CODE REFERENCES

CITY OF AURORA, CO LOCAL AMENDMENTS
2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL PLUMBING CODE
2008 ASHRAE STANDARDS 170
2012 NFPA 99 STANDARDS
2018 FGI GUIDELINES FOR HOSPITALS
2021 HCA ENGINEERING GUIDELINES

DRAWING LIST

MG0.01	MEDICAL GAS LEGEND, MATERIALS AND NOTES	NO SCALE
MG0.02	MEDICAL GAS SPECIFICATIONS	NO SCALE
MG1.01	MEDICAL GAS PARTIAL SECOND FLOOR PLANS	1/8"=1'-0"

MEDICAL GAS MATERIAL LIST

SERVICE DESCRIPTION	MATERIAL
MEDICAL GAS	TYPE 'K' HARD DRAWN SEAMLESS COPPER AND WROT FITTINGS CLEANED & CAPPED FOR OXYGEN SERVICE IN ACCORDANCE TO NFPA 99 STANDARDS. JOINTS SHALL BE BRAZED IN ACCORDANCE TO CURRENT NFPA 99 STANDARDS.

MEDICAL GAS SYMBOL LIST

SYMBOL	DESCRIPTION
OXY	OXYGEN PIPING
AIR	MEDICAL COMPRESSED AIR PIPING
VAC	MEDICAL VACUUM PIPING
	NEW PIPE
	EXISTING PIPE
	ZONE VALVE BOX (ZVB)
	SHUT-OFF VALVE
	EXISTING FIXTURE/EQUIPMENT/PIPING TO BE REMOVED
	NEW CONNECTION

MEDICAL GAS ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
OXY	OXYGEN
AIR	MEDICAL COMPRESSED AIR
VAC	MEDICAL VACUUM
(N)	NEW PIPING
(E)	EXISTING PIPING
DN	DOWN
TYP.	TYPICAL

GENERAL NOTES

1. IT IS THE CONTRACTOR'S RESPONSIBILITY DURING BIDDING TO VERIFY THAT THE AREAS NECESSARY TO PERFORM THE WORK ARE SUFFICIENT FOR THE EQUIPMENT REQUIRED. IF THE AREAS ARE INSUFFICIENT THEY MUST MAKE THIS KNOWN AT THE TIME OF BIDDING.
2. THE PROJECT MUST BE EXECUTED IN MULTIPLE PHASES TO MAINTAIN EXISTING BUILDING OPERATIONS AND KEEP EXISTING BUILDING MEDICAL VACUUM SYSTEM FULLY OPERATIONAL AT ALL TIMES WITH MINIMAL SHUT-DOWN FOR CROSS-OVER. SYSTEM DOWN TIME TO BE KEPT TO AN ABSOLUTE MINIMUM. SHUT-DOWNS SHALL ONLY OCCUR ON OFF PEAK HOURS AT TIMES AND MANNER IN ACCORDANCE TO FACILITY APPROVAL. REQUESTS FOR SHUT-DOWNS SHALL BE MADE NO LESS THAN SEVEN (7) DAYS IN ADVANCE. SHUT-DOWNS SHALL NOT OCCUR WITHOUT WRITTEN FACILITY APPROVAL.
3. CONTRACTOR TO PROVIDE AN ESTIMATED PROJECT SCHEDULE WITH MILESTONES AND A PROPOSED PHASING SEQUENCE TO SUPPORT PROPOSED WORK WITHIN BID.
4. CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY WORK REQUIRED TO COMPLETE THE ENTIRE PROJECT, INCLUDING OTHER TRADES SUCH AS ELECTRICAL AND ROOFER.
5. CONTRACTOR IS RESPONSIBLE TO CONFIRM IN BID THAT EQUIPMENT CAN BE APPROPRIATELY NAVIGATED AND/OR LIFTED TO MECHANICAL SPACE FOR NAVIGATION INTO INTENDED FINAL INSTALLATION SPACE.
6. THE CONTRACTOR MUST PROVIDE A PRICE FOR THE INFORMATION INCLUDED IN THIS SPECIFICATION AND WORK INDICATED ON THE PLANS. ANY DEVIATIONS TO EQUIPMENT OR MATERIAL MUST BE IDENTIFIED AS AN ADDITIVE OR DEDUCT AT THE TIME OF BIDDING.
7. THE CONTRACTOR SHALL COORDINATE AND WORK WITH OWNER TO SECURE ALL REQUIRED SPACES INCLUDING EQUIPMENT SPACE, CEILING SPACE, CHASE SPACE, WALL SPACE, ETC., TO PROPERLY ACCOMMODATE ALL WORK.
8. PROVIDE ALL DOCUMENTS REQUIRED TO SECURE PERMITS. THE DRAWINGS SHALL REFLECT THE REQUIREMENTS OF THE CITY AND OTHER AUTHORITIES HAVING JURISDICTION.
9. PROVIDE OWNER WITH OPERATION AND MAINTENANCE INSTRUCTIONS.
10. PROVIDE MANUFACTURER REPRESENTATIVE FOR ON-SITE OWNER TRAINING AND INSTRUCTION FOR PROPER OPERATION AND MAINTENANCE OF EQUIPMENT.
11. AT COMPLETION OF WORK, FURNISH A WRITTEN GUARANTEE STATING THAT THE EQUIPMENT, MATERIALS, AND WORK PERFORMED ARE IN FULL ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE GUARANTEE SHALL ALSO STATE THAT THIS WORK AND ALL CHANGE ORDERS ARE FULLY GUARANTEED FOR ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE, AND ANY EQUIPMENT MATERIALS, OR WORKMANSHIP WHICH MAY PROVE DEFECTIVE WITHIN THAT TIME WILL BE REPLACED AT NO COST TO THE OWNER.

GENERAL DEMOLITION NOTES

1. BEFORE BID SUBMISSION, CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS WHICH MAY AFFECT THE SCOPE OF THIS PROJECT.
2. ALL WORK SHALL BE PERFORMED IN A CLEAN, WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE INCONVENIENCE OR DISTURBANCE TO AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
3. ALL DEMOLITION WORK SHALL BE COORDINATED WITH HOSPITAL TO LIMIT SHUTDOWNS AND VACUUM SYSTEM SHALL BE AVAILABLE AT ALL TIMES DURING DEMOLITION AND CONSTRUCTION ACTIVITIES. NEW VACUUM PUMP SYSTEM SHALL BE INSTALLED NEXT TO EXISTING VACUUM PUMP SYSTEM AND SHALL BE IN PLACE AND OPERATIONAL BEFORE COMPLETE REMOVAL OF THE EXISTING VACUUM PUMP SYSTEM.
4. ALL WORK SHALL BE DONE IN OFF-PEAK HOURS BETWEEN 8 PM AND 5 AM.
5. THE OWNER MUST BE GIVEN A MINIMUM OF ONE WEEK NOTICE PRIOR TO ANY PROPOSED SHUTDOWNS OF SERVICE.
6. COORDINATE WITH ALL RESPECTIVE TRADES FOR REMOVAL OF PLUMBING DEVICES AND EQUIPMENTS FOR THE PROPER DISCONNECTION AS REQUIRED.
7. PROTECT EXISTING BUILDING ELEMENTS FROM DAMAGE DURING DEMOLITION. PROVIDE ALL NECESSARY PROTECTIVE MEASURES. ANY DAMAGE THAT OCCURS IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR BACK TO ORIGINAL CONDITIONS.
8. PLUMBING EQUIPMENT, PIPING, ACCESSORIES, ETC. NOT SHOWN ON THESE DRAWINGS SHALL REMAIN AND FUNCTION AS INTENDED. PROTECT DURING DEMOLITION AND CONSTRUCTION.
9. REMOVE ALL EXISTING PIPING BACK TO ACTIVE SOURCE LEAVING NO DEAD END RUNS AND AS INDICATED. VALVE AND CAP EXISTING VACUUM RISER FOR CONNECTION TO NEW VACUUM PUMP SYSTEM.
10. REMOVAL OF PIPING SHALL INCLUDE ALL HANGERS & SUPPORTS, ANCHORS, ETC.
11. DISPOSE OF ALL MATERIALS IN ACCORDANCE TO CODE AND LOCAL REQUIREMENTS.

SEPARATE FIRE ALARM PERMIT REQUIRED:
Due to the proposed work the general contractor is required to obtain the services of a fire alarm contractor to determine if a separate alarm permit is required. If it is determined that the spacing of the fire alarm devices is not in compliance, then a separate fire alarm permit is required. Approval of the documents is required prior to system installation or any request for inspection. A certificate of occupancy or final approval cannot be issued by the Building Division without this fire protection system. **2015 IFC, Section 105.7.6.**

Structural plan review is limited to a general survey for code compliance. No review is implied nor was undertaken to verify structural adequacy.

PROVIDE A FULL-SIZE SET OF LEGIBLE APPROVED CONSTRUCTION DOCUMENTS **PRINTED IN COLOR** FOR REVIEW BY INSPECTOR

Code violations that are found during inspection are required to be corrected. Permit issuance does not grant approval of a code violation. 2015 IBC 105.4.

City of Aurora Building Division
Project: *TMCA CARDIAC VACCUM PUMP REP*
Address: *1501 S POTOMAC ST*
Occupancy Group: *IBC I-2*
Construction Type: *IBC TYPE IA-SPK*
RSN: *1669265*
Permit: *22-2236640-LT*

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *Oct 24, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

RSN: *1669265*
Permit #: *22-2236640-LT*

COLORADO LICENSED
MICHAEL P THOMPSON
55150
PROFESSIONAL ENGINEER
9/16/2022

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THE MEDICAL CENTER OF AURORA
CARDIAC TOWER 2ND FLOOR VACUUM PIPING REPLACEMENT

1501 S. POTOMAC ST.
AURORA, CO 80012

REVISION		
MARK	DATE	DESCRIPTION

SALAS O'BRIEN
815 South Wabash Avenue, Chicago, IL 60605
9250 East Costilla Avenue, Greenwood Village, CO 80112

SHEET TITLE:
MEDICAL GAS LEGEND, MATERIALS AND NOTES

PROJECT NUMBER:
2021-00498-00

SHEET NUMBER:
MG0.01

MEDICAL GAS SPECIFICATIONS

PART 1 – BASIC REQUIREMENTS

1.01 DESCRIPTION

A. THE DRAWINGS AND SPECIFICATIONS SHALL BE UNDERSTOOD TO COVER SYSTEMS OF HEATING, VENTILATION AND AIR CONDITIONING, BUILDING AUTOMATION SYSTEMS AND TEMPERATURE CONTROL, MEDICAL GAS, AND INSULATION AND PIPE COVERING AS SHOWN ON THE DRAWINGS AND AS SPECIFIED. THE DRAWINGS AND SPECIFICATIONS ARE TO BE TAKEN TOGETHER. WORK SPECIFIED AND NOT SHOWN, OR WORK SHOWN AND NOT SPECIFIED, SHALL BE AS BINDING AS THOUGH REQUIRED BY BOTH, THE DRAWINGS AND SPECIFICATIONS.

B. MINOR ITEMS AND ACCESSORIES OR DEVICES NOT SHOWN BUT REASONABLY REFERRED AS NECESSARY TO THE COMPLETE AND PROPER OPERATION OF ANY SYSTEM SHALL BE PROVIDED FOR SUCH SYSTEMS, WHETHER OR NOT THEY ARE SPECIFICALLY CALLED FOR BY THE SPECIFICATIONS OR THE DRAWINGS.

1.02 CONTRACTOR

A. WHERE THE TERM "MECHANICAL CONTRACTOR" OR "CONTRACTOR" IS USED IT SHALL BE UNDERSTOOD TO BE A CONTRACTOR PROVIDING SINGLY OR IN COMBINATION PLUMBING SYSTEMS, FIRE PROTECTION SYSTEMS, HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, TEMPERATURE CONTROL AND BUILDING AUTOMATION SYSTEMS, MEDICAL GAS SYSTEMS, TESTING AND BALANCING, OR INSULATION AND PIPE COVERING AS DESCRIBED IN DIVISION 22.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. PERFORM WORK STRICTLY AS REQUIRED BY RULES, REGULATIONS, STANDARDS, CODES, ORDINANCES, AND LAWS OF LOCAL, STATE, AND FEDERAL GOVERNMENTS, AND ANY OTHER AUTHORITIES THAT HAVE LEGAL JURISDICTION OVER THE SITE.

B. PRIOR TO COMMENCEMENT OF WORK, NOTIFY STATE AND AUTHORITIES HAVING JURISDICTION AS REQUIRED AND SUBMIT ALL OF THE APPLICABLE NOTIFICATIONS FOR CONSTRUCTION, OPERATION AND/OR DEMOLITION.

C. THIS PROJECT AND ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL CONFORM TO THE FOLLOWING AGENCIES:
1. TRI-COUNTY HEALTH DEPARTMENT
2. NFPA STANDARD 99 HEALTH CARE FACILITIES
3. NATIONAL ELECTRIC CODE (NEC)
4. CSA NON-FLAMMABLE MEDICAL GAS PIPING SYSTEMS
5. ASTM B819 STANDARD FOR SEAMLESS COPPER TUBE
6. AWS A5.8 AND NFPA BRAZING FILLER METAL

1.04 OWNER REQUIREMENTS

A. HCA MAINTAINS PURCHASING AGREEMENTS FOR SELECT EQUIPMENT AND MATERIALS WHICH ARE OUTLINED IN THE HCA INNOVATION MEMORANDUMS. ALL MATERIALS AND EQUIPMENT PURCHASED UNDER THIS CONTRACT SHALL COMPLY WITH THE INNOVATION MEMORANDUMS.
1. INNOVATION MEMORANDUM 07: ALL PIPING RELATED ITEMS ARE TO BE PURCHASED THROUGH FERGUSON ENTERPRISE (ALTON LASSITER – 615-316-1848, ALTON.LASSITER@FERGUSON.COM). ITEMS INCLUDE BUT ARE NOT LIMITED TO:
   a. COPPER PIPING
   b. CARBON STEEL PIPING
   c. POLYPROPYLENE PIPING
   d. CROSS-LINKED POLYETHYLENE (PEX) PIPING AND FITTINGS
   e. HIGH-DENSITY POLYETHYLENE (HDPE)
   f. SOIL PIPE AND FITTINGS
   g. PVC/ABS PIPE AND FITTINGS
   h. VALVES (ALL)
   i. STEEL PIPE FITTINGS AND FLANGES
   j. BRAZED AND SWEAT FITTINGS.

1.05 RULES AND REGULATIONS

A. ALL WORK SHALL BE INSTALLED IN CONFORMITY WITH ALL GOVERNMENTAL JURISDICTIONAL AUTHORITIES REGULATIONS, LAWS, RULES, OR ORDINANCES IN EFFECT AND GOVERNING SAME; SUCH RULES AND REGULATIONS AND LOCAL ORDINANCES TO BE CONSIDERED PART OF SPECIFICATIONS. THE CONTRACTOR SHALL BE HELD STRICTLY RESPONSIBLE FOR ANY VIOLATION OF SAME AND SHALL CHANGE HIS WORK TO CONFORM WITHOUT ADDITIONAL COST TO OWNER.

B. ALL WORK SHALL ALSO CONFORM TO THE PUBLISHED STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION AND ELECTRICAL WORK AND EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF THE CURRENT ISSUE OF THE NATIONAL ELECTRICAL CODE.

C. ALL MATERIALS, IN GENERAL, SHALL BE UNDERWRITERS' LABORATORIES LISTED AND SHALL BEAR UL LABEL WHERE LABELING SERVICE IS AVAILABLE.

D. ALL CONTRACTORS ON JOB SHALL COOPERATE AND ASSIST EACH OTHER IN CONFORMING WITH ALL TRADE JURISDICTIONAL RULINGS. THEY SHALL PERFORM ALL WORK COVERED BY DRAWINGS AND SPECIFICATIONS WHICH PROPERLY COMES UNDER THE JURISDICTION OF THE PARTICULAR TRADE HE REPRESENTS. IN ADDITION, THEY SHALL INCLUDE, BY SUB-CONTRACT IF NECESSARY, SUCH WORK OF OTHER TRADES THAT IS EITHER INCIDENTAL TO HIS TRADE, OR IS SPECIFIED TO BE INCLUDED IN HIS CONTRACT OR SUB-CONTRACT.

E. WHERE JURISDICTIONAL RULES REQUIRE ASSISTANCE OF MECHANICS OF TRADES OTHER THAN THOSE ORDINARILY EMPLOYED BY A PARTICULAR MECHANICAL CONTRACTOR IN THE HANDLING, STORAGE OR SETTING OF SPECIAL EQUIPMENT, THE MECHANICAL CONTRACTOR SHALL EMPLOY SUCH TRADESMEN SO AS TO BE IN CONFORMANCE WITH LOCAL JURISDICTIONAL AGREEMENTS.

1.06 SCOPE

A. IT IS THE INTENT OF THE SPECIFICATIONS AND DRAWINGS TO ESTABLISH MINIMUM REQUIREMENTS FOR METHODS, PRODUCTS, AND EQUIPMENT, AND TO ENSURE SYSTEMS BE FINISHED, TESTED AND READY FOR OPERATION. INCIDENTAL DETAILS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR PROPER INSTALLATION AND OPERATION, SHALL BE INCLUDED IN THE WORK THE SAME AS IF SPECIFIED. LOCATIONS OF ALL EQUIPMENT AND MATERIAL SHALL BE ADJUSTED AT NO EXTRA COST TO THE OWNER, TO ACCOMMODATE THE WORK INTERFERENCES ANTICIPATED AND/OR ENCOUNTERED. PRIOR TO INSTALLATION DETERMINE THE EXACT ROUTE AND LOCATION OF EACH RACEWAY, PIPE AND PIECE OF EQUIPMENT TO MINIMIZE CONFLICTS WITH OTHER TRADES.

1.07 CONTRACT DOCUMENTS

A. EXTENT OF DRAWINGS DOES NOT LIMIT RESPONSIBILITY OF DETERMINING FULL EXTENT OF WORK REQUIRED. REFER TO ARCHITECTURAL, HVAC, PLUMBING, FIRE PROTECTION, ELECTRICAL, STRUCTURAL, SITE UTILITY AND ALL OTHER DRAWINGS AND OTHER DOCUMENTS THAT INDICATE TYPES OF CONSTRUCTION IN WHICH WORK IS TO BE INSTALLED AND WORK OF OTHER TRADES WITH WHICH WORK OF THIS DIVISION MUST BE COORDINATED.

B. EXCEPT WHERE MODIFIED BY A SPECIFIC NOTATION TO THE CONTRARY, IT SHALL BE UNDERSTOOD THAT THE INDICATION AND/OR DESCRIPTION OF ANY ITEM, IN THE DRAWINGS OR SPECIFICATIONS OR BOTH, CARRIES WITH IT THE INSTRUCTION TO FURNISH AND INSTALL THE ITEM, REGARDLESS OF WHETHER OR NOT THIS INSTRUCTION IS EXPLICITLY STATED AS PART OF THE INDICATION OR DESCRIPTION.

C. WHEN REQUIREMENTS CITED IN THIS SPECIFICATION CONFLICT WITH EACH OTHER OR WITH OTHER CONTRACT DOCUMENTS, THE MOST STRINGENT SHALL GOVERN WORK.

D. ITEMS REFERRED TO IN SINGULAR NUMBER IN CONTRACT DOCUMENTS SHALL BE PROVIDED IN QUANTITIES NECESSARY TO COMPLETE WORK.

E. DRAWINGS ARE DIAGRAMMATIC. THEY ARE NOT INTENDED TO BE ABSOLUTELY PRECISE; THEY ARE NOT INTENDED TO SPECIFY OR TO SHOW EVERY OFFSET, FITTING, AND COMPONENT. THE PURPOSE OF THE DRAWINGS IS TO INDICATE A SYSTEM, CONCEPT, THE MAIN COMPONENTS OF THE SYSTEMS, AND THE APPROXIMATE GEOMETRICAL RELATIONSHIPS. BASED ON THE SYSTEMS CONCEPT, THE MAIN COMPONENTS, AND THE APPROXIMATE GEOMETRICAL RELATIONSHIPS, THE CONTRACTOR SHALL PROVIDE ALL OTHER COMPONENTS AND MATERIALS NECESSARY TO MAKE THE SYSTEMS FULLY COMPLETE AND OPERATIONAL.

F. THE LAYOUT OF THE PIPING, DUCTWORK, EQUIPMENT, ETC., AS SHOWN ON THE DRAWINGS SHALL BE CHECKED AND EXACT LOCATIONS SHALL BE DETERMINED BY THE DIMENSIONS OF EQUIPMENT APPROVED AND MECHANICAL CONTRACTOR SHALL OBTAIN THE ARCHITECT/ENGINEER'S APPROVAL FOR ANY REVISED LAYOUT BEFORE THE APPARATUS IS INSTALLED.

G. INSPECT ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL DRAWINGS FOR ALL DIMENSIONS, LOCATIONS, PARTITIONS AND WALLS, STRUCTURAL DETAILS AND LOCATIONS OF MECHANICAL PIPES AND DUCTS SO THAT INSTALLATION SHALL BE COORDINATED WITH THE WORK OF THE OTHER TRADES.

H. INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL APPLY OR BE PROVIDED AS IF EXPRESSLY REQUIRED ON BOTH.

I. DATA THAT MAY BE FURNISHED ELECTRONICALLY BY THE ARCHITECT (ON COMPUTER TAPE, DISCETTE, OR OTHERWISE) IS DIAGRAMMATIC. SUCH ELECTRONICALLY FURNISHED INFORMATION IS SUBJECT TO THE SAME LIMITATION OF PRECISION AS HERETOFORE DESCRIBED. IF FURNISHED, SUCH DATA IS FOR CONVENIENCE AND GENERALIZED REFERENCE, AND SHALL NOT SUBSTITUTE FOR ARCHITECT'S/ENGINEERS, SEALED OR STAMPED CONSTRUCTION DOCUMENTS.

1.08 RELATED REQUIREMENTS

A. THIS SPECIFICATION SHALL CONTROL ALL LABOR, SERVICES, MATERIALS, EQUIPMENT AND PERFORMANCE OF ALL WORK REQUIRED FOR THE INSTALLATION OF ALL PLUMBING, AS INDICATED WITHIN CONTRACT DOCUMENTS.

B. DEFINITIONS:

1. "PIPING" INCLUDES, IN ADDITION TO PIPE, ALL FITTINGS, VALVES, PIPE COVERING, HANGERS, AND OTHER SUPPORTS AND ACCESSORIES RELATED TO SUCH PIPING.

2. CONCEALED MEANS HIDDEN FROM SIGHT IN CHASES, FURRED SPACES, SHAFTS, HUNG CEILINGS, EMBEDDED IN CONSTRUCTION, IN CRAWL SPACES OR BURIED.

3. "EXPOSED" MEANS NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

4. "PROVIDE" MEANS TO FURNISH AND INSTALL COMPLETE.

1.09 GENERAL REQUIREMENTS

A. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO VERIFY CONDITIONS AND WORK REQUIRED.

B. PRODUCTS AND EXECUTION SHALL BE PROVIDED FOR A COMPLETE AND FULLY OPERATIONAL PLUMBING SYSTEM THROUGHOUT THE EXTENT OF THE PROJECT.

C. PROVIDE SHOP DRAWINGS AND PRODUCT SUBMITTALS FOR ARCHITECT/ENGINEER REVIEW AND APPROVAL PRIOR TO ANY WORK.

D. ALL PRODUCTS AND EQUIPMENT SHALL BE UL LISTED AND APPROVED BY THE LOCAL AUTHORITY.

E. ALL NEW EQUIPMENT SHALL COMPLY WITH RECOGNIZED ASME AND ANSI STANDARDS.

F. EACH MAJOR COMPONENT OR PIECE OF EQUIPMENT TO HAVE THE MANUFACTURER'S NAME, ADDRESS, MODEL NUMBER AND RATING ON A PLATE SECURELY AFFIXED IN A CONSPICUOUS PLACE.

G. CODE RATINGS, LABELS OR OTHER DATA WHICH ARE DIE-STAMPED OR OTHERWISE AFFIXED TO THE SURFACE OF THE EQUIPMENT SHALL BE IN VISIBLE LOCATION.

H. CONTRACTOR SHALL COORDINATE PROPOSED WORK WITH EXISTING FIELD CONDITIONS INCLUDING ARCHITECTURAL BUILDING ELEMENTS, STRUCTURAL CONDITIONS, AND EXISTING MECHANICAL AND ELECTRICAL CONDITIONS.

I. CONTRACTOR SHALL ADHERE TO ALL CURRENT FACILITY STANDARDS AND REQUIREMENTS. SHUT-DOWN OF EXISTING BUILDING SYSTEMS FOR NEW CONNECTIONS SHALL BE AUTHORIZED, SCHEDULED AND PERFORMED IN ACCORDANCE TO BUILDING MANAGEMENT REQUIREMENTS. BUILDING SHALL BE NOTIFIED NO LESS THAN 72 HOURS PRIOR TO ANY SHUT-DOWNS. ACCESS TO AREAS OUTSIDE WORKS SPACES, SUCH AS ADJOINING SPACES AND SPACES IMMEDIATELY BELOW, SHALL BE PERFORMED IN ACCORDANCE TO BUILDING MANAGEMENT REQUIREMENTS.

J. UNLESS SPECIFICALLY INDICATED, NO EXISTING EQUIPMENT, SUPPORT OR RELATED DEVICES SHALL BE REUSED.

1.10 WORK INCLUDED

A. INCLUDE ALL COSTS RELATED TO PROVIDE ALL PERMITS, LICENSES, INSPECTIONS, APPROVALS AND OTHER ARRANGEMENTS FOR WORK.

B. PROVIDE DEMOLITION OF EXISTING MEDICAL GAS INCLUDING REMOVAL OF ALL DEBRIS. REMOVE ALL PIPING BACK TO ACTIVE SOURCE AND CAP LEAVING NO DEAD ENDS.

C. PRIOR TO DEMOLITION OF EQUIPMENT OR DEVICES, COORDINATE WITH OWNER AND/OR BUILDING MANAGEMENT ANY EXISTING EQUIPMENT OR DEVICES THAT SHALL BE RETAINED. CAREFULLY REMOVE SUCH ITEMS AND TURN OVER TO OWNER OR BUILDING MANAGEMENT.

D. PROVIDE REMOVAL OF ALL CONSTRUCTION DEBRIS IN ACCORDANCE WITH APPLICABLE STANDARDS AND FACILITY REQUIREMENTS.

E. MAKE NEW CONNECTIONS TO EXISTING RISERS AND BRANCH PIPING AS INDICATED ON PLANS AND DETAILS, AND AS NECESSARY TO COMPLETE THE WORK. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL SERVICES RELATED TO CLEANING AND INSPECTIONS.

F. INSTALL PIPING WITH ADEQUATE PROVISIONS TO CONTROL EXPANSION AND CONTRACTION.

G. PROVIDE AND SET SLEEVES FOR ALL PIPING SYSTEMS PASSING THROUGH WALLS, FLOORS, PARTITIONS, ETC. SLEEVES SHALL BE SIZED AT LEAST TWO PIPE DIAMETERS LARGER THAN PIPING, OR OUTSIDE DIAMETER OF INSULATED PIPING.

H. PROVIDE ALL CUTTING AND PATCHING OF BUILDING ELEMENTS AS REQUIRED FOR INSTALLATION OF WORK HERE IN SPECIFIED. ALL WORK SHALL BE COORDINATED AND APPROVED BY BUILDING AND ARCHITECTURAL FIELD REPRESENTATIVE PRIOR TO ANY WORK BEING PERFORMED.

I. PROVIDE FIRE-STOP AT ALL FLOOR AND WALL PENETRATIONS AS REQUIRED BY PROJECT PARAMETERS AND LOCAL CODE AUTHORITY.

J. COORDINATE PROPOSED WORK WITH ADDITIONAL TRADES AND OTHERS INVOLVED PRIOR TO ANY INSTALLATION WORK.

K. PROVIDE PIPING IDENTIFICATION MARKERS FOR ALL PIPING SYSTEMS WITH ANSI/ASME STANDARD COLORS AND LABELS. MARKERS SHALL BE INSTALLED 25 FEET ON CENTER.

L. PROVIDE VALVE TAGS OF BRASS OR STAINLESS STEEL HAVING A MINIMUM OF 1-1/2 INCH DIAMETER. PROVIDE COMPLETED VALVE CHART INDICATING VALVE SERVICE AND LOCATION.

M. PROVIDE AS-BUILT DRAWINGS IN AUTOCAD 2015 FORMAT AT COMPLETION OF PROJECT.

N. PROVIDE TWO COPIES OF OWNER'S OPERATION AND MAINTENANCE MANUALS WITH ALL PLUMBING EQUIPMENT AND DEVICES, MANUFACTURER'S MAINTENANCE INSTRUCTIONS AND MANUALS.

O. COORDINATE GENERAL GLEANUP WITH BUILDING MANAGEMENT.

1.11 FIELD TESTING

A. TESTING SHALL BE IN STRICT COMPLIANCE TO THE APPLICABLE CODES AND NFPA STANDARDS.

B. NO WORK SHALL BE ENCLOSED, CONCEALED, COVERED UP OR USED UNTIL THE SYSTEMS HAVE BEEN INSPECTED AND APPROVED BY THE CODE OFFICIALS AND ARCHITECTURAL FIELD REPRESENTATIVE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALL NECESSARY ARRANGEMENTS FOR INSPECTIONS.

C. MEDICAL GAS PIPING SHALL BE TESTED AND CERTIFIED IN ACCORDANCE TO CURRENT NFPA #99 STANDARDS.

PART 2 – BASIC MATERIALS

2.01 PIPES AND FITTINGS

A. MEDICAL GAS: HARD DRAWN SEAMLESS TYPE "K" MEDICAL GAS TUBE; ASTM B819 AND MARKED ACCORDINGLY FOR SERVICE TYPE PER NFPA 99 STANDARDS. FITTINGS SHALL CLEANED AND LISTED FOR OXYGEN SERVICE. JOINTS SHALL BE BRAZED IN ACCORDANCE TO NFPA 99 AND MSS SP-73 BRAZING STANDARDS.

2.02 VALVES

A. PROVIDE VALVES FOR ALL PIPING SYSTEMS FOR PROPER CONTROL AND ISOLATION OF EQUIPMENT AND DEVICES. PROVIDE VALVES FOR PROPER OPERATION OF EQUIPMENT.

B. MEDICAL GAS VALVES SHALL BE 3-PIECE DESIGN CLEANED AND LISTED FOR OXYGEN SERVICE.

C. ALL VALVES SHALL MEET THE 2021 HCA STANDARDS.

2.04 SUPPORTS AND HANGERS

A. PROVIDE ALL NECESSARY HANGERS, SUPPORTS, BUILDING ATTACHMENTS, SUPPLEMENTAL STEEL, ANCHORS, INSERTS, ETC., AS REQUIRED TO INSTALL THE PLUMBING WORK. HANGERS AND SUPPORTS SHALL BE CAPABLE OF SUPPORTING PIPE LOADS AND FULL CONTENTS WITH ALL RELATED DEVICES, PUMPS, ETC.

B. PIPE SHALL BE SUPPORTED IN ACCORDANCE TO CODE, MANUFACTURER REQUIREMENTS, MSS STANDARDS AND CONTRACT DOCUMENTS.

C. HANGERS, SUPPORTS AND RELATED ITEMS SHALL HAVE FACTORY COATED FINISHES THAT WILL NOT PROMOTE GALVANIC OR CORROSION ACTION. RODS, NUTS AND MISCELLANEOUS FASTENERS SHALL BE GALVANIZED.

D. ADDITIONAL HANGERS MUST BE PROVIDED AT ALL VALVE ASSEMBLIES, AUTOMATIC VALVES, BY-PASSES, OR ELSEWHERE, WHERE REQUIRED TO PROPERLY SUPPORT ANY ADDITIONAL PIPE LOADINGS.

E. ANCHORS, FASTENERS AND INSERTS SHALL BE UL LISTED HOT DIP GALVANIZED OF THE SIZES REQUIRED BY HANGER ROD SIZE, SUPPORTS AND THE IMPOSED LOADING.

F. MAXIMUM SPACING FOR HANGERS SHALL BE IN ACCORDANCE TO CODE. MSS STANDARDS AND PIPE MANUFACTURER INSTRUCTIONS. HANGERS SUPPORTING CAST IRON PIPE OF THE HUB AND SPIGOT TYPE IN 60 INCHES LENGTHS SHALL BE 60 INCHES O.C. HANGERS SHALL BE LOCATED AT THE PIPE CONNECTIONS AND AT EACH FITTING.

G. REGARDLESS OF ANY OF THE ABOVE LISTED HANGER SPACING, PROVIDE A HANGER NOT MORE THAN 12 INCHES FROM EACH CHANGE IN DIRECTION OF PIPING.

2.05 PRESSURE SWITCHES

A. VACUUM SWITCH SHALL HAVE AN ADJUSTABLE RANGE OF 0.8" TO 29" HG OF VACUUM. ELECTRICAL CHARACTERISTICS SHALL BE: DUAL CONTROL WITH TWO SINGLE POLE, DOUBLE-THROW SNAP ACTION SWITCHES RATED AT 10 AMPS, 125 VOLTS AC. ALL PRESSURE SWITCHES MAY BE WIRED TO ACCOMMODATE EITHER A NORMALLY OPEN OR NORMALLY CLOSED ALARM CIRCUIT.

B. PROVIDE PRESSURE OR VACUUM GAUGE ASSEMBLY AFTER THE PRESSURE SWITCHES. A GAS SPECIFIC DISS NUT AND NIPPLE SHALL BE ATTACHED TO THE BOTTOM OF THE GAUGE, THEN TO A DEMAND CHECK, HAVING A 3/8 INCH MALE NPT CONNECTION DIRECTLY ONTO THE PIPELINE.

PART 3 – BASIC EXECUTION

3.01 MEDICAL GAS INSTALLATION

A. MEDICAL GAS SYSTEM DEMOLITION AND INSTALLATION SHALL COMPLY WITH CURRENT EDITION OF NFPA 99.

B. SYSTEM TEST AND CERTIFICATIONS SHALL BE IN STRICT COMPLIANCE WITH NFPA STANDARDS. TEST AND CERTIFICATION SHALL CONSIST OF ALL PIPELINES WITHIN AFFECTED AREA OF SCOPE AND PIPELINE IMMEDIATELY UPSTREAM OF AREA AS PRESCRIBED IN NFPA 99. FINAL CROSS CONNECTION, CERTIFICATION AND PURITY TESTS SHALL BE CONDUCTED BY A THIRD PARTY AS DIRECTED BY THE HOSPITAL.

C. PROVIDE ALL REQUIRED CUTTING AND PATCHING FOR THE NEW MEDICAL GAS SYSTEMS.

D. PROVIDE A NOTORIZED DOCUMENT INDICATING ALL TEST RESULTS FOR SUBMISSION TO ALL NECESSARY CODE AUTHORITIES AND FOR FACILITY RECORDS.

3.02 EQUIPMENT INSTALLATION

A. ALL EQUIPMENT, DEVICES AND ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE TO MANUFACTURER'S INSTRUCTIONS. PROVIDE ALL REQUIRED START-UP SERVICES.

B. ALL EQUIPMENT SHALL BE INSTALLED WITH SUFFICIENT UNIONS TO ALLOW REPLACEMENT, TESTING AND SERVICING WITHOUT HAVING TO DISASSEMBLE LARGE PORTIONS OF PIPING.

C. ARRANGE FOR ELECTRICAL CONNECTIONS, RACEWAY, WIRING, ETC TO ALL ALARM LOCATIONS AND ELECTRICAL DEVICES.

PART 4 – EQUIPMENT AND DEVICES

4.01 GENERAL

A. INSTALL ALL ITEMS IN ACCORDANCE TO MANUFACTURER'S INSTRUCTIONS. PROVIDE ALL REQUIRED FACTORY AUTHORIZED START-UP SERVICES WHERE REQUIRED.

B. ITEMS SHALL BE SET, LEVELED, FASTENED AND CONNECTED COMPLETE WITH ALL REQUIRED SUPPORTS, ETC. ALL

C. ALL ITEMS SHALL BE PROVIDED WITH PROPER SUPPORT AND VIBRATION ISOLATION.

D. AFTER WORK HAS BEEN COMPLETED, ALL ITEMS SHALL BE THOROUGHLY CLEANED.

E. PROVIDE ALL MEDICAL GAS EQUIPMENT AND DEVICES AS SPECIFIED. EQUIPMENT DEVICES, VALVES AND RELATED COMPONENTS SHALL BE FROM BECKER AND IN ACCORDANCE TO CURRENT NFPA #99 STANDARDS AND 2021 HCA STANDARDS.

Code violations that are found during inspection are required to be corrected. Permit issuance does not grant approval of a code violation. 2015 IBC 105.4.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *Oct 24, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

RSN: *1669265*
Permit #: *22-2236640-LT*

COLORADO LICENSED DANIEL F THOMPSON 50150 PROFESSIONAL ENGINEER
9/16/2022

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THE MEDICAL CENTER OF AURORA
CARDIAC TOWER 2ND FLOOR VACUUM PIPING REPLACEMENT
1501 S. POTOMAC ST.
AURORA, CO 80012

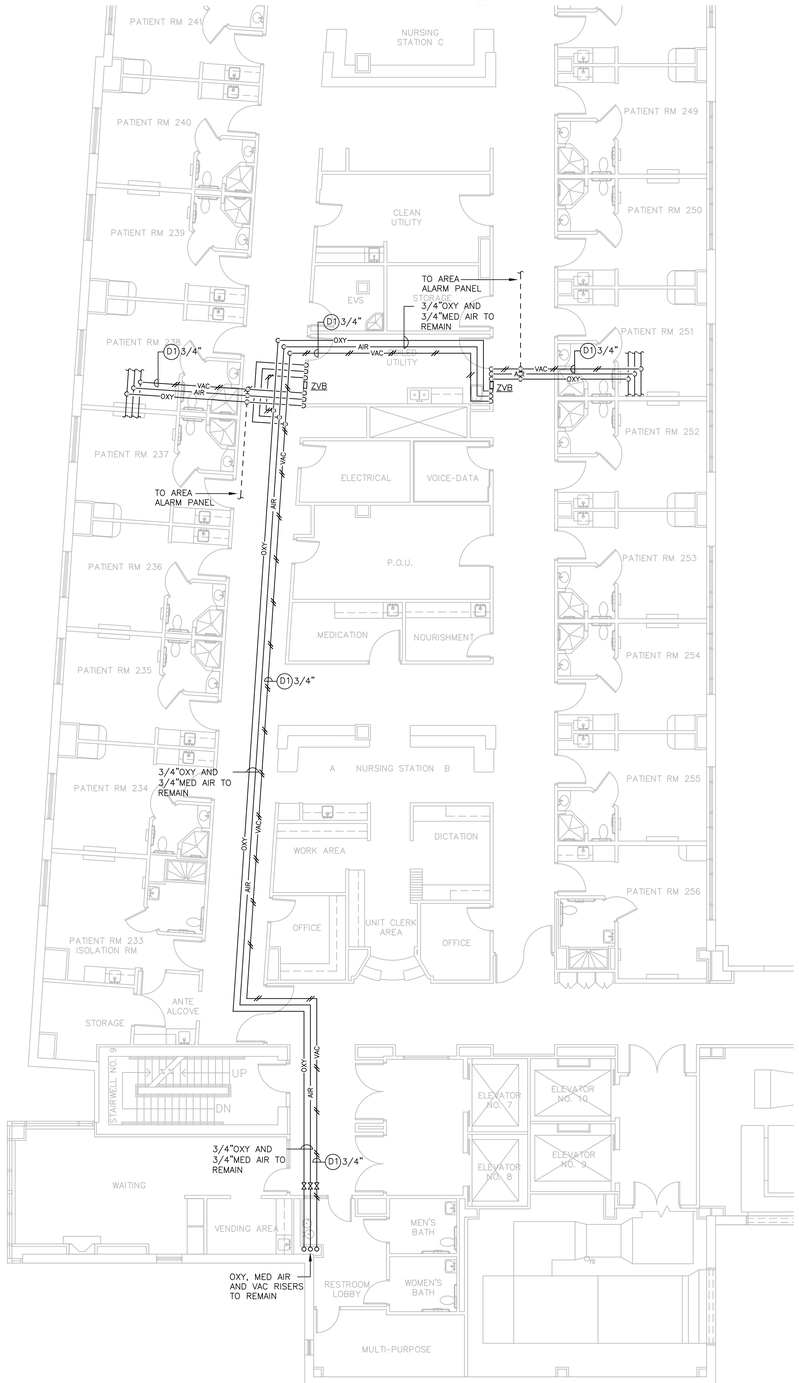
REVISION	MARK	DATE	DESCRIPTION

SALAS O'BRIEN
815 South Wabash Avenue Chicago, IL 60605
9250 East Costilla Avenue Greenwood Village, CO 80112

SHEET TITLE: MEDICAL GAS SPECIFICATIONS

PROJECT NUMBER: 2021-00498-00

SHEET NUMBER: MG0.02



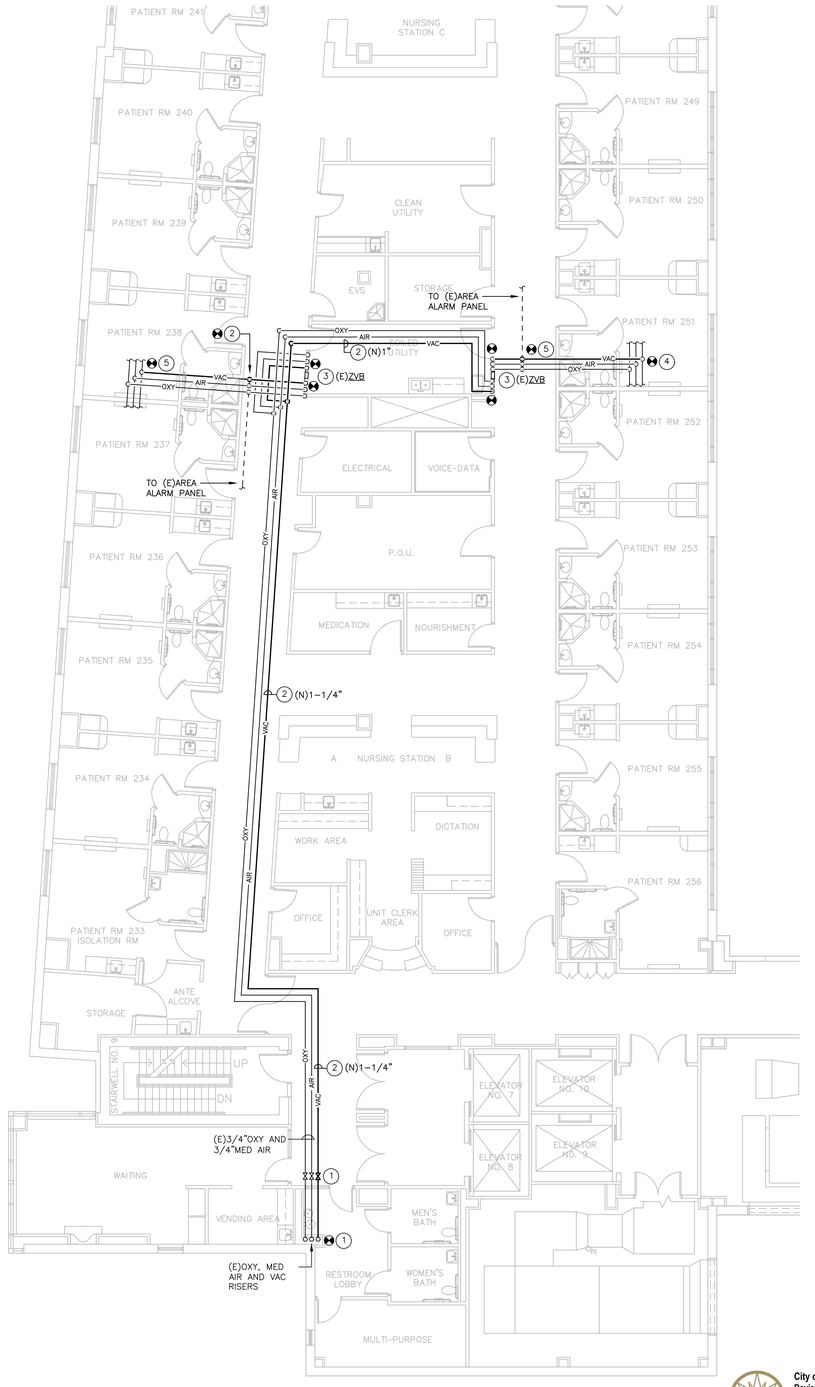
1 MEDICAL GAS PARTIAL SECOND FLOOR DEMOLITION PLAN

1/8"=1'-0"

0 4 8 16

DEMOLITION KEY NOTES:

(D1) AFTER INSTALLATION AND SWITCHOVER OF NEW FULLY FUNCTIONAL VACUUM PIPING, PROVIDE DEMOLITION OF EXISTING VACUUM PIPING INCLUDING ALL UNUSED HANGERS AND SUPPORTS.



2 MEDICAL GAS PARTIAL SECOND FLOOR PLAN

1/8"=1'-0"

0 4 8 16

GENERAL DRAWING NOTES:

1. INSTALLATION OF ALL NEW MEDICAL VACUUM SYSTEMS SHALL BE IN STRICT ACCORDANCE TO NFPA 99 STANDARDS.
2. PROVIDE REQUIRED CLEANING, TESTING & CERTIFICATION OF ALL NEW VACUUM PIPING AND ASSOCIATED ALARMS IN ACCORDANCE TO NFPA 99 STANDARDS.
3. INSTALLATION OF ZONE VALVES, ALARM WORK AND SWITCHOVER TO NEW VACUUM PIPING SYSTEM SHALL BE PERFORMED ON OFF-PEAK OPERATIONAL HOURS AS APPROVED AND DIRECTED BY FACILITY. SHUT-DOWNS TO BE KEPT TO AN ABSOLUTE MINIMUM.
4. NEW VACUUM VALVES SHALL BE OF THE 3-PIECE TYPE WITH EXTENSIONS AND DUAL PORTS, CLEANED AND LISTED FOR OXYGEN SERVICE AS MANUFACTURED BY MEDAES OR AMICO.
5. PROVIDE IDENTIFICATION FOR ALL NEW PIPING, VALVES AND ALARMS IN ACCORDANCE TO NFPA 99 STANDARDS.

DRAWING KEY NOTES:

(1) PROVIDE CONNECTION TO EXISTING BUILDING MAIN RISER. PROVIDE FULL LINE SIZE LOCKING TYPE SERVICE VALVE ON EXTENSION FROM RISER TO NEW FLOOR DISTRIBUTION.

(2) NEW VACUUM PIPING TO BE ROUTED ALONGSIDE EXISTING MEDICAL GAS PIPING SYSTEMS. RETAIN EXISTING VACUUM PIPING OPERATIONAL UNTIL SWITCHOVER TO NEW.

(3) PROVIDE REPLACEMENT OF EXISTING VACUUM VALVE WITHIN ZONE VALVE BOX WITH NEW LARGER 1" SIZE VALVES. PROVIDE LARGER OPENING IN BOX AS NEEDED TO SUPPORT NEW VALVES. PROVIDE REPLACEMENT OF WALL DROPS TO/FROM ZONE VALVE WITH NEW 1" VACUUM PIPING. PROVIDE NECESSARY CUTTING & PATCHING OF WALL AND WALL FINISHES. VERIFY WITH EXACT CONDITIONS IN FIELD.

(4) CONNECT NEW VACUUM PIPING TO EXISTING DISTRIBUTION.

(5) CAREFULLY REMOVE EXISTING AREA ALARM VACUUM SWITCHES AND REINSTALL WITHIN NEW VACUUM PIPING. PROVIDE SEPARATE COST TO REPLACE EXISTING SWITCHES WITH NEW, IN THE EVENT EXISTING CONDITIONS REQUIRE.

City of Aurora Building Division
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Approved as Noted: *Y. Munoz*
Date: *Oct 24, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

RSN: *1669265*
Permit #: *22-2236640-LT*

COLORADO LICENSED
JOSEPH THOMPSON
35150
PROFESSIONAL ENGINEER
9/16/2022

THE MEDICAL CENTER OF AURORA
CARDIAC TOWER 2ND FLOOR VACUUM PIPING REPLACEMENT

1501 S. POTOMAC ST.
AURORA, CO 80012

REVISION		
MARK	DATE	DESCRIPTION

SALASOBRIEN

Chicago, IL 60605
815 South Wabash Avenue
Greenwood Village, CO 80112
9250 East Costilla Avenue

SHEET TITLE:
MEDICAL GAS PARTIAL SECOND FLOOR PLANS

PROJECT NUMBER:
2021-00498-00

SHEET NUMBER:
MG1.01

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