

ELECTRICAL CONSTRUCTION SPECIFICATIONS

1) SCOPE OF WORK -

THE ELECTRICAL CONTRACTOR (EC) SHALL FURNISH ALL LABOR, MATERIAL, SUPPLIES, EQUIPMENT, TOOLS AND SERVICES NECESSARY FOR AND REASONABLY INCIDENTAL TO COMPLETION OF THE ELECTRICAL WORK AS SPECIFIED AND AS SHOWN ON THE ELECTRICAL DRAWINGS. THE ELECTRICAL SYSTEMS SHALL BE FULLY INSTALLED, ADJUSTED, FIELD TESTED AND MADE READY FOR USE BY THE OWNER.

IT SHOULD BE NOTED THE ELECTRICAL CONTRACT DOCUMENTS APPLY TO ALL CONTRACTORS, SUPPLIERS, ETC ON THE PROJECT WHO ARE SUPPLYING, INSTALLING OR WIRING LINE OR LOW VOLTAGE ELECTRICAL EQUIPMENT.

THE SCOPE OF WORK SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING MAJOR ITEMS. IN ADDITION, THE EC SHALL PROVIDE ALL MATERIAL AND WORK IN STRICT REQUIREMENTS WITH THE SCHOOL'S CONSTRUCTION REQUIREMENTS INCLUDING THE PROJECT'S SCHEDULE. ANY POWER SHUTDOWNS MUST BE SCHEDULED AND REVIEWED/APPROVED BY THE TOWN MANAGEMENT PERSONNEL (BOTH SCHOOL AND DPW).

A) PROVIDE POWER DISTRIBUTION SYSTEM REVISIONS INCLUDING BUT NOT LIMITED TO SURVEY OF THE EXISTING BUILDING, SITE, OVERHEAD/UNDERGROUND UTILITIES AND ASSOCIATED SITE UTILITIES. IN ADDITION, NEW SERVICE, EQUIPMENT AND ASSOCIATED WIRING SHALL BE FURNISHED AND INSTALLED AS INDICATED ON THE DRAWINGS. WORK INCLUDES TEMPORARY WIRING AND POWER. EC'S WORK INCLUDES ALL NECESSARY POWER COMPANY PLANS REVIEW, COORDINATION, ETC PRIOR TO RELEASE AND CONSTRUCTION OF ANY ELECTRICAL SYSTEMS INCLUDING MATERIAL RELEASE AND ROUGH WIRING. NOTE, THE NEW SEWAGE DISPOSAL SYSTEMS LOADS INCREASES ARE MINOR HOWEVER THE POWER COMPANY MUST BE INFORMED IN WRITING BY THE ELECTRICAL CONTRACTOR.

B) PROVIDE NEW BUILDING AND SITE ELECTRICAL EQUIPMENT AND WIRING AS INDICATED, NOTE, THE EXISTING (TO REMAIN) EQUIPMENT AND LIGHTING SHALL BE RE-POWERED/RE-WIRED AS INDICATED. EC'S WORK INCLUDES A COMPLETE FIELD SURVEY OF THE EXISTING AFFECTED SITE EQUIPMENT/WIRING AS REQUIRED FOR COORDINATION AND RE-CONSTRUCTION.

C) WIRE SEWAGE DISPOSAL EQUIPMENT (IE - PUMPS, FLOAT SWITCHES, ETC) WITHIN THE TANK STRUCTURES TO THE FACTORY/FIELD WORK DEMARCATIONS. EC'S WORK INCLUDES ALL REQUIRED COORDINATION WITH THE "PROPOSED" SEWAGE DISPOSAL EQUIPMENT. NOTE, THERE ARE MANUFACTURERS VARIATIONS ON CONTROL AND ALARMS REQUIREMENTS INCLUDING MOISTURE AND HIGH TEMPERATURE RELAYS WHICH MUST BE FURNISHED/INSTALLED IN THE NEW PUMPS CONTROL PANELS.

D) FURNISH AND INSTALL NEW TELEPHONE PUNCHDOWN BLOCKS, UTP CABLING, MODULAR CATEGORY "3" OUTLETS, ELECTRONIC TVSS UNITS AND ANY OTHER REQUIRED MISCELLANEOUS ITEMS (IE - GALVANIZED STEEL TELEPHONE BLDG PANELS, TELE GROUNDING, ETC).

E) FURNISH AND INSTALL MISCELLANEOUS ELECTRICAL WORK INCLUDING BUT NOT LIMITED TO WALL CORING (IE - BUILDING AND PUMP CHAMBERS), CONDUIT WALL SEALS, GALVANIZED PULL/JUNCTION BOXES AND GALVANIZED "U" CHANNELS. EC'S WORK INCLUDES STAINLESS STEEL CABLE SUPPORTS INCLUDING KELLUM TIE CABLE SUPPORTS FOR ALL ELECTRICAL WIRING IN THE NEMA "4X" PUMP/DOSING CONCRETE CHAMBERS.

F) IN GENERAL, EC SHALL NOTE THE PROJECT GENERAL CONTRACTOR SHALL FURNISH/INSTALL THE FOLLOWING PROJECT ITEMS ASSOCIATED WITH THE PROJECT ELECTRICAL WORK.

- ELECTRICAL DUCTBANKS EXCAVATION, BACKFILL AND CONCRETE INCLUDING REINFORCEMENT.
- ELECTRICAL ENCLOSURES CONCRETE SUPPORT PADS INCLUDING PAD EXCAVATION AND COMPACTED GRAVEL/SAND.

G) IN GENERAL, EC SHALL NOTE THE PROJECT GENERAL CONTRACTOR SHALL FURNISH, UNLOAD AND INSTALL THE SITE ELECTRICAL ENCLOSURES WHICH ARE FACTORY ASSEMBLED, WIRED AND TESTED PRIOR TO SHIPMENT TO SITE. THE EC SHALL FIELD WIRE TO THE FACTORY/FIELD WIRING DEMARCATIONS INCLUDING FURNISHING/INSTALLING THE ENCLOSURES GROUND RODS AND GROUNDING CONDUIT/WIRE.

H) EC'S WORK INCLUDES ALL NECESSARY TECHNICAL SUPPORT DURING PUMPS START-UP AND FIELD TESTING. THIS SUPPORT WILL INCLUDE BUT NOT BE LIMITED TO INSULATION, VOLTS, AMPERES, ETC READINGS INCLUDING VERIFYING PUMP PROTECTION FIELD DEVICES, CONTROLS, ALARMS, AND TELEPHONE ALARM TELEMETRY.

2) CODE REQUIREMENTS -

THE ENTIRE ELECTRICAL INSTALLATION SHALL BE SUPPLIED AND INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL BUILDING/ELECTRICAL CODES, LAWS, ORDINANCES AND INSURANCE REQUIREMENTS. ALL NEW WORK SHALL BE COORDINATED WITH THE LOCAL BLDG/ELEC INSPECTORS DEPARTMENT PRIOR TO RELEASE AND INSTALLATION.

ALL ELECTRICAL WIRING SHALL BE DONE BY LICENSED ELECTRICIANS INCLUDING LOW VOLTAGE TELE/DATA/CABLE TV WIRING PER SECTION C141:1A OF THE MASSACHUSETTS GENERAL LAWS.

ALL CONTRACTORS, SUPPLIERS, ETC SHALL APPLY AND OBTAIN ELECTRICAL WIRING PERMITS FOR ALL LINE OR LOW VOLTAGE WIRING. SED SHALL BE CONTACTED BY THE EC FOR ANY TOWN REQUIRED ROUGH AND FINAL INSPECTIONS.

ELECTRICAL DRAWINGS REFERENCE NOTES

- 1) FOR SYMBOLS, ABBREVIATIONS & GENERAL NOTES, REFER TO DWG # E-1.
- 2) FOR ELECTRICAL SITE PLAN & DETAILS, REFER TO DWGS # E-2 & E-3.
- 3) FOR TANKS POWER PLANS AND DETAILS, REFER TO DWG # E-4.
- 4) FOR ELECTRICAL ENCLOSURES PLANS AND DETAILS, REFER TO DWG # E-5.
- 5) FOR PWR AND TELE SYSTEMS RISER DIAGRAMS, REFER TO DWG # E-6.
- 6) FOR ELECTRICAL DETAILS, REFER TO DWG # E-7.
- 7) FOR ELECTRICAL SCHEDULES REFER TO DWG # E-8.
- 8) FOR ELECTRICAL SPECIFICATIONS, REFER TO DWG # E-9.

3) INTERPRETATION OF DRAWINGS -

THE DRAWINGS ARE DIAGRAMMATIC ONLY AND ARE NOT INTENDED TO SHOW THE EXACT LOCATIONS OF NEW OR EXISTING UTILITIES AND ARE SUBJECT TO FIELD INSTALLATION ADJUSTMENTS AT THE TIME OF INSTALLATION BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL BE HELD ACCOUNTABLE TO VERIFY WITH THE ENGINEER, OR BUILDING OWNER, THE EXACT LOCATIONS OF EXISTING AFFECTED UTILITIES, SITE WIRING AND NEW WORK PRIOR TO ITS ACTUAL INSTALLATION.

ANY WORK INSTALLED CONTRARY TO OR WITHOUT SUCH APPROVAL BY THE ENGINEER OR BUILDING OWNER SHALL BE SUBJECT TO CHANGE AS DIRECTED. NO ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE ELECTRICAL CONTRACTOR FOR ANY POOR COORDINATION AND OWNER APPROVALS.

IN GENERAL, ALL ELECTRICAL WORK SHALL BE COMPLETED IN STRICT ACCORDANCE WITH ALL APPLICABLE TECHNICAL STANDARDS FOR COMMERCIAL BUILDINGS CONSTRUCTION. IN ADDITION, ALL TELEPHONE LOW VOLTAGE WORK SHALL BE SUPPLIED/INSTALLED/FIELD TESTED TO APPLICABLE TELECOM INDUSTRY STANDARDS INCLUDING BISCI. THE SUPPLIER OF THE TELE EQUIPMENT AND WIRING SHALL BE BISCI CERTIFIED. THE SUPPLIER'S WORK INCLUDES ALL NECESSARY TECHNICAL ASSISTANCE INCLUDING FIELD TESTING AND A WRITTEN CERTIFICATION LETTER OF THE TELECOM EQUIPMENT/INSTALLATION.

4) EXAMINATION OF PREMISES -

THE BIDDING ELECTRICAL CONTRACTORS SHALL VISIT THE SITE PRIOR TO SUBMITTING THE BID AND FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR EXTRA WORK REQUIRED DUE TO THE LACK OF KNOWLEDGE OF THE EXISTING BUILDING/SITE CONDITIONS.

5) COOPERATIONS -

THE ELECTRICAL CONTRACTOR SHALL COOPERATE WITH ANY OTHER CONTRACTORS OR SUPPLIERS THAT MAY BE ON THE SITE. ANY CONFLICTING CONDITIONS SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER.

6) QUALITY OF WORKMANSHIP -

THE WORKMANSHIP OF THE ENTIRE ELECTRICAL INSTALLATION SHALL BE FIRST CLASS IN EVERY RESPECT AND ONLY COMPETENT AND EXPERIENCED LICENSED LABOR SHALL BE ALLOWED ON THE JOB. THE ENGINEER OR OWNER RESERVES THE RIGHT TO REQUEST THE DISMISSAL OF ANY WORK PERSON WHOSE WORK AND PERFORMANCE IS NOT SATISFACTORY.

7) GUARANTEE -

THE ELECTRICAL CONTRACTOR SHALL GUARANTEE (PARTS AND LABOR) ALL THE ELECTRICAL MATERIALS AND WORKMANSHIP AGAINST DEFECTS & FAULTY INSTALLATION FOR A PERIOD OF ONE (1) YEAR STARTING FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK (IN WRITING) BY THE ENGINEER. THE ELECTRICAL CONTRACTOR SHALL MAKE GOOD AT THEIR EXPENSE ANY DEFECTS IN MATERIAL AND WORKMANSHIP, EXCEPT WHERE SUCH IS CAUSED BY ABUSE OR MISUSE BY THE BUILDING MAINTENANCE PERSONNEL.

8) CORING, CUTTING AND PATCHING -

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING, CUTTING, PATCHING AND CONDUITS WALL SEALS AND ALL NECESSARY GALVANIZED STEEL FOR SUPPORT AND INSTALLATION OF THE ELECTRICAL MATERIAL AND EQUIPMENT. THIS INCLUDES ANY REQUIRED SCAFFOLDING OR SIMILAR EQUIPMENT FOR THE ELECTRICAL WORK INSTALLATION.

IN ADDITION, ALL PENETRATIONS THRU FIRE/SMOKE RATED WALLS SHALL BE CAULKED WITH FIRE/SMOKE STOPPING MATERIAL BY THE ELECTRICAL CONTRACTOR. ALL FIRE/SMOKE STOPPING INSTALLATIONS AND MATERIALS MUST BE UL LISTED.

9) SERVICES, PERMITS, FEES AND INSPECTIONS -

THE ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS, LICENSES AND CERTIFICATIONS REQUIRED FOR WORK SPECIFIED OR SHOWN ON THE ELECTRICAL DRAWINGS. NO ELECTRICAL WORK SHALL COMMENCE UNTIL ALL ELECTRICAL CONSTRUCTION IS COORDINATED WITH THE LOCAL TOWN ELECTRICAL INSPECTOR. ANY DIFFERING INSPECTOR REQUIREMENTS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR WITHOUT ANY ADDITIONAL COMPENSATION.

ANY ASSOCIATED UTILITY SERVICE COSTS SHALL BE PAID BY THE OWNER. THE EC'S WORK INCLUDES ALL REQUIRED UTILITIES COORDINATION WORK IN ORDER TO OBTAIN ANY UTILITY SERVICES BACKCHARGES PLUS COORDINATION FOR THE INCREASED ELECTRIC SERVICE LOADS. UPON DETERMINATION, THE EC SHALL PROVIDE AS CONTRACT CHANGE ORDERS TO THE OWNER WITHOUT ANY SUB OR GENERAL CONTRACTOR MARK-UPS FOR REIMBURSEMENT BY THE OWNER. THIS ASSUMES NO BACK CHARGES WILL BE KNOWN PRIOR TO BIDDING.

10) COORDINATION -

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL OF THE ELECTRICAL WIRING WITH THE "AS SUPPLIED" & "EXISTING" EQUIPMENT. NO WIRING SHALL BE INSTALLED OR EQUIPMENT RELEASED UNTIL THE ELECTRICAL CONTRACTOR HAS VERIFIED THE EXACT REQUIRED POWER AND INTERCONNECTION WIRING. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR COORDINATION CONSTRUCTION PROBLEMS.

11) MATERIAL AND EQUIPMENT -

A) MATERIAL - ALL ELECTRICAL CONSTRUCTION MATERIAL SHALL BE OF THE HIGHEST QUALITY (SPECIFICATION GRADE) AND UL LISTED. SUBMIT ALL MATERIAL SHOP DRAWINGS FOR REVIEW AND ACCEPTABILITY TO THE ARCHITECT (PRIOR TO ANY INSTALLATION) FOR REVIEW /APPROVAL. ENGINEER'S REVIEWS ARE LIMITED TO ONLY TWO PER ITEM. ADDITIONAL REVIEWS SHALL BE BACK-CHARGED TO THE EC AT THE ENGINEER'S STANDARD HOURLY BILLING RATES AND ACTUAL HOURS REQUIRED.

ANY MATERIAL NOT SUBMITTED AND APPROVED WHICH DOES NOT MEET THE DRAWINGS AND SPECIFICATIONS REQUIREMENTS MAY AT THE OPTION OF THE ARCHITECT BE REMOVED AND REPLACED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.

SEWAGE DISPOSAL FACILITIES HAZARDOUS RATINGS

PER THE ENVIRONMENTAL PROCESS ENGINEER (IE - DUCHARME & WHEELER, INC) THE SEWAGE DISPOSAL FACILITIES (IE - PUMP CHAMBERS, RECIRCULATION TANKS, ETC) EXCEPT FOR THE EXISTING SEPTIC TANKS INCLUDING THE NEW 2000 GALLON PUMPING CHAMBER ARE NOT HAZARDOUS EXPLOSIVE ENVIRONMENTS. HOWEVER THE CHAMBERS AND TANKS ARE BOTH WET AND CORROSIVE WHICH REQUIRE NEMA "4X" EQUIPMENT AND WIRING.

INSTRUMENTATION & CONTROL CONSTRUCTION SPECIFICATIONS

1) SCOPE OF WORK -

THE GENERAL CONTRACTOR (GC) SHALL FURNISH ALL I&C LABOR, MATERIAL, SUPPLIES, EQUIPMENT, TOOLS AND SERVICES NECESSARY FOR AND REASONABLY INCIDENTAL TO COMPLETION OF THE I&C SYSTEM AS SPECIFIED AND AS SHOWN ON THE DRAWINGS. THE ELECTRICAL SYSTEMS SHALL BE FULLY INSTALLED, FACTORY/FIELD TESTED FOR USE BY THE OWNER.

THE I7C SCOPE OF WORK SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING ITEMS.

- A) PUMPS CONTROL PANELS (NO'S 1, 2 & 3)
- B) SEWAGE SYSTEM ALARM PANEL
- C) ELECTRICAL ENCLOSURES (NO'S 1,2 & 3) WHICH ARE FACTORY WIRED WITH I&C PANELS, HEATERS, FANS AND FIELD INSTRUMENTS
- D) ALARMS DIALERS PANELS (MTD INSIDE PCP'S) WHICH COORDINATE WITH EXISTING TOWN CENTRAL STATION MONITORING COMPANY.
- E) I&C FIELD TEMP ALARM THERMOSTATS AND EMERGENCY ASSISTANCE PUSHBUTTONS.

2) I&C SUPPLIERS -

THE I&C SYSTEM SHALL BE FURNISHED BY A LOCAL NEW ENGLAND I&C INTEGRATOR WHO HAS A MINIMUM OF FIVE YEARS OF APPLICABLE ENVIRONMENTAL PROJECTS INCLUDING MANUFACTURING, ENGINEERING AND FIELD TECHNICAL SUPPORT. THE GENERAL CONTRACTOR SHALL PROVIDE THE I&C SYSTEM FROM ONE OF THE FOLLOWING ACCEPTABLE I&C SUPPLIERS:

- A) R.E. ERICKSON INC, WALPOLE, MASS
- B) WAJA ASSOCIATES, FOXBOROUGH, MASS
- C) ELLIS ENGINEERING INC, GLOUCESTER, MASS
- D) SHERIDAN ENGINEERING INC, PEABODY, MASS

THE I&C SUPPLIER'S WORK GENERALLY INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

- I&C PANELS & ELECTRICAL ENCLOSURES INCLUDING ENGINEERING, PROGRAMMING, FABRICATION, TESTING, START-UP, SHOP DWGS, O&M MANUAL, OWNER TRAINING AND FIRST YEAR TECHNICAL SUPPORT.
- I&C FIELD INSTRUMENTS (IE - THERMOSTATS, EMERGENCY PUSHBUTTONS AND POWER RECEPTACLES). ADDITION I&C SUPPLIER MUST PROVIDE TELE ALARMS DIALER PANELS WITH DIGITAL COMMUNICATORS WHICH COORDINATE WITH THE TOWN'S EXISTING ALARMS MONITORING FIRM.
- FACTORY ACCEPTANCE TESTS BY ENGINEER & OWNER
- FIELD ACCEPTANCE TESTS BY ENGINEER & OWNER
- COORDINATION WITH EQUIPMENT SUPPLIERS AND TOWN'S CENTRAL ALARMS MONITORING FIRM.

3) CODE REQUIREMENTS -

THE I&C MATERIAL AND INSTALLATION SHALL BE PROVIDED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL BUILDING/ELECTRICAL CODES, LAWS, ORDINANCES AND INSURANCE REQUIREMENTS. THE ELECTRICAL ENCLOSURE WITH EQUIPMENT AND WIRING SHALL BE A UL LISTED ASSEMBLY.

ALL ELECTRICAL WIRING SHALL BE DONE BY LICENSED ELECTRICIANS INCLUDING LOW VOLTAGE TELE/DATA/CABLE TV WIRING PER SECTION C141:1A OF THE MASSACHUSETTS GENERAL LAWS.

4) INTERPRETATION OF DRAWINGS -

THE DRAWINGS ARE DIAGRAMMATIC ONLY. THE I&C SUPPLIER SHALL FINAL ENGINEER ALL PANELS, ENCLOSURES, ETC WHICH SUIT THE "AS SUPPLIED" EQUIPMENT AND FACTORY/FIELD WIRING.

IN GENERAL, ALL I&C MATERIAL AND INSTALLATION SHALL BE COMPLETED IN STRICT ACCORDANCE WITH ALL APPLICABLE TECHNICAL STANDARDS OF UL, ISA, FM, NEC, ANSI, EIASI, ETC.

5) COOPERATIONS -

THE I&C SUPPLIER SHALL COOPERATE WITH ANY OTHER CONTRACTORS OR SUPPLIERS THAT MAY BE ON THE SITE. ANY CONFLICTING CONDITIONS SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER.

6) QUALITY OF WORKMANSHIP -

THE WORKMANSHIP OF THE ENTIRE I&C INSTALLATION SHALL BE FIRST CLASS IN EVERY RESPECT AND ONLY COMPETENT AND EXPERIENCED I&C TECHNICIANS LABOR SHALL BE ALLOWED ON THE PROJECT. THE ENGINEER OR OWNER RESERVES THE RIGHT TO REQUEST THE DISMISSAL OF ANY WORK PERSON WHOSE WORK AND PERFORMANCE IS NOT SATISFACTORY.

7) GUARANTEE -

THE I&C SHALL GUARANTEE (PARTS AND LABOR) ALL THE ELECTRICAL MATERIALS AND WORKMANSHIP AGAINST DEFECTS & FAULTY INSTALLATION FOR A PERIOD OF ONE (1) YEAR STARTING FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK (IN WRITING) BY THE ENGINEER. THE I&C SUPPLIER SHALL MAKE GOOD AT THEIR EXPENSE ANY DEFECTS IN MATERIAL AND WORKMANSHIP EXCEPT WHERE SUCH IS CAUSED BY ABUSE OR MISUSE BY THE BUILDING MAINTENANCE PERSONNEL.

8) COORDINATION -

THE I&C SHALL BE RESPONSIBLE FOR COORDINATING ALL OF THE I&C MATERIAL AND WIRING WITH THE "AS SUPPLIED" & "EXISTING" EQUIPMENT. NO EQUIPMENT SHALL BE RELEASED UNTIL THE I&C SUPPLIER HAS VERIFIED THE NECESSARY I&C COORDINATION. NO ADDITIONAL COMPENSATION SHALL BE PROVIDED FOR COORDINATION CONSTRUCTION PROBLEMS.

9) MATERIAL AND EQUIPMENT -

A) MATERIAL - ALL ELECTRICAL CONSTRUCTION MATERIAL SHALL BE OF THE HIGHEST QUALITY (SPECIFICATION GRADE) AND UL LISTED. SUBMIT ALL MATERIAL SHOP DRAWINGS FOR REVIEW AND ACCEPTABILITY TO THE ARCHITECT (PRIOR TO ANY INSTALLATION) FOR REVIEW /APPROVAL. ENGINEER'S REVIEWS ARE LIMITED TO ONLY TWO PER ITEM. ADDITIONAL REVIEWS SHALL BE BACK-CHARGED TO THE EC AT THE ENGINEER'S STANDARD HOURLY BILLING RATES AND ACTUAL HOURS REQUIRED.

ANY MATERIAL NOT SUBMITTED AND APPROVED WHICH DOES NOT MEET THE DRAWINGS AND SPECIFICATIONS REQUIREMENTS MAY AT THE OPTION OF THE ARCHITECT BE REMOVED AND REPLACED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.

B) I&C EQUIPMENT - ALL I&C EQUIPMENT SHALL BE UL LISTED AND MANUFACTURED BY NATIONAL MANUFACTURERS WHO HAVE LOCAL BOSTON AREA SERVICE AND PARTS SUPPORT. THE I&C SUPPLIER MUST BE FACTORY CERTIFIED FOR ANY PROPOSED EQUIPMENT.

- PROGRAMMABLE LOGIC CONTROLLERS SHALL BE ALLEN/BRADLEY MICRO LOGIC MODEL # 1500/1769 UNITS WITH 25% SPARE I/O'S AND FUTURE SCADA RADIO OR TELE MODEM CAPABLE.
- PLC OPERATOR INTERFACE TERMINAL (OIT) UNIT SHALL BE ALLEN/BRADLEY PANELVIEW MICRO-LOGIC 300 TYPES.
- TELEPHONE ALARM DIALERS SHALL BE RACO # GUARD-IT UNITS
- ELECTRICAL ENCLOSURES SHALL BE EITHER ALUMINUM OR STAINLESS STEEL UNITS RATED NEMA "3R" AND UL LISTED. ENCLOSURES SHALL BE SUPPLIED WITH FACTORY SUPPLIED ELECTRIC HEATERS AND FANS WITH THERMOSTATS INCLUDING INTERIOR PAINTED METAL MOUNTING EQUIPMENT MOUNTING PLATES. ALL HARDWARE SHALL BE STAINLESS STEEL AND LOCKABLE (BOTH KEY AND PADLOCK).

- CONTROL RELAYS, INDICATING LIGHTS, ETC SHALL BE EITHER NEMA OR IEC DESIGN RATED AND UL LISTED. ALL RELAYS SHALL BE PLUG-IN TYPE WITH NEON OR LED COIL INDICATORS AND MANUAL ACTUATORS.

- TVSS UNITS SHALL BE ELECTRONIC MOV TYPES FOR BOTH POWER, TELE AND CONTROLS/ALARMS. UNITS MANUFACTURED BY MTL OR EQUAL.

- I&C PANELS SHALL BE GALVANIZED PAINTED STEEL, PVC OR FRP WITH STAINLESS STEEL HARDWARE (KEY LOCKABLE). UNITS (IF REQ'D) SHALL HAVE COOLING FANS, FILTERED AIR INTAKES AND THERMOSTATS. ALL PANELS SHALL HAVE EXTERIOR ENGRAVED PLASTIC NAMEPLATES (PER ENGINEER) AND INTERIOR EQUIPMENT LABELS INCLUDING WIRE TAGS. PANELS SHALL HAVE DOCUMENTATION HOLDERS WHICH INCLUDE PAPER/ELECTRONIC CD COPIES OF PLC/OIT PROGRAMMING, SETTINGS, WIRING DIAGRAMS AND SIMPLIFIED TYPED OPERATING INSTRUCTIONS.

C) ELECTRICAL ENCLOSURE WIRING -

ALL POWER AND TELEPHONE CONDUCTORS SHALL BE INSTALLED IN RACEWAYS AS FOLLOWS:

- USE GALVANIZED RIGID STEEL (RGS) EXPOSED RACEWAYS.
- USE GALVANIZED HINGED COVER WIREWAYS MOUNTED UNDER THE PUMPS CONTROL PANELS FOR INTERCONNECTION TO THE FIELD WIRING.

MINIMUM POWER CONDUCTOR SIZE IS NO. 12 AWG. ALL POWER WIRING SHALL HAVE COPPER GROUNDING CONDUCTORS. NOTE, ALL CONDUIT FITTINGS, JUNCTION/PULL BOXES, ETC SHALL HAVE MATCHING FINISHES TO THEIR ASSOCIATED RACEWAYS.

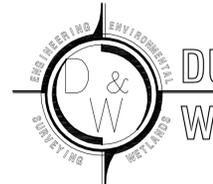
F) WIRING DEVICES - ALL WIRING DEVICES SHALL BE HEAVY DUTY SPECIFICATION GRADE QUALITY. RECEPTACLES SHALL BE GFI TYPES WITH STAINLESS STEEL FACEPLATES AND RATED 15 AMPS @ 120VAC.

10) INSTALLATION -

A) WIRING IDENTIFICATION - ALL POWER WIRING SHALL BE COLOR CODED PER ITS VOLTAGE CLASS AND HAVE SELF ADHESIVE NUMERICAL IDENTIFICATION TAGS THAT INDICATE THE PANELBOARD AND BRANCH CIRCUIT NUMBER. ALL FIRE ALARM WIRING SHALL HAVE NUMERICAL SELF ADHESIVE IDENTIFICATION AT ALL TERMINATIONS WHICH MATCH THE CONTROL PANELS TERMINAL NUMBERS. ALL LOW VOLTAGE WIRING SHALL BE SIMILAR.

B) POWER WIRING TERMINATIONS - ANY FEEDER TERMINATIONS SHALL BE COMPLETED WITH HIGH COMPRESSION BUTT FACTORY TYPE SPLICES. SPLIT-BOLT TAPED CONNECTORS ARE NOT ACCEPTABLE. ALL LUGS AT THE CONNECTOR POINTS SHALL BE TORQUED TO THE RECOMMENDED PRESSURES. ALL LOW VOLTAGE TERMINATIONS SHALL BE COMPLETED AND FIELD TESTED AS RECOMMENDED BY THE APPLICABLE TECHNICAL STANDARDS.

C) INSPECTIONS - ALL I&C WORK AND MATERIAL SHALL BE ROUGH AND FINAL INSPECTED BY THE ENGINEER, PRIOR TO ACCEPTANCE AND PROGRESS PAYMENTS. ALL EQUIPMENT CONTROL/ALARMS SHALL BE FIELD DEMONSTRATED BY THE I&C SUPPLIER TO THE ENGINEER TO INDICATE PROPER COORDINATION, WIRING AND OPERATION. I&C SUPPLIER SHALL CONTACT THE ENGINEER BY TELEPHONE AND IN WRITING TO ARRANGE FOR FIELD INSPECTIONS. THE ENGINEER REQUIRES ONE WEEK'S NOTICE. ANY ADDITIONAL FIELD INSPECTIONS BEING CAUSED BY MAJOR PUNCH LIST ITEMS OR CONSTRUCTION PROBLEMS SHALL BE BILLED DIRECTLY TO THE CONTRACTOR. AS ADDITIONAL HOURLY SERVICES. NO CONSTRUCTION AFFIDAVITS SHALL BE ISSUED BY THE ENGINEER UNTIL ALL MAJOR PUNCH LIST ITEMS, FIELD TESTING, ETC IS COMPLETED AND RECEIPT OF ANY ADDITIONAL SERVICES INVOICES PAYMENTS.

ELECTRICAL SPECIFICATIONS		DWG. NO
EMERSON & SAWYER SCHOOLS SEWAGE DISPOSAL SYSTEM 50 MECHANIC ST. BOLTON, MASS		E-9
PREPARED FOR: TOWN OF BOLTON P.O. 278 BOLTON, MA 01740	TEL: (978) 779-2297 DATE: JANUARY 13, 2005	
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		CHECKED BY: WPE 1-13-05
NO.	DATE	DESCRIPTION
  		
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