TABLE 1 (SEE NOTE 39, DWG. D-215-001)
MIN. CND. SPACING FOR BUTTED CLAMPS

CND. SIZE	.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00
.75	3.25							
1.00	3.25	3.50						
1.25	3.50	3.75	3.75					
1.50	3.50	3.75	4.00	4.00				
2.00	4.50	4.50	4.75	5.00	5.75			
2.50	4.75	4.75	5.00	5.25	6.00	6.25		
3.00	5.00	5.25	5.25	5.50	6.25	6.50	7.00	
4.00	5.50	5.75	5.75	6.00	6.75	7.00	7.50	8.00

TABLE 2 (SEE NOTE 39, DWG. D-215-001)
MIN. CND. SPACING FOR STAGGERED CLAMPS

CND SIZE	.75	1.00	1.25	1.50	2.00	2.50	3.00	4.00
.75	2.25							
1.00	2.50	2.50						
1.25	2.50	2.75	3.00					
1.50	2.75	2.75	3.00	3.25				
2.00	3.50	3.50	3.75	4.00	4.25			
2.50	3.75	3.75	4.00	4.25	4.50	4.75		
3.00	4.00	4.25	4.25	4.50	4.75	5.00	5.25	
4.00	4.50	4.75	4.75	5.00	5.25	5.50	5.75	6.25

TABLE 3 (USE WHEN ELECTRICAL TERMINATIONS ARE NOT SUPPORTED BY PIPING SYSTEMS) - SEALTITE FLEX

CND. SIZE	MIN. INSIDE BEND RADIUS	A (MIN.)	FLEX LENGTH	MAX FLEX LENGTH
.75	1'-1"	3'-10"	A+3"	10'-0"
1.00	1'-3"	4'-2"	A+3"	10'-0"
1.25	1'-6"	4'-9"	A+3"	10'-0"
1.50	1'-8"	5'-0"	A+3"	10'-0"
2.00	1'-10"	5'-6"	A+3"	10'-0"
2.50	2'-0"	5'-10"	A+3"	10'-0"
3.00	2'-6"	6'-9"	A+3"	10'-0"
4.00	3'-0"	7'-3"	A+3"	10'-0"

A = THE PROJECTED STRAIGHT LINE DISTANCE FROM THE END OF THE RIGID CONDUIT TO THE ELECTRICAL TERMINATION (SEE DETAILS "AA" & "BB")

TABLE 4 (USE WHEN ELECTRICAL TERMINATIONS ARE SUPPORTED BY PIPING SYSTEMS) - SEALTITE FLEX

CND SIZE	MIN. INSIDE BEND RADIUS	A (MIN.)	FLEX LENGTH	MAX FLEX LENGTH
.75	1'-1"	4'-1"	A+6"	10'-0"
1.00	1'-3"	4'-7"	A+6"	10'-0"
1.25	1'-6"	5'-4"	A+6"	10'-0"
1.50	1'-8"	5'-9"	A+6"	10'-0"
2.00	1'-10"	6'-3"	A+6"	10'-0"
2.50	2'-0"	6'-8"	A+6"	10'-0"

A = THE PROJECTED STRAIGHT LINE DISTANCE FROM THE END OF THE RIGID CONDUIT TO THE ELECTRICAL TERMINATION SEE DETAILS ("AA" & "BB")

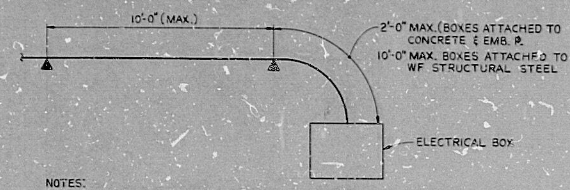
TABLE 6 MINIMUM CONDUIT BENDING RADIUS

CND. DIA. (IN.)	RECOMMENDED MINIMUM BENDING RADIUS (IN.) TO ℄	ACCEPTABLE MIN. (IN.) TO ℄
.75	5.00	4.50
1.00	6.00	5.75
1.25	8.00	7.25
1.50	10.00	8.25
2.00	12.00	9.50
2.50	15.00	12.50
3.00	18.00	15.00
4.00	24.00	20.00

TABLE 5 (MINIMUM OFFSET DISTANCE 'DI' FOR SUPPORTS AT BENDS)

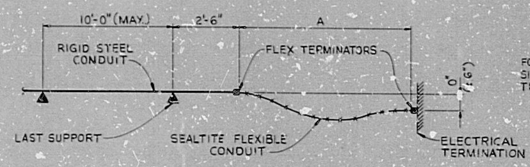
CND SIZE	D_1	CND SIZE	D_1
.75	9"	2.00	1'-2"
1.00	10"	2.50	1'-5"
1.25	1'-0"	3.00	1'-7"
1.50	1'-1"	4.00	2'-0"

'D_1' IS ALWAYS MEASURED TO THE ℄ OF THE CONDUIT AND IS THE MINIMUM VALVE (SEE NOTE 4)



NOTES:
1. FOR BOXES ATTACHED TO CONCRETE, A MINIMUM OF 2 SUPPORTS SHALL BE PROVIDED ON THE CONDUIT PER NOTE 4.
2. FOR BOXES ATTACHED TO WF STRUCTURAL STEEL, A MINIMUM OF ONE SUPPORT SHALL BE PROVIDED ON THE CONDUIT. IN THIS CASE THE BOX ACTS AS A SUPPORT.
3. RIGID CONDUIT SHALL NOT CANTILEVER FROM A BOX.

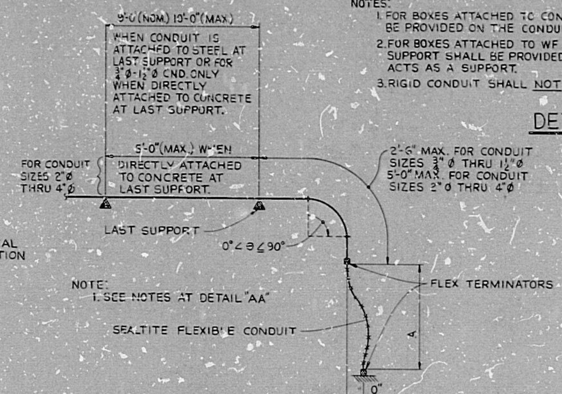
DETAIL "HH"



NOTES:
1. FOR ELECTRICAL TERMINATIONS AT PIPING SYSTEMS (I.E. VALVES, INSTRUMENTS ETC.) SEE TABLE 4.
2. FOR ELECTRICAL TERMINATIONS OTHER THAN PIPING SYSTEMS, SEE TABLE 3.

DETAIL "AA"

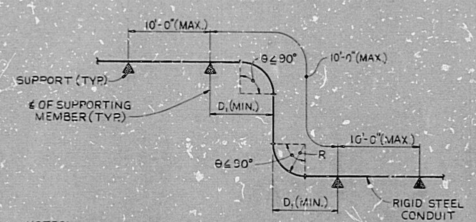
FOR USE WITH SEALTITE FLEXIBLE CONDUIT ONLY



NOTE:
1. SEE NOTES AT DETAIL "AA"

DETAIL "BB"

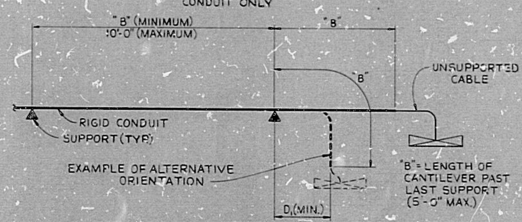
FOR USE WITH SEALTITE FLEXIBLE CONDUIT ONLY



NOTES:
1. SEE TABLE 5 FOR VALUES OF D_1.
2. R = BENDING RADIUS OF CONDUIT (SEE TABLE 6)

DETAIL "EE"

TYP. SPAN CRITERIA FOR HORIZONTAL OR VERTICAL RIGID CONDUIT



NOTE:
1. SEE TABLE 5 FOR VALUES OF D_1.

DETAIL "GG"

ALLOWABLE CANTILEVER OF RIGID CONDUIT WITH UNSUPPORTED CABLE (CABLE TRAY INTERFACE SHOWN)

11. SUPPORTS OTHER THAN CLAMP SUPPORTS ARE USED IN VARIOUS AREAS. THESE SUPPORTS AND THEIR REQUIRED SPACINGS ARE FOUND ON THE FOLLOWING DRAWINGS:

DWG.	SHEET	AREA	ATTACHMENT SURFACE	SUPPORT TYPE
SS-215-005	34,35,36	R.B. OUTSIDE DRYWELL, BELOW DEFINED ELEV.	CONCRETE	VERTICAL LOAD SUPPORTS
SS-215-005	43,44,45	R.B. INSIDE DRYWELL	STRUCTURAL STEEL	SHIM SUPPORTS, ANGLE GUIDE SUPPORTS
SS-215-005	21, 30C 31A, 31B	R.B. INSIDE DRYWELL	BIO-WALL PEDISTAL WALL	ANGLE TENT SUPPORT & LONGITUDINAL SUPPORT
SS-215-005	30B, 31A 47, 49	R.B. INSIDE DRYWELL	BIO-WALL PEDISTAL WALL	HAT SUPPORT & LONGITUDINAL SUPPORT
SS-215-005	27A, 31B 48B, 50	R.B. INSIDE DRYWELL	DRYWELL LINER	ANGLE TENT SUPPORT & LONGITUDINAL SUPPORT
SS-215-005	27B, 47 48A, 50	R.B. INSIDE DRYWELL	DRYWELL LINER	HAT SUPPORT & LONGITUDINAL SUPPORT
SS-215-005	22, 23A 23B, 24, 25 27C, 30B 30C, 31B 47, 49A, 48B	R.B. INSIDE DRYWELL	DRYWELL LINER	TUBE SUPPORT & LONGITUDINAL SUPPORT

12. SUPPORTS AND SPACING OF SUPPORTS DEFINED ON THIS DRAWING REFER TO CLAMP SUPPORTS AS DESCRIBED ON:

DWG.	SHEET	
SS-215-005	1A, 1B	ATTACHMENTS OF STRUTS TO CONCRETE
SS-215-005	2A	ATTACHMENTS OF STRUTS TO CONCRETE
SS-215-005	3	ATTACHMENTS OF STRUTS TO CONCRETE
SS-215-005	7A, 7B	ATTACHMENTS OF STRUTS TO STRUCTURAL STEEL
SS-215-005	8	ATTACHMENTS OF STRUTS TO STRUCTURAL STEEL
SS-215-005	9	ATTACHMENTS OF STRUTS TO STRUCTURAL STEEL
SS-215-005	4	STANDARD CLAMPS

ADDITIONAL REQUIREMENTS FOR CLAMP SUPPORTS ARE DEFINED ON THE FOLLOWING DRAWINGS:

DWG.	SHEET	AREA	ATTACHMENT SURFACE	SPECIAL REQT.
SS-215-005	2A	R.B. OUTSIDE DRYWELL	CONCRETE	NOTE 2: SPECIAL SPACING FOR SUPPORTS ON 1-1/2" Ø CONDUIT
SS-215-005	2B	R.B. OUTSIDE DRYWELL	CONCRETE	NOTE 13: SPACING OF CLAMP SUPPORTS IN RELATIONSHIP TO EXPANSION JOINTS
SS-215-005	7C	R.B. OUTSIDE DRYWELL BELOW DEFINED ELEVATIONS	STRUCTURAL STEEL	NOTE 9
SS-215-005	40, 41 42, 43	R.B. INSIDE DRYWELL	STRUCTURAL STEEL	SEE DRAWING DETAILS FOR ADDITIONAL SPACING REQUIREMENTS FOR CLAMPS.

CLAMP SUPPORTS ARE NOT USED FOR ATTACHMENTS TO THE DRYWELL LINER INSIDE DRYWELL WALL.

NOTES:-

1. THE CRITERIA ON THIS DRAWING PERTAINS TO ALL SEISMIC SUPPORTED CONDUIT WITH THE EXCEPTION OF NOTE 8.
2. FOR LEGEND, REFERENCES, STANDARD DETAILS, AND ADDITIONAL NOTES, SEE DWG. D-215-001.
3. SUPPORT SPACING FOR ALL SEISMIC SUPPORTED CONDUIT SHALL BE 10'-0" MAXIMUM, UNLESS NOTED OR APPROVED OTHERWISE BY THE ENGINEER. THE 10'-0" MAXIMUM SPACING SHALL BE MEASURED ALONG THE RUN OF THE CONDUIT. THIS CRITERIA SHALL NOT APPLY IN THE FOLLOWING AREAS:
   A. INSIDE DRYWELL OF THE REACTOR BUILDING.
   B. OUTSIDE DRYWELL OF REACTOR BUILDING, BELOW EL. 620'-6".
   C. 1-1/2" DIAMETER CONDUIT OUTSIDE DRYWELL OF THE REACTOR BUILDING, ABOVE EL. 620'-6".

   FOR SUPPORT SPACING CRITERIA IN THE ABOVE EXCLUDED AREAS, SEE THE APPROPRIATE SS-215 SERIES DRAWINGS.
4. EVERY LENGTH OF RIGID CONDUIT, INDEPENDENT OF CONFIGURATION, (FROM END-TO-END OF CONDUIT) SHALL HAVE A MINIMUM OF 2 SUPPORTS, EXCEPT AS NOTED OR APPROVED OTHERWISE BY THE ENGINEER. A CONDUIT END IS THE TERMINATION OF THE RIGID CONDUIT, TYPICALLY AT A BOX, FLEX CONNECTION, OR WHERE ENTERING/LEAVING CABLE TRAY AND EXPANSION JOINT.
5. FOR ALLOWABLE CANTILEVER LENGTHS OF CONDUIT, SEE DETAILS "AA", "BB", AND "GG". MINIMUM CANTILEVER PAST LAST SUPPORT SHALL BE 0" OR AS REQUIRED BY THE DETAILS OF THE CONDUIT TO SUPPORT ATTACHMENT.
6. UNLESS OTHERWISE APPROVED BY THE ENGINEER, ALL TERMINATIONS OF RIGID CONDUIT REQUIRING SEAL-TITE FLEXIBLE CONDUIT SHALL HAVE THE CONDUIT INSTALLED AS FOLLOWS:
   A. FLEXIBLE CONDUIT SHALL BE INSTALLED SUCH THAT THE MINIMUM INSIDE BEND RADIUS, AS DEFINED IN TABLES 3 AND 4, SHALL NOT BE VIOLATED.
   B. WHEN THE END OF THE RIGID CONDUIT IS AXIALLY ALIGNED WITH THE ELECTRICAL TERMINATION (±6"), SEE DETAILS "A-A" AND "B-B".
   C. WHEN THE TERMINATION CONFIGURATION VARIES FROM AS DESCRIBED IN "B" ABOVE, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:
      1. INSTALL A MINIMUM LENGTH OF FLEXIBLE CONDUIT EQUAL TO THE SHORTEST LENGTH WHICH WOULD NORMALLY BE INSTALLED WITHOUT VIOLATING THE MINIMUM BEND RADIUS, AS DEFINED IN TABLES 3 AND 4, PLUS AN ADDITIONAL INCREMENT LENGTH OF 6" WHEN ATTACHING TO TERMINATIONS SUPPORTED BY PIPING SYSTEMS, OR 3" FOR ALL OTHER TERMINATIONS. THE FINAL INSTALLATION OF FLEXIBLE CONDUIT SHALL ALSO SATISFY THE MINIMUM BEND RADIUS AS DEFINED IN TABLES 3 AND 4.
      2. THE MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL BE 10'-0".
   D. IF FLEXIBLE CONDUIT CANNOT BE INSTALLED TO MEET THIS CRITERIA, THE ENGINEER SHALL BE CONTACTED TO PROVIDE A SOLUTION.
   E. FLEXIBLE CONDUIT SHALL NOT BE ATTACHED DIRECTLY TO ELECTRICAL BOXES ATTACHED TO CONCRETE/EMBEDDED PLATE, UNLESS NOTED OR APPROVED OTHERWISE BY THE ENGINEER.
7. THE VALUES FOR D1 AS SHOWN IN TABLE 5 ARE BASED ON HAVING THE CONDUIT CLAMP CLEAR THE COUPLING WHEN FACTORY ELBOWS ARE USED. WHEN FACTORY ELBOWS ARE NOT USED, THE D1 VALUES MAY BE DECREASED AS REQUIRED. IT IS PREFERRED, HOWEVER, THAT THE CLAMP FALL ENTIRELY ON THE STRAIGHT PORTION OF CONDUIT (i.e., NOT ON THE RADIUS OF THE BEND). WHEN THIS CONDITION CANNOT BE ACCOMPLISHED, THE CLAMP AND ASSOCIATED HARDWARE SHALL BE POSITIONED RADIALLY TO THE CONDUIT BEND.
8. FOR NON-SAFETY CONDUIT SUPPORTED BY SEISMIC THREADED ROD SUPPORTS (DRAWING SERIES SS-215-006), THE MAXIMUM CANTILEVER LENGTH PAST THE LAST SUPPORT SHALL BE 3'-0" IN LIEU OF THE VALUES AS SPECIFIED ELSEWHERE ON THIS DRAWING.
9. EMBEDDED CONDUIT SLEEVES IN THE 620'-6", 638'-6", AND 654'-6" CONTROL COMPLEX SLABS MAY BE USED AS A SUPPORT POINT FOR THE CONDUIT. HOWEVER, THE CONDUIT SHALL NOT CANTILEVER FROM THE EMBEDDED SLEEVE, UNLESS NOTED OR APPROVED OTHERWISE BY THE ENGINEER.
10. WHEN ELECTRICAL BOXES ARE ATTACHED TO WIDE FLANGE STRUCTURAL STEEL, THE FLEX CONDUIT MAY RUN DIRECTLY FROM A BOX.

NUCLEAR SAFETY RELATED

NO	DATE	MADE	CHKD	APPROVALS

REVISIONS

DATE	RELEASED FOR	ENGR.
6/25/79	CONSTRUCTION SP-33	
	LIMITED CONSTRUCTION: AS NOTED	
	PRELIMINARY NOT FOR CONSTRUCTION	
	BIDDING PURPOSES	

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
PERRY NUCLEAR POWER PLANT UNITS 1 & 2
ELECTRICAL
CONDUIT LAYOUT
DETAILS

READING PA. — GILBERT ASSOCIATES, INC. ENGINEERS AND CONSULTANTS

DRAFTING: MADE J.M.R. 2-8-79; CHECKED W.M.H. 6-1-79; APPROVAL 6-25-79
ENGINEERING APPROVALS: ARCHITECTURAL N/A; CIVIL N/A; STRUCTURAL 6-25-79; ELECTRICAL 6-25-79; MECHANICAL N/A; ENVIRONMENTAL N/A; NUCLEAR N/A

SCALE NONE — 04 — 4549 — D-215-004 — REV J
W.O. 044549-000 — DRAWING NUMBER
SHEET 601

CND LYT DETAILS & REFS SH 601

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