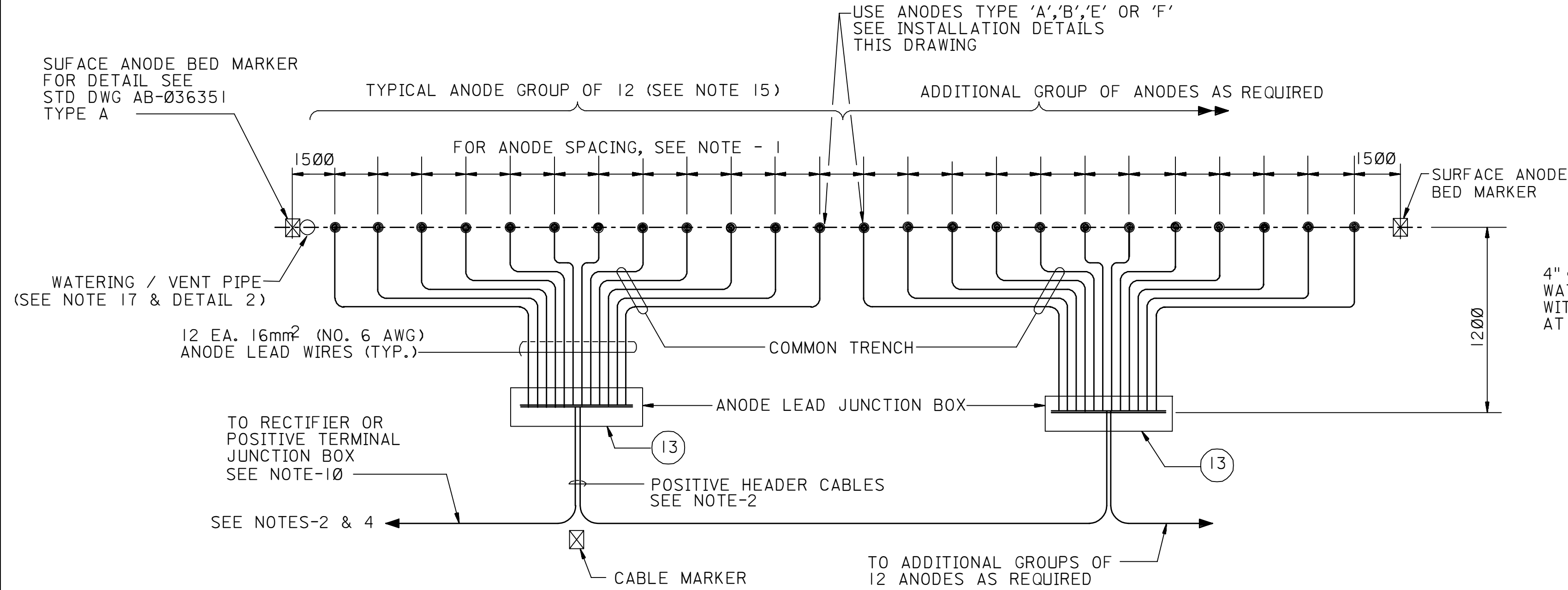
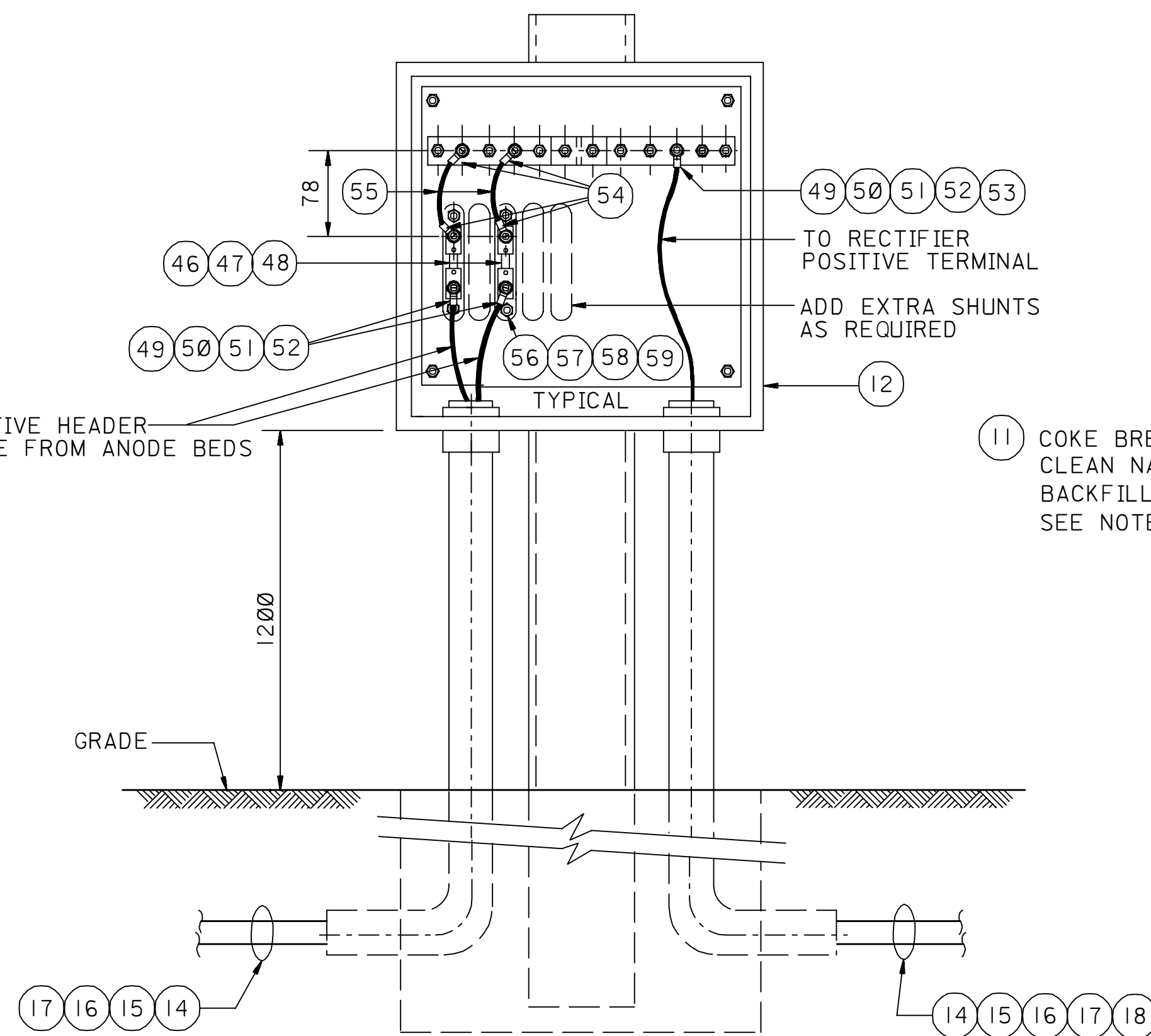


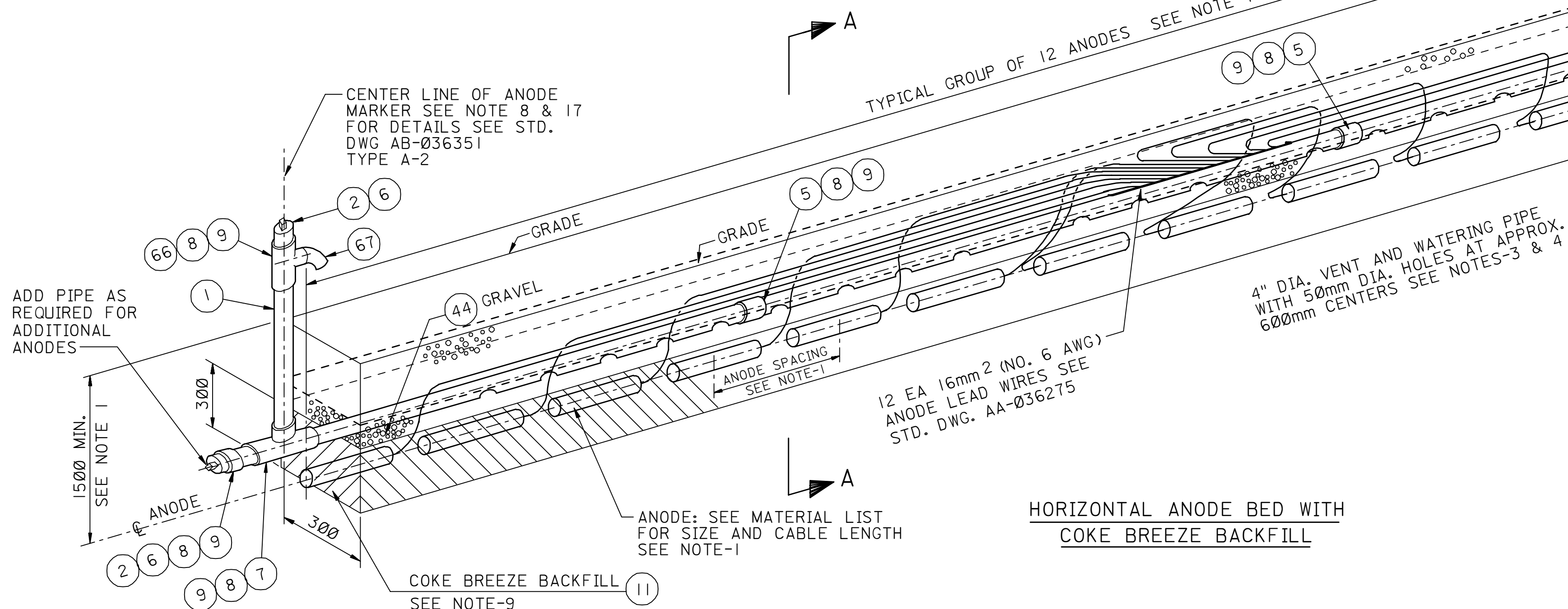


VERTICAL ANODE BED
TYPE 'A', TYPE 'B', TYPE 'E' OR TYPE 'F'

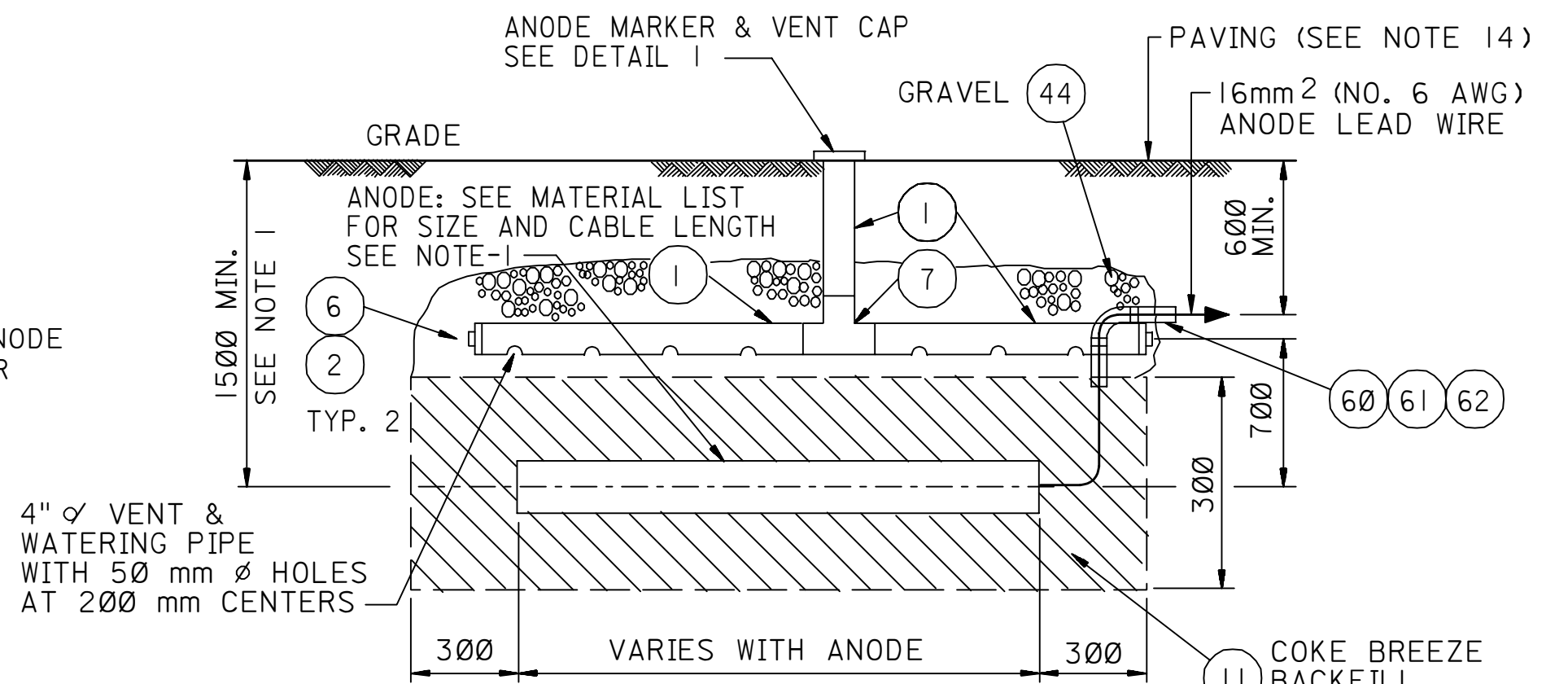


POSITIVE TERMINAL JUNCTION BOX

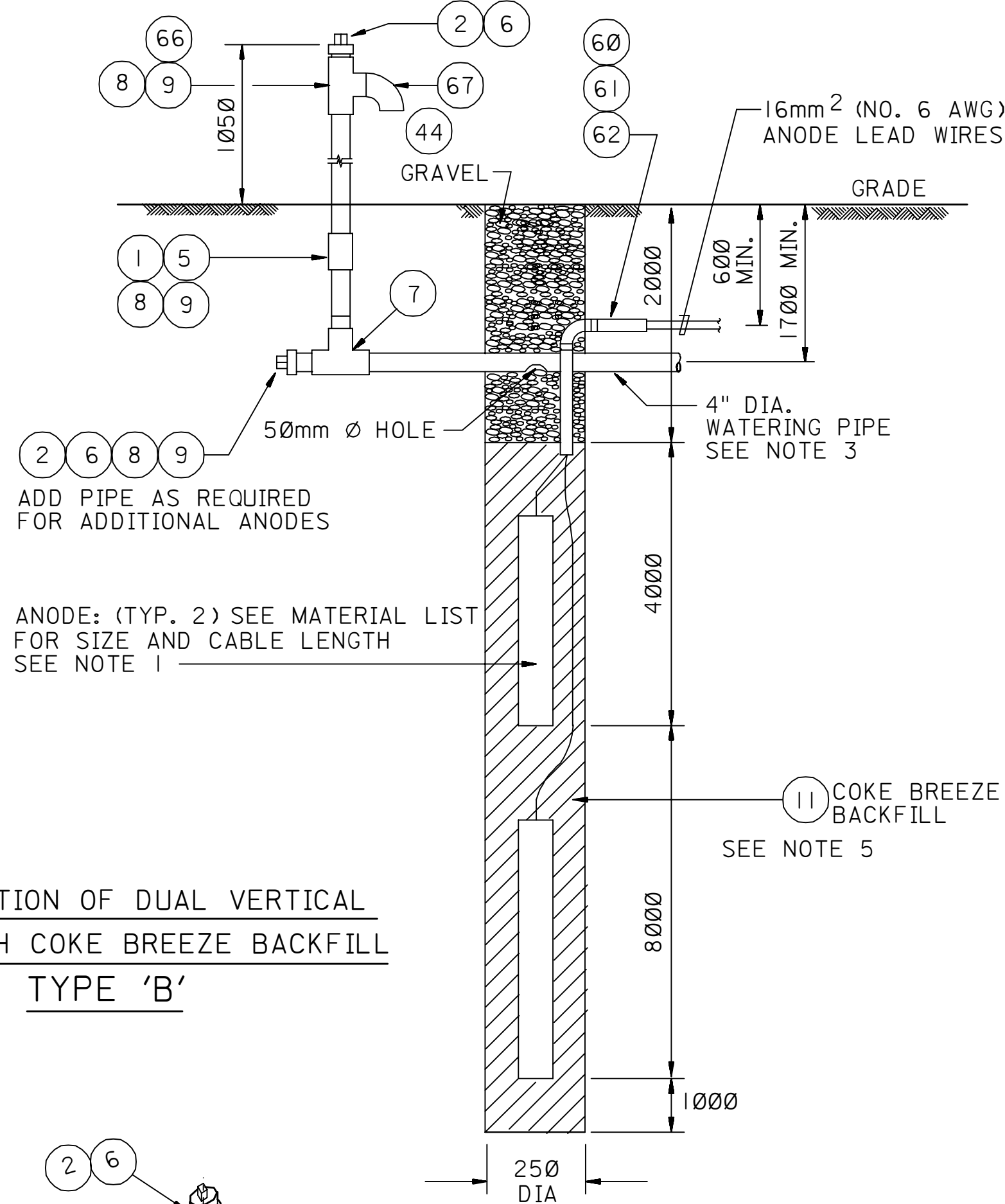
SEE STD. DWG. AB-036540
FOR MOUNTING INSTALLATION DETAILS
SEE NOTE 10



HORIZONTAL ANODE BED WITH
COKE BREEZE BACKFILL



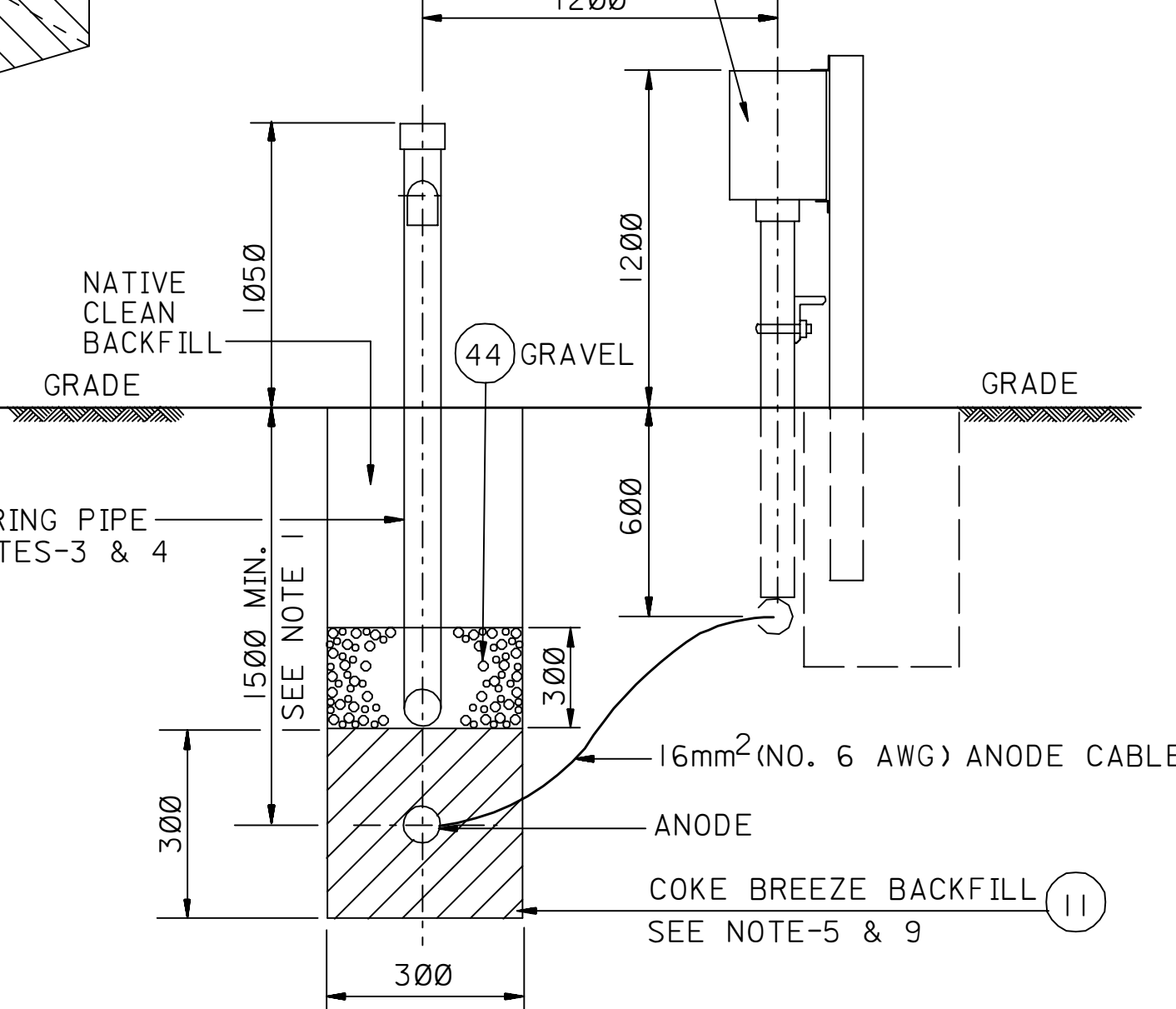
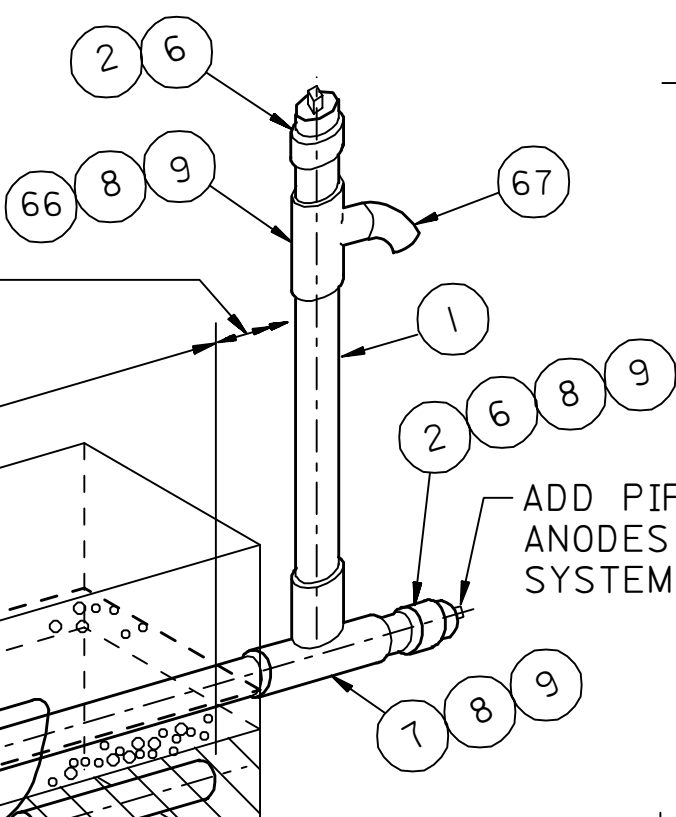
INSTALLATION OF HORIZONTAL ANODE
TYPE 'C'



INSTALLATION OF DUAL VERTICAL
ANODE WITH COKE BREEZE BACKFILL
TYPE 'B'

ADDITIONAL GROUPS OF
ANODES AS REQUIRED

ADD PIPE AS REQUIRED FOR ADDITIONAL
ANODES OR INSTALL SEPARATE WATERING
SYSTEM FOR ADDITIONAL ANODES



SECTION A-A

MATERIAL LIST		
CODE	SAMS NUMBER	DESCRIPTION
1	01-514-272	PIPE: PLASTIC 4" DIAMETER x 6M (20'-0") LONG
2	03-157-143	ADAPTER: CLEANOUT FITTING PLASTIC 4" SIZE.
3	03-157-334	ADAPTER: PIPE PLASTIC 4" SIZE.
4	03-198-342	BUSHING: PIPE PLASTIC 4" x 2" SIZE.
5	03-210-274	COUPLING: PIPE PLASTIC 4" DIAMETER (SEE NOTE 10)
6	03-254-044	PLUG: THREAD 4" SIZE PLASTIC.
7	03-285-084	TEE: PIPE PLASTIC 4" DIAMETER.
8	05-505-443	CEMENT: SOLVENT WELDING.
9	05-511-112	PRIMER: SOLVENT CEMENT, PVC
10	09-259-471	SLAB: CONCRETE; RED, 397mm LONG
11	17-855-011	ANODE BACKFILL: CALCINED PETROLEUM COKE BREEZE
12	17-855-985	MULTI-PURPOSE JUNCTION BOX
13	17-855-950	12 TERMINAL JUNCTION BOX
14	17-858-791	35mm² HMWPE CABLE
15	17-858-793	70mm² HMWPE CABLE
16	17-858-795	120mm² HMWPE CABLE
17	17-858-797	185mm² HMWPE CABLE
18	17-858-799	240mm² HMWPE CABLE
19		
20	17-852-302	ANODE: TA-4 TYPE; W 10M NO. 6 AWG CABLE
21	17-852-304	ANODE: TA-4 TYPE; W 15M NO. 6 AWG CABLE
22	17-852-306	ANODE: TA-4 TYPE; W 23M
23	17-852-308	ANODE: TA-4 TYPE; W 30M
24	17-852-310	ANODE: TA-4 TYPE; W 41M
25	17-852-312	ANODE: TA-4 TYPE; W 52M
26	17-852-350	ANODE: TA-4 TYPE; W 65M
27	17-852-360	ANODE: TA-4 TYPE; W 75M
28	17-852-370	ANODE: TA-4 TYPE; W 85M
29	17-852-380	ANODE: TA-4 TYPE; W 100M
30	17-852-500	ANODE: TA-5A TYPE; W 4.6M
31	17-852-470	ANODE: TA-5A TYPE; W 10M
32	17-852-472	ANODE: TA-5A TYPE; W 15M
33	17-852-474	ANODE: TA-5A TYPE; W 23M
34	17-852-512	ANODE: TA-5A TYPE; W 30.5M
35	17-852-476	ANODE: TA-5A TYPE; W 46M
36	17-852-478	ANODE: TA-5A TYPE; W 65M
37	17-852-480	ANODE: TA-5A TYPE; W 100M
38	17-852-517	ANODE: TA-5A TYPE; W 137.2M
39	12-066-549	PLATE: STEEL; 1/4 " THICK
40	01-167-260	PIPE: STEEL; 3"
41	09-708-133	PRIMER
42	09-630-794	TOP COAT
43	09-258-658	SAND
44	09-246-427	AGGREGATE: CRUSHED STONE 3/4 " GRAVEL
45	09-240-189	CEMENT: PORTLAND; 50KG. BAG
46	17-889-580	SHUNT: 50mV, 50A
47	17-889-595	SHUNT: 50mV, 100A
48	17-889-611	SHUNT: 50mV, 150A
49	14-198-125	CONNECTOR: TERMINAL; FOR 33.63mm² CABLE
50	14-197-827	CONNECTOR: TERMINAL; FOR 67.44mm² CABLE
51	14-198-142	CONNECTOR: TERMINAL; FOR 107.2mm² CABLE
52	14-197-833	CONNECTOR: TERMINAL; FOR 185mm² CABLE
53	14-198-200	CONNECTOR: TERMINAL; FOR 253.9mm² CABLE
54	14-198-133	CONNECTOR: TERMINAL; FOR 53.44mm² CABLE
55	15-111-117	53.44mm² (1/0 AWG) RH/RHW CABLE
56	11-404-812	SCREW: NO. 8-32x19mm LONG
57	10-615-031	NUT: NO. 8-32 THDS./IN
58	10-888-804	WASHER: FLAT; 3/16 " I.D.
59	10-832-008	LOCKWASHER: NO. 8
60	03-711-970	32mm PVC COUPLING
61	03-723-120	32mm PVC 90° ELBOW
62	01-515-520	32mm PVC PIPE
63		
64	D/C	MASTIC FILLED HEAT SHRINK ANODE CAP
65	D/C	TEFLON HEAT SHRINK TUBING
66	03-175-442	REDUCING TEE, PLASTIC 4"x4"x2"
67	03-723-361	ELBOW, 2", PLASTIC
68	15-510-855	CLAMP, 4", ONE-HOLE RIGID STEEL
69	12-408-944	ANGLE: STEEL, 2 1/2 "x2 1/2 "
70	17-852-314	W. 10m LEAD
71	17-852-316	W. 15m LEAD
72	17-852-317	W. 23m LEAD
73	17-852-318	W. 30m LEAD
74	17-852-320	W. 41m LEAD
75	17-852-322	W. 52m LEAD
76	17-852-324	W. 65m LEAD
77	17-852-326	W. 75m LEAD
78	17-852-328	W. 85m LEAD
79	17-852-330	W. 100m LEAD

- NOTES:
- THE TYPE OF ANODE BED, ANODE BED SIZE, ANODE DEPTH AND ANODE SPACING SHALL BE DETERMINED BASED ON THE SOIL RESISTIVITY AND THE REQUIRED CURRENT DISCHARGE AND DESIGN LIFE. IT SHALL BE SPECIFIED FOR EACH INDIVIDUAL ANODE BED.
 - MAXIMUM BURIED LENGTH OF POSITIVE OR ANODE CABLE SHALL NOT EXCEED 150M. IF THIS LENGTH IS TO BE EXCEEDED, AN ABOVE GROUND SPLICE BOX SHALL BE INSTALLED AT INTERMEDIATE LOCATIONS, AS PER STD. DWG. AA-036276.
 - WATERING SYSTEM IS MANDATORY IF SPECIFIED ON THE INSTALLATION DETAIL.
 - TRENCHES TO BE SHORED IN ACCORDANCE WITH STANDARD DRAWING AB-036800.
 - COKE BREEZE TO BE PUMPED. IF PUMPING IS NOT POSSIBLE, THAN COKE BREEZE SHALL BE COMPACTED IN 500mm LAYERS. FOR TYPE A & D INSTALLATION, CLEAN NATIVE BACKFILL (WHEN USED) TO BE COMPACTED IN 500mm LAYERS.
 - BEFORE USING SOLVENT WELDING CEMENT ON ABS PIPE, CLEAN SURFACES TO BE JOINED WITH CLEANER.
 - ANODES INSTALLED UNDER PAVING SHALL BE ADEQUATELY VENTED AS SHOWN.
 - ANODE MARKER SHALL BE INSTALLED AT BOTH ENDS OF ANODE BED TO INDICATE OVERALL LENGTH.
 - WHEN INSTALLING ANODES IN SUBKHA, COKE BREEZE BACKFILL IS OPTIONAL.
 - IF A POSITIVE TERMINAL JUNCTION BOX IS REQUIRED FOR MULTIPLE POSITIVE HEADER CABLES, CONSTRUCT A SEPARATE JUNCTION BOX ASSEMBLY USING THE JUNCTION BOX DETAILS.
 - ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
 - EYEBOLTS OR EQUIVALENT TO BE USED TO LOWER VERTICAL PRE-PACKAGED ANODE INTO BOREHOLE.
 - MARKER POSTS OR COVERS AT INDIVIDUAL ANODES REQUIRED FOR DISTRIBUTED ANODE INSTALLATION.
 - WHEN INSTALLING ANODES IN NON-PAVED AREAS, VENTING FACILITIES ARE NOT REQUIRED. WHEN INSTALLING IN SUBKHA AREA, WATERING FACILITIES ARE NOT REQUIRED.
 - SURFACE ANODE BED GROUPS NOT TO EXCEED 12 ANODES PER GROUP.
 - USE HEAT SHRINK CAP & TUBING FOR ALL IMPRESSED CURRENT ANODES.
 - WATERING PIPE/VENT TO BE ATTACHED TO ANODE SURFACE BED MARKER AT ALL SURFACE ANODE BEDS.
 - WELD ANGLE TO STEEL CHANNEL AND DRILL HOLE FOR MOUNTING CLAMPS.
 - GUARDRAILS REQUIRED FOR JUNCTION BOXES AND WATERING / VENT PIPES.

REFERENCE DRAWINGS

12 TERMINAL JUNCTION BOX DETAIL	AA-036275
MARKER PLATE DETAIL CATHODIC PROTECTION	AB-036351
STANDARD SPECIFICATIONS FOR SHORING TRENCHES	AB-036899
JUNCTION BOX- MOUNTING INSTALLATION DETAILS	AB-036540
MULTI-PURPOSE JUNCTION BOX	AA-036276
DIRECT BURIED "DC" POSITIVE OR NEGATIVE CABLE	AA-036675
DIRECT BURIED CABLES FOR PLANTS	AB-036874

REVISION NOTE:

- REVISED, CHANGED NOTES AND MATERIAL LIST, AND ADDED SHEET 002.

MANDATORY STANDARD

REV. NO.	DATE	BY	JOE/WO	DESCRIPTION	CHKD.	CERT.	APPD.
10	JUL199	ESSD CAB		REVISED NOTES 5 & 13.			
09	SEP93	ESSD RCR		REVISED NOTES 3, 7, 9, 14, 19 & REFORIG. DWG., UPDATE MATERIAL LIST & DWG(SIGNED)	ORIG. SIGNED	ORIG. SIGNED	
08	FEB93	ESSD MAO		GENERAL REVISION	ORIG. SIGNED	ORIG. SIGNED	
07	FEB92	ESSD ASC		SEE REVISION NOTE-1.	ORIG. SIGNED	ORIG. SIGNED	
SAUDI ARABIAN OIL COMPANY							
DRAWN BY: A.B.M.S. CHECKED BY: SCALE: NONE							
DATE STARTED: DATE COMPLETED: 19/3/83							
OPR'G. DEPT. ENC. DEPT. ORIGINAL SIGNED 03-28-86							
APPD. FOR CONST.							
THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED							
CERTIFIED BY: DATE:							

CATHODIC PROTECTION				
SURFACE ANODE BED DETAILS				
HORIZONTAL AND VERTICAL ANODES				
STD. DWG.				METRIC
PLANT NO.	INDEX	DRAWING NUMBER	SHT. NO.	REV. NO.
990	X	AA-036346	10 of 2	10