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'-9"	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')

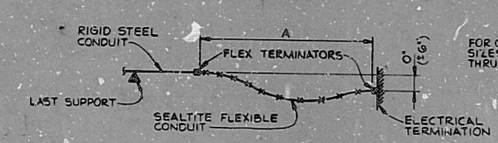
TABLE 6

CND. DIA. (IN.)	RECOMMENDED MINIMUM BENDING RADIUS (IN.) TO ℄	ACCEPTABLE MIN. (IN.) TO ℄
.75	5.00	4.625
1.00	6.00	5.075
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 'D1' FOR SUPPORTS AT BENDS)

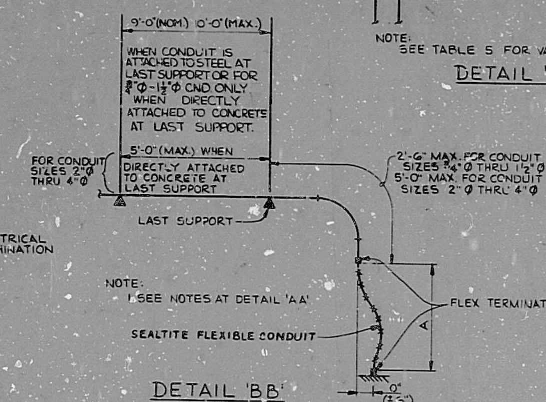
CND SIZE	D_1	CND SIZE	D_1
.75	9"	2.00	1'-2"
1.00	10"	2.50	1'-5"
1.25	1'-0"	3.00	1'-7"
1.50	1'-1"	4.00	2'-0"

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



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

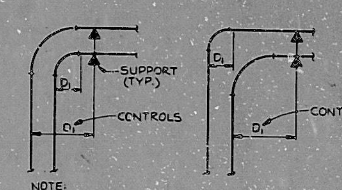
DETAIL 'AA'



NOTE:
1. SEE NOTES AT DETAIL 'AA'

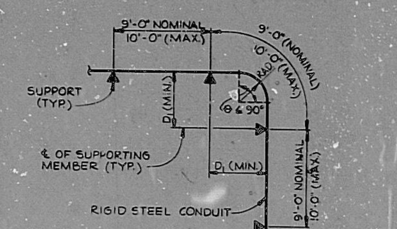
DETAIL 'BB'

SPAN CRITERIA FOR STRAIGHT HORIZONTAL OR VERTICAL RIGID CONDUIT RUN



NOTE:
SEE TABLE 5 FOR VALUES OF D_1

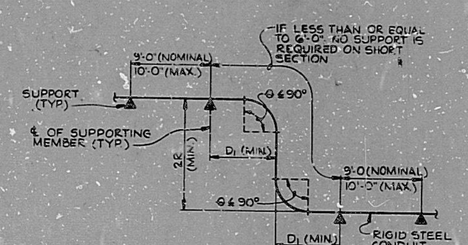
DETAIL 'DD'



NOTES:
1. A MINIMUM OF TWO SUPPORTS IS REQUIRED IN EACH STRAIGHT SECTION ON EACH SIDE OF THE BEND EXCEPT AS SPECIFIED IN DETAIL 'EE' & 'FF'.
2. SEE TABLE 5 FOR VALUES OF 'D_1'.
3. IF MULTIPLE CONDUITS OF DIFFERENT OR EQUAL SIZES BEND TOGETHER HORIZONTALLY OR VERTICALLY, THE MINIMUM DISTANCE FOR THE FIRST CLAMPS (OR SUPPORTING FRAME) AWAY FROM THE BENDS SHALL BE CONTROLLED BY THE 'D_1' VALUE FOR THAT CONDUIT WHICH POSITIONS THE SUPPORT FARTHEST FROM THE GROUP OF BENDS. (SEE DETAIL 'DD').

DETAIL 'CC'

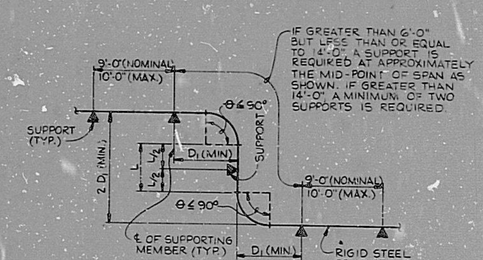
SPAN CRITERIA FOR HORIZONTAL OR VERTICAL RIGID CONDUIT AT BENDS



NOTES:
1. A MINIMUM OF TWO SUPPORTS IS REQUIRED ON THE STRAIGHT SECTION AS SHOWN.
2. SEE TABLE 5 FOR VALUES OF D_1.
3. R = BENDING RADIUS OF CONDUIT (SEE TABLE 6).

DETAIL 'EE'

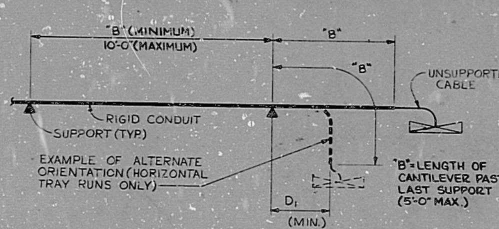
SPAN CRITERIA FOR HORIZONTAL OR VERTICAL RIGID CONDUIT AT BENDS.



NOTES:
1. A MINIMUM OF TWO SUPPORTS IS REQUIRED ON THE STRAIGHT SECTION AS SHOWN.
2. SEE TABLE 5 FOR VALUES OF D_1.

DETAIL 'FF'

SPAN CRITERIA FOR HORIZONTAL OR VERTICAL RIGID CONDUIT AT BENDS



NOTES:
1. SEE TABLE 5 FOR VALUES OF D_1.
2. A MINIMUM OF TWO SUPPORTS IS REQUIRED ON THE STRAIGHT RUN OF CONDUIT AS SHOWN.

DETAIL 'GG'

ALLOWABLE CANTILEVER OF RIGID CONDUIT WHERE UNSUPPORTED CABLE ENTERS CABLE TRAY

7. 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 ELEVATIONS	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, 30	R.B. INSIDE DRYWELL	BIO-WALL PEDESTAL WALL	ANGLE GUIDE TENT SUPPORTS, LONGITUDINAL SUPPORTS
SS-215-005	21, 22, 23, 24, 25, 26	R.B. INSIDE DRYWELL	DRYWELL LINER	ANGLE TENT SUPPORTS, LONGITUDINAL SUPPORTS

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

DWG.	SHEET	DESCRIPTION
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. FOR LEGEND, REFERENCES, STANDARD DETAILS, AND ADDITIONAL NOTES, SEE DWG. D-215-001.
2. UNLESS OTHERWISE APPROVED BY THE ENGINEER, ALL TERMINATIONS OF RIGID CONDUIT REQUIRING SEAL-TITE FLEXIBLE CONDUIT SHALL HAVE THE FLEXIBLE 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 DETAIL "AA".
   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 LENGTH INCREMENT OF 6" WHEN ATTACHING TO TERMINATION 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. THE CONTRACTOR MAY VARY THE CANTILEVER LENGTH OF RIGID CONDUIT PAST THE LAST SUPPORT WITHIN THE FOLLOWING LIMITATIONS:
      1. THE MINIMUM CANTILEVER LENGTH SHALL BE 0" OR AS REQUIRED BY THE DETAILS OF THE CONDUIT TO SUPPORT ATTACHMENT.
      2. THE MAXIMUM CANTILEVER LENGTH SHALL BE 2'-6" PAST THE LAST SUPPORT. WHERE A RIGID CONDUIT CONFIGURATION SIMILAR TO DETAIL "BB" IS SHOWN ON THE LAYOUT DRAWING, ALLOWABLE MAXIMUM CANTILEVER LENGTH SHALL BE AS SHOWN IN DETAIL "BB".
   E. IF THE FLEXIBLE CONDUIT CANNOT BE INSTALLED TO MEET THIS CRITERIA, THE ENGINEER SHALL BE CONTACTED TO PROVIDE A SOLUTION.
3. DIRECT ATTACHMENT CONDUIT SUPPORT SPACING SHALL BE 9'-0" NOMINAL 10'-0" MAXIMUM, UNLESS NOTED OTHERWISE.
4. 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 RADIAL TO THE CONDUIT BEND.
5. "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".

REFERENCES:- (CONTINUED FROM DWG. D-215-001)

GROUNDING - UNIT 1

D-210 SERIES

SERVICE WATER PUMP HOUSE

D-226-112 EL. 561'-4" AND EL. 620'-6"
D-226-113 EL. 561'-4", 603'-6", AND 620'-6"
D-226-132 EMBEDDED CONDUIT - EL. 561'-4"
D-226-133 EMBEDDED CONDUIT - EL. 620'-6"

CIRCULATING WATER PUMP HOUSE AND ACID STORAGE BUILDING - UNIT 1

D-226-311 EL. 621'-6"
D-226-332 EMBEDDED CONDUITS - EL. 621'-6" AND EL. 626'-6"

EMERGENCY SERVICE WATER PUMP HOUSE

D-226-502 TRAY SUPPORT COMPOSITE - EL. 586'-6"
D-226-511 PUMP HOUSE - EL. 586'-6"
D-226-532 EMBEDDED CONDUIT - EL. 586'-6"
SS-226 SERIES, CONDUIT, AND TRAY SUPPORTS

WATER TREATING BUILDING

D-226-611 EL. 62[illegible]'-6"
D-226-612 EL. 642'-0" AND EL. 649'-0"

MISCELLANEOUS BUILDINGS

D-230-001 FUEL OIL PUMP HOUSE, DECHLORINATION EQUIPMENT BUILDING, DECONTAMINATION BUILDING AND HYPOCHLORITE GENERATOR BUILDING
D-230-002 YARD AREA
D-230-003 YARD AREA
D-230-005 GUARDHOUSE

TRAY SUPPORTS - UNIT 2

D-263-SERIES TRAY SUPPORT COMPOSITES

SEPARATION

D-264-004 CONDUIT AND TRAY SEPARATION CRITERIA
D-264-005 CONDUIT AND TRAY SEPARATION CRITERIA

CONDUIT SUPPORTS

SS-215-SERIES
SS-205-SERIES

TURBINE BUILDING - UNIT 2

D-265-012 EAST - EL. 577'-8"
D-265-013 MIDDLE - EL. 577'-8"
D-265-014 WEST - EL. 577'-8"
D-265-021 LUBE OIL AREA - EL. 593'-6"
D-265-022 EAST - EL. 605'-8"
D-265-023 EL. 605'-8"
D-265-024 EL. 605'-8"
D-265-025 WEST - EL. 605'-8"
D-265-031 LUBE OIL AREA - EL. 620'-6"
D-265-032 EAST - EL. 624'-6"
D-265-033 EL. 624'-6"
D-265-034 EL. 624'-3"
D-265-035 WEST - EL. 624'-6"
D-265-036 LAY DOWN AREA - EL. 620'-6"
D-265-037 MAIN TRANSFORMER AREA - EL. 620'-6"
D-265-041 LUBE OIL AREA - EL. 647'-3"
D-265-042 EAST - EL. 647'-6"
D-265-043 EL. 647'-6"
D-265-044 EL. 647'-6"
D-265-045 WEST - EL. 647'-6"
D-265-047 TURBINE FOUNDATION - EMBEDDED CONDUITS

HEATER BAY - UNIT 2

D-265-061 EAST - EL. 580'-6"
D-265-062 WEST - EL. 580'-6"
D-265-071 EAST - EL. 600'-6"
D-265-072 WEST - EL. 600'-6"
D-265-081 EAST - EL. 620'-6"
D-265-082 WEST - EL. 620'-6"
D-265-091 EAST - EL. 647'-6" AND EL. 667'-6"
D-265-092 WEST - EL. 647'-6"

CONDENSATE DEMINERALIZER - UNIT 2

D-265-063 EAST - EL. 568'-6" AND EL. 593'-6"
D-265-064 WEST - EL. 568'-6"
D-265-065 WEST - EL. 546'-6" AND EL. 568'-6"
D-265-074 EAST - EL. 593'-6"
D-265-075 WEST - EL. 593'-6"

REFERENCES:-(CONTINUED)

OFF-GAS BUILDING - UNIT 2

D-265-066 EL. 584'-0"
D-265-067 EL. 602'-6"
D-265-086 EL. 623'-6"
D-265-087 EL. 633'-0", 608'-3", AND 665'-3"

TURBINE POWER COMPLEX - UNIT 2

D-265-084 EAST - EL. 620'-6"
D-265-085 WEST - EL. 620'-6"
D-265-094 EAST - EL. 647'-6"
D-265-095 WEST - EL. 647'-6"

AUXILIARY BUILDING - UNIT 2

D-265-211 EAST - EL. 574'-10"
D-265-212 WEST - EL. 574'-10"
D-265-221 EAST - EL. 599'-0"
D-265-222 WEST - EL. 599'-0"
D-265-231 EAST - EL. 620'-6"
D-265-232 WEST - EL. 620'-6"
D-265-233 STEAM TUNNEL - EL. 614'-6" AND EL. 620'-6"

REACTOR BUILDING - UNIT 2

D-265-311 EAST - EL. 574'-10"
D-265-312 WEST - EL. 574'-10"
D-265-313 AUXILIARY PLAN - UNDER REACTOR PRESSURE VESSEL EL. 594'-5-3/16"
D-265-314 UNDER REACTOR PRESSURE VESSEL EL. 594'-5-3/16" - SECTIONS AND DETAILS
D-265-321 EAST - EL. 599'-9"
D-265-322 WEST - EL. 599'-9"
D-265-331 EAST - EL. 620'-6"
D-265-332 WEST - EL. 620'-6"
D-265-341 EAST - EL. 642'-0"
D-265-342 WEST - EL. 642'-0"
D-265-351 EAST - EL. 652'-0"
D-265-352 WEST - EL. 652'-0"
D-265-361 EAST - EL. 664'-7"
D-265-362 WEST - EL. 664'-7"
D-265-371 EAST - EL. 689'-6"
D-265-372 WEST - EL. 689'-6"
D-265-373 FUEL POOL AREA EMBEDDED CONDUIT - EL. 689'-6"
D-265-374 FUEL POOL AREA EMBEDDED CONDUIT - EL. 689'-6" - DETAILS

SECTIONS AND DETAILS - UNIT 2

D-265-051 THRU D-265-

GROUNDING - UNIT 2

SS-269-SERIES CIRCULATING WATER PUMP HOUSE AND ACID STORAGE BUILDING - UNIT 2
D-276-311 EL. 621'-6" AND EL. 626'-6"
D-276-332 EMBEDDED CONDUITS - EL. 621'-6" AND EL. 626'-6"

TERA APERTURE CARD

NUCLEAR SAFETY RELATED

REV	DATE	DESCRIPTION	MADE	CHKD	APPROVALS
G	9-28-81	REV DETAIL 'B-B' AS PER ECN #6026-33-1171 & NOTE 2-D-1 AS PER ECN #7251-33-1591	DCN	LME	STRUCT. / INTERFACE
F	4-28-81	CHANGED SHEET NUMBER 1 TO 601			STRUCT. / INTERFACE
E	4-14-81	REVISED NOTE #6 & #7, ADDED SHEET 1	Gm	DEC	STRUCT. / INTERFACE
D	2-26-81	ADDED NOTES 6 AND 7. REVISED AS PER ECN #5998-33-1132 AT COORDS F6 & F7, & ADDED NOTE 5; REVISED AS PER ECN #5837-33-1100 & ECN #5764-33-1073 AT COORD C11 & ADDED NOTE 4.	BL	DEC	
C		REVISED DET. 'AA' & 'B-B'	MR	LME	
B	7-18-80	ADDED DETAIL 'GG' PER ECN 4067-33-599	BL	LME	
A	3-24-80	ADDED NOTES 2 & 3. REVISED TABLE 3 & TABLE 4. REV. TABLE 6 AS PER ECN #3654-33-494 & ECN #3655-34-157. DELETED TABLE 7. REVISED DETAIL 'AA' & DETAIL 'BB'. DETAIL 'CC' WAS 'DC', DETAIL 'DD' WAS 'EE', DETAIL 'EE' WAS 'JJ', DETAIL 'FF' WAS 'KK', FROM PREVIOUS ISSUE. DETAILS 'CC', 'FF', 'GG', 'HH', 'II' & 'LL' WERE DELETED. ALSO REV AS INDICATED △A 9 PLACES	MR	LME	

CND LYT DETAILS & REFS SH 601

6/25/79	CONSTRUCTION SP 32
	LIMITED CONSTRUCTION: AS NOTED
	PRELIMINARY NOT FOR CONSTRUCTION
	BIDDING PURPOSES
DATE	RELEASED FOR / ENGR.

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

PERRY NUCLEAR POWER PLANT UNITS 1 & 2

ELECTRICAL
CONDUIT LAYOUT
DETAILS AND REFERENCES

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

DRAFTING: MADE JMR 2-8-79; CHECKED WMH 6-1-79; APPROVAL DC Gilbert 6-13-79
ENGINEER APPROVALS: ARCHITECTURAL N/A; CIVIL N/A; STRUCTURAL D. Campbell 6-25-79; ELECTRICAL D.W. Klemola 6-25-79; MECHANICAL N/A; ENVIRONMENTAL N/A; NUCLEAR N/A

SCALE NONE | W.O. 044549-000 | 04 | 4549 | D-215-004 | REV G

DRAWING NUMBER

SHEET 601

D-GAI 1003-D

1/4" = 1'-0" 0' 5' 10' 15' 20'

RIDS

8112030217