

FE/2012/Z/80/09
August 1980

PIPELINE GAS DEMONSTRATION PLANT

Phase I

ABBREVIATED VERSION
DEMONSTRATION PLANT PROCESS DESIGN

VOLUME 2

BOOK 2 - SUPPLEMENT

SECTION 3
DEMONSTRATION PLANT AREA DESCRIPTIONS
(PLANT AREAS 207 THROUGH 216)

MASTER

ROBERT J. EBY

ILLINOIS COAL GASIFICATION GROUP

122 S. MICHIGAN AVENUE
SUITE 2014
CHICAGO, ILLINOIS 60603
(312) 431-4925

Date Published - August 1980

PREPARED FOR THE
UNITED STATES DEPARTMENT OF ENERGY
(ENERGY TECHNOLOGY, FOSSIL ENERGY, COAL CONVERSION)

UNDER CONTRACT NO. EF-77-C-01-2012

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

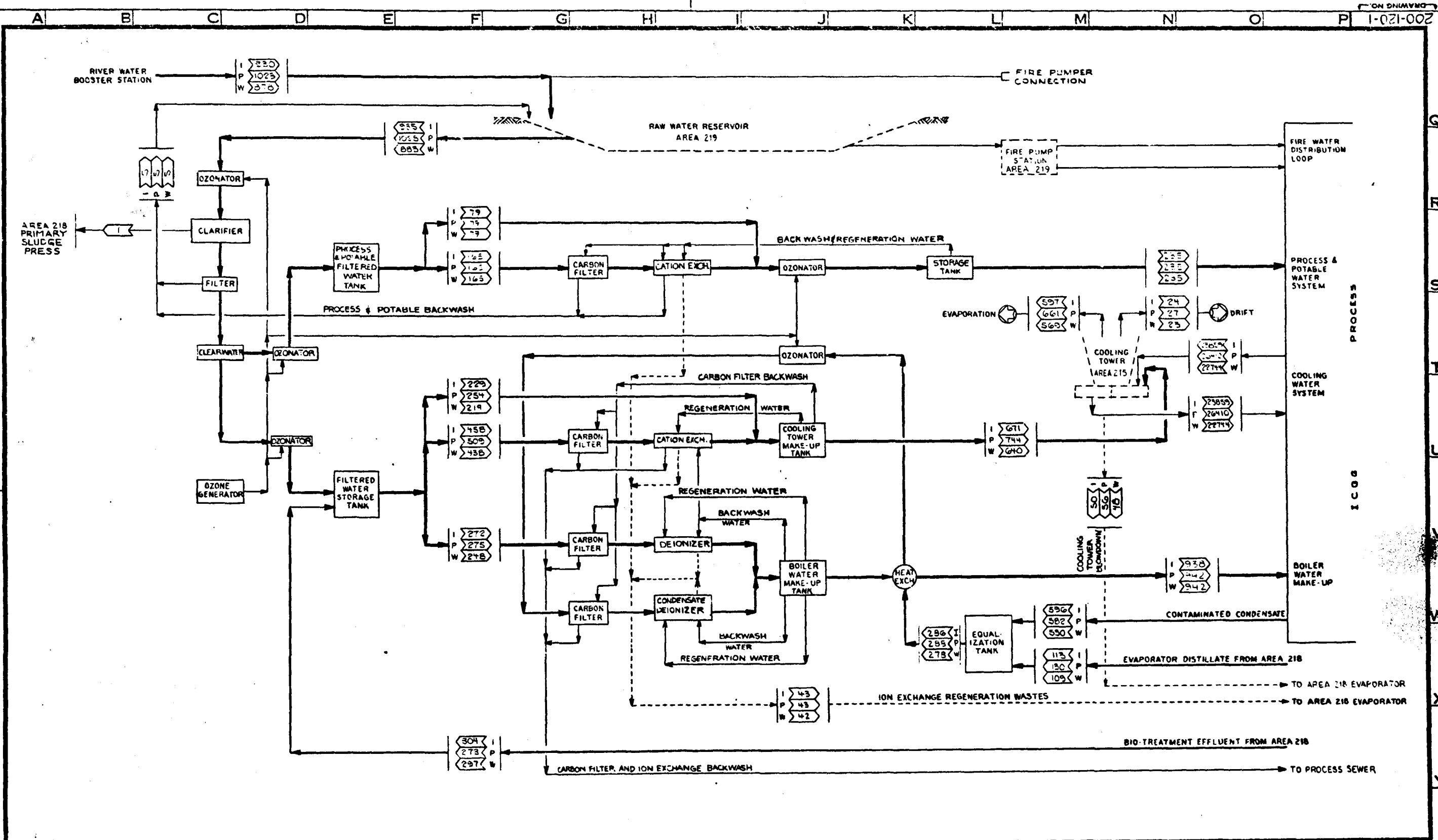
DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

THIS DRAWING IS THE PROPERTY OF THE UNITED STATES GOVERNMENT AND IS LOANED TO YOU BY THE UNITED STATES GOVERNMENT. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION IN WRITING FROM THE UNITED STATES GOVERNMENT.

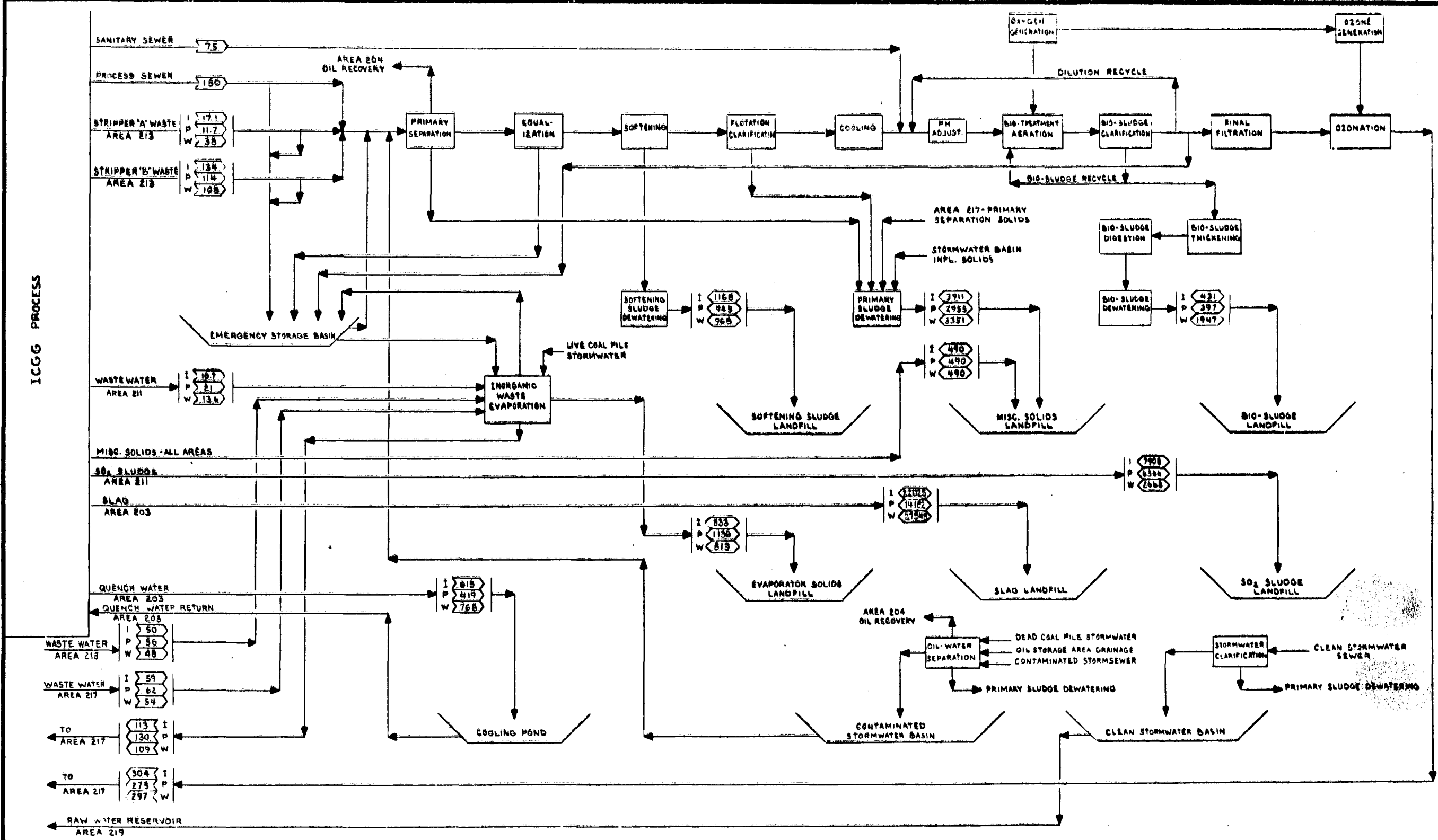


REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD
1	10/1/79	JM			1	10/1/79	JM			1	10/1/79	JM		
2	10/1/79	JM			2	10/1/79	JM			2	10/1/79	JM		
3	10/1/79	JM			3	10/1/79	JM			3	10/1/79	JM		
4	10/1/79	JM			4	10/1/79	JM			4	10/1/79	JM		
5	10/1/79	JM			5	10/1/79	JM			5	10/1/79	JM		
6	10/1/79	JM			6	10/1/79	JM			6	10/1/79	JM		
7	10/1/79	JM			7	10/1/79	JM			7	10/1/79	JM		
8	10/1/79	JM			8	10/1/79	JM			8	10/1/79	JM		
9	10/1/79	JM			9	10/1/79	JM			9	10/1/79	JM		
10	10/1/79	JM			10	10/1/79	JM			10	10/1/79	JM		

BY	DATE	DRAWING STATUS	TITLE	PROJECT NO
DESIGNED	10/1/79	ISSUED	UTILITY FLOW DIAGRAM	7051
DRAWN	10/1/79		WATER TREATMENT	20C-120-1
CHECKED	10/1/79		BLOCK FLOW DIAGRAM	
DRAGO APPL	10/1/79			
ICGG APP	10/1/79			
ICGG APP	10/1/79			
ICGG APP	10/1/79			
ICGG APP	10/1/79			
ICGG APP	10/1/79			

U.S. DOE	ENERGY TECHNOLOGY	PROJECT NO
U.S. DOE	FOSSIL ENERGY PROGRAMS	7051
U.S. DOE	CONTRACT NO. EY-76-CO-2012	20C-120-1
U.S. DOE	PREPARED FOR THE	
U.S. DOE	ILLINOIS COAL GASIFICATION GROUP	
U.S. DOE	BY	
U.S. DOE	DRAGO CORPORATION PITTSBURGH PA	

ICGG PROCESS



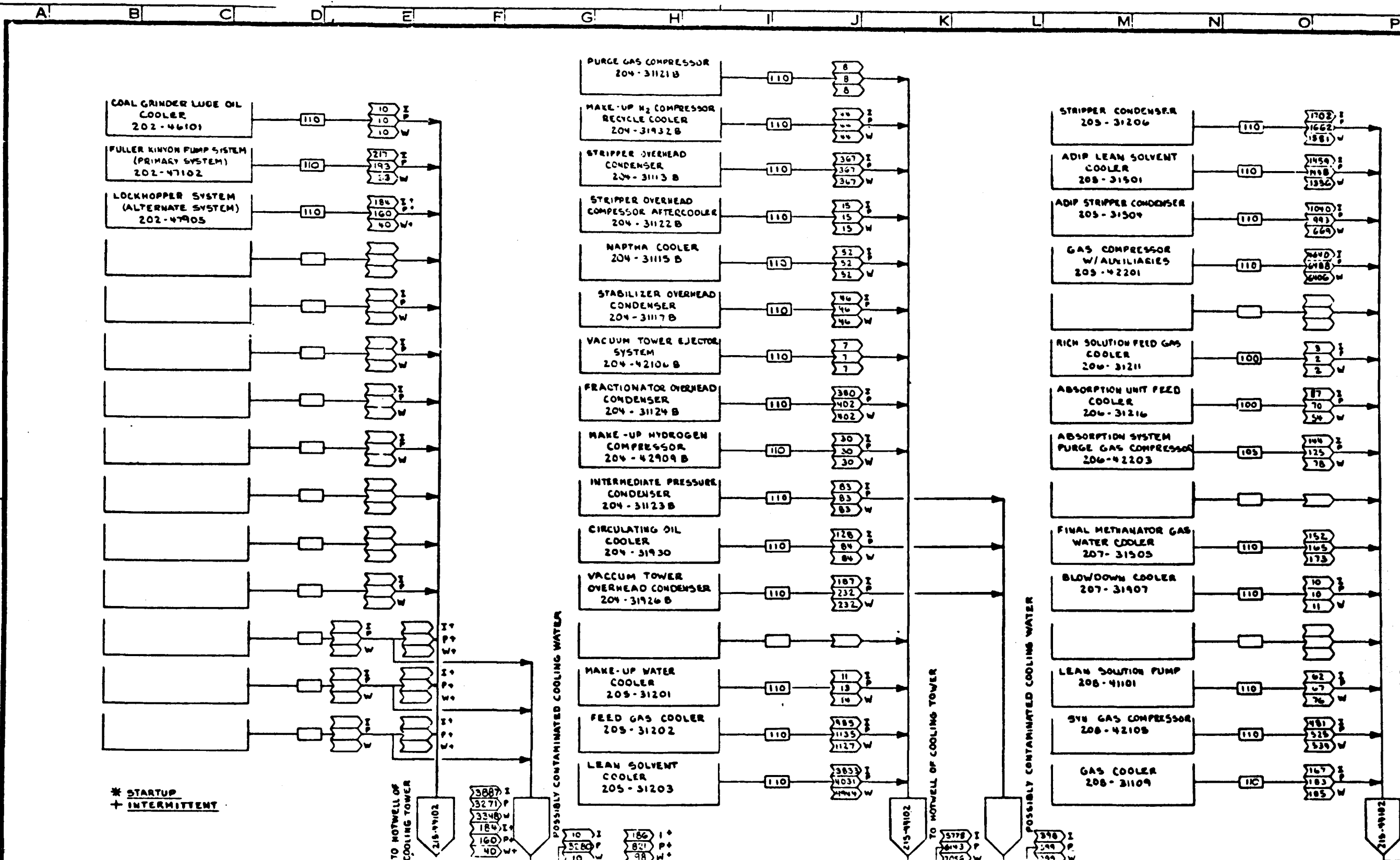
REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D
1	10/1/01	MAN/UA		1	10/1/01	MAN/UA		1	10/1/01	MAN/UA	
2	10/1/01	MAN/UA		2	10/1/01	MAN/UA		2	10/1/01	MAN/UA	
3	10/1/01	MAN/UA		3	10/1/01	MAN/UA		3	10/1/01	MAN/UA	
4	10/1/01	MAN/UA		4	10/1/01	MAN/UA		4	10/1/01	MAN/UA	
5	10/1/01	MAN/UA		5	10/1/01	MAN/UA		5	10/1/01	MAN/UA	
6	10/1/01	MAN/UA		6	10/1/01	MAN/UA		6	10/1/01	MAN/UA	
7	10/1/01	MAN/UA		7	10/1/01	MAN/UA		7	10/1/01	MAN/UA	
8	10/1/01	MAN/UA		8	10/1/01	MAN/UA		8	10/1/01	MAN/UA	
9	10/1/01	MAN/UA		9	10/1/01	MAN/UA		9	10/1/01	MAN/UA	
10	10/1/01	MAN/UA		10	10/1/01	MAN/UA		10	10/1/01	MAN/UA	

DESIGNED	BY	DATE	DRAWING STATUS	TITLE
MAN/UA	MAN/UA	10/1/01	ISSUED	UTILITY FLOW DIAGRAM AREA 218 WASTE TREATMENT & DISPOSAL BLOCK FLOW DIAGRAM
DRAWN	MAN/UA	10/1/01		
CHECKED	MAN/UA	10/1/01		
DRWG APPD	MAN/UA	10/1/01		
ICGS APPD	MAN/UA	10/1/01		
DOE APPD	MAN/UA	10/1/01		
SCALE				

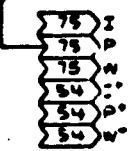
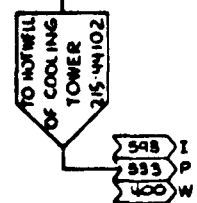
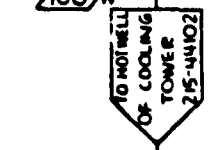
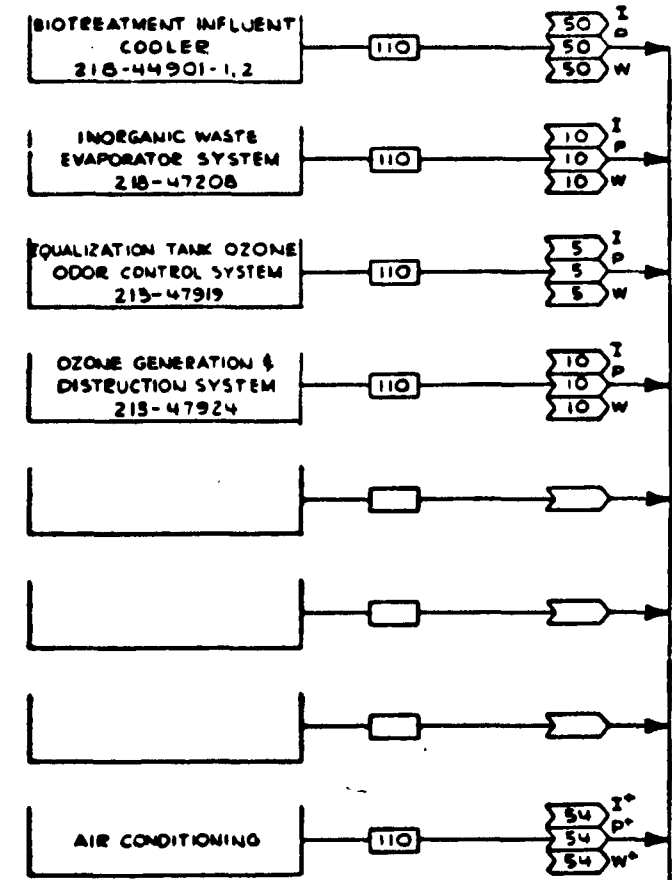
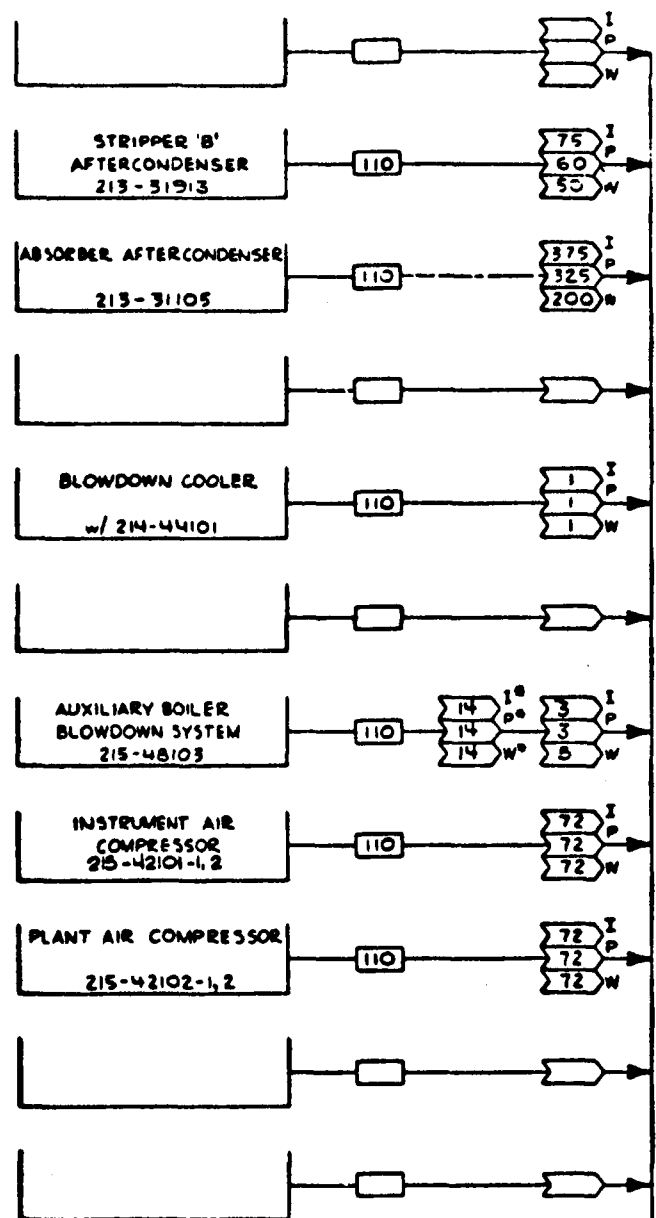
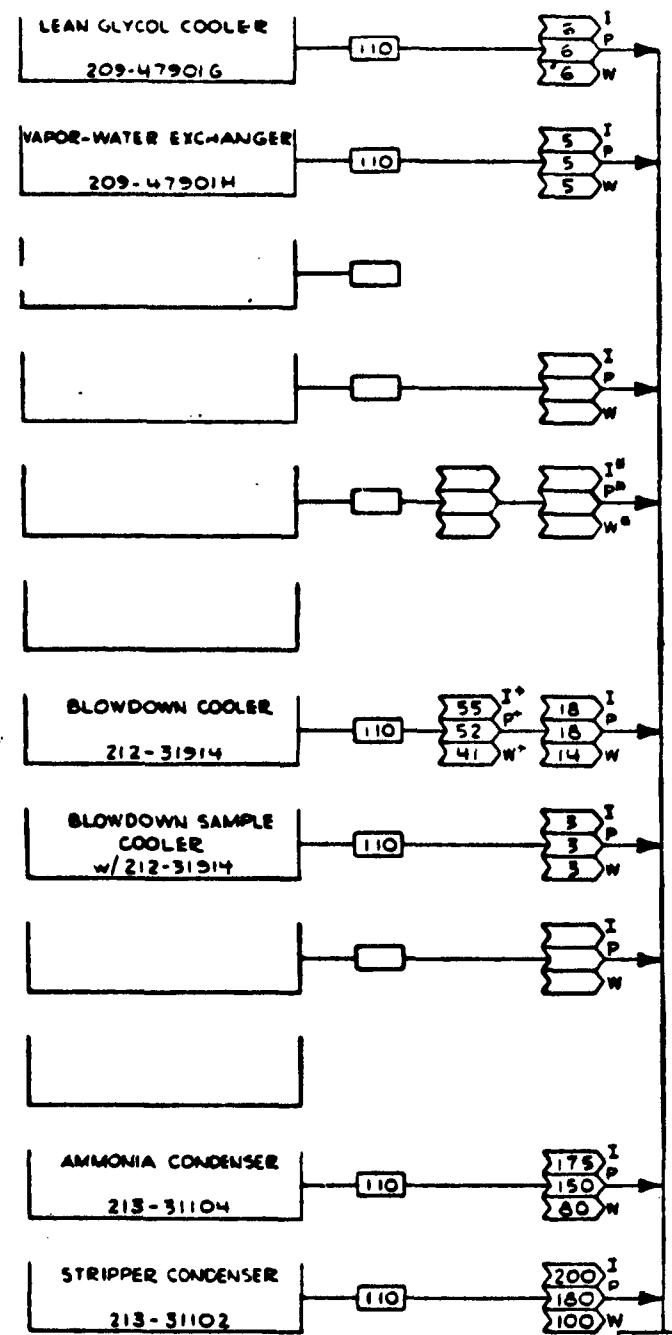
PROJECT NO 7051	DRAWING NO 200-120-2
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH PA
REV	

"D"

DO NOT SCALE THIS DRAWING. IT MAY BE REDUCED FROM ORIGINAL SIZE.

[illegible]

A B C D E F G H I J K L M N O P



TOTAL C.W. REQUIREMENTS

	NORMAL	MAXIMUM	START-UP
I	2376	2425	540
O	2285	2730	559
W	2269	2287	419

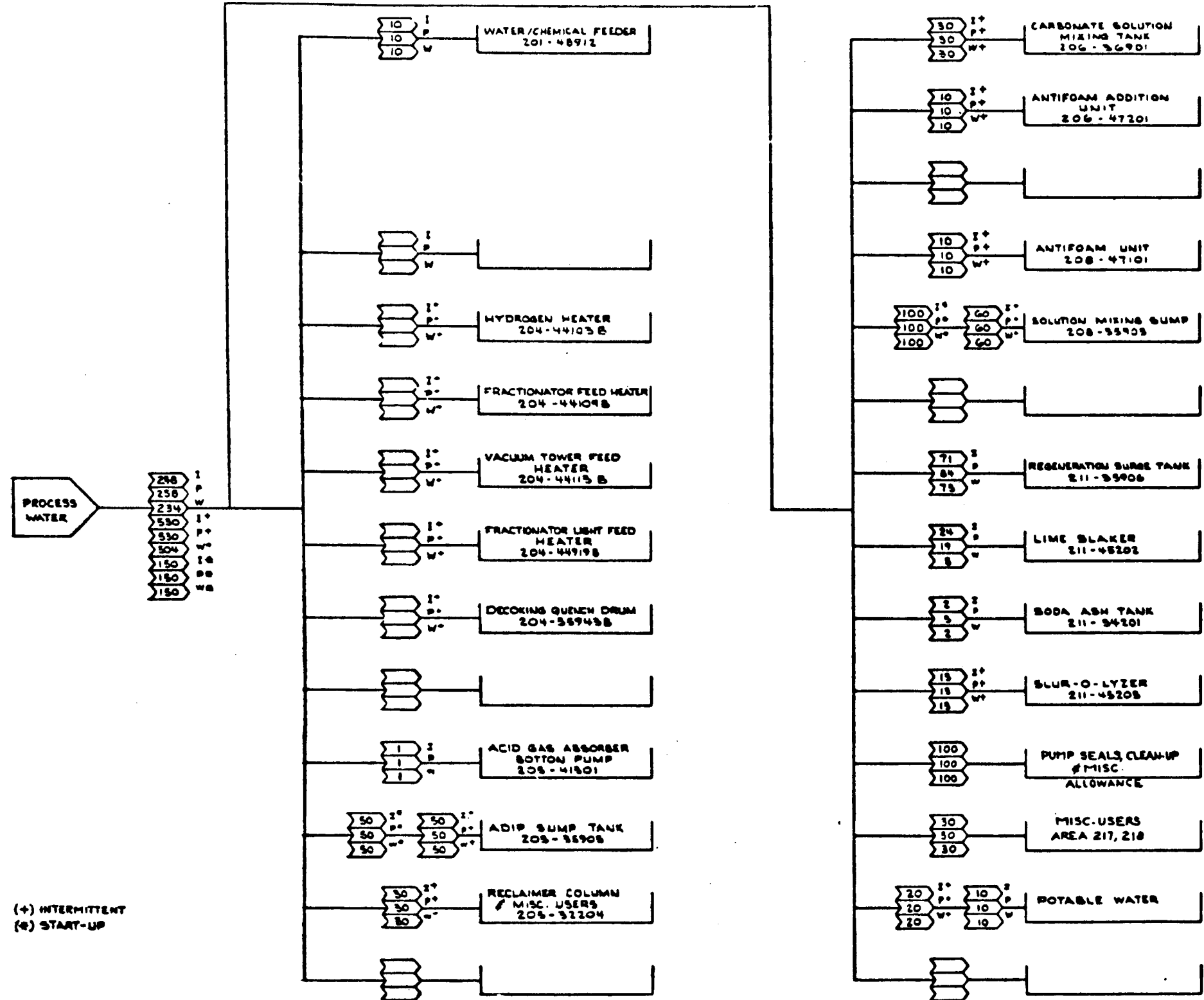
★ START UP
◆ INTERMITTENT

REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO	DATE	BY	CHK'D	APPROV	NO	DATE	BY	CHK'D	APPROV	NO	DATE	BY	CHK'D	APPROV	NO	DATE	BY	CHK'D	APPROV
1	10-1-80	S.V.M.			1	10-1-80	S.V.M.			1	10-1-80	S.V.M.			1	10-1-80	S.V.M.		
2	10-1-80	K.M.M.			2	10-1-80	K.M.M.			2	10-1-80	K.M.M.			2	10-1-80	K.M.M.		
3	10-1-80	C.W.			3	10-1-80	C.W.			3	10-1-80	C.W.			3	10-1-80	C.W.		
4	10-1-80	R.A.			4	10-1-80	R.A.			4	10-1-80	R.A.			4	10-1-80	R.A.		
5	10-1-80	R.A.			5	10-1-80	R.A.			5	10-1-80	R.A.			5	10-1-80	R.A.		
6	10-1-80	R.A.			6	10-1-80	R.A.			6	10-1-80	R.A.			6	10-1-80	R.A.		
7	10-1-80	R.A.			7	10-1-80	R.A.			7	10-1-80	R.A.			7	10-1-80	R.A.		
8	10-1-80	R.A.			8	10-1-80	R.A.			8	10-1-80	R.A.			8	10-1-80	R.A.		
9	10-1-80	R.A.			9	10-1-80	R.A.			9	10-1-80	R.A.			9	10-1-80	R.A.		
10	10-1-80	R.A.			10	10-1-80	R.A.			10	10-1-80	R.A.			10	10-1-80	R.A.		

BY	DATE	DRAWING STATUS
S.V.M.	1-14-80	ISSUED
GAILEPETH	1-15-80	DRPD - TIC
K.M.M.	1-17-80	FOR COMMENTS ON/OF
C.W.	2-15-80	APPROVAL
R.A.	2-15-80	FOR CUSTOMER APPROVAL
R.A.	2-15-80	FOR COMMENTS
R.A.	2-15-80	APPROVAL
R.A.	2-15-80	APPROVAL

DESIGNED	S.V.M.	1-14-80	ISSUED	DATE
DRAWN	GAILEPETH	1-15-80	DRPD - TIC	B.E. 50
CHECKED	K.M.M.	1-17-80	FOR COMMENTS ON/OF	
DRWD APP'D	C.W.	2-15-80	APPROVAL	
ICSS APP'D	R.A.	2-15-80	FOR CUSTOMER APPROVAL	ICSS RAC
TOP APP'D	R.A.	2-15-80	FOR COMMENTS	DOE
SCALE			APPROVAL	

TITLE	UTILITY FLOW DIAGRAM COOLING WATER II	PROJECT NO 7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS	DRAWING NO 200-120-4
CONTRACT NO.	EP-77-C-01-2012	DATE DC-TIC
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP	REV
BY	DRAGO CORPORATION, PITTSBURGH, PA	

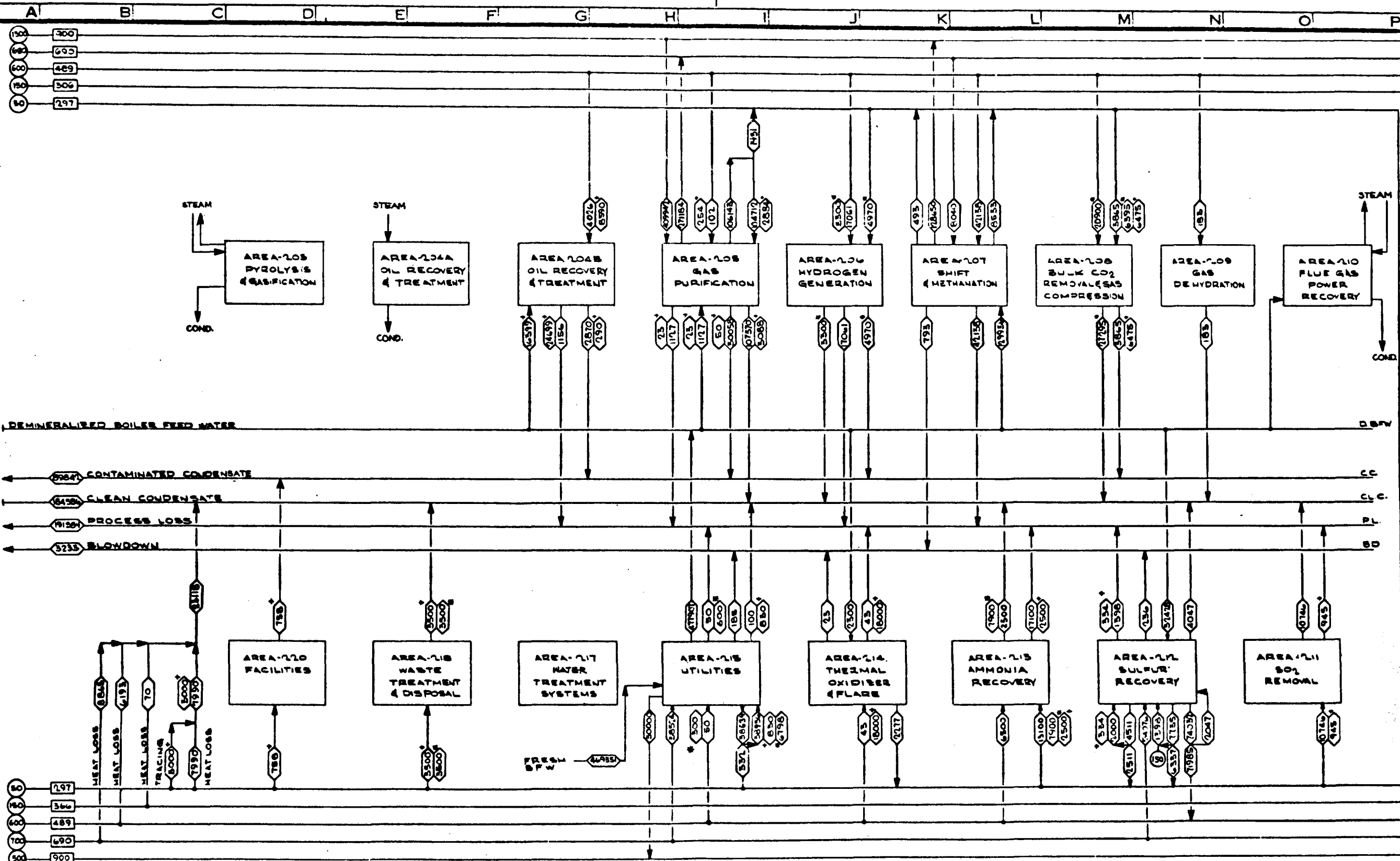


(+) INTERMITTENT
(*) START-UP

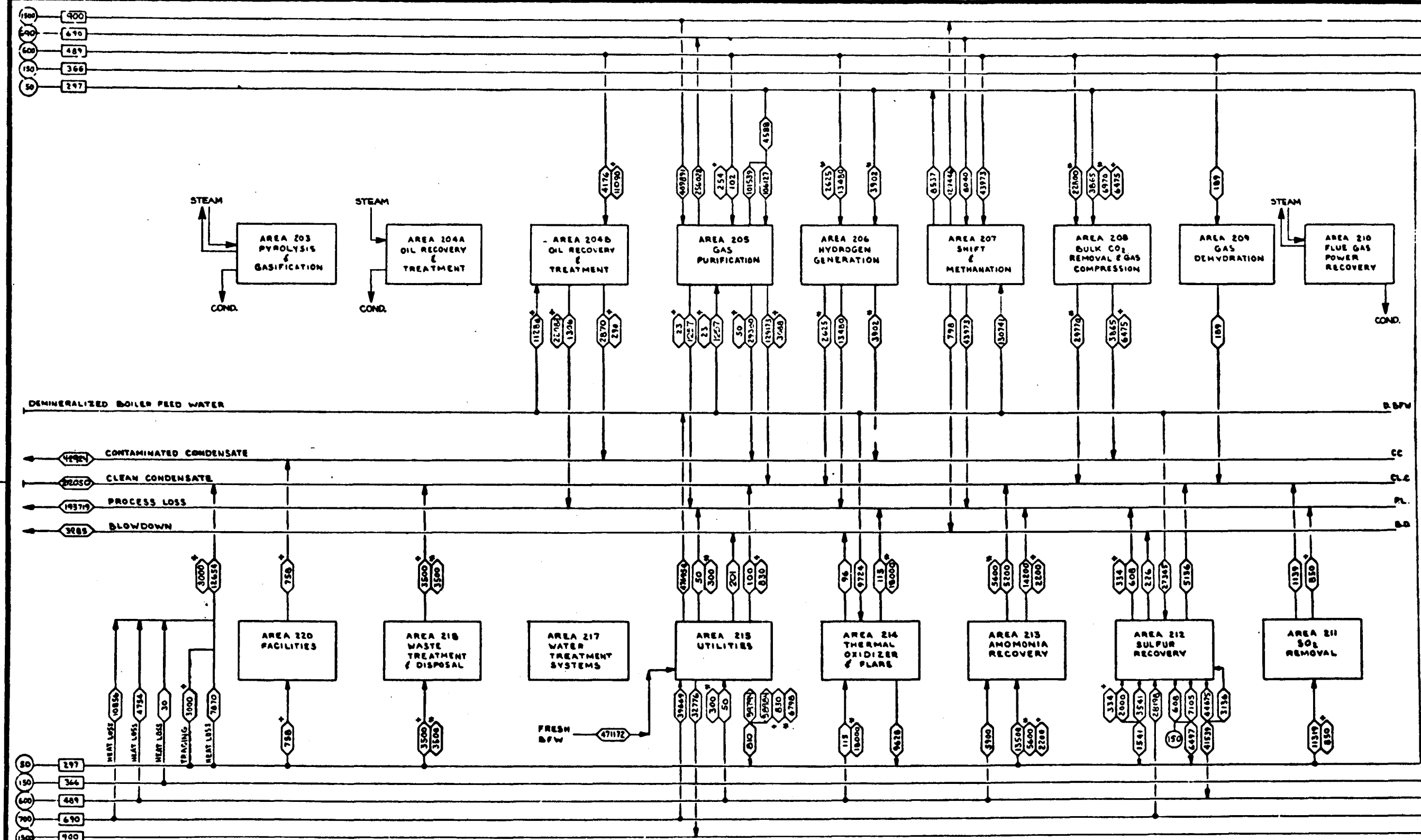
REVISIONS										REVISIONS										REVISIONS									
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10-1-79	SYM	KRM	JRH	1	10-1-79	SYM	KRM	JRH	1	10-1-79	SYM	KRM	JRH	1	10-1-79	SYM	KRM	JRH	1	10-1-79	SYM	KRM	JRH	1	10-1-79	SYM	KRM	JRH
2	10-1-79	SYM	KRM	JRH	2	10-1-79	SYM	KRM	JRH	2	10-1-79	SYM	KRM	JRH	2	10-1-79	SYM	KRM	JRH	2	10-1-79	SYM	KRM	JRH	2	10-1-79	SYM	KRM	JRH
3	10-1-79	SYM	KRM	JRH	3	10-1-79	SYM	KRM	JRH	3	10-1-79	SYM	KRM	JRH	3	10-1-79	SYM	KRM	JRH	3	10-1-79	SYM	KRM	JRH	3	10-1-79	SYM	KRM	JRH
4	10-1-79	SYM	KRM	JRH	4	10-1-79	SYM	KRM	JRH	4	10-1-79	SYM	KRM	JRH	4	10-1-79	SYM	KRM	JRH	4	10-1-79	SYM	KRM	JRH	4	10-1-79	SYM	KRM	JRH
5	10-1-79	SYM	KRM	JRH	5	10-1-79	SYM	KRM	JRH	5	10-1-79	SYM	KRM	JRH	5	10-1-79	SYM	KRM	JRH	5	10-1-79	SYM	KRM	JRH	5	10-1-79	SYM	KRM	JRH
6	10-1-79	SYM	KRM	JRH	6	10-1-79	SYM	KRM	JRH	6	10-1-79	SYM	KRM	JRH	6	10-1-79	SYM	KRM	JRH	6	10-1-79	SYM	KRM	JRH	6	10-1-79	SYM	KRM	JRH
7	10-1-79	SYM	KRM	JRH	7	10-1-79	SYM	KRM	JRH	7	10-1-79	SYM	KRM	JRH	7	10-1-79	SYM	KRM	JRH	7	10-1-79	SYM	KRM	JRH	7	10-1-79	SYM	KRM	JRH
8	10-1-79	SYM	KRM	JRH	8	10-1-79	SYM	KRM	JRH	8	10-1-79	SYM	KRM	JRH	8	10-1-79	SYM	KRM	JRH	8	10-1-79	SYM	KRM	JRH	8	10-1-79	SYM	KRM	JRH
9	10-1-79	SYM	KRM	JRH	9	10-1-79	SYM	KRM	JRH	9	10-1-79	SYM	KRM	JRH	9	10-1-79	SYM	KRM	JRH	9	10-1-79	SYM	KRM	JRH	9	10-1-79	SYM	KRM	JRH
10	10-1-79	SYM	KRM	JRH	10	10-1-79	SYM	KRM	JRH	10	10-1-79	SYM	KRM	JRH	10	10-1-79	SYM	KRM	JRH	10	10-1-79	SYM	KRM	JRH	10	10-1-79	SYM	KRM	JRH

DESIGNED	BY	DATE	DRAWING STATUS	DATE
DESIGNED	SVM	10-1-79	ISSUED	10-1-80
DRAWN	KJH	10-1-79	OPPD-TIC	
CHECKED	KMM	10-1-79	FOR COMMENTS AND/OR	
DRAWN APP'D		10-1-79	APPROVAL	
ICSB APP'D			FOR CUSTOMER APPROVAL	ICSB
DOE APP'D			AND/OR COMMENTS	DOE
DRAWN			APPROVAL FOR	
SCALE			UNSTRUCTION	

TITLE	UTILITY FLOW DIAGRAM PROCESS WATER	PROJECT NO. 7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS	GROUP NO. 200-120-5
CONTRACT NO.	EE-77-0-1-2312	CASE DC-TIC
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP	REV
DRAWN BY	DRAYO CORPORATION, PITTSBURGH, PA	

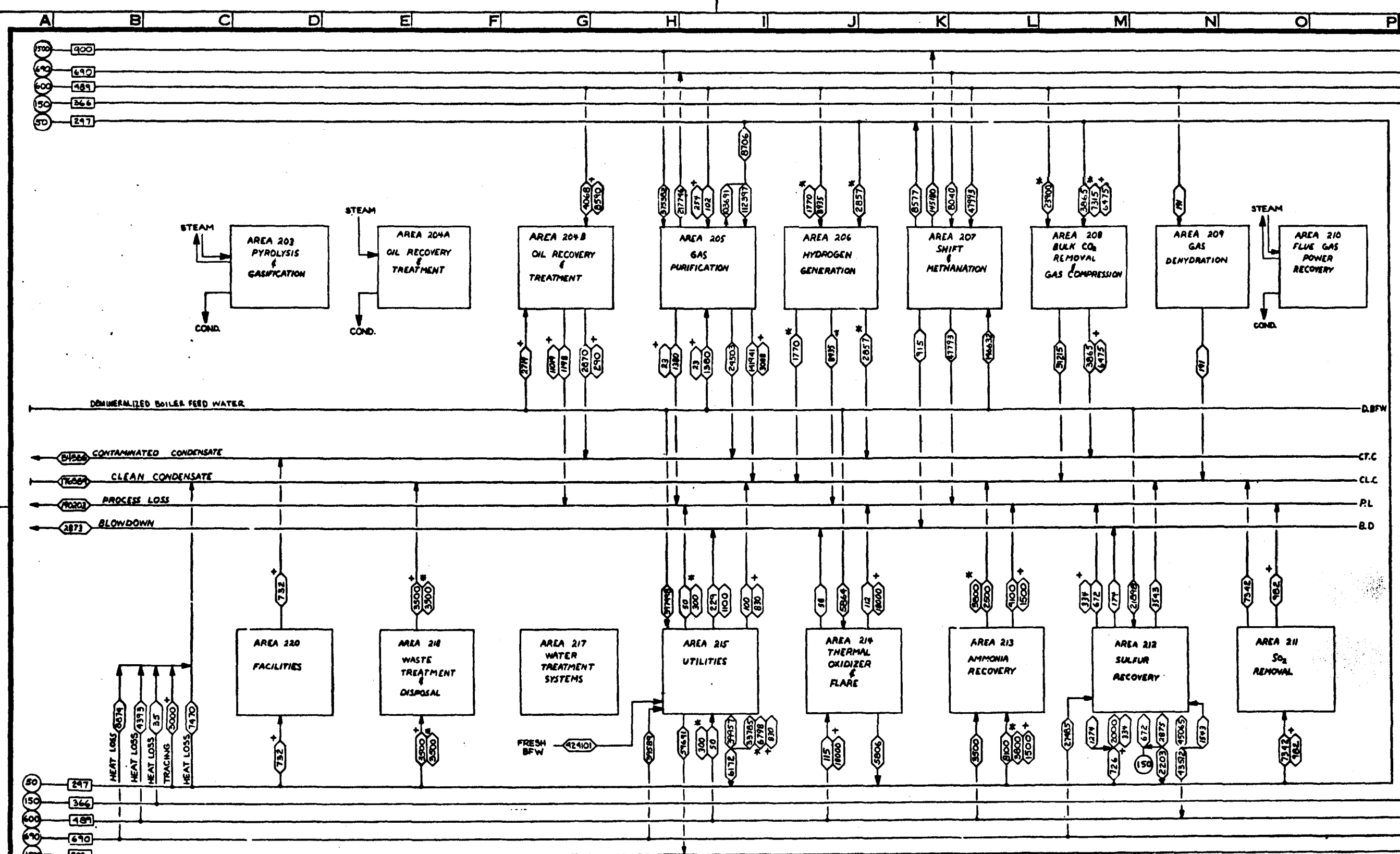


REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHKD	APPROV	NO.	DATE	BY	CHKD	APPROV	NO.	DATE	BY	CHKD	APPROV
1	10-1-77	SVK	KMM	JWH	1	10-1-77	SVK	KMM	JWH	1	10-1-77	SVK	KMM	JWH
2	10-1-77	SVK	KMM	JWH	2	10-1-77	SVK	KMM	JWH	2	10-1-77	SVK	KMM	JWH
3	10-1-77	SVK	KMM	JWH	3	10-1-77	SVK	KMM	JWH	3	10-1-77	SVK	KMM	JWH
4	10-1-77	SVK	KMM	JWH	4	10-1-77	SVK	KMM	JWH	4	10-1-77	SVK	KMM	JWH
5	10-1-77	SVK	KMM	JWH	5	10-1-77	SVK	KMM	JWH	5	10-1-77	SVK	KMM	JWH
6	10-1-77	SVK	KMM	JWH	6	10-1-77	SVK	KMM	JWH	6	10-1-77	SVK	KMM	JWH
7	10-1-77	SVK	KMM	JWH	7	10-1-77	SVK	KMM	JWH	7	10-1-77	SVK	KMM	JWH
8	10-1-77	SVK	KMM	JWH	8	10-1-77	SVK	KMM	JWH	8	10-1-77	SVK	KMM	JWH
9	10-1-77	SVK	KMM	JWH	9	10-1-77	SVK	KMM	JWH	9	10-1-77	SVK	KMM	JWH
10	10-1-77	SVK	KMM	JWH	10	10-1-77	SVK	KMM	JWH	10	10-1-77	SVK	KMM	JWH



REVISIONS					REVISIONS					REVISIONS				
NO	DESCRIPTION	DATE	BY	CHKD	NO	DESCRIPTION	DATE	BY	CHKD	NO	DESCRIPTION	DATE	BY	CHKD
1	DEMONSTRATION CONCEPT	1-8-80	SVM	KMM	JWH	1	PRELIMINARY ISSUE	1-8-80	SVM	KMM	JWH	1	DESIGNED	SVM
2	DEMONSTRATION CONCEPT - TIC	1-8-80	SVM	KMM	JWH	2	DFPD	1-8-80	SVM	KMM	JWH	2	DRAWN	R. KARLIK
3												3	CHECKED	KMM
4												4	BRAND APPR	1-15-80
5												5	ICSG APPR	2-15-80
6												6	CHK APPR	
7												7		
8												8		
9												9		
10												10		
11												11		
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		
18												18		
19												19		
20												20		
21												21		
22												22		
23												23		
24												24		
25												25		
26												26		
27												27		
28												28		
29												29		
30												30		
31												31		
32												32		
33												33		
34												34		
35												35		
36												36		
37												37		
38												38		
39												39		
40												40		
41												41		
42												42		
43												43		
44												44		
45												45		
46												46		
47												47		
48												48		
49												49		
50												50		

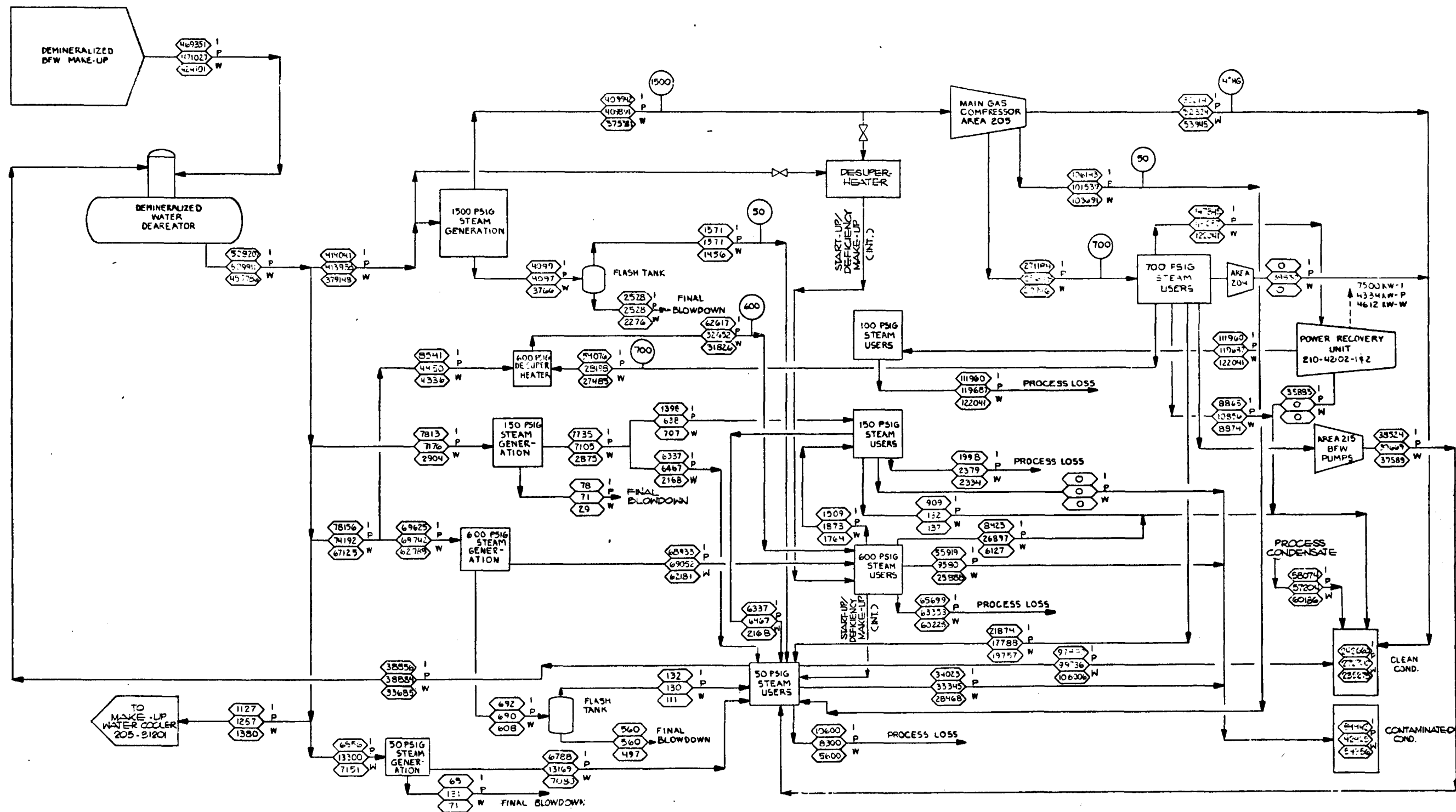
PROJECT NO 7051	DATE 8-8-80
DRAWING NO 200-120-68	REV DC-TIC
TITLE UTILITY FLOW DIAGRAM OVERALL STEAM SUPPLY PITTSBURGH CASE	
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION, PITTSBURGH, PA	



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	1-7-80	SVM	KMH	JWH	1	1-7-80	SVM	KMH	JWH	1	1-7-80	SVM	KMH	JWH
2	1-15-80	M. HEARN			2	1-15-80	M. HEARN			2	1-15-80	M. HEARN		
3	1-17-80	KMH			3	1-17-80	KMH			3	1-17-80	KMH		
4	2-15-80	C. J. JONES			4	2-15-80	C. J. JONES			4	2-15-80	C. J. JONES		
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	DRAWING STATUS	TITLE
SVM	SVM	1-7-80	ISSUED	UTILITY FLOW DIAGRAM OVERALL
M. HEARN	M. HEARN	1-15-80	DPD - TIC	STEAM SUPPLY
KMH	KMH	1-17-80	FOR COMMENTS AND/OR APPROVAL	WESTERN CASE
C. J. JONES	C. J. JONES	2-15-80	FOR CUSTOMER APPROVAL	U.S. DOE ENERGY TECHNOLOGY
			AND/OR COMMENTS	FOSSIL ENERGY PROGRAMS
			APPROVAL FOR CONSTRUCTION	CONTRACT NO. EF-77-C-01-2012
				PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.

PROJECT NO. 7051
DRAWING NO. 200-120-6C
CASE CC-TIC
REV. 1



REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CH'D APP'D	NO.	DATE	BY	CH'D APP'D	NO.	DATE	BY	CH'D APP'D
1	10/1/77	SM	WJH	1	10/1/77	SM	WJH	1	10/1/77	SM	WJH
2	10/1/77	SM	WJH	2	10/1/77	SM	WJH	2	10/1/77	SM	WJH
3	10/1/77	SM	WJH	3	10/1/77	SM	WJH	3	10/1/77	SM	WJH
4	10/1/77	SM	WJH	4	10/1/77	SM	WJH	4	10/1/77	SM	WJH
5	10/1/77	SM	WJH	5	10/1/77	SM	WJH	5	10/1/77	SM	WJH
6	10/1/77	SM	WJH	6	10/1/77	SM	WJH	6	10/1/77	SM	WJH
7	10/1/77	SM	WJH	7	10/1/77	SM	WJH	7	10/1/77	SM	WJH
8	10/1/77	SM	WJH	8	10/1/77	SM	WJH	8	10/1/77	SM	WJH
9	10/1/77	SM	WJH	9	10/1/77	SM	WJH	9	10/1/77	SM	WJH
10	10/1/77	SM	WJH	10	10/1/77	SM	WJH	10	10/1/77	SM	WJH

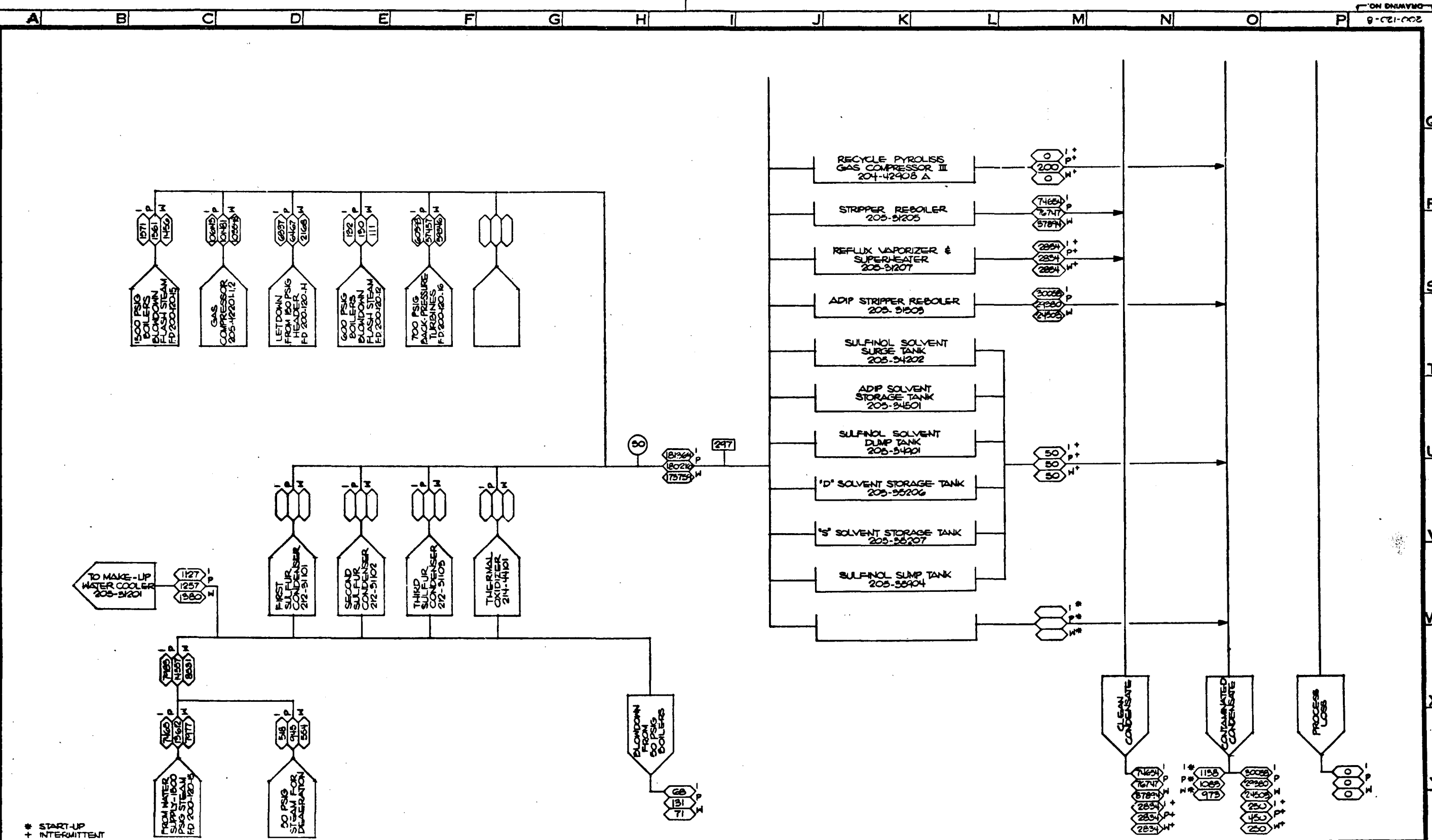
BY	DATE	DRAWING STATUS
DESIGNED	10/1/77	ISSUED
DRAWN	10/1/77	ISSUED
CHECKED	10/1/77	ISSUED
ENGR. APP'D	10/1/77	ISSUED
C.E.G. APP'D	10/1/77	ISSUED
P. APP'D	10/1/77	ISSUED

PROJECT NO.	7051
DRAWING NO.	200-120-7
DC CASE	
REV.	

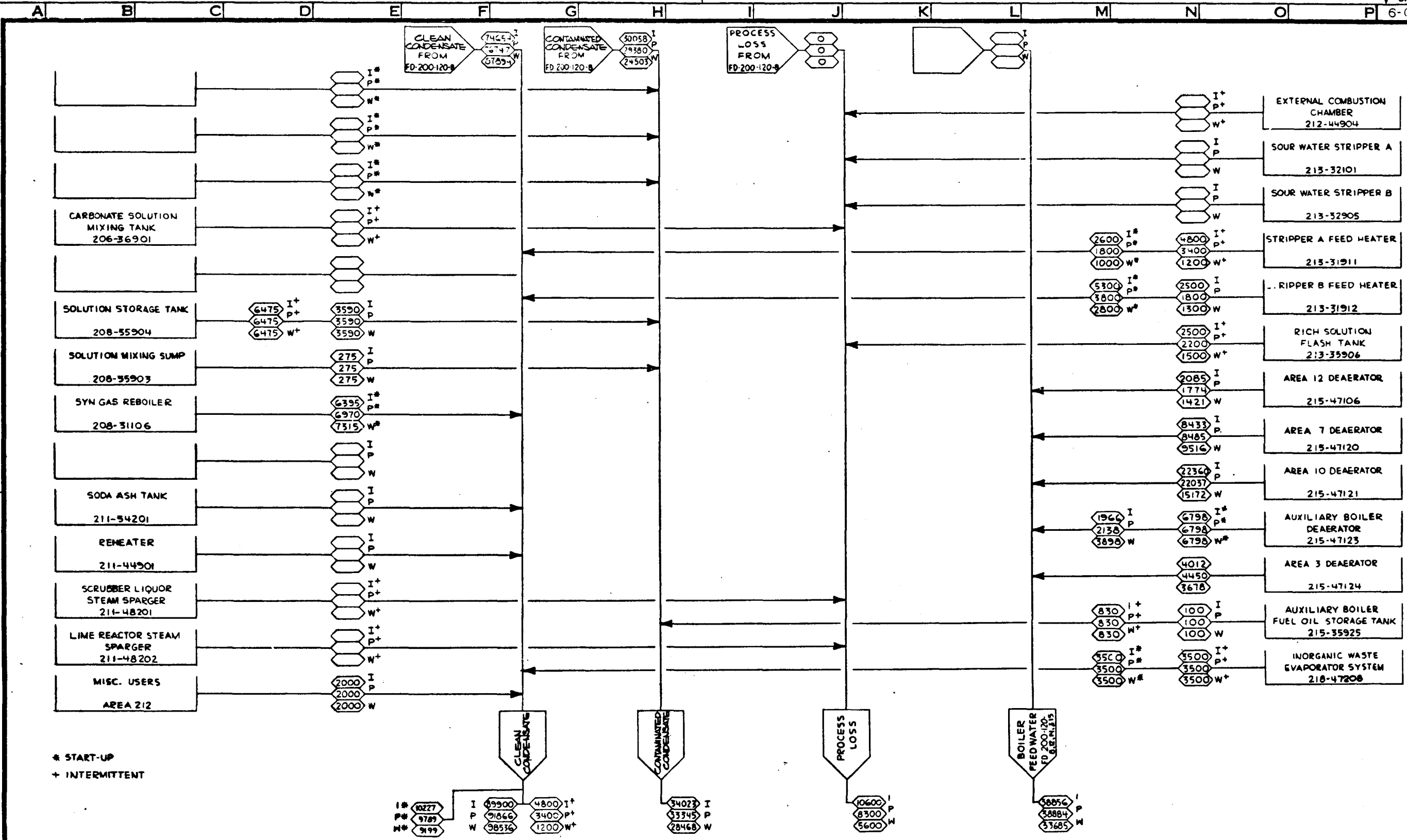
TITLE	UTILITY FLOW DIAGRAM STEAM POWER BALANCE
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF 77-C-01 2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH PA

"D"

DO NOT SCALE DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



REVISIONS						REVISIONS						REVISIONS					
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DB-DEMONSTRATION PLANT BASELINE		CSK	SVN	JNH	1	PRELIMINARY ISSUE		SVN	KMM	JNH	1					
2	DC-DEMONSTRATION CONCEPT-TIC		SVN	KMM	JNH	2	DPD		SVN	KMM	JNH	2					

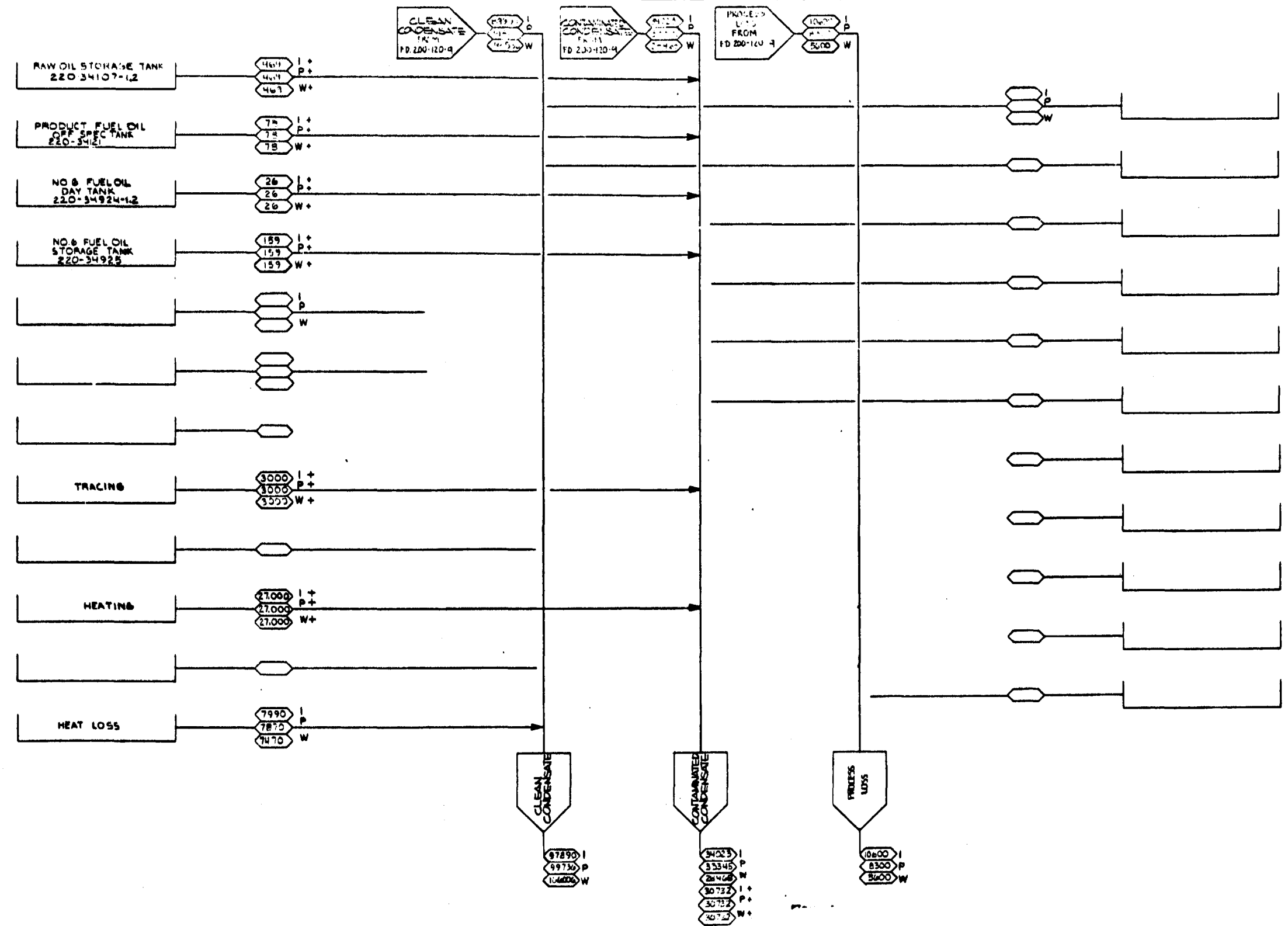


* START-UP
+ INTERMITTENT

REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	12-27-80	SV	KM	JHH	1	12-27-80	SV	KM	JHH	1	12-27-80	SV	KM	JHH
2	12-28-80	SV	KM	JHH	2	12-28-80	SV	KM	JHH	2	12-28-80	SV	KM	JHH
3	12-29-80	SV	KM	JHH	3	12-29-80	SV	KM	JHH	3	12-29-80	SV	KM	JHH
4	12-30-80	SV	KM	JHH	4	12-30-80	SV	KM	JHH	4	12-30-80	SV	KM	JHH
5	12-31-80	SV	KM	JHH	5	12-31-80	SV	KM	JHH	5	12-31-80	SV	KM	JHH
6	1-1-81	SV	KM	JHH	6	1-1-81	SV	KM	JHH	6	1-1-81	SV	KM	JHH
7	1-2-81	SV	KM	JHH	7	1-2-81	SV	KM	JHH	7	1-2-81	SV	KM	JHH
8	1-3-81	SV	KM	JHH	8	1-3-81	SV	KM	JHH	8	1-3-81	SV	KM	JHH
9	1-4-81	SV	KM	JHH	9	1-4-81	SV	KM	JHH	9	1-4-81	SV	KM	JHH
10	1-5-81	SV	KM	JHH	10	1-5-81	SV	KM	JHH	10	1-5-81	SV	KM	JHH

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SV	SV	1-5-80	ISSUED	SV	1-5-80
DRAWN	GALBRAITH	1-22-80	FOR COMMENTS AND/OR APPROVAL	DOE	1-22-80
CHECKED	KM	1-23-80	FOR CUSTOMER APPROVAL	ICGG	1-23-80
DRAWN APP'D	SV	1-24-80	AND/OR COMMENTS	DOE	1-24-80
ICGG APP'D	SV	1-24-80	APPROVAL FOR CONSTRUCTION	DOE	1-24-80
DOE APP'D	SV	1-24-80			
SCALE					

TITLE	UTILITY FLOW DIAGRAM 50 PSIG STEAM GENERATION & USER'S II	PROJECT NO. 7051
U.S. DOE	FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO. 200-120-9
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.	CASE DC-TIC	REV. A



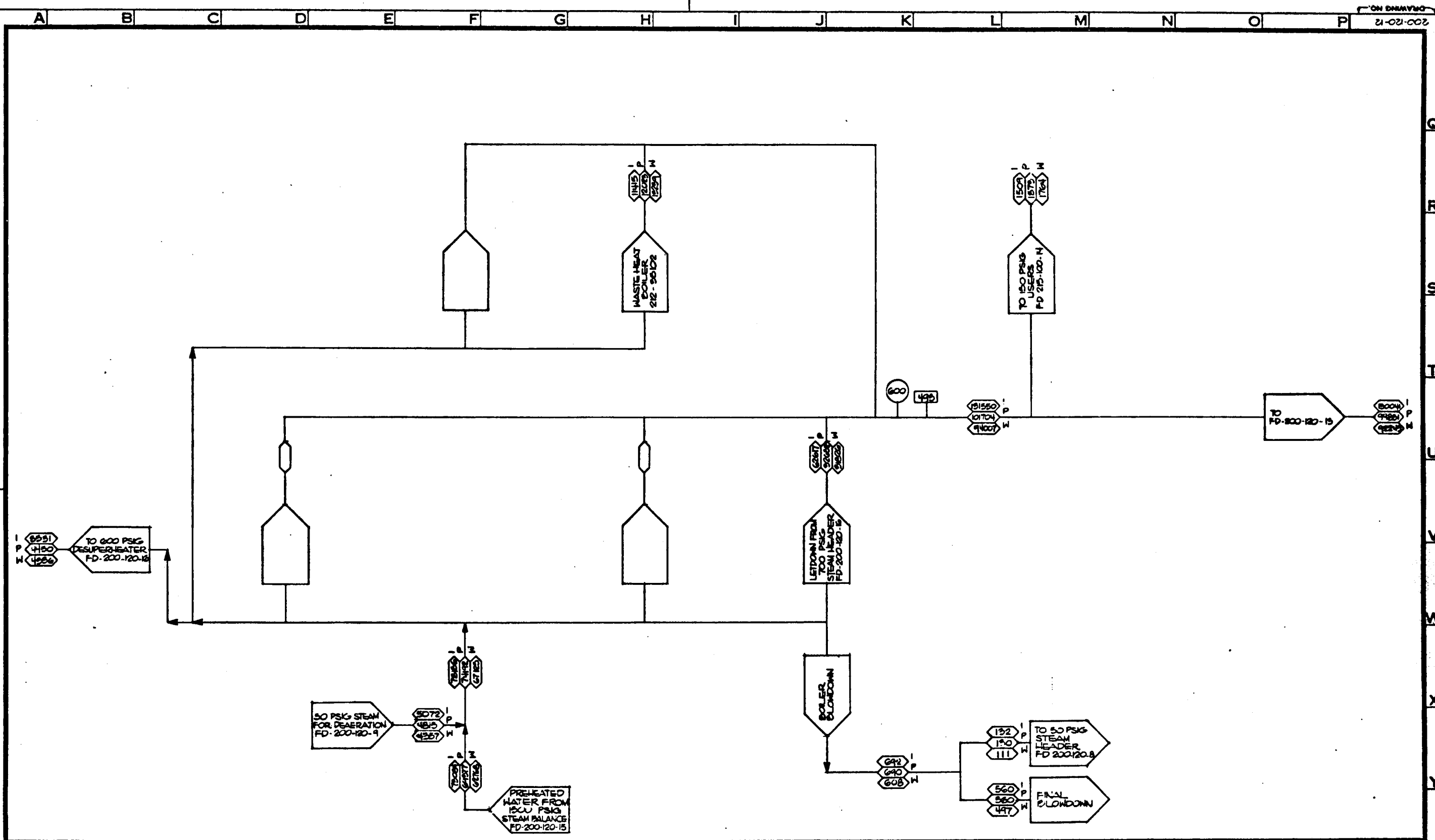
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10/1/10	SM			1	10/1/10	SM			1	10/1/10	SM		
2	10/1/10	SM			2	10/1/10	SM			2	10/1/10	SM		
3	10/1/10	SM			3	10/1/10	SM			3	10/1/10	SM		
4	10/1/10	SM			4	10/1/10	SM			4	10/1/10	SM		
5	10/1/10	SM			5	10/1/10	SM			5	10/1/10	SM		
6	10/1/10	SM			6	10/1/10	SM			6	10/1/10	SM		
7	10/1/10	SM			7	10/1/10	SM			7	10/1/10	SM		
8	10/1/10	SM			8	10/1/10	SM			8	10/1/10	SM		
9	10/1/10	SM			9	10/1/10	SM			9	10/1/10	SM		
10	10/1/10	SM			10	10/1/10	SM			10	10/1/10	SM		

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SM	SM	10/1/10	ISSUED	SM	10/1/10
CHECKED	SM	10/1/10	FOR COMMENTS AND/OR APPROVAL	SM	10/1/10
DRAGO APP'D	SM	10/1/10	FOR CUSTOMER APPROVAL	SM	10/1/10
ICGS APP'D	SM	10/1/10	AND/OR COMMENTS	SM	10/1/10
APP'D	SM	10/1/10	APPROVAL FOR CONSTRUCTION	SM	10/1/10

UTILITY FLOW DIAGRAM 50 PSIG STEAM GENERATION 4 JUBERS III		PROJECT NO 7051 DRAWING NO
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-CO-12012		200-120-10
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA		CASE
		REV

"D"

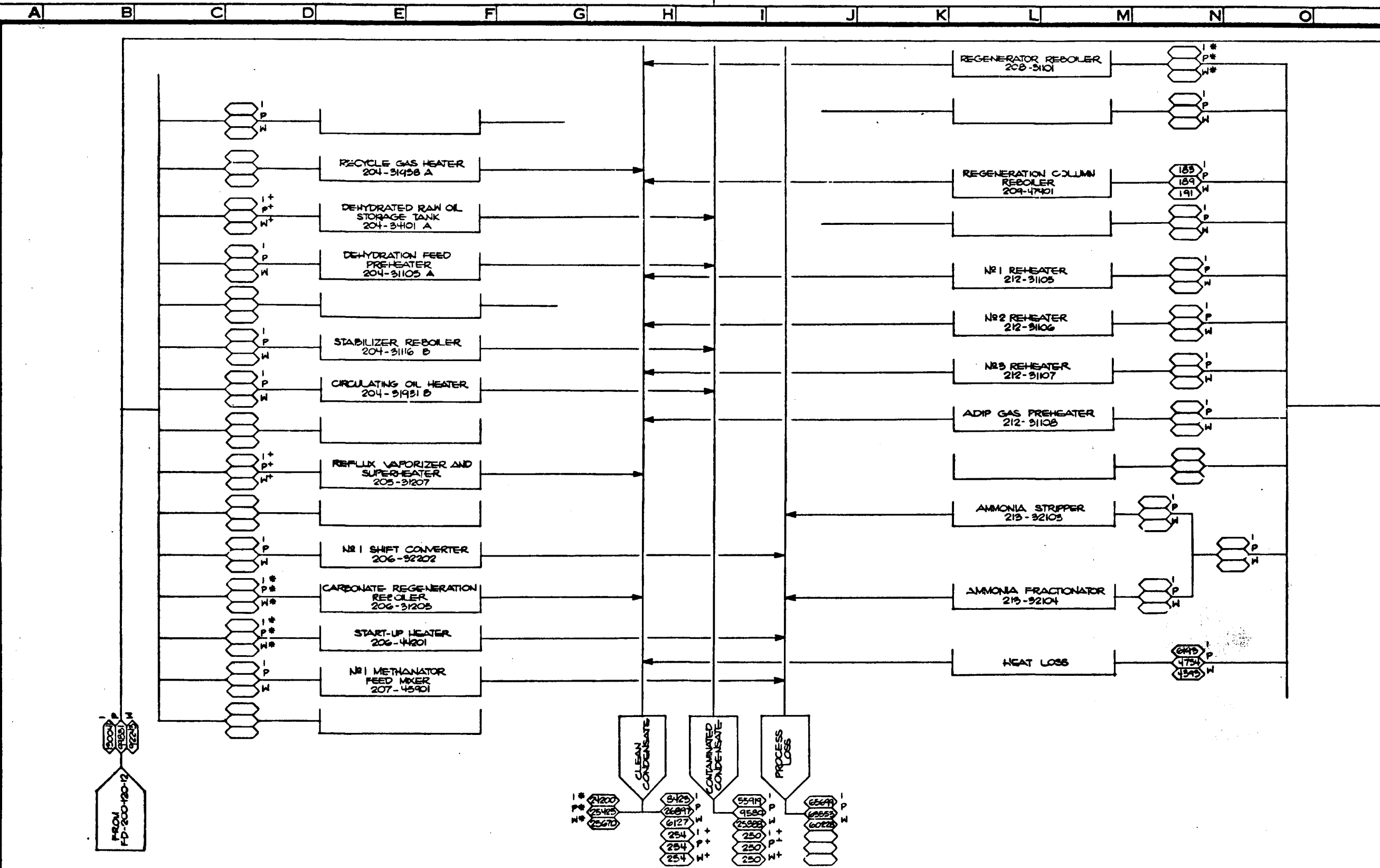
DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



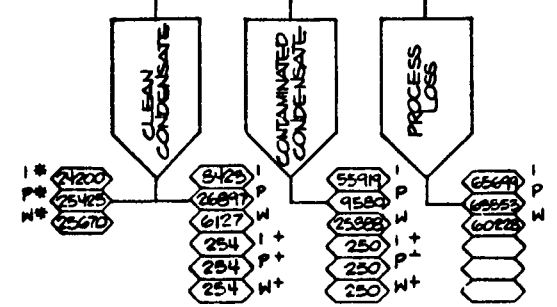
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1					1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				
11					11					11				
12					12					12				
13					13					13				
14					14					14				
15					15					15				
16					16					16				
17					17					17				
18					18					18				
19					19					19				
20					20					20				

DESIGNED	BY	DATE	ISSUED	DATE
TRIVANVO	SVM	1-1-83	DFPD-TIC	8-8-90
CHECKED	KMM	1-17-83	FOR COMMENTS AND/OR	
DRAWN APP'D		2-15-83	APPROVAL	
ICBB APP'D			FOR CUSTOMER APPROVAL	ICBB
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
			CONSTRUCTION	
SCALE				

TITLE	UTILITY FLOW DIAGRAM 600 PSIG STEAM GENERATORS	PROJECT NO. 7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO. 200-120-12
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.		C&M DC-TIC
		REV.



200-120-13
FD-200-120-13
200-120-13



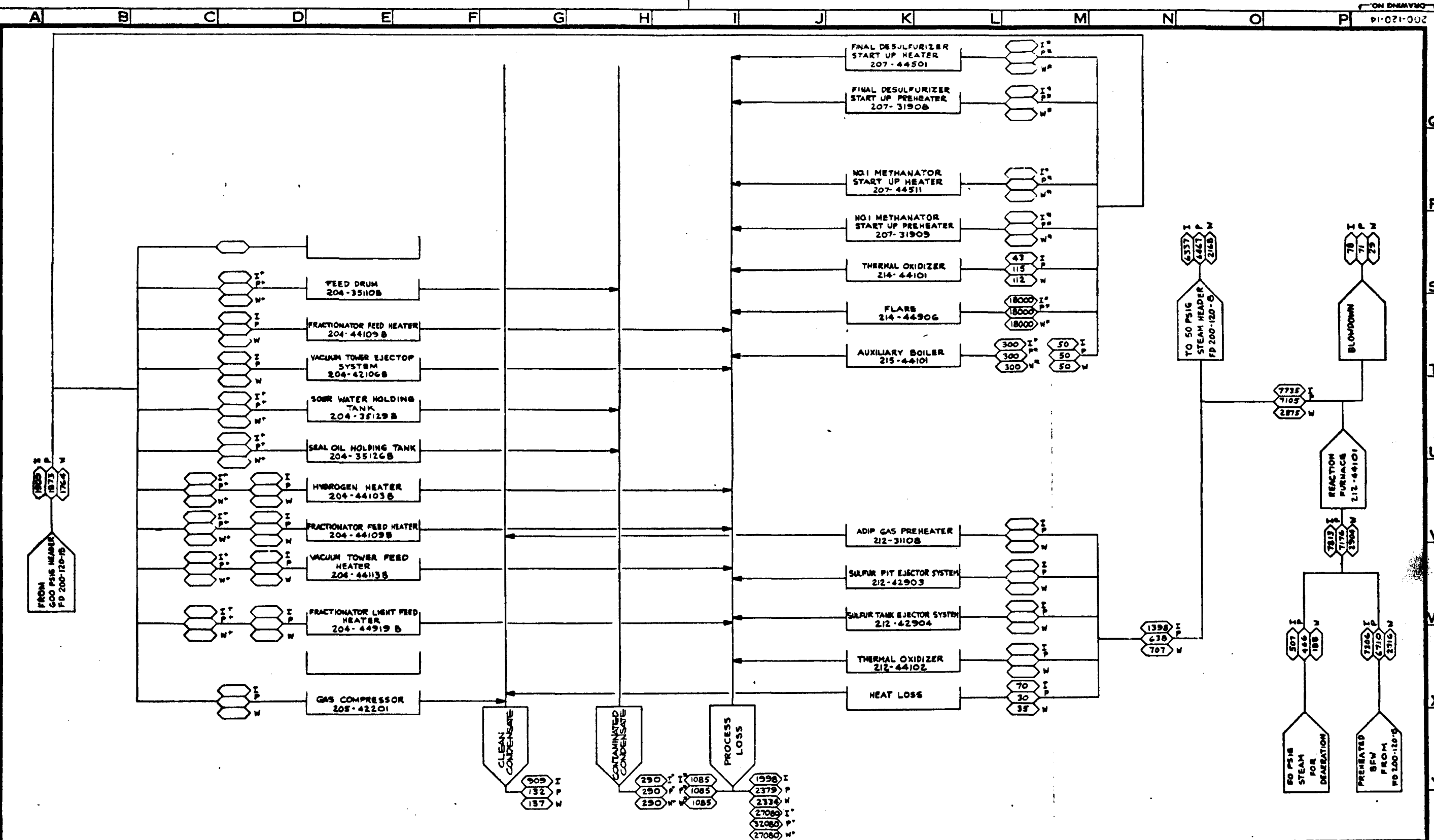
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPROV'D	NO.	DATE	BY	CHK'D	APPROV'D	NO.	DATE	BY	CHK'D	APPROV'D
1	1-5-80	SYM	KLM	UWH	1	1-5-80	SYM	KLM	UWH	1	1-5-80	SYM	KLM	UWH
2	1-5-80	SYM	KLM	UWH	2	1-5-80	SYM	KLM	UWH	2	1-5-80	SYM	KLM	UWH
3	1-5-80	SYM	KLM	UWH	3	1-5-80	SYM	KLM	UWH	3	1-5-80	SYM	KLM	UWH
4	1-5-80	SYM	KLM	UWH	4	1-5-80	SYM	KLM	UWH	4	1-5-80	SYM	KLM	UWH
5	1-5-80	SYM	KLM	UWH	5	1-5-80	SYM	KLM	UWH	5	1-5-80	SYM	KLM	UWH
6	1-5-80	SYM	KLM	UWH	6	1-5-80	SYM	KLM	UWH	6	1-5-80	SYM	KLM	UWH
7	1-5-80	SYM	KLM	UWH	7	1-5-80	SYM	KLM	UWH	7	1-5-80	SYM	KLM	UWH
8	1-5-80	SYM	KLM	UWH	8	1-5-80	SYM	KLM	UWH	8	1-5-80	SYM	KLM	UWH
9	1-5-80	SYM	KLM	UWH	9	1-5-80	SYM	KLM	UWH	9	1-5-80	SYM	KLM	UWH
10	1-5-80	SYM	KLM	UWH	10	1-5-80	SYM	KLM	UWH	10	1-5-80	SYM	KLM	UWH

BY	DATE	DRAWING STATUS
SYM	1-5-80	ISSUED
TRIVANO	1-5-80	FOR COMMENTS AND/OR APPROVAL
KLM	1-7-80	FOR COMMENTS AND/OR APPROVAL
UWH	2-15-80	FOR COMMENTS AND/OR APPROVAL
DOE		FOR COMMENTS AND/OR APPROVAL
SCALE		APPROVAL FOR CONSTRUCTION

PROJECT NO. 7051	TITLE UTILITY FLOW DIAGRAM 600 PSIG STEAM USERS
DRAWING NO. 200-120-13	U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
CASE DC-TIC	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY ORAVO CORPORATION PITTSBURGH, PA.
REV.	REV.

"D"

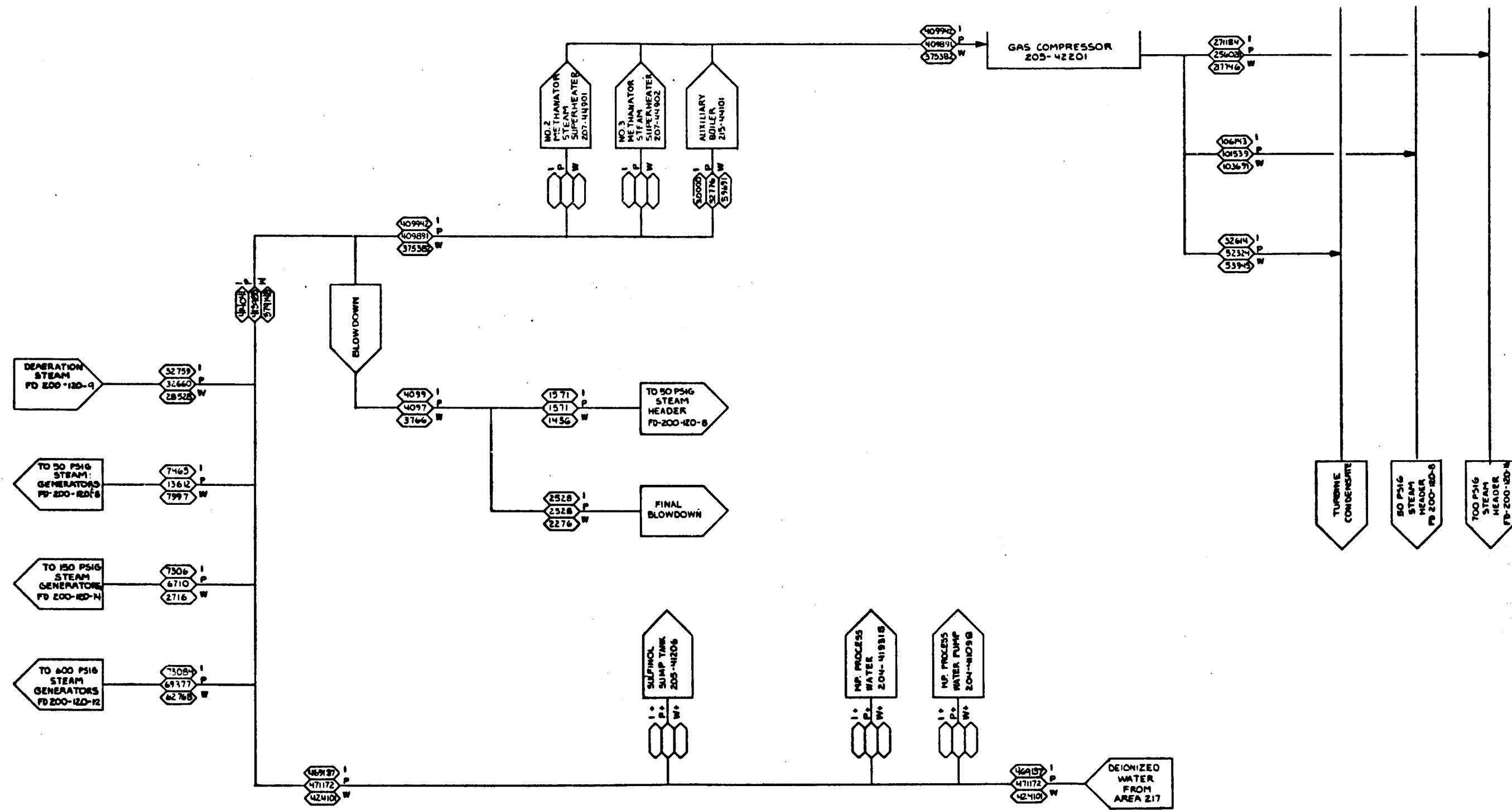
DO NOT SCALE THE DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	1-18-80	SVM	KMM	JWH	1	1-18-80	SVM	KMM	JWH	1	1-18-80	SVM	KMM	JWH
2	1-18-80	SVM	KMM	JWH	2	1-18-80	SVM	KMM	JWH	2	1-18-80	SVM	KMM	JWH
3	1-18-80	SVM	KMM	JWH	3	1-18-80	SVM	KMM	JWH	3	1-18-80	SVM	KMM	JWH
4	1-18-80	SVM	KMM	JWH	4	1-18-80	SVM	KMM	JWH	4	1-18-80	SVM	KMM	JWH
5	1-18-80	SVM	KMM	JWH	5	1-18-80	SVM	KMM	JWH	5	1-18-80	SVM	KMM	JWH
6	1-18-80	SVM	KMM	JWH	6	1-18-80	SVM	KMM	JWH	6	1-18-80	SVM	KMM	JWH
7	1-18-80	SVM	KMM	JWH	7	1-18-80	SVM	KMM	JWH	7	1-18-80	SVM	KMM	JWH
8	1-18-80	SVM	KMM	JWH	8	1-18-80	SVM	KMM	JWH	8	1-18-80	SVM	KMM	JWH
9	1-18-80	SVM	KMM	JWH	9	1-18-80	SVM	KMM	JWH	9	1-18-80	SVM	KMM	JWH
10	1-18-80	SVM	KMM	JWH	10	1-18-80	SVM	KMM	JWH	10	1-18-80	SVM	KMM	JWH

DESIGNED	BY	DATE	ISSUED	DATE
DUDIK	SVM	1-18-80	DCPD - TIC	8-9-90
CHECKED	K.M.M.	1-18-80	FOR COMMENTS AND/OR	
DRAWN APPD		2-15-80	APPROVAL	
ICSG APPD			FOR CUSTOMER APPROVAL	ICSG
DOE APPD			AND/OR COMMENTS	DOE
SCALE			APPROVAL FOR	
			CONSTRUCTION	

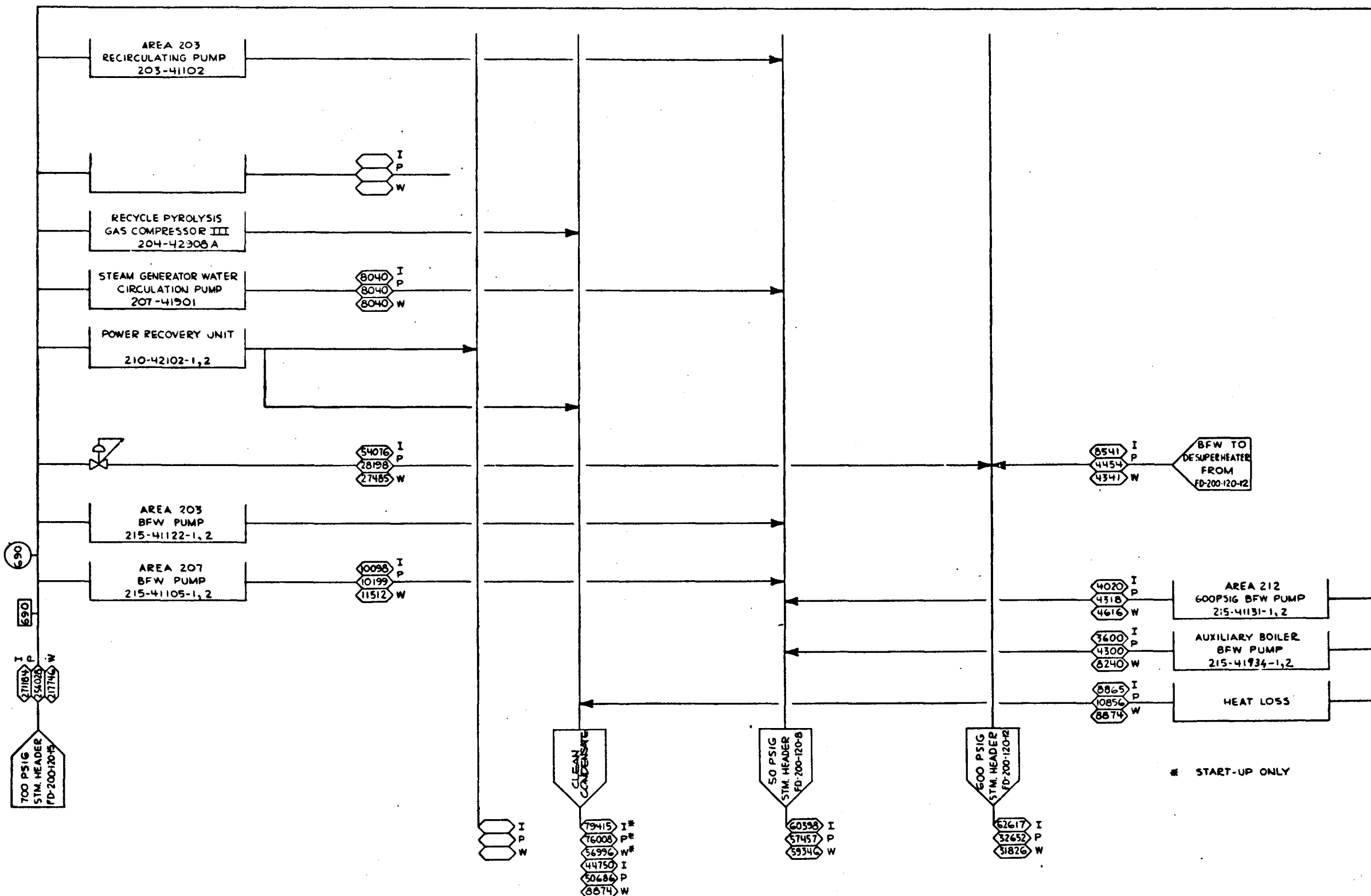
TITLE	UTILITY FLOW DIAGRAM	PROJECT NO.	7051
	150 PSIG STEAM GENERATION & USERS	DRAWING NO.	200-120-14
	U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE	DC-TIC
	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.	REV.	



REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	1/1/80	SV	KMM	JWH	1	1/1/80	SV	KMM	JWH	1	1/1/80	SV	KMM	JWH
2	1/1/80	SV	KMM	JWH	2	1/1/80	SV	KMM	JWH	2	1/1/80	SV	KMM	JWH
3	1/1/80	SV	KMM	JWH	3	1/1/80	SV	KMM	JWH	3	1/1/80	SV	KMM	JWH
4	1/1/80	SV	KMM	JWH	4	1/1/80	SV	KMM	JWH	4	1/1/80	SV	KMM	JWH
5	1/1/80	SV	KMM	JWH	5	1/1/80	SV	KMM	JWH	5	1/1/80	SV	KMM	JWH
6	1/1/80	SV	KMM	JWH	6	1/1/80	SV	KMM	JWH	6	1/1/80	SV	KMM	JWH
7	1/1/80	SV	KMM	JWH	7	1/1/80	SV	KMM	JWH	7	1/1/80	SV	KMM	JWH
8	1/1/80	SV	KMM	JWH	8	1/1/80	SV	KMM	JWH	8	1/1/80	SV	KMM	JWH
9	1/1/80	SV	KMM	JWH	9	1/1/80	SV	KMM	JWH	9	1/1/80	SV	KMM	JWH
10	1/1/80	SV	KMM	JWH	10	1/1/80	SV	KMM	JWH	10	1/1/80	SV	KMM	JWH

BY	DATE	DRAWING STATUS
SV	1/1/80	ISSUED
VERGHIES	1/1/80	ISSUED
KMM	1/1/80	FOR COMMENTS AND/OR APPROVAL
DRWD APP'D	1/1/80	FOR COMMENTS AND/OR APPROVAL
ICSB APP'D	1/1/80	FOR CUSTOMER APPROVAL
DOE APP'D	1/1/80	FOR CUSTOMER APPROVAL
SCALE		CONSTRUCTION

TITLE	UTILITY FLOW DIAGRAM 1500 STEAM GENERATORS & USERS	PROJECT NO. 7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO. 200-120-15
ILLINOIS COAL GASIFICATION GROUP	PREPARED FOR THE BY DRACO CORPORATION PITTSBURGH, PA.	CASE DC-TIC
		REV.



* START-UP ONLY

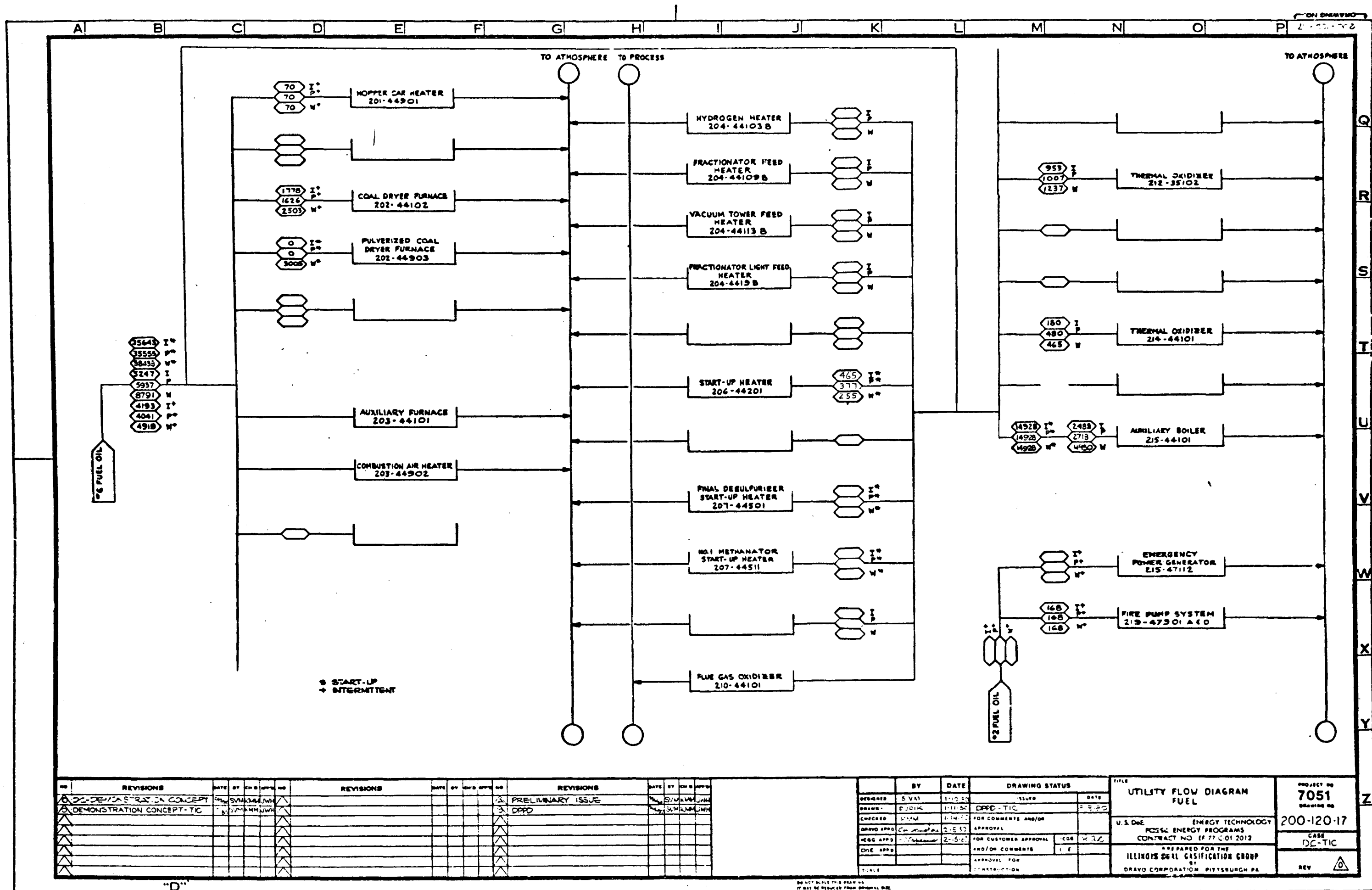
NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.
1	DC-DEMONSTRATION CONCEPT	24-50	SVM	KMM	JWH	1						1	PRELIMINARY ISSUE	24-50	SVM	KMM	JWH	1
2	DEMONSTRATION CONCEPT-TIC	25-50	SVM	KMM	JWH	2						2	DPPD	24-50	SVM	KMM	JWH	2
3						3						3						3
4						4						4						4
5						5						5						5
6						6						6						6
7						7						7						7
8						8						8						8
9						9						9						9
10						10						10						10

DESIGNED	BY	DATE	DRAWING STATUS	DATE
GA. BRAITH	S.V.M.	1-10-80	ISSUED	
GA. BRAITH	S.V.M.	1-17-80	DPPD-TIC	7-2-80
GA. BRAITH	S.V.M.	1-18-80	FOR COMMENTS AND/OR APPROVAL	
GA. BRAITH	S.V.M.	2-15-80	APPROVAL	
GA. BRAITH	S.V.M.	2-15-80	FOR CUSTOMER APPROVAL	
GA. BRAITH	S.V.M.	2-15-80	AND/OR COMMENTS	
GA. BRAITH	S.V.M.	2-15-80	APPROVAL FOR CONSTRUCTION	
SCALE				

PROJECT NO. 7051	DRAWING NO. 200-120-16
CAGE DC-TIC	
REV.	
TITLE UTILITY FLOW DIAGRAM 700 PSIG STEAM	
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA.	

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

"D"



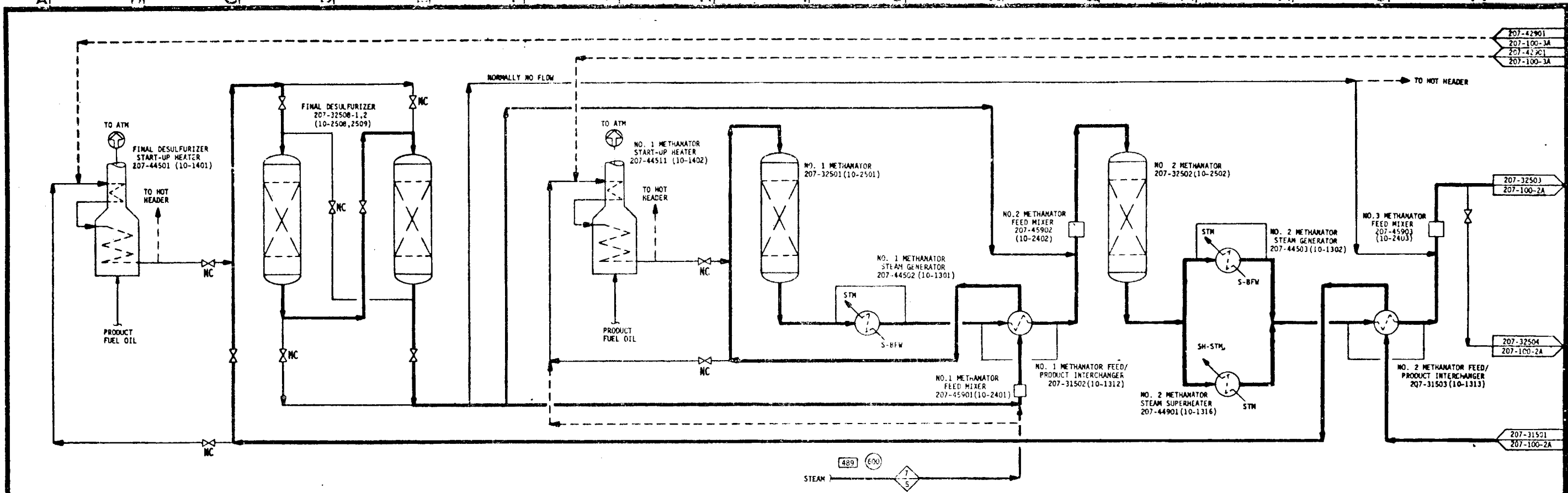
"D"

DO NOT SCALE THIS DRAWING
 IT MAY BE REDUCED FROM ORIGINAL SIZE

REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	12/15/11	SVN	MM	JWH	1	12/15/11	SVN	MM	JWH	1	12/15/11	SVN	MM	JWH	1	12/15/11	SVN	MM	JWH
2	12/15/11	SVN	MM	JWH	2	12/15/11	SVN	MM	JWH	2	12/15/11	SVN	MM	JWH	2	12/15/11	SVN	MM	JWH
3	12/15/11	SVN	MM	JWH	3	12/15/11	SVN	MM	JWH	3	12/15/11	SVN	MM	JWH	3	12/15/11	SVN	MM	JWH
4	12/15/11	SVN	MM	JWH	4	12/15/11	SVN	MM	JWH	4	12/15/11	SVN	MM	JWH	4	12/15/11	SVN	MM	JWH
5	12/15/11	SVN	MM	JWH	5	12/15/11	SVN	MM	JWH	5	12/15/11	SVN	MM	JWH	5	12/15/11	SVN	MM	JWH
6	12/15/11	SVN	MM	JWH	6	12/15/11	SVN	MM	JWH	6	12/15/11	SVN	MM	JWH	6	12/15/11	SVN	MM	JWH
7	12/15/11	SVN	MM	JWH	7	12/15/11	SVN	MM	JWH	7	12/15/11	SVN	MM	JWH	7	12/15/11	SVN	MM	JWH
8	12/15/11	SVN	MM	JWH	8	12/15/11	SVN	MM	JWH	8	12/15/11	SVN	MM	JWH	8	12/15/11	SVN	MM	JWH
9	12/15/11	SVN	MM	JWH	9	12/15/11	SVN	MM	JWH	9	12/15/11	SVN	MM	JWH	9	12/15/11	SVN	MM	JWH
10	12/15/11	SVN	MM	JWH	10	12/15/11	SVN	MM	JWH	10	12/15/11	SVN	MM	JWH	10	12/15/11	SVN	MM	JWH

DESIGNED	BY	DATE	DRAWING STATUS	DATE
SVN	SVN	12/15/11	ISSUED	12/15/11
CHK'D	SVN	12/15/11	FOR COMMENTS AND/OR APPROVAL	
CHK'D	SVN	12/15/11	FOR CUSTOMER APPROVAL	
CHK'D	SVN	12/15/11	AND/OR COMMENTS	
CHK'D	SVN	12/15/11	APPROVAL FOR CONSTRUCTION	

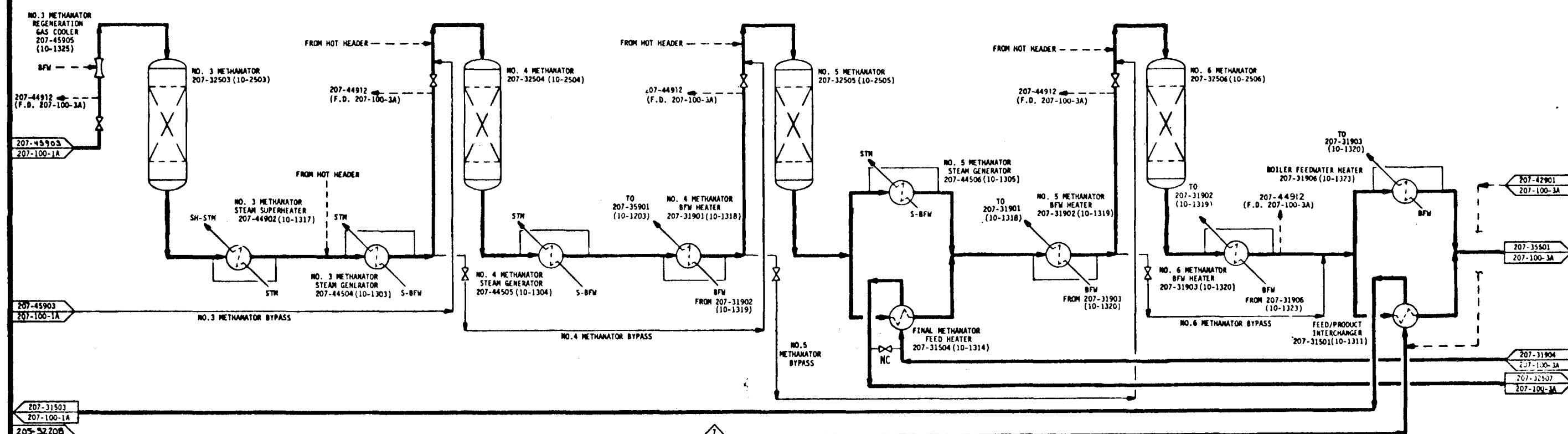
UTILITY FLOW DIAGRAM FUEL	PROJECT NO. 7051
U.S. DOE ENERGY TECHNOLOGY PROGRAMS CONTRACT NO. DE-EE77-CO1-2012	DRAWING NO. 200-120-17
ILLINOIS STATE GASIFICATION GROUP	CASE DC-TIC
DRAGO CORPORATION PITTSBURGH PA	REV 0



MATERIAL	STREAM NO.	7	8	9
POUNDS/HOUR	ILLINOIS NO. 6	PGH NO. 8	WESTERN SUB-BITUMINOUS	
CO ₂				
CO				
H ₂				
H ₂ O VAPOR	42.135	43.172	47.713	
H ₂ O LIQUID				
CH ₄				
C ₂ H ₆				
C ₂ H ₄				
C ₃ H ₈				
C ₃ H ₆				
C ₄ H ₁₀				
Ar				
O ₂				
N ₂				
CO ₂				
H ₂ S				
NAPHTHA				
TOTAL POUNDS/HOUR	42.135	43.172	47.713	
AVG MOLECULAR WEIGHT	16.015	16.015	16.015	
ACFM	510	543	551	
GPM				
PRESSURE, PSIG	600	600	600	
TEMPERATURE, °F	451	451	451	
ENTHALPY, MBTU/HOUR				

REVISIONS						REVISIONS						REVISIONS						DRAWING STATUS				TITLE		PROJECT NO. 7051 DRAWING NO. 207-100-1	
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	DESIGNED	DATE	ISSUED	DATE	U.S. DOE	CASE					
1	DC-DEMONSTRATION CONCEPT	1/2/82	MD	KM	JH											1	MD	KM	JH	TASK VI RELEASE	3-3-80	FOSSIL ENERGY PROGRAMS	CONTRACT NO. EF-77-C-01-2012		
2	DEMONSTRATION CONCEPT-TIC	1/2/82	MD	KM	JH											2	MD	KM	JH	FOR COMMENTS AND/OR		ENERGY TECHNOLOGY			
																3	MD	KM	JH	APPROVAL					
																4	MD	KM	JH	FOR CUSTOMER APPROVAL	ICSB	DOE			
																5	MD	KM	JH	AND/OR COMMENTS	DOE				
																6	MD	KM	JH	APPROVAL FOR					
																7	MD	KM	JH	CONSTRUCTION					
																SCALE	NONE								

PROCESS FLOW DIAGRAM AREA 207 SHIFT & METHANATION PREHEATING & METHANATORS NO. 1 & 2			PROJECT NO. 7051 DRAWING NO. 207-100-1
U.S. DOE FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012			
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA			CASE DC-TIC
			REV. 



MATERIAL	STREAM NO.	1	2	3
POUNDS/HOUR	ILLINOIS NO. 546	PGH NO. 8	WESTERN SUB-BITUMINOUS	
CO ₂	55.5	9.31	9.28	
CO	56.507	9.316	6.672	
H ₂	2.453	2.460	2.465	
H ₂ O VAPOR	2.42	2.43	2.75	
H ₂ O LIQUID				
CH ₄	10.514	2.072	1.632	
C ₂ H ₆	2.32	1.24	4.13	
C ₃ H ₈	1.271	2.115	1.253	
C ₄ H ₁₀	2.17	1.41	6.11	
C ₅ H ₁₂	2.15	1.315	5.14	
C ₆ H ₁₄	1.25	7.23	1.251	
Ar	3.1	4.0	4.1	
O ₂				
N ₂	3.720	3.158	3.624	
CO ₂	1.20	1.23	1.31	
H ₂ S	0.15	2.14	0.16	
NAPHTHA	4.03	1.28	1.11	
TOTAL POUNDS/HOUR	53.515	51.06	46.472	
AVG MOLECULAR WEIGHT	11.33	12.1	12.10	
ACFM	1.501	1.575	1.711	
GPM				
PRESSURE, PSIG	450	450	450	
TEMPERATURE, °F	115	115	115	
ENTHALPY, MBTU/HOUR	11.4	1.1	1.1	

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DC-DEMONSTRATION CONCEPT	7/99	ML	KM	JH	1	TASK VI RELEASE (DRAVO)	7/99	MD	KM	JH	1	FOR RELEASE	7/99	MD	KM	JH
2	DEMONTATION CONCEPT-ETC.	7/99	ML	KM	JH	2	FOR RECORD AND DDD	7/99	MD	KM	JH	2	FOR RELEASE	7/99	MD	KM	JH
3						3	FOR BASELINING (DRAVO)	7/99	MD	KM	JH	3	FOR RELEASE	7/99	MD	KM	JH
4						4	PRELIMINARY (DRAVO)	7/99	MD	KM	JH	4	FOR RELEASE	7/99	MD	KM	JH
5						5	REVISED FOR LATE CHANGES (DRAVO)	7/99	MD	KM	JH	5	FOR RELEASE	7/99	MD	KM	JH
6						6	FOR RELEASE (DRAVO)	7/99	MD	KM	JH	6	FOR RELEASE	7/99	MD	KM	JH
7						7	FOR RELEASE (DRAVO)	7/99	MD	KM	JH	7	FOR RELEASE	7/99	MD	KM	JH
8						8	FOR RELEASE (DRAVO)	7/99	MD	KM	JH	8	FOR RELEASE	7/99	MD	KM	JH
9						9	FOR RELEASE (DRAVO)	7/99	MD	KM	JH	9	FOR RELEASE	7/99	MD	KM	JH
10						10	FOR RELEASE (DRAVO)	7/99	MD	KM	JH	10	FOR RELEASE	7/99	MD	KM	JH

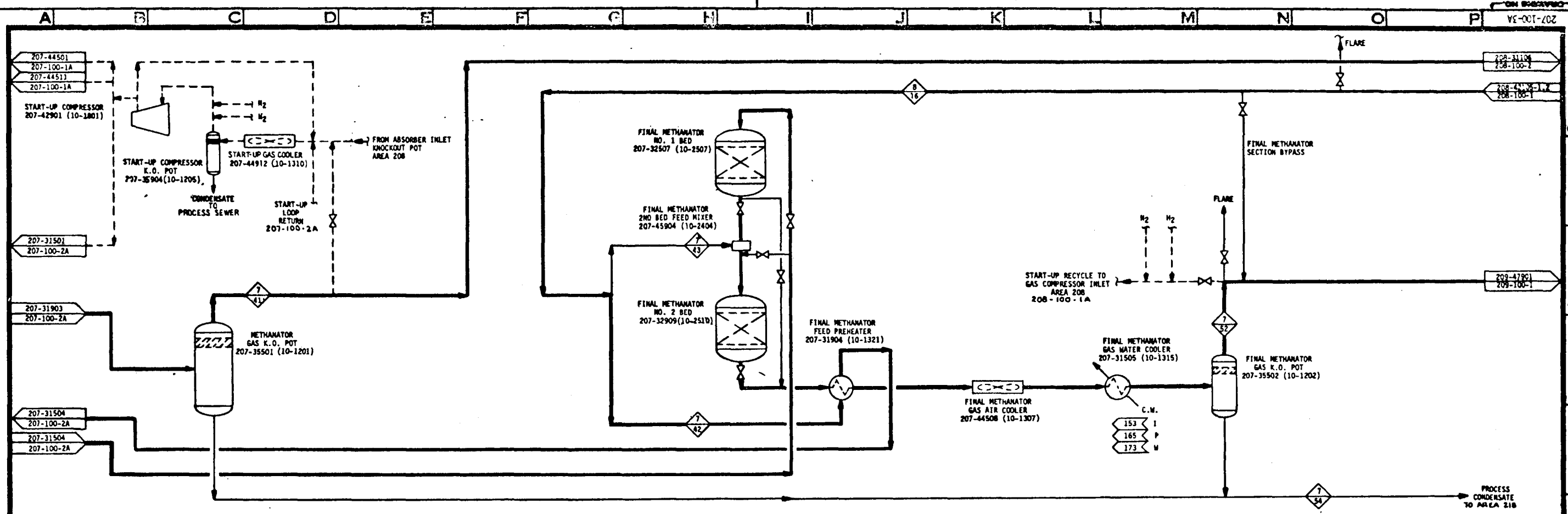
BY	DATE	DRAWING STATUS	TITLE
MD	7/99	FOR RELEASE	PROCESS FLOW DIAGRAM
MD	7/99	FOR RELEASE	AREA 207
MD	7/99	FOR RELEASE	SHIFT & METHANATOR
MD	7/99	FOR RELEASE	METHANATORS NO. 3, 4, 5 & 6
MD	7/99	FOR RELEASE	U.S. DOE ENERGY TECHNOLOGY
MD	7/99	FOR RELEASE	FOSSIL ENERGY PROGRAMS
MD	7/99	FOR RELEASE	CONTRACT NO. EF-77-C-01-2012
MD	7/99	FOR RELEASE	ILLINOIS GASIFICATION GROUP
MD	7/99	FOR RELEASE	DRAVO CORPORATION PITTSBURGH, PA.

PROJECT NO.	7051
DRAWING NO.	207-100-2
SCALE	AS SHOWN
DATE	7/99

APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

RMP
DOCUMENT NUMBER
5940-1
D-10-FS-4
THE RALPH M. PARSONS COMPANY
PASADENA, CALIFORNIA

SEE NOTES ON
PFD 207-100-4A



SEE NOTES ON
PFD 207-100-4A

MATERIAL	STREAM No.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
----------	------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

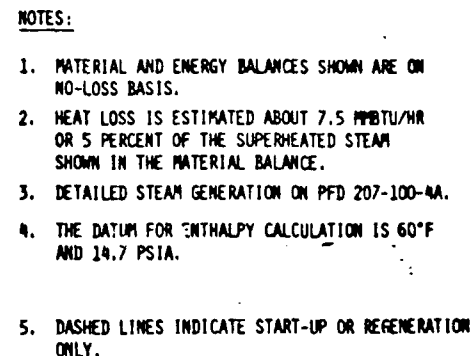
RMP ACCOUNT NUMBER 5940-1
DOCUMENT NUMBER D-10-FS-6
THE RALPH M. PARSONS COMPANY
PASADENA, CALIFORNIA

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	DC-DEMONSTRATION CONCEPT	7/24	MD	KM	JH	2	TASK VI RELEASE (ORAVO)	7/24	MD	KM	JH	3	FOR RECORD AND DRYD	7/24	MD	KM	JH
4	DEMONSTRATION CONCEPT	7/24	MD	KM	JH	5	FOR BASELINING (ORAVO)	7/24	MD	KM	JH	6	PRELIMINARY (ORAVO)	7/24	MD	KM	JH
7						8	REVISED FOR LATE CHANGES (PARSONS)	7/24	MD	KM	JH	9	ISSUED FOR DESIGN (PARSONS)	7/24	MD	KM	JH
10						11	FOR CLIENT REVIEW (PARSONS)	7/24	MD	KM	JH	12					

BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.	DRAWING NO.
MD	7/24/78	ISSUED	PROCESS FLOW DIAGRAM AREA 207 SHIFT & METHANATION FINAL METHANATION	7051	207-100-3
MD	7/24/78	TASK VI RELEASE	U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE DC-TIC	REV
MD	7/24/78	FOR CUSTOMER APPROVAL	ILLINOIS COAL GASIFICATION GROUP		
MD	7/24/78	FOR CUSTOMER APPROVAL	DRACO CORPORATION, PITTSBURGH, PA.		

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE DIFFERENT FROM ORIGINAL SIZE.



APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

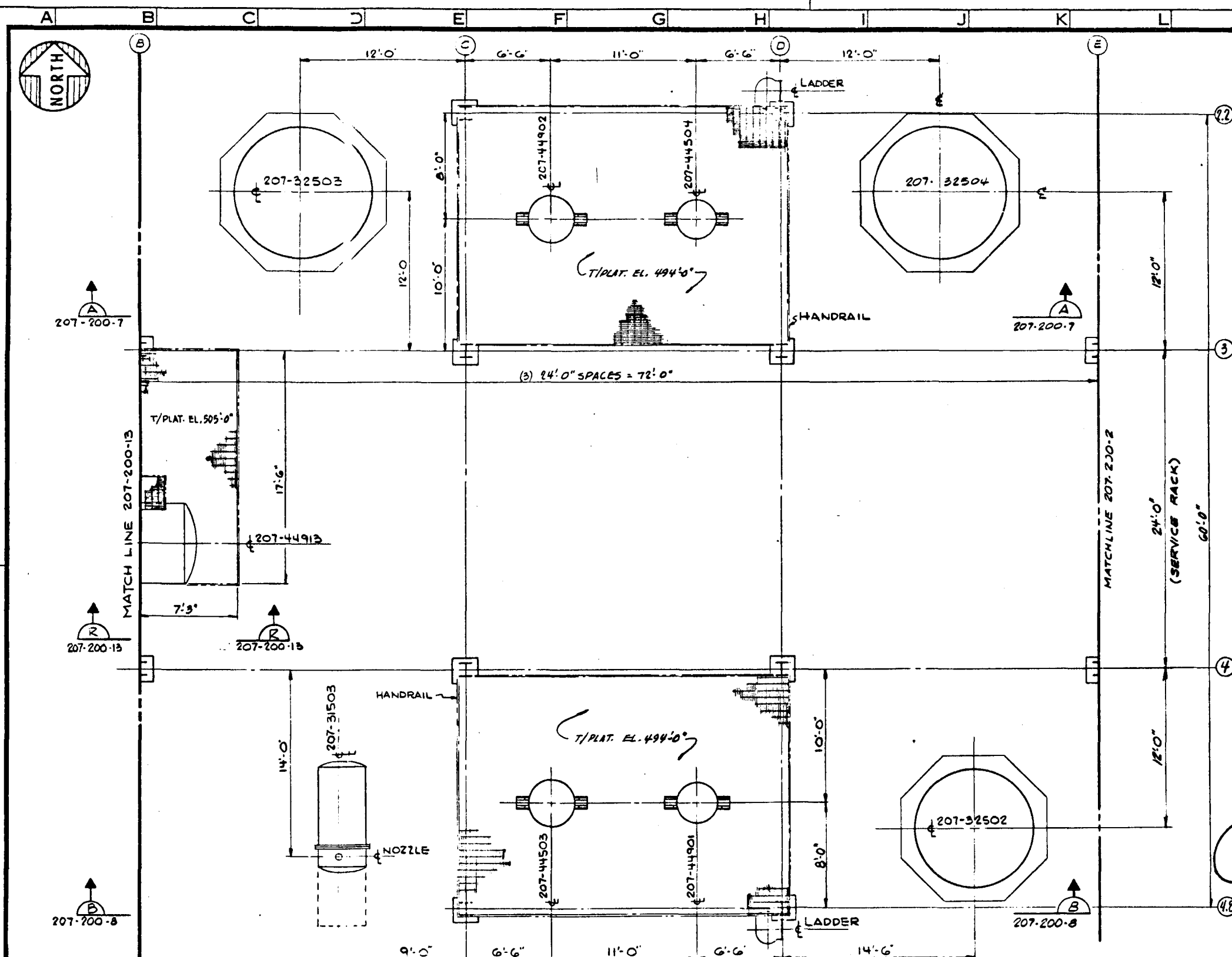
[illegible]

TITLE	PROCESS FLOW DIAGRAM AREA 207 SHIFT & METHANATION STEAM GENERATION
U.S. DoE	ENERGY TECHNOLOG FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA.

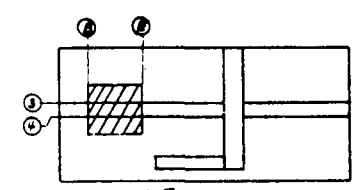
PROJECT NO.
7051
DRAWING NO.
207-100-4

CASE
DC-TIC

REV.



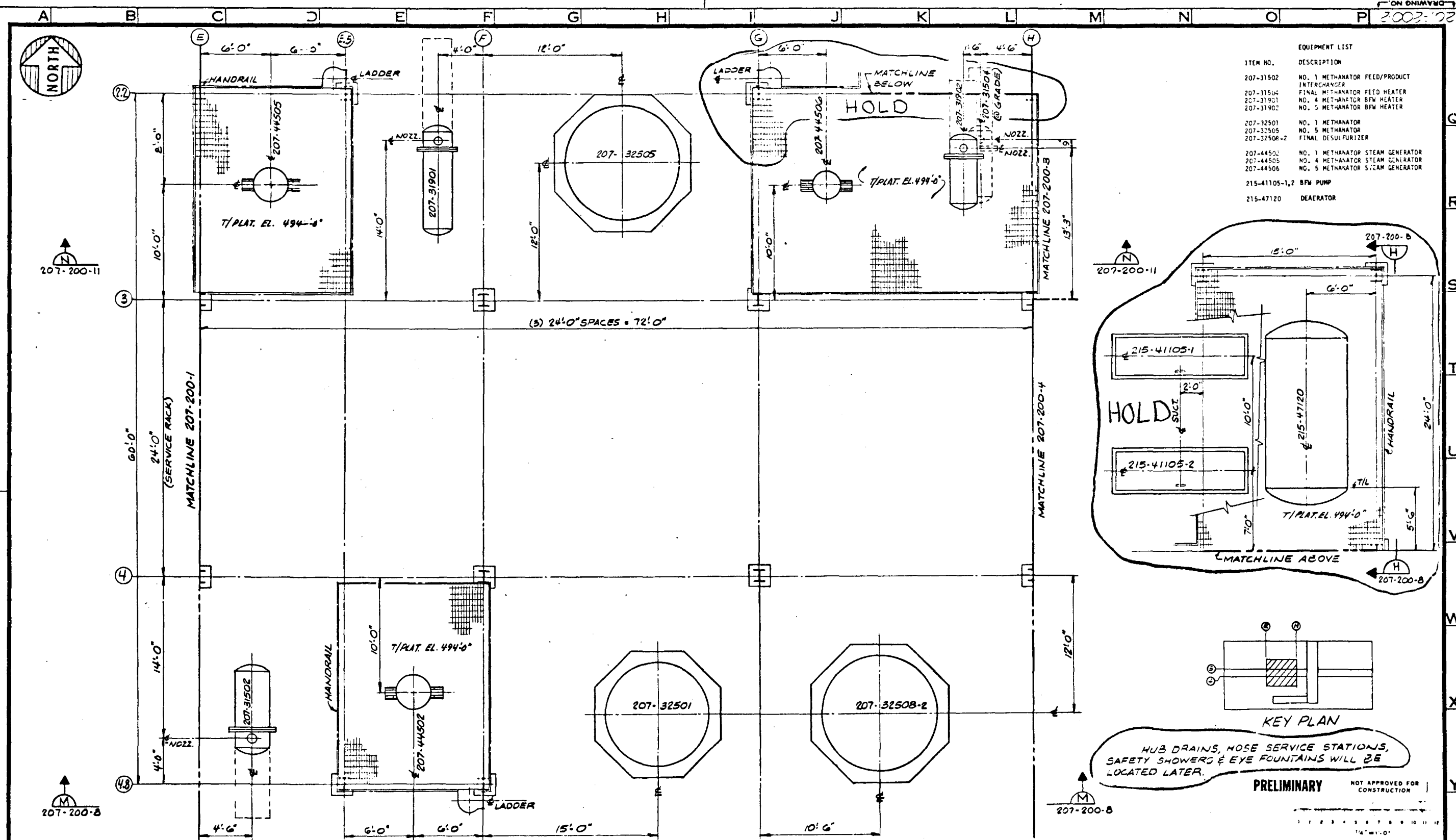
EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
207-31503	NO. 2 METHANATOR FEED PRODUCT INTERCHANGER
207-32502	NO. 2 METHANATOR
207-32503	NO. 3 METHANATOR
207-32504	NO. 4 METHANATOR
207-44503	NO. 2 METHANATOR STEAM GENERATOR
207-44504	NO. 3 METHANATOR STEAM GENERATOR
207-44901	NO. 2 METHANATOR STEAM SUPERHEATER
207-44902	NO. 3 METHANATOR STEAM SUPERHEATER



KEY PLAN
PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

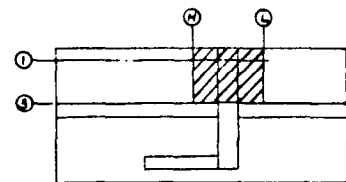
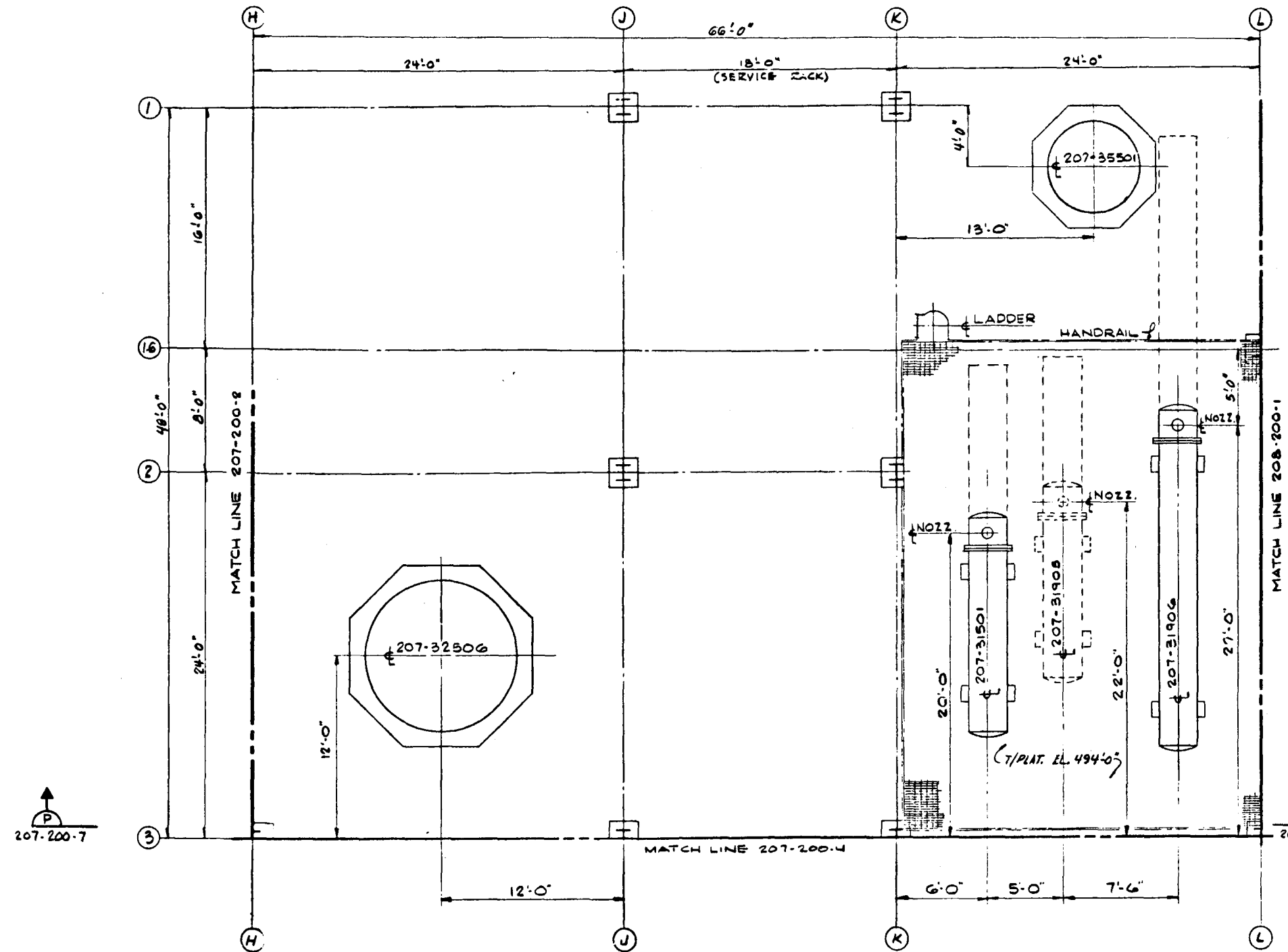
HUB DRAINS, HOSE SERVICE STATIONS, SAFETY CHOWER & EYE FOUNTAINS WILL BE LOCATED LATER.

REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.
1	ISSUED FOR CONSTRUCTION													
2	ISSUED FOR CONSTRUCTION													

[illegible]



EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
207-31501	FEED/PRODUCT INTERCHANGER
207-31903	NO. 6 METHANATOR BFW HEATER
207-31906	BFW HEATER
207-32506	NO. 6 METHANATOR
207-35501	METHANATOR GAS K.O. POT



KEY PLAN
HUB DRAINS, HOSE SERVICE STATIONS,
SAFETY SHOWERS & EYE FOUNTAINS WILL BE
LOCATED LATER.

PRELIMINARY NOT APPROVED FOR CONSTRUCTION

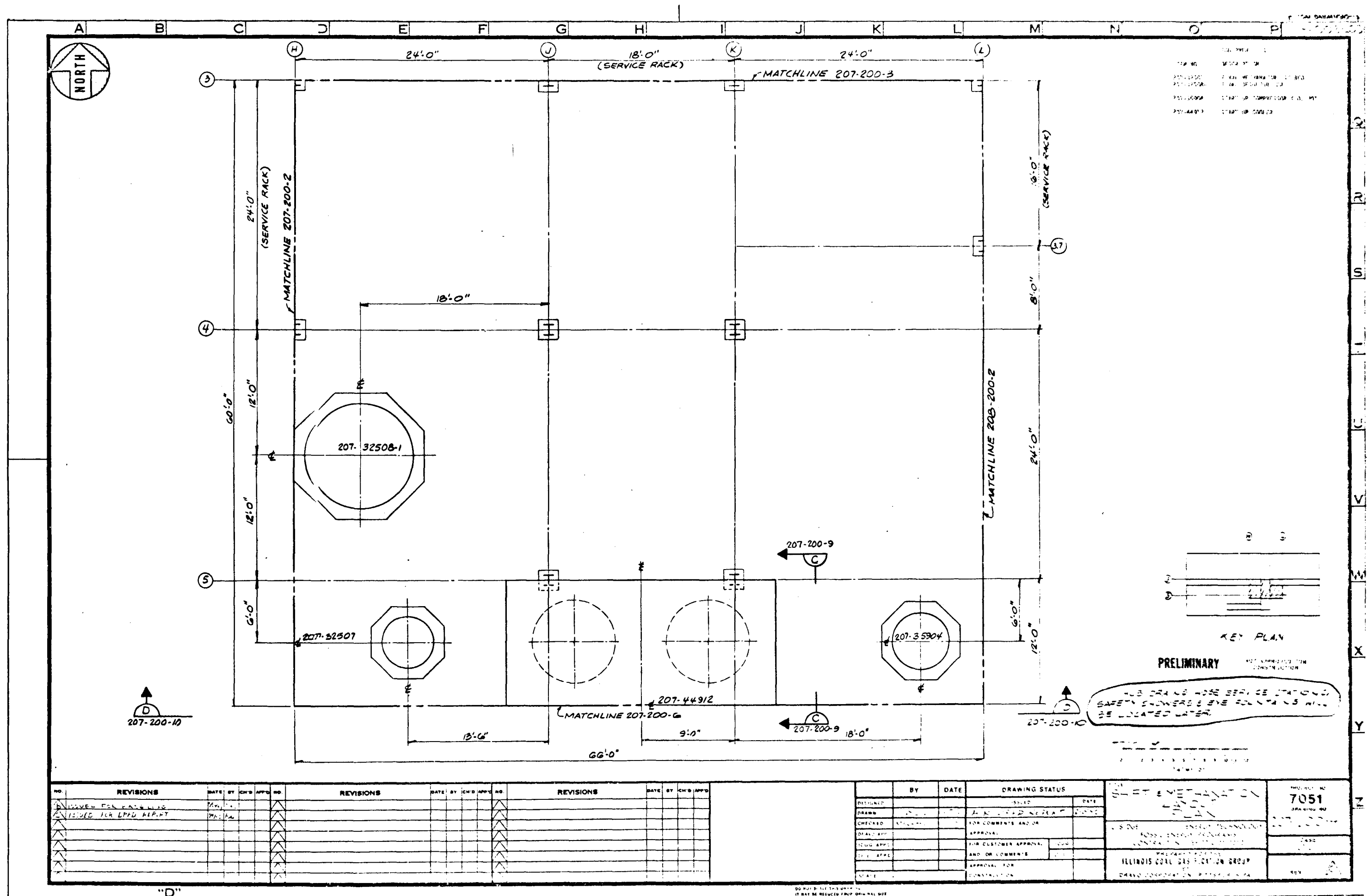


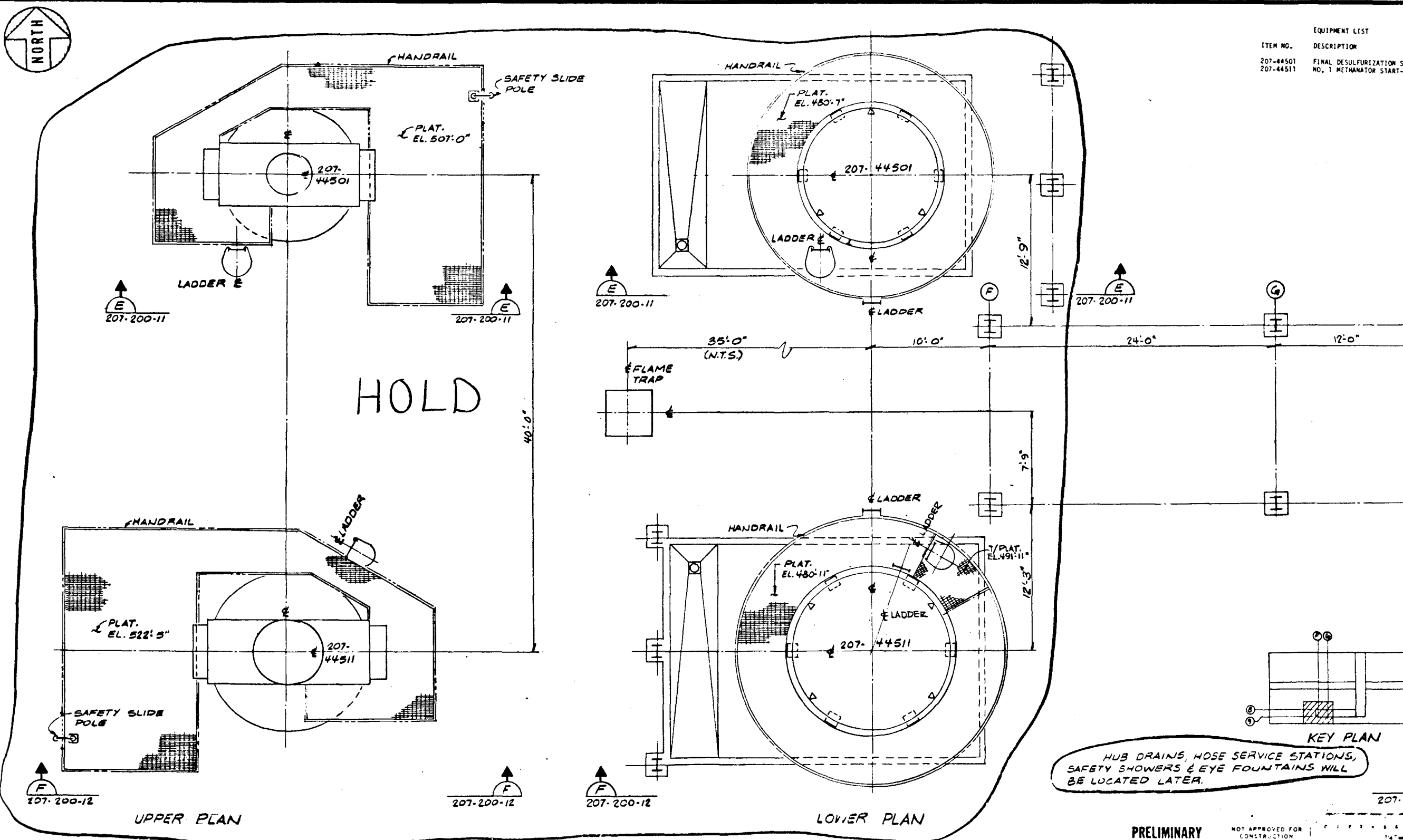
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASE LINE	7/1/12	PL														
2	ISSUED FOR DDPD REPORT	7/1/12	PL														
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	7/1/12	FOR EIR REPORT
CHECKED	7/1/12	FOR COMMENTS AND/OR APPROVAL
DRAWN APP'D		FOR CUSTOMER APPROVAL
ICGG APP'D		AND/OR COMMENTS
DATE APP'D		CONSTRUCTION

SHIFT & METHANATION LAYOUT PLAN		PROJECT NO. 7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EE 77-CG-1-2012		DRAWING NO. 207-200-3
ILLINOIS COAL GASIFICATION GROUP		CASE
DRACO CORPORATION PITTSBURGH PA		REV 1/6





REVISIONS					REVISIONS					REVISIONS					TITLE				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	DRAWING STATUS				
1	ISSUED FOR BASELINE	2/10/01													DESIGNED		ISSUED		DATE
2	ISSUED FOR DHD REPORT	4/18/01													DRAWN	E. C. H. K.	4/28/01	FOR DHD REPORT	4/28/01
															CHECKED	V. L. C. S.	4/28/01	FOR COMMENTS AND/OR	
															APPROVAL				
															ICGG APP'D		FOR CUSTOMER APPROVAL	ICGG	
															D.S. APP'D		AND/OR COMMENTS	D.S.	
																	APPROVAL FOR		
															SCALE	1" = 10'	CONSTRUCTION		

PROJECT NO
7051

DRAWING NO.
207-200-5

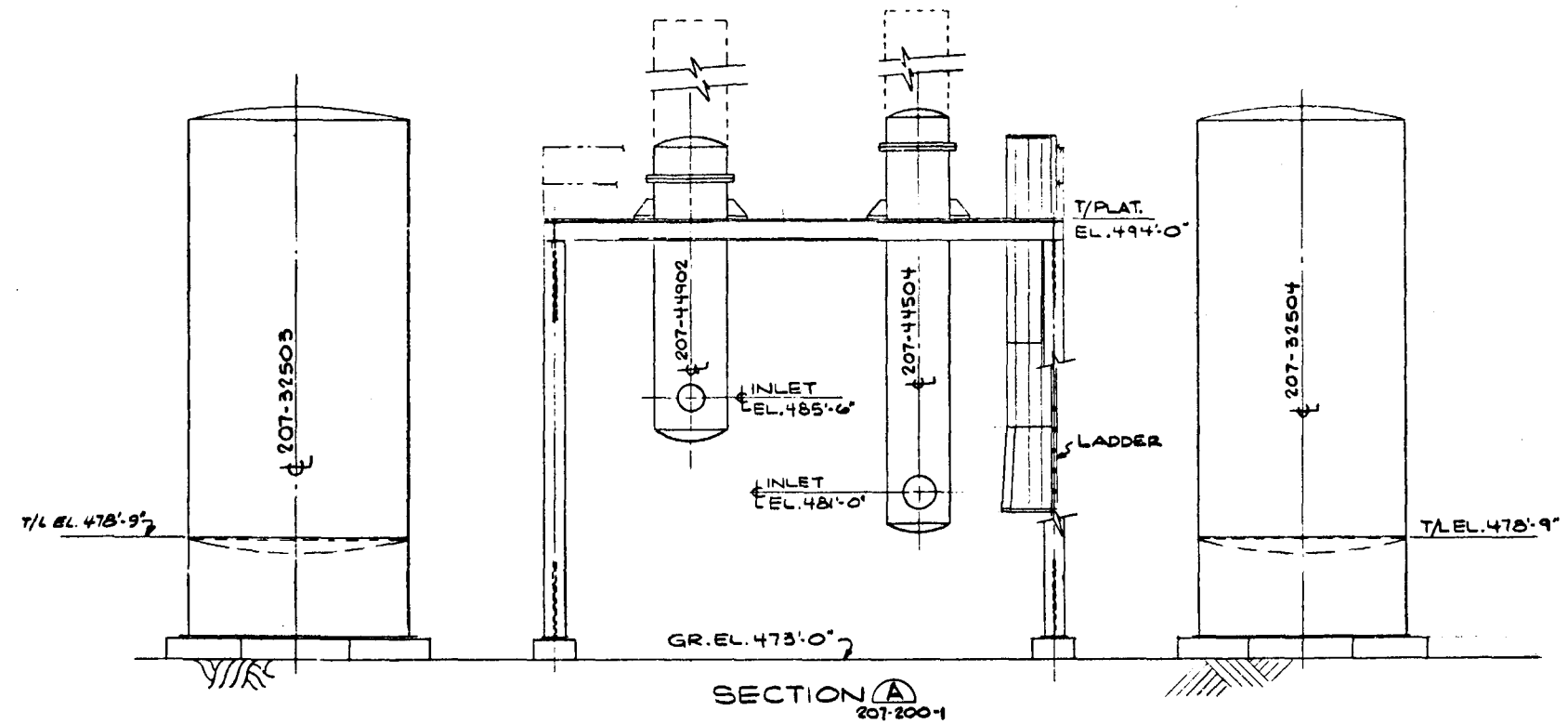
CASE
SC

REV
A

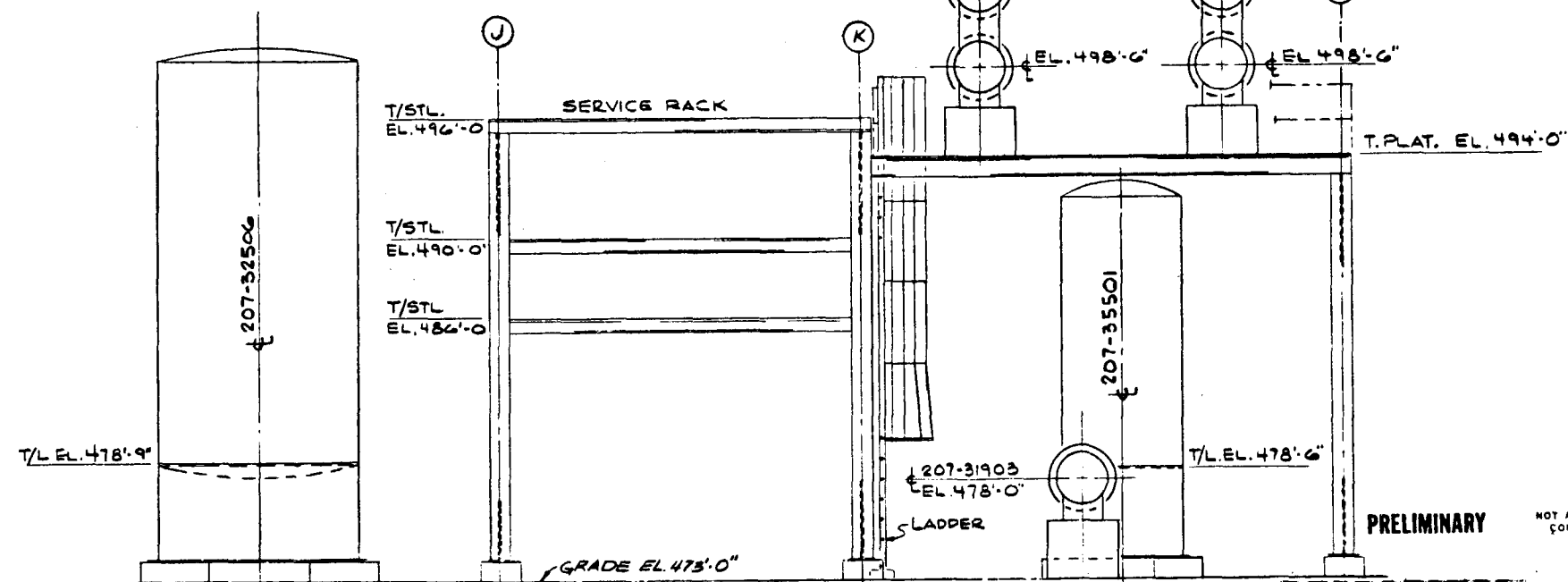
TITLE
SHIFT & METHANATION LAYOUT PLAN

U.S. DoE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. FE 77-C-01-2012

PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRACO CORPORATION PITTSBURGH PA



SECTION A
207-200-1



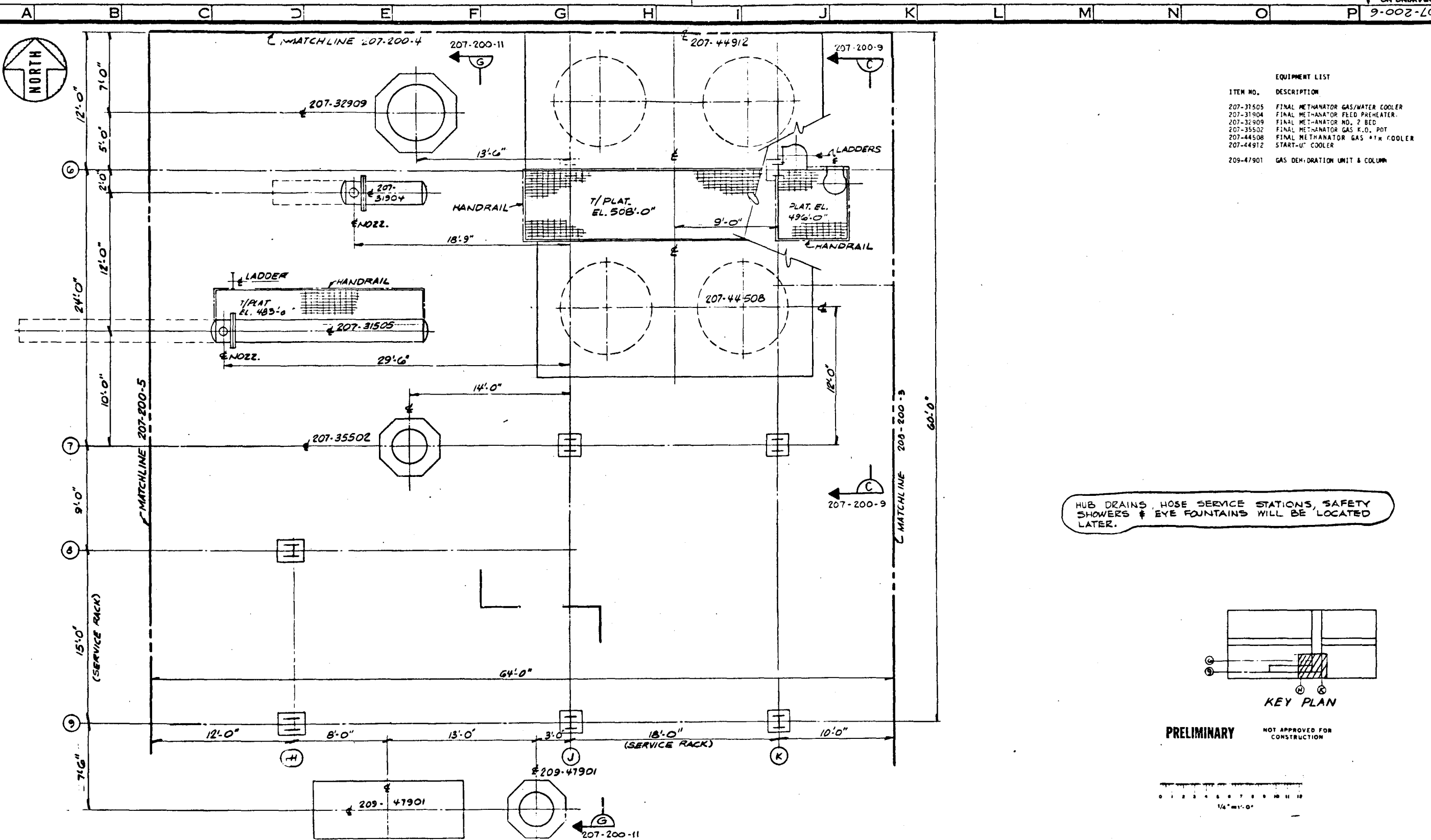
SECTION P
207-200-2

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASELINE	10/1/12	BA														
2	ISSUED FOR DPHD REMNT	11/1/12	BA														

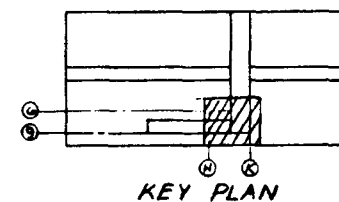
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	10/1/12	FOR DPHD REMNT
CHECKED	11/1/12	FOR COMMENTS AND/OR APPROVAL
DRAWN APP'D		FOR CUSTOMER APPROVAL
ICGG APP'D		AND/OR COMMENTS
DATE APP'D		APPROVAL FOR CONSTRUCTION
SCALE	1" = 1'-0"	

TITLE SHIFT 4 METHANATION LAYOUT SECTION		PROJECT NO. 7051 DRAWING NO. 207-200-7
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-CG-1-2012		CASE SC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVD CORPORATION, PITTSBURGH, PA		REV. A

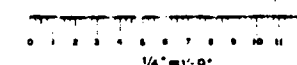


EQUIPMENT LIST

ITEM NO.	DESCRIPTION
207-31505	FINAL METHANATOR GAS/WATER COOLER
207-31904	FINAL METHANATOR FLED. PREHEATER
207-32909	FINAL METHANATOR NO. 2 BED
207-35502	FINAL METHANATOR GAS K.O. POT
207-44508	FINAL METHANATOR GAS K.O. POT
207-44912	START-UP COOLER
209-47901	GAS DEHYDRATION UNIT & COLUMN

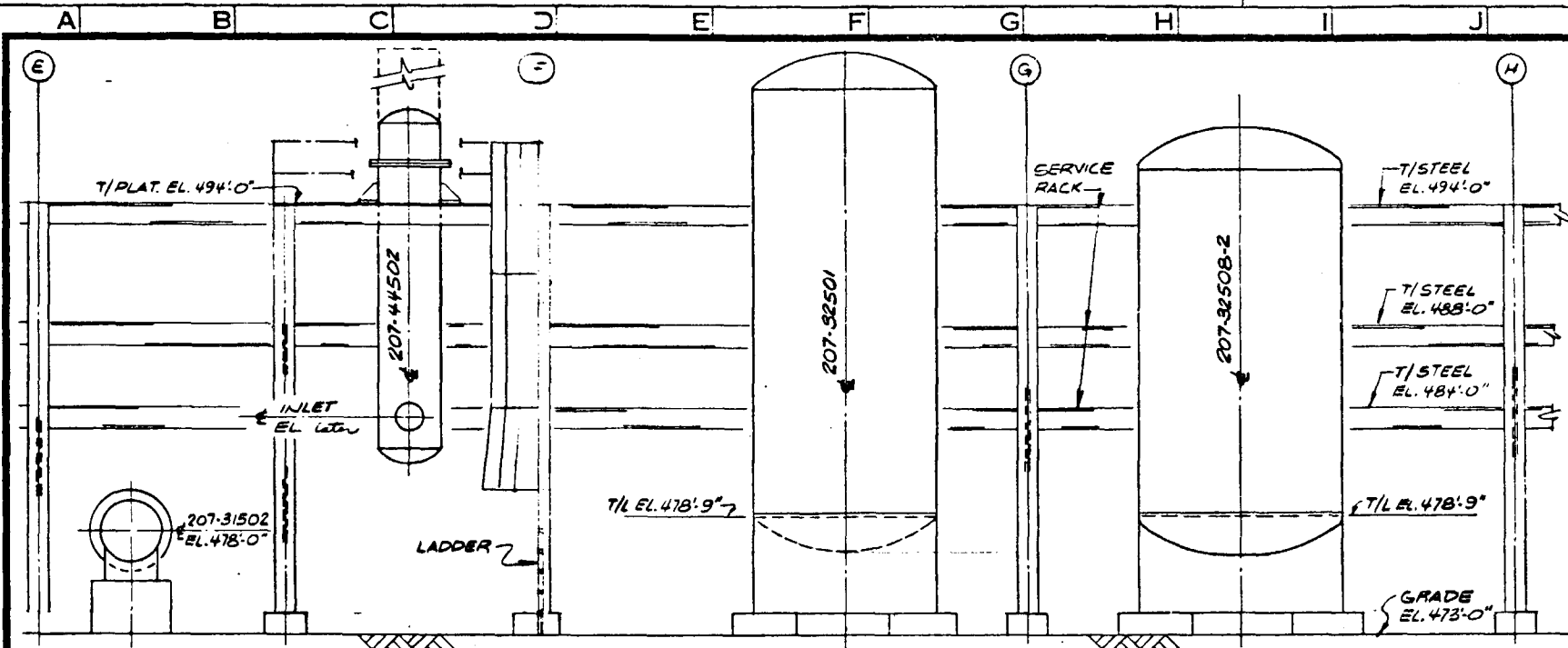


PRELIMINARY NOT APPROVED FOR CONSTRUCTION

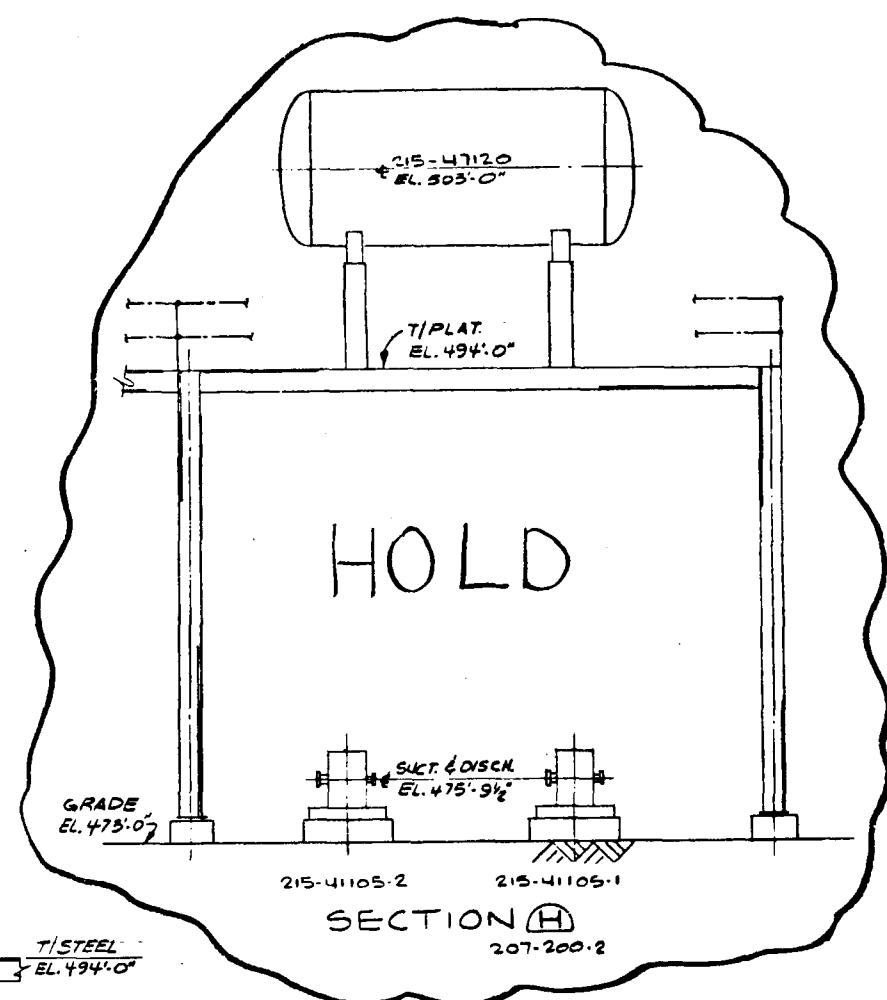


REVISIONS				REVISIONS				REVISIONS				REVISIONS				BY				DATE				DRAWING STATUS				TITLE		PROJECT NO.	
NO.	DATE	BY	APPD.	NO.	DATE	BY	APPD.	NO.	DATE	BY	APPD.	NO.	DATE	BY	APPD.	DESIGNED	ISSUED	DATE	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG	U.S. DOE	ENERGY TECHNOLOGY	FOSSIL ENERGY PROGRAMS	CONTRACT NO. EF 77-C-01-2012	CASE	REV
1	1/15/12	JMK	JMK													DRWN	ISSUED	1/15/12	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG	SHIFT & METHANATION LAYOUT PLAN	7051	207-200-6	1	6	
2	1/15/12	JMK	JMK													CHECKED	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG	ILLINOIS COAL GASIFICATION GROUP	DRAGO CORPORATION PITTSBURGH PA						
3	1/15/12	JMK	JMK													DRWN APPD.	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG								
4	1/15/12	JMK	JMK													ICGG APPD.	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG								
5	1/15/12	JMK	JMK													DATE APPD.	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG								
6	1/15/12	JMK	JMK													S. AIF	FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	ICGG	AND/OR COMMENTS	ICGG	APPROVAL FOR CONSTRUCTION	ICGG								

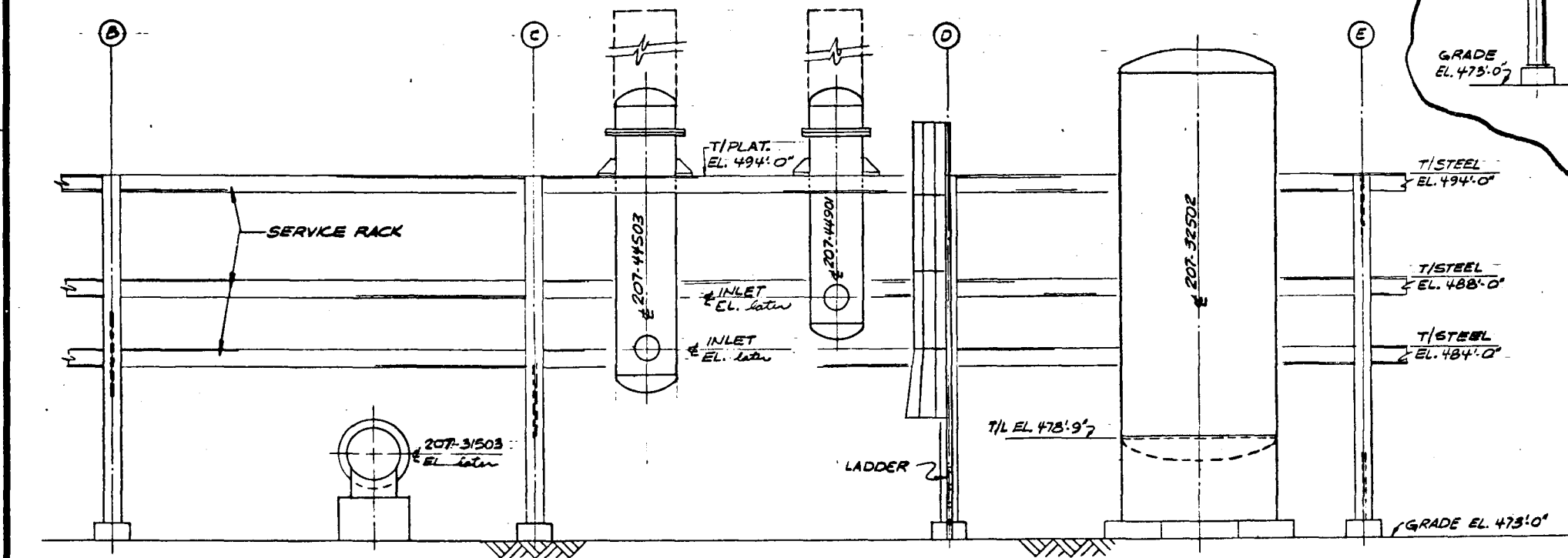
DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED TO ITS ORIGINAL SIZE



SECTION M
207-200-2



SECTION H
207-200-2



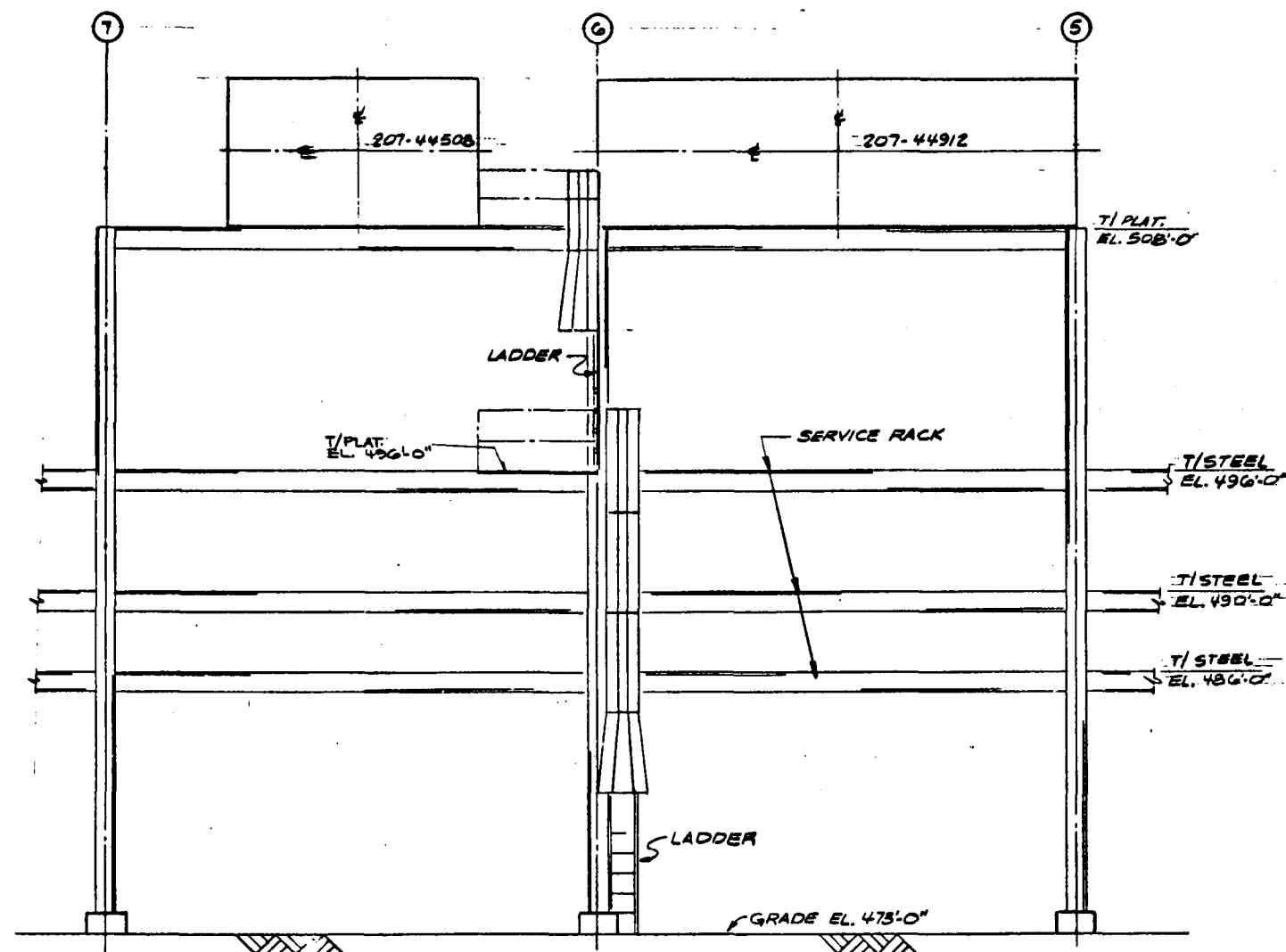
SECTION B
207-200-1

PRELIMINARY NOT APPROVED FOR CONSTRUCTION
0 1 2 3 4 5 6 7 8 9 10 11 12
1/4" = 1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.
1	ISSUED FOR BIDDING	7/2/11	JL															
2	ISSUED FOR DDPD RECAT	7/12/11	JL															

DESIGNED	BY	DATE	DRAWING STATUS	DATE
DRAWN	CHINA	7/2/11	PP DDPD RECAT	7/12/11
CHECKED	MAKES	7/12/11	FOR COMMENTS AND/OR	
DRAWG APP'D			APPROVAL	
ICGG APP'D			FOR CUSTOMER APPROVAL	ICGG
ICME APP'D			AND/OR COMMENTS	ICME
			APPROVAL FOR CONSTRUCTION	

TITLE SHIFT & METHANATION LAYOUT SECTIONS	PROJECT NO 7051 DRAWING NO 207-200-8
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. E7-77.C-01-2012	CASE EC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH PA	REV. E3



SECTION C
207-200-4 & 6

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

0 1 2 3 4 5 6 7 8 9 10 11 12
1/4" = 1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASE LINE	7/2/88	WJG														
2	ISSUED FOR DPPD REPORT	7/18/88	WJG														
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

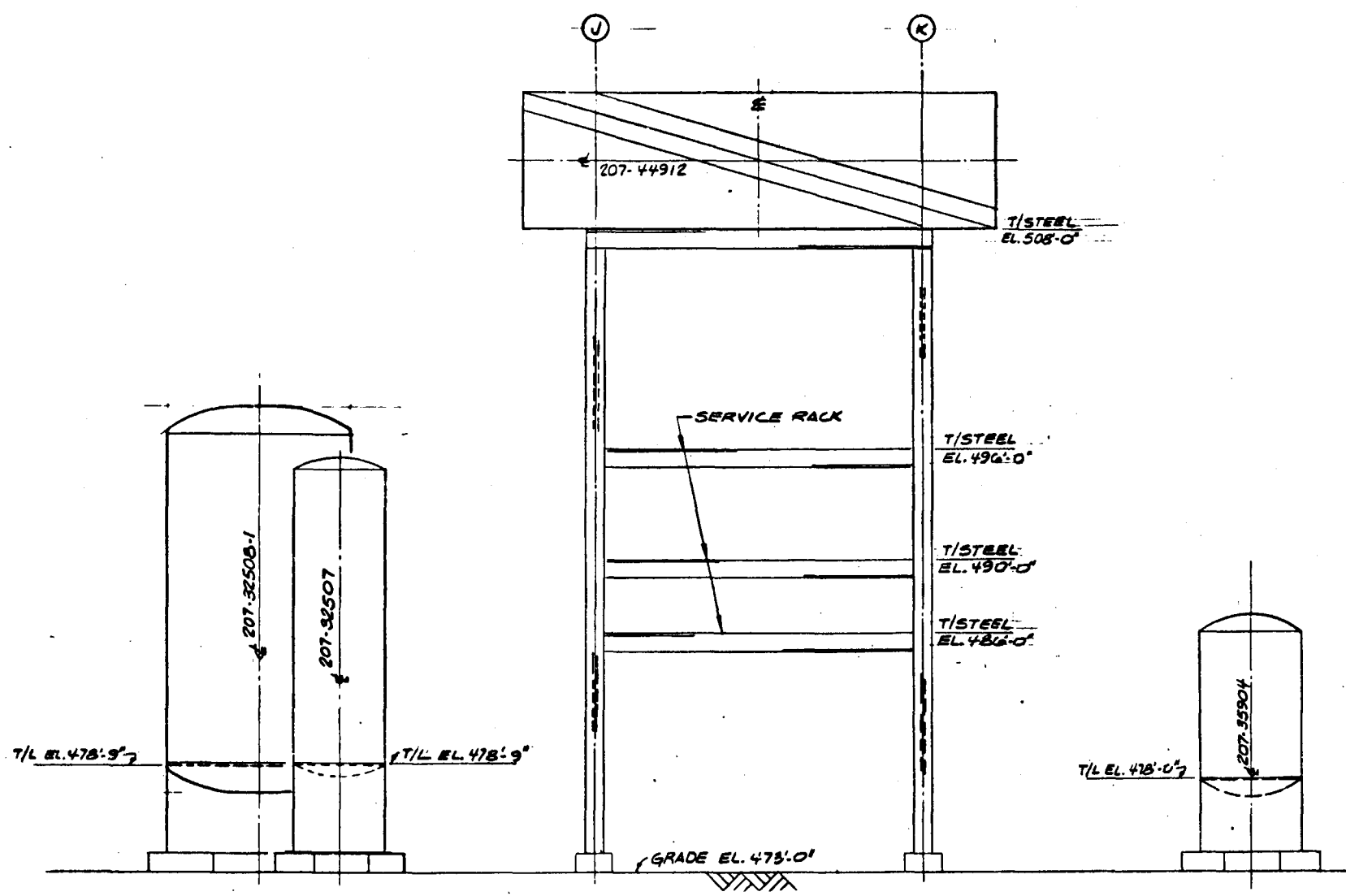
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	WJG 7/2/88	FOR COMMENTS AND/OR APPROVAL
CHECKED	WJG 7/2/88	FOR CUSTOMER APPROVAL
DRAWN APPR		AND/OR COMMENTS
ICGG APPR		APPROVAL FOR CONSTRUCTION
DOE APPR		
SCALE		

TITLE	SHIFT & METHANATION LAYOUT SECTION
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP
BY	DRAYO CORPORATION PITTSBURGH, PA

PROJECT NO.	7051
DRAWING NO.	207-200-9
CASE	SC
REV	A

Q
R
S
T
U
V
W
X
Y
Z

A B C D E F G H I J K L M N O P



SECTION D
207-200.4

PRELIMINARY NOT APPROVED FOR CONSTRUCTION

0 1 2 3 4 5 6 7 8 9 10 11 12
1/4"=1'-0"

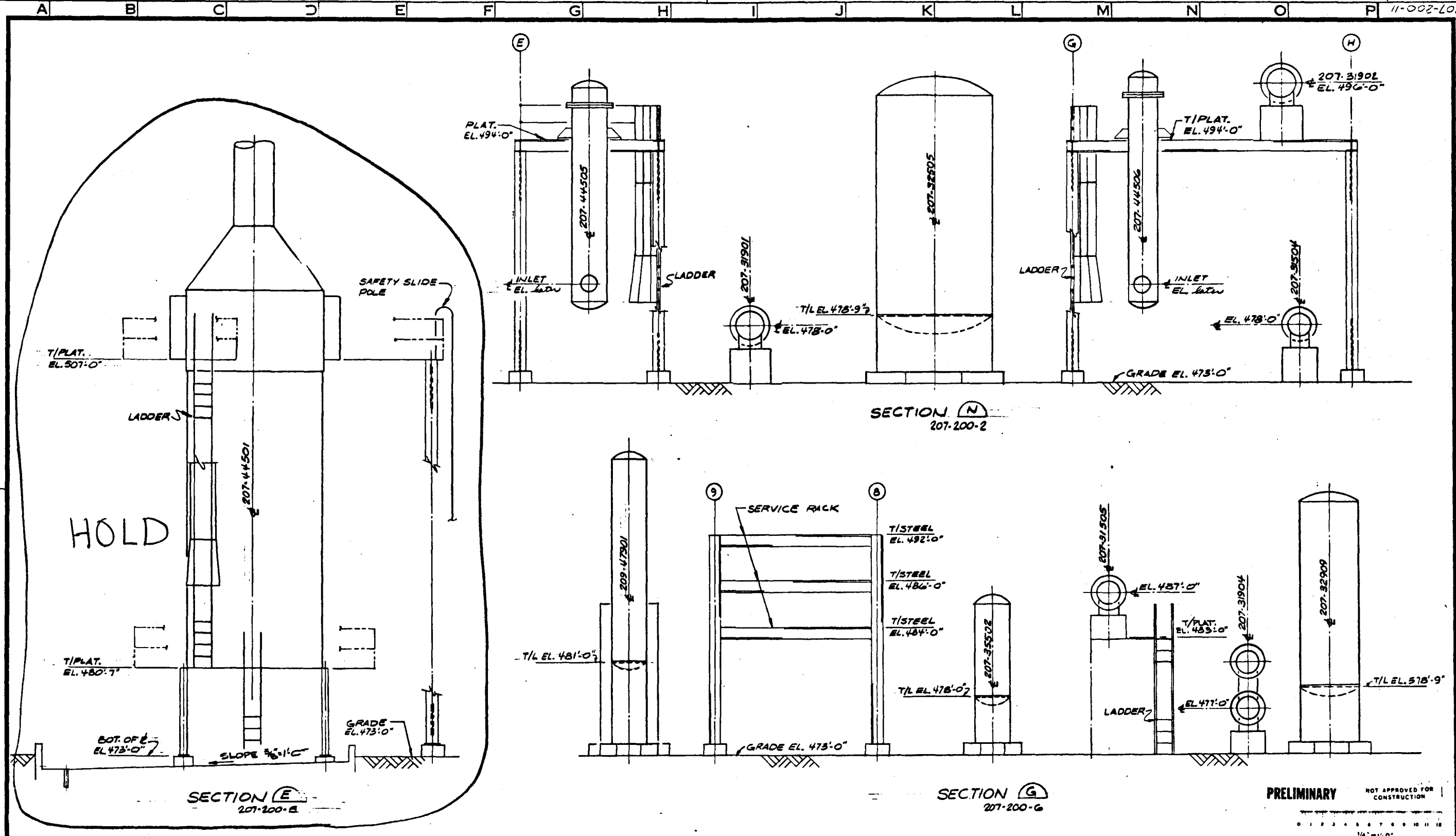
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	10/1/12	SM												
2	10/1/12	SM												
3	10/1/12	SM												
4	10/1/12	SM												
5	10/1/12	SM												
6	10/1/12	SM												
7	10/1/12	SM												
8	10/1/12	SM												
9	10/1/12	SM												
10	10/1/12	SM												
11	10/1/12	SM												
12	10/1/12	SM												

DESIGNED	BY	DATE	ISSUED	DATE
SM	SM	10/1/12	FOR DDP REPORT	10/1/12
CHECKED	SM	10/1/12	FOR COMMENTS AND/OR APPROVAL	
DRAWN	SM	10/1/12	FOR CUSTOMER APPROVAL	
ICGG APP'D			AND/OR COMMENTS	
D.E. APP'D			APPROVAL FOR CONSTRUCTION	
SCALE	1/4"=1'-0"			

TITLE	PROJECT NO.
SHIFT & METHANATION LAYOUT SECTION	7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO.
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH PA	207-200-10
	CASE
	REV.

"D"

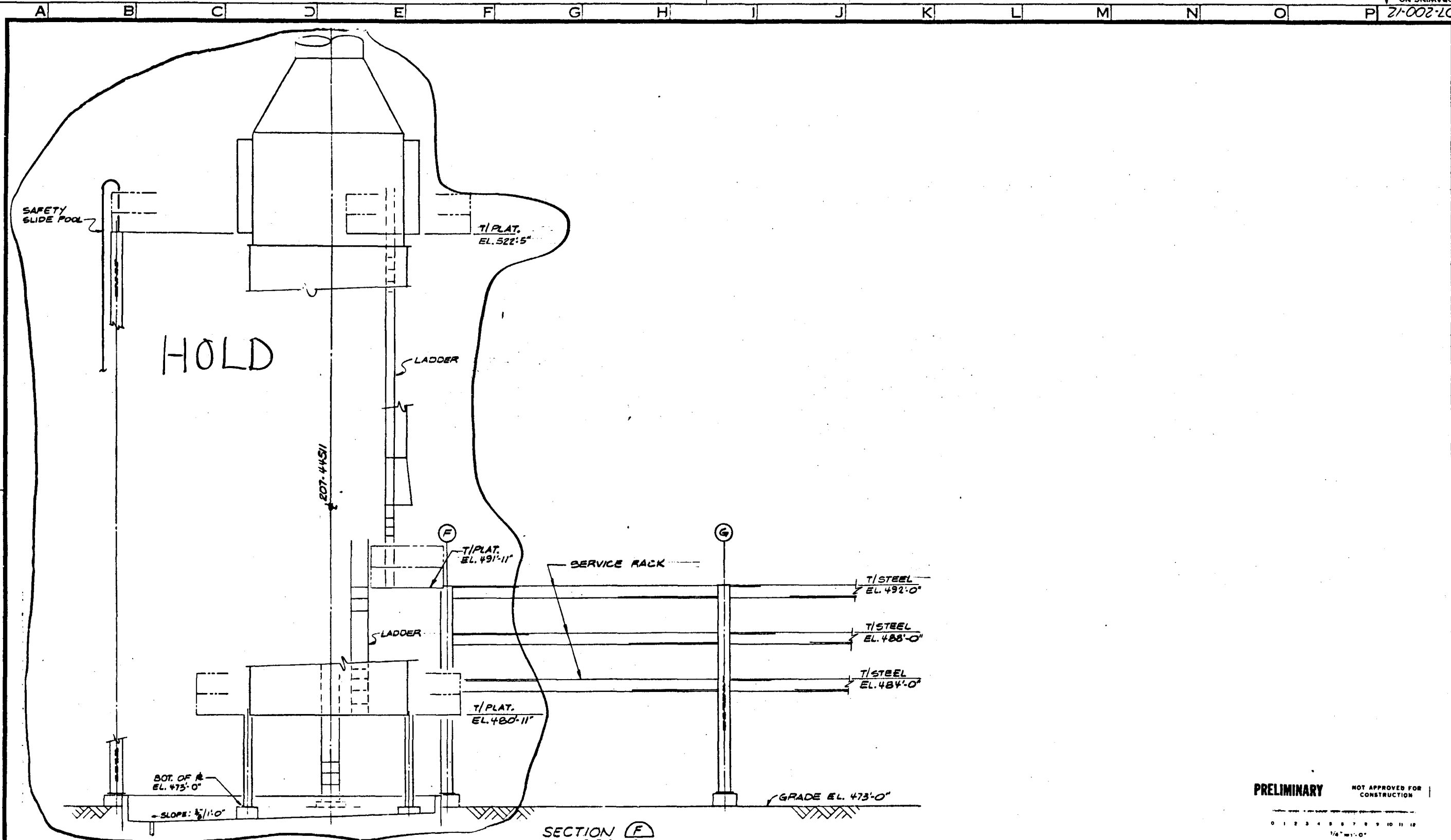
DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	11-002-202	RA	RA	RA															
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	11-002-202	FOR DPPD REPORT
CHECKED	11-002-202	FOR COMMENTS AND/OR APPROVAL
DRAVO APP'D		FOR CUSTOMER APPROVAL
ICGG APP'D		AND/OR COMMENTS
DCE APP'D		APPROVAL FOR CONSTRUCTION
SCALE		

PROJECT NO. 7051 DRAWING NO. 207-200-11	U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012 PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH PA
--	--



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	W/K												
2	ISSUED FOR DPPD REPORT	W/K												
		</												



NO.	REVISIONS	DATE	BY	CHK'D	APPR.	NO.	REVISIONS
①	DC-DEMONSTRATION CONCEPT	MAY 68	AKS	KRM	JWH	②	
②	DEMINKRATION CONCEPT-TIC	" "	" "	" "	" "	③	
③						④	
④						⑤	
⑤						⑥	
⑥						⑦	
⑦						⑧	
⑧						⑨	
⑨						⑩	
⑩						⑪	
⑪						⑫	
⑫						⑬	
⑬						⑭	
⑭						⑮	
⑮						⑯	
⑯						⑰	
⑰						⑱	
⑱						⑲	
⑲						⑳	
㉑						㉒	
㉓						㉔	
㉕						㉖	
㉗						㉘	
㉙						㉚	
㉛						㉜	
㉝						㉞	
㉟						㊱	
㊲						㊳	
㊴						㊵	
㊶						㊷	
㊸						㊹	
㊺						㊻	
㊼						㊽	
㊾						㊿	

1. *Chlorophyll a* (Chl *a*)
 2. *Chlorophyll b* (Chl *b*)
 3. *Chlorophyll c* (Chl *c*)
 4. *Chlorophyll d* (Chl *d*)
 5. *Chlorophyll e* (Chl *e*)
 6. *Chlorophyll f* (Chl *f*)
 7. *Chlorophyll g* (Chl *g*)
 8. *Chlorophyll h* (Chl *h*)
 9. *Chlorophyll i* (Chl *i*)
 10. *Chlorophyll j* (Chl *j*)
 11. *Chlorophyll k* (Chl *k*)
 12. *Chlorophyll l* (Chl *l*)
 13. *Chlorophyll m* (Chl *m*)
 14. *Chlorophyll n* (Chl *n*)
 15. *Chlorophyll o* (Chl *o*)
 16. *Chlorophyll p* (Chl *p*)
 17. *Chlorophyll q* (Chl *q*)
 18. *Chlorophyll r* (Chl *r*)
 19. *Chlorophyll s* (Chl *s*)
 20. *Chlorophyll t* (Chl *t*)
 21. *Chlorophyll u* (Chl *u*)
 22. *Chlorophyll v* (Chl *v*)
 23. *Chlorophyll w* (Chl *w*)
 24. *Chlorophyll x* (Chl *x*)
 25. *Chlorophyll y* (Chl *y*)
 26. *Chlorophyll z* (Chl *z*)
 27. *Chlorophyll aa* (Chl *aa*)
 28. *Chlorophyll ab* (Chl *ab*)
 29. *Chlorophyll ac* (Chl *ac*)
 30. *Chlorophyll ad* (Chl *ad*)
 31. *Chlorophyll ae* (Chl *ae*)
 32. *Chlorophyll af* (Chl *af*)
 33. *Chlorophyll ag* (Chl *ag*)
 34. *Chlorophyll ah* (Chl *ah*)
 35. *Chlorophyll ai* (Chl *ai*)
 36. *Chlorophyll aj* (Chl *aj*)
 37. *Chlorophyll ak* (Chl *ak*)
 38. *Chlorophyll al* (Chl *al*)
 39. *Chlorophyll am* (Chl *am*)
 40. *Chlorophyll an* (Chl *an*)
 41. *Chlorophyll ao* (Chl *ao*)
 42. *Chlorophyll ap* (Chl *ap*)
 43. *Chlorophyll aq* (Chl *aq*)
 44. *Chlorophyll ar* (Chl *ar*)
 45. *Chlorophyll as* (Chl *as*)
 46. *Chlorophyll at* (Chl *at*)
 47. *Chlorophyll au* (Chl *au*)
 48. *Chlorophyll av* (Chl *av*)
 49. *Chlorophyll aw* (Chl *aw*)
 50. *Chlorophyll ax* (Chl *ax*)
 51. *Chlorophyll ay* (Chl *ay*)
 52. *Chlorophyll az* (Chl *az*)
 53. *Chlorophyll aza* (Chl *aza*)
 54. *Chlorophyll abz* (Chl *abz*)
 55. *Chlorophyll acz* (Chl *acz*)
 56. *Chlorophyll adz* (Chl *adz*)
 57. *Chlorophyll aez* (Chl *aez*)
 58. *Chlorophyll afz* (Chl *afz*)
 59. *Chlorophyll agz* (Chl *agz*)
 60. *Chlorophyll ahz* (Chl *ahz*)
 61. *Chlorophyll aiz* (Chl *aiz*)
 62. *Chlorophyll ajz* (Chl *ajz*)
 63. *Chlorophyll akz* (Chl *akz*)
 64. *Chlorophyll alz* (Chl *alz*)
 65. *Chlorophyll amz* (Chl *amz*)
 66. *Chlorophyll anz* (Chl *anz*)
 67. *Chlorophyll aoz* (Chl *aoz*)
 68. *Chlorophyll apz* (Chl *apz*)
 69. *Chlorophyll aqz* (Chl *aqz*)
 70. *Chlorophyll arz* (Chl *arz*)
 71. *Chlorophyll asz* (Chl *asz*)
 72. *Chlorophyll atz* (Chl *atz*)
 73. *Chlorophyll auz* (Chl *auz*)
 74. *Chlorophyll avz* (Chl *avz*)
 75. *Chlorophyll awz* (Chl *awz*)
 76. *Chlorophyll axz* (Chl *axz*)
 77. *Chlorophyll ayz* (Chl *ayz*)
 78. *Chlorophyll azz* (Chl *azz*)
 79. *Chlorophyll azaa* (Chl *aza*)
 80. *Chlorophyll abz* (Chl *abz*)
 81. *Chlorophyll acz* (Chl *acz*)
 82. *Chlorophyll adz* (Chl *adz*)
 83. *Chlorophyll aez* (Chl *aez*)
 84. *Chlorophyll afz* (Chl *afz*)
 85. *Chlorophyll agz* (Chl *agz*)
 86. *Chlorophyll ahz* (Chl *ahz*)
 87. *Chlorophyll aiz* (Chl *aiz*)
 88. *Chlorophyll ajz* (Chl *ajz*)
 89. *Chlorophyll akz* (Chl *akz*)
 90. *Chlorophyll alz* (Chl *alz*)
 91. *Chlorophyll amz* (Chl *amz*)
 92. *Chlorophyll anz* (Chl *anz*)
 93. *Chlorophyll aoz* (Chl *aoz*)
 94. *Chlorophyll apz* (Chl *apz*)
 95. *Chlorophyll aqz* (Chl *aqz*)
 96. *Chlorophyll arz* (Chl *arz*)
 97. *Chlorophyll asz* (Chl *asz*)
 98. *Chlorophyll atz* (Chl *atz*)
 99. *Chlorophyll auz* (Chl *auz*)
 100. *Chlorophyll avz* (Chl *avz*)
 101. *Chlorophyll awz* (Chl *awz*)
 102. *Chlorophyll axz* (Chl *axz*)
 103. *Chlorophyll ayz* (Chl *ayz*)
 104. *Chlorophyll azz* (Chl *azz*)
 105. *Chlorophyll azaa* (Chl *aza*)
 106. *Chlorophyll abz* (Chl *abz*)
 107. *Chlorophyll acz* (Chl *acz*)
 108. *Chlorophyll adz* (Chl *adz*)
 109. *Chlorophyll aez* (Chl *aez*)
 110. *Chlorophyll afz* (Chl *afz*)
 111. *Chlorophyll agz* (Chl *agz*)
 112. *Chlorophyll ahz* (Chl *ahz*)
 113. *Chlorophyll aiz* (Chl *aiz*)
 114. *Chlorophyll ajz* (Chl *ajz*)
 115. *Chlorophyll akz* (Chl *akz*)
 116. *Chlorophyll alz* (Chl *alz*)
 117. *Chlorophyll amz* (Chl *amz*)
 118. *Chlorophyll anz* (Chl *anz*)
 119. *Chlorophyll aoz* (Chl *aoz*)
 120. *Chlorophyll apz* (Chl *apz*)
 121. *Chlorophyll aqz* (Chl *aqz*)
 122. *Chlorophyll arz* (Chl *arz*)
 123. *Chlorophyll asz* (Chl *asz*)
 124. *Chlorophyll atz* (Chl *atz*)
 125. *Chlorophyll auz* (Chl *auz*)
 126. *Chlorophyll avz* (Chl *avz*)
 127. *Chlorophyll awz* (Chl *awz*)
 128. *Chlorophyll axz* (Chl *axz*)
 129. *Chlorophyll ayz* (Chl *ayz*)
 130. *Chlorophyll azz* (Chl *azz*)
 131. *Chlorophyll azaa* (Chl *aza*)
 132. *Chlorophyll*

TITLE PROCESS FLOW DIAGRAM AREA 200 BULK CO ₂ REMOVAL AND GAS COMPRESSION PURIFICATION & COMPRESSION	
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP DRACO CORPORATION PITTSBURGH, PA.	

PROJECT NO.
7051
DRAWING NO.
208-100-1A

CASE
F.C.-TIC

REV. 

ILLINOIS NO. 546
ENERGY BALANCE SUMMARY
MM BTU/HR

41.836

COMPRESSION (+) 5.339
COOLERS (-) 30.293
EQ. HEAT LOSS (-) 0.013

NET SUBTRACTION (-) 24.967

6.806
6.446
0.018
3.599

TOTAL ENERGY IN : 41.836

TOTAL ENERGY OUT : 16.869

NET SUBTRACTION: (-) 24.967

APPROVED FOR ENGINEERING

NOT APPROVED FOR
CONSTRUCTION

COMPRESSION N° 8
ENERGY BALANCE SUMMARY
MMBTU/HR

Process	Value (MMBTU/HR)
COMPRESSION (+)	5.892
COOLERS (-)	33.081
EQ. HEAT LOSS (-)	0.002
NET SUBTRACTION (-)	27.191

TOTAL ENERGY IN: 45.716

TOTAL ENERGY OUT: 18.525

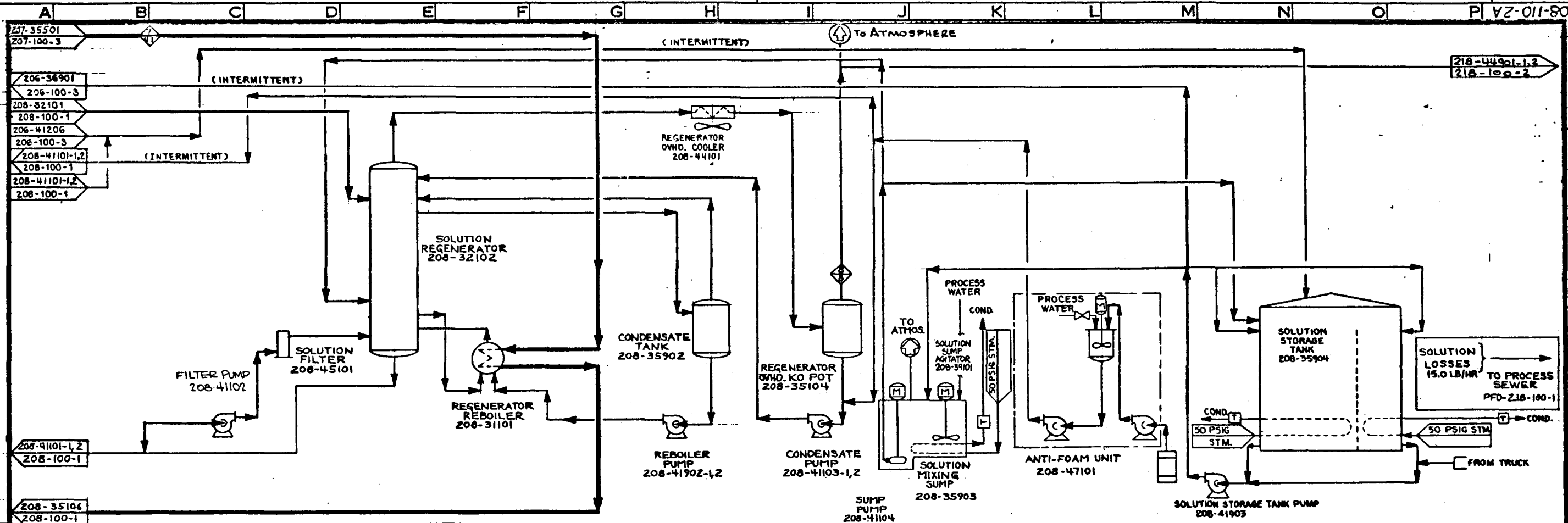
**WESTERN SUB-BITUMINOUS
ENERGY BALANCE SUMMARY
MM BTU/HR**

```
graph LR
    In{47.059} --> Box
    subgraph Box [ ]
        direction TB
        C["COMPRESSION (+) 6.051"]
        CO["COOLERS (-) 34.676"]
        EL["EQ. HEAT LOSS (-) 0.005"]
        NS["NET SUBTRACTION (-) 28.630"]
    end
    Box --> Out1{6.988}
    Box --> Out2{7.296}
    Box --> Out3{0.020}
    Box --> Out4{4.125}
```

TOTAL ENERGY IN 47.059	NET SUBTRACTION (-) 28.630	TOTAL ENERGY OUT 18.429
------------------------------	-------------------------------	-------------------------------

TITLE	PROCESS FLOW DIAGRAM AREA 208 BULK CO ₂ REFINAL AND CAS COMPRESSION <u>PURIFICATION AND COMPRESSION</u> U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-CO1-2012	PROJECT NO. 7051 DRAWING NO. 208-100-
DATE 3-3-80		CASE DC-TIC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA		REV.

BY		DATE	DRAWING STATUS	
DESIGNED	A. K. CHAH	5-15-77	ISSUED	DATE
DRAWN	BYRON C. J. VICK	5-23-77	TAPED & RELEASE	
CHECKED	K. M. MISHU	5-23-77	FOR COMMENTS AND/OR	
DRAWN APP'D	C. J. VICK	5-23-77	APPROVAL	
ICGG APP'D	C. J. VICK	5-15-77	FOR CUSTOMER APPROVAL	
DOE APP'D			AND/OR COMMENTS	
			ICGG	
			DOE	
SCALE			APPROVAL FOR CONSTRUCTION	



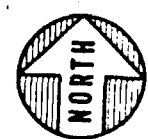
MATERIAL	STREAM NO.	1	2	3	4	5
ILLINOIS NO. 5 & 6 POUNDS/HOUR						
CO ₂	25839	7473	22-91	5.794	32104	31023
CO	36	TRACE	37	TRACE	45	TRACE
H ₂	289	TRACE	289	TRACE	317	TRACE
H ₂ O VAPOR	28902	5076	31574	2069	32340	5124
H ₂ O LIQUID						
CH ₄	37817	47	4639	23	41027	59
C ₂ H ₄						
C ₂ H ₆						
C ₃ H ₆						
C ₃ H ₈						
C ₄ H ₁₀						
Ar	39		40		49	
O ₂						
N ₂	3720	3	3034	3	4224	3
K ₂ CO ₃						
BENFIELD SOLUTION						
TOTAL POUNDS/HOUR	96642	3101	10004	33019	111736	30279
AVG. MOLECULAR WEIGHT	20.02	44.1	24.02	34.53	20.02	35.86
ACFM	2200	441	2402	7291	6502	7676
GPM						
PRESSURE, PSIG	295	0.4	295	0	295	1
TEMPERATURE, °F	330.0	164	212	163	212	161
ENTHALPY, MM BTU/HR	41.836	41.836	41.836	41.836	41.836	41.836

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	QC-DEMONSTRATION CONCEPT	10-15-79	AKS	KM	JWH	1	PRELIMINARY ISSUE	10-15-79	AKS	KM	JWH
2	DEMONSTRATION CONCEPT-TIC	10-15-79	AKS	KM	JWH	2	FOR BASELINING	10-15-79	AKS	KM	JWH
						3	PDBP RECORD AND DPPD	10-15-79	AKS	KM	JWH
						4	TASK VI RELEASE	10-15-79	AKS	KM	JWH

BY	DATE	DRAWING STATUS
AKS	8-25-79	ISSUED
AKS	7-2-79	TASK VI RELEASE
K.M.	10-15-79	FOR COMMENTS AND/OR APPROVAL
C. J. Langdon	2-15-80	APPROVAL
ICGB APP'D	2-15-80	FOR CUSTOMER APPROVAL
DOE APP'D		AND/OR COMMENTS
		APPROVAL FOR CONSTRUCTION

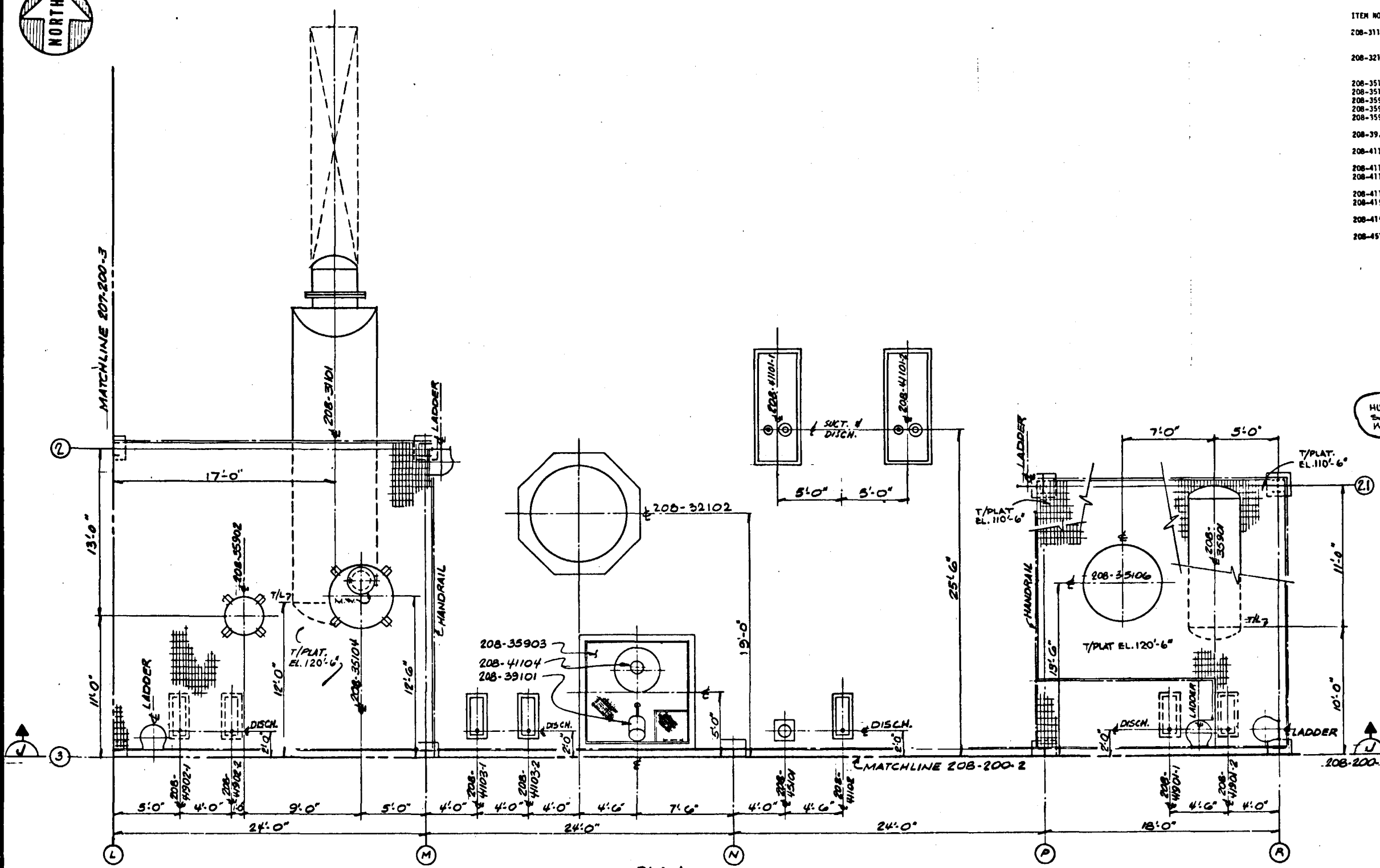
TITLE	PROCESS FLOW DIAGRAM AREA 208 BULK CO ₂ REMOVAL AND GAS COMPRESSION BENFIELD SOLVENT REGENERATION
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP
BY	DRAGO CORPORATION PITTSBURGH, PA.

PROJECT NO.	7051
DRAWING NO.	208-100-2
CASE	UC-TIC
REV.	



EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
208-31101	REGENERATOR REBOILER
208-32102	SOLUTION REGENERATOR
208-35104	REGENERATOR OVERHEAD K.O. POT
208-35106	FEED GAS SEPARATOR
208-35901	CONDENSATE WATER TANK
208-35902	CONDENSATE TANK
208-35903	SOLUTION MIXING SUMP
208-39.01	SOLUTION SUMP AGITATOR
208-41101-1,2	LEAN SOLUTION PUMP
208-41102	FILTER PUMP
208-41103-1,2	CO. CONDENSATE PUMP
208-41104	SUMP PUMP
208-41901-1,2	CONDENSATE WATER PUMP
208-41902-1,2	REBOILER PUMP
208-45101	SOLUTION FILTER

HUB DRAINS, HOSE SERVICE STATIONS,
SAFETY SHOWERS & EYE FOUNTAINS
WILL BE LOCATED LATER.



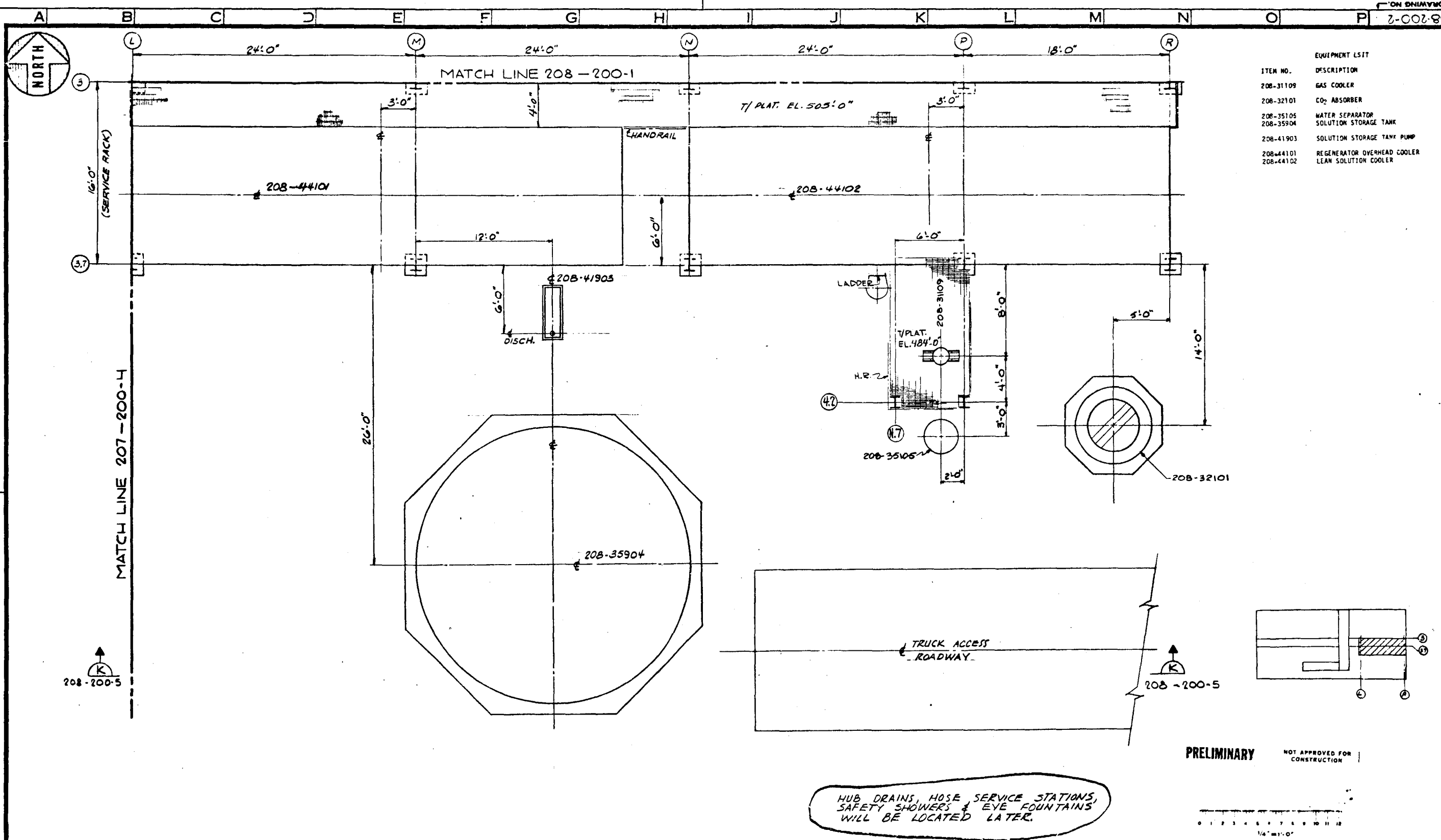
KEY PLAN

APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

1/4" = 1'-0"

REVISIONS						REVISIONS						REVISIONS					
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASELINE	12/10/80	JK														
2	ISSUED FOR DPPD REPORT	1/14/81	JK														
3	ISSUED FOR CUSTOMER APPROVAL	1/14/81	JK														
4	RELEASED FOR TASK II	1/14/81	JK														
5	DEMONSTRATION CONCEPT-TIC	1/14/81	JNR														
																	</

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



ITEM NO.	EQUIPMENT LIST
208-31109	DESCRIPTION
208-32101	GAS COOLER
208-35105	CO2 ABSORBER
208-35904	WATER SEPARATOR
208-41903	SOLUTION STORAGE TANK
208-44101	SOLUTION STORAGE TANK PUMP
208-44102	REGENERATOR OVERHEAD COOLER
	LEAN SOLUTION COOLER

PRELIMINARY NOT APPROVED FOR CONSTRUCTION

HUB, DRAINS, HOSE, SERVICE STATIONS, SAFETY SHOWERS & EYE FOUNTAINS WILL BE LOCATED LATER.

REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	11/1/11	W.H.	W.H.																
2	11/1/11	W.H.	W.H.																
3	11/1/11	W.H.	W.H.																
4	11/1/11	W.H.	W.H.																
5	11/1/11	W.H.	W.H.																
6	11/1/11	W.H.	W.H.																
7	11/1/11	W.H.	W.H.																
8	11/1/11	W.H.	W.H.																
9	11/1/11	W.H.	W.H.																
10	11/1/11	W.H.	W.H.																
11	11/1/11	W.H.	W.H.																
12	11/1/11	W.H.	W.H.																

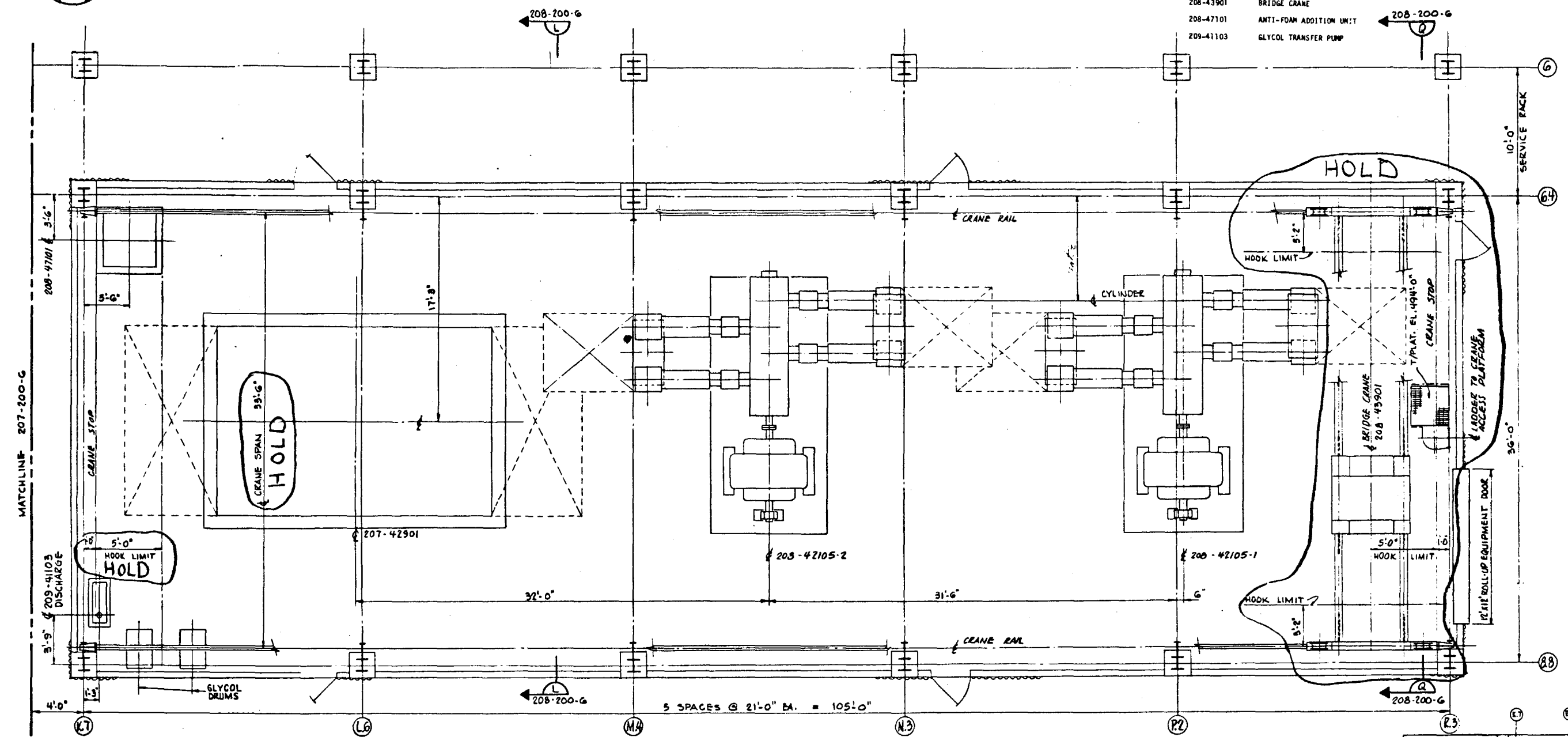
DESIGNED	BY	DATE	DRAWING STATUS
W.H.	W.H.	11/1/11	ISSUED
CHECKED	W.H.	11/1/11	FOR COMMENTS AND/OR APPROVAL
DRAWN	W.H.	11/1/11	FOR CUSTOMER APPROVAL
ICGG APPR			AND/OR COMMENTS
DATE APPR			APPROVAL FOR CONSTRUCTION

PROJECT NO	7051
DRAWING NO	208-200-2
U.S. DOE	ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS	CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP
BY	DRACO CORPORATION PITTSBURGH PA
REV	

DO NOT SCALE THIS DRAWING IT MAY BE REDUCED FROM ORIGINAL SIZE



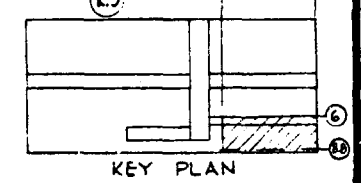
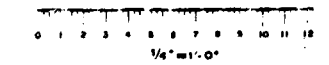
ITEM NO.	DESCRIPTION
207-42901	START-UP COMPRESSOR
208-42105-1,2	SYN. GAS COMPRESSOR
208-43901	BRIDGE CRANE
208-47101	ANTI-FOAM ADDITION UNIT
209-41103	GLYCOL TRANSFER PUMP



HUB DRAINS, HOSE SERVICE STATIONS,
SAFETY SHOWERS & EYE FOUNTAINS WILL BE
LOCATED LATER.

PRELIMINARY

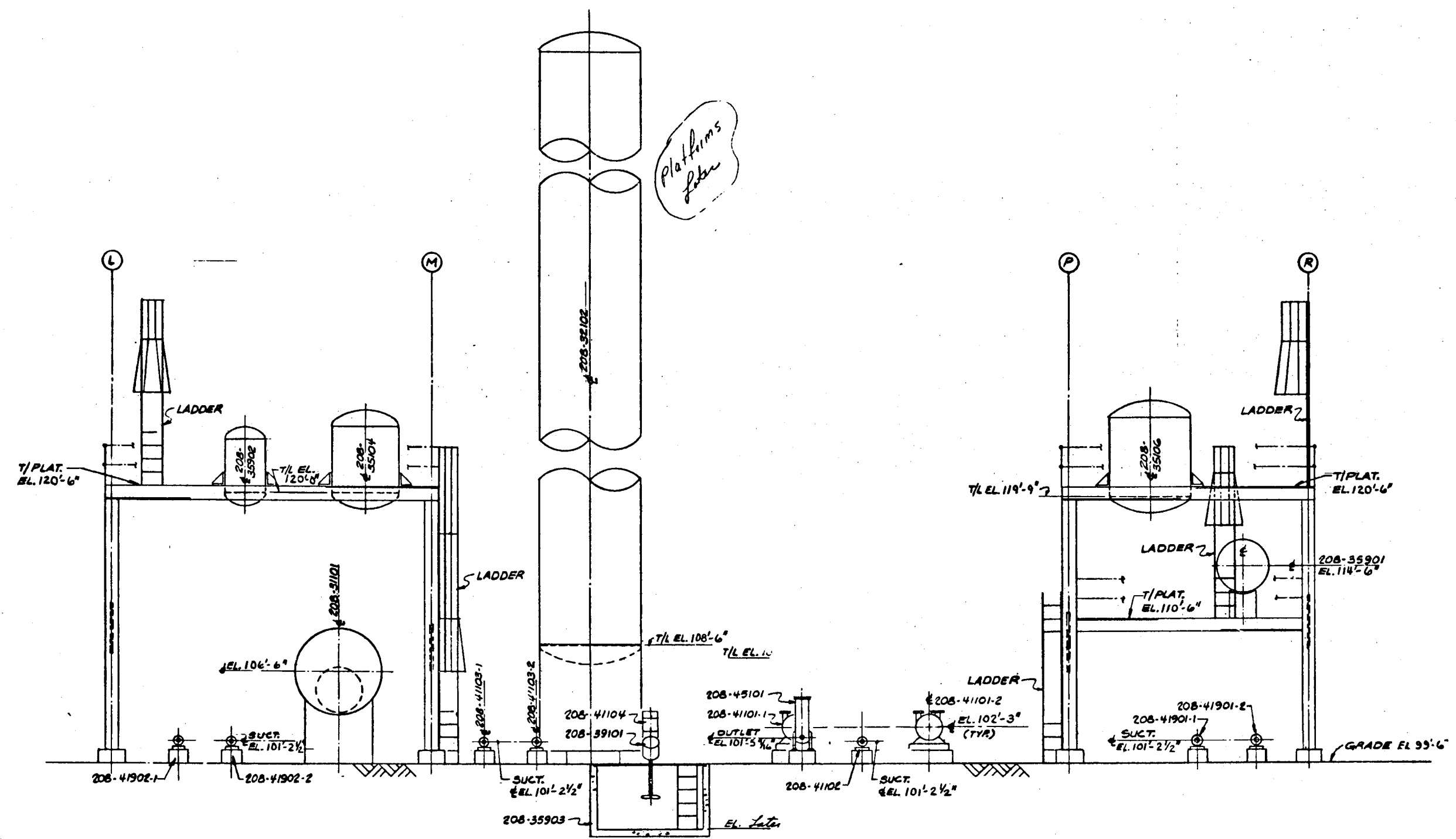
NOT APPROVED FOR
CONSTRUCTION



NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASE LINE	10/1/12	JL														
2	ISSUED FOR UPTD REPORT	11/1/12	JL														

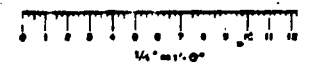
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	G. VACKES	FOR DDPD REPORT
CHECKED	VACKES	FOR COMMENTS AND/OR APPROVAL
DRAWN APP'D		FOR CUSTOMER APPROVAL
ICGG APP'D		AND/OR COMMENTS
DOE APP'D		APPROVAL FOR CONSTRUCTION

TITLE BULK CO₂ REMOVAL LAYOUT PLAN		PROJECT NO. 7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 208-200-3
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH PA		CASE D
		REV A



SECTION J
208-200-1

APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION



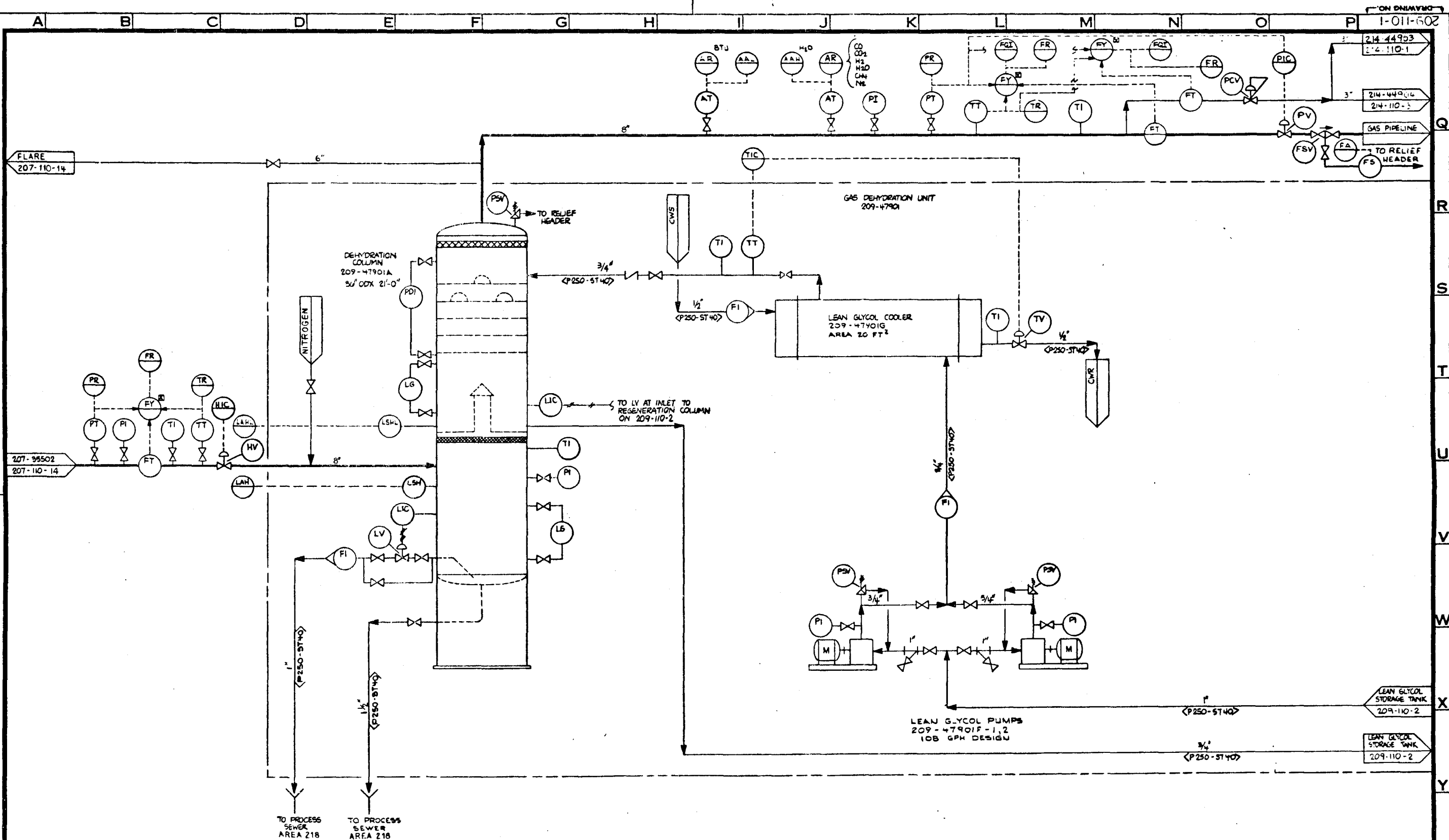
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	12-17-79	EICKER												
2	1-9-80	NACKES												
3	5-28-80	W. H. H. H.												
4	7-1-80	W. H. H. H.												
5														
6														
7														
8														
9														
10														

DESIGNED	BY	DATE	DRAWING STATUS	DATE
DRAWN	EICKER	12-17-79	RELEASED FOR TASK II	7-1-80
CHECKED	NACKES	1-9-80	FOR COMMENTS AND/OR	
DRAWN APP'D	W. H. H. H.	5-28-80	APPROVAL	
ICGG APP'D	W. H. H. H.	7-1-80	FOR CUSTOMER APPROVAL	ICGG
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
			CONSTRUCTION	

TITLE		PROJECT NO.
BULK CO ₂ REMOVAL LAYOUT SECTIONS		7051
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 208-200-4
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH, PA.		CASE DC-TIC
		REV.

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

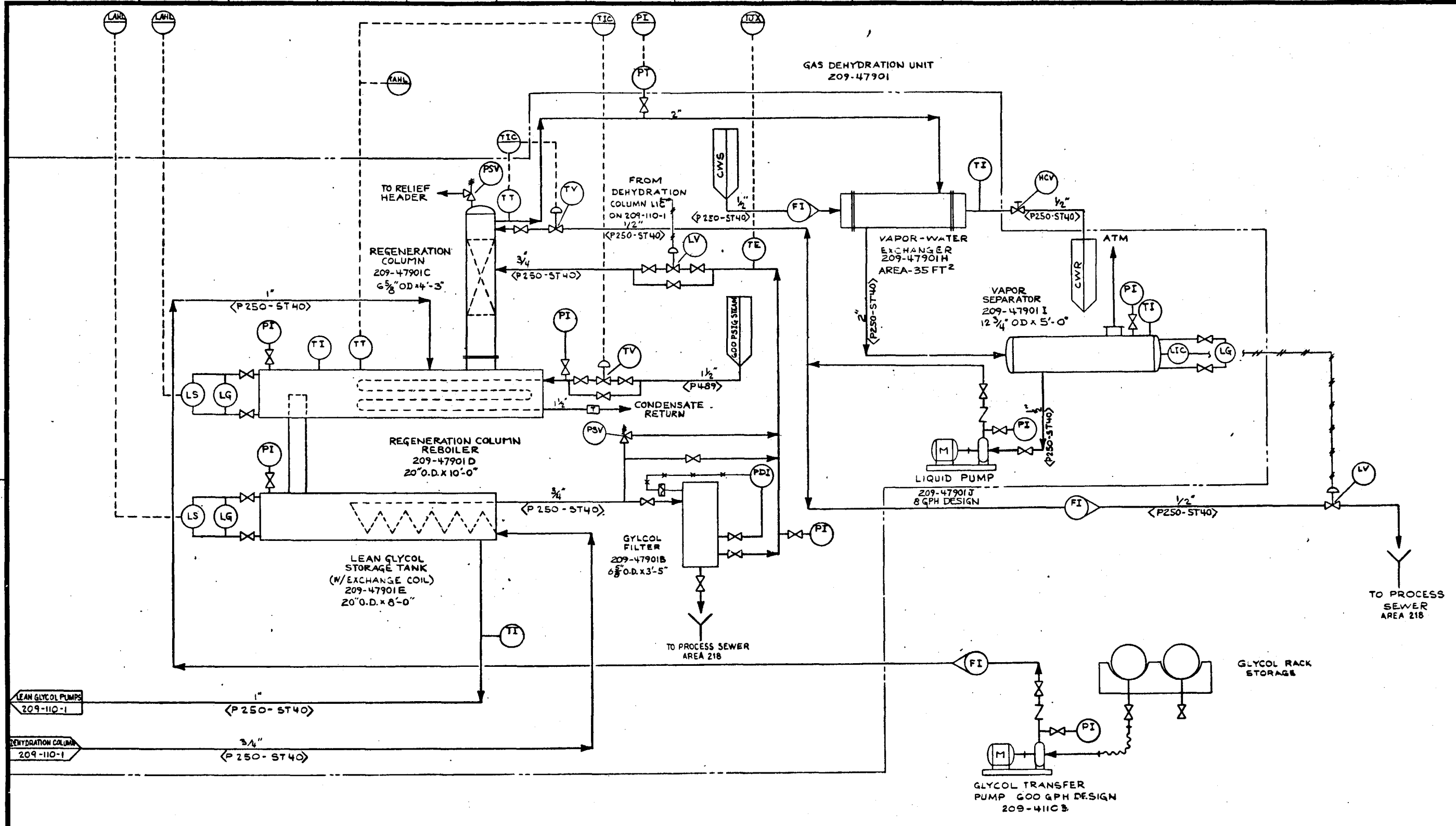
MATERIAL	STREAM No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489
----------	------------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10/1/12	MD	KM	JWH	1	10/1/12	MD	KM	JWH	1	10/1/12	MD	KM	JWH
2	10/1/12	MD	KM	JWH	2	10/1/12	MD	KM	JWH	2	10/1/12	MD	KM	JWH
3	10/1/12	MD	KM	JWH	3	10/1/12	MD	KM	JWH	3	10/1/12	MD	KM	JWH
4	10/1/12	MD	KM	JWH	4	10/1/12	MD	KM	JWH	4	10/1/12	MD	KM	JWH
5	10/1/12	MD	KM	JWH	5	10/1/12	MD	KM	JWH	5	10/1/12	MD	KM	JWH
6	10/1/12	MD	KM	JWH	6	10/1/12	MD	KM	JWH	6	10/1/12	MD	KM	JWH
7	10/1/12	MD	KM	JWH	7	10/1/12	MD	KM	JWH	7	10/1/12	MD	KM	JWH
8	10/1/12	MD	KM	JWH	8	10/1/12	MD	KM	JWH	8	10/1/12	MD	KM	JWH
9	10/1/12	MD	KM	JWH	9	10/1/12	MD	KM	JWH	9	10/1/12	MD	KM	JWH
10	10/1/12	MD	KM	JWH	10	10/1/12	MD	KM	JWH	10	10/1/12	MD	KM	JWH

DESIGNED	BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.
10/1/12	MD	10/1/12	ISSUED	P & I DIAGRAM AREA 209 GAS DEHYDRATION	7051
10/1/12	MD	10/1/12	FOR RECORD AND/OR	U.S. DoE ENERGY TECHNOLOGY	209-110-1
10/1/12	MD	10/1/12	FOR COMMENTS AND/OR	FOSSIL ENERGY PROGRAMS	
10/1/12	MD	10/1/12	APPROVAL	CONTRACT NO. EF-77 C-01-2012	
10/1/12	MD	10/1/12	FOR CUSTOMER APPROVAL	PREPARED FOR THE	
10/1/12	MD	10/1/12	AND/OR COMMENTS	ILLINOIS COAL GASIFICATION GROUP	
10/1/12	MD	10/1/12	APPROVAL FOR	DRAYO CORPORATION PITTSBURGH, PA.	
10/1/12	MD	10/1/12	CONSTRUCTION		

SCALE	DO NOT SCALE THIS DRAWING IT MAY BE REDUCED FROM ORIGINAL SIZE.
-------	--



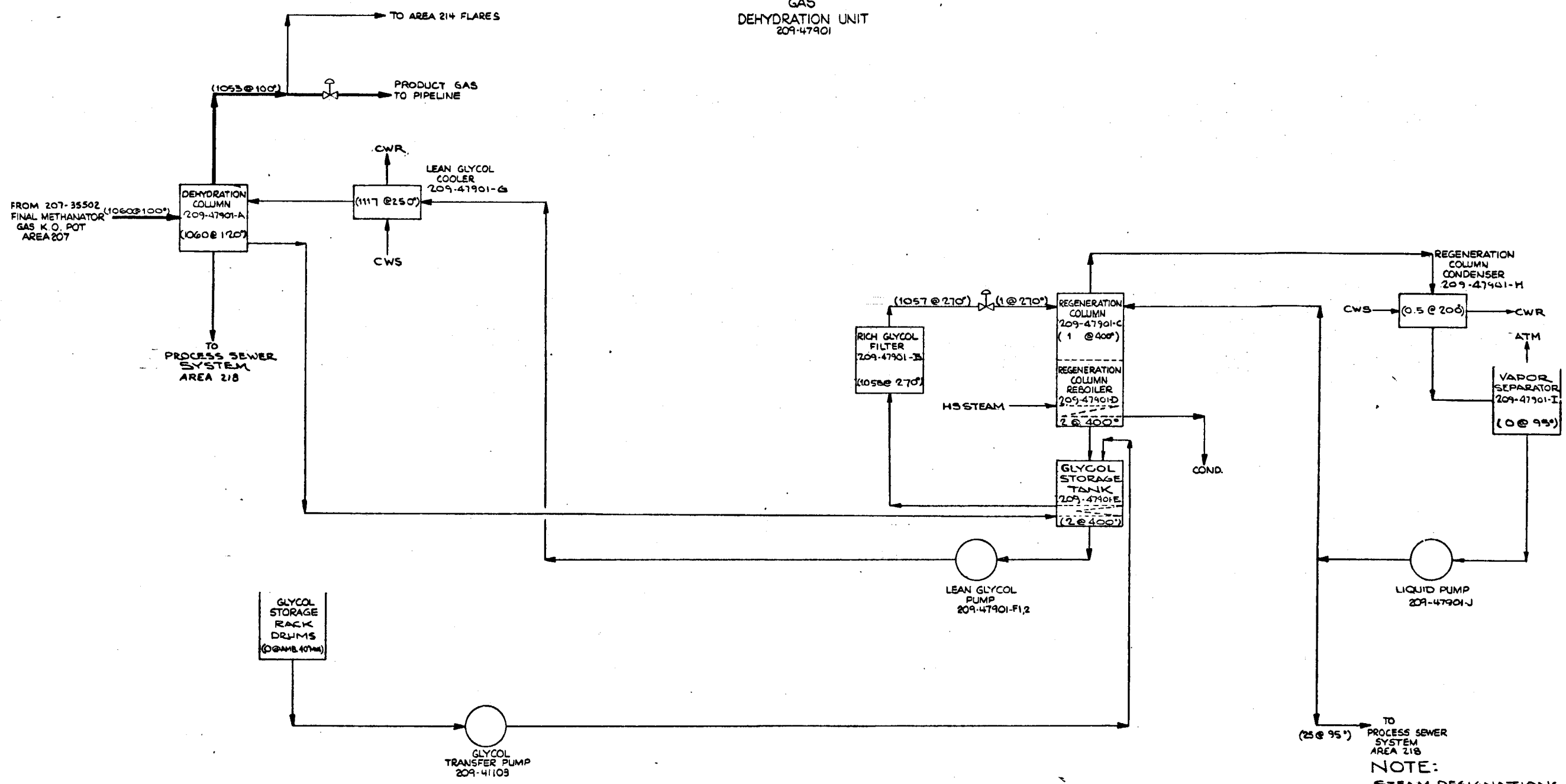
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.
1	11/14/81	MD	KM	JWH	1	11/14/81	MD	KM	JWH	1	11/14/81	MD	KM	JWH
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	DRAWING STATUS
T.H.S.	T.H.S.	11/14/81	ISSUED
DRAWN	J.W.H.	11/15/81	FOR COMMENTS AND/OR APPROVAL
CHECKED	J.W.H.	11/15/81	FOR CUSTOMER APPROVAL
DRAWN APPD	J.W.H.	11/15/81	AND/OR COMMENTS
ICGG APPD	J.W.H.	11/15/81	APPROVAL FOR CONSTRUCTION
APPD	J.W.H.	11/15/81	
SCALE			

TITLE	P/I DIAGRAM AREA 209 GAS DEHYDRATION TEG REGENERATION
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF 77-CG-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.

PROJECT NO	7051
DRAWING NO.	209-110-2
CASE	DC
REV.	

GAS DEHYDRATION UNIT
209-47901



NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	FOR DFPD	2-12-12	PIR	RBR	WJ												

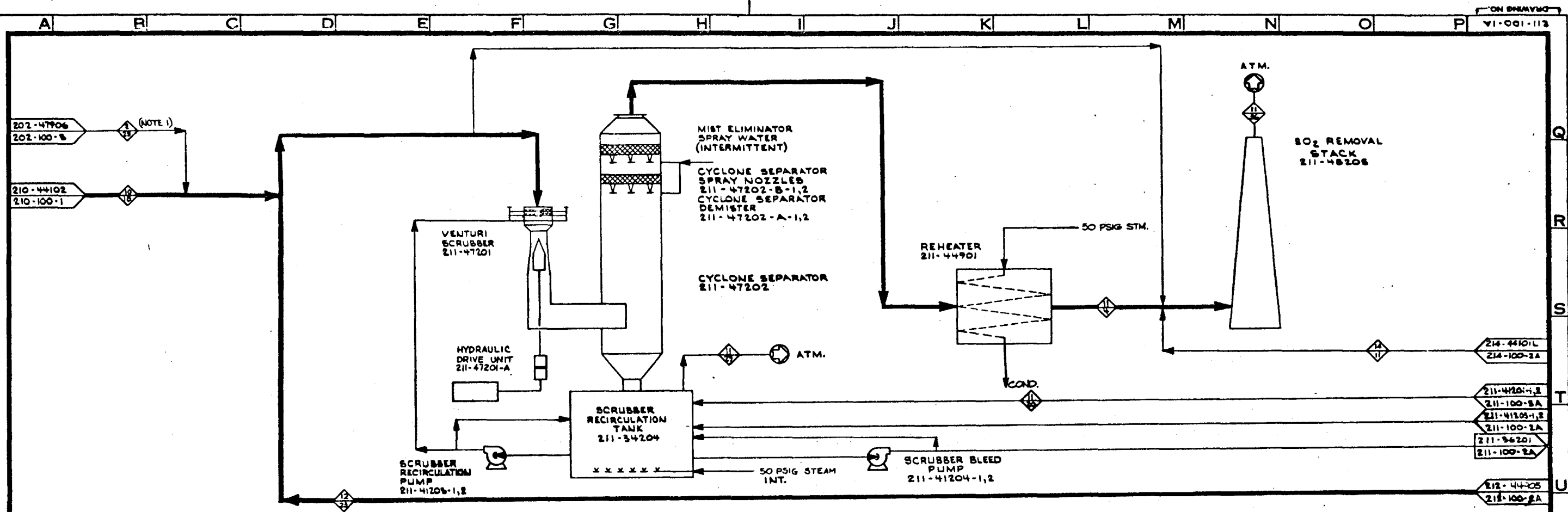
DESIGNED	BY	DATE	DRAWING STATUS	DATE
DRAWN	WJ	2-12-12	ISSUED	2-6-12
CHECKED	WJ	2-12-12	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D	WJ	2-12-12	FOR CUSTOMER APPROVAL	
ICGG APP'D	WJ	2-12-12	AND/OR COMMENTS	
APP'D	WJ	2-12-12	APPROVAL FOR CONSTRUCTION	
SCALE				

PROJECT NO. 7051	DRAWING NO. 209-650-001
CASE DC	REV.

ILLINOIS COAL GASIFICATION GROUP
PREPARED FOR THE
BY
PITTSBURGH, PA.

U.S. DOE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01 2012

AREA 209
GAS DEHYDRATION



MATERIAL	STREAM No.	10	11	12	13	14	15	16
ILLINOIS NO. 5 & 6 POUNDS/HOUR								
N ₂	43240	5000	4500			4000	5747	
O ₂	1212	100	1000			100	172	
CO ₂	15240	4000	1000			100	2100	
SO ₂	200	100	100			100	2	
HCL (NOTE 2)								
A ₂	7341					700	96	
OTHER								
H ₂ O VAPOR	15185	3073	3445			3076	424	
H ₂ O LIQUID								
PARTICULATE	16							
Fe(OH) ₃								
Na ₂ CO ₃						436		
NaHSO ₃								
Na ₂ SO ₃								
Na ₂ SO ₄								
CaSO ₃ · 1/2 H ₂ O								
NaCl								
TOTAL	50000	7473	7344	1404	131	7400	8749	
SPECIFIC GRAVITY								
AVE. MOLECULAR WEIGHT	30.0	33.24	29.24			44.04	29.24	
ACFM (GPM)	1357	5000	1300	2.1	29.24	15470	2009	
PRESSURE, IN. W.G.	15.0	15.0	15.0			15.0	15.0	
TEMPERATURE, °F	175	175	175			175	175	
ENTHALPY, MBTU/LB	5	5	5			5	5	

ILLINOIS NO. 5 & 6
ENERGY BALANCE SUMMARY
MM BTU/LR

73.740	STEAM HEATER (+)	8.788	82.954
0.081	HEAT OF REACTION (+)	0.897	0.002
			0.278
	NET ADDITION (+)	9.685	0.287
TOTAL ENERGY IN:			
73.821	NET ADDITION:	9.685	TOTAL ENERGY OUT:
			83.506

APPROVED FOR ENGINEERING
NOT APPROVED FOR CONSTRUCTION

NOTES:
1. THIS STREAM ON WESTERN COAL ONLY.
2. DESIGN HCL LEVELS WERE ADDED TO THE MATERIAL BALANCE IN THIS AREA BECAUSE THEY WERE NOT SHOWN IN PROCESS STREAMS AND FROM AREAS 202 AND 210.

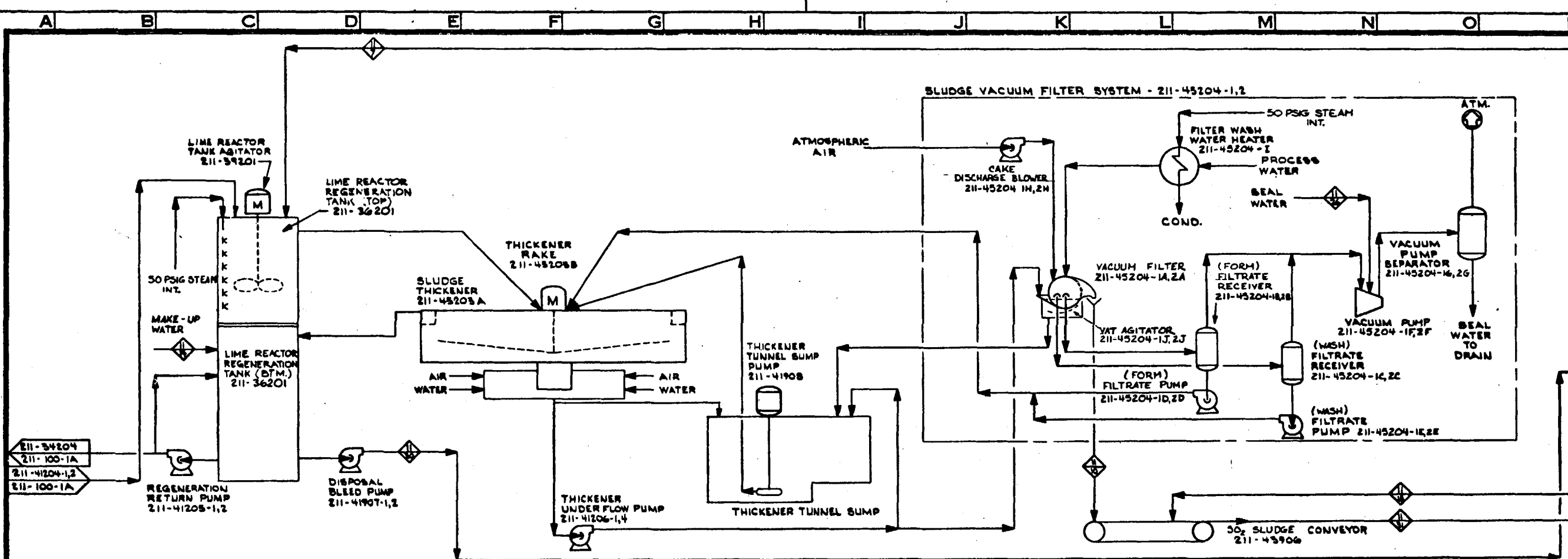
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DC-DEMONSTRATION CONCEPT	12-3-79	AKS	KM	JWN	1	PRELIMINARY ISSUE	12-3-79	AKS	KM	JWN
2	DEMONSTRATION CONCEPT - TIC	1-14-80	KJR	KM	JWN	2	FOR BASELINE	1-14-80	AKS	KM	JWN
						3	FOR RECORD AND DPPD	1-14-80	AKS	KM	JWN
						4	TASK VI RELEASE	1-14-80	AKS	KM	JWN

BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.
DESIGNED	AKS	12-3-79	ISSUED	DATE
DRAWN	KJR	1-14-80	TASK VI RELEASE	5-14-80
CHECKED	KM	1-14-80	FOR COMMENTS AND/OR	
DRWG APP'D	KM	1-14-80	APPROVAL	
ICSB APP'D	KM	1-14-80	FOR CUSTOMER APPROVAL	ICSB
DOE APP'D	KM	1-14-80	AND/OR COMMENTS	DOE
SCALE			APPROVAL FOR CONSTRUCTION	

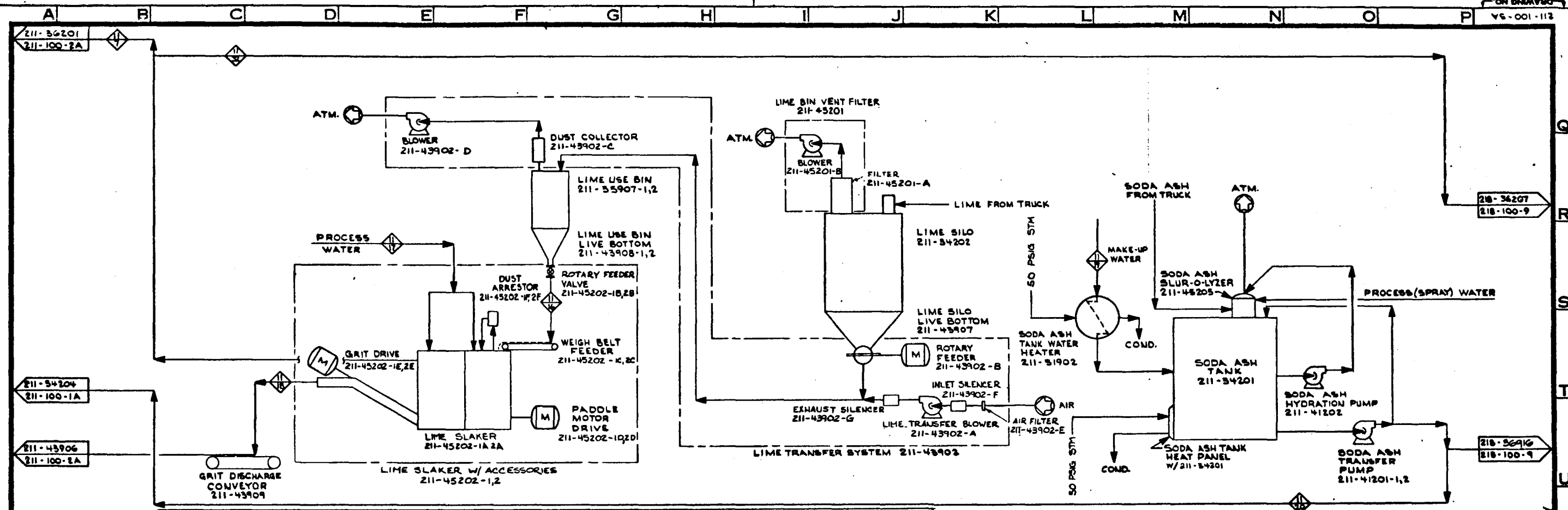
PROCESS FLOW DIAGRAM
AREA 211
SO₂ REMOVAL
SO₂ ABSORPTION
U.S. DOE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRACO CORPORATION PITTSBURGH, PA.

PROJECT NO.
7051
DRAWING NO.
211-100-1A
CASE
DC-TIC
REV.

ON DRAWING
V2-001-113
211-45204-1A,2A
211-100-5A



MATERIAL	STREAM No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
ILLINOIS NO. 5 & 6 POUNDS/HOUR																																	
PITTSBURGH NO. 6 POUNDS/HOUR																																	
WESTERN SUB-BITUMINOUS POUNDS/HOUR																																	
H ₂ O LIQUID	11002	3296	33560		4953	3296																											
PARTICULATE		13		159		172																											
CaO																																	
Ca(OH) ₂	2416																																
Na ₂ CO ₃																																	
NaHSO ₃																																	
Na ₂ SO ₃		115			144	115																											
Na ₂ SO ₄		56			86	56																											
CaSO ₃ · ½ H ₂ O		4211				4211																											
NaCl	1	52	2		74	52																											
OTHER	4	6	6		4	6																											
TOTAL	13423	7749	33568	159	5261	7908																											
SPECIFIC GRAVITY	1.18	1.30	1.0		1.04	1.30																											
SUSPENDED SOLIDS, WT. %	18.0	55.0			0.03	55.4																											
DISSOLVED SOLIDS, WT. %	0.04	4.54	0.05		6.01	6.50																											
CHLORIDE ION, PPM	55	8949	40		8283	8949																											
GFM	22.8		67.1		10.2																												
PRESSURE, PSIG																																	
TEMPERATURE, °F	130	125	60	60	118	125																											
ENTHALPY, MM BTU/HR	0.897	0.287	0.000	0.000	0.278	0.287																											



MATERIAL	STREAM No.	ILLINOIS NO. 1										PITTSBURGH NO. 3										WESTERN SUB-BITUMINOUS									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
POUNDS/HOUR																															
H ₂ O LIQUID	11002		11599		203	203	451	5970		1449		1221	1221	342	3732		3931		708	708	245										
PARTICULATE																															
C ₆ O		1529																													
C ₆ (OH) ₂	243																														
N ₂ CO ₂																															
N ₂ C ₂	1		1																												
OTHER	4		4																												
TOTAL		1455	1365	1594			215	1404	770	144		9454	183	221	1771	417	4554	375	5933	5	708	026	422								
SPECIFIC GRAVITY	1.5		0																												
SUSPENDED SOLIDS, WT%	15.2																														
DISSOLVED SOLIDS, WT%	2.24		0.05																												
CHLORIDE ION, PPM	35		40																												
GPM	101.5		232																												
PRESSURE, PSIG																															
TEMPERATURE, °F	143		10																												
ENTHALPY, MMBTU/HR	2.5		2.000																												

APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

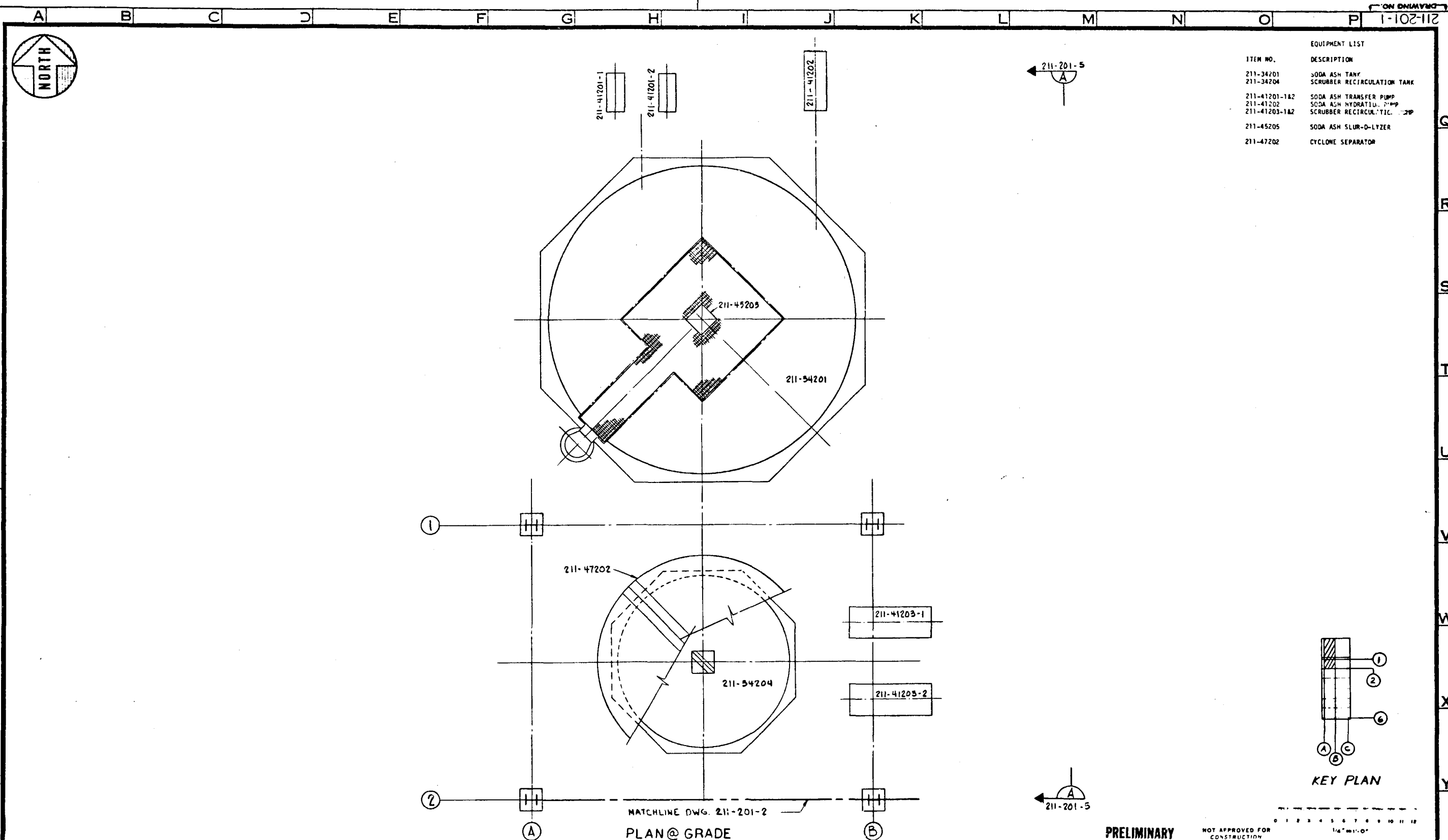
REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	12-11-79	AKS	KM	JWH	1	12-11-79	AKS	KM	JWH	1	12-11-79	AKS	KM	JWH	1	12-11-79	AKS	KM	JWH
2	12-11-79	AKS	KM	JWH	2	12-11-79	AKS	KM	JWH	2	12-11-79	AKS	KM	JWH	2	12-11-79	AKS	KM	JWH
3	12-11-79	AKS	KM	JWH	3	12-11-79	AKS	KM	JWH	3	12-11-79	AKS	KM	JWH	3	12-11-79	AKS	KM	JWH
4	12-11-79	AKS	KM	JWH	4	12-11-79	AKS	KM	JWH	4	12-11-79	AKS	KM	JWH	4	12-11-79	AKS	KM	JWH
5	12-11-79	AKS	KM	JWH	5	12-11-79	AKS	KM	JWH	5	12-11-79	AKS	KM	JWH	5	12-11-79	AKS	KM	JWH
6	12-11-79	AKS	KM	JWH	6	12-11-79	AKS	KM	JWH	6	12-11-79	AKS	KM	JWH	6	12-11-79	AKS	KM	JWH
7	12-11-79	AKS	KM	JWH	7	12-11-79	AKS	KM	JWH	7	12-11-79	AKS	KM	JWH	7	12-11-79	AKS	KM	JWH
8	12-11-79	AKS	KM	JWH	8	12-11-79	AKS	KM	JWH	8	12-11-79	AKS	KM	JWH	8	12-11-79	AKS	KM	JWH
9	12-11-79	AKS	KM	JWH	9	12-11-79	AKS	KM	JWH	9	12-11-79	AKS	KM	JWH	9	12-11-79	AKS	KM	JWH
10	12-11-79	AKS	KM	JWH	10	12-11-79	AKS	KM	JWH	10	12-11-79	AKS	KM	JWH	10	12-11-79	AKS	KM	JWH
11	12-11-79	AKS	KM	JWH	11	12-11-79	AKS	KM	JWH	11	12-11-79	AKS	KM	JWH	11	12-11-79	AKS	KM	JWH
12	12-11-79	AKS	KM	JWH	12	12-11-79	AKS	KM	JWH	12	12-11-79	AKS	KM	JWH	12	12-11-79	AKS	KM	JWH
13	12-11-79	AKS	KM	JWH	13	12-11-79	AKS	KM	JWH	13	12-11-79	AKS	KM	JWH	13	12-11-79	AKS	KM	JWH
14	12-11-79	AKS	KM	JWH	14	12-11-79	AKS	KM	JWH	14	12-11-79	AKS	KM	JWH	14	12-11-79	AKS	KM	JWH
15	12-11-79	AKS	KM	JWH	15	12-11-79	AKS	KM	JWH	15	12-11-79	AKS	KM	JWH	15	12-11-79	AKS	KM	JWH
16	12-11-79	AKS	KM	JWH	16	12-11-79	AKS	KM	JWH	16	12-11-79	AKS	KM	JWH	16	12-11-79	AKS	KM	JWH
17	12-11-79	AKS	KM	JWH	17	12-11-79	AKS	KM	JWH	17	12-11-79	AKS	KM	JWH	17	12-11-79	AKS	KM	JWH
18	12-11-79	AKS	KM	JWH	18	12-11-79	AKS	KM	JWH	18	12-11-79	AKS	KM	JWH	18	12-11-79	AKS	KM	JWH
19	12-11-79	AKS	KM	JWH	19	12-11-79	AKS	KM	JWH	19	12-11-79	AKS	KM	JWH	19	12-11-79	AKS	KM	JWH
20	12-11-79	AKS	KM	JWH	20	12-11-79	AKS	KM	JWH	20	12-11-79	AKS	KM	JWH	20	12-11-79	AKS	KM	JWH
21	12-11-79	AKS	KM	JWH	21	12-11-79	AKS	KM	JWH	21	12-11-79	AKS	KM	JWH	21	12-11-79	AKS	KM	JWH
22	12-11-79	AKS	KM	JWH	22	12-11-79	AKS	KM	JWH	22	12-11-79	AKS	KM	JWH	22	12-11-79	AKS	KM	JWH
23	12-11-79	AKS	KM	JWH	23	12-11-79	AKS	KM	JWH	23	12-11-79	AKS	KM	JWH	23	12-11-79	AKS	KM	JWH
24	12-11-79	AKS	KM	JWH	24	12-11-79	AKS	KM	JWH	24	12-11-79	AKS	KM	JWH	24	12-11-79	AKS	KM	JWH
25	12-11-79	AKS	KM	JWH	25	12-11-79	AKS	KM	JWH	25	12-11-79	AKS	KM	JWH	25	12-11-79	AKS	KM	JWH
26	12-11-79	AKS	KM	JWH	26	12-11-79	AKS	KM	JWH	26	12-11-79	AKS	KM	JWH	26	12-11-79	AKS	KM	JWH
27	12-11-79	AKS	KM	JWH	27	12-11-79	AKS	KM	JWH	27	12-11-79	AKS	KM	JWH	27	12-11-79	AKS	KM	JWH
28	12-11-79	AKS	KM	JWH	28	12-11-79	AKS	KM	JWH	28	12-11-79	AKS	KM	JWH	28	12-11-79	AKS	KM	JWH
29	12-11-79	AKS	KM	JWH	29	12-11-79	AKS	KM	JWH	29	12-11-79	AKS	KM	JWH	29	12-11-79	AKS	KM	JWH
30	12-11-79	AKS	KM	JWH	30	12-11-79	AKS	KM	JWH	30	12-11-79	AKS	KM	JWH	30	12-11-79	AKS	KM	JWH

DESIGNED	AKS	12-5-79	ISSUED	DATE
DRAWN	KJR	12-11-79	TASK VI RELEASE	5-14-80
CHECKED	KLM/KGT	1-30-80	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D	AKS	2-15-83	FOR CUSTOMER APPROVAL	ICGS
ICGS APP'D	AKS	2-15-83	AND/OR COMMENTS	DOE
DOE APP'D			APPROVAL FOR CONSTRUCTION	
SCALE	1/4" = 1'-0"			

TITLE	PROCESS FLOW DIAGRAM AREA 211 SO ₂ REMOVAL CHEMICAL STORAGE & MAKE-UP	PROJECT NO. 7051 DRAWING NO. 211-100-3
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE DC-TIC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.		REV. A

"D"

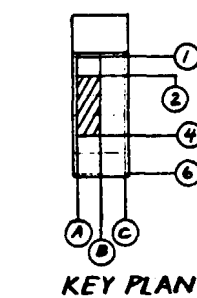
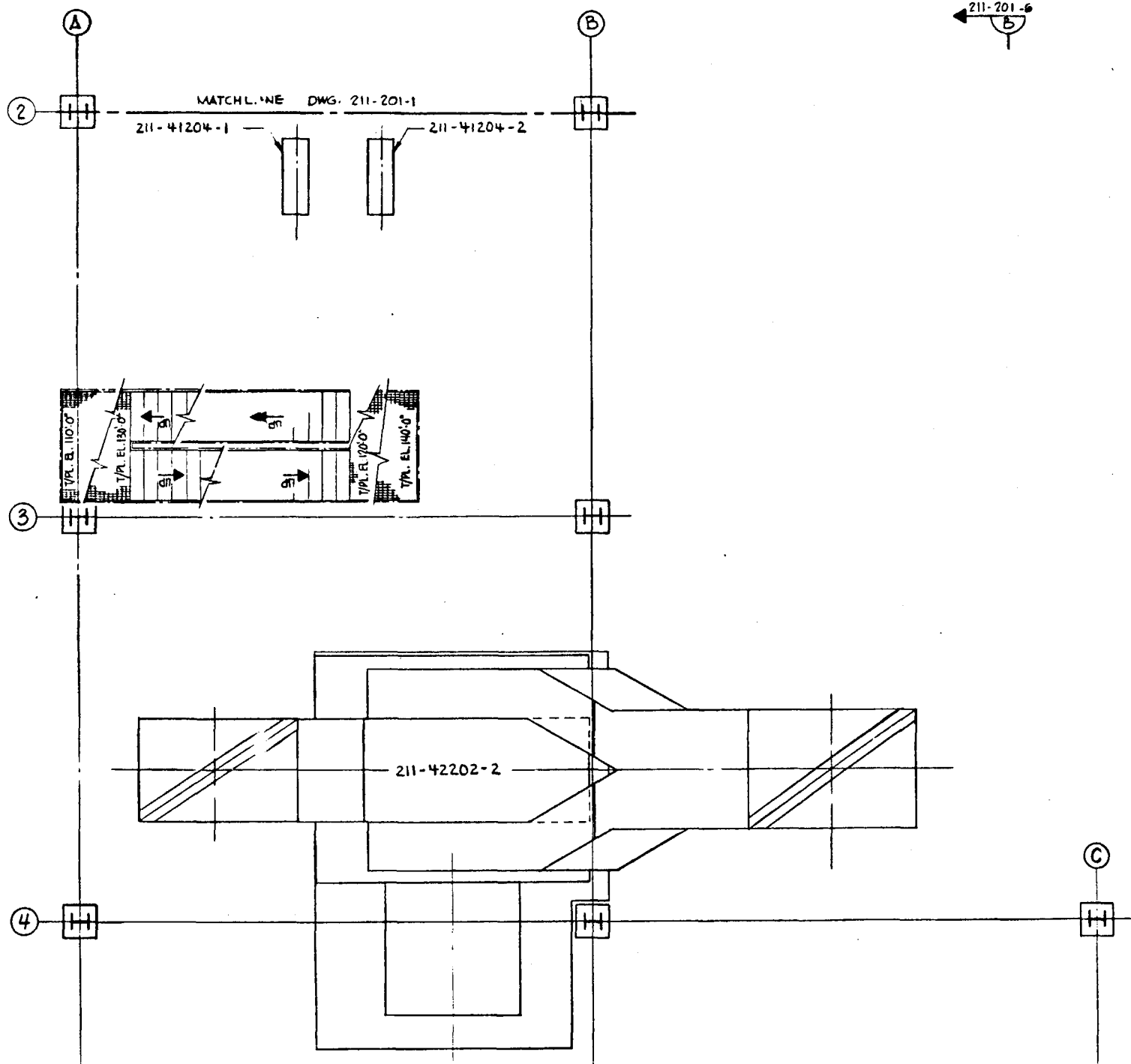
DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

[illegible]

A B C D E F G H I J K L M N O P 211-201-2



ITEM NO.	EQUIPMENT LIST
DESCRIPTION	
211-41204-1&2	SCRUBBER BLEED PUMP
211-42202-2	SCRUBBER BLOWER



211-201-7
MATCHLINE DWG. 211-201-3
PLAN @ GRADE
211-201-6
211-201-7

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

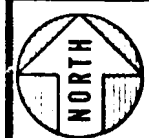
0 1 2 3 4 5 6 7 8 9 10 11 12
1/4"=1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	10-4-12	WURM														
2	ISSUED FOR DDPD REPORT	10-4-12	WURM														

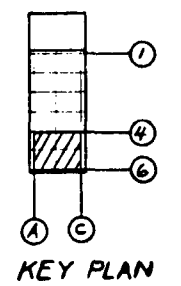
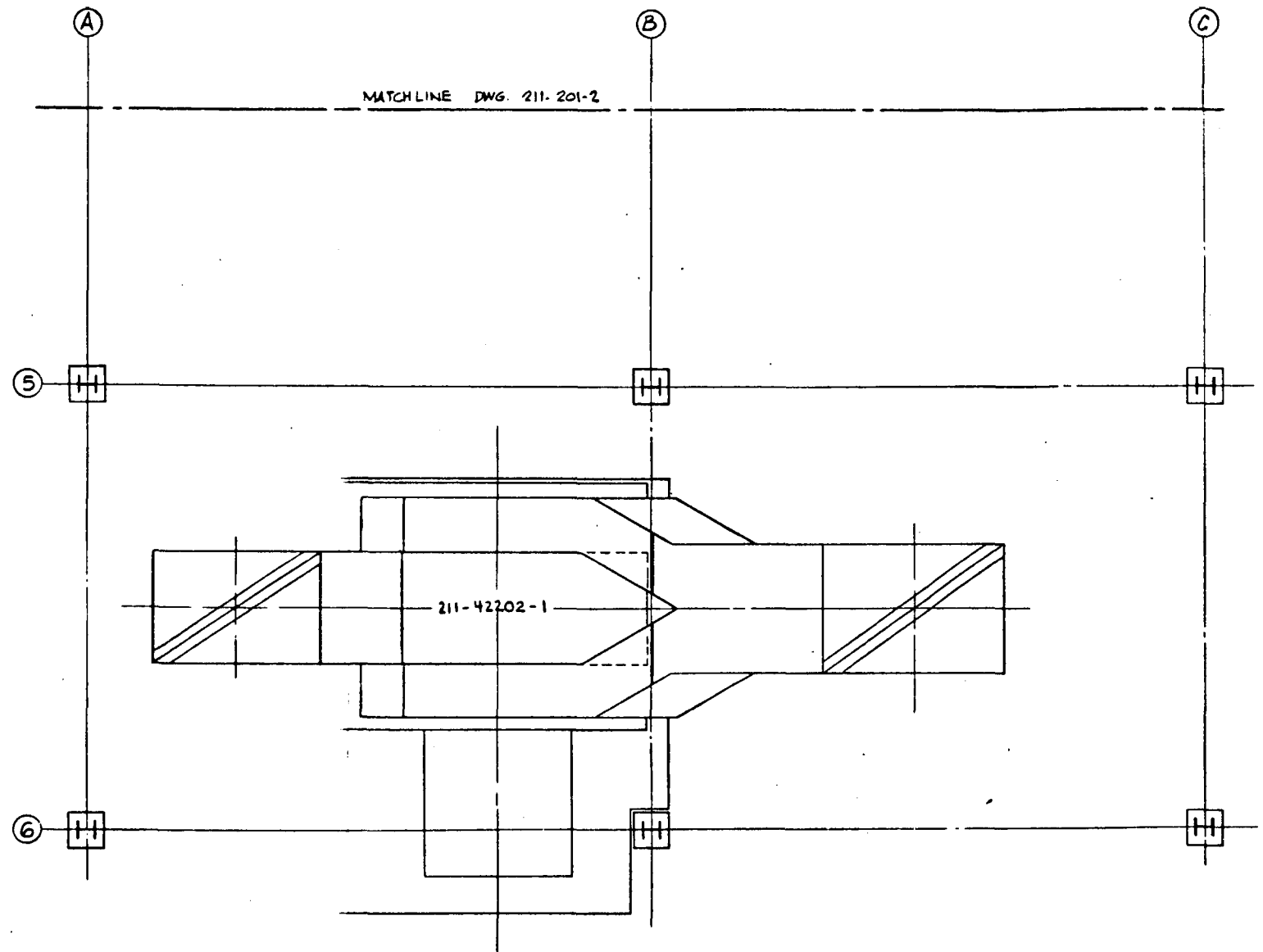
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	WURM 10-4-12	FOR DDPD REPORT 2-15-12
CHECKED		FOR COMMENTS AND/OR APPROVAL
DRAGO APPD		APPROVAL
ICGG APPD		FOR CUSTOMER APPROVAL
DCE APPD		AND/OR COMMENTS
		APPROVAL FOR CONSTRUCTION

TITLE
SO₂ REMOVAL LAYOUT PLAN
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01 2012
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH PA.

PROJECT NO
7051
DRAWING NO
211-201-2
CASE
REV **1**



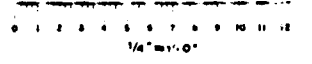
EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
211-42202-1	SCRUBBER BLOWER



PLAN @ GRADE

PRELIMINARY

NOT APPROVED FOR CONSTRUCTION



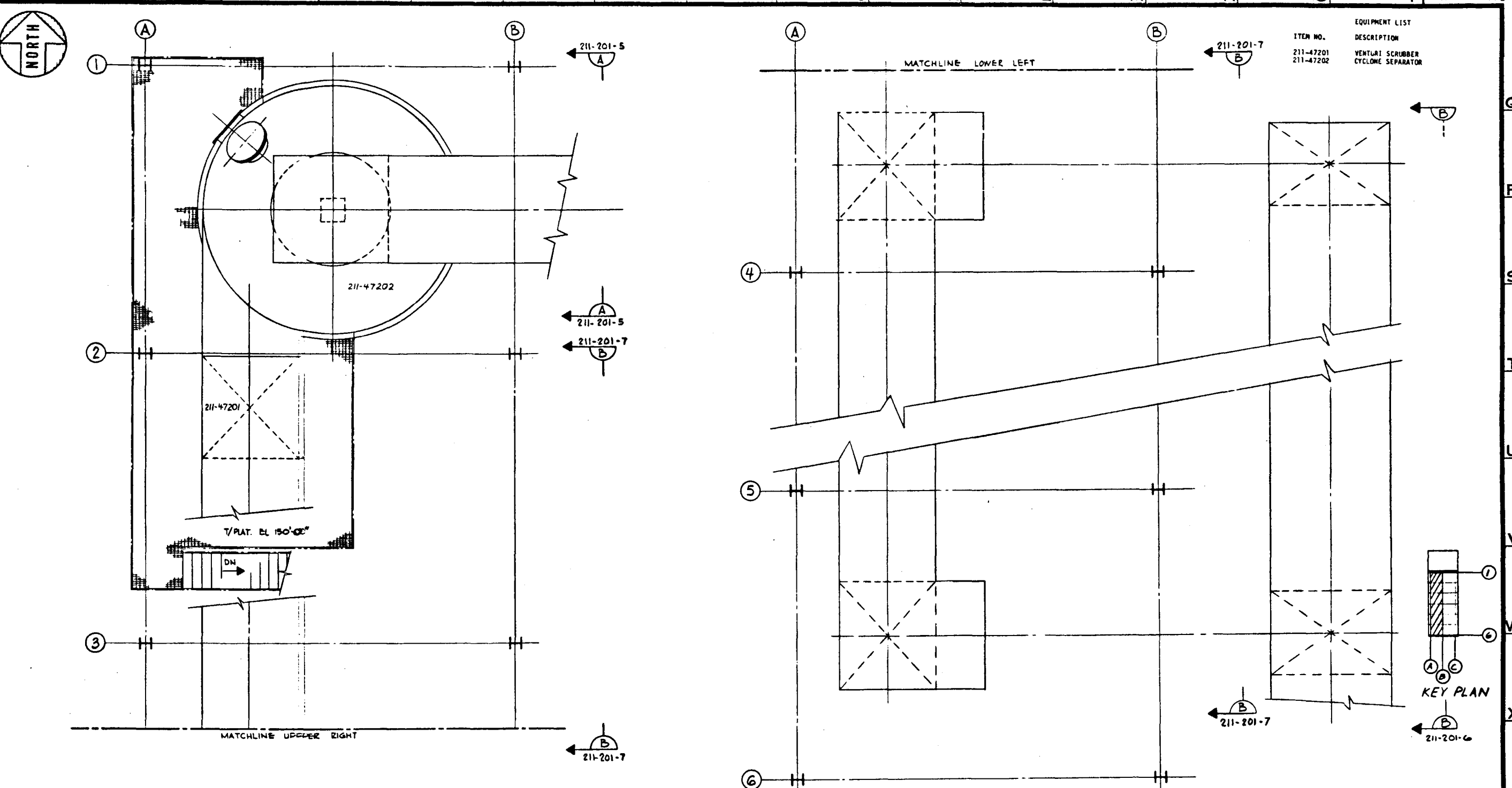
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASELINE	5/1/11				1						1					
2	ISSUED FOR DDP REPORT	7/21/11				2						2					

DESIGNED	BY	DATE	ISSUED	DATE
DRAWN	W. J. H. W.	5/1/11	FOR DDP REPORT 7-15/11	
CHECKED			FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D			FOR CUSTOMER APPROVAL	ICGG
ICGG APP'D			AND/OR COMMENTS	DUE
DCE APP'D			APPROVAL FOR CONSTRUCTION	
SCALE				

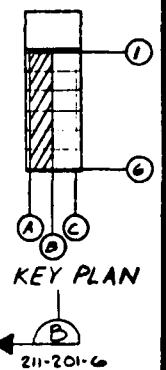
TITLE
SO₂ REMOVAL LAYOUT PLAN
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA

PROJECT NO 7051
DRAWING NO 211-201-3
CASE
REV

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

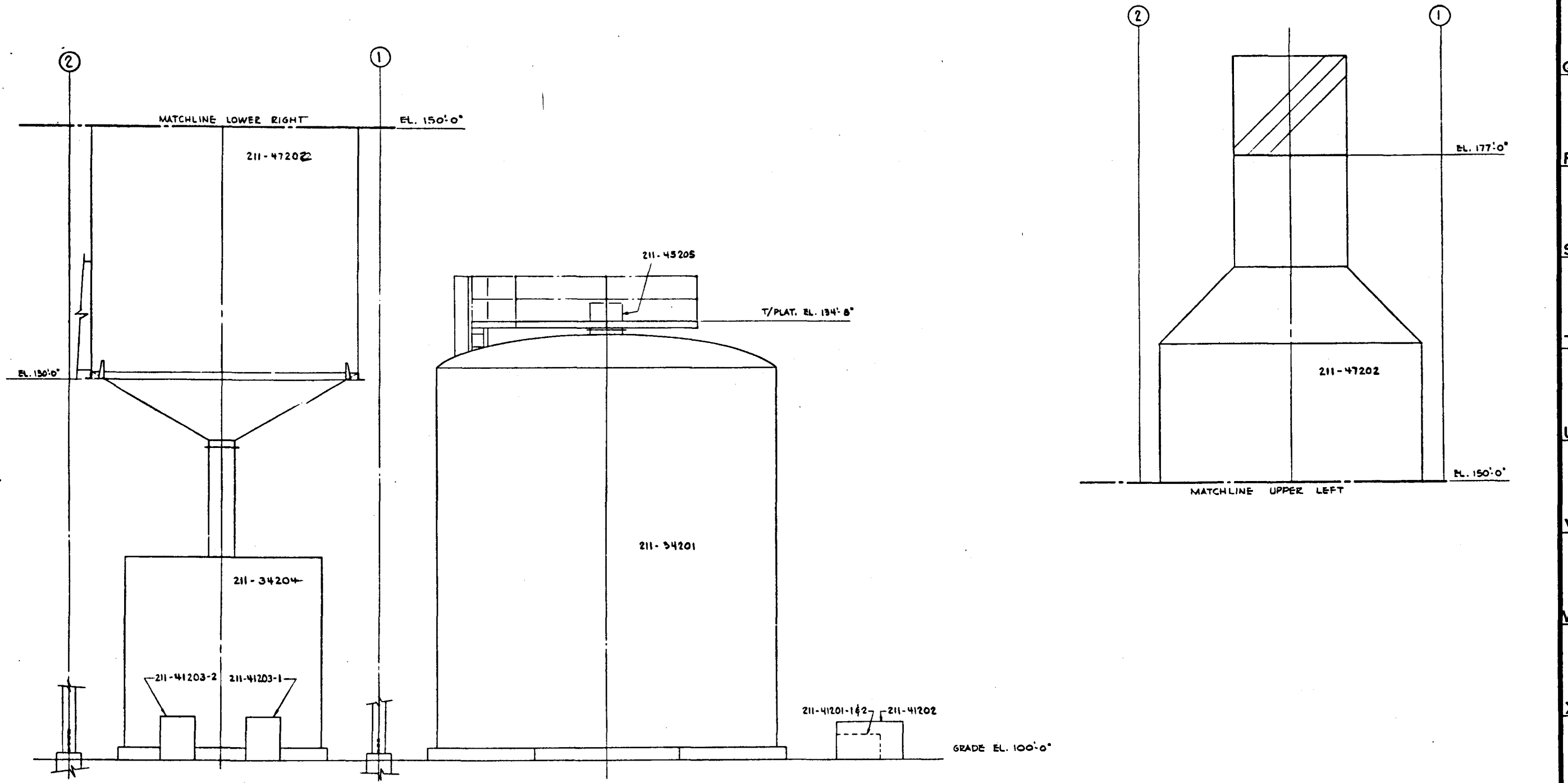


ITEM NO.	EQUIPMENT LIST
211-47201	DESCRIPTION
211-47202	VENTURI SCRUBBER
	CYCLONE SEPARATOR



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	ISSUED FOR INSELINE	JLM												
2	ISSUED FOR DMD REPORT	JLM												
						</								

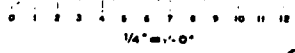
A B C D E F G H I J K L M N O P



SECTION **A**
211-201-1

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR PERMITS	...	...	...										
2	ISSUED FOR DFPD REPORT	...	...	...										

		BY	DATE	DRAWING STATUS	
DESIGNED				ISSUED	DATE
DRAWN	...	...	...	FOR DFPD REPORT	2-15-12
CHECKED				FOR COMMENTS AND/OR	
DRAWN APP'D				APPROVAL	
ICGG APP'D				FOR CUSTOMER APPROVAL	ICGG
DOE APP'D				AND/OR COMMENTS	DOE
SCALE				APPROVAL FOR	
				CONSTRUCTION	

**SO₂ REMOVAL
LAYOUT
SECTIONS**

U.S. DoE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012

PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRACO CORPORATION PITTSBURGH, PA.

PROJECT NO.
7051

DRAWING NO.
211-201-5

CASE
DC

REV

A B C D E F G H I J K L M N O P

Q
R
S
T
U
V
W
X
Y
Z

MATCHLINE DWG. 211-201-7

EL. 150'-0"

EL. 130'-0"

211-47201

T/PLAT. EL. 140'-0"

T/PLAT. EL. 130'-0"

T/PLAT. EL. 120'-0"

T/PLAT. EL. 110'-0"

211-42202-1

211-42202-2

211-41204-2

GRADE EL. 100'-0"

⑥

⑤

④

③

②

SECTION B
211-201-2, 3, 4

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

0 1 2 3 4 5 6 7 8 9 10 11 12
1/4" = 1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASELINE	1/21/12	CM														
2	ISSUED FOR DRPD REPORT	2/3/12	CM														

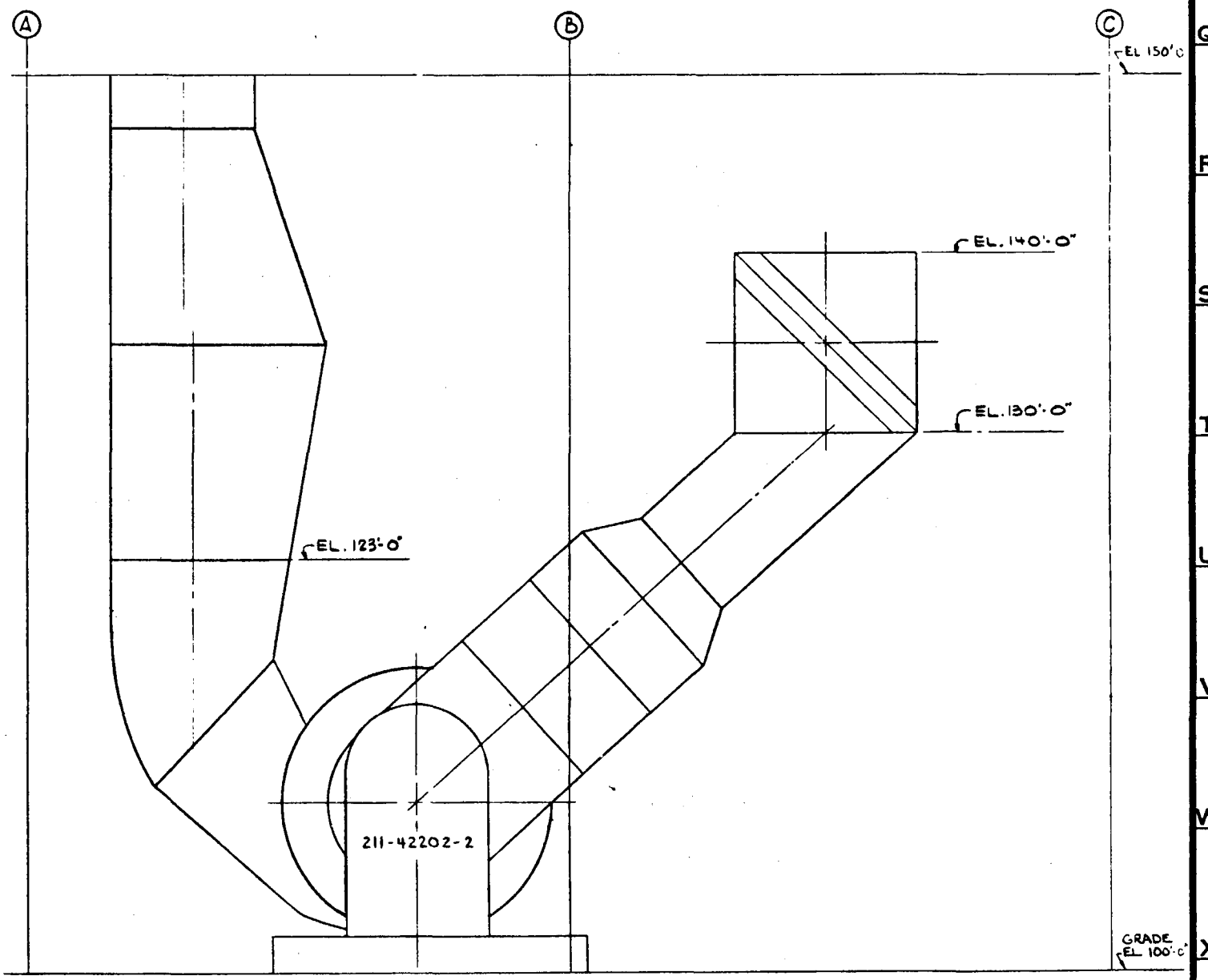
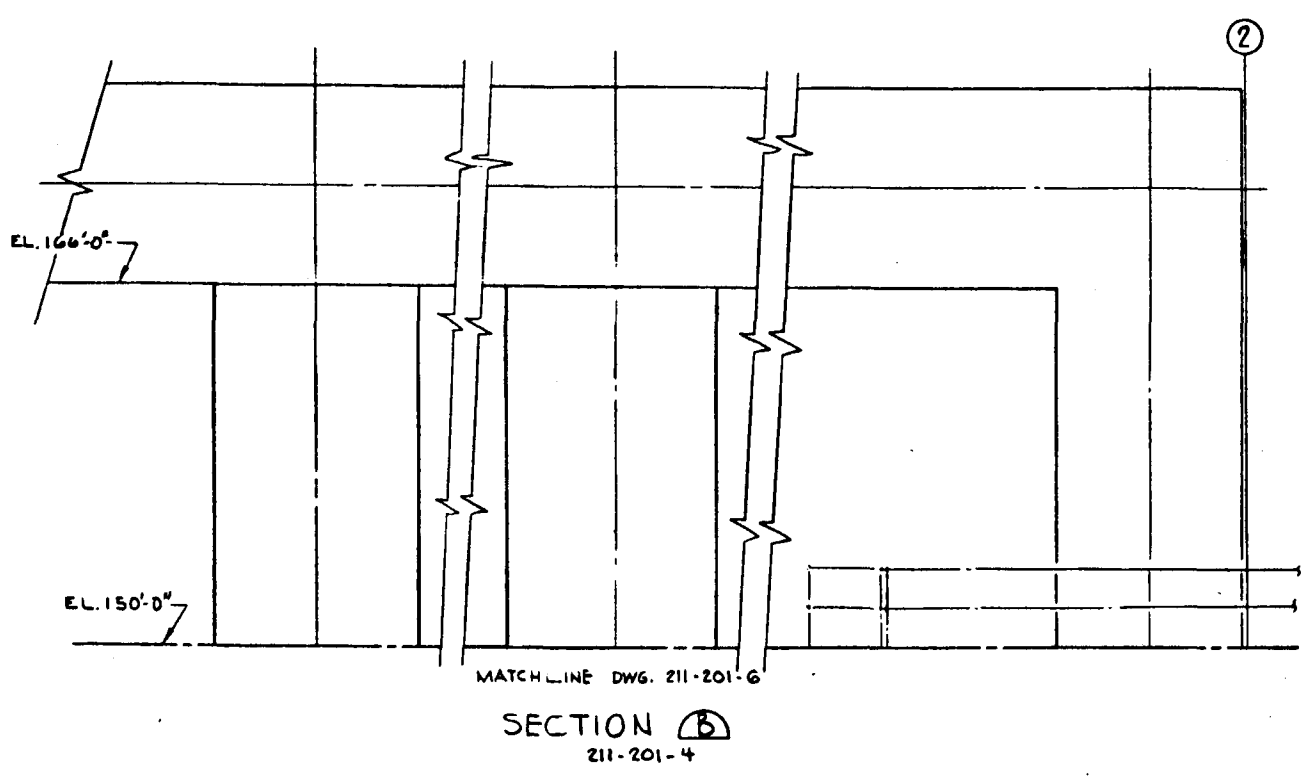
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	W. J. J.	FOR DRPD REPORT 2/3/12
CHECKED		FOR COMMENTS AND/OR APPROVAL
DRAGO APP'D		FOR CUSTOMER APPROVAL
ICGG APP'D		AND/OR COMMENTS
DATE APP'D		APPROVAL FOR CONSTRUCTION
SCALE		

TITLE	SO ₂ REMOVAL LAYOUT SECTIONS	PROJECT NO	7051
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO	211-201-6
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.		CASE	211-201-6
		REV.	6

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.

A B C D E F G H I J K L M N O P



Q
R
S
T
U
V
W
X
Y
Z

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

1/8" = 1'-0"

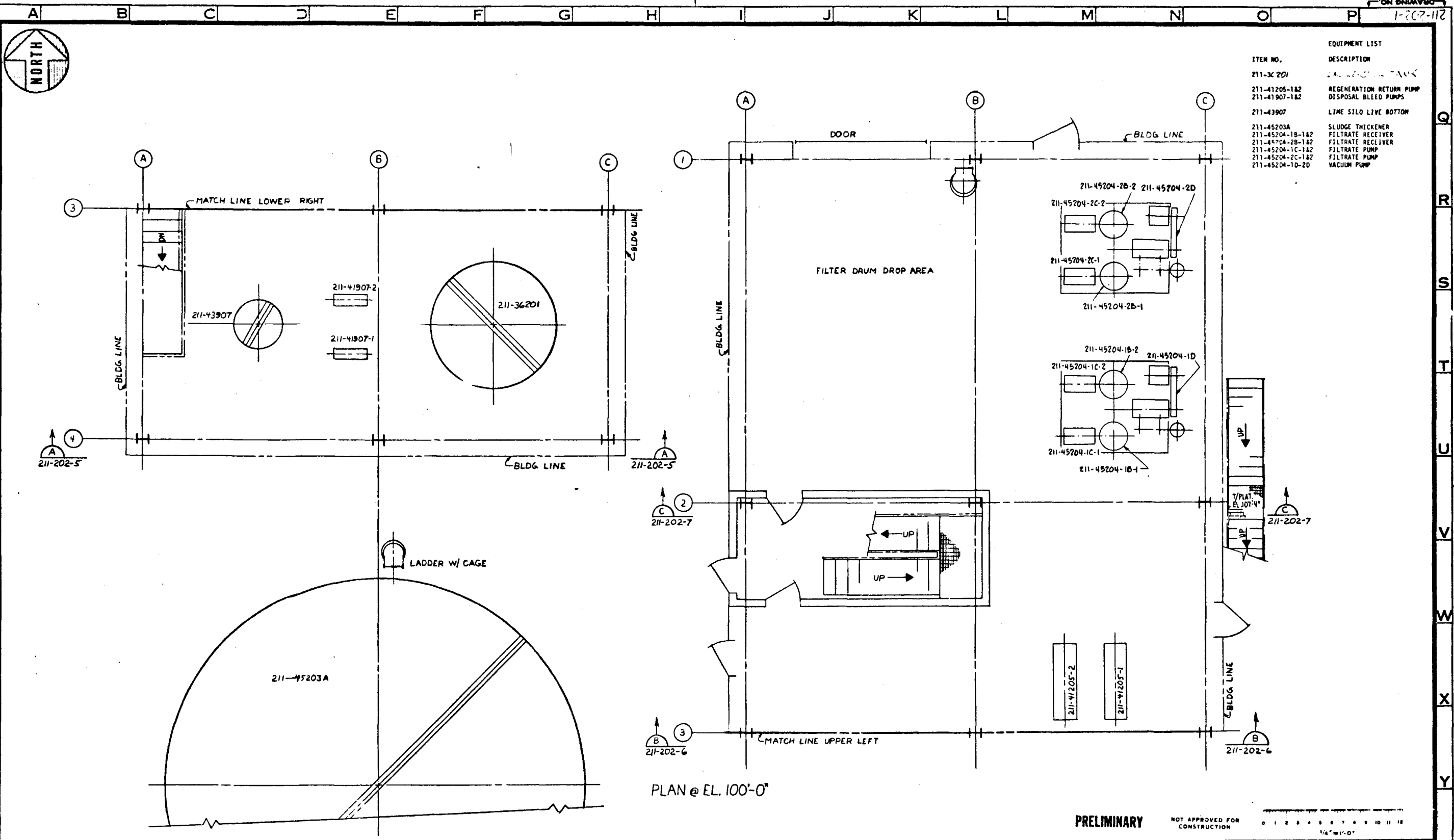
NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.
1	ISSUED FOR BASELINE	08/14/11																
2	ISSUED FOR DDPD REPORT	08/14/11																

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
DRAWN	WJRM	08/14/11	FOR DDPD REPORT	08/14/11	
CHECKED			FOR COMMENTS AND/OR APPROVAL		
DPALC APP'D			FOR CUSTOMER APPROVAL	ICGG	
ICGG APP'D			AND/OR COMMENTS	DPF	
DUL APP'D			APPROVAL FOR CONSTRUCTION		
SCALE					

TITLE SO₂ REMOVAL LAYOUT SECTIONS		PROJECT NO. 7051
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 211-201-7
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA		CASE PC
		REV A

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

"D"

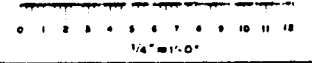


ITEM NO.	EQUIPMENT LIST
211-36201	211-36201
211-41205-1&2	REGENERATION RETURN PUMP
211-41907-1&2	DISPOSAL BLEED PUMPS
211-43907	LIME SILO LIVE BOTTOM
211-45203A	SLUDGE THICKENER
211-45204-1B-1&2	FILTRATE RECEIVER
211-45204-2B-1&2	FILTRATE RECEIVER
211-45204-1C-1&2	FILTRATE PUMP
211-45204-2C-1&2	FILTRATE PUMP
211-45204-1D-2D	VACUUM PUMP

PLAN @ EL. 100'-0"

PRELIMINARY

NOT APPROVED FOR CONSTRUCTION

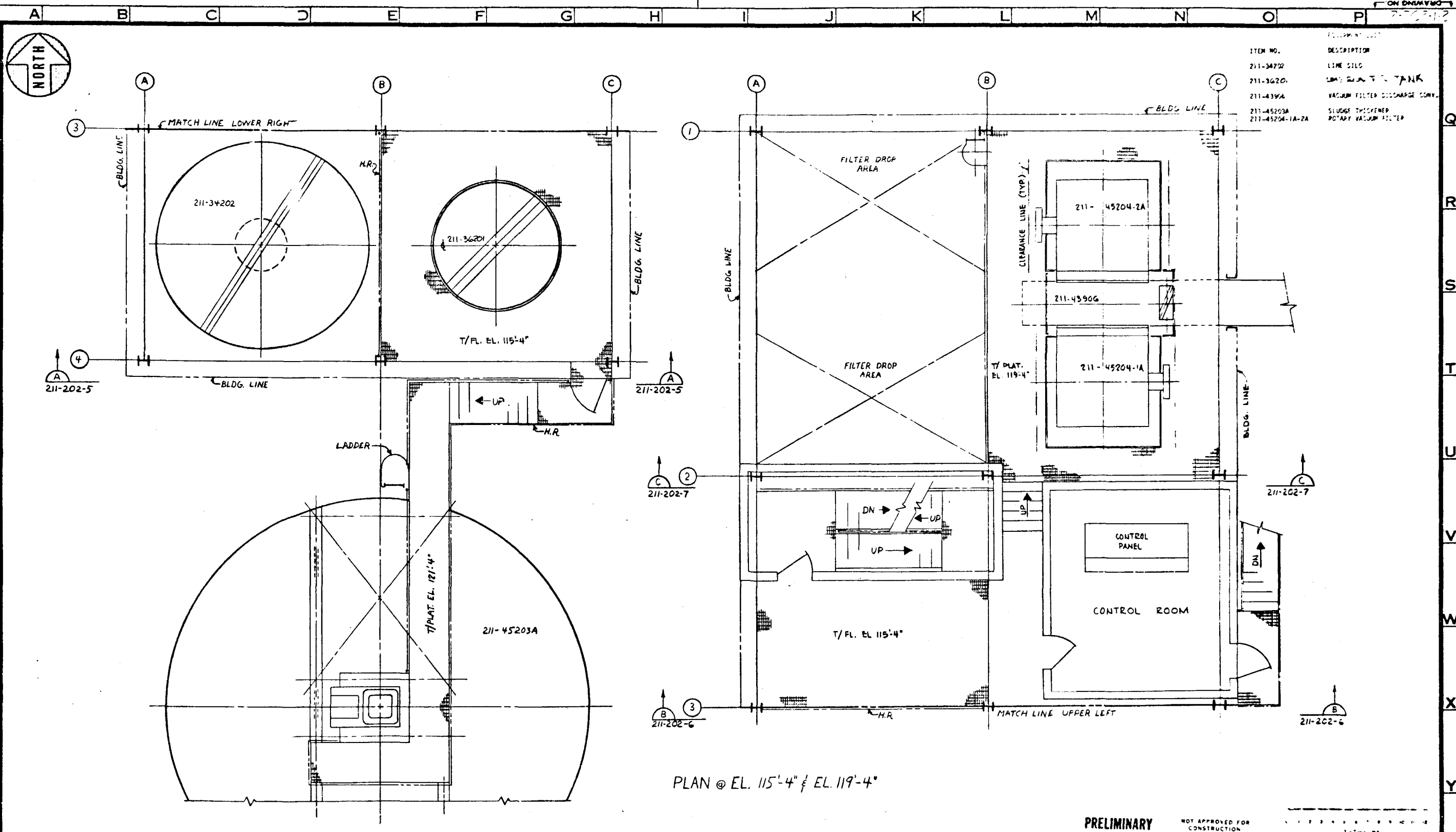


NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.
1	ISSUED FOR DESIGN	7/13/83																
2	ISSUED FOR P&ID	7/13/83																
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN		FOR D&P REPORT
CHECKED		FOR COMMENTS AND/OR APPROVAL
DRGVC APPD		FOR CUSTOMER APPROVAL
ICGG APPD		AND/OR COMMENTS
ONE APPD		APPROVAL FOR CONSTRUCTION
SCALE		

TITLE SO₂ REMOVAL LAYOUT PLAN		PROJECT NO. 7051
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 211-202-1
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH PA.		CASE DC
		REV

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



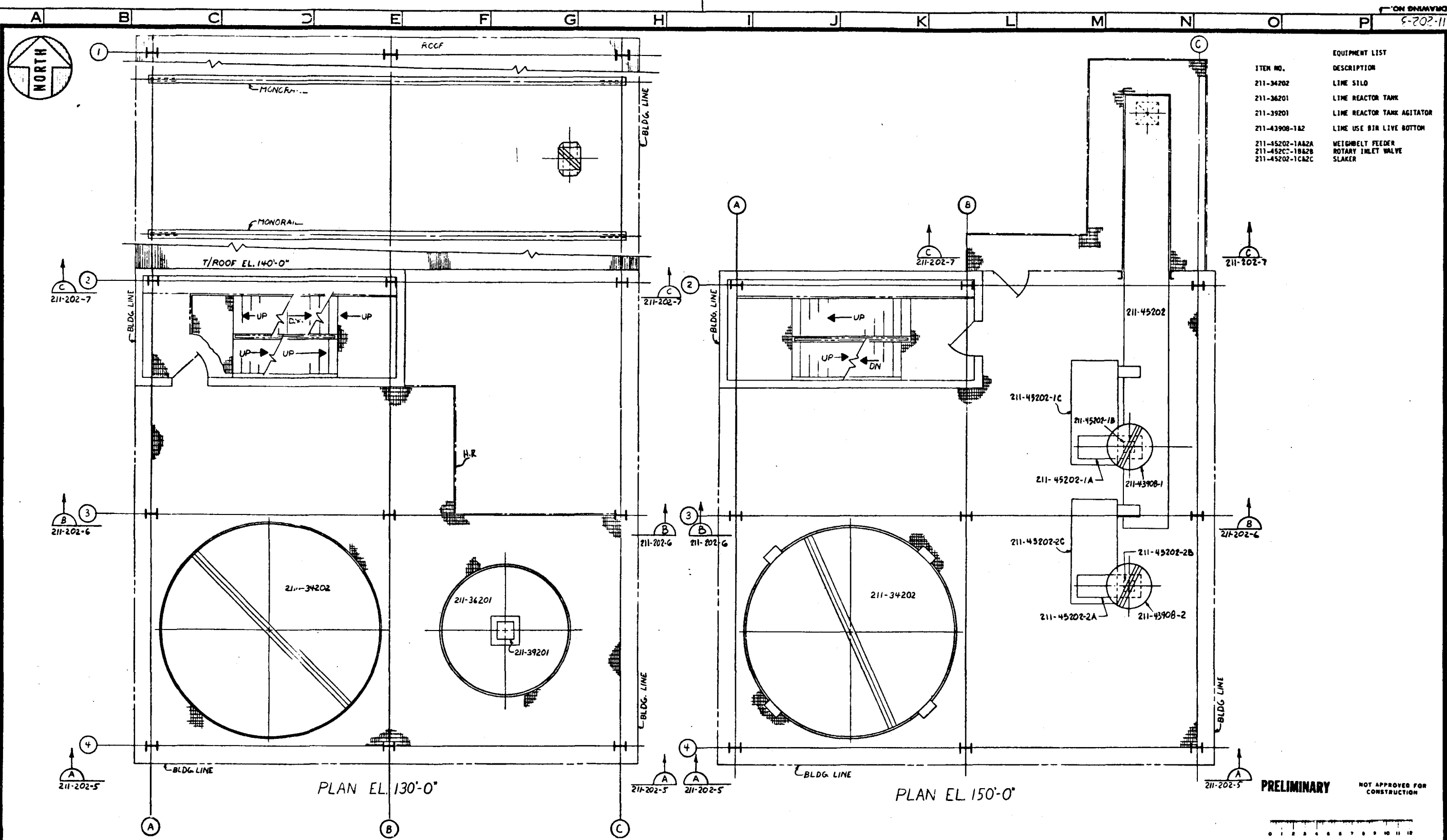
ITEM NO.	DESCRIPTION
211-34202	LINE SILE
211-36201	LINE SILE
211-43906	VACUUM FILTER DISCHARGE CONV.
211-45203A	SLUDGE THICKENER
211-45204-1A-2A	ROTARY VACUUM FILTER

REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	12-1-82	W. J. L.												
2	12-1-82	W. J. L.												
3														
4														
5														
6														
7														
8														
9														
10														

DESIGNED	BY	DATE	ISSUED	DATE
W. J. L.	W. J. L.	12-1-82	W. J. L.	12-1-82
CHECKED			FOR COMMENTS AND/OR	
DRAWN			APPROVAL	
ICGG APP'D			FOR CUSTOMER APPROVAL	ICGG
DATE APP'D			AND/OR COMMENTS	DATE
DATE			APPROVAL FOR	
			CONSTRUCTION	

TITLE	SO. REMEDIAL LAYOUT PLAN	PROJECT NO	7051
U.S. DOE	ENERGY TECHNOLOGY	DRAWING NO	7051-2
FOSSIL ENERGY PROGRAMS		CASE	
CONTRACT NO. E-77-C-01-2012		REV	
PREPARED FOR THE			
ILLINOIS COAL GASIFICATION GROUP			
DRACO CORPORATION, PITTSBURGH, PA			

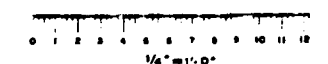
DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



EQUIPMENT LIST

ITEM NO.	DESCRIPTION
211-34202	LINE SILO
211-36201	LINE REACTOR TANK
211-39201	LINE REACTOR TANK AGITATOR
211-43908-1&2	LINE USE BIR LIVE BOTTOM
211-45202-1A&2A	WEIGHBELT FEEDER
211-45202-1B&2B	ROTARY INLET VALVE
211-45202-1C&2C	SLAKER

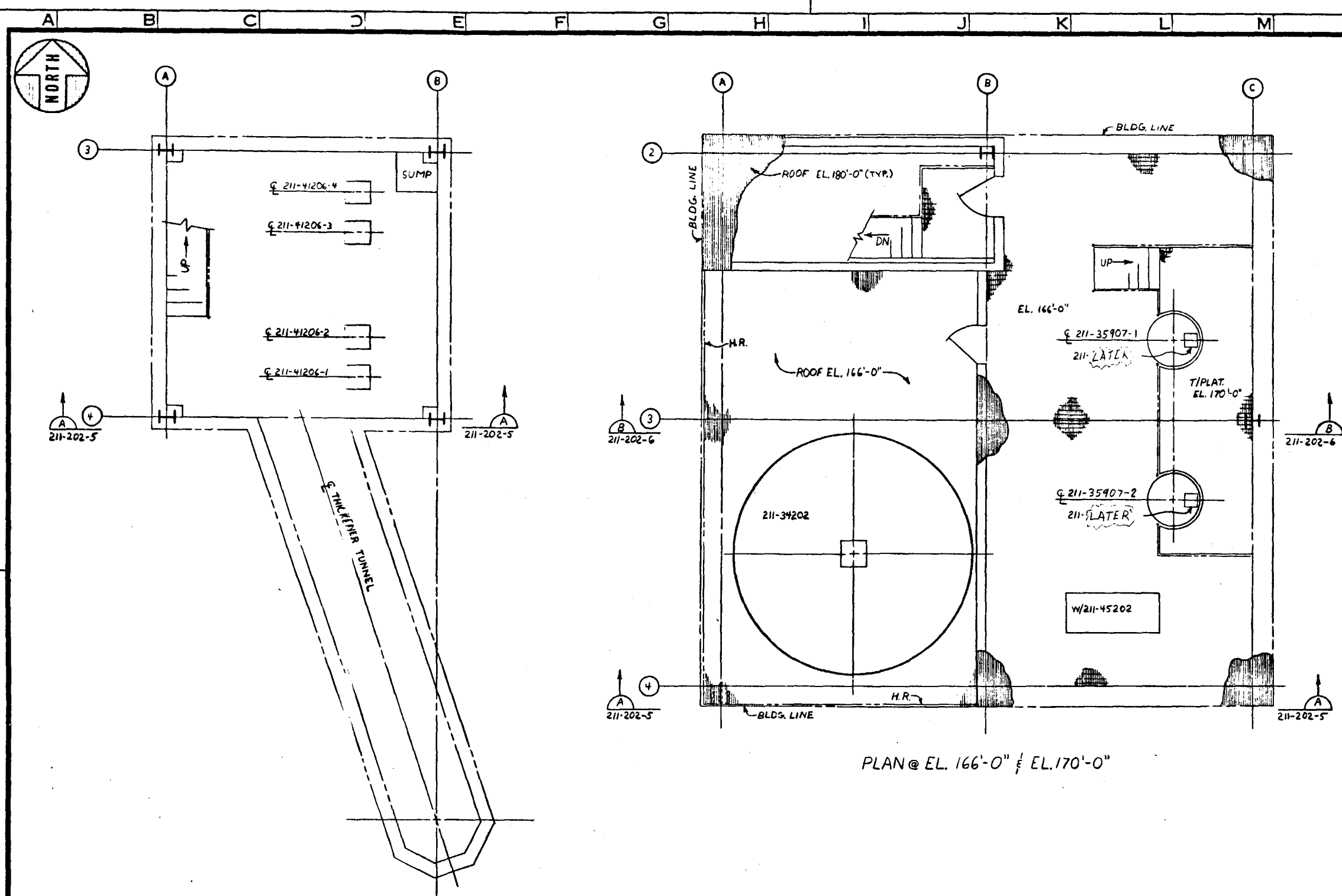
PRELIMINARY NOT APPROVED FOR CONSTRUCTION



REVISIONS					REVISIONS					REVISIONS					BY		DATE		DRAWING STATUS		TITLE		PROJECT NO.		
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	DESIGNED	ISSUED	DATE	SO ₂ REMOVAL LAYOUT PLAN	7051			
1	ISSUED FOR BASELINE	12/1/12																DRAWN	12/1/12	12/1/12					
2	ISSUED FOR DRPD REPORT	12/1/12																	FOR DRPD REPORT	12/1/12					
																		CHECKED	FOR COMMENTS AND/OR APPROVAL						
																		DRAGO APPD							
																		ICGG APPD	FOR CUSTOMER APPROVAL	ICGG					
																		DDE APPD	AND/OR COMMENTS	DDE					
																			APPROVAL FOR CONSTRUCTION						
																		SCALE							
																						U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		211-202-3	
																						PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.		CASE 20	
																						REV.		△	

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

ITEM NO.	EQUIPMENT LIST
211-34202	DESCRIPTION
211-35907-1&2	LINE SILD
211-45202	LINE USE BIN
211-41206-1-2-3-4	DUST COLLECTOR BLOWER
	THICKENER UNDERFLOW PUMPS



PLAN @ EL. 90'-0"

PLAN @ EL. 166'-0" / EL. 170'-0"

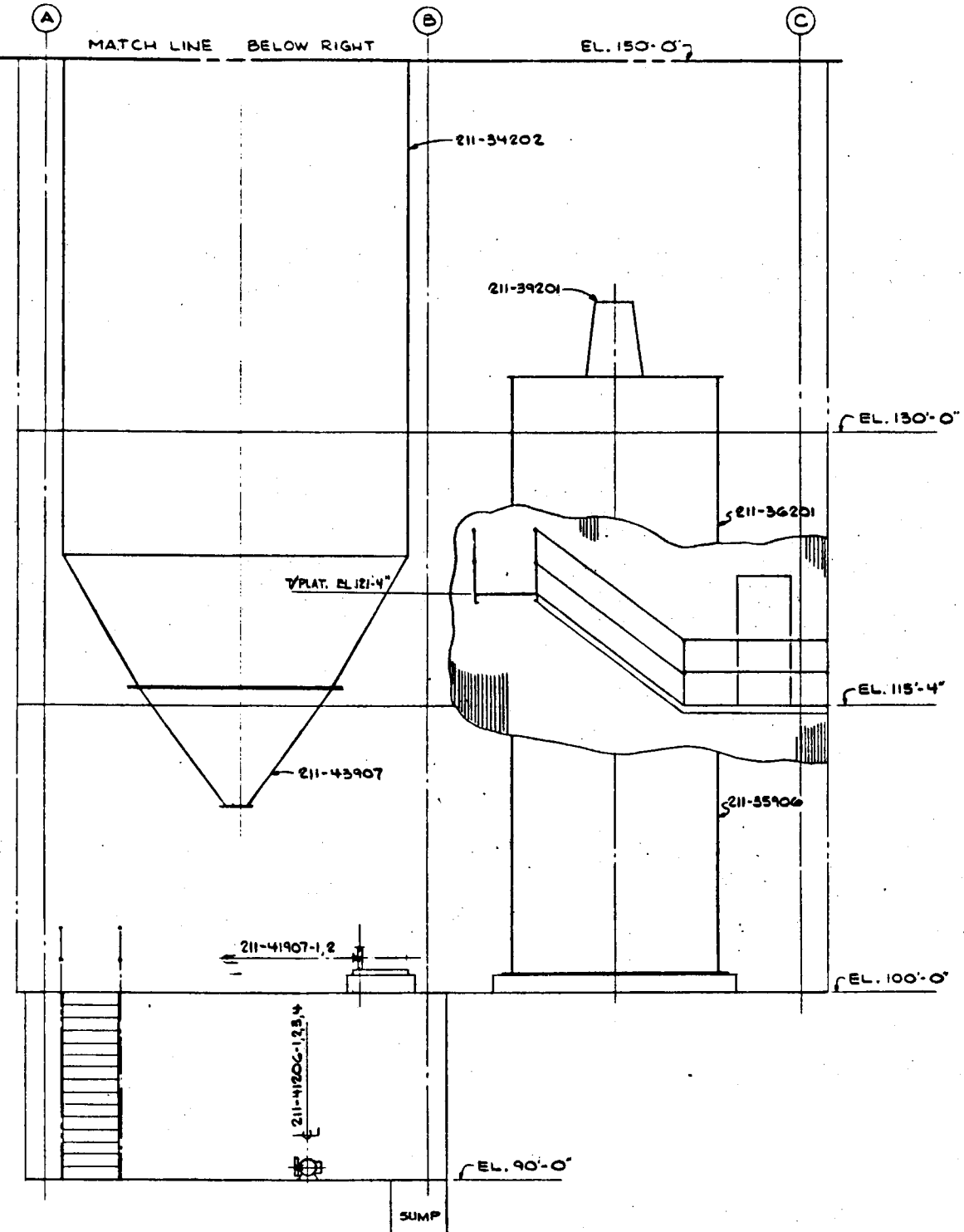
PRELIMINARY NOT APPROVED FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	11-11-11	...	...	...	1	ISSUED FOR BASELINE	11-11-11	...	...	...	1	ISSUED FOR BASELINE	11-11-11	...	...	...
2	ISSUED FOR DDPD REPORT	11-11-11	...	...	...	2	ISSUED FOR DDPD REPORT	11-11-11	...	...	...	2	ISSUED FOR DDPD REPORT	11-11-11	...	...	...
3						3						3					
4						4						4					
5						5						5					
6						6						6					
7						7						7					
8						8						8					
9						9						9					
10						10						10					
11						11						11					
12						12						12					

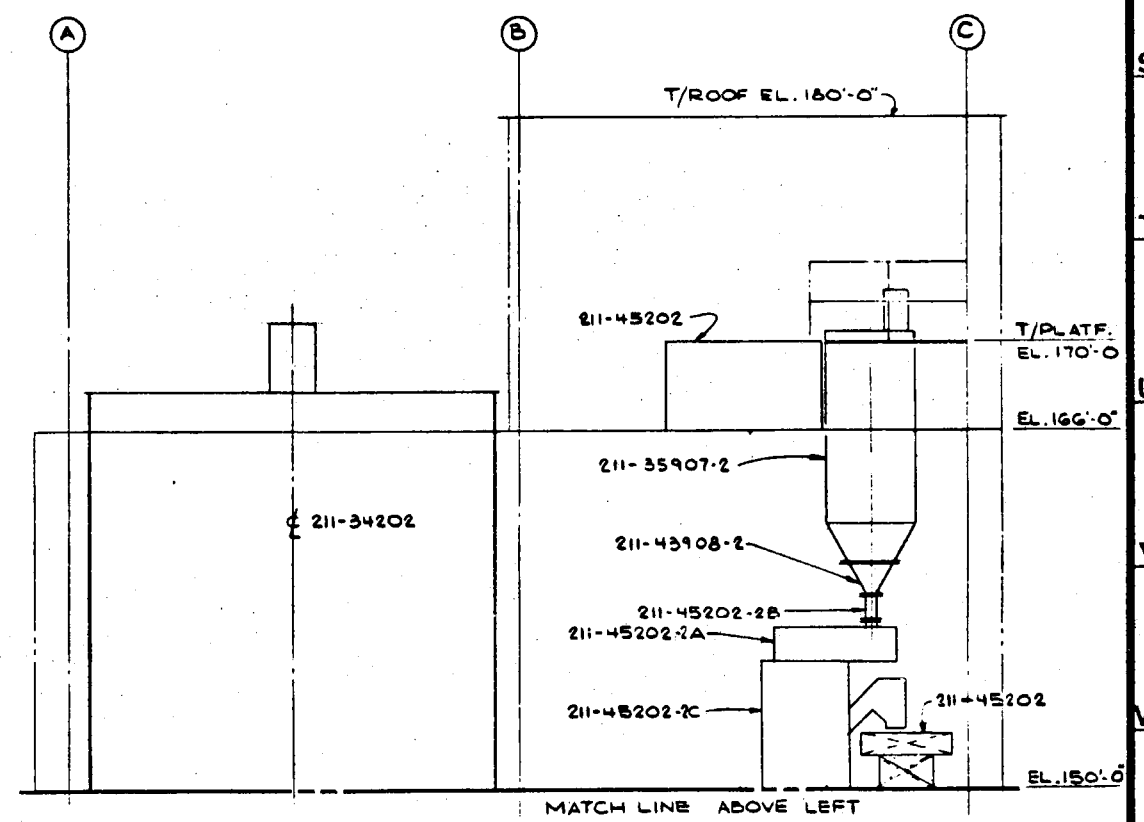
DESIGNED	BY	DATE	DRAWING STATUS
DRAWN	...	...	ISSUED
CHECKED	...	...	FOR COMMENTS AND/OR APPROVAL
DRWG APP'D	...	...	FOR CUSTOMER APPROVAL
ICGG APP'D	...	...	AND/OR COMMENTS
D/E APP'D	...	...	APPROVAL FOR CONSTRUCTION
SCALE	...	...	

TITLE	SO ₂ REMOVAL LAYOUT PLAN	PROJECT NO.	7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO.	211-202-4
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP	BY DRAGO CORPORATION PITTSBURGH PA	CASE	02
		REV.	...

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



SECTION A
211-202-1, 2, 3, 4



SECTION A
211-202-3, 4

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

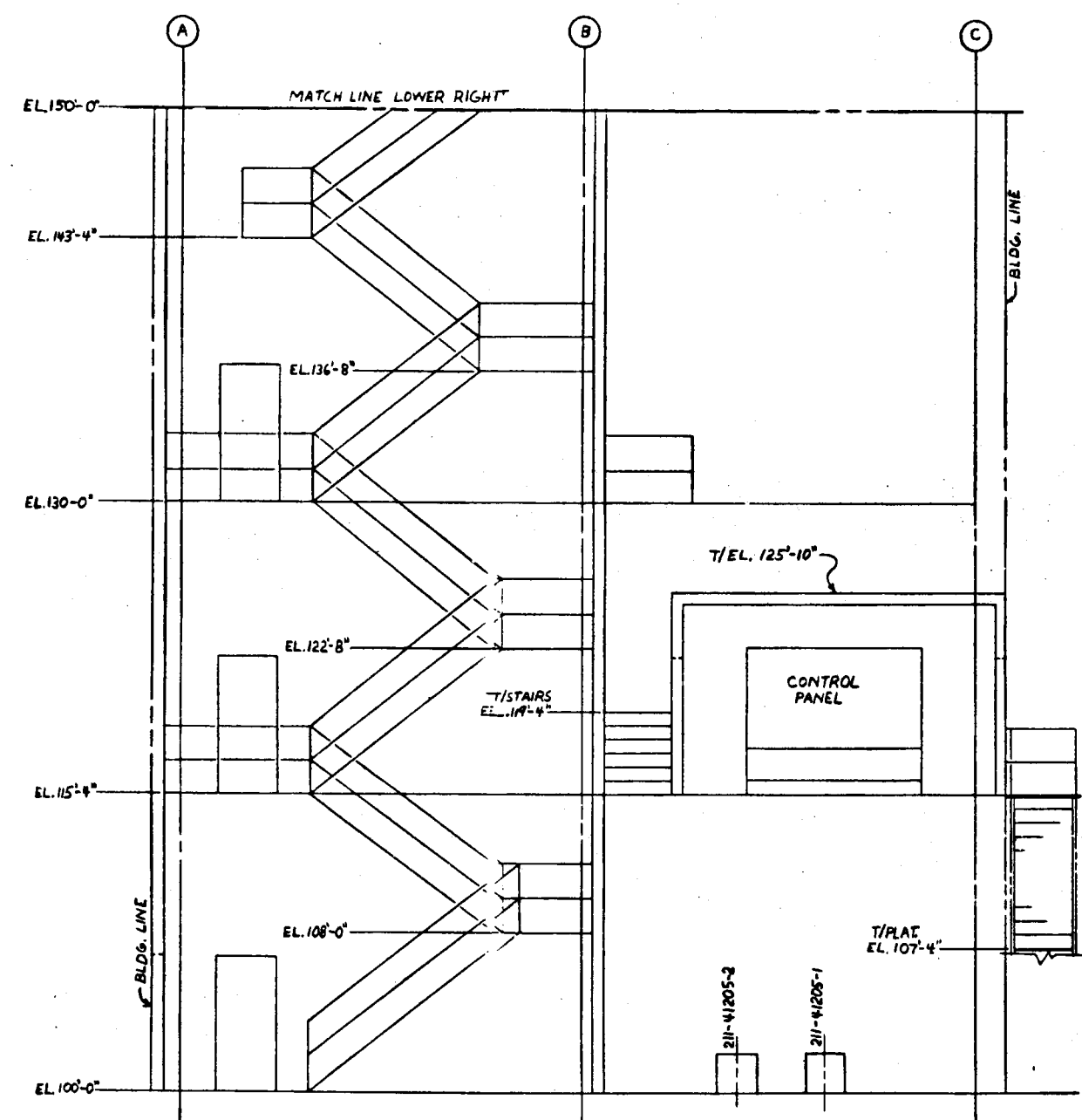
0 1 2 3 4 5 6 7 8 9 10 11 12
1/4"=1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	1/10/12	WGL														
2	ISSUED FOR DDP REPORT	2/1/12	WGL														
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

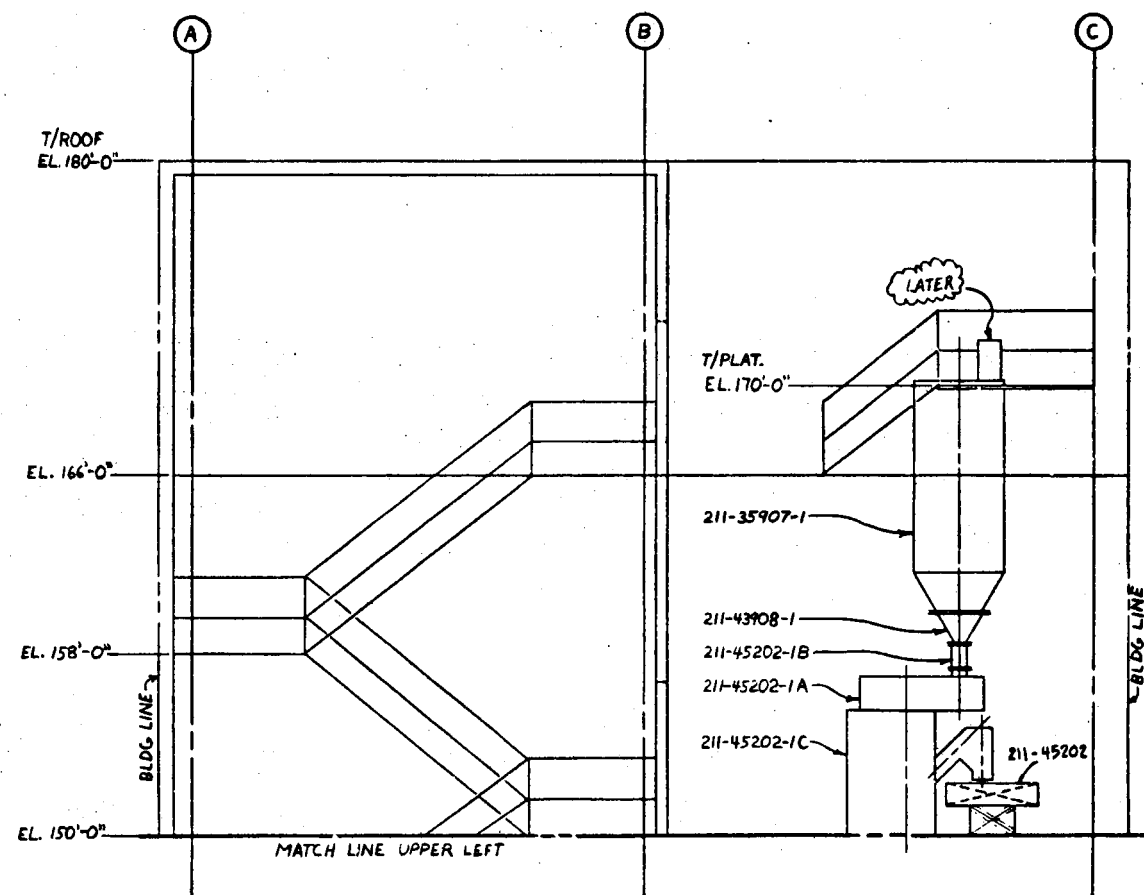
DESIGNED	BY	DATE	ISSUED	DATE
DRAWN	WGL	1/10/12	FOR DDP REPORT	2/1/12
CHECKED			FOR COMMENTS AND/OR	
DRAWN APP'D			APPROVAL	
ICGG APP'D			FOR CUSTOMER APPROVAL	ICGG
DATE APPL.			AND/OR COMMENTS	DCE
SCALE			APPROVAL FOR	
			CONSTRUCTION	

TITLE
**SO₂ REMOVAL
LAYOUT
SECTION**
U.S. DoE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRAVO CORPORATION PITTSBURGH, PA

PROJECT NO
7051
DRAWING NO
211-202-5
CASE
02
REV



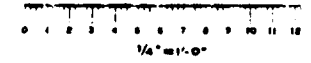
SECTION **B**
211-202-1,2,3



SECTION **B**
211-202-3,4

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION



NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR DESIGN	10/1/12	...	...	...	1						1					
2	ISSUED FOR DRPD REPORT	11/1/12	...	...	...	2						2					
3						3						3					
4						4						4					
5						5						5					
6						6						6					
7						7						7					
8						8						8					
9						9						9					
10						10						10					

BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	10/1/12	FOR DRPD REPORT
CHECKED		FOR COMMENTS AND/OR APPROVAL
DRAGO APPD		FOR CUSTOMER APPROVAL
ICGG APPD		AND/OR COMMENTS
DOE APPD		APPROVAL FOR CONSTRUCTION

TITLE
**SO₂ REMOVAL
LAYOUT
SECTION**

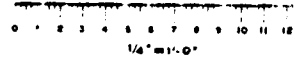
U.S. DOE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRAGO CORPORATION PITTSBURGH PA

PROJECT NO.
7051

DRAWING NO.
211-202-6

CASE
DC

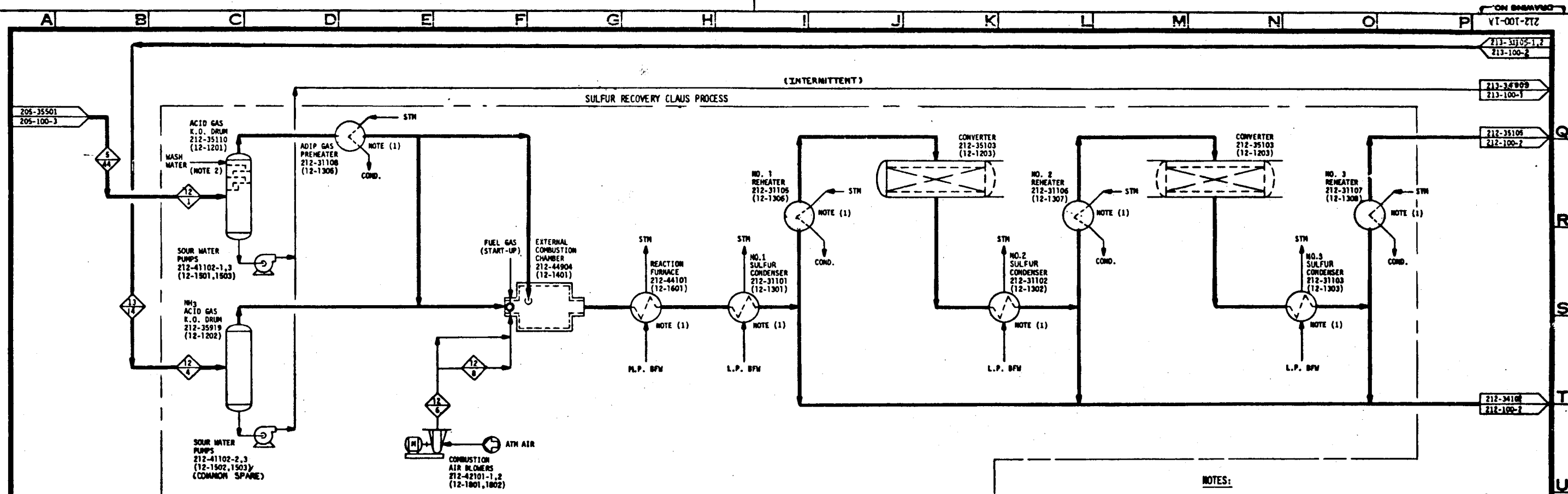
REV.



PRELIMINARY

[illegible]

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

- NOTES:
1. STEAM GENERATION AND USE ARE DETAILED IN PFD 212-100-3.
 2. NORMALLY NO FLOW. MAX. FLOW 10 GPM INTERMITTENT

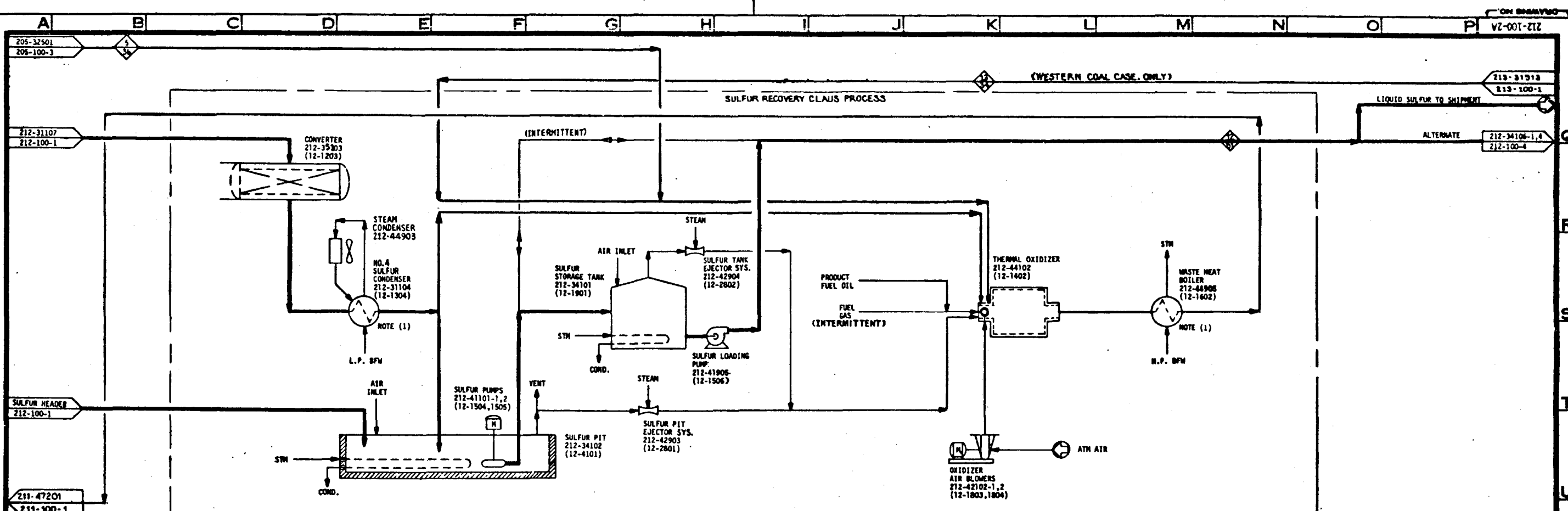
AREA 212
ENERGY BALANCE SUMMARY
MBTU/HR (NORMAL OPERATION)

MATERIAL	STREAM No.	ILLINOIS N-5				PITTSBURGH N-5				WESTERN N-5						
		5	6	7	8	5	6	7	8	5	6	7	8			
		ADIP ACID GAS	NH3 ACID GAS	ADIP ACID GAS	NH3 ACID GAS	ADIP ACID GAS	NH3 ACID GAS	ADIP ACID GAS	NH3 ACID GAS	ADIP ACID GAS	NH3 ACID GAS	ADIP ACID GAS	NH3 ACID GAS			
POUNDS / HOUR																
CO2		6050	0	0	0	6050	0	0	0	6050	0	0	0	6050	0	0
O2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H2O		198	22	198	22	198	22	198	22	198	22	198	22	198	22	198
CH4		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C2H6		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C2H4		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C3H8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C3H6		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NH3		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H2S		45	195	45	195	45	195	45	195	45	195	45	195	45	195	45
NAPHTHA (HCN)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SULFUR VAPOR		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SO2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ELEMENTAL SULFUR		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL LBS/HR		6248	217	6248	217	6248	217	6248	217	6248	217	6248	217	6248	217	6248
LB-MOLS/HR		29.7	1.0	29.7	1.0	29.7	1.0	29.7	1.0	29.7	1.0	29.7	1.0	29.7	1.0	29.7
AVG. MOL. WT.		44.1	32.0	44.1	32.0	44.1	32.0	44.1	32.0	44.1	32.0	44.1	32.0	44.1	32.0	44.1
FLOW, ACFM		2.47	0.2	2.47	0.2	2.47	0.2	2.47	0.2	2.47	0.2	2.47	0.2	2.47	0.2	2.47
FLOW, GPM		1.5	0.1	1.5	0.1	1.5	0.1	1.5	0.1	1.5	0.1	1.5	0.1	1.5	0.1	1.5
TEMP., °F		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PRESS., PSIG		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
ENTHALPY, MBTU/HR		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

REVISIONS		DATE	BY	CHK'D	APPR'D	NO.	REVISIONS		DATE	BY	CHK'D	APPR'D	NO.	REVISIONS		DATE	BY	CHK'D	APPR'D	NO.
DC - DEMONSTRATION CONCEPT		12-15-80	GGN	JWH	NAM		TASK VI RELEASE		12-15-80	GGN	JWH	NAM		PDBP RECORD AND DPPD		12-15-80	GGN	JWH	NAM	
DEMONTATION CONCEPT - TIC		12-15-80	GGN	JWH	NAM		PRELIMINARY ISSUE (DRAWO)		12-15-80	GGN	JWH	NAM		FOR DESIGN		12-15-80	GGN	JWH	NAM	
							FOR CLIENT APPROVAL													

DESIGNED	JEF	DATE		DRAWING STATUS		TITLE	PROCESS FLOW DIAGRAM AREA 212 SULFUR RECOVERY CLAUS PLANT	PROJECT NO.	7051
DRAWN	LOS			TASK VI RELEASE	5-15-80			DRAWING NO.	212-100-1
CHECKED	Pac	12-15-80		FOR COMMENTS AND/OR APPROVAL					
DRAWN APP'D	GGN	12-15-80		FOR CUSTOMER APPROVAL					
ICSB APP'D	GGN	12-15-80		AND/OR COMMENTS					
DOE APP'D				APPROVAL FOR CONSTRUCTION					
SCALE									

U.S. DoE	ENERGY TECHNOLOGY	FOSSIL ENERGY PROGRAMS	CONTRACT NO. EP-77-C-01-2012	PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP	BY	DRAYO CORPORATION	PITTSBURGH, PA.
----------	-------------------	------------------------	------------------------------	------------------	----------------------------------	----	-------------------	-----------------



MATERIAL	STREAM No.	ILLINOIS NO. 6 & 6				PITTSBURGH NO. 6				WESTERN SUBBITUMINOUS			
		ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS	ADIP VENT GAS
CO ₂		329.27	0	329.27	0	329.27	0	329.27	0	329.27	0	329.27	0
CO		34	0	34	0	34	0	34	0	34	0	34	0
H ₂		3	0	3	0	3	0	3	0	3	0	3	0
H ₂ O		269	0	269	0	269	0	269	0	269	0	269	0
CH ₄		15	0	15	0	15	0	15	0	15	0	15	0
C ₂ H ₆		0	0	0	0	0	0	0	0	0	0	0	0
C ₃ H ₈		0	0	0	0	0	0	0	0	0	0	0	0
C ₄ H ₁₀		0	0	0	0	0	0	0	0	0	0	0	0
C ₅ H ₁₂		0	0	0	0	0	0	0	0	0	0	0	0
C ₆ H ₁₄		0	0	0	0	0	0	0	0	0	0	0	0
H ₂ + Ar		21	0	21	0	21	0	21	0	21	0	21	0
N ₂		0	0	0	0	0	0	0	0	0	0	0	0
H ₂ S		2	0	2	0	2	0	2	0	2	0	2	0
NAPHTHA		16	0	16	0	16	0	16	0	16	0	16	0
CO ₂		9.3	0	9.3	0	9.3	0	9.3	0	9.3	0	9.3	0
SULFUR VAPOR		0	0	0	0	0	0	0	0	0	0	0	0
O ₂		0	0	0	0	0	0	0	0	0	0	0	0
SO ₂		0	0	0	0	0	0	0	0	0	0	0	0
ELEMENTAL SULFUR		0	0	0	0	0	0	0	0	0	0	0	0
TOTAL LBS/HR		539.9	0	539.9	0	539.9	0	539.9	0	539.9	0	539.9	0
LB-H ₂ S/HR		2.2	0	2.2	0	2.2	0	2.2	0	2.2	0	2.2	0
AVE. MOL. WT.		44.3	0	44.3	0	44.3	0	44.3	0	44.3	0	44.3	0
FLOW, ACFH		416.5	0	416.5	0	416.5	0	416.5	0	416.5	0	416.5	0
FLOW, GPM		-	0	-	0	-	0	-	0	-	0	-	0
TEMP., °F		127	0	127	0	127	0	127	0	127	0	127	0
PRESS., PSIG		0	0	0	0	0	0	0	0	0	0	0	0
ENTHALPY, MBTU/HR		1.3	0	1.3	0	1.3	0	1.3	0	1.3	0	1.3	0

(NOTE 2)

- NOTE:
1. STEAM GENERATION AND USE ARE DETAILED IN PFD 212-100-3
 2. STREAM , THERMAL OXIDIZER FUEL GAS, IS FOR INTERMITTENT AND STARTUP SERVICE ONLY. FOR NORMAL OPERATION STREAM , PRODUCT OIL (X NO. 6 FUEL OIL EQUIVALENT) WILL BE USED.

APPROVED FOR ENGINEERING
NOT APPROVED FOR
CONSTRUCTION

RMP ACCOUNT NUMBER 5972-1
DOCUMENT NUMBER D-12-FS-4
THE RALPH M. PARSONS COMPANY
PASADENA, CALIFORNIA

REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D
1	10/1/80	LOS	JWH	1	10/1/80	LOS	JWH	1	10/1/80	LOS	JWH
2	10/1/80	LOS	JWH	2	10/1/80	LOS	JWH	2	10/1/80	LOS	JWH
3	10/1/80	LOS	JWH	3	10/1/80	LOS	JWH	3	10/1/80	LOS	JWH
4	10/1/80	LOS	JWH	4	10/1/80	LOS	JWH	4	10/1/80	LOS	JWH
5	10/1/80	LOS	JWH	5	10/1/80	LOS	JWH	5	10/1/80	LOS	JWH
6	10/1/80	LOS	JWH	6	10/1/80	LOS	JWH	6	10/1/80	LOS	JWH
7	10/1/80	LOS	JWH	7	10/1/80	LOS	JWH	7	10/1/80	LOS	JWH
8	10/1/80	LOS	JWH	8	10/1/80	LOS	JWH	8	10/1/80	LOS	JWH
9	10/1/80	LOS	JWH	9	10/1/80	LOS	JWH	9	10/1/80	LOS	JWH
10	10/1/80	LOS	JWH	10	10/1/80	LOS	JWH	10	10/1/80	LOS	JWH

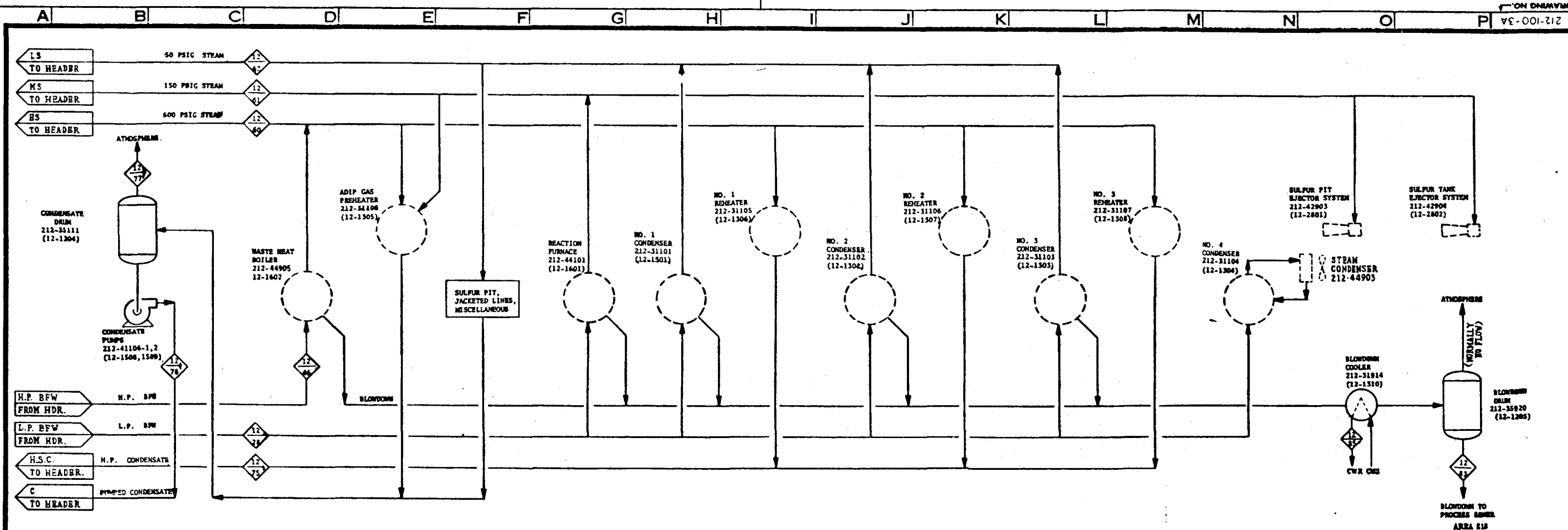
DRAWING STATUS				DRAWING STATUS			
DESIGNED	BY	DATE	ISSUED	DESIGNED	BY	DATE	ISSUED
DRAWN	LOS		TASK VI RELEASE	DRAWN	LOS		TASK VI RELEASE
CHECKED	LOS	10/1/80	FOR COMMENTS AND/OR	CHECKED	LOS	10/1/80	FOR COMMENTS AND/OR
DRAWN APP'D	LOS	10/1/80	APPROVAL	DRAWN APP'D	LOS	10/1/80	APPROVAL
ICBB APP'D	LOS	10/1/80	FOR CUSTOMER APPROVAL	ICBB APP'D	LOS	10/1/80	FOR CUSTOMER APPROVAL
DOE APP'D	LOS	10/1/80	AND/OR COMMENTS	DOE APP'D	LOS	10/1/80	AND/OR COMMENTS
SCALE			APPROVAL FOR	SCALE			APPROVAL FOR
			CONSTRUCTION				CONSTRUCTION

PROCESS FLOW DIAGRAM
AREA 212
SULFUR RECOVERY
CLAUS PLANT

U.S. DOE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012

PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRACO CORPORATION PITTSBURGH, PA.

PROJECT NO.
7051
DRAWING NO.
212-100-2
DC-TIC



MATERIAL	STREAM NO.	12-28	12-29	12-30	12-31	12-32	12-33	12-34	12-35	12-36	12-37	12-38	12-39	12-40	12-41	12-42	12-43	12-44	12-45	12-46
ILLINOIS NO. 5 & 6 POUNDS/HOUR																				
H ₂ O VAPOR																				
H ₂ O LIQUID																				
TOTAL POUNDS/HOUR																				
AVERAGE MOLECULAR WEIGHT																				
ACFM																				
GPM																				
PRESSURE PSIG																				
TEMPERATURE °F																				
ENTHALPY MBTU/HR.																				
H ₂ O VAPOR																				
H ₂ O LIQUID																				
TOTAL POUNDS/HR.																				
AVERAGE MOLECULAR WEIGHT																				
ACFM																				
GPM																				
PRESSURE PSIG																				
TEMPERATURE °F																				
ENTHALPY MBTU/HR.																				

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DC-DEMONSTRATION CONCEPT		SGN	JWH	NAM	1						1					
2	DEMONSTRATION CONCEPT-TIC		SGN	JWH	NAM	2						2					
3						3						3					
4						4						4					
5						5						5					
6						6						6					
7						7						7					
8						8						8					
9						9						9					
10						10						10					
11						11						11					
12						12						12					
13						13						13					
14						14						14					
15						15						15					
16						16						16					
17						17						17					
18						18						18					
19						19						19					
20						20						20					
21						21						21					
22						22						22					
23						23						23					
24						24						24					
25						25						25					
26						26						26					
27						27						27					
28						28						28					
29						29						29					
30						30						30					
31						31						31					
32						32						32					
33						33						33					
34						34						34					
35						35						35					
36						36						36					
37						37						37					
38						38						38					
39						39						39					
40						40						40					
41						41						41					
42						42						42					
43						43						43					
44						44						44					
45						45						45					
46						46						46					
47						47						47					
48						48						48					
49						49						49					
50						50						50					
51						51						51					
52						52						52					
53						53						53					
54						54						54					
55						55						55					
56						56						56					
57						57						57					
58						58						58					
59						59						59					
60						60						60					
61						61						61					
62						62						62					
63						63						63					
64						64						64					
65						65						65					
66						66						66					
67						67						67					
68						68						68					
69						69						69					
70						70						70					
71						71						71					
72						72						72					
73						73						73					
74						74						74					
75						75						75					
76						76						76					
77						77						77					
78						78						78					
79						79						79					
80						80						80					
81						81						81					
82						82						82					
83						83						83					
84						84						84					
85						85						85					
86						86						86					
87						87						87					
88						88						88					
89						89						89					
90						90						90					
91						91						91					
92						92						92					
93						93						93					
94						94						94					
95						95						95					
96						96						96					
97						97						97					
98						98						98					
99						99						99					
100						100						100					

DESIGNED	K K	DATE	11/2/52	DRAWING STATUS	ISSUED	DATE	11-15-50
DRAWN	AGE	DATE	11/6/52	TASK II RELEASE	FOR COMMENTS AND/OR APPROVAL		
CHECKED	JDC/R	DATE	11/6/52	FOR CUSTOMER APPROVAL	ICGG	DATE	
DRAGO APP'D	CW	DATE	11/6/52	AND/OR COMMENTS	DOE	DATE	
ICGG APP'D		DATE		APPROVAL FOR CONSTRUCTION		DATE	
DOE APP'D		DATE				DATE	
SCALE							

TITLE	PROCESS FLOW DIAGRAM AREA 212 SULFUR RECOVERY STEAM GENERATION & USE	PROJECT NO.	7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO.	212-100-3A
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.		CASE	DC-TIC
		REV.	

"D"

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

Q	
R	
S	
T	
U	

V
W
X

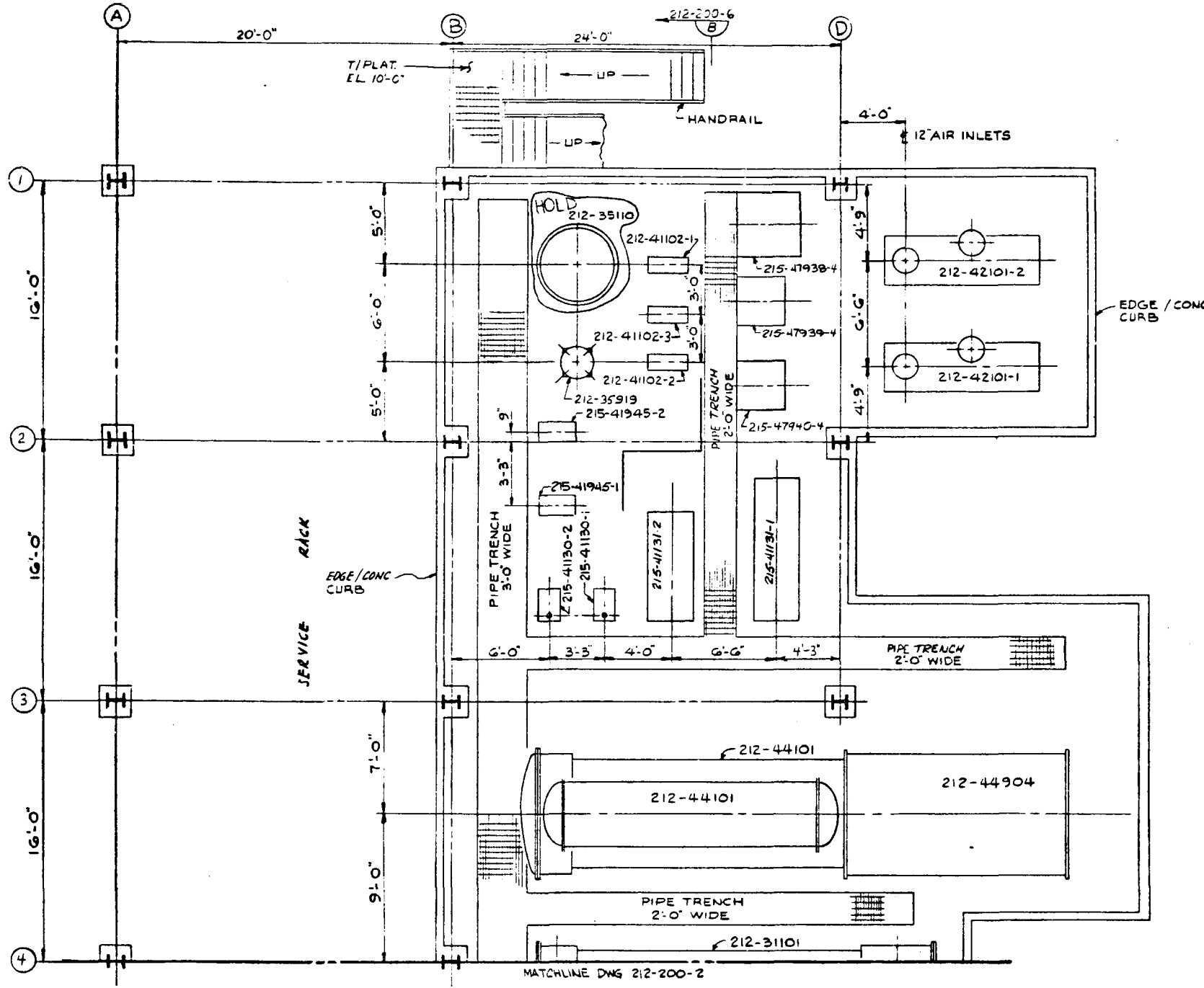
Y
Z

TITLE PROCESS FLOW DIAGRAM AREA 212 SULFUR RECOVERY STEAM GENERATION & USE	PROJECT NO. 7051 DRAWING NO.
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	212-100-3B CASE DC-TIC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA.	REV. 

[illegible]

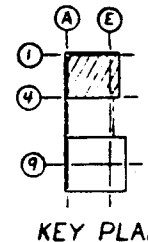
BY		DATE	DRAWING STATUS	
DESIGNED	H.C. VESTER	1-7-80	ISSUED	DATE
DRAWN	DICK SCOTT	1-12-80	PDBP RECORD AND DDPD	2-15-80
CHECKED	G.G. NAHAY	1-19-80	FOR COMMENTS AND/OR	
DRAVO APPD	C. J. Langston	2-15-80	APPROVAL	
ICGG APPD	with signature	2-15-80	FOR CUSTOMER APPROVAL	ICGG
DOE APPD			AND/OR COMMENTS	DOE
			APPROVAL FOR	
			CONSTRUCTION	
SCALE	AS SH.			

TITLE PROCESS FLOW DIAGRAM AREA 212 SULFUR RECOVERY SOLID SULFUR HANDLING	PROJECT NO. 7051
	DRAWING NO. 212-100-4
U. S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE DC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRavo CORPORATION PITTSBURGH, PA.	REV. 



PLAN AT GRADE

ITEM NO.	DESCRIPTION
212-31101	NO. 1 CONDENSER
212-35110	ACID GAS K.O. DRUM
212-35919	ACID GAS K.O. DRUM
212-41102-1,2,3	SOUR WATER PUMPS
212-42101-1,2	COMBUSTION AIR BLOWERS
212-44101	REACTOR FURNACE W/STEAM DRUM
212-44904	EXTERNAL COMBUSTION CHAMBER
215-41130-1,2	AREA 212 50 PSIG BFW PUMP
215-41131-1,2	AREA 212 600 PSIG BFW PUMP
215-41945-1,2	AREA 212 BFW TURBINE CONDENSATE PUMPS
215-47938-4	DYERGEN SCAVENGER & ANTI-FOAM PUMP
215-47939-4	CORROSION INHIBITOR PUMP
215-47940-4	SLUDGE CONTROL PREP



PRELIMINARY

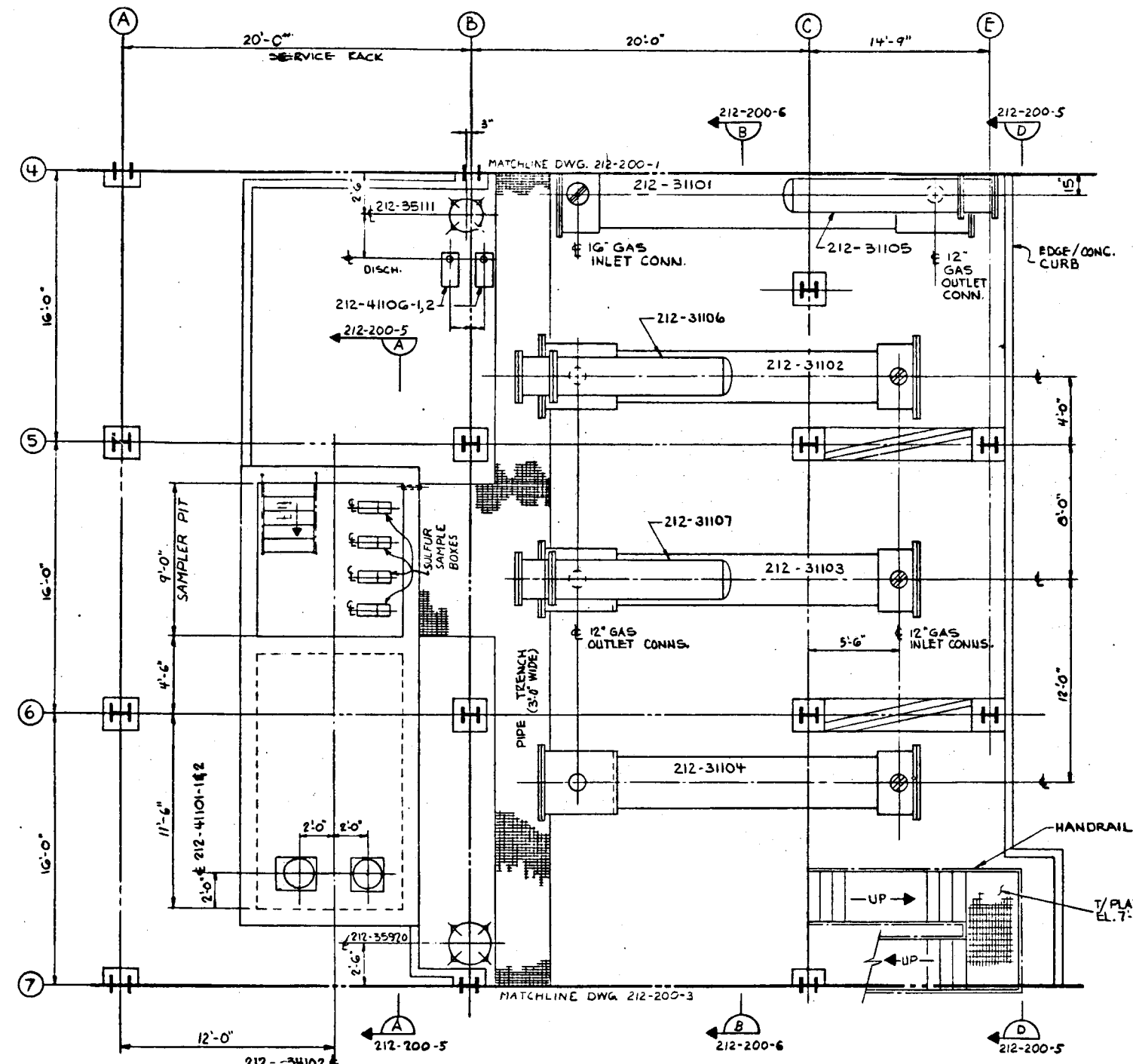
NOT APPROVED FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK	APP	NO.	REVISIONS	DATE	BY	CHK	APP	NO.	REVISIONS	DATE	BY	CHK	APP
1	ISSUED FOR BASELINE	2-10-12	JLD														
2	ISSUED FOR PDR REPORT	4-10-12	JLD														
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

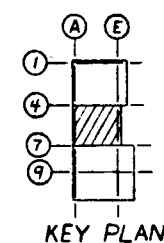
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	JORDAN	FOR PDR REPORT
CHECKED		FOR COMMENTS AND/OR APPROVAL
CRAC APP		FOR CUSTOMER APPROVAL
CCG APP		AND/OR COMMENTS
CCG APP		APPROVAL FOR CONSTRUCTION

TITLE	SULFUR RECOVERY LAYOUT PLAN	PROJECT NO	7051
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS	DRAWING NO	212-200-1
CONTRACT NO	EE 77.C.01.2012	CASE	DC
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP	REV	
BY	DRACO CORPORATION, PITTSBURGH PA		

DO NOT SCALE THIS DRAWING. IT MAY BE REDUCED FROM ORIGINAL SIZE.



EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
212-31101	NO. 1 CONDENSER
212-31102	NO. 2 CONDENSER
212-31103	NO. 3 CONDENSER
212-31104	NO. 4 CONDENSER
212-31105	NO. 1 REHEATER
212-31106	NO. 2 REHEATER
212-31107	NO. 3 REHEATER
212-34102	SULFUR PIT
212-35111	CONDENSATE DRUM
212-35920	BLOWDOWN DRUM
212-41101-1,2	SULFUR PUMPS
212-41106-1,2	CONDENSATE PUMPS



PLAN AT GRADE

PRELIMINARY

NOT APPROVED FOR CONSTRUCTION

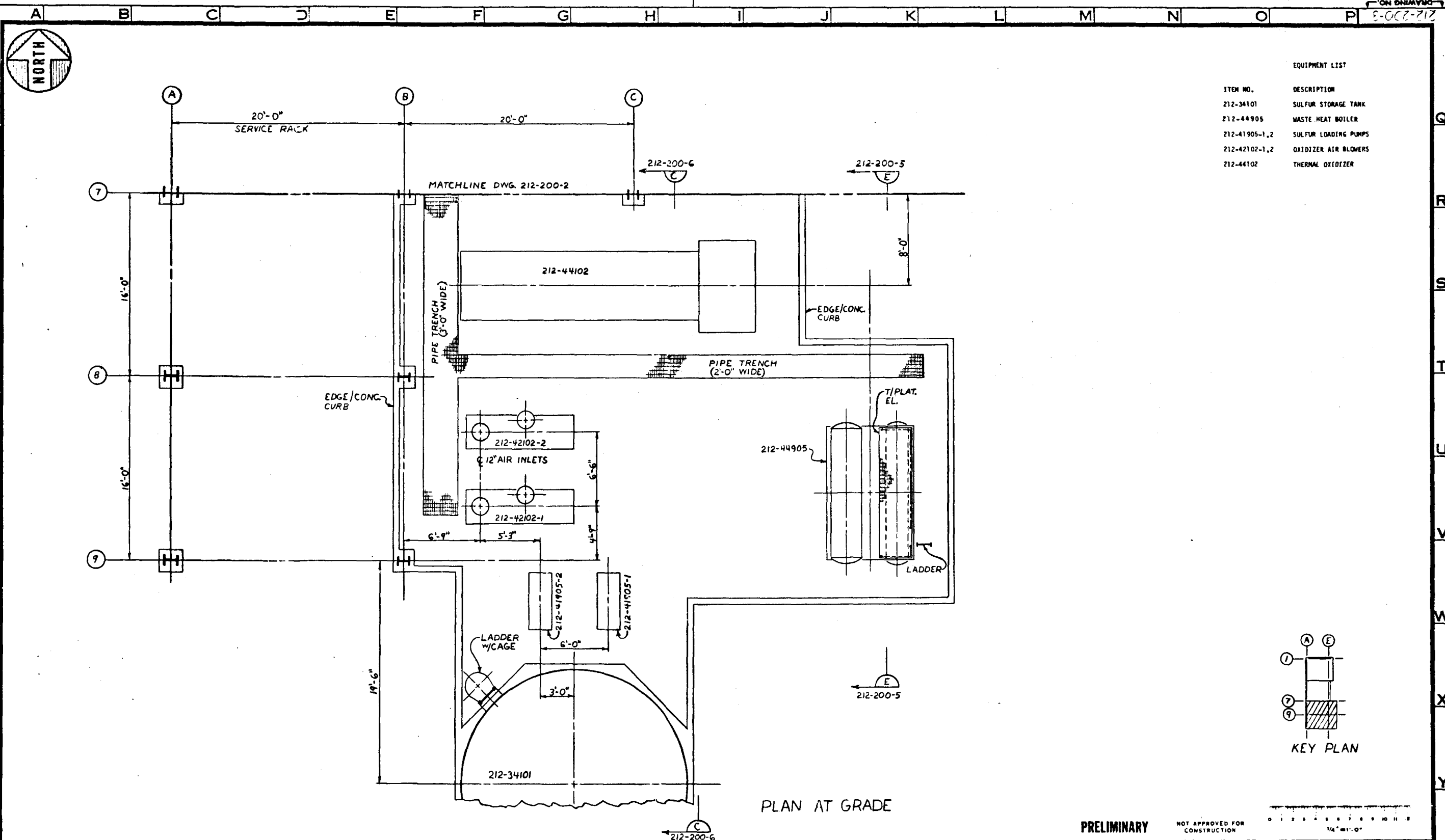
0 1 2 3 4 5 6 7 8 9 10 11 12
1/4" = 1'-0"

REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10/1/12	JL												
2	10/1/12	JL												
3	10/1/12	JL												
4	10/1/12	JL												
5	10/1/12	JL												
6	10/1/12	JL												
7	10/1/12	JL												
8	10/1/12	JL												
9	10/1/12	JL												
10	10/1/12	JL												
11	10/1/12	JL												
12	10/1/12	JL												

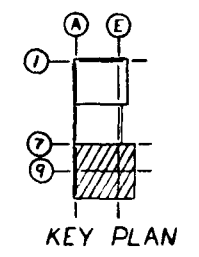
BY		DATE		DRAWING STATUS	
DESIGNED				ISSUED	DATE
DRAWN	JL	10/1/12		FOR DDPD REPORT	2-5-12
CHECKED				FOR COMMENTS AND/OR APPROVAL	
DRAVO APPD				FOR CUSTOMER APPROVAL	ICGG
ICGG APPD				AND/OR COMMENTS	DCE
DCE APPD				APPROVAL FOR CONSTRUCTION	
SCALE	AS SHOWN				

TITLE		PROJECT NO.
SULFUR RECOVERY LAYOUT PLAN		7051
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 212-200-2
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.		CASE
		REV. A

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



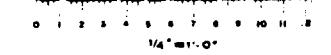
EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
212-34101	SULFUR STORAGE TANK
212-44905	WASTE HEAT BOILER
212-41905-1,2	SULFUR LOADING PUMPS
212-42102-1,2	OXIDIZER AIR BLOWERS
212-44102	THERMAL OXIDIZER



PLAN AT GRADE

PRELIMINARY

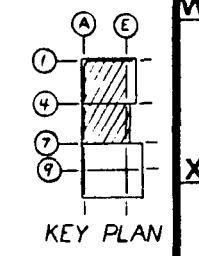
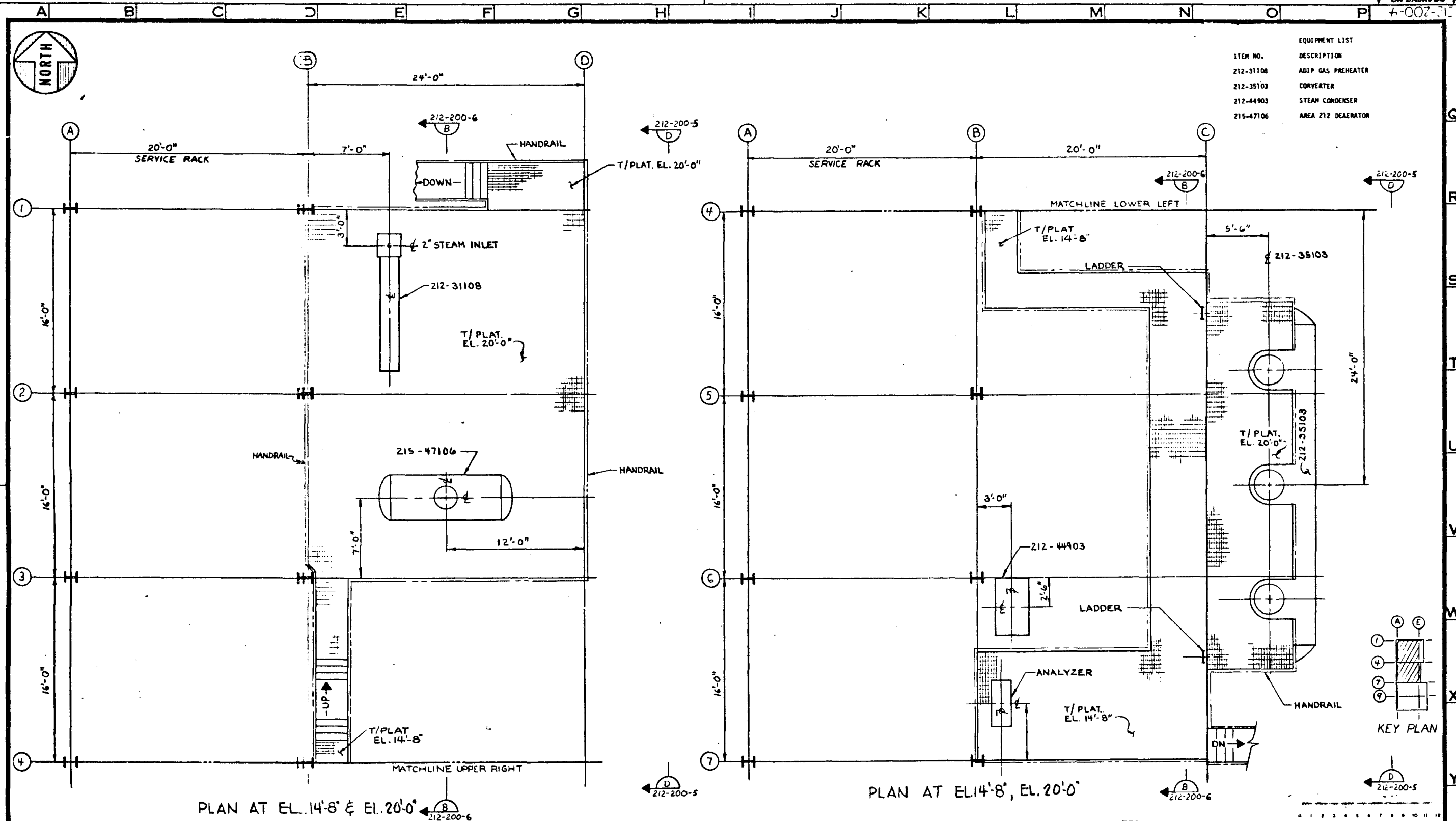
NOT APPROVED FOR CONSTRUCTION



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPROV.	NO.	DATE	BY	CHK'D	APPROV.	NO.	DATE	BY	CHK'D	APPROV.
1	ISSUED FOR BASELINE	7/14/85												
2	ISSUED FOR DPPD REPORT	8/26/85												

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

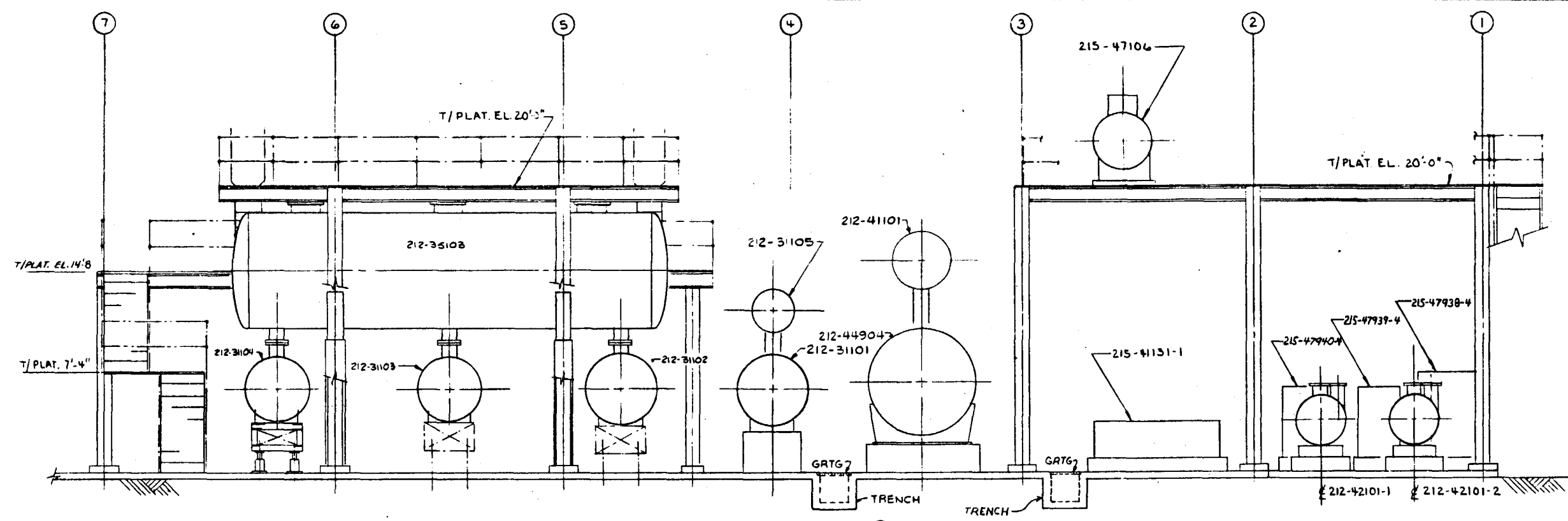
ITEM NO.	DESCRIPTION
212-31108	ADIP GAS PREHEATER
212-35103	CONVERTER
212-44903	STEAM CONDENSER
215-47106	AREA 212 DEAEATOR



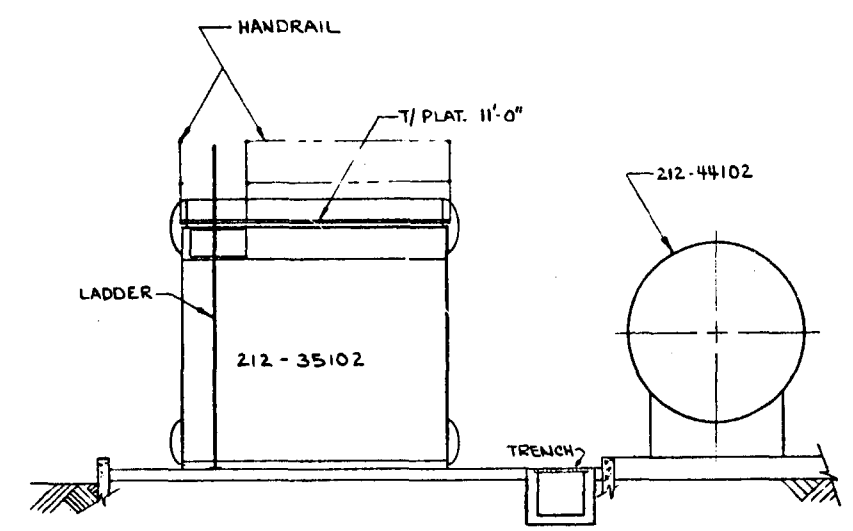
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.
1	ISSUED FOR BASELINE	11/11/11	HLJ															
2	ISSUED FOR ODD REPORT	11/11/11	HLJ															
3																		
4																		
5																		
6																		
7																		
8																		
9																		

BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN		FOR DDD REPORT
CHECKED		FOR COMMENTS AND/OR
DRAW APPD		APPROVAL
ICGG APPD		FOR CUSTOMER APPROVAL
ICGG		AND/OR COMMENTS
ICGG APPD		APPROVAL FOR CONSTRUCTION

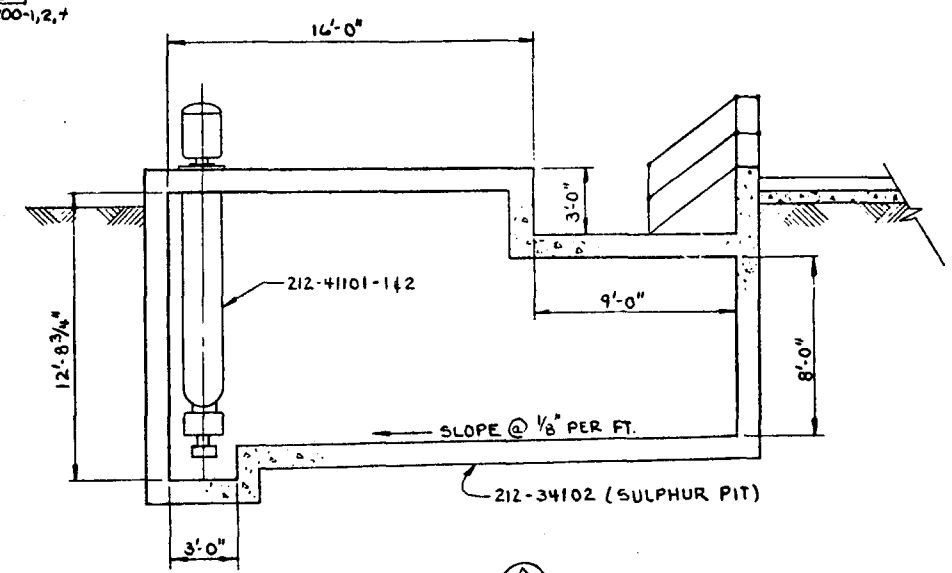
TITLE	SULFUR RECOVERY LAYOUT PLANS	PROJECT NO	7051
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO	72-202-4
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP	CASE	DC
BY	DRAGO CORPORATION PITTSBURGH PA	REV	



SECTION **D**
212-200-1,2,7



SECTION **E**
212-200-3



SECTION **A**
212-200-2

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR SHUTLINE	11/11/11															
2	ISSUED FOR DFPD REPORT	11/11/11															

DESIGNED	BY	DATE	ISSUED	DATE
DRAWN	JORDAN	9-2-11	RR DFPD REPORT	2-6-12
CHECKED			FOR COMMENTS AND/OR	
DRAWN APP'D			APPROVAL	
ICGG APP'D			FOR CUSTOMER APPROVAL	ICGG
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
			CONSTRUCTION	

TITLE	SULFUR RECOVERY LAYOUT SECTIONS
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP
BY	DRAGO CORPORATION PITTSBURGH, PA

PROJECT NO	7051
DRAWING NO.	212-200-5
CASE	DC
REV	

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

DEMONSTRATION PLANT
AREA 243
ENERGY BALANCE SUMMARY
MM BTU/HR

Stream	Value (MM BTU/HR)	Direction
1	0.05	In
2	0.57	In
3	5.39	In
4	1.13	In
5	0.17	In
6	2.50	In
7	5.11	In
8	2.22	In
9	0.73	In
10	1.14	Out
11	3.73	Out
12	0.02	Out
13	0.01	Out
14	0.00	Out
Net Heaters	0.23	Out
Net Coolers	-13.20	Out
Net Depletion	-12.97	Out

TOTAL ENERGY IN: 17.87

TOTAL ENERGY OUT: 4.90

DEMONSTRATION PLANT
AREA 213
ENERGY BALANCE SUMMARY
MM BTU/HR

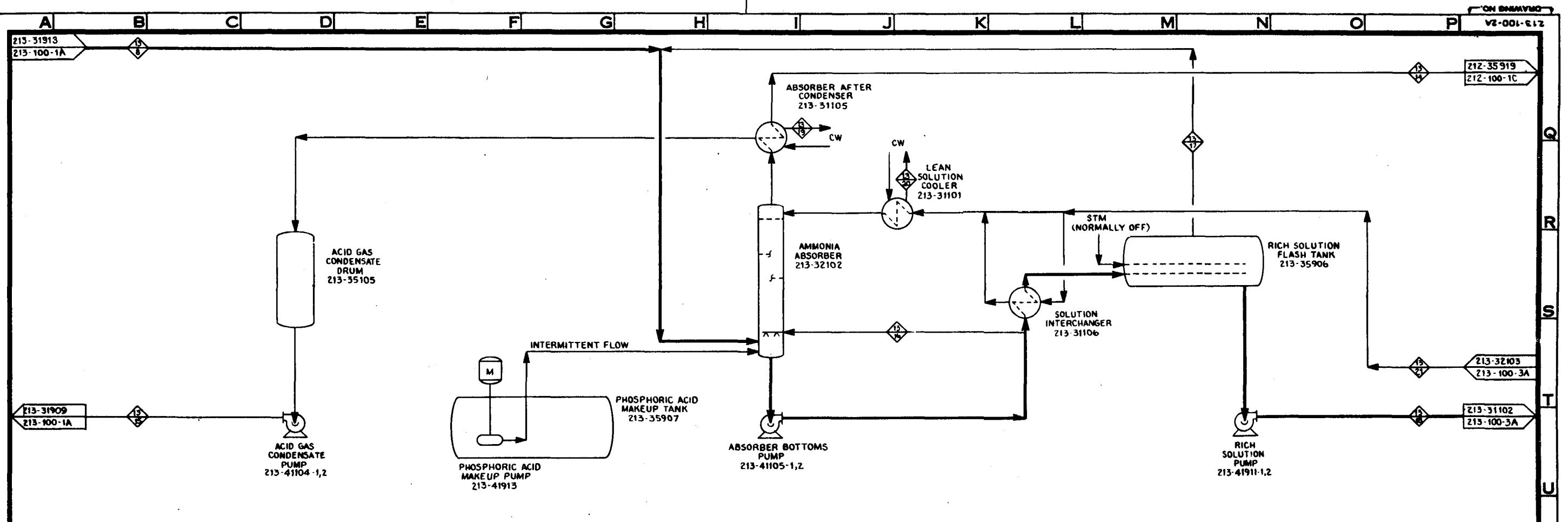
	SERVICE	CONTRIBUTION	
0.00 NORMAL			0.29
0.30			
6.28			
1.41	HEATERS	0.36	4.34
0.14			
3.54	COOLERS	-15.27	0.01
2.68			0.02
4.02			0.08
1.28	NET DEPLETION	-14.91	

TOTAL ENERGY IN: 19.65

TOTAL ENERGY OUT: 4.74

DATA ON THE PFD'S 213-100-1B, 2B & 3B (WESTERN SUBBITUMINOUS) ARE APPLICABLE TO THE ONE WEEK PERIOD (IN A FOUR WEEK SCHEDULE) DURING WHICH AMMONIA IS ACTUALLY RECOVERED. FOR THE BALANCE OF THREE WEEKS, STRIPPER A AND PHOSAM-W PLANT WILL BE OUT OF OPERATION. STRIPPER B OPERATES CONTINUOUSLY BUT ITS STRIPPED GASES WILL BE ROUTED TO AREA 212 FOR INCINERATION.

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.		
1	DC-DEMONSTRATION CONCEPT	7/6/80	MM	GGN	JWR	1	PRELIMINARY ISSUE	8/20/80	MM	GGN	UWH	1	POBP APPROVAL AND DPPD	8/20/80	MM	GGN	UWH	1								
2						2						2						2								
3						3						3						3								
4						4						4						4								
5						5						5						5								
6						6						6						6								
7						7						7						7								
8						8						8						8								
9						9						9						9								
10						10						10						10								
11						11						11						11								
12						12						12						12								
13						13						13						13								
14						14						14						14								
15						15						15						15								
16						16						16						16								
17						17						17						17								
18						18						18						18								
19						19						19						19								
20						20						20						20								
21						21						21						21								
22						22						22						22								
23						23						23						23								
24						24						24						24								
25						25						25						25								
26						26						26						26								

[illegible][illegible]

BY		DATE	DRAWING STATUS	
DESIGNED	M. MURTHY	12-12-79	ISSUED	DATE
DRAWN	lannach/chione	12-14-79	PDBP APPROVAL AND DPPD	2-15-80
CHECKED	NAHAY	12-17-79	FOR COMMENTS AND/OR	
DRAWN APP'D	<i>[Signature]</i>	2-15-80	APPROVAL	
ICGS APP'D	<i>[Signature]</i>	2-15-80	FOR CUSTOMER APPROVAL	ICGS
APP'D			AND/OR COMMENTS	ERDA
			APPROVAL FOR	
			CONSTRUCTION	
SCALE	<i>[Signature]</i>			

TITLE PROCESS FLOW DIAGRAM AREA 213 AMMONIA RECOVERY AMMONIA ABSORPTION SECTION	PROJECT NO. 7051	Z
	DRAWING NO. 213-100-2A	
U. S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EE-77-C-01-2012	CASE DC	
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.	REV.	

MATERIAL	STREAM No.	LEAN SOLUTION	RICH SOLUTION	CWR
WESTERN SUB-BITUMINOUS POUNDS / HOUR				
PHENOL (INCL. OILS)				
CO ₂			18	
H ₂ O			381	
H ₂ S			< 1	
NH ₃				
H ₃ PO ₄				
NaOH				
COOLING WATER				
TOTAL POUNDS / HOUR			399	
AVG. MOL. WT.			32.7	
ACFM			44.2	
GPM				
PRESSURE, PSIG			14	
TEMPERATURE, °F			122	
ENTHALPY, MM BTU / HR.			.01	

BY		DATE	DRAWING STATUS	
DESIGNED	M. MURPHY	1-19-80	ISSUED	DATE
DRAWN	DICK SCOT	1-30-80	PDBP APPROVAL AND DPPD	2-15-80
CHECKED	NAHAY	1-31-80	FOR COMMENTS AND/OR	
DRAWN APP'D	<i>W. Lawrence</i>	2-15-80	APPROVAL	
ICSB APP'D	<i>R. D. [Signature]</i>	2-15-80	FOR CUSTOMER APPROVAL	ICSB <i>SD</i>
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
			CONSTRUCTION	
SCALE				

TITLE PROCESS FLOW DIAGRAM AREA 213 AMMONIA RECOVERY AMMONIA ABSORPTION SECTION	PROJECT NO. 7051
	DRAWING NO. 213-100-213
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE DC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.	REV. 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

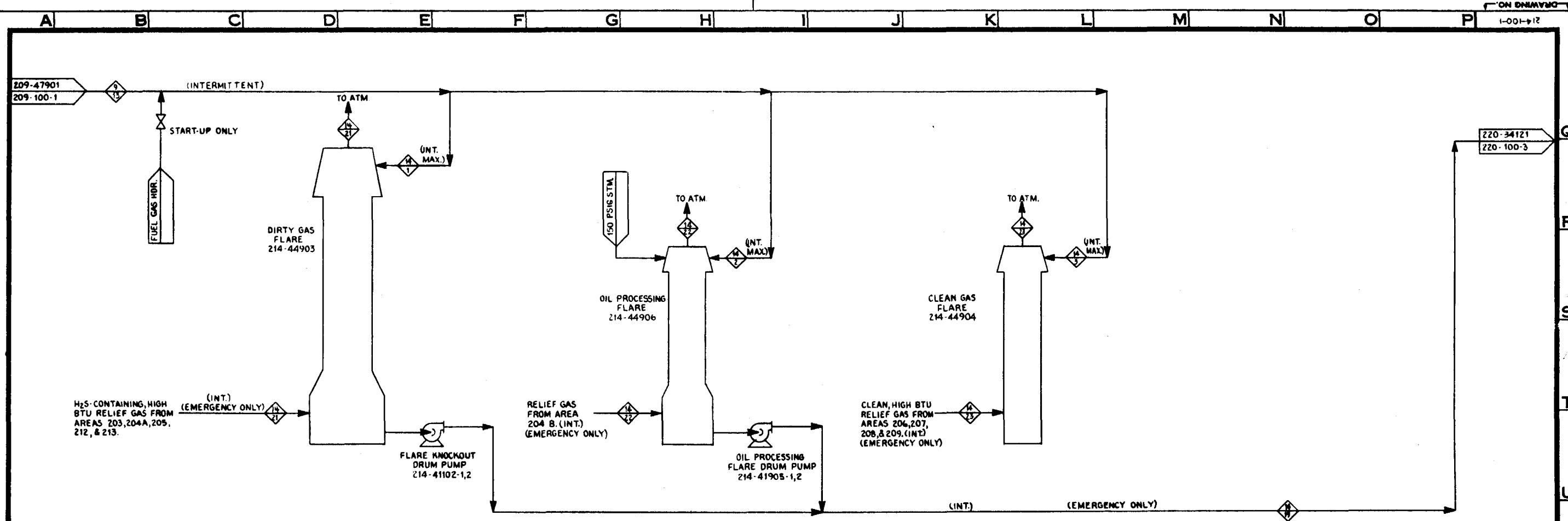
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

	BY	DATE	DRAWING STATUS	
DESIGNED	M. MURPHY	1-29-80	ISSUED	DATE
DRAWN	J. LORRY	1-29-80	VDISP APPROVAL AND DDDP 2-15-80	
CHECKED	G. NAHAY	1-30-80	FOR COMMENTS AND/OR	
DRAWN APP'D	G. NAHAY	2-1-80	APPROVAL	
ICGG APP'D	G. NAHAY	2-1-80	FOR CUSTOMER APPROVAL	
DOE APP'D			AND/OR COMMENTS	ICGG
				DOE
SCALE			APPROVAL FOR CONSTRUCTION	

PROJECT NO.
7051
DRAWING NO.
213-100-3B

CASE

REV.



MATERIAL	STREAM NO.	INT. MAX.	INT. MAX.	INT. MAX.	CONT. PURGE	CONT. PURGE	CONT. PURGE	SPG TO FLARE SYSTEM
ILLINOIS								
CO ₂		TRACE	TRACE	TRACE				
CO		TRACE	TRACE	TRACE				
H ₂		TRACE	TRACE	TRACE				
H ₂ O		TRACE	TRACE	TRACE				
CH ₄		24	24	24				10 SCFH (MAX)
C ₂ H ₆								
C ₃ H ₈								
C ₄ H ₁₀								
n-C ₄ H ₁₀								
H ₂ S								
SO ₂								
NH ₃								
Ar								
O ₂		TRACE	TRACE	TRACE				
N ₂		2	2	2		53	1	19
OFF-SPEC OIL								
TOTAL POUNDS/HR.		25	25	25		53	1	19
AVG. MOLECULAR WEIGHT		16.61	16.61	16.61		28	28	28
ACFM		11	11	11		12	0.3	4.4
GPM								
PRESSURE, PSIG		0	0	0		0	0	0
TEMPERATURE, °F		100	100	100		60	60	60
ENTHALPY, MM BTU/HR						0	0	0

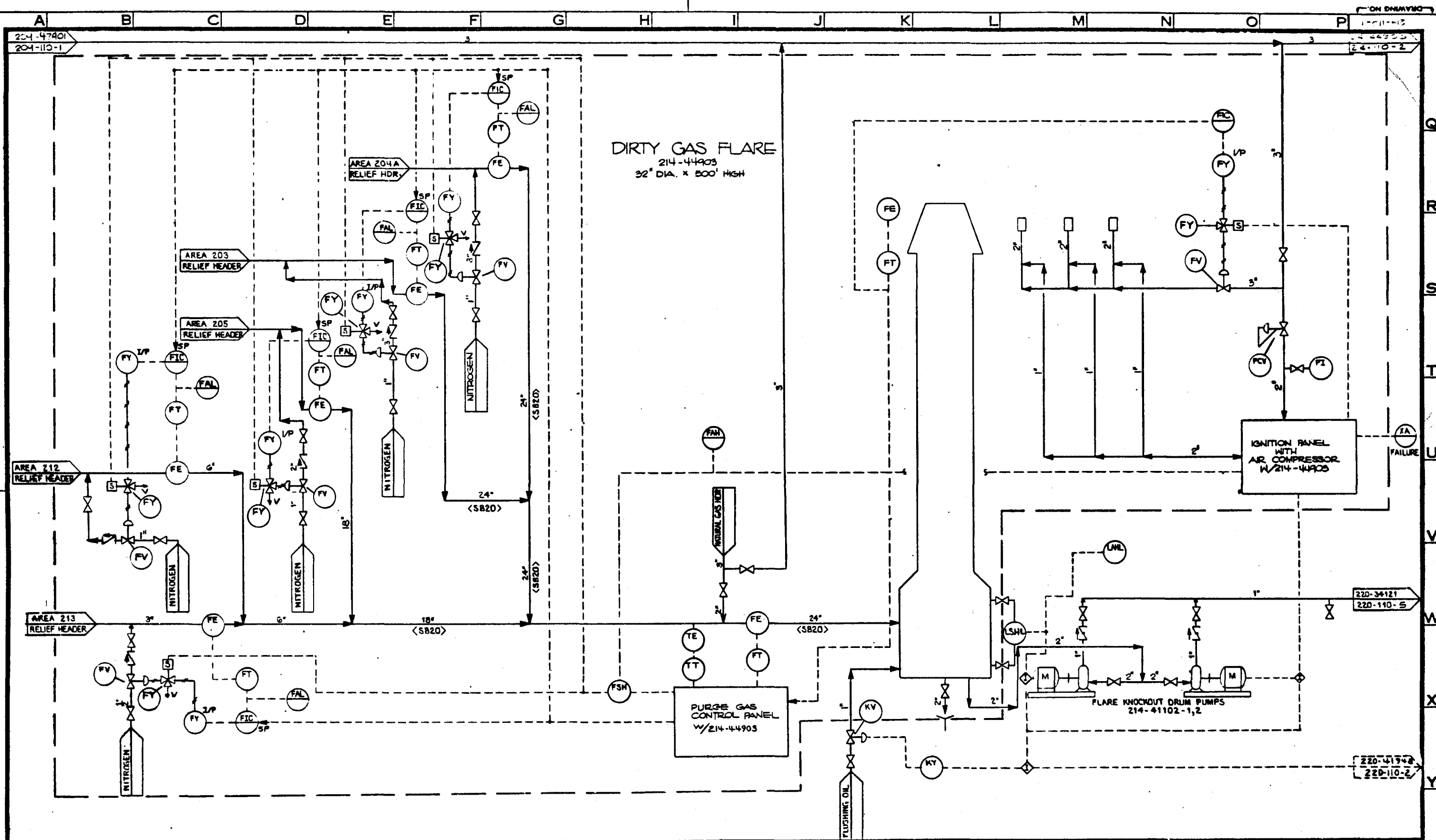
AREA 214 ILLINOIS #5 & 6 ENERGY BALANCE SUMMARY MM BTU/HR			AREA 214 PITTSBURGH #8 ENERGY BALANCE SUMMARY MM BTU/HR			AREA 214 WESTERN ENERGY BALANCE SUMMARY MM BTU/HR		
SERVICE	CONTRIBUTIONS		SERVICE	CONTRIBUTIONS		SERVICE	CONTRIBUTIONS	
ΔH _c	3.135		ΔH _c	12.963		ΔH _c	8.054	
0.58		2.62	2.68		11.08	1.35	6.68	
0		0			0		0	
0.01		1.56	0.03		6.39	0.03	3.90	
0.02		0.002	0.06		0.008	0.04	0.005	
0.05		0.004	0.13		0.009	0.13	0.018	
0.004		0.007	0.015		0.030	0.009		
0.39			1.63			0.99		
ENERGY IN	CONTRIBUTIONS	ENERGY OUT	ENERGY IN	CONTRIBUTIONS	ENERGY OUT	ENERGY IN	CONTRIBUTIONS	ENERGY OUT
1.054	3.135	4.189	4.545	12.963	17.508	2.549	8.054	10.603

REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D
1	11-12-79	HLJ	KMM/JWH	1	12-18-79	SOP	KMM/JWH	1	1-17-80	HLJ	KMM/JWH
2				2				2			
3				3				3			
4				4				4			
5				5				5			
6				6				6			
7				7				7			
8				8				8			
9				9				9			
10				10				10			

DRAWING STATUS				DRAWING STATUS			
DESIGNED	K. M.	11-12-79	ISSUED	DATE	12-18-79	FOR COMMENTS AND/OR APPROVAL	DATE
DRAWN	L. M. C.	12-18-79	FOR COMMENTS AND/OR APPROVAL	DATE	1-17-80	FOR CUSTOMER APPROVAL	DATE
CHECKED	H. L. J.	1-17-80	FOR CUSTOMER APPROVAL	DATE	2-15-80	AND/OR COMMENTS	DATE
DRAGO APP'D	C. J. C.	2-15-80	AND/OR COMMENTS	DATE		DOE APP'D	DATE
ICGB APP'D			DOE APP'D	DATE		SCALE	
DOE APP'D			SCALE			CONSTRUCTION	

TITLE	PROCESS FLOW DIAGRAM	PROJECT NO.	7051
	AREA 214 THERMAL OXIDIZER & FLARE	DRAWING NO.	214-100-1
	FLARE SYSTEM	CASE	DC
	U.S. DOE ENERGY TECHNOLOGY	REV.	
	FOSSIL ENERGY PROGRAMS		
	CONTRACT NO. EF-77-C-01-2012		
	PREPARED FOR THE		
	ILLINOIS COAL GASIFICATION GROUP		
	BY		
	DRAGO CORPORATION PITTSBURGH, PA.		

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



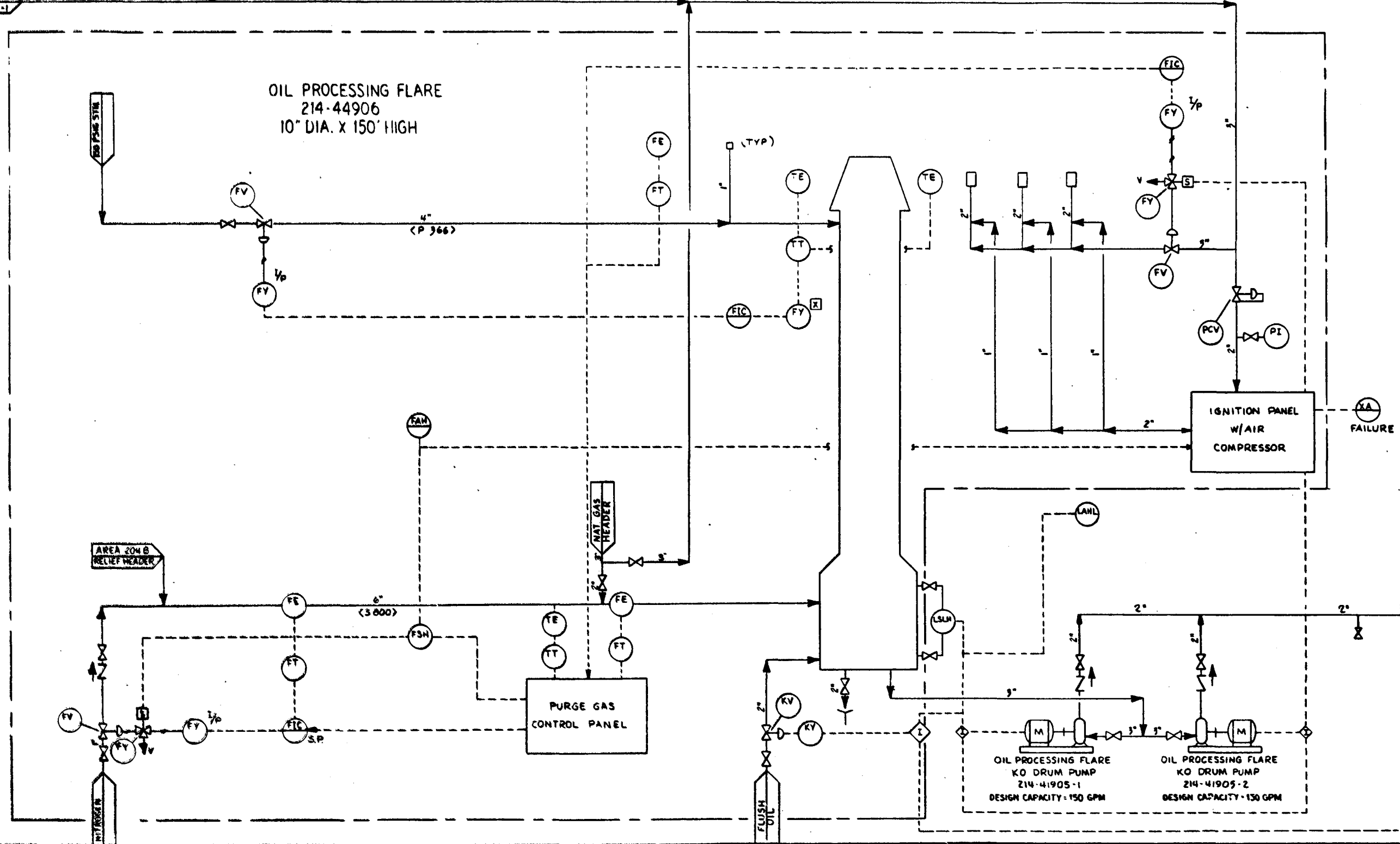
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	11-15-71	H.L.J.	K.M.W.	J.W.H.	1	11-15-71	H.L.J.	K.M.W.	J.W.H.	1	11-15-71	H.L.J.	K.M.W.	J.W.H.
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				
11					11					11				
12					12					12				
13					13					13				
14					14					14				
15					15					15				
16					16					16				
17					17					17				
18					18					18				
19					19					19				
20					20					20				
21					21					21				
22					22					22				
23					23					23				
24					24					24				
25					25					25				
26					26					26				

DESIGNED	BY	DATE	ISSUED	DATE
GLW	H.L.J.	11-15-71	DOE RECORD AND UFFD	4-9-80
CHECKED	H.L.J.	1-17-72	FOR COMMENTS AND/OR	
DRAWN APPD	S. J. W.	2-5-72	APPROVAL	
ICBG APPD			FOR CUSTOMER APPROVAL	ICBG
DOE APPD			AND/OR COMMENTS	DOE
SCALE			APPROVAL FOR	
			CONSTRUCTION	

P & I DIAGRAM AREA 214 - THERMAL OXIDIZER AND FLARE DIRTY GAS FLARE		PROJECT NO. 7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 214-110-1
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.		CASE C.C.
		REV A

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

200-47901
VIA E11-110-1

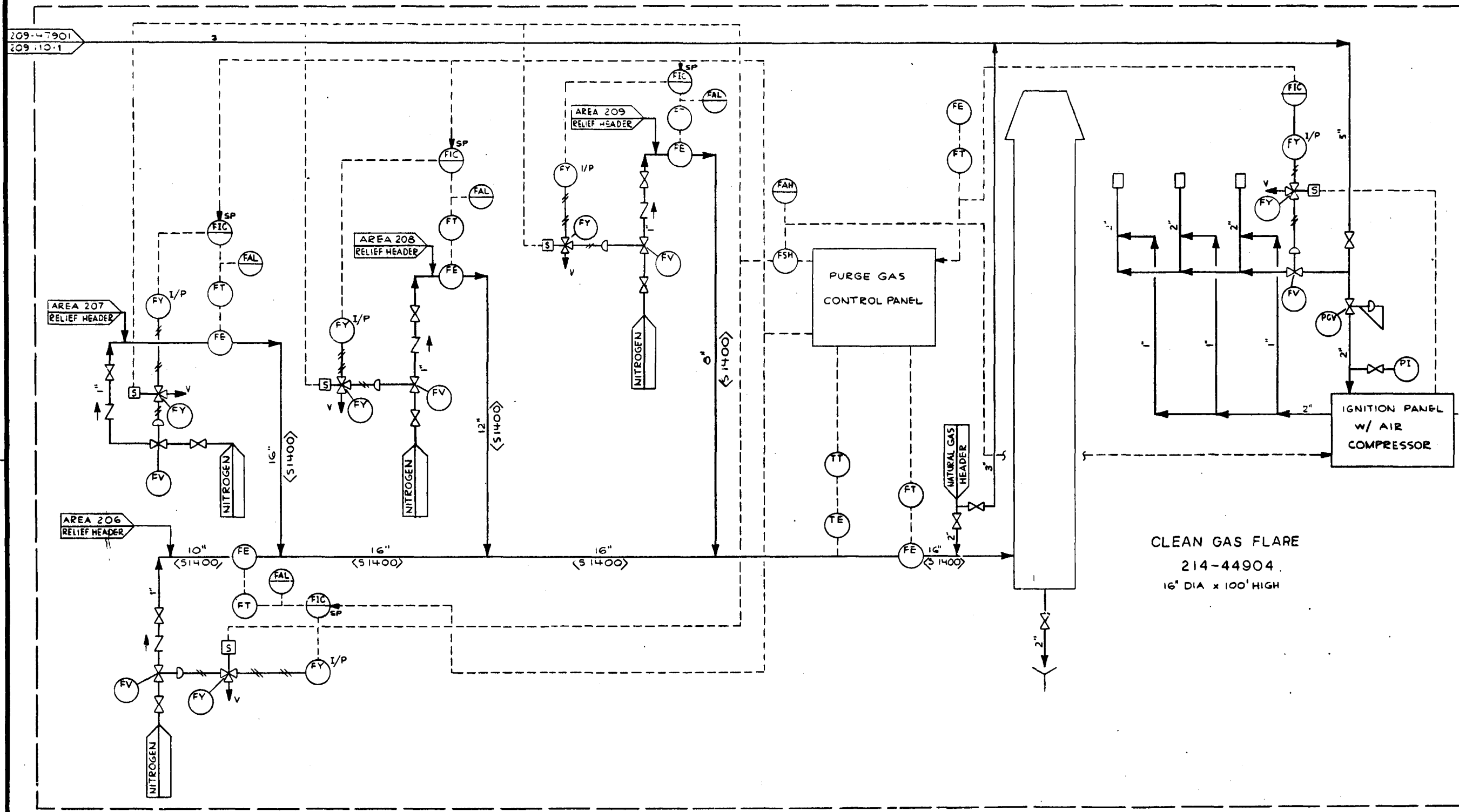


REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D
1	10-1-83	WJH		1	10-1-83	WJH		1	10-1-83	WJH	
2	10-1-83	WJH		2	10-1-83	WJH		2	10-1-83	WJH	
3	10-1-83	WJH		3	10-1-83	WJH		3	10-1-83	WJH	
4	10-1-83	WJH		4	10-1-83	WJH		4	10-1-83	WJH	
5	10-1-83	WJH		5	10-1-83	WJH		5	10-1-83	WJH	
6	10-1-83	WJH		6	10-1-83	WJH		6	10-1-83	WJH	
7	10-1-83	WJH		7	10-1-83	WJH		7	10-1-83	WJH	
8	10-1-83	WJH		8	10-1-83	WJH		8	10-1-83	WJH	
9	10-1-83	WJH		9	10-1-83	WJH		9	10-1-83	WJH	
10	10-1-83	WJH		10	10-1-83	WJH		10	10-1-83	WJH	

BY	DATE	DRAWING STATUS
DESIGNED	10-1-83	ISSUED
DRAWN	10-1-83	FOR RECORD AND APPROVAL
CHECKED	10-1-83	FOR COMMENTS AND/OR APPROVAL
DRAWN APPROVED	10-1-83	FOR CUSTOMER APPROVAL
DOE APPROVED	10-1-83	AND/OR COMMENTS
SCALE		APPROVAL FOR CONSTRUCTION

TITLE	P. I. DIAGRAM AREA 214 THERMAL OXIDIZER & FLARE OIL PROCESSING FLARE
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.

PROJECT NO.	7051
DRAWING NO.	214-110-2
CASE	5C
REV.	

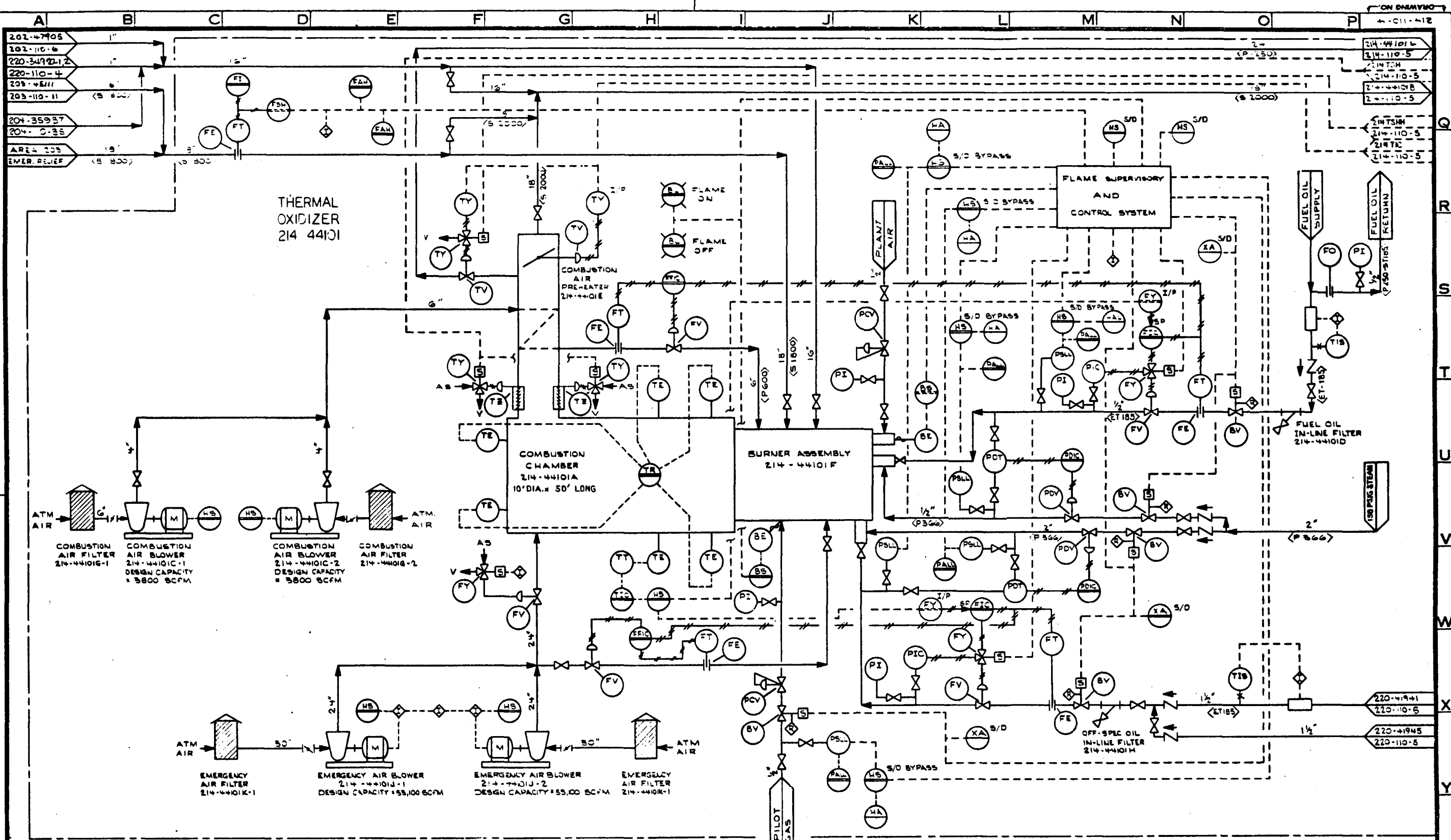


REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D
1	11-12-02	KMM/JWH		1	11-12-02	KMM/JWH		1	11-12-02	KMM/JWH	
2				2				2			
3				3				3			
4				4				4			
5				5				5			
6				6				6			
7				7				7			
8				8				8			
9				9				9			
10				10				10			

DESIGNED	BY	DATE	ISSUED	DATE
K.M.M.	K.M.M.	11-12-02		
DRAWN	S.E.P.	11-12-02	PDBP RECORD AND DPPE	4-9-03
CHECKED	HLJ	1-17-03	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D			FOR CUSTOMER APPROVAL	
ICGG APP'D			AND/OR COMMENTS	
DOE APP'D			APPROVAL FOR CONSTRUCTION	
SCALE				

TITLE	PROCESS DIAGRAM
AREA 214	THERMAL OXIDIZER & FLARE
CLEAN GAS FLARE	
U.S. DOE	ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS	
CONTRACT NO. EF-77-C-01-2012	
PREPARED FOR THE	
ILLINOIS COAL GASIFICATION GROUP	
BY	
DRAYO CORPORATION PITTSBURGH, PA	

PROJECT NO.	7051
DRAWING NO.	214-110-3
CASE	3C
REV.	



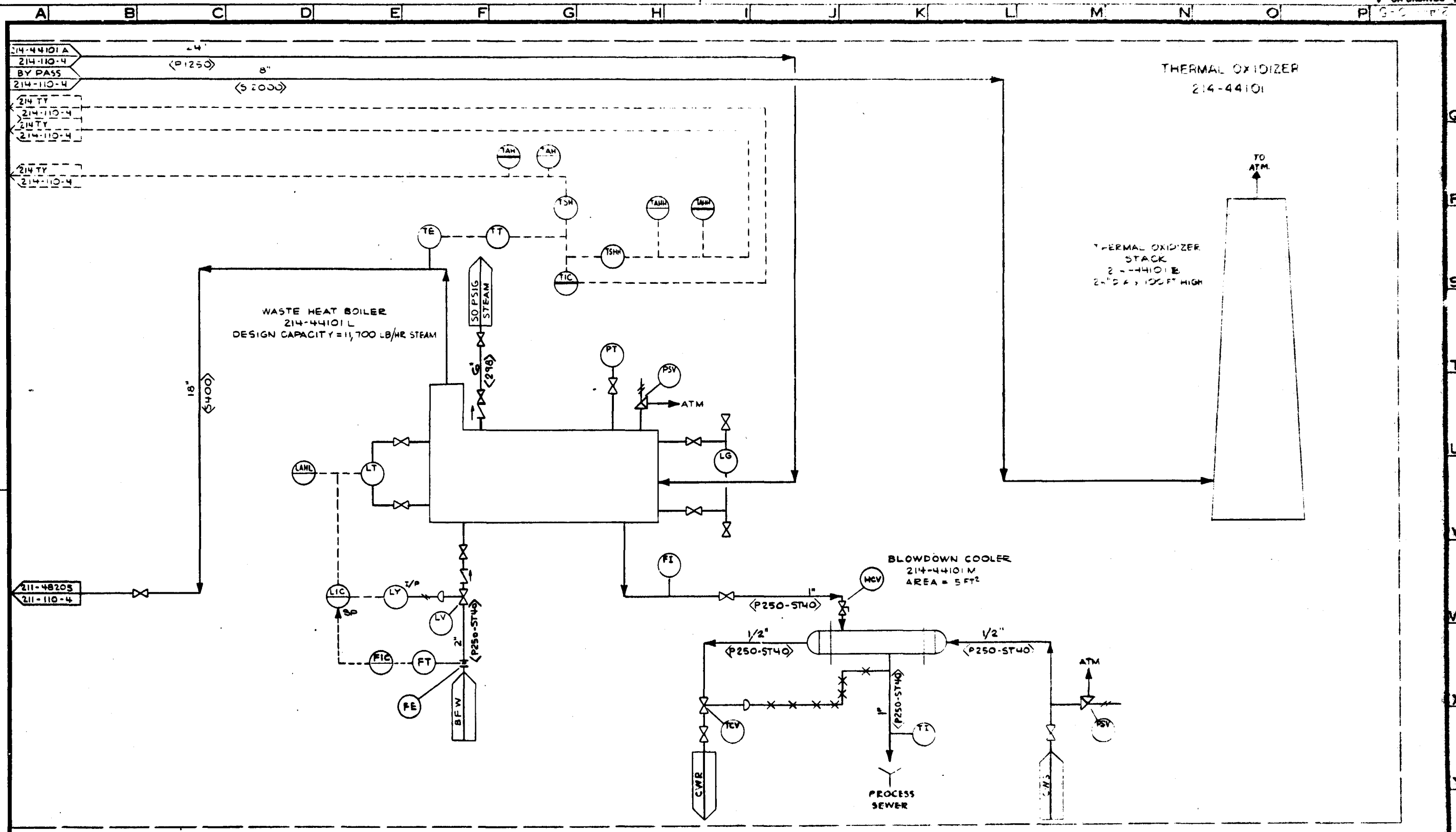
REVISIONS				REVISIONS				REVISIONS			
NO.	DESCRIPTION	DATE	BY	CHK'D	APP'D	NO.	DESCRIPTION	DATE	BY	CHK'D	APP'D
1	DC DEMONSTRATION CONCEPT	7/5/90	HLL	KMM	JWH	1	PRELIMINARY ISSUE FOR BASELINING	7/5/90	KMM	JWH	
2						2	FOR RECORD AND DEED	7/5/90	HLL	KMM	JWH
3						3					
4						4					
5						5					
6						6					
7						7					
8						8					
9						9					
10						10					

BY	DATE	DRAWING STATUS	DATE
DESIGNED	K M	ISSUED	7-5-90
DRAWN	KJR	FOR RECORD AND DEED	7-5-90
CHECKED	HLL	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D		FOR CUSTOMER APPROVAL	
ICGG APP'D		AND/OR COMMENTS	
DOE APP'D		APPROVAL FOR CONSTRUCTION	

TITLE	DCI DIAGRAM AREA 214 THERMAL OXIDIZER AND FLARE THERMAL OXIDIZER I
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP BY
DRAYO CORPORATION	PITTSBURGH, PA.

PROJECT NO	7051
DRAWING NO	214-110-4
CASE	DC
REV	

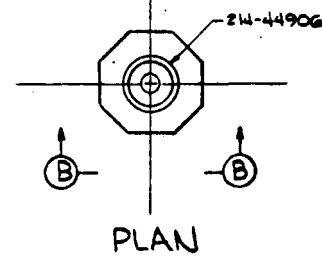
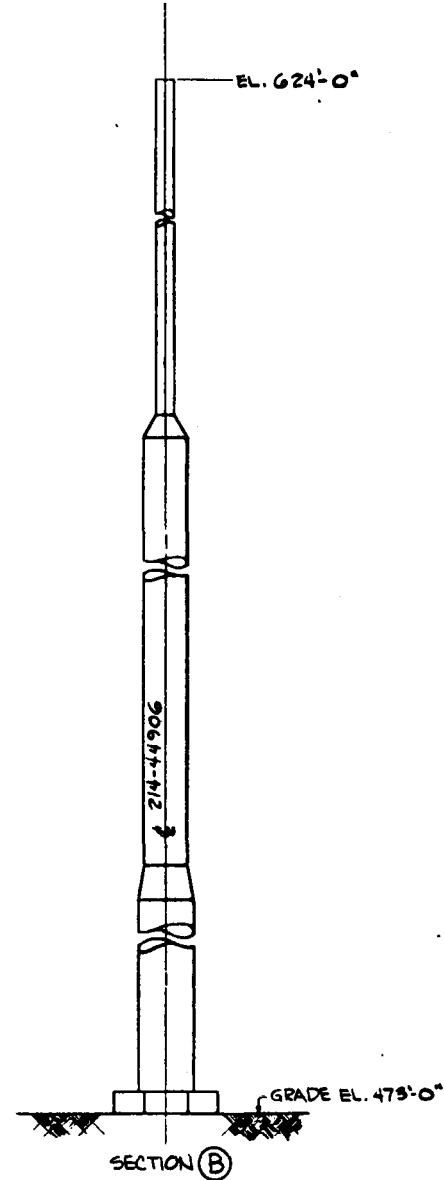
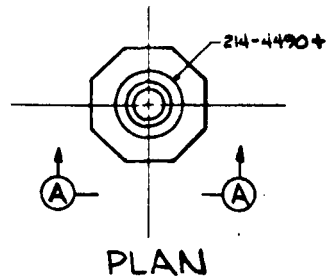
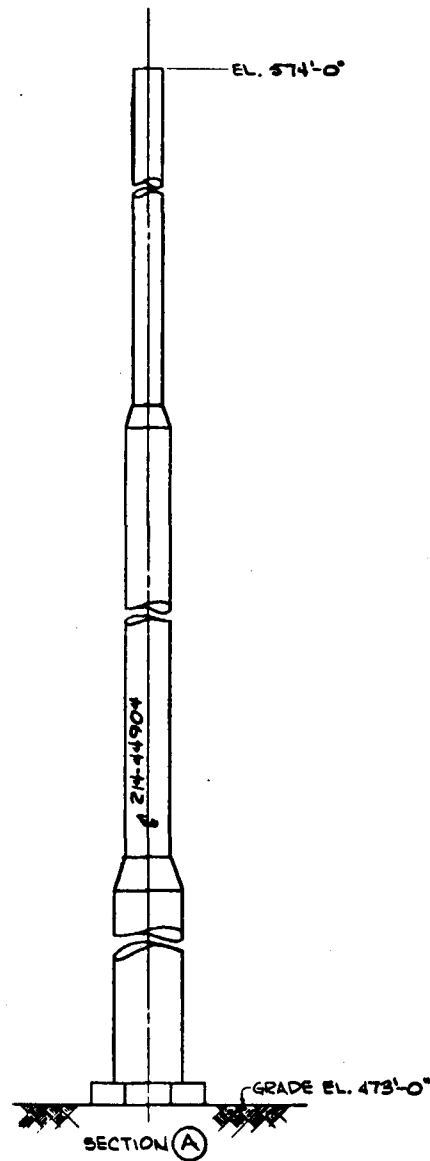
DO NOT SCALE THIS DRAWING IT MAY BE REDUCED FROM ORIGINAL SIZE.



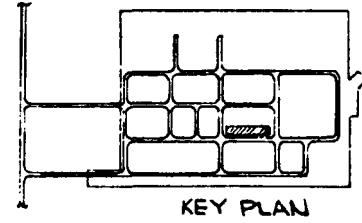
REVISIONS				REVISIONS				REVISIONS				DRAWING STATUS				TITLE AREA 214 THERMAL CYCLER AND FLARE THERMAL CYCLER II U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. E577-01-2010 PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DREVO CORPORATION PITTSBURGH PA		PROJECT NO. 7051 DRAWING NO. 214-110-5 CARE REV	
NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	NO.	DATE	BY	CHK'D	DESIGNED	BY	DATE	ISSUED			DATE	
1	12-14-80	KRM	JWH	1				1				1	12-14-80		12-14-80	12-14-80			
DC-DEMONSTRATION CONCEPT				PRELIMINARY ISSUE FOR BASELINING				FOR COMMENTS AND/OR APPROVAL				FOR COMMENTS AND/OR APPROVAL							

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REPLACED FROM ORIGINAL SIZE



EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
214-44904	FLARE
214-44906	FLARE



PRELIMINARY NOT APPROVED FOR CONSTRUCTION

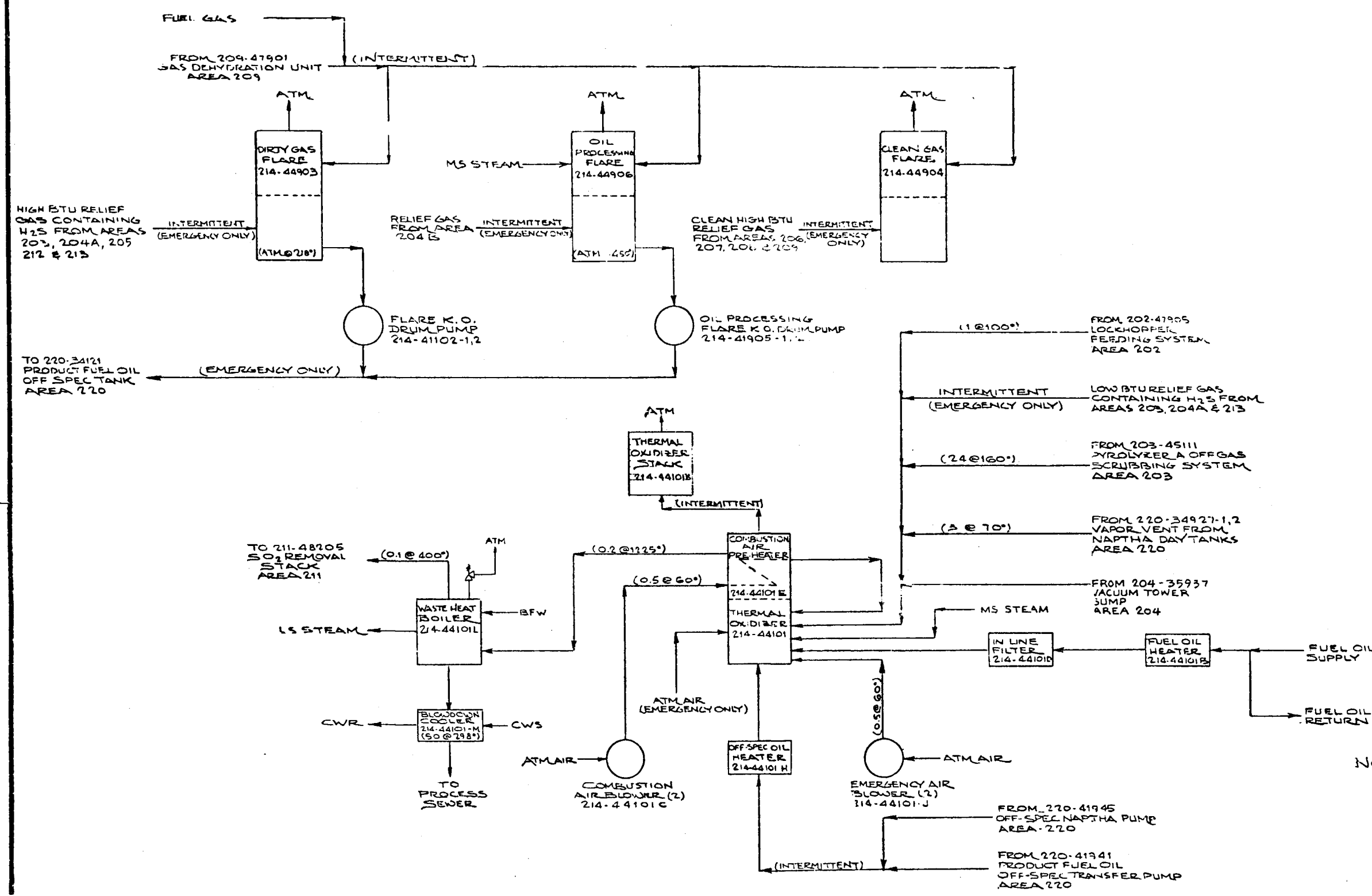
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10/1/12	JM												
2	10/1/12	JM												

BY		DATE		DRAWING STATUS	
DESIGNED				ISSUED	DATE
DRAWN	JORDAN	10/1/12		FOR DDPD REVIEW	10/1/12
CHECKED				FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D				FOR CUSTOMER APPROVAL	ICGG
ICGG APP'D				AND/OR COMMENTS	DOE
DOE APP'D				APPROVAL FOR CONSTRUCTION	
SCALE	1/4" = 1'-0"				

TITLE		PROJECT NO.
FLARE LAYOUT PLAN & SECTION		7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 214-200-1
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH PA		CASE DC
		REV.

DO NOT SCALE THIS DRAWING IT MAY BE REDUCED FROM ORIGINAL SIZE

"D"



NOTE:
STEAM DESIGNATIONS
SEE LOG. 200-100-0

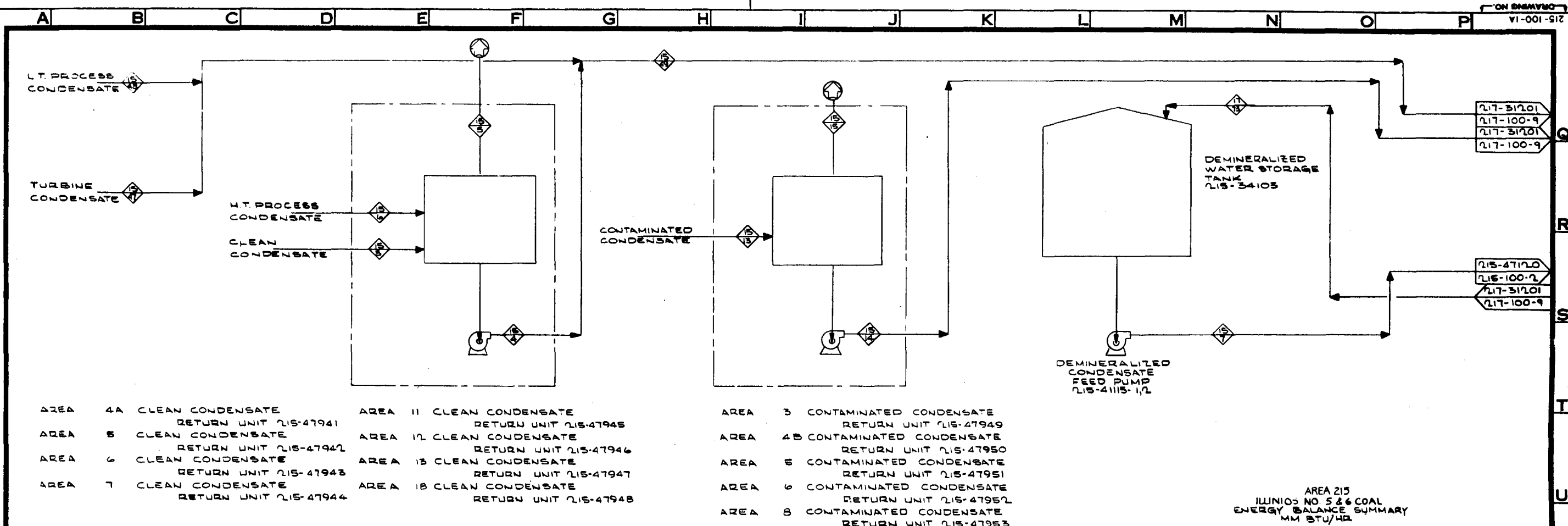
REVISIONS				REVISIONS				REVISIONS			
NO.	DESCRIPTION	DATE	BY	CHK'D	APP'D	NO.	DESCRIPTION	DATE	BY	CHK'D	APP'D
1	FOR DPPD	2/12/78	JVF	RB	CWB	2	FOR DPPD & TASK VI	4/7/78	JVF	RB	CWB
3	TASK VI	7/9/78	JVF	RB	CWB						
4	DPPD & TASK VI	7/9/78	JVF	RB	CWB						
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

DESIGNED	BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.
FOSTER	FOSTER	7-20-78	ISSUED	PRELIMINARY PRESSURE AND TEMPERATURE DIAGRAM AREA 214	7051
DRAWN	BURRITT	7-20-78	DPPD & TASK VI	FLARE STACKS AND THERMAL OXIDIZER	DRAWING NO.
CHECKED	RAJUN	8-11-78	FOR COMMENTS AND/OR APPROVAL		
DRAVO APP'D	RAJUN	8-11-78	FOR CUSTOMER APPROVAL		
ICGG APP'D	RAJUN	8-11-78	FOR CUSTOMER APPROVAL		
DOE APP'D			AND/OR COMMENTS		
SCALE			APPROVAL FOR CONSTRUCTION		

U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-CO-1-2012	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA	CASE "D" C	REV 2
--	---	------------	-------

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



MATERIAL	STREAM NO.	15-5	15-4	15-3	15-2	15-1	15-18	15-14	15-13	15-12	15-11	15-10	15-9	15-8	15-7	15-6	15-5	15-4	15-3	15-2	15-1
H ₂ O (LIQUID)		116087	127540		29370	46945		89942	69909		20055		68499	32331	228370						46945
H ₂ O (VAPOR)				17917						20055											
TOTAL POUNDS/HOUR		116087	127540	17917	29370	46945		89942	69909	20055			68499	32331	228370						46945
AVG MOLECULAR WEIGHT																					
ACFM				7851						8777											
GPM		271	212	0	57	958		215	146				159	68	476						938
PRESSURE, PSIG																					
TEMPERATURE, °F			212	212	330	160			212	212			125		187						160
ENTHALPY, MM BTU/HR		30.7	19.4	20.1	7.6	46.9		33.1	10.6	22.8			4.5	4.9	28.8						46.9

SERVICE	CONTRIBUTION	20.1
BFW TURBINE PUMPS - 8.1	4.8	10.6
FUEL OIL TO BOILER = 43.7	22.5	0.9
BOILER LOSSES = -1.7	28.8	0.1
BOILER BLOWDOWN UNIT = 0	0.0	0.0
	42.2	0.4
	308.7	297.4
	42.8	48.8
	72.4	45.5
NET ADDITION = 36.9		
ENERGY IN = 909.2		ENERGY OUT = 946.0

NO.	REVISIONS	DATE	BY	CHK'D	APPR	NO.	REVISIONS	DATE	BY	CHK'D	APPR	NO.	REVISIONS	DATE	BY	CHK'D	APPR	NO.	REFERENCE DRAWINGS	DESIGNED	BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.	
1	DC-DEMONSTRATION CONCEPT	1-24-80	SVM	KMM	JWH	1	PRELIMINARY ISSUE FOR BASELINING	1-24-80	SVM	KMM	JWH	1	PDBP RECORD AND DPPD	1-24-80	SVM	KMM	JWH	1			5VM		1-24-80	ISSUED	PROCESS FLOW DIAGRAM AREA 215 UTILITIES CONDENSATE RETURN	7051
																									7051	
																									DRAWING NO.	
																									215-100-1A	
																									CASE	
																									DC	

"D"

DO NOT SCALE THIS DRAWING. IT MAY BE REDUCED FROM ORIGINAL SIZE.

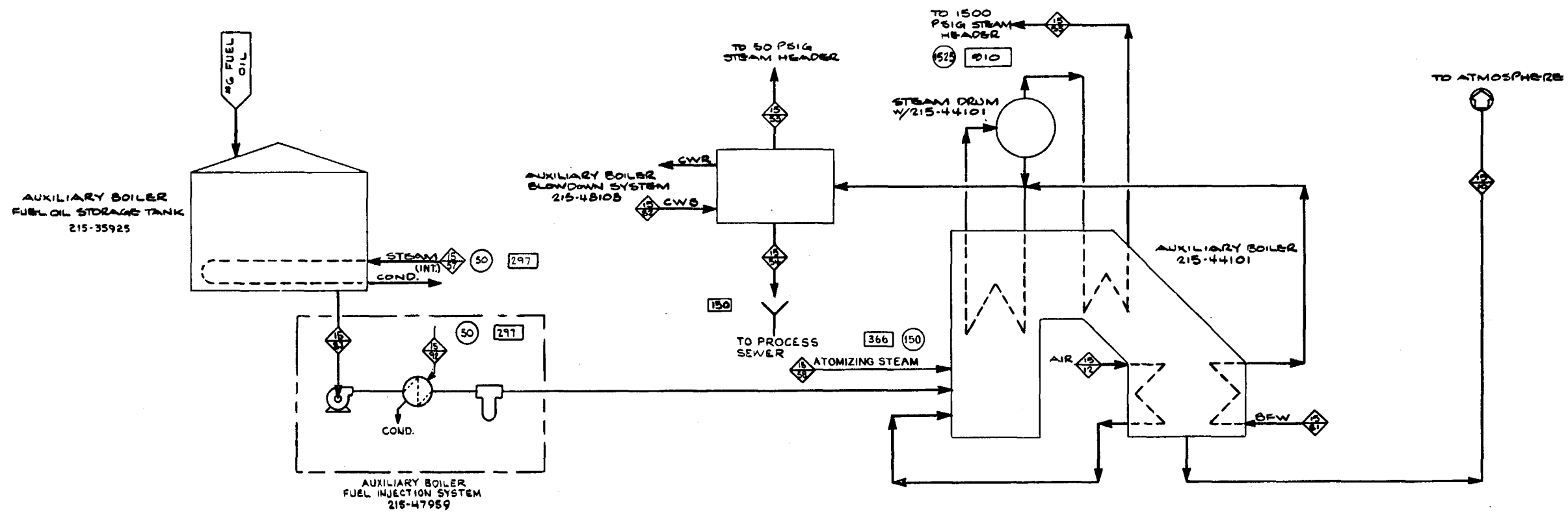
MATERIAL	STREAM No.	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504
----------	------------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

TITLE	PROCESS FLOW DIAGRAM AREA 215 UTILITIES DEAERATION	PROJECT NO. 7051 DRAWING NO. 215-100-2A
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE DC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.		REV. 

[illegible]

BY		DATE	DRAWING STATUS	
DESIGNED	S.V.M.	6/19/79	ISSUED	DATE
DRAWN	CHE M O T	6/26/79	PDBP RECORD AND DPPE	2-15-80
CHECKED	R.M.M.	6/27/79	FOR COMMENTS AND/OR	
DRAWN APP'D	C. W. Baughen	2-15-80	APPROVAL	
ICGG APP'D	20/2/80	2-15/80	FOR CUSTOMER APPROVAL	ICGG <i>RO</i>
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
			CONSTRUCTION	
SCALE	<i>H</i>			

PROJECT NO.	7051
DRAWING NO.	215-100-28
CASE	CC
REV.	



MATERIAL	STREAM No.	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
ILLINOIS NO. 5 & 6 POUNDS/HOUR								TO HEADER	(INT.)			#6 FUEL OIL	
C													
H													
N													
S													
O													
OIL													
CO ₂		7958											
CO													
H ₂ O		2297	219			115	185	30,000		50	30,300	1500	2488
CH ₄													62
H ₂ S													
SO ₂		6.4											
NH ₃													
Ar													
O ₂		1130	8678										
N ₂		28369	28369										
TOTAL POUNDS/HOUR		39960	37466			115	185	30,000		50	30,300	1500	2488
AVG. MOLECULAR WEIGHT		29.4	28.9										
ACFM		14096	9269					139					
GPM											64	3	5
PRESSURE, PSIG						60		1525		150			50
TEMPERATURE, °F		300	60			308	150	910		366	228	95	60
ENTHALPY MM BTU/LB		4.8	0			0.1	0	42.2		0	5.1	0	0

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	DC DEMONSTRATION PLANT BASELINE	6/19/79	KM	CSK	ERD	1	PRELIMINARY ISSUE	6/19/79	SYM	KMM	JWH	1	FOR BASELINING	6/26/79	SYM	KMM	JWH
2	DC DEMONSTRATION PLANT CONCEPT	6/26/79	SYM	KMM	JWH	2	PDBP RECORD AND DPPD	6/26/79	SYM	KMM	JWH	2					
3						3						3					
4						4						4					
5						5						5					
6						6						6					
7						7						7					
8						8						8					
9						9						9					
10						10						10					
11						11						11					
12						12						12					
13						13						13					
14						14						14					
15						15						15					
16						16						16					
17						17						17					
18						18						18					
19						19						19					
20						20						20					
21						21						21					
22						22						22					
23						23						23					
24						24						24					
25						25						25					
26						26						26					
27						27						27					
28						28						28					
29						29						29					
30						30						30					
31						31						31					
32						32						32					
33						33						33					
34						34						34					
35						35						35					
36						36						36					
37						37						37					
38						38						38					
39						39						39					
40						40						40					
41						41						41					
42						42						42					
43						43						43					
44						44						44					
45						45						45					
46						46						46					
47						47						47					
48						48						48					
49						49						49					
50						50						50					
51						51						51					
52						52						52					
53						53						53					
54						54						54					
55						55						55					
56						56						56					
57						57						57					
58						58						58					
59						59						59					
60						60						60					
61						61						61					
62						62						62					
63						63						63					
64						64						64					
65						65						65					
66						66						66					
67						67						67					
68						68						68					
69						69						69					
70						70						70					
71						71						71					
72						72						72					
73						73						73					
74						74						74					
75						75						75					
76						76						76					
77						77						77					
78						78						78					
79						79						79					
80						80						80					
81						81						81					
82						82						82					
83						83						83					
84						84						84					
85						85						85					
86						86						86					
87						87						87					
88						88						88					
89						89						89					
90						90						90					
91						91						91					
92						92						92					
93						93						93					
94						94						94					
95						95						95					
96						96						96					
97						97						97					
98						98						98					
99						99						99					
100						100						100					

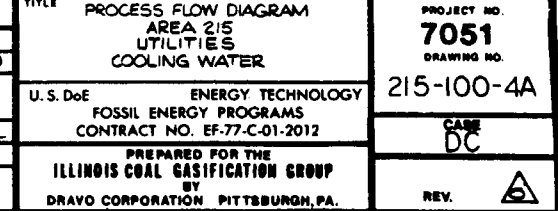
BY	DATE	DRAWING STATUS	
DESIGNED	SYM 6/19/79	ISSUED	DATE
DRAWN	CHENOT 6/26/79	PDBP RECORD AND DPPD	2-15-80
CHECKED	K.M.M. 6/26/79	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D	CW B. 7-15-80	FOR CUSTOMER APPROVAL	
ICGG APP'D	6/26/79	ICGG	6/26/79
DOE APP'D		AND/OR COMMENTS	DOE
SCALE 1/4" = 1'-0"		APPROVAL FOR CONSTRUCTION	

TITLE	PROCESS FLOW DIAGRAM AREA 215 UTILITIES AUXILIARY BOILER	PROJECT NO 7051 DRAWING NO
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-212	215-100-3A
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.		CASE DC
		REV.

MATERIAL	STREAM No.	19 10	19 18					19 23	19 24	19 25	TO HEADER	19 27	19 28		19 31	19 32	19 33	19 32
WESTERN SUB-BITUMINOUS POUNDS / HOUR												(INT.)				#6 FUEL OIL		
C																		
H																		
N																		
S																		
O																		
ASH																		
OIL																		
CO ₂		15368																
CO																		
H ₂ O		4895	434					229	368	59691		50			60288	2500	4950	12.2
CH ₄																		
H ₂ S																		
SO ₂																		
NH ₃																		
Air																		
O ₂		2238	17183															
N ₂		56568	56526															
TOTAL POUNDS/HOUR		79069	74143					229	368	59691		50			60288	2500	4950	12.2
AVG. MOLECULAR WEIGHT		29.4	28.9															
ACFM		27891	18349												127			
GPM																5	10	
PRESSURE, PSIG								60		1525		150						50
TEMPERATURE, °F		300	60					308	150	910		366			228	85	60	297
ENTHALPY, MMBTU/HOUR		9.6	0					0.3	0	84.0		0			10.1	0	0	0

BY		DATE	DRAWING STATUS	
DESIGNED	SVM	6-23-79	ISSUED	DATE
DRAWN	JLG	6-24-79	PDPB RECORD AND DPPD	2-15-80
CHECKED	KMM	6-15-79	FOR COMMENTS AND/OR	
DRAWO APP'D	Cal/...	2-15-80	APPROVAL	
ICGB APP'D	RB Cooper	2-15-80	FOR CUSTOMER APPROVAL	ICGB
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
SCALE			CONSTRUCTION	

"D"

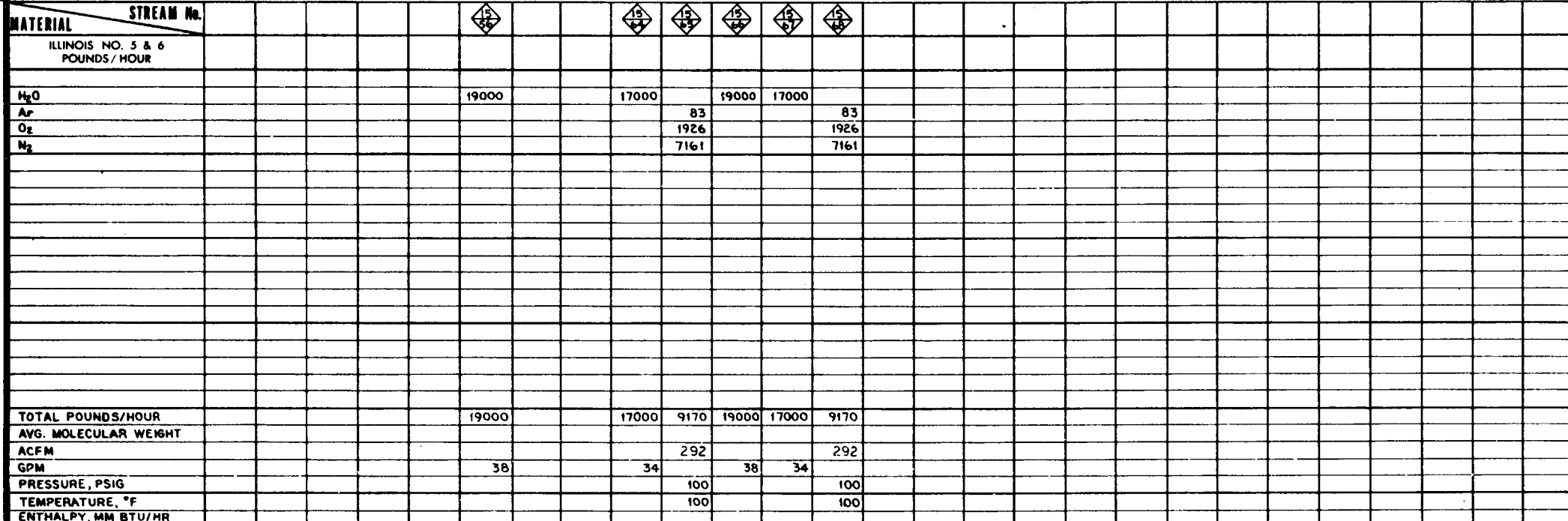


Q
R
S
T
U
V
W
X
Y
Z

V
W
X
Y
Z

BY		DATE	DRAWING STATUS	
DESIGNED	S.N.M.	6-18-79	ISSUED	DATE
DRAWN	CHEVOT	6-26-79	PDBP RECORD AND DDPD	2-15-80
CHECKED	K.M.M.	1-28-80	FOR COMMENTS AND/OR	
DRAWN APP'D	<i>Gov. [Signature]</i>	2-15-80	APPROVAL	
ICGG APP'D	<i>C.D. [Signature]</i>	2-15-80	FOR CUSTOMER APPROVAL	ICGG <i>2-15-80</i>
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR	
SCALE	<i>1/4" = 1'-0"</i>		CONSTRUCTION	

Z



	BY	DATE	DRAWING STATUS	
DESIGNED	SVM	8-1-79	ISSUED	DATE
DRAWN	JANNACCHIONE	8-8-79	PDBP RECORD AND DPPD	2-15-80
CHECKED	KMM	1-26-80	FOR COMMENTS AND/OR	
DRAW APPD	<i>Cal</i>	2-15-80	APPROVAL	
ICGG APPD	<i>Cal</i>	2-15-80	FOR CUSTOMER APPROVAL	ICGG <i>Cal</i>
DoE APPD			AND/OR COMMENTS	DoE
			APPROVAL FOR	
SCALE	<i>H</i>		CONSTRUCTION	

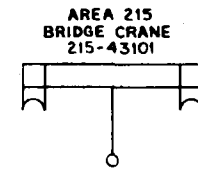
DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

Q
R
S
T
U
V
W
X
Y
Z

V
W
X
Y
Z

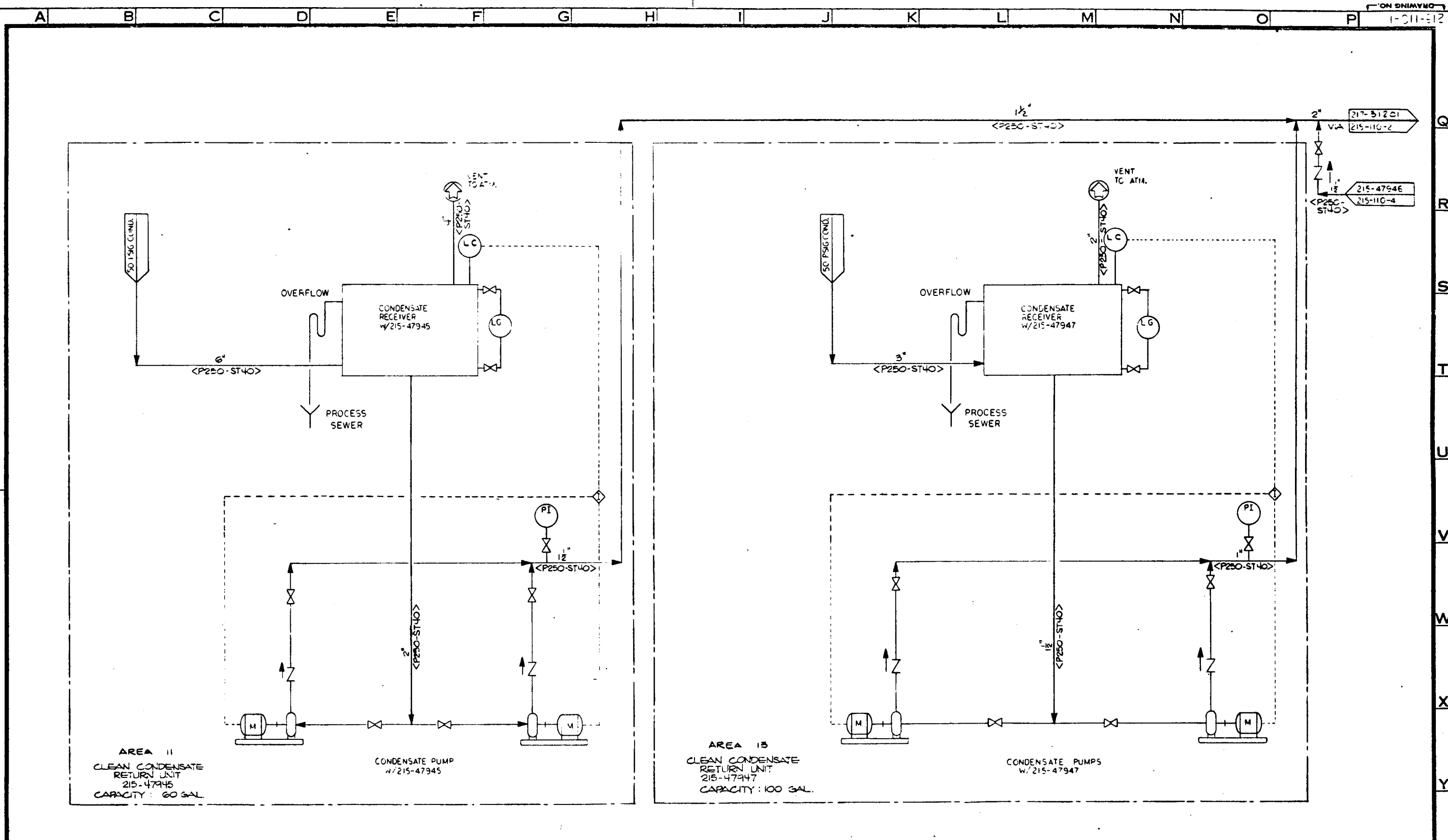
BY		DATE	DRAWING STATUS	
DESIGNED	SVH	6-18-77	ISSUED	DATE
DRAWN	W. CLOVER	1-23-80	PDBP RECORD AND DPPD	2-15-80
CHECKED	KMM	1-26-80	FOR COMMENTS AND/OR	
DRAWN APP'D	W. C. Clover	2-15-80	APPROVAL	
ICGG APP'D	W. C. Clover	2-15-80	FOR CUSTOMER APPROVAL	ICGG <i>rac</i>
DOE APP'D			AND/OR COMMENTS	DOE
SCALE			APPROVAL FOR CONSTRUCTION	

TITLE PROCESS FLOW DIAGRAM AREA-215 UTILITIES PLANT & INSTRUMENT AIR	PROJECT NO. 7051 DRAWING NO. 215-100-58
	U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA	CASE DC REV. 



	BY	DATE	DRAWING STATUS	
DESIGNED	SVM	8-7-79	ISSUED	DATE
DRAWN	IANNACCHIONE	8-7-79	POB RECORD AND DPPP	2-15-80
CHECKED	KMM	1-24-80	FOR COMMENTS AND/OR APPROVAL	
DRAW APP'D	<i>W. Seng</i>	2-15-80		
ICGG APP'D	<i>W. Seng</i>	2-15-80	FOR CUSTOMER APPROVAL	ICGG <i>W. Seng</i>
DOE APP'D			AND/OR COMMENTS	DOE
			APPROVAL FOR CONSTRUCTION	
SCALE	<i>H</i>			

TITLE PROCESS FLOW DIAGRAM AREA 215 UTILITIES EMERGENCY POWER GENERATOR	PROJECT NO. 7051
	DRAWING NO. 215-100-6
U. S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE DC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.	REV. 



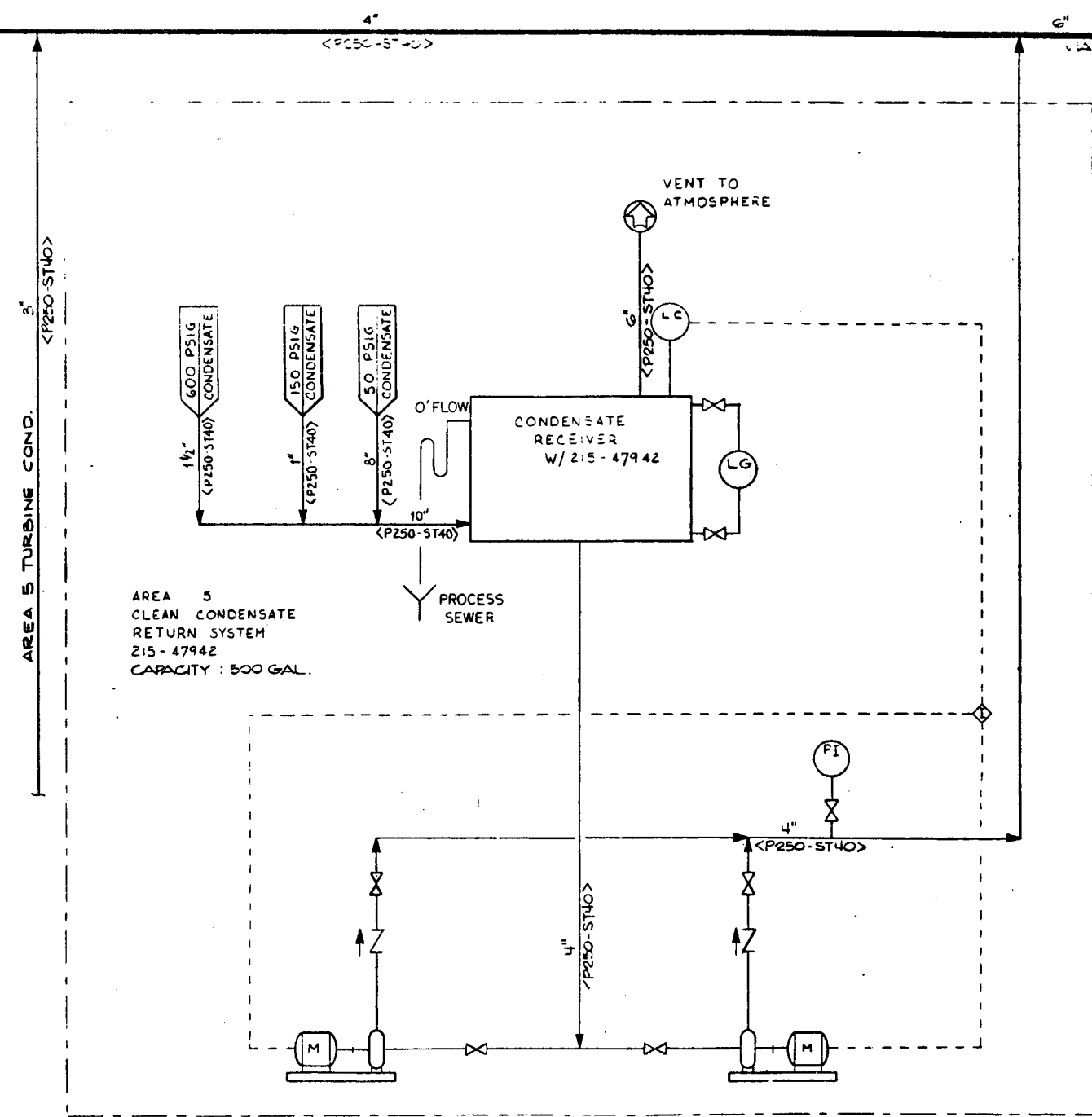
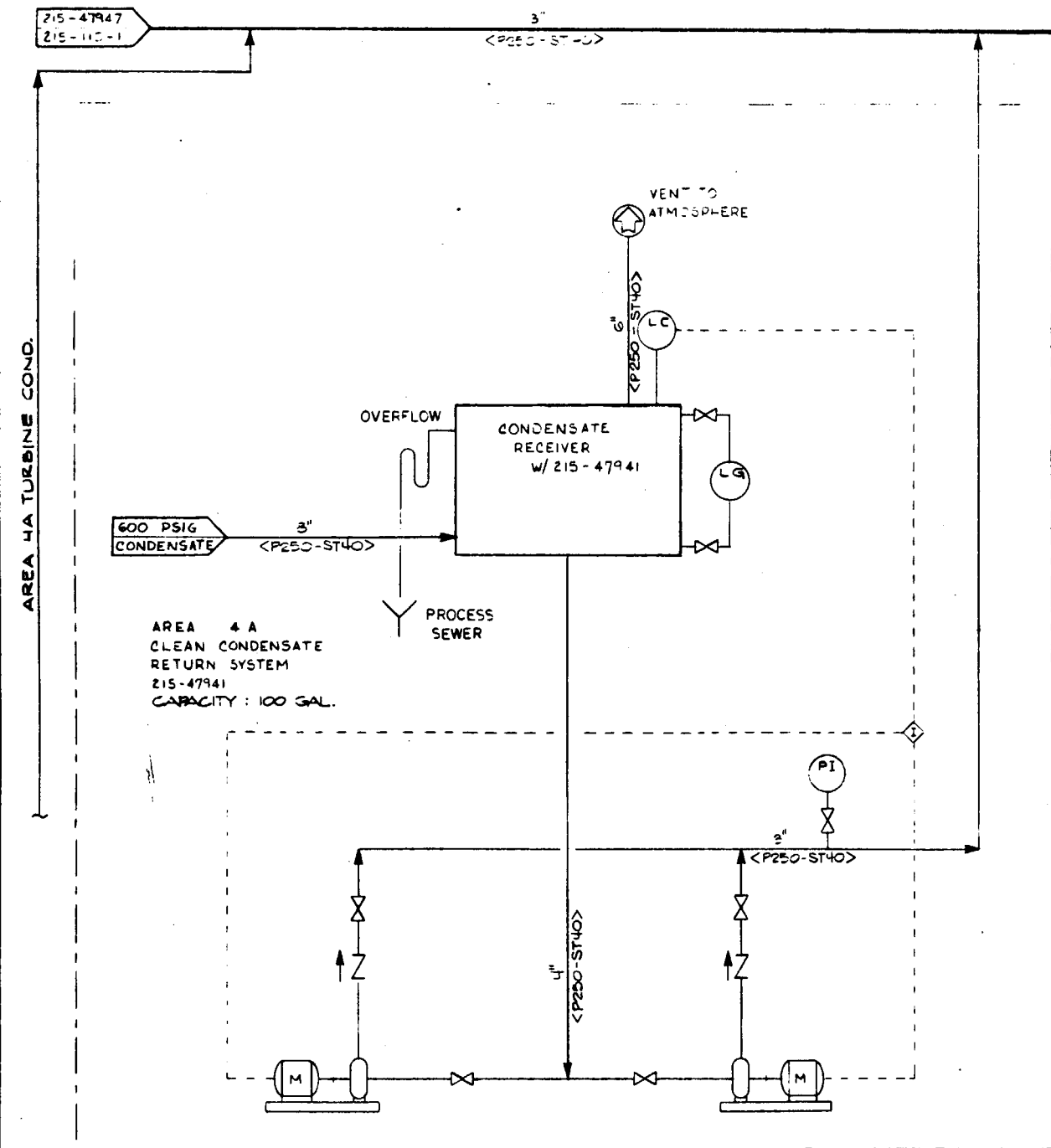
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHKD	APP'D	NO.	DATE	BY	CHKD	APP'D	NO.	DATE	BY	CHKD	APP'D
1					1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	SV 12	12-05	ISSUED		DATE
DRAWN	SV 12		FOR RECORD AND OPRD	4-15-20	
CHECKED	SV 12		FOR COMMENTS AND/OR		
DRAGO APP'D	SV 12		APPROVAL		
ICGG APP'D	SV 12		FOR CUSTOMER APPROVAL	ICGG	
DOE APP'D	SV 12		AND/OR COMMENTS	DOE	
SCALE			APPROVAL FOR CONSTRUCTION		

TITLE	DEL DIAGRAM	PROJECT NO	7051
AREA 215 UTILITIES		DRAWING NO	
CLEAN CONDENSATE RETURN SYSTEMS I			
U.S. DOE ENERGY TECHNOLOGY		215-110-1	
FOSSIL ENERGY PROGRAMS		CASE	
CONTRACT NO. EF-77-C-01-2012		REV.	
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.			

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DC DEMONSTRATION CONCEPT	4-15-20	SVM	KMM	JWH	1	PRELIMINARY ISSUE FOR BASELINING	4-15-20	SVM	KMM	JWH	1	FOR RECORD AND UFG	4-15-20	SVM	KMM	JWH
2						2						2					
3						3						3					
4						4						4					
5						5						5					
6						6						6					
7						7						7					
8						8						8					
9						9						9					
10						10						10					

BY		DATE	DRAWING STATUS	
DESIGNED	SVM	4-15-20	ISSUED	DATE
DRAWN	LG	4-15-20	FOR RECORD AND UFG	4-15-20
CHECKED	KMM	4-15-20	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D	SVM	4-15-20	FOR CUSTOMER APPROVAL	ICGG
ICGG APP'D	SVM	4-15-20	AND/OR COMMENTS	DOE
DOE APP'D			APPROVAL FOR CONSTRUCTION	
SCALE				

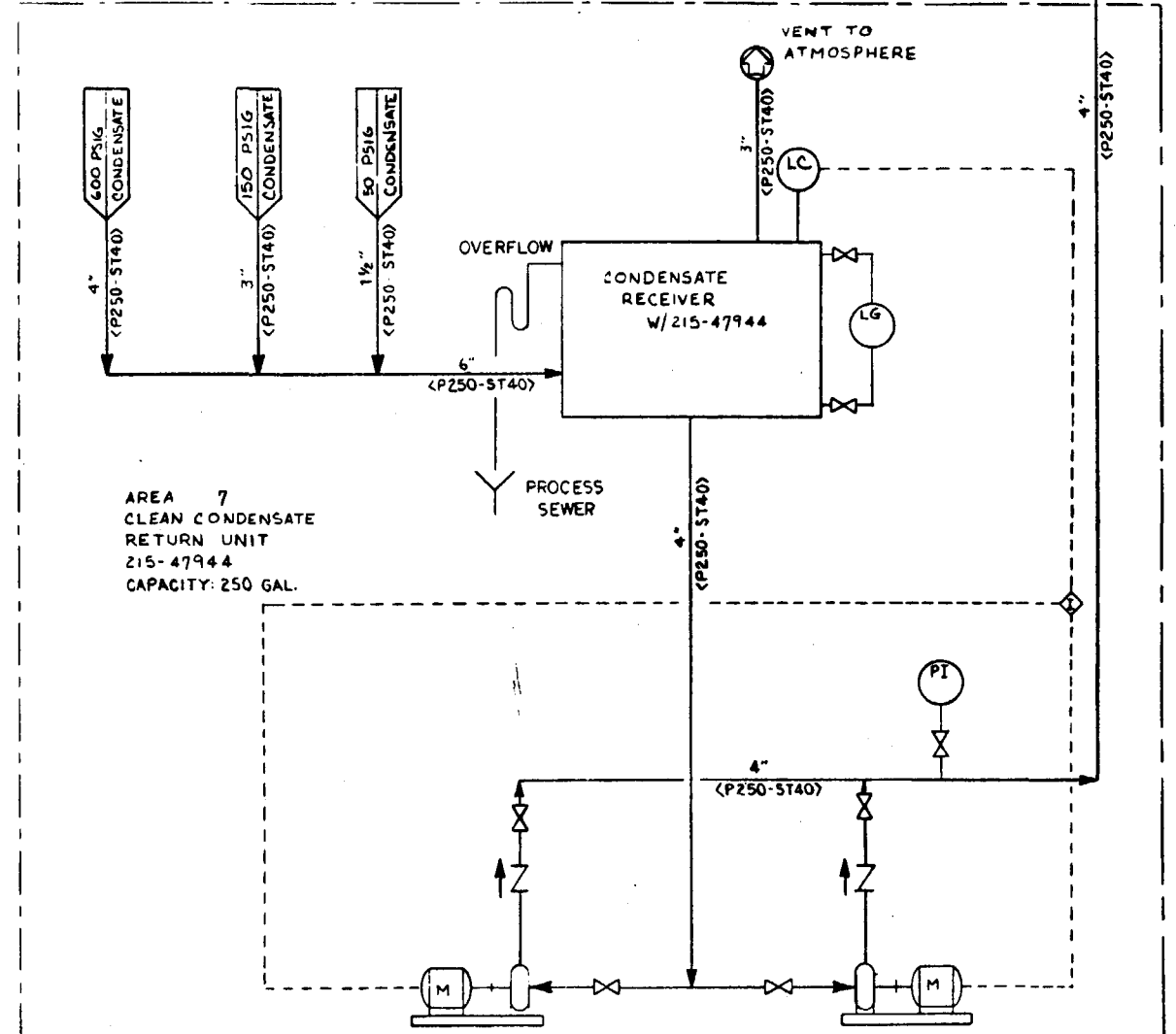
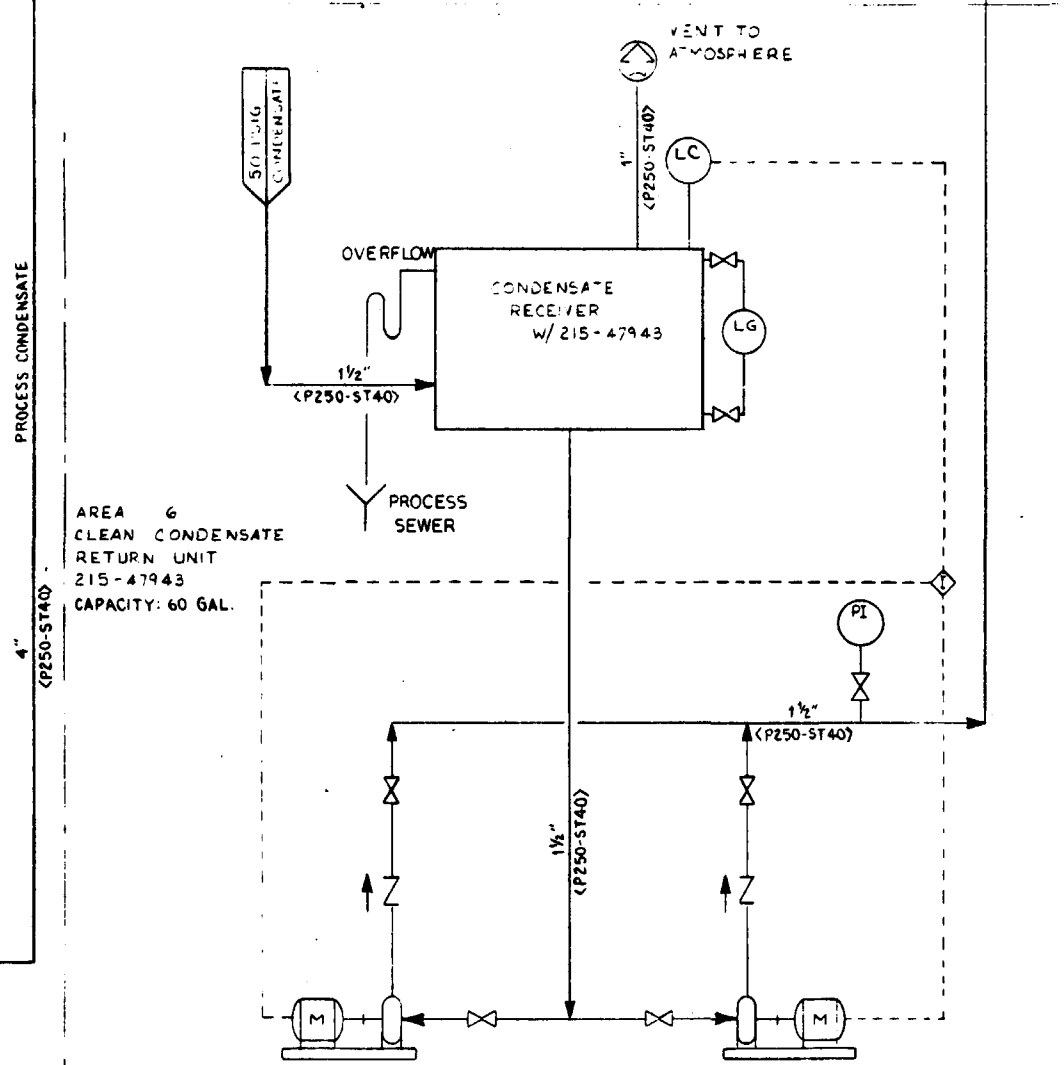
TITLE	P&I DIAGRAM	PROJECT NO.	7051
AREA 215	UTILITIES	DRAWING NO.	215-110-2
CLEAN CONDENSATE RETURN SYSTEMS II		CASE	60
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS	REV.	
CONTRACT NO. EF-77-C-01-2012			
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP			
BY DRAVO CORPORATION PITTSBURGH, PA.			

215-47942
215-110-2

207-41903
207-110-17

207-35502
207-110-14

NO.	REVISIONS	DATE	BY	CHKD	APPD	NO.	REVISIONS	DATE	BY	CHKD	APPD
1	DC DEMONSTRATION CONCEPT	11-14-12	SYM	KMM	JWH	1	PRELIMINARY ISSUE	11-14-12	SYM	KMM	JWH
2						2	FOR BASELINING	11-15-12	SYM	KMM	JWH
3						3	PDBF RECORD AND OPFD	11-15-12	SYM	KMM	JWH
4											
5											
6											
7											
8											
9											
10											



DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.

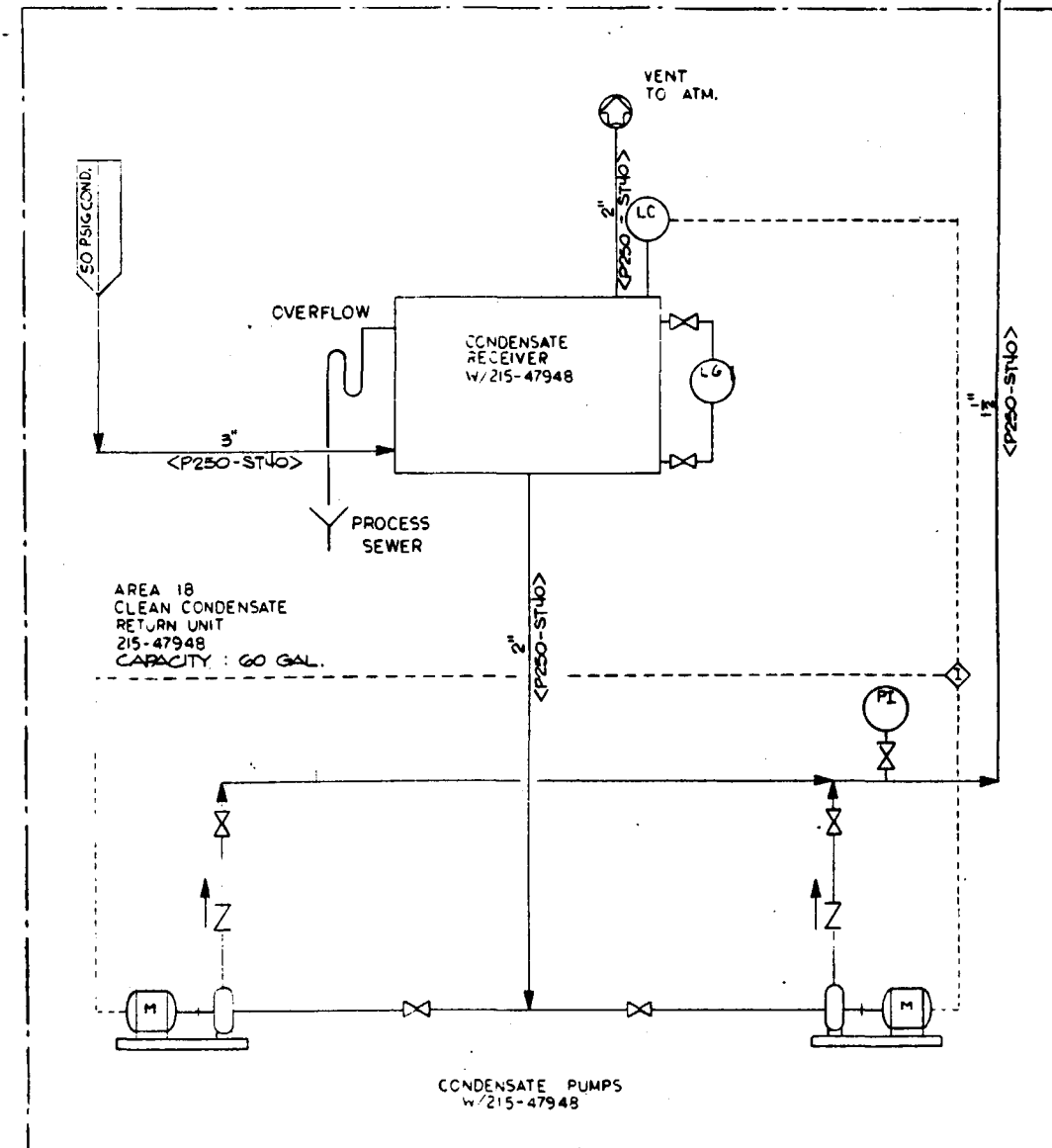
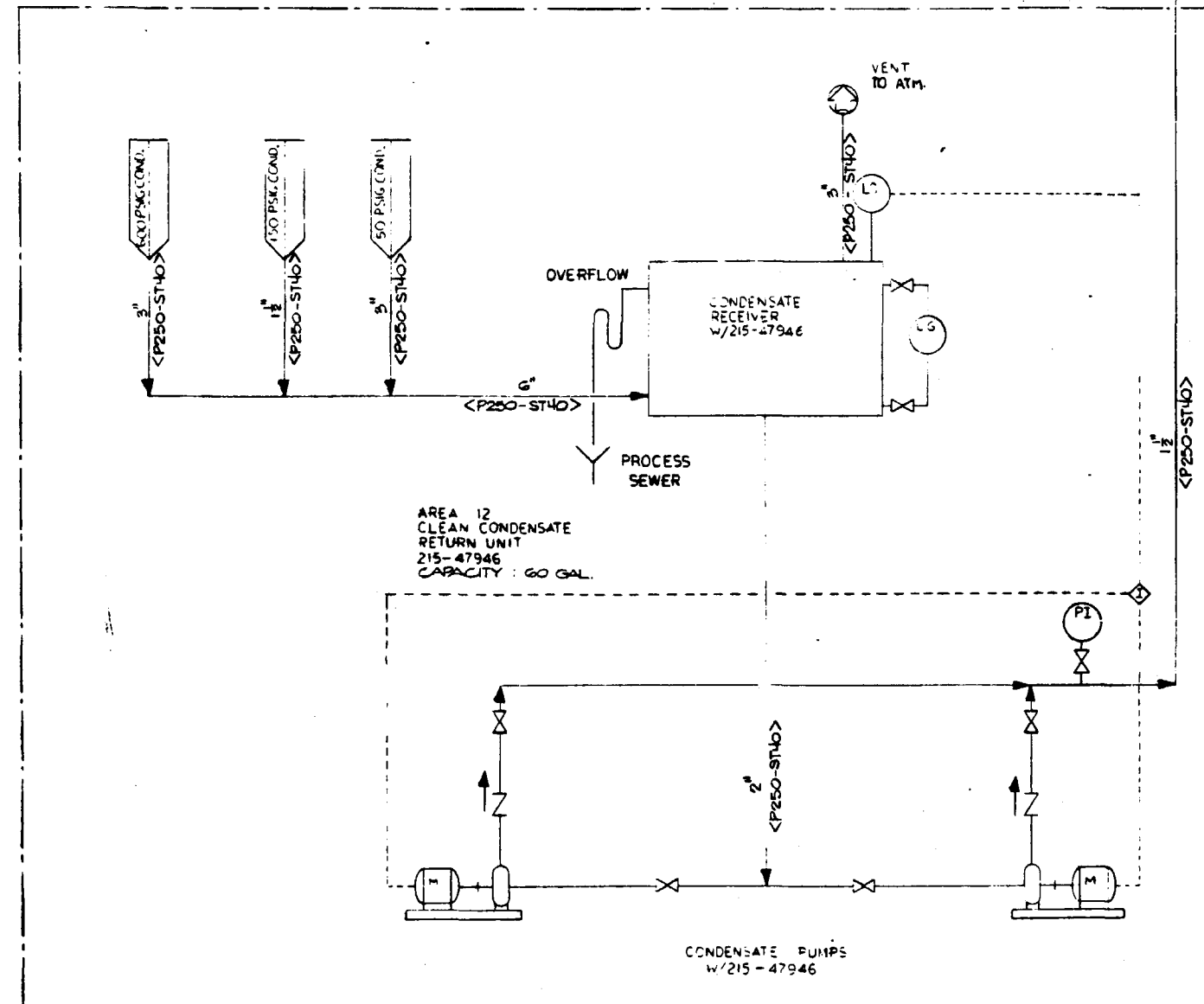
BY	DATE	DRAWING STATUS	TITLE	PROJECT NO
DESIGNED	SYM	11-14-12	ISSUED	DATE
DRAWN	JLG	11-15-12	PDBF RECORD AND OPFD	4-15-80
CHECKED	KMM	11-15-12	FOR COMMENTS AND/OR APPROVAL	
DRAGO APPD			FOR CUSTOMER APPROVAL	ICGG
ICGG APPD			AND/OR COMMENTS	DOE
DOE APPD			APPROVAL FOR CONSTRUCTION	
SCALE				

U.S. DoE FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA	PROJECT NO 7051 DRAWING NO 215-110-3 CASE DC REV C
--	--	--

215-47944
215-110-3

217-31201
217-110-13

215-47947
215-110-1

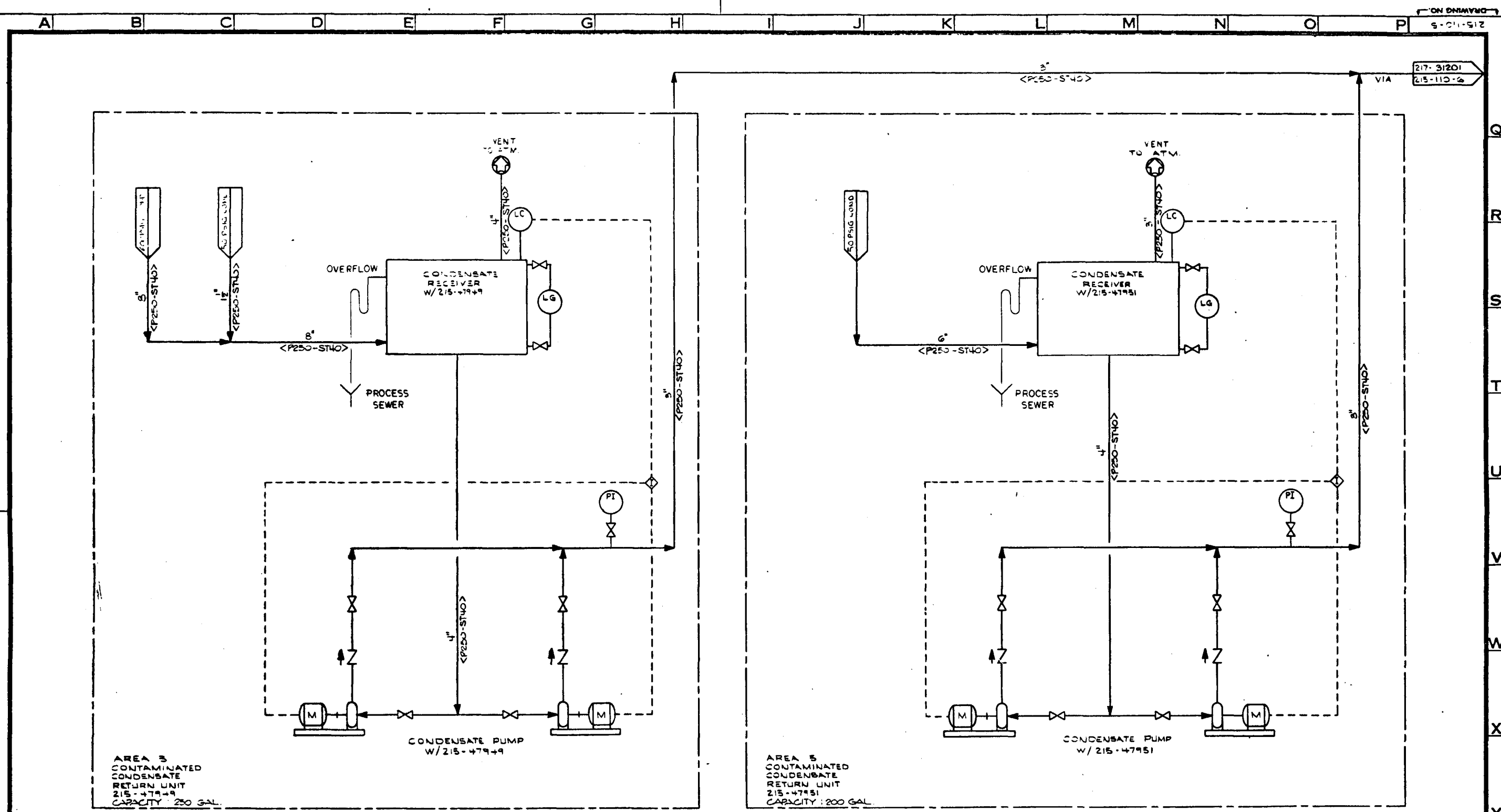


NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DC-DEMONSTRATION CONCEPT	4-15-80	SVM	KMM	JWH	1	PRELIMINARY ISSUE	4-15-80	SVM	KMM	JWH
2						2	FOR BASEL NING		SVM	KMM	JWH
3						3	PDEF RECORD AND CAPP		SVM	KMM	JWH
4											
5											
6											
7											
8											
9											
10											

BY	DATE	DRAWING STATUS
DESIGNED	SVM	ISSUED
DRAWN	KMM	FOR RECORD AND CAPP
CHECKED	JWH	FOR COMMENTS AND/OR APPROVAL
DRAGO APP'D	4-15-80	FOR CUSTOMER APPROVAL
ICGG APP'D	4-15-80	AND/OR COMMENTS
DOE APP'D		DOE
SCALE		CONSTRUCTION

TITLE P&I DIAGRAM
AREA 215
CLEAN CONDENSATE
SYSTEMS II
U.S. DOE
ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRAGO CORPORATION PITTSBURGH, PA.

PROJECT NO
7051
DRAWING NO
215-110-4
CASE
REV.



REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D APP'D NO.	NO.	DATE	BY	CHK'D APP'D NO.	NO.	DATE	BY	CHK'D APP'D NO.
1	10/15/11	SVN	KRM/BJW	1	10/15/11	SVN	KRM/BJW	1	10/15/11	SVN	KRM/BJW
2	10/15/11	SVN	KRM/BJW	2	10/15/11	SVN	KRM/BJW	2	10/15/11	SVN	KRM/BJW
3	10/15/11	SVN	KRM/BJW	3	10/15/11	SVN	KRM/BJW	3	10/15/11	SVN	KRM/BJW
4	10/15/11	SVN	KRM/BJW	4	10/15/11	SVN	KRM/BJW	4	10/15/11	SVN	KRM/BJW
5	10/15/11	SVN	KRM/BJW	5	10/15/11	SVN	KRM/BJW	5	10/15/11	SVN	KRM/BJW
6	10/15/11	SVN	KRM/BJW	6	10/15/11	SVN	KRM/BJW	6	10/15/11	SVN	KRM/BJW
7	10/15/11	SVN	KRM/BJW	7	10/15/11	SVN	KRM/BJW	7	10/15/11	SVN	KRM/BJW
8	10/15/11	SVN	KRM/BJW	8	10/15/11	SVN	KRM/BJW	8	10/15/11	SVN	KRM/BJW
9	10/15/11	SVN	KRM/BJW	9	10/15/11	SVN	KRM/BJW	9	10/15/11	SVN	KRM/BJW
10	10/15/11	SVN	KRM/BJW	10	10/15/11	SVN	KRM/BJW	10	10/15/11	SVN	KRM/BJW

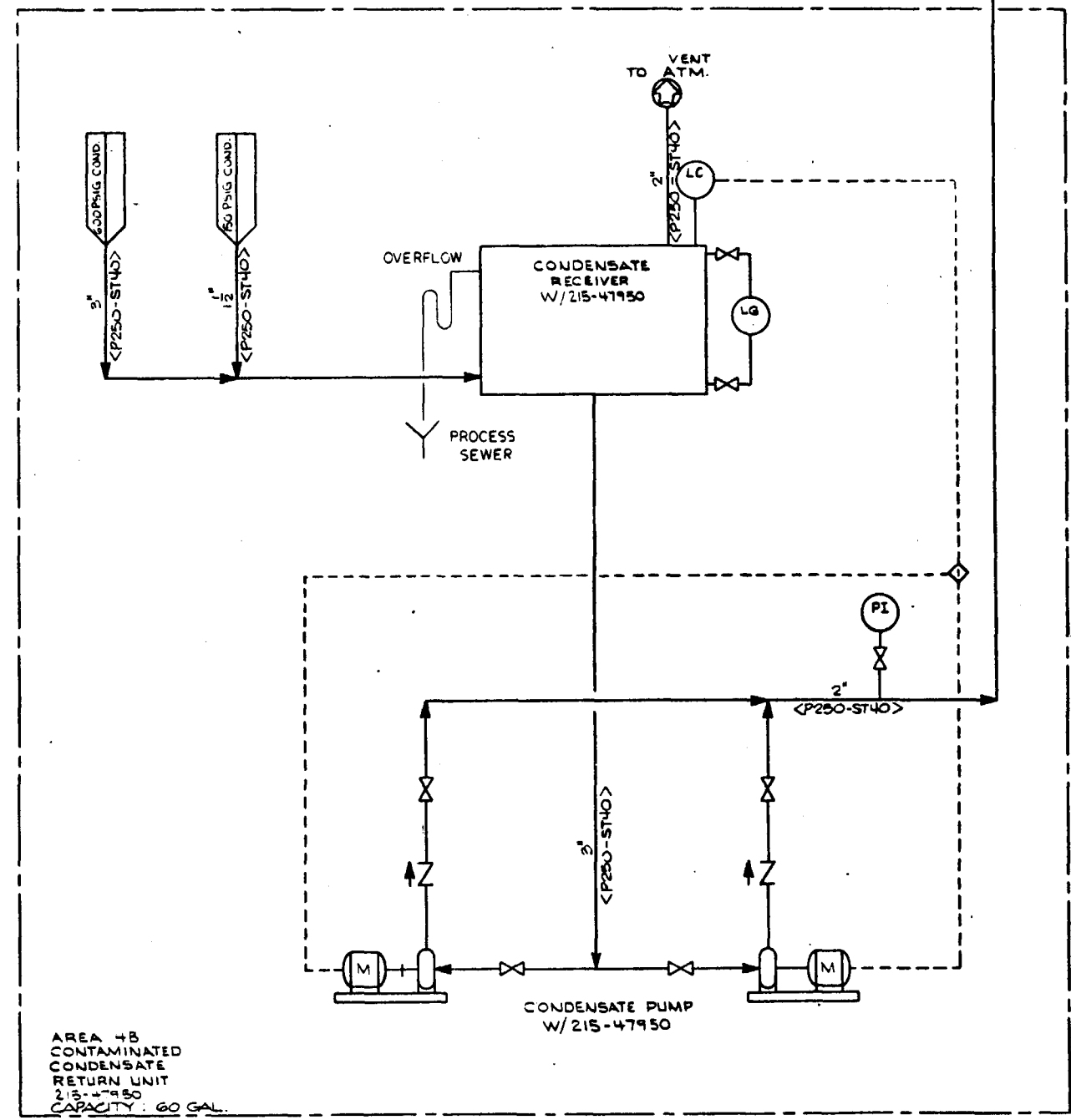
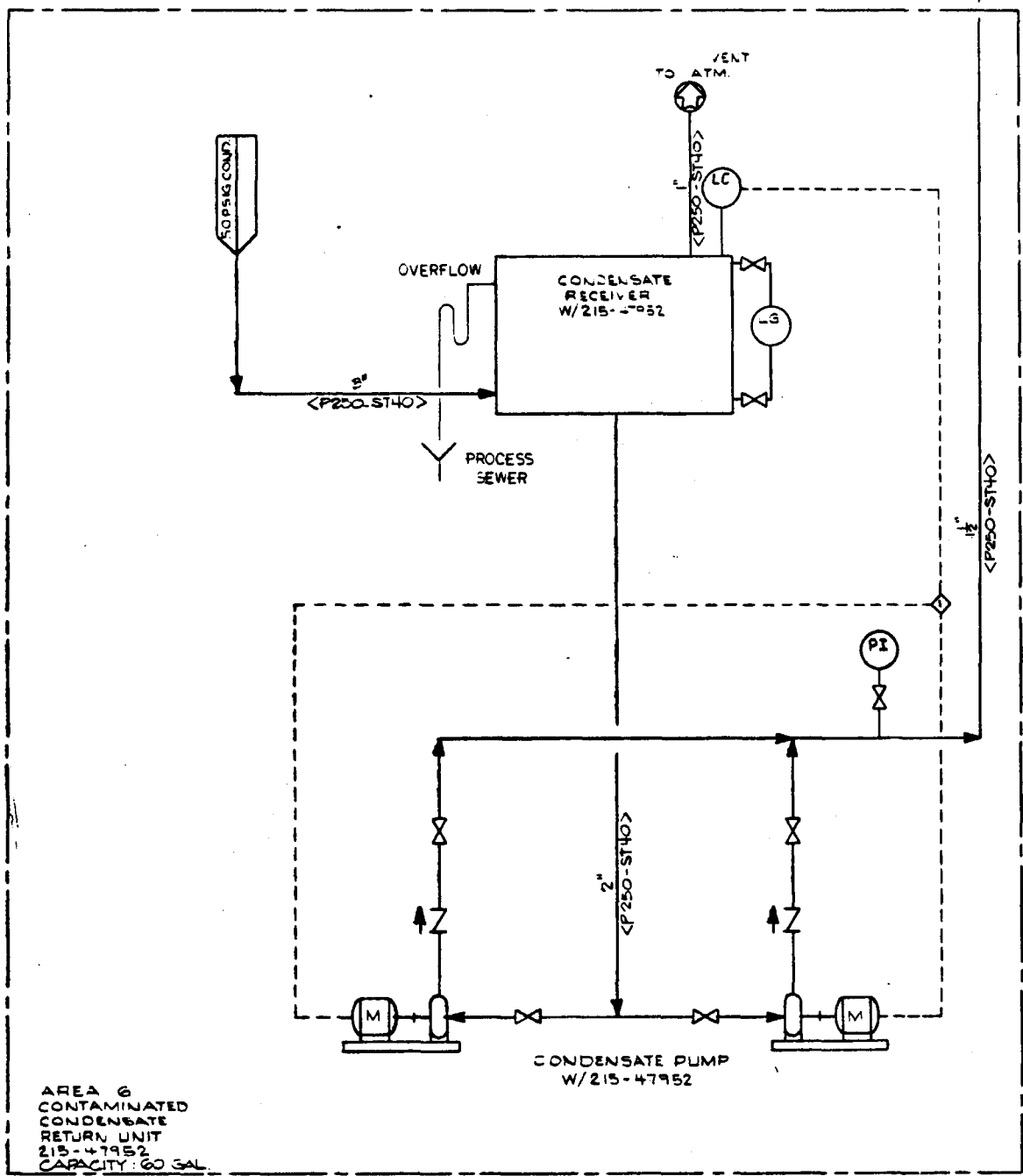
BY	DATE	DRAWING STATUS
SVN	10/15/11	ISSUED
KRM	10/15/11	FOR RECORD AND APPROVAL
SVN	10/15/11	FOR COMMENTS AND/OR APPROVAL
SVN	10/15/11	FOR CUSTOMER APPROVAL
SVN	10/15/11	FOR CONSTRUCTION

PROJECT NO. 7051	TITLE AREA 2.5 UTILITIES CONTAMINATED CONDENSATE RETURN SYSTEMS I
DRAWING NO. 215-110-5	U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
CASE DC	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA.
REV.	

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

215-47951
215-110-5

217-21201
215-110-7



NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.
1	DC-DEMONSTRATION CONCEPT	11-21-00	SVN	KMM	IWN	1	PRELIMINARY ISSUE FOR BASELINING	11-21-00	SVN	KMM	IWN	1	PDEP RECORD AND DFPD	11-21-00	SVN	KMM	IWN	1
2						2						2						2
3						3						3						3
4						4						4						4
5						5						5						5
6						6						6						6
7						7						7						7
8						8						8						8
9						9						9						9
10						10						10						10

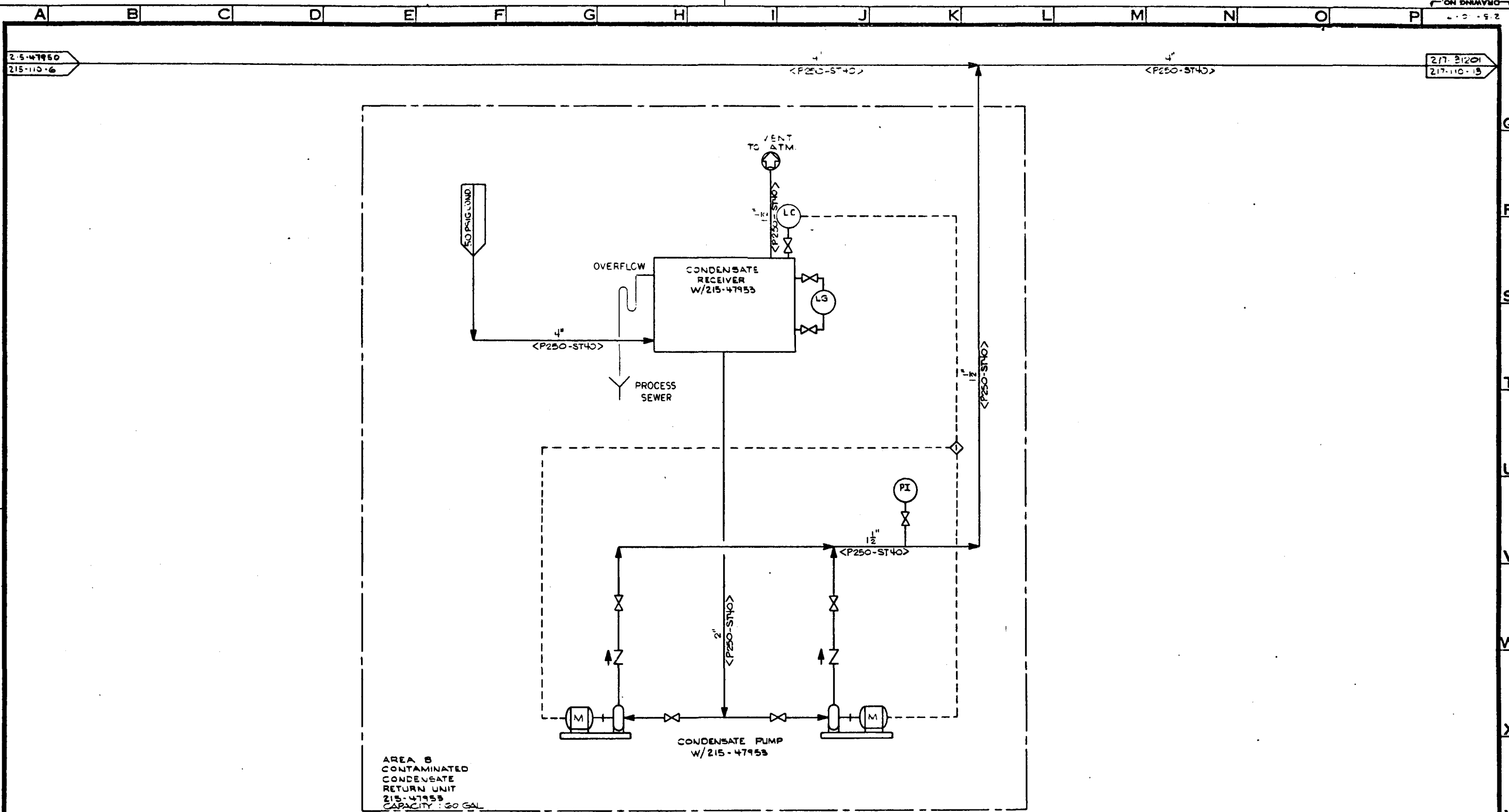
BY	DATE	DRAWING STATUS
DESIGNED	SVN	11-21-00
DRAWN	KJR	11-21-00
CHECKED	KMM	11-21-00
DRAGO APP'D		
ICGG APP'D		
DOE APP'D		
SCALE	1"=1'-0"	

TITLE	PFI DIAGRAM
AREA 215 UTILITIES	
CONTAMINATED CONDENSATE	
RETURN SYSTEMS II	
U.S. DOE	
ENERGY TECHNOLOGY	
FOSSIL ENERGY PROGRAMS	
CONTRACT NO. EF-77-C-01-2012	
PREPARED FOR THE	
ILLINOIS COAL GASIFICATION GROUP	
BY	
DRAGO CORPORATION PITTSBURGH, PA	

PROJECT NO	7051
DRAWING NO	215-110-6
CASE	DC
REV	1

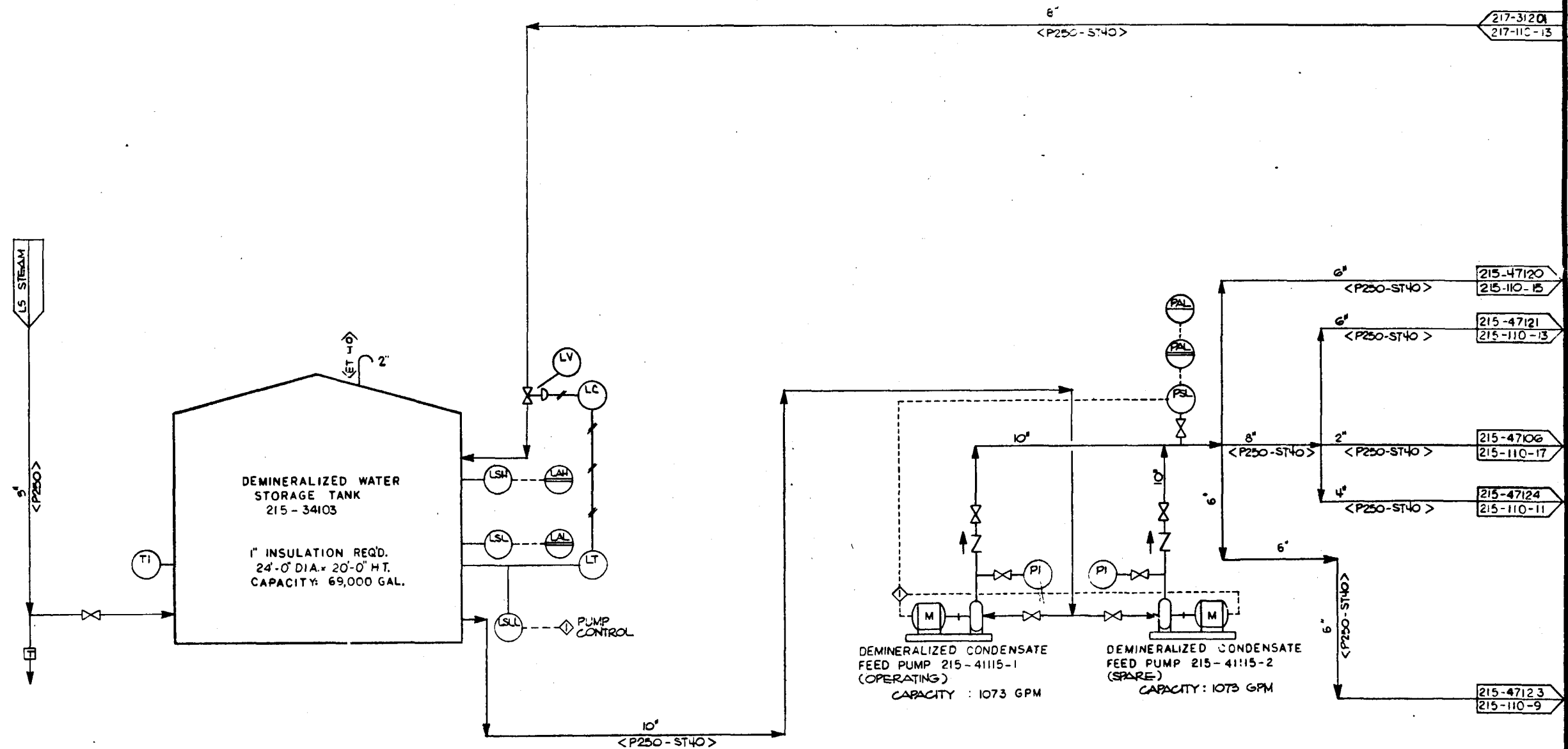
"D"

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPD	NO.	DATE	BY	CHK'D	APPD	NO.	DATE	BY	CHK'D	APPD	NO.	DATE	BY	CHK'D	APPD
1		SW	KMM	JWH	1		SW	KMM	JWH	1		SW	KMM	JWH	1		SW	KMM	JWH
						</													

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.

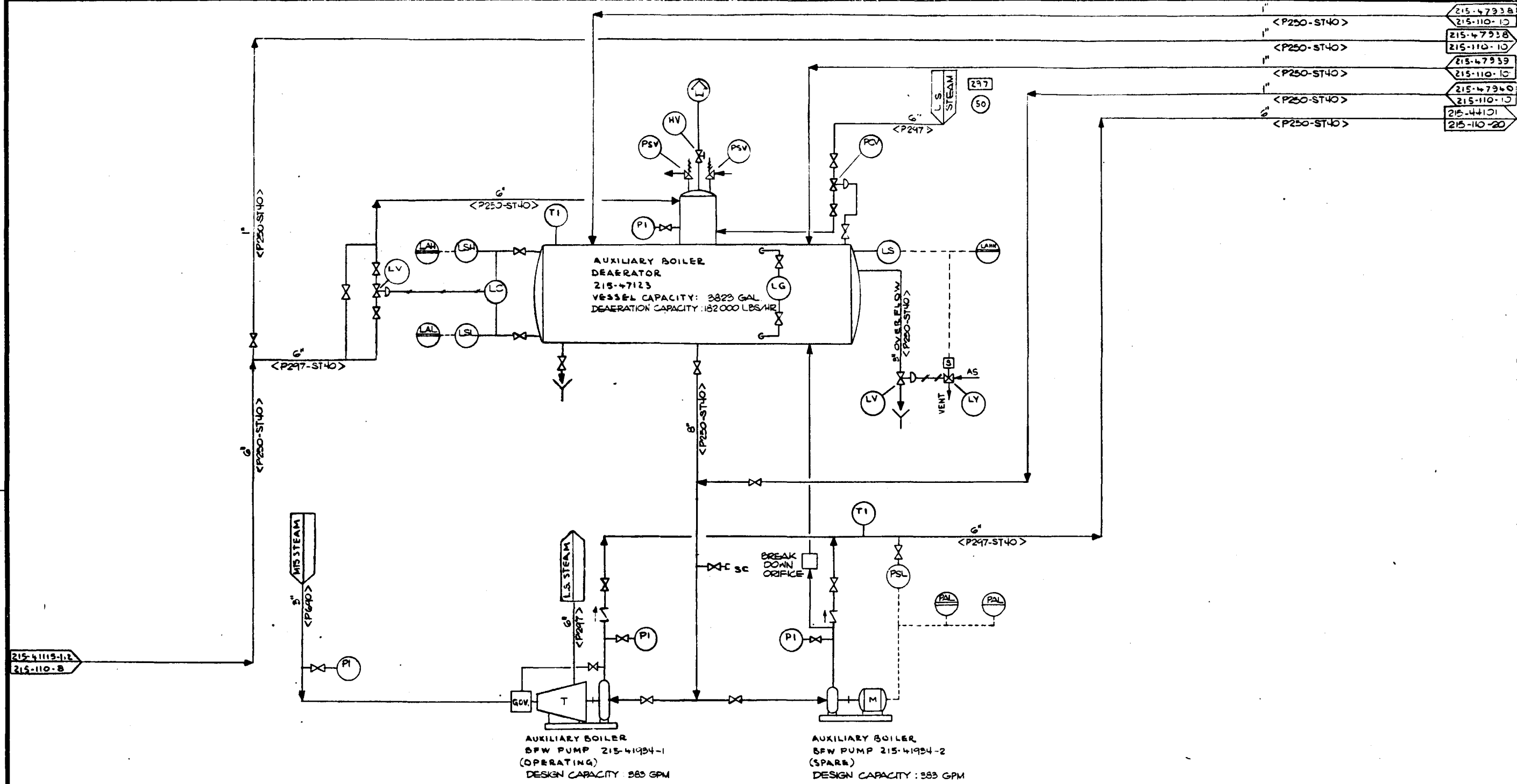


REVISIONS				REVISIONS				REVISIONS			
NO	DATE	BY	CHK'D APP'D	NO	DATE	BY	CHK'D APP'D	NO	DATE	BY	CHK'D APP'D
1				1				1			
2				2				2			
3				3				3			
4				4				4			
5				5				5			
6				6				6			
7				7				7			
8				8				8			
9				9				9			
10				10				10			

BY	DATE	DRAWING STATUS
DESIGNED	BYM	ISSUED
DRAWN	JLG	FOR RECORD AND CFPD
CHECKED	KMM	FOR COMMENTS AND/OR APPROVAL
DRAGO APP'D		FOR CUSTOMER APPROVAL
ICGG APP'D		AND/OR COMMENTS
DOE APP'D		APPROVAL FOR CONSTRUCTION
SCALE		

TITLE	PROJECT NO
P&I DIAGRAM	7051
AREA 215 UTILITIES	DRAWING NO
DEMINERALIZED WATER STORAGE	215-110-8
U.S. DoE ENERGY TECHNOLOGY	CASE
FOSSIL ENERGY PROGRAMS	DC
CONTRACT NO. EF-77-C-01-2012	REV
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.	

DO NOT SCALE THIS DRAWING. IT MAY BE REDUCED FROM ORIGINAL SIZE.

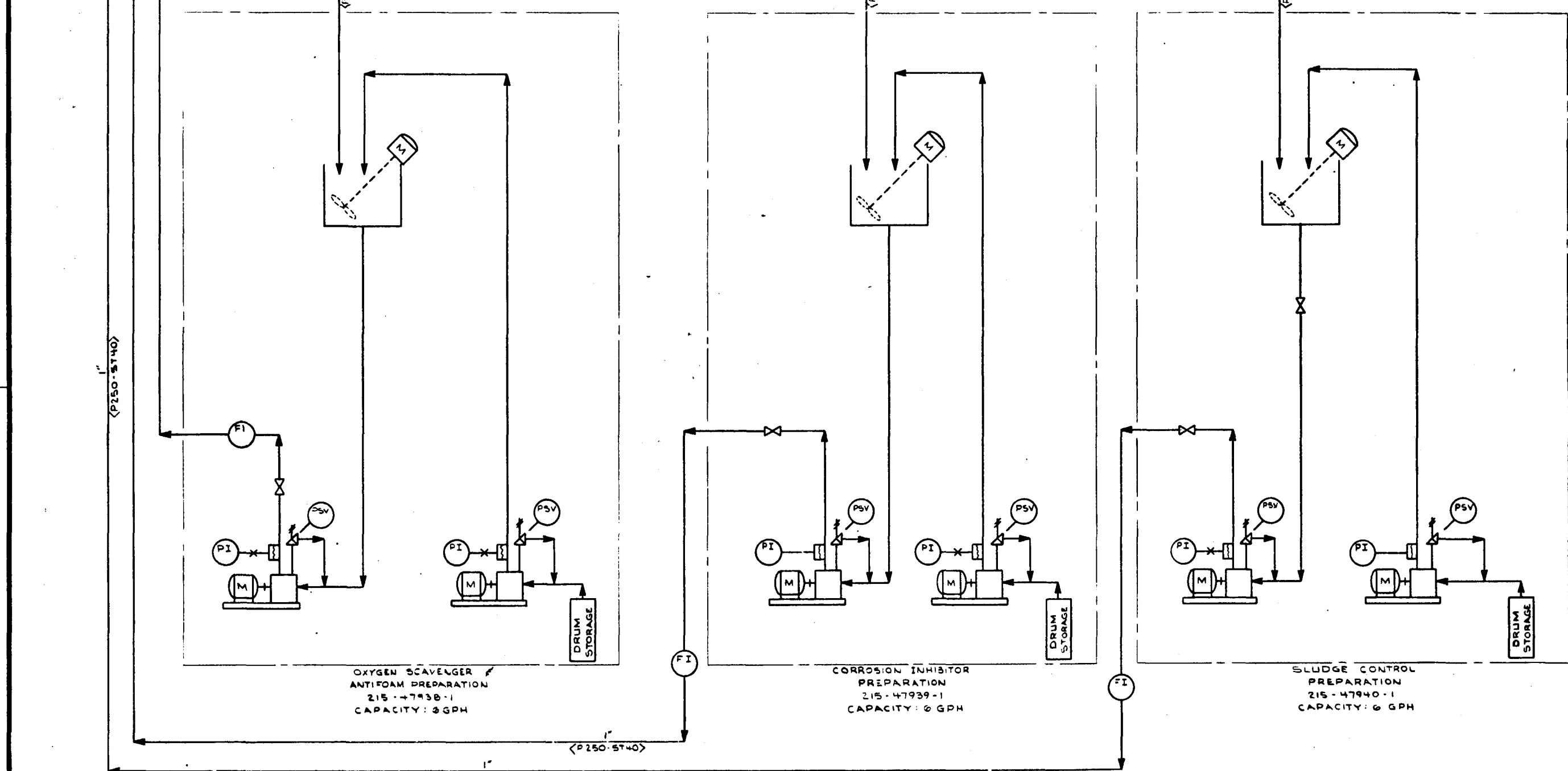


REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10-13-80	SVN	KMM	JWH	1	10-13-80	SVN	KMM	JWH	1	10-13-80	SVN	KMM	JWH
2	10-15-80	SVN	KMM	JWH	2	10-15-80	SVN	KMM	JWH	2	10-15-80	SVN	KMM	JWH
3	10-15-80	SVN	KMM	JWH	3	10-15-80	SVN	KMM	JWH	3	10-15-80	SVN	KMM	JWH
4	10-15-80	SVN	KMM	JWH	4	10-15-80	SVN	KMM	JWH	4	10-15-80	SVN	KMM	JWH
5	10-15-80	SVN	KMM	JWH	5	10-15-80	SVN	KMM	JWH	5	10-15-80	SVN	KMM	JWH
6	10-15-80	SVN	KMM	JWH	6	10-15-80	SVN	KMM	JWH	6	10-15-80	SVN	KMM	JWH
7	10-15-80	SVN	KMM	JWH	7	10-15-80	SVN	KMM	JWH	7	10-15-80	SVN	KMM	JWH
8	10-15-80	SVN	KMM	JWH	8	10-15-80	SVN	KMM	JWH	8	10-15-80	SVN	KMM	JWH
9	10-15-80	SVN	KMM	JWH	9	10-15-80	SVN	KMM	JWH	9	10-15-80	SVN	KMM	JWH
10	10-15-80	SVN	KMM	JWH	10	10-15-80	SVN	KMM	JWH	10	10-15-80	SVN	KMM	JWH

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SVN	SVN	10-13-80	ISSUED	SVN	10-13-80
KJR	KJR	10-15-80	FOR COMMENTS AND/OR APPROVAL	SVN	10-15-80
KMM	KMM	10-15-80	FOR CUSTOMER APPROVAL	ICGG	10-15-80
SVN	SVN	10-15-80	AND/OR COMMENTS	DOE	10-15-80
SVN	SVN	10-15-80	APPROVAL FOR CONSTRUCTION		

U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	PROJECT NO. 7051 DRAWING NO. 215-110-9
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA	CASE DC REV

- 215-47123
- 215-110-9
- 215-47123
- 215-110-9
- 215-47123
- 215-110-9
- 215-47123
- 215-110-9



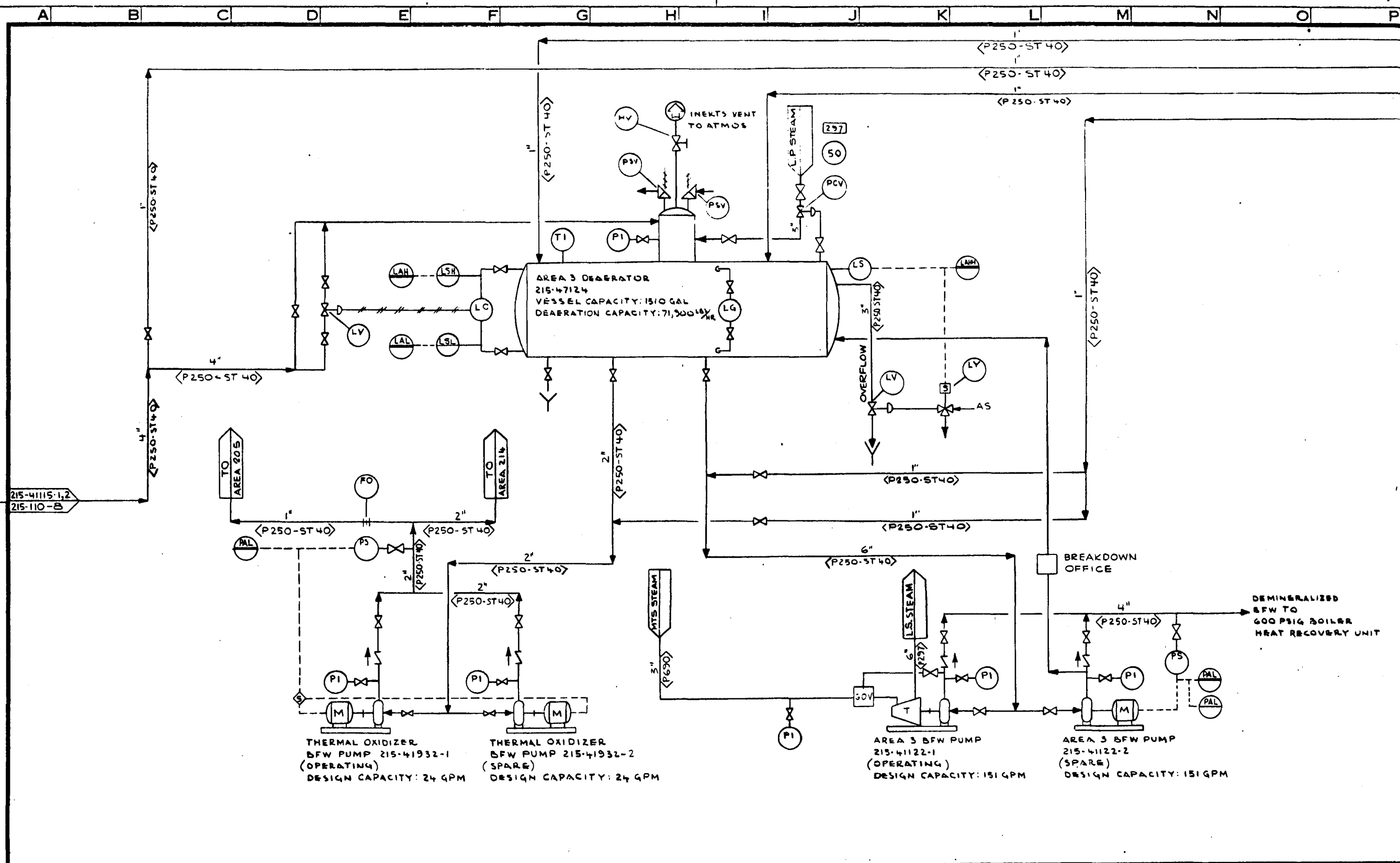
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1					1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	ISSUED	DATE
DRAWN	BY	DATE	FOR RECORD AND DPPD	DATE
CHECKED	BY	DATE	FOR COMMENTS AND/OR APPROVAL	DATE
DRAGO APP'D	BY	DATE	FOR CUSTOMER APPROVAL	DATE
ICGG APP'D	BY	DATE	AND/OR COMMENTS	DATE
DOE APP'D	BY	DATE	APPROVAL FOR CONSTRUCTION	DATE
SCALE	BY	DATE		DATE

TITLE	PROJECT NO.
PSI DIAGRAM AREA 215 UTILITIES AUXILIARY BOILER BFW TREATMENT	7051 DRAWING NO
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	215-110-10
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.	CASE DC
	REV. 

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.

ON DRAWING
11-011-512
215-40930-2
215-110-12
215-47936-1
215-110-12
215-47939-2
215-110-12
215-47940-2
215-110-12



REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1		SVH	KMM	JWH	1					1		SVH	KMM	WH	1				
2					2					2		SVH	KMM	JWH	2				
3					3					3		SVH	KMM	JWH	3				
4					4					4					4				
5					5					5					5				
6					6					6					6				
7					7					7					7				
8					8					8					8				
9					9					9					9				
10					10					10					10				
11					11					11					11				
12					12					12					12				
13					13					13					13				
14					14					14					14				
15					15					15					15				
16					16					16					16				
17					17					17					17				
18					18					18					18				
19					19					19					19				
20					20					20					20				

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
215-41115-1,2 215-110-8	SVH	11-15-80	FOR RECORD AND/OR APPROVAL	4-15-80	
215-41122-1 215-41122-2	SVH	11-15-80	FOR CUSTOMER APPROVAL		
215-41122-1 215-41122-2	SVH	11-15-80	FOR CONSTRUCTION		

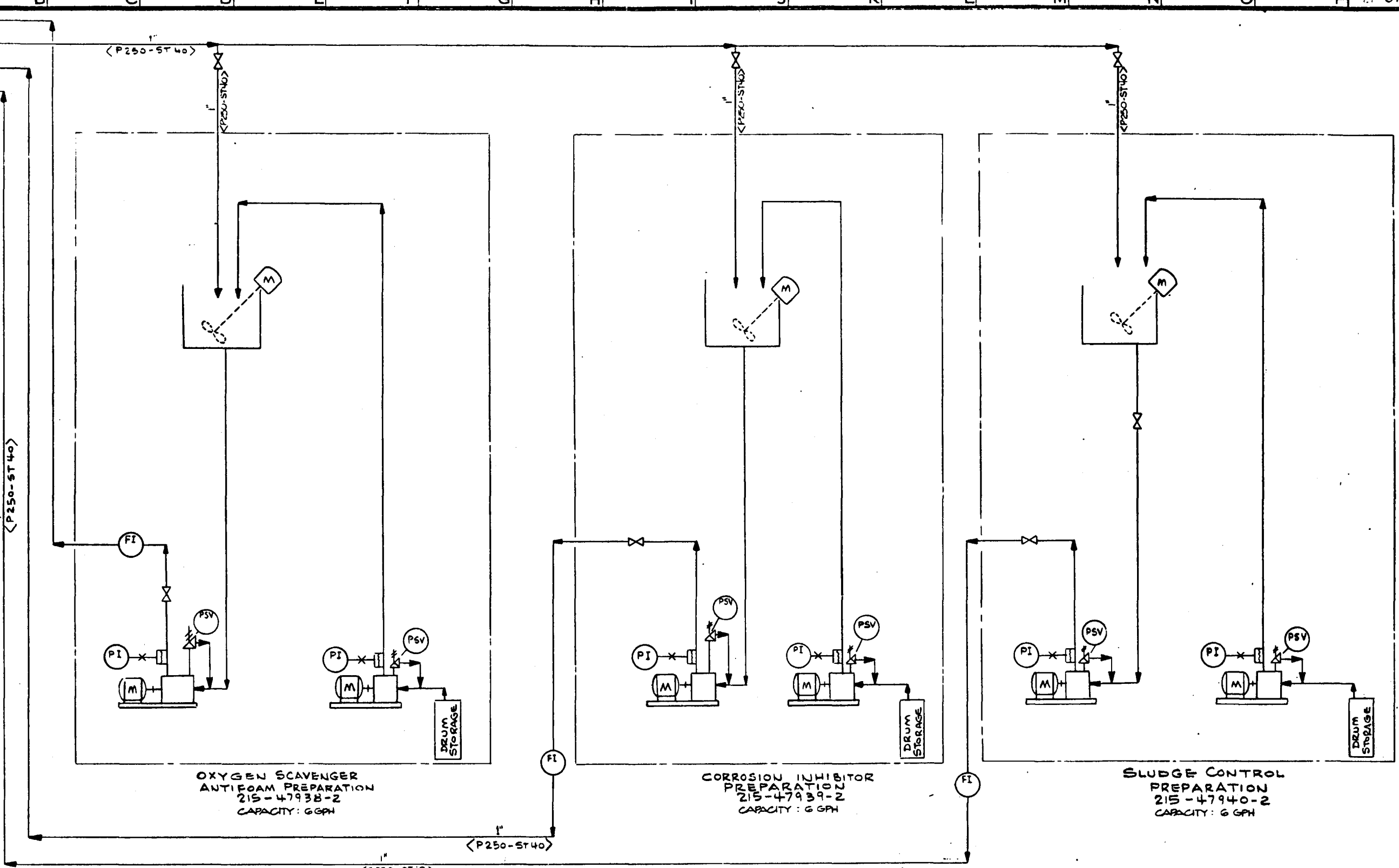
PROJECT NO. 7051 DRAWING NO. 215-110-11 CASE DC REV 0
--

TITLE		PEI DIAGRAM	
AREA 215 UTILITIES		AREA 203 BFW DEARATION	
U.S. DOE		ENERGY TECHNOLOGY	
FOSSIL ENERGY PROGRAMS		CONTRACT NO. EF-77-C-01-2012	
PREPARED FOR THE		ILLINOIS COAL GASIFICATION GROUP	
BY		DRAGO CORPORATION PITTSBURGH, PA.	

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

- 215-47124
- 215-110-11
- 215-47124
- 215-110-11
- 215-47124
- 215-110-11
- 215-47124
- 215-110-11



REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHG. APPD.	NO.	DATE	BY	CHG. APPD.	NO.	DATE	BY	CHG. APPD.
1	12-15-90	SYM/KMM/WH		1	12-15-90	SYM/KMM/WH		1	12-15-90	SYM/KMM/WH	
2	12-15-90	SYM/KMM/WH		2	12-15-90	SYM/KMM/WH		2	12-15-90	SYM/KMM/WH	
3	12-15-90	SYM/KMM/WH		3	12-15-90	SYM/KMM/WH		3	12-15-90	SYM/KMM/WH	
4	12-15-90	SYM/KMM/WH		4	12-15-90	SYM/KMM/WH		4	12-15-90	SYM/KMM/WH	
5	12-15-90	SYM/KMM/WH		5	12-15-90	SYM/KMM/WH		5	12-15-90	SYM/KMM/WH	
6	12-15-90	SYM/KMM/WH		6	12-15-90	SYM/KMM/WH		6	12-15-90	SYM/KMM/WH	
7	12-15-90	SYM/KMM/WH		7	12-15-90	SYM/KMM/WH		7	12-15-90	SYM/KMM/WH	
8	12-15-90	SYM/KMM/WH		8	12-15-90	SYM/KMM/WH		8	12-15-90	SYM/KMM/WH	
9	12-15-90	SYM/KMM/WH		9	12-15-90	SYM/KMM/WH		9	12-15-90	SYM/KMM/WH	
10	12-15-90	SYM/KMM/WH		10	12-15-90	SYM/KMM/WH		10	12-15-90	SYM/KMM/WH	

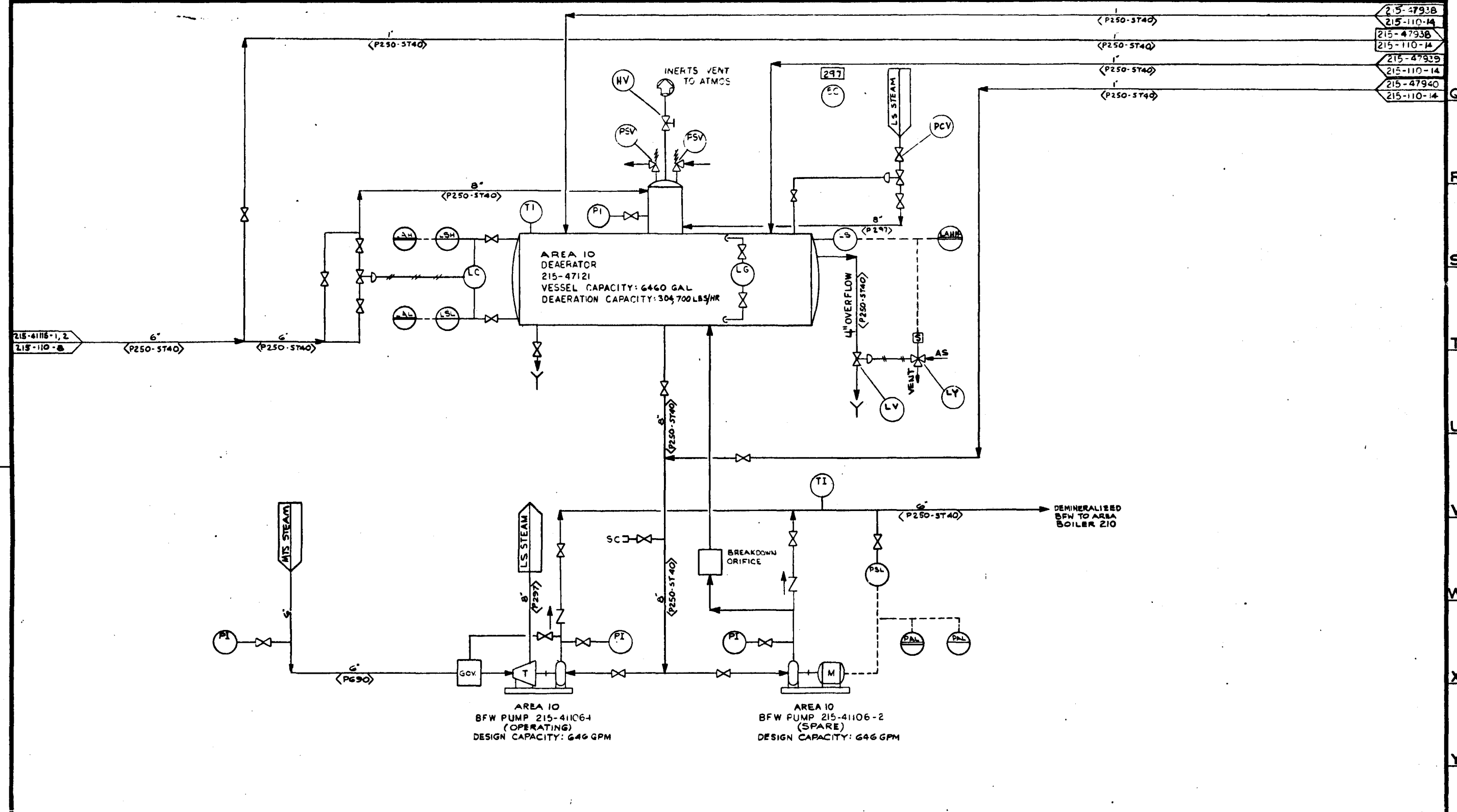
REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHG. APPD.	NO.	DATE	BY	CHG. APPD.	NO.	DATE	BY	CHG. APPD.
1	12-15-90	SYM/KMM/WH		1	12-15-90	SYM/KMM/WH		1	12-15-90	SYM/KMM/WH	
2	12-15-90	SYM/KMM/WH		2	12-15-90	SYM/KMM/WH		2	12-15-90	SYM/KMM/WH	
3	12-15-90	SYM/KMM/WH		3	12-15-90	SYM/KMM/WH		3	12-15-90	SYM/KMM/WH	
4	12-15-90	SYM/KMM/WH		4	12-15-90	SYM/KMM/WH		4	12-15-90	SYM/KMM/WH	
5	12-15-90	SYM/KMM/WH		5	12-15-90	SYM/KMM/WH		5	12-15-90	SYM/KMM/WH	
6	12-15-90	SYM/KMM/WH		6	12-15-90	SYM/KMM/WH		6	12-15-90	SYM/KMM/WH	
7	12-15-90	SYM/KMM/WH		7	12-15-90	SYM/KMM/WH		7	12-15-90	SYM/KMM/WH	
8	12-15-90	SYM/KMM/WH		8	12-15-90	SYM/KMM/WH		8	12-15-90	SYM/KMM/WH	
9	12-15-90	SYM/KMM/WH		9	12-15-90	SYM/KMM/WH		9	12-15-90	SYM/KMM/WH	
10	12-15-90	SYM/KMM/WH		10	12-15-90	SYM/KMM/WH		10	12-15-90	SYM/KMM/WH	

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SYM/KMM/WH	SYM/KMM/WH	12-15-90	ISSUED	SYM/KMM/WH	12-15-90
DRAWN	SYM/KMM/WH	12-15-90	FOR RECORD AND CDD	SYM/KMM/WH	12-15-90
CHECKED	SYM/KMM/WH	12-15-90	FOR COMMENTS AND/OR APPROVAL	SYM/KMM/WH	12-15-90
DRAWN APPD.	SYM/KMM/WH	12-15-90	FOR CUSTOMER APPROVAL	SYM/KMM/WH	12-15-90
ICGG APPD.	SYM/KMM/WH	12-15-90	AND/OR COMMENTS	SYM/KMM/WH	12-15-90
DOE APPD.	SYM/KMM/WH	12-15-90	APPROVAL FOR CONSTRUCTION	SYM/KMM/WH	12-15-90
SCALE					

TITLE	PFI DIAGRAM	PROJECT NO.	7051
AREA 215 UTILITIES		DRAWING NO.	215-110-12
AREA 203 BFW TREATMENT		CASE	DC
U.S. DOE ENERGY TECHNOLOGY		REV.	0
FOSSIL ENERGY PROGRAMS			
CONTRACT NO. EF-77-C-01-2012			
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP			
BY DRAGO CORPORATION PITTSBURGH, PA.			

"D"

DO NOT SCALE THIS DRAWING. IT MAY BE REDUCED FROM ORIGINAL SIZE.



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD
1		SYM	KMN	JWH	1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

BY	DATE	DRAWING STATUS
DESIGNED	SYM	1-23-80
DRAWN	JLG	1-23-80
CHECKED	KMN	1-30-80
DRAWN APPD		2-15-80
ICGG APPD		2-15-80
DOE APPD		
SCALE		

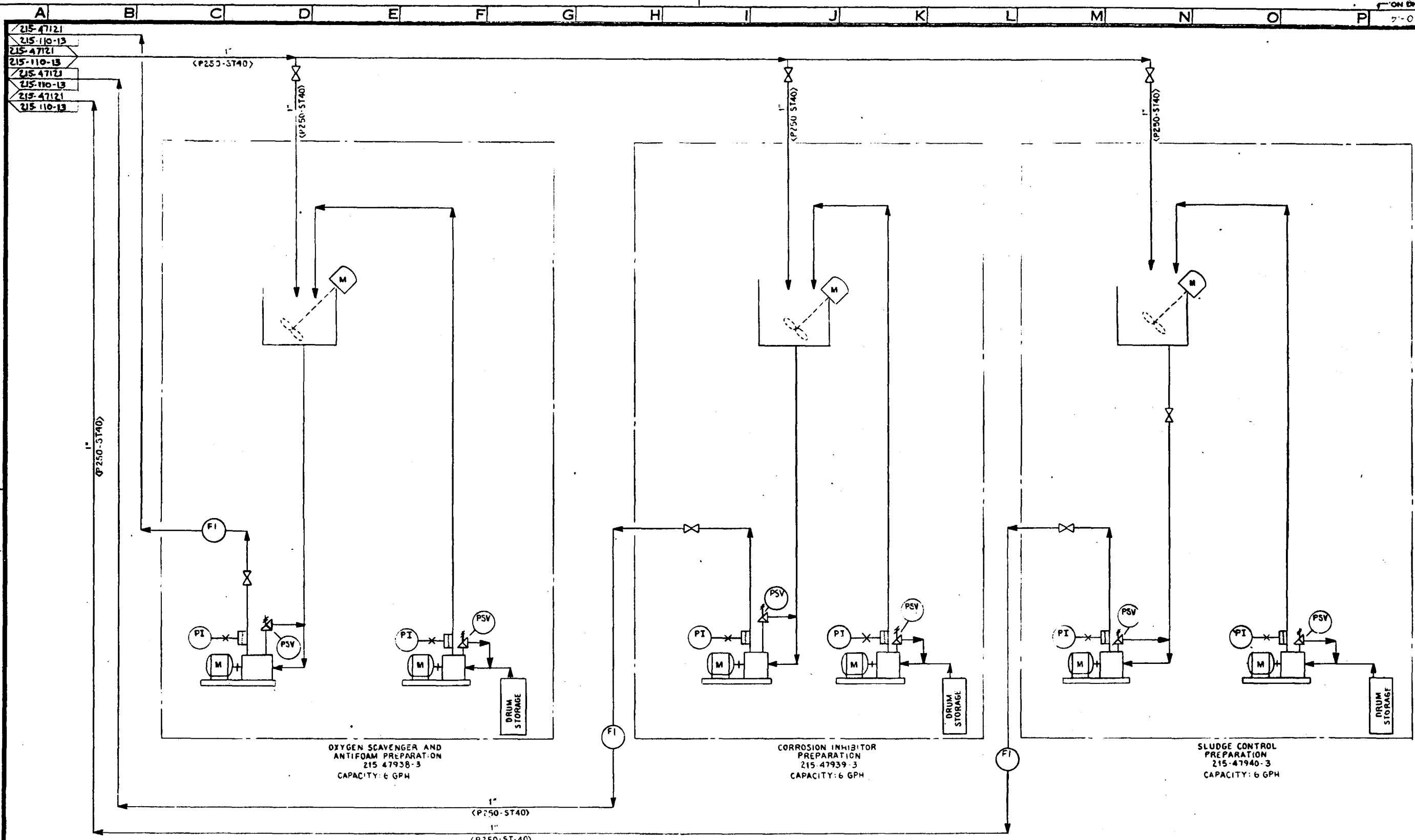
ISSUED	DATE
FOR RECORD AND D-D	4-15-80
FOR COMMENTS AND/OR APPROVAL	
FOR CUSTOMER APPROVAL	
AND/OR COMMENTS	
APPROVAL FOR CONSTRUCTION	

TITLE	P&I DIAGRAM
AREA 215	UTILITIES
AREA 210	BFW DEAEARATION
U.S. DOE	ENERGY TECHNOLOGY
	FOSSIL ENERGY PROGRAMS
	CONTRACT NO. EF-77-C-01-2012
	PREPARED FOR THE
	ILLINOIS COAL GASIFICATION GROUP
	BY
	DRAGO CORPORATION PITTSBURGH, PA

PROJECT NO	7051
DRAWING NO	215-110-13
CASE	DC
REV.	

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

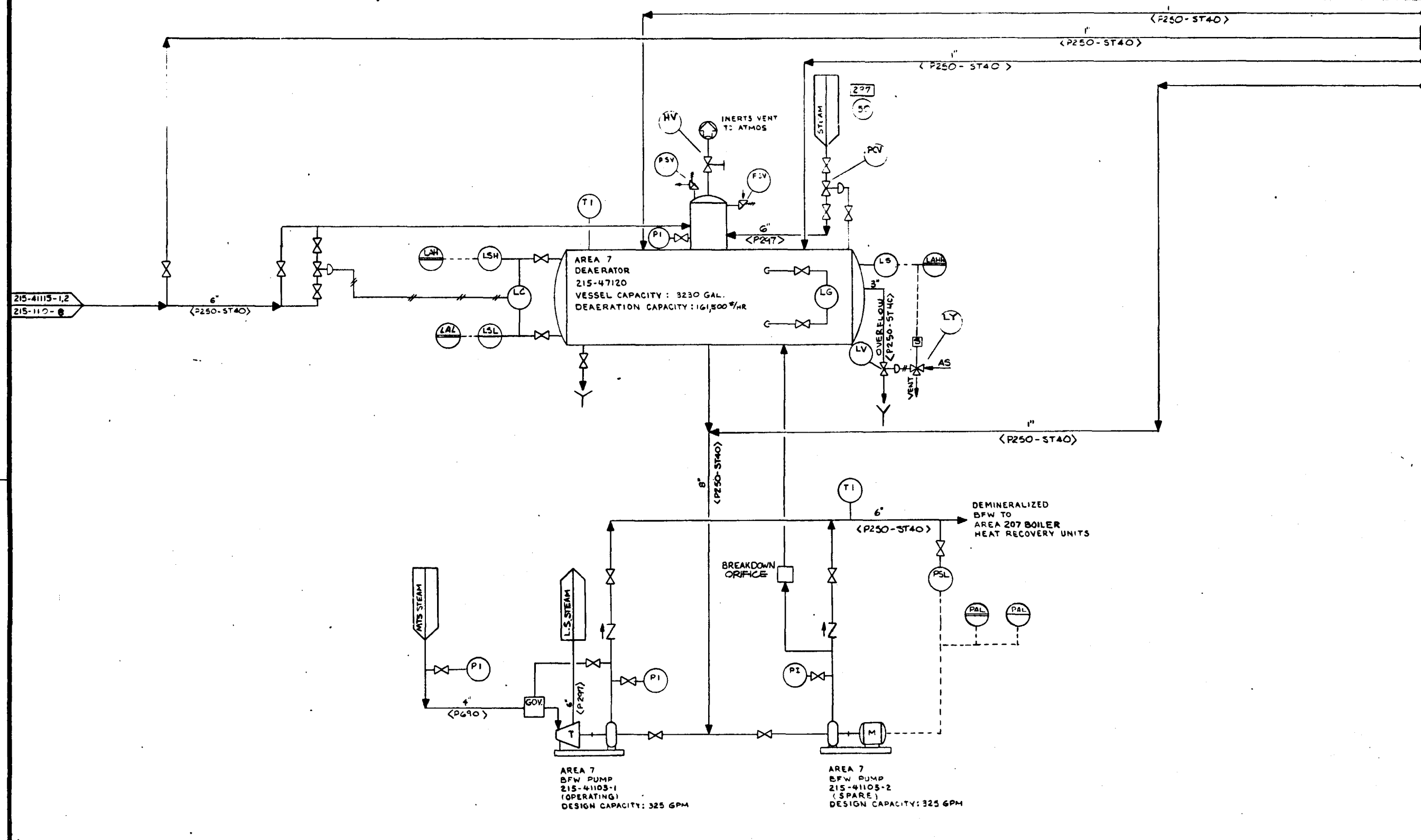


REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1					1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	ISSUED	DATE
DRAWN	BY	DATE	FOR RECORD AND DFPD	DATE
CHECKED	BY	DATE	FOR COMMENTS AND/OR	
			APPROVAL	
DRAGO APP'D	BY	DATE	FOR CUSTOMER APPROVAL	ICGG
			AND/OR COMMENTS	DOE
ICGG APP'D	BY	DATE	APPROVAL FOR	
			CONSTRUCTION	
DOE APP'D	BY	DATE		
SCALE				

TITLE	P&ID DIAGRAM AREA 210 UTILITIES AREA 210 BFW TREATMENT	PROJECT NO. 7051 DRAWING NO. 215-110-14
U.S. DOE FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.	CASE REV.

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.



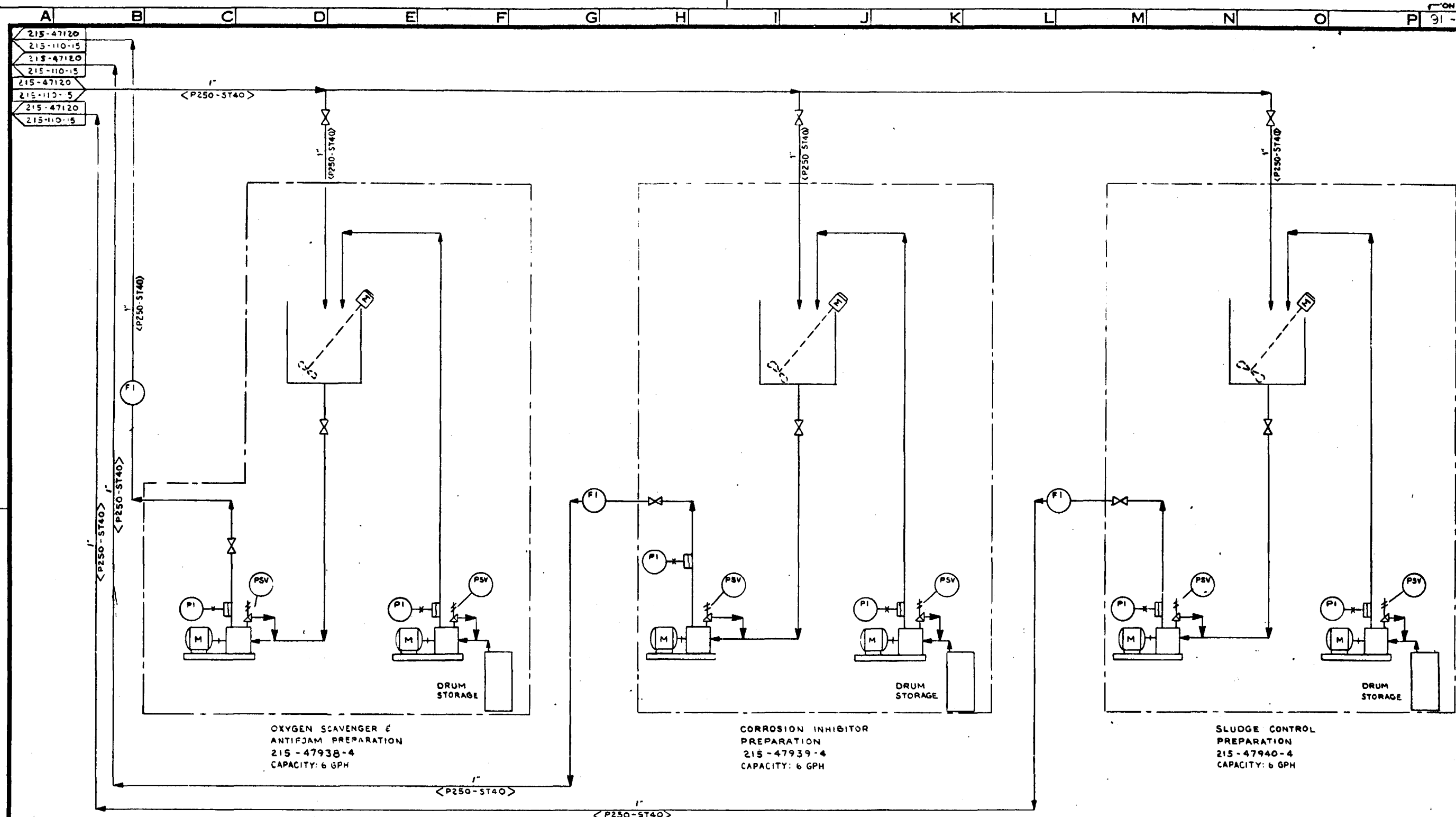
REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D APP'D	NO.	DATE	BY	CHK'D APP'D	NO.	DATE	BY	CHK'D APP'D
1				1				1			
2				2				2			
3				3				3			
4				4				4			
5				5				5			
6				6				6			
7				7				7			
8				8				8			
9				9				9			
10				10				10			

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SYN	SYN	10-30	FOR RECORD AND DDPD	4-15-80	
CHK'D	KMM	10-30	FOR COMMENTS AND/OR APPROVAL		
DRAGO APP'D			FOR CUSTOMER APPROVAL	ICGG	
ICGG APP'D			AND/OR COMMENTS	DOE	
DOE APP'D			APPROVAL FOR CONSTRUCTION		
SCALE					

TITLE	P & I DIAGRAM AREA 215 UTILITIES AREA 207 DEAERATION	PROJECT NO. 7051 DRAWING NO.
U.S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	215-110-15
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.	CASE DC	REV.

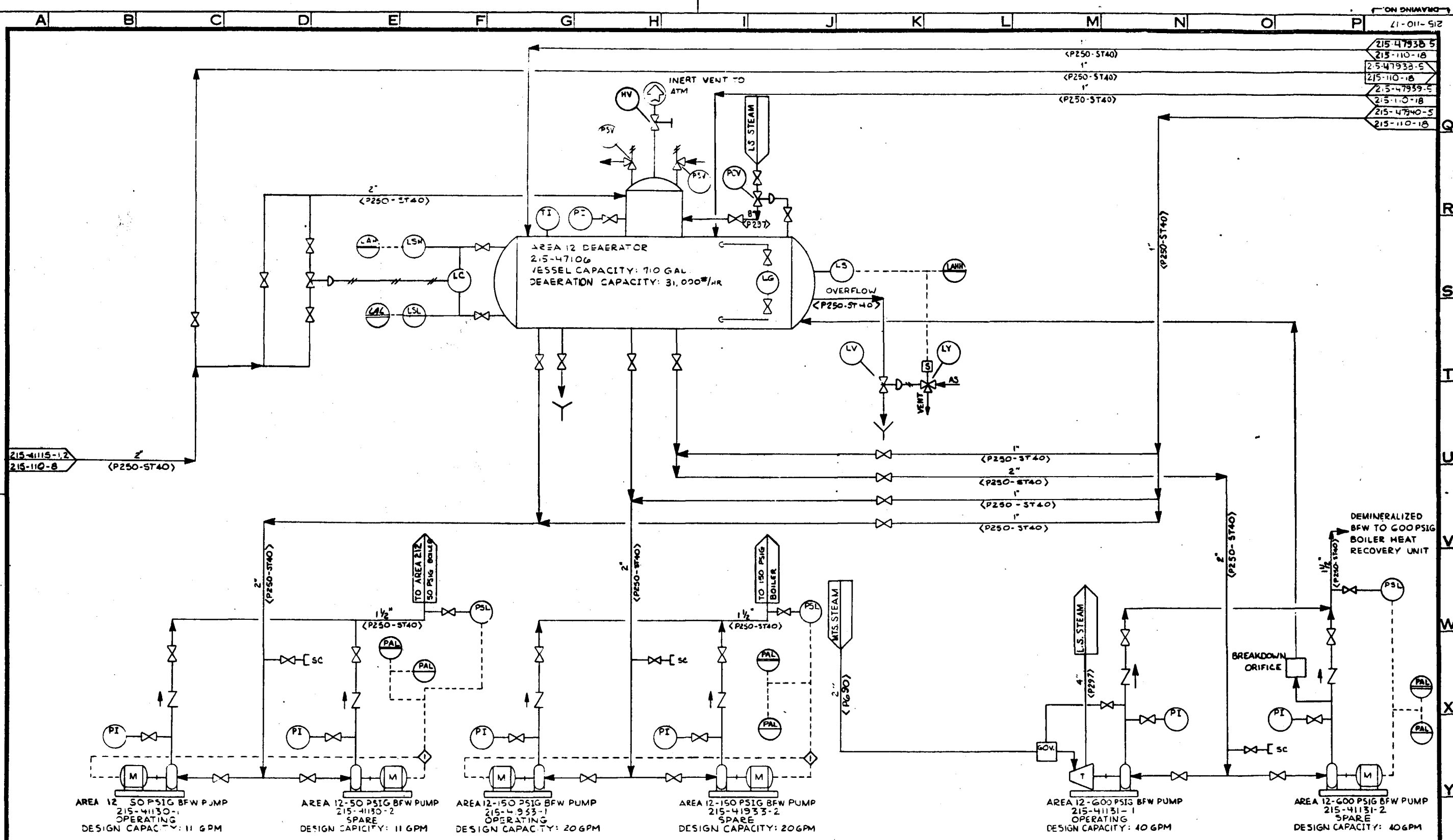
"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.



REVISIONS				REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHK'D APP'D NO.	NO.	DATE	BY	CHK'D APP'D NO.	NO.	DATE	BY	CHK'D APP'D NO.	NO.	DATE	BY	CHK'D APP'D NO.
1	10-15-80	SVM	FOR UWH	1	10-15-80	SVM	FOR UWH	1	10-15-80	SVM	FOR UWH	1	10-15-80	SVM	FOR UWH
2	10-15-80	SVM	FOR UWH	2	10-15-80	SVM	FOR UWH	2	10-15-80	SVM	FOR UWH	2	10-15-80	SVM	FOR UWH
3	10-15-80	SVM	FOR UWH	3	10-15-80	SVM	FOR UWH	3	10-15-80	SVM	FOR UWH	3	10-15-80	SVM	FOR UWH
4	10-15-80	SVM	FOR UWH	4	10-15-80	SVM	FOR UWH	4	10-15-80	SVM	FOR UWH	4	10-15-80	SVM	FOR UWH
5	10-15-80	SVM	FOR UWH	5	10-15-80	SVM	FOR UWH	5	10-15-80	SVM	FOR UWH	5	10-15-80	SVM	FOR UWH
6	10-15-80	SVM	FOR UWH	6	10-15-80	SVM	FOR UWH	6	10-15-80	SVM	FOR UWH	6	10-15-80	SVM	FOR UWH
7	10-15-80	SVM	FOR UWH	7	10-15-80	SVM	FOR UWH	7	10-15-80	SVM	FOR UWH	7	10-15-80	SVM	FOR UWH
8	10-15-80	SVM	FOR UWH	8	10-15-80	SVM	FOR UWH	8	10-15-80	SVM	FOR UWH	8	10-15-80	SVM	FOR UWH
9	10-15-80	SVM	FOR UWH	9	10-15-80	SVM	FOR UWH	9	10-15-80	SVM	FOR UWH	9	10-15-80	SVM	FOR UWH
10	10-15-80	SVM	FOR UWH	10	10-15-80	SVM	FOR UWH	10	10-15-80	SVM	FOR UWH	10	10-15-80	SVM	FOR UWH

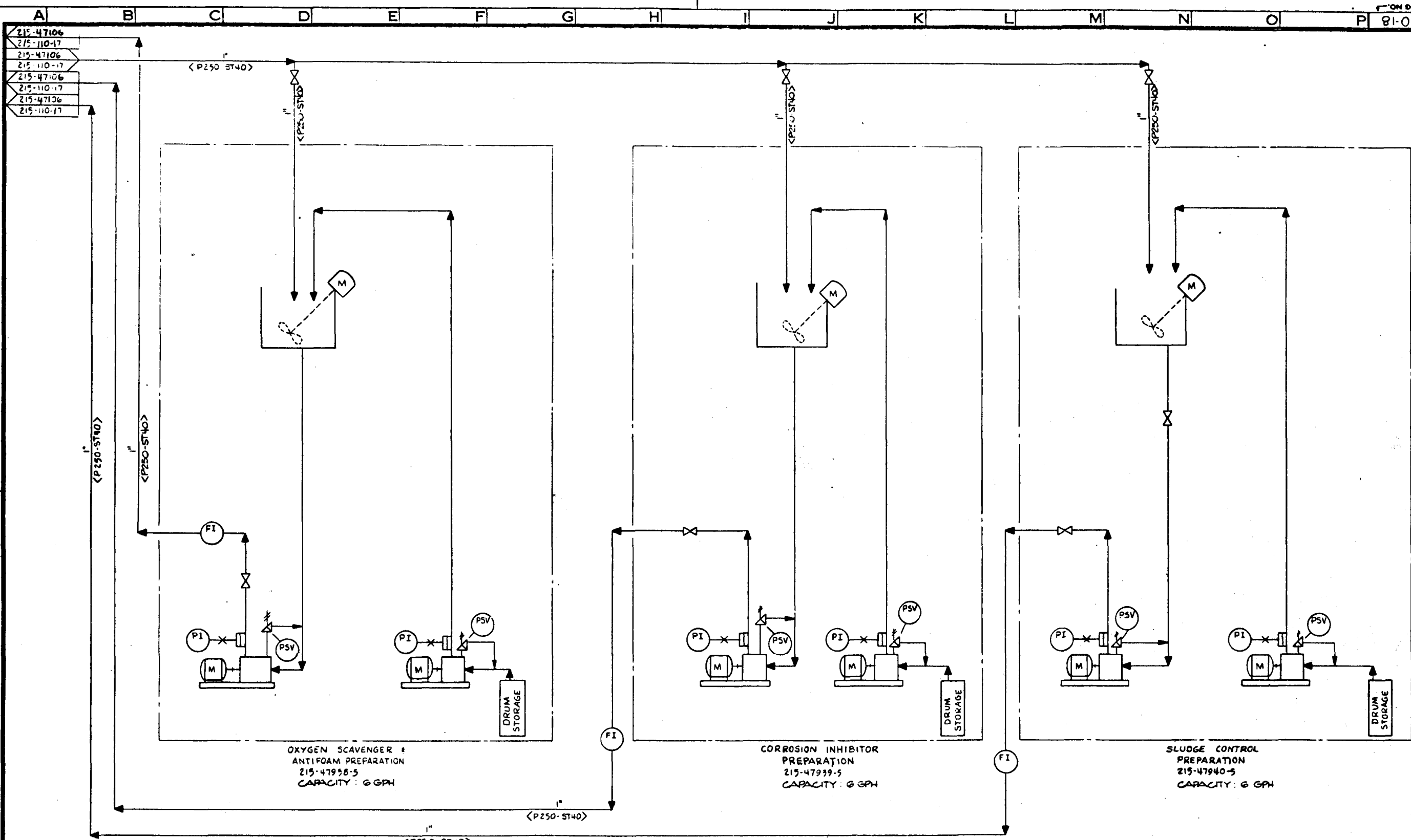
BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.
DESIGNED	SVM	ISSUED	P & I DIAGRAM	7051
DRAWN	SVM	FOR RECORD AND CDD	AREA 215 UTILITIES	DRAWING NO.
CHECKED	KMM	FOR COMMENTS AND/OR	AREA 207 BFW TREATMENT	215-110-16
DRAWN APP'D	SVM	FOR CUSTOMER APPROVAL	U.S. DOE ENERGY TECHNOLOGY	CASE
ICGG APP'D	SVM	AND/OR COMMENTS	FOSSIL ENERGY PROGRAMS	DC
DOE APP'D	SVM	APPROVAL FOR	CONTRACT NO. EF-77-C-01-2012	REV.
SCALE		CONSTRUCTION	PREPARED FOR THE	
			ILLINOIS COAL GASIFICATION GROUP	
			BY	
			ORAVO CORPORATION PITTSBURGH, PA.	



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10-15-80	SYM	KMM	JWH	1	10-15-80	SYM	KMM	JWH	1	10-15-80	SYM	KMM	JWH
2	10-15-80	SYM	KMM	JWH	2	10-15-80	SYM	KMM	JWH	2	10-15-80	SYM	KMM	JWH
3	10-15-80	SYM	KMM	JWH	3	10-15-80	SYM	KMM	JWH	3	10-15-80	SYM	KMM	JWH
4	10-15-80	SYM	KMM	JWH	4	10-15-80	SYM	KMM	JWH	4	10-15-80	SYM	KMM	JWH
5	10-15-80	SYM	KMM	JWH	5	10-15-80	SYM	KMM	JWH	5	10-15-80	SYM	KMM	JWH
6	10-15-80	SYM	KMM	JWH	6	10-15-80	SYM	KMM	JWH	6	10-15-80	SYM	KMM	JWH
7	10-15-80	SYM	KMM	JWH	7	10-15-80	SYM	KMM	JWH	7	10-15-80	SYM	KMM	JWH
8	10-15-80	SYM	KMM	JWH	8	10-15-80	SYM	KMM	JWH	8	10-15-80	SYM	KMM	JWH
9	10-15-80	SYM	KMM	JWH	9	10-15-80	SYM	KMM	JWH	9	10-15-80	SYM	KMM	JWH
10	10-15-80	SYM	KMM	JWH	10	10-15-80	SYM	KMM	JWH	10	10-15-80	SYM	KMM	JWH

DESIGNED	BY	DATE	DRAWING STATUS	TITLE	PROJECT NO.
SYM	SYM	10-15-80	ISSUED	AREA 215 UTILITIES	7051
DRAWN	SYM	10-15-80	FOR RECORD AND DDPD	AREA 212 BFW DEAERATION	215-110-17
CHECKED	SYM	10-15-80	FOR COMMENTS AND/OR	U.S. DOE ENERGY TECHNOLOGY	
DRAWN APP'D	SYM	10-15-80	APPROVAL	FOSSIL ENERGY PROGRAMS	
ICGG APP'D	SYM	10-15-80	FOR CUSTOMER APPROVAL	CONTRACT NO. EF-77-C-01-2012	
DOE APP'D	SYM	10-15-80	AND/OR COMMENTS	DOE	
SCALE			APPROVAL FOR CONSTRUCTION	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA.	

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.



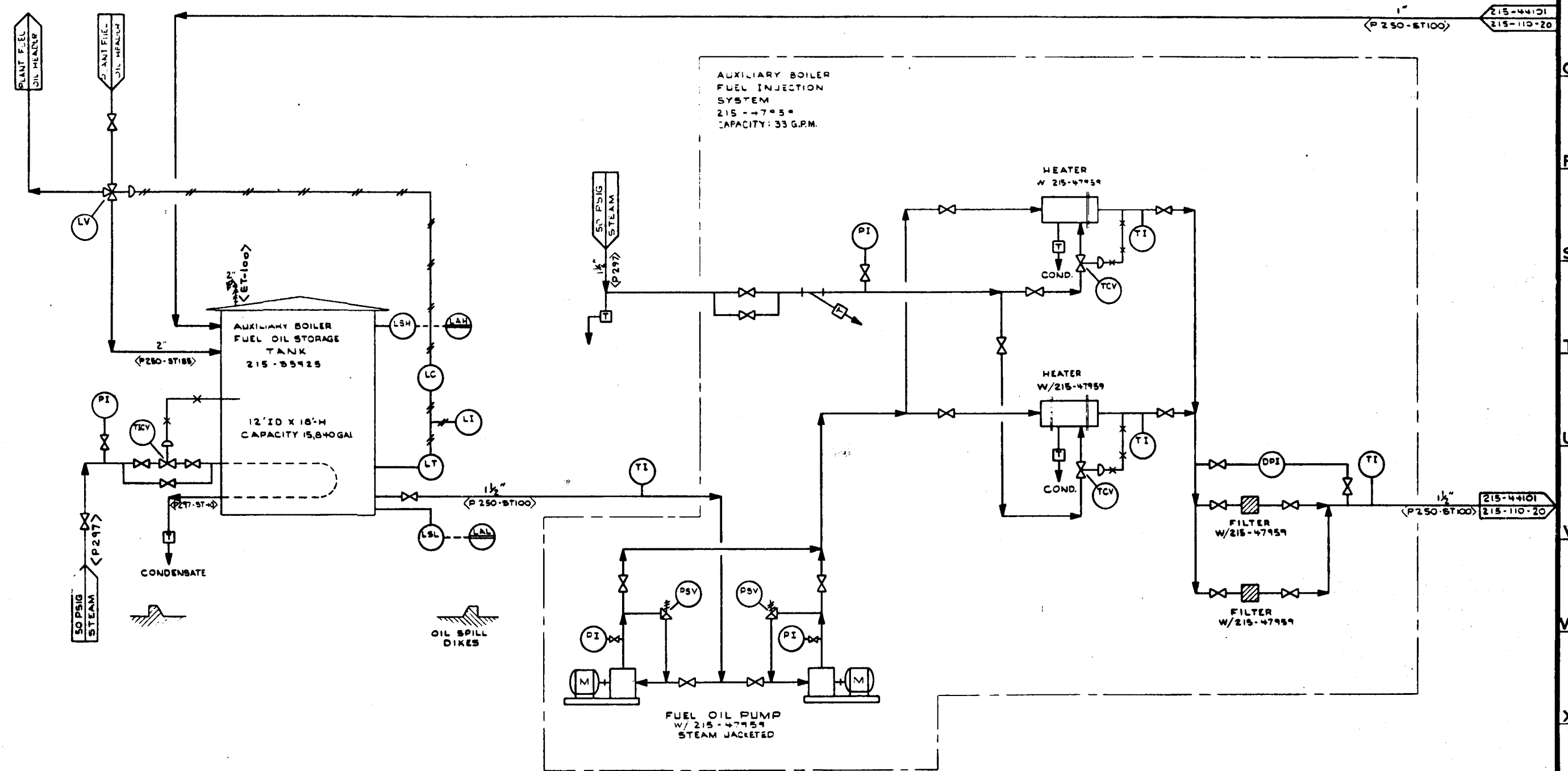
REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	4-15-20	SVN	KMM	JNH	1	4-15-20	SVN	KMM	JNH	1	4-15-20	SVN	KMM	JNH
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	ISSUED	DATE
SVN	SVN	4-15-20	4-15-20	4-15-20
DRAWN	BY	DATE	FOR RECORD AND CFPD	DATE
KMM	KMM	4-15-20	4-15-20	4-15-20
CHECKED	BY	DATE	FOR COMMENTS AND/OR APPROVAL	DATE
KMM	KMM	4-15-20	4-15-20	4-15-20
DRAWN APP'D	DATE	FOR CUSTOMER APPROVAL	ICGG	DATE
SVN	4-15-20	4-15-20	SVN	4-15-20
ICGG APP'D	DATE	AND/OR COMMENTS	DOE	DATE
SVN	4-15-20	4-15-20	SVN	4-15-20
DOE APP'D	DATE	APPROVAL FOR CONSTRUCTION		DATE
SVN	4-15-20	4-15-20		4-15-20
SCALE				

TITLE	PROJECT NO
P&ID DIAGRAM	7051
AREA 215 UTILITIES	DRAWING NO
AREA 212 BFW TREATMENT	215-110-18
U.S. DOE	CASE
FOSSIL ENERGY PROGRAMS	DC
CONTRACT NO. EF-77-C-01-2012	REV.
PREPARED FOR THE	
ILLINOIS COAL GASIFICATION GROUP	
BY	
ORAVO CORPORATION PITTSBURGH, PA.	

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.

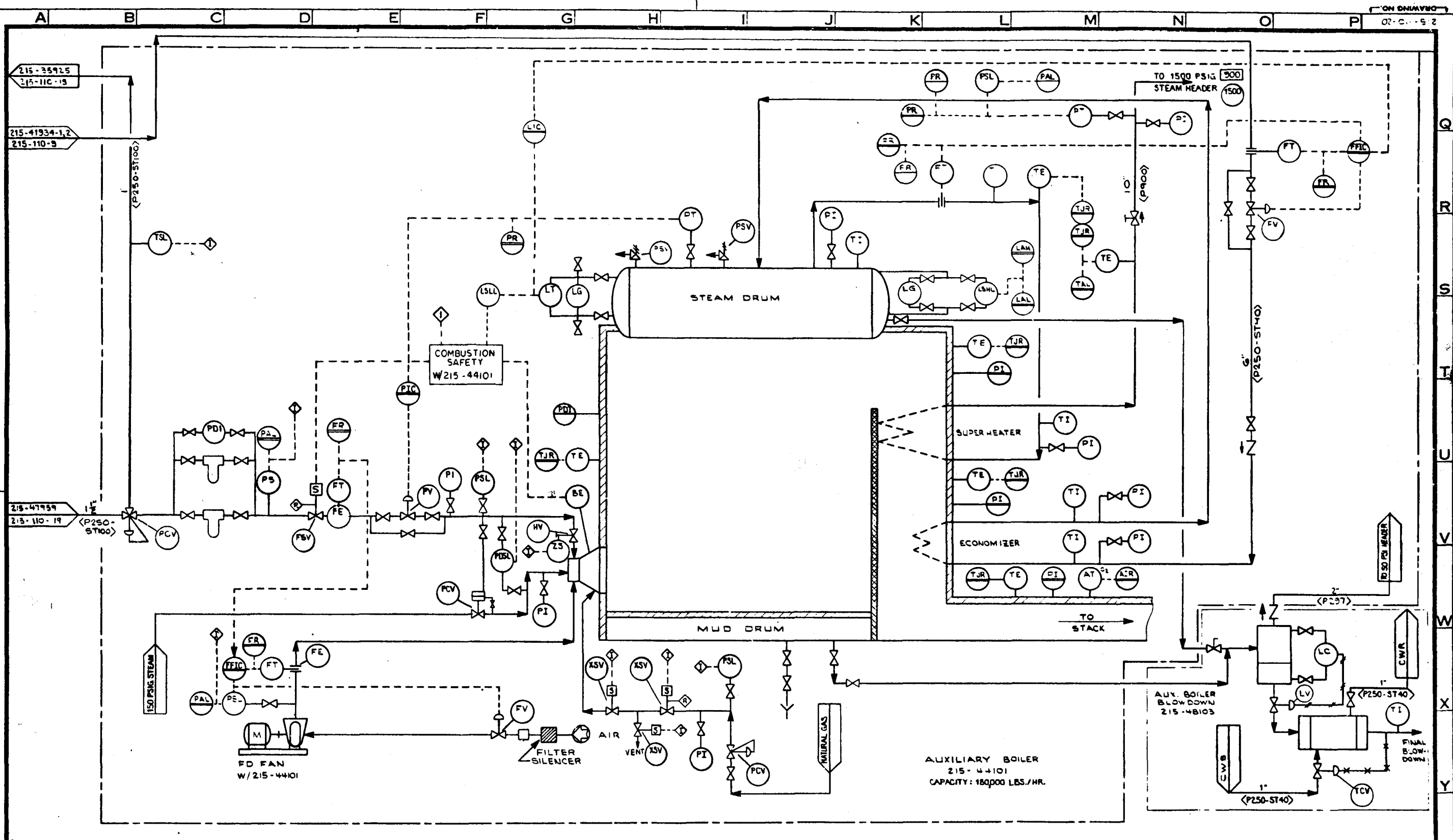
1" (P 250-ST100) 215-44101
215-110-20



NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	DC DEMONSTRATION CONCEPT	11-15-80	KMM	JWN		1	PRELIMINARY ISSUE	11-15-80	KMM	JWN	
2						2	FOR BASELINING	11-15-80	KMM	JWN	
3						3	PDRF RECORD AND CPPD	11-15-80	KMM	JWN	
4											
5											
6											
7											
8											
9											
10											

BY	DATE	DRAWING STATUS	TITLE	PROJECT NO
DESIGNED	11-15-80	ISSUED	PFI DIAGRAM	7051
DRAWN	11-15-80	FOR RECORD AND CPPD	AREA 215 UTILITIES	DRAWING NO
CHECKED	11-15-80	FOR COMMENTS AND/OR APPROVAL	AUXILIARY BOILER FUEL OIL FEED SYSTEM	215-110-19
DRAWN APPD			U.S. DOE ENERGY TECHNOLOGY	CASE
ICGG APPD			FOSSIL ENERGY PROGRAMS	CC
DOE APPD			CONTRACT NO. EF-77-C-01-2012	REV
SCALE			PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH PA	

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.



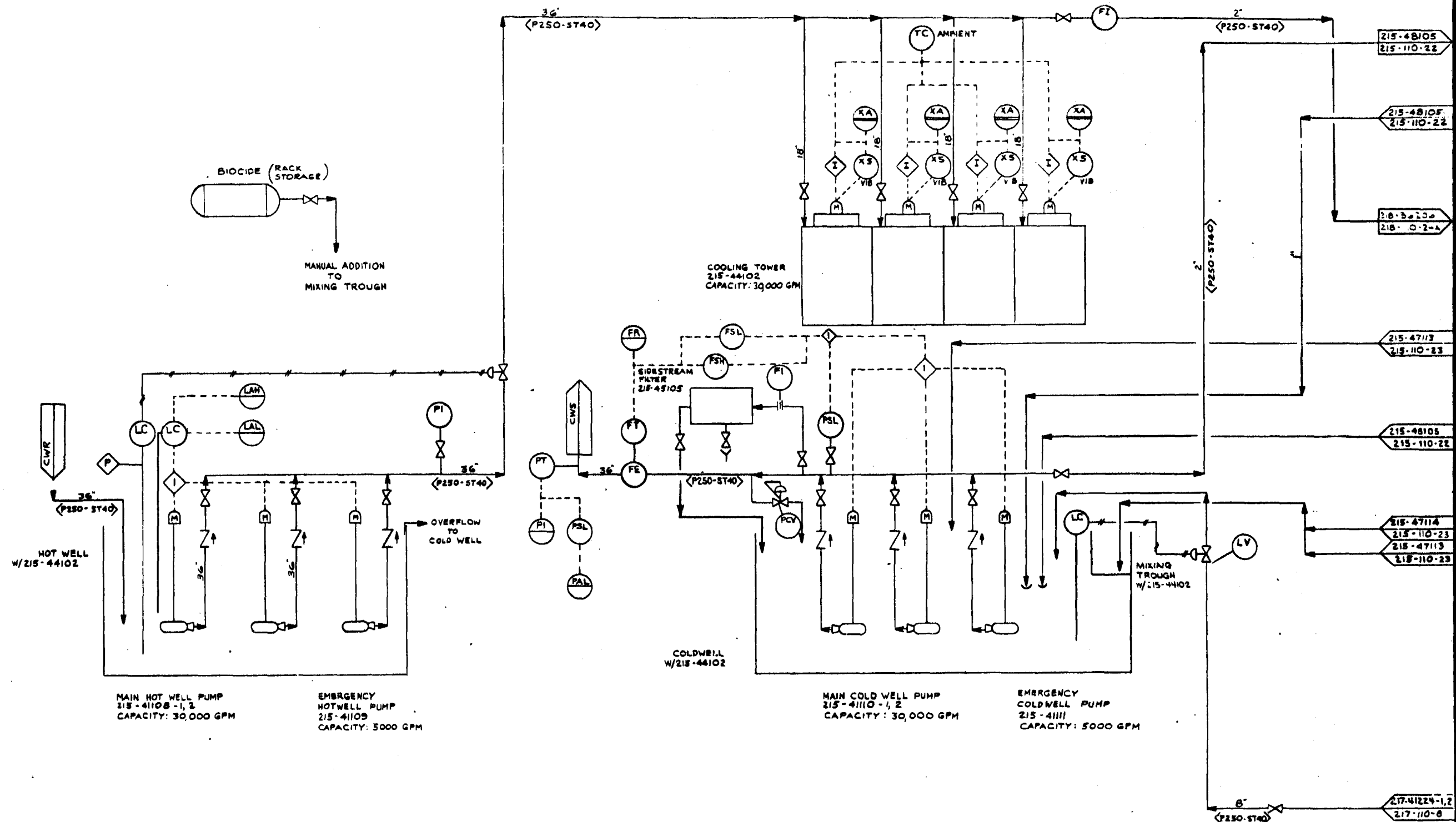
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHKD	APPRD	NO.	DATE	BY	CHKD	APPRD	NO.	DATE	BY	CHKD	APPRD
1					1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				
11					11					11				
12					12					12				
13					13					13				
14					14					14				
15					15					15				
16					16					16				
17					17					17				
18					18					18				
19					19					19				
20					20					20				
21					21					21				
22					22					22				
23					23					23				
24					24					24				
25					25					25				
26					26					26				

BY	DATE	DRAWING STATUS	
DESIGNED	S.V.M.	ISSUED	DATE
DRAWN	K.M.V.	PIEF RECORD AND OFPD	4-15-20
CHECKED	K.M.V.	FOR COMMENTS AND/OR	
DRAWG APPD	S.V.M.	APPROVAL	
ICGG APPD	S.V.M.	FOR CUSTOMER APPROVAL	ICGG
DOE APPD		AND/OR COMMENTS	DOE
		APPROVAL FOR	
SCALE		CONSTRUCTION	

TITLE		PROJECT NO
P&I DIAGRAM		7051
AREA 215		DRAWING NO
UTILITIES		
AUXILIARY BOILER		
U.S DOE		215-110-20
ENERGY TECHNOLOGY		CASE
FOSSIL ENERGY PROGRAMS		DC
CONTRACT NO EF-77-C-01-2012		
PREPARED FOR THE		REV
ILLINOIS COAL GASIFICATION GROUP		0
BY		
DRAVO CORPORATION PITTSBURGH, PA		

DO NOT SCALE THIS DRAWING
OR PART OF DEVELOPED FROM ORIGINAL SIZE

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

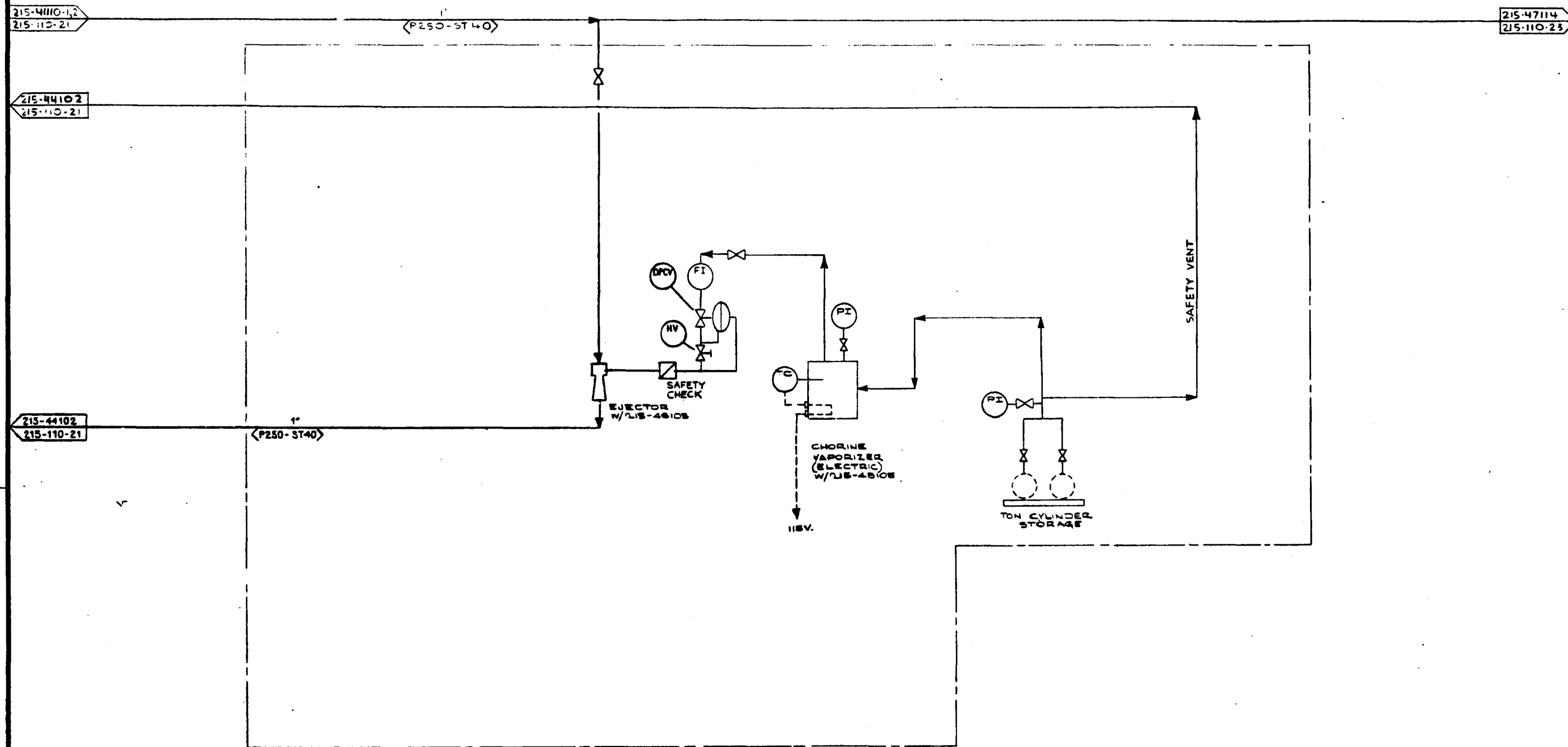


REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD	NO.	DATE	BY	CHKD	APPD
1					1					1					1				
2					2					2					2				
3					3					3					3				
4					4					4					4				
5					5					5					5				
6					6					6					6				
7					7					7					7				
8					8					8					8				
9					9					9					9				
10					10					10					10				

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SYN	SYN	1-1-80	ISSUED		
DUDIK	DUDIK	1-13-80	FOR RECORD AND DFPD	4-15-80	
CHKD	KMM	1-28-80	FOR COMMENTS AND/OR		
DRAYD APPD		2-15-80	APPROVAL		
ICGB APPD			FOR CUSTOMER APPROVAL	ICGB	
DOE APPD			AND/OR COMMENTS	DOE	
SCALE			APPROVAL FOR CONSTRUCTION		

PROJECT NO	7051
DRAWING NO	215-110-21
CASE	DC
REV	3

TITLE	P & I DIAGRAM
AREA 215 UTILITIES	
COOLING TOWER	
U.S. DOE ENERGY TECHNOLOGY	
FOSSIL ENERGY PROGRAMS	
CONTRACT NO. EF-77-C-01-2012	
PREPARED FOR THE	
ILLINOIS COAL GASIFICATION GROUP	
BY	
DRAYD CORPORATION PITTSBURGH, PA.	



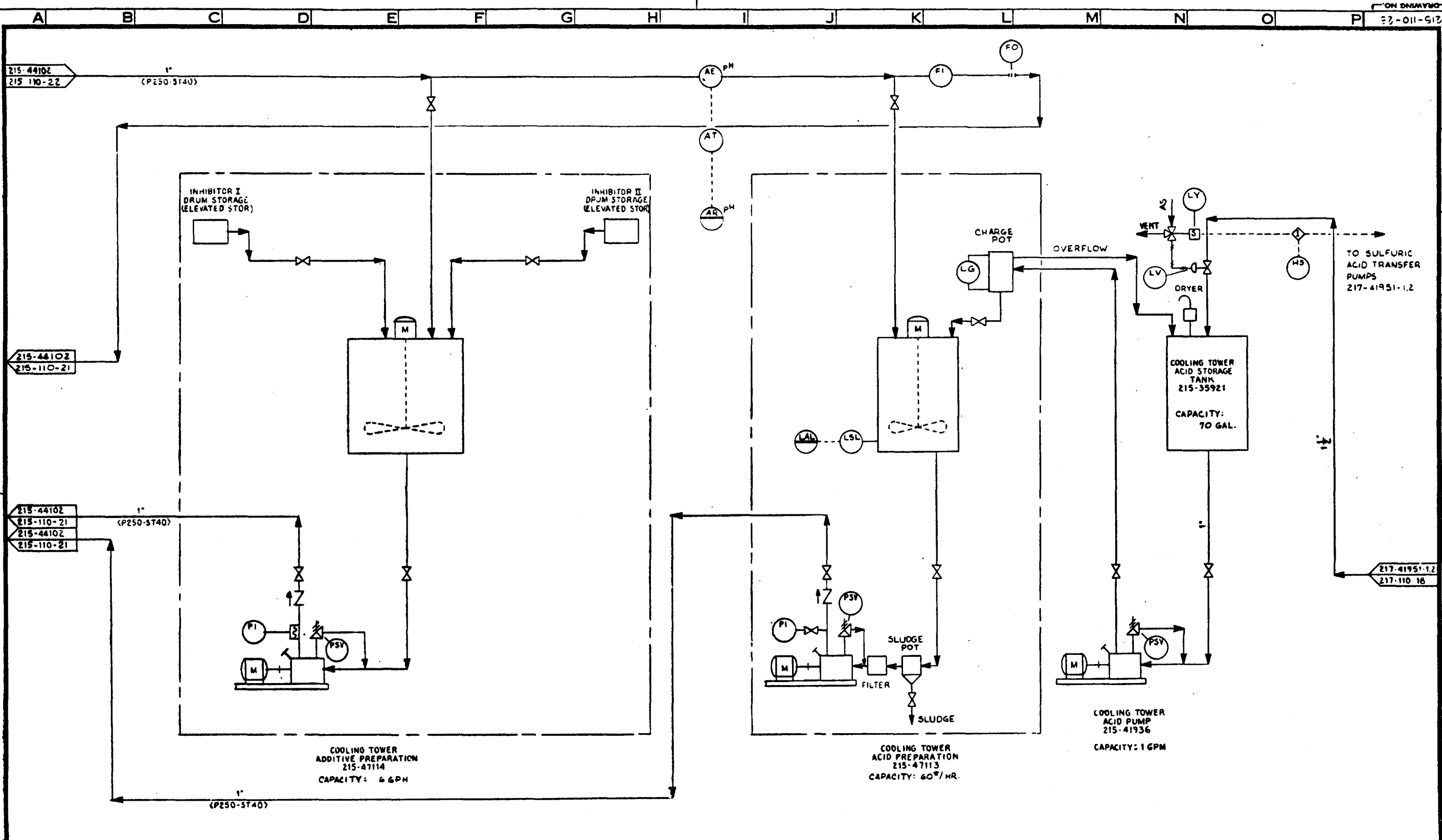
REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CHKD APPD	NO.	DATE	BY	CHKD APPD	NO.	DATE	BY	CHKD APPD
1				1				1			
2				2				2			
3				3				3			
4				4				4			
5				5				5			
6				6				6			
7				7				7			
8				8				8			
9				9				9			
10				10				10			
11				11				11			
12				12				12			
13				13				13			
14				14				14			
15				15				15			
16				16				16			
17				17				17			
18				18				18			
19				19				19			
20				20				20			
21				21				21			
22				22				22			
23				23				23			

DESIGNED	BY	DATE	ISSUED	DATE
215-4110-12	S.V.M.	1-1-80	1-1-80	1-1-80
215-4110-21	S.V.M.	1-1-80	1-1-80	1-1-80
215-4110-22	S.V.M.	1-1-80	1-1-80	1-1-80
215-4110-23	S.V.M.	1-1-80	1-1-80	1-1-80

FOR COMMENTS AND/OR APPROVAL	FOR CUSTOMER APPROVAL	FOR CONSTRUCTION
215-4110-12	215-4110-21	215-4110-22
215-4110-21	215-4110-22	215-4110-23
215-4110-22	215-4110-23	
215-4110-23		

U.S. DOE	ENERGY TECHNOLOGY	PROJECT NO
FOSSIL ENERGY PROGRAMS	CONTRACT NO. EF-77-C-01-2012	7051
ILLINOIS COAL GASIFICATION GROUP	BY	DRAWING NO
DRAGO CORPORATION, PITTSBURGH, PA.		215-110-22

CASE	REV.
DC	0

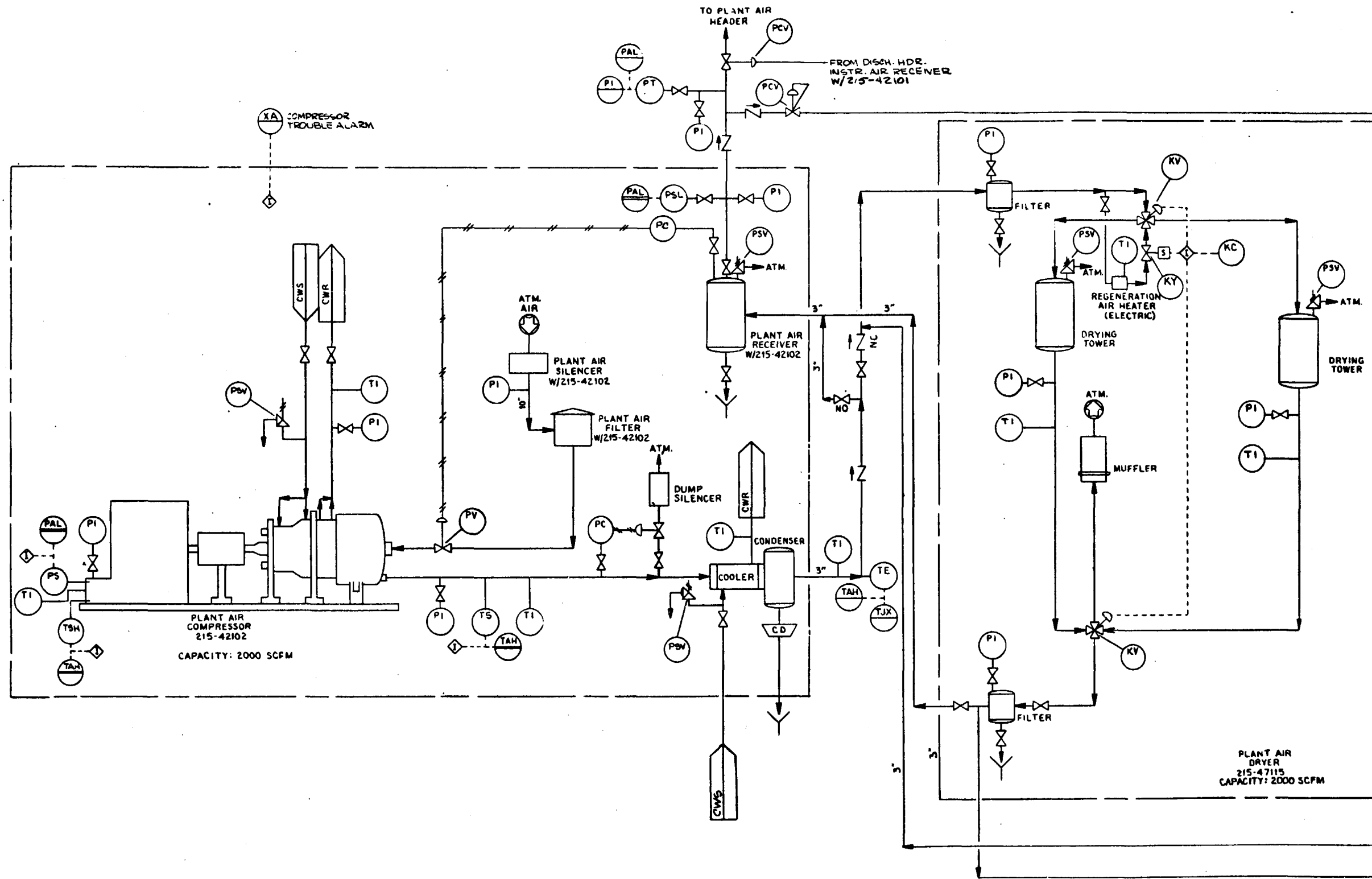


REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1		SYM	MM	JWH	1		SYM	MM	JWH	1		SYM	MM	JWH
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	DRAWING STATUS	DATE
SYN	SYM	4-15-80	ISSUED	4-15-80
DRAWN	SYM	4-15-80	FOR RECORD AND CFPD	4-15-80
CHECKED	SYM	4-15-80	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D	SYM	4-15-80	FOR CUSTOMER APPROVAL	
ICGB APP'D	SYM	4-15-80	AND/OR COMMENTS	
DOE APP'D	SYM	4-15-80	APPROVAL FOR CONSTRUCTION	
SCALE				

TITLE	P&ID ACHAM AREA 215 UTILITIES	PROJECT NO	7051
	COOLING TOWER ADDITIVE & ACID PREPARATION	DRAWING NO	215-110-23
	U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	CASE	CC
	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA	REV.	A

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



215-42101
215-110-25
215-42101
215-110-25

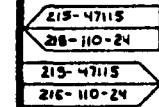
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPROV.	NO.	DATE	BY	CHK'D	APPROV.	NO.	DATE	BY	CHK'D	APPROV.
1	12-15-90	SYM	KMM	JWH	1	12-15-90	SYM	KMM	JWH	1	12-15-90	SYM	KMM	JWH
DC-DEMONSTRATION CONCEPT					PRELIMINARY ISSUE FOR BASELINING					P&ID RECORD AND DDPD				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				
11					11					11				
12					12					12				
13					13					13				
14					14					14				
15					15					15				
16					16					16				
17					17					17				
18					18					18				
19					19					19				
20					20					20				

DESIGNED	BY	DATE	DRAWING STATUS	ISSUED	DATE
SYM	SYM	12-15-90	ISSUED	SYM	12-15-90
DRAWN	SYM	12-15-90	FOR COMMENTS AND/OR APPROVAL	SYM	12-15-90
CHECKED	SYM	1-25-91	FOR COMMENTS AND/OR APPROVAL	SYM	1-25-91
BRV APPD	SYM	1-25-91	FOR CUSTOMER APPROVAL	SYM	1-25-91
ICGG APPD	SYM	1-25-91	AND/OR COMMENTS	SYM	1-25-91
DOE APPD	SYM	1-25-91	APPROVAL FOR CONSTRUCTION	SYM	1-25-91
SCALE					

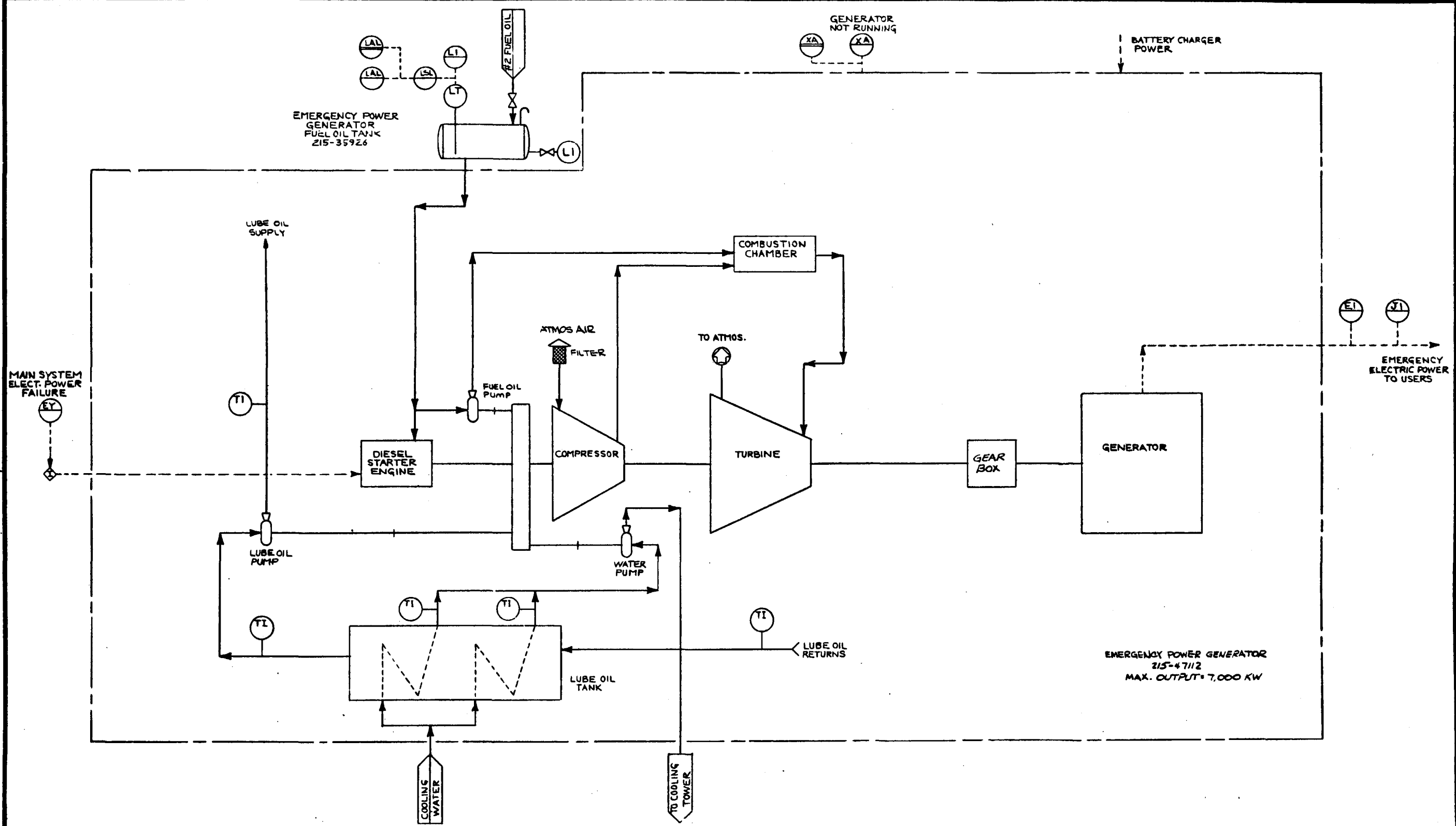
TITLE	P&ID DIAGRAM AREA 215 UTILITIES PLANT AIR
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	PROJECT NO 7051 DRAWING NO 215-110-24
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAGO CORPORATION PITTSBURGH, PA.	CASE REV.

"D"

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



REVISIONS				REVISIONS				REVISIONS						
NO.	DATE	BY	CHK'D	APPRO'D	NO.	DATE	BY	CHK'D	APPRO'D	NO.	DATE	BY	CHK'D	APPRO'D
1	12-15-77	SYM	KMM	JWH	1	12-15-77	SYM	KMM	JWH	1	12-15-77	SYM	KMM	JWH
DC DEMONSTRATION CONCEPT					PRELIMINARY ISSUE FOR BASELINING					PCEP RECORD AND OPD				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

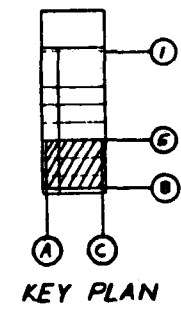
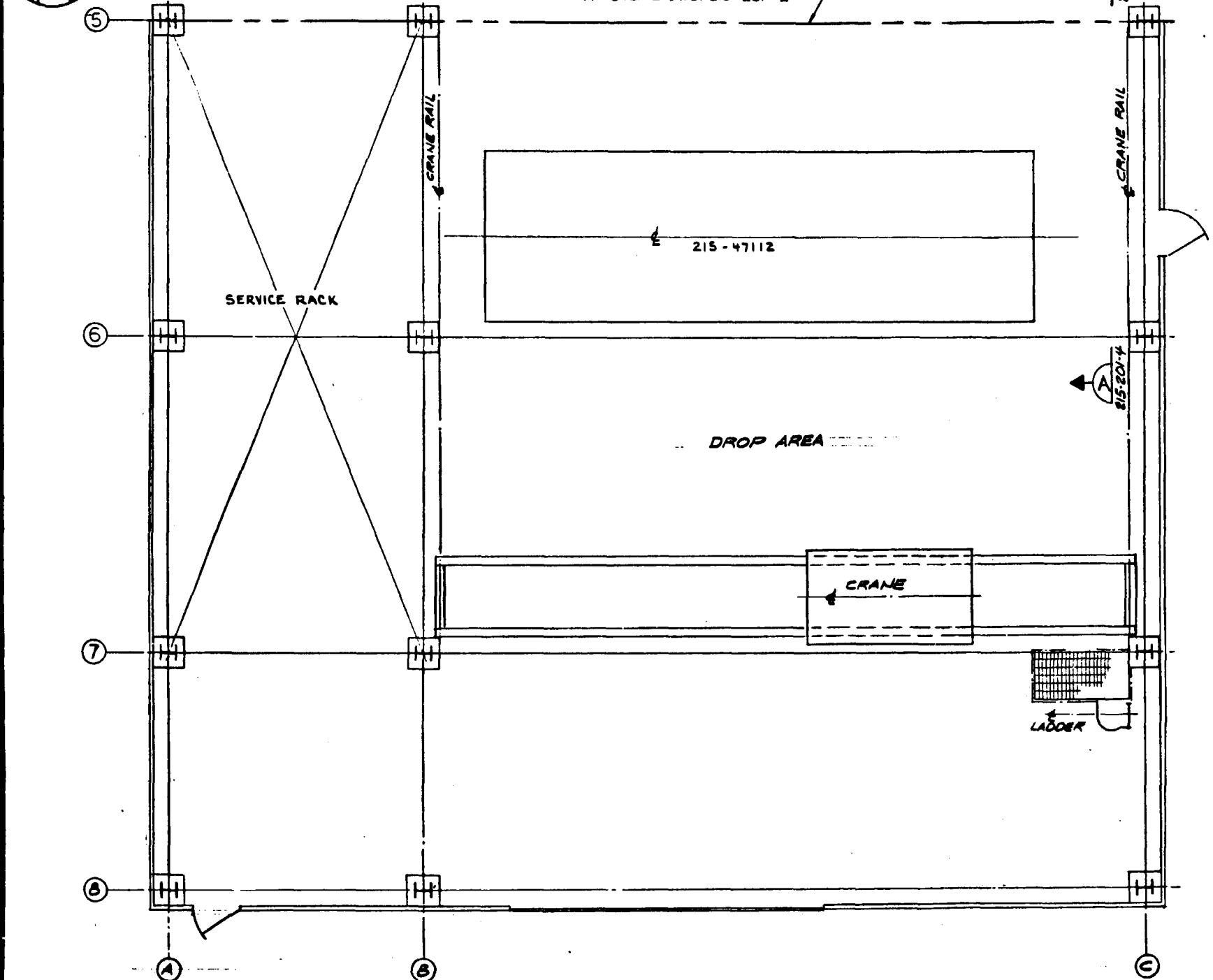
DESIGNED	BY	DATE	ISSUED	DATE
SYM	SYM	12-15-77	12-15-77	12-15-77
DRAWN	SYM	12-15-77	FOR RECORD AND OPD	12-15-77
CHECKED	SYM	12-15-77	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D	SYM	12-15-77	FOR CUSTOMER APPROVAL	
ICGG APP'D			AND/OR COMMENTS	
DOE APP'D			APPROVAL FOR CONSTRUCTION	
SCALE				

TITLE	P&I DIAGRAM	PROJECT NO	7051
AREA 215	UTILITIES	DRAWING NO	215-110-26
EMERGENCY POWER GENERATOR		CASE	DC
U.S. DOE	ENERGY TECHNOLOGY	REV.	
FOSSIL ENERGY PROGRAMS			
CONTRACT NO. EF-77-C-01-2012			
PREPARED FOR THE			
ILLINOIS COAL GASIFICATION GROUP			
BY			
DRAYO CORPORATION PITTSBURGH, PA.			

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE.



ITEM NO.	DESCRIPTION
215-47112	EMERGENCY POWER GENERATOR



PLAN @ GRADE

PRELIMINARY

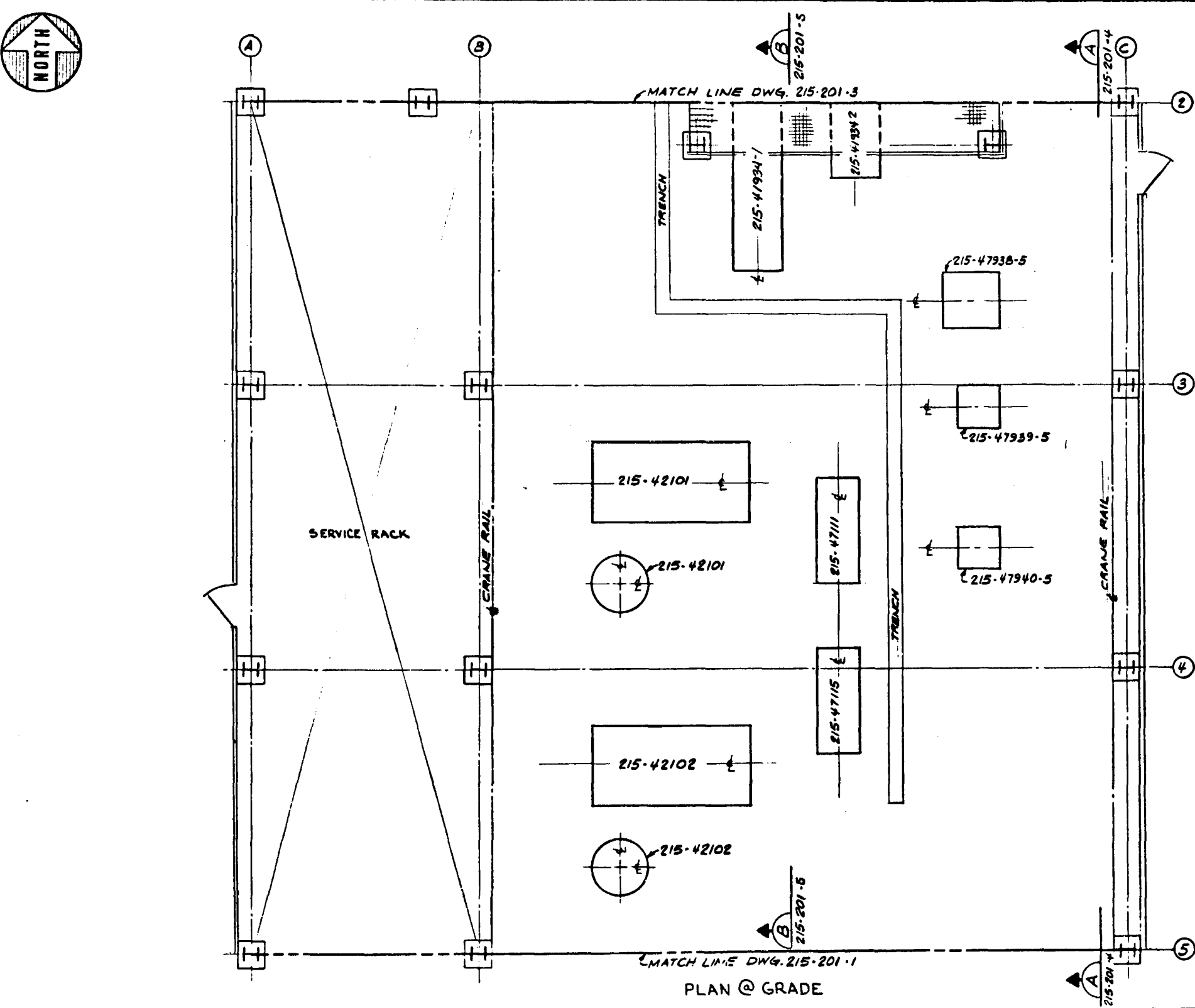
NOT APPROVED FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BRIEFING	1/1/11	WURM														
2	ISSUED FOR DPPD REPORT	1/1/11	WURM														

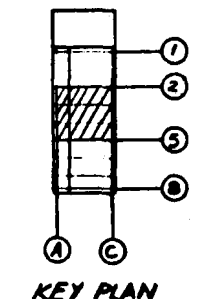
BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	WURM	FOR LAYOUT
CHECKED		FOR COMMENTS AND/OR APPROVAL
DRAWN APP'D		APPROVAL
ICGG APP'D		FOR CUSTOMER APPROVAL
DOE APP'D		AND/OR COMMENTS
SCALE		APPROVAL FOR CONSTRUCTION

TITLE	UTILITY BUILDING LAYOUT PLAN	PROJECT NO.	7051
	U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO.	215-201-1
	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAVO CORPORATION PITTSBURGH, PA	CASE	DC
		REV.	△

DO NOT SCALE THIS DRAWING IT MAY BE REDUCED FROM ORIGINAL SIZE.



EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
215-41934-1	AUXILIARY BOILER BPM PUMP
215-41934-2	AUXILIARY BOILER BPM PUMP
215-42101	INSTRUMENT AIR COMPRESSORS W/INTERCHANGERS
215-42102	PLANT AIR COMPRESSORS W/INTERCHANGERS
215-47111	INSTRUMENT AIR DRYER
215-47115	PLANT AIR DRYER
215-47938-5	DRYER SCAVENGER & ANTI-FDAM PREPARATION
215-47939-5	CORROSION INHIBITOR PREPARATION
215-47940-5	SLUDGE CONTROL PREPARATION

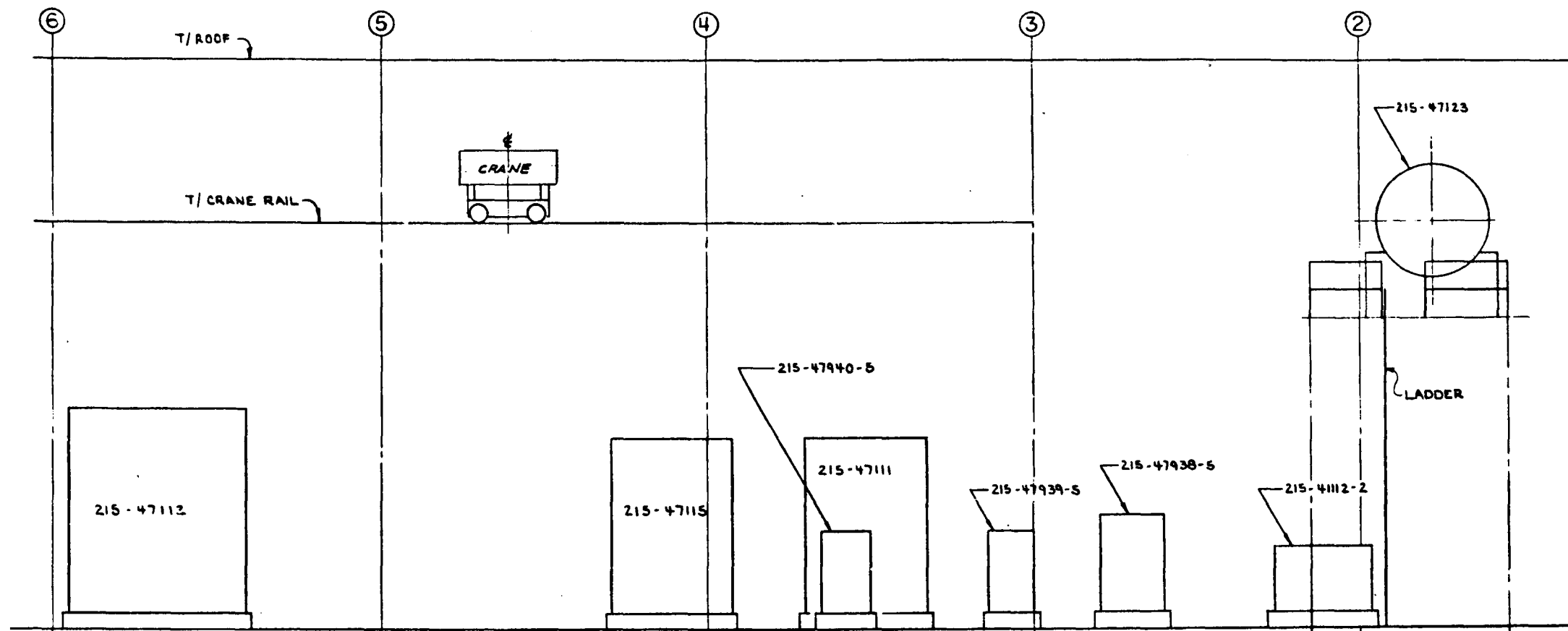


PRELIMINARY NOT APPROVED FOR CONSTRUCTION

REVISIONS					REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10/1/12	ECR																	
2	10/1/12	ECR																	
3	10/1/12	ECR																	
4	10/1/12	ECR																	
5	10/1/12	ECR																	
6	10/1/12	ECR																	
7	10/1/12	ECR																	
8	10/1/12	ECR																	
9	10/1/12	ECR																	
10	10/1/12	ECR																	

BY	DATE	DRAWING STATUS	
DESIGNED		ISSUED	DATE
DRAWN	ECR	FOR COMMENTS AND/OR APPROVAL	
CHECKED		FOR CUSTOMER APPROVAL	ICGG
DRAWN APP'D		AND/OR COMMENTS	DCG
ICGG APP'D		APPROVAL FOR CONSTRUCTION	
DCG APP'D			
SCALE			

UTILITY BUILDING LAYOUT PLAN		PROJECT NO. 7051 DRAWING NO. 215-201-2
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		CASE
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH PA		REV. 



SECTION A
215-201-1, 2 & 3

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

0 1 2 3 4 5 6 7 8 9 10 11 12
1/8" = 1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	10/1/01	WJN			1						1					
2	ISSUED FOR DRPD REPORT	10/1/01	WJN			2						2					
3						3						3					
4						4						4					
5						5						5					
6						6						6					
7						7						7					
8						8						8					
9						9						9					
10						10						10					
11						11						11					
12						12						12					

BY	DATE	DRAWING STATUS
DESIGNED		ISSUED
DRAWN	WJN	FOR COMMENTS AND/OR APPROVAL
CHECKED		FOR COMMENTS AND/OR APPROVAL
DRAGO APPD		FOR CUSTOMER APPROVAL
ICGG APPD		AND/OR COMMENTS
DOE APPD		APPROVAL FOR CONSTRUCTION
SCALE		

TITLE
**UTILITY BUILDING
LAYOUT
SECTION**

U.S. DoE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012

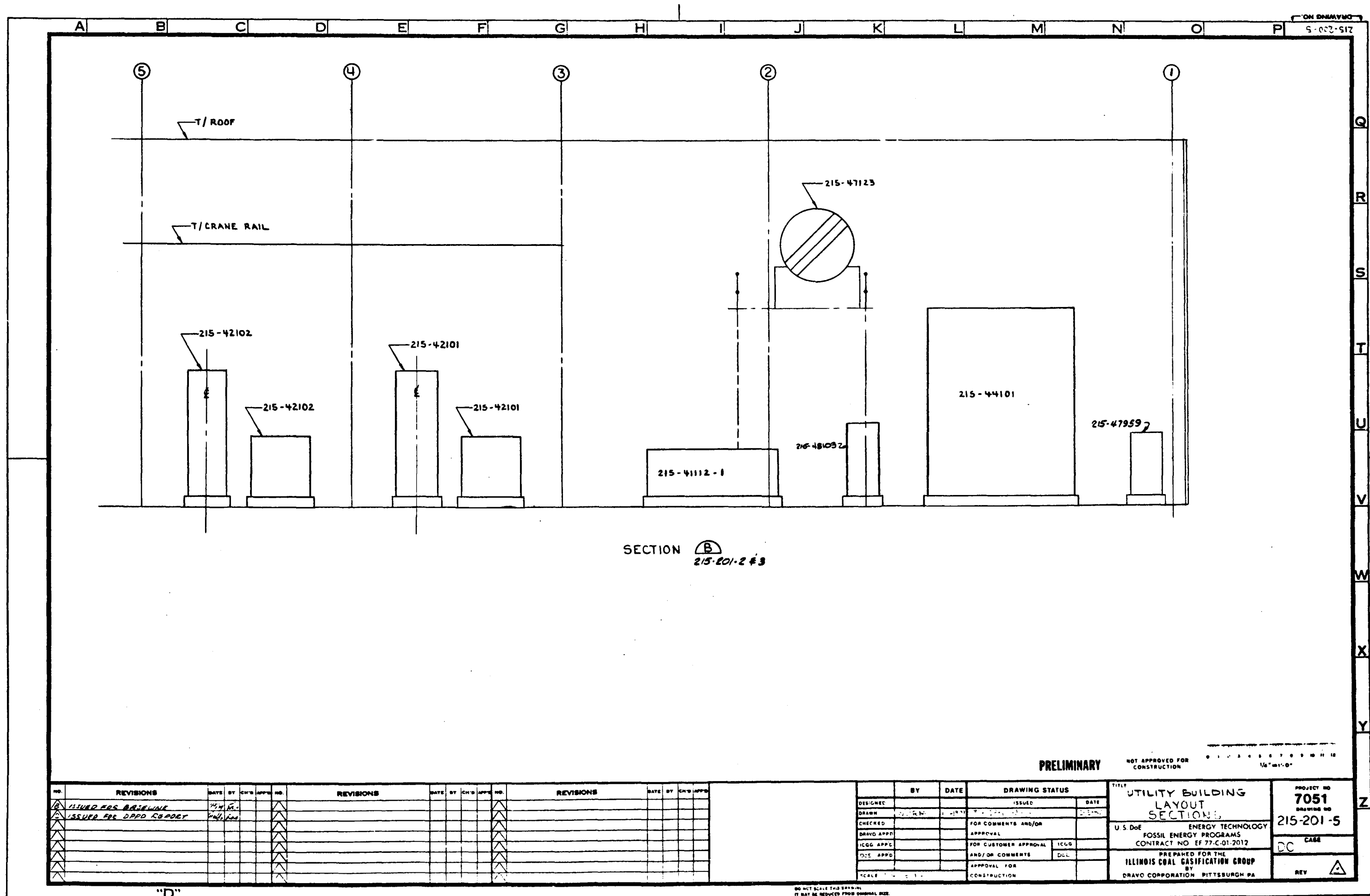
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRAGO CORPORATION PITTSBURGH PA

PROJECT NO
7051

DRAWING NO
215-201-4

CASE
DC

REV.



SECTION **B**
215-201-2 & 3

PRELIMINARY

NOT APPROVED FOR
CONSTRUCTION

0 1 2 3 4 5 6 7 8 9 10 11 12
1/8" = 1'-0"

NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.
1	ISSUED FOR BASELINE	11/14/11	MS															
2	ISSUED FOR DDPD REPORT	11/14/11	MS															

DESIGNED	BY	DATE	ISSUED	DATE
DRAWN				
CHECKED			FOR COMMENTS AND/OR APPROVAL	
DRAWG APPD				
ICGG APPD			FOR CUSTOMER APPROVAL	ICGG
DCE APPD			AND/OR COMMENTS	DCE
SCALE			APPROVAL FOR CONSTRUCTION	

TITLE
**UTILITY BUILDING
LAYOUT
SECTIONS**
U.S. DoE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF 77-C-01-2012
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRAVO CORPORATION PITTSBURGH PA

PROJECT NO
7051
DRAWING NO
215-201-5
CASE
DC
REV

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



0 1 2 3 4 5 6 7 8 9 10 11 12

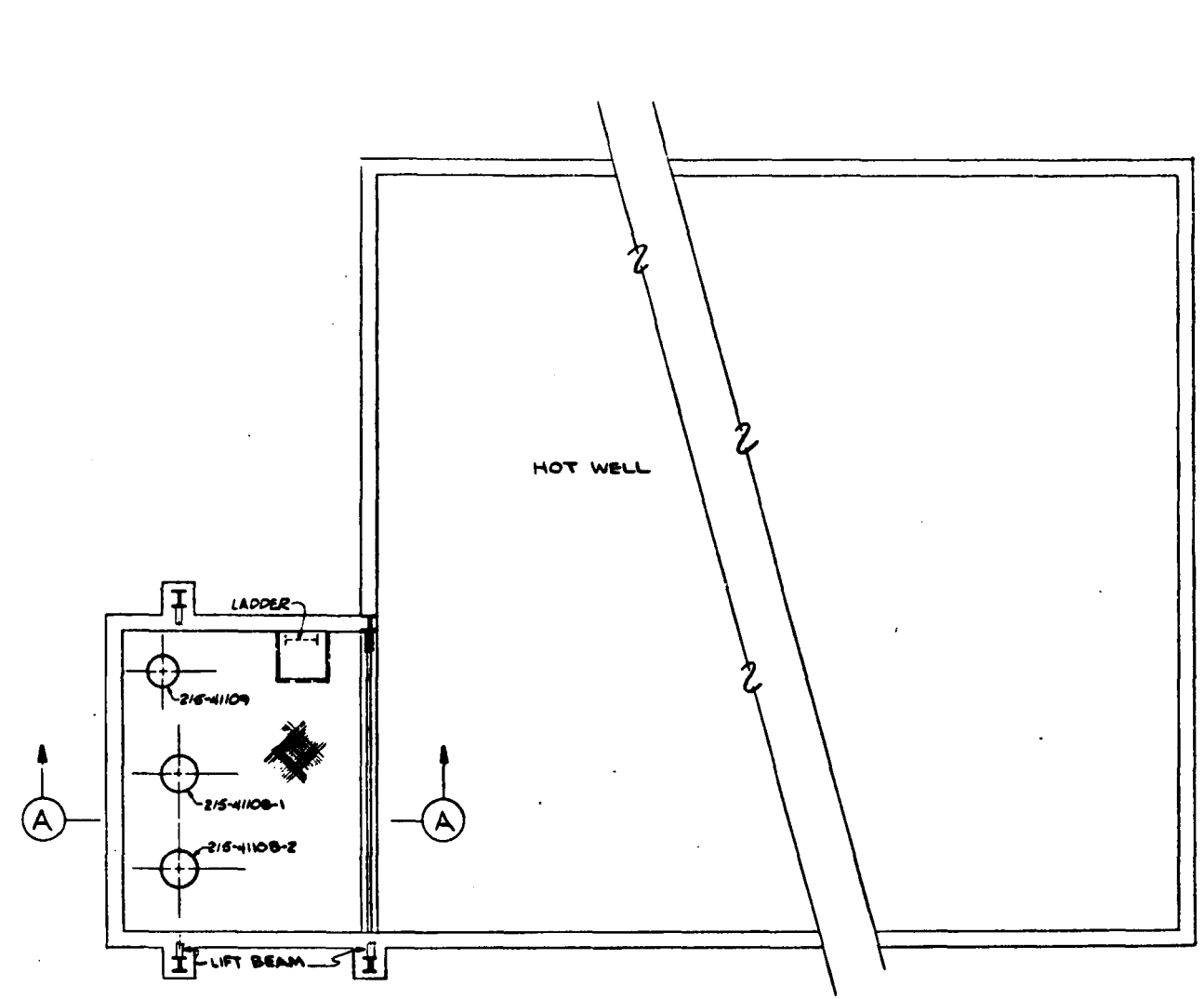
$1/4^\circ = 1.0^\circ$

"D"

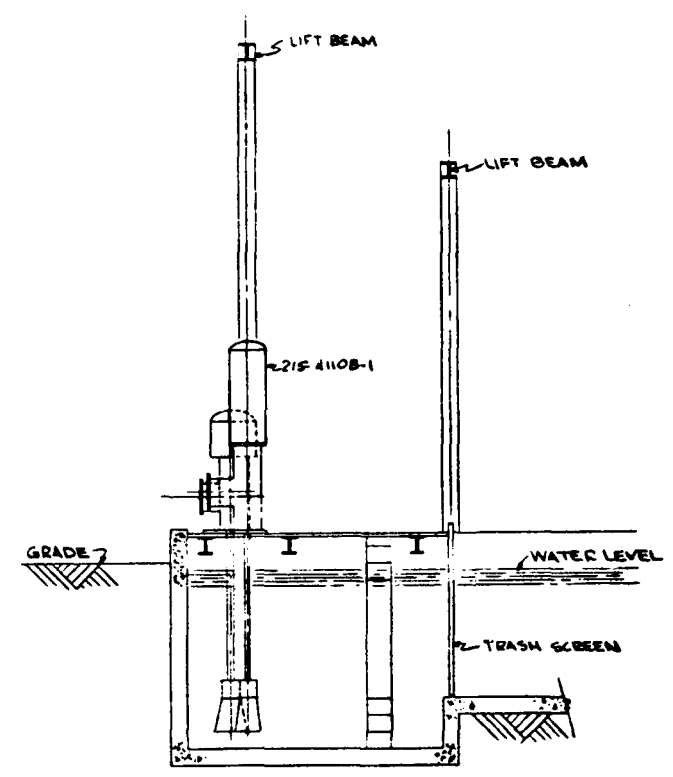
DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE



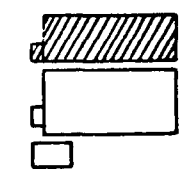
ITEM NO.	EQUIPMENT LIST
DESCRIPTION	
215-41108-1,2	NATH HOT WELL PUMP
215-41109	EMERGENCY HOT WELL PUMP



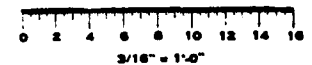
PLAN



SECTION A



KEY PLAN



PRELIMINARY NOT APPROVED FOR CONSTRUCTION

NO	REVISIONS	DATE	BY	CHK'D	APPR'D	NO	REVISIONS	DATE	BY	CHK'D	APPR'D	NO	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	12/1/11	JM														
2	ISSUED FOR O&M REPORT	12/1/11	JM														

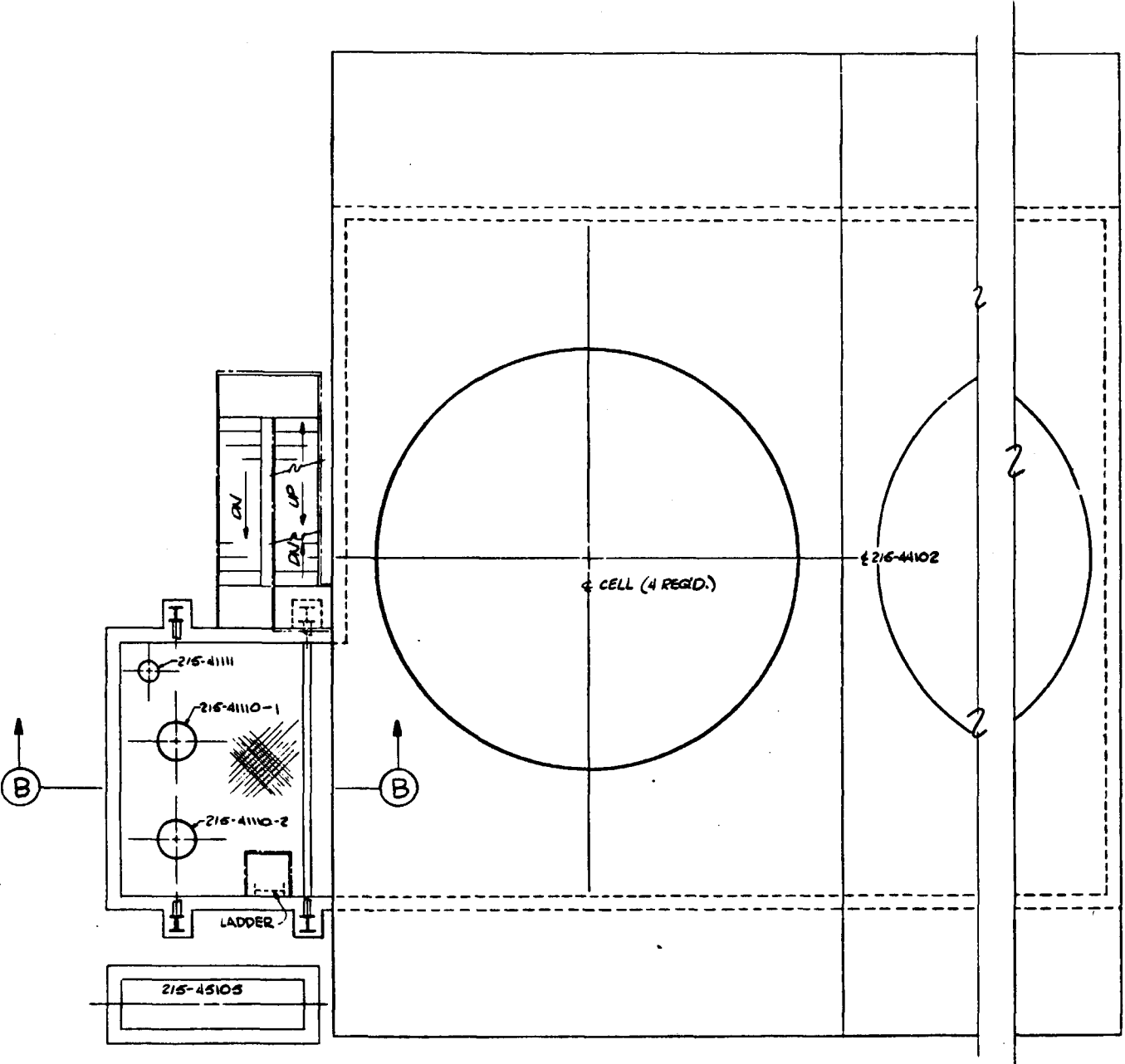
DESIGNED	BY	DATE	DRAWING STATUS	DATE
DRAWN	JORDAN	12/28/11	FOR O&M REPORT	12/28/11
CHECKED			FOR COMMENTS AND/OR APPROVAL	
DRAYO APPR			FOR CUSTOMER APPROVAL	ICGG
ICGG APPR			AND/OR COMMENTS	DOF
DOF APPR			APPROVAL FOR CONSTRUCTION	
SCALE	1" = 1'-0"			

TITLE	COOLING TOWER (HOT WELL) LAYOUT PLAN & SECTION	PROJECT NO	7051
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO	215-202-1
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH PA		CASE	DC
		REV	

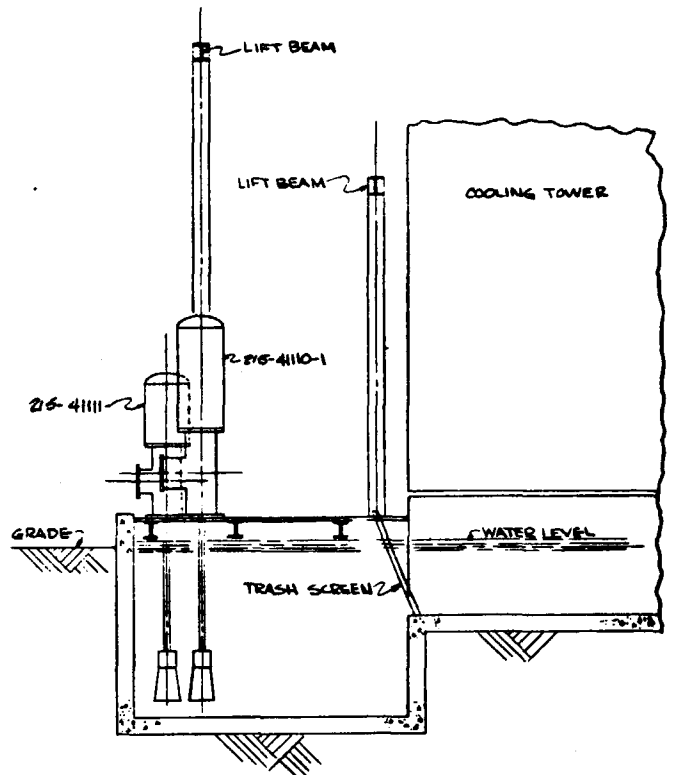
DO NOT SCALE THIS DRAWING IT MAY BE REDUCED FROM ORIGINAL SIZE



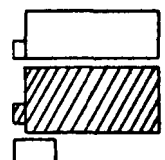
ITEM NO.	DESCRIPTION
215-41110-1,2	MAIN COLD WELL PUMP
215-41111	EMERGENCY COLD WELL PUMP
215-45105	SIDE STREAM FILTER



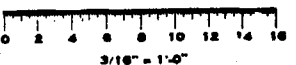
PLAN



SECTION B



KEY PLAN



PRELIMINARY NOT APPROVED FOR CONSTRUCTION

NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASELINE	7/2/12	JLD														
2	ISSUED FOR DAPP ERODER	7/10/12	JLD														

DESIGNED	BY	DATE	ISSUED	DATE
DRAWN	JORDAN	7/2/12	FOR COMMENTS AND/OR APPROVAL	
CHECKED			FOR CUSTOMER APPROVAL	ICGG
DRAWN APP'D			AND/OR COMMENTS	DOF
ICGG APP'D			APPROVAL FOR CONSTRUCTION	
DOF APP'D				

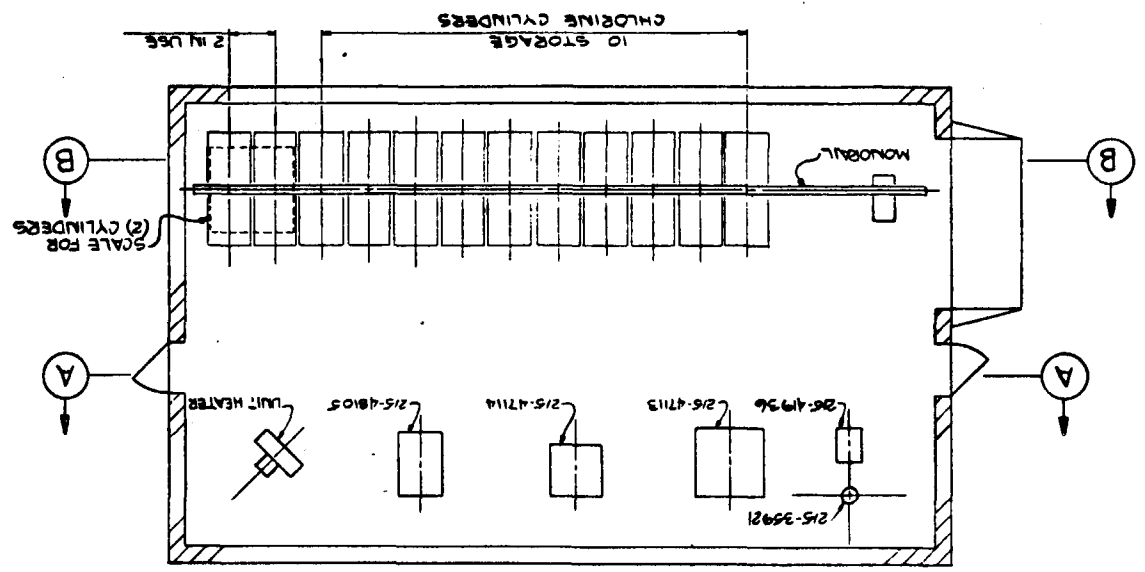
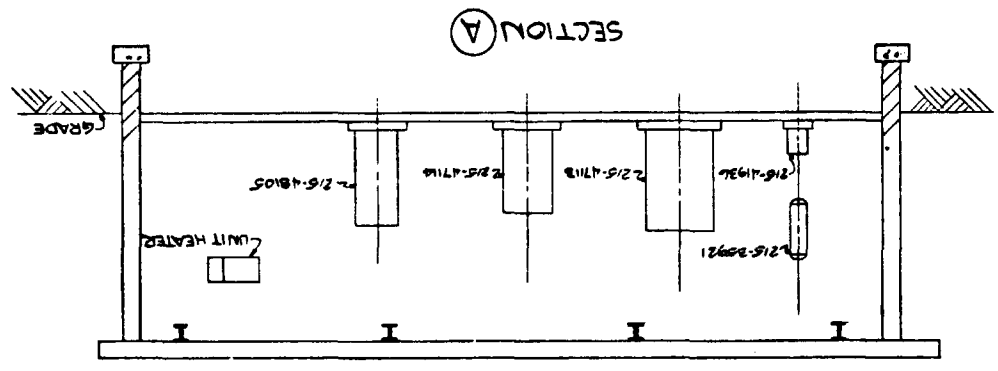
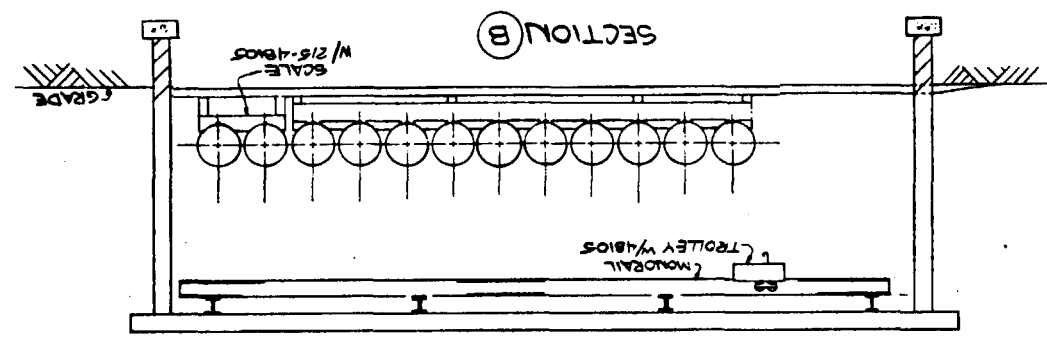
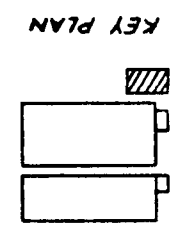
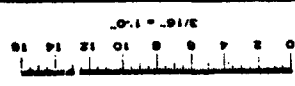
TITLE
COOLING TOWER
LAYOUT
PLAN & SECTION
U.S. DoE ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS
CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE
ILLINOIS COAL GASIFICATION GROUP
BY
DRACO CORPORATION PITTSBURGH, PA.

PROJECT NO. 7051 DRAWING NO. 215-202-2	CASE DC	REV. A
---	------------	-----------

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

D

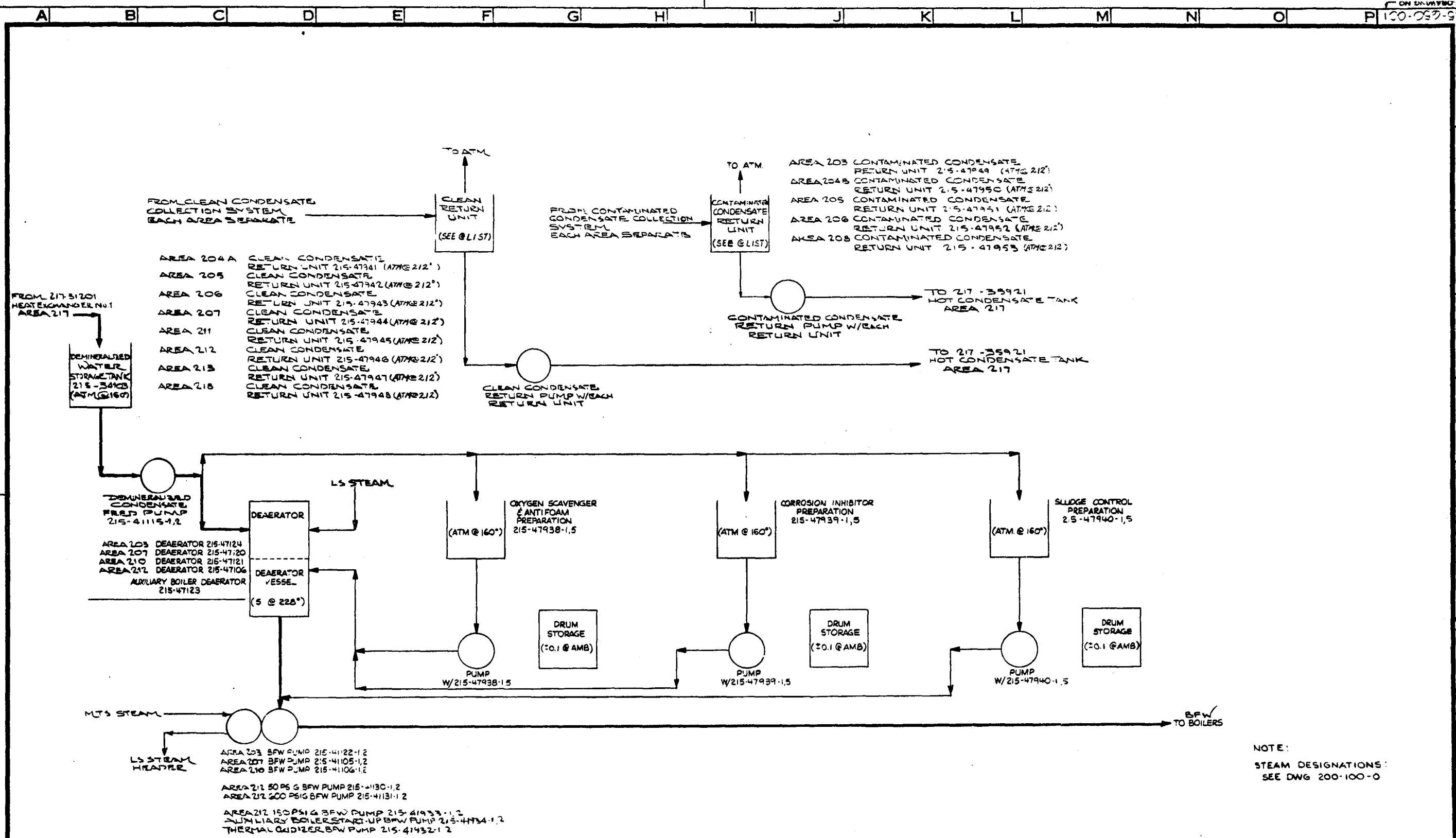
PROJECT NO. 7051 DRAWING NO. 215-202-3		U S DOE FOSSIL ENERGY PROGRAMS COOLING TOWER PLAN & SECTIONS		ILLINOIS COAL GASIFICATION GROUP PREPARED FOR THE CONTRACT NO. EF-77-CO1-2012 BY DRAYO CORPORATION PITTSBURGH PA		SCALE: 1" = 10'-0"		DO NOT SCALE THIS DRAWING IT MAY BE REVISED FROM ORIGINAL SIZE	
DESIGNED CHECKED DRAWN DATE		APPROVAL FOR COMMENTS AND/OR FOR CUSTOMER APPROVAL DATE		CONSTRUCTION APPROVAL FOR AND/OR COMMENTS DATE		SCALE: 1" = 10'-0"		DO NOT SCALE THIS DRAWING IT MAY BE REVISED FROM ORIGINAL SIZE	
REVISIONS		REVISIONS		REVISIONS		REVISIONS		REVISIONS	



EQUIPMENT LIST

ITEM NO.	DESCRIPTION
215-35921	COOLING TOWER ACID STORAGE TANK
215-41936	COOLING TOWER ACID PUMP
215-47113	COOLING TOWER ACID PREPARATION
215-47114	COOLING TOWER ADDITIVE PREPARATION
215-48105	CHLORINATION

DRAWING NO. 215-202-3



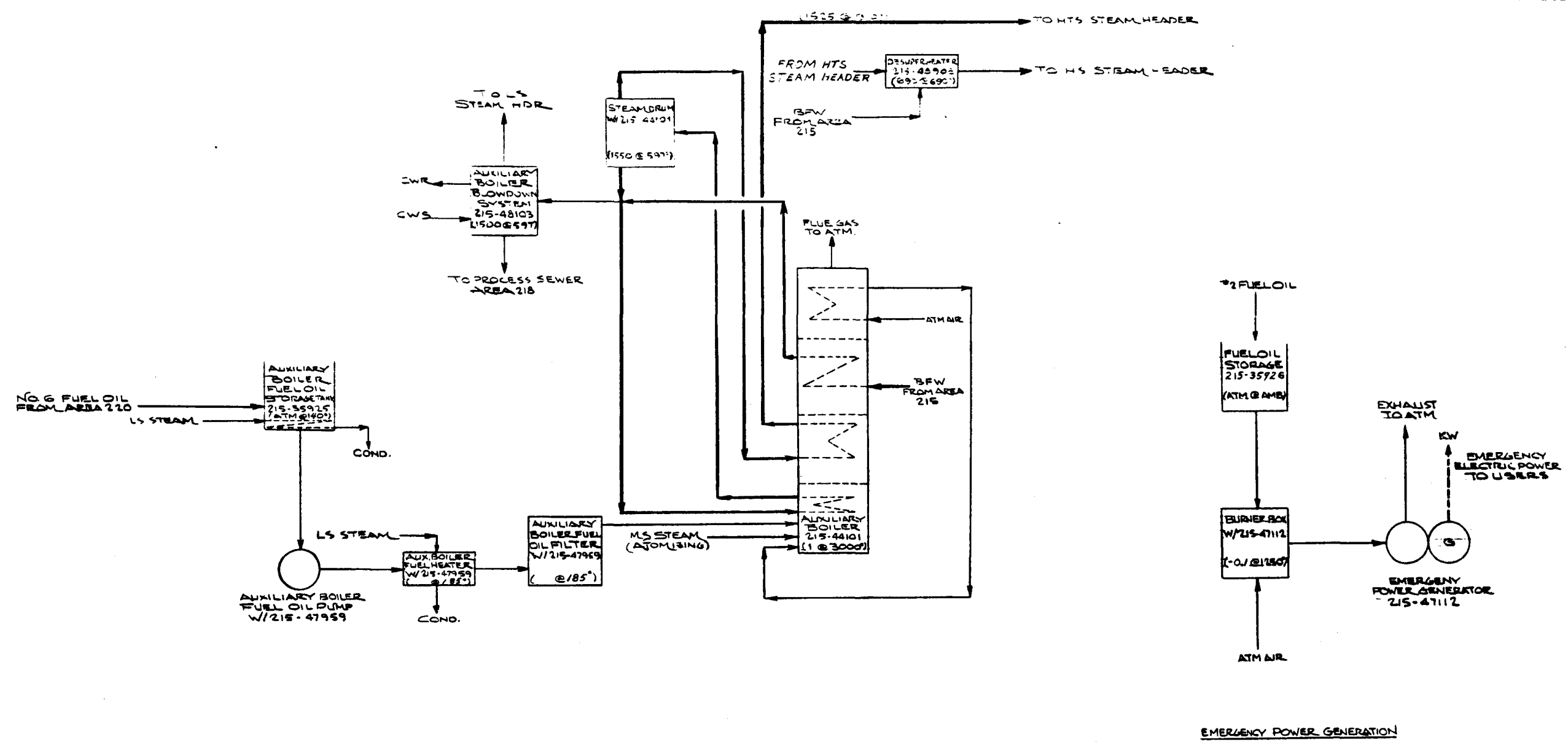
NOTE:
STEAM DESIGNATIONS:
SEE DWG 200-100-0

REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	10/1/80	DPPO												
2														
3														
4														
5														
6														
7														
8														
9														
10														

DESIGNED	BY	DATE	DRAWING STATUS	DATE
DPPO	DPPO	10/1/80	ISSUED	
CHECKED	DPPO	10/1/80	FOR COMMENTS AND/OR APPROVAL	
DRAWN	DPPO	10/1/80	APPROVAL	
ICGB APP'D	DPPO	10/1/80	FOR CUSTOMER APPROVAL	
ICGB			ICGB	
SCALE			AND/OR COMMENTS	
			APPROVAL FOR CONSTRUCTION	

TITLE	PRELIMINARY PRESSURE AND TEMPERATURE DIAGRAMS AREA 203 CONDENSATE RETURN & DEAERATION
U.S. DoE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH, PA.

PROJECT NO	7051
DRAWING NO	215-650-001
CASE	DC
REV.	A

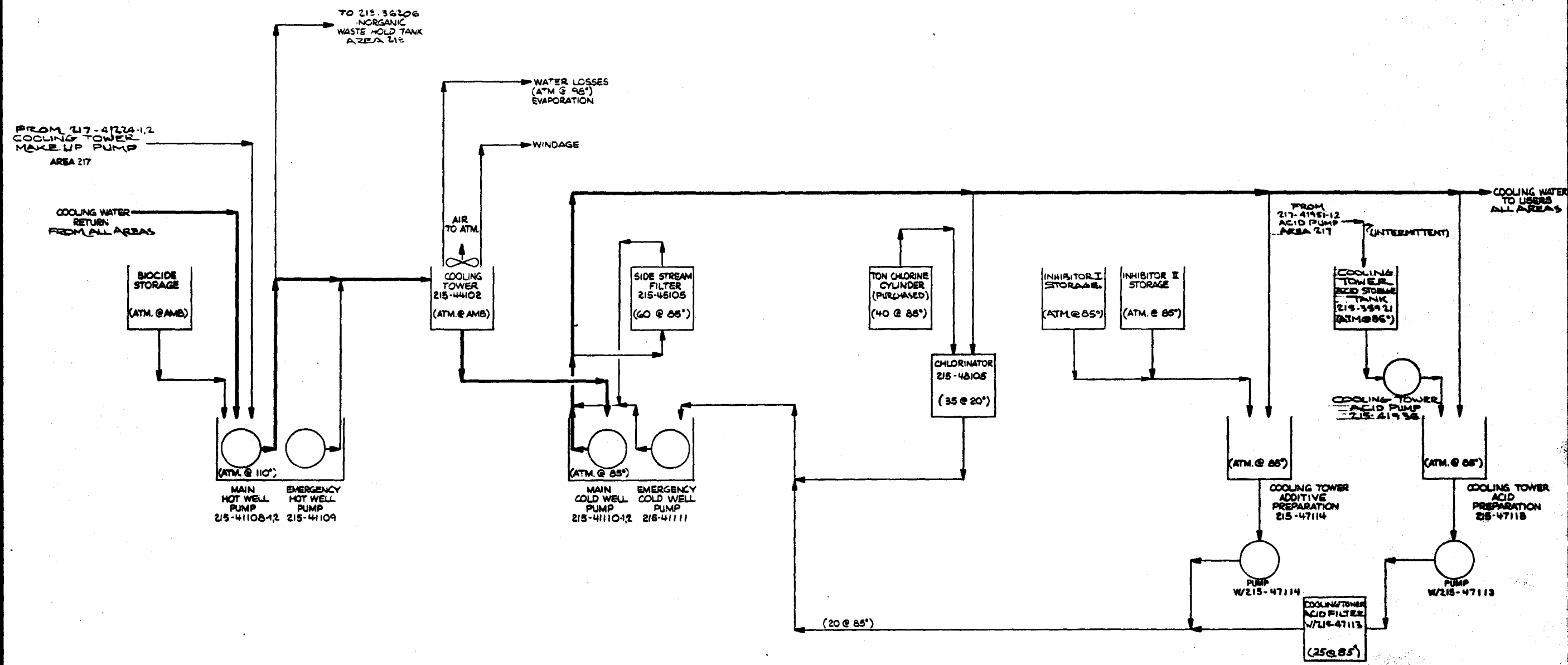


NOTE:
STEAM DESIGNATIONS
SEE DWG 200-100-0

REVISIONS				REVISIONS				REVISIONS			
NO.	DATE	BY	CH'D APP'D	NO.	DATE	BY	CH'D APP'D	NO.	DATE	BY	CH'D APP'D
1	2/2/83	DPPD		1				1			
2				2				2			
3				3				3			
4				4				4			
5				5				5			
6				6				6			
7				7				7			
8				8				8			
9				9				9			
10				10				10			

DESIGNED	BY	DATE	ISSUED	DATE
2/2/83	DPPD	2/2/83		
CHECKED	PRUPEN	2/2/83	FOR COMMENTS AND/OR	
DRAWN	BAUGHN	2/2/83	APPROVAL	
ICGG APP'D			FOR CUSTOMER APPROVAL	ICGS
DOE APP'D			AND/OR COMMENTS	DOE
SCALE			APPROVAL FOR	
			CONSTRUCTION	

TITLE: PRELIMINARY PRESSURE AND TEMPERATURE DIAGRAM AREA 215 - UTILITIES AUXILIARY BOILER & EMERGENCY POWER GENERATION		PROJECT NO. 7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012		DRAWING NO. 215-650-002
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH PA		CASE 2/2
		REV A



NOTE:
STEAM DESIGNATIONS:
SEE DWG. 200-100-0

REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D	NO.	DATE	BY	CHK'D	APP'D
1	2-12-90	PR	REVIEW											

DESIGNED	BY	DATE	DRAWING STATUS	DATE
WOSKOWSKI	WOSKOWSKI	2-12-90	ISSUED	2-12-90
DRAWN	SIANNELLA	2-12-90	DPPD	2-12-90
CHECKED	R. RUPPEN	2-12-90	FOR COMMENTS AND/OR	
DRAWN APP'D	C. BAUGHN	2-12-90	APPROVAL	
ICGS APP'D			FOR CUSTOMER APPROVAL	ICGS
APP'D			AND/OR COMMENTS	
SCALE			APPROVAL FOR CONSTRUCTION	

TITLE	PRELIMINARY PRESSURE AND TEMPERATURE DIAGRAM AREA 215 UTILITIES COOLING WATER
U.S. DOE	ENERGY TECHNOLOGY
FOSSIL ENERGY PROGRAMS	CONTRACT NO. EF-77-C-01-2012
PREPARED FOR THE	ILLINOIS COAL GASIFICATION GROUP
BY	DRAVO CORPORATION PITTSBURGH, PA.

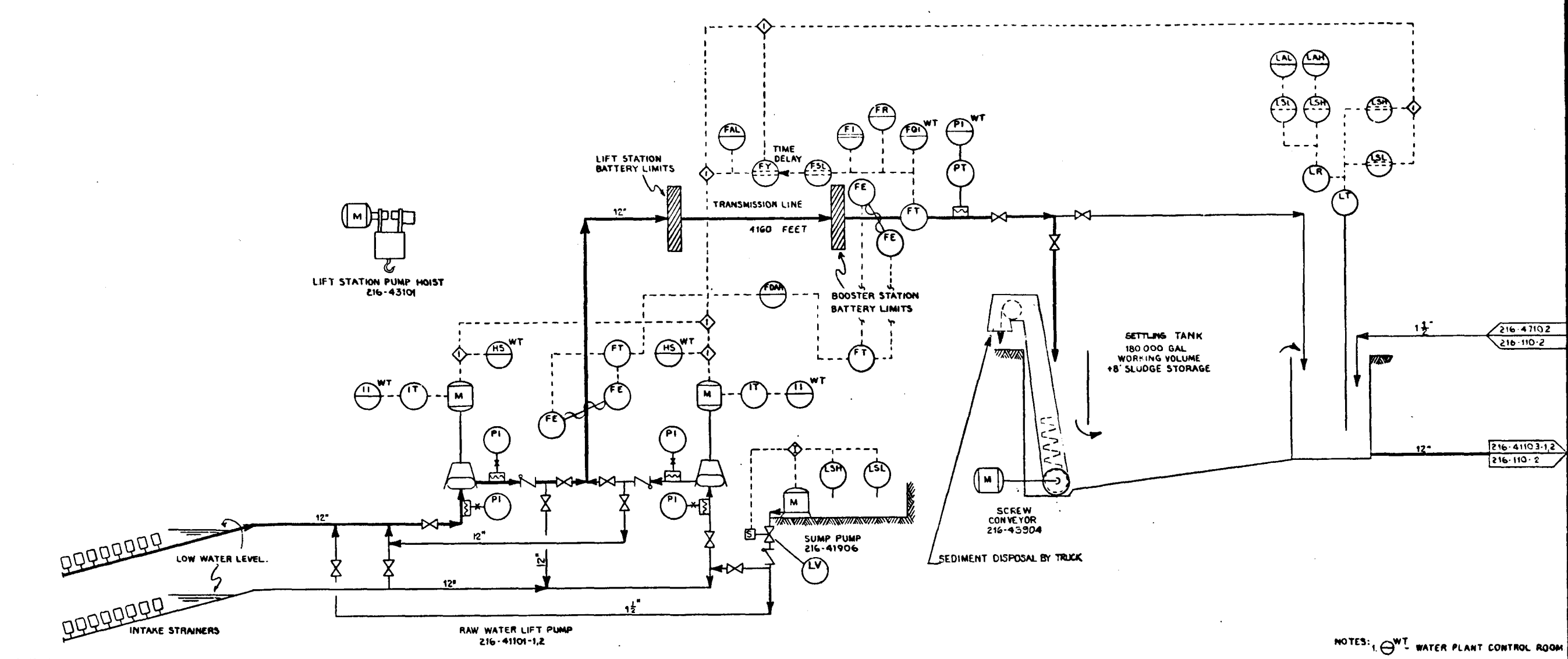
PROJECT NO.	7051
DRAWING NO.	215-650-003
CASE	DC
REV.	

"D"

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.

[illegible]

DO NOT SCALE THIS DRAWING.
IT MAY BE REDUCED FROM ORIGINAL SIZE.



NOTES: 1. WT - WATER PLANT CONTROL ROOM
2. - LOCAL CONTROL PANEL

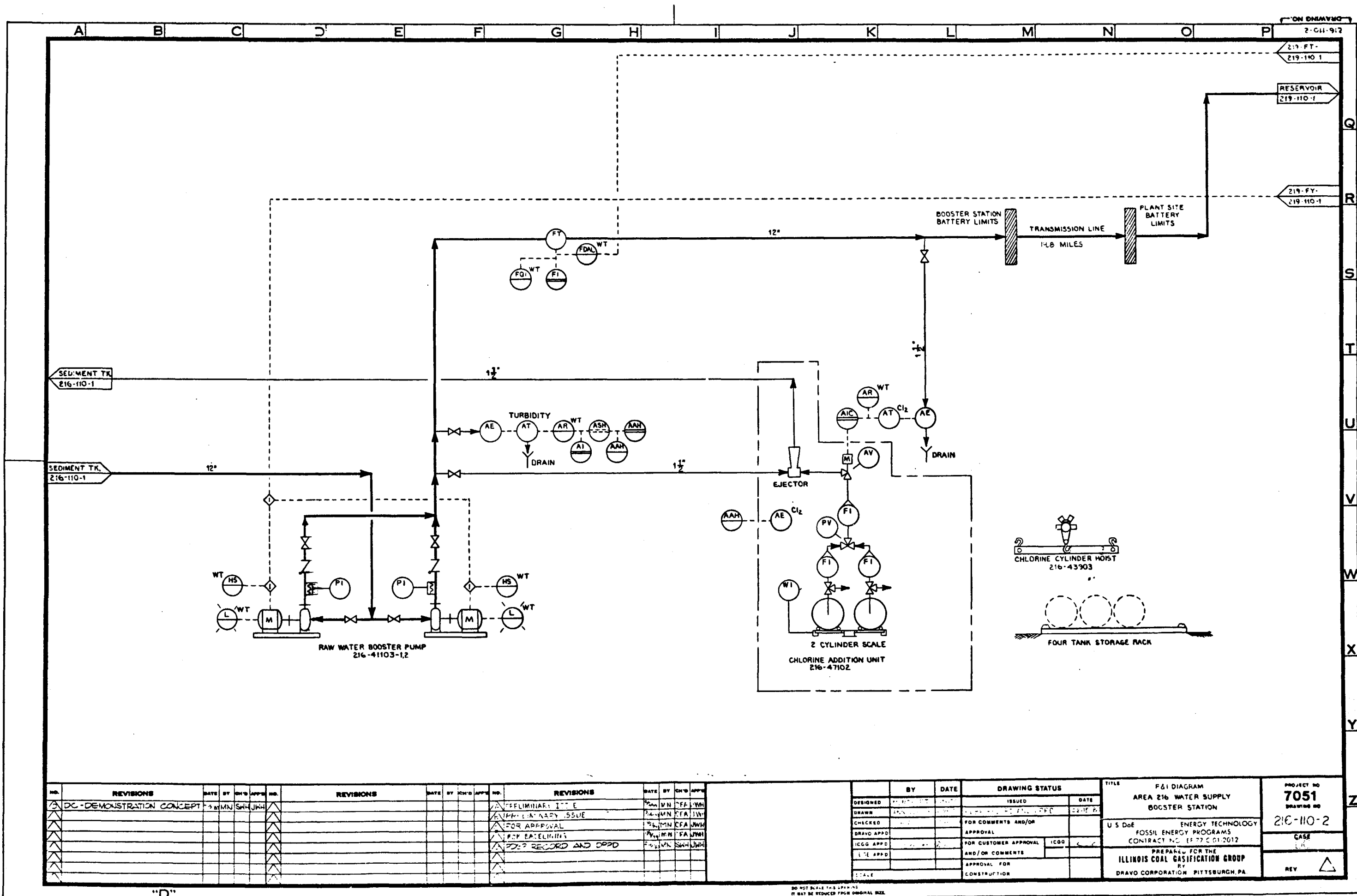
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.
1	10/1/81	JAN	SMH	JMH	1					1				
2					2					2				
3					3					3				
4					4					4				
5					5					5				
6					6					6				
7					7					7				
8					8					8				
9					9					9				
10					10					10				

DESIGNED	BY	DATE	DRAWING S.	ISSUED	DATE
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9
10	10	10	10	10	10

U.S. DOE	ENERGY TECHNOLOGY	PROJECT NO.	7051
ILLINOIS COAL GASIFICATION GROUP	FOSSIL ENERGY PROGRAMS	DRAWING NO.	216-110-1
DRAGO CORPORATION	CONTRACT NO. ET-77-01-2012	CASE	
	PREPARED FOR THE	REV	
	BY		
	PITTSBURGH PA.		

"D"

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED TO 1/2" ORIGINAL SIZE



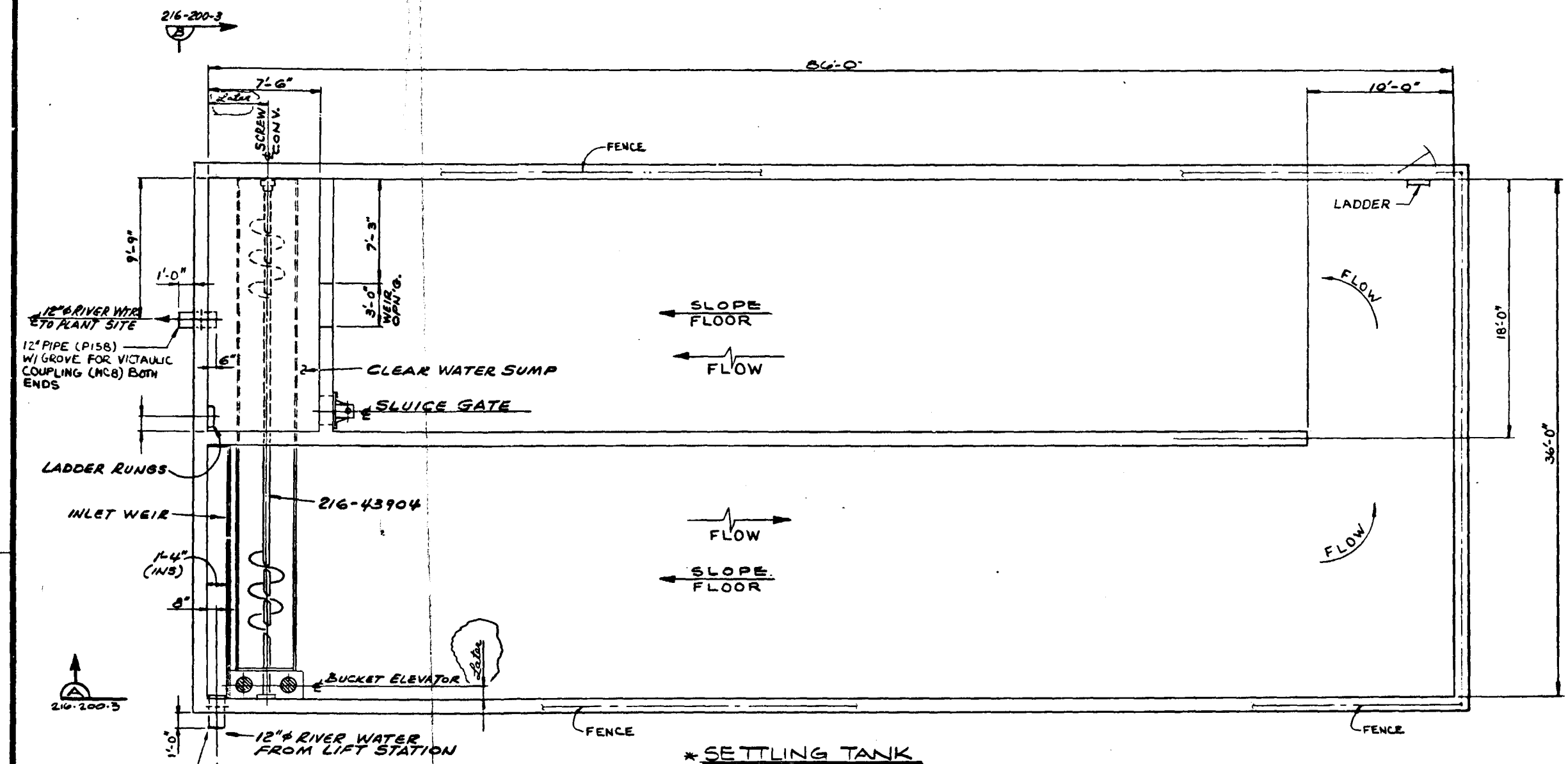
REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.	NO.	DATE	BY	CHK'D	APPR.
1	10/1/81	MMN	SAH	JWH	1	10/1/81	MMN	SAH	JWH	1	10/1/81	MMN	SAH	JWH
2	10/1/81	MMN	SAH	JWH	2	10/1/81	MMN	SAH	JWH	2	10/1/81	MMN	SAH	JWH
3	10/1/81	MMN	SAH	JWH	3	10/1/81	MMN	SAH	JWH	3	10/1/81	MMN	SAH	JWH
4	10/1/81	MMN	SAH	JWH	4	10/1/81	MMN	SAH	JWH	4	10/1/81	MMN	SAH	JWH
5	10/1/81	MMN	SAH	JWH	5	10/1/81	MMN	SAH	JWH	5	10/1/81	MMN	SAH	JWH

BY		DATE		DRAWING STATUS	
DESIGNED	MMN	10/1/81	10/1/81	ISSUED	10/1/81
DRAWN	MMN	10/1/81	10/1/81	FOR COMMENTS AND/OR APPROVAL	10/1/81
CHECKED	MMN	10/1/81	10/1/81	FOR CUSTOMER APPROVAL	10/1/81
DRAGO APPD	MMN	10/1/81	10/1/81	AND/OR COMMENTS	10/1/81
ICGG APPD	MMN	10/1/81	10/1/81	APPROVAL FOR CONSTRUCTION	10/1/81
DATE APPD	MMN	10/1/81	10/1/81		
SCALE	MMN	10/1/81	10/1/81		

TITLE		PROJECT NO	
F&I DIAGRAM		7051	
AREA 216 WATER SUPPLY		DRAWING NO	
BOOSTER STATION		216-110-2	
U S DoE		CASE	
ENERGY TECHNOLOGY		REV	
FOSSIL ENERGY PROGRAMS			
CONTRACT NO. E77C012012			
PREPARED FOR THE			
ILLINOIS COAL GASIFICATION GROUP			
BY			
DRAGO CORPORATION PITTSBURGH, PA.			

ON DRAWING
216-200-2

EQUIPMENT LIST	
ITEM NO.	DESCRIPTION
216-43904	SCREW CONVEYOR



* SETTLING TANK
PLAN @ GRADE
* FOR LOCATION, SEE KEY PLAN DWG. 216-200-1

PRELIMINARY NOT APPROVED FOR CONSTRUCTION

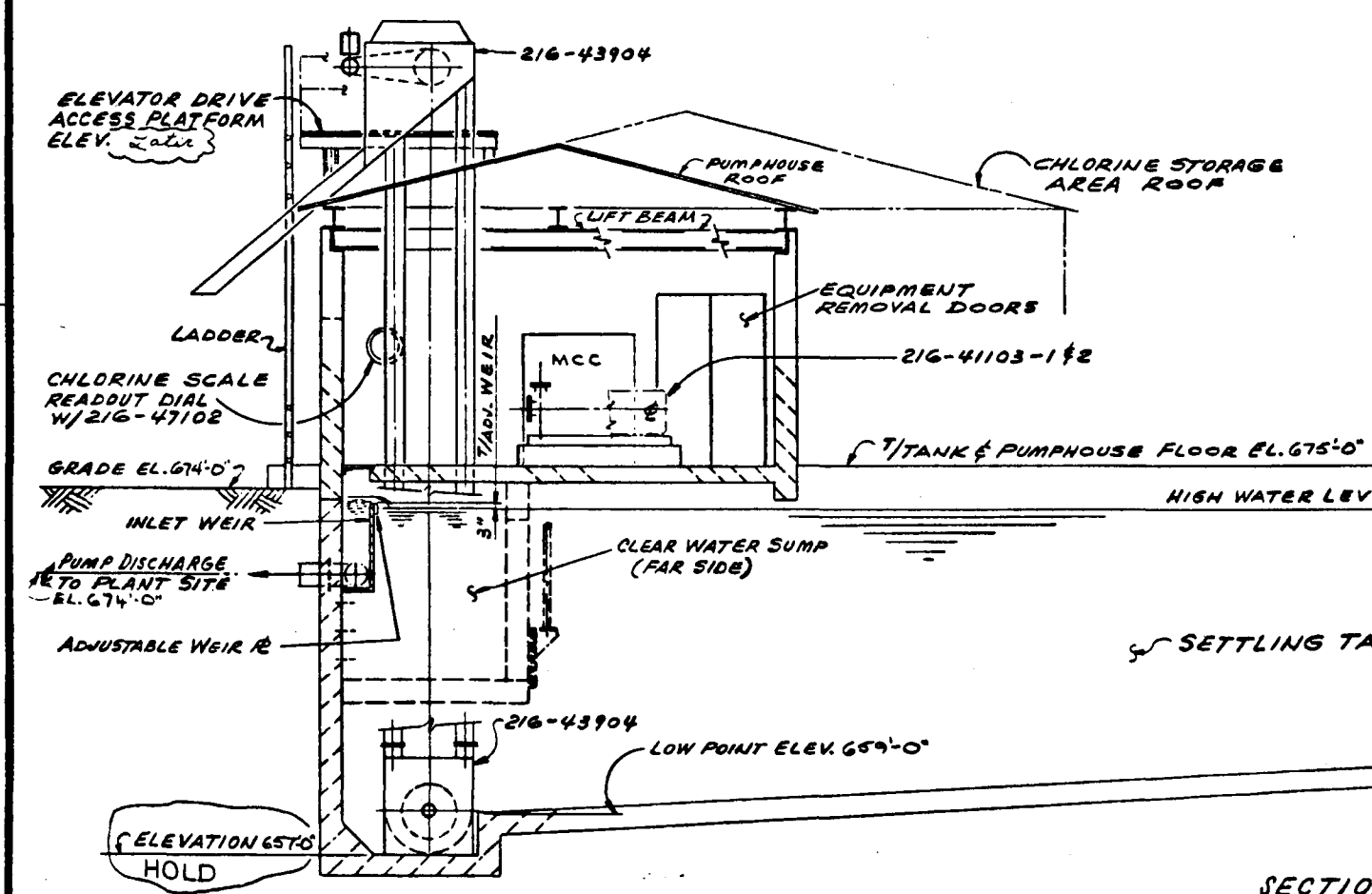
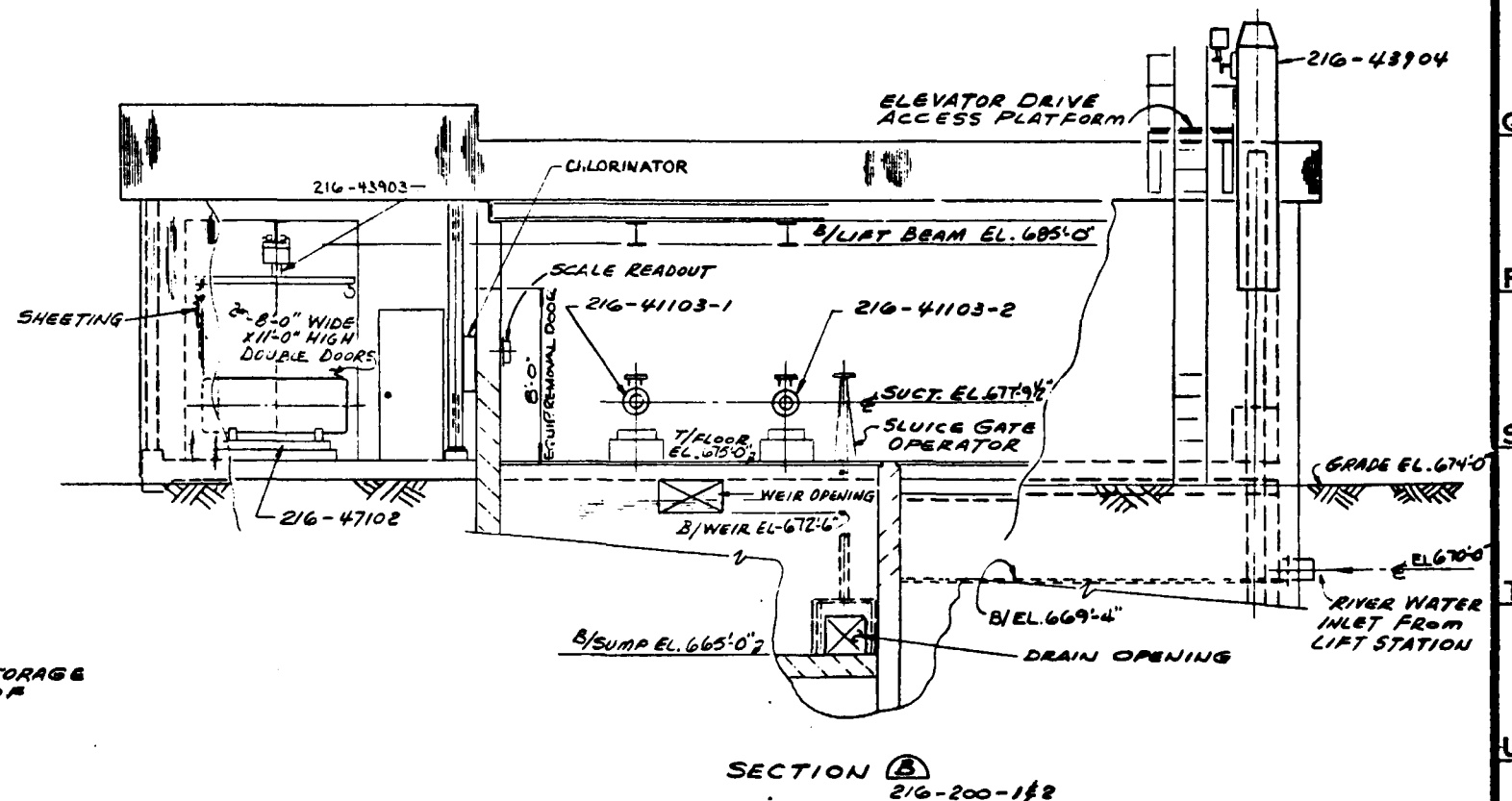
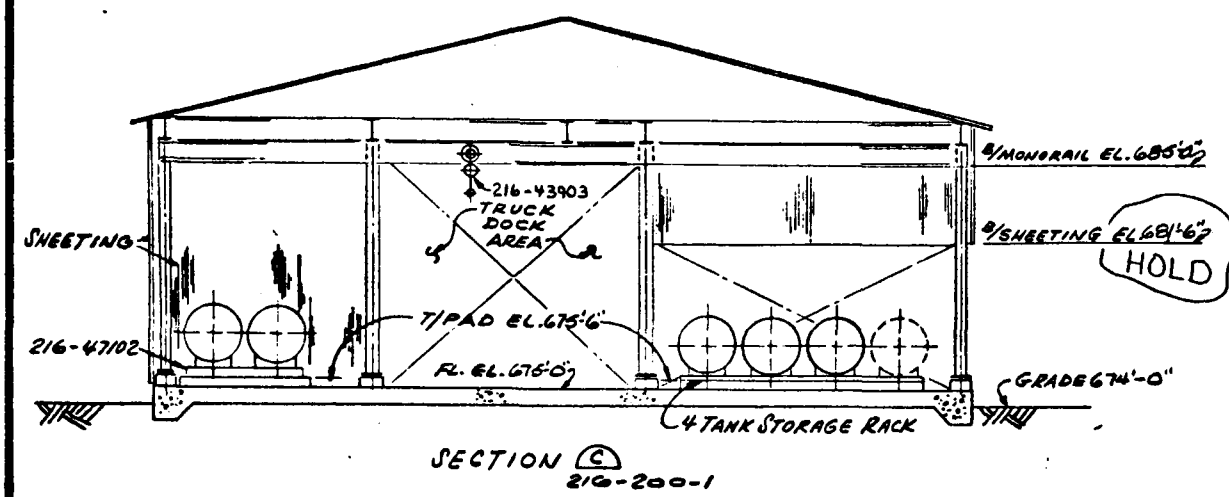
NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D	NO.	REVISIONS	DATE	BY	CHK'D	APP'D
1	ISSUED FOR BASELINE	2/1/12															
2	ISSUED FOR DPPD REPORT	2/1/12															

BY		DATE	DRAWING STATUS		DATE
DESIGNED			ISSUED		
DRAWN	CHEN	2/1/12	FOR COMMENTS AND/OR		
CHECKED			APPROVAL		
DRAGO APP'D			FOR CUSTOMER APPROVAL	ICGG	
ICGG APP'D			AND/OR COMMENTS	D-L	
DCE APP'D			APPROVAL FOR		
SCALE			CONSTRUCTION		

TITLE RIVER WATER INTAKE SETTLING TANK LAYOUT PLAN		PROJECT NO. 7051 DRAWING NO. 216-200-2
U.S. DoE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01 2012		CASE DC
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP DRAGO CORPORATION PITTSBURGH PA		REV A

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

KEY D NOT ISSUED



PRELIMINARY NOT APPROVED FOR CONSTRUCTION
1/4" = 1'-0"

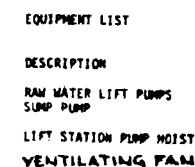
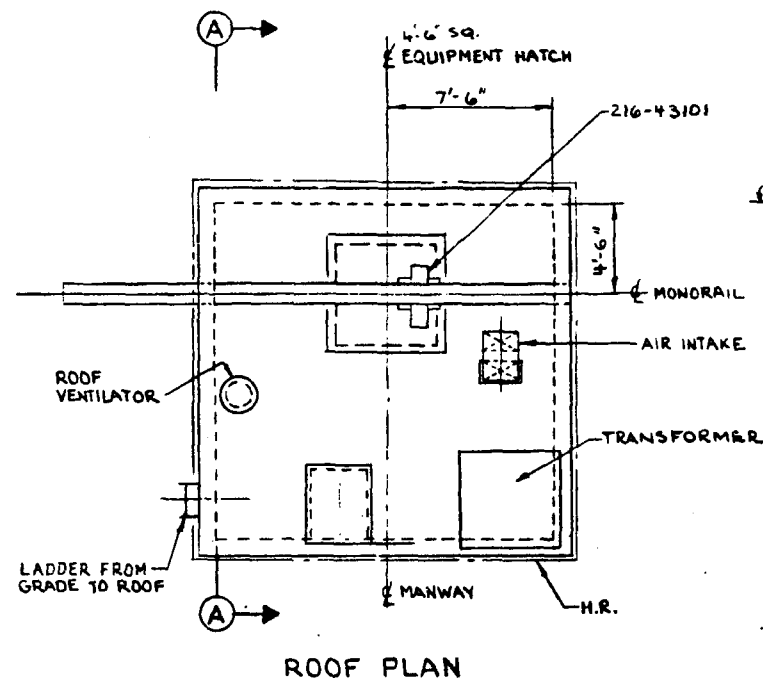
NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D	NO.	REVISIONS	DATE	BY	CHK'D	APPR'D
1	ISSUED FOR BASELINE	10/1/12	WJH														
2	ISSUED FOR DPPD REPORT	10/1/12	WJH														

DESIGNED	BY	DATE	DRAWING STATUS	DATE
DRAWN	WJH	10/1/12	ISSUED	10/1/12
CHECKED	WJH	10/1/12	FOR COMMENTS AND/OR APPROVAL	
DRAWN APP'D			FOR CUSTOMER APPROVAL	
ICGG APP'D			AND/OR COMMENTS	
DSE APP'D			APPROVAL FOR CONSTRUCTION	
SCALE				

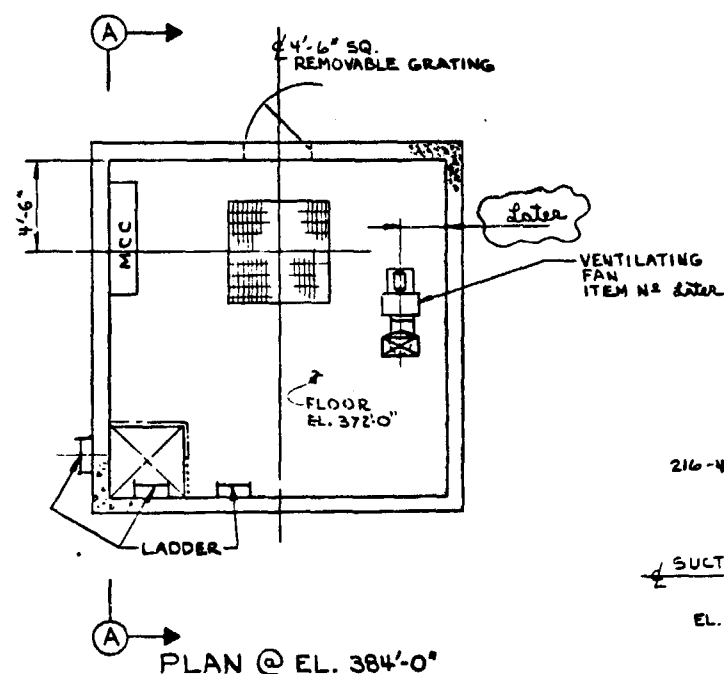
TITLE	PROJECT NO
RIVER WATER INTAKE BOOSTER PUMPHOUSE LAYOUT SECTIONS	7051
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012	DRAWING NO
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRACO CORPORATION PITTSBURGH, PA.	216-200-3
	CASE
	DC
	REV.

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE

REV. D NOT ISSUED



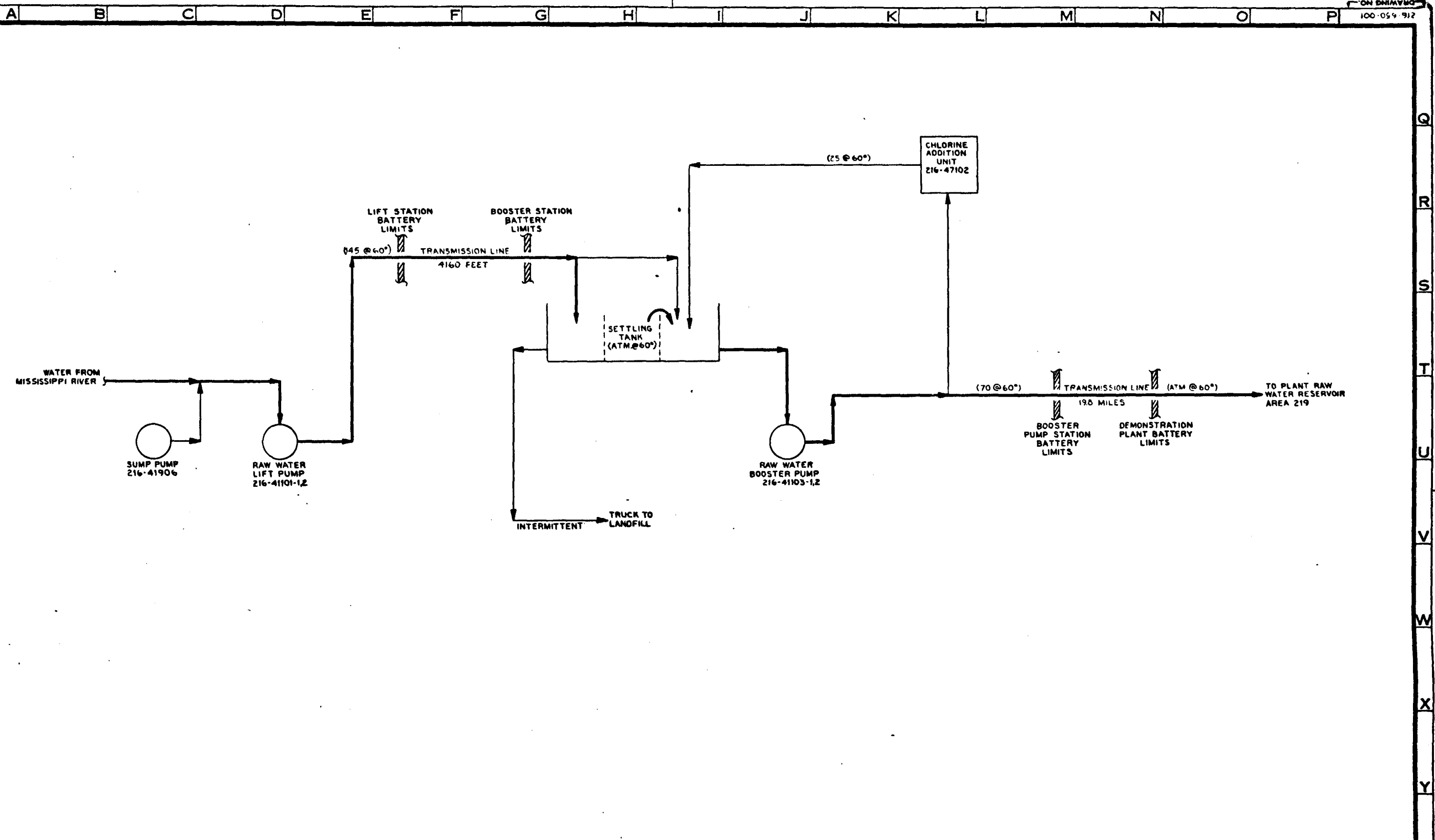
NOTE:
FOR LOCATION OF
RAW WATER LIFT STATION
SEE DWG 216-200-1



	BY	DATE	DRAWING STATUS	
DESIGNED			ISSUED	DATE
DRAWN	W. H. H.	1/1/77	FOR ENGINE WORK	1/1/77
CHECKED	W. H. H.	1/1/77	FOR COMMENTS AND/OR APPROVAL	
BRAVO APP'D			FOR CUSTOMER APPROVAL	
ICCG APP'D			AND/OR COMMENTS	ICCG
JOE APP'D			FOR APPROVAL FOR CONSTRUCTION	JOE
SCA-1				

TITLE	RIVER WATER INTAKE LIFT STATION PUMPHOUSE LAYOUT PLANS & SECTIONS
U. S. DOE	ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EF-77-C-01-2012
	PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH, PA.

PROJECT NO
7051
DRAWING NO
216-200-4
CASE
DC
REV. 



REVISIONS					REVISIONS					REVISIONS				
NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D	NO.	DATE	BY	CHK'D	APPR'D
1	09/10/01	JF	CS	CS										

BY		DATE		DRAWING STATUS	
DESIGNED				ISSUED	
DRAWN					
CHECKED				FOR COMMENTS AND/OR	
DRAWN APP'D				APPROVAL	
ICGG APP'D				FOR CUSTOMER APPROVAL	
DATE				AND/OR COMMENTS	
				APPROVAL FOR	
				CONSTRUCTION	

TITLE		PROJECT NO
PRELIMINARY PRESSURE AND TEMPERATURE DIAGRAM		7051
AREA 216 WATER SUPPLY INTAKE AND PIPELINE		DRAWING NO
U.S. DOE ENERGY TECHNOLOGY FOSSIL ENERGY PROGRAMS CONTRACT NO. EE-77-C-01-2012		216-650-001
PREPARED FOR THE ILLINOIS COAL GASIFICATION GROUP BY DRAYO CORPORATION PITTSBURGH PA		CASE
		REV

DO NOT SCALE THIS DRAWING
IT MAY BE REDUCED FROM ORIGINAL SIZE