

FHWA REGION	STATE	PROJECT	
5	OHIO		

35-6  
101

LAKE COUNTY  
LAK-306-6.15

# GENERAL NOTES

F. CONTROL POWER TRANSFORMER SHALL BE RATED 1000 VA CONTINUOUS, OPEN TYPE CONSTRUCTION, PRIMARY RATED 240/480 VAC 60 HERTZ, SECONDARY RATED 120 VAC. TRANSFORMER SHALL BE DESIGNED FOR HIGH INRUSH CURRENT LOADS WITH MINIMAL VOLTAGE SAG, HEVI-DUTY, TYPE SBW. PROVIDE ADEQUATE SPACING TO INSURE AIR CIRCULATION AROUND TRANSFORMER.

G. PANEL CHANNEL (PLASTIC WIRE TROUGHS) SHALL BE USED TO NEATLY HOUSE AND TRAIN ALL CONTROL WIRING EXCEPT WHERE CONNECTIONS ARE MADE AT OTHER CONTROL DEVICES. USE PLASTIC CABLE TIES TO GROUP WIRES IN TROUGHS AFTER COMPLETION. PROVIDE COVERS. "PANDUCT" PLASTIC WIRING DUCT OR EQUAL. SIZE IN ACCORDANCE WITH JIC STANDARDS OR NEC WIREWAY FILL STANDARDS (NEC PARAGRAPH 362-5, EXCEPTIONS MAY BE USED). NO SPLICES SHALL BE USED FOR CONTROL WIRING. MAKE ALL CONNECTIONS AT DEVICE TERMINALS OR JUMPERED TERMINAL BLOCKS.

H. CABLE MARKERS SHALL BE T & B EZ CODE MARKERS OR EQUAL.

I. POWER DISTRIBUTION AND GROUNDING BLOCKS SHALL BE RATED 600 VOLTS, 60 HERTZ, SUITABLE FOR COPPER CABLES, PHENOLIC INSULATED MOLDED BASE, CONNECTOR FABRICATED FROM A MONOLITHIC BLOCK OF ALUMINUM, U.L. RECOGNIZED (FILE NO. E43665) AS MANUFACTURED BY MARATHON SPECIAL PRODUCTS, DIV. OF MARATHON ELECTRIC, BOWLING GREEN, OHIO 43402, TELEPHONE (419) 352-8441, BULLETIN 2.2.

J. LAMICOID PLATES SHALL BE INSTALLED ON THE CONTROL PANEL AS INSTRUCTED BELOW AND ON THE DRAWINGS.

INFORMATIONAL MESSAGES SHOWN ON THE CONTROL DIAGRAM SHALL BE BLACK FACED, WHITE CORE, AND ATTACHED WITH SHEET METAL SCREWS. LOCATE PLATE NEAR SWITCH, PILOT LIGHT OR OTHER DEVICE TO WHICH MESSAGE APPLIES. NOMINAL LETTER SIZE 1/8".

WARNING OR DANGER MESSAGES SHOWN ON THE CONTROL DIAGRAM OR HEREIN SHALL BE RED FACED, WHITE CORE, AND ATTACHED WITH SHEET METAL SCREWS. LOCATE PLATE NEAR SWITCH, PILOT LIGHT, ACCESS DOOR HANDLE, OR OTHER DEVICE TO WHICH MESSAGE APPLIES. DANGER OR HIGH VOLTAGE LETTERING SHALL BE 1" HIGH, OTHER INFORMATION SHALL BE NOMINAL 1/4" HIGH LETTERS.

## 29. MOUNTING STANDS

WHERE DISCONNECT SWITCHES, FUSIBLE SWITCHES, COMBINATION STARTERS, DRY TYPE TRANSFORMERS, POWER FACTOR CORRECTION CAPACITORS AND SIMILAR APPARATUS CANNOT BE MOUNTED TO A RIGID BUILDING OR MECHANICAL STRUCTURE, FURNISH AND INSTALL MOUNTING STANDS OF THE FOLLOWING CHARACTERISTICS.

STAND SHALL BE FABRICATED FROM STEEL OF SUFFICIENT STRENGTH, FORMED AND JOINED FOR THE STRESSES INVOLVED BUT IN NO CASE OF ANGLE SMALLER THAN 1-3/4" X 1-3/4" X 1/8".

STAND SHALL BE FREE OF MILL SCALE, WELDING SLAG, ALL PAINT AND IN GENERAL WIRE BRUSHED TO BARE METAL.

PICKLE PROCESS COMPLETELY FABRICATED STAND IN HOT CAUSTIC SOLUTION, SULPHURIC ACID SOLUTION, ETC., TO PREPARE FOR GALVANIZING.

HOT DIP GALVANIZE STAND IN ACCORDANCE WITH ASTM STANDARD 123.

IF PAINTING IS REQUIRED, RE-ETCH FOR THIRTY SECONDS. APPLY ONE BASE COAT OF RED ZINC RICH PRIMER IF PAINTING IS REQUIRED.

DO NOT FIELD DRILL, OR IN ANY OTHER WAY DESTROY GALVANIZING COAT.

IF FIELD WELDING MUST BE DONE ON FINISHED STAND, APPLY ONE SHOP COAT OF PAINT AS DESCRIBED ABOVE. AFTER FIELD WELDS ARE ACCOMPLISHED, REMOVE ALL WELD SLAG AND APPLY TWO COATS OF RUSTOLEUM RED ZINC RICH PRIMER TO AREAS DAMAGED.

WHEN DESIGNING STANDS, INSURE THAT HEAT PRODUCING EQUIPMENT SUCH AS TRANSFORMERS AND POWER FACTOR CORRECTION CAPACITORS ARE SPACED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS WITH REGARD TO COOLING AIR CIRCULATION.

## 30. LEVEL SENSORS AND CONTROL UNIT

A. THERE SHALL BE FURNISHED AND INSTALLED AS INDICATED ON THE PLANS, AN ASSEMBLY OF MULTIPLE, MECHANICALLY ACTIVATED, HERMETICALLY SEALED, INDEPENDENTLY ADJUSTABLE MERCURY SWITCHES HOUSED IN A NEMA 4 PEDESTAL MOUNTED ENCLOSURE. AN INTEGRAL 10 INCH INDICATOR WITH WHITE NUMERALS ON A BLACK BACKGROUND SHALL DISPLAY THE LEVEL OF THE MONITORED LIQUID, AND SHALL BE LOCATED AND READ AT THE OPPOSITE END OF THE UNIT FROM THE FLOAT SHEAVE. A 6-1/2 INCH CERAMIC FLOAT, A COUNTERWEIGHT, FLOAT AND COUNTERWEIGHT SHEAVES, OVERLAPPING SHEAVE COVERS, AND APPROPRIATE LENGTHS OF 3/8" X 0.008" STAINLESS STEEL TAPE SHALL BE INCLUDED. THE CONTROL VOLTAGE SHALL BE 120 VOLTS. MAXIMUM FLOAT TRAVEL SHALL BE APPROXIMATELY 28', AND THE INDICATOR DIAL SHALL BE CALIBRATED 0-30'. FLOAT ACTUATION POINTS SHALL BE AS SHOWN ON THE DRAWINGS. CONTROLLER SHALL BE A CLASS 3500 "SELECTROL", AS MANUFACTURED BY AUTOCON INDUSTRIES, HEALEY-RUFF, OR EQUAL.

B. FURNISH FIVE INDEPENDENTLY PROGRAMMABLE MERCURY SWITCHES OF THE DRAWDOWN TYPE, AND TWO NO-DRAWDOWN TYPE FOR HIGH WATER ALARM AND SPACE. PUMP "ON" AND "OFF" LEVELS SHALL BE ADJUSTABLE INDEPENDENTLY OF ONE ANOTHER. SWITCHES SHALL BE POSITIVE ACTING, WITH NO "TEASING" OR "CHATTERING" OF TWO WIRE CONTROL CIRCUIT RELAYS OR STARTERS. SWITCHES SHALL BE RATED 9.8 AMPERES OR MORE AT 120 VAC.

## 31. AUTOMATIC TELEPHONE DIALER AND SUPERVISOR

A. FURNISH AND INSTALL A SOLID STATE, TWO CHANNEL, ELECTRONIC DEVICE WHICH MONITORS NORMALLY OPEN CONTACTS FROM TWO INDEPENDENT SETS OF TROUBLE OR ALARM SENSING DEVICES ON REMOTE (UNMANNED) INSTALLATIONS. UPON CLOSURE OF ANY ONE OF THE CONTACTS, UNIT SHALL AUTOMATICALLY CALL A PREDETERMINED TELEPHONE NUMBER AND TRANSMIT A VOICE RECORDING STATING THE LOCATION OF THE INSTALLATION AND THE NATURE OF THE TROUBLE. IF THE CALLED NUMBER IS BUSY, DOES NOT ANSWER, OR IF AN INCORRECT NUMBER IS REACHED, THE AUTOMATIC SUPERVISOR SHALL HANG UP AND CALL THE SAME NUMBER AGAIN, OR UP TO FOUR DIFFERENT NUMBERS. IT SHALL CONTINUE CALLING THE NUMBERS IN SUCCESSION, UNTIL IT IS ANSWERED AND ACKNOWLEDGED. ONCE THE CALL IS RECEIVED, THE PERSON RECEIVING IT CAN ACKNOWLEDGE THE AUTOMATIC SUPERVISOR FROM HIS TELEPHONE BY PUSHING THE #9 ON "TOUCH TONE" TELEPHONE. THE AUTOMATIC SUPERVISOR SHALL THEN HANG UP AND NOT PLACE ANY MORE CALLS DUE TO THE INITIAL CONTACT CLOSURE. ADDITIONAL ALARM OR TROUBLE CONTACT CLOSURES SHALL REINITIATE THE AUTOMATIC DIALER/SUPERVISOR WITHOUT REQUIRING MANUAL RESETS OR REARMING ACTIONS. IF THE SECOND ALARM/TROUBLE CHANNEL HAS BEEN ACTIVATED, THE AUTOMATIC SUPERVISOR WILL THEN CYCLE ON THAT CHANNEL UNTIL ACKNOWLEDGED.

B. THE AUTOMATIC DIALER/SUPERVISOR SHALL POSSESS THE FOLLOWING CHARACTERISTICS:

1. TWO INDEPENDENT ALARM CHANNELS WITH SEPARATE PRERECORDED MESSAGES AND CAPACITY FOR UP TO FIVE SEQUENTIALLY DIALED TELEPHONE NUMBERS FOR EACH ALARM CHANNEL.
2. BUILT-IN LINE A.C. POWER MONITOR FEATURE. INTERNAL CIRCUIT SHALL MONITOR A.C. POWER LINE AND TRIP CHANNEL ONE IF A.C. POWER FAILS. PROVIDE SLIDE DEFEAT SWITCH, ALLOWING CHANNEL ONE TO BE USED TO MONITOR THE ALARM/TROUBLE CONDITIONS SHOWN ON THE DRAWINGS, OR A.C. POWER FAILURE TO THE AUTODIALER ONLY.
3. ADJUSTABLE DELAY (0-90 SECONDS): IF ALARM OR TROUBLE CONDITION IS CLEARED WITHIN THE DELAY TIME, NO CALLS WILL BE MADE. (SET FOR 60 SECONDS AT FACTORY).
4. REPORT LOGIC: CALL UP TO FIVE TELEPHONE NUMBERS AND REPORT ALARM OR TROUBLE CONDITION. UNIT SHALL CONTINUE TO DIAL THE NUMBERS IN SUCCESSION UNTIL ONE OF THE CALLED PARTIES ACKNOWLEDGES.

5. REMOTE RESET FEATURE: ANY TELEPHONE EQUIPPED WITH A "TOUCH-TONE" DIAL OR TYPE A-15 HANDSET MAY BE USED TO HANG UP AND COMPLETELY RESET THE AUTOMATIC SUPERVISOR AFTER THE MESSAGE IS RECEIVED, UNLESS THE SECOND CHANNEL HAS ALSO BEEN ACTIVATED, IN WHICH CASE, THE SECOND CHANNEL MUST ALSO BE ACKNOWLEDGED TO RESET THE UNIT.

6. FEDERAL COMMUNICATIONS COMMISSION REGISTRATION: UNIT SHALL BE TYPE ACCEPTED OR REGISTERED WITH THE FCC FOR CONNECTION TO TELEPHONE COMMON CARRIER LINES THROUGH AN RJ-31-X JACK INSTALLED BY TELEPHONE COMPANY.

7. COMMON TELEPHONE LINE USE. UNIT SHALL NOT REQUIRE A SPECIAL DEDICATED OR LEASED TELEPHONE LINE. IT SHALL BE COMPATIBLE FOR SHARED USE WITH A COMMON "TOUCH-TONE" TELEPHONE LINE AND LOCAL HANDSET.

8. REMOTE TEST CAPABILITY. TELEPHONE LINE AND AUTOMATIC SUPERVISOR SHALL BE CAPABLE OF BEING REMOTELY TESTED BY CALLING AND TRIPPING THE AUTOMATIC SUPERVISOR FROM A TELEPHONE EQUIPPED WITH "TOUCH-TONE" OR A TYPE A-15 HANDSET. IN ORDER TO UTILIZE THIS FEATURE, THE AUTOMATIC SUPERVISOR MUST BE CONNECTED TO A DEDICATED TELEPHONE LINE WITH NO EXTENSIONS OR TO AN EXTENSION TELEPHONE USED FOR OUT-GOING CALLS ONLY.

9. BUILT-IN STANDBY POWER. UNIT SHALL HAVE BUILT IN LEAD-ACID BATTERIES AND BATTERY CHARGING/CONDITIONING CIRCUITRY. BATTERIES SHALL HAVE SUFFICIENT CAPACITY TO ATTEMPT CALLS FOR A FULL SIX HOURS.

10. TAPE ANTI-FOUL DEVICE. UNIT SHALL HAVE PROVISIONS TO PREVENT RECORDING TAPE FOULING DUE TO TAPE ADHERING TO TRANSPORT MECHANISM PARTS BECAUSE OF LONG IDLE PERIODS.

11. OPERATING TEMPERATURE RANGE: 32°F TO 160°F.

12. OPERATING HUMIDITY RANGE: 10% TO 90% RELATIVE.

13. UNIT SHALL BE EQUIPPED WITH ALL VOLTAGE CONVERSION TRANSFORMERS, RECTIFIERS, REGULATORS, AND CHARGERS REQUIRED TO ACCEPT 120 VAC, 60 HERTZ, SINGLE PHASE POWER AND CONVERT SAME TO UNIT REQUIRED VOLTAGES.

14. BATTERIES SHALL PROVIDE ADEQUATE CAPACITY FOR 60 HOURS IDLE AND 6 HOURS RUNNING TIME.

C. THE AUTOMATIC DIALER/SUPERVISOR, ALONG WITH BATTERIES, POWER SUPPLIES, TERMINAL STRIPS AND ACCESSORIES SHALL BE ENCLOSED IN AN OVERSIZED NEMA-12 ENCLOSURE MEASURING NOT LESS THAN 30" X 20" X 6" AS MANUFACTURED BY HOFFMAN ENGINEERING CO. ADEQUATE SPACE SHALL BE PROVIDED FOR NOT ONLY THE ABOVE MENTIONED DEVICES, BUT ALSO THE TELEPHONE COMPANY LINE PROTECTIVE DEVICE (LIGHTNING BLOCK), LINE ISOLATION PROTECTOR, AND OTHER TELEPHONE COMPANY REQUIRED COMPONENTS. CONTRACTOR SHALL COORDINATE WITH TELEPHONE COMPANY FOR THEIR REQUIRED SPACE BEFORE FINALIZING ENCLOSURE DIMENSIONS. PROVIDE SPACE FOR AND INSTALL GROUNDING HUBS (SUCH AS T & B 3940) IN BOTH THIS ENCLOSURE AND ON OPPOSITE END OF TELEPHONE GROUND CONDUIT IN THE MOTOR CONTROL CENTER. ENCLOSURE SHALL BE PAINTED AS SPECIFIED HEREIN FOR THE CUSTOM PUMP CONTROL PANEL.

D. LOCATE, IN COOPERATION WITH TELEPHONE COMPANY, THE WALL-MOUNTED TELEPHONE HANDSET IMMEDIATELY ADJACENT TO AND TO THE RIGHT OF THE AUTOMATIC DIALER/SUPERVISOR. PROVIDE AN INSULATED CHASE NIPPLE (SUCH AS T & B 1942) WITH LOCK NUT AND BUSHING TO FEED HANDSET FROM AUTOMATIC DIALER/SUPERVISOR ENCLOSURE. NIPPLE SHOULD BE LOCATED AT TELEPHONE MOUNTING HEIGHT. CONTRACTOR SHALL INSURE THAT TELEPHONE IS LOCATED NEAR DIALER IN A NEAT AND WORKMANLIKE MANNER. MAXIMUM EXPOSED TELEPHONE CABLE SHALL NOT EXCEED 12 INCHES.

E. BASIS OF DESIGN. AUTOMATIC DIALER/SUPERVISOR SHALL BE AS SPECIFIED HEREIN, AND SHALL BE AN ADCOR ELECTRONICS (ATLANTA, GEORGIA 404/261-0245) MODEL AS-2B-NEMA-12 IN AN OVERSIZED ENCLOSURE SUCH AS SUPPLIED FOR THE MODEL AS-4B, OR EQUAL.