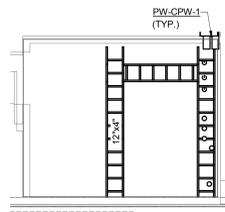


**1 TR-6 ARCH 219 TECHNOLOGY EQUIPMENT**  
1/4" = 1'-0"

NOTES:

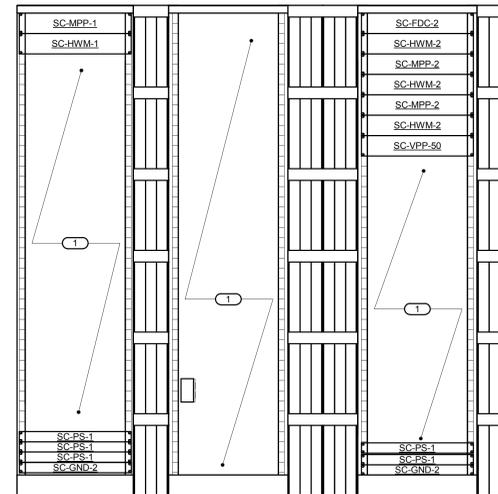
- REFER TO (2/T203) FOR EQUIPMENT ROOM PATHWAY LAYOUT.
- REFER TO (1/T301) FOR BONDING BUS BAR DETAIL.
- MOUNT SC-GND-1 (BONDING BUS BAR) AT 7'-0" ABOVE FINISHED FLOOR.



**2 TR-6 ARCH 219 TECHNOLOGY PATHWAY**  
1/4" = 1'-0"

NOTES:

- MOUNTING HEIGHT OF LADDER RACK THAT SERVES THE TELECOMM RACKS SHALL BE +78" ABOVE FINISHED FLOOR.
- LADDER RACK SHALL BE USED TO FORM A TRANSITION FROM THE HEIGHT OF THE WALL PENETRATION TO THE HEIGHT OF THE LADDER RACK THAT SERVES THE TELECOMM RACKS.
- CABLE RUNWAYS SHALL BE INSTALLED AT ALL CABLE TRANSITIONS FROM ON LADDER RACK TO BELOW SAME LADDER RACK.



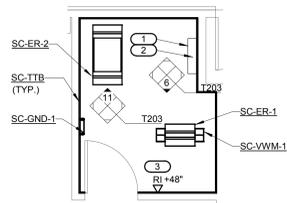
**3 TR-6 RACK ELEVATION**  
NO SCALE

NOTES:

- REFER TO 2/T203 FOR EQUIPMENT PATHWAY TR-6.

KEYNOTES:

- SPACE OPEN FOR OWNER PROVIDED EQUIPMENT.



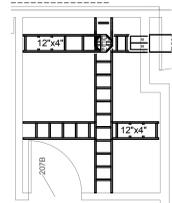
**4 TR-7 ARCH 208 TECHNOLOGY EQUIPMENT**  
1/4" = 1'-0"

GENERAL NOTES:

- REFER TO (5/T203) FOR EQUIPMENT ROOM PATHWAY LAYOUT.
- REFER TO (1/T301) FOR BONDING BUS BAR DETAIL.
- MOUNT SC-GND-1 (BONDING BUS BAR) AT 7'-0" ABOVE FINISHED FLOOR.

KEY NOTES:

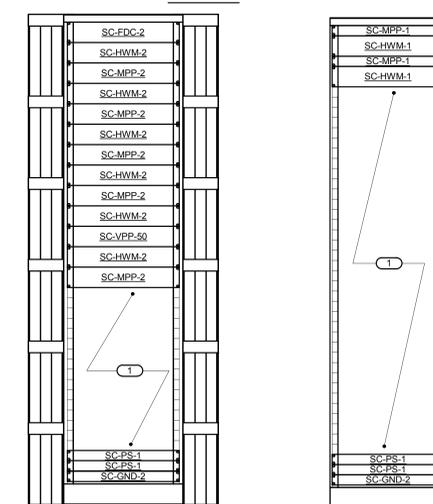
- SPACE RESERVED FOR LIGHTING CONTROLS.
- PROVIDE AND INSTALL CAT CABLE AS NEEDED TO CONNECT LIGHTING CONTROL SYSTEMS. COORDINATE WITH LIGHTING CONTRACTOR FOR DETAILS.
- PROVIDE TELECOM ROUGH-IN WITH BLANK COVER PLATE FOR FUTURE USE WITH LIGHTING CONTROLS. COORDINATE WITH OWNER, ARCHITECT, AND LIGHTING CONTRACTOR FOR EXACT LOCATION.



**5 TR-7 ARCH 208 TECHNOLOGY PATHWAY**  
1/4" = 1'-0"

NOTES:

- MOUNTING HEIGHT OF LADDER RACK THAT SERVES THE TELECOMM RACKS SHALL BE +78" ABOVE FINISHED FLOOR.
- LADDER RACK SHALL BE USED TO FORM A TRANSITION FROM THE HEIGHT OF THE WALL PENETRATION TO THE HEIGHT OF THE LADDER RACK THAT SERVES THE TELECOMM RACKS.
- CABLE RUNWAYS SHALL BE INSTALLED AT ALL CABLE TRANSITIONS FROM ON LADDER RACK TO BELOW SAME LADDER RACK.



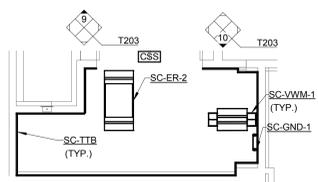
**6 TR-7 RACK ELEVATION**  
1" = 1'-0"

NOTES:

- REFER TO 5/T203 FOR EQUIPMENT PATHWAY TR-7.

KEYNOTES:

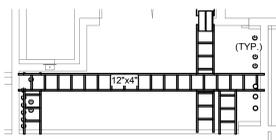
- SPACE OPEN FOR OWNER PROVIDED EQUIPMENT.
- SPACE OPEN FOR AV EQUIPMENT.



**7 TR-8 ARCH 267 TECHNOLOGY EQUIPMENT**  
1/4" = 1'-0"

GENERAL NOTES:

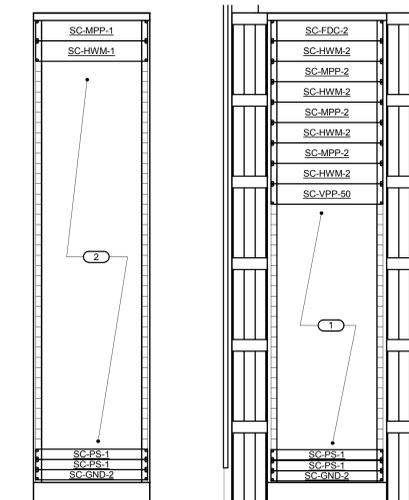
- REFER TO (8/T203) FOR EQUIPMENT ROOM PATHWAY LAYOUT.
- REFER TO (1/T301) FOR BONDING BUS BAR DETAIL.
- MOUNT SC-GND-1 (BONDING BUS BAR) AT 7'-0" ABOVE FINISHED FLOOR.



**8 TR-8 ARCH 267 TECHNOLOGY PATHWAY**  
1/4" = 1'-0"

NOTES:

- MOUNTING HEIGHT OF LADDER RACK THAT SERVES THE TELECOMM RACKS SHALL BE +78" ABOVE FINISHED FLOOR.
- LADDER RACK SHALL BE USED TO FORM A TRANSITION FROM THE HEIGHT OF THE WALL PENETRATION TO THE HEIGHT OF THE LADDER RACK THAT SERVES THE TELECOMM RACKS.
- CABLE RUNWAYS SHALL BE INSTALLED AT ALL CABLE TRANSITIONS FROM ON LADDER RACK TO BELOW SAME LADDER RACK.



**9 TR-8 RACK ELEVATION**  
NO SCALE

NOTES:

- REFER TO 8/T203 FOR EQUIPMENT PATHWAY TR-8.

KEYNOTES:

- SPACE OPEN FOR OWNER PROVIDED EQUIPMENT.
- SPACE OPEN FOR AV EQUIPMENT.

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MIDDLETON, WISCONSIN 53602  
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PROJECT # 2014057-00

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REFERENCE SCALE IN INCHES  
0 1 2 3

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Building Envelope Consultant  
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608.204.0825 tel

**Summit Fire Consulting**  
Fire & Code Consultant  
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651.251.1879 tel

**KRA**  
Acoustical Consultant  
4826 Chicago Avenue South, Suite 206  
Minneapolis, MN 55417  
612.374.2800 tel

**VIERBICHER**  
Civil Engineers  
999 Fourier Drive, Suite 201  
Madison, WI 53717

**Madison Municipal Building Renovation**  
BPW Project #7939  
215 Martin Luther King, Jr. Blvd.  
Madison, WI 53703

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin.  
ARCHITECT SEAL

Signature: \_\_\_\_\_  
Print Names: \_\_\_\_\_  
Date: \_\_\_\_\_ License No.: \_\_\_\_\_

ISSUE	MARK	DATE	DESCRIPTION
		03.24.2017	BID SET

PROJECT NO. 2014057  
PROJECT PHASE BID ISSUE  
DRAWN BY: ROBTHOJAMDEEJ DAVLAR  
Checked By: \_\_\_\_\_  
Drawing Title: \_\_\_\_\_

**ENLARGED PLANS - TECHNOLOGY**

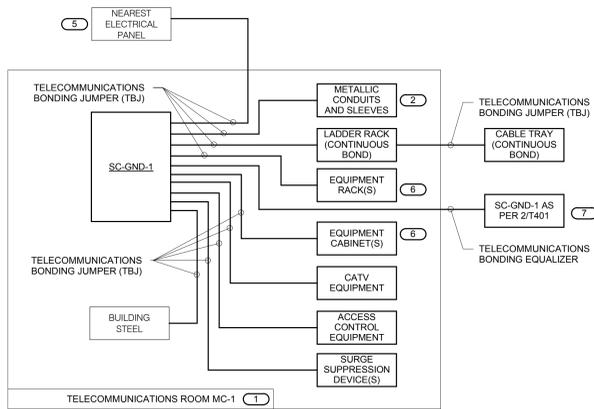
**EXHIBIT M**  
**T203**











### 1 TELECOM ROOM BONDING FLOW DIAGRAM

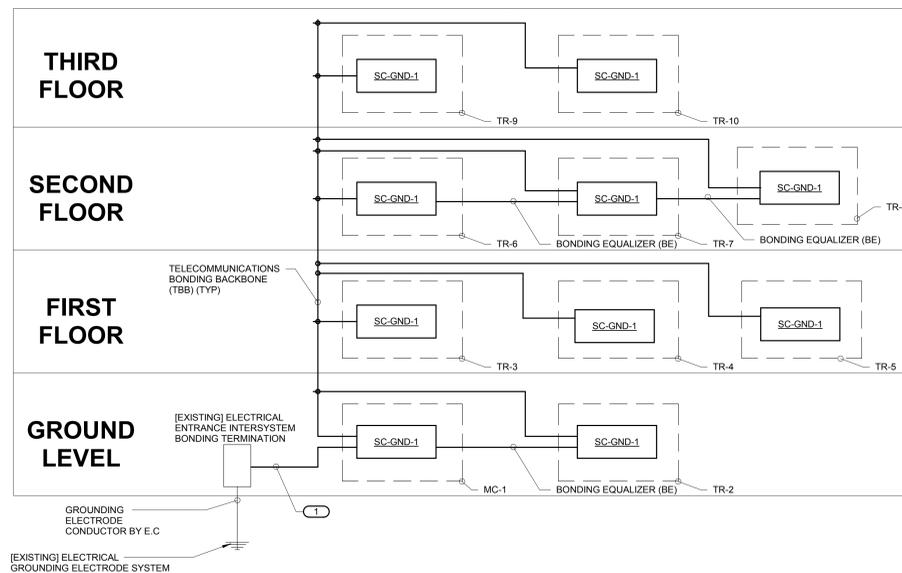
NO SCALE

#### NOTES:

- THIS FLOW DIAGRAM IS DIAGRAMMATIC AND MAY NOT SHOW ACTUAL ROUTING OR QUANTITIES OF MATERIALS. THIS FLOW DIAGRAM IS SHOWN FOR CLARIFICATION OF CONNECTION LOCATIONS AND CONDUCTOR TYPE. ALL CONNECTIONS AND SYSTEM DEVICES SHOWN ARE TYPICAL AND NOT REPRESENTATIVE OF ACTUAL PROJECT QUANTITIES. REFER TO FLOOR PLANS AND ENLARGED FLOOR PLANS FOR ACTUAL QUANTITIES AND LOCATIONS OF DEVICES AND MORE SPECIFIC ROUTING INFORMATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ALL CONDUCTORS IN THE TECHNOLOGY BONDING SYSTEM SHALL BE MINIMUM SIZE OF 3/0 AWG PLENUM RATED COPPER (GREEN OR MARKED WITH A DISTINCTIVE GREEN COLOR) UNLESS CONDUCTOR LENGTH IS LESS THAN 66 FEET. REFER TO BONDING CONDUCTOR SIZING SCHEDULE FOR SIZING CRITERIA FOR CONDUCTORS LESS THAN 66 FEET IN LENGTH. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ALL BONDING CONDUCTORS AND BONDING JUMPERS SHALL BE CONNECTED BY COMPRESSION LUGS, EXOTHERMIC WELDING, OR IRREVERSIBLE COMPRESSION CONNECTORS. SOLDER IS NOT AN ACCEPTABLE MEANS OF CONNECTION. SHEET METAL SCREWS SHALL NOT BE USED TO CONNECT COMMUNICATIONS BONDING CONDUCTORS TO EQUIPMENT. WHERE NECESSARY, REMOVE PAINT AND/OR USE PAINT-PIERCING WASHERS TO PROVIDE PROPER ELECTRICAL BOND AT ALL CONNECTIONS.
- REFER TO 1/T301 FOR BONDING BUS BAR DETAIL AND ADDITIONAL INFORMATION AND REQUIREMENTS FOR SC-GND-1.

#### KEYNOTES:

- REFER TO TELECOM ROOM REFERENCES SCHEDULE ON DRAWING T000 FOR TELECOMMUNICATIONS ROOM NUMBER AND LOCATION INFORMATION.
- INCLUDES HORIZONTAL AND VERTICAL CONDUIT SLEEVES FOR TECHNOLOGY CABLING.
- TELECOMMUNICATIONS BONDING BACKBONE (TBB). REFER TO 2/T401 FOR TELECOMMUNICATIONS BONDING RISER DIAGRAM.
- BONDING CONDUCTOR FOR TELECOMMUNICATIONS (BCT), TO EXISTING ELECTRICAL ENTRANCE INTERSYSTEM BONDING TERMINATION. REFER TO 2/T401 FOR TELECOMMUNICATIONS BONDING RISER DIAGRAM FOR CONTINUATION AND ADDITIONAL INFORMATION AND REQUIREMENTS. THIS CONNECTION OCCURS IN MC-1 ONLY.
- REFER TO THE ELECTRICAL DRAWINGS FOR LOCATION.
- PROVIDE SC-GND-2 RACK MOUNT TELECOMMUNICATIONS BONDING BUSBAR AT EACH EQUIPMENT RACK AND CABINET.
- BONDING EQUALIZER (BE). REFER TO 2/T401 FOR TELECOMMUNICATIONS BONDING RISER DIAGRAM FOR CONTINUATION AND ADDITIONAL INFORMATION AND REQUIREMENTS ON TELECOMMUNICATIONS ROOMS THAT REQUIRE BONDING EQUALIZER CONNECTIONS.



### 2 TECHNOLOGY BONDING RISER DIAGRAM

NO SCALE

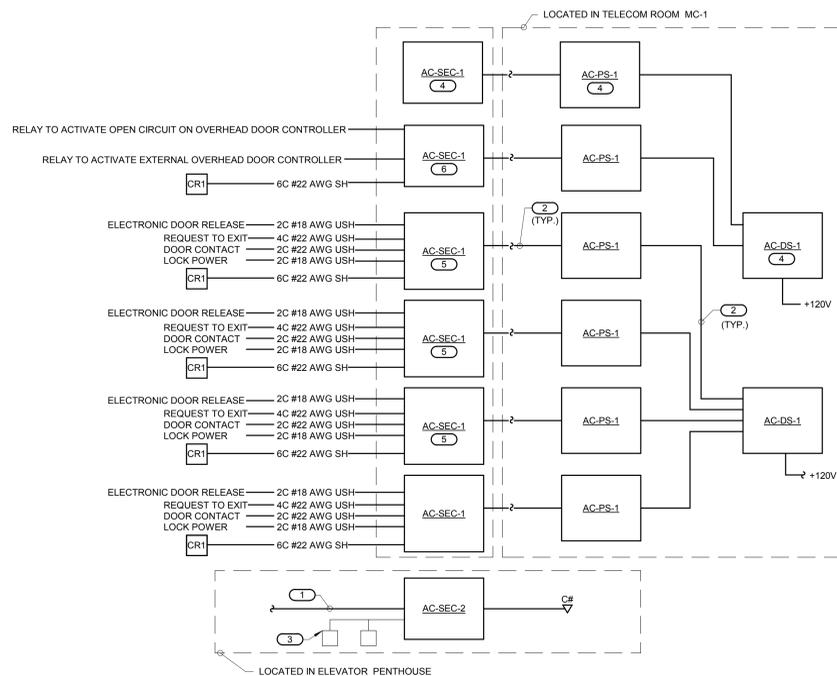
#### NOTES:

- THIS RISER IS DIAGRAMMATIC AND MAY NOT SHOW ACTUAL ROUTING OR QUANTITIES OF MATERIALS. THIS RISER IS SHOWN FOR CLARIFICATION OF CONNECTION LOCATIONS AND CONDUCTOR TYPE. ALL CONNECTIONS AND SYSTEM DEVICES SHOWN ARE TYPICAL AND NOT REPRESENTATIVE OF ACTUAL PROJECT QUANTITIES. REFER TO FLOOR PLANS AND ENLARGED FLOOR PLANS FOR ACTUAL QUANTITIES AND LOCATIONS OF DEVICES AND MORE SPECIFIC ROUTING INFORMATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ALL CONDUCTORS IN THE TECHNOLOGY BONDING SYSTEM SHALL BE MINIMUM SIZE OF 3/0 AWG PLENUM RATED COPPER (GREEN OR MARKED WITH A DISTINCTIVE GREEN COLOR) UNLESS CONDUCTOR LENGTH IS LESS THAN 66 FEET. REFER TO BONDING CONDUCTOR SIZING SCHEDULE FOR SIZING CRITERIA FOR CONDUCTORS LESS THAN 66 FEET IN LENGTH. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- ALL BONDING CONDUCTORS AND BONDING JUMPERS SHALL BE CONNECTED BY COMPRESSION LUGS, EXOTHERMIC WELDING, OR IRREVERSIBLE COMPRESSION CONNECTORS. SOLDER IS NOT AN ACCEPTABLE MEANS OF CONNECTION. SHEET METAL SCREWS SHALL NOT BE USED TO CONNECT COMMUNICATIONS BONDING CONDUCTORS TO EQUIPMENT. WHERE NECESSARY, REMOVE PAINT AND/OR USE PAINT-PIERCING WASHERS TO PROVIDE PROPER ELECTRICAL BOND AT ALL CONNECTIONS.
- REFER TO 1/T401 FOR TYPICAL TELECOM ROOM BONDING FLOW DIAGRAM.
- REFER TO TELECOM ROOM REFERENCES SCHEDULE ON DRAWING T000 FOR TELECOMMUNICATIONS ROOM NUMBER AND LOCATION INFORMATION.

#### KEYNOTES:

- BONDING CONDUCTOR FOR TELECOMMUNICATIONS (BCT), BCT SHALL BE THE SAME SIZE AS THE TBB OR LARGER. REFER TO BONDING CONDUCTOR SIZING SCHEDULE FOR SIZING REQUIREMENTS. THIS CONNECTION OCCURS IN MC-1 ONLY.

BONDING CONDUCTOR SIZING SCHEDULE	
CONDUCTOR LENGTH IN FEET	MINIMUM ACCEPTABLE SIZE - AWG
LESS THAN 13'	6
14' - 20'	4
21' - 26'	3
27' - 33'	2
34' - 41'	1
42' - 52'	1/0
53' - 66'	2/0
GREATER THAN 66'	3/0



### 3 ACCESS CONTROL RISER DIAGRAM

NO SCALE

#### NOTES:

- THIS RISER IS DIAGRAMMATIC AND MAY NOT SHOW DEVICE QUANTITIES AS LOCATIONS. ALL DEVICES SHOWN ARE TYPICAL AND MAY NOT REFLECT EVERY WIRE OR CONNECTION THAT MUST BE MADE.

#### KEYNOTES:

- CONNECTION TO ELEVATOR EQUIPMENT. COORDINATE EXACT REQUIREMENTS WITH ELEVATOR CONTRACTOR.
- CABLE PER MANUFACTURER'S REQUIREMENTS.
- TYPICAL: 16.5 VAC, 30 OR 40 VA TRANSFORMER BY ELECTRICAL CONTRACTOR.
- DEVICE IS BEING PROVIDED FOR FUTURE USE. NO DOOR CONNECTIONS REQUIRED TO THIS DEVICE AT THIS TIME.
- MAY BE INSTALLED ABOVE DOOR. CONTRACTOR SHALL COORDINATE WITH OWNER.
- CONNECTIVITY TO ACTIVATE EXTERNAL OVERHEAD DOOR CONTROLS. RELAY TO ACTIVATE OPEN CIRCUIT ON DOOR CONTROLS SHALL OPEN THE OVERHEAD DOOR WHEN TRIGGERED BY FIRE ALARM OR OTHER EMERGENCY SIGNAL. RELAY TO ACTIVATE DOOR CONTROLS SHALL ACTIVATE THE DOOR CONTROLS FOR A SPECIFIC LENGTH OF TIME. DOOR CONTROL RELAY MAY ALSO BE ACTIVATED ON A SCHEDULE. COORDINATE WITH OWNER FOR LENGTH OF TIME TO ACTIVATE AND FOR SCHEDULE INFORMATION. COORDINATE WITH OVERHEAD DOOR CONTRACTOR.

### 4 TWO-WAY RADIO ONE-LINE DIAGRAM

NO SCALE

#### GENERAL NOTES:

- BDA: WESTELL (FORMERLY CELLULAR SPECIALTIES) CSA -BDA61080-S81 (FREQ BAND SMR 800 IDEN), QTY: 1.
- TRANSMISSION LINE: ANDREW HL4RP-80A PLENUM RATED 1/2", QTY AS REQUIRED.
- SPLITTER WITH CONNECTORS: ANDREW S-2 CPUSE-L1, QTY AS REQUIRED.
- 1/2" N MALE CONNECTORS: ANDREW L4TNM-PSA, QTY AS REQUIRED.
- 800 BAND 6.5 DB GAIN ANTENNA: COMTECO BS800XL7-A, QTY: 1 PER BD.
- N FEMALE T ADAPTER: RF INDUSTRIES RFN-1011-1, QTY AS REQUIRED.
- 4' RG-58 N MALE-MALE JUMPER: RF INDUSTRIES RFW-1973, QTY AS REQUIRED.
- OMNI-DIRECTIONAL INDOOR ANTENNA: KATHREIN SCALA DIVISION 800-10249, QTY AS REQUIRED.
- CONTRACTOR TO INSTALL COMPLETE TWO-WAY RADIO SYSTEM, INCLUDING TERMINATIONS.
- AFTER SYSTEM INSTALLATION IS COMPLETE AND TESTED, PERFORM A SIGNAL STRENGTH FIELD SURVEY DOCUMENTING COMPLIANCE WITH NFPA 72 AND THE CITY OF MADISON FIRE ALARM CODE. SUBMIT DOCUMENTATION OF COMPLIANCE PRIOR TO REQUEST FOR FINAL PUNCH.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT, MISCELLANEOUS PARTS, ACCESSORIES, AND PROGRAMMING TO PROVIDE A COMPLETE AND FULLY OPERATIONAL IN-BUILDING PUBLIC SAFETY NETWORK DISTRIBUTED ACCESS SYSTEM.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY PATHWAYS REQUIRED BY THE PUBLIC SAFETY NETWORK PROVIDER TO SUPPORT THEIR SYSTEMS TO INCLUDE ANY PATHWAYS TO THE ROOF TO SUPPORT ANTENNA CABLING DISTRIBUTION BY THE PSN DAS.
- ANTENNA PLACEMENTS ON DRAWINGS ARE APPROXIMATE.
- FACILITY COVERAGE SHALL INCLUDE 95% OF THE FACILITY TO INCLUDE STAIRWELLS, ELEVATORS, BASEMENTS, UTILITY TUNNELS AND GARAGES IF APPLICABLE.

**KJWW ENGINEERING CONSULTANTS**  
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**THE FUTURE IS SMARTER!**  
PROJECT # 2014057-00

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REFERENCE SCALE IN INCHES  
0 1 2 3

# Madison Municipal Building Renovation

**BPW Project #7939**  
215 Martin Luther King, Jr. Blvd.  
Madison, WI 53703

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Architect under the Laws of the State of Wisconsin. ARCHITECT SEAL

Signature: \_\_\_\_\_

Print Names: \_\_\_\_\_

Date: \_\_\_\_\_ License No: \_\_\_\_\_

ISSUE

MARK DATE DESCRIPTION

03.24.2017 BID SET

PROJECT NO: 2014057

PROJECT PHASE: BID ISSUE

DRAWN BY: ROBTJODAMDEE CHECKED BY: DAVLAR

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## RISER DIAGRAMS - TECHNOLOGY

EXHIBIT M

**T401**







