THE MEDICAL CENTER OF AURORA

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

ISSUE DATE: 24 MARCH 2022
PROJECT #: 21-035

ISSUE FOR CONSTRUCTION

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2022 2136196

1619950

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

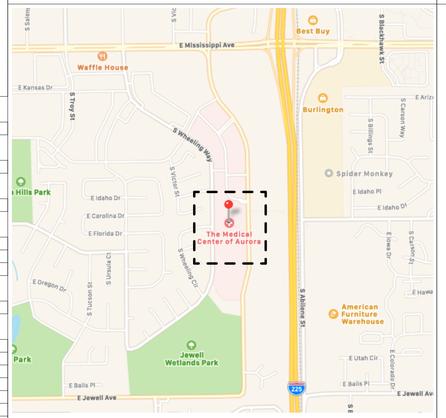
SEPARATE FIRE SPRINKLER PERMIT REQUIRED: Due to the proposed work the general contractor is required to obtain the services of a fire sprinkler contractor to determine if a separate sprinkler permit is required. If it is determined that the spacing of the fire sprinkler heads is not in compliance, then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

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

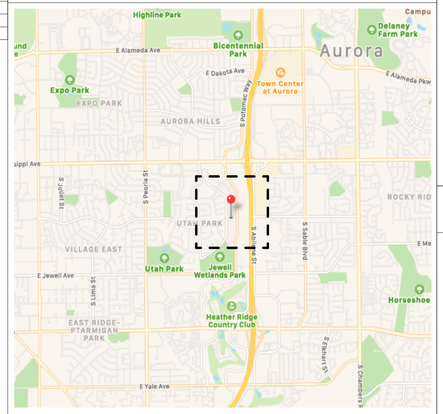
Code violations that are found during inspection are required to be corrected. Permit issuance does not grant approval of a code violation. 2015 IBC 105.4.

At all times during construction, maintain required exits, existing structural elements, fire protection devices and sanitary safeguards per 2015 IBC 3302.1

VICINITY MAP

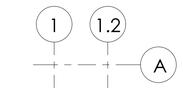


CITY MAP

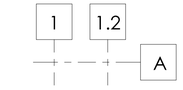


GENERAL SYMBOLS LEGEND

COLUMN GRID DESIGNATION

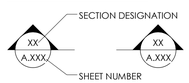


NEW GRID

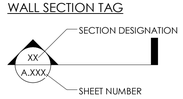


EXISTING GRID

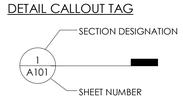
BUILDING SECTION TAG



WALL SECTION TAG



DETAIL CALLOUT TAG



NOTE TAGS

1 NOTE BY NUMBER

XX.XXX SPECIFICATION NOTE

DOOR TAG

XXX DOOR TAG

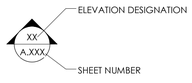
GLAZING TAG

GL-X GLAZING DESIGNATION PER SPECIFICATIONS

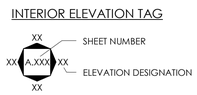
ARCHITECTURAL WOODWORK

24" CABINET WIDTH
A1 CABINET TYPE

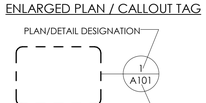
EXTERIOR ELEVATION TAG



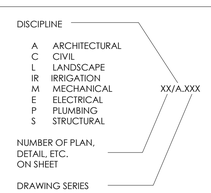
INTERIOR ELEVATION TAG



ENLARGED PLAN / CALLOUT TAG



DRAWING NUMBER KEY



GENERAL PROJECT NOTES

1. REFER TO COMPLETE SET OF ISSUED CONTRACT DOCUMENTS FOR APPLICABLE NOTES, ABBREVIATIONS, AND SYMBOLS.
2. DO NOT SCALE THE DRAWING. IF DIMENSIONS ARE IN QUESTION, OBTAIN CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING.
3. DIMENSIONS SHOWN ON THE FLOOR PLANS FOR NEW CONSTRUCTION ARE TO THE FACE OF FINISH OF INTERIOR WALLS, TO CENTER LINE OF COLUMNS, AND TO FACE OF CONCRETE OR MASONRY WALLS, UNLESS OTHERWISE INDICATED. DIMENSIONS IN RENOVATED AREAS ARE FROM FINISH FACE OF EXISTING WALLS AND TO FINISH FACE OF NEW STUD WALLS, UNLESS OTHERWISE INDICATED.
4. FIELD MEASURE AND CONFIRM DIMENSIONS FOR OWNER PROVIDED EQUIPMENT AND FURNISHINGS. COORDINATE WITH THE OWNER ON DELIVERY AND INSTALLATION OR OFCI EQUIPMENT.
5. FINISH FLOOR ELEVATIONS ARE TO TOP OF FINISHED FLOORING PRODUCT, NOTED BY AFF (ABOVE FINISH FLOOR) UNLESS OTHERWISE NOTED.
6. COORDINATE EXACT SIZE AND PLACEMENT OF EQUIPMENT BASE AND HOUSEKEEPING PADS WITH EQUIPMENT TO BE PROVIDED.
7. WHERE NEW GYPSUM BOARD PARTITIONS ARE A CONTINUATION OF AN EXISTING PARTITION OR COLUMN ENCASEMENT, THE FACE OF THE NEW GYPSUM BOARD SHALL BE ALIGNED WITH THE FACE OF THE EXISTING SURFACE. WHERE A ONE HOUR PARTITION IS SHOWN AS A CONTINUATION OF A TWO-HOUR PARTITION OR COLUMN ENCASEMENT, THE FACE OF THE GYPSUM BOARD SHALL BE OFFSET AS REQUIRED TO PROVIDE FACE ALIGNMENT OF GYPSUM BOARD ON BOTH SIDES.
8. LEVEL FLOORS SO THAT THEY DO NOT EXCEED A 1/4" VARIANCE IN A 10'-0" RADIUS.
9. PARTITION TYPES AND FIRE RESISTIVE RATINGS INDICATED ON A WALL ARE TO BE CONTINUOUS FOR THE LENGTH AND HEIGHT OF A PARTITION.
10. OPENINGS IN A RATED WALL, FLOOR, CEILING, AND ROOF ASSEMBLIES SHALL BE SEALED WITH A FIRE-RESISTANT JOINT SYSTEM OR PROTECTED WITH A FIRE RATED CHASE.
11. WHERE MATERIALS ARE APPLIED TO, OR ARE IN DIRECT CONTACT WITH WORK INSTALLED BY ANOTHER SUBCONTRACTOR, COMMENCEMENT OF WORK IMPLIES ACCEPTANCE OF THE SUBSTRATE AS SUITABLE FOR THE APPLICATION INTENDED.
12. ISOLATE DISSIMILAR METALS TO PREVENT GALVANIC CORROSION.
13. SEALANTS EXPOSED TO VIEW SHALL BE CUSTOM COLOR AS SELECTED BY THE ARCHITECT.
14. COORDINATE LOCATION OF SEALANT AND COMPATIBILITY OF SEALANTS WITH ADJACENT WORK, INCLUDING MATERIALS AND OTHER CONTIGUOUS SEALANTS
15. CAULK AT JUNCTURE OF INTERIOR FACES OF DOOR FRAMES, VIEW WINDOW FRAMES, EXTERIOR WINDOW FRAMES, AND CABINET WORK WITH ADJACENT MATERIALS. MAINTAIN THE FIRE RATING OF CONSTRUCTION AROUND CABINETS, PANELS, AND BOXES RECESSED IN FIRE RATED WALL, FLOOR, AND CEILING ASSEMBLIES.
16. DO NOT HANG (SUPPORT) ANY ITEMS FROM METAL ROOF DECK. IT IS ACCEPTABLE TO ATTACH, I.E. CEILING SYSTEM WIRE HANGERS FROM JOISTS AND/OR BEAMS. IF NO JOIST OR BEAM, PROVIDE A STEEL STRIP.

ABBREVIATIONS LEGEND

ACC	ACCESSIBLE
AFF	ABOVE FINISHED FLOOR
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
B.O.___	BOTTOM OF ___
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED, OWNER INSTALLED
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COORD	COORDINATE
CORR	CORRIDOR
DBL	DOUBLE
DEMO	DEMOLISH, DEMOLITION
EA	EACH
ELEC	ELECTRIC(AL)
ELEV	ELEVATOR
EQ	EQUAL
(E). EXST	EXISTING
FF	FINISH FACE
FF EL	FINISHED FLOOR ELEVATION
FLR	FLOOR
FO	FINISHED OPENING
FP	FIRE PROTECTION
FV	FIELD VERIFY
GALV	GALVANIZED
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTER
INSUL	INSULATION
LAV	LAVATORY
LVR	LOUVER
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OPP	OPPOSITE
PERP	PERPENDICULAR
PLBG	PLUMBING
PLYWD	PLYWOOD
RE:	REFER TO ___
REF	REFRIGERATOR
REINF	REINFORCE, REINFORCING
RO	ROUGH OPENING
ROW	RIGHT OF WAY
SCHED	SCHEDULE
SF	SQUARE FOOT(FEET)
SIM	SIMILAR
SPEC	SPECIFICATION
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
T	TREAD
T&G	TONGUE & GROOVE
TEMP	TEMPORARY
T.O.	TOP OF ____
TOPO	TOPOGRAPHY, TOPOGRAPHIC
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
X	BY

PROJECT DESCRIPTION

THE SCOPE WITHIN INCLUDES A RENOVATION TO AN EXISTING OPERATING ROOM. THE AREA WITHIN THE SCOPE OF WORK IS APPROXIMATELY 606 SF. MECHANICAL, ELECTRICAL, MEDICAL GAS, AND STRUCTURAL UPGRADES WILL BE INCLUDED TO SUPPORT SERVICES AND EQUIPMENT TO BE PROVIDED WITHIN THE AREA OF SCOPE. FINISHES WILL BE UPGRADED AS NECESSARY WITHIN THE ROOM.

PROJECT DATA

- **CODES/LAWS:**
  CITY OF AURORA:
  2021 INTERNATIONAL BUILDING CODE (IBC)
  2021 INTERNATIONAL RESIDENTIAL CODE (IRC)
  2021 INTERNATIONAL MECHANICAL CODE (IMC)
  2021 INTERNATIONAL FUEL GAS CODE (IFGC)
  2021 INTERNATIONAL FIRE CODE (IFC)
  2021 INTERNATIONAL PLUMBING CODE (IPC)
  2021 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
  2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
  2021 INTERNATIONAL SWIMMING POOL AND SPA (ISPSC)
  2020 NATIONAL ELECTRICAL CODE (NEC)
  STATE OF COLORADO:
  2012 COLORADO DEPARTMENT OF HEALTH AND ENVIRONMENT - HOSPITAL LICENSING RULES
  2012 NFPA 101 - LIFE SAFETY CODE
  FEDERAL:
  2010 AMERICANS WITH DISABILITIES ACT GUIDELINES
  2009 ICC / ANSI A117.1 ACCESSIBILITY CODE
- **OCCUPANCY CLASSIFICATION:**
  2021 IBC - GROUP I-2 (SECTION 308.4)
  2012 NFPA 101 - OCCUPANCY TYPE (CHAPTER 18)
- **PRINCIPAL OCCUPANCY TYPE:** HEALTHCARE GROUP I-2
- **CONSTRUCTION TYPE:**
  EXISTING: UBC - TYPE 1FR, UNRESTRAINED, FULLY SPRINKLERED NFPA 101 - 222 STRUCTURE
  NEW: 2021 IBC - TYPE I-A, FULLY SPRINKLERED NFPA 101 - 222 STRUCTURE

This plan is reviewed to **IBC** but the existing building is NOT converted to **IBC**. The construction type listed is **UBC**. Occupancy group is **IBC**.

City of Aurora Building Division
Project: *TMCA SOUTH OR 4 RENOVATION|*
Address: *1501 S POTOMAC ST*
Occupancy Group: *IBC A-2*
Construction Type: *UBC TYPE I FR - SPK*
RSN: *1619950*
Permit: *22-2136196-LT*

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *May 02, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

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Lakewood, CO 80215
ph: 303.341.6100

No.	Description	Date

STATE OF COLORADO
JOHN MENNO NAP
401729
REGISTERED ARCHITECT
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	TB
Checked by	SL / JMN

Sheet Title
COVER & DRAWING INDEX

Sheet Number
G.101

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QUALITY ASSURANCE GENERAL NOTES
STATEMENT OF STRUCTURAL SPECIAL INSPECTIONS AND TESTING

1. GENERAL:

A. SCOPE OF WORK
- THE OWNER WILL ENGAGE A QUALIFIED INSPECTION AND TESTING AGENCY(S) TO PERFORM SPECIAL INSPECTIONS AND TESTING FOR ALL STRUCTURAL MEMBERS AND ASSEMBLIES AS NOTED HEREIN.
- SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE AUTHORITY HAVING JURISDICTION REQUIRED BY IBC 2015 SECTION 110.
- REFER TO ARCH/MECH/ELEC/CIVIL SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL SPECIAL INSPECTION AND TESTING THAT MAY BE REQUIRED.

B. SPECIAL INSPECTIONS AND TESTING ARE APPLICABLE TO ALL REVISIONS AND/OR FUTURE WORK ADDED BY AMENDMENTS TO THESE DOCUMENTS.

C. DEFINITIONS
- SPECIAL INSPECTOR: THE AGENCY ENGAGED BY THE OWNER AND APPROVED BY THE AUTHORITY HAVING JURISDICTION TO ACT AS THE DESIGNATED REPRESENTATIVE TO PERFORM INSPECTIONS.
- SPECIAL INSPECTION: INSPECTION PERFORMED BY THE SPECIAL INSPECTOR ACCORDING TO IBC 2015 SECTION 1704 TO ENSURE COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS.
- (P) PERIODIC INSPECTION: THE PART-TIME OR INTERMITTENT OBSERVATION BY THE SPECIAL INSPECTOR OF WORK BEING PERFORMED. SPECIAL INSPECTOR SHALL BE PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED. OBSERVATION OF ALL WORK (100% VISUAL) SHALL BE MADE AT THE COMPLETION OF THE WORK.
- (C) CONTINUOUS INSPECTION: THE FULL-TIME OBSERVATION BY THE SPECIAL INSPECTOR OF WORK BEING PERFORMED. SPECIAL INSPECTOR SHALL BE PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED. OBSERVATION OF ALL WORK (100% VISUAL) SHALL BE MADE AT THE COMPLETION OF THE WORK.

D. DEFICIENCIES IN WORK
- CORRECT DEFICIENCIES IN WORK THAT TESTS AND INSPECTIONS INDICATE DO NOT COMPLY WITH THE CONTRACT DOCUMENTS AND REFERENCED STANDARDS.
- ALL COST OF ADDITIONAL TESTING AND/OR INSPECTIONS FOR CORRECTIVE WORK SHALL BE BORNE BY THE CONTRACTOR.

2. SHOP FABRICATIONS:

A. GENERAL
- PERFORM INSPECTIONS AND TESTING FOR ALL SHOP FABRICATED STRUCTURAL MEMBERS AND ASSEMBLIES AS NOTED HEREIN. SPECIAL INSPECTOR SHALL PERFORM SPECIAL INSPECTIONS AND TESTING UNLESS THE FABRICATOR IS REGISTERED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION OR FABRICATION HAS A CURRENT ICC-ES EVALUATION REPORT.
- SPECIAL INSPECTOR SHALL VERIFY THE FABRICATOR MAINTAINS AND FOLLOWS DETAILED SHOP FABRICATION AND QUALITY CONTROL PROCEDURES, UNLESS FABRICATOR IS REGISTERED AND APPROVED.
- AT THE COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE AUTHORITY HAVING JURISDICTION ACCORDING TO IBC 2015 SECTION 1704.2.5.1
- APPROVED FABRICATORS MAY PERFORM TESTING NOTED HEREIN EXCEPT THAT NONDESTRUCTIVE TESTING (NDT) SHALL ONLY BE PERFORMED BY PERSONNEL WITH QUALIFICATIONS THAT MEET OR EXCEED THE CRITERIA OF AWS D1.1 SUBCLAUSE 6.14.6 AND AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (ASNT) SNT-TC-1A OR ASNT CP-189.

STRUCTURAL STEEL INSPECTIONS

ITEM	INSPECTION TASK	STANDARD	CRITERIA/REMARKS
- PRIOR TO FABRICATION OR ERECTION	PERFORM	AISC 360, CHAPTER N	REVIEW MATERIAL TEST REPORTS AND CERTIFICATIONS FOR STRUCTURAL STEEL
PRIOR TO WELDING			
- REVIEW MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AND WELDING PROCEDURE SPECIFICATIONS	PERFORM	AISC 360, CHAPTER N	-
- FIT UP OF WELDS, INCLUDING JOINT GEOMETRY, AND CONFIGURATIONS AND FINISH OF ACCESS HOLES	OBSERVE	AISC 360, CHAPTER N	-
- MATERIAL IDENTIFICATION	OBSERVE	AISC 360, CHAPTER N	-
- WELDER IDENTIFICATION SYSTEM	OBSERVE	AISC 360, CHAPTER N	-
DURING WELDING			
- USE OF QUALIFIED WELDERS	OBSERVE	AISC 360, CHAPTER N	-
- CONTROL AND HANDLING OF WELDING CONSUMABLES	OBSERVE	AISC 360, CHAPTER N	-
- NO WELDING OVER CRACKED TACK WELDS	OBSERVE	AISC 360, CHAPTER N	-
- ENVIRONMENTAL CONDITIONS, AND WPS FOLLOWED	OBSERVE	AISC 360, CHAPTER N	-
- WELDING TECHNIQUES - SINGLE PASS WELDS	OBSERVE	AISC 360, CHAPTER N	-
AFTER WELDING			
- WELDS CLEANED	OBSERVE	AISC 360, CHAPTER N	-
- SIZE, LENGTH, AND LOCATION OF WELDS	PERFORM	AISC 360, CHAPTER N	-
- WELDS MEET VISUAL ACCEPTANCE CRITERIA	PERFORM	AISC 360, CHAPTER N, AWS D1.1	WHERE INSPECTOR OBSERVES QUESTIONABLE WELDS, NON-DESTRUCTIVE TESTING SHALL BE PERFORMED
- ARC STRIKES	PERFORM	AISC 360, CHAPTER N	-
- REPAIR ACTIVITIES	PERFORM	AISC 360, CHAPTER N	-
- DOCUMENT ACCEPTANCE OR REJECTION OF WELDED MEMBER OR JOINT	PERFORM	AISC 360, CHAPTER N	-

OBSERVE - OBSERVE THESE ITEMS ON A RANDOM BASIS
PERFORM - THESE INSPECTIONS SHALL BE PERFORMED FOR EACH WELDED CONNECTION, AND EACH ITEM, PRIOR TO ACCEPTANCE

GENERAL NOTES

1) GENERAL:
1A) ENGINEER: REFERENCES ON THE STRUCTURAL DRAWINGS TO 'ENGINEER' MEAN THE STRUCTURAL ENGINEER OF RECORD. OTHER ENTITIES ARE SPECIFICALLY NOTED AS "CONTRACTOR'S ENGINEER", "MECHANICAL ENGINEER", ETC.
1B) THESE NOTES SUPPLEMENT THE SPECIFICATIONS, WHICH SHALL BE REFERENCED FOR ADDITIONAL REQUIREMENTS.
1C) STRUCTURAL ELEMENTS ARE CENTERED ON GRID LINES AND GRID LINE INTERSECTIONS UNLESS DIMENSIONED OTHERWISE.

2) USE OF DRAWINGS:
2A) DO NOT SCALE DRAWINGS.
2B) DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
2C) DETAILS NOTED TYPICAL APPLY TO ALL SIMILAR CONDITIONS. WHERE NO SPECIFIC DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ELSEWHERE ON THE PROJECT.
2D) WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES AND SPECIFICATIONS:
- CONTACT THE ARCHITECT PRIOR TO PROCEEDING WITH CONSTRUCTION
- THE MORE STRINGENT REQUIREMENTS SHALL GOVERN FOR BIDDING / PRICING

3) EXISTING STRUCTURES:
3A) CONTRACT DOCUMENTS HAVE BEEN PREPARED USING AVAILABLE DRAWINGS AND SITE OBSERVATION AS PERMITTED BY ACCESS RESTRICTIONS DURING DESIGN.
3B) DURING CONSTRUCTION, THE CONTRACTOR MAY ENCOUNTER EXISTING CONDITIONS WHICH ARE NOT KNOWN OR ARE AT VARIANCE WITH PROJECT DOCUMENTATION. CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ALL CONDITIONS NOT PER THE CONTRACT DOCUMENTS. EXAMPLES INCLUDE:
- SIZES OR DIMENSIONS OTHER THAN THOSE SHOWN
- DAMAGE OR DETERIORATION TO MATERIALS AND COMPONENTS
- CONDITIONS OF INSTABILITY OR LACK OF SUPPORT
- ITEMS NOTED AS EXISTING ON THE DRAWINGS BUT NOT FOUND IN THE FIELD

3C) PREPARE DIMENSIONAL DRAWINGS OF ALL DISCOVERED ITEMS.
3D) CONTRACTOR SHALL FIELD VERIFY ALL EXISTING STRUCTURAL CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS.
3E) CONTRACTOR SHALL MAKE ALLOWANCE FOR THE RESOLUTION OF SUCH DISCOVERIES IN THE CONSTRUCTION SCHEDULE.
3F) SUBMIT A DIMENSIONED DRAWING OF ALL NEW OPENINGS THROUGH EXISTING STRUCTURE AND SECURE APPROVAL PRIOR TO CUTTING. NEW OPENING MAY BE EITHER SHOWN ON THE CONTRACT DOCUMENTS OR PROPOSED BY THE CONTRACTOR. DRAWING SHALL SHOW:
- VERTICAL & HORIZONTAL LOCATION AND SIZE OF NEW OPENING(S)
- ALL EXISTING OPENINGS IN THE VICINITY OF THE NEW OPENING(S)
- ALL EXISTING STRUCTURE (BEAMS, COLUMNS, SLABS, WALLS, ETC) IN THE VICINITY OF THE NEW OPENING(S)
- ALL REINFORCING BAR SIZES AND POSITIONS (LAYOUT LOCATION AND DEPTH) CONFLICTING WITH OR IN THE VICINITY OF THE NEW OPENING(S).

4) COORDINATION:
4A) STRUCTURAL DRAWINGS ARE NOT STAND-ALONE DOCUMENTS AND ARE INTENDED TO BE USED IN CONJUNCTION WITH CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND DRAWINGS FROM OTHER DISCIPLINES. THE CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS INTO SHOP DRAWINGS AND WORK.
4B) COORDINATE DIMENSIONS OF ALL OPENINGS, BLOCKOUTS, DEPRESSIONS, ETC., WITH ARCHITECTURAL DRAWINGS, DRAWINGS FROM OTHER DISCIPLINES, AND FIELD CONDITIONS PRIOR TO SHOP DRAWING SUBMITTAL.

5) SUBMITTALS AND SUBSTITUTIONS:
5A) SUBMITTALS: REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
- IF THE CONTRACTOR REQUESTS A CHANGE FROM THE STRUCTURAL DRAWINGS, IT SHALL BE APPROVED BY THE ARCHITECT AND DESIGNED BY MARTIN/MARTIN, INC. PRIOR TO SUBMITTING SHOP DRAWINGS. VARIATION SHALL BE INDICATED ON THE SHOP DRAWINGS. CONTRACTOR SHALL COMPENSATE MARTIN/MARTIN, INC. FOR MAKING THE CHANGE.
- CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE IN SUBMITTALS
- ALL SHOP DRAWINGS SHALL REFERENCE THE STRUCTURAL DRAWING NUMBER AND DETAIL USED TO PREPARE THE SUBMITTAL

5B) SUBSTITUTIONS: ARCHITECT'S APPROVAL SHALL BE SECURED FOR ALL SUBSTITUTIONS
5C) NONCONFORMANCE: NOTIFY ARCHITECT OF CONDITIONS NOT CONSTRUCTED PER THE CONTRACT DOCUMENTS PRIOR TO PROCEEDING WITH CORRECTIVE WORK. SUBMIT PROPOSED REPAIR TO THE ARCHITECT FOR ACCEPTANCE. CONTRACTOR SHALL COMPENSATE MARTIN/MARTIN, INC. FOR DESIGNING THE REPAIR.

6) TEMPORARY CONDITIONS, CONSTRUCTION ENGINEERING, AND OSHA STANDARDS:
6A) THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION AND ONLY FOR LOADS ANTICIPATED DURING THE STRUCTURE'S SERVICE LIFE.
6B) THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES. REFER TO "LATERAL LOAD RESISTING SYSTEM DESCRIPTION" IN DESIGN CRITERIA FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL PROVIDE ALL REQUIRED ENGINEERING AND OTHER MEASURES TO ACHIEVE THE MEANS, METHODS, AND SEQUENCES OF WORK WHICH MAY INCLUDE, BUT IS NOT LIMITED TO:
- LAYOUT
- ERECTION PROCEDURES WHICH ADDRESS STABILITY OF THE FRAME DURING CONSTRUCTION
- WELD PROCEDURES
- SURVEYING TO VERIFY CONSTRUCTION TOLERANCES
- EVALUATION OF TEMPORARY CONSTRUCTION LOADS ON STRUCTURE DUE TO EQUIPMENT AND MATERIALS
- STRUCTURAL ENGINEERING TO RESIST ANY OTHER LOADS NOT IDENTIFIED ON DESIGN DRAWINGS

6E) NOTHING SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CONSTRUED AS ELIMINATING THE NEED FOR THE CONTRACTOR TO COMPLY WITH ALL OSHA REQUIREMENTS. WHERE THE STRUCTURAL DRAWINGS APPEAR TO CONFLICT WITH OSHA REQUIREMENTS, THE STRUCTURAL DRAWINGS REPRESENT FINAL CONDITIONS ONLY.

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.

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

DEFERRED SUBMITTALS

1) GENERAL:
1A) THE FOLLOWING PORTIONS OF THE STRUCTURAL DESIGN WILL NOT BE SUBMITTED AT THE TIME OF PERMIT APPLICATION. WHEN RECEIVED AND REVIEWED, THESE DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL BY THE CONTRACTOR:
- ANCHORAGE, BRACING AND ATTACHMENT OF REQUIRED ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE SPRINKLER, AND OTHER EQUIPMENT AND SYSTEMS.
- MEDICAL EQUIPMENT SUPPORT BEYOND SUPPORT FRAMES SHOWN IN STRUCTURAL DRAWINGS.

1B) CONNECTION OF DEFERRED SUBMITTAL ITEMS TO PRIMARY STRUCTURE BY DEFERRED SUBMITTAL SUPPLIER. DEFERRED SUBMITTAL SUPPLIER TO PROVIDE CONNECTIONS AND FRAMING ARRANGEMENT TO AVOID LOADING WHICH EXCEEDS THE CAPACITY OF THE ELEMENT BEING ATTACHED TO.

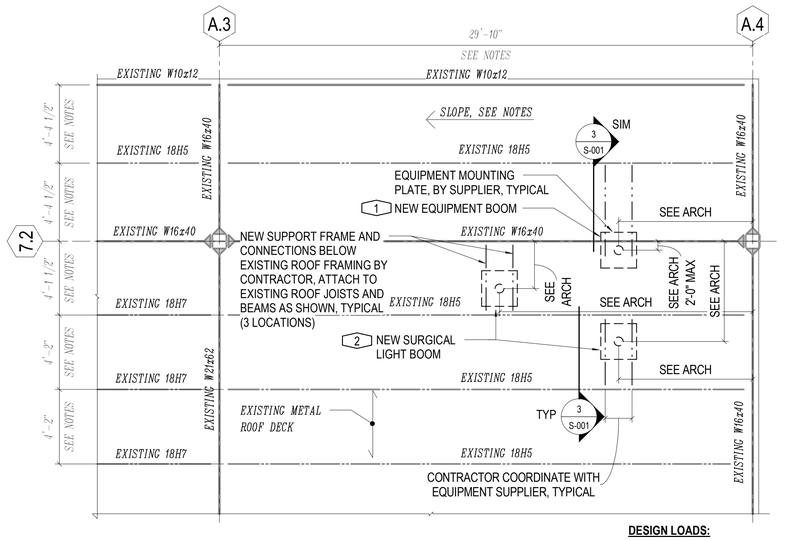
1C) ALL DEFERRED SUBMITTALS TO BE ATTACHED TO PRIMARY STRUCTURE WITH A PINNED CONNECTION. MOMENT CONNECTIONS TO PRIMARY STRUCTURE NOT PERMITTED UNLESS NOTED ON DRAWINGS OR APPROVED BY ENGINEER IN WRITING PRIOR TO SUBMITTAL OF DRAWINGS OR CALCULATIONS.

1D) LOADING AND LOCATION FOR ATTACHMENT OF DEFERRED SUBMITTAL ITEMS NOTED ON DRAWINGS ARE NOT TO BE RE-LOCATED OR INCREASED WITHOUT WRITTEN APPROVAL.

1E) SUBMIT STAMPED STRUCTURAL CALCULATIONS FOR ALL DEFERRED SUBMITTAL ITEMS PRIOR TO OR CONCURRENTLY WITH DRAWINGS OR PRODUCT DATA. INCLUDE ANALYSIS OF ATTACHMENT TO PRIMARY STRUCTURE. INCLUDE CURRENT ICC REPORT WITH ALL PROPRIETARY STRUCTURAL ELEMENTS AND ANCHORS/FASTENERS.

1F) POWDER ACTUATED FASTENERS SHALL NOT BE USED TO RESIST GRAVITY LOADS.

SPECIAL INSPECTIONS REQUIREMENTS – IBC 1704
PRIOR TO THE START OF CONSTRUCTION, THE OWNER OR OWNER'S AUTHORIZED AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PROVIDE SPECIAL INSPECTIONS AND TESTS DURING CONSTRUCTION AS REQUIRED BY THE STRUCTURAL ENGINEER IN THEIR STATEMENT OF SPECIAL INSPECTIONS. THE SPECIAL INSPECTOR'S QUALIFICATIONS AND WRITTEN REPORTS SHALL BE REVIEWED BY THE ENGINEER OF RECORD AND MADE AVAILABLE TO THE BUILDING INSPECTOR ON THE JOBSITE. THE BUILDING DIVISION WILL ONLY ISSUE A CERTIFICATE OF OCCUPANCY AFTER ALL SPECIAL INSPECTION REPORTS, AND THE FINAL SPECIAL INSPECTION REPORT, HAVE BEEN SUBMITTED AND ACCEPTED.



DESIGN LOADS:

1 - 1,100 LBS MAXIMUM WEIGHT
- 5,650 FT-LBS MAXIMUM MOMENT

2 - 555 LBS MAXIMUM WEIGHT
- 1,992 FT-LBS MAXIMUM MOMENT

NOTES:
1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD
2. CONTRACTOR SHALL VERIFY ALL TOP OF EXISTING STEEL FRAMING ELEVATIONS IN FIELD (AS REQUIRED)

1 1/4" = 1'-0" EXISTING ROOF PLAN - OR4 ROOM

DEFERRED SUBMITTALS NOTE (IBC 107.3.4.1):
DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL. THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN GENERAL CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *May 02, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

NOTES:
1. MOMENTS FROM THE BOOM ARM CAN BE APPLIED IN ANY DIRECTION
2. SEE SITE SPECIFIC DRAWINGS FOR ADDITIONAL OVERHEAD MEDICAL EQUIPMENT SUPPORT REQUIREMENTS.
3. COORDINATE FRAME LAYOUT AND LATERAL BRACING WITH ELECTRICAL LIGHTING AND MECHANICAL DUCTS, PIPING, AND EQUIPMENT.
4. STIFFENER REQUIRED FOR ALL CONCENTRATED LOADS EXCEEDING 100 LBS WHERE L EXCEEDS 3"

3 NO SCALE PERFORMANCE SPECIFIED DELEGATED DESIGN - LIGHT

DESIGN CRITERIA

1) CODES AND STANDARDS:
1A) GENERAL DESIGN
- INTERNATIONAL BUILDING CODE (IBC) 2015 W/ CITY OF AURORA AMENDMENTS
- INTERNATIONAL EXISTING BUILDING CODE (IEBC) 2015

2) LATERAL LOADS:
2A) MODIFICATIONS TO THE EXISTING BUILDING LATERAL SYSTEM CAPACITY AND/OR APPLIED LOADING IS LESS THAN THE ALLOWANCE PROVIDED IN THE IEBC. THEREFORE NO MODIFICATIONS ARE REQUIRED FOR THE EXISTING BUILDING LATERAL SYSTEM.
2B) WIND LOADS:
- RISK CATEGORY = IV
- BASIC ULTIMATE WIND SPEED, Vult = 120 mph
- INTERNAL PRESSURE COEFFICIENT, Gcpi = ± 0.18

2C) SEISMIC LOADS:
- SEISMIC DESIGN CATEGORY = C
- RISK CATEGORY = IV
- EARTHQUAKE IMPORTANCE FACTOR, Ie = 1.5
- MAPPED/DESIGN SPECTRAL RESPONSE ACCELERATION, Ss = 17.3%g / SDs = 18.5%g
- MAPPED/DESIGN SPECTRAL RESPONSE ACCELERATION, S1 = 5.7%g / SD1 = 9.1%g
- SOIL SITE CLASS = D (ASSUMED)

3) GRAVITY LOADS
3A) SUPERIMPOSED ROOF DEAD LOAD = 15 PSF (INCLUDES 5 PSF FOR ROOFING)
3B) DRIFTING, SLIDING AND UNBALANCED SNOW
- GROUND SNOW LOAD = 34 psf
- SNOW EXPOSURE FACTOR, Ce = 1.0
- SNOW LOAD IMPORTANCE FACTOR, Is = 1.2
- THERMAL FACTOR, Ct = 1.0
- MINIMUM UNIFORM ROOF SNOW LOAD = 30 psf

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Structural
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12499 West Colfax Avenue
Lakewood, CO 80215
ph: 303.341.6100

No.	Description	Date

COLORADO LICENSED MATTHEW J. DEZORT 44105 PROFESSIONAL ENGINEER
03/23/2022

TMCA South OR 4 Renovation

1501 S. Potomac St.
Aurora, CO 80012

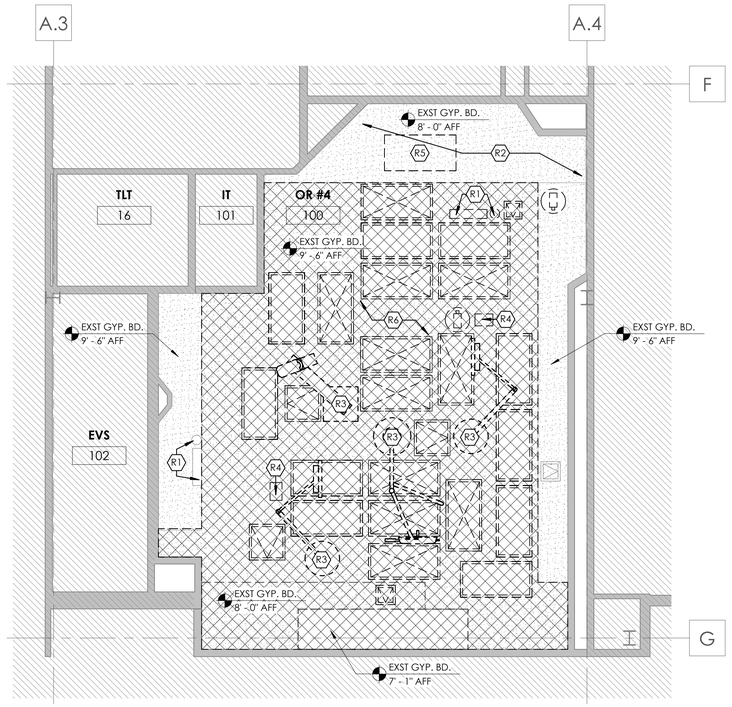
Issue	FOR CONSTRUCTION
Date	23 MAR 2022
Project Number	21.1646.S.01
Drawn by	GR
Checked by	JMD

Sheet Title
STRUCTURAL NOTES AND DETAILS

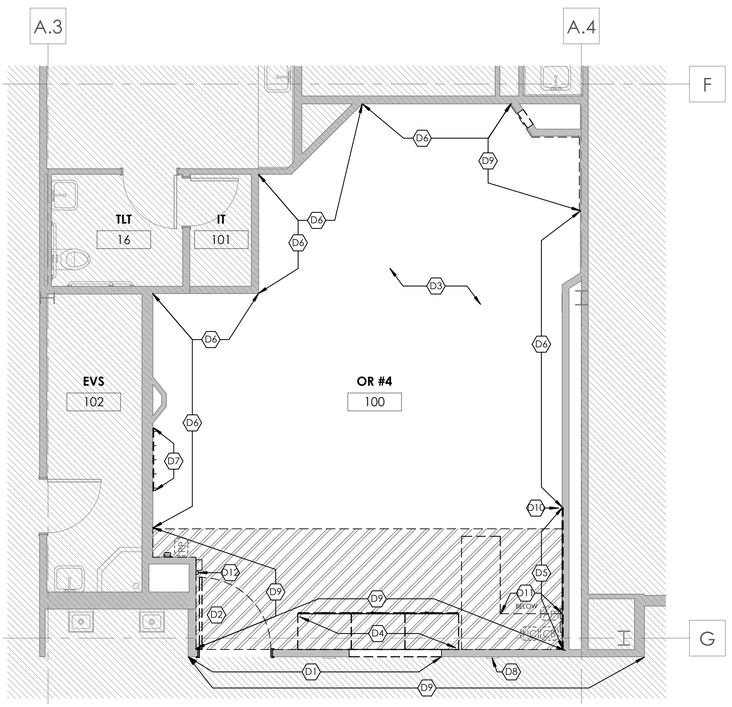
Sheet Number
S-001

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DESIGNERS: GREG RADEMACHER, LINDSEY WHITTINGTON
LEAD REVIT TECH: GREG RADEMACHER, LINDSEY WHITTINGTON
DATE PRINTED: 3/23/2022 1:56:38 PM
FILE PATH: BIM 360/21-033 TMCA OR 4/21-1646.S.01-TMCA - OR 4 Boom Supports_S21.rvt
MM, JOB #: 21-1646.S.01
PRINCIPAL: DAN MULLINS
EOR: DAN MULLINS
PROJECT MANAGER: J MATTHEW DEZORT



02-DEMOLITION REFLECTED CEILING PLAN
1/4" = 1'-0"



01- DEMOLITION FLOOR PLAN
1/4" = 1'-0"

DEMOLITION REFLECTED CEILING PLAN LEGEND

- EXISTING PARTITION TO REMAIN
- EXISTING PARTITION TO BE REMOVED
- OUT OF SCOPE
- EXISTING CEILING TO BE REMOVED WITHIN AREA INDICATED
- EXISTING SUPPLY DIFFUSER TO BE REMOVED
- EXISTING RETURN DIFFUSER TO BE REMOVED
- EXISTING ACCESS PANEL TO BE REMOVED
- EXISTING FLUORESCENT LIGHT FIXTURE TO BE REMOVED

DEMOLITION REFLECTED CEILING PLAN KEYNOTES

- R1 EXISTING MEDICAL GASSES AND REEL TO REMAIN, PROTECT DURING CONSTRUCTION.
- R2 EXISTING GYPSUM BOARD SOFFIT TO REMAIN.
- R3 REMOVE EXISTING EQUIPMENT BOOM AND OFFER TO FACILITY FOR INVENTORY, PRIOR TO DISPOSAL.
- R4 REMOVE AND RETAIN EXISTING SPEAKERS TO BE RELOCATED, RE: ELECTRICAL.
- R5 REMOVE GYPSUM CEILING AND PREPARE TO RECEIVE LIGHTING FIXTURE, RE: ELECTRICAL.
- R6 REMOVE AND RETAIN ALL EXISITING LIGHTING AND DIFFUSERS FOR REINSTALLATION, RE: MPE FOR INSTRUCTION.

DEMOLITION PLAN GENERAL NOTES

1. REFER TO SPECIFICATIONS FOR INTERIM LIFE SAFETY MEASURES.
2. CONSTRUCT TEMPORARY PARTITIONS AS REQUIRED BY PHASING TO MINIMIZE THE SPREAD OF DUST AND NOISE.
3. THESE DRAWINGS HAVE BEEN DEVELOPED FROM EXISITING DRAWINGS WHICH MAY NOT REFLECT ACTUAL FIELD CONDITIONS. VERIFY THESE DRAWINGS WITH EXISTING FIELD CONDITIONS AND NOTIFY THE ARCHITECT IMMEDIATELY OF INCONSISTENCIES BETWEEN THEM AND ACTUAL CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION.
4. REMOVE EXISTING CONSTRUCTION AS INDICATED. TYPICAL WALL REMOVAL INCLUDES FINISHES AND MECHANICAL PLUMBING AND ELECTRICAL SYSTEMS CONTAINED THEREIN. REMOVE DOORS, CASEWORK, WINDOWS, FRAMES, AND OTHER FIXTURES AS REQUIRED. AFTER REMOVAL OF PIPE CHASES, PATCH HOLES IN EXISTING FLOORS OR WALLS TO REMAIN TO MEET ORIGINAL FIRE PROTECTION AND STRUCTURAL REQUIREMENTS. PATCH ADJOINING WALLS.
5. WHERE NEW FINISHES ARE TO BE INSTALLED ON EXISTING SURFACES, REMOVE THE EXISTING FINISH AND PREPARE SURFACE TO RECEIVE THE NEW FINISH.
6. COORDINATE WITH THE OWNER ANY ITEMS TO BE STORED AND/OR RELOCATED.
7. SEE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR DEMOLITION OF UTILITIES.
8. VERIFY THAT EXIT EGRESS IS MAINTAINED FOR ALL OCCUPIED AREAS OF THE BUILDING THROUGHOUT CONSTRUCTION.
9. DEMOLITION WORK SHALL BE EXECUTED IN CONFORMANCE WITH ALL CODES AND AS SET FORTH BY ALL GOVERNING AUTHORITIES.
10. BRACE ALL EXISTING STRUCTURES OR STRUCTURAL ELEMENTS AS NECESSARY DURING DEMOLITION.
11. DO NOT CUT ANY STRUCTURAL WORK WITHOUT PRIOR APPROVAL FROM THE DESIGN TEAM.
12. REPLACE OR REPAIR ANY EXISTING TO REMAIN FINISHES WHICH ARE DAMAGED DURING DEMOLITION (I.E. - CEILING GRID, CEILING TILE, WALL COVERING, FLOOR COVERING, ETC.
13. NOTIFY THE DESIGN TEAM IMMEDIATELY IF THE REMOVAL OF MECHANICAL EXISTING TO REMAIN ELECTRICAL, PLUMBING SYSTEMS OR COMPONENTS WILL ADVERSELY AFFECT THE OPERATION OF MEP SYSTEM OUTSIDE THE LIMIT OF EXISTING TO BE REMOVED - RE: NOTE 5 OF DEMOLITION GENERAL NOTES.
14. SCHEDULE ALL DEMOLITION WITH THE OWNER.

DEMOLITION PLAN LEGEND

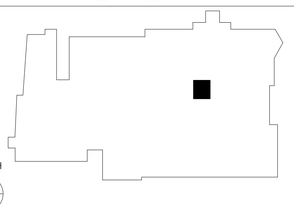
- EXISTING PARTITION TO REMAIN
- EXISTING PARTITION TO BE REMOVED
- OUT OF SCOPE
- EXISTING FLOORING AND BASE ONLY, TO BE REMOVED WITHIN AREA INDICATED.
- AP EXISTING AIPHONE TO BE RELOCATED
- NC EXISTING NURSE CALL DUTY STATION TO BE RELOCATED
- CB EXISTING NURSE CALL CODE BLUE TO BE RELOCATED

DEMOLITION PLAN KEYNOTES

- D1 DEMOLISH PORTION OF WALL TO ACCOMODATE NEW DOOR. VERIFY LOCATION OF EXISITNG ZONE VALVE BOX TO REMAIN. IF FINISHES IN CORRIDOR ARE DAMAGED, REPLACE TO MATCH EXISTING.
- D2 REMOVE DOOR AND ASSOCIATED OPENER AND HARDWARE, RETURN TO FACILITY FOR INVENTORY.
- D3 ALTERNATE NO. 1 DEMOLISH REMAINDER OF EXISITNG FLOORING AND PREPARE ENTIRE SURFACE FOR FLUID APPLIED FLOOR.
- D4 REMOVE EXISTING CASEWORK AND SAVE FOR RELOCATION. SEE FLOOR PLAN FOR NEW LOCATION.
- D5 REMOVE GYPSUM BOARD AND WALL PROTECTION AS REQUIRED TO REMOVE WALL DEVICES. RETAIN FOR REINSTALL.
- D6 EXISTING WALL PROTECTION TO REMAIN, PROTECT DURING CONSTRUCTION.
- D7 REMOVE AND SALVAGE HOOKS FOR RELOCATION.
- D8 OR 7 MEDICAL GASSES TO REMAIN INTACT, PROTECT DURING CONSTRUCTION, RE: PLUMBING FOR AND SPECIFIC MODIFICATIONS.
- D9 REMOVE WALL PROTECTION.
- D10 NEAREST SEAM IN WALL PROTECTION.
- D11 SALVAGE LOUVER DOORS FROM EXISTING CABINET FOR REUSE.
- D12 THERMOSTAT TO BE RELOCATED RE: MECHANICAL.

This sheet of drawings has not been reviewed for code compliance.

KEY PLAN



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Structural
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ph: 303.341.6100

No.	Description	Date

STATE OF COLORADO
JOHN MENNO MARTIN
401729
LICENSED ARCHITECT
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

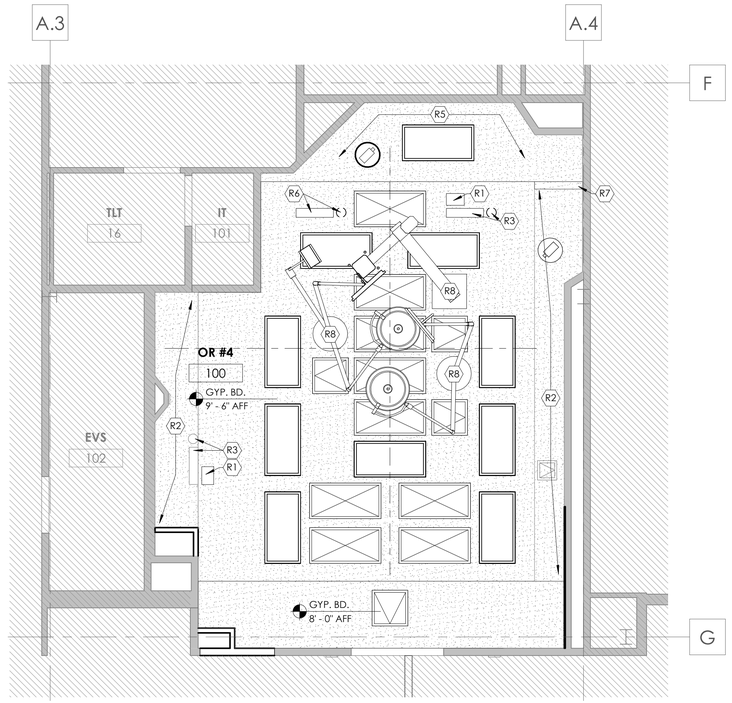
Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	TB
Checked by	SL / JMN

Sheet Title
DEMOLITION PLAN & DEMO REFLECTED CEILING PLAN

Sheet Number
D.201

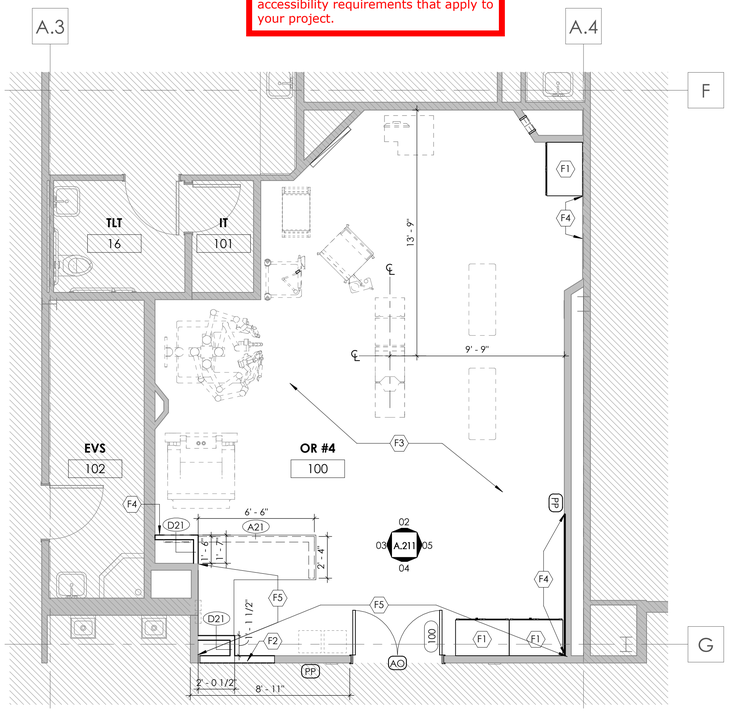
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02- REFLECTED CEILING PLAN
1/4" = 1'-0"

This plan was reviewed for adopted codes and **NOT** for compliance with **ADA** or **FHA** accessibility requirements. Contact 800-949-4232 (**ADA**) and 303-894-7822 x 325 (**FHA**) for federal accessibility requirements that apply to your project.



01- FLOOR PLAN
1/4" = 1'-0"

REFLECTED CEILING PLAN GENERAL NOTES

1. THE CONTRACTOR SHALL COMPARE THIS REFLECTED CEILING PLAN WITH ELECTRICAL LIGHTING PLANS, MECHANICAL SUPPLY, RETURN, AND EXHAUST PLANS. THE CONTRACTOR SHALL REPORT ANY OMISSIONS OR INCONSISTENCIES TO THE ARCHITECT.
2. FOR FURTHER DIMENSIONS SEE ENLARGED PLANS, SECTIONS, ELEVATIONS, AND DETAILS.
3. COORDINATE GYPSUM BOARD FURR DOWN HEIGHTS WITH FULL HEIGHT CABINETS AND INTERIOR ELEVATIONS.
4. 18" MINIMUM VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN THE BOTTOM OF EXTENDED SPRINKLER HEADS AND THE TOP OF ANY FILES, SHELVING, LOCKERS, ETC.
5. THE CONTRACTOR SHALL VERIFY THAT ACCESS PANELS OF TYPE SPECIFIED ARE INSTALLED IN NON-ACCESSIBLE TYPE CEILINGS WHERE SERVICE OR ADJUSTMENT TO MECHANICAL, PLUMBING, OR ELECTRICAL ITEMS MAY BE REQUIRED. ACCESS PANELS SHALL BE THE FIRE RATED TYPE EQUAL TO THE RATING OF THE CEILING IN WHICH THEY OCCUR.

REFLECTED CEILING PLAN LEGEND

- OUT OF SCOPE
- GYPSUM WALL BOARD CEILING
- CEILING TYPE 1' - 0" AFF — CEILING HEIGHT DESIGNATION
- NEW RECESSED LIGHT FIXTURE, RE: ELECTRICAL
- SUPPLY AIR GRILLE RE: MECHANICAL
- RETURN AIR GRILLE RE: MECHANICAL
- 24 X 24 ACCESS PANEL, UNLESS NOTED OTHERWISE
- CEILING MOUNTED SECURITY CAMERA, COORDINATE LOCATION WITH FACILITY PRIOR TO INSTALLATION

REFLECTED CEILING PLAN KEYNOTES

- R1 RELOCATE OVERHEAD SPEAKER. RE: ELECTRICAL.
- R2 EXISTING CEILING TO REMAIN, TAPE AND FLOAT JOINT AT NEW CEILING, LEVEL 5 FINISH.
- R3 EXISTING MEDICAL GAS AND REEL TO REMAIN, PROTECT DURING CONSTRUCTION.
- R4 MEDICAL GAS AND REEL TO BE REINSTALLED IN SAME LOCATION.
- R5 EXISTING SOFFIT TO REMAIN, PROTECT DURING CONSTRUCTION.
- R6 NEW MEDICAL GAS AND REEL. RE: PLUMBING AND ELECTRICAL.
- R7 EXTEND SOFFIT OVER CASEWORK.
- R8 NEW STRYKER BOOMS, RE: DIV 11 IN PROJECT MANIAL FOR NEW EQUIPMENT INSTALLATION GUIDES.

FLOOR PLAN GENERAL NOTES

1. REFER TO SHEET G.101 FOR ADDITIONAL GENERAL NOTES.
2. DIMENSIONS SHOWN ON THE FLOOR PLANS FOR NEW CONSTRUCTION ARE TO THE FACE OF FINISH OF INTERIOR WALLS, TO CENTER LINE OF COLUMNS AND TO THE FACE OF CONCRETE OR MANSONRY WALLS, UNLESS OTHERWISE INDICATED. DIMENSIONS IN RENOVATED AREAS ARE FROM FINISH FACE OF EXISTING WALLS TO FINISH FACE OF NEW STUD WALL, UNLESS OTHERWISE INDICATED.
3. WHERE NEW GYPSUM BOARD PARTITIONS ARE A CONTINUATION OF AN EXISTING PARTITION OR COLUMN ENCASEMENT, THE FACE OF THE NEW GYPSUM BOARD SHALL BE ALIGNED WITH THE FACE OF THE EXISTING SURFACE. WHERE A ONE HOUR PARTITION IS SHOWN AS A CONTINUATION OF A TWO-HOUR PARTITION OR COLUMN ENCASEMENT, THE FACE OF THE GYPSUM BOARD SHALL BE ALIGNED. STUDS SHALL BE OFFSET AND ADDITIONAL LAYERS OF GYPSUM BOARD SHALL BE PROVIDED AS REQUIRED TO PROVIDE FACE ALIGNMENT OF GYPSUM BOARD.

FLOOR PLAN LEGEND

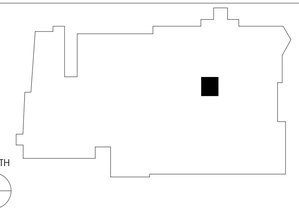
- NEW CONSTRUCTION
- EXISTING TO REMAIN
- XXX — DOOR TAG REF. A.541 FOR DOOR SCHEDULE
- A41 — PARTITION TAG REF. A.501 FOR TYPE CHARTS
- OUT OF SCOPE

FLOOR PLAN KEYNOTES

- F1 RELOCATE EXISTING CASEWORK. PROVIDE NEW 6" BASE BOX. NEW FILLER AND FINISHED END PANEL AS NECESSARY.
- F2 INFILL TO MATCH ASSEMBLY THICKNESS OF EXISTING WALL.
- F3 PROTECT EXISTING WALL PROTECTION DURING CONSTRUCTION.
- F4 PATCH AND REPAIR GYPSUM AND WALL PROTECTION WHERE WALL DEVICES WERE REMOVED.
- F5 PREPARE WALL WITH LEVEL 5 FINISH WHERE WALL PROTECTION WAS REMOVED.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *May 02, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

KEY PLAN



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No.	Description	Date

STATE OF COLORADO
JOHN MENNO HAAS
401729
LICENSED ARCHITECT
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

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AURORA, CO 80012

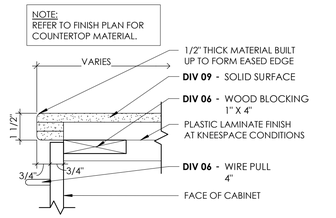
Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	TB
Checked by	SL / JMN

Sheet Title
FLOOR PLAN & REFLECTED CEILING PLAN

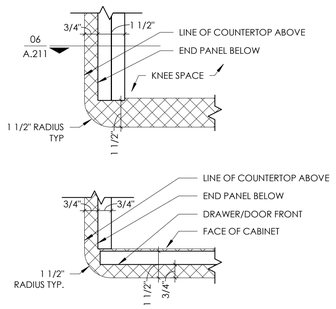
Sheet Number
A.201

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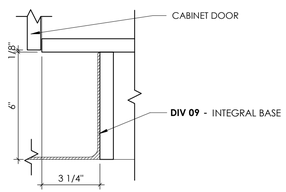
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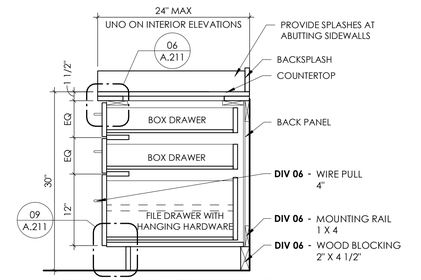
06 - SECTION DETAIL - SOLID SURFACE MAT.
3" = 1'-0"



10 - PLAN DETAIL COUNTER TOP CORNER
3" = 1'-0"



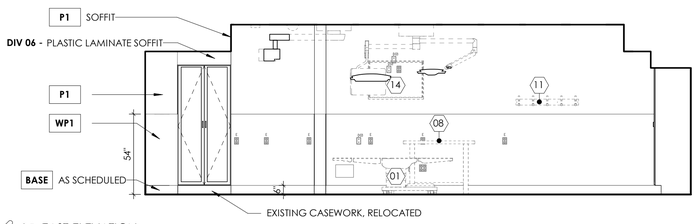
09 - SECTION DETAIL - TOEKICK
3" = 1'-0"



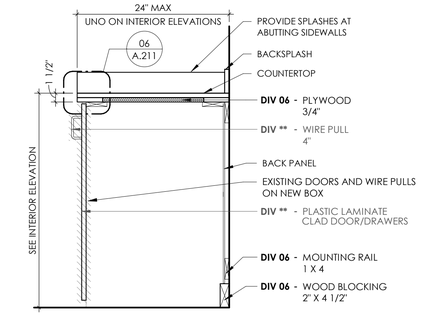
NOTE: REFER TO THIS TYPICAL SECTION D1 FOR MATERIALS, DIMENSIONS AND DETAIL ENLARGEMENTS OF TYPE "D" BASE CABINETS. REFER TO INTERIOR FINISH PLAN FOR COUNTERTOP MATERIAL. REF 01 / A.572 IF PLASTIC LAMINATE, 06 / A.211 IF SIM.

8 - D1 - BASE CABINET
1" = 1'-0"

2 BOX, 1 FILE DRAWER



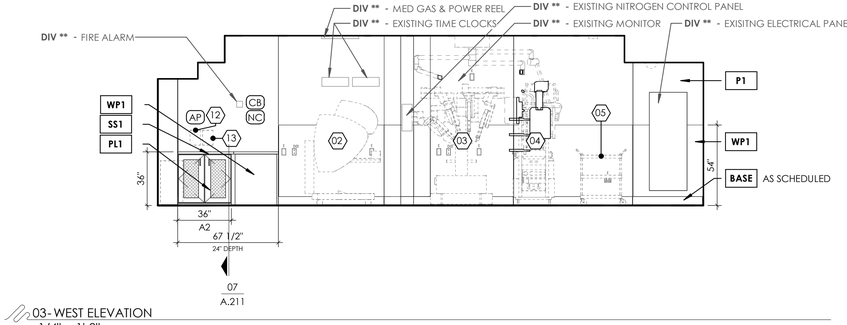
05 - EAST ELEVATION
1/4" = 1'-0"



NOTE: REFER TO THIS TYPICAL DETAIL A1 FOR MATERIALS, DIMENSIONS, ANDDETAIL ENLARGEMENTS OF TYPE "A" BASE CABINETS. REFER TO INTERIOR FINISH PLAN FOR COUNTERTOP MATERIAL. IF PLASTIC LAMINATE RE: 01/A.572, IF SSM RE: 02/A.572

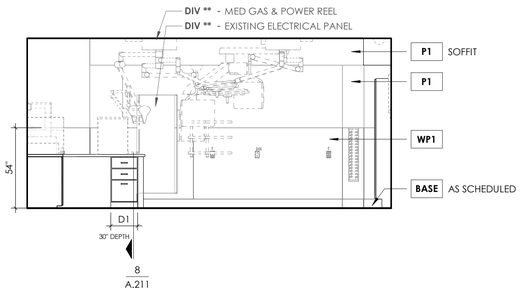
WITH DOOR

07 - A2 - BASE CABINET
1" = 1'-0"

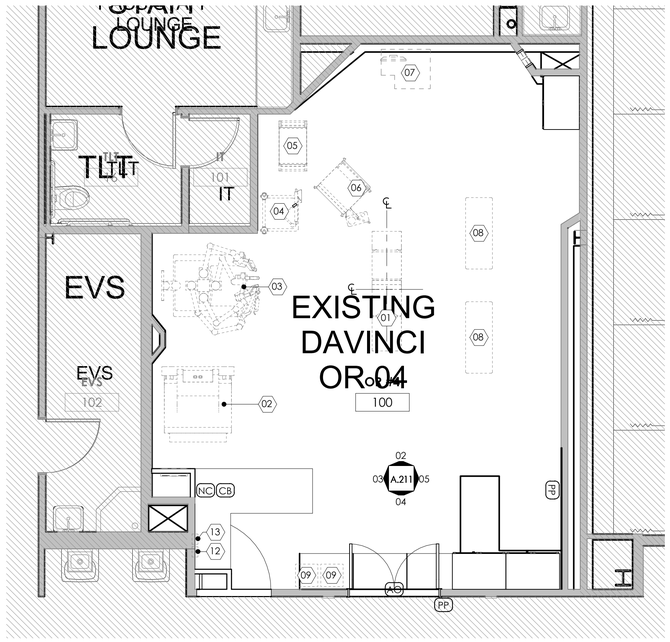


04 - SOUTH ELEVATION
1/4" = 1'-0"

03 - WEST ELEVATION
1/4" = 1'-0"



02 - NORTH ELEVATION
1/4" = 1'-0"



01 - EQUIPMENT PLAN
1/4" = 1'-0"

ELEVATION GENERAL NOTES

1. COORDINATE WITH OWNER, EQUIPMENT PLANS AND ELECTRICAL DOCUMENTS FOR LOCATION OF ALL REQUIRED 2-1/2" GROMMETS AT ALL COUNTER TOP LOCATIONS.
2. PROVIDE PLASTIC LAMINATE FINISHED END PANELS AT ALL EXPOSED ENDS OF BASE AND UPPER CABINETS.
3. CONTRACTOR SHALL PROVIDE SECURE WALL ATTACHMENT FOR ALL CASEWORK TO BE PAINTED TO MATCH ADJACENT WALL COLOR.
4. FILLER STRIPS SHALL BE 1" MINIMUM. NOTIFY ARCHITECT CONCERNING AREAS SMALLER THAN 1".
5. PROVIDE 2" RADIUS CURVED EDGES AT ALL EXPOSED EDGES. RE DETAILS ON A.570 SERIES
6. REFER TO I.100 SERIES FOR CASEWORK FINISHES
7. PROVIDE IN-WALL TUBE SUPPORT FOR COUNTERTOP SUPPORT WHEN NECESSARY AND AS NOTED IN ELEVATIONS IN A.560 SERIES.

ARCHITECTURAL CASEWORK GENERAL NOTES

ALL CASEWORK:

1. ALL SECTION DETAILS ON THIS SHEET MAY NOT APPLY TO THIS PROJECT.
2. ARCHITECTURAL WOODWORK TYPES, WIDTHS, AND HEIGHTS ARE INDICATED ON THE A.56X SERIES SHEETS.
3. FIELD VERIFY EXISTING DIMENSIONS PRIOR TO FABRICATION. NOTIFY ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO FABRICATION.
4. VERIFY AND COORDINATE CLEAR DIMENSIONS REQUIRED FOR OWNER-FURNISHED EQUIPMENT LOCATED WITHIN OR ADJACENT TO ANY CABINETS.
5. COORDINATE INSTALLATION OF SINKS WITH ASSOCIATED PIPING AND FITTINGS PLUS WITH INSTALLATION OF ACCESSIBLE COVER PANELS.
6. REQUIRED SCRIBES AND FILLER PIECES SHALL BE INSTALLED TO ALLOW PROPER OPERATION OF DRAWERS/DOORS. THEY SHALL BE EVENLY DISTRIBUTED AND OF EQUAL WIDTH ALONG A SINGLE RUN OF CABINETS. THEY SHALL BE 3" WIDE, MAXIMUM EXCEPT INSIDE CORNER FILLERS SHALL BE 2 1/2" WIDE MINIMUM.
7. WHERE BASE CABINETS INTERSECT AT INSIDE CORNER CONDITION PROVIDE WALL MOUNTED LEDGERS TO SUPPORT COUNTERTOP AT CORNERS. WHERE UPPER CABINETS INTERSECT AT INSIDE CORNER CONDITIONS PROVIDE HORIZONTAL FILLER PANEL FLUSH WITH BOTTOM OF CABINETS.
8. PROVIDE PLASTIC SCREW COVERS TO CONCEAL SCREW HEADS AT ALL SEMI-EXPOSED CABINET SURFACES. ALL EXPOSED SCREWS SHALL BE COUNTERSUNK.
9. CORE MATERIAL FOR SHELVING GREATER THAN 30" WIDE SHALL BE 1" THICK.
10. ALL VERTICAL JOINTS BETWEEN CABINETS SHALL BE BUTT JOINTS. THEY SHALL LOOK "SEAMLESS" AND BE COVERED IN PLASTIC LAMINATE.
11. ALL EXPOSED SURFACES ON CABINETS WITHOUT DOORS SHALL BE CLAD IN PLASTIC LAMINATE UNO. NO EXPOSED MELAMINE UNO ON INTERIOR ELEVATIONS.

COUNTERTOPS:

1. LOCATE GROMMETS AT BACK OF COUNTERTOPS EVERY 36" OC WITH A MINIMUM OF 1 PER KNEE SPACE UNLESS NOTED OTHERWISE ON THE EQUIPMENT PLAN. COORDIANTE FINAL GROMMET LOCATIONS WITH OWNER. EXCEPTION: DO NOT PROVIDE GROMMETS AT ACCESSIBLE PORTION OF COUNTER, AS INDICATED ON THE EQUIPMENT PLANS.
2. REFER TO INTERIOR ELEVATIONS AND FINISH LEGEND FOR COUNTERTOP MATERIAL. ALL COUNTERTOPS AT SINKS TO BE SOLID SURFACE MATERIAL UNLESS NOTED OTHERWISE ON INTERIOR ELEVATIONS, REF TO TYP. CASEWORK DETAILS ON SHEET A.571 FOR SOLID SURFACE MATERIAL COUNTERTOP EDGE DETAIL AND FOR PLASTIC LAMINATE COUNTEROP EDGE DETAIL.
3. ALL BACK AND SIDE SPLASHES SHALL BE 4" TALL X 3/4" THICK IF PLASTIC LAMINATE. 1/2" THICK IF SOLID SURFACE MATERIAL UNO ON THE INTERIOR ELEVATIONS. ALL SPLASHES SHALL BE SCRIBED TO CONFORM TO THE SURFACE OF ABUTTING WALLS. ALL SPLASHES SHALL BE SEALED TO THE WALL WITH CLEAR SILICONE SEALANT. IF SOLID SURFACE, PROVIDE SPLASHES ON ALL REAR AND SIDE WALLS AT BASE CABINETS.

EQUIPMENT PLAN GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY AND COORDINATE CLEAR DIMENSIONS REQUIRED FOR OWNER FURNISHED EQUIPMENT THAT IS LOCATED WITHIN OR ADJACENT TO BUILT IN CABINETS.
2. ALL GLOVE DISPENSERS ARE TO BE OWNER FURNISHED CONTRACTOR INSTALLED.
3. CONTRACTOR SHALL PROVIDE BLOCKING/STRAPPING FOR ALL MOUNTING BRACKETS OF WALL HUNG EQUIPMENT. COORDINATE FURNISHED EQUIPMENT REQUIREMENTS AND VENDOR DRAWINGS.
4. ALL CEILING AND/OR WALL MOUNTED EQUIPMENT SHALL BE MOUNTED AT 80" CLEAR ABOVE FINISH FLOOR.
5. CONTRACTOR SHALL COORDINATE WITH THE OWNER ON THE DELIVERY AND INSTALLATION OF OWNER FURNISHED EQUIPMENT.

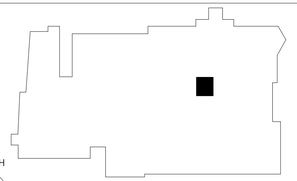
EQUIPMENT PLAN LEGEND

- OWNER FURNISHED EQUIPMENT/ITEM
- CONTRACTOR FURNISHED EQUIPMENT/ITEM
- OUT OF SCOPE
- 1 / A.100 / 1 — INTERIOR ELEVATION TAG
- AO — AUTO OPENER
- NC — NURSE CALL
- PP — PUSH PLATE
- CB — CODE BLUE

EQUIPMENT PLAN KEYNOTES

01	SURGICAL TABLE	OFOI
02	DA VINCI SURGEONS STATION	OFOI
03	DA VINCI ROBOT	OFOI
04	DA VINCI VISION CART	OFOI
05	CART	OFOI
06	ANESTHESIA TOWER	OFOI
07	PYXIS	OFOI
08	STAINLESS STEEL TABLE	OFOI
09	TRASH CAN	OFOI
10	CEILING MOUNTED SECURITY CAMERA	OFOI
11	WALL MOUNT HOOKS	OFCI, EXST
12	INTERCOM SYSTEM	OFCI, EXST
13	STRYKER CONTROL PANEL	OFCI, EXST
14	MONITOR	OFCI, EXST

KEY PLAN



City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: Y. Munoz
Date: May 02, 2022
2015 INTERNATIONAL CODES & 2020 NEC

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No.	Description	Date

STATE OF COLORADO
JOHN MENNO MAP
401729
LICENSED ARCHITECT
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	TB
Checked by	SL / JMN

Sheet Title
EQUIPMENT PLAN, ELEVATIONS & CASEWORK DETAILS

Sheet Number
A.211

3/24/2022 5:11:37 PM

DOOR SCHEDULE

DOOR NO	ROOM NAME	DOOR SIZE W	DOOR SIZE HT	DOOR SIZE THK	DOOR TYPE	DOOR MTL	DOOR FINISH	FRAME TYPE	FRAME MTL	FRAME DETAILS HEAD	FRAME DETAILS JAMB	FRAME DETAILS SILL	DOOR HARDWARE	REMARKS
100	OR #4	5' - 0"	7' - 0"	0' - 1 3/4"	N	WD	PL	B	HM	06/A.501	05/A.501	-	14.0	1, 2, 3
Grand total: 1														

REMARKS:

1. AUTO OPENER.
2. PUSH PLATE / WAVE PLATE.
3. PROVIDE ALTERNATE PRICING FOR PROVISION OF HM DOOR PAINTED TO MATCH HM FRAMES.

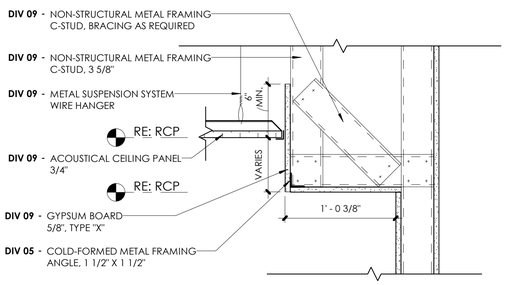
DOOR HARDWARE

HARDWARE #	LEVER SET QTY	LEVER SET TYPE	LEVER SET PRODUCT #	LEVER SET MFR	LEVER SET FINISH	KEYWAY QTY	KEYWAY TYPE	KEYWAY PRODUCT #	KEYWAY MFR	KEYWAY FINISH	HINGES QTY	HINGES TYPE/SIZE	HINGES PRODUCT #	HINGES MFR	HINGES FINISH	CYLINDER QTY	CYLINDER PRODUCT #	CYLINDER MFR	CYLINDER FINISH	AUTOMATIC OPERATOR QTY	AUTOMATIC OPERATOR PRODUCT #	AUTOMATIC OPERATOR MFR	AUTOMATIC OPERATOR FINISH	OVERHEAD STOP QTY	OVERHEAD STOP PRODUCT #	OVERHEAD STOP MFR	OVERHEAD STOP FINISH	KICKPLATE QTY	KICKPLATE PRODUCT #	KICKPLATE MFR	KICKPLATE FINISH	SMOKE GASKET QTY	SMOKE GASKET PRODUCT #	SMOKE GASKET MFR	ASTRAGAL PRODUCT #	ASTRAGAL MFR
14.0	(2) EA	EXIT DEVICE	SG 43.55 56 70 NB8743 ETL	SA	US32D	(1) EA	CORE	KABA PEAKS IC CORE Z50	KA	US15	(2) EA	CONTINUOUS	MCK-12HD-SER-12	MK	CLR	(2) EA	7042	SA	US26D	(2) EA	4.03.05 - LE M-FORCE	STIT	AL	(2) EA	154XS	SA	US26Ż D	(2) EA	K1050 34" X 2" LDW BE CSK	RO	US32D	(1) EA	S88D	PE	303D X LAR	PE

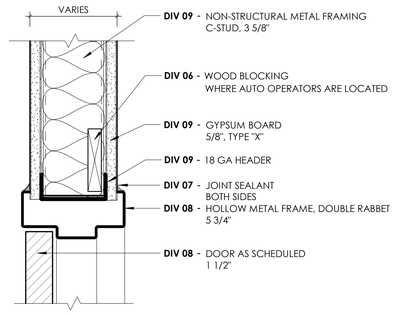
REMARKS:

1. ACTIVING EITHER WALL SWITCH RETRACTS LATCH BOLTS AND INITIATES OPENING CYCLE OF AUTOMATIC OPERATORS. WHEN CYCLE IS COMPLETE, LATCH BOLTS EXTEND AND DOORS ARE LATCHED WHEN CLOSED. KEY SWITCH SHUNTS OUTSIDE WALL SWITCH AND OPERATORS ALLOWING DOORS TO BE LOCKED.
2. ACTUATORS (PUSH PLATE / WAVE PLATE) TO BE REUSED FROM DEMOLITION/RELOCATION.
3. CONFIRM CORE WITH FACILITY STANDARD.
4. PROVIDE MCKINNEY ELECTROLYNX HARNESS QC-C1500 AND QC-C012P
5. PROVIDE SECURITRON POWER SUPPLY (BPS VERIFY VOLTAGE), RELAY RB-4-12, KEYSWITCH MKA2
6. PROVIDE SARGENT RISE AND WIRING DIAGRAMS.

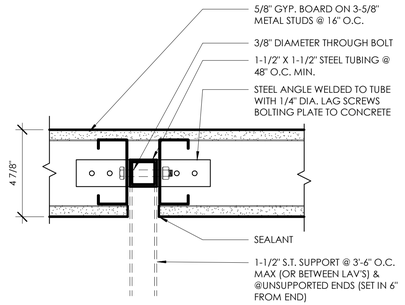
Provide lever or other approved hardware on all new and relocated doors.
2009 ICC/ANSI 117.1 309.4



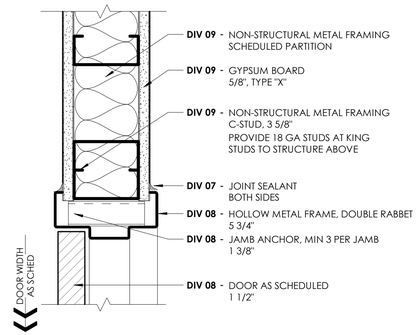
05- DETAIL @ FURR DOWN SOFFIT OVER MILLWORK
1 1/2" = 1'-0"



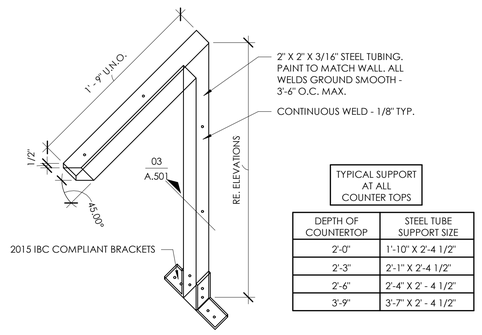
04- HEAD DETAIL
3" = 1'-0"



03- TYPICAL SECTION @ STEEL TUBE SUPPORT
3" = 1'-0"



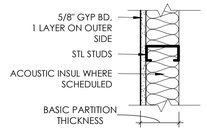
02- JAMB DETAIL
3" = 1'-0"



DEPTH OF COUNTERTOP	STEEL TUBE SUPPORT SIZE
2'-0"	1'-10" X 2'-4 1/2"
2'-3"	2'-1" X 2'-4 1/2"
2'-6"	2'-4" X 2' - 4 1/2"
3'-9"	3'-7" X 2' - 4 1/2"

TYPICAL SUPPORT AT ALL COUNTER TOPS

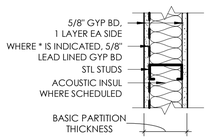
01- STEEL TUBE SUPPORT ISOMETRIC
1 1/2" = 1'-0"



D

NOTE:
1. STC'S ARE PREDICTED USING THE "INSUL" COMPUTER PROGRAM.
2. STC'S ARE BASED ON 0.018" THICK (25 GA) STUDS.
3. REFER TO A.500 SERIES FOR BRACING.

	D1	STC	D2	STC	D3	STC	D4	STC	D5	STC
NON-RATED WITH GYP BD TO STRUCTURE ABOVE	D11	27	D21	29	D31	27	D41	30	D51	27
NON-RATED WITH GYP BD TO 6" ABOVE CEILING	D12		D22		D32		D42		D52	
NON-RATED WITH STUDS & GYP BD TO FINISHED CEILING	D13		D23		D33		D43		D53	
STUD SIZE	2 1/2"		2 1/2"		3 5/8"		3 5/8"		4"	
BASIC PARTITION THICKNESS	3 1/8"		3 1/8"		4 1/4"		4 1/4"		4 5/8"	
ACOUSTICAL INSULATION THICKNESS	-		2"		-		3"		-	
ACOUSTICAL TEST NUMBER	NOTE 1		NOTE 1		NOTE 1		NOTE 1		NOTE 1	
FIRE TEST NUMBER (WHERE APPLICABLE)										

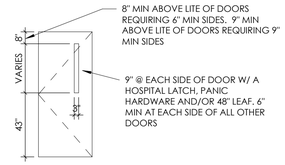


A

NOTE:
1. STC IS PREDICTED USING THE "INSUL" COMPUTER PROGRAM.
2. STC IS MODIFIED FROM THE REFERENCE.
3. STC IS BASED ON 0.018" THICK (25 GA) STUDS
4. WHERE AN * NEXT TO THE PARTITION TAG, A SINGLE LAYER OF LEAD LINED GYPSUM BOARD IN LIEU OF TYPE X GYPSUM BOARD ON THE PROCEDURE ROOM SIDE OF THE WALL, NOT TO BE USED FOR FIRE RATED WALLS.

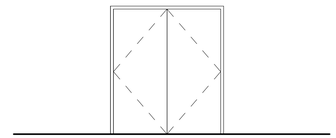
	A1	STC	A2	STC	A3	STC	A4	STC	A5	STC
1-HR RATED WITH GYP BD TO STRUCTURE ABOVE			A20	46	A30	39	A40	47	A50	39
NON-RATED WITH GYP BD TO STRUCTURE ABOVE (SMOKE RESIST)	A11	39	A21	46	A31 (*)	39	A41	47	A51 (*)	39
NON-RATED WITH GYP BD TO 6" ABOVE CEILING	A12		A22		A32 (*)		A42		A52 (*)	
NON-RATED WITH STUDS & GYP BD TO FINISHED CEILING	A13		A23		A33		A43		A53	
PARTIAL HEIGHT PARTITION. SEE FLOOR PLANS FOR HEIGHTS.	A14		A24		A34		A44		A54	
STUD SIZE	2 1/2"		2 1/2"		3 5/8"		3 5/8"		4"	
BASIC PARTITION THICKNESS	3 3/4"		3 3/4"		4 7/8"		4 7/8"		5 1/4"	
ACOUSTICAL INSULATION THICKNESS	-		2"				3"			
ACOUSTICAL TEST NUMBER	SIM USG 860808		SIM SA 831001		SIM USG 860808		SIM USG 870717		SIM USG 860808	
FIRE TEST NUMBER (WHERE APPLICABLE	-		UL DES U419		UL DES U465		UL DES U465		UL DES U465	

DOOR TYPES



N
NARROW LITE
100 SQ IN MAX

DOOR FRAME TYPES



B
DOUBLE EGRESS

DOOR SCHEDULE ABBREVIATIONS

MATERIAL:
HM - HOLLOW METAL
WD - (INSERT SPECIES) DOOR

FINISH:
*REFER TO FINISH LEGEND FOR MORE INFORMATION.
STN1- STAIN
PL - PLASTIC LAMINATE

HARDWARE MANUFACTURERS:
KA - KABA PEAKS
MK - MCKINNEY
SU - SECURITRON
SA - SARGENT
ST - STANLEY
RO - ROCKWOOD
PE - PEMKO
ME - MATCH EXISTING
EX - EXISTING

PARTITION TYPE GENERAL NOTES

1. REFER TO FLOOR PLAN SERIES A.200 FOR LOCATION OF PARTITION TYPES.
2. REFER TO THE I.101 FOR FINAL FINISHES ON PARTITIONS. PARTITION TYPES IN CHARTS REFER TO BASE WALL ONLY.
3. WHEN BLOCKING REQUIRED IN A PARTITION, USE A MINIMUM .033" (20 GA) STUD.
4. PROVIDE FIRE TREATED WOOD BLOCKING, SHEET METAL OR STEEL BACKING IN PARTITIONS TO SUPPORT WALL MOUNTED ITEMS AND EQUIPMENT. FOR EXAMPLE, AT CABINETS, HANDRAILS, GUARDRAILS, TOILET PARTITIONS AND ACCESSORIES, WALL-MOUNTED EQUIPMENT, ETC.
5. ISOLATE NON-LOAD BEARING FRAMING FROM STRUCTURAL ELEMENTS TO PREVENT THE TRANSFER OF LOAD TO PARTITION FRAMING. STOP STUD BELOW METAL RUNNER (TOP TRACK) TO ALLOW FOR VERTICAL EXPANSION. SET TOP TRACK 1" BELOW DEFLECTION TRACK. DO NOT ATTACH STUDS TO TOP TRACK. DO NOT ATTACH GYPSUM BOARD TO THE DEFLECTION TRACK. THIS MAY ALSO BE ACHIEVED, AT THE CONTRACTORS OPTION, BY UTILIZING THE PROPRIETARY SYSTEM DESCRIBED IN THE PROJECT MANUAL.
6. REFER TO DOOR AND WINDOW SCHEDULES FOR NOTES REGARDING STUDS AT OPENINGS.
7. REFER TO THE A.500 SERIES FOR HEAD OF WALL DETAILS FOR NON-RATED PARTITIONS.

ACOUSTICAL PARTITIONS

THE FOLLOWING NOTES APPLY TO ALL PARTITIONS DESIGNATED TO HAVE A SOUND TRASMISSION CLASS (STC) RATING ON THE PARTITION CHARTS. REFER TO DETAILS ON THE A.500 SERIES FOR PARTITION TYPES WITH A DESIGNATED STC RATING.

1. ALL ACOUSTICALLY CLASSED PARTITIONS SHALL BE CONSTRUCTED IN STRICT ACCORDANCE TO THE REFERENCED TEST.
2. STAGGER AND SEAL ALL JOINTS ON MULTIPLE GYPSUM BOARD LAYER PARTITIONS.
3. SEAL PARTITIONS AIR TIGHT AT FLOORS, SIDES, AND CEILINGS ON BOTH SIDES WITH NON-HARDENING ACOUSTICAL SEALANT.
4. ALL BATTS AND BLANKETS IN RATED PARTITIONS MUST BEAR THE REQUIRED UL CLASSIFICATION MARKING AS TO FIRE- RESISTANCE. REFER TO CODE COMPLIANCE DETAILS IN THE G.300 SERIES.
5. AT ACOUSTICALLY RATED PARTITIONS, DO NOT FILL THE STUD CAVITY (DEPTH) FULLY WITH SOUND BATTS. THE WIDTH OF THE SOUND BATTS SHOULD BE SLIGHTLY SMALLER THAN CAVITY TO AVOID BATT COMPRESSION; HOWEVER, THE ENTIRE LENGTH AND HEIGHT OF THE PARTITION SHOULD HAVE CONTINUOUS AND UNINTERRUPTED SOUND ATTENUATION BATTS.
6. SEAL ALL WALL INTERSECTIONS AND CONTROL JOINTS AT ACOUSTICALLY CLASSED PARTITIONS IN ACCORDANCE WITH DETAILS IN THE A.500 SERIES.
7. SEAL ALL CONDUIT, STRUCTURAL, DUCT AND LARGE PIPE PENETRATIONS ACCORDING TO DETAILS IN THE A.500 SERIES TO MAINTAIN THE ACOUSTICAL RATING OF THE WALL. IF THE PARTITION IS FIRE RATED, REF THE CODE COMPLIANCE DETAILS ON THE G.300 SERIES.
8. OUTLETS ON OPPOSITE SIDES OF ACOUSTICALLY CLASSED PARTITIONS SHOULD BE SEPARATED BY A MINIMUM OF ONE STUD. SEAL OUTLETS IN ACCORDANCE WITH DETAILS IN THE A.500 SERIES TO MAINTAIN ACOUSTICAL RATING. IF THE PARTITION IS FIRE RATED REFER TO G.300 SERIES.
9. THE ARCHITECT SHALL OBSERVE THAT ALL BOXES REQUIRED TO BE ACOUSTICALLY SEALED ARE SEALED PRIOR TO CLOSING IN PARTITIONS AND INSTALLING DEVICES AND COVER PLATES.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *May 02, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

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No.	Description	Date

STATE OF COLORADO JOHN MENNO HAP HOFMEYR 401729 LICENSED ARCHITECT
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

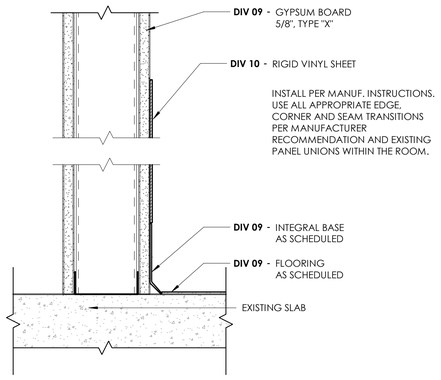
Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	TB
Checked by	SL / JMN

Sheet Title
INTERIOR PARTITION TYPE CHART, DETAILS & DOOR HARDWARE

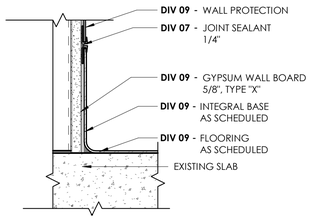
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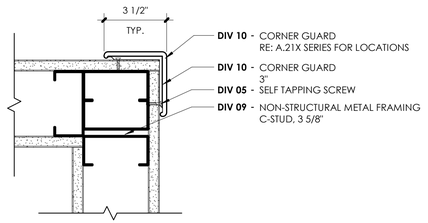
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04- WP1 - WALL PROTECTION DETAIL
3" = 1'-0"

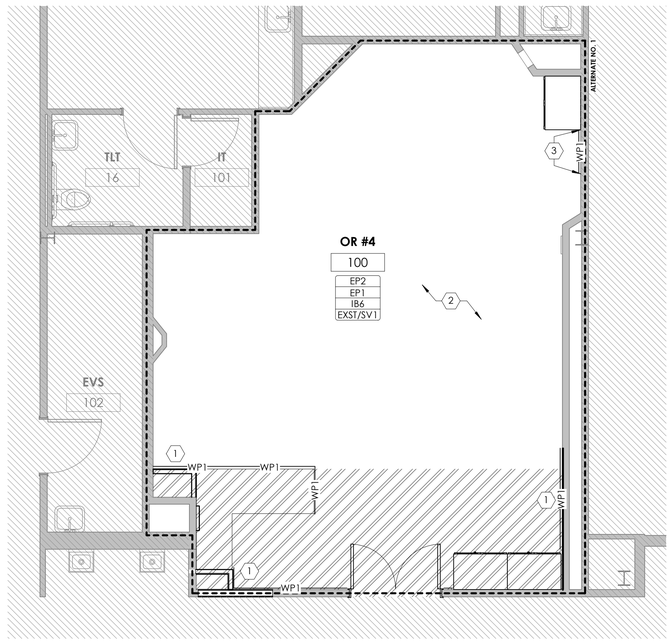


03- TYPICAL INTEGRAL BASE
3" = 1'-0"



*NOTE: CORNER GUARD TO BE MOUNTED ABOVE SCHEDULE BASE

02- WP2 SINGLE CORNER GUARD - DETAIL
3" = 1'-0"



01- FINISH FLOOR PLAN
1/4" = 1'-0"

FINISH LEGEND NOTES

WALL FINISH:
1. WALL TEXTURE SHALL MATCH FACILITY STANDARD, UNLESS NOTED OTHERWISE.
2. PAINT ALL WALLS LATEX EGGSHELL, UNLESS NOTED OTHERWISE. SEE FINISH LEGEND FOR DEFINITION.
3. PAINT ALL ELECTRICAL AND ACCESS WALL PANELS TO MATCH ADJACENT WALL FINISH.

FLOOR FINISH:
1. ALL FLOOR TRANSITIONS ARE TO OCCUR AT THE CENTERLINE OF DOOR WHEN DOOR IS IN CLOSED POSITION.
2. REFER TO INTERIOR FLOOR FINISH PLANS FOR ALL FLOOR PATTERNS.

DOORS/WINDOWS:
1. INTERIOR HOLLOW METAL DOOR & FRAM TO BE PAINTED TO MATCH FACILITY STANDARD, UNLESS NOTED OTHERWISE.

CEILING FINISH:
1. FURR-DOWN FINISH: VERTICAL AND HORIZONTAL SURFACES OF FURR-DOWN TO MATCH ADJACENT WALLS, UNLESS NOTED OTHERWISE.
2. REFER TO REFLECTED CEILING PLAN FOR ALL CEILING HEIGHTS.
3. PAINT ALL GYP. BD. CEILINGS LATEX EGGSHELL, UNLESS NOTED OTHERWISE. SEE FINISH LEGEND FOR DEFINITION.
4. PAINT ALL ACCESS PANELS IN CEILING TO MATCH ADJACENT CEILING FINISH.
5. PAINT ALL SIDES OF SOFFIT FOR GYP. CEILING ABOVE COLOR LISTED ON REFLECTED CEILING PLAN.
6. ALL CEILING GRID WALL ANGLES TO BE SEALED AT WALL WHERE PAINT OCCURS.

ACCESSORIES:
1. REFER TO EQUIPMENT PLAN AND DETAILS FOR WALL PROTECTION (WP) LOCATIONS. REFER TO INTERIOR FINISH LEGEND FOR SPECIFIC PROFILES AND COLORS.
2. PROVIDE CLEAR SILICONE JOINT SEALANT BETWEEN SHEET WALL PROTECTION TRIM AND FINISHED GYPSUM BOARD AS WELL AS SHEET WALL PROTECTION AND FLOORING BASE UNLESS NOTED OTHERWISE.
3. INSTALL ADA COMPLIANT SIGNAGE PROVIDED BY FACILITY AT ALL ROOMS WITHIN SCOPE UNLESS OTHERWISE INDICATED BY FACILITY.

FINISH LEGEND

FLOORING
SV1
MANUF: MANNINGTON
STYLE: BIOSPEC
COLOR: TECHNO GRAY (15371) TO MATCH EXISTING PERIMETER
FLOOR- VIF
SIZE: 6.58' X 90' X 0.08" THICK

COVE BASE SV
MANUF: MANNINGTON
STYLE: ENTWINED LINO
COLOR: HULL EYW102

RF1 (ALTERNATE NO.1)
MANUF: STONHARD
STYLE: STONSHIELD HRI
COLOR: FLAGSTONE MEDIUM TEXTURE
CONTACT: TYLER TENNANT @303.854.7773

BASE
IB6
6" H INTEGRAL BASE

RB1
MANUF: MANNINGTON
STYLE: OPTIMUM EDGE
COLOR: TAUPESTONE 909
NOTE: MITER INSIDE CORNERS. NO NOT USE PREMOLDED OUTSIDE CORNERS.

WALLS
EP2
MANUF: SHERWIN WILLIAMS
COLOR: KILIM BEIGE #SW6106
FINISH: EPOXY, SEMI-GLOSS

WALL PROTECTION

WP1 SHEET
(ME)
COLOR: OATMEAL 0239
*INCLUDE MANUF TRIM PIECES AS REQUIRED.

WP2 SINGLE CORNER GUARD
(ME)
MANUF: CS ACROVYN
STYLE: SM-20
SIZE: 3" X 3" X REFER TO DETAIL HEIGHT
COLOR: OATMEAL 0239

CEILING
EP2
MANUF: SHERWIN WILLIAMS
COLOR: DIVINE WHITE #SW6105
FINISH: EPOXY, SEMI-GLOSS

MILLWORK
PL1
MANUF: WILSONART
COLOR: SHAKER CHERRY #7935K-07

SS1
MANUF: CORIAN
COLOR: TUMBLEWEED

(ME) MATCH EXISTING

(E) EXISTING TO REMAIN

FINISH PLAN GENERAL NOTES

1. REFER TO INTERIOR FINISH LEGEND FOR FINISH MANUFACTURER AND COLOR INFORMATION.

2. REFER TO A.201 REFLECTED CEILING PLAN FOR LOCATION OF CEILING FINISHES AND CEILING HEIGHTS.

FINISH PLAN LEGEND

ROOM FINISH TAG (REFERENCE I.101 SHEET)

ACT	CEILING FINISH
P	WALL FINISH
RB	WALL BASE FINISH
SV	FLOOR FINISH

* DENOTES MULTIPLE FINISHES. PLEASE REFER TO ENLARGED PLANS, DETAILS AND/OR ELEVATIONS FOR MORE INFORMATION.

1 KEYNOTE

OUT OF SCOPE

WP1 WALL PROTECTION

CG2 CORNER GUARD

FINISH PATTERN LEGEND

FLOOR FINISH

SV1

FINISH PLAN KEYNOTES

1 TIE IN EXISTING WALL PROTECTION TO NEW WP1.

2 PREPARE ENTIRE FLOOR SURFACE TO RECIEVE RESINOUS FLOORING PER ALTERNATE #1. RESINOUS FLOORING TO MATCH BASE HEIGHT OF EXISTING FLOORING.

3 PATCH WALL PROTECTION AS REQUIRED.

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *May 02, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

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No.	Description	Date

STATE OF COLORADO
JOHN MENNO MARTIN
401729
LICENSED ARCHITECT
05/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
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Sheet Title

FINISH LEGEND, DETAILS & PLAN

Sheet Number

I.101

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MECHANICAL ABBREVIATIONS

AAV	AUTOMATIC AIR VENT (VALVE)
AB	AIR BLENDER
AC	AIR CONDITIONING UNIT OR AIR COMPRESSOR
ACH	AIR CHANGES PER HOUR
AD	ACCESS DOOR
AF	AIR FILTER
AFC	AUTOMATIC FLOW CONTROL DEVICE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AMP	AMPERE
AMS	AIR FLOW MEASURING STATION
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT/ARCHITECTURAL
AS	AIR SEPARATOR
AUTO	AUTOMATIC
AVG	AVERAGE
BAS	BUILDING AUTOMATION SYSTEM
BD	BALANCING DAMPER
BDD	BACK-DRAFT DAMPER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTUH	BRITISH THERMAL UNIT PER HOUR
CAP	CAPACITY
CC	COOLING COIL
CCW	COUNTER CLOCKWISE
CD	CONDENSATE DRAIN
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CL	CENTER LINE
CO	CLEAN OUT OR CARBON MONOXIDE
CONT	CONTINUOUS, CONTINUATION
CP	COIL PUMP
CT	COOLING TOWER
CU	CONDENSING/ER UNIT
CU FT	CUBIC FEET
CV	CONSTANT AIR VOLUME
CW	COLD WATER OR CLOCKWISE
D	DRAIN
DB	DECIBEL OR DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DE	DRYER EXHAUST
DER	DRYER EXHAUST RISER
DEG.F	DEGREE FARENHEIT
DG	DOOR GRILLE
DIA	DIAMETER
DIFF	DIFFUSER
DISCH	DISCHARGE
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
E	EXHAUST
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EBB	ELECTRIC BASEBOARD HEATER
EC	ELECTRICAL CONTRACTOR
ECH	ELECTRIC CABINET HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL-WATER SOLUTION (% GLYCOL BY VOLUME)
EHC	ELECTRIC HEATING COIL
ELEC	ELECTRIC/ELECTRICAL
EL/ELEV	ELEVATION
ENT	ENTERING
EQUIP OR EQT	EQUIPMENT
E/RF	EXHAUST/RETURN FAN
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXIST	EXISTING
F	FILTER
°F	DEGREE FARENHEIT
FA	FREE AREA
FD	FIRE DAMPER
FLA	FULL LOAD AMPERES
FLEX	FLEXIBLE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
FPB	FAN POWERED TERMINAL UNIT
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FS	FREEZE STAT
F/SD	COMBINATION FIRE/SMOKE DAMPER
FT	FEET OR FLASH TANK
FTR	FIN TUBE RADIATION (HOT WATER)
FV	FACE VELOCITY
GA	GAUGE
GAL	GALLON
GC	GENERAL CONTRACTOR
GD	GRAVITY DAMPER
GEN	GENERAL
GE	GENERAL EXHAUST
GER	GENERAL EXHAUST RISER
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	HUMIDISTAT
HC	HEATING COIL
HORIZ	HORIZONTAL
HP	HORSEPOWER OR HEAT PUMP
HR	HOUR
HTG	HEATING
HUM	HUMIDIFIER
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IN OR "	INCH
INSUL.	INSULATION
IN W.C.	INCHES WATER COLUMN
IN W.G.	INCHES WATER GAUGE
KE	KITCHEN EXHAUST
KER	KTICHEN EXHAUST RISER
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LL	LOW LIMIT OR LANDLORD
LP	LOW PRESSURE GAS
LRA	LOCKED ROTOR AMPERES
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MB	MIXING BOX
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM OR MINUTE(S)
MD	MOTORIZED DAMPER
MP	MEDIUM PRESSURE GAS
NC	NORMALLY CLOSE OR NOISE CRITERIA
NIC	NOT IN CONTRACT
NK	NECK
NO	NORMALLY OPEN
NO OR #	NUMBER
NR	NOT REQUIRED
NTS	NOT TO SCALE
NV	NATURAL VENTILATION
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DIAMETER
OPNG	OPENING
OV	OUTLET VELOCITY OR OVAL
P	PUMP
CTP	COOLING TOWER PUMP
CWP	CONDENSER WATER PUMP
PC	PLUMBING CONTRACTOR
PCD	PUMPED CONDENSATE DISCAHRGE
PG	PROPYLENE GLYCOL-WATER SOLUTION (%GLYCOL BY VOLUME)
PLBG	PLUMBING
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
R	RETURN OR RISER
RA	RETURN AIR
REQ'D	REQUIRED
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RO	RELIEF OPENING
RP	RADIANT PANEL
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE (VENT) OR ROOF VENTILATOR
S	SUPPLY
SA	SOUND ATTENUATOR
SF	SUPPLY FAN OR SQUARE FEET
SHT	SHEET
SL	SENSIBLE LOAD
SP	STATIC PRESSURE
SPECS	SPECIFICATIONS
SQ	SQUARE
SQ.FT.	SQUARE FEET
SS	STAINLESS STEEL
STD	STANDARD
STRUC	STRUCTURE/STRUCTURAL
T	THERMOSTAT/TEMPERATURE SENSOR
TD	TEMPERATURE DIFFERENCE OR TRANSFER DUCT
TEF	TOILET EXHAUST FAN
TER	TOILET EXHAUST RISER
TEMP	TEMPERATURE
TO	TRANSFER OPENING
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UC	UNDER-CUT (DOOR)
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VENT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VSD	VARIABLE SPEED DRIVE
W	WATT
W/	WITH
WC	WATER COLUMN
WFD	WATER PRESSURE DROP
WMS	WIRE MESH SCREEN
WT	WEIGHT
XA	VARIABLE LENGTH ACCESS

SOUND ATTENUATOR

UC OR DG — DG: DOOR GRILLE; UC: DOOR UNDERCUT

T — THERMOSTAT

T — THERMOSTAT MOUNTED TO THERMOISOLATING PAD IF ON EXTERIOR COLUMN

T — DUCT MOUNTED THERMOSTAT

H — HUMIDISTAT

SD — SMOKE DETECTOR

CD — CARBON MONOXIDE DETECTOR

CO2 — CARBON DIOXIDE DETECTOR

TS — TEMPERATURE SENSOR

N.I.C. - FUTURE TENANT BUILDOUT

REQUIRED MAINTENANCE CLEARANCE

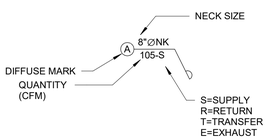
IDENTIFICATION SYMBOLS

X — KEYED NOTE TAG

X / X — EQUIPMENT TAG; EQUIPMENT TAG NO.

X / M-X — SECTION NUMBER; DRAWING ON WHICH SECTION IS SHOWN

AIR DEVICES DATA TAG



DUCTWORK SYMBOLS

DOUBLE LINE

(E)12X12 — EXISTING DUCT

EXISTING DUCT OR ITEM TO BE REMOVED

EXISTING DUCT OR ITEM TO REMAIN

BRANCH TAKE-OFF

RADIUS ELBOW

SQUARE TAP COLLAR

RADIUS TEE

BELLMOUTH CONNECTION TO RECT. DUCT

CONICAL TEE

WYE OR TEE

EXHAUST/RETURN AIR DEVICE

24X12 — RECT. DUCT DIMENSIONS (SIZE IN INCHES. FIRST DIM. IS SHOWN)

24Ø — ROUND DUCT DIMENSIONS DIAMETERS

24/12 — FLAT OVAL (SIZE IN INCHES) (FIRST DIM. IS SHOWN)

DUCT TRANSITION

ELBOW TURNED DOWN

ROUND DUCT DN

SUPPLY AIR DUCT

EXHAUST AND RETURN DUCT

OUTSIDE AIR INTAKE

FLEX. DUCT CONNECTION

FIRE DAMPER — FD

CLEAN OUT

MANUAL DAMPER

MOTORIZED (AUTOMATIC) DAMPER — MD

LOW LEAKAGE MOTORIZED DAMPER — LLMD

ACCESS DOOR — AD

CAP

DUCT OFF-SET DN (IN DIRECTION OF FLOW) — DN

DUCT OFF-SET UP (IN DIRECTION OF FLOW) — UP

FLEXIBLE DUCT

AIR TERMINAL UNIT

AIR TERMINAL UNIT W/REHEAT

PIPING SYMBOLS

(E)SERVICE — EXISTING PIPE

EXISTING PIPE OR ITEM TO BE REMOVED

EXISTING PIPE OR ITEM TO REMAIN

CD — CONDENSATE DRAIN

CWR — CONDENSER WATER RETURN

CWS — CONDENSER WATER SUPPLY

CTWR — COOLING TOWER WATER RETURN

CTWS — COOLING TOWER WATER SUPPLY

D — DRAIN

G — NATURAL GAS

HWR — HOT WATER HEATING RETURN

HWS — HOT WATER HEATING SUPPLY

V — V — VENT

AIR SEPARATOR

DIRECTION OF FLOW ARROW

CONCENTRIC REDUCER

ECCENTRIC REDUCER

TEE

TEE TURNED DOWN

TEE TURNED UP

ELBOW 45°

ELBOW TURNED UP

ELBOW TURNED DOWN

PRESSURE GAUGE

FLANGE

CAPPED END CONNECTION

EXPANSION JOINT

FLEXIBLE CONNECTION

FM — FLOW METER

EXPANSION COMPENSATOR

BALL VALVE

PRESSURE INDEPENDANT FLOW CONTROL AND SHUT-OFF VALVE

BUTTERFLY VALVE

CHECK VALVE

HOSE END DRAIN VALVE

TRIPLE DUTY CHECK VALVE

GATE VALVE

GLOBE VALVE

MANUAL AIR VENT

M M — MOTORIZED 2-WAY OR 3-WAY CONTROL VALVE

SOLENOID VALVE

PRESSURE REDUCING VALVE

PRESSURE RELIEF VALVE

GAS COCK

PIPE UNION

STRAINER

SAFETY VALVE

VACUUM BREAKER

IN-LINE PUMP

PRESSURE GAUGE WITH COCK

THERMOMETER

FLOW SWITCH

PIPE ANCHOR

PIPE GUIDE

UNION

Y-TYPE STRAINER

Y-TYPE STRAINER WITH HOSE ENDED DRAIN VALVE

BASKET STRAINER

FILTER/DRYER

M — MOTOR ACTUATOR

T — CONDENSATE TRAP

PRESSURE-TEMPERATURE PORT

MECHANICAL CODE REFERENCE

2021 CITY OF AURORA BUILDING CODES AND AMENDMENTS
2015 INTERNATIONAL EXISTING BUILDING CODE (IEBC)
2015 INTERNATIONAL BUILDING CODE (IBC)
2015 INTERNATIONAL MECHANICAL CODE (IMC)
2015 INTERNATIONAL PLUMBING CODE (IPC)
2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

MECHANICAL DRAWING LIST

M.101 - MECHANICAL SYMBOLS, ABBREVIATIONS, AND NOTES
M.102 - MECHANICAL SPECIFICATIONS AND DETAILS
M.201 - OR #4 PLAN - MECH - DEMO
M.202 - OR #4 PLAN - MECH - NEW CONSTRUCTION

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No.	Description	Date

COLORADO LICENSED — MICHAEL P. THOMPSON — 56150 — PROFESSIONAL ENGINEER
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	EV
Checked by	JH

Sheet Title
MECHANICAL SYMBOLS, ABBREV., AND NOTES

Sheet Number
M.101

This sheet of drawings has not been reviewed for code compliance.

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MECHANICAL SPECIFICATIONS

GENERAL SPECIFICATIONS

1. WORK UNDER THIS SECTION IS SUBJECT TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, INCLUDING THE DRAWINGS, GENERAL AND SUPPLEMENTARY CONDITIONS OF THE ARCHITECTURAL SPECIFICATIONS.
2. THE DRAWINGS AND SPECIFICATIONS SHALL BE UNDERSTOOD TO COVER SYSTEMS OF HEATING, VENTILATION AND AIR CONDITIONING, INSULATION, BUILDING AUTOMATION SYSTEMS AND TEMPERATURE CONTROL, AND TESTING AND BALANCING. THE DRAWINGS AND SPECIFICATIONS ARE TO BE TAKEN TOGETHER. WORK SPECIFIED AND NOT SHOWN, OR WORK SHOWN AND NOT SPECIFIED, SHALL BE AS BINDING AS THOUGH REQUIRED BY BOTH, THE DRAWINGS AND SPECIFICATIONS.
3. MINOR ITEMS AND ACCESSORIES OR DEVICES REASONABLY INFERABLE AS NECESSARY TO THE COMPLETE AND PROPER OPERATION OF ANY SYSTEM SHALL BE PROVIDED FOR SUCH SYSTEMS, WHETHER OR NOT THEY ARE SPECIFICALLY CALLED FOR BY THE SPECIFICATIONS OR THE DRAWINGS. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL NECESSARY PERMITS AND LICENSE FEES, MAKE ARRANGEMENTS FOR INSPECTIONS, PAY ALL FEES IN CONNECTION THEREWITH, EXCEPT BUILDING PERMIT, AND PAY ALL APPLICABLE FEDERAL, STATE AND LOCAL TAXES.
4. THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL NECESSARY PERMITS AND LICENSE FEES, MAKE ARRANGEMENTS FOR INSPECTIONS, PAY ALL FEES IN CONNECTION THEREWITH, EXCEPT BUILDING PERMIT, AND PAY ALL APPLICABLE FEDERAL, STATE AND LOCAL TAXES.
5. THE CONTRACTOR SHALL GUARANTEE ALL WORK TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR IN ACCORDANCE WITH THE GENERAL CONDITIONS, UNLESS A LONGER PERIOD IS STIPULATED UNDER SPECIFIED HEADINGS. HE SHALL REPAIR OR REPLACE, AT NO ADDITIONAL COST TO THE OWNER, ANY MATERIAL OR EQUIPMENT DEVELOPING DEFECTS. REPAIRS OR REPLACEMENTS SHALL BEAR AN ADDITIONAL TWELVE (12) MONTHS GUARANTEE FROM TIME REPAIR OR REPLACEMENT IS COMPLETE. THIS REQUIREMENT SHALL BE BINDING, EVEN THOUGH IT WILL EXCEED PRODUCT GUARANTEES NORMALLY FURNISHED BY SOME MANUFACTURERS.
6. THE CONTRACTOR SHALL SUBMIT HIS OWN AND EACH MANUFACTURERS' WRITTEN CERTIFICATES AND WARRANTIES WHICH INDICATE THAT EACH ITEM OF EQUIPMENT FURNISHED, COMPLIES WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. GUARANTEES AND WARRANTIES SHALL COMMENCE FROM THE DATE OF THE SIGNED ACCEPTANCE BY THE OWNER OF A PARTICULAR ITEM OF EQUIPMENT OR A PARTICULAR DEFINED PORTION OF THE WORK.
7. ALL WORK SHALL BE INSTALLED IN CONFORMITY WITH ALL GOVERNMENTAL JURISDICTIONAL AUTHORITIES REGULATIONS, LAWS, RULES, OR ORDINANCES IN EFFECT AND GOVERNING SAME; SUCH RULES AND REGULATIONS AND LOCAL ORDINANCES TO BE CONSIDERED PART OF SPECIFICATIONS. MECHANICAL CONTRACTOR SHALL BE HELD STRICTLY RESPONSIBLE FOR ANY VOLATION OF SAME AND SHALL CHANGE HIS WORK TO CONFORM WITHOUT ADDITIONAL COST TO OWNER.
8. ALL WORK SHALL ALSO CONFORM TO THE PUBLISHED STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION, AND ELECTRICAL WORK AND EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF THE CURRENT ISSUE OF THE NATIONAL ELECTRICAL CODE. ALL MATERIALS, IN GENERAL, SHALL BE UNDERWRITERS' LABORATORIES LISTED AND SHALL BEAR UL LABEL WHERE LABELING SERVICE IS AVAILABLE.
9. WHERE JURISDICTIONAL RULES REQUIRE ASSISTANCE OF MECHANICS OF TRADES OTHER THAN THOSE ORDINARLY EMPLOYED BY A PARTICULAR MECHANICAL CONTRACTOR IN THE HANDLING, STORAGE OR SETTING OF SPECIAL EQUIPMENT, THE MECHANICAL CONTRACTOR SHALL EMPLOY SUCH TRADESMEN SO AS TO BE IN CONFORMANCE WITH LOCAL JURISDICTIONAL AGREEMENTS.
10. IT IS CONTEMPLATED THAT WORK INCLUDED BE DONE DURING REGULAR WORKING HOURS ON A "STRAIGHT TIME" BASIS. ANY WORK REQUIRING OVERTIME SHALL INCLUDE THE COST FOR SUCH OVERTIME WORK AS A PART OF THE BASE BID PROPOSAL.
11. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY INTERFERENCE WITH OR DAMAGE TO ANY EXISTING UTILITIES AND SHALL REPAIR OR REPLACE ANY DAMAGED UTILITIES WITH THE LEAST POSSIBLE DELAY AND HOLD THE OWNER HARMLESS IN THE EVENT THAT THERE IS ANY DAMAGE.
12. CERTAIN ITEMS OF EQUIPMENT ARE SPECIFIED ON THE DRAWING EQUIPMENT SCHEDULES OR IN NOTES AS THE PRODUCT OF A SPECIFIC MANUFACTURER INCLUDING THE TRADE NAME, SIZE AND MODEL NUMBER. THIS IS TO ESTABLISH A STANDARD OF QUALITY AND TO MAKE PROVISIONS FOR POWER, SPACE ALLOWANCE, AND CONNECTIONS BY OTHER TRADES.
13. IF ALTERNATE MANUFACTURERS OTHER THAN THOSE NAMED IN THE DOCUMENTS ARE PROPOSED TO BE USED, THE BIDDER SHALL LIST SUCH OTHER ALTERNATE MANUFACTURERS ALONG WITH ANY COST ADDITIONS OR DEDUCTIONS FROM THE BASE BID PROPOSAL. IF THE OWNER ACCEPTS THE ALTERNATE MANUFACTURER THE CONTRACT WILL SO STATE. IF THE CONTRACT DOES NOT CONTAIN THE NAMES OF ALTERNATE MANUFACTURERS THE CONTRACTOR SHALL SUBMIT ONLY MANUFACTURERS NAMED IN THE DOCUMENTS.
14. IF THE MECHANICAL CONTRACTOR PROPOSES TO USE THE PRODUCT OF A MANUFACTURER OTHER THAN THE ONE NAMED IN THE DOCUMENTS HE SHALL BE RESPONSIBLE FOR THAT ITEM OF EQUIPMENT FITTING IN PLACE WITH ADEQUATE CLEARANCES. FURTHER, IF DIFFERENT CONNECTIONS OR PROVISIONS ARE REQUIRED TO BE FURNISHED BY OTHER TRADES FROM THE PRODUCT NAMED IN THE DOCUMENTS, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OTHER TRADES OF ANY CHANGES AND IF ADDITIONAL COSTS ARE REQUIRED BY THE OTHER TRADES HE SHALL PAY SUCH COSTS.
15. THE ENGINEER HAS NO CONTRACTUAL RESPONSIBILITY IN CONNECTION WITH JOB SITE SAFETY MEASURES OR PRECAUTIONS AS RELATED TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES IN THAT REGARD. THE MECHANICAL CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE ARCHITECT/ENGINEER'S OBSERVATIONS OF THE MECHANICAL CONTRACTOR'S PERFORMANCE ARE NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE MECHANICAL CONTRACTOR'S SAFETY MEASURES IN, ON OR NEAR THE CONSTRUCTION SITE. IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION", VOLUME 36, NO.75, PART II OF THE FEDERAL REGISTER BY THE U.S. DEPARTMENT OF LABOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SUCH SAFETY MEASURES AND SHALL CONSULT WITH THE STATE OR FEDERAL SAFETY INSPECTOR FOR INTERPRETATION WHENEVER IN DOUBT AS TO WHETHER SAFE CONDITIONS DO OR DO NOT EXIST; OR WHETHER HE IS OR IS NOT IN COMPLIANCE WITH STATE OR FEDERAL REGULATIONS.
16. THE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC IN NATURE AND SHOW GENERAL ARRANGEMENT OF ALL EQUIPMENT, PIPING, DUCTWORK, SERVICES, ETC. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO SHOW ALL OFFSETS,FITTINGS, AND ACCESSORIES WHICH MAY BE REQUIRED. FURNISH ALL FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED TO MEET SUCH CONDITIONS AND TO FIT WORK OF OTHER TRADES.
17. FURNISH THREE (3) SETS OF CUTS OR BROCHURES, OR ONE SEPIA REPRODUCIBLE SHOP DRAWING AND TWO PRINTS SHOWING ALL DETAILS OF CONSTRUCTION FOR DUCT LAYOUTS AND EQUIPMENT AND ASSOCIATED WIRING DIAGRAMS TO BE FURNISHED.
18. REVIEW OF THE SHOP DRAWINGS IS RENDERED AS A SERVICE ONLY AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR OF BUILDING CONDITIONS; NOR SHALL IT BE CONSTRUED AS RELIEVING THE MECHANICAL CONTRACTORS OF BASIC RESPONSIBILITIES UNDER HIS CONTRACT.
19. ALL EQUIPMENT SUBMITTED AS SHOP DRAWINGS SHALL BE APPROVED BY THE GOVERNING JURISDICTIONAL AUTHORITIES PREVIOUS TO SUBMITTAL. SUBMISSION OF A SHOP DRAWING SHALL MEAN THAT APPROVAL HAS BEEN OBTAINED FOR INSTALLATION OF THE EQUIPMENT SUBMITTED FOR REVIEW.
20. AT COMPLETION OF THE PROJECT, ALL CHANGES AND DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE RECORDED BY THE MECHANICAL CONTRACTOR ON AS-BUILT DRAWINGS. SUPPLY TO THE ARCHITECT/ENGINEER FOUR PAPER BLUE LINE SETS AND
21. THE OWNER, ARCHITECT, ENGINEER OR OTHERS WHO THEY MAY DESIGNATE SHALL BE PRIVILEGED TO ENTER AND OCCUPY THE BUILDING OR PORTIONS THEREOF, AT ANY TIME PRIOR TO COMPLETION OF THE MECHANICAL WORK WITHOUT PREJUDICE.
22. BEFORE MAKING ANY INSTALLATION, THE MECHANICAL CONTRACTOR SHALL CONFER WITH ALL OTHER CONTRACTORS WHOSE WORK MAY AFFECT THE WORK UNDER THEIR SECTIONS AND MAKE THE NECESSARY CHANGES TO AVOID INTERFERENCES OR IMPROPER EFFECT ON WORK TO BE PERFORMED BY ALL OTHER TRADES. IN THE EVENT THAT INTERFERENCES DEVELOP, THE ARCHITECT'S DECISION WILL BE FINAL AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR MOVING OF MISPLACED PIPING, DUCTS, CONDUIT AND/OR EQUIPMENT.
23. ALL MATERIALS AND/OR EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
24. EACH MAJOR COMPONENT OF THE EQUIPMENT SHALL HAVE THE MANUFACTURER'S NAME, ADDRESS, MODEL NUMBER AND RATING ON A PLATE SECURELY AFFIXED IN A CONSPICUOUS PLACE. THE NAMEPLATE OF A DISTRIBUTING AGENT IS NOT ACCEPTABLE. ASME CODE RATINGS, OR OTHER DATA WHICH IS DIE-STAMPED INTO THE SURFACE OF THE EQUIPMENT SHALL BE IN A VISIBLE LOCATION.
25. USE ONLY NEW MATERIALS OF THE BEST QUALITY OF THEIR RESPECTIVE KINDS; LABOR SHALL BE DONE IN A THOROUGH WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT.
26. MATERIALS SHALL BE MANUFACTURED BY REPUTABLE MANUFACTURERS WHO HAVE BEEN PRODUCING THIS TYPE OF MATERIAL TO BE SOLD IN MAJOR CITIES IN THE UNITED STATES FOR A PERIOD OF AT LEAST FIVE (5) YEARS, UNLESS OTHERWISE NOTED HEREIN.
27. THE INSTALLATION OF ANY ACCESS PANEL IS STRICTLY LIMITED TO LOCATIONS AS INDICATED ON THE ARCHITECTURAL DRAWINGS OR APPROVED BY ARCHITECT.
28. FIRE STOPPING SHALL BE REQUIRED AT ALL FLOOR AND FIRE RATED WALL/PARTITION PENETRATIONS. FIRE STOPPING SYSTEMS SHALL BE AS DETAILED ON ARCHITECTURAL DRAWINGS.
29. ALL SHOP FABRICATED AND FACTORY BUILT EQUIPMENT NOT GALVANIZED OR PROTECTED BY PLATING SHALL BE CLEANSED AND GIVEN ONE (1) SHOP COAT OF ZINC-CHROMATE PRIMER BEFORE DELIVERY OR DURING CONSTRUCTION. ALL FINISH PAINTING SHALL BE DONE BY THE GENERAL CONTRACTOR.
30. DUCTWORK BEHIND THE GRILLES, REGISTERS, DIFFUSERS, ETC. WHICH IS EXPOSED TO VIEW THROUGH THE UNITS, SHALL BE GIVEN ONE (1) COAT OF PRIMER AND A FINISH COAT OF FLAT BLACK PAINT.
31. ALL WORKMANSHIP SHALL BE FIRST CLASS IN EVERY RESPECT AND SHALL BE PERFORMED ONLY BY SKILLED MECHANICS, RECOGNIZED AS SUCH IN THEIR RESPECTIVE TRADES.
32. FURNISH NECESSARY SCAFFOLDING, STAGING OR CRIBBING REQUIRED FOR THE COMPLETION OF THE WORK. SUCH SCAFFOLDING, ETC., SHALL BE REMOVED FROM THE PREMISES WHEN ITS USE IS NO LONGER REQUIRED ON THE JOB.
33. SHOULD DAMAGE TO ANY MECHANICAL, ELECTRICAL OR ARCHITECTURAL PART OF THE BUILDING OCCUR, PAY ALL COSTS TO THE RESPECTIVE SUBCONTRACTORS AFFECTED ON THE JOB TO MAKE REPAIRS AND/OR TEMPORARY CONNECTIONS REQUIRED.
34. OPENINGS MADE IN FIRE RATED WALL, CEILING OR FLOOR SHALL BE EFFECTIVELY CLOSED AND REPAIRED SO THE FIRE RATING IS NOT REDUCED BELOW ORIGINAL FIRE RATING REQUIREMENTS.
35. FURNISH 8 COMPLETE PORTFOLIOS TO THE OWNER'S REPRESENTATIVE, CONTAINING AS- BUILT SHOP DRAWINGS, TEST AND BALANCE REPORTS, OPERATING INSTRUCTIONS, WARRANTIES, PARTS LISTS, WIRING DIAGRAMS, ETC., ON ALL EQUIPMENT FURNISHED UNDER THIS CONTRACTOR.
36. THE CONTRACTOR SHALL FURNISH A COMPETENT INSTRUCTOR TO ADVISE THE OWNER'S OPERATING PERSONNEL AS TO THE PROPER OPERATION, SERVICING, ETC., OF ALL EQUIPMENT AND SYSTEMS INSTALLED.
37. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL CLEAN ALL OF HIS WORK, EQUIPMENT, ETC., FREE FROM DUST, ETC., AND LEAVE THE WORK IN GOOD HOUSEKEEPING FASHION IN A MANNER ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. PROVIDE NECESSARY FITTINGS, LAMPS, VALVES, ETC., AND LEAVE THE WORK CLEAN AND IN PERFECT OPERATING CONDITION.
38. WHEN DIRECTED, DURING CONSTRUCTION PERIOD, OPERATE SYSTEM WITH ALL FILTERS IN PLACE AND ALL CAULKING COMPLETE. DO NOT OPERATE OR PERMIT SUPPLY SYSTEM TO BE OPERATED WITHOUT FILTERS.
39. UNDER NO CIRCUMSTANCES SHALL ANY ITEMS OF NEW AIR HANDLING EQUIPMENT BE OPERATED FOR TEMPORARY HEAT OR VENTILATION WITHOUT FILTERS IN PLACE. IF THE UNIT IS USED BEFORE CONSTRUCTION IS COMPLETED, THE FILTERS SHALL BE REPLACED, THE UNIT AND COILS SHALL BE CLEANED AND THIS SET OF FILTERS SHALL NOT BE CONSIDERED AS THE SPARE SET OF FILTERS HEREINAFTER SPECIFIED.
40. THE CONTRACTORS SHALL EXPEDITE THE INSTALLATION OF THEIR RESPECTIVE SYSTEMS AS THAT HEATING SYSTEMS CAN BE USED FOR TEMPORARY HEAT AS SOON AS THE SPACE IS ENCLOSED, THEY SHALL COOPERATE WITH THE GENERAL CONTRACTOR IN PROVIDING TEMPORARY HEAT AS REQUIRED.
41. ALL TENDERS SUBMITTED ON THESE DRAWINGS AND SPECIFICATIONS SHALL BE BASED ON NEW MATERIALS AND APPARATUS OF MAKE AND QUALITY AS SPECIFIED. IF THE CONTRACTOR DESIRES, HE MAY ALSO TENDER ON MATERIALS AND APPARATUS WHICH SHALL BE OF SAME QUALITY AND OF SIMILAR SPECIFICATIONS TO THOSE AS HEREIN SPECIFIED, IN WHICH CASE HE SHALL STATE IN HIS TENDER ALL ADDITIONS OR DEDUCTIONS INVOLVED IN THE ALTERNATE MATERIALS AND APPARATUS, AND SHALL SPECIFY THE NAME OR MAKE ON WHICH HIS ALTERNATE IS BASED. WHEN NO ALTERNATES ARE GIVEN OR ACCEPTED PRIOR TO CONTRACT AWARD, THE MAKE SPECIFIED SHALL BE INSTALLED.

HVAC SYSTEM

1. THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS ARE TO COVER THE FURNISHINGS OF ALL LABOR, MATERIALS, EQUIPMENT, APPARATUS, SERVICE PERMANENT AND TEMPORARY FACILITIES AS NECESSARY TO THE HEATING AND AIR CONDITIONING WORK INVOLVED IN THE FURNISHING, INSTALLING, TESTING, ADJUSTING, RETESTING, READJUSTMENT AS REQUIRED AND DIRECTED, AND PLACING INTO APPROVED SATISFACTORY OPERATION THE COMPLETE RESPECTIVE SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY THE JOB CONDITIONS.
2. BEFORE BEGINNING WORK, THE CONTRACTOR SHALL REVIEW THE IMAGING VENDOR FINAL SHOP DRAWINGS FOR COORDINATION AND IMAGING VENDOR EXPECTATIONS.
3. FURNISH AND INSTALL A COMPLETE AND OPERABLE SYSTEM FOR VENTILATING, HEATING AND AIR CONDITIONING CONSISTING OF, BUT NOT LIMITED TO:
   A. SUPPLY AND EXHAUST/RETURN DUCT SYSTEM
   B. GRILLES, DIFFUSERS, REGISTERS AND MANUAL VOLUME DAMPERS
   C. TESTING AND BALANCING
4. FURNISH ACCESS DOORS TO CEILING CONTRACTOR FOR ACCESS TO VALVES AND DAMPERS. ALL CONTROL DEVICES AND DAMPERS ABOVE INACCESSIBLE CEILINGS. LAY IN CEILINGS SHALL BE CONSIDERED ACCESSIBLE. PROVIDE 12"X12" (MIN.) ACCESS DOORS IN DUCTS FOR ACCESS TO FIRE DAMPERS, DUCT MOUNTED APPARATUSES, AND WHERE INDICATED FOR MAINTENANCE.
5. FURNISH AND INSTALL ALL INSULATION AS HEREINAFTER SPECIFIED.
6. FURNISH CUTTING AND CORING FOR INSTALLATION OF DUCTS AND EQUIPMENT. APPLICABLE STANDARDS AND CODES OF THE FOLLOWING:

   THE WORK UNDER THIS SECTION SHALL COMPLY WITH THE LATEST EDITION OF:
   A. IMC - INTERNATIONAL MECHANICAL CODE
   B. ASME - AMERICAN SOCIETY OF MECHANICAL ENGINEERS
   C. ASHRAE - AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR CONDITIONING
   D. ARI - AIR CONDITIONING AND REFRIGERATION INSTITUTE
   E. ASTM - AMERICAN SOCIETY FOR TESTING MATERIALS
   F. AABC - ASSOCIATED AIR BALANCE COUNCIL NFPA -NATIONAL FIRE PROTECTION ASSOCIATION
   G. SMACNA - SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
7. EXERCISE CARE IN TRANSPORTING AND HANDLING TO AVOID DAMAGE TO FIXTURES, EQUIPMENT AND MATERIALS.
8. STORE MATERIALS ON THE SITE SO AS TO PREVENT DAMAGE.
9. KEEP EQUIPMENT AND MATERIALS CLEAN, DRY AND FREE FROM DELETERIOUS CONDITIONS.
10. ALL DUCTWORK SHALL BE FABRICATED FROM G90 PRIME GALVANIZED SHEET STEEL. THE DUCTS SHALL BE AIRTIGHT AND SHALL BE ANCHORED, BRACED AND REINFORCED TO PREVENT VIBRATION, LEAKAGE AND OIL CANNING. THE SPACING OF STIFFENERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA.
11. THE DUCTWORK SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE WITH 1 INCH X 1/8 INCH SOLID GALVANIZED STRAP HANGERS (BOTH SIDES OF DUCT AT POINT OF SUPPORT) WITH GAGES AND SPACING AS SPECIFIED IN SMACNA.
12. UNLESS OTHERWISE NOTED, ALL ROUND ELBOWS SHALL HAVE CENTER LINED RADIUS EQUAL TO 1-1/2 TIMES THE WIDTH OF THE DUCT. IF SPACE DOES NOT PERMIT, THEN PROVIDE 6" THROAT WITH SPLITTER VANES. SEE DUCT CONSTRUCTION DETAILS.
13. ALL DUCTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS, LOW PRESSURE SUPPLY AND EXHAUST TO HAVE A POSITIVE OR NEGATIVE RATING OF 2" W. G., VELOCITIES BELOW 2500 FPM, SEAL CLASS B.
14. ALL DUCTWORK SHALL BE 24 GAUGE GALVANIZED MINIMUM.
15. ROUND DUCTS AND FITTINGS SHALL BE FACTORY FABRICATED SPIRAL LOCK SEAM DUCT WITH MACHINE FORMED FITTINGS AS MANUFACTURED BY UNITED SHEET METAL. ALL FITTINGS SHALL BE SEALED WITH FIRE RETARDANT DUCT SEALER.
16. FLEXIBLE DUCTS SHALL BE FLEX MASTER OR APPROVED EQUAL. INSULATED FLEXIBLE DUCTS, SECURED WITH WORM DRIVE STAINLESS STEEL CLAMPS. DUCTS SHALL BE U.L. LISTED AND HAVE 2" W. G. GAUGE WORKING PRESSURE, 4'-0" MAXIMUM LENGTH.
17. FOR ALL OPERABLE DEVICES IN WALLS OR ABOVE INACCESSIBLE SUSPENDED CEILINGS, PROVIDE MILCOR ACCESS DOORS WITH SAME KEYED LOCKS AND CONCEALED HINGES. LAY IN CEILINGS ARE CONSIDERED ACCESSIBLE. SIZE AS REQUIRED FOR ACCESS.
   A. STYLE DW IN DRYWALL NO. 16 GA. FRAME NO. 14 GA. PANEL
   B. STYLE AP IN PLASTER NO. 16 GA. FRAME NO. 14 GA. PANEL
   C. STYLE M IN MASONRY NO. 16 GA. FRAME NO. 14 GA. PANEL
18. PROVIDE AN ADJUSTABLE BUTTERFLY OR OPPOSED MULTI BLADE VOLUME DAMPERS IN DUCTWORK AT EVERY DUCT JUNCTION ON ALL SUPPLY, RETURN AND EXHAUST AIR DUCTWORK. DAMPERS SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL 2 GAGES HEAVIER THAN DUCT IN WHICH THE DAMPER IS INSTALLED. EACH DAMPER SHALL BE PROVIDED WITH DAMPER ROD HELD IN PLACE WITH A CLAMPING DEVICE. VISIBLE END OF THE DAMPER RODS SHALL BE FILE MARKED WITH MARKS PARALLEL TO THE BLADES.
19. FIRE DAMPERS SHALL BE COMPLETE WITH WALL FRAME, SLEEVES, ANGLE IRON STOPS, LATCHES, SPRINGS AND FUSIBLE LINK, ETC., AND SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS AND ELSEWHERE AS REQUIRED IN ACCORDANCE WITH NATIONAL BUREAU OF FIRE UNDERWRITER REGULATION BULLETIN 90-A, AND THE CITY OF CHICAGO FIRE PREVENTION BUREAU. THE FIRE DAMPERS SHALL BEAR UL LABEL. FIRE DAMPER SHALL BE 98% FREE AREA, AND BE OF THE LOW RESISTANCE TYPE WITH 1-1/2 HOUR OR 3 HOUR FIRE RATING AS MANUFACTURED BY PHILLIPS-AIRE AMERICAN WARNING AND VENTILATING, INC., AIR BALANCE, INC., OR RUSKIN MANUFACTURING.
20. ALL SUPPLY AND RETURN AIR OUTLETS SHALL BE MOUNTED TIGHTLY WITH RUBBER GASKETS TO PREVENT AIR LEAKAGE.
21. OUTLETS SHALL BE SELECTED AND GUARANTEED BY THE MANUFACTURER TO HANDLE THE AIR QUANTITIES AS SHOWN ON THE DRAWINGS WITH MAXIMUM PRESSURE DROP THROUGH THE OUTLET NOT EXCEEDING 0.10 IN OF WATER.
22. UNLESS OTHERWISE NOTED, DIFFUSERS, REGISTERS OR GRILLES SHALL BE FABRICATED FROM PRIME STEEL AND SHALL BE PROVIDED WITH A FINISH COAT OF WHITE BAKED ENAMEL PAINT, UNLESS NOTED OTHERWISE. DIFFUSERS, REGISTERS AND GRILLES SHALL BE AS MANUFACTURED BY TITUS, PRICE OR APPROVED EQUAL.
23. DRILLED-IN THREADED INSERTS: PHILLIPS "REDHEAD" DRILLED-IN THREADED INSERTS SHALL BE PROVIDED. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
24. PROVIDE ANCHOR BOLTS, NUTS SLEEVES FOR ANCHORING FANS, MOTORS AND ANY OTHER POWER-OPERATED EQUIPMENT.
25. ALL CONDITIONED SUPPLY AIR DUCTS SHALL BE INSULATED WITH 1 1/2" THICK FIBERGLASS INSULATION. MAKE-UP AIR DUCTS DO NOT NEED TO BE INSULATED.

DUCTWORK:

1. DUCTWORK SHALL BE GALVANIZED STEEL CONSTRUCTED & INSTALLED IN ACCORDANCE WITH THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION HVAC DUCT CONSTRUCTION STANDARDS, EXCEPT AS FOLLOWS:
2. INTERNAL LINING OF DUCTWORK SHALL NOT BE PERMITTED.
3. DUCTWORK THICKNESS SHALL BE 24 GAUGE MINIMUM EXCEPT FOR THE FOLLOWING:
   A. WHERE ANY WELDING OTHER THAN LONGITUDINAL SEAM IS PERFORMED, THE THICKNESS SHALL BE 18 GAUGE MINIMUM.
4. ROUND:
   A. ROUND DUCTS MAY BE SPIRAL OR LONGITUDINAL SEAM. LONGITUDINAL SEAMS SHALL BE CONTINUOUSLY WELDED. SNAPLOCK SEAMS ARE NOT PERMITTED. DUCTWORK WHICH WILL BE EXPOSED IN SPACE SHALL BE SPIRAL.
   B. CRIMP JOINTS ARE NOT PERMITTED.
   C. PLEATED ELBOWS ARE NOT PERMITTED.
   D. ADJUSTABLE ELBOWS ARE NOT PERMITTED.
   E. MITERED ELBOWS WITH TURNING VANES ARE NOT PERMITTED. USE RADIUS ELBOWS WITH CENTERLINE RADIUS AT LEAST AS GREAT AS THE DUCT WIDTH.
5. RECTANGULAR:
   A. BUTTON PUNCH SNAPLOCK SEAMS ARE NOT PERMITTED.
   B. TRANSVERSE (GIRTH) JOINTS T-4, 9, 17, 18, 20, AND 23 ARE NOT PERMITTED.
   C. MITERED ELBOWS WITH TURNING VANES ARE PERMITTED ONLY WHERE RADIUS ELBOWS WITH CENTERLINE RADIUS AT LEAST AS GREAT AS THE DUCT WIDTH IS NOT POSSIBLE.
6. SIZES OF NEW DUCT SHOWN ON DRAWINGS ARE FREE AIRWAYS SIZES, NOT OUTSIDE DIMENSIONS.
7. CONSTRUCT SUPPLY DUCTWORK DOWNSTREAM OF TERMINAL BOXES, LOW PRESSURE RETURN AND EXHAUST DUCTWORK FOR 2" W.C. PRESSSURE CLASS. TEES AND TAPS ARE TO BE CONICAL.
8. FOR FINAL CONNECTIONS TO DIFFUSERS AND MODULATING DAMPER BOXES, FLEXIBLE DUCTS MAY BE USED FOR A MAXIMUM OF 2'-0" FEET. FLEXIBLE DUCTS SHALL BE U.L. LISTED, WITH 1" THICK FIBERGLASS INSULATION W/ VAPOR BARRIER. INSTALL FULLY EXTENDED W/ A MAXIMUM OF ONE 90° CHANGE OF DIRECTION, IN LENGTHS NO GREATER THAN NECESSARY. USE GENEROUS RADIUS TURNS AND SUPPORT AS REQUIRED TO PREVENT EXCESSIVE SAGGING. FLEXIBLE ELBOWS AT THE DIFFUSER INLET IS NOT PERMITTED.
9. PROVIDE ADJUSTABLE OPPOSED BLADE OR BUTTERFLY DAMPERS FOR ALL NEW LOW PRESSURE SUPPLY & RETURN BRANCHES. EXTRACTORS AND SPLITTER DAMPERS ARE NOT PERMITTED.
10. SEAL ALL JOINTS OF NEW DUCTWORK. INSPECT EXISTING DUCTWORK FOR LEAKS & REPORT RESULTS BEFORE CONNECTING NEW DUCTWORK, ALL DUCTWORK WITHIN THE CONSTRUCTION LIMIT LINE IS SUBJECT TO LEAK TESTS AS REQUIRED AND WITNESSED BY THE OWNER, SEE LATEST BUILDING CONSTRUCTION STANDARDS FOR MEDIUM AND LOW PRESSURE ALLOWABLE LEAKAGE RATES, AND SPECIFIC TESTING REQUIREMENTS. ALL MEDIUM PRESSURE DUCTWORK UPSTREAM OF VAV AND FAN POWERED BOXES SHALL BE 3" W.G. PRESSURE CLASS, SEAL CLASS A. DUCT SEALANT SHALL BE WATER-BASED-UNITED McGILL OR APPROVED EQUAL. PRESSURE SENSITIVE TAPE IS UNACCEPTABLE. GASKETED FLANGES SHALL BE SEALED WITH A MASTIC.
11. PROTECT NEW & EXISTING DUCT OPENINGS FROM DUST & DIRT. CLEAN INSIDE & OUTSIDE OF NEW & EXISTING DUCTWORK IN AREA OF NEW WORK. REPLACE FILTERS AS REQUIRED DURING CONSTRUCTION PERIOD AND PROVIDE NEW SETS OF FILTERS AFTER COMPLETION OF WORK.
12. INSULATION
   A. ALL CONCEALED SUPPLY AND RETURN DUCTWORK TO BE INSULATED.
   B. INSULATION SHALL BE OWENS-CORNING, CERTAINTEED, ARMSTRONG, OR GUSTIN-BACON. NEW SUPPLY AIR DUCTWORK ABOVE CEILINGS SHALL BE INSULATED WITH MIN. 2" THICK, 1# DENSITY FIBERGLASS WRAP WITH FIRE RETARDANT VAPOR-BARRIER COVERING TO PROVIDE A MAXIMUM INSTALLED CONDUCTANCE OF 0.16.
   C. OVERLAP ALL SEAMS AND JOINTS & SECURE WITH MANUFACTURER APPROVED ADHESIVE TO PROVIDE CONTINUITY OF VAPOR BARRIER.

TEMPERATURE CONTROLS:

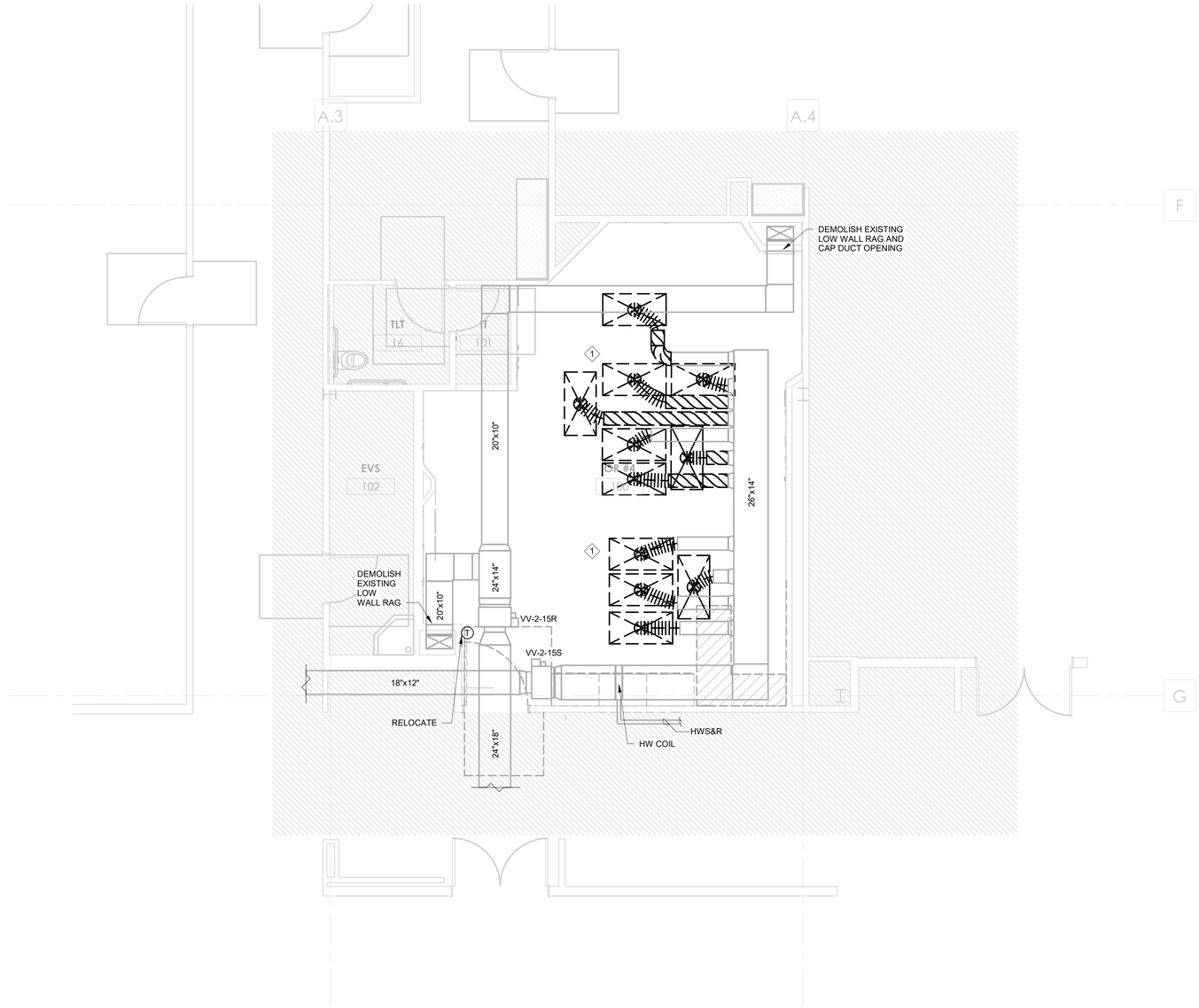
1. EXISTING TEMPERATURE CONTROLS SYSTEM BY JOHHNSON CONTROLS INC TO REMAIN.
2. EXISTING THERMOSTAT TO BE RELOCATED.
3. COORDINATE ALL CONTROL WIRING AND POWER REQUIREMENTS WITH ELECTRICAL CONTRACTOR. CONTROL CONTRACTOR SHALL TERMINATE ALL POWER AND CONTROL WIRING TO CONTROL DEVICES.

SEQUENCE OF OPERATION:

1. SYSTEM OPERATION TO REMAIN IN PLACE.
2. ENSURE VARIABLE AIR VOLUME BOXES ARE BALANCED TO AIRFLOWS CALLED OUT ON THE PLANS.

TESTING AND BALANCING OF AIR SYSTEMS:

1. TESTING AND BALANCING OF AIR SYSTEMS SHALL BE PERFORMED BY AN INDEPENDENT SUB-CONTRACTOR SPECIALIZING IN SUCH WORK AND IS A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL.
2. BALANCE AND TESTING SHALL NOT BEGIN UNTIL EACH SYSTEM HAS BEEN COMPLETED AND IS IN FULL WORKING ORDER. CONTRACTORS SHALL PUT ALL THEIR EQUIPMENT INTO FULL OPERATION AND SHALL CONTINUE THE OPERATION OF SAME DURING EACH WORKING DAY OF TESTING AND BALANCING.
3. TESTING AND BALANCING SHALL BE PERFORMED IN COMPLETE ACCORDANCE WITH THE SMACNA MANUAL OR THE AABC NATIONAL STANDARDS FOR FIELD MEASUREMENT AND INSTRUMENTATION AND THE LEGACY SPECIFICATIONS, SECTION.
4. UPON COMPLETION OF THE WORK, THE BALANCE CONTRACTOR SHALL COMPILE ALL TEST DATA AND SUBMIT 8 TYPEWRITTEN COPIES OF THE COMPLETE TEST DATA TO THE ARCHITECT FOR EVALUATION AND APPROVAL. ALL



KEY NOTES:

1. REMOVE AND CLEAN LAMINAR SUPPLY DIFFUSERS FOR RELOCATIONS IN NEW CEILING. (9) TOTAL DIFFUSERS TO BE RELOCATED. RETURN REMAINING UNUSED DIFFUSERS TO FACILITY.

1 OR #4 PLAN-MECH-EXISTING

1/4" = 1'-0"

This sheet of drawings has not been reviewed for code compliance.

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No.	Description	Date

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03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

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AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	24 MARCH 2022
Project Number	21-035
Drawn by	EV
Checked by	JH

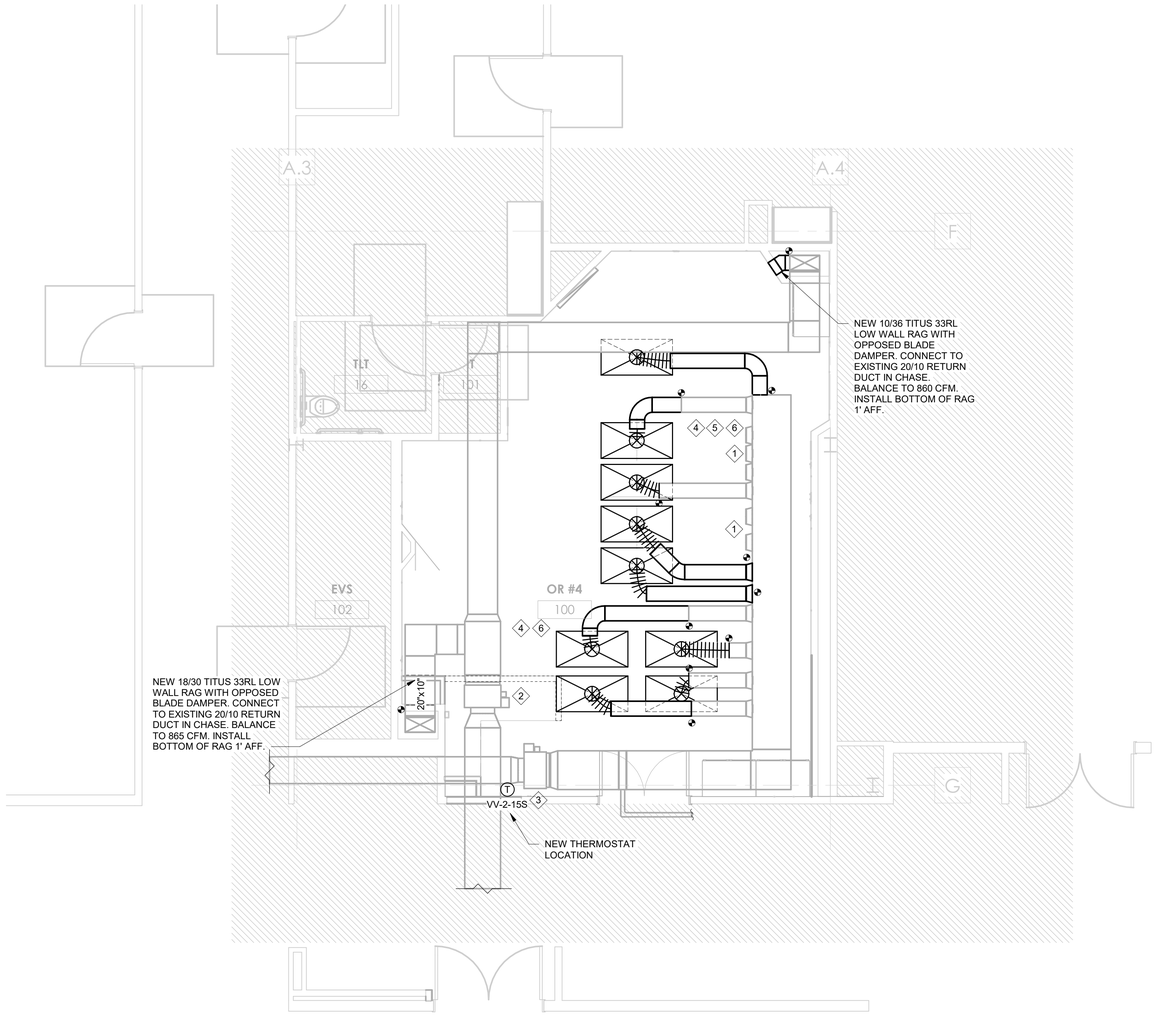
Sheet Title

OR #4 PLAN - MECH - DEMO

Sheet Number

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1 OR #4 PLAN-MECH-NEW CONSTRUCTION

1/4" = 1'-0"

KEYED NOTES:

1. CAP UNUSED 10" ROUND SUPPLY DUCTS.
2. REBALANCE VV-2-15R TO 1725 CFM.
3. REBALANCE VV-2-15S TO 2025 CFM.
4. (9) RELOCATED 2X4 LAMINAR DIFFUSERS. PROVIDE NEW MOUNTING AND TRIM KITS. BALANCE EACH TO 225 CFM UTILIZING FACE ADJUSTABLE DAMPER.
5. COORDINATE ALL NEW DUCTWORK AROUND BOOM AND LIGHT SUPPORT STRUCTURE. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS.
6. ALL DIFFUSER CONNECTIONS TO BE 10" ROUND. CONNECT TO EXISTING DUCTWORK AS SHOWN.

GENERAL NOTES:

FIRE PROTECTION CONTRACTOR SHALL RE-WORK EXISTING SPRINKLER PIPING AND PROVIDE NEW QUICK-RESPONSE CONCEALED HEADS PER NFPA 13 REQUIREMENTS. COORDINATE WITH CEILING ELEMENTS AND OTHER TRADES. CONTRACTOR TO PRESUME SCOPE ENTAILS RELOCATION OF ALL BRANCH LINES/HEADS INSIDE THE ROOM.

Plastic fire sprinkler piping exposed within a plenum shall be used only in wet pipe systems and shall have a maximum: peak optical density of 0.50; average optical density of 0.15; flame spread of 5 feet in accordance with UL 1887. Piping shall be listed and labeled.
2015 IMC 602.2.1.2

Provide proof of a flame spread less than 26 and a smoke development less than 50 for any material used in a plenum.
2015 IMC 602.2.1

Heating system shall be capable of maintaining 68 degrees F a 3'0" above the floor.
2015 IMC 309, IRC 303.9 and IBC 1204.1

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

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Y. Munoz*
Date: *May 02, 2022*
2015 INTERNATIONAL CODES & 2020 NEC

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COLORADO LICENSED
MICHAEL P THOMPSON
56150
PROFESSIONAL ENGINEER
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

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OR #4 PLAN - MECH - NEW CONSTRUCTION

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M.202

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MEDICAL GAS NOTES

PART 1 - BASIC REQUIREMENT

1.01 RELATED REQUIREMENTS

A. THIS SPECIFICATION SHALL CONTROL ALL LABOR, SERVICES, MATERIALS AND EQUIPMENT AND PERFORMANCE OF ALL WORK REQUIRED FOR THE INSTALLATION OF ALL PLUMBING AND MEDICAL GAS WORK AS SPECIFIED IN THE FOLLOWING.

B. DEFINITIONS:
1. "PIPING" INCLUDES, IN ADDITION TO PIPE, ALL FITTINGS, VALVES, PIPE COVERING, HANGERS, AND OTHER SUPPORTS AND ACCESSORIES RELATED TO SUCH PIPING.
2. CONCEALED MEANS HIDDEN FROM SIGHT IN CHASES, FURRED SPACES, SHAFTS, HUNG CEILINGS, EMBEDDED IN CONSTRUCTION, IN CRAWL SPACES OR BURIED.
3. "EXPOSED" MEANS NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
4. "PROVIDE" MEANS TO FURNISH AND INSTALL COMPLETE.

1.02 GENERAL REQUIREMENTS

A. MEDICAL GAS WORK TO COMPLY WITH 2012 EDITION OF NFPA #99 STANDARDS.

B. CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO VERIFY SCOPE OF WORK.

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

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

E. ALL NEW DEVICES AND TRIM SHALL COMPLY WITH RECOGNIZED NFPA STANDARDS.

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

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

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

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

1.03 WORK INCLUDED

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

B. PROVIDE DEMOLITION OF EXISTING SYSTEMS INCLUDING REMOVAL OF ALL DEBRIS. COORDINATE WITH BUILDING MANAGEMENT EXISTING EQUIPMENT, FIXTURES OR DEVICES THAT SHALL BE RETAINED, CAREFULLY REMOVE AND TURN OVER TO OWNER. REMOVE ALL PIPING BACK TO ACTIVE SOURCE AND CAP LEAVING NO DEAD ENDS.

C. PRIOR TO DEMOLITION OF EQUIPMENT, FIXTURES OR TRIM, COORDINATE WITH OWNER ANY ITEMS TO BE RETAINED. CAREFULLY REMOVE SUCH ITEMS AND TURN OVER TO OWNER.

D. PROVIDE FIXTURES AS INDICATED ON PLUMBING AND ARCHITECTURAL DRAWINGS. FOR EXACT LOCATION OF FIXTURES, REFER TO ALL ARCHITECTURAL AND CONSULTANT PLANS AND ELEVATIONS.

E. MAKE NEW CONNECTIONS TO EXISTING BRANCH PIPING AS INDICATED ON PLANS AND RISER DIAGRAMS, AND AS NECESSARY TO COMPLETE THE WORK.

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

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

H. ARRANGE FOR POWER TO SUPPORT ALL ELECTRICAL RELATED EQUIPMENT AND DEVICES.

I. PROVIDE ROUGH-IN AND FINAL CONNECTIONS TO ALL APPLIANCES AND EQUIPMENTS FURNISHED BY OTHERS, INCLUDING ALL REQUIRED DEVICES.

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

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

L. PROVIDE ALL ACCESS PANELS. CONTRACTOR TO GIVE ALL LOCATIONS AND DIMENSIONS OF ALL REQUIRED ACCESS PANELS TO GENERAL CONTRACTOR. GENERAL CONTRACTOR WILL SUBMIT TO ARCHITECT FOR APPROVAL AND FINISH REQUIREMENTS PRIOR TO INSTALLATION.

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

N. PROVIDE PIPING IDENTIFICATION MARKERS FOR ALL PIPING SYSTEMS WITH ANSI/ASME STANDARD COLORS AND LABELS. MARKERS SHALL BE INSTALLED 20 FEET ON CENTER MINIMUM AND MARKERS INSTALLED IN EACH ROOM.

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

P. PROVIDE AS-BUILT DRAWINGS IN AUTOCAD 2017 FORMAT AT COMPLETION OF PROJECT.

Q. PROVIDE TWO COPIES OF OWNER'S OPERATION AND MAINTENANCE MANUALS WITH ALL PLUMBING AND MEDICAL GAS EQUIPMENT, FIXTURES, TRIM AND DEVICES, MANUFACTURER'S MAINTENANCE INSTRUCTIONS AND MANUALS.

1.04 CLEANING

A. COORDINATE GENERAL CLEANUP WITH BUILDING MANAGEMENT.

B. CLEAN ALL PIPING SYSTEMS IN ACCORDANCE TO NFPA STANDARDS.

1.05 FIELD TESTING

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

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

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

PART 2 - BASIC MATERIALS

2.01 PIPES AND FITTINGS

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

2.02 VALVES

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

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

2.03 SUPPORTS AND HANGERS

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

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

2.04 PRODUCTS

A. MANUFACTURED ASSEMBLIES SHALL COMPLY WITH NFPA 99.

B. MEDICAL GAS CEILING MOUNTED HOSE DROPS TO BE DIAMETER INDEX SAFETY TYPE INDIVIDUAL OUTLETS WITH HOSES AND HOSE RETRACTORS.

C. MEDICAL GAS CEILING OUTLETS ARE TO MATCH EXISTING; MANUFACTURED BY AMICO.

PART 3 - BASIC EXECUTION

3.01 MEDICAL GAS

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

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

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

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

MEDICAL GAS MATERIAL LIST

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

MEDICAL GAS SYMBOL LIST

SYMBOL	DESCRIPTION
O2	OXYGEN PIPING
MA	MEDICAL COMPRESSED AIR PIPING
VAC	MEDICAL VACUUM PIPING
N	NITROGEN PIPING
WAGD	WASTE ANESTHETIC GAS DISPOSAL PIPING
CO2	CARBON DIOXIDE PIPING
N20	NITROUS OXIDE PIPING
	NEW PIPE
	EXISTING PIPE
	ZONE VALVE BOX
	SHUT-OFF VALVE
	EXISTING FIXTURE/EQUIPMENT/PIPING TO BE REMOVED
	NEW CONNECTION

MEDICAL GAS ABBREVIATION LIST

ABBREVIATION	DESCRIPTION
MA	MEDICAL COMPRESSED AIR
O2	OXYGEN
VAC	MEDICAL VACUUM
N	NITROGEN
WAGD(EVAC)	WASTE ANESTHETIC GAS DISPOSAL
CO2	CARBON DIOXIDE
N20	NITROUS OXIDE
ZVB	ZONE VALVE BOX
TYP.	TYPICAL
(N)	NEW PIPING
(E)	EXISTING PIPING

MED GAS DRAWING INDEX

SHEET NUMBER	SHEET NAME
MG.101	MED GAS SYMBOLS, ABBREVIATIONS, AND SPECIFICATIONS
MG.201	OR #4 PLAN - MED GAS - DEMO
MG.202	OR #4 PLAN - MED GAS - NEW CONSTRUCTION

CODE REFERENCES

CITY OF AURORA, CO LOCAL AMENDMENTS
2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL PLUMBING CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2017 ASHRAE STANDARDS 170
2012 NFPA 99 STANDARDS
2018 FGI GUIDELINES FOR HOSPITALS

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21-035 TMCA SOUTH OR 4 RENOVATION

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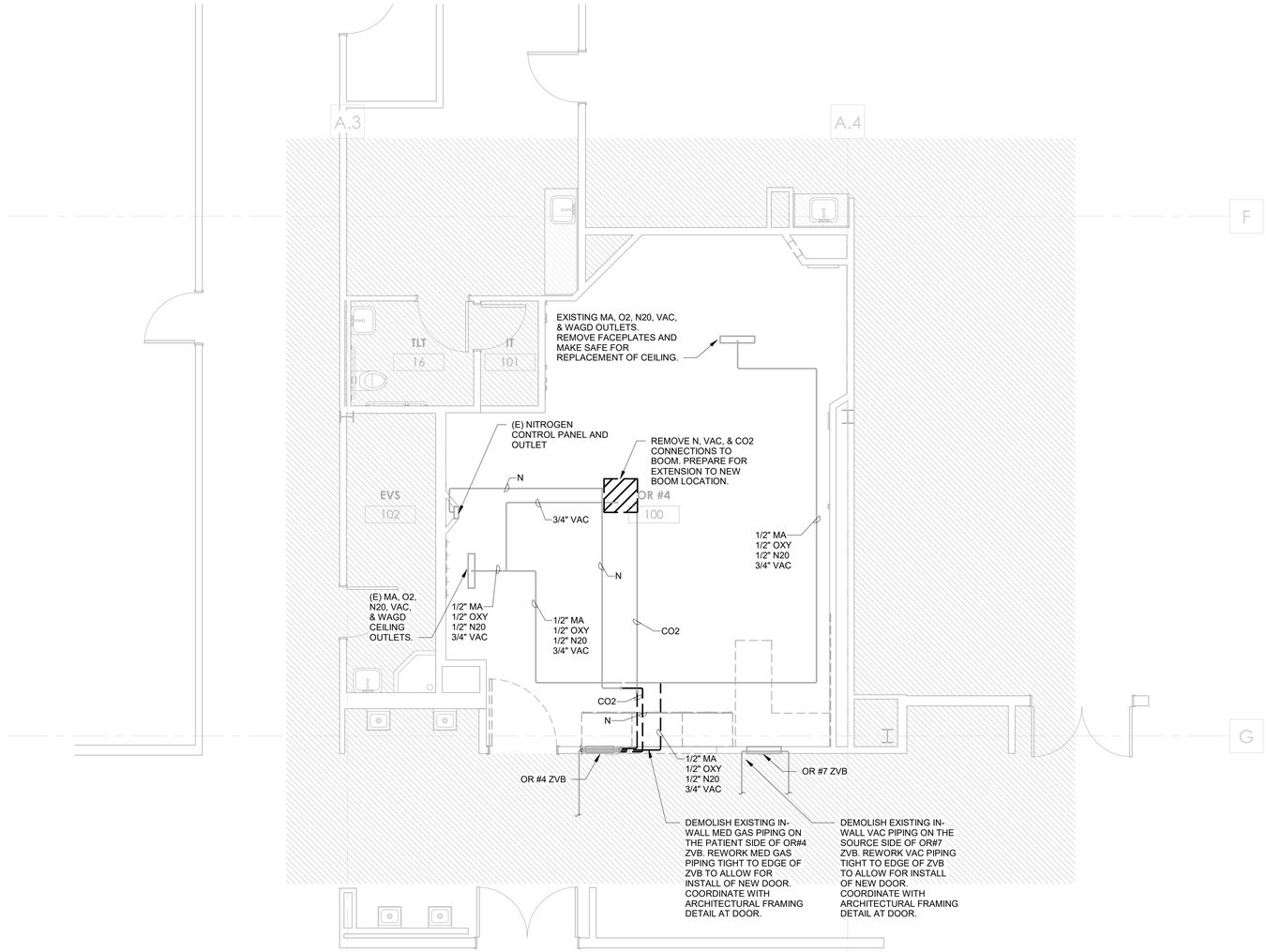
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MED GAS SYMBOLS, ABBREVIATIONS, AND SPECIFICATIONS

Sheet Number
MG.101

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1 OR #4 PLAN-MED GAS-DEMO

1/4" = 1'-0"

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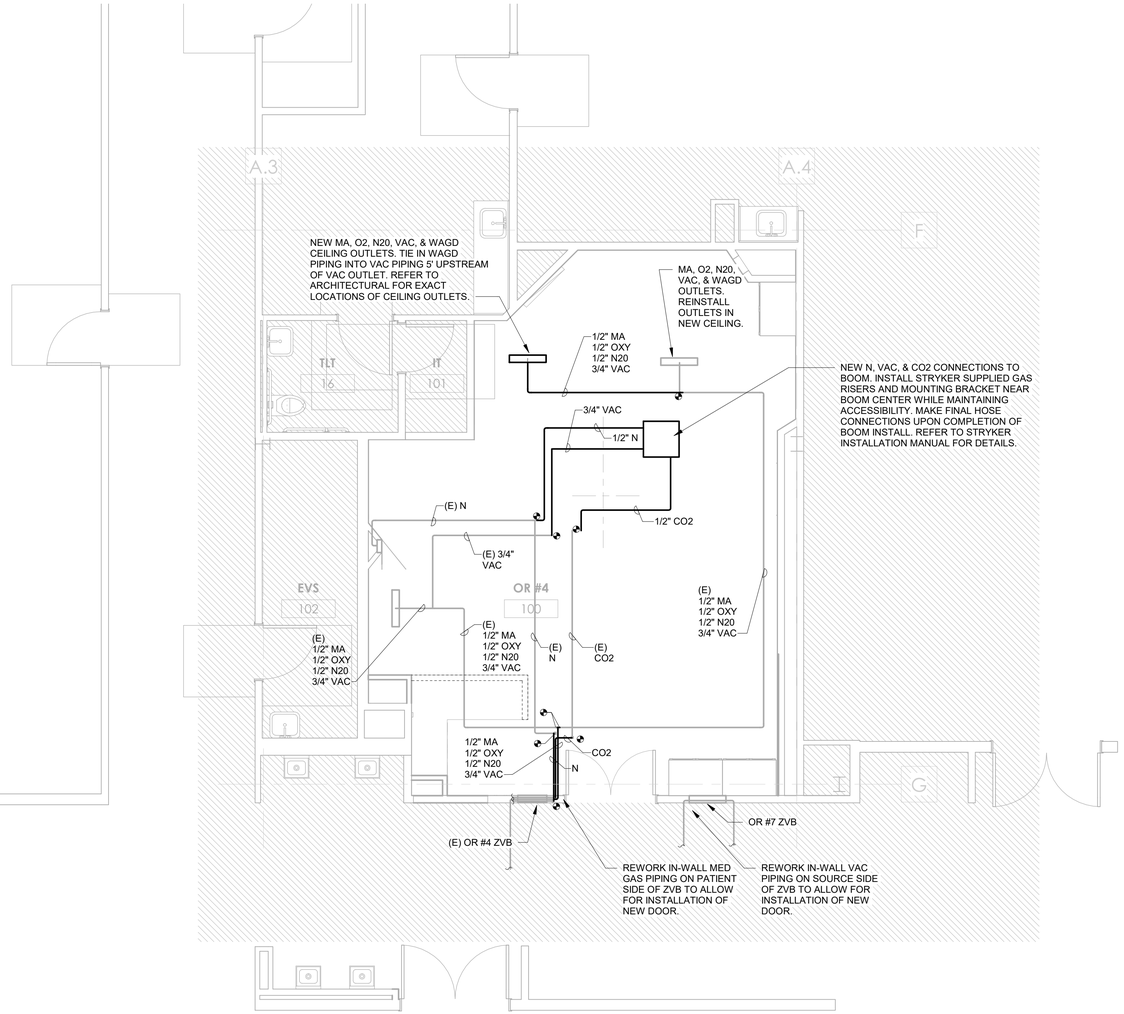
OR #4 PLAN - MED GAS - DEMO

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MG.201

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1 OR #4 PLAN-MED GAS-NEW CONSTRUCTION

1/4" = 1'-0"

GENERAL NOTES:

FIRE PROTECTION CONTRACTOR SHALL RE-WORK EXISTING SPRINKLER PIPING AND PROVIDE NEW QUICK-RESPONSE CONCEALED HEADS PER NFPA 13 REQUIREMENTS. COORDINATE WITH CEILING ELEMENTS AND OTHER TRADES. CONTRACTOR TO PRESUME SCOPE ENTAILS RELOCATION OF ALL BRANCH LINES/HEADS INSIDE THE ROOM.

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DIVISION 16000 – ELECTRICAL

1. GENERAL

A. Requirements:

1) Products and execution shall be provided for a complete and fully operational electrical system throughout the extent of the project, in conformance with applicable codes, laws, ordinances and agency standards of governing bodies having jurisdiction, and in strict accordance with the contract documents, and building standards.

2) Products, including equipment, devices, fixtures, and materials shall be new unless noted otherwise, UL listed, and bear appropriate label.

3) Execution, including preparation, installation, starting, and testing shall be performed by skilled trades personnel, in compliance with the associated manufacturers recommendations, and coordinated with the other construction trades.

B. Applicable Codes:

1) National Electrical Code	NEC
2) International Building	IBC
3) Local Amendments	

C. Applicable Laws and Agency Standards:

1) American National Standards Institute	ANSI
2) American Society for Testing and Materials	ASTM
3) Americans with Disabilities Act	ADA
4) Electrical Testing Laboratories	ETL
5) Electronic/Telecommunications Industries Association	EIA/TIA
6) Federal Aviation Administration	FAA
7) Illuminating Engineering Society of North America	IESNA
8) Institute of Electrical and Electronics Engineers	IEEE
9) Insulated Cable Engineers Association	ICEA
10) National Electrical Manufacturers Association	NEMA
11) National Fire Protection Association	NFPA
12) Underwriters' Laboratories	UL

D. Approvals:

1) Emergency and Exit Lighting Documents shall be prepared and submitted to the Local Fire Department for their approval of system layout, circuiting, and fixture type. Approved drawings shall be submitted for review prior to construction.

2) Fire Alarm and Life Safety Documents shall be prepared and submitted to the Local Fire Department for their approval of system expansion, layout, circuiting, equipment and device type. The base building fire alarm and life safety system manufacturer/installer shall be retained to produce or update the building fire alarm and life safety documents, and to make final connections and alterations to the existing system. Approved drawings shall be submitted for review prior to construction.

3) Other systems requiring specific approval.

E. Submittals:

1) Product Data shall be prepared and submitted for review prior to construction for the following products: cabinets, access panels, supports, raceway components, floor boxes, fire proof fittings, wire, fuses, circuit breakers, receptacles, toggle switches, slide dimmers, disconnect switches, motor starters, contactors, lighting fixtures, ballasts, lamps, controls, fire alarm devices, life safety devices, and electric heating equipment.

2) Shop Drawings shall be prepared and submitted for review prior to construction for the following products: metering equipment, distribution panelboards, branch panelboards, transformers, cable tray, dimming equipment, fire alarm equipment, and life safety equipment.

3) Test Results shall be prepared and submitted prior to project completion for cable insulation, grounding system, emergency system, fire alarm system, and life safety systems in accordance with authorities having jurisdiction, and applicable codes and agency standards.

4) Manufacturers Instructions shall be prepared and submitted prior to construction including installation manuals with application conditions and limitations for electrical apparatus use, storage, handling, protection, examination, preparation, installation, and starting.

5) Utility Service Request shall be prepared and submitted prior to construction. Utility prepared drawings shall be submitted for review prior to construction.

6) Project Record Documents shall be prepared using AutoCAD or equivalent CAD package. Project Record Documents shall be submitted on reproducible media prior to project completion for electrical systems. Record actual location of equipment, devices, fixtures, etc. Record actual routing of overhead feeders. Record actual routing of feeders below slab and branch circuits within or below slab.

7) Maintenance Data shall be prepared and submitted prior to project completion for electrical apparatus including operation manuals and maintenance manuals.

F. Electrical Power System Studies:

1) Short Circuit Current and Protective Device Coordination Studies:
   a. Submit short circuit current and protective device coordination studies with coordination plots on standard log–log graphs for the medium and low voltage systems.
   b. The data shall include:
      1} Selected base quantities.
      2} One line diagrams.
      3} Impedance diagrams.
      4} Calculation methods.
      5} Tabulation of data.
      6} Conclusions.
      7} Recommendations.
   c. Equipment shop drawings shall not be submitted until the short circuit and coordination study has been reviewed by the Architect/Engineer.
   d. Provide proper fuse size and type. Provide proper selection and setting of relays, sensors and circuit breakers.

2) Arc Flash Hazard Analysis:
   a. Submit arc flash hazard analysis study in conjunction with the short circuit current and protective device coordination studies.
   b. The data shall include:
      1} Device or bus name.
      2} Bolted fault and arcing fault current levels.
      3} Flash protection boundary distances.
      4} Personal protective equipment (PPE) classes.
      5} Arc flash incident energy (AFIE) levels.
   c. The arc flash analysis shall include recommendations for reducing AFIE levels and enhancing worker safety.

G. Coordination:

1) Utility Company: Obtain and coordinate temporary service and permanent services in conformance with utility company requirements. Arrange for services in a timely manner. Provide temporary service until such time that permanent service can be energized.

2) Electrical Engineer: Notify the Engineer of any conflicting design information or any design intentions which are not readily interpreted from the contract documents prior to any product selection or execution of work. Notify the Engineer of any products which are damaged, unsuitable, incompatible, or non–compliant with any applicable codes or ordinances of any governing bodies having lawful jurisdiction.

3) Architect: Coordinate construction of the electrical system with the Architect. Final locations and mounting heights of electrical equipment, fire alarm equipment, receptacles, switches, communications devices, fire alarm devices, lighting fixtures, etc. shall be as directed by the Architect.

4) Construction Trades: Coordinate work with other construction trades.

5) Building Management: Meet on site with the building engineer to become familiar with building standards. Normal building working hours shall be recognized. After–hours work or temporary services shall be with prior written approval from building management. Enclose construction area from other areas to prevent transmission of dust, dirt and noise into other existing tenant areas. Product and waste transfer shall be coordinated with building management for scheduling of the elevators, deliveries, and waste removal.

6) Existing Building Systems: Review building standards with the building engineer. Perform a site visit to verify the existing site conditions. Costs associated with unforeseen conditions as result of not performing a site visit shall not be an entitlement for an increase to the contract. Construction shall be performed without interruption to the building power, communications, security, fire alarm and life safety systems, or interference to common areas, corridors, exits or existing tenants. Where any construction would interfere with the daily operations of the building or other tenants, after–hours work or temporary services shall be provided at no increase to the contract.

H. Warrantee and Guarantee

1) Provide warrantee and manufacturers certificate for each product, minimum of one year or longer as specified, from the date of occupancy. Repair and/or replace any equipment, devices, fixtures, materials, etc. with defect as required at no increase to the contract.

2) Provide guarantee of installation for a period of one year from the date of occupancy. Repair and/or reinstall any work with defect as required at no increase to the contract. Provide guarantee of rework for a period of one year from the completion of repair or reinstallation.

3) Damage caused to finishes, surfaces, ceiling tiles, equipment, etc. shall be repaired and/or replaced to match the pre–existing condition at no increase to the contract.

I. Pay fees and other charges incidental to the electrical work and obtain and pay for required liability and casualty insurance, permits, licenses, inspections, taxes, etc.

J. Construction shall be done during regular working hours and days, unless otherwise specified. Work required to be performed during overtime hours or days shall be as indicated.

K. Allow for 8 man–hours of training to the Owners staff for the operation of the electrical systems.

L. Substitutions are not acceptable.

2. PRODUCTS

A. Cabinets, enclosures and access panels shall be code gage steel with baked enamel finish and flangeless hinges and fasteners. Equipment bases shall be 3 inch high concrete, steel braced and reinforced with 1/4 inch chamfer, and shall extend a minimum of 2 inches around base of equipment. Vibration isolation shall be spring elements in suspended rods and isolation pads below equipment, electrical connections shall be flexible conduit.

B. Conduits shall be hot–dipped galvanized or electro–galvanized steel, minimum size shall be 3/4 inch, except power branch circuits may be 1/2 inch (unless noted otherwise) and flexible connections to recessed lighting fixtures which may be 3/8 inch. Flexible steel conduit shall be galvanized steel, with UL listed liquid tight jacket as required, for final connections to motors, recessed lighting fixtures, and life safety devices. Supports, including channels, angles, rods, and fasteners shall be hot–dipped galvanized steel. Manufacturer shall be Allied, LTV/Republic, Steelduct, or Wheatland.

C. Conduit fittings shall be steel, die cast fittings of pot metal are not acceptable. Electrical metallic tubing (EMT) fittings shall be compression type with insulated throats; set screw fittings are not acceptable. Intermediate metal conduit (IMC) and heavy wall conduit (HWG) fittings shall be of threaded joints; set screw and compression fittings are not acceptable. Manufacturer shall be Appleton, Crouse Hinds/Midwest, OZ/GGedney, Raco, Steel City, or T&B.

D. Outlet boxes for all toggle switches, receptacles, communications devices, fire alarm devices, and life safety devices shall include plaster rings, device plates, and cover plates where required. Provide boxes suitable for plenum, wet, or hazardous locations as required. Device cover plates shall be stainless steel painted to match finish. Multi–gang outlet boxes shall include suitable one–piece device cover plate. Outlets located on opposite sides of a partition shall be staggered by 12 inches, minimum. Manufacturer shall be Appleton, Raco, or Steel City.

E. Floor boxes shall be adjustable concrete tight pressed steel with brass flange and covers. Flush floor boxes shall include brass trim and hinged outlet opening covers. Fire rated poke–through floor fittings shall be UL listed and approved for the floor slab fire rating. Floor mounted service fittings for connection to underfloor electrified metal deck shall be compatible with the deck manufacturer. Access floor mounted fittings for use with raised floors shall be flush type with space for equipment cord plug devices and suitable flip type cover. Manufacturer shall be Hubbell, Wiremold, or Steel City.

F. Raceway poles for power and communications shall be two compartment steel, length and finish as required, complete with all bases, adjustable stanchions, horizontal supports, trim plates, and connecting harnesses. Manufacturer shall be Wiremold.

G. Flush infloor duct raceway systems, including power and communications ducts, adjustable supports, elbows, fittings, and all required accessories shall be of UL standard galvanized steel, and shall be sized in accordance with code to adequately facilitate pulling and connecting the quantity and size of wires and cables contained. Manufacturer shall be Wiremold or Steel City.

H. Surface metal raceway including power devices, communications devices, fittings, connectors, feeds, elbows, couplings, blanks, tees, wire clips, device brackets, device covers, and other associated apparatus shall be sized to facilitate pulling the quantity and size of wires and cables, and installing the devices contained. Raceway shall be of code gage galvanized steel, shall include mounting knock–outs, and shall be finished as directed by the Architect. Manufacturer shall be Wiremold.

I. Ladder type cable tray systems, including all runners, elbows, tees, crosses, and fittings shall be of aluminum and shall be sized to facilitate pulling the quantity and size of wires and cables contained. Manufacturer shall be B–Line, Square D, or Legrand.

J. Wire shall be 600 Volt insulated copper, minimum size shall be No.12 AWG, wire sizes No.8 AWG and larger shall be stranded. Manufacturer shall be American Insulated Wire Corp., Cerro, Collyer, Capitol Wire and Cable, Okonite, Senetor, South Wire, or Triangle.

K. Cable supports shall be appropriate for the size of conduit and type of wire and cables. Cable lubricant shall be less than six percent solid residue after drying and shall not contain any waxes, greases, silicones, or glycol oils.

L. Local disconnect switches for electrically operated equipment shall be heavy duty within enclosure suitable for the location. Fusible disconnect switches 800 Amps and larger shall be bolted pressure, load–break type. Fusible and non–fusible disconnect switches 600 Amps and smaller shall be quick–make, quick–break type. Manufacturer shall be Cutler–Hammer, Siemens/ITE, or Square D.

M. Overcurrent and short circuit protection within fusible switches shall be Class L current limiting time delay fuses for switches rated 800 Amps and larger, and Class RK–1 current limiting time delay fuses for switches rated 600 Amps and smaller. Manufacturer shall be Bussmann.

N. Grounding system, including service and equipment grounding and bonding, shall be in accordance with code and shall connect all electrically operated equipment. Provide a separate green ground wire for each branch circuit and feeder.

O. Receptacles shall be duplex NEMA 5–20R, back and side wired, specification grade, unless noted otherwise. Special receptacle configurations, duplex isolated ground receptacles, and duplex ground fault interrupter receptacles shall be as required or as indicated on the contract documents. General receptacle color shall be white and IG receptacle color shall be orange unless specified otherwise, verify color with Architect. Manufacturer shall be Bryant, Hubbell, Leviton, or Pass & Seymour.

P. Toggle switches shall be single pole 20 Amp, 120–277 Volt, back and side wired, specification grade, unless noted otherwise. Special switches, including 3–way, pilot light and momentary contact, shall be as required or as indicated on the contract documents. Color shall be white unless specified otherwise, verify color with Architect. Manufacturer shall be Bryant, Hubbell, Leviton, or Pass & Seymour.

Q. Lighting contactors shall be enclosed and mechanically held, and shall include all required control modules, timeclocks, and remote photocells. Main contactors for panelboard feeders shall match the panel ratings. Multiple pole contactors for branch circuits shall be rated at 20 Amps, or more, as required for the specific load type. Manufacturer shall be ASCO 920 & 917 or Zenith MVP & MMC.

R. Slide dimmers shall be low profile, quiet, slide–to–off type, and shall be rated as required for the wattage and specific load type. Manufacturer shall be Lutron, Lightolier, Hubbell, or Leviton.

S. Lighting fixtures shall include all appropriate accessories, mounting frame and trim for ceiling type. Fluorescent fixtures shall include rapid–start standard–output electronic ballasts with ninety percent (90%) ballast factor and total harmonic distortion of (10%) or less, type or appropriate compact type lamps. Lighting fixtures shall include coordinated air handling capability, plenum rating, damp label, wet label, and shall be explosion proof where required. Lighting fixtures recessed within grid type ceilings shall include securing clips as required by the local authority. Fixture manufacturer shall be as indicated; Electronic ballast manufacturer shall be Advance, Motorola, or MagneTek with minimum 3 year warrantee; Lamp manufacturer shall Osram Sylvania, General Electric, or Phillips.

T. New fire alarm devices provided within existing systems shall match existing device manufacturer and type. Strobes shall meet ADA guidelines for the application and shall rated 75dc, except in sleeping areas which shall be rated 110dc. Strobes rated 15/75dc with 75dc on axis are not acceptable except in small conference rooms. Existing fire alarm devices shall be extended as required. Existing fire alarm equipment shall be expanded as required with any additional components for proper operation of new devices on existing equipment.

U. Uninterruptible power supply (UPS) equipment includes converters, rectifiers, chargers, filters, inverters, pulse–width modulation, self–contained or external batteries, transfer switches, input and output isolation transformers, external maintenance by–pass switch, synchronizing equipment, protective devices, indicated, E.P.O. provisions, instrumentation, monitors, and controls. UPS manufacturer shall be Liebert, MGE or Powerware.

V. Power distribution units (PDU's) shall include input power/control junction box with ten (10) foot liquid tight cable, main input circuit breaker, K–20 rated isolation transformer, protective devices, non–linear output branch circuit panelboards, with main circuit breaker and 200% neutral bus, liquid tight output cables with plenum junction box and wiring devices as indicated, E.P.O. provisions, instrumentation, monitors, and controls in accordance with Owner requirements. PDU manufacturer shall be Liebert, MGE or Powerware.

3. EXECUTION

A. Penetrations and channels in floors and walls shall be via cutting and coring as required for the size of product, only in accordance with the Architect and Engineer recommendations, and as scheduled with the building management. Patch and fill sleeves, inserts, penetrations, and channels with appropriate code approved fire safing or filling to match or restore the original fire rating of the construction.

B. Make final connections to vibrating equipment, fixtures, and devices with flexible metal conduit or liquid tight flexible metal conduit as required. Extend ground wire through flexible connections.

C. Install conduit, fittings, supports, etc. in accordance with codes, standards, and manufacturers recommendations. The voltages identified in the following schedules are line–to–line or line–to–neutral. Interior concealed locations are those locations which are above ceilings, within walls, within floor slabs, and within dedicated electrical rooms. Conduit installation shall be as follows unless noted otherwise:

Voltage Location	0V thru 50V	Above 50V thru 250V	Above 250V thru 600V	Above 600V
Interior Concealed	EMT Concealed	EMT	≤ 2"EMT ≥ 2 1/2"IMC	HWG
Interior Exposed	EMT	≤ 2"EMT ≥ 2 1/2"IMC	IMC	HWG
Exterior and Hazardous Locations	EMT	IMC	HWG	HWG

D. Installations within air handling spaces, including plenum ceilings and built up air handling systems shall be approved for plenum installation and shall be in strict accordance with all applicable codes.

E. Install pull boxes, junction boxes, and outlet boxes in accordance with codes, standards, and manufacturers recommendations. Boxes shall include accessible covers, shall be fabricated of heavy gage galvanized steel, and shall be sized with code to adequately facilitate pulling and connecting the quantity of wires, cables, and feeders contained. Conduit terminations shall be made with bushings and locknuts. Supports for conduits and boxes shall be suspended directly to the building structural components and in no case shall they be attached to suspended ceiling grid, ductwork, or piping components.

F. Install feeders and branch circuit wiring in accordance with codes, standards, and manufacturers recommendations. Provide neutral sized at 200% or (2) neutral conductors where serving panels with 200% rated neutral bus, coordinate installation with panel manufacturers lug provisions. Install normal power, emergency power, fire alarm, and life safety systems within continuous metal raceways. Install concealed security and communications wiring within continuous metal raceways. Separate each system into independent raceways. Provide cable supports as required. Terminate cables per code and manufacturers recommendations. Provide (2) hole lugs for cables 250 kcmil and larger. Power wiring insulation shall be as follows unless noted otherwise:

Wire Location	300 kcmil and smaller	Isolated Power	Environmental Conditions
Interior Locations	THHN/THWN	XHHW	dry
Exterior Locations	THHN/THWN THHN/THWN	XHHW	damp wet

G. Install electrical distribution equipment and devices, including metering, distribution panelboards, branch panelboards, motor starters, local disconnect switches, overcurrent protection, transformers, main contactors, receptacles, etc. in accordance with codes, standards, and manufacturers recommendations.

H. Install grounding systems in accordance with codes, standards, and manufacturers recommendations. Communications system shall include ground lug and AWG No. 6 which shall connect to the electrical service equipment ground bus. Grounding conductor between computer room raised floor pedestals, computer room structural steel, and computer room equipment shall be AWG No. 6. Grounding loop around computer room perimeter pedestals shall be AWG No. 2 which shall connect to the electrical service equipment ground bus. Grounding conductors shall be secured to computer room raised floor pedestals via Burndy GP series clamps.

I. Install lighting and associated controls, including fixtures, ballasts, lamps, toggle switches, slide dimmers, dimming equipment, lighting contactors, etc in accordance with codes, standards, and manufacturers recommendations.

J. Install single and multiple device cover plates as required. Extend existing devices to finished surface as required.

K. Install fire alarm and other life safety systems in accordance with codes, standards, and manufacturers recommendations.

L. Install inscription plates and identification markings for products and wiring including the same inscriptions where indicated on the contract documents. Install plastic laminate nameplates on enclosures for each device within metering equipment, distribution panelboards, branch panelboards, motor starters, disconnect switches, transformers, and contactors. Nameplates shall be white with black core, 1–1/4 inches by 3 inches minimum, with 3/16 inch lettering, secured to equipment with two machine screws. Prepare and install type–written panel directory within each branch panel. Device plates shall be engraved for toggle switches and other devices whose function is not readily apparent. Markers shall be self–sticking for each wire and cable at terminations and at each accessible point in equipment and raceway.

M. Clean electrical apparatus prior to completion of construction. Keep work areas clean at all times.

N. Alterations and Demolition of existing systems shall be as follows:

1) Provide all alterations and demolition of the existing electrical installation as required, including any incidental materials to execute all removal, rerouting, relocation, and any other modifications for proper accommodation of all new construction as indicated on the contract documents. All alterations and demolition shall be as indicated on the contract documents or as required, including any modifications not specifically identified on any contract documents but required to complete all new construction.

2) Provide all modifications to existing equipment as required or as indicated on the contract documents in strict accordance with the existing product manufacturers recommendations.

3) Existing raceway, wire and cable extending through the construction area but serving areas outside the contract shall be rerouted and reconnected as required. All modifications shall be without any interruption to the building power, communications, security, fire alarm and life safety systems, or interference to other areas or tenants. Where any modifications would interfere with the daily operations of the building or other tenants, after–hours work or temporary services shall be provided with prior written approval from the building.

4) Existing conduit, wire, cable, supports, hangers, and other electrical installation which is removed, shall be completely removed, back to the first device or that equipment which is unaffected by the modifications. Conduit which is buried in concrete or otherwise inaccessible may be abandoned and capped at each end. All wire and cable shall be removed from any abandoned conduit.

5) Existing electrical materials and equipment, including lighting fixtures, switches, receptacles, speakers, conduit, outlet boxes, fittings, wire, cable, and other equipment and devices which are removed shall remain the property of the Owner and shall be stored or discarded as directed.

6) Reuse existing electrical products as indicated on the contract documents only as is found practical. Examine the condition of all such products, determine suitability for re–use, and periodically notify the Architect/Engineer of findings for final acceptance of re–use. Wire and cable for new construction or extension of an existing installation shall be new, in no case shall existing wire and cable be reused.

7) Refer to architectural demolition drawings for full extent and scope of partition and ceiling modifications.

   a. Existing ceilings to remain shall not be altered except where removal and replacement of surfaces is required to modify systems within ceiling space.
   b. Existing ceilings to be removed shall include demolition of all fixtures equipment, speakers, raceway, and wire, including any obsolete or previously abandoned products. Remaining areas shall only be altered as required and in accordance with the contract documents.
   c. Existing partitions to remain shall not be altered except where removal and replacement of surfaces is required to modify systems within partitions.
   d. Existing partitions to be removed shall include demolition of all devices, raceway and wire including any obsolete or previously abandoned products. Raceway and wiring systems serving other remaining areas shall only be altered as required and in accordance with the contract documents.
   e. Existing floor mounted devices shall be demolished. Provide abandoning plates and fire proofing as required.

8) Refer to mechanical and plumbing demolition drawings for full extent and scope of electrically operated equipment modifications.

   a. Demolition of existing mechanical equipment shall include associated disconnects, raceway, wire and controls.

THIS SHEET OF DRAWINGS HAS NOT BEEN REVIEWED FOR CODE COMPLIANCE.

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21-035 TMCA SOUTH OR 4 RENOVATION

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Issue	ISSUE FOR CONSTRUCTION
Date	23 MARCH 2022
Project Number	21-035
Drawn by	KC
Checked by	JG

Sheet Title
ELECTRICAL SPECIFICATIONS

Sheet Number
E.001

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GENERAL ELECTRICAL SYMBOLS

	CONDUIT RUN CONCEALED IN CEILING OR WALL
	CONDUIT RUN CONCEALED IN OR BELOW FLOOR
	CONDUIT RUN EXPOSED ON CEILING OR WALL

ARROWHEAD DENOTES HOMERUN TO PANELBOARD. SLASH LINES INDICATE QUANTITY OF WIRE; NEUTRAL WIRE SHOWN AS A LONG LINE, PHASE WIRES AND SWITCH LEGS SHOWN AS SHORT LINES, AND GROUND WIRE SHOWN AS A LONG LINE WITH A DOT.

— X — CONDUIT, WHERE "X" IS THE TYPE OR FUNCTION OF CONDUIT.

"C"	INDICATES CLOCK	"S"	INDICATES SOUND
"CO"	INDICATES CONDUIT ONLY	"T"	INDICATES TELEPHONE
"CTV"	INDICATES CCTV	"TVA"	INDICATES TELEVISION ANTENNA
"D"	INDICATES DATA	"TVC"	INDICATES CABLE TELEVISION
"FA"	INDICATES FIRE ALARM		
"I"	INDICATES INTERCOM		
"LV"	INDICATES LOW VOLTAGE		
"NC"	INDICATES NURSE CALL		

	FLEXIBLE CONDUIT
	UNDERGROUND DUCTBANK
PB	PULL BOX
J	JUNCTION BOX– EXPOSED OR IN CEILING
J	JUNCTION BOX – WALL MOUNTED
J	JUNCTION BOX WITH FLEXIBLE CONDUIT AND FINAL CONNECTION TO EQUIPMENT.
PDQ 13	EQUIPMENT IDENTIFICATION TAG

LIGHTING SYMBOLS

F1 1a	2' X 4' LED LIGHTING FIXTURE.
F1 1a	1' X 4' LED LIGHTING FIXTURE.
F1 1a	LED LIGHTING FIXTURE– LENGTH AS INDICATED.
F1 E1	2' X 4' LED LIGHTING FIXTURE CONNECTED TO EMERGENCY CIRCUIT.
F1 E1	LED LIGHTING FIXTURE CONNECTED TO EMERGENCY CIRCUIT.
OS	OCCUPANCY SENSOR

LIGHTING FIXTURES: "F1" INDICATES LIGHTING FIXTURE TYPE. REFER TO LIGHTING FIXTURE SCHEDULE FOR DESCRIPTION AND MOUNTING. "1" INDICATES CIRCUIT NUMBER "a" INDICATES SWITCH CONTROL. SHADING OF LIGHTING FIXTURE OR "E" INDICATES LIGHTING FIXTURE CONNECTED TO EMERGENCY CIRCUIT.

3W $_{\$}^{XXa}$ LIGHT SWITCH, SINGLE POLE UNLESS NOTED OTHERWISE:

"a"	INDICATES LIGHTS CONTROLLED	"XX"	INDICATES CIRCUIT NUMBER
"D"	INDICATES DIMMER SWITCH	"WP"	INDICATES WEATHERPROOF
"EP"	INDICATES EXPLOSION PROOF	"2P"	INDICATES 2 POLE
"FD"	INDICATES FLUORESCENT DIMMER	"3P"	INDICATES THREE POLE
"ID"	INDICATES INCANDESCENT DIMMER	"3W"	INDICATES THREE–WAY
"K"	INDICATES KEY OPERATED	"4W"	INDICATES FOUR–WAY
"LV"	INDICATES LOW VOLTAGE	"OS"	INDICATES COMBINATION WITH OCCUPANCY SENSOR
"MC"	INDICATES MOMENTARY CONTACT		
"P"	INDICATES PILOT LIGHT		

FIRE ALARM SYMBOLS

SD	SMOKE DETECTOR
S	VOICE SPEAKER
V	VISUAL STROBE
SV	COMBINATION VOICE SPEAKER AND VISUAL STROBE

SIGNAL SYMBOLS

WALL	FLOOR	POKE–THROUGH	
			SUBSCRIPT INDICATES THE FOLLOWING FOR BELOW WALL MOUNTED OUTLETS, (U.N.O.): "H" HANDICAP MOUNTED AT 48" A.F.F. "P" PAY PHONE MOUNTED AT 54" A.F.F. "W" WALL MOUNTED AT 54" A.F.F.
			TELEPHONE OUTLET
			DATA SYSTEMS OUTLET
			COMBINATION TELEPHONE/ DATA SYSTEMS OUTLET
			PUSHBUTTON STATION WITH ONE BUTTON
CCTV			CLOSED CIRCUIT TELEVISION CAMERA

POWER SYMBOLS

WALL	FLOOR	POKE–THROUGH BOX	
			DUPLEX RECEPTACLE
			DOUBLE DUPLEX RECEPTACLE
			SPECIAL RECEPTACLE – NEMA TYPE AS INDICATED
			JUNCTION BOX WITH FLEXIBLE CONDUIT AND FINAL EQUIPMENT OR FURNITURE SYSTEM POWER CONNECTION

WP XX ADJACENT LETTERS IN THE SYMBOLS ABOVE INDICATE THE FOLLOWING:

"CR"	INDICATES CHILD RESISTANT (SAFETY TYPE)
"E"	INDICATES RECEPTACLE FED BY EMERGENCY CIRCUIT
"EP"	INDICATES RECEPTACLE IS EXPLOSION PROOF
"EWC"	INDICATES RECEPTACLE SERVES ELECTRIC WATER COOLER
"GFI"	INDICATES RECEPTACLE HAS GROUND FAULT CIRCUIT INTERRUPTER
"IG"	INDICATES RECEPTACLE HAS ISOLATED GROUND
"TVS"	INDICATES RECEPTACLE HAS TRANSIENT VOLTAGE SURGE SUPPRESSION
"WP"	INDICATES RECEPTACLE HAS WATERPROOF COVER
"XX"	INDICATES RECEPTACLE CIRCUIT NUMBER
"S"	INDICATES RECEPTACLE IS SAFETY TYPE

	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTERTOP OR DUPLEX MOUNTED WITHIN 12" BELOW COUNTERTOP TO SERVE COUNTER
	SWITCHGEAR, SWITCHBOARD OR MOTOR CONTROL CENTER, DASHED LINES INDICATE FUTURE SECTIONS, ARROW INDICATES FRONT
	SURFACE MOUNTED DISTRIBUTION PANELBOARD
	SURFACE MOUNTED BRANCH CIRCUIT PANELBOARD
	RECESSED MOUNTED BRANCH CIRCUIT PANELBOARD
1–HDP–1	SWITCHBOARDS, DISTRIBUTION PANELBOARDS, MOTOR CONTROL CENTERS, PANELBOARDS, CABINETS, AND RELATED EQUIPMENT



INDICATES LEVEL ON WHICH PANEL IS LOCATED – G, B, 1, 2, ETC.
INDICATES TYPE, CODED AS FOLLOWS:
INDICATES PANEL NUMBER

"C"	CRITICAL OR COMPUTER	"L"	208/120V, OR 208V
"D"	DISTRIBUTION	"MCC"	MOTOR CONTROL CENTER
"E"	EMERGENCY	"P"	POWER
"H"	480/277V, OR 480V	"Q"	EQUIPMENT
"ISP"	ISOLATION	"R"	RECEPTACLE
"K"	KITCHEN	"S"	STANDBY
"L"	LIGHTING	"SWBD"	SWITCHBOARD
		"XR"	X–RAY

T TRANSFORMER

SINGLE LINE DIAGRAM SYMBOLS

	GROUNDING ELECTRODE CONDUCTOR
	CIRCUIT BREAKER
	PANELBOARD
	SWITCHBOARD OR MOTOR CONTROL CENTER AS INDICATED
	TRANSFORMER WITH FLEXIBLE CONDUIT AND PAD

HEALTH CARE CALL SYMBOLS

1	SINGLE CALL STATION
2	NOT USED
3	TOILET BATH OR SHOWER CALL STATION
4	SINGLE CORRIDOR DOME ZONE LIGHT
5	NURSE CALL MASTER ANNUNCIATOR
6	NURSE CALL SYSTEM CONTROL PANEL
7	MULTIPLE CORRIDOR DOME ZONE LIGHT
8	DUTY STATION
9	STAFF DUTY STATION
20	PATIENT EXTENSION RECEPTACLE
21	PATIENT SINGLE CORD BEDSIDE STATION
23	CODE BLUE STATION

ABBREVIATIONS

NOTE: ABBREVIATIONS ARE ALPHABETICALLY LISTED BY DESCRIPTION.

ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
ACL	ACROSS THE LINE
ALM	ALARM
AC	ALTERNATING CURRENT
A	AMPERE
AMP	AMPERE
AIC	AMPERES INTERRUPTING CAPACITY
AL	ALUMINUM
ANN	ANNUNCIATOR
ATS	AUTOMATIC TRANSFER SWITCH
BAL	BALLAST
BR	BRANCH
BRKR	BREAKER
BGB	BUILDING GROUND BOX
CAB	CABINET
CATV	CABLE TELEVISION
C.B.	CIRCUIT BREAKER
CCT	CIRCUIT
CCTV	CLOSED CIRCUIT TELEVISION
CLO	CLOSET
COAX	COAXIAL
C.U.	COEFFICIENT OF UTILIZATION
C	CONDUIT
CONN	CONNECTION
CU	COPPER
CUH	CABINET UNIT HEATER
CT	CURRENT TRANSFORMER
HZ	HERTZ (CYCLES/SECOND)
DC	DIRECT CURRENT
DS	DISCONNECT SWITCH
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DT	DUSTTIGHT
ELEC	ELECTRIC
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EM	EMERGENCY
EMT	ELECTRIC METALLIC TUBING (THIN WALL CONDUIT)
EQ	EQUIPMENT
EUH	ELECTRIC UNIT HEATER
EX	EXISTING
EP	EXPLOSION PROOF
FPB	FAN POWERED BOX
FA	FIRE ALARM
FDC	FIRE DEPARTMENT CONNECTION
FB	FLOORBOX
FLUOR	FLUORESCENT
F	FUSE
F.S.	FUSED SWITCH
GEN	GENERATOR
GRD	GROUND
GFI	GROUND FAULT INTERRUPTER
GHW	GALVANIZED HEAVYWALL STEEL CONDUIT
HV	HIGH VOLTAGE
HP	HORSE POWER
IC	INTERRUPTING CAPACITY
IMC	INTERMEDIATE GRADE CONDUIT
JB	JUNCTION BOX
KW	KILOWATT
KWH	KILOWATT–HOUR
KVA	KILOVOLT–AMPERE
KO	KNOCKOUT
LTG	LIGHTING
LS	LOUD SPEAKER
LV	LOW VOLTAGE
MFR	MANUFACTURER
MTR	MOTOR
MCC	MOTOR CONTROL CENTER
MTD	MOUNTED
NEC	NATIONAL ELECTRICAL CODE
NEUT	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPENED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PNL	PANEL
PH	PHASE
PT	POTENTIAL TRANSFORMER
PWR	POWER
PRI	PRIMARY
PROT.	PROTECTION OR PROTECTIVE
PA	PUBLIC ADDRESS
PB	PULL BOX
RT	RAINTIGHT
RECP	RECEPTACLE
RC	REMOTE CONTROL
R	RESISTANCE
REL	RELOCATE
SEC	SECONDARY
SC	SHORT CIRCUIT
SP	SINGLE POLE
SPST	SINGLE POLE SINGLE THROW
SPDT	SINGLE POLE DOUBLE THROW
SPKR	SPEAKER
SPEC	SPECIFICATION
SS	STAINLESS STEEL
STA	STATION
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
SYS	SYSTEM
TC	TERMINAL CABINET
TEL	TELEPHONE
TEL.CL.	TELEPHONE CLOSET
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TERM.	TERMINAL
TX	TRANSFORMER
TRIP	TRIP
TL	TWIST LOCK
UL	UNDERWRITER'S LABORATORIES
UNG	UNGROUNDED
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VA	VOLT–AMPERE
WT	WATERTIGHT
W	WATT
WP	WEATHERPROOF
XR	EXISTING TO BE REMOVED
XRL	EXISTING TO BE RELOCATED
XRW	EXISTING TO BE REWIRED

GENERAL NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF LIGHTING AND CONTROLS, RECEPTACLES, COMMUNICATIONS DEVICES, FIRE ALARM DEVICES, AND LIFE SAFETY DEVICES.
2. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION OF HVAC, PLUMBING, AND FIRE PROTECTION EQUIPMENT.
3. REFER TO PANEL DIVISION LINES FOR BRANCH CIRCUIT HOMERUN PANELBOARD DEMARCATION LINES, UNLESS NOTED OTHERWISE.
4. BRANCH CIRCUIT WIRING FOR 120 VOLT 20 AMP CIRCUITS WIRED TO 208Y/120V SYSTEMS SHALL BE AS FOLLOWS:
   A. GENERAL RECEPTACLE LOADS:
      UP TO 100 FEET IN LENGTH: 3#12, 1#12N, 1#12G –3/4"C.
      OVER 100 FEET IN LENGTH: 3#10, 1#10N, 1#10G –3/4"C.
   B. ISOLATED GROUND RECEPTACLE LOADS:
      UP TO 80 FEET IN LENGTH: 3#12,1#10N,1#12G,1#12IG–3/4"C.
      OVER 80 FEET IN LENGTH: 3#10,1#8N,1#10G,1#10IG–3/4"C.
   C. LIGHTING LOADS:
      UP TO 100 FEET IN LENGTH: 3#12, 1#10N, 1#12G –3/4"C.
      OVER 100 FEET IN LENGTH: 3#10, 1#8N, 1#10G –3/4"C.
5. BRANCH CIRCUIT WIRING FOR 277 VOLT 20 AMP CIRCUITS WIRED TO 480Y/277V SYSTEMS SHALL BE AS FOLLOWS:
   A. ELECTRIC HEATING LOADS:
      UP TO 150 FEET IN LENGTH: 3#12, 1#12N, 1#12G –3/4"C.
      OVER 150 FEET IN LENGTH: 3#10, 1#10N, 1#10G –3/4"C.
   B. LIGHTING LOADS:
      UP TO 100 FEET IN LENGTH: 3#12, 1#10N, 1#12G –3/4"C.
      OVER 100 FEET IN LENGTH: 3#10, 1#8N, 1#10G –3/4"C.
6. MOUNTING HEIGHTS OF ELECTRICAL ITEMS SHALL BE AS LISTED BELOW ABOVE FINISHED FLOOR TO CENTERLINE, UNLESS NOTED OTHERWISE:

A. GENERAL RECEPTACLES	18"
B. GENERAL TELE AND DATA OUTLETS	18"
C. GENERAL TOGGLE SWITCHES	48"
D. CLOCK AND PAGING SPEAKER OUTLETS	84"
E. FIRE ALARM AUDIO VISUAL DEVICES	80"
F. INDIVIDUAL DISCONNECTS AND STARTERS	60"
G. GROUPED DISCONNECTS AND STARTERS	> 12"
	< 72"
H. PANELBOARD OVERCURRENT DEVICES	> 12"
	< 72"

7. PROVIDE RACEWAY AND GROUNDING FOR COMMUNICATIONS SYSTEMS INCLUDING TELEPHONE, DATA, SECURITY, CABLE TELEVISION, PAGING, INTERCOM, ETC. VERIFY REQUIREMENTS WITH COMMUNICATIONS CONSULTANTS AND CONTRACTORS.
8. VOICE AND DATA RACEWAY FOR WALL MOUNTED OUTLETS SHALL BE AS FOLLOWS: PROVIDE A TWO–GANG J–BOX AND SINGLE OR DOUBLE GANG FLUSH WALL OPENING AS REQUIRED FOR EACH VOICE/DATA OUTLET. CONDUITS SHALL INCLUDE PULL STRINGS AND 48" RADIUS BENDS. CONDUIT STUBS SHALL INCLUDE INSULATING BUSHINGS. CONDUIT FROM OUTLET BOX SHALL BE 1" MINIMUM AND SHALL STUB UP INTO ACCESSIBLE CEILING SPACE.

BRANCH CIRCUIT WIRING SCHEDULE

OCPD	1P & 2P	2P–3W & 3P–3W	3P–4W
15	2#12, 1#12G, 3/4"C	3#12, 1#12G, 3/4"C	4#12, 1#12G, 3/4"C
20	2#12, 1#12G, 3/4"C	3#12, 1#12G, 3/4"C	4#12, 1#12G, 3/4"C
25	2#10, 1#10G, 3/4"C	3#10, 1#10G, 3/4"C	4#10, 1#10G, 3/4"C
30	2#10, 1#10G, 3/4"C	3#10, 1#10G, 3/4"C	4#10, 1#10G, 3/4"C
35	2#8, 1#10G, 3/4"C	3#8, 1#10G, 3/4"C	4#8, 1#10G, 3/4"C
40	2#8, 1#10G, 3/4"C	3#8, 1#10G, 3/4"C	4#8, 1#10G, 3/4"C
45	2#6, 1#10G, 3/4"C	3#6, 1#10G, 3/4"C	4#6, 1#10G, 1"C
50	2#6, 1#10G, 3/4"C	3#6, 1#10G, 3/4"C	4#6, 1#10G, 1"C
60	2#4, 1#10G, 3/4"C	3#4, 1#10G, 1"C	4#4, 1#10G, 1 1/4"C
70	2#4, 1#8G, 3/4"C	3#4, 1#8G, 1"C	4#4, 1#8G, 1 1/4"C
80	2#3, 1#8G, 1"C	3#3, 1#8G, 1"C	4#3, 1#8G, 1 1/4"C
90	2#2, 1#8G, 1"C	3#2, 1#8G, 1 1/4"C	4#2, 1#8G, 1 1/4"C
100	2#1, 1#8G, 1 1/4"C	3#1, 1#8G, 1 1/4"C	4#1, 1#8G, 1 1/2"C

THIS SHEET OF DRAWINGS HAS NOT BEEN REVIEWED FOR CODE COMPLIANCE.

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No.	Description	Date

COLORADO LICENSED MICHAEL P. THOMPSON 55150 PROFESSIONAL ENGINEER
03/24/2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	23 MARCH 2022
Project Number	21-035
Drawn by	KC
Checked by	JG

Sheet Title
ELECTRICAL LEGENDS NOTES, AND ABBREVIATIONS

Sheet Number
E.000

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G:\19119-00\320_ELEC\DRAWINGS\E001 - ELECTRICAL SPECIFICATIONS.DWG Last edited by CZI on 10-10-2019 @ 3:56

RSN:1619950 | PERMIT# 22-2136196-LT

DIVISION 16000 – ELECTRICAL

1. GENERAL

A. Requirements:

1) Products and execution shall be provided for a complete and fully operational electrical system throughout the extent of the project, in conformance with applicable codes, laws, ordinances and agency standards of governing bodies having jurisdiction, and in strict accordance with the contract documents, and building standards.

2) Products, including equipment, devices, fixtures, and materials shall be new unless noted otherwise, UL listed, and bear appropriate label.

3) Execution, including preparation, installation, starting, and testing shall be performed by skilled trades personnel, in compliance with the associated manufacturers recommendations, and coordinated with the other construction trades.

B. Applicable Codes:

1) National Electrical Code	NEC
2) International Building	IBC
3) Local Amendments	

C. Applicable Laws and Agency Standards:

1) American National Standards Institute	ANSI
2) American Society for Testing and Materials	ASTM
3) Americans with Disabilities Act	ADA
4) Electrical Testing Laboratories	ETL
5) Electronic/Telecommunications Industries Association	EIA/TIA
6) Federal Aviation Administration	FAA
7) Illuminating Engineering Society of North America	IESNA
8) Institute of Electrical and Electronics Engineers	IEEE
9) Insulated Cable Engineers Association	ICEA
10) National Electrical Manufacturers Association	NEMA
11) National Fire Protection Association	NFPA
12) Underwriters' Laboratories	UL

D. Approvals:

1) Emergency and Exit Lighting Documents shall be prepared and submitted to the Local Fire Department for their approval of system layout, circuiting, and fixture type. Approved drawings shall be submitted for review prior to construction.

2) Fire Alarm and Life Safety Documents shall be prepared and submitted to the Local Fire Department for their approval of system expansion, layout, circuiting, equipment and device type. The base building fire alarm and life safety system manufacturer/installer shall be retained to produce or update the building fire alarm and life safety documents, and to make final connections and alterations to the existing system. Approved drawings shall be submitted for review prior to construction.

3) Other systems requiring specific approval.

E. Submittals:

1) Product Data shall be prepared and submitted for review prior to construction for the following products: cabinets, access panels, supports, raceway components, floor boxes, fire proof fittings, wire, fuses, circuit breakers, receptacles, toggle switches, slide dimmers, disconnect switches, motor starters, contactors, lighting fixtures, ballasts, lamps, controls, fire alarm devices, life safety devices, and electric heating equipment.

2) Shop Drawings shall be prepared and submitted for review prior to construction for the following products: metering equipment, distribution panelboards, branch panelboards, transformers, cable tray, dimming equipment, fire alarm equipment, and life safety equipment.

3) Test Results shall be prepared and submitted prior to project completion for cable insulation, grounding system, emergency system, fire alarm system, and life safety systems in accordance with authorities having jurisdiction, and applicable codes and agency standards.

4) Manufacturers Instructions shall be prepared and submitted prior to construction including installation manuals with application conditions and limitations for electrical apparatus use, storage, handling, protection, examination, preparation, installation, and starting.

5) Utility Service Request shall be prepared and submitted prior to construction. Utility prepared drawings shall be submitted for review prior to construction.

6) Project Record Documents shall be prepared using AutoCAD or equivalent CAD package. Project Record Documents shall be submitted on reproducible media prior to project completion for electrical systems. Record actual location of equipment, devices, fixtures, etc. Record actual routing of overhead feeders. Record actual routing of feeders below slab and branch circuits within or below slab.

7) Maintenance Data shall be prepared and submitted prior to project completion for electrical apparatus including operation manuals and maintenance manuals.

F. Electrical Power System Studies:

1) Short Circuit Current and Protective Device Coordination Studies:
   a. Submit short circuit current and protective device coordination studies with coordination plots on standard log–log graphs for the medium and low voltage systems.
   b. The data shall include:
      1} Selected base quantities.
      2} One line diagrams.
      3} Impedance diagrams.
      4} Calculation methods.
      5} Tabulation of data.
      6} Conclusions.
      7} Recommendations.
   c. Equipment shop drawings shall not be submitted until the short circuit and coordination study has been reviewed by the Architect/Engineer.
   d. Provide proper fuse size and type. Provide proper selection and setting of relays, sensors and circuit breakers.

2) Arc Flash Hazard Analysis:
   a. Submit arc flash hazard analysis study in conjunction with the short circuit current and protective device coordination studies.
   b. The data shall include:
      1} Device or bus name.
      2} Bolted fault and arcing fault current levels.
      3} Flash protection boundary distances.
      4} Personal protective equipment (PPE) classes.
      5} Arc flash incident energy (AFIE) levels.
   c. The arc flash analysis shall include recommendations for reducing AFIE levels and enhancing worker safety.

G. Coordination:

1) Utility Company: Obtain and coordinate temporary service and permanent services in conformance with utility company requirements. Arrange for services in a timely manner. Provide temporary service until such time that permanent service can be energized.

2) Electrical Engineer: Notify the Engineer of any conflicting design information or any design intentions which are not readily interpreted from the contract documents prior to any product selection or execution of work. Notify the Engineer of any products which are damaged, unsuitable, incompatible, or non–compliant with any applicable codes or ordinances of any governing bodies having lawful jurisdiction.

3) Architect: Coordinate construction of the electrical system with the Architect. Final locations and mounting heights of electrical equipment, fire alarm equipment, receptacles, switches, communications devices, fire alarm devices, lighting fixtures, etc. shall be as directed by the Architect.

4) Construction Trades: Coordinate work with other construction trades.

5) Building Management: Meet on site with the building engineer to become familiar with building standards. Normal building working hours shall be recognized. After–hours work or temporary services shall be with prior written approval from building management. Enclose construction area from other areas to prevent transmission of dust, dirt and noise into other existing tenant areas. Product and waste transfer shall be coordinated with building management for scheduling of the elevators, deliveries, and waste removal.

6) Existing Building Systems: Review building standards with the building engineer. Perform a site visit to verify the existing site conditions. Costs associated with unforeseen conditions as result of not performing a site visit shall not be an entitlement for an increase to the contract. Construction shall be performed without interruption to the building power, communications, security, fire alarm and life safety systems, or interference to common areas, corridors, exits or existing tenants. Where any construction would interfere with the daily operations of the building or other tenants, after–hours work or temporary services shall be provided at no increase to the contract.

H. Warrantee and Guarantee

1) Provide warrantee and manufacturers certificate for each product, minimum of one year or longer as specified, from the date of occupancy. Repair and/or replace any equipment, devices, fixtures, materials, etc. with defect as required at no increase to the contract.

2) Provide guarantee of installation for a period of one year from the date of occupancy. Repair and/or reinstall any work with defect as required at no increase to the contract. Provide guarantee of rework for a period of one year from the completion of repair or reinstallation.

3) Damage caused to finishes, surfaces, ceiling tiles, equipment, etc. shall be repaired and/or replaced to match the pre–existing condition at no increase to the contract.

I. Pay fees and other charges incidental to the electrical work and obtain and pay for required liability and casualty insurance, permits, licenses, inspections, taxes, etc.

J. Construction shall be done during regular working hours and days, unless otherwise specified. Work required to be performed during overtime hours or days shall be as indicated.

K. Allow for 8 man–hours of training to the Owners staff for the operation of the electrical systems.

L. Substitutions are not acceptable.

2. PRODUCTS

A. Cabinets, enclosures and access panels shall be code gage steel with baked enamel finish and flangeless hinges and fasteners. Equipment bases shall be 3 inch high concrete, steel braced and reinforced with 1/4 inch chamfer, and shall extend a minimum of 2 inches around base of equipment. Vibration isolation shall be spring elements in suspended rods and isolation pads below equipment, electrical connections shall be flexible conduit.

B. Conduits shall be hot–dipped galvanized or electro–galvanized steel, minimum size shall be 3/4 inch, except power branch circuits may be 1/2 inch (unless noted otherwise) and flexible connections to recessed lighting fixtures which may be 3/8 inch. Flexible steel conduit shall be galvanized steel, with UL listed liquid tight jacket as required, for final connections to motors, recessed lighting fixtures, and life safety devices. Supports, including channels, angles, rods, and fasteners shall be hot–dipped galvanized steel. Manufacturer shall be Allied, LTV/Republic, Steelduct, or Wheatland.

C. Conduit fittings shall be steel, die cast fittings of pot metal are not acceptable. Electrical metallic tubing (EMT) fittings shall be compression type with insulated throats; set screw fittings are not acceptable. Intermediate metal conduit (IMC) and heavy wall conduit (HWG) fittings shall be of threaded joints; set screw and compression fittings are not acceptable. Manufacturer shall be Appleton, Crouse Hinds/Midwest, OZ/GGedney, Raco, Steel City, or T&B.

D. Outlet boxes for all toggle switches, receptacles, communications devices, fire alarm devices, and life safety devices shall include plaster rings, device plates, and cover plates where required. Provide boxes suitable for plenum, wet, or hazardous locations as required. Device cover plates shall be stainless steel painted to match finish. Multi–gang outlet boxes shall include suitable one–piece device cover plate. Outlets located on opposite sides of a partition shall be staggered by 12 inches, minimum. Manufacturer shall be Appleton, Raco, or Steel City.

E. Floor boxes shall be adjustable concrete tight pressed steel with brass flange and covers. Flush floor boxes shall include brass trim and hinged outlet opening covers. Fire rated poke–through floor fittings shall be UL listed and approved for the floor slab fire rating. Floor mounted service fittings for connection to underfloor electrified metal deck shall be compatible with the deck manufacturer. Access floor mounted fittings for use with raised floors shall be flush type with space for equipment cord plug devices and suitable flip type cover. Manufacturer shall be Hubbell, Wiremold, or Steel City.

F. Raceway poles for power and communications shall be two compartment steel, length and finish as required, complete with all bases, adjustable stanchions, horizontal supports, trim plates, and connecting harnesses. Manufacturer shall be Wiremold.

G. Flush infloor duct raceway systems, including power and communications ducts, adjustable supports, elbows, fittings, and all required accessories shall be of UL standard galvanized steel, and shall be sized in accordance with code to adequately facilitate pulling and connecting the quantity and size of wires and cables contained. Manufacturer shall be Wiremold or Steel City.

H. Surface metal raceway including power devices, communications devices, fittings, connectors, feeds, elbows, couplings, blanks, tees, wire clips, device brackets, device covers, and other associated apparatus shall be sized to facilitate pulling the quantity and size of wires and cables, and installing the devices contained. Raceway shall be of code gage galvanized steel, shall include mounting knock–outs, and shall be finished as directed by the Architect. Manufacturer shall be Wiremold.

I. Ladder type cable tray systems, including all runners, elbows, tees, crosses, and fittings shall be of aluminum and shall be sized to facilitate pulling the quantity and size of wires and cables contained. Manufacturer shall be B–Line, Square D, or Legrand.

J. Wire shall be 600 Volt insulated copper, minimum size shall be No.12 AWG, wire sizes No.8 AWG and larger shall be stranded. Manufacturer shall be American Insulated Wire Corp., Cerro, Collyer, Capitol Wire and Cable, Okonite, Senetor, South Wire, or Triangle.

K. Cable supports shall be appropriate for the size of conduit and type of wire and cables. Cable lubricant shall be less than six percent solid residue after drying and shall not contain any waxes, greases, silicones, or glycol oils.

L. Local disconnect switches for electrically operated equipment shall be heavy duty within enclosure suitable for the location. Fusible disconnect switches 800 Amps and larger shall be bolted pressure, load–break type. Fusible and non–fusible disconnect switches 600 Amps and smaller shall be quick–make, quick–break type. Manufacturer shall be Cutler–Hammer, Siemens/ITE, or Square D.

M. Overcurrent and short circuit protection within fusible switches shall be Class L current limiting time delay fuses for switches rated 800 Amps and larger, and Class RK–1 current limiting time delay fuses for switches rated 600 Amps and smaller. Manufacturer shall be Bussmann.

N. Grounding system, including service and equipment grounding and bonding, shall be in accordance with code and shall connect all electrically operated equipment. Provide a separate green ground wire for each branch circuit and feeder.

O. Receptacles shall be duplex NEMA 5–20R, back and side wired, specification grade, unless noted otherwise. Special receptacle configurations, duplex isolated ground receptacles, and duplex ground fault interrupter receptacles shall be as required or as indicated on the contract documents. General receptacle color shall be white and IG receptacle color shall be orange unless specified otherwise, verify color with Architect. Manufacturer shall be Bryant, Hubbell, Leviton, or Pass & Seymour.

P. Toggle switches shall be single pole 20 Amp, 120–277 Volt, back and side wired, specification grade, unless noted otherwise. Special switches, including 3–way, pilot light and momentary contact, shall be as required or as indicated on the contract documents. Color shall be white unless specified otherwise, verify color with Architect. Manufacturer shall be Bryant, Hubbell, Leviton, or Pass & Seymour.

Q. Lighting contactors shall be enclosed and mechanically held, and shall include all required control modules, timeclocks, and remote photocells. Main contactors for panelboard feeders shall match the panel ratings. Multiple pole contactors for branch circuits shall be rated at 20 Amps, or more, as required for the specific load type. Manufacturer shall be ASCO 920 & 917 or Zenith MVP & MMC.

R. Slide dimmers shall be low profile, quiet, slide–to–off type, and shall be rated as required for the wattage and specific load type. Manufacturer shall be Lutron, Lightolier, Hubbell, or Leviton.

S. Lighting fixtures shall include all appropriate accessories, mounting frame and trim for ceiling type. Fluorescent fixtures shall include rapid–start standard–output electronic ballasts with ninety percent (90%) ballast factor and total harmonic distortion of (10%) or less, type or appropriate compact type lamps. Lighting fixtures shall include coordinated air handling capability, plenum rating, damp label, wet label, and shall be explosion proof where required. Lighting fixtures recessed within grid type ceilings shall include securing clips as required by the local authority. Fixture manufacturer shall be as indicated; Electronic ballast manufacturer shall be Advance, Motorola, or MagneTek with minimum 3 year warrantee; Lamp manufacturer shall Osram Sylvania, General Electric, or Phillips.

T. New fire alarm devices provided within existing systems shall match existing device manufacturer and type. Strobes shall meet ADA guidelines for the application and shall rated 75dc, except in sleeping areas which shall be rated 110dc. Strobes rated 15/75dc with 75dc on axis are not acceptable except in small conference rooms. Existing fire alarm devices shall be extended as required. Existing fire alarm equipment shall be expanded as required with any additional components for proper operation of new devices on existing equipment.

U. Uninterruptible power supply (UPS) equipment includes converters, rectifiers, chargers, filters, inverters, pulse–width modulation, self–contained or external batteries, transfer switches, input and output isolation transformers, external maintenance by–pass switch, synchronizing equipment, protective devices, indicated, E.P.O. provisions, instrumentation, monitors, and controls. UPS manufacturer shall be Liebert, MGE or Powerware.

V. Power distribution units (PDU's) shall include input power/control junction box with ten (10) foot liquid tight cable, main input circuit breaker, K–20 rated isolation transformer, protective devices, non–linear output branch circuit panelboards, with main circuit breaker and 200% neutral bus, liquid tight output cables with plenum junction box and wiring devices as indicated, E.P.O. provisions, instrumentation, monitors, and controls in accordance with Owner requirements. PDU manufacturer shall be Liebert, MGE or Powerware.

3. EXECUTION

A. Penetrations and channels in floors and walls shall be via cutting and coring as required for the size of product, only in accordance with the Architect and Engineer recommendations, and as scheduled with the building management. Patch and fill sleeves, inserts, penetrations, and channels with appropriate code approved fire safing or filling to match or restore the original fire rating of the construction.

B. Make final connections to vibrating equipment, fixtures, and devices with flexible metal conduit or liquid tight flexible metal conduit as required. Extend ground wire through flexible connections.

C. Install conduit, fittings, supports, etc. in accordance with codes, standards, and manufacturers recommendations. The voltages identified in the following schedules are line–to–line or line–to–neutral. Interior concealed locations are those locations which are above ceilings, within walls, within floor slabs, and within dedicated electrical rooms. Conduit installation shall be as follows unless noted otherwise:

Voltage Location	0V thru 50V	Above 50V thru 250V	Above 250V thru 600V	Above 600V
Interior Concealed	EMT Concealed	EMT	≤ 2"EMT ≥ 2 1/2"IMC	HWG
Interior Exposed	EMT	≤ 2"EMT ≥ 2 1/2"IMC	IMC	HWG
Exterior and Hazardous Locations	EMT	IMC	HWG	HWG

D. Installations within air handling spaces, including plenum ceilings and built up air handling systems shall be approved for plenum installation and shall be in strict accordance with all applicable codes.

E. Install pull boxes, junction boxes, and outlet boxes in accordance with codes, standards, and manufacturers recommendations. Boxes shall include accessible covers, shall be fabricated of heavy gage galvanized steel, and shall be sized with code to adequately facilitate pulling and connecting the quantity of wires, cables, and feeders contained. Conduit terminations shall be made with bushings and locknuts. Supports for conduits and boxes shall be suspended directly to the building structural components and in no case shall they be attached to suspended ceiling grid, ductwork, or piping components.

F. Install feeders and branch circuit wiring in accordance with codes, standards, and manufacturers recommendations. Provide neutral sized at 200% or (2) neutral conductors where serving panels with 200% rated neutral bus, coordinate installation with panel manufacturers lug provisions. Install normal power, emergency power, fire alarm, and life safety systems within continuous metal raceways. Install concealed security and communications wiring within continuous metal raceways. Separate each system into independent raceways. Provide cable supports as required. Terminate cables per code and manufacturers recommendations. Provide (2) hole lugs for cables 250 kcmil and larger. Power wiring insulation shall be as follows unless noted otherwise:

Wire Location	300 kcmil and smaller	Isolated Power	Environmental Conditions
Interior Locations	THHN/THWN	XHHW	dry
Exterior Locations	THHN/THWN THHN/THWN	XHHW	damp wet

G. Install electrical distribution equipment and devices, including metering, distribution panelboards, branch panelboards, motor starters, local disconnect switches, overcurrent protection, transformers, main contactors, receptacles, etc. in accordance with codes, standards, and manufacturers recommendations.

H. Install grounding systems in accordance with codes, standards, and manufacturers recommendations. Communications system shall include ground lug and AWG No. 6 which shall connect to the electrical service equipment ground bus. Grounding conductor between computer room raised floor pedestals, computer room structural steel, and computer room equipment shall be AWG No. 6. Grounding loop around computer room perimeter pedestals shall be AWG No. 2 which shall connect to the electrical service equipment ground bus. Grounding conductors shall be secured to computer room raised floor pedestals via Burndy GP series clamps.

I. Install lighting and associated controls, including fixtures, ballasts, lamps, toggle switches, slide dimmers, dimming equipment, lighting contactors, etc in accordance with codes, standards, and manufacturers recommendations.

J. Install single and multiple device cover plates as required. Extend existing devices to finished surface as required.

K. Install fire alarm and other life safety systems in accordance with codes, standards, and manufacturers recommendations.

L. Install inscription plates and identification markings for products and wiring including the same inscriptions where indicated on the contract documents. Install plastic laminate nameplates on enclosures for each device within metering equipment, distribution panelboards, branch panelboards, motor starters, disconnect switches, transformers, and contactors. Nameplates shall be white with black core, 1–1/4 inches by 3 inches minimum, with 3/16 inch lettering, secured to equipment with two machine screws. Prepare and install type–written panel directory within each branch panel. Device plates shall be engraved for toggle switches and other devices whose function is not readily apparent. Markers shall be self–sticking for each wire and cable at terminations and at each accessible point in equipment and raceway.

M. Clean electrical apparatus prior to completion of construction. Keep work areas clean at all times.

N. Alterations and Demolition of existing systems shall be as follows:

1) Provide all alterations and demolition of the existing electrical installation as required, including any incidental materials to execute all removal, rerouting, relocation, and any other modifications for proper accommodation of all new construction as indicated on the contract documents. All alterations and demolition shall be as indicated on the contract documents or as required, including any modifications not specifically identified on any contract documents but required to complete all new construction.

2) Provide all modifications to existing equipment as required or as indicated on the contract documents in strict accordance with the existing product manufacturers recommendations.

3) Existing raceway, wire and cable extending through the construction area but serving areas outside the contract shall be rerouted and reconnected as required. All modifications shall be without any interruption to the building power, communications, security, fire alarm and life safety systems, or interference to other areas or tenants. Where any modifications would interfere with the daily operations of the building or other tenants, after–hours work or temporary services shall be provided with prior written approval from the building.

4) Existing conduit, wire, cable, supports, hangers, and other electrical installation which is removed, shall be completely removed, back to the first device or that equipment which is unaffected by the modifications. Conduit which is buried in concrete or otherwise inaccessible may be abandoned and capped at each end. All wire and cable shall be removed from any abandoned conduit.

5) Existing electrical materials and equipment, including lighting fixtures, switches, receptacles, speakers, conduit, outlet boxes, fittings, wire, cable, and other equipment and devices which are removed shall remain the property of the Owner and shall be stored or discarded as directed.

6) Reuse existing electrical products as indicated on the contract documents only as is found practical. Examine the condition of all such products, determine suitability for re–use, and periodically notify the Architect/Engineer of findings for final acceptance of re–use. Wire and cable for new construction or extension of an existing installation shall be new, in no case shall existing wire and cable be reused.

7) Refer to architectural demolition drawings for full extent and scope of partition and ceiling modifications.

   a. Existing ceilings to remain shall not be altered except where removal and replacement of surfaces is required to modify systems within ceiling space.
   b. Existing ceilings to be removed shall include demolition of all fixtures equipment, speakers, raceway, and wire, including any obsolete or previously abandoned products. Remaining areas shall only be altered as required and in accordance with the contract documents.
   c. Existing partitions to remain shall not be altered except where removal and replacement of surfaces is required to modify systems within partitions.
   d. Existing partitions to be removed shall include demolition of all devices, raceway and wire including any obsolete or previously abandoned products. Raceway and wiring systems serving other remaining areas shall only be altered as required and in accordance with the contract documents.
   e. Existing floor mounted devices shall be demolished. Provide abandoning plates and fire proofing as required.

8) Refer to mechanical and plumbing demolition drawings for full extent and scope of electrically operated equipment modifications.

   a. Demolition of existing mechanical equipment shall include associated disconnects, raceway, wire and controls.

THIS SHEET OF DRAWINGS HAS NOT BEEN REVIEWED FOR CODE COMPLIANCE.

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21-035 TMCA SOUTH OR 4 RENOVATION

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AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	23 MARCH 2022
Project Number	21-035
Drawn by	KC
Checked by	JG

Sheet Title
ELECTRICAL SPECIFICATIONS

Sheet Number
E.001

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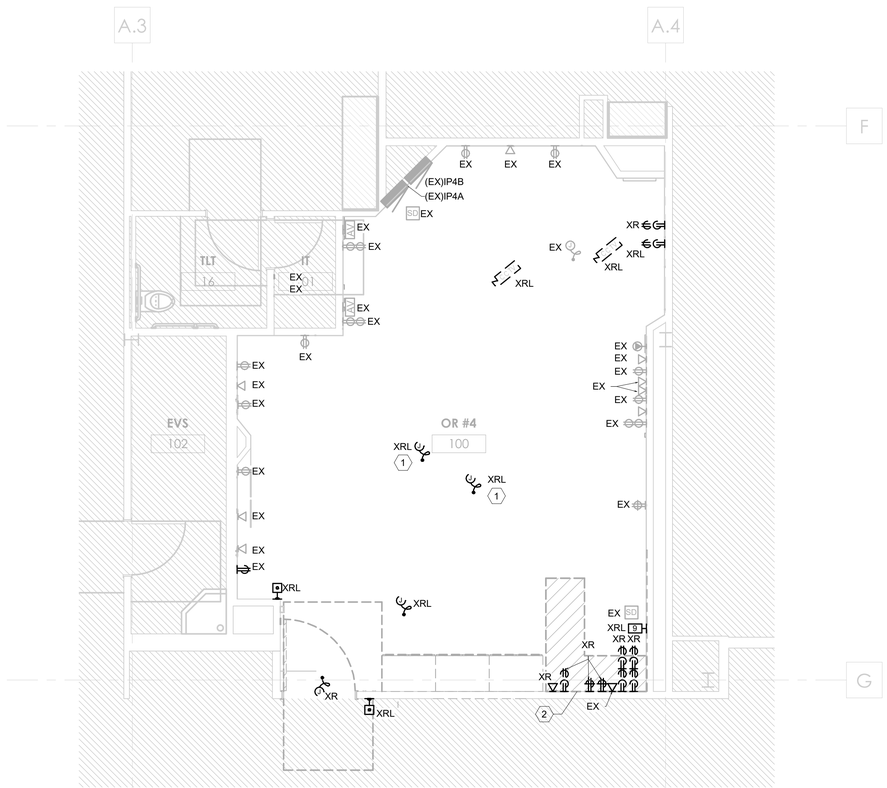
GENERAL NOTES

1. REFER TO SHEET E.000 FOR LEGENDS, NOTES, AND ABBREVIATIONS.
2. REFER TO SHEET E.001 FOR ELECTRICAL SPECIFICATIONS.
3. ALL LIGHTING FIXTURES ARE TO BE SAFELY REMOVED FOR REINSTALLATION IN NEW CEILING. CLEAN LIGHT FIXTURES AND SAFELY STORE UNTIL THE NEW CEILING IS READY FOR LIGHT FIXTURE INSTALLATION. PROVIDE NEW TRIM KITS AS NECESSARY.

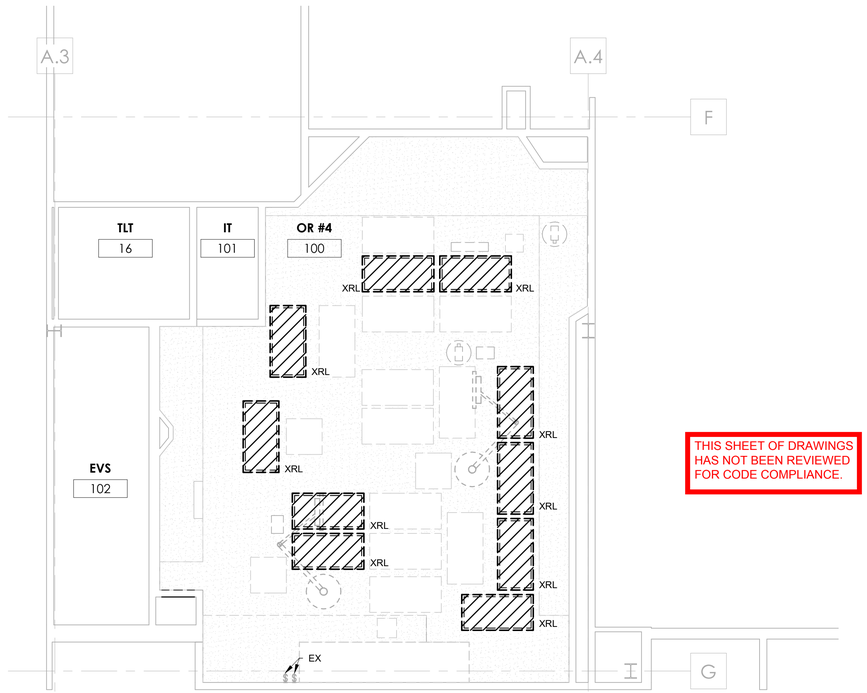
KEYED NOTES (#)

(1) DEMOLISH EXISTING BRANCH CIRCUITS SERVING STRYKER BOOMS BACK TO ISOLATION PANELS.

(2) EXISTING STRYKER CONDUITS AND PULL BOXES ARE TO BE REMOVED AND RELOCATED TO NEW COCKPIT LOCATION SHOWN ON SHEET E.102.



1 OR #4 PLAN-ELEC-DEMO
1/4" = 1'-0"



2 OR #4 REFLECTED CEILING PLAN - LIGHTING - DEMO
1/4" = 1'-0"

THIS SHEET OF DRAWINGS HAS NOT BEEN REVIEWED FOR CODE COMPLIANCE.

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21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
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Issue	ISSUE FOR CONSTRUCTION
Date	23 MARCH 2022
Project Number	21-035
Drawn by	KC
Checked by	JG

Sheet Title
OR #4 PLAN - ELEC - DEMO

Sheet Number
E.101

3/24/2022 12:42:40 PM

PANEL DESIGNATION: IP4A		LOCATION: OR-4			MOUNTING: RECESSED		FAULT DUTY: 10,000A
PRIMARY VOLTAGE: 277V		SECONDARY VOLTAGE: 120V			ISOLATION TRANSFORMER: 10KVA		
PRIMARY MAIN: 45A		SECONDARY MAIN: 80A			PHASE: 1		WIRE: 3
EQUIPMENT DESCRIPTION	WATTS A	BRKR SIZE			BRKR SIZE	WATTS A	EQUIPMENT DESCRIPTION
RECEPTACLES - COCKPIT	1080	20	1	2	20		(EX) RECEPTACLES
RECEPTACLES - COCKPIT	360	20	3	4	20		(EX) RECEPTACLES
RECEPTACLES - COCKPIT	720	20	5	6	20		(EX) RECEPTACLES
RECEPTACLES - WEST WALL	180	20	7	8	20		(EX) RECEPTACLES
(EX) RECEPTACLES		20	9	10	20		(EX) RECEPTACLES
(EX) RECEPTACLES		20	11	12	20		(EX) RECEPTACLES
(EX) RECEPTACLES		20	13	14	20		(EX) RECEPTACLES
		20	15	16	20		
TOTAL "A"	2340		2340			0	2.3 CONN. KVA
							19.5 CONN. AMPS

PANEL DESIGNATION: IP4B		LOCATION: OR-4			MOUNTING: RECESSED		FAULT DUTY: 10,000A
PRIMARY VOLTAGE: 277V		SECONDARY VOLTAGE: 120V			ISOLATION TRANSFORMER: 10KVA		
PRIMARY MAIN: 45A		SECONDARY MAIN: 80A			PHASE: 1		WIRE: 3
EQUIPMENT DESCRIPTION	WATTS A	BRKR SIZE			BRKR SIZE	WATTS A	EQUIPMENT DESCRIPTION
STRYKER BOOM	500	20	1	2	20	500	STRYKER BOOM
STRYKER BOOM	500	20	3	4	20	500	STRYKER BOOM
EXISTING LOAD		20	5	6	20		EXISTING LOAD
EXISTING LOAD		20	7	8	20	700	STRYKER BOOM
EXISTING LOAD		20	9	10	20	700	STRYKER BOOM
STRYKER BOOM	900	20	11	12	20	900	STRYKER BOOM
EXISTING LOAD		20	13	14	20		
		20	15	16	20		
TOTAL "A"	1900		5200			3300	5.2 CONN. KVA
							43.3 CONN. AMPS

TOTAL SECTION 1		2340		7.5 CONN. KVA
TOTAL SECTION 2		5200		
TOTAL SECTION 1 AND 2		7540		27.2 CONN. AMPS

NOTES [#]:
1. ALL CIRCUITS SHOWN ARE SERVING EXISTING DEVICES TO BE RELOCATED.
2. NO NEW LOADS ARE BEING SERVED BY THESE PANELBOARDS AT THIS TIME.

LOAD JUSTIFICATION: **IP4A & IP4B**		
DEMOLISHED LOAD	-7500	VA
ADDED LOAD:	7500	VA
NET ADDED LOAD:	0	VA
	0.00	AMPS

Provide Emergency Illumination Equipment That complies with 2020 NEC 700.12(F) or NEC 700.

Install electrical connections per 2020 NEC 110.14, Identify disconnects per 2020 NEC 110.22 and provide working space around Electrical equipment per 2020 NEC 110.26

Provide a Grounding Electrode System bonded To the service equipment enclosure, grounded Conductors, and grounded electrode conductors Per 2020 NEC 250.50 and 250.104

Wiring shall comply with 2020 NEC Article 517 for health care facilities

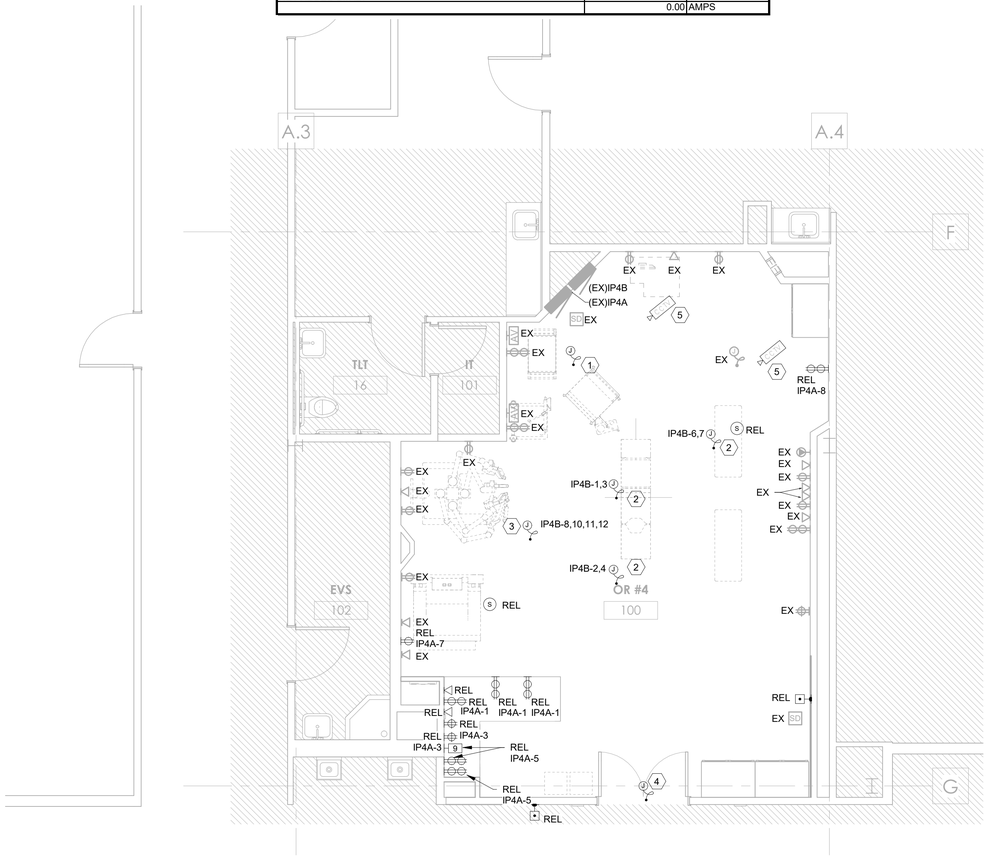
City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: *Bobby McKinzie*
Date: ***Apr 29, 2022***
2015 INTERNATIONAL CODES & 2020 NEC

GENERAL NOTES

1. REFER TO SHEET E.000 FOR LEGENDS, NOTES, AND ABBREVIATIONS.
2. REFER TO SHEET E.001 FOR ELECTRICAL SPECIFICATIONS.
3. PROVIDE RACEWAY FOR STRYKER LOW VOLTAGE CABLING. REFER TO VENDOR DRAWINGS FOR ADDITIONAL INFORMATION. IT SHALL BE ACCEPTABLE TO UTILIZE EXISTING RACEWAY WHERE PRACTICABLE.
4. FOR NEW DEVICES WIRED TO THE ISOLATED POWER SYSTEM. PROVIDE NEW XHHW CONDUCTORS FROM THE PANELBOARD OR LAST UPSTREAM DEVICE ON THE SAME CIRCUIT. SPLICES SHALL NOT BE PERMITTED. ROUTE BRANCH CIRCUITS TO MINIMIZE CIRCUIT CONDUCTOR LENGTH AND LEAKAGE CURRENT. PROVIDE A CONTINUOUS GROUNDING CONDUCTOR IN ADDITION TO THE RACEWAY SYSTEM.
5. RE-COMMISSION THE ISOLATED POWER SYSTEMS UPON COMPLETION OF THE ELECTRICAL INSTALLATION.
6. CLEAN AND RE-INSTALL RELOCATED LIGHTING FIXTURES IN NEW CEILING SYSTEM. PROVIDE NEW DRYWALL TRIM KITS.
7. DESIGN INTENT IS TO RE-USE CIRCUIT NUMBERS SERVING RELOCATED EQUIPMENT. ALL CIRCUIT NUMBERS ARE PROVIDED FOR REFERENCE ONLY. EC TO FIELD VERIFY THE AVAILABLE CIRCUIT NUMBERS AND NOTIFY ENGINEER OF ANY DISCREPANCIES. NET LOAD TO RE-USED CIRCUIT NUMBERS ARE EXPECTED TO = 0VA CHANGE, UNO.

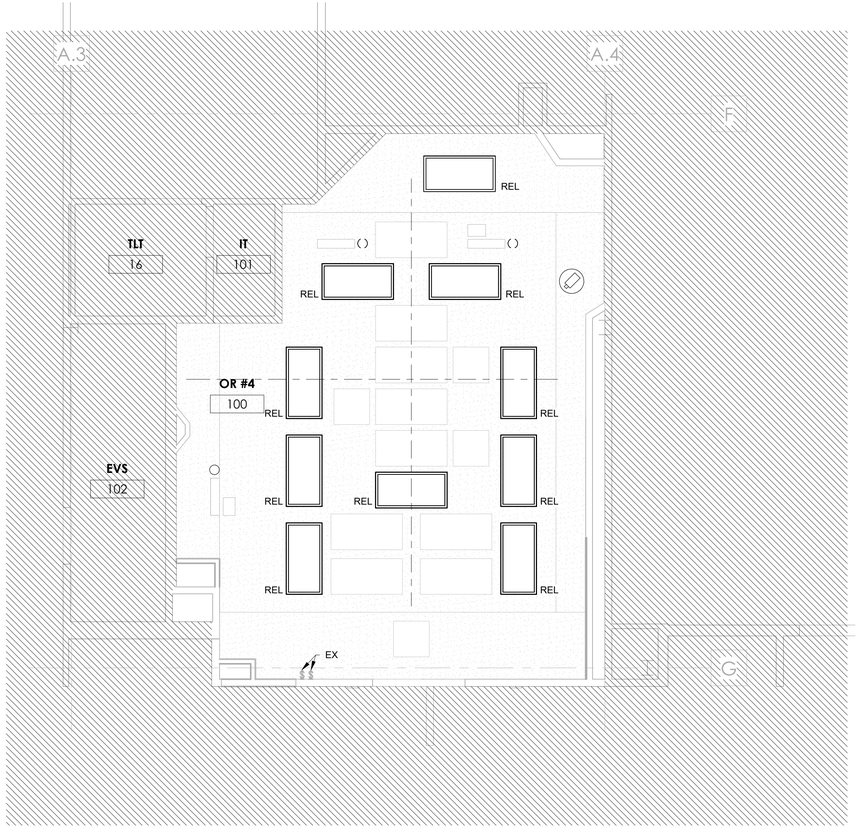
KEYED NOTES (#)

1. PROVIDE NEW CORDREEL DEVICE EQUAL TO MEDREEL #MR-152012-D. REFER TO ARCHITECTURAL RCP FOR EXACT LOCATION. UTILIZE EXISTING 120V CIRCUIT SERVING ADJACENT CORD REEL. NET LOAD TO CIRCUIT = +180VA.
2. RE-USE EXISTING CIRCUITS USED IN RELOCATED STRYKER BOOM. NEW CONDUCTORS MUST BE PULLED FROM THE ISOLATION PANEL TO THE BOOM LOCATION. RE-USE EXISTING RACEWAY AS PRACTICABLE. NET LOAD TO THE CIRCUIT = 0VA.
3. WIRE NEW STRYKER BOOM TO (4) EXISTING BRANCH CIRCUITS PREVIOUSLY SERVING DEMOLISHED EQUIPMENT BOOM. NET LOAD TO PANELBOARD = 0 VA.
4. EXTEND EXISTING BRANCH CIRCUIT CONDUCTORS AND RACEWAY PREVIOUSLY SERVING AUTO DOOR OPERATOR TO NEW DOOR HARDWARE. RELOCATE PUSH PLATE AS INDICATED.
5. REINSTALL CCTV DEVICE IN NEW CEILING. COORDINATE LOCATION AND ORIENTATION WITH OWNER.



1 OR #4 PLAN-ELEC-NEW CONSTRUCTION

1/4" = 1'-0"



2 OR #4 REFLECTED CEILING PLAN - LIGHTING - NEW CONSTRUCTION

1/4" = 1'-0"

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No.	Description	Date

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MICHAEL P THOMPSON
50150
PROFESSIONAL ENGINEER
03|24|2022

21-035 TMCA SOUTH OR 4 RENOVATION

1501 S. POTOMAC ST.
AURORA, CO 80012

Issue	ISSUE FOR CONSTRUCTION
Date	23 MARCH 2022
Project Number	21-035
Drawn by	KC
Checked by	JG

Sheet Title
OR #4 PLAN - ELEC - NEW CONSTRUCTION

Sheet Number
E.102

3/24/2022 12:42:42 PM

MARTIN/MARTIN
CONSULTING ENGINEERS

TMCA SOUTH OR4 RENOVATION

Martin/Martin, Inc. Project No.: **21.1646.S.01**

Structural Calculations

March 23, 2022



MARTIN/MARTIN, INC.
12499 West Colfax Avenue
Lakewood, Colorado 80215
303.431.6100
martinmartin.com

Avon, CO | Fort Collins, CO | Bay Area, CA | Northwest Arkansas | Albuquerque, NM | Cheyenne, WY
mmwyo.com

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CONSULTING ENGINEERS
12499 WEST COLFAX AVENUE, LAKEWOOD, COLORADO 80215
MAIN 303.431.6100 MARTINMARTIN.COM

STRUCTURAL CALCULATIONS

FOR

TMCA SOUTH OR4 RENOVATION

AURORA, CO

Martin/Martin, Inc.
12499 W Colfax Ave.
Lakewood, CO 80215
(303) 431-6100

JOB TITLE YMCA SOUTH OR4 RENOVATION
JOB NO. 21.1646.S.01 **SHEET NO.**
CALCULATED BY GDR **DATE** 3/22/22

www.struware.com

Code Search

Code: International Building Code 2015

Occupancy:

Occupancy Group = B Business

Risk Category & Importance Factors:

Risk Category =	IV
Wind factor =	1.00
Snow factor =	1.20
Seismic factor =	1.50

Wind Loads : ASCE 7- 10

Ultimate Wind Speed	120 mph
Nominal Wind Speed	93 mph
Risk Category	IV
Exposure Category	C
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85

Snow Loads : ASCE 7-10

Nominal Snow Forces

Roof slope		=	1.2 deg
Horiz. eave to ridge dist (W)		=	90.0 ft
Roof length parallel to ridge (L)		=	280.0 ft
Type of Roof			Monoslope
Ground Snow Load	Pg	=	30.0 psf
Risk Category		=	IV
Importance Factor	I	=	1.2
Thermal Factor	Ct	=	1.00
Exposure Factor	Ce	=	1.0
Pf = 0.7*Ce*Ct*I*Pg		=	25.2 psf
Unobstructed Slippery Surface			no
Sloped-roof Factor	Cs	=	1.00
Balanced Snow Load		=	**25.2 psf**
Rain on Snow Surcharge Angle			1.80 deg
Code Maximum Rain Surcharge			5.0 psf
Rain on Snow Surcharge		=	0.0 psf
Ps plus rain surcharge		=	25.2 psf
Minimum Snow Load	Pm	=	24.0 psf
Uniform Roof Design Snow Load		=	**25.2 psf** use 30.0

Near ground level surface balanced snow load = **34.0 psf**

NOTE: Alternate spans of continuous beams shall be loaded with half the design roof snow load so as to produce the greatest possible effect - see code for loading diagrams and exceptions for gable roofs..

Martin/Martin, Inc.
12499 W Colfax Ave.
Lakewood, CO 80215
(303) 431-6100

RSN: I619950 | PERMIT# 22-2136196-LT

JOB TITLE TMCA SOUTH OR4 RENOVATION

JOB NO. 21.1646.S.01 **SHEET NO.**
CALCULATED BY GDR **DATE** 3/22/22

Seismic Loads:

IBC 2015

Strength Level Forces

Risk Category : IV
Importance Factor (I) : 1.50
Site Class : D

Ss (0.2 sec) = 17.30 %g
S1 (1.0 sec) = 5.70 %g

Fa =	1.600		Sms =	0.277	S_{DS} =	0.185	Design Category =	C
Fv =	2.400		Sm1 =	0.137	S_{D1} =	0.091	Design Category =	C

Seismic Design Category = **C**

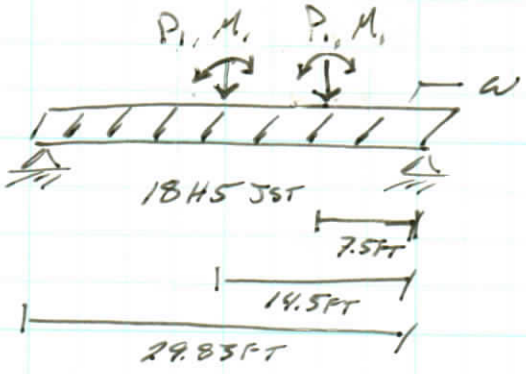
MARTIN/MARTIN CONSULTING ENGINEERS

Title TMCA OR #4 Date 3/9/22 Job no.

Subject EXISTING ROOF EVALUATION By GDR Sheet 1 of

EXISTING JOIST CALC (CONTROLLING JOIST)

GEOMETRY



w)

TRIB ≈ 4.2FT

DEAD LOAD ≈ 15PSF + DECK + SW (3PSF)

18(4.2) + 8

≈ 84PLF

SNOW LOAD ≈ 30 PSF

30 × 4.2 = 126 PLF

ASD DESIGN

P1) (2/3) OF VERT LOADS:

(2/3)(555) = 370 LBS

M1) (2/3) OF MOMENT

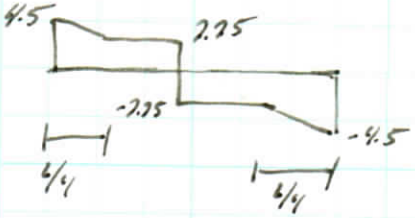
(2/3)(21.FT) = ±14 K-FT

RAM ELEMENTS

MAX SHEAR ≈ 3.2K

Vn ≈ 4.5K ≥ 3.2K ∴ OKAY

SHEAR ENVELOPE



MAX SHEAR 4/4 ≤ x ≤ 36/4

MAX SHEAR ≈ 1.8K ≤ 2.25K ∴ OKAY

MAX MOMENT = 24 K-FT @ 15.4 ≤ M.4 MOMENT WITHIN 5%

ALLOWABLE MOMENT = 27.1 K-FT ∴ OKAY

ROTATION @ EACH UNIT

I_{JST}) LOAD @ 4/360 = 140 PLF

$$\Delta = \frac{5wL^4}{384EI}$$

$$1'' = \frac{5(0.0117^{k}/_{in})(360^4)}{384(29000)I_{req}}$$

$I_{req} = 88 \text{ in}^4 \leq$ W12x14

RSN:1619950 | PERMIT# 22-2136196-LT

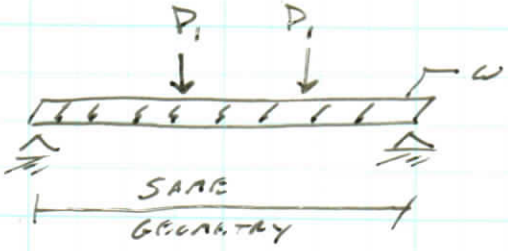
MARTIN/MARTIN
CONSULTING ENGINEERS

Title TMCA OR #4 Date 3/2/2022 Job no.

Subject EXISTING ROOF EVALUATION By GDR Sheet 2 of

EXISTING JOIST CALC

GEOMETRY



* ASSUME MOMENTS DECOUPLED IN OPPOSITE DIRECTION.

w) SAME AS BEFORE

P1) 370# ± 2000/4.2

= 0.85K↓ OR 0.105K↑

MAX SHEAR ≈ 3.5K ≤ 4.5K ∴ OKAY

MAX SHEAR BTWN 4/4 - 36/4

≈ 2.2K ≥ 2.25K

MAX MOMENT ≈ 27K-FT ≤ 27.1K-FT

LOCATION OF MAX MOMENT ≈ 15.4FT ≤ 16.4FT ∴ OKAY

ROTATION CHECK

* CONFIRM JOIST ROTATION ≤ 0.1° UNDER MOMENT

TRY FULL MOMENT.

I_{JST}) BASE ON L/360 LOAD FROM TABLE

L/360 ≈ 1" @ 30FT → ALLOWABLE LOAD = 140PLF.

$\Delta = \frac{5wL^4}{384EI}$ → $1'' = \frac{5(0.0117^{K}/_{in})(360^4)}{384\,(1900)\,I_{JST}}$ → $I_{JST} = 88in^4$ ≈ W12x14

θ_{MAX} @ NEW BEAMS UNDER MOMENT ONLY ≈ 0.0005 RAD ≈ 0.03° ≤ 0.1° ∴ OKAY

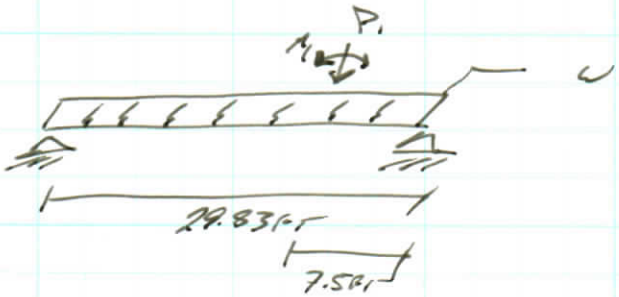
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Title TMCA OR #4 Date 3/2/22 Job no.

Subject EXISTING ROOF EVALUATION By GDR Sheet 3 of

EXISTING W16X40 (AJ6?)

* ASSUME SIMPLY SUPPORTED.



w)

TRIB = 4.2 FT

DEAD = 18 × 4.2 + 40

= 116 PLF

SNOW = 4.2 × 30

= 126 PLF

RAM ELEMENTS

$V_u \simeq 6K \leq \phi V_n \simeq 105K$ ∴ OKAY

$M_u \simeq 43K\text{-}FT \rightarrow \phi M_n \simeq 192K\text{-}FT$ ∴ OKAY

ROTATION @ PT ≃ 0.01° ≤ 0.1°

∴ OKAY

P_1) 1.1K ↓ (LIVE)

M_1) 5.65K-FT } LIVE

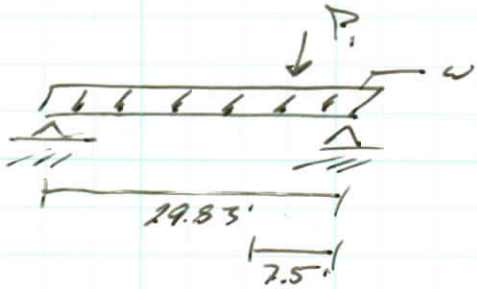
OR

P_2 ALONE

$1.1 \pm \frac{5.65}{4.2}$

= 2.45K↓ OR 0.25K↑

EXISTING JOIST PLAN NORTH OF W16X40



$P_1 \rightarrow \pm\frac{5.65}{4.2} = \pm 1.35K$

$V_{MAX} = 3.5 \leq 4.5K$ ∴ OKAY

V_{MAX} @ $\frac{3L}{4} = 2.15K \leq 2.25K$ ∴ OKAY

$M_{MAX} = 24K\text{-}FT \leq 27.1K\text{-}FT$

M_{MAX} @ 16.4 ≤ 16.4 ∴ OKAY

MARTIN/MARTIN CONSULTING ENGINEERS

Title TMCA OR#4 Date 3/2/22 Job no.

Subject EXISTING ROOF EVALUATION By GDR Sheet 4 of

* CONFIRM MOMENTS OUTSIDE OF 5% ORAY

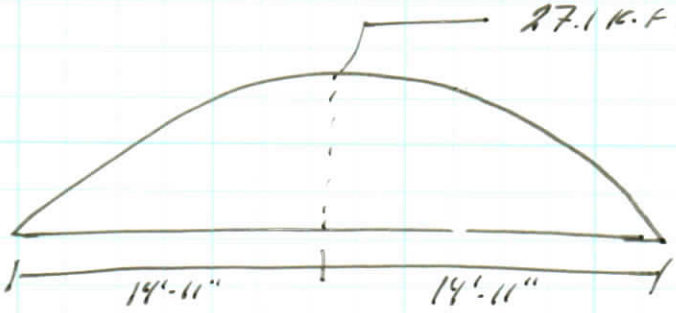
OUTLYING CONDITION FOR ALL JOISTS

M_{MAX} = 12K-FT @ 18.1FT

M_{MAX} = 15.1K-FT @ 19FT

M_{MAX} = 5K-FT @ 10.8FT

MOMENT ENVELOPE



CAPACITY @ 18FT $\simeq \frac{wx}{2}(L-x)$

$\simeq \frac{0.241(18)}{2}(29.83-18)$

$= 25.6 K\text{-}FT \geq 12 K\text{-}FT$ ← 19FT ORAY BY INSPECTION

CAPACITY @ 10.8FT ≃ 24.8K-FT ≥ 5K-FT ∴ ORAY

MARTIN/MARTIN CONSULTING ENGINEERS

Title YMCA CR#4 Date 3/22/21 Job no.

Subject EG LOADING ANALYSIS By GDC Sheet 1 of

* BUILDING IS SDC C.
* CONFIRM EXISTING ROOF OKAY FOR ADDITIONAL EC LOADING.

HORIZONTAL FORCE

$$F_p = \frac{0.4 a_p S_{DS} W_p}{\left(\frac{R_p}{I_p}\right)} \left(1 + 2\frac{z}{h}\right)$$

$$= \frac{0.4(1.0)(0.185)(1.1)}{\left(\frac{2.5}{1.5}\right)} \left(1 + 2\left(\frac{1}{1}\right)\right)$$

* LATS EQUIPMENT
$a_p = 1.0$
$R_p = 2\frac{1}{2}$
$S_{DS} = 0.185$
$W_p = 1.1k$

HEAVY BOOM LEAD

$$F_p = \frac{(0.4)(1.0)(0.185)(1.1)}{\left(\frac{2.5}{1.5}\right)} \left(1 + 2\left(\frac{1}{1}\right)\right) = 150\#$$

* LATERAL FORCE TO BE CARRIED TO ROOF DECK. OKAY BY INSPECTION.

MOMENT FROM HORIZ FORCE.

* ASSUME CENTER OF MASS = 5FT BELOW JSTS.

5FT x 0.15 = **0.75K-Ft (ULT)**

MARTIN/MARTIN CONSULTING ENGINEERS

Title TMC4 OR #4 Date 3/29/22 Job no.

Subject EXISTING ROOF EVALUATION By GDR Sheet 2 of

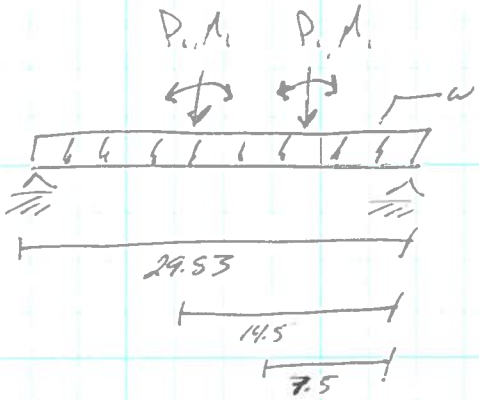
* CHECK EG LOAD COMBINATIONS

1.03D + 0.7E_H

1.02D + 0.525E_H + 0.75L + 0.75S

0.57D + 0.7E_H

EXISTING JOISTS - COND 1



DEAD LOAD ≈ 8.4PLF

SNOW LOAD ≈ 1.9PLF

P1) (2/3 OF VERT LOAD)

370LBS ↓

M1) (2/3 OF MOMENT)

(2/3)(9K-FT) = 1.34K-FT

(2/3)(0.75) = 0.5 K-FT EE.

MAX SHEAR ≈ 3.21K ≤ Vn = 4.5K ∴ OKAY

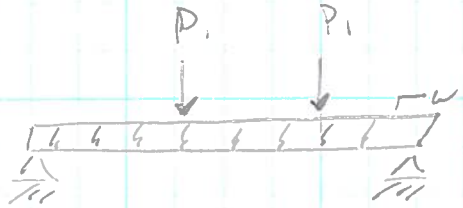
MAX SHEAR @ 4/4 ≤ x ≤ 34/4

MAX SHEAR ≈ 1.85K ≤ 2.25K ∴ OKAY

MAX MOMENT ≈ 24.5K-FT @ 15.2 (WITHIN 5%)

ALLOWABLE MOMENT ≈ 27.1K-FT ∴ OKAY

EXISTING JOISTS - COND 2



w) SAME

P1) 0.85K ↓ OR 0.105K/FT

0.75/9.2 = 0.1B K ↕ EG.

MAX SHEAR ≈ 3.6K ≤ 4.5K ∴ OKAY

MAX SHEAR ≈ 4/4 - 34/4 ≈ 2.32K ≤ 2.25×1.05 = 2.36 ∴ OKAY

MAX MOMENT ≈ 29.3K-FT ≤ 27×1.05 = 28.4K-FT ←

EG LOAD IS CONSERVATIVE. ASSUMES 1.1K UNITS AT ALL LOCATIONS.

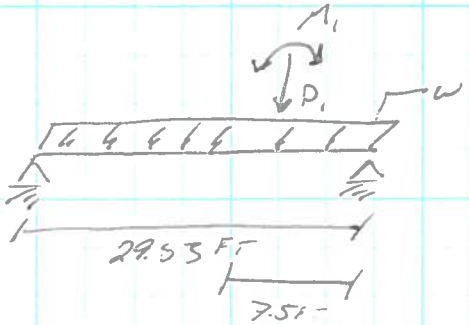
MARTIN/MARTIN CONSULTING ENGINEERS

Title TMCA OB#4 Date 3/22/22 Job no.

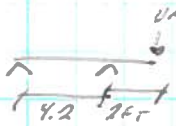
Subject EXISTING ROOF EVAL. By GDR Sheet 3 of

EXISTING W16X40

* ASSUME SIMPLY SUPPORTED.



* ASSUME LOAD CAN CANTILEVER



↑ BUMP LOADS BY 15%.

w) DEAD ≈ 116PLF
SNOW ≈ 176PLF

P1) 1.1K x 1.15 = 1.3K
5.65 x 1.15 = 6.5K.FT
0.75K.FT x 1.15 = 0.86K.FT (EC)

OR

$1.3 \pm \frac{5.65}{4.2}$

= 2.65K↓ OR 40↑

$\frac{0.75 K\cdot FT}{4.2}$ = ±0.18K↑

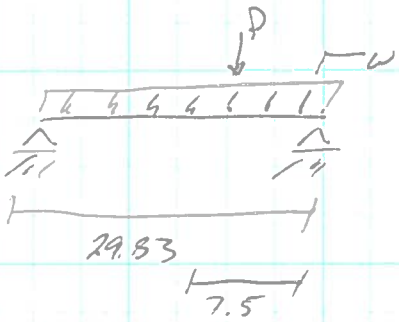
RAM ELEMENTS

$V_u \approx 6.2 \leq \phi V_n \approx 105K$ ∴ OKAY

$M_u \approx 43 \leq \phi M_n \approx 147 K\cdot FT$ ∴ OKAY

ROTATION @ PT ≈ 0.01° ≤ 0.1° ∴ OKAY

EXISTING JOIST PLAN NORTH OF W16X40



w) SAME

P) $\pm \frac{5.65}{4.2}$ = ±1.35K

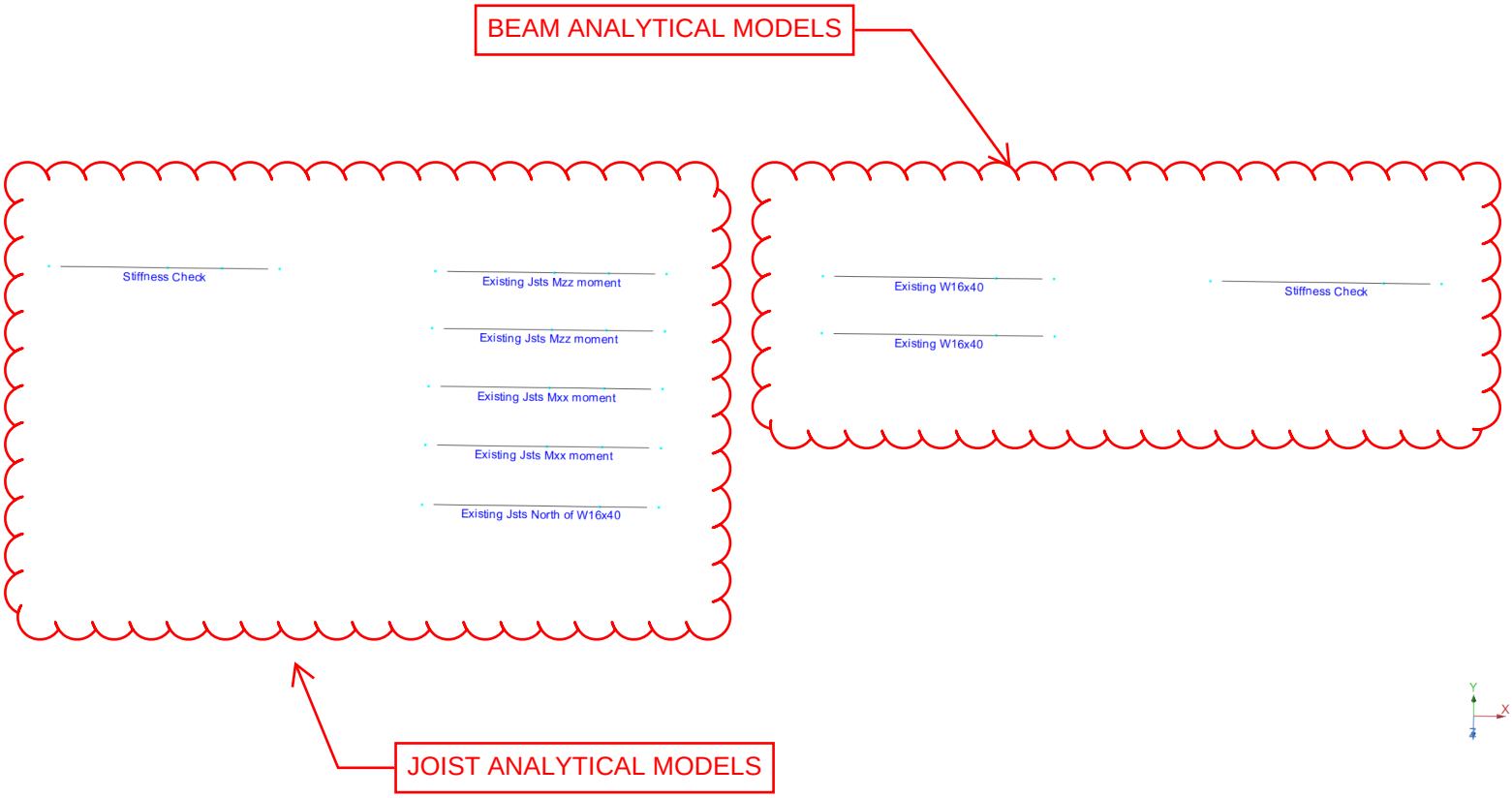
$\frac{0.75 K\cdot FT}{4.2}$ = ± 0.18K

V_{MAX} = 3.5K ≤ 4.5K ∴ OKAY

V_{MAX} @ $\frac{3L}{4}$ ≈ 2.23 ≤ 225K ∴ OKAY

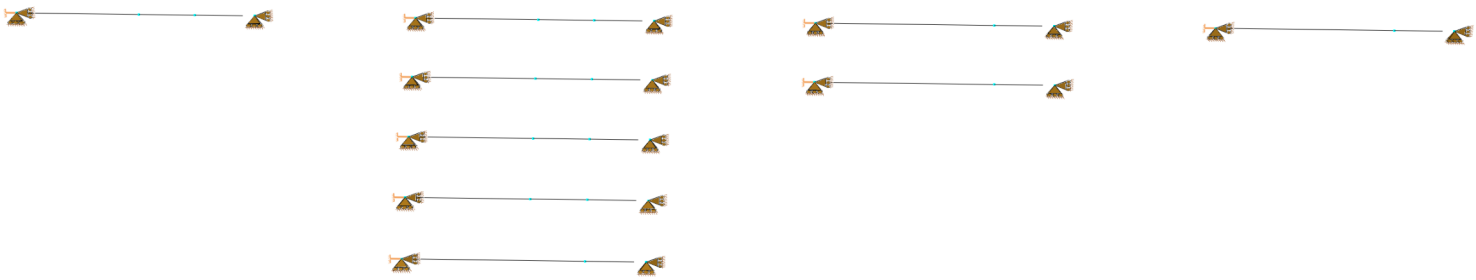
M_{MAX} ≈ 14.5 ≤ 16.4 WITHIN 5% ∴ OKAY

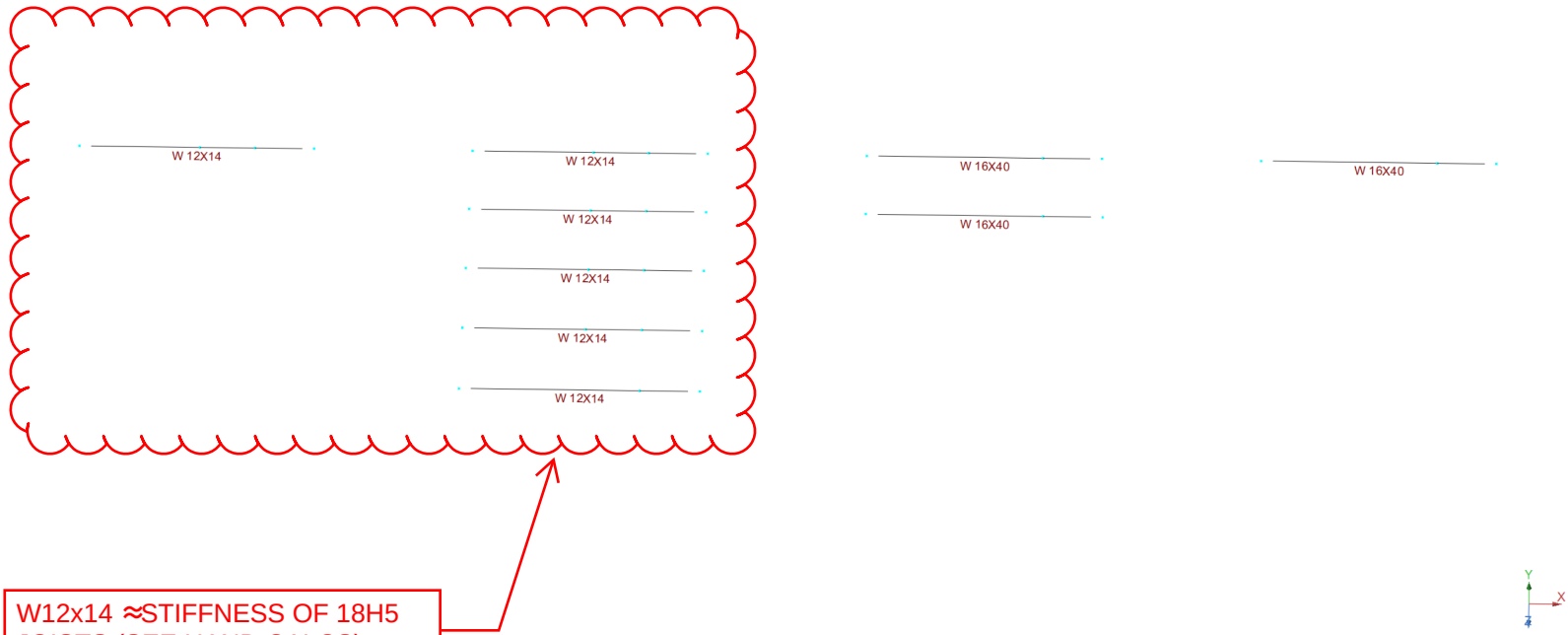
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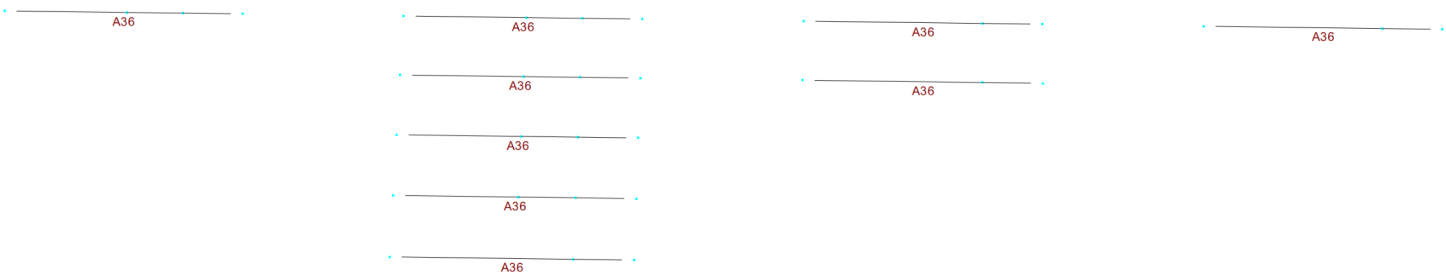



8
1
2
3
4
9
5
6
7


Y
X
Z




W 12X14
W 12X14
W 12X14
W 12X14
W 12X14
W 12X14
W 16X40
W 16X40
W 16X40
W12x14 ≈STIFFNESS OF 18H5 JOISTS (SEE HAND CALCS)


A36
A36
A36
A36
A36
A36
A36
A36
A36
A36


Y
X

Current Date: 3/22/2022 3:51 PM
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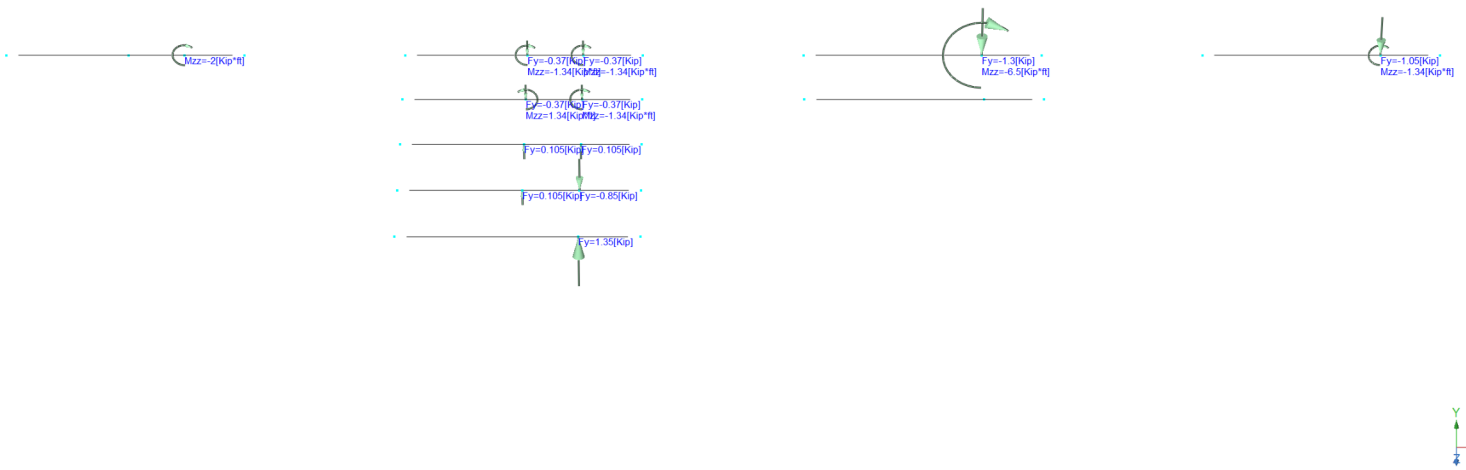
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Load condition: SN=Snow Load



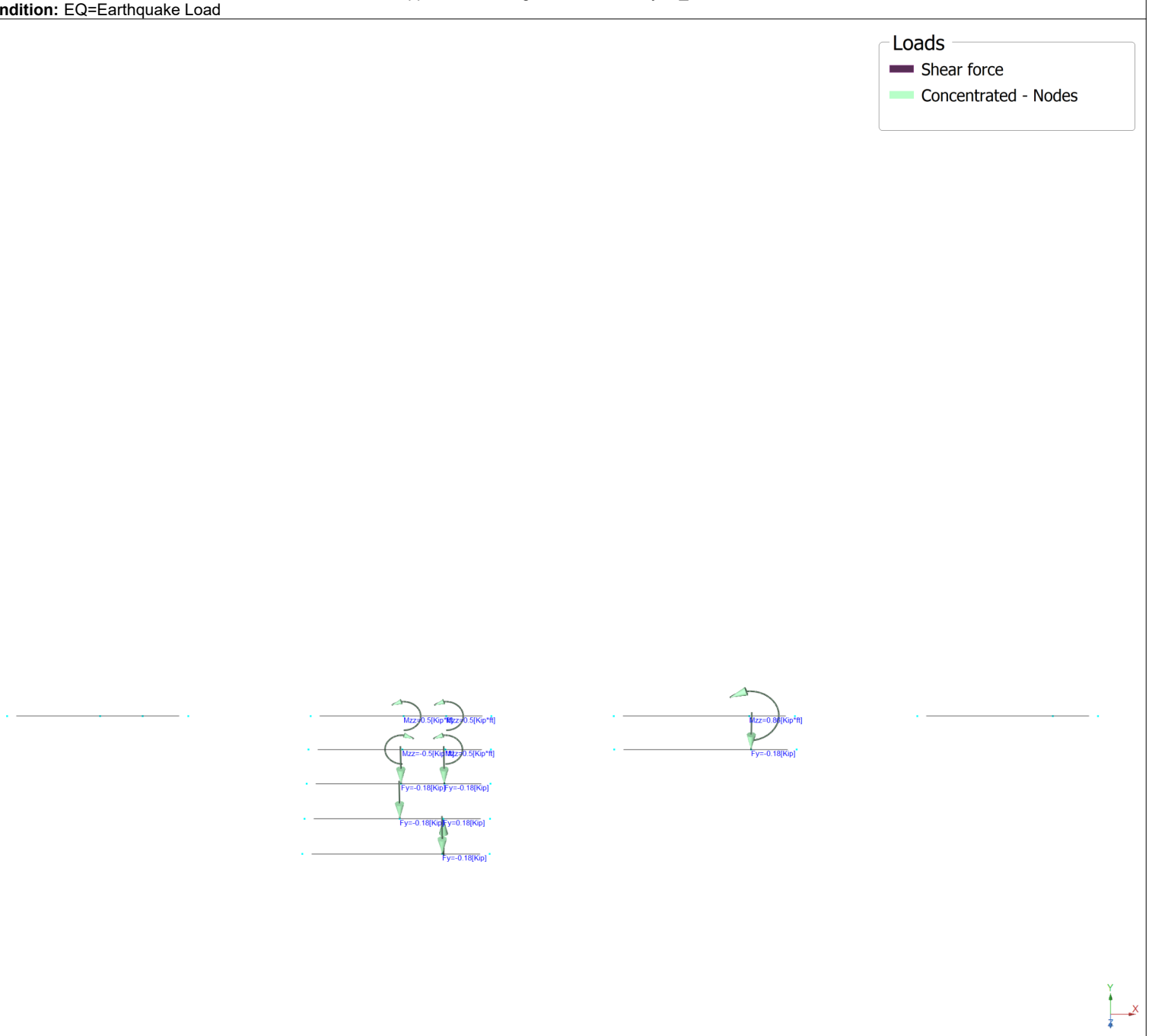
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Load condition: LL=Live Load



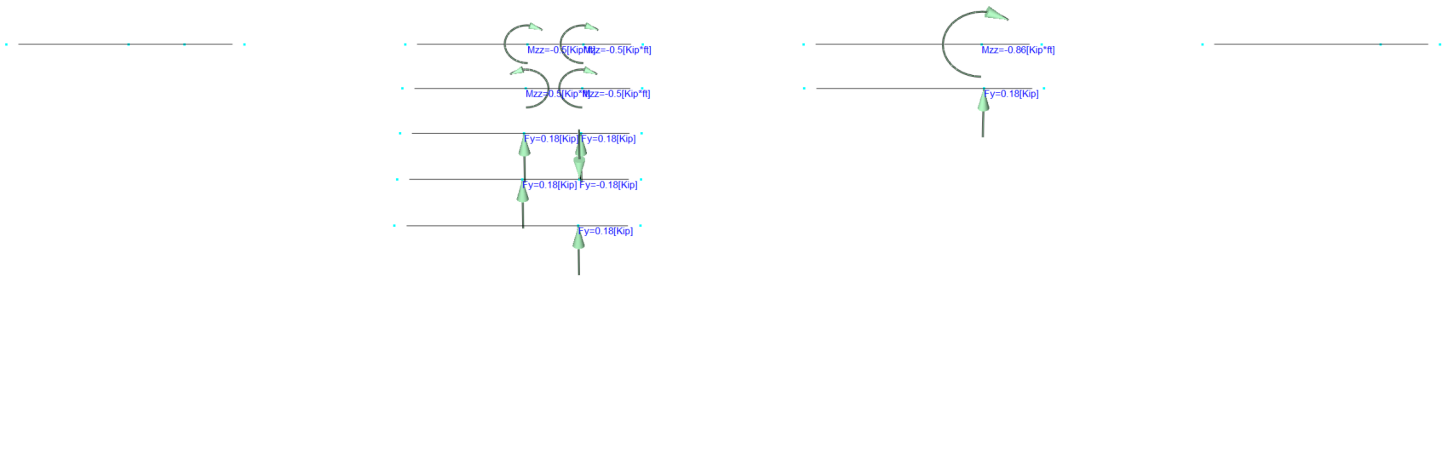
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Units system: English
File name: G:\PROJECTS\21.1646.S.01-TMCA - OR 4 Boom Supports\Calc\Greg Calcs\Joist Analysis_GDR.retx
Load condition: LL1=Live Load (reverse)



Current Date: 3/22/2022 3:53 PM
Units system: English
File name: G:\PROJECTS\21.1646.S.01-TMCA - OR 4 Boom Supports\Calc\Greg Calcs\Joist Analysis_GDR.retx
Load condition: EQ=Earthquake Load



Current Date: 3/22/2022 3:53 PM
Units system: English
File name: G:\PROJECTS\21.1646.S.01-TMCA - OR 4 Boom Supports\Calc\Greg Calcs\Joist Analysis_GDR.retx
Load condition: Eq1=Earthquake Load (reverse)



Current Date: 3/22/2022 3:54 PM
Units system: English
File name: G:\PROJECTS\21.1646.S.01-TMCA - OR 4 Boom Supports\Calc\Greg Calcs\Joist Analysis_GDR.retx

Analysis result

Forces diagram printout

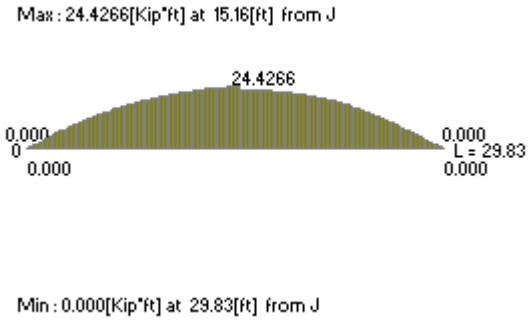
Load conditions:

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ASD2=DL+LL
ASD3=DL+LL1
ASD4=DL+0.75SN+0.75LL
ASD5=DL+0.75SN+0.75LL1
ASD6=1.03DL+0.7EQ
ASD7=1.03DL+0.7Eq1
ASD8=1.02DL+0.75SN+0.75LL+0.525EQ
ASD9=1.02DL+0.75SN+0.75LL1+0.525EQ
ASD10=1.02DL+0.75SN+0.75LL+0.525Eq1
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ASD12=0.57DL+0.7EQ
ASD13=0.57DL+0.7Eq1

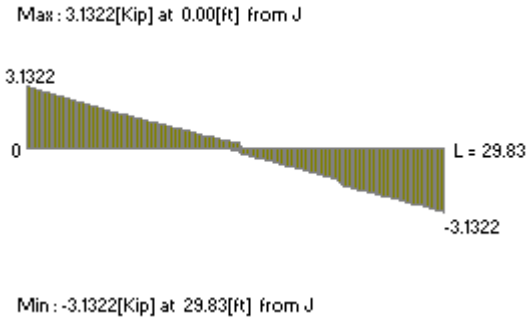
MEMBER	:	**1**	Length	:	29.830 [ft]	Node J	: 1
Material	:	A36	Section	:	W 12X14	Node K	: 2

Envelopes :

M33 bending moment:
Moments [Kip*ft], Length [ft]



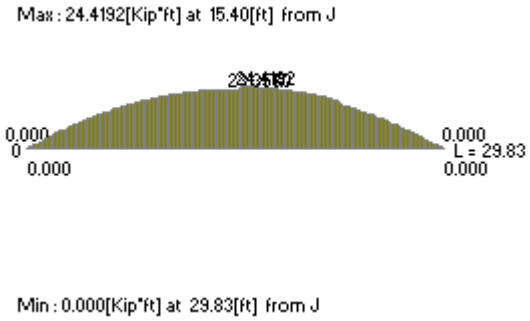
V2 shear forces:
Forces [Kip], Length [ft]



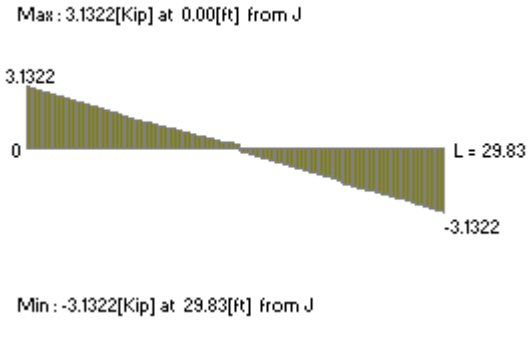
MEMBER	:	**2**	Length	:	29.830 [ft]	Node J	: 5
Material	:	A36	Section	:	W 12X14	Node K	: 6

Envelopes :

M33 bending moment:
Moments [Kip*ft], Length [ft]



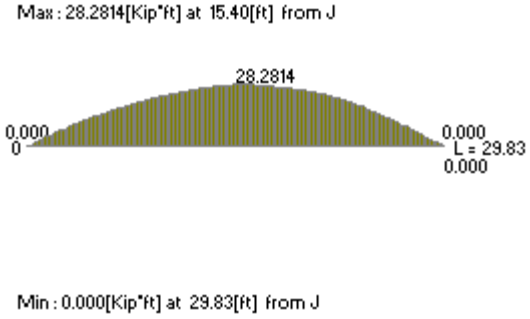
V2 shear forces:
Forces [Kip], Length [ft]



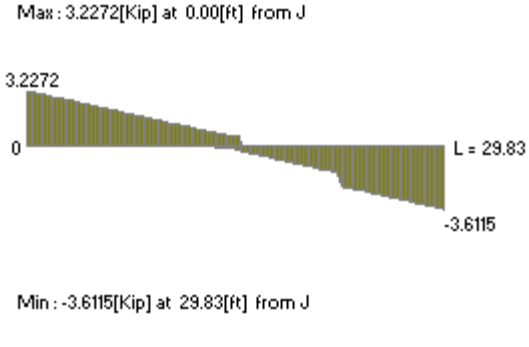
MEMBER	:	**3**	Length	:	29.830 [ft]	Node J	: 9
Material	:	A36	Section	:	W 12X14	Node K	: 10

Envelopes :

M33 bending moment:
Moments [Kip*ft], Length [ft]



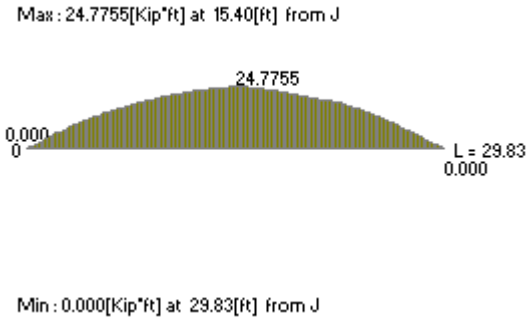
V2 shear forces:
Forces [Kip], Length [ft]



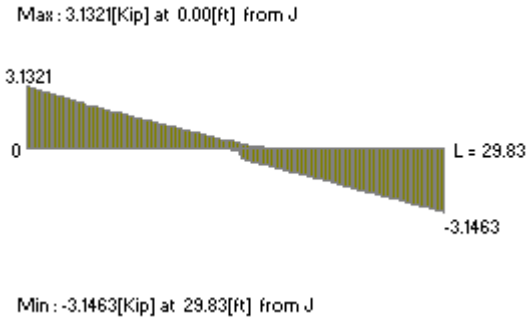
MEMBER	:	**4**	Length	:	29.830 [ft]	Node J	: 13
Material	:	A36	Section	:	W 12X14	Node K	: 14

Envelopes :

M33 bending moment:
Moments [Kip*ft], Length [ft]



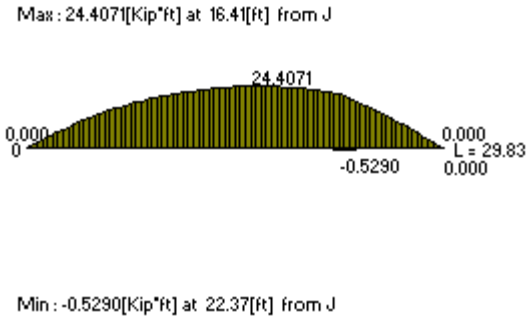
V2 shear forces:
Forces [Kip], Length [ft]



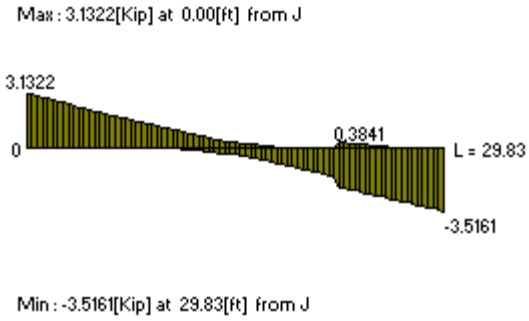
MEMBER	:	**9**	Length	:	29.830 [ft]	Node J	: 32
Material	:	A36	Section	:	W 12X14	Node K	: 33

Envelopes :

M33 bending moment:
Moments [Kip*ft], Length [ft]



V2 shear forces:
Forces [Kip], Length [ft]



Bentley

Current Date: 3/22/2022 3:57 PM
Units system: English
File name: G:\PROJECTS\21.1646.S.01-TMCA - OR 4 Boom Supports\Calc\Greg Calcs\Joist Analysis_GDR.retx

Steel Code Check

Report: Comprehensive

Members: Hot-rolled
Design code: AISC 360-2016 LRFD

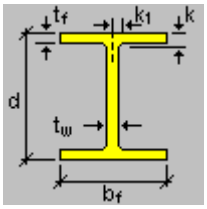
Member	**:**	**5 (Existing W16x40)**
Design status	**:**	**OK**

DESIGN WARNINGS

Section information

Section name: W 16X40 **(US)**

Dimensions



bf	=	7.000	[in]	Width
d	=	16.000	[in]	Depth
k	=	0.907	[in]	Distance k
k1	=	0.813	[in]	Distance k1
tf	=	0.505	[in]	Flange thickness
tw	=	0.305	[in]	Web thickness

Properties

Section properties	Unit	Major axis	Minor axis
Gross area of the section. (Ag)	[in2]	11.800	
Moment of Inertia (local axes) (I)	[in4]	518.000	28.900
Moment of Inertia (principal axes) (I')	[in4]	518.000	28.900
Bending constant for moments (principal axis) (J')	[in]	0.000	0.000
Radius of gyration (local axes) (r)	[in]	6.626	1.565
Radius of gyration (principal axes) (r')	[in]	6.626	1.565
Saint-Venant torsion constant. (J)	[in4]	0.794	
Section warping constant. (Cw)	[in6]	1730.000	
Distance from centroid to shear center (principal axis) (xo,yo)	[in]	0.000	0.000
Top elastic section modulus of the section (local axis) (Ssup)	[in3]	64.700	8.250
Bottom elastic section modulus of the section (local axis) (Sinf)	[in3]	64.700	8.250
Top elastic section modulus of the section (principal axis) (S'sup)	[in3]	64.700	8.250
Bottom elastic section modulus of the section (principal axis) (S'inf)	[in3]	64.700	8.250
Plastic section modulus (local axis) (Z)	[in3]	73.000	12.700
Plastic section modulus (principal axis) (Z')	[in3]	73.000	12.700
Polar radius of gyration. (ro)	[in]	6.808	
Area for shear (Aw)	[in2]	7.070	4.880

Torsional constant. (C)	[in3]	1.480

Material : A36

Properties	Unit	Value
Yield stress (Fy):	[Kip/in2]	36.00
Tensile strength (Fu):	[Kip/in2]	58.00
Elasticity Modulus (E):	[Kip/in2]	29000.00
Shear modulus for steel (G):	[Kip/in2]	11507.94

DESIGN CRITERIA

Description	Unit	Value
Length for tension slenderness ratio (L)	[ft]	29.83

Distance between member lateral bracing points

Length (Lb) [ft]	
Top	Bottom
1.00	29.83

Laterally unbraced length

Length [ft]			Effective length factor		
Major axis(L33)	Minor axis(L22)	Torsional axis(Lt)	Major axis(K33)	Minor axis(K22)	Torsional axis(Kt)
29.83	29.83	29.83	1.0	1.0	1.0

Additional assumptions

Continuous lateral torsional restraint	No
Tension field action	No
Continuous flexural torsional restraint	No
Effective length factor value type	None
Major axis frame type	Sway
Minor axis frame type	Sway

DESIGN CHECKS

AXIAL TENSION DESIGN ✔

Axial tension

Ratio	:	0.00			
Capacity	:	382.32 [Kip]	Reference	:	Cl.D2
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Factored axial tension capacity(ϕP_n)	[Kip]	382.32	Cl.D2
Nominal axial tension capacity (P_n)	[Kip]	424.80	Eq.D2-1

AXIAL COMPRESSION DESIGN ✔

Compression in the major axis 33

Ratio	:	0.00			
Capacity	:	326.34 [Kip]	Reference	:	Cl.E3
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Non slender	
Unstiffened element slenderness (λ)	--	6.93	
Unstiffened element limiting slenderness (λ_r)	--	15.89	Table.4.1a.Case1
Stiffened element classification	--	Slender	
Stiffened element slenderness (λ)	--	46.51	
Stiffened element limiting slenderness (λ_r)	--	42.29	Table.4.1a.Case5
Factored flexural buckling strength(ϕP_{n33})	[Kip]	326.34	Cl.E3
Unbraced length (L_{33})	[ft]	29.83	Cl.E2
Effective slenderness ($(KL/r)_{33}$)	--	54.03	Cl.E2
Elastic critical buckling stress (F_{e33})	[Kip/in2]	98.06	Eq.E3-4
Effective area of the cross section based on the effective width (A...	[in2]	11.75	
Critical stress for flexural buckling (F_{cr33})	[Kip/in2]	30.87	Eq.E3-2
Nominal flexural buckling strength (P_{n33})	[Kip]	362.60	Eq.E7-1

Compression in the minor axis 22

Ratio	:	0.00			
Capacity	:	50.95 [Kip]	Reference	:	Cl.E3
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Non slender	
Unstiffened element slenderness (λ)	--	6.93	
Unstiffened element limiting slenderness (λ_r)	--	15.89	Table.4.1a.Case1
Stiffened element classification	--	Slender	
Stiffened element slenderness (λ)	--	46.51	
Stiffened element limiting slenderness (λ_r)	--	42.29	Table.4.1a.Case5
Factored flexural buckling strength(ϕP_{n22})	[Kip]	50.95	Cl.E3
Unbraced length (L_{22})	[ft]	29.83	Cl.E2
Effective slenderness ($(KL/r)_{22}$)	--	228.73	Cl.E2
Elastic critical buckling stress (F_{e22})	[Kip/in2]	5.47	Eq.E3-4
Effective area of the cross section based on the effective width (A...	[in2]	11.80	
Critical stress for flexural buckling (F_{cr22})	[Kip/in2]	4.80	Eq.E3-3
Nominal flexural buckling strength (P_{n22})	[Kip]	56.61	Eq.E7-1
Factored torsional or flexural-torsional buckling strength(ϕP_{n11})	[Kip]	202.85	Cl.E4
Unbraced length (L_{11})	[ft]	29.83	Cl.E2
Torsional or flexural-torsional elastic buckling stress (F_{e11})	[Kip/in2]	23.77	Eq.E4-2
Effective area of the cross section based on the effective width (A...	[in2]	11.80	
Critical stress for torsional or flexural-torsional buckling (F_{cr11})	[Kip/in2]	19.10	Eq.E3-2
Nominal torsional or flexural-torsional buckling strength (P_{n11})	[Kip]	225.38	Eq.E7-1

FLEXURAL DESIGN ✔

Bending about major axis, M33

Ratio	:	0.21			
Capacity	:	197.10 [Kip*ft]	Reference	:	Cl.F2.1
Demand	:	42.08 [Kip*ft]	Ctrl Eq.	:	Des at 53.13%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Compact	
Unstiffened element slenderness (λ)	--	6.93	
Limiting slenderness for noncompact unstiffened element (λ_r)	--	28.38	
Limiting slenderness for compact unstiffened element (λ_p)	--	10.79	
Stiffened element classification	--	Compact	
Stiffened element slenderness (λ)	--	46.51	
Limiting slenderness for noncompact stiffened element (λ_r)	--	161.78	
Limiting slenderness for compact stiffened element (λ_p)	--	106.72	
Factored yielding strength(ϕM_n)	[Kip*ft]	197.10	Cl.F2.1
Yielding (M_n)	[Kip*ft]	219.00	Eq.F2-1
Factored lateral-torsional buckling strength(ϕM_n)	[Kip*ft]	67.95	Cl.F2.2
Limiting laterally unbraced length for yielding (L_p)	[ft]	6.51	Eq.F2-5
Effective radius of gyration used in the determination of Lr (r_{ts})	[in]	1.86	Eq.F2-7
Lateral-torsional factor (c)	--	1.00	Eq.F2-8a
Limiting laterally unbraced length for inelastic lateral-torsional bucklin...	[ft]	19.62	Eq.F2-6
Lateral-torsional buckling modification factor (C_b)	--	1.00	Eq.F1-1
Critical stress (F_{cr})	[Kip/in2]	14.00	Eq.F2-4
Nominal lateral-torsional buckling moment strength (M_n)	[Kip*ft]	75.50	Eq.F2-3

Bending about minor axis, M22

Ratio	:	0.00			
Capacity	:	34.29 [Kip*ft]	Reference	:	Cl.F6.1
Demand	:	0.00 [Kip*ft]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Compact	
Unstiffened element slenderness (λ)	--	6.93	
Limiting slenderness for noncompact unstiffened element (λ_r)	--	28.38	
Limiting slenderness for compact unstiffened element (λ_p)	--	10.79	
Stiffened element classification	--	Compact	
Stiffened element slenderness (λ)	--	46.51	
Limiting slenderness for noncompact stiffened element (λ_r)	--	161.78	
Limiting slenderness for compact stiffened element (λ_p)	--	106.72	
Factored yielding strength about a geometric axis(ϕM_n)	[Kip*ft]	34.29	Cl.F6.1
Yielding (M_n)	[Kip*ft]	38.10	Eq.F6-1

DESIGN FOR SHEAR ✔

Shear in major axis 33

Ratio	:	0.00			
Capacity	:	137.44 [Kip]	Reference	:	Cl.G1
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Factored shear capacity(ϕV_n)	[Kip]	137.44	Cl.G1
Web buckling coefficient (k_v)	--	1.20	Cl.G6
Web buckling coefficient (C_v)	--	1.00	Eq.G2-9
Nominal shear strength (V_n)	[Kip]	152.71	Eq.G6-1

Shear in minor axis 22

Ratio	:	0.05			
Capacity	:	105.41 [Kip]	Reference	:	Cl.G1
Demand	:	5.68 [Kip]	Ctrl Eq.	:	Des1 at 100.00%

Intermediate results	Unit	Value	Reference
Factored shear capacity(ϕV_n)	[Kip]	105.41	Cl.G1
Web buckling coefficient (k_v)	--	5.34	Eq.G2-5
Web buckling coefficient (C_v)	--	1.00	-
Nominal shear strength (V_n)	[Kip]	105.41	Eq.G2-1

COMBINED ACTIONS DESIGN ✔

Combined flexure and axial

Ratio	:	0.21			
Ctrl Eq.	:	Des at 53.13%	Reference	:	Eq.H1-1b

Intermediate results	Unit	Value	Reference
Interaction of flexure and axial force	--	0.21	Eq.H1-1b
Available flexural strength about strong axis (M_{c33})	[Kip*ft]	197.10	Cl.H1.1
Available flexural strength about weak axis (M_{c22})	[Kip*ft]	34.29	Cl.H1.1
Available axial strength (P_c)	[Kip]	382.32	Cl.H1.1

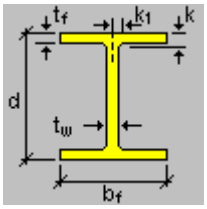
Member : 6 (Existing W16x40)
Design status : OK

DESIGN WARNINGS

Section information

Section name: W 16X40 **(US)**

Dimensions



bf	=	7.000	[in]	Width
d	=	16.000	[in]	Depth
k	=	0.907	[in]	Distance k
k1	=	0.813	[in]	Distance k1
tf	=	0.505	[in]	Flange thickness
tw	=	0.305	[in]	Web thickness

Properties

Section properties	Unit	Major axis	Minor axis
Gross area of the section. (Ag)	[in2]	11.800	
Moment of Inertia (local axes) (I)	[in4]	518.000	28.900
Moment of Inertia (principal axes) (I')	[in4]	518.000	28.900
Bending constant for moments (principal axis) (J')	[in]	0.000	0.000
Radius of gyration (local axes) (r)	[in]	6.626	1.565
Radius of gyration (principal axes) (r')	[in]	6.626	1.565
Saint-Venant torsion constant. (J)	[in4]	0.794	
Section warping constant. (Cw)	[in6]	1730.000	
Distance from centroid to shear center (principal axis) (xo,yo)	[in]	0.000	0.000
Top elastic section modulus of the section (local axis) (Ssup)	[in3]	64.700	8.250
Bottom elastic section modulus of the section (local axis) (Sinf)	[in3]	64.700	8.250
Top elastic section modulus of the section (principal axis) (S'sup)	[in3]	64.700	8.250
Bottom elastic section modulus of the section (principal axis) (S'inf)	[in3]	64.700	8.250
Plastic section modulus (local axis) (Z)	[in3]	73.000	12.700
Plastic section modulus (principal axis) (Z')	[in3]	73.000	12.700
Polar radius of gyration. (ro)	[in]	6.808	
Area for shear (Aw)	[in2]	7.070	4.880
Torsional constant. (C)	[in3]	1.480	

Material : A36

Properties	Unit	Value
Yield stress (Fy):	[Kip/in2]	36.00
Tensile strength (Fu):	[Kip/in2]	58.00
Elasticity Modulus (E):	[Kip/in2]	29000.00
Shear modulus for steel (G):	[Kip/in2]	11507.94

DESIGN CRITERIA

Description	Unit	Value
Length for tension slenderness ratio (L)	[ft]	29.83

Distance between member lateral bracing points

Length (Lb) [ft]	
Top	Bottom
1.00	29.83

Laterally unbraced length

Length [ft]			Effective length factor		
Major axis(L33)	Minor axis(L22)	Torsional axis(Lt)	Major axis(K33)	Minor axis(K22)	Torsional axis(Kt)
29.83	29.83	29.83	1.0	1.0	1.0

Additional assumptions

Continuous lateral torsional restraint	No
Tension field action	No
Continuous flexural torsional restraint	No
Effective length factor value type	None
Major axis frame type	Sway
Minor axis frame type	Sway

DESIGN CHECKS

AXIAL TENSION DESIGN ✔

Axial tension

Ratio	:	0.00			
Capacity	:	382.32 [Kip]	Reference	:	Cl.D2
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Factored axial tension capacity(ϕP_n)	[Kip]	382.32	Cl.D2
Nominal axial tension capacity (P_n)	[Kip]	424.80	Eq.D2-1

AXIAL COMPRESSION DESIGN ✔

Compression in the major axis 33

Ratio	:	0.00			
Capacity	:	326.34 [Kip]	Reference	:	Cl.E3
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Non slender	
Unstiffened element slenderness (λ)	--	6.93	
Unstiffened element limiting slenderness (λ_r)	--	15.89	Table.4.1a.Case1
Stiffened element classification	--	Slender	
Stiffened element slenderness (λ)	--	46.51	
Stiffened element limiting slenderness (λ_r)	--	42.29	Table.4.1a.Case5
Factored flexural buckling strength(ϕP_{n33})	[Kip]	326.34	Cl.E3
Unbraced length (L_{33})	[ft]	29.83	Cl.E2
Effective slenderness ($(KL/r)_{33}$)	--	54.03	Cl.E2
Elastic critical buckling stress (F_{e33})	[Kip/in2]	98.06	Eq.E3-4
Effective area of the cross section based on the effective width (A...	[in2]	11.75	
Critical stress for flexural buckling (F_{cr33})	[Kip/in2]	30.87	Eq.E3-2
Nominal flexural buckling strength (P_{n33})	[Kip]	362.60	Eq.E7-1

Compression in the minor axis 22

Ratio	:	0.00			
Capacity	:	50.95 [Kip]	Reference	:	Cl.E3
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Non slender	
Unstiffened element slenderness (λ)	--	6.93	
Unstiffened element limiting slenderness (λ_r)	--	15.89	Table.4.1a.Case1
Stiffened element classification	--	Slender	
Stiffened element slenderness (λ)	--	46.51	
Stiffened element limiting slenderness (λ_r)	--	42.29	Table.4.1a.Case5
Factored flexural buckling strength(ϕP_{n22})	[Kip]	50.95	Cl.E3
Unbraced length (L_{22})	[ft]	29.83	Cl.E2
Effective slenderness ($(KL/r)_{22}$)	--	228.73	Cl.E2
Elastic critical buckling stress (F_{e22})	[Kip/in2]	5.47	Eq.E3-4

Effective area of the cross section based on the effective width (A...	[in2]	11.80	
Critical stress for flexural buckling (F_{cr22})	[Kip/in2]	4.80	Eq.E3-3
Nominal flexural buckling strength (P_{n22})	[Kip]	56.61	Eq.E7-1
Factored torsional or flexural-torsional buckling strength(ϕP_{n11})	[Kip]	202.85	Cl.E4
Unbraced length (L_{11})	[ft]	29.83	Cl.E2
Torsional or flexural-torsional elastic buckling stress (F_{e11})	[Kip/in2]	23.77	Eq.E4-2
Effective area of the cross section based on the effective width (A...	[in2]	11.80	
Critical stress for torsional or flexural-torsional buckling (F_{cr11})	[Kip/in2]	19.10	Eq.E3-2
Nominal torsional or flexural-torsional buckling strength (P_{n11})	[Kip]	225.38	Eq.E7-1

FLEXURAL DESIGN ✔

Bending about major axis, M33

Ratio	:	0.22			
Capacity	:	197.10 [Kip*ft]	Reference	:	Cl.F2.1
Demand	:	43.04 [Kip*ft]	Ctrl Eq.	:	Des at 53.13%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Compact	
Unstiffened element slenderness (λ)	--	6.93	
Limiting slenderness for noncompact unstiffened element (λ_r)	--	28.38	
Limiting slenderness for compact unstiffened element (λ_p)	--	10.79	
Stiffened element classification	--	Compact	
Stiffened element slenderness (λ)	--	46.51	
Limiting slenderness for noncompact stiffened element (λ_r)	--	161.78	
Limiting slenderness for compact stiffened element (λ_p)	--	106.72	
Factored yielding strength(ϕM_n)	[Kip*ft]	197.10	Cl.F2.1
Yielding (M_n)	[Kip*ft]	219.00	Eq.F2-1
Factored lateral-torsional buckling strength(ϕM_n)	[Kip*ft]	67.95	Cl.F2.2
Limiting laterally unbraced length for yielding (L_p)	[ft]	6.51	Eq.F2-5
Effective radius of gyration used in the determination of Lr (r_{ts})	[in]	1.86	Eq.F2-7
Lateral-torsional factor (c)	--	1.00	Eq.F2-8a
Limiting laterally unbraced length for inelastic lateral-torsional bucklin...	[ft]	19.62	Eq.F2-6
Lateral-torsional buckling modification factor (C_b)	--	1.00	Eq.F1-1
Critical stress (F_{cr})	[Kip/in2]	14.00	Eq.F2-4
Nominal lateral-torsional buckling moment strength (M_n)	[Kip*ft]	75.50	Eq.F2-3

Bending about minor axis, M22

Ratio	:	0.00			
Capacity	:	34.29 [Kip*ft]	Reference	:	Cl.F6.1
Demand	:	0.00 [Kip*ft]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Section classification			
Unstiffened element classification	--	Compact	
Unstiffened element slenderness (λ)	--	6.93	
Limiting slenderness for noncompact unstiffened element (λ_r)	--	28.38	
Limiting slenderness for compact unstiffened element (λ_p)	--	10.79	
Stiffened element classification	--	Compact	
Stiffened element slenderness (λ)	--	46.51	
Limiting slenderness for noncompact stiffened element (λ_r)	--	161.78	
Limiting slenderness for compact stiffened element (λ_p)	--	106.72	
Factored yielding strength about a geometric axis(ϕM_n)	[Kip*ft]	34.29	Cl.F6.1
Yielding (M_n)	[Kip*ft]	38.10	Eq.F6-1

DESIGN FOR SHEAR ✔

Shear in major axis 33

Ratio	:	0.00			
Capacity	:	137.44 [Kip]	Reference	:	Cl.G1
Demand	:	0.00 [Kip]	Ctrl Eq.	:	Des at 0.00%

Intermediate results	Unit	Value	Reference
Factored shear capacity(ϕV_n)	[Kip]	137.44	Cl.G1
Web buckling coefficient (k_v)	--	1.20	Cl.G6
Web buckling coefficient (C_v)	--	1.00	Eq.G2-9
Nominal shear strength (V_n)	[Kip]	152.71	Eq.G6-1

Shear in minor axis 22

Ratio	:	0.06			
Capacity	:	105.41 [Kip]	Reference	:	Cl.G1
Demand	:	6.19 [Kip]	Ctrl Eq.	:	Des2 at 100.00%

Intermediate results	Unit	Value	Reference
Factored shear capacity(ϕV_n)	[Kip]	105.41	Cl.G1
Web buckling coefficient (k_v)	--	5.34	Eq.G2-5
Web buckling coefficient (C_v)	--	1.00	-
Nominal shear strength (V_n)	[Kip]	105.41	Eq.G2-1

COMBINED ACTIONS DESIGN ✔

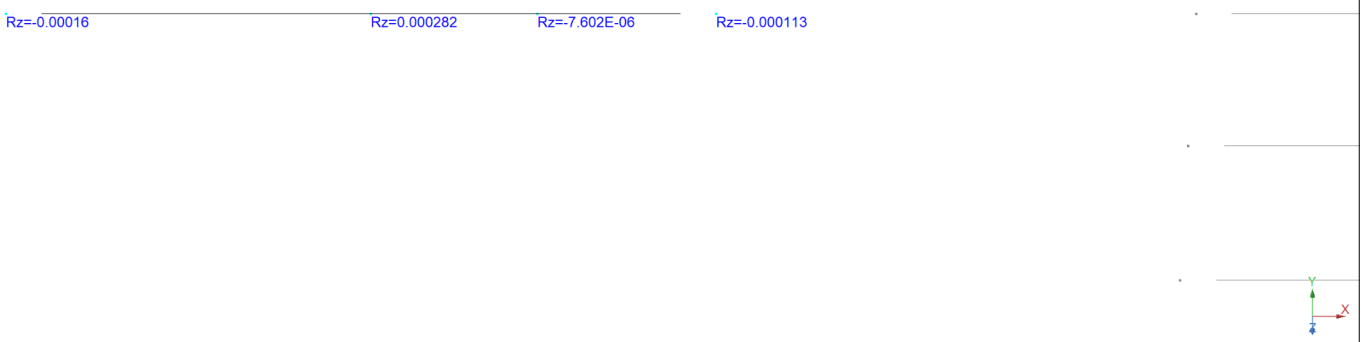
Combined flexure and axial

Ratio	:	0.22			
Ctrl Eq.	:	Des at 53.13%	Reference	:	Eq.H1-1b

Intermediate results	Unit	Value	Reference
Interaction of flexure and axial force	--	0.22	Eq.H1-1b
Available flexural strength about strong axis (M_{c33})	[Kip*ft]	197.10	Cl.H1.1
Available flexural strength about weak axis (M_{c22})	[Kip*ft]	34.29	Cl.H1.1
Available axial strength (P_c)	[Kip]	382.32	Cl.H1.1

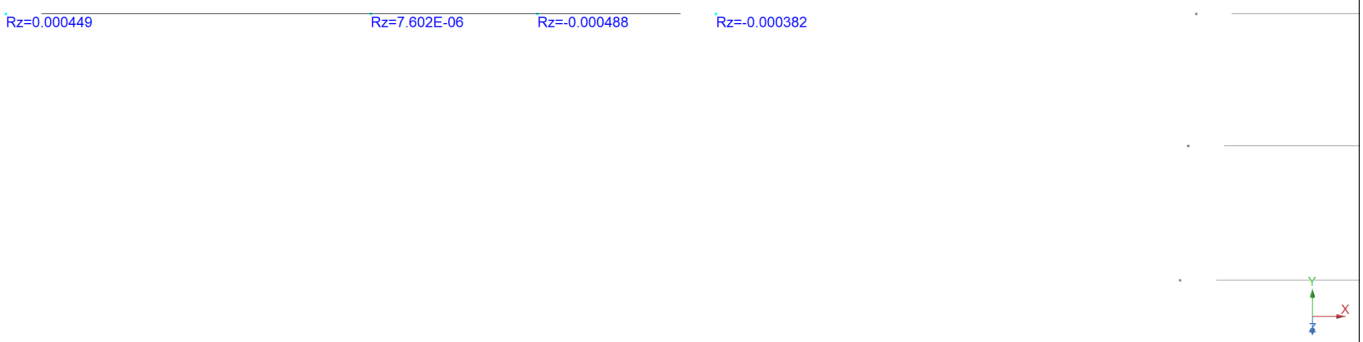
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JOIST ROTATION



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JOIST ROTATION



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BEAM ROTATION





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BEAM ROTATION

