

ELECTRICAL SPECIFICATION CONT.

GENERAL CONDITIONS

- 1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. ELECTRICAL SUBCONTRACTOR SHALL PROVIDE AND INSTALL AND NECESSARY ELECTRICAL EQUIPMENT NECESSARY TO FULFILL APPLICABLE CODES, REGULATIONS, BUILDING STANDARDS AND THE BEST PRACTICES OF THE TRADE FOR INSTALLATION OF ELECTRICAL WORK.
2. ALL ELECTRICAL WORK, MATERIALS AND EQUIPMENT SHALL CONFORM WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, UNDERWRITERS LABORATORIES, BOARD OF UNDERWRITERS, OSHA, NEMA, NFPA, MALL STANDARDS AND ALL AUTHORITIES HAVING JURISDICTION. THE ELECTRICAL SUBCONTRACTOR SHALL PAY FOR AND OBTAIN ALL REQUIRED PERMITS AND CERTIFICATES OF REQUIRED ORDINANCES, AND DELIVER THEM TO THE CITY OF WINNIPEG REPRESENTATIVE.
3. THE ELECTRICAL SUBCONTRACTOR SHALL VISIT AND EXAMINE CAREFULLY THE AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. THE ELECTRICAL SUBCONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. SUBMITTING A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOUR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
4. UPON REVIEW OF THE DRAWINGS PRIOR TO SUBMITTING HIS PROPOSAL, THE ELECTRICAL SUBCONTRACTOR SHALL INFORM THE CONTRACT ADMINISTRATOR OF ANY DISCREPANCIES WITHIN THE DRAWINGS AND REQUEST CLARIFICATION CONCERNING THE DISCREPANCIES. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS SHOULD SUCH PROCEDURE NOT BE FOLLOWED.
5. THE ELECTRICAL SUBCONTRACTOR SHALL COORDINATE THIS WORK WITH OTHER SUBCONTRACTORS WHOSE WORK MIGHT AFFECT THIS INSTALLATION. THE ELECTRICAL SUBCONTRACTOR SHALL ARRANGE ALL PARTS OF THIS WORK AND EQUIPMENT IN PROPER RELATION TO THE WORK AND EQUIPMENT OF OTHERS.
6. THE ELECTRICAL SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONDUIT, OUTLET BOXES, POKE-THRU SERVICE FITTINGS REQUIRED TO FACILITATE THE INSTALLATION OF COMMUNICATION WIRING AND DEVICES.
7. THE DRAWINGS INDICATE THE SIZE AND GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. VERIFY SCALE WITH ARCHITECTURAL DRAWINGS. THE EXACT LOCATION AND ELEVATION OF ALL LIGHTING FIXTURES, SWITCHES, RECEPTACLES, ETC. SHALL BE DETERMINED FROM THE ARCHITECTS DRAWINGS.
8. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION" AS APPLICABLE, ARE PART OF THE CONTRACT.

FIRE ALARM SYSTEM

- 1. THE WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS INCLUDES THE FURNISHING OF ALL PERMITS, FEES, LABOR, EQUIPMENT, MATERIALS, AND PERFORMANCE OF ALL OPERATIONS IN CONNECTION WITH THE INSTALLATION OF THE FIRE ALARM SYSTEM AS SHOWN ON THE DRAWINGS AND AS HEREIN SPECIFIED.
2. THE COMPLETE INSTALLATION SHALL CONFORM TO THE APPLICABLE SECTIONS OF NFPA-72, LOCAL CODE REQUIREMENTS AND THE NATIONAL ELECTRICAL CODE.
3. EACH AND ALL ITEMS OF THE FIRE ALARM SYSTEM SHALL BE LISTED AS A PRODUCT OF A SINGLE FIRE ALARM SYSTEM MANUFACTURER.
4. THE SYSTEM ALARM OPERATION SUBSEQUENT TO THE ALARM ACTIVATION OF ANY INITIATING DEVICE SHALL BE AS FOLLOWS:
a. THE APPROPRIATE INITIATING DEVICE CIRCUIT RED LED SHALL FLASH ON THE CONTROL PANEL.
b. A PULSING ALARM TONE SHALL OCCUR WITHIN THE CONTROL PANEL UNTIL SILENCED.
c. ALL ALARM INDICATING APPLIANCES SHALL SOUND AND OR DISPLAY IN A SYNCHRONIZED CONTINUOUS PATTERN UNTIL SILENCED BY THE ALARM SILENCE SWITCH.
d. A SUPERVISED SIGNAL TO NOTIFY THE LOCAL FIRE DEPARTMENT OR AN APPROVED CENTRAL STATION SHALL BE ACTIVATED.
e. THE MECHANICAL CONTROLS SHALL ACTIVATE THE AIR HANDLING SYSTEMS AS REQUIRED TO SHUTDOWN ALL FANS AND GAS SUPPLY VALVES.
5. THE CONTROL PANEL SHALL RECEIVE 120 VAC POWER. VIA A DEDICATED CIRCUIT.
6. THE SYSTEM SHALL BE PROVIDED WITH 24 HOUR BATTERY BACK-UP.
7. THE CONTRACTOR SHALL WARRANT THE COMPLETED FIRE ALARM SYSTEM WIRING AND EQUIPMENT TO BE FREE FROM INHERENT MECHANICAL AND ELECTRICAL DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF THE COMPLETED AND CERTIFIED TEST OR FROM THE DATE OF FIRST BENEFICIAL USE.

TEMPORARY POWER

- 1. FURNISH AND INSTALL WIRING FOR ADEQUATE TEMPORARY LIGHT AND POWER FOR THE PROJECT.
2. MAINTAIN THE SYSTEM IN GOOD AND ADEQUATE WORKING CONDITIONS AT ALL TIMES.
3. FURNISH AND INSTALL ALL LAMPS, BREAKERS, AND FUSING, AS IS NECESSARY.
4. REPLACE BURNED OUT LAMPS, DEFECTIVE BREAKERS OR BLOWN FUSES.
5. MAINTENANCE FOR THE ABOVE SHALL BE BASED ON OPERATION 1/2 HOUR BEFORE THE START OF THE FIRST TRADE THROUGH 1/2 HOUR AFTER THE END OF THE LAST TRADE.
6. WIRE ADEQUATE FOR ALL CONSTRUCTION NEEDS.

LIGHTING FIXTURES

- 1. ALL FIXTURES, LAMPS AND BALLASTS ARE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
2. ALL LIGHT FIXTURE MOUNTING HARDWARE SHALL MATCH AND ALL LIGHT FIXTURE MOUNTING HARDWARE SHALL MATCH AND TYPE.
3. FLUORESCENT BALLASTS SHALL BE ELECTRONIC, U.L. CLASS "P" AND SHALL CONFORM TO ANSI AND UL SPECIFICATIONS. BALLASTS FOR FLUORESCENT LAMPS SHALL BE OF THE ENERGY SAVING SUPER LOW HEAT DESIGN WITH HIGH POWER FACTOR ELECTRONIC TYPE AS MANUFACTURED BY ADVANCE, UNIVERSAL, MOTOROLA OR GE. BALLASTS SHALL BE APPROVED FOR THE UTILITY COMPANY ENERGY REBATE PROGRAM.
4. PROVIDE LAMPS SUITABLE FOR LIGHTING FIXTURES IN WHICH THEY ARE USED AND AS INDICATED ON THE DRAWINGS. FLUORESCENT LAMPS SHALL BE "RAPID START" AND SHALL DELIVER NOT LESS THAN 3150 LUMENS. MINIMUM CHROMATICITY OF LAMPS SHALL BE 4100 KELVIN UNLESS OTHERWISE NOTED. MINIMUM COLOR RENDERING INDEX (CRI) OF LAMPS SHALL BE 86. INCANDESCENT LAMPS SHALL BE AS MANUFACTURED BY GE, SYLVANIA, OSRAM OR PHILIPS.

TELECOMMUNICATIONS SPECIFICATIONS

- 1. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. THE FOLLOWING REFERENCES ARE APPLICABLE FOR THE INSTALLATION OF COMMUNICATIONS SUPPORT STRUCTURES AND EQUIPMENT. IF A DISCREPANCY BETWEEN THE SPECIFICATIONS AND THE REFERENCES EXIST THE MOST STRINGENT REQUIREMENTS SHALL APPLY.
a. ANSI/TIA/EIA 606, DESIGN GUIDELINES FOR ADMINISTRATION OF TELECOMMUNICATIONS IN COMMERCIAL BUILDINGS.
b. J-STD-607-A, GROUNDING AND BONDING FOR TELECOMMUNICATIONS IN COMMERCIAL BUILDINGS.
c. ANSI/TIA/EIA 568-A DESIGN GUIDELINES FOR TELECOMMUNICATIONS WIRING SYSTEMS IN COMMERCIAL BUILDINGS.
d. ANSI/TIA/EIA 569, COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATIONS PATHWAYS AND SPACES.
e. BICSI TELECOMMUNICATIONS DISTRIBUTION METHODS MANUAL 10TH EDITION.
f. BICSI INFORMATION TRANSPORT SYSTEMS INSTALLATION MANUAL 4TH EDITION.
g. ANSI/NECA/BICSI 568-2001 INSTALLING COMMERCIAL TELECOMMUNICATIONS CABLING.
3. HEIGHTS OF COMMUNICATIONS SYSTEM OUTLET BOXES
a. VOICE/DATA OUTLETS, 12 INCHES AFF(SAME AS ADJACENT RECEPTACLES).
4. EACH COMPONENT OF THE SYSTEM MUST BE NON-PROPRIETARY AND NOT EXCLUSIVE TO ANY INSTALLER.
5. SUBMIT TO CONTRACT ADMINISTRATOR SHOP DRAWINGS, PROOF OF CABLING VENDOR CERTIFICATION, PRODUCT DATA (INCLUDING CUT SHEETS AND CATALOG INFORMATION). SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WITH SUCH PROMPTNESS AND IN SUCH SEQUENCE AS TO CAUSE NO DELAY IN THE WORK OR IN THE ACTIVITIES OF SEPARATE CONTRACTORS. THE CONTRACT ADMINISTRATOR WILL INDICATE APPROVAL OF SHOP DRAWINGS, AND PRODUCT DATA.

COMMUNICATIONS EQUIPMENT ROOM

FITTINGS NOTES

- 1. COMMUNICATIONS TERMINATION BLOCKS AND PATCH PANEL INSTALLATION
a. INSTALL PATCH PANELS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INCLUDING ALL CABLE MANAGEMENT RAILS AND ACCESSORIES.
b. INSTALL CATEGORY 6 PATCH PANELS FOR ALL HORIZONTAL CABLING TO THE WORKSTATION, VOICE AND DATA CABLING WILL BE COMPLETELY CATEGORY 6 CABLING AT THE WORKSTATION AND ALL HORIZONTAL CABLING WILL BE INSTALLED ON PATCH PANELS.
2. COMMUNICATIONS CABLE MANAGEMENT AND LADDER RACK
a. INSTALL 1 - 2RU RACK UNIT HORIZONTAL CABLE MANAGEMENT BETWEEN EACH ABOVE AND BELOW EACH PATCH PANEL. PROVIDE QUANTITIES TO COVER EACH RACK TYPE THAT PATCH PANELS ARE USED.

PATHWAYS FOR COMMUNICATIONS

INSTALLATION NOTES

- 1. CONDUIT INSTALLATION REQUIREMENTS
a. ALL COMMUNICATIONS SYSTEMS SHALL BE INSTALLED IN CONDUIT.
b. THE INSIDE RADIUS OF A BEND IN CONDUIT SHALL BE NOT LESS THAN 10 TIMES THE INTERNAL DIAMETER OF THE CONDUIT.
c. ALL CONDUITS SHALL BE IDENTIFIED AND LABELLED AT BOTH ENDS. TAGS SHALL IDENTIFY START AND FINISH OF CONDUIT.
d. A MAXIMUM OF ONE TELECOMMUNICATIONS OUTLET PER 27MM CONDUIT RUN.
e. ALL CONDUITS SHALL ORIGINATE IN THE TELECOMMUNICATIONS ROOM, PULL BOX OR CABLE TRAY.
f. CONDUITS SHALL BE RIGIDLY AND ADEQUATELY FASTENED TO WITHSTAND PULLING TENSIONS AS PER MANUFACTURER'S RECOMMENDATIONS.
g. CONDUITS MUST FOLLOW BUILDING LINES.
h. CONDUITS ENTERING AND EXITING THROUGH THE CEILING OF A TELECOMMUNICATIONS ROOM (TR) SHALL PROTRUDE INTO THE ROOM 25-50MM (1-2") ABOVE THE 2400MM (8FT) LEVEL.
i. THE MAXIMUM FILL RATE AUTHORIZED FOR CONDUITS IS 40 PERCENT.
j. ALL CONDUITS SHALL USE THE TRAPEZE HANGER METHOD TO SUPPORT THE CONDUITS, SHALL US THREADED ROD NOT LESS THAN 3/8" DIAMETER.
2. PULL BOX INSTALLATION REQUIREMENTS
a. IN ALL INSTANCES PULL BOXES SHALL BE PLACED IN STRAIGHT SECTIONS OF A CONDUIT RUN AND SHALL NOT BE USED IN LIEU OF A BEND. CORRESPONDING ENDS OF THE CONDUIT ARE TO BE ALIGNED WITH EACH OTHER. CONDUIT FITTINGS SHALL NOT BE USED IN PLACE OF PULL BOXES. CONDUITS SHALL ALWAYS PROTRUDE IN THE DIRECTION OF PULL. CONDUITS SHALL NOT EXIT THE SIDES BOTTOM OR BACK OF THE PULL BOX.
b. PULL BOXES SHALL BE PLACED IN AN EXPOSED LOCATION, AND READILY ACCESSIBLE. PULL BOXES SHALL NOT BE PLACED IN A FIXED FALSE CEILING SPACE, UNLESS IMMEDIATELY ABOVE A SUITABLY MARKED AND HINGED PANEL. IF THE PULL BOX IS INSTALLED ABOVE A SUSPENDED TYPE CEILING A GREEN INDICATOR DOT SHALL BE PLACED ON CEILING T-RAIL TO INDICATE THE LOCATION OF PULL BOX.
c. ALL BOXES SHALL BE ADEQUATELY SECURED. THEY SHALL NOT BE SUPPORTED BY THE CONDUITS ENTERING THE BOX.
d. RISER CABLES AND TELECOMMUNICATIONS OUTLET CANNOT SHARE THE SAME CONDUIT SYSTEM OR PULL BOXES.
3. OUTLET BOX INSTALLATION REQUIREMENTS.
a. INSTALL TELECOMMUNICATIONS OUTLET BOXES FOR VOICE DATA SYSTEMS SAME LEVEL AS ADJACENT RECEPTACLES AND FLUSH TO THE WALL WHEREVER POSSIBLE.
b. ENSURE OUTLET BOX IS MECHANICALLY BONDED TO THE CONDUIT SYSTEM.
c. CONDUITS MUST ENTER THE OUTLET BOX FROM THE TOP OR BOTTOM.

COMMUNICATIONS HORIZONTAL CABLING

INSTALLATION

- 1. LABEL ALL FACEPLATES CABLES AND CONNECTORS.
2. PROVIDE THE FOLLOWING SEPARATION FROM ELECTRICAL POWER SYSTEMS INSTALLED IN CONDUITS
a. 50MM FROM CIRCUITS OF 300VOLT AND LESS.
b. 600MM FROM CIRCUITS 300VOLT AND HIGHER.
c. 2 METRES FROM CIRCUITS BETWEEN 300V AND 15KV.
d. 3 METRES FOR CIRCUITS ABOVE 15KV.
e. ELECTRICAL SYSTEMS CANNOT SHARE THE SAME PATHWAY.
3. COORDINATE WITH OWNER TO IDENTIFY THE LOCATION WHERE EXISTING FACILITIES CAN BE ACCESSED TO PROVIDE INTERCONNECTION BETWEEN NEW AND EXISTING CABLES.
4. NEVER CRUSH THE CABLE, VELCRO TIES SHALL BE USED AS PER MANUFACTURER'S RECOMMENDATION.
5. USE OF VELCRO CABLE TIES THROUGHOUT THE INSTALLATION AND IN THE TELECOM ROOMS IS REQUIRED.
6. DO NOT KINK, KNOT OR SNAG THE CABLE WHILE PULLING, THIS WILL CAUSE DAMAGE UNDER THE JACKET AND MAY ALTER CABLE PERFORMANCE.
7. DO NOT EXCEED THE MINIMUM BEND OF 4 X OUTSIDE DIAMETER (OD) FOR 4 PAIR UTP, 10 X OD FOR MULTI PAIR (MORE THAN 4 PAIR) UTP, 1.18 IN. FOR TWO FIBRE CABLE, AND 10 X OD FOR MULTI FIBRE CABLE.
8. PER TIA/EIA 568-A NEVER UNTWIST THE PAIRS OF CABLE BEYOND THE ABSOLUTE MINIMUM REQUIRED FOR TERMINATION.
9. USE THE SAME PERFORMANCE CRITERIA FOR BOTH CABLE AND CONNECTING HARDWARE THROUGH THE ENTIRE HORIZONTAL RUN.
10. ONLY ONE PIN-OUT THROUGHOUT THE TOTAL INSTALLATION T568A IS ALLOWED.
11. INSTALL ALL CABLES THROUGH PRIMARY AND SECONDARY PATHWAYS. UNLESS OTHERWISE SPECIFIED, INSTALLATION METHODS AND TECHNIQUES SHALL SATISFY ANSI/EIA/TIA-569, COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATIONS PATHWAYS AND SPACES.
12. HORIZONTAL STATION CABLES SHALL BE HOME-RUN FROM THE COMMUNICATION OUTLET BOX AT THE WORK AREA TO THE DISTRIBUTION FRAME SERVING THE AREA AS SHOWN ON THE DRAWINGS.
13. CABLES SHALL NOT BE INSTALLED OR ROUTED IN ANY MANNER THAT VIOLATES THE MANUFACTURER'S SPECIFICATIONS. MANUFACTURER'S MINIMUM BEND RADIUS FOR STATIC (POST INSTALLATION) CABLES IS 10 TIMES THE CABLE DIAMETER. MANUFACTURER'S MINIMUM BEND RADIUS FOR CABLES UNDER STRAIN (PULLING TENSION) IS 20 TIMES THE CABLE DIAMETER.
14. INSTALLED DAMAGED CABLE WILL NOT BE ACCEPTED. UNLESS OTHERWISE ALLOWED BY THE OWNER, DAMAGED CABLE SHALL BE REMOVED AND NEW CABLE INSTALLED AT THE EXPENSE OF THE CONTRACTOR. DAMAGE INCLUDES PHYSICAL DAMAGE TO THE CABLE AND DAMAGE THAT MAY AFFECT PERFORMANCE. THE OWNER WILL NOT ACCEPT CABLE OF ANY TYPE UNTIL AFTER IT IS INSTALLED AND PASSES A PHYSICAL INSPECTION AND ALL PERFORMANCE TESTS.
15. CABLE BUNDLING HARDWARE SHALL BE RATED FOR THE ENVIRONMENT AND APPLICATION IN WHICH USED. APPLICATIONS INCLUDE, BUT ARE NOT LIMITED TO, GENERAL PURPOSE, OUTDOOR, CHEMICAL RESISTANT, FLAME RETARDANT, HIGH TEMPERATURE, AND VIBRATION.
16. PROVIDE REUSABLE CABLE MANAGEMENT STRAPS FOR BUNDLING AND SECURING HORIZONTAL STATION CABLES AND EQUIPMENT JUMPER CABLES WITHIN ENTRANCE FACILITIES AND TELECOMMUNICATION CLOSETS. DO NOT USE NYLON CABLE TIES.

COMMUNICATIONS CONNECTING CORDS

INSTALLATION

- 1. PROVIDE 2 WORK AREA CORDS PER TELECOMMUNICATIONS OUTLET AND 2 PATCH CORDS PER TELECOMMUNICATION OUTLET.
2. ONLY ONE PIN-OUT FOR WORK-AREA CORDS AND PATCH CORDS THROUGHOUT THE TOTAL INSTALLATION (T568A) IS ALLOWED.

TESTING OF COMMUNICATIONS SYSTEMS

- 1. A PERMANENT LINK TEST SHALL BE PERFORMED ON ALL HORIZONTAL CABLING INSTALLED UNDER THE PROJECT AND WHERE THE TERMINATION IS DISTURBED TO PERFORM WORK UNDER THE PROJECT.
2. ONE WEEK PRIOR TO SCHEDULED CUTOVER DATE THE CONSULTANT AND OWNER SHALL RECEIVE FROM THE CONTRACTOR PRINTED AND ELECTRONIC COPPER CABLE TEST RESULTS. CUTOVER SHALL NOT COMMENCE UNLESS TEST RESULTS ARE SUBMITTED.

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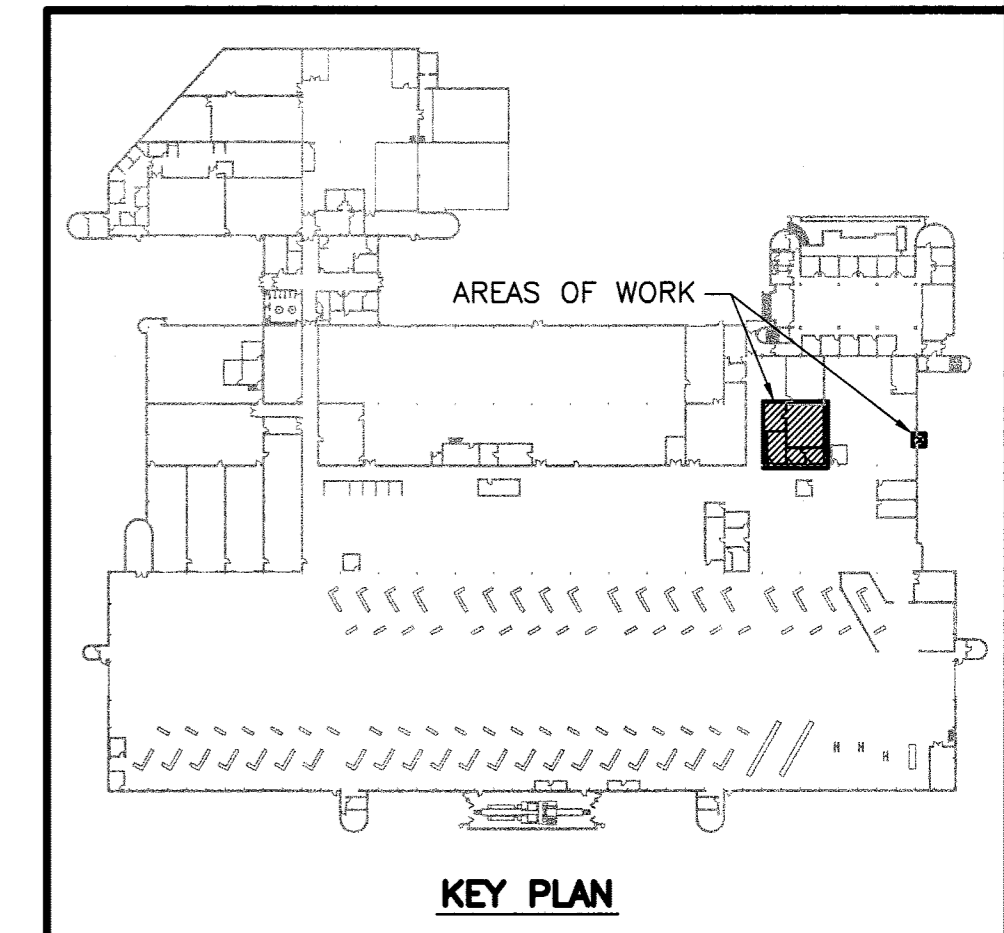


Table with 4 columns: NO., DATE, DESCRIPTION, PREPARED

Table with 4 columns: REVISIONS/ISSUE, DRAFTING, ENGINEERING

Professional Engineer seal for H.A. CEJA-CANAS, Member 22882, and APEGM Certificate of Authorization for TETRA TECH WEI Inc. No. 5313, Date: April 30, 2014.

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