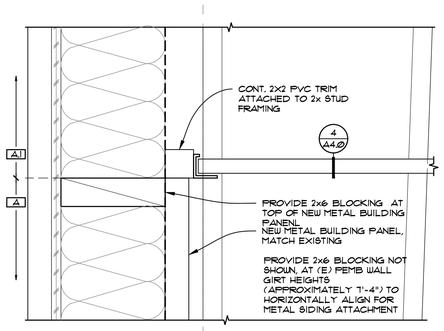
9 TYP. SUSPENDED LIGHT FIX
SCALE: 3" = 1'-0"



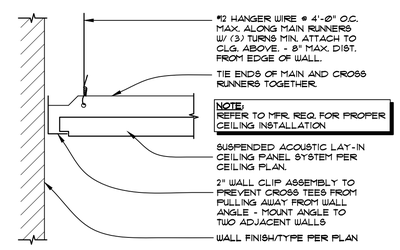
11 EXT. DOOR JAMB, TYP
SCALE: 3" = 1'-0"



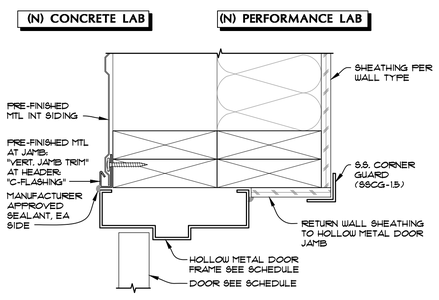
12 DOOR 201A HEADER & JAMB
SCALE: 3" = 1'-0"



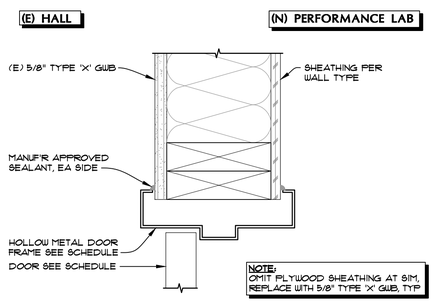
13 CEILING TRANSITION
SCALE: 3" = 1'-0"



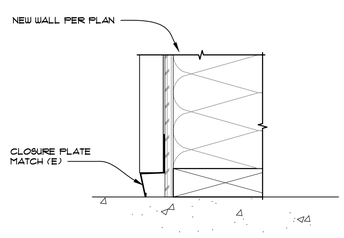
14 TYP. SUSP. ACOUSTICAL CLG
SCALE: 3" = 1'-0"



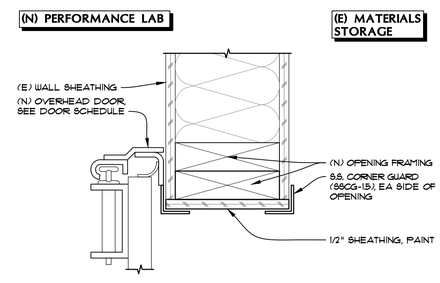
16 DOOR 112B HEADER & JAMB
SCALE: 3" = 1'-0"



17 DOOR 110B HEADER & JAMB
SCALE: 3" = 1'-0"



18 BOTTOM OF WALL DETAIL
SCALE: 3" = 1'-0"



19 DOOR 110A JAMB (HEAD SIM)
SCALE: 3" = 1'-0"

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT
STATE OF IDAHO

CASTELLAW ◆ KOM ◆ ARCHITECTS
1126 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

REVISIONS

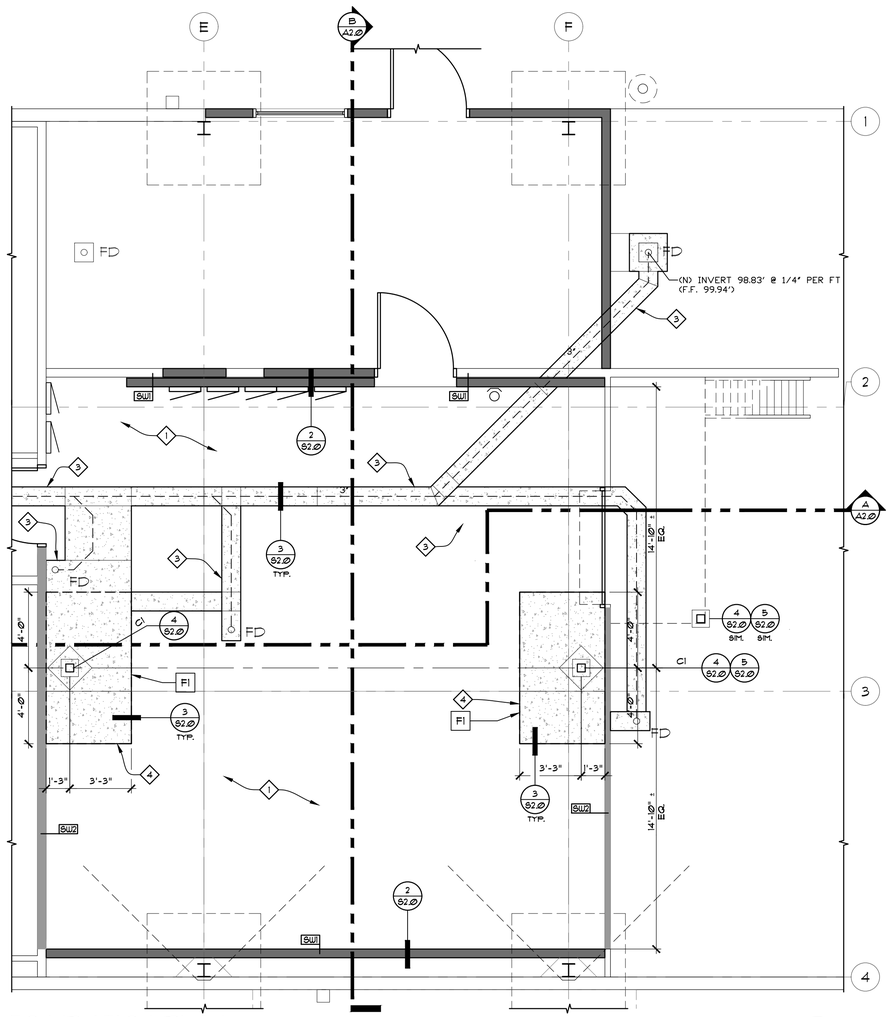
DATE ◇ 01/16/2023
DRAWN ◇ DJG
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CONSULTANTS ◇

PROJECT ◇
ITD # FM-22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
DETAILS AND WALL TYPES

SHEET ◇
A4.0



FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

NORTH

FOUNDATION PLAN REFERENCE NOTES

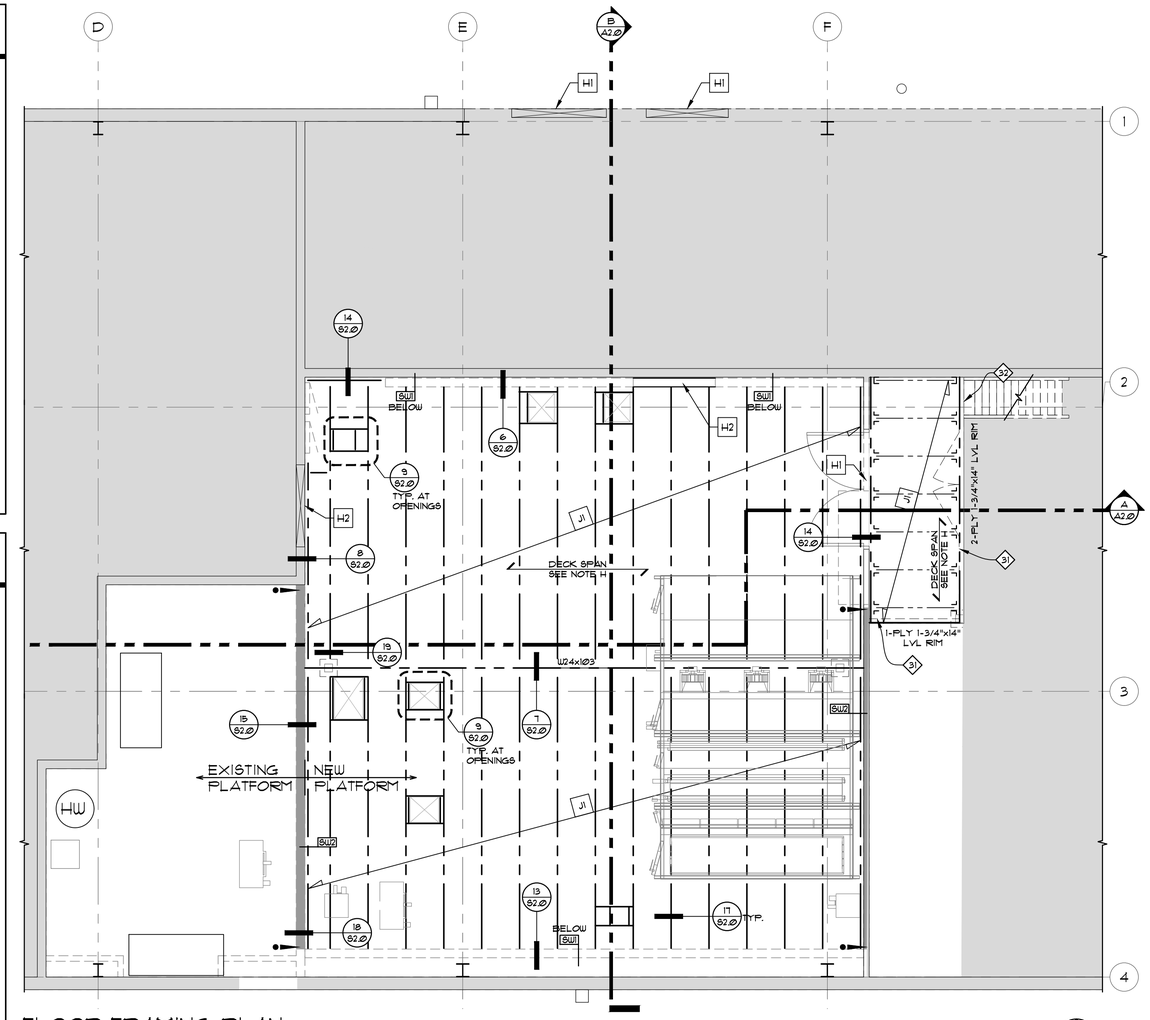
FOUNDATION PLAN REF NOTES: (1-30)

1. EXISTING SLAB TO REMAIN- EXISTING CONCRETE TO REMAIN TO EXTENTS SHOWN.
2. SLAB DEMO & PATCH- DEMO CONCRETE TO EXTENTS SHOWN AND PROVIDE NEW SLOPED CONCRETE FLOOR SLAB (SEE STRUCTURAL DETAIL 3/S2.0).
3. SLAB DEMO & PATCH- DEMO CONCRETE TO EXTENTS NEEDED FOR NEW PLUMBING AND PATCH BACK CONCRETE FLOOR SLAB (SEE STRUCTURAL DETAIL 3/S2.0), COORDINATE WITH PLUMBING.
4. SLAB DEMO & PATCH- DEMO CONCRETE TO EXTENTS SHOWN FOR NEW FOOTING (SEE STRUCTURAL DETAIL 3/S2.0).

LOFT FRAMING PLAN REFERENCE NOTES

LOFT FRAMING PLAN REF NOTES: (31-60)

31. CHAIN LINK GUARD RAIL- SALVAGED CHAIN LINK GUARDRAIL, COORDINATE WITH FLOOR PLANS.
32. SHIPS LADDER- SALVAGED SHIPS LADDER, ANCHOR TO (N) LANDING RIM BOARD.



FLOOR FRAMING PLAN

SCALE: 1/4" = 1'-0"

NORTH

COLUMN (C) SCHEDULE

MARK	MATERIAL	SIZE	BASE PLATE U.N.O.	ANCHORAGE U.N.O.
C1	STEEL	HSS 5x5x5/16	5/8" X 11" X 11"	(4) 3/4" DIA A.B.

GENERAL STRUCTURAL NOTES

A. SEE DETAILS 4 & 5/S2.0 FOR TYPICAL STEEL COLUMN ANCHORAGE/BASE DETAIL.

B. COORDINATE W/ FOOTING SCHEDULE.

C. F'c=2,500 PSI MINIMUM CONCRETE STRENGTH

D. "SW" DENOTES SHEAR WALL (PART OF LATERAL FORCE RESISTING SYSTEM). SEE SHEAR WALL SCHEDULE

E. LOADING
DEAD LOAD=25 PSF
LIVE LOAD=125 PSF

F. SOIL BEARING=1,500 PSF

G. ALL LOAD BEARING STUD WALLS SHALL BE 2X6 DFL STUD GRADE AT 16" OC.

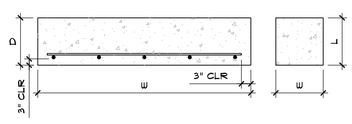
H. FLOOR SHEATHING TO BE 1-1/8" T&G WITH THE FOLLOWING FASTENING REQ'S:
EDGE NAILING: 10d NAILS AT 8" O.C. ALL PANEL EDGES
FIELD NAILING: 10d NAILS AT 12" O.C.

I. SEISMIC CRITERIA
S_S=0.236 S_1=0.106 S_{MS}=0.308 S_{M1}=0.169;
F_a=1.56 F_v=2.39 SOIL SITE CLASS D SDC C
EQUIVALENT LATERAL FORCE PROCEDURE LIGHT-FRAME (WOOD) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS.

J. CONTRACTOR TO FILED VERIFY EXISTING STRUCTURAL CONDITIONS. IF ANY DISCREPANCIES ARE FOUND, CONTRACTOR SHALL CONTACT THE ARCHITECT BEFORE PERFORMING ALTERATION WORK.

K. SEE SECTION 014000 FOR SPECIAL INSPECTION REQUIREMENTS.

FX FOOTING SCHEDULE



MARK	FOOTING SIZE	T.O. FTG. LOCATION	DEPTH (D)	REINFORCEMENT
F1	4'-6" x 8'-0"	100'-0"	1'-4"	W/ #5 BARS @ 10" O.C. EACH WAY TOP AND BOTTOM

JX JOIST SCHEDULE

MARK	T.O. ELEV	WIDTH	DEPTH (D)	SPACING	COMMENTS
J1	110'-11 1/2"	1-3/4"	14"	24" O.C.	MICROLAM LVL 1.9 E

HX HEADER SCHEDULE

MARK	T.O. ELEV	SIZE	TYPE	JAMB	DETAIL	COMMENTS
H1	PER OPENING	(2) 2x6	WOOD	(2) 2x6	16/S2.0	DFL NORTH NO. 2 OR GREATER
H2	PER OPENING	(3) 2x8	WOOD	(2) 2x8	16/S2.0	DFL NORTH NO. 2 OR GREATER

HOLD DOWN SCHEDULE

MARK	HOLD DOWN	COMMENTS
◄●	HDU2-2.5SDS	

SHEAR WALL SCHEDULE

MARK	SHEATHING MATERIAL	EDGE NAILING	FIELD NAILING	SILL PLATE ANCHOR AT FNDN SILL PLATE ANCHOR AT FLOOR
SW-1	7/16" APA RATED PLYWOOD ONE SIDE OF WALL	8d COMMON AT 6" OC	8d COMMON 12" OC	1/2" DIAMETER AB AT 48" OC OR 16d COMMON NAILS AT 9" OC
SW-2	7/16" APA RATED PLYWOOD ONE SIDE OF WALL	8d COMMON AT 6" OC	8d COMMON 12" OC	CONTRACTOR TO FIELD VERIFY EXISTING SILL PLATE ATTACHMENT AND REPORT TO ARCHITECT.

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT IDAHO STATE OF IDAHO

REVISIONS

CONSULTANTS ◇

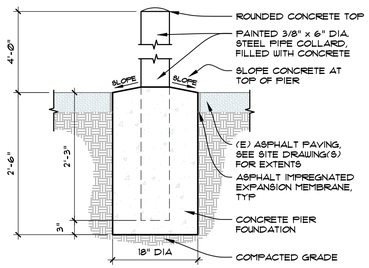
DATE ◇ 01/16/2023
DRAWN ◇ DMW, DJG
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CASTELLAW ◆ KOM ◆ ARCHITECTS
1128 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

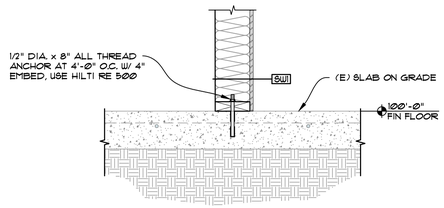
PROJECT ◇
IDAHO TRANSPORTATION DEPARTMENT
ITD # FM-22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
STRUCTURAL PLANS

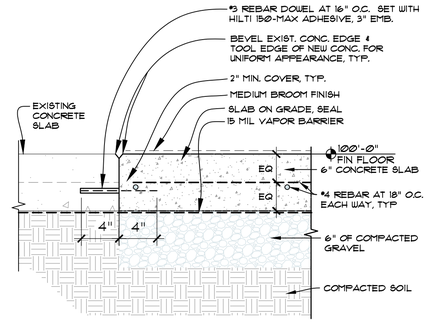
SHEET ◇
S1.0



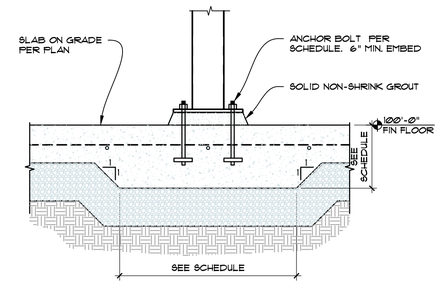
1 BOLLARD DETAIL
SCALE: 3/4" = 1'-0"



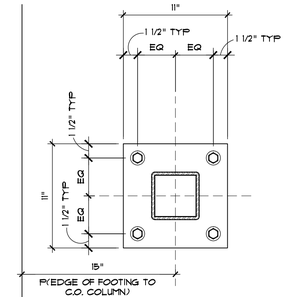
2 INTERIOR BEARING WALL
SCALE: 1" = 1'-0"



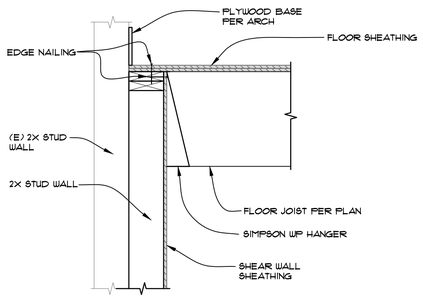
3 NEW TO EXISTING SLAB ON GRADE
SCALE: 1 1/2" = 1'-0"



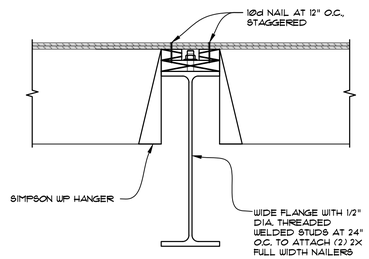
4 INTERIOR SPREAD FOOTING
SCALE: 1" = 1'-0"



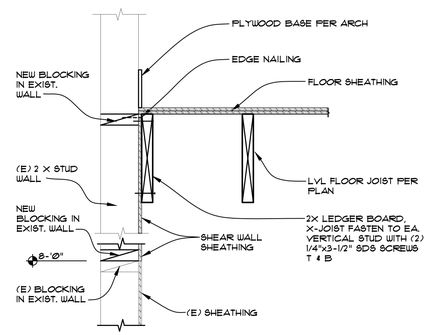
5 BASEPLATE DETAIL
SCALE: 1 1/2" = 1'-0"



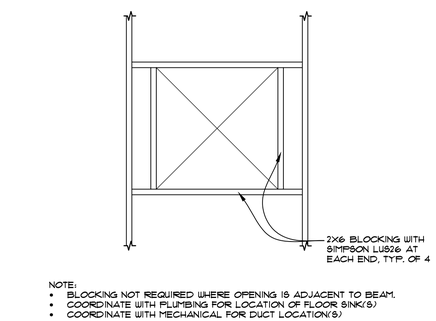
6 JOIST BEARING AT WALL
SCALE: 1"= 1'-0"



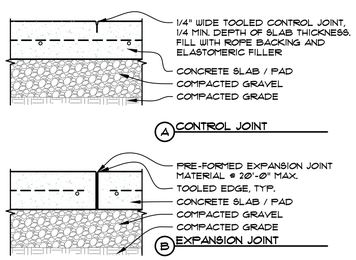
7 MEZZANINE FRAMING AT WF BM
SCALE: 1" = 1'-0"



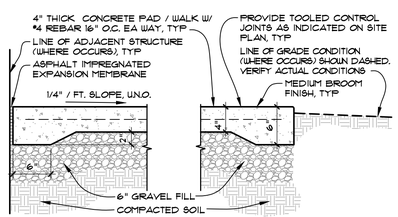
8 FLOOR TO SHEARWALL DETAIL
SCALE: 1" = 1'-0"



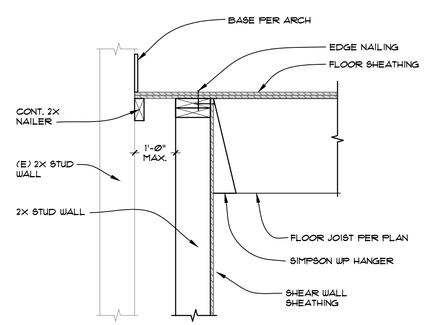
9 FRAMING AT OPENINGS
SCALE: 1/2" = 1'-0"



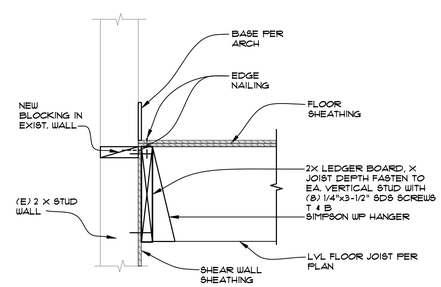
11 TYP. CONTROL JOINT(S)
SCALE: 1" = 1'-0"



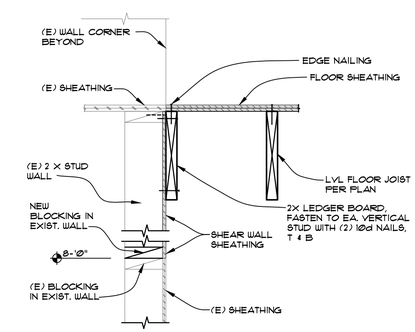
12 TYP. CONC WALK/ LANDING
SCALE: 1" = 1'-0"



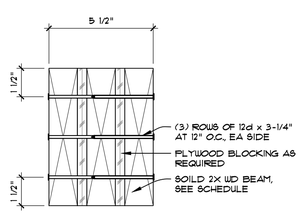
13 JOIST BEARING AT EXTERIOR WALL
SCALE: 1" = 1'-0"



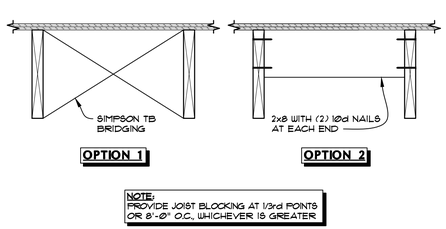
14 FLOOR JOIST TO LEDGER
SCALE: 1" = 1'-0"



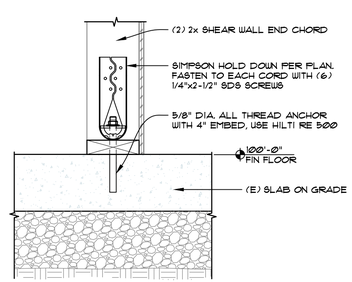
15 TYP. CONTROL JOINT(S)
SCALE: 1" = 1'-0"



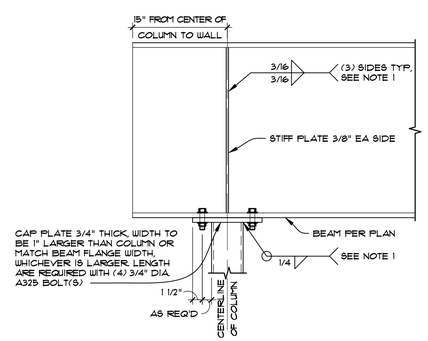
16 BUILT-UP HEADER
SCALE: 3" = 1'-0"



17 JOIST BRIDGING DETAIL
SCALE:



18 SHEAR WALL HOLD DOWN
SCALE: 1-1/2" = 1'-0"



19 BEAM TO COLUMN
SCALE: 1" = 1'-0"

95% CONSTRUCTION DOCUMENTS

LICENSED ARCHITECT
STATE OF IDAHO

REVISIONS

DATE ◇ 01/16/2023
DRAWN ◇ DM, ALS
CHECKED ◇ BLL
CKA PROJ. NO.◇ 22040
ITD FM NO.◇ FM22011

CONSULTANTS ◇

CASTELLAW ◆ KOM ◆ ARCHITECTS
1128 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FM-22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING
STRUCTRUAL DETAILS

SHEET ◇
S2.0

MECHANICAL ABBREVIATIONS

A/C or AC	AIR CONDITIONING	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	KWH	KILOWATT HOUR
AHU	AIR HANDLING UNIT		
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS	LAT	LEAVING AIR TEMPERATURE
		LAV	LAVATORY
BTU	BRITISH THERMAL UNITS	LEED	LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN
BTUH	BTUS PER HOUR	LWT	LEAVING WATER TEMPERATURE
CA	COMBUSTION AIR	MAX	MAXIMUM
CC	COOLING COIL	MCA	MINIMUM CIRCUIT AMPS
CFM	AIR FLOW RATE (CUBIC FEET PER MINUTE)	MOCP	MAXIMUM OVERCURRENT PROTECTION
CHWR	CHILLED WATER RETURN	MIN	MINIMUM
CHWS	CHILLED WATER SUPPLY		
CLG	CEILING	NC	NOISE CRITERIA
CW	COLD WATER	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
		NTS	NOT TO SCALE
DEG or °	DEGREE		
DIA or Ø	DIAMETER	OSA	OUTSIDE AIR
DB	DRY BULB		
		PD	PRESSURE DROP
EA	EXHAUST AIR	PH or Ø	PHASE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
EER	ENERGY EFFICIENCY RATIO		
ESP	EXTERNAL STATIC PRESSURE	RA	RETURN AIR
EWT	ENTERING WATER TEMPERATURE	RPM	REVOLUTIONS PER MINUTE
		RTU	ROOFTOP UNIT
FCO	FLOOR CLEANOUT		
FD	FIRE DAMPER	SA	SUPPLY AIR
FLA	FULL LOAD AMPS	SEER	SEASONAL ENERGY EFFICIENCY RATIO
FLR	FLOOR	SFD	COMBINATION SMOKE/FIRE DAMPER
FPM	FEET PER MINUTE	SP	STATIC PRESSURE
FT	FEET	SYM	SYMBOL
GA	GAUGE	T & P	TEMPERATURE AND PRESSURE
GCO	GRADE CLEANOUT	TEMP	TEMPERATURE
GPM	WATER FLOW RATE (GALLONS PER MINUTE)	TYP	TYPICAL
HC	HEATING COIL	UMC	UNIFORM MECHANICAL CODE
HP	HORSE POWER	UPC	UNIFORM PLUMBING CODE
HVAC	HEATING, VENTILATING, AIR CONDITIONING	URL	URINAL
HW	HOT WATER		
HWR	HOT WATER RETURN	VTR	VENT THROUGH ROOF
HWS	HOT WATER SUPPLY	V	VOLTS
IBC	INTERNATIONAL BUILDING CODE	W/	WITH
IEEC	INTERNATIONAL ENERGY CONSERVATION CODE	WB	WET-BULB
IFC	INTERNATIONAL FIRE CODE	WC	WATER CLOSET
IFGC	INTERNATIONAL FUEL GAS CODE	WCO	WALL CLEANOUT
IMC	INTERNATIONAL MECHANICAL CODE	WH	WATER HEATER
IPC	INTERNATIONAL PLUMBING CODE		

NOTE: THIS IS A STANDARD LIST OF COMMONLY USED MECHANICAL ABBREVIATIONS. SOME OF THE ABBREVIATIONS SHOWN ABOVE MAY NOT BE USED IN THIS DRAWING PACKAGE.

MECHANICAL GENERAL NOTES

1. ALL MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE (IMC) LATEST EDITION, AND ALL LOCAL & STATE CODES.
2. ALL PLUMBING EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST ADOPTED PLUMBING CODE, AND ALL LOCAL & STATE CODES.
3. ALL MECHANICAL AND PLUMBING EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.
4. MECHANICAL CONTRACTORS SHALL RECEIVE PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER BEFORE MAKING CUTS THROUGH ANY STRUCTURAL MEMBER.
5. MECHANICAL CONTRACTORS SHALL COORDINATE INSTALLATION WITH CONSTRUCTION SUPERVISOR AND WITH ALL OTHER TRADES TO AVOID CONFLICTS.
6. THE MECHANICAL CONTRACTORS SHALL VERIFY MOTOR VOLTAGES WITH THE ELECTRICAL DRAWINGS BEFORE ORDERING MOTORIZED EQUIPMENT AND CONTROLS.
7. SEE MECHANICAL SCHEDULE SHEET FOR SCHEDULED CAPACITIES OF ALL MECHANICAL EQUIPMENT AND MATERIALS SPECIFIED.
8. ALL MECHANICAL EQUIPMENT TO BE PROPOSED MUST BE ON THE APPROVED LIST PRIOR TO SUBMITTALS. ALL APPROVED MANUFACTURERS MUST BE CAPABLE OF MEETING THE REQUIREMENTS OF THE SPECIFIED EQUIPMENT.
9. RUNOUT AND HOOKUP SIZES TO INDIVIDUAL PLUMBING FIXTURE CAN BE FOUND ON THE PLUMBING FIXTURE SCHEDULE.
10. PROVIDE REMOTE CEILING ACCESS BALANCE DAMPERS WITH CONCEALED CHROME PLATE COVERS FOR BALANCE DAMPERS LOCATED ABOVE HARD CEILINGS.
11. PAINT ALL VTR'S, FLUES, EXHAUST CAPS, AND OTHER MECHANICAL ITEMS ON THE ROOF TO MATCH THE ROOF COLOR.
12. INSULATED FLEXIBLE DUCTWORK MAY BE USED FOR RUNOUTS TO GRILLES AND DIFFUSERS, IN LENGTHS OF 6'-0" OR LESS.
13. MAINTAIN MINIMUM OF 10'-0" DISTANCE BETWEEN ALL FRESH AIR INTAKES AND EXHAUST OR GAS FLUE DISCHARGES.
14. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL BACKFLOW DEVICES TO BE INSPECTED BY A CERTIFIED BACKFLOW TECHNICIAN BEFORE THE USE OF THE BUILDING POTABLE WATER SYSTEM.
15. LOCATE ACCESS HATCHES SO AS TO PROVIDE OPTIMUM SERVICEABILITY TO EQUIPMENT AND/OR VALVING. SEE ARCHITECTURAL SPECIFICATION FOR TYPE AND COLOR. COORDINATE LOCATION WITH STRUCTURAL & LIGHTING.
16. WHENEVER THERE IS A DISCREPANCY BETWEEN THE RUNOUT DUCT SIZE SHOWN ON THE PLANS AND THAT SHOWN IN THE SCHEDULE, ALWAYS USE THE LARGER OF THE TWO DUCT SIZES.
17. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR VERIFICATION OF EXISTING JOB CONDITIONS PRIOR TO BID. NO ADDITIONAL COST SHALL BE AWARDED TO THE SUCCESSFUL CONTRACTOR (OR THEIR SUBCONTRACTORS) AFTER BIDS HAVE BEEN SUBMITTED AND CONTRACTS AWARDED FOR FAILURE TO VERIFY EXISTING FIELD CONDITIONS. DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION FOR ALTERNATIVE METHODS OF INSTALLATION PRIOR TO THE BIDDING OF THIS PROJECT.
18. UNLESS OTHERWISE NOTED ALL EXISTING MECHANICAL EQUIPMENT, PIPING, ETC, TO BE REMOVED SHALL BE DISPOSED OF BY THE CONTRACTOR UNDER THIS CONTRACT. THE OWNER SHALL RETAIN THE RIGHT TO KEEP ANY REMOVED ITEMS.
19. ALL DOMESTIC COLD AND HOT WATER LINES IN THE AREA OF WORK WHICH ARE NO LONGER IN USE DUE TO THIS PROJECT SHALL BE REMOVED BACK TO THE MAINS AND CAPPED.
20. HOLES IN EXISTING WALL OR FLOORS SHALL BE PATCHED TO MATCH EXISTING WHERE PIPING, DUCTWORK, ETC. WERE REMOVED OR ADDED DURING THIS PROJECT.
21. DAMAGE TO THE EXISTING FACILITY DURING THE CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

MECHANICAL AND PLUMBING DRAWINGS LEGEND

FLEXIBLE DUCTWORK	TRIPLE DUTY VALVE
DUCTWORK	THREE WAY CONTROL VALVE
DUCTWORK BREAK	TWO WAY CONTROL VALVE
DUCTWORK OR PIPING RISE	PRESSURE REDUCING VALVE
CONCENTRIC SQUARE TO ROUND TRANSITION	GATE VALVE
M — MOTORIZED DAMPER	REDUCER
MANUAL VOLUME DAMPER	GLOBE VALVE
AIRFLOW — SPIN-IN FITTING W/ AIR EXTRACTOR AND HAND DAMPER	BALL VALVE
AIRFLOW — HIGH EFFICIENCY FITTING W/ HAND DAMPER	BUTTERFLY VALVE
$ — SWITCH	BALANCE VALVE
T — THERMOSTAT	CHECK VALVE
S — TEMPERATURE SENSOR	FCO — FLOOR CLEANOUT
CO2 — CARBON DIOXIDE SENSOR	WCO — WALL CLEANOUT
SD — DUCT SMOKE DETECTOR	GCO — GRADE CLEANOUT
-- / # — EQUIPMENT CALLOUT	WATER HAMMER ARRESTOR
TURNING VANES	FLOOR DRAIN
INTAKE OR EXHAUST	FLOOR SINK
DIRECTION OF AIRFLOW	GAS PRESSURE REGULATOR W/ GAS COCK
D-X / CFM / X"Ø — SUPPLY DIFFUSER	PRESSURE RELIEF VALVE
R-X / X"Ø — RETURN GRILLE	VENT-THROUGH-ROOF
R-X / CFM / X"Ø — EXHAUST GRILLE	VENT
CEILING EXHAUST FAN	SOIL, WASTE, OR SANITARY SEWER
TEMPERATURE GAUGE	CD — CONDENSATE DRAIN LINE
PRESSURE GAUGE (LIQUID FILLED W/ ISOLATION VALVE)	DOMESTIC COLD WATER (CW)
TS — TEMPERATURE SENSOR (DUCT OR PIPING)	DOMESTIC HOT WATER (HW)
FS — FLOW SWITCH	DOMESTIC HOT WATER RETURN (HWR)
STAINLESS STEEL BRAIDED FLEX CONNECTION	TW — TEMPERED WATER (TW)
ELASTOMETRIC FLEX CONNECTOR	MPG — MEDIUM PRESSURE NATURAL GAS
SUCTION DIFFUSER	G — LOW PRESSURE NATURAL GAS
Y TYPE STRAINER (1 1/2" OR LARGER PROVIDED W/ BLOW DOWN VALVE)	F — FIRE SPRINKLER LINE
FLOW DIRECTION	CWS — CHILLED WATER SUPPLY
DEMOLITION / EQUIPMENT TO BE REMOVED	CWR — CHILLED WATER RETURN
NEW TO EXISTING CONNECTION POINT	HWS — HEATING WATER SUPPLY
(E) EXISTING	HWR — HEATING WATER RETURN
(F) FUTURE	L — LIQUID REFRIGERANT LINE
(N) NEW	S — SUCTION REFRIGERANT LINE
REDUCED PRESSURE BACKFLOW PREVENTER	SLOPE PIPE IN DIRECTION OF ARROW
DOUBLE CHECK BACKFLOW PREVENTER	PIPE ANCHOR
UNION	PIPE GUIDE
AIR VENT	CAP

NOTE: THIS IS A LIST OF COMMONLY USED MECHANICAL AND PLUMBING SYMBOLS. SOME OF THE SYMBOLS SHOWN ABOVE MAY NOT BE USED IN THIS DRAWING PACKAGE.

ENERGY CODE COMPLIANCE

A. COMPLIANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL ENERGY CONSERVATION CODE IS REQUIRED FOR THIS PROJECT. THESE NOTES COVER MANDATORY REQUIREMENTS OF THE CODE. ADDITIONAL REQUIREMENTS ARE NOTED ON THE DRAWINGS AND IN THE SPECIFICATIONS.

B. MINIMUM REQUIREMENTS FOR SUPPLY AND RETURN DUCTWORK INSULATION:

1. R-6: DUCTS LOCATED IN UNCONDITIONED SPACES (SPACE NEITHER HEATED NOR COOLED SUCH AS ABOVE CEILING SPACES, WALL SPACES, DUCT CHASES, SOFFITS, ATTICS, CRAWL SPACES, UNHEATED BASEMENTS, AND UNHEATED GARAGES).
2. R-12: DUCTS LOCATED OUTSIDE OF THE BUILDING'S INSULATION ENVELOPE (SUCH AS ABOVE THE ATTIC INSULATION).

TYPICAL INSULATION THICKNESS REQUIRED TO MEET THESE REQUIREMENTS:

1. DUCT WRAP:
   R-6 = 1-1/2"
   R-12 = 4"
2. DUCT LINER:
   R-6 = 1-1/2"
   R-12 = 3"

C. CONTRACTOR SHALL VERIFY WITH THE MANUFACTURER, THE R-VALUES OF THE ACTUAL INSULATION USED. R-VALUES SHALL BE INSTALLED VALUES.

D. WHERE DUCTS USED FOR COOLING ARE EXTERNALLY INSULATED, THE INSULATION SHALL BE COVERED WITH A VAPOR RETARDER HAVING A MAXIMUM PERMEANCE OF 0.05 PERM OR ALUMINUM FOIL HAVING A MINIMUM THICKNESS OF 2 MILS. INSULATION HAVING A PERMEANCE OF 0.05 PERMS OR LESS SHALL NOT BE REQUIRED TO BE COVERED. ALL JOINTS AND SEAMS SHALL BE SEALED TO MAINTAIN THE CONTINUITY OF THE VAPOR RETARDER.

E. ALL DUCT JOINTS, SEAMS, AND CONNECTIONS SHALL BE FASTENED AND SEALED WITH WELDS, GASKETS, ADHESIVES, MASTIC-PLUS-EMBEDDED-FABRIC SYSTEMS, OR TAPES. TAPES AND MASTICS SHALL BE LISTED AND LABELED PER UL181A OR UL181B. DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCTS. DUCT CONNECTIONS TO FLANGES OR EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED.

F. MINIMUM REQUIREMENTS (THICKNESS) FOR PIPING INSULATION SHALL BE AS FOLLOWS:

FLUID	NOMINAL PIPE DIAMETER		
	1/2" TO < 1 1/2"	1 1/2" TO < 4"	4" AND ABOVE
1. HEATING WATER	1 1/2"	2"	2"
2. CHILLED WATER	1/2"	1"	1"
3. REFRIGERANT	SEE SPECIFICATIONS		

THE ABOVE INSULATION IS BASED ON HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU-INCH/HOUR-FT2-°F.

G. DOMESTIC HOT WATER PIPING SYSTEMS SHALL BE INSULATED WITH 1" INSULATION HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU-INCH/HOUR-FT2-°F.

H. DOMESTIC WATER HEATERS WHICH ARE NOT PROVIDED WITH INTEGRAL HEAT TRAPS AND SERVE NONCIRCULATING SYSTEMS SHALL BE PROVIDED WITH HEAT TRAPS ON THE SUPPLY AND DISCHARGE PIPING AT THE WATER HEATER.

I. DOMESTIC HOT WATER SYSTEMS WITH RECIRCULATION PUMPS OR ELECTRIC HEAT TRACE SHALL BE CONTROLLED WITH 7-DAY TIME CLOCKS.

J. AN OPERATING AND MAINTENANCE MANUAL SHALL BE PROVIDED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY. THE O&M MANUAL SHALL CONTAIN THE FOLLOWING INFORMATION AS A MINIMUM:

1. EQUIPMENT CAPACITY (INPUT & OUTPUT).
2. EQUIPMENT OPERATING AND MAINTENANCE INSTRUCTIONS.
3. CONTROL SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCES.
4. CONTROL SYSTEM SETPOINTS SHALL BE SHOWN ON CONTROL DRAWINGS, AT CONTROL DEVICES, OR IN PROGRAMMING COMMENT ON DDC SYSTEMS.
5. A COMPLETE WRITTEN NARRATIVE ON HOW EACH MECHANICAL SYSTEM IS INTENDED TO OPERATE.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NUMBER 16683 EXPIRES 1/31/2023 STATE OF IDAHO CHRISTOPHER D. TYE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FAC22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL
COVER SHEET

SHEET ◇
M0.0

CONSTRUCTION DOCUMENTS

COMcheck Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: ITD D2 Lab Remodel
Location: Lewiston, Idaho
Climate Zone: 5b
Project Type: Addition

Construction Site: Owner/Agent: Designer/Contractor:

Mechanical Systems List

Quantity System Type & Description

1 HVAC System (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 18 kBtuh,
Proposed Efficiency = 9.50 HSPF, Required Efficiency = 8.20 HSPF
Cooling Mode: Capacity = 19 kBtuh,
Proposed Efficiency = 19.00 SEER, Required Efficiency = 14.00 SEER
Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00

1 AHU-1 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 919 kBtuh
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 629 kBtuh, Air Economizer
No minimum efficiency requirement applies
Fan System: FAN SYSTEM 1 – Compliance (Brake HP and fan efficiency method) : Passes

Fans:
FAN 1 Supply, Multi-Zone VAV, 16400 CFM, 30.0 motor nameplate hp, 26.4 design brake hp (26.4 max. BHP), 90.0 fan efficiency grade, 90.0 total fan efficiency, 90.0 design fan efficiency
Pressure Drop Credits:
Fully ducted return and/or exhaust air systems in laboratories or vivarium systems, 8.5355 credit
Particulate filtration credit: MERV 13 through 15, 3.5730 credit

2 B-1B-2:
Heating: Hot Water Boiler, Capacity 1000 kBtuh, Gas
Proposed Efficiency: 98.36 % Et, Required Efficiency: 80.00 % Et

1 CH-1:
Cooling: Water Chiller, Capacity 50 tons, Condenser Air-Cooled, Standard Centrifugal Chiller
Proposed Efficiency: 10.10 EER-FL, Required Efficiency: 10.10 EER-FL
Proposed Part Load Efficiency: 16.03 EER-IPLV, Required Part Load Efficiency: 13.70 EER-IPLV

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Christopher Dyke, PE — Signature — 11/9/2022
Name - Title — Signature — Date

COMcheck Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2018 IECC

Requirements: 100.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2]^{1}	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and systems installed, equal to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** See plans and specifications.
C406 [PR9]^{1}	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

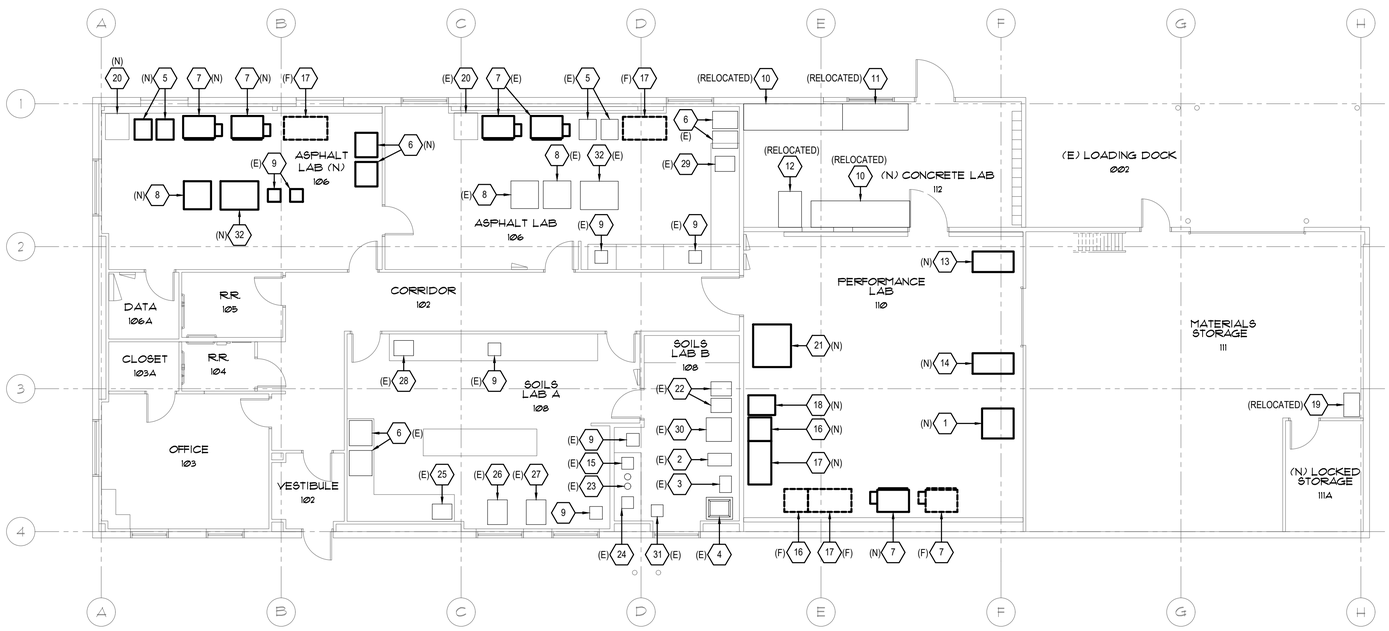
1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.12.2 [FO6]^{1} C403.12.3 [FO9]^{1}	Snowlike melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature and outdoor temperature. future connection to controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6]^{1}	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** See plans and specifications.



LAB EQUIPMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH

OWNER PROVIDED MATERIALS LAB EQUIPMENT LIST:

1. LA ABRASION MACHINE
2. GILSON LARGE AGGREGATE SPLITTER
3. GILSON PORTA SCREEN
4. GILSON TESTING SCREEN
5. NCAT LAB OVEN
6. SHEL LAB CONVECTION OVEN
7. GREIVE LARGE CAPACITY BENCH OVEN
8. PINE GYRATORY COMPACTOR
9. SCALE
10. CONCRETE BATH
11. CYLINDER TABLE
12. CONCRETE GRINDER
13. FORNEY COMPRESSION MACHINE
14. INSTRON COMPRESSION MACHINE
15. SMALL AGGREGATE SPLITTER
16. ROTARY EVAPORATOR
17. INFRATEST EXTRACTOR
18. THERMOFLEX 7500 CHILLER
19. FLAMMABLE STORAGE CABINET
20. WORKING TABLE
21. HAMBURG WHEEL TRACKER
22. MARY ANNE LABORATORY SIFTER
23. SIEVES
24. BRUSHES
25. LAB-LINE MAGNESTIR BATH
26. HOBART MIXER
27. PLOOG COMPACTOR
28. INSTROTEK COREDRY
29. INSTROTEK CORELOK
30. LANCASTER MIXER
31. AGGREGATE BAG
32. HEATED TABLE

GENERAL NOTES:

A. ALL LAB EQUIPMENT TO BE PROVIDED BY OWNER, INSTALLED BY THE CONTRACTOR.

B. FINAL EQUIPMENT LOCATION SHALL BE COORDINATED WITH OWNER PRIOR TO INSTALLATION.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 STATE OF IDAHO CHRISTOPHER D. TUCK 1/11/2023

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

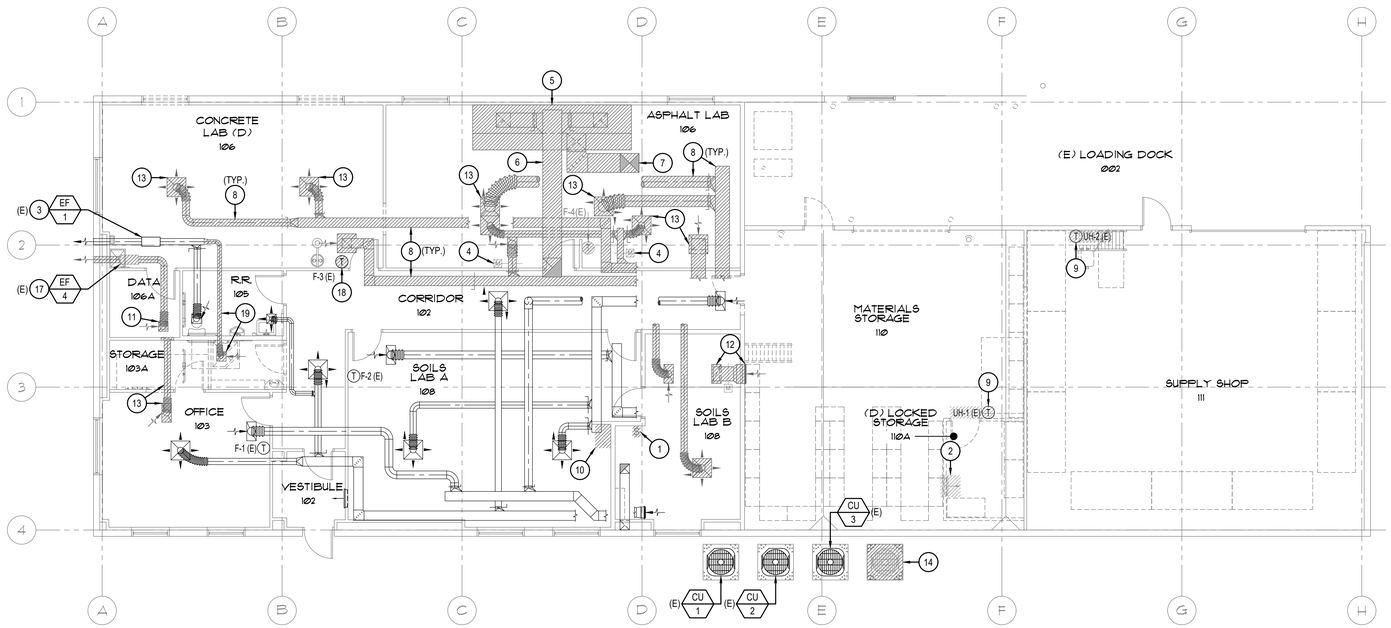
DRAWING ◇
LAB EQUIPMENT LAYOUT

SHEET ◇
M0.2

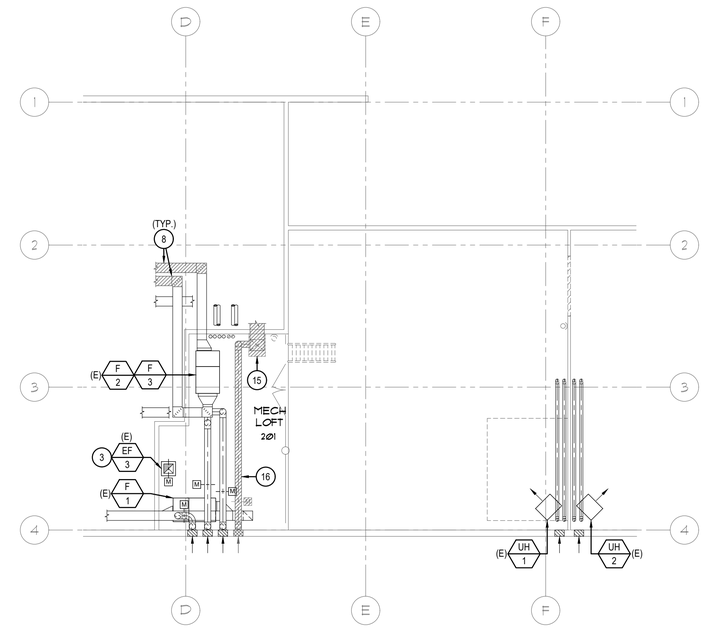
CONSTRUCTION DOCUMENTS

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER
LICENSED
16683
1/11/2023
STATE OF IDAHO
CHRISTOPHER D. TATE



MECHANICAL DEMOLITION FLOOR PLAN
SCALE: 1/8" = 1'-0"
NORTH



MECHANICAL DEMOLITION FLOOR PLAN - MECHANICAL LOFT
SCALE: 1/8" = 1'-0"
NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. REMOVE EXISTING EXHAUST FAN WALL SWITCH. CONDUIT AND WIRING TO REMAIN.
2. REMOVE WALL HEATER, CONTROLS, CONDUIT, AND ALL RELATED ACCESSORIES.
3. EXISTING EXHAUST FAN TO REMAIN.
4. REMOVE MOTORIZED DAMPER.
5. REMOVE EXHAUST HOOD, CONTROLS, AND ALL RELATED ACCESSORIES.
6. REMOVE EXHAUST DUCTWORK. TEMPORARILY COVER AND SEAL ROOF PENETRATION. SEE NEW WORK ON SHEET M2.1 FOR FOR CONTINUATION.
7. REMOVE SUPPLY DUCTWORK BACK TO ROOF. COVER, SEAL, PATCH, AND REPAIR ROOF OPENING.
8. REMOVE DUCTWORK. (TYPICAL)
9. DISCONNECT AND RELOCATE EXISTING THERMOSTAT. SEE SHEET M2.0 FOR CONTINUATION.
10. FLAMMABLE STORAGE CABINET TO BE RELOCATED. SEE SHEET M2.0 FOR CONTINUATION.
11. REMOVE EXHAUST DUCTWORK AND GRILLE. PATCH, REPAIR, AND PAINT CEILING TO MATCH EXISTING.
12. REMOVE WALL GRILLE, DUCTWORK, MOTORIZED DAMPER, AND CEILING GRILLE. PATCH/REPAIR WALL TO MATCH EXISTING.
13. REMOVE EXISTING DIFFUSER AND ASSOCIATED DUCTWORK.
14. DISCONNECT AND REMOVE OUTDOOR CONDENSING UNIT, CONTROLS, REFRIGERANT PIPING, AND ALL OTHER RELATED COMPONENTS. CONTRACTOR TO CONFIRM WHICH OUTDOOR UNIT IS ASSOCIATED WITH INDOOR UNIT BEING REMOVED PRIOR TO ANY WORK BEING DONE. EQUIPMENT TO BE RETURNED TO OWNER.
15. REMOVE EXISTING AIR HANDLING UNIT (AH-4), DUCTWORK CONNECTIONS, CONTROLS, REFRIGERANT LINES, AND ALL OTHER ASSOCIATED COMPONENTS. SEAL WALL AND FLOOR OPENINGS. EQUIPMENT TO BE RETURNED TO OWNER.
16. REMOVE MOTORIZED DAMPER AND OUTSIDE AIR DUCTWORK BACK TO WALL. EXISTING WALL PENETRATION TO BE REUSED. SEE SHEET M2.0 FOR CONTINUATION.
17. DISCONNECT AND REMOVE EXISTING EXHAUST FAN, CONTROLS, WIRING, AND ALL RELATED ACCESSORIES. EXISTING EXTERIOR WALL LOUVER TO REMAIN. CONTRACTOR SHALL INSULATE, PATCH, AND REPAIR WALL OPENING ON THE INSIDE OF THE BUILDING.
18. EXISTING THERMOSTAT TO BE RELOCATED. SEE SHEET M2.0 FOR CONTINUATION.
19. BID ALTERNATE #1: EXISTING EXHAUST DUCT AND GRILLE TO BE REMOVED BACK TO INDICATED POINT.

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

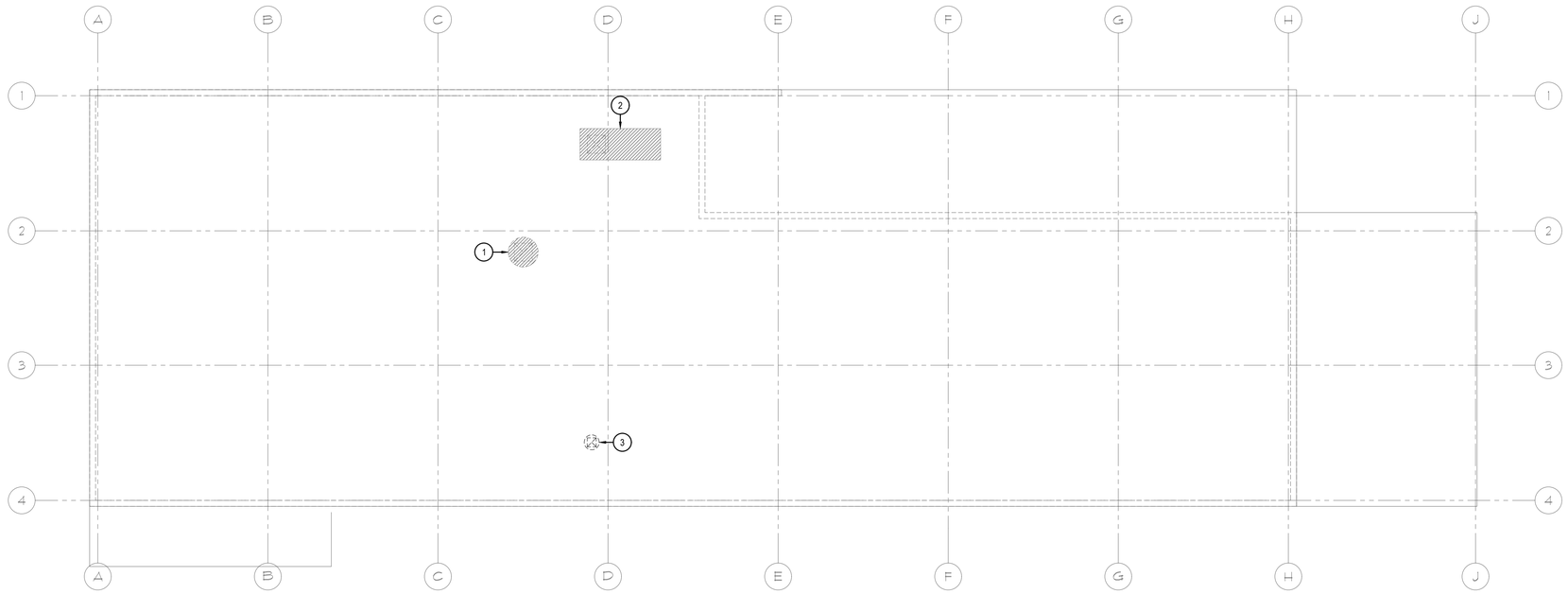
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL DEMOLITION FLOOR PLAN

SHEET ◇
M1.0

CONSTRUCTION DOCUMENTS



MECHANICAL DEMOLITION ROOF PLAN

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. REMOVE EXISTING EXHAUST FAN, CONTROLS, AND ALL RELATED ACCESSORIES. EXISTING CURB TO BE REUSED. TEMPORARILY SEAL AND COVER ROOF OPENING UNTIL NEW WORK IS COMPLETE. SEE SHEET M2.2 FOR CONTINUATION.
2. REMOVE EXISTING MAKEUP AIR UNIT, CURB, CONTROLS, AND ALL RELATED ACCESSORIES. PATCH, REPAIR, AND SEAL ROOF OPENING.
3. EXISTING EXHAUST FAN ROOF CAP TO REMAIN.

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com

Project No. 20-227

PROFESSIONAL ENGINEER
LICENSED
16683
1/11/2023
STATE OF IDAHO
CHRISTOPHER D. TATE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

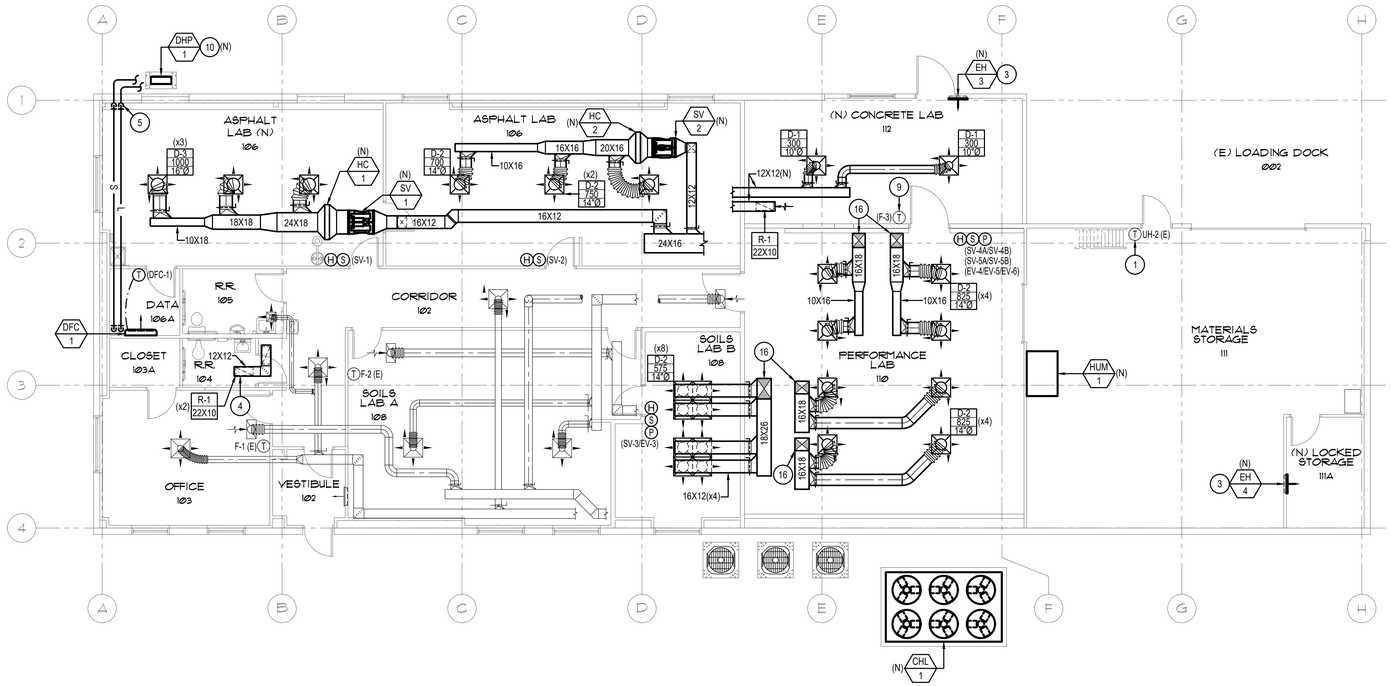
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL
DEMOLITION
ROOF PLAN

SHEET ◇
M1.1

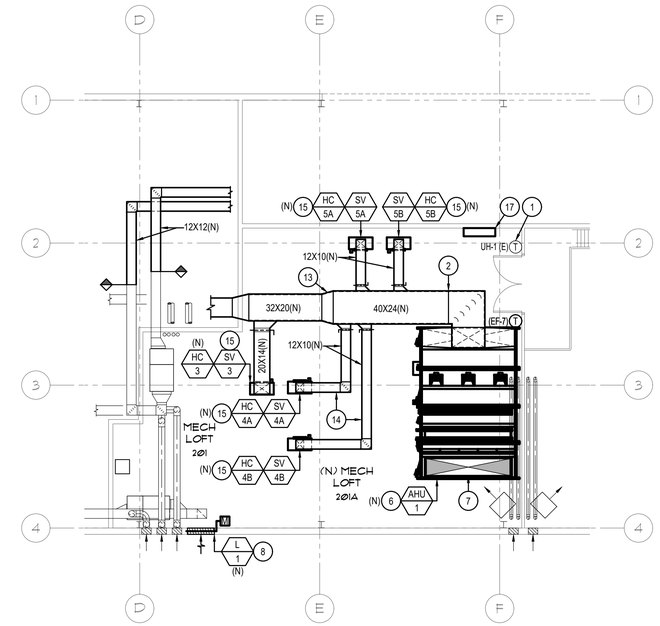
CONSTRUCTION DOCUMENTS



HVAC NEW WORK FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH



MECHANICAL NEW WORK FLOOR PLAN - MECHANICAL LOFT

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. RELOCATED UNIT HEATER THERMOSTAT.
2. INTERNALLY INSULATE SUPPLY DUCTWORK. ROUTE TIGHT TO BOTTOM OF STRUCTURE.
3. RECESSED ELECTRIC HEATER MOUNTED 24" A.F.F.
4. BID ALTERNATE #1: PROVIDE 12"X4" TRANSFER DUCT AND GRILLES. SEE DETAIL #3 ON SHEET M4.4 FOR INSTALLATION REQUIREMENTS.
5. ROUTE REFRIGERANT LINES DOWN INSIDE OF NEW WALL AND OUT BUILDING LOW TO CONDENSING UNIT. SEAL WALL PENETRATION. SEE REFRIGERANT SUPPORT DETAIL #4 ON SHEET M4.3 FOR INSTALLATION REQUIREMENTS.
6. INSTALL AIR HANDLING UNIT BETWEEN JOISTS WITH FLOOR ISOLATORS ON 4" CONCRETE PAD.
7. ROUTE 108"X22" FRESH AIR DUCT TO ROOF. TRANSITION TO 60"X54" OPENING AND CONNECT TO PENTHOUSE. SEAL ROOF PENETRATION.
8. INSTALL MOTORIZED LOUVER ADJACENT TO EXISTING LOUVERS.
9. RELOCATED FAN COIL THERMOSTAT.
10. INSTALL OUTDOOR HEAT PUMP UNIT ON 4" CONCRETE PAD.
11. ROUTE 16"X18" DUCT THROUGH FLOOR TO CEILING SPACE BELOW. AVOID WIDE FLANGED BEAM AND PURLINS.
12. ROUTE 18"X26" DUCT THROUGH FLOOR TO CEILING SPACE BELOW. AVOID WIDE FLANGED BEAM AND PURLINS.
13. TRANSITION DUCTWORK AND ROUTE UNDER EXISTING CEILING BEAM. MAINTAIN A MINIMUM HEAD HEIGHT OF 7'-3" UNDER DUCTWORK.
14. ROUTE 12"X10" DUCTWORK UNDER EXISTING CEILING ROOF BEAM. MAINTAIN A MINIMUM HEAD HEIGHT OF 7'-3" UNDER DUCTWORK. ALSO MAINTAIN AIR HANDLER CLEARANCE REQUIREMENTS.
15. ROUTE SUPPLY DUCT DOWN AND TRANSITION TO AIR VALVE INLET. CONNECT TO AIR VALVE PER DETAIL #2 ON SHEET M4.4
16. ROUTE SUPPLY DUCTWORK UP THROUGH CEILING JOISTS.
17. DDC CONTROL PANEL.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com

Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TYE

REVISIONS

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CONSULTANTS ◇

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

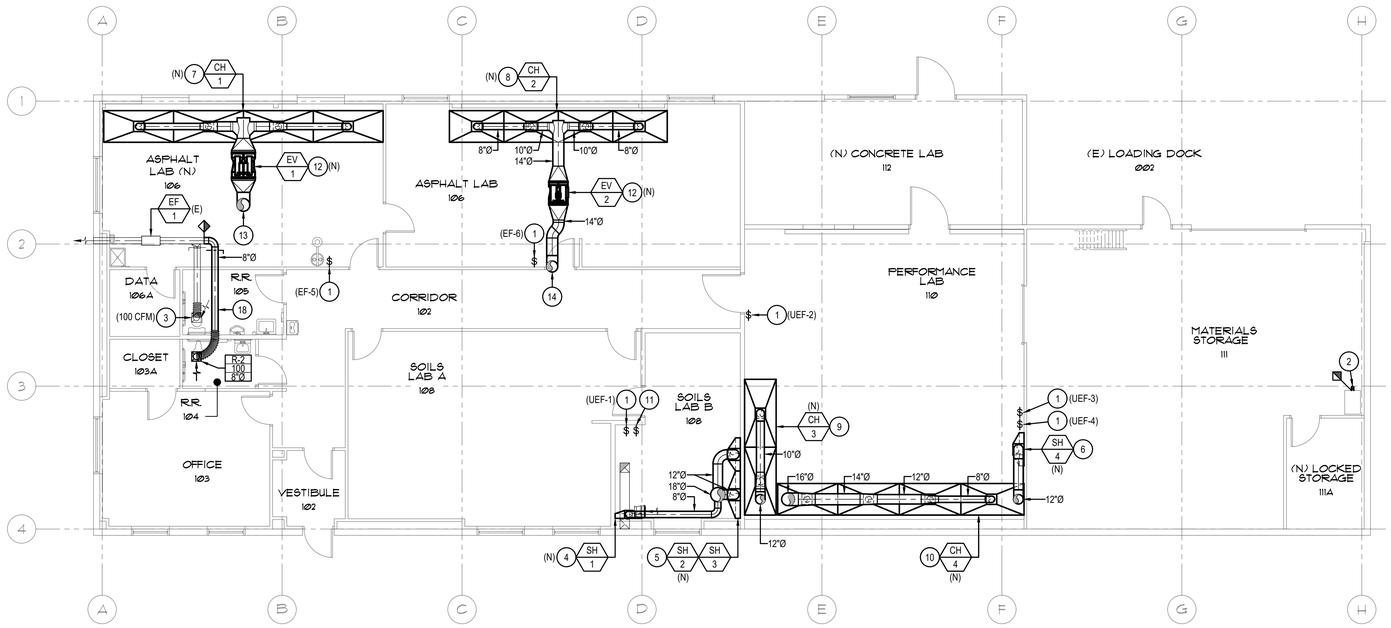
DRAWING ◇
HVAC NEW WORK
FLOOR PLAN

SHEET ◇
M2.0

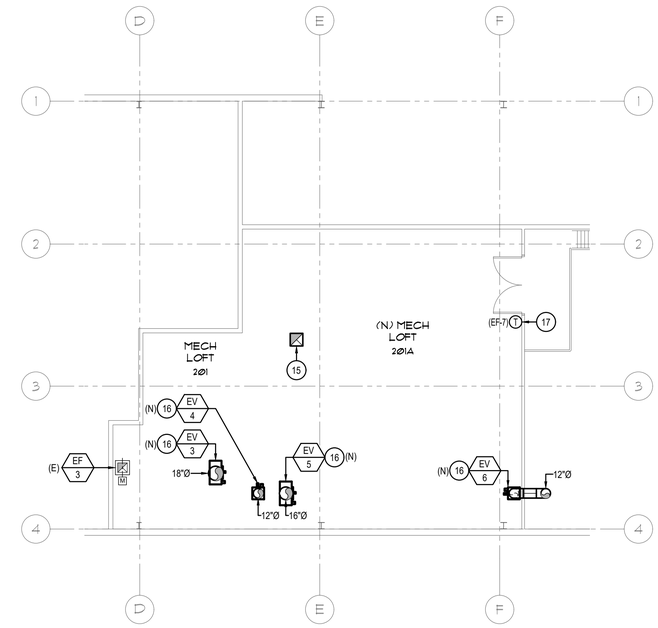
CONSTRUCTION DOCUMENTS

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER
LICENSED
16683
1/11/2023
STATE OF IDAHO
CHRISTOPHER D. TATE



EXHAUST NEW WORK FLOOR PLAN
SCALE: 1/8" = 1'-0"
NORTH



EXHAUST NEW WORK FLOOR PLAN - MECHANICAL LOFT
SCALE: 1/8" = 1'-0"
NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. NEW WALL SWITCH WITH PILOT LIGHT.
2. PROVIDE NEW 3"Ø SCHEDULE 80 STEEL VENT FROM CHEMICAL STORAGE CABINET TO ROOF. PROVIDE TURNED DOWN NECK WITH STAINLESS STEEL INSECT SCREEN. SEAL AROUND ROOF PENETRATION.
3. BID ALTERNATE #1: REBALANCE EXHAUST GRILLE TO INDICATED AIRFLOW.
4. SEE SLOT HOOD DETAIL #4 ON SHEET M4.4 FOR INSTALLATION REQUIREMENTS.
5. SEE SLOT HOOD DETAIL #5 ON SHEET M4.4 FOR INSTALLATION REQUIREMENTS
6. SEE SLOT HOOD DETAIL #6 ON SHEET M4.4 FOR INSTALLATION REQUIREMENTS
7. SEE CANOPY HOOD DETAIL #1 ON SHEET M4.3 FOR INSTALLATION REQUIREMENTS.
8. SEE CANOPY HOOD DETAIL #3 ON SHEET M4.3 FOR INSTALLATION REQUIREMENTS.
9. SEE CANOPY HOOD DETAIL #2 ON SHEET M4.3 FOR INSTALLATION REQUIREMENTS
10. SEE CANOPY HOOD DETAIL #1 ON SHEET M4.4 FOR INSTALLATION REQUIREMENTS.
11. REPLACE EXISTING SWITCH CONTROLLING EXISTING EXHAUST FAN (EF-3) WITH A NEW SWITCH WITH PILOT LIGHT.
12. NEW EXHAUST VALVE INSTALLED ABOVE CEILING.
13. ROUTE NEW 16"Ø EXHAUST DUCT THROUGH NEW ROOF PENETRATION TO NEW EXHAUST FAN (EF-1). SEAL AROUND PENETRATION AS REQUIRED. SEE SHEET M2.2 FOR CONTINUATION.
14. ROUTE NEW 14"Ø EXHAUST DUCT THROUGH EXISTING ROOF PENETRATION TO NEW EXHAUST FAN (EF-2). SEAL AROUND PENETRATION AS REQUIRED. SEE SHEET M2.2 FOR CONTINUATION.
15. EXTEND A FULL SIZE DUCT FROM ROOF MOUNTED EXHAUST FAN THROUGH CEILING. TERMINATE THE DUCT WITH AN EXPANDED METAL SCREEN WITH A 1" FRAME. PAINT THE EXPANDED METAL AND ALL VISIBLE DUCTWORK THE SAME COLOR. COORDINATE FINAL COLOR SELECTION WITH ARCHITECT.
16. ROUTE EXHAUST DUCTWORK THROUGH NEW ROOF PENETRATION. SEE SHEET M2.2 FOR CONTINUATION.
17. MOUNT NEW EXHAUST FAN SENSOR NEXT TO RELOCATED TEMPERATURE SENSOR. SEE SHEET M2.0 FOR COORDINATION.
18. BID ALTERNATE #1: ROUTE AND EXTEND NEW 8"Ø EXHAUST DUCT TO NEW RESTROOM. CONNECT TO EXISTING DUCTWORK AS REQUIRED.

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

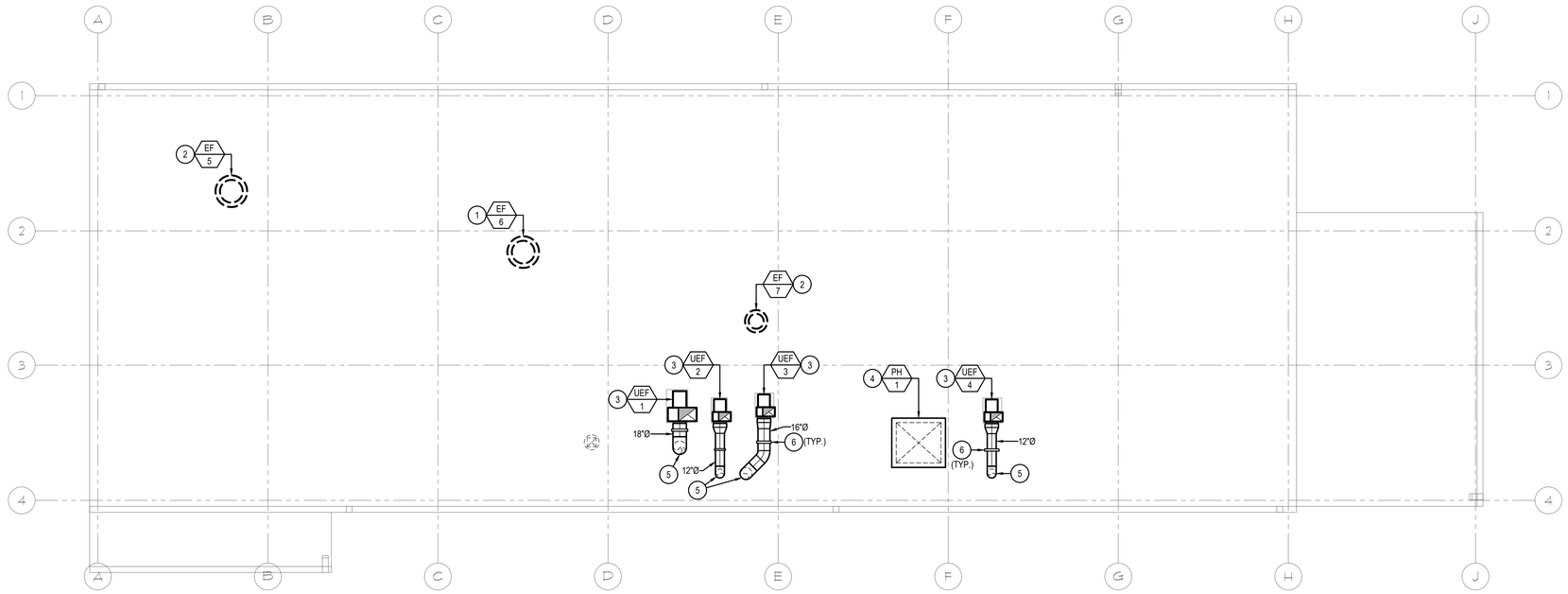
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
EXHAUST NEW
WORK FLOOR PLAN

SHEET ◇
M2.1

CONSTRUCTION DOCUMENTS



MECHANICAL NEW WORK ROOF PLAN

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. INSTALL NEW UPBLAST EXHAUST FAN ON EXISTING CURB. MODIFY EXISTING CURB AS REQUIRED TO ACCOMMODATE NEW FAN.
2. NEW UPBLAST EXHAUST FAN. INSTALL SLOPED ROOF CURB PER DETAIL #5 ON SHEET M4.0.
3. SEE UTILITY EXHAUST FAN INSTALLATION DETAIL #1 & #2 ON SHEET M4.1.
4. INSTALL PENTHOUSE PER MANUFACTURER GUIDELINES. SEAL ROOF PENETRATION.
5. ROUTE ROUND EXHAUST DUCT THROUGH ROOF. SEE SHEET M2.1 FOR CONTINUATION. SEAL AROUND ROOF PENETRATION.
6. SUPPORT DUCTWORK PER DETAIL #3 ON SHEET M4.1. (TYPICAL)

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER
LICENSED
16683
1/11/2023
STATE OF IDAHO
CHRISTOPHER D. TATE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

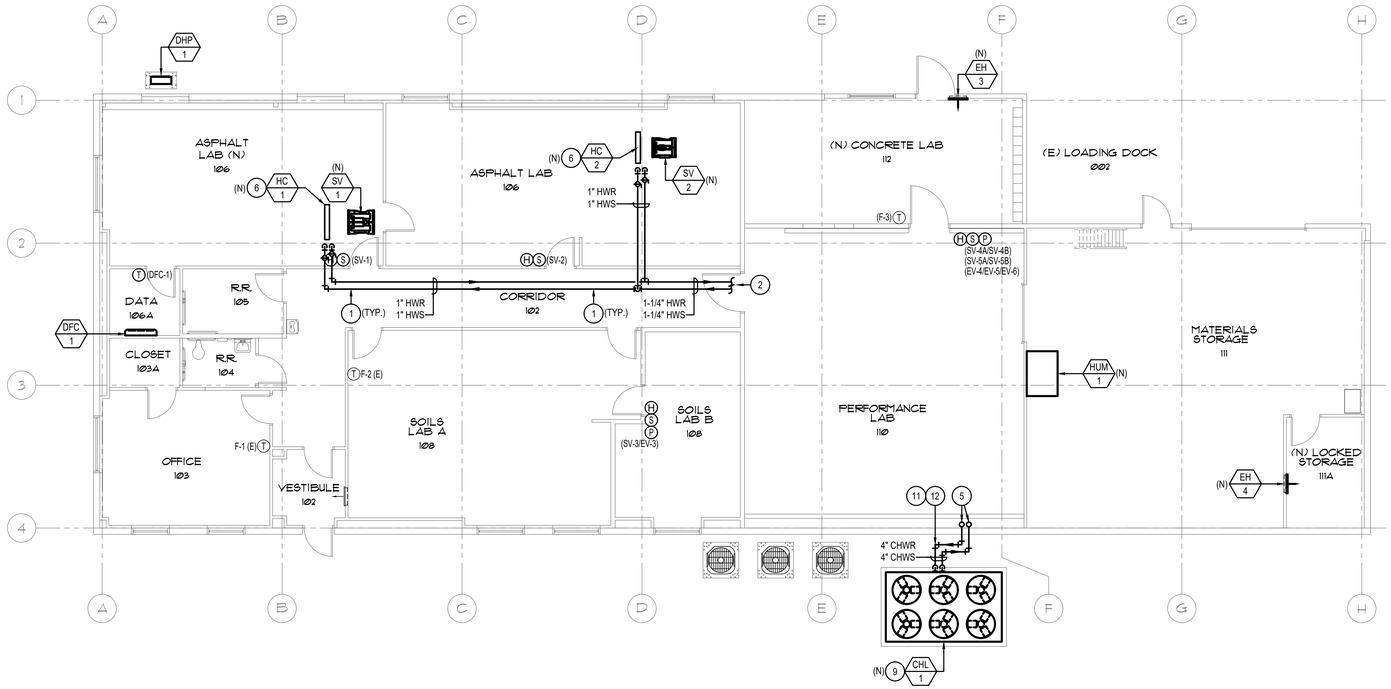
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FAC22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL NEW
WORK ROOF PLAN

SHEET ◇
M2.2

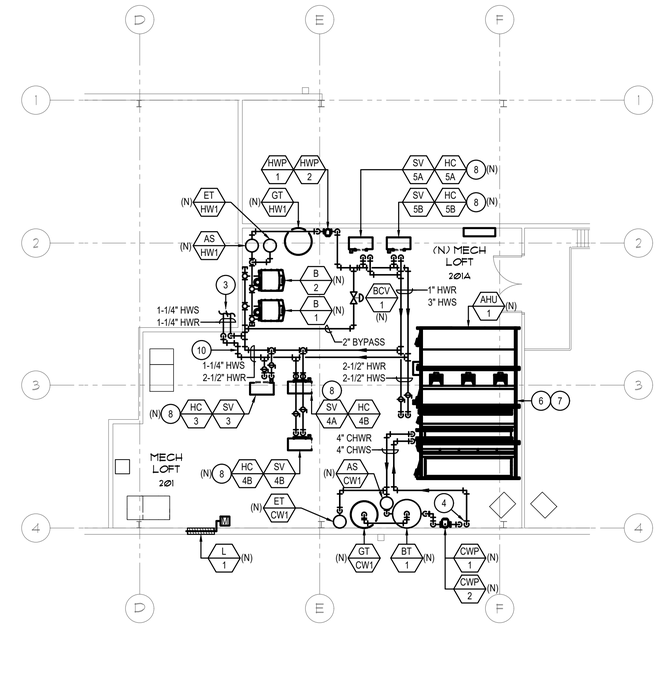
CONSTRUCTION DOCUMENTS



HYDRONIC NEW WORK FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH



HYDRONIC NEW WORK FLOOR PLAN - MECHANICAL LOFT

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. ROUTE PIPING ABOVE CEILING. AVOID EXISTING DUCTWORK AND OTHER EQUIPMENT.
2. SEE MECHANICAL LOFT HYDRONIC FLOOR PLAN FOR CONTINUATION.
3. SEE HYDRONIC NEW WORK FLOOR PLAN FOR CONTINUATION.
4. ROUTE 4"Ø CHWR & CHWS PIPING DOWN THROUGH FLOOR. SEE PIPE SLEEVE DETAIL #6 ON SHEET M4.0.
5. ROUTE 4"Ø CHWR & CHWS PIPING FROM FLOOR ABOVE TO OUTSIDE OF BUILDING. SEAL WALL PENETRATION.
6. SEE HOT WATER COIL PIPING DETAIL #4 ON SHEET M4.1.
7. SEE CHILLED WATER COIL PIPING DETAIL #5 ON SHEET M4.1.
8. SEE SEE VERTICAL AIR VALVE AND HOT WATER COIL PIPING DETAIL #2 ON SHEET M4.4.
9. INSTALL NEW CHILLER ON 6" CONCRETE PAD. MAINTAIN ALL MANUFACTURER CLEARANCE REQUIREMENTS FOR NEW CHILLER.
10. APPROXIMATE LOCATION FOR PRESSURE TRANSDUCER. FINAL LOCATION TO BE COORDINATED WITH CONTROL AND BALANCE CONTRACTOR.
11. COVER EXTERIOR CHILLED WATER PIPE WITH WEATHER-PROOF ALUMINUM ALLOY JACKET PER THE SPECIFICATIONS 230100.
12. SUPPORT EXTERIOR CHILLED WATER PIPE PER DETAIL #7 ON SHEET M4.2.

GENERAL NOTES:

A. SEE HOT WATER PIPING SCHEMATIC #1 ON SHEET M4.5 FOR ADDITIONAL REQUIREMENTS.

B. SEE CHILLED WATER PIPING SCHEMATIC #2 ON SHEET M4.5 FOR ADDITIONAL REQUIREMENTS.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 STATE OF IDAHO CHRISTOPHER D. TAYLOR 1/11/2023

REVISIONS

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CONSULTANTS ◇

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

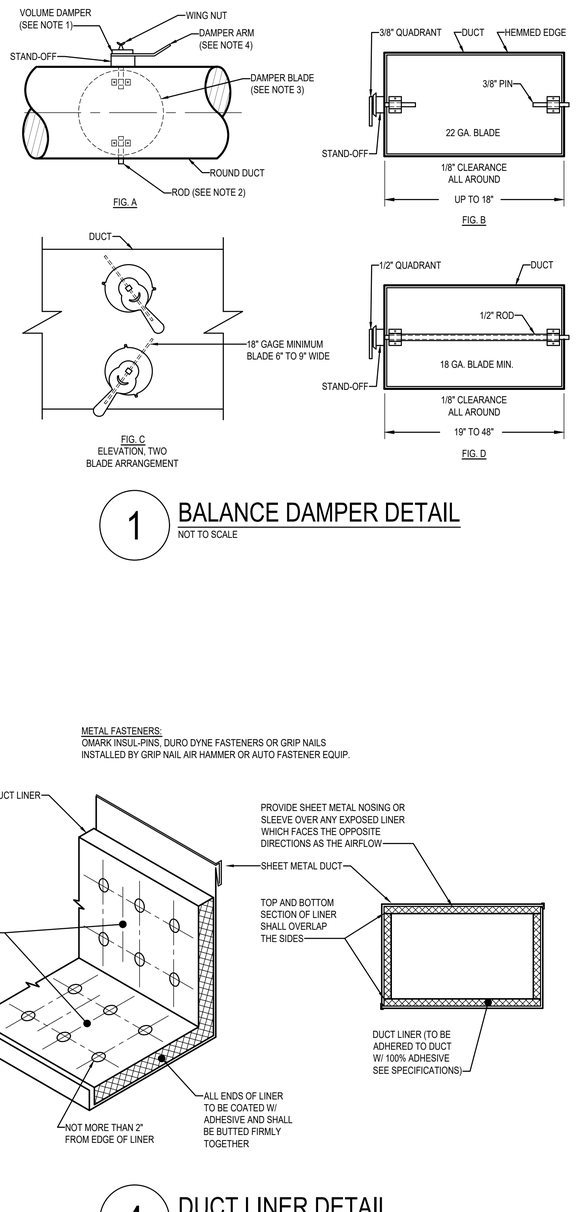
PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
HYDRONIC NEW WORK FLOOR PLAN

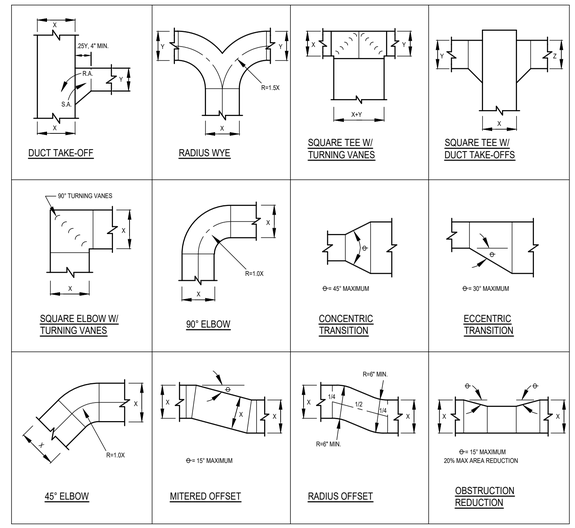
SHEET ◇
M3.0

CONSTRUCTION DOCUMENTS

NOTES:
1. FOR TAKE-OFFS LARGER THAN 12" DIAMETER, USE A FACTORY MANUFACTURED DAMPER. LOUVERS & DAMPERS, INC. MODEL CD-600 WITH A LOCKING HAND QUADRANT OR EQUAL.
2. ROD CONTINUOUS ON 2" W.G. CLASS AND ON ALL DAMPERS OVER 12" DIAMETER.
3. BLADE 22 GAGE MIN., BUT NOT LESS THAN TWO GAGES MORE THAN THE DUCT GAGE.
4. PROVIDE REMOTE CEILING OPERATOR WHERE DAMPER IS INACCESSIBLE.
5. FOR DUCTS OVER 12" HIGH USE MULTIPLE BLADE DAMPERS (SEE FIG. C).
6. ALTERNATE MANUFACTURERS INCLUDE: AMERICAN WARMING, SAFE-AIR/DOWCO, J&J, LOUVERS & DAMPERS, RUSKIN, NAILOR, ARROW UNITED, POTTORFF, & CESCO.
7. PROVIDE STAND-OFF FOR DAMPER ARMS LOCATED W/EXTERNAL INSULATION.

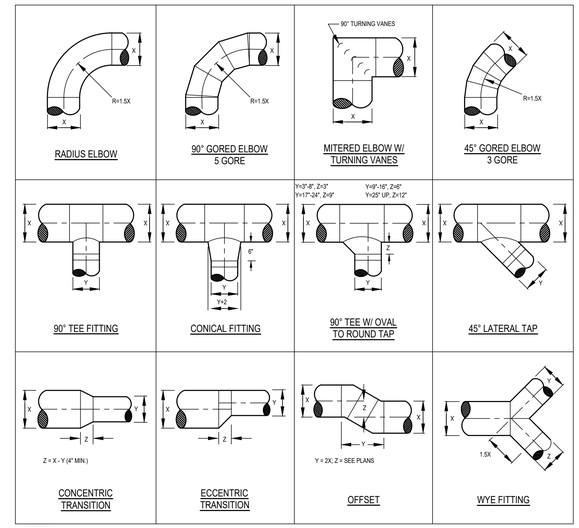


1 BALANCE DAMPER DETAIL
NOT TO SCALE



NOTE:
1. ALL DUCTWORK TRANSITIONS SHALL BE CONSTRUCTED AND INSTALLED TO SMACNA, SPECIFICATIONS AND THE ABOVE NOTED STANDARDS. ANY DEVIATIONS SHALL BE COORDINATED WITH THE ENGINEER.

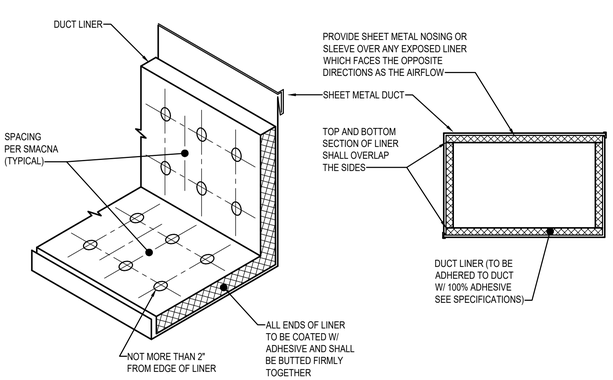
2 RECTANGULAR DUCT FITTING DETAILS
NOT TO SCALE



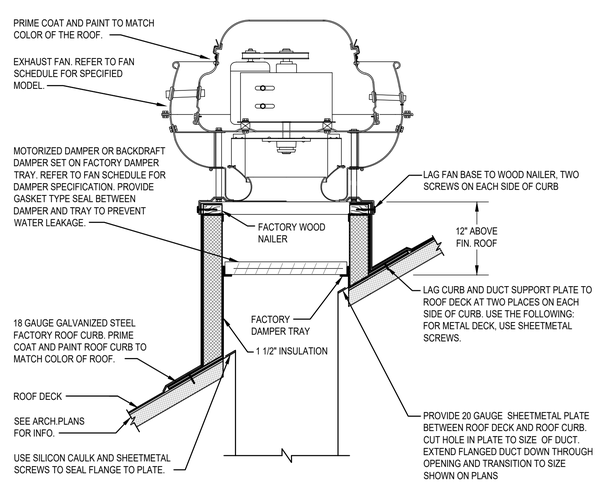
NOTE:
1. ALL DUCTWORK TRANSITIONS SHALL BE CONSTRUCTED AND INSTALLED TO SMACNA, SPECIFICATIONS, AND THE ABOVE NOTED STANDARDS. ANY DEVIATIONS SHALL BE COORDINATED WITH THE ENGINEER.

3 ROUND DUCT FITTING DETAILS
NOT TO SCALE

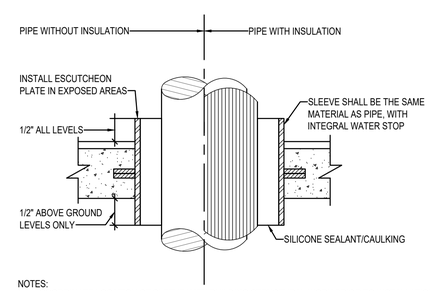
METAL FASTENERS:
OMARK INSUL-PINS, DURO DYNE FASTENERS OR GRIP NAILS INSTALLED BY GRIP NAIL AIR HAMMER OR AUTO FASTENER EQUIP.



4 DUCT LINER DETAIL
NOT TO SCALE



5 EXHAUST FAN MOUNTING DETAIL
NOT TO SCALE



NOTES:
1. COORDINATE LOCATION OF SLEEVE WITH BUILDING STRUCTURAL WORK PRIOR TO INSTALLATION.
2. COORDINATE LOCATION OF SLEEVE FOR UNDERGROUND PIPE WITH BUILDING STRUCTURAL FOOTING PRIOR TO INSTALLATION.
3. SILICONE SEALANT SHALL MEET FIRE RATING PER MECHANICAL AND ARCHITECTURAL SPECIFICATIONS.
4. USE LINK SEAL ASSEMBLY FOR PIPING PASSING THROUGH SLAB-ON-GRADE OR PERIMETER WALLS.
5. REFER TO SPECIFICATIONS FOR BELOW GRADE PIPING WRAP. DO NOT BURY WITH CONCRETE. PROVIDE SLEEVE TO 1/2" A.F.F. AS SHOWN HERE.

6 POURED IN PLACE FLOOR PIPE SLEEVE DETAIL
NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 STATE OF IDAHO CHRISTOPHER D. TEE 1/11/2023

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

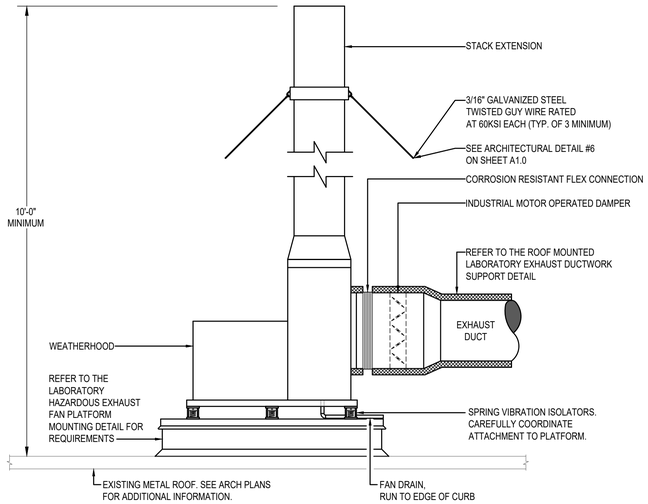
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

CONSTRUCTION DOCUMENTS

PROJECT ◇
ITD # FH22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

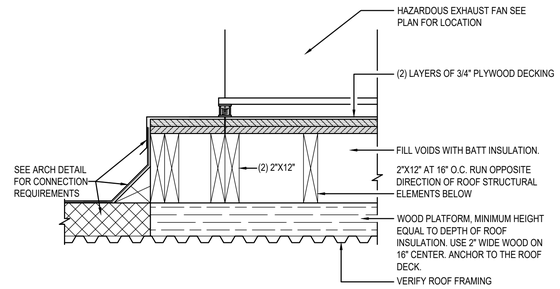
DRAWING ◇
MECHANICAL DETAILS

SHEET ◇
M4.0



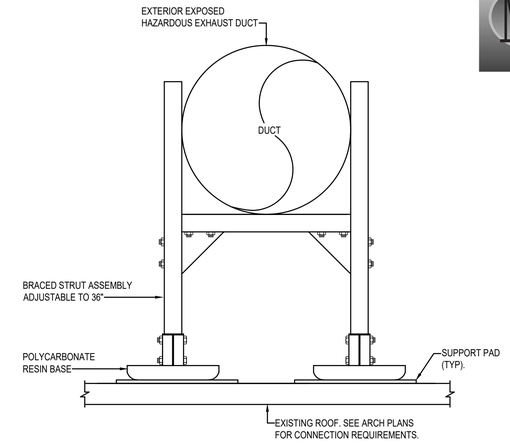
1 UTILITY SET LABORATORY EXHAUST FAN DETAIL

NOT TO SCALE



2 UTILITY SET LABORATORY EXHAUST FAN PLATFORM DETAIL

NOT TO SCALE

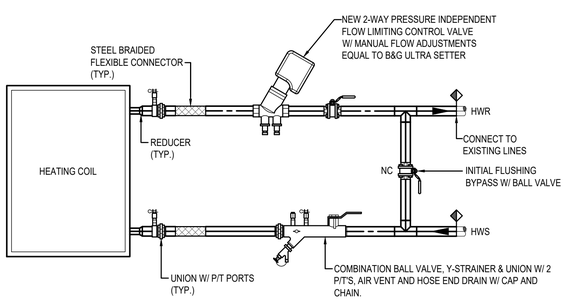


NOTES:

1. ROOF SUPPORT SYSTEM BASED ON MIRO INDUSTRIES, INC.
2. ALL METAL PRODUCTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
3. DUCT SUPPORTS SHALL BE SPACED BASE ON THE MANUFACTURER'S RECOMMENDATIONS.

3 ROOF MOUNTED EXHAUST DUCTWORK SUPPORT DETAIL

NOT TO SCALE

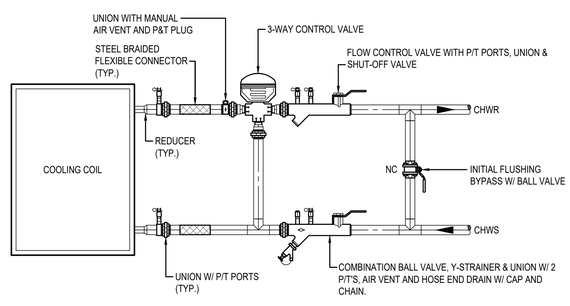


NOTES:

1. ALL COMPONENTS SHOWN SHALL BE EQUAL TO AUTOFLOW FLOW DESIGN, INC.
2. INSTALL ALL AIR VENTS, STRAINERS, CONTROL VALVES, BALL VALVES, ETC. IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.

4 HEATING COIL PIPING DETAIL

NOT TO SCALE

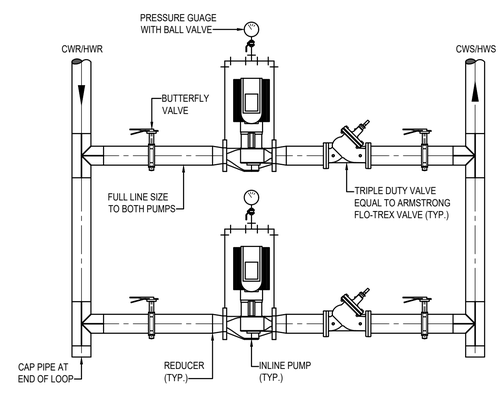


NOTES:

1. ALL COMPONENTS SHOWN SHALL BE EQUAL TO AUTOFLOW FLOW DESIGN, INC.
2. INSTALL ALL AIR VENTS, STRAINERS, CONTROL VALVES, BALL VALVES, ETC. IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.

5 COOLING COIL PIPING DETAIL

NOT TO SCALE



6 INLINE PUMP DETAIL

NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇ ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇ MECHANICAL DETAILS

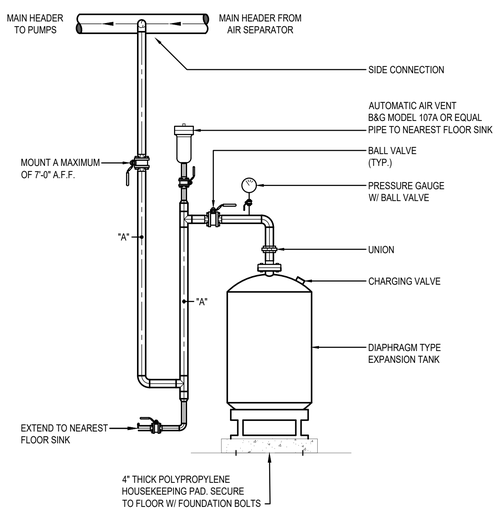
SHEET ◇ M4.1

CONSTRUCTION DOCUMENTS

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER
LICENSE
16683
1/11/2023
STATE OF IDAHO
CHRISTOPHER D. TATE

WESSELS MODEL NO.	PIPE SIZE "A"
NLAP 40, 60	3/4"
NLAP 100, 150	1"
NLAP 220	1-1/2"



NOTES:

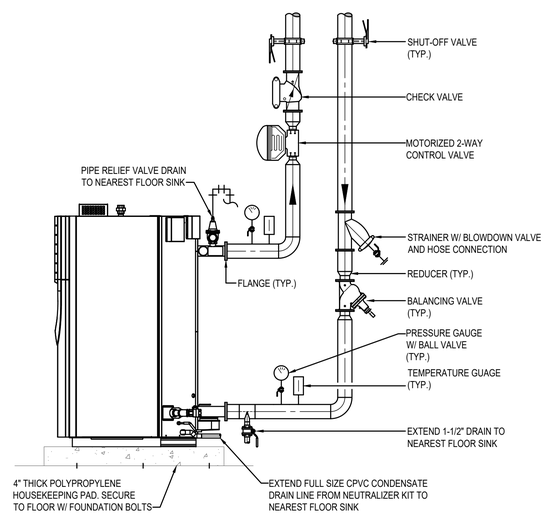
1. INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
2. INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR VIEWING PURPOSES.

1 FLOOR MOUNTED EXPANSION TANK DETAIL

NOT TO SCALE

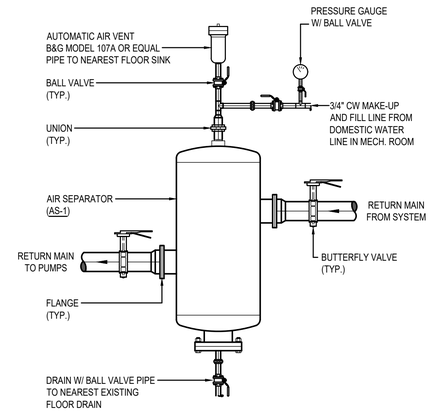
NOTES:

1. PIPING SHALL BE SUPPORTED INDEPENDENTLY FROM THE CONNECTIONS TO THE BOILER.
2. INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
3. INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE / VIEWING PURPOSES.
4. ALL BUTTERFLY VALVES MOUNTED HIGHER THAN ABOVE 7'-0" A.F.F SHALL BE PROVIDED W/ A CHAIN WHEEL AND GUIDES.



2 BOILER PIPING DETAIL

NOT TO SCALE

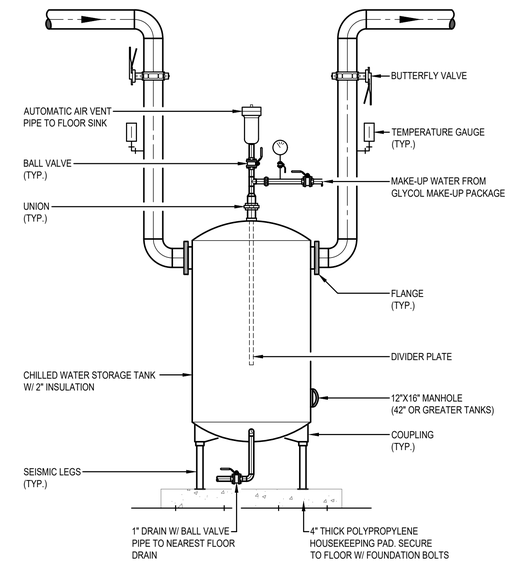


NOTES:

1. INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
2. INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE / VIEWING PURPOSES.
3. ALL BUTTERFLY VALVES MOUNTED HIGHER THAN ABOVE 7'-0" A.F.F SHALL BE PROVIDED W/ A CHAIN WHEEL AND GUIDES.

3 AIR SEPARATOR PIPING DETAIL

NOT TO SCALE



NOTES:

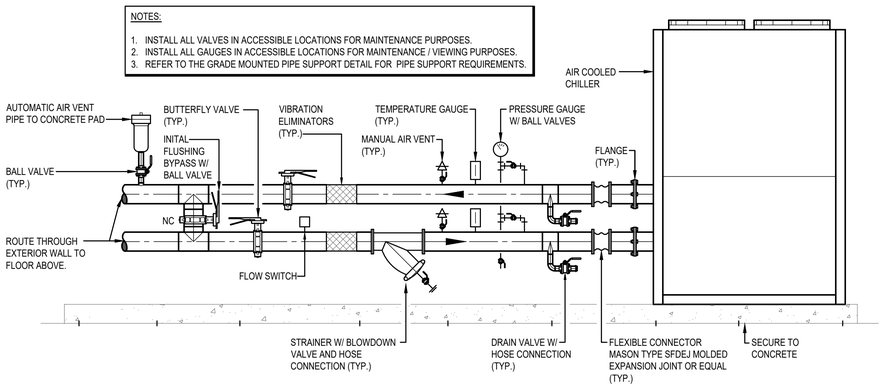
1. INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
2. INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE / VIEWING PURPOSES.
3. ALL BUTTERFLY VALVES MOUNTED HIGHER THAN ABOVE 7'-0" A.F.F SHALL BE PROVIDED W/ A CHAIN WHEEL AND GUIDES.

4 CHILLED WATER BUFFER TANK DETAIL

NOT TO SCALE

NOTES:

1. INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
2. INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE / VIEWING PURPOSES.
3. REFER TO THE GRADE MOUNTED PIPE SUPPORT DETAIL FOR PIPE SUPPORT REQUIREMENTS.

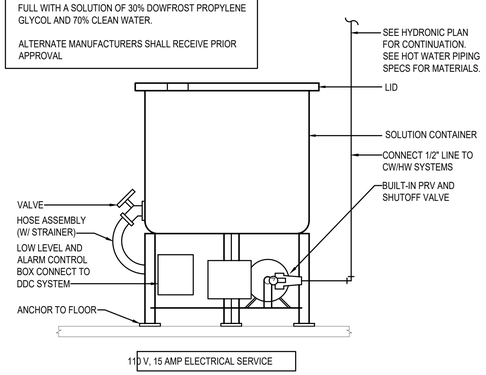


5 AIR COOLED CHILLER PIPING DETAIL

NOT TO SCALE

MANUFACTURER:
WESSELS GLYCOL MAKE-UP PACKAGE MODEL GMP-13050, PACKAGE SHALL BE PROVIDED WITH PUMP (1.8 GPM @ 50 PSI - 1/3 HP MOTOR - 110 VOLT, SINGLE PHASE), MAGNETIC STARTER, PRESSURE TANK WITH A PRESSURE CONTROL, PRIMING VALVE, PRV, SHUT-OFF VALVE AND PRESSURE GAUGE. PRESET SYSTEM TO 12 PSI AT SYSTEM CONNECTION. TANK SHALL BE FILLED FULL WITH A SOLUTION OF 30% DOWFROST PROPYLENE GLYCOL AND 70% CLEAN WATER.

ALTERNATE MANUFACTURERS SHALL RECEIVE PRIOR APPROVAL

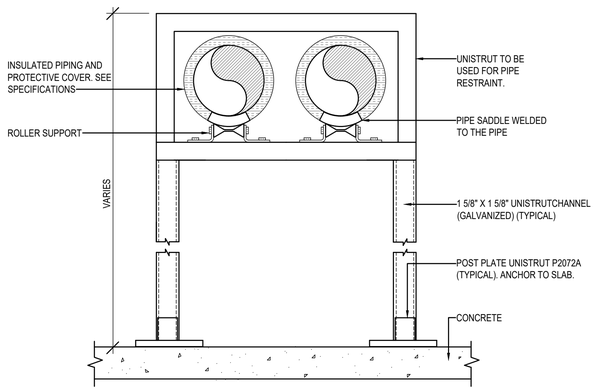


7 GLYCOL MAKEUP PACKAGE PIPING DETAIL

NOT TO SCALE

NOTE:

1. PROVIDE EXTERIOR RAISED PIPING SUPPORTS ON 8'-0" CENTERS, AT ALL ELBOWS, AND DIRECTLY AFTER ALL RISES. EQUIPMENT CONNECTIONS SHALL NOT SUPPORT ANY PIPING WEIGHT.



7 EXTERIOR PIPE SUPPORT DETAIL

NOT TO SCALE

CONSTRUCTION DOCUMENTS

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

REVISIONS

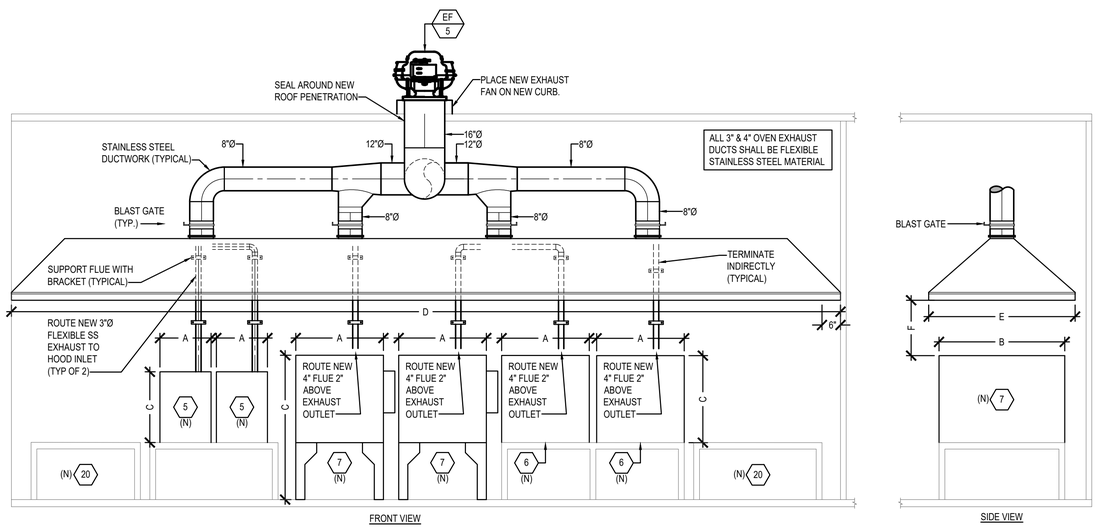
CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

PROJECT ◇ ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

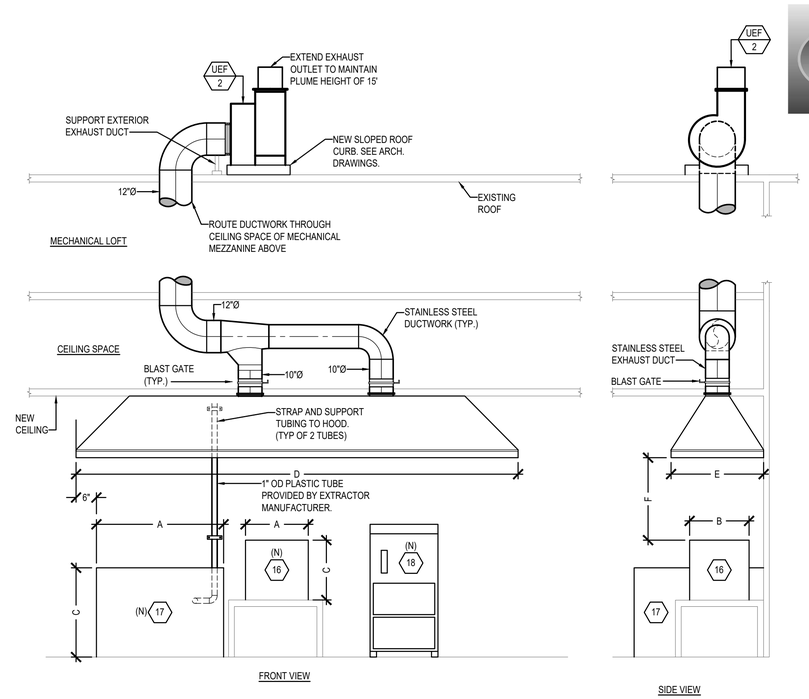
DRAWING ◇ MECHANICAL DETAILS

SHEET ◇ M4.2



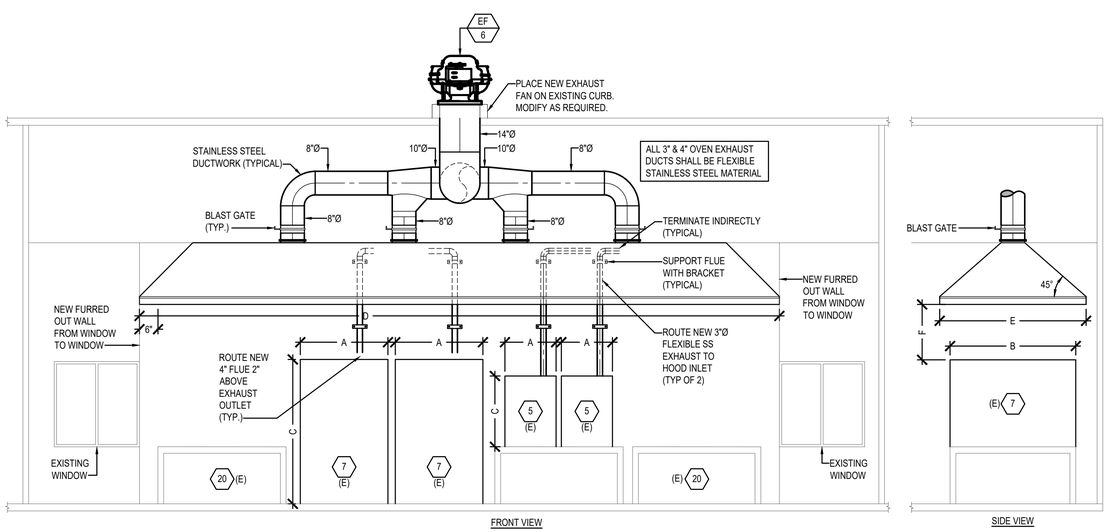
1 CANOPY HOOD DETAIL

(CH-1)



2 CANOPY HOOD DETAIL

(CH-3)

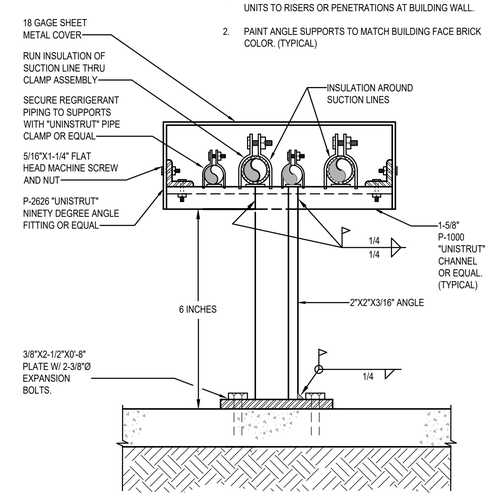


3 CANOPY HOOD DETAIL

(CH-2)

NOTES:

1. RUN STEEL GUTTER CONTINUOUS FROM CONDENSING UNITS TO RISERS OR PENETRATIONS AT BUILDING WALL.
2. PAINT ANGLE SUPPORTS TO MATCH BUILDING FACE BRICK COLOR. (TYPICAL)



4 EXTERIOR REFRIGERANT PIPE SUPPORT

NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

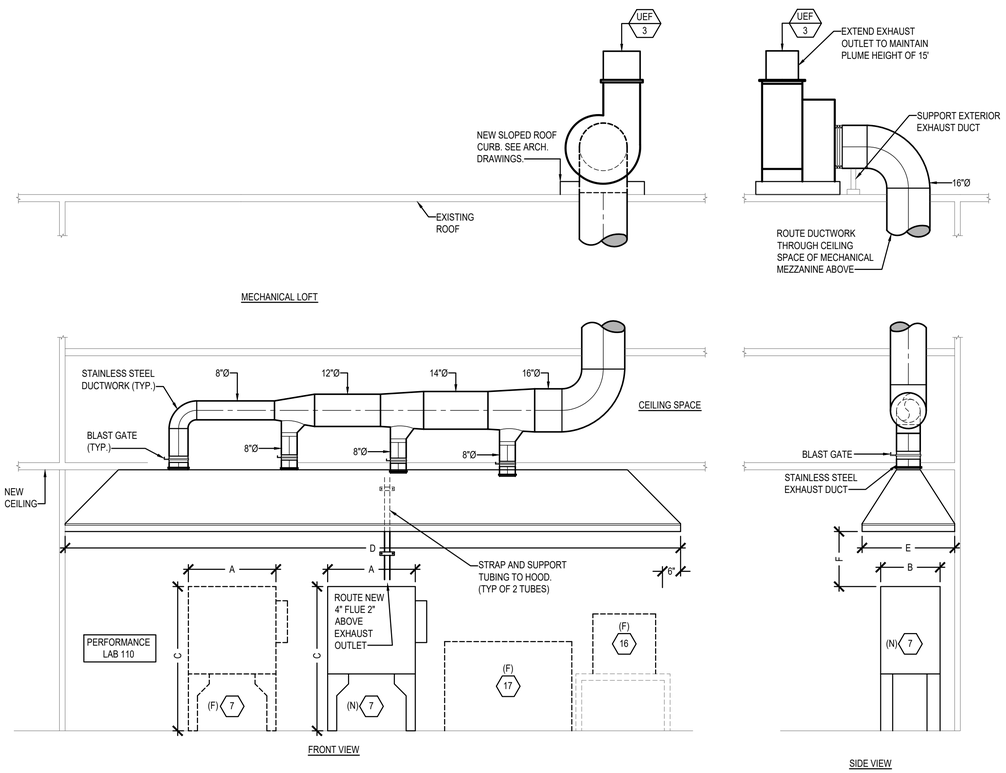
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

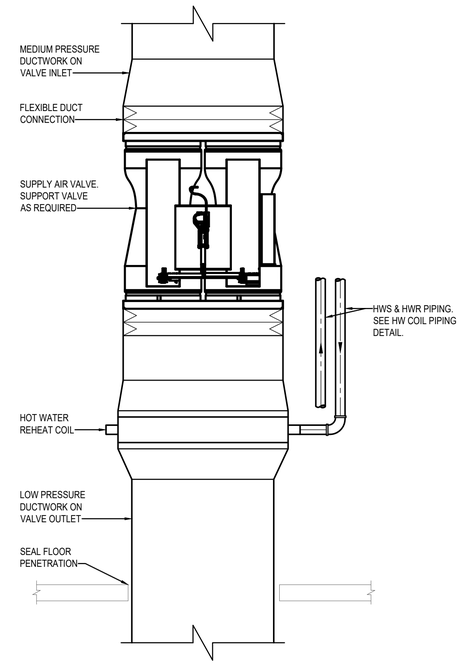
DRAWING ◇
MECHANICAL DETAILS

SHEET ◇
M4.3

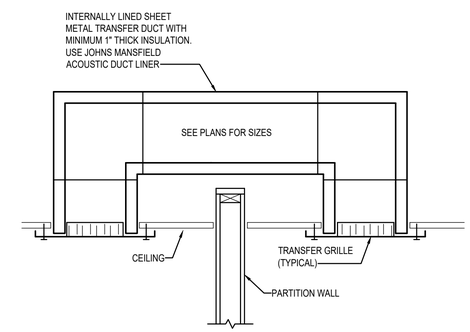
CONSTRUCTION DOCUMENTS



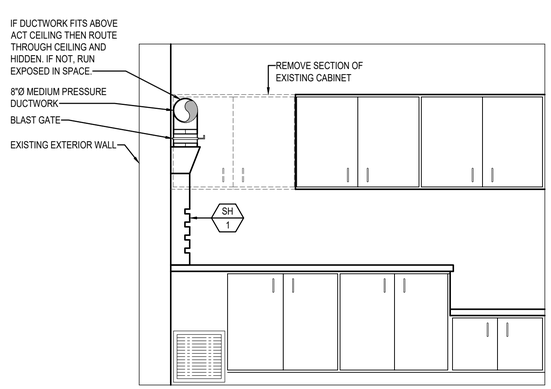
1 CANOPY HOOD DETAIL
(CH-4)



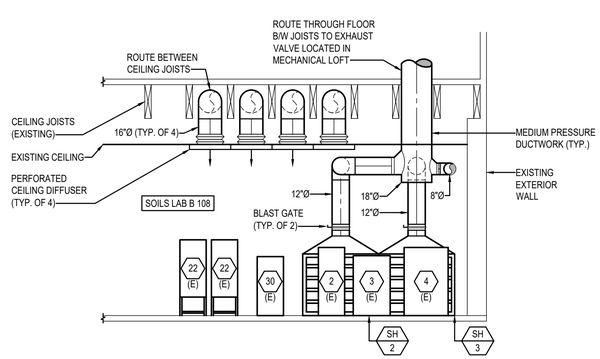
2 VERTICAL AIR VALVE AND REHEAT COIL DETAIL
NOT TO SCALE



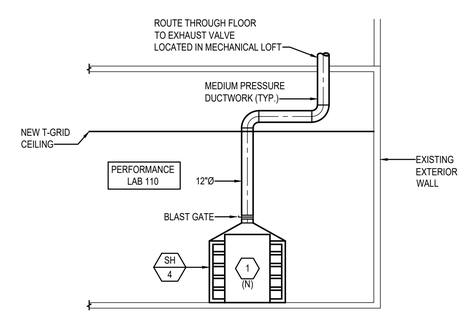
3 TRANSFER DUCT DETAIL
NOT TO SCALE



4 SLOT HOOD & EXHAUST FAN DETAIL
(SH-1)



5 SLOT HOOD & EXHAUST FAN DETAIL
(SH-2, SH-3, & UEF-1)



6 SLOT HOOD & EXHAUST FAN DETAIL
(SH-4, & UEF-4)

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 STATE OF IDAHO CHRISTOPHER D. TATE 1/11/2023

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

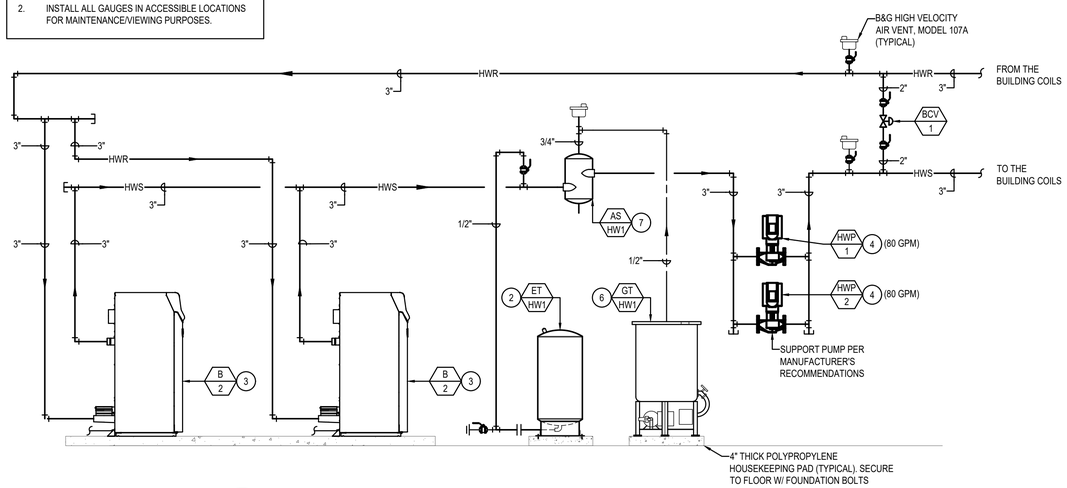
PROJECT ◇
ITD # FM22011
DAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD., LEWISTON, ID 83501

DRAWING ◇
MECHANICAL DETAILS

SHEET ◇
M4.4

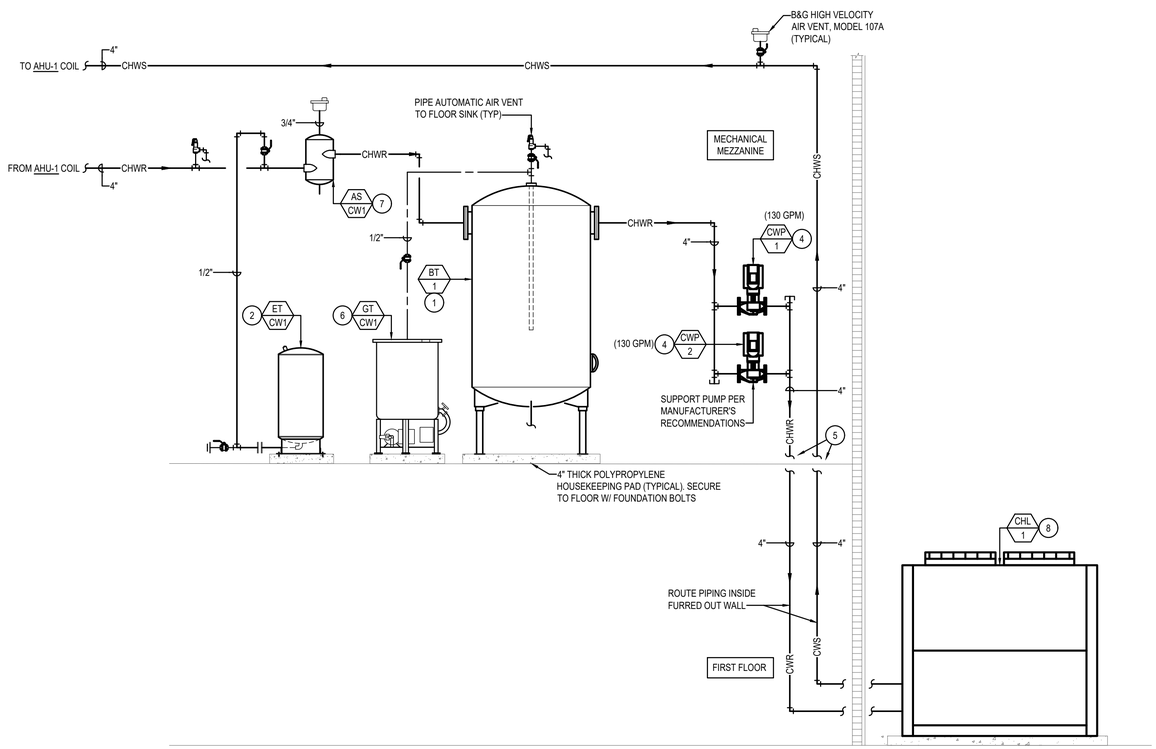
CONSTRUCTION DOCUMENTS

1. INSTALL ALL VALVES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE PURPOSES.
2. INSTALL ALL GAUGES IN ACCESSIBLE LOCATIONS FOR MAINTENANCE/VIEWING PURPOSES.



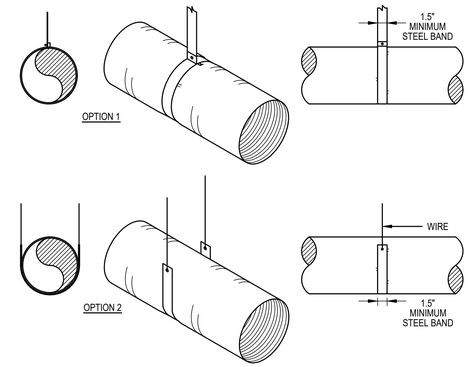
1 HOT WATER SYSTEM PIPING SCHEMATIC

NOT TO SCALE



2 CHILLED WATER SYSTEM PIPING SCHEMATIC

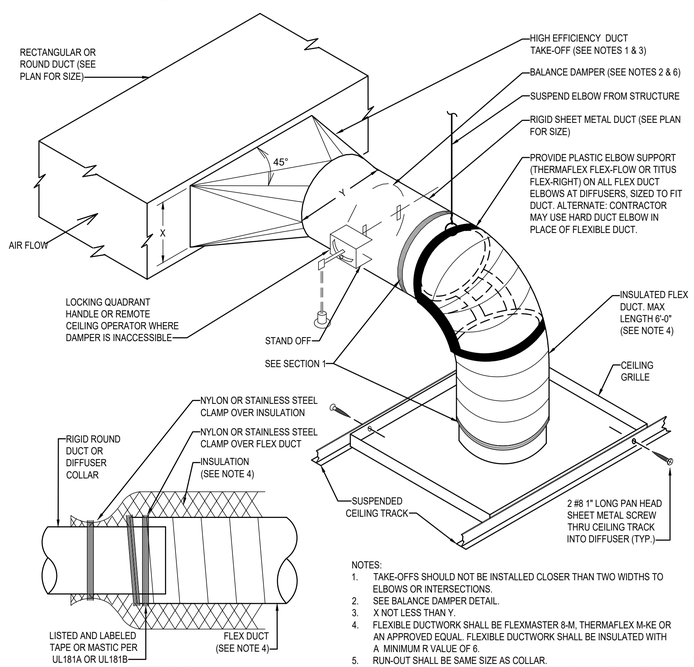
NOT TO SCALE



NOTES:
1. SUPPORT SYSTEM SHALL NOT DAMAGE, CRIMP, OR INHIBIT DUCT FREE AREA IN ANY WAY.
2. FLEXIBLE DUCT MUST NOT EXCEED 6'-0" FROM CONNECTION TO TERMINATION.
3. MAXIMUM LENGTH BETWEEN SUPPORTS MUST NOT EXCEED 3'-0" ON CENTER.
4. ATTACH BANDS OR WIRES TO SUPPORT STRUCTURE ABOVE.
5. FLEXIBLE DUCTWORK SHALL BE FLEXMASTER 1-M OR APPROVED EQUAL.
6. FLEXIBLE DUCTWORK SHALL BE INSULATED WITH A MINIMUM R-VALUE OF 5.0.
7. FLEXIBLE DUCTWORK IS FOR INDOOR USE ONLY. DO NOT INSTALL OR STORE PRODUCT WHERE EXPOSURE TO DIRECT SUNLIGHT CAN OCCUR. PROLONGED EXPOSURE TO SUNLIGHT MAY CAUSE DETERIORATION OF VAPOR BARRIER.
8. TERMINAL DEVICES SHALL BE SUPPORTED INDEPENDENTLY OF THE FLEXIBLE DUCTWORK.
9. REPAIR TURN OR DAMAGED VAPOR BARRIER/JACKET WITH DUCT TAPE LISTED AND LABELED TO UL 181B. IF INTERNAL CORE IS PENETRATED, REPLACE FLEXIBLE DUCTWORK.
10. AVOID BENDING DUCT ACROSS SHARP CORNERS OR INCIDENTAL CONTACT WITH METAL FIXTURES, PIPES, OR CONDUITS.
11. FLEXIBLE DUCTWORK SHALL NOT BE INSTALLED WITHIN 4 INCHES OF HOT EQUIPMENT (FURNACES, BOILERS, STEAM PIPES, ETC.) THAT IS ABOVE 250°F.
12. FLEXIBLE DUCTWORK SHALL NOT BE INSTALLED IN CONCRETE, BURIED BELOW GRADE, OR IN CONTACT WITH THE GROUND.
13. DO NOT INSTALL FLEXIBLE DUCTWORK IN EXPOSED CEILING AREA.

3 FLEXIBLE DUCT SUPPORT

NOT TO SCALE



NOTES:
1. TAKE-OFFS SHOULD NOT BE INSTALLED CLOSER THAN TWO WIDTHS TO ELBOWS OR INTERSECTIONS.
2. SEE BALANCE DAMPER DETAIL.
3. X NOT LESS THAN Y.
4. FLEXIBLE DUCTWORK SHALL BE FLEXMASTER 8-M, THERMAFLEX M-KE OR AN APPROVED EQUAL. FLEXIBLE DUCTWORK SHALL BE INSULATED WITH A MINIMUM R VALUE OF 6.
5. RUN-OUT SHALL BE SAME SIZE AS COLLAR.
6. REFERENCE HVAC PLANS FOR REQUIRED BALANCE DAMPER LOCATIONS.

4 HIGH EFFICIENCY TAKE-OFF DETAIL

NOT TO SCALE

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. SEE CHILLED WATER BUFFER TANK PIPING DETAIL #4 ON SHEET M4.2.
2. SEE FLOOR MOUNTED EXPANSION TANK PIPING DETAIL #1 ON SHEET M4.2.
3. SEE BOILER PIPING DETAIL #2 ON SHEET M4.2.
4. SEE INLINE MOUNTED PUMP PIPING DETAIL #6 ON SHEET M4.1.
5. SEE PIPE SLEEVE DETAIL #6 ON SHEET M4.0.
6. SEE GLYCOL TANK PIPING DETAIL #7 ON SHEET M4.2.
7. SEE AIR SEPARATOR DETAIL #3 ON SHEET M4.2.
8. SEE AIR-COOLED CHILLER DETAIL #5 ON SHEET M4.2

GENERAL NOTES:

A. CHILLED WATER AND HOT WATER LOOPS SHALL BE FLUSHED PRIOR TO OPERATION. SEE SPECIFICATIONS SECTION 230100 FOR MORE INFORMATION.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

CONSTRUCTION DOCUMENTS

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL DETAILS

SHEET ◇
M4.5

EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	UNIT TYPE	BLOWER				ELECTRICAL		MAXIMUM SONES/dBA	OPERATING WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
			CFM	ESP	MAXIMUM RPM	DRIVE	HP/W	V/Ø				
EF-5	ASPHALT LAB (N)	ROOF MOUNTED UPBLAST	3,200	1.0	1,725	DIRECT	1.5-HP	460/3	32 SONES	150	COOK MODEL ACRUD 150R17D	1 , 3 , 7
EF-6	ASPHALT LAB (E)	ROOF MOUNTED UPBLAST	2,400	1.0	1,725	DIRECT	1.0-HP	460/3	22 SONES	150	COOK MODEL ACRUD 150R17D	1 , 3 , 8
EF-7	MECH LOFT 201	ROOF MOUNTED UPBLAST	1,500	0.25	1,725	DIRECT	0.5-HP	115/1	11.6 SONES	100	COOK MODEL ACRUD 135R15D	1 , 2 , 6
UEF-1	SOILS LAB B 108	LAB EXHAUST UTILITY FAN	4,800	3.0	1,725	BELT	5.0-HP	460/3	82 DBA	800	COOK MODEL 165 CPS	1 , 3 , 4
UEF-2	PERFORMANCE LAB	LAB EXHAUST UTILITY FAN	2,200	1.5	1,725	BELT	1.5-HP	460/3	77 DBA	600	COOK MODEL 120 CPS	1 , 3 , 4
UEF-3	PERFORMANCE LAB	LAB EXHAUST UTILITY FAN	3,200	1.75	3,450	BELT	3.0-HP	460/3	80 DBA	700	COOK MODEL 135 CPS	1 , 3 , 4
UEF-4	PERFORMANCE LAB	LAB EXHAUST UTILITY FAN	1,800	1.75	1,725	BELT	1.0-HP	208/3	73 DBA	600	COOK MODEL 120 CPS	1 , 4 , 5

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: GREENHECK, PENNBARRY, TWIN CITY FAN COMPANY, SOLER & PALAU, ACME, AND BARRY BLOWER.
2. PROVIDE UNIT WITH MANUFACTURER'S ROOF CURB (W/ INTEGRAL BIRD SCREEN), MOTORIZED BACKDRAFT DAMPER, OUTLET FLEX DUCT CONNECTION, STANDARD PLUG DISCONNECT, PRE-WIRED FAN SPEED CONTROLLER, THERMAL OVERLOAD PROTECTION, AND HANGING VIBRATION ISOLATORS.
3. CONTROL FAN WITH HIGH/LOW WALL SWITCH. FAN SHALL RUN CONTINUOUSLY.
4. PROVIDE UNIT WITH MOTORIZED BACKDRAFT DAMPER, ALUMINUM INLET AND OUTLET COMP FLANGE, PHENOLIC EPOXY COATING WITH UV, NEMA 3 PRE-WIRED DISCONNECT, VFD WITH FAN SPEED CONTROLLER, THERMAL OVERLOAD PROTECTION, ALUMINUM DRAIN, ALUMINUM DOOR HINGE, ALUMINUM BELT GUARD, RUBBER ISOLATORS, WEATHER COVER, ISOLATION RAILS, MANUFACTURERS CURB, CONCENTRIC LOCK BRGS, SS EXT LUBE LINES, SIDE INTAKE, AND STACK EXTENSION.
5. CONTROL FAN WITH SEPARATE ON/OFF WALL SWITCH. PROVIDE WITH PILOT LIGHT. SEE CONTROL DRAWINGS FOR SEQUENCE OF OPERATION.
6. FAN TO PROVIDE HEAT RELIEF CONTROL IN MECH LOFT 201. SEE CONTROL DRAWINGS FOR SEQUENCE OF OPERATION.
7. PROVIDE UNIT WITH MANUFACTURER'S ROOF CURB (W/ INTEGRAL BIRD SCREEN), MOTORIZED BACKDRAFT DAMPER, OUTLET FLEX DUCT CONNECTION, STANDARD PLUG DISCONNECT, EXTERNAL SPEED CONTROL, CONTROLLED BY DDC, THERMAL OVERLOAD PROTECTION, AND HANGING VIBRATION ISOLATORS.
8. PROVIDE UNIT WITH TRANSITION ROOF CURB (W/ INTEGRAL BIRD SCREEN), MOTORIZED BACKDRAFT DAMPER, OUTLET FLEX DUCT CONNECTION, STANDARD PLUG DISCONNECT, EXTERNAL SPEED CONTROL, CONTROLLED BY DDC, THERMAL OVERLOAD PROTECTION, AND HANGING VIBRATION ISOLATORS.

HUMIDIFIER SCHEDULE

SYMBOL	AREA SERVED	AREA R.H. / °F	STEAM CAPACITY	GAS INPUT	ELECTRIC REQUIREMENTS		OUTSIDE AIR		ENTERING DISTRIBUTOR		AIR STREAM SYSTEM		WATER SYSTEM	MANUFACTURER AND MODEL	REMARKS
			LBS OF STEAM/HR	MBH	AMPS	V/Ø	TEMP.	RH %	TEMP.	RH %	DUCT SIZE (WxH)	DUCT CFM			
HUM-1	AIR HANDLING UNIT AHU-1	30% / 70°	400	444.0	4.5	115/1	13°F	5%	70°F	1%	118"X62"	16,400	CITY	CAREL UH180H1105	1 , 2 , 3

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: DRISTEAM AND NEPTRONIC.
2. PROVIDE WITH FULLY MODULATING CONTROL FUNCTIONS, RUBBER STEAM HOSES, STAINLESS STEEL STEAM DISTRIBUTOR, 3/8" CONDENSATE HOSE, STEAM INLET KIT, DUCT MOUNTED DIFFERENTIAL PRESSURE SENSOR, DUCT TEMPERATURE & RELATIVE HUMIDITY SENSOR, AND REMOTE PGDX TERMINAL KIT. PROVIDE FACTORY START-UP AND CALIBRATION.
3. CONNECT UNIT TO DDC CONTROL SYSTEM.

SLOT HOOD SCHEDULE

SYMBOL	LOCATION	SERVES	EXHAUST MATERIAL	EXHAUST AIRFLOW (CFM)	EXHAUST OUTLET SIZE	MINIMUM DUCT VELOCITY (FPM)	PD (" WG)	HOOD DIMENSIONS				SLOTS				OPERATING WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
								LENGTH	HEIGHT	DEPTH	MAXIMUM VELOCITY (FPM)	NO.	LENGTH	HEIGHT	MINIMUM VELOCITY (FPM)			
SH-1	SOILS LAB B 108	WORK TABLE	LIGHT DUST	1,000	9"Ø	2,500	1.5"	34"	29"	6"	1/2 SLOT VELOCITY	4	34"	3/4"	1,450	175	CARMON FUME HOOD	1 , 2 , 3 , 4
SH-2	SOILS LAB B 108	LAB EQUIPMENT	LIGHT DUST	1,800	12"Ø	2,500	1.5"	42"	48"	6"	1/2 SLOT VELOCITY	4	48"	3/4"	2,100	200	CARMON FUME HOOD	1 , 2 , 3 , 4
SH-3	SOILS LAB B 108	LAB EQUIPMENT	LIGHT DUST	2,000	12"Ø	2,500	1.5"	58"	48"	6"	1/2 SLOT VELOCITY	4	58"	3/4"	1,680	200	CARMON FUME HOOD	1 , 2 , 3 , 4
SH-4	PERFORMANCE LAB	LAB EQUIPMENT	LIGHT DUST	1,800	12"Ø	2,500	1.5"	42"	48"	6"	1/2 SLOT VELOCITY	4	48"	3/4"	2,100	200	CARMON FUME HOOD	1 , 2 , 3 , 4

REMARKS:

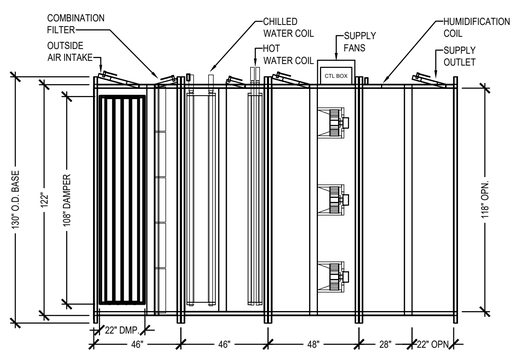
1. ALTERNATE MANUFACTURERS: ACS, NEDERMAN, MONOXIVENT, KEES, & VENTAIRE.
2. PROVIDE W/ MANUFACTURER'S BLAST GATE FOR BALANCING.
3. PROVIDE W/ 304 STAINLESS STEEL CONSTRUCTION.
4. RUN-OUT DUCT SHALL BE THE SAME SIZE AS THE SLOT HOOD EXHAUST OUTLET.

AIR HANDLING UNIT SCHEDULE

SYMBOL	TYPE	AREA SERVED	SUPPLY FAN							CHILLED WATER/DEHUMIDIFICATION COOLING COIL															HEATING COIL												HUMIDIFICATION COIL							COMBINATION FILTER						MIN. O.S.A. CFM	OPERATING WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
			TYPE	CFM	ESP	TSP	HP/QTY	V/Ø	RPM	FLUID TYPE	CAPACITY (MBH)		CFM	E.A.T. (°F)		L.A.T. (°F)		MAX FACE VELOCITY (FPM)	AIR P.D. (W.C.)	FLUID PERFORMANCE			FLUID P.D. (FT)	MAX RH	FLUID TYPE	CAPACITY (MBH)	CFM	E.A.T. (°F)		L.A.T. (°F)		MAX FACE VELOCITY (FPM)	AIR P.D. (W.C.)	FLUID PERFORMANCE				FLUID P.D. (FT)	UNIT TAG	COIL AIR P.D. (FT)	FINNED HEIGHT (IN)	FINNED WIDTH (IN)	FACE AREA (FT^2)	FACE VEL. (FPM)	COIL TYPE	PRE-FILTER		FINAL FILTER		MAX FACE VELOCITY (FPM)				
											SENSIBLE	TOTAL		D.B.	W.B.	D.B.	W.B.			E.W.T.	L.W.T.	GPM						D.B.		D.B.				E.W.T.	L.W.T.	GPM											EFF.	DEPTH	EFF.	DEPTH				
AHU-1	SEMI-CUSTOM	LABORATORIES	REMARK 2	16,400	2.0	5.1	3.2 \ 6	460/3	3,169	REMARK 3	842.7	842.7	16,400	98.7	65.5	50.2	46.9	500	0.8	45	55.0	177.0	18.0	50%	REMARK 3	960.0	16,400	12.9		66.9		500	0.11	140	98.1	48.0		5.1	HUM-1	0.01	24.0	109.0	36.33	451	REMARK 7	MERV 8	2"	MERV 13	4"	500	2,150	7,000	DAIKIN CAH044GDCM	4 , 5 , 6

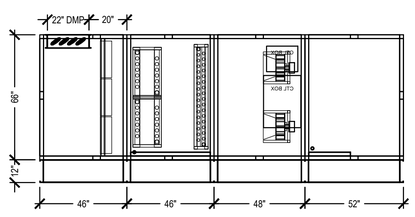
REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: SCOTT SPRINGFIELD, GOVERNAIR, TEMPTROL, HUNT AIR, ENERGY LABS, TMI, UNITECH, & AAON.
2. PROVIDE FAN ASSEMBLY WITH ECM MOTORIZED IMPELLER FANS.
3. CAPACITIES BASED ON A FLUID MIXTURE OF 70% WATER AND 30% PROPYLENE GLYCOL.
4. EXTERNAL STATIC PRESSURE (ESP) DOES NOT INCLUDE THE COILS, FILTERS, OR OTHER INTERNAL AIR HANDLER LOSSES.
5. CAPACITIES FOR FANS AND COILS ARE BASED ON 750 FEET ELEVATION.
6. PROVIDE WITH 12" BASE RAIL.
7. SEE HUMIDIFIER SCHEDULE FOR ADDITIONAL INFORMATION.



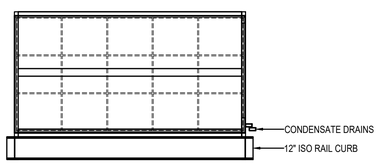
AHU-1 PLAN VIEW

NOT TO SCALE



AHU-1 ELEVATION VIEW

NOT TO SCALE



AHU-1 FRONT VIEW

NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

CONSTRUCTION DOCUMENTS

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL SCHEDULES

SHEET ◇
M5.0

CONDENSING HOT WATER BOILER SCHEDULE

SYMBOL	AREA SERVED	THERMAL EFFICIENCY	FUEL	EWT (°F)	LWT (°F)	BOILER FLOW (GPM)	MAX P.D. (FT H_2O)	CAPACITY		MANUFACTURER AND MODEL	REMARKS
								INPUT MBH	OUTPUT MBH		
B-1	HOT WATER LOOP	98.3%	NATURAL GAS	100.0	140.0	49.0	4.0	1,000	982	LOCHINVAR FTX1000	1 , 2 , 3 , 4
B-1	HOT WATER LOOP	98.3%	NATURAL GAS	100.0	140.0	49.0	4.0	1,000	982	LOCHINVAR FTX1000	1 , 2 , 3 , 4

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: FULTON ENDURA, CLEAVER BROOKS CLEARFIRE, AERCO BENCHMARK.
2. PROVIDE BOILER VENTING KIT, BACnet INTERFACE, MOTORIZED 2-WAY CONTROL VALVE, NEUTRALIZING KIT, COMBUSTION AIR INTAKE KIT, LOW WATER CUT-OFF, FLOW SWITCH, MODULATING GAS BURNER, CONDENSATE TRAP, 316L STAINLESS STEEL COMBUSTION CHAMBER, EXHAUST PIPE, CSD-1 AND OSA RESET, AND O_2 CONTROL WITH 10:1 TURNDOWN.
3. BOILER SHALL BE PROVIDED W/FACTORY START-UP, START-UP IS NOT COMPLETE UNTIL ALL BURNERS AND BLOWER ARE CALIBRATED FOR PEAK PERFORMANCE AND AT COMPLETION OF PROJECT ALL BURNERS, BLOWERS, HEAT EXCHANGERS, AND OTHER INTERNAL PARTS SHALL BE THOROUGHLY CLEANED OF CONSTRUCTION DEBRIS.
4. SEE CONTROLS DRAWINGS FOR SEQUENCE OF OPERATION.
5. CAPACITY BASED ON 70% WATER AND 30% PROPYLENE GLYCOL.

AIR COOLED WATER CHILLER SCHEDULE

SYMBOL	UNIT TYPE	REFR.	FANS		COMPRESSORS		CAPACITY @ 98.7°F EAT			EVAPORATOR WATER		ELECTRICAL (SINGLE POINT)			MANUFACTURER AND MODEL	REMARKS
			QTY	HP/EA.	QTY	RLA TOTAL	ACTUAL CAPACITY (TONS)	WATER TEMP. (°F)		GPM	MAX PD (FT)	V/Ø	MCA	MOCP		
								ENT	LVG							
CHL-1	AIR COOLED	410A	6	---	4	119.3	72.9	55.0	45.0	185.2	18.0	460/3	155.0	175.0	DAIKIN AGZ076E	1 , 2 , 3

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: TRANE, YORK, AND CARRIER.
2. PROVIDE CHILLER W/ BACnet INTERFACE, WYE DELTA STARTER (ACROSS THE LINE STARTER FOR SCROLL COMPRESSORS), COMPRESSOR SOUND BLANKETS, DISCONNECT SWITCH, 115 VOLT CONVENIENCE OUTLET, SINGLE POINT ELECTRICAL CONNECTION, 5 YEAR COMPRESSOR WARRANTY, WATER FLOW SWITCH, AND CONTROLS TRANSFORMER.
3. SEE CONTROL DRAWINGS FOR SEQUENCE OF OPERATION.
4. CAPACITY BASED ON 30% WATER AND 70% PROPYLENE GLYCOL.

PUMP SCHEDULE

SYMBOL	AREA SERVED	TYPE	CAPACITY			MOTOR			SUCTION DIFFUSER	TRIPLE DUTY VALVE	OPERATING WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
			FLOW (GPM)	HEAD (FT)	MIN EFF	HP	RPM	V/Ø					
CWP-1	CHILLED WATER LOOP	INLINE PRIMARY	185	55	79.2%	5.0	2,900	460/3	N/A	N/A	80	ARMSTRONG 4380	1 , 2 , 3 , 4
CWP-2	CHILLED WATER LOOP	INLINE PRIMARY	185	55	79.2%	5.0	2,900	460/3	N/A	N/A	80	ARMSTRONG 4380	1 , 2 , 3 , 4
HWP-1	HOT WATER LOOP	INLINE VARIABLE PRIMARY	80	40	72.3%	1.5	4,200	460/3	-	-	50	ARMSTRONG 4380	1 , 2 , 3 , 4
HWP-2	HOT WATER LOOP	INLINE VARIABLE PRIMARY	80	40	72.3%	1.5	4,200	460/3	-	-	50	ARMSTRONG 4380	1 , 2 , 3 , 4

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: B&G, GRUNDFOS, TACO, PACO, & PATTERSON.
2. PROVIDE UNIT WITH PREMIUM EFFICIENCY MOTOR.
3. PROVIDE WITH INTEGRAL VARIABLE SPEED DRIVE.
4. CAPACITY BASED ON 30% WATER AND 70% PROPYLENE GLYCOL.

BYPASS CONTROL VALVE SCHEDULE

SYMBOL	SERVES	VALVE TYPE	OPERATION	FLUID	FLOW (GPM)	FLOW RANGE (GPM)	P.D. (PSI)	MAXIMUM P.D. (PSI)	SIZE (IN)	CONTROL	MANUFACTURER AND MODEL	REMARKS
BCV-1	HOT WATER SYSTEM	PRESSURE INDEPENDENT	2-WAY MODULATING	30% PROPYLENE GLYCOL	35.0	6-50	3.4	5.0	2.0	REFER TO THE CONTROL SCHEMATICS	B&G ULTRA SETTER	1 , 2 , 4 , 5

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: BELIMO, GRISWOLD, ALFA-LAVAL.
2. CAPACITIES BASED ON A FLUID MIXTURE OF 70% WATER & 30% PROPYLENE GLYCOL.
3. PROVIDE STAINLESS STEEL VALVE.

PENTHOUSE SCHEDULE

SYMBOL	AREA SERVED	TYPE	NUMBER OF TIERS	THROAT SIZE	MINIMUM FREE AREA (ft^2)	FINISH	WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
PH-1	AHU-1 INTAKE	TIERED	7	60"X54"	25.46	AAMA 2604	400	COOK MODEL 54X60X7TRE	1 , 2 , 3

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: UNITED ENERTECH, GREENHECK, CARNES, AIROLITE, RUSKIN, AND CESCO.
2. COLOR TO BE SELECTED BY ARCHITECT.
3. PROVIDE WITH BIRD SCREEN, 120V/Ø LOW LEAKAGE MOTORIZED DAMPER, AND ROOF CURB.

ELECTRIC HEATER SCHEDULE

SYMBOL	AREA SERVED	UNIT TYPE	FAN			ELECTRICAL				MANUFACTURER AND MODEL	REMARKS
			CFM	RPM	HP	KW	STEPS	V/Ø	AMPS		
EH-3	CONCRETE LAB 112 (N)	RECESSED	245	1400	1/8	2.0	1	240/1	8.3	MARKEL MODEL 3420 SERIES	1 , 2 , 3
EH-4	LOCKED STORAGE 111A (N)	RECESSED	245	1400	1/8	2.0	1	240/1	8.3	MARKEL MODEL 3420 SERIES	1 , 2 , 3

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: BRASCH, QMARK, INDEECO, OUELLET, AND CHROMALOX.
2. MOUNT BOTTOM OF HEATER 24" ABOVE FINISH FLOOR.
3. PROVIDE UNIT WITH AN INTEGRAL THERMOSTAT. THERMOSTAT SHALL BE COVERED WITH A TAMPER-PROOF ACCESS COVER.

MECHANICAL SPECIALTY EQUIPMENT SCHEDULE

SYMBOL	EQUIPMENT DESCRIPTION	SYSTEM SERVED	DESCRIPTION	MANUFACTURER AND MODEL
GT-HW1	SINGLE PUMP GLYCOL FEEDER	HEATING WATER/HYDRONIC SYSTEM	PROVIDE WITH LOW LEVEL CUT-OFF AND ALARM ARRANGEMENT INCLUDING A 110V SIGNAL FOR REMOTE ALARM, ISOLATION VALVES, STRAINER, PRESSURE TANK WITH PRESSURE CONTROL, PRESSURE REDUCING VALVE AND GAUGE, 50 GAL. TRANSLUCENT POLYETHYLENE SOLUTION CONTAINER WITH LID TO ACCOMMODATE RELIEF VALVE PIPING, 1/3 HP (MAGNETIC STARTER, 110V, 60 HZ MOTOR AND CONTROLS). PRESET SYSTEM TO 12 PSI. SOLUTION SHALL BE 30% DOWFROST PROPYLENE GLYCOL WITH INHIBITOR AND 70% WATER. GROSS OPERATING WEIGHT=550 LBS.	WESSELS MODEL GMP-13050 ALTERNATE APPROVED MANUFACTURERS: AXIOM
AS-HW1	AIR SEDIMENT SEPARATOR	HEATING WATER/HYDRONIC SYSTEM	DESIGN FLOW IS 80 GPM WITH A DESIGN PD OF 1.0 FT-H_2O.	B & G MODEL SRS-3F ALTERNATE APPROVED MANUFACTURERS: TACO, ARMSTRONG, AND PACO
ET-HW1	EXPANSION TANK (VERTICAL DIAPHRAGM TYPE)	HEATING WATER/HYDRONIC SYSTEM	23 GALLON CAPACITY, ACCEPTANCE 7 GALLONS-DIAPHRAGM TYPE EXPANSION TANK. (PRE-CHARGED TO 10 PSI)	B & G MODEL D-60 ALTERNATE APPROVED MANUFACTURERS: TACO, ARMSTRONG, AND PACO
GT-CW1	SINGLE PUMP GLYCOL FEEDER	CHILLED WATER/HYDRONIC SYSTEM	PROVIDE WITH LOW LEVEL CUT-OFF AND ALARM ARRANGEMENT INCLUDING A 110V SIGNAL FOR REMOTE ALARM, ISOLATION VALVES, STRAINER, PRESSURE TANK WITH PRESSURE CONTROL, PRESSURE REDUCING VALVE AND GAUGE, 50 GAL. TRANSLUCENT POLYETHYLENE SOLUTION CONTAINER WITH LID TO ACCOMMODATE RELIEF VALVE PIPING, 1/3 HP (MAGNETIC STARTER, 110V, 60 HZ MOTOR AND CONTROLS). PRESET SYSTEM TO 12 PSI. SOLUTION SHALL BE 30% DOWFROST PROPYLENE GLYCOL WITH INHIBITOR AND 70% WATER. GROSS OPERATING WEIGHT=550 LBS.	WESSELS MODEL GMP-13050 ALTERNATE APPROVED MANUFACTURERS: AXIOM
AS-CW1	AIR SEDIMENT SEPARATOR	CHILLED WATER/HYDRONIC SYSTEM	DESIGN FLOW IS 185 GPM WITH A DESIGN PD OF 1.8 FT-H_2O.	B & G MODEL SRS-3F ALTERNATE APPROVED MANUFACTURERS: TACO, ARMSTRONG, AND PACO
ET-CW1	EXPANSION TANK (VERTICAL DIAPHRAGM TYPE)	CHILLED WATER/HYDRONIC SYSTEM	12 GALLON CAPACITY, ACCEPTANCE 3 GALLONS-DIAPHRAGM TYPE EXPANSION TANK. (PRE-CHARGED TO 10 PSI)	B & G MODEL D-40 ALTERNATE APPROVED MANUFACTURERS: TACO, ARMSTRONG, AND PACO

CANOPY HOOD SCHEDULE

SYMBOL	LOCATION	SERVES	EXHAUST MATERIAL	EQUIPMENT DIMENSIONS			EXHAUST AIRFLOW (CFM)	CAPTURE VELOCITY (FPM)	ACGIH RECOMMENDED CAPTURE VELOCITY (FPM)	EXHAUST OUTLET SIZE	MINIMUM DUCT VELOCITY (FPM)	RECTANGULAR CANOPY HOOD		LOCATION OF HOOD ABOVE OPERATING EQUIPMENT	MANUFACTURER AND MODEL	REMARKS
				WIDTH "A"	DEPTH "B"	HEIGHT "C"						WIDTH "D"	DEPTH "E"	HEIGHT "F"		
CH-1	ASPHALT LAB (N) 106	(2) NEW NCAT OVENS	VAPORS/HEAT	21-3/4"	25-3/4"	36-3/4"	3,200	100	50-500	16"Ø	2,500	355-1/2"	40"	12"	CAR-MON CUSTOM MODEL	1 , 2
		(2) NEW GRIEVE OVENS	VAPORS/HEAT	50"	30"	70"										
		(2) NEW SHEL LAB OVENS	VAPORS/HEAT	31"	28"	39"										
		(1) FUTURE INFRATEST EXTRACTOR	VAPORS	50"	29-1/2"	54"										
CH-2	ASPHALT LAB 106	(2) EXISTING GRIEVE OVENS	VAPORS/HEAT	50"	30"	70"	2,400	100	50-500	14"Ø	2,400	276"	40"	12"	CAR-MON CUSTOM MODEL	1 , 3
		(2) EXISTING NCAT OVENS	VAPORS/HEAT	21-3/4"	25-3/4"	36-3/4"										
		(1) FUTURE INFRATEST EXTRACTOR	VAPORS	50"	29-1/2"	54"										
CH-3	PERFORMANCE LAB 110	(1) NEW ROTARY EVAPORATOR	VAPORS	30"	20"	36"	2,200	100	50-500	14"Ø	2,000	172"	40"	12"	CAR-MON CUSTOM MODEL	1 , 4
		(1) NEW INFRATEST EXTRACTOR	VAPORS	50"	29-1/2"	54"										
CH-4	PERFORMANCE LAB	(1) FUTURE ROTARY EVAPORATORS	VAPORS	30"	20"	36"	3,200	100	50-500	16"Ø	2,300	312"	52"	12"	CAR-MON CUSTOM MODEL	1 , 5
		(1) FUTURE INFRATEST EXTRACTORS	VAPORS	50"	29-1/2"	54"										
		(1) NEW GRIEVE OVEN (1) FUTURE GRIEVE OVEN	VAPORS/HEAT	50"	30"	70"										

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: KEES, MONOXIVENT, NEDERMAN, & VENTAIRE.
2. SEE CANOPY HOOD DETAIL #1 ON SHEET M4.3.
3. SEE CANOPY HOOD DETAIL #2 ON SHEET M4.3.
4. SEE CANOPY HOOD DETAIL #3 ON SHEET M4.3.
5. SEE CANOPY HOOD DETAIL #1 ON SHEET M4.4.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSED 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL SCHEDULES

SHEET ◇
M5.1

CONSTRUCTION DOCUMENTS

HOT WATER REHEAT COIL SCHEDULE

SYMBOL	AREA / SUPPLY VALVE SERVED	CAPACITY (MBH)	CFM	E.A.T. (°F)	L.A.T. (°F)	AIR P.D. (IN W.C.)	FLUID PERFORMANCE			FLUID P.D. (FT)	ROWS	FPI	COIL SIZE		PIPING RUNOUT SIZE	MANUFACTURER AND MODEL	REMARKS
							E.W.T.	L.W.T.	GPM				WIDTH (IN)	HEIGHT (IN)			
HC-1	ASPHALT LAB (N) / SV-1	111.8	3,000	55.0	90.4	0.4	140.0	99.6	5.8	1.1	3	10	50.75	21.0	1"	DAIKIN MODEL 5WH	1 , 2 , 3 , 4 , 5
HC-2	ASPHALT LAB (E) / SV-2	81.1	2,200	55.0	90.0	0.4	140.0	100.0	4.3	0.8	3	10	46.75	18.0	1"	DAIKIN MODEL 5WH	1 , 2 , 3 , 4 , 5
HC-3	SOILS LAB B 108 / SV-3	168.3	4,600	55.0	89.7	0.4	140.0	100.3	8.9	1.6	3	9	56.75	27.0	1-1/4"	DAIKIN MODEL 5WH	1 , 2 , 3 , 4 , 5
HC-4A	PERFORMANCE LAB / SV-4A	61.1	1,650	55.0	90.2	0.2	140.0	99.8	3.2	1.4	3	9	34.62	24.0	1"	DAIKIN MODEL 5WQ	1 , 2 , 3 , 4 , 5
HC-4B	PERFORMANCE LAB / SV-4B	61.1	1,650	55.0	90.2	0.2	140.0	99.8	3.2	1.4	3	9	34.62	24.0	1"	DAIKIN MODEL 5WQ	1 , 2 , 3 , 4 , 5
HC-5A	PERFORMANCE LAB / SV-5A	61.1	1,650	55.0	90.2	0.2	140.0	99.8	3.2	1.4	3	9	34.62	24.0	1"	DAIKIN MODEL 5WQ	1 , 2 , 3 , 4 , 5
HC-5B	PERFORMANCE LAB / SV-5B	61.1	1,650	55.0	90.2	0.2	140.0	99.8	3.2	1.4	3	9	34.62	24.0	1"	DAIKIN MODEL 5WQ	1 , 2 , 3 , 4 , 5

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: CARRIER, TRANE, & USA COIL.
2. SEE DETAILS FOR REQUIRED VALVING.
3. CAPACITIES BASED ON 745 FEET ELEVATION.
4. CAPACITIES BASED ON A FLUID MIXTURE OF 70% WATER AND 30% PROPYLENE GLYCOL.
5. BASE BID SHALL INCLUDE CONTROLS BY SUPPLY VALVE SYSTEM. BID ALTERNATE #2 SHALL INCLUDE BACnet INTEGRATION CARD. SEE CONTROL DRAWINGS FOR SEQUENCE OF OPERATION.

PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE

SYMBOL	LOCATION	AREA SERVED	TYPE	VALVE INLET		MINIMUM DUCT VELOCITY (FPM)	VALVE AIRFLOWS		VALVE AIRFLOW RANGE		PRESSURE DROP (IN. W.C.)		INSTALLED POSITION	MANUFACTURER AND MODEL	REMARKS
				QUANTITY	SIZE		MIN. (CFM)	MAX (CFM)	MIN. (CFM)	MAX (CFM)	MIN.	MAX.			
SV-1	ASPHALT LAB (N) 106	ASPHALT LAB (N) 106	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	2	14"Ø	2,500	450	3,000	400	5,000	0.6"	3.0"	HORIZONTAL	PHOENIX MEDIUM PRESSURE TSVA214M	1 , 2 , 3
SV-2	ASPHALT LAB (E) 106	ASPHALT LAB (E) 106	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	2	12"Ø	2,500	500	2,200	180	3,000	0.6"	3.0"	HORIZONTAL	PHOENIX MEDIUM PRESSURE TSVA214M	1 , 2 , 3
SV-3	MECH LOFT 201	SOILS LAB B 108	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	2	14"Ø	2,500	400	4,600	400	5,000	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TSVA214M	1 , 2 , 3
SV-4A	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	1	14"Ø	2,500	200	1,650	200	2,500	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TSVA114M	1 , 2 , 3
SV-4B	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	1	14"Ø	2,500	200	1,650	200	2,500	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TSVA114M	1 , 2 , 3
SV-5A	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	1	14"Ø	2,500	200	1,650	200	2,500	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TSVA114M	1 , 2 , 3
SV-5B	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC SUPPLY VALVE	1	14"Ø	2,500	200	1,650	200	2,500	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TSVA114M	1 , 2 , 3

REMARKS:

1. ALTERNATE MANUFACTURERS: CRC & TRIATEK.
2. PROVIDE W/ MANUFACTURER'S CLOSED CELL FOAM EXTERIOR INSULATION, COATED VALVE, DRAWBAND CLAMPS FOR INLET AND OULET CONNECTIONS, ON/OFF SWITCH, 24 VOLT POWER WITH LESS THAN 1 SECOND CONTROL TYPE, VAV CONTROLLER, ALUMINUM BODY, 316 STAINLESS STEEL SHAFT.
3. BASE BID SHALL INCLUDE CONTROLS BY SUPPLY VALVE SYSTEM. BID ALTERNATE #2 SHALL INCLUDE BACnet INTEGRATION CARD. SEE CONTROL DRAWINGS FOR SEQUENCE OF OPERATION.

PRESSURE INDEPENDENT ROOM EXHAUST VALVE SCHEDULE

SYMBOL	LOCATION	AREA SERVED	TYPE	VALVE INLET		MINIMUM DUCT VELOCITY (FPM)	VALVE AIRFLOWS		VALVE AIRFLOW RANGE		PRESSURE DROP (IN. W.C.)		INSTALLED POSITION	MANUFACTURER AND MODEL	REMARKS
				QUANTITY	SIZE		MIN. (CFM)	MAX (CFM)	MIN. (CFM)	MAX (CFM)	MIN.	MAX.			
EV-1	ASPHALT LAB (N) 106	ASPHALT LAB (N) 106	VARIABLE VOLUME ELECTRONIC EXHAUST VALVE	2	14"Ø	2,500	650	3,200	400	5,000	0.6"	3.0"	HORIZONTAL	PHOENIX MEDIUM PRESSURE TEVB214M	1 , 2 , 3
EV-2	ASPHALT LAB (E) 106	ASPHALT LAB (E) 106	VARIABLE VOLUME ELECTRONIC EXHAUST VALVE	2	12"Ø	2,500	700	2,400	180	3,000	0.6"	3.0"	HORIZONTAL	PHOENIX MEDIUM PRESSURE TEVB214M	1 , 2 , 3
EV-3	MECH LOFT 201	SOILS LAB B 108	VARIABLE VOLUME ELECTRONIC EXHAUST VALVE	2	14"Ø	2,500	600	4,800	400	5,000	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TEVB214M	1 , 2 , 3
EV-4	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC EXHAUST VALVE	1	14"Ø	2,500	500	2,200	200	2,500	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TEVB214M	1 , 2 , 3
EV-5	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC EXHAUST VALVE	2	14"Ø	2,500	500	3,200	400	5,000	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TEVB214M	1 , 2 , 3
EV-6	MECH LOFT 201	PERFORMANCE LAB 110	VARIABLE VOLUME ELECTRONIC EXHAUST VALVE	1	12"Ø	2,500	1,800	1,800	200	2,500	0.6"	3.0"	VERTICAL	PHOENIX MEDIUM PRESSURE TEVB114M	1 , 2 , 3

REMARKS:

1. ALTERNATE MANUFACTURERS: CRC & TRIATEK.
2. PROVIDE W/ MANUFACTURER'S CLOSED CELL FOAM EXTERIOR INSULATION, COATED VALVE, DRAWBAND CLAMPS FOR INLET AND OULET CONNECTIONS, ON/OFF SWITCH, 24 VOLT POWER WITH LESS THAN 1 SECOND CONTROL TYPE, VAV CONTROLLER, ALUMINUM BODY, 316 STAINLESS STEEL SHAFT.
3. BASE BID SHALL INCLUDE CONTROLS BY SUPPLY VALVE SYSTEM. BID ALTERNATE #2 SHALL INCLUDE BACnet INTEGRATION CARD. SEE CONTROL DRAWINGS FOR SEQUENCE OF OPERATION.

BUFFER TANK SCHEDULE

SYMBOL	AREA SERVED	UNIT TYPE	VOLUME (GAL)	CONNECTION SIZE		TANK WEIGHT (LBS) / OPERATING WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
				INLET	OUTLET			
BT-1	MECH LOFT 201	CW BUFFER TANK	300	4"	4"	580 / 3,100	WESSELS MODEL CBT-300	1 , 2 , 3

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: NILES, LAARS, AMTROL, LOCHINVAR, & WESSELS.
2. SEE SCHEMATIC FOR PIPING DETAILS.
3. PROVIDE WITH SIESMIC LEGS, FLANGED FITTINGS, 2" OF INSULATION, AND TANK TEMPERATURE WELL FOR DDC MONITORING.

DUCTLESS SPLIT HIGH WALL COOLING & HEATING UNIT SCHEDULE

SYMBOL	AREA SERVED	NOMINAL TONS	UNIT TYPE	SUPPLY FAN			COOLING REQUIRED AT 95°F OSA, 80°F EDB, 62°F EWB		HEATING REQUIRED AT 32°F OSA, 69°F EDB.	ELECTRICAL OUTDOOR UNIT			MINIMUM SEER / HSPF	INDOOR/ OUTDOOR OPERATING WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
				CFM	HP	V/Ø	TOTAL MBH	SENSIBLE MBH	TOTAL MBH	MCA	MOCP	V/Ø				
DFC-1 , DHP-1	DATA 106A	1.5	HIGH WALL COOL/HEAT UNIT	353-559	.037	THROUGH OUTDOOR UNIT	19.0	15.0	15.50	15	20	230/1	19.0/10.6	35/75	CARRIER INDOOR UNIT MODEL 40MHHQ18 CARRIER OUTDOOR UNIT MODEL 38MHRBQ18	1 , 2 , 3 , 4 , 5 , 6

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: LENNOX, MITSUBISHI, PANASONIC, SAMSUNG, LG, DAIKIN , OR APPROVED EQUAL BY ENGINEER.
2. CONTROL UNIT WITH MANUFACTURER'S HARD-WIRED WALL MOUNTED 7 DAY PROGRAMMABLE THERMOSTAT WITH AUTO CHANGE OVER.
3. PROVIDE MANUFACTURERS CRANKCASE HEATER , LOW AMBIENT CONTROLS & (TO -0°F COOLING TO -0°F HEATING) WIND BAFFLES, REFRIGERATION LINE SET SIZED BY MANUFACTURER, AND TAMPER PROOF PORT CAPS.
4. PROVIDE WITH MIRO INDUSTRIES LIGHT DUTY MECHANICAL GALVANIZED SUPPORT STAND WITH ADJUSTABLE SUPPORT LEGS. SUPPORT SHALL EXTEND A MINIMUM OF 6" BEYOND EQUIPMENT IN EACH DIRECTION. BOLT EQUIPMENT TO MECHANICAL SUPPORT.
5. PROVIDE WITH MANUFACTURER'S CONDENSATE PUMP, OR LITTLE GIANT MINI CONDENSATE PUMP, CONCEAL PUMP BEHIND UNIT WITHIN MOUNTING BRACKET ASSEMBLY. ELECTRICAL CIRCUIT FOR PUMP SHALL BE INTEGRATED TO FAN COIL.
6. ELECTRICAL TO PROVIDE DISCONNECT AND HEAT TRACE BENEATH UNIT.

LOUVER SCHEDULE

SYMBOL	SERVICE	TYPE	NOMINAL SIZE	MINIMUM FREE AREA (SQ.FT.)	FINISH	MANUFACTURER AND MODEL	REMARKS
L-1	MECH LOFT 201	FIXED DRAINABLE	35X24	2.91	AAMA 2604	RUSKIN ELF375DX	1 , 2 , 3 , 4

REMARKS:

1. APPROVED ALTERNATE MANUFACTURERS: GREENHECK, SAFE-AIR/DOWCO, ARROW UNITED, NAILOR, POTTORFF, AND UNITED ENERTECH.
2. COLOR TO MATCH EXISTING LOUVERS. FINAL COLOR TO BE SELECTED BY ARCHITECT.
3. PROVIDE WITH FLANGED FRAME AND BIRD SCREEN, AND 120V/Ø LOW LEAKAGE MOTORIZED DAMPER.
4. LOUVER TO BE INTERLOCKED WITH EF-7.

DIFFUSER SCHEDULE

SYMBOL	NOMINAL SIZE	NECK / RUNOUT SIZE	CFM RANGE	REMARKS
D-1 CFM 10"Ø	10"Ø	10"Ø	200 - 350	1 , 2 , 3 , 4 , 5 , 6 , 7
D-2 CFM 14"Ø	14"Ø	14"Ø	500 - 825	1 , 3 , 4 , 5 , 6 , 7 , 8 , 9
D-3 CFM 16"Ø	16"Ø	16"Ø	850 - 1125	1 , 3 , 4 , 5 , 6 , 7 , 8 , 9

REMARKS:

1. ALTERNATE MANUFACTURERS: ANEMOSTAT, J&J REGISTER, NAILOR, METAL-AIRE, TUTTLE & BAILEY, KRUEGER, PRICE, AND UNITED ENERTECH.
2. SIZES BASED ON TITUS MODEL TDCA SERIES WITH ADJUSTABLE THROW.
3. SIZES BASED ON A MAXIMUM NC LEVEL OF 25.
4. ALL DIFFUSERS LOCATED IN LAY-IN CEILING AREAS SHALL BE BORDER TYPE 3 AND BE MOUNTED IN MANUFACTURER PROVIDED 24"x24" PANELS. ALL DIFFUSERS LOCATED IN HARD CEILING AREAS SHALL BE BORDER TYPE 6 (BEVELED) SURFACE MOUNTED. SEE ARCHITECTURAL PLANS FOR LOCATIONS OF VARIOUS CEILING TYPES.
5. SEE HVAC FLOOR PLANS FOR DIRECTIONAL THROW REQUIREMENTS FOR EACH DIFFUSER.
6. WHENEVER THERE IS A DISCREPANCY BETWEEN THE RUNOUT DUCT SIZE SHOWN ON THE PLANS AND THAT SHOWN IN THE SCHEDULE, ALWAYS USE THE LARGER OF THE TWO DUCT SIZES.
7. COLOR TO BE SELECTED BY ARCHITECT.
8. SIZES BASED ON TITUS MODEL PAS, PERFORATED DIFFUSER, STEEL CONSTRUCTION.
9. PROVIDE WITH FIXED POSITION ADJUSTABILITY SET TO VERTICAL DOWNFLOW.

RETURN & EXHAUST GRILLE SCHEDULE

SYMBOL	NOMINAL SIZE	NECK / RUNOUT SIZE	CFM RANGE	REMARKS
R-1 22X10	22X10	22X10	0-600	1 , 2 , 3 , 4 , 5 , 6

REMARKS:

1. ALTNERNATE MANUFACTURERS: ANEMOSTAT, CARNES, PRICE, NAILOR, METAL-AIRE, TUTTLE & BAILEY, KRUEGER, J&J REGISTER, AND UNITED ENERTECH.
2. SIZES BASED ON TITUS MODEL 50F, ALUMINUM EGGCRATE RETURN GRILLE, 1/2" x 1/2" x 1" SPACING (SINGLE CORE). PROVIDE SQUARE TO ROUND TRANSITION (WHERE ROUND RUN-OUT INDICATED).
3. SIZES BASED ON A MAXIMUM NC LEVEL OF 25.
4. ALL GRILLES LOCATED IN LAY-IN CEILING AREAS SHALL HAVE BORDER #3, UNLESS OTHERWISE INDICATED. ALL GRILLES LOCATED IN HARD CEILING AREAS SHALL HAVE BORDER #1, UNLESS OTHERWISE INDICATED. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS OF VARIOUS CEILING TYPES. SHEET METAL DUCTWORK VISIBLE BEHIND GRILLE SHALL BE PAINTED FLAT BLACK.
5. WHENEVER THERE IS A DISCREPANCY BETWEEN THE RUNOUT DUCT SIZE SHOWN ON THE PLANS AND THAT SHOWN IN THE SCHEDULE, ALWAYS USE THE LARGER OF THE TWO DUCT SIZES.
6. COLOR TO BE SELECTED BY ARCHITECT.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL SCHEDULES

SHEET ◇
M5.2

CONSTRUCTION DOCUMENTS

CONTROLS LEGEND

SYMBOL	DESCRIPTION
AI	ANALOG INPUT
DI	DIGITAL INPUT
AO	ANALOG OUTPUT
DO	DIGITAL OUTPUT
--	CONTROL ELEMENT TAG
	3-WAY, 2-WAY CONTROL VALVE
	PARALLEL BLADE CONTROL DAMPER
	OPPOSED BLADE CONTROL DAMPER
	OPPOSED BLADE CONTROL DAMPER

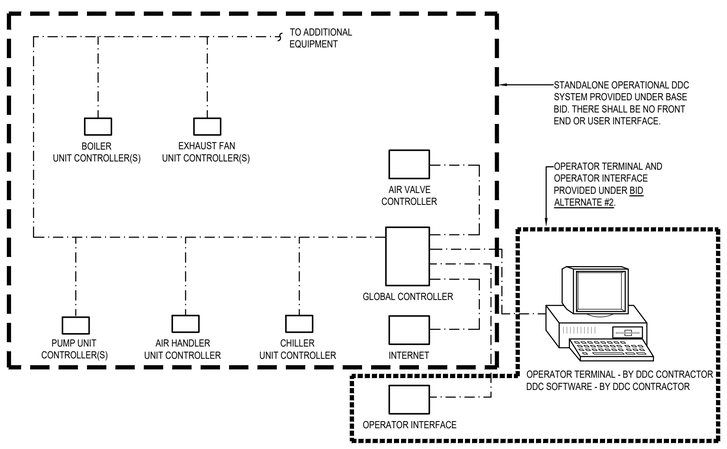
NOTES:
1. ALL DATA THAT IS NOTED TO BE "ADJUSTABLE" ON THE FOLLOWING CONTROL SHEETS SHALL MADE BOTH ADJUSTABLE AND LOCKABLE FROM THE OPERATOR'S WORKSTATION AND IN PARTICULAR, THE GRAPHICAL USER INTERFACE (GUI).
2. GLOBAL CALENDAR SCHEDULING SHALL BE PROVIDED.

CONTROLS LEGEND

SYMBOL	DESCRIPTION
M	MOTOR
	THERMOWELL
	CURRENT SENSING RELAY
	CONTROL RELAY
AS	AIRFLOW MEASURING STATION (EBTRON GOLD SERIES) BY CONTROL CONTRACTOR
DX / C	DX REFRIGERANT COOLING COIL
C / C	CHILLED WATER COOLING COIL
H / C	HOT WATER HEATING COIL
HR / C	HEAT RECOVERY COIL
PH / C	HOT WATER PREHEAT COIL
RH / C	HOT WATER REHEAT COIL
	GAS-FIRED HEAT EXCHANGER
T	THERMOSTAT
S	SPACE TEMPERATURE SENSOR
H	SPACE HUMIDITY SENSOR
CO	SPACE CARBON MONOXIDE SENSOR
PT	SPACE PRESSURE TRANSMITTER
	LOW VOLTAGE SIGNAL
	LINE VOLTAGE POWER

CONTROLS LEGEND

SYMBOL	DESCRIPTION
APS	AIRFLOW PROVING SWITCH
BAS	BUILDING AUTOMATION SYSTEM
BCV	BYPASS CONTROL VALVE
C	CONDENSATE
CFL	CONDENSATE FLOAT LEVEL SWITCH
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CR	CONTROL RELAY
CSR	CURRENT SENSING RELAY
D	DAMPER
DA	DAMPER ACTUATOR
DDC	DIRECT DIGITAL CONTROLS
DPT	DAMPER POSITION TRANSMITTER
FS	FLOW SWITCH
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
LS	LIMIT SWITCH
PDS	PRESSURE DIFFERENTIAL SWITCH
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PS	PRESSURE SWITCH
PT	PRESSURE TRANSMITTER
TT	TEMPERATURE TRANSMITTER
TV	TEMPERATURE CONTROL VALVE
WL	WATER LEVEL SWITCH



CONTROLS ARCHITECTURE

GENERAL:
THE HEAT RELIEF FAN UNIT SYSTEM CONSISTS OF A MOTORIZED INTAKE WALL LOUVER, MOTORIZED EXHAUST DAMPER, A ROOF MOUNTED HEAT RELIEF FAN, AND A HEAT RISE THERMOSTAT. THE CONTROL CONTRACTOR SHALL PROVIDE A NEW CONTROL PACKAGE DEDICATED TO THE COMPLETE OPERATION OF THE SYSTEM. THIS SYSTEM SHALL BE STANDALONE AND NOT TIED TO THE DDC SYSTEM.

THE NEW HEAT RISE THERMOSTAT SENSOR SHALL CONTROL THE MOTORIZED INTAKE WALL LOUVER, MOTORIZED EXHAUST DAMPER, AND ROOF MOUNTED HEAT RELIEF FAN.

HEAT RELIEF MODE OF OPERATION:
THE HEAT RELIEF SYSTEM SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITIONS BOTH EXIST:

1. THE SPACE TEMPERATURE INCREASES ABOVE THE COOLING SET POINT.

WHEN THE ABOVE CONDITIONS EXIST THE HEAT RISE THERMOSTAT SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE INTAKE WALL LOUVER.
2. SEND AN OPEN COMMAND TO THE EXHAUST DAMPER.
3. SEND AN ENABLE COMMAND TO THE HEAT RELIEF FAN TO RUN CONTINUOUSLY.

THE HEAT RELIEF MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE REACHES 3°F BELOW THE COOLING SET POINT.

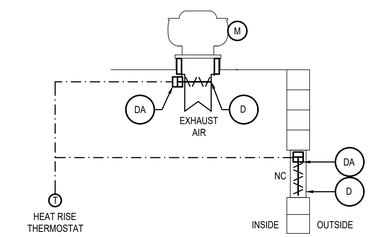
WHEN THE ABOVE CONDITION EXISTS THE HEAT RISE THERMOSTAT SHALL SEQUENCE THE FOLLOWING:

1. SEND A DISABLE COMMAND TO THE HEAT RELIEF FAN.
2. SEND A CLOSE COMMAND TO THE EXHAUST DAMPER.
3. SEND A CLOSE COMMAND TO THE INTAKE WALL LOUVER.

THE SPACE TEMPERATURE COOLING SET POINT SHALL BE SET AT 85°F (ADJUSTABLE).
THE HEAT RELIEF FAN SHALL HAVE A MINIMUM OPERATION TIME OF 5 MINUTES (ADJUSTABLE)

HEAT RELIEF FAN SEQUENCE OF OPERATION

(EF-7/L-1)



HEAT RELIEF FAN CONTROL SCHEMATIC

(EF-7/L-1)

GENERAL:
THE DUCTLESS SPLIT SYSTEM SHALL CONSIST OF AN INDOOR FAN COIL UNIT, AN OUTDOOR CONDENSING UNIT, AND A MANUFACTURER PROVIDED WIRELESS CONTROLLER. THIS SYSTEM SHALL BE STANDALONE AND NOT TIED TO THE DDC SYSTEM.

OPERATION:
THE WIRELESS CONTROLLER SHALL CONTROL THE OPERATION OF THE DUCTLESS SPLIT SYSTEM.

COOLING MODE OF OPERATION:
IF COOLING IS REQUIRED, THE WIRED CONTROLLER SHALL ENABLE THE COMPRESSORIZED COOLING SYSTEM TO MAINTAIN THE USER ADJUSTABLE COOLING SPACE SET POINT. IF THE SPACE IS BELOW THE COOLING SET POINT, THE DUCTLESS SPLIT SYSTEM SHALL BE DISABLED.

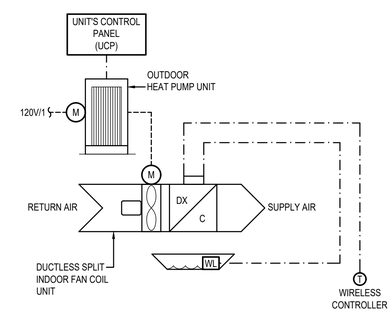
THE SPACE TEMPERATURE COOLING SET POINT SHALL BE SET AT 75°F (ADJUSTABLE).
THE SPACE TEMPERATURE HEATING SET POINT SHALL BE SET AT 70°F (ADJUSTABLE).

DFC-1/DHP-1 SHALL BE LOCKED OUT OF HEATING MODE.

SAFETIES:
1. THE SYSTEM SHALL BE DISABLED WHENEVER THE WATER LEVEL OVERFLOW SWITCH INDICATES A HIGH CONDENSATE LEVEL.

DUCTLESS SPLIT SYSTEM SEQUENCE OF OPERATION

(DFC-1/DHP-1)



DUCTLESS SPLIT SYSTEM CONTROL SCHEMATIC

(DFC-1/DHP-1)

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

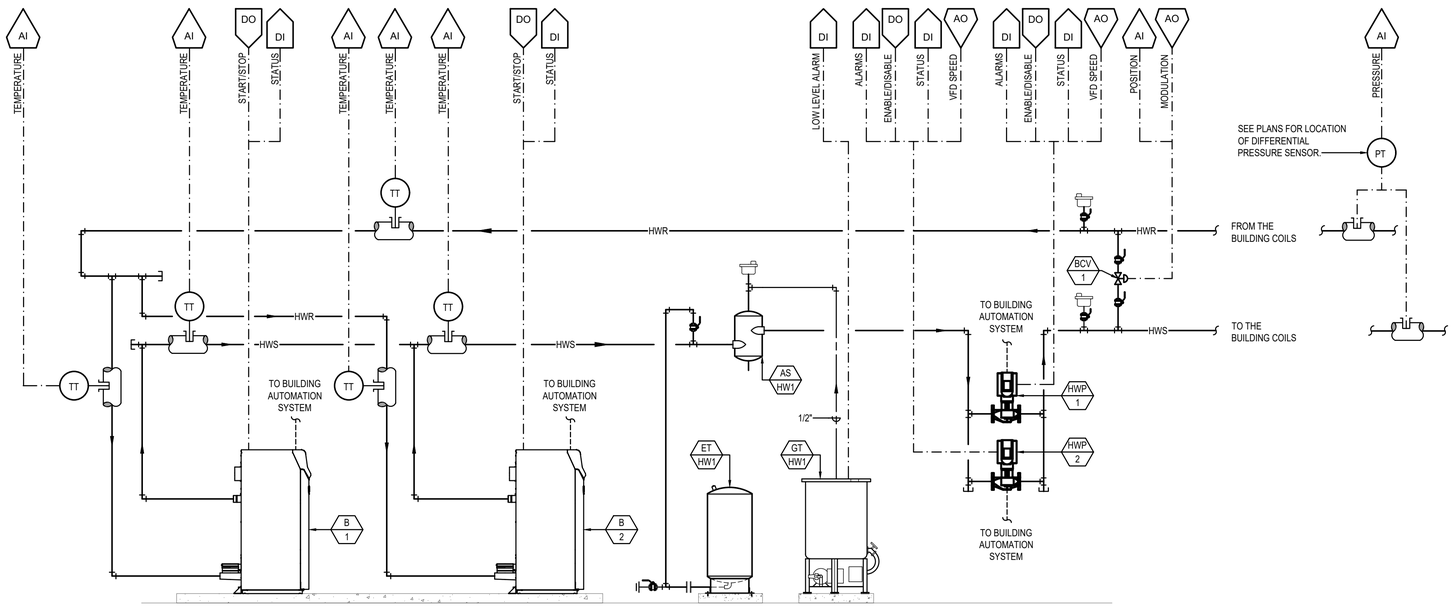
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.0

CONSTRUCTION DOCUMENTS



HEATING WATER SYSTEM CONTROL SCHEMATIC

GENERAL:
THE HOT WATER HEATING SYSTEM SHALL CONSIST OF (2) VARIABLE SPEED PRIMARY HOT WATER PUMPS WITH VFD'S (LEAD/LAG OPERATION), (2) HOT WATER BOILERS (LEAD/LAG OPERATION) WITH A BACnet INTERFACE, AND A BYPASS CONTROL VALVE. THE CONTROL CONTRACTOR SHALL PROVIDE A NEW DDC CONTROL PACKAGE DEDICATED TO THE COMPLETE OPERATION OF THE SYSTEM.

OPERATION:
THE HEATING WATER SYSTEM SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITION EXISTS:

1. THE OUTSIDE AIR TEMPERATURE DECREASES TO THE HEATING ENABLE SET POINT FOR A PERIOD OF 10 CONSECUTIVE MINUTES.
2. THERE IS A CALL FOR HEAT FROM AT LEAST ONE ZONE (BASED ON A HEATING COIL CONTROL VALVE MINIMUM POSITION OF 25% OPEN) FOR A PERIOD OF 30 CONSECUTIVE SECONDS. (BID ALTERNATE #2)

WHEN THE ABOVE CONDITIONS ARE MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE LEAD HEATING WATER PUMP.
   a. VALIDATE THE RUNNING STATUS THROUGH THE VFD CONTROL INTERFACE.
   b. VALIDATE THE RUNNING STATUS THROUGH THE CURRENT SENSING RELAY.
      1) IF THE LEAD PUMP FAILS TO START, THE STANDBY PUMP SHALL BE ENABLED.
      2) IF THE STANDBY PUMP FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE DDC CONTROLLER SHALL MODULATE THE VFD BASED ON A DIFFERENTIAL PRESSURE SETPOINT (ADJUSTABLE) LOCATED ACROSS THE PIPING ASSEMBLY. THE SETPOINT SHALL BE COORDINATED BETWEEN THE BALANCE CONTRACTOR AND THE CONTROL CONTRACTOR. THE SETPOINT SHALL BE SUFFICIENT ENOUGH TO ALLOW ADEQUATE FLOW TO ALL HOT WATER HEATING COILS.

2. SEND AN ENABLE COMMAND TO THE LEAD BOILER.
   a. VALIDATE THE RUNNING STATUS OF THE BOILER THROUGH THE UNIT CONTROL PANEL (UCP).
      1) IF THE LEAD BOILER FAILS TO START, THE LAB BOILER SHALL BE ENABLED.
      2) IF EITHER BOILER FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   b. THE HEATING WATER SYSTEM SHALL CONTINUE TO OPERATE UNDER ITS OWN INTERNAL CONTROLS BY ENABLING AND MODULATING THE NECESSARY BOILERS. THE DDC CONTROLLER SHALL SEND THE UNIT CONTROL PANEL A HEATING WATER SUPPLY TEMPERATURE SET POINT TO MAINTAIN (REFER TO THE HEATING WATER SUPPLY TEMPERATURE RESET SCHEDULE).

IN THE EVENT THAT THE LEAD SECONDARY HEATING WATER PUMP IS OPERATING ABOVE 90% CAPACITY AND IS UNABLE TO MAINTAIN THE DIFFERENTIAL PRESSURE SETPOINT, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE LAG SECONDARY HEATING WATER PUMP.
   a. VALIDATE THE RUNNING STATUS THROUGH THE VFD CONTROL INTERFACE.
   b. VALIDATE THE RUNNING STATUS THROUGH THE CURRENT SENSING RELAY.
      1) IF THE SECONDARY PUMP FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

2. THE TWO SECONDARY HEATING WATER PUMPS SHALL CONTINUE TO OPERATE IN PARALLEL UTILIZING THE SAME CONTROL POINT.

3. WHEN THE CAPACITY OF THE LAG PUMP IS REDUCED TO 35%, THE DDC CONTROLLER SHALL STAGE BACK DOWN TO THE LEAD SECONDARY HEATING WATER PUMP IN REVERSE ORDER FROM THE STEPS NOTED ABOVE.

4. EACH PUMP SHALL OPERATE FOR A MINIMUM OF 10 CONSECUTIVE MINUTES AND WHEN DISABLED, SHALL REMAIN OFF FOR A MINIMUM OF 5 CONSECUTIVE MINUTES BEFORE RESTARTING TO PREVENT SHORT-CYCLING EXCEPT WHEN MANUALLY ENABLED/DISABLED OR BY THE OCCUPIED/UNOCCUPIED SYSTEM SCHEDULE.

THE HEATING ENABLE SET POINT SHALL BE SET AT 60°F.

THE HEATING WATER SYSTEM SHALL BE DISABLED WHENEVER ONE OF THE FOLLOWING CONDITIONS EXISTS:

1. THE OUTSIDE AIR TEMPERATURE INCREASES ABOVE THE HEATING ENABLE SETPOINT FOR A PERIOD OF 10 CONSECUTIVE MINUTES.
2. NO ZONES HAVE A CALL FOR HEAT (BASED ON A HEATING COIL CONTROL VALVE POSITION OF 0% OPEN FOR A PERIOD OF 10 CONSECUTIVE MINUTES. (BID ALTERNATE #2)

WHEN ONE OF THE ABOVE CONDITIONS ARE MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND A DISABLE COMMAND TO THE LEAD BOILER'S UNIT CONTROLLER.
   a. VALIDATE THE RUNNING STATUS OF THE BOILER THROUGH THE UNIT CONTROL PANEL (UCP).
      1) IF THE LEAD BOILER FAILS TO STOP, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

WHEN THE HEATING WATER SYSTEM IS DISABLED, THE LEAD HEATING WATER PUMP SHALL CONTINUE TO OPERATE FOR A PERIOD OF 10 CONSECUTIVE MINUTES.

THE DDC CONTROLLER SHALL PROVIDE LEAD/LAG CONTROL OF THE HEATING WATER PUMPS. IT SHALL INCLUDE AN AUTOMATIC ROTATION OF THE LEAD PUMP BASED ON THE MONTH. THE EVEN NUMBERED PUMP SHALL BE THE LEAD ON EVEN NUMBERED MONTHS AND THE ODD NUMBERED PUMP SHALL BE THE LEAD ON ODD NUMBERED MONTHS. IN ADDITION, MANUAL OVERRIDE AND OPERATOR OVERRIDE CAPABILITIES SHALL ALSO BE PROVIDED.

THE BOILER'S UNIT CONTROL PANEL (UCP) SHALL PROVIDE CONTROL OF THE BOILERS. IN ADDITION, MANUAL OVERRIDE AND OPERATOR OVERRIDE CAPABILITIES SHALL ALSO BE PROVIDED.

HEATING WATER BYPASS CONTROL VALVE (LOW FLOW CONTROL MODE):
THE BYPASS CONTROL VALVE (BCV-1) SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE DIFFERENTIAL PRESSURE INCREASES TO THE MAXIMUM THE DIFFERENTIAL PRESSURE SETPOINT FOR A PERIOD OF 10 CONSECUTIVE MINUTES.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. THE DDC CONTROLLER SHALL MODULATE THE VALVE TO MAINTAIN THE MAXIMUM DIFFERENTIAL PRESSURE SETPOINT.

THE MAXIMUM DIFFERENTIAL PRESSURE SETPOINT SHALL BE SET AT 5 PSIG ABOVE THE DIFFERENTIAL PRESSURE SETPOINT. THIS SETPOINT SHALL ALSO MAINTAIN MINIMUM FLOW THROUGH BOILERS AND PUMPS.

HEATING WATER SUPPLY TEMPERATURE SET POINT RESET SCHEDULE
THE HEATING WATER SUPPLY TEMPERATURE SET POINT SHALL BE RESET BY THE DDC CONTROLLER BASED ON OUTDOOR AIR TEMPERATURE. WHEN THE SYSTEM IS FIRST ENABLED, A HEATING WATER SUPPLY TEMPERATURE OF 140°F SHALL BE PROVIDED AND SHALL DECREASE LINEARLY DOWN TO 120°F BASED ON THE FOLLOWING OUTDOOR AIR CONDITIONS:

1. OUTSIDE AIR TEMPERATURE = 40°F, SUPPLY WATER TEMPERATURE = 140°F
2. OUTSIDE AIR TEMPERATURE = 60°F, SUPPLY WATER TEMPERATURE = 120°F

SAFETIES:
REFER TO THE ELECTRICAL DRAWINGS FOR THE REQUIREMENTS OF THE EMERGENCY SHUT-DOWN SWITCH.

VFD POINTS LIST:
THE VFD CONTROL INTERFACE SHALL PROVIDE BUT NOT BE LIMITED TO THE FOLLOWING:

1. ENABLE/DISABLE
2. ALARMS
3. HERTZ
4. SPEED CONTROL

BID ALTERNATE #2:

1. ALL PARAMETERS SHALL BE REMOTELY ADJUSTABLE FROM THE BUILDING AUTOMATION SYSTEM.
2. ALL ALARMS SHALL BE INCLUDED AS PART OF BID ALTERNATE #2.

HEATING WATER SYSTEM SEQUENCE OF OPERATION

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.1

CONSTRUCTION DOCUMENTS

GENERAL:
THE CHILLED WATER SYSTEM SHALL CONSIST OF AN OUTDOOR AIR-COOLED CHILLER, TWO (2) VARIABLE SPEED PRIMARY CHILLED WATER PUMPS W/ VFD'S (LEAD / STANDBY OPERATION), A BUFFER TANK, AND A FLOW METER. THE CONTROL CONTRACTOR SHALL PROVIDE A NEW DDC CONTROL PACKAGE DEDICATED TO THE COMPLETE OPERATION OF THE SYSTEM.

OPERATION:
THE CHILLED WATER SYSTEM SHALL BE ENABLED WHENEVER ONE OF THE FOLLOWING CONDITIONS EXIST:

1. THE OUTSIDE AIR TEMPERATURE INCREASES TO THE COOLING ENABLE SET POINT FOR A PERIOD OF 10 CONSECUTIVE MINUTES.
2. THE CHILLED WATER BUFFER TANK TEMPERATURE RISES ABOVE 45°F FOR A PERIOD OF 30 SECONDS.
3. THERE IS A CALL FOR DEHUMIDIFICATION.

WHEN ONE OF THE ABOVE CONDITIONS IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE LEAD CHILLED WATER PUMP.
   a. VALIDATE THE RUNNING STATUS THROUGH THE VFD CONTROL INTERFACE.
   b. VALIDATE THE RUNNING STATUS THROUGH THE CURRENT SENSING RELAY.
      1) IF THE LEAD PUMP FAILS TO START, THE STANDBY PUMP SHALL BE ENABLED.
      2) IF THE STANDBY PUMP FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE DDC CONTROLLER SHALL MODULATE THE VFD BASED ON A DIFFERENTIAL PRESSURE SETPOINT LOCATED ACROSS THE PIPING ASSEMBLY. THE SETPOINT SHALL BE COORDINATED BETWEEN THE BALANCE CONTRACTOR AND THE CONTROL CONTRACTOR. THE SETPOINT SHALL BE SUFFICIENT ENOUGH TO ALLOW ADEQUATE FLOW TO THE AIR HANDLER CHILLED WATER COOLING COIL.
   d. THE LEAD CHILLED WATER PUMP SHALL MAINTAIN MINIMUM FLOW OF THE PUMPS AND CHILLER USING A MINIMUM HERTZ DETERMINED BY THE BALANCE CONTRACTOR. MAINTAIN CHILLER AND PUMP MANUFACTURER REQUIREMENTS FOR MINIMUM FLOW.

2. SEND AN ENABLE COMMAND TO THE AIR-COOLED CHILLER'S UNIT CONTROL PANEL (UCP).
   a. VALIDATE THE RUNNING STATUS OF THE CHILLER THROUGH THE UNIT CONTROL PANEL (UCP).
      1) IF THE CHILLER FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

WHEN A RUNNING STATUS FROM THE CHILLER'S UNIT CONTROL PANEL (UCP) HAS BEEN CONFIRMED IT SHALL CONTINUE TO OPERATE UNDER ITS OWN INTERNAL CONTROLS AND MAINTAIN ITS OWN RAMPING AND LOADING RATES. THE DDC CONTROLLER SHALL SEND THE CHILLER'S UCP A CHILLED WATER SUPPLY TEMPERATURE SET POINT TO MAINTAIN (REFER TO THE CHILLED WATER SUPPLY TEMPERATURE RESET SCHEDULE).

THE COOLING ENABLE SET POINT SHALL BE SET AT 60°F.

THE CHILLED WATER SYSTEM SHALL BE DISABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE OUTSIDE AIR TEMPERATURE DECREASES 2° (ADJUSTABLE) OR MORE BELOW THE COOLING ENABLE SET POINT FOR A PERIOD OF 10 CONSECUTIVE MINUTES (ADJUSTABLE).
2. THE CHILLED WATER BUFFER TANK TEMPERATURE FALLS BELOW 45°F FOR A PERIOD OF 30 SECONDS.

WHEN THE CHILLED WATER SYSTEM IS DISABLED, THE LEAD PRIMARY CHILLED WATER PUMP SHALL CONTINUE TO OPERATE FOR A PERIOD OF 10 CONSECUTIVE MINUTES.

THE DDC CONTROLLER SHALL PROVIDE LEAD / STAND-BY CONTROL OF THE PRIMARY CHILLED WATER PUMPS. IT SHALL INCLUDE AN AUTOMATIC ROTATION OF THE LEAD PUMP BASED ON RUNTIME, FIXED ROTATION OR CALENDAR DATE. IN ADDITION, MANUAL OVERRIDE AND OPERATOR OVERRIDE CAPABILITIES SHALL ALSO BE PROVIDED.

COOLDOWN MODE OF OPERATION:
THE CHILLED WATER SYSTEM SHALL BE DISABLED 10 MINUTES PRIOR TO THE SWITCHOVER FROM THE OCCUPIED TO UNOCCUPIED MODE OF THE LAST AIR VALVE SYSTEM. THIS WILL ENABLE THE BUILDING TO UTILIZE THE RESIDUAL COOLING CAPACITY WITHIN THE CHILLED WATER PIPING SYSTEM.

CHILLED WATER SUPPLY TEMPERATURE SET POINT RESET SCHEDULE
THE CHILLED WATER SUPPLY TEMPERATURE SET POINT SHALL BE RESET BY THE DDC CONTROLLER BASED ON OUTDOOR AIR TEMPERATURE. WHEN THE SYSTEM IS FIRST ENABLED, A CHILLED WATER SUPPLY TEMPERATURE OF 45°F SHALL BE PROVIDED AND SHALL DECREASE LINEARLY UP TO 55°F BASED ON THE FOLLOWING OUTDOOR AIR CONDITIONS:

1. OUTSIDE AIR TEMPERATURE = 60°F, SUPPLY WATER TEMPERATURE = 55°F
2. OUTSIDE AIR TEMPERATURE = 75°F, SUPPLY WATER TEMPERATURE = 45°F

CHILLER POINTS LIST (BID ALTERNATE #2):
ALL AVAILABLE CHILLER POINTS SUPPORTED BY THE CHILLER'S INTEGRATION MODULE SHALL BE MAPPED TO THE OPERATOR'S WORKSTATION AS PART OF BID ALTERNATE #2. POINTS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

1. CHILLER ENABLE / DISABLE .
2. CHILLER ENABLE / DISABLE STATUS .
3. ENTERING CHILLED WATER TEMPERATURE.
4. LEAVING CHILLED WATER TEMPERATURE.
5. CHILLED WATER SET POINT.
6. PERCENT TOTAL CAPACITY.
7. ALARM STATE.
8. CURRENT ALARMS.
9. ALL COMPRESSOR CIRCUITS:
   a. EVAPORATOR SATURATED REFRIGERANT PRESSURE
   b. EVAPORATOR SATURATED REFRIGERANT TEMPERATURE
   c. EXV POSITION

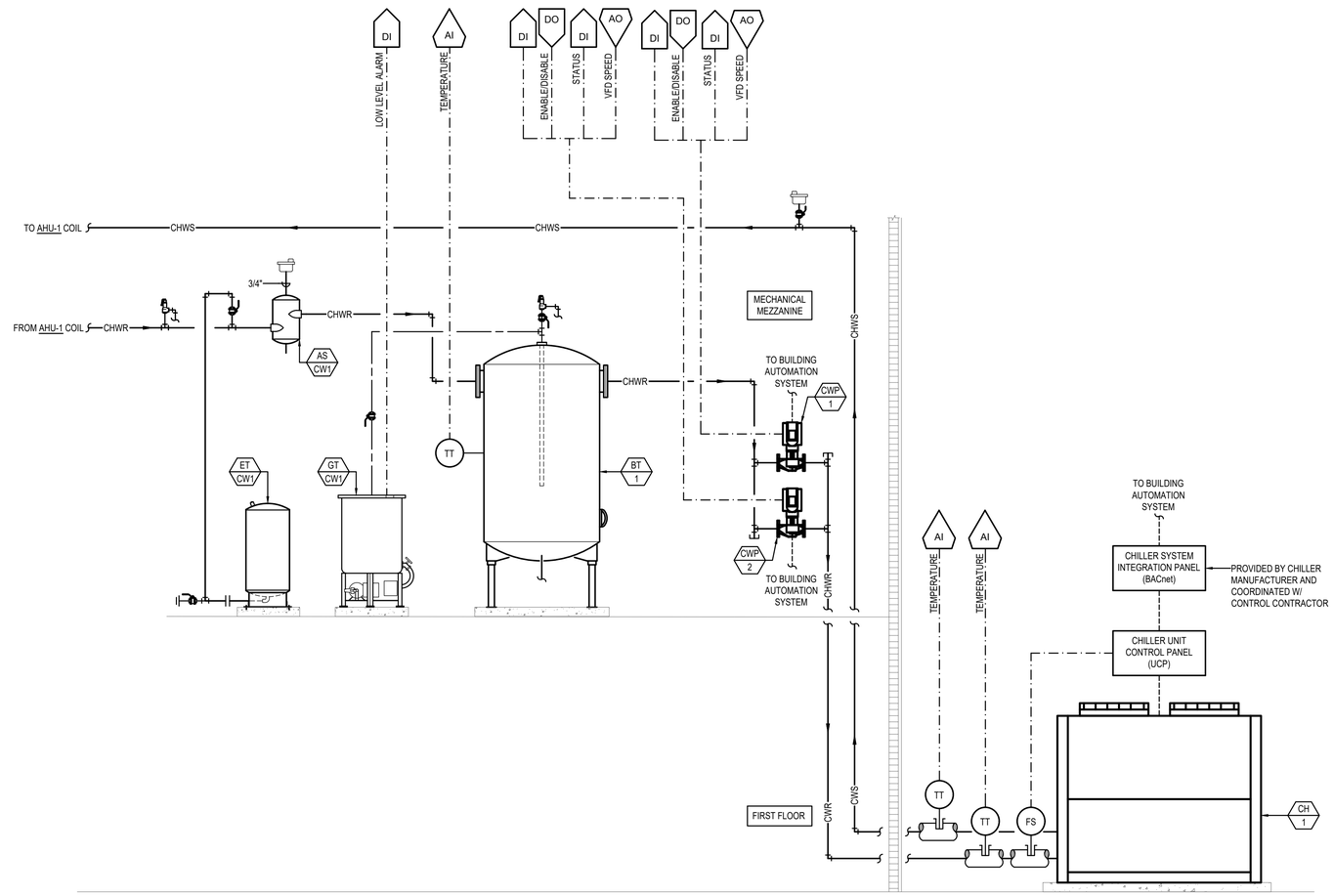
VFD POINTS LIST:
THE VFD CONTROL INTERFACE SHALL PROVIDE BUT NOT BE LIMITED TO THE FOLLOWING:

1. ENABLE/DISABLE
2. ALARMS
3. HERTZ
4. SPEED CONTROL

BID ALTERNATE #2:

1. ALL PARAMETERS SHALL BE REMOTELY ADJUSTABLE FROM THE BUILDING AUTOMATION SYSTEM.
2. ALL ALARMS SHALL BE INCLUDED AS PART OF BID ALTERNATE #2.

CHILLED WATER SYSTEM SEQUENCE OF OPERATION



CHILLED WATER SYSTEM CONTROL SCHEMATIC

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.2

CONSTRUCTION DOCUMENTS

GENERAL:
THE AIR HANDLING UNIT W/ VARIABLE AIR VOLUME (VAV) CONTROL SHALL CONSIST OF AN OUTSIDE AIR INTAKE W/ MODULATING DAMPERS, VARIABLE SPEED SUPPLY FANS, A HOT WATER HEATING COIL, A CHILLED WATER COOLING/DEHUMIDIFICATION COIL, A STEAM HUMIDIFICATION MANIFOLD, AND A GAS-FIRED STEAM HUMIDIFIER. THE CONTROL CONTRACTOR SHALL PROVIDE A NEW DDC CONTROL PACKAGE DEDICATED TO THE COMPLETE OPERATION OF THE UNIT.

THE AIR HANDLING UNIT SHALL OPERATE CONTINUOUSLY.

OCCUPIED MODE:
THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE OUTSIDE AIR DAMPERS.
   a. THE DAMPERS SHALL MODULATE TO PROVIDE THE MINIMUM AMOUNT OF OUTSIDE AIRFLOW (AS INDICATED IN THE AIR HANDLING UNIT SCHEDULE - SET BY BALANCE CONTRACTOR).
   b. VALIDATE THE POSITION THROUGH THE DAMPER POSITION TRANSMITTER.
      1) IF THE DAMPERS FAIL TO PROVIDE THE MINIMUM AMOUNT OF OUTSIDE AIR, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

2. SEND AN ENABLE COMMAND TO THE SUPPLY FAN SYSTEM.
   a. VALIDATE THE RUNNING STATUS THROUGH THE CURRENT SENSING RELAYS.
      1) IF THE FAN(S) FAIL TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   b. THE DDC CONTROLLER SHALL MODULATE THE FANS TO MAINTAIN THE DUCT STATIC PRESSURE SET POINT (REFER TO THE DUCT STATIC PRESSURE RESET SCHEDULE).

COOLING MODE OF OPERATION (CHILLED WATER):
THE CHILLED WATER COOLING MODE OF OPERATION SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SUPPLY AIR TEMPERATURE INCREASES 2°F ABOVE THE SUPPLY AIR TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE CHILLED WATER COOLING COIL CONTROL VALVE.
   a. THE CONTROL VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT.
   b. VALIDATE THE POSITION THROUGH THE SUPPLY AIR TEMPERATURE.
      1) IF THE SUPPLY AIR TEMPERATURE FAILS TO DECREASE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

THE COOLING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SUPPLY AIR TEMPERATURE DECREASES 2°F BELOW THE DISCHARGE AIR TEMPERATURE SET POINT FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND A DISABLE COMMAND TO THE CHILLED WATER COOLING COIL CONTROL VALVE.
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE SUPPLY AIR TEMPERATURE.
   b. IF THE DISCHARGE AIR TEMPERATURE FAILS TO INCREASE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

HEATING MODE OF OPERATION (HEATING WATER):
THE HOT WATER HEATING MODE OF OPERATION SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE DISCHARGE AIR TEMPERATURE DECREASES 2°F BELOW THE SUPPLY AIR TEMPERATURE SET POINT FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE HOT WATER HEATING COIL CONTROL VALVE.
   a. THE CONTROL VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT.

THE HEATING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE DISCHARGE AIR TEMPERATURE INCREASES 1°F ABOVE THE SUPPLY AIR TEMPERATURE SET POINT (AS INDICATED IN THE SUPPLY AIR TEMPERATURE RESET SCHEDULE) FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND A DISABLE COMMAND TO THE HOT WATER HEATING COIL CONTROL VALVE.
   a. VALIDATE THE POSITION THROUGH THE VALVE POSITION TRANSMITTER.
      1) IF THE VALVE FAILS TO CLOSE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

THE DISCHARGE AIR TEMPERATURE SET POINT SHALL BE 55°F.

HUMIDIFICATION MODE OF OPERATION:
THE HUMIDIFICATION MODE OF OPERATION SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. ANY SPACE RELATIVE HUMIDITY DECREASES 1% BELOW THE RELATIVE HUMIDITY LOW LIMIT SET POINT OF 35% FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE ZONE HUMIDIFIER (HUM-1).
   a. VALIDATE THE STATUS OF THE HUMIDIFIER THROUGH THE UNIT CONTROL PANEL (UCP).
      1) IF THE UNIT FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

WHEN A RUNNING STATUS FROM THE UNIT CONTROL PANEL (UCP) HAS BEEN CONFIRMED, THE HUMIDIFIER SHALL CONTINUE TO OPERATE UNDER ITS OWN INTERNAL CONTROLS BY MODULATING AS REQUIRED TO MAINTAIN THE SUPPLY AIR RELATIVE HUMIDITY LOW LIMIT SET POINT. THE DDC CONTROLLER SHALL SEND THE UNIT CONTROL PANEL (UCP) THE SET POINT TO MAINTAIN.

THE HUMIDIFICATION MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. ALL SPACE RELATIVE HUMIDITY LEVELS INCREASES 1% ABOVE THE SUPPLY AIR RELATIVE HUMIDITY LOW LIMIT SET POINT OF 30% FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND A DISABLE COMMAND TO THE HUMIDIFIER (HUM-1).
   a. VALIDATE THE STATUS THROUGH THE UNIT CONTROL PANEL (UCP).
      1) IF THE HUMIDIFIER FAILS TO STOP, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

DEHUMIDIFICATION MODE OF OPERATION (CHILLED WATER):
THE DEHUMIDIFICATION MODE OF OPERATION SHALL BE ENABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. ANY SPACE RELATIVE HUMIDITY LEVEL INCREASES 1% ABOVE THE RELATIVE HUMIDITY HIGH LIMIT SET POINT OF 45% FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

WHEN THE ABOVE CONDITION IS MET, THE DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN ENABLE COMMAND TO THE CHILLED WATER COOLING COIL CONTROL VALVE.
   a. THE CONTROL VALVES SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE DEHUMIDIFICATION SUPPLY AIR TEMPERATURE SET POINT OF 50°F.
      1) IF THE SUPPLY AIR RELATIVE HUMIDITY FAILS TO DECREASE, THE DEHUMIDIFICATION SUPPLY AIR TEMPERATURE SHALL CONTINUE TO DECREASE DOWN TO 45°F.
   b. THE HOT WATER COIL CONTROL VALVE SHALL CONTINUOUSLY MAINTAIN A DISCHARGE AIR TEMPERATURE OF 55°F BY REHEATING THE SUB-COOLED AIR.

THE DEHUMIDIFICATION MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. ALL SPACE RELATIVE HUMIDITY LEVELS DECREASE 1% BELOW THE HIGH LIMIT RELATIVE HUMIDITY SET POINT FOR A PERIOD OF 30 CONSECUTIVE SECONDS.

SAFETIES:
1. IF THE LOW LIMIT TEMPERATURE SWITCH SENSES A SUPPLY AIR TEMPERATURE BELOW 38°F FOR A PERIOD OF 60 CONSECUTIVE SECONDS, THE UNIT SHALL BE DISABLED AND AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

2. IF THE DUCT STATIC PRESSURE SWITCH SENSES A STATIC PRESSURE ABOVE 4" W.G., THE UNIT SHALL BE DISABLED AND AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

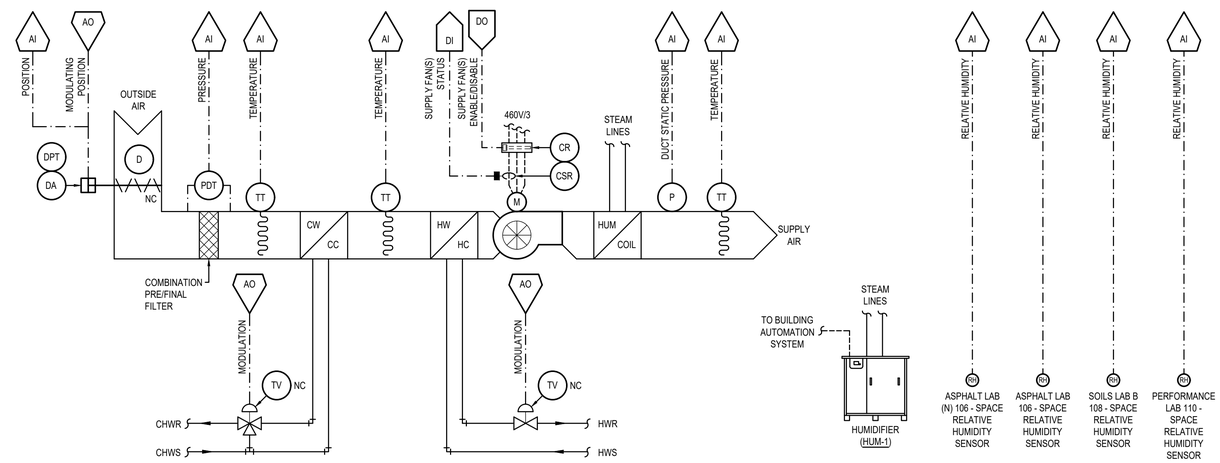
3. IF THE SUPPLY AIR TEMPERATURE DECREASES 5°F BELOW OR INCREASES 5°F ABOVE THE DISCHARGE AIR TEMPERATURE SET POINT FOR A PERIOD OF 60 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

4. IF ANY SPACE RELATIVE HUMIDITY LEVEL DECREASES 5% BELOW OR 5% ABOVE THE RELATIVE HUMIDITY LOW LIMIT AND HIGH LIMIT SET POINTS FOR A PERIOD OF 60 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

5. AS A SECONDARY LOW LIMIT SAFETY, IF THE OUTSIDE AIR TEMPERATURE DROPS BELOW 35°F, THE CHILLED WATER VALVE SHALL OPEN TO 10% AND THE CHILLED WATER PUMP SHALL RUN TO MAINTAIN MINIMUM AMOUNT OF FLOW TO PREVENT COIL FROM FREEZING.

BID ALTERNATE #2:
1. ALL PARAMETERS SHALL BE REMOTELY ADJUSTABLE FROM THE BUILDING AUTOMATION SYSTEM.
2. ALL ALARMS SHALL BE INCLUDED AS PART OF BID ALTERNATE #2.

VARIABLE AIR VOLUME AIR HANDLING UNIT SEQUENCE OF OPERATION
(AHU-1)



VARIABLE AIR VOLUME AIR HANDLING UNIT CONTROL SYSTEM SCHEMATIC
(AHU-1)

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 STATE OF IDAHO CHRISTOPHER D. TEE 1/11/2023

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

CONSTRUCTION DOCUMENTS

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD., LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.3

GENERAL:
EACH ASPHALT LABORATORY VENTILATION CONTROL SYSTEMS SHALL CONSIST OF (1) VARIABLE VOLUME / PRESSURE INDEPENDENT ROOM SUPPLY VALVE W/ A HOT WATER RE-HEAT COIL, (1) VARIABLE VOLUME / PRESSURE INDEPENDENT EXHAUST VALVE, A ROOF MOUNTED EXHAUST FAN, A SYSTEM CONTROL PANEL, AND A HIGH/LOW WALL SWITCH.

AS PART OF THE BASE BID, THE SUPPLY VALVES, EXHAUST VALVES, AND REHEAT COIL SHALL BE CONTROLLED BY A LOCAL TEMPERATURE SENSOR AND A HIGH/LOW WALL SWITCH. THE DDC CONTROLLER WILL CONTROL THE EXHAUST FAN WITH THE HIGH/LOW WALL SWITCH. THE SUPPLY / EXHAUST AIRFLOW AMOUNTS SHALL VARY DEPENDING ON THE MASTER WEEKLY AND HOLIDAY SCHEDULE SET BY THE VALVE MANUFACTURER CONTROLLER.

AS PART OF BID ALTERNATE #2 AN INTEGRATION GATEWAY TO FACILITATE COMMUNICATION BETWEEN THE LABORATORY CONTROL SYSTEM AND THE BUILDING AUTOMATION SYSTEM (BAS). THE SUPPLY / EXHAUST AIRFLOW AMOUNTS SHALL VARY DEPENDING ON THE MASTER WEEKLY AND HOLIDAY SCHEDULE SET BY THE DDC CONTRACTOR. THE DDC CONTROLLER SHALL BE CAPABLE OF BEING MANUALLY RESET TO THE OCCUPIED MODE FOR A 2-HOUR TIME PERIOD UPON A SIGNAL FROM AN OVERRIDE BUTTON LOCATED ON THE SPACE TEMPERATURE SENSOR.

OPERATING MODE:
1. THE ROOM SUPPLY VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE FOLLOWING:
   a. NEGATIVE ROOM OFFSET AIRFLOW VOLUME.
      OR
   b. THE SPACE TEMPERATURE SET POINT.
2. THE EXHAUST VALVE SHALL CONTINUOUSLY MODULATE AS NEEDED TO HELP TO MAINTAIN THE NEGATIVE ROOM OFFSET AIRFLOW VOLUME.

THE SPACE EXHAUST FAN SHALL OPERATE CONTINUOUSLY. THERE SHALL BE TWO EXHAUST FAN OPERATING MODES BASED ON THE SPACE SWITCH POSITION.

OCCUPIED MODE (OPERATING MODE #1):
WHEN THE LABORATORY VENTILATION SYSTEM IS SCHEDULED INTO THE OCCUPIED MODE, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE ROOM SUPPLY VALVE (SV-1 / SV-2).
   a. THE VALVE SHALL MODULATE TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   b. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% FOR A PERIOD OF 30 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE EXHAUST VALVE (EV-1 / EV-2) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.
2. SEND AN ENABLE COMMAND TO THE EXHAUST FAN (EF-5 / EF-6).
   a. THE FAN SHALL MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE. SETPOINT SHALL BE SET BY BALANCE CONTRACTOR.
   b. VALIDATE THE OPERATION OF THE FAN THROUGH THE VFD INTERFACE.
      1) IF THE FAN FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

THE OCCUPIED MODE SPACE TEMPERATURE SET POINT SHALL BE SET AT 72°F.

NOTE: CONTROL OF THE SPACE TEMPERATURE SHALL BE PROVIDED THROUGH A PROPORTIONAL PLUS INTEGRAL (PI) CONTROLLER IN ORDER TO MAINTAIN THE SPACE TEMPERATURE WITHIN +/- 2°F OF THE SET POINT. ADDITIONAL TIME MUST BE PROVIDED BY THE CONTROLS CONTRACTOR TO PROPERLY TUNE THE PROPORTIONAL PLUS INTEGRAL (PI) CONTROL LOOP. (BID ALTERNATE #2)

OCCUPIED MODE (OPERATING MODE #2):
IF THE WALL SWITCH IS ENABLED WHILE THE VENTILATION MODE IS OPERATING, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE ROOM SUPPLY VALVE (SV-1 / SV-2).
   a. THE VALVE SHALL MODULATE TO PROVIDE THE MAXIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   b. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% (ADJUSTABLE) FOR A PERIOD OF 30 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE EXHAUST VALVE (EV-1 / EV-2) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.
2. THE EXHAUST FAN (EF-5 / EF-6) SHALL CONTINUE TO MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE SETPOINT.

COOLING MODE OF OPERATION:
THE COOLING MODE OF OPERATION SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE SUPPLY AIRFLOW IS BELOW THE COOLING SUPPLY AIRFLOW REQUIRED TO MAINTAIN THE SPACE TEMPERATURE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
2. THE SPACE TEMPERATURE INCREASES ABOVE THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITIONS ARE MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OVERRIDE COMMAND TO THE ROOM SUPPLY VALVE AND MODULATE THE DAMPER TO THE COOLING AIRFLOW POSITION (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. THE EXHAUST VALVE (EV-1 / EV-2) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).

THE COOLING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE IS EQUAL TO OR BELOW THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. ALLOW THE SUPPLY VALVE TO ENTER BACK INTO ITS RESPECTIVE OCCUPIED / UNOCCUPIED AIRFLOW RATE.
   a. THE EXHAUST VALVE (EV-1 / EV-2) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.

HEATING MODE OF OPERATION:
THE HEATING MODE OF OPERATION SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE SUPPLY AIRFLOW IS BELOW THE HEATING SUPPLY AIRFLOW REQUIRED TO MAINTAIN THE SPACE TEMPERATURE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
2. THE SPACE TEMPERATURE DECREASES BELOW THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITIONS ARE MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OVERRIDE COMMAND TO THE ROOM SUPPLY VALVE AND MODULATE THE DAMPER TO THE HEATING AIRFLOW POSITION (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. THE EXHAUST VALVE (EV-1 / EV-2) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
2. SEND A ENABLE COMMAND TO THE HOT WATER REHEAT COIL CONTROL VALVE.
   a. THE CONTROL VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT.

THE HEATING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE IS EQUAL TO OR ABOVE THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. ALLOW THE SUPPLY VALVE TO ENTER BACK INTO ITS RESPECTIVE OCCUPIED / UNOCCUPIED AIRFLOW RATE.
   a. THE EXHAUST VALVE (EV-1 / EV-2) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.

UNOCCUPIED MODE:
WHEN THE LABORATORY VENTILATION SYSTEM IS SCHEDULED INTO THE UNOCCUPIED MODE, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND A COMMAND TO THE ROOM SUPPLY VALVE (SV-1/SV-2) TO CLOSE DOWN TO THE MINIMUM POSITION.
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO CLOSE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
2. SEND A COMMAND TO THE ROOM EXHAUST VALVE (EV-3/EV-4) TO CLOSE DOWN TO THE MINIMUM POSITION.
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO CLOSE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   b. THE EXHAUST FAN (EF-5/EF-6) SHALL MODULATE DOWN TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.

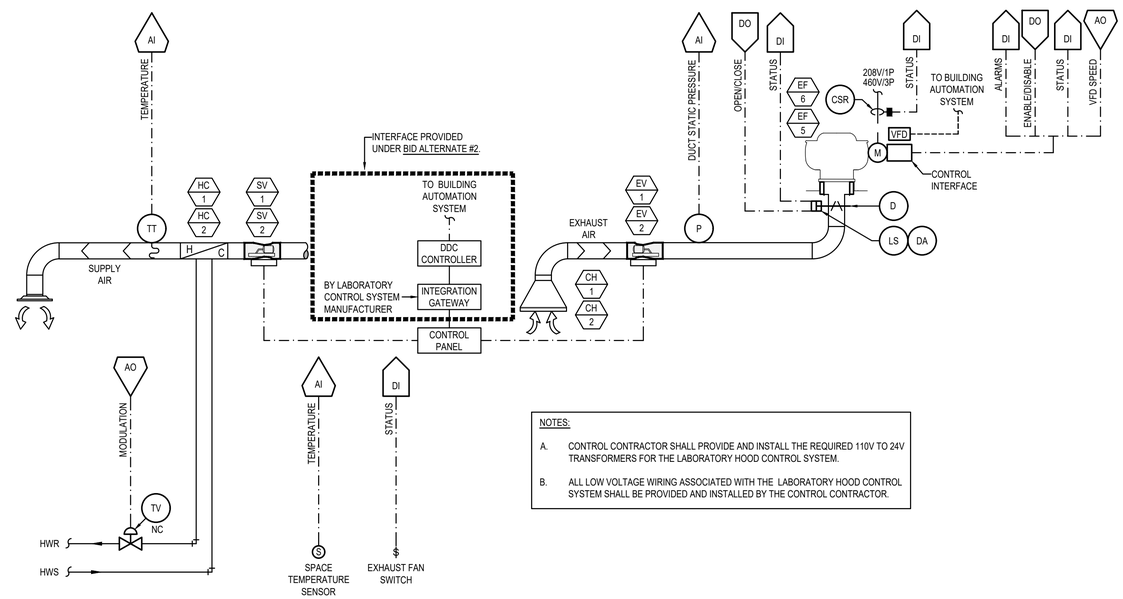
THE UNOCCUPIED MODE SPACE TEMPERATURE SET POINT SHALL BE SET AT 68°F.

SAFETIES
THE MAIN EXHAUST DUCT SHALL INCLUDE A LOW DUCT STATIC LIMIT SWITCH TO PREVENT UNDER-PRESSURIZATION.

BID ALTERNATE #2:
1. ALL PARAMETERS SHALL BE REMOTELY ADJUSTABLE FROM THE BUILDING AUTOMATION SYSTEM.
2. ALL ALARMS SHALL BE INCLUDED AS PART OF BID ALTERNATE #2.

ASPHALT LAB VENTILATION SEQUENCE OF OPERATION

(EXISTING & NEW ASPHALT LABS)



NOTES:

A. CONTROL CONTRACTOR SHALL PROVIDE AND INSTALL THE REQUIRED 110V TO 24V TRANSFORMERS FOR THE LABORATORY HOOD CONTROL SYSTEM.

B. ALL LOW VOLTAGE WIRING ASSOCIATED WITH THE LABORATORY HOOD CONTROL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTROL CONTRACTOR.

ASPHALT LAB VENTILATION CONTROL SCHEMATIC

(EXISTING & NEW ASPHALT LABS)

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 1/1/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.4

CONSTRUCTION DOCUMENTS

GENERAL:
THE SOILS LABORATORY VENTILATION CONTROL SYSTEMS SHALL CONSIST OF (1) VARIABLE VOLUME / PRESSURE INDEPENDENT ROOM SUPPLY VALVE W/ A HOT WATER RE-HEAT COIL, (1) VARIABLE VOLUME / PRESSURE INDEPENDENT EXHAUST VALVE, A ROOF MOUNTED EXHAUST FAN, A SYSTEM CONTROL PANEL, AND A HIGH/LOW WALL SWITCH.

AS PART OF THE BASE BID, THE SUPPLY VALVE, EXHAUST VALVE, AND REHEAT COIL SHALL BE CONTROLLED BY A LOCAL TEMPERATURE SENSOR AND A HIGH/LOW WALL SWITCH. THE DDC CONTROLLER WILL CONTROL THE EXHAUST FAN WITH THE HIGH/LOW WALL SWITCH. THE SUPPLY / EXHAUST AIRFLOW AMOUNTS SHALL VARY DEPENDING ON THE MASTER WEEKLY AND HOLIDAY SCHEDULE SET BY THE VALVE MANUFACTURER CONTROLLER.

AS PART OF BID ALTERNATE #2 AN INTEGRATION GATEWAY TO FACILITATE COMMUNICATION BETWEEN THE LABORATORY CONTROL SYSTEM AND THE BUILDING AUTOMATION SYSTEM (BAS). THE SUPPLY / EXHAUST AIRFLOW AMOUNTS SHALL VARY DEPENDING ON THE MASTER WEEKLY AND HOLIDAY SCHEDULE SET BY THE DDC CONTRACTOR. THE DDC CONTROLLER SHALL BE CAPABLE OF BEING MANUALLY RESET TO THE OCCUPIED MODE FOR A 2-HOUR TIME PERIOD UPON A SIGNAL FROM AN OVERRIDE BUTTON LOCATED ON THE SPACE TEMPERATURE SENSOR.

OPERATING MODE:
1. THE ROOM SUPPLY VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE FOLLOWING:
   a. NEGATIVE ROOM OFFSET AIRFLOW VOLUME.
      OR
   b. THE SPACE TEMPERATURE SET POINT.
2. THE EXHAUST VALVE SHALL CONTINUOUSLY MODULATE AS NEEDED TO HELP TO MAINTAIN THE NEGATIVE ROOM OFFSET AIRFLOW VOLUME.

THE SPACE EXHAUST FAN SHALL OPERATE CONTINUOUSLY. THERE SHALL BE TWO EXHAUST FAN OPERATING MODES BASED ON THE SPACE SWITCH POSITION.

OCCUPIED MODE (OPERATING MODE #1):
WHEN THE LABORATORY VENTILATION SYSTEM IS SCHEDULED INTO THE OCCUPIED MODE, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE ROOM SUPPLY VALVE (SV-3).
   a. THE VALVE SHALL MODULATE TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   b. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% FOR A PERIOD OF 30 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE EXHAUST VALVE (EV-3) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.

2. SEND AN ENABLE COMMAND TO THE EXHAUST FAN (UEF-5).
   a. THE FAN SHALL MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE. SETPOINT SHALL BE SET BY BALANCE CONTRACTOR.
   b. VALIDATE THE OPERATION OF THE FAN THROUGH THE VFD INTERFACE.
      1) IF THE FAN FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

THE OCCUPIED MODE SPACE TEMPERATURE SET POINT SHALL BE SET AT 72°F.

NOTE: CONTROL OF THE SPACE TEMPERATURE SHALL BE PROVIDED THROUGH A PROPORTIONAL PLUS INTEGRAL (PI) CONTROLLER IN ORDER TO MAINTAIN THE SPACE TEMPERATURE WITHIN +/- 2°F OF THE SET POINT. ADDITIONAL TIME MUST BE PROVIDED BY THE CONTROLS CONTRACTOR TO PROPERLY TUNE THE PROPORTIONAL PLUS INTEGRAL (PI) CONTROL LOOP. (BID ALTERNATE #2)

OCCUPIED MODE (OPERATING MODE #2):
IF THE WALL SWITCH IS ENABLED WHILE THE VENTILATION MODE IS OPERATING, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE ROOM SUPPLY VALVE (SV-3).
   a. THE VALVE SHALL MODULATE TO PROVIDE THE MAXIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   b. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% (ADJUSTABLE) FOR A PERIOD OF 30 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE EXHAUST VALVE (EV-3) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.

2. THE EXHAUST FAN (UEF-1) SHALL CONTINUE TO MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE SETPOINT.

COOLING MODE OF OPERATION:
THE COOLING MODE OF OPERATION SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE SUPPLY AIRFLOW IS BELOW THE COOLING SUPPLY AIRFLOW REQUIRED TO MAINTAIN THE SPACE TEMPERATURE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).

2. THE SPACE TEMPERATURE INCREASES ABOVE THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITIONS ARE MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OVERRIDE COMMAND TO THE ROOM SUPPLY VALVE AND MODULATE THE DAMPER TO THE COOLING AIRFLOW POSITION (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. THE EXHAUST VALVE (EV-3) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).

THE COOLING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE IS EQUAL TO OR BELOW THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. ALLOW THE SUPPLY VALVE TO ENTER BACK INTO ITS RESPECTIVE OCCUPIED / UNOCCUPIED AIRFLOW RATE.
   a. THE EXHAUST VALVE (EV-3) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.

HEATING MODE OF OPERATION:
THE HEATING MODE OF OPERATION SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE SUPPLY AIRFLOW IS BELOW THE HEATING SUPPLY AIRFLOW REQUIRED TO MAINTAIN THE SPACE TEMPERATURE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).

2. THE SPACE TEMPERATURE DECREASES BELOW THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITIONS ARE MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OVERRIDE COMMAND TO THE ROOM SUPPLY VALVE AND MODULATE THE DAMPER TO THE HEATING AIRFLOW POSITION (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. THE EXHAUST VALVE (EV-3) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).

2. SEND A ENABLE COMMAND TO THE HOT WATER REHEAT COIL CONTROL VALVE.
   a. THE CONTROL VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT.

THE HEATING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE IS EQUAL TO OR ABOVE THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. ALLOW THE SUPPLY VALVE TO ENTER BACK INTO ITS RESPECTIVE OCCUPIED / UNOCCUPIED AIRFLOW RATE.
   a. THE EXHAUST VALVE (EV-3) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.

UNOCCUPIED MODE:
WHEN THE LABORATORY VENTILATION SYSTEM IS SCHEDULED INTO THE UNOCCUPIED MODE, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. THE SUPPLY VALVE (SV-3) SHALL MODULATE DOWN TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO CLOSE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

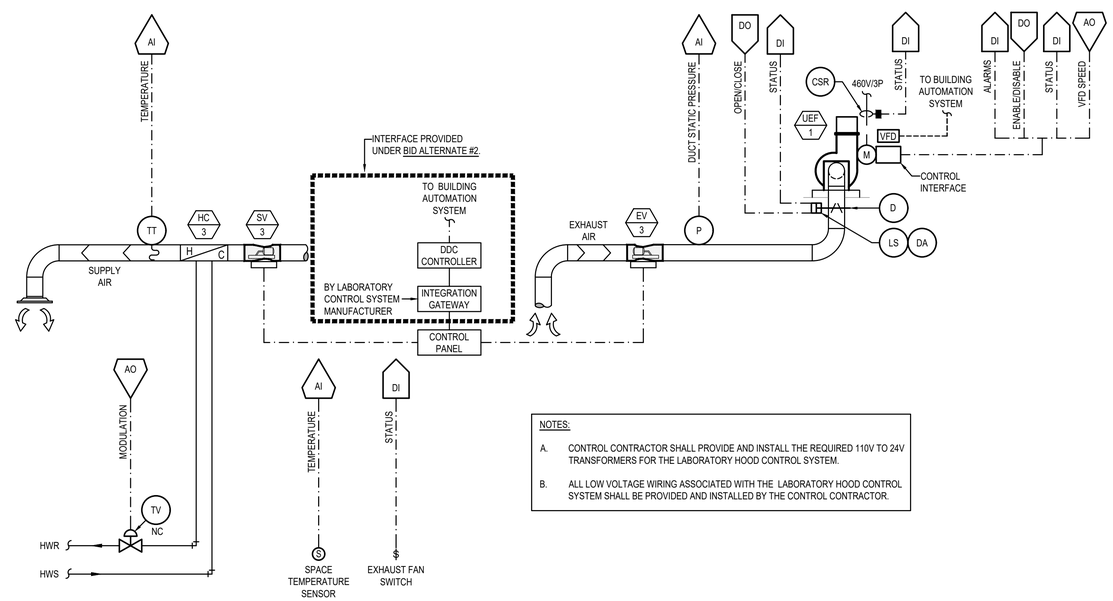
2. THE EXHAUST VALVE (EV-3) SHALL MODULATE DOWN TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM EXHAUST VALVE SCHEDULE)..
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO CLOSE, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   b. THE UTILITY EXHAUST FAN (UEF-1) SHALL MODULATE DOWN TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.

THE UNOCCUPIED MODE SPACE TEMPERATURE SET POINT SHALL BE SET AT 68°F.

SAFETIES
THE MAIN EXHAUST DUCT SHALL INCLUDE A LOW DUCT STATIC LIMIT SWITCH TO PREVENT UNDER-PRESSURIZATION.

BID ALTERNATE #2:
1. ALL PARAMETERS SHALL BE REMOTELY ADJUSTABLE FROM THE BUILDING AUTOMATION SYSTEM.
2. ALL ALARMS SHALL BE INCLUDED AS PART OF BID ALTERNATE #2.

SOILS LAB VENTILATION SEQUENCE OF OPERATION



NOTES:

A. CONTROL CONTRACTOR SHALL PROVIDE AND INSTALL THE REQUIRED 110V TO 24V TRANSFORMERS FOR THE LABORATORY HOOD CONTROL SYSTEM.

B. ALL LOW VOLTAGE WIRING ASSOCIATED WITH THE LABORATORY HOOD CONTROL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTROL CONTRACTOR.

SOILS LAB VENTILATION CONTROL SCHEMATIC

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER
LICENSE NO. 16683
Expiration 1/31/2023
STATE OF IDAHO
CHRISTOPHER D. TATE

REVISIONS

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CONSULTANTS ◇

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.5

CONSTRUCTION DOCUMENTS

GENERAL:
THE PERFORMANCE LABORATORY VENTILATION CONTROL SYSTEMS SHALL CONSIST OF (2) VARIABLE VOLUME / PRESSURE INDEPENDENT ROOM SUPPLY VALVES W/ HOT WATER RE-HEAT COILS, (3) VARIABLE VOLUME / PRESSURE INDEPENDENT EXHAUST VALVES, (3) ROOF MOUNTED EXHAUST FANS, A SYSTEM CONTROL PANEL, (1) ON/OFF SWITCH, AND A (2) HIGH/LOW WALL SWITCHES.

AS PART OF THE BASE BID, THE SUPPLY VALVES, EXHAUST VALVES, AND REHEAT COILS SHALL BE CONTROLLED BY A LOCAL TEMPERATURE SENSOR AND A HIGH/LOW WALL SWITCH. THE DDC CONTROLLER WILL CONTROL THE EXHAUST FAN WITH THE HIGH/LOW WALL SWITCH. THE SUPPLY / EXHAUST AIRFLOW AMOUNTS SHALL VARY DEPENDING ON THE MASTER WEEKLY AND HOLIDAY SCHEDULE SET BY THE VALVE MANUFACTURER CONTROLLER.

AS PART OF BID ALTERNATE #2 AN INTEGRATION GATEWAY TO FACILITATE COMMUNICATION BETWEEN THE LABORATORY CONTROL SYSTEM AND THE BUILDING AUTOMATION SYSTEM (BAS). THE SUPPLY / EXHAUST AIRFLOW AMOUNTS SHALL VARY DEPENDING ON THE MASTER WEEKLY AND HOLIDAY SCHEDULE SET BY THE DDC CONTRACTOR. THE DDC CONTROLLER SHALL BE CAPABLE OF BEING MANUALLY RESET TO THE OCCUPIED MODE FOR A 2-HOUR TIME PERIOD UPON A SIGNAL FROM AN OVERRIDE BUTTON LOCATED ON THE SPACE TEMPERATURE SENSOR.

THE SUPPLY AIR VALVES SHALL OPERATE IN THE SAME MODE TO PREVENT SIMULTANEOUS HEATING AND COOLING.

OPERATING MODE:
1. THE ROOM SUPPLY VALVES SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE FOLLOWING:
   a. NEGATIVE ROOM OFFSET AIRFLOW VOLUME.
      OR
   b. THE SPACE TEMPERATURE SET POINT.
2. THE EXHAUST VALVES SHALL CONTINUOUSLY MODULATE AS NEEDED TO HELP TO MAINTAIN THE NEGATIVE ROOM OFFSET AIRFLOW VOLUME.

THE UTILITY EXHAUST FANS (UEF-2 & UEF-3) SHALL OPERATE CONTINUOUSLY. THERE SHALL BE TWO EXHAUST FAN OPERATING MODES BASED ON THE INDIVIDUAL SPACE SWITCH POSITION.

THE UTILITY EXHAUST FAN (UEF-4) SHALL OPERATE OFF A SINGLE ON/OFF SWITCH.

OCCUPIED MODE (OPERATING MODE #1):
WHEN THE LABORATORY VENTILATION SYSTEM IS SCHEDULED INTO THE OCCUPIED MODE, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE ROOM SUPPLY VALVES (SV-4 & SV-5).
   a. THE VALVE SHALL MODULATE TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   b. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% FOR A PERIOD OF 30 CONSECUTIVE SECONDS, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE EXHAUST VALVES (EV-4 & EV-5) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.
2. SEND AN ENABLE COMMAND TO THE UTILITY EXHAUST FANS (UEF-2 & UEF-3).
   a. THE FANS SHALL MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE. SETPOINT SHALL BE SET BY BALANCE CONTRACTOR.
   b. VALIDATE THE OPERATION OF THE FAN THROUGH THE VFD INTERFACE.
      1) IF THE FAN FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)

THE OCCUPIED MODE SPACE TEMPERATURE SET POINT SHALL BE SET AT 72°F.

NOTE: CONTROL OF THE SPACE TEMPERATURE SHALL BE PROVIDED THROUGH A PROPORTIONAL PLUS INTEGRAL (PI) CONTROLLER IN ORDER TO MAINTAIN THE SPACE TEMPERATURE WITHIN +/- 2°F OF THE SET POINT. ADDITIONAL TIME MUST BE PROVIDED BY THE CONTROLS CONTRACTOR TO PROPERLY TUNE THE PROPORTIONAL PLUS INTEGRAL (PI) CONTROL LOOP.

OCCUPIED MODE (OPERATING MODE #2):
UEF-2 & UEF-3 INCLUDE INDIVIDUAL WALL SWITCHES LOCATED IN THE PERFORMANCE LAB. IF THE RESPECTIVE UTILITY EXHAUST FAN WALL SWITCH IS ENABLED WHILE THE VENTILATION MODE IS OPERATING,THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE ROOM SUPPLY VALVES (SV-4 & SV-5).
   a. THE VALVES SHALL MODULATE AS NECESSARY TO PROVIDE THE MAXIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   b. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% FOR A PERIOD OF 30 CONSECUTIVE SECONDS (ADJUSTABLE), AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE EXHAUST VALVE (EV-4 & EV-5) SHALL ADJUST ACCORDINGLY TO MAINTAIN THE REQUIRED OFFSET AIRFLOW VOLUME.
2. THE UTILITY EXHAUST FANS (UEF-2 & UEF-3) SHALL CONTINUE TO MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE SETPOINT.

COOLING MODE OF OPERATION:
THE COOLING MODE OF OPERATION SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE SUPPLY AIRFLOW IS BELOW THE COOLING SUPPLY AIRFLOW REQUIRED TO MAINTAIN THE SPACE TEMPERATURE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
2. THE SPACE TEMPERATURE INCREASES ABOVE THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITIONS ARE MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OVERRIDE COMMAND TO THE ROOM SUPPLY VALVES (SV-4 & SV-5), AND MODULATE THE DAMPERS TO THE COOLING AIRFLOW POSITION (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. THE EXHAUST VALVES (EV-4 & EV-5) SHALL ADJUST ACCORDINGLY TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.

THE COOLING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE IS EQUAL TO OR BELOW THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. ALLOW THE SUPPLY VALVES (SV-4 & SV-5) TO ENTER BACK INTO ITS RESPECTIVE OCCUPIED / UNOCCUPIED AIRFLOW RATE.
   a. THE EXHAUST VALVE (EV-4 & EV-5) SHALL ADJUST ACCORDINGLY TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.

HEATING MODE OF OPERATION:
THE HEATING MODE OF OPERATION SHALL BE ENABLED WHENEVER BOTH OF THE FOLLOWING CONDITIONS EXIST:

1. THE SUPPLY AIRFLOW IS BELOW THE HEATING SUPPLY AIRFLOW REQUIRED TO MAINTAIN THE SPACE TEMPERATURE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
2. THE SPACE TEMPERATURE DECREASES BELOW THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITIONS ARE MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OVERRIDE COMMAND TO THE ROOM SUPPLY VALVE AND MODULATE THE DAMPER TO THE HEATING AIRFLOW POSITION (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. THE EXHAUST VALVE (EV-4 & EV-5) SHALL ADJUST ACCORDINGLY TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.
2. SEND A ENABLE COMMAND TO THE HOT WATER REHEAT COIL CONTROL VALVE.
   a. THE CONTROL VALVE SHALL CONTINUOUSLY MODULATE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SET POINT.

THE HEATING MODE OF OPERATION SHALL BE DISABLED WHENEVER THE FOLLOWING CONDITION EXISTS:

1. THE SPACE TEMPERATURE IS EQUAL TO OR ABOVE THE SPACE TEMPERATURE SET POINT.

WHEN THE ABOVE CONDITION IS MET, THE VALVE CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. ALLOW THE SUPPLY VALVE TO ENTER BACK INTO ITS RESPECTIVE OCCUPIED / UNOCCUPIED AIRFLOW RATE.

UTILITY EXHAUST FAN AND EXHAUST VALVE (UEF-4 & EV-6) MODE OF OPERATION:
IF THE INDIVIDUAL UTILITY EXHAUST FAN SWITCH IS ENABLED THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

1. SEND AN OPEN COMMAND TO THE EXHAUST VALVE (EV-6).
   a. VALIDATE THE OPERATION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVE FAILS TO PROVIDE THE REQUIRED OFFSET WITHIN +/-10% FOR A PERIOD OF 30 CONSECUTIVE SECONDS (ADJUSTABLE), AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
2. SEND AN ENABLE COMMAND TO THE UTILITY EXHAUST FAN (UEF-4).
   a. THE FAN SHALL MODULATE TO MAINTAIN A NEGATIVE DUCT STATIC PRESSURE. SETPOINT SHALL BE SET BY BALANCE CONTRACTOR.
   b. VALIDATE THE OPERATION OF THE FAN THROUGH THE VFD INTERFACE.
      1) IF THE FAN FAILS TO START, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   c. THE SUPPLY VALVES (SV-4 & SV-5) SHALL CONTINUE TO MODULATE TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.

UNOCCUPIED MODE:
WHEN THE LABORATORY VENTILATION SYSTEM IS SCHEDULED INTO THE UNOCCUPIED MODE, THE VALVE CONTROLLER AND DDC CONTROLLER SHALL SEQUENCE THE FOLLOWING:

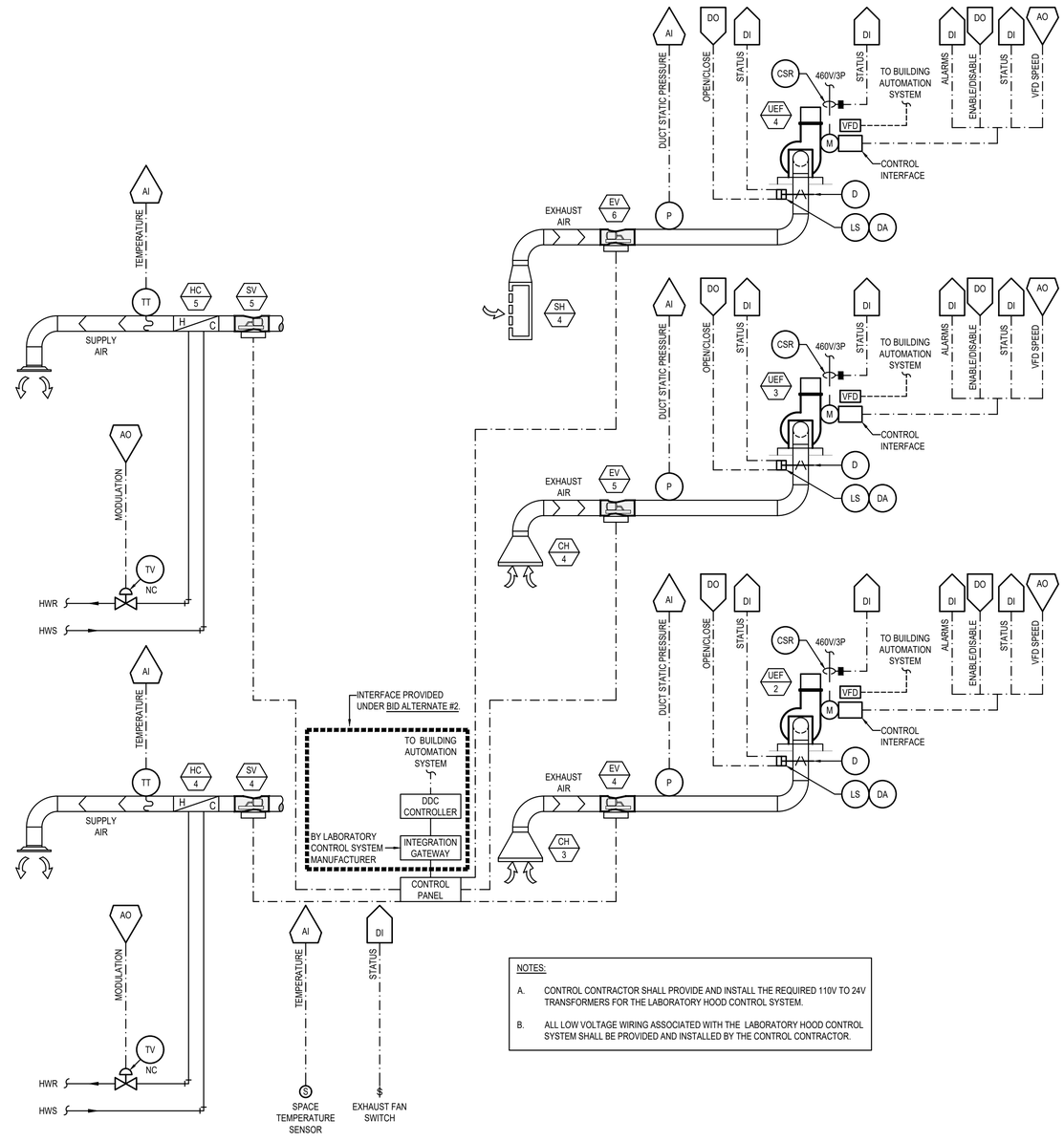
1. THE SUPPLY VALVES SHALL MODULATE DOWN TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM SUPPLY VALVE SCHEDULE).
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVES FAIL TO CLOSE DOWN, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
2. THE EXHAUST VALVES (EV-4 / EV-5) SHALL MODULATE DOWN TO PROVIDE THE MINIMUM OCCUPIED AIRFLOW RATE (AS INDICATED IN THE PRESSURE INDEPENDENT ROOM EXHAUST VALVE SCHEDULE).
   a. VALIDATE THE POSITION OF THE VALVE THROUGH THE CALCULATED AIRFLOW.
      1) IF THE VALVES FAIL TO CLOSE DOWN, AN ALARM OF THE EVENT SHALL BE SENT TO THE OPERATOR'S WORKSTATION. (BID ALTERNATE #2)
   b. THE UTILITY EXHAUST FANS (UEF-2 & UEF-3) SHALL MODULATE DOWN TO MAINTAIN A NEGATIVE ROOM PRESSURE SETPOINT OF -0.01"W.C.

THE UNOCCUPIED MODE SPACE TEMPERATURE SET POINT SHALL BE SET AT 68°F.

SAFETIES
THE MAIN EXHAUST DUCT SHALL INCLUDE A LOW DUCT STATIC LIMIT SWITCH TO PREVENT UNDER-PRESSURIZATION.

BID ALTERNATE #2:
1. ALL PARAMETERS SHALL BE REMOTELY ADJUSTABLE FROM THE BUILDING AUTOMATION SYSTEM.
2. ALL ALARMS SHALL BE INCLUDED AS PART OF BID ALTERNATE #2.

PERFORMANCE LAB VENTILATION SEQUENCE OF OPERATION



NOTES:

A. CONTROL CONTRACTOR SHALL PROVIDE AND INSTALL THE REQUIRED 110V TO 24V TRANSFORMERS FOR THE LABORATORY HOOD CONTROL SYSTEM.

B. ALL LOW VOLTAGE WIRING ASSOCIATED WITH THE LABORATORY HOOD CONTROL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTROL CONTRACTOR.

PERFORMANCE LAB VENTILATION CONTROL SCHEMATIC

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TAYLOR

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

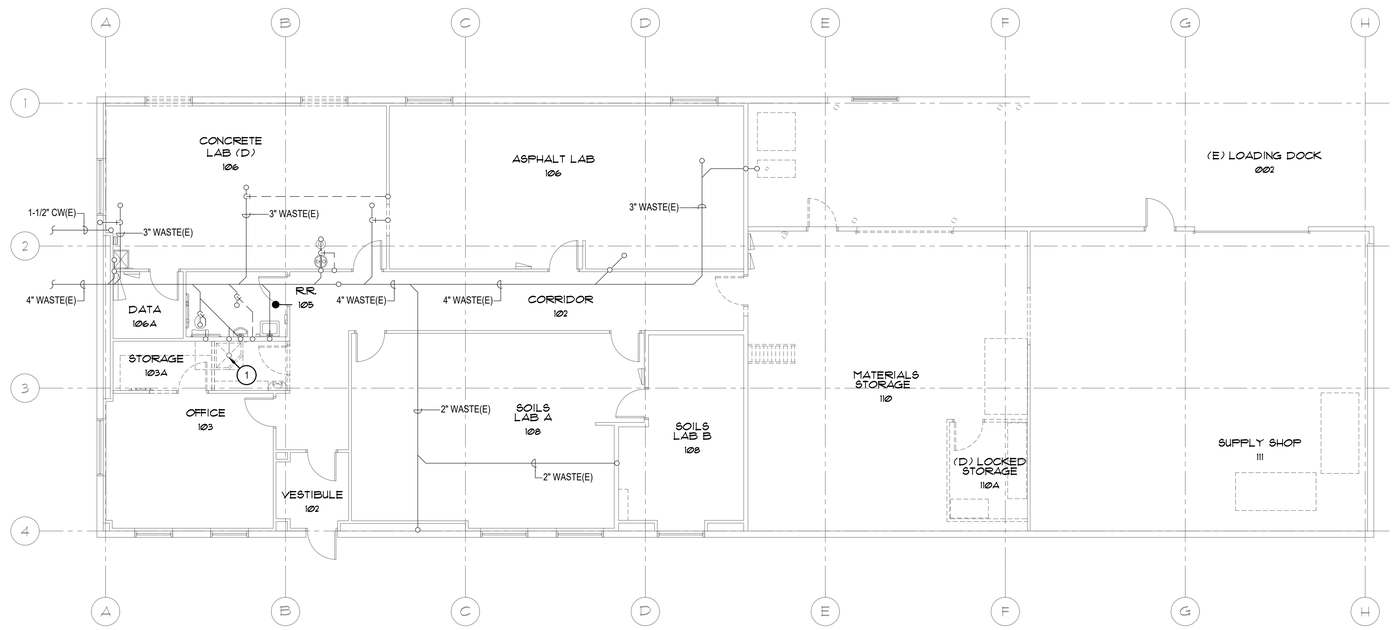
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FHX2011
DAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
MECHANICAL CONTROLS

SHEET ◇
M6.5

CONSTRUCTION DOCUMENTS



PLUMBING DEMOLITION FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. BID ALTERNATE #1: REMOVE MOP SINK WASTE LINE BACK TO WALL AND CAP UNDER. SEE SHEET P1.1 FOR CONTINUATION.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com

Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TN

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

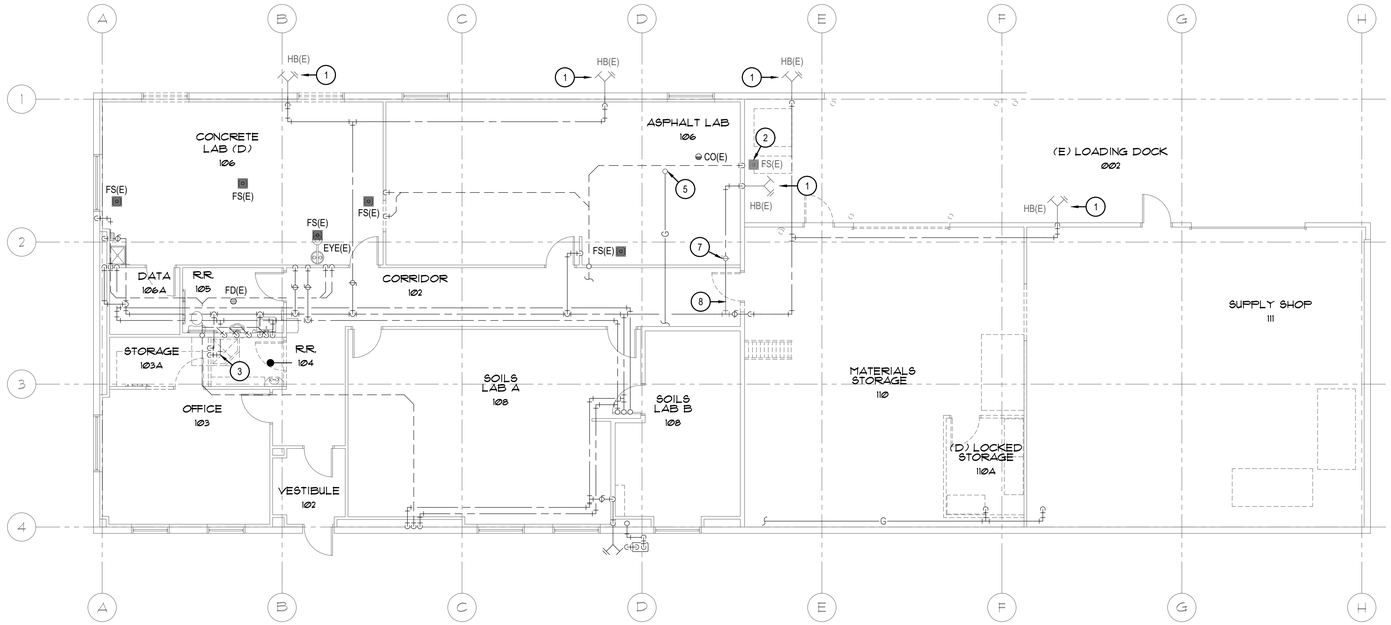
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FM22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD., LEWISTON, ID 83501

DRAWING ◇
PLUMBING
DEMOLITION
FOUNDATION PLAN

SHEET ◇
P1.0

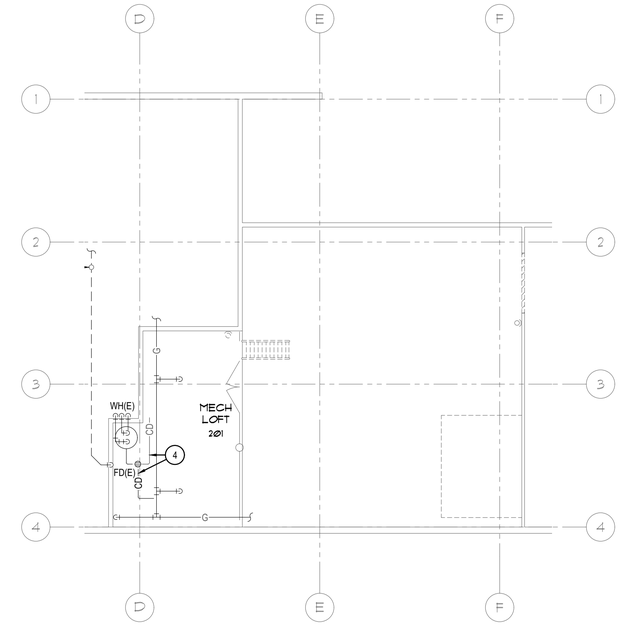
CONSTRUCTION DOCUMENTS



PLUMBING DEMOLITION FLOOR PLAN

SCALE: 1/8" = 1'-0"

NORTH



PLUMBING DEMOLITION FLOOR PLAN - MECHANICAL LOFT

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. DISCONNECT AND REMOVE EXISTING EXTERIOR HOSE BIBB. EXISTING CW LINE TO BE REUSED. SEE NEW WORK ON SHEET P2.1 FOR CONTINUATION.
2. DISCONNECT AND REMOVE EXISTING EXTERIOR FLOOR SINK. EXISTING WASTE LINE TO REMAIN AND BE REUSED. SEE NEW WORK ON SHEET P2.1 FOR CONTINUATION.
3. BID ALTERNATE #1: DISCONNECT AND REMOVE EXISTING MOP SINK AND ALL RELATED ACCESSORIES. EXISTING CW & HW CONNECTIONS TO BE REUSED. SEE NEW WORK ON SHEET P2.1 FOR CONTINUATION.
4. EXISTING CONDENSATE LINE TO REMAIN.
5. DISCONNECT AND REMOVE 2" GAS RISER TO ROOF. SEAL ROOF PENETRATION.
6. DISCONNECT, CAP, AND REMOVE EXISTING GAS LINE ROUTED TO ROOF. SEAL, PATCH, AND REPAIR ROOF PENETRATION.
7. REMOVE EXISTING SHUTOFF VALVE. SEE NEW WORK ON SHEET P2.1 FOR NEW VALVE INSTALLATION LOCATION.
8. DISCONNECT AND CAP 3/4" CW CONNECTION. EXISTING 3/4" CW LINE TO REMAIN AND BE REUSED. SEE NEW WORK ON SHEET P2.1 FOR CONTINUATION.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

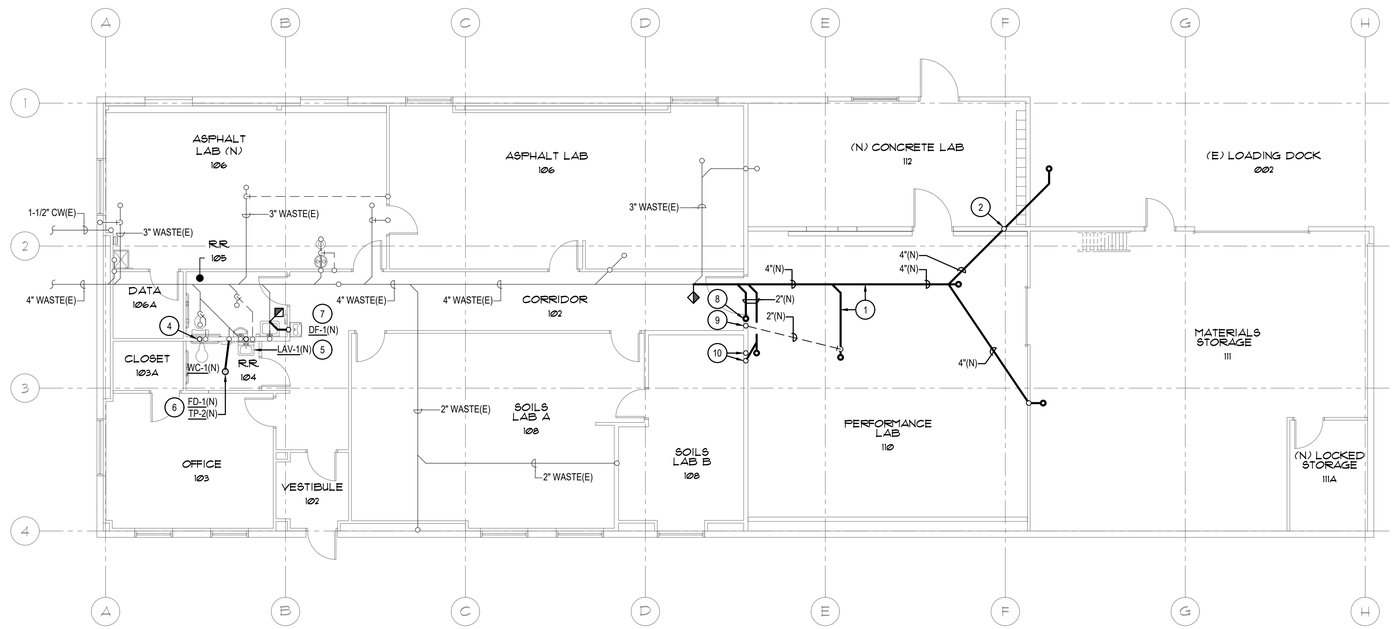
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
PLUMBING DEMOLITION FLOOR PLAN

SHEET ◇
P1.1

CONSTRUCTION DOCUMENTS



PLUMBING NEW WORK FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. SAWCUT FLOOR AND TIE IN NEW 4"Ø WASTE FROM FLOOR SINK TO EXISTING WASTE LINE.
2. ROUTE NEW 2"Ø VENT UP THROUGH EXISTING WALL. SEE SHEET P2.1 FOR CONTINUATION.
3. REPLACE EXISTING FLOOR SINK. RECONNECT TO EXISTING WASTE LINE.
4. BID ALTERNATE #1: CONNECT NEW 4"Ø WASTE TO EXISTING 4" WASTE TIED TO EXISTING WATER CLOSET ON OPPOSITE WALL. ROUTE SEPARATE NEW 2"Ø VENT TO CEILING SPACE AND CONNECT TO NEAREST VENT OF SAME SIZE OR LARGER.
5. BID ALTERNATE #1: CONNECT NEW 1-1/2"Ø WASTE TO EXISTING 1-1/2" WASTE TIED TO EXISTING LAVATORY ON OPPOSITE WALL. ROUTE SEPARATE NEW 1-1/2"Ø VENT TO CEILING SPACE AND CONNECT TO NEAREST VENT OF SAME SIZE OR LARGER.
6. BID ALTERNATE #1: ROUTE NEW 2"Ø WASTE AND CONNECT TO EXISTING WASTE FROM REMOVED SERVICE SINK. ROUTE NEW 2"Ø VENT AND CONNECT TO EXISTING VENT.
7. SAWCUT FLOOR AND TIE IN NEW 1-1/2"Ø WASTE FROM DF-1 TO EXISTING WASTE LINE. ROUTE NEW 1-1/2"Ø VENT TO CEILING SPACE AND CONNECT TO NEAREST VENT OF SAME SIZE OR LARGER.
8. ROUTE NEW 2" WASTE FROM ABOVE. SEE SHEET P2.1 FOR CONTINUATION.
9. COMBINE 2"Ø FS-2 VENT AND 2"Ø FD-1 VENT. ROUTE NEW COMBINED 2"Ø VENT UP THROUGH EXISTING WALL. SEE SHEET P2.1 FOR CONTINUATION.
10. COMBINE 1-1/2"Ø VENT FROM FD-1 AND 2"Ø VENT FROM EYE-1 TO COMMON 2"Ø VENT AND ROUTE TO ROOF.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TYE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

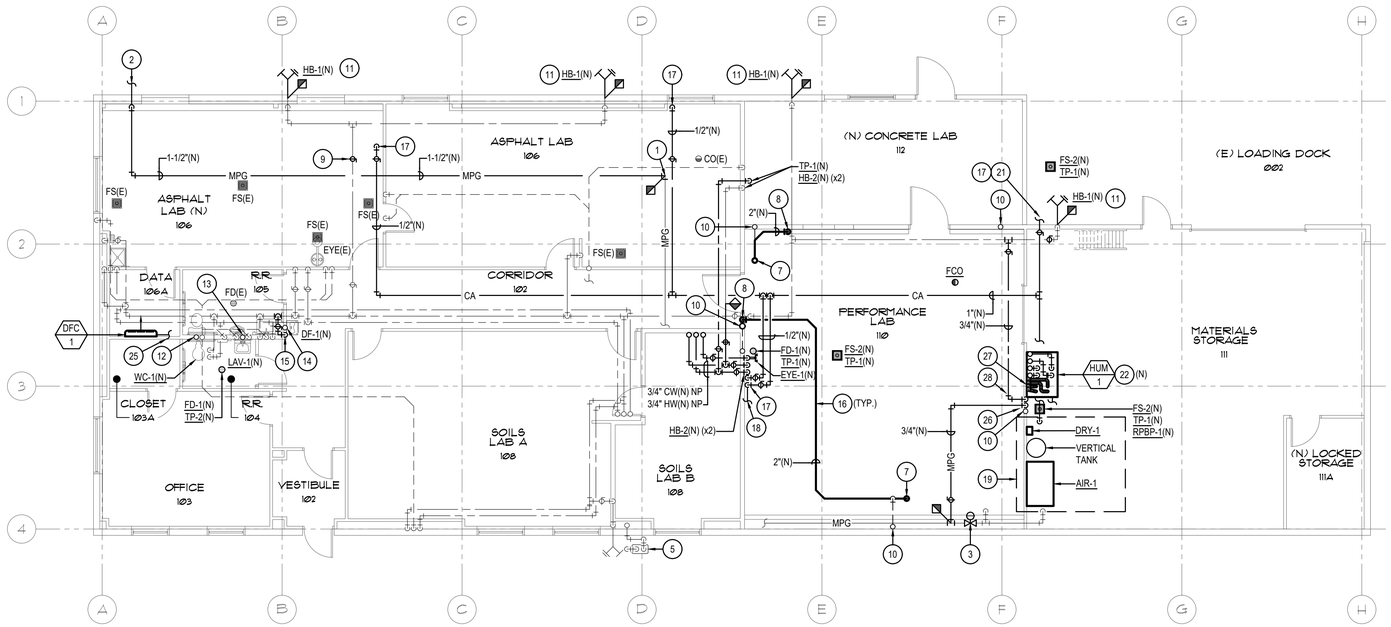
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
DAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD., LEWISTON, ID 83501

DRAWING ◇
PLUMBING NEW WORK FOUNDATION PLAN

SHEET ◇
P2.0

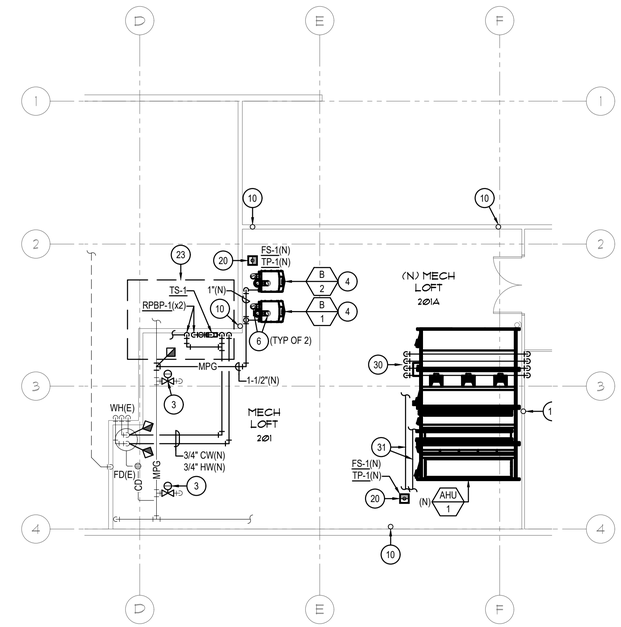
CONSTRUCTION DOCUMENTS



PLUMBING NEW WORK PLAN

SCALE: 1/8" = 1'-0"

NORTH



PLUMBING NEW WORK FLOOR PLAN - MECHANICAL LOFT

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. CONNECT TO EXISTING 2"Ø MPG LINE. ROUTE NEW 1-1/2"Ø MPG LINE ABOVE CEILING.
2. ROUTE NEW 1-1/2"Ø MPG LINE DOWN WALL AND PENETRATE BUILDING LOW. EXTEND LINE TO NEW GENERATOR. SUPPORT GAS PIPING PER DETAIL #3 ON SHEET P3.1.
3. NEW 2 PSI MPG TO LPG REGULATOR WITH ISOLATION VALVES.
4. ROUTE NEW 1"Ø MPG LINE TO EACH BOILER. PROVIDE WITH GAS REGULATOR AND SHUTOFF VALVES. SEE GAS PIPING DETAIL #4 & #5 ON SHEET P3.0 FOR INSTALLATION REQUIREMENTS.
5. CONTRACTOR TO COORDINATE WITH AVISTA TO MODIFY EXISTING OR PROVIDE GAS NEW METER TO ACCOMMODATE NEW GAS LOAD OF 4,099-MBH AT 2 PSI.
6. ROUTE 6"Ø VENT AND 6"Ø FLUE TO ROOF. SEE ROOF PLAN ON SHEET P2.2 FOR CONTINUATION.
7. ROUTE 2"Ø DRAIN FROM MEZZANINE ABOVE.
8. ROUTE 2"Ø DRAIN DOWN WALL TO SLAB BELOW. SEE SHEET P2.0 FOR CONTINUATION.
9. NEW WATER SHUTOFF VALVE.
10. ROUTE 2"Ø VENT TO ROOF. SEE SHEET P2.2 FOR CONTINUATION.
11. CONNECT NEW EXTERIOR FROST PROOF HOSE BIBB TO EXISTING WATER CONNECTION AT WALL.
12. BID ALTERNATE #1: FOR NEW WATER CLOSET ROUTE SEPARATE NEW 2"Ø VENT TO CEILING SPACE AND CONNECT TO NEAREST VENT OF SAME SIZE OR LARGER.
13. BID ALTERNATE #1: FOR NEW LAVATORY ROUTE SEPARATE NEW 1-1/2"Ø VENT TO CEILING SPACE AND CONNECT TO NEAREST VENT OF SAME SIZE OR LARGER
14. ROUTE NEW 1-1/2"Ø VENT TO CEILING SPACE AND CONNECT TO NEAREST VENT OF SAME SIZE OR LARGER.
15. ROUTE NEW 1/2"Ø CW TO DF-1. PROVIDE WITH SHUTOFF VALVE.
16. ROUTE WASTE PIPING ABOVE CEILING. (TYPICAL)
17. SEE AIR COMPRESSOR PIPING CONNECTION DETAIL #2 ON P3.0.
18. ROUTE 1/2" COMPRESSED AIR LINE TO NEW EXTRACTOR.
19. SEE DETAIL #8 ON P3.0 FOR PIPING DIAGRAM OF AIR COMPRESSOR SYSTEM.
20. BLOCKOUT FLOOR AND CAULK SEEPAGE HOLES IN FLOOR SINKS.
21. ROUTE 1/2" COMPRESSED AIR LINE THROUGH EXTERIOR WALL. SEAL WALL PENETRATION.
22. ROUTE CONDENSATE FROM HUM-1 TO FS-2.
23. SEE PIPING DETAIL #5 ON SHEET P3.1.
24. ROUTE 3/4"Ø NON-POTABLE CW, 3/4"Ø NON-POTABLE HW, & 3/4"Ø TW FROM MEZZANINE ABOVE.
25. ROUTE CONDENSATE FROM DFC-1 TO LAV-1, SEE TAILPIECE TRAP CONNECTION DETAIL.
26. ROUTE NEW 3/4"Ø MPG LINE DOWN INSIDE EXISTING WALL TO NEW HUMIDIFIER (HUM-1), PROVIDE WITH GAS REGULATOR AT CONNECTION.
27. ROUTE (2) 3"Ø INTAKES AND (2) 3"Ø FLUES TO ROOF. SEE ROOF PLAN ON SHEET P2.2 FOR CONTINUATION.
28. ROUTE NEW 3/4"Ø CW LINE DOWN TO HUMIDIFIER (HUM-1). PROVIDE WITH RPBP-1 AND FILTER.
29. ROUTE INSULATED STEAM LINES UP TIGHT TO WALL.
30. ROUTE INSULATED STEAM LINES DOWN TO STEAM MANIFOLD AND CONNECT TO AIR HANDLER.
31. ROUTE CONDENSATE LINES FROM HUMIDIFIER AND COOLING COIL DRAIN PAN TO INDIRECT RECEPTACLE.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

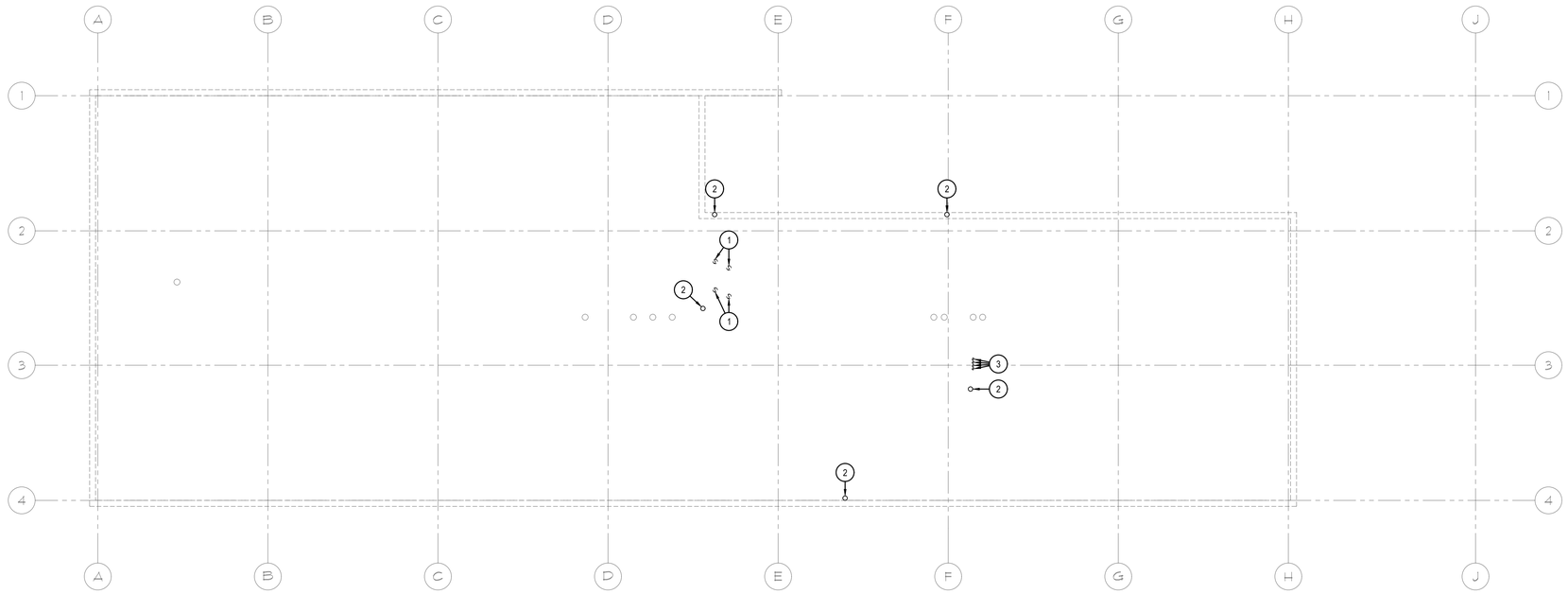
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
IDAHO TRANSPORTATION DEPARTMENT
ITD # FAK2011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
PLUMBING NEW WORK PLAN

SHEET ◇
P2.1

CONSTRUCTION DOCUMENTS



PLUMBING NEW WORK ROOF PLAN

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. ROUTE 6"Ø VENT AND 6"Ø FLUE UP FROM FLOOR BELOW. MAINTAIN FLUE OUTLET 12" ABOVE AND 12" AWAY FROM NEAREST INTAKE PER THE BOILER INSTALLATION MANUAL. SEE SHEET P2.1 FOR CONTINUATION.
2. ROUTE 2"Ø VENT FROM FLOOR BELOW. SEE SHEET P2.1 FOR CONTINUATION. MAINTAIN 10' FROM NEAREST INTAKE.
3. ROUTE (2) 3"Ø INTAKES AND (2) 3"Ø FLUES FROM FLOOR BELOW. SEE FLOOR PLAN ON SHEET P2.1 FOR CONTINUATION. PROVIDE GOOSENECK TURNDOWN ON INTAKE PER MANUFACTURER INSTALLATION REQUIREMENTS.

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com

Project No. 20-227

PROFESSIONAL ENGINEER
LICENSED
16683
1/11/2023
STATE OF IDAHO
CHRISTOPHER D. TATE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

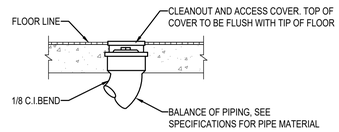
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
PLUMBING NEW
WORK ROOF PLAN

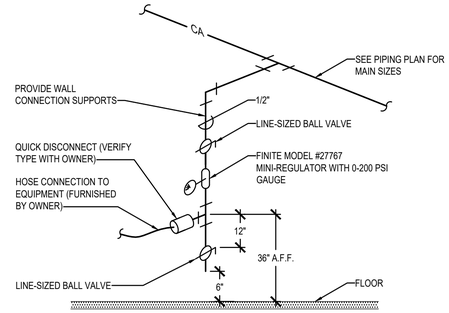
SHEET ◇
P2.2

CONSTRUCTION DOCUMENTS

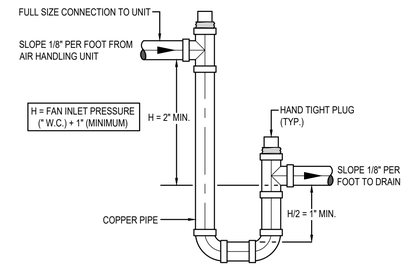


NOTE:
1. CLEANOUTS SHALL BE PROVIDED AT EACH HORIZONTAL DRAINAGE PIPE AT ITS UPPER TERMINAL, AND EACH RUN OF PIPING WHICH IS MORE THAN 100 FEET, AND SHALL BE PROVIDED FOR EACH 100 FEET DEVELOPED LENGTH, OR FRACTION THEREOF OF SUCH PIPING. AN ADDITIONAL CLEANOUT SHALL BE PROVIDED FOR EACH AGGREGATE HORIZONTAL CHANGE OF DIRECTION EXCEEDING ONE HUNDRED THIRTY-FIVE DEGREES, PER APPLICABLE PLUMBING CODE. THIS SHALL BE PROVIDED REGARDLESS OF WHAT IS SHOWN ON THE DRAWINGS.

1 FLOOR CLEANOUT (FCO) DETAIL
NOT TO SCALE

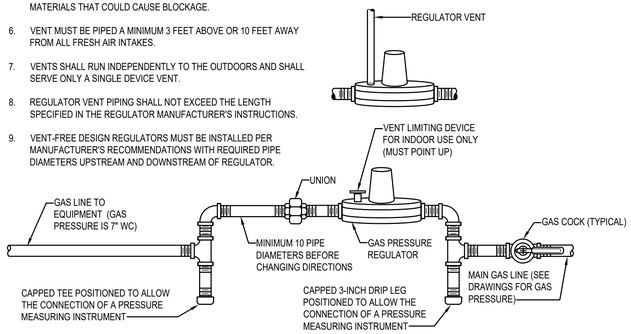


2 COMPRESSED AIR DETAIL
NOT TO SCALE

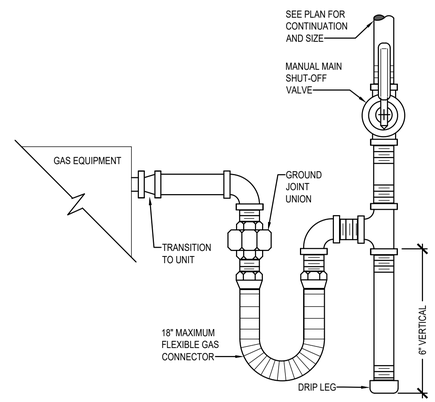


3 DRAW-THRU COIL CONDENSATE DRAIN TRAP DETAIL
NOT TO SCALE

NOTES:
1. VENT REGULATORS PER MANUFACTURER'S AND LOCAL GAS COMPANY'S REQUIREMENTS.
2. DO NOT REDUCE THE VENT PIPE SIZE FROM THE REGULATOR.
3. TO LIMIT THE CONSEQUENCES OF RAIN, SNOW OR DEBRIS GETTING INTO THE VENT, ALWAYS TURN THE OUTLET OF THE VENT DOWN AND ABOVE POTENTIAL WATER OR SNOW LINES.
4. PROVIDE A BUG SCREEN ON THE VENT OUTLET TO DETER INSECTS FROM NESTING IN THE LINE. NEVER PAINT OVER THE BUG SCREEN.
5. A VENT LINE PROTECTOR MAY BE USED IN OUTDOOR APPLICATIONS TO PREVENT ENTRY OF WATER, INSECTS OR OTHER FOREIGN MATERIALS THAT COULD CAUSE BLOCKAGE.
6. VENT MUST BE PIPED A MINIMUM 3 FEET ABOVE OR 10 FEET AWAY FROM ALL FRESH AIR INTAKES.
7. VENTS SHALL RUN INDEPENDENTLY TO THE OUTDOORS AND SHALL SERVE ONLY A SINGLE DEVICE VENT.
8. REGULATOR VENT PIPING SHALL NOT EXCEED THE LENGTH SPECIFIED IN THE REGULATOR MANUFACTURER'S INSTRUCTIONS.
9. VENT-FREE DESIGN REGULATORS MUST BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS WITH REQUIRED PIPE DIAMETERS UPSTREAM AND DOWNSTREAM OF REGULATOR.

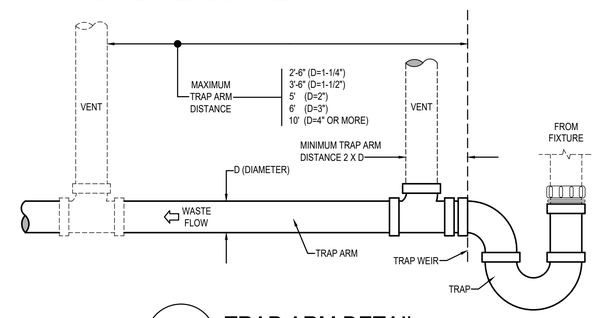


4 GAS PRESSURE REGULATOR DETAIL
NOT TO SCALE

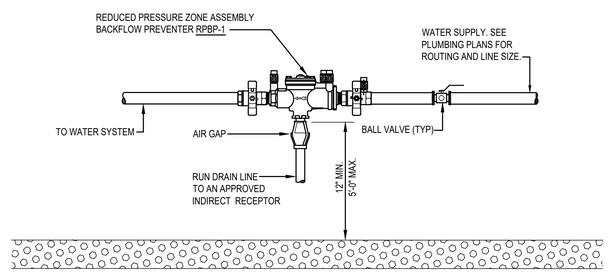


5 GAS EQUIPMENT CONNECTION DETAIL
NOT TO SCALE

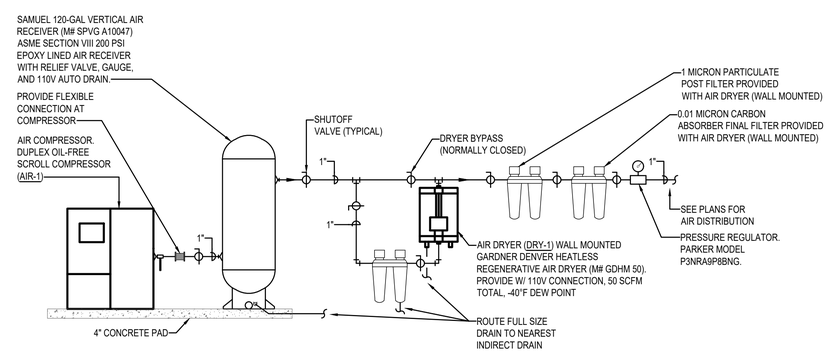
NOTES:
1. MAINTAIN ONE-FOURTH (1/4) INCH PER FOOT SLOPE.
2. THE DEVELOPED LENGTH BETWEEN THE TRAP OF A WATER CLOSET OR SIMILAR FIXTURE (MEASURED FROM THE TOP OF THE CLOSET FLANGE TO THE INNER EDGE OF THE VENT) AND IT'S VENT SHALL NOT EXCEED SIX (6) FEET.
3. ALL PLUMBING EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST ADOPTED PLUMBING CODE, AND ALL LOCAL AND STATE CODES.



6 TRAP ARM DETAIL
NOT TO SCALE



7 REDUCED PRESSURE BACKFLOW PREVENTER (RPBP-1)
NOT TO SCALE



8 COMPRESSED AIR SYSTEM PIPING DETAIL
NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 Expiration 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

REVISIONS

CONSULTANTS ◇

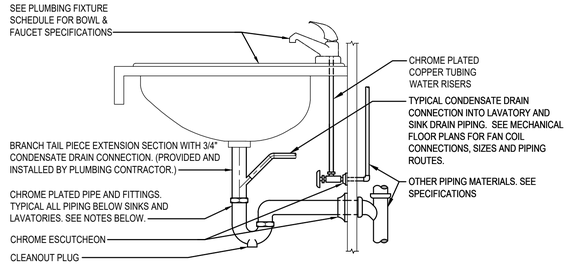
DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

PROJECT ◇ ITD # FA22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇ PLUMBING DETAILS

SHEET ◇ P3.0

CONSTRUCTION DOCUMENTS



NOTES:

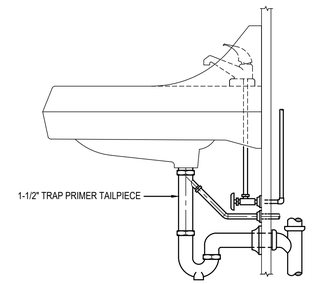
1. INTERIOR EXPOSED PIPE, VALVES AND FIXTURE TRIM, INCLUDING TRIM BEHIND CASEWORK DOORS, SHALL BE CHROME PLATED.
2. ALL PIPING PENETRATIONS THROUGH FINISHED WALLS SHALL BE PROVIDED WITH CHROME ESCUTCHEONS.
3. ALL SINK AND LAVATORY TRAPS SHALL BE PROVIDED WITH A CLEANOUT PLUG IN THE BOTTOM OF THE TRAP.
4. ALL PLUMBING FIXTURES SHALL BE CAULKED AND SEALED TO SURROUNDING SURFACES.
5. PLUMBING CONTRACTOR SHALL VERIFY THE LOCATION OF ALL LAVATORIES AND SINKS THAT NEED TO BE INSTALLED WITH THE BRANCH TAIL PIECE SECTION WITH 3/4" DRAIN CONNECTION. THE PLUMBING CONTRACTOR WILL BE RESPONSIBLE TO VERIFY THE PLUMBING ROUGH-IN DIMENSIONS AND SHALL TAKE INTO ACCOUNT THE TAIL PIECE EXTENSION DIMENSIONS.

1 SINK/LAVATORY TAILPIECE & TRAP DETAIL (WITH CONDENSATE DRAIN CONNECTION)

NOT TO SCALE

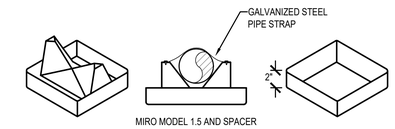
TAILPIECE PRIMER NOTES:

1. THE TAILPIECE PRIMER IS DESIGNED TO PRIME ONE FLOOR DRAIN TRAP AT A DISTANCE NOT TO EXCEED 20 FEET FROM POINT OF INSTALLATION.
2. TRAP PRIMER SHALL BE DEARBORN BRASS MODEL 832-1 OR AN APPROVED EQUAL.



2 TRAP PRIMER CONNECTION DETAIL

NOT TO SCALE



NOTE: ALL GAS PIPING SHALL BE SUPPORTED 6" MINIMUM ABOVE ROOF STRUCTURE.

APPROVED PIPE SUPPORT SYSTEMS:

- MIRO MODEL 1.5 WITH SPACERS
- ADVANCED SUPPORT PRODUCTS
- VERSABLOCK BY FREEDOM INC

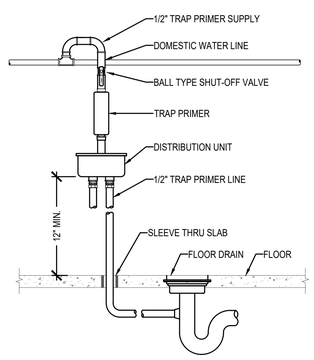
PIPE SUPPORT REQUIREMENTS	
SIZE OF PIPE	SUPPORT REQUIRED
1/2"	6' O.C.
3/4" - 1"	8' O.C.
1-1/4" OR LARGER	10' O.C.

3 GRADE MOUNTED PIPING DETAIL

NOT TO SCALE

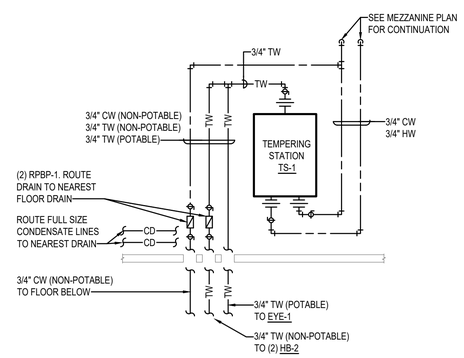
PRESSSURE ACTIVATED PRIMER NOTES:

1. THE PRIMING VALVE MUST BE INSTALLED ON A FRESH COLD WATER LINE OF 1/2" TO 1-1/2" DIAMETER.
2. DISTRIBUTION UNIT MUST BE INSTALLED LEVEL WITH AN ACCESS DOOR FOR PERIODIC INSPECTION.
3. DO NOT SUBJECT TRAP PRIMER VALVE TO ROUGH-IN PRESSURE TEST.
4. DISTANCE FROM DISTRIBUTION UNIT TO FLOOR MUST BE 12" FOR EVERY 20' HORIZONTALLY.
5. TRAP PRIMER SHALL BE PRECISION PLUMBING PRODUCTS MODEL CPO-500 WITH DU DISTRIBUTION UNIT IF REQUIRED. APPROVED ALTERNATES: MIFAB, SIOUX CHIEF, AND ZURN.



4 TRAP PRIMER CONNECTION DETAIL

NOT TO SCALE



5 TEMPERING STATION PIPING DETAIL

NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 1/11/2023 STATE OF IDAHO CHRISTOPHER D. TEE

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
PLUMBING DETAILS

SHEET ◇
P3.1

CONSTRUCTION DOCUMENTS

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE DESCRIPTION	CONNECTION SIZE					MANUFACTURER / MODEL NUMBER / DESCRIPTION / ADDITIONAL COMMENTS
		WASTE	VENT	TRAP	CW	HW	
AIR-1	AIR COMPRESSOR	-	-	-	-	-	GARDNER DENVER ENVIROAIRE DUPLEX OIL ROTARY SCROLL COMPRESSOR W/ DUAL 7.5-HP PUMPS, MODEL BENVS15D-Q. RATED AT 21.5-SCFM PER PUMP, 43-SCFM TOTAL AT 116-PSI. BASE MOUNTED WITH SOUND ENCLOSURE.
DRY-1	REGENERATIVE AIR DRYER	-	-	-	-	-	GARDNER DENVER HEATLESS REGENERATIVE COMPRESSED AIR DRYER, MODEL GDHM 50. PROVIDE WITH 110V CONNECTION. RATED AT 50-SCFM AT -40°F DEW POINT.
DF-1	DRINKING FOUNTAIN WITH BOTTLE FILLING STATION (INTERIOR SINGLE BUBBLER) (ELECTRIC WATER COOLER) (ADA COMPLIANT)	1 1/2	1 1/2	1 1/2	1/2	--	ELKAY MODEL LZS8WSLP (FILTERED) MODEL EZSG8WSLK (NON-FILTERED) SINGLE ADA COOLER WITH BOTTLE FILLING STATION FURNISHED WITH FLEXI-GUARD SAFETY BUBBLER. BUBBLER ACTIVATED BY PUSHBAR. BOTTLE FILLER ACTIVATED BY ELECTRONIC SENSOR WITH AUTOMATIC 30-SECOND SHUT-OFF TIMER. 115 VOLT, 5.0 AMPS, 60 HERTZ. PROVIDE WITH JAY R. SMITH 0830 FLOOR MOUNTED SUPPORT CARRIER. OPTION - CANE APRON.
EYE-1	EMERGENCY EYE WASH (WALL MOUNTED w/ BOWL) (ADA COMPLIANT)	1 1/2	1 1/2	1 1/4	1/2	1/2	ACORN SAFETY MODEL S0440-BF-CS1, BARRIER-FREE, WALL MOUNTED EYE/FACE WASH, STAINLESS STEEL BOWL WITH A "CLAM-SHELL" STAINLESS STEEL COVER, AND ACORN MODEL ET71-1-BVS-OTG LEAD-FREE EMERGENCY THERMOSTATIC MIXING VALVE WITH 1/2" NPT INLETS & OUTLET, 4 GPM @ 5 PSID. PROVIDE WITH LOCKABLE INLET BALL VALVES, STANDARD OUTLET TEMPERATURE GAUGE, AND SELECTABLE TEMPERATURE RANGE FROM 60°F TO 95°F.
FCO	FLOOR CLEANOUT	SEE PLANS	--	--	--	--	JAY R. SMITH 4020 SERIES WITH ADJUSTABLE, ROUND NICKEL BRONZE TOP AND ABS PLUG.
FD-1	FLOOR DRAIN (PVC BODY) (CONCRETE FLOOR)	2	2	2	--	--	SIOUX CHIEF SERIES NUMBER 832-2PNR, POST- CONSTRUCTION LEVELING FLOOR DRAIN, NO-HUB OUTLET, 6-1/2" ROUND, ADJUSTABLE NICKEL BRONZE STRAINER AND TRAP PRIMER PORT. INSTALL TOP OF DRAIN 1/8" BELOW FINISH FLOOR AND CAULK EDGE.
FS-1	FLOOR SINK (6" DEEP) (HALF GRATE, FOOT TRAFFIC RATED)	2	2	2	--	--	JAY R. SMITH FIGURE NUMBER 3100Y-12, CAST IRON RECEPTOR, ALUMINUM DOME STRAINER, NICKEL BRONZE GRATE, AND TRAP PRIMER. INSTALL TOP OF SINK 1/8" BELOW FINISH FLOOR AND CAULK EDGE.
FS-2	FLOOR SINK (FULL GRATE, TRAFFIC RATED)	4	2	4	--	--	JAY R. SMITH FIGURE NUMBER 2440, GALVANIZED STEEL RECEPTOR, SQUARE TOP WITH FREE STANDING 7" SEDIMENT BUCKET, NICKEL BRONZE GRATE, SIDE DISCHARGE, AND TRAP PRIMER. INSTALL TOP OF SINK 1/8" BELOW FINISH FLOOR AND CAULK EDGE.
HB-1	HOSE BIBB (EXTERIOR - NON-FREEZE)	--	--	--	3/4	--	WOODFORD MODEL 67 - EXPOSED STYLE WITH MODEL 50HA BACKFLOW PREVENTER, 3/4" INLET , AND CHROME PLATED. PROVIDE WITH TEE KEY AND INSTALL AT 18" ABOVE FINISH GRADE.
HB-2	HOSE BIBB (INTERIOR -HOT AND COLD)	--	--	--	1/2	1/2	WOODFORD MODEL 122/V122 HOT AND COLD WALL FAUCET - EXPOSED STYLE WITH 3/4" MALE HOSE NOZZLE. PROVIDE WITH ANTI-SIPHON INTEGRAL CHECK AND ATMOSPHERIC VENT.
LAV-1	LAVATORY (WALL MOUNTED) (ADA COMPLIANT)	1 1/2	1 1/2	1 1/4	1/2	1/2	KOHLER KINGSTON MODEL K-2005: VITREOUS CHINA, WALL MOUNTED, HOLES ON 4" CENTERS, AND GRID STRAINER. KOHLER CORALAIS MODEL K-15198: 4-1/2" LONG, SINGLE LEVER FAUCET WITH 0.5 GPM AERATOR. PROVIDE WITH JAY R. SMITH FIGURE NUMBER 0700-Z SUPPORT WITH CONCEALED ARMS AND WATTS SERIES LFUSG-B LEAD-FREE, THERMOSTATIC MIXING VALVE, ASSE STANDARD 1070 LISTED, BRONZE BODY, INTEGRAL CHECK VALVES, AND SELECTABLE TEMPERATURE RANGE FROM 80°F TO 120°F. PROVIDE WITH LS-1 LAV SHIELD.
LS-1	LAVATORY SHIELD (WALL MOUNTED SHIELD FOR CONCEALING PIPING & VALVES)	--	--	--	--	--	TRUEBRO "LAV SHIELD" ADA COMPLIANT, TOTAL ENCLOSURE. SINGLE-PIECE CONSTRUCTION, SLOAN OPTISHIELD ETF-529, OR APPROVED EQUAL.
RPBP-1	REDUCED PRESSURE BACKFLOW PREVENTER	INDIRECT			--	--	WATTS SERIES LF009 LEAD-FREE REDUCED PRESSURE ZONE ASSEMBLY WITH QUARTER-TURN BALL VALVES, STRAINER, AND AIR GAP. CAST COPPER BODY CONSTRUCTION - 1/2" THRU 2". PROVIDE SERIES 957 FOR SIZES 2 1/2" THRU 10".
TP-1	TRAP PRIMER (PRESSURE ACTIVATED) (1 TO 4 TRAPS)	--	--	--	1/2"	--	PRECISION PLUMBING PRODUCTS MODEL CPO-500 WITH DU DISTRIBUTION UNIT IF REQUIRED FOR SERVING MORE THAN ONE TRAP. APPROVED ALTERNATES: MIFAB, SIOUX CHIEF, SLOAN, AND ZURN
TP-2	TRAP PRIMER (LAVATORY TAILPIECE PRIMER) (1 TRAP)	--	--	--	1/2"	--	DEARBORN BRASS 1-1/2" TRAP PRIMER TAILPIECE WITH COMPRESSION CONNECTION.
TS-1	TEMPERING STATION	--	--	--	3/4"	3/4"	LEONARD EMERGENCY EYEWASH MIXING VALVE, MODEL TA-300-LF. PROVIDE WITH METAL WALL MOUNTED ENCLOSURE AND INLET THERMOMETERS. SET TO 72°F DISCHARGE WATER TEMPERATURE.
WC-1	WATER CLOSET (17-1/2" SEAT HEIGHT) (FLUSH TANK) (FLOOR MOUNTED) (COMFORT HEIGHT / ADA)	4	2	INT.	1/2	--	KOHLER CIMARRON MODEL K-5310 (LEFT LEVER) / K-5310-RA (RIGHT LEVER), FLOOR MOUNTED, GRAVITY FLUSH TANK WITH ELONGATED BOWL, 1.28 GPF. KOHLER LUSTRA MODEL K-4650 ELONGATED, OPEN FRONT SEAT WITH CHECK HINGE AND NO COVER.

NOTES:

1. ALL ADA COMPLIANT FIXTURES MUST COMPLY WITH ICC/ANSI A117.1. SEE ARCHITECTURAL PLANS FOR HANDICAPPED FIXTURE DESIGNATIONS, LOCATIONS, CLEARANCES, AND MOUNTING HEIGHTS.
2. ALL EXPOSED HW PIPING, CW PIPING, AND DRAIN LINES BENEATH ALL LAVATORIES AND ALL ADA COMPLIANT SINKS MUST BE INSULATED TO PREVENT INJURY. REFER TO ARCHITECTURAL PLANS. INSULATE WITH MOLDED CLOSED CELL VINYL INSULATION - TRUEBRO, PLUMBEREX, OR EQUAL.
3. PROVIDE P-TRAP PRIMERS FOR ALL FLOOR DRAINS AND FLOOR SINKS (NOT ALL TRAP PRIMERS ARE INDICATED ON PLANS - REFERENCE DETAILS FOR ADDITIONAL INFORMATION). PROVIDE A BALL TYPE SHUT-OFF VALVE UPSTREAM OF PRIMER VALVE. SEE SPECIFICATIONS.
4. SEE SPECIFICATIONS FOR ALTERNATE APPROVED MANUFACTURERS.

GAS SIZING CHART

SYMBOL	INPUT (MBH)	RUNOUT SIZE (2PSI) (INCHES)	EQUIPMENT CONNECTION SIZES (7" WC) (INCHES)
F-1 (E)	40.0	3/4"	3/4"
F-2 (E)	40.0	3/4"	3/4"
F-3 (E)	40.0	3/4"	3/4"
UH-1 (E)	60.0	3/4"	3/4"
UH-2 (E)	60.0	3/4"	3/4"
B-1 (N)	1000	3/4"	3/4"
B-2 (N)	1000	3/4"	3/4"
HUM-1 (N)	444	3/4"	1"
GENERATOR (N)	1,415	1-1/2"	3"
TOTAL	4099.0	EQUIVALENT LENGTH = 160 FT PRESSURE = 2 PSI MAIN SIZE = 2"Ø	

NOTE: GAS SIZES TO EQUIPMENT ARE AS NOTED IN SCHEDULE ABOVE. ROUTE NOTED (2 PSI) GAS LINE TO GAS EQUIPMENT. PROVIDE GAS COCK AND PRESSURE REGULATOR (2 PSI-7" WC) SIZED FOR GAS LOAD AT EACH PIECE OF EQUIPMENT. VENT TO ATMOSPHERE PER MANUFACTURERS RECOMMENDATIONS. ROUTE NOTED (7" WC) GAS LINE TO GAS FIRED EQUIPMENT WITH GAS COCK AND FLEX CONNECTOR AT UNIT. SEE GAS CONNECTION DETAILS ON SHEET P3.0.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER LICENSE NO. 16683 STATE OF IDAHO CHRISTOPHER D. TATE 1/11/2023

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ CD
CHECKED ◇ TN
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
IDAHO TRANSPORTATION DEPARTMENT
ITD # FM22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD., LEWISTON, ID 83501

DRAWING ◇
PLUMBING SCHEDULES

SHEET ◇
P4.0

CONSTRUCTION DOCUMENTS

ELECTRICAL LEGEND - LIGHTING

REFERENCE FIXTURE SCHEDULE FOR MOUNTING TYPE, MOUNTING HEIGHT, AND FIXTURE TYPE.

- DOUBLE FACE EXIT SIGN, CEILING MOUNTED, PROVIDE UNSWITCHED CONDUCTOR.
- WALL MOUNTED DOUBLE FACE EXIT SIGN PROVIDE UNSWITCHED CONDUCTOR. MOUNT AT +8'-0" UNO.
- SINGLE FACE EXIT SIGN, CEILING MOUNTED PROVIDE UNSWITCHED CONDUCTOR.
- WALL MOUNTED SINGLE FACE EXIT SIGN PROVIDE UNSWITCHED CONDUCTOR. MOUNT AT +8'-0" UNO.
- ARROW INDICATES DIRECTION TO BE SHOWN ON SIGN.
- 1'X1' LIGHT FIXTURE.
- 1'X1' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- 1'X4' LIGHT FIXTURE.
- 1'X4' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- 2'X4' LIGHT FIXTURE.
- 2'X4' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- 2'X2' LIGHT FIXTURE.
- 2'X2' LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- DIRECT/INDIRECT LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH.
- DIRECT/INDIRECT LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR
- STRIP LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH.
- STRIP LIGHT FIXTURE. SEE SCHEDULE FOR LENGTH. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR
- WALL MOUNTED LIGHT FIXTURE.
- WALL MOUNTED LIGHT FIXTURE, PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- RECESSED LIGHT FIXTURE
- RECESSED LIGHT FIXTURE. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- ROUND LIGHT FIXTURE
- ROUND EMERGENCY LIGHT FIXTURE. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- WALL MOUNTED LIGHT FIXTURE.
- WALL MOUNTED EMERGENCY LIGHT FIXTURE. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR.
- POLE LIGHT 1 HEAD WITH POLE
- TIME CLOCK
- PHOTO CONTROL CELL LOCATED 12" ABOVE ROOF FACING NORTH.
- OS — OCCUPANCY SENSOR. PROVIDE RELAYS AND POWER PACKS AS REQUIRED.
- EMERGENCY EGRESS LIGHTING WITH OUT FIXTURE HEADS. CONNECT TO AN UNSWITCHED CONDUCTOR.
- EMERGENCY EGRESS LIGHTING. CONNECT TO AN UNSWITCHED CONDUCTOR.
- WALL MOUNTED SINGLE FACE EXIT SIGN WITH EMERGENCY EGRESS LIGHTING. PROVIDE UNSWITCHED CONDUCTOR. MOUNT AT +8'-0" UNO.
- CEILING MOUNTED. SINGLE FACE EXIT SIGN WITH EMERGENCY EGRESS LIGHTING. PROVIDE UNSWITCHED CONDUCTOR.
- CEILING MOUNTED. DOUBLE FACE EXIT SIGN WITH EMERGENCY EGRESS LIGHTING. PROVIDE UNSWITCHED CONDUCTOR.
- XXX — INDICATES FIXTURE TYPE. REFER TO FIXTURE SCHEDULE.
- EXTERIOR WALL PACK
- EMERGENCY EXTERIOR WALL PACK. PROVIDE EMERGENCY BATTERY BACKUP CONNECTED TO AN UNSWITCHED CONDUCTOR

DEVICES

- S^x_x — SWITCH, TYPE AS INDICATED. +46"AFF
  - 2 — DOUBLE POLE
  - 3 — 3-WAY
  - 4 — 4-WAY
  - K — KEYED
  - P — PILOT LIGHT
  - D — DIMMER
  - HP — HORSEPOWER RATED
  - TO — THERMAL OVERLOAD
  - LV — LOW VOLTAGE
  - OS — OCCUPANCY SENSOR
  - OR — LOW VOLTAGE, MOMENTARY OVERRIDE
  - VS — VACANCY SENSOR
  - a — SUPERSCRIPT INDICATES LIGHTS TO BE SWITCHED TOGETHER
- S^S — DUAL LEVEL SWITCHING, INSIDE AND OUTSIDE LAMPS OF FIXTURE TO BE SWITCHED SEPARATELY.
- S^S_{OS} — DUAL LEVEL SWITCHING WITH OCCUPANCY SENSOR, INSIDE AND OUTSIDE LAMPS OF FIXTURE TO BE SWITCHED SEPARATELY.
- S^D_{OS} — OCCUPANCY SENSOR WITH MANUAL DIMMING, SET FOR 50% AUTOMATIC ON, AUTOMATIC OFF, WITH MANUAL DIMMING.
- SINGLE CONVENIENCE OUTLET, +18" AFF UNO
- FLOOR MOUNT SINGLE CONVENIENCE OUTLET
- DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
- FLOOR MOUNT DUPLEX CONVENIENCE OUTLET
- EMERGENCY DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
- SWITCHED DUPLEX CONVENIENCE OUTLET, +18" AFF UNO
- FLOOR MOUNTED SWITCHED DUPLEX CONVENIENCE OUTLET
- FOURPLEX CONVENIENCE OUTLET. +18"AFF UNO
- FLOOR MOUNT FOURPLEX CONVENIENCE OUTLET
- CONNECTION POINT TO EQUIPMENT SPECIFIED, ELECTRICAL CONTRACTOR TO SUPPLY RACEWAY AND CONDUCTORS AND MAKE FINAL CONNECTION TO EQUIPMENT UNDER THIS SECTION. UNO
- FLOOR MOUNTED CONNECTION POINT, SEE NOTE ABOVE FOR REQUIREMENTS
- FLOOR MOUNTED JUNCTION BOX
- JUNCTION BOX
- WALL MOUNTED PUSH BUTTON, MOUNT AT SWITCH HEIGHT UNO
- HC — WALL MOUNTED PUSH BUTTON, HANDICAPPED MOUNT AT SWITCH HEIGHT UNO
- WALL MOUNTED PUSH BUTTON, MOUNT AT SWITCH HEIGHT UNO
- MOTOR STARTER/CONTACTOR, SIZE/POLES NEMA 1 UNO AS INDICATED
- COMBINATION STARTER AND DISCONNECT, SIZE/POLES, STARTER SIZE AS INDICATED, NEMA 1 UNO
- F — FUSED DISCONNECT SWITCH, SIZE/POLES, FUSE SIZES AS INDICATED, NEMA 1 UNO
- NON-FUSED DISCONNECT SIZE/ POLES AS INDICATED, NEMA 1 UNO
- T (unit #) — THERMOSTAT, +46" AFF PROVIDE CONDUIT, J-BOX, CONDUCTORS AS REQUIRED TO CONTROL ASSOCIATED UNITS. UNO COORDINATE WITH DIVISION 15.
- H (unit #) — HUMIDISTAT, +46" AFF PROVIDE CONDUIT, J-BOX, CONDUCTORS AS REQUIRED TO CONTROL ASSOCIATED UNITS.
- POWER POLE - DUAL CHANNEL
- REB — RECESSED ENTERTAINMENT BOX
- T — TRANSFORMER
- PANELBOARD. SEE SCHEDULE FOR TYPE.
- EQUIPMENT CABINET, SURFACE MOUNTED
- EQUIPMENT CABINET FLUSH MOUNTED
- SURFACE MULTI-OUTLET RACEWAY
- # / # — MECHANICAL EQUIPMENT CALL OUT
- # — KITCHEN EQUIPMENT CALLOUT

ONE LINE

- DELTA WYE TRANSFORMER UNO
- # PANEL NAME VOLTAGE PHASE — PANEL BOARD, SEE SCHEDULE FOR TYPE AND SIZE
- ##A #P — CIRCUIT BREAKER, SIZE AND POLES INDICATED
- ##A — FUSE, SIZE AND TYPE INDICATED, PROVIDE FUSE FOR EACH POLE
- ##A #P — INTERRUPTER SWITCH, SIZE AND POLES INDICATED
- ##A #P — FUSED SWITCH, SIZE/POLES AND FUSE SIZE INDICATED
- ##A #P — DRAW OUT CIRCUIT BREAKER, SIZE AND POLES INDICATED
- ###A #P — INDIVIDUAL BREAKER WITH SHUNT TRIP, SIZE AND POLES INDICATED. NEMA 1 UNO
- ###A #P — INDIVIDUAL BREAKER, SIZE AND POLES INDICATED. NEMA 1 UNO
- GFP — GROUND FAULT PROTECTION
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSION
- LSIGR — ADJUSTABLE BREAKER SETTINGS (PER SPECIFICATIONS):
  - 'L'-LONG TIME
  - 'S'-SHORT TIME
  - 'I'-INSTANTANEOUS
  - 'G'-GROUND FAULT
  - 'R'-ENERGY REDUCING MAINTENANCE SWITCH W/STATUS INDICATOR
- GROUND
- ST — SHUNT TRIP COIL
- M — MOTOR
- 100A 3P — DISCONNECT SWITCH, SIZE AND POLES INDICATED. NEMA 1 UNO
- OVERHEAD SERVICE DROP
- ###A/3P — GENERATOR SET, MAIN BREAKER SIZE INDICATED
- AUTOMATIC TRANSFER SWITCH (ATS)
- M — METER AND BASE
- N — NEUTRAL
- T — DRY TYPE TRANSFORMER
- PAD MOUNT TRANSFORMER

FIRE ALARM

- F — PULL STATION, +44" AFF WITH PRE-ALARM COVER
- F — FIRE ALARM HORN, +84" AFF UNO
- F 15 — FIRE ALARM STROBE, +84" AFF UNO, STROBE INTENSITY INDICATED. 'C' INDICATES CEILING MOUNTED
- F 15 — FIRE ALARM HORN/STROBE +84" AFF, UNO, STROBE INTENSITY INDICATED. 'C' INDICATES CEILING MOUNTED
- F — FIRE ALARM BELL, +84" AFF UNO. 'C' INDICATES CEILING MOUNTED
- F — FIRE ALARM CHIME, +84" AFF UNO. 'C' INDICATES CEILING MOUNTED
- F 15 — FIRE ALARM CHIME/STROBE, +84" AFF UNO, STROBE INTENSITY INDICATED. 'C' INDICATES CEILING MOUNTED
- F — SPEAKER STROBE, +84" AFF UNO. 'C' INDICATES CEILING MOUNTED
- EOL — END OF LINE RESISTOR
- FS — FLOW SWITCH, PROVIDE MONITOR MODULE AS REQUIRED
- TS — TAMPER SWITCH, PROVIDE MONITOR MODULE AS REQUIRED
- PS — PRESSURE SWITCH, PROVIDE MONITOR MODULE AS REQUIRED
- FSA — FIRE SYSTEM ANNUNCIATOR, FLUSH MOUNTED +54"UNO
- PIV — POST INDICATOR VALVE, PROVIDE MONITOR MODULE AS REQUIRED
- DH — ELECTROMAGNETIC DOOR HOLDER
- R — RELAY
- CM — CONTROL MODULE
- MM — MONITOR MODULE
- FIRE ALARM KNOX BOX
- FIRE ALARM CONTROL PANEL
- NAC EXTENDER PANEL
- F — FIRE/SMOKE DAMPER
- F — LED INDICATOR LIGHT, CEILING MOUNTED UNO
- F T — LED INDICATOR LIGHT WITH TEST SWITCH, CEILING MOUNTED UNO
- SD — DUCT-MOUNTED SMOKE DETECTOR
- F # — SMOKE DETECTOR, CEILING MOUNTED UNO
  - H — HEAT
  - I — IONIZATION
  - ID — IN DUCT
  - P — PHOTOELECTRIC
  - R — RELAY
  - WG — PROVIDE PROTECTIVE WIRE GUARD
- BS,BR — BEAM DETECTOR, SENDER & RECEIVER

COMMUNICATIONS

- JUNCTION BOX FOR FUTURE TELEPHONE/DATA OUTLET. MOUNT AT 18" A.F.F. UNO. PROVIDE SINGLE-GANG MUD RING WITH BLANK COVER PLATE. PROVIDE 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE.
- #D,#T — TELEPHONE/DATA OUTLET. MOUNT AT 18" A.F.F. UNO. PROVIDE 1" CONDUIT TO NEAREST ACCESSIBLE CEILING. INSTALL QUANTITY OF DATA (#D) AND TELEPHONE (#T) CABLES INDICATED TO THE NEAREST DATA RACK. PROVIDE (2) DATA CABLES IF A CABLE QUANTITY IS NOT INDICATED.
- FLOOR MOUNTED BOX FOR FUTURE TELEPHONE/DATA OUTLET. JUNCTION BOX WITH SINGLE-GANG MUD RING. PROVIDE 1" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. PROVIDE BLANK COVER PLATE.
- #D,#T — FLOOR MOUNTED TELEPHONE/DATA OUTLET. PROVIDE 1" CONDUIT TO NEAREST ACCESSIBLE CEILING. INSTALL QUANTITY OF DATA (#D) AND TELEPHONE (#T) CABLES INDICATED TO THE NEAREST DATA RACK. PROVIDE (2) DATA CABLES IF A CABLE QUANTITY IS NOT INDICATED.
- IC — INTERCOM SYSTEM CALL BUTTON. +46" UNO.
- SP — CEILING MOUNTED SPEAKER WITH BACKBOX
- SP — WALL MOUNTED SPEAKER, WITH BACKBOX +80" UNO
- V — VOLUME CONTROL, +46" UNO
- TV — TELEVISION OUTLET, +18" AFF UNO. PROVIDE 1-1/4" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE
- TV — CEILING MOUNTED TELEVISION OUTLET
- TTB — TELEPHONE TERMINAL BOARD
- CT-XX — CABLE TRAY, 4" DEEP, WIRE BASKET STYLE, 'XX' INDICATES WIDTH PROVIDE ALL FITTINGS AND SUPPORT HARDWARE REQUIRED

NOTE:	THIS IS A STANDARD LIST OF COMMONLY USED ELECTRICAL SYMBOLS. SOME OF THE SYMBOLS SHOWN MAY NOT HAVE BEEN USED IN THIS DRAWING PACKAGE.

ELECTRICAL ABBREVIATIONS

A	AMPERES
AC	6" ABOVE BACKSPLASH
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AF	AMP FRAME
AIC	AMPS INTERRUPTING CAPACITY
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BD	BOTTOM OF DECK
BS	BOTTOM OF STRUCTURE
C	CEILING MOUNTED
C	CONDUIT
CB	CIRCUIT BREAKER
CF	COMPACT FLUORESCENT
CKT	CIRCUIT
CO	CONDUIT ONLY, PROVIDE PULL-LINE
CT	CURRENT TRANSFORMER
CTL	CONTROL
DC	DIRECT CURRENT
(D)	DEMOLITION
DEMO	DEMOLITION
DET	DETAIL
DTT	DOUBLE TWIN TUBE
E	EMERGENCY
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
EL	EMERGENCY LIGHT
F	FUSE
(F)	FUTURE
FACP	FIRE ALARM CONTROL PANEL
G/GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
HH	HAND HOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HPS	HIGH PRESSURE SODIUM
HVAC	HEATING, VENTILATION, & AIR CONDITIONING
IG	ISOLATED GROUND
IPCO	IDAHO POWER COMPANY
J-BOX	JUNCTION BOX
KA	KILOAMP
KVA	KILO VOLT-AMP
KW	KILOWATT
KWH	KILOWATT HOUR
LCP	LIGHTING CONTROL PANEL
MB	MAIN BREAKER
MBR	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUGS ONLY
MMC	MODULAR METERING CENTER
MH	METAL HALIDE
MSB	MAIN SWITCH BOARD
MTG	MOUNTING
N	NEUTRAL
(N)	NEW
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OH	OVERHEAD
OS	OCCUPANCY SENSOR
P	POLES
PC	PHOTO-CONTROL
PVC	POLYVINYL CHLORIDE
PWR	POWER
RE:	REFERENCE
REC	RECEPTACLE
(R)	RELOCATED
SF	SQUARE FEET
TBD	TO BE DETERMINED
TDR	TIME DELAY RELAY
TK	TOE KICK
TSP	TWISTED SHIELDED PAIR
TRT	TRIPLE TUBE
TTB	TELEPHONE TERMINAL BOARD
(TYP.)	TYPICAL
UC	UNDERCABINET
UG	UNDERGROUND
U.N.O.	UNLESS NOTED OTHERWISE
V	VOLT
VA	VOLT-AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHER PROOF/NEMA 3R
PROVIDED/ PROVIDE BY INSTALLED/ INSTALL	PROVIDE AND INSTALL / PROVIDED AND INSTALLED BY / PROVIDE AND INSTALL

NOTE:	THIS IS A STANDARD LIST OF COMMONLY USED ELECTRICAL ABBREVIATIONS. SOME OF THE ABBREVIATIONS SHOWN ABOVE MAY NOT BE USED IN THIS DRAWING PACKAGE.

ELECTRICAL GENERAL NOTES

A. THESE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE; THEREFORE, THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL EQUIPMENT AND DEVICE LOCATIONS WITH ARCHITECTURAL, MECHANICAL, AND PLUMBING DIVISIONS PRIOR TO ROUGH-IN. REFER TO AND COORDINATE WITH ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL WORK THAT IS REQUIRED BY THE ELECTRICAL CONTRACTOR.

B. ALL CONDUIT AND JUNCTION BOXES ARE TO BE CONCEALED UNLESS LOCATED WITHIN DEDICATED ELECTRICAL OR MECHANICAL ROOMS. USE OF SURFACE MOUNTED RACEWAYS IN ALL OTHER SPACES MUST BE APPROVED BY THE ARCHITECT FOR EACH LOCATION. WHERE SURFACE RACEWAYS ARE APPROVED, UTILIZE WIREMOLD, OR APPROVED EQUAL, SURFACE MOUNTED RACEWAYS PAINTED TO MATCH SURROUNDING WALLS.

C. REFER TO ARCHITECTURAL ELEVATIONS FOR OUTLET HEIGHTS WHERE THE SPECIFIC OUTLET HEIGHT IS NOT INDICATED. REFER TO THE ELECTRICAL LEGEND FOR THE DEFAULT OUTLET HEIGHT WHEN NOT INDICATED ON ELEVATIONS OR ON AT THE DEVICES.

D. PROVIDE PULL-LINE IN ALL EMPTY CONDUITS.

E. TERMINATE ALL LOW-VOLTAGE CONDUITS WITH INSULATED THROAT BUSHING.

F. MECHANICAL EQUIPMENT INDICATED IS SHOWN IN AN APPROXIMATE LOCATION. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

FIRE ALARM:

G. INSTALL PLENUM RATED FIRE ALARM CONDUCTORS FROM ALL FIRE ALARM DEVICES INDICATED TO THE FIRE ALARM CONTROL PANEL OR NAC EXTENDER PANEL(S) AS REQUIRED. STUB 3/4" CONDUIT FROM DEVICE TO VOID ABOVE CEILING. PROVIDE NAC EXTENDER PANELS (QUANTITY AS REQUIRED) IN LOCATIONS INDICATED AND CIRCUITING AS REQUIRED FOR A COMPLETE INSTALLATION. CIRCUIT THE FIRE ALARM NOTIFICATION AND INITIATION DEVICES PER THE ELECTRICAL SPECIFICATIONS. FURNISH AND INSTALL ALL APPURTENANCES AND PROGRAMMING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. REFER TO ELECTRICAL FIRE ALARM SPECIFICATIONS FOR SYSTEM REQUIREMENTS AND SUBMITTAL PROCEDURES.

SITE:

H. CONTRACTOR SHALL COORDINATE WITH AN UNDERGROUND LOCATING SERVICE PRIOR TO COMMENCING WORK. SEE CIVIL DRAWINGS FOR ADDITIONAL SITE INFORMATION. COORDINATE WITH OTHER SITE DISCIPLINES.

I. SITE LIGHTING AND UTILITY EQUIPMENT SHOWN IN APPROXIMATE LOCATION. COORDINATE EXACT LOCATION WITH CIVIL DRAWINGS, PROPERTY LINES, AND UTILITY COMPANIES PRIOR TO ROUGH-IN.

J. REFER TO POLE BASE DETAIL FOR SITE LIGHTING POLE BASE REQUIREMENTS.

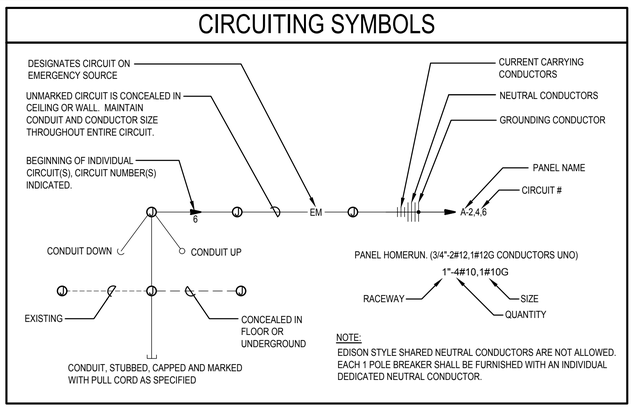
K. ROUTE CONDUITS IN COMMON TRENCH WHERE POSSIBLE REFER TO TRENCHING DETAIL.

DEMO:

L. THE ELECTRICAL DEMOLITION DRAWING(S) PROVIDED ARE INTENDED TO ASSIST THE ELECTRICAL CONTRACTOR IN ESTABLISHING AREAS REQUIRING DISCONNECTION, REMOVAL, OR RELOCATION OF ELECTRICAL EQUIPMENT, OUTLETS, WIRING, DEVICES, FIXTURES, ETC. AND MAY NOT INDICATE ALL DEVICES OR THE FULL EXTENT OF DEMOLITION AND RECONNECTION WHICH MAY BE REQUIRED. THE ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND THOROUGHLY EXAMINE ALL REQUIRED DEMOLITION WORK AND INCLUDE ALL LABOR AND INCIDENTALS THAT WILL BE NECESSARY TO PERFORM DEMOLITION RECONNECTION AND TEMPORARY POWER CONNECTIONS IN THE BID.

M. ALL ELECTRICAL DEVICES AND WALLS INDICATED ON THE ELECTRICAL DEMOLITION DRAWING(S) ARE TO REMAIN UNLESS OTHERWISE NOTED.

CIRCUITING SYMBOLS



NOTE:
EDISON STYLE SHARED NEUTRAL CONDUCTORS ARE NOT ALLOWED. EACH 1 POLE BREAKER SHALL BE FURNISHED WITH AN INDIVIDUAL DEDICATED NEUTRAL CONDUCTOR.

SECURITY

- CCTV CAMERA POWER SUPPLY
- CCTV SYSTEM POWER SUPPLY
- ADJUSTABLE CAMERA (PAN/TILT/ZOOM)
- FIXED CAMERA
- CAMERA IN OUTDOOR HOUSING
- ADJUSTABLE CAMERA (PAN/TILT/ZOOM) IN OUTDOOR HOUSING
- C — CCTV OUTLET, +18" UNO
- C — CEILING MOUNTED CCTV OUTLET
- K — SECURITY SYSTEM KEYPAD CONTROLLER COORDINATE BOX SIZE AND MUDRING WITH VENDOR
- CR — CARD READER
- M — CEILING MOUNTED MOTION SENSOR
- M +80" — WALL MOUNTED MOTION SENSOR, MOUNTING HEIGHT INDICATED
- PANIC BUTTON - MOUNTED UNDER COUNTER

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FH22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL COVER SHEET

SHEET ◇
E0.0

CONSTRUCTION DOCUMENTS

COM*check* Software Version 4.1.5.3

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title:
Project Type: Alteration

Construction Site:
Owner/Agent:
Designer/Contractor:
Musgrove Engineering
234 S Whisperwood Way
Boise, ID 83709
208-384-0585

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-LAB BUILDING (Office)	7252	0.82	5947
		Total Allowed Watts =	5947

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
LAB BUILDING (Office 7252 sq.ft.)				
LED 1: GL1: 2X4 GRID: LED Other Fixture Unit 36W:	1	58	38	2204
LED 2: PL2: STORAGE WRAP: LED Other Fixture Unit 40W:	1	6	40	240
LED 3: SL1: SURFACE WRAP: LED Other Fixture Unit 46W:	1	5	49	245
LED 4: RR1: CAN: LED Other Fixture Unit 16W:	1	4	17	68
LED 5: PL1: SURFACE STRIP: LED Other Fixture Unit 28W:	1	12	28	336
		Total Proposed Watts =		3093

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.1.5.3 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

NICK SCHAFER, P.E. — Name - Title
Signature
1/12/23 — Date

Project Title:
Data filename: P:\Files\2020\20227\CALCS\ELEC\20227 Electrical_Compliance.cck
Report date: 01/12/23
Page 1 of 7

COM*check* Software Version 4.1.5.3

Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title:
Project Type: Alteration
Exterior Lighting Zone 2 (Light industrial area with limited nighttime use (LZ2))

Construction Site:
Owner/Agent:
Designer/Contractor:
Musgrove Engineering
234 S Whisperwood Way
Boise, ID 83709
208-384-0585

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
ENTRY (Entry canopy)	154 ft2	0.25	Yes	38
BUILDING EXT WALK (Walkway < 10 feet wide)	110 ft of	0.7	Yes	77
		Total Tradable Watts (a) =		116
		Total Allowed Watts =		116
		Total Allowed Supplemental Watts (b) =		600

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
(b) A supplemental allowance equal to 800 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
ENTRY (Entry canopy 154 ft2): Tradable Wattage				
LED 1: CL1: SURFACE CANOPY: LED Other Fixture Unit 36W:	1	3	35	105
BUILDING EXT WALK (Walkway < 10 feet wide 110 ft of walkway length): Tradable Wattage				
LED 2: WP1: LED Other Fixture Unit 46W:	1	5	47	235
		Total Tradable Proposed Watts =		340

Exterior Lighting PASSES

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.1.5.3 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

NICK SCHAFER, P.E. — Name - Title
Signature
1/12/23 — Date

Project Title:
Data filename: P:\Files\2020\20227\CALCS\ELEC\20227 Electrical_Compliance.cck
Report date: 01/12/23
Page 2 of 7

ENERGY CODE COMMISSIONING COMPLIANCE NOTES

SECTION 408 SYSTEM COMMISSIONING

IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL BELOW NOTED DOCUMENTS WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY:

A. AS-BUILT DRAWINGS - DRAWINGS SHALL INCLUDE THE LOCATION AND PERFORMANCE DATA OF ALL PIECES OF MECHANICAL EQUIPMENT.

B. OPERATING AND MAINTENANCE MANUALS - MANUALS SHALL INCLUDE THE FOLLOWING:

1. SUBMITTAL DATA ON ALL PIECES OF EQUIPMENT REQUIRING MAINTENANCE.
2. MANUFACTURER'S OPERATIONS AND MAINTENANCE DATA ON ALL PIECES OF EQUIPMENT. ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
3. NAME AND ADDRESS AND PHONE NUMBER OF OF AT LEAST ONE (1) SERVICE PROVIDED.
4. LIGHTING CONTROL SYSTEMS MAINTENANCE AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, EQUIPMENT AND SYSTEM SCHEMATICS, AND CONTROL SEQUENCES OF OPERATIONS. DESIRED OR FIELD DETERMINED SETPOINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT ALL CONTROL DEVICES, OR FOR DIGITAL CONTROL SYSTEMS, IN THE SYSTEM PROGRAMMING INSTRUCTIONS.
5. A NARRATIVE ON HOW EACH LIGHTING SYSTEM IN INTENDED TO OPERATE, INCLUDING RECOMMENDED SETPOINTS.

C. LIGHTING SYSTEM FUNCTIONAL TESTING REQUIREMENTS

FUNCTIONAL TESTING - ALL AUTOMATIC LIGHTING CONTROL SYSTEM SHALL BE FULLY TESTED TO ENSURE THE CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, P|ROGRAMMED, AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

WHERE OCCUPANT SENSORS, TIME SWITCHES, PROGRAMMABLE CONTROLS, PHOTOSENSORS OR DAYLIGHTING CONTROLS ARE INSTALLED, THE FOLLOWING PROCEDURES SHALL BE PREFORMED:

1. CONFIRM THAT THE PLACEMENT, SENSITIVITY AND TIME-OUT ADJUSTMENTS FOR OCCUPANT SENSORS YIELD ACCEPTABLE PERFORMANCE.
2. CONFIRM THAT THE TIME SWITCHES AND PROGRAMMABLE SCHEDULE CONTROLS ARE PROGRAMMED TO TURN THE LIGHTS OFF.
3. CONFIRM THAT THE PLACEMENT AND SENSITIVITY ADJUSTMENTS FOR PHOTOSENSOR CONTROLS REDUCE ELECTRIC LIGHT BASED ON THE AMOUNT OF USABLE DAYLIGHT IN THE SPACE AS SPECIFIED.

D. FINAL LIGHTING SYSTEM FUNCTIONAL REPORT - A REPORT OF TEST PROCEDURES AND RESULTS IDENTIFIED AS THE "FINAL LIGHTING CONTROL REPORT" SHALL BE DELIVERED TO THE BUILDING OWNER. THE REPORT SHALL INCLUDE THE FOLLOWING:

1. LIST OF FUNCTIONAL TESTS USED DURING THE COMMISSIONING PROCESS ON EACH PIECE OF EQUIPMENT.
2. RESULTS OF ALL FUNCTIONAL TESTS ON ALL PIECES OF EQUIPMENT.
3. LIST OF DEFICIENCIES FOUND AND CORRESPONDING CORRECTIVE MEASURES EITHER IMPLEMENTED OR PROPOSED ON EACH PIECE OF EQUIPMENT.
4. LIST OF EQUIPMENT NOT ABLE TO BE FUNCTIONALLY TESTED DUE TO CURRENT CLIMATE CONDITIONS. THESE PIECES OF EQUIPMENT WILL FUNCTIONALLY TESTED ONCE CLIMATE CHANGES ALLOW.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

REVISIONS

CONSULTANTS ◇
DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

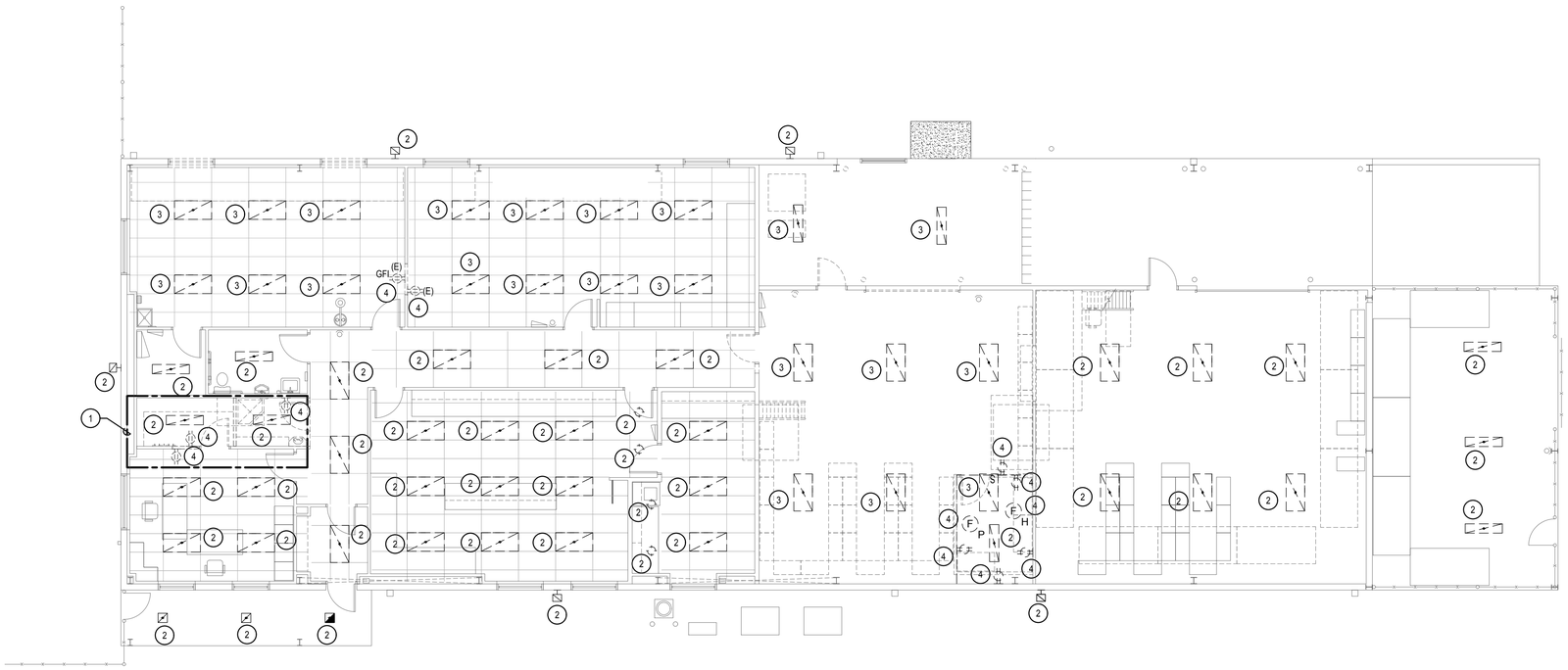
CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22071
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL
COMCHECK

SHEET ◇
E1.0

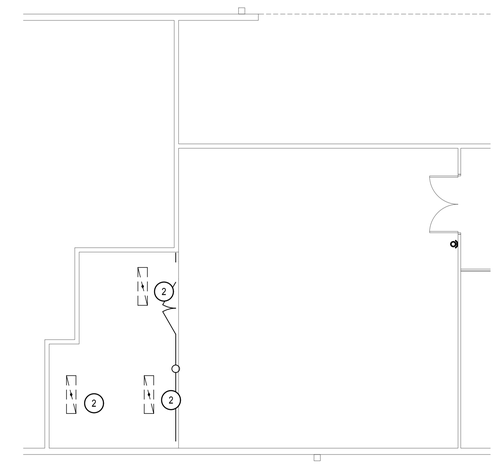
CONSTRUCTION DOCUMENTS



ELECTRICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

NORTH



ELECTRICAL DEMOLITION PLAN - LOFT

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. WORK IN THIS AREA IS TO BE INCLUDED UNDER ADD ALTERNATE. REFER TO DIVISION 2 FOR ALTERNATE NUMBERING AND DESCRIPTIONS.
2. REMOVE LIGHT FIXTURE UNDER ADD ALTERNATE PRICING. REFER TO DIVISION 1 FOR ALTERNATE NUMBERING AND DESCRIPTIONS. MAINTAIN AND PROTECT THE EXISTING CIRCUIT IN THIS AREA FOR RECONNECTION TO NEW FIXTURE IN THIS AREA. REFER TO NEW LIGHTING PLAN.
3. REMOVE LIGHT FIXTURE UNDER BASE BID. MAINTAIN AND PROTECT THE EXISTING CIRCUIT IN THIS AREA FOR RECONNECTION TO NEW FIXTURE IN THIS AREA. REFER TO NEW LIGHTING PLAN.
4. EXISTING DEVICES TO BE REMOVED. REMOVE ALL CONDUIT, CONDUCTORS, AND JUNCTION BOXES BACK TO SOURCE OR NEAREST UPSTREAM DEVICE THAT IS TO REMAIN. MAINTAIN CONTINUITY TO ALL DOWNSTREAM DEVICES THAT ARE TO REMAIN

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FAC22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

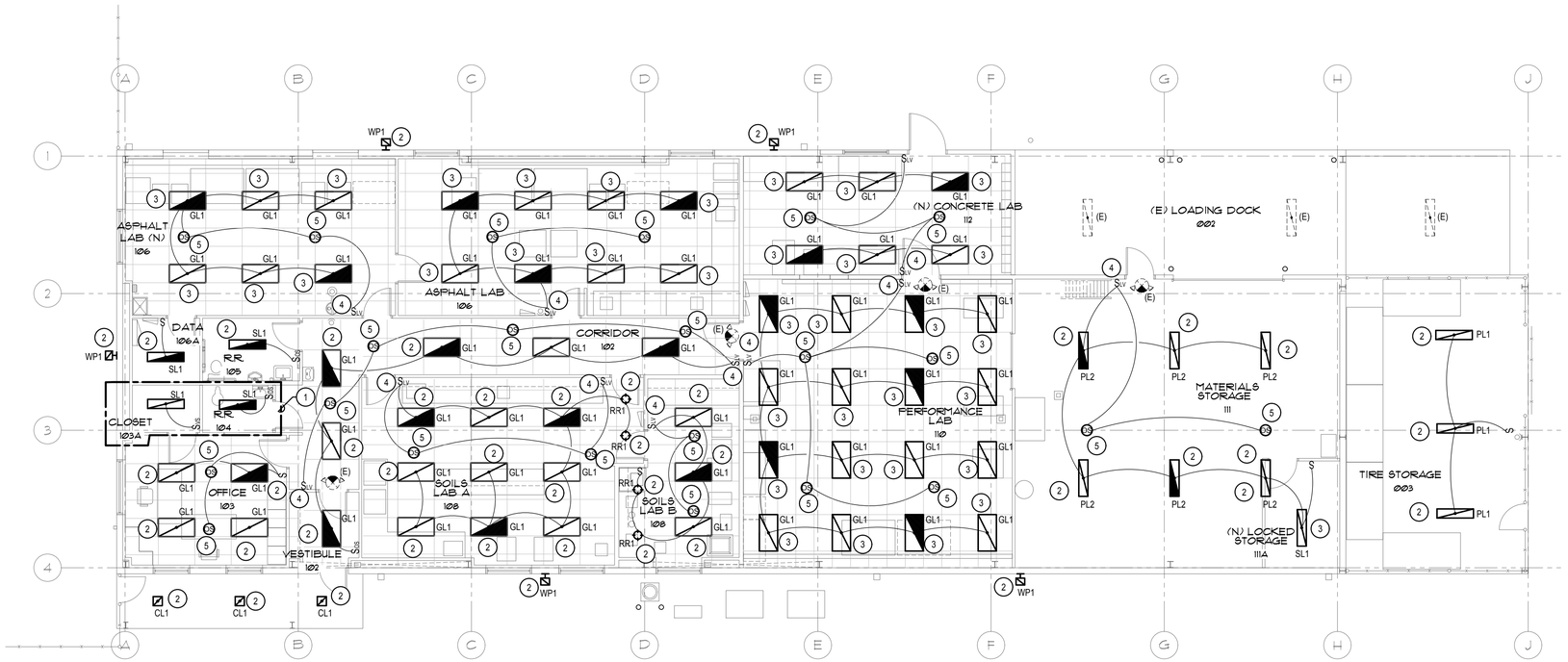
DRAWING ◇
ELECTRICAL DEMO PLAN

SHEET ◇
E2.0

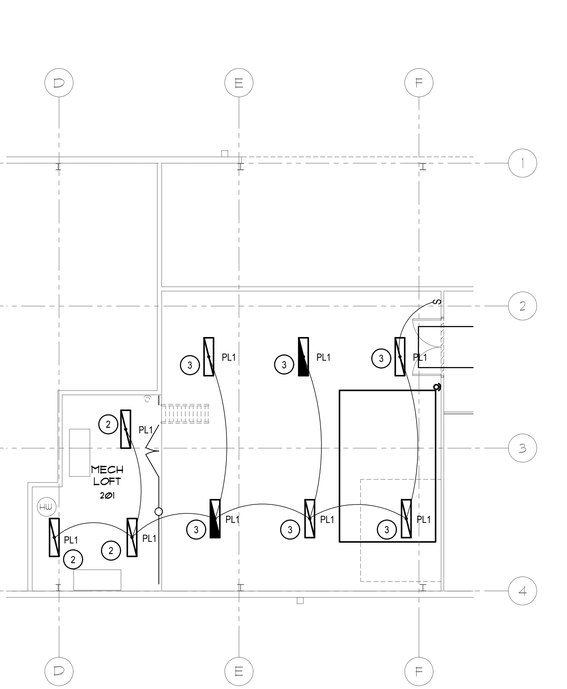
CONSTRUCTION DOCUMENTS

MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER



ELECTRICAL NEW LIGHTING PLAN
SCALE: 1/8" = 1'-0"
NORTH



ELECTRICAL NEW LIGHTING PLAN - LOFT
SCALE: 1/8" = 1'-0"
NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. WORK IN THIS AREA IS TO BE INCLUDED UNDER ADD ALTERNATE. REFER TO DIVISION 1 FOR ALTERNATE NUMBERING AND DESCRIPTIONS.
2. NEW LIGHT IN THIS LOCATION IS TO BE INCLUDED AS ADD ALTERNATE. REFER TO DIVISION 1 FOR ALTERNATE NUMBERING AND DESCRIPTIONS. CONNECT NEW LIGHT TO THE EXISTING CIRCUIT LEFT FROM THE REMOVAL OF THE EXISTING LIGHT IN THIS LOCATION. PROVIDE ALL CONDUIT, CONDUCTORS AND NEW CONTROL DEVICES AS SHOWN FOR A COMPLETE INSTALLATION.
3. UNDER BASE BID CONNECT THE NEW LIGHT TO THE CIRCUIT LEFT FROM THE REMOVAL OF THE EXISTING LIGHT FIXTURE IN THIS LOCATION. PROVIDE ALL CONDUIT, CONDUCTORS AND NEW CONTROL DEVICES AS SHOWN FOR A COMPLETE INSTALLATION.
4. PROVIDE LOW VOLTAGE MOMENTARY CONTACT SWITCH(ES) AT THIS LOCATION WITH BUTTONS CAPABLE OF PROVIDING MANUAL ON/OFF AND UP/DOWN DIMMING CONTROL OF ALL ZONES INDICATED. PROVIDE ALL POWER PACKS, CONTROL MODULES AND OTHER HARDWARE REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
5. CONNECT SENSORS SO THAT ANY SENSOR IN THIS ROOM IS CONTROLS ALL ZONES IN THIS ROOM. PROGRAM SO LIGHTS AUTOMATICALLY TURN ON TO 50% WITH AUTOMATIC TIME OFF BASED ON OCCUPANCY SENSING.

REVISIONS

CONSULTANTS ◇
DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

CONSTRUCTION DOCUMENTS

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL
LIGHTING PLAN

SHEET ◇
E2.1

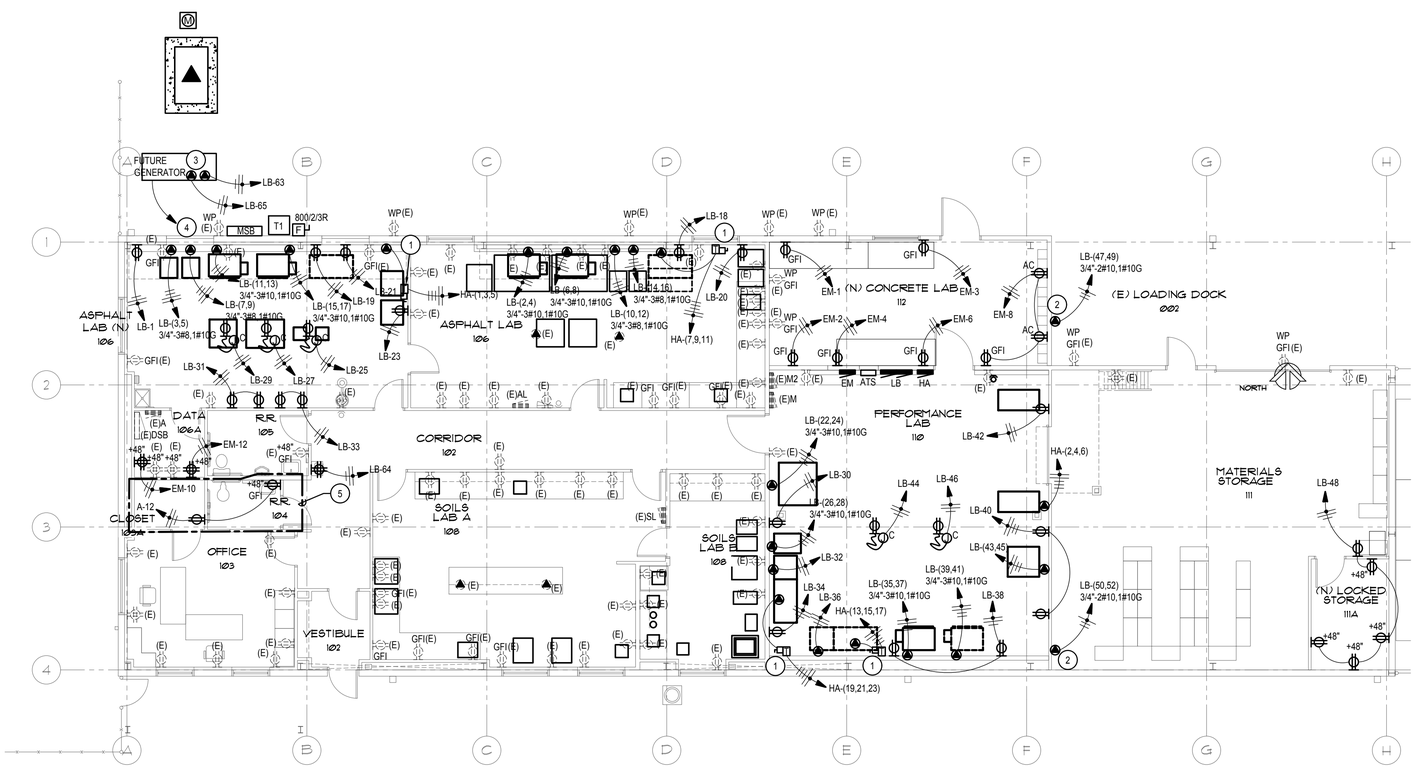
MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

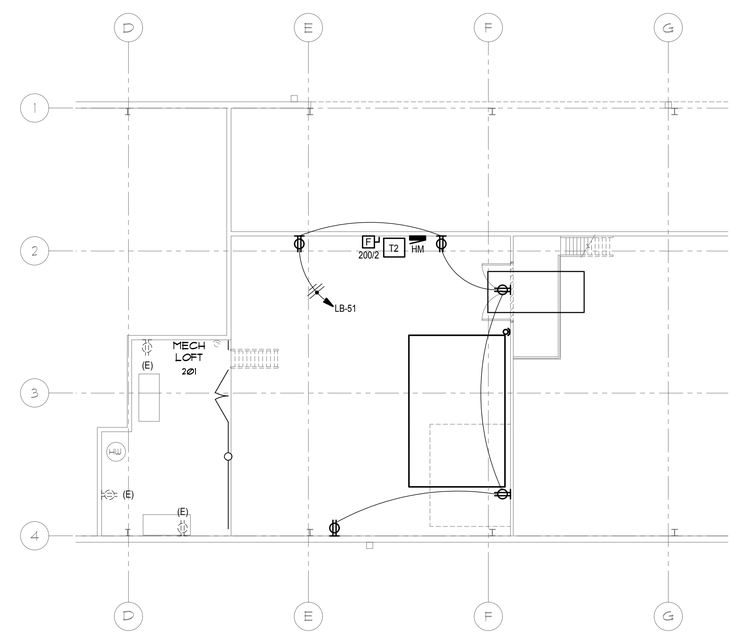
KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. TRANSFORMER PROVIDED WITH UNIT BY MANUFACTURER. TRANSFORMER TO BE INSTALLED BY ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL 30A/3P SECONDARY DISCONNECT SWITCH FOR TRANSFORMER. COORDINATE TRANSFORMER AND DISCONNECT LOCATION AS REQUIRED TO MAINTAIN WORKING CLEARANCE REQUIREMENTS.
2. PROVIDE WITH NEMA 6-30R RECEPTACLE WITH WATERPROOF COVER.
3. CONNECTIONS FOR FUTURE GENERATOR. STUB 1" EMPTY CONDUITS FOR EACH HOME RUN SHOWN AND CAP FOR FUTURE USE.
4. PROVIDE 1" CONDUIT FOR FUTURE CONTROL AND COMMUNICATIONS CONDUCTORS FROM THE ATS TO THE GENERATOR. CAP AND MARK CONDUIT.
5. WORK IN THIS AREA IS TO BE INCLUDED UNDER ADD ALTERNATE. REFER TO DIVISION 1 FOR ALTERNATE NUMBERING AND DESCRIPTIONS.



ELECTRICAL POWER PLAN
SCALE: 1/8" = 1'-0"



ELECTRICAL POWER PLAN - LOFT
SCALE: 1/8" = 1'-0"

CONSTRUCTION DOCUMENTS

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

CONSULTANTS ◇

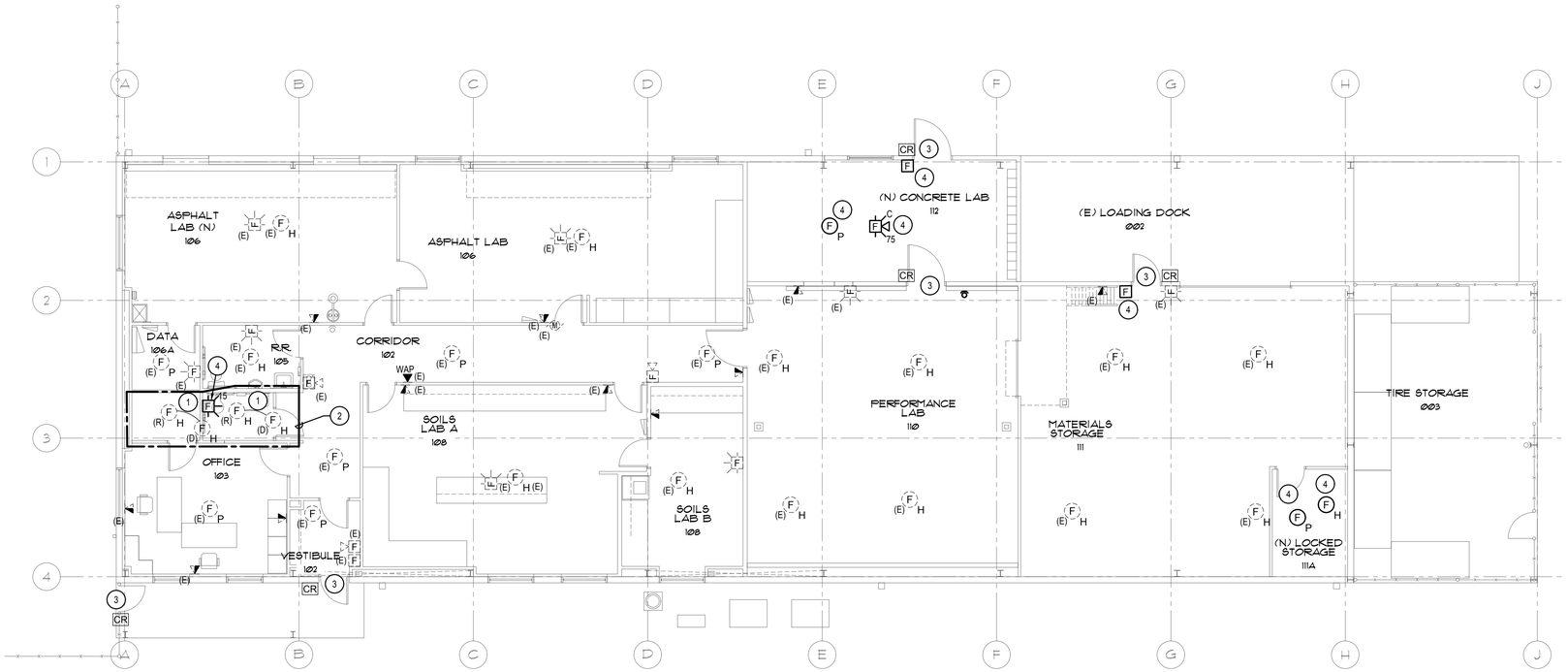
DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

REVISIONS

PROJECT ◇
IDAHO TRANSPORTATION DEPARTMENT
ITD # FM22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL POWER PLAN

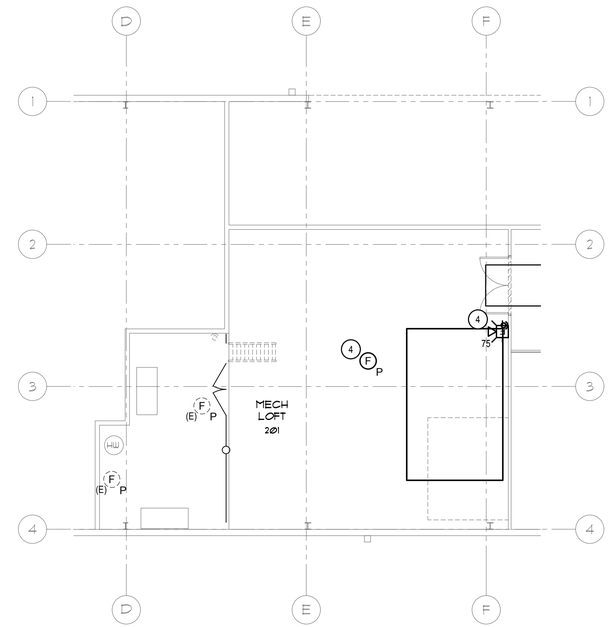
SHEET ◇
E2.2



ELECTRICAL SPECIAL SYSTEMS

SCALE: 1/8" = 1'-0"

NORTH



ELECTRICAL SPECIAL SYSTEMS - LOFT

SCALE: 1/8" = 1'-0"

NORTH

KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. DISCONNECT THE EXISTING FIRE ALARM DEVICE AND RELOCATE TO ACCOMMODATE THE REVISED WALLS IN THIS AREA. RECONNECT THE DEVICE TO THE ORIGINAL CIRCUIT. PROVIDE AND INSTALL ALL HARDWARE AND PROGRAMMING REQUIRED.
2. WORK IN THIS AREA IS TO BE INCLUDED UNDER ADD ALTERNATE. REFER TO DIVISION 1 FOR ALTERNATE NUMBERING AND DESCRIPTIONS.
3. DOOR TO BE PROVIDED WITH ACCESS CONTROL HARDWARE AND BE CONTROLLED BY LOCAL CARD READER. ACCESS CONTROL HARDWARE AND CARD READER ARE TO BE PROVIDED BY OWNER OUTSIDE OF THIS SCOPE OF WORK. ELECTRICAL CONTRACTOR TO PROVIDE RACEWAYS AND BACK BOXES FOR FUTURE INSTALLATION. REFER TO DETAILS ON E
4. PROVIDE AND INSTALL ALL HARDWARE AND PROGRAMMING REQUIRED TO INTEGRATE NEW FIRE ALARM DEVICES INTO THE EXISTING FIRE ALARM SYSTEM.

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
DAHO TRANSPORTATION DEPARTMENT
ITD # FAK22011
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL SPECIAL SYSTEMS PLAN

SHEET ◇
E2.3

CONSTRUCTION DOCUMENTS

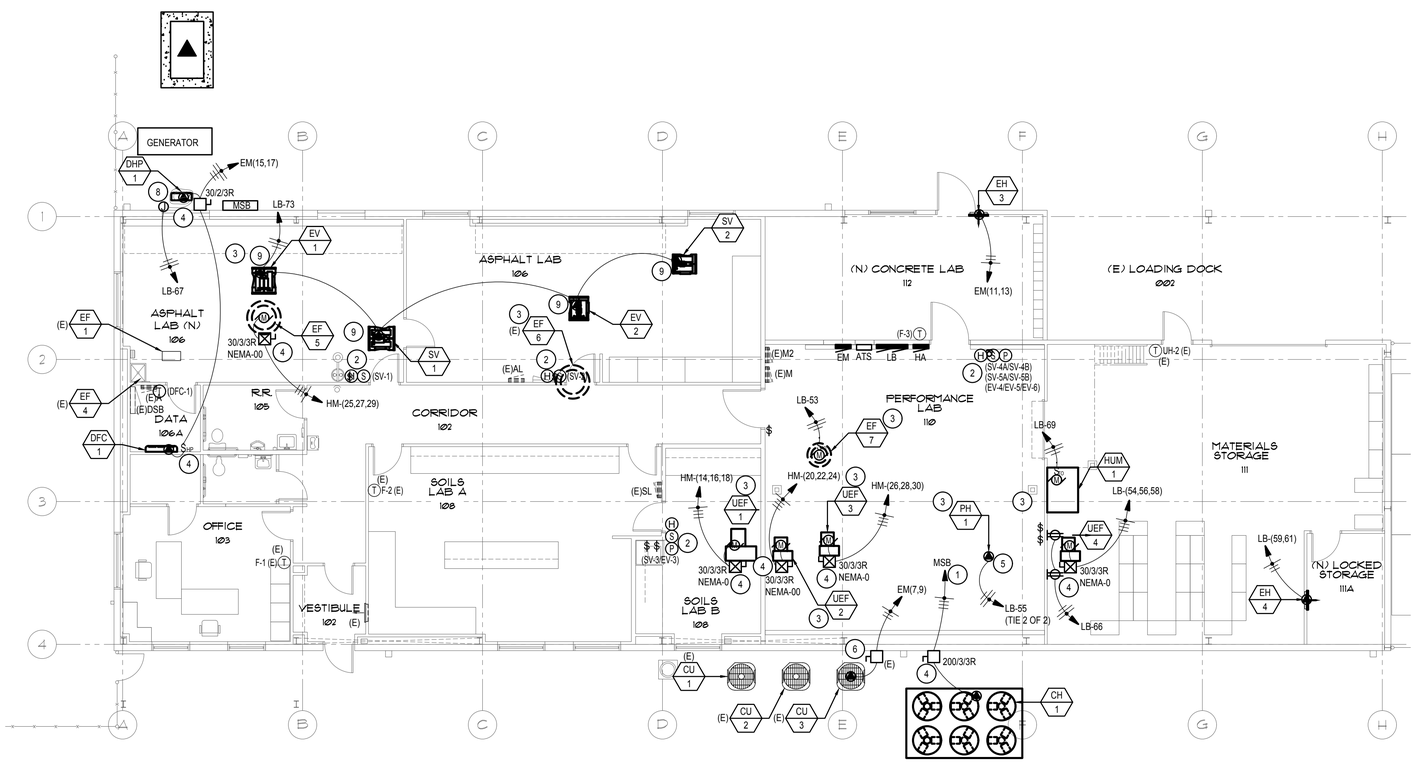
MUSGROVE
ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

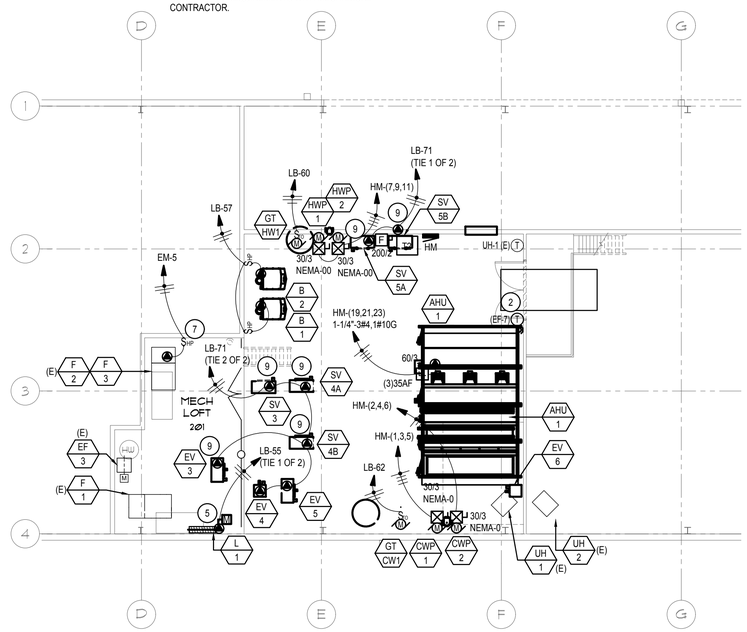
KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. REFER TO ONE LINE DIAGRAM FOR CONDUIT AND CONDUCTOR REQUIREMENTS.
2. 1/2" CONDUIT TO CORRESPONDING MECHANICAL UNIT. BOX, CONDUIT, AND CONDUCTORS TO BE PROVIDED BY ELECTRICAL CONTRACTOR. LEAVE 12" SLACK AT BOX AND MECHANICAL UNIT. MECHANICAL CONTRACTOR TO MAKE FINAL CONNECTIONS. COORDINATE BOX SIZE AND QUANTITY OF CONDUCTOR(S) WITH MECHANICAL CONTRACTOR. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.
3. EQUIPMENT LOCATED ON ROOF.
4. FIELD COORDINATE DISCONNECT AND CONDENSER LOCATION WITH MECHANICAL CONTRACTOR TO MAINTAIN ALL REQUIRED CLEARANCES.
5. CONNECTION FOR MOTORIZED DAMPER. PROVIDE ICE-CUBE TYPE RELAY IN A NEMA 1 ENCLOSURE FOR CONTROL BY ASSOCIATED DEVICE. COORDINATE COIL VOLTAGE WITH MECHANICAL CONTRACTOR.
6. RECIRCUIT EXISTING DISCONNECT AND CONDENSER UNIT TO NEW CIRCUIT SHOWN TO PROVIDE WITH EMERGENCY POWER. PROVIDE AND INSTALL ALL HARDWARE REQUIRED FOR A COMPLETE INSTALLATION.
7. RECIRCUIT EXISTING FURNACE TO NEW CIRCUIT SHONW TO PROVIDE FURNACE WITH EMERGENCY POWER. PROVIDE AND INSTALL ALL HARDWARE REQUIRED FOR A COMPLETE INSTALLATION.
8. PROVIDE AND INSTALL HEAT TAPE AROUND THE BASE OF THE HEAT PUMP. WRAP AROUND THE BASE OF THE UNIT. UTILIZE 12W/FT REYCHEM ICESTOP HEAT TAPE OR EQUAL. PROVIDE AND INSTALL 1 PENTAIR AMC-1A TEMPERATURE CONTROL UNIT PER CIRCUIT. COORDINATE THE INSTALLATION WITH THE MECHANICAL CONTRACTOR.
9. PROVIDE CONNECTION TO VALVE ACTUATOR MOTOR TRANSFORMER. COORDINATE EXACT LOCATION AND CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR.



MECHANICAL POWER PLAN
SCALE: 1/8" = 1'-0"
NORTH



MECHANICAL POWER PLAN - LOFT
SCALE: 1/8" = 1'-0"
NORTH

CONSTRUCTION DOCUMENTS

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

REVISIONS

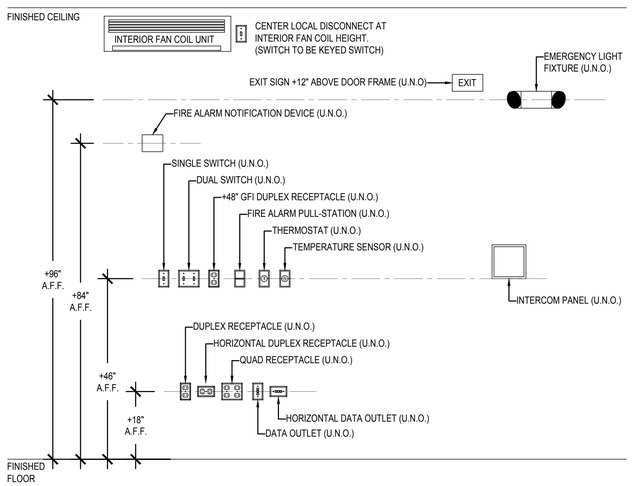
CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD., LEWISTON, ID 83501

DRAWING ◇
MECHANICAL POWER PLAN

SHEET ◇
E2.4

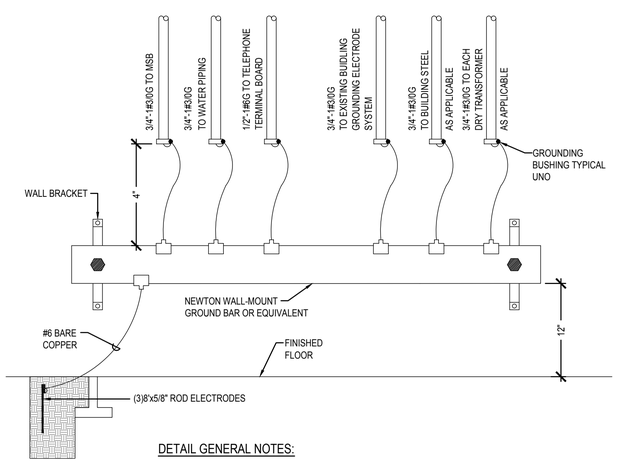


DETAIL GENERAL NOTES:

1. PROVIDE FRAMING AS REQUIRED.

STANDARD MOUNTING HEIGHTS

NTS



DETAIL GENERAL NOTES:

A. ALL CONDUCTORS SHALL BE IN EMT CONDUIT UNLESS NOTED OTHERWISE. ALL CONDUIT SHALL HAVE A GROUNDING BUSHING AT EACH END.

B. ALL CONNECTIONS SHALL BE EXOTHERMIC WELD, LISTED PRESSURE CONNECTORS, LISTED CLAMPS OR OTHER LISTED MEANS.

C. PROVIDE BONDING OF GAS PIPING PER NEC 250.104(B)(1).

GROUNDING BAR DETAIL

NTS

GENERAL NOTES:

A. CONDUIT, CONDUCTORS AND AIC CALCULATIONS FOR ALL SERVICE, PANEL AND EQUIPMENT FEEDERS INDICATED ON THE ONE-LINE HAVE BEEN SIZED BASED ON COPPER. THE CONTRACTOR MAY USE COMPRESSED ALUMINUM CONDUCTORS FOR THESE FEEDERS PROVIDING THE CONDUIT, CONDUCTOR SIZES AND AIC CALCULATIONS ARE ADJUSTED AS REQUIRED TO MEET ALL NATIONAL ELECTRICAL CODE REQUIREMENTS.

B. FURNISH AND INSTALL ENGRAVED LABEL ON THE FRONT OF ALL ELECTRICAL EQUIPMENT NOTING THE AVAILABLE FAULT CURRENT VALUE SHOWN.

C. A COORDINATION STUDY SHALL BE PERFORMED ON THE GROUND FAULT PROTECTION SYSTEM AND THE GROUND FAULT PROTECTION SYSTEM SHALL BE PERFORMANCE TESTED TO VERIFY PROPER OPERATION AS REQUIRED BY NEC 230.95 AT A MINIMUM. REFER TO SPECIFICATIONS FOR ADDITIONAL STUDY AND TESTING REQUIREMENTS.

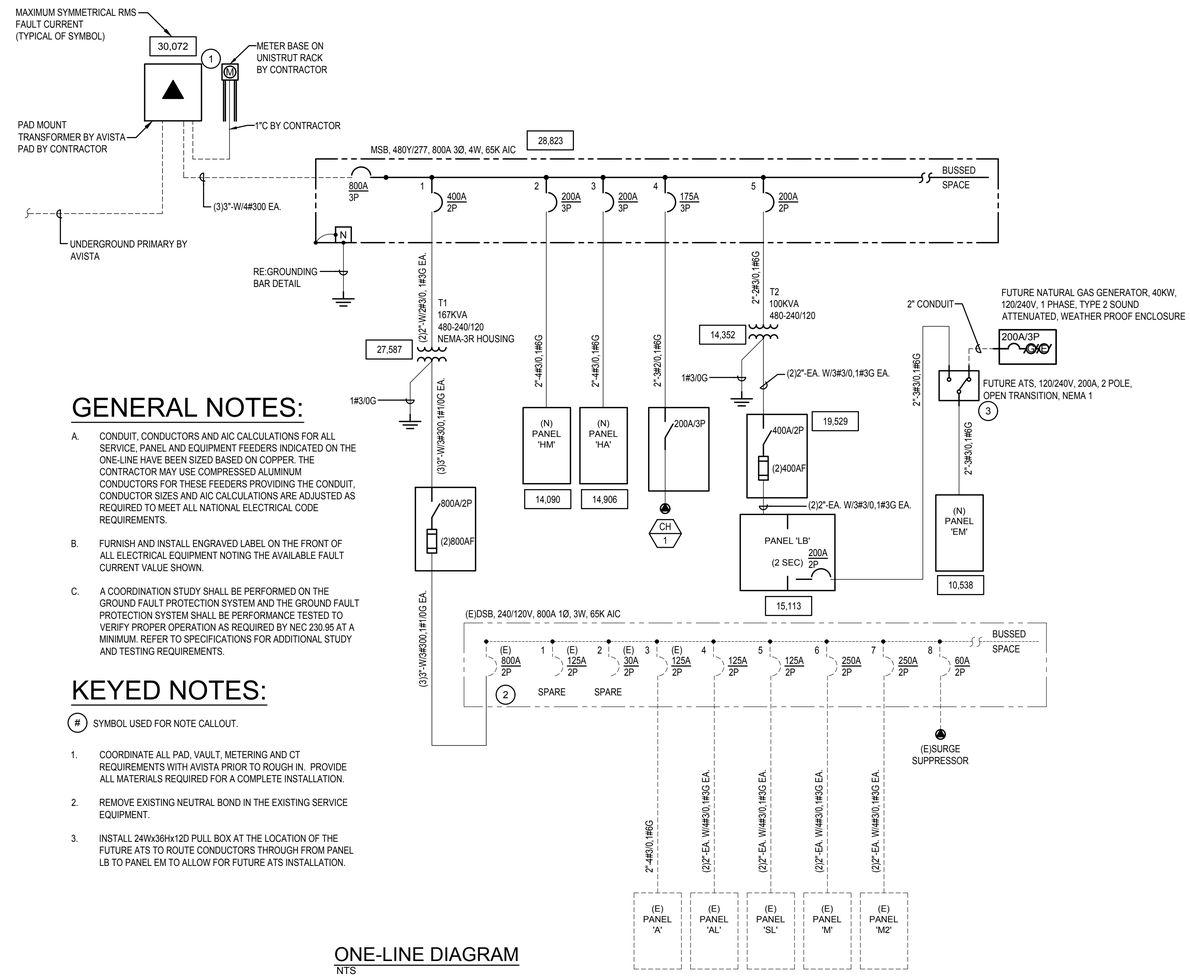
KEYED NOTES:

(#) SYMBOL USED FOR NOTE CALLOUT.

1. COORDINATE ALL PAD, VAULT, METERING AND CT REQUIREMENTS WITH AVISTA PRIOR TO ROUGH IN. PROVIDE ALL MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.

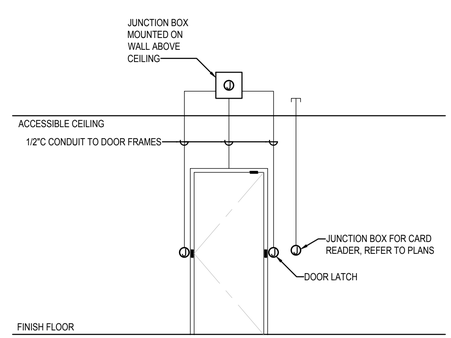
2. REMOVE EXISTING NEUTRAL BOND IN THE EXISTING SERVICE EQUIPMENT.

3. INSTALL 24Wx36Hx12D PULL BOX AT THE LOCATION OF THE FUTURE ATS TO ROUTE CONDUCTORS THROUGH FROM PANEL LB TO PANEL EM TO ALLOW FOR FUTURE ATS INSTALLATION.



ONE-LINE DIAGRAM

NTS



CARD READER DOOR DETAIL

NOT TO SCALE

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12731 1/12/2023 STATE OF IDAHO NICK SCHAFER

REVISIONS

CONSULTANTS ◇

DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO.◇ 22040
ITD PROJ. NO.◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FMX2011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL DETAILS

SHEET ◇
E3.0

CONSTRUCTION DOCUMENTS

LIGHTING FIXTURE SCHEDULE (20-227)

TYPE	DESCRIPTION	MTG.	LAMPS	WATTS	MFG. & CATALOG NUMBER	OR EQUAL BY	NOTES
CL1	CANOPY MOUNTED EXTERIOR LIGHT	CANOPY SURFACE	LED 4000K 4000LM	35W	LITHONIA NO. KACM-20C-350-40K-R5-MVOLT-SRM-DDBXD		1
GL1	GRID LED FIXTURE ACRYLIC LENS	CEILING GRID	LED 4000K 4800LM	38W	LITHONIA NO. 2BLT4-48L-ADP-EZ1-LP840	LIGHTOLIER METALUX H.E. WILLIAMS	1
PL1	SUSPENDED LED FIXTURE	CEILING SUSPENDED	LED 4000K 4000LM	28W	LITHONIA NO. CLX-L48-4000LM-SEF-FDL-MVOLT-EZ1-40K-80CRI-WH-ZACHVHM100		1
PL2	SUSPENDED LED FIXTURE	CEILING SUSPENDED	LED 4000K 4800LM	40W	LITHONIA NO. BLWP4-48L-ADP-MVOLT-EZ1-LP840-BLWPCG36		1
RR1	RECESSED CAN	CEILING RECESSED	LED 4000K 1500LM	17W	LITHONIA NO. LDN6-40/15-L06AR-LD-MVOLT-EZ1		1
SL1	LED SURFACE MOUNT FIXTURE	CEILING SURFACE	LED 4000K 4000LM	49W	LITHONIA NO. FML4W-48-AL06-SEF-840-MVOLT		1
WP1	LED WALL MOUNTED EXTERIOR FIXTURE	WALL SURFACE	LED 4000K 6000LM	47W	LITHONIA NO. WPX2-LED-40K-MVOLT-DDBXD		1

LIGHTING FIXTURE SCHEDULE NOTES:

1 SUBSTITUTIONS WILL BE ALLOWED IF SUBMITTED PRIOR TO BID DATE BY THE GREATER OF: 7 BUSINESS DAYS OR THE TIME PERIOD SPECIFIED BY DIVISION 1 SPECIFICATIONS, AND IF DEEMED EQUAL BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING SUBSTITUTED FIXTURES MEET OR EXCEED THE SPECIFICATIONS OF THE FIXTURES SPECIFIED.

ELECTRICAL LOAD SUMMARY (GSB)

FEEDER	VOLTAGE	CONNECTED LOAD (KVA)									TOTAL CONNECTED LOAD		TOTAL DEMAND LOAD	
		LIGHTING	RECEP	MOTORS	OVENS	HVAC	ELEC HEAT	WATER HEAT	MISC	EXIST	KVA	AMPS	KVA	AMPS
HM	277/480Y	0.0	0.0	17.6	0.0	41.9	0.0	0.0	2.5	0.0	62.0	74.6	62.0	74.6
HA	277/480Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.6	0.0	57.6	69.3	57.6	69.3
LB	120/240	0.0	9.5	0.0	54.7	2.8	0.0	0.0	29.8	0.0	96.9	403.8	77.7	324.0
CH-1	277/480Y	0.0	0.0	0.0	0.0	83.1	0.0	0.0	0.0	0.0	83.1	100.0	83.1	100.0
DSB	120/240	6.4	17.8	0.0	0.0	16.1	0.0	4.3	112.1	0.0	156.7	653.1	152.8	636.8
TOTAL	277/480Y	6.4	27.3	17.6	54.7	143.9	0.0	4.3	202.0	0.0	456.4	549.2	430.1	517.6

DISTRIBUTION BOARD 'DSB'

FEEDER	VOLTAGE	CONNECTED LOAD (KVA)									TOTAL CONNECTED LOAD		TOTAL DEMAND LOAD	
		LIGHTING	RECEP	MOTORS	KITCHEN	HVAC	ELEC HEAT	WATER HEAT	MISC	EXIST	KVA	AMPS	KVA	AMPS
A	120/240	2.9	6.8	0.0	0.0	1.1	0.0	0.0	5.8	0.0	16.6	69.0	16.6	69.0
AL	120/240	0.7	1.6	0.0	0.0	0.0	0.0	0.0	17.0	0.0	19.4	80.8	19.4	80.8
SL	120/240	0.7	7.0	0.0	0.0	0.0	0.0	0.0	17.5	0.0	25.3	105.3	25.3	105.3
M	120/240	0.5	2.3	0.0	0.0	15.0	0.0	4.3	15.0	0.0	37.2	154.9	37.2	154.9
M2	120/240	1.6	0.0	0.0	0.0	0.0	0.0	0.0	56.8	0.0	58.4	243.3	58.4	243.3
	120/240										0.0	0.0	0.0	0.0
	120/240										0.0	0.0	0.0	0.0
SUB TOTAL		6.4	17.8	0.0	0.0	16.1	0.0	4.3	112.1	0.0	156.7	653.1	152.8	636.8

PANEL: HM | PROJECT: ITD MATERIALS LAB
VOLTAGE: 480/ 277 | 3 PH 4 WIRE | AMPERE RATING: 200 MLO | SC RATING: 35000 AIC
CKT NOTES: | REMARKS: | MOUNTING: SURFACE
1. RED HANDLE, LOCKABLE BREAKER 5. EXISTING BREAKER
2. GFCI FOR PERSONNEL PROTECTION (5mA)
3. GFEP FOR EQUIPMENT PROTECTION (30mA)
4. AFCI COMBINATION STYLE BREAKER

CKT	DESCRIPTION	CKT NOTE	LOAD AMPS	AMPS/ POLES	PHASE (AMPS) A	B	C	AMPS/ POLES	LOAD AMPS	CKT NOTE	DESCRIPTION	CKT
1	CWP-1		7.6	15 3	15.2			15 3	7.6		CWP-2	2
3	***		7.6	** *		15.2		** *	7.6		***	4
5	***		7.6	** *			15.2	** *	7.6		***	6
7	HWP-1, HWP-2		6.0	15 3	6							8
9	***		6.0	** *		6						10
11	***		6.0	** *			6					12
13	EF-4		3.0	15 3	10.6			15 3	7.6		EUF-1	14
15	***		3.0	** *		10.6		** *	7.6		***	16
17	***		3.0	** *			10.6	** *	7.6		***	18
19	AHU-1		32.0	60 3	35			15 3	3.0		EUF-2	20
21	***		32.0	** *		35		** *	3.0		***	22
23	***		32.0	** *			35	** *	3.0		***	24
25	EF-5		3.0	15 3	7.8			15 3	4.8		EUF-3	26
27	***		3.0	** *		7.8		** *	4.8		***	28
29	***		3.0	** *			7.8	** *	4.8		***	30
31	SPARE			20 1	0			20 1			SPARE	32
33	SPARE			20 1		0		20 1			SPARE	34
35	SPARE			20 1			0	20 1			SPARE	36
37	SPARE			20 1	0			20 1			SPARE	38
39	SPARE			20 1		0		20 1			SPARE	40
41	SPARE			20 1			0	20 1			SPARE	42
					74.6	74.6	74.6	AMPS				
					20.7	20.7	20.7	KW			62 TOTAL KW	

PANEL: LB | PROJECT: ITD MATERIALS LAB
VOLTAGE: 120/ 240 | 1 PH 3 WIRE | AMPERE RATING: 400 MLO | SC RATING: 22000 AIC
CKT NOTES: | REMARKS: | MOUNTING: SURFACE
1. RED HANDLE, LOCKABLE BREAKER 5. EXISTING BREAKER
2. GFCI FOR PERSONNEL PROTECTION (5mA)
3. GFEP FOR EQUIPMENT PROTECTION (30mA)
4. AFCI COMBINATION STYLE BREAKER
PROVIDE SECTION 1 WITH FEED THROUGH LUGS.
MAINTAIN SPECIFIED CONDUIT AND FEEDER SIZE FROM SECTION 1 TO SECTON 2

CKT	DESCRIPTION	CKT NOTE	LOAD AMPS	AMPS/ POLES	PHASE (AMPS) A	N/A	C	AMPS/ POLES	LOAD AMPS	CKT NOTE	DESCRIPTION	CKT
1	REC - ASHALT LAB NW COUNTER NW		1.5	20 1	19.5			30 2	18.0		GRIEVE OVEN ASPHALT LAB E	2
3	NCAT ASPHALT LAB NW		27.0	35 2			45	** *	18.0		***	4
5	***		27.0	** *	45			30 2	18.0		GRIEVE OVEN ASPHALT LAB E	6
7	NCAT ASPHALT LAB NW		27.0	35 2			45	** *	18.0		***	8
9	***		27.0	** *	54			35 2	27.0		GRIEVE OVEN ASPHALT LAB E	10
11	GRIEVE OVEN ASPHALT LAB NW		18.0	30 2			45	** *	27.0		***	12
13	***		18.0	** *	45			35 2	27.0		GRIEVE OVEN ASPHALT LAB E	14
15	GRIEVE OVEN ASPHALT LAB NW		18.0	30 2			45	** *	27.0		***	16
17	***		18.0	** *	19.5			20 1	1.5		REC - ASPHALT LAB E N WALL	18
19	VWR OVEN ASPHALT LAB NW		12.0	20 1			13.5	20 1	1.5		REC - ASPHALT LAB E N WALL	20
21	VWR OVEN ASPHALT LAB NW		12.0	20 1	28			30 2	16.0		HAMBURG WHEEL TRACKER	22
23	REC - ASHALT LAB NW E WALL		1.5	20 1			17.5	** *	16.0		***	24
25	REC - ASHALT LAB NW CEILING		1.5	20 1	17.5			30 2	16.0		THERMOFLEX CHILLER	26
27	REC - ASHALT LAB NW CEILING		1.5	20 1			17.5	** *	16.0		***	28
29	REC - ASHALT LAB NW CEILING		1.5	20 1	3			20 1	1.5		REC - PERFORM LAB W WALL	30
31	REC - ASHALT LAB NW S WALL		3.0	20 1			8	20 1	5.0		REC - ROTARY EVAPORATOR	32
33	REC - ASHALT LAB NW S WALL		3.0	20 1	4.5			20 1	1.5		REC - PERFORM LAB W WALL	34
35	GRIEVE OVEN PERFORM LAB		18.0	30 2			23	20 1	5.0		REC - ROTARY EVAPORATOR	36
37	***		18.0	** *	21			20 1	3.0		REC - PERFORM LAB S WALL	38
39	GRIEVE OVEN PERFORM LAB		18.0	30 2			21	20 1	3.0		REC - PERFORM LAB E WALL	40
41	***		18.0	** *	23.8			20 1	5.8		REC - FORNEY COMPRESSION MACH	42
43	LA ABRASION MACHINE		5.8	20 2			7.3	20 1	1.5		REC - CEILING PERFORM LAB	44
45	***		5.8	** *	7.3			20 1	1.5		REC - CEILING PERFORM LAB	46
47	REC - 230V STORAGE		5.0	30 2			12.5	20 1	7.5		REC - STORAGE	48
49	***		5.0	** *	10			30 2	5.0		REC - 230V STORAGE	50
51	REC - MECH LOFT		7.5	20 1			12.5	** *	5.0		***	52
53	EF-7		9.8	20 1	14.4			15 3	4.6		UEF-4	54
55	LOUVERS L-1, PH-1		1.5	20 1			6.1	** *	4.6		***	56
57	BOILERS 1 AND 2		3.0	20 1	7.6			** *	4.6		***	58
59	EH-4		8.3	20 2			15.5	20 1	7.2		GT-HW1	60
61	***		8.3	** *	15.5			20 1	7.2		GT-OW1	62
63	GENERATOR HEATER		3.0	20 1			6	20 1	3.0	2	DRINKING FOUNTAIN	64
65	GENERATOR BATTERY		3.0	20 1	6			20 1	3.0		REC - AIR COMP ACCESSORIES	66
67	HEAT TAPE		5.0	20 1			5	20 1			SPARE	68
69	HUMIDIFIER 1		4.5	20 1	4.5			20 1			SPARE	70
71	SV AND EV IN LOFT		3.0	20 1			3	20 1			SPARE	72
73	SV AND EV IN LABS		3.0	20 1	3			20 1			SPARE	74
75	SPARE			20 1			0	20 1			SPARE	76
77	SPARE			20 1	0			20 1			SPARE	78
79	SPARE			20 1			0	20 1			SPARE	80
81	RESERVED				61.2			200 2	61.2		ATS (PANEL EM)	82
83	RESERVED						48.8	** *	48.8		***	84
					410.3		397.2	AMPS				
					49.2		47.7	KW			96.9 TOTAL KW	

PANEL: HA | PROJECT: ITD MATERIALS LAB
VOLTAGE: 480/ 277 | 3 PH 4 WIRE | AMPERE RATING: 200 MLO | SC RATING: 35000 AIC
CKT NOTES: | REMARKS: | MOUNTING: SURFACE
1. RED HANDLE, LOCKABLE BREAKER 5. EXISTING BREAKER
2. GFCI FOR PERSONNEL PROTECTION (5mA)
3. GFEP FOR EQUIPMENT PROTECTION (30mA)
4. AFCI COMBINATION STYLE BREAKER

CKT	DESCRIPTION	CKT NOTE	LOAD AMPS	AMPS/ POLES	PHASE (AMPS) A	B	C	AMPS/ POLES	LOAD AMPS	CKT NOTE	DESCRIPTION	CKT
1	INFRATEST EXTR ASPHALT LAB NW		14.0	20 3	24			20 3	10.0		INSTRON COMPRESSION MACH	2
3	***		14.0	** *		24		** *	10.0		***	4
5	***		14.0	** *			24	** *	10.0		***	6
7	INFRATEST EXTR ASPHALT LAB NW		14.0	20 3	19			30 2	5.0		REC - 230V STORAGE	8
9	***		14.0	** *		19		** *	5.0		***	10
11	***		14.0	** *			14	20 1			SPARE	12
13	INFRATEST PERFORM LAB		14.0	20 3	14			20 1			SPARE	14
15	***		14.0	** *		14		20 1			SPARE	16
17	***		14.0	** *			14	20 1			SPARE	18
19	INFRATEST PERFORM LAB		14.0	20 3	14			20 1			SPARE	20
21	***		14.0	** *		14		20 1			SPARE	22
23	***		14.0	** *			14	20 1			SPARE	24
25	SPARE			20 1	0			20 1			SPARE	26
27	SPARE			20 1		0		20 1			SPARE	28
29	SPARE			20 1			0	20 1			SPARE	30
31	SPARE			20 1	0			20 1			SPARE	32
33	SPARE			20 1		0		20 1			SPARE	34
35	SPARE			20 1			0	20 1			SPARE	36
37	SPARE			20 1	0			20 1			SPARE	38
39	SPARE			20 1		0		20 1			SPARE	40
41	SPARE			20 1			0	20 1			SPARE	42
					71.0	71.0	66.0	AMPS				
					19.7	19.7	18.3	KW			57.6 TOTAL KW	

MUSGROVE ENGINEERING, P.A.
234 S. Whisperwood Way
Boise, ID 83709
208.384.0585
645 West 25th Street
Idaho Falls, ID 83402
208.523.2862
www.musgrovepa.com
Project No. 20-227

PROFESSIONAL ENGINEER REGISTERED 12791 1/12/2023 STATE OF IDAHO NICK SCHAFER

REVISIONS

CONSULTANTS ◇
DATE ◇ 1/16/2023
DRAWN ◇ NJS
CHECKED ◇ KEL
CKA PROJ. NO. ◇ 22040
ITD PROJ. NO. ◇ 21161

CASTELLAW ◆ KOM ◆ ARCHITECTS
850 MAIN STREET ◆ LEWISTON, IDAHO
OFFICE (208) 746-0183 ◆ FAX (208) 746-7267

PROJECT ◇
ITD # FM22011
IDAHO TRANSPORTATION DEPARTMENT
ITD DISTRICT 2
MATERIALS LAB REMODEL
2606 FRONTAGE RD, LEWISTON, ID 83501

DRAWING ◇
ELECTRICAL SCHEDULES

SHEET ◇
E3.1

CONSTRUCTION DOCUMENTS