

SECT'S  
A-A  
B-B  
C-C  
D-D  
E-E  
F-F  
G-G  
H-H  
J-J  
K-K  
L-L  
M-M

M-K-A-C-D-E-F-G-H-J-K-L-M-N-P-R-S-T-U-V-W-X-Y-Z

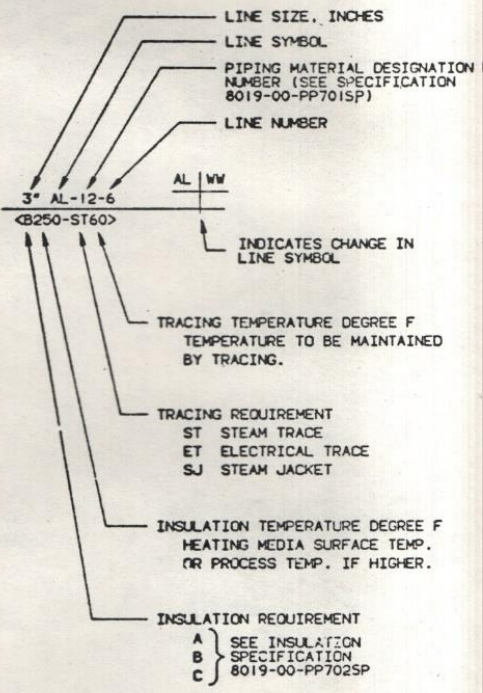
C-6651

BILL OF MATERIAL	
ITEM NO.	DESCRIPTION

GENERAL SYMBOLS

	GATE VALVE
	GLOBE VALVE
	PLUG VALVE
	BUTTERFLY VALVE
	KNIFE GATE VALVE
	BALL VALVE
	V-BALL VALVE
	CHECK VALVE
	STRAINER (WITH BLOW-OFF VALVE)
	ANGLE VALVE
	3-WAY VALVE
	SPECTACLE BLIND (SHOWN OPEN)
	STEAM TRAP
	FLEXIBLE CONNECTION, HOSE
	EXPANSION JOINT
	FLOW GLASS
	SIGHT GLASS
	LIGHT GLASS
	TERMINI OF UTILITY LINES
	DRAIN TO SEWER
	PLUG
	NEW
	EXISTING
	FUTURE

GENERAL SYMBOLS (CON'T)



CSO	CAR SEAL OPEN
CSC	CAR SEAL CLOSED
DO	DRAW OFF
NC	NORMALLY CLOSED
PC	PURGE CONNECTION
SO	STEAM OUT
TC	TEST CONNECTION
FC	FIELD CHECK

GENERAL SYMBOLS (CON'T)

	MAIN PROCESS LINES
	AUX. PROCESS AND SERVICE LINES
	EXISTING
	BARRELS PER DAY
	U.S. GALLONS PER MINUTE
	POUNDS PER HOUR
	NORMAL CUBIC FEET PER MINUTE
	PRESSURE, POUNDS PER SQUARE INCH, ABS.
	TEMPERATURE, DEGREE F
	MOLS PER HOUR
	PRESSURE, PSIG
	MAX OPERATING CONDITION
	MIN REQUIRED DESIGN

ITEM NO. USED WHEN LINES GO FROM ONE DRAWING TO ANOTHER  
P&ID NO.

STANDARD VALVE DESIGNATIONS

VBL	BALL
VBY	BUTTERFLY
VCH	CHECK
VGA	GATE
VGL	GLOBE
VNE	NEEDLE
VPL	PLUG
VSP	SPECIAL

STANDARD LINE DESIGNATIONS

AL	AMMONIA LIQUOR
AV	AMMONIA VAPOR
CS	50% CAUSTIC
CM	COOLING WATER
COG	COKE OVEN GAS
C10	CONDENSATE
C50	CONDENSATE
C380	CONDENSATE
IA	INSTRUMENT AIR
S10	STEAM - 10 PSIG
S50	STEAM - 50 PSIG
S380	STEAM - 380 PSIG
ST	STEAM TRACING 1/2 CD
WW	WASTE WATER

GENERAL NOTES

1. ALL LINES TO HAVE DRAINS AT LOW POINTS AND VENTS AT HIGH POINTS.
2. ALL MANUAL VALVES TO BE FULL LINE SIZE UNLESS NOTED.
3. ALL PUMP DISCHARGE VALVES TO BE LINE SIZE UNLESS OTHERWISE NOTED.
4. DISCHARGE POINTS OF DRAINS, VENTS, PSV, ETC. GOING TO ATMOSPHERE MUST BE IN A SAFE LOCATION, WITH PIPE EXTENSION AS NECESSARY.

REVISIONS

RELEASED FOR CONSTRUCTION

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Dravo/Still		CONTRACT NO.
8019		
APPROVAL ISSUE	CONSTRUCTION ISSUE	
JE	JE	
DL	DL	
SE	SE	
CS	CS	
ISSUE NO.		
DATE ISSUED		
DRAGO/STILL DRAWING NUMBER	PP-00-010	

TOLERANCE EXCEPT AS NOTED

REFERENCE DRAWINGS LISTED ABOVE	
Interlake CHICAGO COKE PLANT	

AMMONIA STILL SYSTEM  
PIPING LEGEND

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DO NOT SCALE WORK TO DIMENSIONS

DR	CAD	CH	DP	REV	
SCALE	NONE	APP		C-6651	0



C-6652

SECT  
A-A  
B-B  
C-C  
D-D  
E-E  
F-F  
G-G  
H-H  
J-J  
K-K  
L-L  
M-M

BILL OF MATERIAL	
ITEM NO.	DESCRIPTION

GENERAL SYMBOLS

- LOCALLY MOUNTED INSTRUMENT
- INSTRUMENT FURNISHED WITH EQUIPMENT PACKAGE
- PANEL MOUNTED INSTRUMENT-CONTROL ROOM NORMALLY OPERATOR ACCESSIBLE
- REAR PANEL MOUNTED INSTRUMENT-CONTROL ROOM NORMALLY NOT OPERATOR ACCESSIBLE
- PANEL MOUNTED INSTRUMENT-LOCAL PANEL
- REAR PANEL MOUNTED INSTRUMENT-LOCAL PANEL
- DUAL FUNCTION INSTRUMENT BOTH FUNCTIONS IN SAME LOOP
- DUAL FUNCTION INSTRUMENT EACH FUNCTION IN SEPARATE LOOP
- PANEL MOUNTED INDICATION LIGHT(S) OR CONTROL STATION WITH LIGHT(S)
- HARDWIRED INTERLOCK/LOGIC CIRCUIT X DENOTES INTERLOCK NUMBER (SEE GENERAL NOTE 2)
- ORIFICE FLOW ELEMENT
- OTHER IN-LINE FLOW INSTRUMENT \* DENOTES PRIMARY ELEMENT OR TRANSMITTER TYPE (MAG., VENTURI, VORTEX, PD, SONIC, PROP., TURB., ETC.)
- ROTAMETER
- CHEMICAL SEAL
- PURGE AIR UNLESS NOTED OTHERWISE

DISTRIBUTED CONTROL/SHARED DISPLAY, LOGIC & COMPUTER SYSTEM SYMBOLS

- SHARED CONFIGURABLE INSTRUMENT NORMALLY OPERATOR ACCESSIBLE
- SHARED CONFIGURABLE INSTRUMENT NOT NORMALLY OPERATOR ACCESSIBLE
- COMPUTER FUNCTION WITH SHARED DISPLAY NORMALLY OPERATOR ACCESSIBLE
- COMPUTER INPUT, OUTPUT OR OTHER FUNCTION NOT NORMALLY OPERATOR ACCESSIBLE
- PROGRAMMABLE LOGIC FUNCTION (PLC) NOT NORMALLY OPERATOR ACCESSIBLE
- OPERATOR ACCESSIBLE PROGRAMMABLE LOGIC FUNCTION

SYSTEM ALARMS AND SUPPLEMENTAL FUNCTIONS

- 1. DENOTES SYSTEM ALARM(S) ON MEASURED VARIABLE
- 2. DENOTES SYSTEM ALARM(S) ON OUTPUT SIGNAL
- \* DENOTES SUPPLEMENTAL FUNCTION IDENTIFICATION (SEE NEXT COLUMN)

INSTRUMENT LINE SYMBOLS

- PROCESS INSTRUMENT LINE
- PNEUMATIC INSTRUMENT LINE/SIGNAL
- ELECTRIC INSTRUMENT SIGNAL (HARDWIRED CIRCUIT)
- INSTRUMENT CAPILLARY TUBING
- HYDRAULIC INSTRUMENT LINE/SIGNAL
- ELECTROMAGNETIC OR SONIC SIGNAL (WITHOUT WIRING OR TUBING)
- CONFIGURABLE INSTRUMENT SOFTWARE LINK

SUPPLEMENTAL FUNCTION IDENTIFICATION

- SINGLE FUNCTION INSTRUMENT
- ANALOG INSTRUMENT W/INTEGRAL SUPPL. FUNCTION
- CONFIGURABLE INSTRUMENT W/INTEGRAL SUPPL. FUNCTION

FUNCTIONS (☆)

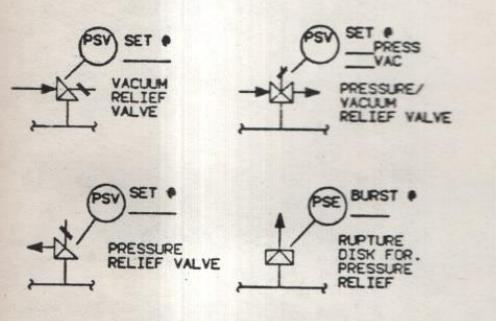
A/D ANALOG/DIGITAL	I:1 BOOST
I/D INVERSE DERIVATIVE OR RATE	I:0 ON-OFF
D DERIVATIVE OR RATE	Δ DIFFERENCE
> HIGH SELECTOR	X:Y GAIN
< LOW SELECTOR	REV REVERSE
Σ ADD	X MULTIPLY
± BIAS	∫ INTEGRATE (FOR INPUT/OUTPUT OF THE FOLLOWING)
÷ DIVIDE	•/•
AVG AVERAGE	
f(x) CHARACTERIZE	(*) DESIGNATION   SIGNAL
x^n RAISE TO POWER	E   VOLTAGE
√ EXTRACT SQUARE ROOT	H   HYDRAULIC
∩ HIGH LIMIT	I   CURRENT
∪ LOW LIMIT	P   PNEUMATIC
TD TIME DELAY	R   RESISTANCE

COMMON ABBREVIATIONS

AS = AIR SUPPLY	PROP = PROPELLER
BRG = BEARING	R = RESET
CAP = CAPACITANCE	REV = REVERSE ACTING
CASC = CASCADE	RTD = RESISTANCE TEMPERATURE DETECTOR
COMP = COMPENSATION	ROT = ROTARY
COND = CONDUCTIVITY	S = SOLENOID
DISPL = DISPLACER	SP = SET POINT
ES = ELECTRICAL SUPPLY	TC = THERMOCOUPLE
IF = INTERFACE	TURB = TURBINE
LIO = LIQUID	VIB = VIBRATION
MAG. = MAGNETIC	VS = VARIABLE SPEED
PO = POSITIVE DISPLACEMENT	WS = WATER SUPPLY

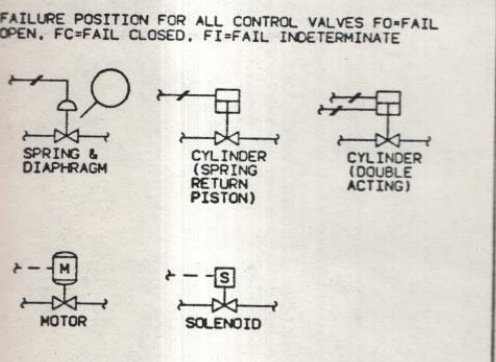
INSTRUMENT EQUIPMENT SYMBOLS

RELIEF DEVICES



NOTE: RUPTURE DISK BURST PRESSURE IS MAXIMUM FOR SERVICE.

CONTROL VALVES

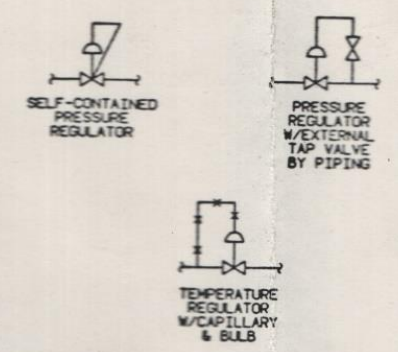


INSTRUMENT PANEL IDENTIFICATION

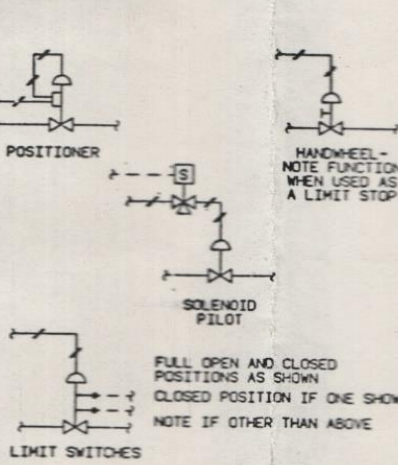
NUMBER	SERVICE/LOCATION
IP-	
IP-	
	(FOR DEFINITION OF LOCATION NOT OTHERWISE OBVIOUS)

INSTRUMENT EQUIPMENT SYMBOLS (CON'T)

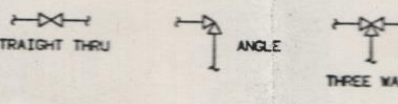
REGULATORS



ACCESSORIES



BODY TYPES



INSTRUMENT FUNCTIONAL IDENTIFICATION

FIRST LETTER	MODIFIER LETTER	SUCCEEDING LETTERS
A		ALARM
B		
C		CONTROL
D	DIFFERENTIAL	DRIVE UNIT
E		PRIMARY ELEMENT
F	RATIO (FRACTION)	
G		GAUGE GLASS
H		HIGH
I		INDICATE
J		
K		
L		LOW LIGHT
M		SIGNAL CONVERTER
O		RESTRICTION ORIFICE
P		
Q	INTEGRATE OR TOTALIZE	
R		RECORD
S	SAFETY	SWITCH
T		TRANSMIT
U		MULTIFUNCTION
V		VALVE
W		WELL
X		UNASSIGNED
Y		RELAY, COMPUTE
Z		FINAL ELEMENT

L=LIGHT, S=SWITCH (MAY BE USED ALONE FOR MOTOR CONTROL/STATUS) WHEN USED, MODIFIER LETTER IS SECOND LETTER OF INSTRUMENT FUNCTIONAL IDENTIFICATION.

GENERAL NOTES

- LOCAL MOTOR CONTROL STATIONS NOT SHOWN.
- INTERLOCKS I-1, I-2, ETC., ARE NUMBERED BY EFD. THE EFD NUMBER & INTERLOCK (I) NUMBER FORM THE INTERLOCK IDENTIFICATION NUMBER. A DESCRIPTION OF AN INTERLOCK WILL APPEAR AT THE INTERLOCK SYMBOL OR ELSEWHERE ON THE SAME EFD.
- POWER AND AIR SUPPLIES ARE NOT GENERALLY SHOWN.
- INSTRUMENT PIPING DETAIL BEYOND PROCESS BLOCK VALVES IS SHOWN ON INSTRUMENT INSTALLATION DETAILS, OR EQUIVALENT. VALVES SHOWN ON INSTRUMENT TAPS ARE PROCESS BLOCK VALVES. VALVES FURNISHED WITH INSTRUMENTS ARE NOT SHOWN.
- INSTRUMENT TRACING & INSULATION IS NOT SHOWN ON EFD'S EXCEPT FOR SPECIAL CASES. IN-LINE INSTRUMENTS-SUBJECT TO SAME REQUIREMENTS AS PIPING UNLESS NOTED OTHERWISE.
- BASIC SYMBOLS ARE ESSENTIALLY IN ACCORDANCE WITH ISA-SS.1 AND ISA-SS.3.

RELEASED FOR CONSTRUCTION

Dravo Still		CONTRACT NO.
		3019
APPROVAL ISSUE	CONSTRUCTION ISSUE	
1E	1E	
2E	2E	
3E	3E	
4E	4E	
5E	5E	
6E	6E	
7E	7E	
8E	8E	
9E	9E	
10E	10E	
11E	11E	
12E	12E	
13E	13E	
14E	14E	
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43E	43E	
44E	44E	
45E	45E	
46E	46E	
47E	47E	
48E	48E	
49E	49E	
50E	50E	

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REFERENCE DRAWINGS LISTED ABOVE	
interlake CHICAGO COKE PLANT	

AMMONIA STILL SYSTEM INSTRUMENT LEGEND

REVISIONS

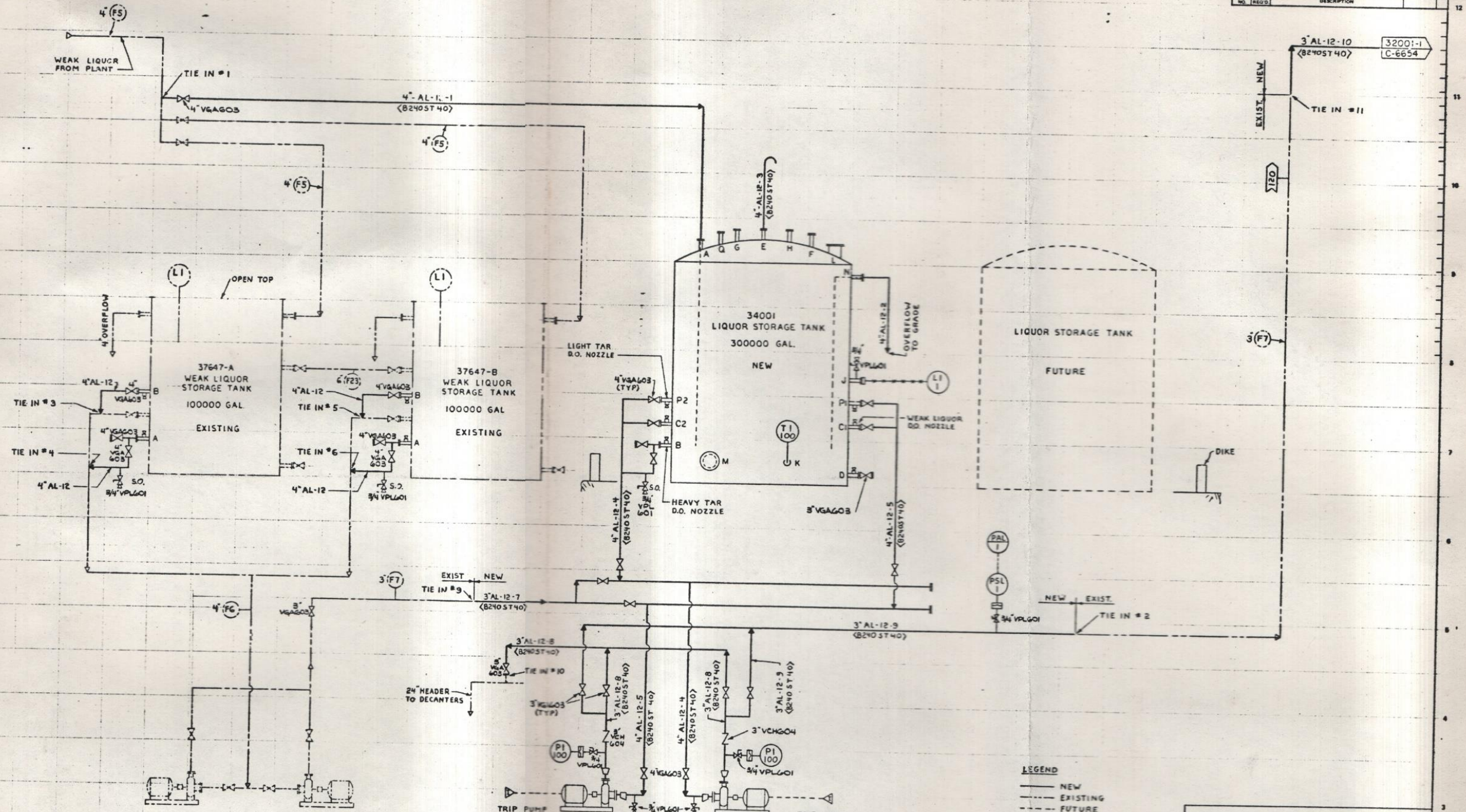
DR	DAD	CH	DP	REV	
SCALE	NONF	APP			
					C-6652
					0



SECTS  
 A-A  
 B-B  
 C-C  
 D-D  
 E-E  
 F-F  
 G-G  
 H-H  
 J-J  
 K-K  
 L-L  
 M-M

C-6653

BILL OF MATERIAL	
ITEM NO.	DESCRIPTION
32001-1	C-6654



WEAK LIQUOR PUMPS  
 EXISTING  
 94 GPM, 28 FT TDH  
 (AVERAGE - EACH PUMP - AS  
 CALCULATED FROM 12/84  
 TEST DATA)

41002-1 & 2  
 AMMONIA STILL FEED PUMPS  
 1 OPER - 1 SPARE  
 120 GPM 151 FT TDH

LEGEND  
 — NEW  
 - - - EXISTING  
 - - - FUTURE

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REVISIONS

RELEASED FOR CONSTRUCTION

Dravo/Still		CONTRACT NO. 8019
APPROVAL ISSUE	CONSTRUCTION ISSUE	
AE	CE	
DL	GL	
EL	HL	
FE	IL	
GE	KL	
HE	LL	
IE	ML	
JE	NL	
KE	OL	
LE	PL	
ME	QL	
NE	RL	
OE	SL	
PE	TL	
QE	UL	
RE	VL	
SE	WL	
TE	XL	
UE	YL	
VE	ZL	
WE		
XE		
YE		
ZE		

C-6651 - PIPING LEGEND  
 C-6652 - INSTRUMENTATION LEGEND  
 37510 - FLOW DIAGRAM - TAR & LIQUOR HANDLING  
 REFERENCE DRAWINGS LISTED ABOVE

Interlake  
 CHICAGO COKE PLANT  
 AMMONIA STILL SYSTEM  
 WEAK LIQUOR STORAGE  
 PIPING & INSTRUMENT DIAGRAM

DR	OPP	CR	DRP	REV
SCALE	NONE	APP		0
			C-6653	

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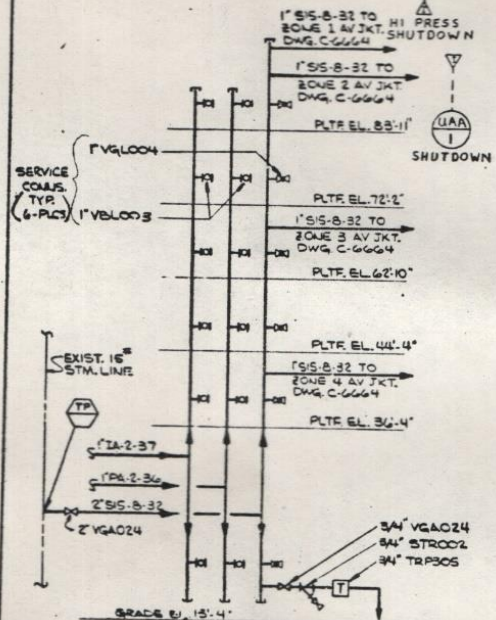
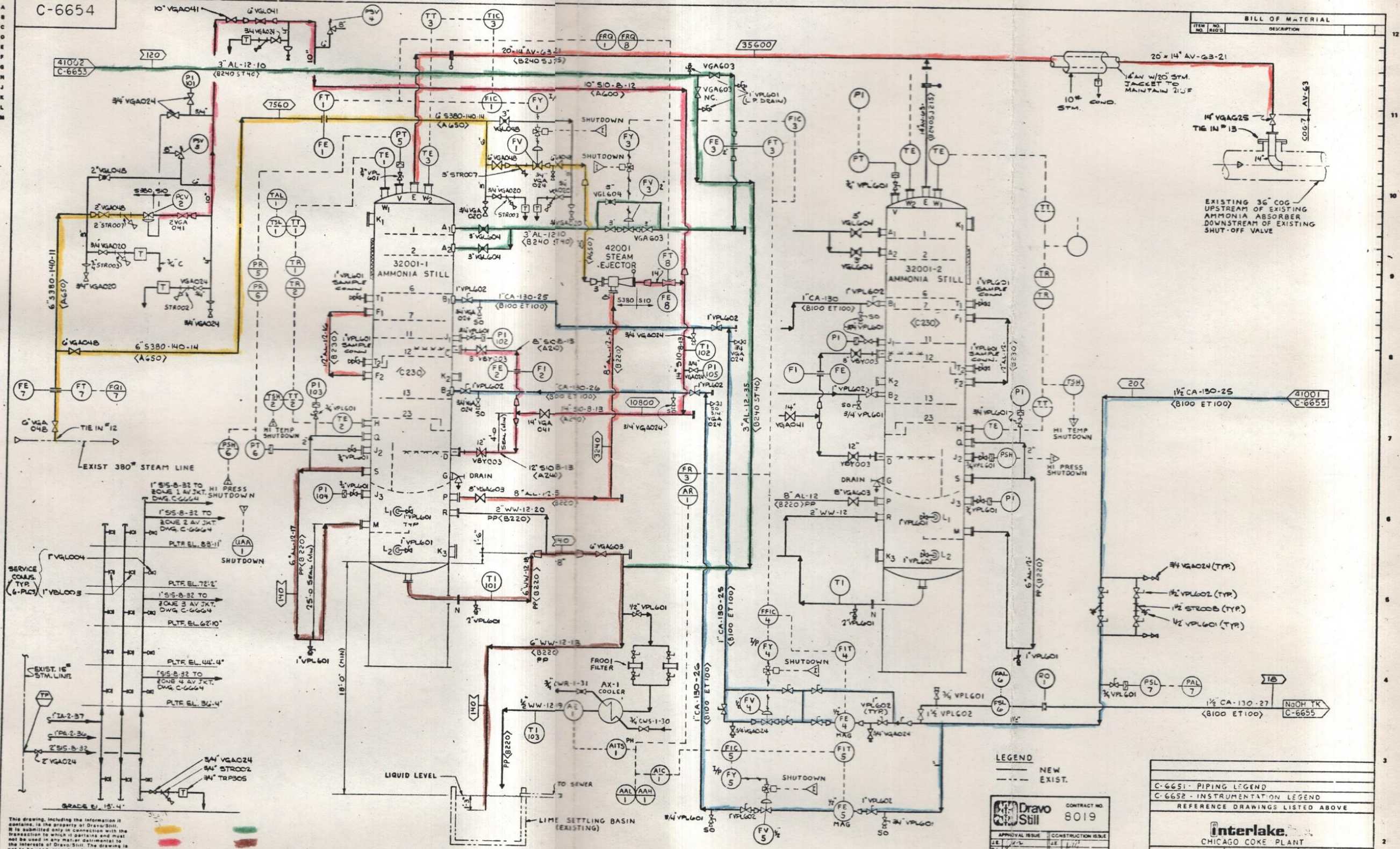
DO NOT  
 SCALE  
 1" = 3' UNLESS  
 OTHERWISE NOTED



RECTS  
A-A  
B-B  
C-C  
D-D  
E-E  
F-F  
G-G  
H-H  
J-J  
K-K  
L-L  
M-M

C-6654

BILL OF MATERIAL	
ITEM NO.	DESCRIPTION



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REVISIONS

LEGEND  
— NEW  
--- EXIST.

Dravo Still		CONTRACT NO. 8019
APPROVAL ISSUE	CONSTRUCTION ISSUE	
JE	JE	
DL	DL	
BE	BE	
CR	CR	
DS	DS	
DATE ISSUED		
DRAWING NUMBER	PP-00-0104	

C-6651 - PIPING LEGEND  
C-6652 - INSTRUMENTATION LEGEND  
REFERENCE DRAWINGS LISTED ABOVE

**Interlake**  
CHICAGO COKE PLANT

AMMONIA STILL SYSTEM  
AMMONIA STILLS  
PIPING & INSTRUMENT DIAGRAM

RELEASED FOR CONSTRUCTION

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TOLERANCE EXCEPT AS NOTED  
SCALE NONE

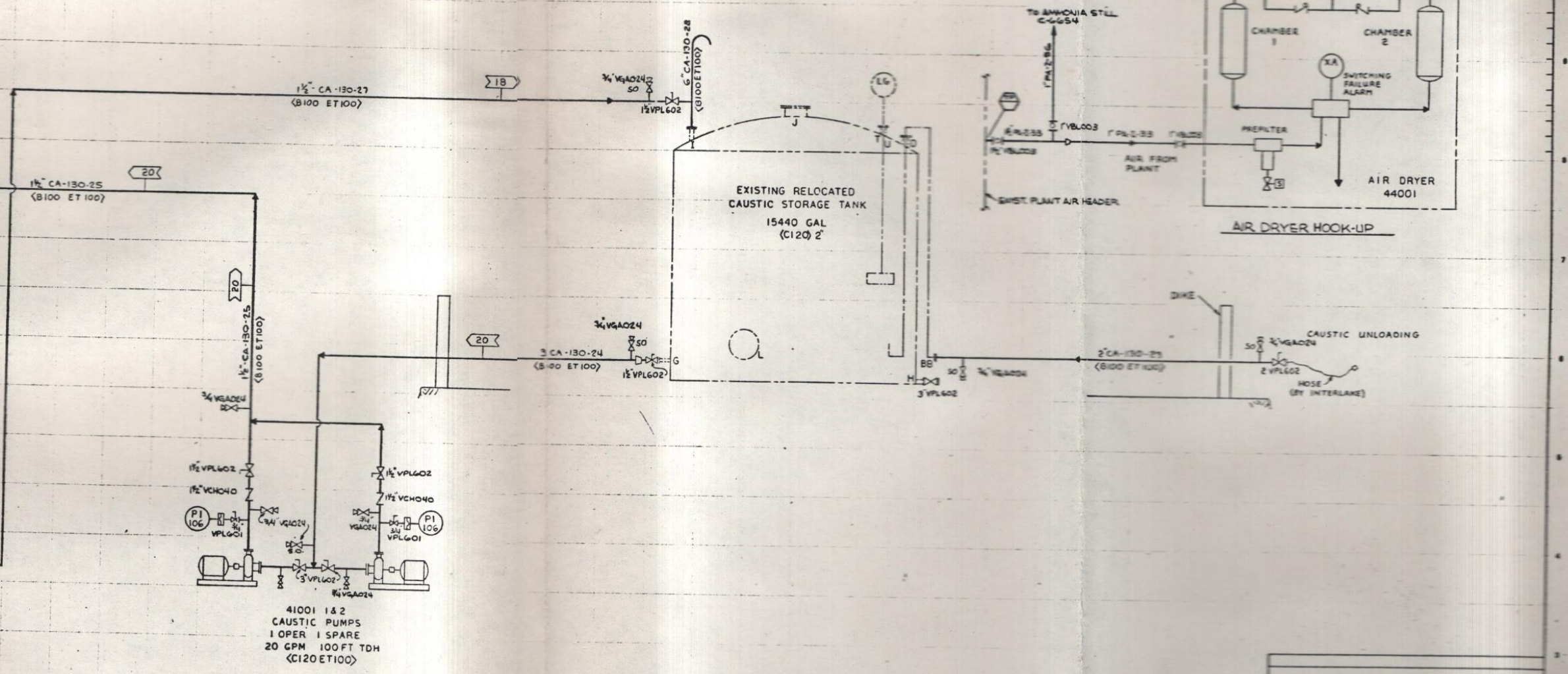
DR	DPP	CH	1/1	REV
SCALE	NONE	APP		
			C-6654	0



SECT'S  
 A-A  
 B-B  
 C-C  
 D-D  
 E-E  
 F-F  
 G-G  
 H-H  
 J-J  
 K-K  
 L-L  
 M-M

C-6655

BILL OF MATERIAL		
ITEM NO.	QTY	DESCRIPTION



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REVISIONS

RELEASED FOR CONSTRUCTION

APPROVAL	CONSTRUCTION
DATE	DATE
BY	BY
DATE	DATE
DATE	DATE
DATE	DATE

C-6651 - PIPING LEGEND
C-6652 - INSTRUMENTATION LEGEND
REFERENCE DRAWINGS LISTED ABOVE
<b>Interlake</b> CHICAGO COKE PLANT
AMMONIA STILL SYSTEM CAUSTIC STORAGE PIPING & INSTRUMENT DIAGRAM
APP: [ ]
DATE: [ ]
BY: [ ]
DATE: [ ]
DATE: [ ]
DATE: [ ]
DATE: [ ]

C-6655