# BUILDING 24 - BASEMENT REMODEL

24 H RD.
MISSOULA, MT 59804

PROJECT TO BE SPLIT INTO SEPARATE AREAS, THE PROJECT EAST WING AND PROJECT WEST WING WILL BE BID SEPARATELY.

## ABBREVIATIONS:

| | |
|---|---|
| @ | at |
| A.B. | anchor bolt |
| A/C | air conditioning |
| ACC PNL | access panel |
| ACOUST | acoustical |
| ACT | acoustical ceiling tile |
| AD | area drain |
| ADJ | adjacent |
| AFF | above finished floor |
| AIB | air infiltration barrier |
| ALT | alternate |
| ALUM | aluminum |
| ANOD | anodized |
| APPROX | approximate |
| ARCH | architect |
| AUTO | automatic |
| BBD | bulletin board |
| BD | board |
| BITUM | bituminous |
| BL | building line |
| BLDG | building |
| BLK | block |
| BLKG | blocking |
| BM | beam/bench mark |
| BO | by CONTRACTING OFFICER |
| B.O. | bottom of |
| BOT | bottom |
| BRG | bearing |
| BSBD | baseboard |
| BTWN | between |
| B.O.W. | bottom of wall |
| BU | built up |
| CAB | cabinet |
| CAP | capacity |
| CB | catch basin |
| CL | centerline |
| C.C. | center to center |
| CDX | exterior grade plywood |
| CG | corner guard |
| CH | channel |
| CI | cast iron/cubic inches |
| CJ | control joint |
| CLG | ceiling |
| C.L.L. | contract limit line |
| CL | center line |
| CLR | clear |
| CMU | concrete masonry unit |
| CO | CONTRACTING OFFICER |
| COL | column |
| CONC | concrete |
| COND | condition |
| CONF | conference |
| CONN | connection |
| CONST | construction |
| CTRD | centered |
| CONT | continuous |
| CONTR | contractor |
| CORR | corridor |
| CPT | carpet |
| CT | ceramic tile |
| CUH | cabinet unit heater |
| CW | curtain wall system |
| CY | cubic yard |
| DBL | double |
| DEPT | department |
| DF | drinking fountain |
| DIA | diameter |
| DIAG | diagonal |
| DIM | dimension |
| DISP | dispenser |
| DN | down |
| DR | door |
| DWR | drawer |
| DS | downspout |
| DTL | detail |
| DWG | drawing |
| E | east |
| EA | each |
| EIFS | exterior insulation finish system |
| E.J. | expansion joint |
| EL/ELEV | elevation - height/elevator |
| ELEC | electrical |
| ENCL | enclosure |
| EO | electrical outlet |
| EP | electrical panel |
| EQ | equal |
| EQUIP | equipment |
| EWA/EW | exterior wall assembly |
| EWC | electrical water cooler |
| EWH | electrical water heater |
| (E)/EXIST | existing |
| EXH | exhaust |
| EXP | expansion |
| EXT | exterior |
| FA | fire alarm/floor-ceiling assembly |
| FAH | fire alarm horn |
| FAS | fire alarm station |
| FD | floor drain |
| FDN/FND | foundation |
| FE | fire extinguisher |
| FEC | fire extinguisher cabinet |
| FF | finished floor |
| FFHB | frost free hose bib |
| FG | finish grade |
| FH | fire hydrant |
| FIN. FLR | top of floor sheathing |
| FIN | finish |
| FIXT | fixture |
| F.O. | face of |
| FLR/FL | floor |
| FLUOR | fluorescent |
| FND | feminine napkin dispenser/disposal |
| FOC | face of concrete |
| FOF | face of finish |
| FOS | face of stud |
| FOW | face of wall |
| FT | foot or feet |
| FTG | footing |
| GA | gauge |
| GB | grab bar |
| GALV | galvanized |
| G.C. | general contractor |
| GEN | general |
| GFRG | glass fiber reinforced gypsum |
| GI | galvanized iron |
| GL | glass |
| GLU LAM or G.L.B. | glue laminated beam |
| GRD | grade/grid |
| GWB | gypsum wall board |
| GYP | gypsum |
| HB | hose bib |
| HC | hollow core/handicapped |
| HD BD | Hard board |
| HDR | header |
| HOR | horizontal |
| HR | hour |
| HT | height |
| HTG | heating |
| HVAC | heating, ventilation, air conditioning |
| HW | hot water |
| IN | inch |
| INCL | included |
| INFO | information |
| INSUL | insulation |
| INT | interior |
| IWA/IW | interior wall assembly |
| JAN | janitor |
| JST | joist |
| JT | joint |
| LAV | lavatory |
| LF | lineal foot |
| LTG | lighting |
| M | men's |
| MAT | material |
| MAX | maximum |
| MECH | mechanical |
| MDF | medium density fiber board |
| MEMB | membrane |
| MEZZ | mezzanine |
| MFR | manufacturer |
| MH | manhole |
| MIN | minimum |
| MIR | mirror |
| MISC | miscellaneous |
| MO | masonry opening |
| MTL | metal |
| MULL | mullion |
| N | north |
| NA | not applicable |
| NIC | not in contract |
| NO | number |
| NTS | not to scale |
| OFCI | CONTRACTING OFFICER |
| furnished/contractor installed | |
| OC | on center |
| OD | outside diameter |
| OH | overhead/opposite hand |
| OPNG | opening |
| OPP | opposite/board |
| PART'N | partition |
| PC | precast concrete |
| PFM | prefinished metal |
| PL | plate |
| P.LAM | plastic laminate |
| PLWD | plywood |
| PNL | panel |
| PR | pair |
| PSL | parallel strand lumber |
| PT | point |
| PTD | paper towel dispenser |
| PTD/R | paper towel dispenser/receptacle |
| PVMT | pavement |
| PVC | polyvinylchloride |
| QTY | quantity |
| R/RAD | radius |
| R | riser |
| RA | roof/ceiling assembly |
| RB | rubber base |
| RD | roof drain |
| RE | regarding |
| REF | reference/refrigerator |
| REINF | reinforcing |
| REQD | required |
| RES | resilient |
| RM | room |
| RO | rough opening |
| RV | roof vent |
| R&S | rod and shelf |
| S | south |
| SACT | suspended acoustical ceiling tile |
| SC | solid core |
| SCD | seat cover dispenser |
| SCHED | schedule |
| SD | soap dispenser |
| SECT | section |
| SF | square feet |
| SGL | single |
| SHT | sheet |
| SHTG | sheathing |
| SHWR | shower |
| SIM | similar |
| S.I.P. | structural insulated panel |
| SLNT | sealant |
| SOG | slab on grade |
| SPEC | specifications |
| S.S. | stainless steel |
| SS | service sink |
| SSM | solid surface material |
| STD | standard |
| STF | storefront |
| STL | steel |
| STOR | storage |
| STRUCT | structural |
| SUBFLR | subfloor |
| SUSP | suspended |
| SV | sheet vinyl |
| SY | square yard |
| T | tread/thermostat |
| TB | towel bar |
| TEL | telephone |
| TEMP | temperature |
| T&G | tongue and groove |
| THK | thick |
| THRU | through |
| TJI | Truss Joist Incorporated |
| T.O. | top of |
| T.O.B. | top of beam |
| T.O.C. | top of concrete |
| T.O.P. | top of plate |
| T.O. FTG | top of footing |
| T.O.S. | top of steel |
| T.O.SL | top of slab |
| T.O.W. | top of wall |
| TPD | toilet paper dispenser |
| TR | tread |
| TS | tubular steel |
| TV | television |
| TYP | typical |
| U/G | underground |
| UNO | unless noted otherwise |
| UR | urinal |
| VAC | vacuum outlet |
| VAR | varies |
| VB | vapor barrier |
| VCT | vinyl composition tile |
| VERT | vertical |
| VEST | vestibule |
| VFY | verify |
| VT | vinyl tile |
| VWC | vinyl wall covering |
| W | west/women's/width |
| W/ | with |
| W/O | without |
| WC | water closet |
| WD | wood |
| W/D | washer/dryer |
| WH | water heater |
| WNDW | window |
| WP | waterproof |
| WR | water resistant |
| WRB | weather resistive barrier |
| WT | weight |
| WWF | welded wire fabric |
| WWM | welded wire mesh |
| X | by |
| YD | yard |

## REFERENCE SYMBOLS:

- 23 VIEW NAME — 1/8" = 1'-0" — SCALE — DRAWING TITLE
- DRAWING NUMBER 5 / SHEET NUMBER A3-8 — BUILDING SECTIONS
- DRAWING NUMBER 3 / SHEET NUMBER A5-2 — SIM — WALL SECTIONS; "SIM" INDICATES SIMILAR CONDITION: SEE NOTES
- DRAWING NUMBER 4 / SHEET NUMBER A7-1 — EXTERIOR ELEVATION
- DRAWING NUMBER 1 / SHEET NUMBER A1-1 — DETAIL CALLOUT
- DRAWING NUMBER 1 / SHEET NUMBER A1-1 — INTERIOR ELEVATION
- 101A — DOOR NUMBER
- A — WINDOW TYPE -SEE ELEVATIONS FOR HEIGHTS
- Room name 101 — ROOM NAME, NUMBER, AND AREA
- A / 1 — GRID LINES: LETTERS LEFT TO RIGHT NUMBERS TOP TO BOTTOM
- 1 — WALL TYPE
- FA1 — FLOOR TYPE
- RA1 — ROOF TYPE
- Name / Elevation — ELEVATION TAG; FLOOR = 100' - 0"
- TEXT INDICATES STOREFRONT SYSTEM: iSF = INTERIOR STOREFRONT; SF = EXTERIOR STOREFRONT; CW = CURTAINWALL — cw1 — STOREFRONT/CURTAINWALL CALLOUT
- WITH CABINET — FIRE EXTINGUISHER, SEE CODE PLANS
- WALL-HUNG, NO CABINET — FE

## GENERAL NOTES:

1. GENERAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS & CONDITIONS. EXISTING DIMENSIONS SHOWN ARE APPROXIMATE AND MUST BE FIELD VERIFIED.
2. REFER TO SPECIFICATIONS FOR DETAILED DESCRIPTIONS & REQUIREMENTS OF CONSTRUCTION.
3. GENERAL CONTRACTOR SHALL COORDINATE THE WORK OF ALL TRADES, PROVIDE ON-SITE SUPERVISION & BE RESPONSIBLE FOR COMPLIANCE WITH ALL SAFETY PRECAUTIONS, CODES AND REGULATIONS.
4. PROTECT EXISTING UTILITIES, SITE IMPROVEMENTS & PLANTING TO REMAIN.
5. PATCH ANY SURFACES DAMAGED DURING CONSTRUCTION. SURFACES ARE TO BE PATCHED FLUSH WITH EXISTING. MATCH EXISTING ADJACENT FINISH OR APPLY NEW FINISH AS SCHEDULED.
6. PROVIDE SOLID BACKING FOR ALL WALL-MOUNTED ITEMS.
7. IN GENERAL, REPETITIVE DETAILS DRAWN ARE SHOWN IN FULL ONLY ONCE. REPETITIONS MAY NOT BE COMPLETE IN EVERY DETAIL AS SHOWN IN THE ORIGINAL DETAIL.
8. DIMENSIONS ARE SHOWN ON THE DRAWINGS. DO NOT SCALE THE DRAWINGS.
9. ALL HEIGHTS ARE DIMENSIONED FROM THE TOP OF FINISH FLOOR UNLESS NOTED OTHERWISE.
10. WHERE COLUMNS & STUD WALLS ALIGN, GYPSUM BOARD TO BE CONTINUOUS OVER COLUMNS OR BOXED AROUND COLUMN IF COLUMN PROJECTS BEYOND WALL.
11. BRING TO THE ATTENTION OF THE ARCHITECT/CONTRACTING OFFICER ANY CONDITION OR AREA OF FINISH THAT IS IN QUESTION OR NOT NOTED.
12. SEAL ALL PENETRATIONS OF WALLS, FLOORS AND CEILINGS WITH A FIRE RATING EQUIVALENT TO THE CONSTRUCTION PENETRATED AND PER DETAILS & SPECIFICATIONS.
13. DUST BARRIERS MUST BE INSTALLED WHEREVER NEW WORK IS ADJACENT TO OCCUPIED AREAS. BARRIERS MUST BE SEALED TO INSURE NO DUST TRANSMISSION TO OCCUPIED SPACES.
14. COORDINATE LAYOUT, CLEARANCES, PENETRATIONS, BACKING & FASTENERS WITH WORK TO FOLLOW.
15. HEATING, PLUMBING AND ELECTRICAL PLANS WHERE SHOWN DIAGRAMMATICALLY ARE INTENDED TO INDICATE CAPACITY, SIZE, LOCATION & GENERAL ARRANGEMENTS. ALL NECESSARY FEATURES OF RELATED CONSTRUCTION WILL BE REQUIRED AS IF SHOWN IN DETAIL.
16. WHERE MECHANICAL & ELECTRICAL EQUIPMENT LOCATIONS CONFLICT ELECTRICAL, LIGHT FIXTURE LOCATIONS SHALL TAKE PRECEDENCE.
17. PROVIDE SUFFICIENT STUD DEPTH TO CONCEAL MECHANICAL & ELECTRICAL WORK IN WALLS.
18. PROVIDE ALL NEW MATERIALS (U.N.O.) AND QUALIFIED CRAFT PERSONS TO COMPLETE THE WORK.
19. CONSTRUCTION DOCUMENTS SHOW THE DESIGN INTENT OF THE PROJECT AND MAY NOT SHOW MINOR DETAILS OF PROPOSED INSTALLATIONS. THE INCLUSION OF THESE MINOR DETAILS IS IMPLIED TO PROVIDE A COMPLETE PROJECT AND ARE TO BE INCLUDED AS A PART OF A BID.
20. REFER TO MECHANICAL & ELECTRICAL DRAWINGS FOR COORDINATION OF WORK.
21. IN THE CASE OF CONTRADICTIONS BETWEEN DRAWINGS OR BETWEEN DRAWINGS & SPECIFICATIONS, ASSUME THE MORE COSTLY APPROACH FOR BIDDING PURPOSES. BRING ALL CONTRADICTIONS TO THE ATTENTION OF THE ARCHITECT/CONTRACTING OFFICER.
22. CONTRACTOR SHALL PROMPTLY REMOVE ALL WASTE MATERIALS AND LEAVE PREMISES AND SITE CLEAN.
23. THE CONTRACTOR SHALL PROVIDE ALL CEILING AND/OR WALL ACCESS PANELS/DOORS AS REQUIRED BY THE AIR CONDITIONING, PLUMBING & ELECTRICAL SYSTEMS, PROVIDE APPROVED ASSEMBLIES W/ SELF-CLOSING DEVICES IN RATED CONSTRUCTION. (PAINT TO MATCH ADJACENT WALL COLOR)
24. ELECTRICAL OUTLETS AND LIGHTING ARE ONLY SHOWN ON ARCHITECTURAL "A" SHEETS WHERE PLACEMENT OF SUCH IS CRITICAL TO PARTICULAR AESTHETICS. SEE ELECTRICAL DRAWINGS FOR ALL ELECTRICAL AND DATA FEATURES.

**DRAWING SET NOTE: THESE DRAWINGS ARE TO BE UTILIZED AS A COMPLETE SET FOR BIDDING & CONSTRUCTION. INDIVIDUAL SECTIONS OF DRAWINGS SHOULD NOT BE SEPARATED FROM THE ENTIRE SET. IMPORTANT NOTES FOR ONE AREA OF WORK MAY BE INCLUDED IN OTHER AREAS IN THE DRAWINGS. ALL CONTRACTORS & SUPPLIERS MUST REVIEW ENTIRE DRAWING SET & SPECIFICATIONS.**

DATE STAMP: 7/15/2026 2:10:16 PM

## VICINITY MAP

## EAST APPROACH

## SHEET INDEX


### ARCHITECTURAL DRAWINGS

| | |
|---|---|
| AD-000 | COVER |
| AD-001 | CODE INFORMATION & TYP. ASSEMBLIES |
| AD-101 | DEMOLITION PLAN - BASEMENT |
| AD-102 | FLOOR PLAN & RCP - BASEMENT |
| AD-701 | FINISH PLAN & SCHEDULE- BASEMENT |

### MECHANICAL DRAWINGS

| | |
|---|---|
| M001 | MECHANICAL LEGEND & NOTES |
| M002 | MECHANICAL SPECIFICATIONS, SCHEDULES & DETAILS |
| M101 | MECHANICAL DEMO PLAN - BASEMENT |
| M201 | MECHANICAL FLOOR PLAN - BASEMENT |

### PLUMBING DRAWINGS

| | |
|---|---|
| P001 | PLUMBING LEGEND AND NOTES |
| P002 | PLUMBING SPECIFICATIONS. SCHEDULES & DETAILS |
| P101 | PLUMBING DEMO PLAN - BASEMENT |
| P201 | PLUMBING FLOOR PLAN - BASEMENT |

### ELECTRICAL DRAWINGS

| | |
|---|---|
| E0.1 | ELECTRICAL SYMBOLS AND ABBREVIATIONS |
| E0.2 | ELECTRICAL SPECIFICATIONS |
| E0.3 | ELECTRICAL SPECIFICATIONS |
| E0.4 | ELECTRICAL DETAILS |
| E0.5 | ELECTRICAL SCHEDULES |
| E101 | ELECTRICAL DEMO PLAN |
| E102 | ELECTRICAL BASEMENT PLAN- POWER AND SIGNAL |
| E103 | ELECTRICAL BASEMENT PLAN- LIGHTING |

### ICT DRAWINGS

| | |
|---|---|
| T001 | ICT SYMBOLS AND ABBREVIATIONS |
| T002 | ICT DETAILS |
| T003 | ICT SPECIFICATIONS |
| T004 | ICT SPECIFICATIONS |
| T101 | ICT BASEMENT DEMO PLAN |
| T102 | ICT BASEMENT PLAN |


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| # | DATE | REVISION |
|---|---|---|

100% CONSTRUCTION DOCUMENTS


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**BUILDING 24 REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**COVER**

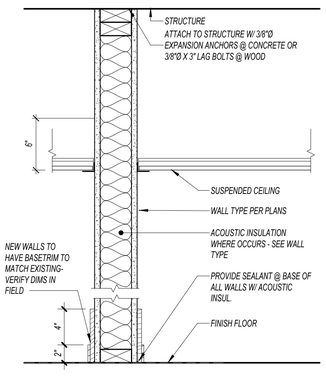
DATE: 05.19.2026

SHEET:

**AD-000**

**1 CODE REVIEW - BASEMENT**
1/16" = 1'-0"

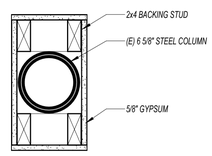
## PARTITION WALL TO STRUCTURE




INTERIOR PARTITION

NON-RATED SOUND WALL

## NEW FURR-OUT COLUMN DETAIL

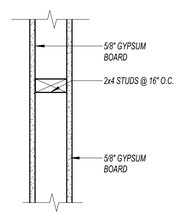



f1 INTERIOR PARTITION

NON-RATED SOUND WALL

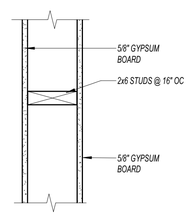
## INTERIOR WALL TYPES

NOTE: SEE ELEVATIONS AND FINISH SCHEDULES FOR WALL FINISHES, TYPICAL ALL WALL TYPES




i1 INTERIOR PARTITION

NON-RATED




i2 INTERIOR PARTITION

NON-RATED

## SUMMARY CODE REVIEW

*SEE CODE ANALYSIS PLANS THIS SHEET.*

**PROJECT DESCRIPTION:** *REMODEL EXISTING OFFICE SPACE FOR UPDATED OFFICE NEEDS, OCCUPANCY USE AND TYPE DOES NOT CHANGE.*

**OCCUPANCY GROUPS:** *(CHAPTER 3)*
- **B** - BUSINESS
- ACCESSORY OCCUPANCIES PER SEC. 508.2 WHERE OCCUR.
- INCIDENTAL USES PER TABLE 509 WHERE OCCUR.

**NONSEPARATED OCCUPANCIES:** *(SEC. 508.3.2)* *THIS MIXED OCCUPANCY BUILDING INCORPORATES NONSEPARATED OCCUPANCIES. NO OCCUPANCY SEPARATIONS ARE PROVIDED, AND THE ALLOWABLE AREA AND HEIGHT OF THE BUILDING IS BASED ON THE REQUIREMENTS OF THE MOST RESTRICTIVE OCCUPANCY.*

**CONSTRUCTION TYPE:** *(TABLE 601)* *TYPE IIIB, SPRINKLERED*

**ALLOWABLE FLOOR AREA (At):** *(TABLE 506.2)* *B: 57,000 SF*

**FRONTAGE INCREASE (If):** *(TABLE 506.3.3)* *>30' OPEN SPACE FOR 100% OF BLDG PERIMETER: If = .75*

**ALLOWABLE FLOOR AREA:**
**SINGLE OCCUPANCY**
**MULTISTORY BLDG: (Aa)**
*(SEC. 506.2.1)*

*Aa = [At + (NS x If)] x Sa*
*S-1: Aa = 57,000 + [57,000 x .75] x 4*
*Aa = 228,000 SF*

**ACTUAL FLOOR AREA:** *EXSTING: BASEMENT: 14,240 SF*
*1-2 LEVELS: 28,480 SF*

*42,720 SF < 228,000 SF ALLOWABLE; OK*

**ALLOWABLE NO. OF STORIES / HEIGHT:** *(TABLE 504.4/504.3)* *B: 3 STORIES / 55 FT*

**ACTUAL NO. OF STORIES / HEIGHT:** *2 STORY / 43 FT; OK*

**INTERIOR FINISH REQUIREMENTS:** *(TABLE 803.13)* *INTERIOR EXIT STAIRWAYS, EXIT RAMPS & EXIT PASSAGEWAYS: CLASS A. CORRIDORS & ENCLOSURE FOR EXIT ACCESS STAIRWAYS & EXIT ACCESS RAMPS: CLASS B. ROOMS AND ENCLOSED SPACES: CLASS C*

**OCCUPANT LOADS FOR EGRESS DESIGN:** *(SEC. 1004 + TABLE 1004.5)* *SEE CODE ANALYSIS PLAN. OCCUPANT LOADS BASED ON MAX. FLOOR AREA IN SQ FT PER OCCUPANT FROM TABLE 1004.5:*

| | |
|---|---|
| *ASSEMBLY - UNCONCENTRATED* | *15 NET* |
| *BUSINESS:* | *150 GROSS* |
| *STORAGE/MECHANICAL EQUIPMENT* | *300 GROSS* |

**OCCUPANT LOAD :**

| | |
|---|---|
| *BUSINESS AREAS:* | *28 occu* |
| *TOTAL OCCUPANTS:* | *28 occu* |

**EGRESS WIDTH PER OCCUPANT SERVED:** *(SEC. 1005.3)*

| | |
|---|---|
| *STAIRWAYS:* | *0.3 INCHES / OCCUPANT* |
| *OTHER EGRESS COMPONENTS:* | *0.2 INCHES / OCCUPANT* |

**EGRESS WIDTH MINIMUMS BY COMPONENT (USE WHERE EXCEED MINIMUMS BY OCCUPANT LOAD):**
**44" AT STAIRWAYS** *(36" WHERE OCC LOAD < 50) [IBC §1011.2];*
**32" CLEAR AT DOORS** *[§1010.1.1],*
**44" AT CORRIDORS, AISLES & EXIT PASSAGEWAYS (36" for occupant load <50)** *[§ 1020.2; 1018.3, 1018.5; 1024.2 RESPECTIVELY].* **PROVIDED.**

**CORRIDOR FIRE RESISTANCE RATING:** *(TABLE 1020.2)* *B OCCUPANCY, OCC LOAD >30: 0-HOUR (SPRINKLERED)*

**EXIT ACCESS TRAVEL:** *(TABLE 1017.2)* *B- 300' SPRINKLERED*

## IECC COMPLIANCE FOR COMMERCIAL PROJECTS

*CLIMATE ZONE: 6*

**INSULATION REQUIREMENTS - IECC 2021 TABLE C402.1.3/C402.4 AND MT AMENDMENTS**

| | |
|---|---|
| *ROOFS* | *R-30 CONTINUOUS ABOVE DECK, R-49 AT ATTICS* |
| *METAL FRAMED WALLS, ABOVE GRADE* | *R-13 CAVITY + R-12.5 CONTINUOUS* |
| *WOOD FRAMED WALLS, ABOVE GRADE* | *R-13 CAVITY + R-7.5 CONTINUOUS OR R-20 + R-3.8 CONTINUOUS* |
| *MASS WALLS, ABOVE GRADE:* | *R-15.2 CONTINUOUS* |
| *BELOW GRADE WALLS:* | *R-15 CONTINUOUS* |
| *FLOORS - JOIST/FRAMING:* | *R-38 (R-38 FOR STEEL FLOOR JOISTS)* |
| *UN-HEATED SLAB:* | *R-20 VERTICAL FOR 48" BELOW (FULL HEIGHT OF THICKENED SLAB EDGE)* |
| *HEATED SLAB:* | *R-15 FOR 36" BELOW + R-5 FULL SLAB* |
| *OPAQUE SWINGING DOORS:* | *U-0.37* |
| *SKYLIGHT U-FACTOR:* | *0.50, MAXIMUM* |
| *FIXED FENESTRATION U-FACTOR:* | *0.34, MAXIMUM* |
| *OPERABLE FENESTRATION U FACTOR* | *0.42 MAXIMUM* |
| *ENTRANCE DOOR:* | *0.63, MAXIMUM* |
| *SHGC* | *0.41 WITH ADJUSTMENT FOR PROJECTION FACTOR > 2* |

**INSULATION TO BE PROVIDED - REQUIREMENTS IN OTHER AREAS OF DRAWINGS OR SPECIFICATIONS TAKE PRECEDENCE OVER THE FOLLOWING REQUIREMENTS:**

| | |
|---|---|
| *ROOFS* | *R-30 BLOWN-IN ATTIC INSULATION* |
| *WOOD FRAMED WALLS:* | *R-21 CAVITY + R3.8 CONTINUOUS* |
| *UNHEATED SLAB:* | *R-10 VERTICAL FOR 24" BELOW (FULL HEIGHT OF THICKENED SLAB EDGE)* |
| *OPAQUE SWINGING DOORS:* | *U-0.37* |
| *ROLL UP OR SLIDING DOORS* | *R-4.75* |
| *FENESTRATION U-FACTOR (FIXED):* | *0.34 MAXIMUM* |
| *FENESTRATION U-FACTOR (OPERABLE):* | *0.42, MAXIMUM* |
| *ENTRANCE DOOR:* | *0.63, MAXIMUM* |
| *SHGC* | *0.40 WITH PROJECTION FACTOR < 2* |

## GENERAL WALL NOTES

1. *WALL TYPE CONSTRUCTION IS CONTINUOUS FROM SLAB TO ROOF FRAMING ABOVE UNLESS INDICATED OTHERWISE.*
2. *IF A WALL TYPE IS NOT INDICATED, PROVIDE WALL TYPE OF MOST SIMILAR CONDITION - VERIFY WITH CO/ ARCHITECT.*
3. *IN CASES OF CONFLICT BETWEEN SECTIONS AND WALL TYPES, CLARIFY WITH ARCHITECT PRIOR TO BIDDING WHEN TIME ALLOWS. OTHERWISE ASSUME THE MOST EXPENSIVE CONDITION FOR BIDDING PURPOSES.*
4. *STRUCTURAL NOTES, SPECIFICATIONS, STUD GAUGE NOTATIONS ETC. TAKE PRECEDENCE OVER ARCHITECTURAL WALL TYPES.*
5. *FOR LIGHT GAUGE (NON-STRUCTURAL) METAL FRAMING, PROVIDE MIN. 22 GAUGE STUDS UNLESS THE CONTRACTOR CAN PROVIDE MANUFACTURER'S DATA SUPPORTING LIGHTER GAUGE STUDS BASED ON HEIGHT AND FINISH MATERIALS.*
6. *ALL VOIDS IN EXTERIOR WALLS - INCLUDING IN NON-VISIBLE LOCATIONS - TO BE FILLED TIGHT WITH INSULATION. SMALL CRACKS & VOIDS TO BE CAULKED OR SPRAY-FOAMED FOR TIGHT SEAL.*
7. *ALL EXTERIOR WALLS TO RECEIVE VAPOR BARRIER UNDER INTERIOR FINISH. ALL SEAMS OF VAPOR BARRIER MUST BE TAPED/SEALED TIGHT AND ALL JOINTS MUST BE TAPED/ SEALED TIGHT WITH MATERIALS AND METHODS APPROVED BY VAPOR BARRIER MFR.*
8. *TYPE "X" GYPSUM WALL BOARD SPECIFIED THROUGHOUT. PROVIDE WATER-RESISTANT TYPE "X" GYPSUM BOARD ON ENTIRE WALL WHERE PLUMBING FIXTURES OCCUR. PROVIDE TILE BACKER BOARD TYPE "X" ON ALL WALLS WITH TILE.*
9. *WALLS INDICATED WITH ACOUSTICAL INSULATION TO MEET AN STC RATING OF 48 OR MORE, UNLESS OTHERWISE INDICATED.*
10. *PROVIDE SOUND ATTENUATION INSULATION ON TOP OF ACT WHERE WALLS TERMINATE AT CEILING OR 6" ABOVE CEILING. EXTEND 5 FEET TO BOTH SIDES OF WALL. HOLD INSULATION 7" AWAY FROM LIGHT FIXTURES.*
11. *PROVIDE BACKER ROD & CAULKING JOINT AT ABUTMENT OF ALL DISSIMILAR MATERIALS.*
12. *PROVIDE STEEL "J" EDGE METAL AND 1/4" CAULK JOINT AT PERIMETER OF ALL GYPSUM BOARD WALLS WHERE ABUTTING DIFFERENT MATERIALS.*
13. *PROVIDE CORNER BEADS AT ALL EXTERNAL GYPSUM BOARD CORNERS.*
14. *PENETRATIONS OF FIRE-RESISTIVE WALLS, HORIZONTAL ASSEMBLIES SHALL BE PROTECTED AS REQUIRED IN IBC SECTION 714.*
15. *PROVIDE FIRE, SMOKE AND CEILING RADIATION DAMPERS AT DUCT PENETRATIONS AND AIR TRANSFER OPENINGS IN FIRE RATED ASSEMBLIES PER IBC SECTION 717.*

## APPLICABLE BUILDING CODES

*THIS PROJECT SHALL COMPLY WITH THE LATEST EDITION OF CODES ADOPTED BY THE STATE OF MONTANA:*
- *2021 International Building Code (IBC)*
- *2021 International Mechanical Code (IMC)*
- *2021 International Fuel Gas Code (IFGC)*
- *2021 Uniform Plumbing Code (IAMPO)*
- *2020 National Electrical Code (NEC)*
- *2012 International Fire Code (IFC)*
- *2021 International Energy Conservation Code (IECC)*

## CODE PLAN LEGEND

*OCCUPANCY GROUP **B** AREA*

*OCCUPANCY GROUP **B** WITH ACCESSORY SMALL ASSEMBLY SPACE WITH OCCUPANT LOAD <50 OR AREA <750 SF, CLASSIFIED AS PART OF GROUP B OCCUPANCY PER 303.1.2*

IU — *INCIDENTAL USE: W/ REQUIRED SEPARATION PER TABLE 509.1. SHALL NOT OCCUPY >10% OF FLOOR AREA OF STORY IN WHICH LOCATED, AND IS CALCULATED AS PART OF OCCUPANCY IN WHICH IT IS LOCATED.*

AO — *ACCESSORY OCCUPANCY AREA: W/ NO SEPARATION REQUIRED AND CALCULATED AS PART OF MAIN OCCUPANCY IF TOTAL ACCESSORY OCCUPANCIES WITHIN A STORY OCCUPY LESS THAN 10% OF AREA OF THAT STORY, PER SECTION 508.2.3.*

**ROOM NAME**
500 SF
100 5

*ROOM AREA*
*OCCUPANT LOAD*
*MAX. FLOOR AREA PER OCCUPANT FROM TABLE 1004.5*

*OCCUPANT LOADS FOR FUNCTIONS DESIGNATED* **NET FLOOR AREA** *IN TABLE 1004.5 ARE IDENTIFIED FOR ACTUAL OCCUPIED AREAS.*

*OCCUPANT LOADS FOR FUNCTIONS DESIGNATED* **GROSS FLOOR AREA** *ARE IDENTIFIED FOR ENTIRE AREA OF THE FUNCTION W/ DEDUCTIONS ONLY FOR AREA OF EXTERIOR WALLS, VENT SHAFTS AND INTERIOR COURTS.*

*2-HOUR FIRE WALL OR FIRE BARRIER: OR COMBINATION OF (WHERE OCCURS) CONFORMING TO THE MOST STRINGENT REQUIREMENTS OF EACH. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS. ALL WITH FIRE-RESISTIVE OPENING PROTECTION AT DOORS, WINDOWS, DUCTS (WITH EXCEPTIONS), PENETRATIONS, AND PROTECTION AT JOINTS. SEE WALL TYPES, DOOR AND WINDOW SCHEDULES, MECHANICAL DRAWINGS, PENETRATION DETAILS, AND JOINT DETAILS WHERE APPLICABLE.*

*1-HOUR FIRE WALL, FIRE BARRIER, FIRE PARTITION, OR SMOKE BARRIER WALL: OR COMBINATION OF (WHERE OCCURS) CONFORMING TO THE MOST STRINGENT REQUIREMENTS OF EACH. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS. ALL WITH FIRE-RESISTIVE OPENING PROTECTION AT DOORS, WINDOWS, DUCTS (WITH EXCEPTIONS), PENETRATIONS, AND PROTECTION AT JOINTS. SEE WALL TYPES, DOOR AND WINDOW SCHEDULES, MECHANICAL DRAWINGS, PENETRATION DETAILS, AND JOINT DETAILS WHERE APPLICABLE.*

*NONRATED WALL: WITH NO OPENING PROTECTION REQUIRED AT DOORS, WINDOWS, DUCTS, PENETRATIONS, AND JOINTS UON. SEE WALL TYPES.*

*MOER:2* — *MEANS OF EGRESS REQUIRED (QUANTITY). ONLY DESIGNATED WHERE (2) MEANS OF EGRESS ARE REQUIRED, PER §1006.2.1.*

*EXIT SIGN W/ INTEGRATED DIRECTIONAL ARROW WHERE OCCURS AT ALL EXITS, EVERY 100' IN CORRIDORS, AND IN SPACES WHERE 2 MEANS OF EGRESS ARE REQUIRED PER § 1006. SEE ELECTRICAL DRAWINGS. (W/ POCHE IN QUADRANT INDICATING "EXIT" TEXT SIDE OF SIGN.) SIGNS SHOWN IN CORRIDORS ARE CEILING HUNG. SIGNS SHOWN ON WALL ARE WALL HUNG.*

12 — *REQUIRED EXIT AND EXIT EGRESS DIRECTION WITH ACCUMULATIVE NUMBER OF OCCUPANTS SERVED. (DESIGNATED WHERE (2) MEANS OF EGRESS ARE REQUIRED PER TABLE §1006.2.1)*

*Wmin* — *MINIMUM EGRESS WIDTH (INCHES) BASED ON ACCUMULATIVE NUMBER OF OCCUPANTS SERVED AT INDICATED EGRESS COMPONENT, PER SECTION 1005.3: .3 INCHES/OCC FOR STAIRWAYS(NONSPRINKLERED BUILDINGS); .2 INCHES/OCC FOR OTHER EGRESS COMPONENTS (NONSPRINKLERED BLDGS).*

*EXIT ACCESS TRAVEL DISTANCE (E.A.T.D.) - MAXIMUM 200' FOR 'B' OCCUPANCY W/OUT SPRINKLER SYSTEM, PER TABLE 1017.2. MAXIMUM DISTANCE FOR EACH STORY SHOWN.*

*COMMON PATH OF EGRESS TRAVEL (C.P.E.T.) - MAXIMUM 75' FOR 'B' OCCUPANCY W/OUT SPRINKLER SYSTEM, OCC LOAD >30, PER TABLE 1006.2.1.*

FE — *PORTABLE CLASS ABC FIRE EXTINGUISHER IN ADA-COMPLIANT SEMI-RECESSED CABINET*

## REQUIRED SPECIAL INSPECTIONS:

*IN ADDITION TO REGULAR INSPECTIONS, THE FOLLOWING ITEMS WILL ALSO REQUIRE SPECIAL INSPECTIONS AND TESTING IN ACCORDANCE WITH SECTIONS 1704 AND 1705 OF THE 2015 INTERNATIONAL BUILDING CODE. SEE STRUCTURAL FOR SPECIFIC REQUIREMENTS.* **COPIES OF 3RD PARTY REPORTS TO BE SENT TO BUILDING DEPARTMENT & COPIES KEPT ON-SITE FOR INSPECTOR REVIEW.**

*a) SPECIAL INSPECTIONS:*
- *INSPECTION OF FABRICATORS (1704.2.5)*
- *STEEL CONSTRUCTION (1705.2)*
- *CONCRETE CONSTRUCTION (1705.3)*
- *MASONRY CONSTRUCTION (1705.4)*
- *WOOD CONSTRUCTION (1705.5)*
- *SOILS (1705.6)*
- *SPECIAL CASES (1705.1.1)*
  - *EPOXY SET ANCHORS*
  - *POWDER-ACTUATED FASTENERS*
  - *CONCRETE EXPANSION ANCHORS*

*b) SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE (1705.12):*
- *STRUCTURAL STEEL (1705.12.1)*
- *STRUCTURAL WOOD (1705.12.2)*
- *COLD-FORMED STEEL LIGHT-FRAME CONSTRUCTION (1705.12.3)*

LICENSED ARCHITECT
MATT AUNE
NO. 14204
STATE OF MONTANA

| # | DATE | REVISION |
|---|---|---|

100% CONSTRUCTION DOCUMENTS

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**BUILDING 24 REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

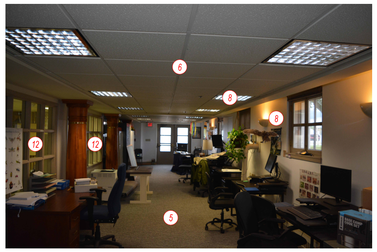
**CODE INFORMATION & TYP. ASSEMBLIES**

DATE: 05.19.2026

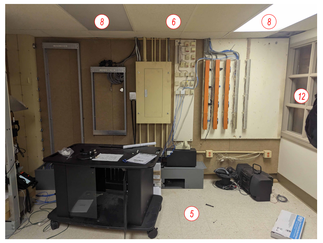
SHEET:

**AD-001**

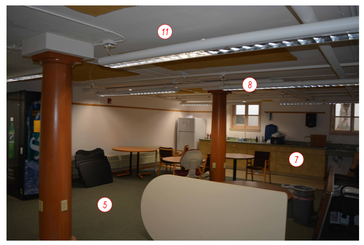
DATE STAMP: 7/15/2026 2:10:18 PM



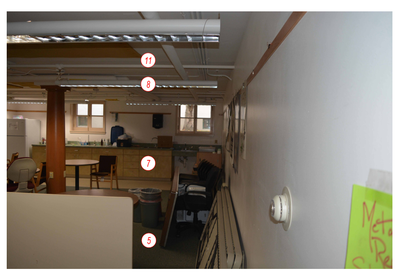
5 **DEMO - OFFICE**
1/4" = 1'-0"



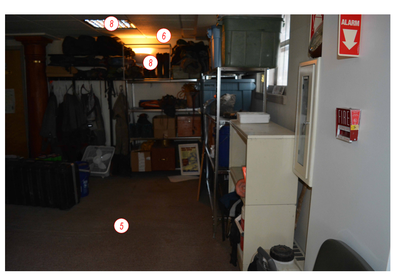
6 **DEMO - IT**
1/4" = 1'-0"



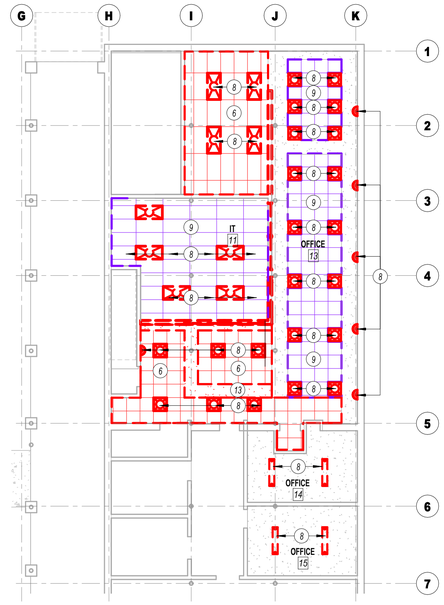
7 **DEMO - KITCHEN**
1/4" = 1'-0"



8 **DEMO - KITCHEN WALL**
1/4" = 1'-0"



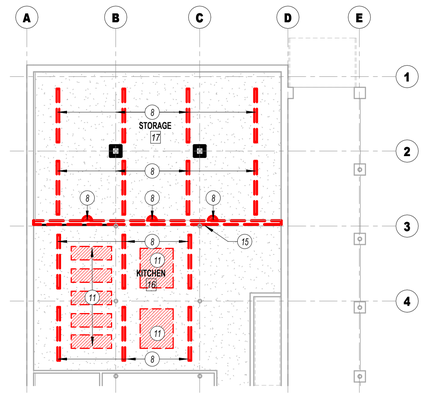
9 **DEMO - BACK ROOM**
1/4" = 1'-0"



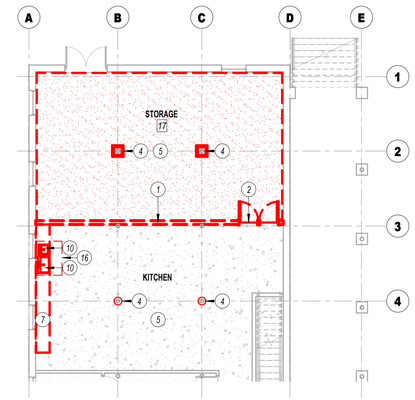

1 **DEMO - RCP - EAST**
3/32" = 1'-0"

FLOORING IN THIS AREA CONTAINS ASBESTOS. REFER TO ASBESTOS REPORT FOR ADDITIONAL INFORMATION PRIOR TO DEMOLITION.

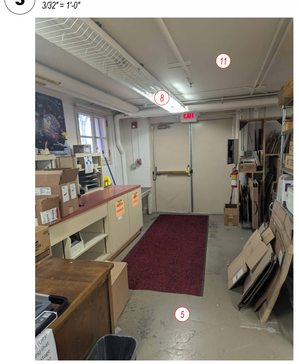
2 **DEMO - EAST**
3/32" = 1'-0"



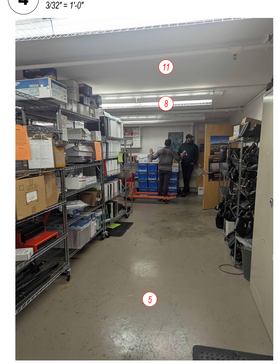

3 **DEMO - RCP - WEST**
3/32" = 1'-0"




4 **DEMO - WEST**
3/32" = 1'-0"



10 **DEMO - BASEMENT**
1/4" = 1'-0"



11 **DEMO - BASEMENT 2**
1/4" = 1'-0"

## GENERAL FLOOR PLAN NOTES

1. DIMENSIONS ARE TO FACE OF STUD, EXISTING WALL FINISH, MASONRY, OR DOOR/WINDOW OPENINGS. DIMENSIONS OF EXISTING CONSTRUCTION ARE NOT SHOWN ON DRAWINGS - VERIFY DIMENSIONS OF ALL EXISTING CONSTRUCTION IN THE FIELD. DIMENSIONS TO OPENINGS ARE NOMINAL. VERIFY ALL OPENINGS WITH ROUGH OPENING REQUIREMENTS.
2. ALL DOOR OPENINGS PERPENDICULAR TO A WALL ARE 4" TO THE WALL FRAMING UNO.
3. EXISTING CONSTRUCTION TO REMAIN SHOWN SHADED. NEW CONSTRUCTION SHOWN SOLID.
4. SEE SHEET A-002 FOR WALL TYPES. IN AREAS WITH SUSPENDED ACOUSTICAL TILE CEILINGS, GYPSUM WALL BOARD MAY BE TERMINATED 6" ABOVE THE CEILING.
5. VERIFY EXISTING WALL CONSTRUCTION.

## LINEWORK LEGEND

NEW CONSTRUCTION

EXISTING ELEMENTS TO REMAIN

## GENERAL DEMOLITION NOTES

1. VERIFY ALL CONDITIONS AND COORDINATE WITH ALL DISCIPLINES OF CONTRACT. UNDOCUMENTED FIELD CHANGES MAY HAVE OCCURRED AND ARE TO BE BROUGHT TO THE ATTENTION OF THE CO/ARCHITECT WHEN DISCOVERED.
2. SEE CIVIL DRAWINGS FOR SITE DEMOLITION.
3. SEE MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR DEMOLITION WORK OF THOSE TRADES.
4. WHERE DEMOLITION IS INDICATED, WALLS SHALL BE REMOVED AND CEILING SHALL BE PATCHED, REPAIRED AND PAINTED TO MATCH EXISTING.
5. CONTRACTOR SHALL MAINTAIN A TEMPORARY WEATHER TIGHT ENCLOSURE AS ITEMS ARE BEING REMOVED.
6. COORDINATE ALL MECHANICAL, ELECTRICAL, FIRE SYSTEMS, COMMUNICATIONS AND UTILITY SHUT-DOWNS WITH CONTRACTING OFFICER PRIOR TO REMOVING AND OR RELOCATING.
7. DEMOLITION IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON DRAWINGS. THE INTENT IS TO INDICATE THE GENERAL SCOPE OF DEMOLITION REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONTRACT DRAWINGS.
8. SEE HAZARDOUS MATERIALS ABATEMENT DRAWINGS FOR ADDITIONAL INFORMATION AND COORDINATION.
9. ANY MATERIALS LEFT ON WALLS TO BE REMOVED AND RETURNED TO FOREST SERVICE
10. ALL EXISTING FURNITURE TO BE REMOVED BY FOREST SERVICE COORDINATE ANY ADDITIONAL ITEMS TO BE REMOVED WITH CONTRACTING OFFICER.

## DEMOLITION KEYNOTES

**NOTE:** SEE MECH/ELEC/STRUCT AND CIVIL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.

1. REMOVE EXISTING INTERIOR WALL COMPLETELY, INCLUDING BRACING ABOVE CEILING WHERE OCCURS. REPAIR ALL ADJACENT SURFACES TO RECEIVE NEW FINISHES.
2. REMOVE DOOR, FRAME AND HARDWARE. WHERE REQUIRED INFILL TO MATCH EXISTING CONSTRUCTION
3. REMOVE PORTION OF WALL NECESSARY TO RECEIVE NEW DOOR AND FRAME. REROUTE ELECTRICAL AS REQUIRED.
4. REMOVE COLUMN WRAP IN ITS ENTIREETY. ONLY STEEL SUPPORT COLUMN TO REMAIN.
5. REMOVE EXISTING FLOORING AND PREPARE FOR INSTALLATION OF NEW FLOORING.
6. REMOVE SUSPENDED CEILING SYSTEM, INCLUDING ALL ASSOCIATED SUPPORT CABLE & PERIMETER T-BAR. COORDINATE EXTENT OF DEMOLITION WITH REMODEL PLANS. REMOVE ALL ASSOCIATED LIGHT FIXTURES, DIFFUSERS AND RETURN GRILLES. LEAVE ANY SMOKE DETECTORS ACTIVATED & DANGLING AFTER CEILING REMOVAL FOR REINSTALLATION. ENSURE DUCTWORK TO REMAIN IS PROPERLY SUPPORTED. - PORTION OF CEILING ABOVE MAY NEED TO BE REMOVED TO BRACE NEW CEILING.
7. COUNTERTOP AND CABINETS TO BE REMOVED
8. REMOVE LIGHT FIXTURES TO BE DEMOLISHED. SEE ELEC.
9. REMOVE SUSPENDED CEILING TILES AND LIGHT FIXTURES PER ELEC. EXISTING GRID AND ASSOCIATED BRACING TO REMAIN AND BE REUSED
10. REMOVE PLUMBING FIXTURE - SEE PLUMBING FOR ADDNL INFO
11. REMOVE ACOUSTIC MATERIAL ON CEILING SYSTEM, PROTECT REMAINING GYP CEILING WHERE POSSIBLE.
12. REMOVE EXISTING INTERIOR WINDOWS, FRAME AND HARDWARE WHERE NOTED, INFILL WALL TO MATCH SURROUNDING CONSTRUCTION AS SHOWN ON REMODEL PLANS.
13. REMOVE SOFFIT WHERE INDICATED ON PLANS, PROTECT REMAINING SOFFIT
14. SAVE ALL WALL BASE FOR REINSTALL
15. REMOVE PICTURE RAIL - RETAIN FOR REINSTALL ON NEW WALL
16. DEMOLITION MAY BE REQUIRED FOR PLUMBING REPLACEMENT - VERIFY EXTENTS WITH PLUMBING DRAWINGS

LICENSED ARCHITECT MATT AUNE NO. 14204 STATE OF MONTANA

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**BUILDING 24 REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**DEMOLITION PLAN - BASEMENT**

DATE: 05.19.2026

SHEET: **AD-101**

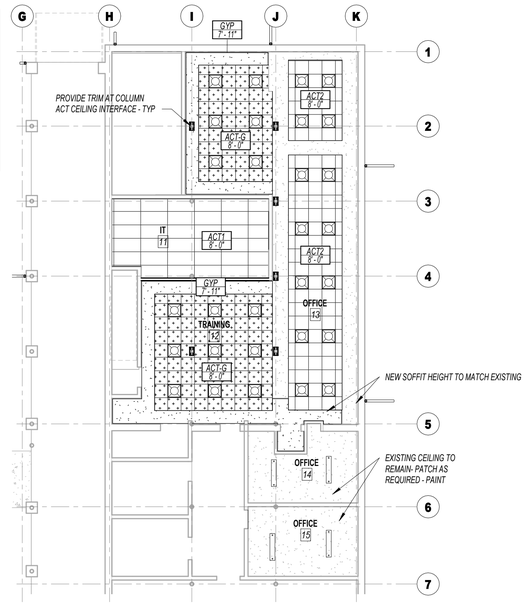
DATE STAMP: 7/15/2026 2:10:26 PM

## GENERAL DOOR NOTES

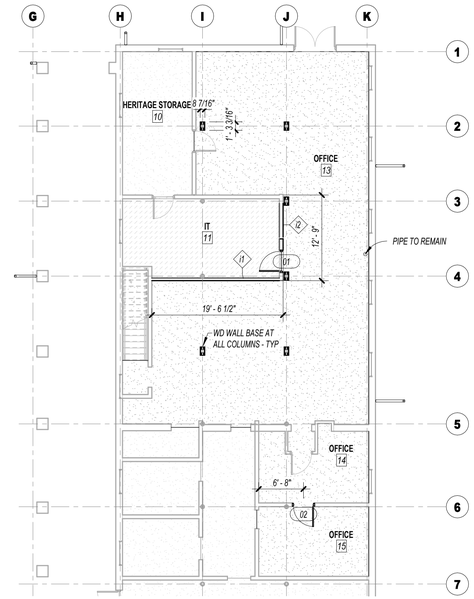
1. ALL DOOR LOCATIONS NOT SPECIFICALLY DIMENSIONED TO BE PLACED 4 INCHES FROM ADJACENT WALL SURFACE. IF THERE IS NO DIRECTLY ADJACENT SIDEWALL, CONTACT ARCHITECT FOR PROPER PLACEMENT.
2. ALL DOORS TO HAVE ADA COMPLIANT THRESHOLDS WITH 1/2" MAXIMUM RISE UNLESS SPECIFICALLY DETAILED OTHERWISE.
3. ALL METAL DOORS AND FRAMES TO BE PRIMED AND PAINTED. VERIFY COLOR WITH ARCHITECT.
4. ALL EXTERIOR DOORS TO BE FULLY INSULATED.
5. ALL EXTERIOR DOORS TO HAVE FULL PERIMETER WEATHERSTRIPPING.
6. ALL HARDWARE ON FIRE-RATED DOORS MUST BE APPROVED FOR SUCH USE AND INSTALLED AS REQUIRED TO MAINTAIN SYSTEM FIRE RATING.
7. ALL DOORS/FRAMES TO HAVE RESILIENT SILENCERS.
8. CONTRACTOR TO USE ARCHITECT'S DOOR TYPE PLAN DESIGNATION NUMBER IN ADDITION TO THE ROOM NUMBER ON ALL SHOP DRAWING SUBMITTALS
9. FIRE RATING FOR FRAMES MUST MATCH RATING FOR DOORS.
10. SEE WINDOW ELEVATIONS FOR DETAILS.
11. ALL EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.

## ABBREVIATIONS

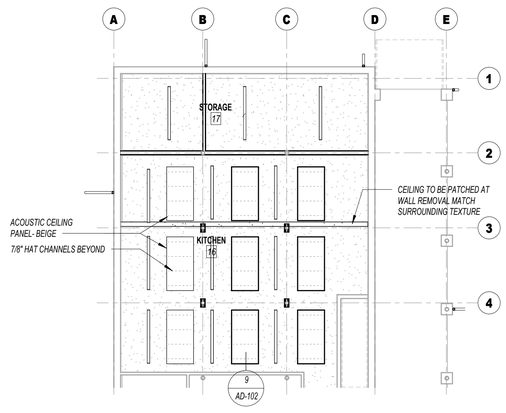
| | |
|---|---|
| ALUM | ALUMINUM |
| ANOD | ANODIZED FINISH - DK BRONZE |
| F | FLUSH |
| FACT | FACTORY FINISH |
| HL | HALF LITE |
| HM | HOLLOW METAL |
| MFR | MANUFACTURER |
| SF | ALUMINUM STOREFRONT |
| STL | STEEL |
| WD | WOOD - SOLID CORE |



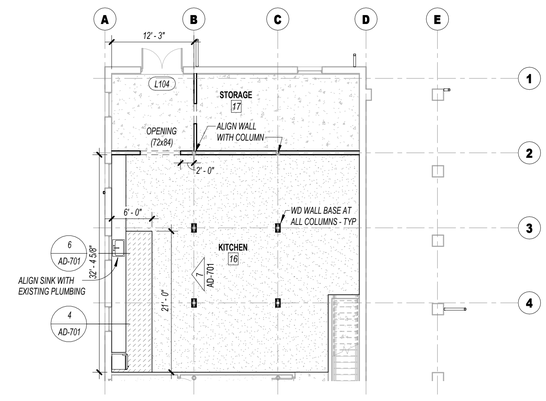

1 **RCP - PLAN EAST**
3/32" = 1'-0"



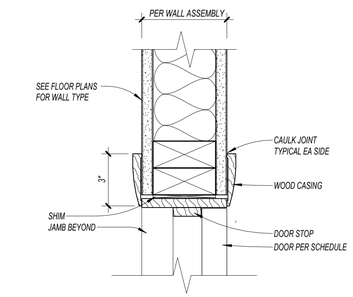

2 **FLOOR PLAN - BASEMENT - PLAN EAST**
3/32" = 1'-0"



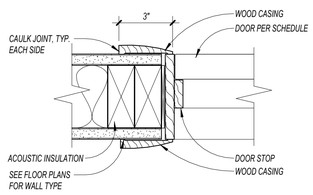

3 **RCP - PLAN WEST**
3/32" = 1'-0"




4 **FLOOR PLAN - BASEMENT - PLAN WEST**
3/32" = 1'-0"




5 **INTERIOR WOOD DOOR FRAME HEAD**
3" = 1'-0"



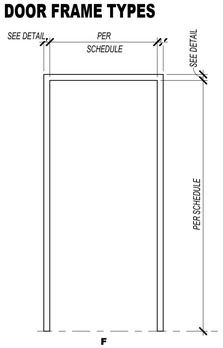

6 **INTERIOR WOOD DOOR JAMB**
3" = 1'-0"

## DOOR SCHEDULE

| MARK | ROOM NAME | DOOR TYPE | WIDTH | HEIGHT | THICKNESS | DOOR MAT'L | DOOR FINISH | FRAME TYPE | FRAME MAT'L | FRAME FINISH | DOOR HDWR GROUP | FIRE RAT'G | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | OFFICE | HL | 3' - 0" | 6' - 8" | 1 3/4" | WD | FACT | F | WD | PAINT | 01 | NONE | |
| 02 | OFFICE | F | 3' - 0" | 6' - 8" | 1 3/4" | WD | FACT | F | WD | PAINT | 01 | NONE | |

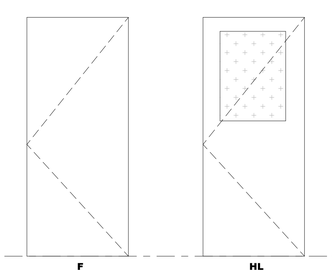
*SEE PLAN AND SCHEDULE FOR ALL DOOR SIZES*

## DOOR FRAME TYPES




F
STANDARD FRAME

## DOOR TYPES



F
FLUSH

HL
FLUSH W HALF LITE

GLAZING LEGEND
1/4" LAMINATED SAFETY GLASS

## GENERAL DOOR NOTES

1. ALL DOOR LOCATIONS NOT SPECIFICALLY DIMENSIONED TO BE PLACED 4 INCHES FROM ADJACENT WALL SURFACE. IF THERE IS NO DIRECTLY ADJACENT SIDEWALL, CONTACT ARCHITECT FOR PROPER PLACEMENT.
2. ALL DOORS TO HAVE ADA COMPLIANT THRESHOLDS WITH 1/2" MAXIMUM RISE UNLESS SPECIFICALLY DETAILED OTHERWISE.
3. ALL METAL DOORS AND FRAMES TO BE PRIMED AND PAINTED. VERIFY COLOR WITH ARCHITECT.
4. ALL DOORS/FRAMES TO HAVE RESILIENT SILENCERS.
5. CONTRACTOR TO USE ARCHITECT'S DOOR TYPE PLAN DESIGNATION NUMBER IN ADDITION TO THE ROOM NUMBER ON ALL SHOP DRAWING SUBMITTALS
6. SEE WINDOW ELEVATIONS FOR FRAME TYPES FOR ALUMINUM FRAMES.
7. ALL EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE OR EFFORT.

## DOOR HARDWARE

*Hardware Group No. 01*
*For use on Door #(s): 01, 02*

*Provide each SGL door(s) with the following:*

| QTY. | DESCRIPTION | CATALOG NUMBER | FINISH | MFR |
|---|---|---|---|---|
| 3 EA | HINGE | BA4 5BB1 SERIES (WEIGHT, SIZE, NRP AS REQ'D) | F695 | IVE |
| 1 EA | ENTRANCE LOCK | ND53 (LEVER PREP AS REQ'D) RHO BA | 606 | SCH |
| 1 EA | CYLINDER | MATCH EXISTING KEY SYSTEM | 606 | |
| 1 EA | WALL STOP | WS406/407CCV | 606 | IVE |
| 3 EA | SILENCER | SR64/SR65 AS REQ'D BY FRAME MATERIAL | GRY | IVE |

## GENERAL FLOOR PLAN NOTES

1. DIMENSIONS ARE TO FACE OF STUD, EXISTING WALL FINISH, MASONRY, OR DOOR/WINDOW OPENINGS. DIMENSIONS OF EXISTING CONSTRUCTION ARE NOT SHOWN ON DRAWINGS - VERIFY DIMENSIONS OF ALL EXISTING CONSTRUCTION IN THE FIELD. DIMENSIONS TO OPENINGS ARE NOMINAL. VERIFY ALL OPENINGS WITH ROUGH OPENING REQUIREMENTS.
2. ALL DOOR OPENINGS PERPENDICULAR TO A WALL ARE 4" TO THE WALL FRAMING UNO.
3. EXISTING CONSTRUCTION TO REMAIN SHOWN SHADED. NEW CONSTRUCTION SHOWN SOLID.
4. SEE SHEET A-002 FOR WALL TYPES. IN AREAS WITH SUSPENDED ACOUSTICAL TILE CEILINGS, GYPSUM WALL BOARD MAY BE TERMINATED 6" ABOVE THE CEILING.
5. VERIFY EXISTING WALL CONSTRUCTION.

## GENERAL CEILING NOTES

1. SEE FLOOR PLAN FOR WALL TYPES AND WALLS THAT EXTEND FULL HEIGHT TO STRUCTURE.
2. CEILING FIXTURES ARE SHOWN FOR REFERENCE ONLY FOR COORDINATION WITH CEILING FINISH SYSTEM.
3. SPOT ELEVATIONS ARE FROM FINISH FLOOR TO SURFACE FINISH OF CEILING AND ARE ROUNDED TO THE NEAREST INCH.

## WALL TYPE TAG

a — WALL TYPE
b — WALL HEIGHT

**WALL STUD & FINISH HEIGHT**

a GWB TO 6" ABOVE CEILING; FRAME OR BRACE TO STRUCTURE
b TO STRUCTURE

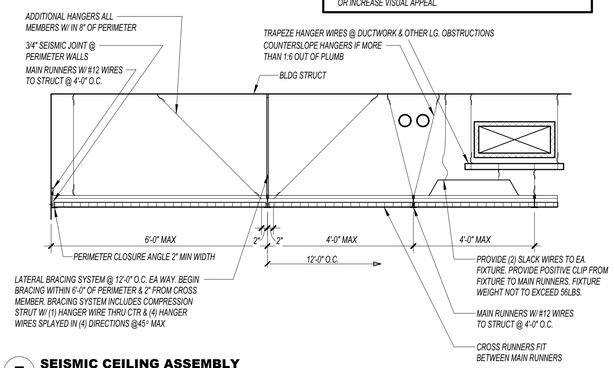
## CEILING LEGEND

| | |
|---|---|
| GWB | 5/8" TYPE "X" GYPSUM WALLBOARD ON STL. FRAMING - SEE DETAILS. PAINT P1 UNO |
| ACT1 | 2x4 CEILING TILES - ONLY |
| ACT2 | 2x2 CEILING TILES - ONLY |
| ACT-G | 2x2 ACT SYSTEM. 2X2 TILES WITH 15/15" HEAVY DUTY GRID. SEE SEISMIC INSTALLATION REQ'TS AND DETAILS. |

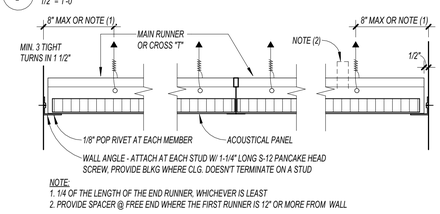
**CEILING LAYOUT NOTES:** LAY-IN CEILINGS ARE SHOWN CONCEPTUALLY. IT IS THE INTENT THE CEILINGS AREA CENTERED WITHIN THE ROOM. IN ODD SHAPED ROOMS, PRIMARY VISUAL AREA TO BE CENTERED. CEILING INSTALLER SHOULD CONSULT WITH THE CO IN THE FIELD FOR ANY AREAS IN WHICH THEY WOULD LIKE TO MODIFY THE LAYOUT FROM THAT SHOWN ON THE PLAN. MODIFICATIONS MAY BE ALLOWED, AT THE DISCRETION OF THE CONTRACTING OFFICER, TO EASE INSTALLATION, SAVE CUTTING, OR INCREASE VISUAL APPEAL.

## LINEWORK LEGEND

NEW CONSTRUCTION
EXISTING ELEMENTS TO REMAIN

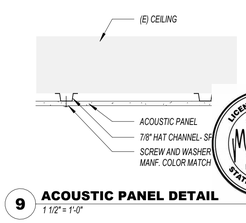



7 **SEISMIC CEILING ASSEMBLY**
1/2" = 1'-0"

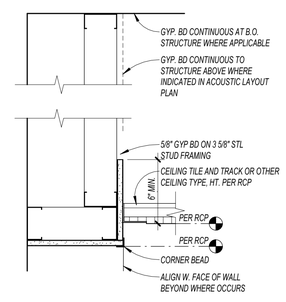



NOTE:
1. 1/4 OF THE LENGTH OF THE END RUNNER, WHICHEVER IS LEAST
2. PROVIDE SPACER @ FREE END WHERE THE FIRST RUNNER IS 12" OR MORE FROM WALL

8 **ACOUSTIC CEILING DETAIL**
1 1/2" = 1'-0"

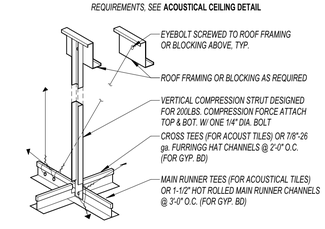



9 **ACOUSTIC PANEL DETAIL**
1 1/2" = 1'-0"

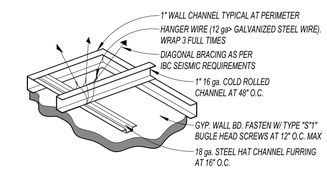



10 **SOFFIT DETAIL - MTL STUD**
1 1/2" = 1'-0"

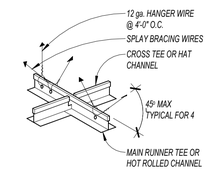
NOTE:
FOR LOCATION OF BRACING AND ADDITIONAL REQUIREMENTS, SEE **ACOUSTICAL CEILING DETAIL**




11 **SUSPENDED CEILING BRACING**
1 1/2" = 1'-0"




12 **SUSPENDED GWB CEILING**
1 1/2" = 1'-0"




NOTES:

1. HANGING WIRES SHALL BE ATTACHED TO SUSPENDED MEMBERS WITH A MINIMUM OF THREE TIGHT TURNS IN 1-1/2". BOTH ENDS OF WIRE.
2. BRACING WIRES SHALL BE ATTACHED TO SUSPENDED MEMBERS WITH A MINIMUM OF FOUR TIGHT TURNS IN 1-1/2". BOTH ENDS OF WIRE.
3. COMPLY WITH CCR TITLE 24 REQUIREMENTS.

13 **FOUR WAY TEE BRACING**
1 1/2" = 1'-0"

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

LICENSED ARCHITECT MATT AUNE NO. 14204 STATE OF MONTANA

**100% CONSTRUCTION DOCUMENTS**

| # | DATE | REVISION |
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**BUILDING 24 REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**FLOOR PLAN & RCP - BASEMENT**

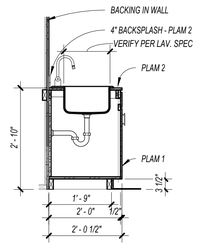
DATE: 05.19.2026

SHEET: **AD-102**

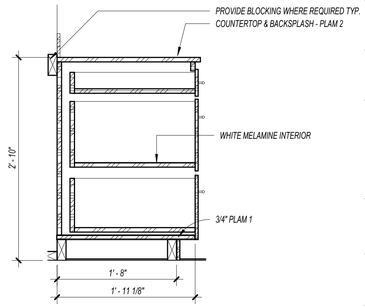
DATE STAMP: 7/15/2026 2:10:28 PM

**3 CARPET TRANSITION**
3" = 1'-0"

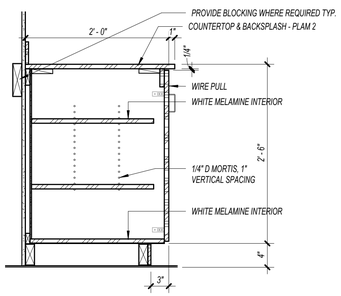
**2 CARPET TO CON. TRANS.**
3" = 1'-0"



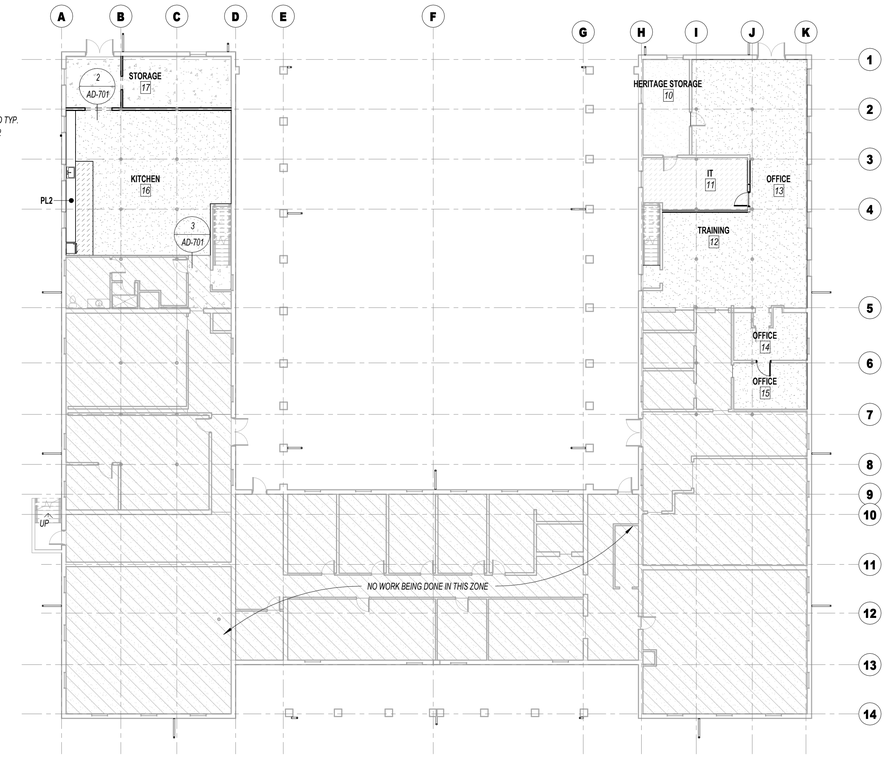

**6 KITCHEN CABINETRY - AT SINK**
1/2" = 1'-0"



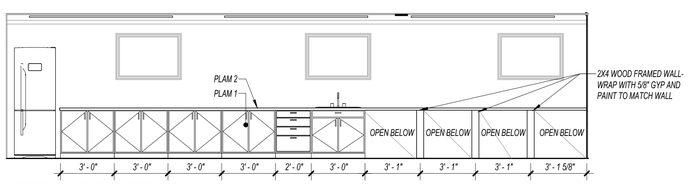

**5 DRAWER BASE**
1" = 1'-0"




**4 TYP. BASE**
1" = 1'-0"




**1 BASEMENT - FINISH PLAN**
1/16" = 1'-0"




**7 KITCHEN ELEVATION**
1/4" = 1'-0"

## ROOM FINISH SCHEDULE

| NO. | ROOM NAME | AREA | FLOOR FINISH | BASE FINISH | NORTH WALL | EAST WALL | SOUTH WALL | WEST WALL | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 10 | HERITAGE STORAGE | 221 SF | (E) | WD (e) | P1 | P1 | P1 | P1 | REUSE EXISTING WALL BASE WHERE POSSIBLE |
| 11 | IT | 268 SF | CNCR | WD (e) | P1 | P1 | P1 | P1 | REUSE EXISTING WALL BASE WHERE POSSIBLE |
| 12 | TRAINING | 215 SF | CPT1 | WD | P1 | P1 | P1 | P1 | |
| 13 | OFFICE | 1209 SF | CPT1 | WD (e) | P1 | P1 | P1 | P1 | REUSE EXISTING WALL BASE WHERE POSSIBLE |
| 14 | OFFICE | 161 SF | CPT1 | WD (e) | P1 | P1 | P1 | P1 | REUSE EXISTING WALL BASE WHERE POSSIBLE |
| 15 | OFFICE | 171 SF | CPT1 | WD (e) | P1 | P1 | P1 | P1 | REUSE EXISTING WALL BASE WHERE POSSIBLE |
| 16 | KITCHEN | 1138 SF | CPT1 | WD | P1 | P1 | P1 | P1 | |
| 17 | STORAGE | 279 SF | CNCR | RB | P1 | P1 | P1 | P1 | |

SEE FINISH SCHEDULE FOR LISTING OF MATERIALS .

## GENERAL FINISH NOTES:

1. ALL PAINTING, WALLCOVERING & GYPSUM WALLBOARD FINISHING PER SPECIFICATIONS AND DECORATING CONTRACTORS OF AMERICA.
2. PROVIDE SAMPLES OF SPECIFIED FINISHES TO ARCHITECT/CONTRACTING OFFICER FOR APPROVAL PRIOR TO APPLICATION
3. PROVIDE TO CONTRACTING OFFICER APPROXIMATELY 5% OF ADDITIONAL FINISH MATERIAL FOR FUTURE REPAIR AND MAINTENANCE. (I.E - PAINT, VINYL FLOORING, RUBBER BASE, ETC.)
4. WALL FINISH LEVEL AND TEXTURE TO MATCH EXISTING

## FLOOR FINISH NOTES:

1. IF FINISHES ARE NOT CLEARLY INDICATED FOR AN AREA, CLARIFY INTENT WITH CO.
2. PROVIDE APPROPRIATE TRANSITION TRIM AT ALL MATERIAL CHANGES.
3. PROVIDE EXTRUDED ALUMINUM EDGE METAL AT TERMINATION OF ALL CERAMIC TILE AREAS.
4. TEST ALL SUBSTRATES TO VERIFY COMPLIANCE WITH FINISH MANUFACTURER'S SPECIFICATIONS PRIOR TO FLOORING INSTALLATION.
5. PATCH, REPAIR, AND/OR GRIND ALL SUBSTRATES TO ACCEPTABLE LEVEL OF SMOOTHNESS/LEVELNESS PRIOR TO FLOORING INSTALLATION.
6. FLOORING CHANGES FROM ROOM TO ROOM TO OCCUR DIRECTLY UNDER THE DOOR LOCATION.

## WALL FINISH NOTES:

1. IF FINISHES ARE NOT CLEARLY INDICATED FOR AN AREA, CLARIFY INTENT WITH CONTRACTING OFFICER/ARCHITECT.
2. PROVIDE APPROPRIATE TRANSITION TRIM AT ALL MATERIAL CHANGES.
3. PROVIDE CLEAN, CONSISTENT CAULK JOINTS AT ABUTMENTS OF DISSIMILAR MATERIALS.
4. PROVIDE METAL EDGING AT ALL GYPSUM BOARD EDGES THAT ABUT DISSIMILAR MATERIALS.
5. PROVIDE BULLNOSE TILES AT ALL EXPOSED TILE EDGES.
6. WALL FINISH LEVEL AND TEXTURE TO MATCH EXISTING

## CEILING FINISH NOTES:

1. IF FINISHES ARE NOT CLEARLY INDICATED FOR AN AREA, CLARIFY INTENT WITH CO.
2. PROVIDE APPROPRIATE TRANSITION TRIM AT ALL MATERIAL CHANGES.
3. PROVIDE CLEAN, CONSISTENT CAULK JOINTS AT ABUTMENTS OF DISSIMILAR MATERIALS.

## ROOM FINISH LEGEND

### FLOOR FINISHES

CPT1 LVT CNCR (E)

**CPT1:** CARPET TILE - INTERFACE, STYLE 'STEP IT UP', COLOR - ASH
**LVT:** LUXURY VINYL TILE - INTERFACE, 22 MIL, STYLE: 'RIDGE', COLOR: AGATE
**CNCR:** EXISTING CONCRETE TO BE CLEANED AND CRACKS FILLED
**(E):** EXISTING FINISH - NO WORK

### BASE FINISHES

**RB1:** 6" RUBBER BASE - JOHNSONITE TRADITIONAL VINYL BASE - COLOR: BY CO
**WB:** MATCH EXISTING - 6" WOOD BASE TRIM WITH 1" TRIM PIECE- PAINT TO MATCH EXISTING

**FLOOR AND BASE FINISH NOTES:**

1. SEE SPECIFICATIONS FOR FINISH MANUFACTURER.
2. ALL FLOORING TO BE INSTALLED ON MANUFACTURERED APPROVED SUB FLOOR.
3. INSTALL FACTORY-PROVIDED TRANSITION STRIP OR AS DETAILED AT ALL FLOORING CHANGES.
4. CHANGE FLOORING WHERE INDICATED ON PLANS, CHANGE FLOOR CENTERED UNDER DOOR AT ROOM TO ROOM CHANGES, U.N.O.
5. AT CASEWORK, CONTINUE BASE AROUND ENDPANELS AND TOE-KICKS, U.N.O.

### CEILING FINISHES

SEE RCP

### WALL FINISHES

**PAINT NOTE:** MANUF. SHOWN ARE BASIS OF DESIGN ONLY. SUBSTITUTIONS ALLOWED WITH APPROVAL; SEE SPEC SECTION ON SUBSTITUTIONS. VERIFY FINAL PAINT COLORS AND LOCATIONS W/ CO PRIOR TO INSTALLATION.

**P1:** PAINT - COLOR: WHITE - MAIN WALLS - COORDINATE WITH PROJECT CO

**WALL FINISHES NOTES:**

1. SEE INTERIOR ELEVATIONS AND/OR DETAILS FOR INTERIOR WINDOWS, SPECIAL WALL FINISHES, TRIM, ETC.
2. FINISH SCHEDULE APPLIES TO GENERAL AREA; THERE MAYBE SPECIFIC FINISH REQUIREMENTS SHOWN ON DETAILS, DRAWINGS OR SPECIFICATIONS.
3. SEE SPECIFICATION FOR LEVEL(S) OF FINISH AT GWB SURFACES.
4. ALL WALLS/CEILINGS P1 UNLESS OTHERWISE NOTED ON PLANS &/OR ELEVATIONS.

### COUNTERTOPS, CASEWORK SURFACES, TRIM

**PL1:** PLASTIC LAMINATE 1 - WILSONART PREMIUM LAMINATE - COLOR: HARVEST MAPLE
**PL2:** PLASTIC LAMINATE 2 - WILSONART PREMIUM LAMINATE - COLOR: CANYON ZEPHYR

**COUNTERTOP AND CASEWORK FINISHES NOTES:**

1. SEE SPECIFICATION FOR MANUFACTURER.
2. PLASTIC LAMINATE COUNTERTOPS TO HAVE LAMINATE EDGES, U.N.O. NOTED IN DETAILS.
3. PROVIDE FINISHED END PANELS WHERE EXPOSED TO VIEW. PROVIDE SCRIBE STRIP AT ALL WALL ABUTMENTS.
4. WHERE NOTED ON ELEVATIONS, PROVIDE 4" BACKSPLASH W/ SQUARE EDGES, MATCH ADJ. COUNTERTOP MATERIAL.
5. FOR BIDDING PURPOSES ASSUME EACH DRAWER AND/OR DOOR HAS A PULL, EVEN IF NOT SHOWN IN ELEVATIONS

LICENSED ARCHITECT
MATT AUNE
NO. 14204
STATE OF MONTANA

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**BUILDING 24 REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**FINISH PLAN & SCHEDULE-BASEMENT**

DATE: 05.19.2026

SHEET:

**AD-701**

DATE STAMP: 7/15/2026 2:10:30 PM

# ABBREVIATIONS

| | |
|---|---|
| ACC | AIR COOLED CONDENSER |
| ACU | AIR CONDITIONING UNIT |
| AD | ACCESS DOOR |
| ADJ | ADJUSTABLE |
| AF | AIR FOIL |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AFR | ABOVE FINISHED ROOF |
| AFS | AIR FLOW STATION |
| AHU | AIR HANDLING UNIT |
| AP | ACCESS PANEL |
| ATC | AUTOMATIC TEMPERATURE CONTROL |
| ATM | ATMOSPHERE |
| AWG | AMERICAN WIRE GAUGE |
| B | BOILER |
| BB | BASEBOARD |
| BC | BACKWARD CURVED |
| BD | BACKDRAFT DAMPER |
| BF | BOILER FEED |
| BHP | BRAKE HORSEPOWER |
| BI | BACKWARD INCLINED |
| BMS | BUILDING MANAGEMENT SYSTEM |
| BOD | BOTTOM OF DUCT |
| BOJ | BOTTOM OF JOIST |
| BOS | BOTTOM OF STEEL |
| BTU | BRITISH THERMAL UNIT |
| C | COMMON |
| CAV | CONSTANT AIR VOLUME |
| CC | COOLING COIL |
| CCW | COUNTER CLOCKWISE |
| CFM | CUBIC FEET PER MINUTE |
| CH | CHILLER |
| C&I | CONTROLS & INSTRUMENTATION |
| CLG | CEILING |
| CMU | CONCRETE MASONRY UNIT |
| CND | CONDENSATE |
| CONT | CONTINUATION |
| CORR | CORRIDOR |
| CT | COOLING TOWER |
| CU | CONDENSING UNIT |
| CH | CABINET HEATER |
| CV | CONTROL VALVE |
| CVS | CONTROL VALVE STATION |
| CW | CLOCKWISE |
| dB | DECIBEL |
| DB | DRY BULB TEMPERATURE (°F) |
| DDC | DIRECT DIGITAL CONTROL |
| DH | DUCT HEATER |
| DP | DEW POINT TEMPERATURE (°F) |
| DX | DIRECT EXPANSION |
| E | EXHAUST |
| EA | EXHAUST AIR |
| EAT | ENTERING AIR TEMPERATURE (°F) |
| EC | ELECTRICAL CONTRACTOR |
| EDR | EQUIVALENT DIRECT RADIATION |
| EER | ENERGY EFFICIENCY RATIO |
| EF | EXHAUST FAN |
| EFF | EFFICIENCY |
| ELEV | ELEVATION |
| ERV | ENERGY RECOVERY VENTILATOR |
| ESP | EXTERNAL STATIC PRESSURE |
| ET | EXPANSION TANK |
| EWT | ENTERING WATER TEMPERATURE (°F) |
| F&T | FLOAT & THERMOSTATIC |
| FA | FACE AREA |
| FC | FORWARD CURVED |
| FC | FAN COIL |
| FP | FIRE PROTECTION |
| FPM | FEET PER MINUTE |
| FT | FEET |
| GA | GAUGE OR GAGE |
| GC | GENERAL CONTRACTOR |
| GEN | GENERATOR |
| GH | GRAVITY HOOD |
| GPD | GALLONS PER DAY |
| GPH | GALLONS PER HOUR |
| GPM | GALLONS PER MINUTE |
| H | HUMIDIFIER |
| HC | HEATING COIL |
| HG | MERCURY |
| HOA | HAND-OFF-AUTOMATIC |
| HP | HORSEPOWER |
| HR | HOUR |
| HX | HEAT EXCHANGER |
| ID | INSIDE DIAMETER |
| IFB | INTEGRAL FACE & BYPASS |
| IGV | INLET GUIDE VANES |
| IPS | IRON PIPE SIZE |
| IU | INDUCTION UNIT |
| KW | KILOWATTS |
| KWH | KILOWATT HOUR |
| LAT | LEAVING AIR TEMPERATURE (°F) |
| LF | LINEAR FEET |
| LWT | LEAVING WATER TEMPERATURE (°F) |
| M | MOTOR OPERATED |
| MAU | MAKEUP AIR UNIT |
| MB | MIXING BOX |
| MBH | 1000 BTU/HR |
| MC | MECHANICAL CONTRACTOR |
| MFR | MANUFACTURER |
| MS | MINI-SPLIT |
| NC | NORMALLY CLOSED |
| NIC | NOT IN CONTRACT |
| NL | NEW LOCATION |
| NO | NORMALLY OPEN |
| NPS | NOMINAL PIPE SIZE |
| OA | OUTSIDE AIR |
| OAD | OUTSIDE AIR DAMPER |
| OBD | OPPOSED BLADE DAMPER |
| P | PUMP |
| PC | PLUMBING CONTRACTOR |
| PD | PRESSURE DROP |
| PH | PHASE |
| PHC | PREHEAT COIL |
| PPM | PART PER MILLION |
| PROP | PROPELLER |
| PRV | PRESSURE REDUCING VALVE |
| PSIA | PSI, ABSOLUTE |
| PSIG | PSI, GAUGE |
| QTY | QUANTITY |
| R | REGISTER |
| RA | RETURN AIR |
| RD | RADIAL DAMPER |
| RF | RETURN/RELIEF AIR FAN |
| RH | RELATIVE HUMIDITY |
| RHC | REHEAT COIL |
| SA | SUPPLY AIR |
| SAF | SUPPLY AIR FAN |
| SC | SENSIBLE COOLER |
| SCFM | CFM, STANDARD CONDITIONS |
| SD | SMOKE DETECTOR |
| SEER | SEASONAL ENERGY EFFICIENCY RATIO |
| SENS | SENSIBLE |
| SP | STATIC PRESSURE |
| SPS | STATIC PRESSURE SENSOR |
| SS | STAINLESS STEEL |
| T | THERMOSTAT |
| TA | TRANSFER AIR |
| TCC | TEMPERATURE CONTROL CONTRACTOR |
| TCP | TEMPERATURE CONTROL PANEL |
| TG | TRANSFER GRILL |
| TOS | TOP OF STEEL |
| TSP | TOTAL STATIC PRESSURE |
| TYP | TYPICAL |
| UH | UNIT HEATER |
| UNC | UNDERCUT |
| UV | UNIT VENTILATOR |
| VA | VOLT-AMPERE |
| VAV | VARIABLE AIR VOLUME |
| VD | VOLUME DAMPER |
| VEL | VELOCITY |
| VFD | VARIABLE FREQUENCY DRIVE |
| VRF | VARIABLE REFRIGERANT FLOW |
| WB | WET BULB TEMPERATURE (°F) |
| WC | WATER COLUMN |
| WG | WATER GAUGE |
| WSHP | WATER SOURCE HEAT PUMP |
| ΔT | TEMPERATURE DIFFERENCE (°F) |

# MECHANICAL LEGEND

## ANNOTATION SYMBOLS

- X / X — 3D VIEW NUMBER / SHEET NUMBER
- X / X — DETAIL NUMBER / SHEET NUMBER
- X / X — SECTION NUMBER / SHEET NUMBER
- X / CFM — AIR DEVICE MARK AND CFM
- X / CFM / OBD — AIR DEVICE MARK AND CFM - PROVIDE OPPOSED BLADE DAMPER
- X / CFM / RD — AIR DEVICE MARK AND CFM - PROVIDE RADIAL DAMPER
- ME-# — MECHANICAL EQUIPMENT MARK
- (E) ME-# — EXISTING MECHANICAL EQUIPMENT
- (D) ME-# — DEMOLISHED MECHANICAL EQUIPMENT
- POINT OF NEW CONNECTION
- POINT OF DISCONNECTION

## HVAC CONTROL SYMBOLS

- T — ADJUSTABLE THERMOSTAT
- T# — ADJUSTABLE THERMOSTAT W/ EQUIPMENT MARK
- T — ADJUSTABLE THERMOSTAT W/ LOCKABLE COVER
- C — ADJUSTABLE CO2 SENSOR
- $ — WALL SWITCH
- H — ADJUSTABLE HUMIDISTAT
- T — TEMPERATURE SENSOR
- H — HUMIDITY SENSOR
- C — CO2 SENSOR
- P — BUILDING PRESSURE SENSOR
- SP — STATIC PRESSURE SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- CO/NO — CARBON MONOXIDE / NITRIC OXIDE SENSOR

## HVAC DUCTWORK

- W"xD" — RECTANGULAR DUCT WIDTH x DEPTH
- X"ø — ROUND DUCT DIAMETER
- W"/D" — OVAL DUCT WIDTH/DEPTH
- X"ø — FLEXIBLE DUCT DIAMETER
- FLOOR/CEILING SUPPLY DIFFUSER
- FLOOR/CEILING RETURN GRILLE
- FLOOR/CEILING EXHAUST GRILLE
- SIDEWALL SUPPLY DIFFUSER
- SIDEWALL RETURN/EXHAUST GRILLE

NOTE: THIS IS A STANDARD LEGEND. NOT ALL PIPE TYPES AND SYMBOLS ARE NECESSARILY UTILIZED IN THE DRAWINGS.

## HVAC DUCTWORK (CONT.)

- SUPPLY DUCT (SECTION VIEW)
- RETURN DUCT (SECTION VIEW)
- EXHAUST DUCT (SECTION VIEW)
- OUTDOOR AIR DUCT (SECTION VIEW)
- DUCT UP (PLAN VIEW)
- DUCT DOWN (PLAN VIEW)
- R — INCLINED RISE - IN DIRECTION OF AIRFLOW
- D — INCLINED DROP - IN DIRECTION OF AIRFLOW
- INTERNAL DUCT LINING
- ELBOW WITH TURNING VANES
- RADIUS ELBOW
- MANUAL VOLUME DAMPER
- R — REMOTE VOLUME DAMPER
- BD — BACKDRAFT DAMPER
- Z — ZONE DAMPER
- B — BYPASS DAMPER
- M — MOTORIZED DAMPER
- F — FIRE DAMPER
- FS — FIRE/SMOKE DAMPER
- S — SMOKE DAMPER

## GENERAL

- (E) NAME — EXISTING PIPE TO REMAIN
- (D) NAME — EXISTING PIPE TO BE DEMOLISHED
- NAME — NEW PIPING
- DIRECTION OF FLOW

## HVAC PIPING

- HWS — HEATING WATER SUPPLY
- HWR — HEATING WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- CTS — COOLING TOWER SUPPLY
- CTR — COOLING TOWER RETURN
- HPWS — HEAT PUMP WATER SUPPLY
- HPWR — HEAT PUMP WATER RETURN
- HPS — HIGH PRESSURE STEAM
- MPS — MEDIUM PRESSURE STEAM
- LPS — LOW PRESSURE STEAM
- CND — STEAM CONDENSATE RETURN
- ATV — ATMOSPHERIC VENT
- REF — REFRIGERANT (LIQUID AND SUCTION)

## PIPE FITTINGS

- ELBOW
- PIPE BREAK
- PIPE UP
- PIPE DOWN
- CHANGE IN ELEVATION OF PIPE
- SIDE CONNECTION, TEE FITTING
- TOP CONNECTION, TEE FITTING UP
- BOTTOM CONNECTION, TEE FITTING DOWN
- CAPPED OUTLET OR BLIND FLANGE
- CONCENTRIC REDUCER

## VALVES

- MANUAL BALANCING VALVE
- AUTOMATIC BALANCING VALVE
- VENTURI VALVE
- ISOLATION VALVE
- MANUAL 3-WAY VALVE
- STRAINER
- CHECK VALVE
- BACKFLOW PREVENTER
- PRESSURE REDUCING VALVE
- GAS PRESSURE REGULATOR
- TEMPERATURE AND/OR PRESSURE RELIEF VALVE
- HOSE-END DRAIN W/ CAP
- BOILER DRAIN W/ CAP
- S — SOLENOID VALVE
- M — 2-WAY TEMPERATURE CONTROL VALVE
- M — 3-WAY TEMPERATURE CONTROL VALVE
- STEAM TRAP

## PIPING SPECIALTIES

- AUTOMATIC AIR VENT
- MANUAL AIR VENT
- PRESSURE / TEMPERATURE PORT
- UNION OR FLANGE
- PIPE WELL - EMPTY
- T — TEMPERATURE SENSOR
- P — PRESSURE SENSOR
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- P — PRESSURE GAUGE, SNUBBER & NEEDLE VALVE
- T — TEMPERATURE GAUGE
- FLEXIBLE CONNECTOR
- THERMAL/SEISMIC EXPANSION LOOP
- PIPE GUIDES
- ANCHOR
- F — FLOW METER

# MECHANICAL GENERAL NOTES

INSTALLATION:

A. NEW PIPING, DUCTWORK AND EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE CURRENTLY ADOPTED INTERNATIONAL MECHANICAL AND INTERNATIONAL BUILDING CODES.
B. EQUIPMENT SHALL BE INSTALLED LEVEL, PLUMB, AND FIRMLY ANCHORED IN LOCATIONS INDICATED ON PLAN. OBSERVE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE THEIR INTENDED FUNCTION.
C. INSTALL EQUIPMENT, DUCTWORK, AND PIPING SO AS TO MAINTAIN CODE REQUIRED CLEARANCES FOR ELECTRICAL AND TELECOMMUNICATION EQUIPMENT.
D. ELEMENTS PENETRATING BUILDING COMPONENTS (ROOF ASSEMBLIES, WALL ASSEMBLIES, ETC.) SHALL BE SEALED WEATHER AND WATER TIGHT. COORDINATE PENETRATIONS WITH GENERAL CONTRACTOR TO PATCH TO THE SATISFACTION OF THE ARCHITECT OR ENGINEER.
E. EQUIPMENT MANUFACTURED AFTER 1/1/2023 SHALL MEET MINIMUM SEER2 RATINGS.

COORDINATION:

A. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO FIELD COORDINATE THE LOCATION OF EQUIPMENT, ROUTING OF DUCTWORK, AND ROUTING OF PIPING WITH OTHER TRADES.
B. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO REVIEW THE DRAWINGS OF OTHER DISCIPLINES AND PROVIDE THE NECESSARY LABOR AND MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.
C. COORDINATE THE INSTALLATION OF GRILLES, REGISTERS AND DIFFUSERS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS, THE ELECTRICAL LIGHTING PLANS, AND IF RELEVANT, THE TELECOMMUNICATION AND FIRE SPRINKLER PLANS.

ELECTRICAL COORDINATION:

A. SEE THE MEP COORDINATION SCHEDULE FOR ELECTRICAL INFORMATION. COORDINATE WITH OTHER TRADES TO ENSURE THAT ELECTRICAL DISCONNECTS, MOTOR STARTERS, VARIABLE FREQUENCY DRIVES, CONTROLS, AND ELECTRICAL ACCESSORIES ARE FURNISHED AND/OR INSTALLED BY THE APPROPRIATE TRADE.

FREEZE PROTECTION:

A. THE MECHANICAL CONTRACTOR SHALL FILL THE HYDRONIC SYSTEMS WITH THE FOLLOWING SOLUTION:
   a. HEATING HOT WATER SYSTEM: 0% PROPYLENE GLYCOL & 100% DISTILLED WATER - GLYCOL SHALL INCLUDE CORROSION INHIBITORS.
B. SEE SPECIFICATIONS FOR ADDITIONAL CHEMICAL TREATMENT REQUIREMENTS.

SITE ELEVATION:

A. EQUIPMENT SHALL BE SELECTED FOR THE PROJECT ELEVATION OF 3,150'.

# MECHANICAL SHEET INDEX


| NUMBER | SHEET NAME |
|---|---|
| M001 | MECHANICAL LEGEND & NOTES |
| M002 | MECHANICAL SPECIFICATIONS, SCHEDULES, DETAILS |
| M101 | MECHANICAL DEMO PLAN - BASEMENT |
| M201 | MECHANICAL FLOOR PLAN - BASEMENT |


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100% CONSTRUCTION DOCUMENTS

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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**MECHANICAL LEGEND & NOTES**

DATE: 07.14.2026

SHEET: **M001**

DATE STAMP: 7/13/2026 8:19:37 AM

# MECHANICAL SPECIFICATIONS

**GENERAL**

1. THE MECHANICAL CONTRACTOR SHALL INCLUDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS AND METHODS LISTED, MENTIONED, OR SCHEDULED IN THESE SPECIFICATIONS AND THE ACCOMPANYING DRAWINGS. ALL MATERIAL, EQUIPMENT, AND LABOR SHALL BE FURNISHED TOGETHER WITH ALL INCIDENTAL ITEMS REQUIRED BY GOOD PRACTICE TO PROVIDE THE COMPLETE SYSTEMS DESCRIBED.
2. EXAMINE AND REFER TO ALL ARCHITECTURAL, CIVIL, STRUCTURAL, ELECTRICAL, UTILITY, LANDSCAPE AND MECHANICAL DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION CONDITIONS WHICH MAY AFFECT THE MECHANICAL WORK. INSPECT THE BUILDING SITE AND EXISTING FACILITIES FOR VERIFICATION OF PRESENT CONDITIONS. MAKE PROPER PROVISIONS FOR THESE CONDITIONS IN PERFORMANCE OF THE WORK AND COST THEREOF.
3. ALL WORK ON THE PROJECT SHALL CONFORM TO ALL ADOPTED CITY, STATE, AND NATIONAL CODES & REGULATIONS. SUCH CODES & REGULATIONS INCLUDE, BUT ARE NOT LIMITED TO, THE IBC, IMC, IECC, IPC, NFPA, NEC, SERVICING UTILITY COMPANIES AND THE AUTHORITY HAVING JURISDICTION.
4. THE MECHANICAL AND ELECTRICAL CONTRACTORS SHALL BE RESPONSIBLE FOR AND PAY FOR ALL FEES AND PERMITS REQUIRED FOR WORK UNDER THEIR CONTRACT AND UNDER THEIR SUPERVISION BY SUBCONTRACT.
5. ALL USAGE CONTRACTS BETWEEN THE OWNER AND THE SERVING UTILITIES COMPANY, SUCH AS MEMBERSHIP AND USAGE CHARGES OR FEES, ETC., FOR THE PURPOSE OF OBTAINING THE SERVICES FOR THE UTILITY COMPANY SHALL BE APPLIED FOR AND PAID FOR BY THE OWNER.

**RESPONSIBILITY**

1. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF A SATISFACTORY AND COMPLETE SYSTEM IN ACCORDANCE WITH THE INTENT OF THE DRAWING AND SPECIFICATIONS. PROVIDE, AT NO EXTRA COST, ALL INCIDENTAL ITEMS, MATERIALS, ACCESSORIES AND LABOR REQUIRED FOR COMPLETION OF THE WORK EVEN THOUGH THEY ARE NOT SPECIFICALLY MENTIONED OR INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
2. THE DRAWINGS DO NOT ATTEMPT TO SHOW COMPLETE DETAILS OF THE BUILDING CONSTRUCTION WHICH AFFECT THE MECHANICAL INSTALLATION; AND REFERENCE IS THEREFORE REQUIRED TO THE ARCHITECTURAL, CIVIL, STRUCTURAL, LANDSCAPE AND ELECTRICAL DRAWINGS AND SPECIFICATIONS AND TO SHOP DRAWINGS OF ALL TRADES FOR ADDITIONAL DETAILS WHICH AFFECT THE INSTALLATION OF THE WORK COVERED UNDER THIS DIVISION OF THE CONTRACT.
3. LOCATION OF MECHANICAL SYSTEM COMPONENTS SHALL BE CHECKED FOR CONFLICTS WITH OPENINGS, STRUCTURAL MEMBERS AND COMPONENTS OF OTHER SYSTEMS HAVING FIXED LOCATIONS. IN THE EVENT OF ANY CONFLICTS, THE CONTRACTING OFFICER SHALL BE CONSULTED AND THEIR DECISION SHALL GOVERN. NECESSARY CHANGES SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
4. DO NOT INSTALL EQUIPMENT UNTIL COMPLETE SHOP DRAWINGS OF SUCH EQUIPMENT HAVE BEEN APPROVED BY THE CONTRACTING OFFICER. ANY WORK INSTALLED BY THE CONTRACTOR, PRIOR TO APPROVAL OF SHOP DRAWINGS, WILL BE AT THE CONTRACTOR'S RISK.
5. ALL MODIFICATIONS AND CHANGES REQUIRED DUE TO INSTALLATION OF EQUIPMENT OTHER THAN THE EQUIPMENT SCHEDULED AND SPECIFIED SHALL BE MADE AT THE CONTRACTOR'S EXPENSE, THIS INCLUDES WORK BY OTHER TRADES. IF THE INSTALLATION OF EQUIPMENT OTHER THAN THE SCHEDULED AND SPECIFIED EQUIPMENT REQUIRES MODIFICATIONS TO STRUCTURE, ELECTRICAL SYSTEMS, PLUMBING SYSTEMS, FIRE PROTECTION OR FIRE ALARM SYSTEMS, ANY AND ALL CHANGES SHALL BE MADE AT THE MECHANICAL CONTRACTORS EXPENSE.
6. ALL WORK TO BE PERFORMED SHALL FIRST BE SCHEDULED AND SUBMITTED TO THE CONTRACTING OFFICER FOR ACCEPTANCE.
7. THE CONTRACTOR SHALL BE CAREFUL NOT TO BLOCK ANY PATHS OF EGRESS WHILE PERFORMING THE WORK SPECIFIED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP OF ALL MATERIALS RESULTING FROM THEIR WORK. CLEANUP SHALL BE PERFORMED TO THE LEVEL OF ACCEPTANCE OF THE CONTRACTING OFFICER.
9. THE CONTRACTOR SHALL GUARANTEE THAT ALL WORK EXECUTED UNDER THEIR CONTRACT SHALL BE FREE OF DEFECTS OF MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

**INTENT OF DRAWINGS**

1. THE DRAWINGS ARE PARTLY DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EXACT LOCATION OF PIPING AND DUCTWORK UNLESS SPECIFICALLY DIMENSIONED. RISER AND OTHER DIAGRAMS ARE SCHEMATIC AND DO NOT NECESSARILY SHOW THE PHYSICAL ARRANGEMENT OF THE EQUIPMENT. THEY SHALL NOT BE USED FOR OBTAINING LINEAL RUNS OF PIPING OR DUCTWORK, NOR SHALL THEY BE USED FOR SHOP DRAWINGS FOR PIPING AND DUCTWORK FABRICATION OR ORDERING. DISCREPANCIES SHOWN ON DIFFERENT PLANS, OR BETWEEN PLANS AND ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR RESOLUTION.

**MATERIALS AND EQUIPMENT**

1. MANUFACTURER'S TRADE NAMES AND CATALOG NUMBERS ARE LISTED TO INDICATE THE QUALITY OF EQUIPMENT OR MATERIALS DESIRED FOR INSTALLATION. ALTERNATIVE EQUIPMENT OR MATERIALS MAY BE SUBMITTED FOR PRIOR APPROVAL BEFORE BIDDING THE PROJECT. NO SUBSTITUTIONS WILL BE ALLOWED AFTER BIDDING.
2. WRITTEN PRIOR APPROVAL FOR SUBSTITUTIONS MUST BE SUBMITTED TO AND RECEIVED BY THE CONTRACTING OFFICER SEVEN (7) DAYS PRIOR TO BID OPENING. REQUESTS FOR SUBSTITUTION ARE TO BE SUBMITTED SUFFICIENTLY AHEAD OF THE DEADLINE TO GIVE AMPLE TIME FOR EXAMINATION. PRIOR APPROVAL REQUEST FOR SUBSTITUTION MUST INDICATE THE SPECIFIC ITEM OR ITEMS TO BE FURNISHED IN LIEU OF THOSE SCHEDULED, TOGETHER WITH COMPLETE TECHNICAL AND COMPARATIVE DATA ON SCHEDULED ITEMS AND ITEMS PROPOSED FOR SUBSTITUTION.
3. HIGH ALTITUDE OPERATION: CAPACITY OF ALL EQUIPMENT IS TO BE SIZED AND MANUFACTURED TO PERFORM AT THE ELEVATION OF THE PROJECT SITE. IF NOT SPECIFICALLY INDICATED IN THE EQUIPMENT SCHEDULE OR IN THE SPECIFICATIONS PROVIDE ALL REQUIRED ACCESSORIES AND EQUIPMENT FOR PROPER OPERATION AT ELEVATION OF THE PROJECT SITE.
4. STORE MATERIALS AND EQUIPMENT INDOORS AT THE JOB SITE OR, IF THIS IS NOT POSSIBLE, STORE ON RAISED PLATFORMS AND PROTECT FROM THE WEATHER BY MEANS OF WATERPROOF COVERS. COVERINGS SHALL PERMIT CIRCULATION OF AIR AROUND THE MATERIALS TO PREVENT CONDENSATION OF MOISTURE. SCREEN OR CAP OPENINGS IN EQUIPMENT TO PREVENT THE ENTRY OF VERMIN.
5. ALL NEW PIPING SHALL BE IDENTIFIED WITH SETON SET MARK PIPE MARKERS, LETTERED TO MATCH EXISTING - IF APPLICABLE - AND MARKED AT A MAXIMUM OF EVERY 25 FT. ALL NEW VALVES SHALL BE IDENTIFIED WITH BRASS OR ALUMINUM VALVE TAGS.

**MATERIALS AND EQUIPMENT (CONT.)**

6. SEE THE DUCTWORK SCHEDULE AND MECHANICAL PIPING SCHEDULE ON THE DRAWINGS FOR MATERIAL AND INSULATION REQUIREMENTS.
7. COORDINATE THE INSTALLATION OF GRILLES, REGISTERS AND DIFFUSERS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND THE ELECTRICAL LIGHTING PLANS.
8. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE CONTRACTING OFFICER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ABA REQUIREMENTS.
9. PROVIDE AND INSTALL SEISMIC BRACING FOR ALL EQUIPMENT, DUCTWORK AND PIPING PER THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE.
10. FLEXIBLE DUCTWORK BETWEEN BRANCH DUCTS AND GRILLES, REGISTERS OR DIFFUSERS SHALL BE LIMITED TO 5FT.
11. INSTALL ACCESSIBLE PLUMBING FIXTURES IN COMPLIANCE WITH ABA REQUIREMENTS. INSULATE ALL EXPOSED PIPING BELOW ABA ACCESSIBLE FIXTURES.
12. INSTALL FLOOR DRAIN STRAINERS AND CLEANOUT COVERS FLUSH AND LEVEL WITH FINISHED FLOOR.
13. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIRE-CAULKING ALL FIRE-RATED AND SMOKE-RATED WALL PENETRATIONS OF PIPING, DUCTWORK, ETC.
14. PROVIDE ACCESS DOORS TO ALLOW SERVICE AND INSPECTION OF EQUIPMENT, VALVES, DAMPERS AND DEVICES INSTALLED ABOVE NON-REMOVABLE CEILINGS.

**SHOP DRAWINGS AND SUBMITTALS**

1. WITHIN 30 DAYS OF AWARDING OF THE CONTRACT, THE MECHANICAL CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND/OR SUBMITTALS FOR ALL SCHEDULED EQUIPMENT AND MATERIALS INCLUDED IN THE CONSTRUCTION DOCUMENTS.
2. ALL SHOP DRAWINGS AND SUBMITTALS SHALL BE IN THE FORM OF ELECTRONICALLY TRANSMITTED PDFS. SHOP DRAWINGS AND SUBMITTALS SHALL INCLUDE SHOP DRAWINGS AND LITERATURE SHOWING ITEMS TO BE USED, SIZE, DIMENSIONS, CAPACITY, ROUGH-IN, AND ANY OTHER INFORMATION NECESSARY FOR A COMPLETE REVIEW. MANUFACTURER'S LITERATURE SHOWING MORE THAN ONE ITEM SHALL BE CLEARLY MARKED AS TO WHICH ITEM IS BEING FURNISHED OR IT WILL BE REJECTED AND RETURNED WITHOUT REVIEW.
3. EACH SUBMITTED ITEM MUST BE CLEARLY MARKED WITH THE PROJECT NAME, DATE, BRANCH OF WORK, SUBMITTING PARTY, REVISION NUMBER, AND ASSOCIATED SCHEDULE. SUBMITTALS NOT IDENTIFIED AS DESCRIBED ABOVE WILL BE REJECTED AND RETURNED WITHOUT REVIEW.
4. PRIOR TO THEIR SUBMISSION, EACH SUBMITTAL SHALL BE THOROUGHLY CHECKED BY THE CONTRACTOR FOR COMPLIANCE WITH THE CONTRACT DOCUMENT REQUIREMENTS. EACH SUBMITTAL SHALL THEN BEAR A STAMP EVIDENCING SUCH CHECKING AND SHALL SHOW CORRECTIONS MADE, IF ANY. SUBMITTALS REQUIRING EXTENSIVE CORRECTIONS SHALL BE REVISED BEFORE SUBMISSION TO THE CONTRACTING OFFICER. EACH SUBMITTAL NOT STAMPED AND SIGNED BY THE CONTRACTOR EVIDENCING SUCH CHECKING WILL BE REJECTED AND RETURNED WITHOUT REVIEW.
5. REVIEW OF THE SHOP DRAWINGS AND LITERATURE BY THE CONTRACTING OFFICER SHALL NOT RELIEVE THE CONTRACTOR FOR RESPONSIBILITY FOR DEVIATIONS FOR THE DRAWINGS OR SPECIFICATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN THE SHOP DRAWINGS OR LITERATURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE MATERIALS AND EQUIPMENT WHICH MEET THE SPECIFICATIONS AND JOB REQUIREMENTS.

**REVIEW & SITE INSPECTIONS**

1. ALL WORK AND MATERIAL IS SUBJECT TO REVIEW AT ANY TIME BY THE CONTRACTING OFFICER. IF THE CONTRACTING OFFICER FINDS MATERIAL THAT DOES NOT CONFORM TO THESE SPECIFICATIONS OR THAT IS NOT PROPERLY INSTALLED OR FINISHED, CORRECT THE DEFICIENCIES IN A MANNER SATISFACTORY TO THE CONTRACTING OFFICER AT THE CONTRACTOR'S EXPENSE.

**STARTUP, TESTING AND OWNER TRAINING**

1. ENGAGE A FACTORY AUTHORIZED REPRESENTATIVE TO CONDUCT AN INSPECTION OF THE INSTALLATION OF THEIR COMPANY'S EQUIPMENT PRIOR TO START-UP OF ANY EQUIPMENT. THE REPRESENTATIVE SHALL SUBMIT A REPORT IDENTIFYING ANY DEFICIENCIES TO THE CONTRACTING OFFICER. ANY DEFICIENCIES IDENTIFIED SHALL BE ADDRESSED PRIOR TO START-UP. START-UP SHALL BE CONDUCTED BY A FACTORY AUTHORIZED REPRESENTATIVE. STARTUP REPORTS SHALL BE SUBMITTED TO THE CONTRACTING OFFICER ONCE COMPLETED.
2. NEW AIR AND WATER SYSTEMS SHALL BE BALANCED IN THEIR ENTIRETY TO THE SATISFACTION OF THE CONTRACTING OFFICER IN ACCORDANCE WITH NEBB STANDARDS.

**PROJECT CLOSEOUT**

1. THE MECHANICAL CONTRACTOR SHALL MAINTAIN AT THE PROJECT SITE, A "RECORD SET OF DRAWINGS" SHOWING FIELD CHANGES, AS-BUILT ELEVATIONS, UNUSUAL CONDITIONS ENCOUNTERED DURING CONSTRUCTION, AND SUCH OTHER DATA AS REQUIRED TO PROVIDE THE CONTRACTING OFFICER WITH AN ACCURATE "AS CONSTRUCTED" SET OF RECORD DRAWINGS. THE CONTRACTOR SHALL FURNISH THIS "RECORD SET" TO THE CONTRACTING OFFICER FOLLOWING THE FINAL INSPECTION OF THE PROJECT.
2. THE MECHANICAL CONTRACTOR SHALL PROVIDE AN "OPERATION AND MAINTENANCE MANUAL" (O&M MANUAL) PRIOR TO THE COMMENCEMENT OF OWNER TRAINING. THE O&M MANUAL SHALL BE PROVIDED IN DIGITAL OR THREE PAPER COPIES (BOUND & LABELED) FORMAT AS REQUESTED BY THE CONTRACTING OFFICER. THE O&M MANUAL SHALL CONSIST OF A TITLE PAGE, TABLE OF CONTENTS, AND MANUAL CONTENTS. THE MANUAL CONTENTS SHALL CONSIST OF PRODUCT DATA INFORMATION, PRODUCT SERVICE/MAINTENANCE MANUAL, AND EXECUTED WARRANTY FOR EACH AND ALL EQUIPMENT AND PRODUCTS INSTALLED UNDER THE SCOPE OF THIS PROJECT.

# FINNED TUBE RADIATOR (HOT WATER) SCHEDULE

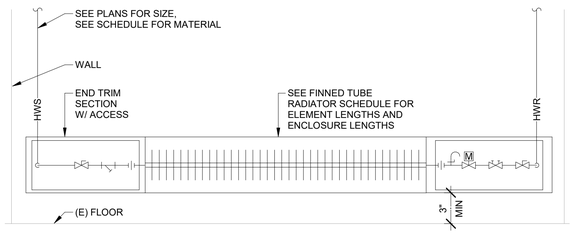
REMARKS:
1. PROVIDE 3/4" COPPER TUBE WITH 3-5/8" x 4-1/4" ALUMINUM FINS AT 32 FIN/FT MECHANICALLY EXPANDED ONTO TUBE.
2. PROVIDE 20" HEIGHT 18 GA. ENCLCOSURE WITH 1 TIER OF FINNED TUBE ELEMENT, WITH SLOPE TOP OUTLET, PENCIL PROOF LOUVERS, BAKED POWDER FINISH.
3. PROVIDE B.B. HANGER WALL MOUNTED BRACKET.
4. PROVIDE WITH DAMPER BLADES FACTORY INSTALLED, DAMPER KNOB.
5. PROVIDE WITH 8-3/8" ACCESS DOOR END SECTION, EACH END.

| MARK | MANUF. | MODEL | ELEMENT LENGTH | ROWS | PIPE SIZE (IN) | RATING (BTU/HR/FT) | TOTAL RATING (BTU/HR) | FLOW (GPM) | CONTROL VALVE | WORKING FLUID | AWT (°F) | EWT / LWT (°F) | COLOR | PHYSICAL DATA | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | LENGTH (IN) | HEIGHT (IN) | DEPTH (IN) |
| FT-16A | VULCAN | LV4-S | 168 | 1 | 3/4 | 980 | 35000 | 3.5 | NO | WATER | 170 | 180 / 160 | CONTRACTING OFFICER | 192 | 12 | 3-3/4 |
| FT-17A | VULCAN | LV4-S | 96 | 1 | 3/4 | 980 | 35000 | 3.5 | NO | WATER | 170 | 180 / 160 | CONTRACTING OFFICER | 120 | 12 | 3-3/4 |
| FT-17C | VULCAN | LV4-S | 96 | 1 | 3/4 | 980 | 35000 | 3.5 | (NL) | WATER | 170 | 180 / 160 | CONTRACTING OFFICER | 120 | 12 | 3-3/4 |

# MECHANICAL PIPE SCHEDULE

NOTE:
1. INSULATION THICKNESS IS BASED ON A CONDUCTIVITY NOT EXCEEDING 0.27 BTU • INCH / (HR • FT² • °F)
2. PROVIDE SEISMIC BRACING OF PIPING 2-1/2" AND LARGER OR AS REQUIRED BY LOCAL CODES.
3. PIPE INSULATION MUST HAVE A FLAME SPREAD LESS THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL723.
4. EXPOSED PLASTIC PIPING IS NOT ALLOWED IN AIR PLENUMS. IF PLASTIC PIPE IS USED, IT MUST BE WRAPPED IN PLENUM RATED PIPE INSULATION.
5. HYDRONIC WATER PIPING SHALL BE ONE OF THE MATERIALS SPECIFIED AT THE CONTRACTORS OPTION.
6. PIPE CONNECTIONS OF DISSIMILAR METALS SHALL REQUIRE A DIELECTRIC NIPPLE. DIELECTRIC UNIONS ARE NOT ALLOWED.
7. PROVIDE FIBERGLASS ALL SERVICE JACKET (ASJ).
8. ASJ TO BE SEALED AT SEAMS AND EDGES.
9. PROVIDE PVC COATED JACKET ON EXPOSED PIPING.

| SYSTEM | ABBREV | PIPE / FITTING MATERIAL | INSULATION |
|---|---|---|---|
| HOT WATER SUPPLY & RETURN < 2-1/2"ø | HWS / HWR | COPPER TYPE-L / SOLDER | 1-1/2" |




1 FINNED-TUBE PIPING DETAIL
N.T.S.

DATE STAMP: 7/13/2026 8:19:38 AM

Morrison Maierle
engineers - surveyors - planners - scientists

MONTANA PROFESSIONAL ENGINEER LICENSED JASON D. LAFAYETTE 11138 PE

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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**MECHANICAL SPECIFICATIONS, SCHEDULES, DETAILS**

DATE: 07.14.2026

**100% CONSTRUCTION DOCUMENTS**

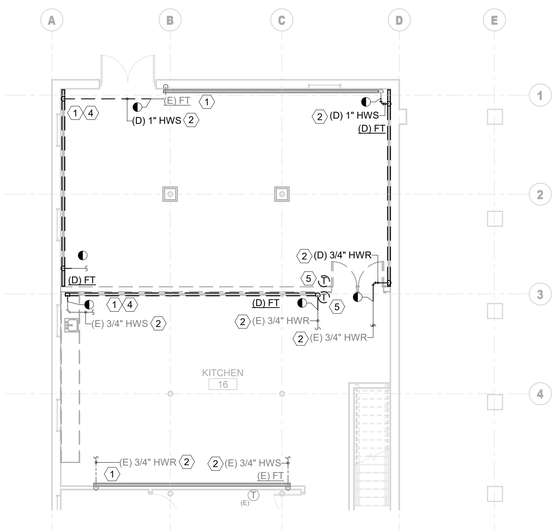
SHEET: **M002**

# MECHANICAL DEMO NOTES

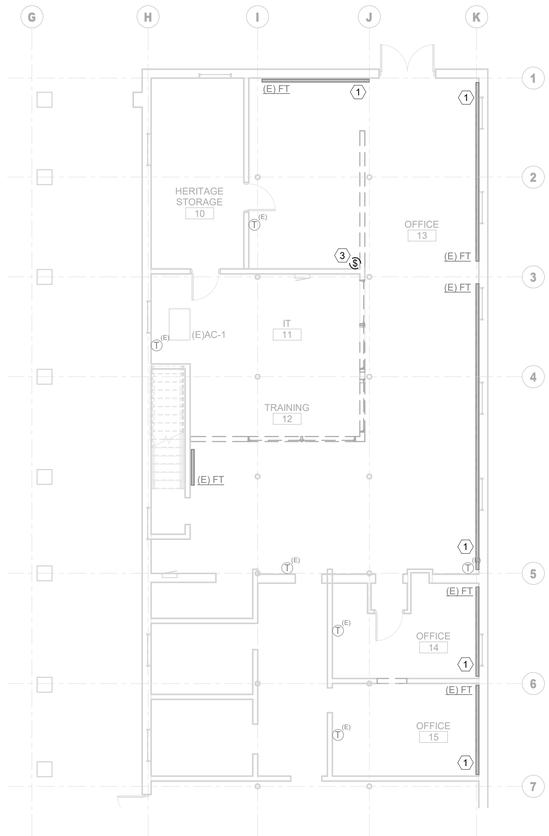
A. LOCATIONS AND DIMENSIONS OF EXISTING FACILITIES IDENTIFIED ON THIS DRAWING ARE APPROXIMATE AND REPRESENT THE BEST AVAILABLE INFORMATION BASED ON A COMBINATION OF FIELD INVESTIGATIONS AND VARIOUS DESIGN AND RECORD DRAWINGS AVAILABLE AT THE TIME OF THE DESIGN. FIELD VERIFY LOCATIONS AND DIMENSIONS PRIOR TO AND DURING PERFORMANCE OF THE WORK. PROVIDE DEMOLITION WORK NECESSARY TO COMPLETE THE SCOPE OUTLINED IN THE CONSTRUCTION DOCUMENTS.
B. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN AS DARK AND DASHED SHALL BE DEMOLISHED. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN LIGHT SHALL REMAIN UNCHANGED.
C. THE MECHANICAL CONTRACTOR SHALL COORDINATE SALVAGE OF REMOVED EQUIPMENT IN GOOD CONDITION WITH THE OWNER. THE MECHANICAL CONTRACTOR SHALL DISPOSE OF UNWANTED EQUIPMENT.
D. COORDINATE UTILITY OUTAGES WITH THE GENERAL CONTRACTOR THROUGHOUT THE DURATION OF CONSTRUCTION. NOTIFICATION MUST BE GIVEN TO THE OWNER AT LEAST A WEEK PRIOR TO ANY PLANNED OUTAGES.
E. COORDINATE WITH THE GENERAL CONTRACTOR TO PATCH AND REPAIR ROOF, WALL, CEILING, OR FLOOR PENETRATIONS ASSOCIATED WITH THE DEMOLITION OF THE EXISTING MECHANICAL SYSTEMS.

# # KEY NOTES:

1. LOCATION OF THE (E) HYDRONIC TEMPERATURE CONTROL VALVE WITHIN THE FIN TUBE ENCLOSURE.
2. EXISTING PIPE SIZE AND LOCATION IS BASED ON AS-BUILT DRAWINGS, AND SITE OBSERVATION WHERE VISIBLE.
3. EMERGENCY SHUT DOWN 'MUSHROOM' SWITCH. NO WORK.
4. SALVAGE THE (E) TEMPERATURE CONTROL VALVE. SEE CONSTRUCTION DRAWINGS FOR NEW LOCATION.
5. SALVAGE THE (E) THERMOSTAT. SEE CONSTRUCTION DRAWINGS FOR NEW LOCATION.




1 MECHANICAL DEMO PLAN WEST
N.T.S.




2 MECHANICAL DEMO PLAN EAST
N.T.S.

KEY PLAN

Morrison Maierle
engineers · surveyors · planners · scientists

MONTANA
JASON D. BEAUDETTE
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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**MECHANICAL DEMO PLAN - BASEMENT**

DATE: 07.14.2026

SHEET: **M101**

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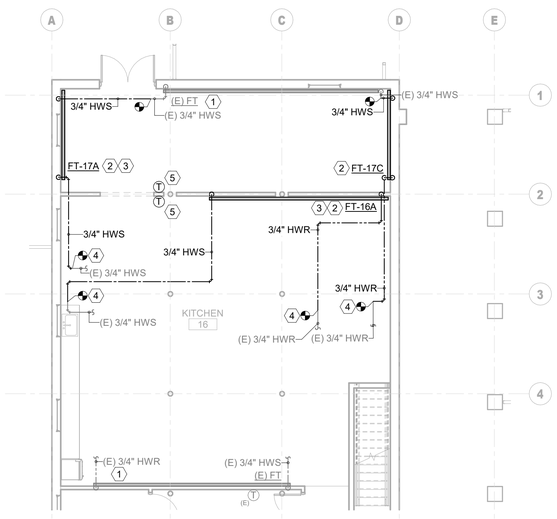
# MECHANICAL PLAN NOTES

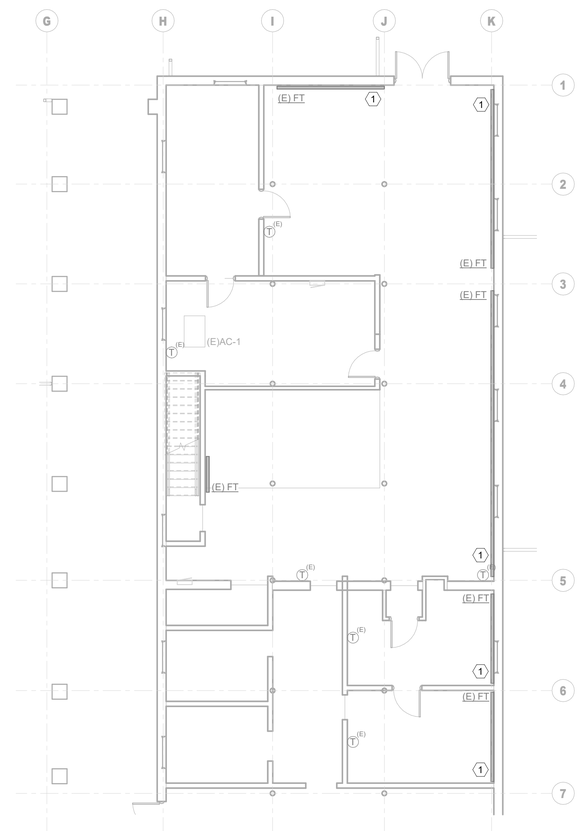
A. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ADA REQUIREMENTS.
B. PROVIDE AND INSTALL SEISMIC BRACING FOR EQUIPMENT, DUCTWORK AND PIPING PER THE REQUIREMENTS OF THE CURRENTLY ADOPTED INTERNATIONAL BUILDING CODE.
C. FLEXIBLE DUCTWORK BETWEEN BRANCH DUCTS AND GRILLES, REGISTERS, OR DIFFUSERS SHALL BE LIMITED TO 5 FT. FLEXIBLE DUCT SHALL NOT BE USED IN PLACE OF ELBOWS.
D. PROVIDE AND INSTALL FIRE, SMOKE, OR COMBINATION FIRE/SMOKE DAMPERS WHERE DUCTWORK PASSES THROUGH RATED ASSEMBLIES. ASSOCIATED DUCT DETECTORS SHALL BE ADDRESSABLE. SMOKE DAMPERS AND COMBINATION SMOKE/FIRE DAMPERS SHALL INCLUDE A KEYED REMOTE TEST SWITCH LOCATED IN AN ACCESSIBLE LOCATION. FIELD COORDINATE THE LOCATION OF TEST SWITCHES WITH THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION.
E. SEAL DUCT AND PIPE PENETRATIONS THROUGH FIRE RATED ASSEMBLIES WITH A UL-APPROVED FIRE STOP SYSTEM.
F. MAINTAIN THE INTEGRITY OF DRAFTSTOPPING WHERE DUCTWORK AND PIPING PENETRATE DRAFTSTOPPING MATERIALS.
G. PROVIDE ACCESS DOORS TO ALLOW SERVICE AND INSPECTION OF EQUIPMENT, VALVES, DAMPERS AND DEVICES INSTALLED IN INACCESSIBLE LOCATIONS. COORDINATE SUCH INSTALLATIONS WITH THE ARCHITECT AND ENGINEER.
H. DUCTWORK DIMENSIONS INDICATE THE CLEAR WIDTH/HEIGHT AND HAVE NOT BEEN INCREASED TO ACCOMMODATE DUCT LINER. INSTALLED DUCT SHALL BE INCREASED TO ACCOMMODATE LINER THICKNESS WHERE LINER IS INDICATED IN THE DRAWINGS OR SPECIFICATIONS.
I. EXPOSED DUCTWORK TO BE HOT DIPPED GALVANIZED STEEL AND PAINTED PER ARCHITECTURAL. CONTRACTOR TO CLEAN AND DRY DUCTWORK PRIOR TO PAINTING.
J. GAS PIPING TO BE WELDED IN CONCEALED SPACES.
K. PIPING SHALL BE IDENTIFIED WITH PIPE LABELS MARKED AT A MAXIMUM OF EVERY 25 FT. VALVES SHALL BE IDENTIFIED WITH BRASS OR ALUMINUM VALVE TAGS.
L. PROVIDE AND INSTALL PIPE GUIDES, EXPANSION JOINTS, AND HANGERS PER MANUFACTURER'S RECOMMENDATIONS.
M. PIPING WALL PENETRATIONS SHALL BE FINISHED WITH A CHROME ESCUTCHEON PLATE.
N. MINIMUM TERMINAL DEVICE BRANCH PIPE SIZE IS 3/4"ø UNLESS OTHERWISE NOTED.
O. PROVIDE HIGH POINT AIR VENTS, LOW POINT DRAINS (WITH CAPPED HOSE CONNECTIONS), AND SLOPE PIPING AS NECESSARY TO ALLOW FOR COMPLETE DRAINAGE OF THE HYDRONIC SYSTEMS.

# KEY NOTES:

1. LOCATION OF THE (E) HYDRONIC TEMPERATURE CONTROL VALVE WITHIN THE FIN TUBE ENCLOSURE.
2. CONNECT (N) 3/4" HWS AND 3/4" HWR INTO THE EXISTING BRANCH LINE AND THE (N) FIN TUBE EQUIPMENT TO MAINTAIN THE ORIGINAL HYDRONIC PIPE CONFIGURATION.
3. NEW LOCATION FOR THE (E) HYDRONIC TEMPERATURE CONTROL VALVE WITHIN THE FIN TUBE ENCLOSURE.
4. NEW HYDRONIC PIPING TO TIE INTO CAPPED EXISTING HYDRONIC PIPING. EXACT LOCATION TO BE FIELD VERIFIED.
5. NEW LOCATION FOR THE (E) THERMOSTAT. RE-CONNECT TO THE ASSOCIATED FINNED TUBE CONTROL VALVE.




1 MECHANICAL BASEMENT PLAN WEST
N.T.S.




2 MECHANICAL BASEMENT PLAN EAST
N.T.S.

KEY PLAN

N

Morrison Maierle
engineers - surveyors - planners - scientists

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**MECHANICAL FLOOR PLAN - BASEMENT**

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# ABBREVIATIONS

| | |
|---|---|
| ACC | AIR COOLED CONDENSER |
| ACU | AIR CONDITIONING UNIT |
| AD | ACCESS DOOR |
| ADJ | ADJUSTABLE |
| AF | AIR FOIL |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AFR | ABOVE FINISHED ROOF |
| AFS | AIR FLOW STATION |
| AHU | AIR HANDLING UNIT |
| AP | ACCESS PANEL |
| ATC | AUTOMATIC TEMPERATURE CONTROL |
| ATM | ATMOSPHERE |
| AWG | AMERICAN WIRE GAUGE |
| B | BOILER |
| BB | BASEBOARD |
| BC | BACKWARD CURVED |
| BD | BACKDRAFT DAMPER |
| BF | BOILER FEED |
| BHP | BRAKE HORSEPOWER |
| BI | BACKWARD INCLINED |
| BMS | BUILDING MANAGEMENT SYSTEM |
| BOD | BOTTOM OF DUCT |
| BOJ | BOTTOM OF JOIST |
| BOS | BOTTOM OF STEEL |
| BTU | BRITISH THERMAL UNIT |
| C | COMMON |
| CAV | CONSTANT AIR VOLUME |
| CC | COOLING COIL |
| CCW | COUNTER CLOCKWISE |
| CFM | CUBIC FEET PER MINUTE |
| CH | CHILLER |
| C&I | CONTROLS & INSTRUMENTATION |
| CLG | CEILING |
| CMU | CONCRETE MASONRY UNIT |
| CND | CONDENSATE |
| CONT | CONTINUATION |
| CORR | CORRIDOR |
| CT | COOLING TOWER |
| CU | CONDENSING UNIT |
| CH | CABINET HEATER |
| CV | CONTROL VALVE |
| CVS | CONTROL VALVE STATION |
| CW | CLOCKWISE |
| dB | DECIBEL |
| DB | DRY BULB TEMPERATURE (°F) |
| DDC | DIRECT DIGITAL CONTROL |
| DH | DUCT HEATER |
| DP | DEW POINT TEMPERATURE (°F) |
| DX | DIRECT EXPANSION |
| E | EXHAUST |
| EA | EXHAUST AIR |
| EAT | ENTERING AIR TEMPERATURE (°F) |
| EC | ELECTRICAL CONTRACTOR |
| EDR | EQUIVALENT DIRECT RADIATION |
| EER | ENERGY EFFICIENCY RATIO |
| EF | EXHAUST FAN |
| EFF | EFFICIENCY |
| ELEV | ELEVATION |
| ERV | ENERGY RECOVERY VENTILATOR |
| ESP | EXTERNAL STATIC PRESSURE |
| ET | EXPANSION TANK |
| EWT | ENTERING WATER TEMPERATURE (°F) |
| F&T | FLOAT & THERMOSTATIC |
| FA | FACE AREA |
| FC | FORWARD CURVED |
| FC | FAN COIL |
| FP | FIRE PROTECTION |
| FPM | FEET PER MINUTE |
| FT | FEET |
| GA | GAUGE OR GAGE |
| GC | GENERAL CONTRACTOR |
| GEN | GENERATOR |
| GH | GRAVITY HOOD |
| GPD | GALLONS PER DAY |
| GPH | GALLONS PER HOUR |
| GPM | GALLONS PER MINUTE |
| H | HUMIDIFIER |
| HC | HEATING COIL |
| HG | MERCURY |
| HOA | HAND-OFF-AUTOMATIC |
| HP | HORSEPOWER |
| HR | HOUR |
| HX | HEAT EXCHANGER |
| ID | INSIDE DIAMETER |
| IFB | INTEGRAL FACE & BYPASS |
| IGV | INLET GUIDE VANES |
| IPS | IRON PIPE SIZE |
| IU | INDUCTION UNIT |
| KW | KILOWATTS |
| KWH | KILOWATT HOUR |
| LAT | LEAVING AIR TEMPERATURE (°F) |
| LF | LINEAR FEET |
| LWT | LEAVING WATER TEMPERATURE (°F) |
| M | MOTOR OPERATED |
| MAU | MAKEUP AIR UNIT |
| MB | MIXING BOX |
| MBH | 1000 BTU/HR |
| MC | MECHANICAL CONTRACTOR |
| MFR | MANUFACTURER |
| MS | MINI-SPLIT |
| NC | NOISE CRITERIA |
| NC | NORMALLY CLOSED |
| NIC | NOT IN CONTRACT |
| NO | NORMALLY OPEN |
| NPS | NOMINAL PIPE SIZE |
| OA | OUTSIDE AIR |
| OAD | OUTSIDE AIR DAMPER |
| OBD | OPPOSED BLADE DAMPER |
| P | PUMP |
| PC | PLUMBING CONTRACTOR |
| PD | PRESSURE DROP |
| PH | PHASE |
| PHC | PREHEAT COIL |
| PPM | PART PER MILLION |
| PROP | PROPELLER |
| PRV | PRESSURE REDUCING VALVE |
| PSIA | PSI, ABSOLUTE |
| PSIG | PSI, GAUGE |
| QTY | QUANTITY |
| R | REGISTER |
| RA | RETURN AIR |
| RD | RADIAL DAMPER |
| RF | RETURN/RELIEF AIR FAN |
| RH | RELATIVE HUMIDITY |
| RHC | REHEAT COIL |
| SA | SUPPLY AIR |
| SAF | SUPPLY AIR FAN |
| SC | SENSIBLE COOLER |
| SCFM | CFM, STANDARD CONDITIONS |
| SD | SMOKE DETECTOR |
| SEER | SEASONAL ENERGY EFFICIENCY RATIO |
| SENS | SENSIBLE |
| SP | STATIC PRESSURE |
| SPS | STATIC PRESSURE SENSOR |
| SS | STAINLESS STEEL |
| T | THERMOSTAT |
| TA | TRANSFER AIR |
| TCC | TEMPERATURE CONTROL CONTRACTOR |
| TCP | TEMPERATURE CONTROL PANEL |
| TG | TRANSFER GRILL |
| TOS | TOP OF STEEL |
| TSP | TOTAL STATIC PRESSURE |
| TYP | TYPICAL |
| UH | UNIT HEATER |
| UNC | UNDERCUT |
| UV | UNIT VENTILATOR |
| VA | VOLT-AMPERE |
| VAV | VARIABLE AIR VOLUME |
| VD | VOLUME DAMPER |
| VEL | VELOCITY |
| VFD | VARIABLE FREQUENCY DRIVE |
| VRF | VARIABLE REFRIGERANT FLOW |
| WB | WET BULB TEMPERATURE (°F) |
| WC | WATER COLUMN |
| WG | WATER GAUGE |
| WSHP | WATER SOURCE HEAT PUMP |
| ΔT | TEMPERATURE DIFFERENCE (°F) |

# PLUMBING LEGEND

## ANNOTATION SYMBOLS

- X / X — 3D VIEW NUMBER / SHEET NUMBER
- X / X — DETAIL NUMBER / SHEET NUMBER
- X / X — SECTION NUMBER / SHEET NUMBER
- PF# — PLUMBING FIXTURE / EQUIPMENT MARK
- (E) PF# — EXISTING PLUMBING FIXTURE / EQUIPMENT
- (D) PF# — DEMOLISHED PLUMBING FIXTURE / EQUIPMENT
- POINT OF NEW CONNECTION
- POINT OF DISCONNECTION
- 1/4" SLOPE — DIRECTION OF FLOW AND SLOPE PER FOOT

## GENERAL

- NAME (E) — EXISTING PIPE TO REMAIN
- NAME (D) — EXISTING PIPE TO BE DEMOLISHED
- NAME — NEW PIPING
- DIRECTION OF FLOW

## PLUMBING

- DCW — DOMESTIC COLD WATER
- DHW — DOMESTIC HOT WATER (120°F)
- DHWR — DOMESTIC HOT WATER RECIRC.
- HTHW — HIGH TEMPERATURE HOT WATER (140°F)
- IRR — IRRIGATION
- RO — REVERSE OSMOSIS TREATED
- TP — TRAP PRIMER LINES
- SAN — SANITARY WASTE
- V — SANITARY VENT
- GW — GREASE WASTE
- AW — ACID WASTE
- AV — ACID VENT
- NG — NATURAL GAS
- LPG — LIQUIFIED PETROLEUM GAS
- RWL — RAIN WATER LEADER
- ORL — RAIN WATER OVERFLOW
- CND — CONDENSATE DRAIN
- CA — COMPRESSED AIR

## PIPE FITTINGS

- ELBOW
- PIPE BREAK
- PIPE UP
- PIPE DOWN
- CHANGE IN ELEVATION OF PIPE
- SIDE CONNECTION, TEE FITTING
- TOP CONNECTION, TEE FITTING UP
- BOTTOM CONNECTION, TEE FITTING DOWN
- CAPPED OUTLET OR BLIND FLANGE
- CONCENTRIC REDUCER

## VALVES

- MANUAL BALANCING VALVE
- AUTOMATIC BALANCING VALVE
- VENTURI VALVE
- ISOLATION VALVE
- MANUAL 3-WAY VALVE
- STRAINER
- CHECK VALVE
- BACKFLOW PREVENTER
- PRESSURE REDUCING VALVE
- GAS PRESSURE REGULATOR
- TEMPERATURE AND/OR PRESSURE RELIEF VALVE
- HOSE-END DRAIN W/ CAP
- BOILER DRAIN W/ CAP
- S — SOLENOID VALVE

## PIPING SPECIALTIES

- AUTOMATIC AIR VENT
- MANUAL AIR VENT
- PRESSURE / TEMPERATURE PORT
- UNION OR FLANGE
- PIPE WELL - EMPTY
- T — TEMPERATURE SENSOR
- P — PRESSURE SENSOR
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- P — PRESSURE GAUGE, SNUBBER & NEEDLE VALVE
- T — TEMPERATURE GAUGE
- FLEXIBLE CONNECTOR
- THERMAL/SEISMIC EXPANSION LOOP
- PIPE GUIDES
- ANCHOR
- W — WATER METER
- FLOOR CLEAN OUT
- WALL CLEAN OUT
- WATER HAMMER ARRESTER
- HOSE BIBB
- WALL HYDRANT
- IRRIGATION BLOWOUT PORT

NOTE: THIS IS A STANDARD LEGEND. NOT ALL PIPE TYPES AND SYMBOLS ARE NECESSARILY UTILIZED IN THE DRAWINGS.

# PLUMBING GENERAL NOTES

INSTALLATION:

A. NEW PIPING AND EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE CURRENTLY ADOPTED INTERNATIONAL PLUMBING AND INTERNATIONAL BUILDING CODES.
B. EQUIPMENT SHALL BE INSTALLED LEVEL, PLUMB, AND FIRMLY ANCHORED IN LOCATIONS INDICATED. OBSERVE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE THEIR INTENDED FUNCTION.
C. DRAWINGS ARE DIAGRAMMATIC IN NATURE. THE PURPOSE OF THESE PLANS IS TO INDICATE THE INTENDED SIZES, APPROXIMATE LOCATION AND ROUTING OF MAJOR COMPONENTS. ACTUAL CONDITIONS AND LOCATIONS SHALL BE FIELD VERIFIED AND ADJUSTED IF NECESSARY.
D. PROVIDE AND INSTALL SEISMIC BRACING FOR EQUIPMENT AND PIPING PER THE REQUIREMENTS OF THE CURRENTLY ADOPTED INTERNATIONAL BUILDING CODE.
E. ELEMENTS PENETRATING BUILDING COMPONENTS (ROOF ASSEMBLIES, WALL ASSEMBLIES, ETC.) SHALL BE SEALED WEATHER AND WATER TIGHT. COORDINATE PENETRATIONS WITH GENERAL CONTRACTOR TO PATCH TO THE SATISFACTION OF THE ARCHITECT OR ENGINEER.
F. MATERIAL THAT IS IN CONTACT WITH POTABLE DOMESTIC WATER SHALL BE NSF CERTIFIED LEAD FREE.

COORDINATION:

A. IT SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO FIELD COORDINATE THE LOCATION OF EQUIPMENT AND ROUTING OF PIPING WITH OTHER TRADES.
B. IT SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO REVIEW THE DRAWINGS OF OTHER DISCIPLINES AND PROVIDE LABOR AND MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.

ELECTRICAL COORDINATION:

A. SEE THE MEP COORDINATION SCHEDULE FOR ELECTRICAL INFORMATION. COORDINATE WITH OTHER TRADES TO ENSURE THAT ELECTRICAL DISCONNECTS, MOTOR STARTERS, VARIABLE FREQUENCY DRIVES, CONTROLS, AND ELECTRICAL ACCESSORIES ARE FURNISHED AND/OR INSTALLED BY THE APPROPRIATE TRADE.

SITE ELEVATION:

A. EQUIPMENT SHALL BE SELECTED FOR THE PROJECT ELEVATION OF 3,150'.

# PLUMBING SHEET INDEX


| NUMBER | SHEET NAME |
|---|---|
| P001 | PLUMBING LEGEND & NOTES |
| P002 | PLUMBING SPECIFICATIONS, SCHEDULES, DETAILS |
| P101 | PLUMBING DEMO PLAN - BASEMENT |
| P201 | PLUMBING FLOOR PLAN - BASEMENT |


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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**PLUMBING LEGEND & NOTES**

DATE: 07.14.2026

SHEET: **P001**

DATE STAMP: 7/13/2026 8:20:23 AM

# PLUMBING SPECIFICATIONS

**GENERAL**

1. THE PLUMBING CONTRACTOR SHALL INCLUDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS AND METHODS LISTED, MENTIONED, OR SCHEDULED IN THESE SPECIFICATIONS AND THE ACCOMPANYING DRAWINGS. ALL MATERIAL, EQUIPMENT, AND LABOR SHALL BE FURNISHED TOGETHER WITH ALL INCIDENTAL ITEMS REQUIRED BY GOOD PRACTICE TO PROVIDE THE COMPLETE SYSTEMS DESCRIBED.
2. EXAMINE AND REFER TO ALL ARCHITECTURAL, CIVIL, STRUCTURAL, ELECTRICAL, UTILITY, LANDSCAPE AND PLUMBING DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION CONDITIONS WHICH MAY AFFECT THE PLUMBING WORK. INSPECT THE BUILDING SITE AND EXISTING FACILITIES FOR VERIFICATION OF PRESENT CONDITIONS. MAKE PROPER PROVISIONS FOR THESE CONDITIONS IN PERFORMANCE OF THE WORK AND COST THEREOF.
3. ALL WORK ON THE PROJECT SHALL CONFORM TO ALL ADOPTED CITY, STATE, AND NATIONAL CODES & REGULATIONS. SUCH CODES & REGULATIONS INCLUDE, BUT ARE NOT LIMITED TO, THE IBC, IMC, IECC, IPC, NFPA, NEC, SERVICING UTILITY COMPANIES AND THE AUTHORITY HAVING JURISDICTION.
4. THE PLUMBING AND ELECTRICAL CONTRACTORS SHALL BE RESPONSIBLE FOR AND PAY FOR ALL FEES AND PERMITS REQUIRED FOR WORK UNDER THEIR CONTRACT AND UNDER THEIR SUPERVISION BY SUBCONTRACT.
5. ALL USAGE CONTRACTS BETWEEN THE OWNER AND THE SERVING UTILITIES COMPANY, SUCH AS MEMBERSHIP AND USAGE CHARGES OR FEES, ETC., FOR THE PURPOSE OF OBTAINING THE SERVICES FOR THE UTILITY COMPANY SHALL BE APPLIED FOR AND PAID FOR BY THE OWNER.

**RESPONSIBILITY**

1. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF A SATISFACTORY AND COMPLETE SYSTEM IN ACCORDANCE WITH THE INTENT OF THE DRAWING AND SPECIFICATIONS. PROVIDE, AT NO EXTRA COST, ALL INCIDENTAL ITEMS, MATERIALS, ACCESSORIES AND LABOR REQUIRED FOR COMPLETION OF THE WORK EVEN THOUGH THEY ARE NOT SPECIFICALLY MENTIONED OR INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
2. THE DRAWINGS DO NOT ATTEMPT TO SHOW COMPLETE DETAILS OF THE BUILDING CONSTRUCTION WHICH AFFECT THE PLUMBING INSTALLATION; AND REFERENCE IS THEREFORE REQUIRED TO THE ARCHITECTURAL, CIVIL, STRUCTURAL, LANDSCAPE AND ELECTRICAL DRAWINGS AND SPECIFICATIONS AND TO SHOP DRAWINGS OF ALL TRADES FOR ADDITIONAL DETAILS WHICH AFFECT THE INSTALLATION OF THE WORK COVERED UNDER THIS DIVISION OF THE CONTRACT.
3. LOCATION OF PLUMBING SYSTEM COMPONENTS SHALL BE CHECKED FOR CONFLICTS WITH OPENINGS, STRUCTURAL MEMBERS AND COMPONENTS OF OTHER SYSTEMS HAVING FIXED LOCATIONS. IN THE EVENT OF ANY CONFLICTS, THE CONTRACTING OFFICER SHALL BE CONSULTED AND THEIR DECISION SHALL GOVERN. NECESSARY CHANGES SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
4. DO NOT INSTALL EQUIPMENT UNTIL COMPLETE SHOP DRAWINGS OF SUCH EQUIPMENT HAVE BEEN APPROVED BY THE CONTRACTING OFFICER. ANY WORK INSTALLED BY THE CONTRACTOR, PRIOR TO APPROVAL OF SHOP DRAWINGS, WILL BE AT THE CONTRACTOR'S RISK.
5. ALL MODIFICATIONS AND CHANGES REQUIRED DUE TO INSTALLATION OF EQUIPMENT OTHER THAN THE EQUIPMENT SCHEDULED AND SPECIFIED SHALL BE MADE AT THE CONTRACTOR'S EXPENSE, THIS INCLUDES WORK BY OTHER TRADES. IF THE INSTALLATION OF EQUIPMENT OTHER THAN THE SCHEDULED AND SPECIFIED EQUIPMENT REQUIRES MODIFICATIONS TO STRUCTURE, ELECTRICAL SYSTEMS, PLUMBING SYSTEMS, FIRE PROTECTION OR FIRE ALARM SYSTEMS, ANY AND ALL CHANGES SHALL BE MADE AT THE PLUMBING CONTRACTORS EXPENSE.
6. ALL WORK TO BE PERFORMED SHALL FIRST BE SCHEDULED AND SUBMITTED TO THE CONTRACTING OFFICER FOR ACCEPTANCE.
7. THE CONTRACTOR SHALL BE CAREFUL NOT TO BLOCK ANY PATHS OF EGRESS WHILE PERFORMING THE WORK SPECIFIED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP OF ALL MATERIALS RESULTING FROM THEIR WORK. CLEANUP SHALL BE PERFORMED TO THE LEVEL OF ACCEPTANCE OF THE CONTRACTING OFFICER.
9. THE CONTRACTOR SHALL GUARANTEE THAT ALL WORK EXECUTED UNDER THEIR CONTRACT SHALL BE FREE OF DEFECTS OF MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

**INTENT OF DRAWINGS**

1. THE DRAWINGS ARE PARTLY DIAGRAMMATIC AND DO NOT NECESSARILY SHOW EXACT LOCATION OF PIPING AND DUCTWORK UNLESS SPECIFICALLY DIMENSIONED. RISER AND OTHER DIAGRAMS ARE SCHEMATIC AND DO NOT NECESSARILY SHOW THE PHYSICAL ARRANGEMENT OF THE EQUIPMENT. THEY SHALL NOT BE USED FOR OBTAINING LINEAL RUNS OF PIPING OR DUCTWORK, NOR SHALL THEY BE USED FOR SHOP DRAWINGS FOR PIPING AND DUCTWORK FABRICATION OR ORDERING. DISCREPANCIES SHOWN ON DIFFERENT PLANS, OR BETWEEN PLANS AND ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER FOR RESOLUTION.

**MATERIALS AND EQUIPMENT**

1. MANUFACTURER'S TRADE NAMES AND CATALOG NUMBERS ARE LISTED TO INDICATE THE QUALITY OF EQUIPMENT OR MATERIALS DESIRED FOR INSTALLATION. ALTERNATIVE EQUIPMENT OR MATERIALS MAY BE SUBMITTED FOR PRIOR APPROVAL BEFORE BIDDING THE PROJECT. NO SUBSTITUTIONS WILL BE ALLOWED AFTER BIDDING.
2. WRITTEN PRIOR APPROVAL FOR SUBSTITUTIONS MUST BE SUBMITTED TO AND RECEIVED BY THE CONTRACTING OFFICER SEVEN (7) DAYS PRIOR TO BID OPENING. REQUESTS FOR SUBSTITUTION ARE TO BE SUBMITTED SUFFICIENTLY AHEAD OF THE DEADLINE TO GIVE AMPLE TIME FOR EXAMINATION. PRIOR APPROVAL REQUEST FOR SUBSTITUTION MUST INDICATE THE SPECIFIC ITEM OR ITEMS TO BE FURNISHED IN LIEU OF THOSE SCHEDULED, TOGETHER WITH COMPLETE TECHNICAL AND COMPARATIVE DATA ON SCHEDULED ITEMS AND ITEMS PROPOSED FOR SUBSTITUTION.
3. HIGH ALTITUDE OPERATION: CAPACITY OF ALL EQUIPMENT IS TO BE SIZED AND MANUFACTURED TO PERFORM AT THE ELEVATION OF THE PROJECT SITE. IF NOT SPECIFICALLY INDICATED IN THE EQUIPMENT SCHEDULE OR IN THE SPECIFICATIONS PROVIDE ALL REQUIRED ACCESSORIES AND EQUIPMENT FOR PROPER OPERATION AT ELEVATION OF THE PROJECT SITE.
4. STORE MATERIALS AND EQUIPMENT INDOORS AT THE JOB SITE OR, IF THIS IS NOT POSSIBLE, STORE ON RAISED PLATFORMS AND PROTECT FROM THE WEATHER BY MEANS OF WATERPROOF COVERS. COVERINGS SHALL PERMIT CIRCULATION OF AIR AROUND THE MATERIALS TO PREVENT CONDENSATION OF MOISTURE. SCREEN OR CAP OPENINGS IN EQUIPMENT TO PREVENT THE ENTRY OF VERMIN.
5. ALL NEW PIPING SHALL BE IDENTIFIED WITH SETON SET MARK PIPE MARKERS, LETTERED TO MATCH EXISTING - IF APPLICABLE - AND MARKED AT A MAXIMUM OF EVERY 25 FT. ALL NEW VALVES SHALL BE IDENTIFIED WITH BRASS OR ALUMINUM VALVE TAGS.

**MATERIALS AND EQUIPMENT (CONT.)**

6. SEE THE PLUMBING PIPING SCHEDULE ON THE DRAWINGS FOR MATERIAL AND INSULATION REQUIREMENTS.
7. COORDINATE THE INSTALLATION OF GRILLES, REGISTERS AND DIFFUSERS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS AND THE ELECTRICAL LIGHTING PLANS.
8. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE CONTRACTING OFFICER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ADA REQUIREMENTS.
9. PROVIDE AND INSTALL SEISMIC BRACING FOR ALL EQUIPMENT, DUCTWORK AND PIPING PER THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE.
10. FLEXIBLE DUCTWORK BETWEEN BRANCH DUCTS AND GRILLES, REGISTERS OR DIFFUSERS SHALL BE LIMITED TO 5FT.
11. INSTALL ACCESSIBLE PLUMBING FIXTURES IN COMPLIANCE WITH ABA REQUIREMENTS. INSULATE ALL EXPOSED PIPING BELOW ABA ACCESSIBLE FIXTURES.
12. INSTALL FLOOR DRAIN STRAINERS AND CLEANOUT COVERS FLUSH AND LEVEL WITH FINISHED FLOOR.
13. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR FIRE-CAULKING ALL FIRE-RATED AND SMOKE-RATED WALL PENETRATIONS OF PIPING, DUCTWORK, ETC.
14. PROVIDE ACCESS DOORS TO ALLOW SERVICE AND INSPECTION OF EQUIPMENT, VALVES, DAMPERS AND DEVICES INSTALLED ABOVE NON-REMOVABLE CEILINGS.

**SHOP DRAWINGS AND SUBMITTALS**

1. WITHIN 30 DAYS OF AWARDING OF THE CONTRACT, THE PLUMBING CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND/OR SUBMITTALS FOR ALL SCHEDULED EQUIPMENT AND MATERIALS INCLUDED IN THE CONSTRUCTION DOCUMENTS.
2. ALL SHOP DRAWINGS AND SUBMITTALS SHALL BE IN THE FORM OF ELECTRONICALLY TRANSMITTED PDFS. SHOP DRAWINGS AND SUBMITTALS SHALL INCLUDE SHOP DRAWINGS AND LITERATURE SHOWING ITEMS TO BE USED, SIZE, DIMENSIONS, CAPACITY, ROUGH-IN, AND ANY OTHER INFORMATION NECESSARY FOR A COMPLETE REVIEW. MANUFACTURER'S LITERATURE SHOWING MORE THAN ONE ITEM SHALL BE CLEARLY MARKED AS TO WHICH ITEM IS BEING FURNISHED OR IT WILL BE REJECTED AND RETURNED WITHOUT REVIEW.
3. EACH SUBMITTED ITEM MUST BE CLEARLY MARKED WITH THE PROJECT NAME, DATE, BRANCH OF WORK, SUBMITTING PARTY, REVISION NUMBER, AND ASSOCIATED SCHEDULE. SUBMITTALS NOT IDENTIFIED AS DESCRIBED ABOVE WILL BE REJECTED AND RETURNED WITHOUT REVIEW.
4. PRIOR TO THEIR SUBMISSION, EACH SUBMITTAL SHALL BE THOROUGHLY CHECKED BY THE CONTRACTOR FOR COMPLIANCE WITH THE CONTRACT DOCUMENT REQUIREMENTS. EACH SUBMITTAL SHALL THEN BEAR A STAMP EVIDENCING SUCH CHECKING AND SHALL SHOW CORRECTIONS MADE, IF ANY. SUBMITTALS REQUIRING EXTENSIVE CORRECTIONS SHALL BE REVISED BEFORE SUBMISSION TO THE CONTRACTING OFFICER. EACH SUBMITTAL NOT STAMPED AND SIGNED BY THE CONTRACTOR EVIDENCING SUCH CHECKING WILL BE REJECTED AND RETURNED WITHOUT REVIEW.
5. REVIEW OF THE SHOP DRAWINGS AND LITERATURE BY THE CONTRACTING OFFICER SHALL NOT RELIEVE THE CONTRACTOR FOR RESPONSIBILITY FOR DEVIATIONS FOR THE DRAWINGS OR SPECIFICATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN THE SHOP DRAWINGS OR LITERATURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE MATERIALS AND EQUIPMENT WHICH MEET THE SPECIFICATIONS AND JOB REQUIREMENTS.

**REVIEW & SITE INSPECTIONS**

1. ALL WORK AND MATERIAL IS SUBJECT TO REVIEW AT ANY TIME BY THE CONTRACTING OFFICER. IF THE CONTRACTING OFFICER FINDS MATERIAL THAT DOES NOT CONFORM TO THESE SPECIFICATIONS OR THAT IS NOT PROPERLY INSTALLED OR FINISHED, CORRECT THE DEFICIENCIES IN A MANNER SATISFACTORY TO THE CONTRACTING OFFICER AT THE CONTRACTOR'S EXPENSE.

**STARTUP, TESTING AND OWNER TRAINING**

1. ENGAGE A FACTORY AUTHORIZED REPRESENTATIVE TO CONDUCT AN INSPECTION OF THE INSTALLATION OF THEIR COMPANY'S EQUIPMENT PRIOR TO START-UP OF ANY EQUIPMENT. THE REPRESENTATIVE SHALL SUBMIT A REPORT IDENTIFYING ANY DEFICIENCIES TO THE CONTRACTING OFFICER. ANY DEFICIENCIES IDENTIFIED SHALL BE ADDRESSED PRIOR TO START-UP. START-UP SHALL BE CONDUCTED BY A FACTORY AUTHORIZED REPRESENTATIVE. STARTUP REPORTS SHALL BE SUBMITTED TO THE CONTRACTING OFFICER ONCE COMPLETED.
2. NEW AIR AND WATER SYSTEMS SHALL BE BALANCED IN THEIR ENTIRETY TO THE SATISFACTION OF THE CONTRACTING OFFICER IN ACCORDANCE WITH NEBB STANDARDS.
3. THE PLUMBING CONTRACTOR SHALL PROVIDE 4 HRS OF TRAINING TO THE OWNER TO ENSURE THE OWNER KNOWS HOW TO OPERATE THE SYSTEMS INSTALLED UNDER THE PLUMBING CONTRACT.

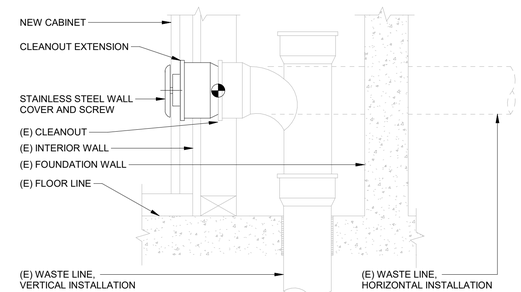
**PROJECT CLOSEOUT**

1. THE PLUMBING CONTRACTOR SHALL MAINTAIN AT THE PROJECT SITE, A "RECORD SET OF DRAWINGS" SHOWING FIELD CHANGES, AS-BUILT ELEVATIONS, UNUSUAL CONDITIONS ENCOUNTERED DURING CONSTRUCTION, AND SUCH OTHER DATA AS REQUIRED TO PROVIDE THE CONTRACTING OFFICER WITH AN ACCURATE "AS CONSTRUCTED" SET OF RECORD DRAWINGS. THE CONTRACTOR SHALL FURNISH THIS "RECORD SET" TO THE CONTRACTING OFFICER FOLLOWING THE FINAL INSPECTION OF THE PROJECT.
2. THE PLUMBING CONTRACTOR SHALL PROVIDE AN "OPERATION AND MAINTENANCE MANUAL" (O&M MANUAL) PRIOR TO THE COMMENCEMENT OF OWNER TRAINING. THE O&M MANUAL SHALL BE PROVIDED IN DIGITAL OR THREE PAPER COPIES (BOUND & LABELED) FORMAT AS REQUESTED BY THE CONTRACTING OFFICER. THE O&M MANUAL SHALL CONSIST OF A TITLE PAGE, TABLE OF CONTENTS, AND MANUAL CONTENTS. THE MANUAL CONTENTS SHALL CONSIST OF PRODUCT DATA INFORMATION, PRODUCT SERVICE/MAINTENANCE MANUAL, AND EXECUTED WARRANTY FOR EACH AND ALL EQUIPMENT AND PRODUCTS INSTALLED UNDER THE SCOPE OF THIS PROJECT.

# PLUMBING FIXTURE SCHEDULE

REMARKS:
1. PROVIDE ALL FIXTURES WITH APPROPRIATE COMMERCIAL GRADE SUPPORTS/CARRIERS, BASKET STRAINER, TAILPIECE, P-TRAP, 1/4 TURN STOP VALVES, BRAIDED FLEXIBLE SUPPLIES, ESCUTCHEONS, AND TRIM TO WALL.

| MARK | FIXTURE | | | | | | TRIM | | | | ROUGH-IN SIZE (IN) | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DESCRIPTION | ADA | MANUF. | MODEL | MATERIAL / FINISH | MOUNTING / HEIGHT | DESCRIPTION | MANUF. | MODEL | MATERIAL / FINISH | WASTE | VENT | COLD | HOT | |
| S-1 | SINK | NO | ELKAY | LR3122PD | STAINLESS STEEL | LAY-IN | FAUCET | MOEN | 87912 | CHROME | 2" | 1-1/2" | 1/2" | 1/2" | PROVIDE COMPLETE WITH 1/4 TURN WATER STOPS, 17GA CHROME P-TRAP, FLEXIBLE CONNECTORS, BASKET STRAINER, TAILPIECE, AND ESCUTCHEONS. |




2 SEWER LINE CLEANOUT THRU WALL DETAIL
N.T.S.

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**BUILDING 24 BASEMENT REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**PLUMBING SPECIFICATIONS, SCHEDULES, DETAILS**

DATE: 07.14.2026

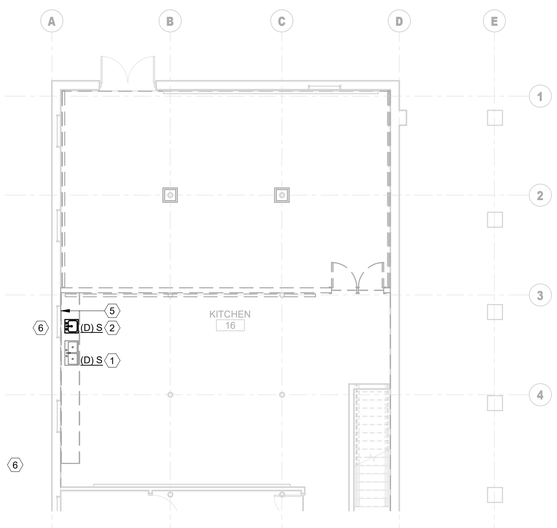
SHEET: **P002**

# PLUMBING DEMO NOTES

A. LOCATIONS AND DIMENSIONS OF EXISTING FACILITIES IDENTIFIED ON THIS DRAWING ARE APPROXIMATE AND REPRESENT THE BEST AVAILABLE INFORMATION BASED ON A COMBINATION OF FIELD INVESTIGATIONS AND VARIOUS DESIGN AND RECORD DRAWINGS AVAILABLE AT THE TIME OF DESIGN. FIELD VERIFY LOCATIONS AND DIMENSIONS PRIOR TO ORDERING EQUIPMENT AND DURING PERFORMANCE OF THE WORK. PROVIDE DEMOLITION WORK, NECESSARY FITTINGS, TRANSITIONS, AND OTHER COMPONENTS AS REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION OF NEW SYSTEMS AT NO ADDITIONAL COST TO THE OWNER.
B. EXISTING PLUMBING EQUIPMENT, FIXTURES, AND PIPING SHOWN AS DARK AND DASHED SHALL BE DEMOLISHED. EXISTING PLUMBING EQUIPMENT, FIXTURES, AND PIPING SHOWN LIGHT SHALL REMAIN UNCHANGED.
C. THE PLUMBING CONTRACTOR SHALL COORDINATE SALVAGE OF REMOVED EQUIPMENT IN GOOD CONDITION WITH THE OWNER. THE PLUMBING CONTRACTOR SHALL DISPOSE OF UNWANTED EQUIPMENT.
D. COORDINATE WITH GENERAL CONTRACTOR TO PATCH AND REPAIR ROOF AND WALL ASSEMBLIES ASSOCIATED WITH PLUMBING DEMOLITION.
E. CONCRETE SLAB CUTTING REGIONS SHOWN ON DRAWINGS ARE APPROXIMATE AND MUST BE FIELD COORDINATED PRIOR TO THE CUTTING OF THE SLAB.
F. PROTECT EXISTING BUILDING ELEMENTS DURING DEMOLITION WORK. COORDINATE WITH OTHER TRADES TO ENSURE NO EXISTING EQUIPMENT/PIPING TO REMAIN IS DAMAGED DURING THE DEMOLITION WORK.

# (#) KEY NOTES:

1. COMPLETELY DEMOLISH THE EXISTING SINK, INCLUDING ALL TRIM TO THE WALL. FURNISH AND INSTALL A PERMANENT CAP ON DCW, DHW, AND SAN.
2. COMPLETELY DEMOLISH THE EXISTING SINK, INCLUDING ALL TRIM TO THE WALL INCLUDING ANGLE VALVES. PREPARE THE EXISTING DCW, DHW, AND SAN ROUGH-IN SERVICES FOR NEW CONNECTION.
3. EXISTING 4" PVC RADON PIPE RISES FROM BELOW THE BASEMENT FLOOR SLAB-ON-GRADE, AND TERMINATES THROUGH THE WALL AT APPROXIMATELY 4'-6" AFF. NO WORK.
4. EXISTING AC-1 PUMPED CONDENSATE LINE TO REMAIN, NO WORK. EXISTING 3/8" POLY LINE IS ROUTED ABOVE THE LAY-IN CEILING.
5. EXISTING WALL CLEAN OUT TO REMAIN. SEE CONSTRUCTION DRAWINGS FOR NEW WORK.
6. PLUMBING CONTRACTOR SHALL COORDINATE WITH THE SITE CIVIL CONTRACTOR TO RESTORE EXTERIOR SANITARY SEWER SERVICE TO THE EXTERIOR SEWER MANHOLE. NO WORK IS ANTICIPATED FROM THE FIXTURE UP TO AND INCLUDING TO THE BUILDING FOUNDATION WALL.




1 PLUMBING DEMO PLAN WEST
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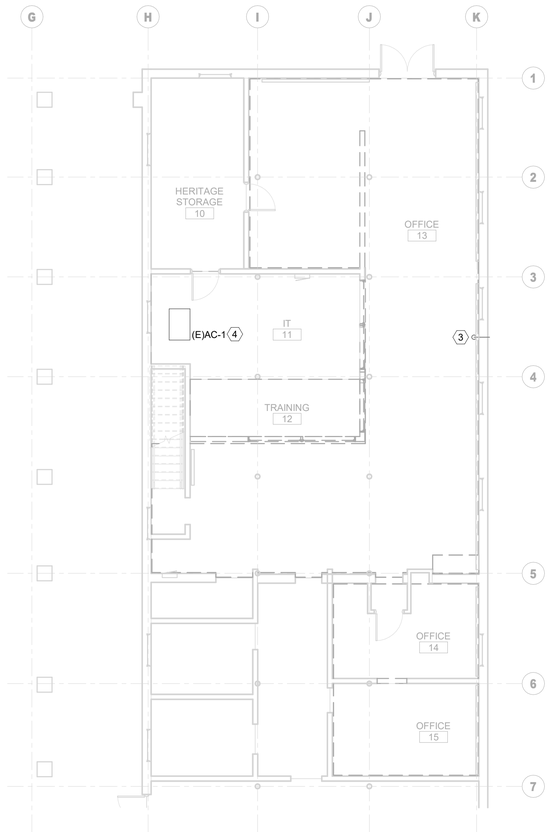


2 PLUMBING DEMO PLAN EAST
N.T.S.

KEY PLAN

Morrison Maierle
engineers - surveyors - planners - scientists

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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**PLUMBING DEMO PLAN - BASEMENT**

DATE: 07.14.2026

SHEET: **P101**

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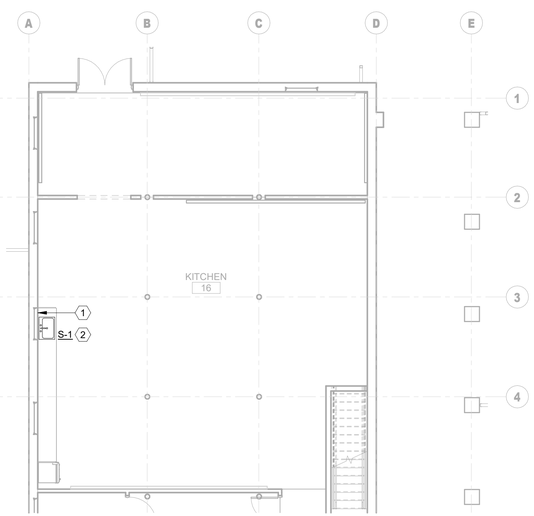
# PLUMBING PLAN NOTES

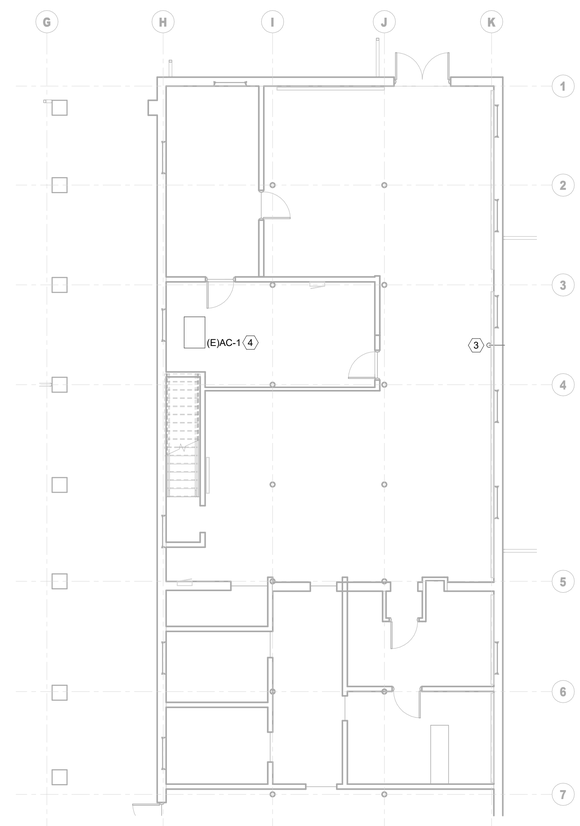
A. PROVIDE ACCESS DOORS TO ALLOW SERVICE AND INSPECTION OF EQUIPMENT, VALVES, AND OTHER DEVICES INSTALLED IN INACCESSIBLE LOCATIONS. COORDINATE SUCH INSTALLATIONS WITH THE ARCHITECT AND ENGINEER.
B. PROVIDE TRAP SEALS AND TRAP PRIMERS FOR FLOOR DRAINS, FLOOR SINKS, AND OTHER FLOOR RECEPTORS.
C. INSTALL ACCESSIBLE PLUMBING FIXTURES IN COMPLIANCE WITH ADA REQUIREMENTS. INSULATE EXPOSED PIPING BELOW ADA ACCESSIBLE FIXTURES.
D. INSTALL FLOOR DRAIN STRAINERS AND CLEANOUT COVERS FLUSH AND LEVEL WITH FINISHED FLOOR.
E. PIPING SHALL BE IDENTIFIED WITH PIPE LABELS MARKED AT A MAXIMUM OF EVERY 25 FT. VALVES SHALL BE IDENTIFIED WITH BRASS OR ALUMINUM VALVE TAGS.
F. PROVIDE AND INSTALL PIPE GUIDES, EXPANSION JOINTS, AND HANGERS PER MANUFACTURER'S RECOMMENDATIONS.
G. PIPING WALL PENETRATIONS SHALL BE FINISHED WITH A CHROME ESCUTCHEON PLATE.
H. MAINTAIN THE INTEGRITY OF DRAFTSTOPPING WHERE PIPES PENETRATE DRAFTSTOPPING MATERIALS.
I. NO FITTINGS OR PIPING CONNECTIONS SHALL BE INSTALLED UNDERSLAB.
J. REFER TO THE PLUMBING FIXTURE SCHEDULE FOR PIPE SIZES TO INDIVIDUAL FIXTURES.
K. COORDINATE CONCRETE PENETRATIONS WITH STRUCTURAL DRAWINGS TO VERIFY HOW AND WHERE CONCRETE CAN BE CUT.
L. EXPOSED PIPING SHALL BE PAINTED PER ARCHITECTURAL OR PROVIDED WITH A PVC COATED JACKET IN THE COLOR OF THE ARCHITECT'S CHOOSING. CONTRACTOR TO CLEAN AND DRY PIPING PRIOR TO PAINTING.
M. SANITARY SEWER, RAINWATER, AND OTHER DRAIN PIPING SHALL BE INSTALLED AT A MINIMUM 1/4" PER FOOT (2%) SLOPE IN DIRECTION OF FLOW. UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
N. COORDINATE UNDERGROUND FIRE RISER STUB UP LOCATION WITH FIRE SUPPRESSION SHOP DRAWINGS.

# # KEY NOTES:

1. EXISTING WALL CLEAN OUT TO REMAIN. EXTEND EXISTING CLEAN OUT THROUGH NEW CABINET BACK WALL. FURNISH AND INSTALL STAINLESS STEEL COVER AND SCREW. COORDINATE WITH GENERAL CONTRACTOR TO MAINTAIN ACCESS.
2. CONNECT (N) SINK TO EXISTING DCW, DHW, AND SAN SERVICES.
3. EXISTING 4" PVC RADON PIPE RISES FROM BELOW THE BASEMENT FLOOR SLAB-ON-GRADE, AND TERMINATES THROUGH THE WALL AT APPROXIMATELY 4'-6" AFF. NO WORK.
4. EXISTING AC-1 PUMPED CONDENSATE LINE TO REMAIN, NO WORK. EXISTING 3/8" POLY LINE IS ROUTED ABOVE THE LAY-IN CEILING.




1 PLUMBING BASEMENT PLAN WEST
1/8" = 1'-0"




2 PLUMBING BASEMENT PLAN EAST
1/8" = 1'-0"

KEY PLAN

Morrison Maierle
engineers - surveyors - planners - scientists

MONTANA
JASON D. BEAUDETTE
11138 PE
LICENSED
PROFESSIONAL ENGINEER

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**PLUMBING FLOOR PLAN - BASEMENT**

DATE: 07.14.2026

SHEET: **P201**

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# ELECTRICAL ABBREVIATIONS LEGEND

| | |
|---|---|
| A, AMP | AMPERES |
| AC | ALTERNATING CURRENT |
| A/C | AIR CONDITIONING |
| AF | AMP FUSE |
| AFC | AVAILABLE FAULT CURRENT |
| AFCI | ARC FAULT CIRCUIT INTERRUPTER |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AHU | AIR HANDLING UNIT |
| AL | ALUMINUM |
| AS | AMP SWITCH |
| ATS | AUTOMATIC TRANSFER SWITCH |
| BAS | BUILDING AUTOMATION SYSTEM |
| BKR | BREAKER |
| BOF | BOTTOM OF FIXTURE |
| C | RACEWAY/CONDUIT |
| CB | CIRCUIT BREAKER |
| CCT | COLOR RENDERING TEMPERATURE |
| CCTV | CLOSED CIRCUIT TELEVISION |
| CKT | CIRCUIT |
| CLG | CEILING |
| C.O. | RACEWAY/CONDUIT ONLY, WITH PULL STRING |
| COD | CENTER OF DEVICE |
| CNTRL | CONTROL |
| CU | COPPER |
| (D) | EXISTING TO BE DEMOLISHED |
| DISC | DISCONNECT |
| DIST | DISTRIBUTION |
| DPDT | DOUBLE POLE DOUBLE THROW |
| DWG | DRAWING |
| EA | EACH |
| EC | ELECTRICAL CONTRACTOR |
| EF | EXHAUST FAN |
| ELEC | ELECTRIC |
| EMT | ELECTRICAL METALLIC TUBING |
| EQUIP | EQUIPMENT |
| EX, EXIST | EXISTING |
| FA | FIRE ALARM |
| FAA | FIRE ALARM ANNUNCIATOR |
| FACP | FIRE ALARM CONTROL PANEL |
| FD | FUSED DISCONNECT |
| FLR | FLOOR |
| FO | FIBER OPTIC |
| FSD | FIRE SMOKE DAMPER RELAY, CONTROLLED BY ASSOCIATED SMOKE DETECTOR AND CIRCUITED BACK TO FACP |
| FVNR | FULL VOLTAGE NON-REVERSING |
| GEC | GROUNDED ELECTRODE CONDUCTOR |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| GFI | GROUND FAULT INTERRUPTER |
| GFP | GROUND FAULT PROTECTION |
| GND | GROUND |
| GRC | GALVANIZED RIGID CONDUIT |
| HOA | HAND-OFF-AUTOMATIC |
| HP | HORSEPOWER |
| HTR | HEATER |
| HVAC | HEATING, VENTILATION & AIR CONDITIONING |
| HZ | HERTZ |
| J-BOX | JUNCTION BOX |
| KVA | KILOVOLT-AMPERES |
| KW | KILOWATTS |
| LCP | LIGHTING CONTROL PANEL |
| LPW | LUMENS PER WATT |
| LTG | LIGHTING |
| LM | LUMENS |
| LV | LOW VOLTAGE |
| MAG | MAGNETIC STARTER |
| MAN | MANUAL |
| MAX | MAXIMUM |
| MC | MECHANICAL CONTRACTOR |
| MCA | MINIMUM CIRCUIT AMPACITY |
| MCC | MOTOR CONTROL CENTER |
| MDP | MAIN DISTRIBUTION PANEL |
| MECH | MECHANICAL |
| MEP | MECHANICAL, ELECTRICAL, PLUMBING |
| MIN | MINIMUM |
| MOCP | MAXIMUM OVERCURRENT PROTECTION |
| MSS | MOTOR STARTER SWITCH WITH THERMAL OVERLOADS |
| N | NEUTRAL |
| NC | NORMALLY CLOSED |
| NEC | NATIONAL ELECTRIC CODE |
| NEMA | NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION |
| NFD | NON-FUSED DISCONNECT |
| NL | NIGHT LIGHT, UN-SWITCHED 24/7 OPERATION |
| NIC | NOT IN CONTRACT |
| NO | NORMALLY OPEN |
| # | NUMBER |
| OAE | OR APPROVED EQUAL |
| OCPD | OVERCURRENT PROTECTIVE DEVICE |
| OH | OVERHEAD |
| P | POLE |
| PB | PUSHBUTTON |
| PC | PLUMBING CONTRACTOR |
| PH | PHASE |
| PNL | PANEL |
| PVC | POLYVINYL CHLORIDE CONDUIT |
| PWR | POWER |
| (R) | EXISTING TO REMAIN |
| RCPT | RECEPTACLE |
| RGS | RIGID GALVANIZED STEEL |
| RM | ROOM |
| RVNR | REDUCED VOLTAGE NON-REVERSING |
| SP | SINGLE POLE TOGGLE SWITCH |
| SPD | SURGE PROTECTIVE DEVICE (TVSS) |
| SPEC | SPECIFICATION |
| SPST | SINGLE POLE SINGLE THROW |
| SSPB | START-STOP PUSHBUTTON |
| SW | SWITCH |
| SWBD | SWITCHBOARD |
| SWGR | SWITCHGEAR |
| TB | TELEPHONE BOARD |
| TC | TIME CLOCK |
| TD | TIME DELAY |
| TEL | TELEPHONE |
| TR | TAMPER RESISTANT |
| TSP | TWISTED SHIELDED PAIR |
| TTB | TELEPHONE TERMINAL BOARD |
| TYP | TYPICAL |
| UG | UNDERGROUND |
| UH | UNIT HEATER |
| UNO | UNLESS NOTED OTHERWISE |
| V | VOLT |
| VA | VOLT-AMPERES |
| VFD | VARIABLE FREQUENCY DRIVE |
| W | WATTS |
| WAO | WORK AREA OUTLET |
| WP | WEATHERPROOF |
| WPI | WEATHERPROOF WHILE-IN-USE |
| WR | WEATHER RESISTANT |
| W/O | WITHOUT |
| XFMR | TRANSFORMER |
| Y | WYE-CONNECTED |
| Δ | DELTA-CONNECTED |
| ø | PHASE |

# ELECTRICAL LIGHTING FIXTURE LEGEND

| | |
|---|---|
| | RECESSED LED FIXTURE - "a" & "b" DESIGNATES SWITCH |
| | RECESSED EMERGENCY LED FIXTURE - "a" & "b" DESIGNATES SWITCH |
| | SURFACE LED FIXTURE - "a" & "b" DESIGNATES SWITCH |
| | SURFACE EMERGENCY LED FIXTURE - "a" & "b" DESIGNATES SWITCH |
| | SURFACE WALL MOUNT LED FIXTURE |
| | LED STRIP OR INDUSTRIAL, SURFACE OR CHAIN HUNG |
| | EMERGENCY LED STRIP OR INDUSTRIAL, SURFACE OR CHAIN HUNG |
| | PENDANT FIXTURE; HIGH BAY, LOW BAY, DECORATIVE |
| | EXIT SIGN - WALL MOUNT, CEILING MOUNT. ARROW INDICATES DIRECTION OF TRAVEL, SHADING INDICATES LIGHTED FACE. |
| | COMBINATION EXIT SIGN/ EGRESS LIGHTING UNIT - WALL MOUNT, CEILING MOUNT. ARROW INDICATES DIRECTION OF TRAVEL, SHADING INDICATES LIGHTED FACE. |
| | DUAL HEAD EMERGENCY EGRESS BATTERY PACK, WALL MOUNT OR CEILING MOUNT |
| | WALL MOUNTED SCONCE |
| | SURFACE DOWNLIGHT |
| | SURFACE EMERGENCY DOWNLIGHT |
| | RECESSED CAN DOWNLIGHT |
| | RECESSED CAN EMERGENCY DOWNLIGHT |
| | RECESSED CAN WALL WASHER |

# ELECTRICAL LIGHTING CONTROL LEGEND

| STANDARD LIGHTING CONTROLS: SWITCHES AND LINE VOLTAGE DIMMERS | DIGITAL LIGHTING CONTROLS: ROOM CONTROLLERS AND LOW VOLTAGE DEVICES |
|---|---|
| $X — TOGGLE SWITCH (MOUNT AT +48", UNO)<br>"X" INDICATES TYPE:<br>BLANK - SINGLE POLE<br>3 - INDICATES THREE-WAY<br>4 - INDICATES FOUR-WAY<br>D - INDICATES DIMMER SWITCH PHILIPS SUNRISE - ON/OFF<br>T - INDICATES TIMER<br>OS - INDICATES WALL SWITCH OCC SENSOR WATTSTOPPER DSW-301 (SINGLE OR DUAL DSW-302 SWITCH)<br>OSD - INDICATES WALL SWITCH OCC SENSOR WITH 0-10V DIMMING - WATTSTOPPER DW-311<br>a - SINGLE POLE LIGHTING SWITCH ZONE 'a'<br>b - SINGLE POLE LIGHTING SWITCH ZONE 'b'<br>ab - INDICATES LIGHTING SWITCHES WITH MULTIPLE ZONES | OS LV / OSD LV — OCCUPANCY SENSOR - DUAL TECHNOLOGY CEILING MOUNT: WATTSTOPPER LMDC-100, OR EQUAL WALL MOUNT: WATTSTOPPER LMDX-100, OR EQUAL WALL MOUNT AT +96", UNO |
| OS / OSD — OCCUPANCY SENSOR - DUAL TECHNOLOGY CEILING MOUNT: WATTSTOPPER DT-300, OR EQUAL WALL MOUNT: WATTSTOPPER DT-200, OR EQUAL WALL MOUNTED SHALL BE AT +96", UNO PROVIDE WITH BZ-50 POWER PACKS AS NEEDED. | P LV — PHOTOCELL - CEILING MOUNT WATTSTOPPER LMLS-400, OR EQUAL |
| P — PHOTOCELL - CEILING MOUNT, WATTSTOPPER LS-301, OR EQUAL | R1 — ON/OFF ROOM CONTROLLER WITH (1) RELAY WATTSTOPPER DLM LMRC-101, OR EQUAL |
| PL — PLUG LOAD CONTROL RELAY | R2 — ON/OFF ROOM CONTROLLER WITH (2) RELAYS WATTSTOPPER DLM LMRC-102, OR EQUAL |
| TSD — UL1008 TRANSFER SWITCH DEVICE BODINE GTD20A, OR EQUAL | R3 — ON/OFF/0-10V ROOM CONTROLLER WITH (2) RELAYS WATTSTOPPER DLM LMRC-212, OR EQUAL |
| EB — UL924 LIGHTING CONTROLS EMERGENCY BYPASS WATTSTOPPER ELCU-200, OR EQUAL | R4 — ON/OFF/0-10V ROOM CONTROLLER WITH (3) RELAYS WATTSTOPPER DLM LMRC-213, OR EQUAL |
| | $LVD — LOW VOLTAGE DIMMING SWITCH WATTSTOPPER DLM LMSM-211, OR EQUAL |
| | $LV — LOW VOLTAGE SWITCH, # INDICATES NUMBER OF BUTTONS. NO "#" IS A 2 BUTTON SWITCH. WATTSTOPPER DLM LMSW-2#0, OR EQUAL |

# ELECTRICAL ONE-LINE LEGEND

| | |
|---|---|
| M — CT AND CUSTOMER POWER METER | AUTOMATIC TRANSFER SWITCH |
| M — MOTOR | VFD — VARIABLE FREQUENCY DRIVE |
| M — UTILITY ELECTRIC METER AND BASE (BASE BY CUSTOMER) | FIXED MOUNT LV BREAKER |
| SPD — SURGE PROTECTION DEVICE | FUSED SWITCH ("XXAS/XXAF" - SW AND FUSE AMP RATING) |
| L — LIGHTNING ARRESTER, TYPE 1 SPD, MOUNTED ON EXTERIOR OF MAIN SWITCHGEAR (SQUARE D. SDSA SERIES, OAE) | G — GENERATOR |
| | CB — WALL MOUNTED BREAKER |
| STRESS RELIEF CONE | DISCONNECT SWITCH ("XXAS" = SWITCH AMP RATING) |
| $X — EQUIPMENT TOGGLE DISCONNECT SWITCH<br>"X" INDICATES TYPE:<br>F - FUSTAT<br>M - MOTOR STARTER SWITCH W/ THERMAL OVERLOADS | FUSED DISCONNECT SWITCH ("XXAS/XXAF" = SW AND FUSE AMP RATING) |
| | COMBINATION MOTOR STARTER (STR SIZE, TYP, AS, AF, SEE MEP COORDINATION SCHEDULE) |
| CONTACTOR NORMALLY OPEN, NORMALLY CLOSED | 480/277 VAC 3Ø 4W — SWITCHBOARD OR PANELBOARD; NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED |
| TRANSFORMER, 3-PH, 3-WIRE DELTA CONNECTION | |
| TRANSFORMER, 3-PH, 4-WIRE GROUNDED WYE CONNECTION | |

# ELECTRICAL POWER LEGEND

| | |
|---|---|
| D-1 X — PANEL AND CIRCUIT DESIGNATION ARE NEXT TO EACH DEVICE (PANEL NAME - CIRCUIT NUMBER). MINIMUM BRANCH CIRCUIT WIRE SIZE IS #12, UNO. A SINGLE INSULATED GREEN GROUND CONDUCTOR SHALL BE PROVIDED WITH EACH HOME RUN. PROVIDE A SEPARATE NEUTRAL FOR EACH CIRCUIT. HOME RUNS SHALL HAVE NO MORE THAN THREE CIRCUITS. LINE VOLTAGE AND LOW VOLTAGE WIRING IS NOT SHOWN ON PLANS.<br>"X" INDICATES TYPE:<br>C - AUTOMATIC CONTROL<br>GFI - GROUND FAULT INTERRUPTER<br>WP - WEATHERPROOF FLIP COVER<br>WPI - WEATHERPROOF WHILE-IN-USE COVER<br>WR - WEATHER-RESISTANT TYPE, WITH GFI<br>U - PROVIDE WITH (2) USB PORTS<br>TR - TAMPER RESISTANT | PANELBOARD OR LOAD CENTER |
| | X — SPECIAL PURPOSE RECEPTACLE (MOUNT AT +18", UNO)<br>"X" INDICATES TYPE:<br>A - NEMA 5-20R, #12 CU; B - NEMA 5-30R, #10 CU;<br>C - NEMA 5-50R, #6 CU; D - NEMA 6-20R, #12 CU;<br>E - NEMA 6-30R, #10 CU; F - NEMA 6-50R, #6 CU;<br>G - NEMA 14-20R, #12 CU; H - NEMA 14-30R, #10 CU;<br>I - NEMA 14-50R, #6 CU*<br>* +4" AFF FOR RANGE |
| | X — PUSHBUTTON (MOUNT AT +48", UNO)<br>"X" INDICATES TYPE:<br>EPO - EMERGENCY POWER OFF<br>ADA - HANDICAPPED ACCESSIBLE DOOR (DEVICE BY OTHERS)<br>ODO - OVERHEAD DOOR OPERATOR (DEVICE BY OTHERS) |
| SIMPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO) | RECESSED TV BOX, WITH BLANK COVERS FOR LOW VOLTAGE OPENINGS. MOUNT AT +72", UNO.<br>X INDICATES TYPE:<br>A - 2-GANG, WITH DUPLEX RECEPTACLE & SINGLE GANG DATA OPENING. HUBBELL RACO NSAV62M, WITH NSAV6C COVER<br>B - 3-GANG, WITH DUPLEX RECEPTACLE, LOW VOLTAGE DIVIDER, SINGLE GANG FOR DATA (CENTER), AND REMOVABLE SINGLE GANG FOR AUDIO/VISUAL (SIDE). ARLINGTON TVBS507<br>NOTE: ROUTE (1) 1" C. TO DATA OPENING AND (1) 1-1/4" C. TO AUDIO/VISUAL OPENING, FROM TOP OF GANG IN WALL INTO ACCESSIBLE CEILING SPACE. ALSO ROUTE 1-1/4" C. FROM AUDIO/VISUAL OPENING TO FLOOR BOX WHERE APPLICABLE. |
| DUPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO) | J — JUNCTION BOX |
| QUADRUPLEX RECEPTACLE: (2) DUPLEX IN A 2-GANG BOX - CEILING MOUNT, WALL MOUNT (+18", UNO) | J — DROP-DOWN RECEPTACLE |
| ABOVE COUNTER RECEPTACLE - MOUNT AT +4" ABOVE BACKSPLASH | PS-X — SURFACE MOUNTED PLUGSTRIP<br>"X" INDICATES TYPE:<br>A - PLUGSTRIP, POWER ONLY, OUTLET EVERY 3' OC<br>B - WIREMOLD SERIES 4000 POWER AND DATA<br>C - WIREMOLD SERIES 5000 POWER AND DATA |
| FLOOR BOX WITH (2) DUPLEX RECEPTACLES - FURNISH WITH (1) 3/4" MIN. CONDUIT FOR POWER FROM BOX. INCLUDE ALL HARDWARE/ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION. PROVIDE COVER (COORDINATE WITH ARCHITECT FOR FLOORING TYPE AND FINISH).<br>"X" INDICATES TYPE:<br>A - 4-GANG FLOOR BOX, CORROSION RESISTANT COATING FOR CONCRETE FLOORS (3" MIN. POUR DEPTH), (HUBBELL NO. CFB4G30CR, OAE)<br>B - 4-GANG FLOOR BOX FOR RAISED ACCESS FLOORS, (HUBBELL NO. AFB4G50, OAE)<br>C - FIRE RATED POKE-THROUGH FLOOR BOX FOR ELEVATED CONCRETE SLABS, 3" DIA. CORE (HUBBELL NO. PT7FSD, OAE)<br>D - 8" DIA., FIRE RATED POKE-THROUGH FLOOR BOX FOR ELEVATED CONCRETE* SLABS, (HUBBELL NO. S1R8PTFIT1, OAE)<br>E - FLUSH, ROUND SINGLE SERVICE FLOOR BOX FOR CONCRETE* FLOORS, UP TO 1" CONDUIT FEED (HUBBELL NO. B2506, OAE)<br>F - TOMBSTONE PEDESTAL FLOOR BOX, 1" CONDUIT FEED (HUBBELL NO. 6301, OAE)<br>*POKE-THROUGH FLOOR BOXES CAN ALSO BE USED FOR TILE, CARPET, OR WOOD FLOORS. | SURFACE MOUNTED RACEWAY |
| | RACEWAY CONCEALED IN WALL, FLOOR, OR CEILING IN FINISHED SPACES, EXPOSED IN UNFINISHED SPACES |
| | RACEWAY BELOW FLOOR OR BELOW GRADE |
| FLOOR BOX WITH ADDITIONAL C.O. FOR DATA. FURNISH (1) 1-1/4" DEDICATED CONDUIT FROM EACH DATA COMPARTMENT, COMPLETE WITH PULL STRINGS OVER TO AND UP WALL INTO ACCESSIBLE CEILING SPACE, UNO. | RACEWAY STUB-OUT WITH CAPPED END |
| | RACEWAY STUB-OUT WITH BUSHED END |
| | GROUNDING BUS |

# ELECTRICAL LOW VOLTAGE LEGEND

| FIRE ALARM SYSTEM | TELEPHONE/DATA SYSTEM |
|---|---|
| PS — SPRINKLER PRESSURE SWITCH | CO — CARBON MONOXIDE DETECTOR |
| FS — SPRINKLER FLOW SWITCH | D — DOOR HOLDER |
| TS — SPRINKLER TAMPER SWITCH | F — MANUAL STATION (MOUNT AT +48", UNO) |
| FSD — FIRE/SMOKE DAMPER | F — STROBE - WALL MOUNT (+90"), CEILING MOUNT |
| H — HEAT DETECTOR | HORN/STROBE - WALL MOUNT (+90"), CEILING MOUNT |
| SD X — SMOKE DETECTOR<br>"X" INDICATES TYPE:<br>BLANK - PHOTO-ELECTRIC SYSTEM DETECTOR<br>CO - 120V COMBINATION SMOKE/CARBON MONOXIDE DETECTOR W/ BATTERY BACKUP<br>D - DUCT SMOKE DETECTOR<br>LF - PROVIDE LOW-FREQUENCY SOUNDER BASE | LF — LOW-FREQUENCY TONE GENERATOR DEVICE - WALL MOUNT (+90"), CEILING MOUNT |
| | S — SPEAKER STROBE - WALL MOUNT (+90"), CEILING MOUNT |

# ABBREVIATIONS AND SYMBOLS GENERAL NOTES

A. THE ABBREVIATIONS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL ABBREVIATIONS APPEAR ON THIS PROJECT.
B. THE SYMBOLS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL SYMBOLS APPEAR ON THIS PROJECT.
C. ALL MOUNTING HEIGHTS ARE TO CENTER OF DEVICE ABOVE FINISHED FLOOR, UNLESS NOTED OTHERWISE. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS, MAKING ADJUSTMENTS AS REQUIRED TO AVOID INTERFERENCE WITH EQUIPMENT SUCH AS BASEBOARD FIN-TUBE, CABINET UNIT HEATERS, ETC. ARCHITECT/ENGINEER SHALL BE NOTIFIED OF ALL SUCH HEIGHT ADJUSTMENTS. MOUNTING HEIGHTS INDICATED ON ARCHITECTURAL WALL ELEVATIONS OR AS NOTED SPECIFICALLY ON THE DRAWINGS OR IN THE SPECIFICATIONS SHALL TAKE PRECEDENCE OVER MOUNTING HEIGHTS LISTED.

# ELECTRICAL PROJECT GENERAL NOTES

A. PRIOR TO BID CONTRACTOR SHALL VISIT THE SITE. NOT ALL WORK REQUIRED TO COMPLETE THE PROJECT IS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH ALL THE WORK REQUIRED TO COMPLETE THE PROJECT IN ADDITION TO THE LOCAL CONDITIONS AND INCLUDE SAID WORK IN THE BID.
B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL ELECTRICAL SERVICE WORK WITH UTILITY. CONTRACTING OFFICER PAYS ALL FEES, CONTRACTOR DOES ALL SCHEDULING AND COORDINATION OF WORK. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE ALL SCHEDULES ARE MET.
C. GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA 1, "STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING." THIS PUBLICATION IS AVAILABLE FROM NECA BY TELEPHONE AT 301-657-3110 OR ON-LINE AT WWW.NECANET.ORG.
D. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH MECHANICAL FOR PLENUM SPACES AND PROVIDE PLENUM RATED CABLES WHERE REQUIRED FOR LIGHTING CONTROL, DATA, FIRE ALARM AND ALL OTHER L.V. SYSTEMS NOT INSTALLED IN CONDUIT. VERIFY CONDUIT REQUIREMENTS ON DRAWINGS AND SPECIFICATIONS.
E. FIRE-RESISTANCE: PROVIDE A MINIMUM HORIZONTAL DISTANCE OF 24" BETWEEN OUTLET BOXES LOCATED ON OPPOSITE SIDES OF FIRE-RESISTANCE RATED WALLS. WHERE THIS IS NOT POSSIBLE INSTALL UL LISTED PUTTY PADS ON ALL OUTLET BOXES NOT MEETING THE 24" SEPARATION. PROVIDE A UL LISTED THROUGH -PENETRATION FIRESTOP FOR PENETRATIONS OF FIRE-RESISTANCE RATED ASSEMBLIES.
F. CONDUCTORS ARE SIZED PER THE 75 DEGREE C RATING COLUMN OF NEC TABLE 310.16. IF THE TERMINAL USED FOR A TERMINATION OF A PARTICULAR CONDUCTOR IS NOT MARKED, OR THE TERMINAL IS MARKED FOR 60 DEGREE C CONDUCTORS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EITHER ADJUST THE AMPACITY OF THE CONDUCTOR TO MATCH THE 60 DEGREE COLUMN OF TABLE 310.16, OR REPLACE THE TERMINAL WITH ONE RATED FOR AT LEAST 75 DEGREES C.
G. BASED ON ACTUAL HOMERUN LENGTHS REQUIRED IN THE FIELD, THE CONTRACTOR SHALL CALCULATE AND INCREASE THE WIRE SIZES AS REQUIRED TO LIMIT BRANCH CIRCUIT VOLTAGE DROP TO 3%. FOR 20A BRANCH CIRCUITS THE MINIMUM CONDUCTOR SIZES SHALL BE AS FOLLOWS: #10 AWG CU FOR RUNS BETWEEN 100 AND 200 LINEAR FEET, #8 AWG CU FOR RUNS BETWEEN 200 AND 325 LINEAR FEET, AND AS CALCULATED BY THE CONTRACTOR FOR CIRCUITS EXTENDING BEYOND 325 LINEAR FEET. IN ALL CASES WHERE WIRE SIZES INCREASE, THE CONTRACTOR SHALL PROVIDE LARGER CONDUITS AS REQUIRED.
H. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120V BRANCH CIRCUIT.

# ELECTRICAL PROJECT DEMO NOTES

A. DURING DEMOLITION, THE CONTRACTOR SHALL NOTE ALL EXISTING RACEWAY (BOTH SURFACE AND CONCEALED) TO THE EXTENT POSSIBLE. THESE RACEWAYS SHALL BE REUSED TO THE GREATEST EXTENT POSSIBLE TO INSURE A CLEAN FINISHED PRODUCT. WHERE PRACTICAL, AND ALLOWED PER CODE, FISHING THROUGH WALLS WITH MC CABLE IS PREFERRED TO SURFACE-MOUNTED CONDUIT.
B. CONTRACTOR SHALL REMOVE, TRANSPORT, AND LEGALLY DISPOSE OF LAMPS AND BALLASTS OFF-SITE. IT IS ASSUMED THAT THE BALLASTS DO NOT CONTAIN PCBs. THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER IMMEDIATELY IF IT IS SUSPECTED THAT BALLASTS CONTAIN PCBs.
C. ALL POWER INTERRUPTIONS SHALL BE COORDINATED WITH CONTRACTING OFFICER. ANY DISRUPTION OF WORKERS IN THE SPACE SHALL BE KEPT TO A MINIMUM AND BE COORDINATED WITH THE CONTRACTING OFFICER PRIOR TO WORK COMMENCING IN THAT SPACE.
D. CONTRACTOR SHALL EXTEND UNSWITCHED HOT LEG FROM EXISTING EMERGENCY FIXTURE LOCATION TO NEW EMERGENCY FIXTURES, AS NEEDED. SEE DEMO PLANS FOR AN APPROXIMATION OF EXISTING EMERGENCY FIXTURE LOCATIONS. FIELD VERIFY EXACT LOCATION PRIOR TO BID.
E. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ANY EXISTING CONDUIT OR FEEDER CIRCUITS THAT ARE INTENDED TO REMAIN THAT ARE SAW-CUT, OR OTHERWISE DAMAGED, AS PART OF THE DEMOLITION PROCESS. PROVISION FOR THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO: ALL NECESSARY CONDUIT AND CONDUCTORS, MOUNTING ACCESSORIES AND LABOR, TO RESTORE THE SYSTEM TO ITS INTENDED FUNCTION.
F. ELECTRICAL DRAWINGS SHOWING EXISTING BUILDING CONDITIONS, SUCH AS DEMOLITION DRAWINGS, EXISTING PANEL SCHEDULES, ETC ARE BASED ON RECORD DRAWINGS AND SITE VISITS. IF ACTUAL EXISTING CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, PLEASE NOTIFY ENGINEER.

# ELECTRICAL SHEET INDEX


| NUMBER | SHEET NAME |
|---|---|
| E0.1 | ELECTRICAL SYMBOLS AND ABBREVIATIONS |
| E0.2 | ELECTRICAL SPECIFICATIONS |
| E0.3 | ELECTRICAL SPECIFICATIONS |
| E0.4 | ELECTRICAL DETAILS |
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| E102 | ELECTRICAL BASEMENT PLAN - POWER AND SIGNAL |
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**BUILDING 24 BASEMENT REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ELECTRICAL SYMBOLS AND ABBREVIATIONS**

DATE: 07.14.2026

SHEET: **E0.1**

**100% CONSTRUCTION DOCUMENTS**

DATE STAMP: 7/15/2026 11:37:08 AM

**260010 - GENERAL REQUIREMENTS OF ELECTRICAL**

A. SUMMARY
1. THE REQUIREMENTS LISTED IN THIS SECTION ARE SUPPLEMENTAL TO THE DIVISION 01 GENERAL REQUIREMENTS.
2. IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL AND LOW-VOLTAGE CONTRACTORS TO EXAMINE AND REFER TO ALL ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, PLUMBING AND LANDSCAPE DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION CONDITIONS WHICH MAY AFFECT THE SCOPE OF ELECTRICAL, COMMUNICATIONS, ELECTRONIC SAFETY AND SECURITY WORK. INSPECT THE BUILDING SITE AND EXISTING FACILITIES FOR VERIFICATION OF PRESENT CONDITIONS. MAKE PROPER PROVISIONS FOR THESE CONDITIONS IN PERFORMANCE OF THE WORK AND COST THEREOF.
3. ELECTRICAL, COMMUNICATIONS, ELECTRONIC SAFETY AND SECURITY WORK FOR THIS PROJECT SHALL INCLUDE ALL ITEMS, ARTICLES, MATERIALS AND THE ASSOCIATED LABOR MENTIONED, SCHEDULES OR SHOWN IN THESE SPECIFICATIONS AND IN THE ACCOMPANYING DRAWINGS.
4. FURNISH AND INSTALL ALL EQUIPMENT, MATERIALS AND ANY REQUIRED INCIDENTAL ITEMS REQUIRED BY GOOD PRACTICE TO COMPLETE THE SYSTEMS DESCRIBED HEREIN.
5. REFER TO DIVISION 01 FOR ALL LISTED ALTERNATES AND PROVIDE SEPARATE PRICING AND WORK AS INDICATED IN DIVISION 01 AND CONTRACT DOCUMENTS.

B. DEFINITIONS - THROUGHOUT CONTRACT DOCUMENTS THESE WORDS AND PHRASES ARE USED:
1. CONTRACT DOCUMENTS – ALL DRAWINGS, SPECIFICATIONS, ADDENDA AND CHANGE ORDERS THAT DOCUMENT WORK TO BE DONE.
2. DEMOLITION – CAREFULLY DISCONNECT AND REMOVE ITEMS. ALL REASONABLE CAUTION SHALL BE TAKEN TO AVOID DAMAGING REMOVED EQUIPMENT AND TO RETAIN ITS OPERABILITY.
3. REMOVE BACK TO SOURCE - REMOVE ALL CONDUIT AND WIRE BACK TO PANELBOARD OR LAST LIVE DEVICE.
4. EQUIVALENT OR EQUAL - PRODUCT OF LIKE TYPE AND FUNCTION THAT COMPLIES WITH ALL APPLICABLE PROVISIONS OF DRAWINGS AND SPECIFICATIONS AND WHICH HAS BEEN APPROVED AS SUBSTITUTE FOR SPECIFIED ITEM.
5. FURNISH - PURCHASE MATERIAL AS SHOWN AND SPECIFIED, AND PLACE MATERIAL TO APPROVED LOCATION ON SITE OR ELSEWHERE AS NOTED OR AGREED UPON.
6. INSTALL - SET IN PLACE AND CONNECT, READY FOR USE AND IN COMPLETE AND PROPERLY OPERATING FINISHED CONDITION.
7. PROVIDE - FURNISH AND INSTALL WITH ALL PRODUCTS, LABOR, SUB-CONTRACTS, AND APPURTENANCES REQUIRED FOR A COMPLETE AND PROPERLY OPERATING, FINISHED CONDITION.
8. ROUGH-IN - PROVIDE CONDUIT RACEWAY SYSTEM WITH JUNCTION BOXES, FITTINGS, STRAPS, BUSHINGS, ETC., FOR FUTURE INSTALLATION OF WIRING, DEVICES, DISCONNECTS AND BREAKERS. PROVISION SHALL BE MADE IN PANELBOARD (HARDWARE, ETC.) FOR FUTURE INSTALLATION OF BREAKERS.
9. SERVICEABLE - ARRANGED SO THAT COMPONENT OR PRODUCT IN QUESTION MAY BE PROPERLY REMOVED AND REPLACED WITHOUT DISASSEMBLY, DESTRUCTION OR DAMAGE TO SURROUNDING INSTALLATION.

C. CODES, STANDARDS AND REGULATIONS
1. CODES - PERFORM ALL WORK IN STRICT ACCORDANCE WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES, INCLUDING, BUT NOT LIMITED TO LATEST LEGALLY ENACTED EDITIONS OF FOLLOWING CODES:
   a. NFPA 70, NATIONAL ELECTRIC CODE – NEC
   b. NFPA 72, NATIONAL FIRE ALARM CODE
   c. ANSI-C2, NATIONAL ELECTRICAL SAFETY CODE – NESC
   d. INTERNATIONAL BUILDING CODE – IBC
   e. INTERNATIONAL FIRE CODE – IFC
   f. INTERNATIONAL ENERGY CONSERVATION CODE – IECC
2. STANDARDS - REFERENCE TO STANDARDS INFERS THAT INSTALLATION, EQUIPMENT AND MATERIAL SHALL BE WITHIN LIMITS FOR WHICH IT WAS DESIGNED, TESTED AND APPROVED, IN CONFORMANCE WITH CURRENT PUBLICATIONS AND STANDARDS OF FOLLOWING ORGANIZATIONS:
   a. AMERICAN NATIONAL STANDARDS INSTITUTE – ANSI
   b. AMERICAN SOCIETY FOR TESTING AND MATERIALS – ASTM
   c. AMERICAN SOCIETY OF HEATING REFRIGERATING AND AIR CONDITIONING ENGINEERS – ASHRAE (STANDARD 90-75)
   d. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS – IEEE
   e. INSULATED CABLE ENGINEERS ASSOCIATION – ICEA
   f. NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION – NECA
   g. NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION – NEMA
   h. NATIONAL FIRE PROTECTION ASSOCIATION – NFPA
   i. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION – OSHA
   j. UNDERWRITERS' LABORATORIES, INC. – UL
   k. RULES AND REGULATIONS OF THE STATE/LOCAL FIRE MARSHAL
   l. STANDARDS AND REQUIREMENT OF THE SERVING UTILITIES
   m. STATE AND LOCAL ORDINANCES
3. REGULATIONS - DESIGN HAS BEEN PERFORMED IN ACCORDANCE WITH APPLICABLE REGULATIONS AND GUIDELINES NOTED BELOW. CONTRACTOR SHALL CAREFULLY APPLY THESE REGULATIONS AND BRING ANY DISCREPANCIES TO IMMEDIATE ATTENTION OF ARCHITECT/ENGINEER.
   a. AMERICANS WITH DISABILITIES ACT – ADA
   b. **ARCHITECTURAL BARRIERS ACT – ABA**

D. FEES AND PERMITS
1. ELECTRICAL CONTRACTOR SHALL PAY FOR ALL PERMITS OR FEES IN CONNECTION WITH ELECTRICAL WORK. FEES SHALL INCLUDE ANY OR ALL USER FEES, GOVERNMENT FEES, SYSTEM DEVELOPMENT FEES, CONNECTION FEES OR OTHER FEES THAT ARE REQUIRED TO BE PAID BEFORE SYSTEMS CAN BE CONNECTED OR USED.
2. SCHEDULE ALL REQUIRED ELECTRICAL INSPECTIONS WITH LOCAL ELECTRICAL INSPECTOR. NOTIFY ENGINEER OF ALL ITEMS OF DISCREPANCY NOTED BY ELECTRICAL INSPECTOR IF THOSE ITEMS AFFECT COST OR FUNCTION OF SYSTEM, OR IF THEY CONFLICT WITH ELECTRICAL DRAWINGS AND SPECIFICATIONS.
3. ALL UTILITY COST AND FEES FROM THE UTILITY WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTING OFFICER. CONTRACTOR TO COORDINATE ALL UTILITY REQUIREMENTS AND RESPONSIBILITIES WITH SERVING UTILITY FOR A COMPLETE SCOPE OF WORK PRIOR TO BID.
4. DELIVER ALL INSPECTION CERTIFICATES TO ARCHITECT/ENGINEER PRIOR TO FINAL ACCEPTANCE OF WORK.

E. INTENT OF SPECIFICATIONS AND DRAWINGS
1. PLANS AND SPECIFICATIONS ARE INTENDED TO RESULT IN COMPLETE ELECTRICAL INSTALLATION IN FULL COMPLIANCE WITH ALL APPLICABLE CODES, STANDARDS AND ORDINANCES.
2. PLANS AND SPECIFICATIONS ARE TO SUPPLEMENT EACH OTHER AND ANY DETAILS CONTAINED IN ONE SHALL BE INCLUDED AS IF CONTAINED IN BOTH.
3. ELECTRICAL DRAWINGS SHALL SERVE AS WORKING DRAWINGS, BUT ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE IF ANY DIMENSIONAL DISCREPANCIES EXIST.
4. DRAWINGS ARE PARTLY DIAGRAMMATIC AND DO NOT SHOW ROUTING OF CONDUITS, EXACT LOCATION OF PRODUCTS, OR INSTALLATION FEATURES IN EXACT DETAIL. LOCATIONS OF DEVICES, FIXTURES AND EQUIPMENT ARE APPROXIMATE UNLESS DIMENSIONED.
5. RISER DIAGRAMS AND CONTROL SCHEMATICS ARE NOT TO SCALE AND DO NOT SHOW PHYSICAL ARRANGEMENT OF EQUIPMENT. DO NOT USE RISER DIAGRAMS OR SCHEMATICS TO OBTAIN LINEAL CONDUIT AND CABLING DISTANCES.
6. ITEMS ARE SHOWN ON DRAWINGS IN LOCATIONS TO MINIMIZE INTERFERENCE WITH OTHER EQUIPMENT, STRUCTURAL MEMBERS, ETC. EXACT FINISH LOCATIONS ARE NOT INDICATED, HOWEVER, AND ALL WORK SHALL BE DONE TO AVOID INTERFERENCE, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR.
7. IN EVENT THAT DISCREPANCIES OF ANY KIND EXIST OR REQUIRED ITEMS/DETAILS HAVE BEEN OMITTED, CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER IN WRITING OF SUCH DISCREPANCY OR OMISSION AT LEAST TEN DAYS PRIOR TO BID DATE. FAILURE TO DO SO SHALL BE CONSTRUED AS WILLINGNESS OF CONTRACTOR TO SUPPLY ALL NECESSARY MATERIALS AND LABOR REQUIRED FOR PROPER COMPLETION OF WORK.

F. CONTRACTOR'S RESPONSIBILITY - CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF COMPLETE AND FUNCTIONAL PIECE OF WORK IN ACCORDANCE WITH TRUE INTENT OF CONTRACT DOCUMENTS. PROVIDE ALL INCIDENTAL ITEMS REQUIRED FOR COMPLETE INSTALLATION AND SATISFACTORY OPERATION OF ALL EQUIPMENT, WHETHER OR NOT SPECIFICALLY NOTED IN CONTRACT DOCUMENTS.
1. QUALIFICATIONS
   a. CONTRACTOR SHALL EMPLOY ON THIS PROJECT, CAPABLE, EXPERIENCED AND RELIABLE FOREMAN AND SUCH SKILLED WORKMEN AS MAY BE REQUIRED FOR VARIOUS CLASSES OF WORK TO BE PERFORMED.
   b. WHERE SPECIAL SKILLS AND CERTIFICATION ARE REQUIRED, CONTRACTOR SHALL ENSURE THAT WORK IS PERFORMED BY INDIVIDUALS WITH REQUIRED EXPERIENCE, SKILL AND CERTIFICATION.
   c. IF, IN ENGINEER'S OPINION, CONTRACTOR'S EMPLOYEES DO NOT POSSESS NECESSARY QUALIFICATIONS TO PERFORM SPECIALTY WORK, CONTRACTOR WILL BE REQUIRED TO OBTAIN SERVICES OF WORKMEN WHO ARE APPROVED BY MANUFACTURER AND CERTIFIED BY APPLICABLE AGENCY OR GROUP. THESE WORKMEN, IF REQUIRED, SHALL BE PROVIDED AT NO ADDITIONAL EXPENSE.
   d. REFER TO OTHER SPECIFICATION SECTIONS FOR ADDITIONAL REQUIRED CONTRACTOR QUALIFICATIONS AND CERTIFICATION.
2. LICENSING AND CERTIFICATION - ALL DIVISION 26 WORK SHALL BE ACCOMPLISHED BY ELECTRICIANS, LICENSED BY STATE IN WHICH WORK IS BEING DONE, CERTIFIED AS REQUIRED, AND SKILLED IN THEIR CRAFT. ELECTRICIAN MAY ELECT TO HIRE SUBCONTRACTORS FOR PORTIONS OF WORK (SUCH AS SYSTEMS DESCRIBED IN DIVISIONS 27 AND 28) WHO ARE NOT LICENSED ELECTRICIANS, BUT HAVE REQUIRED CERTIFICATES AND ARE LICENSED IN THEIR DISCIPLINE BY STATE IN WHICH WORK IS BEING DONE.
3. COORDINATION
   a. CONTRACTOR SHALL CONSULT ALL CONTRACT DOCUMENTS, SHOP DRAWINGS OF OTHER TRADES, AND ACTUAL BUILDING DIMENSIONS TO PREDETERMINE THAT HIS WORK AND EQUIPMENT WILL FIT AS PLANNED. DO NOT SCALE DRAWINGS FOR FABRICATION. NO EXTRA PAYMENT WILL BE ISSUED FOR MATERIALS OR ITEMS WHICH DO NOT FIT BECAUSE OF CONTRACTOR'S FAILURE TO VERIFY AS-BUILT BUILDING DIMENSIONS.
   b. CONTRACTOR SHALL CHECK LOCATION OF FIXTURES, OUTLETS, EQUIPMENT, CONDUIT, ETC., TO DETERMINE THEY CLEAR ALL OPENINGS, STRUCTURAL MEMBERS, PIPING, DUCTS AND MISCELLANEOUS EQUIPMENT HAVING FIXED LOCATIONS.
   c. CHANGES IN LOCATION OF ELECTRICAL WORK, NECESSARY DUE TO OBSTACLES OR INSTALLATION OF OTHER TRADES SHOWN ON CONTRACT DOCUMENTS, SHALL BE MADE BY ELECTRICAL CONTRACTOR AT NO EXTRA COST.
   d. CONTRACTOR SHALL COORDINATE WITH PLUMBING AND MECHANICAL CONTRACTORS TO AVOID INSTALLATION OF PIPING AND DUCTWORK ABOVE OR BELOW PANELBOARDS IN VIOLATION OF NATIONAL ELECTRICAL CODE.
   e. LAY OUT ALL WORK IN ADVANCE AND AVOID CONFLICT WITH OTHER WORK IN PROGRESS. PHYSICAL DIMENSIONS SHALL BE DETERMINED FROM ARCHITECTURAL AND STRUCTURAL PLANS. VERIFY LOCATIONS FOR JUNCTION BOXES, DISCONNECT SWITCHES, STUB-UPS, ETC., FOR CONNECTION TO EQUIPMENT FURNISHED BY OTHERS, OR IN OTHER DIVISIONS OF THIS WORK.
   f. CONTRACTOR SHALL COORDINATE AND PLAN WORK TO PROCEED WITH WORK OF OTHER TRADES.
   g. CONTRACTOR SHALL INFORM GENERAL CONTRACTOR OF ALL REQUIRED OPENINGS IN BUILDING STRUCTURE FOR INSTALLATION OF ELECTRICAL EQUIPMENT.
   h. CONTRACTOR SHALL CHECK DIMENSIONS OF ALL ELECTRICAL EQUIPMENT INSTALLED, PROVIDED BY HIMSELF OR BY OTHERS, SO CORRECT CLEARANCES AND CONNECTIONS CAN BE MADE.
   i. CONSULTING ALL CONTRACT DOCUMENTS AND SHOP DRAWINGS OF OTHER TRADES, CONTRACTOR SHALL DETERMINE WHERE ELECTRICAL JUNCTION BOXES AND EQUIPMENT CAN BE INSTALLED TO MAINTAIN PROPER ACCESSIBILITY. WHERE ACCESSIBILITY CANNOT BE MAINTAINED BY JUDICIOUS PLACEMENT OF BOXES, ELECTRICAL CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE, FABRICATE, INSTALL, ADJUST, PAINT, ETC. ACCESS DOORS THROUGH NON-ACCESSIBLE FLOOR, WALL, AND CEILING FINISHES TO ALLOW ACCESS. PROVIDE ELECTRICAL JUNCTION AND PULL BOXES, ELECTRICAL DEVICES, ELECTRICAL EQUIPMENT, ETC. AT ALL REQUIRED LOCATIONS WHETHER SHOWN OR NOT SHOWN ON PLANS. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR DETERMINING SIZE AND LOCATION OF THE ACCESS DOORS. REPORT ANY CONFLICTS TO ARCHITECT/ENGINEER.

G. REVIEW - ALL WORK AND MATERIAL IS SUBJECT TO REVIEW AT ANY TIME BY THE ARCHITECT/ENGINEER OR HIS REPRESENTATIVE. IF THE ARCHITECT/ENGINEER OR HIS REPRESENTATIVE FINDS MATERIAL THAT DOES NOT CONFORM TO THESE SPECIFICATIONS OR THAT IS NOT PROPERLY INSTALLED OR FINISHED, CORRECT THE DEFICIENCIES IN A MANNER SATISFACTORY TO THE ARCHITECT/ENGINEER AT THE CONTRACTOR'S EXPENSE.

H. TEMPORARY FACILITIES
1. ELECTRICAL UTILITIES
   a. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY ELECTRICAL POWER TO THE CONSTRUCTION SITE AS DIRECTED BY THE GENERAL CONTRACTOR. NO CONNECTIONS TO THE OWNER'S SYSTEM SHALL BE ALLOWED WITHOUT CONTRACTING OFFICER'S WRITTEN APPROVAL. PROVIDE A SEPARATE UTILITY SERVICE AS REQUIRED.
   b. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY ELECTRICAL POWER TO JOB TRAILERS AS DIRECTED BY THE GENERAL CONTRACTOR.
   c. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY COMMUNICATIONS TO JOB TRAILERS AS DIRECTED BY THE GENERAL CONTRACTOR.
   d. ALL COSTS ASSOCIATED WITH TEMPORARY POWER, COMMUNICATIONS AND UTILITY COST SHALL BE PAID BY TO THE GENERAL CONTRACTOR.
   e. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION LIGHTING AS DIRECTED BY THE GENERAL CONTRACTOR TO PROVIDE A SAFE WORKING ENVIRONMENT.
   f. ALL TEMPORARY SERVICES ARE TO BE REMOVED IN THEIR ENTIRETY PRIOR TO OCCUPANCY AS DIRECTED BY THE GENERAL CONTRACTOR.
2. OFFICES
   a. THE ELECTRICAL CONTRACTOR MUST HAVE THE PERMISSION OF THE CONTRACTING OFFICER AND GENERAL CONTRACTOR OR CONSTRUCTION MANAGER TO INSTALL A TEMPORARY OFFICE/JOB TRAILER ON THE PROJECT SITE.
   b. CONTRACTOR SHALL COMPLETELY REMOVE HIS TEMPORARY INSTALLATIONS WHEN NO LONGER NEEDED AND THE PREMISES SHALL BE COMPLETELY CLEAN, DISINFECTED, PATCHED, AND REFINISHED TO MATCH ADJACENT AREAS.
3. LADDERS AND SCAFFOLDS - THE ELECTRICAL AND LOW-VOLTAGE CONTRACTORS SHALL PROVIDE THEIR OWN LADDERS, SCAFFOLDS, ETC. OF SUBSTANTIAL CONSTRUCTION FOR ACCESS TO THEIR WORK IN VARIOUS PORTIONS OF THE BUILDING AS MAY BE REQUIRED. WHEN NO LONGER NEEDED, THEY SHALL BE REMOVED BY THE CONTRACTOR.
4. PROTECTION DEVICES - THE ELECTRICAL AND LOW-VOLTAGE CONTRACTORS SHALL PROVIDE AND MAINTAIN THEIR OWN NECESSARY BARRICADES, FENCES, SIGNAL LIGHTS, ETC., REQUIRED BY ALL GOVERNING AUTHORITIES OR SHOWN ON THE DRAWINGS. WHEN NO LONGER NEEDED, THEY SHALL BE REMOVED BY THE CONTRACTOR.
5. TEMPORARY FIRE PROTECTION - THE ELECTRICAL AND LOW-VOLTAGE CONTRACTORS SHALL PROVIDE ALL NECESSARY FIRST AID HAND FIRE EXTINGUISHERS FOR CLASS A, B, C AND SPECIAL HAZARDS AS MAY EXIST IN HIS OWN WORK AREA ONLY IN ACCORDANCE WITH GOOD AND SAFE PRACTICE AND AS REQUIRED BY JURISDICTIONAL SAFETY AUTHORITY.

I. RECORD DOCUMENTS (AS-BUILT DRAWINGS)
1. SEE REQUIREMENTS REGARDING RECORD DOCUMENTS IN GENERAL DIVISION AND DIVISION 1.
2. AT BEGINNING OF WORK, CONTRACTOR SHALL SET ASIDE ONE COMPLETE SET OF DRAWINGS WHICH SHALL BE MAINTAINED AS COMPLETE "AS-BUILT" SET. DRAWINGS SHALL BE UPDATED DAILY IN NEAT AND LEGIBLE MANNER AND SHALL NOT BE USED FOR ANY OTHER PURPOSE. DRAWINGS, SPECIFICATION, ADDENDA, CHANGE ORDERS, ETC. SHALL BE MAINTAINED AT JOB SITE AND AVAILABLE FOR REVIEW AT ANY TIME.
3. SHOW DIMENSIONED LOCATION AND ROUTING OF ALL ELECTRICAL WORK THAT WILL BECOME PERMANENTLY CONCEALED, CAST IN CONCRETE OR BURIED UNDERGROUND.
4. SHOW COMPLETE ROUTING AND SIZING OF ANY SIGNIFICANT REVISIONS TO SYSTEMS SHOWN.
5. SHOW PROVISIONS FOR FUTURE CONNECTION, REFERENCED TO BUILDING LINES OR APPROVED BENCH MARKS.
6. PROVIDE WIRING DIAGRAMS FOR ALL INDIVIDUAL COMMUNICATIONS SYSTEMS AS INSTALLED. IDENTIFY ALL COMPONENTS AND SHOW ALL WIRE AND TERMINAL NUMBERS AND CONNECTIONS.
7. AT COMPLETION OF PROJECT, DELIVER DRAWINGS TO ENGINEER FOR REVIEW.

J. WARRANTY
1. THE CONTRACTOR SHALL GUARANTEE THAT ALL MATERIALS AND LABOR INSTALLED ARE NEW AND OF FIRST QUALITY AND THAT ANY MATERIAL OR LABOR FOUND DEFECTIVE SHALL BE REPLACED WITHOUT COST TO THE OWNER WITHIN ONE (1) YEAR AFTER SUBSTANTIAL COMPLETION OF THE CONTRACT OR ONE (1) FULL SEASON OF HEATING AND COOLING OPERATION, WHICHEVER IS THE GREATER. THE GUARANTEE SHALL LIST THE DATE OF THE BEGINNING OF THE ONE (1) YEAR PERIOD, WHICH SHALL BE THE DATE THAT THE SUBSTANTIAL COMPLETION CERTIFICATE IS ISSUED.
2. ANY DAMAGE TO THE BUILDING, CAUSED BY DEFECTIVE WORK OR MATERIAL OF THE CONTRACTOR WITHIN THE ABOVE-MENTIONED PERIOD, SHALL BE SATISFACTORILY REPAIRED WITHOUT COST TO THE CONTRACTING OFFICER.
3. THE GUARANTEE DOES NOT INCLUDE MAINTENANCE OF EQUIPMENT. THE CONTRACTING OFFICER SHALL ACCEPT FULL RESPONSIBILITY FOR PROPER OPERATION AND MAINTENANCE OF EQUIPMENT IMMEDIATELY UPON SUBSTANTIAL COMPLETION AND OCCUPANCY OF THE BUILDING.
4. FINAL ACCEPTANCE BY THE CONTRACTING OFFICER WILL NOT OCCUR UNTIL ALL OPERATING INSTRUCTIONS ARE MOUNTED IN EQUIPMENT ROOMS AND OPERATING PERSONNEL THOROUGHLY INDOCTRINATED IN THE OPERATION OF ALL ELECTRICAL EQUIPMENT BY THE CONTRACTOR.
5. NO EQUIPMENT INSTALLED AS PART OF THIS PROJECT SHALL BE USED FOR TEMPORARY HEAT DURING CONSTRUCTION.

K. MATERIALS AND EQUIPMENT
1. MANUFACTURERS TRADE NAMES AND CATALOG NUMBERS LISTED ARE INTENDED TO INDICATE THE QUALITY OF EQUIPMENT OR MATERIALS DESIRED. MANUFACTURERS NOT LISTED IN THE SPECIFICATION WILL BE CONSIDERED SUBSTITUTIONS AND MUST HAVE PRIOR APPROVAL.
2. SEE DIVISION 01 FOR SUBSTITUTIONS PROCEDURES. REQUESTS FOR SUBSTITUTION ARE TO BE SUBMITTED SUFFICIENTLY AHEAD OF THE DEADLINE, TO GIVE AMPLE TIME FOR EXAMINATION. PRIOR APPROVAL REQUEST FOR SUBSTITUTION MUST INDICATE THE SPECIFIC ITEM OR ITEMS TO BE FURNISHED IN LIEU OF THOSE SCHEDULED, TOGETHER WITH COMPLETE TECHNICAL AND COMPARATIVE DATA ON SCHEDULED ITEMS AND ITEMS PROPOSED FOR SUBSTITUTION.
3. IF THE ENGINEER APPROVES ANY PROPOSED SUBSTITUTION, THE APPROVED PRODUCT WILL BE LISTED IN AN ADDENDUM. BIDDERS SHALL NOT RELY ON APPROVALS MADE IN ANY OTHER MANNER.
4. ELECTRICAL EQUIPMENT MAY BE INSTALLED WITH MANUFACTURER'S STANDARD FINISH AND COLOR EXCEPT WHERE SPECIFIC COLOR, FINISH OR CHOICE IS INDICATED. IF THE MANUFACTURER HAS NO STANDARD FINISH, EQUIPMENT SHALL HAVE A PRIME COAT AND TWO FINISH COATS OF GRAY ENAMEL.
5. HIGH ALTITUDE - VERIFY CAPACITY OF ALL EQUIPMENT IS DERATED, SIZED AND MANUFACTURED TO PERFORM AT THE ELEVATION OF THE PROJECT SITE. IF NOT SPECIFICALLY INDICATED IN THE EQUIPMENT SCHEDULE OR IN THE SPECIFICATIONS PROVIDE ALL REQUIRED ACCESSORIES AND EQUIPMENT FOR PROPER OPERATION AT ELEVATION OF THE PROJECT SITE.
6. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR MATERIALS AND EQUIPMENT INSTALLED UNDER THIS CONTRACT. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE PROTECTION OF MATERIALS AND EQUIPMENT OF OTHERS FROM DAMAGE AS A RESULT OF HIS WORK.
7. MANUFACTURED MATERIAL AND EQUIPMENT SHALL BE APPLIED, INSTALLED, CONNECTED, ERECTED, USED, CLEANED AND CONDITIONED AS DIRECTED BY MANUFACTURER UNLESS HEREIN SPECIFIED TO THE CONTRARY.
8. THIS CONTRACTOR SHALL MAKE THE REQUIRED ARRANGEMENT WITH GENERAL CONTRACTOR FOR PROTECTION MANAGEMENT FOR THE INTRODUCTION INTO THE BUILDING OF EQUIPMENT TOO LARGE TO PASS THROUGH FINISHED OPENINGS.
9. STORE MATERIALS AND EQUIPMENT INDOORS AT THE JOB SITE OR, IF THIS IS NOT POSSIBLE, STORE ON RAISED PLATFORMS AND PROTECT FROM THE WEATHER BY MEANS OF WATERPROOF COVERS. COVERINGS SHALL PERMIT CIRCULATION OF AIR AROUND THE MATERIALS TO PREVENT CONDENSATION OF MOISTURE. SCREEN OR CAP OPENINGS IN EQUIPMENT TO PREVENT THE ENTRY OF VERMIN.

L. SUBSTITUTION OF MATERIALS - WHERE SUBSTITUTED EQUIPMENT REQUIRES STRUCTURAL, ARCHITECTURAL, MECHANICAL, PLUMBING OR ELECTRICAL WORK THAT DIFFERS FROM BASIC DESIGN, COST OF ALL CHANGES, INCLUDING RE-DESIGN, SHALL BE RESPONSIBILITY OF CONTRACTOR USING SUBSTITUTION.
1. APPROVED MANUFACTURERS
   a. IN GENERAL, ONE PARTICULAR MANUFACTURER AND PART NUMBER OR SERIES IS LISTED TO DESCRIBE EQUIPMENT. EQUIVALENT EQUIPMENT OF OTHER MANUFACTURERS LISTED FOR THAT ITEM MAY BE SUBSTITUTED WITHOUT PRIOR APPROVAL. IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ITEM USED FOR BIDDING PURPOSES IS TRULY EQUIVALENT TO THAT SPECIFIED. IF IT IS NOT EQUIVALENT, IT WILL BE REJECTED AT SHOP DRAWING REVIEW AND CONTRACTOR SHALL SUPPLY SPECIFIED ITEM AT HIS OWN COST.
   b. IT IS UNDERSTOOD THAT MANUFACTURERS LISTED MAY NOT ACTUALLY HAVE EQUIVALENT PRODUCT TO THAT SPECIFIED. IF CONTRACTOR/DISTRIBUTOR HAS ANY QUESTIONS REGARDING DESIRED PRODUCT CHARACTERISTICS AND SUITABILITY OF PROPOSED SUBSTITUTION, HE IS ENCOURAGED TO SUBMIT FOR PRIOR APPROVAL. ALSO, ANY MANUFACTURER NOT LISTED SHALL BE SUBMITTED FOR PRIOR APPROVAL.
2. PRIOR APPROVALS
   a. MANUFACTURERS NOT LISTED IN SPECIFICATION OR ON SCHEDULE FOR A PARTICULAR ITEM ARE OPEN FOR SUBSTITUTION PRIOR TO BID OPENING ONLY.
   b. MANUFACTURERS DESIRING APPROVAL SHALL SUBMIT CATALOG CUTS THAT DEFINE QUALITY OF PRODUCT AND ABILITY TO PERFORM AS SPECIFIED. IT IS UNDERSTOOD THAT NO TWO MANUFACTURES USE IDENTICAL METHODS OR MAKE IDENTICAL PRODUCTS. ANY AND ALL DEVIATIONS FROM THAT SPECIFIED SHALL BE CLEARLY NOTED.
   c. SUBMITTALS SHALL ARRIVE AT ENGINEER AT LEAST TEN (10) DAYS PRIOR TO BID OPENING. ALL APPROVALS WILL BE LISTED IN LAST ADDENDUM AS BEING APPROVED TO BID. ITEMS SUBSTITUTED, BUT NOT LISTED IN CONTRACT DOCUMENTS, WILL NOT BE CONSIDERED IF SUBMITTED ON SHOP DRAWINGS.
   d. APPROVAL OF SUBSTITUTE EQUIPMENT IS ON BASIS OF QUALITY ONLY. MATERIALS SUPPLIER SHALL BE RESPONSIBLE FOR HIS QUOTATION REFLECTING PROPER SELECTION OF HIS PARTICULAR EQUIPMENT WITH REGARD TO PROPER CAPACITIES, PHYSICAL DIMENSIONS, REQUIREMENTS, INTENDED FUNCTION, FINISH, COLOR, ETC. ENGINEER WILL NOT GIVE APPROVAL TO SPECIFIC MODEL NUMBERS OR CHECK CAPACITIES, DIMENSIONS, OR REQUIREMENTS. EVALUATION WILL BE ON BASIS OF QUALITY AND EQUALITY TO SPECIFIED ITEMS.
   e. PRIOR APPROVAL SHALL BE OBTAINED FROM ENGINEER AND NO OTHER ENTITY (CONTRACTOR, CONTRACTING OFFICER, ETC.) IS AUTHORIZED TO GIVE SUCH APPROVAL.
3. SAMPLES
   a. WHERE, IN ENGINEER/ARCHITECT'S OPINION, PRODUCT SAMPLE IS REQUIRED IN ORDER TO DETERMINE APPEARANCE, QUALITY, WORKMANSHIP OR OPERATION, CONTRACTOR SHALL SUBMIT ACTUAL PRODUCTION SAMPLES OF ITEM IN QUESTION.
   b. SAMPLES WILL BE RETURNED TO CONTRACTOR. APPROVED SAMPLES MAY BE USED.
   c. ALL COSTS INCURRED IN PROVIDING AND RETURNING SAMPLES WILL BE CONTRACTOR'S RESPONSIBILITY.

M. PRODUCT AND SYSTEM SUBMITTALS
1. SUBMITTALS WILL BE REQUIRED FOR EACH PIECE OF EQUIPMENT, MATERIAL OR PRODUCT UTILIZED IN THE PROJECT. ALL SUBMITTAL SHALL BE SUBMITTED, REVIEWED AND ALL DISCREPANCIES ADDRESSED PRIOR TO ORDERING EQUIPMENT OR STARTING WORK. ANY EQUIPMENT ORDERED WITHOUT HAVING FIRST COMPLETED THE SUBMITTAL PROCESS IS DONE AT THE RISK OF THE CONTRACTOR. ANY WORK PERFORMED PRIOR TO COMPLETING THE SUBMITTAL PROCESS IS DONE AT THE RISK OF THE CONTRACTOR.
2. SUBMITTAL DEFINITIONS
   a. PRODUCT DATA: PROVIDE MANUFACTURERS CUT SHEETS THAT INCLUDE GENERAL PRODUCT INFORMATION INCLUDING BUT NOT LIMITED TO: MODEL NUMBER, PHYSICAL DATA, NOMINAL CAPACITIES, ROUGH-IN REQUIREMENTS.
   b. PERFORMANCE DATA: PROVIDE DETAILED PERFORMANCE AND CAPACITIES BASED ON PROJECT SPECIFIC REQUIREMENTS INCLUDING BUT NOT LIMITED TO: VOLTAGE, PHASE, AMPERAGE, OVERCURRENT PROTECTION, CONDUCTOR SIZE, CONDUCTOR MATERIAL, CONDUIT SIZE, COLOR TEMPERATURE, COLOR RENDERING INDEX, LIFE EXPECTANCE, EFFICACY, EFFICIENCY, IP RATINGS, LIGHT DISTRIBUTION TYPES AND LIGHTING CONTROL.
   c. SHOP DRAWINGS: PROVIDE DETAILED DRAWINGS OF THE EQUIPMENT SHOWING OVERALL DIMENSIONS, LOCATION OF ELECTRICAL CONNECTION, LOCATION OF ANCHORAGE POINTS, LOCATION OF ELECTRICAL AND CONTROL PANELS, AND ALL OPERATING, SERVICE AND MAINTENANCE CLEARANCES.
   d. DELEGATED DESIGN: PROVIDE DETAILED DRAWINGS PREPARED AND STAMPED BY A REGISTERED PROFESSIONAL ENGINEER THAT DETAIL PERTINENT DESIGN CRITERIA, THE MATERIALS AND PRODUCTS TO BE INSTALLED AND THE REQUIRED INSTALLATION LOCATIONS.
   e. WIRING DIAGRAM: PROVIDE DIAGRAMS THAT IDENTIFY AND DETAIL REQUIRED FIELD WIRING.
   f. COLOR CHART: PROVIDE A PHYSICAL COLOR CHART OF MATERIAL SAMPLES REQUIRED FOR SELECTION OF EQUIPMENT COLORS.
   g. SUSTAINABILITY COMPLIANCE: PROVIDE LITERATURE THAT INDICATED A PRODUCTS COMPLIANCE WITH LEED OR GREEN GLOBES. SEE DIVISION 01 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
3. SUBMITTAL FORMATS
   a. INCLUDE THE FOLLOWING INFORMATION WITH EACH SUBMITTAL:
      - PROJECT NAME
      - SUBMITTAL DATE
      - NAME OF ARCHITECT
      - NAME OF ENGINEER
      - NAME OF GENERAL CONTRACTOR OR CONSTRUCTION MANAGER
      - NAME OF SUB-CONTRACTOR
      - NAME OF FIRM OR ENTITY THAT PREPARED THE SUBMITTAL
      - UNIQUE SUBMITTAL NUMBER
      - TYPE OF SUBMITTAL
      - SPECIFICATION SECTION
      - NAME OR MARK OF EQUIPMENT OR MATERIAL AND DETAIL OR DRAWINGS REFERENCE.
   b. ALL SUBMITTALS WITH THE EXCEPTION OF COLOR CHARTS OR MATERIAL SAMPLES SHALL BE ELECTRONICALLY T

**260505 - SELECTIVE DEMOLITION OF ELECTRICAL SYSTEMS**

A. NOT ALL REMOVAL AND REVISION WORK REQUIRED AS PART OF THE DEMOLITION WORK IS SHOWN ON THE PLANS. THE PLANS ARE INTENDED TO INDICATE AREAS WHERE DEMOLITION WILL OCCUR AND TO ESTABLISH THE INTENT OF THE DEMOLITION WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ALL EXISTING ELECTRICAL RACEWAYS, WIRES, DEVICES AND EQUIPMENT THAT FALL WITHIN THE AREA AFFECTED BY DEMOLITION OF THE STRUCTURE.
B. THE CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH WORK AND LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. USING ORIGINAL DESIGN DRAWINGS AND WALK-THROUGH INSPECTIONS, A CONCERTED EFFORT WAS MADE TO PLACE PERTINENT INFORMATION ON THE CONTRACT DRAWINGS. HOWEVER, DUE TO THE NATURE OF DEMO/REMODEL WORK, THE CONTRACTOR MUST BEAR IN MIND THAT UNFORESEEN CONDITIONS MAY EXIST, AND SHALL THOROUGHLY INSPECT THE WORK AREA PRIOR TO HIS BID. THE CONTRACTOR SHALL INCLUDE IN HIS BID ANY/ALL INCIDENTAL ITEMS WHICH MAY BE REQUIRED TO PROVIDE COMPLETE DEMOLITION AND REWORK ASSOCIATED SYSTEMS IN ADJACENT AREAS WHERE NO DEMOLITION IS OCCURRING.
C. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS AND FOLLOW THE SAFE WORKING PRACTICE REQUIREMENTS OF NFPA 70E.
D. INVENTORY AND RECORD, BY USE OF PRECONSTRUCTION PHOTOGRAPHS OR VIDEO, THE CONDITION OF ITEMS TO BE REMOVED AND SALVAGED. PROVIDE PHOTOGRAPHS OR VIDEO OF CONDITIONS THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY SALVAGE OPERATIONS.
E. MAKE PROVISIONS TO MAINTAIN EXISTING ELECTRICAL SERVICE ENERGIZED UNTIL NEW SYSTEM IS COMPLETE AND READY FOR USE. OBTAIN PERMISSION FROM THE CONTRACTING OFFICER AND THE ARCHITECT/ENGINEER AT LEAST [48] HOURS PRIOR TO PARTIALLY OR COMPLETELY DISABLING THE SYSTEM. MINIMIZE THE DURATION OF ANY OUTAGES. IF REQUIRED, MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO THE DEMOLITION WORK AREA.
F. REMOVE ALL ELECTRICAL DEVICES FROM WALLS, FLOORS AND CEILINGS THAT ARE TO BE DEMOLISHED OR MOVED. REMOVE ABANDONED OUTLETS IF CONDUIT AND WIRING SERVICING THEM IS ABANDONED AND REMOVED. PROVIDE BLANK COVER FOR ANY ABANDONED BOXES WHICH ARE NOTED ON THE PLANS AS NOT REMOVED. REMOVE CONDUIT TO POINT WHERE IT NO LONGER INTERFERES WITH CONSTRUCTION AND IS CONCEALED. FOR CONDUIT BURIED IN CONCRETE OR CMU WALLS, CUT CONDUIT OFF FLUSH WITH FLOOR AND PLUG CONDUIT. REMOVE ALL CONDUCTORS BACK TO SOURCE (PANELBOARD OR LAST LIVE DEVICE).
G. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS THAT REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS REQUIRED.
H. PROVIDE REVISED TYPED CIRCUIT DIRECTORY IN PANELBOARDS THAT HAVE CIRCUITS REMOVED.
I. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
J. EQUIPMENT TO BE RELOCATED SHALL BE SERVICED, MODIFIED AND REPAIRED AS NECESSARY TO PLACE IT IN GOOD WORKING ORDER AND TO THE SATISFACTION OF ARCHITECT/ENGINEER. PROTECT ITEMS FROM DAMAGE DURING TRANSPORT AND STORAGE. ANY LOST, STOLEN OR DAMAGED ITEMS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPLACED WITH NEW ITEMS THAT MATCH THE ORIGINAL. REINSTALL ITEMS IN LOCATIONS INDICATED. COMPLY WITH INSTALLATION REQUIREMENTS FOR NEW MATERIALS AND EQUIPMENT. PROVIDE CONNECTIONS, SUPPORTS, AND MISCELLANEOUS MATERIALS NECESSARY TO MAKE THE ITEM FUNCTIONAL FOR USE AT THE NEW LOCATION. EQUIPMENT SHALL BE TESTED IN THE NEW LOCATION AND PROPER FUNCTION DEMONSTRATED.
K. EXCEPT FOR ITEMS OR MATERIALS INDICATED TO BE RECYCLED, REUSED, SALVAGED, REINSTALLED, OR OTHERWISE INDICATED TO REMAIN OWNER'S PROPERTY, REMOVE PROJECT SITE AND LEGALLY DISPOSE OF THEM IN AN EPA-APPROVED LANDFILL. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON-SITE. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.
L. HANDLING OF BALLASTS WITH PCBS - GENERALLY, ALL HIGH POWER FACTOR FLUORESCENT LIGHTING BALLASTS, AND SOME HID BALLASTS, THAT WERE MANUFACTURED BEFORE 1978 CONTAIN POLYCHLORINATED BIPHENYL (PCB) COMPOUNDS IN THEIR CAPACITORS. FOR BALLASTS OF THIS VINTAGE, IF THE PCB CONTENT IS NOT STATED ON THE BALLAST LABEL, THE BALLAST SHALL BE HANDLED AS A PCB BALLAST. SUCH BALLASTS SHALL BE HANDLED PER EPA AND DNR PCB REGULATIONS.
**M. MAINTAIN EXISTING FIRE ALARM SYSTEM IN SERVICE UNTIL NEW SYSTEM IS TESTED, CERTIFIED AND ACCEPTED. OBTAIN PERMISSION FROM THE CONTRACTING OFFICER AND THE ARCHITECT/ENGINEER AT LEAST [48] HOURS PRIOR TO PARTIALLY OR COMPLETELY DISABLING THE FIRE ALARM SYSTEM. MINIMIZE THE DURATION OF ANY OUTAGES AND MAINTAIN A FIRE WATCH THROUGHOUT THE OUTAGE DURATION. IF REQUIRED, MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO THE DEMOLITION WORK AREA.**
**N. COORDINATE WITH FACILITY IT PERSONNEL AND REMOVE ALL ABANDONED COMMUNICATIONS AND SECURITY SYSTEM CABLE FROM ORIGIN TO DESTINATION IN ACCORDANCE WITH NEC 800.25. DO NOT ABANDON IN PLACE UNLESS SPECIFICALLY NOTE AS BEING LEFT FOR FUTURE USE. IDENTIFY FOR FUTURE USE IN ACCORDANCE WITH NEC 800.25**

**260519 - CONDUCTORS**

A. FEEDERS: COPPER **OR ALUMINUM**, TYPE THHN/THWN-2, SINGLE CONDUCTORS IN RACEWAY.
**B.** BRANCH CIRCUITS: COPPER, TYPE THHN/THWN-2, MINIMUM SIZE IS #12 AWG, SOLID FOR NO. 10 AWG AND SMALLER; STRANDED FOR NO. 8 AWG AND LARGER. SINGLE CONDUCTORS IN RACEWAY **OR METAL-CLAD CABLE, (TYPE MC) OR NONMETALLIC-SHEATHED CABLE, (TYPE NM - 'ROMEX').**
C. CORD DROPS AND PORTABLE APPLIANCE CONNECTIONS: TYPE SO, CORD WITH STAINLESS-STEEL, WIRE-MESH, STRAIN RELIEF DEVICE AT TERMINATIONS.
D. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120 V BRANCH CIRCUIT.
E. **USE OXIDE INHIBITOR IN EACH SPLICE, TERMINATION, AND TAP FOR ALUMINUM CONDUCTORS.**

**260526 - GROUNDING AND BONDING**

A. GROUNDING ELECTRODE CONDUCTOR: BARE COPPER, SIZED PER NEC 250.66.
B. BONDING CONDUCTOR: BARE COPPER FOR LENGTHS OF 6 FEET OR LESS, COPPER WITH INSULATION IN PVC CONDUIT (METALLIC CONDUIT IN AIR PLENUM) WHERE LONGER THAN 6 FEET IN LENGTH. IF METALLIC CONDUIT IS USED, PROVIDE BONDING BUSHING AT EACH END. SIZE PER NEC 250.102.
C. EQUIPMENT GROUND CONDUCTOR: COPPER WITH GREEN INSULATION (LARGER WIRES MAY BE PERMANENTLY MARKED WITH GREEN), SIZED PER NEC 250.122. DO NOT RELY ON CONDUIT FOR THE GROUNDING PATH.
D. GROUNDING BUS: RECTANGULAR COPPER BAR, 1/4" X 4" X 12" WITH 9/32" HOLES SPACED 1-1/8" APART. WALL-MOUNT WITH STAND-OFF INSULATORS.
E. PIPE CONNECTORS: COPPER OR COPPER ALLOY, PRESSURE TYPE CLAMP, SIZED FOR PIPE, SECURED WITH AT LEAST TWO BOLTS. BOND EACH ABOVEGROUND PORTION OF GAS PIPING SYSTEM DOWNSTREAM FROM EQUIPMENT SHUTOFF VALVE.
F. BUS-BAR CONNECTORS: MECHANICAL TYPE, CAST SILICON BRONZE, SOLDERLESS COMPRESSION-TYPE WIRE TERMINALS, AND LONG-BARREL, TWO-BOLT CONNECTION TO GROUND BUS BAR.
G. BEAM CLAMPS: WHEN AVAILABLE, BOND STRUCTURAL STEEL TO GROUNDING ELECTRODE SYSTEM WITH MECHANICAL TYPE CLAMP TERMINAL WITH GROUND WIRE ACCESS FROM FOUR DIRECTIONS, AND DUAL, TIN-PLATED OR SILICON BRONZE BOLTS.
H. BONDING INTERIOR METAL DUCTS: BOND METAL AIR DUCTS TO EQUIPMENT GROUNDING CONDUCTORS OF ASSOCIATED FANS, BLOWERS, ELECTRIC HEATERS, AND AIR CLEANERS. INSTALL BONDING JUMPER TO BOND ACROSS FLEXIBLE DUCT CONNECTIONS TO ACHIEVE CONTINUITY. SIZE BONDING CONDUCTORS AND JUMPERS IN ACCORDANCE WITH NEC 250.122, USING THE RATING OF THE CIRCUIT THAT IS LIKELY TO ENERGIZE THE DUCTS.

**260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS**

A. RACEWAYS AND CABLES CARRYING CIRCUITS WITHIN BUILDINGS. IDENTIFY THE COVERS OF EACH JUNCTION AND PULL BOX OF THE FOLLOWING SYSTEMS WITH PAINT AS FOLLOWS:
   1. BATTERY OR GENERATOR BACKED UP EMERGENCY SYSTEM: ORANGE
   2. FIRE DETECTION AND ALARM SYSTEM: RED
   3. SYSTEMS WITH VOLTAGE GREATER THAN 600V: YELLOW
   4. DIRECT CURRENT SYSTEMS (SOLAR PV SYSTEM): GREEN
B. CONDUCTOR COLOR-CODING:
   1. 208Y/120V: PHASE A - BLACK, PHASE B - RED, PHASE C - BLUE, NEUTRAL - WHITE.
   2. GROUNDS: BARE COPPER OR GREEN.
C. ALL EQUIPMENT SHALL HAVE AN IDENTIFICATION LABEL, BLACK LETTERS ON A WHITE FIELD. LABEL INCLUDES UNIT NAME AND CIRCUIT THAT FEEDS IT.
   1. 1" MINIMUM HEIGHT LETTERS FOR SERVICE DISCONNECT AND EMERGENCY SHUT-OFF SWITCHES.
   2. 1/2" MINIMUM HEIGHT LETTERS FOR PANELBOARDS, SWITCHBOARDS, RELAY ENCLOSURES AND TRANSFORMERS.
   3. 1/4" MINIMUM HEIGHT LETTERS FOR DISCONNECT SWITCHES AND MOTOR STARTERS.
   4. 1/8" MINIMUM HEIGHT LETTERS FOR DEVICE COVERPLATES.
D. PANELBOARDS/SWITCHBOARDS LABEL SHALL INCLUDE - PANEL NAME, VOLTAGE, AMPERAGE, NUMBER OF PHASES AND WIRES, SOURCE AND AVAILABLE FAULT CURRENT WITH DATE CALCULATED. INCLUDE TYPEWRITTEN DIRECTORY OF CIRCUITS IN THE LOCATION PROVIDED BY PANELBOARD MANUFACTURER. INDICATE CIRCUIT LOAD INCORPORATING CONTRACTING OFFICER'S FINAL ROOM DESIGNATIONS. SPARES SHALL BE FILLED IN BY HAND WITH PENCIL. ON MAIN DISTRIBUTION PANEL DOOR / SWITCHBOARD FRONT PROVIDE A LAMINATED ONE-LINE DIAGRAM OF THE ELECTRICAL SYSTEM AND ALL PANEL CONFIGURATIONS.
E. RECEPTACLES: IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH THE DEVICE IS SERVED.
   1. MARK INSIDE OF BOX OR COVERPLATE WITH PERMANENT MARKER. TEST TO ENSURE THAT MARKER LINES ARE NOT VISIBLE ON OUTSIDE OF COVER WHEN IT IS INSTALLED.
   2. MARK OUTSIDE OF COVERPLATE USING LABELER SUCH AS BROTHER PT-90 TO PRODUCE 1/8" BLACK LETTERS (WHITE LETTERS IF COVER IS DARK) ON CLEAR TAPE.

**260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS**

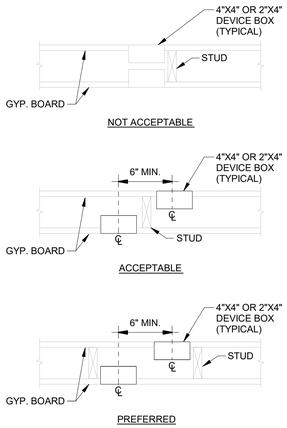
A. MINIMUM RACEWAY SIZE: 1 INCH TRADE SIZE FOR TELECOM/DATA AND 3/4 INCH TRADE SIZE FOR ALL OTHER APPLICATIONS.
B. INSTALL NONMETALLIC CONDUIT OR TUBING FOR PROTECTING BARE GROUNDING CONDUCTORS.
C. DO NOT INSTALL RACEWAYS OR ELECTRICAL ITEMS ON ANY "EXPLOSION-RELIEF" WALLS OR ROTATING EQUIPMENT.
D. DO NOT INSTALL PARALLEL CONDUITS ONTO THE BOTTOM SIDE OF A METAL DECK ROOF.
E. KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.
F. ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE FINISHED SLAB.
G. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN EXCEPT FOR CONTROL WIRING CONDUITS, FOR WHICH FEWER BENDS ARE ALLOWED. SUPPORT WITHIN 12 INCHES OF CHANGES IN DIRECTION. SUPPORT CONDUIT WITHIN 12 INCHES OF ENCLOSURES TO WHICH THEY ARE ATTACHED.
H. UNLESS BURIED, INSTALL ALL CONDUITS PARALLEL OR PERPENDICULAR TO BUILDING LINES.
I. INSTALL RACEWAYS SQUARE TO THE ENCLOSURE AND TERMINATE AT ENCLOSURES WITH LOCKNUTS. INSTALL LOCKNUTS HAND TIGHT PLUS 1/4 TURN MORE. DO NOT RELY ON LOCKNUTS TO PENETRATE NONCONDUCTIVE COATINGS ON ENCLOSURES. REMOVE COATINGS IN THE LOCKNUT AREA PRIOR TO ASSEMBLING CONDUIT TO ENCLOSURE TO ENSURE A CONTINUOUS GROUND PATH.
J. RACEWAYS MAY BE INSTALLED UNDER THE CONCRETE SLAB, BUT NO CONDUITS SHALL BE EMBEDDED WITHIN THE SLAB. DIRECT-BURIED CONDUIT - INSTALL MANUFACTURED RIGID STEEL CONDUIT ELBOWS FOR STUB-UPS AT POLES AND EQUIPMENT AND AT BUILDING ENTRANCES THROUGH FLOOR. ANY METALLIC CONDUIT THAT DOES OR MAY COME INTO CONTACT WITH SOIL SHALL BE COATED WITH TWO COATS OF BITUMASTIC OR TWO LAYERS OF 10 MIL. CORROSION PROTECTION TAPE.
K. INSTALL FIRESTOPPING AT PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES.
L. INSTALL SLEEVES AND SLEEVE SEALS AT PENETRATIONS OF EXTERIOR FLOOR AND WALL ASSEMBLIES. INCLUDE CAST-IRON PIPE SLEEVES SIZED TO ALLOW FOR 1-INCH ANNULAR CLEAR SPACE BETWEEN RACEWAY OR CABLE AND SLEEVE FOR INSTALLING SLEEVE-SEAL SYSTEM WHICH INCLUDES MANUFACTURED EPDM RUBBER INTERLOCKING LINKS SHAPED TO FIT SURFACE OF PIPE AND WITH NUMBER REQUIRED FOR PIPE MATERIAL AND SIZE OF PIPE. INCLUDE STAINLESS STEEL PRESSURE PLATES AND CONNECTING BOLTS AND NUTS.
M. INDOOR RACEWAYS:
   1. EXPOSED, NOT SUBJECT TO PHYSICAL DAMAGE: EMT.
   2. EXPOSED AND SUBJECT TO SEVERE PHYSICAL DAMAGE: RIGID STEEL CONDUIT.
   3. CONCEALED IN NEW CEILINGS AND INTERIOR WALLS AND PARTITIONS: EMT.
   4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMC, EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
   5. DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
   6. BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT USE NEMA 250, TYPE 3R, NONMETALLIC IN DAMP OR WET LOCATIONS.
   7. RACEWAY FITTINGS: COMPATIBLE WITH RACEWAYS AND SUITABLE FOR USE AND LOCATION.
   8. RIGID AND INTERMEDIATE STEEL CONDUIT: USE THREADED RIGID STEEL CONDUIT FITTINGS, UNLESS NOTED OTHERWISE.
   9. INSTALL SURFACE RACEWAYS ONLY WHERE SPECIFICALLY INDICATED ON DRAWINGS. INSTALL SURFACE RACEWAY WITH A MINIMUM 2-INCH RADIUS CONTROL AT BEND POINTS.
   10. FLEXIBLE CONDUIT CONNECTIONS: MAXIMUM OF 72 INCHES OF FLEXIBLE CONDUIT FOR RECESSED AND SEMI-RECESSED LUMINAIRES, EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR TRANSFORMERS AND MOTORS. USE LFMC IN DAMP OR WET LOCATIONS SUBJECT TO SEVERE PHYSICAL DAMAGE. USE LFMC OR LFNC IN DAMP OR WET LOCATIONS NOT SUBJECT TO SEVERE PHYSICAL DAMAGE.
N. OUTDOOR RACEWAYS:
   1. EXPOSED CONDUIT: RIGID STEEL CONDUIT.
   2. CONCEALED CONDUIT, ABOVE GROUND: EMT.
   3. UNDERGROUND CONDUIT: RNC, TYPE EPC-40-PVC, DIRECT BURIED. USE TYPE EPC-80-PVC UNDER PAVED SURFACES.
   4. CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFNC.
   5. BOXES AND ENCLOSURES, ABOVE GROUND: NEMA250, TYPE 3R.
O. ENCLOSURES – BOXES AND ENCLOSURES FOR PANELBOARD, DISCONNECT SWITCH AND MOTOR CONTROL UNITS, ETC. BASED ON THE INSTALLATION LOCATIONS/ENVIRONMENTS.
   1. INDOOR, DRY AND CLEAN LOCATIONS: NEMA 250, TYPE 1.
   2. OUTDOOR LOCATIONS: NEMA 250, TYPE 3R.
   3. KITCHEN/WASH-DOWN AREAS: NEMA 250, TYPE 4X, STAINLESS STEEL.
   4. OTHER WET OR DAMP, INDOOR LOCATIONS: NEMA 250, TYPE 4.
   5. INDOOR LOCATIONS SUBJECT TO DUST, FALLING DIRT, AND DRIPPING NONCORROSIVE LIQUIDS: NEMA 250, TYPE 12.
   6. HAZARDOUS AREAS INDICATED ON DRAWINGS: NEMA 250, TYPE 7/TYPE 9 WITH COVER ATTACHED BY TYPE 316 STAINLESS STEEL BOLTS.
P. GENERAL BOX MOUNTING
   1. MOUNT BOXES AT HEIGHTS INDICATED ON DRAWINGS. IF MOUNTING HEIGHTS OF BOXES ARE NOT INDIVIDUALLY INDICATED, GIVE PRIORITY TO ADA REQUIREMENTS. INSTALL BOXES WITH HEIGHT MEASURED TO CENTER OF BOX UNLESS OTHERWISE INDICATED.
   2. HORIZONTALLY SEPARATE BOXES MOUNTED ON OPPOSITE SIDES OF WALL SO THEY ARE NOT IN THE SAME VERTICAL CHANNEL.
   3. LOCATE BOXES SO THAT COVER OR PLATE WILL NOT SPAN DIFFERENT BUILDING FINISHES.
   4. FASTEN JUNCTION AND PULL BOXES TO OR SUPPORT FROM BUILDING STRUCTURE. DO NOT SUPPORT BOXES BY CONDUITS.
   5. SET METAL FLOOR BOXES LEVEL AND FLUSH WITH FINISHED FLOOR SURFACE.

**260925 – NON-DIGITAL LIGHTING CONTROL SYSTEM**

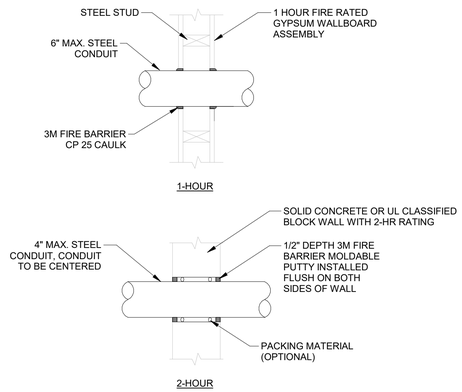
A. TIME SWITCHES - SOLID STATE, PROGRAMMABLE, WITH ALPHANUMERIC DISPLAY; COMPLYING WITH UL 917. DESIGN IS BASED ON INTERMATIC ET1100 SERIES.
   1. CONTACT CONFIGURATION: SPST, OR AS NOTED ON PLANS.
   2. CONTACT RATING: 20A BALLAST LOAD, 120/240V AC.
   3. PROGRAMS: TWO ON-OFF SET POINTS ON A 24-HOUR SCHEDULE, ALLOWING DIFFERENT SET POINTS FOR EACH DAY OF THE WEEK AND AN ANNUAL HOLIDAY SCHEDULE THAT OVERRIDES THE WEEKLY OPERATION ON HOLIDAYS.
   4. CIRCUITRY: ALLOW CONNECTION OF A PHOTOELECTRIC RELAY AS SUBSTITUTE FOR ON-OFF FUNCTION OF A PROGRAM ON SELECTED CHANNELS.
   5. AUTOMATIC DAYLIGHT SAVINGS TIME CHANGEOVER.
   6. BATTERY BACKUP: NOT LESS THAN SEVEN DAYS RESERVE, TO MAINTAIN SCHEDULES AND TIME CLOCK.
B. OUTDOOR PHOTOELECTRIC SWITCHES - SOLID STATE, WITH SPST DRY CONTACTS RATED FOR 1000W INCANDESCENT OR 1800VA TUNGSTEN, TO OPERATE CONNECTED RELAY. CONTACTOR COILS, OR MAGNETIC LAMP BALLASTS: COMPLYING WITH UL 773A, AND COMPATIBLE WITH BALLASTS AND LED LAMPS. DESIGN IS BASED ON INTERMATIC NIGHTFOX EK4436SM SERIES.
C. INDOOR OCCUPANCY AND VACANCY SENSORS - WALL AND CEILING-MOUNTED, SOLID-STATE INDOOR OCCUPANCY/VACANCY SENSOR; DUAL TECHNOLOGY (PASSIVE INFRARED AND ULTRASONIC). DESIGN IS BASED ON WATTSTOPPER DT-300 AND DT-200 SERIES.
   1. OCCUPANCY SENSOR: TURN LIGHTS ON WHEN COVERAGE AREA IS OCCUPIED, AND TURN THEM OFF WHEN IT IS UNOCCUPIED.
   2. VACANCY SENSOR: LIGHTS ARE MANUALLY TURNED ON AND SENSOR TURNS LIGHTS OFF WHEN THE ROOM IS UNOCCUPIED.
D. SWITCHBOX-MOUNTED OCCUPANCY SENSORS, DUAL TECHNOLOGY - SWITCHBOX-MOUNTED, COMBINATION LIGHTING-CONTROL SENSOR AND CONVENTIONAL SWITCH LIGHTING-CONTROL UNIT USING DUAL TECHNOLOGY (PASSIVE INFRARED AND ULTRASONIC). DESIGN IS BASED ON WATTSTOPPER DW-100 SERIES.
E. DIGITAL TIMER LIGHT SWITCHES - COMBINATION DIGITAL TIMER AND CONVENTIONAL SWITCH LIGHTING CONTROL UNIT. SWITCHBOX-MOUNTED, BACKLIT LCD DISPLAY, WITH SELECTABLE TIME INTERVAL IN 10-MINUTE INCREMENTS, 120/277V DUAL VOLTAGE, COLOR TO MATCH OTHER WIRING DEVICES. DESIGN IS BASED ON WATTSTOPPER TS-400 SERIES.
F. LIGHTING CONTACTORS – MULTI-POLE (UP TO 12) ELECTRICALLY OPERATED AND MECHANICALLY HELD CONTACTOR COMPLYING WITH NEMA ICS 2 AND UL 508. UNIT INCLUDES NEMA 1 ENCLOSURE, HAND-OFF-AUTO SWITCH, PILOT DEVICES AND SOLID-STATE CONTROL MODULE AS REQUIRED FOR 2 OR 3 WIRE CONTROL. DESIGN IS BASED ON ASCO 918 SERIES.
G. EMERGENCY LIGHTING CONTROL DEVICES - UL 924 LISTED DEVICE THAT MONITORS A SWITCHED CIRCUIT PROVIDING NORMAL LIGHTING TO AN AREA. THE UNIT PROVIDES NORMAL ON/OFF CONTROL OF EMERGENCY LIGHTING ALONG WITH THE NORMAL LIGHTING. UPON NORMAL POWER FAILURE THE EMERGENCY LIGHTING CIRCUIT WILL CLOSE, FORCING THE EMERGENCY LIGHTING ON UNTIL NORMAL POWER IS RESTORED. DESIGN IS BASED ON WATTSTOPPER EL-200 SERIES.
H. LIGHTING CONTROL RELAY PANEL - HINGED, LOCKABLE NEMA 1 ENCLOSURE WITH UP TO (8) SINGLE-POLE OR (4) TWO-POLE ELECTRICALLY HELD, SPST AND DPST RELAYS WITH 20A CONTACT RATINGS. BACK-LIT TOUCHSCREEN, 8 CHANNELS OF TIME CONTROL WITH PROVISION FOR 42 HOLIDAYS AND AUTOMATIC DAYLIGHT SAVINGS ADJUSTMENT. NON-VOLATILE MEMORY TO RETAIN TIME KEEPING DURING POWER OUTAGES UP TO 48 HOURS. DESIGN IS BASED ON WATTSTOPPER LC8 SERIES.
I. INSTALL SENSORS IN APPROPRIATE LOCATIONS AND AIM EACH TO ACHIEVE NOT LESS THAN 90% REPORTED COVERAGE OF AREAS INDICATED. DO NOT EXCEED COVERAGE LIMITS SPECIFIED IN MANUFACTURER'S WRITTEN INSTRUCTIONS.
J. MOUNT ELECTRICALLY HELD LIGHTING CONTACTORS WITH ELASTOMERIC ISOLATOR PADS TO ELIMINATE STRUCTURE-BORNE VIBRATION UNLESS CONTACTORS ARE INSTALLED IN AN ENCLOSURE WITH ELASTOMERIC VIBRATION ISOLATORS.
K. CALIBRATE ALL SENSOR TIME DELAYS AND SENSITIVITY TO GUARANTEE PROPER DETECTION OF OCCUPANTS AND ENERGY SAVINGS. ADJUST TIME DELAY SO THAT CONTROLLED AREA REMAINS LIGHTED FOR 5 MINUTES AFTER OCCUPANT LEAVES AREA.
L. AND VOLTAGE CABLES DO NOT REQUIRE RACEWAY WHERE CONCEALED IN ACCESSIBLE CEILINGS. CABLING SHALL BE CLEANLY ORGANIZED AND SUPPORTED BY J-HOOKS OR APPROVED METHODS EVERY 4 FEET. LOW VOLTAGE CABLES SHALL BE INSTALLED IN CONDUIT/RACEWAY WHERE EXPOSED.
M. WIRING WITHIN ENCLOSURES: SEPARATE POWER-LIMITED AND NONPOWER-LIMITED CONDUCTORS ACCORDING TO CONDUCTOR MANUFACTURER'S WRITTEN INSTRUCTIONS.
N. ALL LINE VOLTAGE CONNECTIONS SHALL BE TAGGED TO INDICATE CIRCUIT AND SWITCHED LEGS. RUN SEPARATE NEUTRALS FOR ANY PHASE DIMMED BRANCH LOAD CIRCUIT. DIFFERENT TYPES OF DIMMING LOADS SHALL HAVE SEPARATE NEUTRAL.
O. OCCUPANCY SENSOR LOCATIONS SHALL BE SHIFTED AS NECESSARY TO ENSURE THE FOLLOWING:
   1. NORMAL OCCUPIES SHALL BE INSTALLED NO HIGHER THAN 120" AFF.
   2. NO DEVICE RELYING SOLELY ON PIR SENSING SHALL BE INSTALLED IN A LOCATION WHERE OBSTACLES MAY BLOCK THE SENSOR'S FIELD OF VIEW.
   3. ANY DEVICE EMPLOYING ULTRASONIC SENSING SHALL BE INSTALLED AT A MINIMUM OF 72" AWAY FROM ANY STRONG TRANSFER OF AIR SUCH AS SUPPLY DIFFUSERS.

**262726 - WIRING DEVICES**

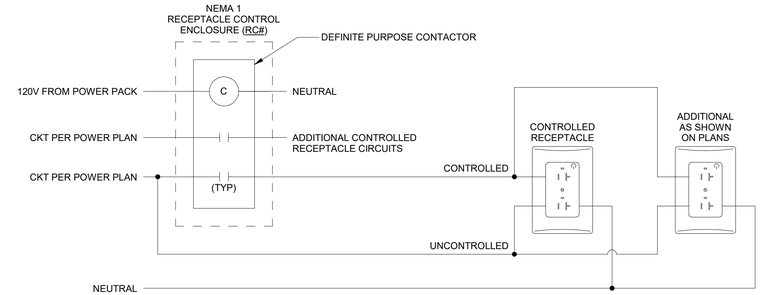
A. STRAIGHT-BLADE RECEPTACLES - DUPLEX CONVENIENCE RECEPTACLES, 125V, 20A: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, UL 498, AND FS W-C-596.
   1. COOPER; 5351 (SINGLE), 5362 (DUPLEX), 5362CH (HALF-CONTROLLED DUPLEX) TR5362 (TAMPER DUPLEX).
   2. HUBBELL; HBL5361 (SINGLE), HBL5362 (DUPLEX), BR20C1 (HALF-CONTROLLED DUPLEX) HBL5362TR (TAMPER DUPLEX).
   3. LEVITON; 5361 (SINGLE), 5362 (DUPLEX), 5362-S1 (HALF-CONTROLLED DUPLEX)5362-SG (TAMPER DUPLEX).
   4. P&S; 5351 (SINGLE), CRB5362 (DUPLEX), 5362CDW (HALF-CONTROLLED DUPLEX) TR5352 (TAMPER DUPLEX).
B. TV OUTLET (POWER & SIGNAL) - RECESSED, 3-GANG, IN-WALL ENCLOSURE WITH 20A DUPLEX RECEPTACLE LOCATED IN LEFT, SINGLE-GANG OPENING. CENTER SINGLE-GANG, LOW-VOLTAGE OPENING WITH 1-1/4" CONDUIT AND PULLSTRING PROVISION FOR SIGNAL CABLE. ROUTE TO ACCESSIBLE CEILING SPACE AND TO FLOOR BOX WHERE APPLICABLE. RIGHT SINGLE-GANG, LOW-VOLTAGE OPENING WITH 1" CONDUIT AND PULLSTRING PROVISION FOR SIGNAL CABLE. ROUTE TO ACCESSIBLE CEILING SPACE.
   1. ARLINGTON; TVBS505SS.
C. GFCI RECEPTACLES - 125V, 20A, DUPLEX, STRAIGHT BLADE. NON-FEED-THROUGH TYPE. COMPLY WITH NEMA WD 1. NEMA WD 6 CONFIGURATION 5-20R, UL 498, UL 943 CLASS A, AND FS W-C-596. INCLUDE SELF-TESTING AND INDICATOR LIGHT THAT SHOWS WHEN THE GFCI HAS MALFUNCTIONED AND NO LONGER PROVIDES PROPER GFCI PROTECTION.
   1. COOPER; VGF20 (STANDARD), TRVGF20 (TAMPER), WRSGF20 (OUTDOOR).
   2. HUBBELL; GFR5352L (STANDARD), GFRTRST20 (TAMPER), GFTWRST20 (OUTDOOR).
   3. LEVITON; GFNT2 (STANDARD), GFTR2-KW (TAMPER), GFWR2 (OUTDOOR).
   4. P&S; 2097 (STANDARD), 2097TR (TAMPER), 2097TRWR (OUTDOOR).
D. TOGGLE SWITCHES - 120/277V, 20A. COMPLY WITH NEMA WD 1, UL 20, AND FS W-S-896.
   1. COOPER; AH1221 (SINGLE-POLE), AH1222 (TWO-POLE), AH1223 (THREE-WAY), AH1224 (FOUR-WAY).
   2. HUBBELL; HBL1221 (SINGLE-POLE), HBL1222 (TWO-POLE), HBL1223 (THREE-WAY), HBL1224 (FOUR-WAY).
   3. LEVITON; 1221-2 (SINGLE-POLE), 1222-2 (TWO-POLE), 1223-2 (THREE-WAY), 1224-2 (FOUR-WAY).
   4. P&S; CSB20AC1 (SINGLE-POLE), CSB20AC2 (TWO-POLE), CSB20AC3 (THREE-WAY), CSB20AC4 (FOUR-WAY).
E. WALL-BOX DIMMERS (FOR 0-10V DIMMING) - STAND-ALONE SLIDE DIMMER WITH SEPARATE ON/OFF SWITCH BUTTON, DESIGNED FOR USE ALONE OR WITH STANDARD THREE-WAY AND FOUR-WAY SWITCHES. MATCH DIMMER TO LED DRIVER IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES. INSTALL ALL HOT, SWITCHED, TRAVELERS, NEUTRAL AND GROUND WIRES AS REQUIRED, AS WELL AS LOW-VOLTAGE WIRES.
   1. PHILIPS; SUNRISE SERIES (LTL203261).
   2. WATT STOPPER; RADIANT SERIES (RH4FBL3P).
   3. ACUITY; SYNERGY SERIES (ISD-BC).
   4. LUTRON; DIVA SERIES (DVSTV).
F. WALL-BOX DIMMER (FOR SCREW-IN LED LAMPS WITH INTEGRAL DRIVERS) - MODULAR, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES AND AUDIBLE FREQUENCY AND EMI/RFI SUPPRESSION FILTERS. MATCH DIMMER TO LAMP(S) BEING DIMMED IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES, DEMONSTRATE CONSISTENT, PROPER FUNCTION WITH LAMP. INSTALL ALL HOT, SWITCHED, TRAVELERS, NEUTRAL AND GROUND WIRES AS REQUIRED.
   1. WATTSTOPPER; RADIANT TRU-UNIVERSAL SERIES (RH703PTU).
G. DEVICE COLOR - AS SELECTED BY ARCHITECT UNLESS OTHERWISE INDICATED OR REQUIRED BY NFPA 70 OR DEVICE LISTING.
H. WALL PLATES
   1. INDOOR FINISHED AREAS - SMOOTH, HIGH-IMPACT THERMOPLASTIC WITH COLOR TO MATCH CORRESPONDING WIRING DEVICES.
   2. INDOOR UNFINISHED AREAS - GALVANIZED STEEL.
   3. OUTSIDE AND WET-LOCATIONS - NEMA 250, COMPLYING WITH TYPE 3R, WEATHERPROOF-IN-USE, DIE-CAST ALUMINUM WITH LOCKABLE COVER.




1 BOXES INSTALLATION IN NON-FIRERATED WALLS
N.T.S.

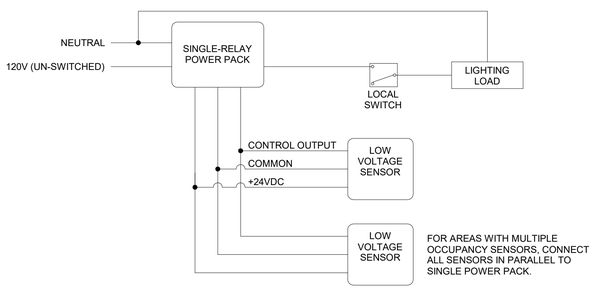



2 CONDUIT PENETRATION DETAIL WITH FIRE-STOP
N.T.S.

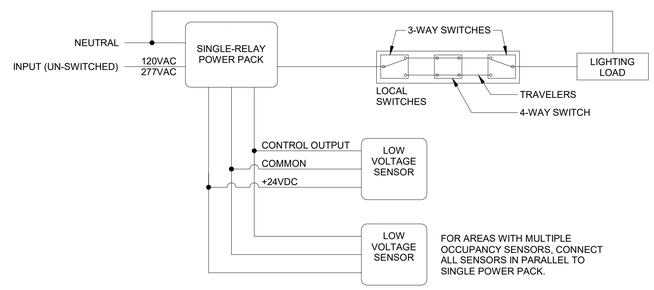



NOTES:
- SIZE CONTACTOR PER NUMBER OF CONTROLLED RECEPTACLE CIRCUITS REQUIRED.
- **MOUNT CONTACTOR ABOVE THE ACCESSIBLE CEILING SPACE OF ROOM BEING SERVED.**
- EC SHALL REMOVE BREAK-OFF TAB ON HOT SIDE OF RECEPTACLE AS REQUIRED FOR SPLIT-CIRCUIT WIRING.
- RECEPTACLE SHALL HAVE PERMANENTLY MARKED SYMBOL ON FACE OF TOP RECEPTACLE INDICATING THAT IT IS CONTROLLED.
- SEE POWER PLANS FOR SPACES WHERE CONTROLLED RECEPTACLES ARE REQUIRED.
- OCCUPANCY SENSORS SHOWN ON LIGHTING PLAN(S). PROVIDE COMPATIBLE POWER PACK RELAY AS REQUIRED FOR USE WITH OCCUPANCY SENSOR.
- WHERE MULTIPLE OCCUPANCY SENSORS CONTROL THE SAME SPACE, CIRCUIT THE POWER PACK RELAYS SO THAT MOTION DETECTION FROM EITHER SENSOR WILL ENABLE POWER TO THE RECEPTACLE.

3 PLUG-LOAD CONTROL DIAGRAM - OCCUPANCY SENSOR ENABLED CONTACTOR
N.T.S.




4 LIGHTING CONTROL DIAGRAM - MULTIPLE OCCUPANCY
N.T.S.




5 LIGHTING CONTROL DIAGRAM - MULTIPLE OCCUPANCY, 3-WAY
N.T.S.

Morrison Maierle
engineers - surveyors - planners - scientists

MONTANA
RICHARD, J.
Lic. No. 19773 PE
LICENSED PROFESSIONAL ENGINEER

| # | DATE | REVISION |
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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ELECTRICAL DETAILS**

DATE: 07.14.2026

SHEET: **E0.4**

**100% CONSTRUCTION DOCUMENTS**

DATE STAMP: 7/15/2026 11:37:11 AM

# LUMINAIRE SCHEDULE

NOTES:

1. PRIOR SUBMITTAL NOT REQUIRED. ALL ALTERNATE FIXTURE SHOP DRAWINGS WILL BE REVIEWED AFTER THE PROJECT IS AWARDED.
2. PRIOR SUBMITTAL IS REQUIRED.
3. ALTERNATE FIXTURE IS NOT ACCEPTED FOR SUBSTITUTIONS.
4. PROVIDE 0-10V DIMMING, DOWN TO 10% LUMEN OUTPUT, MINIMUM.
5. PROVIDE FUSING.
6. VERIFY FINISH WITH ARCHITECT.
7. PROVIDE WITH REMOTE 12V STEP-DOWN TRANSFORMER.
8. CIRCUIT VIA TYPE EM INVERTER.
9. LAMP DATA IS FOR 4' CROSS-SECTION OF FIXTURE.
10. MOUNT BOTTOM OF FIXTURE CENTERED AT 6" ABOVE TOP OF MIRROR. SEE ARCHITECT ELEVATIONS.

GENERAL NOTES:

A. ALL LUMINAIRES SHALL BE TESTED AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) SUCH AS UL OR ETL.
B. ALL LUMINAIRES SHALL HAVE DESIGN LIGHTS CONSORTIUM (DLC) CERTIFICATION AND/OR ENERGY STAR RATING. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL CEILING TYPES AND PROVIDE ALL MOUNTING, FIRE-RATED, AND IC-RATED
C. ACCESSORIES AS REQUIRED. FOR FIRE-RATED CEILING ASSEMBLIES AND FOR CEILINGS WITH INSULATION, VERIFY ALL RECESSED LUMINAIRE HOUSINGS ARE RATED APPROPRIATELY OR PROVIDE DROP-OVER ENCLOSURES OR TENTS FOR LUMINAIRES. VERIFY THAT DROP-OVER ENCLOSURES OR TENTS ALLOW FOR AIR SPACE AROUND LUMINAIRE PER MANUFACTURER'S RECOMMENDATIONS.

| TYPE | LAMPS | LOAD (W) | OUTPUT (LM, NOMINAL) | CCT (K) | DESCRIPTION | MFR | CATALOG NO. OR SERIES | FINISH | MOUNTING | VOLTAGE | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B1 | LED | 36 W | 4000 | 3500 | RECESSED 2X2 PARABOLIC | LITHONIA | 2ESL2-40L-MVOLT-E0HN-LP835 | WHITE | RECESSED | 120 V | 1 |
| B1E | LED | 36 W | 4000 | 3500 | SAME AS TYPE B1, WITH EMERGENCY BATTERY | LITHONIA | 2ESL2-40L-MVOLT-E0HN-LP835-EM | WHITE | RECESSED | 120 V | 1 |
| F1 | LED | 30 W | 6000 | 3500 | 96" INDUSTRIAL STRIP LED, FROSTED LENS, WITH WIREGUARD | LITHONIA | ZTZL1N-L96-SMR-6000LM-FST-MVOLT-35K-80CRI-WHT-WGZ48 | WHITE | SURFACE | 120 V | 1 |
| P1 | LED | 80 W | 2070 DN / 6900 UP | 3500 | 8FT LINEAR PENDANT, DIRECT 50deg PARABOLIC, BATWING DISTRIBUTION UP, OPTIC, WHITE | EXTANT ARCHITECTURAL LIGHTING | LGADU-1P-TD-8'-DLL-PSL50-WML-UHL-PROBW-35-VU-WP | WHITE | PENDANT | 120 V | 1 |
| P2 | LED | 60 W | 5780 | 3500 | 4FT LINEAR PENDANT, 40% DIRECT / 60% INDIRECT, PARABOLIC OPTIC, WHITE, WITH ENDCAP AND INDIRECT LIGHT DIFFUSER | ALCON LIGHTING | 12125-4FT-D60W-35K-80-WH-AC4-D10-WHLV-DEC-ILD | WHITE | PENDANT | 120 V | 1 |

# Existing Branch Panel: 1LP

**Equipment Notes:**

**Location:** OFFICE 13
**Supply From:**
**Mounting:** Surface
**Enclosure:** Type 1
**Volts:** 120/208 Wye
**Phases:** 3
**Wires:** 4
**A.F.C.:** EXISTING
**Mains Type:** MLO
**Mains Rating:** 225 A

| CKT | Circuit Description | Circuit Notes | Load Classification | Trip | Poles | A | | B | | C | | Poles | Trip | Load Classification | Circuit Notes | Circuit Description | CKT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LTG - OPEN OFFICE (SOUTHEAST) | | -- | 20 A | 1 | 0 | 0 | | | | | 1 | 20 A | -- | | RCPT - OPEN OFFICE (SOUTH WALL) | 2 |
| 3 | LTG - SCONCES | | -- | 20 A | 1 | | | 0 | 0 | | | 1 | 20 A | -- | | RCPT - STORAGE AREA (EAST) | 4 |
| 5 | RCPT - OPEN OFFICE (WEST) | | -- | 20 A | 1 | | | | | 0 | 0 | 1 | 20 A | -- | | LTG - PRINTER ROOM (HALL) | 6 |
| 7 | LTG - OPEN OFFICE (WEST) | | -- | 20 A | 1 | 0 | 0 | | | | | 1 | 20 A | -- | | SPARE | 8 |
| 9 | RCPT - PRINTER ROOM | | -- | 20 A | 1 | | | 0 | 0 | | | 1 | 20 A | -- | | RCPT - HALL, UNDER COUNTER PRINTER RM | 10 |
| 11 | RCPT - OPEN OFFICE (EAST) | | -- | 20 A | 1 | | | | | 0 | 0 | 1 | 20 A | -- | | LTG - STAIRWAY EMERGENCY BATTERY... | 12 |
| 13 | LTG - OPEN OFFICE (EAST) | | -- | 20 A | 1 | 0 | 0 | | | | | 1 | 20 A | -- | | LTG - EMERGENCY NIGHT LIGHTS | 14 |
| 15 | RCPT - OPEN OFFICE (SOUTH WALL) | | -- | 20 A | 1 | | | 0 | 0 | | | 1 | 20 A | -- | | RCPT - OPEN OFFICE (EAST) | 16 |
| 17 | LTG - STORAGE AREA (NORTH EAST) | | -- | 20 A | 1 | | | | | 0 | 0 | 1 | 20 A | -- | | SPARE | 18 |
| 19 | RCPT - PRINTER ROOM | | -- | 20 A | 1 | 0 | 0 | | | | | 1 | 20 A | -- | | LTG - COMPUTER ROOM | 20 |
| 21 | RCPT - PRINTER ROOM | | -- | 20 A | 1 | | | 0 | 0 | | | 1 | 20 A | -- | | SPARE | 22 |
| 23 | RCPT - NEW QUAD (TRAINING 12, OFFICE 13) | | Receptacle | 20 A | 1 | | | | | 720 | 0 | 1 | 20 A | -- | | EX LOAD | 24 |
| 25 | SPARE | | -- | 20 A | 1 | 0 | 0 | | | | | 1 | 20 A | -- | | SPARE | 26 |
| 27 | SPARE | | -- | 20 A | 1 | | | 0 | 0 | | | 1 | 20 A | -- | | SPARE | 28 |
| 29 | SPARE | | -- | 20 A | 1 | | | | | 0 | 0 | 1 | 20 A | -- | | SPARE | 30 |
| 31 | SPARE | | -- | 20 A | 1 | 0 | -- | | | | | 1 | -- | -- | | SPACE | 32 |
| 33 | SPACE | | -- | -- | 1 | | | -- | -- | | | 1 | -- | -- | | SPACE | 34 |
| 35 | SPACE | | -- | -- | 1 | | | | | -- | -- | 1 | -- | -- | | SPACE | 36 |
| 37 | SPACE | | -- | -- | 1 | -- | -- | | | | | 1 | -- | -- | | SPACE | 38 |
| 39 | SPACE | | -- | -- | 1 | | | -- | -- | | | 1 | -- | -- | | SPACE | 40 |
| 41 | SPACE | | -- | -- | 1 | | | | | -- | -- | 1 | -- | -- | | SPACE | 42 |
| | | | | | **Total Load:** | 0 VA | | 0 VA | | 720 VA | | | | | | | |
| | | | | | **Total Amps:** | 0 A | | 0 A | | 6 A | | | | | | | |

**Circuit Notes:**

A: ARC FAULT
Q: 30mA GFCI FOR EQUIPMENT
P: 6mA GFCI FOR PERSONNEL
S: SHUNT-TRIP
L: LOCKABLE
H: HASP

| Load Classification | Connected Load | Demand Factor | Estimated Demand | Panel Totals | |
|---|---|---|---|---|---|
| Receptacle | 720 VA | 100.00% | 720 VA | | |
| | | | | **Total Conn. Load:** | 720 VA |
| | | | | **Total Est. Demand:** | 720 VA |
| | | | | **Total Conn.:** | 2 A |
| | | | | **Total Est. Demand:** | 2 A |

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MONTANA
RICHARD J. [illegible]
No. 19773 PE
LICENSED PROFESSIONAL ENGINEER

| # | DATE | REVISION |
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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ELECTRICAL SCHEDULES**

DATE: 07.14.2026

SHEET: **E0.5**

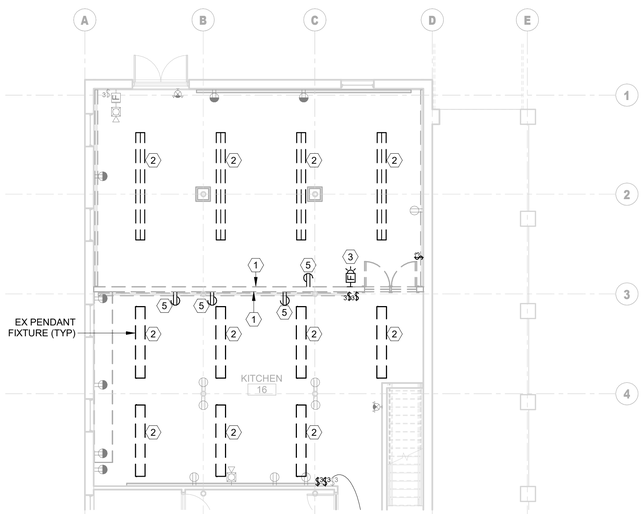
DATE STAMP: 7/15/2026 11:37:12 AM

# ELECTRICAL DEMO NOTES

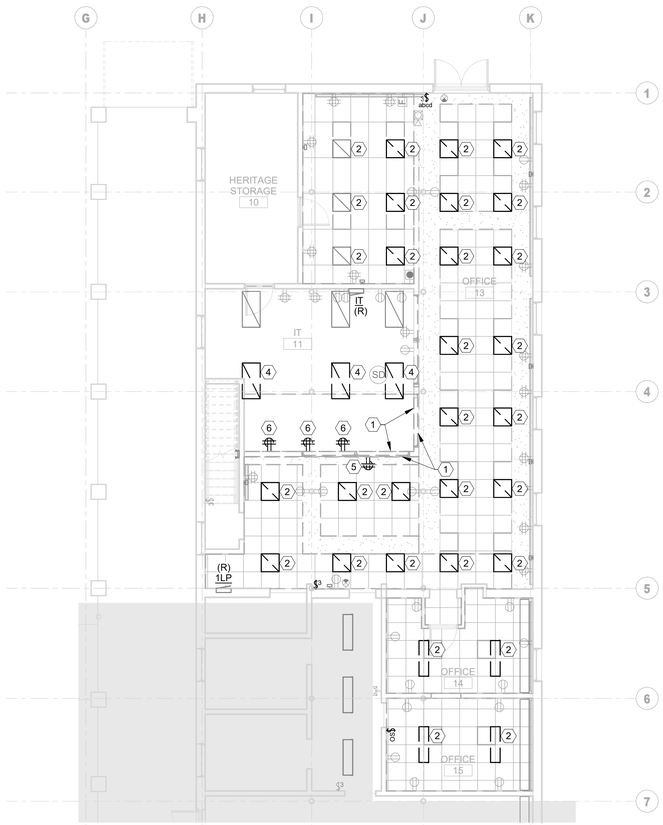
A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
C. ALL WALL REGIONS SHOWN DASHED ARE EXISTING, TO BE DEMO'D, OR IN SOME CASES ARE EXISTING DOORWAYS TO BE WALLED IN. CONTRACTOR SHALL FIELD-VERIFY AFFECTED POWER, LIGHTING AND SIGNAL, PRIOR TO BID.
D. DASHED WALLS, EQUIPMENT, FIXTURES AND DEVICES SHOWN BLACK, OR BLACK AND DASHED ARE EXISTING FOR DEMO, AND ITEMS IN GRAY AND SOLID ARE EXISTING TO REMAIN, UNLESS SPECIFICALLY NOTED OTHERWISE.
E. ALL ITEMS NOTED FOR DEMO SHALL BE COMPLETELY DEMO'D, INCLUDING DISCONNECTS, CONDUIT AND CONDUCTORS BACK TO SOURCE, UNLESS SPECIFICALLY NOTED OTHERWISE.
F. NOT ALL EXISTING DEVICE LOCATIONS HAVE BEEN VERIFIED OR SHOWN ON THESE PLANS. THE CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS, PRIOR TO BID.

# (#) KEY NOTES:

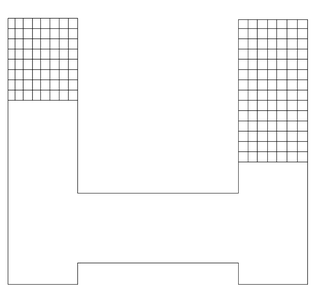
1. DASHED WALL TO BE DEMO'D: DISCONNECT AND REMOVE ALL EXISTING DEVICES ON WALL, INCLUDING EXISTING CIRCUIT(S) BACK TO NEAREST UPSTREAM DEVICE TO MAINTAIN ORIGINAL CIRCUIT CONTINUITY, UNLESS NOTED OTHERWISE. ALL UNUSED CONDUIT AND CONDUCTORS TO BE COMPLETELY REMOVED.
2. DISCONNECT EXISTING LUMINAIRE AND ASSOCIATED CONTROLS, AND SALVAGE CIRCUIT TO BE EXTENDED TO NEW LIGHTING IN NEARBY LOCATION, VIA NEW CONTROLS.
3. DISCONNECT EXISTING FA DEVICE AND SALVAGE FOR REINSTALLATION IN NEW LOCATION.
4. DISCONNECT EXISTING LUMINAIRE AND SALVAGE FOR REINSTALLATION IN NEW LOCATION.
5. SALVAGE CIRCUIT TO BE EXTENDED TO NEW DEVICES ON NEW WALL CONFIGURATION.
6. ISOLATED GROUND CIRCUIT DEVICE: SALVAGE CIRCUIT, INCLUDING ISOLATED GROUND CONDUCTOR, TO BE EXTENDED TO NEW DEVICES ON NEW WALL CONFIGURATION.




1 ELECTRICAL DEMO PLAN BASEMENT WEST
1/8" = 1'-0"




2 ELECTRICAL DEMO PLAN BASEMENT EAST
1/8" = 1'-0"



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**BUILDING 24**
**BASEMENT**
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26 FORT MISSOULA RD, MISSOULA, MT

**ELECTRICAL DEMO PLAN**

DATE: 07.14.2026

SHEET: **E101**

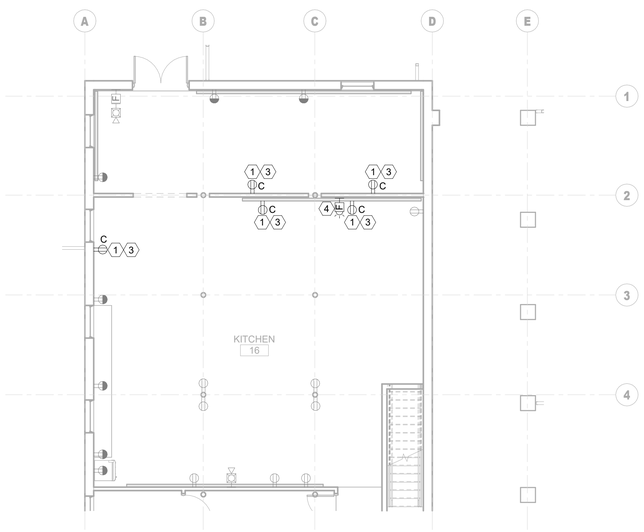
DATE STAMP: 7/15/2026 11:37:13 AM

# POWER AND SIGNAL PLAN GENERAL NOTES

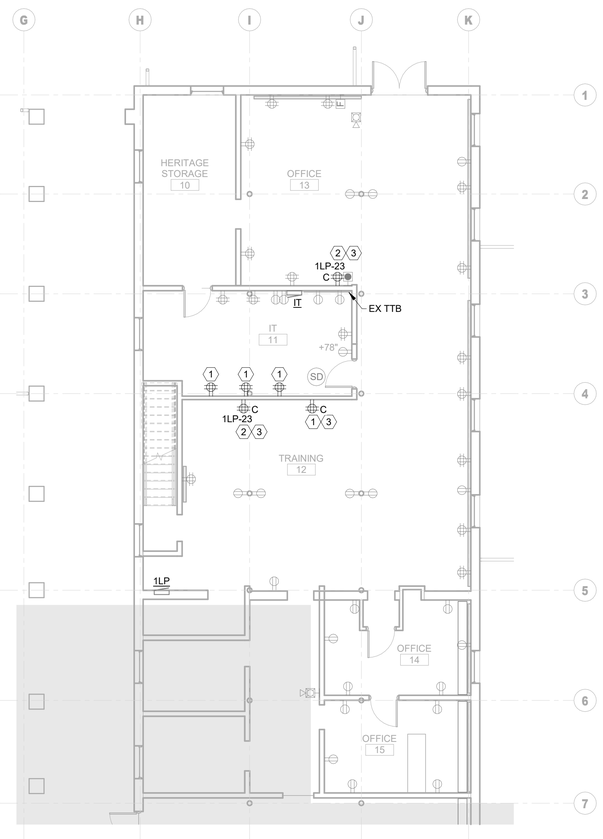
A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
C. LOW VOLTAGE CABLES (LIGHTING CONTROLS) ABOVE ACCESSIBLE CEILINGS SHALL BE SUPPORTED USING J-HOOKS AT INTERVALS NOT TO EXCEED 48" OC, UNO.

# # KEY NOTES:

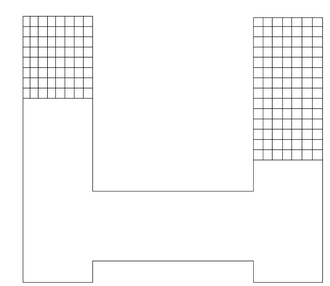
1. PROVIDE ISOLATED GROUND TYPE RECEPTACLE (FINISH COLOR ORANGE), AND EXTEND SALVAGED CIRCUIT TO THE NEW DEVICE IN THE RECONFIGURED WALL. SEE KEYNOTE 6 ON ELECTRICAL DEMO PLAN SHEET E101.
2. CIRCUIT NEW DEVICE TO AVAILABLE SPARE 20A/1P BREAKER AT CIRCUIT INDICATED.
3. CONTROLLED RECEPTACLE: SPLIT-WIRE EACH DUPLEX RECEPTACLE FOR THE TOP RECEPTACLE TO BE AUTOMATICALLY SHUT-OFF, VIA OCCUPANCY SENSOR ENABLED RELAY. WHEN THE SPACE IS NOT OCCUPIED FOR A SET TIME PERIOD, AND THE BOTTOM RECEPTACLE TO BE UNSWITCHED. SEE DETAIL 3 ON SHEET E0.4.
4. INSTALL SALVAGED FA NOTIFICATION DEVICE IN NEW WALL, AND RECONNECT.




1 ELECTRICAL BASEMENT PLAN - WEST
1/8" = 1'-0"




2 ELECTRICAL BASEMENT PLAN - EAST
1/8" = 1'-0"



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**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ELECTRICAL BASEMENT PLAN - POWER AND SIGNAL**

DATE: 07.14.2026

SHEET: **E102**

**100% CONSTRUCTION DOCUMENTS**

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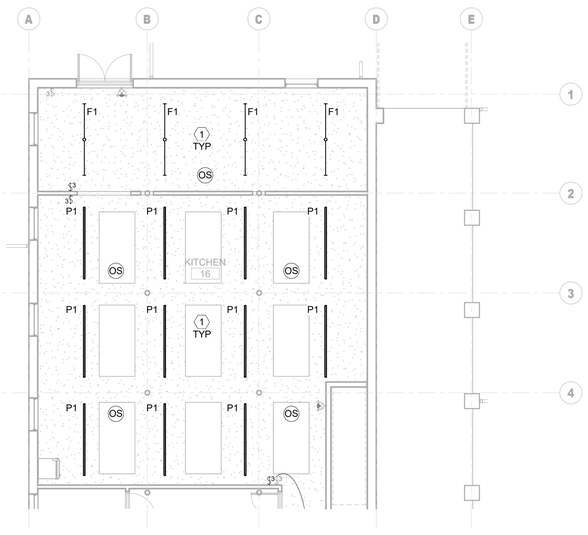
# LIGHTING PLAN GENERAL NOTES

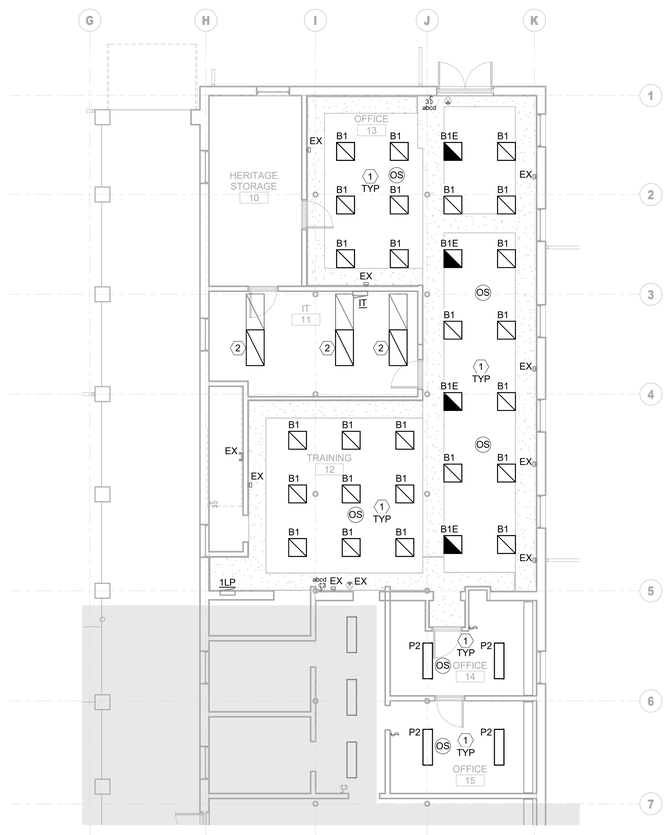
A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
C. LOW VOLTAGE CABLES (LIGHTING CONTROLS) ABOVE ACCESSIBLE CEILINGS SHALL BE SUPPORTED USING J-HOOKS AT INTERVALS NOT TO EXCEED 48" OC, UNO.

# # KEY NOTES:

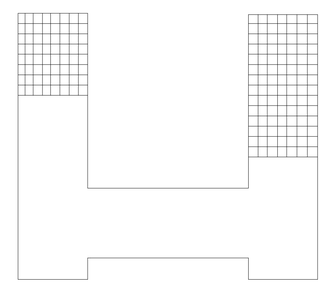
1. EXTEND SALVAGED LIGHTING CIRCUIT IN THIS SPACE TO NEW LIGHTING, VIA NEW CONTROLS FOR THE ASSOCIATED SPACE. SEE DETAIL 4 AND 5 ON SHEET E0.4. FOR PENDANT FIXTURES, MOUNT NEW LIGHTING IN SAME LOCATION AS DEMO'D LIGHTING, TO RE-USE EXISTING CEILING JBOX TO THE EXTENT POSSIBLE.
2. RE-INSTALL SALVAGED LUMINAIRE, AND EXTEND EXISTING LIGHTING CIRCUIT TO THE FIXTURE.




1 BASEMENT RCP - WEST
1/8" = 1'-0"




2 BASEMENT RCP - EAST
1/8" = 1'-0"



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**ELECTRICAL BASEMENT PLAN - LIGHTING**

DATE: 07.14.2026

SHEET: **E103**

DATE STAMP: 7/15/2026 11:37:15 AM

# ICT ABBREVIATIONS LEGEND

| | | | |
|---|---|---|---|
| AFC | ABOVE FINISHED CEILING | MMF | MULTI-MODE FIBER |
| ACT | ACOUSTICAL CEILING TILE | MUTOA | MULTI-USER TELECOMMUNICATIONS OUTLET ASSEMBLY |
| AFF | ABOVE FINISHED FLOOR | (N) | NEW |
| AFG | ABOVE FINISHED GRADE | NEC | NATIONAL ELECTRIC CODE |
| AHJ | AUTHORITY HAVING JURISDICTION | NEMA | NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION |
| AP | ACCESS POINT (WIRELESS, TYP.) | NIC | NOT IN CONTRACT |
| AV | AUDIO-VISUAL | NTS | NOT TO SCALE |
| AWG | AMERICAN WIRE GAUGE | O.C. | ON CENTER |
| BAS | BUILDING AUTOMATION SYSTEM | OFCI | OWNER FURNISHED, CONTRACTOR INSTALLED |
| C | CONDUIT | OFOI | OWNER FURNISHED, OWNER INSTALLED |
| CAT | CATEGORY | OH | OVERHEAD |
| CFCI | CONTRACTOR FURNISHED, CONTRACTOR INSTALLED | OSP | OUTSIDE PLANT CABLE |
| CFOI | CONTRACTOR FURNISHED, OWNER INSTALLED | PB | PULLBOX |
| CMP | COMMUNICATIONS PLENUM (RATED) | PBB | PRIMARY BONDING BUSBAR |
| CMR | COMMUNICATIONS RISER (RATED) | PEX | PRESS TO EXIT |
| CU | COPPER | PoE | POWER OVER ETHERNET |
| (D) | DEMOLISHED | PP | PATCH PANEL |
| DIM | DIMENSION | QEL | QUIET ELECTRIFIED LATCH |
| DMARC | DEMARCATION | QTY | QUANTITY |
| DPS | DOOR POSITION SWITCH | REQ | REQUIREMENT |
| (E), EX. | EXISTING | RM | ROOM |
| EA | EACH | REX | REQUEST TO EXIT |
| EC | ELECTRICAL CONTRACTOR (DIV 26) | SBB | SECONDARY BONDING BUSBAR |
| EF | ENTRANCE FACILITY | SMF | SINGLE-MODE FIBER |
| E.L. | ELECTRIFIED LATCH | SP | SERVICE PROVIDER |
| EMT | ELECTRICAL METALLIC TUBING | SPEC | SPECIFICATION |
| EPT | ELECTRIC POWER TRANSFER | STP | SHIELDED TWISTED PAIR |
| ER | EQUIPMENT ROOM | TR | TELECOM ROOM |
| FACP | FIRE ALARM CONTROL PANEL | TTB | TELEPHONE TERMINAL BOARD |
| FLR | FLOOR | TYP | TYPICAL |
| GND | GROUND | UG | UNDERGROUND |
| HT | HEIGHT/HIGH | UPS | UNINTERRUPTIBLE POWER SUPPLY |
| I/O | INDOOR/OUTDOOR | UNO | UNLESS NOTED OTHERWISE |
| ICT | INFORMATION AND COMMUNICATIONS TECHNOLOGY | UTP | UNSHIELDED TWISTED PAIR |
| IDS | INTRUSION DETECTION SYSTEM | VIF | VERIFY IN FIELD |
| IMC | INTERMEDIATE METAL CONDUIT | W/ | WITH |
| ISP | INTERNET SERVICE PROVIDER | W/O | WITHOUT |
| J-BOX | JUNCTION BOX | WAO | WORK AREA OUTLET |
| MFR | MANUFACTURER | WAP | WIRELESS ACCESS POINT |
| MH | MAINTENANCE HOLE | WP | WEATHERPROOF |
| MIN | MINIMUM | | |

# ABBREVIATIONS AND SYMBOLS GENERAL NOTES

A. THE ABBREVIATIONS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL ABBREVIATIONS APPEAR ON THIS PROJECT.
B. THE SYMBOLS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL SYMBOLS APPEAR ON THIS PROJECT.
C. ALL MOUNTING HEIGHTS ARE TO CENTER OF DEVICE ABOVE FINISHED FLOOR, UNLESS NOTED OTHERWISE. MOUNTING HEIGHTS INDICATED ON ARCHITECTURAL WALL ELEVATIONS OR AS NOTED SPECIFICALLY ON THE DRAWINGS OR IN THE SPECIFICATIONS SHALL TAKE PRECEDENCE OVER MOUNTING HEIGHTS LISTED.

# ICT PROJECT GENERAL NOTES

1. THIS PROJECT IS TO CONFORM TO THE LATEST LOCALLY ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE AND THE LATEST REVISION OF:
   *ANSI/TIA-526-7-A, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant, and its published addenda.*
   *ANSI/TIA-526-14-C, Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant, and its published addenda.*
   *ANSI/TIA-568.0-E, Generic Telecommunications Cabling for Customer Premises, and its published addenda.*
   *ANSI/TIA-568.1-E, Commercial Building Telecommunications Infrastructure Standard, and its published addenda.*
   *ANSI/TIA-568.2-E, Balanced Twisted-Pair Telecommunications Cabling and Components Standard, and its published addenda.*
   *ANSI/TIA-568.3-E, Optical Fiber Cabling and Components Standard, and its published addenda.*
   *ANSI/TIA-569-E, Telecommunications Pathways and Spaces, and its published addenda*
   *ANSI/TIA-598-D Optical Fiber Cable Color Coding*
   *ANSI/TIA-606-D, Administration Standard for Telecommunications Infrastructure, and its published addenda*
   *ANSI/TIA-607-D, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises, and its published addenda.*
   *ANSI/TIA-758-C, Customer Owned Outside-Plant Telecommunications Infrastructure Standard, and its published addenda.*
2. SEE SPECIFICATIONS FOR ADDITIONAL CONTRACTOR QUALIFICATIONS, PRODUCT INSTALLATION, AND QUALITY REQUIREMENTS.
3. ALL DIMENSIONS MUST BE VERIFIED IN THE FIELD AND ANY DEVIATIONS CAUSING CHANGES EXCEEDING 6 INCHES TO THE INTENDED LOCATION OF MAJOR TELECOMMUNICATIONS INFRASTRUCTURE COMPONENTS MUST BE COORDINATED WITH THE ARCHITECT AND DESIGNER PRIOR TO INSTALLATION.
4. ALL ICT DEVICES SHALL BE SECURELY MOUNTED PLUMB AND STRAIGHT TO WALLS, FLOORS, OR RACKS, PER THE MANUFACTURER'S RECOMMENDED MOUNTING PRACTICE, UNLESS OTHERWISE INDICATED IN THE ICT DRAWINGS.
5. ALL CABLES SHALL BE RATED FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED.
6. INSTALL FIRESTOP ASSEMBLIES IN ALL THROUGH-SLAB AND THROUGH-WALL PENETRATIONS FOR THE INSTALLATION OF ICT CABLING AS REQUIRED TO MAINTAIN FIRE RATING OF PENETRATED SLAB OR WALL. REVIEW DRAWINGS FOR PARTITION TYPE RATINGS. FIRESTOPPING SYSTEMS USED FOR ALL PENETRATIONS SHALL BE A UL LISTED ASSEMBLY AND APPROVED BY APPLICABLE AUTHORITIES HAVING JURISDICTION PRIOR TO INSTALLATION.
7. THE METHOD OF INSTALLATION FOR ALL ICT RELATED BACK BOXES IN WALLS AND THE METHOD FOR PASSAGE OF CONDUIT AND WIREWAYS THROUGH ACOUSTICALLY SENSITIVE WALLS SHALL BE COORDINATED WITH THE ACOUSTICAL CONSULTANT OR CONTRACTING OFFICER PRIOR TO INSTALLATION.
8. BOND ALL CONDUITS, CABLE TRAYS, AND JUNCTION BOXES PER ANSI/TIA-607-D IN ADDITION TO ANY APPLICABLE CODE REQUIREMENTS.
9. ALL ICT RELATED FLOOR BOXES, POKE THRU DEVICES, JUNCTION BOXES AND BACK BOXES SHOULD BE PROVIDED WITH AN EMPTY CONDUIT TO THE APPLICABLE TELECOMMUNICATIONS ROOM, CABLE TRAY PATHWAY OR PULL BOX. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL DETAILS.
10. CONDUIT ROUTES ON THE ICT DRAWINGS SHOW ONLY INTERCONNECTION BETWEEN THE TERMINATION POINTS AND APPROXIMATE ROUTES. THE EXACT ROUTE OF CONDUIT AND CABLE PATHWAYS ARE DETERMINED BY FIELD CONDITIONS AND VERIFIED BY INSTALLING CONTRACTOR.
11. NOTIFY THE DESIGNER OF ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE "T" (ICT) DRAWINGS. OBTAIN CLARIFICATION BEFORE PROCEEDING WITH WORK.
12. ALL PATHWAY AND RACEWAY INCLUDING CONDUIT SLEEVES, FLOOR BOXES, OUTLET BOXES AND CONDUIT BY ELECTRICAL, UNO.
13. ALL CABLES SHALL BE SUPPORTED EVERY 48" O.C. MAX. BY J-HOOKS, CABLE TRAY, OR IN CONDUIT.
14. ALL CABLES RUN IN CONDUIT UNDER SLAB SHALL BE INDOOR/OUTDOOR RATED CATEGORY 6A.
15. CABLE GAUGE AND NUMBER OF CONDUCTORS ARE SHOWN IN THE FORMAT: AWG/#
    (EX. 16/2 = 16 AWG / 2 CONDUCTOR)
16. CALL 811 PRIOR TO PERFORMING ANY EXCAVATION.

# CABLE ROUTING LEGEND

- HORIZONTAL CABLE PATHWAY
- BACKBONE CABLE PATHWAY
- BELOW GRADE
- CONDUIT OR CONDUIT SLEEVE. EMT, UNO.
- LADDER RACK OR CABLE TRAY, SEE PLANS FOR ADDITIONAL INFORMATION.
- VERTICAL TRANSITION BETWEEN FLOORS OR GRADE
- HORIZONTAL TRANSITION BETWEEN SHEETS AND/OR DETAILS
- J — JUNCTION BOX. 4" x 4" x 2-1/8", UNO.

# STRUCTURED CABLING LEGEND

- X — WORK AREA OUTLET - WALL MOUNT AT +18", UNO. "X" INDICATES NUMBER OF CATEGORY 6A JACKS, UNO. SEE NOTE 1.
- AP X — "AP" - WORK AREA OUTLET - WALL MOUNT WIRELESS ACCESS POINT. MOUNT AT +8' AFF, UNO. "X" INDICATES NUMBER OF CATEGORY 6A JACKS, UNO. SEE NOTE 1. WIRELESS ACCESS POINT PROVIDED BY CONTRACTING OFFICER.
- X — WORK AREA OUTLET - CEILING MOUNT. PROVIDE 15' SERVICE LOOP. "X" INDICATES NUMBER OF CATEGORY 6A JACKS, UNO. SEE NOTE 2.
- AP X — "AP" - WORK AREA OUTLET - CEILING MOUNT WIRELESS ACCESS POINT. "X" INDICATES NUMBER OF CATEGORY 6A JACKS. SEE NOTE 2. WIRELESS ACCESS POINT PROVIDED BY CONTRACTING OFFICER.
- X — WORK AREA OUTLET - FLOOR MOUNT. BOX AND CONDUIT PATHWAY PROVIDED BY ELECTRICAL CONTRACTOR. "X" INDICATES NUMBER OF CATEGORY 6A JACKS.

NOTE 1: PROVIDE 4" SQUARE BOX (2-1/8" DEEP) WITH SINGLE-GANG MUD RING & 1" EMT CONDUIT STUBBED UP TO ACCESSIBLE CEILING SPACE.

NOTE 2: IN LOCATIONS ABOVE T-BAR CEILING, TERMINATE IN BISCUIT STYLE HOUSING ABOVE CEILING TILE. LABEL HOUSING AND T-BAR RAIL. IN HARD LID CEILINGS, STUB 1" EMT CONDUIT FROM OUTLET TO NEAREST ACCESSIBLE CEILING SPACE

# SECURITY LEGEND

- CR — (E) CARD READER. CARD READER TO REMAIN, UNO.
- DPS — (E) DOOR POSITION SWITCH. DPS TO REMAIN, UNO.
- DR — (E) DOOR RELEASE BUTTON. DOOR RELEASE BUTTON TO REMAIN, UNO.

# ICT SHEET INDEX


| NUMBER | SHEET NAME |
|---|---|
| T001 | ICT SYMBOLS AND ABBREVIATIONS |
| T002 | ICT DETAILS |
| T003 | ICT SPECIFICATIONS |
| T004 | ICT SPECIFICATIONS |
| T101 | ICT BASEMENT DEMO PLAN |
| T102 | ICT BASEMENT PLAN |


DATE STAMP: 7/13/2026 4:42:07 PM

100% CONSTRUCTION DOCUMENTS


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engineers - surveyors - planners - scientists

MONTANA PAUL HEFFERNAN No. 91429 PE LICENSED PROFESSIONAL ENGINEER

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Bicsi
Paul Heffernan
BICSI ID # 357246
EXPIRES 12-31-26
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| # | DATE | REVISION |
|---|---|---|


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406.449.2013
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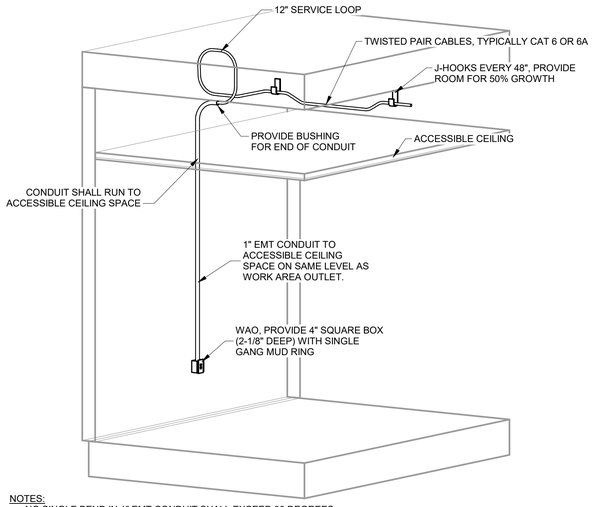
**BUILDING 24 BASEMENT REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ICT SYMBOLS AND ABBREVIATIONS**

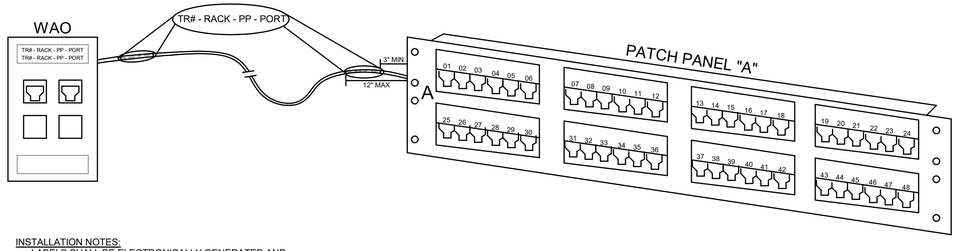
DATE: 07.14.2026

SHEET: **T001**




NOTES:
- NO SINGLE BEND IN 1" EMT CONDUIT SHALL EXCEED 90 DEGREES.
- THE AGGREGATE OF CONDUIT BENDS SHALL NOT EXCEED 180 DEGREES
- CONDUIT SHALL STUB TO CEILING SPACE ON SAME LEVEL AS WORK AREA OUTLET.

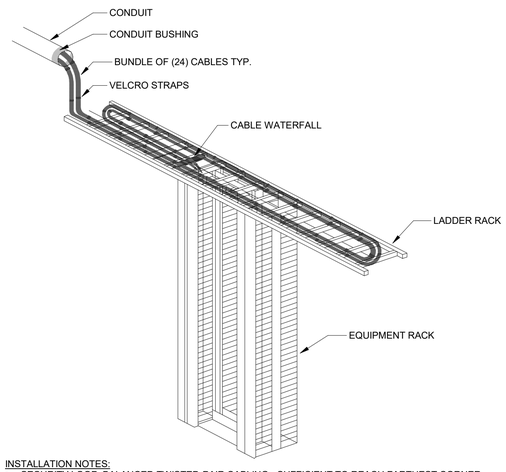
## 1 WORK AREA OUTLET DETAIL
N.T.S.




INSTALLATION NOTES:
- LABELS SHALL BE ELECTRONICALLY GENERATED AND:
  - PROVIDE VINYL SUBSTRATE WITH WHITE PRINTING AREA AND A CLEAR 'TAIL' THAT SELF LAMINATES THE PRINTED AREA WHEN WRAPPED AROUND THE PRINTED AREA. IF CABLE IS WHITE IN COLOR, A DIFFERENT COLOR SHALL BE USED.
- CONTRACTOR TO PROVIDE AND INSTALL TYPED LABEL ON EACH TELECOM ROOM, JACK, FACEPLATE, PATCH PANEL, AND AT EACH END OF EVERY CABLE INSTALLED BY THIS CONTRACTOR.
- LABEL EACH CABLE/WIRE WITHIN 12" OF EACH TERMINATION POINT, BUT ENSURE THAT AT LEAST 3" SHALL REMAIN BETWEEN LABEL AND TERMINATION POINT.
- CONTRACTOR SHALL SUBMIT AND REVIEW THE FINAL LABELING SCHEME WITH THE DESIGNER PRIOR TO INSTALLATION.
- LABELING SHALL FOLLOW ANSI/TIA-606-D, UNLESS THE CONTRACTING OFFICER SPECIFIES THEIR OWN LABELING REQUIREMENTS.

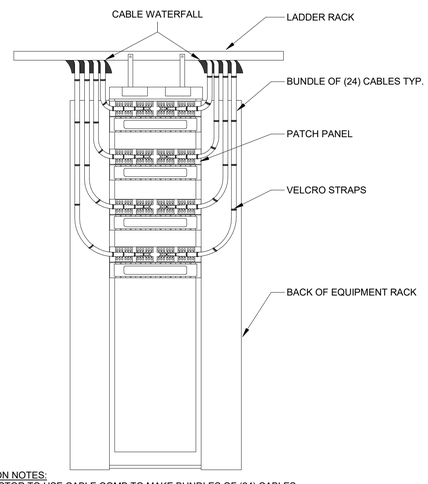
LABELING EXAMPLE:
- FOR A DUPLEX WAO THAT TERMINATES IN TR 01, RACK 2, PATCH PANEL C, PORTS 36 & 37: THE CORRESPONDING LABELS SHOULD LOOK LIKE 01-2-C-36 AND 01-2-C-37, RESPECTIVELY.
  - FOR TRs (TELECOMMUNICATIONS ROOMS) WITH A COMBINED TOTAL OF ONE TELECOMMUNICATIONS RACK AND/OR CABINET, THE RACK/CABINET IDENTIFIER MAY BE DROPPED FROM THE LABEL (I.E. "TR# - PP - PORT).

## 2 DATA CABLE LABELING DETAIL
N.T.S.



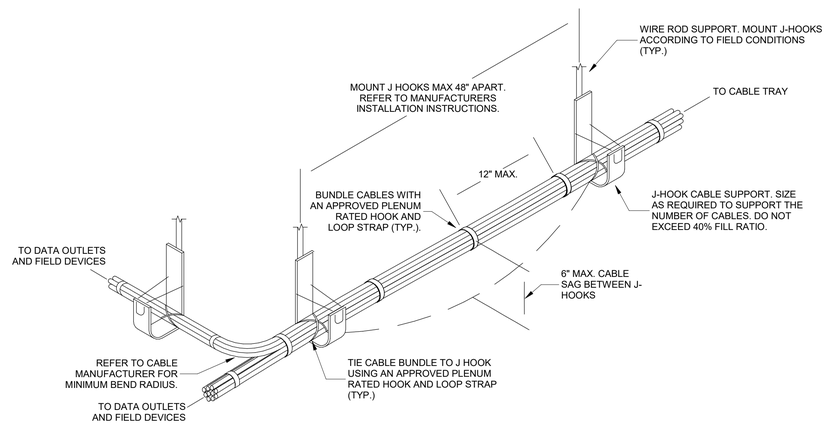

INSTALLATION NOTES:
- SECURITY LOOP: BALANCED TWISTED-PAIR CABLING - SUFFICIENT TO REACH FARTHEST CORNER OF THE TR VIA THE PATHWAYS PLUS THE DISTANCE FROM FLOOR TO CEILING WITHOUT EXCEEDING THE ~90m (295ft) LIMITATION.
- SECURITY LOOP: OPTICAL FIBER CABLING - SUFFICIENT TO REACH FARTHEST CORNER OF THE TR VIA THE PATHWAYS PLUS THE DISTANCE FROM FLOOR TO CEILING AND AN ADDITIONAL ~3m (10ft) OF SLACK FOR STORAGE INSIDE HARDWARE.
- CONTRACTOR TO MAKE BUNDLES OF (24) CABLES USING VELCRO STRAPS AND UTILIZING CABLE COMBS TO MAINTAIN ORGANIZED BUNDLES.
- CONTRACTOR TO PROVIDE AND INSTALL VELCRO STRAPS AROUND CABLE BUNDLES EVERY 12". CABLE TIES NOT ACCEPTED.
- BUNDLES TO HAVE ONLY CATEGORY 6 OR 6A CABLES. NO MIXING CATEGORY 6 WITH 6A IN SAME BUNDLE.

## 3 TYPICAL LADDER RACK
N.T.S.




INSTALLATION NOTES:
- CONTRACTOR TO USE CABLE COMB TO MAKE BUNDLES OF (24) CABLES.
- CONTRACTOR TO PROVIDE AND INSTALL VELCRO STRAPS AROUND CABLE BUNDLES EVERY 12". CABLE TIES NOT ACCEPTED.

## 4 CABLE MANAGEMENT DETAIL
N.T.S.




## 5 J-HOOK DETAIL
N.T.S.

Morrison Maierle
engineers - surveyors - planners - scientists

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**BUILDING 24 BASEMENT REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ICT DETAILS**

DATE: 07.14.2026

SHEET: **T002**

DATE STAMP: 7/13/2026 4:42:08 PM

**270528 - PATHWAYS FOR COMMUNICATIONS SYSTEMS**

**PART 1 - GENERAL**

1.1 ACTION SUBMITTALS
- A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT USED ON THIS PROJECT, PROVIDE CUT SHEET WITH HIGHLIGHTED PART NUMBER OF PRODUCT. A SEPARATE SUBMITTAL IS REQUIRED FOR EACH SPECIFICATION SECTION. DO NOT COMBINE OR MERGE SPECIFICATION SECTIONS.
- B. SHOP DRAWINGS: FOR CUSTOM ENCLOSURES AND CABINETS. INCLUDE PLANS, ELEVATIONS, SECTIONS, AND ATTACHMENT DETAILS.

**PART 2 - PRODUCTS**

2.1 METAL CONDUITS AND FITTINGS
- A. DESCRIPTION: METAL RACEWAY OF CIRCULAR CROSS SECTION WITH MANUFACTURER-FABRICATED FITTINGS.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. O-Z/GEDNEY; A BRAND OF EMERSON INDUSTRIAL AUTOMATION.
  2. SOUTHWIRE COMPANY.
  3. THOMAS & BETTS CORPORATION; A MEMBER OF THE ABB GROUP.
- C. GENERAL REQUIREMENTS FOR METAL CONDUITS AND FITTINGS:
  1. LISTED AND LABELED AS DEFINED IN NFPA 70, BY A NATIONALLY RECOGNIZED TESTING LABORATORY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
  2. COMPLY WITH TIA-569-E.
- D. GRC: COMPLY WITH ANSI C80.1 AND UL 6.
- E. ARC: COMPLY WITH ANSI C80.5 AND UL 6A.
- F. IMC: COMPLY WITH ANSI C80.6 AND UL 1242.
- G. PVC-COATED STEEL CONDUIT: PVC-COATED IMC.
  1. COMPLY WITH NEMA RN 1.
  2. COATING THICKNESS: 0.040 INCH (1 MM), MINIMUM.
- H. EMT: COMPLY WITH ANSI C80.3 AND UL 797.
- I. FITTINGS FOR METAL CONDUIT: COMPLY WITH NEMA FB 1 AND UL 514B.
  1. CONDUIT FITTINGS FOR HAZARDOUS (CLASSIFIED) LOCATIONS: COMPLY WITH UL 1203 AND NFPA 70.
  2. FITTINGS FOR EMT:
     - a. MATERIAL: STEEL
     - b. TYPE: SETSCREW
  3. EXPANSION FITTINGS: PVC OR STEEL TO MATCH CONDUIT TYPE, COMPLYING WITH UL-467, RATED FOR ENVIRONMENTAL CONDITIONS WHERE INSTALLED, AND INCLUDING FLEXIBLE EXTERNAL BONDING JUMPER.
  4. COATING FOR FITTINGS FOR PVC-COATED CONDUIT: MINIMUM THICKNESS OF 0.040 INCH (1 MM), WITH OVERLAPPING SLEEVES PROTECTING THREADED JOINTS.
- J. JOINT COMPOUND FOR IMC, GRC, OR ARC: APPROVED, AS DEFINED IN NFPA 70, BY AUTHORITIES HAVING JURISDICTION FOR USE IN CONDUIT ASSEMBLIES, AND COMPOUNDED FOR USE TO LUBRICATE AND PROTECT THREADED CONDUIT JOINTS FROM CORROSION AND TO ENHANCE THEIR CONDUCTIVITY.

2.2 NONMETALLIC CONDUITS AND FITTINGS
- A. DESCRIPTION: NONMETALLIC RACEWAY OF CIRCULAR SECTION WITH MANUFACTURER-FABRICATED FITTINGS.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. CARLON; A BRAND OF THOMAS & BETTS CORPORATION.
  2. DURA-LINE.
  3. RACO; HUBBELL.
- C. GENERAL REQUIREMENTS FOR NONMETALLIC CONDUITS AND FITTINGS:
  1. LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
  2. COMPLY WITH TIA-569-E.
- D. RNC: TYPE EPC-40-PVC TYPE EPC-80-PVC, COMPLYING WITH NEMA TC 2 AND UL 651 UNLESS OTHERWISE INDICATED.
- E. RIGID HDPE: COMPLY WITH UL 651A.
- F. CONTINUOUS HDPE: COMPLY WITH UL 651A.
- G. RTRC: COMPLY WITH UL 2515A AND NEMA TC 14.
  1. FITTINGS: COMPLY WITH NEMA TC 3; MATCH TO CONDUIT OR TUBING TYPE AND MATERIAL.
- H. SOLVENTS AND ADHESIVES: AS RECOMMENDED BY CONDUIT MANUFACTURER.

2.3 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS
- A. DESCRIPTION: COMPLY WITH UL 2024; FLEXIBLE-TYPE PATHWAY WITH A CIRCULAR CROSS SECTION, APPROVED FOR PLENUM OR RISER INSTALLATION UNLESS OTHERWISE INDICATED.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. CARLON; A BRAND OF THOMAS & BETTS CORPORATION.
  2. DURA-LINE.
  3. HUBBELL.

2.4 SURFACE METAL PATHWAYS
- A. DESCRIPTION: GALVANIZED STEEL WITH SNAP-ON COVERS, COMPLYING WITH UL 5.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. MONOSYSTEMS, INC.
  2. PANDUIT CORP.
  3. WIREMOLD / LEGRAND.
- C. LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- D. COMPLY WITH TIA-569-E.

2.5 SURFACE NONMETALLIC PATHWAYS:
- A. DESCRIPTION: TWO- OR THREE-PIECE CONSTRUCTION, COMPLYING WITH UL 5A, AND MANUFACTURED OF RIGID PVC.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. PANDUIT CORP.
  2. QUAZITE: HUBBELL POWER SYSTEMS, INC.
  3. WIREMOLD / LEGRAND.
- C. FINISH: TEXTURE AND COLOR DETERMINED AT TIME OF SUBMITTAL.
- D. LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- E. COMPLY WITH TIA-569-E.

2.6 J-HOOKS
- A. DESCRIPTION: PREFABRICATED SHEET METAL CABLE SUPPORTS FOR TELECOMMUNICATIONS CABLE.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. EATON, B-LINE.
  2. PANDUIT CORP.
  3. WIREMOLD / LEGRAND.
- C. LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- D. COMPLY WITH TIA-569-E.

2.7 BOXES, ENCLOSURES, AND CABINETS
- A. DESCRIPTION: ENCLOSURES FOR COMMUNICATIONS.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. O-Z/GEDNEY; A BRAND OF EMERSON INDUSTRIAL AUTOMATION.
  2. RACO; HUBBELL.
  3. THOMAS & BETTS CORPORATION; A MEMBER OF THE ABB GROUP.
- C. GENERAL REQUIREMENTS FOR BOXES, ENCLOSURES, AND CABINETS:
  1. COMPLY WITH TIA-569-E.
  2. BOXES, ENCLOSURES, AND CABINETS INSTALLED IN WET LOCATIONS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR USE IN WET LOCATIONS.
  3. BOX EXTENSIONS USED TO ACCOMMODATE NEW BUILDING FINISHES SHALL BE OF SAME MATERIAL AS RECESSED BOX.
  4. DEVICE BOX DIMENSIONS: 4 INCHES SQUARE BY 2-1/8 INCHES DEEP, WITH SINGLE GANG MUD RING, U.N.O.

**270528 - PATHWAYS FOR COMMUNICATIONS SYSTEMS (CONTINUED)**
- D. SMALL SHEET METAL PULL AND JUNCTION BOXES: NEMA OS 1.
- E. NONMETALLIC OUTLET AND DEVICE BOXES: COMPLY WITH NEMA OS 2 AND UL 514C.
- F. HINGED-COVER ENCLOSURES: COMPLY WITH UL 50 AND NEMA 250, TYPE 3R, WITH CONTINUOUS-HINGE COVER WITH FLUSH LATCH UNLESS OTHERWISE INDICATED.
  1. METAL ENCLOSURES: STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.
  2. NONMETALLIC ENCLOSURES:
     - a. MATERIAL: FIBERGLASS.
     - b. FINISHED INSIDE WITH RADIO-FREQUENCY-RESISTANT PAINT.
  3. INTERIOR PANELS: STEEL; ALL SIDES FINISHED WITH MANUFACTURER'S STANDARD ENAMEL.

2.8 POLYMER-CONCRETE HANDHOLES
- A. DESCRIPTION: MOLDED OF SAND AND AGGREGATE; BOUND TOGETHER WITH POLYMER RESIN; AND REINFORCED WITH STEEL, FIBERGLASS, OR A COMBINATION OF THE TWO.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. HYPERLINK "HTTP://WWW.SPECAGENT.COM/LOOKUP?ULID=123457067061" ARMORCAST PRODUCTS COMPANY.
  2. HYPERLINK "HTTP://WWW.SPECAGENT.COM/LOOKUP?ULID=123457067063" NEWBASIS.
  3. QUAZITE: HUBBELL POWER SYSTEMS, INC.
- C. GENERAL REQUIREMENTS FOR POLYMER CONCRETE HANDHOLES:
  1. BOXES AND HANDHOLES FOR USE IN UNDERGROUND SYSTEMS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
  2. BOXES INSTALLED IN WET AREAS SHALL BE LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
  3. COMPLY WITH TIA-569-E.
- D. CONFIGURATION: DESIGNED FOR FLUSH BURIAL WITH OPEN BOTTOM UNLESS OTHERWISE INDICATED.
- E. COVER: WEATHERPROOF, SECURED BY TAMPER-RESISTANT LOCKING DEVICES AND HAVING STRUCTURAL LOAD RATING CONSISTENT WITH ENCLOSURE AND HANDHOLE LOCATION.
  1. COVER FINISH: NONSKID FINISH SHALL HAVE A MINIMUM COEFFICIENT OF FRICTION OF 0.50.
  2. COVER LEGEND: MOLDED LETTERING, "COMMUNICATIONS".

2.9 CABLE TRAYS
- A. DESCRIPTION: WIRE MESH BASKET CABLE SUPPORT FOR TELECOMMUNICATIONS CABLE.
- B. HYPERLINK "HTTP://WWW.SPECAGENT.COM/LOOKUP?ULID=12517" MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. EATON, B-LINE.
  2. HYPERLINK "HTTP://WWW.SPECAGENT.COM/LOOKUP?ULID=123457067039" PANDUIT CORP.
  3. WIREMOLD / LEGRAND.
- C. LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- D. COMPLY WITH TIA-569-E.

2.10 LADDER RACK
- A. DESCRIPTION: RAIL/RUNG STYLE CABLE SUPPORT FOR TELECOMMUNICATIONS CABLE.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
  1. EATON, B-LINE.
  2. HYPERLINK "HTTP://WWW.SPECAGENT.COM/LOOKUP?ULID=123457067039" PANDUIT CORP.
  3. CHATSWORTH.
- C. LISTED AND LABELED AS DEFINED IN NFPA 70, BY AN NRTL, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- D. COMPLY WITH TIA-569-E.

**PART 3 - EXECUTION**

3.1 PATHWAY APPLICATION
- A. MINIMUM PATHWAY SIZE: REFER TO DRAWINGS.
- B. PATHWAY FITTINGS: COMPATIBLE WITH PATHWAYS AND SUITABLE FOR USE AND LOCATION.
- C. DO NOT INSTALL ALUMINUM CONDUITS, BOXES, OR FITTINGS IN CONTACT WITH CONCRETE OR EARTH.
- D. INSTALL SURFACE PATHWAYS ONLY WHERE INDICATED ON DRAWINGS.
- E. DO NOT INSTALL NONMETALLIC CONDUIT WHERE AMBIENT TEMPERATURE EXCEEDS 120 DEG F.

3.2 INSTALLATION
- A. COMPLY WITH THE FOLLOWING STANDARDS FOR INSTALLATION REQUIREMENTS EXCEPT WHERE REQUIREMENTS ON DRAWINGS OR IN THIS SECTION ARE STRICTER:
  1. NECA 1.
  2. TIA-569-E.
  3. NECA 101.
  4. NECA 102.
  5. NECA 105.
  6. NECA 111.
- B. COMPLY WITH NFPA 70 LIMITATIONS FOR TYPES OF PATHWAYS ALLOWED IN SPECIFIC OCCUPANCIES AND NUMBER OF FLOORS.
- C. KEEP PATHWAYS AT LEAST 12 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZONTAL PATHWAY RUNS ABOVE WATER AND STEAM PIPING.
- D. COMPLETE PATHWAY INSTALLATION BEFORE STARTING CONDUCTOR INSTALLATION.
- E. INSTALL NO MORE THAN THE EQUIVALENT OF 180-DEGREE BENDS IN ANY PATHWAY RUN. PROVIDE JUNCTION BOX AT LOCATIONS EXCEEDING 180-DEGREE BENDS. SUPPORT WITHIN 12 INCHES OF CHANGES IN DIRECTION. UTILIZE LONG RADIUS ELBOWS FOR ALL OPTICAL-FIBER CABLES.
- F. CONCEAL RIGID CONDUIT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS UNLESS OTHERWISE INDICATED. INSTALL CONDUITS PARALLEL OR PERPENDICULAR TO BUILDING LINES.
- G. SUPPORT CONDUIT WITHIN 12 INCHES OF ENCLOSURES TO WHICH ATTACHED.
- H. PATHWAYS EMBEDDED IN SLABS:
  1. RUN CONDUIT LARGER THAN 1-INCH TRADE SIZE, PARALLEL OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT. SECURE PATHWAYS TO REINFORCEMENT AT MAXIMUM 10-FOOT INTERVALS.
  2. ARRANGE PATHWAYS TO CROSS BUILDING EXPANSION JOINTS AT RIGHT ANGLES WITH EXPANSION FITTINGS. COMPLY WITH REQUIREMENTS FOR EXPANSION JOINTS SPECIFIED IN THIS ARTICLE.
  3. ARRANGE PATHWAYS TO KEEP A MINIMUM OF 1 INCH OF CONCRETE COVER IN ALL DIRECTIONS.
  4. DO NOT EMBED THREADLESS FITTINGS IN CONCRETE UNLESS SPECIFICALLY APPROVED BY ARCHITECT FOR EACH SPECIFIC LOCATION.
- I. STUB-UPS TO ABOVE RECESSED CEILINGS:
  1. USE EMT, IMC, OR RMC FOR PATHWAYS.
  2. USE A CONDUIT BUSHING OR INSULATED FITTING TO TERMINATE STUB-UPS NOT TERMINATED IN HUBS OR IN AN ENCLOSURE.

**270528 - PATHWAYS FOR COMMUNICATIONS SYSTEMS (CONTINUED)**
- J. THREADED CONDUIT JOINTS, EXPOSED TO WET, DAMP, CORROSIVE, OR OUTDOOR CONDITIONS: APPLY LISTED COMPOUND TO THREADS OF PATHWAY AND FITTINGS BEFORE MAKING UP JOINTS. FOLLOW COMPOUND MANUFACTURER'S WRITTEN INSTRUCTIONS.
- K. COAT FIELD-CUT THREADS ON PVC-COATED PATHWAY WITH A CORROSION-PREVENTING CONDUCTIVE COMPOUND PRIOR TO ASSEMBLY.
- L. DO NOT RELY ON LOCKNUTS TO PENETRATE NONCONDUCTIVE COATINGS ON ENCLOSURES. REMOVE COATINGS IN THE LOCKNUT AREA PRIOR TO ASSEMBLING CONDUIT TO ENCLOSURE, TO ASSURE A CONTINUOUS GROUND PATH.
- M. CUT CONDUIT PERPENDICULAR TO THE LENGTH. FOR CONDUITS OF 2-INCH TRADE SIZE AND LARGER, USE ROLL CUTTER OR A GUIDE TO ENSURE CUT IS STRAIGHT AND PERPENDICULAR TO THE LENGTH.
- N. INSTALL PULL WIRES IN EMPTY PATHWAYS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE AT LEAST 12 INCHES OF SLACK AT EACH END OF PULL WIRE. SECURE PULL WIRE, SO IT CANNOT FALL INTO CONDUIT. CAP PATHWAYS DESIGNATED AS SPARE ALONGSIDE PATHWAYS IN USE.
- O. SURFACE PATHWAYS:
  1. INSTALL SURFACE PATHWAY FOR SURFACE TELECOMMUNICATIONS OUTLET BOXES ONLY WHERE INDICATED ON DRAWINGS.
  2. INSTALL SURFACE PATHWAY WITH A MINIMUM 2-INCH RADIUS CONTROL AT BEND POINTS.
  3. SECURE SURFACE PATHWAY WITH SCREWS OR OTHER ANCHOR-TYPE DEVICES AT INTERVALS NOT EXCEEDING 48 INCHES AND WITH NO LESS THAN TWO SUPPORTS PER STRAIGHT PATHWAY SECTION. SUPPORT SURFACE PATHWAY ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. TAPE AND GLUE ARE NOT ACCEPTABLE SUPPORT METHODS.
- P. PATHWAYS FOR OPTICAL-FIBER AND COMMUNICATIONS CABLE: INSTALL PATHWAYS, METAL AND NONMETALLIC, RIGID AND FLEXIBLE, AS FOLLOWS:
  1. 1-INCH TRADE SIZE AND LARGER: INSTALL PATHWAYS IN MAXIMUM LENGTHS OF 75 FEET.
  2. INSTALL WITH A MAXIMUM OF TWO 90-DEGREE BENDS OR EQUIVALENT FOR EACH LENGTH OF PATHWAY UNLESS DRAWINGS SHOW STRICTER REQUIREMENTS. SEPARATE LENGTHS WITH PULL OR JUNCTION BOXES OR TERMINATIONS AT DISTRIBUTION FRAMES OR CABINETS WHERE NECESSARY TO COMPLY WITH THESE REQUIREMENTS.
- Q. INSTALL PATHWAY-SEALING FITTINGS AT ACCESSIBLE LOCATIONS ACCORDING TO NFPA 70 AND FILL THEM WITH LISTED SEALING COMPOUND. FOR CONCEALED PATHWAYS, INSTALL EACH FITTING IN A FLUSH STEEL BOX WITH A BLANK COVER PLATE HAVING A FINISH SIMILAR TO THAT OF ADJACENT PLATES OR SURFACES. INSTALL PATHWAY-SEALING FITTINGS ACCORDING TO NFPA 70.
- R. INSTALL DEVICES TO SEAL PATHWAY INTERIORS AT ACCESSIBLE LOCATIONS. LOCATE SEALS, SO NO FITTINGS OR BOXES ARE BETWEEN THE SEAL AND THE FOLLOWING CHANGES OF ENVIRONMENTS. SEAL THE INTERIOR OF ALL PATHWAYS AT THE FOLLOWING POINTS:
  1. WHERE CONDUITS PASS FROM WARM TO COLD LOCATIONS, SUCH AS BOUNDARIES OF REFRIGERATED SPACES.
  2. WHERE AN UNDERGROUND SERVICE PATHWAY ENTERS A BUILDING OR STRUCTURE.
  3. WHERE OTHERWISE REQUIRED BY NFPA 70.
- S. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SOLVENT WELDING PVC CONDUIT AND FITTINGS.
- T. J-HOOKS:
  1. SIZE TO ALLOW A MINIMUM OF 25 PERCENT FUTURE CAPACITY WITHOUT EXCEEDING DESIGN CAPACITY LIMITS.
  2. SHALL BE SUPPORTED BY DEDICATED SUPPORT WIRES. DO NOT USE CEILING GRID SUPPORT WIRE OR SUPPORT RODS.
  3. HOOK SPACING SHALL ALLOW NO MORE THAN 6 INCHES OF SLACK. THE LOWEST POINT OF THE CABLES SHALL BE NO LESS THAN 6 INCHES ADJACENT TO CEILINGS, MECHANICAL DUCTWORK AND FITTINGS, LUMINAIRES, POWER CONDUITS, POWER AND TELECOMMUNICATIONS OUTLETS, AND OTHER ELECTRICAL AND COMMUNICATIONS EQUIPMENT.
  4. SPACE HOOKS NO MORE THAN 4 FEET O.C.
  5. PROVIDE A HOOK AT EACH CHANGE IN DIRECTION.
- U. MOUNT BOXES AT HEIGHTS INDICATED ON DRAWINGS. INSTALL BOXES WITH HEIGHT MEASURED TO CENTER OF BOX UNLESS OTHERWISE INDICATED.
- V. RECESSED BOXES IN MASONRY WALLS: SAW-CUT OPENING FOR BOX IN CENTER OF CELL OF MASONRY BLOCK, AND INSTALL BOX FLUSH WITH SURFACE OF WALL. PREPARE BLOCK SURFACE TO PROVIDE A FLAT SURFACE FOR A RAINTIGHT CONNECTION BETWEEN BOX AND COVER PLATE OR SUPPORTED EQUIPMENT AND BOX.
- W. HORIZONTALLY SEPARATE BOXES MOUNTED ON OPPOSITE SIDES OF WALLS, SO THEY ARE NOT IN THE SAME VERTICAL CHANNEL.
- X. FASTEN JUNCTION AND PULL BOXES TO OR SUPPORT FROM BUILDING STRUCTURE. DO NOT SUPPORT BOXES BY CONDUITS.
- Y. SET METAL FLOOR BOXES LEVEL AND FLUSH WITH FINISHED FLOOR SURFACE.
- Z. SET NONMETALLIC FLOOR BOXES LEVEL. TRIM AFTER INSTALLATION TO FIT FLUSH WITH FINISHED FLOOR SURFACE.

3.3 INSTALLATION OF UNDERGROUND CONDUIT
- A. DIRECT-BURIED CONDUIT:
  1. EXCAVATE TRENCH BOTTOM TO PROVIDE FIRM AND UNIFORM SUPPORT FOR CONDUIT. INSTALL BACKFILL.
  2. AFTER INSTALLING CONDUIT, BACKFILL AND COMPACT.
  3. INSTALL MANUFACTURED DUCT ELBOWS FOR STUB-UPS AT POLES AND EQUIPMENT AND AT BUILDING ENTRANCES THROUGH FLOOR UNLESS OTHERWISE INDICATED. INSTALL MANUFACTURED RIGID STEEL CONDUIT ELBOWS FOR STUB-UPS AT POLES AND EQUIPMENT AND AT BUILDING ENTRANCES THROUGH FLOOR.
     - a. COUPLE STEEL CONDUITS TO DUCTS WITH ADAPTERS DESIGNED FOR THIS PURPOSE, AND ENCASE COUPLING WITH 3 INCHES OF CONCRETE AROUND CONDUIT FOR A MINIMUM OF 12 INCHES ON EACH SIDE OF THE COUPLING.
     - b. FOR STUB-UPS AT EQUIPMENT MOUNTED ON OUTDOOR CONCRETE BASES AND WHERE CONDUITS PENETRATE BUILDING FOUNDATIONS, EXTEND STEEL CONDUIT HORIZONTALLY A MINIMUM OF 60 INCHES FROM EDGE OF FOUNDATION OR EQUIPMENT BASE. INSTALL INSULATED GROUNDING BUSHINGS ON TERMINATIONS AT EQUIPMENT.
  4. UNDERGROUND WARNING TAPE: PROVIDE WARNING TAPE 12" ABOVE TRENCHED CONDUIT.

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES
- A. INSTALL HANDHOLES AND BOXES LEVEL AND PLUMB AND WITH ORIENTATION AND DEPTH COORDINATED WITH CONNECTING CONDUITS TO MINIMIZE BENDS AND DEFLECTIONS REQUIRED FOR PROPER ENTRANCES.
- B. UNLESS OTHERWISE INDICATED, SUPPORT UNITS ON A LEVEL BED OF CRUSHED STONE OR GRAVEL, GRADED FROM 1/2-INCH SIEVE TO NO. 4 SIEVE AND COMPACTED TO SAME DENSITY AS ADJACENT UNDISTURBED EARTH.
- C. ELEVATION: IN PAVED AREAS, SET SO COVER SURFACE WILL BE FLUSH WITH FINISHED GRADE. SET COVERS OF OTHER ENCLOSURES 1 INCH ABOVE FINISHED GRADE.
- D. FIELD CUT OPENINGS FOR CONDUITS ACCORDING TO ENCLOSURE MANUFACTURER'S WRITTEN INSTRUCTIONS. CUT WALL OF ENCLOSURE WITH A TOOL DESIGNED FOR MATERIAL TO BE CUT. SIZE HOLES FOR TERMINATING FITTINGS TO BE USED, AND SEAL AROUND PENETRATIONS AFTER FITTINGS ARE INSTALLED.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS
- A. INSTALL SLEEVES AND SLEEVE SEALS AT PENETRATIONS OF EXTERIOR FLOOR AND WALL ASSEMBLIES.

3.6 FIRESTOPPING
- A. INSTALL FIRESTOPPING AT PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES.

3.7 PROTECTION
- A. PROTECT COATINGS, FINISHES, AND CABINETS FROM DAMAGE OR DETERIORATION.
  1. REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER.

REPAIR DAMAGE TO PVC COATINGS OR PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER

**271513 - COMMUNICATIONS COPPER HORIZONTAL CABLING**

SUMMARY
- A. SECTION INCLUDES:
  1. CATEGORY 6 TWISTED PAIR CABLE.
  2. CATEGORY 6A TWISTED PAIR CABLE.
  3. TWISTED PAIR CABLE HARDWARE, INCLUDING PLUGS AND JACKS.
  4. CABLE MANAGEMENT SYSTEM.
  5. GROUNDING PROVISIONS FOR TWISTED PAIR CABLE.
- B. COPPER HORIZONTAL CABLING DESCRIPTION
  1. THE MAXIMUM ALLOWABLE HORIZONTAL CABLE LENGTH IS 90 METERS. THIS MAXIMUM ALLOWABLE LENGTH DOES NOT INCLUDE AN ALLOWANCE FOR THE LENGTH OF 10 METERS USED FOR PATCHING.
- C. ACTION SUBMITTALS
  1. PRODUCT DATA: FOR EACH TYPE OF PRODUCT USED ON THIS PROJECT, PROVIDE CUT SHEET WITH HIGHLIGHTED PART NUMBER OF PRODUCT. A SEPARATE SUBMITTAL IS REQUIRED FOR EACH SPECIFICATION SECTION. DO NOT COMBINE OR MERGE SPECIFICATION SECTIONS.
  2. SUBMITTAL REQUIRES EXAMPLE WORK AREA OUTLET LABELING SCHEME AND PHYSICAL CABLE LABELS TO BE USED ON PROJECT.
- D. CLOSEOUT SUBMITTALS
  1. MAINTENANCE DATA.
  2. AS-BUILT DRAWINGS
  3. TEST RESULTS
  4. WARRANTY CERTIFICATE
- E. INSTALLER QUALIFICATIONS
  1. INSTALLER QUALIFICATIONS: DIVISION 27 SUB-CONTRACTOR SHALL BE A MANUFACTURER CERTIFIED CONTRACTOR AND WILL BE REQUIRED TO PROVIDE A MINIMUM 25-YEAR PERFORMANCE WARRANTY ON PARTS AND LABOR FOR ALL CATEGORY 6 AND CATEGORY 6A CABLING AND SYSTEMS. PROOF OF THE SUB-CONTRACTOR'S ABILITY TO PROVIDE SUCH A WARRANTY SHALL BE SUBMITTED TO THE GENERAL CONTRACTOR AT THE TIME OF BIDDING AND TO THE CONTRACTING OFFICER PRIOR TO THE NOTICE TO PROCEED. THIS WARRANTY SHALL COVER THE PATCH PANELS, HORIZONTAL CABLING, WORK AREA OUTLETS, AND PATCH CORDS.
  2. CONTRACTOR SHALL EMPLOY, IN CONJUNCTION WITH CONSTRUCTION OF THE PROJECT, A CAPABLE, EXPERIENCED, AND RELIABLE FOREPERSON AND SUCH SKILLED WORKERS AS MAY BE REQUIRED FOR THE VARIOUS CLASSES OF WORK TO BE PERFORMED. CONTRACTOR SHALL BE REQUIRED TO SUBMIT EVIDENCE OF FOREPERSON'S SKILLED EXPERIENCE ON ANSI/TIA CERTIFIED FIBER OPTIC SYSTEMS. EVIDENCE OF EXPERIENCE SHALL BE SUBMITTED TO THE CONTRACTING OFFICER WITH SUBMITTAL OF BID. MINIMUM EXPERIENCE FOR ANY WORKMAN INVOLVED IN CABLING WORK SHALL BE CABLE PULLING AND TERMINATION WORK ON PROJECTS FOR A MINIMUM OF 5 YEARS AND COMPLETION OF TRAINING (40 HRS. MINIMUM) WHICH CERTIFIES THE PERSON'S WORK IN COPPER CABLING INSTALLATIONS. TRAINING CAN BE A COMBINATION OF BICSI AND MANUFACTURER TRAINING.

PRODUCTS
- A. CATEGORY 6A TWISTED PAIR CABLE
  1. DESCRIPTION: FOUR-PAIR, BALANCED-TWISTED PAIR CABLE, CERTIFIED TO MEET TRANSMISSION CHARACTERISTICS OF CATEGORY 6A CABLE AT FREQUENCIES UP TO 500MHZ. SEE DRAWINGS FOR ADDITIONAL DETAILS.
  2. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE THE FOLLOWING:
     - a. COMMSCOPE, INC.
     - b. LEVITON.
     - c. THE SIEMON COMPANY.
  3. STANDARD: COMPLY WITH TIA-568.2-E FOR CATEGORY 6A CABLES.
  4. CONDUCTORS: 100-OHM, 23 AWG SOLID COPPER.
  5. SHIELDING/SCREENING: UNSHIELDED TWISTED PAIRS (UTP)
  6. CABLE RATING: RISER.
  7. JACKET: BLUE.
- B. TWISTED PAIR CABLE HARDWARE
  1. DESCRIPTION: HARDWARE DESIGNED TO CONNECT, SPLICE, AND TERMINATE TWISTED PAIR COPPER COMMUNICATIONS CABLE.
  2. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
     1. COMMSCOPE, INC.
     2. LEVITON.
     3. THE SIEMON COMPANY.
  3. GENERAL REQUIREMENTS FOR TWISTED PAIR CABLE HARDWARE:
     1. COMPLY WITH THE PERFORMANCE REQUIREMENTS OF CATEGORY 6.
     2. COMPLY WITH TIA-568.2-E, IDC TYPE, WITH MODULES DESIGNED FOR PUNCH-DOWN CAPS OR TOOLS.
     3. CABLES SHALL BE TERMINATED WITH CONNECTING HARDWARE OF SAME CATEGORY OR HIGHER.
  4. PATCH PANEL: MODULAR PANELS HOUSING NUMBERED JACK UNITS WITH IDC-TYPE CONNECTORS AT EACH JACK LOCATION FOR PERMANENT TERMINATION OF PAIR GROUPS OF INSTALLED CABLES.
     1. FEATURES:
        - a. UNIVERSAL T568A AND T568B WIRING LABELS.
        - b. LABELING AREAS ADJACENT TO CONDUCTORS.
        - c. REPLACEABLE CONNECTORS.
        - d. 48 PORTS.
     2. CONSTRUCTION: 16-GAUGE STEEL AND MOUNTABLE ON 19-INCH EQUIPMENT RACKS.
     3. NUMBER OF JACKS PER PANEL: 48.
  5. PATCH CORDS: PROVIDE ONE FACTORY TERMINATED CATEGORY 6A PATCH CORD FOR EACH HORIZONTAL CABLE TERMINATED WITHIN THE PATCH PANELS. THE PATCH CABLE LENGTHS SHALL BE FIELD MEASURED BEFORE ORDERING (TYPICAL LENGTHS ARE 3' AND 5'). PROVIDE TWO FACTORY TERMINATED CATEGORY 6A PATCH CORD FOR EACH DUPLEX OUTLET INDICATED ON THE PLANS AND FOUR FOR EACH QUAD OUTLET INDICATED ON THE PLANS. THE PATCH CABLE LENGTHS SHALL BE FIELD MEASURED BEFORE ORDERING (TYPICAL LENGTHS ARE 5' – 9').
     1. PATCH CORDS SHALL HAVE BEND-RELIEF-COMPLIANT BOOTS AND COLOR-CODED ICONS TO ENSURE PERFORMANCE. PATCH CORDS SHALL HAVE LATCH GUARDS TO PROTECT AGAINST SNAGGING.
     2. PATCH CORDS TO BE 28 AWG, UNO.
        - A. PERMANENT LINKS THAT EXCEED 83 METERS SHALL USE 24 AWG PATCH CORDS.
     3. PROVIDE ALL PATCHING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
  6. PLUGS AND PLUG ASSEMBLIES:
     1. MALE; EIGHT POSITION; COLOR-CODED MODULAR TELECOMMUNICATIONS CONNECTOR DESIGNED FOR TERMINATION OF A SINGLE FOUR-PAIR, 100-OHM, UNSHIELDED OR SHIELDED TWISTED PAIR CABLE.
     2. STANDARD: COMPLY WITH TIA-568.2-E.
     3. MARKED TO INDICATE TRANSMISSION PERFORMANCE.
  7. JACKS AND JACK ASSEMBLIES:
     1. FEMALE; EIGHT POSITION; MODULAR; FIXED TELECOMMUNICATIONS CONNECTOR DESIGNED FOR TERMINATION OF A SINGLE FOUR-PAIR, 100-OHM, UNSHIELDED OR SHIELDED TWISTED PAIR CABLE.
     2. DESIGNED TO SNAP-IN TO A PATCH PANEL OR FACEPLATE.
     3. STANDARD: COMPLY WITH TIA-568.2-E.
     4. MARKED TO INDICATE TRANSMISSION PERFORMANCE.
     5. COLOR TO BE DETERMINED AT TIME OF SUBMITTAL

**271700 - TESTING IDENTIFICATION AND ADMINISTRATION OF BALANCED TWISTED PAIR INFRASTRUCTURE**

**PART 1 - GENERAL**

1.1 WORK INCLUDED
- A. PROVIDE ALL LABOR, MATERIALS, TOOLS, FIELD-TEST INSTRUMENTS AND EQUIPMENT REQUIRED FOR THE COMPLETE TESTING, IDENTIFICATION AND ADMINISTRATION OF THE WORK CALLED FOR IN THE CONTRACT DOCUMENTS.
- B. IN ORDER TO CONFORM TO THE OVERALL PROJECT EVENT SCHEDULE, THE CABLING CONTRACTOR SHALL SURVEY THE WORK AREAS AND COORDINATE CABLING TESTING WITH OTHER APPLICABLE TRADES.
- C. IN ADDITION TO THE TESTS DETAILED IN THIS DOCUMENT, THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER OF ANY ADDITIONAL TESTS THAT ARE DEEMED NECESSARY TO GUARANTEE A FULLY FUNCTIONAL SYSTEM. THE CONTRACTOR SHALL CARRY OUT AND RECORD ANY ADDITIONAL MEASUREMENT RESULTS AT NO ADDITIONAL CHARGE.

1.2 SCOPE
- A. THIS SECTION INCLUDES THE MINIMUM REQUIREMENTS FOR THE TEST CERTIFICATION, IDENTIFICATION AND ADMINISTRATION OF HORIZONTAL BALANCED TWISTED PAIR CABLING.
- B. THIS SECTION INCLUDES MINIMUM REQUIREMENTS FOR:
  1. COPPER CABLING TEST INSTRUMENTS
  2. COPPER CABLING TESTING
  3. IDENTIFICATION
     - a. LABELS AND LABELING
  4. ADMINISTRATION
  5. TEST RESULTS DOCUMENTATION
  6. AS-BUILT DRAWINGS
- C. TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH THIS DOCUMENT.
- D. TESTING SHALL BE PERFORMED ON EACH CABLING LINK. (100% TESTING)
- E. ALL TESTS SHALL BE DOCUMENTED.

1.3 QUALITY ASSURANCE
- A. ALL TESTING PROCEDURES AND FIELD-TEST INSTRUMENTS SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF:
  1. ANSI/TIA-1152, REQUIREMENTS FOR FIELD TEST INSTRUMENTS AND MEASUREMENTS FOR BALANCED TWISTED-PAIR CABLING
  2. ANSI/TIA-568.0-E, GENERIC TELECOMMUNICATIONS CABLING FOR CUSTOMER PREMISES.
  3. ANSI/TIA-568.1-E, COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD
  4. ANSI/TIA-568.2-E, BALANCED TWISTED-PAIR TELECOMMUNICATIONS CABLING AND COMPONENTS STANDARDS.
  5. ANSI/TIA-606-D, ADMINISTRATION STANDARD FOR COMMERCIAL TELECOMMUNICATIONS INFRASTRUCTURE, INCLUDING THE REQUIREMENTS SPECIFIED BY THE CUSTOMER, UNLESS THE CUSTOMER SPECIFIES THEIR OWN LABELING REQUIREMENTS.
- B. TRAINED TECHNICIANS WHO HAVE SUCCESSFULLY ATTENDED AN APPROPRIATE TRAINING PROGRAM AND HAVE OBTAINED A CERTIFICATE AS PROOF THEREOF SHALL EXECUTE THE TESTS. THESE CERTIFICATES MAY HAVE BEEN ISSUED BY ANY OF THE FOLLOWING ORGANIZATIONS OR AN EQUIVALENT ORGANIZATION:
  1. MANUFACTURER OF THE CONNECTORS OR CABLE.
  2. MANUFACTURER OF THE TEST EQUIPMENT USED FOR THE FIELD CERTIFICATION.
  3. TRAINING ORGANIZATIONS (E.G., BICSI, A TELECOMMUNICATIONS ASSOCIATION HEADQUARTERS IN TAMPA, FLORIDA; ACP [ASSOCIATION OF CABLING PROFESSIONALS™] CABLING BUSINESS INSTITUTE LOCATED IN DALLAS, TEXAS)
- C. THE CONTRACTING OFFICER SHALL BE INVITED TO WITNESS AND/OR REVIEW FIELD-TESTING.
  1. THE CONTRACTING OFFICER SHALL BE NOTIFIED OF THE START DATE OF THE TESTING PHASE FIVE (5) BUSINESS DAYS BEFORE TESTING COMMENCES.
  2. THE CONTRACTING OFFICER WILL SELECT A RANDOM SAMPLE OF 5% OF THE INSTALLED LINKS. THESE RANDOMLY SELECTED LINKS SHALL BE TESTED AND THE RESULTS ARE TO BE STORED IN ACCORDANCE WITH PART 3 OF THIS DOCUMENT. THE RESULTS OBTAINED SHALL BE COMPARED TO THE DATA PROVIDED BY THE INSTALLATION CONTRACTOR. IF MORE THAN 2% OF THE SAMPLE RESULTS DIFFER IN TERMS OF THE PASS/FAIL DETERMINATION, THE INSTALLATION CONTRACTOR UNDER SUPERVISION OF THE REPRESENTATIVE SHALL REPEAT 100% TESTING AT NO COST TO THE CONTRACTING OFFICER.

1.4 SUBMITTALS
- A. MANUFACTURERS CATALOG SHEETS AND SPECIFICATIONS FOR THE TEST EQUIPMENT BEING USED ON THIS PROJECT.
- B. A SCHEDULE (LIST) OF ALL BALANCED TWISTED-PAIR COPPER LINKS TO BE TESTED.
- C. SAMPLE TEST REPORTS.

1.5 ACCEPTANCE OF TEST RESULTS
- A. UNLESS OTHERWISE SPECIFIED BY THE CONTRACTING OFFICER, EACH CABLING LINK SHALL BE IN TESTED FOR:
  1. WIRE MAP
  2. LENGTH
  3. PROPAGATION DELAY
  4. DELAY SKEW
  5. DC LOOP RESISTANCE – RECORDED FOR INFORMATION ONLY
  6. DC RESISTANCE UNBALANCE – RECORDED FOR INFORMATION ONLY
  7. INSERTION LOSS
  8. NEXT (NEAR-END CROSSTALK)
  9. PS NEXT (POWER SUM NEAR-END CROSSTALK)
  10. ACR-N (ATTENUATION TO CROSSTALK RATIO NEAR-END) – RECORDED FOR INFORMATION ONLY
  11. PS ACR-N (POWER SUM ATTENUATION TO CROSSTALK RATIO NEAR-END) – RECORDED FOR INFORMATION ONLY
  12. ACR-F (ATTENUATION TO CROSSTALK RATIO FAR-END)
  13. PS ACR-F (POWER SUM ATTENUATION TO CROSSTALK RATIO FAR-END)
  14. RETURN LOSS
  15. TCL (TRANSVERSE CONVERSION LOSS) – RECORDED FOR INFORMATION ONLY
  16. ELTCTL (EQUAL LEVEL TRANSVERSE CONVERSION TRANSFER LOSS) – RECORDED FOR INFORMATION ONLY
- B. ALL INSTALLED CABLING PERMANENT LINKS SHALL BE FIELD-TESTED AND PASS THE TEST REQUIREMENTS AND ANALYSIS AS DESCRIBED IN PART 3. ANY PERMANENT LINK THAT FAILS THESE REQUIREMENTS SHALL BE DIAGNOSED AND CORRECTED. ANY CORRECTIVE ACTION THAT MUST TAKE PLACE SHALL BE DOCUMENTED AND FOLLOWED WITH A NEW TEST TO PROVE THAT THE CORRECTED PERMANENT LINK MEETS PERFORMANCE REQUIREMENTS. THE FINAL AND PASSING RESULT OF THE TESTS FOR ALL PERMANENT LINKS SHALL BE PROVIDED IN THE TEST RESULTS DOCUMENTATION IN ACCORDANCE WITH PART 3.
- C. ACCEPTANCE OF THE TEST RESULTS SHALL BE GIVEN IN WRITING AFTER THE PROJECT IS FULLY COMPLETED AND TESTED IN ACCORDANCE WITH CONTRACT DOCUMENTS AND TO THE SATISFACTION OF THE CONTRACTING OFFICER.

**PART 2 - PRODUCTS**

2.1 BALANCED TWISTED-PAIR CABLE TESTERS
- A. THE FIELD-TEST INSTRUMENT SHALL BE WITHIN THE CALIBRATION PERIOD RECOMMENDED BY THE MANUFACTURER, TYPICALLY 12 MONTHS.
- B. CERTIFICATION TESTER
  1. ACCURACY
     - a. LEVEL IV ACCURACY IN ACCORDANCE WITH ANSI/TIA-1152
     - b. INDEPENDENT VERIFICATION OF ACCURACY
     - c. ACCEPTABLE MANUFACTURERS
       - FLUKE NETWORKS
  2. PERMANENT LINK ADAPTERS
     - a. RJ45 PLUG MUST MEET THE REQUIREMENTS FOR NEXT, FEXT AND RETURN LOSS IN ACCORDANCE WITH ANSI/TIA-568.2-E ANNEX C.
     - b. TWISTED PAIR CATEGORY 5E, 6, AND 6A CORDS ARE NOT PERMITTED AS THEIR PERFORMANCE DEGRADES WITH USE AND CAN CAUSE FALSE RETURN LOSS FAILURES.
  3. RESULTS STORAGE
     - **a.** MUST BE CAPABLE OF STORING > 10,000 RESULTS FOR ALL MEASUREMENTS FOUND IN 2.1 B.4 BELOW.

**271700 - TESTING IDENTIFICATION AND ADMINISTRATION OF BALANCED TWISTED PAIR INFRASTRUCTURE (CONTINUED)**

  4. MEASUREMENT CAPABILITIES
     - a. WIRE MAP
     - b. LENGTH
     - c. PROPAGATION DELAY
     - d. DELAY SKEW
     - e. DC LOOP RESISTANCE
     - f. DC RESISTANCE UNBALANCE
     - g. INSERTION LOSS
     - h. NEXT (NEAR-END CROSSTALK)
     - i. PS NEXT (POWER SUM NEAR-END CROSSTALK)
     - j. ACR-N (ATTENUATION TO CROSSTALK RATIO NEAR-END)
     - k. PS ACR-N (POWER SUM ATTENUATION TO CROSSTALK RATIO NEAR-END)
     - l. ACR-F (ATTENUATION TO CROSSTALK RATIO FAR-END)
     - m. PS ACR-F (POWER SUM ATTENUATION TO CROSSTALK RATIO FAR-END)
     - n. RETURN LOSS
     - o. TCL (TRANSVERSE CONVERSION LOSS)
     - p. ELTCTL (EQUAL LEVEL TRANSVERSE CONVERSION TRANSFER LOSS)
     - q. TIME DOMAIN REFLECTOMETER
     - r. TIME DOMAIN XTALK ANALYZER
- C. PC SOFTWARE
  1. WINDOWS® BASED.
  2. MUST SHOW WHEN 3 DB AND 4 DB RULES ARE APPLIED.
  3. RE-CERTIFICATION CAPABILITY, WHERE RESULTS MUST HAVE THEIR CABLE IDS SUFFIXED WITH (RC).
  4. BUILT IN PDF EXPORT – NO ADDITIONAL THIRD PARTY SOFTWARE PERMITTED.
  5. BUILT-IN STATISTICAL ANALYSIS.

2.2 IDENTIFICATION
- A. LABELS
  1. SHALL MEET THE LEGIBILITY, DEFACEMENT, EXPOSURE AND ADHESION REQUIREMENTS OF UL 969.
  2. SHALL BE PREPRINTED USING A MECHANICAL MEANS OF PRINTING (E.G., LASER PRINTER).
  3. WHERE USED FOR CABLE MARKING, PROVIDE VINYL SUBSTRATE WITH A WHITE PRINTING AREA AND A CLEAR “TAIL” THAT SELF LAMINATES THE PRINTED AREA WHEN WRAPPED AROUND THE CABLE. IF CABLE JACKET IS WHITE, PROVIDE CABLE LABEL WITH PRINTING AREA THAT IS ANY OTHER COLOR THAN WHITE, PREFERABLY ORANGE OR YELLOW – SO THAT THE LABELS ARE EASILY DISTINGUISHABLE.
  4. WHERE INSERT TYPE LABELS ARE USED PROVIDE CLEAR PLASTIC COVER OVER LABEL.
  5. PROVIDE PLASTIC WARNING TAPE 6 INCHES WIDE CONTINUOUSLY PRINTED AND BRIGHT COLORED 18” ABOVE ALL DIRECT BURIED SERVICES, UNDERGROUND CONDUITS AND DUCT-BANKS.
  6. ACCEPTABLE MANUFACTURERS:
     - a. BRADY CORPORATION
     - b. SILVER FOX
     - c. BROTHER
     - d. EPSON
     - e. DYMO

2.3 ADMINISTRATION
- A. ADMINISTRATION OF THE DOCUMENTATION SHALL INCLUDE TEST RESULTS OF EACH PERMANENT LINK.
- B. THE TEST RESULT INFORMATION FOR EACH LINK SHALL BE RECORDED IN THE MEMORY OF THE FIELD-TEST INSTRUMENT UPON COMPLETION OF THE TEST.
- C. THE TEST RESULT RECORDS SAVED WITHIN THE FIELD-TEST INSTRUMENT SHALL BE TRANSFERRED INTO A WINDOWS®-BASED DATABASE UTILITY THAT ALLOWS FOR THE MAINTENANCE, INSPECTION AND ARCHIVING OF THESE TEST RECORDS.

**PART 3 - EXECUTION**

3.1 GENERAL
- A. ALL OUTLETS, CABLES, PATCH PANELS AND ASSOCIATED COMPONENTS SHALL BE FULLY ASSEMBLED AND LABELED PRIOR TO FIELD-TESTING. ANY TESTING PERFORMED ON INCOMPLETE SYSTEMS SHALL BE REDONE ON COMPLETION OF THE WORK.

3.2 BALANCED TWISTED PAIR CABLE TESTING
- A. FIELD-TEST INSTRUMENTS SHALL HAVE THE LATEST SOFTWARE AND FIRMWARE INSTALLED.
- B. PERMANENT LINK TEST RESULTS INCLUDING THE INDIVIDUAL FREQUENCY MEASUREMENTS FROM THE TESTER SHALL BE RECORDED IN THE TEST INSTRUMENT UPON COMPLETION OF EACH TEST FOR SUBSEQUENT UPLOADING TO A PC IN WHICH THE ADMINISTRATIVE DOCUMENTATION (REPORTS) MAY BE GENERATED.
- C. TESTING SHALL BE PERFORMED ON EACH CABLING SEGMENT (CONNECTOR TO CONNECTOR). SAMPLING IS NOT ACCEPTABLE.
- D. PERMANENT LINK ADAPTERS MADE FROM TWISTED PAIR CATEGORY 5E, 6, 6A, 7 OR 7A CORDS ARE NOT PERMITTED AS THEIR PERFORMANCE DEGRADES WITH USE AND CAN CAUSE FALSE RETURN LOSS FAILURES.
- E. THE INSTALLER SHALL BUILD A REFERENCE LINK. ALL COMPONENTS SHALL BE ANCHORED SO IT IS NOT POSSIBLE TO DISTURB THEM. THE TECHNICIAN IS TO CONDUCT A CATEGORY 6A PERMANENT LINK TEST EACH DAY TO ENSURE NO DEGRADATION OF THE TESTER OR ITS PERMANENT LINK ADAPTERS.
- F. WIRE MAP MEASUREMENT
  1. THE WIRE MAP TEST IS INTENDED TO VERIFY PIN-TO-PIN TERMINATION AT EACH END AND CHECK FOR INSTALLATION CONNECTIVITY ERRORS. FOR EACH OF THE 8 CONDUCTORS IN THE CABLING, THE WIRE MAP INDICATES:
     - a. CONTINUITY TO THE REMOTE END
     - b. SHORTS BETWEEN ANY TWO OR MORE CONDUCTORS
     - c. REVERSED PAIRS
     - d. SPLIT PAIRS
     - e. TRANSPOSED PAIRS
     - f. DISTANCE TO OPEN ON SHIELD
     - g. ANY OTHER MISS-WIRING
  2. THE CORRECT CONNECTIVITY OF TELECOMMUNICATIONS OUTLETS/CONNECTORS IS DEFINED IN ANSI/TIA-568.2-E. TWO COLOR SCHEMES ARE PERMITTED. THE USER SHALL DEFINE WHICH SCHEME IS TO BE USED. THE FIELD TESTER SHALL DOCUMENT WHICH COLOR SCHEME WAS USED. EXAMPLES ARE GIVEN BELOW:
- G. LENGTH MEASUREMENT
  1. THE LENGTH OF EACH BALANCED TWISTED PAIR SHALL BE RECORDED.
  2. SINCE PHYSICAL LENGTH IS DETERMINED FROM ELECTRICAL LENGTH, THE PHYSICAL LENGTH OF THE LINK CALCULATED USING THE PAIR WITH THE SHORTEST ELECTRICAL DELAY SHALL BE REPORTED AND USED FOR MAKING THE PASS OR FAIL DETERMINATION.
  3. THE PASS OR FAIL CRITERIA IS BASED ON THE MAXIMUM LENGTH ALLOWED FOR THE PERMANENT LINK AS SPECIFIED IN ANSI/TIA-568.2-E PLUS THE NOMINAL VELOCITY OF PROPAGATION (NVP) UNCERTAINTY OF 10%. FOR A PERMANENT LINK, THE LENGTH MEASUREMENT CAN BE 325 FT. (99 M) BEFORE A FAIL IS REPORTED.
- H. PROPAGATION DELAY MEASUREMENT
  1. IS THE TIME IT TAKES FOR A SIGNAL TO REACH THE END OF THE LINK.
  2. THE MEASUREMENT SHALL BE MADE AT 10 MHZ PER ANSI/TIA-1152.
  3. THE PROPAGATION DELAY OF EACH BALANCED TWISTED PAIR SHALL BE RECORDED.
  4. IS NOT TO EXCEED 498 NS PER ANSI/TIA-568.2-E SECTION 6.3.18.
- I. DELAY SKEW MEASUREMENT
  1. IS THE DIFFERENCE IN PROPAGATION DELAY @ 10 MHZ BETWEEN THE SHORTEST DELAY AND THE DELAYS OF THE OTHER WIRE PAIRS.
  2. THE DELAY SKEW OF EACH BALANCED TWISTED PAIR SHALL BE RECORDED.
  3. IS NOT TO EXCEED 44 NS PER ANSI/TIA-568.2-E SECTION 6.3.19.
- J. DC RESISTANCE
  1. OFTEN REPORTED AS RESISTANCE, IS THE LOOP RESISTANCE OF BOTH CONDUCTORS IN THE PAIR.
  2. IS NOT SPECIFIED IN ANSI/TIA-1152, BUT SHALL BE RECORDED FOR ALL FOUR PAIRS.
- K. DC RESISTANCE UNBALANCE
  1. OFTEN REPORTED AS RESISTANCE UNBALANCE, IS THE DIFFERENCE IN RESISTANCE OF THE TWO WIRES WITHIN THE PAIR.
  2. IS NOT SPECIFIED IN ANSI/TIA-1152 FOR A PERMANENT LINK, BUT SHALL BE RECORDED FOR ALL FOUR PAIRS.

**271700 - TESTING IDENTIFICATION AND ADMINISTRATION OF BALANCED TWISTED PAIR INFRASTRUCTURE (CONTINUED)**

- L. INSERTION LOSS
  1. IS THE LOSS OF SIGNAL STRENGTH OVER THE CABLING (IN DB).
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. WORST CASE SHALL BE REPORTED FOR ALL FOUR PAIRS IN ONE DIRECTION ONLY.
  4. REPORTED MARGINS FOUND TO BE WITHIN THE ACCURACY OF THE FIELD TESTER SHALL BE MARKED WITH AN ASTERISK (*).
  5. IS NOT TO EXCEED THE CATEGORY 6A PERMANENT LINK LIMITS FOUND IN ANSI/TIA-568.2-E SECTION 6.3.7.
- M. NEXT (NEAR-END CROSSTALK)
  1. IS THE DIFFERENCE IN AMPLITUDE (IN DB) BETWEEN A TRANSMITTED SIGNAL AND THE CROSSTALK RECEIVED ON OTHER WIRE PAIRS AT THE SAME END OF THE CABLING.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS. (12 PAIR TO PAIR POSSIBLE COMBINATIONS)
  4. BOTH WORST CASE AND WORST MARGINS SHALL BE REPORTED.
  5. IS NOT TO EXCEED THE CATEGORY 6A PERMANENT LINK LIMITS FOUND IN ANSI/TIA-568.2-E SECTION 6.3.8.
  6. REPORTED MARGINS FOUND TO BE WITHIN THE ACCURACY OF THE FIELD TESTER SHALL BE MARKED WITH AN ASTERISK (*).
  7. THE TIME DOMAIN XTALK DATA SHALL BE STORED FOR ANY MARGINAL OR FAILING NEXT RESULTS.
- N. PS NEXT (POWER SUM NEAR-END CROSSTALK)
  1. IS THE DIFFERENCE (IN DB) BETWEEN THE TEST SIGNAL AND THE CROSSTALK FROM THE OTHER PAIRS RECEIVED AT THE SAME END OF THE CABLING.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS. (8 PAIR POSSIBLE COMBINATIONS)
  4. BOTH WORST CASE AND WORST MARGINS SHALL BE REPORTED.
  5. IS NOT TO EXCEED THE CATEGORY 6A PERMANENT LINK LIMITS FOUND IN ANSI/TIA-568.2-E SECTION 6.3.9.
  6. REPORTED MARGINS FOUND TO BE WITHIN THE ACCURACY OF THE FIELD TESTER SHALL BE MARKED WITH AN ASTERISK (*).
  7. THE TIME DOMAIN XTALK DATA SHALL BE STORED FOR ANY MARGINAL OR FAILING PS NEXT RESULTS.
- O. ACR-N (ATTENUATION CROSSTALK RATIO NEAR-END)
  1. IS A CALCULATION OF NEXT MINUS INSERTION LOSS OF THE DISTURBED PAIR IN DB.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE CALCULATED IN BOTH DIRECTIONS.
  4. IS NOT SPECIFIED IN ANSI/TIA-1152, BUT SHALL BE RECORDED FOR ALL 12 POSSIBLE COMBINATIONS.
- P. PS ACR-N (POWER SUM ATTENUATION CROSSTALK RATIO NEAR-END)
  1. IS A CALCULATION OF PS NEXT MINUS INSERTION LOSS OF THE DISTURBED PAIR IN DB.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE CALCULATED IN BOTH DIRECTIONS.
  4. IS NOT SPECIFIED IN ANSI/TIA-1152, BUT SHALL BE RECORDED FOR ALL 8 POSSIBLE COMBINATIONS.
- Q. ACR-F (ATTENUATION CROSSTALK RATIO FAR-END)
  1. IS A CALCULATION OF FEXT MINUS INSERTION LOSS OF THE DISTURBED PAIR IN DB.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS. (24 PAIR TO PAIR POSSIBLE COMBINATIONS)
  4. BOTH WORST CASE AND WORST MARGINS SHALL BE REPORTED.
  5. IS NOT TO EXCEED THE CATEGORY 6A PERMANENT LINK LIMITS FOUND IN ANSI/TIA-568.2-E SECTION 6.3.11.
  6. REPORTED MARGINS FOUND TO BE WITHIN THE ACCURACY OF THE FIELD TESTER SHALL BE MARKED WITH AN ASTERISK (*).
- R. PS ACR-F (POWER SUM ATTENUATION CROSSTALK RATIO FAR-END)
  1. IS A CALCULATION OF PS FEXT MINUS INSERTION LOSS OF THE DISTURBED PAIR IN DB.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS. (8 PAIR POSSIBLE COMBINATIONS)
  4. BOTH WORST CASE AND WORST MARGINS SHALL BE REPORTED.
  5. IS NOT TO EXCEED THE CATEGORY 6 PERMANENT LINK LIMITS FOUND IN ANSI/TIA-568.2-E SECTION 6.3.13.
  6. REPORTED MARGINS FOUND TO BE WITHIN THE ACCURACY OF THE FIELD TESTER SHALL BE MARKED WITH AN ASTERISK (*).
- S. RETURN LOSS
  1. IS THE DIFFERENCE (IN DB) BETWEEN THE POWER OF A TRANSMITTED SIGNAL AND THE POWER OF THE SIGNALS REFLECTED BACK.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS. (8 PAIR POSSIBLE COMBINATIONS)
  4. BOTH WORST CASE AND WORST MARGINS SHALL BE REPORTED.
  5. SHALL BE IGNORED AT ALL FREQUENCIES WHERE THE INSERTION LOSS IS LESS THAN 3 DB FOR THAT PAIR.
  6. IS NOT TO EXCEED THE CATEGORY 6 PERMANENT LINK LIMITS FOUND IN ANSI/TIA-568.2-E SECTION 6.3.6.
  7. REPORTED MARGINS FOUND TO BE WITHIN THE ACCURACY OF THE FIELD TESTER SHALL BE MARKED WITH AN ASTERISK (*).
  8. THE TIME DOMAIN REFLECTOMETER DATA SHALL BE STORED FOR ANY MARGINAL OR FAILING RETURN LOSS RESULTS.
- T. TCL (TRANSVERSE CONVERSION LOSS)
  1. IS THE RATIO (IN DB) BETWEEN A DIFFERENTIAL MODE SIGNAL INJECT AT THE NEAR-END AND THE COMMON-MODE SIGNAL MEASURED AT THE NEAR-END ON THE SAME WIRE PAIR.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS.
  4. IS NOT SPECIFIED IN ANSI/TIA-1152 FOR A PERMANENT LINK, BUT SHALL BE RECORDED FOR ALL 8 POSSIBLE COMBINATIONS.
- U. ELTCTL (EQUAL LEVEL TRANSVERSE CONVERSION TRANSFER LOSS)
  1. IS THE RATIO (IN DB) BETWEEN A DIFFERENTIAL MODE SIGNAL INJECT AT THE NEAR-END AND THE COMMON-MODE SIGNAL MEASURED AT THE FAR END ON THE SAME WIRE PAIR MINUS THE INSERTION LOSS OF THAT PAIR.
  2. THE FREQUENCY RESOLUTION SHALL BE:
     - a. 1 – 500 MHZ
  3. SHALL BE MEASURED IN BOTH DIRECTIONS.
  4. IS NOT SPECIFIED IN ANSI/TIA-1152 FOR A PERMANENT LINK, BUT SHALL BE RECORDED FOR ALL 8 POSSIBLE COMBINATIONS.

**271700 - TESTING IDENTIFICATION AND ADMINISTRATION OF BALANCED TWISTED PAIR INFRASTRUCTURE (CONTINUED)**

3.3 ADMINISTRATION
- A. TEST RESULTS DOCUMENTATION
  1. TEST RESULTS SAVED WITHIN THE FIELD-TEST INSTRUMENT SHALL BE TRANSFERRED INTO A WINDOWS™-BASED DATABASE UTILITY THAT ALLOWS FOR THE MAINTENANCE, INSPECTION AND ARCHIVING OF THE TEST RECORDS. THESE TEST RECORDS SHALL BE UPLOADED TO THE PC UNALTERED, I.E., “AS SAVED IN THE FIELD-TEST INSTRUMENT”. THE FILE FORMAT, CSV (COMMA SEPARATED VALUE), DOES NOT PROVIDE ADEQUATE PROTECTION OF THESE RECORDS AND SHALL NOT BE USED.
  2. THE TEST RESULTS DOCUMENTATION SHALL BE AVAILABLE FOR INSPECTION BY THE CONTRACTING OFFICER DURING THE INSTALLATION PERIOD AND SHALL BE PASSED TO THE CONTRACTING OFFICER WITHIN 5 WORKING DAYS OF COMPLETION OF TESTS ON CABLING SERVED BY A TELECOMMUNICATIONS ROOM OR OF BACKBONE CABLING. THE INSTALLER SHALL RETAIN A COPY TO AID PREPARATION OF AS BUILT INFORMATION.
  3. THE DATABASE FOR THE COMPLETE PROJECT, INCLUDING TWISTED-PAIR COPPER CABLING LINKS, IF APPLICABLE, SHALL BE STORED AND DELIVERED IN PDF FORMAT PRIOR TO CONTRACTING OFFICER'S ACCEPTANCE OF THE BUILDING.
  4. CIRCUIT IDS REPORTED BY THE TEST INSTRUMENT SHOULD MATCH THE SPECIFIED LABEL ID (SEE 3.3 OF THIS SECTION).
  5. THE DETAILED TEST RESULTS DOCUMENTATION DATA IS TO BE PROVIDED IN AN ELECTRONIC DATABASE FOR EACH TESTED BALANCE TWISTED-PAIR AND SHALL CONTAIN THE FOLLOWING INFORMATION
     - a. THE OVERALL PASS/FAIL EVALUATION OF THE LINK-UNDER-TEST
     - b. THE DATE AND TIME THE TEST RESULTS WERE SAVED IN THE MEMORY OF THE TESTER
     - c. THE IDENTIFICATION OF THE CUSTOMER SITE AS SPECIFIED BY THE END-USER
     - d. THE NAME OF THE TEST LIMIT SELECTED TO EXECUTE THE STORED TEST RESULTS
     - e. THE NAME OF THE PERSONNEL PERFORMING THE TEST
     - f. THE VERSION OF THE TEST SOFTWARE AND THE VERSION OF THE TEST LIMIT DATABASE HELD WITHIN THE TEST INSTRUMENT
     - g. THE MANUFACTURER, MODEL AND SERIAL NUMBER OF THE FIELD-TEST INSTRUMENT
     - h. THE ADAPTERS USED
     - i. THE FACTORY CALIBRATION DATE
     - j. WIRE MAP
     - k. PROPAGATION DELAY VALUES, FOR ALL FOUR PAIRS
     - l. DELAY SKEW VALUES, FOR ALL FOUR PAIRS
     - m. DC RESISTANCE VALUES, FOR ALL FOUR PAIRS
     - n. DC RESISTANCE UNBALANCE, VALUES FOR ALL FOUR PAIRS
     - o. INSERTION LOSS, WORST CASE VALUES FOR ALL FOUR PAIRS
     - p. NEXT, WORST CASE MARGIN AND WORST CASE VALUES, BOTH DIRECTIONS
     - q. PS NEXT, WORST CASE MARGIN AND WORST CASE VALUES, BOTH DIRECTIONS
     - r. ACR-F, WORST CASE MARGIN AND WORST CASE VALUES, BOTH DIRECTIONS
     - s. PS ACR-F, WORST CASE MARGIN AND WORST CASE VALUES, BOTH DIRECTIONS
     - t. RETURN LOSS, WORST CASE MARGIN AND WORST CASE VALUES, BOTH DIRECTIONS
     - u. TCL, WORST CASE VALUES BOTH DIRECTIONS
     - v. ELTCTL, WORST CASE VALUES, BOTH DIRECTIONS
     - w. TIME DOMAIN CROSSTALK DATA IF THE LINK IS MARGINAL OR FAILS
     - x. TIME DOMAIN REFLECTOMETER DATA IF THE LINK IS MARGINAL OR FAILS
- B. RECORD COPY AND AS-BUILT DRAWINGS.
  1. PROVIDE RECORD COPY DRAWINGS PERIODICALLY THROUGHOUT THE PROJECT AS REQUESTED BY THE CONSTRUCTION MANAGER OR CONTRACTING OFFICER, AND AT END OF THE PROJECT IN PDF FORMAT. RECORD COPY DRAWINGS AT THE END OF THE PROJECT SHALL BE IN CAD FORMAT AND INCLUDE NOTATIONS REFLECTING THE AS BUILT CONDITIONS OF ANY ADDITIONS TO OR VARIATION FROM THE DRAWINGS PROVIDED SUCH AS, BUT NOT LIMITED TO CABLE PATHS AND TERMINATION POINT. THE AS BUILT DRAWINGS SHALL INCLUDE, BUT ARE NOT LIMITED TO BLOCK DIAGRAMS, FRAME AND CABLE LABELING, CABLE TERMINATION POINTS, EQUIPMENT ROOM LAYOUTS AND FRAME INSTALLATION DETAILS. THE AS-BUILTS SHALL INCLUDE ALL FIELD CHANGES MADE UP TO CONSTRUCTION COMPLETION:
     - a. FIELD DIRECTED CHANGES TO PULL SCHEDULE.
     - b. HORIZONTAL CABLE ROUTING CHANGES.
     - c. ASSOCIATED DETAIL DRAWINGS.

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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ICT SPECIFICATIONS**

DATE: 07.14.2026

SHEET: **T004**

**100% CONSTRUCTION DOCUMENTS**

DATE STAMP: 7/13/2026 4:42:10 PM

1 BASEMENT - ICT DEMO PLAN
1/8" = 1'-0"

# GENERAL ICT DEMO NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER.
B. CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
C. ALL WALL REGIONS SHOWN DASHED ARE EXISTING, TO BE DEMOLISHED, OR IN SOME CASES ARE EXISTING DOORWAYS TO BE WALLED IN. CONTRACTOR SHALL FIELD VERIFY AFFECTED ICT SYSTEMS PRIOR TO BID, AND DURING CONSTRUCTION.
D. DASHED WALLS, EQUIPMENT, AND DEVICES SHOWN BLACK, OR BLACK AND DASHED, IN HATCHED GRID REGION ARE EXISTING FOR DEMOLITION, AND ITEMS IN SOLID GREY ARE EXISTING TO REMAIN, UNO.
E. THE DEVICE LAYOUT IN THESE DEMOLITION PLANS DOES NOT REFLECT ALL DEVICES OR CONDITIONS THE CONTRACTOR MAY FIND IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOTION OF DEVICES NOT SHOWN IN THE ICT DEMOLITION DRAWINGS. THE CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS PRIOR TO BID.
F. THE CONTRACTOR SHALL REMOVE ALL CABLING ASSOCIATED WITH DEMOED DEVICES FROM SOURCE TO DESTINATION.
G. ALL WORK AREA OUTLETS, CABLING, CAMERAS, KEYPADS, CARD READERS, RACKS, CABINETS, SPEAKERS, AND ACTIVE EQUIPMENT IN HATCHED GRID REGION SHALL BE RETURNED TO CONTRACTING OFFICER, UNO.

# (#) KEY NOTES:

1. THERE ARE (2) EXISTING WAOS NEXT TO EACH OTHER (TYPICALLY ONE IS LABELED DATA THE OTHER IS LABELED VOICE). DEMO CABLING BACK TO SOURCE FOR BOTH WAOS. CONDUITS AND BOXES TO BE REUSED FOR NEW CABLING, SEE ICT BASEMENT PLAN FOR ADDITIONAL INFO.
2. THERE ARE (2) EXISTING WAOS NEXT TO EACH OTHER (TYPICALLY ONE IS LABELED DATA THE OTHER IS LABELED VOICE). DEMO CABLING BACK TO SOURCE FOR BOTH WAOS. PROVIDE BLANK FACEPLATES FOR BOTH WAOS.
3. DEMO CABLING BACK TO SOURCE. CONDUIT AND BOX TO BE REUSED FOR NEW CABLING, SEE ICT BASEMENT PLAN FOR ADDITIONAL INFO.
4. RETURN AP AND ANY MOUNTING HARDWARE TO CONTRACTING OFFICER.

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**BUILDING 24**
**BASEMENT**
**REMODEL**

26 FORT MISSOULA RD, MISSOULA, MT

**ICT BASEMENT DEMO PLAN**

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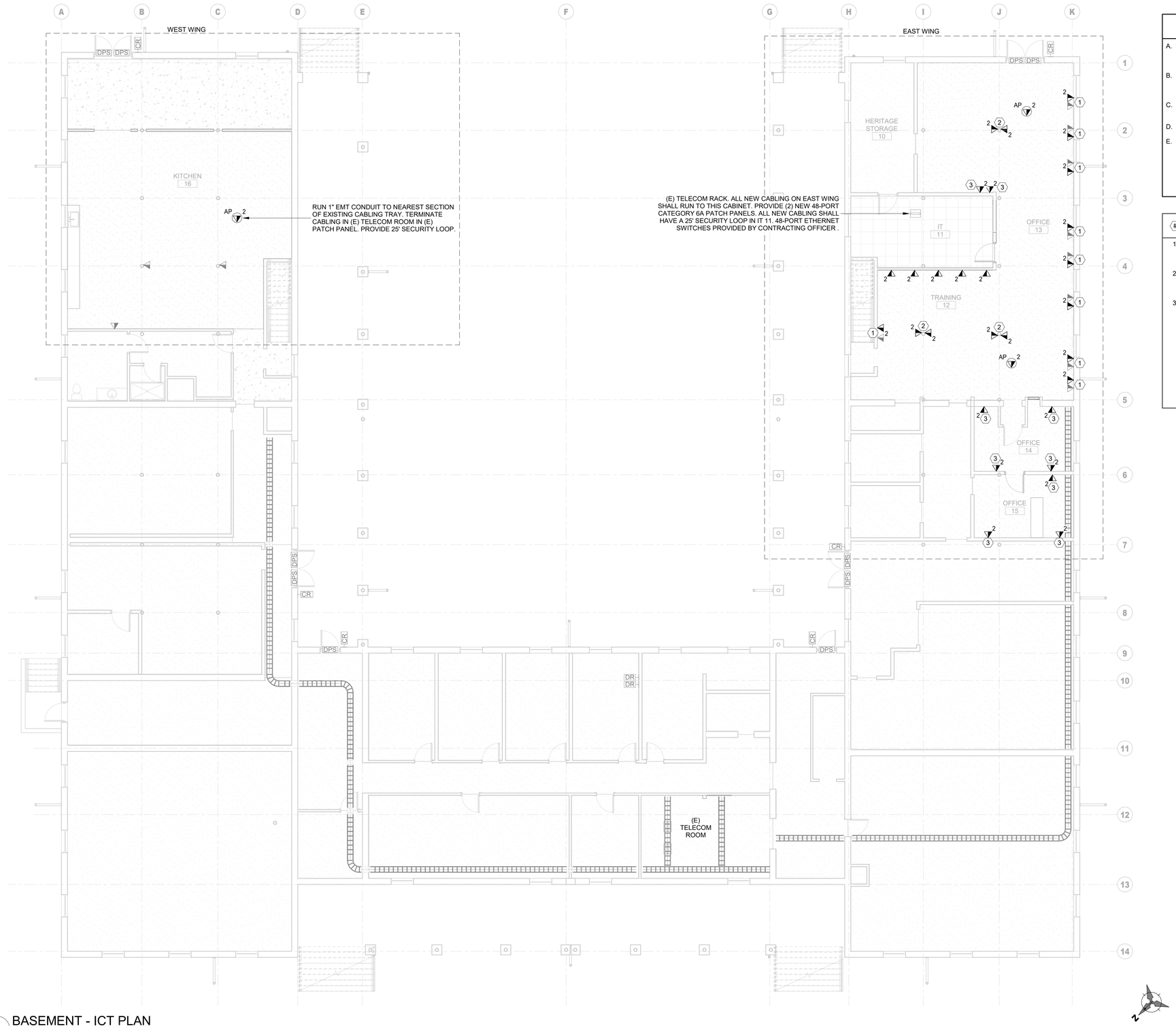


1 BASEMENT - ICT PLAN
1/8" = 1'-0"

# GENERAL ICT NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
C. ALL SIZING, PLACEMENT, AND QUANTITIES FOR CONDUITS, CONDUIT SLEEVES, CABLE TRAY, AND LADDER RACK CALLED OUT ON STRUCTURED CABLING PLANS AND/OR ENLARGED VIEWS.
D. ALL CONDUIT ENDS SHALL BE FURNISHED WITH PLASTIC BUSHINGS FOR CABLE PROTECTION.
E. PROVIDE PULL STRINGS FOR ALL CONDUITS INSTALLED GREATER THAN 10'.

# (#) KEY NOTES:

1. THERE ARE (2) EXISTING WAOS NEXT TO EACH OTHER (TYPICALLY ONE IS LABELED DATA THE OTHER IS LABELED VOICE). PROVIDE NEW CABLING, JACKS, AND FACEPLATE AT ONE AND BLANK FACEPLATE AT THE OTHER. PROVIDE NEW CONDUIT BUSHING AS REQUIRED.
2. THERE ARE (2) EXISTING WAOS IN EXISTING COLUMN (TYPICALLY ONE IS LABELED DATA THE OTHER IS LABELED VOICE). PROVIDE NEW CABLING, JACKS, AND FACEPLATE FOR BOTH WAOS. PROVIDE NEW CONDUIT BUSHINGS AS REQUIRED.
3. USE EXISTING WAO CONDUIT AND BOX, PROVIDE NEW CABLING, JACKS, AND FACEPLATE. PROVIDE NEW CONDUIT BUSHING AS REQUIRED.

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**BUILDING 24**
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**REMODEL**

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