

FHWA REGION	STATE	PROJECT	
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101

LAKE COUNTY
LAK-306-6.15

GENERAL NOTES

- B. REFER TO THE SPECIFICATIONS COVERING ALL BRANCHES OF THE WORK AND KEEP FULLY INFORMED OF THE PROGRESS OF THE GENERAL CONSTRUCTION. INSTALL ALL WORK THAT IS CONCEALED AND BUILT INTO THE BUILDING IN PLACE IN SUFFICIENT TIME TO INSURE PROPER LOCATION WITHOUT DELAYS TO THE WORK OF THE OTHER TRADES. PROPERLY ATTEND THE WORK DURING THE PROCESS OF BUILDING-IN TO PREVENT MISALIGNMENT AND DAMAGE.
8. WORKMANSHIP
- A. ALL WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE BY CRAFTSMEN SKILLED IN THIS PARTICULAR WORK.
9. MATERIALS AND SUBSTITUTIONS
- A. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.
- B. IT IS THE INTENT OF THIS ARTICLE TO MAKE THE SPECIFICATION OPEN IN EVERY RESPECT TO ALL AVAILABLE BRANDS OF MATERIAL OF EQUAL QUALITY DURING THE PERIOD OF BIDDING.
- C. BID SHALL BE BASED ON FURNISHING THE BRANDS OF MATERIAL AND EQUIPMENT MENTIONED IN THE SPECIFICATIONS. SUBMIT, ATTACHED TO THE BID, A LIST OF ALL MATERIAL AND/OR EQUIPMENT BRANDS INTENDED TO BE FURNISHED IF AWARDED THE CONTRACT. NO CHANGE OF BRANDS SHALL BE MADE AFTER RECEIPT OF BID AND ATTACHED MATERIAL BRANDS LIST, UNLESS APPROVED IN WRITING BY THE ENGINEER.
- D. BIDDER IS ALSO INVITED TO BID ON ANY OTHER EQUAL OR SIMILAR BRANDS OF MATERIAL AND EQUIPMENT HE MAY DESIRE TO FURNISH, OR SUBSTITUTE, STATING THE DIFFERENCE IN COST, IF ANY. OTHER BRANDS MUST BE CLEARLY STATED ON A SUBSTITUTION SHEET. BE PREPARED TO SUBMIT SAMPLE MATERIAL WITHIN THREE (3) WEEKS AFTER REQUESTED BY THE ENGINEER OR OWNER, AND ASSUME ALL TRANSPORTATION COSTS INVOLVED IN SHIPMENT AND RETURN OF SAMPLES. LAMPS ARE TO BE SENT WITH SAMPLE FIXTURES AND FIXTURES ARE TO BE WIRED WITH CORD AND PLUG TO FACILITATE LIGHTING FOR APPRAISAL. THE ENGINEER SHALL DECIDE THE QUESTION OF EQUALITY BEFORE THE CONTRACT IS AWARDED.
- E. SUBSTITUTIONS WHICH ARE ACCEPTED SHALL BE WRITTEN INTO THE CONTRACT AND NO CHANGES OF BRANDS SHALL BE MADE AFTER THE CONTRACT IS SIGNED UNLESS APPROVED IN WRITING BY THE ENGINEER.
10. TEMPORARY AND PERMANENT SERVICE
- A. PROVIDE BOTH TEMPORARY AND PERMANENT ELECTRICAL SERVICE, AND PAY ALL POWER COMPANY INSTALLATION AND SERVICE CHARGES UNTIL ACCEPTANCE OF THE PROJECT BY THE OWNER.
- B. TEMPORARY WIRING AND LIGHTING WHEN REQUIRED SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH NEC AND OSHA.
11. EXISTING WORK AND DEMOLITION
- A. SUITABLY AND ADEQUATELY PROTECT THE EXISTING WORK WITHIN, AND IMMEDIATELY ADJACENT TO, THE NEW WORK AREAS FROM DAMAGE AND INJURY DURING THE PROCESS OF INSTALLING THE WORK UNDER THIS CONTRACT. EXISTING WORK THAT HAS BEEN HARMED, DAMAGED OR INJURED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED, RESTORED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
12. CUTTING AND PATCHING
- A. AVOID CUTTING OF CONCRETE, MASONRY AND OTHER WORK BY USE OF INSERTS AND SLEEVES, AND WHEN NECESSARY SHALL BE DONE BY THE CONTRACTOR WITH SUCH TOOLS AND METHODS AS TO PREVENT UNNECESSARY DAMAGE TO SURROUNDING AREAS OR EQUIPMENT.
- B. NO CUTTING SHALL BE DONE WHICH WILL IN ANY WAY REDUCE THE STRUCTURAL STRENGTH OF THE BUILDING. SHOULD SUCH CUTTING BE FOUND NECESSARY THE ENGINEER MUST FIRST BE FULLY INFORMED OF, AND CONSENT TO, THE PROPOSED OPERATION.
- ALL CUTTING THROUGH POURED CONCRETE SLABS AND WALLS SHALL BE DONE WITH CORE DRILLS. NO JACK HAMMERS WILL BE ALLOWED.
- C. PATCHING SHALL MATCH EXISTING SURFACES IN KIND AND FINISH AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.
13. CLEANING AND PAINTING
- A. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. SWITCHGEAR, MOTOR CONTROL CENTERS, GENERATORS, ETC., SHALL BE COVERED WITH FIBERGLASS REINFORCED PLASTIC SHEETING AS A MINIMUM FORM OF PROTECTION. PROVIDE ADDITIONAL PROTECTION, IF JOB CONDITIONS SO REQUIRE. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
- B. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE OF THE WORK.
- C. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE ENGINEER, ALL FIXTURES, CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.
- D. ALL LAMPS IN ALL FIXTURES SHALL BE INSTALLED NEW AND THE ENTIRE SYSTEM SHALL BE CHECKED FOR SATISFACTORY OPERATION.
- E. DUST MUST BE HELD TO A MINIMUM WHERE WORK IS PERFORMED INSIDE OF THE EXISTING BUILDING.
14. EXCAVATION AND BACKFILL
- A. PROVIDE ALL EXCAVATION AND BACKFILL NECESSARY TO GET THE WORK IN PLACE, IN CONFORMANCE WITH CMS 203.12. SUCH EXCAVATION SHALL BE CARRIED TO DIMENSIONS AND DEPTHS INDICATED AND/OR AS NECESSARY FOR THE PROPER INSTALLATION AND COMPLETION OF THE WORK.
- B. REMOVE ALL FORM WORK AND DEBRIS BEFORE BACKFILL IS PLACED.
- C. SURPLUS SOIL AND/OR DEBRIS SHALL BE REMOVED FROM SITE AT COMPLETION OF WORK.
- D. ALL EXCAVATED AREAS SHALL BE BARRICADED AND PROPERLY PROTECTED.
15. CAST-IN CONCRETE ITEMS
- A. ANCHOR BOLTS, BOXES, CONDUIT, SLEEVES OR ANY OTHER ITEM REQUIRED TO BE IN PRECAST CONCRETE OR POURED-IN-PLACE CONCRETE SHALL BE FURNISHED ALONG WITH FULL INFORMATION IN TIME TO CAUSE NO DELAY IN WORK.
16. STANDARD OF INSTALLATION
- A. ELECTRICAL WORK AND ELECTRICAL CRAFTSMANSHIP SHALL BE EQUAL TO THAT DESCRIBED IN THE PUBLICATION: "STANDARD OF INSTALLATION", PUBLISHED BY THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, 7315 WISCONSIN AVENUE, WASHINGTON, D.C. 20014. OUTLET HEIGHTS SPECIFIED ON THE DRAWINGS OR IN THESE SPECIFICATIONS SHALL TAKE PRECEDENCE OVER HEIGHTS LISTED IN THE ABOVE REFERENCED PUBLICATION.
17. CONDUIT
- A. ALL WIRING INCLUDING FEEDERS, BRANCH CIRCUITS AND AUXILIARY WIRING SHALL BE RUN IN RIGID HEAVY WALL CONDUIT.
- B. ALL STEEL CONDUIT SHALL BE GALVANIZED AND ALL CONDUIT SHALL HAVE THE MANUFACTURER'S NAME AND U.L. LABEL ATTACHED TO OR STAMPED ON EACH PIECE.
- C. ALL CONDUIT ENTERING CABINETS, PULL BOXES, JUNCTION BOXES OR OUTLET BOXES SHALL BE SECURED WITH DOUBLE LOCK NUTS AND ENDS BUSHED.
- D. FLEXIBLE NEOPRENE-CLAD GALVANIZED STEEL CONDUIT SHALL BE USED FOR "MAKEUP" CONNECTIONS TO ROTATING MACHINERY AND HEATING ELEMENTS. LIGHTING FIXTURES MAY BE SUPPLIED WITH SHORT LENGTHS OF FLEXIBLE CONDUIT WITH GREEN GROUND WIRE. MINIMUM SIZE OF FLEXIBLE CONDUIT SHALL BE 1/2" TRADE SIZE.
- E. EACH SECTION OF CONDUIT FURNISHED SHALL BE STRAIGHT, FREE FROM BLISTERS AND OTHER DEFECTS AND IN 10'-0" LENGTHS. GALVANIZING SHALL BE OF SUCH NATURE AND SO APPLIED THAT IT WILL NOT CRACK OR FLAKE WHEN CONDUIT IS BENT.
- F. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN 3/4" UNLESS OTHERWISE NOTED.
- G. NO MORE THAN FOUR (4) 90 DEGREE BENDS WILL BE ALLOWED IN ANY ONE CONDUIT RUN. WHERE MORE BENDS ARE NECESSARY IN ANY SINGLE RUN, A PULL BOX SHALL BE INSTALLED; PULL BOXES SHALL ALSO BE INSTALLED IN LONG RUNS AT A MAXIMUM SEPARATION OF 100'-0". ALL CONDUIT SHALL BE ROUTED PARALLEL TO THE LINES OF THE BUILDING AND NO OUT OF PLUMB OR DIAGONAL LINES WILL BE ACCEPTED.
- H. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.
- I. STRAP IRON HANGERS AND WIRE WILL NOT BE APPROVED FOR CONDUIT SUPPORT.
- J. EXPOSED CONDUITS RISING FROM FLOOR TO SURFACE PANELS, AND/OR BOXES, SHALL HAVE A 4" HIGH CONCRETE CURB ENCASING THE CONDUITS AT THE FLOOR LINE. CURB TO HAVE CHAMFERED EDGES.
- K. CONDUIT IN EARTH EITHER INSIDE OR OUTSIDE OF BUILDING SHALL BE ENCASED IN A CONCRETE ENVELOPE NOT LESS THAN 3" THICK.
18. BOXES AND COVERS
- A. FURNISH AND INSTALL ALL OUTLET, JUNCTION AND PULL BOXES AS INDICATED ON THE DRAWINGS AND/OR AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND WORKMANLIKE MANNER. PULL BOXES AND JUNCTION BOXES SHALL BE IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE APPROVED BY UNDERWRITERS' LABORATORIES. CLOSE ALL UNUSED AND OPEN KNOCKOUTS WITH PLUGS OF THE PROPER SIZE.
- B. JUNCTION AND PULL BOXES SHALL BE PRESSED STEEL, GALVANIZED OR SHERARDIZED AND SHALL BE A MINIMUM OF 4" SQUARE OR OCTAGONAL SIMILAR TO APPLETON #40. STEEL BOXES CAST IN CONCRETE SHALL BE DESIGNED FOR CONCRETE INSTALLATION.
- C. ALL BOXES SHALL BE RIGIDLY SUPPORTED FROM BUILDING STRUCTURE INDEPENDENT OF THE CONDUIT SYSTEM.
- D. ALL OUTLET BOXES SHALL BE "FS" OR "FD" TYPE WITH THREADED HUBS.
- E. ALL OUTLET BOX COVERS SHALL BE CAST COVERS SUITABLE FOR USE ON "FS" OR "FD" BOXES. COVERS SHALL BE SIMILAR TO PYLE NATIONAL N-1 OR N-2.
19. WIRE AND WIRING METHODS
- A. ALL WIRING REQUIRED TO CONNECT A COMPLETE LIGHTING CONTROL AND POWER SYSTEM AS SHOWN ON THE DRAWINGS, COMPLETE WITH ANY AND ALL AUXILIARY SYSTEM AND CONTROL WIRING SHALL CONFORM TO THE FOLLOWING.
- B. ALL CONDUCTORS SHALL BE STRANDED AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS. WHERE NO SIZE AND/OR TYPE IS SHOWN, CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE THW. ALL CONDUCTORS SHALL BE COPPER AND HAVE 600 VOLT INSULATION; BE U.L. LABELED AND OF AMERICAN MANUFACTURER.
- C. ALL CONDUCTORS SHALL BE CONTINUOUS FROM BOX TO BOX; NO JOINTS SHALL BE PERMITTED IN THE CIRCUIT OTHER THAN IN JUNCTION BOXES OR FIXTURES. ALL CONDUCTORS OF A CIRCUIT SHALL FOLLOW THE SAME PATH THROUGH ANY OPENING IN STEEL PARTITIONS WITHIN ENCLOSURES.
- D. JOINTS IN #10 AND SMALLER WIRE SHALL BE MADE USING THE FOLLOWING TYPES OF CONNECTORS: MINNESOTA MINING AND MFG. COMPANY "SCOTCH-LOK", IDEAL INDUSTRIES, INC. "WING-NUT", OR THOMAS AND BETTS COMPANY TYPE "PT". CONNECTORS SHALL BE USED ONLY WITHIN THEIR RANGE. OTHER THREADED-ON TYPES OF INSULATED CONNECTORS SHALL NOT BE USED.
- E. JOINTS IN #8 AND LARGER WIRE OR JOINTS IN ANY WIRES ABOVE THE RANGE OF THREADED-ON CONNECTORS SHALL BE MADE USING PRESSURE TYPE MECHANICAL CONNECTORS APPLIED AFTER WIRES