GENERAL NOTES

5.0 WIREWAYS

5.1 HORIZONTAL WIREWAYS BOTH TOP AND BOTTOM SHALL BE THE FULL DEPTH OF THE CONTROL CENTER. EACH WIREWAY SHALL PROVIDE A MINIMUM OF 90 SQUARE INCHES OF UNOBSTRUCTED WIRING SPACE. THE HORIZONTAL WIREWAY SHALL BE NOT LESS THAN 6" HIGH AND SHALL EXTEND THE LENGTH AND THE DEPTH OF THE CONTROL CENTER WITH A 25 SQUARE INCH OPENING BETWEEN SECTIONS. THE WIREWAYS SHALL BE COMPLETELY ISOLATED FROM ALL BUSES.

5.1.1 A TOP HORIZONTAL WIREWAY 6" HIGH AND 7" FRONT TO BACK SHALL EXTEND THROUGH THE INCOMING LINE SECTION AND BE ISOLATED FROM THE INCOMING LINE COMPARTMENT.

5.2 A FULL HEIGHT VERTICAL WIREWAY SHALL BE PROVIDED IN EACH STANDARD VERTICAL SECTION WITH THE MINIMUM DIMENSIONS OF 4" WIDE AND 7" DEEP, AND SHALL BE COMPLETELY ISOLATED FROM THE HORIZONTAL AND THE VERTICAL BUS. A SEPARATELY REMOVABLE HINGED DOOR WITH 1/4 TURN PAWL TYPE LATCHES SHALL COVER THE VERTICAL WIREWAY, AND PROVIDE FOR EASY ACCESS TO WIRING WITHOUT DISTURBING ENERGIZED CONTROL UNITS.

5.2.1 WIRE TIES SHALL BE FURNISHED IN THE VERTICAL WIRE TROUGH TO GROUP AND SECURELY HOLD WIRE IN PLACE.

6.0 BUS BARS

6.1 THE MAIN HORIZONTAL BUS BARS 1/8" X 4" SHALL BE RATED NOT LESS THAN 600 AMPERES BASED ON TEMPERATURE RISE, AND SHALL BE LOCATED AT THE VERTICAL CENTER OF THE CONTROL CENTER. THE BUS SHALL BE ONE CONTINUOUS PIECE AND EXTEND THE FULL LENGTH OF THE CENTER, EXCEPT WHEN THE CENTER IS SPLIT FOR SHIPMENT. THEN THE BUS SHALL BE CONTINUOUS IN EACH SHIPPING BLOCK. A SPLICE KIT SHALL BE SUPPLIED WHEN REQUIRED TO INTERCONNECT THE BUSES IN THE FIELD. THE HORIZONTAL BUS SHALL BE TIN PLATED COPPER.

6.2 VERTICAL BUS SHALL BE SOLID COPPER ROD, TIN PLATED RATED 300 AMPERES ABOVE AND BELOW THE HORIZONTAL BUS, EXCEPT FOR INCOMING FEEDER VERTICAL BARS WHICH SHALL BE RATED AT HORIZONTAL BUS AMPACITY.

6.3 BOTH THE HORIZONTAL AND VERTICAL BUS SHALL BE SUPPORTED AND BRACED BY A ONE-PIECE MOLDING OF ROSITE. THE VERTICAL BUS SPACING SHALL BE ON 4" CENTERS AND THE HORIZONTAL BUS ON 6-1/2" CENTERS. THE BUS SHALL BE BRACED TO WITHSTAND 65,000 RMS SYMMETRICAL AMPERES.

6.4 HORIZONTAL AND VERTICAL BUSES SHALL BE FASTENED TOGETHER WITH AN ASSEMBLY COMPRISED OF WELD STUDS WITH FLAT WASHERS AND PRE-ASSEMBLED NUTS WITH CONICAL WASHERS. SPLICING OF THE HORIZONTAL BUS SHALL BE ACCOMPLISHED WITH THE SAME ASSEMBLY IN KIT FORM. THE CONNECTIONS SHALL BE FRONT ACCESSIBLE FOR SERVICING WITH A TORQUE WRENCH.

6.5 THE HORIZONTAL GROUND BUS SHALL BE COPPER, 1/4" X 1" LOCATED IN THE HORIZONTAL WIREWAY BOTTOM. FOUR GROUND LUGS SHALL BE PROVIDED.

7.0 ISOLATION AND INSULATION

7.1 ALL WIREWAYS SHALL BE COMPLETELY ISOLATED FROM ACCIDENTAL CONTACT WITH THE BUS. UPPER AND LOWER HORIZONTAL WIREWAY PANS SHALL PROVIDE ISOLATION FROM ABOVE AND BELOW THE VERTICAL BUS TO PROTECT AGAINST CONTACT WITH FISH TAPE ENTERING AT THE TOP OR BOTTOM OF THE ENCLOSURE.

7.2 BUS BARRIERS SHALL ISOLATE THE HORIZONTAL AND VERTICAL BUS TO GUARD AGAINST THE HAZARD OF ACCIDENTAL CONTACT. THESE BARRIERS SHALL BE MOLDED FROM A HIGH STRENGTH TRACK RESISTANT GLASS POLYESTER ROSITE MATERIAL, AND SHALL BE RED IN COLOR TO INDICATE THE PROXIMITY OF ENERGIZED BUS. PLUG-IN OPENINGS IN THE VERTICAL BUS BARRIERS SHALL PERMIT UNIT PLUG-IN CONTACTS TO PASS THROUGH AND ENGAGE THE VERTICAL BUS BARS.

7.3 ALL PLUG-IN UNITS SHALL BE ISOLATED FROM ONE ANOTHER BY UNIT SUPPORT PANS.

7.4 THE INCOMING LINE COMPARTMENTS SHALL BE ISOLATED FROM UNITS, AND HORIZONTAL AND VERTICAL WIREWAYS BY STEEL BARRIERS.

8.0 UNITS

8.1 UNIT PLUG-IN CONNECTIONS SHALL BE HIGH QUALITY TWO POINT CONNECTION FOR EACH PHASE, DESIGNED TO TIGHTEN DURING HEAVY CURRENT SURGE. THE PLUG-IN FINGERS SHALL BE ELECTROLYTICALLY TIN PLATED TO YIELD A LOW RESISTANCE CONNECTION, AND SHALL BE BACKED BY SPRING STEEL CLIPS TO PROVIDE HIGH PRESSURE CONNECTION POINTS. PLUG-IN FINGERS SHALL BE MOUNTED IN A SUPPORT ASSEMBLY MOLDED OF A HIGH STRENGTH TRACK RESISTANT GLASS POLYESTER ROSITE INSULATING MATERIAL. THE SUPPORT ASSEMBLY SHALL PRESENT AN OFFSET PATH BETWEEN THE UNIT AND THE VERTICAL BUS TO MINIMIZE THE POSSIBILITY OF A UNIT FAULT CONDITION REACHING THE POWER BUS SYSTEM. THE PLUG-IN FINGERS SHALL BE FREE FLOATING AND SELF-ALIGNING.

8.2 EACH PLUG-IN UNIT SHALL BE SUPPORTED AND GUIDED BY A LIFTOUT REMOVABLE UNIT SUPPORT PAN, SO THAT UNIT REARRANGEMENT IS EASILY ACCOMPLISHED. TRANSFER OF THIS UNIT SUPPORT PAN FROM ONE LOCATION TO ANOTHER SHALL BE ACCOMPLISHED WITHOUT THE USE OF TOOLS. INSERTION OF THE UNIT SUPPORT PAN SHALL ESTABLISH GROUND TO THE FRAME.

8.3 EACH PLUG-IN UNIT SHALL BE HELD IN PLACE BY THREE MULTITURN LATCHES, LOCATED AT THE FRONT OF THE UNIT. TWO LATCHES LOCATED AT THE TOP OF THE INSERT AND ONE AT THE BOTTOM, SHALL PROVIDE MAXIMUM FRONT ACCESSIBILITY AND INSTALLATION CONVENIENCE.

8.4 THE FOLLOWING TYPES AND SIZES OF STARTERS SHALL BE AVAILABLE IN PLUG-IN CONSTRUCTION:

8.4.1 FULL VOLTAGE COMBINATION STARTERS

DEVICE		SIZE
BUL. 2106	REVERSING STARTER WITH FUSIBLE DISCONNECT SWITCH	1-4
BUL. 2107	REVERSING STARTER WITH CIRCUIT BREAKER	1-4
BUL. 2112	NON-REVERSING STARTER WITH FUSIBLE DISCONNECT SWITCH	1-5
BUL. 2113	NON-REVERSING STARTER WITH CIRCUIT BREAKER	1-5

8.4.2 FULL VOLTAGE TWO SPEED COMBINATION STARTERS

DEVICE		
BUL. 2116	WITH FUSIBLE DISCONNECT SWITCH (SEPARATE WINDING OR CONSEQUENT POLE)	1-4
BUL. 2117	WITH CIRCUIT BREAKER (SEPARATE WINDING OR CONSEQUENT POLE)	1-4

8.4.3 REDUCED VOLTAGE COMBINATION STARTERS

DEVICE		
BUL. 2136D	TWO STEP PART WINDING COMBINATION STARTER WITH FUSIBLE DISCONNECT SWITCH	1PW, 2PW & 3PW
BUL. 2136M	TWO STEP PART WINDING COMBINATION STARTER WITH CIRCUIT BREAKER	1PW, 2PW & 3PW

DEVICE		SIZE
BUL. 2146D	AUTO-TRANSFORMER STARTER WITH DISCONNECT SWITCH	2 & 3
BUL. 2146M	AUTO-TRANSFORMER STARTER WITH CIRCUIT BREAKER	2 & 3

8.4.4 BRANCH FEEDERS

BRANCH CIRCUIT FUSIBLE DISCONNECT SWITCH UNITS, 200 AMP. SWITCH RATING AND SMALLER.

BRANCH FEEDER CIRCUIT BREAKER UNITS, 225 AMP. FRAME AND SMALLER.

8.5 OTHER UNITS SHALL BE AVAILABLE AS FOLLOWS:

8.5.1 STARTER UNITS OF SIZES OTHER THAN THOSE PREVIOUSLY LISTED, MAIN BREAKERS, BRANCH FEEDER BREAKER OVER 225 AMPERES, FEEDER DISCONNECTS GREATER THAN 200 AMPERES SHALL BE BOLTED DIRECTLY TO THE HORIZONTAL BUS.

8.5.2 STANDARD LIGHTING PANELS SHALL BE WIRED DIRECTLY TO THE SECONDARY OF THE LIGHTING TRANSFORMER.

8.6 EACH UNIT SHALL BE PROVIDED WITH A REMOVABLE DOOR MOUNTED ON REMOVABLE PIN TYPE HINGES WHICH WILL ALLOW THE DOOR TO SWING OPEN AT LEAST 110°. DOORS SHALL BE REMOVABLE FROM ANY LOCATION IN THE CENTER WITHOUT DISTURBING ANY OTHER DOORS. THE UNIT DOOR SHALL BE FASTENED TO THE STATIONARY STRUCTURE SO THAT IT CAN BE CLOSED TO COVER THE UNIT SPACE WHEN THE INSERT HAS BEEN REMOVED. THE UNIT DOORS SHALL BE HELD CLOSED WITH 1/4 TURN PAWL TYPE LATCHES, DESIGNED TO RESIST FORCES DURING FAULT CONDITIONS. EACH UNIT DOOR SHALL BE PROVIDED WITH EXTERNAL LOW PROFILE OVERLOAD RESET BUTTONS.

8.7 STARTER UNITS FURNISHED WITH PUSH BUTTONS, SELECTOR SWITCHES OR PILOT LIGHTS SHALL BE PROVIDED WITH A DOOR MOUNTED CONTROL STATION ENCLOSURE. THE ENCLOSURE ASSEMBLY SHALL INCLUDE A REMOVABLE CONTROL DEVICE PANEL FOR THE PURPOSE OF WIRING COMPONENTS, AND BE HELD IN PLACE WITH FOUR CAPTIVE SCREWS. WHEN ASSEMBLED AND WIRED, ALL LIVE CONTACT SURFACES OF COMPONENTS SHALL BE RECESSED WITHIN THE ENCLOSURE, TO MINIMIZE DANGER OF ACCIDENTAL CONTACT WHEN THE DOOR IS OPEN.

9.0 FLANGE OPERATOR

9.1 AN INDUSTRIAL FLANGE MOUNTED HANDLE MECHANISM SHALL BE SUPPLIED FOR THE CONTROL OF EACH DISCONNECT SWITCH OR CIRCUIT BREAKER. THIS MECHANISM SHALL BE ENGAGED WITH THE SWITCH OR CIRCUIT BREAKER AT ALL TIMES REGARDLESS OF UNIT DOOR POSITION. THE OPERATOR HANDLES SHALL HAVE AN UP-DOWN MOTION WITH THE DOWN POSITION AS OFF. A DECAL TO INDICATE THE ON-OFF CONDITION SHALL BE PROMINENTLY LOCATED ON THE DEVICE OPERATOR. IT SHALL BE POSSIBLE TO LOCK THIS HANDLE IN THE OFF POSITION WITH UP TO THREE 3/8" DIAMETER SHACKLE PADLOCKS, AND THE ON POSITION WITH ONE 3/8" DIAMETER SHACKLE PADLOCK.

9.1.1 THE OPERATOR HANDLES SHALL BE INTERLOCKED WITH THE UNIT DOORS SO THAT THE DISCONNECT MEANS CANNOT BE SWITCHED TO THE ON POSITION UNLESS THE UNIT DOOR IS CLOSED. IT SHALL BE POSSIBLE TO DEFEAT THIS INTERLOCK BY DELIBERATE ACT OF THE ELECTRICIAN IF HE SHOULD DESIRE TO OBSERVE THE OPERATION OF THE HANDLE OPERATOR MECHANISM. THIS INTERLOCK SHALL ALSO PREVENT OPENING THE UNIT DOOR UNLESS THE DISCONNECT IS IN THE OFF POSITION. A DEFEATER FOR THIS ACTION REQUIRING THE USE OF A SCREWDRIVER, SHALL ALSO BE PROVIDED IN THE EVENT AN ELECTRICIAN MUST GAIN ACCESS TO THE UNIT WITHOUT INTERRUPTING SERVICE.