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3.03 EXPOSED CONDUIT INSTALLATION NOTES

A. THE FOLLOWING EXPOSED CONDUIT RUNS ARE SHOWN AND DIMENSIONED ON CONTRACT DRAWINGS EXCEPT THAT ALL CONDUITS ADDED AFTER A DWG. HAS BEEN ISSUED WITH AN "APPROVED FOR CONSTRUCTION" STICKER AFFIXED SHALL BE FIELD ROUTED.

1. ALL EXPOSED CONDUITS THAT ARE THREE (3) INCH IN DIAMETER AND LARGER, UNLESS OTHERWISE NOTED ON CABLE AND CONDUIT LIST B-5016 REPORT "D-15".
2. ALL EXPOSED SAFETY RELATED CONDUITS RUNNING IN A GROUP THAT CONTAINS AT LEAST ONE THREE (3) INCH DIAMETER CONDUIT OR LARGER IN THAT GROUP.
3. ALL EXPOSED, NON-SAFETY RELATED CONDUITS REQUIRING COMMON SEISMIC SUPPORT, RUNNING IN A GROUP THAT CONTAINS AT LEAST ONE (3) INCH DIAMETER CONDUIT OR LARGER IN THAT GROUP.

B. 1. ALL OTHER EXPOSED CONDUIT TO BE INSTALLED ARE LISTED ON CABLE AND RACE-WAY SYSTEM - REPORT D15 DWG 3240-B5016 AS "EXPOSED CONDUIT - FIELD ROUTED" AND SHALL BE ROUTED BY CONTRACTOR.

2. 90° CONDUIT PULL BOX FITTING (CONDULET) SHALL BE USED IN ACCORDANCE WITH PAR. 3.03W (SH. 5B).

3. FOR EXPOSED FIELD ROUTED CONDUITS THAT REQUIRE SEISMIC SUPPORT, SEE SEISMIC SUPPORT CRITERIA PAR 3.04.

4. CONDUITS LESS THAN THREE (3) INCHES IN DIAMETER LEAVING A CONDUIT GROUP SHALL BE FIELD ROUTED. BREAK POINT IS DEFINED BY SYMBOL E/C AND IS SHOWN WHERE THEY LEAVE THE GROUP.

5. CONTRACTOR SHALL SELECT THE OPTIMUM ROUTE FOR THE EXPOSED FIELD ROUTED CONDUIT TO MINIMIZE THE LENGTH OF RUN AND AVOID PHYSICAL INTERFERENCES AND TO MAINTAIN SEPARATION AS PER PAR. 5.05. THE POWER PLANT MODEL MAY BE USED FOR THIS PURPOSE.

C. FOR A GROUP OF EXPOSED CONDUIT RUNS, WHICH ARE DIMENSIONED, A $\pm$ (2) INCH CUMULATIVE INSTALLATION TOLERANCE WILL BE ALLOWED FOR THE CONDUIT ENVELOPE. SEE FIG. 1 & 2 SH. 5F.

D. THE ROUTING OF DIMENSIONED CONDUIT RUNS SHALL NOT BE CHANGED WITHOUT APPROVAL OF ENGINEER.

E. CONDUIT DIMENSIONS ARE TO THE ℓ OF CONDUITS AND CONDUIT ELEVATIONS ARE TO THE OUTSIDE BOTTOM EDGE OF CONDUITS UNLESS OTHERWISE NOTED. SEE FIG. 1 & 2 SH. 5F.

F. LOW POINTS IN EXPOSED CONDUITS THAT CANNOT DRAIN AND WHEN NOT SEALED AT BOTH ENDS SHALL HAVE WEEP HOLES FOR DRAINAGE. SIZE OF THE WEEP HOLES MAY VARY FROM $\frac{1}{4}$" TO $\frac{3}{4}$", AND SHALL BE CAREFULLY FILED TO REMOVE ROUGH EDGES THAT COULD DAMAGE CABLE JACKET/INSULATION. A ZINC RICH PAINT WILL BE APPLIED OVER THE WEEP HOLE TO PREVENT RUST.

G. ALL EXPOSED METALLIC CONDUITS EXCEPT EMT SHALL BE CONNECTED WITH TREADED COUPLING EXCEPT WHERE CONDUIT CONFIGURATION DOES NOT PERMIT IN WHICH CASE ERICKSON OR SPLIT (TURBINE BUILDING ONLY) COUPLINGS MAY BE USED PER SPEC. 3240-511.

H. FLEXIBLE METAL CONDUIT SHALL BE IN ACCORDANCE TO SPEC # 3240-511.

1. LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE UTILIZED BETWEEN RIGID CONDUIT AND EQUIPMENT JUNCTION BOXES WHERE VIBRATION AND MOVEMENT BY EXPANSION AND CONTRACTION IS ANTICIPATED DURING NORMAL OPERATION. IN ADDITION IT SHALL BE USED AT ALL CONNECTION TO PLANT INSTRUMENTS MOUNTED ON PIPING.
2. BENDING RADIUS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. FLEXIBLE METAL CONDUIT (NON LIQUID-TIGHT) MEETING THE REQUIREMENTS OF UL MAY BE USED IN DRY NON HAZARDOUS LOCATIONS SUCH AS OFFICE AREAS, CONTROL ROOM, ETC.
4. PVC JACKETED FLEXIBLE METAL CONDUIT SHALL NOT BE USED.
5. LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH RADIATION RESISTANT JACKET SIMILAR TO ANACONDA NWC AND NPW MEETING UL360 SHALL BE USED IN ALL PLANT AREAS UNLESS SPACE LIMITATIONS PREVENTS ITS USE. IN LOCATIONS WHERE SPACE LIMITATIONS DO NOT PERMIT THE USE OF LIQUIDTIGHT FLEXIBLE METAL CONDUIT WITH RADIATION RESISTANT JACKET, LEAK-TIGHT CORRUGATED STAINLESS STEEL HOSE SIMILAR TO AMERICAN BOA INC. TYPE "NBI-O" SHALL BE USED.
6. LIQUID-TIGHT FLEXIBLE METAL CONDUITS UP TO 1¼" SIZE HAVE BUILT IN GROUND CABLE, WHICH ASSURES ELECTRICAL CONTINUITY OF CONDUIT AS A GROUND FAULT CURRENT PATH. FOR 1½" AND LARGER, OR 1¼" AND UNDER WITH LENGTH OVER 6 FT., A #2 AWG BARE GROUNDING CABLE SHALL BE USED TO ASSURE THE ELECTRICAL CONTINUITY OF CONDUIT AS A GROUND FAULT CURRENT PATH. FOR DETAILS SEE FIG. 7 SH. 5F.

I. ALL OUTDOOR CONDUITS AND CONDUITS IN WET OR UNHEATED AREAS ENTERING EQUIPMENT FROM THE TOP SHALL BE SEALED WHERE THE CONDUIT ENTERS THE EQUIPMENT AND A DRAIN FITTING SHALL BE PROVIDED TO PREVENT ACCUMULATION OF CONDENSED WATER ABOVE THE SEAL. THE DRAIN FITTING SHALL DRAIN ANY CONDENSATION AWAY FROM THE EQUIPMENT ENCLOSURE. THIS REQUIREMENT DOES NOT APPLY TO CONDUITS SEALED AT BOTH ENDS.

J. CONDUITS PENETRATING AN HVAC ENVELOPE (NEGATIVE PRESSURE BOUNDARY) SHALL HAVE SEALING FITTINGS INSTALLED. SEE GENERAL ARRANGEMENT DWGS G-1010, G-1011, G-1013 & G-1040 THRU G-1043 FOR BOUNDARY OF HVAC ENVELOPES.

WHERE SEALING FITTINGS CANNOT BE INSTALLED, CONDUITS WILL BE SEALED AT PULL BOX NEXT TO HVAC ENVELOPE (NEGATIVE PRESSURE BOUNDARY). SEE DETAIL SEE FIG 1 SH. 5G ALL SEALING METHODS USED TO MAINTAIN THE NEGATIVE PRESSURE BOUNDARY SHALL WITHSTAND DIFFERENTIAL PRESSURE OF 0.25" H_2O.

K. TRANSMITTAL OF AIR, MOISTURE, AND SMOKE FROM THE CONDUIT SYSTEM AND ENVIRONS INTO SWITCHGEAR, MOTOR CONTROL CENTERS, PANELS AND ENCLOSURES SHALL BE PREVENTED BY SEALING CABLE ENTRANCES TO EQUIPMENT TO WITHSTAND DIFFERENTIAL PRESSURE OF 1" H_2O. SEE SPECIFICATION 3240-485.

L. FOR CONDUITS TERMINATED AT EQUIPMENT, CONDUIT REDUCERS AND FITTINGS MAY BE USED TO MATCH THE RIGID OR FLEXIBLE CONDUIT TO EQUIPMENT. SEE TYPICAL DETAILS A, B, C, D, E, F, G ON SH 5L, 5M, 5P & 5R

M. FOR TYPICAL DETAILS SHOWING CONDUITS TERMINATED AT MOTORS, SEE FIG 8,9 SH. 5F & FIG 2 SH. 5G FOR TYPICAL DETAIL SHOWING CONDUITS TERMINATED AT SWITCHGEAR, MCC'S, PANELS AND OTHER ELECTRICAL ENCLOSURES SEE FIG 4,5,6,10 SH 5F FOR BOTTOM ENTRY; FIG. 6 SH. 5G FOR TOP ENTRY OR SIDE ENTRY.

N. ALL CONDUIT ENTERING TRAY SHALL BE GROUNDED TO THE TRAY. CONDUIT COUPLINGS THAT ARE EMBEDDED IN WALL AND EXIT BY MORE THAN 4" HORIZONTAL AND 12" VERTICAL OF CABLE TRAY WILL REQUIRE CONDUIT NIPPLE TO THE TRAY. SEE FIG. 1 (& 5) SH. 5H. FOR CONDUIT ENTERING TRAY WITH SOLID COVER, SEE FIG. 2,3 SH. 5H.

O. ALL EXPOSED NON SAFETY RELATED CONDUITS SHALL BE SEISMICALLY SUPPORTED IF THEY RUN ABOVE OR WITHIN 9' HORIZONTALLY OF SAFETY RELATED EQUIPMENT AND RACEWAYS.

P. FOR NON-SEISMIC SUPPORT OF CONDUIT:

1. CONDUIT SHALL BE SUPPORTED WITHIN THREE (3) FEET OF EACH PULLBOX AND ANY TERMINATION POINT.
2. EXPOSED RIGID STEEL CONDUIT WITH THREADED COUPLING SHALL BE SUPPORTED FOR STRAIGHT HORIZONTAL & VERTICAL RUNS, PROVIDED SUCH SUPPORTS PREVENT THE TRANSMISSION OF STRESSES TO TERMINATION WHERE CONDUIT IS DEFLECTED BETWEEN SUPPORTS. THE SPACING BETWEEN SUPPORTS SHALL NOT EXCEED THE DISTANCE SHOWN IN THE FOLLOWING TABLE.

CONDUIT SIZE	MAX DISTANCE BETWEEN CONDUIT SUPPORT
¾"	10'
1"	12'
1½"	14'
2"	16'
3" AND LARGER	20'

IN GROUPS OF DIFFERENT SIZE CONDUITS RUNNING VERTICAL, DISTANCE BETWEEN SUPPORTS WILL BE DETERMINED BASED ON THE SMALLEST CONDUIT IN THAT GROUP.

3. NON-SEISMIC SUPPORT MAY BE OF THE COMMERCIAL TYPE.

Q. FOR FIELD RUN CONDUITS, A LONG RADIUS BEND SHALL BE USED OR ADDITIONAL PULL BOXES INSTALLED WHEN THE USE OF A STANDARD BEND WILL RESULT IN A SIDE WALL PRESSURE EXCEEDING THE MANUFACTURER'S MAXIMUM RECOMMENDED VALUE.

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CH. E. SENKUS
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NUCLEAR SAFETY RELATED | WPPSS QUALITY CLASS I, II & G

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
NUCLEAR PROJECTS NO. 3 & 5
GENERAL NOTES, SYMBOLS AND REFERENCE DRAWINGS

WPPS-3240
D-5023
SHEET 5A

RIDS

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