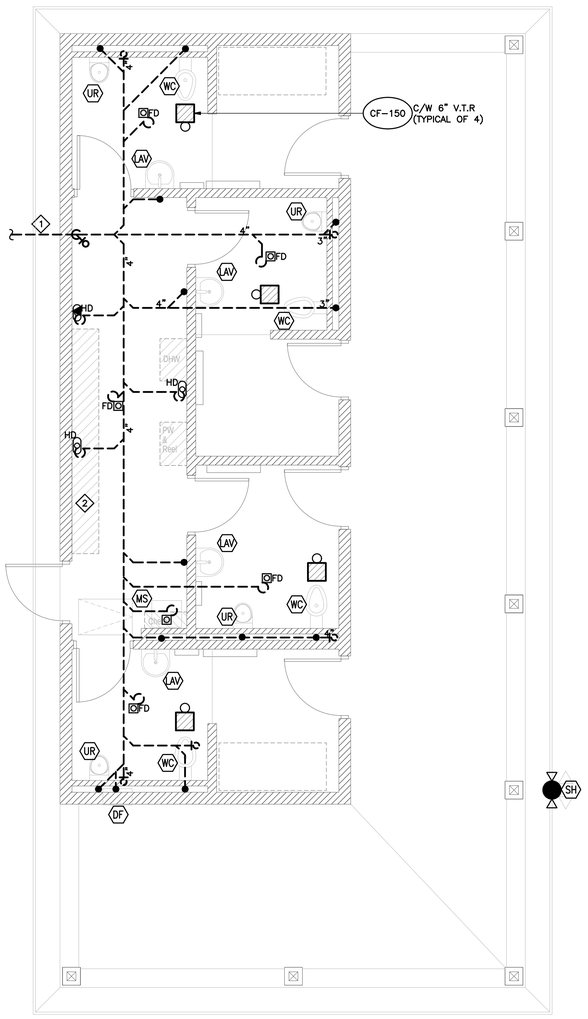
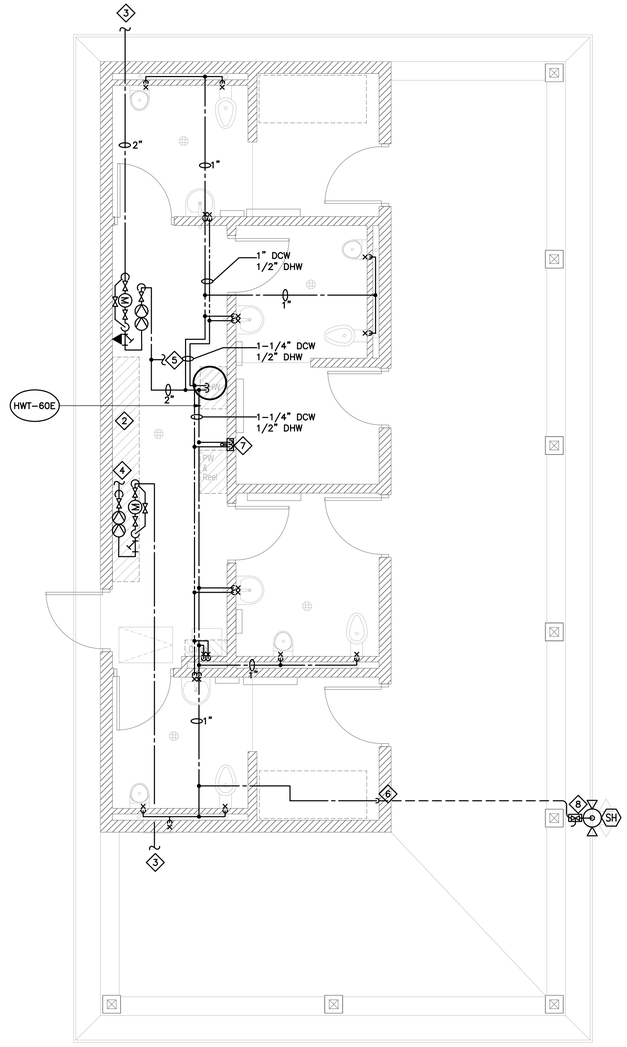


SANITARY LAYOUT



PLUMBING LAYOUT

HVAC GENERAL NOTES

1. ALL EQUIPMENT AND ASSOCIATED DUCTWORK/GRILLES IS NEW UNLESS OTHERWISE NOTED.
2. PAINTING OF EXPOSED DUCTWORK IS BY OTHERS.
3. FLEXIBLE BRANCH DUCTWORK TO BE MAXIMUM 10FT. IN LENGTH.
4. UNDERCUT DOORS FOR ALL WASHROOMS.
5. ALL INTERIOR EXPOSED OPEN ENDED DUCTS TO BE FINISHED OFF WITH WIRE MESH.
6. WHERE APPLICABLE ALL GOOSENECKS, OPEN ENDED DUCTS AND EXTERIOR LOUVRES TERMINATING TO THE EXTERIOR SHALL BE C/W 1/2"X1/2" GALVANIZED WIRE MESH BIRD SCREENS AND B/D/D OR MOTORIZED DAMPER WHERE SPECIED AND BE ACCESSIBLE FOR CLEANING.
7. ALL MOTORIZED DAMPERS ARE C/W END SWITCHES UNLESS NOTED.
8. ALL EXTERIOR LOUVRES AND VENT OPENINGS MUST BE MIN. 24" ABOVE FINISHED GRADE. ADJUST OPENING LOCATIONS OR MODIFY GRADE AS REQUIRED.
9. ALL DUCTWORK SHALL CONFORM TO ASHRAE. ALL DUCTWORK SHALL AND PLENUMS SHALL BE CONSTRUCTED, INSTALLED AND SEALED AND PRESSURE TESTED AS DETAILED IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE. CONTRACTOR TO SEAL DUCT WITH ZERO VOC DUCT SEALANT. WHERE DUCTWORK IS EXPOSED SEAL WITH CLEAR SILICONE.
10. RADIUS OF ELBOW SHALL BE AT LEAST 1.5 TIMES THE WIDTH OF THE DUCT. WHERE A RADIUS IS NOT POSSIBLE TURNING VANES MUST BE INTRODUCED.

KEYED NOTES

1. REFER TO SITE SERVICING DWGS FOR CONTINUATION OF 4" LEAVING SANITARY
2. SPLASH PAD WATER SYSTEM BY OTHERS
3. REFER TO SITE SERVICING DWGS FOR CONTINUATION OF 2" DCW MAIN
4. 2" DCW TO SPLASH PAD WATER SYSTEM (BY OTHERS)
5. 2" DCW TO IRRIGATION SYSTEM (BY OTHERS)
6. 1" DCW DN UNDERSLAB TO SERVE SHOWER
7. 1" H+C WATER DN TO HOSE BIB SERVING PRESSURE WASHER SYSTEM
8. 1" UNDERSLAB DCW TO SERVE SHOWER. PROVIDE RECESSED VALVE BOX AND DRAIN VALVE FOR WINTERIZATION.

PLUMBING NOTES

ALL EXISTING EQUIPMENT, PIPING, ETC BEING RE-USED SHALL BE INSPECTED AND LOCATED BEFORE AND AFTER DEMOLITION AND PRIOR TO ANY NEW CONSTRUCTION. DETAILS OF PERFORMANCE/CONDITION/SIZING AND LOCATION SHALL BE SUPPLIED TO THE ENGINEER AND OWNER. . ANY EXTRA WORK AND REQUIRED TO THE ABOVE MENTIONED SHALL BE DETERMINED PRIOR TO NEW CONSTRUCTION. CONTRACTOR TO ALLOW FOR THE INSPECTION IN HIS PRICE INCLUDING X-RAYING, AIR FLOW MEASUREMENT, SCANNING AND CAMERA SCOPE TO EXISTING BURIED DRAINS. NO EXTRAS WILL BE ALLOWED ONCE NEW CONSTRUCTIONS STARTS.

1. ALL PLUMBING/DRAINAGE AND EQUIPMENT IS NEW UNLESS OTHERWISE NOTED.
2. NEW WATER CLOSETS ARE SIZED FOR FLUSH VALVES UNLESS NOTED. ANY DISCREPANCIES MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. PROVIDE WATER HAMMER ARRESTORS ON HOT AND COLD WATER SUPPLIES TO ALL QUICK VALVES, SOLENOIDS, AND PLUMBING FIXTURES, AND LOCATE IN AN UPRIGHT POSITION BETWEEN THE LAST TWO FIXTURES ON A LINE, OR HORIZONTALLY AT THE END OF LINE CLOSEST TO SUPPLY SOURCE. ON PROJECTS EXCEEDING FIVE STORIES IN HEIGHT, PROVIDE WATER HAMMER ARRESTORS ON DOMESTIC WATER RISERS AS FOLLOWS. LOCATE ARRESTORS AT THE END OF RISER OPPOSITE SUPPLY SOURCE. ARRESTOR SHALL BE TWO PIPE SIZES LARGER THAN THE RISER IS AT THE CONNECTION POINT, NOT EXCEEDING THE LARGEST PIPE SIZE DIAMETER IN THE RISER WATER HAMMER ARRESTORS.
4. ALL TRAPS SERVING FLOOR DRAINS SHALL BE PRIMED AND ALL TRAPS SEAL PRIMERS SHALL BE C/ B.F.P.
5. PRIOR TO CONSTRUCTION CONTRACTOR SHALL INSPECT OR OBTAIN AS NECESSARY STATIC WATER PRESSURE AT BUILDING AND INFORM ENGINEER. AFTER CONSTRUCTION CONTRACTOR SHALL INSPECT STATIC WATER PRESSURE AT THE FURTHEST DOWNSTREAM FIXTURE.
6. ALL BACK FLOW PREVENTORS SHALL BE INSTALLED AND TESTED AS PER B64.10-07 AND B64.10.1-07 STANDARDS. ALL INSTALLATION AND TESTING MUST BE LICENCED AS PER THE ABOVE MENTIONED STANDARD.
7. UNLESS SPECIFIED ON THESE DRAWINGS ALL PLUMBING FIXTURES ARE TO BE SPECIFIED BY OTHERS. PLUMBER SHALL PURCHASE AND INSTALL THE FIXTURES AND ASSOCIATED FITTINGS TO FINAL CONNECTIONS. ALL ROUGH IN LOCATIONS AND INSTALLATION SHALL SUIT ARCHITECTURAL AND APPROVED FIXTURE SHOP DRAWINGS. PROVIDE PARTITION VALVE STOPS FOR ALL FIXTURES AND RISERS/WASHROOM GROUPINGS. (INSTALL PARTITION STOPS SO THEY LAND UNDERNEATH LAV'S AND OR BEHIND WATER CLOSETS). ALL EXPOSED DOMESTIC PIPING SHALL BE COPPER FOR FINAL CONNECTION.
8. UNLESS SPECIFIED ON THESE DRAWINGS STEAM SHOWERS, WALK-IN COOLERS, WATER TREATMENT, SAUNA EQUIPMENT, DISHWASHERS, FRIDGES WASHERS, STEAM DRYERS ETC ARE TO BE SUPPLIED BY OTHERS. PLUMBER SHALL ROUGH-IN TO DRYWALL STAGE AND MAKE ALL FINAL CONNECTIONS. ALL ROUGH IN LOCATIONS AND REQUIRED P&D SHALL SUIT ARCHITECTURAL AND APPROVED FIXTURE SHOP DRAWINGS.
9. PROVIDE ACCESSIBLE ISOLATION VALVES FOR EACH FIXTURE AND EACH PIECE OF EQUIPMENT.
10. PLUMBER TO PIPE DRAINS AS REQUIRED FOR ALL AIR HANDLERS, WALK-IN COOLERS, BACKFLOW PREVENTORS, HRV UNITS, BOILERS, STEAM HUMIDIFIERS, HOT WATER TANK, COILS ETC TO NEAREST HUB DRAIN AS PER MANUFACTURERS RECOMMENDATIONS. REVIEW HVAC/P&D DRAWINGS/SCHEMATICS FOR EQUIPMENT LOCATIONS, DRAIN REQUIREMENTS AND PROVIDE HUB DRAIN AS REQUIRED. EXACT LOCATION TO BE CO-ORDINATED AT SITE WITH APPLICABLE TRADES.
11. CONTRACTOR TO ALLOW FOR BACK WATER VALVES ON LEAVING DRAINS. THIS SHALL BE DISCUSSED AS IT PERTAINS TO LOCAL JURISDICTION PRIOR TO BACK FILLING AND POURING OF FLOOR.
12. THIS CONTRACTOR IS RESPONSIBLE FOR ALL PLUMBING SERVICES WITHIN BUILDING UP 1 FT OUTSIDE BUILDING OR TO CONNECTION POINTS SUPPLIED BY SITE SERVICING ENGINEER AND OR LANDSCAPE DESIGNER. REFER TO LATEST SITE SERVICING DRAWINGS FOR SIZE AND LOCATION OF INCOMING SERVICES CONNECTION POINTS. ALL SITE SERVICING INFO MUST BE VERIFIED AT SITE. CONTRACTOR TO REFER TO HEATING SCHEMATIC TO DETERMINE WORK BY THEM.
13. ALL PLUMBING SHALL RUN ON THE WARM SIDE OF AN INSULATED WALL/CEILING/FLOOR. WHERE PLUMBING ISN'T ADEQUATELY PROTECTED ENGINEER SHALL BE CONTACTED.
14. FINAL LOCATIONS AND QUANTITY OF HOSE-BIBBS TO BE APPROVED BY OWNER PRIOR TO INSTALLATION. WHERE LOCATIONS ARE NOT SHOWN ON THESE DRAWINGS ALLOW FOR 3 HOSE-BIBBS. EACH HOSE-BIBB SHALL HAVE A ACCESSIBLE WINTER SHUT-OFF VALVE.
15. WHERE SPECIFIED FIXTURES IN PUBLIC WASHROOMS REQUIRE A MIXED WATER TEMPERATURE AND DO NOT HAVE MIXING CAPABILITIES, CONTRACTOR SHALL PROVIDE A MIXING VALVE IN AN ACCESSIBLE LOCATION AS CLOSE TO THE GROUP OF FIXTURES AS POSSIBLE.
16. ALL DOMESTIC AND DRAINAGE PIPING FOR BARRIER FREE SINKS/LAVS TO BE PROTECTED WITH INSULATION AND PVC JACKET

PLUMBING VENTING NOTES

1. ALL VENTING TO TERMINATE WITH 3" VENT THRU ROOF.
2. CONTRACTOR TO CONNECT ALL NEW VENTING INTO EXISTING AND/OR PROVIDE NEW VENTING AS REQUIRED.
3. VENT TERMINATION THRU ROOF SHALL BE A MIN. 10FT FROM FRESH AIR OPENINGS.

GENERAL PLUMBING FIXTURE SIZING NOTES

1. REFER TO PLAN FOR COMBINED FIXTURE AND MAIN SIZING. PLUMBER SHALL REVIEW ALL SCHEMATICS/EQUIPMENT SCHEDULES FOR WORK NOT DETAILED ON FLOOR PLANS. REFER TO BELOW FOR INDIVIDUAL FIXTURE PLUMBING SIZES.
2. THE BELOW SCHEDULE IS A GENERAL SCHEDULE AND FIXTURES ONLY APPLY WHERE TAGGED ON PLANS:

   WATER CLOSET FLUSH VALVE (WC)
   3" DRAIN, 1-1/2 VENT, 1" C.W

   URINAL (UR)
   2" DRAIN, 1-1/2 VENT, 3/4" C.W

   LAVATORY (LV), MISC SINKS (SI)
   2" DRAIN, 1-1/2" VENT, 1/2" H&C.W

   JANITORS SINK (JS).
   3" DRAIN, 1-1/2" VENT, 3/4" H&CW

   SHOWERS (SH).
   2" DRAIN, 1-1/2" VENT, 3/4" H&C.W. HIGH DEMAND SHOWERS WITH BODY JETS/RAINFALL SHOWER HEADS AND SOAKER TUBS SHALL BE C/W 1" H&CW SUPPLY.

   FLOOR, HUB, FUNNEL FLOOR DRAINS (FD),(HD)(FFD)
   2" ABOVE GRADE, 3" BURIED

   HOSEBIBB (HB)
   3/4" CW

DRAINAGE SLOPES

UNLESS NOTED ALL DRAINS SLOPES ARE AS FOLLOWS:

3" AND UNDER SHALL RUN AT 2.0% SLOPE

4" TO 6" SHALL RUN AT 1.0% SLOPE

8" AND UP SHALL BE NOTED ON PLANS

NO.	DATE	DESCRIPTION
4	10.01.2020	ISSUED FOR TENDER
3	05.26.2020	ISSUED FOR PERMIT
2	05.24.2018	ISSUED FOR REVIEW
1	05.01.2018	ISSUED FOR REVIEW

THIS DRAWING SHALL BE USED ONLY FOR THE PURPOSE INDICATED IN THE LATEST ISSUED COLUMN ABOVE

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GARNET GRAHAM PARK

KAWARTHA LAKES ONTARIO

MECHANICAL

PLOT DATE

PROJECT No. 18-776

DRAWING TITLE

PLUMBING & DRAINAGE LAYOUTS

DATE 2018

DRAWN BY JW

SCALE 1/4"=1'-0"

M-1

OF 3

SPECIFICATIONS

1. REFER TO THE ARCHITECTURAL SPECIFICATIONS, THE GENERAL CONDITIONS, TENDER FORMS, SCHEDULE OF COMPLETION, ETC.
2. CO-ORDINATE YOUR WORK WITH ALL OTHER TRADES ON THE SITE TO THE EXTENT OF PROPERLY LOCATING ALL EQUIPMENT, PIPING, DUCTWORK, ETC. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ACCURATE DIMENSIONS FROM THE ARCHITECTURAL DRAWINGS, OR AT THE SITE.
3. EACH CONTRACTOR SHALL SUPERVISE THE LAYING OUT OF HIS WORK AND SHALL ARRANGE IT IN CO-ORDINATION WITH OTHERS WORKING ON THE SITE WHILE THE WORK OF THIS CONTRACT IS IN PROGRESS. HE SHALL PROTECT FINISHED AND UNFINISHED WORK OF THE CONTRACT AND/OR WORK OF OTHERS ON THE SITE UNTIL THE COMPLETE WORK HAS BEEN ACCEPTED.
4. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH ALL BY-LAWS AND CODES OF THE AUTHORITIES HAVING JURISDICTION. MAKE ALL NECESSARY TESTS AND ALTERATION AS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
5. INCLUDE ALL NECESSARY MATERIALS, LABOUR AND EQUIPMENT TO INSTALL MECHANICAL WORK AS SHOWN ON THE DRAWINGS, AS THE MINIMUM REQUIREMENT, AND INCLUDE AS PART OF CONTRACT ANY WORK REQUIRED TO MAKE THE INSTALLATION CONFORM WITH ALL APPLICABLE REGULATIONS.
6. ALL MATERIALS REQUIRED FOR THE PERFORMANCE OF THE WORK SHALL BE THE BEST OF THEIR RESPECTIVE KINDS, CSA APPROVED, OF UNIFORM PATTERN THROUGHOUT. WHERE THIS WORK IS WITHIN A BASE BUILDING. THE HIGHER SPECIFICATION STANDARD BETWEEN THE BASE BUILDING AND THIS SPECIFICATION MUST BE ADHERED TO.
7. THE DRAWINGS ARE TO BE CONSIDERED AS DIAGRAMMATIC ONLY, AND DO NOT SHOW ALL STRUCTURAL AND CONSTRUCTION DETAILS. ANY INFORMATION INVOLVING ACCURATE MEASUREMENTS OF THE BUILDING SHALL BE TAKEN AT THE SITE. ANY NECESSARY CHANGES OR ADDITIONS TO ACCOMMODATE STRUCTURE CONDITIONS SHALL BE MADE WITHOUT ADDITIONAL CHARGE.
8. ALL ENQUIRIES PERTAINING TO ADJACENT WORK, PARTICULARLY PLASTER, WOOD FINISHES AND OTHER MATERIALS OR DAMAGE TO OTHER EQUIPMENT CAUSED BY SUCH DEFECTS OF THIS CONTRACTOR'S WORK OR BY SUBSEQUENT REPLACEMENT AND REPAIRS, SHALL BE MADE GOOD AT THE EXPENSE OF THIS CONTRACTOR.
9. CONCEAL PIPING AND DUCTWORK IN PARTITIONS AND WALLS, AT BETWEEN FLOOR AND CEILING, EXCEPT AS SPECIFIED OTHERWISE.
10. ALL EXCAVATION, REMOVAL OF EXCESS MATERIAL, BEDDING, BACKFILLING, COVERING, ETC., SHALL BE CARRIED OUT BY THE TRADES CONCERNED. PIPING BEDDING, BACKFILLING AND TESTING SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND LOCAL AUTHORITIES REQUIREMENTS.
11. ALL TRADES MUST KEEP AN UP TO DATE SET OF AS BUILT DRAWINGS ON SITE AS IT RELATES TO THERE SCOPE. A FINAL SET MUST BE PROVIDED TO ENGINEER PRIOR TO FINAL INSPECTION. ALL BURIED PIPING, DUCTWORK AND GEO-THERMAL PIPING MUST BE MARKED ON AS BUILT DRAWINGS SHOWING LOCATION AND DEPTH PRIOR TO COVERING. IN ADDITION PICTURES MUST BE TAKEN OF ALL BURIED PIPING, DUCTWORK AND/OR GEO-THERMAL PIPING PRIOR TO COVERING. AS BUILT MARK UPS MUST BE SUBMITTED PRIOR TO A FINAL INSPECTION.
12. ALL EQUIPMENT AND INSTALLATION TO BE IN ACCORDANCE WITH ASHRAE STANDARDS, INCLUDING WORKMANSHIP, ENERGY, NOISE, ETC.
13. FURNISH ALL LABOUR, MATERIAL, TOOLS AND EQUIPMENT REQUIRED TO COMPLETE THE INSTALLATION AND TESTING OF MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN, INCLUDING; HEATING, VENTILATION & AIR CONDITIONING, PLUMBING & DRAINAGE AND FIRE PROTECTION.
14. ALL INSTALLATIONS ARE TO COMPLY WITH LOCAL BUILDING CODE REQUIREMENTS AND ALL APPLICABLE CODES.
15. IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE ENGINEER AND TO INFORM THE GENERAL CONTRACTOR THAT WE MUST BE CONTACTED FOR AN INSPECTION PRIOR TO POURING THE FLOOR, DRY-WALLING AND AFTER FINAL COMPLETION OF THERE WORK SO WE CAN DO OUR INSPECTIONS. A MINIMUM OF THREE DAYS NOTICE SHALL BE GIVEN. A REQUEST FOR AN INSPECTION SHALL BE DONE IN AN EMAIL TO THE ENGINEER JOB CAPTAIN. BEFORE A FINAL REPORT IS ISSUED CONTRACTOR TO PROVIDE (WHERE APPLICABLE) AIR BALANCING REPORTS, COMMISSIONING REPORTS, NFPA LETTERS, BACK FLOW PREVENTOR TESTING REPORTS, AS BUILT MARK UPS ETC.
16. ALL EQUIPMENT, PIPING, INSULATION, CONTROLS, DUCTWORK, FITTINGS, ETC AND ASSOCIATED PRODUCTS MUST BE INSTALLED AS PER MANUFACTURERS RECOMMENDATIONS. WHERE THERE IS A DISCREPANCY ENGINEER MUST BE CONTACTED FOR FURTHER INSTRUCTION.
17. CONTRACTOR IS TO REMOVE FROM SITE AND DISPOSE OF ANY UN-USED EQUIPMENT AND ASSOCIATED DUCT WORK/PIPING/GRILLES ETC AND CAP OFF EXISTING AS REQUIRED. MAKE GOOD ON ALL REDUNDANT OPENINGS AS A RESULT OF CONSTRUCTION.
18. ALL ROOF PENETRATION, EQUIPMENT HUNG FROM STRUCTRE AND DUCT SLEEVING THROUGH STRUCTURAL MEMBERS SHALL BE APPROVED BY ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION. CONTRACTOR TO PROVIDE APPROVED SHOP DRAWINGS TO GENERAL CONTRACTOR FOR REVIEW. ALL DUCT DROPS FROM EQUIPMENT IS TO TERMINATE AT 24" BELOW LOWEST STRUCTURE.
19. WHERE IT IS DISCOVERED THAT EXISTING PIPING/ MATERIALS BEING RE-USED IN THIS BUILDING IS ASBESTOS OR NON METALLIC CONTRACTOR SHALL NOTIFY ENGINEER TO DETERMINE PIPING MEETS CODE.
20. WHERE THE SCOPE OF WORK TAKES PLACE WITHIN AN EXISTING BUILDING THIS CONTRACTOR SHALL CONFIRM ALL WORK MEETS THE BASE BUILDING STANDARDS. PRICING SHALL BE AS PER THESE DRAWINGS. CHANGES TO THESE SPECIFICATIONS TO SUIT BASE BUILDING SHALL BE DETERMINED AND APPROVED.

GUARANTEE

THIS SUBCONTRACTOR SHALL GUARANTEE ALL MATERIAL AND WORKMANSHIP USED IN THE WORK TO BE IN STRICT ACCORDANCE WITH THE SPECIFICATIONS, OF BEST QUALITY AND TYPE OBTAINABLE TO GIVE FIRST-CLASS CONSTRUCTION AND PROPER AND EFFICIENT OPERATION, AND FREE FROM ANY DEFECTS. ANY SUCH DEFECTS WHICH MAY APPEAR IN ANY OF THE WORK WITHIN 1 YEAR AFTER WRITTEN ACCEPTANCE OF HIS WORK TO SUIT CLOSE OUT REQUIREMENTS, SHALL BE REPAIRED AND REPLACED BY THIS SUBCONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER. WHERE SUCH DEFECTS OCCUR, THIS SUBCONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL COSTS INCURRED IN MAKING THE DEFECTIVE WORK GOOD. THIS SHALL NOT OBSOLETE ANY LONGER WARRANTIES ON SPECIFIC ITEM OF EQUIPMENT.

CUTTING AND PATCHING

1. CUTTING, CORING, DRILLING, PATCHING AND REPAIRS TO EXISTING SURFACES REQUIRED AS A RESULT OF THE REMOVAL AND/OR RELOCATION OF EXISTING EQUIPMENT AND PIPING, AND/OR INSTALLATION OF NEW EQUIPMENT AND PIPING TO BE INCLUDED BY DIVISION 15 – MECHANICAL IN TENDER PRICE. DIVISION 15 TO EMPLOY AND PAY APPROPRIATE SUB-TRADE WHOSE WORK IS INVOLVED, FOR CARRYING OUT WORK DESCRIBED ABOVE.
2. THE CUTTING OF OPENINGS NOT REQUIRING LINTELS OR OTHER STRUCTURAL SUPPORT WILL BE THE RESPONSIBILITY OF THE TRADE REQUIRING THE OPENING, THE OPENING SIZE WILL BE THE MINIMUM REQUIRED, AND THAT PATCHING WILL BE THE RESPONSIBILITY OF THE TRADES NORMALLY ENGAGED IN WORKING WITH THE FINISHING MATERIALS REQUIRED TO RESTORE THE OPENING TO THE ORIGINAL OR SPECIFIED CONDITIONS.
3. WHERE OPENINGS REQUIRE LINTELS OR OTHER STRUCTURAL SUPPORT, OR ROOFING WORK, SUCH OPENINGS WILL BE SPECIFIED UNDER OTHER DIVISIONS.

PRODUCT CHANGES AND SUBMITTALS

1. WHERE THE CONTRACT DOCUMENTS STIPULATE PARTICULAR PRODUCTS/MATERIALS, EQUAL ALTERNATES MAY BE CONSIDERED BY THE CONSULTANT FOLLOWING THE CONTRACT AWARD. WHEN A REQUEST TO SUBSTITUTE PRODUCTS/MATERIALS IS MADE, THE CONSULTANT MAY APPROVE OR REJECT THE SUBSTITUTION. IF A SUBSTITUTION IS REJECTED, A RESPONSE TO THE PARTY SUBMITTING WILL BE RENDERED. IT IS RECOMMEDNED TO GET APPROVAL PRIOR TO DURING TENDER PROCESS.
2. THESE SUBMISSIONS MUST BE DETAILED AND COMPLETE BY IDENTIFYING THE PRODUCTS, MATERIALS OR SYSTEMS SPECIFIED AND COMPARED TO AN ALTERNATIVE PRODUCT, MATERIALS OR SYSTEMS. CONTRACTOR MUST STATE THE DIFFERENCE IN THE CONTRACT COST AND TIME.
3. EACH TRADE SHALL EMAIL ONE COMPLETE BOUND PDF FILE OF SHOP DRAWINGS FOR REVIEW TO THE PROJECT ENGINEER FOR REVIEW AND COMMENTS PRIOR TO ORDERING. EQUIPMENT SHALL BE TAGGED TO CORRESPOND WITH EQUIPMENT SCHEDULE AND PLANS NOTING ALL ACCESSORIES ETC. THE ASSOCIATED CONTRACTOR SHALL INCLUDE THEIR CONTACT INFORMATION WITHIN THE DOCUMENT. ENGINEER WILL REQUIRE MINIMUM ONE WEEK TO REVIEW. WHERE PDF FILE IS TOO LARGE TO EMAIL CONTRACTOR TO CONTACT ENGINEER FOR ALTERNATE METHOD.

FIRE/SMOKE DAMPERS AND FIRESTOPPING

UNLESS NOTED THE BELOW WORK SHALL BE DONE BY THE TRADE WHO IS RESPONSIBLE FOR THE MATERIAL BEING RATED OR FIRE STOPPED. ALL PRODUCTS SHALL BE INSTALLED AS PER MANUFACTURERS LISTING AND INSTRUCTION GUIDELINES. FIRE AND OR SMOKE DAMPERS SHALL BE INSTALLED IN THE PLANE OF PENETRATION OF FIRE SEPARATIONS AND IN ACCORDANCE WITH NFPA-90A AND ULC-S505, AND SHALL BEAR THE ULC SEAL. A TIGHTLY FITTED ACCESS DOOR SHALL BE INSTALLED FOR EACH FIRE DAMPER TO PROVIDE ACCESS FOR INSPECTION, AND RESETTING OF DAMPER, AND REPLACING OF FUSIBLE LINK. DAMPERS SHALL BE SUPPORTED INDEPENDENTLY FROM DUCTWORK. DAMPERS SHALL BE OF THE SAME MATERIAL AS THE ASSOCIATED DUCTWORK. FIRE STOP ALL PIPE AND DUCT PENETRATIONS THROUGH ALL RATED SEPARATIONS. FIRE STOPPING MATERIALS TO SATISFY CURRENT CAN4/ULC-S115 STANDARD. PROVIDE FIRE-STOPPING FOR ALL OPENINGS IN FIRE SEPARATIONS FOR PASSAGE OF PIPES, DUCTS, ETC. TO MAINTAIN INTEGRITY OF FIRE SEPARATIONS AND TO SATISFY THE APPLICABLE FIRE-STOP AND SMOKE SEAL RATING. INSTALLATIONS TO CONFORM TO APPROVED MANUFACTURERS DETAILS AND CURRENT CAN/ULC STANDARDS. FIRE-STOPPING TO BE EQUAL TO 3M, HILTI OR TREMCO FIRE STOP SYSTEMS. CONTRACTOR TO SUBMIT INSTALLATION DETAILS AND SHOP DRAWINGS OF APPROVED SYSTEM FOR EACH VARIATION OF PENETRATION. CONTRACTOR SHALL BE PREPARED TO REMOVE FIRE-STOPPING ASSEMBLY FOR THREE (3) RANDOM INSPECTIONS BY CONSULTANT AND REPLACE AT NO EXTRA COST.

MATERIAL IDENTIFICATION

1. IDENTIFY PIPING WITH FACTORY FABRICATED SNAP ON PIPE MARKERS AND DUCTWORK WITH FACTORY FABRICATED NAMEPLATES. PIPE MARKERS SHALL BE FLEXIBLE, SEMI-RIGID PREFORMED TO FIT AROUND PIPE WITH OR WITHOUT COVERING. MARKERS SHALL INDICATE FLOW DIRECTION, FLUID, OR AIR SYSTEM BEING CONVEYED INDICATING ASSOCIATED ZONES WHERE APPLICABLE. APPLY LABELS AT 50 FT INTERVALS, BEFORE AND AFTER PIPES/DUCTS PASS THROUGH WALLS, AT ACCESS DOOR OPENINGS OR CLOSER. COLOR TO CONFORM TO ASME A13.1.
2. PROVIDE 3/4" DIAMETER BRASS NUMBER TAGS WITH NUMBER STAMPED IN BLACK, SECURED TO VALVE WHEEL WITH KEY CHAIN FOR VALVES NOT IN PLAIN SIGHT OF APPARATUS CONTROLLED. PROVIDE NEAT, TYPEWRITTEN DIRECTORIES GIVING VALVE NUMBER, VALVE SERVICE AND LOCATION OF VALVES. FRAME ONE COPY UNDER GLASS FOR WALL MOUNTING.
3. IDENTIFY EQUIPMENT, ELECTRIC STARTING SWITCHES AND REMOTE PUSH-BUTTON STATIONS WITH 1/4" LAMINATED PLASTIC PLATES.
4. WHERE HVAC/PLUMBING SERVICES ARE CAPPED IN FUTURE SPACE FOR FUTURE CONNECTION, CONTRACTOR TO EXTEND HVAC/PLUMBING SERVICES MINIMUM 12" INTO SPACE TO ALLOW FOR IDENTIFICATION.

DISINFECTION OF WATER PIPING AND CHEMICAL TREATMENT

CONTRACTOR TO CONTACT LOCAL WATER SPECIALIST PRIOR TO CONSTRUCTION TO ADVISE ON APPROPRIATE WATER TREATMENT. THIS CONTRACTOR SHALL ADVISE ENGINEER OF ANALYSIS AND PROVIDE A SEPARATE PRICE TO SUPPLY AND INSTALL THE REQUIRED EQUIPMENT.

PERFORM ALL TESTS AS REQUIRED BY CODE AND/OR LOCAL AUTHORITIES. APPLY 1035 KPA (150 PSI) WATER PRESSURE FOR EIGHT (8) HOURS WITHOUT A DROP IN PRESSURE, REPAIR LEAKS AND RE-TEST UNTIL SYSTEM DOES NOT DROP IN PRESSURE OVER 8 HOURS. FLUSH ALL SYSTEMS WITH SUFFICIENT VELOCITY UNTIL WATER IS CLEAR.

ALL DISINFECTION AND CHEMICAL TREATMENT SHALL BE DONE BY A SPECIALISTS WITH MINIMUM 3 YEARS OF RELATED EXPERIENCE AND APPROVED BY ENGINEER. CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT TO OBTAIN DESIRED RESULTS

DISINFECTION OF DOMESTIC WATER (AWWA C651) INTRODUCE CHLORINE (AWWA B301) INTO SYSTEM FOR 24 HOURS. AFTER 24 HOURS FLUSH SYSTEM AGAIN AND CHECK FOR RESIDUAL CHLORINE. WHERE REQUIRED FLUSH AGAIN TO ACCEPTABLE LEVELS OF LESS THAN 10 PPM.

CHEMICAL TREATMENT PROVIDE SHOP DRAWING OF EQUIPMENT, PREPARATION, MATERIALS AND PROPOSED CHEMICALS FOR APPROVAL. ALL PIPING SYSTEMS SHALL BE CHEMICALLY TREATED AND VENTED AS PER MANUFACTURES COMMISSIONING GUIDELINES. ENSURE PH LEVELS AND WATER HARDNESS IS WITHIN MANUFACTURERS GUIDELINES. CONTRACTOR TO CONTACT LOCAL WATER COMPANY FOR A CHEMICAL ANALYSIS AND ADVISE IN WRITING TO THE ENGINEER THE RESULT OF THE CHEMICAL ANALYSIS TO DETERMINE IF FILTERS AND OR WATER SOFTENERS MAY BE REQUIRED. PROVIDE AN OUTLINE OF ANY ADDITIONAL TREATMENT AND/OR PERMANENT EQUIPMENT THAT MAY BE REQUIRED FOR THE SYSTEM. THIS SHALL BE DONE BY THE HVAC CONTRACTOR AT AWARD OF TENDER AND PRIOR TO CHEMICAL TREATMENT PROCEDURE. CONTRACTOR TO ADVISE THE DATE OF CLEANING FOR ENGINEER PRESENCE. WHERE ANY ADDITIONAL PERMANENT EQUIPMENT IE. WATER SOFTENER/FILTER SYSTEM, IS REQUIRED CONTRACTOR TO PROVIDE A SEPARATE PRICE TO SUPPLY AND INSTALL.

CHEMICAL TREATMENT PROCEDURE ESTABLISH CIRCULATION AND APPLY HEAT TO RAISE TEMPERATURE SLOWLY TO 160°F. CIRCULATE FOR 12 HOURS AND ENSURE FLOW IN ALL CIRCUITS. REMOVE HEAT AND CONTINUE TO CIRCULATE 100°F OR LESS. DRAIN SYSTEM AS QUICKLY AS POSSIBLE. REFILL WITH CLEAN WATER, CIRCULATE FOR 6 HOURS AT DESIGN TEMPERATURE, DRAIN. REFILL WITH CLEAN WATER AND ADD APPROVED CHEMICALS IN APPROPRIATE CONCENTRATIONS AS REQUIRED.

1. PROVIDE EQUIPMENT TO ADD CHEMICALS AS REQUIRED.
2. PREVENT DEBRIS AND DIRT FROM ENTERING SYSTEM DURING CONSTRUCTION.
3. PROVIDE ADEQUATE DRAIN CONNECTIONS TO COMPLETELY DRAIN EACH SYSTEM IN ONE HOUR.
4. CLEAN STRAINERS FREQUENTLY.
5. CONTRACTOR TO ENSURE ALL SYSTEMS ARE OPERATIONAL TO ENSURE FLOW THROUGH ALL SYSTEMS.
6. SYSTEM PUMPS MAY BE USED FOR CLEANING PROVIDED SEALS ARE REPLACED, PUMPS ARE DISMANTLED AND INSPECTED BY PUMP MANUFACTURER.

DUCTWORK MATERIAL AND GAUGE

– 6" TO 12" WIDE OR ROUND – 26 GAUGE GALVANIZED, 24 GAUGE ALUMINUM

– 14" TO 30" WIDE OR ROUND – 24 GAUGE GALVANIZED, 22 GAUGE ALUMINUM

– 32" TO 54" WIDE OR ROUND – 22 GAUGE GALVANIZED 20 GAUGE ALUMINUM

– NFPA GREASE DUCTWORK SHALL BE 16 GAUGE WELDED

1. SIZES ABOVE ARE BASED ON 2" W.G, 2000FPM.
2. ALL GOOSENECKS TO BE 22 GAUGE, TERMINATE 24" AFR.
3. UNLESS NOTED ON PLANS ALL OUTDOOR HORIZONTAL DUCTWORK OR BURIED DUCTWORK WITH EXCEPTION TO NFPA DUCTWORK SHALL BE 20 GAUGE.
4. ALL DUCTWORK SERVING DISHWASHERS, POOLS OR APPLICATIONS WITH HIGHER THAN NORMAL HUMIDITY APPLICATIONS SHALL BE ALUMINUM.
5. DISHWASHER DUCTWORK SHALL BE SLOPED BACK FOR DRAINAGE AND PIPED TO AN APPROVED DRAIN. ALL JOINTS MUST BE SOLDERED TO PREVENT LEAKING. AN ACCESSIBLE BALANCING DAMPER SHALL BE PROVIDED AT THE DISHWASHER CONNECTION TO THE EXHAUST SYSTEM.
6. REFER TO BURIED DUCTWORK DETAIL FOR BURIED DUCTWORK. IF NOT SHOWN ON PLANS PLEASE CONTACT ENGINEER FOR DETAIL. ALL BURIED DUCT TO BE BELOW FROST LINE.
7. ALL DUCTWORK SHALL BE PRESSURE TESTED AND SEALED AS PER ASHRAE 90.1

SQUARE DUCTWORK SUPORTS

UP TO 18" – PAIR OF 1"X16 GAUGE HANGER STRAPS OR PAIR OF 1/4" RODS AND 1"X1"X1/8" ANGLES. SUPPORT EVERY 8FT

18" TO 30" – PAIR OF 1"X16 GAUGE HANGER STRAPS OR PAIR OF 1/4" RODS AND 1"X1"X1/8" ANGLES. SUPPORT EVERY 8FT

32" TO 42" – PAIR OF 1"X16 GAUGE HANGER STRAPS OR PAIR OF 1/4" RODS AND 11/2"X11/2"X1/8" ANGLES. SUPPORT EVERY 8FT

44" TO 60" – PAIR OF 3/8" RODS AND 11/2"X11/2"X1/8" ANGLES. SUPPORT EVERY 4FT

1. IN ADDITION TO ABOVE SUPPORT AT 2FT FROM EACH ELBOW AND WITHIN 4 FT OF EACH BRANCH INTERSECTION.
2. 2FT FROM EACH PIECE OF ASSOCIATED EQUIPMENT TO WHICH IT IS ATTACHED.
3. HANGER STRAPS SHALL NOT BE USED WHERE DUCTWORK IS EXPOSED.
4. HANGER STRAPS SHALL TURN 2" AT UNDERSIDE OF DUCT AND BE FASTENED AT SIDES AND BOTTOM.
5. ALL HANGERS ARE FROM BUILDING STRUCTURE.
6. IN ADDITION TO THE ABOVE SPACING SUPPORT VERTICAL DUCTS THROUGH FLOOR WITH CONTINUOUS LENGTHS OF STRUCTURAL ANGLE. SIZED AT LEAST TO THAT OF STIFFENING.
7. ROOFTOP EXPOSED DUCTWORK SHALL BE SUPPORTED WITH MIFAB C-PORT DSA SYSTEM

ROUND DUCTWORK SUPORTS

UP TO 24"–1/4" ROD WITH 20 GAUGE BAND AND GRINNELL FIGURE 114 TURNBUCKLE. SUPPORT EVERY 10FT

25"–36" – 3/8" ROD WITH 18 GAUGE BAND AND GRINNELL FIGURE 114 TURNBUCKLE. SUPPORT EVERY 8 FT

38"–50" – TWO 3/8" RODS WITH TWO 18 GAUGE BANDS AND GRINNELL FIGURE 114 TURNBUCKLE. SUPPORT EVERY 8 FT

1. IN ADDITION TO ABOVE SUPPORT AT 2FT FROM EACH ELBOW AND WITHIN 4 FT OF EACH BRANCH INTERSECTION.
2. 2FT FROM EACH PIECE OF ASSOCIATED EQUIPMENT TO WHICH IT IS ATTACHED.
3. ROUND FLEXIBLE DUCTWORK SHALL BE SUPPORTED EVERY 5 FT AND SHALL NOT BE USED IN RESIDENTIAL APPLICATIONS.
4. ALL HANGERS ARE FROM BUILDING STRUCTURE.
5. ALL DUCTWORK SHALL BE SUPPORTED BEFORE AND AFTER WALL OPENINGS/SLEEVES. DO NOT REST DUCTS ON WALL OPENINGS/SLEEVES.

DUCTWORK INSULATION

1. ALL REQUIRED INSULATION TO BE OF 100% COVERAGE AND INSTALLED WITHOUT SAGGING. PROVIDE ACCESSORIES AS REQUIRED.
2. ALL DUCTWORK SURFACES MUST BE CLEANED PRIOR TO INSTALLATION.
3. ALL EQUIPMENT SHALL BE INSULATED TO THE SAME STANDARD AS THE CONNECTED DUCT OR PIPE.
4. CONTINUE INSULATION THROUGH PENETRATIONS WITH VAPOUR BARRIER.

TYPE A – FLEXIBLE GLASS FIBRE; K VALUE OF 0.29 AT 75 DEGREES F FOIL SCRIM FACING

TYPE B – RIGID GLASS FIBRE; K VALUE OF 0.24 AT 75 DEGREES F

EXHAUST – 11/2" TYPE A TO 10 FT. FROM EXTERIOR WALL/ROOF

OUTDOOR AIR INTAKE – 3" TYPE A (R-8.4) UP TO HEAT SOURCE. 11/2" (R-4.2) AFTER HEAT SOURCE

EXPOSED DUCTWORK (OUTDOORS) – 4" TYPE B (MIN R-17). PROVIDE AS PER MANUFACTURERS RECOMMENDATIONS VENTURECLAD CW1577 INSULATION CLADDING

SUPPLY DUCTWORK – 11/2" TYPE A (R-4.2) – UNLESS NOTED OTHERWISE

ALL DUCTWORK IN UNHEATED AREAS – 3" TYPE B (MIN R-12)

DISHWASHER, KITCHEN EXHAUST DUCTWORK – 2" TYPE A (R-6.8)

ACOUSTIC INSULATION – ALL SUPPLY AIR AND RETURN AIR DUCTWORK FOR AIR HANDLING UNITS INCLUDING INTAKE/EXHAUST FANS SHALL BE INTERNAL ACOUSTICALLY LINED TO 15 FEET FROM UNIT OR AS SHOWN ON DRAWINGS WITH 1" TYPE B NEOPRENE COATED RIGID FIBERGLASS, WITH MECHANICAL FASTENER AT 16" CENTERS. UPSIZE DUCTWORK AS REQUIRED TO SUIT INSULATION THICKNESS

SYSTEM BALANCING AND COMMISSIONING

1. PRIOR TO COMMISSIONING AND ONCE AGAIN PRIOR TO OCCUPANCY CONTRACTOR SHALL ENSURE ALL FILTERS ARE CLEANED/REPLACED, PARTS LUBRICATED, WATER SYSTEMS CLEANED AND FLUSHED, BELTS TIGHTENED, CONTROLS COMPLETED, DUCTWORK CLEANED ETC. CONTRACTOR TO ALLOW FOR THIS IN HIS SCOPE OF WORK.
2. CONTRACTOR TO ADJUST AND SET ALL CONTROLS FOR ALL EQUIPMENT THAT FALLS WITHIN THERE SCOPE PRIOR TO COMMISSIONING SO THAT THE SYSTEM WORKS AS INTENDED AND AS PER OWNERS REQUIREMENTS.
3. ALL SYSTEMS AND EQUIPMENT SHALL BE COMMISSIONED AND BALANCED AS PER DRAWINGS, SPECIFICATIONS AND MANUFACTURES RECOMMENDATIONS FOR A COMPLETE WORKING SYSTEM. ALL COMMISSIONING SHALL BE CO-ORDINATED AND EXECUTED WITH THE APPLICABLE CONTRACTOR AND FOR LARGER CENTRAL SYSTEMS THE MANUFACTURERS REPRESENTATIVE. ALL SYSTEMS AND COMPONENTS MUST BE CONNECTED AND COMPLETE AS PER DRAWINGS. A CLEAR, DATED AND LEGIBLE TYPED START UP, COMMISSIONING AND BALANCING REPORT COMPLETE WITH SYSTEM SCHEMATICS NOTING ACTUAL SITE CONDITIONS SHALL BE PROVIDED TO ENGINEER FOR APPROVAL. ALL SYSTEMS SHALL BE BALANCED BY AN INDEPENDENT LICENSED CONTRACTOR TO WITHIN 10%. CONTRACTOR TO MAKE ADJUSTMENTS AS REQUIRED TO ACHIEVE DESIGN. THE ABOVE MENTIONED REPORT SHALL NOTE ALL ADDITIONAL WORK DONE IE REPLACING/CLEANING FILTERS, DUCTWORK CLEANING, WATER TREATMENT, CHANGING PULLEYS ETC.
4. CONTRACTOR TO ALLOW FOR TWO ADDITIONAL SITE VISITS TO MAKE FURTHER ADJUSTMENTS AS REQUIRED.
5. APPLICABLE CONTRACTOR SHALL PROVIDE MAINTENANCE AND OPERATION MANUALS CLEARLY HIGHLIGHTING MAINTENANCE SCHEDULE AND OPERATING OF EQUIPMENT/CONTROLS TO BUILDING OWNER AND/OR BUILDING ENGINEER. CONTRACTOR TO REVIEW IN PERSON MAINTENANCE PROCEDURE, SCHEDULE AND OPERATION OF ALL EQUIPMENT AND CONTROLS TO BUILDING OWNER OR ENGINEER.
6. WHERE SEASONAL CONSTRAINTS PREVENT EQUIPMENT TO FOLLOW THE ABOVE PROCEDURES CONTRACTOR TO SCHEDULE AS REQUIRED FOR SUCH EQUIPMENT AND SYSTEMS.
7. BALANCING CONTRACTOR SHALL BE A MEMBER OF A.A.B.C OR N.E.B.B.
8. ALL BALANCING SHALL BE IN ACCORDANCE WITH NATIONAL ENVIRONMENTAL BALANCING BUREAU STANDARDS.

GRILLES, DAMPERS, LOUVRES, TERMINATION

THE FOLLOWING SPECIFICATIONS ONLY APPLY WHERE NOTED ON PLANS OR IN THE EQUIPMENT SCHEDULE

1. ALL GRILLES AND DIFFUSERS TO BE C/W APPROPRIATE BORDER/FRAME TO SUIT CEILING/WALL/DOOR. CONTRACTOR TO CONFIRM CEILING/WALL/DOOR TYPES PRIOR TO ORDERING.
2. ALL NEW S.A AND R.A GRILLES ARE TO BE OF HIGH QUALITY AND SAMPLES ARE TO BE SUBMITTED TO ARCHITECT AND OR INTERIOR DESIGNER OR OWNER FOR APPROVAL PRIOR TO ORDERING. FINISH IS TO BE SELECTED BY ARCHITECT AND OR INTERIOR DESIGNER.
3. EXACT LOCATION AND MOUNTING HEIGHTS OF ALL SUPPLY, RETURN AND EXHAUST GRILLES TO BE APPROVED BY ARCHITECT AND/OR INTERIOR DESIGNER PRIOR TO INSTALLATION.
4. ALL EXTERIOR TERMINATIONS SHALL BE APPROVED BY ARCHITECT PRIOR TO ROUGH-IN. PROVIDE INSULATED PLENUM WHERE MULTIPLE DUCTS CONNECT INTO ONE LOUVRE.
5. AIR EXTRACTORS SHALL BE ADDED WHERE SUPPLY AIR OUTLETS ARE CONNECTED DIRECLTY TO A DUCT SERVING MULTIPLE OUTLETS.
6. CONTRACTOR TO ENSURE ALL NEW WALL LOUVRES AND ROOF PENETRATIONS AND CAPS MATCH BASE BUILDING
7. FINISH TO BE OFF-WHITE OR TO MATCH INTERIOR.

GRILLES AND DIFFUSERS

SHALL BE EQUAL TO EH PRICE UNLESS NOTED OTHERWISE

TYPE A – SUPPLY AIR REGISTER, SIZE AS SHOWN, MODEL 620L C/W ALUMINUM OBVD AND TYPE F BORDER, B-12 FINISH.

TYPE B – RETURN/EXHAUST AIR GRILLE, SIZE AS SHOWN, MODEL 630. C/W ALUMINUM OBVD AND TYPE F BORDER WHEN USED FOR DUCTED EXHAUST, B-12 FINISH.

TYPE C – RETURN/EXHAUST AIR GRILLE (EGG CRATE), SIZE AS SHOWN, MODEL CORE 80. PROVIDE TYPE F BORDER/FRAME FOR DUCTED AND SURFACE MOUNTED. PROVIDE ALUMINUM OBVD WHEN DUCTED, B-12 FINISH.

TYPE D – SQUARE CEILING SUPPLY AIR DIFFUSER, SIZE AS SHOWN, MODEL SCD C/W OBVD, B-12 FINISH.

TYPE E – LINEAR SUPPLY SLOT DIFFUSER, 1" SLOT, SURFACE MOUNT CONCEALED FRAME, SIZE OF LINEAR AND PLENUMS AS SHOWN ON PLANS. MODEL SDS-100 C/W VOLUME CONTROL. USE EH PRICE SDBI-100 INSULATED PLENUM. PLENUMS ARE OFFERED IN 2,3,4 AND 5 FT SECTIONS. COLLAR SIZES ARE 6,8,10,12. CUSTOM MADE PLENUMS SHALL MATCH MANUFACTURED PLENUMS.

TYPE F – LINEAR RETURN SLOT DIFFUSER, 1" SLOT, SURFACE MOUNT CONCEALED FRAME, SIZE AS SHOWN ON PLANS, MODEL SDR-100.

TYPE G – LINEAR SUPPLY BAR GRILLE, SIZE AS SHOWN, MODEL LBP15B FOR ALL APPLICATIONS EXCEPT FLOOR MOUNTED WHICH SHALL BE LBMH15B. C/W OBVD, CONCEALED FASTENING AND 3/4" BORDER. WHERE BEING SERVED BY A BRANCH DUCT CONTRACTOR IS TO PROVIDE INSULATED PLENUM BOOT EQUAL TO EH PRICE UP OR UPL, B-12 FINISH WHERE PAINTED OR #66 WHERE NOT PAINTED. EXACT FINISH TBD.

TYPE H – LINEAR RETURN BAR GRILLE, SIZE AS SHOWN, MODEL LBP15B, C/W CONCEALED FASTENING AND 3/4" BORDER, B-12 FINISH WHERE PAINTED OR #66 WHERE NOT PAINTED. EXACT FINISH TBD.

TYPE I – ROUND CEILING SUPPLY AIR DIFFUSER, SIZE AS SHOWN IS NOMINAL DUCT SIZE), MODEL RCD C/W OBVD, B-12 FINISH.

TYPE J – DOOR TRANSFER GRILLE SIZE AS SHOWN, MODEL ATG1, B-12 FINISH.

TYPE K – FIRE RATED DOOR TRANSFER GRILLE, SIZE AS SHOWN. NAILOR MODEL 61DGD-FR, B-12 FINISH.

TYPE L1 AND L-2 – LINEAR VANE GRILLE, SIZE AS SHOWN, MODEL (L1 FOR LV-1) (L2 FOR LV-2) C/W OBVD, CONCEALED FASTENING AND 3/4" BORDER. WHERE BEING SERVED BY A BRANCH DUCT CONTRACTOR IS TO PROVIDE CUSTOM 1/2" INSULATED PLENUM BOOT. BOOT SHALL BE SIZED AS FOLLOWS LENGTH AND WIDTH 2" LARGER THAN LINEAR COLLAR SIZE AND HEIGHT SHALL BE 2" LARGER THAN ASSOCIATED DUCT BRANCH SIZE.

TYPE M – SQUARE PERFORATED CEILING DIFFUSER, SIZE AS SHOWN, MODE APDDR B-12 FINISH.

TYPE N – LINEAR ADJUSTA SLOT DIFFUSER MUD IN TYPE, SINGLE SLOT MODEL (REFER TO PLANS FOR LENGTH AND SLOT WIDTH) AS210 WITH 22 BORDER, CONCEALED MOUNTING, DUAL PATTERN CONTROLLERS, XX ENDS. REFER TO PLANS FOR PROVIDE INSULATED UNIVERSAL PLENUM MODEL UP22SM WITH 6" CONNECTION TO MATCH ASSOCIATED LINEAR. PLENUMS ARE OFFERED IN 2,3,4 AND 5FT SECTIONS.

LOUVRES AND TERMINATIONS

WALL BOX- GREENHECK – FOR MASONRY USE BRICK VENT BVF808 FOR UP TO 250CFM FOR C/W B/SC AND B/D/D BAKED ENAMEL. COLOUR BY OTHERS.

WALL LOUVRE L-2 – MODEL ESD-202 WITH ALUMINUM SLEEVE AS REQUIRED. MIN 8" DEEP.

WALL LOUVRE L-4 – MODEL ESD-403 WITH ALUMINUM SLEEVE AS REQUIRED MIN 12" DEEP.

L2 AND L-4 LOUVRE SIZES AS NOTED ON PLANS C/W PRIME COAT FINISH FOR FIELD PAINTING, B/SC, B/D/D (UNLESS NOTED AS A MOTORIZED DAMPER ON PLANS). WALL OPENING SIZE SHALL BE LISTED LOUVRE SIZE. EXAMPLE 6X6 LOUVRE WILL NEED AN 6X6 OPENING. OPENING SIZE SHALL BE CONFIRMED AND SUPPLIED TO MANUFACTURER PRIOR TO ORDERING.

RV-EXH, RV-INT (ROOF VENTILATOR FOR EXH./INTAKE)

GREENHECK FABRA MODEL FGI FOR INTAKE AND FGR FOR EXHAUST. SPUN ALUMINUM, COLOUR AS PER OWNER/ARCHITECT, C/W 12" TALL BASE ROOF CURB OR PITCHED ROOF CURB AS REQUIRED, B/SC, PRIME COAT FINISH FOR FIELD PAINTING AND FULL SIZE INSULATED DUCT DROP (EXACT LENGTH OF DROP T.B.D AT SITE). PROVIDE B/D/D TO EACH CONNECTION AT PLENUM DROP OR MOTORIZED DAMPER WHERE NOTED ON PLANS.

ROOF CAP (ALUMINUM)- GREENHECK – MODEL RCC-7 (UNLESS LISTED ON PLAN) C/W B/SC AND HORIZONTAL B/D/D AND 12" CURB.

BACK DRAFT- GREENHECK – COMMERCIAL WD SERIES C/W ACTUATOR PACK WHERE NOTED ON PLANS. CONTRACTOR TO VERIFY ORIENTATION AND DIRECTION OF AIRFLOW WITH MANUFACTURER WHEN ORDERING. HORIZONTAL MOUNTED DAMPERS SHALL BE C/W COUNTERBALANCE WHERE MOTORIZED DAMPER IS NOT SPECIFIED ON PLANS. PROVIDE ALUMINUM SLEEVE AND OR FLANGE AS REQUIRED. WHERE DAMPER IS ATTACHED TO LOUVRE, LOUVRE SHALL BE ORDERED WITH SLEEVE TO ACCOMMODATE THIS DAMPER. CONTRACTOR TO VERIFY WALL OPENING PRIOR TO ORDERING.

MANUAL BALANCING DAMPER- GREENHECK – MDB-15 SERIES. CONTRACTOR TO VERIFY ORIENTATION AND DIRECTION OF AIRFLOW WITH MANUFACTURER WHEN ORDERING. . PROVIDE ALUMINUM SLEEVE AND OR FLANGE AS REQUIRED.

MOTORIZED DAMPER- GREENHECK – COMMERCIAL VCD-20 SERIES C/W --- MOTORIZED DAMPER PACK WHERE NOTED ON PLANS. PROVIDE ALUMINUM SLEEVE AND OR FLANGE AS REQUIRED. WHERE DAMPER IS ATTACHED TO LOUVRE, LOUVRE SHALL BE ORDERED WITH SLEEVE TO ACCOMMODATE THIS DAMPER. CONTRACTOR TO VERIFY WALL.

FIRE DAMPER- GREENHECK – MODEL FD SHALL BE TYPE B, --- HOUR FIRE RATED AND COMPLETE WITH 160 DEG. REPLACEABLE LINK. DISHWASHER, KITCHEN OR ANY DUCTWORK DISCHARGING HIGH TEMPERATURE SHALL BE COMPLETE WITH A 350°F REPLACEABLE LINK.

SMOKE DAMPER- GREENHECK – MODEL SMD, 3-V BLADE CLASS 2 C/W ACTUATOR, SLEEVE AND SMOKE DETECTOR OR TIED INTO BUILDING MONITORING SYSTEM. POWER FOR ACTUATOR SHALL BE ---.

FIRE/SMOKE DAMPER- GREENHECK – TBD

PIPE MATERIAL

1. ALL PIPING MUST BE APPROVED FOR THE WATER TEMPERATURES BEING SERVED.
2. WHERE APPROVED ALL NON METALLIC PIPING MUST BE APPROVED BY ENGINEER IN WRITING AND BE INSTALLED AS PER MANUFACTURERS GUIDLINES. IN ADDITION, TO ENSURE COMPATIBILITY, PERFORMANCE AND MATERIAL QUALITY, IT IS RECOMMENDED THAT THE PIPE AND FITTING DRAINAGE SYSTEM SHALL BE PRODUCED BY THE SAME MANUFACTURER. THE MANUFACTURER OF THE PIPE AND FITTING SYSTEM SHALL BE CONTACTED BY THE TRADE CONTRACTOR PRIOR TO THE INSTALLATION TO OBTAIN PRECISE INSTALLATION INSTRUCTIONS. AS WELL, SITE MEETINGS SHALL BE ARRANGED AND INCLUDE, THE CONTRACTOR, MANUFACTURER AND BUILDING INSPECTOR.
3. ALL BLACK STEEL PIPING AND ACCESSORIES LOCATED IN AREAS THAT ARE CORROSIVE OR AREAS WHICH ARE SUBJECT TO HIGH HUMIDITY CONDITIONS SUCH AS AN INDOOR POOL OR AN ARENA SHALL BE GALVANIZED.
4. ALL PIPING SHALL MEET THE FLAME AND OR SMOKE RATING AS SPECIFIED IN THE APPLICABLE CODES.
5. ADD AN ADDITIONAL 1" INSULATION TO THE VALUES BELOW WHERE PIPING IS LOCATED IN UNHEATED AREAS WITHOUT OR WITHOUT HEAT TRACING.
6. PROVIDE EXPANSION LOOPS, COMPENSATORS, GUIDES, ANCHORS OR JOINTS AS REQUIRED BY APPLICABLE CODES. WHERE CONTRACTOR IN UNSURE OF THESE CODES ENGINEER SHALL BE CONTACTED INSTRUCTION.
7. WHERE NON METALLIC PIPING IS NOT APPROVED DURING TENDER PROCESS IT IS ASSUMED THAT IT IS NOT BEING USED.
8. USE UNIONS, FLANGES, AND COUPLINGS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
9. USE NON-CONDUCTING DIELECTRIC CONNECTIONS WHENEVER JOINTING DISSIMILAR METALS IN OPEN SYSTEMS.
10. ALL DRAINAGE PIPING SHALL BE CHECKED FOR SLOPES TO THE SATISFACTION OF THE ENGINEER.

ALL UNBURIED DOMESTIC WATER PIPING – 4" AND UNDER SHALL BE TYPE 'L' COPPER COMPLETE WITH WROUGHT COPPER SOLDERED/BRAZED JOINT PRESSURE FITTINGS. PIPING OVER 4" SHALL BE ---.

ALTERNATIVELY WHERE APPROVED DURING TENDER PROCESS BY LANDLORD/ENGINEER PIPING MAY BE AS FOLLOWS. PEX-A FOR SIZES 11/2" AND UNDER. IT MUST BE ENGEL METHOD PEX-A. PEX SHALL NOT BE USED WHERE EXPOSED TO UV LIGHT AND FOR INDIVIDUAL FIXTURE SUPPLIES. PEX SHALL BE INSTALLED TO SUIT MANUFACTURERS LISTED RATINGS. ALL PEX PIPING SHALL BE PLENUM RATED.

BURIED DOMESTIC WATER PIPING – FOR SIZE 2" DIAMETER AND SMALLER TO BE TYPE 'K' COPPER COMPLETE WITH WROUGHT COPPER SOLDERED/BRAZED JOINT PRESSURE FITTINGS. FOR SIZES 3" AND LARGER TO BE PVC C-900 C.S.A. LABELED AND COMPLETE WITH WIRE TRACER. PIPE TO BE BEDDED AS REQUIRED BY LOCAL AUTHORITIES AND PROVIDE MINIMUM 6FT COVER WHERE EXPOSED TO FROST. WHERE 6FT COVERAGE IS NOT POSSIBLE CONTRACTOR TO NOTIFY ENGINEER PRIOR TO ANY WORK BEING DONE. CROSS LINKED POLYETHYLENE MAY BE USED IN AREAS WITHIN BUILDING AS LONG AS THE PIPING IS NOT EXPOSED TO FROST, IS 11/2" AND SMALLER, RUN IN CONDUIT C/W WIRE TRACER AND IS APPROVED BY BUILDING LANDLORD AND/OR OWNER. PEX PIPING MUST BE APPROVED FOR POTABLE WATER.

UNBURIED STORM, SANITARY, VENT, CONDENSATE, PIPING

SHALL BE TYPE L DWV COPPER WITH WROUGHT COPPER SOLDERED/BRAZED JOINTS OR CAST IRON PIPE AND APPROVED FITTINGS/JOINTS.

ALTERNATIVELY WHERE APPROVED DURING TENDER PROCESS AND PRIOR TO CONSTRUCTION BY LANDLORD/ENGINEER PIPING, MAY BE AS FOLLOWS.

NON HIGH RISE BUILDINGS OF NON COMBUSTIBLE CONSTRUCTION

IPEX SYSTEM 15. SYSTEM XFR SHALL BE USED IN PLENUMS AND UNLESS APPROVED OTHERWISE ALL AREAS LOCATED AT 7FT ABOVE FLOOR. NO COMBUSTIBLE PIPING SHALL BE USED IN VERTICAL SHAFTS.

NON HIGHRISE BUILDING OF COMBUSTIBLE CONSTRUCTION

IPEX SYSTEM 15 AND ABS. NO COMBUSTIBLE PIPING SHALL BE USED IN VERTICAL SHAFTS.

HIGH RISE BUILDINGS OF ALL CONSTRUCTION

IPEX SYSTEM XFR. NO COMBUSTIBLE PIPING SHALL BE USED IN VERTICAL SHAFTS.

ALL IPEX SYSTEMS SHALL BE INSTALLED AS PER MANUFACTURERS GUIDELINES USING THE APPROVED FITTINGS AND SOLVENT CEMENT.

BURIED STORM AND SANITARY PIPING – SHALL BE PVC AND SHALL LEAVE THE BUILDING WITH MINIMUM 6FT OF COVERAGE. PROVIDE APPROVED SOLVENT CEMENT. WHERE THIS IS NOT POSSIBLE HEAT TRACING AND INSULATION SHALL BE ADDED. ENGINEER TO BE CONTACTED FOR FURTHER DETAIL.

HOT WATER TANK RELIEF PIPING – SHALL BE DWV COPPER.

GAS PIPING – SHALL BE SCHEDULE 40 STEEL SCREWED FOR 2" AND SMALLER AND WELDED FOR LARGER SIZES. ALL SIZED GAS PIPING SHALL BE WELDED WITHIN CONCEALED SPACES. INSTALLATION AND IDENTIFICATION SHALL BE AS PER LOCAL GAS CODE AND INSTALLED BY LICENSED CONTRACTOR FAMILIAR WITH APPLICABLE CODES. PIPING SHALL NOT BE RUN IN A HEATING OR VENTILATING PLENUM UNLESS ITS A FAKE REMOVABLE CEILING OR IN A STAIRWELL WITHIN A VENTILATED SHAFT. PIPING WITH FITTINGS CANNOT RUN WHERE THE JOINTS CANNOT BE INSPECTED IN THERE FINAL POSITION PRIOR TO CONCEALING.

BURIED GAS PIPING – SHALL BE BURIED MINIMUM 3FT BELOW GRADE AND C/W TRACER WIRE AND MARKING TAPE. INSTALLATION AND IDENTIFICATION SHALL BE AS PER LOCAL GAS CODE AND INSTALLED BY LICENSED CONTRACTOR FAMILIAR WITH APPLICABLE CODES.

HEATING/HEATPUMP/CHILLED WATER PIPING – SHALL BE TYPE L COPPER OR BLACK STEEL SCHEDULE 40 THREADED TO 2" AND WELDED OVER 2".

PIPING SUPPORTS

1. ANVIL OR EQUIVALENT. ALL COMPONENTS ARE TO BE GALVANIZED.
2. WHERE SADDLE IS SPECIFIED HANGER SHALL NOT TOUGH PIPING.
3. REFER TO ANVIL MANUAL FOR SIZING AND DETAILS FOR ALL COMPONENETS.
4. USE TRAPEZE HANGERS WHERE PIPES CAN BE HUNG IS PARALLEL.
5. FOR ROOFTOP PIPE SUPPORTS USE MIFAB C RUBBER SUPPORT SERIES. PROVIDE PIPE EXTENSIONS AS REQUIRED TO SUIT LOCAL BY LAWS AND OBSTRUCTIONS.

PIPING LOWER ATTACHMENT

1. UP TO 2" USE FIGURE 65 WITH FIGURE 167 SADDLE . SADDLE ONLY USED WHERE PIPING IS INSULATED. USE CT-65 FOR UN-INSULATED COPPER APPLICATIONS.
2. 21/2"-4" USE FIGURE 260 WITH FIGURE 167 SADDLE. SADDLE ONLY USED WHERE PIPING IS INSULATED. USE CT-65 FOR UN-INSULATED COPPER APPLICATIONS.
3. 6" AND OVER USE FIGURE 260 WHERE NOT INSULATED AND USE FIGURE 260ISS WHERE PIPING IS INSULATED.

PIPING UPPER ATTACHMENT – CONCRETE INSERTS USE FIGURE 152, STEEL BEAMS USE FIGURE(S) 92 OR 93 BEAM CLAMPS.

PIPING INTERMEDIATE ATTACHMENT – USE FIGURE 146 THREADED ROD.

WALL SUPPORTS – USE FIGURE 67 FOR STEEL, USE FIGURE 67F FOR COPPER.

VERTICAL SUPPORTS – FOR UNDER 2" USE FIGURE 261 FOR STEEL AND CAST IRON, USE FIGURE CT-121 FOR COPPER.

PIPE SUPPORT SPACING

1. ALL PIPING SHALL BE SUPPORTED BEFORE AND AFTER WALL OPENINGS/SLEEVES. DO NOT REST PIPE ON OPENINGS.

STEEL – 6FT INTERVAL FOR 4" AND LESS, 10FT INTERVAL FOR OVER 4" AND AT ALL PIPE CONNECTIONS.

CAST IRON – AT EACH HUB OR JOINT, INTERVALS NOT EXCEEDING 10FT AND AT INTERVALS NOT EXCEEDING 3FT IF PIPE HAS MECHANICAL JOINTS AND THE LENGTH OF PIPE BETWEEN ADJACENT FITTINGS IS LESS THAN 12".

IPEX DRAINAGE SYSTEMS – 4FT INTERVAL OR AS PER MANUFACTURES GUIDELINES. SUPPORT AT END OF BRANCHES, CHANGE OF DIRECTION/ELEVATION. IF FIXTURE DRAIN IS MORE THAN 3FT PROVIDE SUPPORT AT TRAP.

COPPER – 6FT FOR 1" AND LESS AND 8FT FOR 11/4" AND ABOVE.

HEATING AND DOMESTIC PEX SYSTEMS – 3FT INTERVAL OR AS PER MANUFACTURERS GUIDLINES.

GAS PIPE – 8FT. FOR 3/4" , 10FT FOR 11/4"-21/2", 14FT FOR 3"-4" , 18 FT FOR 6"-8" AND AT ALL PIPE CONNECTIONS.

PIPE AND EQUIPMENT INSULATION

1. TYPE A INSULATION SHALL BE GLASS FIBRE INSULATION; <<K VALUE OF 0.24 AT 75 DEGREES F>>.
2. ALL EQUIPMENT SHALL BE INSULATED TO THE SAME STANDARD AS THE CONNECTED DUCT OR PIPE.
3. ALL REQUIRED INSULATION TO BE OF 100% COVERAGE INCLUDING FITTINGS.
4. WHERE THIS WORK IS PART OF AN EXISTING BASE BUILDING THE BASE BUILDING STANDARDS MUST BE ADHERED TO UNLESS THE THE BELOW SPECIFICATION IS MORE STRINGENT. BASE BUILDING CONSULTANTS TO CONFIRM.
5. ALL PIPING AND EQUIPMENT MUST BE TESTED AND SURFACES CLEANED PRIOR TO INSTALLATION.
6. CONTINUE INSULATION THROUGH PENETRATIONS WITH VAPOUR BARRIER.

JACKETS

1. FOR INTERIOR CONCEALED AREAS USE VAPOUR BARRIER JACKETS: KRAFT REINFORCED FOIL VAPOUR BARRIER WITH SELF-ADHESIVE JOINTS.
2. FOR INTERIOR EXPOSED AREAS USE PVC JACKETS: ONE PIECE, PRE-MOULDED TYPE.
3. FOR OUTSIDE EXTERIOR PIPING USE ALUMINUM JACKETS: <0.51 MM> <<0.020 INCH>> THICK; SMOOTH FINISH.

ABOVE GRADE DOMESTIC PIPING, CONDENSATE PIPING, TRAP PRIMER LINES AND SUMP PUMP DISCHARGE MAINS –1" INSULATION

ABOVE GRADE DOMESTIC HOT, RECIRCULATION PIPING

–1" INSULATION UP TO 2", 11/2" INSULATION OVER 2"

ABOVE GRADE STORM – 1" INSULATION

ABOVE GRADE SANITARY – 1" INSULATION ON HORIZONTAL PIPING AND 1" WHERE THERE IS A CONTINUOUS FLOW OF BELOW AMBIENT WATER.

SANITARY VENTING – 1" INSULATION UP TO 10 FEET FROM INSIDE FACE OF EXTERIOR WALL.

HEATING WATER PIPING AND TWO PIPE FAN COIL – 1" INSULATION UP TO 3/4", 11/2" INSULATION UP TO 11/2", 2" INSULATION FOR OVER 2" PIPE.

CHILLED WATER PIPING – 1" INSULATION UP TO 4", 11/2" INSULATION OVER 4".

FIRE STANDPIPE AND WET SPRINKLER PIPING – 2" TYPE A INSULATION WHERE RUNNING THROUGH UNHEATED AREAS.

HEAT TRACING – UNLESS NOTED OTHERWISE THE FOLLOWING SHALL APPLY. WHERE EXPOSED TO OUTDOOR TEMPERATURES OR LOCATED BELOW 6 FT FROST LINE ALL PIPING MENTIONED IN THESE SPECIFICATIONS INCLUDING FIRE STANDPIPE, WET SPRINKLER SYSTEMS, SUMP PUMP DISCHARGE LINES AND DRY PIPE DRUM DRIPS PIPING SHALL BE HEAT TRACED C/W 2" OF INSULATION. ONLY TRACE STORM PIPING FROM ROOF DRAIN UP TO 5 FT WITHIN HEATED SPACE. PIPE TRACING CABLES SHALL BE SUPPLIED AND INSTALLED BY CONTRACTOR INSTALLING ASSOCIATED PIPING. POWER SUPPLY SHALL BE SUPPLIED AND INSTALLED BY ELECTRICAL DIVISION. PIPE TRACING CABLES SHALL BE SELF REGULATING TYPE. MIN 5 WATTS/SQ.FT. CUT TO LENGTH, HARD WIRED. C/W ALL REQUIRED SENSORS, TERMINATION KITS, HARDWARE AND ACCESSORIES. 3M TTS SERIES OR APPROVED EQUAL. MECHANICAL AND ELECTRICAL DIVISIONS SHALL COORDINATE WORK FOR EXACT QUANTITIES & LOCATIONS OF REQUIRED PIPE TRACING, POWER SUPPLY LOCATIONS AND POWER/VOLTAGE REQUIREMENTS.

DRAINS

1. OUTLET SIZE TO BE AS PER PLUMBING SIZING NOTES UNLESS NOTED ON PLANS.
2. IN QUARRY OR MOSAIC TILED AREAS, PROVIDE SQUARE NICKEL BRONZE STRAINER.
3. FOR FLOATING FLOORS PROVIDE 9340-WSH.
4. CONTRACTOR TO CONFIRM WITH SUPPLIER EXACT USE AND INSTALLATION DETAILS FOR FURTHER RECOMMENDATIONS.

FLOOR DRAIN (FINISHED FLOORS) – SERIES 2005-A05NB-P050 NICKLE BRONZE, NO HUB, 5" DIA STRAINER, PRIMER CONNECTION.

FLOOR DRAIN (UNFINISHED FLOORS) – SERIES 2320-P050 CAST IRON TRACTOR GRATE, NO HUB, 8" DIA STRAINER, PRIMER CONNECTION.

FLOOR DRAIN (COMMERCIAL KITCHEN) – PROVIDE 9700-C-U ALL STAINLESS STEEL DRAINS WITH FLASHING CLAMP, 7" STRAINER AND TAMPER PROOF GRATE.

(ALTERNATE) FLOOR DRAIN (COMMERCIAL KITCHEN) – PROVIDE 2005-A06NBSS-B-U CAST IRON DRAINS WITH FLASHING CLAMP, 6" STAINLESS STEEL STRAINER, SEDIMENT BUCKET AND TAMPER PROOF GRATE.

FUNNEL FLOOR DRAIN (FINISHED FLOORS) – SERIES 2005-A05NB-2695-3591NB, 5" DIA NICKLE BRONZE OPEN THRROAT STRAINER, NO HUB, NICKEL BRONZE OVAL FUNNEL--- ADAPTER PRIMER CONNECTION.

FUNNEL FLOOR DRAIN (UNFINISHED FLOORS) – SERIES 2320-2695-3591, CAST IRON TRACTOR GRATE WITH FULL OPEN THROAT, NO HUB, OVAL CAST IRON FUNNEL--- ADAPTER PRIMER CONNECTION.

HUB DRAIN (FINISHED FLOORS) – SERIES 2005-2645RB-P050, ROUGH BRONZE HUB FUNNEL, NO HUB, 4" ADAPTER, PRIMER CONNECTION.

HUB DRAIN (UNFINISHED FLOORS) – SERIES 2005-2645-P050, CSAT IRON HUB FUNNEL, NO HUB, 4" ADAPTER, PRIMER CONNECTION.

TRAFFIC AREA DRAINS (LARGE CAPACITY) – SERIES SQ-2-1717B FLOOR DRAIN. PROVIDE SMITH SQ-2-1717-ADJ-B DRAIN WHEN AN ADJUSTABLE EXTENSION SLEEVE IS REQUIRED – HEIGHT TO SUIT DECK CONSTRUCTION.

GARAGE DRAIN (LARGE CAPACITY) – SERIES SQ-2-1717B FLOOR DRAIN. PROVIDE SMITH SQ-2-1717-ADJ-B DRAIN WHEN AN ADJUSTABLE EXTENSION SLEEVE IS REQUIRED – HEIGHT TO SUIT DECK CONSTRUCTION.

AREA DRAIN (LIGHT TRAFFIC AREAS) – SERIES 2320NB NICKEL BRONZE TRACTOR GRATE, NO HUB, 8" DIA STRAINER.

TERRACE DRAIN (BALCONY AREA) – SERIES 1670T NICKEL BRONZE SRRAINER, THREADED CONNECTION, 6" DIA STRAINER WITH SIDE OUTLET.

TERRACE DRAIN (BALCONY AREA) – SERIES 1610T-B4 NICKEL BRONZE SRRAINER, THREADED CONNECTION, 6" DIA STRAINER WITH 4' DEEP BODY, BOTTOM OUTLET.

TRENCH DRAINS – SMITH SERIES 9930 TRENCH DRAIN SYSTEMS. FOR APPLICATIONS WITH TRAFFIC UNDER 3500 LBS-70PSI USE GRATE 9870-451-SSPA GRATE AND TYPE 304 STAINLESS STEEL OVERLAY RAIL EDGE OR 9870-491-HPP POLYPROPYLENE. FOR TRAFFIC OVER 3500 LBS-70PSI AND VEHICLE TRAFFIC USE GRATE 9870-455-SSHD GRATE.

ROOF DRAIN – SMITH SERIES 1010ERCCID ROOF DRAIN. ON SMALL AREA ROOFS PROVIDE SERIES 1330ERCCID DRAIN. INVERTED ROOF INSTALLATION USE SERIES 1017RCCID DRAINS. PROVIDE SUMP RECEIVER.

ROOF DRAIN (FLOW CONTROL) – SMITH SERIES 1083-CAN ROOF DRAIN. INVERTED ROOF INSTALLATION USE SERIES 1017-83 DRAINS. PROVIDE SUMP RECEIVER.

VALVES

1. WHERE POSSIBLE PROVIDE VALVES OF SAME MANUFACTURER THROUGHOUT. PROVIDE VALVES WITH MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON BODY (PER MSS-SP-25). PRODUCT SHALL CARRY VALID CRN (CANADIAN REGISTRATION NUMBER) ISSUED BY RESPECTIVE PROVINCES. ALL PRESSURE RATINGS, MANUFACTURERS TRADEMARK AND SIZE TO CONFORM AS PER MSS-SP-25.
2. DISSIMILAR METALLIC CONNECTION USE DIELECTRIC ISOLATING COUPLING FOR BUSHINGS.
3. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.

BALL VALVES (ISOLATION & BALANCING) – UP TO 4", 1034 KPA (150PSIG)/600WOG RATING, BRASS AND OR BRONZE BODY, FULL PORT, TFE SEATS, DOUBLE O-RING DESIGN, OR TEFLON PACKING, CHROME PLATED SOLID BRONZE BALL, LEVER HANDLE. PROVIDE STEM EXTENSION WITH PIPING THAT IS INSULATED. SOLDERED: KITZ 59, THREADED: KITZ 58.

DRAIN VALVE – KITZ 3/4" 68AC

CHECK VALVES (BACKFLOW PREVENTION) HORIZONTAL & VERTICAL SERVICE.

UP TO 2", 860KPA (125PSIG)/200 WOG RATING, BRONZE BODY TO ASTM B62, BRONZE TRIM, AND Y SWING PATTERN. SOLDERED: KITZ 2, THREADED: KITZ 22. OVER 2", 860KPA (125PSIG) /200WOG RATING, CAST IRON BODY, TO ASTM A126 BRONZE TRIM, BOLTED BONNET, FLANGED. FLANGED: KITZ 78.

CIRCUIT BALANCING VALVES – B&G PIC-V UP TO 4.5 GPM, B&G CIRCUIT SENTRY FOR ABOVE 4.5 GPM.

PLUMBING AND HYDRONIC SPECIALTIES

STRAINERS – UP TO 2", 860KPA (125PSIG)/200 WOG RATING, BRONZE BODY, SCREWED CAP, Y-PATTERN, S.S SCREEN WITH 1/32 PERFORATION, SOLDERED: KITZ 16, THREADED: KITZ 15. OVER 2", 860KPA (125 PSIG) / 200 WOG RATING, CAST IRON BODY, BOLTED COVER, Y-PATTERN, S.S. SCREEN WITH 1/32 PERFORATION, FLANGED: KITZ#80.

WALL HYDRANT BOX – SMITH SERIES 5509QTSAP BOX TYPE WALL HYDRANT.

CLEANOUTS – SERIES 4100 FLOOR CLEANOUT, DUCO COATED CAST IRON BODY AND REMOVABLE POSITIVE GASKET SEAL CLOSURE.

PLUG AND HEAVY DUTY 6" (150MM) WITH EXTRA HEAVY NICKEL BRONZE COVER AND FRAME, SECURED WITH STAINLESS STEEL SCREWS, C.O. CAST IN COVER. (FOR WATER-PROOFED AREAS PROVIDE 'FC' FLANGE WITH FLASHING CLAMP).

NON FREEZE WALL HYDRANT – BOX – EXTERIOR – JAY R. SMITH SERIES 5509QT BOX TYPE WALL HYDRANT, 1/4 TURN NON-DRIP, CERAMIC CARTRIDGE, 3/4" (19MM) NON FREEZE WALL TYPE WITH BRONZE FACE AND STAINLESS STEEL WITH FULL 180 DEG. COVER OPENING BOX, ADJUSTABLE WALL-FLANGE OPERATING KEY AND SELF-DRAINING INTEGRAL VACUUM BREAKER. LENGTH TO SUIT WALL THICKNESS.

WATER HAMMER ARRESTORS – SMS INC. #SC SERIES SC SERIES SERIES 'SC' WATER HAMMER ARRESTORS WITH BRASS PISTON IN A TYPE 'K' COPPER CASING SIZE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS CHART BELOW TO ELIMINATE WATER HAMMER AND SHOCK FROM PIPING SYSTEM. PROVIDE AT ALL FIXTURES

TRAP SEAL PRIMER – SERVING 1 TO 4 DRAINS – SMS INC. #PR-500 SMS INC. #PR-500 AUTOMATIC TRAP SEAL PRIMER VALVE, CAST BRASS BODY, SERVING INDIVIDUAL OR REMOTE AREA DRAINS (PRIMER AUTOMATICALLY ACTIVATED WHEN THERE IS A PRESSURE DROP IN THE SYSTEM) WITH 1/2" (12.7MM) NPT (MTOF) CONNECTIONS WITH STRAINER AND INTEGRAL BACK FLOW PREVENTER & VACUUM BREAKER. PROVIDE APPROPRIATE DISTRIBUTION FITTING UP TO 4 DRAINS MAXIMUM. WHERE CONTRACTOR SUBSITUTES PRIMER WITH ALRERNATIVE REQUIREING POWER CONTRACTOR MUST INFORM ELECTRICIAN.

THERMOMETERS – TRERICE BX9 SERIES.

1. PROPER RANGE SHALL BE SELECTED SO THAT OPERATING TEMPERATURE OF THE MATERIAL BEING MEASURED WILL FALL APPROXIMATELY IN THE MIDDLE OF THE SCALE. WHERE INSULATION EXCEEDS 2" THICK, A LONGER STEM THERMOMETER WILL BE USED WITH AN EXTENSION NECK BRASS SEPARABLE THERMOWELL. THE EXTENSION NECK WILL BE AT LEAST 2" LONG.
2. THERMOMETERS FOR MEASURING FLUID WILL HAVE STEMS WITH INSERTION LENGTHS ROUGHLY HALF THE PIPE DIAMETER, MINIMUM INSERTION LENGTH WILL BE 2". THERMOMETERS INSTALLED ON TANKS WILL HAVE MIMIMUM INSERTION LEGTHS OF 5".
3. THERMOMETERS FOR MEASURING AIR TEMPERATURES WILL BE SAME AS LIQUID WITH THE EXCEPTION OF HAVING A PERFORATED GUARD STEM AND A MOUNTING FLANGE INSTEAD OF A BRASS SEPARABLE THERMOWELL.
4. THERMOSTATS SHALL BE EASILY ACCESSIBLE AND READABLE.

PRESSURE GAUGES – TRERICE 450 SERIES WITH 316 STAINLESS STEEL BOURDON TUBE/SOCKET AND STAINLESS STEEL NEEDLE VALVES.

1. PROPER RANGE SHALL BE SELECTED SO THAT THE AVERAGE OPERATING PRESSURE OF THE MATERIAL BEING MEASURED WILL FALL APPROXIMATELY IN THE MIDDLE OF THE SCALE.
2. GAUGES ON ANY SERVICE WHERE PRESSURE SURGES OR PULSATIONS ARE POSSIBLE WILL BE PROVIDED WITH TRERICE #872 PRESSURE SNUBBERS.
3. GAUGES SHALL BE EASILY ACCESSIBLE AND READABLE.

AUTOMATIC AIR VENTS – B&G SERIES #792.

1. INSTALL AIR VENTS AT HIGH POINTS IN PIPING SYSTEMS, WHERE SPECIFIED, WHERE SHOWN ON THE DRAWINGS, AND WHERE REQUIRED TO FULLY VENT PIPING SYSTEMS.
2. INSTALL BALL VALVE IN THE PIPING TO EACH AIR VENT.
3. FOR ALL VENTS, EXCEPT FOR CREWDRIVER-OPERATED TYPE AT CONVECTORS AND UNITARY HEATING EQUIPMENT, PROVIDE 9MM (3/8") COPPER DRAINS TO NEAREST FLOOR DRAIN.
4. INSTALL DRAIN PIPING TO NEAREST SUITABLE APPROVED DRAIN OR LOCATION AND TERMINATE SO DISCHARGE IS VISIBLE.

AIR SEPARATOR – B&G USE BLA FOR 10 GAL AND UP USE HFT FOR UNDER 10 GAL.

1. FOR 2" AND UNDER SERIES USE B&G EAS. SIZED AS PER INCOMING/DISCHARGE PIPE SIZE.
2. FOR 3" AND UP SERIES USE B&G ROLAIRTROL. SIZED AS PER INCOMING/DISCHARGE PIPE SIZE.

ZONE VALVES – CALEFFI MODEL 6442 UP TO 1" AND MODEL Z-4 FOR 11/4".

SAFETY RELIEF VALVES – B&G SERIES.

THERMOSTATIC MIXING VALVE – CALEFFI 521 MIXCAL WITH BUILT IN PRESSURE GUAGE

PRESSURE REDUCING VALVE – WATTS UB5-Z3

REDUCED PRESSURE BACKFLOW PREVENTOR – WATTS 009 UP TO 3" AND WATTS 909 OVER 3".

SIDE SREAM FILTER – AXIOM CBF SERIES WITH FLOW RATE AS NOTED ON PLANS.

CHEMICAL POT FEEDER – AXIOM SFP SERIES WITH SIZE AS NOTED ON PLANS.

EQUIPMENT SCHEDULE

REFER TO SPECIFICATIONS FOR PRODUCT CHANGES AND SUBMITTAL PROCESS. REFER TO PLANS FOR EXACT QUNATITY AND LOCATION OF EACH PIECE OF EQUIPMENT

MANUAL AND MAGNETIC STARTERS

ALL EQUIPMENT WITH MOTORS GREATER THAN OR EQUAL TO 1/3 HP SHALL HAVE MANUAL STARTERS UNLESS NOTED OTHERWISE OR AS BELOW.
ALL EQUIPMENT WITH MOTORS THAT ARE INTERLOCKED OR NOT MANUALLY OPERATED, WHERE THE MOTOR WILL START OR SHUT-DOWN BY ITSELF SHALL HAVE MAGNETIC STARTERS.

WIRING NOTES

DIVISION 15 WILL SUPPLY/MOUNT ALL ELECTRIC MOTORS, STARTERS, TRANSFORMERS, NECESSARY CONTROLS, STATS, CONTROL ACCESSORIES, RELAYS, DISCONNECTS AND SWITCHES FOR EQUIPMENT SUPPLIED BY THEM. WHERE EQUIPMENT IS NOT SUPPLIED BY THEM BUT REQUIRES INTERLOCKING BY THEM DIVISION 15 SHALL OBTAIN SHOP DRAWINGS AND SUPPLY/MOUNT ALL PREVIOUSLY MENTIONED STARTERS, TRANSFORMER ETC. DIVISION 15 SHALL DO ALL INTERLOCKING OF EQUIPMENT AS NOTED ON THESE DRAWINGS. DIVISION 15 SHALL CO-ORDINATE AND OBTAIN SERVICES OF DIVISION 16 FOR ALL LINE VOLTAGE CONTROL WIRING AND ALL CONDUIT. ALL WIRING SHALL BE IN CONDUIT. ALL WIRING SHALL BE PLENUM RATED WHERE REQUIRED.

EQUIPMENT GENERAL NOTES

1. ALL APPROVED EQUIPMENT SHALL BE INSTALLED AND COMMISSIONED AS PER MANUFACTURERS RECOMMENDATIONS AND INSTALLATION GUIDLINES. CONTRACTOR TO REVIEW GUIDLINES AND PROVIDE ALL NECESSARY ACCESSORIES AS REQUIRED

2. ALL CEILING HUNG EQUIPMENT THAT RECEIVES WATER OR PRODUCES CONDENSATE THAT IS NOT LOCATED IN A MECHANICAL ROOM WITH A DRAIN SHALL BE C/W A WATERPROOFED DRAIN PAN SIZED TO PROTECT SURROUNDING WALLS AND CEILINGS ETC. DRAIN PANS SHALL BE BY ASSOCIATED EQUIPMENT INSTALLER. PLUMBER SHALL CO-ORDINATE DRAIN PAN LOCATIONS WITH HVAC CONTRACTOR AND PIPE TO NEARETS DRAIN AS REQUIRED

3. ALL EQUIPMENT SHALL BE MOUNTED LEVEL AS PER MANUFACTURERS INSTRUCTIONS. CONTRACTOR TO MODIFY CURBS, ISOLATORS, HANGERS ETC AS REQUIRED

4. ALL EQUIPMENT SHALL BE ADEQUATELY SUPPORTED TO BUILDING STRUCTURE AND ISOLATED TO AVOID VIBRATION TRANSMISSION TO BUILDING STRUCTURE. CONTRACTOR TO PROVIDE UNISTRUT AND ANCHORS AS REQUIRED TO SUIT EQUIPMENT WEIGHT AND BUILDING STRUCTURE. NOISE LEVEL FROM MECHANICAL EQUIPMENT SHALL NOT EXCEED ASHRAE AND MOE STANDARDS. THIS CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THIS ENGINEER AND STRUCTURAL ENGINEER OF RECORD FOR APPROVAL

5. ALL EQUIPMENT CONNECTED TO PIPING AND DUCTWORK SHALL BE C/W FLEXIBLE CONNECTIONS TO AVOID NOISE TRANSMISSION. FLEXIBLE CONNECTIONS SHALL BE PLENUM RATED WHERE LOCATED IN A PLENUM

6. ALL EQUIPMENT, DAMPERS VALVES, ETC IS TO BE ACCESSIBLE FOR SERVICING. REFER TO MANUFACTURERS GUIDELINES AND PROVIDE ULC LISTED ACCESS PANELS AS REQUIRED. ACCESS PANELS SHALL NOT BE SURFACE MOUNTED

7. REFER TO GRILLES, DIFFUSERS LOUVERS, TERMINATIONS SCHEDULE FOR SPECIFICATION WHERE REFERENCED IN EQUIPMENT SCHEDULE

8. ALL EQUIPMENT TO BE ACCESSIBLE FOR SERVICING. CONTRACTOR TO VERIFY WITH ENGINEER AND ARCHITECT WHERE ACCESSIBILITY CANNOT BE OBTAINED BY A PERMANENT OR CSA APPROVED LADDER AND NOTIFY ENGINEER AND ARCHITECT WHERE GAS FIRED EQUIPMENT IS LOCATED MORE THAN 10 FEET ABOVE FINISHED FLOOR FOR FURTHER INSTRUCTION

9. PROVIDE 4" HOUSE KEEPING PADS FOR ALL EQUIPMENT EXTENDING 6" BEYOND EQUIPMENT.

10. PROVIDE CONDENSATE NEUTRALIZING KITS FOR ALL GAS AND OR PROPANE FIRED EQUIPMENT DISCHARGING CONDENSATE

11. ENGINEER SHALL BE INFORMED WHERE APPLIANCE VENTING TERMINATE ON OR OVER A PROPERTY LINE. CONTRACTOR TO ALLOW FOR FLUSH MOUNT ALTERNATIVE VENTING KIT

12. DO NOT USE EXISITNG TO REMAIN OR NEW PERMANENT SYSTEMS AS NOTED IN THE PLANS OR SCHEDULE BELOW DURING CONSTRUCTION UNLESS WRITTEN APPROVAL BY ENGINEER.

13. WHERE PUMPS ARE AFFECTED BY CITY WATER PRESSURE CONTRACTOR TO ALLOW FOR TRIMMING AS REQUIRED

APPLIANCE VENTING

ALL VENTING FOR APPLIANCES MUST BE AS PER MANUFACTURER RECOMMENDATIONS AND AS PER LATEST B149-1 GAS CODE. WHERE MANUFACTURER ALLOWS PVC OR CPVC IT SHALL BE AS FOLLOWS. ALL IPEX SYSTEMS SHALL BE INSTALLED AS PER MANUFACTURERS GUIDELINES USING THE APPROVED FITTINGS AND SOLVENT CEMENT. WHERE REQUIRED ALL METAL VENTING SHALL BE DOUBLE WALL INSULATED AL-294C AND SLOPED BACK TO APPLIANCE. ALL PIPING SHALL MEET THE APPLICABLE FLAME/SMOKE RATINGS

ALL DIRECT VENT PVC OR CPVC TERMINATION KITS MUST HAVE A SIMILAR LOOK TO IPEX LOW PROFILE KITS. KITS SHALL BE HANDED OVER TO ARCHITECT AND OWNER FOR APPROVAL PRIOR TO PURCHASING. KITS SHALL BE APPROVED BY MANUFACTURER AND WHERE MANUFACTURER OF APPLIANCE OFFERS LOW PROFILE KITS THEY SHOULD BE USED. ALL DIRECT VENT APPLIANCES SHALL TERMINATE INTAKE AND DISCHARGE DIRECTLY TO THE OUTDOORS UNLESS NOTED OTHERWISE

NON HIGH RISE BUILDINGS OF NON COMBUSTIBLE CONSTRUCTION
IPEX SYSTEM S636 PVC. SYSTEM 636 CPVC SHALL BE USED IN PLENUMS AND UNLESS APPROVED OTHERWISE ALL AREAS LOCATED AT 7FT ABOVE FLOOR. NO COMBUSTIBLE VENTING SHALL BE USED IN SHAFTS

NON HIGHRISE BUILDING OF COMBUSTIBLE CONSTRUCTION
IPEX SYSTEM S636 PVC. NO COMBUSTIBLE VENTING SHALL BE USED IN SHAFTS

HIGH RISE BUILDINGS OF ALL CONSTRUCTION
IPEX SYSTEM S636 CPVC. NO COMBUSTIBLE VENTING SHALL BE USED IN SHAFTS

APPLIANCE VENTING INSULATION

TYPE A – FLEXIBLE GLASS FIBRE; K VALUE OF 0.29 AT 75 DEGREES F FOIL SCRIM FACING. USE APPROVED INSULATION AND THICKNESS FOR HIGH TEMPERATURE APPLICATIONS LIKE EMERGENCY GENERATOR EXHAUST
EXHAUST – 11/2" TYPE A TO 10 FT. FROM EXTERIOR WALL
AIR INTAKE – 2" TYPE A UP TO BOILER

WHERE VENTING RUNS THROUGH UNCONDITIONED AREAS FULLY INSULATE INTAKE AND EXHAUST WITH 2" TYPE A

HOT WATER TANK SCHEDULE

MARK	MANUFACTURER	MODEL #	CAPACITY	HEATER	RECOVERY @ 100°F	VOLTAGE	DIAMETER	HEIGHT	WEIGHT(LBS)
HWT-60E	BRADFORD WHITE	LE265T3-3	60 US GALLONS	3 KW	XX	208/1/60	22"Ø	60"	550
-	C/W HEAT TRAP, VENTING AND TERMINATION KIT (AS PER MANUFACTURERS RECOMMENDATIONS). PIPE RELIEF TO NEAREST FLOOR DRAIN. PROVIDE OVERSIZED DRAIN PAN PIPED TO FLOOR DRAIN, PROVIDE ANGLE IRON AND MOUNTING PLATFORM FOR CEILING MOUNTED TANKS AS REQUIRED.								

FAN SCHEDULE

MARK	MANUFACTURER	MODEL #	QTY.	FAN DATA			VOLTAGE	RPM	OPERATION	WEIGHT(LBS)	LOCATION	MOUNTING	NOTES
				CFM	E.S.P.	H.P.							
CF-150	PANASONIC	FV15VQ5		150	.25	1/4	120/1/60		SWITCH	10	WASH RM.	CEILING MOUNT	C/W 10FT OF WIRING, INSULATED CABINET, 6" OUTLET

NOTES: 1. DISCHARGE FROM FAN TO BE MIN. 10FT. FROM INTAKE OPENINGS.
2. C/W TIMER (AS DECIDED BY OWNER/ARCHITECT) EXCEPT LAUNDRY ROOM BY HUMIDISTAT, INSULATED DUCT 10FT FROM INSIDE FACE OF EXTERIOR WALL, ROOF, SOFFIT OR SIDEWALL AS SHOWN.
3. EXACT LOCATION OF TERMINATION TO BE CO-ORDINATED WITH ARCHITECT.
4. PROVIDE B/D/D AND B/SCREEN. UNLESS NOTED ON PLANS TERMINATIONS THRU WALLS SHALL BE A WALL BOX. TERMINATIONS THRU ROOF SHALL BE A ROOF CAP. REFER TO TERMINATION SCHEDULE FOR DETAIL

WC — **WALL HUNG TOILET - VITREOUS CHINA- FLUSHOMETER - EXPOSED - NO TOUCH - HARDWIRED**

- **AMERICAN STANDARD #3351.101.020,** 'AFWALL MILLENNIUM FLOWISE ELONGATED', TOILET, VITREOUS CHINA, WALL HUNG, OPERATES IN THE RANGE OF 4.2 L TO 6 L (1.1 US GAL TO 1.6 US GAL) PER FLUSH, ELONGATED BOWL, SIPHON JET FLUSH ACTION, CONDENSATE CHANNEL.
- **CENTOCO #820STS.001, EXTRA HEAVY DUTY TOILET SEAT, SOLID PLASTIC, OPEN FRONT WITH COVER.**
- **SLOAN #ROYAL OPTIMA 111 ES-S-CP, 'ROYAL OPTIMA', POLISHED CHROME FINISH, EXPOSED FLUSHOMETER FOR TOP SPUD TOILET, 6 L (1.6 US GAL) FACTORY SET FLOW.**
- **SLOAN #EL-154, HARDWIRED TRANSFORMER.**
- **WATTS #ISCA-141-3, MOUNTED ON CONCRETE FLOOR SINGLE VERTICAL, ADJUSTABLE TOILET CARRIER.**
- CHAMPION MI-HUB TR-440 COUPLING
- **SENSOR TO CLEAR TOILET SEAT COVER.**
- **PROVIDE 4" (102 MM) SQUARE ELECTRICAL BOX FOR MOUNTING SENSOR PLATE.**
- **WILL OPERATE UP TO 10 'OPTIMA' FLUSH VALVE UNITS.**

UR — **WALL HUNG URINAL- FLUSHOMETER - EXPOSED - NO TOUCH - HARDWIRED**

- **AMERICAN STANDARD #6590.001.020, 'WASHBROOK FLOWISE', URINAL, WHITE FINISH VITREOUS CHINA, OPERATES IN THE RANGE OF 0.5 L TO 3.8 L (0.125 US GAL TO 1.0 US GAL) PER FLUSH, WALL HUNG, #7301242-100 CHROME PLATED, NON-METALLIC STRAINER.**
- **SLOAN #REGAL XL OPTIMA 186-0.5 XL ES-S-CP, 'REGAL XL OPTIMA', CHROME PLATED, EXPOSED FLUSHOMETER FOR TOP SPUD URINAL, 1.9 L (0.5 US GAL) FACTORY SET FLOW.**
- **SLOAN #EL-154, HARDWIRED TRANSFORMER.**
- **WATTS #CA-321, MOUNTED ON CONCRETE FLOOR, FIXTURE CARRIER.**
- **WATTS #WUCO URINAL WALL ACCESS CLEANOUT.**
- CHAMPION MI-HUB TR COUPLING
- **PROVIDE 4" (102 MM) SQUARE ELECTRICAL BOX FOR MOUNTING SENSOR PLATE.**

BF LAV — **WALL HUNG BASINELECTRONIC FAUCETBELOW DECK MECHANICAL WATER MIXING VALVE**

- **AMERICAN STANDARD #0954.004EC.020/0059.020EC.020 'MURRO WITH EVERCLEAN' BASIN, WHITE FINISH.**
- AMERICAN STANDARD 0059.020EC.020
- SLOAN #ETF-600-LT-CP, 'OPTIMA', ELECTRONIC FAUCET.
- **SLOAN #EL-154, HARDWIRED TRANSFORMER.**
- **LAWLER #TMM-1070, BELOW DECK MECHANICAL WATER MIXING VALVE, INTEGRAL CHECKS.**
- **MCGUIRE #155A OPEN GRID DRAIN.**
- **MCGUIRE #LFH170BVRB, POLISHED BRASS FAUCET SUPPLIES.**
- **MCGUIRE #8872C,** P-TRAP.
- **WATTS #WCA-411-CA-481, BASIN CARRIER.**
- **PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION.**
- **15 VA POWER REQUIRED PER UNIT.**
- **PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION.**

DF — **WATER COOLER GALVANIZED STEEL**

- **ELKAY #LZS8WSLP, 'EZH2O BOTTLE FILLING STATION WITH SINGLE FILTERED LZ COOLER', WATER COOLER, SENSOR, TOUCHLESS ACTIVATION WITH AUTO 20-SECOND SHUT OFF (BOTTLE FILLER)**
- **ALL METAL CONSTRUCTION DRINKING FOUNTAIN SUPPLY.**
- PROVIDE P-TRAP.
- **WATTS #CA-311, MOUNTED ON CONCRETE FLOOR, FIXTURE CARRIER.**
- **PROVIDE ELECTRICAL DUPLEX BOX WITH GFI.**

SH — **OUTDOOR SHOWER -STEEL-PEDESTAL-METERING**

- **STERN WILLIAMS #6400-6500, 'DUAL BODY AND FOOT FOUNTAINS', STEEL POWDER COAT FINISH, PEDESTAL, BODY AND FOOT SHOWER**

MS — **FLOOR MOUNTED SERVICE / MOP SINK - TWO HANDLES FAUCET**

- **Stern Williams #MTB-2424, 'MTB series', Service / Mop Sink.**
- American Standard #8344212.004, 'Yoke', Two handles Faucet.
- Provide P-Trap.
- **Complete with drain gasket.**

DRAWING LEGEND

- SANITARY DRAIN – UNBURIED
- SANITARY DRAIN – BURIED
- STORM DRAIN – UNBURIED
- STORM DRAIN – BURIED
- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER RECIRCULATED
- G — GAS LINE
- FCS — FAN COIL SUPPLY
- FCS — FAN COIL SUPPLY
- FCR — FAN COIL RETURN
- HS — HEATING SUPPLY
- HR — HEATING RETURN
- HPS — HEAT PUMP SUPPLY
- HPR — HEAT PUMP RETURN
- C — CONDENSATE DRAIN
- R — REFRIGERANT PIPING
- F — FIRE STAND PIPE
- SPK — SPRINKLER LINE
- V — SANITARY VENT
- BALL VALVE UNLESS SPECIFIED OTHERWISE
- SOLENOID VALVE
- GLOBE VALAVE
- GATE VALVE
- CIRCUIT BALANCING VALVE WITH P/T PORT
- CHECK VALVE
- THERMOSTATIC MIXING VALVE
- PRESSURE REDUCING VALVE
- DRAIN VALVE
- REDUCED PRESSURE BACK FLOW PREVENTOR
- AV — AUTO AIR VENT
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- THERMOMETER
- PRESSURE GUAGE
- PUMP
- STRAINER
- T — THERMOSTAT
- RA — REVERSE ACTING T-STAT
- SC — SPEED CONTROL
- FLOOR, HUB, FUNNEL FLOOR DRAIN
- WC — PLUMBING FIXTURE FROM FLOOR ABOVE
- PLUMBING FIXTURE DRAIN DN
- PENDANT SPRINKLER HEAD
- UPRIGHT SPRINKLER HEAD
- SIDEWALL SPRINKLER HEAD
- FULLY CONCEALED SPRINKLER HEAD
- BALANCING DAMPER
- SPLITTER DAMPER
- F — FIRE DAMPER
- M — MOTORIZED DAMPER
- B — BACK DRAFT DAMPER
- SPIN COLLAR WITH BALANCING DAMPER
- HUNG/LEAVING/BURIED CLEANOUTS
- BREAK
- END CAP
- CUT AND EXTEND EXISTING
- CAP OFF EXISTING
- CONNECT TO EXISTING
- FLOOR SUPPLY AIR GRILLE
- CEILING AND WALL SUPPLY AIR GRILLE
- CEILING AND WALL RETURN AIR GRILLE
- SUPPLY DUCT UP
- SUPPLY DUCT DN
- RETURN DUCT UP
- RETURN DUCT DN

UNLESS NOTED. DUCT RISER SHALL MATCH ASSOCIATED HORIZONTAL DUCT

- NFHB. — NON-FREEZE WALL HYDRANT
- HB — HOSE BIBB
- DOMESTIC WATER UP
- DOMESTIC WATER DOWN TO ABOVE FLOOR
- DOMESTIC WATER DOWN TO BELOW FLOOR
- DOM. VALVED PLUMBING FIXTURE CONNECTION
- AIR SEPARATOR
- SAFETY RELIEF VALVE

ABBREVIATIONS

GENERAL

AFF – ABOVE FINISHED FLOOR
AFG – ABOVE FINISHED GRADE
AFR – ABOVE FINISHED ROOF
BFP– BACK FLOW PREVENTOR
BRD – BELOW ROOF DECK
EX. – EXISTING
N – NEW
NA – NOT APPLICABLE
R – RELOCATED
TBD – TO BE DETERMINED

GENERAL HVAC

AL – ACOUSTIC LINED
EA – EXHAUST AIR
ETR – EXISTING TO REMAIN
FR – FIRE RATED
GM – GAS METER
HWR – HIGH WALL RETURN
LWR – LOW WALL RETURN
LWS – LOW WALL SUPPLY
NC – NORMALLY CLOSED
OED – OPENED ENDED DUCT
RA – RETURN AIR
SA – SUPPLY AIR
TAD – TRANSFER AIR DUCT
TAG – TRANSFER AIR GRILLE
BSC – BIRD SCREEN
UC – UNDERCUT
DSD – DUCT SMOKE DETECTOR

GENERAL PLUMBING

BWV – BACK WATER VALVE
CFRD – CONTROL FLOW ROOF DRAIN
DS – DRAIN STACK
RWL – RAIN WATER LEADER
VTR – VENT THRU ROOF
WM – WATER METER

DRAINS

AD – AREA DRAIN
FD – FLOOR DRAIN
FFD – FUNNEL FLOOR DRAIN
HD – HUB DRAIN
PD – PAVED AREA DRAIN
RD – ROOF DRAIN
SAD – SODDED AREA DRAIN
SD – SCUPPER DRAIN

DAMPERS

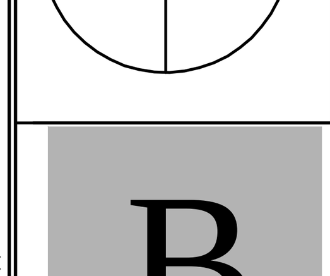
B/D – BALANCING DAMPER
F/D – FIRE DAMPER
M/D – MOTORIZED DAMPER
S/D – SPLITTER DAMPER
B/D/D – BACK DRAFT DAMPER

NO.	DATE	DESCRIPTION
4	10.01.2020	ISSUED FOR TENDER
3	05.26.2020	ISSUED FOR PERMIT
2	05.24.2018	ISSUED FOR REVIEW
1	05.01.2018	ISSUED FOR REVIEW

THIS DRAWING SHALL BE USED ONLY FOR THE PURPOSE INDICATED IN THE LATEST ISSUED COLUMN ABOVE

THESE DRAWINGS ARE NOT TO BE SCALED.

CONSTRUCTION NORTH



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COMFORT STATION
GARNET GRAHAM PARK

KAWARTHA LAKES **ONTARIO**

MECHANICAL

PLOT DATE

PROJECT No. 18-776

DRAWING TITLE

SPECIFICATIONS

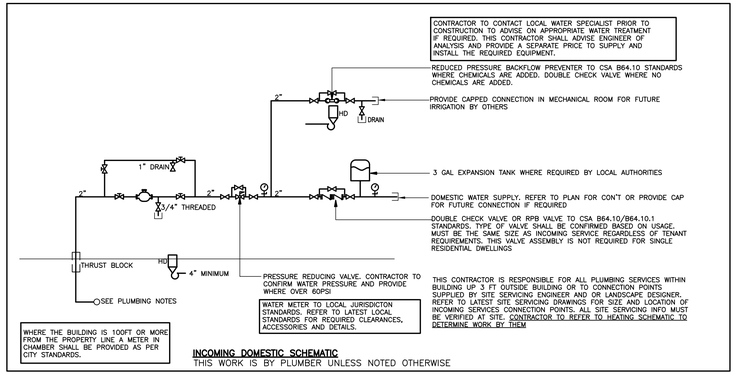
DATE 2018

DRAWN BY JW

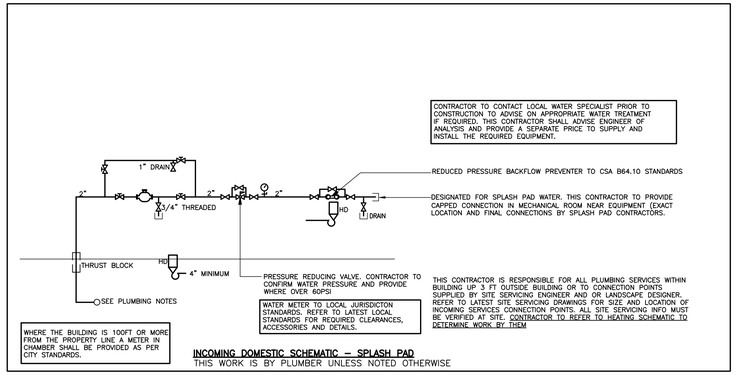
SCALE NTS

M-2

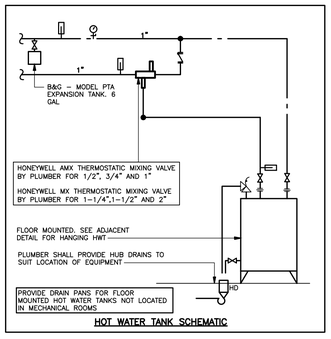
OF 3



INCOMING DOMESTIC SCHEMATIC
THIS WORK IS BY PLUMBER UNLESS NOTED OTHERWISE



INCOMING DOMESTIC SCHEMATIC – SPLASH PAD
THIS WORK IS BY PLUMBER UNLESS NOTED OTHERWISE



HOT WATER TANK SCHEMATIC

NO.	DATE	DESCRIPTION
4	10.01.2020	ISSUED FOR TENDER
3	05.26.2020	ISSUED FOR PERMIT
2	05.24.2018	ISSUED FOR REVIEW
1	05.01.2018	ISSUED FOR REVIEW

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CONSTRUCTION NORTH

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COMFORT STATION
GARNET GRAHAM PARK

KAWARTHA LAKES **ONTARIO**

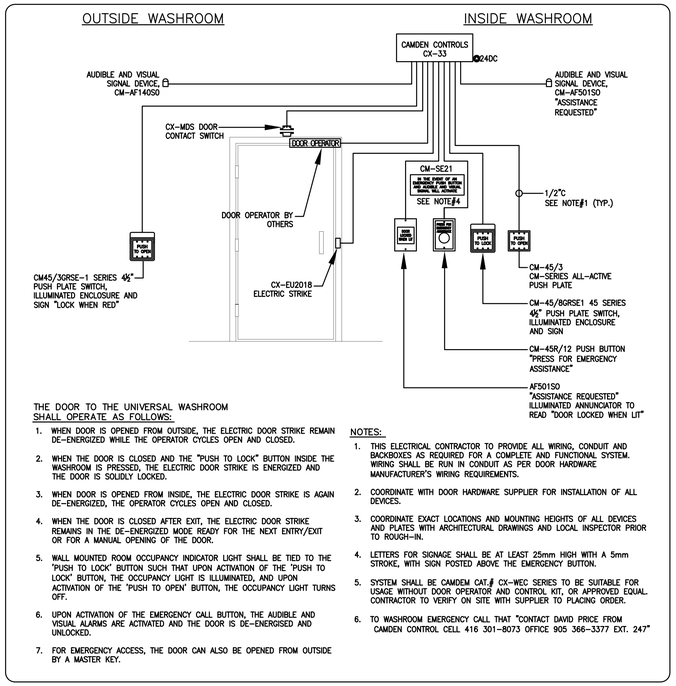
MECHANICAL

PLOT DATE
PROJECT No. 18-776

DRAWING TITLE
MECHANICAL DETAILS

DATE 2018
DRAWN BY JW
SCALE NTS

M-3
OF 3



THE DOOR TO THE UNIVERSAL WASHROOM SHALL OPERATE AS FOLLOWS:

1. WHEN DOOR IS OPENED FROM OUTSIDE, THE ELECTRIC DOOR STRIKE REMAIN DE-ENERGIZED WHILE THE OPERATOR CYCLES OPEN AND CLOSED.
2. WHEN THE DOOR IS CLOSED AND THE "PUSH TO LOCK" BUTTON INSIDE THE WASHROOM IS PRESSED, THE ELECTRIC DOOR STRIKE IS ENERGIZED AND THE DOOR IS SOLIDLY LOCKED.
3. WHEN DOOR IS OPENED FROM INSIDE, THE ELECTRIC DOOR STRIKE IS AGAIN DE-ENERGIZED, THE OPERATOR CYCLES OPEN AND CLOSED.
4. WHEN THE DOOR IS CLOSED AFTER EXIT, THE ELECTRIC DOOR STRIKE REMAINS IN THE DE-ENERGIZED MODE READY FOR THE NEXT ENTRY/EXIT OR FOR A MANUAL OPENING OF THE DOOR.
5. WALL MOUNTED ROOM OCCUPANCY INDICATOR LIGHT SHALL BE TIED TO THE 'PUSH TO LOCK' BUTTON SUCH THAT UPON ACTIVATION OF THE 'PUSH TO LOCK' BUTTON, THE OCCUPANCY LIGHT IS ILLUMINATED, AND UPON ACTIVATION OF THE 'PUSH TO OPEN' BUTTON, THE OCCUPANCY LIGHT TURNS OFF.
6. UPON ACTIVATION OF THE EMERGENCY CALL BUTTON, THE AUDIBLE AND VISUAL ALARMS ARE ACTIVATED AND THE DOOR IS DE-ENERGISED AND UNLOCKED.
7. FOR EMERGENCY ACCESS, THE DOOR CAN ALSO BE OPENED FROM OUTSIDE BY A MASTER KEY.

NOTES:

1. THIS ELECTRICAL CONTRACTOR TO PROVIDE ALL WIRING, CONDUIT AND BACKBOXES AS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM. WIRING SHALL BE RUN IN CONDUIT AS PER DOOR HARDWARE MANUFACTURER'S WIRING REQUIREMENTS.
2. COORDINATE WITH DOOR HARDWARE SUPPLIER FOR INSTALLATION OF ALL DEVICES.
3. COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL DEVICES AND PLATES WITH ARCHITECTURAL DRAWINGS AND LOCAL INSPECTOR PRIOR TO ROUGH-IN.
4. LETTERS FOR SIGNAGE SHALL BE AT LEAST 25mm HIGH WITH A 5mm STROKE, WITH SIGN POSTED ABOVE THE EMERGENCY BUTTON.
5. SYSTEM SHALL BE CAMDEN CAT.# CX-WEC SERIES TO BE SUITABLE FOR USAGE WITHOUT DOOR OPERATOR AND CONTROL KIT, OR APPROVED EQUAL. CONTRACTOR TO VERIFY ON SITE WITH SUPPLIER TO PLACING ORDER.
6. TO WASHROOM EMERGENCY CALL THAT "CONTACT DAVID PRICE FROM CAMDEN CONTROL CELL 416 301-8073 OFFICE 905 366-3377 EXT. 247"

1 E2 UNIVERSAL WASHROOM DOOR AND CALL FOR ASSISTANCE SYSTEM
SCALE: N.T.S.

PANEL SCHEDULE

NOTES	PANEL	AMPS	VOLTAGE	PHASE	WIRE	CIRCUIT	TYPE	MOUNTING	NOTES
	A	200	120/240	1	3	42	NEW	SURFACE	

NOTES:

* ON LIGHTING CONTACTOR

MAIN BREAKER A B — TO MATCH EXISTING SERVICE SIZE

	EXIT SIGNS	15A	1	2	15A	TIMER/CONTACTOR	
	104 WASHROOM LTG/POWER	15A	3	4	15A	EXHAUST FAN	
	101 WASHROOM LTG/POWER	15A	5	6	15A	WATER FOUNTAIN	
3.0KW	HOT WATER TANK	35A	7	8	15A	SPARE	
	STORAGE ROOM PLUGS	15A	9	10			
	STORAGE ROOM LTGS	15A	11	12		SPACE	
	PRESSURE WASHER	15A	13	14			
*	SOFFIT LIGHTS	15A	15	16			
	EXTERIOR PLUGS	15A	17	18			
	EXTERIOR PLUGS	15A	19	20			
	SPARE	15A	21	22			
	SPARE	15A	23	24			
SUPPLY/INSTALL ALL QUANTITY AND SIZE OF BREAKERS REQUIRED FOR SPLASH PAD.			25	26			
			27	28			
			29	30			
			31	32			
			33	34			
			35	36	30A 2P	PONY PANEL 'B'	VIA TIMER/CONTACTOR
			37	38			
			39	40	30A 2P	TVSS	
			41	42			

PANEL SCHEDULE

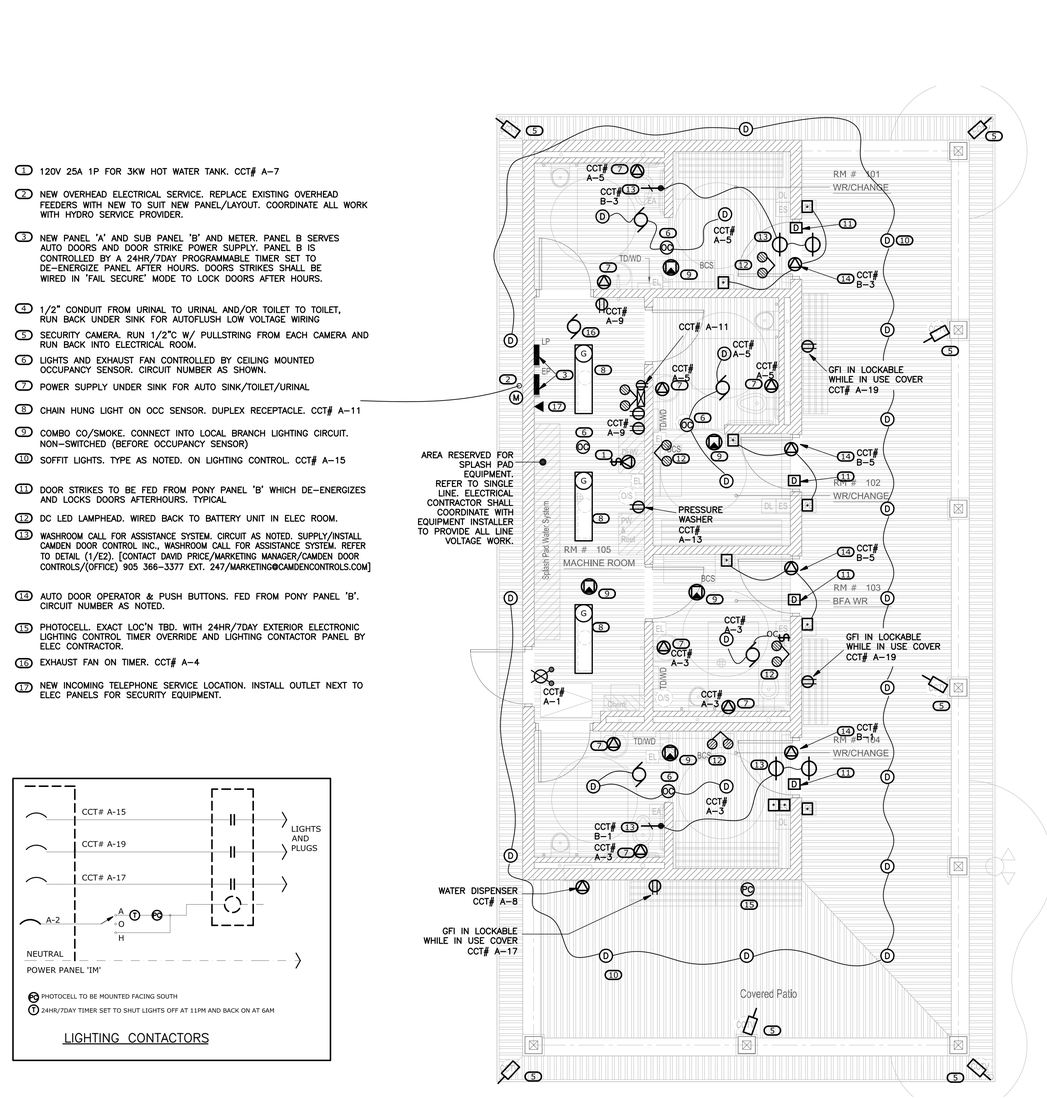
NOTES	PANEL	AMPS	VOLTAGE	PHASE	WIRE	CIRCUIT	TYPE	MOUNTING	NOTES
	B	60	120/240	1	3	12	NEW	SURFACE	

NOTES:

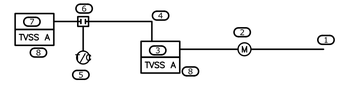
THIS PANEL IS CONTROLLED BY TIMER

			A	B			
AUTO DOOR/CALL FOR ASSISTANCE	15A	1	2	15A	DOOR STRIKE POWER SUPPLY	
AUTO DOOR/CALL FOR ASSISTANCE	15A	3	4		SPACE	
AUTO DOOR OPERATORS	15A	5	6			
SPARE	15A	7	8			
SPARE	15A	9	10	30A 2P	TVSS	
SPACE		11	12			

1. 120V 25A 1P FOR 3KW HOT WATER TANK. CCT# A-7
2. NEW OVERHEAD ELECTRICAL SERVICE. REPLACE EXISTING OVERHEAD FEEDERS WITH NEW TO SUIT NEW PANEL/LAYOUT. COORDINATE ALL WORK WITH HYDRO SERVICE PROVIDER.
3. NEW PANEL 'A' AND SUB PANEL 'B' AND METER. PANEL B SERVES AUTO DOORS AND DOOR STRIKE POWER SUPPLY. PANEL B IS CONTROLLED BY A 24HR/7DAY PROGRAMMABLE TIMER SET TO DE-ENERGIZE PANEL AFTER HOURS. DOORS STRIKES SHALL BE WIRED IN 'FAIL SECURE' MODE TO LOCK DOORS AFTER HOURS.
4. 1/2" CONDUIT FROM URINAL TO URINAL AND/OR TOILET TO TOILET, RUN BACK UNDER SINK FOR AUTOFLUSH LOW VOLTAGE WIRING
5. SECURITY CAMERA. RUN 1/2"C W/ PULLSTRING FROM EACH CAMERA AND RUN BACK INTO ELECTRICAL ROOM.
6. LIGHTS AND EXHAUST FAN CONTROLLED BY CEILING MOUNTED OCCUPANCY SENSOR. CIRCUIT NUMBER AS SHOWN.
7. POWER SUPPLY UNDER SINK FOR AUTO SINK/TOILET/URINAL
8. CHAIN HUNG LIGHT ON OCC SENSOR. DUPLEX RECEPTACLE. CCT# A-11
9. COMBO CO/SMOKE. CONNECT INTO LOCAL BRANCH LIGHTING CIRCUIT. NON-SWITCHED (BEFORE OCCUPANCY SENSOR)
10. SOFFIT LIGHTS. TYPE AS NOTED. ON LIGHTING CONTROL. CCT# A-15
11. DOOR STRIKES TO BE FED FROM PONY PANEL 'B' WHICH DE-ENERGIZES AND LOCKS DOORS AFTERHOURS. TYPICAL
12. DC LED LAMPHEAD. WIRED BACK TO BATTERY UNIT IN ELEC ROOM.
13. WASHROOM CALL FOR ASSISTANCE SYSTEM. CIRCUIT AS NOTED. SUPPLY/INSTALL CAMDEN DOOR CONTROL INC., WASHROOM CALL FOR ASSISTANCE SYSTEM. REFER TO DETAIL (1/E2). [CONTACT DAVID PRICE/MARKETING MANAGER/CAMDEN DOOR CONTROLS/(OFFICE) 905 366-3377 EXT. 247/MARKETING@CAMDENCONTROLS.COM]
14. AUTO DOOR OPERATOR & PUSH BUTTONS. FED FROM PONY PANEL 'B'. CIRCUIT NUMBER AS NOTED.
15. PHOTOCELL. EXACT LOC'N TBD. WITH 24HR/7DAY EXTERIOR ELECTRONIC LIGHTING CONTROL TIMER OVERRIDE AND LIGHTING CONTACTOR PANEL BY ELEC CONTRACTOR.
16. EXHAUST FAN ON TIMER. CCT# A-4
17. NEW INCOMING TELEPHONE SERVICE LOCATION. INSTALL OUTLET NEXT TO ELEC PANELS FOR SECURITY EQUIPMENT.



LIGHTING CONTACTORS



SINGLE LINE DIAGRAM

1. REPLACE EXISTING OVERHEAD SERVICE WITH NEW. WIRES AND SERVICE SIZE TO MATCH EXISTING.
2. HYDRO METER SOCKET
3. PANEL 'A' C/W MAIN BREAKER
4. 3# 10 + GND – 1/2"C
5. 24HR/7DAY ELECTRONIC PROGRAMMABLE TIMER WITH BATTERY BACKUP.
6. 60A 2P CONTACTOR
7. PANEL 'B'
8. SURGE SUPPRESSOR. INNOSYS POWER. JOHN SHAMES 877-755-7474 JSHAMESS@INNOSYSPOWER.COM

TYPE A: TK-LP080-1S240-FL

LIGHT FIXTURE SCHEDULE

TYPE	MTG	DESCRIPTION	LAMP
D	RECESSED CEILING	6" SQUARE RECESSED SHALLOW LED DOWNLIGHT C/W TRIM AND ALL ACCESSORIES FOR MOUNTING ON METAL CEILING, 120V. SIMILAR TO LITHONIA WF6SQS-LED-40K.	920 LUMENS 4000K 80 CRI 13.9W LED
G	RECESSED CEILING	1X4' LED EDGE-LIT FLAT PANEL LIGHT FIXTURE C/W ALL ACCESSORIES FOR MOUNTING ON METAL CEILING, AND DRYWALL GRID ADAPTOR, 120V. SIMILAR TO LITHONIA EPANL1X4-4000LM-80CRI-40K-MIN10-ZT-MVOLT, DRYWALL GRID ADAPTOR: DGA14.	4000 LUMENS 4000K 80 CRI 38.5W LED

* ALL LIGHT FIXTURES ARE TO BE C/W APPROPRIATE LAMPS
* SUBMIT SHOP DRAWINGS FOR APPROVAL. COLOR AND FINISH TO BE APPROVED BY ARCHITECT/CLIENT.
* ALL CONTRACTORS SHALL SUBMIT THEIR BID BASED ON THE LUMINAIRE SCHEDULES ON THESE DRAWINGS.

NO.	DATE	DESCRIPTION
5	MAY 26/20	PERMIT
4	JUNE 11/18	ADDED TELEPHONE & SOFFIT LIGHTS
3	MAY 23/18	REVIEW
2	MAY 8/18	REVIEW
1	MAY 1/18	REVIEW

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CONSTRUCTION NORTH

LICENSED PROFESSIONAL ENGINEER — MAY 26/20 — J-M. BOMEMIER — PROVINCE OF ONTARIO

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GARNET GRAHAM PARK

FENLON FALLS **ONTARIO**

ELECTRICAL

PLOT DATE 6.3.2020 | PROJECT No. 18-776

DRAWING TITLE: LAYOUT

DATE 2018 | DRAWN BY RH | SCALE 1:50

E-1 OF 2

ELECTRICAL SPECIFICATIONS

1. COMPLY WITH ALL DIVISION 1 GENERAL CONDITIONS.
2. OBTAIN ALL APPROVALS FROM PUBLIC AUTHORITIES HAVING JURISDICTION, BEFORE COMMENCING WORK AND PAY ALL INSPECTION FEES AND ALL PERMITS. COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE APPLICABLE C.S.A. STANDARDS, ONTARIO BUILDING CODE, ONTARIO ELECTRICAL SAFETY CODE, APPLICABLE U.L.C. STANDARDS AND THE OWNERS' REQUIREMENTS. SUBMIT CERTIFICATE OF INSPECTION AND APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION. DO NOT REDUCE THE STANDARDS ESTABLISHED BY THE DRAWINGS AND SPECIFICATIONS BY APPLYING ANY OF THE CODES REFERRED TO HEREIN. SUBMIT ALL NECESSARY DRAWINGS TO HYDRO FOR THEIR APPROVAL.
3. PROVIDE PROOF OF PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE COVERAGE AND AMOUNT. SUBMIT WITH TENDER.
4. DRAWINGS – EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS BEFORE PROCEEDING WITH THE WORK. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS MUST BE REFERRED TO THE ARCHITECT BEFORE ANY AFFECTED WORK IS COMMENCED. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING LOCATIONS OF ALL LIGHT FIXTURES & DEVICES.
5. ENSURE THAT ALL ELECTRICAL EQUIPMENT SUPPLIED BY OTHER TRADES IS SUITABLE FOR THE RESPECTIVE VOLTAGE. CONFIRM POWER REQUIREMENTS OF ALL OWNER SUPPLIED EQUIPMENT.
6. ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS DIVISION SHALL BE CARRIED OUT BY THIS DIVISION. NO CHASING BLOCKWORK WILL BE ALLOWED. ALLOW TO SCAN THE FLOOR PRIOR TO CUTTING. IN LOCATION OF EXISTING SERVICES. PROVIDE DUCT CONTROL MEASURES DURING CUTTING. DO NOT LEAVE ANY FLOOR TRENCHES OPEN DURING THE DAY. USE TRIP FREE COVERS WITH BEVELLED EDGES.

   BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BUILDING INCURRED BY WORK OF THIS DIVISION.
7. SUBMIT 6 COPIES OF SHOP DRAWINGS FOR REVIEW AND RECORDS.
8. ALL MATERIALS USED THROUGHOUT SHALL BE NEW, OF BEST QUALITY C.S.A. APPROVED AND OF ONE MANUFACTURE. WHEREVER TRADE NAMES ARE NOT USED TO DESCRIBE MATERIALS, THESE MATERIALS SHALL BE OF BEST AVAILABLE QUALITY AND MANUFACTURE. OBTAIN AND PAY FOR SPECIAL HYDRO INSPECTION OF SPECIFIED NON–C.S.A. ELECTRICAL EQUIPMENT.
9. PROVIDE ALL CONDUIT, WIRING, BOXES, SWITCHES, OUTLETS, DEVICES, ETC., AS REQUIRED. MAKE FINAL CONNECTIONS TO VIBRATING EQUIPMENT WITH FLEXIBLE CONDUIT.
10. PROVIDE ALL HANGERS, INSERTS AND SUPPORTS OF APPROVED TYPES REQUIRED FOR THE WORK OF THIS DIVISION. PROVIDE CONDUIT FOR ALL SERVICES PENETRATING THE FLOOR SLAB. SEAL ALL PENETRATIONS THROUGH FLOOR SLABS WITH AN APPROVED NON–SHRINK, WATERPROOF AND FIREPROOF SEALANT APPROVED BY ARCHITECT. CARE TO BE TAKEN WHILE RUNNING CONDUITS THROUGH EXISTING MALL AND TENANT SPACES. ALL CONDUITS TO BE ABOVE BOTTOM CHORD OF JOISTS.
11. ALL CONDUIT SHALL BE RIGID STEEL THICK WALLED OR EMT THINWALL WITH STEEL SET SCREW COUPLINGS AND CONNECTORS WITH INSULATED THROATS UNLESS OTHERWISE NOTED. ALL CONDUITS SHALL BE CONCEALED UNLESS OTHERWISE NOTED. EXPOSED CONDUITS AND WIREMOLD CHANNELS SHALL BE NEAT IN APPEARANCE, RUN PARALLEL TO BUILDING LINES AND CONCENTRIC RIGHT ANGLE BENDS ONLY SHALL BE USED. ENT MAY NOT BE USED.
12. ALL EMPTY CONDUITS SHALL BE COMPLETE WITH NYLON FISH WIRE.
13. ALL WIRING SHALL BE MINIMUM #12 GAUGE COPPER, EXCEPT AS OTHERWISE NOTED. ALL WIRING SHALL BE 600 VOLT TYPE RW90. BX CABLE MAY BE USED WHERE PERMITTED BY CODE IN CEILING SPACE FOR FINAL CONNECTION TO LIGHT FIXTURE AND FROM CEILING DISTRIBUTION BOXES DOWN PARTITIONS TO RECEPTACLES ONLY. MINIMUM SIZE WIRING FOR DC WIRING & FLOOR OUTLETS SHALL BE #10 GAUGE. MAXIMUM VOLTAGE DROP SHALL NOT EXCEED 2 PERCENT AT ALL FINAL OUTLET LOCATION.
14. PROVIDE GROUND WIRES WITH ALL FEEDERS AND CIRCUITS IN ACCORDANCE WITH APPLICABLE CODES AND HYDRO REQUIREMENTS.

    PROVIDE ALL REQUIRED BONDING AS REQUIRED BY CODE.
15. CO–ORDINATE WITH OTHER TRADES IN LAYING OUT OF THE WORK SO AS NOT TO CONFLICT WITH THE WORK OF OTHER TRADES. CARRY OUT WORK PROMPTLY WHICH MAY INTERFERE WITH THE WORK SCHEDULE OF OTHER TRADES. IN PARTICULAR, FLOOR OUTLETS TO BE CENTRED IN FLOOR TILES.
16. MECHANICAL TRADES WIRING: PROVIDE ALL CONDUIT, WIRING, SPLITTERS, OUTLET BOXES AND DISCONNECT SWITCHES AS SHOWN. ALL MOTORS, STARTERS AND CONTROL WIRING PROVIDED UNDER DIVISION 15. DIV.16 SHALL INSTALL ALL STARTERS AND WIRE COMPLETE.
17. CLEARLY MARK ALL EXPOSED CONDUIT, PULL BOXES, JUNCTION BOXES, ETC., TO INDICATE THE NATURE OF THE SERVICE.
18. MERGER ALL LIGHTING AND POWER CIRCUITS TO MEET CODES.
19. PROVIDE LAMACOID NAMEPLATES FOR ALL ELECTRICAL DISTRIBUTION EQUIPMENT INDICATING SOURCE OF POWER AND EQUIPMENT BEING FED. PROVIDE TYPEWRITTEN DIRECTORIES FOR ALL PANELS.
20. AFTER COMPLETION OF THE WORK, PROVIDE THE LANDLORD WITH A SET OF REPRODUCIBLE 'AS–BUILT' RECORD DRAWINGS. INCORPORATE ALL CHANGES ON AUTOCAD 2000.

    PROVIDE FOLLOWING DOCUMENTS.
    - CERTIFICATE OF FIRE ALARM VERIFICATION
    - HYDRO INSPECTION CERTIFICATE
    - EMERGENCY LIGHTING TEST REPORT
21. CLEAN AND TEST ALL EQUIPMENT BEFORE FINAL ACCEPTANCE IS GIVEN FOR THE WORK.
22. AFTER THE WORK IS COMPLETED, GIVE A WRITTEN GUARANTEE FOR ONE YEAR COVERING WORKMANSHIP AND MATERIALS. REPAIR OR REPLACE, WITHOUT EXPENSE TO THE OWNER, ANY DEFECTS DUE TO WORKMANSHIP OR MATERIALS WHICH IN THE OWNER'S OPINION, ARE NOT DUE TO MISUSE OR NEGLECT.
23. IT/COMMUNICATIONS SYSTEMS

    SUPPLY AND INSTALL THE REQUIRED RACEWAY SYSTEM COMPLETE WITH CONDUITS, PULLBOXES, PANELS, OUTLET BOXES, COVER PLATES, SUITABLE FOR THE INSTALLATION OF IT AND COMMUNICATIONS CABLES AND ASSOCIATED EQUIPMENT.

    RACEWAYS SHALL BE RIGID, GALVANIZED STEEL CONDUIT WHERE EXPOSED TO MECHANICAL INJURY. IN ALL OTHER LOCATIONS, EMT MAY BE USED. MINIMUM CONDUIT SIZE TO BE 19MM. WORK TO BE DONE TO CSA T527 AND CSA T530.

    ALL FLOOR OUTLETS SHALL BE WIRED WITH CAT6E CABLING AND TERMINATED @ BOTH ENDS. USE A BIX BLOCK IN ELEPHONE ROOMS & RJ45 OUTLETS IN FLOORS. CERTIFY ALL CABLES AT END OF INSTALLATION.

    UNLESS OTHERWISE SHOWN, STEEL PULLBOXES SHALL BE INSTALLED EVERY 30M OR LESS OF STRAIGHT CONDUIT RUN; EVERY 25M OR LESS OF STRAIGHT CONDUIT RUN AND ONE 90 DEG. BEND OR EQUIVALENT; EVERY TWO 90 DEG. BENDS OR EQUIVALENT.
24. DISTRIBUTION: FEEDERS SHALL BE SIZED AS DETAILED. SUBSTITUTION OF FEEDERS EITHER IN MATERIAL OR ROUTING WILL NOT BE PERMITTED UNLESS ENGINEER'S WRITTEN APPROVAL IS OBTAINED. FEEDERS SHALL HAVE MAXIMUM VOLTAGE DROP OF 3% AT FULL LOAD AT THE PANELS SUPPLIED. ALL FEEDERS SHALL BE BALANCED UNDER FULL LOAD CONDITIONS TO WITHIN 5% BETWEEN PHASES. ALL PHASES AND NEUTRALS SHALL BE IDENTIFIED AND MAINTAINED IN THEIR CORRECT ORDER WHEN READING LEFT TO RIGHT THROUGHOUT THE BUILDING.
25. EACH PANEL BOARD SHALL BE COMPLETE WITH A DIRECTORY GIVING THE NUMBER AND DESCRIPTION OF EACH CIRCUIT CONTROLLED. THE DIRECTORIES SHALL BE CLEARLY TYPED, LEGIBLE AND OF AMPLE SIZE AND SHALL BE MOUNTED IN A METAL FRAME WITH A CLEAR PLASTIC COVER ON THE INSIDE OF THE DOOR. THE CIRCUIT BREAKERS SHALL BE CONNECTED TO THE PANEL BY BOLTED CONNECTIONS. ALL BUS BARS, LUGS AND BREAKER TERMINALS SHALL BE SILVER PLATED AT CONNECTION POINTS. THE INTERRUPTING CAPACITY OF EACH BOARD SHALL BE DETERMINED BY THE CO–ORDINATION STUDY OR AS PER DRAWINGS, MINIMUM 10 KA FOR 208 VOLT PANELS, AND 14KA FOR 347/600 VOLT PANELS.

    ALL TWO OR THREE POLE BREAKERS SHALL OPERATE WITH A COMMON TRIP AND WITH A SINGLE HANDLE. TWO POLE CIRCUIT BREAKERS CONSISTING OF TWO SINGLE POLE BREAKERS WITH A TIE HANDLE, TWIN BREAKERS AND SERIES RATED BREAKERS WILL NOT BE ACCEPTED.

    ALL PANEL BOARDS SHALL BE SPRINKLERPROOFED AS REQUIRED TO MEET LOCAL AND HYDRO CODES.
26. COVER PLATES:

    COVER PLATES FOR RECEPTACLES, SWITCHES, PILOT LIGHTS, TELEPHONE OUTLETS AND OTHER DEVICES REQUIRING COVER PLATES FOR FLUSH MOUNTED BOXES SHALL BE METAL, STAINLESS STEEL #18–8,TYPE 302.

    WEATHERPROOF COVER PLATES SHALL BE DIECAST CORROSION RESISTANT ALUMINUM TYPE WITH TWO SEPARATE LIDS FOR DUPLEX RECEPTACLES SUITABLE FOR MOUNTING ON F.S. TYPE BOXES. ALL WEATHERPROOF COVER PLATES SHALL HAVE RUBBER OR NEOPRENE GASKETS.

    PLATES FOR SURFACE MOUNTED CAST BOXES SHALL BE GALVANIZED FORMED STEEL TYPE.

    COVER PLATES FOR FLUSH MOUNTED EQUIPMENT SHALL BE SUPPLIED OF QUALITY AND PERFORMANCE SPECIFIED BY THE MANUFACTURER OF THE EQUIPMENT.

    COVER PLATES SHALL NOT CARRY MANUFACTURER'S NAME.

    COVER PLATES OF QUALITY SPECIFIED SHALL BE PASS & SEYMOUR, BRYANT LEVITON, SMITH & STONE OR HARVEY HUBBELL.
27. LIGHT SWITCHES:

    SWITCHES SHALL BE, UNLESS OTHERWISE INDICATED, BRYANT QUIET TYPE WITH WHITE SPECIFICATION GRADE FOR 120V AND HEAVY DUTY GRADE FOR 347V.

    LIGHT SWITCHES OF QUALITY AS MANUFACTURED BY BRYANT, P & S, ARROW HART, LEVITON AND HUBBELL SHALL BE CONSIDERED AS ACCEPTABLE AS SPECIFIED ALTERNATES.

    DIMMERS SHALL BE LUTRON SPECIFICATION GRADE OR APPROVED ALTERNATE.
28. RECEPTACLES:

    RECEPTACLES SHALL BE, UNLESS OTHERWISE INDICATED, U GROUND TYPE, WHITE SCREW TERMINAL TYPE.

    RECEPTACLES SHALL BE SPECIFICATION GRADE.
29. DISTRIBUTION COORDINATION STUDY, SHORT CIRCUIT STUDY AND COMMISSIONING REPORT:

    PROVIDE A DISTRIBUTION COORDINATION AND SHORT CIRCUIT STUDY TO CONFIRM THAT ALL EQUIPMENT OFFERED IS SUITABLY RATED FOR THIS PROJECT. THIS REPORT TO BE SIGNED BY A P. ENG. ALLOW TO PROVIDE THE COORDINATION SHORT CIRCUIT STUDY WITH THE DISTRIBUTION SHOP DRAWINGS SUBMISSION. SHOW ALL SWITCHGEAR AND DISTRIBUTION FROM THE SERVICE ENTRY TO THE LAST PANEL. OBTAIN DETAILS FROM UTILITY AND INCORPORATE INTO STUDY.

    ALLOW TO FULLY COMMISSION THE SWITCHGEAR AND AT THE END OF THE PROJECT. WORK TO BE DONE BY AN INDEPENDENT SPECIALIST. RETORQUE ALL CONNECTIONS. FOR SERVICES 1200 AMPS AND OVER, ALLOW TO CARRY OUT AN INFRA RED SCAN OF THE ENTIRE DISTRIBUTION.
30. AUTOMATIC CONTROL OF EXTERIOR LIGHTS.

    CONTACTORS, PHOTO–ELECTRIC CONTROLS AND TIME SWITCHES SHALL BE USED TO CONTROL THE EXTERIOR LIGHTS.

    IF THE PHOTOCELL IS NOT INDICATED ON THE DRAWINGS, OBTAIN THE LOCATION FROM THE CONSULTANT.

    THE PHOTO–ELECTRIC CELL AND TIME CLOCKS SHALL BE WIRED SO AS TO CONTROL A MAGNETIC CONTACTOR. EACH CONTACTOR SHALL HAVE AN 'ON–OFF–AUTO' SWITCH TO PERMIT MANUAL OPERATION OF THE INDIVIDUAL CONTACTOR. CONTACTORS TO BE MINIMUM 20 AMP HID LIGHTING DUTY. TIME CLOCKS TO BE DIGITAL WITH 96 HOUR SPRING CARRYOVER.

    CONTACTORS SHALL HAVE LAMACOID NAMEPLATES INDICATING THAT CONTROL CIRCUIT IS SUPPLIED FROM A DIFFERENT SOURCE.
31. SERVICE ENTRANCE BOARD

    THE SERVICE ENTRANCE BOARD SHALL CONSIST OF A COMPLETELY METAL ENCLOSED FREE–STANDING STRUCTURE CONSISTING OF A MAIN SWITCH COMPARTMENT, HYDRO METERING AS REQUIRED, METERING PANEL DISTRIBUTION SECTIONS AND THE THROUGH FLOOR/WALL BUS DUCT TO THE VAULT COMPLETE WITH FIRE BARRIER. DETAILS OF MAIN INCOMING (600V) SERVICE TO BE VERIFIED WITH HYDRO PRIOR TO SUBMISSION OF SHOP DRAWINGS.

    BUSWORK SHALL BE BRACED TO WITHSTAND AVAILABLE SHORT CIRCUIT ON THE SYSTEM AND BREAKERS AND FUSES SHALL HAVE ADEQUATE INTERRUPTING CAPACITY AND SHALL BE FULLY CO–ORDINATED WITH OTHER EQUIPMENT ON THE LOAD AND LINE SIDE.

    THE MAIN SWITCH COMPARTMENT SHALL CONTAIN BREAKER OF TYPE, FRAME AND SIZE OR FUSED DISCONNECT SWITCH WITH FUSES OF TYPE AND SIZE AS INDICATED. THE MAIN SWITCH COMPARTMENT SHALL HAVE DOOR WITH HINGE AND THE SWITCH HANDLE SHALL PROTRUDE THROUGH AN OPENING IN THE DOOR. THE DOOR SHALL HAVE PROVISIONS FOR PADLOCKING.

    MAIN SWITCH OR BREAKER SHALL BE EQUIPPED WITH GROUND FAULT RELAYS. IN ADDITION, PROVIDE GROUND FAULT EQUIPMENT WHERE INDICATED ON DRAWINGS OR AS REQUIRED BY CODE.

    THE CURRENT TRANSFORMER COMPARTMENT WHERE REQUIRED SHALL HAVE A REMOVABLE STEEL MOUNTING PLATE AND SHALL BE EQUIPPED WITH ALL HARDWARE AND BUS DUCT TO RECEIVE THE LOCAL UTILITIES CURRENT AND POTENTIAL TRANSFORMERS. CURRENT TRANSFORMERS SHALL BE OBTAINED FROM THE UTILITY AND INSTALLED IN THE COMPARTMENT BY THE SERVICE ENTRANCE BOARD MANUFACTURER OR AS PER UTILITIES STANDARD REQUIREMENTS.

    THE ENTIRE PANEL, BUSWORK AND CONNECTIONS SHALL BE TO THE UTILITIES APPROVAL. OBTAIN THEIR REQUIREMENTS PRIOR TO INSTALLATION.

    SWITCHBOARD SHALL BE SPRINKLERPROOFED AS REQUIRED TO MEET LOCAL AND HYDRO CODES.
32. LOCKABLE HINGED SPARE FUSE CABINET:

    PROVIDE A LOCKABLE HINGED SPARE FUSE CABINET IN EACH ELECTRICAL ROOM. PROVIDE A MINIMUM OF 3 SPARE FUSES OF EACH SIZED USED. PROVIDE AN INVENTORY MOUNTED ON THE INSIDE OF THE CABINET.
33. DRY TYPE DISTRIBUTION TRANSFORMERS SHALL BE INDOOR AIR COOLED TYPE RATED THREE PHASE 60 CYCLE, OF KVA RATING AND VOLTAGE AS SHOWN ON THE DRAWINGS, 1.2 KV CLASS, AND CAPABLE OF WITHSTANDING A 10 KV BASIC IMPULSE LEVEL (BIL). THEY SHALL HAVE STANDARD PRIMARY TAPS. THE TRANSFORMER SHALL BE DESIGNED WITH A CLASS B OR H INSULATION SYSTEM.

    THE SOUND LEVEL IN DECIBELS SHALL BE IN ACCORDANCE WITH NEMA TRI CURRENT STANDARDS. THE TRANSFORMER SHALL BE EQUIPPED WITH TERMINAL BOARDS, TAP CHANGING LINKS, SUITABLE SOLDERLESS CONNECTORS AND SHALL HAVE A VENTILATED CODE GAUGE STEEL ENCLOSURE COMPLETE WITH HINGED REMOVABLE EXPANDED METAL SIDE PANELS AND MOUNTING BRACKETS FOR FLOOR OR WALL MOUNTING AS SHOWN. MOUNT ALL TRANSFORMERS 75KVA AND UNDER AT HIGH LEVEL IN LOCATION SHOWN UNLESS OTHERWISE NOTED.

    THE COMPLETED ASSEMBLY SHALL BE PAINTED WITH A PRIMER COAT AND A FINISH COAT OF ASA #61 GRAY. THE TRANSFORMER SHALL CONFORM TO CSA – C9, NEMA TRI AND CEMA L2 CURRENT STANDARDS EXCEPT WHERE NOTED AND SHALL BE APPROVED TO CSA CODE PART 2 SPECIFICATION C22.2 NO. 47 WHERE APPLICABLE.

    TRANSFORMERS SHALL BE COMPLETED WITH COPPER WINDING & SPRINKLERPROOFED AS REQUIRED TO MEET LOCAL AND HYDRO CODES.
34. METERING CABINETS SHALL BE OF SIZE SHOWN ON DRAWING OR AS REQUIRED WITH REMOVABLE STEEL METER MOUNTING PLATE, TWO DOORS AND SEALING HASPS TO UTILITY APPROVAL. PROVIDE A CAT6E WIRED TELEPHONE LINE FROM EACH METER CABINET TO THE MAIN TELEPHONE ENTRY POINT.

    THE CABINET SHALL BE MOUNTED ON THE WALL AS SHOWN ON THE DRAWINGS AND TO THE SATISFACTION OF THE LOCAL UTILITY.

    METER SOCKETS SHALL BE TO APPROVAL OF UTILITY. PROVIDE ALL REQUIRED NEUTRAL WIRE TO METER AS PER LOCAL HYDRO'S REQUIREMENT.
35. CONFIRM ALL LOCATIONS AND OUTLETS PRIOR TO INSTALLATION. ALLOW TO RELOCATE ANY OUTLET WITHIN 5M OF SPECIFIED LOCATION, PRIOR TO INSTALLATION.
36. PROVIDE ALL CONCRETE WORK REQUIRED FOR ELECTRICAL WORK IN ACCORDANCE WITH ARCHITECTURAL DIVISION OF SPECIFICATION. THIS INCLUDES HOUSEKEEPING PAD BELOW ALL FLOOR STANDING EQUIPMENT.
37. SUPPLY AND INSTALL ALL UNDERGROUND DUCTS WHERE INDICATED. THESE SHALL BE INSPECTED AND APPROVED BY ALL LOCAL AUTHORITIES AS REQUIRED. AFTER COMPLETION OF INSTALLATION DUCTS SHALL BE CLEANED AND ENDS PLUGGED WITH DUCT PLUGS. ALL DUCT JOINTS TO BE GLUED. ALL EXCAVATION AND BACKFILLING SHALL BE CARRIED OUT IN ACCORDANCE WITH ARCHITECTURAL DIVISION OF SPECIFICATION.

    DUCTS TO BE PVC TYPE 11 CSA APPROVED AND TO BE SLOPED FROM BUILDING TO STREET.

    PROVIDE AN UNDERGROUND 100MM DRAIN PIPE FROM EACH PADMOUNT TRANSFORMER TO THE CLOSEST CATCH BASIN.
38. TWO CABLE PULLING EYES ARE TO BE INSTALLED ABOVE CABLE DUCTS ON CEILING AND OVER DOOR AS DIRECTED BY LOCAL AUTHORITY INSPECTOR.
39. ALTERATIONS AND ADDITIONS:

    CONTRACTORS SHALL NOTE THAT THIS CONTRACT IS AN ALTERATION TO AN EXISTING BUILDING AND SHALL THOROUGHLY INVESTIGATE THE EXISTING ELECTRICAL INSTALLATION AND CONDITIONS.

    CONTRACTORS ARE REQUIRED TO VISIT THE SITE AND ENSURE THAT ALL WORK ASSOCIATED WITH THE ELECTRICAL INSTALLATION REQUIRED TO BE REMOVED OR RELOCATED IS ALLOWED FOR IN THE TENDER PRICE. ALSO CONTRACTORS SHALL ENSURE THAT THE WORK CAN BE CARRIED OUT AS INDICATED ON THE DRAWINGS OR SHALL ADVISE THE ENGINEER IMMEDIATELY OF ANY ANTICIPATED PROBLEMS.

    NO EXTRA WILL SUBSEQUENTLY BE ALLOWED TO COVER ANY SUCH ERROR, OMISSION AND/OR OVERSIGHT FOR NOT HAVING MADE A THOROUGH INSPECTION OF THE GROUNDS, EXISTING CONDITIONS, DRAWINGS, SPECIFICATION AND DESIGN INTENT.

    THE ELECTRICAL CONTRACTOR SHALL NOTE THAT THE EXISTING BUILDING WILL REMAIN IN OPERATION THROUGHOUT BUILDING OPERATIONS. THEY SHALL ACCORDINGLY ALLOW FOR ANY WORK REQUIRED TO BE DONE WHICH MAY AFFECT POWER SUPPLY AND OPERATION OF THE BUILDING TO BE CARRIED OUT AFTER HOURS OR AT A TIME CONVENIENT TO THE BUILDING MANAGEMENT. PROVIDE TEMPORARY SERVICES AS REQUIRED TO ENSURE CONTINUED OPERATION AT ALL TIMES.
40. DEMOLITION

    REMOVE ALL EXPOSED CONDUITS, BRANCH WIRING, OUTLETS, LUMINAIRES, EMERGENCY LIGHTING, ETC. FROM CEILINGS AND WALLS BEING DEMOLISHED. REMOVE WIRING TO PANELBOARDS.

    REMOVE ANY AND ALL PCB BALLASTS FROM LUMINAIRES. PLACE IN STORAGE DRUMS AND REMOVE AND DISPOSE OF OFF SITE. ALL WORK TO BE DONE IN ACCORDANCE WITH MINISTRY OF ENVIRONMENT RULES AND REGULATIONS.

    REMOVE ALL REDUNDANT TELECOMMUNICATION WIRING, BACK TO THE ENTRY POINTS.

    EXISTING FIRE ALARM SYSTEM TO REMAIN OPERATIONAL AT ALL TIMES. FOR ALTERATIONS AND ANY TIME WHEN FIRE ALARM IS INOPERATIVE ARRANGE FOR 24 HOUR SECURITY WATCH TO APPROVAL OF LOCAL FIRE MARSHALL.

    ALL EXISTING EQUIPMENT BEING REMOVED SHALL BE FIRST OFFERED TO THE OWNER. ANY EQUIPMENT NOT REQUIRED BY THE OWNER, SHALL BE DISPOSED OF OFF SITE BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST.

    ANY CONCRETE FOUNDATIONS OR OTHER SUPPORTS FOR ELECTRICAL EQUIPMENT SHALL BE REMOVED TO BELOW 600MM FROM FINISHED FLOOR.

    ALL WORK TO BE DONE IN ACCORDANCE WITH HYDRO REGULATIONS.
41. SEISMIC RESTRAINTS

    PROVIDE ALL SEISMIC RESTRAINTS AS REQUIRED BY CODE AND BY LOCAL AUTHORITY. PROVIDE INDEPENDENT CERTIFICATION BY A P. ENGINEER AT THE END OF THE PROJECT TO CONFIRM SUITABILITY AND CONFORMANCE.
42. EXCAVATION AND BACKFILLING

    .1 EXCAVATE AND BACKFILL AS REQUIRED FOR THIS WORK BOTH INSIDE AND OUTSIDE THE BUILDING. ALL TRENCH EXCAVATION SHALL BE CARRIED OUT IN STRICT CONFORMITY WITH THE TRENCH EXCAVATOR PROTECTION ACT AND AMENDMENTS, STATUTES OF ONTARIO AND REGULATIONS, AS REVISED AND AMENDED TO DATE.

    .2 ALL EXCAVATION AND BACKFILLING SHALL BE PROVIDED BY THIS CONTRACTOR.

    .3 CAREFULLY CHECK AND AVOID DISTURBING OR DAMAGING ANY EXISTING UNDERGROUND PIPING, CONDUIT OR OTHER SERVICES UNCOVERED DURING CARRYING OUT OF WORK. MAKE GOOD ANY DAMAGE.

    .4 UNDERGROUND SEWERS AND OTHER SERVICES ARE INDICATED APPROXIMATELY ON THE SITE SERVICE, MECH., ELEC., OR ARCH. SITE PLANS. THE LOCATION OF SUCH SERVICES HAS BEEN DETERMINED FROM AVAILABLE INFORMATION BUT HAS NOT BEEN VERIFIED IN THE FIELD. CAREFULLY CHECK SUCH LOCATIONS, PERFORM ALL NECESSARY EXPLORATORY EXCAVATIONS AND REPORT ANY SERIOUS DISCREPANCY BEFORE PROCEEDING WITH ANY NEW WORK. ENGAGE THE SERVICES OF LOCAL PUC, HYDRO, TELEPHONE AND GAS AUTHORITIES TO ACCURATELY DETERMINE LOCATION OF ANY UNDERGROUND UTILITIES.

    .5 EXCAVATIONS FOR ALL UNDERGROUND SERVICES SHALL BE OF THE REQUIRED DEPTH AND DIMENSION AND SHALL BE:

      .1 PREPARED AS REQUIRED, SO THAT NO PORTION OF ANY DUCT SHALL BEAR DIRECTLY AGAINST ANY ROCK OR OTHER HARD SURFACE.

      .2 KEPT DRY AT ALL TIMES BY BAILING, PUMPING OR OTHER MEANS. SIDES AND BOTTOMS SHALL BE KEPT FROM FREEZING.

      .3 BOTTOMS OF EXCAVATION SHALL BE GRADED AS REQUIRED.

      .4 BANKS OF EXCAVATIONS SHALL BE EVENLY CUT AND/OR TRIMMED AND THEY SHALL BE SHORED AS REQUIRED TO PREVENT CAVING IN, AND THE MATERIAL USED SHALL BE CAREFULLY WITHDRAWN DURING BACKFILLING.

      .5 WIDTH OF EXCAVATION SHALL BE CAREFULLY CONTROLLED AND SHALL BE LIMITED TO TWICE THE O.D. OF DUCTS, CONDUITS OR DUCT BANK, AND AS SHOWN ON THE DRAWINGS.

      .6 EXCAVATING, DUCT LAYING, AND BACKFILLING SHALL BE EXECUTED IN LIMITED LENGTH AS DETERMINED BY PROJECT MANAGER TO ENABLE ALL PROTECTIVE MEASURES TO FUNCTION EFFICIENTLY AT ALL TIMES.

    .6 WHERE EXCAVATING IS NECESSARY IN CLOSE PROXIMITY TO AND BELOW ANY FOOTING LEVEL, BACKFILLING SHALL BE DONE WITH 2000# CONCRETE FURNISHED UNDER THIS SECTION TO THE LEVEL OF THE TOP OF HIGHEST ADJACENT FOOTING.

    .7 ALL DUCTS ENTERING AND LEAVING THE BUILDING OR PASSING OTHER EXCAVATED AREAS SHALL BE SUPPORTED ON A REINFORCED CONCRETE PAD, RESTING AT BOTH ENDS ON AT LEAST 1.8M SOLID UNDISTURBED EARTH OR A CHECK IN A CONCRETE FOUNDATION WALL.

    .8 IN AREAS WHERE REINFORCED SUSPENDED SLAB IS INDICATED ON STRUCTURAL DRAWINGS, DUCTS SHALL BE SUPPORTED FROM REINFORCING RODS.

    .9 SHOULD THE EXCAVATION BY NEGLIGENCE OR ERROR, BE CARRIED TO GREATER DEPTH THAN SHOWN OR AUTHORIZED, SUCH EXTRA EXCAVATION SHALL BE REPLACED WITH WELL–COMPACTED APPROVED GRANULAR B CRUSHED STONE FILL OR 2000# CONCRETE, AS REQUIRED TO GIVE A BEARING VALUE EQUAL TO THAT PROVIDED BY ADJACENT SOIL.

    .10 BACKFILLING SHALL NOT BE COMMENCED UNTIL INSTALLATION IS INSPECTED AND APPROVED. BACKFILLING SHALL BE CARRIED OUT CAREFULLY TO AVOID INJURY TO THE WORK AND SUBSEQUENT SETTLEMENT AND SHALL BE EXECUTED AS FOLLOWS:

    .11 ALL BACKFILLING REQUIRED TO BRING LEVEL UP TO UNDERSIDE OF STONE FILL (UNDER PARKING AREAS, AND ROADS) AND TO UNDERSIDE OF SIDEWALK SHALL BE GRANULAR B MATERIAL, SUPPLIED AND PLACED UNDER THIS SECTION AND TAMPED EVERY 150mm IN DEPTH TO CONSOLIDATE SAID FILL SHALL BE CLEAN, SHALL NOT HAVE PARTICLES OVER 65mm IN LARGEST DIMENSIONS, WITH NOT MORE THAN 8% PASSING A #200 SIEVE.

    .12 ALL BACKFILL PLACED UNDER PAVED AREAS (PARKING AREAS , DRIVEWAYS, SIDEWALKS, ETC.), SHALL BE COMPACTED IN 150MM TO 200MM LAYERS TO 98% SPDD (REFER TO GENERAL REQUIREMENTS OUTLINED IN SPECIFICATION SECTION 02315 & SOIL REPORT). TESTING AND INSPECTION OF SAID BACKFILL INCLUDING CHECKING THE PLACING AND COMPACTION OF FILL, SHALL BE DONE BY AN INDEPENDENT INSPECTION TESTING CO..THE COST OF THE INSPECTION & TESTING OF THIS FILL WILL BE PAID BY OTHERS . ONE TEST SHALL BE MADE (EVERY 2 LAYERS OF FILL) FOR EACH 5,000 SQ. FT. OR LESS OF FILLED AREAS FOR DRIVEWAYS, PARKING AREAS AND SIDEWALKS. "

    .13 EXTERIOR BACKFILL IN AREAS TO RECEIVE SOD OR SEED SHALL BE CLEAN FILL, FREE FROM ORGANIC MATERIAL AND DEBRIS, PLACED IN MAXIMUM 300mm LAYERS AND COMPACTED TO ACHIEVE 90% DRY DENSITY AS DETERMINED BY THE STANDARD AASHO TEST. FROZEN EARTH SHALL NOT BE USED FOR BACKFILLING NOR SHALL ANY BACKFILLING BE PLACED ON OR AGAINST FROZEN GROUND.

    .14 BACKFILL TRENCHES WITHIN BUILDING WITH GRANULAR B CRUSHED STONE IN LAYERS AND COMPACT TO 100% STANDARD PROCTOR DENSITY.

    .15 SUPPLY AND INSTALL A 150mm WIDE PLASTIC FILM 200mm BELOW FINISHED SURFACE OR GRADE TO MARK THE LOCATION OF DUCTS, CABLES AND CONDUITS. FILM SHALL BE MANUFACTURED BY GRIFFOLYN OR EQUAL AND SHALL CONTAIN CONTINUOUS PRINTED WARNING AND MESSAGE DESIGNATING SERVICE BURIED. FILM SHALL BE ORANGE FOR POWER LINES AND GREEN FOR COMMUNICATION LINES.

    .16 IF SETTLEMENT OCCURS, IT SHALL BE MADE UP AS SOON AS POSSIBLE, SO THAT THE REGULAR TRAFFIC IN AND AROUND THE WORK WILL NOT BE INCONVENIENCED. AFTER A PERIOD ADEQUATE TO REVEAL THAT SETTLEMENT HAS PASSED, FILL ALL DEPRESSIONS TO RESTORE THE CORRECT GRADE.

    .17 PATCHING OF ALL PAVED AREAS, ROADS, WALKS, SODDING, ETC., DAMAGED BY NEW WORK WILL BE DONE BY ANOTHER DIVISION.

    .18 BE RESPONSIBLE FOR MAKING GOOD ANY SUBSEQUENT SETTLEMENT OF FILL AND PAY ALL COSTS INVOLVED IN MAKING GOD PAVING, CURBS AND ALL OTHER SURFACES RESTORATIONS.

    19 BACKFILLING TO SUBGRADE LEVEL BY THIS CONTRACTOR AND FINISH BACKFILLING SHALL BE DONE BY PAVING CONTRACTOR.

    .20 EXCAVATED MATERIALS SHALL BE PILED, STORED AND/OR DISPOSED OF AS FOLLOWS:

      .1 DURING THE PROCESS OF THE CONTRACT, IN SUCH PLACES AND IN SUCH A MANNER THAT A MINIMUM OF DAMAGE OR DISFIGUREMENT OF EXISTING GROUND WILL RESULT.

      .2 ON COMPLETION OF WORK, ALL EXCAVATED MATERIAL SHALL BE REMOVED & DEPOSED OFF SITE.
43. UNDERGROUND DUCT BANK

    .1 SUPPLY AND INSTALL UNDERGROUND CONCRETE ENCASED DUCT BANKS FOR CABLES INDICATED. CONCRETE WORK AS DETAILED HEREIN SHALL BE PROVIDED BY THIS SECTION. TRENCHING AND BACKFILLING SHALL BE DONE BY THIS SECTION.

    .2 DUCT BANKS SHALL FOLLOW GENERAL ROUTE SHOWN ON THE DRAWINGS AND SHALL TERMINATE AT SPECIFIED LOCATIONS. EXACT LOCATION OF DUCT BANKS AND TERMINATING POINTS SHALL BE VERIFIED ON THE SITE PRIOR TO COMMENCEMENT OF WORK.

    .3 THE DUCT BANK SHALL CONSIST OF PARALLELED DUCTS ENCASED IN CONCRETE. THE NUMBER AND ARRANGEMENT OF DUCTS SHALL BE AS SHOWN ON THE DRAWINGS.

    .4 DUCTS SHALL BE C.S.A. CERTIFIED TYPE DBII POLYVINYL FOR CONCRETE ENCASEMENT OR DIRECT BURIAL, WITH AN INTERNAL DIAMETER OF FOUR INCHES MINIMUM UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

    .5 BENDS SHALL GENERALLY BE AS FACTORY SUPPLIED OF APPROVED RADIUS. RADIUS OF SUCH BENDS SHALL NOT BE LESS THAN STANDARD FOR THE 100MM DIAMETER DUCT 1M.

    .6 THE DUCT LENGTHS SHALL BE JOINED TOGETHER WITH AN APPROVED COUPLING TO PROVIDE A SOUND JOINT. ADJACENT COUPLINGS SHALL BE STAGGERED BY AT LEAST 200MM. JOINT SOLVENT SHALL BE USED TO SEAL THE COUPLINGS.

    .7 WHERE TRENCH IS DRY AND FIRM, NO BED SHALL BE REQUIRED; WHERE TRENCH IS WET, SUPPLY AND INSTALL AT 150MM LAYER OF CRUSHED STONE IN THE BOTTOM. NO CONCRETE SHALL BE POURED IN TRENCHES CONTAINING WATER.

    .8 THE DUCTS SHALL BE LAID WITH A MINIMUM SPACING OF 150MM CENTRE TO CENTRE, BOTH HORIZONTALLY AND VERTICALLY FOR 100MM DIAMETER. FOR LARGER DUCTS SPACING SHALL BE INCREASED CORRESPONDINGLY. SPACERS SHALL BE INSTALLED ON 3M CENTRES AND WITHIN 600MM OF EACH COUPLING USED. SPACERS SHALL BE SPECIALLY FORMED PLASTIC. WOOD SPACERS SHALL NOT BE USED.

    .9 THE DUCTS SHALL BE ON EVEN GRADE SLOPED NOT LESS THAN 1 IN 400 IN DIRECTION INDICATED ON THE DRAWINGS. IF NOT INDICATED, CHECK WITH CONSTRUCTION MANAGER.

    .10 THE TOP SURFACE OF THE CONCRETE ENCASEMENT SHALL BE A MINIMUM OF 1M BELOW FINISHED GRADE, UNLESS OTHERWISE INDICATED ON THE DRAWING BUT IN NO CHASE SHALL IT BE LESS THAN 12" TO THE FINISHED GRADE OR SURFACE.

    .11 NO FERROUS METAL SHALL BE INSTALLED BETWEEN PRIMARY CABLE DUCTS. RE–ENFORCING SHALL BE INSTALLED ONLY NEAR BOTTOM OF DUCT UNLESS SPECIFICALLY INDICATED OTHERWISE OR REQUIRED BY A LOCAL HYDRO AUTHORITY.

    .12 WHERE THE DUCTBANK IS CONSTRUCTED OVER RECENT FILL OR UNSTABLE GROUND OR PASSES THROUGH WALLS OR FOOTINGS OR UNDER DRIVEWAYS OR PARKING LOTS, THE CONCRETE SHALL BE REINFORCED WITH 5/8" DIAMETER HI–BOND STEEL BARS LAID LONGITUDINALLY AT 150MM LATERAL SPACING AND SET AT 2/3 THE DEPTH OF THE CONCRETE ENVELOPE BELOW THE BOTTOM ROW OF DUCTS.

    .13 ALL REINFORCING RODS USED SHALL HAVE A MINIMUM LENGTH OF 2M. INDIVIDUAL LENGTHS OF REINFORCING RODS ARE TO BE OVERLAPPED BY A MINIMUM OF 300MM AND IS TO EXTEND AT LEAST 1M ONTO SOLID GROUND. IN ALL CASES WHERE THE DUCT BANK ENTERS A BUILDING IT SHALL BE REINFORCED FOR A DISTANCE OF 2.5M OUTSIDE THE BUILDING. DUCT BANK PASSING BENEATH OR THROUGH BUILDING FOOTINGS, UNDER HIGHWAYS, STREETS, ROADS OR HEAVILY TRAVELLED DRIVEWAYS SHALL BE REINFORCED AND REINFORCING SHALL EXTEND A DISTANCE OF 1.5M BEYOND IN BOTH DIRECTIONS.

    .14 THE DUCTS SHALL BE ENCASED WITH MINIMUM 21 MPA CONCRETE WITH A MINIMUM COVER OF 75MM ON ALL SIDES. THE CONCRETE SHALL HAVE A SLUMP OF 100MM TO 150MM AND BE OF A PEA GRAVEL AGGREGATE.

    .15 TO PREVENT ANY DISPLACEMENT OF THE DUCT STRUCTURE DURING POURING THE DUCT STRUCTURE SHALL BE BRACED DOWN EVERY 3M AND THE CONCRETE SHALL BE DEFLECTED DOWN ALONGSIDE THE DUCTS TO THE BOTTOM AND UP THROUGH THE DUCT ASSEMBLY.

    .16 WHEN CROSSING OTHER UTILITIES THE CONCRETE DUCT ENCASEMENT SHALL MAINTAIN A MINIMUM OF 150MM VERTICAL CLEARANCE. WHEN RUNNING PARALLEL TO ANOTHER UTILITY THE DUCT BANK SHALL BE A MINIMUM OF 1.5M CLEAR OF SAID UTILITY BUT IN NO CASE SHALL IT BE INSTALLED IN THE SAME EXCAVATION.

    .17 WHEN COMPLETED THE DUCTS SHALL BE CLEANED AND THE ENDS PLUGGED WITH DUCT PLUGS. THE DUCTS SHALL BE TESTED FOR CLEARANCE BY PULLING A STEEL WIRE BRUSH AND A 95MM MANDREL THROUGH THEIR COMPLETE LENGTH.

    .18 DUCTS INSTALLED FOR P.U.C. CABLES AND DUCTS LEFT AS SPARE SHALL HAVE ONE CONTINUOUS LENGTH 10MM POLYPROPYLENE ROPE INSTALLED IN EACH DUCT TO FACILITATE THE INSTALLATION OF THE CABLES IN THE DUCT. TERMINATION POINTS, GRADES AND ROUTE OF DUCT BANK SHALL BE CONFIRMED BY THE P.U.C. ON SITE.

    .19 NOTIFY CONSULTANT AND P.U.C AT LEAST 48 HOURS BEFORE CONCRETE IS POURED TO PERMIT INSPECTION OF THE DUCT INSTALLATION.

    .20 ASSUME RESPONSIBILITY TO HAVE THE DUCTS INSPECTED BY THE INSPECTION OFFICE AND P.U.C. (WHERE APPLICABLE) PRIOR TO POURING OF CONCRETE AND AGAIN PRIOR TO BACKFILLING.

ELECTRICAL LEGEND

	15A, 120V, SINGLE PHASE, 'U' GROUND DUPLEX RECEPTACLE, MOUNTED @ 12" AFF U.N.O. DECORA STYLE
	SAME AS ABOVE, BUT MOUNTED ABOVE COUNTER. MOUNTING HEIGHT AS SHOWN ON DRAWINGS. DECORA STYLE
	15A, 120V, SINGLE PHASE, ISOLATED GROUND DUPLEX RECEPTACLE FOR COMPUTERS. ORANGE COVERPLATE.
	FLUSH FLOOR MOUNTED DUPLEX RECEPTACLE
	HALF SWITCHED DUPLEX RECEPTACLE
	SIMPLEX RECEPTACLE. CONFIGURATION AS REQUIRED.
$	SINGLE POLE DECORA SWITCH
$3	3–WAY DECORA SWITCH
$M	MASTER SWITCH
$D	DIMMER SWITCH. LUTRON MAESTRO U.N.O. CAPACITY AS REQ'D
$ OCC	OCCUPANCY SENSOR SWITCH. LUTRON U.N.O.
	120 VOLT SINGLE PHASE OUTLET
	208 VOLT SINGLE PHASE OUTLET
	208 VOLT THREE PHASE OUTLET
	600 VOLT THREE PHASE OUTLET
	FAN MOTOR OUTLET
	SINGLE PHASE MOTOR STARTER
	THREE PHASE MOTOR STARTER
U	FUSED / UNFUSED DISCONNECT SWITCH
T	UNIT HEATER
	COMBINATION SMOKE ALARM/CARBON MONOXIDE DETECTOR
T	ELECTRIC HEATER BY ELEC CONTRACTOR.
	POLE LIGHT. REFER TO LIGHTING SPECS

TELECOMMUNICATIONS

	COMBINATION OF VOICE/DATA OUTLET BACKBOX WITH 3/4"C & PULL STRING STUBBED 6" ABOVE FINISH CEILING
	VOICE TELEPHONE OUTLET BACKBOX WITH 3/4"C & PULL STRING STUBBED 6" ABOVE FINISH CEILING
	TELEVISION OUTLET BACKBOX WITH 3/4"C & PULL STRING STUBBED 6" ABOVE FINISH CEILING
	DATA OUTLET BACKBOX WITH 3/4"C & PULL STRING STUBBED 6" ABOVE FINISH CEILING

EMERGENCY LIGHTING

SYMBOL	DESCRIPTION
	GREEN PICTOGRAM WITH OR WITHOUT WHITE GRAPHIC DIRECTIONAL SYMBOL. MODEL TO BE LUMACELL SERIES OR EQUAL
	SINGLE OR DOUBLE REMOTE MR16 LED LAMP HEAD. MODEL# LUMACELL–SIGNATURE SERIES. CEILING OR WALL MOUNTED TO SUIT. WATTAGE/VOLTAGE AS NOTED.
	SELF CONTAIN EXIT LIGHT W/ 2–12W QUARTZ LAMPS. 1/2 HOUR BATTERY. LUMACELL GREEN PICTOGRAM
	BATTERY BACK UP UNIT. OPERATING VOLTAGE AS NOTED. BATTERY CAPACITY TO SUPPORT CONNECTED LOAD FOR MINIMUM 2 HOURS IN HIGH RISE BUILDING. ALL OTHER BUILDINGS ARE TO HAVE 1/2HR CAPACITY AT CONNECTED LOAD. 10 YEAR BATTERY LIFE. LUMACELL MODEL# RG SERIES

ACCESS CONTROL & SECURITY

C	DOOR CONTACT
	PUSHBUTTON
D	DOOR STRIKE
CR	CARD READER
	CCTV CAMERA
ML	MAG LOCK
DH	DOOR HOLD OPEN DEVICE
I	INTERCOM
RX	REQUEST TO EXIT DEVICE

ABBREVIATIONS

AFI	DENOTES ARC FAULT BREAKER
E/B/B	DENOTES ELECTRIC BASE BOARD HEATER
FFH	DENOTES FORCE FLOW HEATER
GFI	DENOTES GROUND FAULT INTERRUPTER
ER	DENOTES EXISTING TO RELOCATED
EX	DENOTES EXISTING TO REMAIN & BE REUSED
LOC'N	DENOTES LOCATION
M/D	DENOTES MOTORIZED DAMPER
N	DENOTES NEW
RQ'D	DENOTES REQUIRED
RM	DENOTES EXISTING TO BE REMOVED
RN	DENOTES REPLACE EXISTING WITH NEW
RP	DENOTES EXISTING IN RELOCATED POSITION
U/H	DENOTES UNIT HEATER
U.N.O.	DENOTES UNLESS NOTED OTHERWISE
WP	DENOTES WEATHERPROOF

NO.	DATE	DESCRIPTION
5	MAY 26/20	PERMIT
4	JUNE 11/18	ADDED TELEPHONE & SOFFIT LIGHTS
3	MAY 23/18	REVIEW
2	MAY 8/18	REVIEW
1	MAY 1/18	REVIEW

THIS DRAWING SHALL BE USED ONLY FOR THE PURPOSE INDICATED IN THE LATEST ISSUED COLUMN ABOVE

THESE DRAWINGS ARE NOT TO BE SCALED.

CONSTRUCTION NORTH

LICENSED PROFESSIONAL ENGINEER
MAY 26/20
J–M. J BOHEMIER
PROVINCE OF ONTARIO

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GARNET GRAHAM PARK

FENLON FALLS ONTARIO

ELECTRICAL

PLOT DATE 5.26.2020
PROJECT No. 18–776

DRAWING TITLE
LEGEND & SPECS

DATE 2018
DRAWN BY RH
SCALE _

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OF 2