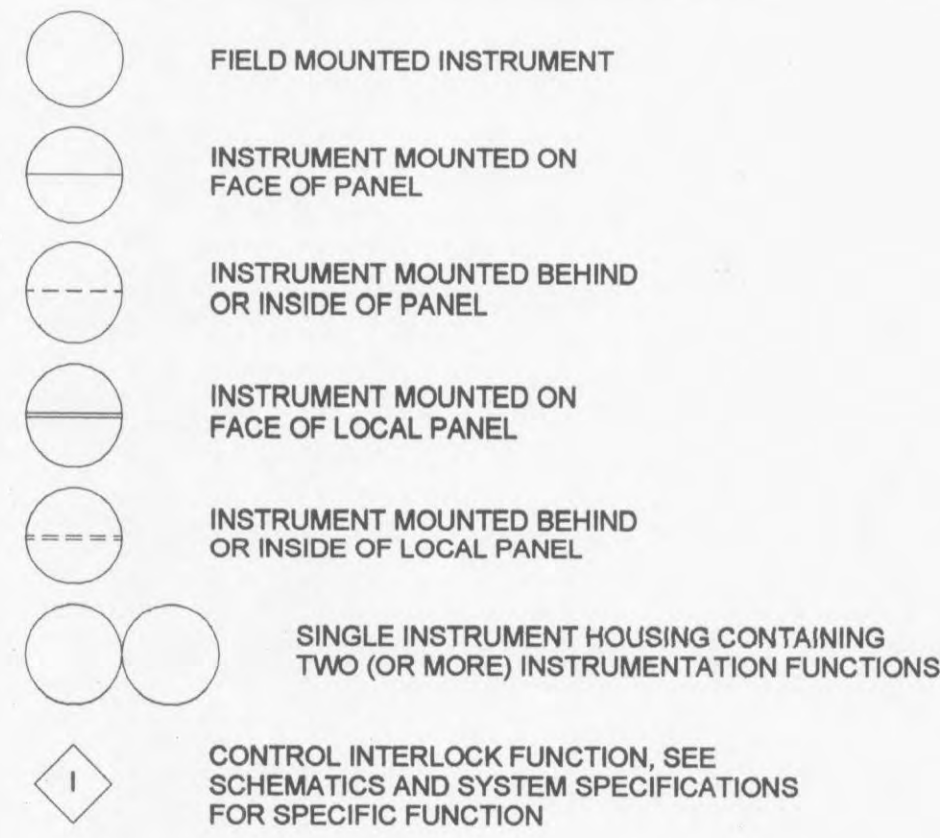
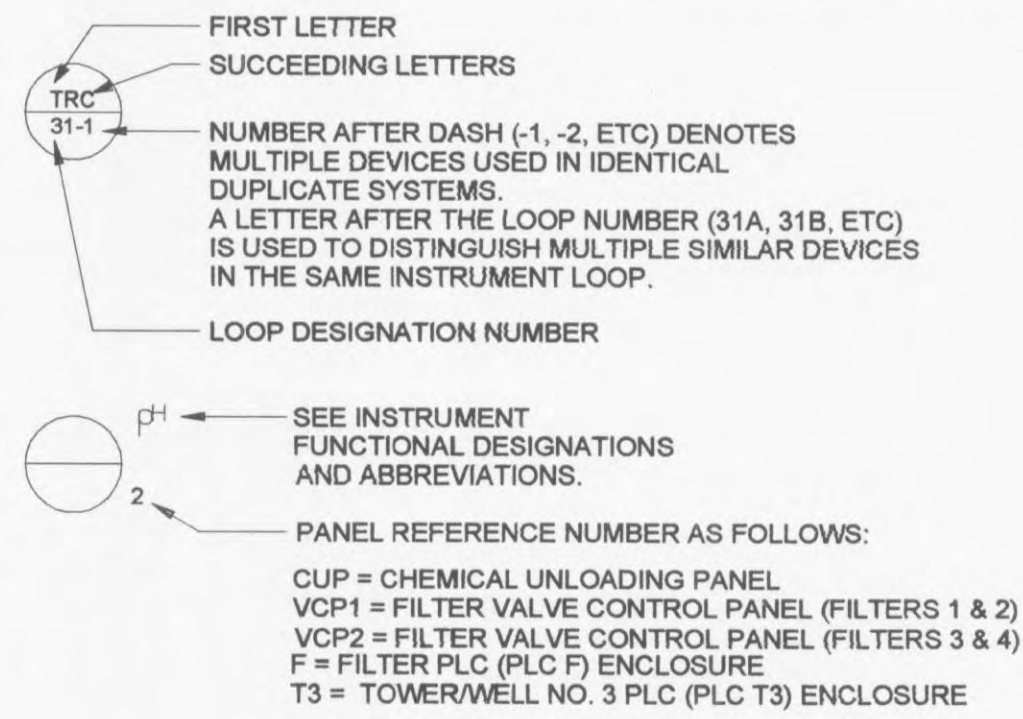


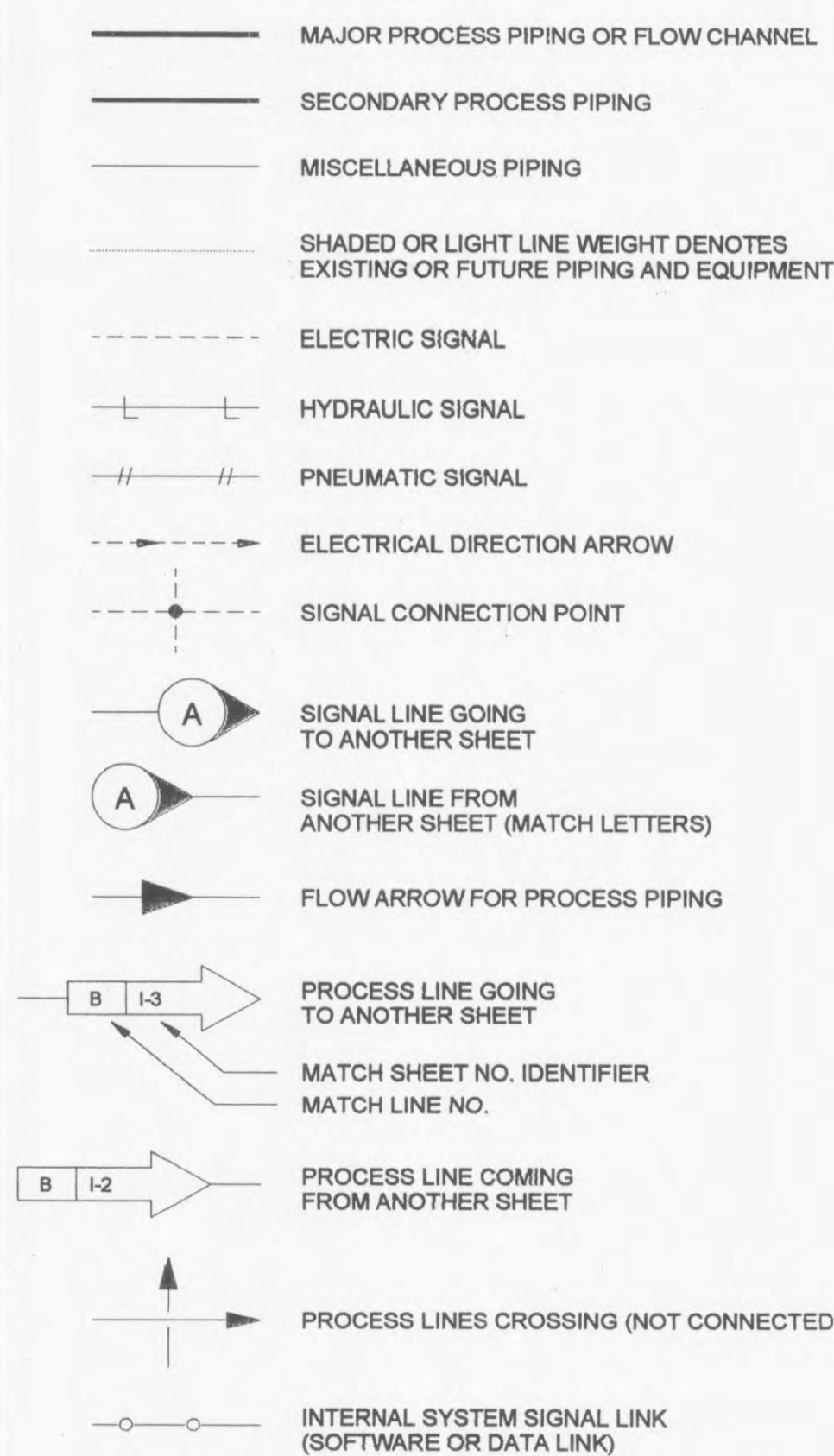
GENERAL INSTRUMENT SYMBOLS



TAG NUMBERS AND ADDITIONAL DESIGNATIONS



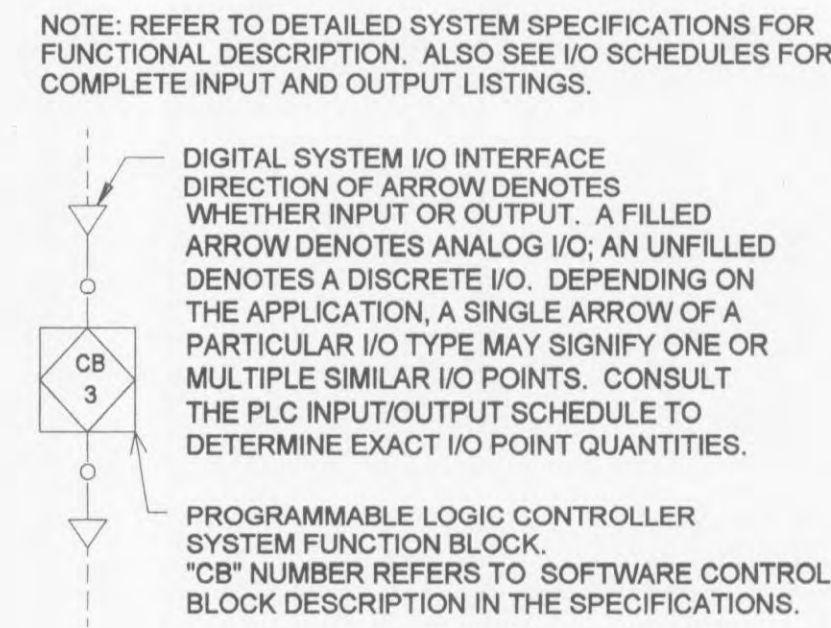
LINE SYMBOLS



TAG NUMBERS MEANINGS OF IDENTIFICATION LETTERS

LETTER	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME-SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY	MOMENTARY			MIDDLE OR INTER-MEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE (RESTRICTION)		
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE OR TOTALIZE	INTEGRATE OR TOTALIZE		
R	RADIATION		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER, OR LOUVER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE			RELAY OR COMPUTE	
Z	POSITION DIMENSION			DRIVE, ACTUATOR OR UNCLASSIFIED FINAL CONTROL ELEMENT	

DIGITAL SYSTEMS INTERFACE SYMBOLS



GENERAL NOTES

- IN GENERAL, THE P AND I SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INSTRUMENT SOCIETY OF AMERICA, STANDARD PRACTICE ISA-S5.1 (1988). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
- ADDITIONAL CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P & ID DRAWINGS. SOME PROCESS ITEMS, SUCH AS EQUIPMENT ISOLATION VALVES, BYPASS LINES, ETC., WHICH ARE NOT CRITICAL FOR AN UNDERSTANDING OF THE INSTRUMENTATION FUNCTIONS HAVE ALSO BEEN OMITTED.
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- PIPING AND EQUIPMENT LEGEND APPLIES TO P & ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

FUNCTION DESIGNATIONS AND ABBREVIATIONS

INSTRUMENT DESIGNATIONS		HAND SWITCH DESIGNATIONS	
K	GAIN OR ATTENUATE (INPUT-OUTPUT)	HOA	HAND-OFF-AUTO
-K	GAIN AND REVERSE	LR	LOCAL REMOTE
Σ	ADD OR SUM (ADD AND SUBTRACT)	OC	OPEN-CLOSE
Δ	SUBTRACT (DIFFERENCE)	OO	ON-OFF
√	EXTRACT SQUARE ROOT	LOR	LOCAL-OFF-REMOTE
÷	DIVIDE	OOA	ON-OFF-AUTO
F(X)	CHARACTERIZE SIGNAL	OCR	OPEN-CLOSE-REMOTE
>	HIGH-SELECT	OOR	ON-OFF-REMOTE
<	LOW-SELECT	OSCA	OPEN-STOP-CLOSE-AUTO
X	MULTIPLY	TRANSUCER & CONVERTER DESIGNATION	
J	INTEGRATE (TIME INTEGRAL)	E	VOLTAGE
CH4	METHANE	FSK	FREQUENCY SHIFT KEYING
CL2	CHLORINE RESIDUAL	H	HYDRAULIC CURRENT
CO2	CARBON DIOXIDE	I	PNEUMATIC
COND	CONDUCTIVITY	PD	PULSE DURATION
DO	DISSOLVED OXYGEN	PF	PULSE FREQUENCY
F	FLUORIDE	R	RESISTANCE (ELECTRICAL)
LEL	LOWER EXPLOSIVE LIMIT	EXAMPLE: IP = CURRENT TO PNEUMATIC TRANSDUCER	
MCC	MOTOR CONTROL CENTER	POWER SUPPLY ABBREVIATIONS	
O2	OXYGEN (PURITY)	AS	AIR SUPPLY
pH	pH CELL	ES	ELECTRIC SUPPLY
TURB	TURBIDITY	GS	GAS SUPPLY
PIPE MATERIAL ABBREVIATIONS		HS	HYDRAULIC SUPPLY
A-20	ALLOY 20	NS	NITROGEN SUPPLY
CPVC	CHLORINATED POLYVINYL CHLORIDE	SS	STEAM SUPPLY
CS	CARBON STEEL	WS	WATER SUPPLY
PVC	POLYVINYL CHLORIDE	VALVE AND GATE ACTUATOR SYMBOLS	

PROCESS DEVICE SYMBOLS



CONFORMED TO CONSTRUCTION RECORDS

REVISIONS AND RECORD OF ISSUE

NO. BY OK APP

DATE

CYBNET ID:

SAVED:

DWG VER #:

PLOTTED:

USER:

SWK

* THIS DRAWING HAS BEEN APPROVED FOR CONSTRUCTION BY JOHN E. ROUSH, JR., ON 10-08-2001 AND SEALED AS A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF MISSOURI, NO. E-28417.

BLACK & VEATCH
CORPORATION
St. Louis, Missouri

CITY OF O'FALLON, MISSOURI
WATER TREATMENT PLANT

P&ID LEGEND

DESIGNED: JER
DETAILED: JER
CHECKED: MJP
APPROVED: JER
DATE: 10/08/01

PROJECT NO. 97515

N1

SHEET 74 OF 96

THE FOLLOWING ADDITIONAL DESIGNATIONS MAY BE UTILIZED ADJACENT TO SOME VALVE OR GATE SYMBOLS.

NC NORMALLY CLOSED
FC FAILS CLOSED
FO FAILS OPEN
FIP FAILS IN LAST POSITION