General Project Requirements

1. As instruments of service, the Architect's drawings and specifications are not complete by themselves, and the Architect's continued services and advice are required for interpretation and application of those documents to a specific project and site. The modification or use of the documents without the Architect's advice may cause damage or injury to a person or property which could have been avoided had the Architect been consulted in the application of these documents. If the documents are modified and/or used without the Architect's services or approval, then the owner shall hold the Architect harmless for the consequences of such modification.
2. Construction of the project shall comply strictly and fully with codes having jurisdiction, including applicable state, city and county building, zoning, electrical, mechanical, plumbing and fire codes. The contractor shall verify code requirements before commencement of construction and bring any discrepancies between code requirements and Construction Documents to the attention of the Architect.
3. Accessibility requirements as applied to construction shall be based on the most current version of ICC/ANSI A117.1 Accessibility Standards adopted by the Authority having jurisdiction over the project.
4. The Contractor shall bring errors and omissions which may occur in the contract documents to the attention of the Architect verbally and in writing. Written instructions shall be obtained before proceeding with the work. The contractor will be held responsible for the results of any errors, discrepancies or omissions in the Contract Documents, of which the Contractor failed to notify the Architect before construction and/or fabrication of the work.
5. The Contractor shall make no structural changes without written approval of the structural engineer of record.
6. The Contractor and subcontractors shall verify all dimensions and job conditions at the project site sufficiently in advance of work to be performed to assure the orderly progress of the work.
7. All drawings shall be fully coordinated by the Contractor to verify all dimensions, locate depressed slabs, slopes, drains, outlets, recesses, reglets, bolt settings, sleeves, etc.
8. Details and sections on the Architect's drawings are shown at specific locations and are intended to show general requirements throughout. Details noted as typical (typ.) imply that all conditions are to be treated similarly.
9. All Manufacturer's printed warnings for handling and installation of products must be strictly observed.
10. The Architect shall not be responsible for construction means, methods, techniques, sequences or procedures in connection with the work. The Architect shall not be responsible for safety precautions and/or programs in connection with the work. The Architect shall not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents and / or applicable building codes.
11. The Contractor shall submit Contract Documents to the Authorities having jurisdiction over the project and shall obtain all necessary building permits.

Medical Equipment Drawings Coordination Requirements

General Coordination

1. Medical Equipment drawings are provided by each equipment vendor and are included as a part of the construction documents. Each vendor has specific requirements in addition to the work described on drawings provided by DJA and the consultants.
2. It is the responsibility of the general contractor and the subcontractors to review, include and coordinate the work required by the Medical Equipment drawings with work described on drawings and specifications provided by DJA and the design consultants.
3. Using both sets of drawings, it is the contractors responsibility to prepare the room and to make it ready for the installation of new medical equipment. This includes but is not limited to floor levelness, ceiling heights, electrical conduits and fixtures, structural and unistrut equipment support requirements

Work Coordination Requirements

General Coordination

1. All Material Selections and installation methods must meet the requirements of Invision Sally Jobe.
2. Unless otherwise noted, all selected and described materials shall be installed per manufacturer's recommendations
3. Products, materials and installatin methods must meet the requirements of all building codes adopted by the local jurisdiction having authority.

Roof Penetrations:

1. The General Contractor shall coordinate the exact location of roof penetrations.
2. All roof penetration work must be performed in such a way as to not reduce or eliminate the existing work roof warranty.
3. All cut and Patch work shall meet industry standards for the type of work necessary to install equipment and patch in a weathertight manner.

Wall Penetrations:

1. The General Constractor shall coordinate the exact location of wall penetrations.
2. All penetrations through rated wall assemblies shall match the rating of the wall they penetrate.
3. All Cut and Patch work shall meet industry standards for the type of work necessary in install equipment and patch in a seamless manner.

General Project Notes

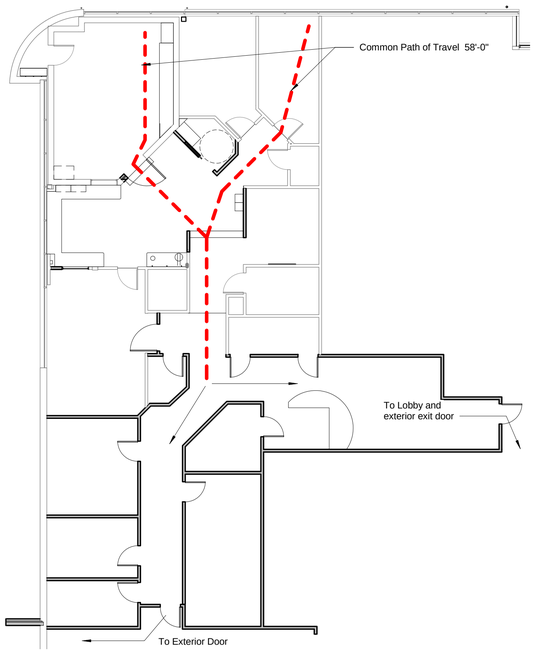
1. All Contractors and Material/Equipment suppliers are responsible for reviewing the entire set of Contract Documents (Plans / Specifications) prior to submitting a final proposal. If a contractor or other bidder becomes aware of an error and/or omission in the Contract Documents, then that error and/or ommission must be brought to the immediate attention ofthe architect for action prior to submission of the General Contractor's final proposal. Failure to bring any error and/or ommision to the Architect's attention prior to submission of the General Contractor's final proposal will not relieve the General Contractor from Construction a complete, functioning project as outlined in the Contract Documents at the General Contractor's final proposal amount.
2. Suppliers are wholly responsible for coordination of the work with the General Contractor, all subcontractors and material/equipment from other trades to provide a complete, functioning project. The Mechanical, Plumbing and Electrical Subcontractors shall pay special attention to the coordination with other Utility service and site contractors prior to construction to assure a complete, functioning service is provided to the project. Likewise, all other subcontractors are responsible for the coordination and interface of their work with each of the other methods to accomplish a complete, functioning project.
3. As such, the General Contractor, Subcontractors and material/equipment suppliers are to be experts in their related constructin systems and those applications/installations. The General Contractor, subcontractors and material/equipment suppliers are fully responsible for the means and methods of construction and the ultimate compliance of the project with all requirements/regulations of construction. There are no limits to the Contractor's responsibility in this regard. The Contractor(s) are responsible for the project's construction compliance with any and all regulations. This resonsibility is not limited to building code and certificate of occupancy issues. Nothing in or not shown within the Contract Documents will relieve the General Contractor, Subcontractors and material/equipment suppliers from a complete compliance with any and all requirements and regulations for construction of this specific project.

General Material Coordination Requirements

1. The Drawings and Specifications describe the intended design result and require the Contractor, Sub-contractors, and Client (Owner) to make adjustments, modifications or adaptations based on the existing field conditions.
2. Material and equipment installation is based on Manufacturer's installation requirements and accepted standards of practice within the construction industry
3. Finish materials are described generically (Ex. Porcelain Tile) and require the owner (client) and contractor to select the exact manufacturer for color, style, and texture for the intended use.
4. All work shall meet the requirements of buildings codes, procedures and techniques adopted by the local authority having jurisdiction over the project.

Invsion Sally Jobe

MRI Replacement
Misc. Suite Alterations
1400 S. Potomac Street, Suite 180
Aurora , CO 80012



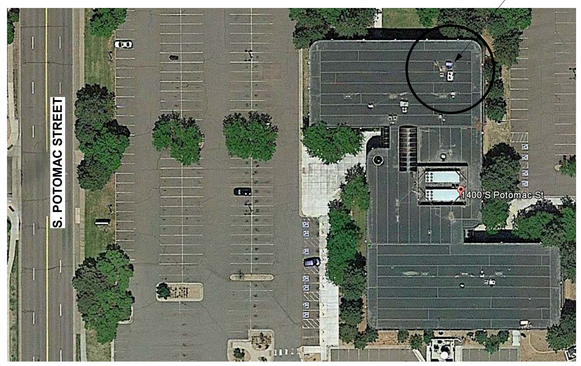
4 Level 1 - Egress Plan
3/32" = 1'-0"

City of Aurora Building Division
Project: *Tenant Improvement*
Address: *1400 S Potomac St, Unit 180*
Occupancy Group: *B*
Construction Type: *UBC IIN-Spk*
RSN: *1281167*
Permit: *18-1445333-LT*

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

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

SUITE LOCATION



SEPARATE FIRE SPRINKLER PERMIT REQUIRED: Due to the proposed work the general contractor is required to obtain the services of a fire sprinkler contractor to determine if a separate sprinkler permit is required. If it is determined that the spacing of the fire sprinkler heads is not in compliance, then a separate fire sprinkler 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 105.7.1.**

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: jlocke
Date: May 01, 2018
2015 INTERNATIONAL CODES & 2017 NEC

Code Study

PROJECT DESCRIPTION
Alteration of existing Tenant Suite
- **Work includes removal and replacement of existing MRI unit**
- **Alteration to existing tenant suite for new work**

City of Aurora Adopted Codes:
2015 International Building Code (IBC)
2015 International Residential Code (IRC)
2015 International Mechanical Code (IMC)
2015 International Plumbing Code (IPC)
2015 International Energy Conservation Code (IECC)
2015 International Fire Code (IFC)
2015 International Fuel Gas Code (IFGC)
2015 International Existing Building Code (IEBC)
2017 National Electrical Code (NEC)

BUILDING DESCRIPTION
Year building was constructed: Unknown
Number of stories 2
Type of construction II-B
Fire Suppression: Fully Sprinkled

BUILDING OCCUPANCY CLASSIFICATION
The existing building
- **Group B (Office)**

TENANT OCCUPANCY CLASSIFICATION
Tenant occupancy Group B: Outpatient Clinic

Tenant area = 3,700 g.s.f. / 100 l.f. = 37 Occupants - No change

CONSTRUCTION TYPE
- **Type II-B (IBC Table 503)**

FIRE PROTECTION SYSTEMS
- **Fully Sprinklered Building**
- **Not an ambulartory care facility.**
- **Existing Local system**

MEANS OF EGRESS
Chapter 10
- **No change to existing egress route or common path of travel**
- **3,700 s.f tenant space (Group B) / 100 = 37 people;**
- **Occupant load < 49; one exit required (Table 1015.1)**
- **Maximum Common Path of Egress travel: 100' (sprinkled - IBC Table1014.3; occupant load > 30**
- **Maximum Travel Distance: 300' at B (fully sprinkled - Table1016.2)**
- **Occupant load < 50 therefore exit door do not have to swing in the direction of travel (IBC 1008.1.2)**

Table 1015.1 Spaces with one exit
- **The tenant space is considered a space with one exit**
- **Max. O.L. is 37, therefore one exit is allowed. Common path of travel is < 100 ft. (fully sprinkled bldg)**

Table 1018.1 Corridor Fire Resistant Rating
- **0 hr with sprinkler system**

Sheet Index

Architecture
A0.0 Cover Sheet; Code Analysis; General Notes
D1.0 Demo Sheet
A1.0 Wall Dimension Plan
A1.1 Millwork Plan
A1.2 Finish and Equipment Plan
A1.3 Enlarged Plans and elevation
A4.0 Reflected Ceiling Plan
A7.0 Schedules

Structural
S1.0 Foundation Plan

Mechanical
M1.0 Mechanical Specifications
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M2.1 Mechanical Roof Plan

Plumbing
P1.0 Plumbing Schedules and Specifications; D.W.V.; Isometric
P2.0 Plumbing Plans

Electrical
E0.1 Electrical Specs and Legend
E0.2 One-Line Diagram
E0.3 Schedules and Details, Lighting Comcheck
E1.1 Power Plan, Partial Roof Power Plan
E2.1 Lighting Plan

DJ Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
Davis / Jones 303.886.3860

STATE OF COLORADO · JEFFREY A. JONES · C-4659 · LICENSED ARCHITECT

4-19-18

Building Site:
1400 S. Potomac
Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
Emerald C.M. General Contractors
13275 East Fremont Place, Suite 300
Centennial, CO 80112

Architect:
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Davis/Jones Architecture, Inc.
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Aurora, CO 80013
303.886.3860

Mechanical Engineer:
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Christopher Menges Engineering, Inc.
1100 W Littleton Blvd #400
Littleton, CO
720.283.3018

Electrical Engineer:
Bryan Kazin, PE
Kazin & Associates, Inc.
9364 Teddy Lane, Suite 101
Lone Tree, CO 80124
720.489.1609

Structural Engineer:
Craig Carroll
Monroe & Newell Engineers, Inc
1400 Glenarm Pl, #101
Denver, CO 80202

No.	Description	Date

Invision Sally Jobe

MRI Replacement

Cover

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	JAJ

A0.0

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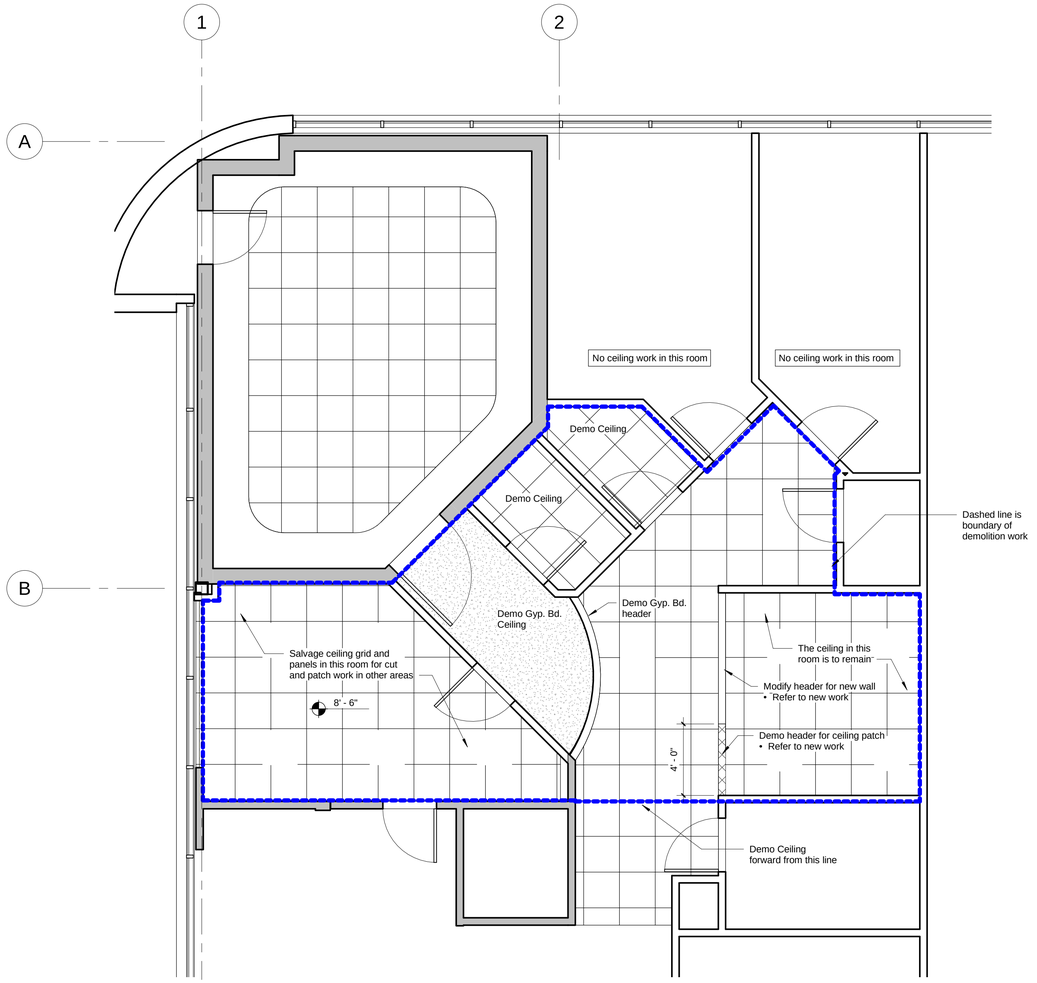
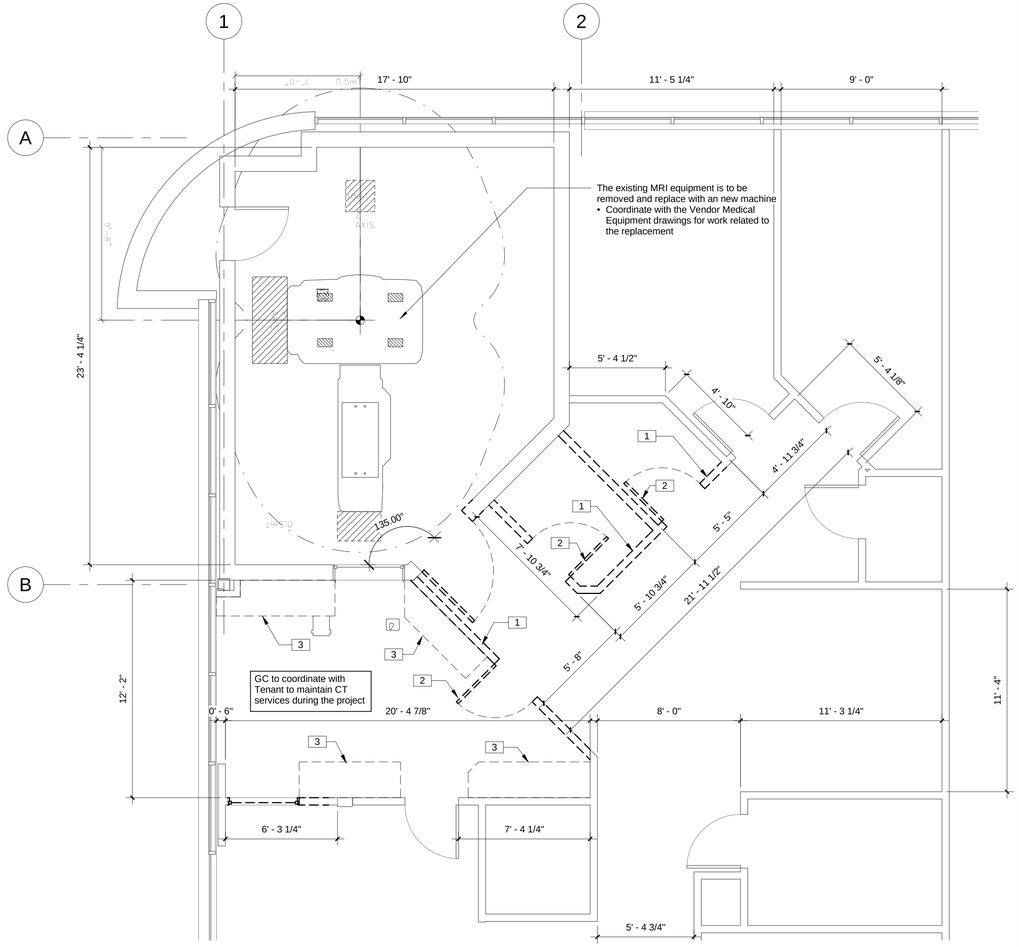
RSN: 1281167
Permit #: 18-1445333-LT



2 Level 1 - RCP Demo Plan
1/4" = 1'-0"



NORTH

1 Level 1 Demo Plan
1/4" = 1'-0"

Keynote Legend - Sally Jobe	
Key Value	Keynote Text
1	Existing full height walls to be demolished, typical
2	Existing door and frame to be demolished, typical
3	Demo existing upper and lower cabinets

GENERAL NOTE
1. Contractor to schedule and coordinate work with tenant to maintain CT services during the project

City of Aurora Building Division
Reviewed for Code Compliance
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Date: May 01, 2018
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STATE OF COLORADO
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Denver, CO 80202

No.	Description	Date

Invision Sally Jobe

MRI Replacement

Demo Plan

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	Checker

D1.0

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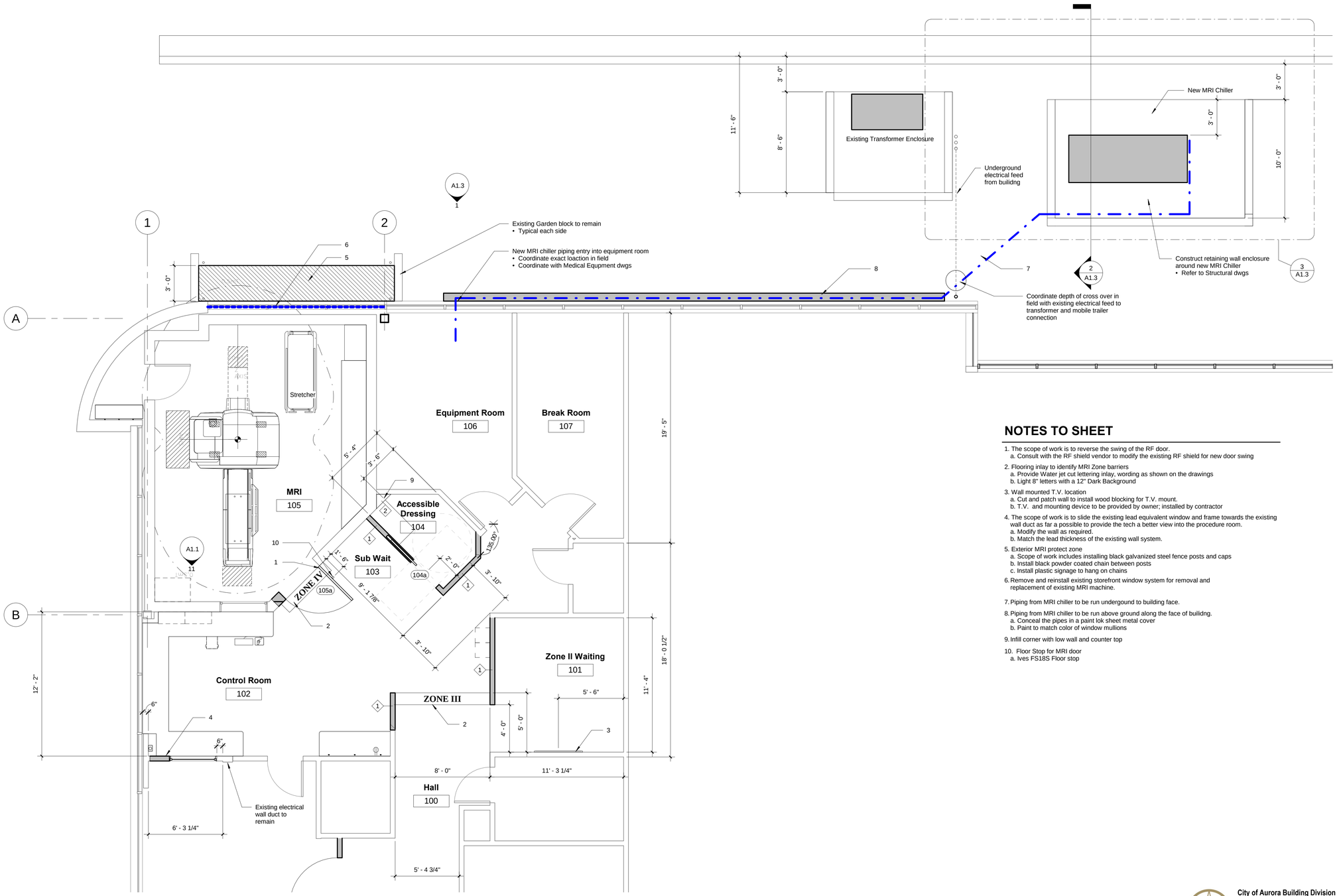
RSN: 1281167
Permit #: 18-1445333-LT



1 Level 1 - Wall Dimension Plan
1/4" = 1'-0"

NOTES TO SHEET

1. The scope of work is to reverse the swing of the RF door.
   a. Consult with the RF shield vendor to modify the existing RF shield for new door swing
2. Flooring inlay to identify MRI Zone barriers
   a. Provide Water jet cut lettering inlay, wording as shown on the drawings
   b. Light 8" letters with a 12" Dark Background
3. Wall mounted T.V. location
   a. Cut and patch wall to install wood blocking for T.V. mount.
   b. T.V. and mounting device to be provided by owner; installed by contractor
4. The scope of work is to slide the existing lead equivalent window and frame towards the existing wall duct as far a possible to provide the tech a better view into the procedure room.
   a. Modify the wall as required.
   b. Match the lead thickness of the existing wall system.
5. Exterior MRI protect zone
   a. Scope of work includes installing black galvanized steel fence posts and caps
   b. Install black powder coated chain between posts
   c. Install plastic signage to hang on chains
6. Remove and reinstall existing storefront window system for removal and replacement of existing MRI machine.
7. Piping from MRI chiller to be run undergound to building face.
8. Piping from MRI chiller to be run above ground along the face of builidng.
   a. Conceal the pipes in a paint lok sheet metal cover
   b. Paint to match color of window mullions
9. Infill corner with low wall and counter top
10. Floor Stop for MRI door
    a. Ives FS18S Floor stop

City of Aurora Building Division
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LICENSED ARCHITECT
4-19-18

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Denver, CO 80202

No.	Description	Date

Invision Sally Jobe

MRI Replacement Wall Dimension Plan

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	Checker

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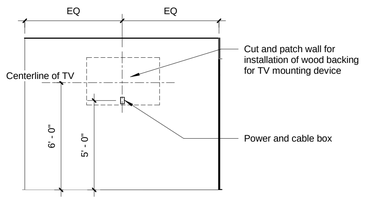
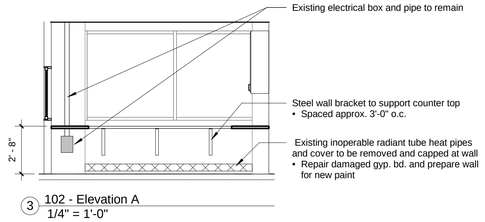
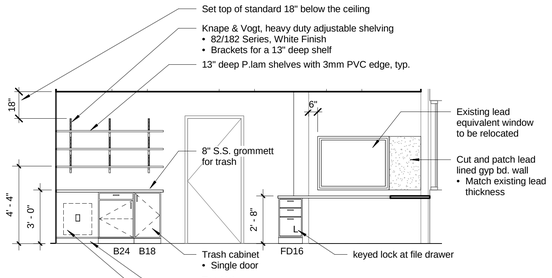
RSN: 1281167
Permit #: 18-1445333-LT



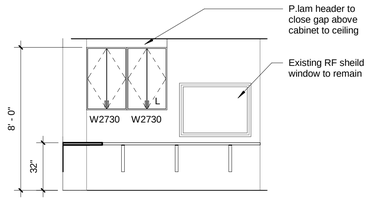
2 100-Elevation A
1/4" = 1'-0"



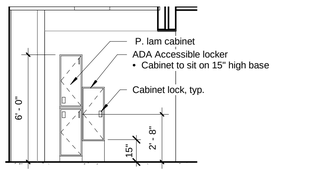
3 102 - Elevation A
1/4" = 1'-0"



4 102 - Elevation B
1/4" = 1'-0"

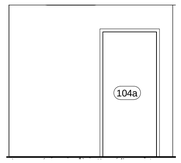


5 102 - Elevation C
1/4" = 1'-0"

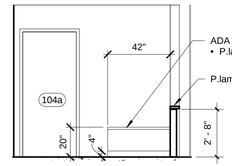


Cabinet locks are Digilock DAK1-ATS1 Electronic Keypad with locker pull
- Shared use; Brushed Nickel finish
- Manager bipass key

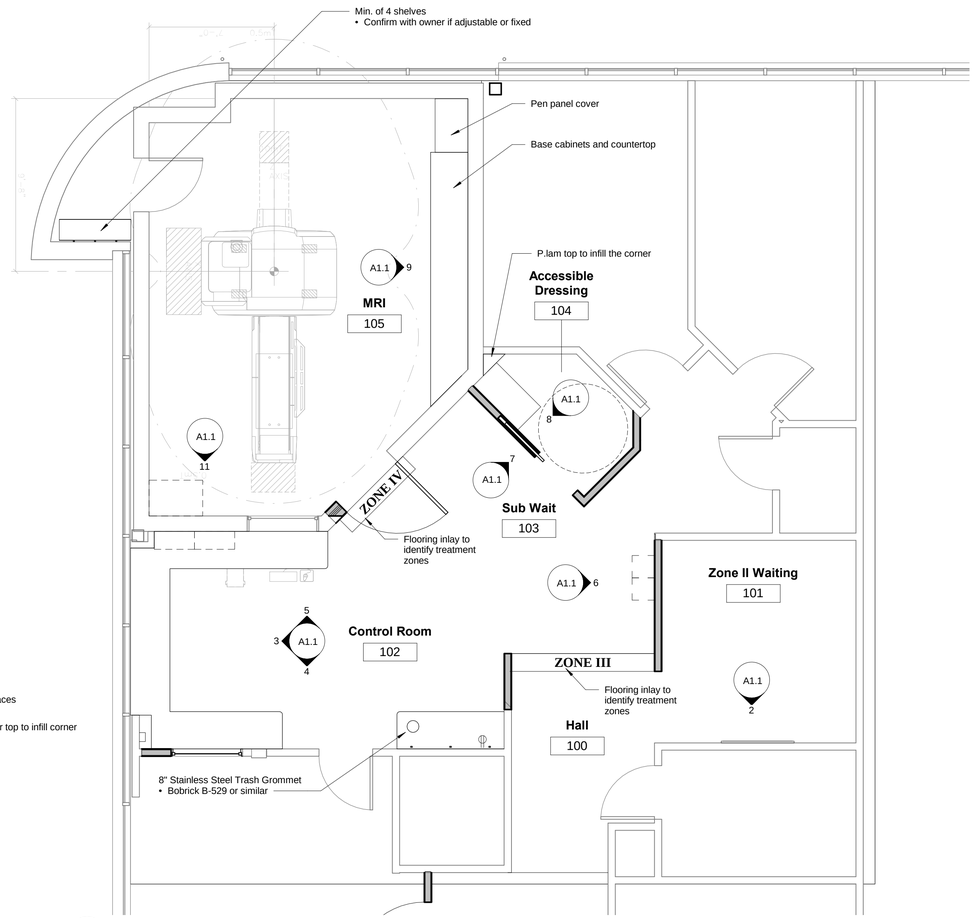
6 103 - Elevation A
1/4" = 1'-0"



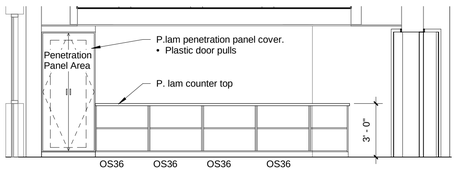
7 103 - Elevation B
1/4" = 1'-0"



8 104 - Elevation A
1/4" = 1'-0"

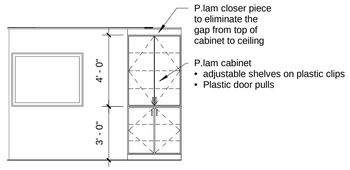


1 Millwork plan
1/4" = 1'-0"

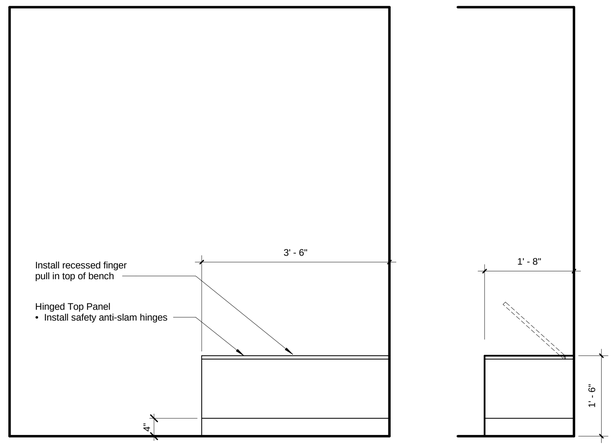


Open cabinets with adjustable shelves
- Adjustable shelves on plastic supports
- 3mm PVC edges

9 105 - Elevation A
1/4" = 1'-0"



11 105 - Elevation B
1/4" = 1'-0"



10 Accessible Changing Room - Bench
3/4" = 1'-0"

City of Aurora Building Division
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Date: May 01, 2018
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STATE OF COLORADO
JEFFREY A. JONES
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LICENSED ARCHITECT

4-19-18

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No.	Description	Date

Invision Sally Jobe

MRI Replacement
Millwork Plan

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	JAJ

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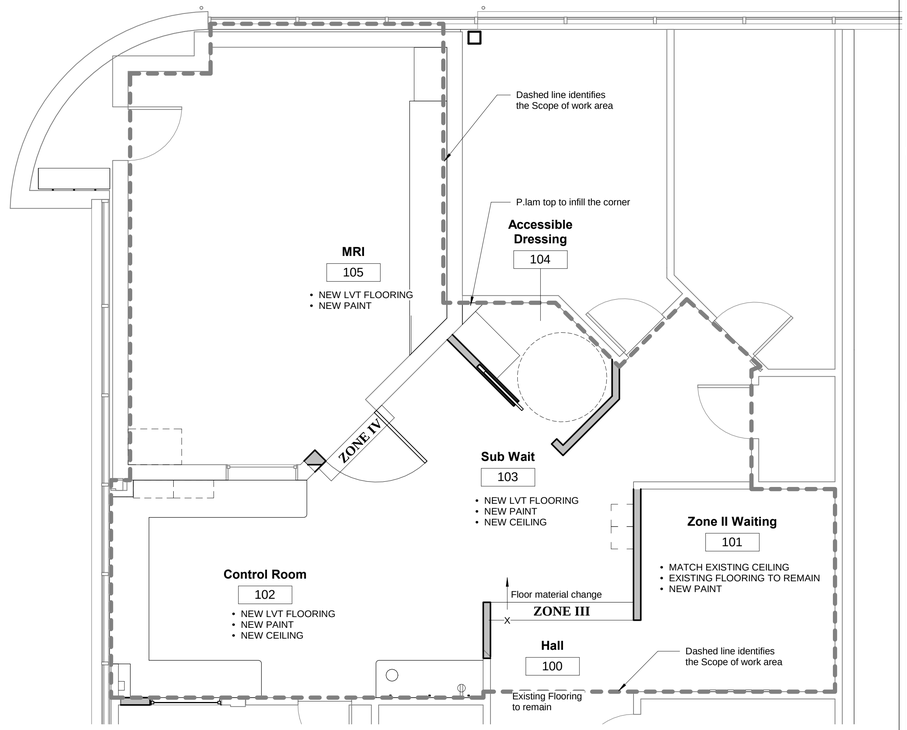
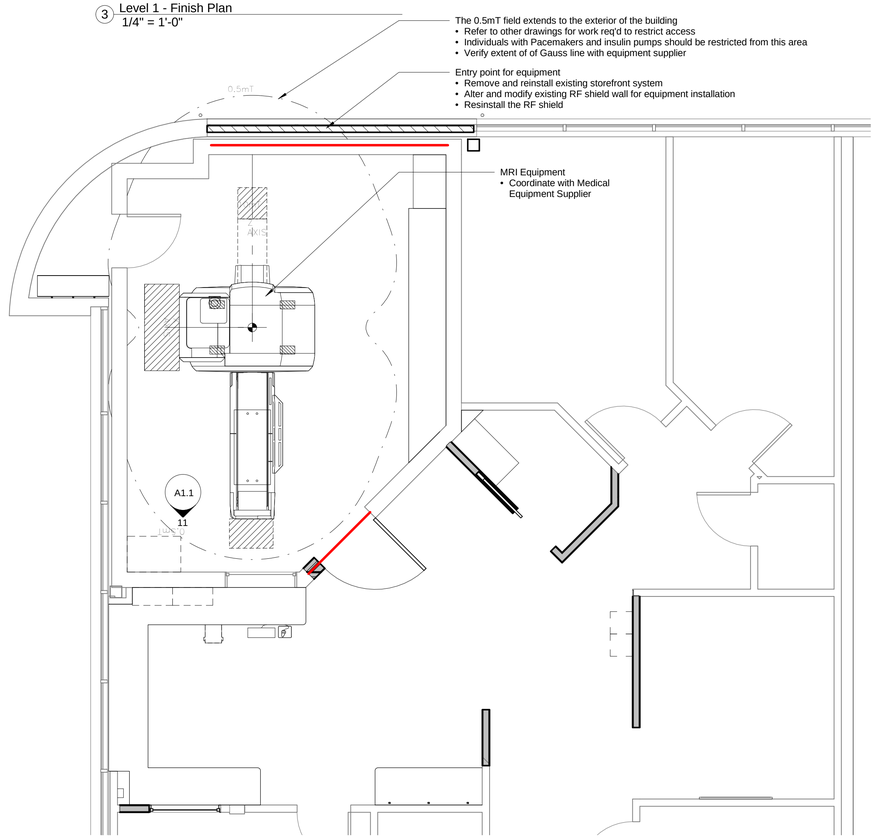
RSN: 1281167
Permit #: 18-1445333-LT



3 Level 1 - Finish Plan
1/4" = 1'-0"



1 Equipment Plan
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303.886.3860

STATE OF COLORADO · JEFFREY A. JONES · C-4659 · LICENSED ARCHITECT

4-19-18

Building Site:
1400 S. Potomac
Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
Emerald C.M. General Contractors
13275 East Fremont Place, Suite 300
Centennial, CO 80112

Architect:
Jeff Jones, AIA
Davis/Jones Architecture, Inc.
21076 E. Jefferson Circle
Aurora, CO 80013
303.886.3860

Mechanical Engineer:
Jeff Bellman
Christopher Menges Engineering, Inc.
1100 W Littleton Blvd #400
Littleton, CO
720.283.3018

Electrical Engineer:
Bryan Kazin, PE
Kazin & Associates, Inc.
9364 Teddy Lane, Suite 101
Lone Tree, CO 80124
720.489.1609

Structural Engineer:
Craig Carroll
Monroe & Newell Engineers, Inc
1400 Glenarm Pl, #101
Denver, CO 80202

No.	Description	Date

Invision Sally Jobe

MRI Replacement

Finish and Equipment Plan

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	JAJ

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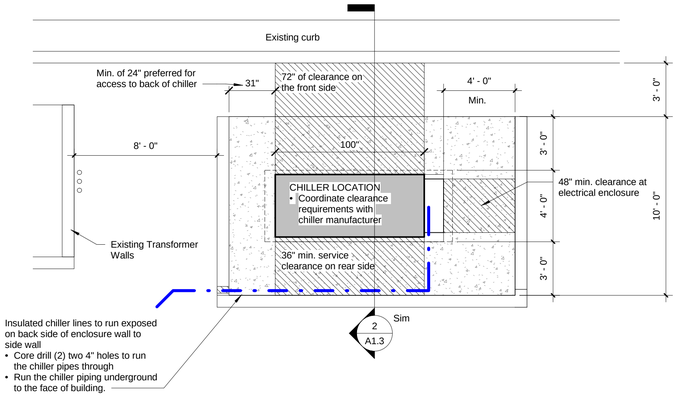
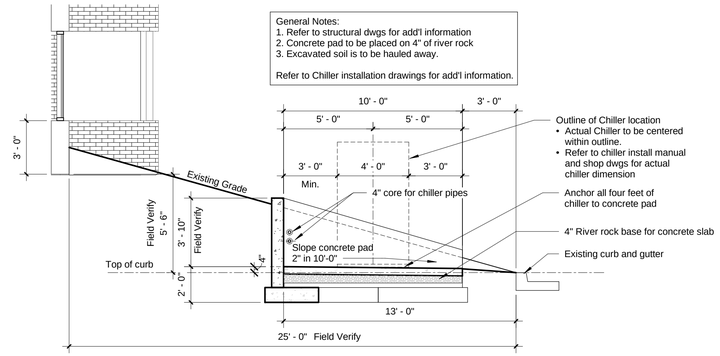
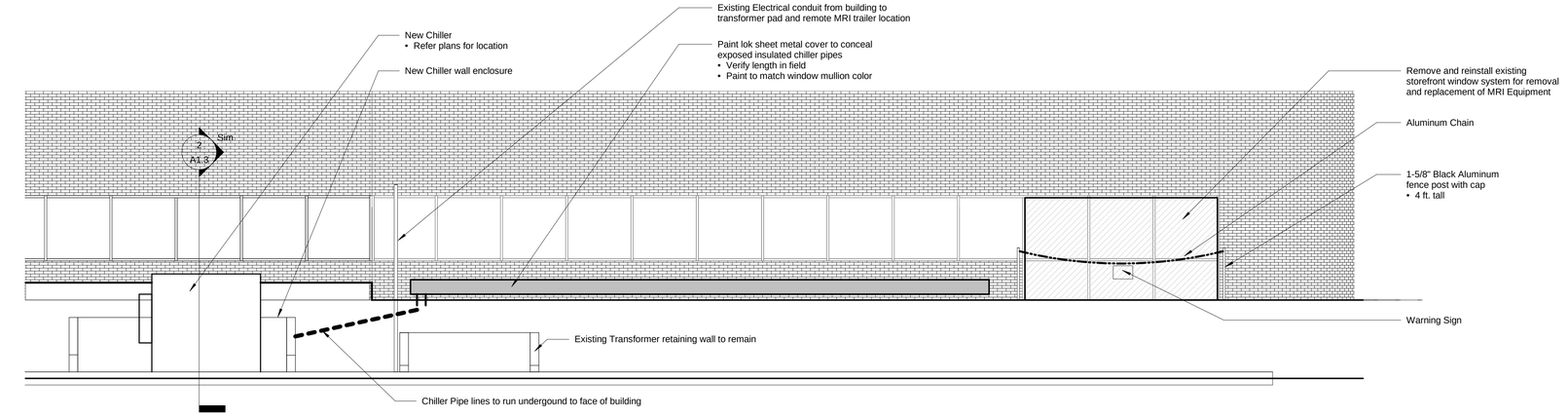
RSN: 1281167
Permit #: 18-1445333-LT



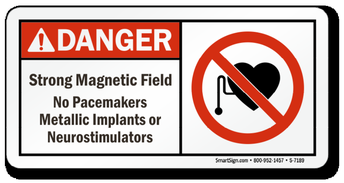
3 Level 1 - Chiller Pad
1/4" = 1'-0"



2 Section thru Chiller pad
1/4" = 1'-0"



1 Exterior Elevation at Equipment Entry
3/16" = 1'-0"



Exterior Warning Sign
• SmartSign 5"x10", Plastic or equal
• Attach to chain

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: jlocke
Date: May 01, 2018
2015 INTERNATIONAL CODES & 2017 NEC

Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
Davis / Jones 303.886.3860

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No.	Description	Date

Invision Sally Jobe

MRI Replacement

Enlarged Plans and Elevation

Project number	18-004
Date	2-14-18
Drawn by	Author
Checked by	Checker

A1.3

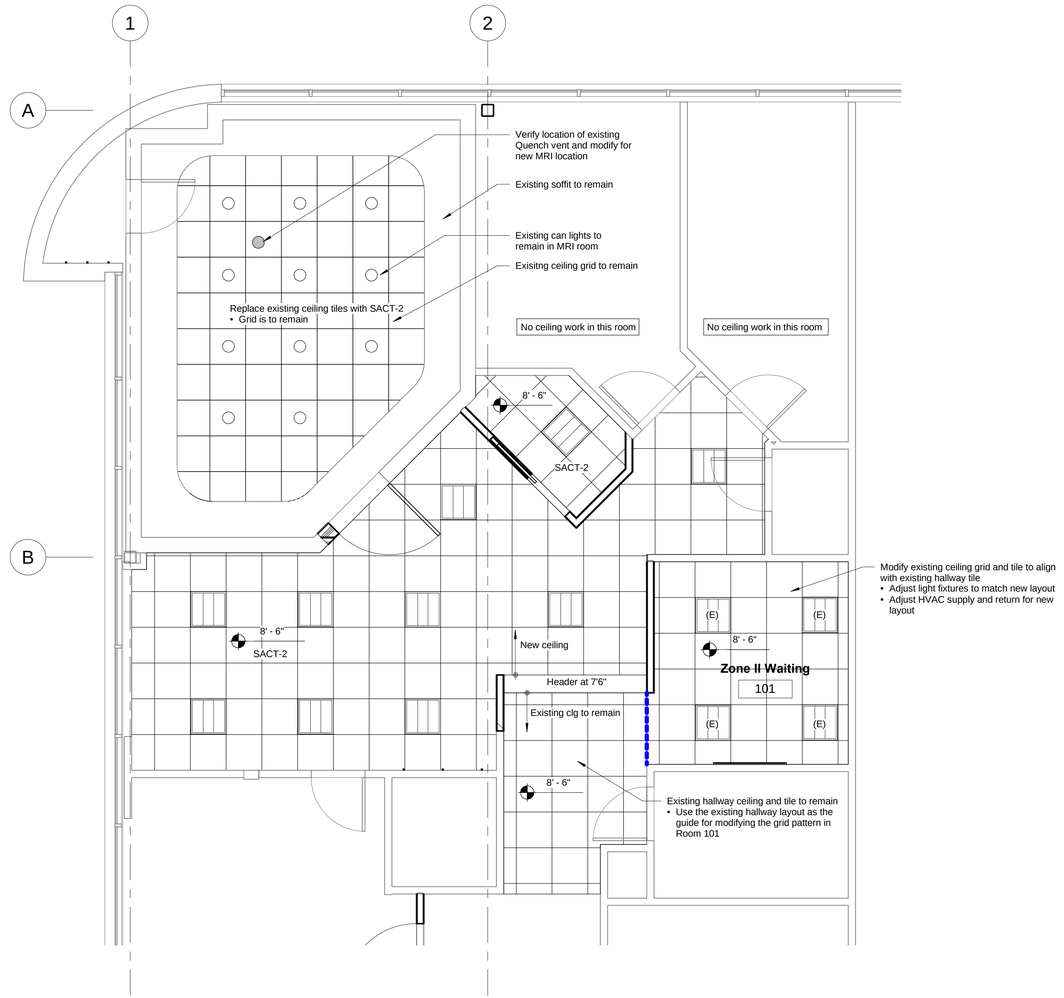
4/19/2018 3:34:48 PM

RSN: 1281167
Permit #: 18-1445333-LT

	Recessed can light		Exit light location
	2x2 light fixture per fixture schedule; refer electrical dwgs		Return grille per mechanical specifications for a suspended ceiling system
	2x4 light fixture per fixture schedule; refer electrical dwgs.		Supply grille per mechanical specifications for a suspended ceiling system

UNLESS NOTED OTHERWISE, ALL SUSPENDED ACOUSTICAL CEILING SYSTEMS ARE SACT-2
- REFER TO MATERIALS LEGEND

RCP Legend
1/4" = 1'-0"



1 Level 1 - RCP New Work
1/4" = 1'-0"

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No.	Description	Date

Invision Sally Jobe

MRI Replacement

Reflected Ceiling Plan

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	JAJ

A4.0

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RSN: 1281167
Permit #: 18-1445333-LT

Provide lever or other approved hardware on all new and relocated doors.
2009 ICC/ANSI 117.1 309.4

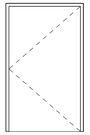
Door Schedule

Mark	Type Mark	Width	Height	Frame Type	Hardware Group	Comments
104a	8	3' - 0"	7' - 0"	Type B	1	
105a	7	4' - 0"	7' - 0"	PM		GC to confirm if door needs to lock and keying requirements

Provide lever type door handles operable by a single effort with no grasping or hand movement required. All exit doors shall be operable from the interior, without any special knowledge, effort, or use of a key.

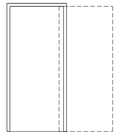
Where door closers are called for, the allowable pressure is:
- Interior Doors: 5 lbs
- Exterior Doors: 8.5 lbs
- Fire doors: 15 lbs.

DOOR ELEVATIONS



1

RF SHIELDED DOOR ASSEMBLY
- INSTALL NEW DOOR; FRAME AND HARDWARE WITH SWING AS SHOWN
- CONSULT WITH SHIELD MANUF. TO PROVIDE ASSEMBLY MEETING EXISTING SHEILDING REQUIREMENTS.
- SHIELD VENDOR TO PROVIDE DOOR, FRAME AND HARDWARE.



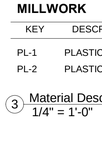
2

POCKET DOOR
- MARSHFIELD SIGNATURE SERIES OR EQUAL
- 1-3/4" THICK; FLUSH STYLE
- PLAIN SLICE WHITE BIRCH
- CLEAR COAT 095
- BOOK MATCH PATTERN

Hardware Groups

Group #1: Interior Pocket Door
Accurate Lock and Hardware
US26D Satin Chrome Finish
- 2001ADAP-5i (Privacy with occupancy indicator)
  1. 2001SDL Sliding Door Lock
  2. 7200P Pull handles
  3. 7200ADA Thumb turn
  4. 7200ER-I Emergency Coin Release with Occupancy Indicator

FRAME ELEVATIONS



A. TYPICAL DOOR FRAME:
WELDED HOLLOW METAL

B. POCKET DOOR DOOR FRAME:
- ASSA ABLOY WELDED FRAME

Room Finish Schedule

Number	Name	Floor Finish	Base Finish	Wall Finish				Ceiling Finish	Comments
				North	South	West	East		
100	Hall	ETR	ETR	P-1	P-1	P-1	P-1	ETR	
101	Zone II Waiting	ETR	RB-1	P-1	P-1	P-1	P-1	E/Modify	Modify existing ceiling
102	Control Room	LVT-1	RB-1	P-1	P-1	P-1	P-1	SACT-2	
103	Sub Wait	LVT-1	RB-1	P-1	P-1	P-1	P-1	SACT-2	
104	Accessible Dressing	LVT-1	RB-1	P-1	P-1	P-1	P-1	SACT-2	
105	MRI	LVT-1	RB-1	P-1	P-1	P-1	P-1	SACT-2	New ceiling panels; exist grid to remain
106	Equipment Room	ETR	ETR	P-2	P-2	P-2	P-2	ETR	
107	Break Room	ETR	ETR	ETR	ETR	ETR	ETR	ETR	

ETR = Existing to Remain

PARTITION LEGEND

1 Full height partition: Non-structural; Non-Composite framing; Fully Braced
- 3 5/8" metal studs (362PDS125-15-50ksi) framing at 16" OC. x 10'-0"
- Brace to floor/ceiling structure or decking at 4'-0" o.c.
- 5/8" gyp. bd. on both sides
- Extend gyp bd to 6" above ceiling height

SUB-NOTES (none)

2 Low partition (32 1/2"): Non-structural;
- 3 5/8" metal studs (362PDS125-19-65ksi) framing
- 5/8" gyp. board on room side

SUB-NOTES (none)

Partition Sub-notes

(i) Insulation: Install unfaced batt insulation, full depth of stud cavity, to height of gyp. bd. in wall system.

Partition Finish Notes

Provide Level 4 finish on all gypsum board walls and ceilings.

MATERIAL DESCRIPTION

CEILING

KEY	DESCRIPTION	MANUFACTURER	MATERIAL	SIZE	SUSPENSION SYSTEM	REMARKS
SACT-2	SUSPENDED ACOUSTICAL CEILING SYSTEM	ARMSTRONG	#1772 DUNE; SQUARE EDGE • SQUARE TEGULAR EDGE; WHITE • NRC 0.50; CAC 30	24x24x15/16"	PRELUDE XL 15/16" EXPOSED TEE SYSTEM IN A 2x2 GRID PATTERN; WHITE	TYPICAL AREAS
SACT-3	SUSPENDED ACOUSTICAL CEILING SYSTEM	ARMSTRONG	# 3115 OPTIMA HEALTH ZONE; 0.95 NRC; WHITE	24x48x1 SQUARE LAY IN	PRELUDE PLUS XL ALUMINUM 15/16" EXPOSED TEE; WHITE ISOLATION HANGARS	MRI ROOM

WALLS

KEY	DESCRIPTION	MANUFACTURER	MATERIAL	SIZE	REMARKS
P-1	PAINT	SHERWIN WILLIAMS	SW6176 Liveable Green; Egg-shel sheen	NA	TYPICAL PAINT COLOR
P-2	PAINT	SHERWIN WILLIAMS	SW6385 Dover White; Egg-shel sheen	NA	REFER TO FINISH SCHEDULE FOR LOCATION

WALL PROTECTION

KEY	DESCRIPTION	MANUFACTURER	MATERIAL	SIZE	REMARKS
CG8	CORNER GUARD	KOROGARD	G100 SURFACE MOUNTED; WHITE	8 FT HIGH	REFER TO PLAN FOR LOCATIONS

FLOORING

KEY	DESCRIPTION	MANUFACTURER	MATERIAL	SIZE	REMARKS
LVT-1	Luxury Vinyl Tile	Powerhold Gallery Series	Florentino Collection, Tanner Oak PP30-4050	7" X 48"	

WALL BASE

KEY	DESCRIPTION	MANUFACTURER	MATERIAL	SIZE	REMARKS
RB-1	RUBBER BASE	ROPPE	COVE BASE ; COLOR- #113 Pistachio; standard toe	4"	ALL ROOMS; UNLESS NOTED OTHERWISE IN SCHEDULE

MILLWORK

KEY	DESCRIPTION	MANUFACTURER	MATERIAL	SIZE	REMARKS	
PL-1	PLASTIC LAMINATE	WILSONART	D439-60 Wallaby; Standard HPL Finish	PER PLANS	TYPICAL VERTICAL SURFACES	3mm PVC EDGES
PL-2	PLASTIC LAMINATE	WILSONART	4885-38 Green Soapstone; Fine Velvet Texture Finish	PER PLANS	TYPICAL HORIZONTAL SURFACES	3mm PVC EDGES

3 Material Description Sally Jobe
1/4" = 1'-0"

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MRI Replacement

Schedules

Project number	18-004
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A7.0

4/19/2018 3:34:49 PM

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GENERAL NOTES

1. LIVE LOADS USED IN DESIGN:

   A. ROOF — 30 PSF

   B. WIND
      3 SECOND GUST — 110 MPH
      EXPOSURE — C

   C. SNOW
      GROUND SNOW LOAD P — 30

   D. LIVE LOADS ARE REDUCED PER CODE IF APPLICABLE.

   E. CODE USED IN DESIGN: 2016 IBC.

2. FOUNDATIONS

   A. MAXIMUM SOIL DESIGN PRESSURE ASSUMED 1500 PSF

   B. CONTRACTOR TO ENGAGE A GEOTECHNICAL ENGINEER AT TIME OF EXCAVATION TO VERIFY IN WRITING ACTUAL BEARING CAPACITY MEETS OR EXCEEDS ASSUMED VALUE.

   C. ALL FOOTING BEARING ELEVATIONS SHOWN ARE ASSUMED. EXACT BEARING ELEVATIONS SHALL BE VERIFIED IN THE FIELD WITH ACTUAL CONDITIONS BY CONTRACTOR WITH APPROVAL OF SOILS ENGINEER AND ALL BOTTOMS OF FOOTINGS SHALL BE A MINIMUM OF 36" BELOW EXTERIOR GRADE.

   D. ALL FOOTINGS ARE TO BE PLACED ON FIRM, UNDISTURBED, NATURAL SOIL OR PROPERLY COMPACTED BACKFILL, APPROVED BY THE SOILS ENGINEER. BACKFILL SHALL BE COMPACTED TO 95% (MINIMUM) MODIFIED PROCTOR DENSITY PER ASTM D1557 UNLESS OTHERWISE RECOMMENDED IN THE SOILS REPORT. IF SOFT SPOTS ARE ENCOUNTERED REMOVE SOIL AND RECOMPACT WITH APPROVED FILL (RE: SOIL REPORT FOR DESCRIPTION OF BEARING SOIL).

   E. CENTER ALL FOOTINGS UNDER WALLS, COLUMNS OR GRID LINES UNLESS NOTED OTHERWISE ON PLANS.

   F. CONTRACTOR TO PROVIDE, AT HIS EXPENSE, FIELD DENSITY TEST ON COMPACTED FILL UNDER FOOTINGS AND INTERIOR SLABS-ON-GRADE.

   G. NOTIFY SOILS ENGINEER WHEN EXCAVATION IS COMPLETED SO THAT CONDITIONS MAY BE INSPECTED PRIOR TO PLACEMENT OF ANY FILL OR CONCRETE.

3. CONCRETE

   A. ALL CAST-IN-PLACE CONCRETE SHALL BE MADE WITH TYPE I/II PORTLAND CEMENT, STONE AGGREGATE AND SHALL SATISFY THE FOLLOWING REQUIREMENTS:

CONCRETE ITEM	F'C MIX TYPE	MAX W/C RATIO	% AIR REQ.
FOOTINGS	3000 psi STD	---	---
FOUNDATION WALLS	3000 psi STD	---	---
INTERIOR SLABS ON GRADE	3000 psi STD	0.50	---
EXTERIOR CONCRETE (++)	4500 psi STD	0.45	6%-8%

   ++ MAXIMUM SLUMP SHALL NOT EXCEED 4".

   B. IF CONCRETE SUPPLIER PROPOSES USE OF FLYASH HE SHALL PROVIDE OWNER WITH LETTER INDICATING COST REDUCTION AT TIME OF BID. THE MODULUS OF ELASTICITY OF ALL CONCRETE SHALL EXCEED WC1.5 33 F'C (OR 57,000 F'C NORMAL WEIGHT CONCRETE).

   C. CONTRACTOR SHALL SAWCUT OR TROWELCUT JOINTS IN SLABS ON GRADE. JOINTS SHALL BE SPACED 15 FEET AND SAWCUT OR TROWELCUT 1/4 OF SLAB DEPTH X 3/16" WIDE WITHIN 12 HOURS AFTER POURING. CARRY ALL SLAB REINFORCEMENT THROUGH JOINT.

   D. SLABS, TOPPING, FOOTINGS, BEAMS AND WALLS SHALL NOT HAVE JOINTS IN A HORIZONTAL PLANE. ANY STOP IN CONCRETE WORK MUST BE MADE AT THIRD POINT OF SPAN WITH VERTICAL BULKHEADS AND HORIZONTAL SHEAR KEYS UNLESS OTHERWISE SHOWN. ALL CONSTRUCTION JOINTS SHALL BE AS DETAILED OR AS REVIEWED BY THE ENGINEER.

   E. ALL CONCRETE WORK AND REINFORCEMENT DETAILING SHALL BE IN ACCORDANCE WITH ACI BUILDING CODE 318 LATEST EDITION, UNLESS NOTED OTHERWISE. USE STANDARD HOOKS FOR DOWELS UNLESS NOTED OTHERWISE. ALL EXPOSED EDGES OF CONCRETE WORK SHALL HAVE 3/4 INCH CHAMFER.

4. REINFORCEMENT

   A. ALL REINFORCING SHALL BE HIGH-STRENGTH DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 EXCEPT TIES, STIRRUPS AND PLATE ANCHORS WHICH SHALL BE DEFORMED BARS, ASTM DESIGNATION A615, GRADE 40 OR ASTM A706 GRADE 60.

   B. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 GRADE 65 AND SHALL BE LAPPED ONE FULL MESH AT SIDE AND END SPLICES AND WIRED TOGETHER.

   C. REINFORCEMENT PROTECTION UNLESS NOTED OTHERWISE:
      1. CONCRETE POURED AGAINST EARTH — 3"
      2. CONCRETE POURED IN FORMS (EXPOSED TO WEATHER OR EARTH) — 2"
      3. COLUMNS AND BEAMS (TIE BARS) — 1-1/2"
      4. SLABS AND WALLS (NOT EXPOSED TO WEATHER) — 3/4"

   D. REINFORCEMENT PLACEMENT AND TOLERANCES SHALL BE IN ACCORDANCE WITH SECTIONS 7.5, 7.6 AND 7.7 OF ACI 318, LATEST EDITION.

   E. NO SPLICES OF REINFORCEMENT SHALL BE MADE EXCEPT AS DETAILED OR AUTHORIZED BY THE STRUCTURAL ENGINEER. LAP SPLICES, WHERE PERMITTED, SHALL BE A MINIMUM OF 48 BAR DIAMETERS FOR #6 BARS AND SMALLER AND SHALL BE A MINIMUM OF 80 BAR DIAMETERS FOR #7 AND #8 REINFORCEMENT UNLESS NOTED OTHERWISE. MAKE ALL BARS CONTINUOUS AROUND CORNERS.

   F. PLACE TWO #5 (PER 8" THICKNESS) WITH 2'-0" PROJECTION AROUND ALL OPENINGS IN CONCRETE WALLS, SLABS, AND BEAMS. ALSO PROVIDE TWO #5 X 4'-0" DIAGONALLY AT EACH CORNER.

   G. CONTINUOUS TOP AND BOTTOM BARS IN WALLS AND BEAMS SHALL BE SPLICED AS FOLLOWS: TOP BARS AT MIDSPAN, BOTTOM BARS OVER SUPPORTS.

5. STRUCTURAL STEEL

   A. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 EXCEPT WIDE FLANGE BEAMS WHICH SHALL CONFORM TO ASTM 992, (50 KSI) AND EXCEPT PIPE COLUMNS WHICH SHALL CONFORM TO ASTM A53 AND TUBE COLUMNS TO ASTM A500, GRADE B, LATEST EDITIONS. STEEL SUPPLIER MAY PROVIDE ASTM A572, GRADE 50 AT HIS OPTION. MISCELLANEOUS EMBEDDED ITEMS SHALL BE A36 STEEL.

   B. ALL STRUCTURAL BOLTS SHALL BE A325N INSTALLED TO A MINIMUM SNUG TIGHT CONDITION. ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A307 UNLESS NOTED OTHERWISE.

   C. STRUCTURAL STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC "MANUAL OF STEEL CONSTRUCTION."

   D. EXCEPT WHERE DETAILED OTHERWISE, FABRICATOR SHALL SELECT STEEL CONNECTIONS PER AISC "MANUAL OF STEEL CONSTRUCTION" (ASD), TABLE 11-A AND/OR AISC "SIMPLE SHEAR CONNECTION MANUAL" WITH A325 N BOLTS (OR WELDED EQUIVALENT) TO SUPPORT LOADS INDICATED ON THE STRUCTURAL DRAWINGS. WHEN LOADS ARE NOT SHOWN, SELECT CONNECTION TO SUPPORT 60% THE TOTAL UNIFORM LOAD CAPACITY PER AISC "MANUAL OF STEEL CONSTRUCTION" FOR EACH GIVEN BEAM AND SPAN FOR NON-COMPOSITE MEMBERS.

   E. ALL WELDERS SHALL HAVE EVIDENCE OF PASSING THE AMERICAN WELDING SOCIETY STANDARD QUALIFICATIONS TESTS AS OUTLINED IN AWS-D1.1.

   F. MINIMUM WELDS TO BE PER AISC TABLE J2.4 BUT NOT LESS THAN 3/16" CONTINUOUS FILLET UNLESS NOTED OTHERWISE.

   G. FOR ALL BEAM/COLUMN OR BEAM/BEAM CONNECTIONS, PROVIDE HORIZONTAL SHORT SLOTS IN CONNECTION MEMBER ONLY (WT-SECTIONS, ANGLES OR SHEAR PLATES).

6. NON-SHRINK GROUT

   A. NON-SHRINK GROUT SHALL BE PROVIDED:
      1. BETWEEN COLUMN BASES AND CONCRETE OR MASONRY SUPPORTS.
      2. BETWEEN BEAM BEARING PLATES AND CONCRETE OR MASONRY SUPPORTS.
      3. GROUT SHALL BE COMPLETE AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 6000 PSI PRIOR TO ADDING BUILDING LOADS ABOVE.

7. NON-STRUCTURAL ELEMENTS

   A. ELEMENTS SUCH AS NON-BEARING PARTITIONS, ETC. ATTACHED TO AND/OR SUPPORTED BY THE STRUCTURE SHALL TAKE INTO ACCOUNT DEFLECTIONS AND OTHER STRUCTURAL MOVEMENTS.

   B. FIRE PROTECTION FOR ALL STRUCTURAL PARTS SHALL BE PROVIDED AND SHALL MEET ALL CODE REQUIREMENTS FOR THE TYPE OF CONSTRUCTION SPECIFIED BY THE ARCHITECTURAL DRAWINGS. STRUCTURAL STEEL MEMBERS SHALL BE CONSIDERED UNRESTRAINED UNLESS NOTED OTHERWISE.

8. LIGHT GAGE FRAMING

   A. LIGHT-GAGE METAL FRAMING SHALL BE THE SIZE AND GAGE SHOWN ON THE DRAWINGS.

   B. FRAMING ROLLED FROM STEEL 18 GAGE AND LIGHTER SHALL CONFORM TO ASTM A570, LATEST EDITION, WITH A MINIMUM YIELD STRESS OF 33,000 PSI.

   C. FRAMING ROLLED FROM STEEL 16 GAGE AND HEAVIER SHALL CONFORM TO ASTM A570, LATEST EDITION, WITH A MINIMUM YIELD STRESS OF 50,000 PSI.

   D. ALL WORK SHALL CONFORM WITH THE RECOGNIZED STANDARDS AND CODES FOR LIGHT GAGE METAL FRAMING.

9. GENERAL

   A. ENGINEER'S ACCEPTANCE MUST BE SECURED FOR ALL STRUCTURAL SUBSTITUTIONS.

   B. VERIFY ALL OPENINGS THROUGH FLOORS, ROOF AND WALLS WITH MECHANICAL AND ELECTRICAL CONTRACTORS. VERIFICATION OF LOCATIONS, SIZES, LINTELS AND REQUIRED CONNECTIONS ARE CONTRACTOR'S COMPLETE RESPONSIBILITY.

   C. PRIOR TO INSTALLATION OF MECHANICAL AND ELECTRICAL EQUIPMENT OR OTHER ITEMS TO BE ATTACHED TO THE STRUCTURE, ENGINEER'S APPROVAL OF CONNECTIONS AND SUPPORTS SHALL BE OBTAINED. UNLESS SPECIFICALLY DETAILED ON ARCHITECTURAL AND STRUCTURAL DRAWINGS, RESPECTIVE SUBCONTRACTOR SHALL FURNISH ALL HANGERS, CONNECTIONS, ETC., REQUIRED FOR INSTALLATION OF HIS ITEMS.

   D. PROVIDE ALL EMBEDDED ITEMS IN STRUCTURE AS NOTED ON ARCHITECTURAL, MECHANICAL, ELECTRICAL AND STRUCTURAL DRAWINGS. MISCELLANEOUS EMBEDDED ITEMS AND ANCHOR BOLTS SHALL BE FURNISHED BY STEEL SUPPLIER AND INSTALLED BY CONCRETE CONTRACTOR. STEEL SHALL FULFILL ASTM A36.

   E. PROVIDE ASPHALTIC MASTIC-COATING ON ALL STEEL AND WOOD EXPOSED TO EARTH.

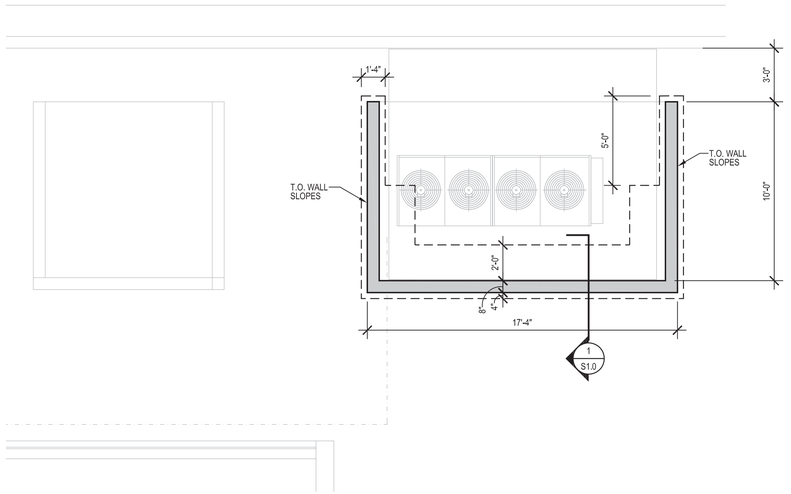
   F. SUBMIT SHOP AND ERECTION DRAWINGS TO ENGINEER FOR REVIEW OF ALL STRUCTURAL STEEL.
      THE MANUFACTURING OR FABRICATION OF ANY ITEMS PRIOR TO WRITTEN REVIEW OF SHOP DRAWINGS WILL BE ENTIRELY AT THE RISK OF THE CONTRACTOR.

   G. WATERPROOFING, VAPOR BARRIERS, WATERSTOP, ETC., SHALL BE AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND AS INDICATED IN THE SPECIFICATIONS.

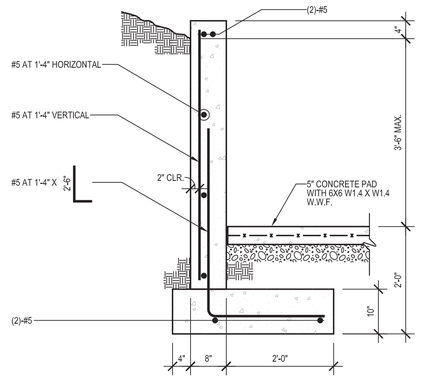
   H. ALL MASONRY AND STONE VENEERS SHALL BE ATTACHED TO INTERIOR AND EXTERIOR WALLS AS SPECIFIED IN SECTION 1405 OF THE INTERNATIONAL BUILDING CODE.

   I. ALL DIMENSIONS ON STRUCTURAL DRAWINGS SHALL BE CHECKED AGAINST FIELD AND ARCHITECTURAL DRAWINGS.

   J. PRE-MANUFACTURED STAIRS, HANDRAILS, AND GUARDRAILS NOTED ON PLAN SHALL HAVE ALL ENGINEERING, DESIGN AND DETAILING PROVIDED BY STAIR DESIGNER AND SHALL BE SUBMITTED FOR ARCHITECTS REVIEW BEARING THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF COLORADO. STAIRS SHALL BE DESIGNED TO SUPPORT A LIVE LOAD OF 100 PSF. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL REQUIREMENTS AND CRITERIA.



1 Level 1 - Retaining Wall Plan
1/4" = 1'-0"



RETAINING WALL
SECTION 1
3/4" = 1'-0"

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

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: jlocke
Date: May 01, 2018
2015 INTERNATIONAL CODES & 2017 NEC

DJ Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
Davis / Jones 303.886.3860

Digitally signed by Craig Carroll PE
Date: 2018.04.20 09:04:52-06'00'

Building Site:
1400 S. Potomac
Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
Emerald C.M. General Contractors
13275 East Fremont Place, Suite 300
Centennial, CO 80112

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720.489.1609

Structural Engineer:
Craig Carroll
Monroe & Newell Engineers, Inc
1400 Glenarm Pl, #101
Denver, CO 80202

No.	Description	Date

Touchstone Imaging

Imaging Clinic

Wall Dimension Plan

Project number	18-004
Date	2-14-18
Drawn by	JAJ
Checked by	Checker

S1.0

3/5/2018 10:27:55 AM

RSN: 1281167
Permit #: 18-1445333-LT

MECHANICAL SPECIFICATIONS

GENERAL:

THE DRAWINGS INDICATE DIAGRAMMATICALLY THE EXTENT, GENERAL CHARACTER, AND LOCATION OF THE WORK INCLUDED. OFFSETS AND/OR CHANGES IN ELEVATION OF PIPING AND DUCTWORK DUE TO STRUCTURAL OR OTHER INTERFERENCES SHALL BE PROVIDED WITHOUT EXTRA COST.

VERIFY AND EVALUATE ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. SUBMISSION OF PROPOSAL IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE. NO EXTRA CHARGE WILL BE ALLOWED FOR CHANGES AS A RESULT FROM FAILURE TO EXAMINE THE JOB SITE.

PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE AND OPERATING SYSTEM. PROVIDE CONTROL WIRING NECESSARY FOR THE OPERATION OF THE MECHANICAL SYSTEMS INDICATED ON THE MECHANICAL DRAWINGS. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THERMOSTATS.

ENTIRE NEW WORK INSTALLATION SHALL CONFORM WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF MUNICIPAL, STATE AND FEDERAL AUTHORITIES INCLUDING: THE 2015 INTERNATIONAL BUILDING, MECHANICAL, AND ENERGY CONSERVATION CODES; ANY AND ALL LOCAL AMENDMENTS ADOPTED AND ENFORCED BY THE CITY OF AURORA, COLORADO; ASME; ASTM; ASHRAE; SMACNA; AND NFPA.

WHERE REQUIRED BY CODE, ALL WORK MUST BE INSPECTED AND APPROVED BY LOCAL AUTHORITIES. PRIOR TO FINAL ACCEPTANCE, FURNISH THE ARCHITECT/OWNER WITH CERTIFICATES OF INSPECTION AND APPROVALS BY LOCAL AUTHORITIES.

THIS WORK SHALL BE PERFORMED IN A CLEAN AND PROFESSIONAL MANNER. CARE SHALL BE EXERCISED TO MINIMIZE INCONVENIENCE OR DISTURBANCE TO OTHER TRADES DURING CONSTRUCTION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DEBRIS WITHIN THE CONSTRUCTION AREA. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.

FIELD VERIFY ALL DIMENSIONS, EXISTING CONDITIONS, AND BUILDING POWER, VOLTAGE, AND PHASE PRIOR TO ORDERING EQUIPMENT AND PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE OWNER AND MECHANICAL ENGINEER IMMEDIATELY FOR RESOLUTION.

THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS/HER OWN PROPERTY ON THE JOB SITE. THE OWNER OR TENANT ASSUMES NO RESPONSIBILITY FOR PROTECTION OF THIS CONTRACTOR'S PROPERTY AGAINST FIRE, THEFT, OR ENVIRONMENTAL CONDITIONS.

THIS CONTRACTOR SHALL SECURE AND PAY ALL FEES AND PERMITS PERTAINING TO THIS CONTRACT, SHALL BE RESPONSIBLE FOR WORKER'S IDENTIFICATION AND BADGING, SAFETY, AND LIABILITY INSURANCE. PROVIDE BARRICADES, WARNING SIGNS, AND TRASH REMOVAL FOR THE SAFETY OF THE WORKERS UNDER THIS CONTRACTOR'S EMPLOY.

SYSTEM, MATERIAL, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER THE COMPLETION AND ACCEPTANCE. REPLACE ALL DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS WITHOUT ADDITIONAL CHARGES, INCLUDING REFRIGERANT THAT IS LOST DURING RELATED REPAIRS.

EQUIPMENT MAY BE SUBSTITUTED BY PRODUCTS AVAILABLE FROM ALTERNATE MANUFACTURERS, IF ADEQUATE MANUFACTURER'S CATALOG DATA IS SUPPLIED TO THE ENGINEER AND IS DEEMED BY THE ENGINEER AS AN ACCEPTABLE "EQUAL" TO THE PRODUCT OR EQUIPMENT AS SPECIFIED ON THE DRAWINGS. DO NOT ORDER ANY SUBSTITUTED EQUIPMENT WITHOUT APPROVAL FROM THE ENGINEER.

SUBMITTALS:

SUBMIT ELECTRONIC COPY IN ADOBE PDF FORMAT OF SHOP DRAWINGS, CONTROL DIAGRAMS, AND EQUIPMENT CUTS TO THE MECHANICAL ENGINEER FOR APPROVAL PRIOR TO STARTING RELATED WORK. UPON COMPLETION OF CONSTRUCTION, SUPPLY THE MECHANICAL ENGINEER WITH ONE COMPLETE SET OF FULL SIZE AS-BUILT DRAWINGS. PROVIDE THE OWNER WITH ELECTRONIC COPY AND ONE (1) HARD BOUND COPY OF OPERATION AND MAINTENANCE MANUALS FOR EACH TYPE OF EQUIPMENT INSTALLED.

THIS CONTRACTOR SHALL ASSUME ALL ADDED EXPENSES TO ALL TRADES ASSOCIATED WITH THE INSTALLATION OF SUBMITTED AND APPROVED ALTERNATE EQUIPMENT.

SUBMIT THE TESTING, ADJUSTING, AND BALANCING REPORT TO THE MECHANICAL ENGINEER AND BUILDING OFFICIAL AS PART OF THE PROJECT CLOSEOUT.

TENANT FINISH NOTES:

PROVIDE NEW CONTROL WIRING, CUTTING AND PATCHING, AS REQUIRED FOR RELOCATED THERMOSTATS. PROTECT EXISTING THERMOSTATS FROM DAMAGE DURING CONSTRUCTION. TEST AND RECALIBRATE/REPLACE ALL ZONE THERMOSTATS AS REQUIRED.

REPLACE AIR FILTERS FOR ALL AIR MOVING EQUIPMENT SERVING THIS SPACE ONCE CONSTRUCTION IS COMPLETE. DURING CONSTRUCTION, PROTECT ALL RETURN AIR DUCT OPENINGS WITHIN THE PROJECT AREA WITH FILTER MEDIA SECURED WITH TEMPORARY METAL STRAPPING AND TAPE.

THE SPACE ABOVE THE CEILING IS USED AS A RETURN AIR PLENUM. ALL EXPOSED MATERIALS SHALL BE PLENUM RATED, AS DEFINED BY THE BUILDING CODE, AND SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84.

OUTSIDE AIR REQUIRED FOR THIS TENANT SPACE IS AS INDICATED IN THE VENTILATION SUMMARY. VERIFY THAT THE (EXISTING) AIR HANDLERS' OUTSIDE AIR DAMPERS ARE FUNCTIONING PROPERLY, AND PROVIDE THE SCHEDULED QUANTITY OF OUTSIDE AIR DURING OCCUPIED BUILDING HOURS.

MATERIALS AND METHODS:

PROVIDE ALL DAMPER CONTROL HANDLES, ELECTRIC CONTROLS, AIR CONTROLS, MECHANICAL EQUIPMENT, AND OTHER APPARATUS THAT MUST BE PROVIDED IN AN INACCESSIBLE LOCATION WITH SUITABLE ACCESS DOORS OR COVERS IN A FRAMED OPENING, WHICH WILL PERMIT PROPER OPERATION AND SERVICING.

WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS, WALLS, OR PARTITIONS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS U.L. LISTED (EQUAL TO DOW CORNING) AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THE SERVICE. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS IN ORDER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL, FLOOR, OR PARTITION. INSTALLATION SHALL BE A THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E 814 AND UL 1479. THE FIRE RATING SHALL MATCH THE RATING OF THE BARRIER BEING PENETRATED.

ALL EQUIPMENT AND DEVICES SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS AND SHALL PROVIDE EXTRA MATERIALS REQUIRED FOR A PROPER INSTALLATION.

COORDINATE WITH THE GENERAL CONTRACTOR AND THE ARCHITECTURAL REFLECTED CEILING PLAN AS TO THE EXACT LOCATION OF CEILING REGISTERS, GRILLES, AND DIFFUSERS. INSTALL SAME FLUSH, AND PERPENDICULAR TO ADJACENT WALLS.

MECHANICAL DUCTWORK AND VENTING:

ENTIRE DUCTWORK INSTALLATION SHALL COMPLY WITH NFPA 90A. DUCT SYSTEMS SHALL BE FABRICATED FROM G60 LOCK FORMING QUALITY GALVANIZED STEEL OR ALUMINUM SHEET METAL. FABRICATE, INSTALL, AND SUPPORT IN STRICT ACCORDANCE WITH SMACNA. DUCTWORK SHALL BE CROSS BROKEN OR BEADED. DUCT GAGES SHALL COMPLY WITH SMACNA 2" W.C. PRESSURE CLASSIFICATION FOR LOW PRESSURE DUCTWORK. SEAL DUCTWORK TO SMACNA SEAL CLASS "B".

NOTE: ALL DUCTWORK WITHIN THE MRI ROOM SHIELD ENCLOSURE SHALL BE ALUMINUM.

DUCT DIMENSIONS SHOWN ARE SHEET METAL (UNLESS OTHERWISE NOTED). ANY LINER THICKNESS HAS ALREADY BEEN TAKEN INTO ACCOUNT AND IS INCLUDED AS THE O.D. ON THE PLANS. DUCT DIMENSIONS MAY BE CHANGED IF THE NET FREE FACE AREA IS MAINTAINED.

DUCT SEALANT FOR CONCEALED DUCTWORK SHALL BE EQUAL TO IRON-GRIP 601 AS MANUFACTURED BY HARDCAST. APPLY PER MANUFACTURER'S INSTRUCTIONS. DUCT TAPE IS NOT AN ACCEPTABLE MEANS OF SEALING DUCTS. EXCEPTION: USE ONLY CLEAR SEALANT EQUAL TO RCD CORPORATION #20 CLEAR ADHESIVE SEALANT ON EXPOSED DUCTWORK.

FLEXIBLE DUCTS SHALL BE EQUAL TO HART & COOLEY MODEL # F214, LISTED AS U.L. CLASS 1 AIR DUCT, AND SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED RATING NOT EXCEEDING 50. DUCTS SHALL CONFORM TO NFPA 90A. METALIZED POLYESTER JACKET REINFORCED WITH FIBERGLASS SCRIM. INSULATION SHALL BE R-4.2.

ALL DUCT CONNECTIONS TO FAN DRIVEN UNITS SHALL BE MADE WITH 4-IN. LONG FIREPROOF FLEXIBLE DUCT CONNECTOR FOR VIBRATION SOUND ISOLATION.

SMOOTH TURN RADIUS ELBOWS OR DOUBLE-THICKNESS TURNING VANES SHALL BE USED WHERE THE AIR FLOW IS 150 CFM OR ABOVE.

PROVIDE FLEXIBLE DUCT ONLY FOR FINAL CONNECTIONS TO DIFFUSERS, AND ONLY WHERE CONCEALED ABOVE FINISHED CEILINGS. MAXIMUM LENGTH SHALL BE LIMITED TO 6 FEET.

SPIN COLLAR FITTINGS FOR ROUND TAKE-OFFS ON RECTANGULAR DUCTS IN LOW PRESSURE SYSTEMS SHALL BE EQUAL TO FLEXMASTER MODEL FL FOR RETURN AIR AND FLD WITH DAMPER FOR SUPPLY AND EXHAUST AIR. FITTINGS SHALL BE 26 GAUGE G-90 GALVANIZED STEEL.

DUCT INSULATION:

RECTANGULAR SUPPLY, RETURN, AND TRANSFER AIR DUCTWORK LOCATED WITHIN RETURN AIR PLENUMS SHALL BE INTERNALLY LINED WITH ACOUSTICAL LINER EQUAL TO JOHNS MANVILLE LINACOUSTIC RC FIBERGLASS DUCT LINER WITH REINFORCED COATING SYSTEM, 1-INCH THICK (R-4.2). RETURN AND TRANSFER AIR DUCTWORK SHALL NOT BE LINED, EXCEPT WHERE INDICATED ON THE DRAWINGS FOR ACOUSTICAL (SOUND ATTENUATION) PURPOSES.

DUCT INSULATION:

ROUND SUPPLY AIR DUCTWORK LOCATED WITHIN RETURN AIR PLENUMS SHALL BE INSULATED WITH FIBERGLASS DUCT INSULATION WITH FSK FACING EQUAL TO JOHNS MANVILLE MICROLITE, 75# DENSITY, 1-INCH THICK (R-3.7). INSTALL PER MANUFACTURER'S PUBLISHED INSTRUCTIONS.

WHERE DUCTWORK IS NOTED TO BE INSULATED DIFFERENTLY ON THE DRAWINGS (i.e. EXTERNAL INSULATION ON RECTANGULAR DUCTWORK), THE CORRESPONDING INSULATION SPECIFICATIONS ABOVE SHALL APPLY.

MAGNET QUENCH VENT DUCTWORK:

THE SIEMENS MAGNET HAS A QUENCH VALVE ASSEMBLY FOR CONNECTION TO THE TUBE LOCATED AT THE TOP LEFT SIDE OF THE MAGNET (SEE MAGNET ELEVATION). THE MECHANICAL CONTRACTOR WILL SUPPLY AND INSTALL A QUENCH VENT TUBE WITH CAP, TO BE NON-MAGNETIC STAINLESS STEEL (>22 GAUGE RECOMMENDED). GRADES AISI304, 309, 316, OR 321 ONLY. THERMAL CONDITIONS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'-9" NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE QUENCH TUBE MAY ALSO BE MADE OF ALUMINUM, EXTRUDED TUBE ALUMINUM GRADES 6063 AND 6082 ONLY MUST BE USED. ROLLED AND WELDED TUBE FROM SHEET ALUMINUM GRADE 5083 ONLY MUST BE USED. THE WALL SECTIONS OF ALUMINUM TUBE MUST BE A MINIMUM 14 GAUGE. THERMAL CONTRACTION OF 4.5 MM/METER MUST BE CONSIDERED FOR ALUMUNIUM QUENCH TUBES. THE MOVEMENT OF THE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE EXPANSION DUE TO PRESSURE. THE WEIGHT OF THE TUBE MUST BE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION. THE WALL EXIT SHOULD ALSO BE FLEXIBLE.

THERE MUST BE A 12-19 INCH FLEXIBLE SECTION OF PIPE FOR CONNECTION TO THE QUENCH VALVE AT THE MAGNET WITH AN INSIDE DIAMETER GREATER THAN 4" AND ABLE TO WITHSTAND 6.5 PSI.

SECTIONS OF THE PIPE CAN ONLY BE JOINED BY WELDING OR BOLTED FLANGES WITH FIBER GASKETS. ROTARY FLANGES ARE PERMITTED, VEE CLAMPED FLANGES MAY NOT BE USED.

THE PROTECTION AT THE END OF THE TUBE SHALL BE 3/8" WIRE MESH COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS SECTION AREA OF THE QUENCH PIPE.

THE QUENCH TUBE MUST HAVE MINIMUM 1" INSULATION FOR THE FULL LENGTH. WITHIN THE RF ROOM THERE SHOULD BE A 1" LAYER OF MINERAL FIBER INSULATION WITH A VAPOR BARRIER AND 1" CLASS O OR CLASS AP ARMAFLEX. OUTDOOR PIPES MUST BE WEATHERPROOF. THE TUBE MUST HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS - AUTHORIZED PERSONNEL ONLY. THE INSULATION MUST NOT TOUCH THE MAGNET COVERS.

GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MR SYSTEM, THE RF ROOM, AND THE BUILDING, TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY.

SEE SIEMENS DRAWINGS FOR ADDITIONAL REQUIREMENTS

MECHANICAL PIPING SYSTEMS:

REFRIGERANT PIPING SHALL BE SEAMLESS COPPER TUBE, TYPE ACR, ASTM B 280, WITH BRAZED COPPER JOINTS. INSULATE SUCTION LINES WITH 1 1/2-IN. PREFORMED FIBERGLASS PIPE INSULATION WITH ALL SERVICE JACKET. INSULATION SHALL BE PLENUM RATED, AND HAVE A MAXIMUM CONDUCTIVITY OF 0.27 BTU/IN/H*FT^2*F.

CONDENSATE PIPING SHALL BE TYPE L COPPER WITH SOLDERED COPPER JOINTS. INSULATE CONDENSATE LINES WITH 1/2-IN. PREFORMED FIBERGLASS PIPE INSULATION WITH ALL SERVICE JACKET. INSULATION SHALL BE PLENUM RATED.

HYDRONIC PIPING:

MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE AROUND AND ABOVE ALL EQUIPMENT. COORDINATE LOCATIONS WITH BUILDING MANAGEMENT. INCLUDE EQUIPMENT LAYOUT IN THE SHOP DRAWING SUBMITTAL PACKAGE.

CHILLED WATER PIPING PASSING THROUGH WALLS OR FLOORS SHALL BE SLEEVED AND CAULKED. PIPING SHALL BE TYPE L COPPER WITH WROUGHT COPPER JOINTS SOLDERED WITH 95-5 TIN-ANTIMONY. PROVIDE DIELECTRIC NIPPLES FOR CONNECTIONS OF DISSIMILAR METALS. HYDRONIC PIPING SHALL BE INSULATED WITH PRE-FORMED FIBERGLASS PIPE INSULATION, 1 1/2 INCHES THICK, WITH A MAXIMUM CONDUCTIVITY OF 0.27 EQUAL TO JOHNS MANVILLE MICRO-LOK. PIPING LOCATED OUTDOORS SHALL HAVE ALUMINUM WEATHERPROOF JACKET SEALED AND PAINTED. COLOR TO BE DIRECTED BY THE BUILDING MANAGER OR ARCHITECT. INDOOR PIPING SHALL HAVE ALL-SERVICE JACKET. PIPING LOCATED BELOW GRADE SHALL BE PRE-INSULATED AND FACTORY SEALED WATER TIGHT WITH POLYURETHANE FOAM INSULATION AND FIELD OR FACTORY SEALED JOINTS. FOLLOW ALL MANUFACTURER'S INSTRUCTIONS FOR DIRECT BURIAL INSTALLATION. LABEL ABOVE GROUND PIPING (i.e. "CHILLED WATER SUPPLY" OR "CHILLED WATER RETURN") AT MAXIMUM INTERVALS OF 20 FEET.

VALVES: BALL VALVES SHALL BE RATED FOR 150 PSI AT 350 DEG. F., HAVE TWO-PIECE BRONZE BODY CONFORMING TO ASTM 584, FULL PORT CHROME PLATED BRASS BALL, REINFORCED PTFE SEATS AND PACKING, BLOW-OUT PROOF STEM, VINYL COVERED STEEL HANDLE. PROVIDE SOLDER ENDS. VALVES SHALL BE EQUAL TO APOLLO OR WATTS.

FILL SYSTEM WITH GLYCOL MIX PER MFR REQUIREMENS (DO NOT USE TAP WATER) AND CHECK ACIDITY, HARDNESS, AND CLORINE CONCENTRATION PER MFR REQUIREMENTS, CHECK EXPANSION TANK TO DETERMINE THAT IT IS NOT AIR BOUND AND THAT THE SYSTEM IS COMPLETELY FULL OF WATER. OPEN VALVES TO FULL POSITION, CLOSE COIL BYPASS VALVES, REMOVE AND CLEAN STRAINERS, SET SYSTEM PRESSURE PER SIEMENS REQUIREMENTS. CHECK AIR VENTS AT HIGH POINTS OF SYSTEM AND DETERMINE IF ALL ARE INSTALLED AND OPERATING FREELY, BLEED AIR COMPLETELY.

TESTING, ADJUSTING, AND BALANCING:

TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE 2011 ASHRAE HANDBOOK OF HVAC APPLICATIONS, CHAPTER 38. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO:
* BALANCING AIR DISTRIBUTION SYSTEMS
* ADJUSTING THE TOTAL SYSTEM TO PROVIDE DESIGN QUANTITIES
* ELECTRICAL MEASUREMENT
* ESTABLISHING QUANTITATIVE PERFORMANCE OF ALL HVAC EQUIPMENT
* VERIFYING AUTOMATIC CONTROLS

TESTING AND BALANCING SUB-CONTRACTOR SHALL BE INDEPENDENTLY HIRED BY THE G.C., SHALL BE NEBB CERTIFIED, AND SHALL HAVE A MINIMUM OF 5 YEARS EXPERIENCE ON COMMERCIAL PROJECTS SIMILAR IN NATURE TO THIS PROJECT.

SUBMIT THE TESTING, ADJUSTING, AND BALANCING REPORT TO THE MECHANICAL ENGINEER AND BUILDING OFFICIAL AS PART OF THE PROJECT CLOSEOUT, AND PRIOR TO FINAL CERTIFICATE OF OCCUPANCY (CO).

ADJUST WATER FLOWS TO COILS TO WITHIN +/- 5%.

ADJUST AIR FLOWS FOR TERMINALS TO WITHIN +/- 10%. ADJUST AIR FLOWS IN DUCT MAINS TO WITHIN +/- 5%, USING THE PITOT-TUBE TRANSVERSE METHOD. FURNISH TO THE ARCHITECT, FIVE (5) COPIES OF THE TESTING AND BALANCING REPORT.

BEFORE ACCEPTANCE AND FINAL PAYMENT, DEMONSTRATE THAT ALL APPERATI ARE FUNCTIONING PROPERLY AND EFFICIENTLY. STARTUPS AND ADJUSTMENTS FOR THE FIRST HEATING AND THE FIRST COOLING SEASON SHALL BE INCLUDED IN THE BID.

SEQUENCE OF OPERATIONS:

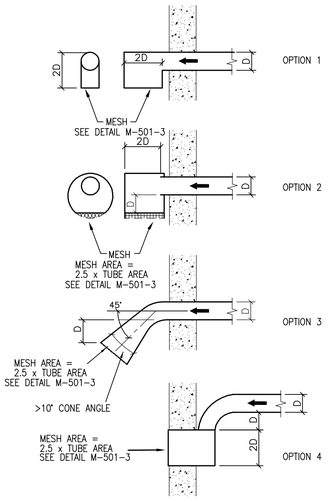
NOTE TO GENERAL CONTRACTOR: THE SEQUENCE OF OPERATIONS REQUIRES MATERIALS, DEVICES, AND LABOR FROM VARIOUS PARTIES INCLUDING: THE GENERAL CONTRACTOR (GC), MECHANICAL SUBCONTRACTOR (MC), ELECTRICAL SUBCONTRACTOR (EC), AND THE FIRE ALARM SUBCONTRACTOR (TO BE INCLUDED UNDER GC).

EXISTING EXHAUST FAN SERVING MRI SCAN ROOM - FAN SHALL RUN CONTINUOUSLY.

MECHANICAL SYMBOL LEGEND

- MANUAL VOLUME DAMPER - PROVIDE IN EACH NEW SUPPLY AND EXHAUST AIR RUNOUT.
- (T) ROOM THERMOSTAT (ARROW INDICATES RELOCATED)
- (1) KEYED NOTE
- EXISTING DUCTWORK TO REMAIN
- NEW SHEETMETAL DUCTWORK - ACOUSTICALLY LINED
- NEW SHEETMETAL DUCTWORK
- EXISTING DUCTWORK TO BE REMOVED
- FLEX DUCT
- 45 DEGREE ENTRY FITTING
- ROUND SPIN-IN ENTRY FITTING
- SQUARE-TO-ROUND TRANSITION
- ELBOW WITH TURNING VANES
- NEW RETURN AIR GRILLE
- RETURN GRILLE W/ LINED SOUND ATTENUATING BOOT
- EXISTING SUPPLY AIR DIFFUSER (ARROW INDICATES RELOCATED)
- EXISTING RETURN AIR GRILLE (ARROW INDICATES RELOCATED)
- NEW SUPPLY AIR DIFFUSER
- SD-1 / 150 AIR OUTLET/INLET TAG - BOTTOM NUMBER INDICATES AIR FLOW IN CFM
- EF / 1 EQUIPMENT TAG - REFER TO SCHEDULES
- POINT OF CONNECTION TO EXISTING

(D) MECHANICAL ITEMS TO BE DEMOLISHED
(E) EXISTING MECHANICAL TO REMAIN
(R) RELOCATE MECHANICAL ITEMS
RA RETURN AIR
SA SUPPLY AIR



OPTIONS FOR QUENCH TUBE EXITING THROUGH A WALL

1 Quench Vent Termination Details
not to scale

HUMIDIFIER SCHEDULE

MARK	MANUFACTURER & MODEL NO.	TYPE	HEATER TYPE	CAPACITY (LB/HR)	VOLTAGE	WATTS	AMPS	MAX FUSE SIZE	WEIGHT (LBS)	DIMENSIONS W X D X H	NOTES
HD-1	NORTEC EL 10	WALL	ELECTRIC	10	460-1-60	3,700	18.0	25	55	16.5" X 14.3" X 26.4"	1,2,3

1. PROVIDE WITH NORTEC ASD TUBE TYPE DUCT DISTRIBUTOR, 1" COPPER STEAM PIPING AND 1/4" COPPER CONDENSATE PIPING. NOTE: INSULATE ALL PIPING AND PROVIDE PLENUM RATED JACKETING.
2. SLOPE STEAM AND CONDENSATE PIPING PER MFR INSTRUCTIONS.
3. PROVIDE WITH REMOTE HUMIDISTAT, LOCATED IN EXISTING 14"ø EXHAUST DUCT SERVING THE MRI ROOM.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: jlocke
Date: May 01, 2018
2015 INTERNATIONAL CODES & 2017 NEC

VENTILATION SUMMARY

Room Name(s)	Occupancy Classification	Room Area Sq. Ft.	Area Outdoor Air Rate (Ra) CFM / Sq. Ft.	Area Outdoor Air (RaAz) CFM	Occupant Load People Per 1000 SF	Estimated Occupancy (Pz)	Occupant Outdoor Air Rate (Rp) CFM	Occupant Outdoor Air Total (RpPz) CFM	Breathing Zone Outdoor Air (RpPz + RaAz)	Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Air (Voz= Vbz/Ez) CFM	Supply Air Design (Vpz) CFM	Uncorrected Outdoor Air Fraction (Zp=Voz/Vpz)
Zone Waiting, 101	Reception	150	0.06	9	30	4.5	5.0	23	32	0.8	39	170	23%
Control Room, 102	Office Spaces	215	0.06	12.9	5	2.0	5.0	10	23	0.8	29	600	5%
Sub Wait, 103	Reception	40	0.06	2.4	30	2.0	5.0	10	12	0.8	16	70	22%
Accessible Dressing, 104	Office Spaces	40	0.06	2.4	5	0.5	5.0	3	5	0.8	6	20	31%
MRI, 105	Office Spaces	380	0.06	22.8	5	2.0	5.0	10	33	0.8	41	1300	3%
Break, 107	Office Spaces	150	0.06	9	5	2.0	5.0	10	19	0.8	24	310	8%
Totals											**154**	**2470**	**6.3%**
Ventilation Efficiency (Ev) =		0.84	Corrected Outdoor Air Fraction =		**7.4%**	Total Required Outside Air (CFM) =		**184**					

DJ Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
Davis / Jones 303.886.3860

COLORADO REGISTERED CHRISTOPHER P. MENGES 36005 4-19-18 PROFESSIONAL ENGINEER

Building Site:
1400 S. Potomac
Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
Emerald C.M. General Contractors
13275 East Fremont Place, Suite 300
Centennial, CO 80112

Architect:
Jeff Jones, AIA
Davis/Jones Architecture, Inc.
21076 E. Jefferson Circle
Aurora, CO 80013
303.886.3860

Mechanical Engineer:
Jeff Bellman
Christopher Menges Engineering, Inc.
1100 W Littleton Blvd #400
Littleton, CO
720.283.3018

Electrical Engineer:
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Kazin & Associates, Inc.
9364 Teddy Lane, Suite 101
Lone Tree, CO 80124
720.489.1609

Structural Engineer:
Craig Carroll
Monroe & Newell Engineers, Inc
1400 Glenarm Pl, #101
Denver, CO 80202

No.	Description	Date
	Pricing	3-30-18
	Permit	4-19-18

Invision Sally Jobe

MRI Replacement

Mechanical Schedules and Specifications

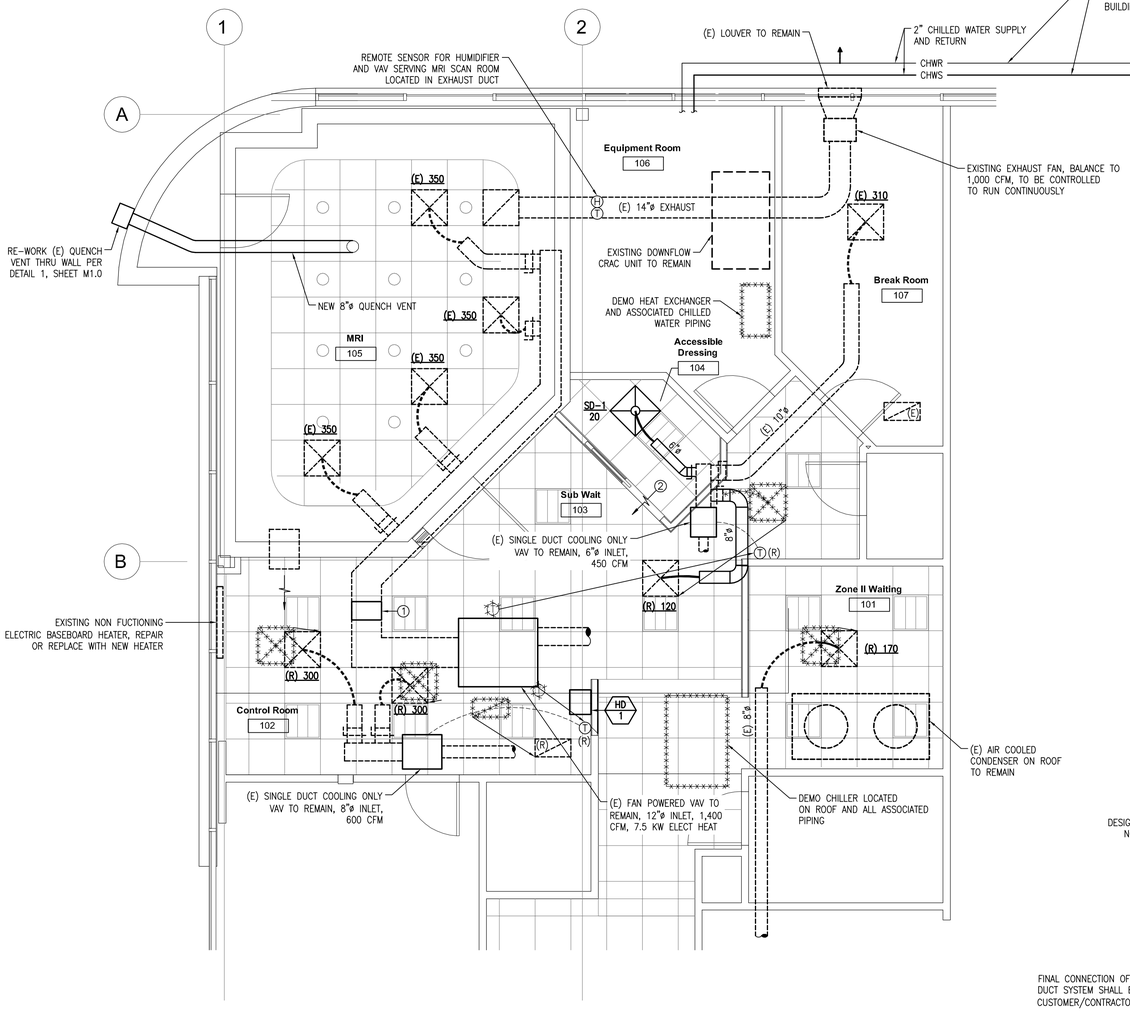
Project number	180208
Date	4-19-18
Drawn by	JWB
Checked by	CPM

M1.0

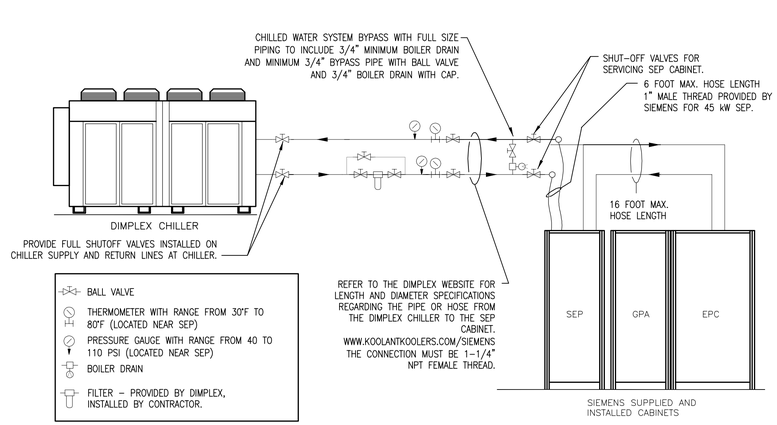
RSN: 1281167
Permit #: 18-1445333-LT

MECHANICAL KEYED NOTES

1. HUMIDIFIER DUCT DISTRIBUTOR, PROVIDE 1" COPPER STEAM PIPING AND 1/4" COPPER CONDENSATE PIPING BETWEEN HUMIDIFIER AND DISTRUBUTOR. INSULATE ALL PIPING AND SLOPE STEAM AND CONDENSATE PIPING PER MFR INSTRUCTIONS.
2. UNDERCUT DOOR 5/8" FOR AIR TRANSFER



1 Mechanical Plan
1/4" = 1'-0"



NOTES:

ALL PIPING AND PLUMBING FIXTURES SHALL BE FURNISHED, INSTALLED, PRESSURE TESTED AND CHARGED BY THE MECHANICAL CONTRACTOR PRIOR TO THE DELIVERY AND INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED EQUIPMENT UNLESS SPECIFIED OTHERWISE.

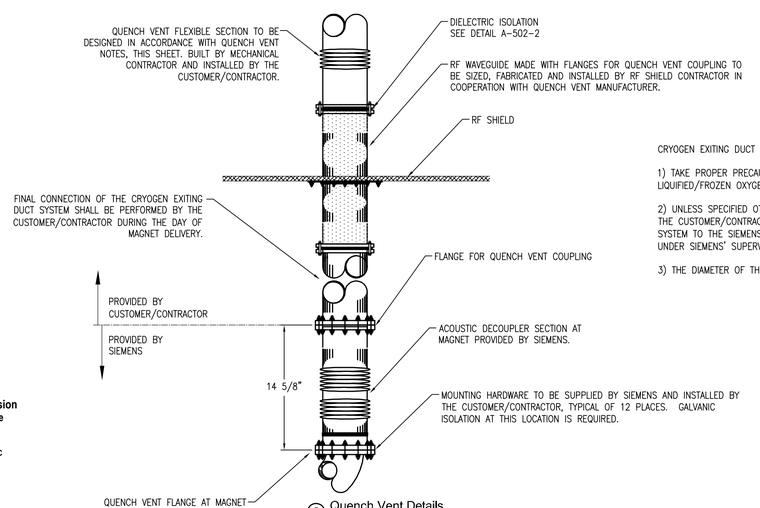
AT THE HIGHEST POINT OF THE WATER SUPPLY PIPE FROM THE CHILLER AN AUTOMATIC DEAERATION DEVICE (AIR VENT) WITH BALL VALVE MUST BE INSTALLED BY THE MECHANICAL CONTRACTOR.

SYSTEM MUST BE PROVEN TO BE FREE FROM LEAKAGE.

THE SUPPLY AND RETURN PIPES FROM THE CHILLED WATER SUPPLY TO THE SEP MUST BE LABELED TO SHOW FLOW DIRECTION AND CONTENT (WATER/GLYCOL).

SEE SIEMENS DRAWINGS M-101 & M-501 FOR ADDITIONAL REQUIREMENTS

2 Chiller Piping Details
not to scale



3 Quench Vent Details
not to scale

CRYOGEN EXITING DUCT SYSTEM NOTES:

1) TAKE PROPER PRECAUTIONS WHEN FIELD WELDING IN THE VICINITY OF LIQUIFIED/FROZEN OXYGEN.

2) UNLESS SPECIFIED OTHERWISE ALL MATERIAL AND WORK SHALL BE PERFORMED BY THE CUSTOMER/CONTRACTOR WITH FINAL CONNECTION OF THE CRYOGEN EXITING DUCT SYSTEM TO THE SIEMENS MAGNET TO BE PERFORMED BY THE CUSTOMER/CONTRACTOR UNDER SIEMENS' SUPERVISION.

3) THE DIAMETER OF THE CRYOGEN EXITING DUCT MAY VARY WITH ACTUAL ROUTING.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: jlocke
Date: May 01, 2018
2015 INTERNATIONAL CODES & 2017 NEC

DJ Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
Davis / Jones 303.886.3860

COLORADO REGISTERED CHRISTOPHER P. MENGES 36005 4-19-18 PROFESSIONAL ENGINEER

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M2.0

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PLUMBING SPECIFICATIONS

PART 1 – GENERAL

1.1 SUMMARY: PROVIDE PLUMBING WHERE SHOWN ON THE DRAWINGS, AS SPECIFIED HEREIN, AND AS NEEDED FOR A COMPLETE AND PROPER INSTALLATION INCLUDING, BUT NOT NECESSARILY LIMITED TO:

DOMESTIC HOT AND COLD WATER PIPING SYSTEMS
DRAIN, WASTE, AND VENT SYSTEMS
PLUMBING FIXTURES AND TRIM AS SHOWN ON THE DRAWINGS

DOCUMENTS AFFECTING WORK OF THIS SECTION INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, AND SECTIONS IN DIVISION 1 OF THE ARCHITECTURAL SPECIFICATIONS.

1.2 SUBMITTALS: COMPLY WITH PERTINENT PROVISIONS OF DIVISION 1 AND THE ARCHITECTURAL SCOPE.
PRODUCT DATA: WITHIN 30 CALENDAR DAYS AFTER THE CONTRACTOR HAS RECEIVED THE OWNER'S NOTICE TO PROCEED, SUBMIT:

MATERIALS LIST OF ITEMS PROPOSED TO BE PROVIDED UNDER THIS SECTION:

MANUFACTURER'S SPECIFICATIONS, CATALOG CUTS, AND OTHER DATA NEEDED TO PROVE COMPLIANCE WITH THE SPECIFIED REQUIREMENTS.

SHOP DRAWINGS AND OTHER DATA AS REQUIRED TO INDICATE METHOD OF INSTALLING AND ATTACHING EQUIPMENT, EXCEPT WHERE SUCH DETAILS ARE FULLY SHOWN ON THE DRAWINGS.

UPON COMPLETION OF THE WORK OF THIS SECTION, DELIVER TO THE ARCHITECT FIVE (5) COPIES OF ALL SHOP DRAWINGS (EQUIPMENT AND FIXTURE SUBMITTALS), OPERATION AND MAINTENANCE MANUALS AND AS-BUILT (RECORD) DRAWINGS. ALL MANUALS SHALL INCLUDE A MAINTENANCE SCHEDULE FOR ALL REQUIRED EQUIPMENT (I.E. PUMPS, WATER FILTERS). ALL MANUALS SHALL BE COMPILED IN ACCORDANCE WITH THE PROVISIONS OF DIVISION 1 OF THESE SPECIFICATIONS.

1.3 QUALITY ASSURANCE: USE ADEQUATE NUMBERS OF SKILLED WORKERS WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK OF THIS SECTION.

CODES AND REGULATIONS: IN ADDITION TO COMPLYING WITH THE SPECIFIED REQUIREMENTS, COMPLY WITH THE PERTINENT REGULATIONS OF GOVERNMENTAL AGENCIES HAVING JURISDICTION; INCLUDING THE 2015 INTERNATIONAL BUILDING, PLUMBING, FUEL GAS, AND ENERGY CONSERVATION CODES; AND THE CITY OF AURORA, CO AMENDMENTS. IN THE EVENT OF CONFLICT BETWEEN OR AMONG SPECIFIED REQUIREMENTS AND PERTINENT REGULATIONS, THE MORE STRINGENT REQUIREMENT WILL GOVERN.

1.4 DELIVERY, STORAGE, AND HANDLING: COMPLY WITH THE PERTINENT PROVISIONS OF DIVISION 1.

1.5 GENERAL REQUIREMENTS: WHERE REQUIRED BY CODE, ALL WORK MUST BE INSPECTED AND APPROVED BY LOCAL AUTHORITIES. PRIOR TO FINAL ACCEPTANCE, FURNISH THE ARCHITECT/OWNER WITH CERTIFICATES OF INSPECTION AND APPROVALS BY LOCAL AUTHORITIES. BEFORE ACCEPTANCE AND FINAL PAYMENT, DEMONSTRATE THAT ALL APPERATI ARE FUNCTIONING PROPERLY AND EFFICIENTLY. SYSTEM, MATERIAL, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER THE COMPLETION AND ACCEPTANCE. REPLACE ALL DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS WITHOUT ADDITIONAL CHARGES, INCLUDING REFRIGERANT THAT IS LOST DURING RELATED REPAIRS.

PART 2 – PRODUCTS

2.1 PIPE SCHEDULE:

DRAIN, WASTE, AND VENT SYSTEM:

ABOVE CEILINGS WITHIN RETURN AIR PLENUMS:
STANDARD DUTY HUBLESS CAST-IRON PIPE AND FITTINGS, ASTM A 888, WITH SHIELDED STAINLESS-STEEL COUPLINGS AND HUBLESS-COUPLING JOINTS.

BELOW FLOOR SLAB OR CONCEALED WITHIN PARTITIONS:
SCHEDULE 40 PVC PIPE, ASTM D 2665, SOLID-WALL DRAIN, WASTE AND VENT PIPING WITH PVC SOCKET FITTINGS COMPLYING WITH ASTM D 2665, SOCKET TYPE, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS. UNDERGROUND PIPING MAY BE JOINED PER IPC SECTION 705.14.1. ALL ABOVE GROUND PIPING SHALL BE JOINED WITH SOLVENT CEMENTED JOINTS PER IPC SECTION 705.14.2

COPPER DWV TUBE: ASTM B 306, DRAINAGE TUBE, DRAWN TEMPER WITH COPPER DRAINAGE FITTINGS COMPLYING WITH ASME B16.29 WROUGHT COPPER WITH SOLDER-JOINT FITTINGS.

WATER SYSTEMS (DOMESTIC PIPING):

PROVIDE TYPE "L" HARD DRAWN COPPER JOINED WITH ASTM B 32 LEAD FREE SOLDER. COPPER PRESSURE FITTINGS: ASME B16.18, CAST-COPPER-ALLOY OR ASME B16.22, WROUGHT- COPPER, SOLDER-JOINT FITTINGS.

INDIRECT DRAINS: PROVIDE TYPE "L" COPPER WITH WROUGHT COPPER FITTINGS JOINED WITH 95/5 TIN-ANTIMONY OR LEAD FREE SOLDER. WHEN SIZE ALLOWS PROVIDE DWV TYPE FITTINGS. PROVIDE LINES FULL SIZE OF ANY EQUIPMENT CONNECTIONS.

2.2 VALVES: GATE VALVES: EQUAL TO WATTS GV SERIES, BRONZE, 200-PSI WOG. GLOBE VALVES: EQUAL TO WATTS GLV SERIES, BRONZE, 200-PSI WOG. BALL VALVES: EQUAL TO WATTS B-600 SERIES, STANDARD PORT, BRONZE. 1/4" – 2" VALVES SHALL BE 600 PSI WOG. 2-1/2" – 4" SHALL BE 400 PSI WOG.

2.3 FLASHING: WHERE PIPES OF THIS SECTION PASS THROUGH THE ROOF, FLASH WITH SEMCO #1100-4 SEAMLESS 4 LB. FLASHING, WITH STEEL REINFORCED "VARI-PITCH" BOOT AND CAST IRON COUNTER FLASHING SLEEVE.

2.4 PIPE HANGERS:

WATER PIPING: PROVIDE FEE AND MASON #212 (OR EQUAL) SPLIT RING HANGERS WITH SUPPORTING RODS. PROVIDE SEMCO "TRISOLATORS".

SOIL AND WASTE PIPING: PROVIDE FEE AND MASON #212 (OR EQUAL) ADJUSTABLE RING HANGERS WITH SUPPORTING RODS. USE FEE AND MASON #212 RISER CLAMPS AS REQUIRED.

2.5 CLEANOUTS: ZURN Z-1400 "LEVEL-TROL" ADJUSTABLE FLOOR CLEANOUT, DURA-COATED CAST IRON BODY, WITH GAS AND WATERTIGHT ABS TAPERED THREAD PLUG, AND ROUND SCORIATED SECURED TOP ADJUSTABLE TO THE FINISHED FLOOR. FINISHED FLOORS: PROVIDE ZURN ZN-1400 WITH APPROPRIATE SUFFIX FOR FLOOR FINISH. FLOORS WITH WATERPROOFING MEMBRANE: PROVIDE "FLUSH-WITH-FLOOR" TYPE CLEANOUTS, WITH ADJUSTABLE WATERTIGHT COVERS AND INTEGRAL ANCHORING FLANGE WITH CLAMPING COLLAR. FINISHED WALLS: PROVIDE ZURN ZS-1469 WITH STAINLESS STEEL ACCESS PLATE AND SCREW.

2.6 TRAPS: FOR LAVATORIES AND SINKS, EXCEPT SERVICE SINKS, PROVIDE CAST BRASS TRAPS WITH BRASS NUTS EQUAL TO DEARBORN BRASS. FIXTURE TRAPS SHALL HAVE A LIQUID SEAL OF BETWEEN 2 AND 4 INCHES.

2.7 WATER HAMMER ARRESTORS: REFER TO SCHEDULE.

2.8 FIXTURES AND EQUIPMENT: PROVIDE PLUMBING FIXTURES, TRIM, AND EQUIPMENT AS INDICATED ON THE PLUMBING PLANS.

2.9 INSULATION: INSULATE HOT, COLD, AND RECIRCULATED HOT WATER PIPING PER IECC C403.2.10. THIS INCLUDES SERVICE TEMPERATURES UP TO 140°F. PIPE INSULATION SHALL BE FIBERGLASS, WITH PLENUM RATED JACKET, EQUAL TO JOHNS MANVILLE MICRO-LOK, WITH A MAXIMUM CONDUCTIVITY OF 0.27 BTU PER IN/HR * SF * degF. COLD WATER PIPING INSULATION SHALL HAVE VAPOR BARRIER. AT ALL HANGER AND SUPPORT LOCATIONS, PROVIDE 8-IN. LONG, 20 GAUGE GALVANIZED IRON INSULATION GUARDS. INSULATION AT THESE LOCATIONS SHALL BE RIGID. INSULATION THICKNESS SHALL BE 1 IN. FOR NOMINAL PIPE SIZES THROUGH 1-1/4 IN., AND 1-1/2 IN. THICK FOR NOMINAL PIPE SIZES 1-1/2 IN. THROUGH 4 IN.

PROTECT EXPOSED PIPING FOR ALL ADA ACCESSIBLE FIXTURES WITH INSULATION EQUAL TO TRU BRO.

2.10 SLEEVES: WHERE PIPES PASS THROUGH CONCRETE, MASONRY, OR STUD WALLS, OR PASS THROUGH CEILINGS, PROVIDE "SPERZEL" RUSTPROOF "CRETE-SLEEVE" OF THE SIZE REQUIRED. WHERE PIPES PASS THROUGH FIRE RATED PARTITIONS AS DESIGNATED ON THE ARCHITECTURAL PLANS, PROVIDE FIRE SEALS AROUND PIPES, WHICH ARE EITHER UL LISTED OR FM APPROVED.

2.11 OTHER MATERIALS: PROVIDE OTHER MATERIALS NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, AS SELECTED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE ARCHITECT.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS: EXAMINE THE AREAS AND CONDITIONS UNDER WHICH WORK OF THIS SECTION WILL BE PERFORMED. CORRECT CONDITIONS DETRIMENTAL TO TIMELY AND PROPER COMPLETION OF THE WORK. DO NOT PROCEED UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.

3.2 INSTALLATION OF PIPING AND EQUIPMENT:

PROCEED AS RAPIDLY AS THE BUILDING CONSTRUCTION WILL PERMIT. THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION. CAP PIPE OPENINGS TO EXCLUDE DIRT UNTIL FIXTURES ARE INSTALLED AND FINAL CONNECTIONS HAVE BEEN MADE. CUT PIPE ACCURATELY, AND WORK INTO PLACE WITHOUT SPRINGING OR FORCING, PROPERLY CLEARING WINDOWS, DOORS, AND OTHER OPENINGS. EXCESSIVE CUTTING OR OTHER WEAKENING OF THE BUILDING WILL NOT BE PERMITTED. SHOW NO TOOL MARKS OR THREADS ON EXPOSED PLATED, POLISHED, OR ENAMELED CONNECTIONS FROM FIXTURES. TAPE ALL FINISHED SURFACES TO PREVENT DAMAGE DURING CONSTRUCTION. MAKE CHANGES IN DIRECTION WITH FITTINGS; MAKE CHANGES IN MAIN SIZES WITH ECCENTRIC REDUCING FITTINGS. UNLESS OTHERWISE NOTED, INSTALL WATER SUPPLY AND RETURN PIPING WITH FLAT SIDE OF ECCENTRIC FITTINGS FACING UP. RUN HORIZONTAL SANITARY PIPING AT A UNIFORM GRADE OF 1/4" PER FOOT, UNLESS OTHERWISE NOTED. RUN HORIZONTAL WATER PIPING WITH AN ADEQUATE PITCH UPWARDS IN DIRECTION OF FLOW TO ALLOW COMPLETE DRAINAGE. PROVIDE SUFFICIENT SWING JOINTS, BALL JOINTS, EXPANSION LOOPS, AND DEVICES NECESSARY FOR A FLEXIBLE PIPING SYSTEM, EVEN IF NOT SPECIFICALLY SHOWN ON THE DRAWINGS. SECURELY BOLT ALL EQUIPMENT, ISOLATORS, HANGERS, AND SIMILAR ITEMS IN PLACE. SUPPORT EACH ITEM INDEPENDENTLY FROM THE STRUCTURE. DO NOT USE WIRE FOR HANGING OR STRAPPING PIPES. PROVIDE COMPLETE DIELECTRIC ISOLATION BETWEEN FERROUS AND NONFERROUS METALS. FOR INSULATED PIPE, PROVIDE SLEEVES OF ADEQUATE SIZE TO ACCOMMODATE THE FULL THICKNESS OF PIPE COVERING, WITH CLEARANCE FOR PACKING AND CAULKING. CAULK THE SPACE BETWEEN SLEEVE AND PIPE OR PIPE COVERING, USING A NON-COMBUSTIBLE, PERMANENTLY PLASTIC, WATERPROOF, NON-STAINING COMPOUND WHICH LEAVES A SMOOTH FINISHED APPEARANCE, OR PACK WITH NON-COMBUSTIBLE, NON-ASBESTOS COTTON, ROPE, OR FIBERGLASS TO WITHIN 1/2" OF BOTH WALL FACES, AND PROVIDE THE WATERPROOF COMPOUND DESCRIBED ABOVE.

3.2.1 PIPE SUPPORT: PIPING SHALL BE SUPPORTED WITH HANGERS, ANCHORS AND SUPPORTS DESIGNED TO CARRY THE LOAD OF THE PIPE FULL OF INTENDED FLUID, AND SHALL RESIST GALVANIC ACTION. SECURE UPPER ATTACHMENTS TO STRUCTURE. DO NOT SUPPORT FROM THE ROOF DECK. SUPPORT INTERVALS SHALL BE AS FOLLOWS:

DOMESTIC WATER PIPING (TYPE L COPPER, HORIZONTAL PIPING):

1/2-IN. THRU 1-1/2-IN. MAX. 6 FT.
2-IN. OR LARGER MAX. 10 FT.

VERTICAL TYPE L COPPER PIPING SUPPORT SPACING IS MAX. 10 FT.

CAST IRON VENT PIPING:

ALL SIZES (HORIZONTAL) MAX 5 FT, (NOTE: MAY BE INCREASED TO 10' WHERE 10' LENGTHS OF PIPE ARE INSTALLED)
ALL SIZES (VERTICAL) MAX 15 FT

3.3 FINISH AND ESCUTCHEONS: SMOOTH UP ROUGH EDGES AROUND SLEEVES WITH PLASTER OR SPACKLING COMPOUND. PROVIDE 1" WIDE CHROME OR NICKEL PLATED ESCUTCHEONS ON ALL PIPES EXPOSED TO VIEW WHERE PASSING THROUGH WALLS, FLOORS, PARTITIONS, CEILINGS, OR SIMILAR LOCATIONS. SIZE THE ESCUTCHEONS TO FIT PIPE AND COVERING. HOLD ESCUTCHEONS IN PLACE WITH SET SCREW.

3.4 CLEANOUTS: SECURE THE ARCHITECT'S APPROVAL OF LOCATIONS FOR CLEANOUTS IN FINISHED AREAS PRIOR TO INSTALLATION. PROVIDE CLEANOUTS OF SAME NOMINAL SIZE AS THE PIPES THEY SERVE; EXCEPT WHERE CLEANOUTS ARE REQUIRED IN PIPES LARGER THAN 4", PROVIDE 4" CLEANOUTS. MAKE CLEANOUTS ACCESSIBLE. AFTER PRESSURE TESTS ARE MADE AND APPROVED, THOROUGHLY GRAPHITE THE CLEANOUT THREADS.

3.5 VALVES: PROVIDE VALVES IN DOMESTIC WATER SUPPLY SYSTEMS. LOCATE AND ARRANGE SO AS TO GIVE COMPLETE REGULATION OF FIXTURES. PROVIDE VALVES IN AT LEAST THE FOLLOWING LOCATIONS: IN BRANCHES AND/OR HEADERS OF WATER PIPING SERVING A GROUP OF FIXTURES; FOR SHUTOFF OF BRANCH MAINS; FOR FLUSHING AND STERILIZING THE SYSTEM; WHERE SHOWN ON THE DRAWINGS. LOCATE VALVES FOR EASY ACCESSIBILITY AND MAINTENANCE

3.6 WATER HAMMER ARRESTORS: PROVIDE WATER HAMMER ARRESTORS ON HOT WATER LINES AND COLD WATER LINES. INSTALL IN UPRIGHT POSITION AT ALL QUICK CLOSING VALVES, SOLENOIDS, ISOLATED PLUMBING FIXTURES, AND SUPPLY HEADERS AT PLUMBING FIXTURE GROUPS. LOCATE AND SIZE IN ACCORDANCE WITH THE PLUMBING AND DRAINAGE INSTITUTE STANDARD WH-201. INSTALL WATER HAMMER ARRESTORS BEHIND ACCESS PANELS.

3.7 BACKFLOW PREVENTION: PROTECT PLUMBING FIXTURES AND FAUCETS AGAINST POSSIBLE BACK-SIPHONAGE. ARRANGE FOR TESTING OF BACKFLOW DEVICES AS REQUIRED BY THE GOVERNMENTAL AGENCY HAVING JURISDICTION.

3.8 PLUMBING FIXTURE INSTALLATION: SET FIXTURES LEVEL AND IN PROPER ALIGNMENT WITH RESPECT TO WALLS AND FLOORS AND WITH FIXTURES EQUALLY SPACED. PROVIDE SUPPLIES IN PROPER ALIGNMENT WITH FIXTURES AND WITH EACH OTHER. PROVIDE FLUSH VALVES IN ALIGNMENT WITH THE FIXTURE, WITHOUT VERTICAL OR HORIZONTAL OFFSETS. GROUT WALL AND FLOOR MOUNTED FIXTURES WATERTIGHT WHERE THE FIXTURES ARE IN CONTACT WITH WALLS AND FLOORS. FOR WATER CLOSETS, URINALS, AND LAVATORIES, MAINTAIN A MINIMUM OF 15 IN. FROM CENTERLINE OF FIXTURE TO ADJACENT WALL, AND A MINIMUM OF 30 IN. BETWEEN FIXTURE CENTERLINES.

3.9 PURGING OF POTABLE WATER SYSTEMS: FLUSH AND/OR DISINFECT POTABLE WATER SYSTEM PER ALL LOCAL AUTHORITIES PRIOR TO PLACING SYSTEM BACK IN SERVICE.

3.10 OTHER TESTING AND ADJUSTING: PROVIDE PERSONNEL AND EQUIPMENT, AND ARRANGE FOR AND PAY THE COSTS OF ALL REQUIRED TESTS AND INSPECTIONS REQUIRED BY GOVERNMENTAL AGENCIES HAVING JURISDICTION. WHERE TESTS SHOW MATERIALS OR WORKMANSHIP TO BE DEFICIENT, REPLACE OR REPAIR AS NECESSARY, AND REPEAT THE TESTS UNTIL THE SPECIFIED STANDARDS ARE ACHIEVED. ADJUST THE SYSTEM TO OPTIMUM STANDARDS OF OPERATION.

3.11 FIRE PENETRATIONS: WHERE PIPING PASSES THROUGH FIRE RATED FLOORS, WALLS, OR PARTITIONS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS U.L. LISTED (EQUAL TO DOW CORNING) AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THE SERVICE. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS IN ORDER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL, FLOOR, OR PARTITION. INSTALLATION SHALL BE A THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLED AS TESTED IN ACCORDANCE WITH ASTM E 814 AND UL 1479. THE FIRE RATING SHALL MATCH THE RATING OF THE BARRIER BEING PENETRATED.

3.12 EXISTING WASTE LINES DOCUMENTATION:

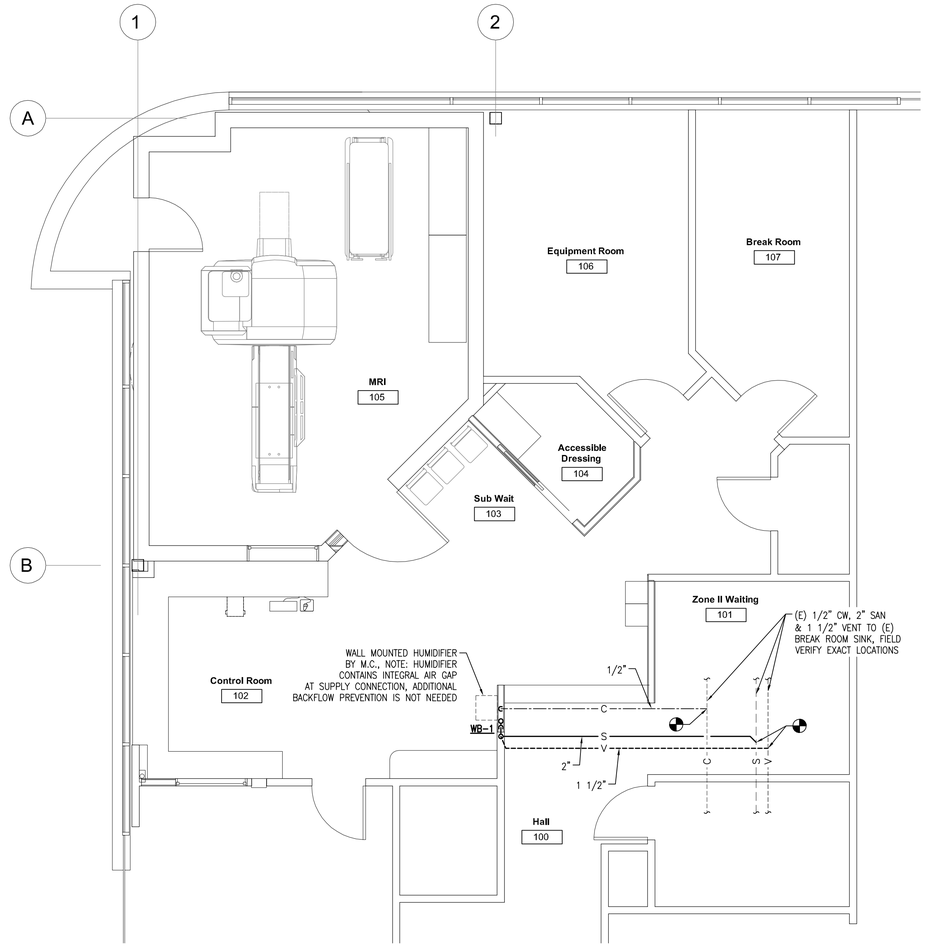
WITHIN THREE (3) DAYS OF PROJECT START, PLUMBING CONTRACTOR SHALL LOCATE NEAREST SANITARY WASTE TIE-IN AND DETERMINE IF THERE IS ADEQUATE DEPTH TO ALLOW FOR ¼-IN. PER FOOT SLOPE FROM THE FURTHEST FIXTURE. IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCOVERED ISSUES.

PLUMBING PIPING LEGEND

——◀——	REDUCING FITTING – PIPE REDUCES IN SIZE IN DIRECTION OF ARROW
——▷◁——	BALL VALVE WITH MANUAL LEVER ACTUATOR
——▷◁——	STOP VALVE
——WHA——	WATER HAMMER ARRESTOR
——— S ———	SANITARY DRAIN PIPING
- - - V - - -	SANITARY VENT PIPING
—·—·— C —·—·—	DOMESTIC COLD WATER PIPING
—·—·— H —·—·—	DOMESTIC HOT WATER PIPING
— — — S — — —	EXISTING SANITARY DRAIN PIPING
- - - V - - -	EXISTING SANITARY VENT PIPING
- - - C - - -	EXISTING DOMESTIC COLD WATER PIPING
- - - H - - -	EXISTING DOMESTIC HOT WATER PIPING
——CD——	CONDENSATE PIPING
—·—·—▷	PIPE TURNING DOWN
—·—·—○	PIPE TURNING UP
——○——	PIPE DROP
◔	POINT OF CONNECTION TO EXISTING
(D)	DEMOLISH
(E)	EXISTING TO REMAIN
(R)	RELOCATE
(N)	NEW

ABBREVIATIONS

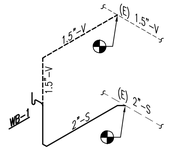
ASHRAE – AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS, INC.
BTU/H – BRITISH THERMAL UNITS PER HOUR
CW – DOMESTIC COLD WATER
DEG. F – DEGREES FAHRENHEIT
DWV – DRAINAGE, WASTE, AND VENT
GAL – U.S. GALLON
G.C. – GENERAL CONTRACTOR
GPH – GALLONS PER HOUR
HW – DOMESTIC HOT WATER
LBS – POUNDS
P.C. – PLUMBING SUBCONTRACTOR
PSI – POUNDS PER SQUARE INCH
RC – DOMESTIC RECIRCULATION HOT WATER
SAN – SANITARY WASTE
TW – TEMPERED HOT WATER
VTR – VENT THROUGH ROOF
W/ – WITH
WCO – WALL CLEANOUT
FCO – FLOOR CLEANOUT



1 Plumbing Plan
1/4" = 1'-0"

PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	MFG/MODEL	CW	HW	WASTE	I.W.	VENT	REMARKS
WB-1	WASHING MACHINE BOX	IPS T200	–	–	2"	–	1-1/2"	USE FOR HUMIDIFIER DRAIN ONLY, PROVIDE 1" AIR GAP



2 D.W.V. Isometric Diagram
not to scale

Failure to follow the approved plans may result in a 2-hour minimum fee to review the field changes for code compliance.

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: James Comer
Date: Apr 27, 2018
2015 INTERNATIONAL CODES & 2017 NEC

RSN: 1281167
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No.	Description	Date
	Pricing	3-30-18
	Permit	4-19-18

Invision Sally Jobe

MRI Replacement

Plumbing Plan and Specifications

Project number	180208
Date	4-19-18
Drawn by	JWB
Checked by	CPM

P1.0

LEGEND

NOTE: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT

DEVICES

- SINGLE RECEPT. - 125V, 15A/20A AS REQUIRED
- DUPLEX RECEPT - 125V, 15A/20A AS REQUIRED
- FOURPLEX RECEPT. - 125V, 15A/20A AS REQUIRED
- HALF-SWITCHED RECEPT. - 125V, 15A/20A AS REQ'D
- FACELESS GFCI OUTLET - READILY ACCESSIBLE
- SPECIAL PURPOSE RECEPT. - V AND A AS REQUIRED
- FLUSH FLOOR OUTLET (DEVICE AS INDICATED)
- CLOCK RECEPTACLE
- PW12 — PLUGMOLD - # INDICATES RECEPTACLE SPACING O.C.
- WM — WIREMOLD - AS SPECIFIED ON PLAN
- PP — POWER POLE
- PP — POWER/DATA POLE (DIVIDED)
- POWER OUTLET FURNITURE WHIP
- BELL, CHIME, OR BUZZER
- HOOD CONNECTION
- THERMOSTAT
- DAMPER MOTOR
- IBTD — INTERSYSTEM BONDING TERMINATION DEVICE

SWITCHES/CONTROLS

- S — SINGLE POLE SWITCH
- S_2 — TWO POLE SWITCH
- S_3 — 3-WAY SWITCH
- S_4 — 4-WAY SWITCH
- S_{DL} — DUAL-LEVEL SWITCHING (ALTERNATE LAMPS OR FIXTURES)
- S_P — SWITCH WITH PILOT LIGHT
- S_K — KEY OPERATED SWITCH
- S_D — DIMMER SWITCH - WATTAGE AS REQUIRED
- S_T — MECHANICAL TIME SWITCH
- S_{LV} — LOW VOLTAGE SWITCH
- S_V — VARIABLE SPEED MOTOR CONTROL SWITCH
- S_{CB} — CIRCUIT-BREAKER SWITCH - 20A1P
- OCCUPANCY SENSOR - CEILING MOUNTED
- OCCUPANCY SENSOR - WALL MOUNTED
- OCCUPANCY SENSOR - 2-POLE, WALL MOUNTED
- OCCUPANCY SENSOR - 3-WAY, WALL MOUNTED
- OCCUPANCY SENSOR - CORNER MOUNTED - WALL OR CEILING
- OCCUPANCY SENSOR - LIGHT FIXTURE MOUNTED/INTEGRAL
- PHOTOSENSOR - CEILING MOUNTED
- PHOTOSENSOR - LIGHT FIXTURE MOUNTED/INTEGRAL
- DLM — DIGITAL LOAD CONTROL MODULE WITH 1 RELAY
- DM2 — DIGITAL LOAD CONTROL MODULE WITH 2 RELAYS
- DM3 — DIGITAL LOAD CONTROL MODULE WITH 3 RELAYS
- DMD1 — DIGITAL LOAD CONTROL MODULE WITH 1 RELAY & DIMMING
- DMD2 — DIGITAL LOAD CONTROL MODULE WITH 2 RELAYS & DIMMING
- DIGITAL SWITCH
- DIGITAL SWITCH - # = NUMBER OF BUTTONS
- DIGITAL SWITCH WITH RAISE/LOWER BUTTON
- LCD TOUCHSCREEN - X = SCREEN SIZE
- S_{TO} — THERMAL OVERLOAD SWITCH
- PUSH BUTTON
- EMERGENCY POWER-OFF SHUNT-TRIP
- TIME SWITCH - TORK (DIGITAL)
- PC — PHOTOCELL

POWER DISTRIBUTION

- SWITCHBOARD OR EQUIPMENT ENCLOSURE
- ELECTRICAL PANEL
- SWITCH WITH FUSE
- SWITCH
- PULLOUT FUSED DISCONNECT
- CIRCUIT BREAKER
- M2 — CONTACT - NO - # INDICATES ASSOC. COIL
- M2 — CONTACT - NC - # INDICATES ASSOC. COIL
- M2 — COIL - # INDICATES ASSOCIATED CONTACT
- OVERLOAD RELAY
- KK1 2 — KIRK KEY INTERLOCK - # INDICATES RELATED KEYS
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSER
- SPD — SURGE PROTECTIVE DEVICE
- AC POWER SOURCE
- DC POWER SOURCE
- NF — NON-FUSED DISCONNECT SWITCH
- FUSED DISCONNECT SWITCH
- MAGNETIC STARTER OR CONTACTOR
- COMBINATION STARTER
- ELECTRIC METER - UTILITY METER U.O.N.
- CR — CURRENT TRANSFORMER
- MOTOR
- TRANSFER SWITCH
- GENERATOR
- J/B — JUNCTION BOX
- CIRCUIT RUN CONCEALED IN WALL OR CEILING
- CIRCUIT RUN IN OR UNDER FLOOR OR IN EARTH
- CIRCUIT RUN SURFACE MOUNTED
- CONDUIT UP, CONDUIT DOWN
- CONDUIT STUB - CAP IF UNDERGROUND
- FLEXIBLE CONNECTION TO EQUIPMENT
- HOMERUN - ARROWS INDICATE # OF PHASE COND.
- GROUNDING ELECTRODE
- PAD MOUNTED TRANSFORMER
- TR — TRANSFORMER
- OVERHEAD SERVICE ENTRANCE

PHONE/DATA

- DATA OUTLET
- TELEPHONE OUTLET
- COMBINATION TELEPHONE/DATA OUTLET
- FLUSH FLOOR OUTLET (DEVICE AS INDICATED)
- COMMUNICATIONS OUTLET FURNITURE WHIP
- TELEPHONE TERMINAL BOARD
- TELEPHONE TERMINAL CABINET

SECURITY

- C — CAMERA
- MTV — MONITOR OUTLET
- SCP — SECURITY CONTROL PANEL
- CR — CARD READER
- MD — MOTION DETECTOR
- MI — MASTER INTERCOM
- I — INTERCOM
- K — KEYPAD
- DC — DOOR CONTACT
- WC — WINDOW CONTACT
- B — DOORBELL
- B — DOOR BUZZER/CHIME
- E — ELECTRIC STRIKE RELEASE BUTTON
- ES — ELECTRIC STRIKE

LIGHTING

- RECESSED FLUORESCENT
- SURFACE FLUORESCENT
- FLUORESCENT STRIP LIGHT
- LIGHT - TYPE INDICATED ON SCHEDULE
- LIGHT - TYPE INDICATED ON SCHEDULE
- TRACK LIGHT
- SURFACE MOUNTED FIXTURE
- RECESSED FIXTURE
- WR — RECESSED WALL WASHER
- PENDANT MOUNTED FIXTURE
- WH — WALL MOUNTED FIXTURE
- KEYLESS PORCELAIN LAMP HOLDER - 150W
- BATTERY PACK EMERGENCY LIGHT
- REMOTE EMERGENCY LIGHT
- EXTERIOR EMERGENCY EGRESS LIGHT
- BATTERY PACK FOR REMOTE EMERGENCY LIGHT
- BATTERY PACK EXIT LIGHT
- BATTERY PACK EXIT/EM COMBINATION LIGHT
- NL — INDICATES NON-SWITCHED NIGHT LIGHT
- EM — INDICATES INTEGRAL EMERGENCY POWER BATTERY

UPPERCASE LETTER ADJACENT TO FIXT. INDICATES FIXTURE TYPE

LOWERCASE LETTER ADJACENT TO FIXT. INDICATES CONTROL

FIRE ALARM & DETECTION

- SD — SMOKE DETECTOR
- HD — HEAT DETECTOR (F-FIXED TEMP, R-RATE-OF-RISE)
- SS — SINGLE STATION SMOKE DETECTOR WITH SOUNDER
- XXXsb — SINGLE STATION SMOKE DET. WITH HORN & STROBE
- BT — BEAM DETECTOR TRANSMITTER
- BR — BEAM DETECTOR RECEIVER
- DD — DUCT DETECTOR
- MOTOR OPERATED FIRE/SMOKE DAMPER
- FS — FLOW SWITCH
- TS — TAMPER SWITCH
- PS — PRESSURE SWITCH
- RM — RELAY MODULE
- MM — MONITOR MODULE
- CM — CONTROL MODULE
- CR — CONTROL RELAY
- CO — CARBON MONOXIDE DETECTOR
- MD — MH — MAGNETIC DOOR HOLDER
- MANUAL PULLSTATION
- SPEAKER AND STROBE
- SPEAKER
- HORN AND STROBE
- HORN
- STROBE
- MH — MINI-HORN AND STROBE
- MINI-HORN
- REMOTE INDICATING LIGHT
- FACP — FIRE ALARM CONTROL PANEL
- FAA — FIRE ALARM ANNUNCIATOR PANEL
- ERSP — ELEVATOR RECALL SUPERVISORY PANEL
- BPS — BOOSTER POWER SUPPLY
- EOL — END-OF-LINE RESISTOR
- RTS — REMOTE TEST SWITCH
- OCPA — OPEN/CLOSE/AUTOMATIC SWITCH

ABBREVIATIONS

AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI/AFCI	ARC-FAULT CIRCUIT INTERRUPTER
AIC	AMPERE INTERRUPTING CAPACITY (MINIMUM RATING)
ATS	AUTOMATIC TRANSFER SWITCH
CD	CORD DROP
CLG	CEILING MOUNTED
DT	DUST TIGHT
E OR (E)	EXISTING
FLR	FLOOR MOUNTED
G OR GND	GROUND
GFI/GFCI	PERSONNEL GROUND-FAULT PROTECTION (.5ma)
GF/GFPE	EQUIPMENT GROUND-FAULT PROTECTION
IG	ISOLATED GROUND
ISC	AVAILABLE FAULT CURRENT (RMS SYMMETRICAL)
ILT	LET-THROUGH FAULT CURRENT (RMS SYMMETRICAL)
N OR (N)	NEW
NO/NC	NORMALLY OPEN/NORMALLY CLOSED
O.C.	ON CENTER
R OR (R)	RELOCATE
SCCR	SHORT CIRCUIT CURRENT RATING
ST	SHUNT-TRIP
TL	TWIST-LOCK
TR	TAMPER RESISTANT
UC	UNDER COUNTER
UON	UNLESS OTHERWISE NOTED
WP	WEATHER PROOF
XP	EXPLOSION PROOF

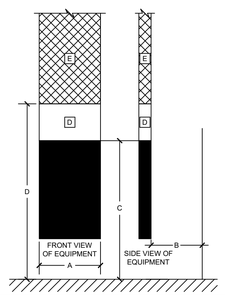
AUDIO/VISUAL

- SPEAKER - CEILING MOUNTED (FLUSH)
- SPEAKER - WALL MOUNTED
- AUDIO/VISUAL EQUIPMENT RACK - FLOOR MOUNTED
- AUDIO/VISUAL EQUIPMENT RACK - WALL MOUNTED
- VC — VOLUME CONTROL
- MICROPHONE OUTLET - FLOOR MOUNTED
- MICROPHONE OUTLET - WALL MOUNTED
- CABLE/TV OUTLET

DESIGNATIONS

- MECHANICAL/PLUMBING EQUIPMENT
- REVISION TAG
- DETAIL NOTE
- DETAIL NOTE
- XXX — KITCHEN EQUIPMENT

CLEAR SPACE/WORKING SPACE ABOUT ELECTRICAL EQUIPMENT



A	PROVIDE CLEAR SPACE EQUAL TO THE WIDTH OF EQUIPMENT OR 30", WHICHEVER IS GREATER.
B	PROVIDE THE FOLLOWING CLEAR SPACE IN FRONT OF EQUIPMENT: 3' FOR 0-150 L-G VOLTAGE AND 4' FOR 151-600 L-G VOLTAGE.
C	PROVIDE CLEAR SPACE, FOR THE WIDTH OF THE EQUIPMENT, FROM GRADE, FLOOR OR PLATFORM TO A HEIGHT OF 6-1/2' OR THE HEIGHT OF THE EQUIPMENT, WHICHEVER IS GREATER.
D	THE SPACE EQUAL TO THE WIDTH AND DEPTH OF THE EQUIPMENT AND EXTENDING FROM THE FLOOR TO A HEIGHT OF 6' ABOVE THE EQUIPMENT OR TO THE STRUCTURAL CEILING, WHICHEVER IS LOWER, SHALL BE DEDICATED TO THE ELECTRICAL INSTALLATION - NO PIPING, DUCTS, LEAK PROTECTION APPARATUS, OR OTHER EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION SHALL BE LOCATED IN THIS ZONE. SUSPENDED CEILINGS WITH REMOVABLE PANELS SHALL BE PERMITTED WITHIN THE 6' ZONE. SPRINKLER PROTECTION SHALL BE PERMITTED FOR THE DEDICATED SPACE WHERE THE PIPING COMPLIES WITH THIS SECTION. A DROPPED, SUSPENDED, OR SIMILAR CEILING THAT DOES NOT ADD STRENGTH TO THE BUILDING STRUCTURE SHALL NOT BE CONSIDERED A STRUCTURAL CEILING.
E	THE AREA ABOVE THE DEDICATED SPACE SHALL BE PERMITTED TO CONTAIN FOREIGN SYSTEMS, PROVIDED PROTECTION IS INSTALLED TO AVOID DAMAGE TO THE ELECTRICAL EQUIPMENT FROM CONDENSATION, LEAKS, OR BREAKS IN SUCH FOREIGN SYSTEMS.

THE FINAL LOCATION OF EQUIPMENT SHALL BE COORDINATED IN THE FIELD, PRIOR TO ROUGH-IN, TO MEET APPLICABLE LOCATION, HEIGHT AND CLEARANCE REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL STOP WORK IMMEDIATELY, AND ADVISE OTHERS TO STOP WORK IF THERE IS A CONFLICT WITH THE ELECTRICAL CLEARANCE AND WORK SPACE REQUIREMENTS PER THE ABOVE INFORMATION AND THE NEC.

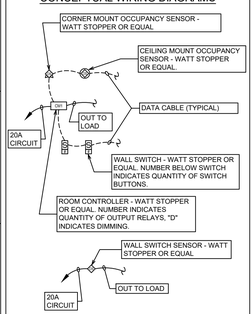
BRANCH-CIRCUIT WIRING SCHEDULE (UNLESS OTHERWISE NOTED)

OVERCURRENT PROTECTION DEVICE RATING/ SETTING	PHASE CONDUCTOR SIZE (CU)	NEUTRAL CONDUCTOR SIZE (CU) (IF REQUIRED)	EQUIPMENT GROUNDING CONDUCTOR SIZE (CU)	CONDUIT SIZE
15 A	#12 AWG	#12 AWG	#12 AWG	1/2"
20 A	#12 AWG	#12 AWG	#12 AWG	1/2"
25 A	#10 AWG	#10 AWG	#10 AWG	1/2"
30 A	#10 AWG	#10 AWG	#10 AWG	1/2"
35 A	#8 AWG	#8 AWG	#10 AWG	3/4"
40 A	#8 AWG	#8 AWG	#10 AWG	3/4"
45 A	#6 AWG	#6 AWG	#10 AWG	1"
50 A	#6 AWG	#6 AWG	#10 AWG	1"
60 A	#4 AWG	#4 AWG	#10 AWG	1 1/4"
70 A	#4 AWG	#4 AWG	#8 AWG	1 1/4"
80 A	#3 AWG	#3 AWG	#8 AWG	1 1/4"
90 A	#2 AWG	#2 AWG	#8 AWG	1 1/2"
100 A	#1 AWG	#1 AWG	#8 AWG	1 1/2"

NOTES:

1.	FOR MOTOR LOADS, USE MCA (MINIMUM CIRCUIT AMPACITY) TO SIZE PHASE AND NEUTRAL CONDUCTORS AND USE MOCP (MAXIMUM OVER-CURRENT PROTECTIVE DEVICE) TO SIZE EQUIPMENT GROUNDING CONDUCTOR.
2.	INCREASE PHASE, NEUTRAL, AND EQUIPMENT GROUNDING CONDUCTOR SIZES BY 1 STANDARD CONDUCTOR SIZE PER EACH 75' OF CONDUCTOR LENGTH. INCREASE CONDUIT SIZE ACCORDINGLY.

OCCUPANCY SENSOR CONCEPTUAL WIRING DIAGRAMS



ELECTRICAL SPECIFICATIONS

GENERAL REQUIREMENTS

DRAWINGS ARE DIAGRAMMATIC AND DO NOT INDICATE ALL FITTINGS, JUNCTION BOXES, ETC. REQUIRED. PROVIDE ALL REQUIRED EQUIPMENT, CONDUIT, FITTINGS, WIRING, BOXES, ETC. FOR A COMPLETE AND OPERATIONAL INSTALLATION.

WORK AND EQUIPMENT SHALL COMPLY WITH STATE AND LOCALLY ADOPTED CODES AND STANDARDS, INCLUDING THE 2017 NATIONAL ELECTRICAL CODE (NEC), INTERNATIONAL CODES (I-CODES), AND LOCAL AMENDMENTS.

ANYTHING DRAWN OR SPECIFIED SHALL NOT BE CONSTRUED TO CONFLICT WITH STATE AND LOCALLY ADOPTED CODES AND STANDARDS, INCLUDING THE NATIONAL ELECTRICAL CODE, WHICH GOVERNS THE INSTALLATION OF ANY ELECTRICAL WORK. ITEMS SHALL NOT BE INSTALLED IN CONFLICT WITH THE NEC. RESOLVE ANY AND ALL CONFLICTS PRIOR TO INSTALLATION.

BECOME THOROUGHLY ACQUAINTED WITH THE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED. EXAMINE ALL SERVICES, EQUIPMENT, AND EXISTING CONDITIONS, WHICH THIS WORK IS IN ANY WAY DEPENDENT UPON, AND BRING ANY DISCREPANCIES OR OMISSIONS FOUND IN THE DRAWINGS TO THE ELECTRICAL ENGINEER'S ATTENTION PRIOR TO SUBMITTING BID.

THE LOCATION OF OUTLETS AND EQUIPMENT SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE ARCHITECT AND ENGINEER SHALL HAVE THE RIGHT TO ADJUST THE LOCATION OF OUTLETS OR FIXTURES, WITHIN 10' OF THE SPECIFIED LOCATION, BEFORE THEY ARE INSTALLED AND WITHOUT ADDITIONAL COST.

PROVIDE DRAWINGS TO LOCAL BUILDING AUTHORITY AND OBTAIN A PERMIT PRIOR TO STARTING ANY WORK.

NOTIFY ELECTRICAL ENGINEER OF ANY CHANGES REQUESTED BY THE LOCAL BUILDING AUTHORITY IMMEDIATELY AND PRIOR TO STARTING WORK.

VERIFY AND COMPLY WITH UTILITY COMPANY REQUIREMENTS. PROVIDE METERING, CONNECTION CABINETS, CT CABINETS, AND TRANSFORMER AND CONNECTION CABINET PADS PER LOCAL UTILITY COMPANY REQUIREMENTS.

PROVIDE A REDLINED AS-BUILT SET OF ELECTRICAL DRAWINGS TO OWNER UPON COMPLETION OF WORK.

ELECTRICAL WORK SHOWN LIGHT OR MARKED "E" IS EXISTING, SHOWN DARK IS NEW, AND SHOWN DASHED IS EXISTING TO BE REMOVED OR RELOCATED UNLESS OTHERWISE INDICATED. DASHING MAY ALSO INDICATE UNDER FLOOR OR UNDER GROUND CONDUIT. IF UNCLEAR, CONTACT ELECTRICAL ENGINEER FOR CLARIFICATION.

EQUIPMENT, WIRING, AND DEVICES SHOWN ARE NEW UNLESS OTHERWISE NOTED.

MAINTAIN CIRCUITING TO EXISTING EQUIPMENT AND DEVICES TO REMAIN.

REFERENCE ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

INSTALL EQUIPMENT AND DEVICES PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. NOTIFY ELECTRICAL ENGINEER, PRIOR TO INSTALLING EQUIPMENT AND DEVICES, IF MANUFACTURER'S INSTALLATION INSTRUCTIONS CONFLICT WITH ELECTRICAL INFORMATION ON THE THESE DRAWINGS.

ELECTRICALLY OPERATED EQUIPMENT SHOWN ON PLANS (ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, CIVIL EQUIPMENT SUPPLIER, SHOP DRAWINGS) AND NOT CIRCUITED ON THE ELECTRICAL PLANS, WILL REQUIRE ELECTRICAL SERVICE. CONTACT ELECTRICAL ENGINEER FOR CONNECTION REQUIREMENTS AND CLARIFICATION PRIOR TO BID. THE COST FOR THIS WORK SHALL BE INCLUDED IN THE BID.

PROVIDE HANGERS AND SUPPORTS TO ADEQUATELY AND SECURELY SUPPORT ELECTRICAL SYSTEM COMPONENTS IN A NEAT AND WORKMANLIKE MANNER.

MAINTAIN THE FIRE RATING OF THE ASSEMBLY (CEILING, WALL, OR FLOOR) IN WHICH EQUIPMENT, WIRING, AND DEVICES ARE TO BE INSTALLED.

EQUIPMENT SHALL BE FULLY RATED FOR THE AMBIENT CONDITIONS (ELEVATION, TEMPERATURE, WIND LOAD, SOIL CONDITIONS, ETC) AT THE PROJECT LOCATION.

KEEP PRODUCTS IN ORIGINAL MANUFACTURER'S PACKAGING AND PROTECT FROM DAMAGE UNTIL READY FOR INSTALLATION.

PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED.

UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED CONDUIT, BOXES, WIRING, CONNECTORS, HARDWARE, SUPPORTS, TRIMS, ACCESSORIES, ETC. AS NECESSARY FOR COMPLETE AND OPERATIONAL SYSTEMS.

SUBMITTALS AND SUBSTITUTIONS

PROVIDE PRODUCT DATA SHEETS AND SHOP DRAWINGS FOR EQUIPMENT, FIXTURES, AND DEVICES TO ELECTRICAL ENGINEER PRIOR TO PURCHASING. REVIEW, STAMP AND INITIAL ALL ELECTRICAL SUBMITTALS AND SHOP DRAWINGS CERTIFYING THAT THE SUBMITTALS HAVE BEEN REVIEWED PRIOR TO SUBMITTING TO ELECTRICAL ENGINEER FOR REVIEW.

EQUIPMENT AND FIXTURES SPECIFIED REPRESENT REQUIRED QUALITY AND PERFORMANCE.

PROVIDE PRODUCT DATA SHEETS AND SHOP DRAWING OF PROPOSED SUBSTITUTIONS TO SPECIFIED EQUIPMENT TO ELECTRICAL ENGINEER FOR REVIEW. ELECTRICAL ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF SUBSTITUTIONS TO SPECIFIED EQUIPMENT. REVIEW, STAMP AND INITIALED ALL ELECTRICAL SUBMITTALS AND SHOP DRAWINGS CERTIFYING THAT SUBMITTALS HAVE BEEN REVIEWED PRIOR TO SUBMITTING TO ELECTRICAL ENGINEER FOR REVIEW.

SUBMITTALS AND SHOP DRAWINGS ARE TO INCLUDE THE FOLLOWING: KEY TO PLAN DESIGNATIONS, MANUFACTURER, MODEL NUMBER, DATA SHEETS, QUANTITIES, COLORS, LABELS, DIMENSIONS, INSTALLATION INSTRUCTIONS, AND ANY ADDITIONAL INFORMATION REQUIRED TO DETERMINE IF THE PRODUCT MEETS THE DESIGN INTENT.

CONSTRUCTION PHASE REVIEW REQUIREMENTS

INSTALL POWER, LIGHTING, COMMUNICATIONS AND SPECIAL SYSTEM (FIRE ALARM, SECURITY, BUILDING AUTOMATION, ETC) BOXES PRIOR TO RUNNING CABLE OR CONDUIT TO BOXES. ARRANGE FOR OWNER, ARCHITECT, AND ENGINEER TO REVIEW BOX LOCATIONS PRIOR TO RUNNING CABLE OR CONDUIT TO BOXES. ADJUST BOXES AS DIRECTED BY OWNER, ARCHITECT, AND ENGINEER.

REQUESTS FOR MODIFICATIONS TO THE CONTRACT (CHANGE ORDERS)

REQUESTS BY CONTRACTOR FOR ADDITION OR REDUCTION TO THE CONTRACT AMOUNT SHALL BE ACCOMPANIED BY THE FOLLOWING FOR EVALUATION BY THE OWNER AND ENGINEER:

1. ORIGIN AND DATE OF CLAIM
2. QUANTITIES OF PRODUCTS, LABOR, AND EQUIPMENT
3. DOLLAR AMOUNT OF TAXES, OVERHEAD, AND PROFIT
4. JUSTIFICATION FOR ANY CHANGE IN CONTRACT TIME
5. CREDIT AMOUNT FOR DELETIONS (WITH DOCUMENTATION)
6. DATES AND TIMES OF WORK PERFORMED, AND BY WHOM
7. TIME RECORDS AND WAGE RATES PAID.
8. INVOICES AND RECEIPTS FOR PRODUCTS AND EQUIPMENT

SUBMIT ALL DOCUMENTATION TO ENGINEER AND OWNER, AND OBTAIN WRITTEN APPROVAL PRIOR TO STARTING ANY WORK THAT AFFECTS THE CONTRACT AMOUNT OR COMPLETION DATE.

EXISTING CONDITIONS

THESE DRAWINGS CONTAIN INFORMATION REGARDING EXISTING CONDITIONS. THIS INFORMATION WAS COMPILED FROM EXISTING DRAWINGS, CASUAL FIELD OBSERVATIONS OR INFORMATION PROVIDED BY OTHERS. IN SOME CASES, ASSUMPTIONS WERE MADE WHEN FIELD OBSERVATIONS OR EXISTING DRAWINGS DID NOT PROVIDE NECESSARY INFORMATION (I.E. LOCKED DISCONNECTS, NO WIRE SIZE INDICATED, NAMEPLATE DATA MISSING, INACCURATE AS-BUILT DRAWINGS, ETC.).

EXISTING CONDITIONS SHALL BE VERIFIED AND ALLOWED FOR PRIOR TO BID AND CONSTRUCTION. NOTIFY THE ELECTRICAL ENGINEER OF ANY DISCREPANCIES WITH THESE DRAWINGS IMMEDIATELY AND PRIOR TO COMMENCING ANY FURTHER WORK.

COORDINATION

THE ELECTRICAL DRAWINGS ARE ONLY ONE PART OF A COMPLETE SET OF CONSTRUCTION DOCUMENTS. EXAMINE THE ARCHITECTURAL, MECHANICAL, PLUMBING, AND CIVIL DRAWINGS PRIOR TO SUBMITTING BID AND STARTING WORK TO DETERMINE THE FULL EXTENT OF ELECTRICAL WORK REQUIRED.

COORDINATE WORK WITH OTHER TRADES PRIOR TO ROUGH-IN. COORDINATION SHALL INCLUDE REVIEWING THE ARCHITECTURAL, MECHANICAL, PLUMBING, ETC. DRAWINGS AND SHOP DRAWINGS PRIOR TO BID AND CONSTRUCTION.

OBTAIN AND REVIEW SHOP DRAWINGS, PRODUCT DATA, MANUFACTURER'S WIRING DIAGRAMS AND MANUFACTURER'S INSTRUCTIONS FOR EQUIPMENT PROVIDED BY OTHERS.

THE FINAL LOCATION OF EQUIPMENT SHALL BE COORDINATED IN THE FIELD, PRIOR TO ROUGH-IN, TO MEET APPLICABLE LOCATION, HEIGHT AND CLEARANCE REQUIREMENTS.

DEMOLITION

DISCONNECT WIRING TO EQUIPMENT, DEVICES, AND FIXTURES TO BE REMOVED. REMOVE EQUIPMENT, WIRING, DEVICES AND CONDUIT NOT BEING USED. DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS TO BE REMOVED.

FIELD VERIFY EXISTING CONDITIONS TO DETERMINE EXTENT OF DEMOLITION WORK. REFERENCE ARCHITECTURAL, MECHANICAL, AND ELECTRICAL PLANS FOR ADDITIONAL INFORMATION. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION AND EXISTING RECORD DOCUMENTS. DEMO PLANS ARE PROVIDED FOR REFERENCE ONLY.

MAINTAIN THE ELECTRICAL SERVICE TO EXISTING EQUIPMENT AND DEVICES TO REMAIN. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS.

PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION.

MAINTAINING EXISTING SERVICES

MAINTAIN THE ELECTRICAL SERVICE TO EXISTING TENANTS AND AREAS. ANY SERVICE DISCONTINUITY SHALL BE COORDINATED AND APPROVED BY OWNER AND TENANTS PRIOR TO OUTAGE. IF REQUIRED, PROVIDE TEMPORARY POWER DURING OUTAGE.

WIRING AND CONDUIT

NEW WIRING SHALL BE THHN/THWN-2, 90°C INSULATED COPPER UNLESS OTHERWISE NOTED. ALUMINUM CONDUCTORS SHALL BE XHHW-2, INSULATED COMPACT STRAND.

THE CONDUCTORS FOR 15A AND 20A BRANCH CIRCUITS SHALL BE #12 THHN/THWN-2, 90°C INSULATED COPPER.

BRANCH-CIRCUIT CONDUCTORS GREATER THAN 20A SHALL BE AS INDICATED ON PLANS OR REQUIRED PER CODE.

INCREASE CONDUCTOR SIZES AS REQUIRED TO LIMIT FEEDER VOLTAGE DROP TO 3%, BRANCH-CIRCUIT VOLTAGE DROP TO 3%, AND TOTAL VOLTAGE DROP (FEEDER + BRANCH-CIRCUIT) TO 5%.

THE MAXIMUM NUMBER OF CONDUCTORS IN A CONDUIT FOR A 3Ø SYSTEM SHALL BE THREE (AØ, BØ, CØ), NOT INCLUDING NEUTRAL AND EQUIPMENT GROUNDING CONDUCTORS, UNLESS OTHERWISE INDICATED. CONDUIT SIZE SHALL BE BASED UPON NEC CHAPTER 9 AND ANNEX C. MORE THAN 3 CURRENT-CARRYING CONDUCTORS MAY BE INSTALLED IN A RACEWAY IF THE APPROPRIATE AMPACITY-DERATING FACTORS ARE APPLIED.

PROVIDE A DEDICATED NEUTRAL FOR EACH LINE-TO-NEUTRAL CIRCUIT UNLESS A MULTI-POLE BREAKER, WHICH DISCONNECTS ALL PHASE CONDUCTORS THAT SHARE A NEUTRAL, IS PROVIDED (LISTED BREAKER-TIES ARE PERMITTED).

PROVIDE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH ALL FEEDERS AND BRANCH-CIRCUIT WIRING.

INCREASE CONDUIT SIZE AS REQUIRED TO ACCOMMODATE EQUIPMENT GROUNDING CONDUCTOR.

PROVIDE ALL CONDUIT, FITTINGS, SUPPORTS, AND ACCESSORIES REQUIRED FOR A COMPLETE RACEWAY SYSTEM.

CONDUIT SHALL BE CONCEALED IN WALLS, FLOOR OR CEILING IN FINISHED AREAS UNLESS OTHERWISE INDICATED.

IN FINISHED AREAS, WHERE CONDUIT AND CABLE CAN NOT BE CONCEALED IN WALLS OR CEILINGS (I.E. EXISTING MASONRY CONSTRUCTION), PROVIDE WIREMOLD OR EQUAL SURFACE MOUNTED RACEWAY AS APPROVED BY ARCHITECT OR ENGINEER.

UNLESS OTHERWISE INDICATED AND WHERE NOT OTHERWISE RESTRICTED, USE THE CONDUIT TYPES INDICATED BELOW FOR THE SPECIFIED APPLICATIONS. WHERE MORE THAN ONE LISTED APPLICATION APPLIES, COMPLY WITH THE MOST RESTRICTIVE REQUIREMENTS. WHERE CONDUIT TYPE FOR A PARTICULAR APPLICATION IS NOT SPECIFIED, USE GALVANIZED STEEL RIGID METAL CONDUIT. DO NOT USE CONDUIT AND ASSOCIATED FITTINGS FOR APPLICATIONS OTHER THAN AS PERMITTED BY NFPA 70 AND PRODUCT LISTING. REFERENCE THE NEC FOR ADDITIONAL APPLICATION REQUIREMENTS.

APPLICATION	TYPE OF CONDUIT
IN CONCRETE OR MASONRY	EMT, IMC, GRC, PVC
OUTDOORS (ABOVE GRADE)	EMT, IMC, GRC
BRANCH CIRCUITS (EXPOSED)	EMT, IMC, GRC
INTERIOR BRANCH CIRCUITS (CONCEALED BEHIND DRYWALL)	MC, EMT, IMC
INTERIOR BRANCH CIRCUITS (ABOVE DROPPED CEILINGS)	EMT, IMC
BRANCH CKTS (CONCEALED IN PATIENT CARE AREAS)	HCFAC, EMT, IMC, GRC
SUPPLY TO DISTRIBUTION PANELS	EMT, IMC, GRC, PVC
UNDERGROUND	PVC, IMC, GRC
OVERHEAD SERVICE MAST	GRC (2" MIN)

CONNECTIONS TO LUMINAIRES ABOVE ACCESSIBLE CEILINGS: USE FLEXIBLE METAL CONDUIT. MAXIMUM LENGTH TO BE 6' UNLESS OTHERWISE INDICATED.

WHERE MC CABLE IS PERMITTED TO BE USED, A 6' LENGTH IS PERMITTED TO BE EXPOSED ABOVE A DROPPED CEILING TO CONNECT THE ABOVE CEILING JUNCTION BOX TO THE DEVICES BEHIND DRYWALL.

FINAL CONNECTIONS TO VIBRATING EQUIPMENT (MOTORS, TRANSFORMERS, ETC) SHALL BE MADE WITH FLEXIBLE METAL CONDUIT IN DRY LOCATIONS AND LIQUIDTIGHT FLEXIBLE METAL CONDUIT IN DAMP, WET, OR CORROSIVE LOCATIONS. MAXIMUM LENGTH TO BE 6' UNLESS OTHERWISE INDICATED.

INSTALL RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS A MINIMUM OF 1" ABOVE ROOF SURFACE.

PROVIDE PVC COATED GRC FOR ELBOWS IN PVC CONDUIT RUNS.

ALL CONDUITS AND CABLES PASSING THROUGH RATED WALLS, FLOORS OR CEILINGS SHALL BE FIRE STOPPED WITH APPROVED FIRE BARRIER CAULK. INSTALL CAULK PER MANUFACTURE'S INSTRUCTIONS AND MAINTAIN THE RATING OF THE WALL, FLOOR, OR CEILING BEING PENETRATED.

MEDICAL/DENTAL OFFICE REQUIREMENTS

INSTALL BRANCH CIRCUIT WIRING IN PATIENT CARE AREAS IN A METAL RACEWAY SYSTEM. CABLE USED IN PATIENT CARE AREAS SHALL BE LISTED FOR SUCH USE (HCFAC OR EQUAL).

PROVIDE AN INSULATED COPPER EQUIPMENT GROUNDING CONDUCTOR TO ALL RECEPTACLES, LIGHTS, AND EQUIPMENT IN PATIENT CARE AREAS.

IF EXISTING, RELOCATED, OR RECONNECTED RECEPTACLES, LIGHTING, OR SWITCHES ARE LOCATED IN A PATIENT CARE AREA, AND THE WIRING IS NOT INSTALLED IN A METAL RACEWAY WITH AN INSULATED EQUIPMENT GROUNDING CONDUCTOR, OR A CABLE LISTED FOR USE IN A HEALTH-CARE FACILITY, THEN RE-CIRCUIT THE EXISTING DEVICES WITH THE REQUIRED GROUNDING FOR A PATIEN

PANEL: HMR

PANEL TYPE	EXISTING
L-L VOLTAGE	480
L-N VOLTAGE	277
PHASE	3
WIRE	4
MINIMUM AMP RATING	400
MAIN BREAKER	MLO
A/C RATING MIMIMUM	14,000

GENERAL PANEL NOTES: A, B, C, D, E, F, G

BRANCH-CIRCUIT NOTES: 1 PROVIDE BREAKER; 2; 3; 4; 5; 6; 7

NOTES	DESCRIPTION	LOAD (VA) RECEPTACLES	LIGHTING	LARGEST MOTOR	MISC	KITCHEN EQUIPMENT	BREAKER IE/I/F EXISTING	TRIP	POLES	#	Φ	#	BREAKER IE/I/F EXISTING	TRIP	POLES	KITCHEN EQUIPMENT	LOAD (VA) MISC	LARGEST MOTOR	LIGHTING	RECEPTACLES	DESCRIPTION	NOTES
	NOT USABLE									1	A	2	E	125	3		17175				E CT MAIN DISC SW	
	NOT USABLE									3	B	4	E	125	-		17175				E -	
	NOT USABLE									5	C	6	E	125	-		17175				E -	
1	HD-1				1850			15	2	7	A	8		100	3		27000				MRI	1
1	-				1850			15	-	9	B	10		100	-		27000				-	1
	SPACE									11	C	12		100	-		27000				-	1
E	CU-1 LIEBERT UNIT COND				1250		E	15	3	13	A	14	E	15	3		2500				E LIEBERT CHILLER AUX WATER	
E	-				1250		E	15	-	15	B	16	E	15	-		2500				E -	
E	-				1250		E	15	-	17	C	18	E	15	-		2500				E -	
E	EQUIPMENT				2200		E	20	3	19	A	20	E	50	3		8314				E LIEBERT AC UNIT	
E	-				2200		E	20	-	21	B	22	E	50	-		8314				E -	
E	-				2200		E	20	-	23	C	24	E	50	-		8314				E -	
E	SILOUTTEE				16000		E	100	3	25	A	26	E	20			2499				E VAV-2	
E	-				16000		E	100	-	27	B	28	E	20			2499				E VAV-2	
E	-				16000		E	100	-	29	C	30	E	20			2499				E VAV-2	
E	BASEBOARD - N.STORE RM				2490		E	20	1	31	A	32	E	20	3		2499				E VAV-1	
E	BASEBOARD - SNDCTL RM				2271		E	20	1	33	B	34	E	20			2499				E -	
E	BASEBOARD - BREAK ROOM				1247		E	20	1	35	C	36	E	20	-		2499				E -	
E	LIGHTING - CTL/BREAK/EQUIP		1325				E	20	1	37	A	38	E	70	3		15000				E PANEL LMR	
E	LIGHTING - OFFICE/COMM/CT RM		1650				E	20	1	39	B	40	E	70	-		15000				E -	
E	LIGHTING - CORR/WAITING/RECEPT		1710				E	20	1	41	C	42	E	70	-		15000				E -	
	SPACE									43	A	44									SPACE	
	SPACE									45	B	46									SPACE	
	SPACE									47	C	48									SPACE	

	CONNECTED LOAD (VA) AΦ	BΦ	CΦ	NEC FACTOR (%)	NEC DEMAND LOAD (VA) AΦ	BΦ	CΦ	TOTAL
RECEPT < 10,000VA	0	0	0	100%	0	0	0	0
RECEPT > 10,000VA	0	0	0	50%	0	0	0	0
LIGHTING	1,325	1,650	1,710	125%	1,656	2,063	2,138	5,856
LARGEST MOTOR	0	0	0	125%	0	0	0	0
MISCELLANEOUS	98,777	98,558	95,684	100%	98,777	98,558	95,684	293,019
KITCHEN EQUIPMENT	0	0	0	65%	0	0	0	0
SHOW WINDOW LIGHTING	0	0	0	125%	0	0	0	0
TRACK LIGHTING	0	0	0	125%	0	0	0	0
EXISTING PEAK DEMAND	0	0	0	125%	0	0	0	0
ADDITIONAL LOADS	0	0	0	100%	0	0	0	0
TOTAL VA	100,102	100,208	97,394		100,433	100,621	97,822	298,875
AMPERAGE	361.2	361.6	351.4		362.4	363.1	353.0	359.5

ELECTRICAL ENGINEER: KAZIN & ASSOCIATES (720) 489-1609

PANEL: LMR

PANEL TYPE	EXISTING
L-L VOLTAGE	208
L-N VOLTAGE	120
PHASE	3
WIRE	4
MINIMUM AMP RATING	150
MAIN BREAKER	150A/3P
A/C RATING MIMIMUM	10,000

GENERAL PANEL NOTES: A, B, C, D, E, F, G

BRANCH-CIRCUIT NOTES: 1; 2; 3; 4; 5; 6; 7

NOTES	DESCRIPTION	LOAD (VA) RECEPTACLES	LIGHTING	LARGEST MOTOR	MISC	KITCHEN EQUIPMENT	BREAKER IE/I/F EXISTING	TRIP	POLES	#	Φ	#	BREAKER IE/I/F EXISTING	TRIP	POLES	KITCHEN EQUIPMENT	LOAD (VA) MISC	LARGEST MOTOR	LIGHTING	RECEPTACLES	DESCRIPTION	NOTES
E	RECEPT - ULTRASONIC ROOM	720					E	20	1	1	A	2	E	20	1		600				E COMMUNICATION EQUIPMENT	
E	RECEPT - ULTR SND IV PREP RM	720					E	20	1	3	B	4	E	20	1		600				E COMMUNICATION EQUIPMENT	
E	RECEPT - IV PREP / STORAGE	540					E	20	1	5	C	6	E	20	1		600				E COMMUNICATION EQUIPMENT	
E	RECEPT & VIEW BOX - OFFICE	560					E	20	1	7	A	8	E	20	1					1080	E RECEPT - CT SCAN CORRIDOR	
E	RECEPT - OFFICE	720					E	20	1	9	B	10	E	20	1					540	E RECEPT - WORK ROOM	
E	RECEPT - OFFICE	540					E	20	1	11	C	12	E	20	1					720	E RECEPT & VIEW BOX - WORK RM	
E	RECEPT - OFFICE & RESTROOM	720					E	20	1	13	A	14	E	20	1					720	E RECEPT - CT / MRI CTL ROOM	
E	RECEPT - RECEPTION DESK	720					E	20	1	15	B	16	E	20	1					720	E RECEPT - CT / MRI CTL ROOM	
E	RECEPT - WAITING ROOM	720					E	20	1	17	C	18	E	20	1					1440	E RECEPT - CT / MRI CTL & WAITING	
E	RECEPT - COFFEE / DISP				1500		E	20	1	19	A	20	E	20	1		200				E TELEPHONE EQUIPMENT	
E	MICROWAVE				1800		E	20	1	21	B	22	E	20	1					540	E RECEPT - MRI EQUIP / CHANGE RM	
E	RECEPT & REFRIG - BREAK ROOM				1360		E	20	1	23	C	24	E	20	1					180	E RECEPT - MRI ROOM	
E	RECEPT - READING ROOM	540					E	20	1	25	A	26	E	20	1		1000				E WATER HEATER	
E	RECEPT - ROOF	540					E	20	1	27	B	28	E	15	2		750				E FILM PROCESSOR	
E	FA BOOSTER PANEL				500		E	20	1	29	C	30	E	15	-		750				E -	
E	COFFEE MAKER				1400		E	20	1	31	A	32	E	20	1				380		E LIGHTING - RECEPTION 102	
E	CO & X-RAY PRINTER				1130		E	20	1	33	B	34	E	20	1					360	E RECEPT - I.T. 125	
E	COPIER / PRINTER				794		E	20	1	35	C	36	E	20	1			1400			E LIGHTING - ULTRASOUND / CT	
E	RECEPT - RADIOLOGY 114	360					E	20	1	37	A	38	E	20	3			1200			E DCL LIGHTING PANEL	
E	EF-1				90		E	20	1	39	B	40	E	20	-			1200			E -	
E	EF-2				828		E	20	1	41	C	42	E	20	-			1200			E -	

	CONNECTED LOAD (VA) AΦ	BΦ	CΦ	NEC FACTOR (%)	NEC DEMAND LOAD (VA) AΦ	BΦ	CΦ	TOTAL
RECEPT < 10,000VA	4,700	4,860	4,140	100%	4,700	4,860	4,140	13,700
RECEPT > 10,000VA	0	0	0	50%	0	0	0	0
LIGHTING	1,580	1,200	2,600	125%	1,975	1,500	3,250	6,725
LARGEST MOTOR	0	0	0	125%	0	0	0	0
MISCELLANEOUS	4,700	4,370	4,832	100%	4,700	4,370	4,832	13,902
KITCHEN EQUIPMENT	0	0	0	65%	0	0	0	0
SHOW WINDOW LIGHTING	0	0	0	125%	0	0	0	0
TRACK LIGHTING	0	0	0	125%	0	0	0	0
EXISTING PEAK DEMAND	0	0	0	125%	0	0	0	0
ADDITIONAL LOADS	0	0	0	100%	0	0	0	0
TOTAL VA	10,980	10,430	11,572		11,375	10,730	12,222	34,327
AMPERAGE	91.4	86.9	96.4		94.7	89.4	101.8	95.3

ELECTRICAL ENGINEER: KAZIN & ASSOCIATES (720) 489-1609

FAULT CURRENT CALCULATIONS (END OF CONDUCTOR)

LOCATION DESCRIPTION (@ Isc END)	STARTING Isc	MINIMUM CONDUCTOR LENGTH	PHASE MULTIPLIER	VOLTAGE	# OF CONDUCTOR SETS	C VALUE	Isc END
@ 1600A MDP	16,900	60	1.73	480	4	12,843	15,778
@ PANEL HMR	15,778	70	1.73	480	2	12,843	13,661
@ CHILLER	15,778	60	1.73	480	1	12,843	12,466

FAULT CURRENT CALCULATIONS (TRANSFORMER SECONDARY)

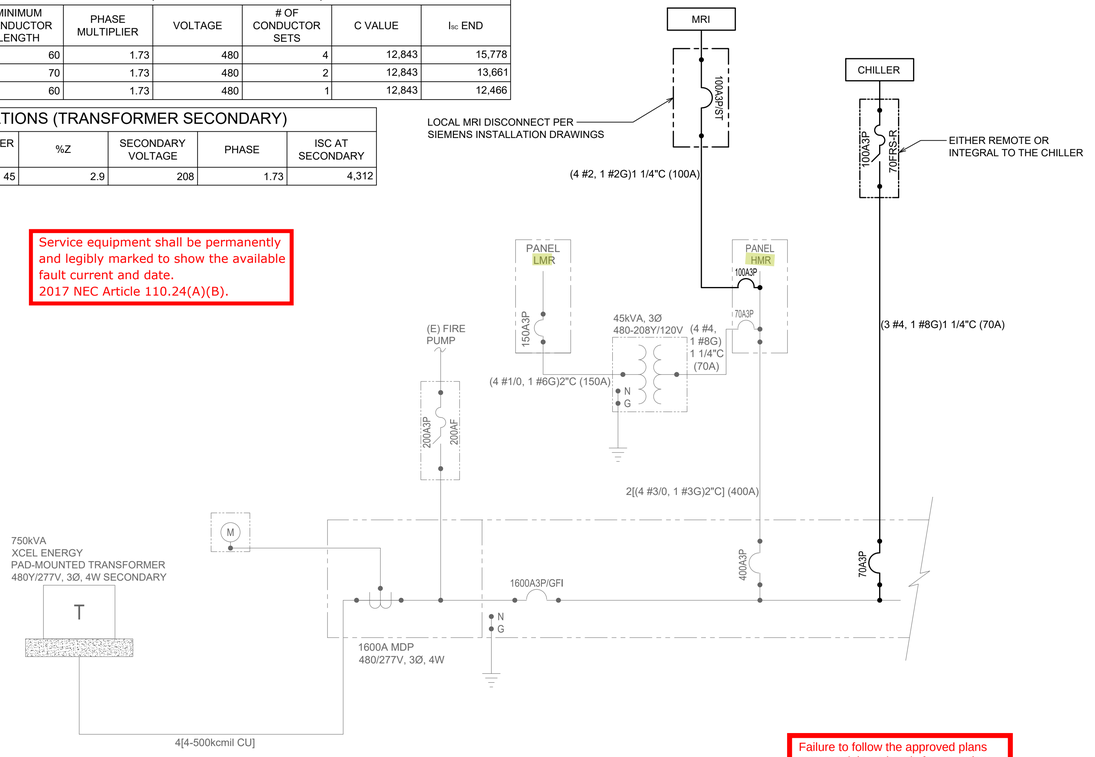
LOCATION DESCRIPTION	TRANSFORMER KVA	%Z	SECONDARY VOLTAGE	PHASE	ISC AT SECONDARY
@ SECONDARY OF 45KVA XFMR	45	2.9	208	1.73	4,312

SERVICE LOAD CALCULATION

LOAD DESCRIPTION	LOAD
XCEL PEAK DEMAND X 125%	467.2kVA
CHILLER	43.8kVA
LOAD ADDED TO PANEL HMR (INCLUDED NEW LMR LOADS)	85.8kVA
TOTAL LOAD	596.8kVA
TOTAL AMPERAGE @	718A
VOLTAGE 480 PHASE 3	

Service equipment shall be permanently and legibly marked to show the available fault current and date.
2017 NEC Article 110.24(A)(B).

Legibly identify each breaker or switch for it's use or purpose on the circuit directory in the panel/switchboard per 2017 NEC 408.4.



2 PARTIAL ONE-LINE DIAGRAM

NOT TO SCALE

NOTES:

1. EQUIPMENT, WIRING, AND DEVICES SHOWN LIGHT ARE EXISTING AND SHOWN DARK ARE NEW UNLESS OTHERWISE NOTED.
2. CONDUCTORS ARE COPPER UNLESS OTHERWISE NOTED.
3. NEW WIRING SHALL BE THHN/THWN-2 INSULATED COPPER UNLESS OTHERWISE NOTED.

Failure to follow the approved plans may result in an hourly fee to review the field changes for code compliance.

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: James Comer
Date: Apr 27, 2018
2015 INTERNATIONAL CODES & 2017 NEC

RSN: 1281167
Permit #: 18-1445333-LT

LIGHTING FIXTURE SCHEDULE

PREPARED BY KAZIN & ASSOCIATES

DESCRIPTION OF LUMINAIRE				BASIS OF DESIGN			
ID	DESCRIPTION	FINISH	MOUNTING INFO	MANUFACTURER	CATALOG NUMBER	LOAD (VA)	VOLTAGE
A	2' X 2' RECESSED LED WITH CENTER BASKET LENSE	WHITE	RECESSED IN GRID	METALUX OR EQUAL	22CZ-LD5-44SE-UNV-L835-CD1-U	LED: 40W, 4375LM	120-277

NOTES:

1. FIXTURE SPECIFICATIONS REPRESENT THE ENGINEER'S UNDERSTANDING OF THE REQUIRED FIXTURES. FIXTURE SPECIFICATIONS SHALL BE REVIEWED AND APPROVED IN WRITING BY OWNER OR OWNER'S REPRESENTATIVE PRIOR TO ORDERING FIXTURES. NOTIFY ELECTRICAL ENGINEER OF ANY FIXTURE CHANGES PRIOR TO PURCHASING FIXTURES.
2. PROVIDED HANGERS, ADAPTERS, INSTALLATION KITS, PARTS AND PIECES TO INSTALL THE SPECIFIED FIXTURE IN THE LOCATIONS SHOWN ON THE PLAN.
3. UNLESS OTHERWISE INDICATED, PROVIDE COMPLETE LUMINAIRES INCLUDING LAMP(S) AND ALL SOCKETS, BALLASTS, REFLECTORS, LENSES, HOUSINGS AND OTHER COMPONENTS REQUIRED TO POSITION, ENERGIZE AND PROTECT THE LAMP AND DISTRIBUTE THE LIGHT.
4. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED CONDUIT, BOXES, WIRING, CONNECTORS, HARDWARE, SUPPORTS, TRIMS, ACCESSORIES, ETC. AS NECESSARY FOR A COMPLETE OPERATING SYSTEM.

EXIT AND EMERGENCY LIGHTING FIXTURE SCHEDULE

DESCRIPTION OF LUMINAIRE				LUMINAIRE SPECIFICATION			
SYMBOL	DESCRIPTION	FINISH	MOUNTING INFO	MANUFACTURER	CATALOG NUMBER	LAMP(S)	VOLTAGE
	EXIT/EM LIGHT (UNIVERSAL) WITH 90-MINUTE BATTERY	WHITE WITH GREEN LETTERS	SEE PLAN	SURE-LITE OR EQUAL	LPXC-25-SD	LED EXIT + (2) LED HEADS	120/277 INPUT

Architecture
Davis / Jones
21076 E. Jefferson Circle, Aurora, CO 80013
303.886.3860

COLORADO LICENSED BRYAN EDWARD KAZIN 36628 4/20/2018 PROFESSIONAL ENGINEER

NOT ISSUED FOR CONSTRUCTION UNLESS SIGNED THROUGH THE SEAL IN BLUE INK OR DIGITALLY SIGNED BY BRYAN KAZIN. LIMITED TO ELECTRICAL.

Building Site:
1400 S. Potomac St
Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
Emerald C.M. General Contractors
13275 East Fremont Place, Suite 300
Centennial, CO 80112

Architect:
Jeff Jones, AIA
Davis/Jones Architecture, Inc.
21076 E. Jefferson Circle
Aurora, CO 80013
303.886.3860

Mechanical Engineer:
Jeff Bellman
Christopher Menges Engineering, Inc.
1100 W Littleton Blvd #400
Littleton, CO
720.283.3018

Electrical Engineer:
Bryan Kazin, PE
Kazin & Associates, Inc.
9364 Teddy Lane, Suite 101
Lone Tree, CO 80124
720.489.1609

Structural Engineer:
Craig Carroll
Monroe & Newell Engineers, Inc
1400 Glenarm Pl, #101
Denver, CO 80202

No.	Description	Date

Invision Sally Jobe

ONE-LINE DIAGRAM & SCHEDULES

Project number	18-004
Date	4/20/18
Drawn by	BEK
Checked by	BEK

E0.2

COMcheck Software Version 4.0.7.0

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: Sally Jobe
Project Type: Alteration

Construction Site:
1400 S Potomac St
Aurora, CO 80109

Owner/Agent:

Designer/Contractor:
Kazin & Associates, Inc
9364 Teddy Lane, Suite 101
Lone Tree, CO 80124
(720) 489-1609
bkazin@dmka.com

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B X C)
1-Healthcare Facility:Exam/Treatment	496	1.66	823
2-Common Space Types:Lounge/Breakroom	121	0.73	88
		Total Allowed Watts =	912

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Healthcare Facility:Exam/Treatment (496 sq.ft.)				
LED 1: A: New 2x2 LED: Other:	1	10	40	400
Common Space Types:Lounge/Breakroom (121 sq.ft.)				
Linear Fluorescent 1: (R): Relocated 2x2: 24" T8U 32W: Electronic:	2	4	64	256
			Total Proposed Watts =	656

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COM*check* Version 4.0.7.0 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Bryan Kazin — Name - Title
Digitally signed by Bryan Kazin Date: 2018.04.01 12:14:38 -06'00' — Signature
4/1/18 — Date

COMcheck Software Version 4.0.7.0

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.1 [EL15][1]	Lighting controls installed to uniformly reduce the lighting load by at least 50%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.1 [EL18][1]	Occupancy sensors installed in required spaces.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.1, C405.2.2.3 [EL23][2]	Independent lighting controls installed per approved lighting plans and all manual controls readily accessible and visible to occupants.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.2.1 [EL22][2]	Automatic controls to shut off all building lighting installed in all buildings.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3 [EL16][2]	Daylight zones provided with individual controls that control the lights independent of general area lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3, C405.2.3.1, C405.2.3.2 [EL20][1]	Primary sidelighted areas are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.3, C405.2.3.1, C405.2.3.3 [EL21][1]	Enclosed spaces with daylight area under skylights and rooftop monitors are equipped with required lighting controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.4 [EL4][1]	Separate lighting control devices for specific uses installed per approved lighting plans.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.2.4 [EL8][1]	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.3 [EL6][1]	Exit signs do not exceed 5 watts per face.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.2 [FI17][3]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.4.1 [FI18][1]	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Interior Lighting fixture schedule for values.*
C408.2.5.1 [FI16][3]	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.3 [FI33][1]	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: James Comer
Date: Apr 27, 2018
2015 INTERNATIONAL CODES & 2017 NEC

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

RSN: *1281167*
Permit #: *18-1445333-LT*

DJ Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
Davis / Jones 303.886.3860

COLORADO LICENSED
BRYAN EDWARD KAZIN
36628
4/20/2018
PROFESSIONAL ENGINEER

NOT ISSUED FOR CONSTRUCTION UNLESS SIGNED THROUGH THE SEAL IN BLUE INK OR DIGITALLY SIGNED BY BRYAN KAZIN. LIMITED TO ELECTRICAL.

Building Site:
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Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
Emerald C.M. General Contractors
13275 East Fremont Place, Suite 300
Centennial, CO 80112

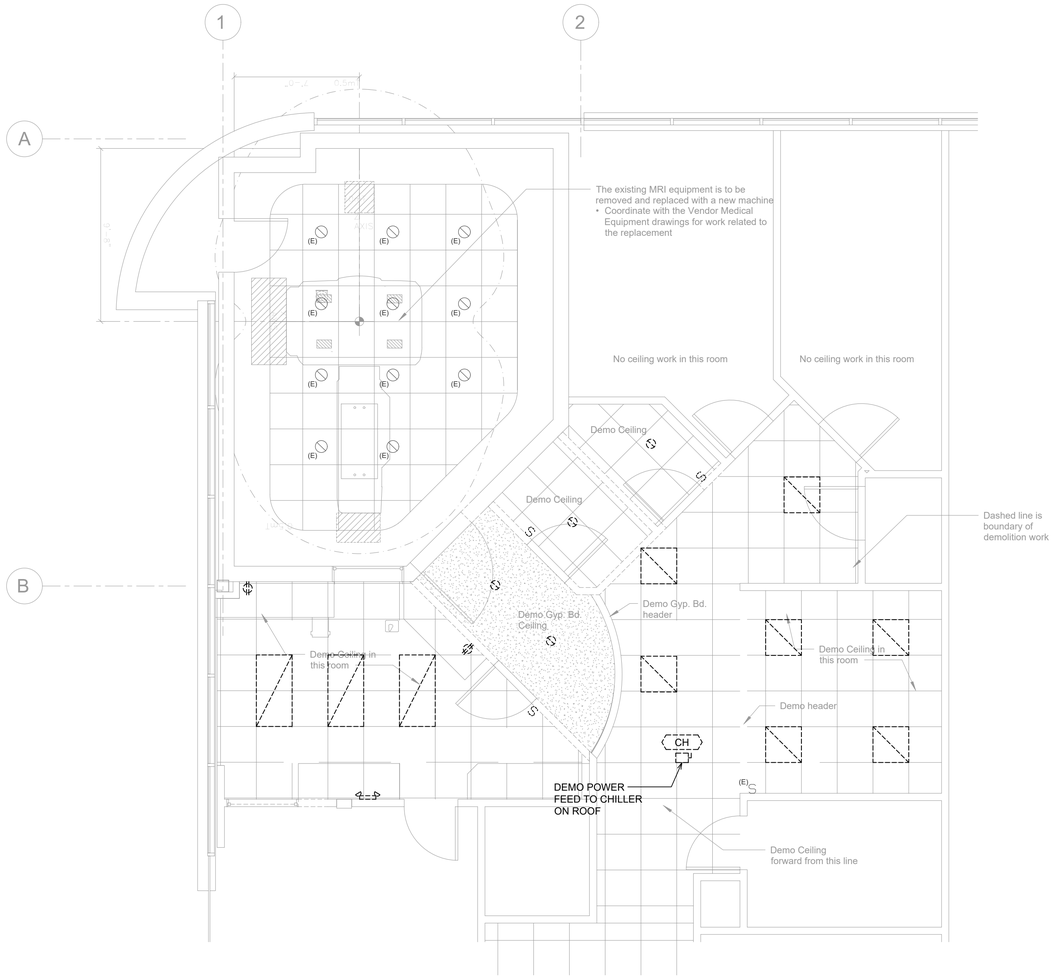
Architect:
Jeff Jones, AIA
Davis/Jones Architecture, Inc.
21076 E. Jefferson Circle
Aurora, CO 80013
303.886.3860

Mechanical Engineer:
Jeff Bellman
Christopher Menges Engineering, Inc.
1100 W Littleton Blvd #400
Littleton, CO
720.283.3018

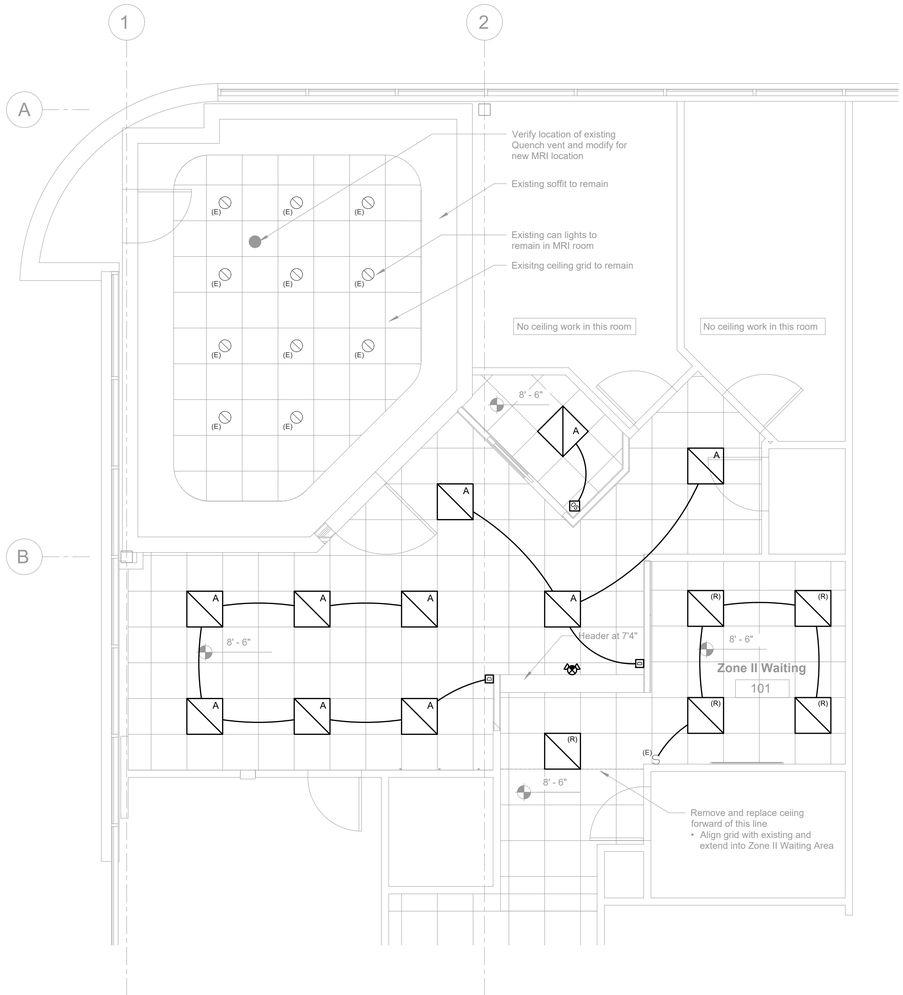
Electrical Engineer:
Bryan Kazin, PE
Kazin & Associates, Inc.
9364 Teddy Lane, Suite 101
Lone Tree, CO 80124
720.489.1609

Structural Engineer:
Craig Carroll
Monroe & Newell Engineers, Inc
1400 Glenarm Pl, #101
Denver, CO 80202

No.	Description	Date



1 PARTIAL EXISTING/DEMO POWER & LIGHTING PLAN
SCALE: 1/4" = 1'-0"



2 PARTIAL LIGHTING PLAN
SCALE: 1/4" = 1'-0"

NOTES:

1. CONNECT RELOCATED AND NEW LIGHT FIXTURES TO (E) LIGHTING CIRCUITS FROM DEMO'D LIGHTING.

Wiring in air handling spaces must comply with 2017 NEC 300.22. Firestop penetrations per 2017 NEC 300.21. Secure and support equipment per 2017 NEC 300.11.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: James Comer
Date: Apr 27, 2018
2015 INTERNATIONAL CODES & 2017 NEC

RSN: *1281167*
Permit #: *18-1445333-LT*

Davis / Jones Architecture
21076 E. Jefferson Circle,
Aurora, CO 80013
303.886.3860

COLORADO LICENSED
BRYAN EDWARD KAZIN
36628
4/20/2018
PROFESSIONAL ENGINEER

NOT ISSUED FOR CONSTRUCTION UNLESS SIGNED THROUGH THE SEAL IN BLUE INK OR DIGITALLY SIGNED BY BRYAN KAZIN. LIMITED TO ELECTRICAL.

Building Site:
1400 S. Potomac St
Aurora, CO 80109

Tenant:
Invision Sally Jobe - Radiology Imaging Associates
1400 S. Potomac St., Suite 180
Aurora, CO 80012

General Contractor:
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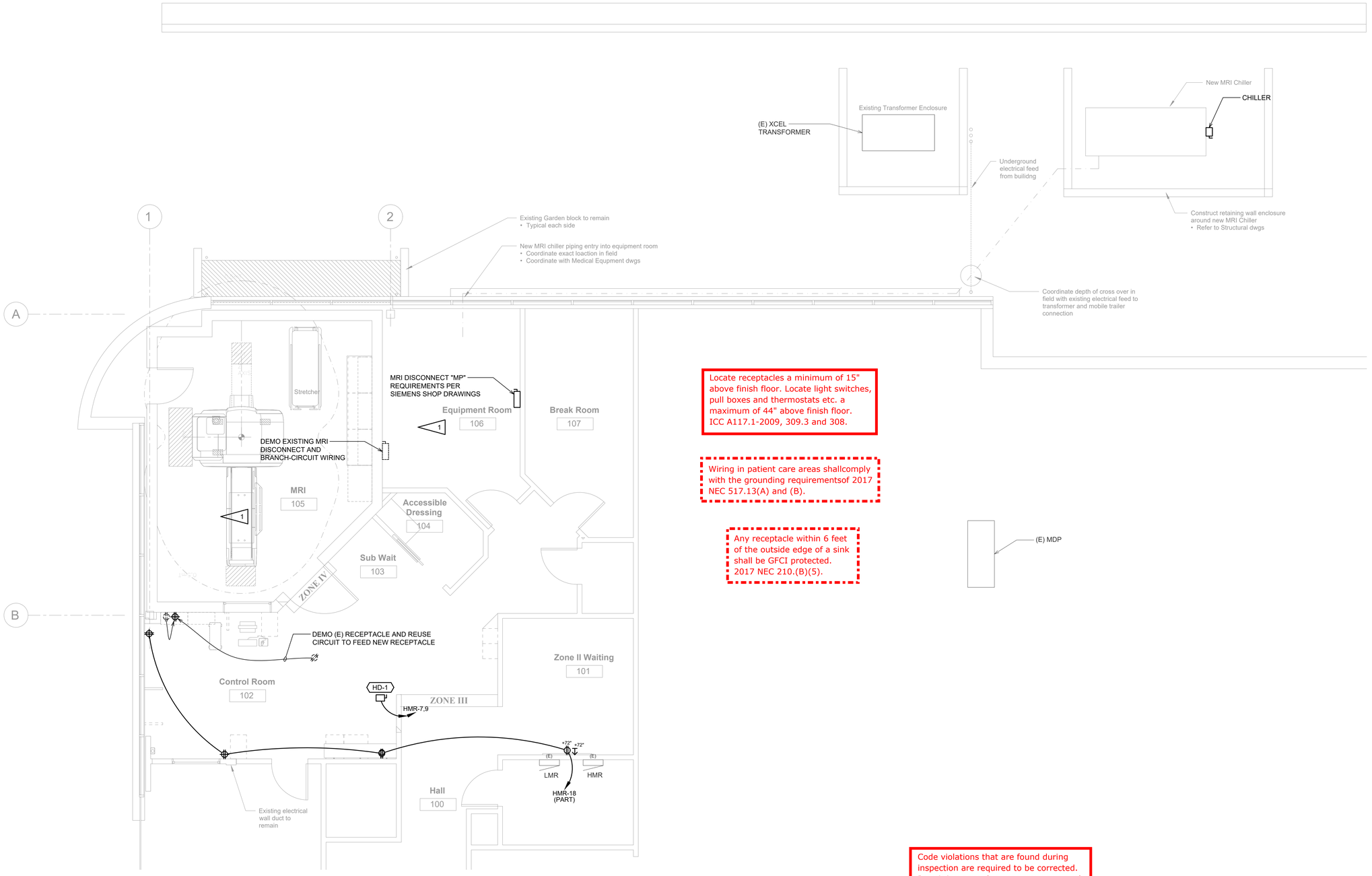
No.	Description	Date

Invision Sally Jobe

PARTIAL DEMO & LIGHTING PLAN

Project number	18-004
Date	4/20/18
Drawn by	BEK
Checked by	BEK

E1.1



1 PARTIAL POWER PLAN
SCALE: 1/4" = 1'-0"

Locate receptacles a minimum of 15" above finish floor. Locate light switches, pull boxes and thermostats etc. a maximum of 44" above finish floor. ICC A117.1-2009, 309.3 and 308.

Wiring in patient care areas shallcomply with the grounding requirementsof 2017 NEC 517.13(A) and (B).

Any receptacle within 6 feet of the outside edge of a sink shall be GFCI protected. 2017 NEC 210.(B)(5).

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.

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DETAIL NOTES	
	NOTE
1	REFERENCE SIEMENS SHOP DRAWINGS FOR ROOM LAYOUT AND ADDITIONAL REQUIREMENTS.

Architecture
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No.	Description	Date

Invision Sally Jobe

PARTIAL POWER PLAN

Project number	18-004
Date	4/20/18
Drawn by	BEK
Checked by	BEK

E1.2