

CONDUITS, CABLE TRAYS, BOXES, MANHOLES, AND
PULLBOXES PER SPECIFICATIONS BELOW

1.1 SUMMARY

- A. CONDUIT:
1. RIGID GALVANIZED STEEL CONDUIT, FITTINGS, AND COATINGS.
 2. LIQUID-TIGHT FLEXIBLE METAL CONDUIT AND FITTINGS.
 3. RIGID PVC CONDUIT.
 4. CONDUIT SUPPORTS.
- C. BOXES, WIREWAYS, GUTTERS, JUNCTION BOXES, AND PULLBOXES:
2. DEVICE BOXES.
 3. CONDUIT FITTINGS.

1.2 REFERENCES

- A. AMERICAN NATIONAL STANDARDS INSTITUTE STANDARDS:
1. ANSI C80.1 — ELECTRICAL RIGID STEEL CONDUIT.
 2. ANSI C80.3 — ELECTRICAL METALLIC TUBING, ZINC-COATED.
 3. ANSI C80.4 — FITTINGS FOR RIGID METAL CONDUIT AND ELECTRICAL METAL TUBING.
 4. ANSI/NEMA FB 1 — FITTINGS, CAST METAL BOXES AND CONDUIT BODIES FOR CONDUIT, ELECTRICAL METALLIC TUBING AND CABLE.
 5. ANSI/NEMA OS 1 — SHEET-STEEL OUTLET BOXES, DEVICE BOXES, COVERS, AND BOX SUPPORTS.
- B. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)STANDARDS:
1. NEMA FB 1 — FITTINGS, CAST METAL BOXES AND CONDUIT BODIES FOR CONDUIT, ELECTRICAL METALLIC TUBING AND CABLE.
 2. NEMA RN 1 — PVC EXTERNALLY-COATED GALVANIZED RIGID STEEL CONDUIT AND INTERMEDIATE METAL CONDUIT.
 3. NEMA TC2 — ELECTRICAL POLYVINYL CHLORIDE TUBING AND CONDUIT.
 4. NEMA TC3 — PVC FITTINGS FOR USE WITH RIGID PVC CONDUIT AND TUBING.
- C. NATIONAL ELECTRICAL CODE (NEC).
- D. UNDERWRITERS LABORATORIES, INC. STANDARDS:
1. UL 797 — ELECTRICAL METALLIC TUBING — STEEL.
 2. UL 870 — WIREWAYS, AUXILIARY GUTTERS, AND ASSOCIATED FITTINGS.

1.3 DEFINITIONS

- A. DUCTBANK: ONE OR MORE DUCTS (CONDUITS) IN A SINGLE TRENCH. DEPENDING ON THE WIRING SYSTEM AND SOIL CONDITIONS, A DUCT BANK MAY BE PLACED IN A TRENCH AND COVERED WITH NATIVE MATERIAL OR ENCASED IN CONCRETE. ALSO KNOWN AS CONDUIT BANK.
- B. BOXES:
1. DEVICE BOXES: SINGLE TO MULTI-GANG FOR MOUNTING UTILIZATION DEVICES SUCH AS:
 - a. OUTLETS/RECEPTACLES,
 - b. SWITCHES,
 - c. FIRE STROBES/HORNS,
 - d. THERMOSTATS,
 - e. INSTRUMENTS, ETC.
 2. JUNCTION BOXES AND ABOVE GRADE PULLBOXES: SUFFICIENTLY SIZED BOX TO PROVIDE FREE SPACE FOR ALL ENCLOSED CONDUCTORS AND APPURTENANCES FOR THE APPLICATION AND IN ACCORDANCE WITH THE NEC AND DRAWINGS.
 3. BELOW GRADE PULLBOXES ARE IN ACCORDANCE WITH. BELOW GRADE PULLBOXES ALSO KNOWN AS HANDHOLES AND/OR MANHOLES.

PART 2 —PRODUCTS

2.1 CONDUIT

- A. RGS CONDUIT AND FITTINGS:
1. ANSI C80.1.
 2. PVC EXTERNALLY COATED CONDUIT:
 - a. NEMA RN 1.
 - b. RIGID STEEL CONDUIT WITH EXTERNAL 40 MIL PVC COATING AND INTERNAL, 2 MIL, CHEMICALLY CURED URETHANE COATING.
 - c. EXTEND THE PVC COATING EQUAL TO THE OD OF THE CONDUIT 1-1/2 INCHES FROM THE END OF CONDUIT FITTINGS.
 - d. PVC EXTERNALLY COATED CONDUIT FITTINGS:
 - 1) KORKAP ST STYLE KNOCKOUT HUBS FOR CONDUIT TERMINATION ON SHEET METAL ENCLOSURES OR WHEN APPLICABLE.
 - 2) ALL OTHER FITTINGS, STRAPS, UNIONS, AND CONDULETS AVAILABLE TO MATCH STANDARD RIGID CONDUIT REQUIREMENTS AS MANUFACTURED BY KORKAP, ROBROY OR OWNER APPROVED EQUAL.
 3. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1; THREADED TYPE, FORM 7 CONDULETS. AS MANUFACTURED BY COOPER OR CROUSE-HINDS.
 - a. TYPE FORM 7 FERALOY IRON ALLOY BODY NO. LB27.
 - b. SIMILAR TO FORM 7 GASKET NO. GASK572 WITH SHEET STEEL WEDGENUT NO. 270.
 - c. SIMILAR TO FERALOY IRON ALLOY NO. 270F.
 4. CONDUIT: RGS (ZINC-COATED).
 5. INTERMEDIATE METAL CONDUIT IS PROHIBITED.
- B. LIQUID-TIGHT FLEXIBLE CONDUIT AND FITTINGS:
1. CONDUIT: FORM LIQUID TIGHT FLEXIBLE STEEL CONDUIT FROM SPIRALLY WOUND GALVANIZED STEEL STRIP SECURELY INTERLOCKED AND JACKETED WITH LIQUID TIGHT PLASTIC COVER.
 2. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1:
 - a. FITTINGS FOR LIQUID TIGHT FLEXIBLE CONDUIT: ZINC-PLATED MALLEABLE IRON BODY AND GLAND NUT THREADED TO ENGAGE CONDUIT SPIRAL, SEALING GASKET AND RING SEALS AND HAVE AN INSULATED THROAT.
 - b. FOR 45 AND 90 DEGREE FITTINGS AND COMBINATION FITTINGS, USE WHERE APPLICABLE.
 - c. USE STEEL FOR 1/2 INCH THROUGH 2 INCH FITTINGS. USE MALLEABLE IRON FOR 2-1/2 INCH THROUGH 4-INCH FITTINGS. LOCKNUTS TO MATCH.
 - d. PLASTIC FITTINGS ARE PROHIBITED.
 - e. MANUFACTURED BY:
 - 1) O-Z/GEDNEY CO. TYPE 4Q MALLEABLE IRON NO. STB-125 FOR 1-1/4 INCH.
 - 2) APPLETON STEEL OR MALLEABLE IRON TYPE NO. STB-125 FOR 1-1/4 INCH.
 - 3) OWNER APPROVED EQUAL.
- C. RIGID PVC CONDUIT:
1. CONDUIT: NEMA TC 2 AND UL LISTED, SCHEDULE 40 PVC.
 2. FITTINGS AND CONDUIT BODIES: NEMA TC 3. PVC SOLVENT WELD TYPE.
 3. NON-METALLIC BOXES:
 - a. FD STYLE WITH MATCHING COVERS, FOUR SCREW ATTACHMENT.
- D. CONDUIT SUPPORTS:
1. CONDUIT CLAMPS AND SUPPORTS:
 - a. STEEL OR MALLEABLE IRON SUPPORTED OR AFFIXED BY METALLIC EXPANSION ANCHORS OR TOGGLE BOLTS.
 - b. SHOT PIN TYPE ANCHORING IS PROHIBITED.
 2. CORROSIVE ENVIRONMENTS: USE REINFORCED FIBERGLASS RESIN SUPPORTS AND CLAMPS.

2.2 BOXES, WIREWAYS, GUTTERS, JUNCTION BOXES, AND PULLBOXES

- A. DEVICE BOXES:
1. SHEET METAL DEVICE BOXES:
 - a. ANSI/NEMA OS 1, GALVANIZED STEEL.
 - b. CONCRETE CEILING BOXES: CONCRETE TYPE FOR CEILING MOUNTED LIGHTING FIXTURES.
 - c. RECEPTACLE AND LIGHT SWITCH BOXES: INTERIOR, FLUSH, DRY LOCATIONS.
 2. CAST DEVICE BOXES:
 - a. NEMA FB 1, TYPE FD, MALLEABLE-IRON.
 - b. PROVIDE GASKETED COVER BY BOX MANUFACTURER.
 - 1) CAST BOXES: THREADED HUBS AND SUFFICIENT INTERIOR SPACE FOR ALL CONDUCTORS TO BE ENCLOSED. MULTI-GANG AND HUB OPTIONS AS REQUIRED.
 - c. CAST BOXES MANUFACTURES:
 - 1) CROUSE-HINDS NO. FD2 FOR SINGLE GANG WITH A 3/4 INCH HUB.
 - 2) APPLETON NO. FD-1-75L FOR SINGLE GANG WITH A 3/4 INCH HUB.
 - 3) O-Z/GEDNEY CO. NO. FD-1-75 FOR SINGLE GANG WITH A 3/4 INCH HUB.
 - 4) OWNER APPROVED EQUAL.
 - d. FOR ABOVE GRADE OUTDOOR LOCATIONS, FINISH WITH ZINC ELECTROPLATE COVERED WITH ALUMINUM CELLULOSE LACQUER FOR WET OR DAMP LOCATIONS.
 - e. INDOOR DAMP OR BELOW GRADE LOCATIONS WHERE PVC COATED CONDUIT IS REQUIRED:
 - 1) PVC COAT FITTINGS, DEVICE BOXES, COVERS, CONDUIT BODIES AND SUPPORTS: PVC COATED TO THE SAME SPECIFICATIONS AS THE CONDUIT.
 - 2) ASSOCIATED MOUNTING HARDWARE: STAINLESS STEEL.
 - f. PVC COATING: BONDED TO THE SURFACES OF CAST DEVICE BODIES, BOXES, FITTINGS AND SUPPORTS.
 - g. PVC COATING MANUFACTURERS:
 - 1) OCCIDENTAL COATING.
 - 2) KOR-KAP.
 - 3) ROBROY.
 - 4) OWNER APPROVED EQUAL.
- B. WIREWAYS, GUTTERS, JUNCTION BOXES, AND PULLBOXES LARGER THAN A 4-GANG DEVICE BOX OR LARGER THAN 100 CUBIC INCHES:
1. IN ACCORDANCE WITH UL 870: 16 GAGE STEEL MINIMUM.
 2. COVERS: HINGED WITH HASPS, END CAPS, SCREW COVER, USE KEYED TYPED LOCK ONLY IN ACCORDANCE WITH THE DRAWINGS.
 3. AFFIX NAMEPLATES IN ACCORDANCE WITH APPLICABLE STANDARDS.
 4. PROVIDE BACK PANELS AND TERMINALS AS REQUIRED.
 5. WIREWAYS: PROVIDE GUTTERS AND JUNCTION BOXES FOR USE IN EXPOSED DRY LOCATIONS AS A PREFABRICATED CHANNEL SHAPED SHEET METAL TROUGH WITH HINGED OR REMOVABLE COVERS.
 6. OUTDOOR AND WET LOCATIONS: NEMA 3R OR 4X OR IN ACCORDANCE WITH DRAWINGS.
- C. CONDUIT FITTINGS:
1. LIQUID TIGHT CONDUIT FITTINGS: DURA-PLATE TYPE FINISH.
 2. MANUFACTURED BY:
 - a. THOMAS AND BETTS, SERIES 5300.
 - b. APPLETON, TYPE STB.
 - c. OWNER APPROVED EQUAL.
 3. PROVIDE TWO-PIECE FLAME-RESISTANT INSULATED-THROAT CONDUIT HEX-HUB ASSEMBLY TO PROVIDE NEAR FLUSH FITTING OPENING IN ENCLOSURE BODY: CAST MALLEABLE-IRON OR FERALOY WITH INSULATED THROAT. HUBS WITH LOCK NUT FITTINGS ARE PROHIBITED UNLESS OTHERWISE APPROVED BY OWNER.
 - a. APPLETON, MODEL CF2 HUB.
 - b. CROUSE-HINDS, "HUB" SERIES.
 - c. O-Z/GEDNEY CO. SPACE MAKER HUBS, TYPE CH OR CHT.
 - d. OWNER APPROVED EQUAL.
 4. PROVIDE MALLEABLE INSULATED BUSHINGS WITH GROUNDING TERMINALS ON THE ENDS OF THREADED STEEL CONDUITS AND NIPPLES.
 - a. MALLEABLE IRON GROUNDING BUSHINGS: SMOOTH AND WELL-ROUNDED SURFACES TO PROTECT THE CONDUCTORS FROM INSULATION DAMAGE.
 - b. BUSHING MANUFACTURERS:
 - 1) COOPER/CROUSE-HINDS, TYPE HGLL-C.
 - 2) APPLETON, TYPE GIB.
 - 3) O-Z/GEDNEY CO., TYPE BLG AND HBLG.
 - 4) OWNER APPROVED EQUAL.
 5. SEALING FITTINGS EQUAL TO APPLETON EYS WILL BE REQUIRED FOR ALL CONDUITS ENTERING OR LEAVING THE DISINFECTION ROOM. DO NOT POUR IN GROUT SEALING COMPOUND UNTIL THE ELECTRICAL INSTALLATION HAS BEEN ACCEPTED.
 6. LONG RADIUS BENDS ARE NOT PERMITTED BY SPACE LIMITATIONS. USE MALLEABLE IRON CONDUIT BODIES, FORM 7, WITH CAST GRAY IRON MALLEABLE OR STEEL COVERS, SCREWS, AND GASKETS SUITABLE FOR THE APPLICATION.
 - a. MANUFACTURERS:
 - 1) CROUSE-HINDS, FORM 7.
 - 2) APPLETON, FM 7.
 - 3) O-Z/GEDNEY CO., FORM 7.
 - 4) OWNER APPROVED EQUAL.
 7. IN DAMP AREAS AND IN OUTDOOR LOCATIONS, JUNCTION AND PULL BOXES LOCATED IN EXPOSED CONDUIT RUNS: MALLEABLE IRON WITH SCREW COVERS AND THREADED HUBS IN THE CONFIGURATION REQUIRED BY THE APPLICATION WHEN LESS THAN 4 SQUARE INCHES, OTHERWISE USE SUITABLY SIZED NEC ENCLOSURE LISTED FOR THE APPLICATION.
 - a. MANUFACTURERS:
 - 1) CROUSE-HINDS.
 - 2) APPLETON.
 - 3) O-Z/GEDNEY CO.
 - 4) OWNER APPROVED EQUAL.
 8. CONDUIT UNIONS:
 - a. SOLELY UTILIZED TO JOIN FIXED SECTIONS OF RGS CONDUIT.
 - b. THREE PIECE TYPE WITH CONDUIT ALIGNMENT MATING SURFACE.
 - c. MALLEABLE IRON OR STEEL WITH ZINC ELECTROPLATING.
 - d. SIZES:
 - 1) USE STEEL TYPE FOR 3/4 AND 1-INCH SIZES.
 - 2) USE MALLEABLE IRON TYPE FOR LARGER THAN 1 INCH SIZES. STEEL SUBSTITUTIONS FOR ABOVE 1-INCH AS APPROVED BY OWNER FOR CLEARANCE ACCOMMODATIONS.
 - e. APPROVED MANUFACTURERS:
 - 1) CROUSE HINDS, TYPE UNY, UNF.
 - 2) APPLETON, TYPE EC.
 - 3) O-Z/GEDNEY CO., TYPE UNY, UNF.
 - 4) OWNER APPROVED EQUAL.

9. MECHANICAL BLANK DUCT PLUG:

- 1) HIGH IMPACT PLASTIC WITH NEOPRENE GASKETS.
- 2) EXPANDABLE GASKET BETWEEN FRONT AND BACK PRESSURE PLATES.
- 3) SIZED FOR CONDUIT.
- 4) CORROSION PROOF LONG TERM SEAL.
- 5) WATER-TIGHT AND GAS-TIGHT.
- 6) EQUIPPED WITH A ROPE TIE LOOP FOR SECURING PULL ROPE/TAP TO THE BACK (CONDUIT SIDE) COMPRESSION PLATE.
- 7) LOOP NUT ON THE FRONT (VAULT/PULLBOX SIDE).
- 8) REMOVABLE AND REUSABLE.
- 9) TAPERED STYLE BLANK PLUGS ARE NOT ACCEPTABLE.

PART 3 —EXECUTION

3.1 CONDUIT

- A. CONDUIT SIZING, ARRANGEMENT, AND SUPPORT:
1. SIZE CONDUIT FOR TYPE THW CONDUCTORS. MINIMUM ABOVE GROUND CONDUIT SIZE: 3/4 INCH OR AS INDICATED ON THE DRAWINGS.
 2. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND PRESENT A NEAT APPEARANCE. ORGANIZE CONDUIT RUNS TO AVOID UNNECESSARY CROSSINGS. ALIGN MULTIPLE CONDUIT ENTRIES INTO ENCLOSURES AND EQUIPMENT ON COMMON CENTERLINES, PARALLEL AND PERPENDICULAR TO ENTRY PANELS.
 3. ROUTE EXPOSED CONDUIT PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE AND ADJUST UNDERGROUND CONDUIT TO MINIMIZE CONFLICTS WITH UNDERGROUND INTERFERENCE AND TO ALLOW INSTALLATION OF STANDARD ELBOW RADII WHEREVER POSSIBLE. MINIMUM UNDERGROUND CONDUIT SIZE: 1-INCH.
 4. MAINTAIN MINIMUM 6 INCH CLEARANCE BETWEEN CONDUIT AND PIPING.
 5. ARRANGE CONDUIT SUPPORTS TO PREVENT DISTORTION OF CONDUIT ALIGNMENT BY WIRE PULLING OPERATIONS AND SPACE SUPPORTS AT DISTANCES NO GREATER THAN ALLOWED BY NEC.
 6. FASTEN CONDUIT USING GALVANIZED STRUT OR CHANNEL STRAPS, MALLEABLE CLAMPS WITH CLAMP BACKS, LAY-IN ADJUSTABLE HANGERS, CLEVIS HANGERS OR BOLTED SPLIT STAMPED GALVANIZED HANGERS. INSTALL STRUT OR CHANNEL SUPPORTS IN ACCORDANCE WITH.
 - a. SUPPORT UP TO TWO EXPOSED PARALLEL CONDUITS BY CLAMP BACK STRAPS.
 - b. FOR MORE THAN TWO CONDUITS, OR LARGER THAN 1-1/2 INCH CONDUITS, SUPPORT BY CHANNEL SUPPORTS BY MEANS OF TWO-PIECE, BOLTED PIPE CLAMPS FOR EACH RACEWAY INSTALLED.
 7. IN CORROSIVE ENVIRONMENTS, USE FIBERGLASS REINFORCED OR NON-METALLIC RESIN SUPPORTS AND STAINLESS STEEL EXPANSION ANCHORS.
 8. GROUP CONDUIT IN PARALLEL RUNS WHERE PRACTICAL:
 - a. USE CONDUIT RACK CONSTRUCTED OF STEEL CHANNEL WITH CONDUIT STRAPS OR CLAMPS.
 - b. MULTIPLE PARALLEL HORIZONTAL CONDUIT ROUTES CAN BE SUPPORTED FROM FRAMING CHANNEL IN A "TRAPEZIE" CONFIGURATION USING SUITABLE SIZED SPANS, RODS, ANCHORS, AND FITTINGS CARRY THE COMBINED INSTALLED LOAD.
 - c. VERTICAL CONDUITS THAT PENETRATE SLABS: SUPPORT BY CHANNEL ASSEMBLY SUITABLY ANCHORED AND PAINTED AS APPROVED BY OWNER OR IN ACCORDANCE WITH DRAWINGS.
 - d. PROVIDE SPACE FOR 25 PERCENT ADDITIONAL CONDUIT OR AS INDICATED ON DRAWINGS.
 9. DO NOT FASTEN CONDUIT WITH WIRE OR PERFORATED PIPE STRAPS. REMOVE WIRE USED FOR TEMPORARY CONDUIT SUPPORT DURING CONSTRUCTION. BEFORE CONDUCTORS ARE PULLED.
 10. SUPPORT RIGID METAL CONDUIT AT MAXIMUM OF 10 FEET ON CENTER AND NO MORE THAN 3 FEET FROM ANY BOX, ENCLOSURE, OR CABINET.
- B. CONDUIT INSTALLATION:
1. CUT CONDUIT SQUARE USING SAW OR PIPE CUTTER; DE-BURR AND REAM CUT ENDS.
 - a. TERMINATIONS, CONNECTIONS, AND THREADS ON RIGID CONDUIT: STANDARD CONDUIT THREAD.
 - b. INSTALL CONDUIT SUCH THAT LAST EXPOSED METAL THREAD IS TIGHTLY ENGAGED BY FITTING OR COUPLING USED.
 - c. GROUND ALL METAL RACEWAY COMPONENTS IN ACCORDANCE WITH APPLICABLE STANDARDS.
 2. USE CONDUIT HUBS FOR FASTENING CONDUIT TO SHEET METAL BOXES IN ALL LOCATIONS UNLESS OTHERWISE SPECIFIED.
 - a. WHERE MULTIPLE THREADED CONDUIT HUBS ARE FURNISHED INTEGRAL TO THE CAST BOX OR ENCLOSURE, INSTALL CONDUIT UNIONS TO FACILITATE INSTALLATION/REMOVAL OF CONDUIT.
 3. INSTALL NO MORE THAN EQUIVALENT OF THREE 90-DEGREE BENDS BETWEEN PULLING POINTS OR BOXES.
 4. USE CONDUIT BODIES TO MAKE SHARP CHANGES IN DIRECTION, AS AROUND BEAMS.
 5. USE HYDRAULIC ONE-SHOT CONDUIT BENDER OR LONG RADIUS FACTORY ELBOWS FOR BENDS IN CONDUIT LARGER THAN 2-INCH SIZE.
 6. AVOID MOISTURE TRAPS WHERE POSSIBLE; WHERE UNAVOIDABLE, PROVIDE JUNCTION BOX WITH DRAIN FITTING AT CONDUIT LOW POINT.
 7. USE SUITABLE CONDUIT CAPS TO PROTECT INSTALLED CONDUIT AGAINST ENTRANCE OF DIRT AND MOISTURE.
 8. PROVIDE 3/16 INCH POLYPROPYLENE PULL ROPE IN EMPTY CONDUIT, EXCEPT SLEEVES AND NIPPLES.
 9. INSTALL EXPANSION-DEFLECTION JOINTS WHERE CONDUIT CROSSES BUILDING EXPANSION OR SEISMIC JOINTS.
 10. WHERE CONDUIT PENETRATES WALLS AND FLOORS, SEAL OPENING AROUND CONDUIT WITH UL-LISTED FOAMED SILICONE ELASTOMER COMPOUND.
 11. PROVIDE THERMAL EXPANSION JOINTS FOR EXPOSED PVC CONDUIT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 12. USE PVC-COATED RIGID STEEL FACTORY ELBOWS FOR BENDS GREATER THAN 10 DEGREES IN PLASTIC CONDUIT RUNS.
 13. PROVIDE PVC TO RGS TRANSITION FITTINGS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 14. WIPE PLASTIC CONDUIT CLEAN AND DRY BEFORE JOINING.
 - a. APPLY FULL EVEN COAT OF JOINING CEMENT OR PORTLAND CEMENT TO ENTIRE AREA THAT WILL BE INSERTED INTO FITTING.
 - b. LET JOINT CURE FOR 20 MINUTES MINIMUM.
 - c. INSTALL MINIMUM 1-FOOT LIQUID-TIGHT FLEX AT POINT OF CONNECTION WITH MOTORS, FIELD INSTRUMENTS, OR VIBRATING EQUIPMENT. FOR LIQUID-TIGHT FLEX CONDUIT, PROVIDE MAXIMUM OF 3 FEET RUN LENGTH UNLESS OTHERWISE APPROVED BY OWNER.
 - d. TOOLS:
 - 1) USE SPECIALLY INSULATED WRENCH FOR TIGHTENING PVC-COATED CONDUIT AND FITTINGS. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS TO PROTECT SPECIAL FINISHES, CORROSION RESISTANT COATINGS AND MATERIALS OF CONSTRUCTION.
 - 2) USE ONLY APPROPRIATE METHODS AND MEANS FOR RACEWAY ASSEMBLIES TO AVOID DAMAGE TO ALL RACEWAYS AND FITTINGS.

- e. INSTALL TYPE EYS CONDUIT SEALS ON ALL CONDUIT PASSING THROUGH OR ENTERING THE DISINFECTION ROOM. DO NOT POUR SEALS UNTIL WIRING HAS BEEN INSPECTED AND ACCEPTED BY OWNER.
- f. INSTALL ALL CONDUIT PENETRATIONS FLUSH WITH FINISH FLOOR/SURFACE AND FLUSH WITH TOP OF EQUIPMENT PAD/HOUSEKEEPING PAD OR CURBING AND IN ACCORDANCE WITH DRAWINGS.

D. CONDUIT INSTALLATION SCHEDULE:

1. UNDERGROUND INSTALLATIONS MORE THAN 5 FEET FROM FOUNDATION WALL: SCHEDULE 40 PVC CONDUIT.
2. UNDERGROUND INSTALLATIONS BENEATH AND EXTENDING 5 FEET EACH SIDE OF FOUNDATION WALL: PVC COATED RIGID GALVANIZED STEEL CONDUIT.
3. INSTALLATIONS UNDER CONCRETE SLAB: PVC CONDUIT, IN TRENCH WITH TYPE II BACKFILL, WITH MINIMUM 12 INCHES OF COVER BELOW SLAB AND IN ACCORDANCE WITH APPLICABLE STANDARDS AND DRAWINGS.
4. IN SLAB ON GRADE OR ABOVE GRADE: RIGID GALVANIZED STEEL CONDUIT.
5. EXPOSED OUTDOOR LOCATIONS: RIGID GALVANIZED STEEL CONDUIT.
6. WET INTERIOR LOCATIONS: PVC CONDUIT.
7. DISINFECTION ROOM: PVC CONDUIT.
8. CONCEALED DRY INTERIOR LOCATIONS: PVC CONDUIT [, OR EMT CONDUIT WHEN APPROVED BY OWNER].
9. EXPOSED DRY INTERIOR LOCATIONS: RIGID GALVANIZED STEEL CONDUIT [, OR EMT CONDUIT WHEN APPROVED BY OWNER].

3.2 BOXES

- A. EXAMINATION:
1. VERIFY FIELD MEASUREMENTS AS SHOWN ON DRAWINGS.
 2. VERIFY LOCATIONS OF JUNCTION BOXES AND OUTLETS SO THAT INTERFERENCES WITH OTHER EQUIPMENT ARE AVOIDED.
 3. ELECTRICAL BOXES ARE SHOWN ON DRAWINGS IN APPROXIMATE LOCATIONS UNLESS DIMENSIONED. INSTALL AT LOCATION REQUIRED FOR BOX TO SERVE INTENDED PURPOSE.
- B. INSTALLATION:
1. INSTALL ELECTRICAL BOXES AS SHOWN ON DRAWINGS, AND AS REQUIRED FOR SPLICES, TAPS, WIRE PULLING, EQUIPMENT CONNECTIONS, AND COMPLIANCE WITH REGULATORY REQUIREMENTS.
 2. INSTALL ELECTRICAL BOXES TO MAINTAIN HEADROOM AND TO PRESENT NEAT MECHANICAL APPEARANCE.
 3. ALIGN ADJACENT WALL-MOUNTED OUTLET BOXES FOR SWITCHES, THERMOSTATS AND SIMILAR DEVICES WITH EACH OTHER.
 4. SUPPORT BOXES INDEPENDENTLY OF CONDUIT.
 5. USE CAST MULTI-GANG BOX WHERE MORE THAN ONE DEVICE IS MOUNTED TOGETHER.
 6. USE CAST OUTLET BOX IN INTERIOR AND EXTERIOR LOCATIONS UNLESS OTHERWISE SPECIFIED AND USE WEATHERPROOF COVERS.
 7. UTILIZE INTEGRAL FLANGES AND MOUNTING BRACKETS TO ATTACH BOXES TO ALL SURFACES.
 8. INSTALL SURFACE MOUNT CABINETS IN ACCORDANCE WITH INCHES:
 - a. INSTALLED SUCH THAT HINGED SIDE NOT ON TOP.
 - b. CONDUITS ENTER ENCLOSURE THROUGH KNOCKOUTS OR HUBS.
 - c. STRAIGHT SECTION NOT TO EXCEED 5 FEET IN LENGTH.
 - d. WHERE SEVERAL FEEDERS AND/OR BRANCH CIRCUITS PASS THROUGH A COMMON PULLBOX AND LAND ON TERMINAL BLOCKS OR DISTRIBUTION POWER BLOCKS THEY MUST BE IDENTIFIED TO INDICATE THE ELECTRIC CHARACTERISTICS, CIRCUIT NUMBER AND PANEL DESIGNATION IN ACCORDANCE WITH SECTION 26 05 53.
 - e. FOR CONDUCTORS INSTALLED THROUGH BOXES AND GUTTERS, PROVIDE A MINIMUM OF 4 INCHES OF SLACK OR AS APPROVED BY OWNER.
- 3.3 MANHOLES AND PULLBOXES
- A. INSTALLATION OF MANHOLE ACCESSORIES:
1. INSTALL DRAINS IN MANHOLES. CONNECT TO DRAINAGE SYSTEM, OR DRAIN THROUGH 4INCH PIPE TERMINATING IN 1/3 CUBIC YARD CRUSHED GRAVEL BED IN ACCORDANCE WITH APPLICABLE STANDARDS.
 2. INSTALL GROUND ROD WITH TOP PROTRUDING FOUR INCHES ABOVE MANHOLE FLOOR OR OUTSIDE MANHOLE AS IN ACCORDANCE WITH DRAWINGS.
 3. INSTALL CABLE SUPPORTS AT THREE FOOT INTERVALS. FASTEN WITH GALVANIZED BOLTS FABRICATED OF FIBERGLASS OR GALVANIZED STEEL.
 4. ASSEMBLE SECTIONS WITH WATERPROOF MASTIC AND HAND PACK GROUT ON MANHOLE AND PULLBOXES WHEN LADDER RINGS OR COLLARS ARE INSTALLED FOR A SMOOTH SEALED FINISH.
 5. AFTER ALL INSTALLATIONS ARE FINAL, CLEAN SUBSTRUCTURES THOROUGHLY OF ALL ROCKS, DIRT, AND DEBRIS AND PULLING LUBRICANT.
 6. PERMANENTLY LABEL LIDS IN REGARDS TO ELECTRICAL INSTALLATION SUCH AS: HIGH VOLTAGE, MEDIUM VOLTAGE, ELECTRICAL CONTROLS, IRRIGATION, MIXED VOLTAGES OR IN ACCORDANCE WITH DRAWINGS. ANCHOR A BRASS TAG, 2X4 INCHES MINIMUM, WITH 3/4 INCH RAISED LETTERING AND USE PULLBOX SCHEDULE OR LOCATIONS THROUGHOUT TO LABEL AS PB1, JB1, MH1, AND IN ACCORDANCE WITH DRAWINGS.
 7. PROVIDE SUITABLE GROUNDING CONNECTIONS FOR GROUND GRID CONTINUITY THROUGH PULLBOXES AND MANHOLES.
 8. IDENTIFY ALL WIRING ACCORDING TO POINT OF ORIGIN AND DESTINATION ACCORDINGLY AT POINTS OF ENTRY AND EXIT INCLUDING CIRCUIT/CONTROL NUMBERS OF SERVICE/PANEL NAME IN ACCORDANCE WITH APPLICABLE STANDARDS.
 9. ATTACH CABLE RACKS TO INSERTS AFTER MANHOLE INSTALLATION IS COMPLETE.
 10. GROUT AROUND CONDUITS FOR SMOOTH BOX ENTRY WHEN PRECAST BOX WALL IS NOT SEALED DUE TO UNSLEEVED PENETRATIONS.
- B. INSTALLATION OF CONDUIT:
1. INSTALL CONDUIT PENETRATIONS WITH END BELLS FLUSH WITH INSIDE WALL.
 2. PLACE CONDUIT PENETRATIONS THROUGH MANHOLE WALLS PERPENDICULAR TO WALL.
 3. SEAL EMPTY CONDUITS USING MECHANICAL DUCT PLUG TO PREVENT ENTRY OF FOREIGN MATERIAL OR WATER.

VERIFY SCALE



BAR REPRESENTS ONE AND ONE-HALF INCHES ON ORIGINAL

SCALE

AS SHOWN

NOTES 3

DRAWN BY: CHRISTOPHER G. BLANK

CHECKED BY: 11/02/07

RECOMMENDED BY: 11/02/07

DATE

DATE

REVISIONS:

CONTRACT NUMBER

DRAWING NUMBER E X
SHEET X OF



CLV DWG #