



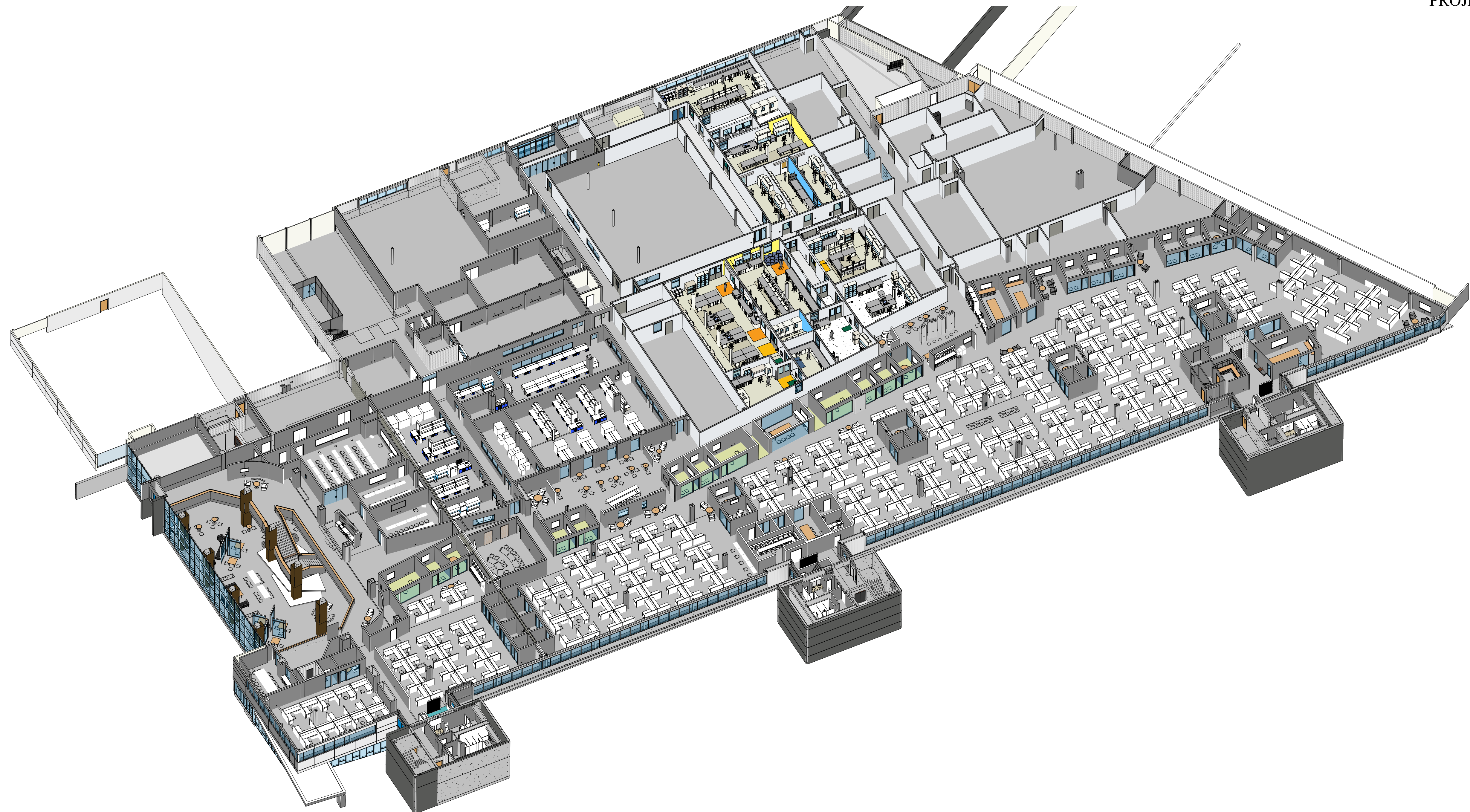
# PROJECT INDIGO

RESULTS WAY - 3RD FLOOR

## CLD & CCM LABS

JUNE 10, 2021 - ISSUED FOR CONSTRUCTION

PROJECT NUMBER - 20021A



HIGHLAND CORPORATE PARK  
800 SCENIC VIEW DRIVE  
CUMBERLAND, RI 02864

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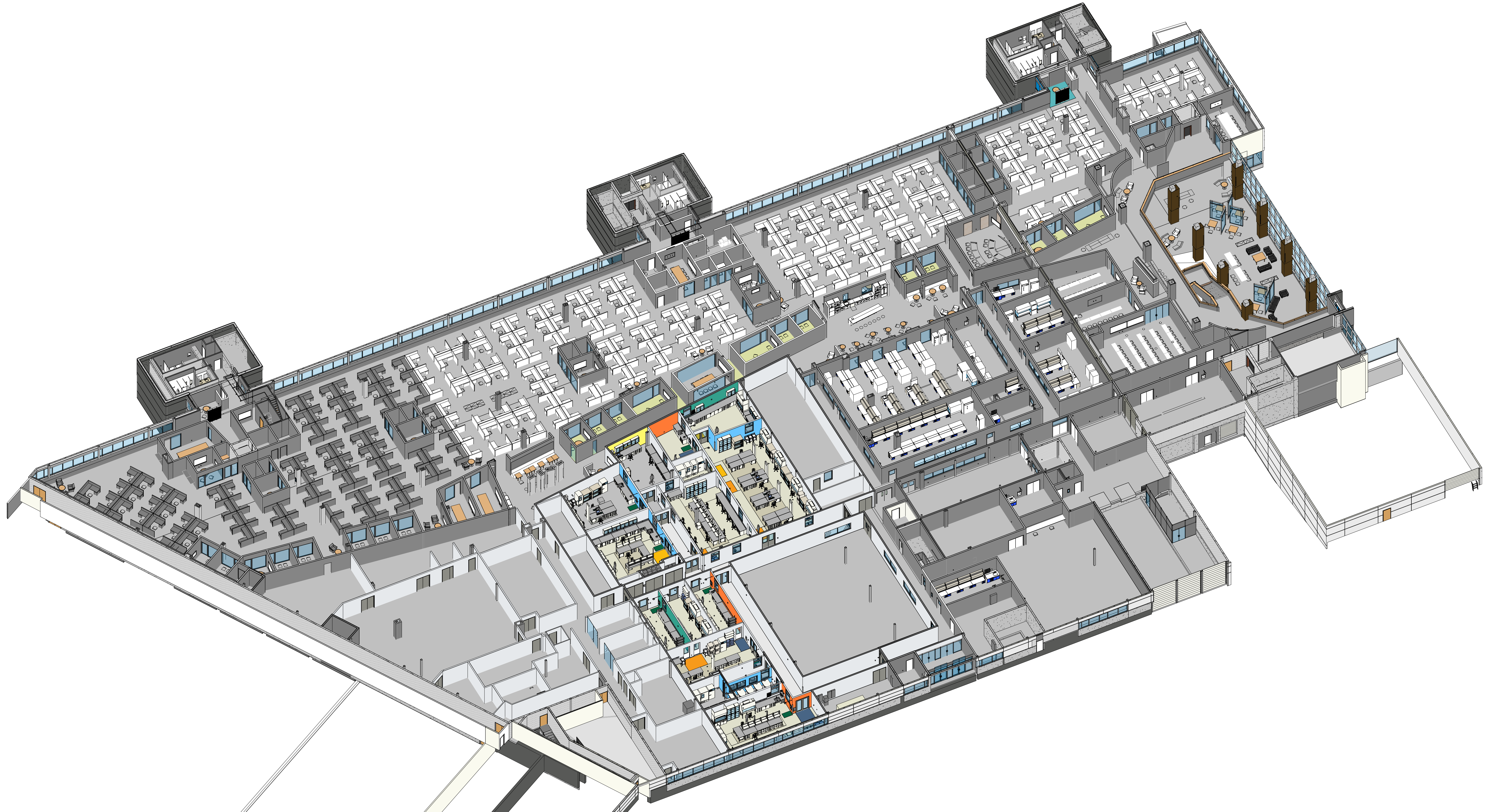
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# PROJECT INDIGO

RESULTS WAY - 3RD FLOOR







PROJECT INDIGO  
RESULTS WAY - 3RD FLOOR

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PROJECT NUMBER - 20021A

| SHEET NUMBER | SHEET NAME | ISSUE TYPE AND DATE |   |   |                                    |  | LATEST DRAWING DATE | LATEST REVISION | INCLUDED IN SET |
|--------------|------------|---------------------|---|---|------------------------------------|--|---------------------|-----------------|-----------------|
|              |            |                     | ISSUED FOR 60% CLIENT REVIEW - 03/22/21 | ISSUED FOR 90% CLIENT REVIEW - 04/19/21 | ISSUED FOR CONSTRUCTION - 06/10/21 |  |                     |                 |                 |

|                     |   |  |   |   |   |  |          |   |   |
|---------------------|---|--|---|---|---|--|----------|---|---|
| GENERAL             |   |  |   |   |   |  |          |   |   |
| G-001               | COVER SHEET   |  | X | X | X |  | 06/10/21 | 0 | X |
| G-002               | COVER SHEET   |  |   | X | X |  | 06/10/21 | 0 | X |
| G-003               | SHEET INDEX (FORMERLY G-002 @ 60% SET)                    |  | X | X | X |  | 06/10/21 | 0 | X |
| GENERAL ARRANGEMENT |   |  |   |   |   |  |          |   |   |
| GA-100              | OVERALL THIRD FLOOR PLAN                                  |  | X | X | X |  | 06/10/21 | 0 | X |
| GA-101              | PARTIAL THIRD FLOOR PLAN WEST SHELL SPACE                 |  | X | X | X |  | 06/10/21 | 0 | X |
| GA-102              | PARTIAL THIRD FLOOR PLAN EAST SHELL SPACE                 |  | X | X | X |  | 06/10/21 | 0 | X |
| GA-401              | ENLARGED WEST SHELL SPACE PART "A"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| GA-402              | ENLARGED WEST SHELL SPACE PART "B"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| GA-403              | ENLARGED EAST SHELL SPACE PART "A"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| GA-404              | ENLARGED EAST SHELL SPACE PART "B"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| ARCHITECTURAL       |   |  |   |   |   |  |          |   |   |
| A-001               | LEAD SHEET  |  | X | X | X |  | 06/10/21 | 0 | X |
| A-002               | LIFE SAFETY PLAN  |  | X | X | X |  | 06/10/21 | 0 | X |
| AD-101              | PARTIAL DEMOLITION PLAN WEST SHELL SPACE                  |  |   |   | X |  | 06/10/21 | 0 | X |
| AD-102              | PARTIAL DEMOLITION PLAN EAST SHELL SPACE                  |  |   |   | X |  | 06/10/21 | 0 | X |
| A-101               | PARTIAL THIRD FLOOR PLAN WEST SHELL SPACE                 |  | X | X | X |  | 06/10/21 | 0 | X |
| A-102               | PARTIAL THIRD FLOOR PLAN EAST SHELL SPACE                 |  | X | X | X |  | 06/10/21 | 0 | X |
| A-103               | PARTIAL ROOF PLAN ROOFING DETAILS                         |  |   | X | X |  | 06/10/21 | 0 | X |
| A-201               | PARTIAL REFLECTED CEILING PLAN WEST SHELL SPACE           |  | X | X | X |  | 06/10/21 | 0 | X |
| A-202               | PARTIAL REFLECTED CEILING PLAN EAST SHELL SPACE           |  | X | X | X |  | 06/10/21 | 0 | X |
| A-301               | BUILDING SECTIONS   |  |   | X | X |  | 06/10/21 | 0 | X |
| A-302               | BUILDING SECTIONS   |  |   | X | X |  | 06/10/21 | 0 | X |
| A-303               | BUILDING SECTIONS   |  |   | X | X |  | 06/10/21 | 0 | X |
| A-401               | ENLARGED WEST SHELL SPACE PART "A"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| A-402               | ENLARGED WEST SHELL SPACE PART "B"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| A-403               | ENLARGED EAST SHELL SPACE PART "A"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| A-404               | ENLARGED EAST SHELL SPACE PART "B"                        |  | X | X | X |  | 06/10/21 | 0 | X |
| A-405               | PARTIAL FLOOR FINISH PLAN WEST SHELL SPACE                |  |   | X | X |  | 06/10/21 | 0 | X |
| A-406               | PARTIAL FLOOR FINISH PLAN EAST SHELL SPACE                |  |   | X | X |  | 06/10/21 | 0 | X |
| A-411               | ENLARGED WEST SHELL SPACE REFLECTED CEILING PLAN PART "A" |  |   | X | X |  | 06/10/21 | 0 | X |
| A-412               | ENLARGED WEST SHELL SPACE REFLECTED CEILING PLAN PART "B" |  |   | X | X |  | 06/10/21 | 0 | X |
| A-413               | ENLARGED EAST SHELL SPACE REFLECTED CEILING PLAN PART "A" |  |   | X | X |  | 06/10/21 | 0 | X |
| A-414               | ENLARGED EAST SHELL SPACE REFLECTED CEILING PLAN PART "B" |  |   | X | X |  | 06/10/21 | 0 | X |
| A-501               | ENLARGED BLDG. SECTIONS DETAILS                           |  |   | X | X |  | 06/10/21 | 0 | X |
| A-502               | ENLARGED BLDG. SECTIONS DETAILS                           |  |   | X | X |  | 06/10/21 | 0 | X |
| A-601               | DOOR & WINDOW SCHEDULE                                    |  | X | X | X |  | 06/10/21 | 0 | X |
| A-602               | WINDOW & FINISH SCHEDULES PARTITION & CEILING TYPES       |  |   | X | X |  | 06/10/21 | 0 | X |
| A-603               | INTERIOR DETAILS  |  |   |   | X |  | 06/10/21 | 0 | X |
| A-701               | INTERIOR ELEVATIONS                                       |  | X | X | X |  | 06/10/21 | 0 | X |
| A-702               | INTERIOR ELEVATIONS                                       |  | X | X | X |  | 06/10/21 | 0 | X |
| A-703               | INTERIOR ELEVATIONS                                       |  | X | X | X |  | 06/10/21 | 0 | X |
| A-704               | INTERIOR ELEVATIONS                                       |  | X | X | X |  | 06/10/21 | 0 | X |
| A-705               | INTERIOR ELEVATIONS                                       |  | X | X | X |  | 06/10/21 | 0 | X |
| A-901               | INTERIOR RENDERINGS OVERVIEW - WEST SHELL                 |  |   | X | X |  | 06/10/21 | 0 | X |
| A-902               | INTERIOR RENDERINGS OVERVIEW - EAST SHELL                 |  |   | X | X |  | 06/10/21 | 0 | X |
| A-903               | INTERIOR RENDERINGS ROOMS 3521, 3522                      |  |   | X | X |  | 06/10/21 | 0 | X |
| A-904               | INTERIOR RENDERINGS ROOMS 3525, 3526, 3530                |  |   | X | X |  | 06/10/21 | 0 | X |

| SHEET NUMBER | SHEET NAME | ISSUE TYPE AND DATE |   |   |                                    |  | LATEST DRAWING DATE | LATEST REVISION | INCLUDED IN SET |
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|              |            |                     | ISSUED FOR 60% CLIENT REVIEW - 03/22/21 | ISSUED FOR 90% CLIENT REVIEW - 04/19/21 | ISSUED FOR CONSTRUCTION - 06/10/21 |  |                     |                 |                 |

|            |                                      |  |   |   |   |   |          |   |   |
|------------|--------------------------------------|--|---|---|---|---|----------|---|---|
| A-905      | INTERIOR RENDERINGS ROOMS 3533, 3534 |  |   | X | X |   | 06/10/21 | 0 | X |
| A-906      | INTERIOR RENDERINGS ROOM 3540        |  |   | X | X |   | 06/10/21 | 0 | X |
| STRUCTURAL |                                      |  |   |   |   |   |          |   |   |
| S-001      | GENERAL NOTES                        |  |   | X | X |   | 06/10/21 | 0 | X |
| S-101      | WEST MEZZANINE FRAMING PLAN          |  | X | X | X |   | 06/10/21 | 0 | X |
| S-102      | EAST MEZZANINE FRAMING PLAN          |  | X | X | X |   | 06/10/21 | 0 | X |
| S-103      | 3RD FLOOR SLAB PLAN                  |  |   | X | X |   | 06/10/21 | 0 | X |
| S-501      | STRUCTURAL DETAILS                   |  |   | X | X |   | 06/10/21 | 0 | X |
| S-502      | ROOF PENETRATION AND SUPPORT DETAILS |  |   |   | X |   | 06/10/21 | 0 | X |
| S-503      | LADDER DETAILS                       |  |   |   | X |   | 06/10/21 | 0 | X |
| MECHANICAL |                                      |  |   |   |   |   |          |   |   |
| M-001      | HVAC & PLUMBING LEAD SHEET           |  |   | X | X |   | 06/10/21 | 0 | X |
| PLUMBING   |                                      |  |   |   |   |   |          |   |   |
| PL-001     | SPECIFICATIONS                       |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-101     | THIRD FLOOR WATER PIPING (WEST)      |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-102     | THIRD FLOOR WATER PIPING (EAST)      |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-103     | THIRD FLOOR LAB WASTE & VENT (WEST)  |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-104     | THIRD FLOOR LAB WASTE & VENT (EAST)  |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-105     | SECOND FLOOR LAB WASTE & VENT        |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-106     | THIRD FLOOR GAS PIPING (WEST)        |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-107     | THIRD FLOOR WATER PIPING (EAST)      |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-501     | DETAILS                              |  |   | X | X |   | 06/10/21 | 0 | X |
| PL-601     | SCHEDULES                            |  |   | X | X |   | 06/10/21 | 0 | X |
| HVAC       |                                      |  |   |   |   |   |          |   |   |
| H-001.     | LEAD SHEET (DISCONTINUED)            |  |   | X |   |   | 03/22/21 | A |   |
| H-001      | SPECIFICATIONS                       |  |   | X | X |   | 06/10/21 | 0 | X |
| H-002      | SPECIFICATIONS                       |  |   | X | X |   | 06/10/21 | 0 | X |
| H-003      | SPECIFICATIONS                       |  |   | X | X |   | 06/10/21 | 0 | X |
| H-004      | SPECIFICATIONS                       |  |   | X | X |   | 06/10/21 | 0 | X |
| H-101      | ZONE PLAN WEST                       |  |   | X | X | X | 06/10/21 | 0 | X |
| H-102      | ZONE PLAN EAST                       |  |   | X | X | X | 06/10/21 | 0 | X |
| H-103      | HVAC PLAN WEST                       |  |   | X | X | X | 06/10/21 | 0 | X |
| H-103.1    | HVAC HYDRONIC PLAN WEST              |  |   | X | X | X | 06/10/21 | 0 | X |
| H-104      | HVAC PLAN EAST                       |  |   | X | X | X | 06/10/21 | 0 | X |
| H-104.1    | HVAC HYDRONIC PLAN EAST              |  |   | X | X | X | 06/10/21 | 0 | X |
| H-105      | HVAC ROOF PLAN                       |  |   | X | X | X | 06/10/21 | 0 | X |
| H-501      | HVAC SCHEDULES                       |  |   | X | X | X | 06/10/21 | 0 | X |
| H-601      | AIRFLOW DIAGRAMS                     |  |   | X | X | X | 06/10/21 | 0 | X |
| H-602      | AIRFLOW DIAGRAM                      |  |   | X | X | X | 06/10/21 | 0 | X |
| H-603      | AIRFLOW DIAGRAM                      |  |   | X | X | X | 06/10/21 | 0 | X |
| H-604      | HVAC CONTROL DIAGRAMS                |  |   | X | X | X | 06/10/21 | 0 | X |
| H-605      | HVAC CONTROL DIAGRAMS                |  |   | X | X | X | 06/10/21 | 0 | X |
| H-701      | HVAC DETAILS                         |  |   | X | X |   | 06/10/21 | 0 | X |

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|                 |   |  |  |   |   |   |          |   |   |
|-----------------|---|--|--|---|---|---|----------|---|---|
| H-702           | HVAC DETAILS                                    |  |  | X | X |   | 06/10/21 | 0 | X |
| H-703           | HVAC DETAILS                                    |  |  | X | X |   | 06/10/21 | 0 | X |
| FIRE PROTECTION |   |  |  |   |   |   |          |   |   |
| FP-101          | FIRE PROTECTION PLAN WEST                       |  |  | X | X |   | 06/10/21 | 0 | X |
| FP-102          | FIRE PROTECTION PLAN EAST                       |  |  | X | X |   | 06/10/21 | 0 | X |
| ELECTRICAL      |   |  |  |   |   |   |          |   |   |
| E-001           | LEAD SHEET                                      |  |  | X | X | X | 06/10/21 | 0 | X |
| E-101           | LEVEL 3 WEST PART PLAN 120 VAC POWER LAYOUT     |  |  | X | X | X | 06/10/21 | 0 | X |
| E-101.1         | LEVEL 3 WEST PART PLAN HVAC POWER LAYOUT        |  |  | X | X | X | 06/10/21 | 0 | X |
| E-101.2         | ENLARGED WEST SHELL SPACE 120 VAC POWER LAYOUT  |  |  | X | X |   | 06/10/21 | 0 | X |
| E-102           | LEVEL 3 EAST PART PLAN 120 VAC POWER LAYOUT     |  |  | X | X | X | 06/10/21 | 0 | X |
| E-102.1         | LEVEL 3 EAST PART PLAN HVAC POWER LAYOUT        |  |  | X | X | X | 06/10/21 | 0 | X |
| E-102.2         | ENLARGED EAST SHELL SPACE 120 VAC POWER LAYOUT  |  |  | X | X |   | 06/10/21 | 0 | X |
| E-103           | LEVEL 3 PART PLAN CONDUIT LAYOUT                |  |  | X | X |   | 06/10/21 | 0 | X |
| E-104           | LEVEL 3 WEST PART PLAN LIGHTING LAYOUT          |  |  | X | X |   | 06/10/21 | 0 | X |
| E-105           | LEVEL 3 EAST PART PLAN LIGHTING LAYOUT          |  |  | X | X |   | 06/10/21 | 0 | X |
| E-106           | LEVEL 3 WEST PART PLAN DATA AND SPECIAL SYSTEMS |  |  | X | X |   | 06/10/21 | 0 | X |
| E-107           | LEVEL 3 EAST PART PLAN DATA AND SPECIAL SYSTEMS |  |  | X | X |   | 06/10/21 | 0 | X |
| E-108           | LEVEL 3 WEST PART PLAN FIRE ALARM               |  |  | X | X |   | 06/10/21 | 0 | X |
| E-109           | LEVEL 3 EAST PART PLAN FIRE ALARM               |  |  | X | X |   | 06/10/21 | 0 | X |
| E-110           | LEVEL 3 WEST PART PLAN SECURITY LAYOUT          |  |  |   | X |   | 06/10/21 | 0 | X |
| E-111           | LEVEL 3 WEST PART PLAN SECURITY LAYOUT          |  |  |   | X |   | 06/10/21 | 0 | X |
| E-112           | SECOND FLOOR PART PLAN 120 VAC POWER LAYOUT     |  |  |   | X |   | 06/10/21 | 0 | X |
| E-120           | ROOF WEST PART PLAN HVAC POWER LAYOUT           |  |  |   | X | X | 06/10/21 | 0 | X |
| E-121           | ROOF EAST PART PLAN HVAC POWER LAYOUT           |  |  |   | X | X | 06/10/21 | 0 | X |
| E-122           | BUILDING SECTIONS 120 VAC POWER WEST LAYOUT     |  |  |   | X | X | 06/10/21 | 0 | X |
| E-123           | BUILDING SECTIONS 120 VAC POWER EAST LAYOUT     |  |  |   |   | X | 06/10/21 | 0 | X |
| E-501           | ONE LINE DIAGRAM NORMAL POWER - DP-31           |  |  | X | X | X | 06/10/21 | 0 | X |
| E-502           | ONE LINE DIAGRAM NORMAL POWER - DP-32           |  |  | X | X | X | 06/10/21 | 0 | X |
| E-503           | ONE LINE DIAGRAM NORMAL POWER - DP-33           |  |  | X | X | X | 06/10/21 | 0 | X |
| E-504           | ONE LINE DIAGRAM STANDBY POWER SDP1             |  |  | X | X | X | 06/10/21 | 0 | X |
| E-505           | ONE LINE DIAGRAM UPS POWER UDP31                |  |  | X | X | X | 06/10/21 | 0 | X |
| E-506           | PANELS SCHEDULES 480 / 277 VAC                  |  |  |   | X | X | 06/10/21 | 0 | X |
| E-506.1         | PANELS SCHEDULES 480 / 277 VAC CONT.            |  |  |   | X | X | 06/10/21 | 0 | X |
| E-507           | PANELS SCHEDULES 208 / 120 VAC                  |  |  |   | X | X | 06/10/21 | 0 | X |
| E-508           | PANELS SCHEDULES 208 / 120 VAC CONT.            |  |  |   | X | X | 06/10/21 | 0 | X |
| E-509           | PANELS SCHEDULES 277 VAC                        |  |  |   | X | X | 06/10/21 | 0 | X |
| E-510           | DETAILS AND 3D VEIWS                            |  |  |   | X | X | 06/10/21 | 0 | X |



HART DESIGN GROUP

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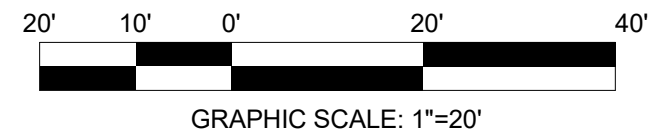
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



1 OVERALL THIRD FLOOR GENERAL ARRANGEMENT PLAN  
1" = 20'-0"



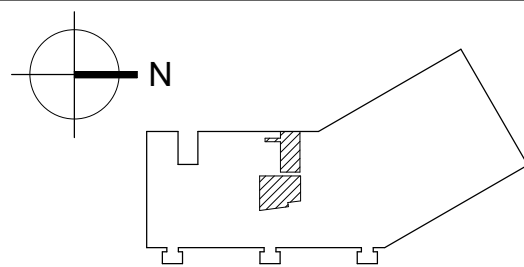
GRAPHIC SCALE: 1"=20'

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100 RESULTS WAY  
MARLBOROUGH, MA 01752

GENERAL NOTE:  
ALL CONTRACTED PARTIES ARE  
REQUIRED TO REVIEW ALL  
CONTRACT DOCUMENTS,  
INCLUDING CONTRACT  
DRAWINGS AND/OR PROJECT  
SPECIFICATIONS. FOR ALL  
DISCIPLINES TO ASCERTAIN THE  
COMPLETE SCOPE OF WORK FOR  
THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



CLD & CCM LABS  
GENERAL ARRANGEMENT  
OVERALL THIRD FLOOR PLAN

PROJ. NO: 20021A CAD FILE:

ISSUE DATE:  
SCALE: 1" = 20'-0"  
SHEET NUMBER  
**GA-100**



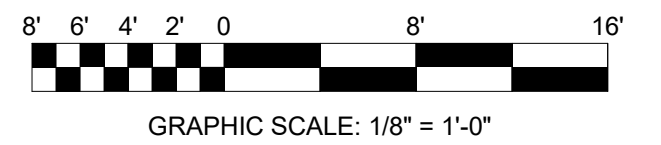
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0

BAR IS ONE INCH ON ORIGINAL DRAWING



1 PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"

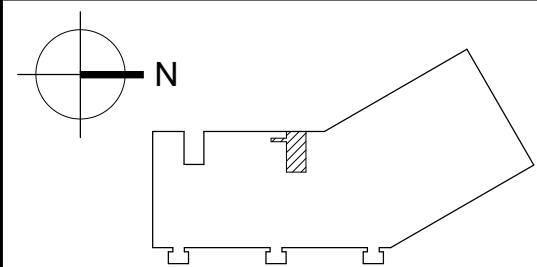


GRAPHIC SCALE: 1/8" = 1'-0"

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



CLD & CCM LABS  
GENERAL ARRANGEMENT  
PARTIAL THIRD FLOOR PLAN  
WEST SHELL SPACE

PROJ. NO: 20021A CAD FILE:

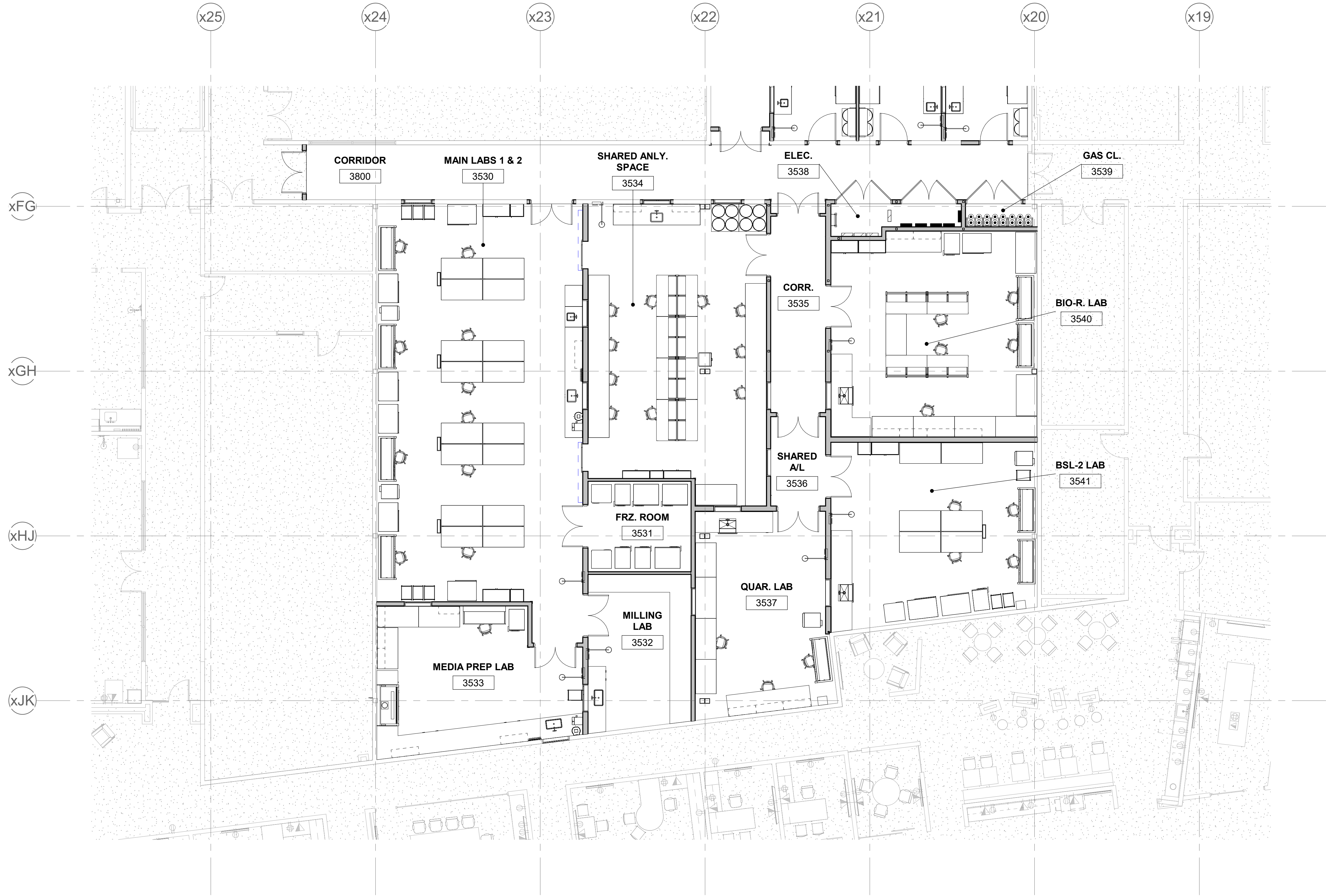
ISSUE DATE:  
SCALE: 1/8" = 1'-0"  
SHEET NUMBER  
**GA-101**



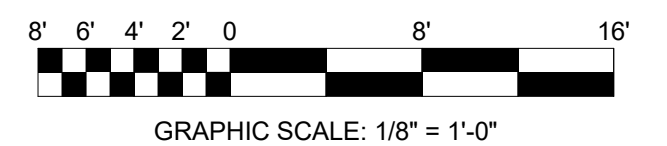
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING

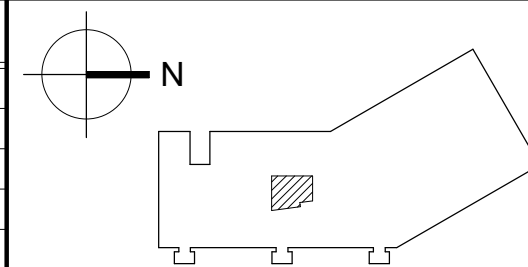


① PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"



GRAPHIC SCALE: 1/8" = 1'-0"

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |






IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 2' 4' 8'

BAR IS ONE INCH ON ORIGINAL DRAWING



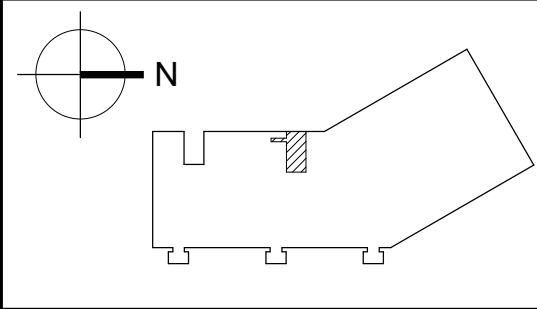
**HART DESIGN GROUP**  
800 SCENIC VIEW DRIVE | T: (401) 658-4600  
CUMBERLAND, RI 02864 | F: (401) 658-4609  
A MEMBER OF THE HART COMPANIES WWW.HARTCOMPANIES.COM



**cytiva**  
100 RESULTS WAY  
MARLBOROUGH, MA 01752

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THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

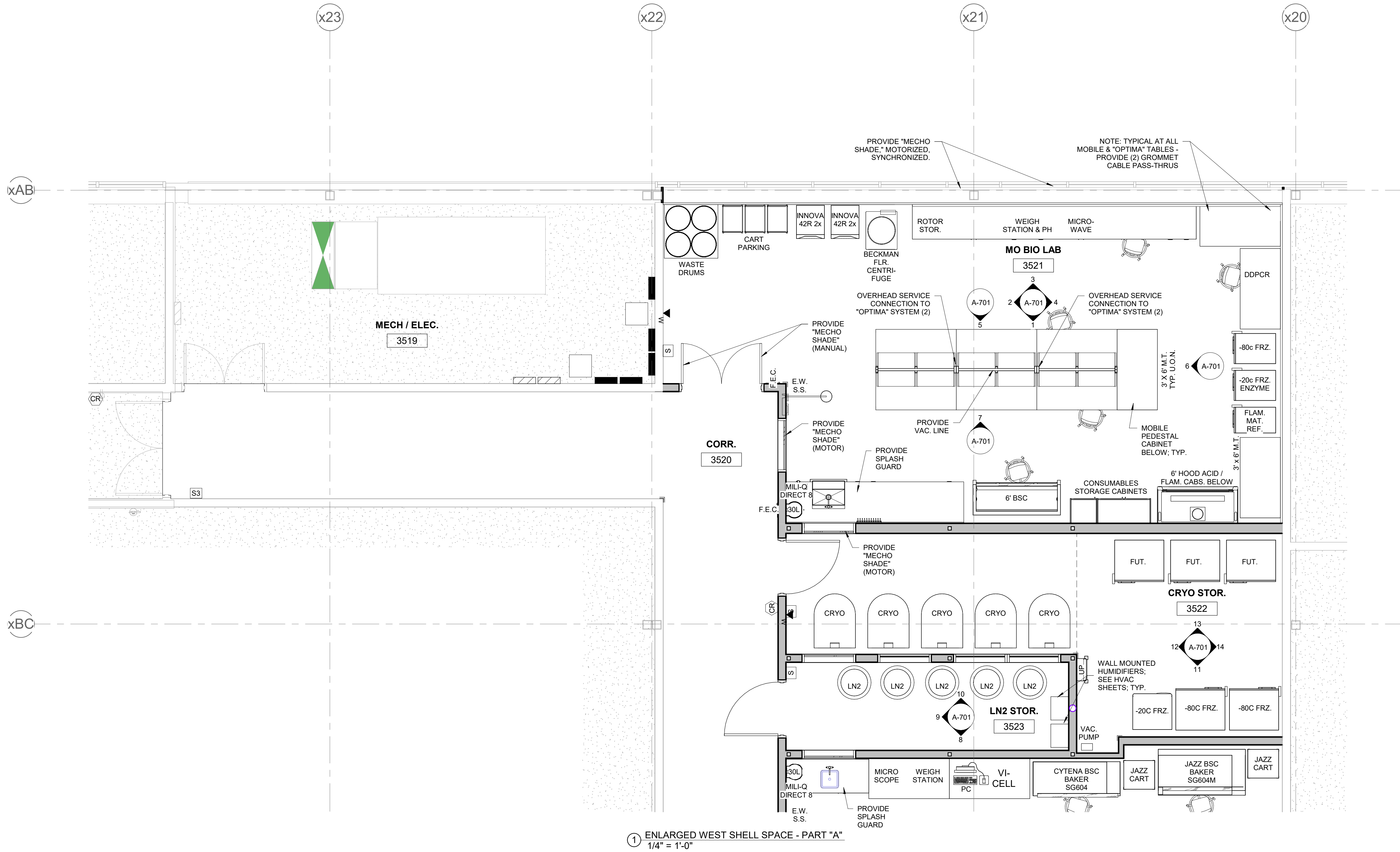


**CLD & CCM LABS**  
**GENERAL ARRANGEMENT**  
**ENLARGED WEST SHELL SPACE**  
**PART "A"**

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE:  
SCALE: 1/4" = 1'-0"

SHEET NUMBER  
**GA-401**




1 ENLARGED WEST SHELL SPACE - PART "A"  
1/4" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0' 1" 0'



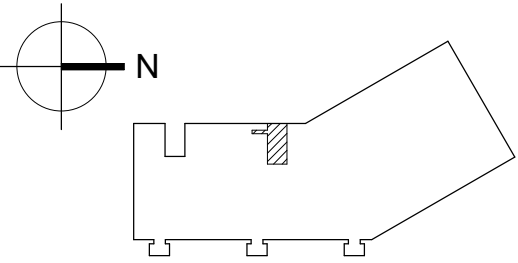
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| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
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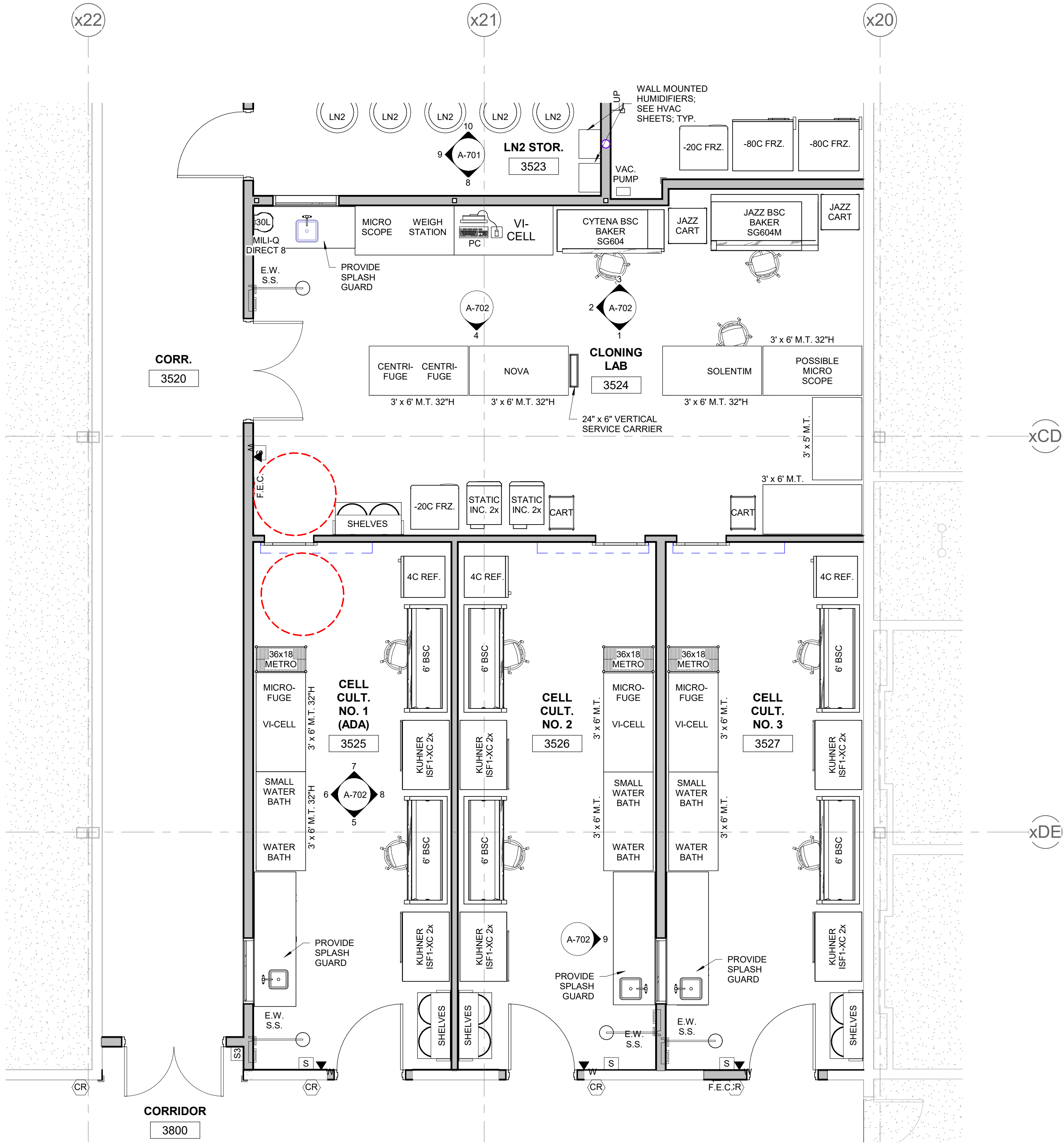
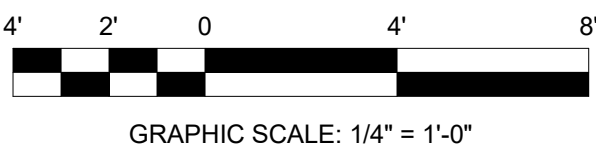


CLD & CCM LABS  
GENERAL ARRANGEMENT  
ENLARGED WEST SHELL SPACE  
PART "B"

PROJ. NO: 20021A CAD FILE:

ISSUE DATE:  
SCALE: 1/4" = 1'-0"  
SHEET NUMBER  
GA-402

1 ENLARGED WEST SHELL SPACE - PART "B"  
1/4" = 1'-0"



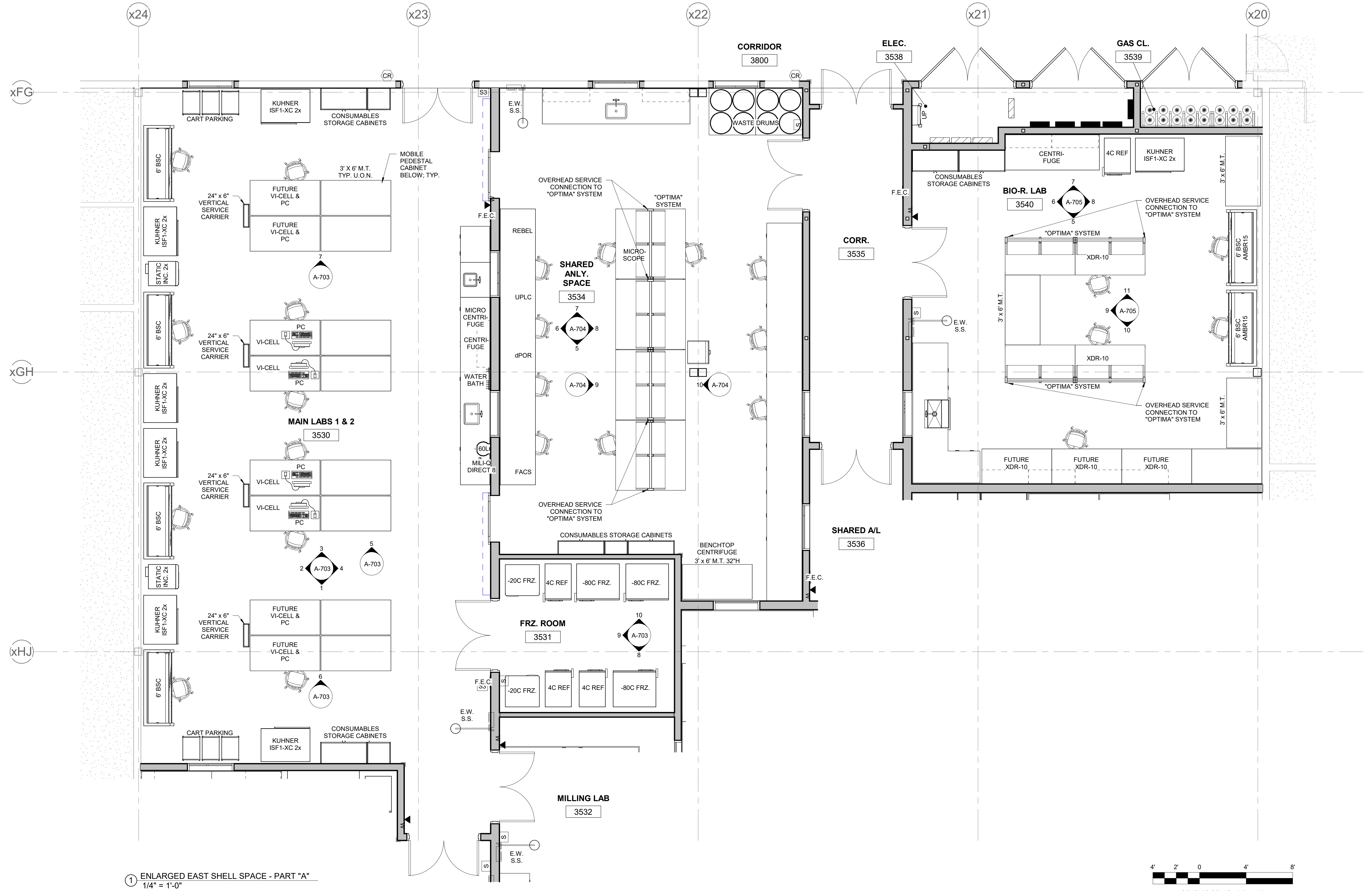
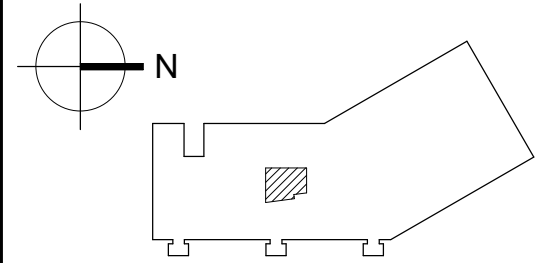


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1" = 1'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING

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| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |






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0' 1' 2' 4' 8'

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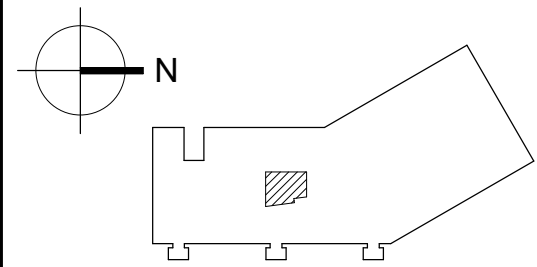
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| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



CLD & CCM LABS  
**GENERAL ARRANGEMENT**  
ENLARGED EAST SHELL SPACE  
PART "B"

PROJ. NO: 20021A

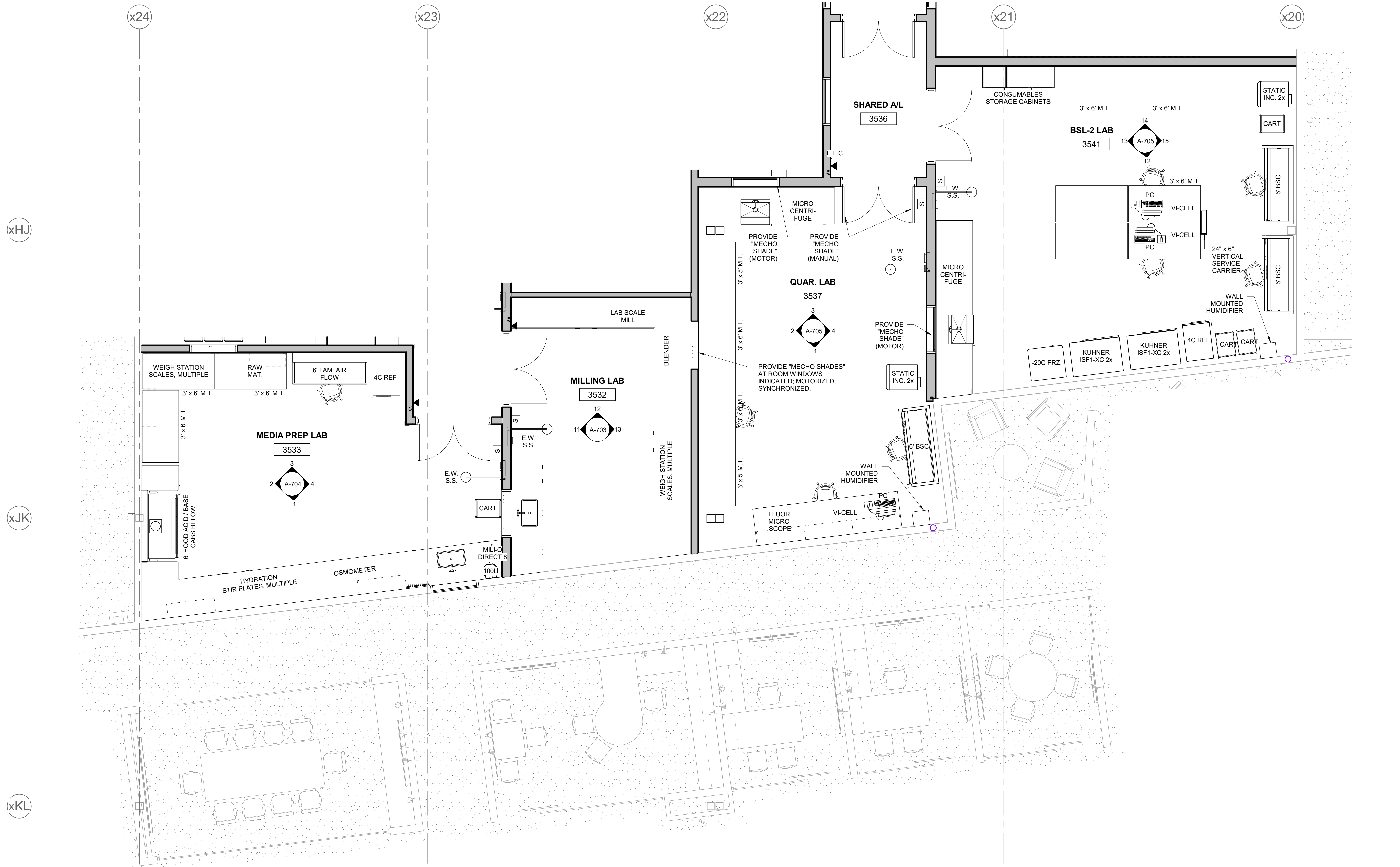
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ISSUE DATE:

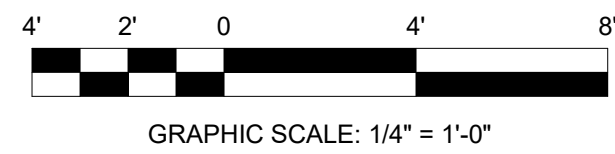
SCALE: 1/4" = 1'-0"

SHEET NUMBER

**GA-404**



1 ENLARGED EAST SHELL SPACE - PART "B"  
1/4" = 1'-0"





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STANDARD ABBREVIATIONS

|        |                                   |        |   |
|--------|-----------------------------------|--------|---|
| ABAN   | ABANDON, ABANDONED                | MR     | MOISTURE RESISTANT                      |
| ABV    | ABOVE                             | MTD    | MOUNTED                                 |
| ACP    | ACOUSTICAL CEILING PANEL          | MTL    | METAL                                   |
| ACT    | ACOUSTICAL CEILING TILE           | MWP    | METAL WALL PANEL                        |
| ADH    | ADHESIVE                          |        |   |
| ADJ    | ADJUST                            | N/A    | NOT APPLICABLE                          |
| AFF    | ABOVE FINISHED FLOOR              | NIC    | NOT IN CONTRACT                         |
| AIA    | AMERICAN INSTITUTE OF ARCHITECTS  | NO     | NUMBER                                  |
| ALT    | ALTERNATE                         | NOM    | NOMINAL                                 |
| ANSI   | AMERICAN NATIONAL STANDARDS INST. | NTS    | NOT TO SCALE                            |
| APPROX | APPROXIMATE                       |        |   |
| ARCH   | ARCHITECT, ARCHITECTURAL          | OA     | OVERALL                                 |
|        |                                   | OAE    | OR APPROVED EQUAL                       |
| BLDG   | BUILDING                          | OC     | ON CENTER                               |
| BOF    | BOTTOM OF FOOTING                 | OD     | OUTSIDE DIAMETER                        |
| BOS    | BOTTOM OF STEEL                   | OH     | OVERHEAD                                |
| BOT    | BOTTOM                            | OPP    | OPPOSITE                                |
|        |                                   | P&R    | PATCH AND REPAIR                        |
| CAB    | CABINET, CABINETRY                | PEN    | PENETRATION,PENETRATIONS                |
| CG     | CORNER GUARD                      | PERIM  | PERIMETER                               |
| CJ     | CONSTRUCTION JOINT                | PL     | PLATE PROPERTY LINE                     |
| CL     | CENTER LINE, CLEAR, CLEARANCE     | PLAS   | PLASTIC                                 |
| CLG    | CEILING                           | PLUMB  | PLUMBING                                |
| CLR    | CLEAR,CLEARANCE                   | PLYWD  | PLYWOOD                                 |
| CM     | CENTIMETER                        | PSF    | POUNDS PER SQUARE FOOT                  |
| CMU    | CONCRETE MASONRY UNIT             | PSI    | POUNDS PER SQUARE INCH                  |
| COL    | COLUMN                            | PT     | PRESSURE TREATED                        |
| CONC   | CONCRETE                          | PTD    | PAINT, PAINTED                          |
| CORR   | CORRIDOR                          | PVC    | PVC WALL/CEILING PANELS                 |
| CPT    | CARPET                            |        |   |
| CRCS   | CLEAN ROOM CEILING SYSTEM         | RR&D   | REMOVE, RECYCLE AND/OR PROPERLY DISPOSE |
| CRCT   | CLEAN ROOM CEILING TILE           | R&R    | REMOVE & RESET, REMOVE & REINSTALL      |
| CRWJ   | CLEAN ROOM WALL LINER             | R&S    | REMOVE & SALVAGE                        |
| CRWP   | CLEAN ROOM WALL PANEL             | RC     | RESINOUS COVE BASE                      |
| CT     | CERAMIC TILE                      | RCB    | RUBBER COVE BASE                        |
|        |                                   | RCP    | REFLECTED CEILING PLAN                  |
| D/B    | DESIGN/ BUILD(ER)                 | RD     | ROOF DRAIN                              |
| DEMO   | DEMOLISH(ED)                      | RECP   | RECEPTACLE                              |
| DIA    | DIAMETER                          | REF    | REFERENCE                               |
| DIM    | DIMENSION                         | REINF  | REINFORCE, REINFORCING                  |
| DN     | DOWN                              | REQ    | REQUIRED                                |
| DR     | DRAIN                             | RESIL  | RESILENT                                |
| DWG    | DRAWING                           | REV    | REVISED, REVISION                       |
|        |                                   | RFS    | RESINOUS FLOORING SYSTEM                |
| EA     | EACH                              | RH     | RIGHT HAND                              |
| EJ     | EXPANSION JOINT                   | RL     | RAIN LEADER                             |
| ELEC   | ELECTRIC, ELECTRICAL              | RM     | ROOM                                    |
| ELEV   | ELEVATION                         | RO     | ROUGH OPENING                           |
| EPS    | EXTERIOR PAINTING SYSTEM          | RT     | RUBBER TILE                             |
| EQ     | EQUAL                             | RTU    | ROOFTOP UNIT                            |
| EQUIP  | EQUIPMENT                         |        |   |
| ERCP   | ENVIRONMENTAL ROOM CEILING PANEL  | SCHED  | SCHEDULE, SCHEDULED                     |
| ERWP   | ENVIRONMENTAL ROOM WALL PANEL     | SD     | STORM DRAIN                             |
| EXIST  | EXISTING                          | SEAL   | CONCRETE SEALER                         |
| EXP    | EXPOSED                           | SECT   | SECTION                                 |
|        |                                   | SF     | SQUARE FOOT, SQUARE FEET                |
| FDN    | FOUNDATION                        | SIM    | SIMILAR                                 |
| FDR    | FLOOR DRAIN                       | SLNT   | SEALANT                                 |
| FEC    | FIRE EXTINGUISHER CABINET         | SPEC   | SPECIFICATION                           |
| FIN    | FINISHED                          | SQ     | SQUARE                                  |
| FL     | FLOOR                             | SS     | STAINLESS STEEL                         |
| FM     | FM GLOBAL                         | STD    | STANDARD                                |
| F.O.   | FACE OF                           | STIFF  | STIFFENER                               |
| FOS    | FACE OF STUD                      | STL    | STEEL                                   |
| FRP    | FIBERGLASS REINFORCED PLASTIC     | STOR   | STORAGE                                 |
| FT     | FOOT, FEET                        | STRUCT | STRUCTURAL, STRUCTURE                   |
| FTG    | FOOTING                           | SUP    | SUPPLY                                  |
|        |                                   | SUSP   | SUSPENDED                               |
| GA     | GAUGE                             | SYMM   | SYMMETRICAL                             |
| GAL    | GALLON                            |        |   |
| GALV   | GALVANIZED                        | T      | TREADS                                  |
| GC     | GENERAL CONTRACTOR                | T&B    | TOP AND BOTTOM                          |
| GLAZ   | GLAZING SYSTEM                    | T&G    | TONGUE AND GROOVE                       |
| GRND   | GROUND                            | TEL    | TELEPHONE                               |
| GWB    | GYPSUM WALL BOARD                 | TEMP   | TEMPORARY                               |
|        |                                   | THK    | THICK, THICKNESS                        |
| HC     | HANDICAP, HANDICAPPED             | TOC    | TOP OF CONCRETE                         |
| HDR    | HARDWOOD                          | TOF    | TOP OF FOUNDATION                       |
| HDWR   | HARDWARE                          | TOS    | TOP OF STEEL                            |
| HM     | HOLLOW METAL                      | TOW    | TOP OF WALL                             |
| HOR    | HORIZONTAL                        | TYP    | TYPICAL                                 |
| HP     | HIGH POINT                        |        |   |
| HGT    | HEIGHT                            | U/G    | UNDERGROUND                             |
|        |                                   | UC     | UNDERCUT                                |
| ICB    | INTEGRAL COVE BASE                | UL     | UNDERWRITER'S LABORATORIES              |
| ID     | INSIDE DIAMETER                   | UNFIN  | UNFINISHED                              |
| IF     | INSIDE FACE                       | UON    | UNLESS OTHERWISE NOTED                  |
| IN     | INCH                              |        |   |
| INSUL  | INSULATION                        | VB     | VAPOR BARRIER                           |
| INT    | INTERIOR                          | VCB    | VINYL COVE BASE                         |
| IPS    | INTERIOR PAINTING SYSTEM          | VCT    | VINYL COMPOSITE TILE                    |
|        |                                   | VERT   | VERTICAL                                |
| L      | LENGTH                            | VIF    | VERIFY IN FIELD                         |
| LAB    | LABORATORY                        | VSF    | VINYL SHEET FLOORING                    |
| LAM    | LAMINATE, LAMINATED               | VTR    | VENT THROUGH ROOF                       |
| LAV    | LAVATORY                          |        |   |
| LH     | LEFT HAND                         | W      | WIDE, WIDTH                             |
| LOC    | LOCATION                          | W/     | WITH                                    |
| LP     | LOW POINT                         | W/A    | WHERE APPLICABLE                        |
| LxW    | LENGTH x WIDTH                    | W/O    | WITHOUT                                 |
|        |                                   | WD     | WOOD                                    |
| M      | METERS                            | WIP    | WORK-IN-PROGRESS                        |
| MAT    | MATERIAL                          | WP     | WORKING POINT                           |
| MAX    | MAXIMUM                           | WPF    | WEATHERPROOF                            |
| MECH   | MECHANICAL                        | WGT    | WEIGHT                                  |
| MFR    | MANUFACTURER                      |        |   |
| MM     | MILLIMETER                        |        |   |
| MO     | MASONRY OPENING                   |        |   |

PLAN SYMBOLS

|                  |                                 |  |  |
|------------------|---------------------------------|--|--|
| <b>Room Name</b> | ROOM IDENTIFIER                 |  | MULTIPLE VIEW INTERIOR ELEVATION INDICATOR |
|                  | COLUMN LINE REFERENCE           |  | ELEVATION DESIGNATION                      |
|                  | DOOR SYMBOL                     |  | WINDOW SYMBOL                              |
|                  | WINDOW SYMBOL                   |  | PARTITION TYPE SYMBOL                      |
|                  | FIXTURE / ACCESSORY DESIGNATION |  | SECTION INDICATOR                          |

REFLECTED CEILING PLAN LEGEND

NOTE: REFER TO ELECTRICAL PLANS FOR SPECIFIC FISTURE INFORMATION. LETTERS INCLUDED WITH FIXTURE SYMBOL INDICATE EXISTING FIXTURE TO REMAIN, EXIST. FIXTURE TO BE RELOCATED, OR NEW FIXTURE TYPE.

|   |   |  |                                  |
|---|---|--|----------------------------------|
| E | EXISTING FIXTURE TO REMAIN                  |  | RECESSED DOWNLIGHT               |
| R | EXISTING FIXTURE TO BE RELOCATED            |  | CEILING MOUNTED POWER RECEPTACLE |
| D | EXISTING FIXTURE TO BE DEMOLISHED / REMOVED |  | EXIT SIGN (SHADING MAY VARY)     |
|   | 2' x 4' TROFFER FIXTURE                     |  | 2' x 4' TROFFER FIXTURE          |

NOTE: REFER TO HVAC AND FIRE PROTECTION PLANS FOR ADDITIONAL INFORMATION ON THE BELOW OBJECTS.

|  |                |  |                 |
|--|----------------|--|-----------------|
|  | HEPA FILTER    |  | AIR DUCT SUPPLY |
|  | SPRINKLER HEAD |  | AIR DUCT RETURN |

LINETYPE LEGEND

|  |                  |  |                      |
|--|------------------|--|----------------------|
|  | EXISTING WALLS   |  | EXISTING TO REMAIN   |
|  | DEMOLISHED WALLS |  | DEMOLISHED / REMOVED |
|  | NEW WALLS        |  | NEW                  |

PROJECT SUMMARY

**CYTIVA**  
**PROJECT INDIGO**  
**100 RESULTS WAY**  
**MARLBOROUGH, MA. 01752**

THIS PROJECT PROPOSES TO CREATE FOURTEEN (14) NEW LABS WITH ASSOCIATED UTILITIES FOR CYTIVA CELL LINE DEVELOPMENT AND CELL CULTURE MEDIA SERVICE GROUPS ON THE THIRD FLOOR OF THE EXISTING STRCUTURE. IN ADDITION, IT WILL PROVIDE SUPPORT AND WORK AREAS FOR THOSE LAB TECHNICIANS. THERE IS NO ADDITIONAL BUILDING AREA OR ADJUSTMENT TO THE BUILDING'S HEIGHT NECESSARY TO ACCOMODATE THE WORK.

PROJECT SCOPE INCLUDES THE LIMITED DEMOLITION OF EXISTING WALL PARTITIONS, AS WELL AS ANY ELECTRICAL, PLUMBING, AND MECHANICAL ITEMS INDICATED. THE RECONFIGURED SPACE WILL INCORPORATE NEW WALL PARTITIONS, SHEET & RESINOUS FLOORING SYSTEMS WITH INTEGRAL COVE BASE, ACOUSTICAL & CLEAN ROOM-TYPE CEILING SYSTEMS, NEW LIGHTING FIXTURES & ELECTRICAL DEVICES, NEW LAB PLUMBING FIXTURES, NEW HVAC MODIFICATIONS, AS WELL AS A NEW CRYO STORAGE AND SHARED ANALYTICAL SPACE. WORKSTATIONS ARE TO BE PROVIDED WITHIN THE BUILDING BY ASSIGNING AVAILABLE EXISTING WORKSTATIONS.

PROPOSED MODIFICATIONS HAVE BEEN DESIGNED FOR COMPLIANCE WITH PROVISIONS OF THE FOLLOWING CODES AND REGULATIONS:

- NINTH EDITION, THE MASSACHUSETTS STATE BUILDING CODE [MSBC, 780 CMR], (2015 EDITION, THE INTERNATIONAL BUILDING CODE WITH MA. AMENDMENTS).
- 2015 EDITION, THE INTERNATIONAL EXISTING BUILDING CODE [IEBC].
- 2015 EDITION, THE INTERNATIONAL MECHANICAL CODE [IMC].
- 2015 EDITION, THE INTERNATIONAL PLUMBING CODE [IPC].
- 2018 EDITION, THE INTERNATIONAL ENERGY CONSERVATION CODE [IECC].
- THE MASSACHUSETTS STATE FIRE CODE, [MSFC, 527 CMR], BOARD OF FIRE REGULATIONS (2015 EDITION, NFPA 1 WITH MA. AMENDMENTS).
- 2020 EDITION, NFPA 70, NATIONAL ELECTRICAL CODE [NEC].

|                               |  |
|-------------------------------|--|
| PROJECT:                      | CYTIVA - PROJECT INDIGO.   |
| JURISDICTION:                 | TOWN OF MARLBOROUGH, MA.   |
| USE GROUP:                    | EXISTING MIXED USE & OCCUPANCY [B BUSINESS, S1 MODERATE HAZARD, STORAGE, AND H2 HIGH HAZARD]. (MSBC, SECTION 508)<br>A3 ASSEMBLY OCCUPANCIES ARE ALSO PROVIDED FOR USE AS BREAK ROOMS (ACCESSORY USE). |
| CONSTRUCTION TYPE:            | TYPE IIB WITH FULLY AUTOMATIC SPRINKLER SYSTEM. (MSBC, SECTION 602)  |
| HEIGHT & AREA:                | APPROX. 103,300 SF. EXISTING THREE (3) STORY SPRINKLERED BUILDING WITH EXISTING SEPARATED H2 HIGH HAZARD OCCUPANCY. (MSBC TABLE 504.4, TABLE 506.2).   |
| EXIT ACCESS TRAVEL DISTANCE:  | B BUSINESS OCCUPANCY, 300-FEET WITH SPRINKLER SYSTEM. (MSBC, TABLE 1017.2).  |
| COMMON PATH OF EGRESS TRAVEL: | B BUSINESS OCCUPANCY, 100-FEET WITH SPRINKLER SYSTEM. (MSBC TABLE 1006.2.1).   |

LAYOUTS PROVIDED HAVE ALSO BEEN DEVELOPED TO COMPLY WITH THE PERTINENT REQUIREMENTS OF THE 2015 EDITION, INTERNATIONAL EXISTING BUILDING CODE [IEBC] ACCORDINGLY AS FOLLOWS:

- IEBC, SECTION 301 ADMINISTRATION – RECONFIGURATION OF EXISTING SPACE WOULD INCORPORATE THE WORK AREA COMPLIANCE METHOD APPLICABLE REQUIREMENTS (2015 EDITION, CHAPTERS 5 THRU 13).
- IEBC, SECTION 504 ALTERATION LEVEL 2 – CYTIVA'S “PROJECT INDIGO” WOULD BE A RECONFIGURATION OF EXISTING SPACE, LESS THAN 50 PERCENT FLOOR AREA.

GENERAL NOTES - CYTIVA RESULTS WAY

- D/B OR GC SHALL ERECT TEMPORARY ZIP-POLE FIRE RESISTANT BARRIERS TO ISOLATE ALL WORK AREAS FROM ONGOING CYTIVA RESULTS WAY OPERATIONS INCLUDING WAREHOUSING, MANUFACTURING, ADMIN., AND LAB AREAS TO CONTROL DUST TO THE GREATEST EXTENT POSSIBLE.
- D/B OR GC SHALL CO-ORDINATE WITH ELEC., MECH., AND SECURITY SUB-CONTRACTORS ON THE SAFE “LOCK-OUT / TAG-OUT” OF ENERGIZED SYSTEMS PRIOR TO ANY INSTALLATION OF NEW WORK.
- D/B OR GC SHALL COORDINATE ALL REMOVAL, RELOCATION, REPLACEMENT, RE-USE, SHUT-OFF, STUB-OFF, CAPPING-OFF, OR UPGRADES TO ANY EXISTING PLUMB, HVAC, F/A, SECURITY AND ELEC SYSTEMS, EQUIP. AND OTHER APPURTENANCES AS OCCUR. THIS WORK SHALL INCLUDE GRAVITY VENTS, UTILITY LINES, DUCTWORK, CONNECTORS, SINKS, ELEC. DEVICES, AND CONDUIT AS REQUIRED, SCHEDULED, OR SPECIFIED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES, AS WELL AS OTHER PERTINENT REGULATIONS.
- ANY EXISTING ARCHITECTURAL FINISHES INCLUDING PARTITIONS, CEILING, AND FLOORING MATERIALS OR SYSTEMS SCHEDULED TO REMAIN WHICH INCUR DAMAGE DURING THE INSTALLATION OF NEW WORK ARE TO BE PATCHED, REPAIRED, AND/OR REPLACED TO MATCH ADJACENT CONSTRUCTION.
- ALL CONSTRUCTION DEBRIS WHICH RESULTS FROM THE INSTALLATION OF NEW WORK IS TO BE SEPARATED OR RECYCLED TO GREATEST EXTENT POSSIBLE.

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

|       |       |      |          |                              |      |      |       |
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|       |       | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KM   | DC   |       |
| CHK:  | DC    | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| APVD: |       |      |          |                              |      |      |       |

ISSUE DATE:

SCALE: 12" = 1'-0"

SHEET NUMBER

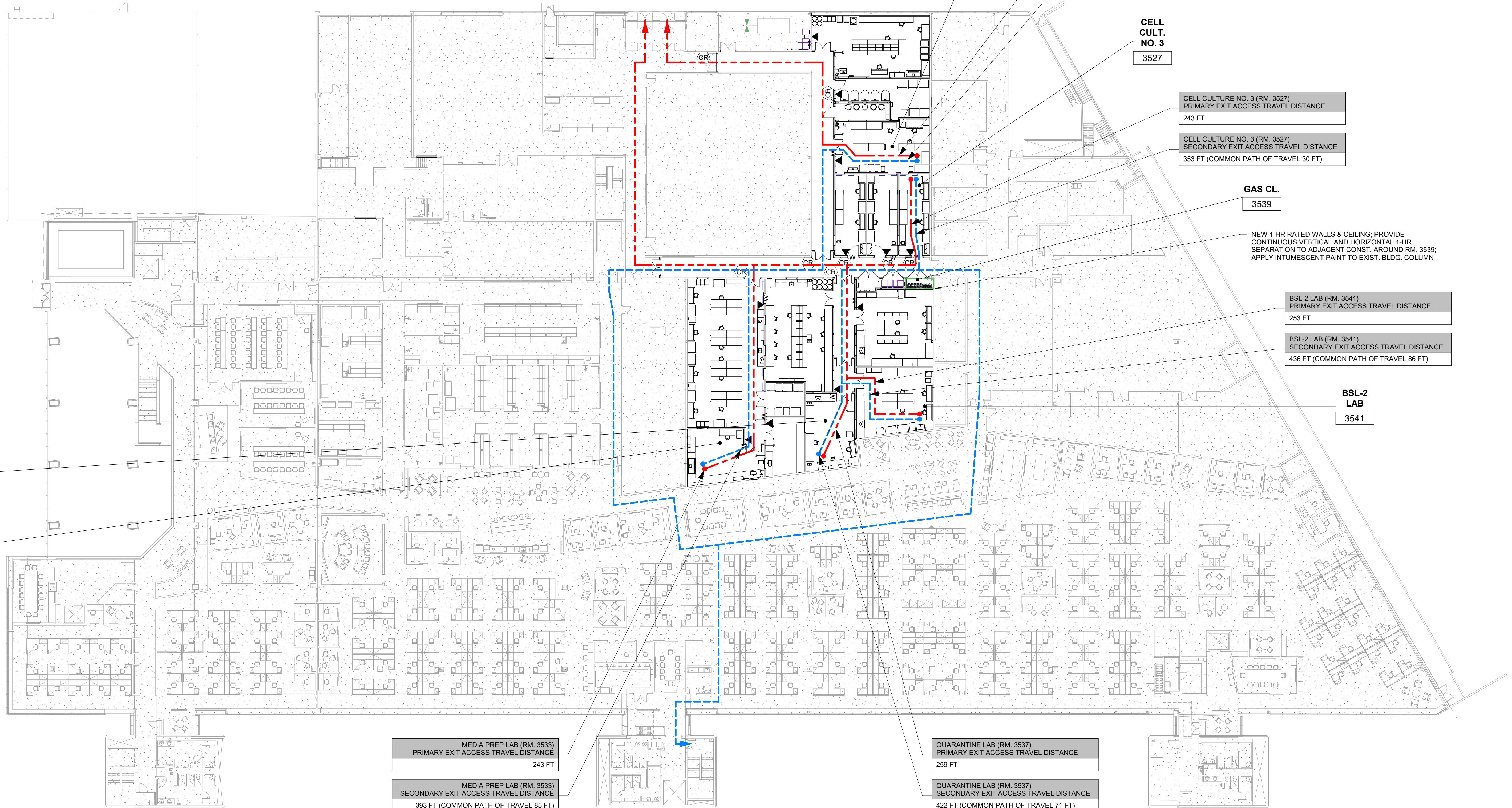
A-001



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

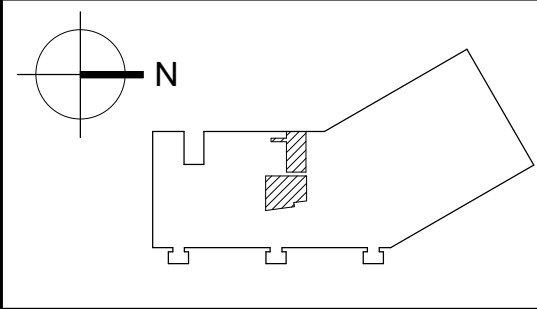
1" = 20'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING

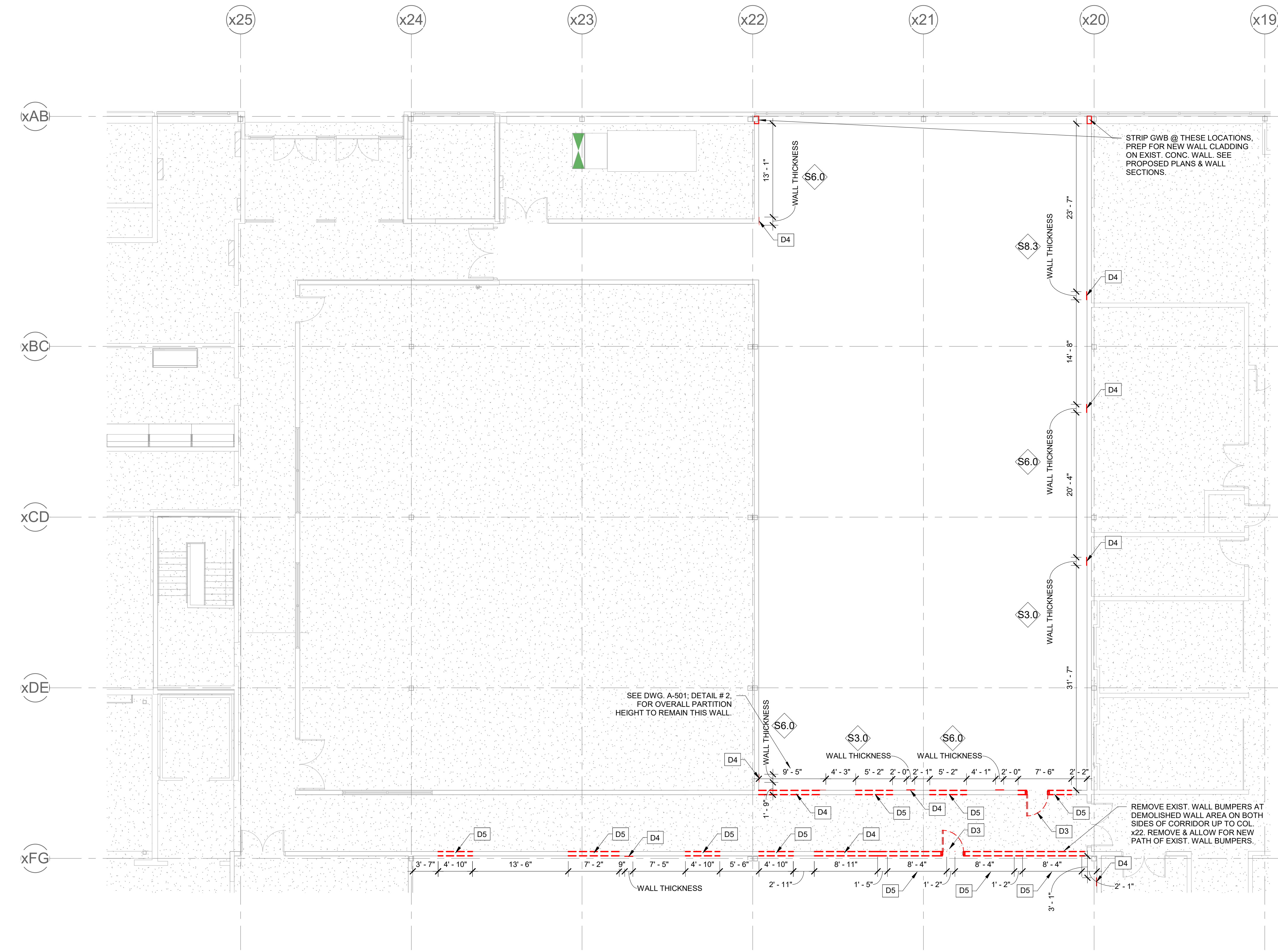


① LIFE SAFETY PLAN  
1" = 20'-0"

| DSGN:   | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|---------|------|----------|------------------------------|------|------|-------|
| DR: DC  | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| AB      | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| CHK: DC | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| APVD:   |      |          |                              |      |      |       |







- GENERAL DEMOLITION NOTES**
- CONTRACTOR OR D/B SHALL ERECT TEMPORARY ZIP-POLE FIRE RESISTANT BARRIERS TO ISOLATE DEMOLITION WORK AREAS FROM ONGOING CYTIVA OPERATIONS TO CONTROL DUST.
  - CONTRACTOR OR D/B SHALL CO-ORDINATE WITH ELEC, MECH, AND SECURITY SUB-CONTRACTORS ON THE SAFE "LOCK-OUT / TAG-OUT" OF ENERGIZED SYSTEMS PRIOR TO ANY DEMOLITION WORK.
  - ALL DEMOLITION MATERIALS ARE TO BE SEPARATED AND / OR RECYCLED TO THE GREATEST EXTENTS POSSIBLE.
  - CONTRACTOR OR D/B SHALL DISCONNECT, REMOVE, PROPERLY DISPOSE, RELOCATE, AND/OR STORE ANY EQUIPMENT AS REQUIRED AT OWNER'S DIRECTION. CONTRACTOR SHALL COORDINATE ALL REMOVAL, RELOCATION, REPLACEMENT, RE-USE, SHUT-OFF, STUB-OFF, CAPPING-OFF, OR UPGRADES TO ANY EXISTING PLUMB, HVAC, F/A, SECURITY AND ELEC SYSTEMS, EQUIP AND OTHER APPURTENANCES AS OCCUR. THIS WORK SHALL INCLUDE GRAVITY VENTS, UTILITY LINES, DUCTWORK, CONNECTORS, SINKS, ELEC DEVICES, AND CONDUIT AS REQUIRED, SCHEDULED, OR SPECIFIED IN ACCORDANCE WITH ALL STATE AND LOCAL CODES, AS WELL AS OTHER PERTINENT REGULATIONS.
  - EXISTING FLOORS, OR OTHER FLOOR FINISHES SCHEDULED TO REMAIN, WHICH INCUR DAMAGE DURING DEMOLITION WORK SHALL BE PATCHED AND REFINISHED TO "LIKE NEW" CONDITION, U.N.O. BY REQUIREMENTS OF LIKE NEW CONSTRUCTION.
  - ANY EXISTING ARCHITECTURAL FINISHES (INCLUDING PARTITIONS, CEILING, AND FLOORING SYSTEMS) SCHEDULED TO REMAIN WHICH INCUR DAMAGE DURING DEMOLITION ACTIVITIES ARE TO BE PATCHED, REPAIRED, AND/OR REPLACED TO MATCH ADJACENT CONSTRUCTION.

- KEYED ARCHITECTURAL DEMOLITION NOTES**
- D1** PROPERLY DE-ACTIVATE, DE-ENERGIZE, AND / OR DISCONNECT REMAINING EQUIPMENT SCHEDULED FOR REMOVAL. COORDINATE WITH OWNER ON DISPOSITION / STORAGE OF ANY / ALL ITEMS REMOVED.
  - D2** RR&D EXIST. SUSP. CEILING SYSTEM TO EXTENT INDICATED, INCLUDING SUSPENSION GRID, HANGER WIRES, CLIPS, TILES, ETC. COORDINATE ALL DEMO, ACTIVITIES WITH ELEC. AND MECH. / PLUMB. SUB-CONTRACTORS.
  - D3** REMOVE EXIST. HM. DOORS, DOOR FRAMES, AND ASSOCIATED DOOR HARDWARE TO EXTENT INDICATED AND PROVIDE TO OWNER FOR STORAGE / RE-USE. COORDINATE ALL DEMO, ACTIVITIES WITH ELECTRICAL AND SECURITY SUBCONTRACTORS AS NECESSARY. SEE ELEC. DEMO. DWGS. FOR ADDITIONAL INFO.
  - D4** RR&D EXISTING GYP. WALLBOARD PARTITIONS, INCLUDING VINYL COVE BASE WHERE REQUIRED, TO EXTENT INDICATED.
  - D5** CREATE NEW DOOR OR WINDOW OPENING IN EXISTING PARTITION. SEE NEW WORK PLANS.

① PARTIAL DEMOLITION PLAN - WEST SHELL SPACE  
1/8" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



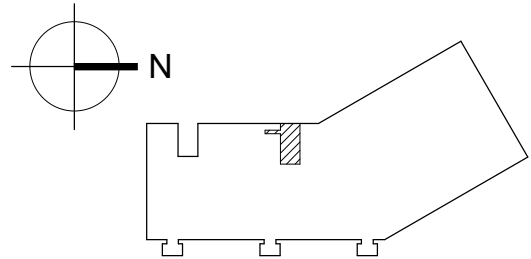
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| DSGN:     | REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|-----------|------|----------|-------------------------|------|------|-------|
| DC        | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | KM   | DC   | DC    |
| DR: AB/KM |      |          |                         |      |      |       |
| CHK: DC   |      |          |                         |      |      |       |
| APVD:     |      |          |                         |      |      |       |

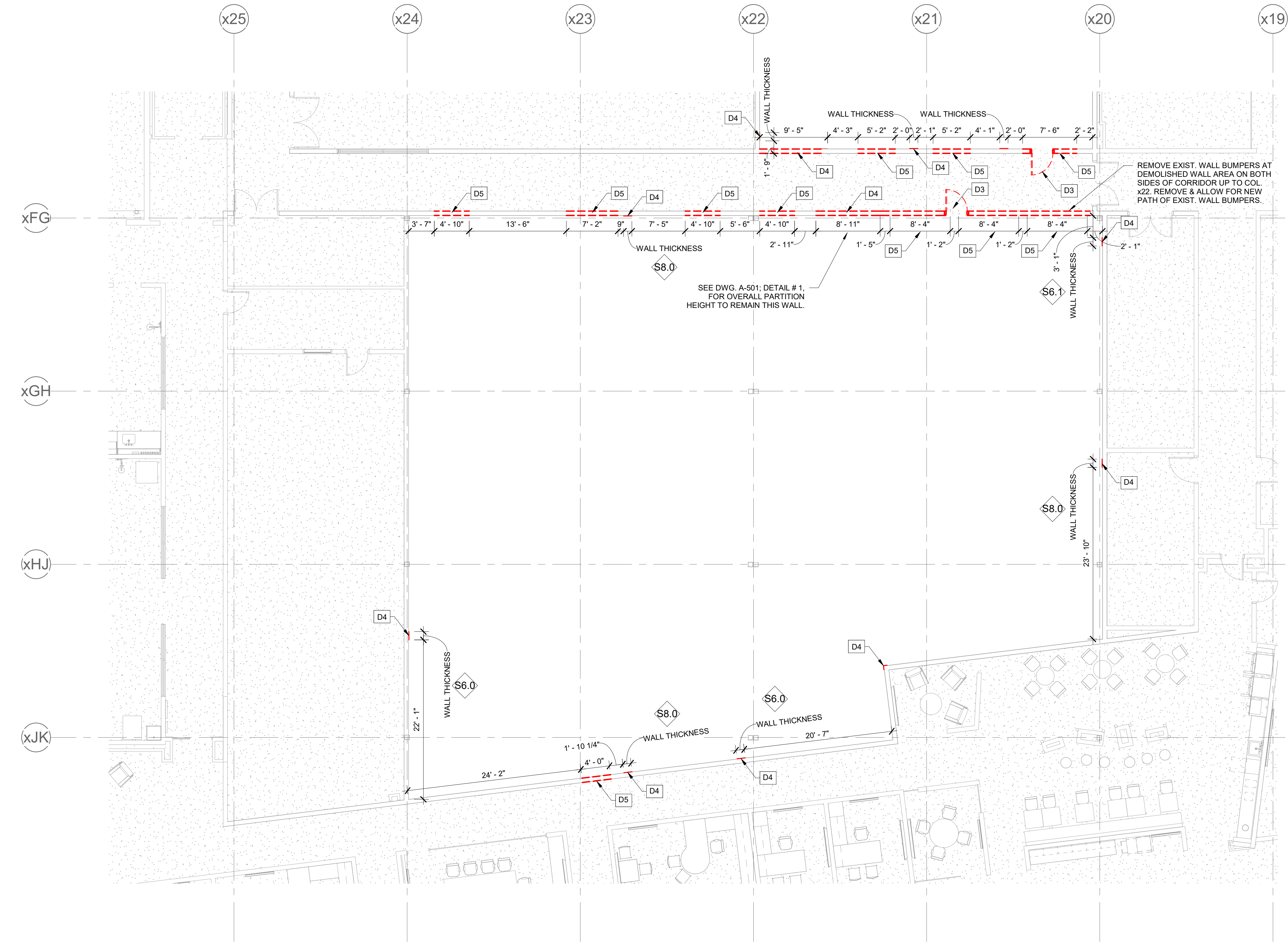


CLD & CCM LABS  
**ARCHITECTURAL**  
PARTIAL DEMOLITION PLAN  
WEST SHELL SPACE  
PROJ. NO: 20021A CAD FILE:

ISSUE DATE:  
SCALE: AS NOTED  
SHEET NUMBER  
**AD-101**



BAR IS ONE INCH ON ORIGINAL DRAWING  
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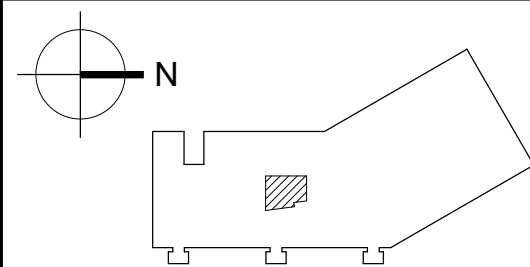
① PARTIAL DEMOLITION PLAN - EAST SHELL SPACE  
1/8" = 1'-0"

#### GENERAL DEMOLITION NOTES

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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"



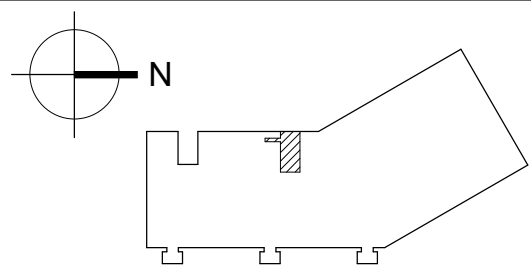
① PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"



GENERAL NOTE:

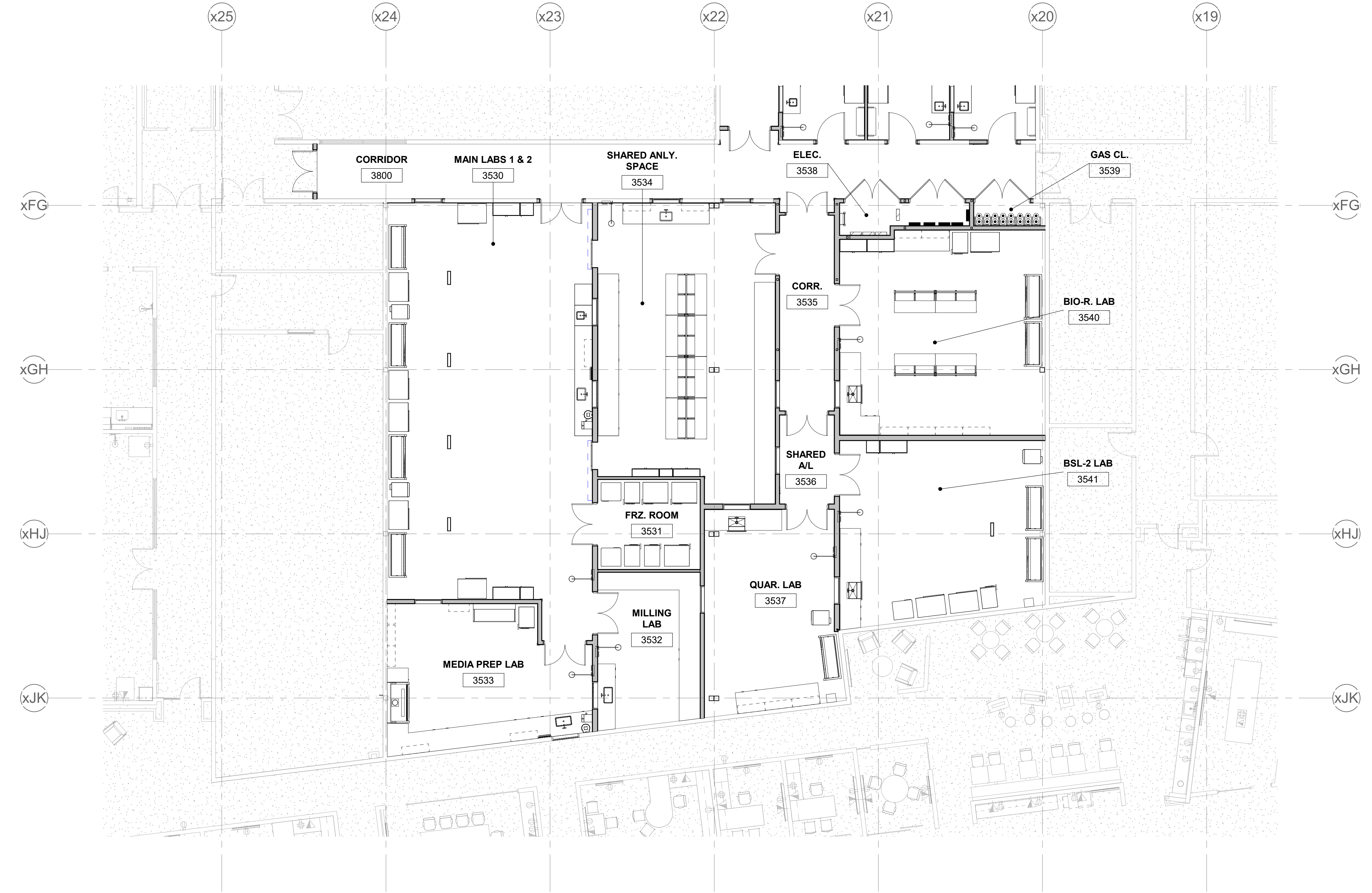
ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

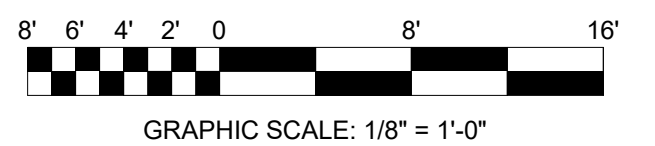




BAR IS ONE INCH ON ORIGINAL DRAWING  
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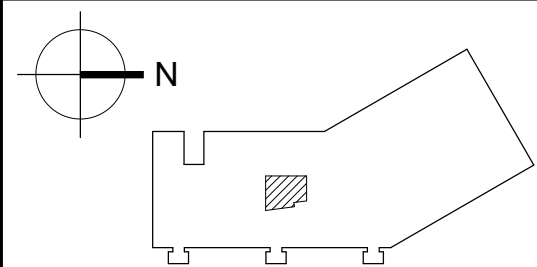
① PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"



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|-------|------|----------|------------------------------|------|------|-------|
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| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

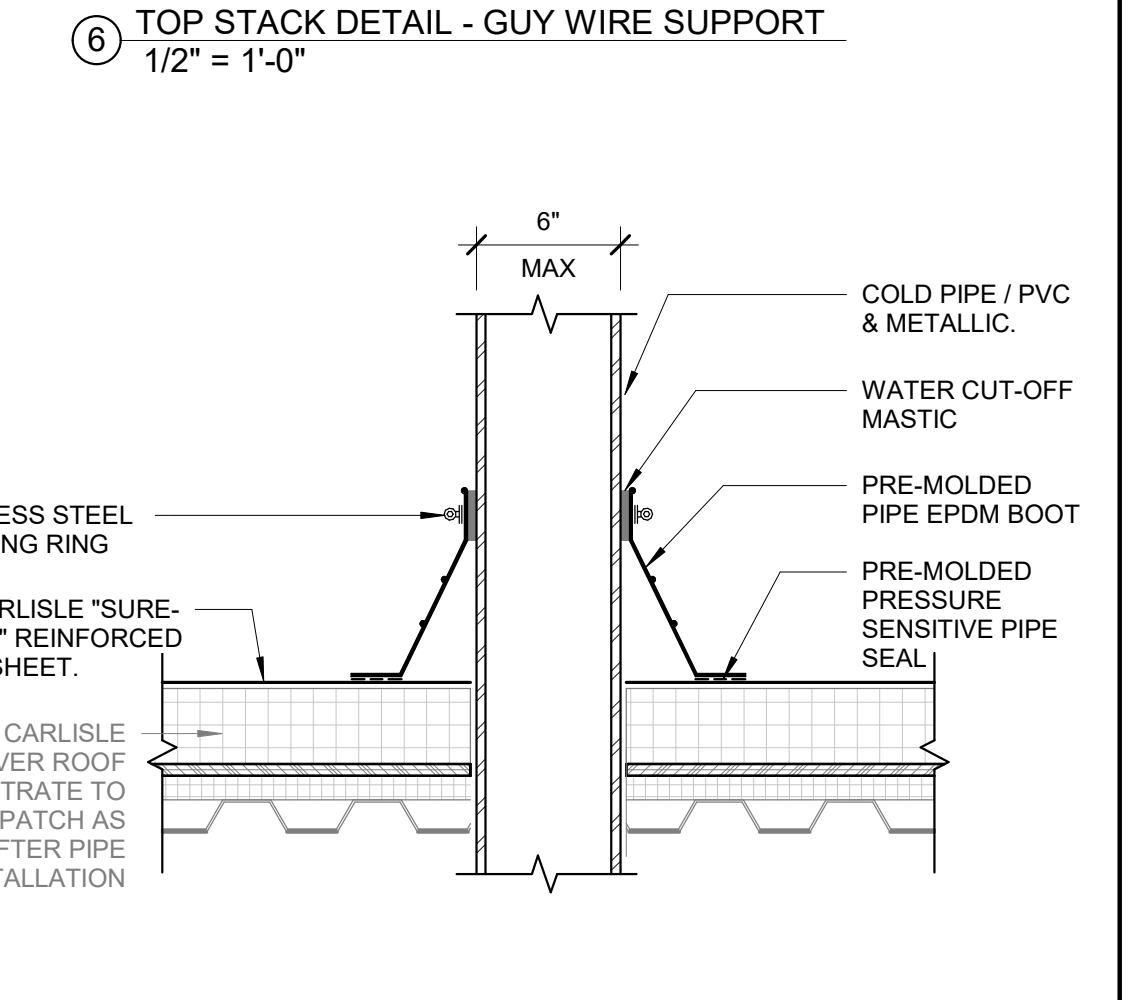
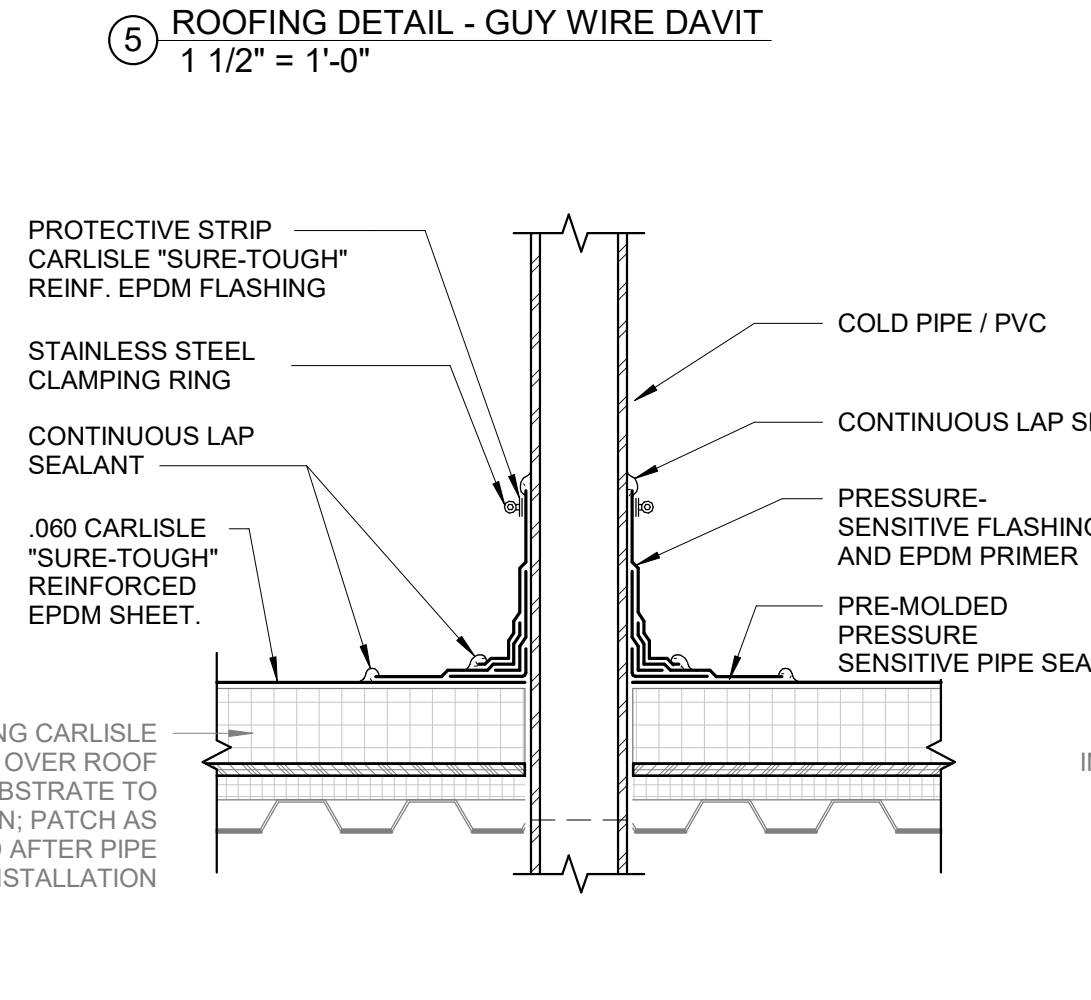
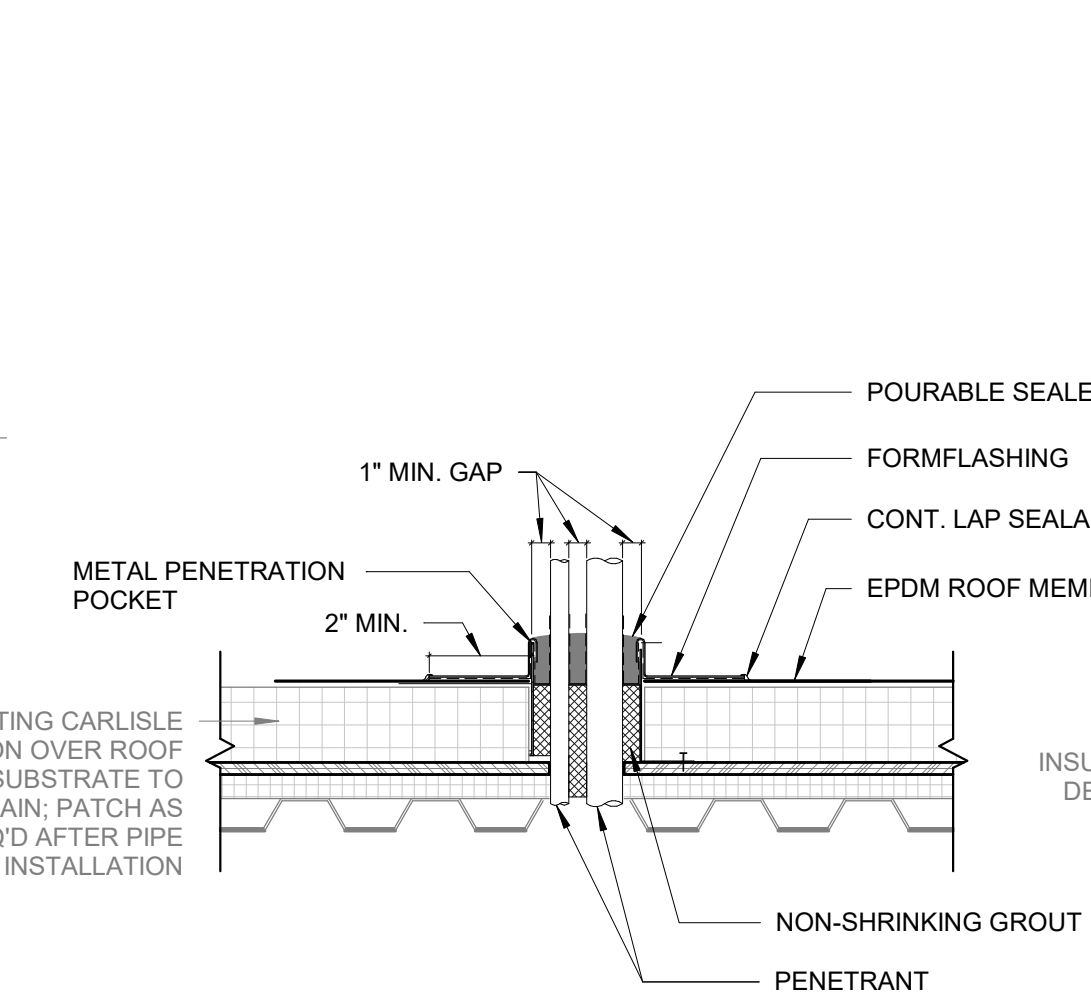
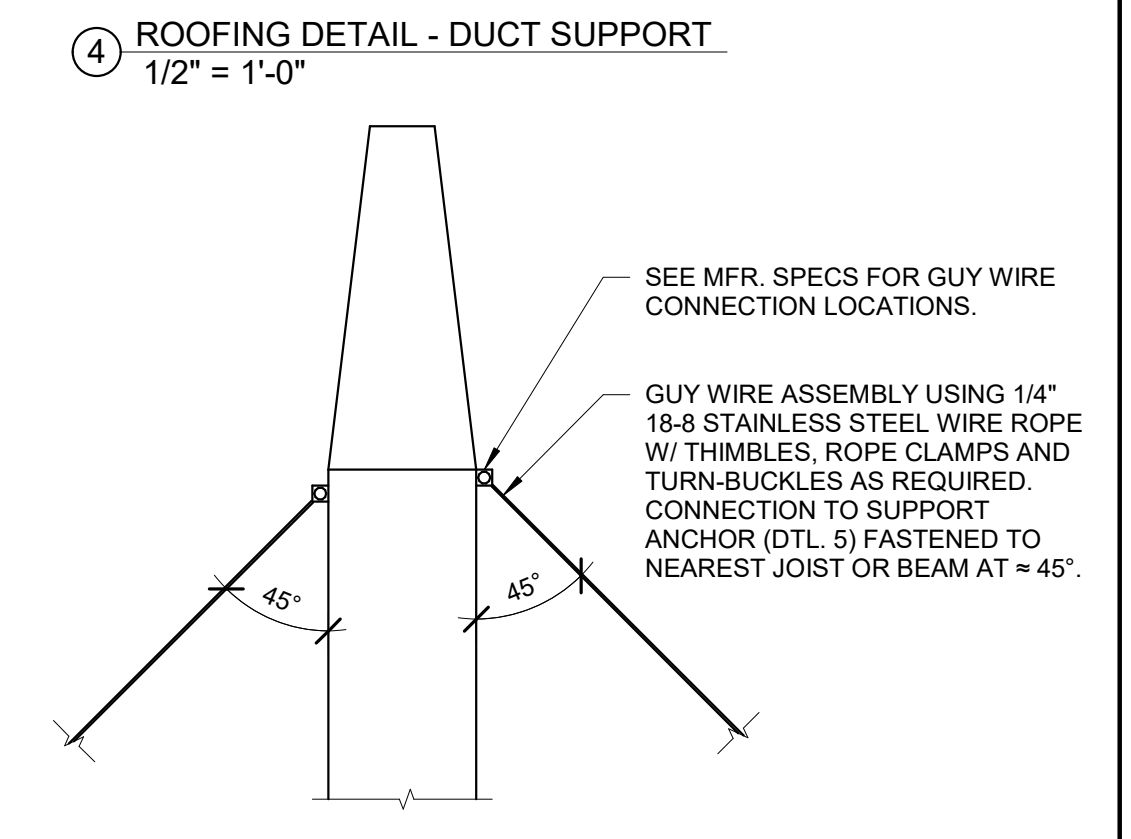
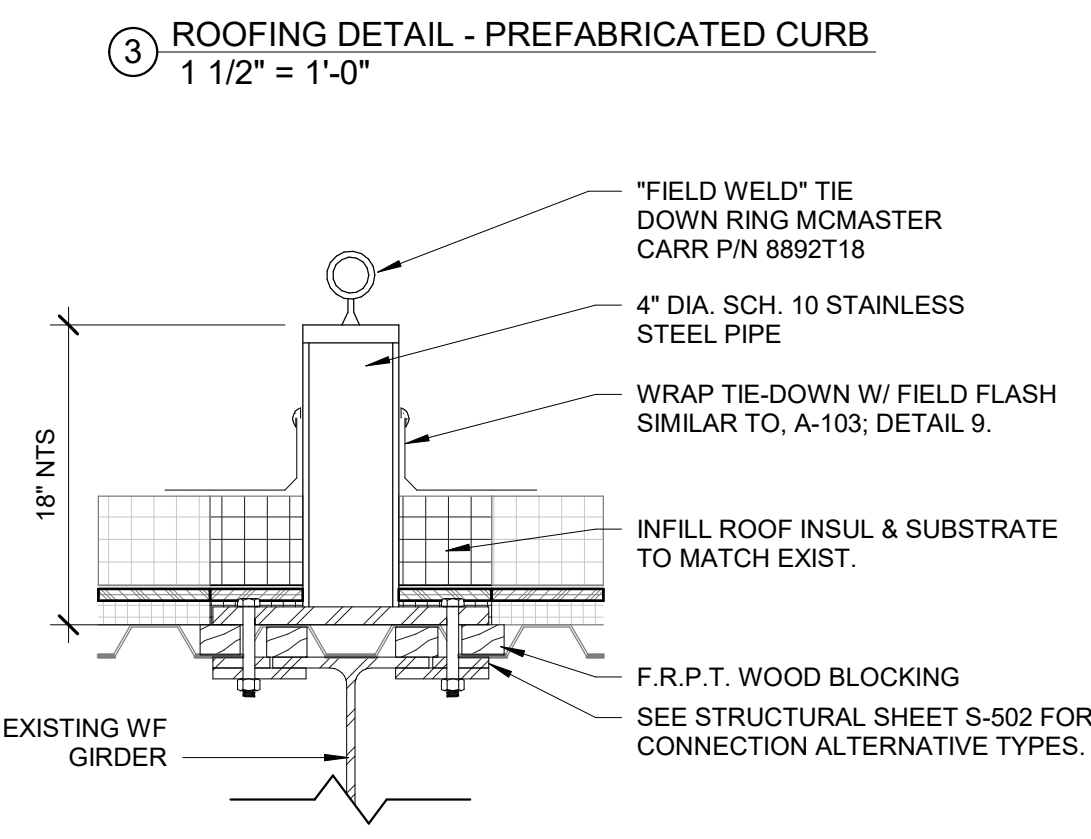
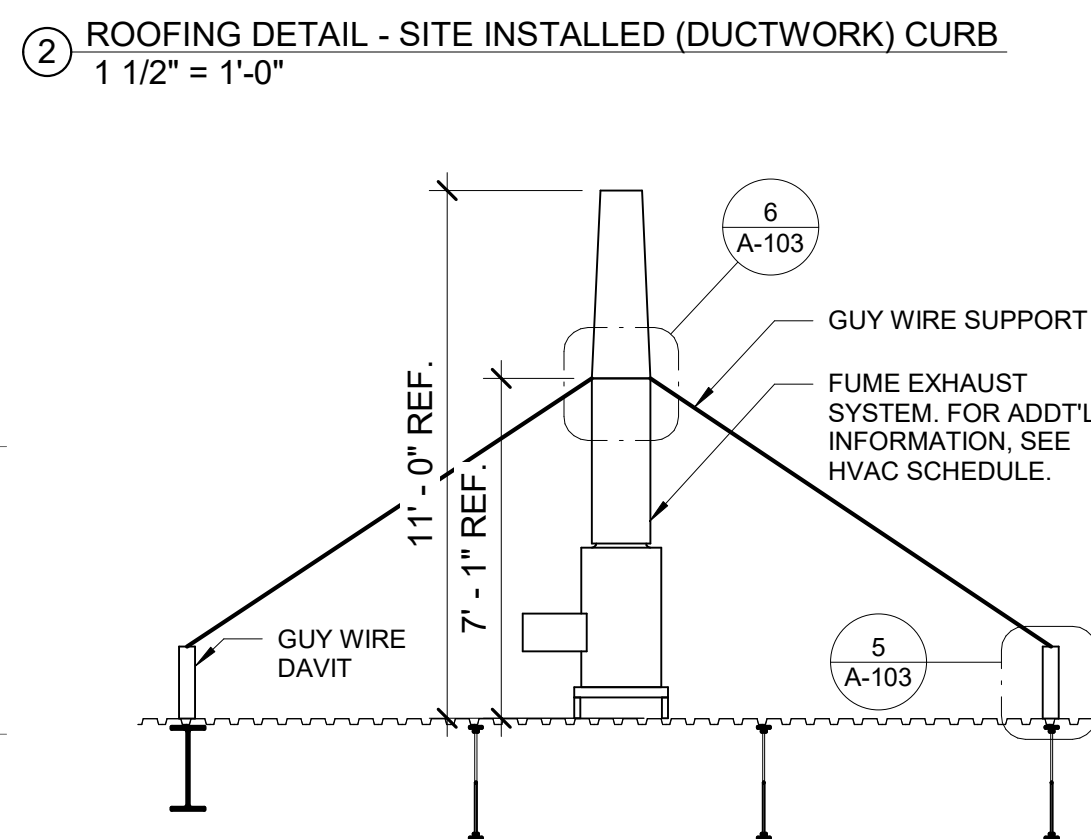
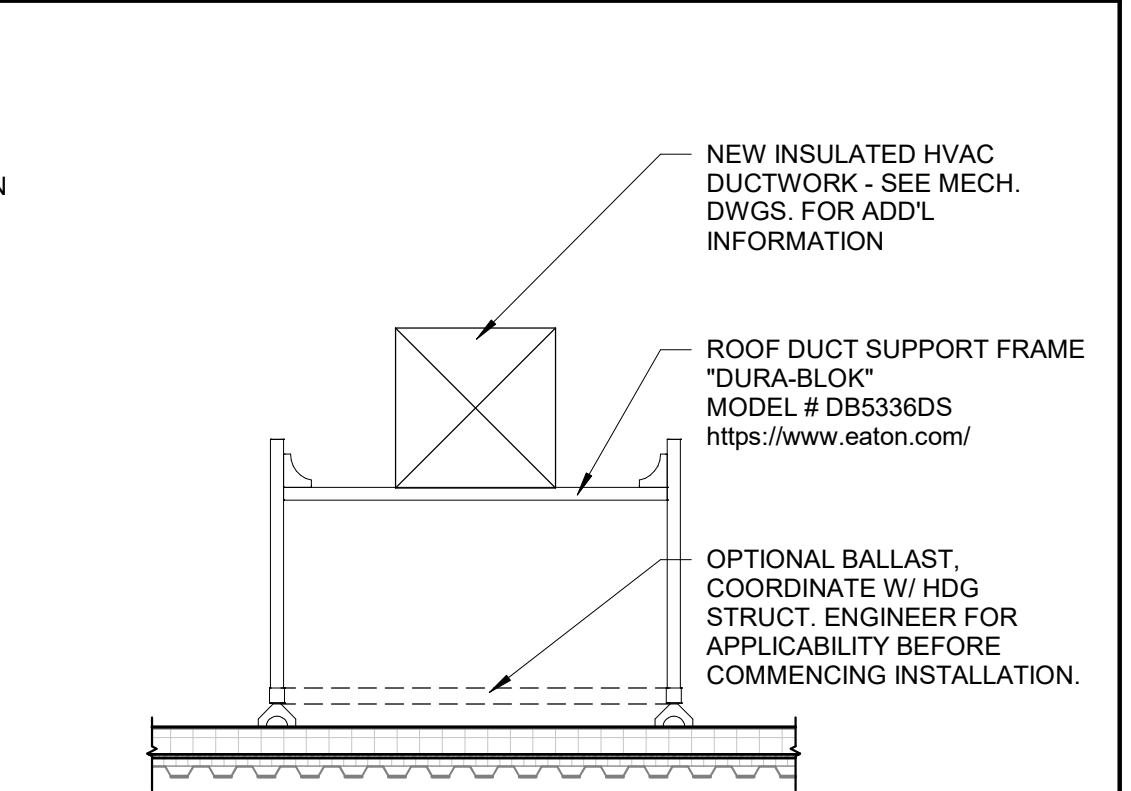
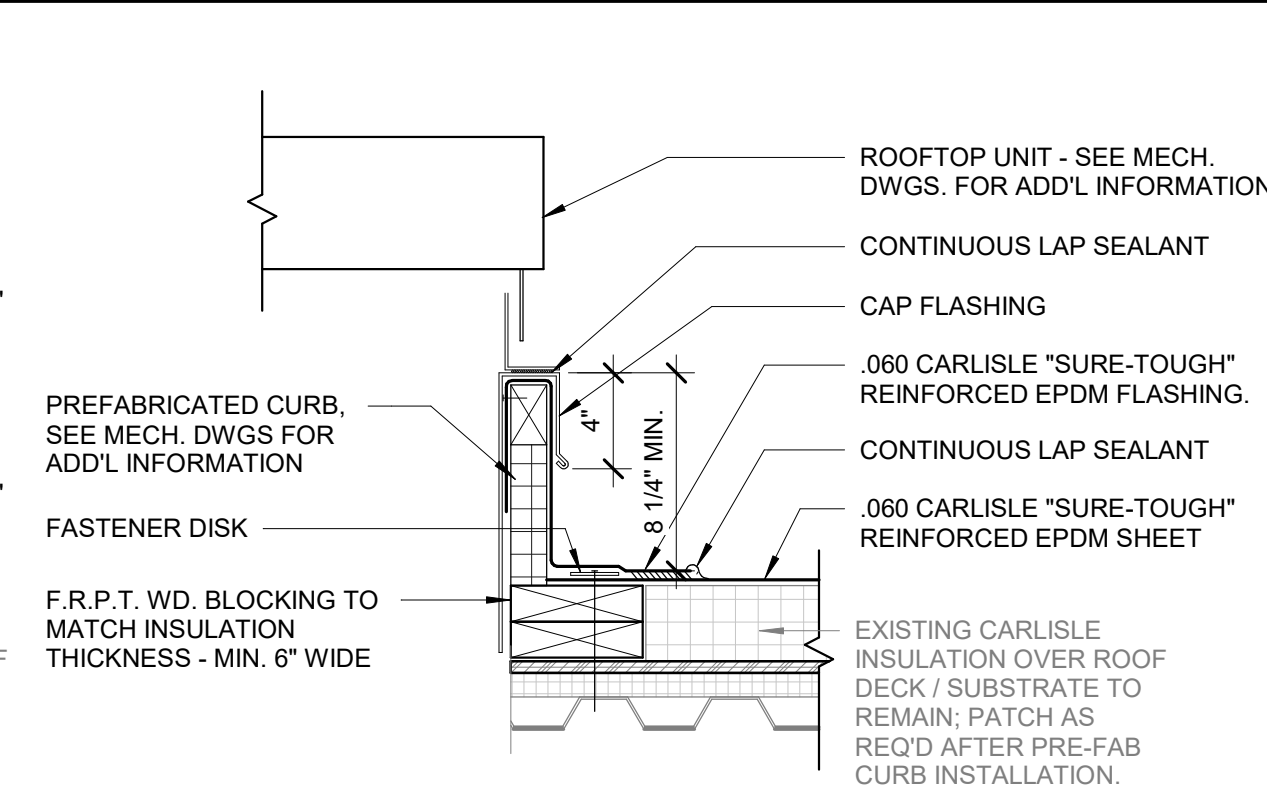
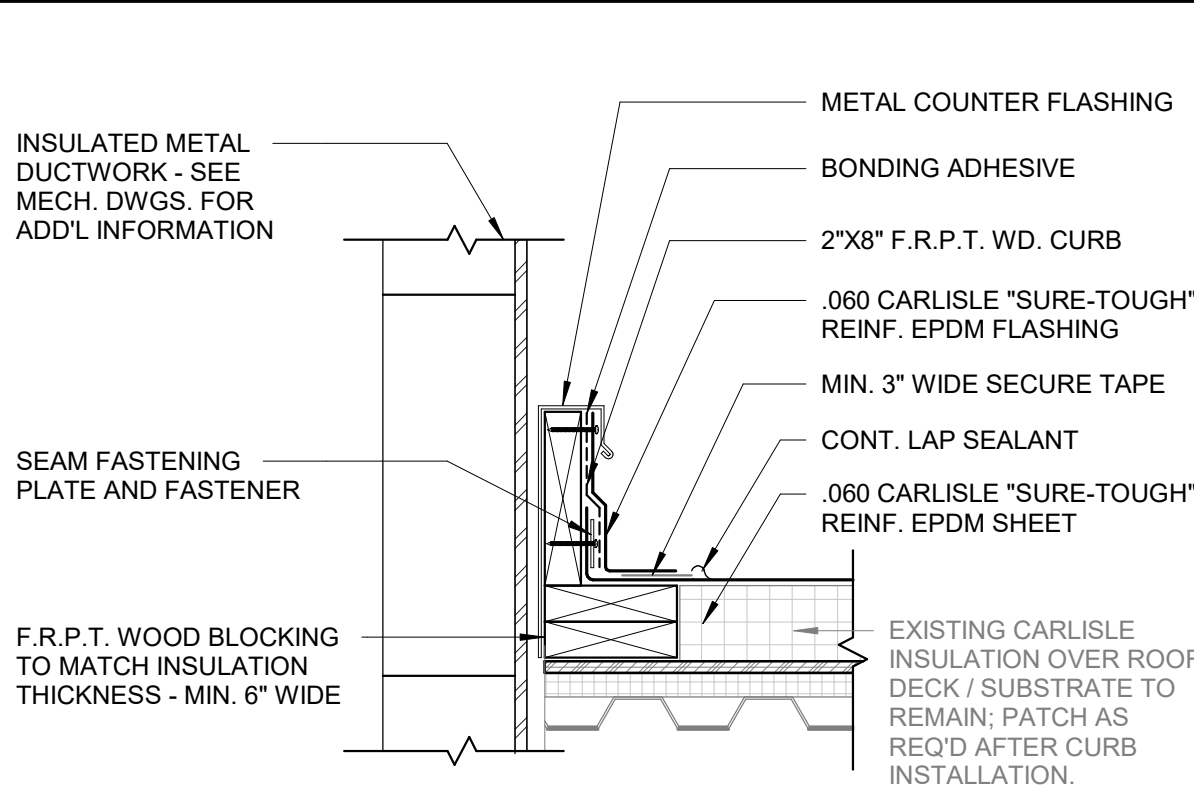
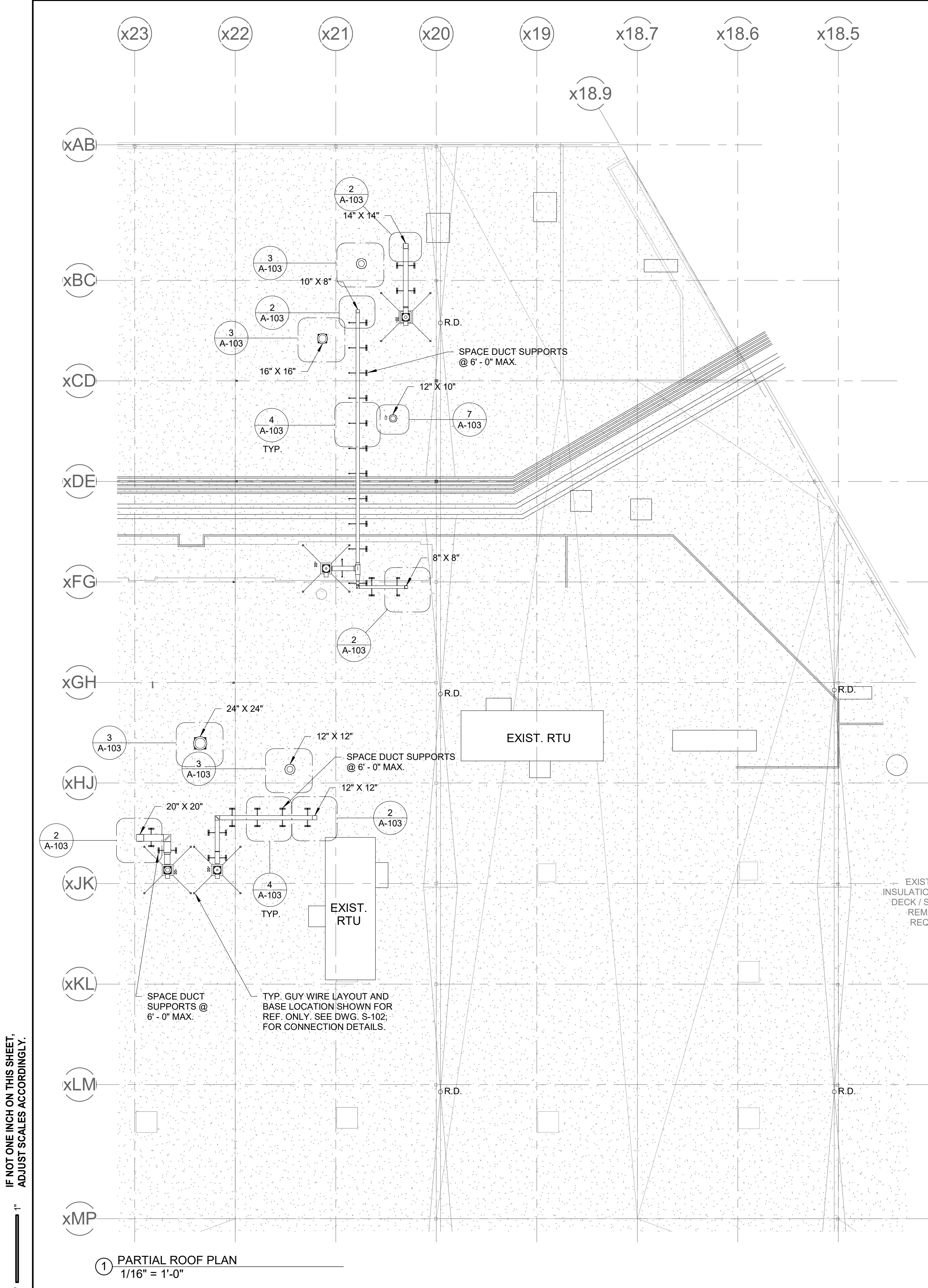


CLD & CCM LABS  
**ARCHITECTURAL**  
PARTIAL THIRD FLOOR PLAN  
EAST SHELL SPACE

PROJ. NO: 20021A CAD FILE:

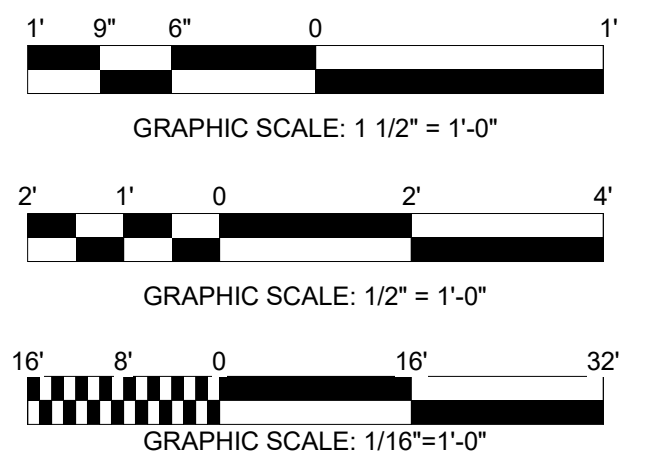
ISSUE DATE:  
SCALE: 1/8" = 1'-0"  
SHEET NUMBER  
**A-102**





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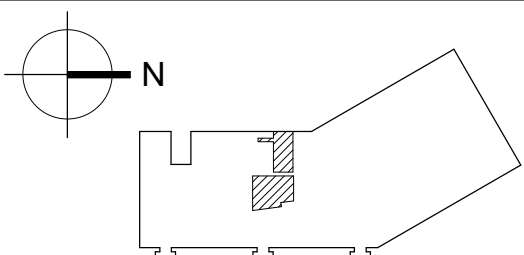
1" = 0'



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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KM   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | KM   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

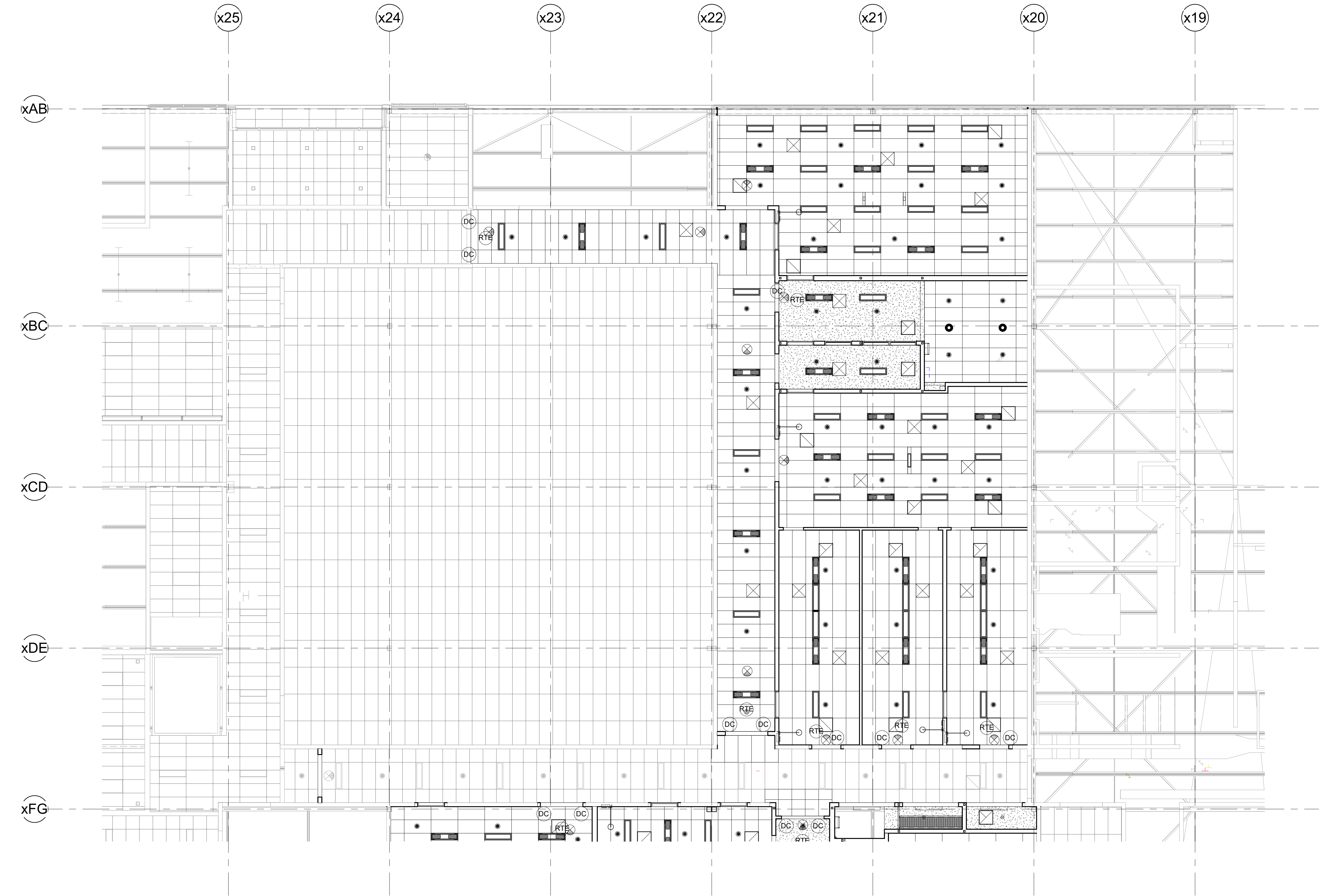




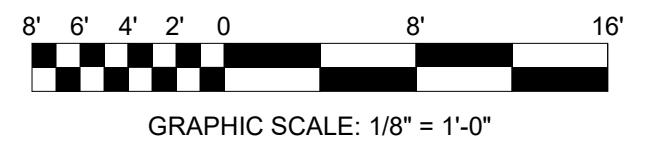
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING



1 PARTIAL REFLECTED CEILING PLAN - WEST SHELL SPACE  
1/8" = 1'-0"



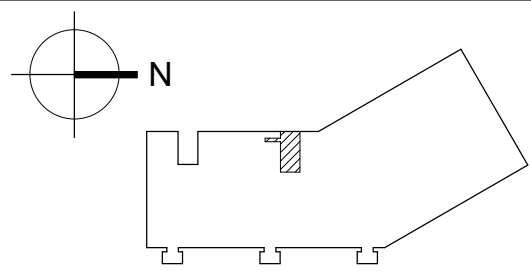
GRAPHIC SCALE: 1/8" = 1'-0"

**HART DESIGN GROUP**  
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COMPLETE SCOPE OF WORK FOR  
THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



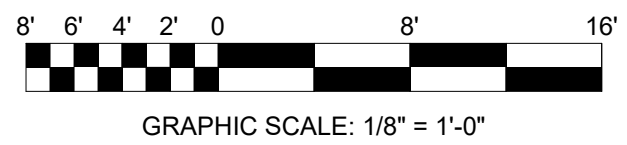
|  |                              |
|--|------------------------------|
| CLD & CCM LABS<br><b>ARCHITECTURAL</b><br>PARTIAL REFLECTED CEILING PLAN<br>WEST SHELL SPACE | ISSUE DATE:                  |
|  | SCALE: 1/8" = 1'-0"          |
|  | SHEET NUMBER<br><b>A-201</b> |
| PROJ. NO: 20021A CAD FILE:   |                              |



BAR IS ONE INCH ON ORIGINAL DRAWING  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



① PARTIAL REFLECTED CEILING PLAN - EAST SHELL SPACE  
1/8" = 1'-0"

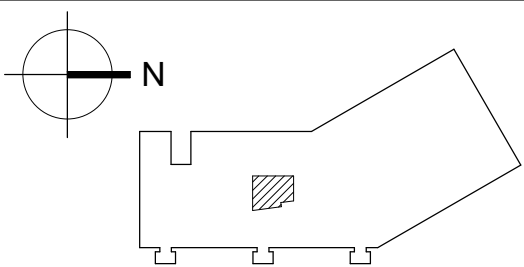


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|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| CHK:  | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
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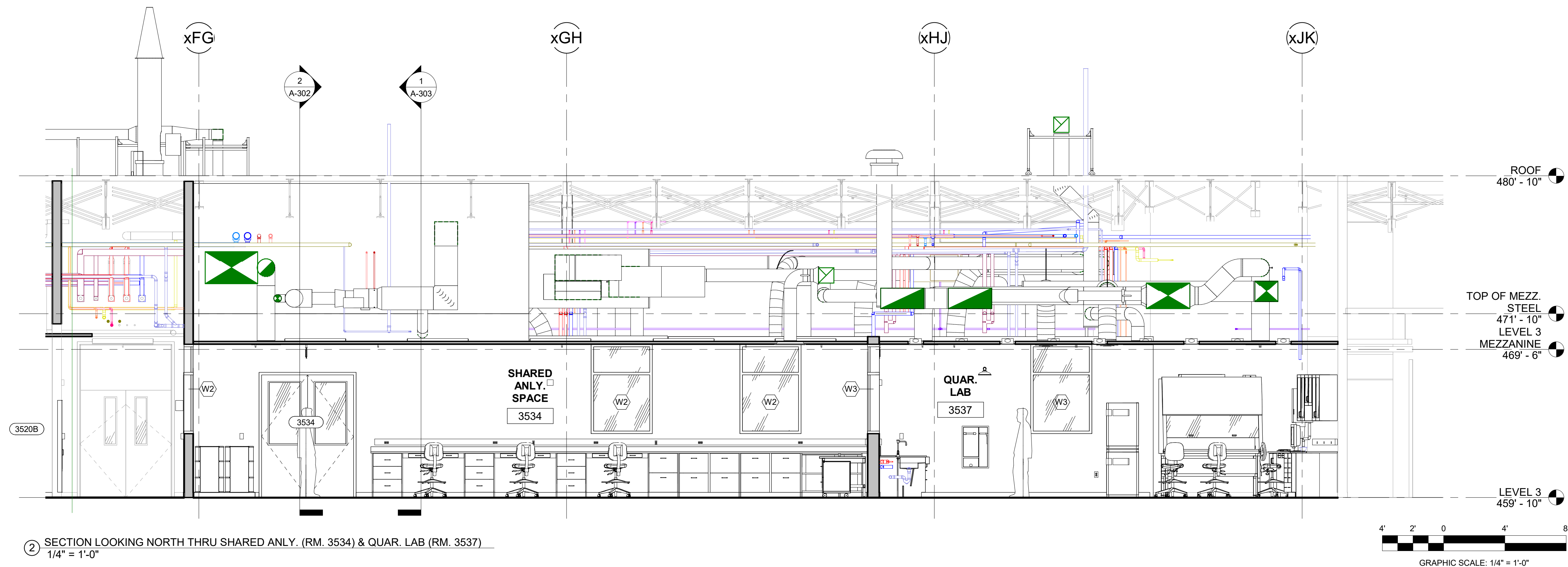
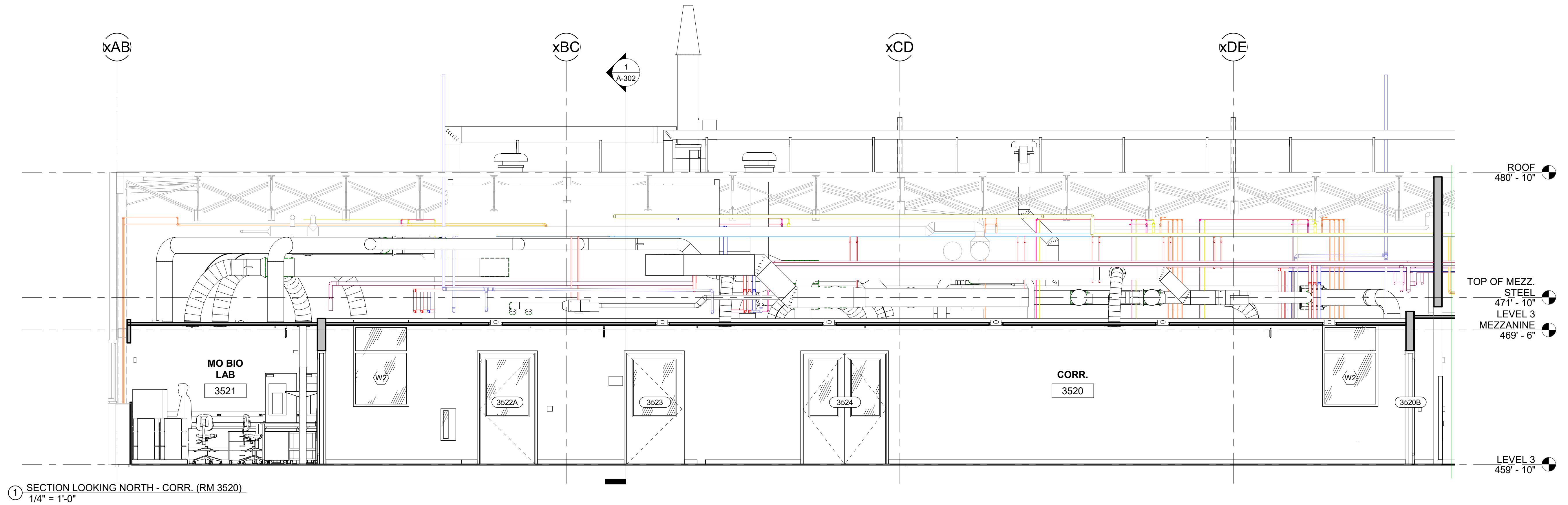


CLD & CCM LABS  
**ARCHITECTURAL**  
PARTIAL REFLECTED CEILING PLAN  
EAST SHELL SPACE

PROJ. NO: 20021A CAD FILE:

ISSUE DATE:  
SCALE: 1/8" = 1'-0"  
SHEET NUMBER  
**A-202**





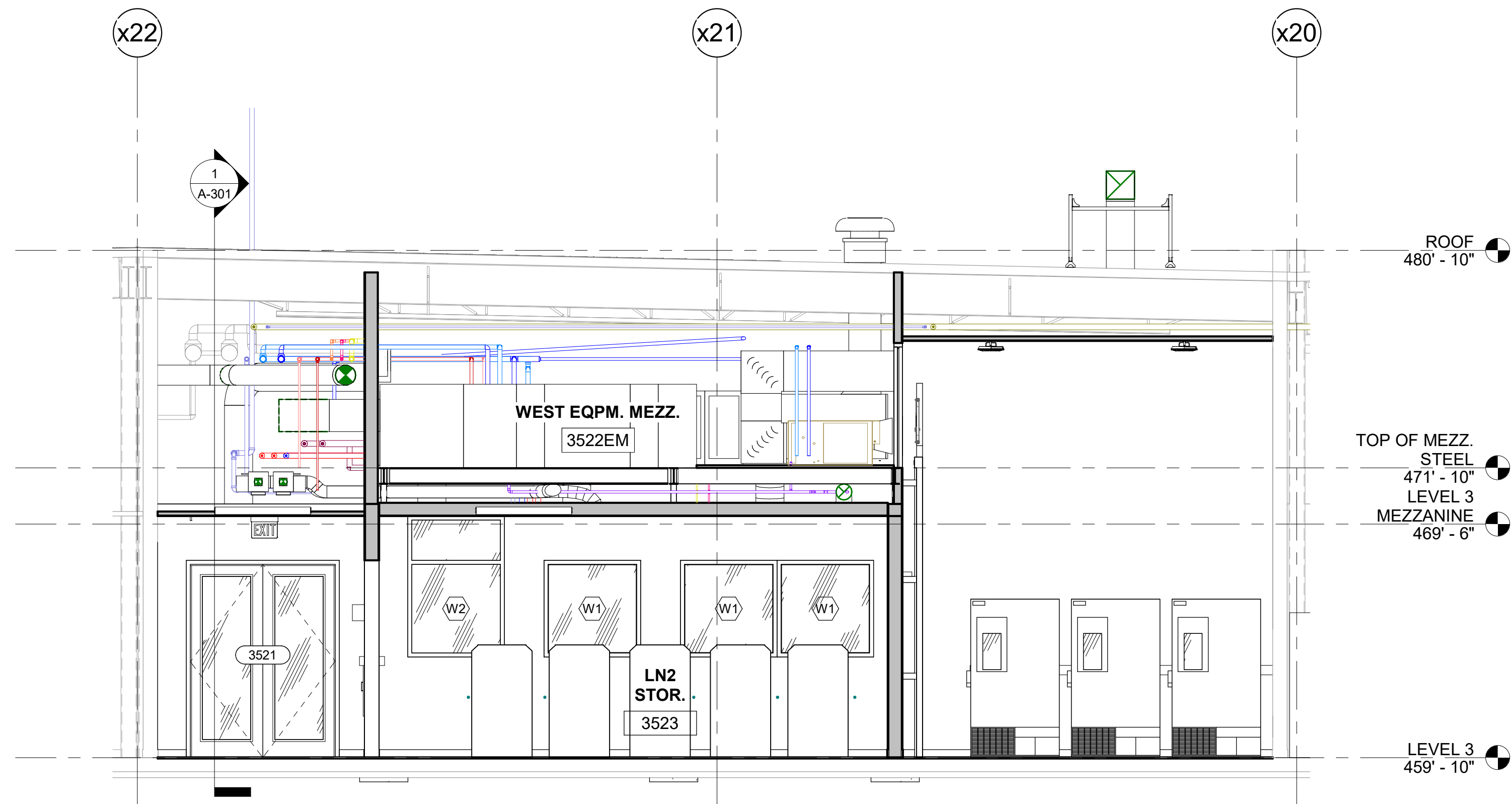
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0 1" 0'

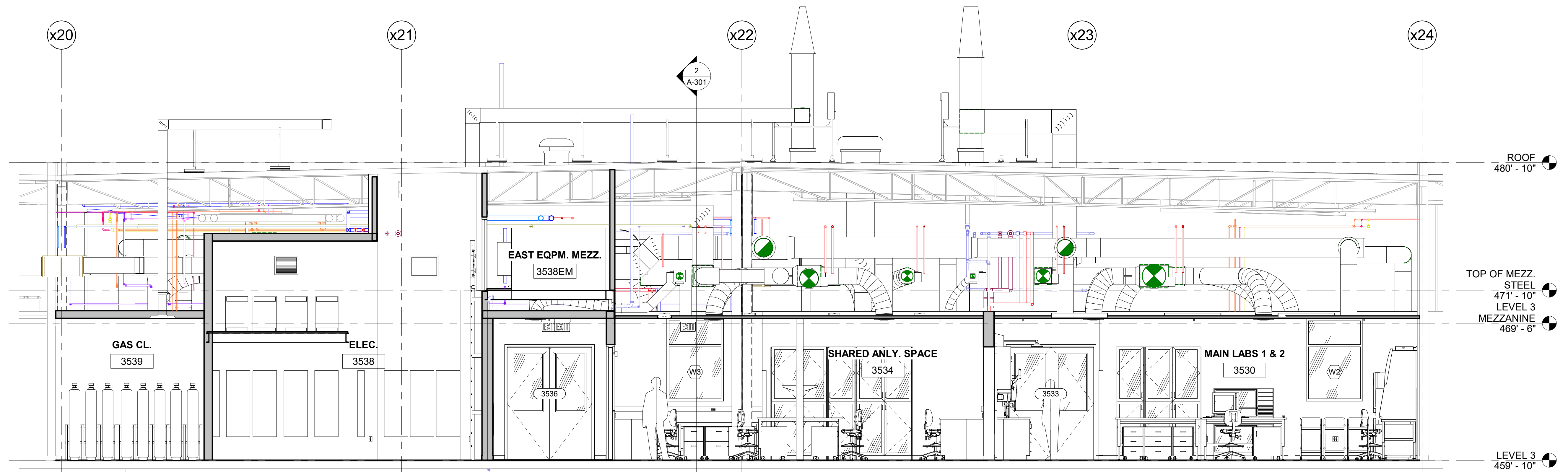
BAR IS ONE INCH ON ORIGINAL DRAWING

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
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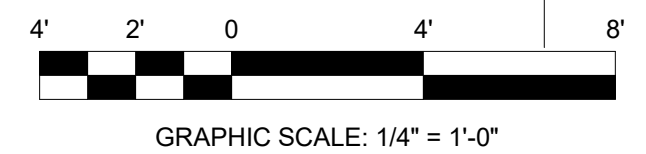




1 SECTION LOOKING WEST THROUGH WEST SHELL EQUIP. MEZZANINE  
1/4" = 1'-0"



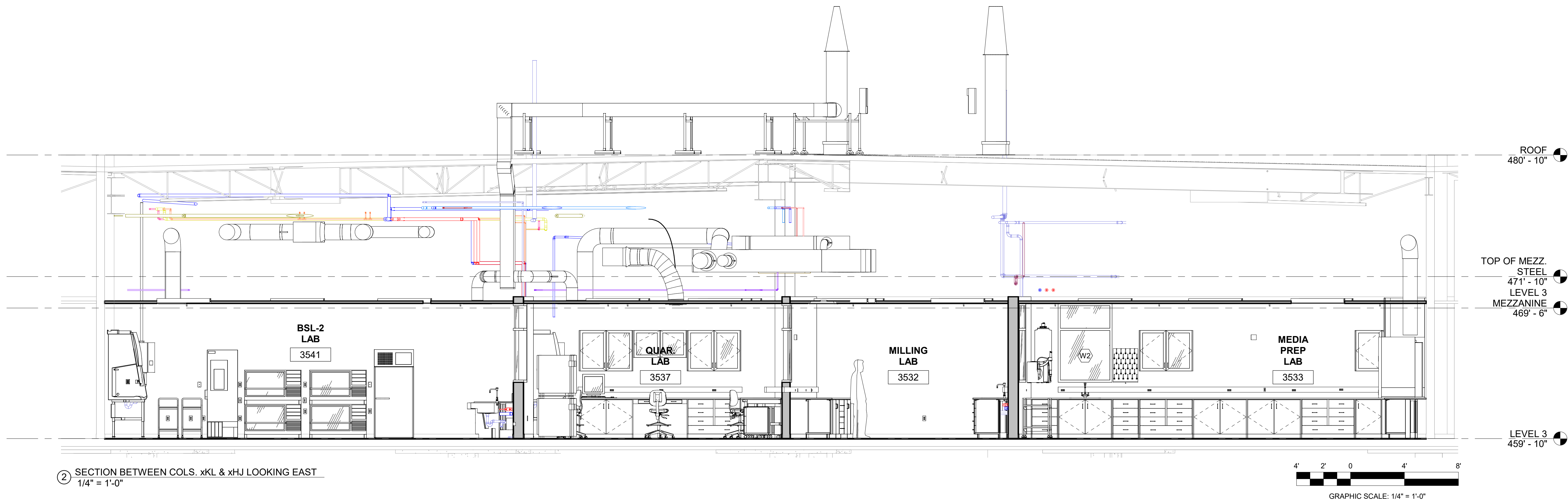
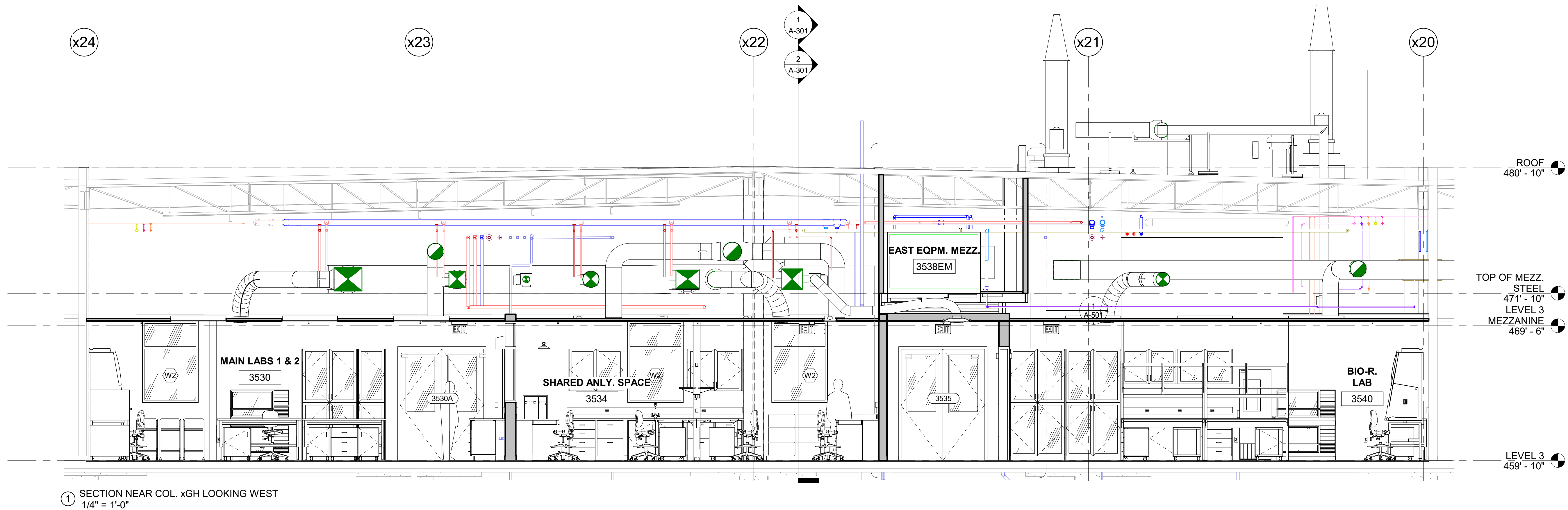
2 SECTION LOOKING EAST THROUGH EAST SHELL EQUIP. MEZZANINE  
1/4" = 1'-0"



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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |





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|       |       |      |          |                              |      |      |       |
|-------|-------|------|----------|------------------------------|------|------|-------|
| DSGN: | DC    | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
| DR:   | AB/KM | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| CHK:  | DC    | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| APVD: |       |      |          |                              |      |      |       |



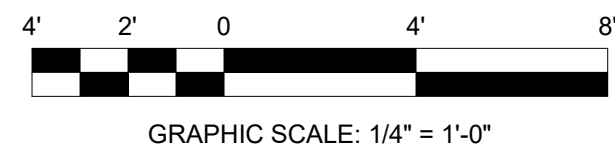
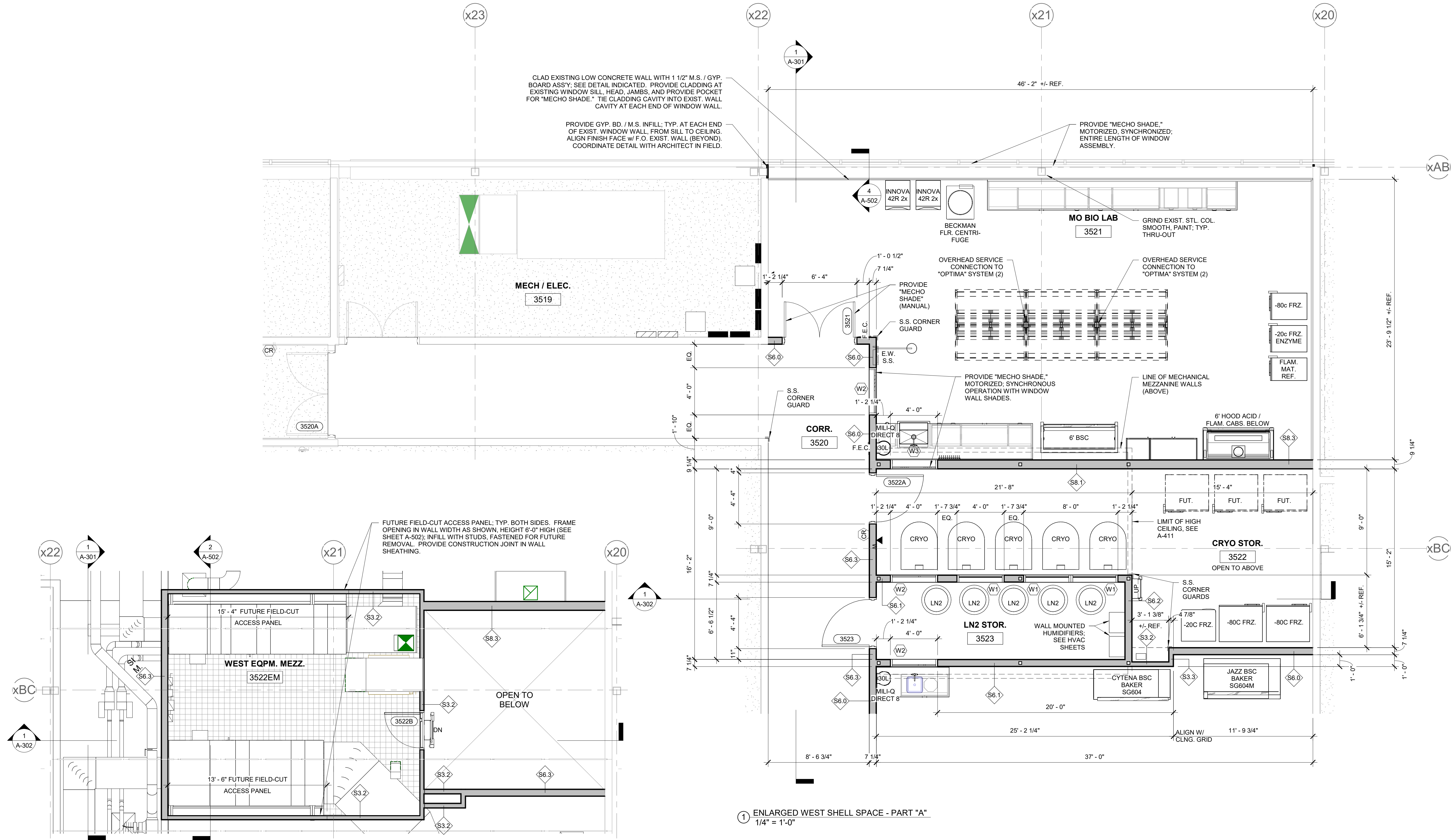
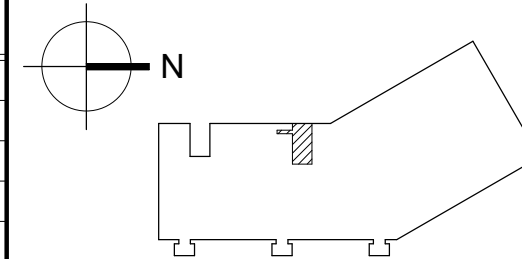
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1' 2'

BAR IS ONE INCH ON ORIGINAL DRAWING

GENERAL NOTE:  
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SPECIFICATIONS. FOR ALL  
DISCIPLINES TO ASCERTAIN THE  
COMPLETE SCOPE OF WORK FOR  
THE PROJECT.


| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |





IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



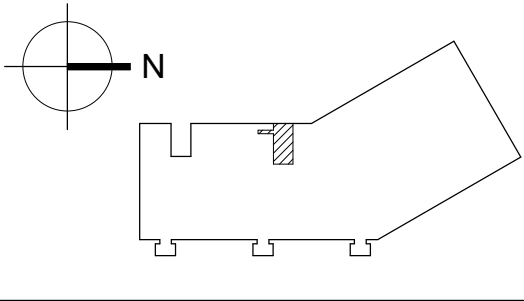
**HART DESIGN GROUP**  
800 SCENIC VIEW DRIVE | T: (401) 658-4600  
CUMBERLAND, RI 02864 | F: (401) 658-4609  
A MEMBER OF THE HART COMPANIES WWW.HARTCOMPANIES.COM



**cytiva**  
100 RESULTS WAY  
MARLBOROUGH, MA 01752

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COMPLETE SCOPE OF WORK FOR  
THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

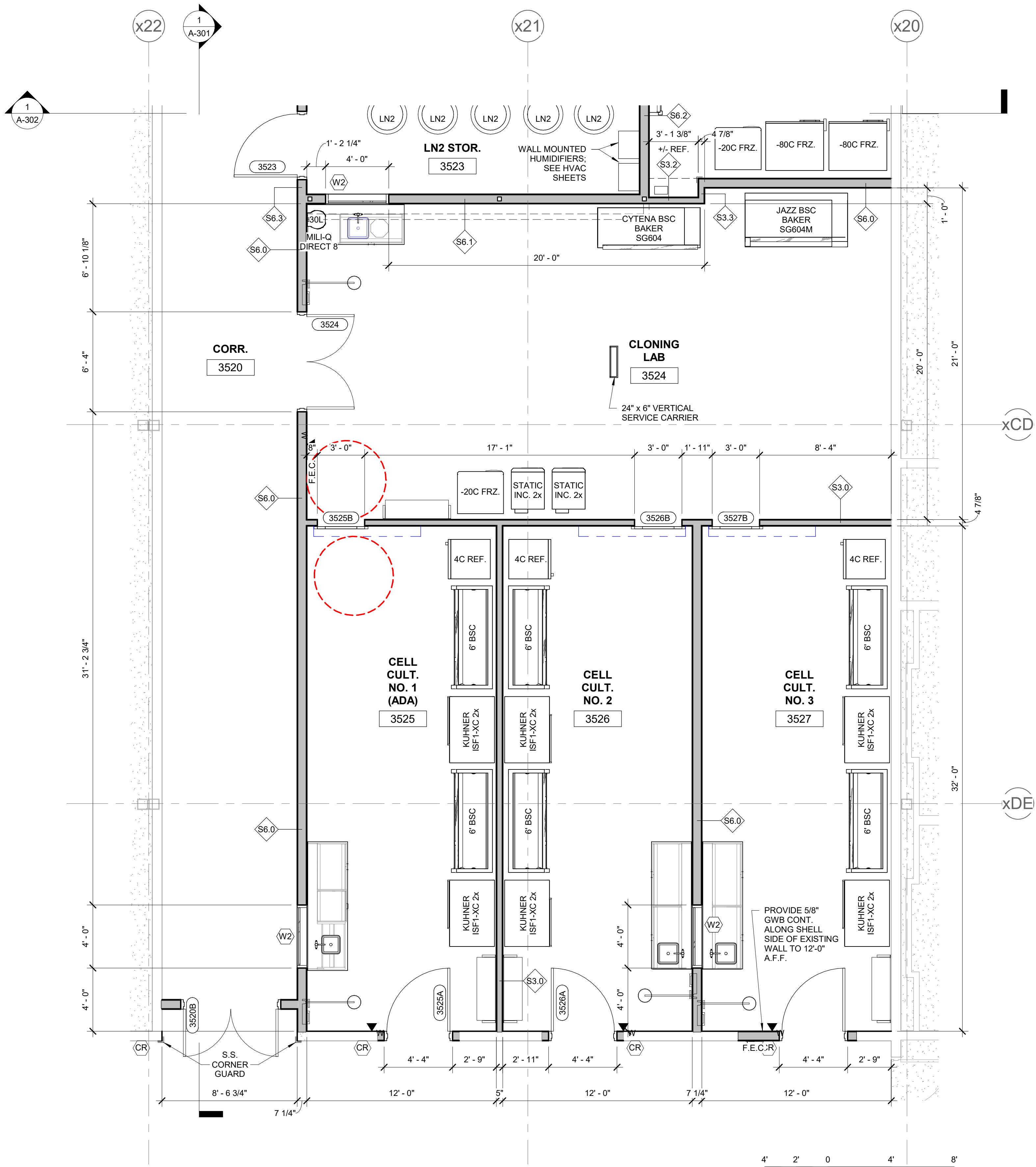
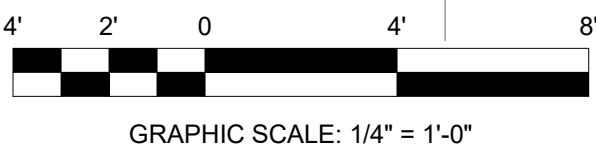


CLD & CCM LABS  
ARCHITECTURAL  
ENLARGED WEST SHELL SPACE  
PART "B"

PROJ. NO: 20021A CAD FILE:

ISSUE DATE:  
SCALE: 1/4" = 1'-0"  
SHEET NUMBER  
**A-402**

1 ENLARGED WEST SHELL SPACE - PART "B"  
1/4" = 1'-0"





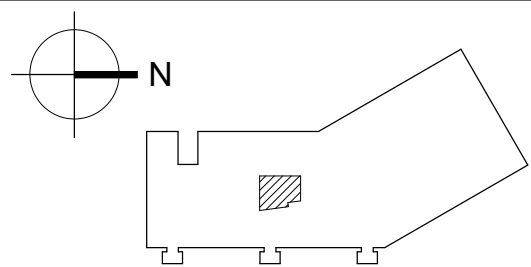
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0'

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

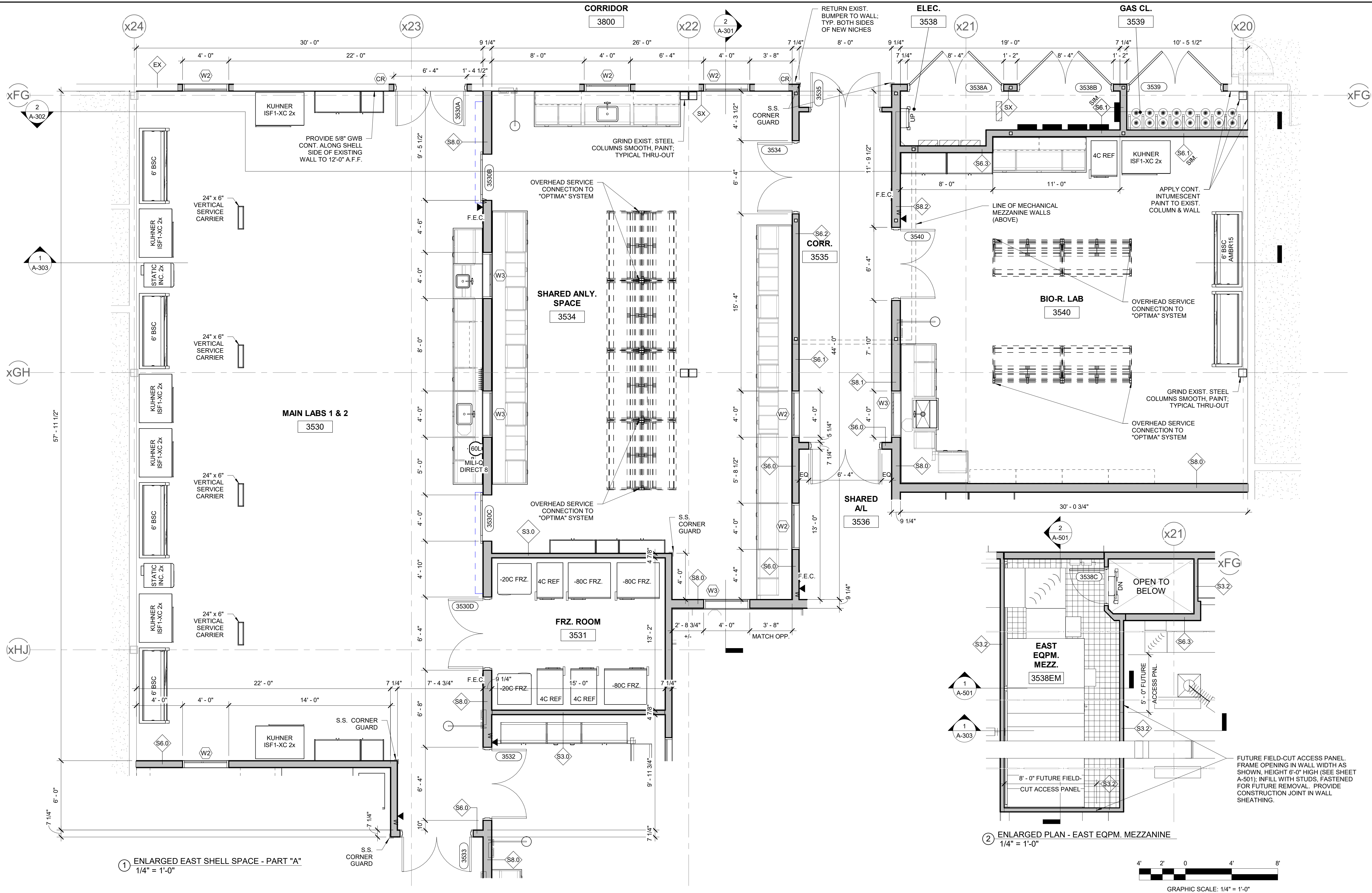
| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



CLD & CCM LABS  
ARCHITECTURAL  
ENLARGED EAST SHELL SPACE  
PART "A"

PROJ. NO: 20021A CAD FILE:

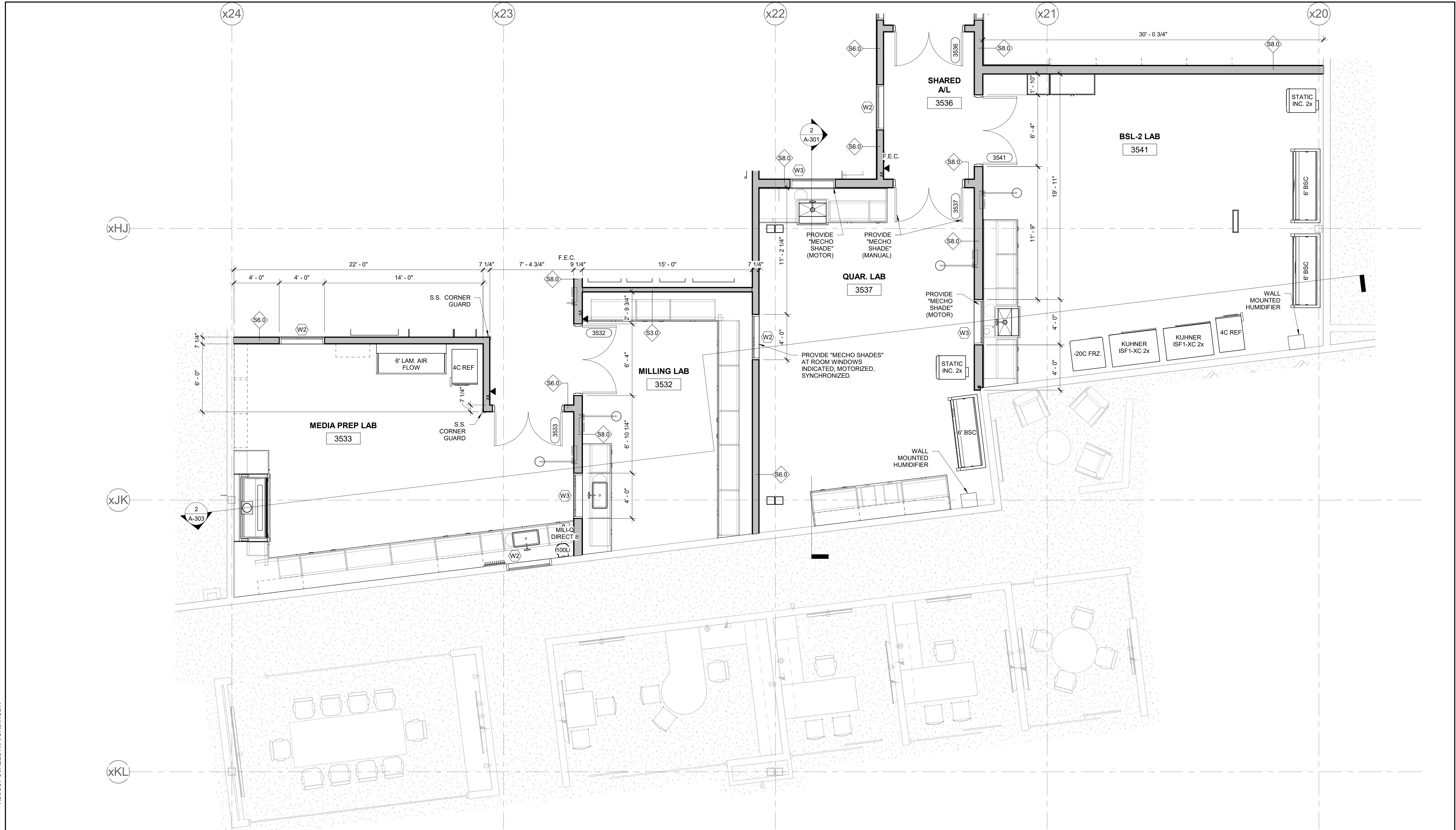
ISSUE DATE:  
SCALE: 1/4" = 1'-0"  
SHEET NUMBER  
**A-403**



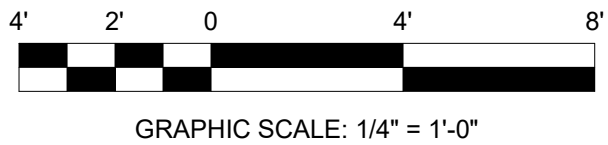


IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



1 ENLARGED EAST SHELL SPACE - PART "B"  
1/4" = 1'-0"



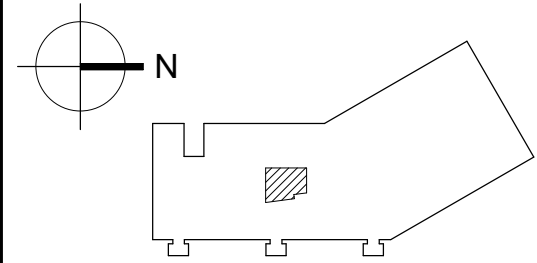
GRAPHIC SCALE: 1/4" = 1'-0"

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



CLD & CCM LABS  
**ARCHITECTURAL**  
ENLARGED EAST SHELL SPACE  
PART "B"

PROJ. NO: 20021A CAD FILE:

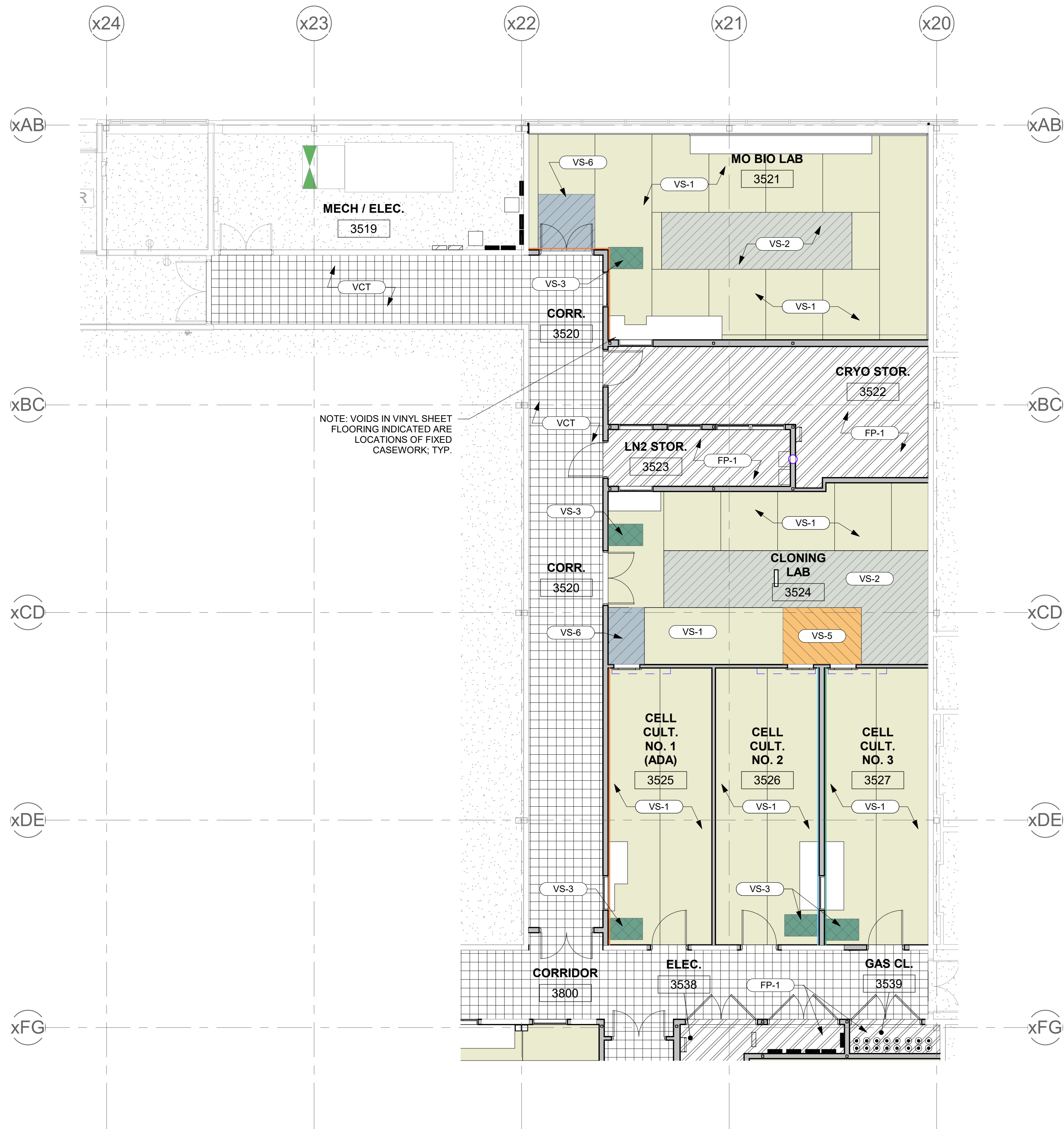
ISSUE DATE:  
SCALE: 1/4" = 1'-0"  
SHEET NUMBER  
**A-404**



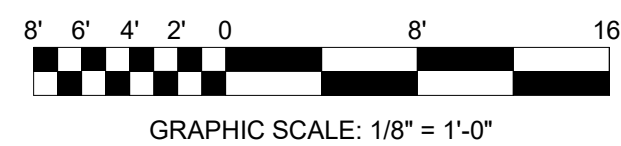
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0'

BAR IS ONE INCH ON ORIGINAL DRAWING



1 PARTIAL FLOOR FINISH PLAN - WEST SHELL SPACE  
1/8" = 1'-0"



**FLOORING LEGEND**

- FP-1 (FLOOR PAINT)
- RF-1 (RESINOUS FLOOR W/ ICB)
- VS-1 (VINYL SHEET FLOORING)
- VS-2 (VINYL SHEET FLOORING)
- VS-3 (VINYL SHEET FLOORING)
- VS-4 (VINYL SHEET FLOORING)
- VS-5 (VINYL SHEET FLOORING)
- VS-6 (VINYL SHEET FLOORING)


| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| AB/KM |      |          |                              |      |      |       |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 1/8" = 1'-0"

BAR IS ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



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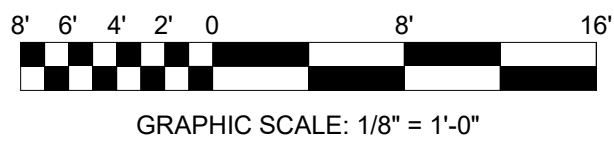
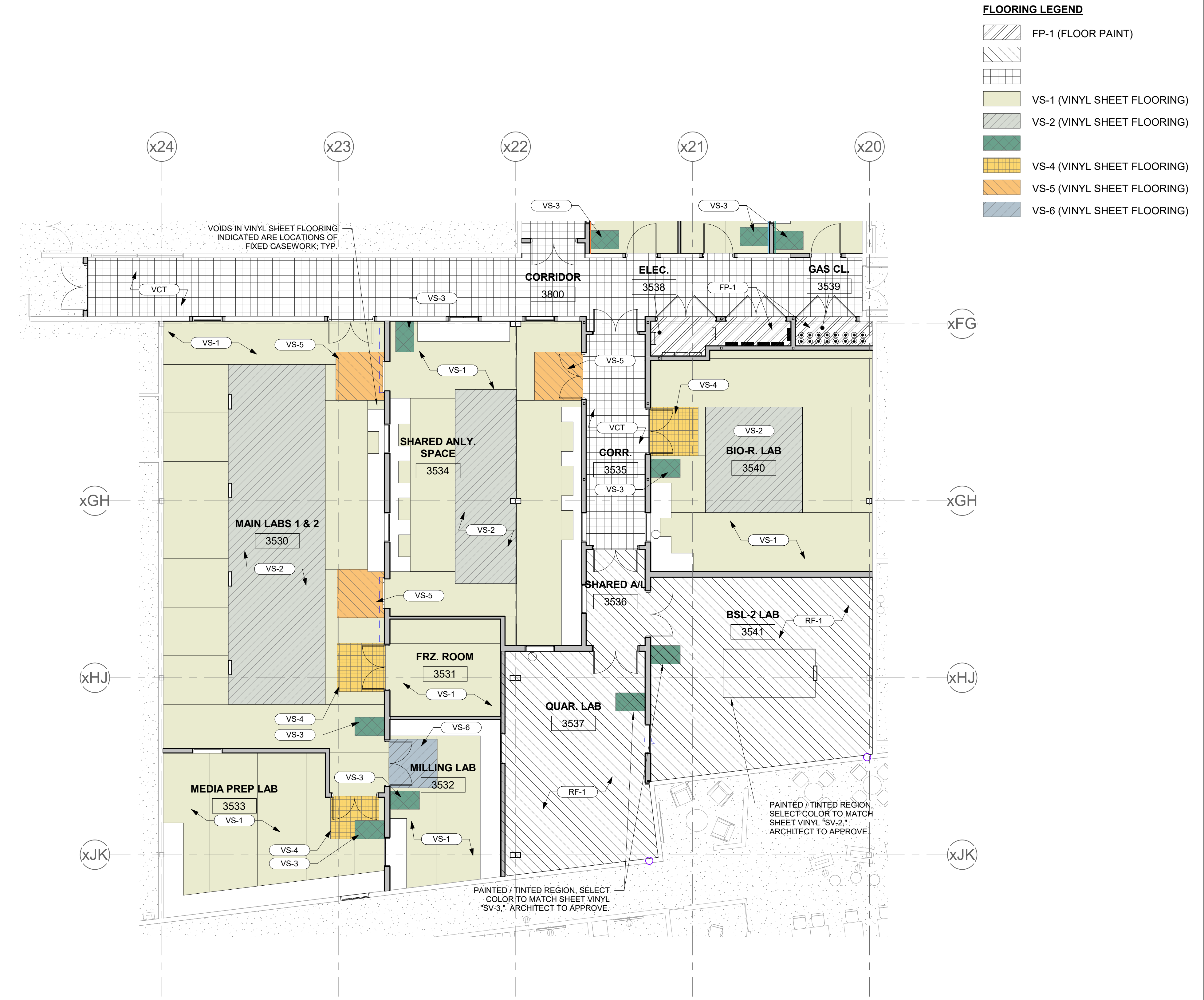
| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

CLD & CCM LABS  
**ARCHITECTURAL**  
PARTIAL FLOOR FINISH PLAN  
EAST SHELL SPACE

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE:  
SCALE: 1/8" = 1'-0"

SHEET NUMBER  
**A-406**



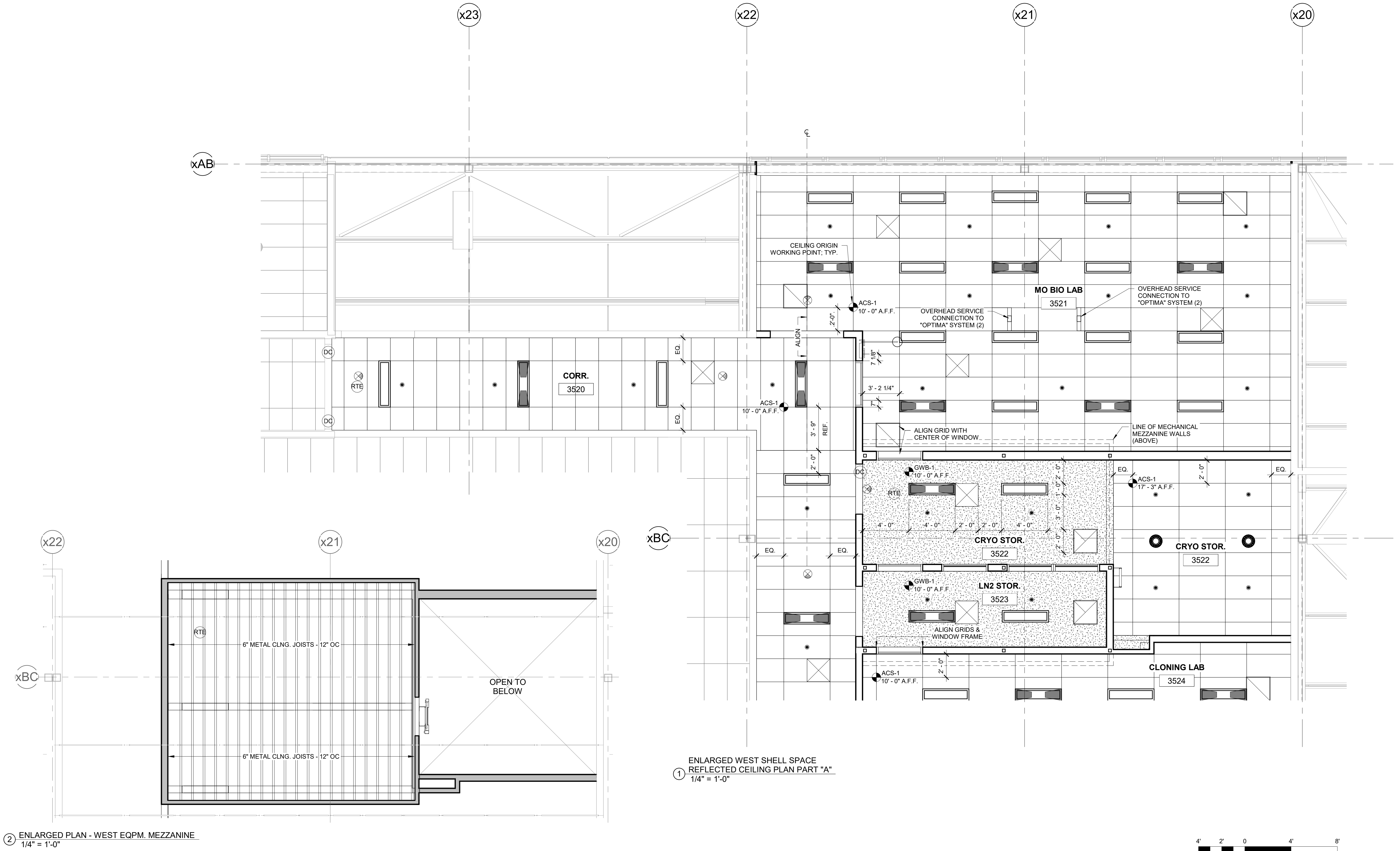
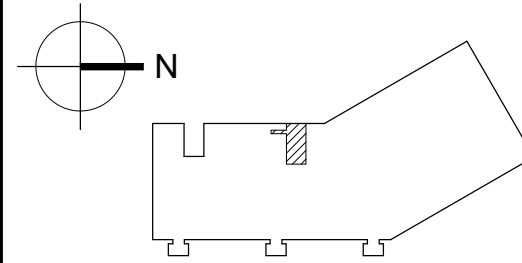


IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"

BAR IS ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



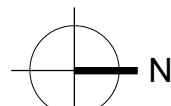


10



GENERAL NOTE:

|       |       |
|-------|-------|
| DSGN: | DC    |
| DR:   | AB/KM |
| CHK:  | DC    |
| APVD: |       |

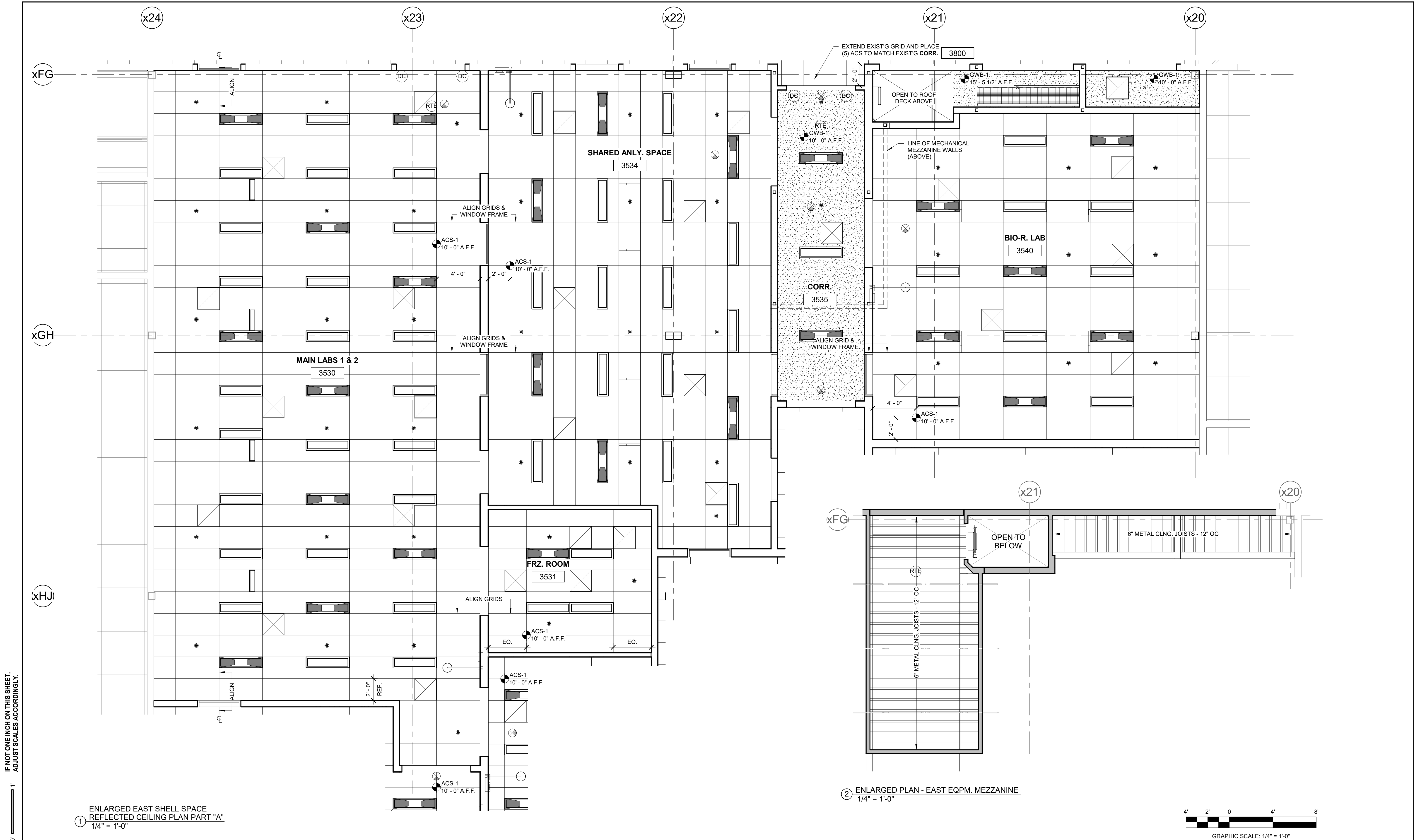


CLD & CCM LABS  
**ARCHITECTURAL**  
 ENLARGED WEST SHELL SPACE  
 REFLECTED CEILING PLAN PART "B"

ISSUE DATE:





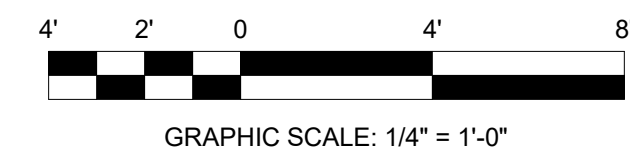


IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

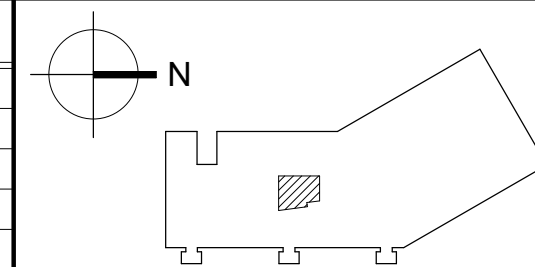
BAR IS ONE INCH ON ORIGINAL DRAWING

1 ENLARGED EAST SHELL SPACE  
REFLECTED CEILING PLAN PART "A"  
1/4" = 1'-0"

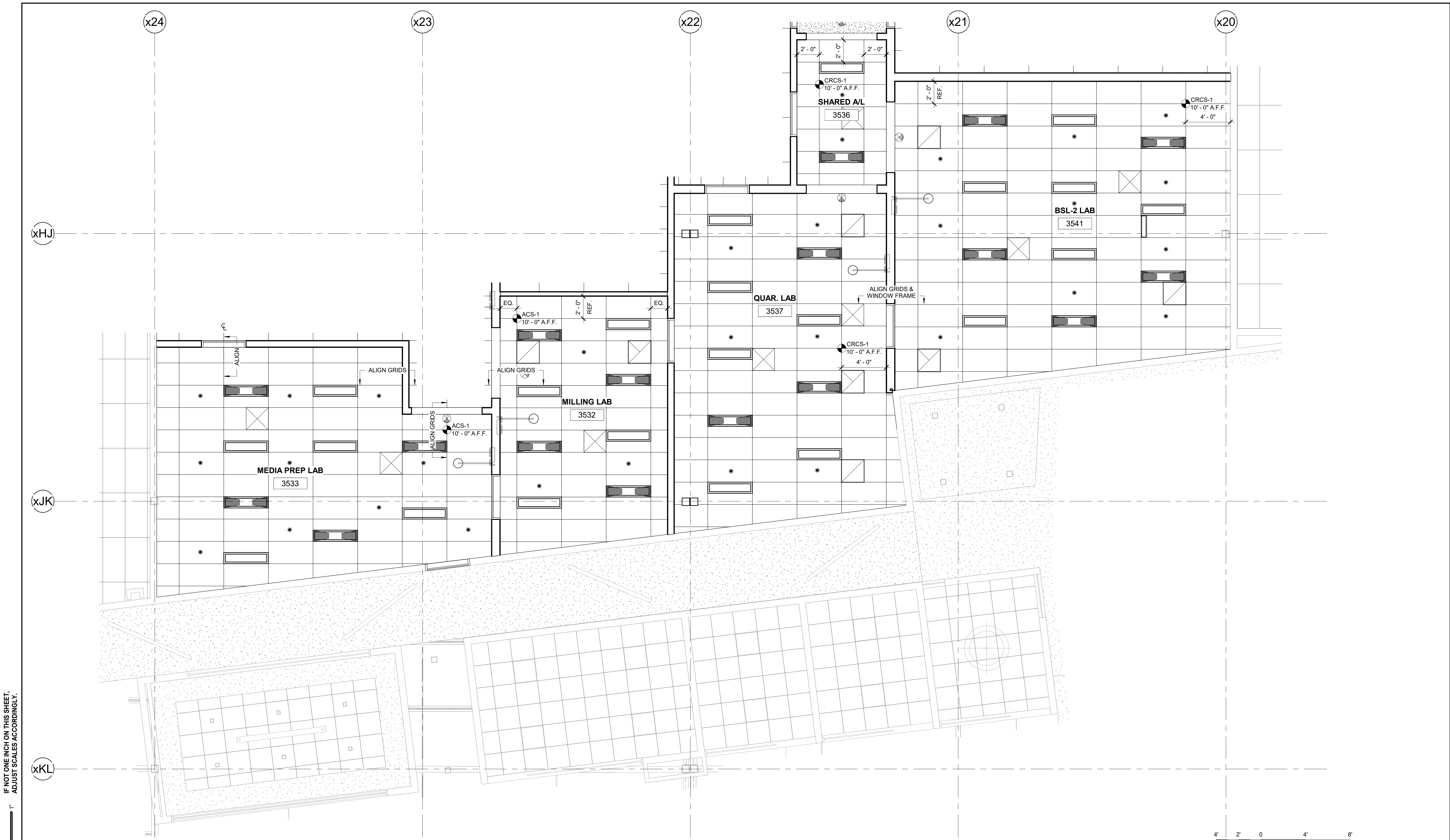
2 ENLARGED PLAN - EAST EQPM. MEZZANINE  
1/4" = 1'-0"



| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |





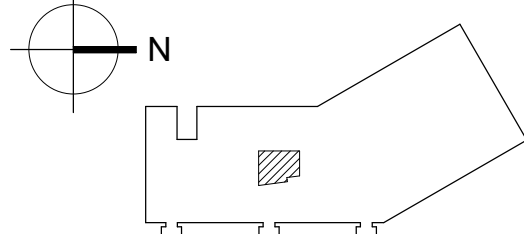




ENLARGED EAST SHELL SPACE  
REFLECTED CEILING PLAN PART "B"  
1/4" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING

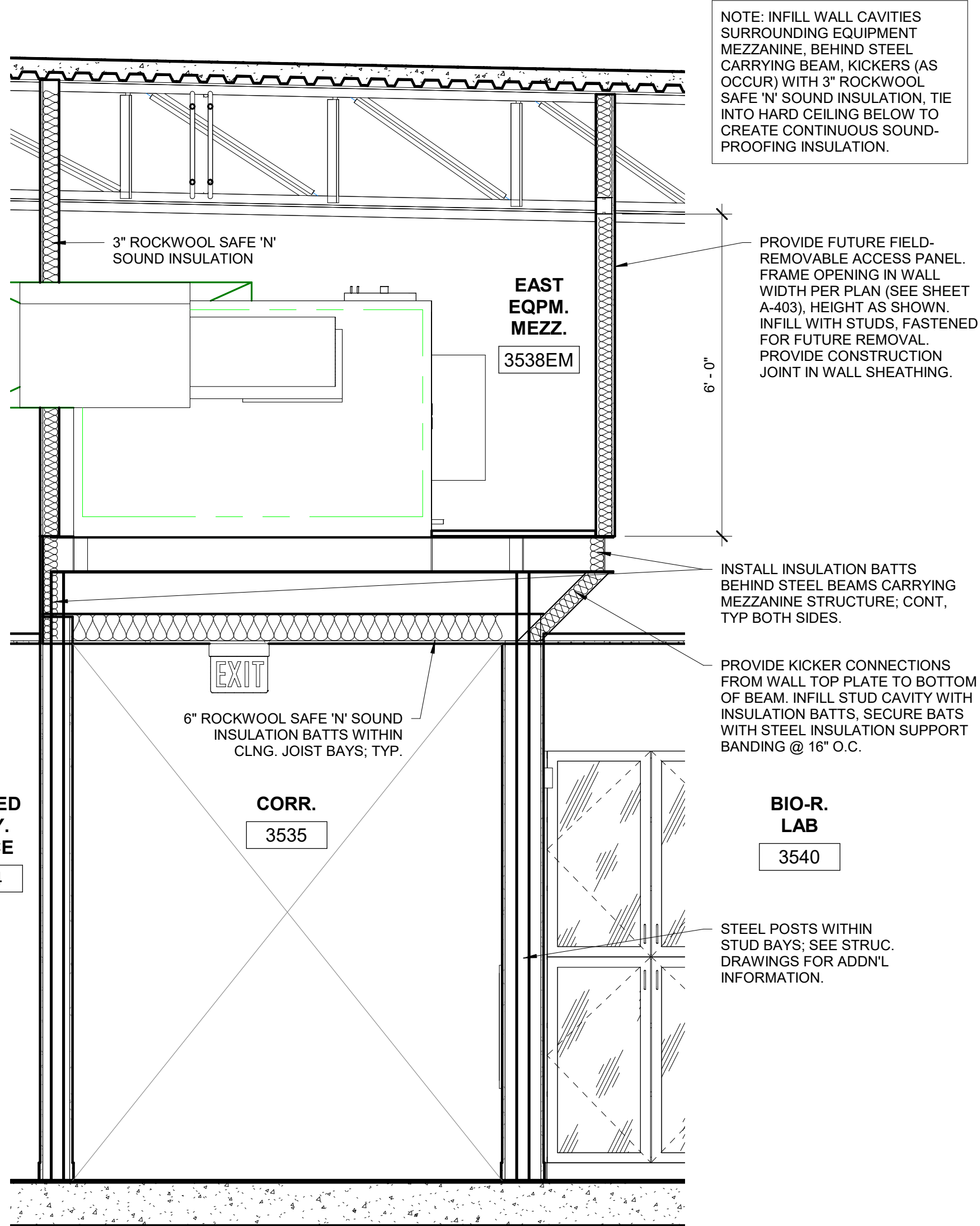
|   |   |  |           |        |               |   |         |         |          |   |  |                                    |
|---|---|--|-----------|--------|---------------|---|---------|---------|----------|---|--|------------------------------------|
|  <b>HART DESIGN GROUP</b><br>800 SCENIC VIEW DRIVE   T: (401) 858-4600<br>CUMBERLAND, RI 02864   F: (401) 858-4609<br>A MEMBER OF THE HART COMPANIES WWW.HARTCOMPANIES.COM |  <b>cytiva</b><br>100 RESULTS WAY<br>MARLBOROUGH, MA 01752 | GENERAL NOTE:<br>ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT. | DSGN: DC  | REV. A | DATE 04-19-21 | REVISION DESCRIPTION ISSUED FOR 90% CLIENT REVIEW | DWG. AB | CHK. DC | APVD. DC |  | CLD & CCM LABS<br><b>ARCHITECTURAL</b><br>ENLARGED EAST SHELL SPACE<br>REFLECTED CEILING PLAN PART "B" | ISSUE DATE:<br>SCALE: 1/4" = 1'-0" |
|   |   |  | DR: AB/KM | 0      | 06-10-21      | ISSUED FOR CONSTRUCTION                           | AB      | DC      | DC       |   |  | PROJ. NO: 20021A CAD FILE:         |



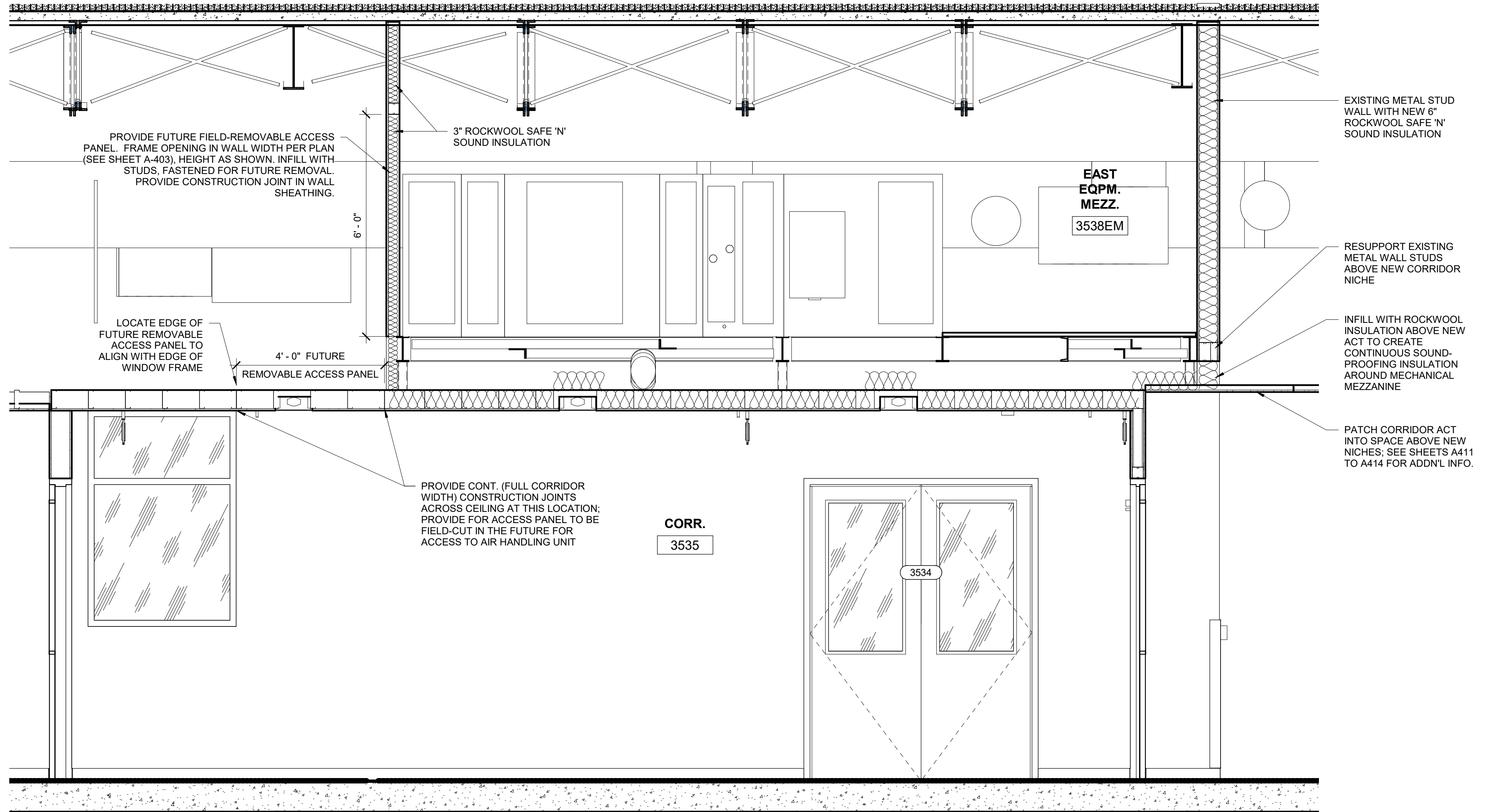
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1'

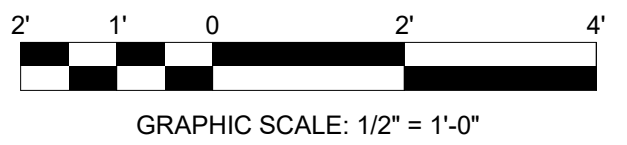
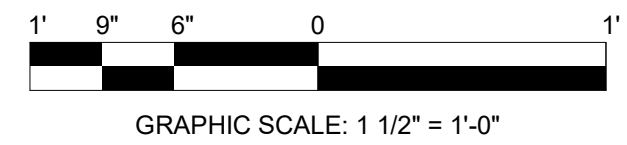
BAR IS ONE INCH ON ORIGINAL DRAWING



① SECTION THROUGH EQUIP. MEZZ. 3528EM - LOOKING WEST.  
1/2" = 1'-0"

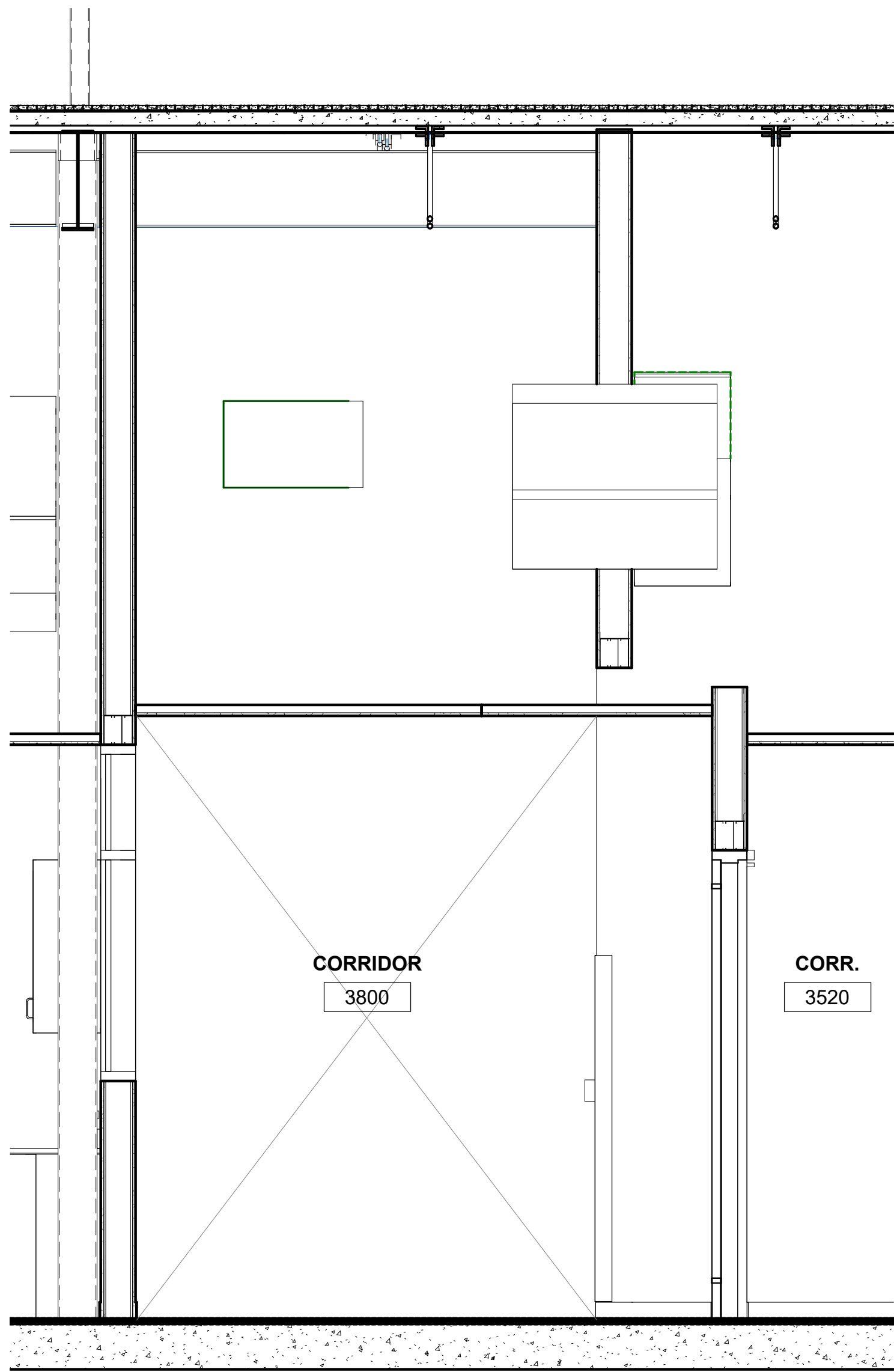


② SECTION THROUGH EQUIP. MEZZ. 3528EM - LOOKING SOUTH  
1/2" = 1'-0"

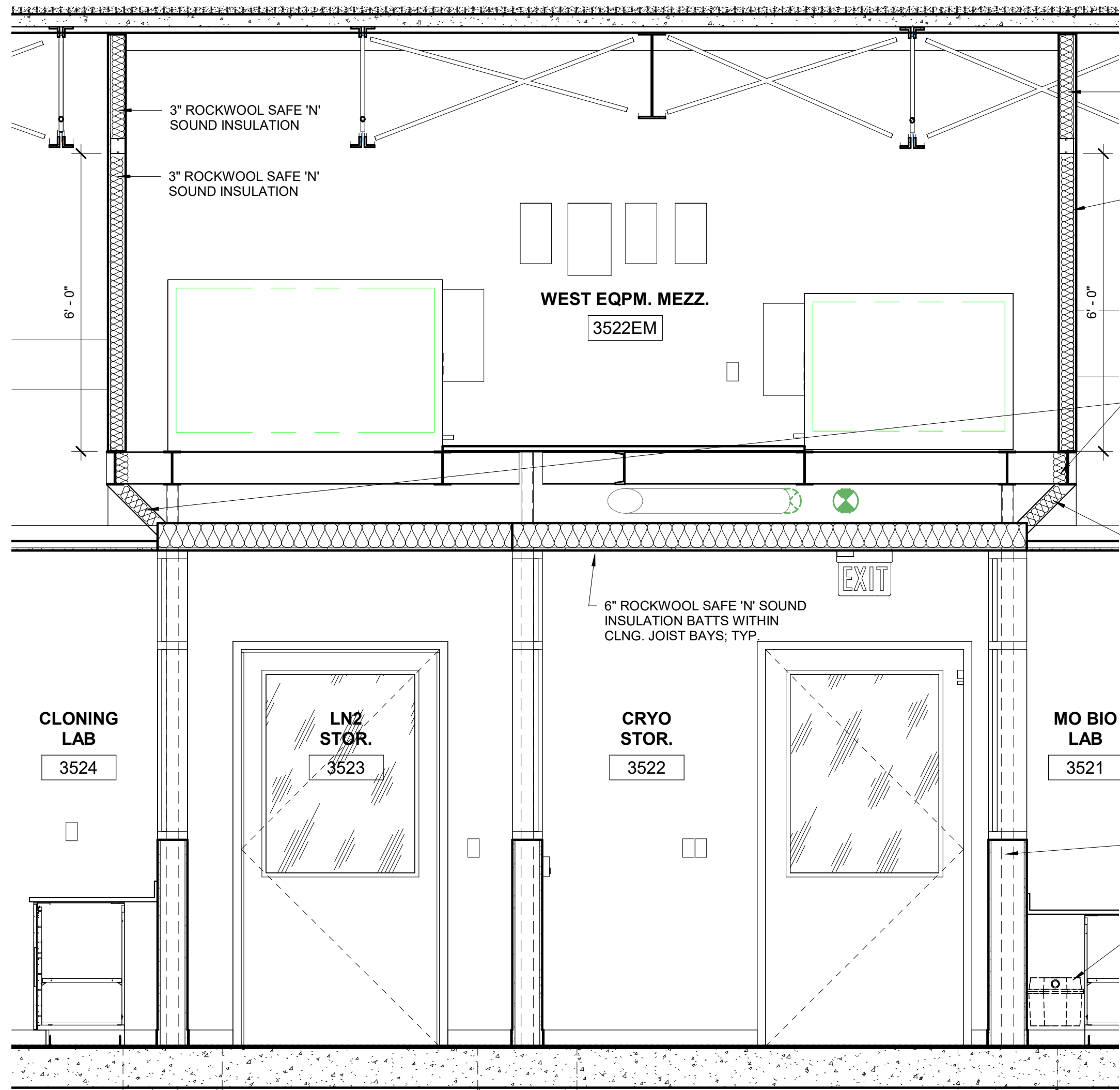


| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KM   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

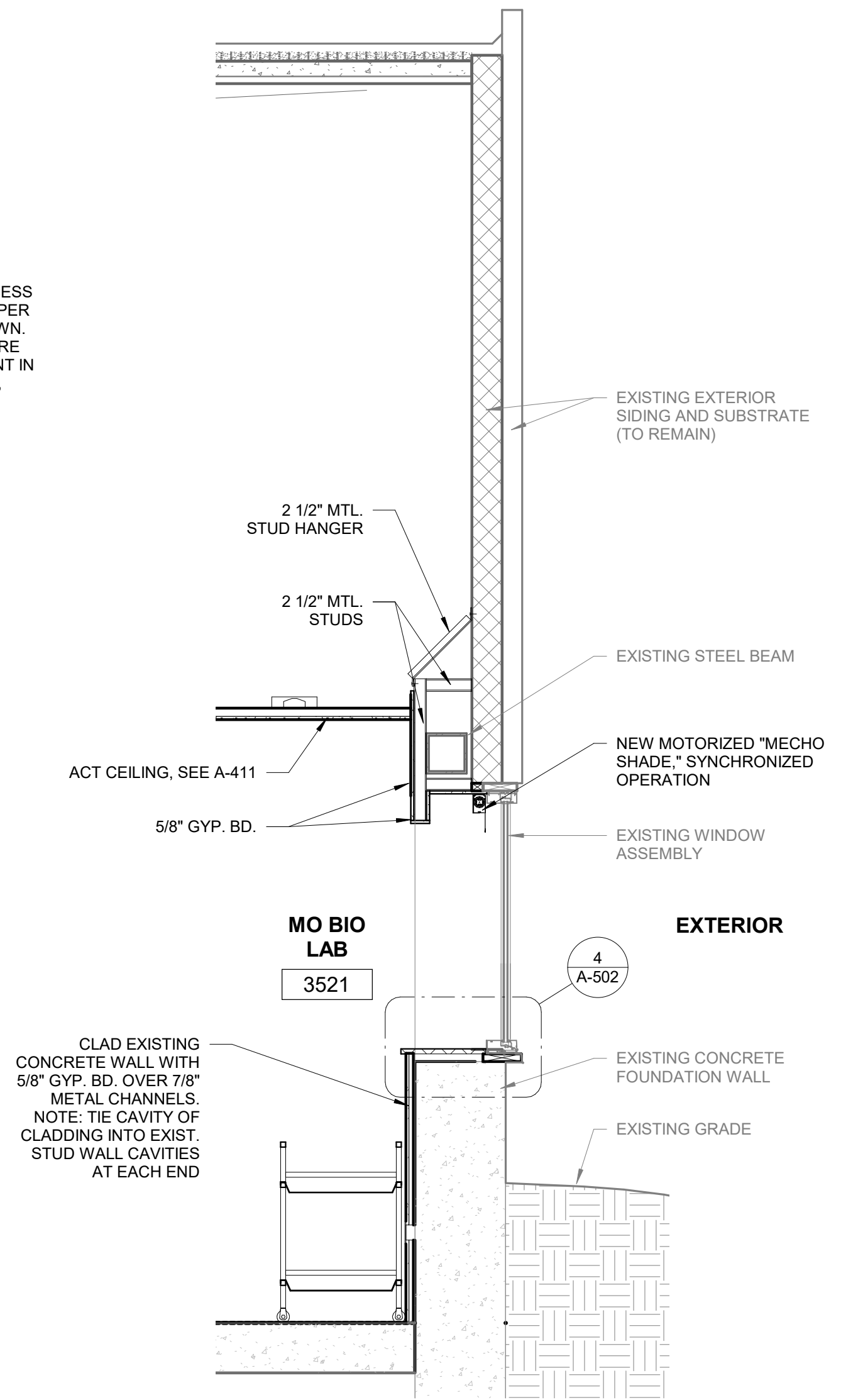




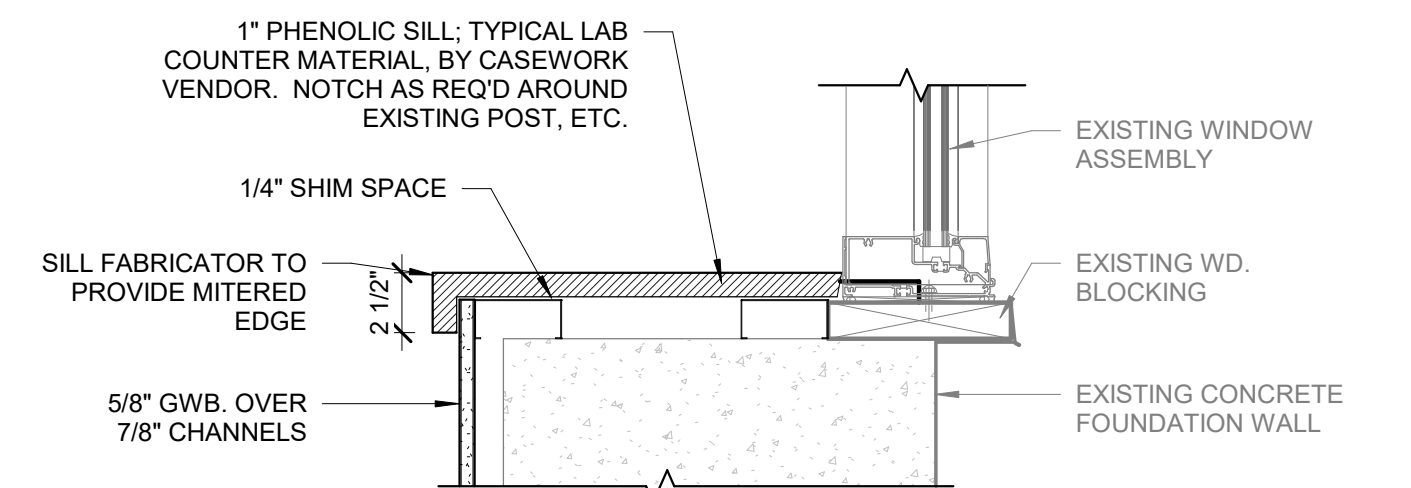
① PART. SECTION @ INTER. CORR'S 3520 & 3800  
1/2" = 1'-0"



② SECTION THROUGH EQUIP. MEZZ. 3522 - LOOKING SOUTH  
1/2" = 1'-0"



③ WALL SECTION @ MO. BIO - EXT. WALL  
1/2" = 1'-0"



④ SILL DETAIL - MO. BIO.  
1 1/2" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

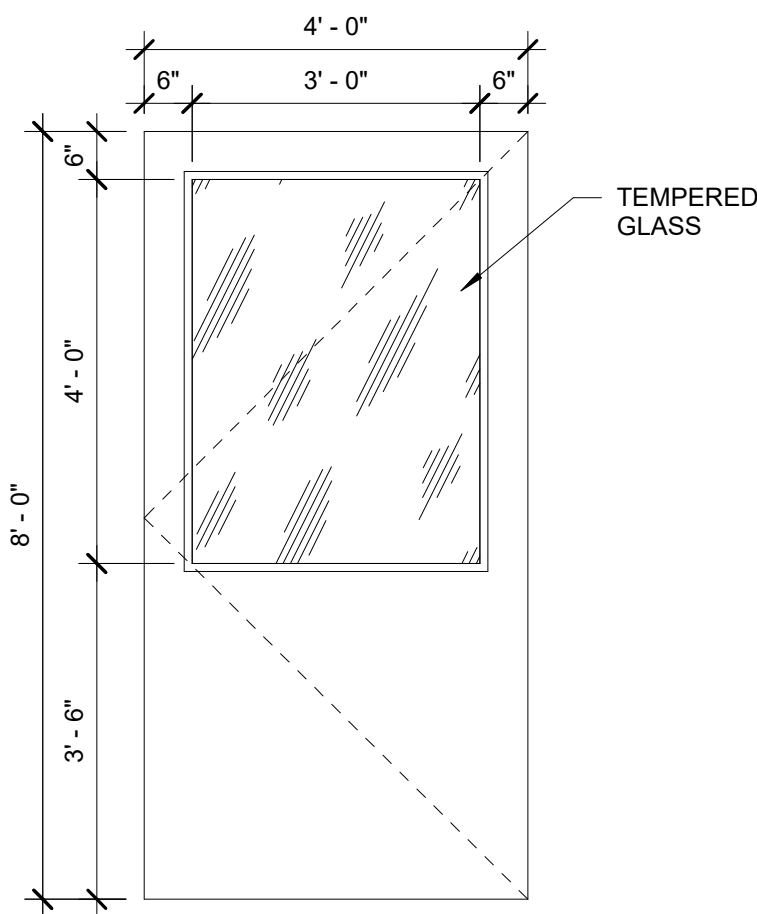
1" = 1'-0"

GENERAL NOTE:

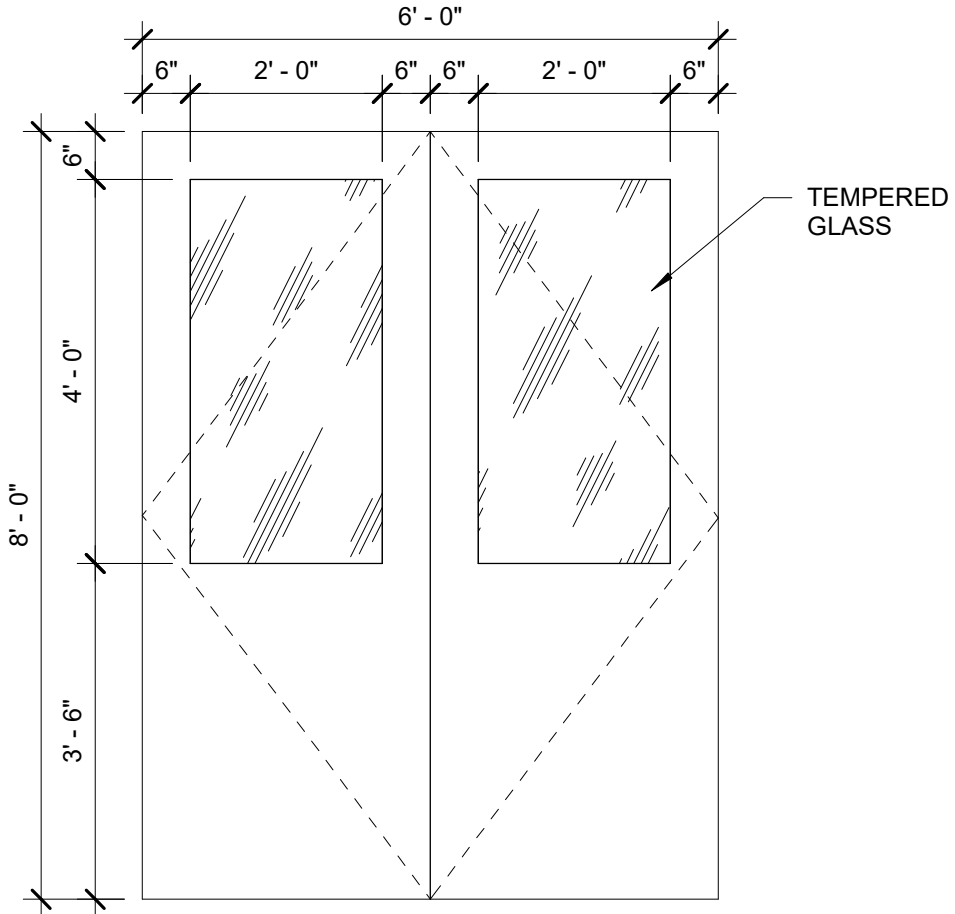
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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| AB/KM |      |          |                              |      |      |       |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

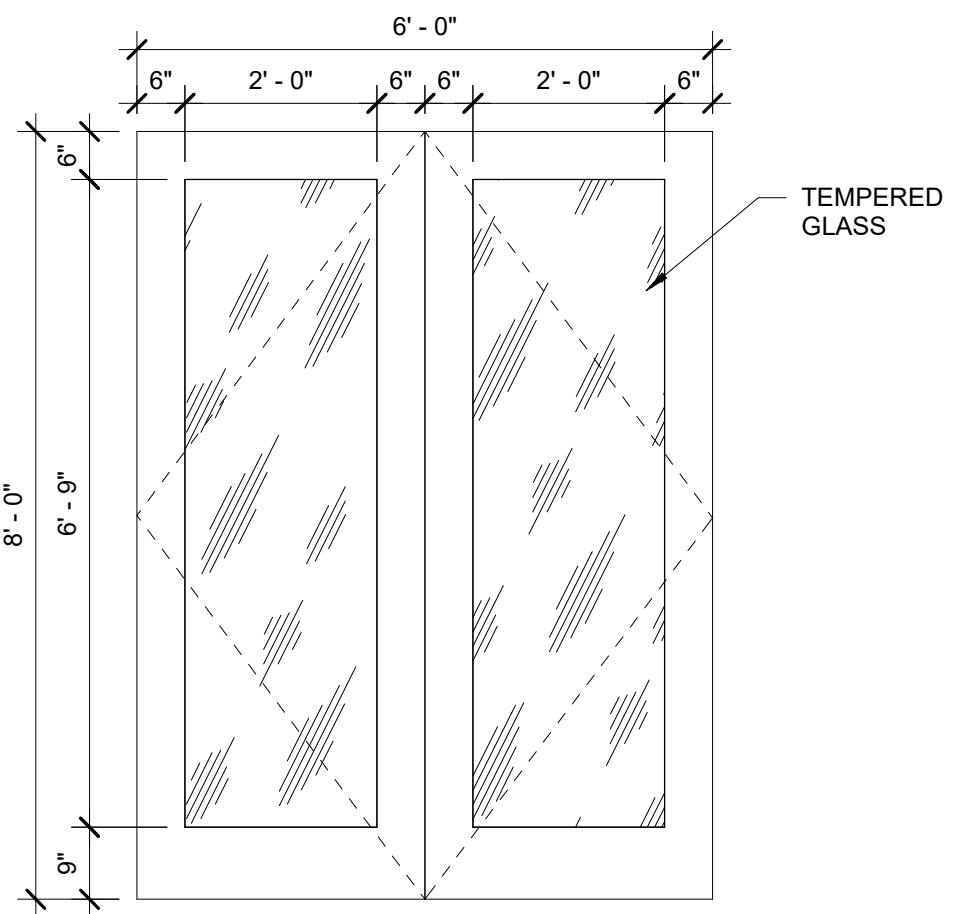




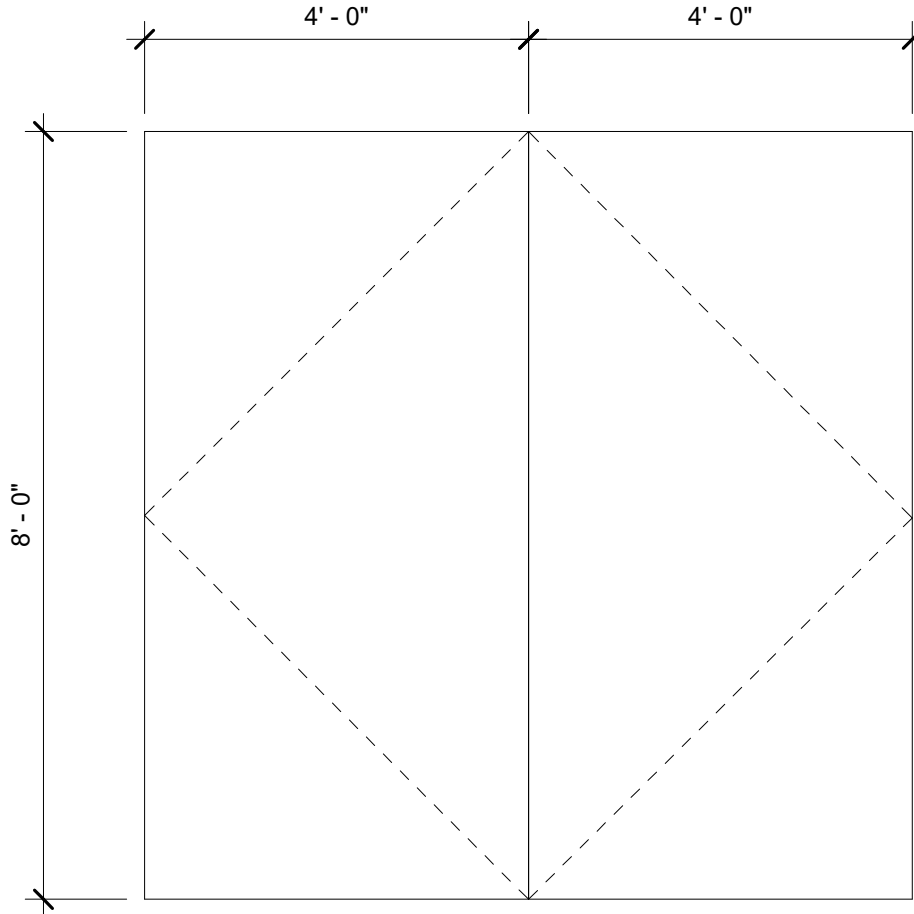
D1 SINGLE DOOR W/ VISION PANEL  
1/2" = 1'-0"



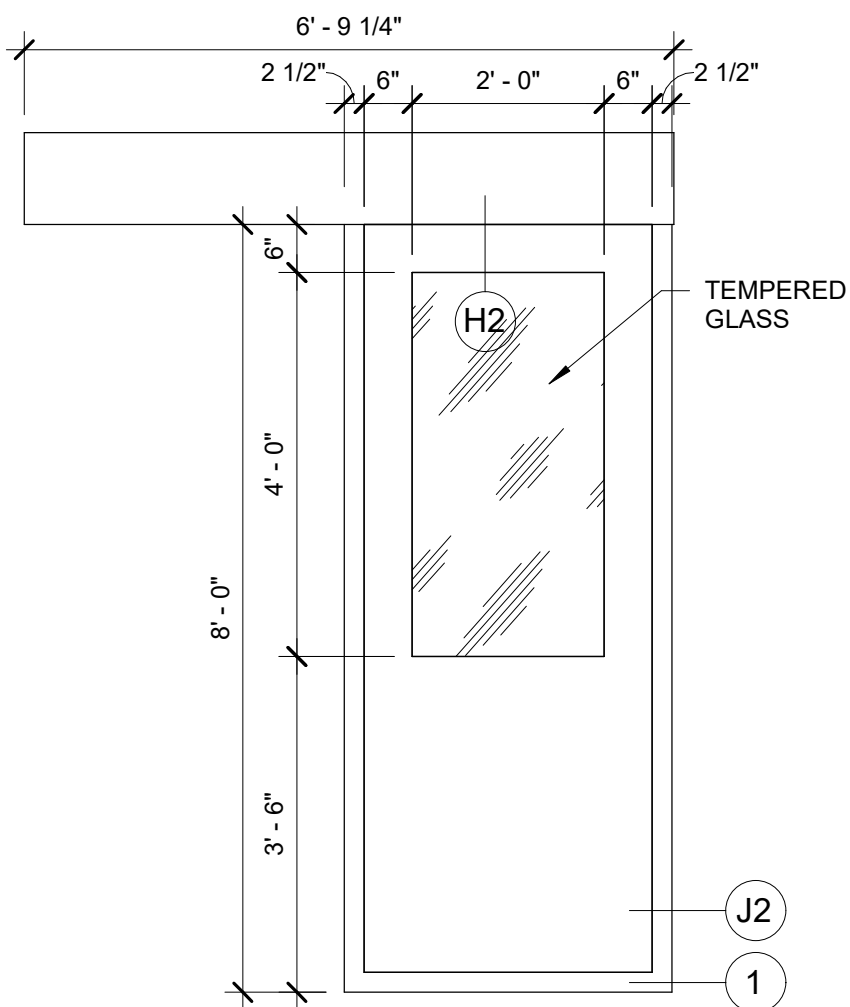
D2 DOUBLE DOOR W/ VISION PANELS  
1/2" = 1'-0"



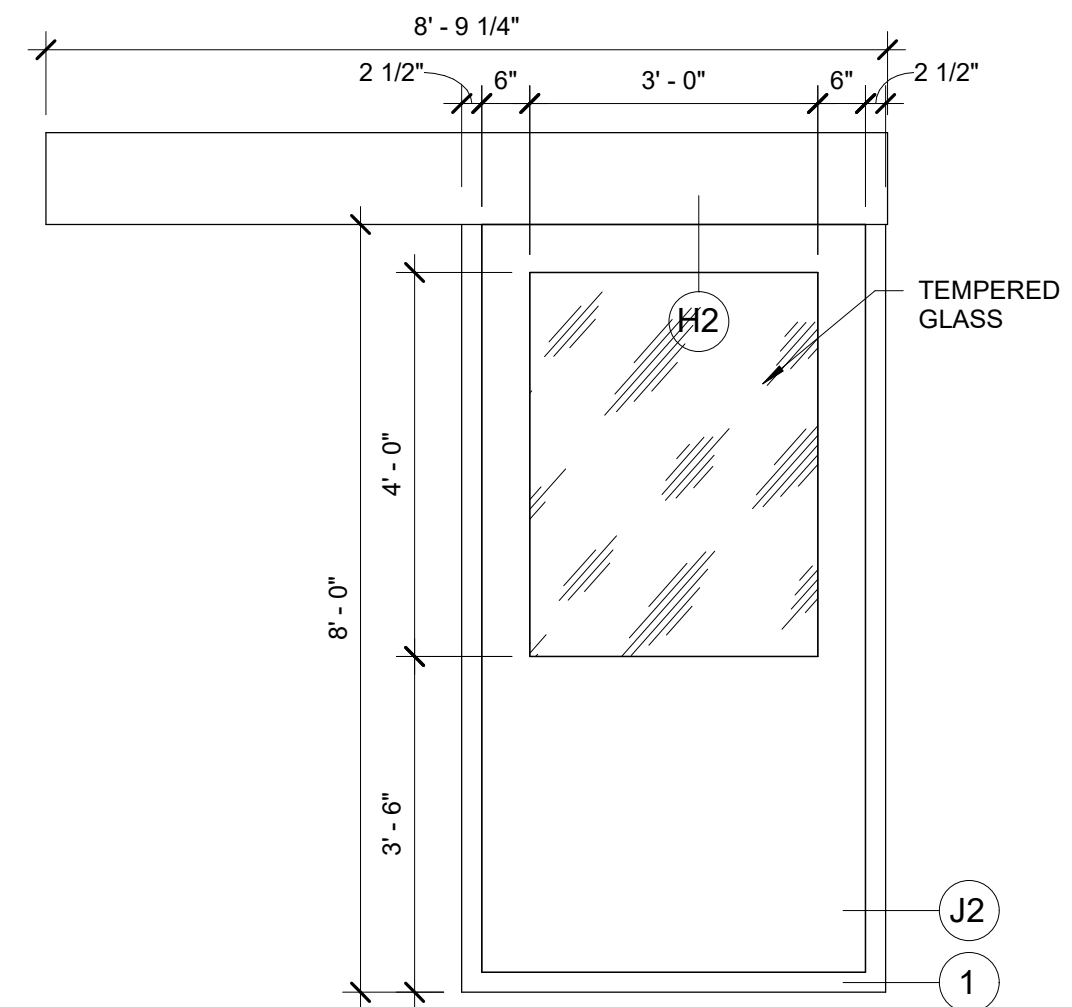
D3 DOUBLE DOOR W/ VISION PANELS  
1/2" = 1'-0"



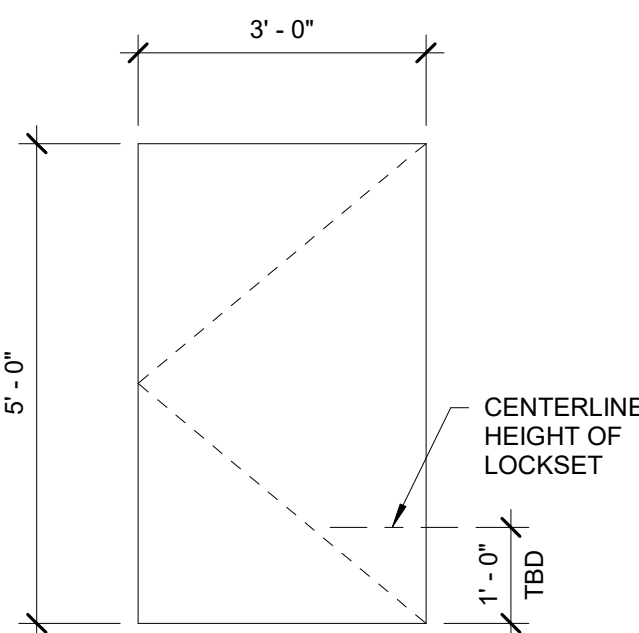
D4 DOUBLE DOOR  
1/2" = 1'-0"



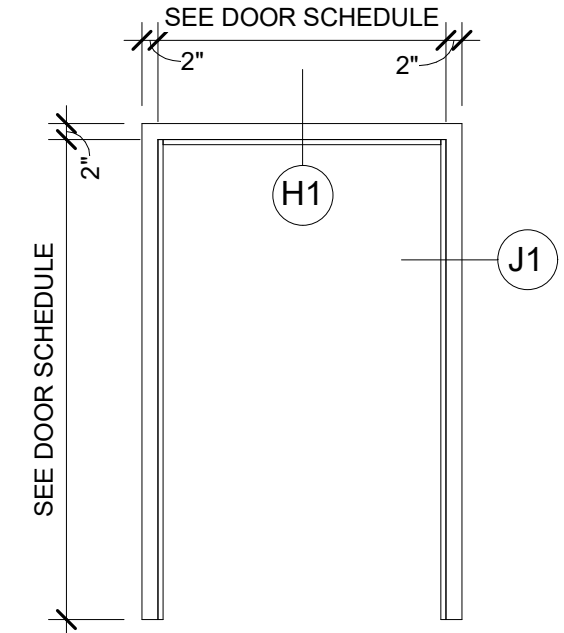
D5 SLIDING DOOR W/ VISION PANEL - 36" W  
1/2" = 1'-0"



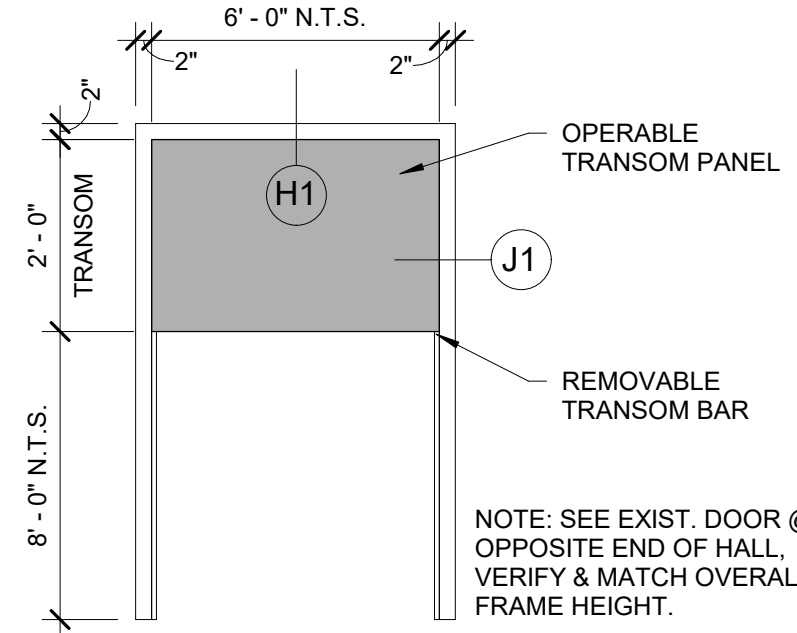
D6 SLIDING DOOR W/ VISION PANEL - 48" W  
1/2" = 1'-0"



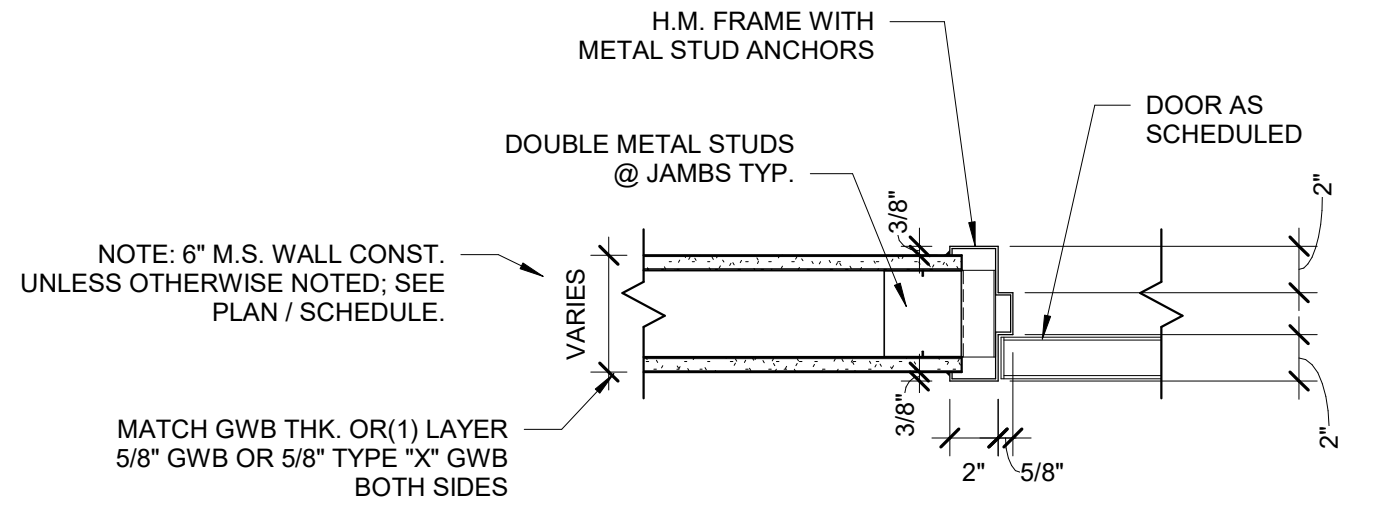
D7 EQUIPMENT MEZZANINE  
1/2" = 1'-0"



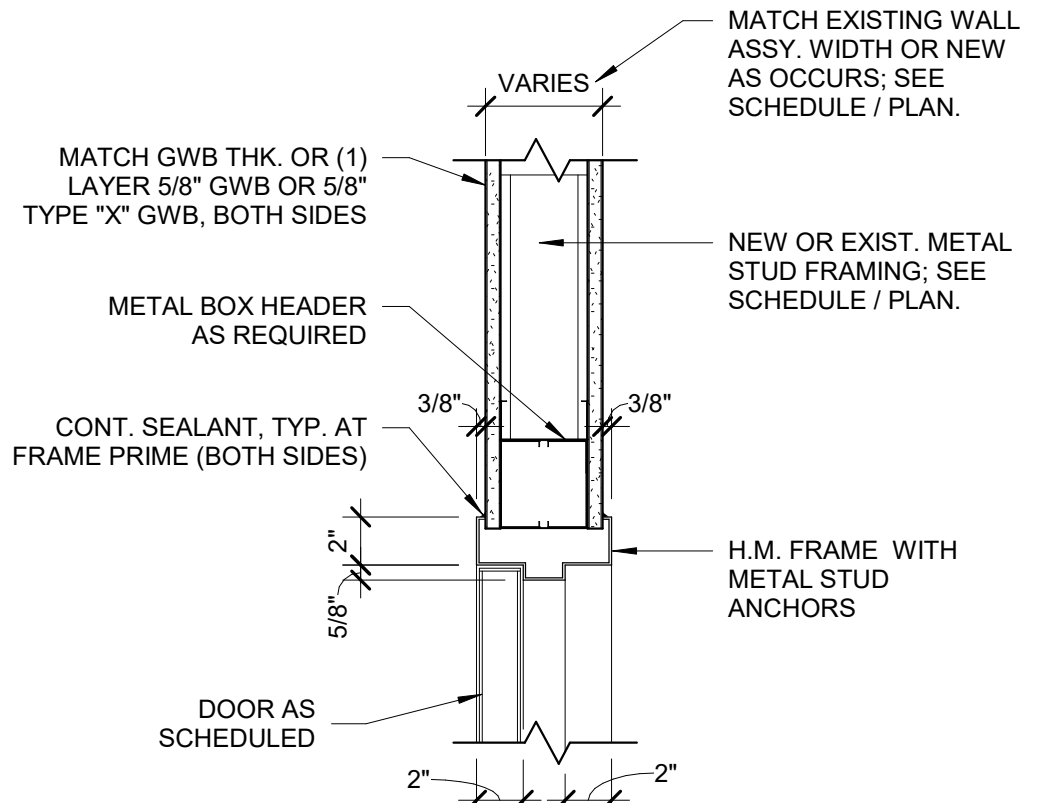
F1 H.M. DOOR FRAME  
1/2" = 1'-0"



F2 H.M. DOOR FRAME W/ TRANSOM  
1/2" = 1'-0"

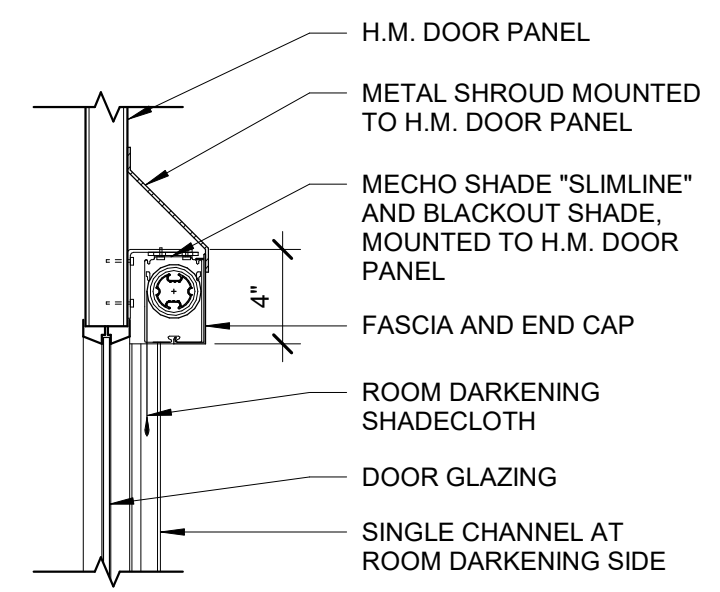


J1 DOOR JAMB - H.M. FRAME IN GWB  
1 1/2" = 1'-0"

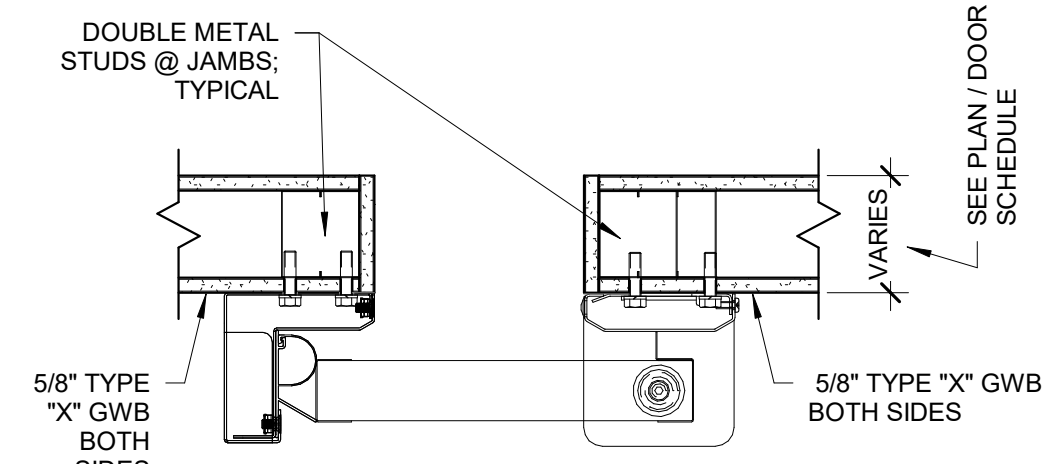


H1 DOOR HEAD - H.M. FRAME IN GWB  
1 1/2" = 1'-0"

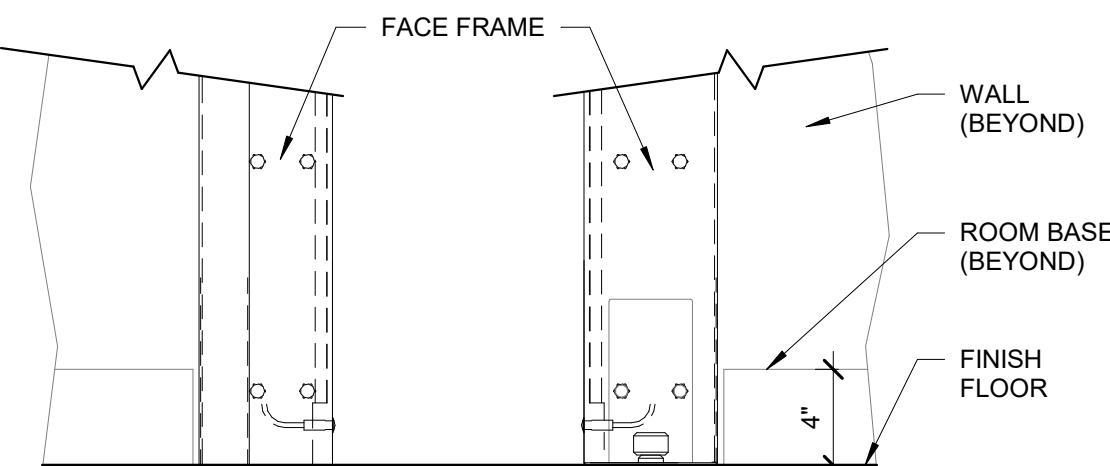
| DOOR SCHEDULE |        |         |         |        |          |       |      |      |          |         |          |  |
|---------------|--------|---------|---------|--------|----------|-------|------|------|----------|---------|----------|--|
| DOOR NO.      | DOOR   |         |         |        |          | FRAME |      |      |          | OPENING |          | COMMENTS                                   |
|               | TYPE   | WIDTH   | HEIGHT  | THICK. | MATERIAL | TYPE  | HEAD | JAMB | MATERIAL | RATING  | HDWR SET |  |
| LEVEL 3       |        |         |         |        |          |       |      |      |          |         |          |  |
| 3520A         | DE1/D1 | 7' - 0" | 7' - 0" | 1 3/4" |          | FE1   |      |      | HM       |         | R-1      | REPLACE EXIST. ACTIVE LEAF; SEE NOTE 'A'   |
| 3520B         | D3     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 2        |  |
| 3521          | D3     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        | PROVIDE MANUAL "MECHO SHADES" AT DOORS     |
| 3522A         | D1     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 1        |  |
| 3522B         | D7     | 3' - 0" | 5' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 6        | 4 7/8" WALL CONST. / SEE NOTE 'B'          |
| 3523          | D1     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 3        |  |
| 3524          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        |  |
| 3525A         | D1     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 1        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3525B         | D5     | 3' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | PVC-STL  | N/A     | C-1      |  |
| 3526A         | D1     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 1        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3526B         | D5     | 3' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | PVC-STL  | N/A     | C-1      |  |
| 3527A         | D1     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 1        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3527B         | D5     | 3' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | PVC-STL  | N/A     | C-1      |  |
| 3530A         | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 2        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3530B         | D6     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | PVC-STL  | N/A     | C-1      | 9 1/4" WALL CONST.                         |
| 3530C         | D6     | 4' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | PVC-STL  | N/A     | C-1      | 9 1/4" WALL CONST.                         |
| 3530D         | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        | 9 1/4" WALL CONST.                         |
| 3532          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        | 9 1/4" WALL CONST.                         |
| 3533          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        |  |
| 3534          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        |  |
| 3535          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 2        |  |
| 3536          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        |  |
| 3537          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        | 9 1/4" WALL / MANUAL "MECHO SHADE" AT DOOR |
| 3538A         | D4     | 8' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 5        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3538B         | D4     | 8' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 5        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3538C         | D7     | 3' - 0" | 5' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 6        | 4 7/8" WALL CONST. / SEE NOTE 'B'          |
| 3539          | D4     | 8' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | 45 MIN. | 5        | MATCH EXIST. WALL THICKNESS (6" APX.)      |
| 3540          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        | 9 1/4" WALL CONST.                         |
| 3541          | D2     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F1    | H1   | J1   | HM       | N/A     | 4        | 9 1/4" WALL CONST.                         |
| 3800          | D3     | 6' - 0" | 8' - 0" | 1 3/4" | HM       | F2    | H1   | J1   | HM       | N/A     | 7        | W/ REMOVABLE DOOR TRANSOM                  |



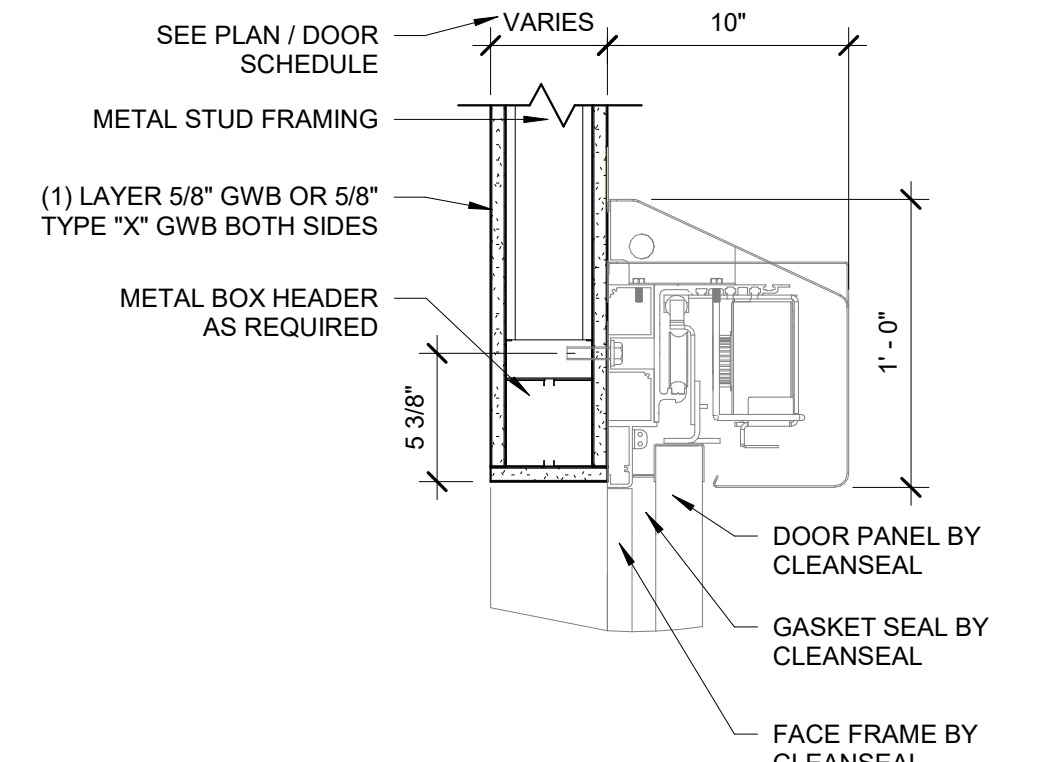
J2 DOOR SHADE DETAIL  
1 1/2" = 1'-0"



J1 DOOR JAMB - H.M. FRAME IN GWB  
1 1/2" = 1'-0"



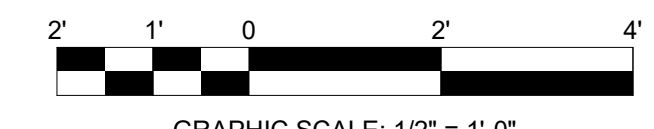
H1 DOOR HEAD - H.M. FRAME IN GWB  
1 1/2" = 1'-0"



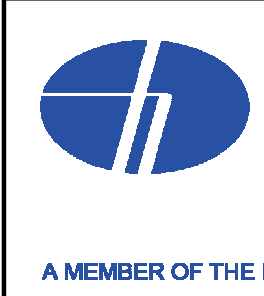
H2 HEADER & SHROUD ASSEMBLY (SIDE VIEW)  
1 1/2" = 1'-0"

**NOTE 'A':**  
REPLACE ACTIVE LEAF; RETROFIT HARDWARE PER SPECS. INACTIVE LEAF AND TRANSOM PANEL TO REMAIN. PROVIDE VIEWING LITE IN NEW ACTIVE LEAF SIMILAR TO TYPE "D1," EXCEPT 2'-6" WIDE LITE (EXIST LEAF IS 3'-6" WIDE).

**NOTE 'B':**  
DOOR HANDLESET TO BE LOW-MOUNTED AS TO BE WITHIN REACH OF LADDER. COORDINATE LOCATION WITH ARCHITECT PRIOR TO INSTALL.



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



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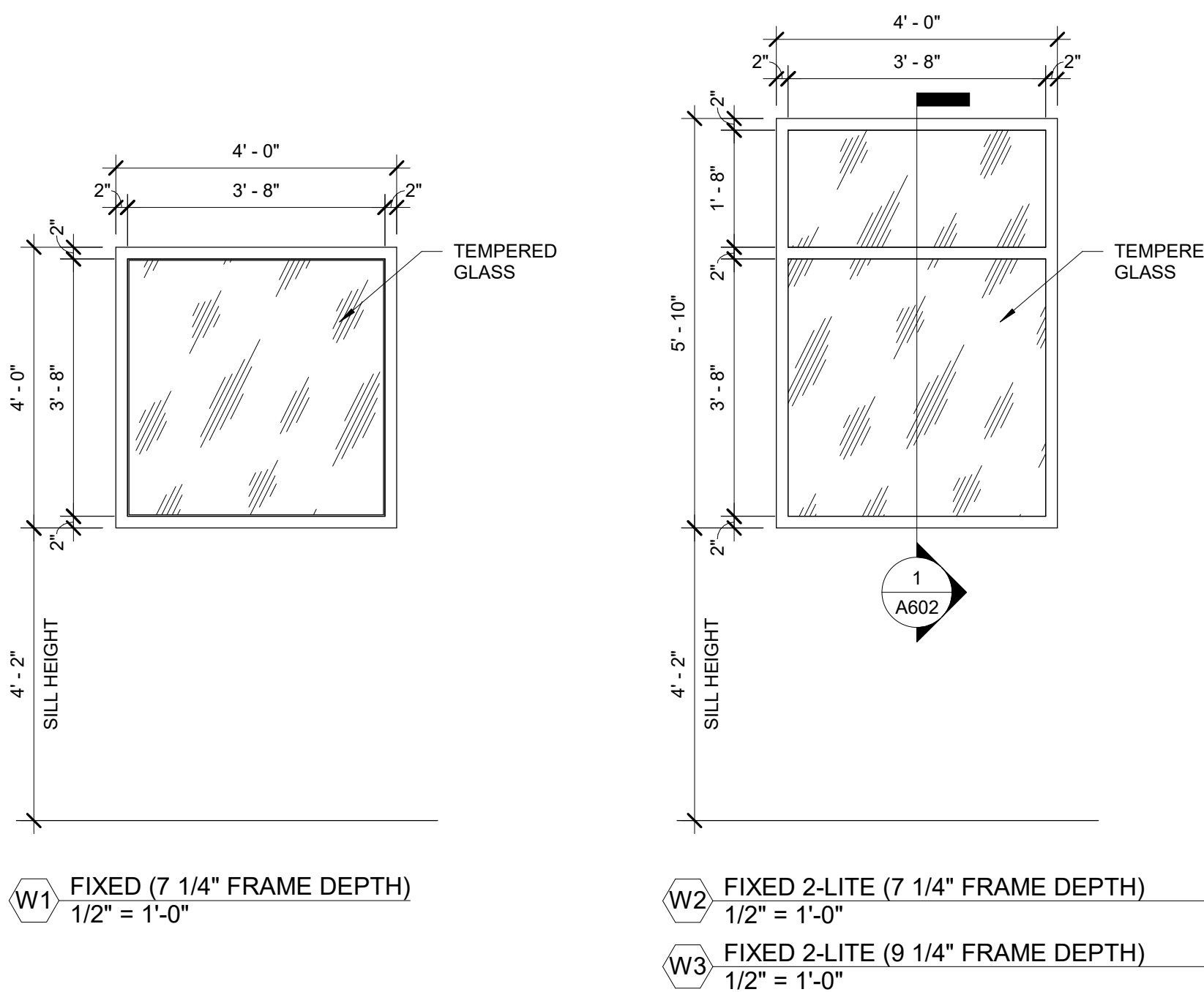
|  |  |       |    |      |          |                              |      |      |       |
|--|--|-------|----|------|----------|------------------------------|------|------|-------|
| GENERAL NOTE:<br>ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT. |  | DSGN: | DC | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|  |  | DR:   | KM | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | KM   | DC   |       |
|  |  |       |    | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KM   | DC   |       |
|  |  | CHK:  | DC | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
|  |  | APVD: |    |      |          |                              |      |      |       |

CLD & CCM LABS  
**ARCHITECTURAL**  
DOOR & WINDOW SCHEDULE

ISSUE DATE:  
SCALE: AS NOTED  
SHEET NUMBER  
**A-601**

PROJ. NO: 20021A CAD FILE:



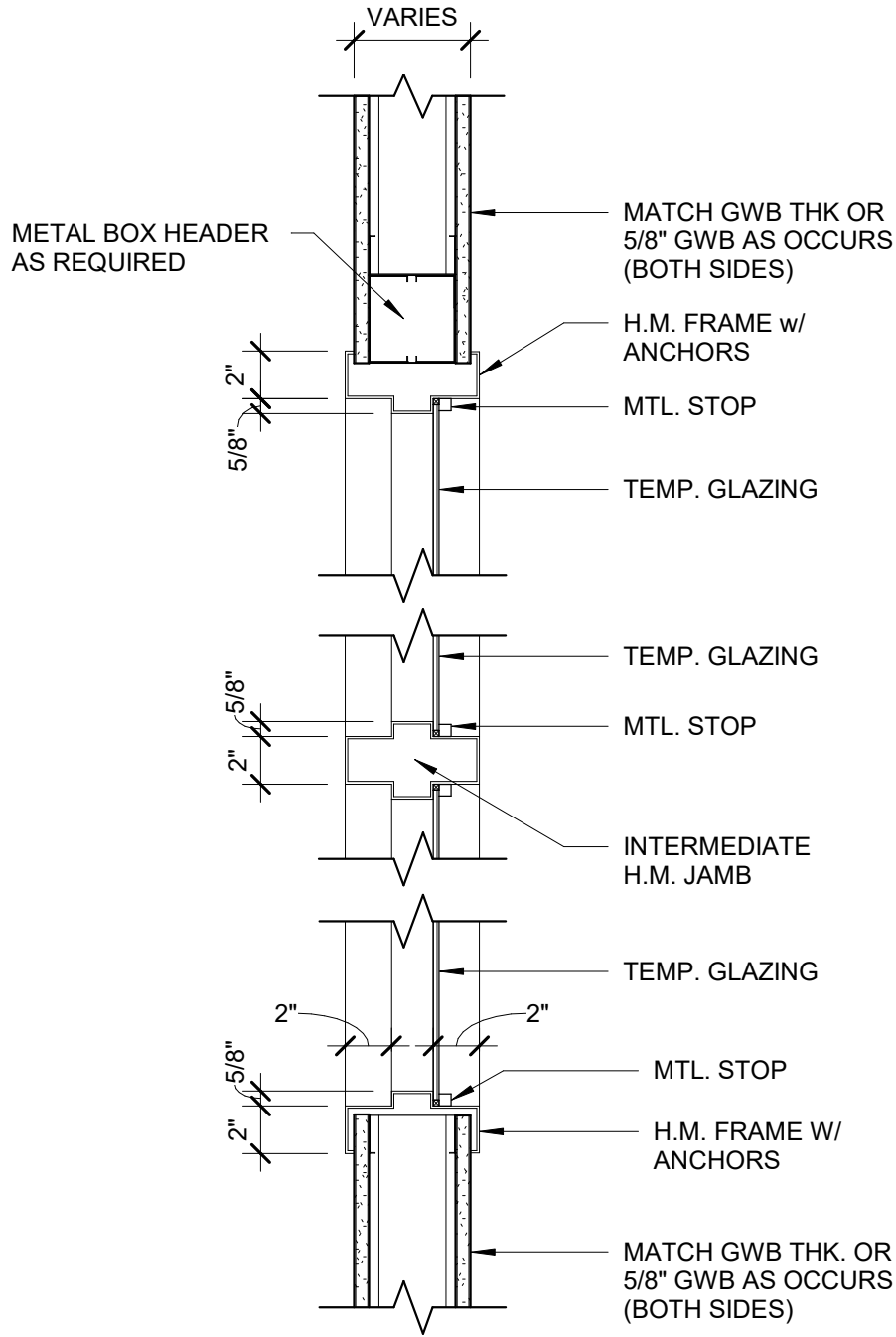


W1 FIXED (7 1/4" FRAME DEPTH)  
1/2" = 1'-0"

W2 FIXED 2-LITE (7 1/4" FRAME DEPTH)  
1/2" = 1'-0"

W3 FIXED 2-LITE (9 1/4" FRAME DEPTH)  
1/2" = 1'-0"

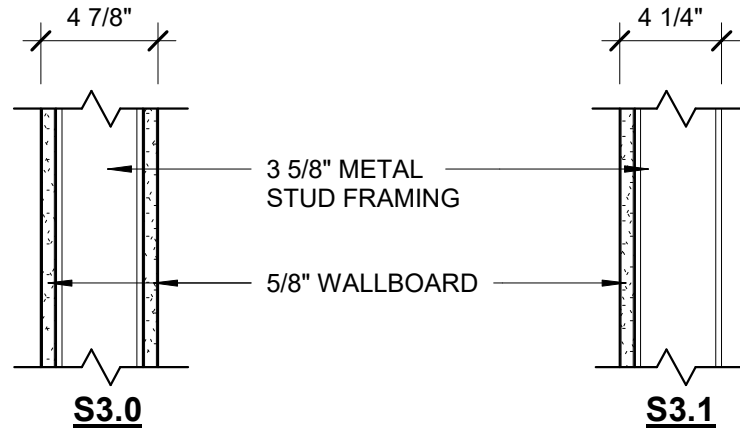
| WINDOW SCHEDULE |       |         |         |          |            |          |
|-----------------|-------|---------|---------|----------|------------|----------|
| WINDOW TYPE     | COUNT | HEIGHT  | WIDTH   | GLAZING  | FRAME MAT. | COMMENTS |
| W1              | 3     | 3' - 8" | 3' - 8" | TEMPERED | HM         |          |
| W2              | 13    | 5' - 6" | 3' - 8" | TEMPERED | HM         |          |
| W3              | 7     | 5' - 6" | 3' - 8" | TEMPERED | HM         |          |



1 SECTION AT INT. WINDOW  
1 1/2" = 1'-0"

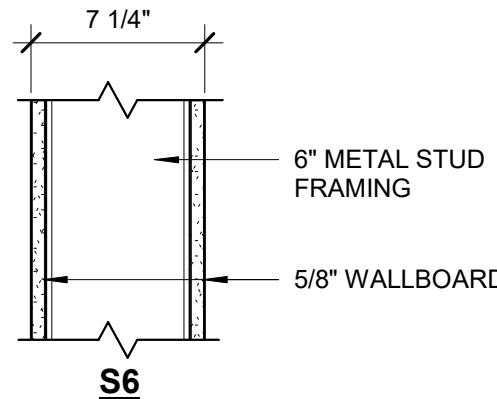
NOTE:  
FOR ALL PARTITIONS NOT DIRECTLY ATTACHED TO ROOF STRUCTURE ABOVE PROVIDE BRACING / ATTACHMENT FROM TOP PLATE OF METAL PARTITIONS UP TO ROOF DECK ABOVE PER METAL FRAMING MANUFACTURER REQUIREMENTS.

NOTE:  
FOR EXISTING DEMISING PARTITIONS BETWEEN CORRIDOR 3800 AND SHELL SPACES: PROVIDE 5/8" GWB CONT. ALONG SHELL SIDE OF EXISTING WALL TO 12'-0" A.F.F. SEE SHEETS A-402, A-403, AND SEE FINISH SCHEDULE.



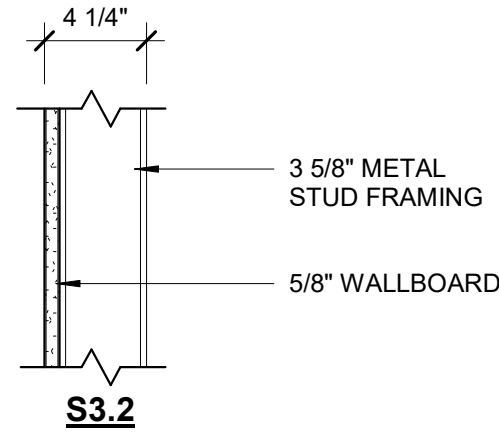
S3.0 (4 7/8")  
• 3 5/8" - 20 Ga. TOP AND BOTTOM TRACKS.  
• 3 5/8" - 20 Ga. METAL STUDS @16" O.C. TO 10'-6" AFF.  
• (1) LAYER OF 5/8" TYPE "X" GYPSUM WALLBOARD ON BOTH SIDE OF PARTITION.  
S3.1 (4 1/4") - SAME AS S3.0 EXCEPT:  
• (1) LAYER OF 5/8" TYPE "X" GYPSUM WALLBOARD ON FINISH SIDE OF PARTITION.

S3 INTERIOR PARTITION - 3 5/8" MTL. STUDS  
1 1/2" = 1'-0"

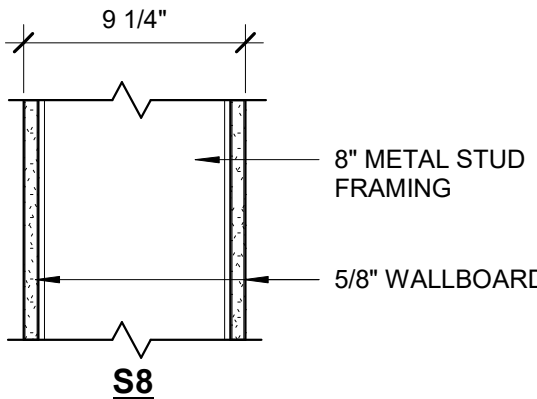


S6 (7 1/4")  
• 6" - 20 Ga. TOP AND BOTTOM TRACKS.  
• 6" - 20 Ga. METAL STUDS @16" O.C. TO 10'-6" AFF.  
• (1) LAYER OF 5/8" TYPE "X" GYPSUM WALLBOARD ON BOTH SIDE OF PARTITION.  
• 1-HR FIRE RATED; UL U419 (SIMILAR)  
S6.1 (7 1/4") - SAME AS S6.0 EXCEPT:  
• SET TOP TRACK / TOP OF WALL TO SUPPORT METAL CLNG. JOISTS FOR GWB-1 "HARD" CEILINGS; TYP. 10'-0" A.F.F. U.O.N.  
S6.2 (7 1/4") - SAME AS S6.0 EXCEPT:  
• FASTEN TOP TRACK TO BOTTOM OF MEZZANINE STEEL BEAMS (APX. 11'-4" A.F.F. (REF)).  
S6.3 (7 1/4") - SAME AS S6.0 EXCEPT:  
• FASTEN TOP TRACK TO ROOF DECK / STRUCTURE ABOVE.

S6 INTERIOR PARTITION - 6" MTL. STUDS  
1 1/2" = 1'-0"

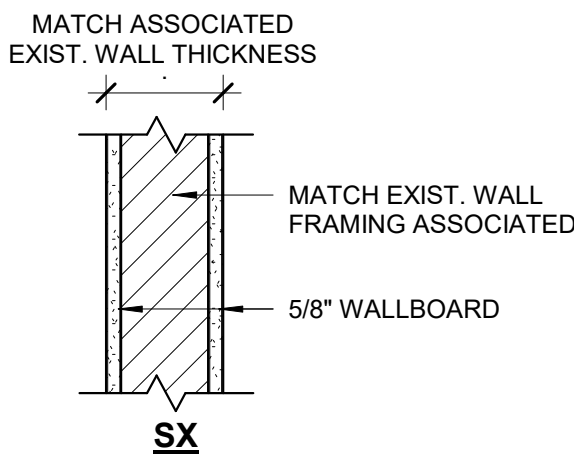


S3.2 (4 7/8") - SAME AS S3.0 EXCEPT:  
• 3 5/8" - 20 Ga. TOP AND BOTTOM TRACKS.  
• 3 5/8" 20 Ga. METAL STUDS @16" O.C. TO 8'-9 1/4" AFF.  
• (1) LAYER OF 5/8" TYPE "X" GYPSUM WALLBOARD ON EXTERIOR SIDE OF PARTITION  
• FASTEN TOP TRACK TO ROOF DECK / STRUCTURE ABOVE.  
• CONT. BATT INSULATION WITHIN STUD BAYS



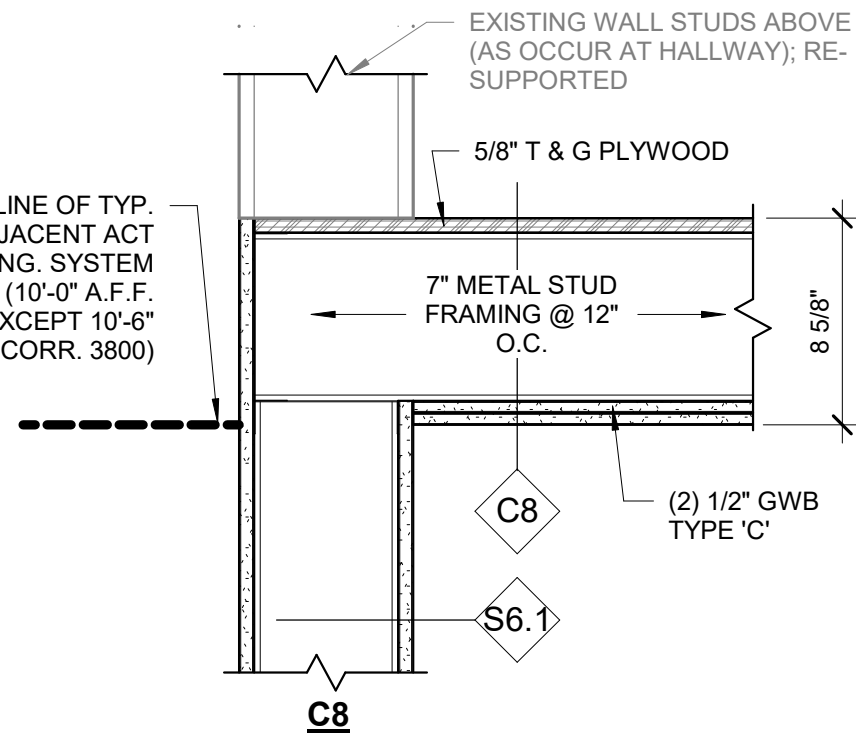
S8 (9 1/4")  
• 8" - 20 Ga. TOP AND BOTTOM TRACKS.  
• 8" - 20 Ga. METAL STUDS @16" O.C. TO 10'-6" AFF.  
• (1) LAYER OF 5/8" TYPE "X" GYPSUM WALLBOARD ON BOTH SIDE OF PARTITION.  
S8.1 (9 1/4") - SAME AS S8.0 EXCEPT:  
• SET TOP TRACK / TOP OF WALL AT 10'-0" A.F.F.  
S8.2 (9 1/4") - SAME AS S8.0 EXCEPT:  
• FASTEN TOP TRACK TO BOTTOM OF MEZZANINE STEEL BEAMS (APX. 11'-4" A.F.F. (REF)).  
S8.3 (9 1/4") - SAME AS S8.0 EXCEPT:  
• FASTEN TOP TRACK TO ROOF DECK / STRUCTURE ABOVE.

S8 INTERIOR PARTITION - 8" MTL. STUDS  
1 1/2" = 1'-0"



SX (MATCH EXISTING)  
• MATCH EXIST. - TOP AND BOTTOM TRACKS.  
• MATCH EXIST. - METAL STUDS @16" O.C. TO 10'-6" AFF. OR TO EXIST T.O.W. AS OCCURS.  
• (1) LAYER OF 5/8" TYPE "X" GYPSUM WALLBOARD ON BOTH SIDE OF PARTITION.

SX INTERIOR PARTITION - MATCH EXISTING  
1 1/2" = 1'-0"



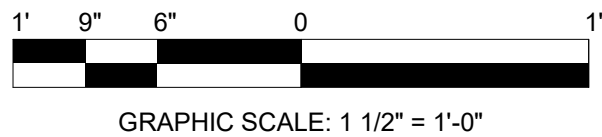
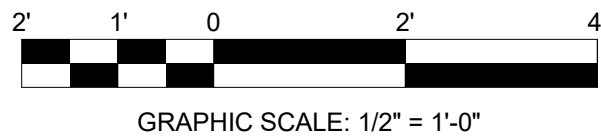
C8 (8 5/8")  
• 7" - 18 Ga. METAL STUDS @24" O.C.  
• (1) LAYER OF 5/8" T & G PLYWOOD  
• (2) LAYERS OF 1/2" GWB TYPE 'C'  
• 1HR FIRE RATED - UL L524

C8 1-HR CEILING SYSTEM @ RATED WALL  
1 1/2" = 1'-0"

ROOM FINISH SCHEDULE

| RM. NO. | ROOM NAME              | FLOOR          |          |      | WALLS           |                   |                |                  |                 |                   |                |                  | CEILING | NOTES   |
|---------|------------------------|----------------|----------|------|-----------------|-------------------|----------------|------------------|-----------------|-------------------|----------------|------------------|---------|---|
|         |                        | MATERIAL       | FINISH   | BASE | NORTH WALL MAT. | NORTH WALL FINISH | EAST WALL MAT. | EAST WALL FINISH | SOUTH WALL MAT. | SOUTH WALL FINISH | WEST WALL MAT. | WEST WALL FINISH | FINISH  |   |
| 3520    | CORR.                  | VCT            | SEE A405 | VCB  | GLAZ/GWB        | PAINT             | N/A            | N/A              | EX. GWB         | PAINT             | GWB            | PAINT            | ACS-1   | COMPOUND, SAND SMOOTH EXIST. SOUTH & EAST WALLS PRIOR TO PAINT.   |
| 3521    | MO BIO LAB             | SHEET VINYL    | SEE A405 | ICB* | EX. GWB         | PAINT             | GWB            | PAINT            | EX. GWB         | PAINT             | EX. GLAZ/GWB   | PAINT            | ACS-1   | PROVIDE AUTO, SYNCHRONIZED "MECHO SHADES" AS NOTED (EXCEPT AT DOORS)                                    |
| 3522    | CRYO STOR.             | FLOOR PAINT    | N/A      | VCB  | EX. GWB         | PAINT             | GLAZ/GWB       | PAINT            | GWB             | PAINT             | GLAZ/GWB       | PAINT            | GWB     | PROVIDE BATT INSULATION CONT. WITHIN CLNG. JOIST BAYS   |
| 3522EM  | WEST EQPM. MEZZ.       | MTL. GRATE     | N/A      | N/A  | N/A             | N/A               | N/A            | N/A              | N/A             | N/A               | N/A            | N/A              | N/A     | PROVIDE BATT INSULATION CONT. AT ALL WALLS  |
| 3523    | LN2 STOR.              | FLOOR PAINT    | N/A      | VCB  | GWB             | PAINT             | GLAZ/GWB       | PAINT            | GWB             | PAINT             | GLAZ/GWB       | PAINT            | GWB     |   |
| 3524    | CLONING LAB            | SHEET VINYL    | SEE A405 | ICB* | EX. GWB         | PAINT             | GWB            | PAINT            | GWB             | PAINT             | GLAZ/GWB       | PAINT            | ACS-1   |   |
| 3525    | CELL CULT. NO. 1 (ADA) | SHEET VINYL    | SEE A405 | ICB* | GWB             | PAINT             | EX. GWB        | PAINT            | GLAZ/GWB        | PAINT             | GWB            | PAINT            | ACS-1   |   |
| 3526    | CELL CULT. NO. 2       | SHEET VINYL    | SEE A405 | ICB* | GLAZ/GWB        | PAINT             | EX. GWB        | PAINT            | GWB             | PAINT             | GWB            | PAINT            | ACS-1   |   |
| 3527    | CELL CULT. NO. 3       | SHEET VINYL    | SEE A405 | ICB* | EX. GWB         | PAINT             | EX. GWB/GWB    | PAINT            | GLAZ/GWB        | PAINT             | GWB            | PAINT            | ACS-1   |   |
| 3530    | MAIN LABS 1 & 2        | SHEET VINYL    | SEE A406 | ICB* | GLAZ/GWB        | PAINT             | GLAZ/GWB       | PAINT            | EX. GWB         | PAINT             | EX. GWB        | PAINT            | ACS-1   |   |
| 3531    | FRZ. ROOM              | SHEET VINYL    | SEE A406 | ICB* | GWB             | PAINT             | GWB            | PAINT            | GWB             | PAINT             | GWB            | PAINT            | ACS-1   |   |
| 3532    | MILLING LAB            | SHEET VINYL    | SEE A406 | ICB* | GLAZ/GWB        | EPOXY PAINT       | EX. GWB        | EPOXY PAINT      | GLAZ/GWB        | EPOXY PAINT       | GWB            | EPOXY PAINT      | ACS-1   |   |
| 3533    | MEDIA PREP LAB         | SHEET VINYL    | SEE A406 | ICB* | GLAZ/GWB        | PAINT             | EX. GWB        | PAINT            | EX. GWB         | PAINT             | GLAZ/GWB       | PAINT            | ACS-1   |   |
| 3534    | SHARED ANLY. SPACE     | SHEET VINYL    | SEE A406 | ICB* | GLAZ/GWB        | PAINT             | GLAZ/GWB       | PAINT            | GLAZ/GWB        | PAINT             | GLAZ/GWB       | PAINT            | ACS-1   |   |
| 3535    | CORR.                  | VCT            | SEE A406 | VCB  | GLAZ/GWB        | PAINT             | GWB            | PAINT            | GLAZ/GWB        | PAINT             | N/A            | N/A              | GWB     | PROVIDE BATT INSULATION CONT. WITHIN CLNG. JOIST BAYS   |
| 3536    | SHARED A/L             | STONSHIELD HRI | SEE A406 | RCB  | GWB             | EPOXY PAINT       | GWB            | EPOXY PAINT      | GLAZ/GWB        | EPOXY PAINT       | GWB            | EPOXY PAINT      | CRCS-1  | PROVIDE AUTO, SYNCHRONIZED "MECHO SHADES" AS NOTED (EXCEPT AT DOORS)                                    |
| 3537    | QUAR. LAB              | STONSHIELD HRI | SEE A406 | RCB  | GLAZ/GWB        | EPOXY PAINT       | EX. GWB        | EPOXY PAINT      | GLAZ/GWB        | EPOXY PAINT       | GLAZ/GWB       | EPOXY PAINT      | CRCS-1  |   |
| 3538    | ELEC.                  | FLOOR PAINT    | N/A      | VCB  | GWB             | PAINT             | GWB            | PAINT            | GWB             | PAINT             | GWB            | PAINT            | GWB     | PROVIDE BATT INSULATION CONT. WITHIN CLNG. JOIST BAYS   |
| 3538EM  | EAST EQPM. MEZZ.       | MTL. GRATE     | N/A      | N/A  | N/A             | N/A               |                |                  |                 |                   |                |                  |         | PROVIDE BATT INSULATION CONT. AT ALL WALLS  |
| 3539    | GAS CL.                | FLOOR PAINT    | N/A      | VCB  | GWB             | PAINT             | GWB            | PAINT            | GWB             | PAINT             | GWB            | PAINT            | GWB     | 1-HR FIRE RESISTANCE RATED THROUGHOUT, FIRE CAULK PENETRATIONS  |
| 3540    | BIO-R. LAB             | SHEET VINYL    | SEE A406 | ICB* | EX. GWB         | PAINT             | GWB            | PAINT            | GLAZ/GWB        | PAINT             | GWB            | PAINT            | ACS-1   |   |
| 3541    | BSL-2 LAB              | STONSHIELD HRI | SEE A406 | RCB  | EX. GWB         | EPOXY PAINT       | EX. GWB        | EPOXY PAINT      | GLAZ/GWB        | EPOXY PAINT       | GWB            | EPOXY PAINT      | CRCS-1  |   |
| 3800    | CORRIDOR               | VCT            | SEE A406 | VCB  | EX. GWB         | PAINT             | EX. GWB        | PAINT            | GWB             | PAINT             | EX. GWB        | PAINT            | N/A     | NEW WALL PAINT, VCB AT AREA OF WORK; OMIT RUB RAIL AT NEW NICHES & BETW. DOORS 3538A, 3538B, 3539, 3800 |

\*ICB : INTEGRAL COVE BASE



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

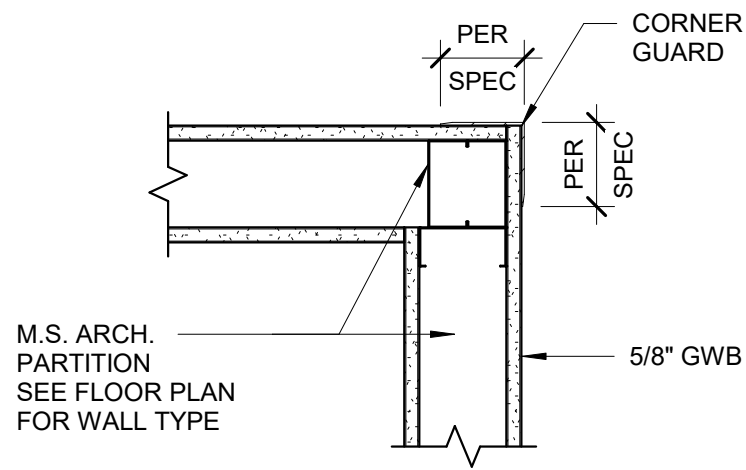
|       |    |      |          |                              |      |      |       |
|-------|----|------|----------|------------------------------|------|------|-------|
| DSGN: | DC | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
| DR:   | KM | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KM   | DC   |       |
| CHK:  | DC | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | KM   | DC   | DC    |
| APVD: |    |      |          |                              |      |      |       |



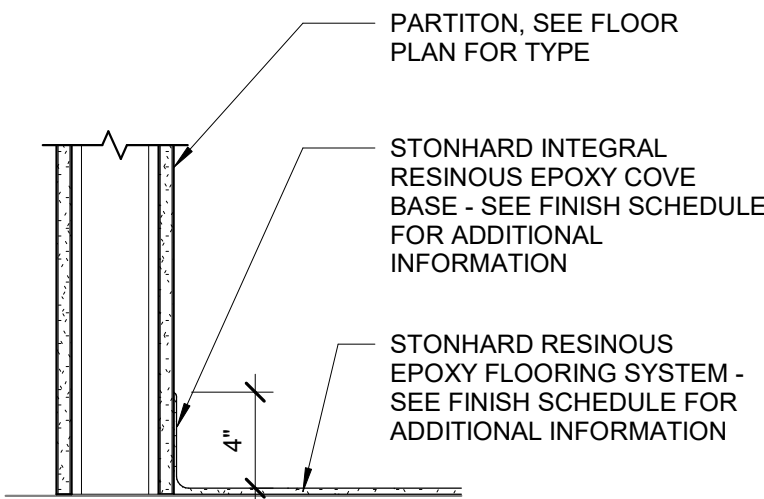
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"

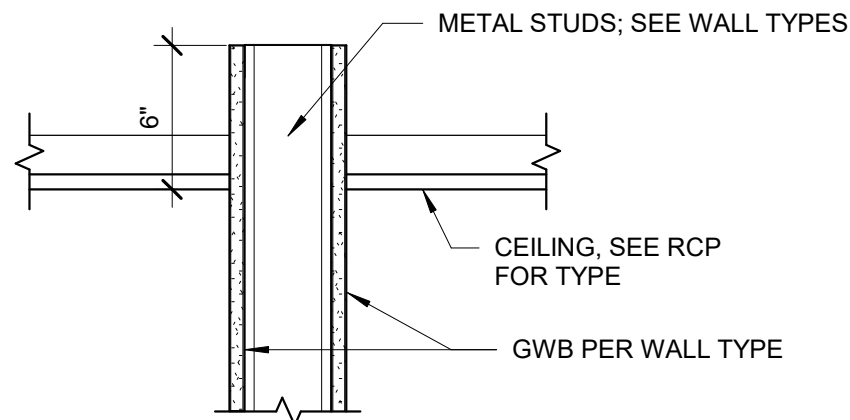
BAR IS ONE INCH ON ORIGINAL DRAWING



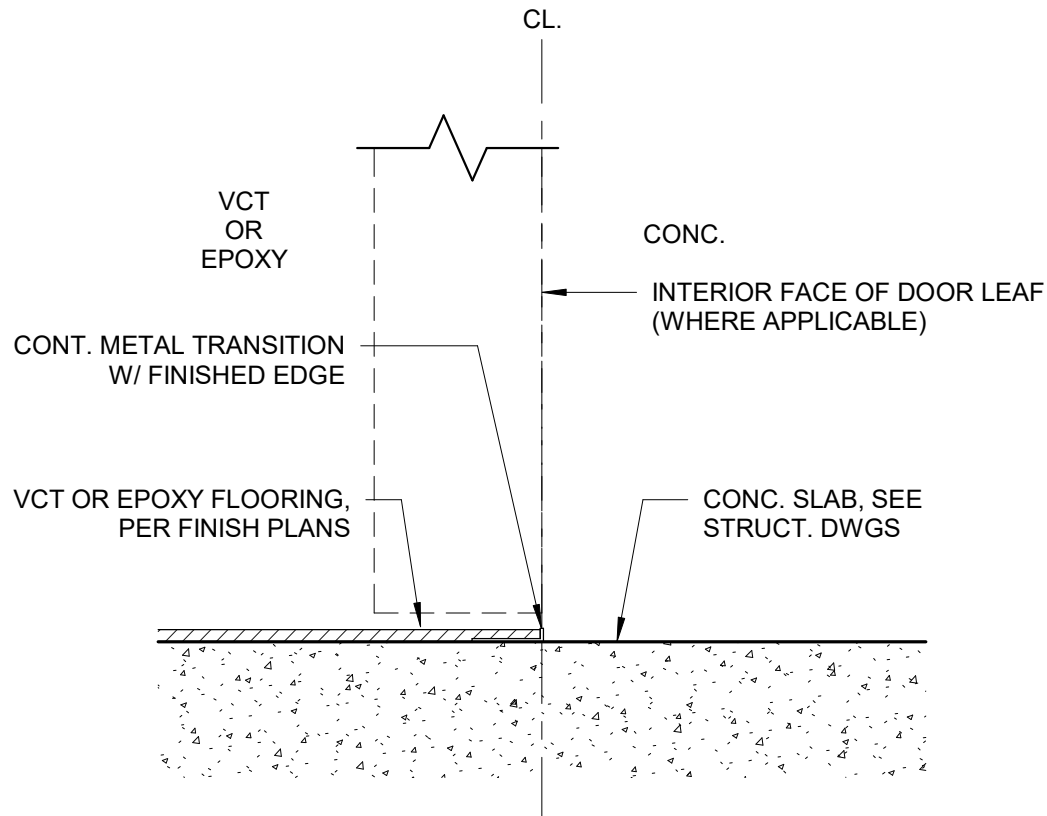
① PLAN DETAIL - CORNER GUARD  
1 1/2" = 1'-0"



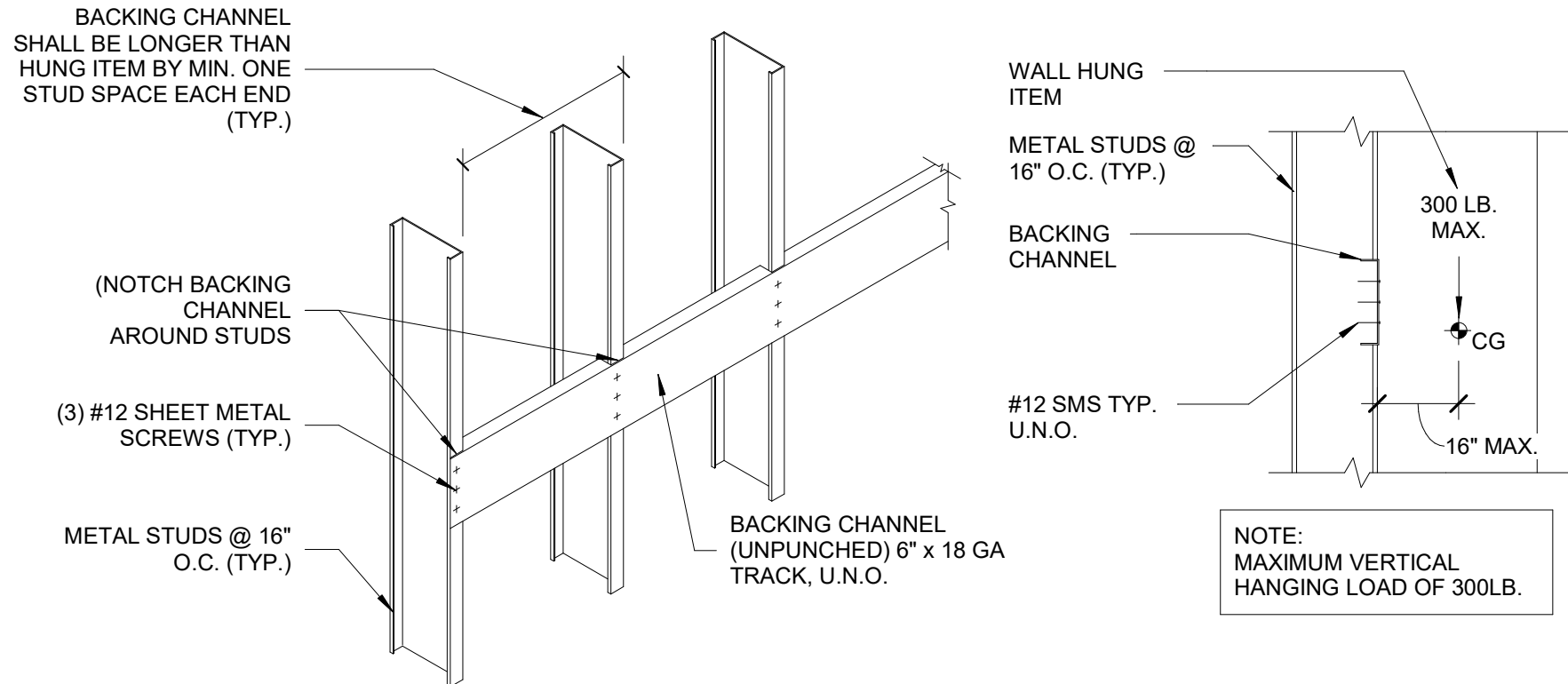
② DETAIL - RESINOUS COVE BASE  
1 1/2" = 1'-0"



③ DETAIL - TOP OF WALL; TYP. INTERIOR PARTITION  
1 1/2" = 1'-0"



④ TRANSITION DETAIL - CONC. TO VCT OR EPOXY  
6" = 1'-0"



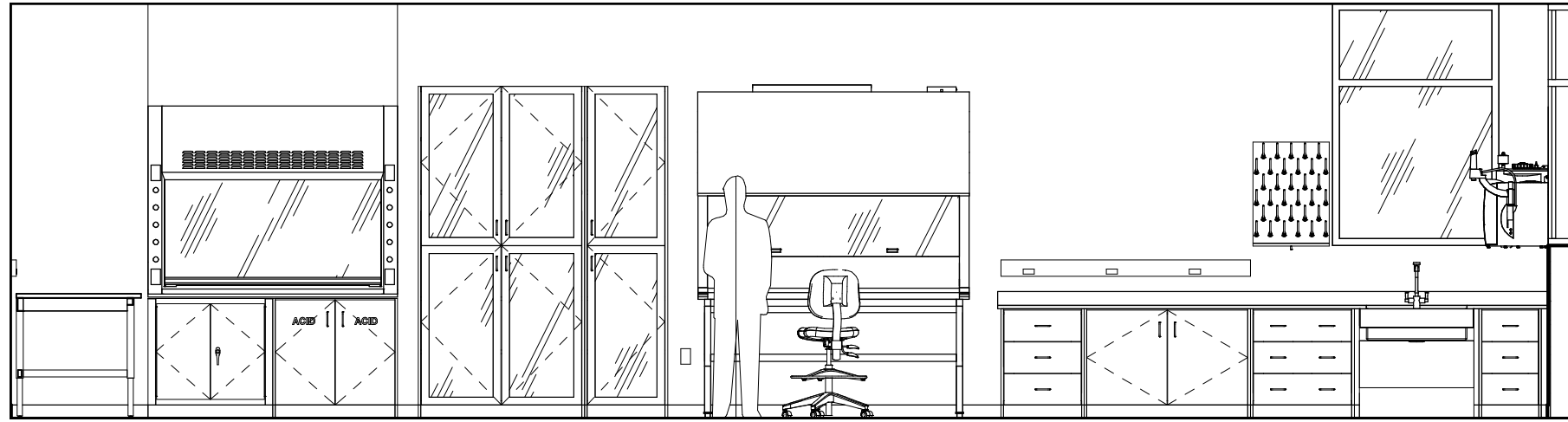
⑤ TYP WALL HANG BACKING DETAIL  
1" = 1'-0"

GENERAL NOTE:

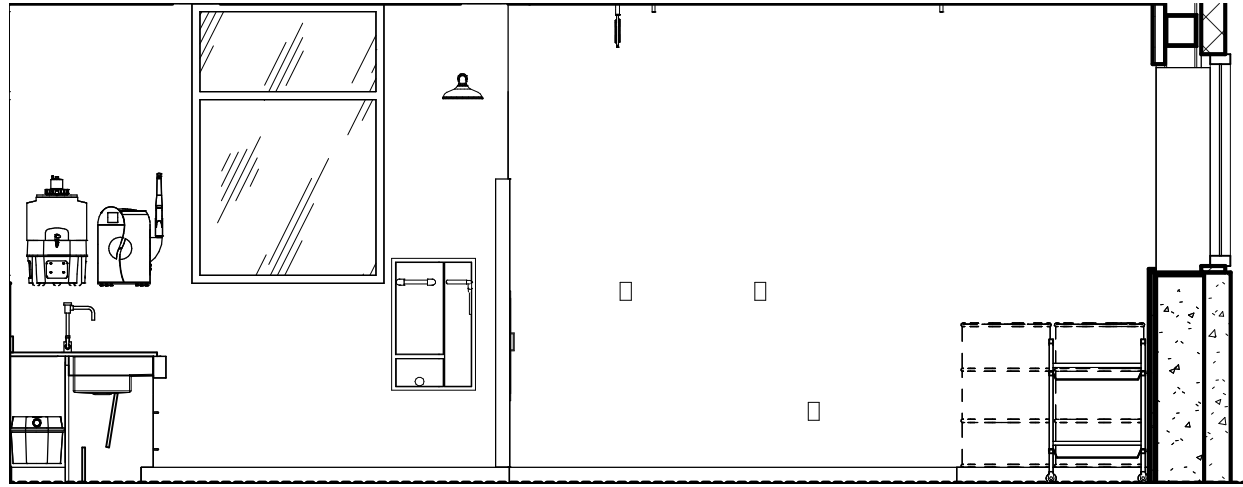
ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN:    | REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|----------|------|----------|-------------------------|------|------|-------|
| DC       | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | AB   | DC   |       |
| DR:      |      |          |                         |      |      |       |
| AB/KM    |      |          |                         |      |      |       |
| CHK:     |      |          |                         |      |      |       |
| DC       |      |          |                         |      |      |       |
| APVD:    |      |          |                         |      |      |       |
| Approver |      |          |                         |      |      |       |

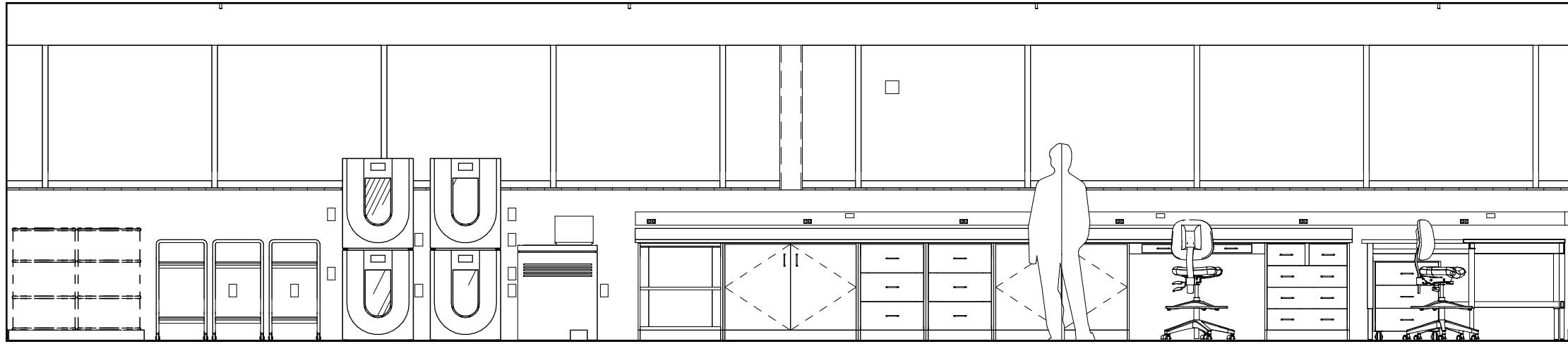




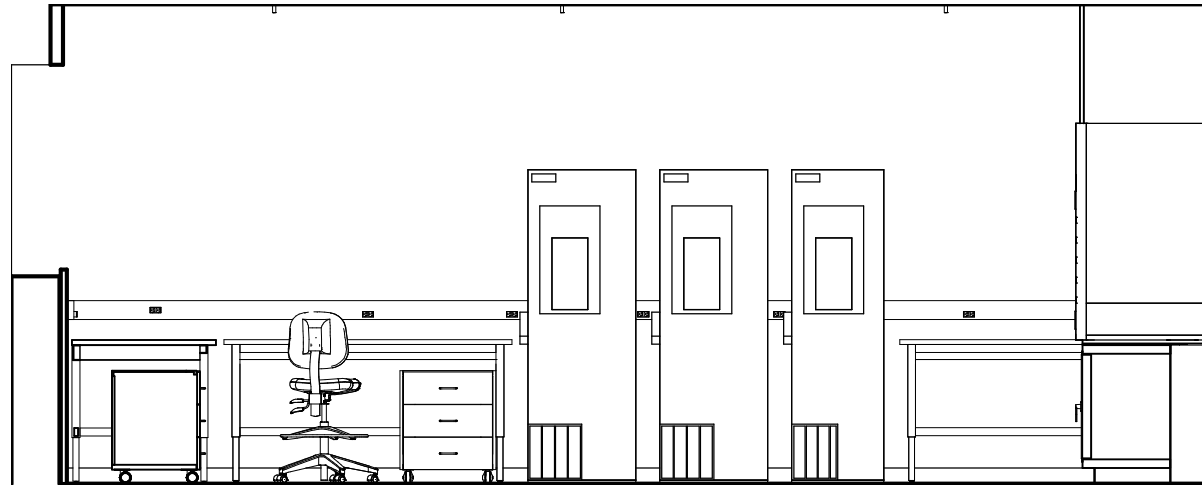
① 3521 - E - MO BIO LAB  
1/4" = 1'-0"



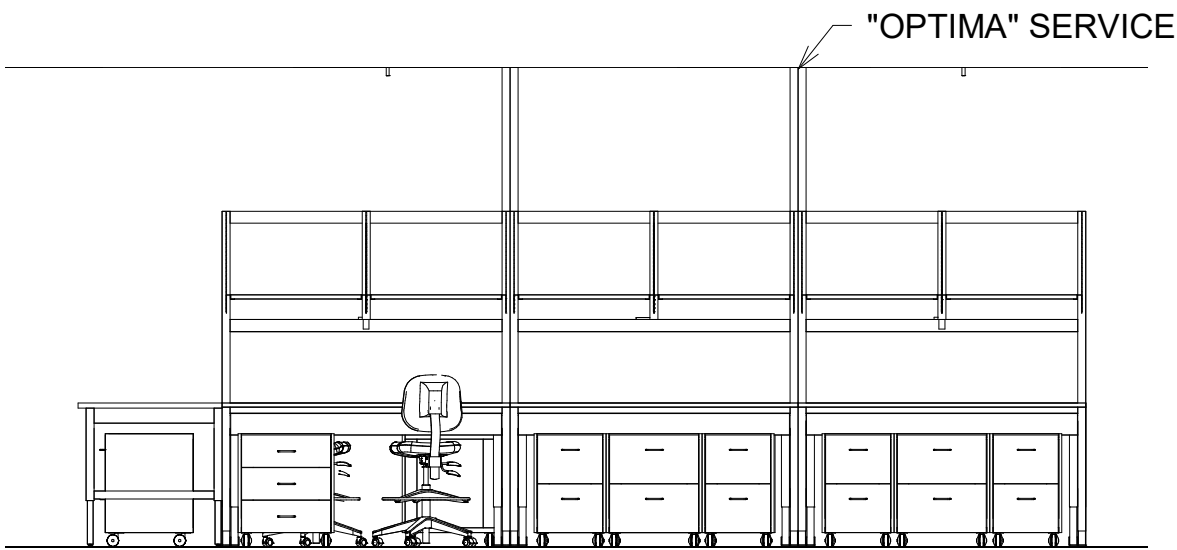
② 3521 - S - MO BIO LAB  
1/4" = 1'-0"



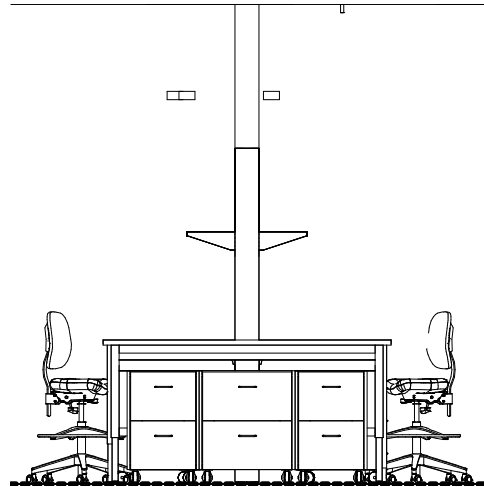
③ 3521-W-MO BIO LAB  
1/4" = 1'-0"



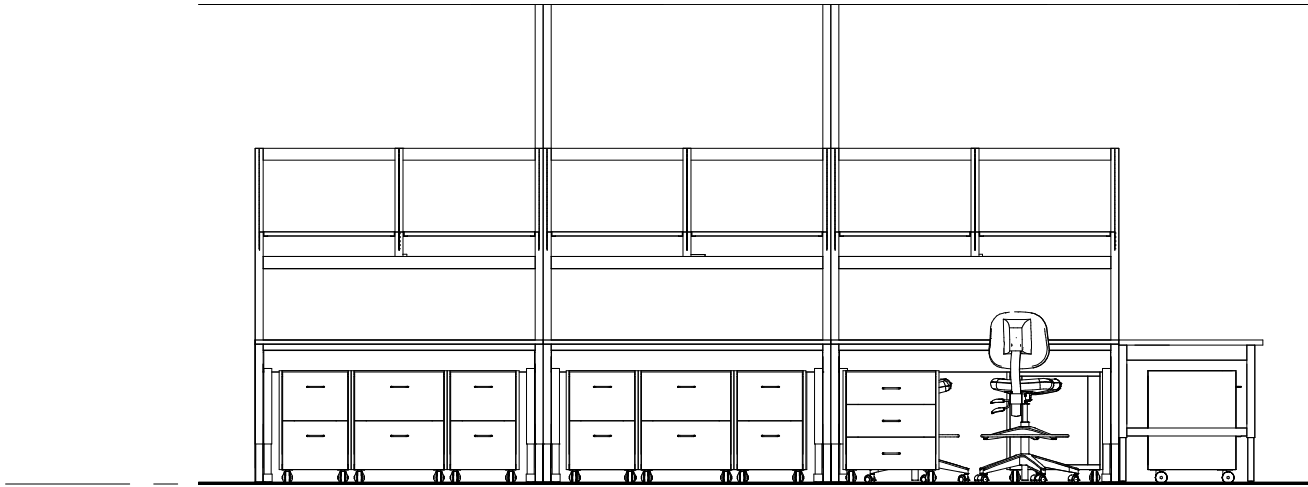
④ 3521 - N - MO BIO LAB  
1/4" = 1'-0"



⑤ 3521 - MO BIO LAB - ISLAND - LOOKING EAST  
1/4" = 1'-0"

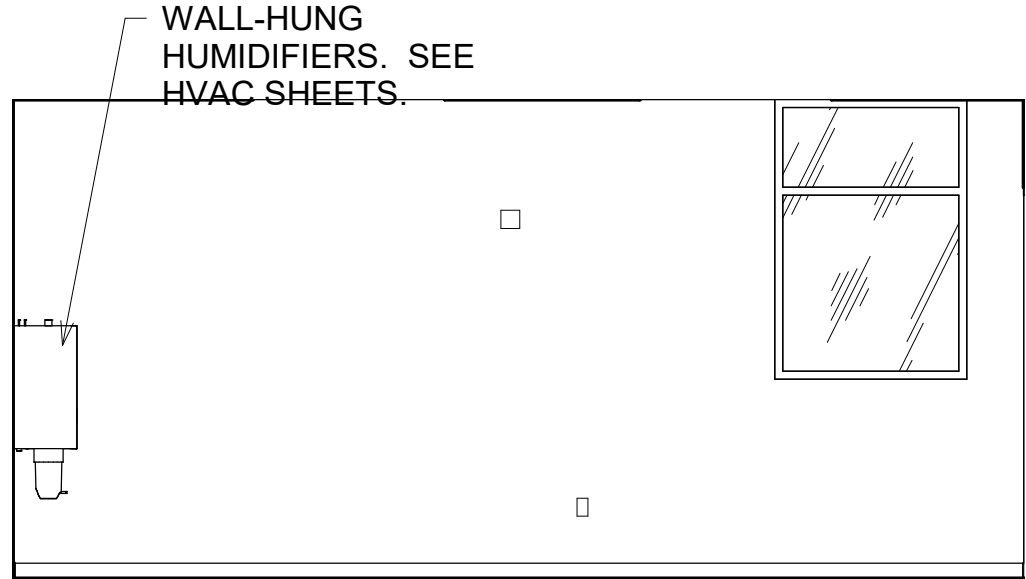


⑥ 3521 - MO BIO LAB - ISLAND - LOOKING SOUTH  
1/4" = 1'-0"

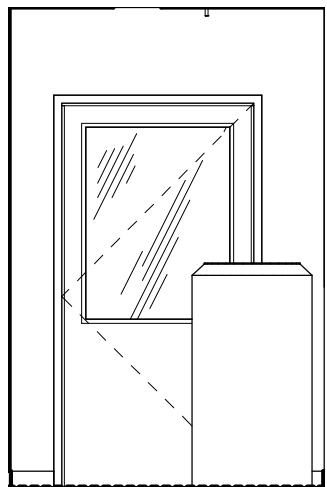


⑦ 3521 - MO BIO LAB - ISLAND - LOOKING WEST  
1/4" = 1'-0"

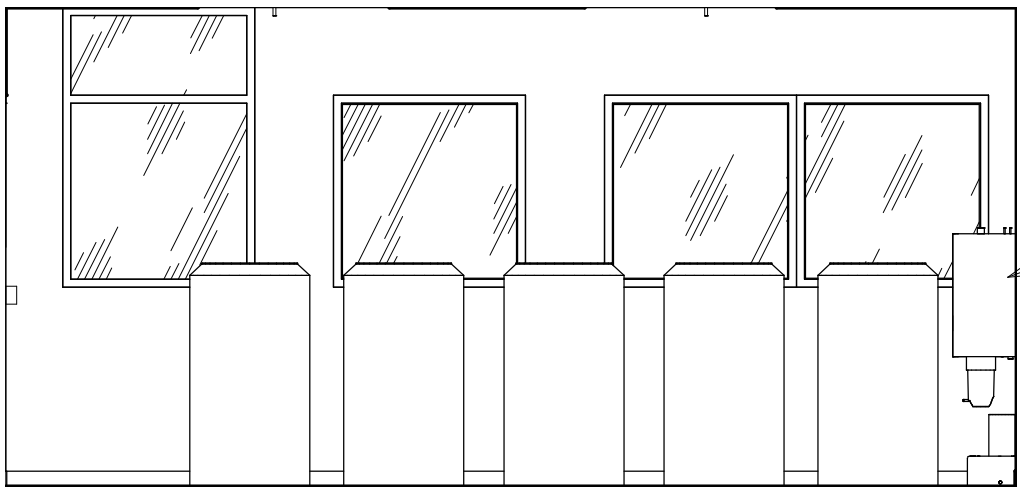
LEVEL 3  
459' - 10"



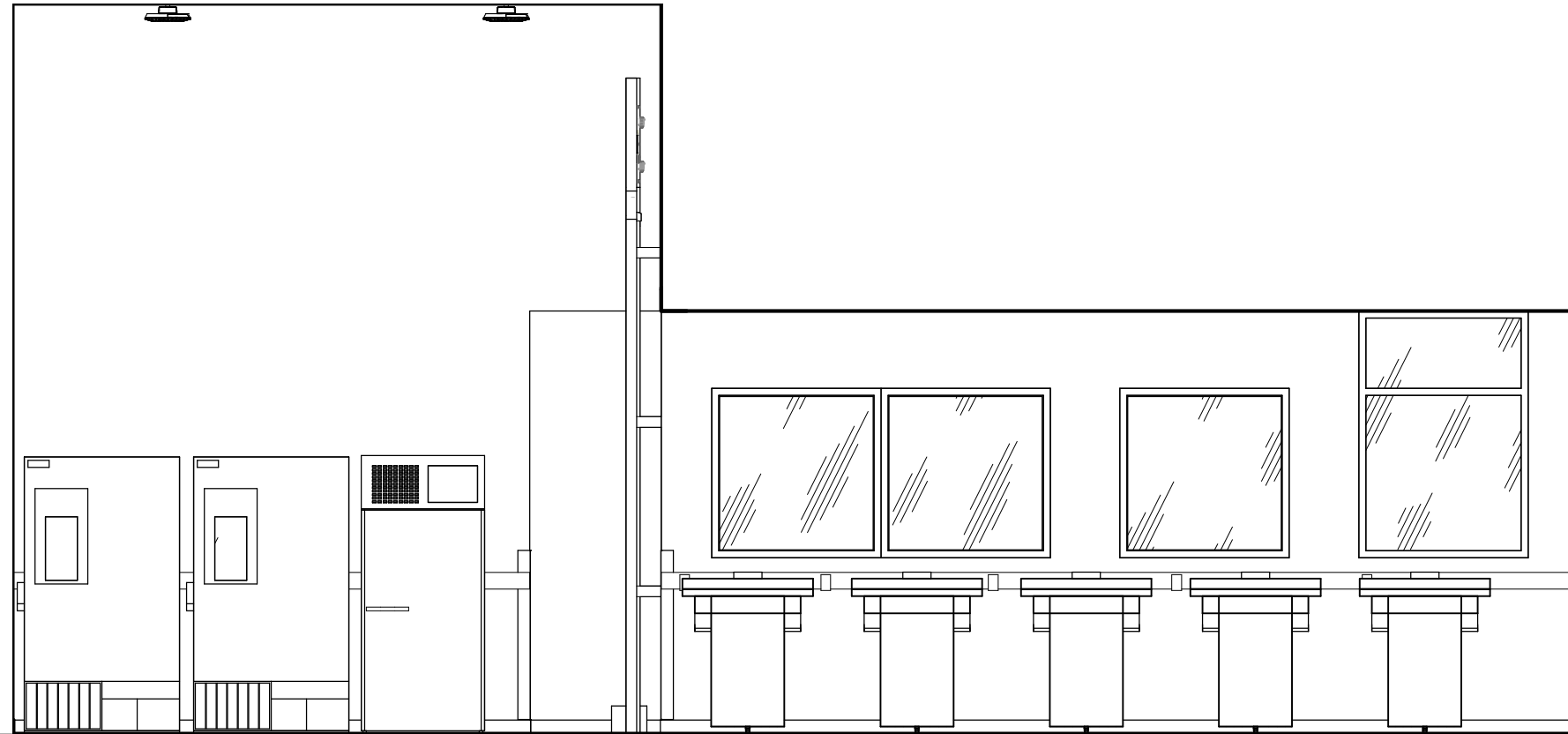
⑧ 3523 - E - LN2 STOR  
1/4" = 1'-0"



⑨ 3523 - S - LN2 STOR  
1/4" = 1'-0"

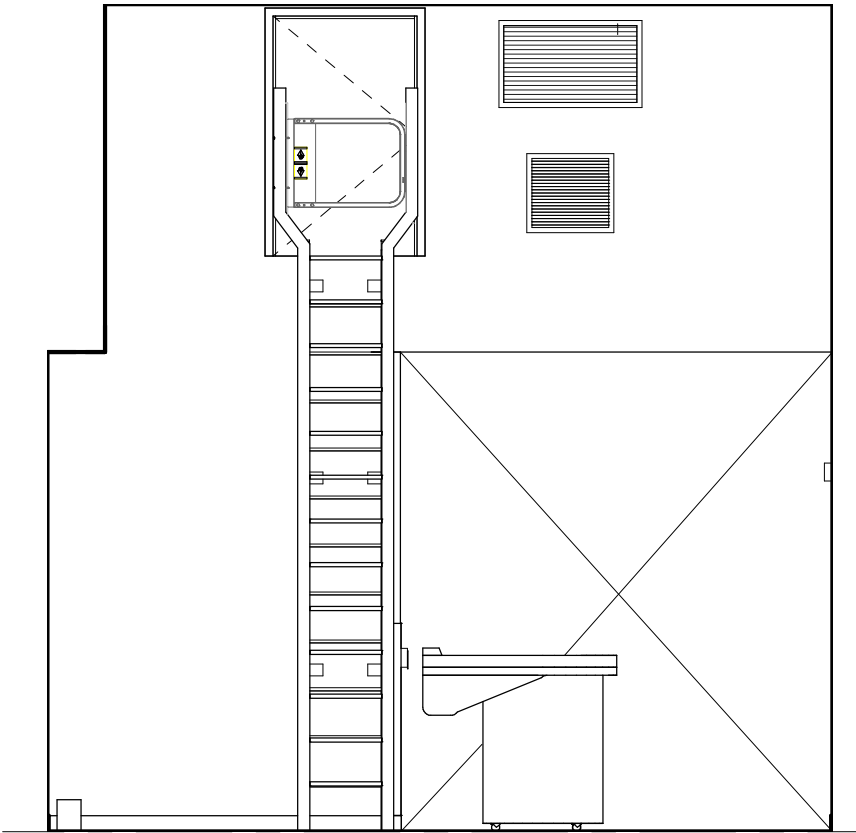


⑩ 3523 - W - LN2 STOR  
1/4" = 1'-0"

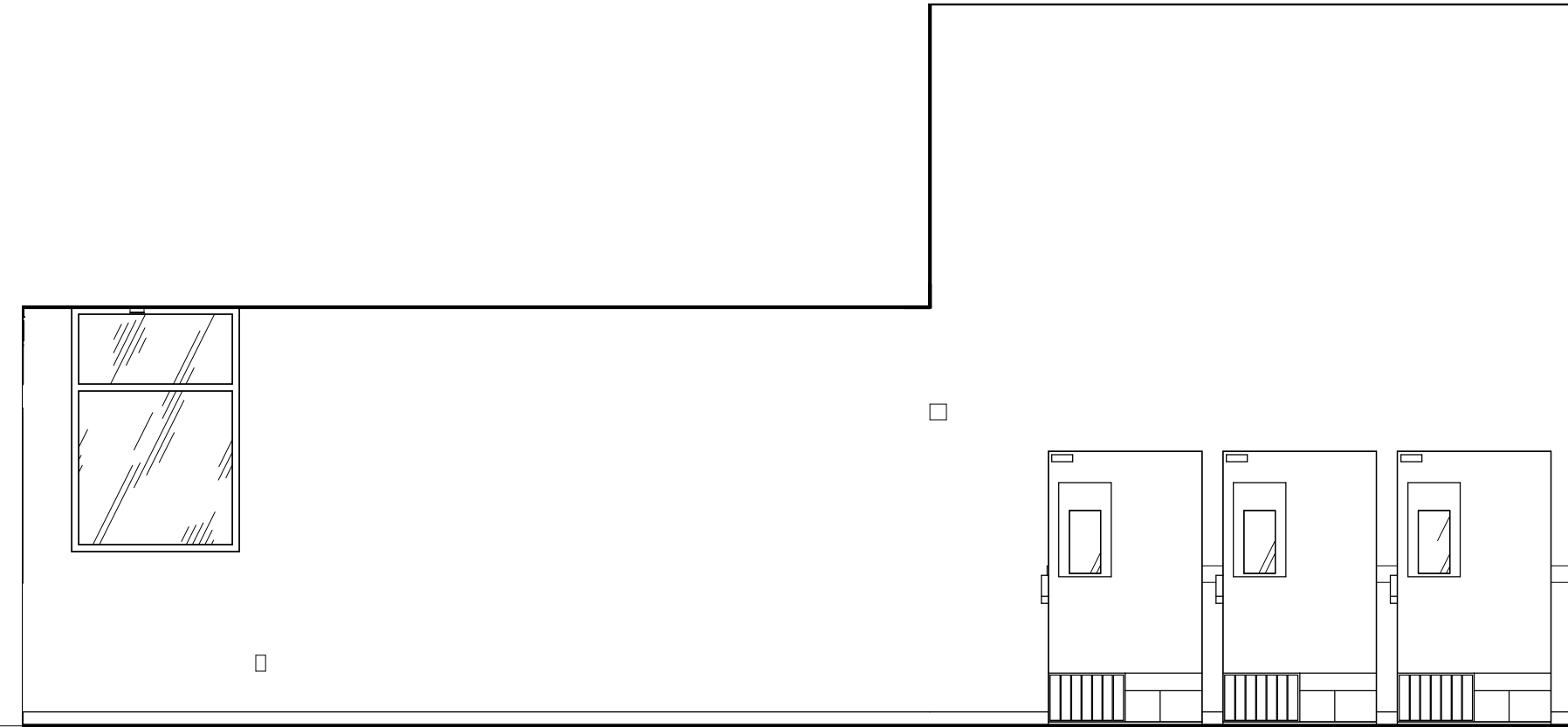


⑪ 3522 - E - CRYO STOR.  
1/4" = 1'-0"

LEVEL 3  
459' - 10"

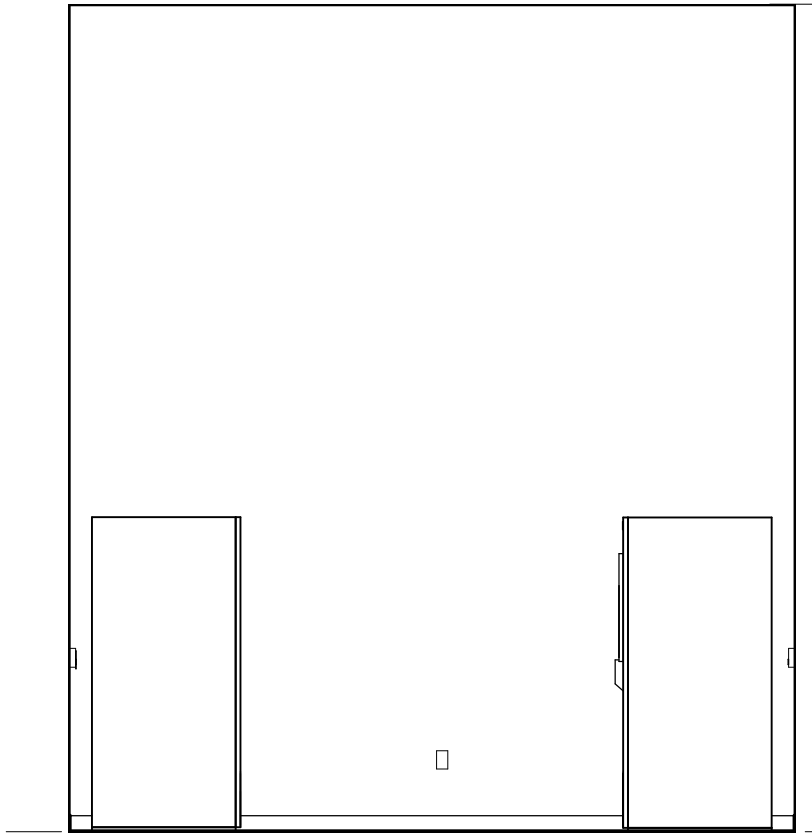


⑫ 3522 - S - CRYO STOR.  
1/4" = 1'-0"



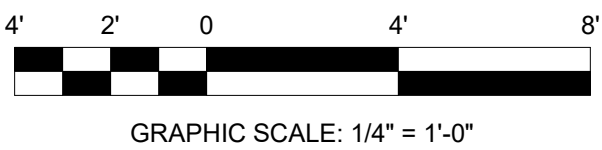
⑬ 3522 - W - CRYO STOR.  
1/4" = 1'-0"

LEVEL 3  
459' - 10"



⑭ 3522 - N - CRYO STOR.  
1/4" = 1'-0"

BOTTOM  
OF CEILING  
17' - 3"



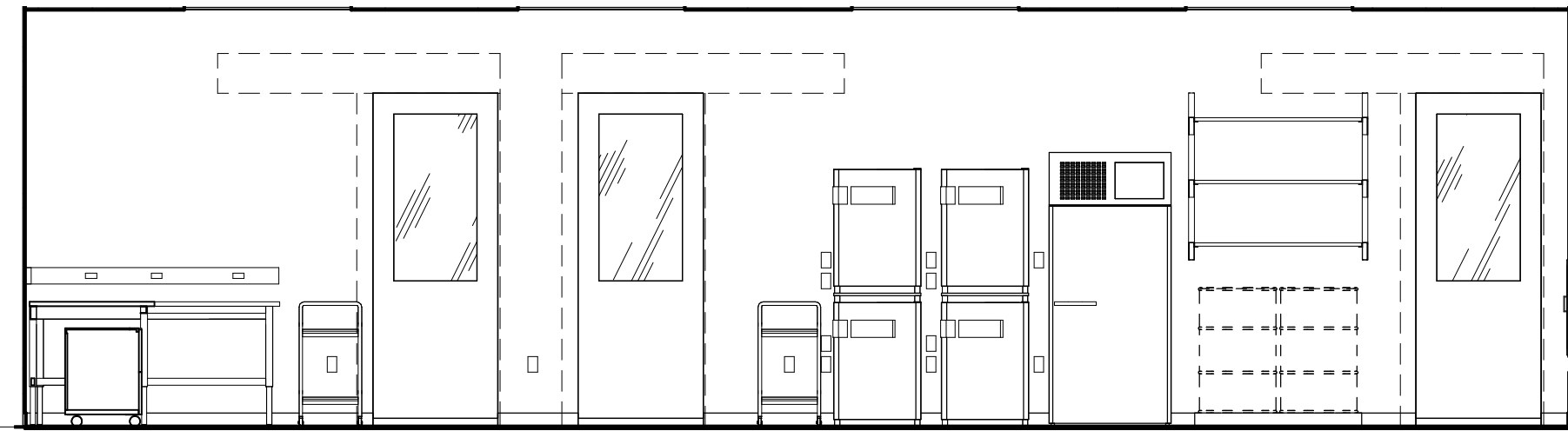
GRAPHIC SCALE: 1/4" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

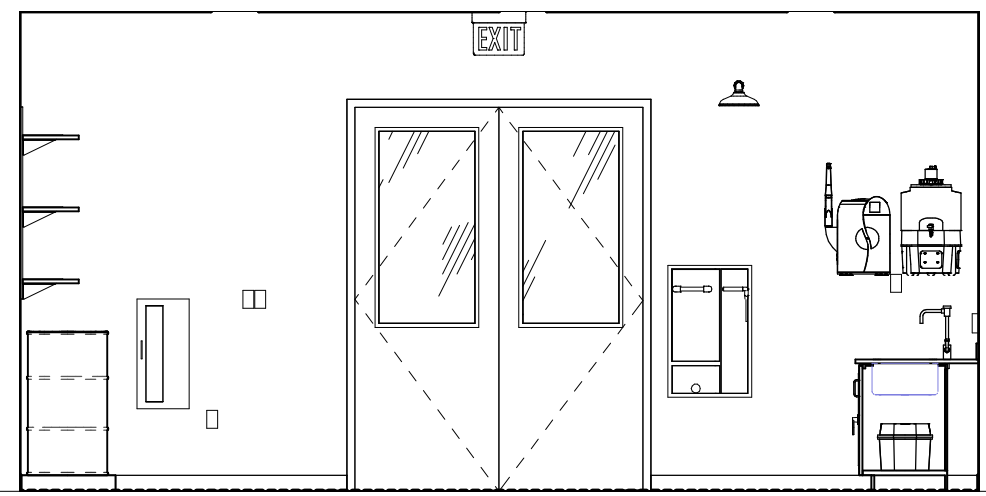


BAR IS ONE INCH ON ORIGINAL DRAWING

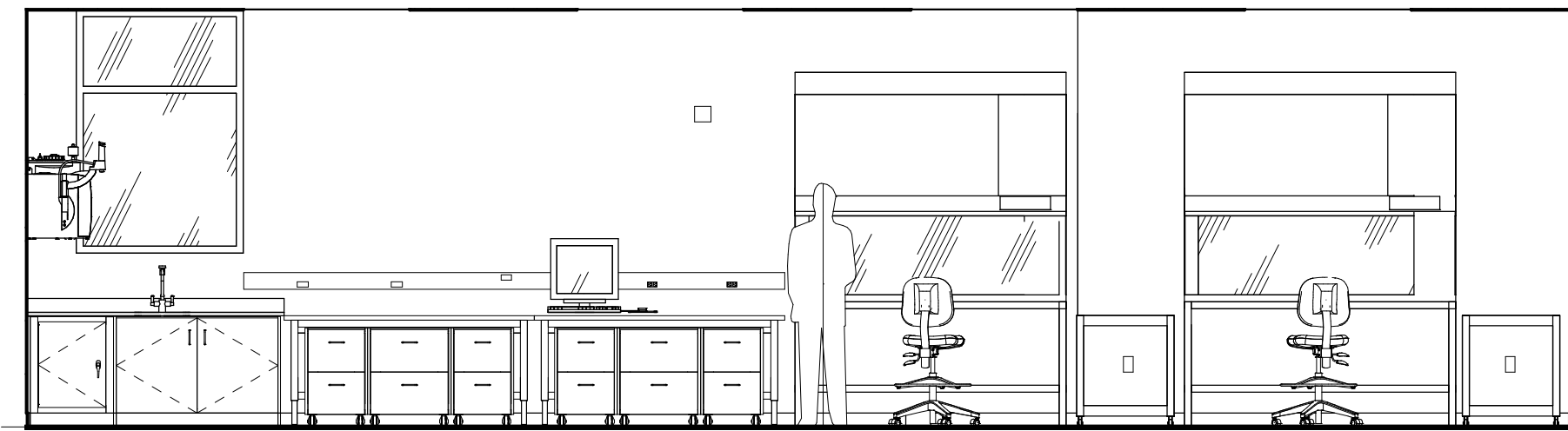




① 3524 - E - CLONING LAB  
1/4" = 1'-0"

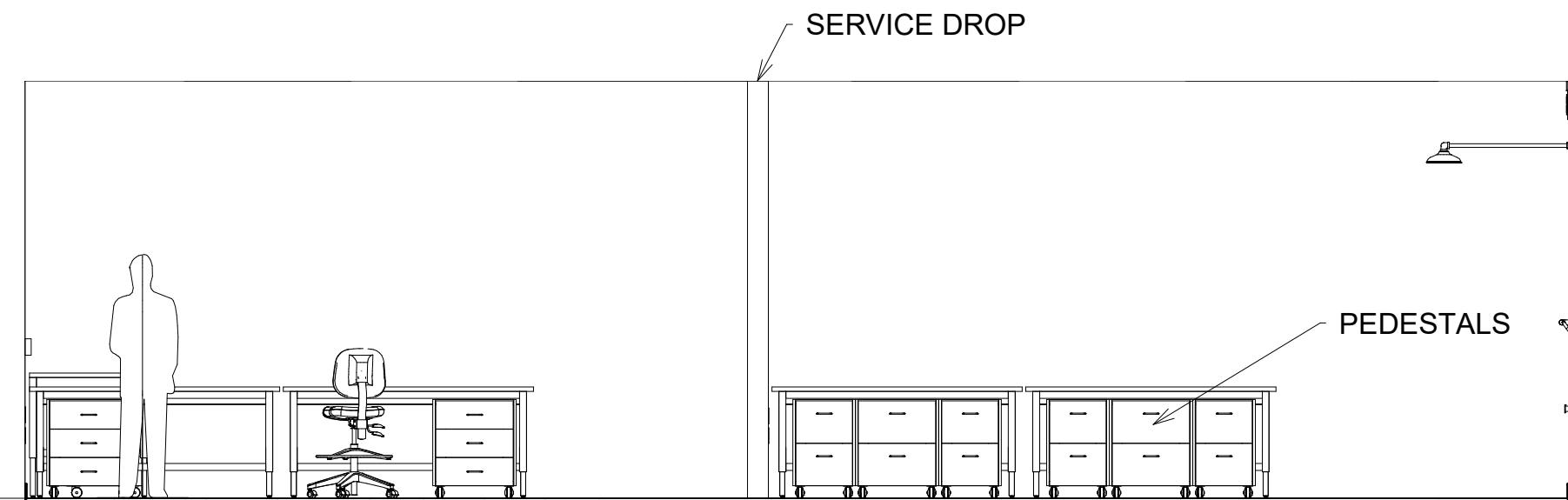


② 3524 - S - CLONING LAB  
1/4" = 1'-0"



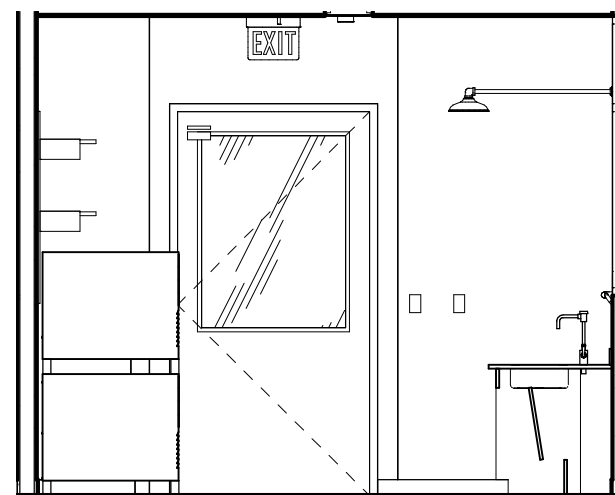
③ 3524 - W - CLONING LAB  
1/4" = 1'-0"

LEVEL 3  
459' - 10"

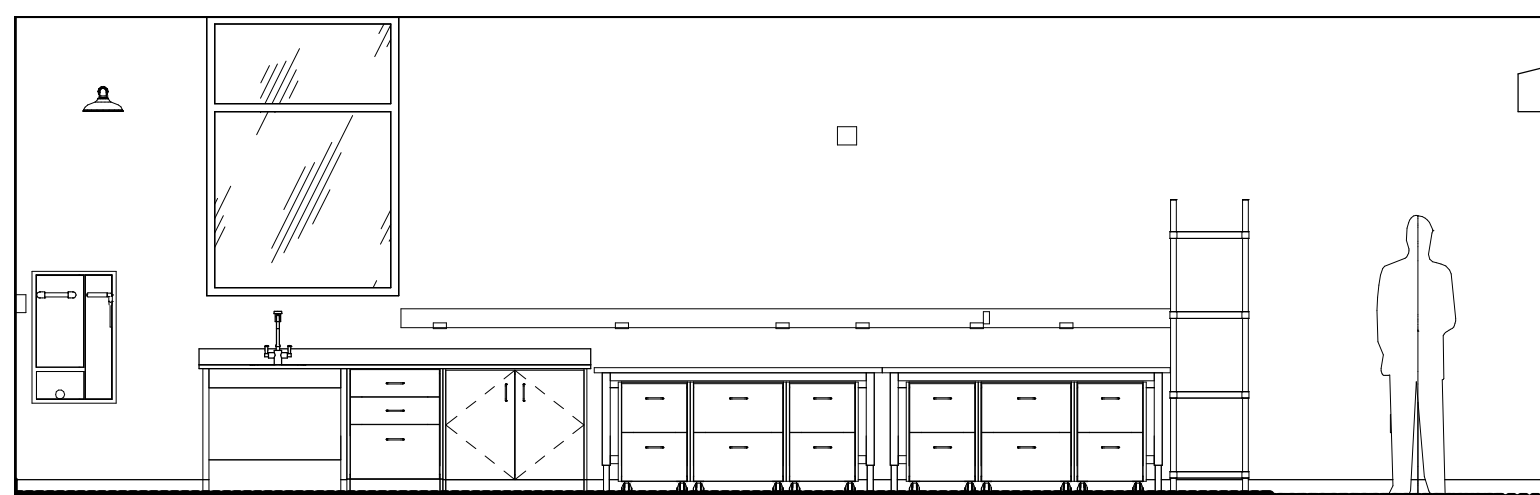


LEVEL 3  
459' - 10"

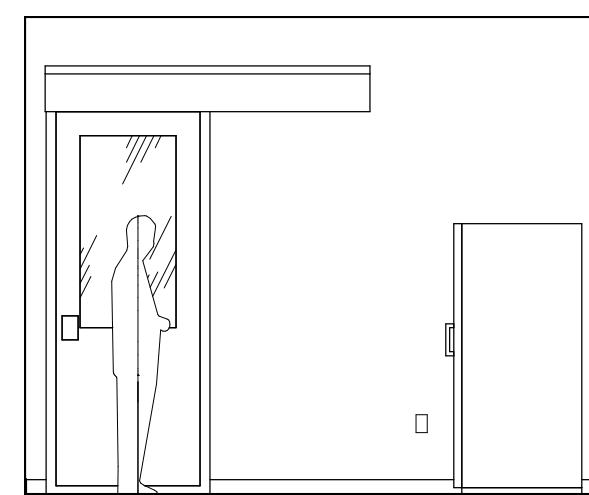
④ 3524 - CLONING LAB - ISLAND / TABLES - LOOKING EAST  
1/4" = 1'-0"



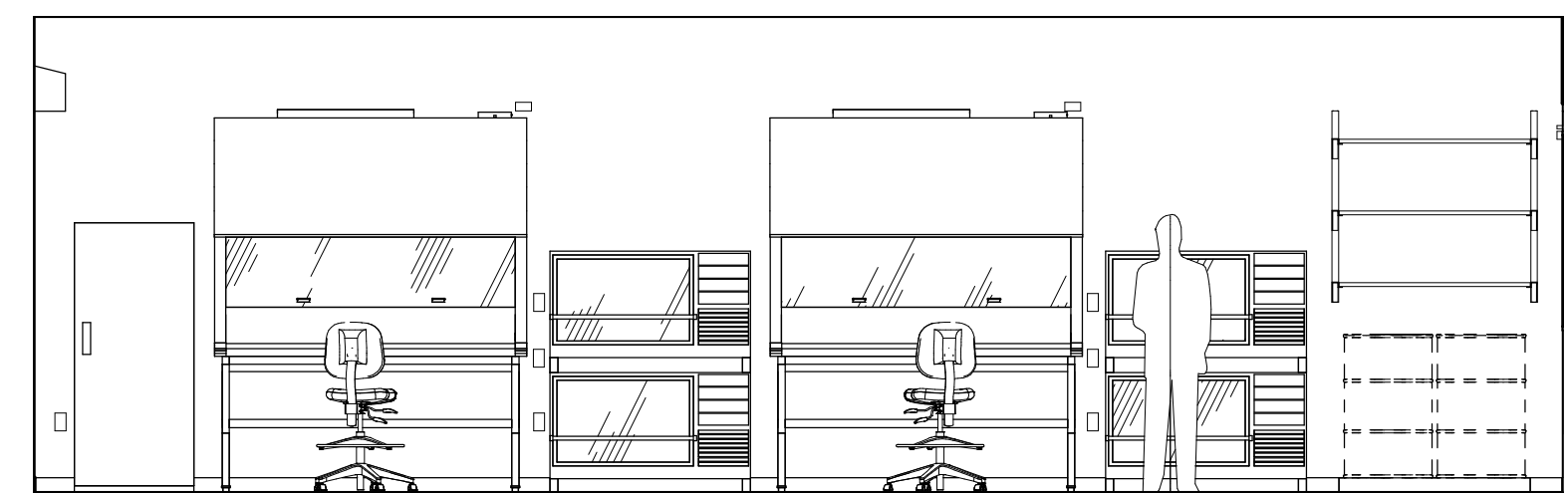
⑤ 3525 - E - CELL CULT No. 1 (ADA)  
1/4" = 1'-0"



⑥ 3525 - S - CELL CULT No. 1 (ADA)  
1/4" = 1'-0"

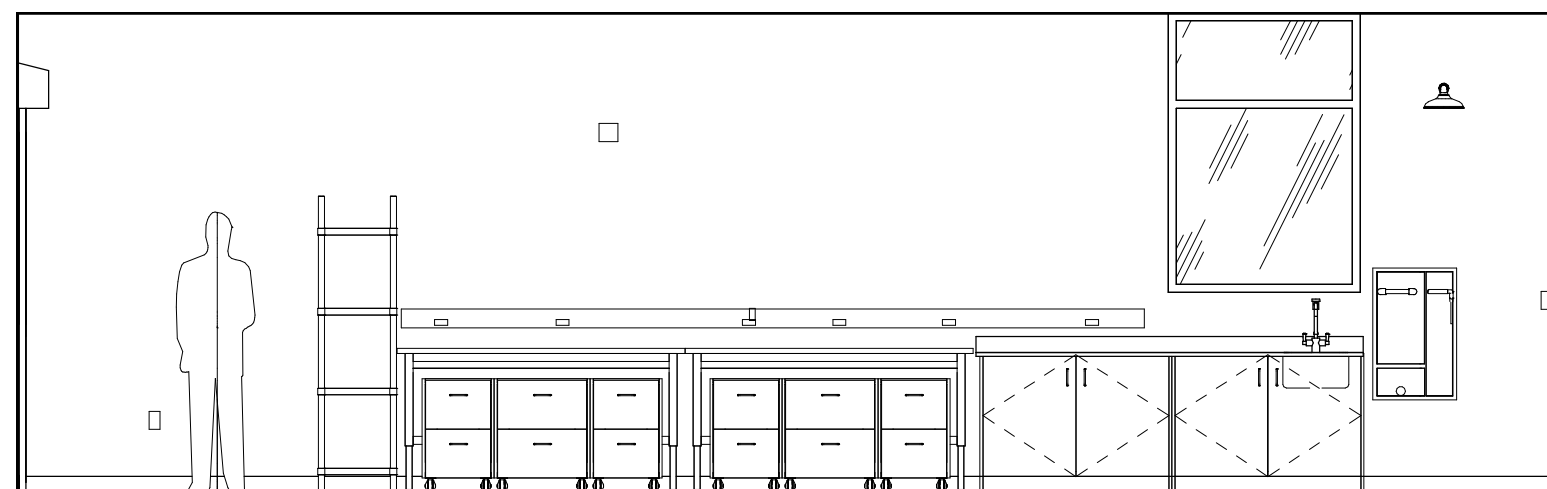


⑦ 3525 - W - CELL CULT No. 1 (ADA)  
1/4" = 1'-0"

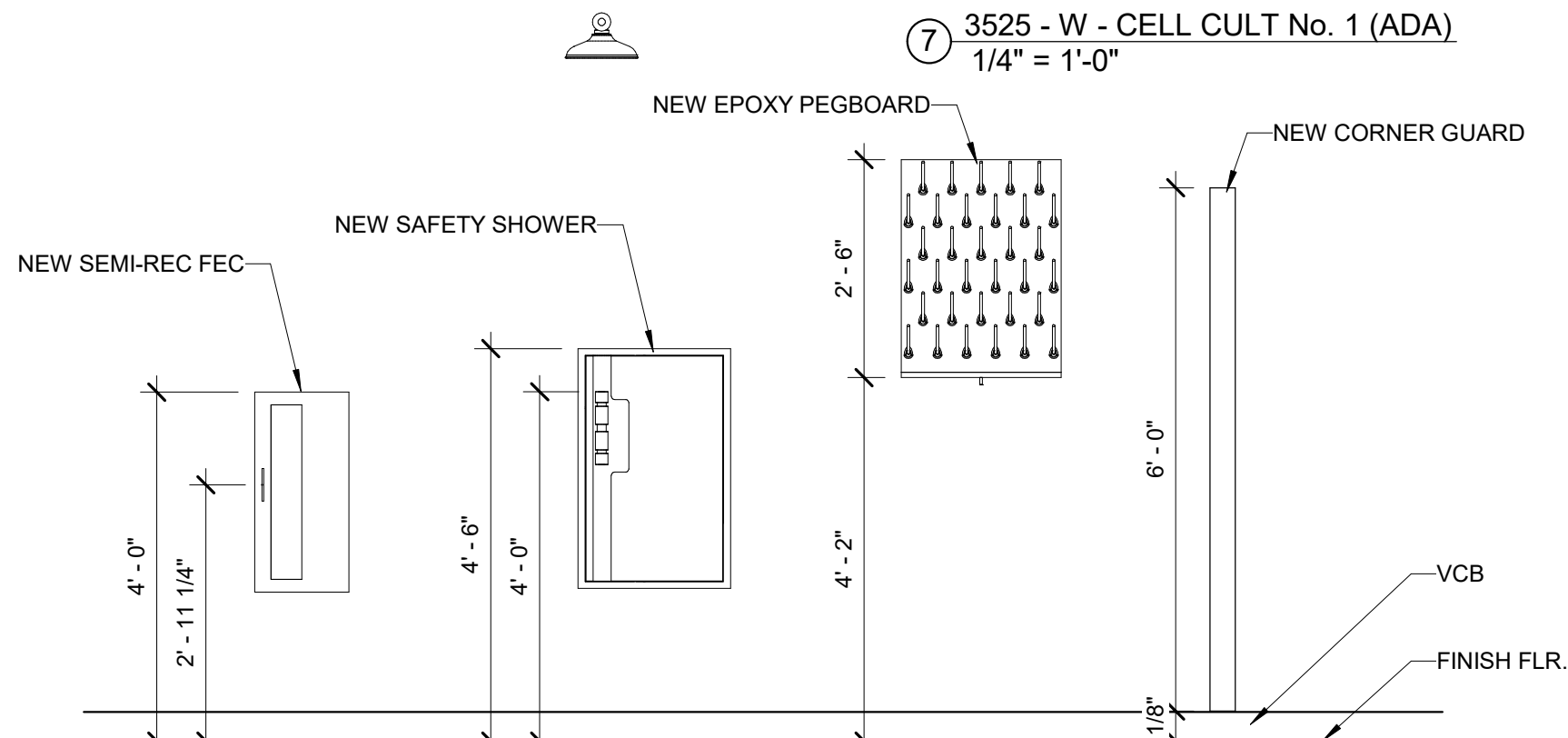


⑧ 3525 - N - CELL CULT No. 1 (ADA)  
1/4" = 1'-0"

LEVEL 3  
459' - 10"

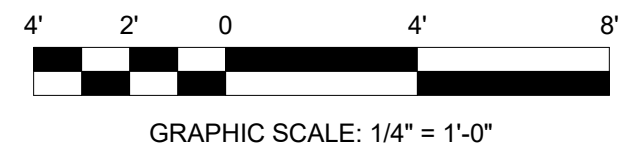
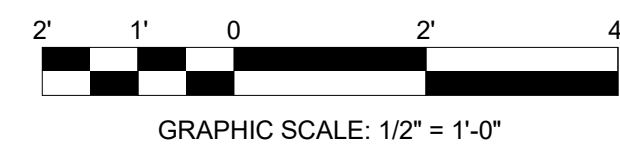


⑨ 3526 - N - CELL CULT No. 2  
1/4" = 1'-0"



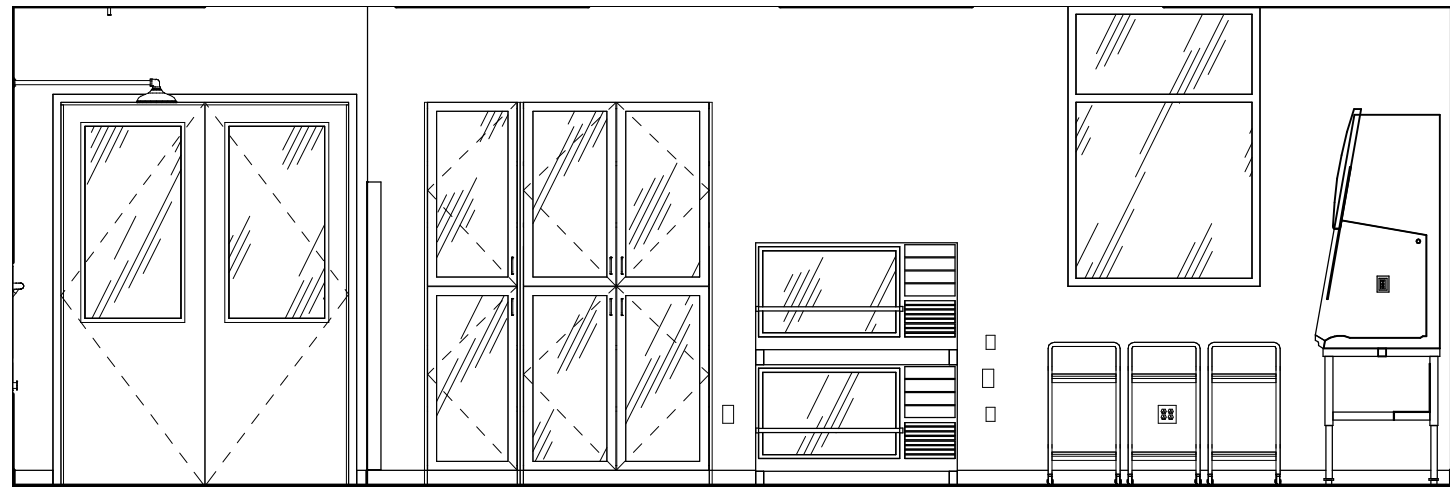
⑩ TYPICAL MOUNTING HEIGHTS  
1/2" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

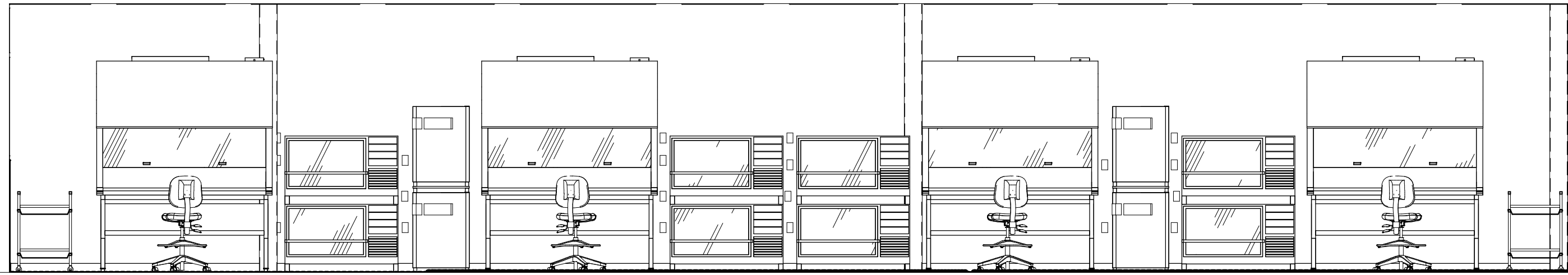


| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



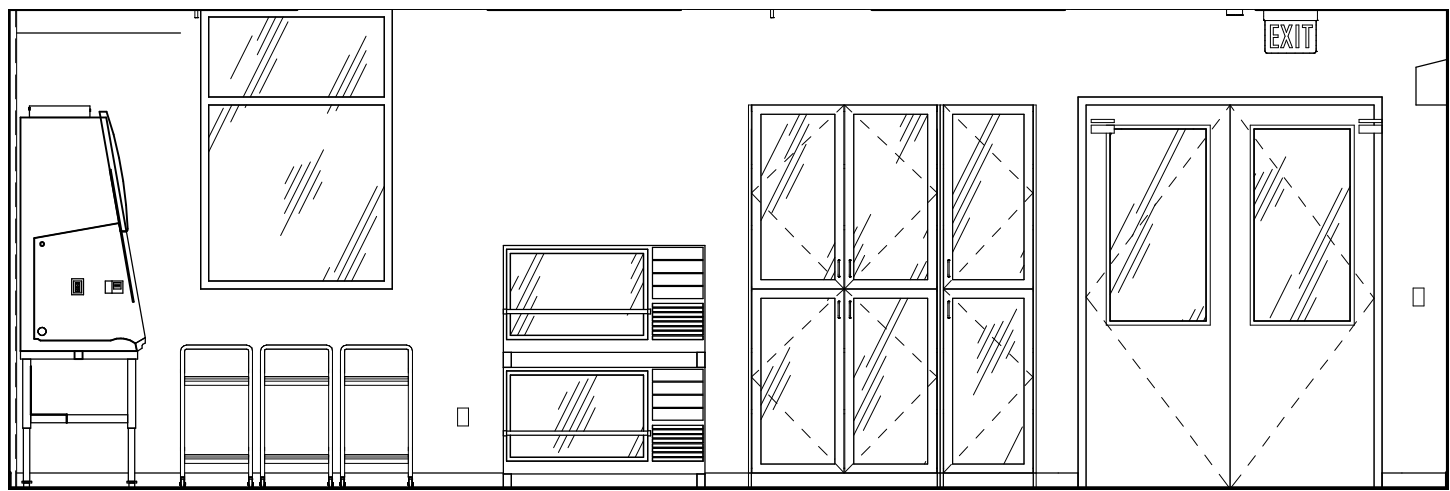


① 3530 - E - MAIN LABS 1 & 2  
1/4" = 1'-0"

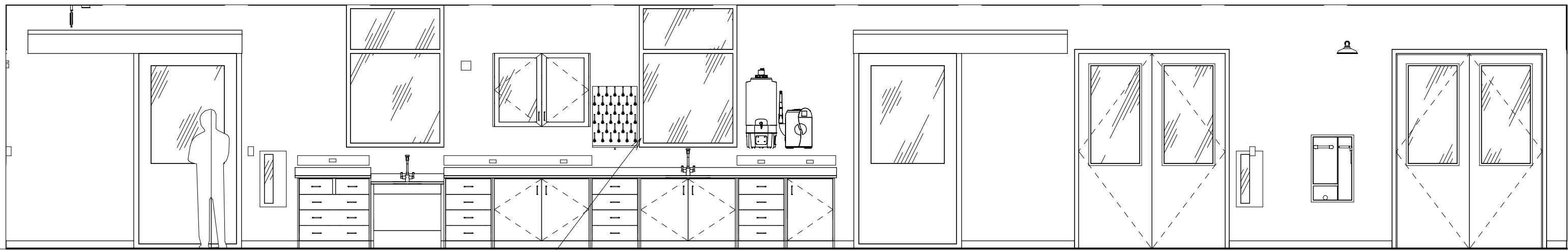


② 3530 - S - MAIN LABS 1 & 2  
1/4" = 1'-0"

LEVEL 3  
459' - 10"



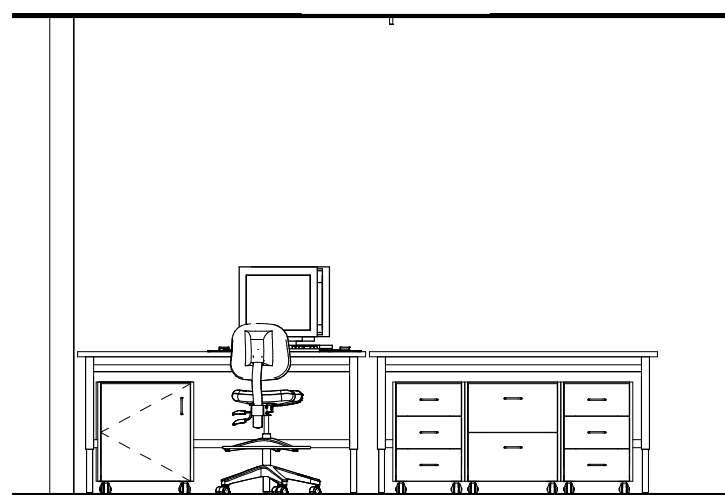
③ 3530 - W - MAIN LABS 1 & 2  
1/4" = 1'-0"



④ 3530 - N - MAIN LABS 1 & 2  
1/4" = 1'-0"

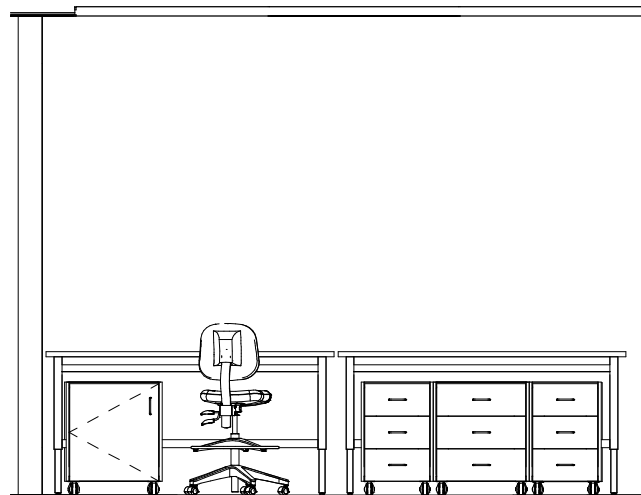
PROVIDE S.S. DRIP TRAY

LEVEL 3  
459' - 10"



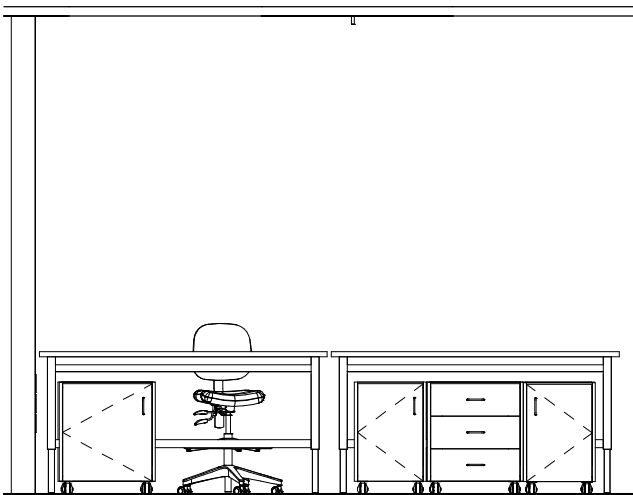
⑤ 3530 - ISLAND ELEV. (TYP. @ 4 LOCATIONS)  
1/4" = 1'-0"

NOTE: OPPOSITE SIDE OF ISLAND SIMILAR



⑥ 3530 - ISLAND VARIANT "A" (TYP. @ 2 LOCATIONS)  
1/4" = 1'-0"

NOTE: OPPOSITE SIDE OF ISLAND SIMILAR

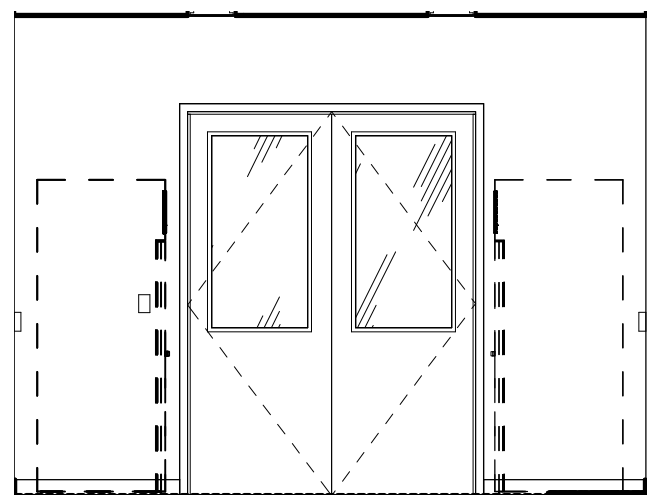


⑦ 3530 - ISLAND VARIANT "B" (TYP. @ 2 LOCATIONS)  
1/4" = 1'-0"

NOTE: OPPOSITE SIDE OF ISLAND SIMILAR



⑧ 3531 - E - FRZ. ROOM  
1/4" = 1'-0"

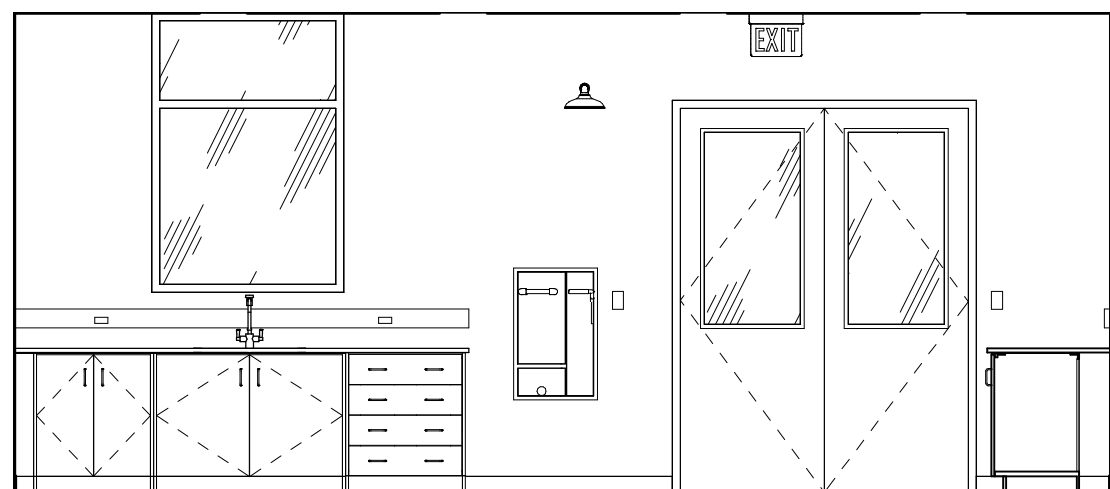


⑨ 3531 - S - FRZ. ROOM  
1/4" = 1'-0"

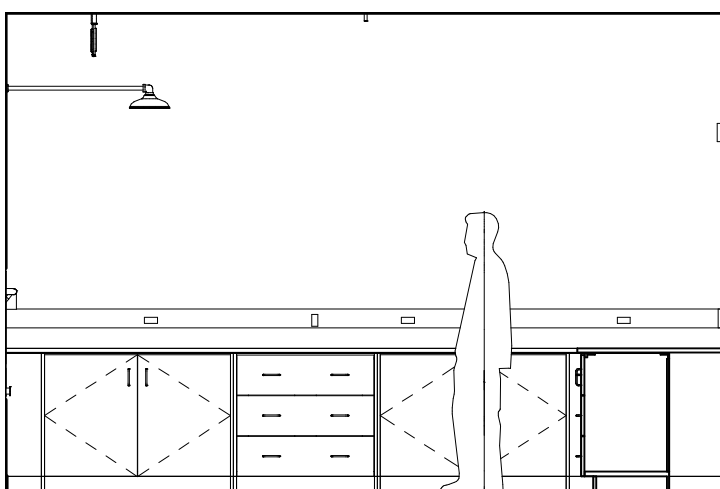
LEVEL 3  
459' - 10"



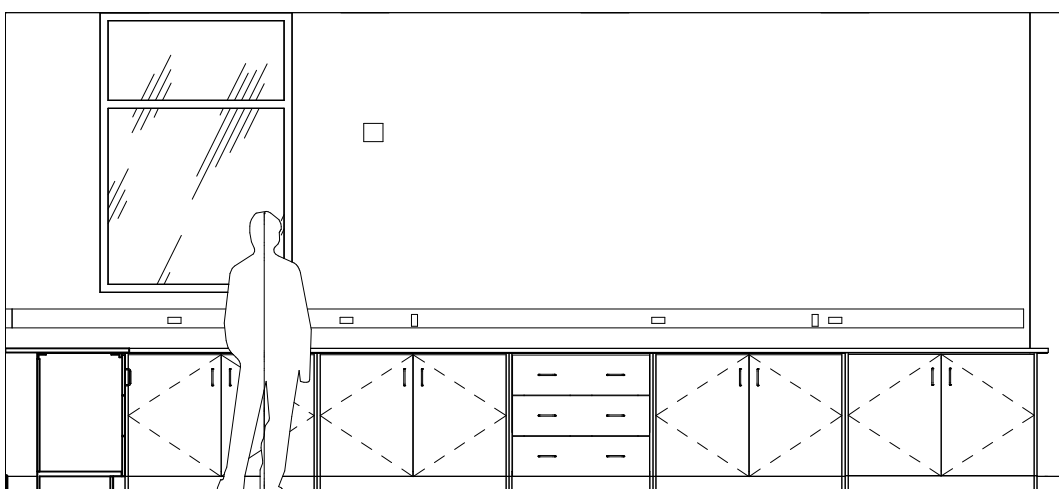
⑩ 3531 - W - FRZ. ROOM  
1/4" = 1'-0"



⑪ 3532 - S - MILLING LAB  
1/4" = 1'-0"



⑫ 3532 - W - MILLING LAB  
1/4" = 1'-0"



⑬ 3532 - N - MILLING LAB  
1/4" = 1'-0"

LEVEL 3  
459' - 10"



GRAPHIC SCALE: 1/4" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



BAR IS ONE INCH ON ORIGINAL DRAWING

GENERAL NOTE:

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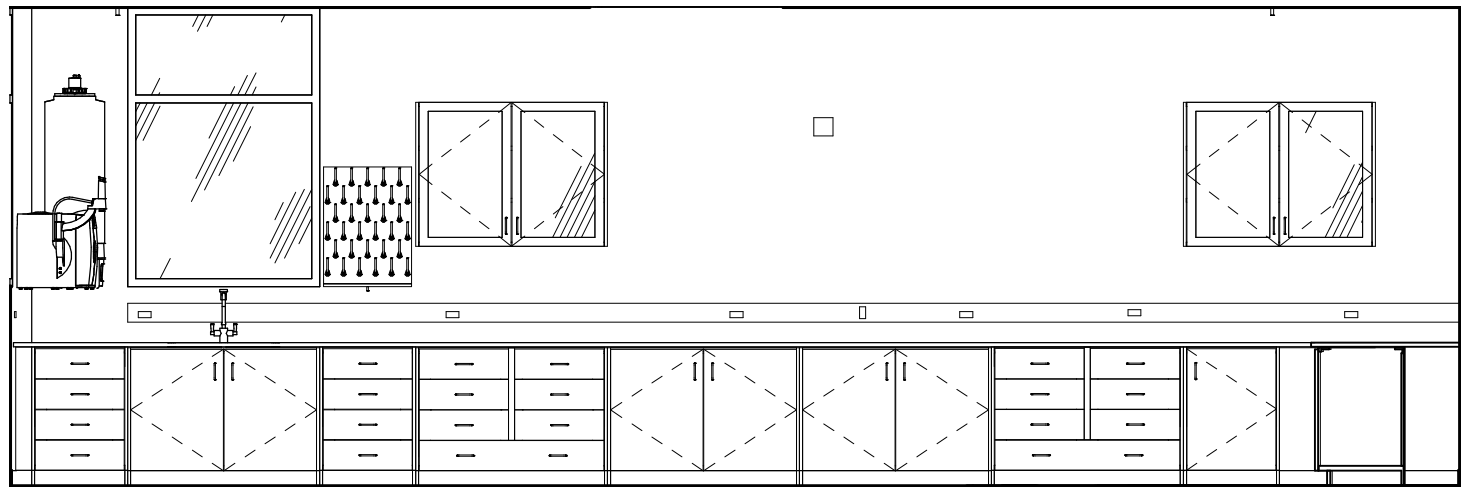
| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

ISSUE DATE:

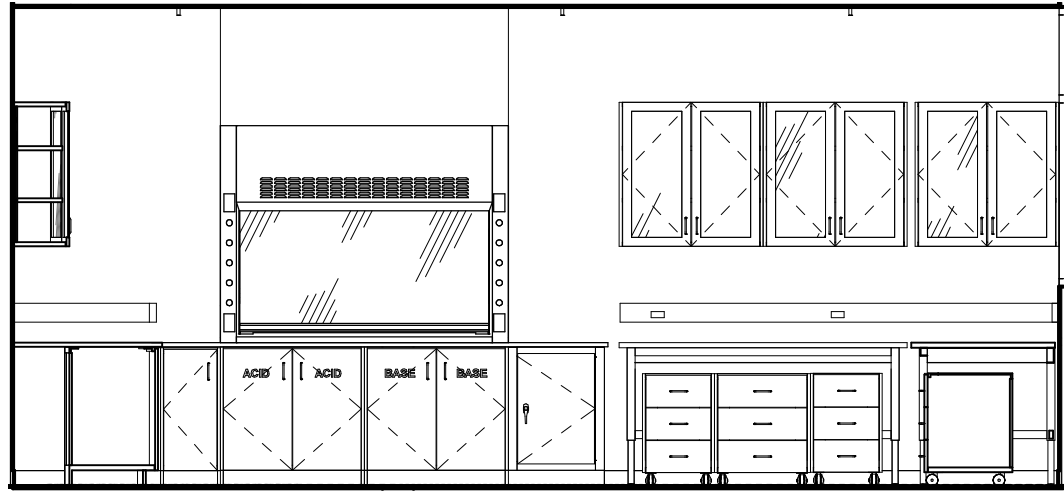
SCALE: 1/4" = 1'-0"

SHEET NUMBER

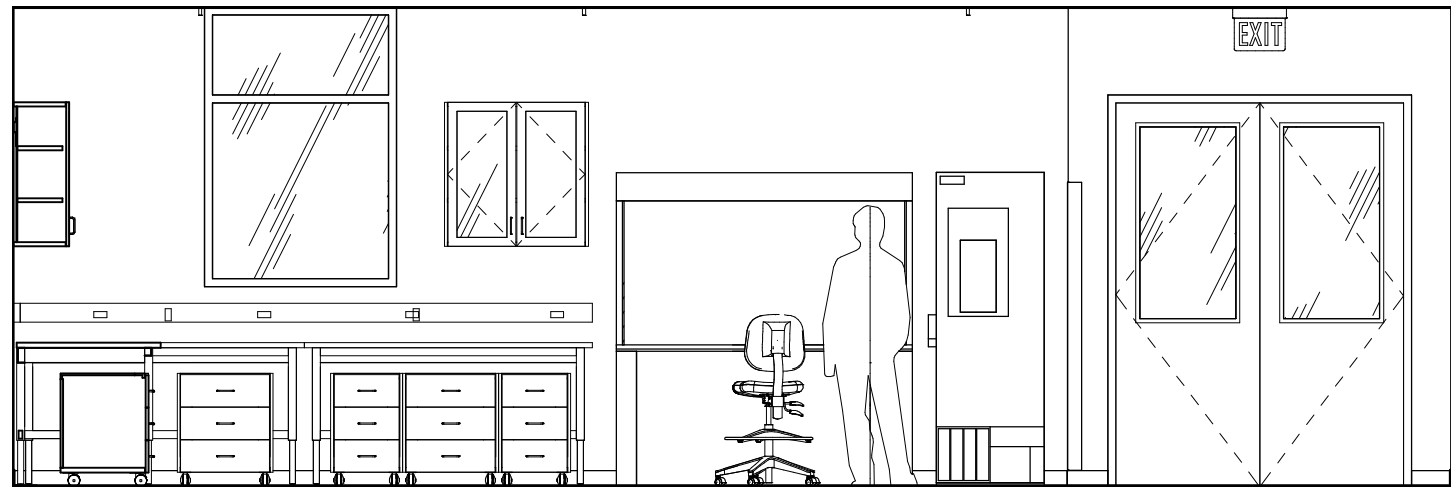
A-703



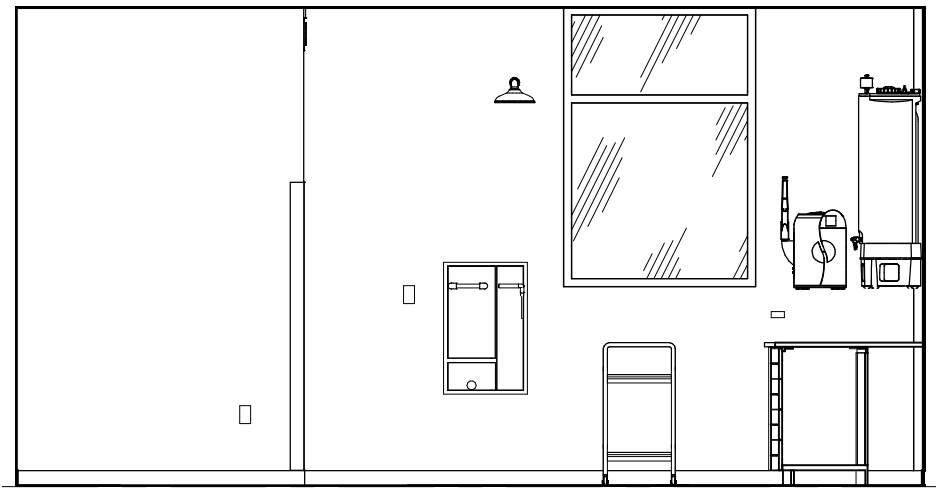
① 3533 - E - MEDIA PREP LAB  
1/4" = 1'-0"



② 3533 - S - MEDIA PREP LAB  
1/4" = 1'-0"

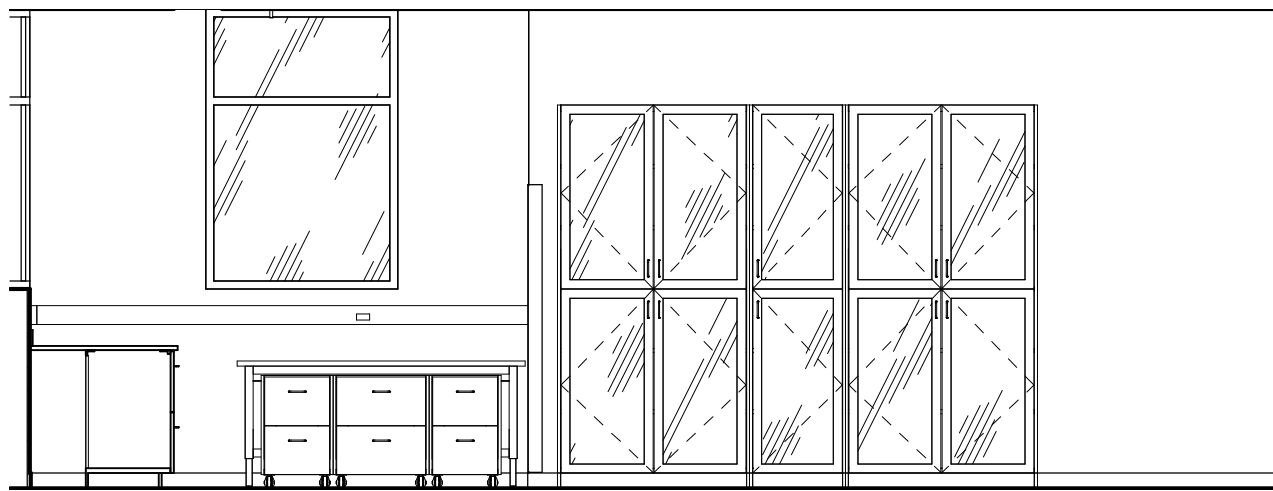


③ 3533 - W - MEDIA PREP LAB  
1/4" = 1'-0"

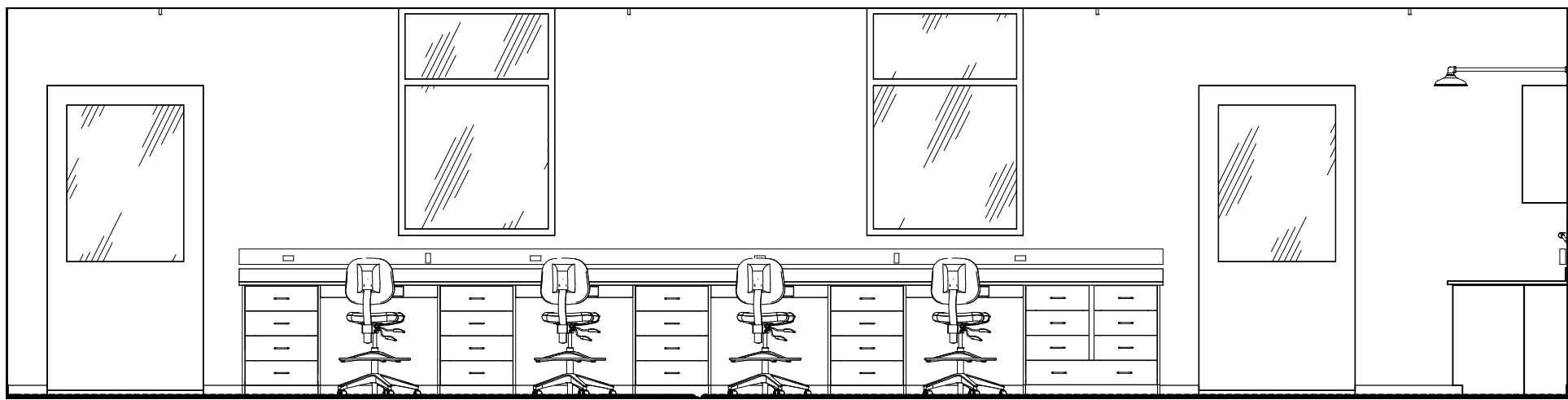


④ 3533 - N - MEDIA PREP LAB  
1/4" = 1'-0"

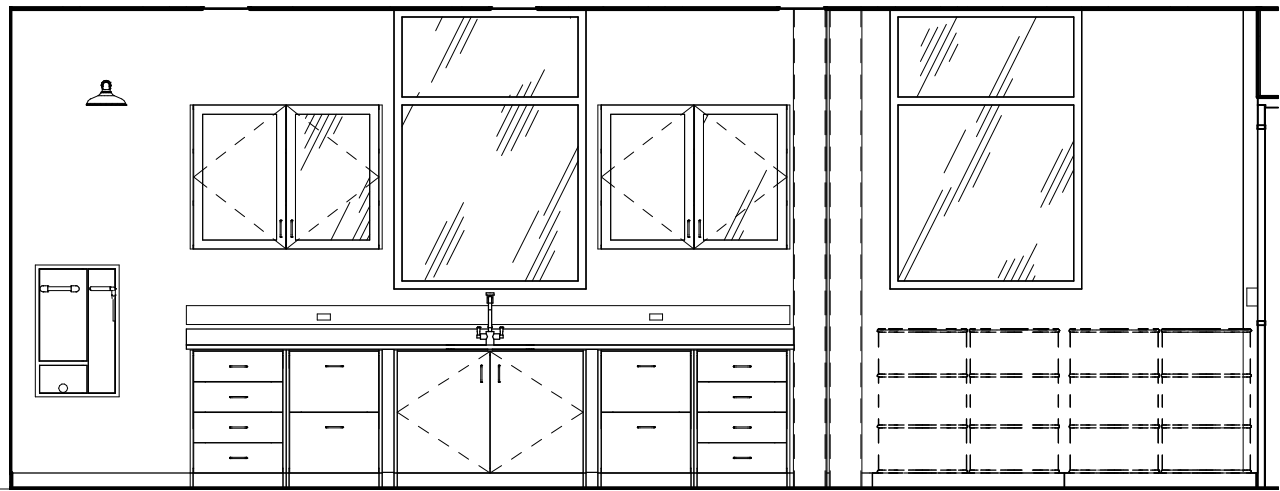
LEVEL 3  
459' - 10"



⑤ 3534 - E - SHARED ANLY. SPACE  
1/4" = 1'-0"

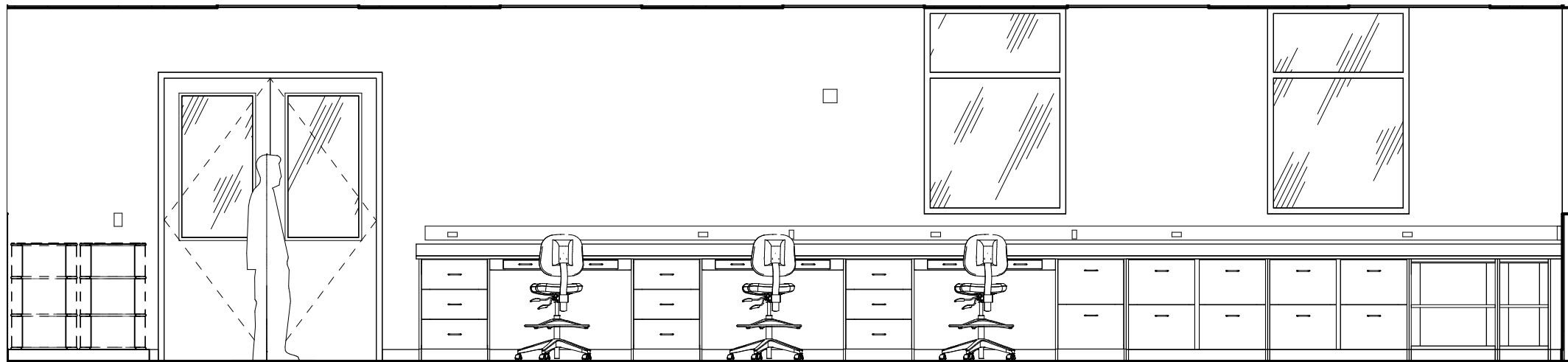


⑥ 3534-S-SHARED ANLY. SPACE  
1/4" = 1'-0"

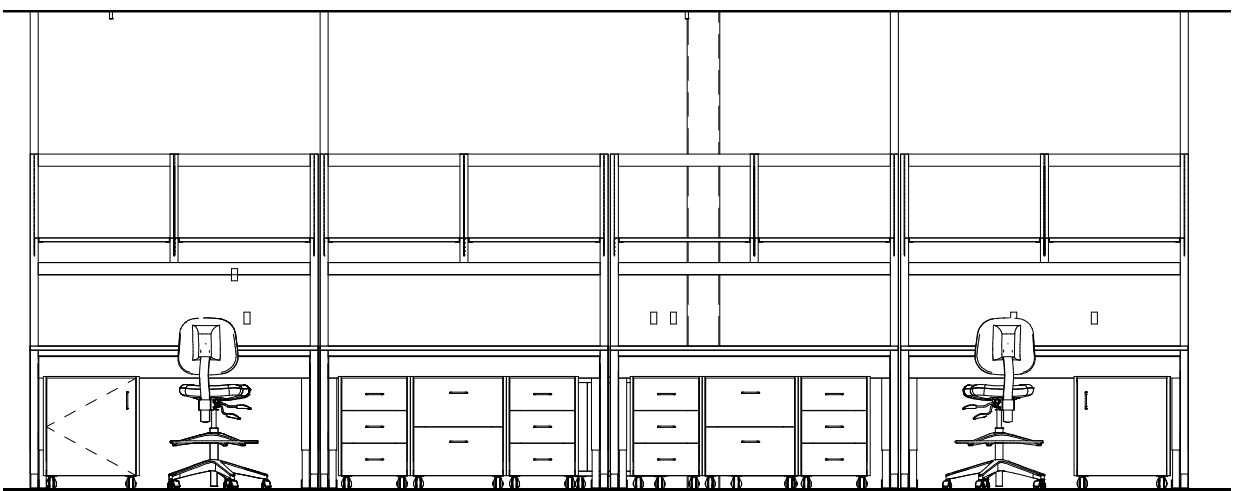


⑦ 3534-W-SHARED ANLY. SPACE  
1/4" = 1'-0"

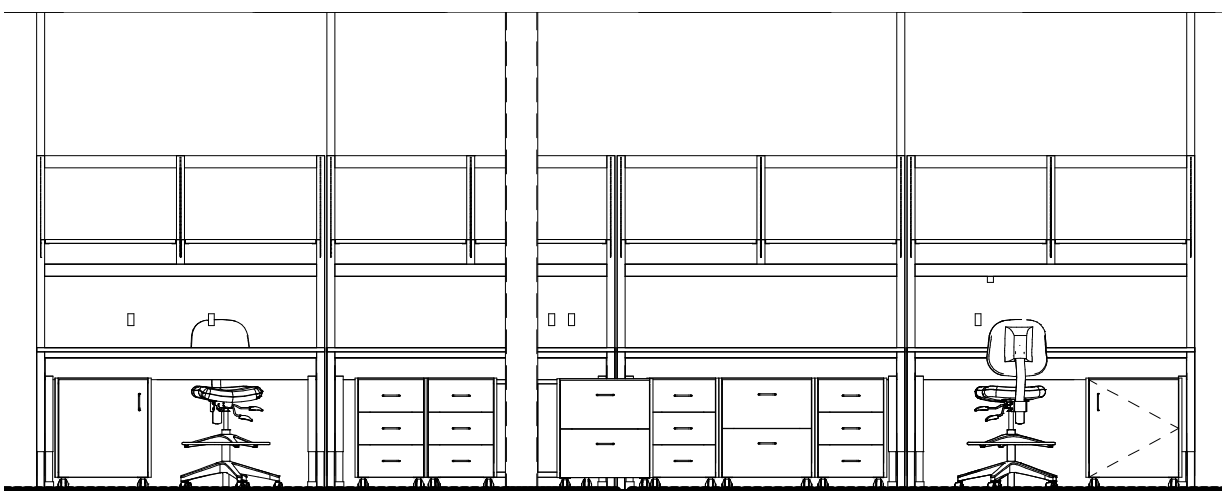
LEVEL 3  
459' - 10"



⑧ 3534-N-SHARED ANLY. SPACE  
1/4" = 1'-0"



⑨ 3534 - ISLAND - LOOKING NORTH  
1/4" = 1'-0"



⑩ 3534 - ISLAND - LOOKING SOUTH  
1/4" = 1'-0"

LEVEL 3  
459' - 10"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"



GRAPHIC SCALE: 1/4" = 1'-0"

GENERAL NOTE:

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

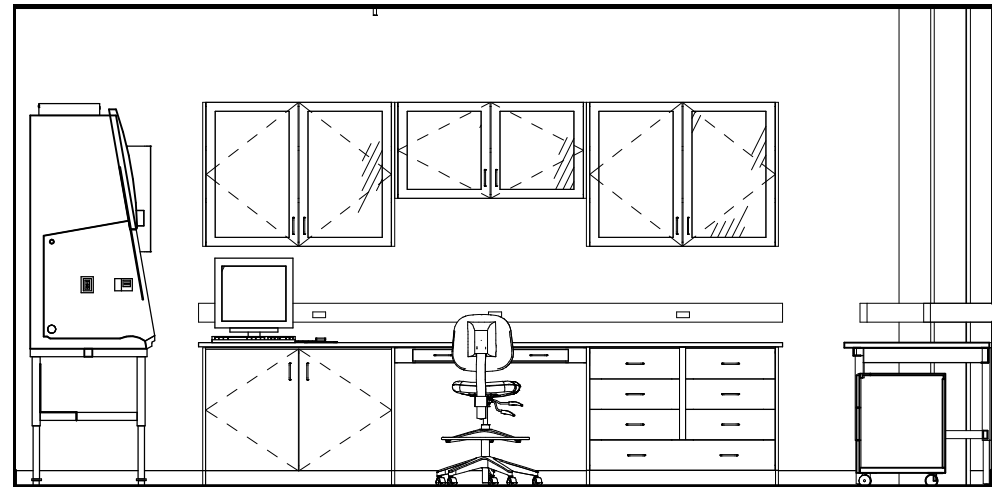
ISSUE DATE:

SCALE: 1/4" = 1'-0"

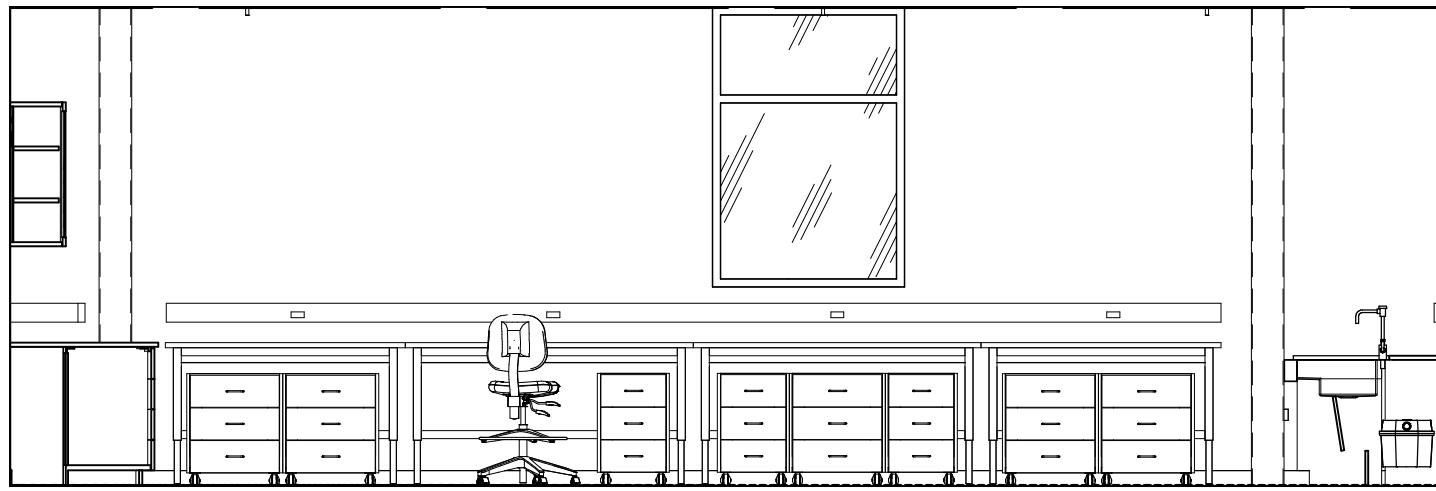
SHEET NUMBER

A-704

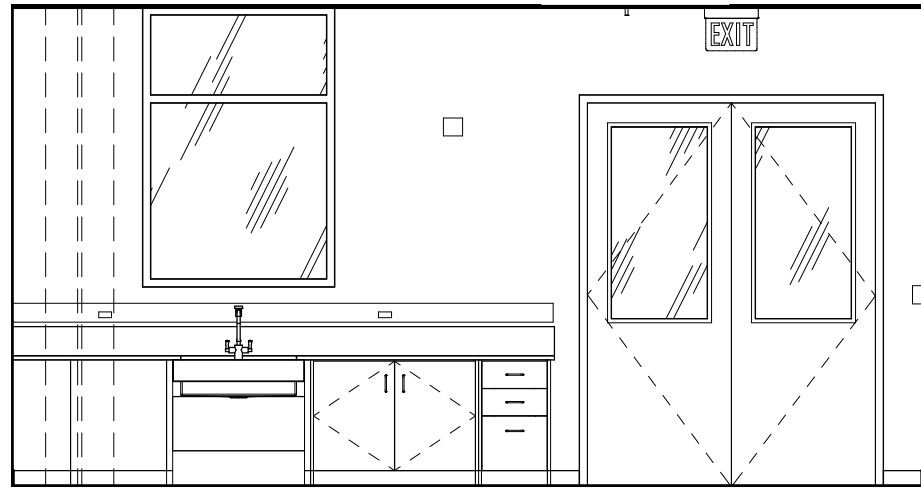




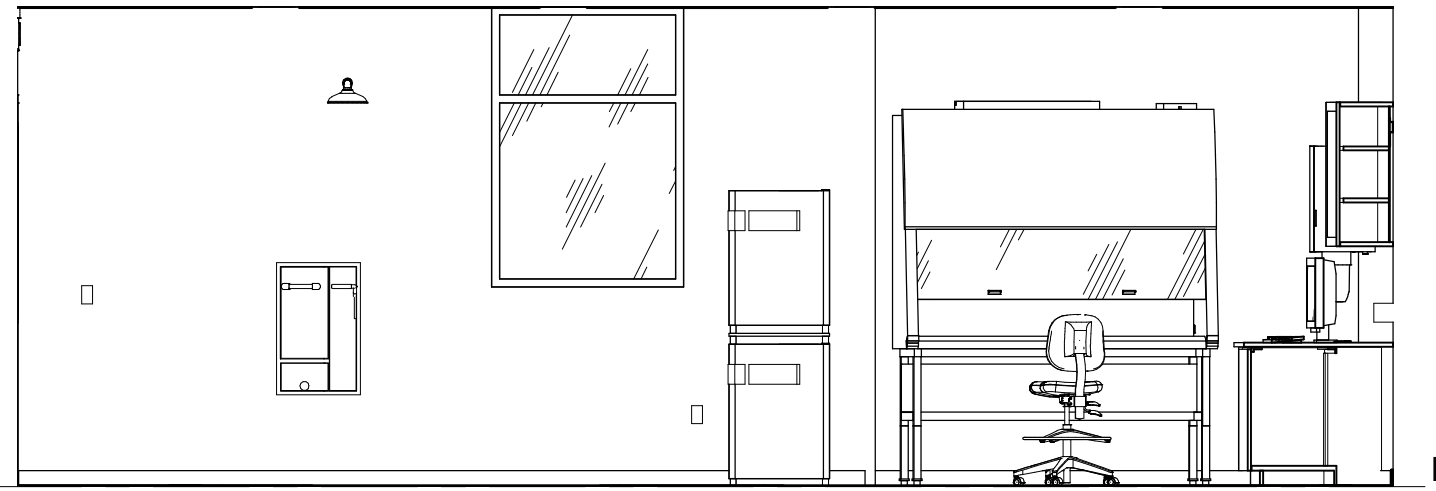
① 3537 - E - QUAR. LAB  
1/4" = 1'-0"



② 3537 - S - QUAR. LAB  
1/4" = 1'-0"

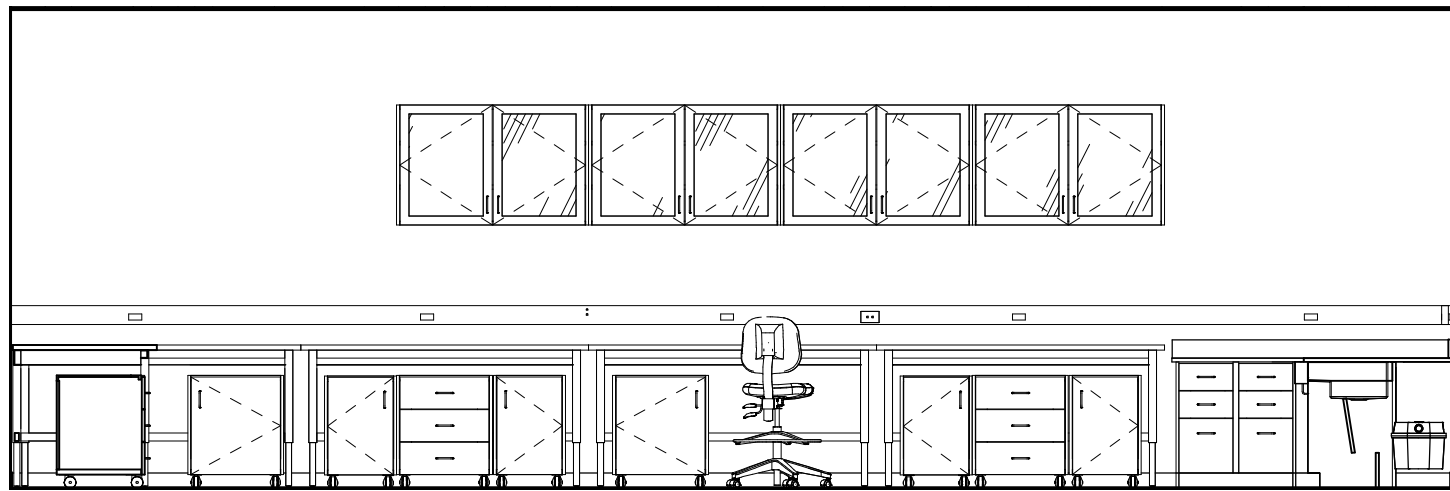


③ 3537 - W - QUAR. LAB  
1/4" = 1'-0"

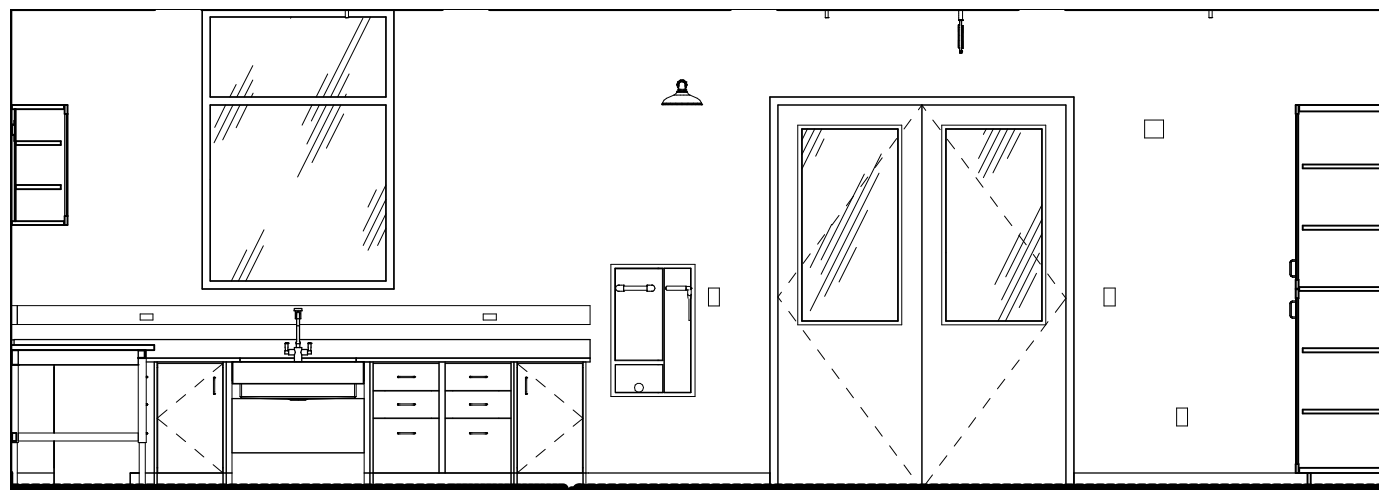


④ 3537 - N - QUAR. LAB  
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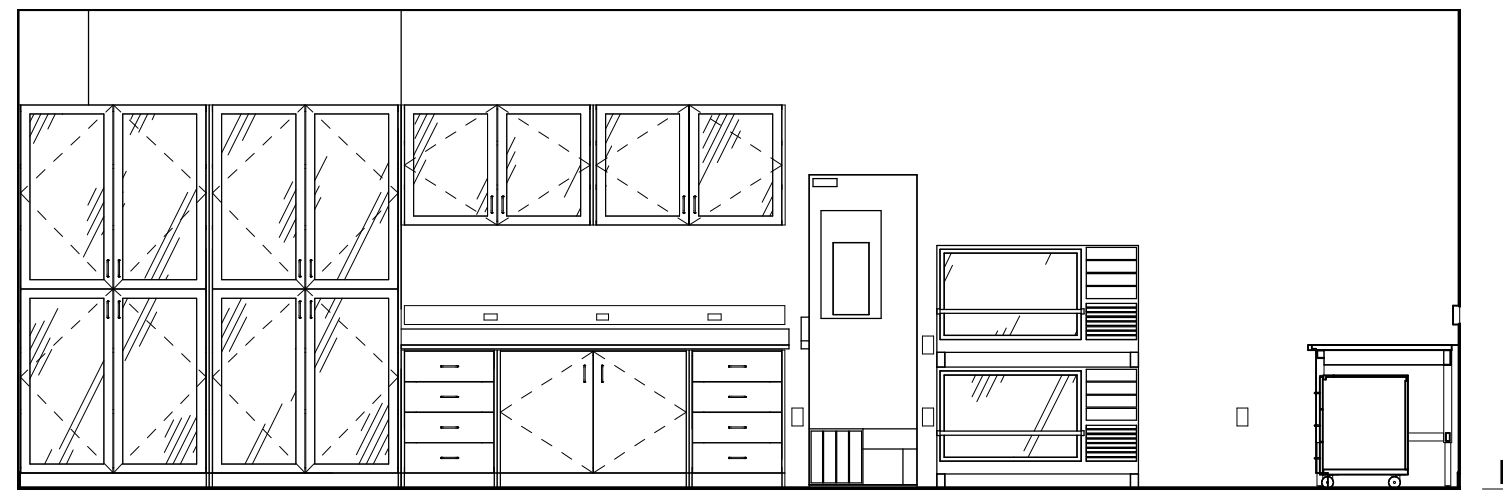
LEVEL 3  
459' - 10"



⑤ 3540 - E - BIO-R. LAB  
1/4" = 1'-0"

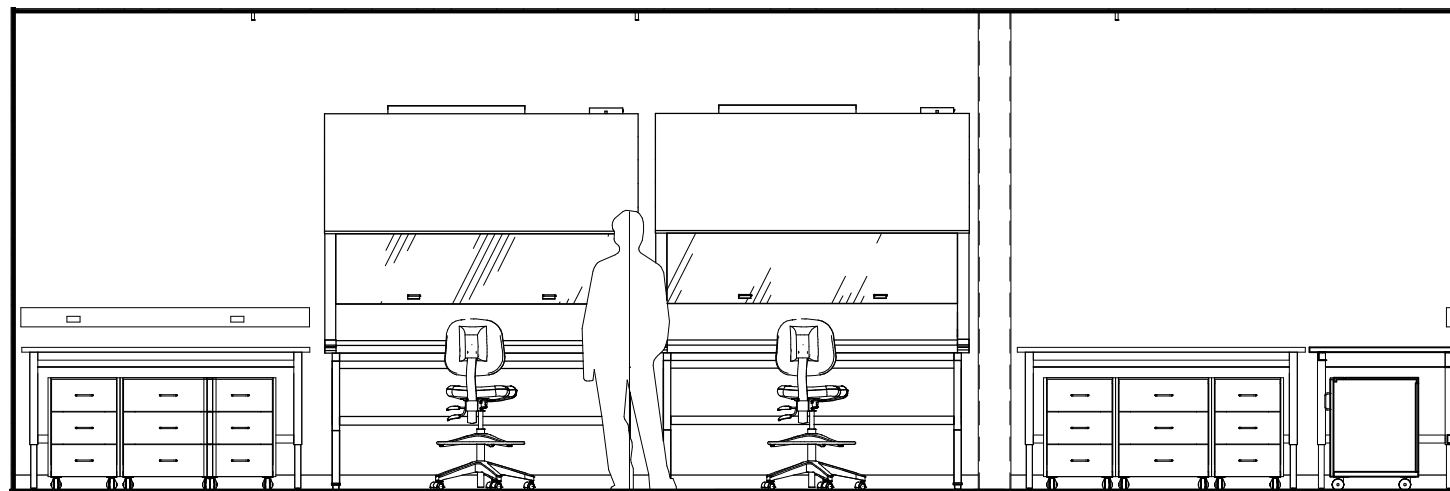


⑥ 3540 - S - BIO-R. LAB  
1/4" = 1'-0"

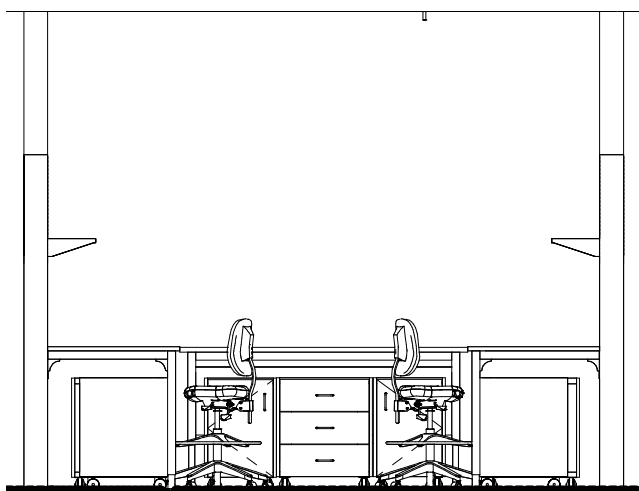


⑦ 3540 - W - BIO-R. LAB  
1/4" = 1'-0"

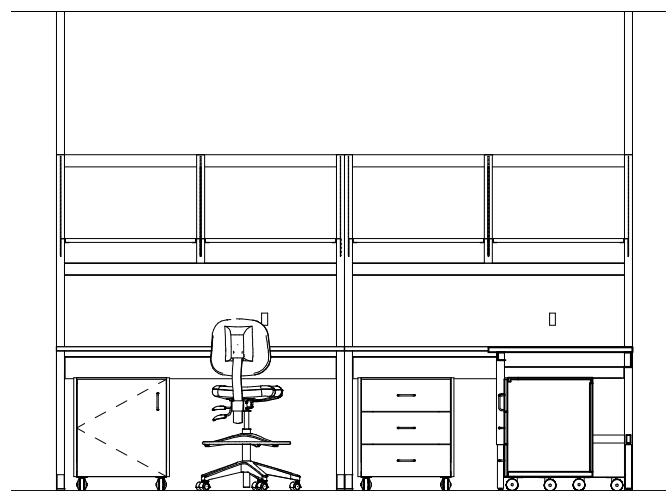
LEVEL 3  
459' - 10"



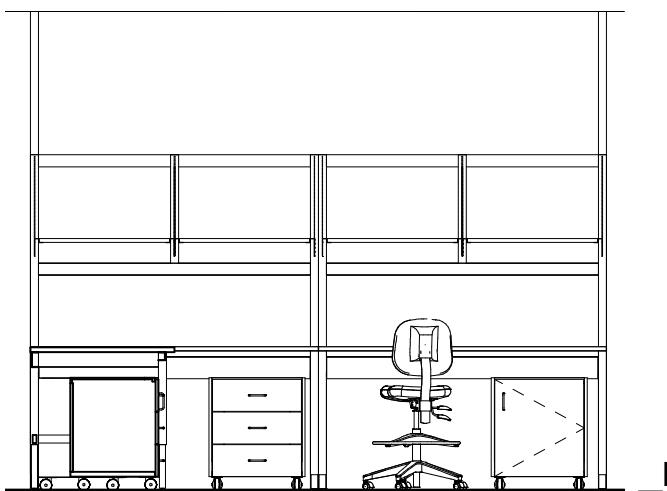
⑧ 3540 - N - BIO-R. LAB  
1/4" = 1'-0"



⑨ 3540 -END ELEV. - BIO-R. LAB ISLAND  
1/4" = 1'-0"



⑩ 3540 -INT. SIDE ELEV. - BIO-R. LAB ISLAND - LOOKING EAST  
1/4" = 1'-0"

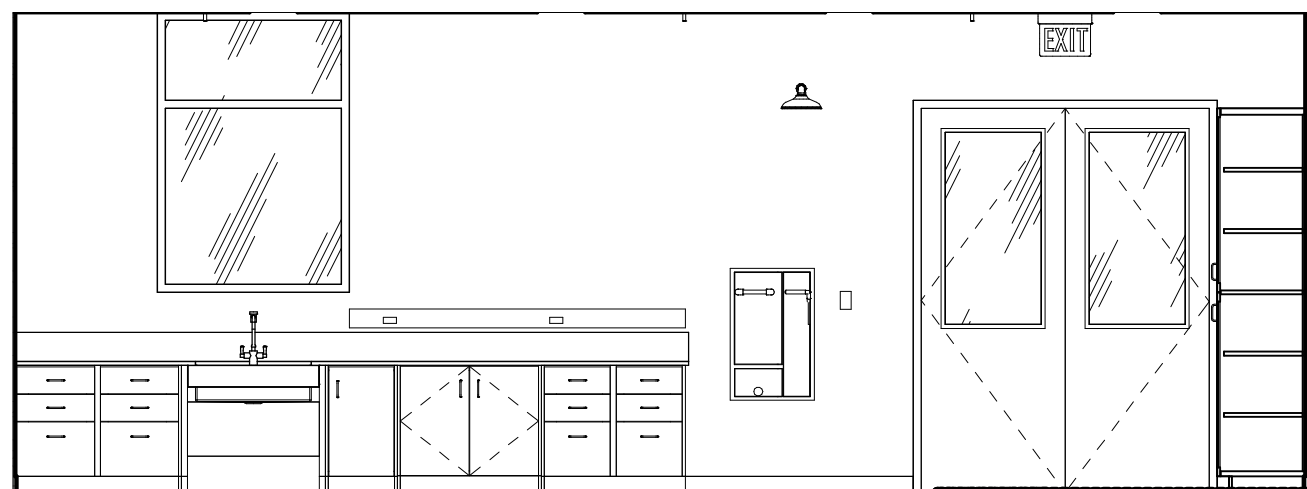


⑪ 3540 - INT. SIDE ELEV. - BIO-R. LAB ISLAND - LOOKING WEST  
1/4" = 1'-0"

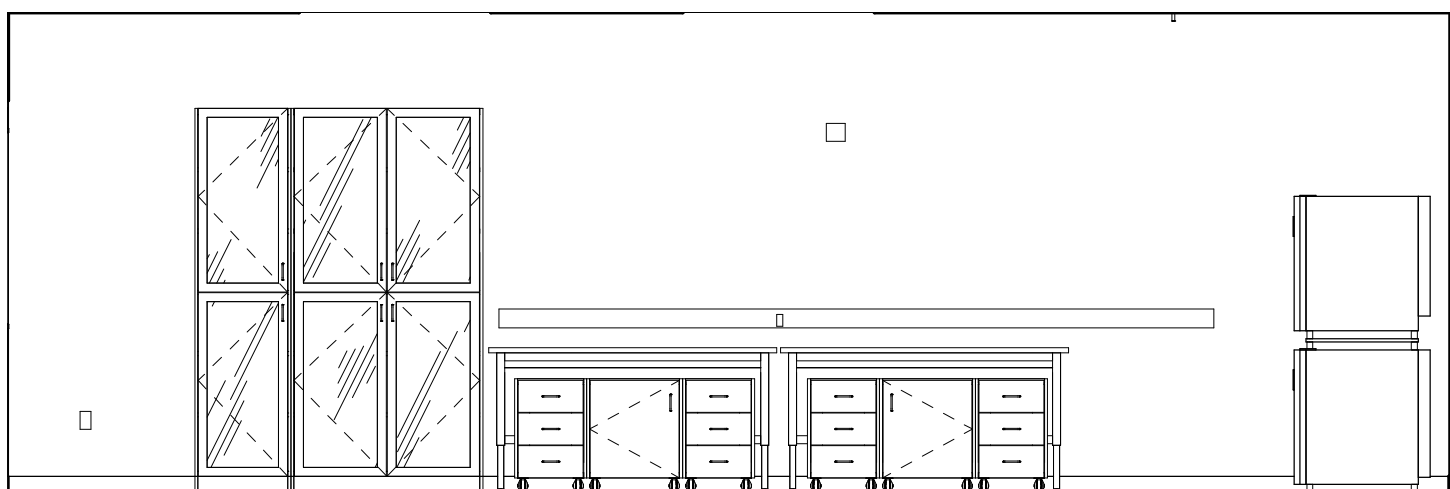
NOTE: OPPOSITE SIDE OF ISLAND SIMILAR



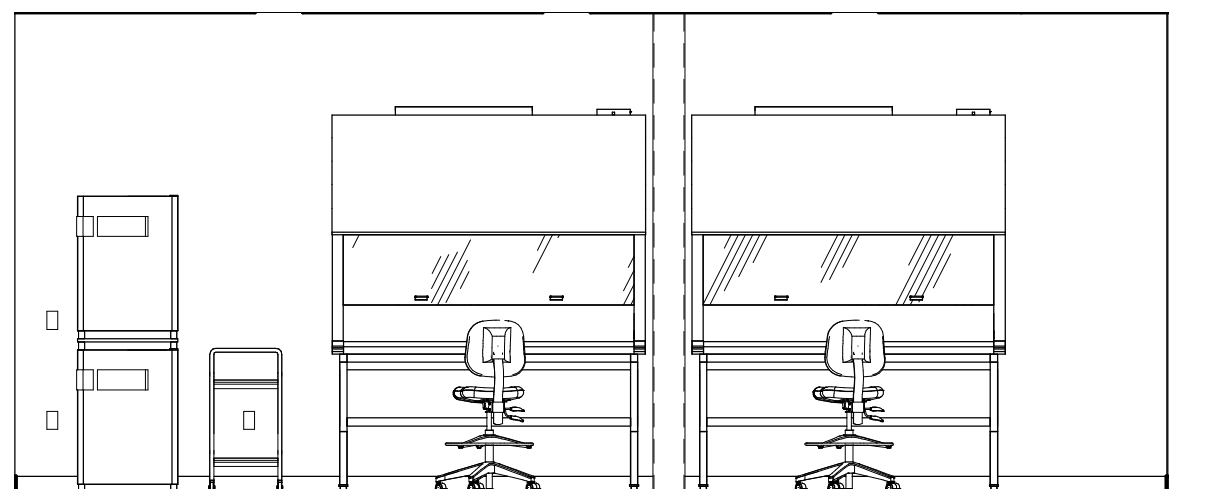
⑫ 3541 - E - BSL-2 LAB  
1/4" = 1'-0"



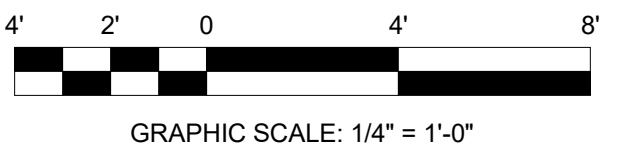
⑬ 3541 - S - BSL-2 LAB  
1/4" = 1'-0"



⑭ 3541 - W - BSL-2 LAB  
1/4" = 1'-0"



⑮ 3541 - N - BSL-2 LAB  
1/4" = 1'-0"



GRAPHIC SCALE: 1/4" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | AB   | DC   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| AB/KM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  | DC   |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

ISSUE DATE:

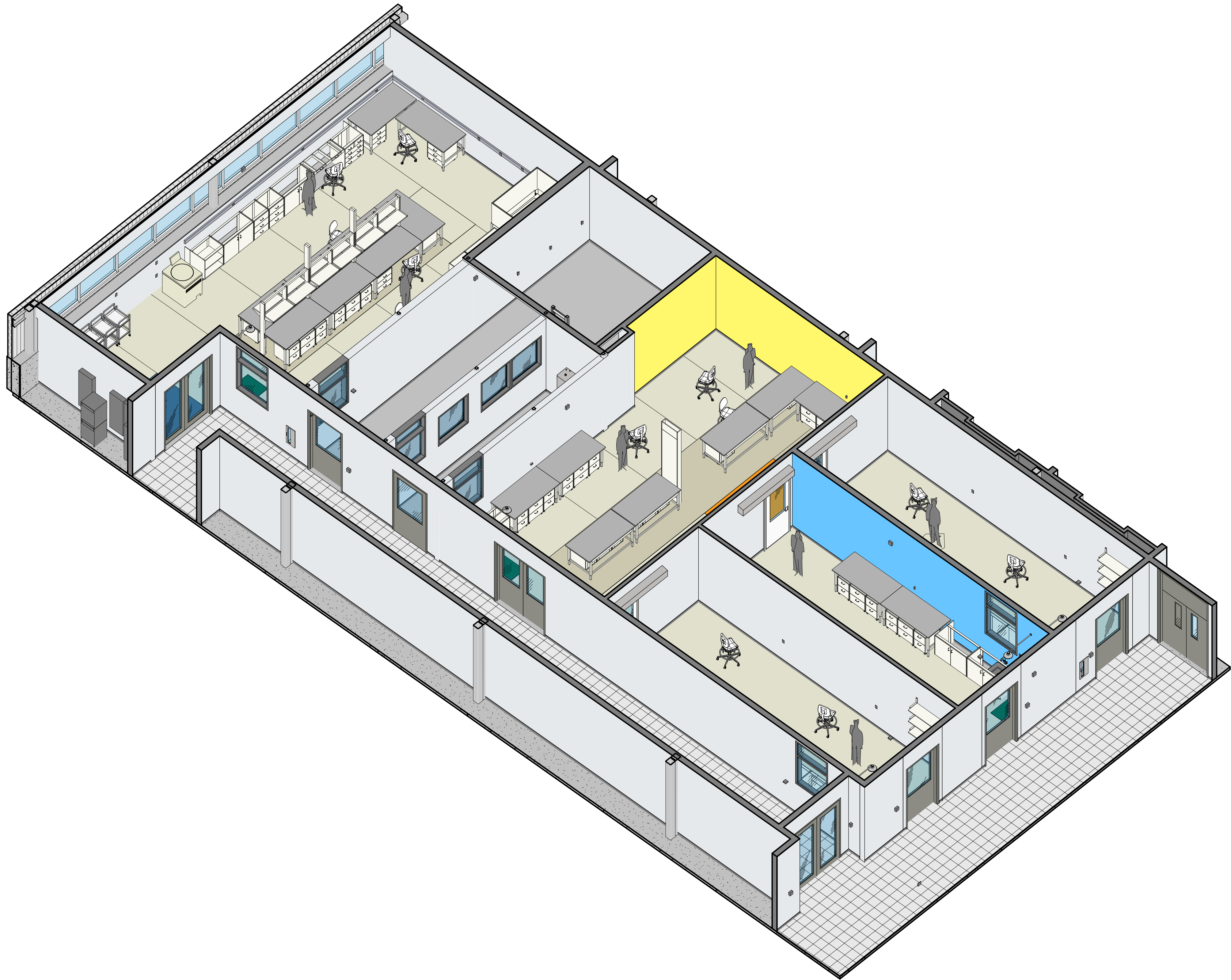
SCALE: 1/4" = 1'-0"

SHEET NUMBER

A-705



BAR IS ONE INCH ON THIS SHEET. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



① 3D RENDERING - OVERVIEW - WEST SHELL

GENERAL NOTE:

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| AB/KM |      |          |                              |      |      |       |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

ISSUE DATE:

SCALE:

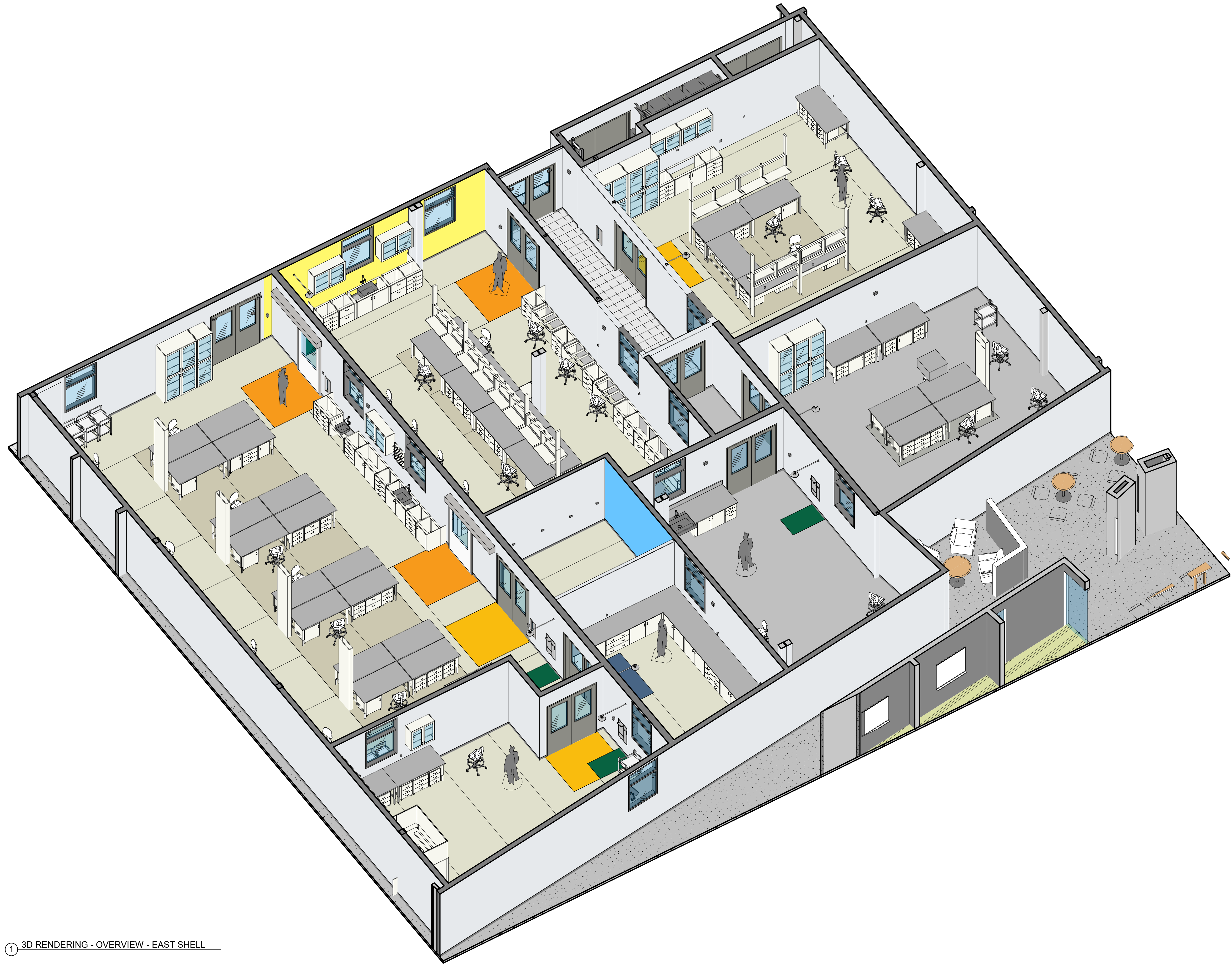
SHEET NUMBER

A-901



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1"



① 3D RENDERING - OVERVIEW - EAST SHELL

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   |       |
| CHK:  | DC   |          |                              |      |      | DC    |
| APVD: |      |          |                              |      |      |       |

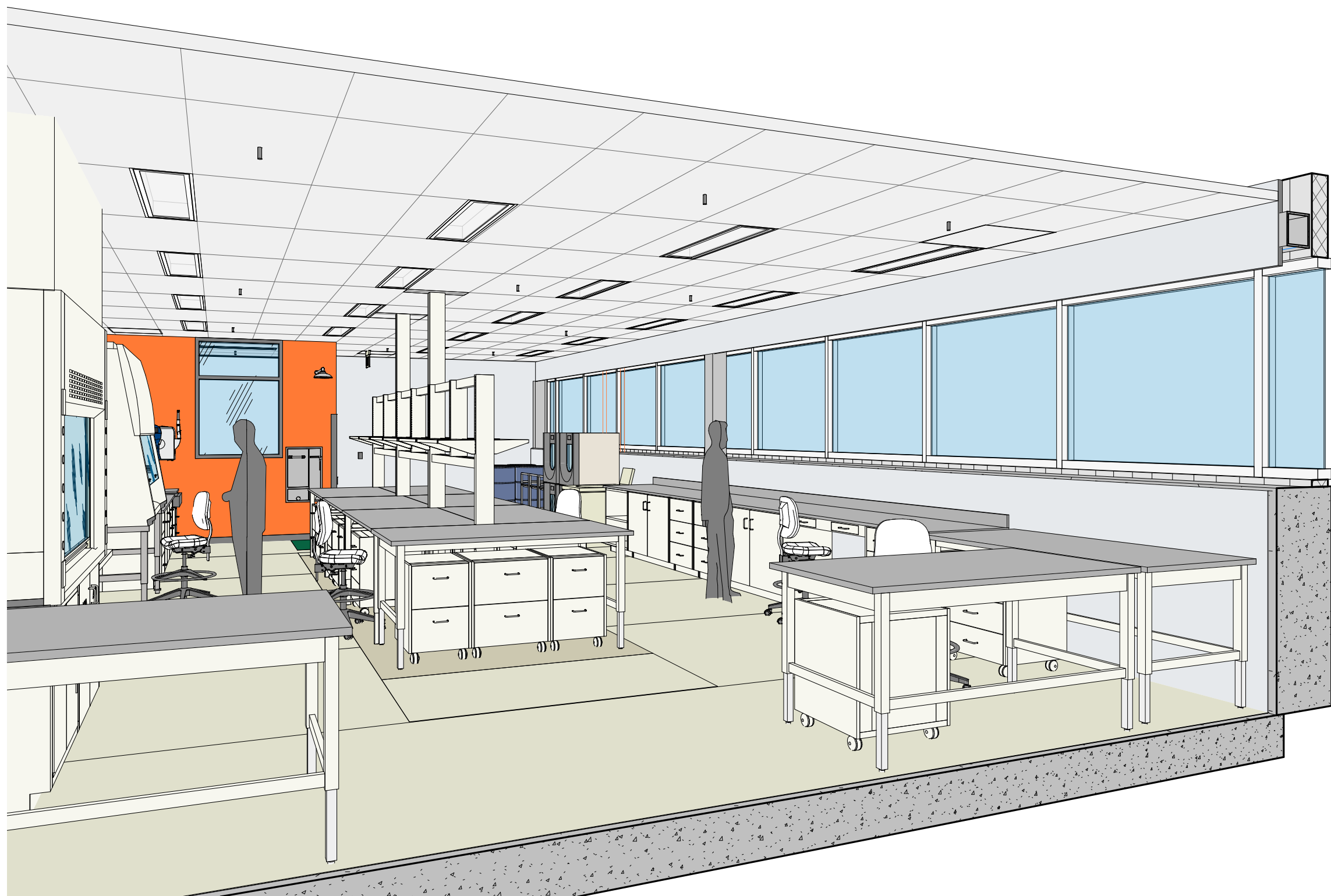




① INTERIOR RENDERING - RM. 3521



② INTERIOR RENDERING - RM. 3521

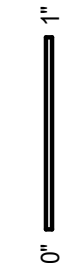


③ INTERIOR RENDERING - RM. 3521



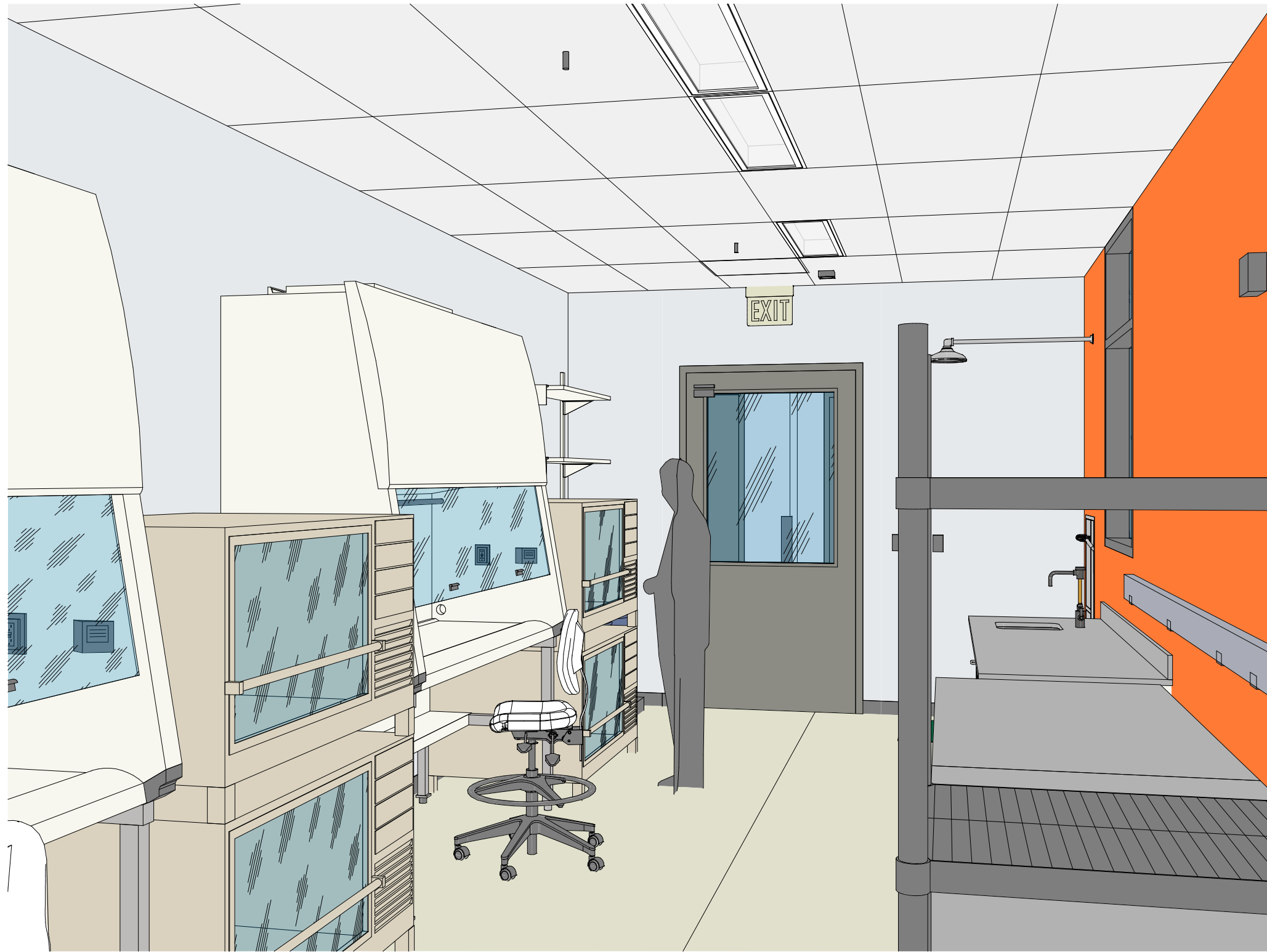
④ INTERIOR RENDERING - RM. 3522

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |





① INTERIOR RENDERING - RM. 3525



② INTERIOR RENDERING - RM. 3525



③ INTERIOR RENDERING - RM. 3526



④ INTERIOR RENDERING - RM. 3530

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| AB/KM |      |          |                              |      |      |       |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |

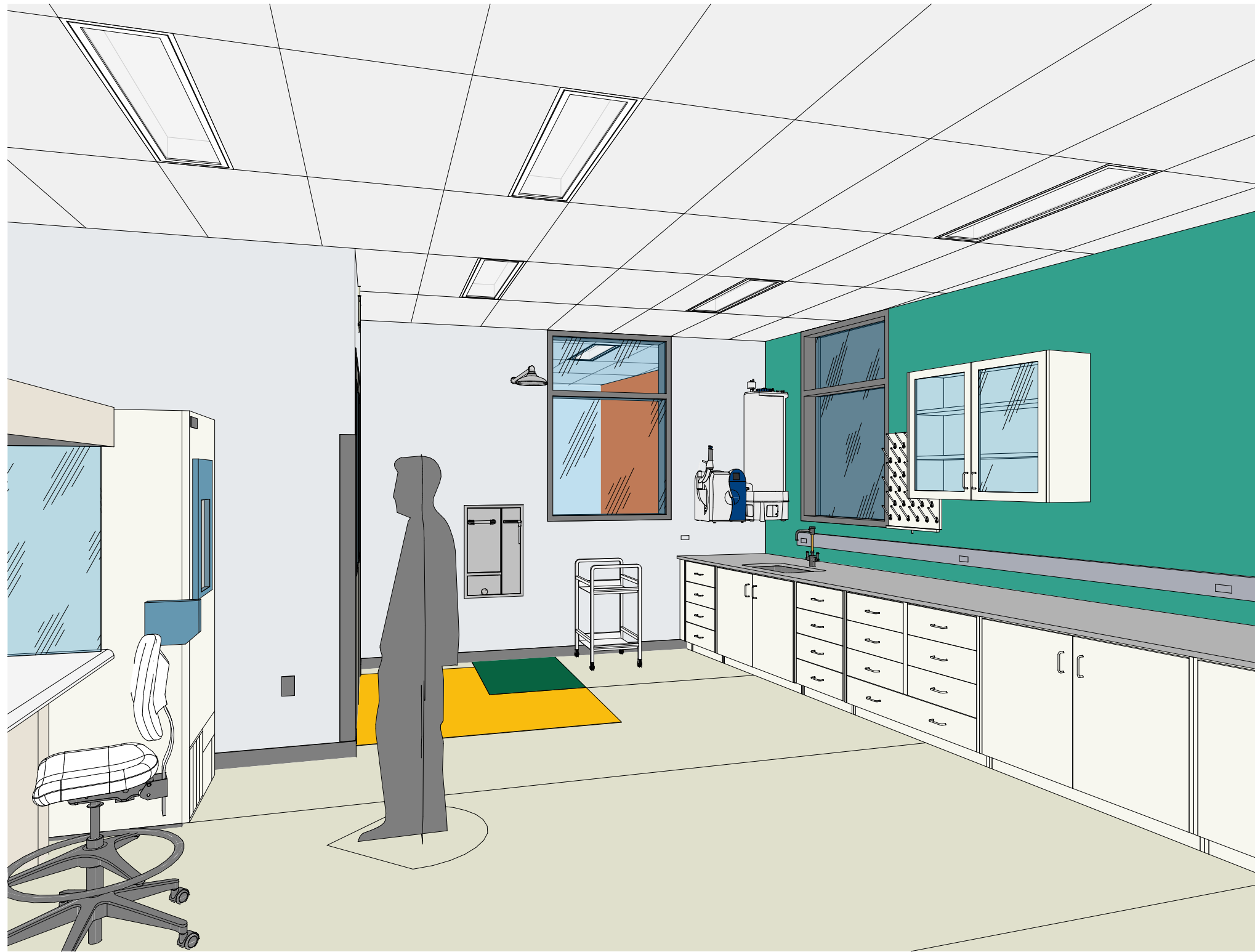
ISSUE DATE:

SCALE:

SHEET NUMBER

A-904





① INTERIOR RENDERING - RM. 3533



② INTERIOR RENDERING - RM. 3534



③ INTERIOR RENDERING - RM. 3534



④ INTERIOR RENDERING - RM. 3534

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |





① INTERIOR RENDERING - RM. 3540



② INTERIOR RENDERING - RM. 3540



③ INTERIOR RENDERING - RM. 3540

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| DC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | AB   | DC   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | AB   | DC   | DC    |
| CHK:  |      |          |                              |      |      |       |
| DC    |      |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |



IF NOT ONE INCH ON THIS SHEET,  
ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON  
ORIGINAL DRAWING

GENERAL REQUIREMENTS

- DESIGN IS IN ACCORDANCE WITH, AND CONSTRUCTION SHALL CONFORM TO, REQUIREMENTS OF THE APPLICABLE STATE BUILDING CODE REGULATIONS - MASSACHUSETTS STATE BUILDING CODE (9TH EDITION PLUS AMENDMENTS) EFFECTIVE OCTOBER, 2017 WITH SUBSEQUENT UPDATES, AND THE PROVISIONS OF THE 2015 INTERNATIONAL BUILDING CODE AS ADOPTED. IN THE EVENT OF A DISCREPANCY BETWEEN THE PLANS / SPECIFICATIONS AND APPLICABLE CODES AND ORDINANCES THE MORE STRINGENT PROVISION SHALL APPLY.
- THE SITE IS LOCATED AT 100 RESULTS WAY, MARLBOROUGH, MA.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN UNANTICIPATED OR APPARENTLY DANGEROUS CONDITIONS ARE UNCOVERED DURING NEW CONSTRUCTION WORK, OR DEMOLITION OF EXISTING STRUCTURE WHERE APPLICABLE.
- INFORMATION REGARDING EXISTING CONSTRUCTION AND CONDITIONS IS BASED ON EXISTING AS-BUILT DRAWINGS AND MODELS PROVIDED BY OWNER AND FIELD INSPECTION, AND IS INCLUDED TO ASSIST THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY OR COMPLETENESS.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THAT PORTION OF THE WORK.
- DETAILS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR TO THOSE FOR MOST NEARLY SIMILAR CONDITION AS DETERMINED BY THE ENGINEER.
- THE CONTRACTOR SHALL SHORE, BRACE, SHEETPILE OR OTHERWISE SUPPORT THE STRUCTURE AS REQUIRED TO MAINTAIN STRUCTURAL INTEGRITY AT ALL TIMES. SHORING DESIGN SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.
- HEADERS SHALL BE PLACED ACROSS TOP OF SHORING POSTS AND SHALL BE TIGHT AGAINST UNDERSIDE OF STRUCTURE ABOVE.
- SHORING SHALL BEAR ON SLEEPERS TO PREVENT DAMAGE TO STRUCTURE BELOW.
- TEMPORARY SHORES SHALL BE DESIGNED, ERECTED, SUPPORTED, BRACED AND MAINTAINED BY THE CONTRACTOR TO SUPPORT SAFELY ALL DEAD LOADS PRESENTLY CARRIED BY THE STRUCTURAL WORK BEING SHORED, AND ANY CONSTRUCTION LIVE LOADS.
- NEW STRUCTURAL SYSTEMS SHALL BE COMPLETELY INSTALLED AND CAPABLE OF SUPPORTING DESIGN LOADS BEFORE SHORES ARE REMOVED. SHORES SHALL BE RELEASED GRADUALLY.
- A GEOTECHNICAL REPORT HAS NOT BEEN PREPARED FOR THIS PROJECT.
- THE GENERAL CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS.
- THESE DRAWINGS ARE INTENDED TO SHOW ONLY STRUCTURAL PLANS AND DETAILS. SEE APPROPRIATE DRAWINGS FROM OTHER DISCIPLINES SUCH AS ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL FOR THE DESIGN, LOCATION AND SIZE OF DROPS, OPENINGS, SLEEVES, ETC.
- SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

DESIGN LOADS: SELECT DESIGN LOADS ARE NOTED BELOW:

- GENERAL DESIGN REQUIREMENTS
  - BUILDING CATEGORY.....II
- LIVE LOAD
  - MECHANICAL MEZZANINE.....60 PSF

CONCRETE

- CONCRETE WORK SHALL CONFORM TO LATEST EDITIONS OF "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318) AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301).
- CONCRETE SHALL BE PROPORTIONED, MIXED AND PLACED UNDER THE SUPERVISION OF THE APPROVED TESTING AGENCY.
- CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI FOR ALL NEW WORK.
- CONCRETE USED SHALL BE NORMAL WEIGHT CONCRETE WITH AN APPROXIMATE UNIT WEIGHT OF 150 PCF.
- CONCRETE SHALL BE CURED FOR A MINIMUM OF SEVEN DAYS BEFORE ANY LOADS ARE APPLIED THERETO.
- PORTLAND CEMENT TYPE I SHALL BE USED FOR ALL CONCRETE. PROVIDE MINIMUM 6 SACKS OF CEMENT PER CUBIC YARD FOR 4000 PSI CONCRETE.
- THE MAXIMUM PERMISSIBLE WATER-CEMENT RATIO OF CONCRETE SHALL BE 0.40 FOR 4000 PSI CONCRETE (4.5 GALLONS PER 94 LB. SACK OF CEMENT).
- ALL CONCRETE SHALL BE PLACED IN THE DRY.
- CONCRETE (OTHER THAN HIGH-EARLY-STRENGTH) SHALL BE MAINTAINED ABOVE 50 DEGREES F AND IN A MOIST CONDITION FOR AT LEAST THE FIRST SEVEN DAYS AFTER PLACEMENT, EXCEPT WHEN CURING IS TO BE ACCELERATED IN ACCORDANCE WITH ACI 318.
- MECHANICAL AND ELECTRICAL DRAWINGS MAY IDENTIFY AND LOCATE EMBEDDED ITEMS (PIPES, SLEEVES, EQUIP. BOLTS, RAILINGS, LIFTING RINGS, FRAMES, ETC.) AND ARE TO BE USED IN CONJUNCTION WITH STRUCTURAL DRAWINGS DURING CONSTRUCTION.
- PRIOR TO CORING FOR PENETRATION THROUGH EXISTING CONCRETE, USE GPR TO LOCATE AND AVOID EXISTING REBAR. IF EXISTING REBAR CANNOT BE AVOIDED, REPLACE PIPING PENETRATION WITH PUMPS.
- ALL EQUIPMENT ANCHOR BOLTS FURNISHED BY EQUIPMENT MANUFACTURER ARE TO BE INSTALLED BY GENERAL CONTRACTOR.
- ADHESIVE ANCHORS/DOWELS IN CONCRETE SHALL BE HILTI HIT HY-200. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING CONCRETE MIX DESIGNS AND SPECIFICATION SHEETS FOR ALL ADMIXTURES FOR APPROVAL BY THE ARCHITECT/ENGINEER PRIOR TO THE PLACEMENT OF ANY CONCRETE.

FOUNDATIONS

- THE PROJECT HAS BEEN DESIGNED BASED UPON A SOIL BEARING CAPACITY OF 4.0 TONS PER SQ. FT. (8 KSF) FOR SAND/GRAVEL & ENGINEERED FILL, AS TAKEN FROM ORIGINAL STRUCTURAL FOUNDATION DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF UNSUITABLE BEARING MATERIALS EXIST.
- THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE VALIDITY OF SUBSURFACE CONDITIONS WHERE DESCRIBED ON DRAWINGS, SPECIFICATIONS, TEST BORINGS OR TEST PITS. THESE DATA ARE INCLUDED ONLY TO ASSIST THE CONTRACTOR DURING CONSTRUCTION, AND REPRESENT CONDITIONS ONLY AT THESE SPECIFIC LOCATIONS AT THE PARTICULAR TIME THEY WERE MADE.
- UNSUITABLE BEARING MATERIALS, SUCH AS MISCELLANEOUS FILL AND ORGANIC SOILS MAY EXIST IN AREAS OF NEW FOUNDATIONS. EXISTING UNSUITABLE MATERIALS SHALL BE EXCAVATED AS DIRECTED OR AS INDICATED ON THE DRAWINGS AND SHALL BE REPLACED WITH STRUCTURAL FILL. WHERE ROCK IS ENCOUNTERED, IT SHALL BE EXCAVATED TO 1'-0" BELOW BOTTOMS OF FOOTINGS AND SLABS AND REPLACED WITH A 1'-0" LAYER OF COMPACTED GRAVEL OR SAND.
- EXCAVATIONS FOR COLUMN FOOTINGS SHALL BE FINISHED BY HAND.
- NO FOUNDATION CONCRETE SHALL BE PLACED IN WATER OR ON FROZEN SOIL.
- BACKFILL UNDER ANY PORTION OF THE STRUCTURE SHALL BE COMPACTED IN 6" LIFTS, UNLESS FLOWABLE FILL IS UTILIZED.

STRUCTURAL STEEL

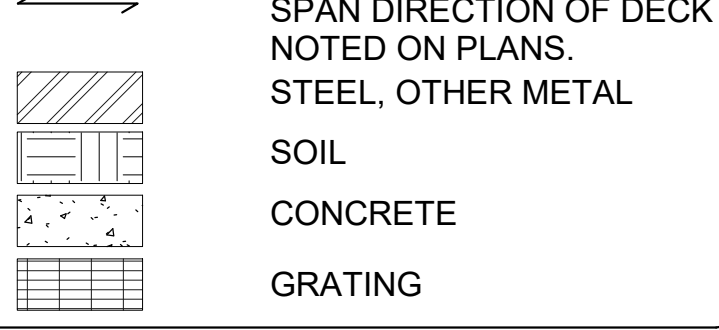
- STRUCTURAL STEEL IS DESIGNED IN ACCORDANCE WITH, AND WORK SHALL CONFORM TO, THE LATEST EDITIONS OF "SPECIFICATIONS FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (AISC), "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (AISC) AND "STRUCTURAL WELDING CODE- STEEL (AWS).
- ALL STEEL SHOWN SHALL BE CARBON STEEL OF THE GRADES BELOW UNO ON PLANS
  - W-SHAPES SHALL BE ASTM A992/A992M, GRADE 50 (Fy=50 KSI)
  - T-SHAPES SHALL BE CUT FROM STRUCTURAL W-SHAPES TYPICAL
  - CHANNELS AND ANGLES SHALL BE ASTM A36/A36M (Fy=36 KSI).
  - ROUND HSS SHALL BE ASTM A500, GRADE B (Fy=42 KSI).
  - SQUARE AND RECTANGULAR HSS SHALL BE ASTM A500, GRADE B (Fy=46 KSI).
  - STRUCTURAL PIPE SHALL BE ASTM A53/A53M, GRADE B (Fy=35 KSI).
  - STRUCTURAL PLATES AND BARS SHALL BE ASTM A36/A36M TYPICAL UNO
- STRUCTURAL SHAPES CALLED OUT AS S.S. (STAINLESS STEEL) SHALL BE FABRICATED FROM 304 STAINLESS STEEL COMPONENTS IN SIZES INDICATED ON THE DRAWINGS WITH MILL FINISH UNLESS OTHERWISE NOTED.
- ALL STEEL SHALL BE UNFINISHED EXCEPT THE FOLLOWING
  - ALL ITEMS EXPOSED TO EXTERIOR WEATHERING, EMBEDDED IN CONCRETE, AND THOSE ITEMS NOTED AS "GALVANIZED" SHALL BE GALVANIZED.
  - THOSE ITEMS NOTED AS "PAINTED" SHALL BE SHOP PRIMED WITH PRIMER COMPATIBLE WITH FINISH PAINT SYSTEM NOTED IN SPECIFICATIONS.
- ALL GALVANIZED STRUCTURAL STEEL, COMPONENTS AND FITTINGS SHALL BE HOT DIPPED GALVANIZED (2 OZ/ SQ. FT.) AFTER FABRICATION IN COMPLIANCE WITH ASTM-A123, A153, A384 OR A385 AS APPLICABLE. GALVANIZER SHALL FURNISH TO ENGINEER A NOTARIZED CERTIFICATE OF COMPLIANCE WITH THESE SPECIFICATIONS.
- STEEL FRAMING SHALL BE TRUED AND PLUMB BEFORE CONNECTIONS ARE PERMANENTLY BOLTED OR WELDED.
- TEMPORARY ERECTION BRACING AND SUPPORTS SHALL BE PROVIDED TO HOLD STRUCTURAL STEEL FRAMING SECURELY IN POSITION. SUCH TEMPORARY BRACING AND SUPPORTS SHALL NOT BE REMOVED UNTIL PERMANENT BRACING HAS BEEN INSTALLED AND FLOOR SLABS HAVE ATTAINED 75% OF SPECIFIED CONCRETE STRENGTH.
- CONNECTIONS:
  - ALL CONNECTIONS SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, UNLESS NOTED OTHERWISE. CONNECTION MATERIAL SHALL BE A36.
  - BEAM CONNECTIONS SHALL BE STANDARD FRAMED BEAM CONNECTIONS.
  - CONNECTIONS SHALL BE BOLTED OR WELDED OR BOTH, AND FABRICATOR SHALL SUBMIT PROPOSED CONNECTION DETAILS FOR APPROVAL PRIOR TO FABRICATION.
  - BOLTED CONNECTIONS SHALL BE MADE WITH 3/4" DIAMETER ASTM A325 HIGH-STRENGTH STEEL BOLTS AND LOAD INDICATING DEVICES.
  - WELDED CONNECTIONS SHALL BE MADE BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS D.1.1, USING CLASS E70 SERIES ELECTRODES FOR CARBON STEEL OR USING A SERIES ELECTRODES APPROPRIATE TO STAINLESS STEEL. WELDS SHALL DEVELOP THE FULL STRENGTH OF THE MATERIALS BEING WELDED.
  - ANCHOR BOLTS SHALL BE HOT-DIPPED GALVANIZED A307 BOLTS OR STAINLESS STEEL AS NOTED.
- AT A MINIMUM, ALL BEAM END CONNECTIONS SHALL HAVE A MINIMUM OF TWO BOLTS. SEE DETAILS FOR SPECIFIC BEAM END CONNECTIONS.
- MINIMUM 3/8" WELDED WEB STIFFENERS SHALL BE PROVIDED ON EACH SIDE OF BEAM WEB AT ALL LOAD CONCENTRATIONS ON CONTINUOUS SUPPORTING BEAM MEMBERS OVER COLUMNS, AND WHERE SHOWN ON THE DRAWINGS.
- WHERE INDICATED ON DRAWINGS, WELDS SHALL BE INSPECTED IN THE FIELD BY QUALIFIED WELDING INSPECTORS UNDER THE SUPERVISION OF AN APPROVED TESTING AGENCY.
- ALL GROOVE WELDS SHALL BE COMPLETE PENETRATION GROOVE WELDS AND ALL FILLET WELDS SHALL BE 1/4" FILLET WELD MINIMUM UNLESS NOTED OTHERWISE.
- FIELD CUTTING OR ANY OTHER FIELD MODIFICATIONS OF STRUCTURAL STEEL SHALL NOT BE MADE WITHOUT APPROVAL FROM ENGINEER FOR EACH SPECIFIC CASE.
- ANCHOR BOLTS AND BEARING PLATES SHALL BE LOCATED BY TEMPLATES OR SIMILAR METHOD. PLATES SHALL BE SET IN FULL BEDS OF NON-SHRINKING GROUT. BOTTOM OF BASE PLATES SHALL BE SET APPROXIMATELY 3/4" ABOVE TOP OF BEARING, UNLESS NOTED OTHERWISE ON DETAILS. RESULTING SPACE SHALL BE FILLED WITH DRY PACKED NON-SHRINK GROUT.

REINFORCING STEEL

- REINFORCING STEEL SHALL BE GRADE 60 NEW BILLET STEEL, CONFORMING TO ASTM A615. WELDED WIRE FABRIC SHALL BE ASTM A185.
- DETAILING, FABRICATION AND ERECTION OF REINFORCEMENT SHALL CONFORM TO LATEST EDITIONS OF "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318) AND "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
- MINIMUM LAP OF REINFORCING BARS SHALL BE 40 BAR DIAMETERS, U.N.O.
- MINIMUM COVER OF CONCRETE SHALL BE 3" AT BOTTOMS OF FOOTINGS. REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS.
- INSTALLATION OF REINFORCEMENT SHALL BE COMPLETED AT LEAST 24 HOURS PRIOR TO SCHEDULED CONCRETE PLACEMENT, UNLESS OTHERWISE APPROVED BY ENGINEER. SCHEDULE INSPECTION WITH ENGINEER AFTER PLACEMENT.
- MINIMUM CONCRETE COVER FOR REINFORCEMENT, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:

|  |
|--|
| CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH..3.0"     |
| CONCRETE (FORMED) EXPOSED TO EARTH OR WEATHER                    |
| #6 THROUGH #18 BARS .....2.0"                                    |
| #5 BAR, W31, OR D31 WIRE, AND SMALLER.....1.5"                   |
| CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND        |
| #11 BAR AND SMALLER .....1.0"                                    |
| BEAMS, COLUMNS: PRIMARY REINF., TIES, STIRRUPS, SPIRALS.....1.5" |
- PROVIDE AND SCHEDULE ON SHOP DRAWINGS THE NECESSARY ACCESSORIES TO HOLD REINFORCEMENT SECURELY IN POSITION. MINIMUM REQUIREMENTS SHALL BE HIGH CHAIRS, 4'-0" O.C. WITH CONTINUOUS #5 SUPPORT BAR; SLAB BOLSTERS, CONTINUOUS AND 3'-6" O.C.; BEAM BOLSTERS, 5'-0" O.C. ALL CHAIRS SHALL BE GALVANIZED AND SHALL BE USED AGAINST ALL FORMS (SLABS, WALLS, PILASTERS, ETC.)
- WHERE REINFORCEMENT IS REQUIRED IN SECTION, REINFORCEMENT IS CONSIDERED TYPICAL WHEREVER THE SECTION APPLIES.
- COLUMN DOWELS SHALL BE SET WITH A TEMPLATE AND POSITIONED SO AS TO BE ENCLOSED BY THE COLUMN TIES.
- U.N.O., DOWELS SHALL MATCH BAR SIZE AND NUMBER.
- WELDED WIRE FABRIC SHALL LAP 6" OR ONE SPACE, WHICHEVER IS LARGER, AND SHALL BE WIRED TOGETHER.
- REINFORCEMENT SHALL NOT BE TACK WELDED.

STRUCTURAL SYMBOLS



STRUCTURAL ABBREVIATIONS

|         |  |         |                       |           |                              |
|---------|--|---------|-----------------------|-----------|------------------------------|
| AFF     | ABOVE FINISHED FLOOR                       | EMBED   | EMBEDMENT             | PSF       | POUNDS PER SQUARE FOOT       |
| ADDM    | ADDENDUM                                   | ENGR    | ENGINEER              | PUR       | PURLINS                      |
| ADDL    | ADDITIONAL                                 | EQ      | EQUAL                 | QTY       | QUANTITY                     |
| ADJ     | ADJACENT                                   | EQUIP   | EQUIPMENT             | R         | RADIUS                       |
| AGGR    | AGGREGATE                                  | EXIST   | EXISTING              | RLG       | RAILING                      |
| AHU     | AIR HANDLING UNIT                          | EXP     | EXPANSION             | REC       | RECESSED                     |
| ALT     | ALTERNATE                                  | EXP BT  | EXPANSION BOLT        | RECT      | RECTANGULAR                  |
| ALUM    | ALUMINUM                                   | EJ      | EXPANSION JOINT       | REF       | REFERENCE                    |
| ACI     | AMERICAN CONCRETE INSTITUTE                | EXT     | EXTERIOR              | RCP       | REFLECTED CEILING PLAN       |
| AISC    | AMERICAN INSTITUTE OF STEEL CONSTRUCTION   | FD      | FLOOR DRAIN           | REINF     | REINFORCE, REINFORCEMENT     |
|         |  | FOC     | FACE OF CONCRETE      | REBAR     | REINFORCING STEEL BARS       |
| ASTM    | AMERICAN SOCIETY FOR TESTING AND MATERIALS | FOW     | FACE OF WALL          | REM       | REMOVABLE                    |
|         |  | F/F     | FACE TO FACE          | REPL      | REPLACE                      |
| ASCE    | AMERICAN SOCIETY OF CIVIL ENGINEERS        | FS      | FAR SIDE              | RFI       | REQUEST FOR INFORMATION      |
|         |  | FSTNR   | FASTENER              | REQ       | REQUIRE                      |
| AWS     | AMERICAN WELDING SOCIETY                   | FT      | FEET                  | REQD      | REQUIRED                     |
| AB      | ANCHOR BOLT                                | FLR     | FLOOR                 | REV       | REVISION                     |
| APPD    | APPROVED                                   | FIN     | FINISH                | R         | RISER                        |
| APPROX  | APPROXIMATE                                | F.D     | FLOOR DRAIN           | RD        | ROOF DRAIN                   |
| ARCH    | ARCHITECT                                  | FDTN    | FOUNDATION            | RM        | ROOM                         |
| A/E     | ARCHITECT/ENGINEER                         | FR      | FRAME                 | RO        | ROUGH OPENING                |
| ASSY    | ASSEMBLY                                   | FTG     | FOOTING               | RND       | ROUND                        |
| ATTN    | ATTENTION                                  | GALV    | GALVANIZED            | SCHED     | SCHEDULE                     |
| AUX     | AUXILIARY                                  | G       | GIRDER                | SLNT      | SEALANT                      |
| BSMT    | BASEMENT                                   | GLU LAM | GLUE LAMINATED WOOD   | SECT      | SECTION                      |
| BM      | BEAM                                       | GR BM   | GRADE BEAM            | SEP       | SEPARATE                     |
| WF BM   | WIDE FLANGE BEAM                           | GRTG    | GRATING               | SHT       | SHEET                        |
| BRG     | BEARING                                    | GR FL   | GROUND FLOOR          | SIM       | SIMILAR                      |
| BRG PL  | BEARING PLATE                              | GWB     | GYPSUM WALLBOARD      | SK        | SKETCH                       |
| BLW     | BELOW                                      | HGR     | HANGER                | SLV       | SLEEVE                       |
| BFF     | BELOW FINISH FLOOR                         | HD      | HEAVY DUTY            | SPEC      | SPECIFICATION                |
| BTWN    | BETWEEN                                    | HST     | HOIST                 | SQ        | SQUARE                       |
| BITUM   | BITUMINOUS                                 | HSS     | HOLLOW STRUCT SECTION | SF        | SQUARE FOOT                  |
| BC      | BOLT CIRCLE                                | HM      | HOLLOW METAL          | STAG      | STAGGERED                    |
| BF      | BOTH FACES                                 | HORIZ   | HORIZONTAL            | SST       | STAINLESS STEEL              |
| BW      | BOTH WAYS                                  | HPT     | HIGH POINT            | SSP       | STAINLESS STEEL PIPE         |
| BOT     | BOTTOM                                     | IN      | INCH                  | ST        | STAIRS                       |
| BC      | BOTTOM CHORD                               | INCL    | INCLUDED              | STD       | STANDARD                     |
| BOS     | BOTTOM OF STEEL                            | ID      | INSIDE DIAMETER       | SDI       | STEEL DECK INSTITUTE         |
| BRGC    | BRACING                                    | IF      | INSIDE FACE           | STL JST   | STEEL JOIST                  |
| BRDG    | BRIDGING                                   | INSUL   | INSULATION            | SJI       | STEEL JOIST INSTITUTE        |
| BLDG    | BUILDING                                   | INV     | INVERT                | STL LNTL  | STEEL LINTEL                 |
| CANT    | CANTILEVER                                 | INV EL  | INVERT ELEVATION      | STL PL    | STEEL PLATE                  |
| CIP     | CAST IN PLACE                              | KSF     | KIPS PER SQUARE FOOT  | STL RF DK | STEEL ROOF DECK              |
| CB      | CATCH BASIN                                | LAD     | LADDER                | STIF      | STIFFENER                    |
| CLG     | CEILING                                    | LT WT   | LIGHTWEIGHT           | SD        | STORM DRAIN                  |
| CEM     | CEMENT                                     | LIN     | LINEAR                | STRUCT    | STRUCTURAL                   |
| CTR     | CENTER                                     | LL      | LIVE LOAD             | SUB FL    | SUBFLOOR                     |
| CL      | CENTERLINE                                 | LOC     | LOCATION              | SPRT      | SUPPORT                      |
| C TO C  | CENTER TO CENTER                           | LLH     | LONG LEG HORIZONTAL   | TEMP      | TEMPORARY                    |
| CHFR    | CHAMFER                                    | LLV     | LONG LEG VERTICAL     | THK       | THICKNESS                    |
| C       | CHANNEL                                    | LONG    | LONGITUDINAL          | TB        | THROUGH BOLT                 |
| CIR     | CIRCLE                                     | LPT     | LOW POINT             | TOL       | TOLERANCE                    |
| CO      | CLEANOUT                                   | L       | ANGLE                 | T&G       | TONGUE AND GROOVE            |
| COL     | COLUMN                                     | MB      | MASONRY BEARING       | T&B       | TOP AND BOTTOM               |
| CONC    | CONCRETE                                   | MH      | MANHOLE               | T.O.      | TOP OF ...                   |
| CMU     | CONCRETE MASONRY UNIT                      | MO      | MASONRY OPENING       | T.O.B.    | TOP OF BEAM                  |
| CRSI    | CONCRETE REINFORCING STEEL INSTITUTE       | MATL    | MATERIAL              | T.O.C.    | TOP OF CONCRETE              |
|         |  | MAX     | MAXIMUM               | T.O.F.    | TOP OF FLOOR, TOP OF FOOTING |
|         |  | MECH    | MECHANICAL            | T.O.J.    | TOP OF JOIST                 |
| CONN    | CONNECT                                    | MTL     | METAL                 | T.O.P.    | TOP OF PLATE                 |
| CONSTR  | CONSTRUCTION                               | MID     | MIDDLE                | T.O.S.    | TOP OF SLAB, TOP OF STEEL    |
| CJ      | CONSTRUCTION JOINT                         | MIN     | MINIMUM               | T.O.W.    | TOP OF WALL                  |
| CONT    | CONTINUE                                   | MISC    | MISCELLANEOUS         | T         | TREAD                        |
| CNR     | CORNER                                     | NF      | NEAR FACE             | TS        | TUBE STEEL                   |
| X BRACE | CROSS BRACE                                | NIC     | NOT IN CONTRACT       | TYP       | TYPICAL                      |
| CU FT   | CUBIC FEET                                 | NOM     | NOMINAL               | UNEX      | UNEXCAVATED                  |
| DL      | DEAD LOAD                                  | NA      | NOT APPLICABLE        | UNFIN     | UNFINISHED                   |
| DEG     | DEGREE                                     | NTS     | NOT TO SCALE          | UNIF      | UNIFORM                      |
| DEMO    | DEMOLITION                                 | OC      | ON CENTER             | U.N.O.    | UNLESS NOTED OTHERWISE       |
| DET     | DETAIL                                     | OPNG    | OPENING               | UTIL      | UTILITY                      |
| DIAG    | DIAGONAL                                   | OPP     | OPPOSITE              | VAR       | VARIES                       |
| DIA     | DIAMETER                                   | OF      | OUTSIDE FACE          | VIF       | VERIFY IN FIELD              |
| DIM     | DIMENSION                                  | OA      | OVERALL               | VERT      | VERTICAL                     |
| DR      | DOOR                                       | PT      | PRESSURE TREATED      | WP        | WATERPROOF                   |
| EA      | EACH                                       | PAR     | PARAPET               | WWF       | WELDED WIRE FABRIC           |
| EF      | EACH FACE                                  | PH      | PENTHOUSE             | WWR       | WELDED WIRE REINFORCEMENT    |
| EW      | EACH WAY                                   | PERF    | PERFORATED            | WF        | WIDE FLANGE                  |
| EOS     | EDGE OF SLAB                               | PERIM   | PERIMETER             | WL        | WIND LOAD                    |
| EOD     | EDGE OF DECK                               | PLAT    | PLATFORM              | W/        | WITH                         |
| EL      | ELEVATION                                  | PLYWD   | PLYWOOD               | WD        | WOOD                         |
| ELEV    | ELEVATOR                                   | LB      | POUND                 | WP        | WORKING POINT                |

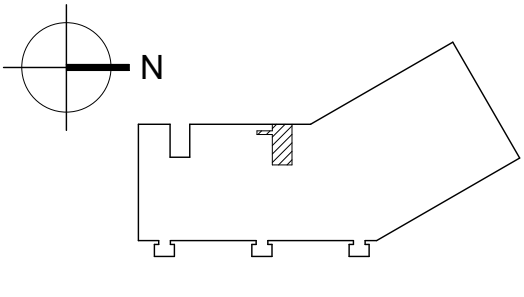
GRATINGS AND RAILINGS

- PLATFORM GRATING SHALL BE GW-125-A AS MANUFACTURED BY MCNICHOLS, GALVANIZED FINISH.
- BEARING BARS TO BE 1 1/4" x 1/8" AT 1 3/16" CENTER TO CENTER SPACING WITH A SMOOTH SURFACE TOP FINISH.
- PROVIDE MANUFACTURER'S APPLIED EDGE BANDING ON ALL EXPOSED EDGES OF GRATING. MINIMUM 1 1/2" x 1/8" BANDING AT ALL INTERIOR EDGES AND 5 1/2" x 1/4" BANDING AT PLATFORM EXTERIOR OPEN EDGES TO PROVIDE A MINIMUM 4" TOE KICK AT OPEN EDGES OF PLATFORM.

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS, FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

|       |    |      |          |                              |      |      |       |
|-------|----|------|----------|------------------------------|------|------|-------|
| DSGN: | KC | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
| DR:   | KC | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KC   | TT   |       |
| CHK:  | KC | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | KC   | NM   | KC    |
| APVD: | KC |      |          |                              |      |      |       |
|       | KC |      |          |                              |      |      |       |



CLD & CCM LABS  
STRUCTURAL  
GENERAL NOTES

ISSUE DATE:

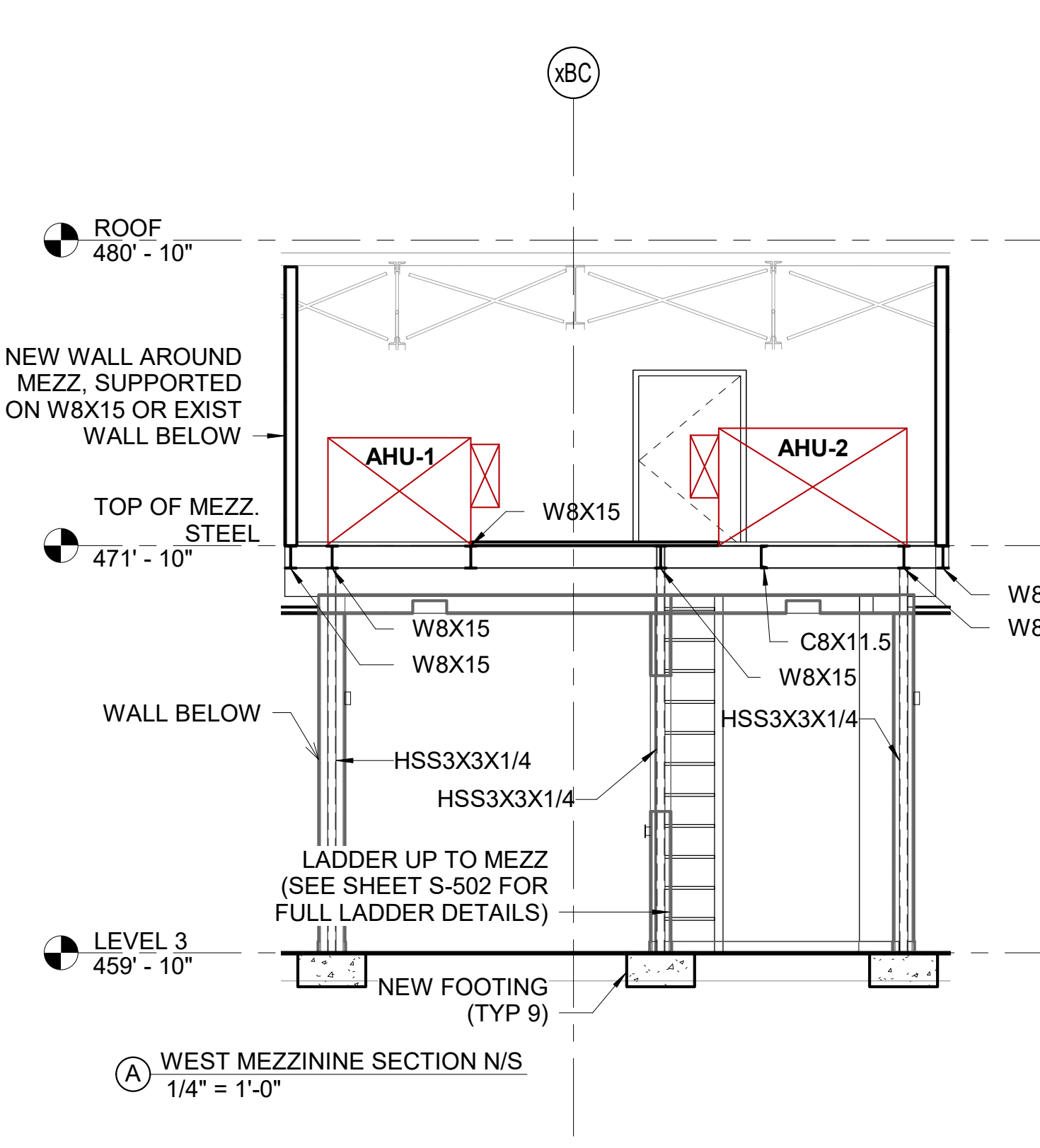
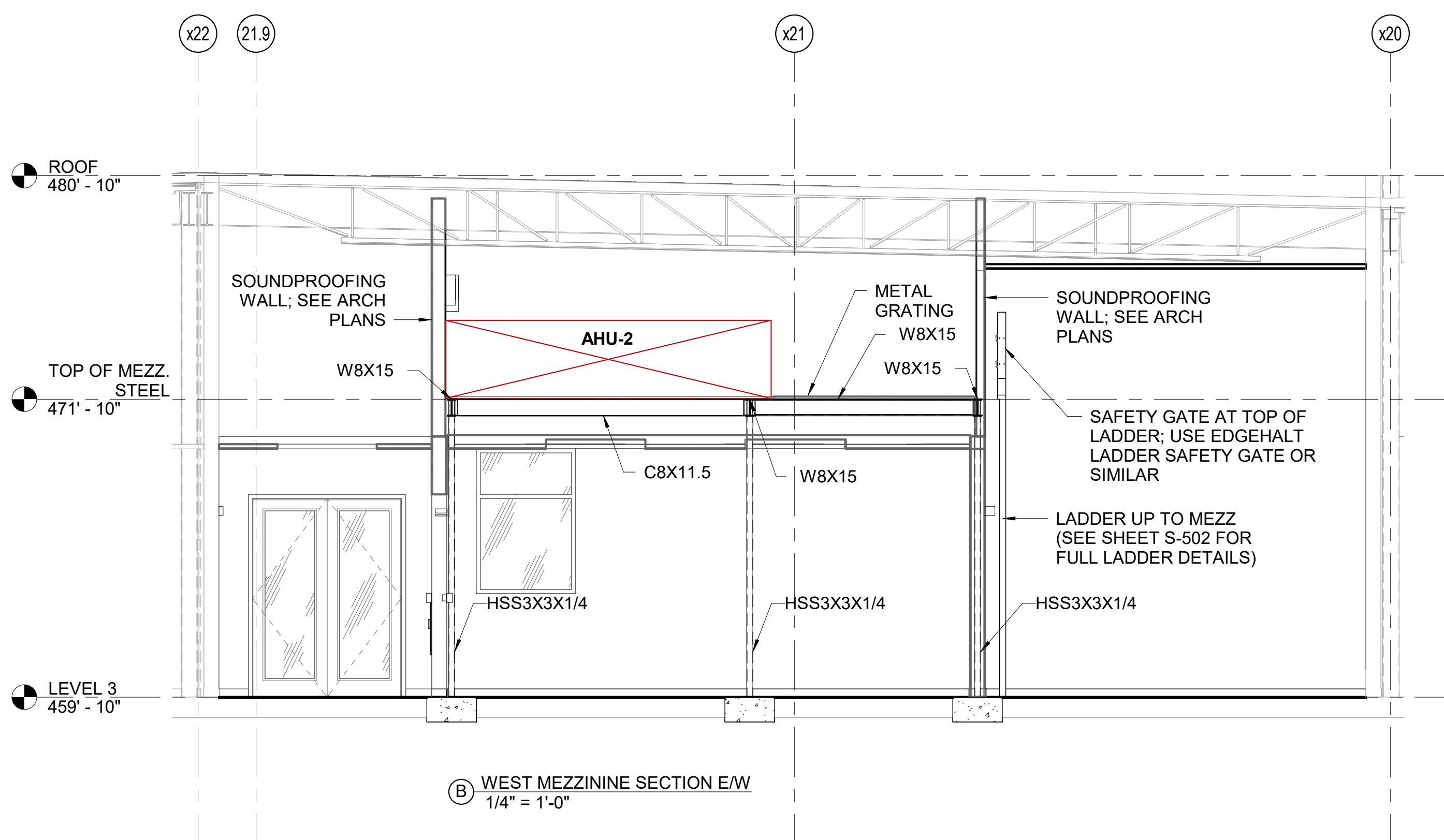
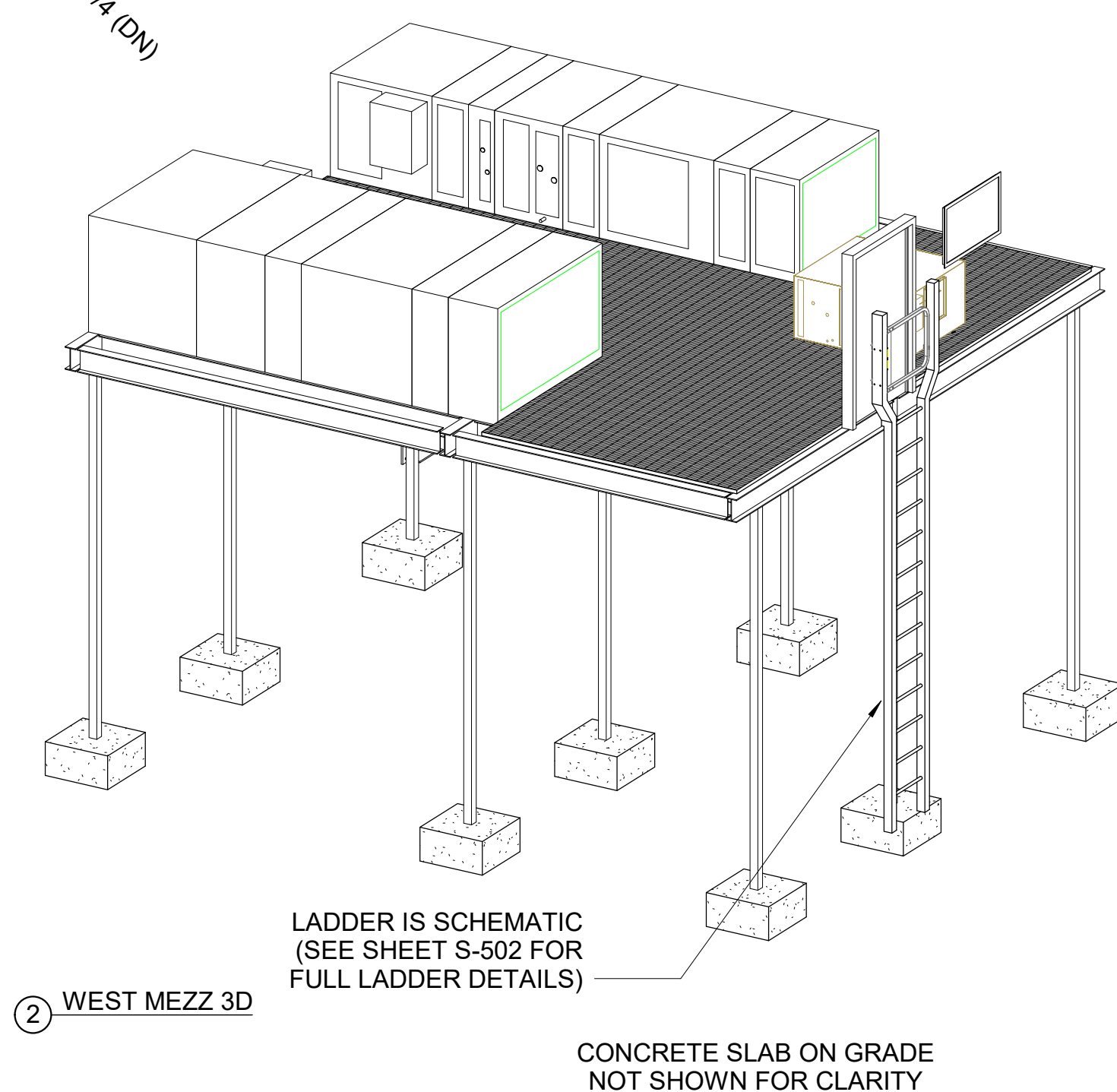
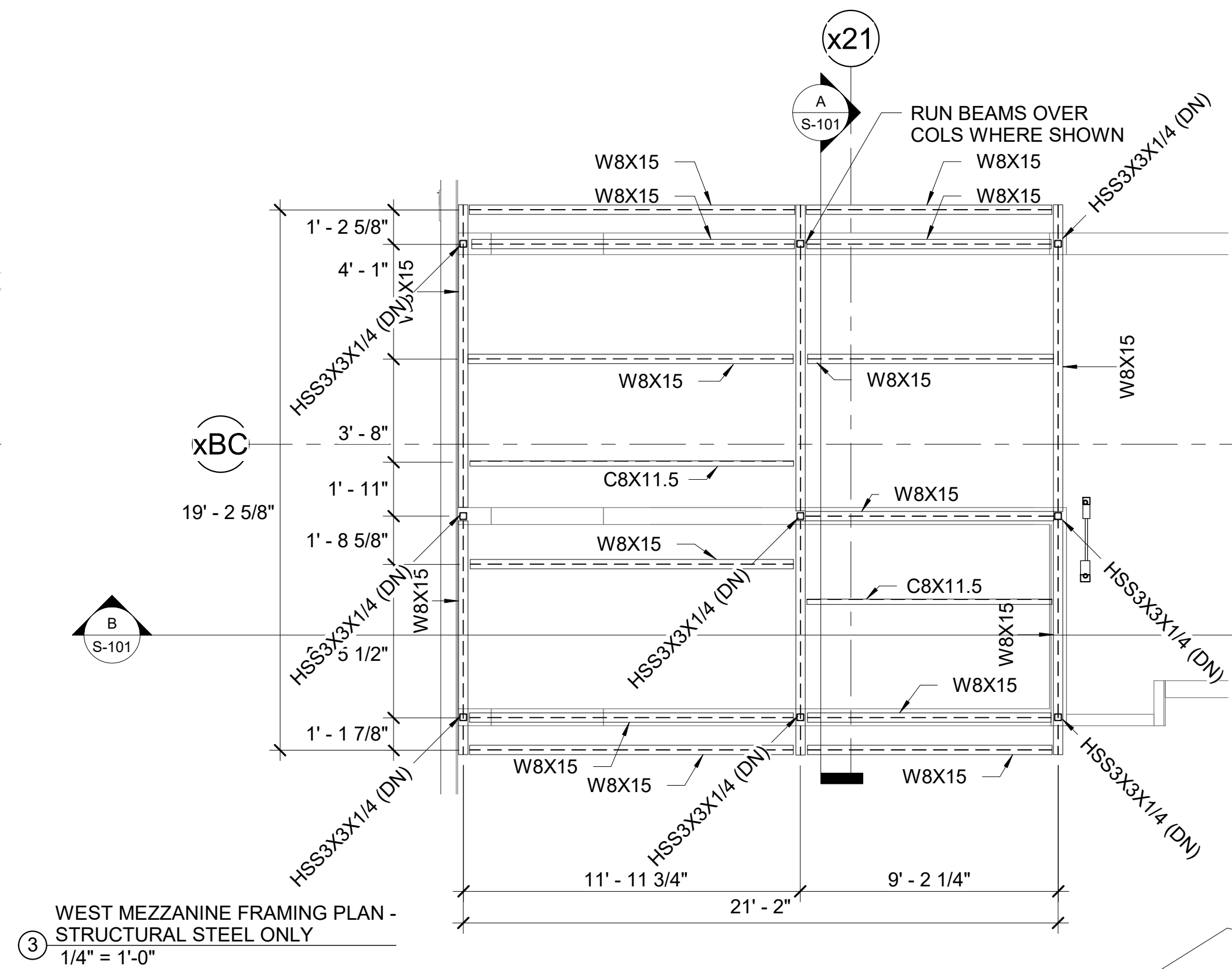
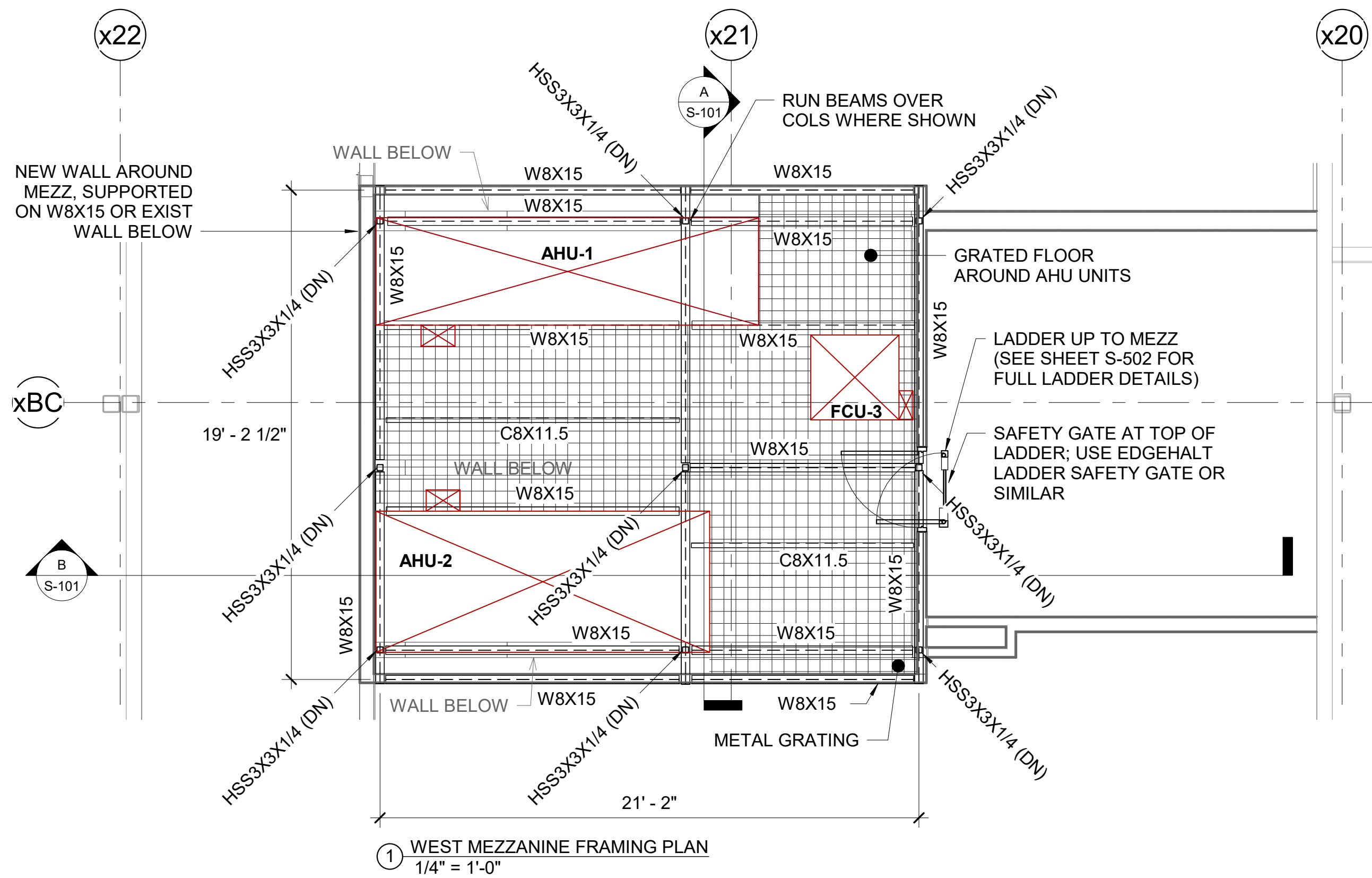
SCALE: 12" = 1'-0"

SHEET NUMBER

S-001

PROJ. NO: 20021A | CAD FILE:



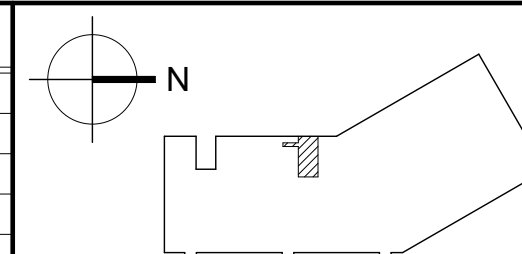


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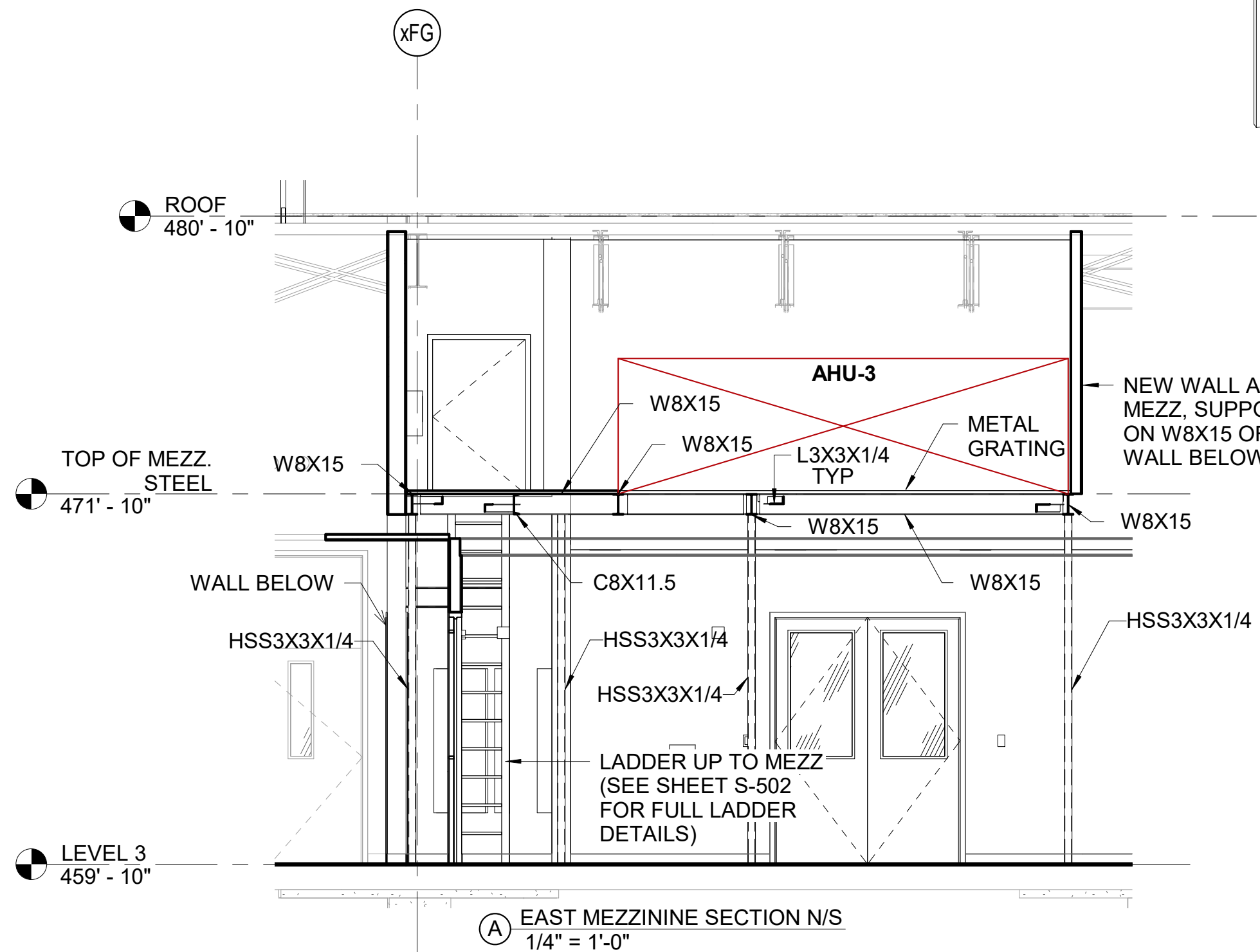
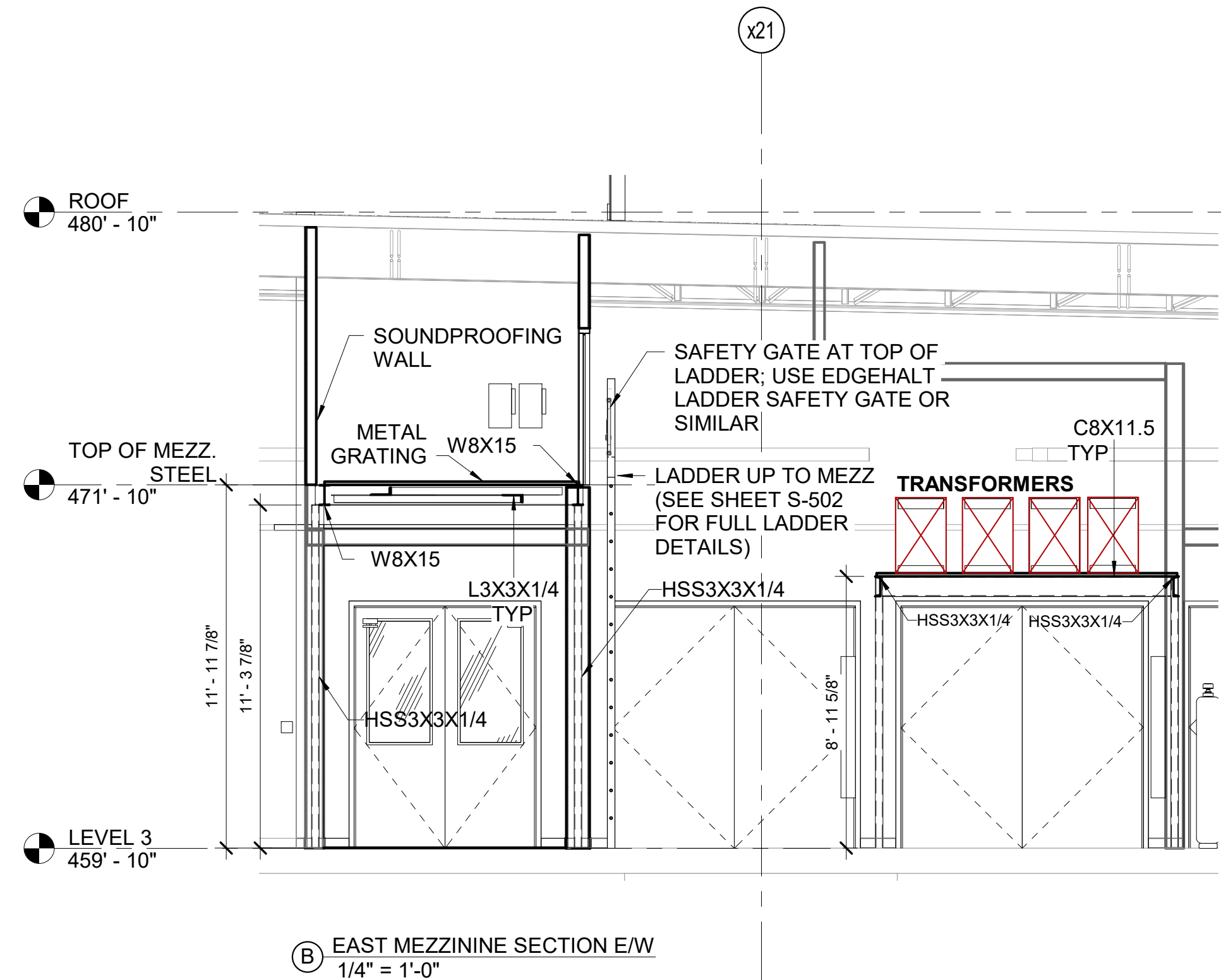
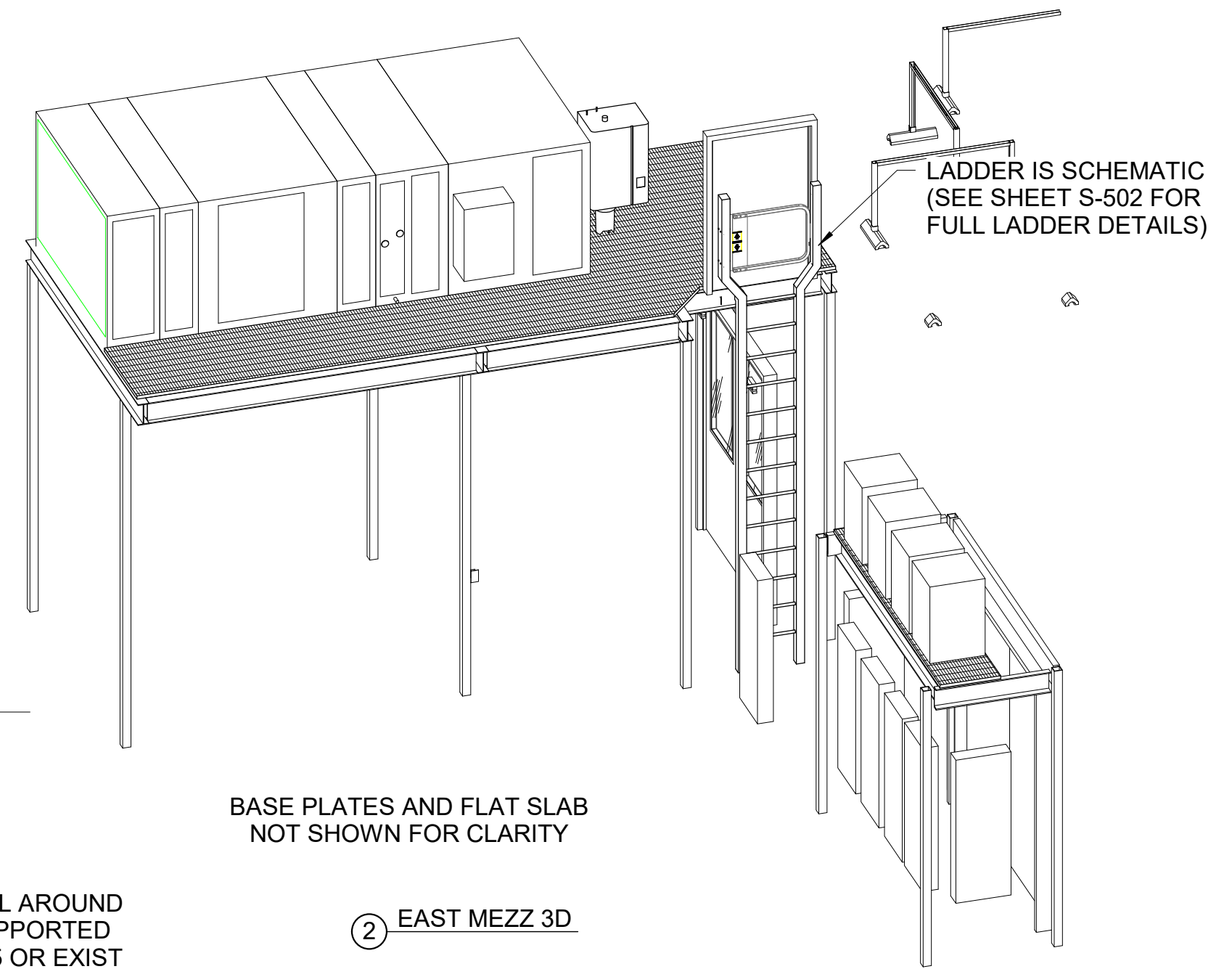
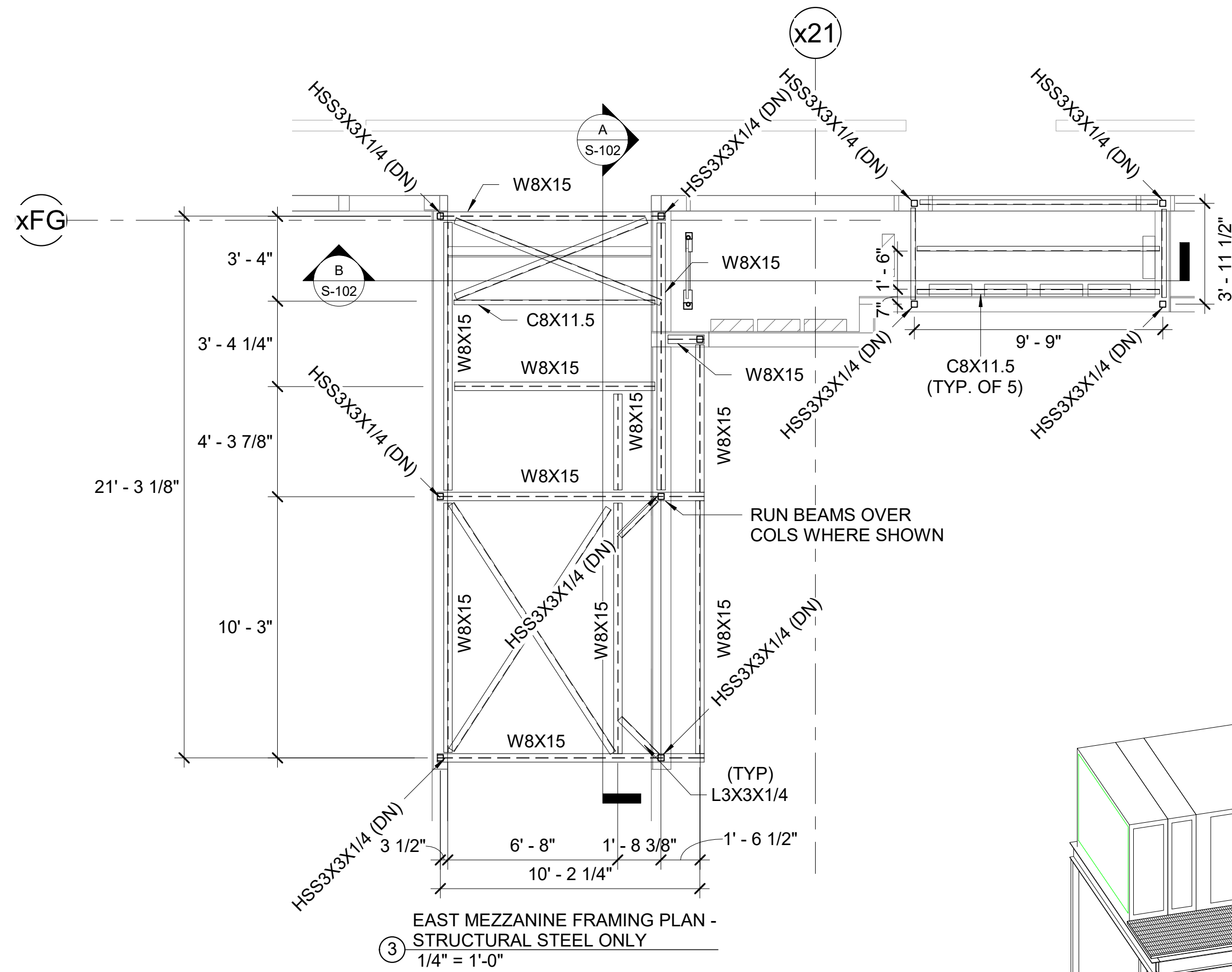
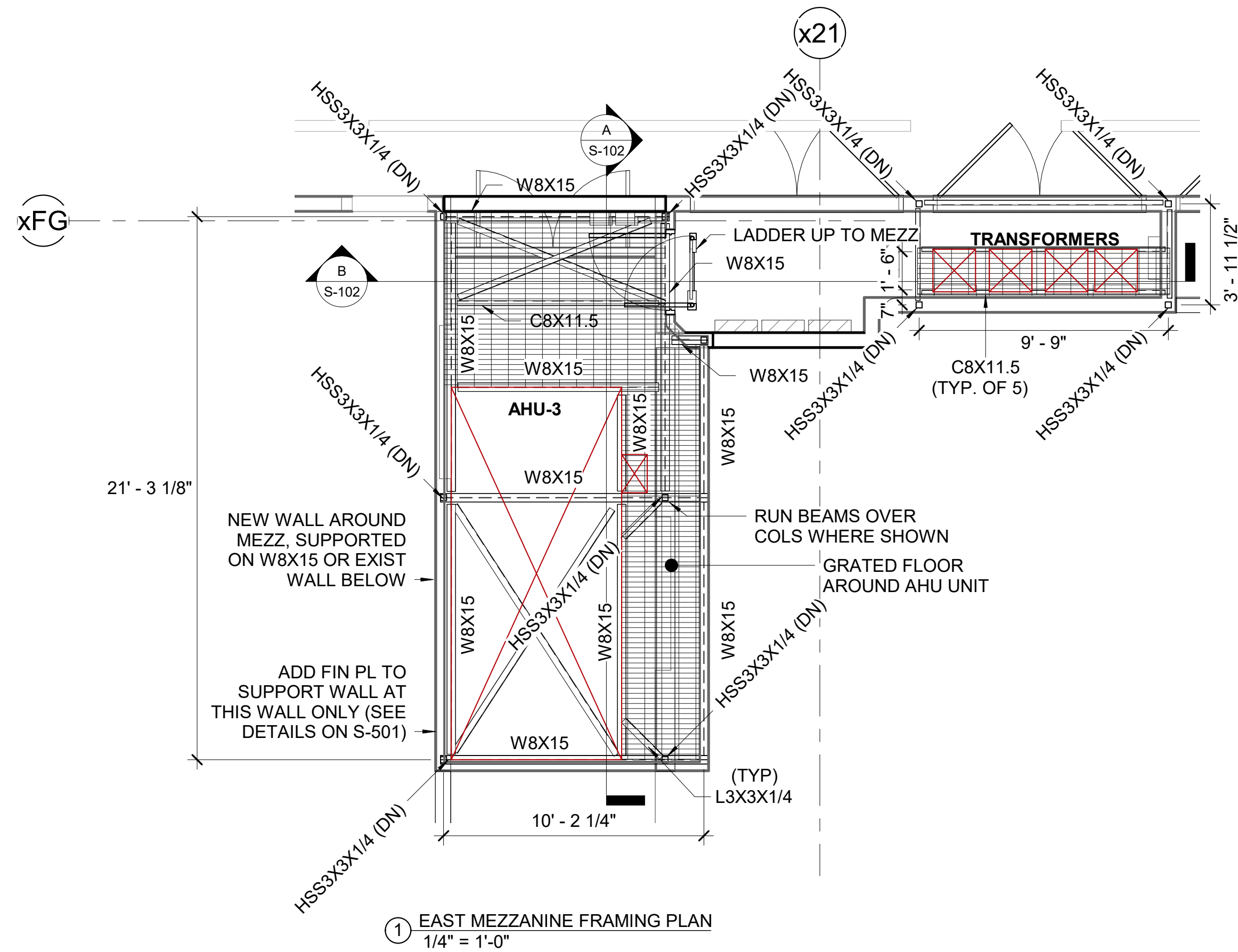
GENERAL NOTE:

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| TT    | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | KM   | TT   |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KC   | TT   |       |
| CHK:  | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | KC   | NM   | KC    |
| APVD: | TT   |          |                              |      |      |       |
|       | KC   |          |                              |      |      |       |





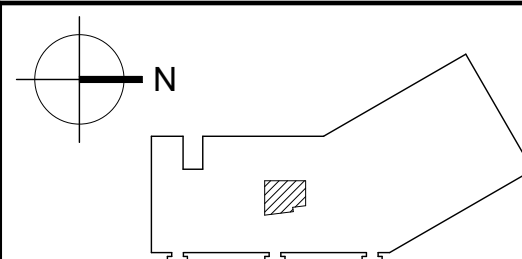


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GENERAL NOTE:

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| TT    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KC   | TT   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | KC   | NM   | KC    |
| CHK:  | TT   |          |                              |      |      |       |
| APVD: | KC   |          |                              |      |      |       |





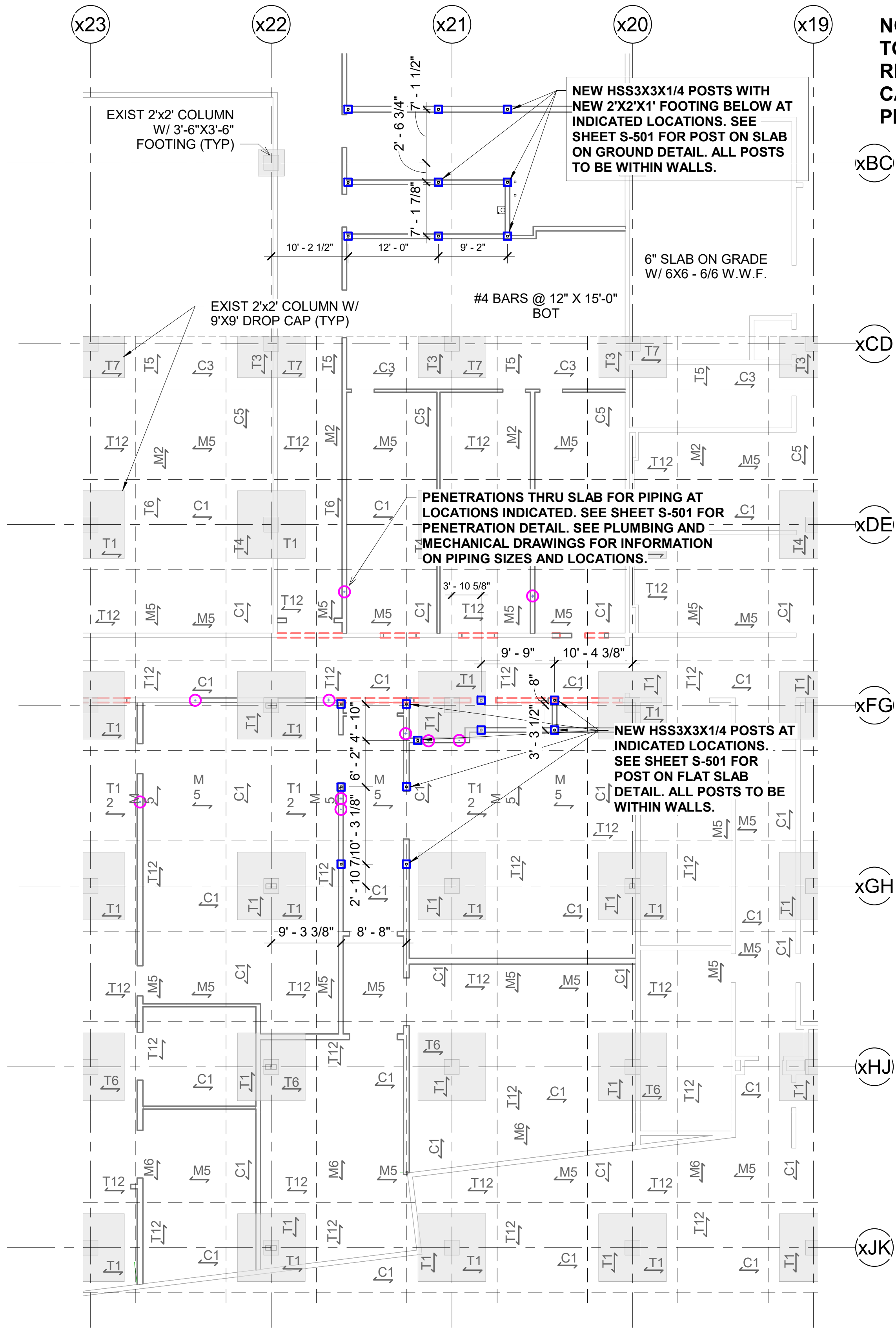
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0'

| FLAT SLAB REBAR SCHEDULE REINFORCING |       |        |
|--------------------------------------|-------|--------|
| MARK                                 | TOP   | BOTTOM |
| C1                                   |       | 12-#6  |
| C2                                   |       | 14-#6  |
| C3                                   |       | 5-#6   |
| C4                                   |       | 16-#6  |
| C5                                   |       | 15-#6  |
| C6                                   |       | 8-#6   |
| C7                                   |       | 7-#6   |
| C8                                   |       | 9-#6   |
| M1                                   |       | 13-#5  |
| M2                                   |       | 12-#6  |
| M3                                   |       | 13-#6  |
| M4                                   |       | 7-#5   |
| M5                                   |       | 12-#5  |
| M6                                   |       | 14-#6  |
| T1                                   | 18-#6 |        |
| T2                                   | 13-#5 |        |
| T3                                   | 13-#6 |        |
| T4                                   | 20-#6 |        |
| T5                                   | 12-#6 |        |
| T6                                   | 10-#6 |        |
| T7                                   | 6-#6  |        |
| T8                                   | 5-#6  |        |
| T9                                   | 15-#6 |        |
| T10                                  | 22-#6 |        |
| T11                                  | 11-#6 |        |
| T12                                  | 12-#5 |        |
| T13                                  | 16-#6 |        |
| T14                                  | 19-#6 |        |
| T15                                  | 7-#6  |        |
| T16                                  | 9-#6  |        |

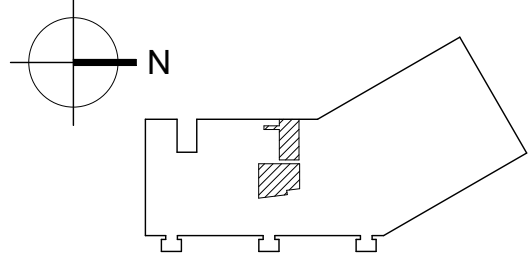
2 ORIGINAL REBAR NOTES  
12" = 1'-0"

1 LEVEL 3 SLAB PLAN  
1" = 10'-0"



NOTE: PRIOR TO CORING USE GPR TO LOCATE AND AVOID EXISTING REBAR. IF EXISTING REBAR CANNOT BE AVOIDED, REPLACE PIPING PENETRATION WITH PUMPS.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| KC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KC   | TT   |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | KC   | NM   | KC    |
| CHK:  | NM   |          |                              |      |      |       |
| APVD: | KC   |          |                              |      |      |       |

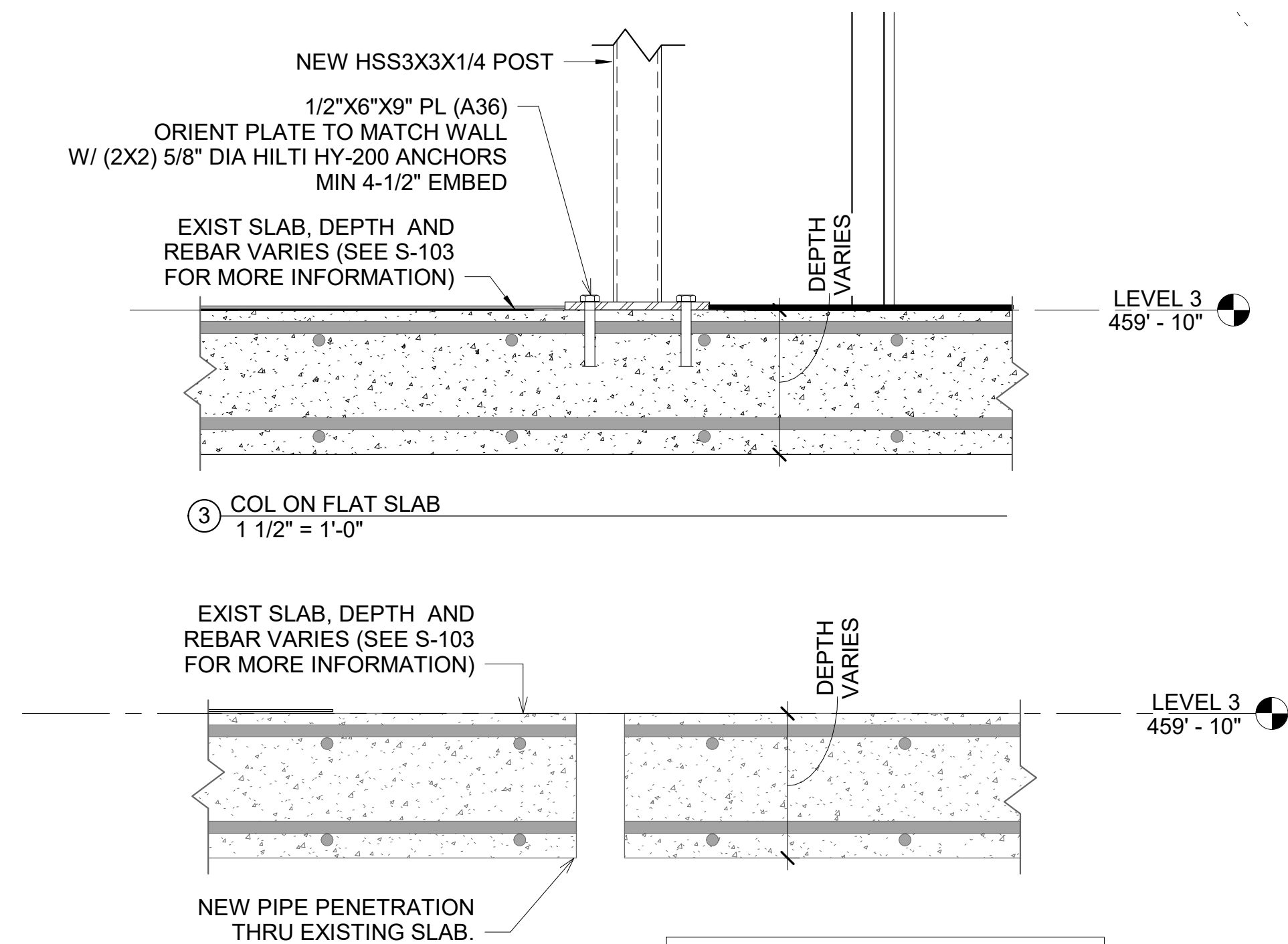
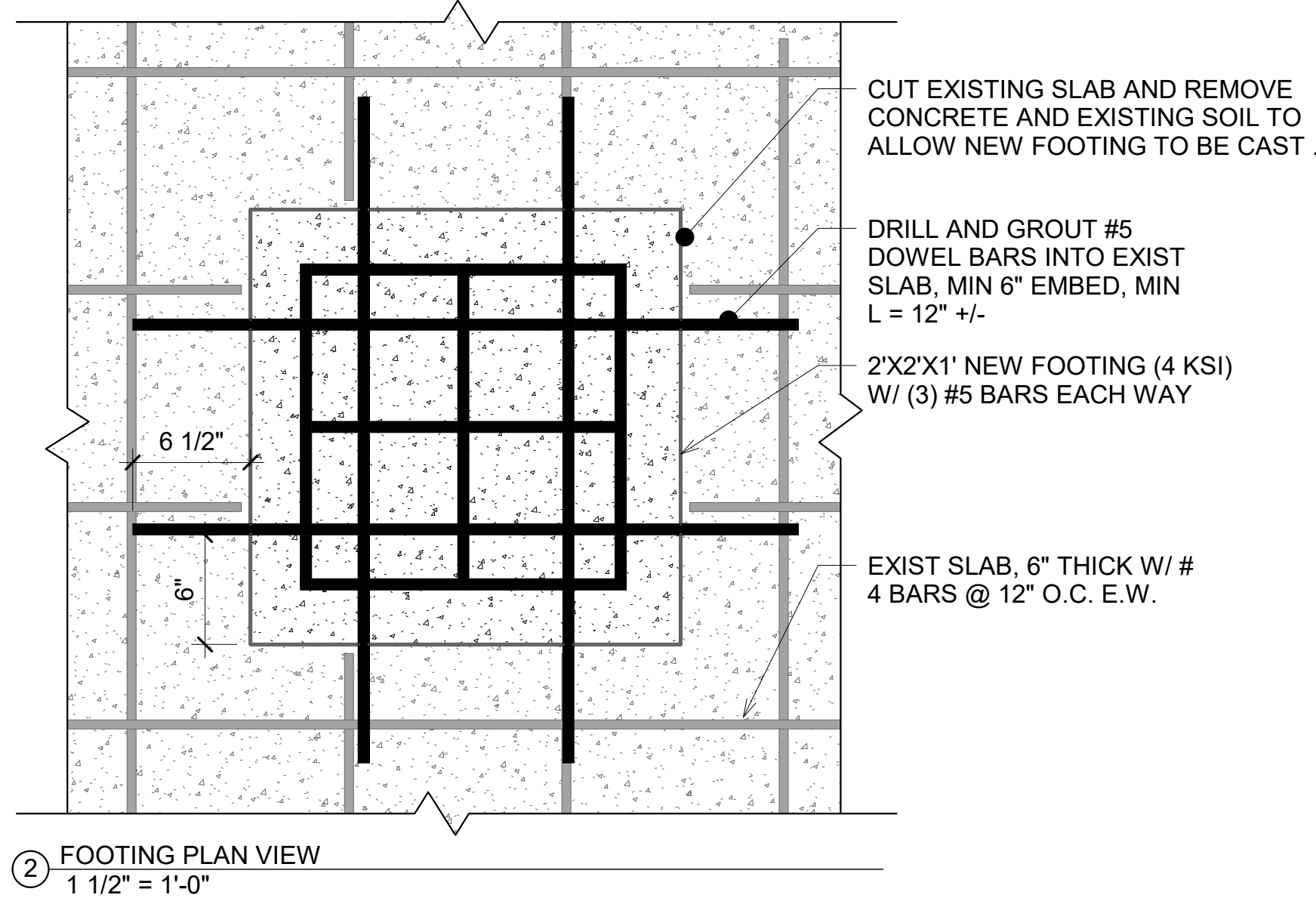
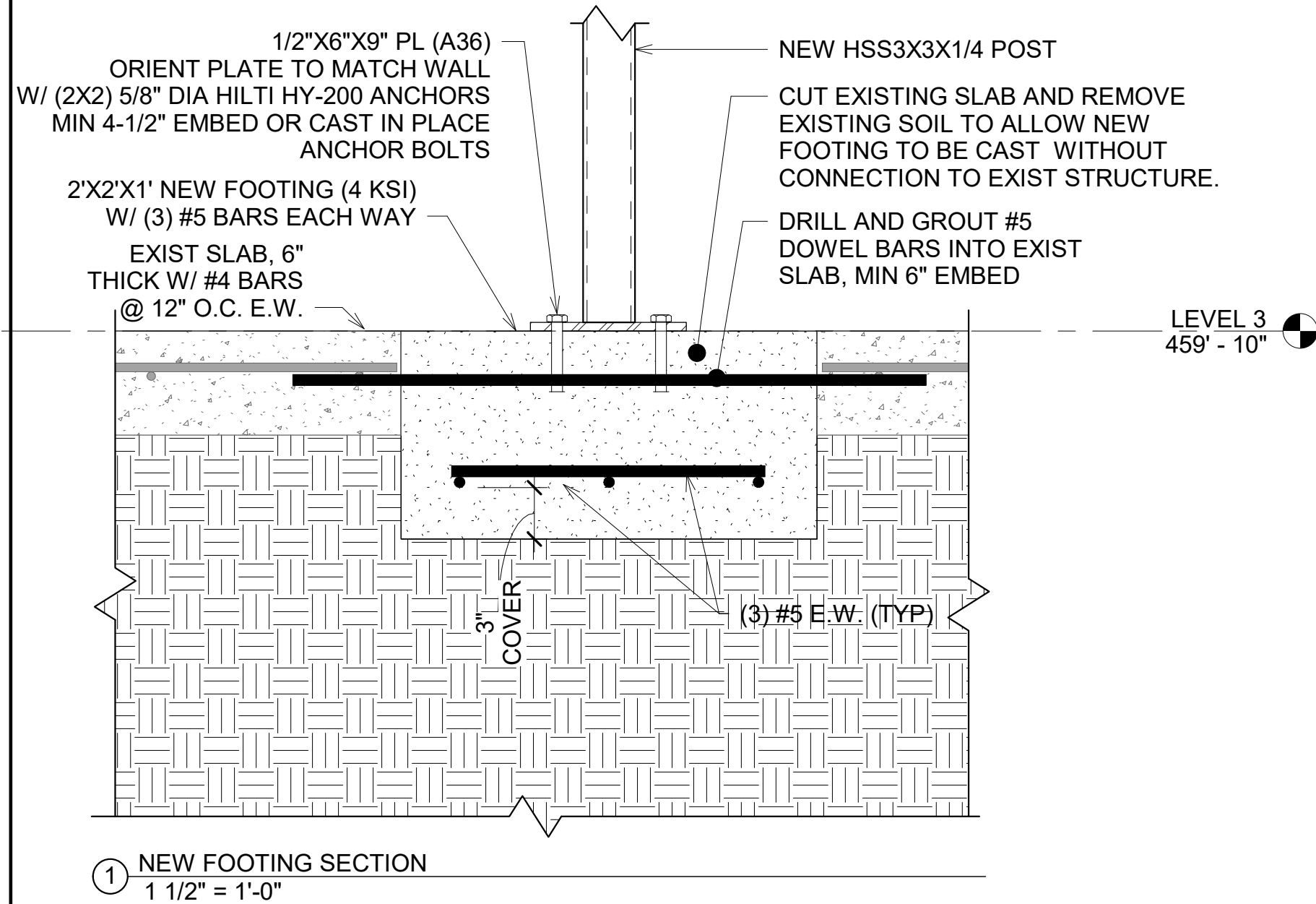




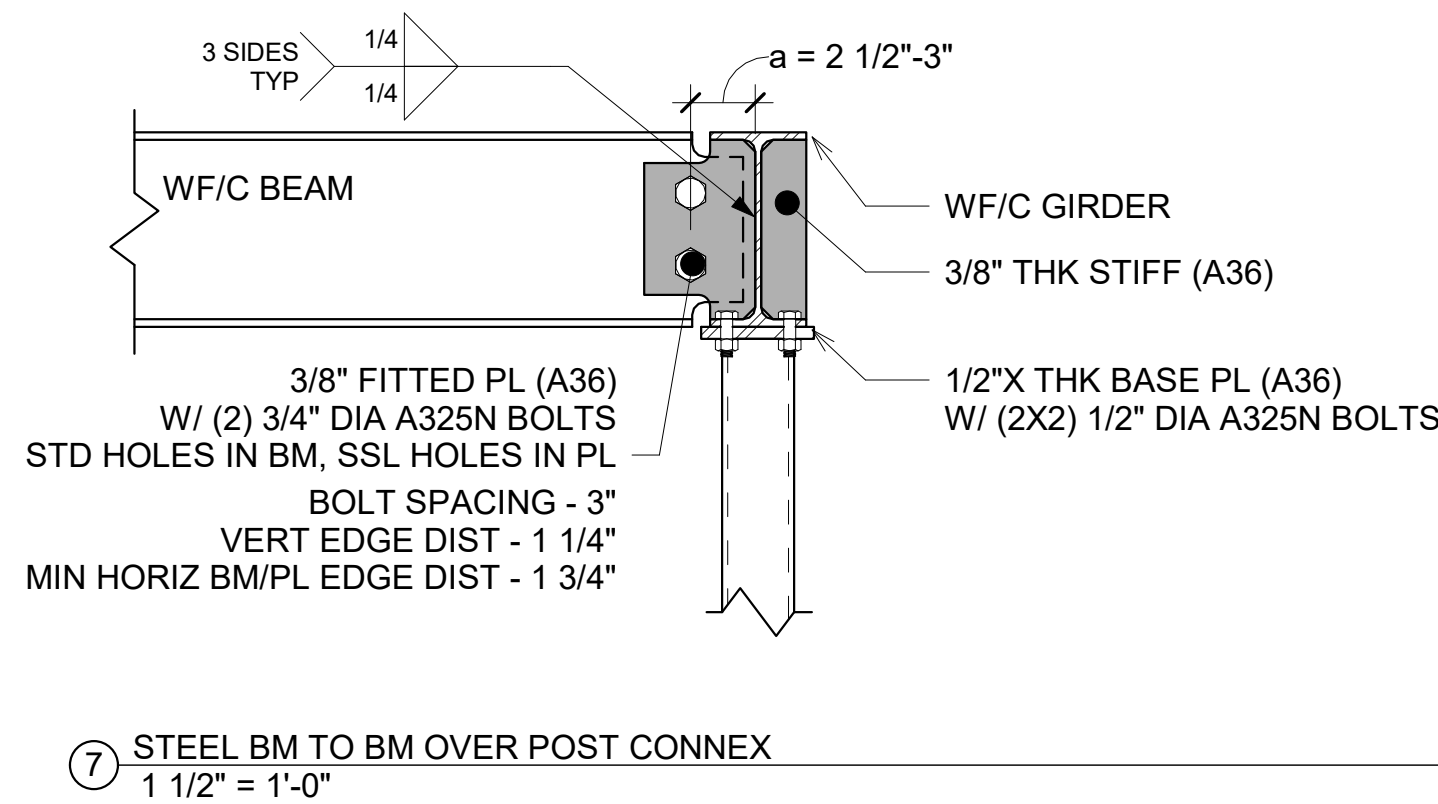
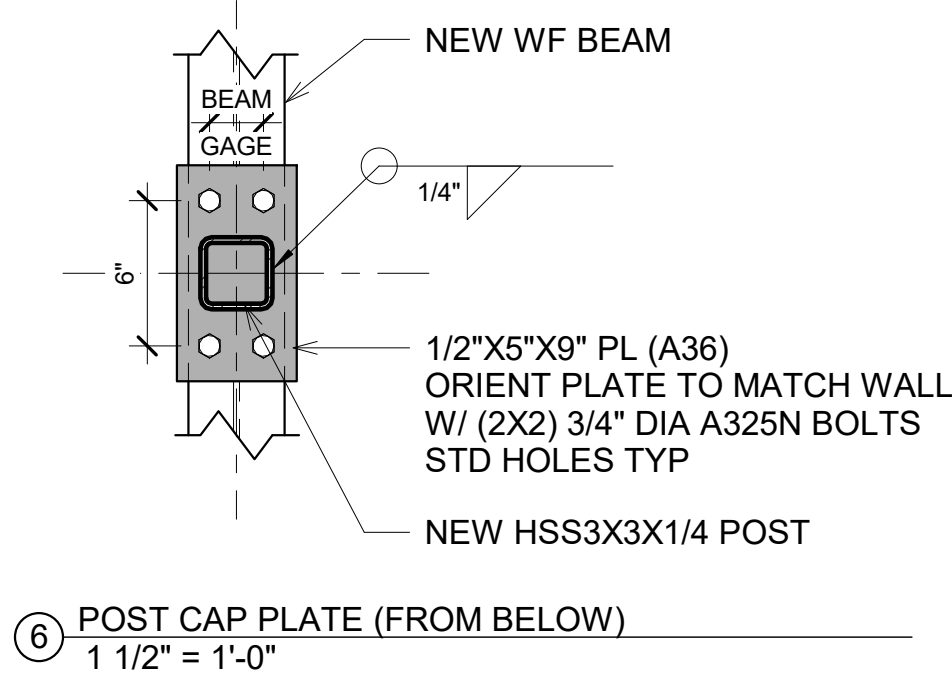
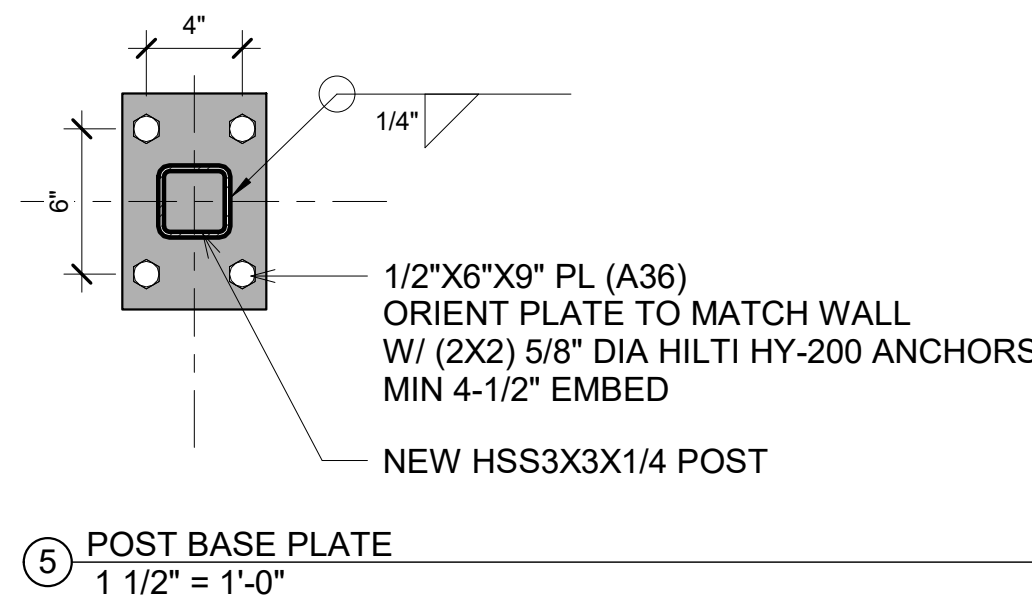
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1" = 0'

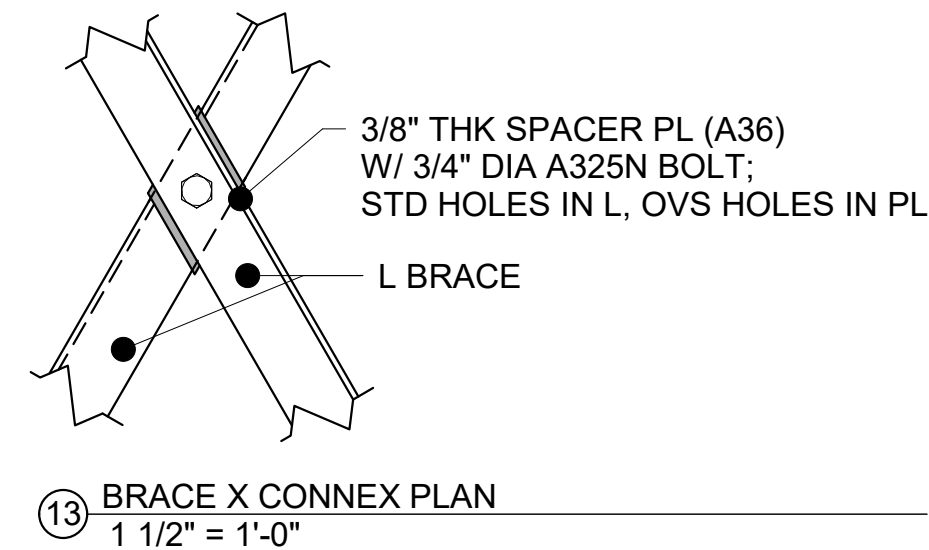
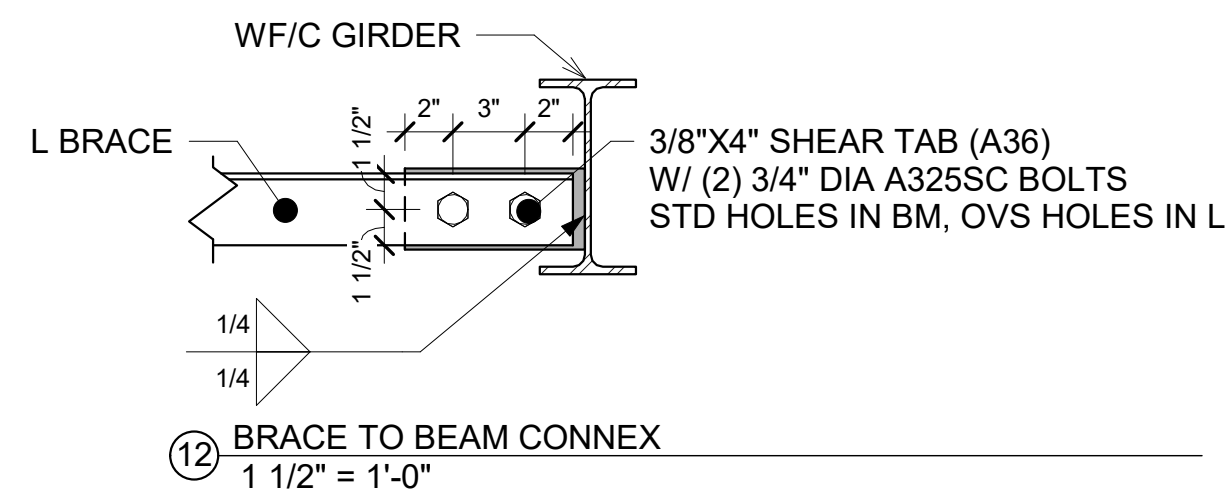
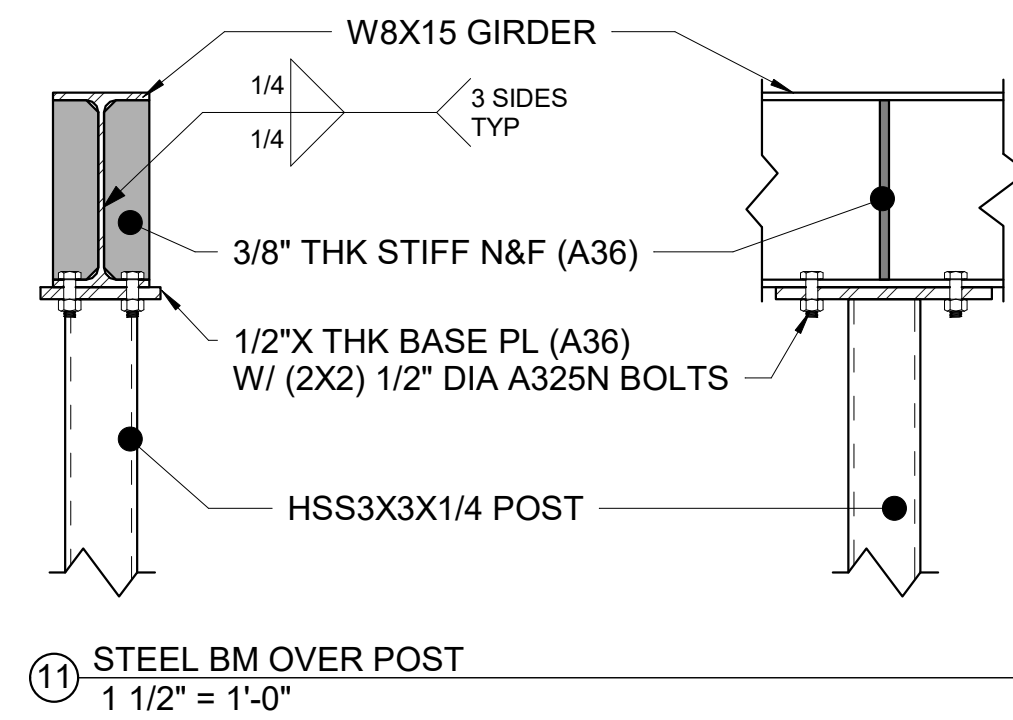
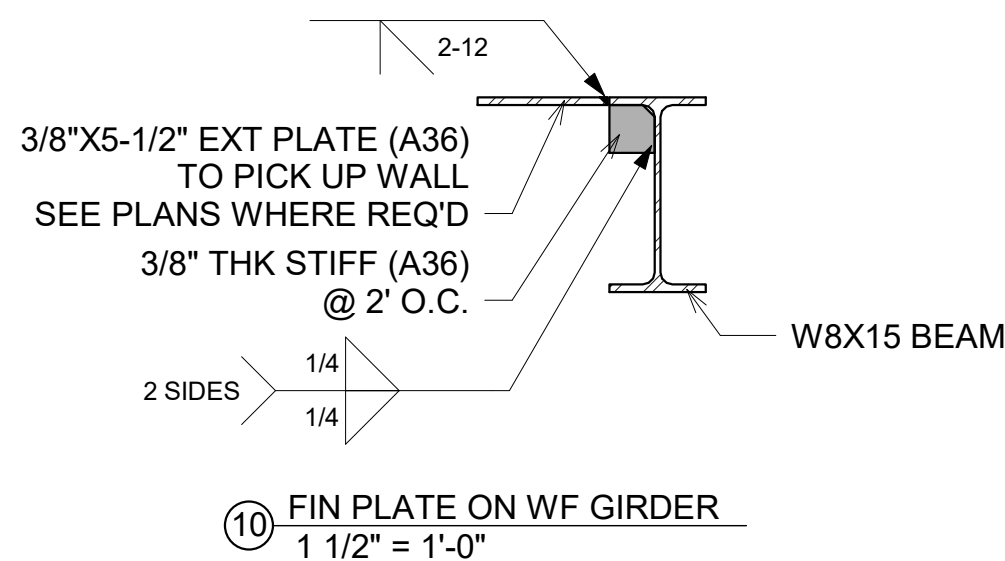
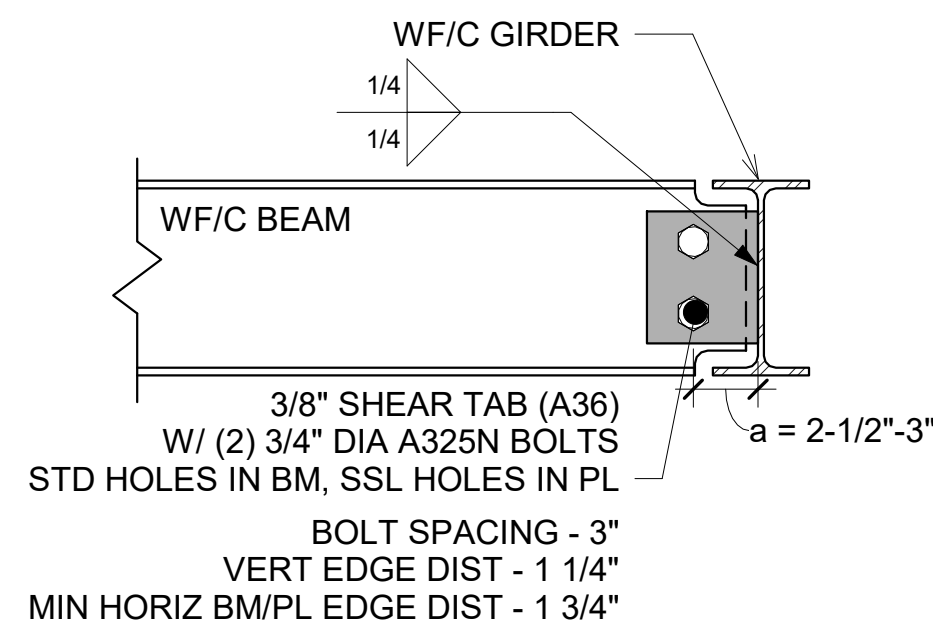
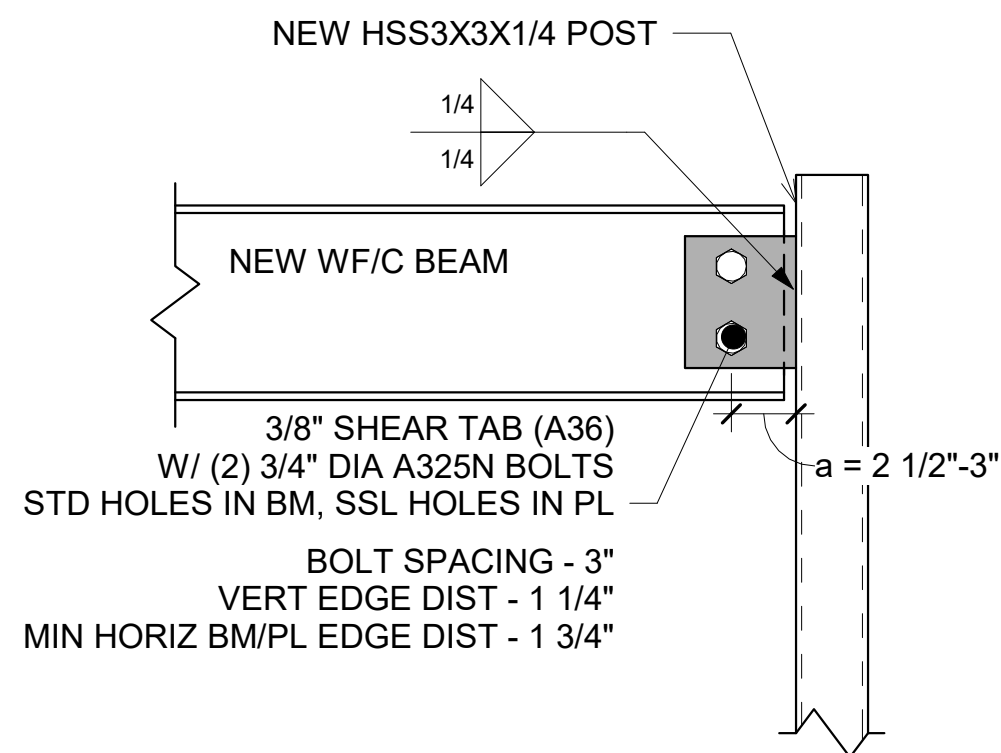
BAR IS ONE INCH ON ORIGINAL DRAWING



NOTE: PRIOR TO CORING, USE GPR TO LOCATE AND AVOID EXISTING REBAR. IF EXISTING REBAR CANNOT BE AVOIDED, REPLACE PIPING PENETRATION WITH PUMPS.



4 PENETRATION DETAIL AT 3RD FLOOR SLAB 1 1/2" = 1'-0"

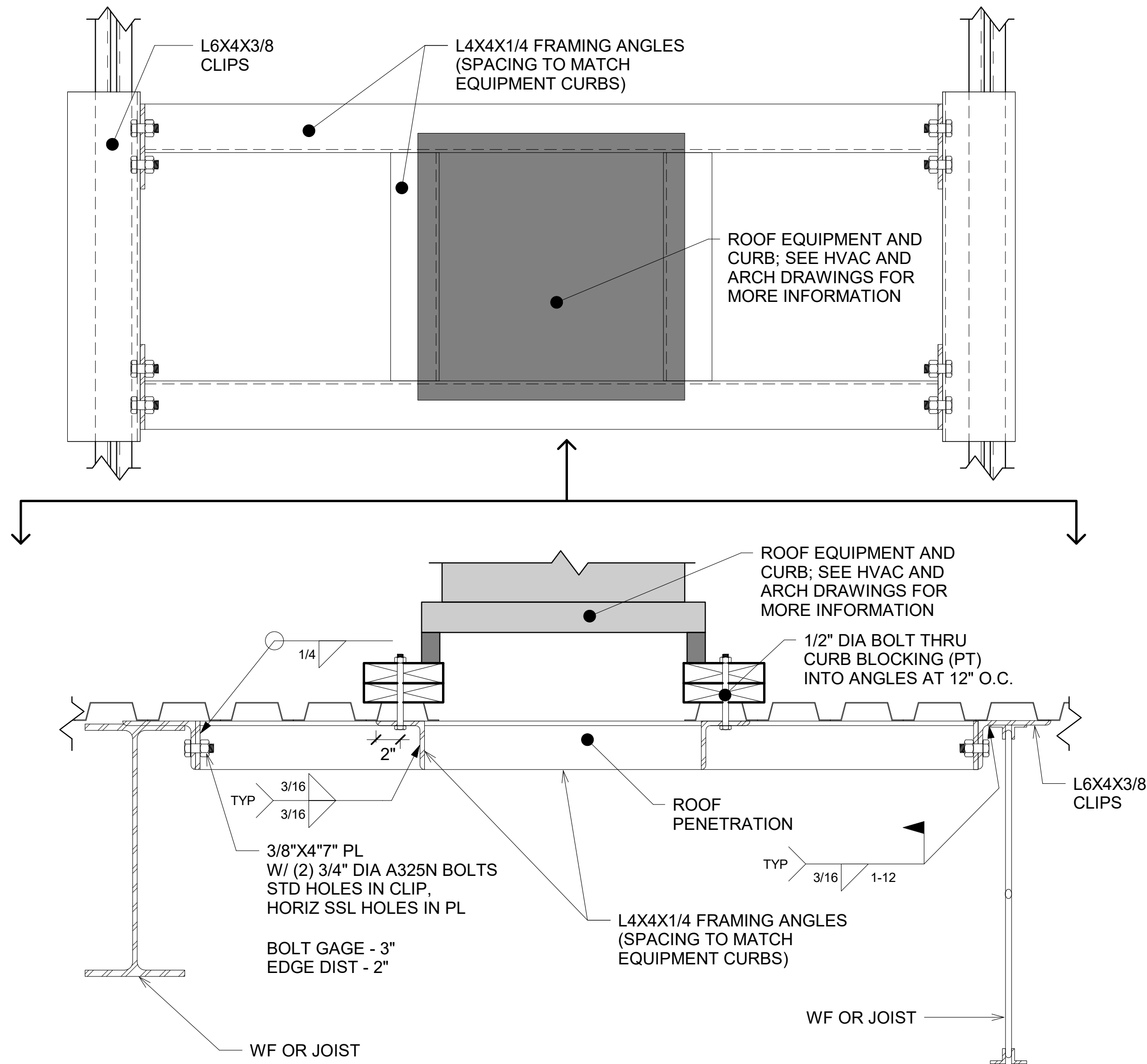


GENERAL NOTE:

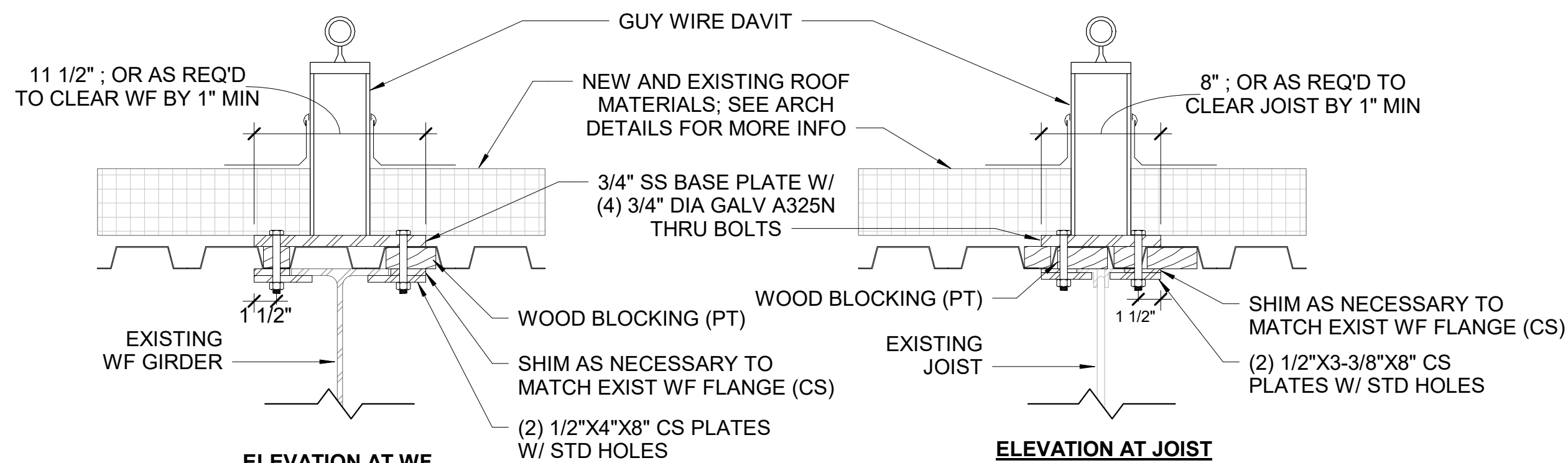
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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG.                    | CHK. | APVD. |
|-------|------|----------|------------------------------|-------------------------|------|-------|
| KC    | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | KC                      | TT   |       |
| DR:   | KC   | 0        | 06-10-21                     | ISSUED FOR CONSTRUCTION | KC   | NM KC |
| CHK:  | NM   |          |                              |                         |      |       |
| APVD: | KC   |          |                              |                         |      |       |



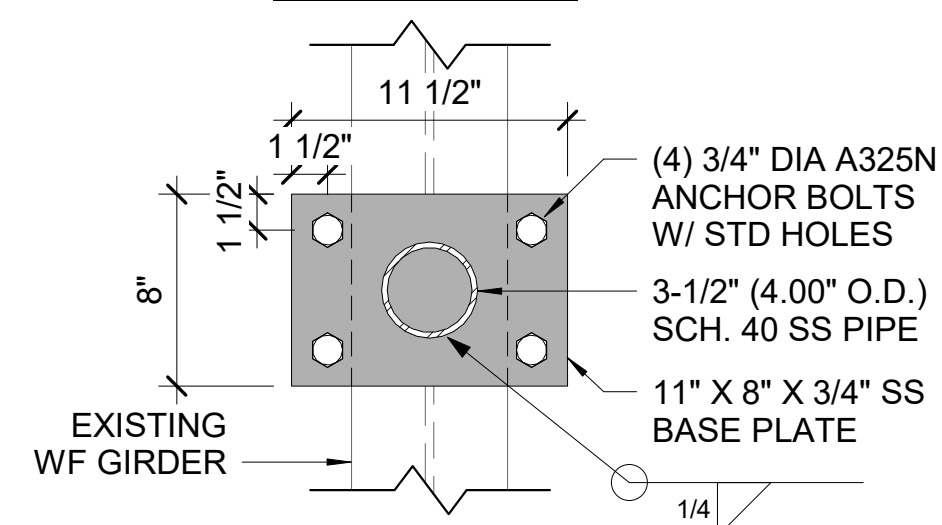


① ROOF PENETRATION DETAIL  
1 1/2" = 1'-0"

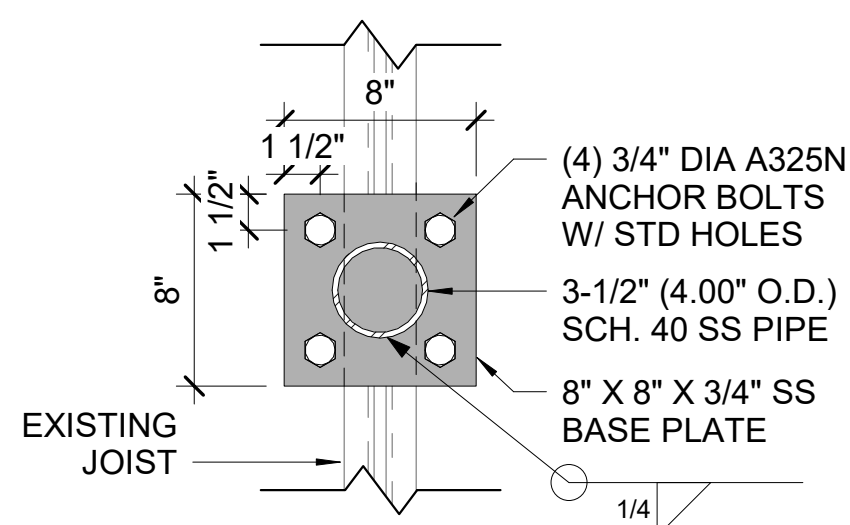


ELEVATION AT WF

ELEVATION AT JOIST

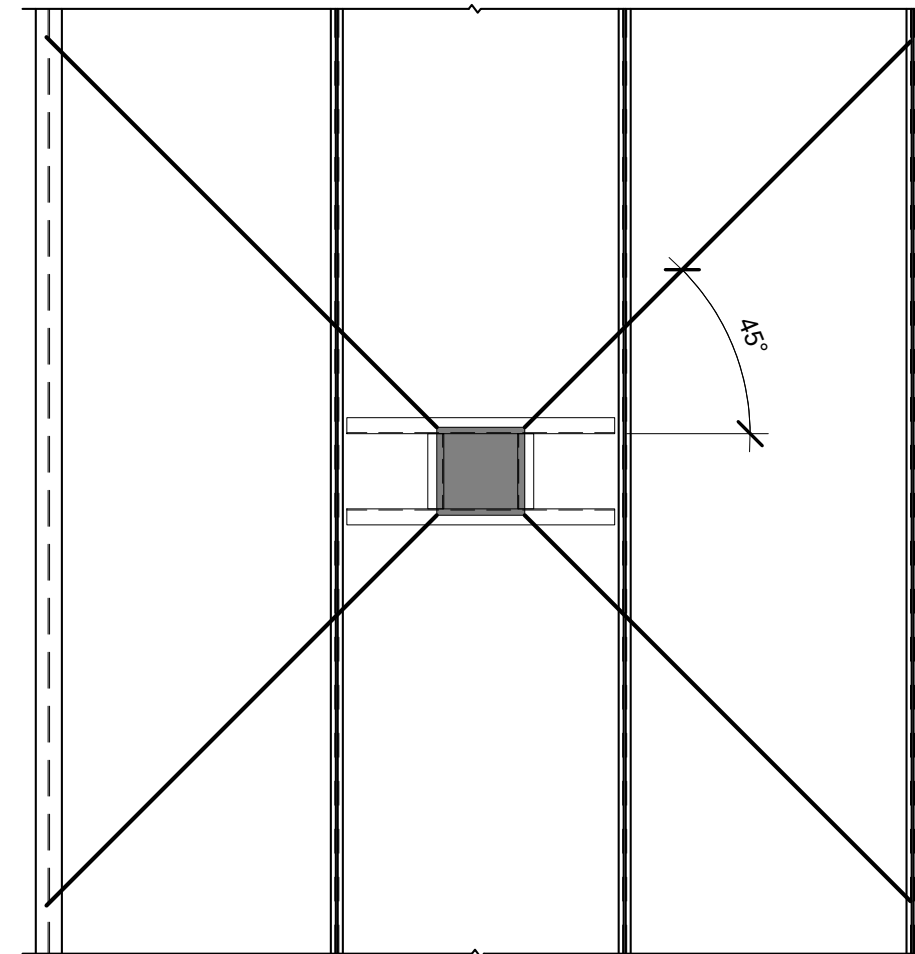


PLAN AT WF

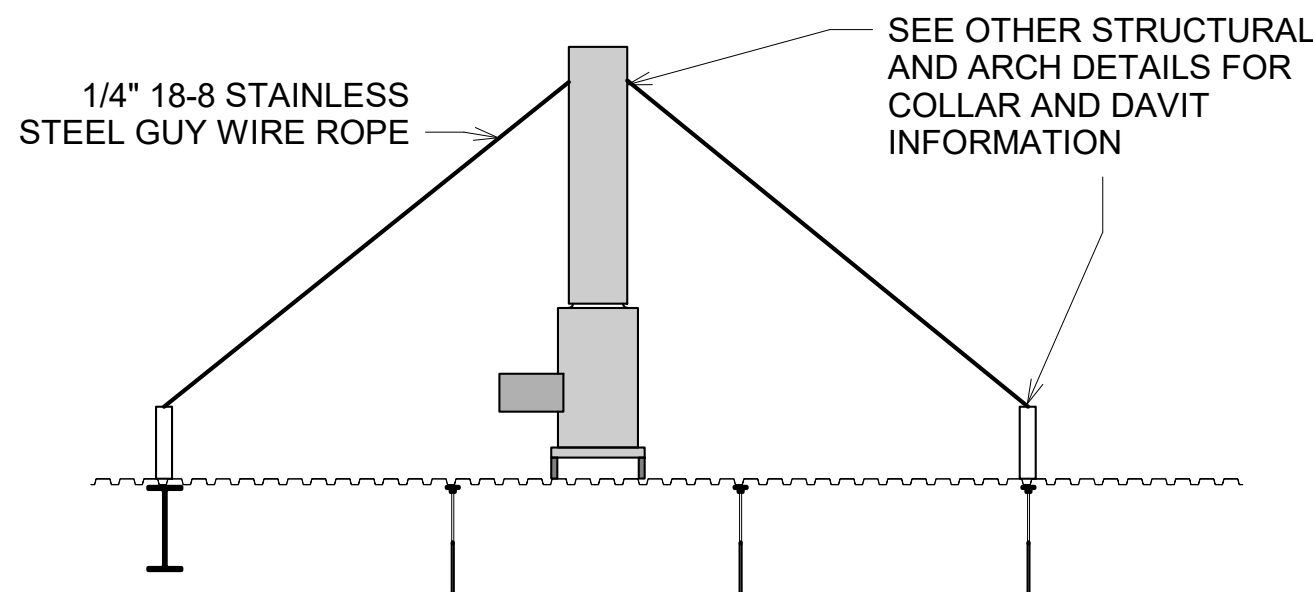


PLAN AT JOIST

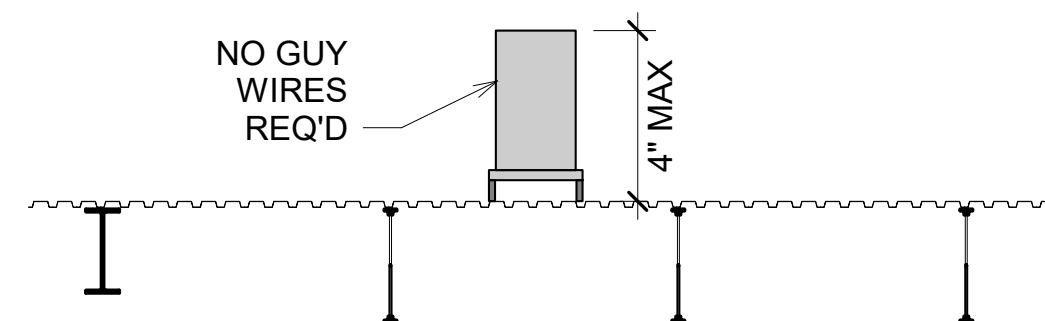
③ DAVIT BASE DETAILS  
1 1/2" = 1'-0"



GUY WIRE PLAN LAYOUT



TALL EQUIPMENT GUY WIRE ELEVATION



LOW EQUIPMENT ELEVATION

② EQUIPMENT ROOF SUPPORT LAYOUT  
1/4" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS, FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

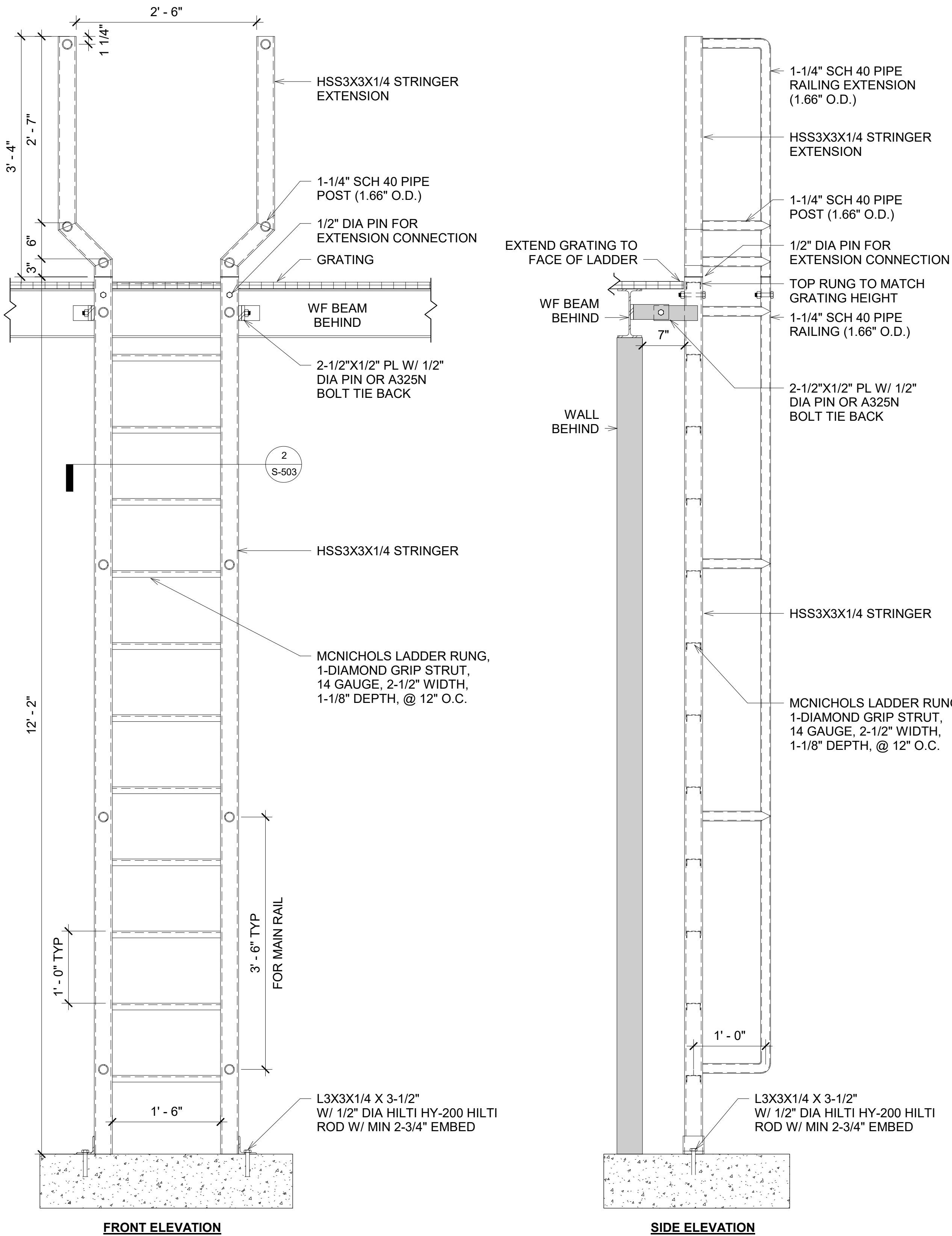
| DSGN: | REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|-------|------|----------|-------------------------|------|------|-------|
| KC    | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | KC   | NM   | KC    |
| DR:   |      |          |                         |      |      |       |
| KC    |      |          |                         |      |      |       |
| CHK:  |      |          |                         |      |      |       |
| NM    |      |          |                         |      |      |       |
| APVD: |      |          |                         |      |      |       |
| KC    |      |          |                         |      |      |       |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

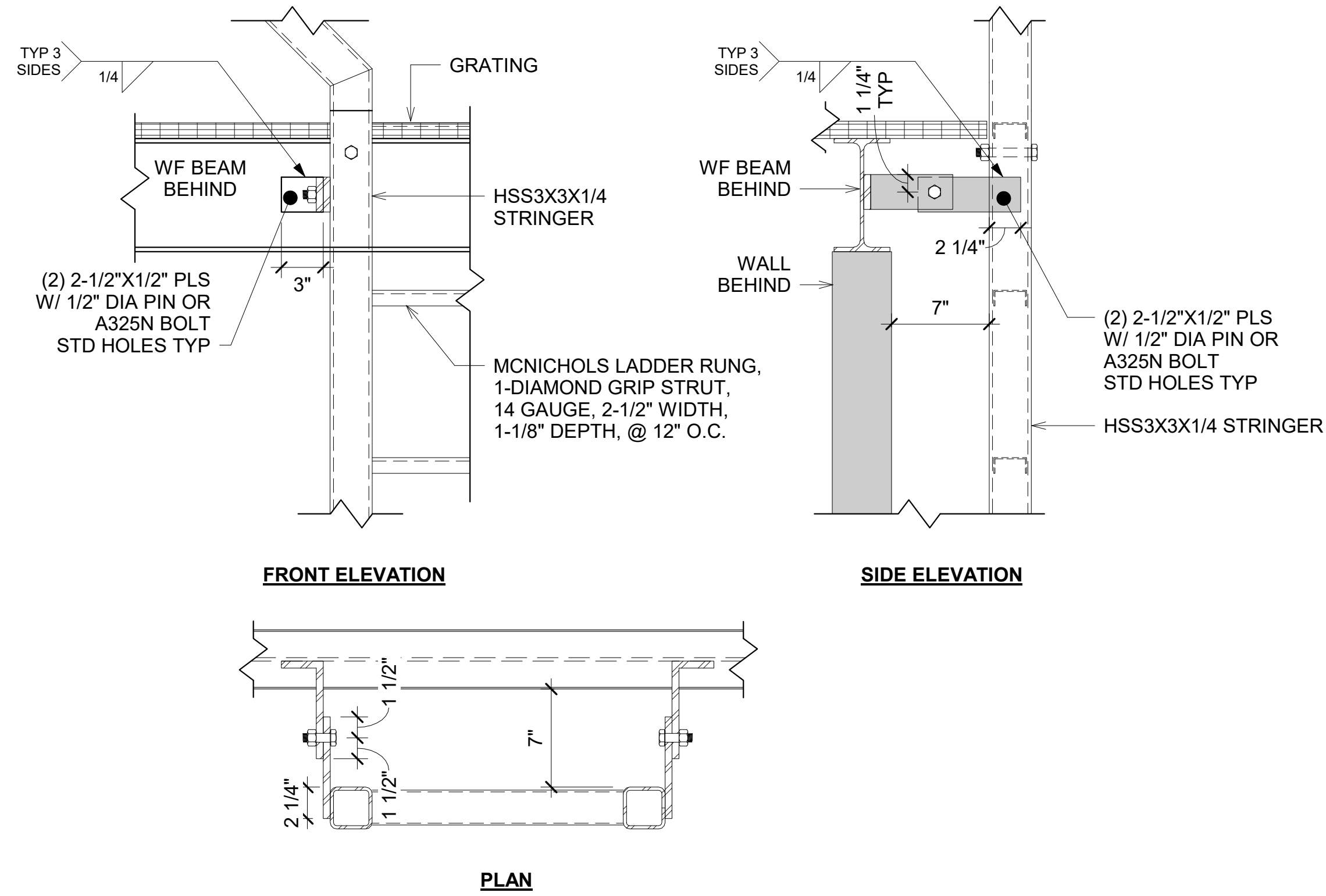
1" = 1'-0"

0"

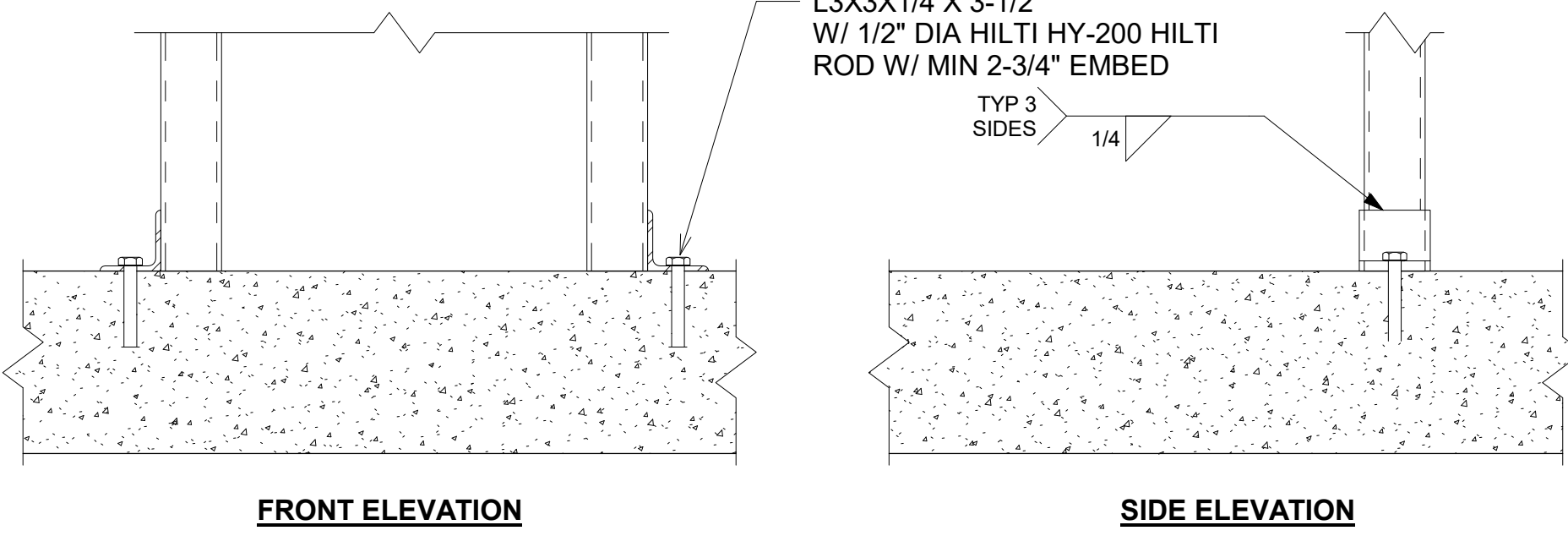


1 LADDER ELEVATIONS  
1" = 1'-0"

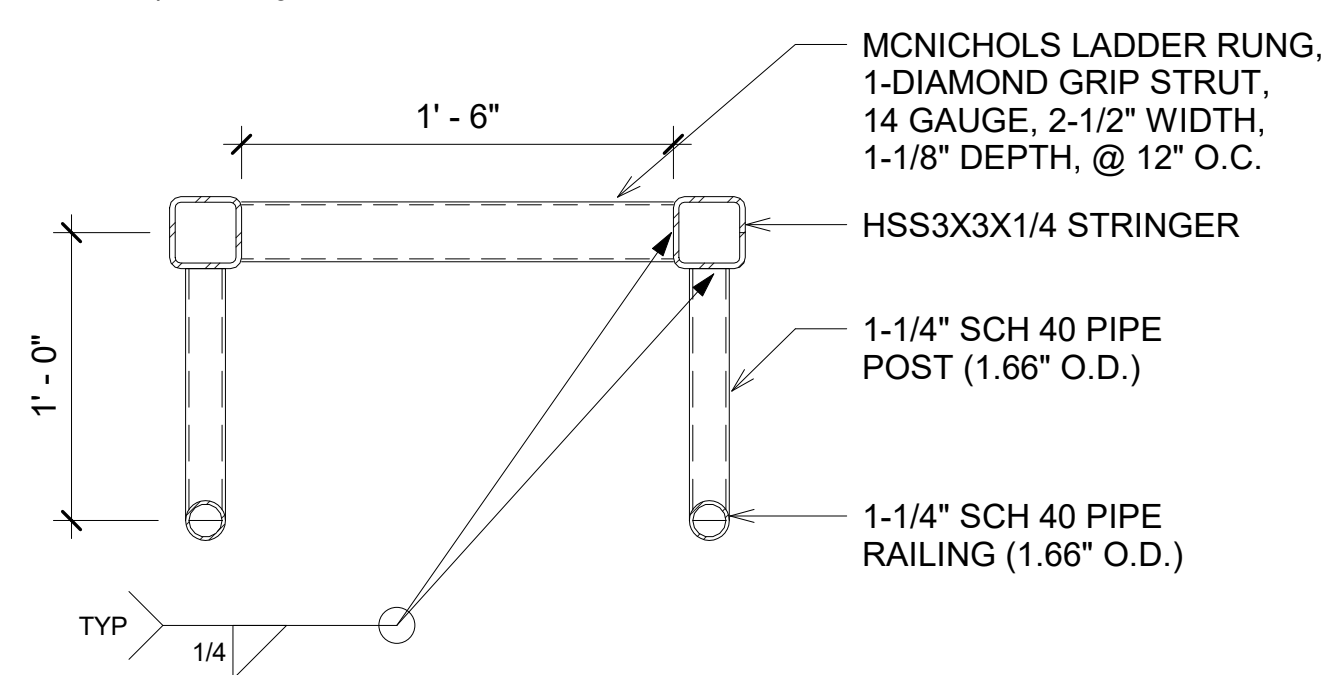
NOTE: LADDER (AND GATE AT TOP, NOT SHOWN HERE) PAINT SCHEME TO BE SELECTED BY ARCHITECT AND VERIFIED BY CYTIVA EH&S



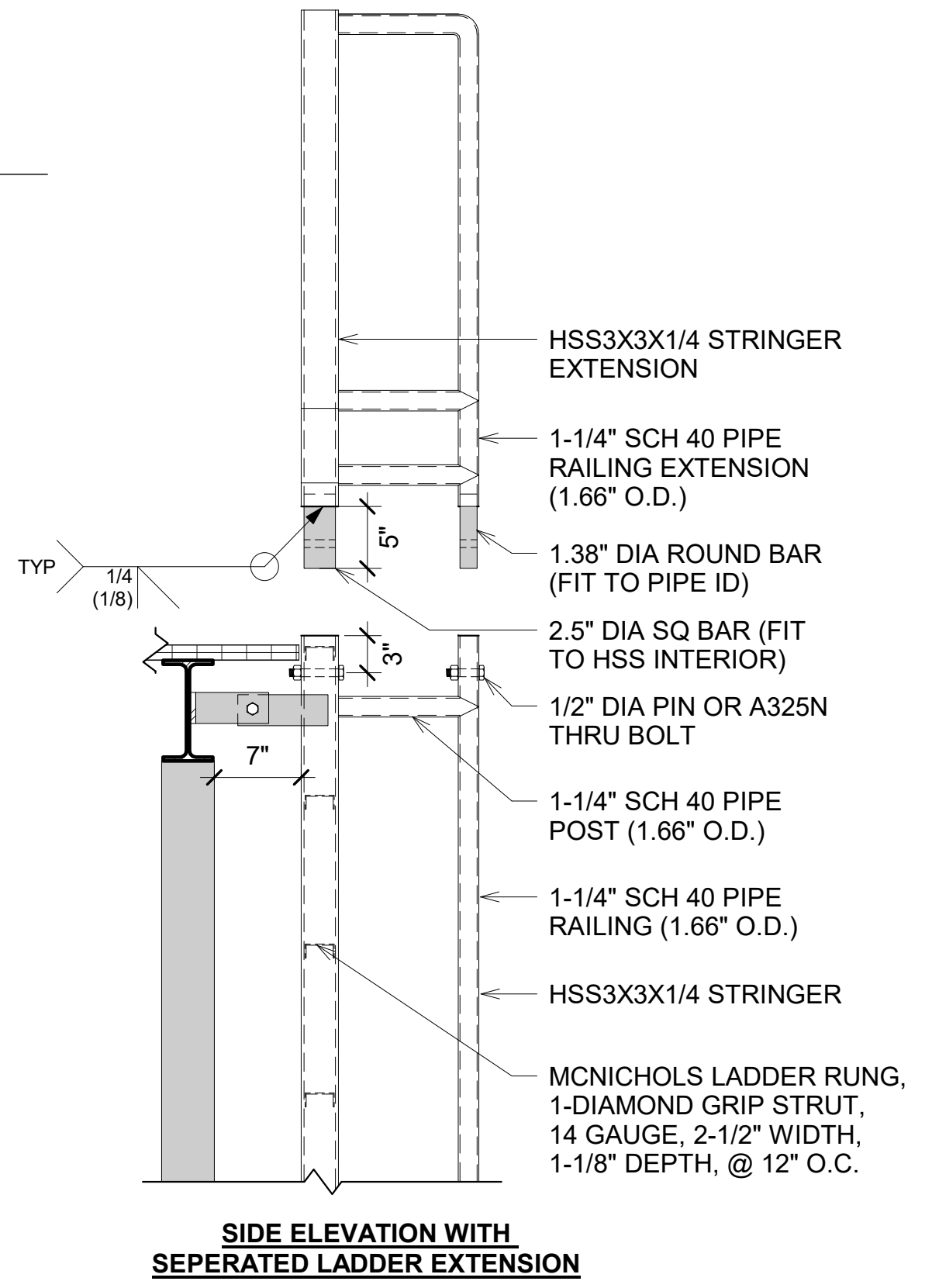
3 LADDER TOP TIE BACK DETAIL  
1 1/2" = 1'-0"



4 LADDER BASE TIE BACK DETAIL  
1 1/2" = 1'-0"



2 LADDER PLAN  
1 1/2" = 1'-0"



5 LADDER EXTENSION CONNECTION DETAIL  
1" = 1'-0"



## GENERAL LEGEND

| ABBREVIATION  |   |   |   | PIPING  |  |  |  | HVAC   |             |        |             | SCHEMATIC LEGEND |             |
|---|---|---|---|---|--|--|--|--|-------------|--------|-------------|------------------|-------------|
| SYMBOL  | DESCRIPTION   | SYMBOL  | DESCRIPTION   | SYMBOL  | DESCRIPTION  | SYMBOL   | DESCRIPTION  | SYMBOL   | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL           | DESCRIPTION |
| FAC-X<br>ACC-X<br>AD<br>AFF<br>AFS<br>AHU<br>AI<br>AO<br>AP<br>ATMOS<br>ATV<br>BAS<br>BGD<br>BHP<br>BKO<br>BOD<br>BOL<br>BOP<br>BOT<br>BPCD<br>BTUH<br>BVS<br>C<br>CA<br>CAV-X<br>CC<br>CD<br>CD-X<br>CFM<br>CG<br>CH-X<br>CHWR<br>CHWS<br><br>CLG<br>CONT<br>CO2<br>CTWR<br>CTWS<br>CU FT<br>CUH-X<br>CW<br>D<br>DB<br>DCW<br>DDCFP<br>DDC<br>DET<br>DHW<br>DI<br>DIL<br>DN<br>DP<br>DWG<br>DX<br>EA<br>EAT<br>EF-X<br>EG-X<br>ELEV<br>EPP<br>ES<br>EWI<br>EXH<br>EXIST<br>F-X<br>FAI<br>FB<br>FC<br>FCD<br>FCO<br>FD<br>FD-X<br>FH<br>FILL<br>FL<br>FMS<br>FPM<br>FS<br>FSD<br>FT<br>FV<br>FVD<br>GALV<br>GCHWR<br>GCHWS<br>GPM<br>H-X<br>HC<br>HL<br>HL<br>HP<br>HTP<br>HWR<br>HWS | AIR CONDITION UNIT - MARK NO.<br>AIR-COOLED CONDENSING UNIT - MARK NO.<br>ACCESS DOOR<br>ABOVE FINISHED FLOOR<br>AIR FLOW SWITCH<br>AIR HANDLING UNIT<br>ANALOG INPUT<br>ANALOG OUTPUT<br>ACCESS PANEL<br>ATMOSPHERE<br>ATMOSPHERIC VENT<br>BUILDING AUTOMATION SYSTEM<br>BLAST GATE DAMPER<br>BRAKE HORSE POWER<br>BLANK OFF<br>BOTTOM OF DUCT<br>BOTTOM OF LOUVER<br>BOTTOM OF PIPE<br>BOTTOM<br>BY-PASS CONTROL DAMPER<br>BRITISH THERMAL UNIT PER HOUR<br>BALANCING VALVE STATION<br>CONDENSATE<br>COMPRESSED AIR<br>CONSTANT AIR VOLUME BOX - MARK NO.<br>COOLING COIL<br>CONDENSATE DRAIN<br>CONTROL DAMPER - MARK NO.<br>CUBIC FEET PER MINUTE<br>CEILING GRILLE<br>CHILLER UNIT - MARK NO.<br>CHILLED WATER RETURN<br>CHILLED WATER SUPPLY<br>CENTERLINE<br>CEILING<br>CONTINUATION<br>CARBON DIOXIDE<br>COOLING TOWER WATER RETURN<br>COOLING TOWER WATER SUPPLY<br>CUBIC FEET<br>CABINET UNIT HEATER - MARK NO.<br>CITY WATER<br>DRAIN<br>DRY BULB TEMPERATURE °F<br>DOMESTIC COLD WATER<br>DIRECT DIGITAL CONTROL FIELD PANEL<br>DIRECT DIGITAL CONTROLLER<br>DETAIL<br>DOMESTIC HOT WATER<br>DE-IONIZED<br>DYNAMIC INSERTION LOSS<br>DOWN<br>DEW POINT<br>DRAWING<br>DIRECT EXPANSION<br>EXHAUST AIR<br>ENTERING AIR TEMPERATURE<br>EXHAUST FAN - MARK NO.<br>EXHAUST GRILL - MARK NO.<br>ELEVATION<br>ELECTRO PNEUMATIC POSITIONER<br>END SWITCH<br>ENTERING WATER TEMPERATURE<br>EXHAUST<br>EXISTING<br>FILTER - MARK NO.<br>FRESH AIR INTAKE<br>BLAT BOTTOM DUCT TRANSITION<br>FLEX CONNECTION<br>FLOW CONTROL DAMPER<br>FLOOR CLEAN OUT<br>FLOOR DRAIN<br>FIRE DAMPER - MARK NO.<br>FUME HOOD<br>FILL<br>FLOOR<br>FLOW MEASURING STATION<br>FEET PER MINUTE<br>FLOOR SINK<br>FIRE & SMOKE DAMPER<br>FLAT TOP DUCT TRANSITION<br>FACE VELOCITY<br>FLAMMABLE VAPOR DETECTOR<br>GALVANIZED<br>GLYCOL CHILLED WATER RETURN<br>GLYCOL CHILLED WATER SUPPLY<br>GALLONS PER MINUTE<br>HUMIDIFIER - MARK NO.<br>HEATING COIL<br>REFRIGERANT HOT GAS<br>HIGH LIMIT<br>HORSE POWER<br>HEAT TRANSFER PACKAGE<br>HOT WATER RETURN<br>HOT WATER SUPPLY | FID-X<br>IFB<br>ITS<br>L<br>LA<br>LAT<br>LFM-X<br>LP<br>LPC<br>LPS<br>LW<br>LWT<br>LWV<br>MAU<br>MAX<br>MBC<br>MBH<br>MEC<br>MECH<br>MIN<br>MPC<br>MPS<br>NC<br>NCW<br>NHW<br>NHWR<br>NIC<br>NO<br>NO<br>NOM<br>NTS<br>OA<br>OAI<br>OBD<br>O2<br>PAD<br>PC<br>PCD<br>PD<br>PLW<br>PRD<br>PRV<br>PSIA<br>PSI OR PSIG<br>PV<br>PV-X<br>PW<br>R-X<br>RA<br>RD<br>RF-X<br>RG-X<br>RH<br>RHC-X<br>RPM<br>RS<br>RWL<br>SA<br>SAU-X<br>SD-X<br>SF-X<br>SN<br>SP<br>SPS<br>SR-X<br>SRD<br>SS<br>ST<br>ST<br>START<br>STM<br>SV<br>SW<br>SWD<br><br>TC<br>TEC<br>TGD<br>THR<br>TOD<br>TOS<br>TRANS<br>TNR<br>TNR<br>TWS<br>TYP<br>UH-X<br>UON<br>VAC<br>VAU-X<br>V-X<br>VD-X<br>VEL<br>VIFB<br>WB<br>WC OR WG<br>WMS | ISOLATION DAMPER - MARK NO.<br>INTEGRAL FACE & BY-PASS<br>INSTRUMENT TEST HOLE<br>LOUVER<br>LAB AIR<br>LEAVING AIR TEMPERATURE<br>LAMINAR FLOW MODULE - MARK NO.<br>LOCAL INDICATING PANEL<br>LOW PRESSURE CONDENSATE<br>LOW PRESSURE STEAM<br>LAB WASTE<br>LEAVING WATER TEMPERATURE<br>LAB WASTE VENT<br>MAKE-UP AIR UNIT<br>MAXIMUM<br>MODULAR BUILDING CONTROLLER<br>THOUSAND BTUH<br>MODULAR EQUIPMENT CONTROLLER<br>MECHANICAL<br>MANUFACTURER<br>MINIMUM<br>MEDIUM PRESSURE CONDENSATE<br>MEDIUM PRESSURE STEAM<br>NORMALLY CLOSED<br>NON-POTABLE COLD WATER<br>NON-POTABLE HOT WATER<br>NON-POTABLE HOT WATER RECIRCULATION<br>NOT IN CONTRACT<br>NORMALLY OPEN<br>NUMBER<br>NOMINAL<br>NOT TO SCALE<br>OUTSIDE AIR<br>OUTSIDE AIR INTAKE<br>OPPOSED BLADE DAMPER<br>OXYGEN<br>PNEUMATIC AIR DAMPER<br>PUMPED STEAM CONDENSATE<br>PRESSURE CONTROL DAMPER<br>PRESSURE DROP<br>PUMPED LAB WASTE<br>PRESSURE RELIEF DAMPER<br>PRESSURE REDUCING VALVE<br>POUNDS PER SQUARE INCH ABSOLUTE<br>POUNDS PER SQUARE INCH GAUGE<br>PROCESS VENT<br>PNEUMATIC VALVE - MARK NO.<br>PROCESS WASTE<br>REGISTER - MARK NO.<br>RETURN AIR<br>REFRIGERANT DISCHARGE<br>RETURN FAN - MARK NO.<br>RETURN GRILLE - MARK NO.<br>RELATIVE HUMIDITY<br>REHEAT COIL - MARK NO.<br>REVOLUTIONS PER MINUTE<br>REFRIGERANT SUPPLY<br>RAIN WATER LEADER<br>SUPPLY AIR<br>SOUND ATTENUATOR - MARK NO.<br>SUPPLY DIFFUSER - MARK NO.<br>SUPPLY FAN - MARK NO.<br>SELF NOISE<br>STATIC PRESSURE<br>STATIC PRESSURE SENSOR<br>SUPPLY REGISTER - MARK NO.<br>SMOKE RELIEF DAMPER<br>STAINLESS STEEL<br>SOUND TRAP<br>SPECIFICATION TYPE<br>MOTOR STARTER<br>STEAM SUPPLY<br>SANITARY VENT<br>SANITARY WASTE<br>SUMMER/WINTER AIRFLOW SETTING<br>DAMPEN<br>TEMPERATURE CONTROLLER<br>TERMINAL EQUIPMENT CONTROLLER<br>TOXIC GAS DETECTOR<br>TEMPERATURE HUMIDITY RECORDER<br>TOP OF DUCT<br>TOP OF STEEL<br>TRANSITION<br>TEMPERED WATER RECIRCULATION<br>TEMPERED WATER SUPPLY<br>TYPICAL<br>UNIT HEATER - MARK NO.<br>UNLESS OTHERWISE NOTED<br>VACUUM<br>VARIABLE AIR VOLUME BOX - MARK NO.<br>CONTROL VALVE - MARK NO.<br>VOLUME DAMPER - MARK NO.<br>VELOCITY<br>VERTICAL INTEGRATED FACE & BYPASS<br>WET BULB TEMPERATURE °F<br>WATER COLUMN (GAUGE)<br>WIRE MESH SCREEN | — LPS —<br>— LPC —<br>— PC —<br>— CW —<br>— ATV —<br>— HWS —<br>— HWR —<br>— CA —<br>— VAC —<br>— RL —<br>— RS —<br>— RD —<br>— HG —<br>— C —<br>— CHWS —<br>— CHWR —<br>— CTWS —<br>— CTWR —<br>— FILL —<br>— H —<br>— D —<br><br>// // // //<br>--- --- --- ---<br><br>— HC —<br><br>— TEE - TURNED DOWN<br><br>— TEE - TURNED UP<br><br>— ELBOW - TURNED UP<br><br>— ELBOW - TURNED DOWN<br><br><br>— INSULATED LINE<br><br>— E —<br><br>— PIPE GUIDE<br><br>— PIPE ANCHOR<br><br>— FLEXIBLE PIPE CONNECTION<br><br>— PITCH —<br><br>— PITCH —<br><br>— AO —<br>— M —<br><br>— AUTOMATIC AIR VENT<br><br>— UNION<br><br>— REDUCER<br><br>— ECCENTRIC REDUCER<br><br>— SLIDE GATE<br><br>— CONTINUATION BREAK<br><br><br><br>— WELDED CAP<br><br>— SCREWED CAP<br><br>— PIPE PLUG<br><br>— PRESSURE GUAGE<br><br><br><br>— THERMOSTAT | <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br> | <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br> | <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br> | <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br> |             |        |             |                  |             |
|   | PIPING TIE-IN POINT   | <u>SECTION DESIGNATION</u>  |   |   |  |  |  |  |             |        |             |                  |             |
|   | DUCT TIE-IN POINT   | UPPER - SECTION DESIGNATION<br>LOWER - DRAWING NUMBER   |   |   |  |  |  |  |             |        |             |                  |             |
|   | LIMIT OF DEMOLITION   |   |   |   |  |  |  |  |             |        |             |                  |             |





IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING

|   |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|
| GENERAL PLUMBING SPECIFICATION  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| GENERAL   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>THE WORK COVERED CONSISTS OF FURNISHING ALL LABOR AND MATERIALS NECESSARY TO INSTALL, COMPLETE AND READY FOR CONTINUOUS OPERATION, THE PLUMBING SYSTEMS, APPARATUS AND EQUIPMENT FOR THE CYTIVA LAB RENOVATION.</li></ul>   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SHOP DRAWINGS   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>SHOP DRAWINGS FOR ALL SPECIFIED FIXTURES, EQUIPMENT AND APPARATUS SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR APPROVAL.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CODES   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>ALL EQUIPMENT AND MATERIALS FURNISHED UNDER THE PLUMBING SUB-CONTRACT AND LABOR AND TESTING PERFORMED THEREIN SHALL BE IN COMPLETE ACCORDANCE WITH THE MASSACHUSETTS STATE BUILDING, FUEL GAS, PLUMBING CODES LOCAL ORDINANCES AND REGULATIONS OF THE TOWN OF SHREWSBURY, NATIONAL FIRE PROTECTION ASSOCIATION AND INSURANCE REGULATIONS AND REQUIREMENTS GOVERNING SUCH WORK.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PERMITS   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>ANY AND ALL PERMITS REQUIRED FOR INSTALLATION OF ANY MATERIAL SHALL BE OBTAINED AS PART OF THE WORK OF THIS SPECIFICATION INCLUDING ALL FEES OR EXPENSES INCURRED.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| GUARANTEE   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>ALL MATERIALS AND EQUIPMENT FURNISHED AND INSTALLED UNDER THIS SPECIFICATION SHALL BE GUARANTEED IN WRITING FOR (1) YEAR FROM THE DATE OF ACCEPTANCE OF THE BUILDING BY THE OWNER.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| INSPECTION  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>ALL WORK SHALL BE SUBJECT TO THE INSPECTION OF THE OWNER, THE ARCHITECT AND OTHER SUCH INSPECTORS HAVING JURISDICTION. A PROPERLY EXECUTED CERTIFICATE OF INSPECTION SHALL BE PROVIDED. EXAMINATION OF SITE: THE PLUMBING SUBCONTRACTOR, BEFORE SUBMITTING PRICES OR BEGINNING WORK, SHALL THOROUGHLY EXAMINE THE SITE AND CONTRACT DOCUMENTS. NO CLAIM FOR EXTRA COMPENSATION WILL BE RECOGNIZED IF DIFFICULTIES WHICH AN EXAMINATION OF SITE CONDITIONS AND CONTRACT DOCUMENTS PRIOR TO EXECUTING CONTRACT WOULD HAVE REVEALED.</li></ul>   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| COORDINATION  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>COORDINATE ALL WORK INSTALLED UNDER THIS SPECIFICATION WITH THAT OF ALL OTHER TRADES.</li></ul>   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PROTECTION OF PROPERTY  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>PROTECT ALL NEW AND EXISTING WORK BEFORE, DURING AND AFTER INSTALLATION.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TESTS   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>THE PLUMBING SUBCONTRACTOR SHALL PERFORM ALL TESTS AT THE COMPLETION OF THE WORK, AND THE RESULTS FURNISHED TO THE OWNER AND ARCHITECT IN WRITING.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CERTIFICATES OF APPROVAL  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>UPON COMPLETION OF ALL WORK, THE PLUMBING SUBCONTRACTOR SHALL FURNISH, IN DUPLICATE, CERTIFICATES OF INSPECTIONS FROM ALL INSPECTORS AND AUTHORITIES HAVING JURISDICTION, NOTARIZED LETTERS FROM THE MANUFACTURERS STATING THAT AUTHORIZED FACTORY ENGINEERS HAVE INSPECTED AND TESTED THE INSTALLATION OF THEIR RESPECTIVE SYSTEMS AND FOUND SAME TO BE IN PERFECT OPERATING CONDITION.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CONTRACT DRAWINGS   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE ONLY THE GENERAL ARRANGEMENTS OF WORK.IT IS NOT THE INTENT OF THESE DRAWINGS TO SHOW EVERY PIPE, RISE, DROP, ELBOW, ETC. ANY ADDITIONAL WORK NOT SHOWN AND REQUIRED TO INSTALL THE PLUMBING SYSTEMS SHALL BE INCLUDED AS PART OF THIS CONTRACT.</li></ul>   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| REMOVAL WORK  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>PARTICULAR CARE SHALL BE TAKEN TO AVOID CREATING HAZARDS ON THE SITE OR CAUSING DISRUPTION OF SERVICE IN THE BUILDING. ALL EXISTING EQUIPMENT TO BE REMOVED SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER. ALL EXISTING EQUIPMENT TO BE TURNED OVER TO THE OWNER SHALL BE PRESENTED IN GOOD CONDITION AT A LOCATION DESIGNATED BY THE OWNER. ALL OTHER EQUIPMENT TO BE REMOVED FROM THE PREMISES. REMOVE ALL ABANDONED PIPING AND EQUIPMENT NOT BUILT INTO BUILDING CONSTRUCTION. WHERE CEILINGS OR WALLS ARE REMOVED, ALL ABANDONED PIPING SHALL BE REMOVED AND ENDS OF LIVE SERVICES CAPPED. ABANDONED ELEMENTS BUILT INTO WALLS OR LOCATED ABOVE EXISTING INACCESSIBLE CEILINGS SHALL REMAIN AND ENDS CAPPED AND MARKED ABANDONED.</li><li>CONTINUITY OF SERVICES: SERVICES SHALL BE MAINTAINED IN ALL AREAS WHICH WILL BE OCCUPIED DURING THE CONSTRUCTION PERIOD. WHEN AN INTERRUPTION OF SERVICE BECOMES NECESSARY, SUCH SHALL BE MADE ONLY UPON CONSENT OF THE OWNER AT A TIME OUTSIDE NORMAL WORKING HOURS AS HE SHALL DESIGNATE. REFER TO THE OVERALL SCHEDULING OF THE WORK OF THE PROJECT. SCHEDULE WORK TO CONFORM TO THIS SCHEDULE AND INSTALL WORK TO NOT DELAY NOR INTERFERE WITH THE PROGRESS OF THE PROJECT.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SCOPE   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <ul style="list-style-type: none"><li>THE WORK OF THIS SECTION CONSISTS OF ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO PROVIDE ALL PLUMBING WORK COMPLETE, IN PLACE, AS SHOWN ON THE DRAWINGS, SPECIFIED HEREIN AND AS NECESSARY FOR A PROPER INSTALLATION.</li><li>ALL CORE DRILLING THROUGH CONCRETE FLOORS, WALLS, OR ROOF IS PART OF THE SCOPE, SHALL BE PROCEED BY X-RAYING OR GROUND PENETRATING RADAR. THIS WORK IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE CONDUCTED IN COMPLIANCE WITH BUILDING STANDARD REGULATIONS.</li><li>SLOPE ALL SANITARY WASTE LINES DOWN TOWARDS DRAIN. MINIMUM SLOPE EQUALS 1/4" PER LINEAR FOOT FOR PIPING 2-1/2" DIAMETER AND SMALLER; 1/8" PER LINEAR FOOT FOR ALL PIPING 3" DIAMETER AND LARGER. SLOPE ALL SANITARY VENT LINES TOWARD TRAP SERVED AT MINIMUM 1/10" PER LINEAR FOOT.</li><li>ALL REQUIRED SAWCUTTING, EXCAVATING, AND BACKFILLING SHALL BE PERFORMED BY PLUMBING CONTRACTOR FOR INSTALLATION OF NEW PLUMBING PIPING. CONCRETE FLOOR PATCHING SHALL BE PERFORMED BY G.C.</li></ul>  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MATERIALS   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| COPPER PIPE SPECIFICATION   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SERVICE:<br>CO2 - CARBON DIOXIDE<br>CW - DOMESTIC COLD WATER<br>HW - DOMESTIC HOT WATER<br>LA - LAB AIR<br>NCW - NON POTABLE COLD WATER<br>NHW – NON POTABLE HOT WATER<br>NHW R – NON POTABLE HOT WATER RECIRCULATION<br>N2 - NITROGEN<br>O2 - OXYGEN<br>TWR - TEMPERED WATER RECIRCULATION<br>TWS – TEMPERED WATER SUPPLY<br>VAC - VACUUM  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MAXIMUM DESIGN RATING: 150 PSIG @ 300°F<br>PIPE: 1/2"- 3" SEAMLESS COPPER WATER TUBE, ASTM B-88, HARD DRAWN, TYPE L, STRAIGHT LENGTHS.<br>FITTINGS: 1/2"- 3" WROUGHT COPPER, SOLDER JOINT ENDS. THREADED ADAPTERS AS REQUIRED FOR CONNECTING TO EQUIPMENT OR INSTRUMENTS.<br>PIPING BELOW GRADE - TYPE "K" SOFT DRAWN COPPER WITH WROUGHT COPPER BRAZED FITTINGS. USE ONLY CANFIELD BRAZESAFE 56 BRAZING ALLOY OR APPROVED EQUAL. DO NOT USE LEAD OR ANTIMONY BRAZING ALLOYS. INSTALL WITHOUT JOINTS WHERE POSSIBLE. IF JOINTS ARE REQUIRED, LOCATE THEM ON THE RECORD DRAWINGS WITH DIMENSIONS TO WALLS OR OTHER REFERENCE POINTS.<br>UNIONS: 1/2"- 3" BRONZE AND/OR WROUGHT COPPER, SOLDER JOINT ENDS.<br>1/2"- 3" DIELECTRIC UNION FOR CONNECTING TO STAINLESS STEEL, CARBON STEEL OR ANY OTHER DISSIMILAR METAL.<br>FLANGES: 1/2"- 3" CLASS 150, CAST BRONZE, FLAT FACE, SOLDER JOINT END.<br>GASKETS: GARLOCK BLUE-GARD, STYLE 3000, 1/8" THICK. (GENERAL PURPOSE).<br>BOLTS: ASTM A193 GRADE B7 ALLOY STEEL STUD BOLTS WITH TWO ASTM A194 GRADE 2H HEAVY HEX NUTS. FLANGE AND BOLT INSULATING KITS ARE TO BE USED IF FLANGES ARE DISSIMILAR MATERIALS.<br>SOLDER: FOR ALL SERVICES ONLY LEAD FREE SOLDER SHALL BE USED. SOLDER MAY BE EITHER COPPER/TIN/SILVER/NICKEL ALLOY SUCH AS BRIDGIT BY HARRIS OR, SILVER-TIN SOLDER SUCH AS STAY-BRITE BY HARRIS. SOLDERS SHALL HAVE A MELTING POINT OF APPROXIMATELY 450°F. NO LEADED SOLDER SHALL BE PRESENT ON THE JOB SITE.<br>FLUX: HARRIS STAY CLEAN PER MANUFACTURER DIRECTIONS.<br>BALL VALVE: 1/2" - 2" BRONZE BODY, 316 STAINLESS STEEL BALL, BRONZE TRIM, 3 PIECE CONSTRUCTION, TFE SEATS AND SEALS (SEE NOTE 1), SOLDER ENDS, NIBCO S-595- BR-Y-66.<br>BUTTERFLY VALVE: 2" - 3" DUCTILE IRON BODY, 316 STAINLESS STEEL SHAFT AND DISC, VITON LINER AND SEALS, LUGGED BODY FOR USE WITH CLASS 125 150 FLANGES, LEVER-LOCK HANDLE, NIBCO LD 3222.<br>CHECK VALVES: 1/2"- 3" BRONZE HORIZONTAL SWING CHECK, BRONZE DISC, Y-PATTERN (UP TO 3"), SOLDER ENDS, 300 LB W.O.G., NIBCO S-433.<br>Y-STRAINER: 1/2"- 3" CAST BRONZE BODY, SOLDER ENDS, 20 MESH STAINLESS STEEL SCREEN, SPIRAX SARCO TBT. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| LABORATORY WASTE AND CONDENSATE PIPING SPECIFICATION  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| FRPP PIPE SCHEDULE 40 POLYPROPYLENE ACID WASTE PIPE MANUFACTURED FROM RESIN MEETING ASTM D4101 (FUSEAL OR EQUIVALENT). PIPE SHALL MEET THE DIMENSIONAL TOLERANCES OF ASTM D2447. PIPE TO BE SUPPLIED IN 10' TO 20' SECTIONS.<br>FITTINGS: NO-HUB/PLAIN END FITTINGS TO MEET OR EXCEED ASTM F1412. FITTINGS MANUFACTURED FROM POLYOLEFIN MATERIAL IN ACCORDANCE WITH ASTM D4101. THE OUTER BAND OF EACH NO-HUB/PLAIN END SHALL BE 300 SERIES STAINLESS STEEL, AND 5/16" BOLTS, NUTS AND WASHERS PLATED TO MEET A 100 HOUR SALT SPRAY TEST PER ASTM B117.<br>SOCKET FUSION FITTINGS— SOCKET FUSION SYSTEMS TO CONFORM TO ASTM F1412. SOCKET FUSION FITTINGS SHALL MEET OR EXCEED ASTM D2657 STANDARDS. POLYPROPYLENE FITTINGS SHALL BE MANUFACTURED FROM POLYOLEFIN MATERIAL IN ACCORDANCE WITH ASTM D4101. ELECTROFUSION FITTINGS SHALL MEET OR EXCEED ASTM F1412.<br>POLYPROPYLENE FITTINGS TO BE MANUFACTURED FROM POLYOLEFIN MATERIAL IN ACCORDANCE WITH ASTM D4101.<br>THE MOLDED COIL TO BE MADE OF HEAVY GAUGE WIRE. CLAMPS ARE NOT TO BE USED AT ANY TIME DURING INSTALLATION.  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| STAINLESS STEEL PIPING: 316 STAINLESS STEEL SCHEDULE 40 PIPE MEETING ASTM A312. SIZE: 1 1/2" SPECIFIC LOCATION OF STAINLESS PIPING ON PLAN, WITHIN SUITE / EXPOSED WASTE PIPING.<br>FITTINGS: BUTT WELD 316 STAINLESS STEEL FITTINGS MEETING OR EXCEEDING ASTM A403 316L. SCHEDULE TO MATCH PIPE  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PIPE INSULATION   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ALL WATER SUPPLY AND RECIRCULATION PIPE, FITTINGS AND VALVES SHALL BE INSULATED WITH HEAVY DENSITY RIGID FIBERGLASS WITH A VAPOR BARRIER AND ALL PURPOSE JACKET WITH SELF-SEALING LAP JOINT. VALVES AND FITTINGS SHALL BE INSULATED WITH ZESTON HI-LO INSULATION AND COVERED WITH 25/50 RATED PVC COVERS SECURED WITH VAPOR RETARDER MASTIC.<br>SMALLER THAN 1.5 INCH: 1" THICK, 0.26 BTU IN/H FT^2 °F.<br>1.5 INCH AND LARGER: 1.5" THICK, 0.26 BTU IN/H FT^2 °F.<br>ALL PIPE INSULATION MATERIALS SHALL CONFORM TO ASTM 84, NFPA 50A AND 255 AND UL 723 NOT TO EXCEED RATING OF 25 FLAME SPREAD AND 50 SMOKE DEVELOPED. ALL INSTALLED INSULATION SHALL MEET OR EXCEED ASHRAE STANDARD 90.1.   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PIPE SLEEVES, HANGER AND SUPPORTS   |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PROVIDE HANGERS AND SUPPORTS THAT COMPLY WITH MSS SP-58. ALL PIPING SHALL BE PROPERLY SUPPORTED FROM THE BUILDING STRUCTURE IN ACCORDANCE WITH LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS. HANGERS FOR INSULATED PIPING SHALL BE OVERSIZED AND FURNISHED WITH A SHEETMETAL INSULATION SHIELD TO ALLOW THE INSULATION TO PASS THROUGH UNCUT. PROVIDE SCHEDULE 40 PIPE SLEEVES, EXTEND 1 INCH ABOVE FLOOR, MAKE WATERTIGHT AND PACK WITH MATERIAL THAT SHALL MAINTAIN FIRE RATING. PROVIDE CORE DRILLING WHERE REQUIRED AND PROVIDE FIRE RATED LINK SEAL PENETRATION CLOSURES.  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PIPE IDENTIFICATION AND VALVE TAGS  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ALL PLUMBING SYSTEMS SHALL BE LABELED AT EACH VALVE, AT EACH BRANCH, AT EACH PIPE PASSAGE THROUGH WALL AND AT INTERVALS OF NOT MORE THAN 20' WITH COLOR CODED SEMI-RIGID SETMARK PIPE MARKERS WITH ARROWS INDICATING THE DIRECTION OF FLOW. ALL VALVES SHALL BE TAGGED WITH 1-1/2" DIAMETER BRASS TAGS AND NUMBERED IN SEQUENCE FROM POINT OF ORIGIN. VALVE CHARTS SHALL BE PLACED UNDER GLASS, FRAMED AND PRESENTED TO OWNER.  |  |  |  |  |  |  |  |  |  |  |  |  |  |

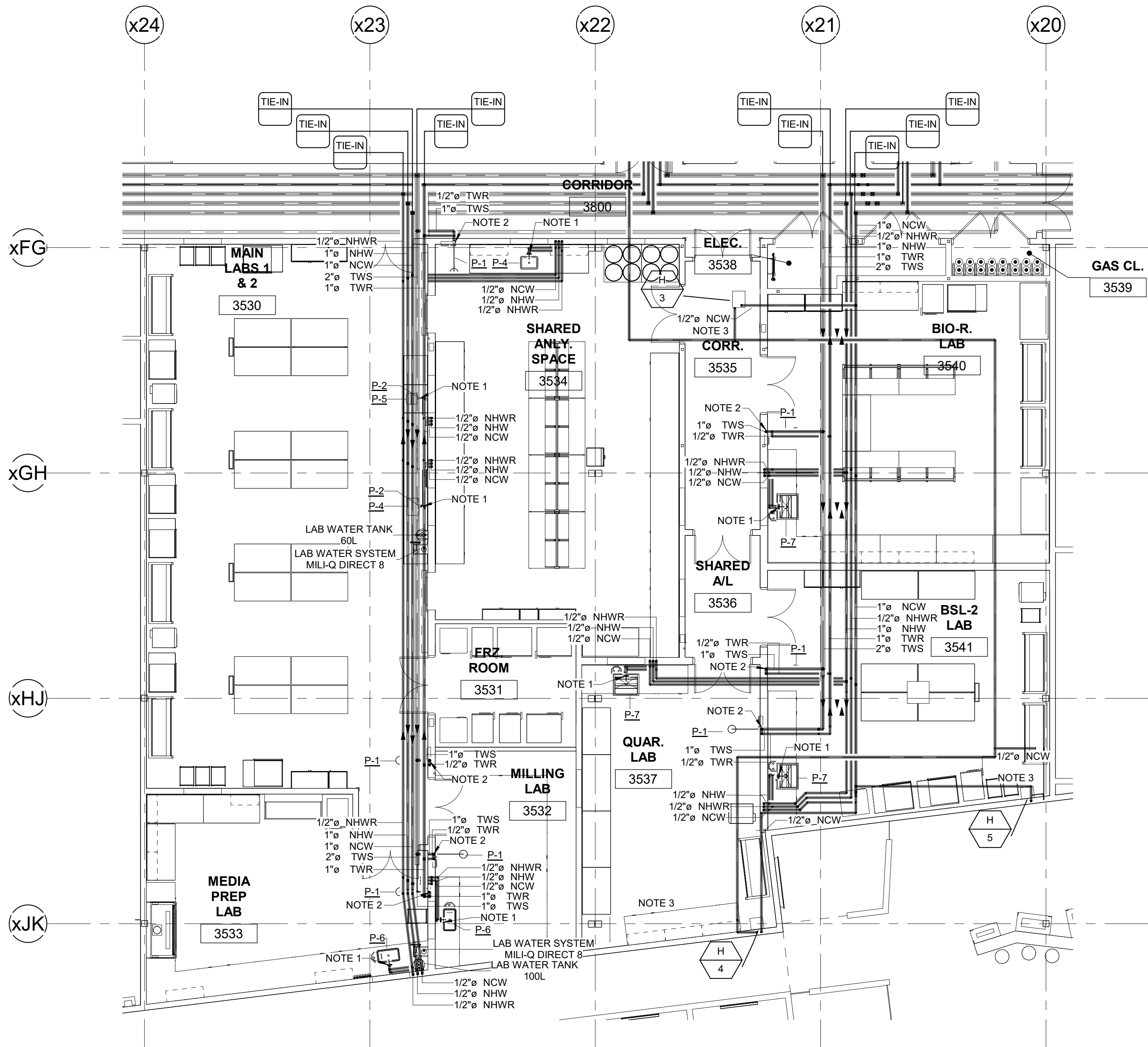
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|--|--|--|-------|-----|------|------------|------------------------------|------|------|-------|--|--|--|--|--------------|
|  <div>800 SCENIC VIEW DRIVE   T: (401) 658-4600<br/>CUMBERLAND, RI 02864   F: (401) 658-4609</div> <div>A MEMBER OF THE HART COMPANIES</div> <div>WWW.HARTCOMPANIES.COM</div> |  <div>100 RESULTS WAY<br/>MARLBOROUGH, MA 01752</div> | GENERAL NOTE:<br>ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS, FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT. | DSGN: | ZAC | REV. | DATE       | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |  |  |  | CLD & CCM LABS<br>PLUMBING<br>SPECIFICATIONS | ISSUE DATE:  |
|  |  |  | DR:   | ZAC | A    | 04/19/2021 | ISSUED FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |  |  |  |  | SCALE:       |
|  |  |  | CHK:  | MC  | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION      | ZAC  | MC   | MC    |  |  |  |  | SHEET NUMBER |
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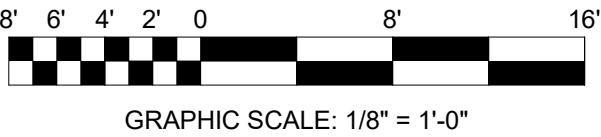




- NOTES:
1. SEE DETAIL 7 ON PL-501 FOR FAUCET TIE-IN DETAIL.
  2. SEE DETAIL 1 ON PL-501 FOR SAFETY SHOWER PLUMBING DETAIL.
  3. NCW SUPPLY FOR HUMIDIFIER FLUSH. SEE H-104.1.
  4. SEE PL-104 FOR LAB WASTE AND VENT PIPING.



PARTIAL PLAN: THIRD FLOOR EAST HOT, COLD & TEMPERED WATER PLUMBING  
1/8" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING

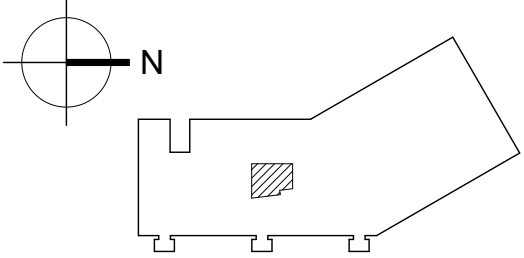
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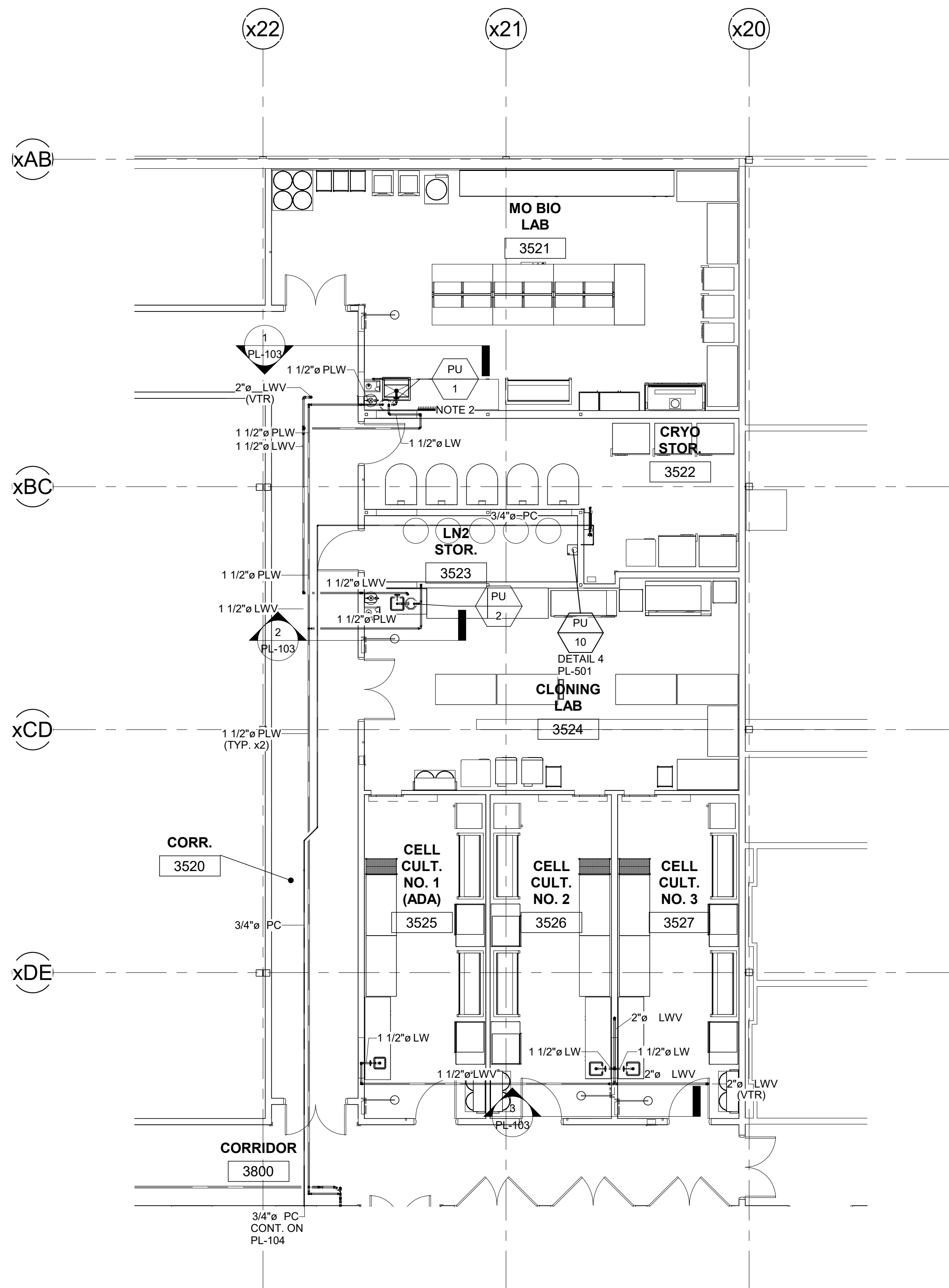
ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

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| DR:   | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION      | ZAC  | MC   | MC    |
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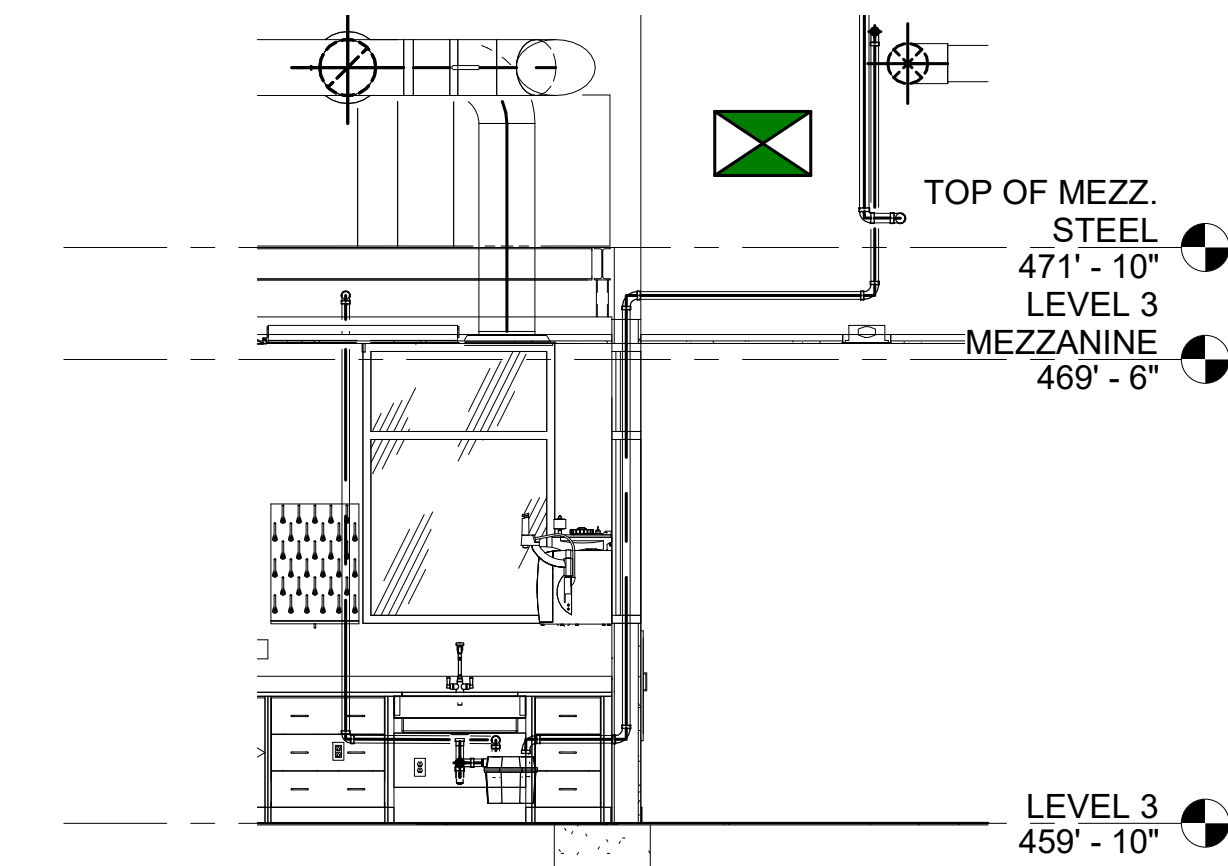


|                                 |  |                     |
|---------------------------------|--|---------------------|
| CLD & CCM LABS<br>PLUMBING      |  | ISSUE DATE:         |
| THIRD FLOOR WATER PIPING (EAST) |  | SCALE: 1/8" = 1'-0" |
| PROJ. NO: 20021A CAD FILE:      |  | SHEET NUMBER        |
|                                 |  | PL-102              |

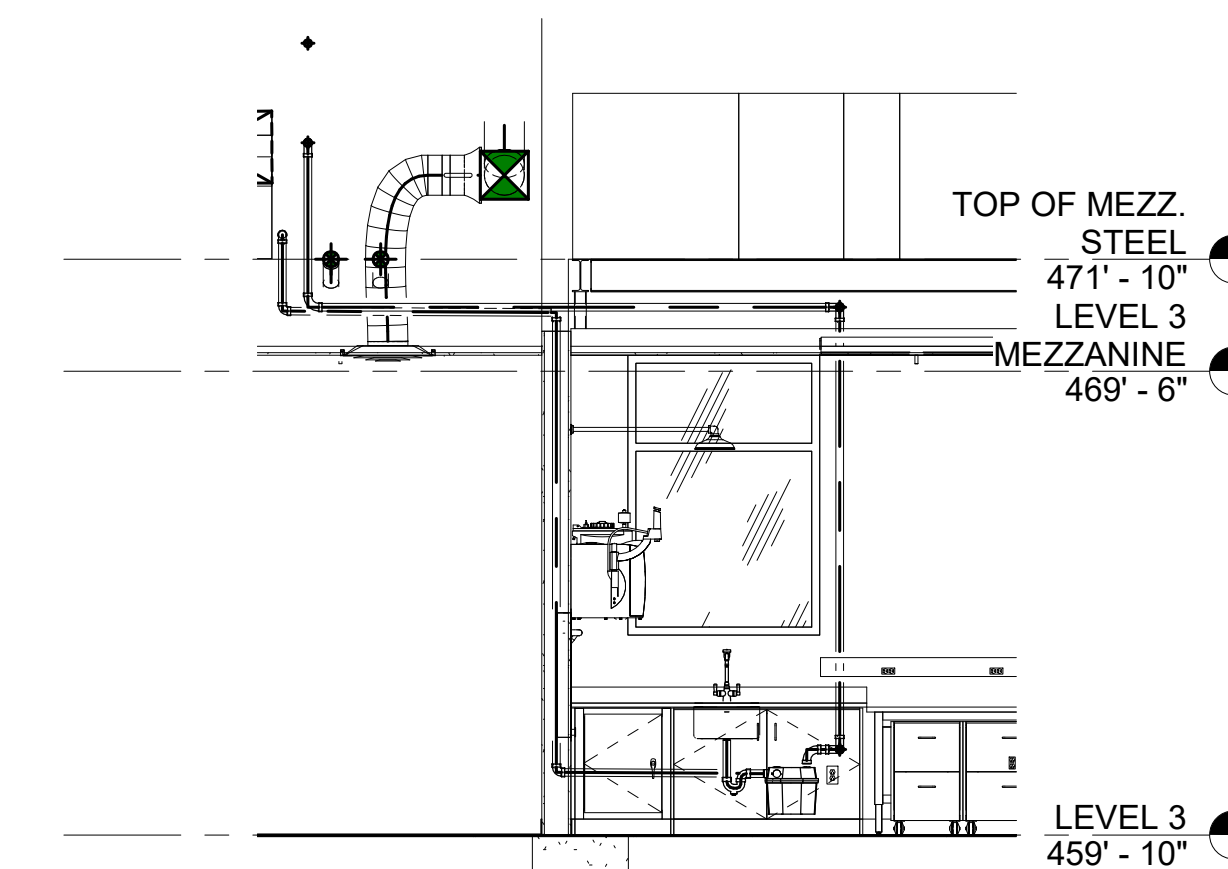




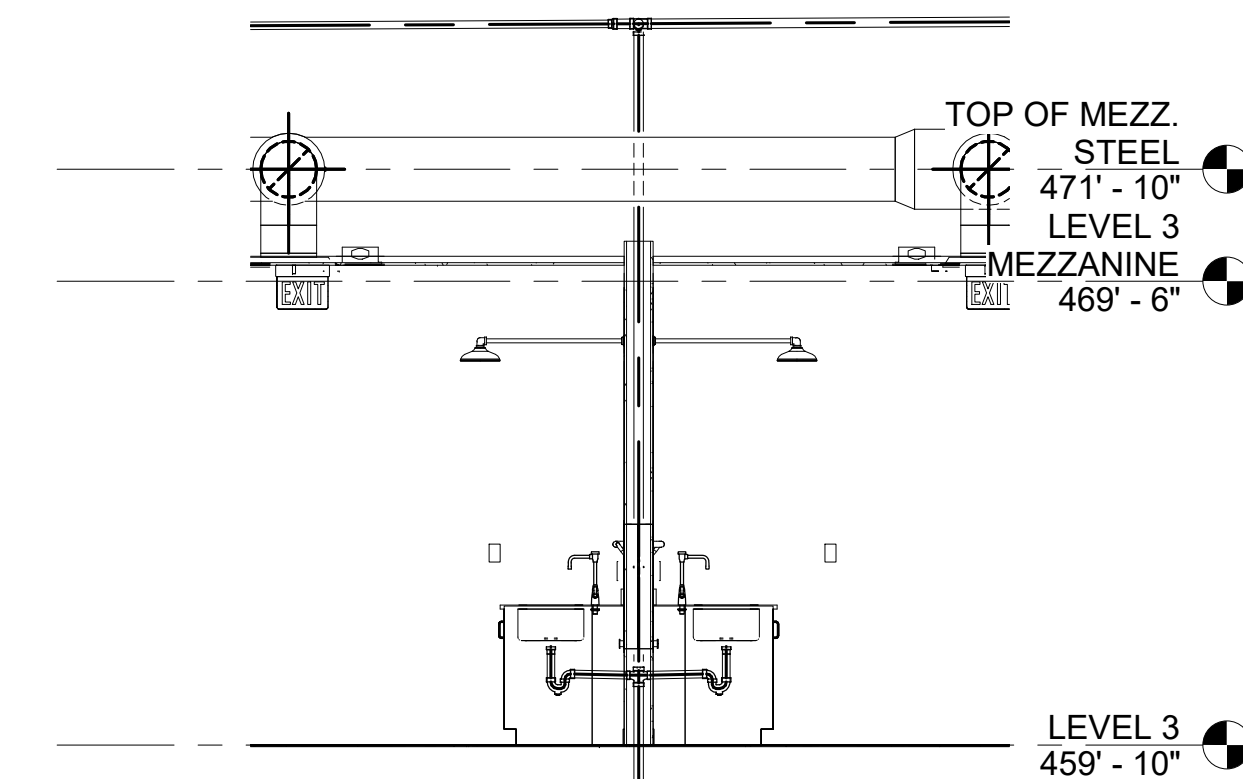
PARTIAL PLAN: THIRD FLOOR LAB WASTE & VENT PLUMBING (WEST)  
1/8" = 1'-0"



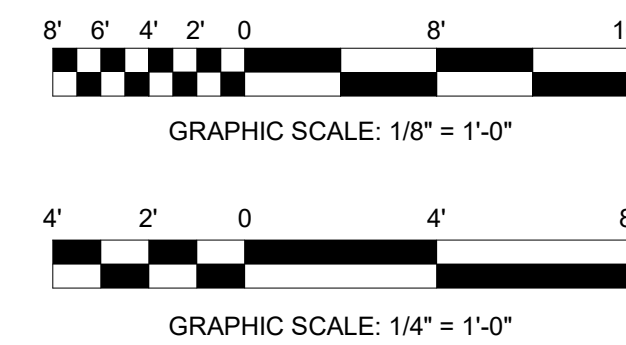
① SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #1 (WEST)  
1/4" = 1'-0"



② SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #2 (WEST)  
1/4" = 1'-0"



③ SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #3 (WEST)  
1/4" = 1'-0"



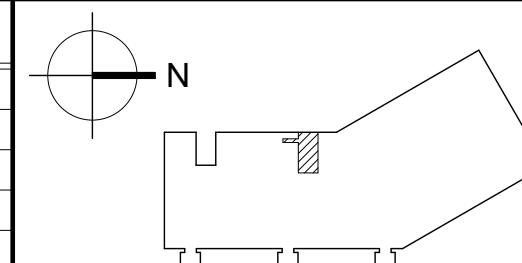
- NOTES:
- SEE DETAIL 4 ON PL-501 FOR PUMP PLUMBING DETAIL.
  - ELEVATE PUMP WITH MOUNT OR STAND TO ALLOW FOR CONNECTING TO SIDE INLET OF LIBERTY PUMP AND MAINTAIN PROPER SLOPE OF TRAP ARM.

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GENERAL NOTE:

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|-------|------|------------|------------------------------|------|------|-------|
| ZAC   | A    | 04/19/2021 | ISSUED FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |
| DR:   | ZAC  | 0          | 06/10/2021                   | ZAC  | MC   | MC    |
| CHK:  | MC   |            |                              |      |      |       |
| APVD: | MC   |            |                              |      |      |       |





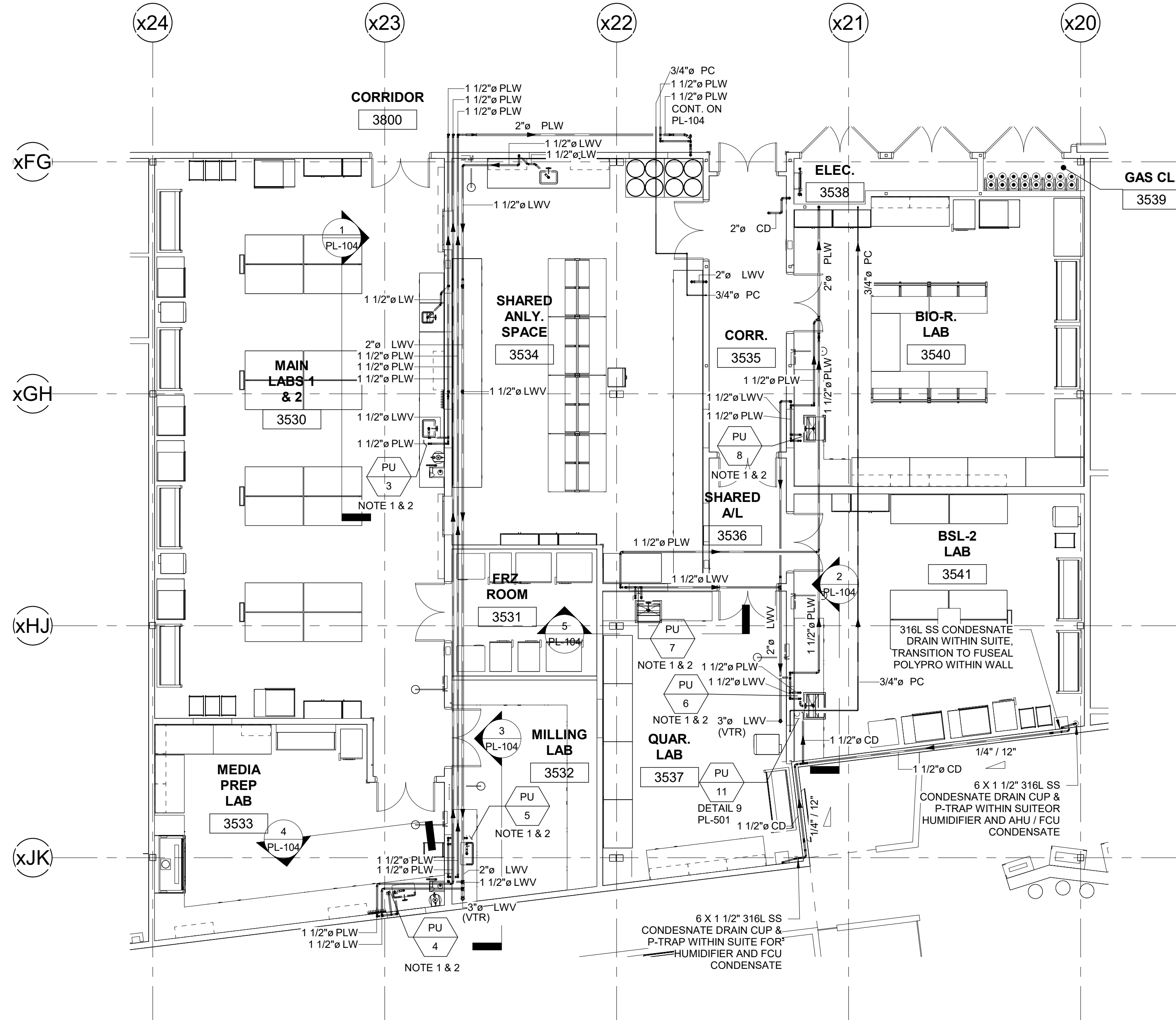
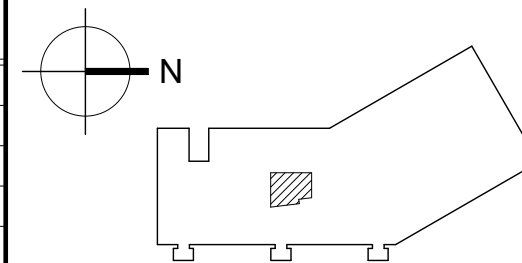
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0'

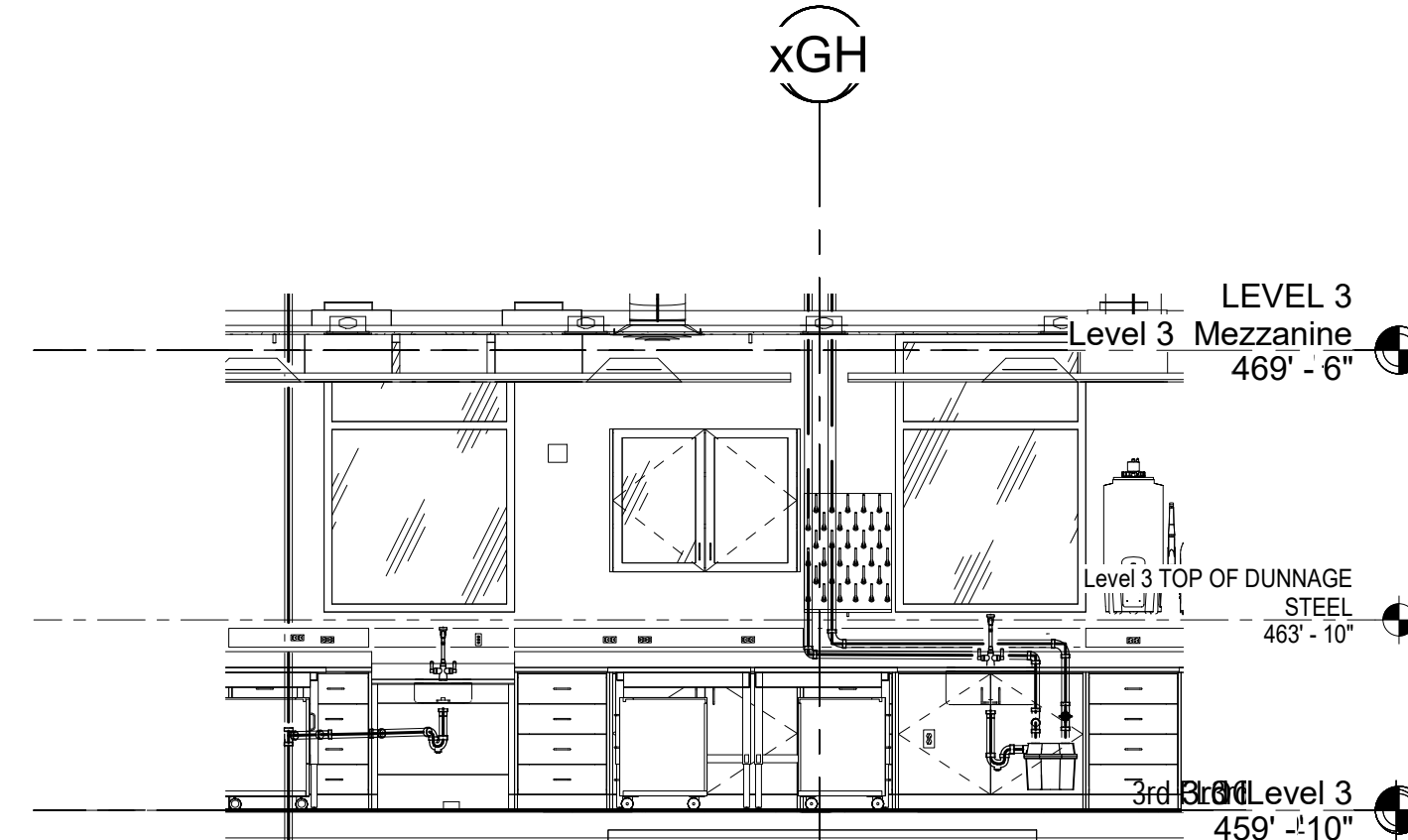
BAR IS ONE INCH ON ORIGINAL DRAWING

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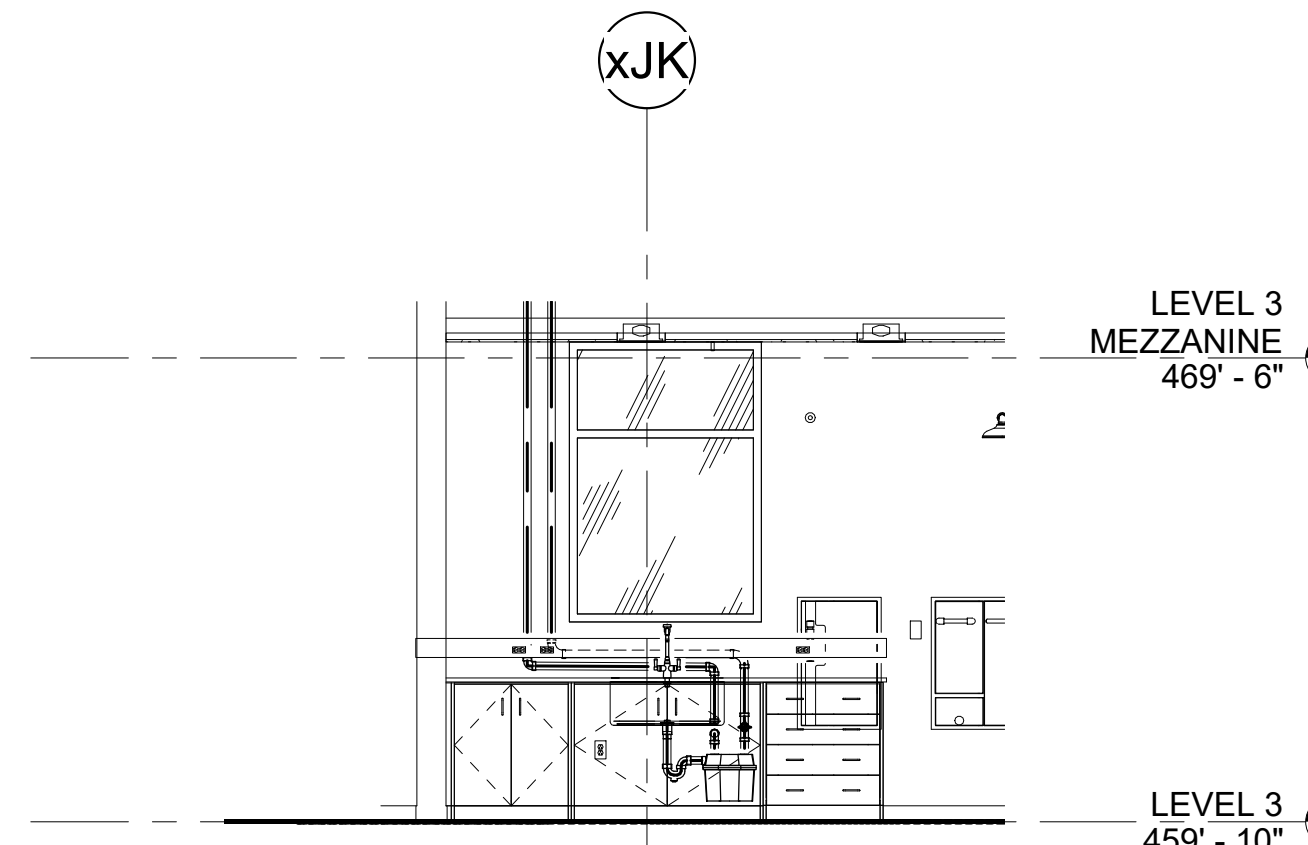
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| ZAC   | A    | 04/19/2021 | ISSUED FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |
| DR:   | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION      | ZAC  | MC   | MC    |
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| APVD: |      |            |                              |      |      |       |



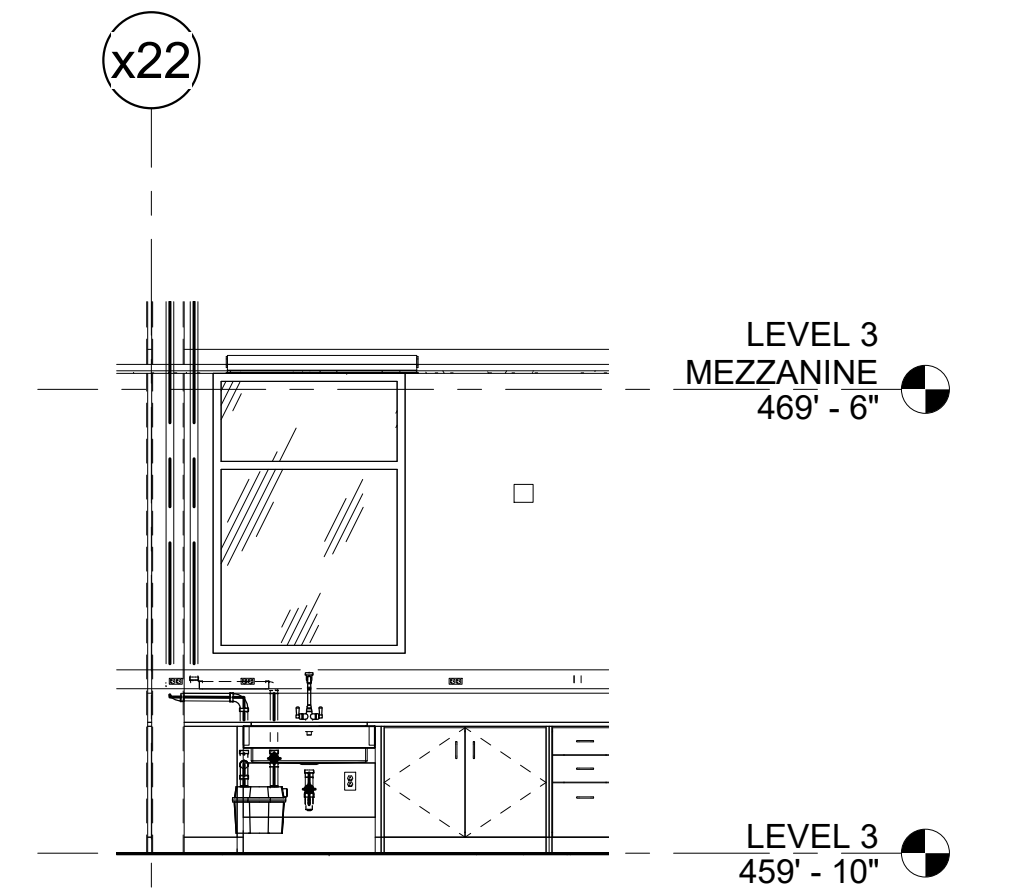
PARTIAL PLAN: THIRD FLOOR LAB WASTE & VENT PLUMBING (EAST)  
1/8" = 1'-0"



1 SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #1 (EAST)  
1/4" = 1'-0"



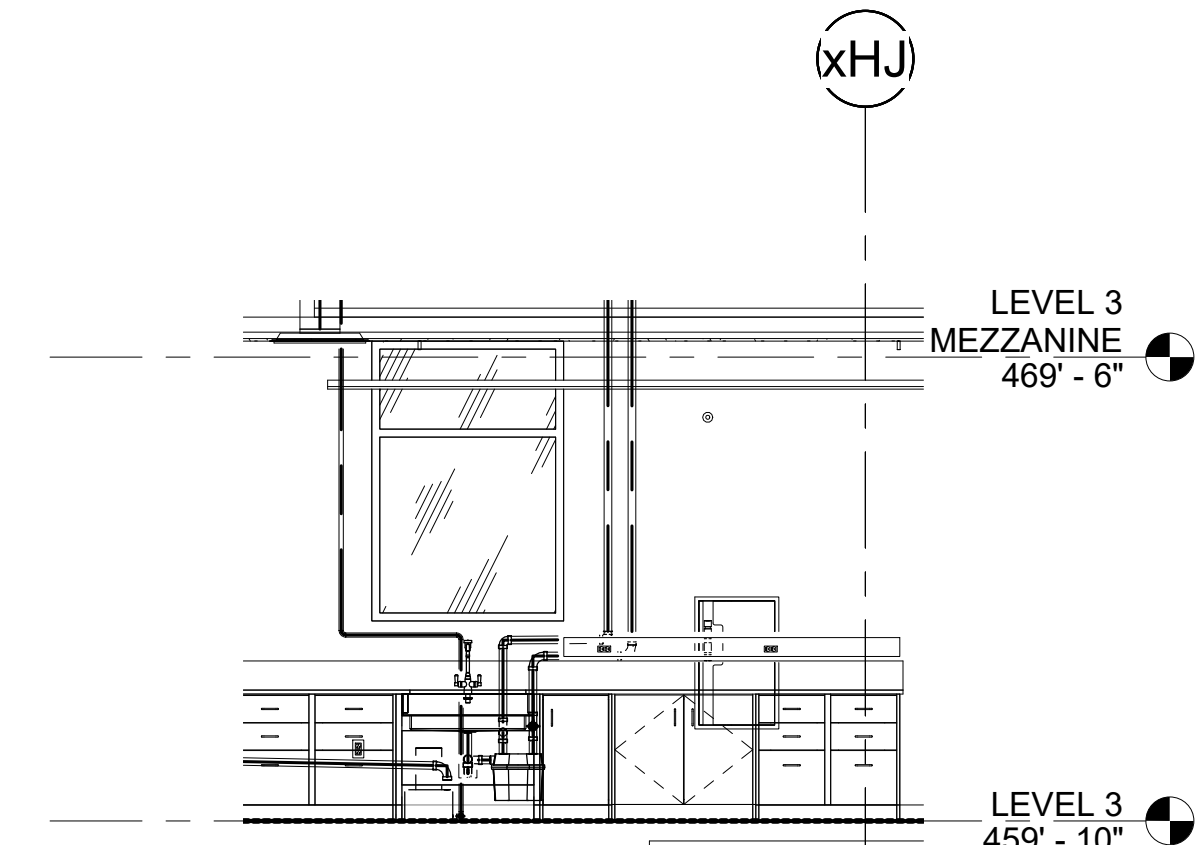
3 SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #3 (EAST)  
1/4" = 1'-0"



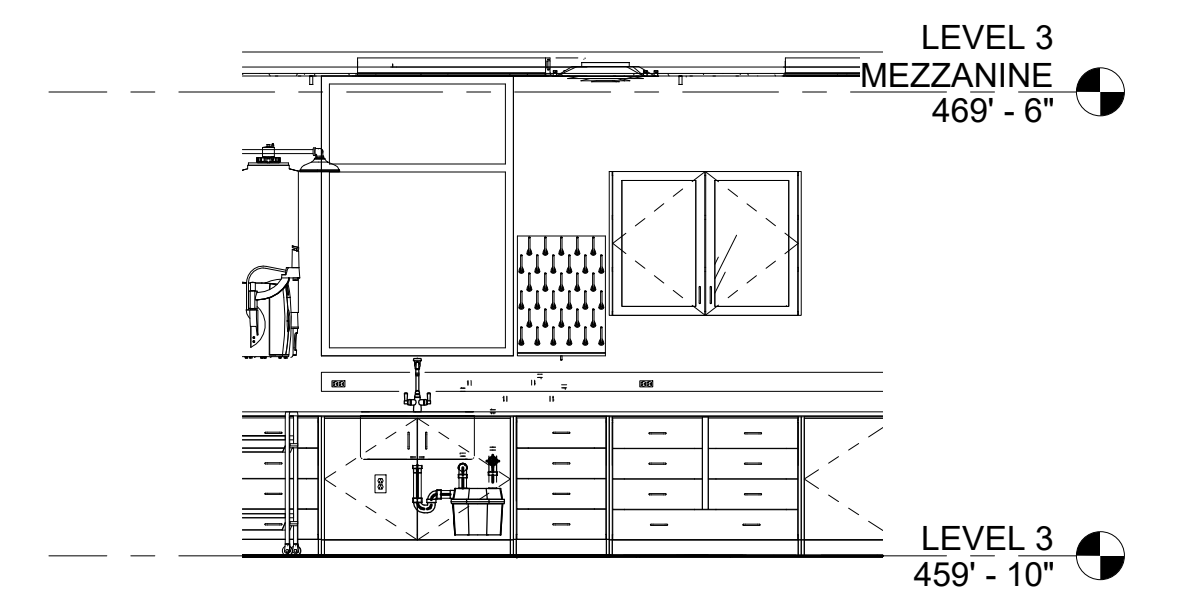
5 SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING 5 (EAST)  
1/4" = 1'-0"

NOTES:

- SEE DETAIL 4 ON PL-501 FOR PUMP PLUMBING DETAIL.
- ELEVATE PUMP WITH MOUNT OR STAND TO ALLOW FOR CONNECTING TO SIDE INLET OF LIBERTY PUMP AND MAINTAIN PROPER SLOPE OF TRAP ARM.



2 SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #2 (EAST)  
1/4" = 1'-0"



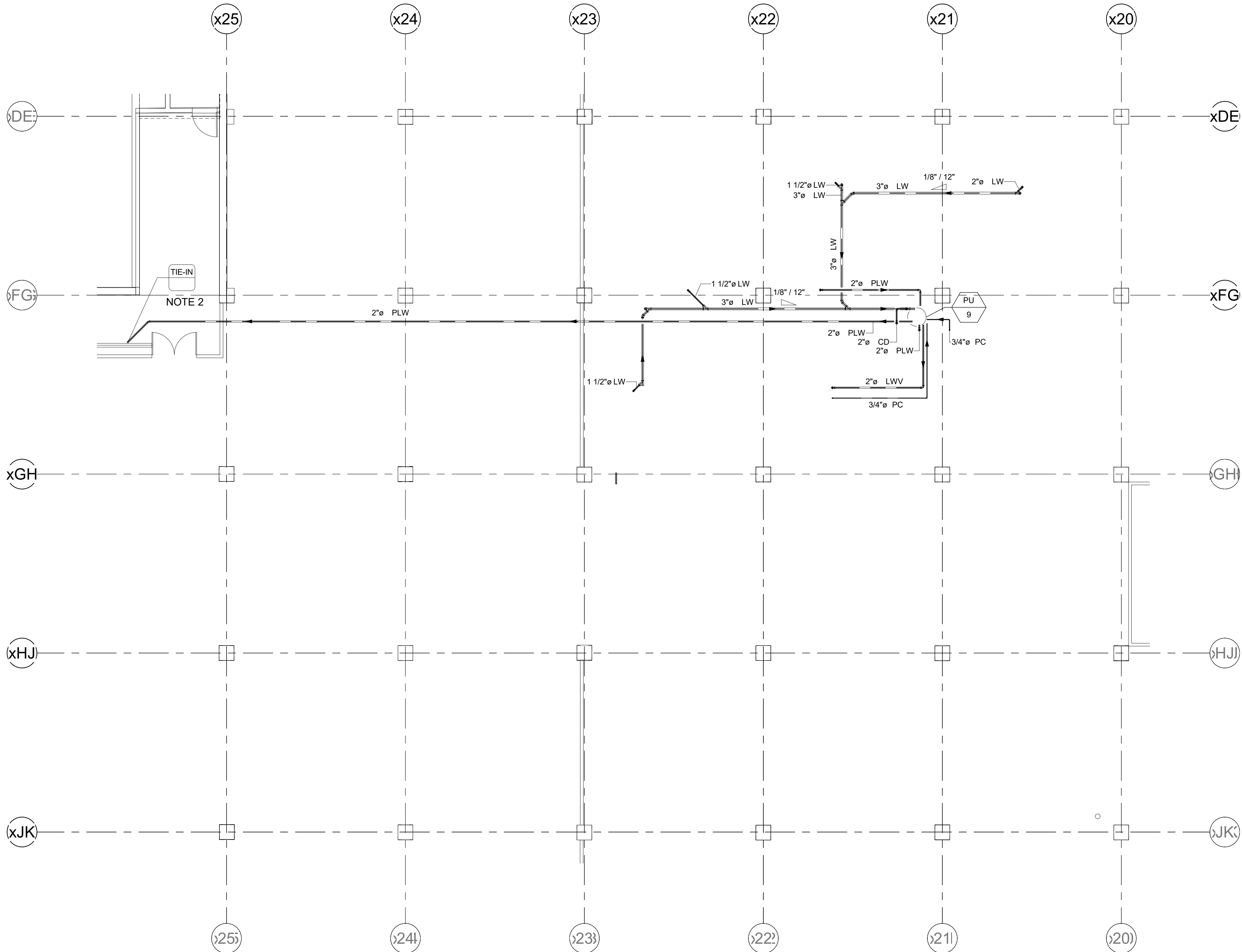
4 SECTION VIEW: THIRD FLOOR LAB WASTE PLUMBING #4 (EAST)  
1/4" = 1'-0"

8' 6' 4' 2' 0' 8' 16'  
GRAPHIC SCALE: 1/8" = 1'-0"

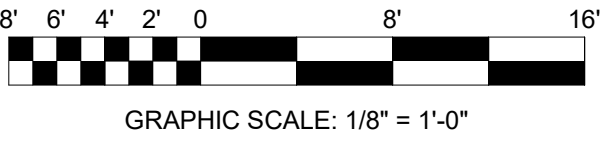
4' 2' 0' 4' 8'  
GRAPHIC SCALE: 1/4" = 1'-0"



- NOTES:
- SEE DETAIL 5 ON PL-501 FOR SUMP PUMP PLUMBING DETAIL.
  - TIE INTO EXISTING LAB WASTE MAIN TO BUILDING WASTE SYSTEM.




PARTIAL PLAN: SECOND FLOOR LAB WASTE & VENT PLUMBING  
1/8" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



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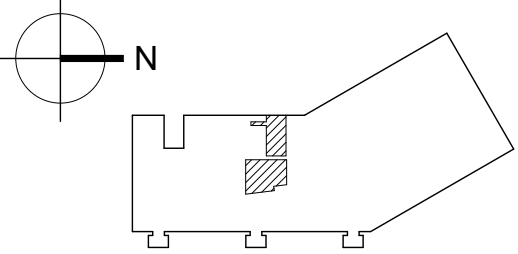


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| ZAC   | A    | 04/19/2021 | ISSUED FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |
| DR:   | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION      | ZAC  | MC   | MC    |
| CHK:  | MC   |            |                              |      |      |       |
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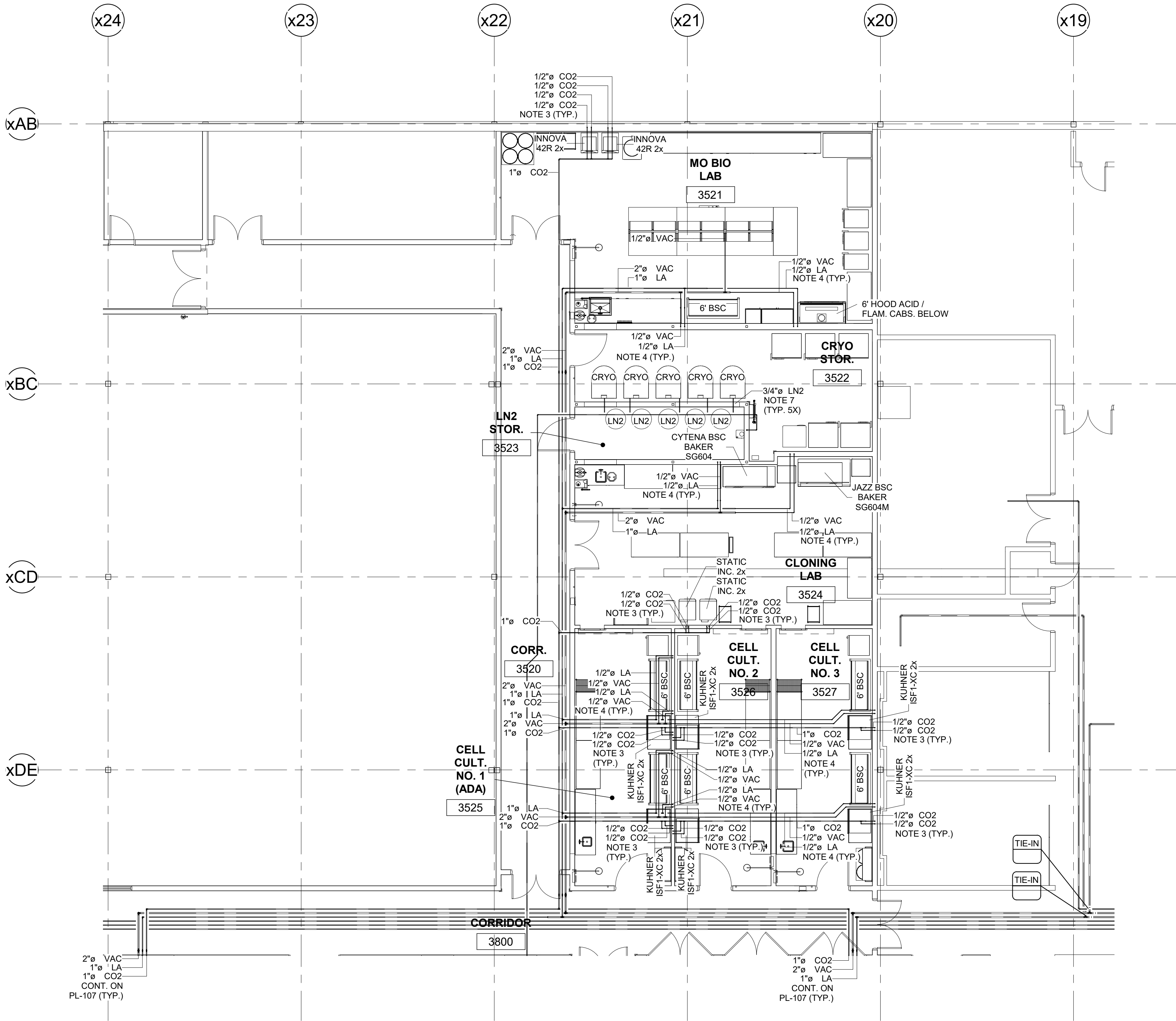
CLD & CCM LABS  
**PLUMBING**  
SECOND FLOOR LAB WASTE & VENT

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE:  
SCALE: 1/8" = 1'-0"

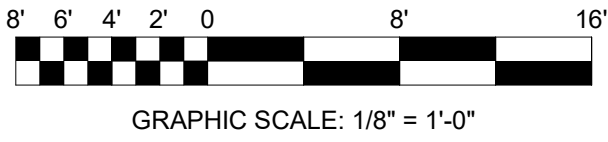
SHEET NUMBER  
**PL-105**






- NOTES:
1. PROVIDE ISOLATION VALVES FOR ALL SERVICES AT BRANCH CONNECTIONS ON SUBHEADERS.
  2. PROVIDE ISOLATION VALVES AND CAPS FOR FUTURE CONNECTIONS.
  3. SEE DETAIL 6 ON PL-501 FOR GAS WALL PENETRATION DETAIL.
  4. CONNECT TO BIOSAFETY CABINET AT THIS LOCATION.
  5. LOCATION OF CHANGEOVER STATION (APPLIES FOR N2, O2 & CO2.)
  6. DROPS THROUGH WORKBENCH SHROUD TO SERVICE BENCHTOP BIOREACTOR. TRANSITION TO FLEXIBLE TUBING AS SHOWN IN DETAIL 8 ON PL-501.
  7. STAINLESS STEEL BRAIDED FLEXIBLE HOISING CONNECTIONS THROUGH WALL PASS THROUGH FROM LN<sub>2</sub> STORAGE TO CRYO FREEZERS. VENT AS REQUIRED.

PARTIAL PLAN: THIRD FLOOR WEST GAS PLUMBING  
1/8" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

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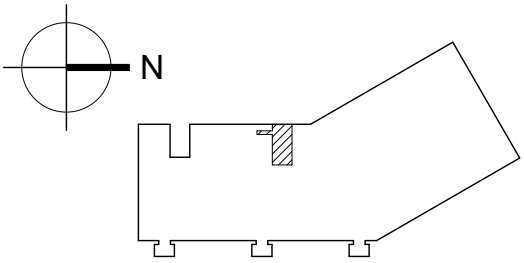


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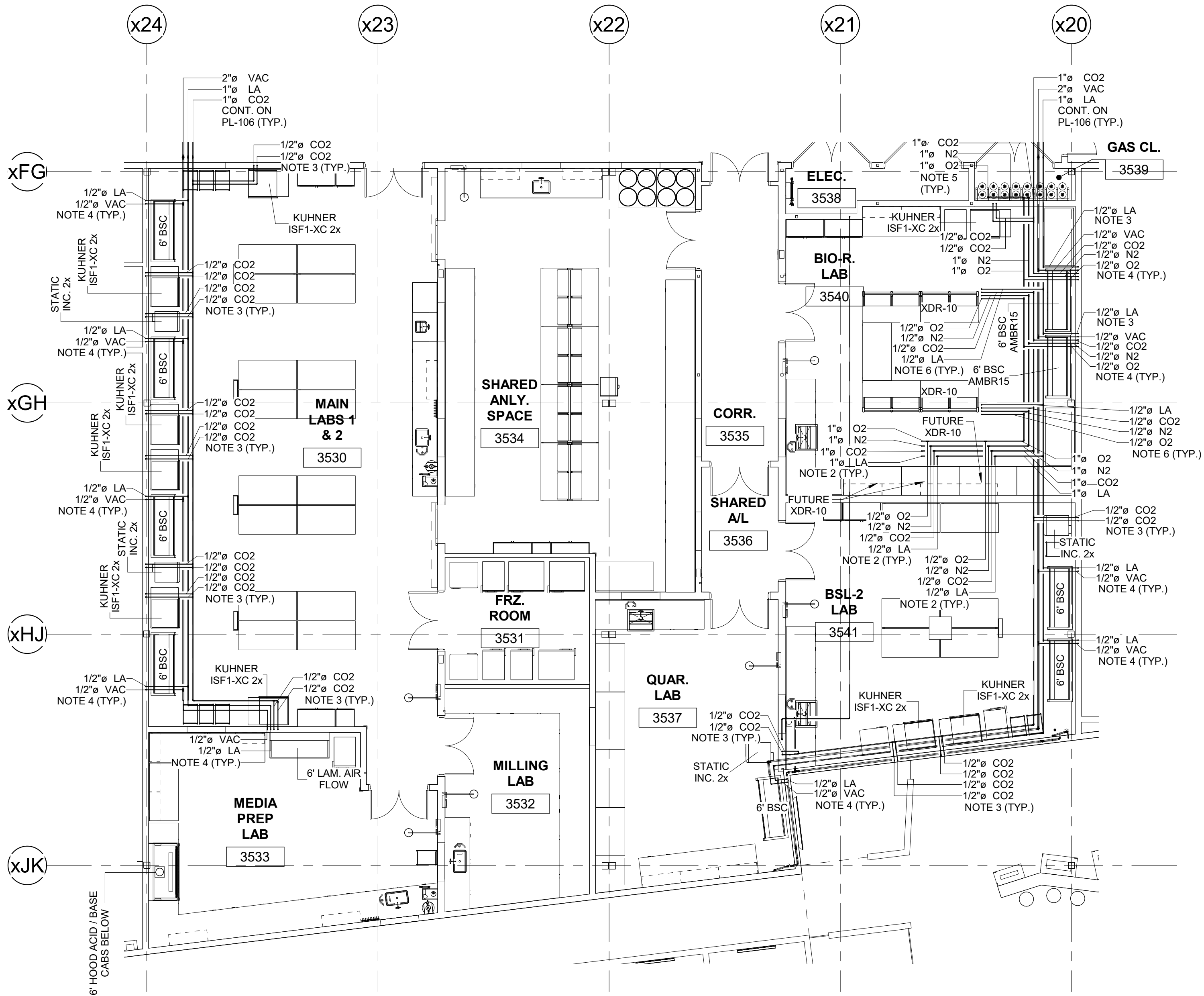
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|-------|------|------------|------------------------------|------|------|-------|
| ZAC   | A    | 04/19/2021 | ISSUED FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |
| DR:   | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION      | ZAC  | MC   | MC    |
| CHK:  | MC   |            |                              |      |      |       |
| APVD: | MC   |            |                              |      |      |       |



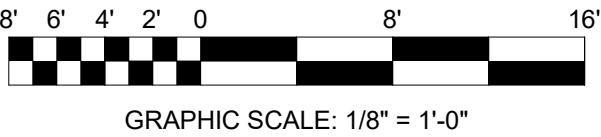
|                               |           |                     |
|-------------------------------|-----------|---------------------|
| CLD & CCM LABS<br>PLUMBING    |           | ISSUE DATE:         |
| THIRD FLOOR GAS PIPING (WEST) |           | SCALE: 1/8" = 1'-0" |
|                               |           | SHEET NUMBER        |
|                               |           | PL-106              |
| PROJ. NO: 20021A              | CAD FILE: |                     |



- NOTES:
1. PROVIDE ISOLATION VALVES FOR ALL SERVICES AT BRANCH CONNECTIONS ON SUBHEADERS.
  2. PROVIDE ISOLATION VALVES AND CAPS FOR FUTURE CONNECTIONS.
  3. SEE DETAIL 6 ON PL-501 FOR GAS WALL PENETRATION DETAIL.
  4. CONNECT TO BIOSAFETY CABINET AT THIS LOCATION.
  5. LOCATION OF CHANGEOVER STATION (APPLIES FOR N2, O2 & CO2.)
  6. DROPS THROUGH WORKBENCH SHROUD TO SERVICE BENCHTOP BIOREACTOR. TRANSITION TO FLEXIBLE TUBING AS SHOWN IN DETAIL 8 ON PL-501.



PARTIAL PLAN: THIRD FLOOR EAST GAS PLUMBING  
1/8" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

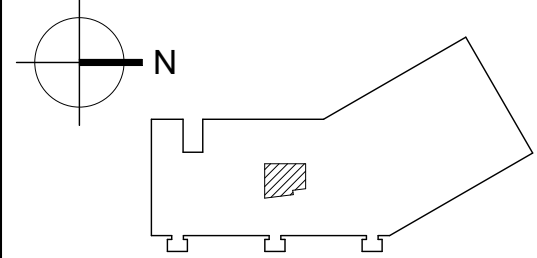
1" = 1'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING

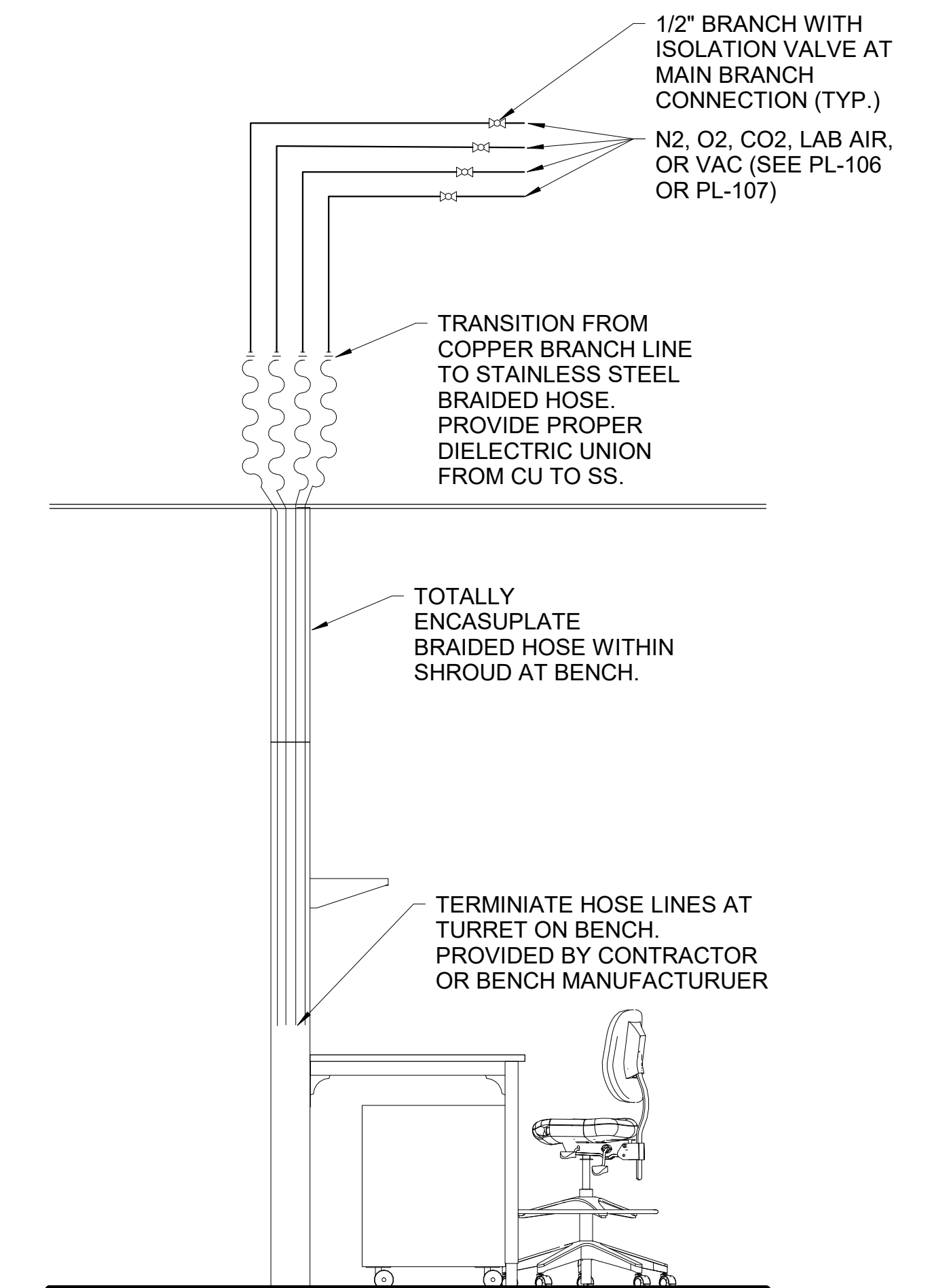
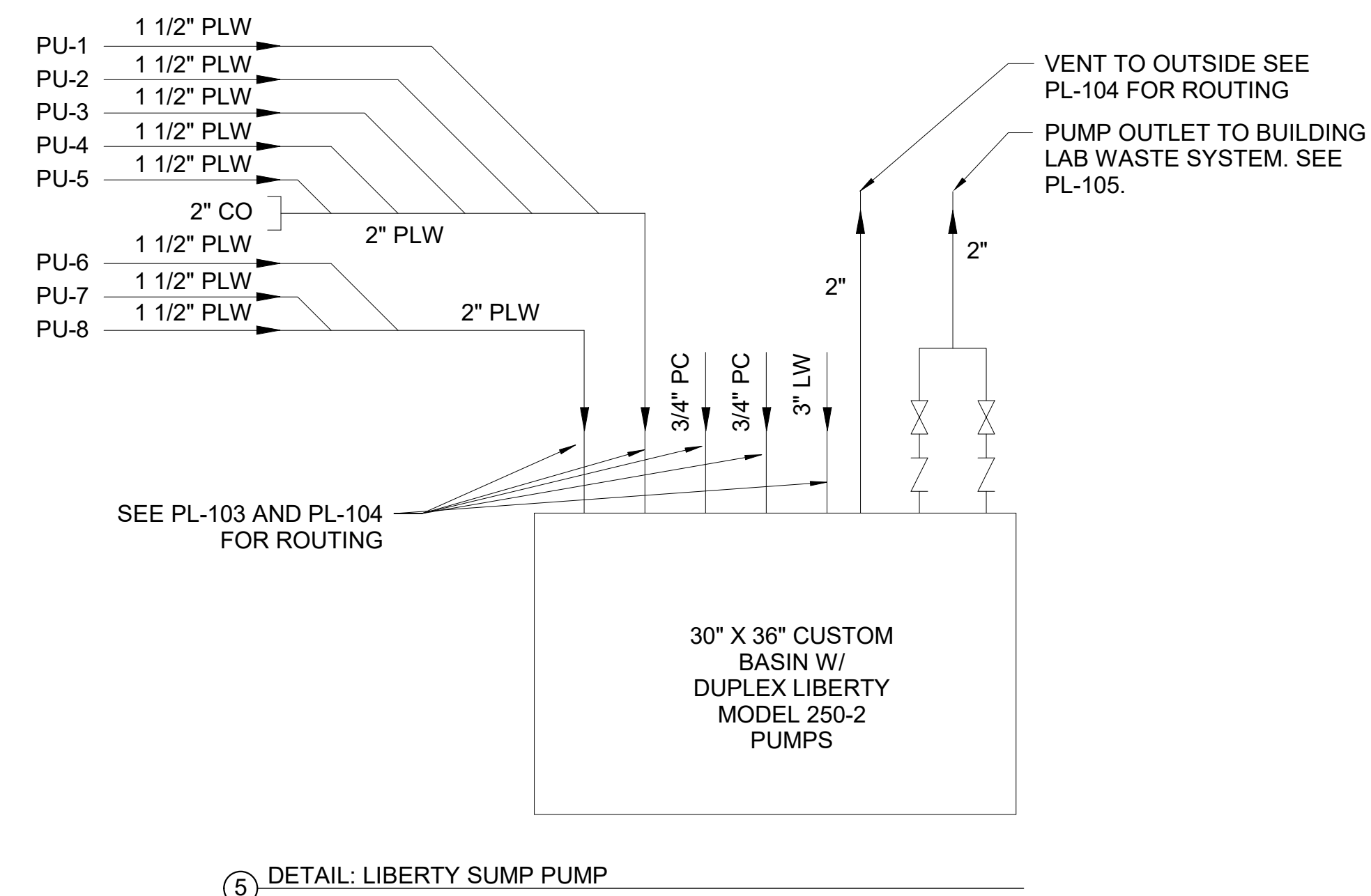
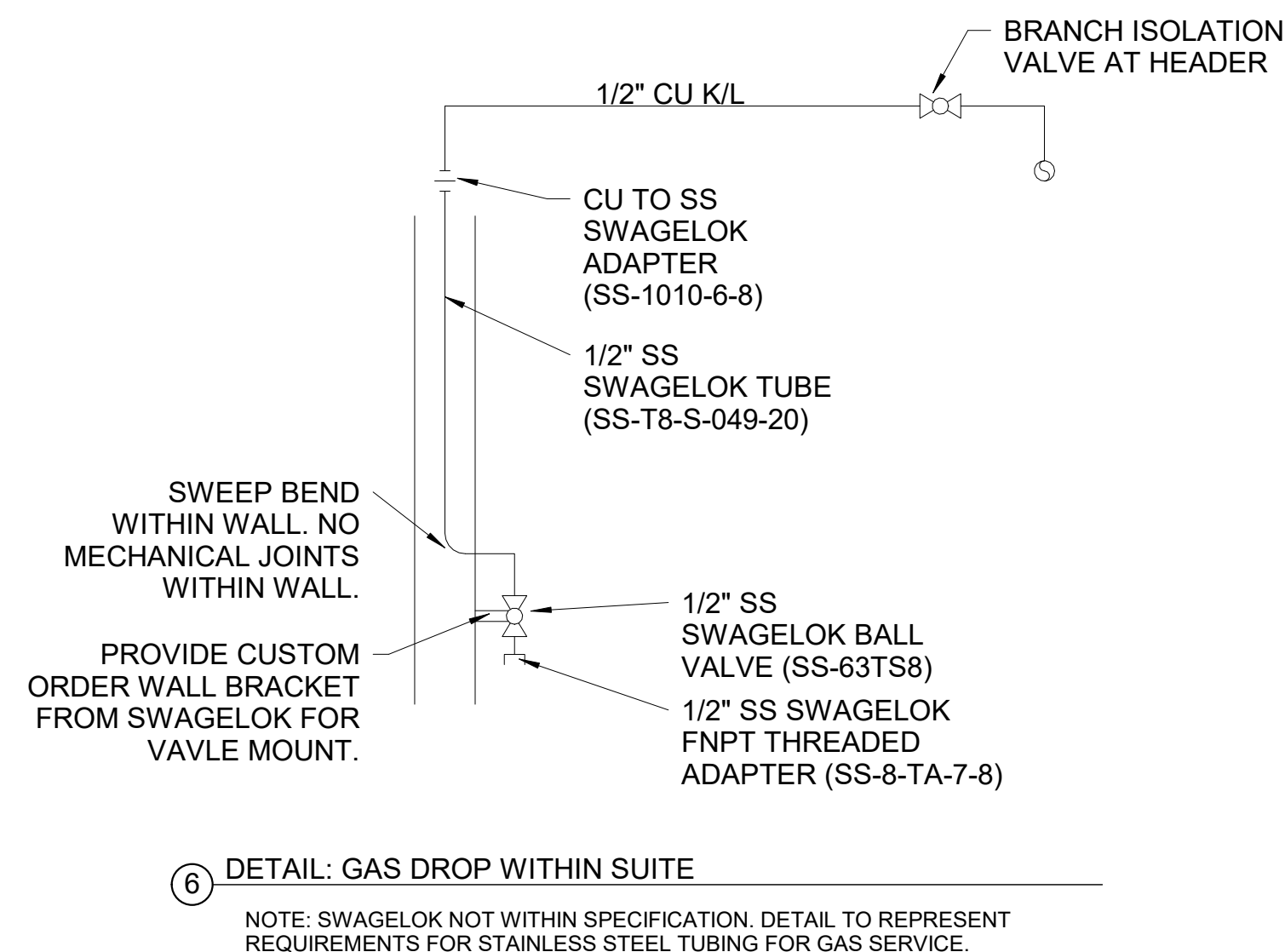
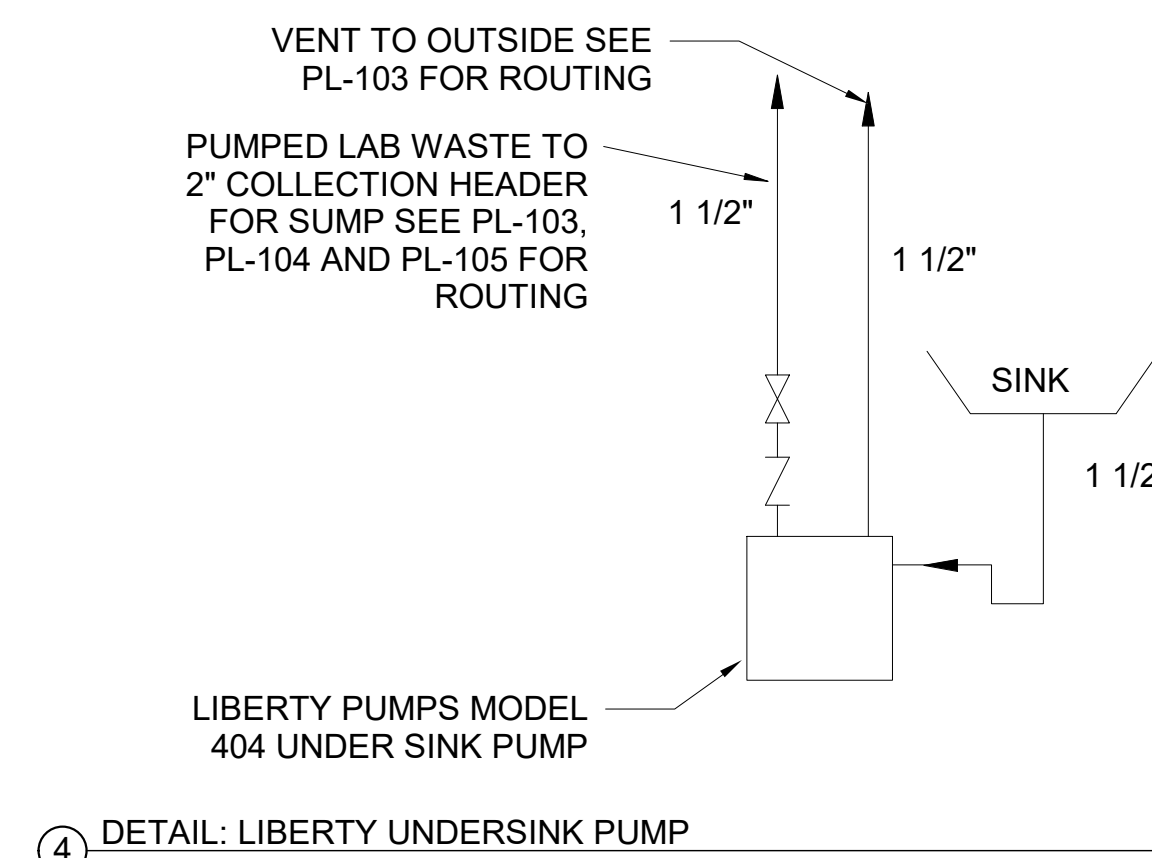
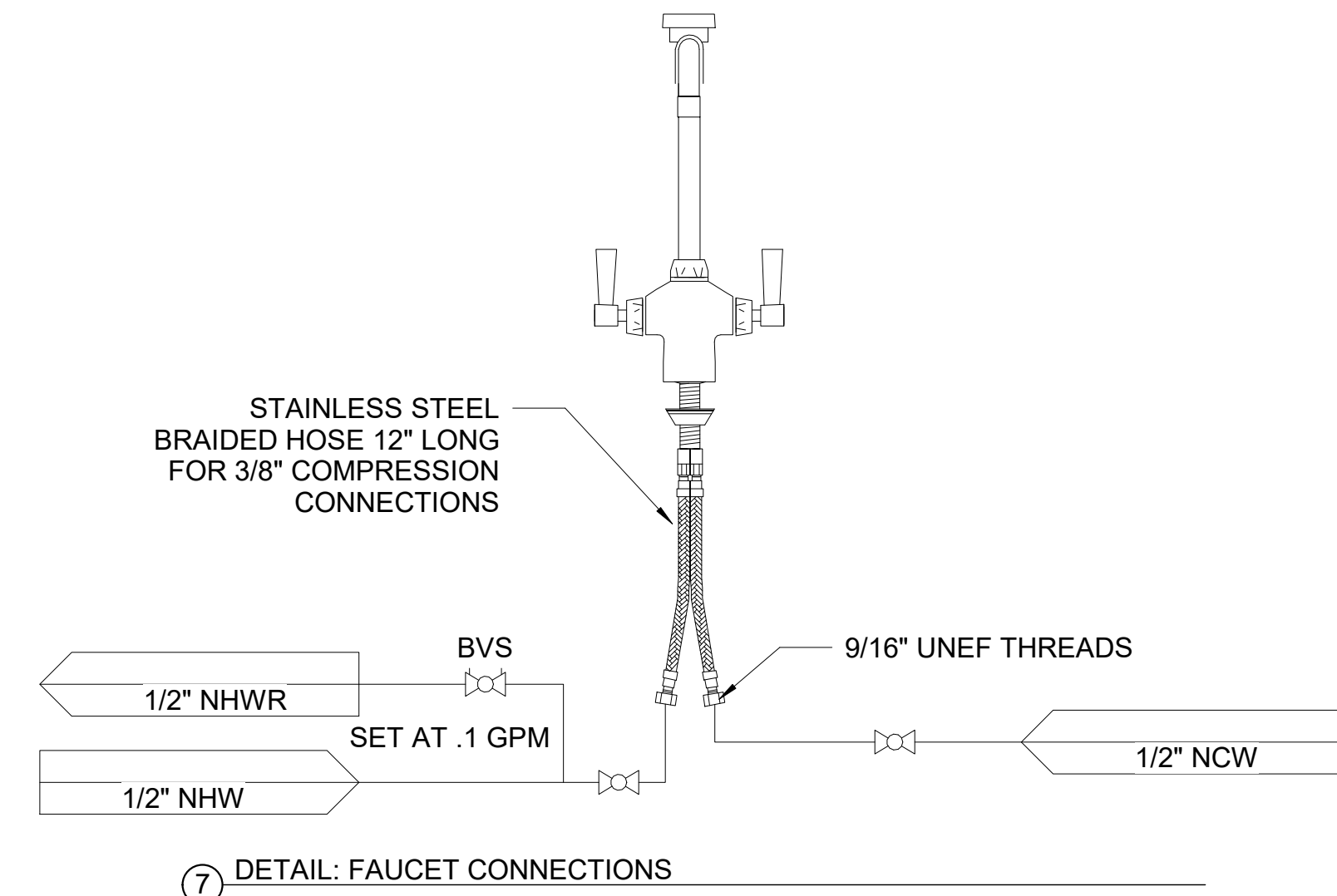
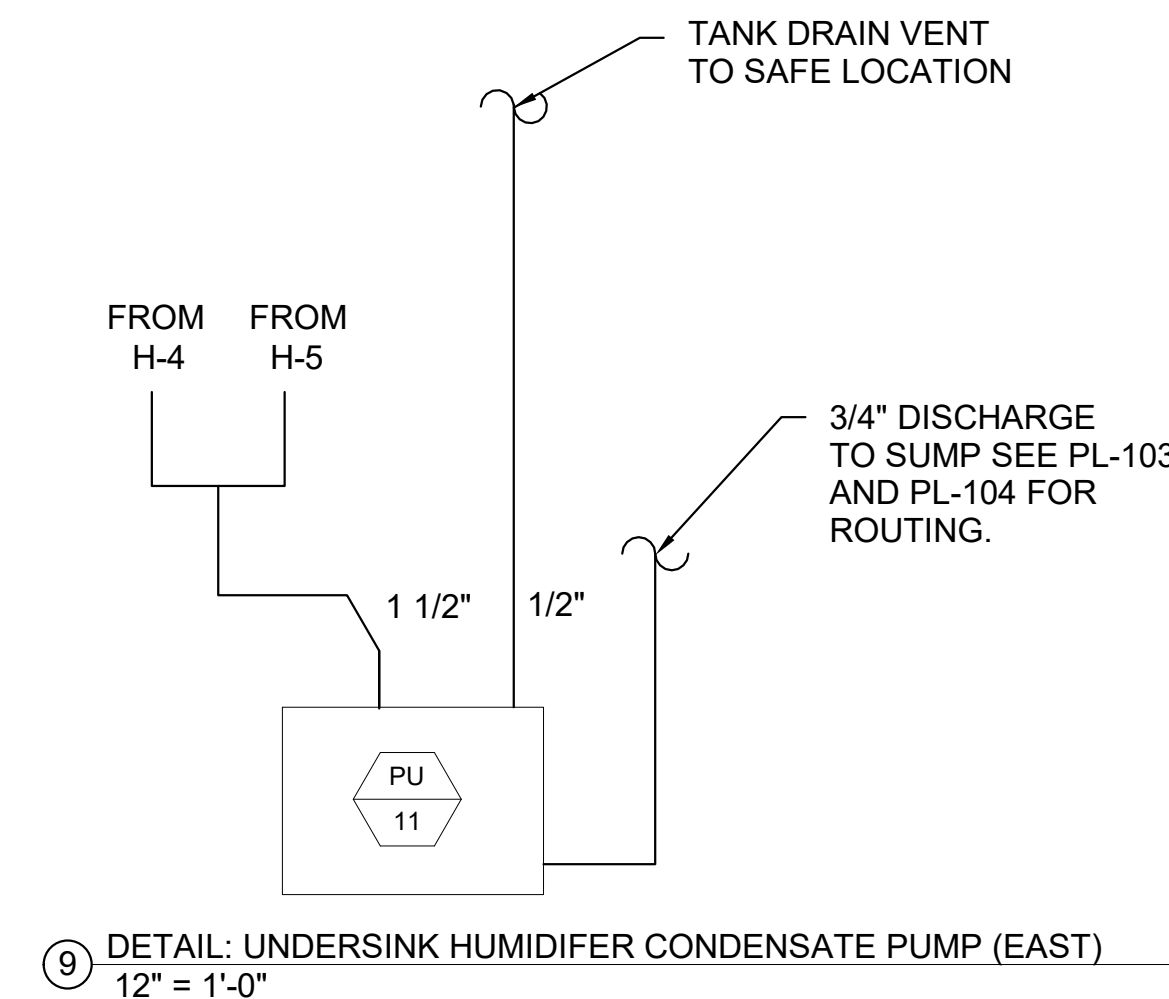
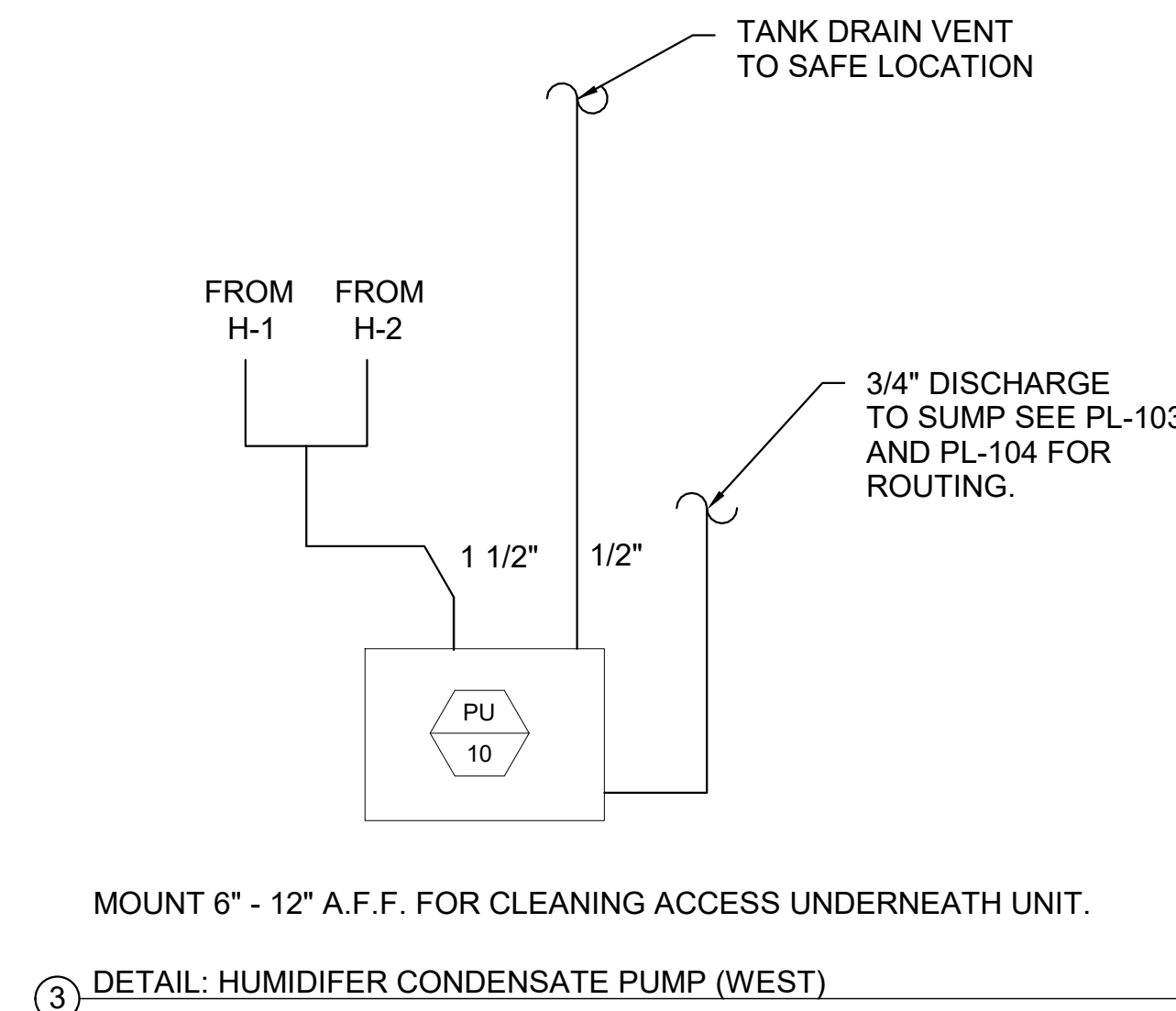
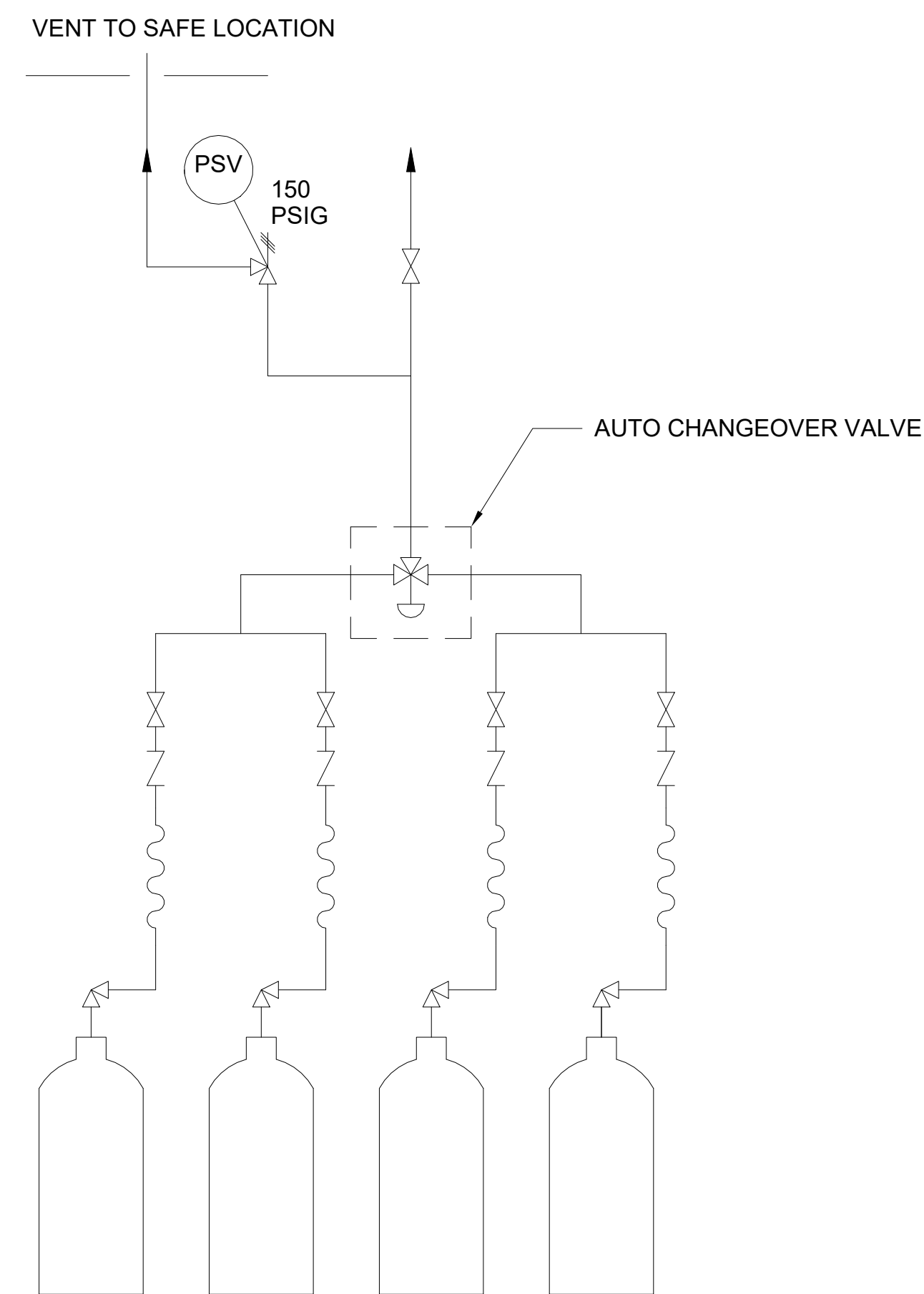
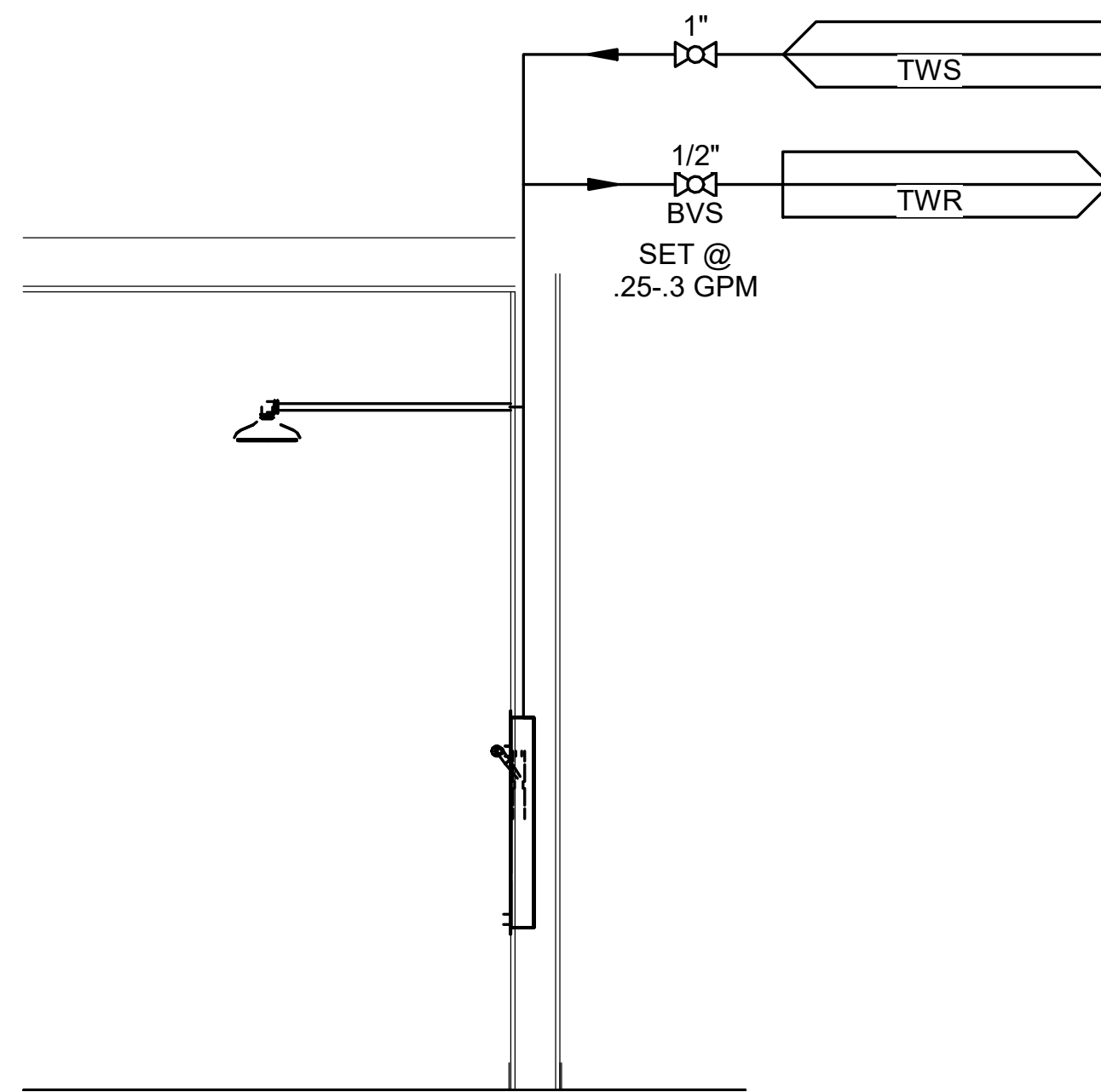
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| DSGN: | REV. | DATE       | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|------------|------------------------------|------|------|-------|
| ZAC   | A    | 04/19/2021 | ISSUED FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |
| DR:   | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION      | ZAC  | MC   | MC    |
| CHK:  | MC   |            |                              |      |      |       |
| APVD: | MC   |            |                              |      |      |       |







IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0"  1"



IF NOT ONE INCH ON THIS SHEET,  
ADJUST SCALES ACCORDINGLY.

0"

1"

BAR IS ONE INCH ON ORIGINAL DRAWING

| PLUMBING FIXTURE SCHEDULE |                     |                    |                              |                    |                    |                    |                       |       |
|---------------------------|---------------------|--------------------|------------------------------|--------------------|--------------------|--------------------|-----------------------|-------|
| FIXTURE TYPE              | FIXTURE DESCRIPTION | MANUFACTURER       | MODEL                        | HW CONNECTION SIZE | CW CONNECTION SIZE | TW CONNECTION SIZE | WASTE CONNECTION SIZE | Count |
| P-1                       | SAFETY STATION      | Guardian Equipment | GBF2572                      | -                  | -                  | 1"                 | 1 1/2"                | 12    |
| P-2                       | FAUCET              | Watersaver         | L424-8VB                     | 1/2"               | 1/2"               | -                  | -                     | 13    |
| P-3                       | LAB SINK            | Just Manufacturing | US-1818-A                    | -                  | -                  | -                  | 1 1/2"                | 3     |
| P-4                       | LAB SINK            | Just Manufacturing | US-1824-A                    | -                  | -                  | -                  | 1 1/2"                | 2     |
| P-5                       | LAB SINK            | Just Manufacturing | US-ADA-1616-A (4 1/2" DEPTH) | -                  | -                  | -                  | 1 1/2"                | 2     |
| P-6                       | LAB SINK            | Just Manufacturing | USX-1830-A                   | -                  | -                  | -                  | 1 1/2"                | 2     |
| P-7                       | LAB SINK            | Elkay              | ELDSSF33279DBG               | -                  | -                  | -                  | 1 1/2"                | 4     |

1. PROVIDE CUP STRAINER FOR ALL LAB SINKS.

| PUMP SCHEDULE |            |                     |       |      |    |    |     |                   |                                      |         |
|---------------|------------|---------------------|-------|------|----|----|-----|-------------------|--------------------------------------|---------|
| UNIT NO.      | GPM        | DISCHARGE PRESS TDH | MOTOR |      |    |    |     | RECEIVER SIZE GAL | MODEL                                | REMARKS |
|               |            |                     | HP    | RPM  | PH | HZ | V   |                   |                                      |         |
| PU-1          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-2          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-3          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-4          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-5          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-6          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-7          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-8          | 4          | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 4.3               | LIBERTY PUMPS, INC. MODEL 404/A      |         |
| PU-9          | 12         | 20'                 | 1/3   | 3450 | 1  | 60 | 115 | 130               | LIBERTY PUMPS, INC. MODEL 250-2 (x2) | 1       |
| PU-10         | 3420 (GPH) | 18'                 | 1/2   | 3450 | 1  | 60 | 115 | 4                 | HARTELL SC-1AX                       |         |
| PU-11         | 3420 (GPH) | 18'                 | 1/2   | 3450 | 1  | 60 | 115 | 4                 | HARTELL SC-1AX                       |         |

1. DUPLEX SUMP PUMP STATION WITH REDUNDANT PUMPS WITHIN 30" X 36" BASIN. AE24L=3 NEMA 4X DUPLEX ALTERNATING CONTROL PANEL INCLUDING 3 FLOATS, AUX. CONTACTS AND INTEGRAL AUTO/VISUAL HIGH LEVEL ALARM. SEE DETAIL X ON PL-501.

| AUTO CHANGEOVER MANIFOLD SCHEDULE |               |             |   |                           |            |
|-----------------------------------|---------------|-------------|---|---------------------------|------------|
| GAS                               | MANIFOLD TYPE | MODEL       | OPTIONS   | PIGTAIL MODEL             | CONNECTION |
| CO2                               | AUTO-LOGIC II | 918TS-1-200 | 912-AVA (AUDIO VISUALALARM MODULE)<br>914/918-HUB (MULTIPLE DRY CONNECTION HUB) | 918-FPB-601-Y-CV-CGA (x2) | CGA 320    |
| N2                                | AUTO-LOGIC II | 918TS-1-200 | 912-AVA (AUDIO VISUALALARM MODULE)<br>914/918-HUB (MULTIPLE DRY CONNECTION HUB) | 918-FPB-601-Y-CV-CGA (x2) | CGA 580    |
| O2                                | AUTO-LOGIC II | 918TS-1-200 | 912-AVA (AUDIO VISUALALARM MODULE)<br>914/918-HUB (MULTIPLE DRY CONNECTION HUB) | 918-FPB-601-Y-CV-CGA (x2) | CGA 540    |

| BSC ACCESSORY SCHEDULE |              |                    |              |           |         |
|------------------------|--------------|--------------------|--------------|-----------|---------|
| BSC LOCATION           | MANUFACTURER | ACCESSORY PART NO. | FIXTURE QTY. | BSC COUNT | REMARKS |
| LABS                   | LABCONCO     | 3747500            | 2            | 16        | 1       |
| BIO-R. LAB             | LABCONCO     | 3747500            | 4            | 2         | 1, 2    |

1. BIO SAFETY CABINETS TO BE PROVIDED BY OTHER  
2. INSTALL WALL MOUNTED DROP FOR LAB AIR

| MILLI-Q DIRECT LAB WATER |                 |               |           |                      |   |                     |                            |
|--------------------------|-----------------|---------------|-----------|----------------------|---|---------------------|----------------------------|
| MANUFACTURER             | MODEL           | FEED WATER    | FLOW RATE | PRODUCT WATER VOLUME | PRODUCT WATER RESISTIVITY                             | VOLTAGE             | STORAGE TANK VOLUME        |
| MILLIPORE SIGMA          | MILLIQ DIRECT-8 | LAB TAP WATER | 8 L/HR    | 160 L/DAY            | ULTRAPURE WATER: 18.2 MegOhm-cm<br>PURE WATER: TYPE 3 | 100-240V / 50-60 Hz | SEE PL-101 &102 FOR VOLUME |

| RODI SKID    |               |      |    |     |      |    |    |         |                           |  |
|--------------|---------------|------|----|-----|------|----|----|---------|---------------------------|--|
| MANUFACTURER | MODEL         | SKID |    |     | PUMP |    |    | REMARKS |                           |  |
|              |               | PH   | HZ | V   | HP   | PH | HZ |         |                           |  |
| REO-PURE     | LP3-1000 OPTI | 1    | 60 | 115 | 3/4  | 1  | 60 | 115     | 1, 2, 3, 4, 5, 6, 7, 8, 9 |  |

1.

FLEXWAVE STEEL RO TANK, 85 GALLONS.
2.

TANK ADAPTER SHUTOFF KIT 1 1/4" MNPT STYLE 5 584114012.
3.

ARIES HP MIXBED DI 4.5 X 20AF-20-4010-BB (TYP x4).
4.

EC-WHF SYS 1STG 20"BB
5.

GRUNDFOS BOOSTER PUMP SCALA2.
6.

RESILITE DI INDICATOR LIGHT.
7.

FLECK 9100/735/160 GRAIN TWIN SOFTENER
8.

CARBON FILTER
9.

CARBON FILTER, THREADED YOKE (TYP x2)



**HART DESIGN GROUP**

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CUMBERLAND, RI 02864 | F: (401) 658-4609

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100 RESULTS WAY  
MARLBOROUGH, MA 01752

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| CHK:  | MC   |            |                              |                         |      |       |
| APVD: | MC   |            |                              |                         |      |       |



|   |  |                        |
|---|--|------------------------|
| CLD & CCM LABS<br>PLUMBING<br>SCHEDULES |  | ISSUE DATE:            |
|   |  | SCALE: 12" = 1'-0"     |
|   |  | SHEET NUMBER<br>PL-601 |
| PROJ. NO: 20021A                        |  | CAD FILE:              |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" 0

|   |  |   |  |   |  |
|---|--|---|--|---|--|
| PART I - GENERAL  |  | 1.05 CONTRACT DOCUMENTS   |  | 5. DUCTWORK SHALL BE CONSTRUCTED AS PER SMACNA-DCS ACCORDING TO THE FOLLOWING PRESSURE-SEAL CLASSIFICATIONS.  |  |
| 1.01 REFERENCES   |  | A. WORK TO BE PERFORMED UNDER THIS SECTION IS SHOWN PRIMARILY ON THE DRAWINGS IN THE HVAC AND PLUMBING SECTION OF THE DRAWING LIST ON THE COVER PAGE (SEE G-001).   |  | SMACNA PRESSURE CLASS   | DUCT SYSTEMS   |
| A. BEFORE SUBMITTING BID, VISIT AND CAREFULLY EXAMINE SITE TO IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK OF THIS SECTION. NO EXTRA PAYMENT WILL BE ALLOWED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY CONSTRUED BY EXPERIENCED OBSERVER.   |  | B. LISTING OF HVAC DRAWINGS ABOVE DOES NOT LIMIT RESPONSIBILITY OF DETERMINING FULL EXTENT OF WORK REQUIRED BY CONTRACT DOCUMENTS. REFER TO ARCHITECTURAL, PLUMBING, ELECTRICAL, STRUCTURAL AND OTHER DRAWINGS AND OTHER SECTIONS THAT INDICATE TYPES OF CONSTRUCTION IN WHICH WORK MUST BE INSTALLED AND WORK OF OTHER TRADES WITH WHICH WORK OF THIS SECTION MUST BE COORDINATED. LOCATIONS SHOWN HVAC DRAWINGS SHALL BE CHECKED AGAINST GENERAL AND DETAILED DRAWINGS OF THE CONSTRUCTION PROPER.  |  | 1" W.G. POS. OR NEG.  | STANDARD DUCT  |
| B. BEFORE STARTING WORK, VISIT THE SITE AND EXAMINE THE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED INCLUDING PREPARATORY WORK PERFORMED UNDER OTHER SECTIONS OR CONTRACTS, OR BY OWNER. REPORT CONDITIONS WHICH MIGHT ADVERSELY AFFECT WORK IN WRITING THROUGH CONTRACTOR TO OWNER. DO NOT PROCEED WITH WORK UNTIL DEFECTS HAVE BEEN CORRECTED AND CONDITIONS ARE SATISFACTORY. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS AND PREPARATORY WORK.                              |  | C. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN CONTRACT. INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS BUT NOT SHOWN ON PLANS, AND VICE VERSA, SHALL APPLY OR BE PROVIDED AS IF EXPRESSLY REQUIRED ON BOTH. IT IS NOT INTENDED TO SPECIFY OR TO SHOW EVERY OFFSET, FITTING, OR COMPONENT; HOWEVER, CONTRACT DOCUMENTS REQUIRE COMPONENTS AND MATERIALS WHETHER OR NOT INDICATED OR SPECIFIED AS NECESSARY TO MAKE HVAC INSTALLATION COMPLETE AND OPERATIONAL.   |  | 2" W.G. POS. OR NEG.  | VARIABLE VOLUME DUCT<br>UPSTREAM OF VAV BOX                                |
| 1.02 SCOPE  |  | D. ADDRESS QUESTIONS REGARDING CONTRACT DOCUMENTS TO OWNER IN WRITING PRIOR TO AWARD OF CONTRACT. OTHERWISE, OWNER'S INTERPRETATION OF MEANING AND INTENT OF CONTRACT DOCUMENTS SHALL BE FINAL.   |  | 3" W.G. POS. OR NEG.  | SPECIAL APPLICATIONS   |
| A. PERFORM WORK AND PROVIDE MATERIAL AND EQUIPMENT FOR SYSTEMS SHOWN ON DRAWINGS AND AS SPECIFIED IN THIS SECTION. COMPLETELY COORDINATE WORK OF THIS SECTION WITH WORK OF OTHER TRADES AND PROVIDE COMPLETE AND FULLY FUNCTIONAL INSTALLATION.   |  | 1.06 DISCREPANCIES IN DOCUMENTS   |  | 6. SEALANTS   |  |
| B. DRAWINGS AND SPECIFICATIONS SHALL BE TAKEN TOGETHER; PROVIDE WORK SPECIFIED AND NOT SHOWN, AND WORK SHOWN AND NOT SPECIFIED AS THOUGH EXPRESSLY REQUIRED BY BOTH. ALTHOUGH SUCH WORK IS NOT SPECIFICALLY SHOWN OR SPECIFIED, PROVIDE SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES, DEVICES AND MATERIALS INCIDENTAL TO OR NECESSARY FOR SOUND, SECURE AND COMPLETE INSTALLATION.  |  | A. WHERE DRAWINGS OR SPECIFICATIONS INDICATE DISCREPANCIES OR ARE UNCLEAR, ADVISE OWNER OF SUCH IRREGULARITIES IN WRITING BEFORE AWARD OF CONTRACT. FAILURE TO SUBMIT SUCH INFORMATION IN WRITING WILL CAUSE OWNER'S INTERPRETATION OF CONTRACT DOCUMENTS TO BE FINAL. NO ADDITIONAL COMPENSATION WILL BE APPROVAL BECAUSE OF DISCREPANCIES OR UNCLARITIES THUS RESOLVED.   |  | 6.1 SEAL DUCT JOINTS AS PER SMACNA DUCT SEALING CLASSIFICATIONS:  |  |
| C. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACK CHARGES AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION, AS REQUIRED TO PERFORM WORK IN ACCORDANCE WITH ALL LEGAL REQUIREMENTS AND WITH SPECIFICATIONS, DRAWINGS, ADDENDA AND CHANGE ORDERS, ALL OF WHICH ARE PART OF CONTRACT DOCUMENTS.  |  | B. WHERE DRAWINGS OR SPECIFICATIONS DO NOT COINCIDE WITH RECOMMENDATIONS OF MANUFACTURER OF MATERIAL OR PIECE OF EQUIPMENT, ALERT OWNER IN WRITING BEFORE INSTALLATION OF ITEM IN QUESTION. OTHERWISE, MAKE CHANGES IN INSTALLATION AS OWNER REQUIRES WITHOUT ADDITIONAL COST TO THE OWNER.   |  | SEAL CLASS  | SEAL APPLICABLE  |
| D. WORK SHALL INCLUDE BUT SHALL NOT BE LIMITED TO THE FOLLOWING:  |  | 1.07 RECORD DRAWINGS  |  | A   | ALL TRANSVERSE JOINTS,<br>LONGITUDINAL SEAMS AND DUCT<br>WALL PENETRATIONS |
| 1. COMPLETE AIR DISTRIBUTION SYSTEM.  |  | A. AS WORK PROGRESSES, MAINTAIN COMPLETE AND SEPARATE SET OF BLACKLINE PRINTS OF CONTRACT DRAWINGS AT JOB SITE AT ALL TIMES. RECORD WORK COMPLETED AND CHANGES FROM ORIGINAL CONTRACT DRAWINGS, CLEARLY AND ACCURATELY. VALVE TAGS SHALL BE RECORDED AS THEY ARE INSTALLED.   |  | B   | ALL TRANSVERSE JOINTS AND<br>LONGITUDINAL SEAMS                            |
| 2. AUTOMATIC CONTROL SYSTEM.  |  | B. AT COMPLETION OF WORK, OWNER WILL FURNISH SET OF MYLAR COPIES, OR AUTOCAD DRAWING FILES OF ORIGINALS TO CONTRACTOR. CONTRACTOR'S PROFESSIONAL DRAFTSMAN SHALL TRANSFER CHANGES TO THE MYLARS, OR AUTOCAD DRAWING FILES. AS APPROPRIATE; SUBMIT APPROPRIATE MEDIA AND ONE SET OF PRINTS TO OWNER FOR REVIEW AND APPROVAL.   |  | C   | TRANSVERSE JOINTS  |
| 3. INSULATION.  |  | 1.08 SUBMITTALS   |  | 6.2 SEAL DUCT JOINTS AND JOINTS BETWEEN FITTINGS AND DUCTS WITH 3M, UNITED SHEETMETAL OR APPROVED EQUAL SEALANT AS REQUIRED BY MANUFACTURER'S INSTRUCTIONS.   |  |
| 4. TESTING AND BALANCING.   |  | A. MATERIAL AND EQUIPMENT REQUIRING SHOP DRAWING OR PRODUCT DATA SUBMITTAL SHALL INCLUDE BUT NOT BE LIMITED TO:   |  | 6.3 MAKE AND SEAL DUCT JOINTS PROPERLY. APPLY SEALANT OVER JOINT LINES AND SCREWS. COVERAGE SHALL BE 1-INCH WIDE ON EACH SIDE OF JOINT. WHEN JOINT IS INACCESSIBLE FOR SEALING FROM OUTSIDE, CUT HAND-HOLE IN DUCT TO SEAL JOINT FROM INSIDE. WHERE POSSIBLE, SEALING SHALL BE ON INSIDE OF DUCTWORK. |  |
| 5. EQUIPMENT BASES AND SUPPORTS.  |  | 1. DIFFUSERS AND GRILLES.   |  | 6.4 BEFORE ASSEMBLING FITTINGS AND JOINTS, APPLY SEALER TO RIVETS, GROOVED SEAMS AND TOP-OFF COLLARS ON INSIDE OF DUCTWORK. FLOOD PITTSBURGH LOCK POCKETS WITH SEALER.  |  |
| 6. SLEEVES, INSERTS AND HANGERS.  |  | 2. DUCTWORK.  |  | 6.5 BRUSH SEALER AROUND WASHERS, CORNERS, NOTCHES AND TOP-OFF COLLARS AFTER ASSEMBLING DUCTS.   |  |
| 7. INSTRUCTION MANUALS AND STARTUP INSTRUCTIONS.  |  | 3. VAV BOXES.   |  | 6.6 COAT INSIDE OF CONNECTING LAP OF SLIP JOINTS AND DUCT SURFACE WITH SEALER.  |  |
| 8. CLEANING.  |  | 4. AUTOMATIC CONTROLS.  |  | 6.7 DO NOT USE TAPE TO SEAL SHEET METAL DUCTS.  |  |
| 9. HOISTING AND RIGGING REQUIRED TO COMPLETE THE WORK OF THIS SECTION.  |  | PART 2 - PRODUCTS   |  | 7. PROVIDE VOLUME DAMPER, OR OTHER APPROVED AIR BALANCING DEVICE, WITH INDICATING AND LOCKING QUADRANT (WHETHER OR NOT SHOWN ON DRAWINGS): AT EACH BRANCH FROM MAIN DUCT, AT EACH DUCT TAKE-OFF AND AT EACH NECK TO INDIVIDUAL DIFFUSER OR REGISTER IN SUPPLY, RETURN OR EXHAUST DUCTS.               |  |
| 10. RELOCATION OF EXISTING SYSTEMS WHICH INTERFERE WITH NEW CONSTRUCTION.   |  | 2.01 METAL DUCTWORK AND AIR DISTRIBUTION EQUIPMENT  |  | 8. SUPPORT  |  |
| 11. COORDINATION WITH OWNER AND OWNER WITH REGARD TO MAINTAINING EXISTING SERVICES DURING CONSTRUCTION.   |  | NOTE: SUBMIT DUCT CONSTRUCTION STANDARDS FOR APPROVAL.  |  | 8.1 HANG HORIZONTAL DUCT ON 8 FT. MAXIMUM CENTERS.  |  |
| 12. SHEETMETAL WORK.  |  | A. GENERAL  |  | 8.2 SUPPORT VERTICAL DUCT ON EACH FLOOR OR SLAB IT PENETRATES.  |  |
| 13. CUTTING AND PATCHING OF MASONRY, CONCRETE, TILE AND OTHER PARTS OF STRUCTURE.   |  | 1. MATERIAL, CONSTRUCTION AND INSTALLATION SHALL MEET REQUIREMENTS OF MOST RECENT EDITIONS OF THE FOLLOWING STANDARDS AND REFERENCES, EXCEPT AS OTHERWISE SPECIFIED OR SHOWN ON DRAWINGS: AS APPLICABLE TO STANDARD SMACNA DUCT SHEETMETAL DUCTWORK; CONSTRUCTION STANDARDS, DUCT LINERS, FASTENERS, METAL AND FLEXIBLE ADHESIVES; FLEXIBLE DUCTWORK (SMACNA-DCS) ADC, TIMA FLEXIBLE DUCT FLEXIBLE DUCTWORK MATERIALS PERFORMANCE STANDARDS FIRE DAMPERS; FIRE RESISTANCE NFPA 90A & 90B UL-555 STANDARDS FOR DUCTS AND LINERS DUCTWORK INSTALLATION ADC TEST CODE 106 R4 RATINGS OF DIFFUSERS, REGISTERS GRILLES |  | 8.3 SUPPORTS FOR DUCTWORK AND EQUIPMENT SHALL BE GALVANIZED UNLESS SPECIFIED OTHERWISE.   |  |
| 1.03 CODES, STANDARDS AND AUTHORITIES   |  | B. METHODS OF CONSTRUCTION  |  | 9. CONNECTIONS  |  |
| A. PERFORM WORK IN STRICT ACCORDANCE WITH RULES, REGULATIONS, STANDARDS, CODES, ORDINANCES, AND LAWS OF LOCAL, STATE, AND FEDERAL GOVERNMENTS, AND OTHER AUTHORITIES THAT HAVE LAWFUL JURISDICTION, AND BE RESPONSIBLE FOR COMPLIANCE THEREWITH. UNLESS SPECIFIED OTHERWISE, MATERIALS AND EQUIPMENT SHALL BE MANUFACTURED, TESTED AND INSTALLED IN ACCORDANCE WITH LATEST EDITIONS OF APPLICABLE PUBLICATIONS AND STANDARDS OF THE FOLLOWING ORGANIZATIONS. SUCH AUTHORITIES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: |  | 1. DUCTWORK SHALL BE FREE FROM VIBRATION UNDER ALL CONDITIONS OF OPERATION.   |  | 9.1 INLETS AND OUTLETS OF AIR HANDLING UNITS AND FANS SHALL BE CONNECTED TO DUCTWORK WITH FLEXIBLE CONNECTIONS.   |  |
| 1. LOCAL AND STATE BUILDING, PLUMBING, MECHANICAL, ELECTRICAL, FIRE AND HEALTH DEPARTMENT AND PUBLIC SAFETY CODES.  |  | 2. PROPRIETARY DUCT CONSTRUCTION SYSTEMS SHALL BE PERMITTED IN LIEU OF SYSTEMS HEREIN SPECIFIED WITH ENGINEERS APPROVAL.  |  | 9.2 INDOORS, FLEXIBLE CONNECTIONS SHALL BE FIRE RETARDANT FABRIC, BY VENTFABRICS OR APPROVED EQUAL. OUTDOORS, FLEXIBLE CONNECTIONS SHALL BE FIRE, WEATHER, AND UV-RESISTANT VENTLON BY VENTFABRICS OR APPROVED EQUAL.   |  |
| 2. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)  |  | 3. PIPE OR CONDUIT CROSSING DUCT:   |  | 9.3 SECURE FLEXIBLE CONNECTIONS TIGHTLY TO AIR HANDLERS WITH METAL BANDS.   |  |
| 3. AMERICAN INSURANCE ASSOCIATION (A.I.A) (FORMERLY NATIONAL BOARD OF FIRE UNDERWRITERS)  |  | 3.1 NO PIPE OR CONDUIT SHALL PASS THROUGH DUCT WITHOUT WRITTEN APPROVAL OF OWNER.   |  | 9.4 CONNECTIONS FROM TRUNK TO BRANCH DUCTS SHALL BE AS DETAILED ON DRAWINGS.  |  |
| 4. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)  |  | 3.2 WHERE IT IS IMPOSSIBLE TO RE-ROUTE PIPE OR CONDUIT AND WHEN WRITTEN APPROVAL HAS BEEN OBTAINED, INCREASE DUCT SIZE TO MAINTAIN CONSTANT CROSS-SECTIONAL AREA AT POINT OF INTERFERENCE.  |  | 10. DUCT REINFORCEMENT  |  |
| 5. FACTORY MUTUAL ASSOCIATION (FM)  |  | 3.3 PROVIDE STREAMLINED ENCLOSURE FOR PIPE OR CONDUIT, AS ILLUSTRATED IN SMACNA DCS.  |  | 10.1 UNLESS OTHERWISE SPECIFIED, RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED AND REINFORCED IN ACCORDANCE WITH SMACNA-DCS ACCORDING TO LISTED DUCT PRESSURE CLASSES.  |  |
| 6. SHEET METAL AND AIR CONDITIONING NATIONAL CONTRACTORS ASSOCIATION (SMACNA)   |  | 4. WHEN MAKING OFFSETS AND TRANSFORMATIONS NECESSARY TO ACCOMMODATE STRUCTURAL CONDITIONS, PRESERVE FULL CROSS-SECTIONAL AREA OF DUCTWORK SHOWN ON DRAWINGS.  |  | 10.2 DUCT REINFORCEMENT SHALL BE GALVANIZED STEEL.  |  |
| 7. AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI).  |  |   |  | 10.3 DUCT FITTINGS SHALL BE REINFORCED SIMILARLY TO SECTIONS OF STRAIGHT DUCT. ON SIZE CHANGE FITTINGS (TRANSITIONS) THE GREATER FITTING DIMENSION DETERMINES THE DUCT GAUGE.   |  |
| B. MATERIALS AND EQUIPMENT SHALL BE UNDERWRITER'S LABORATORY (UL), ASME AND AGA APPROVED, AS APPLICABLE, FOR INTENDED SERVICE.  |  |   |  | 11. JOINTS  |  |
| C. WHEN TWO OR MORE CODES, REGULATIONS, ETC. CONFLICT WITH EACH OTHER OR WITH CONTRACT DOCUMENTS, MORE SEVERE REQUIREMENT SHALL GOVERN CONDUCT OF WORK. OWNER MAY RELAX THIS REQUIREMENT AT HIS SOLE DISCRETION WHEN SUCH RELAXATION DOES NOT VIOLATE RULING OF ANY AUTHORITY THAT HAS JURISDICTION. APPROVAL FOR SUCH RELAXATION SHALL BE OBTAINED IN WRITING.   |  |   |  | 11.1 LONGITUDINAL LOCK SEAMS SHALL BE DOUBLE-LOCKED AND FLATTENED TO MAKE TIGHT JOINTS.   |  |
| D. MOST RECENT EDITIONS OF APPLICABLE SPECIFICATIONS AND PUBLICATIONS OF THE FOLLOWING ORGANIZATIONS FORM PART OF CONTRACT DOCUMENTS:   |  |   |  | 11.2 MAKE TRANSVERSE JOINTS, FIELD CONNECTIONS, COLLAR ATTACHMENTS AND FLEXIBLE CONNECTIONS TO DUCTS AND EQUIPMENT WITH SHEET METAL SCREWS OR BOLTS AND NUTS. DO NOT USE RIVETS AND STAPLES.  |  |
| 1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)   |  |   |  | 12. ELBOWS AND BENDS  |  |
| 2. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)  |  |   |  | 12.1 ELBOWS AND BENDS FOR RECTANGULAR DUCTS SHALL HAVE CENTERLINE RADIUS OF 1-1/2 TIMES DUCT WIDTH WHEREVER POSSIBLE.   |  |
| 3. NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION (NEMA)   |  |   |  | 12.2 WHERE CENTERLINE RADIUS IS LESS THAN 1-1/2 TIMES DUCT WIDTH (ON SUPPLY, RETURN AND EXHAUST DUCTWORK), ELBOWS SHALL HAVE SINGLE/DOUBLE THICKNESS TURNING VANES. FASTEN VANES TO RUNNERS IN INSTALLED OPERATING POSITION. INSTALL VANES IN ACCORDANCE WITH SMACNA DCS.                             |  |
| 4. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)  |  |   |  | 12.3 PROVIDE STAMPED ELBOWS, WITH CENTERLINE RADII EQUAL TO 1-1/2 TIMES DUCT DIAMETER, OR GORED ELBOWS FOR ROUND DUCTS AS FOLLOWS:  |  |
| 5. AMERICAN SOCIETY FOR HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS (ASHRAE)  |  |   |  | ELBOW ANGLE   |  |
| 6. AIR MOVING AND CONDITIONING ASSOCIATION (AMCA)   |  |   |  | NO. OF GORES  |  |
| 7. SHEET METAL AND AIR CONDITIONING NATIONAL CONTRACTORS ASSOCIATION (SMACNA)   |  |   |  | 0 DEGREES - 36 DEGREES  |  |
| 8. AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)   |  |   |  | 2   |  |
| 9. NATIONAL INSULATION MANUFACTURERS ASSOCIATION (NIMA).  |  |   |  | 37 DEGREES - 72 DEGREES   |  |
|   |  |   |  | 3   |  |
|   |  |   |  | 73 DEGREES - 90 DEGREES   |  |
|   |  |   |  | 5   |  |
|   |  |   |  | 12.4 ELBOWS FOR FLAT OVAL DUCTS SHALL HAVE CENTERLINE RADII EQUAL TO 1-1/2 TIMES DUCT DIAMETER IN PLANE OF BEND, OR GORED ELBOWS WITH GORES AS SPECIFIED FOR ROUND DUCTS.   |  |
|   |  |   |  | 13. ENDS OF DUCT SECTIONS SHALL BE NOTCHED AND LAPPED ON. CONNECT ENDS WITH BAR SLIPS, S-SLIP AND DRIVE CAPS. SLIPS SHALL BE MADE IN FORM OF FRAMES, MITERED AND RIVETED AT CORNERS TO PREVENT LEAKAGE.   |  |
|   |  |   |  | 14. EXTRACTORS SHALL HAVE ADJUSTING ROD AND LOCKNUT ON OUTSIDE OF DUCT.   |  |
| 1.04 GUARANTEE  |  |   |  |   |  |
| A. GUARANTEE WORK OF THIS SECTION IN WRITING FOR ONE YEAR FROM DATE FINAL NOTICE OF ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP, OR INSTALLATION THAT DEVELOP WITHIN THIS PERIOD, PROMPTLY AND TO OWNER'S SATISFACTION AT NO COST TO OWNER. CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO COST TO OWNER.   |  |   |  |   |  |

|   |  |  |       |     |      |          |                          |      |      |       |                  |           |  |              |       |
|---|--|--|-------|-----|------|----------|--------------------------|------|------|-------|------------------|-----------|--|--------------|-------|
| <div><div><b>HART DESIGN GROUP</b><br/>800 SCENIC VIEW DRIVE   T: (401) 658-4600<br/>CUMBERLAND, RI 02864   F: (401) 658-4609<br/><small>A MEMBER OF THE HART COMPANIES      WWW.HARTCOMPANIES.COM</small></div></div> | <div><div><b>cytiva</b><br/>100 RESULTS WAY<br/>MARLBOROUGH, MA 01752</div></div> | GENERAL NOTE:<br>ALL CONTRACTED PARTIES ARE<br>REQUIRED TO REVIEW ALL<br>CONTRACT DOCUMENTS,<br>INCLUDING CONTRACT<br>DRAWINGS AND/OR PROJECT<br>SPECIFICATIONS, FOR ALL<br>DISCIPLINES TO ASCERTAIN THE<br>COMPLETE SCOPE OF WORK FOR<br>THE PROJECT. | DSGN: | RRM | REV. | DATE     | REVISION DESCRIPTION     | DWG. | CHK. | APVD. |                  |           | CLD & CCM LABS<br>HVAC<br>SPECIFICATIONS | ISSUE DATE:  |       |
|   |  |  | DR:   | RRM | A    | 04-19-21 | ISSUED FOR CLIENT REVIEW | RRM  | MDC  |       |                  |           |  | SCALE:       |       |
|   |  |  | CHK:  | MC  | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION  | GHS  | MC   | MC    |                  |           |  | SHEET NUMBER | H-001 |
|   |  |  | APVD: | MC  |      |          |                          |      |      |       |                  |           |  |              |       |
|   |  |  |       |     |      |          |                          |      |      |       | PROJ. NO: 20021A | CAD FILE: |  |              |       |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1"0

BAR IS ONE INCH ON ORIGINAL DRAWING

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|--|--|--|--|--|--|--|--|--|--|
| 15. MATERIALS  |  |  |  |  |  |  |  |  |  |
| 15.1 SHEET METAL DUCTS SHALL BE CONSTRUCTED OF HOT-DIPPED GALVANIZED SHEET METAL WITH G90 COMMERCIAL COATING ACCORDING TO ASTM 525 UNLESS SPECIFIED OTHERWISE. BRACING ANGLES AND DUCT REINFORCEMENT SHALL BE GALVANIZED STEEL.  |  |  |  |  |  |  |  |  |  |
| 15.2 MANUAL VOLUME DAMPERS (BALANCING DAMPERS)   |  |  |  |  |  |  |  |  |  |
| 15.2.1 WHERE SPECIFIED, REMOTE BALANCING DAMPERS SHALL BE FURNISHED AND INSTALLED ON THE PLANS. DAMPERS SHALL BE GREENHECK RBD-10, OR EQUAL.   |  |  |  |  |  |  |  |  |  |
| 15.2.2 DAMPERS SHALL CONSIST OF 22 GA GALVANIZED STEEL FRAME WITH A 3 1/2" DEPTH, WITH BLADES FABRICATED FROM 20 GA GALVANIZED STEEL, AND AXLES SHALL BE 1/2" DIAMETER.  |  |  |  |  |  |  |  |  |  |
| 15.2.3 DAMPERS SHALL BE SUPPLIED WITH 9 VOLT ACTUATOR KIT (FIELD INSTALLED.) ALL WIRE CONNECTIONS SHALL BE MADE USING RJ11 PLUGS AND SOCKETS, NO ADDITIONAL WIRING OR TOOLS SHALL BE NEEDED.   |  |  |  |  |  |  |  |  |  |
| 15.2.4 DAMPERS SHALL BE SUITABLE FOR PRESSURES UP TO 1" WG AND VELOCITIES UP TO 2000 FPM AND TEMPERATURES UP TO 18°F.  |  |  |  |  |  |  |  |  |  |
| 15.2.5 DAMPERS SHALL BE TESTED AND TREATED IN ACCORDANCE WITH AMCA STANDARD 500-D  |  |  |  |  |  |  |  |  |  |
| 15.2.6 MOUNT 1-1/8 INCHES ABOVE SURFACE OF DUCTWORK:   |  |  |  |  |  |  |  |  |  |
| 15.2.6.1 CONTROL QUADRANT FOR DUCTS 19-IN. AND OVER  |  |  |  |  |  |  |  |  |  |
| 15.2.6.2 END BEARINGS.   |  |  |  |  |  |  |  |  |  |
| 15.2.7 BRACKETS SHALL BE 18 GA. GALVANIZED METAL, SECURED TO DUCTWORK WITH FOUR SHEETMETAL SCREWS.   |  |  |  |  |  |  |  |  |  |
| 15.2.8 NOTE: ALL REQUIRED VOLUME DAMPERS MAY NOT BE INDICATED ON DRAWINGS BUT DAMPERS SHALL BE PROVIDED AS NECESSARY FOR SYSTEM BALANCING.   |  |  |  |  |  |  |  |  |  |
| 15.2.9 DIFFUSERS, REGISTERS AND GRILLES  |  |  |  |  |  |  |  |  |  |
| 15.2.9.1 SHALL BE PROVIDED FOR SUPPLY, RETURN AND EXHAUST OUTLETS AND SHALL BE OF SIZE, TYPE AND DESIGN SHOWN ON DRAWINGS.   |  |  |  |  |  |  |  |  |  |
| 15.2.9.2 SHALL BE ADC CERTIFIED AND TESTED AND SHALL BE RATED IN ACCORDANCE WITH ADC.  |  |  |  |  |  |  |  |  |  |
| 15.2.9.3 SHALL HANDLE AIR QUANTITIES AT OPERATING VELOCITIES: WITH MAXIMUM DIFFUSION WITHIN SPACE SUPPLIED OR EXHAUSTED. WITHOUT OBJECTIONABLE AIR MOVEMENT AS DETERMINED BY OWNER. WITH SOUND PRESSURE LEVEL NOT TO EXCEED NC 35.   |  |  |  |  |  |  |  |  |  |
| 15.2.9.4 SUPPLY, RETURN AND EXHAUST OUTLETS SHALL HAVE OPPOSED BLADE VOLUME DAMPERS OPERABLE FROM FRONT.   |  |  |  |  |  |  |  |  |  |
| 15.2.10 SUPPLY REGISTERS SHALL HAVE TWO SETS OF DIRECTIONAL CONTROL BLADES.  |  |  |  |  |  |  |  |  |  |
| 15.2.11 DIFFUSERS WITHIN SAME ROOM OR AREA SHALL BE OF SAME TYPE AND STYLE TO PROVIDE ARCHITECTURAL UNIFORMITY.  |  |  |  |  |  |  |  |  |  |
| 15.2.12 DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED WITH GASKETS AND INSTALLED WITH FACES SET LEVEL AND PLUMB, TIGHTLY AGAINST MOUNTING SURFACE.   |  |  |  |  |  |  |  |  |  |
| 15.2.13 FINISH SHALL BE AS APPROVED BY OWNER.  |  |  |  |  |  |  |  |  |  |
| 2.03 DUCT INSULATION   |  |  |  |  |  |  |  |  |  |
| A. GENERAL   |  |  |  |  |  |  |  |  |  |
| 1. APPLY INSULATION AFTER SYSTEMS HAVE BEEN TESTED, PROVED TIGHT AND APPROVED BY OWNER. REMOVE DIRT, SCALE, OIL, RUST AND OTHER FOREIGN MATTER PRIOR TO INSTALLATION OF INSULATION.  |  |  |  |  |  |  |  |  |  |
| 2. LEAKS IN VAPOR BARRIER OR VOIDS IN INSULATION WILL NOT BE ACCEPTED.   |  |  |  |  |  |  |  |  |  |
| 3. INSULATION SHALL BE CERTAIN-TEED, MANVILLE, OWENS CORNING OR APPROVED EQUAL. INSTALL INSULATION, MASTICS, ADHESIVES, COATINGS, COVERS, WEATHER-PROTECTION AND OTHER WORK EXACTLY AS REQUIRED BY MANUFACTURER'S RECOMMENDATION. MATERIALS SHALL MEET REQUIREMENTS OF ADHESIVE AND SEALANT COUNCIL STANDARDS AND SMACNA.  |  |  |  |  |  |  |  |  |  |
| 4. MINIMUM FIRE HAZARD RATINGS SHALL BE 25 FLAME SPREAD, 50 FUEL CONTRIBUTED AND 50 SMOKE DEVELOPED, AS REQUIRED BY ASTM E-84.   |  |  |  |  |  |  |  |  |  |
| 5. WHERE DUCTS ARE INSULATED, FLEXIBLE CONNECTIONS TO DUCTS SHALL BE INSULATED.  |  |  |  |  |  |  |  |  |  |
| 6. INSULATE STANDING SEAMS WITH SAME MATERIAL AND THICKNESS AS DUCT.   |  |  |  |  |  |  |  |  |  |
| 7. INTERNALLY ACOUSTICALLY LINED DUCTWORK SHALL NOT BE EXTERNALLY INSULATED, EXCEPT AS OTHERWISE NOTED.  |  |  |  |  |  |  |  |  |  |
| 8. RETURN DUCTWORK IN CEILING PLENUMS SHALL NOT BE INSULATED.  |  |  |  |  |  |  |  |  |  |
| 9. INSULATION SHALL BE CONTINUOUS THROUGH WALL AND CEILING OPENINGS AND IN SLEEVES.  |  |  |  |  |  |  |  |  |  |
| 10. TRANSMISSION RATES OF VAPOR BARRIERS SHALL NOT EXCEED 0.02 PERMS.  |  |  |  |  |  |  |  |  |  |
| 11. DO NOT INSULATE FIBROUS GLASS DUCT.  |  |  |  |  |  |  |  |  |  |
| B. CONCEALED RECTANGULAR DUCTWORK  |  |  |  |  |  |  |  |  |  |
| 1. INSULATE SUPPLY AIR DUCTS AND PLENUMS IN CONCEALED SPACES AND RETURN DUCT NOT IN CEILING PLENUM WITH AT LEAST 1-1/2-INCH THICK FIBROUS GLASS DUCT WRAP, WITH FOIL-KRAFT FLAME RESISTANT VAPOR BARRIER.  |  |  |  |  |  |  |  |  |  |
| 2. INSULATION DENSITY SHALL BE 3/4 LB/CF AND MAXIMUM K-FACTOR SHALL BE 0.30 AT 75 DEGREES F MEAN TEMPERATURE.  |  |  |  |  |  |  |  |  |  |
| 3. IF INSULATION DOES NOT HAVE PRE-CUT LAP MAKE LAPPED BUTT JOINTS BY CUTTING 2 INCH STRIP OF INSULATION AWAY FROM VAPOR BARRIER. APPLY SIX-INCH STRIPS OF APPROVED ADHESIVE ON 16-INCH CENTERS AND WRAP DUCT WITH INSULATION. STAPLE LAPPED JOINT WITH OUTWARD-CLINCHING STAPLES. SEAL STAPLED JOINTS AIR-TIGHT WITH APPROVED VAPOR BARRIER MASTIC OR PRESSURE-SENSITIVE TAPE.  |  |  |  |  |  |  |  |  |  |
| 4. FOR RECTANGULAR DUCT 24 INCHES OR LARGER IN ANY DIMENSION, AUGMENT APPLICATION METHOD SPECIFIED IN ITEM WITH APPROVED MECHANICAL FASTENERS, SUCH AS WELD PINS WITH SPEED WASHERS, ON 18-INCH CENTERS ON BOTTOM OF DUCT.   |  |  |  |  |  |  |  |  |  |
| 5. COVER BREAKS IN VAPOR MATERIAL WITH PATCHES OF SAME MATERIAL, SECURED WITH ADHESIVE AND STAPLES. SEAL STAPLES WITH APPROVED VAPOR BARRIER COATING.  |  |  |  |  |  |  |  |  |  |
| 6. FILL VOIDS IN INSULATION AT JACKET PENETRATIONS AND SEAL WITH VAPOR BARRIER COATING.  |  |  |  |  |  |  |  |  |  |
| 7. SEAL AND FLASH TERMINATIONS AND PUNCTURES WITH FIBROUS GLASS CLOTH BETWEEN TWO COATS OF VAPOR BARRIER COATING.  |  |  |  |  |  |  |  |  |  |
| 8. TERMINATE VAPOR BARRIER AND EXTEND INSULATION AT STANDOFF BRACKETS.   |  |  |  |  |  |  |  |  |  |
| C. EXPOSED ROUND DUCTWORK  |  |  |  |  |  |  |  |  |  |
| 1. EXPOSED SUPPLY, RETURN AND FRESH AIR DUCTS AND EXPOSED AND CONCEALED PLENA SHALL BE INSULATED WITH 1-INCH THICK, FIBROUS GLASS DUCT WRAP WITH FACTORY-APPLIED FIRE RETARDANT VINYL-REINFORCED KRAFT VAPOR BARRIER FACING.   |  |  |  |  |  |  |  |  |  |
| 2. INSULATION DENSITY SHALL BE 3/4 LB/CF WITH MAXIMUM K-FACTOR OF 0.30 AT 75 DEGREES F MEAN TEMPERATURE.   |  |  |  |  |  |  |  |  |  |
| 3. IF INSULATION DOES NOT HAVE PRE-CUT LAP MAKE BUTT JOINTS BY CUTTING 2 INCH STRIP OF INSULATION AWAY FROM VAPOR BARRIER. APPLY SIX-INCH STRIPS OF APPROVED ADHESIVE ON 16-INCH CENTERS AND WRAP DUCT WITH INSULATION. STAPLE LAPPED JOINT WITH OUTWARD-CLINCHING STAPLES. SEAL STAPLED JOINTS AIR-TIGHT WITH APPROVED VAPOR BARRIER MASTIC OR PRESSURE-SENSITIVE TAPE.   |  |  |  |  |  |  |  |  |  |
| 4. EXTEND INSULATION TO STANDING SEAMS, REINFORCING, AND OTHER VERTICAL PROJECTIONS 1-INCH AND LESS; DO NOT CARRY OVER. VAPOR BARRIER JACKET SHALL BE CONTINUOUS ACROSS SEAMS, REINFORCING AND PROJECTIONS. INSULATION AND JACKET SHALL BE CARRIED OVER PROJECTIONS THAT EXCEED INSULATION THICKNESS.  |  |  |  |  |  |  |  |  |  |
| 5. COVER BREAKS, RIPS AND STANDING SEAM PENETRATIONS WITH PATCH OF JACKET MATERIAL NO LESS THAN 2 INCHES BEYOND BREAK; SECURE WITH ADHESIVE AND STAPLE. SEAL STAPLES AND JOINTS WITH BRUSH-COAT OF VAPOR BARRIER COATING.  |  |  |  |  |  |  |  |  |  |
| 6. FILL VOIDS IN INSULATION AT JACKET PENETRATIONS AND SEAL WITH VAPOR BARRIER COATING.  |  |  |  |  |  |  |  |  |  |
| 7. SEAL AND FLASH-TERMINATIONS AND PUNCTURES WITH FIBROUS GLASS CLOTH BETWEEN TWO COATS OF VAPOR BARRIER COATING.  |  |  |  |  |  |  |  |  |  |
| 8. TERMINATE VAPOR BARRIER AND EXTEND INSULATION AT STANDOFF BRACKETS.   |  |  |  |  |  |  |  |  |  |
| 2.04 MOTORS, STARTERS AND WIRING   |  |  |  |  |  |  |  |  |  |
| A. PROVIDE MOTORS AND CONTROLS, AND STARTERS FOR HVAC EQUIPMENT, EXCEPT UNITS SERVED BY MCC PROVIDED UNDER SECTION 16100, ELECTRICAL WORK. PROVIDE CONTROL AND OTHER RELATED WIRING INCLUDING INTERLOCKS. POWER WIRING TO PANELBOARDS, DISCONNECT SWITCHES, STARTERS AND MOTORS WILL BE PROVIDED UNDER SECTION 16100, ELECTRICAL. STARTERS THAT ARE NOT INTEGRAL TO EQUIPMENT WILL BE INSTALLED AND WIRED UNDER SECTION 16100, ELECTRICAL AND FURNISHED UNDER THIS SECTION 15600.  |  |  |  |  |  |  |  |  |  |
| B. UNLESS OTHERWISE SPECIFIED, MOTORS SHALL BE NEMA DESIGN B, CONSTANT SPEED, SELF-VENTILATED HIGH EFFICIENCY SQUIRREL CAGE INDUCTION TYPE. MOTORS SHALL HAVE 1.15 SERVICE FACTOR UNLESS TOTALLY ENCLOSED. MOTORS SHALL HAVE CLASS B INSULATION.   |  |  |  |  |  |  |  |  |  |
| B.1 MOTORS UNDER 1 HP, SHALL BE DESIGNED FOR 120V, 60 HZ, SINGLE PHASE, UNLESS OTHERWISE SPECIFIED.  |  |  |  |  |  |  |  |  |  |
| B.2 MOTORS 1 HP AND OVER SHALL BE AS REQUIRED IN SCHEDULES.  |  |  |  |  |  |  |  |  |  |
| C. STARTERS THAT REQUIRE INTERLOCKS OR REMOTE CONTROL SHALL BE MAGNETIC WITH HAND-OFF-AUTOMATIC SWITCH IN COVER.   |  |  |  |  |  |  |  |  |  |
| C.1. EACH 3-PHASE, 60 HZ MOTOR SHALL BE PROVIDED WITH MAGNETIC STARTER WITH EITHER ON-OFF PUSH BUTTON OR HAND-OFF-AUTOMATIC SWITCH.  |  |  |  |  |  |  |  |  |  |
| C.2. OTHER MOTORS SHALL BE PROVIDED WITH A MANUAL STARTER WITH ON-OFF SWITCH.  |  |  |  |  |  |  |  |  |  |
| C.3. CONTROL RELAY FOR EACH STARTER SHALL BE FOR OPERATION 120V, SINGLE PHASE, AND TRANSFORMER OF SUFFICIENT CAPACITY WITHIN STARTER CASE SHALL BE FURNISHED FOR THIS PURPOSE.   |  |  |  |  |  |  |  |  |  |
| C.4. EACH STARTER SHALL BE PROVIDED WITH INVERSE TIME LIMIT OVERLOAD AND UNDER VOLTAGE PROTECTION IN EACH LEG AND WITH PILOT LIGHT. STARTERS SHALL BE OF SAME MAKE: CUTLER-HAMMER, CLARK, ARROW HART OR APPROVED EQUAL.  |  |  |  |  |  |  |  |  |  |
| C.5. ABOVE ITEMS SHALL BE PROVIDED IN ALL CASES, EXCEPT AS REQUIRED OTHERWISE IN SCHEDULES.  |  |  |  |  |  |  |  |  |  |
| C.6. EACH STARTER SHALL BE PROVIDED WITH NAMEPLATE WITH ENGRAVED WHITE LETTERING, DESIGNATING AREA AND EQUIPMENT SERVED.   |  |  |  |  |  |  |  |  |  |
| D. DRIVES FOR BELTED MOTORS SHALL BE ALLIS-CHALMERS TEXROPE OR APPROVED EQUAL WITH ADJUSTABLE MOTOR SHEAVE. DRIVES SHALL BE AS SHORT AS PRACTICAL AND SHALL HAVE NUMBER OF BELTS NECESSARY TO TRANSMIT REQUIRED HORSEPOWER WITHOUT UNDUE SLIP OR STRAIN. SHEAVES SHALL BE BALANCED STATICALLY AND DYNAMICALLY.   |  |  |  |  |  |  |  |  |  |
| PART 3 - EXECUTION   |  |  |  |  |  |  |  |  |  |
| 3.01 SPECIAL RESPONSIBILITIES  |  |  |  |  |  |  |  |  |  |
| A. COORDINATION: COOPERATE AND COORDINATE WITH OTHER TRADES IN EXECUTING WORK OF THIS SECTION AS DESCRIBED HEREUNDER.  |  |  |  |  |  |  |  |  |  |
| 1. NOTIFY OWNER OF LOCATION AND EXTENT OF EXISTING PIPING, DUCTWORK AND EQUIPMENT WHICH INTERFERE WITH NEW CONSTRUCTION. IN COORDINATION WITH AND WITH APPROVAL OF OWNER, RELOCATE SUCH PIPING, DUCTWORK AND EQUIPMENT TO PERMIT NEW WORK TO BE PROVIDED AS REQUIRED BY CONTRACT DOCUMENTS. WITH APPROVAL OF OWNER, REMOVE NON-FUNCTIONING OR ABANDONED PIPING, DUCTWORK AND EQUIPMENT.IF REQUESTED BY OWNER, REMOVE NON-FUNCTIONING PIPING, DUCTWORK AND EQUIPMENT WHICH DOES NOT INTERFERE WITH NEW WORK. DISPOSE OF OR STORE ITEMS AS REQUESTED BY OWNER.   |  |  |  |  |  |  |  |  |  |
| B. USE OF PREMISES: USE OF PREMISES SHALL BE RESTRICTED AS DIRECTED BY OWNER AND AS REQUIRED BELOW.  |  |  |  |  |  |  |  |  |  |
| 1. AS REQUIRED, DURING PROGRESS OF WORK, REMOVE AND PROPERLY DISPOSE OF RESULTANT DIRT AND DEBRIS, AND KEEP PREMISES REASONABLY CLEAN. UPON COMPLETION OF WORK, REMOVE EQUIPMENT AND UNUSED MATERIAL PROVIDED FOR WORK, AND PUT BUILDING AND PREMISES IN NEAT AND CLEAN CONDITION, AND DO CLEANING AND WASHING REQUIRED TO PROVIDE ACCEPTABLE APPEARANCE AND OPERATION OF EQUIPMENT, TO SATISFACTION OF OWNER, AND AS SPECIFIED UNDER PARAGRAPH "CLEANING".  |  |  |  |  |  |  |  |  |  |
| 2. CONDUCT WORK SO AS NOT TO INTERFERE WITH FUNCTIONING OF EXISTING SEWERS AND WATER AND GAS MAINS. EXTREME CARE SHALL BE OBSERVED TO PREVENT DEBRIS FROM ENTERING DUCTWORK. CONFER WITH OWNER AS TO DISRUPTION OF HEATING SERVICES OR OTHER UTILITIES DUE TO TESTING OR CONNECTION OF NEW WORK TO EXISTING. INTERRUPTION OF HEATING SERVICES SHALL BE PERFORMED AT TIME OF DAY OR NIGHT DEEMED BY OWNER TO PROVIDE MINIMAL INTERFERENCE WITH NORMAL OPERATION.  |  |  |  |  |  |  |  |  |  |
| C. INSPECTIONS BY OWNER: UNDERTAKING OF PERIODIC INSPECTIONS BY OWNER OR DESIGNATED AGENT SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION, NOR MAKE EITHER RESPONSIBLE FOR PROVIDING SAFE PLACE FOR PERFORMANCE OF WORK OF VARIOUS TRADES OR SUPPLIERS, OR FOR VISITORS OR OCCUPANTS, OR MAKE EITHER RESPONSIBLE FOR OMISSION OF SAFETY DEVICES CALLED FOR BY CODES, ORDINANCES, OR SPECIFICATIONS OF MANUFACTURER OF EQUIPMENT SUPPLIED.   |  |  |  |  |  |  |  |  |  |
| 3.02 MATERIALS AND WORKMANSHIP   |  |  |  |  |  |  |  |  |  |
| A. WORK SHALL BE EXECUTED IN WORKMANLIKE MANNER AND SHALL PRESENT NEAT AND MECHANICAL APPEARANCE WHEN COMPLETED. DUCTWORK AND PIPING SHALL RUN CONCEALED EXCEPT IN MECHANICAL ROOMS AND AREAS WHERE NO HUNG CEILING EXISTS. MATERIAL AND EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDED BEST PRACTICE SO THAT COMPLETED INSTALLATION SHALL OPERATE SAFELY AND WITHOUT LEAKAGE, UNDUE WEAR, NOISE, VIBRATION, CORROSION OR WATER HAMMER. USE OF DIELECTRIC COUPLINGS BETWEEN DISSIMILAR MATERIALS IS MANDATORY. WORK SHALL BE PROPERLY AND EFFECTIVELY PROTECTED, AND PIPE AND DUCT OPENINGS SHALL BE TEMPORARILY CLOSED TO PREVENT OBSTRUCTION AND DAMAGE PRIOR TO COMPLETION. |  |  |  |  |  |  |  |  |  |
| B. FULLY INSURE WORKMEN AND WORK AS REQUIRED.  |  |  |  |  |  |  |  |  |  |
| C. EXCEPT AS OTHERWISE NOTED, MATERIAL OR EQUIPMENT MENTIONED IN SPECIFICATIONS OR ON DRAWINGS SHALL BE FURNISHED NEW AND SUPPLIES, APPLIANCES AND CONNECTIONS NECESSARY FOR COMPLETE AND OPERATIONAL INSTALLATION SHALL BE PROVIDED. FURTHER, EQUIPMENT SHALL BE PROVIDED WITH COMPONENTS REQUIRED OR RECOMMENDED BY OSHA AND APPLICABLE NFPA DOCUMENTS, AND SHALL BE UL APPROVED WHERE APPLICABLE. PROTECTION FACILITIES INCLUDING EXPANDED METAL GUARDS OVER BELT DRIVES AND COUPLINGS SHALL BE PROVIDED IN CONFORMANCE WITH OSHA STANDARDS AND OTHER APPLICABLE REGULATIONS.   |  |  |  |  |  |  |  |  |  |
| D. NOTWITHSTANDING ANY REFERENCE IN SPECIFICATIONS OR ON DRAWINGS TO MATERIAL OR PIECE OF EQUIPMENT BY NAME, MAKE OR CATALOG NUMBER, SUCH REFERENCE SHALL BE INTERPRETED AS ESTABLISHING TYPE, FUNCTION, AND STANDARD OF QUALITY DESIRED AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION.   |  |  |  |  |  |  |  |  |  |
| E. FINISH OF MATERIALS, COMPONENTS AND EQUIPMENT SHALL NOT BE INFERIOR TO INDUSTRY GOOD PRACTICE. WHEN MATERIAL OR EQUIPMENT IS VISIBLE OR SUBJECT TO CORROSIVE OR ATMOSPHERIC CONDITIONS, FINISH SHALL BE AS APPROVED BY OWNER.   |  |  |  |  |  |  |  |  |  |
| F. OWNER SHALL NOT BE RESPONSIBLE FOR MATERIAL AND EQUIPMENT BEFORE TESTING AND ACCEPTANCE.  |  |  |  |  |  |  |  |  |  |
| 3.03 BULLETINS, MANUALS AND INSTRUCTIONS   |  |  |  |  |  |  |  |  |  |
| A. OBTAIN AT TIME OF PURCHASE OF EQUIPMENT, THREE COPIES OF OPERATION, LUBRICATION AND MAINTENANCE MANUALS FOR ALL ITEMS. ASSEMBLE LITERATURE IN COORDINATED MANUALS WITH ADDITIONAL INFORMATION DESCRIBING COMBINED OPERATION OF FIELD ASSEMBLED UNITS, INCLUDING AS-BUILT WIRING DIAGRAMS. MANUAL SHALL CONTAIN NAMES AND ADDRESSES OF MANUFACTURERS AND LOCAL REPRESENTATIVES WHO STOCK OR FURNISH REPAIR PARTS FOR ITEMS OR EQUIPMENT. DIVIDE MANUALS INTO THREE SECTIONS OR BOOKS AS FOLLOWS:   |  |  |  |  |  |  |  |  |  |
| B. OPERATING INSTRUCTIONS: UPON COMPLETION OF INSTALLATION OR WHEN OWNER ACCEPTS PORTIONS OF BUILDING AND EQUIPMENT FOR OPERATIONAL USE, INSTRUCT OWNER'S OPERATING PERSONNEL IN ANY OR ALL PARTS OF VARIOUS SYSTEMS. SUCH INSTRUCTIONS SHALL COVER PERIOD OF CONTROL SUCH AS WILL TAKE MECHANICAL EQUIPMENT THROUGH COMPLETE CYCLE. MAKE ADJUSTMENTS UNDER ACTUAL OPERATING CONDITION. THIS TIME SHALL BE MINIMUM OF FIVE WORKING DAYS.   |  |  |  |  |  |  |  |  |  |
| 3.04 CONTINUITY OF SERVICES  |  |  |  |  |  |  |  |  |  |
| A. DO NOT INTERRUPT EXISTING SERVICES WITHOUT OWNER'S APPROVAL.  |  |  |  |  |  |  |  |  |  |
| B. SCHEDULE INTERRUPTIONS IN ADVANCE, ACCORDING TO OWNER'S INSTRUCTIONS. SUBMIT, IN WRITING, WITH REQUEST FOR INTERRUPTION, METHODS PROPOSED TO MINIMIZE LENGTH OF INTERRUPTION.   |  |  |  |  |  |  |  |  |  |
| C. INTERRUPTIONS SHALL BE SCHEDULED AT SUCH TIMES OF DAY AND WORK THAT THEY HAVE MINIMAL IMPACT ON OWNER'S OPERATIONS.   |  |  |  |  |  |  |  |  |  |
| 3.05 BALANCING   |  |  |  |  |  |  |  |  |  |
| A. BALANCE AIR SYSTEMS TO THE QUANTITIES SHOWN ON DRAWINGS.  |  |  |  |  |  |  |  |  |  |

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|  <div><b>HART DESIGN GROUP</b><br/>800 SCENIC VIEW DRIVE   T: (401) 858-4600<br/>CUMBERLAND, RI 02864   F: (401) 858-4609<br/><small>A MEMBER OF THE HART COMPANIES</small>    <small>WWW.HARTCOMPANIES.COM</small></div> |  <div><b>cytiva</b><br/>100 RESULTS WAY<br/>MARLBOROUGH, MA 01752</div> | GENERAL NOTE:<br>ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS, FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT. | DSGN: | RRM | REV. | DATE | REVISION DESCRIPTION | DWG. | CHK. | APVD. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



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| PART 1 GENERAL   |  |  |  |  |  |  |  |  |  |  |  |
| 1.1 SUMMARY  |  |  |  |  |  |  |  |  |  |  |  |
| A. SECTION INCLUDES:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. PIPE HANGERS AND SUPPORTS.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. PIPE AND PIPE FITTINGS.   |  |  |  |  |  |  |  |  |  |  |  |
| 3. VALVES.   |  |  |  |  |  |  |  |  |  |  |  |
| 4. PIPING SPECIALTIES.   |  |  |  |  |  |  |  |  |  |  |  |
| 5. HVAC PIPING SPECIALTIES.  |  |  |  |  |  |  |  |  |  |  |  |
| 6. HVAC PUMPS.   |  |  |  |  |  |  |  |  |  |  |  |
| 7. CHEMICAL TREATMENT.   |  |  |  |  |  |  |  |  |  |  |  |
| 1.2 SUBMITTALS   |  |  |  |  |  |  |  |  |  |  |  |
| A. SHOP DRAWINGS: INDICATE SCHEMATIC LAYOUT OF REFRIGERATION SYSTEM, INCLUDING EQUIPMENT, CRITICAL DIMENSIONS, AND SIZES.  |  |  |  |  |  |  |  |  |  |  |  |
| B. PRODUCT DATA:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. PIPE HANGERS AND SUPPORTS: SUBMIT MANUFACTURERS CATALOG DATA INCLUDING LOAD CARRYING CAPACITY.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. VALVES: SUBMIT MANUFACTURERS CATALOG INFORMATION WITH VALVE DATA AND RATINGS FOR EACH SERVICE.  |  |  |  |  |  |  |  |  |  |  |  |
| 3. PIPING SPECIALTIES: SUBMIT PRODUCT DESCRIPTION, MODEL, DIMENSIONS, COMPONENT SIZES, ROUGHIN REQUIREMENTS, SERVICE SIZES, AND FINISHES. SUBMIT SCHEDULE INDICATING MANUFACTURER, MODEL NUMBER, SIZE, LOCATION, RATED CAPACITY, LOAD SERVED, AND FEATURES FOR EACH SPECIALTY.   |  |  |  |  |  |  |  |  |  |  |  |
| 4. PIPE EXPANSION PRODUCTS: INDICATE MAXIMUM TEMPERATURE AND PRESSURE RATING, AND MAXIMUM EXPANSION COMPENSATION.  |  |  |  |  |  |  |  |  |  |  |  |
| 5. PUMPS: SUBMIT PUMP TYPE, CAPACITY, CERTIFIED PUMP CURVES SHOWING PUMP PERFORMANCE CHARACTERISTICS WITH PUMP AND SYSTEM OPERATING POINT PLOTTED. INCLUDE NPSH CURVE WHEN APPLICABLE. INCLUDE ELECTRICAL CHARACTERISTICS AND CONNECTION REQUIREMENTS. INCLUDE MANUFACTURERS CATALOGUE INFORMATION.  |  |  |  |  |  |  |  |  |  |  |  |
| 6. CHEMICAL TREATMENT: SUBMIT CHEMICAL TREATMENT MATERIALS, CHEMICALS, AND EQUIPMENT.  |  |  |  |  |  |  |  |  |  |  |  |
| C. WELDERS CERTIFICATE: INCLUDE WELDERS CERTIFICATION OF COMPLIANCE WITH AWS D1.1.   |  |  |  |  |  |  |  |  |  |  |  |
| D. MANUFACTURER'S INSTALLATION INSTRUCTIONS: SUBMIT INSTALLATION INSTRUCTIONS FOR PUMPS, VALVES AND ACCESSORIES.   |  |  |  |  |  |  |  |  |  |  |  |
| 1.3 CLOSEOUT SUBMITTALS  |  |  |  |  |  |  |  |  |  |  |  |
| A. OPERATION AND MAINTENANCE DATA: SUBMIT SPARE PARTS LISTS AND MAINTENANCE PROCEDURES.  |  |  |  |  |  |  |  |  |  |  |  |
| 1.4 WARRANTY   |  |  |  |  |  |  |  |  |  |  |  |
| A. FURNISH FIVE YEAR MANUFACTURER WARRANTY FOR PUMPS.  |  |  |  |  |  |  |  |  |  |  |  |
| 1.5 MAINTENANCE SERVICE  |  |  |  |  |  |  |  |  |  |  |  |
| A. FURNISH CHEMICALS FOR TREATMENT AND TESTING DURING WARRANTY PERIOD.   |  |  |  |  |  |  |  |  |  |  |  |
| PART 2 PRODUCTS  |  |  |  |  |  |  |  |  |  |  |  |
| 2.1 PIPE HANGERS AND SUPPORTS  |  |  |  |  |  |  |  |  |  |  |  |
| A. MANUFACTURERS:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. CARPENTER & PATERSON INC.   |  |  |  |  |  |  |  |  |  |  |  |
| 2. ANVIL.  |  |  |  |  |  |  |  |  |  |  |  |
| 3. COOPER B-LINE   |  |  |  |  |  |  |  |  |  |  |  |
| 4. GLOBE PIPE HANGER PRODUCTS INC  |  |  |  |  |  |  |  |  |  |  |  |
| 5. SUBSTITUTIONS: PERMITTED.   |  |  |  |  |  |  |  |  |  |  |  |
| B. CONFORM TO ASME B31.9.  |  |  |  |  |  |  |  |  |  |  |  |
| C. HANGERS FOR PIPE SIZES 1/2 TO 1-1/2 INCH: CARBON STEEL, ADJUSTABLE SWIVEL, SPLIT RING.  |  |  |  |  |  |  |  |  |  |  |  |
| D. HANGERS FOR COLD PIPE SIZES 2 INCHES AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS.  |  |  |  |  |  |  |  |  |  |  |  |
| E. HANGERS FOR HOT PIPE SIZES 2 TO 4 INCHES: CARBON STEEL, ADJUSTABLE, CLEVIS.   |  |  |  |  |  |  |  |  |  |  |  |
| F. MULTIPLE OR TRAPEZE HANGERS FOR PIPE SIZES TO 4 INCHES: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS.   |  |  |  |  |  |  |  |  |  |  |  |
| G. MULTIPLE OR TRAPEZE HANGERS FOR HOT PIPE SIZES 6 INCHES AND OVER: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS, CAST IRON ROLL AND STAND.   |  |  |  |  |  |  |  |  |  |  |  |
| H. VERTICAL SUPPORT: STEEL RISER CLAMP.  |  |  |  |  |  |  |  |  |  |  |  |
| I. COPPER PIPE SUPPORT: COPPER-PLATED, CARBON STEEL RING.  |  |  |  |  |  |  |  |  |  |  |  |
| 2.2 PIPES AND TUBES  |  |  |  |  |  |  |  |  |  |  |  |
| A. CHILLED WATER AND ENERGY RECOVERY SYSTEM PIPING:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. STEEL PIPE (2-1/2" AND LARGER): ASTM A53/A53M, GRADE B, SCHEDULE 40, BLACK, MALLEABLE IRON OR FORGED STEEL FITTINGS, THREADED OR WELDED JOINTS. *ALTERNATE FOR ROLL GROOVED FITTINGS ACCEPTABLE.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. COPPER TUBING (2" AND SMALLER): ASTM B88, TYPE L DRAWN, CAST BRASS, WROUGHT COPPER, OR MECHANICALLY EXTRACTED FITTINGS, LEAD FREE SOLDER JOINTS. *ALTERNATE FOR PRO-PRESS COPPER FITTINGS ACCEPTABLE.   |  |  |  |  |  |  |  |  |  |  |  |
| B. EQUIPMENT DRAINS AND OVERFLOWS:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. COPPER TUBING: ASTM B88, TYPE M, DRAWN, CAST BRASS, WROUGHT COPPER OR MECHANICALLY EXTRACTED FITTINGS, LEAD FREE SOLDER JOINTS.   |  |  |  |  |  |  |  |  |  |  |  |
| 2.3 VALVES   |  |  |  |  |  |  |  |  |  |  |  |
| A. MANUFACTURERS:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. APOLLO, NIBCO OR EQUAL BALL VALVES (VIEGA FOR PROPRESS OPTION)  |  |  |  |  |  |  |  |  |  |  |  |
| 2. VELAN, VOGT OR EQUAL GATE VALVES FOR STEAM SERVICE.   |  |  |  |  |  |  |  |  |  |  |  |
| 3. AMRI (KSB), KEYSTONE OR EQUAL BUTTERFLY VALVES.   |  |  |  |  |  |  |  |  |  |  |  |
| 4. SIEMENS OR EQUAL GLOBE VALVE AS SUBMITTED BY SIEMENS BUILDING TECHNOLOGIES.   |  |  |  |  |  |  |  |  |  |  |  |
| 5. ARMSTRONG, SPENCE, WATTS FOR RELIEF VALVES.   |  |  |  |  |  |  |  |  |  |  |  |
| 6. SUBSTITUTIONS: PERMITTED.   |  |  |  |  |  |  |  |  |  |  |  |
| B. GATE VALVES:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. UP TO 2 INCHES: BRONZE BODY, BRONZE TRIM, NON-RISING STEM, HAND WHEEL, INSIDE SCREW, DOUBLE WEDGE DISC, SOLDERED OR THREADED.   |  |  |  |  |  |  |  |  |  |  |  |
| 2. OVER 2 INCHES: IRON BODY, BRONZE TRIM, RISING STEM, HAND WHEEL, OS&Y, SOLID WEDGE, FLANGED OR GROOVED ENDS.   |  |  |  |  |  |  |  |  |  |  |  |
| C. GLOBE VALVES:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. UP TO 2 INCHES: BRONZE BODY, BRONZE TRIM, RISING STEM AND HAND WHEEL, INSIDE SCREW, RENEWABLE COMPOSITION DISC, SOLDER OR THREADED ENDS, WITH BACK SEATING CAPACITY.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. OVER 2 INCHES: IRON BODY, BRONZE TRIM, RISING STEM, HAND WHEEL, OS&Y, PLUG TYPE DISC, FLANGED ENDS, RENEWABLE SEAT AND DISC.  |  |  |  |  |  |  |  |  |  |  |  |
| D. BALL VALVES:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. UP TO 2 INCHES: BRONZE OR STAINLESS STEEL TWO PIECE BODY, CHROME PLATED BRASS BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, SOLDER OR THREADED ENDS.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. OVER 2 INCHES: CAST STEEL FLANGED BODY, CHROME PLATED STEEL BALL, TEFLON SEAT AND STUFFING BOX SEALS AND LEVER HANDLE.  |  |  |  |  |  |  |  |  |  |  |  |
| E. BUTTERFLY VALVES:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. OVER 2 INCHES: IRON BODY, CHROME PLATED IRON DISC, RESILIENT REPLACEABLE SEAT, WAFER OR LUG ENDS, EXTENDED NECK, 10 POSITION LEVER HANDLE.  |  |  |  |  |  |  |  |  |  |  |  |
| F. SWING CHECK VALVES:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. UP TO 2 INCHES: BRONZE BODY AND SWING DISC, SOLDER OR THREADED ENDS.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. OVER 2 INCHES: IRON BODY, BRONZE TRIM, SWING DISC, RENEWABLE DISC AND SEAT, FLANGED ENDS.   |  |  |  |  |  |  |  |  |  |  |  |
| G. SPRING LOADED CHECK VALVES:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. IRON BODY, BRONZE TRIM WITH THREADED, WAFER OR FLANGED ENDS AND STAINLESS STEEL SPRING WITH RENEWABLE COMPOSITION DISC.   |  |  |  |  |  |  |  |  |  |  |  |
| H. RELIEF VALVES:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. BRONZE BODY, TEFLON SEAT, STAINLESS STEEL STEM AND SPRINGS, AUTOMATIC, DIRECT PRESSURE ACTUATED CAPACITIES ASME CERTIFIED AND LABELED.  |  |  |  |  |  |  |  |  |  |  |  |
| 2.4 PIPING SPECIALTIES   |  |  |  |  |  |  |  |  |  |  |  |
| A. FLANGES, UNIONS, AND COUPLINGS:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. PIPE SIZE 2 INCHES AND UNDER: MALLEABLE IRON UNIONS FOR THREADED FERROUS PIPING; BRONZE UNIONS FOR COPPER PIPE, SOLDERED JOINTS.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. PIPE SIZE OVER 2-1/2" INCHES: FORGED STEEL FLANGES FOR FERROUS PIPING; BRONZE FLANGES FOR COPPER PIPING; PREFORMED NEOPRENE GASKETS.  |  |  |  |  |  |  |  |  |  |  |  |
| 3. GROOVED AND SHOULDERED PIPE END COUPLINGS: MALLEABLE IRON HOUSING, C-SHAPE ELASTOMER COMPOSITION SEALING GASKET, STEEL BOLTS, NUTS, AND WASHERS.  |  |  |  |  |  |  |  |  |  |  |  |
| 4. DIELECTRIC CONNECTIONS: UNION WITH GALVANIZED OR PLATED STEEL THREADED END, COPPER SOLDER END, WATER IMPERVIOUS ISOLATION BARRIER.  |  |  |  |  |  |  |  |  |  |  |  |
| B. STRAINERS:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. MANUFACTURERS:  |  |  |  |  |  |  |  |  |  |  |  |
| A. TACO  |  |  |  |  |  |  |  |  |  |  |  |
| B. ARMSTRONG.  |  |  |  |  |  |  |  |  |  |  |  |
| C. BELL AND GOSSETT.   |  |  |  |  |  |  |  |  |  |  |  |
| D. SUBSTITUTIONS: PERMITTED.   |  |  |  |  |  |  |  |  |  |  |  |
| 2. CONSTRUCTION: CLOSED, WELDED STEEL, ASME TESTED AND LABELED, 125 PSIG RATING; CLEANED, PRIME COATED, AND SUPPLIED WITH STEEL SUPPORT SADDLES; WITH TAPS FOR INSTALLATION OF ACCESSORIES.  |  |  |  |  |  |  |  |  |  |  |  |
| 3. MANUAL COLD WATER FILL ASSEMBLY: PRESSURE REDUCING VALVE, TEST COCKS, STRAINER, BREAKER, AND BY-PASS WITH VALVES.   |  |  |  |  |  |  |  |  |  |  |  |
| 4. GLYCOL WATER SYSTEM: SELECT PRESSURE RELIEF VALVE AT 125 PSI. SET PRESSURE REDUCING VALVE AT 15 PSI.  |  |  |  |  |  |  |  |  |  |  |  |
| B. AIR/DIRT SEPARATORS:  |  |  |  |  |  |  |  |  |  |  |  |
| 1. MANUFACTURERS:  |  |  |  |  |  |  |  |  |  |  |  |
| A. TACO 4900 SERIES  |  |  |  |  |  |  |  |  |  |  |  |
| B. SPIROTHERM MODEL SPIROVENT  |  |  |  |  |  |  |  |  |  |  |  |
| C. SUBSTITUTIONS: NOT PERMITTED.   |  |  |  |  |  |  |  |  |  |  |  |
| 2. IN-LINE AIR SEPARATORS: CAST IRON FOR SIZES 1-1/2 INCH AND SMALLER, OR STEEL FOR SIZES 2 INCH AND LARGER; ASME TESTED AND STAMPED; FOR 125 PSIG OPERATING PRESSURE.   |  |  |  |  |  |  |  |  |  |  |  |
| 2.6 PIPE INSULATION  |  |  |  |  |  |  |  |  |  |  |  |
| A. TYPE P-1 (JOHNS MANVILLE MICRO-LOK HP): PREFORMED FIBERGLASS PIPE INSULATION, COMPLYING WITH ASTM C547, CLASS 3. INSULATION SHALL BE RIGID, MOLDED, NONCOMBUSTIBLE AND HAVE THE FOLLOWING PROPERTIES:   |  |  |  |  |  |  |  |  |  |  |  |
| 1. CONFORM TO ASTM C795 FOR APPLICATION ON AUSTENITIC STAINLESS STEEL.   |  |  |  |  |  |  |  |  |  |  |  |
| 2. THERMAL CONDUCTIVITY: 0.23 AT 75 DEGREES F.   |  |  |  |  |  |  |  |  |  |  |  |
| 3. OPERATING TEMPERATURE RANGE: UP TO 850 DEGREES F.   |  |  |  |  |  |  |  |  |  |  |  |
| 4. VAPOR BARRIER JACKET: A WHITE, KRAFT PAPER, REINFORCED WITH A GLASS FIBER YARN AND BONDED TO AN ALUMINUM FOIL, WITH SELF SEALING LONGITUDINAL CLOSURE LAPS AND BUTT STRIPS. JACKET SHALL CONFORM TO ASTM C1136. WATER VAPOR PERMEANCE 0.02 PERMS MAXIMUM.   |  |  |  |  |  |  |  |  |  |  |  |
| B. TYPE P-2 (AP/ARMAFLEX BLACK LAPSEAL): PREFORMED, BLACK FLEXIBLE CLOSED-CELL ELASTOMERIC THERMAL INSULATION IN TUBULAR FORM WITH A SELF-SEAL SYSTEM REINFORCED WITH LAP SEAL TAPE, COMPLYING WITH ASTM C534, TYPE 1 GRADE 1. PRODUCT SHALL BE GREENGUARD GOLD CERTIFIED, MANUFACTURED WITHOUT CFCS, HFCS, HCFCs, PBDES, OR FORMALDEHYDE AND MADE WITH MICROBAN ANTIMICROBIAL PRODUCT PROTECTION. THE INSULATION SHALL HAVE THE FOLLOWING PROPERTIES: |  |  |  |  |  |  |  |  |  |  |  |
| 1. CONFORM TO ASTM E84 25/50 RATINGS FOR FLAME SPREAD AND SMOKE DEVELOPED.   |  |  |  |  |  |  |  |  |  |  |  |
| 2. SINGLE INTERIOR ADHESIVE LINER FOR QUICKER APPLICATION.   |  |  |  |  |  |  |  |  |  |  |  |
| 3. THERMAL CONDUCTIVITY: 0.28 BTU-IN/HR-FT2 AT 75 DEGREES F PER ASTM C177.   |  |  |  |  |  |  |  |  |  |  |  |
| 4. OPERATING TEMPERATURE RANGE: -297 TO 220 DEGREES F.   |  |  |  |  |  |  |  |  |  |  |  |
| 5. WATER VAPOR PERMEABILITY: 0.08 PERMS MAXIMUM FOR 1.5" WALLS PER ASTM E96, PROCEDURE A.  |  |  |  |  |  |  |  |  |  |  |  |
| 6. WATER ABSORPTION: 0.2% BY VOLUME PER ASTM C 209.  |  |  |  |  |  |  |  |  |  |  |  |
| 2.3 PIPE INSULATION JACKETS  |  |  |  |  |  |  |  |  |  |  |  |
| A. PVC PLASTIC PIPE JACKET FOR EXPOSED INDOOR PIPING (JOHNS MANVILLE ZESTON 2000):   |  |  |  |  |  |  |  |  |  |  |  |
| 1. PRODUCT DESCRIPTION: ASTM D1784, ONE PIECE MOLDED TYPE FITTING COVERS AND SHEET MATERIAL, OFF-WHITE COLOR.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. THICKNESS: 15 MIL.  |  |  |  |  |  |  |  |  |  |  |  |
| 3. CONNECTIONS: BRUSH ON WELDING ADHESIVE  |  |  |  |  |  |  |  |  |  |  |  |
| B. ALL SERVICE JACKET W/ SELF SEAL LAP TAPE FOR OUTDOOR PIPING (VENTURETAPE 1541S)   |  |  |  |  |  |  |  |  |  |  |  |
| 1. PRODUCT DESCRIPTION: NON-ADHESIVE KRAFT/SCRIM/FOIL LAMINATE (ASJ) WITH 1-7/32" STRIP OF ACRYLIC ADHESIVE LENGTHWISE ALONG ONE EDGE OF THE SHEET FOR USE AS A SELF-SEAL LAP ACTING AS VAPOR BARRIER JACKET.  |  |  |  |  |  |  |  |  |  |  |  |
| 2. FACING COMPOSITION:   |  |  |  |  |  |  |  |  |  |  |  |
| A. FOIL: ALUMINUM 0.0003 INCH  |  |  |  |  |  |  |  |  |  |  |  |
| B. BARRIER COATING: ELASTOMERIC POLYMER 0.0002 INCH  |  |  |  |  |  |  |  |  |  |  |  |
| C. REINFORCING: TRI-DIRECTIONAL FIBERGLASS: 5/INCH   |  |  |  |  |  |  |  |  |  |  |  |
| D. KRAFT: HIGH INTENSITY WHITE – 45LBS/3000 FT2  |  |  |  |  |  |  |  |  |  |  |  |
| 3. BURSTING STRENGTH: 65 PSI PER ASTM D774   |  |  |  |  |  |  |  |  |  |  |  |
| 4. VAPOR PERMEABILITY: 0.02 PERM   |  |  |  |  |  |  |  |  |  |  |  |



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|   |  |  | DR:   | ZAC | A    | 04/19/2021 | ISSUE FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |  |  |  |  |  |  |   | SCALE:       |
|   |  |  | CHK:  | ZAC | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION     | ZAC  | MC   | MC    |  |  |  |  |  |  |   | SHEET NUMBER |
|   |  |  | APVD: | MC  |      |            |                             |      |      |       |  |  |  |  |  |  |   | H-003        |
|   |  |  |       | MC  |      |            |                             |      |      |       |  |  |  |  |  |  |   |              |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



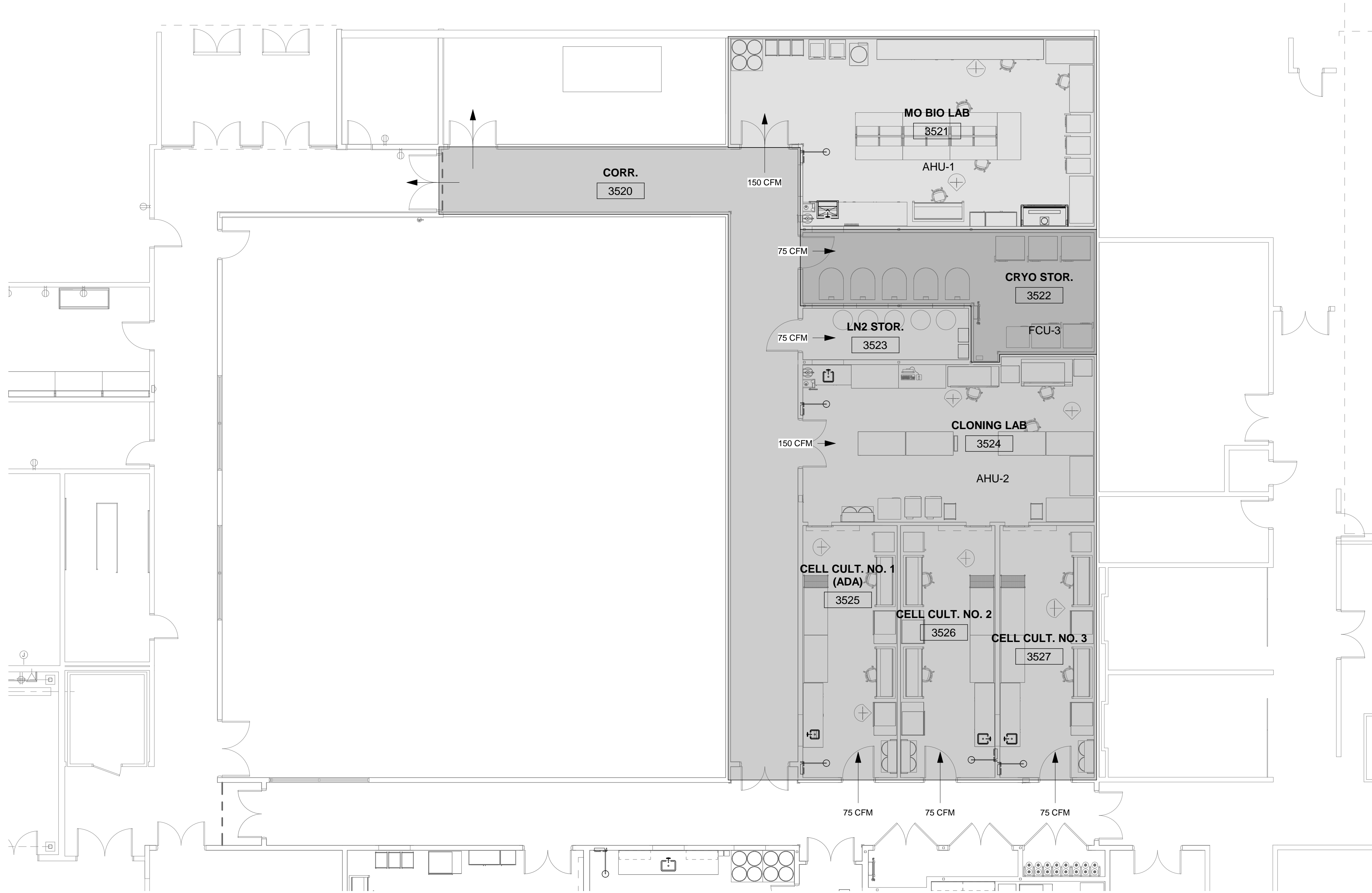
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|---|--|
| 2.4 PIPE INSULATION ACCESSORIES   | C. INSTALL RELIEF VALVES ON EXPANSION TANKS.   |
| A. VAPOR RETARDER LAP ADHESIVE: COMPATIBLE WITH INSULATION.   | D. SELECT SYSTEM RELIEF VALVE CAPACITY GREATER THAN MAKE-UP PRESSURE REDUCING VALVE CAPACITY. SELECT EQUIPMENT RELIEF VALVE CAPACITY TO EXCEED RATING OF CONNECTED EQUIPMENT. INSTALL PIPING FROM RELIEF VALVE OUTLET TO NEAREST ROOF DRAIN.   |
| B. GALVANIZED STEEL INSULATION PROTECTION SHIELD. MSS SP-69, TYPE 40. LENGTH: BASED ON PIPE SIZE AND INSULATION THICKNESS.  | E. SUPPORT PIPING ADJACENT TO PUMP SO NO WEIGHT IS CARRIED ON PUMP CASINGS.  |
| C. ADHESIVES: COMPATIBLE WITH INSULATION.   | F. INSTALL LINE SIZE SHUT-OFF VALVE AND STRAINER ON PUMP SUCTION. INSTALL LINE SIZE SHUT-OFF VALVE ON PUMP DISCHARGE.  |
| PART 3 EXECUTION  | G. INSTALL AIR COCK AND DRAIN CONNECTION ON HORIZONTAL PUMP CASINGS. INSTALL DRAIN PIPING FOR BASES AND SEALS, PIPED TO AND DISCHARGING INTO FLOOR DRAINS. LUBRICATE PUMPS BEFORE START-UP.  |
| 3.1 PREPARATION   | H. CLEANING: <div>1. AFTER COMPLETION, FILL, START, AND VENT PRIOR TO CLEANING. USE WATER METER TO RECORD CAPACITY IN EACH SYSTEM. PLACE TERMINAL CONTROL VALVES IN OPEN POSITION DURING CLEANING.</div> <div>2. ADD CLEANER TO CLOSED SYSTEMS AT CONCENTRATION AS RECOMMENDED BY MANUFACTURER.</div> <div>3. GLYCOL WATER SYSTEMS: CIRCULATE FOR 48 HOURS, THEN DRAIN. REFILL WITH CLEAN WATER, CIRCULATE FOR 24 HOURS, THEN DRAIN. REFILL WITH CLEAN WATER. REPEAT UNTIL SYSTEM CLEANER IS REMOVED.</div> <div>4. FLUSH OPEN SYSTEMS WITH CLEAN WATER FOR ONE-HOUR MINIMUM. DRAIN COMPLETELY AND REFILL.</div> <div>5. REMOVE, CLEAN, AND REPLACE STRAINER SCREENS. DISASSEMBLE SYSTEM COMPONENTS TO INSPECT AND REMOVE SLUDGE. FLUSH LOW POINTS WITH CLEAN WATER AFTER CLEANING PROCESS IS COMPLETED.</div> |
| A. REAM PIPE AND TUBE ENDS. REMOVE BURRS.   | 3.6 INSTALLATION - PIPE HANGERS AND SUPPORTS   |
| B. REMOVE SCALE AND DIRT, ON INSIDE AND OUTSIDE PIPING BEFORE ASSEMBLY.   | A. SUPPORT HORIZONTAL PIPING AS SCHEDULED.   |
| C. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES OR UNIONS.  | B. INSTALL HANGERS WITH MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.  |
| 3.2 INSTALLATION - PIPING SYSTEMS   | C. PLACE HANGERS WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.  |
| A. INSTALL DIELECTRIC CONNECTIONS WHEREVER JOINTING DISSIMILAR METALS   | D. USE HANGERS WITH 1-1/2 INCH MINIMUM VERTICAL ADJUSTMENT.  |
| B. INSTALL UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS.   | E. SUPPORT HORIZONTAL CAST IRON PIPE ADJACENT TO EACH HUB, WITH 5 FEET MAXIMUM SPACING BETWEEN HANGERS.  |
| C. ROUTE PIPING PARALLEL TO BUILDING STRUCTURE AND MAINTAIN GRADIENT.   | F. WHERE PIPING IS INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE PIPE OR TRAPEZE HANGERS.  |
| D. INSTALL PIPING TO MAINTAIN HEADROOM. GROUP PIPING TO CONSERVE SPACE. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.   | G. PROVIDE COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.   |
| E. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.  | H. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.   |
| F. PROVIDE CLEARANCE IN HANGERS AND FROM STRUCTURE AND OTHER EQUIPMENT FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.  | I. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS.  |
| G. SLEEVE PIPE PASSING THROUGH PARTITIONS, WALLS AND FLOORS.  | 3.7 INSTALLATION - PIPING SYSTEMS  |
| H. INSTALL PIPING SYSTEM ALLOWING CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.   | A. PIPING EXPOSED TO VIEW IN FINISHED SPACES: LOCATE INSULATION AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.  |
| I. PROTECT PIPING SYSTEMS FROM ENTRY OF FOREIGN MATERIALS BY TEMPORARY COVERS, COMPLETING SECTIONS OF THE WORK, AND ISOLATING PARTS OF COMPLETED SYSTEM.  | B. CONTINUE INSULATION THROUGH PENETRATIONS OF BUILDING ASSEMBLIES OR PORTIONS OF ASSEMBLIES HAVING FIRE RESISTANCE RATING OF ONE HOUR OR LESS. PROVIDE INTUMESCENT FIRE STOPPING WHEN CONTINUING INSULATION THROUGH ASSEMBLY. FINISH AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.   |
| 3.3 INSTALLATION - VALVES   | C. PIPING SYSTEMS CONVEYING FLUIDS BELOW AMBIENT TEMPERATURE: <div>1. FURNISH FACTORY-APPLIED RETARDER JACKETS. SECURE FACTORY-APPLIED JACKETS WITH SELF-SEALING LONGITUDINAL LAPS AND BUTT STRIPS.</div> <div>2. INSULATE FITTINGS, JOINTS, VALVES, STRAINERS, FLEXIBLE CONNECTIONS, EXPANSION JOINTS, FLANGES, UNIONS, ETC. WITH INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE. FINISH PVC FITTING COVERS INDOORS, ASJ OUTDOORS.</div>   |
| A. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.   | D. PIPING SYSTEMS LESS THAN 140 DEGREES F: <div>1. FURNISH FACTORY-APPLIED RETARDER JACKETS. SECURE FACTORY-APPLIED JACKETS WITH SELF-SEALING LONGITUDINAL LAPS AND BUTT STRIPS.</div> <div>2. INSULATE FITTINGS, JOINTS, VALVES, STRAINERS, FLEXIBLE CONNECTIONS, EXPANSION JOINTS, ETC. WITH INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE. FINISH PVC FITTING COVERS.</div> <div>3. DO NOT INSULATE UNIONS AND FLANGES AT EQUIPMENT, BUT BEVEL AND SEAL ENDS OF INSULATION AT SUCH LOCATIONS.</div>   |
| B. INSTALL GATE, BALL OR BUTTERFLY VALVES FOR SHUT-OFF AND TO ISOLATE EQUIPMENT, PART OF SYSTEMS, OR VERTICAL RISERS.   | E. HOT PIPING SYSTEMS GREATER THAN 140 DEGREES F: <div>1. FURNISH FACTORY-APPLIED RETARDER JACKETS. SECURE FACTORY-APPLIED JACKETS WITH SELF-SEALING LONGITUDINAL LAPS AND BUTT STRIPS.</div> <div>2. INSULATE FITTINGS, JOINTS, VALVES, STRAINERS, FLEXIBLE CONNECTIONS, EXPANSION JOINTS, ETC. WITH I NSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE. FINISH PVC FITTING COVERS.</div> <div>3. INSULATE UNIONS AND FLANGES AT EQUIPMENT.</div>   |
| C. INSTALL GLOBE VALVES FOR THROTTLING, BYPASS, OR MANUAL FLOW CONTROL SERVICES.  | F. INSERTS AND SHIELDS: <div>1. INSTALL GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.</div> <div>2. SHIELD SHALL BE MINIMUM 6 INCHES LONG, OF THICKNESS AND CONTOUR MATCHING ADJOINING INSULATION; MAY BE FACTORY FABRICATED.</div>  |
| D. PROVIDE LUG END BUTTERFLY VALVES ADJACENT TO EQUIPMENT WHEN FUNCTIONING TO ISOLATE EQUIPMENT.  | G. INSULATION TERMINATING POINTS: <div>1. COIL BRANCH PIPING: TERMINATE HOT WATER PIPING AT UNION UPSTREAM OF THE COIL CONTROL VALVE.</div> <div>2. PIPING SYSTEMS CONVEYING FLUIDS ABOVE AMBIENT TEMPERATURE: INSULATE PIPING AND ASSOCIATED COMPONENTS UP TO EQUIPMENT CONNECTION.</div> <div>3. PIPING SYSTEMS CONVEYING FLUIDS BELOW AMBIENT TEMPERATURE: INSULATE ENTIRE PIPING SYSTEM AND COMPONENTS AND SEAL INSULATION AT EQUIPMENT TO PREVENT CONDENSATION.</div>   |
| E. INSTALL SPRING LOADED CHECK VALVES ON DISCHARGE OF PUMPS.  | H. HEAT TRACED PIPING EXTERIOR TO BUILDING: INSULATE FITTINGS, JOINTS, AND VALVES WITH INSULATION OF LIKE MATERIAL, THICKNESS, AND FINISH AS ADJOINING PIPE. SIZE LARGE ENOUGH TO ENCLOSE PIPE AND HEAT TRACER.  |
| F. INSTALL BUTTERFLY VALVES IN CHILLED WATER SYSTEMS AND GLYCOL WATER SYSTEMS, INTERCHANGEABLY WITH GATE AND GLOBE VALVES.  |  |
| G. INSTALL 3/4 INCH BALL DRAIN VALVES WITH INTEGRAL HOSE BIBBS AND CAPS AT MAIN SHUT-OFF VALVES, LOW POINTS OF PIPING, AND AT EQUIPMENT.  |  |
| 3.4 INSTALLATION - PIPING SPECIALTIES   |  |
| A. INSTALL ONE PRESSURE GAGE FOR EACH PUMP, LOCATE TAPS BEFORE STRAINERS AND ON SUCTION AND DISCHARGE OF PUMP; PIPE TO GAGE.  |  |
| B. INSTALL PRESSURE GAGES WITH PULSATION DAMPERS. PROVIDE NEEDLE VALVE OR BALL VALVE TO ISOLATE EACH GAGE. INSTALL SIPHON ON GAGES IN STEAM SYSTEMS. EXTEND NIPPLES AND SIPHONS TO ALLOW CLEARANCE FROM INSULATION. |  |
| C. INSTALL THERMOMETERS IN PIPING SYSTEMS IN SOCKETS IN SHORT COUPLINGS. ENLARGE PIPES SMALLER THAN 2-1/2 INCHES FOR INSTALLATION OF THERMOMETER SOCKETS. ALLOW CLEARANCE FROM INSULATION.                          |  |
| D. INSTALL GAGES AND THERMOMETERS IN LOCATIONS WHERE THEY ARE EASILY READ FROM NORMAL OPERATING LEVEL. INSTALL VERTICAL TO 45 DEGREES OFF VERTICAL.   |  |
| E. ADJUST GAGES AND THERMOMETERS TO FINAL ANGLE, CLEAN WINDOWS AND LENSES, AND CALIBRATE TO ZERO.   |  |
| F. INSTALL MANUAL AIR VENTS AT SYSTEM HIGH POINTS.  |  |
| G. INSTALL AIR SEPARATOR ON SUCTION SIDE OF SYSTEM CIRCULATION PUMP AND CONNECT TO EXPANSION TANK.  |  |
| H. PROVIDE DRAIN AND HOSE CONNECTION WITH VALVE ON STRAINER BLOW DOWN CONNECTION.   |  |
| I. PIPE RELIEF VALVE OUTLET TO ROOF.  |  |
| 3.5 INSTALLATION - HEATING AND COOLING PIPING   |  |
| A. INSTALL STEAM, CHILLED WATER AND GLYCOL WATER PIPING IN ACCORDANCE WITH ASME B31.9.  |  |
| B. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN AT LOW POINTS. USE ECCENTRIC REDUCERS TO MAINTAIN TOP OF PIPE LEVEL.   |  |

|   |  |  |       |     |      |            |                             |      |      |       |  |  |  |              |                  |           |       |  |  |  |
|---|--|--|-------|-----|------|------------|-----------------------------|------|------|-------|--|--|--|--------------|------------------|-----------|-------|--|--|--|
| <div><div><b>HART DESIGN GROUP</b><br/>800 SCENIC VIEW DRIVE   T: (401) 658-4600<br/>CUMBERLAND, RI 02864   F: (401) 658-4609<br/><br/>A MEMBER OF THE HART COMPANIES    WWW.HARTCOMPANIES.COM</div></div> | <div><div><b>cytiva</b><br/>100 RESULTS WAY<br/>MARLBOROUGH, MA 01752</div></div> | GENERAL NOTE:<br>ALL CONTRACTED PARTIES ARE<br>REQUIRED TO REVIEW ALL<br>CONTRACT DOCUMENTS,<br>INCLUDING CONTRACT<br>DRAWINGS AND/OR PROJECT<br>SPECIFICATIONS, FOR ALL<br>DISCIPLINES TO ASCERTAIN THE<br>COMPLETE SCOPE OF WORK FOR<br>THE PROJECT. | DSGN: |     | REV. | DATE       | REVISION DESCRIPTION        | DWG. | CHK. | APVD. |  |  | CLD & CCM LABS<br>HVAC<br>SPECIFICATIONS | ISSUE DATE:  |                  |           |       |  |  |  |
|   |  |  | DR:   | ZAC | A    | 04/19/2021 | ISSUE FOR 90% CLIENT REVIEW | ZAC  | MC   | MC    |  |  |  | SCALE:       |                  |           |       |  |  |  |
|   |  |  | CHK:  | MC  | 0    | 06/10/2021 | ISSUED FOR CONSTRUCTION     | ZAC  | MC   | MC    |  |  |  | SHEET NUMBER |                  |           |       |  |  |  |
|   |  |  |       |     |      |            |                             |      |      |       |  |  |  |              |                  |           | H-004 |  |  |  |
|   |  |  |       |     |      |            |                             |      |      |       |  |  |  |              | PROJ. NO: 20021A | CAD FILE: |       |  |  |  |




IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"



1 PARTIAL THIRD FLOOR PLAN - ZONE PLAN WEST  
1/8" = 1'-0"



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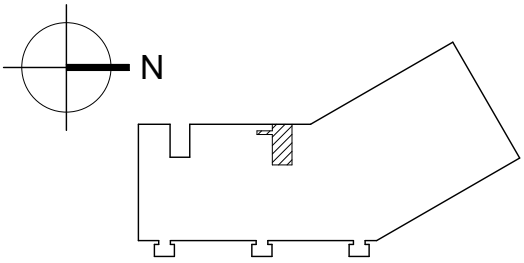


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MARLBOROUGH, MA 01752

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| RRM   | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | RRM  | MDC  |       |
| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| RRM   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MDC  | MDC   |
| CHK:  | MDC  |          |                              |      |      |       |
| APVD: |      |          |                              |      |      |       |
| MDC   |      |          |                              |      |      |       |



CLD & CCM LABS  
HVAC  
ZONE PLAN WEST

PROJ. NO: 20021A CAD FILE:

ISSUE DATE:  
SCALE: 1/8" = 1'-0"  
SHEET NUMBER  
**H-101**

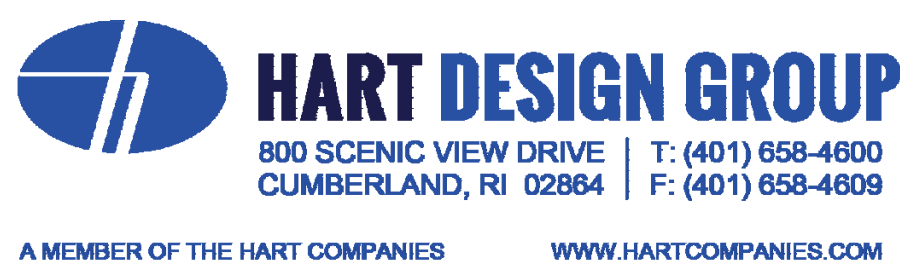




IF NOT ONE INCH ON THIS SHEET,  
ADJUST SCALES ACCORDINGLY.

0"  1"

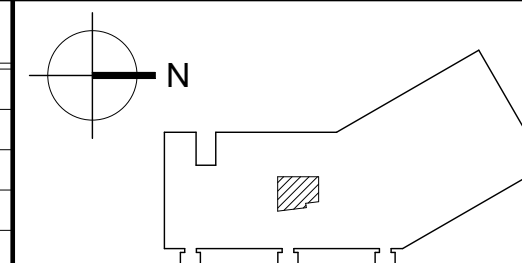
BAR IS ONE INCH ON  
ORIGINAL DRAWING



**GENERAL NOTE:**

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| DSGN: |     | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|-----|------|----------|------------------------------|------|------|-------|
| DR:   | RRM | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | RRM  | MDC  |       |
|       | RRM | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| CHK:  |     | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MDC  | MDC   |
|       | MDC |      |          |                              |      |      |       |
| APVD: |     |      |          |                              |      |      |       |
|       | MDC |      |          |                              |      |      |       |



CLD & CCM LABS  
HVAC  
ZONE PLAN EAST

|                  |           |
|------------------|-----------|
| PROJ. NO: 20021A | CAD FILE: |
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|              |              |
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| ISSUE DATE:  |              |
| SCALE:       | 1/8" = 1'-0" |
| SHEET NUMBER | H-102        |

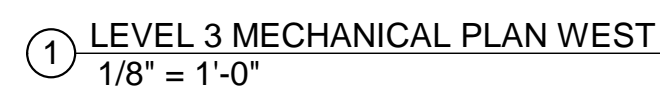
E:  $1/8" = 1'-0"$

SHEET NUMBER

H-102



BAR IS ONE INCH ON  
ORIGINAL DRAWING



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|                  |           |
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| PROJ. NO: 20021A | CAD FILE: |
|------------------|-----------|

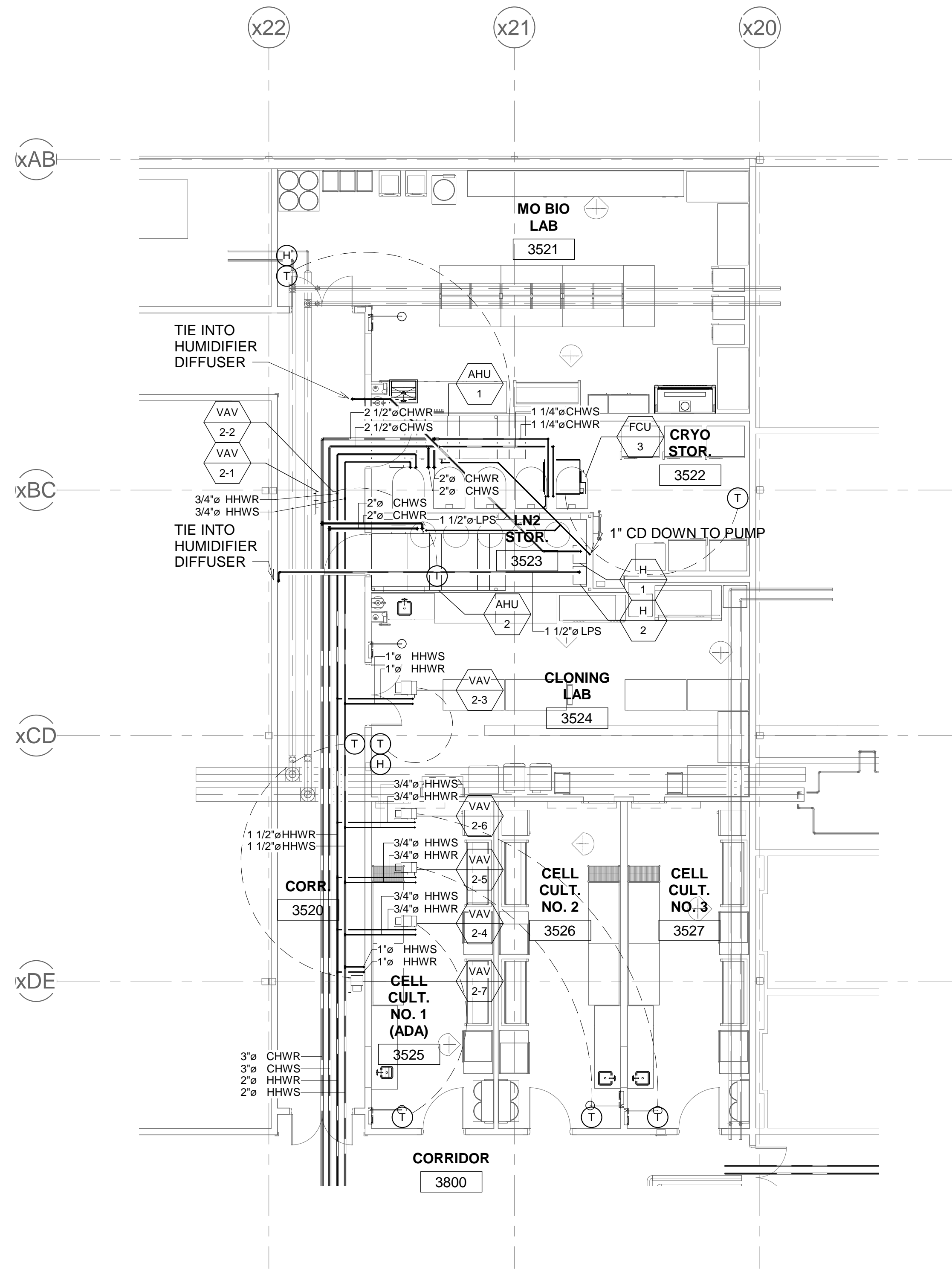
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|--------------|--------------|
| ISSUE DATE:  |              |
| SCALE:       | 1/8" = 1'-0" |
| SHEET NUMBER |              |
| H-103        |              |




IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1"

BAR IS ONE INCH ON ORIGINAL DRAWING





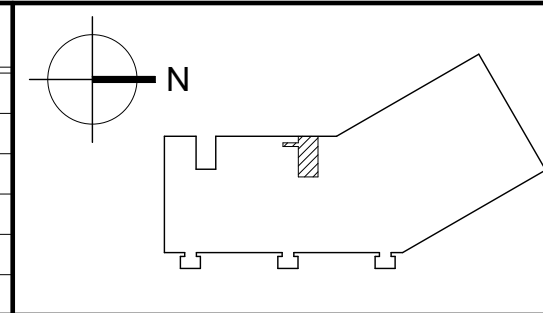
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COMPLETE SCOPE OF WORK FOR  
THE PROJECT.

| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| RRM   | A    | 03-22-21 | ISSUED FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| RRM   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MC   | MC    |
| CHK:  | MDC  |          |                              |      |      |       |
| APVD: | MC   |          |                              |      |      |       |



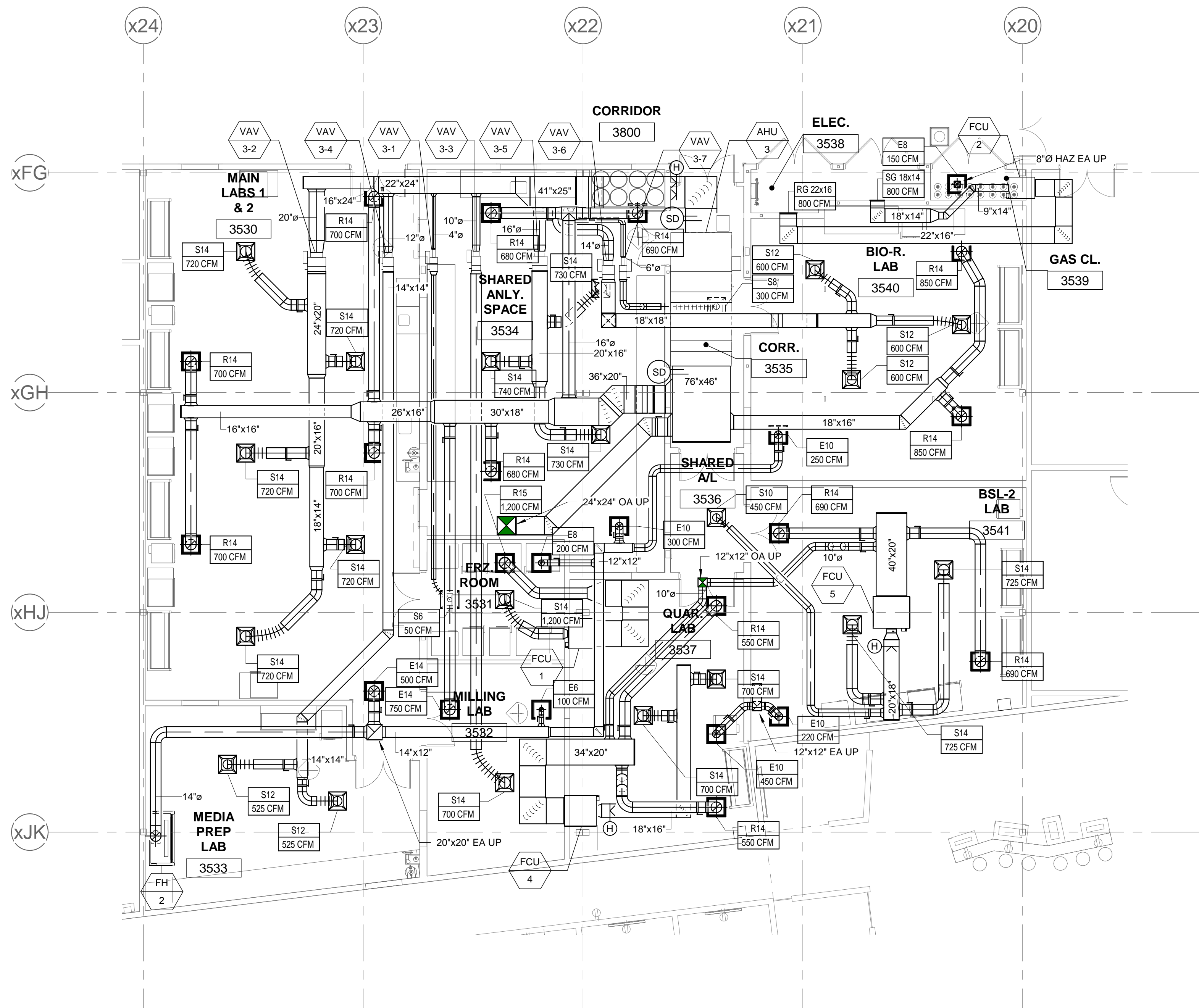
CLD & CCM LABS  
HVAC  
HVAC HYDRONIC PLAN WEST

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE:  
SCALE: 1/8" = 1'-0"

SHEET NUMBER  
H-103.1





LEVEL 3 MECHANICAL PLAN EAST  
1/8" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"

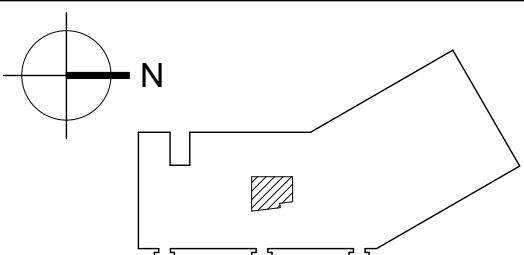
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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| RRM   | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | RRM  | MDC  |       |
| RRM   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| MDC   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MC   | MC    |
| APVD: |      |          |                              |      |      |       |
| MC    |      |          |                              |      |      |       |



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HVAC  
HVAC PLAN EAST

ISSUE DATE:  
SCALE: 1/8" = 1'-0"  
SHEET NUMBER  
**H-104**

PROJ. NO: 20021A CAD FILE:




$$0^* \quad 1''$$

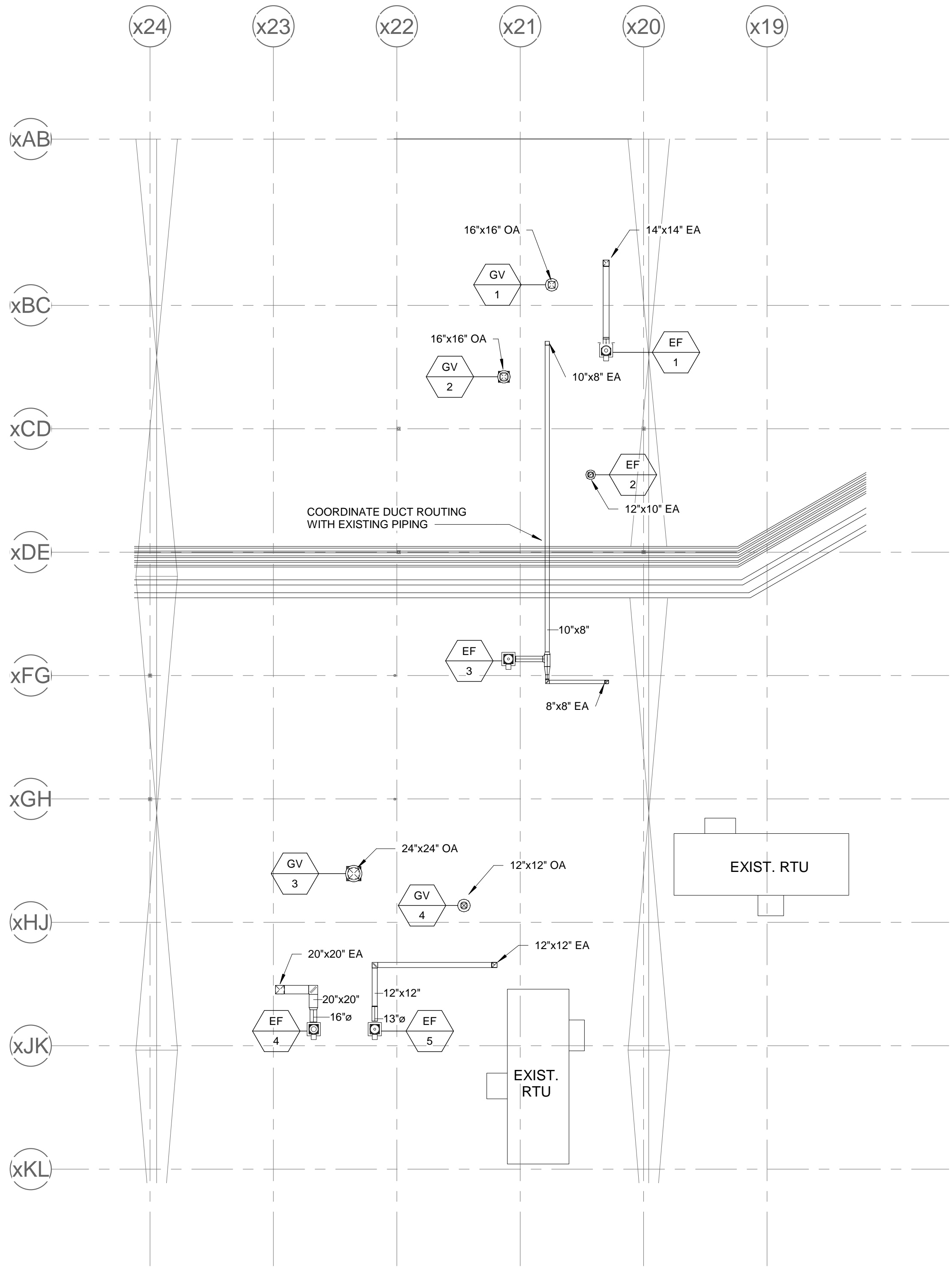

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| PROJ. NO: 20021A | CAD FILE: |
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| ISSUE DATE:  |              |
| SCALE:       | 1/8" = 1'-0" |
| SHEET NUMBER |              |
|              | H-104.1      |



BAR IS ONE INCH ON ORIGINAL DRAWING  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1'

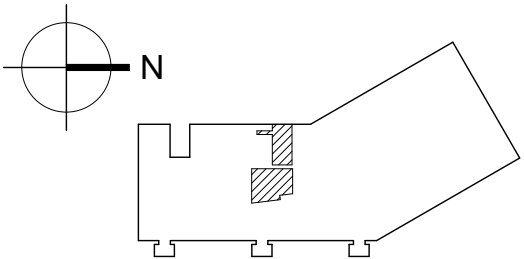


1 ROOF MECHANICAL PLAN  
1/16" = 1'-0"

GENERAL NOTE:

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| DSGN: | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|-------|------|----------|------------------------------|------|------|-------|
| RRM   | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | RRM  | MDC  |       |
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| RRM   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MC   | MC    |
| CHK:  | MDC  |          |                              |      |      |       |
| APVD: | MC   |          |                              |      |      |       |





IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0"

1"

| AHU SCHEDULE 1 |         |            |                          |                       |             |             |               |       |       |         |                       |             |           |               |                               |                              |         |         |      |
|----------------|---------|------------|--------------------------|-----------------------|-------------|-------------|---------------|-------|-------|---------|-----------------------|-------------|-----------|---------------|-------------------------------|------------------------------|---------|---------|------|
| DES.           | MODEL   | AIRFLOW    | FAN                      |                       |             |             |               |       |       |         | ELECTRIC HEATING COIL |             |           |               |                               |                              |         |         |      |
|                |         |            | EXTERNAL STATIC PRESSURE | TOTAL STATIC PRESSURE | MOTOR POWER | BRAKE POWER | MOTOR VOLTAGE | PHASE | FLA   | MCA     | MOP                   | HEAT OUTPUT | FACE AREA | FACE VELOCITY | ENTERING DRY BULB TEMPERATURE | LEAVING DRY BULB TEMPERATURE | FLA     | MCA     | MOP  |
| AHU-1          | CSIA008 | 3,000 CFM  | 3 in-wg                  | 5.13 in-wg            | 5 hp        | 3.89 hp     | 460 V         | 3     | 8.2 A | 10.25 A | 15 A                  | 18.0 kW     | 6 SF      | 466 FPM       | 33 °F                         | 52 °F                        | 22.85 A | 28.51 A | 30 A |
| AHU-2          | CSIA012 | 6,000 CFM  | 3 in-wg                  | 5.62 in-wg            | 10 hp       | 8.76 hp     | 460 V         | 3     | 14 A  | 17.5 A  | 30 A                  | 22.7 kW     | 11 SF     | 569 FPM       | 40 °F                         | 52 °F                        | 38.80 A | 35.95 A | 40 A |
| AHU-3          | CSIA021 | 10,000 CFM | 3 in-wg                  | 5.65 in-wg            | 15 hp       | 13.59 hp    | 460 V         | 3     | 21 A  | 26.25 A | 45 A                  | 31.6 kW     | 17 SF     | 572 FPM       | 42 °F                         | 52 °F                        | 39.9 A  | 49.8 A  | 50 A |

| AHU SCHEDULE (CONTINUED) |               |           |               |       |                               |                               |                              |                              |                |                   |                            |                           |              |           |               |      |                               |                              |                |                            |                           |                 |                  |         |  |
|--------------------------|---------------|-----------|---------------|-------|-------------------------------|-------------------------------|------------------------------|------------------------------|----------------|-------------------|----------------------------|---------------------------|--------------|-----------|---------------|------|-------------------------------|------------------------------|----------------|----------------------------|---------------------------|-----------------|------------------|---------|--|
| DES.                     | COOLING COIL  |           |               |       |                               |                               |                              |                              |                |                   |                            |                           | HEATING COIL |           |               |      |                               |                              |                |                            |                           | SHIPPING WEIGHT | OPERATING WEIGHT | REMARKS |  |
|                          | SYSTEM TYPE   | FACE AREA | FACE VELOCITY | RO WS | ENTERING DRY BULB TEMPERATURE | ENTERING WET BULB TEMPERATURE | LEAVING DRY BULB TEMPERATURE | LEAVING WET BULB TEMPERATURE | TOTAL CAPACITY | SENSIBLE CAPACITY | ENTERING FLUID TEMPERATURE | LEAVING FLUID TEMPERATURE | SYSTEM TYPE  | FACE AREA | FACE VELOCITY | ROWS | ENTERING DRY BULB TEMPERATURE | LEAVING DRY BULB TEMPERATURE | TOTAL CAPACITY | ENTERING FLUID TEMPERATURE | LEAVING FLUID TEMPERATURE |                 |                  |         |  |
| AHU-1                    | Chilled water | 8 SF      | 376 FPM       | 6     | 79 °F                         | 69 °F                         | 52 °F                        | 51.9 °F                      | 158,870 Btu/h  | 89,570 Btu/h      | 45 °F                      | 55 °F                     | Hot water    | 7 SF      | 410 FPM       | 1    | 52 °F                         | 75 °F                        | 74,830 Btu/h   | 155 °F                     | 135 °F                    | 2151.73 lb      | 2211.43 lb       | (1)     |  |
| AHU-2                    | Chilled water | 12 SF     | 488 FPM       | 6     | 76 °F                         | 67 °F                         | 52 °F                        | 51.9 °F                      | 274,190 Btu/h  | 159,000 Btu/h     | 45 °F                      | 55 °F                     |              |           |               |      |                               |                              |                |                            |                           | 2531.47 lb      | 2598.87 lb       | (1)     |  |
| AHU-3                    | Chilled water | 21 SF     | 481 FPM       | 6     | 77 °F                         | 67 °F                         | 52 °F                        | 51.9 °F                      | 456,620 Btu/h  | 275,930 Btu/h     | 45 °F                      | 55 °F                     |              |           |               |      |                               |                              |                |                            |                           | 3731.21 lb      | 3847.31 lb       | (1)     |  |

1. PROVIDE AND INSTALL 3/4" SUPER W WAFFLE PAD UNDER AIR HANDLER BASE.

| FAN COIL UNIT SCHEDULE |          |           |         |            |             |             |         |       |        |        |      |              |              |       |       |          |          |       |          |           |         |                |       |       |        |        |           |         |           |              |             |
|------------------------|----------|-----------|---------|------------|-------------|-------------|---------|-------|--------|--------|------|--------------|--------------|-------|-------|----------|----------|-------|----------|-----------|---------|----------------|-------|-------|--------|--------|-----------|---------|-----------|--------------|-------------|
| DES.                   | MODEL    | AIRFLOW   | FAN     |            |             |             |         |       |        |        |      | COOLING COIL |              |       |       |          |          |       |          |           |         | HEATING COIL   |       |       |        |        |           |         |           | OPER. WEIGHT | SHIP WEIGHT |
|                        |          |           | ESP     | TSP        | MOTOR POWER | BRAKE POWER | VOLTAGE | PHASE | FLA    | MCA    | MOP  | TOT. CAP.    | SENS. CAP.   | EDB   | EWB   | LDB      | LWB      | EWT   | LWT      | FLOW RATE | PD      | TOTAL CAPACITY | EAT   | LAT   | EWT    | LWT    | FLOW RATE | PD      |           |              |             |
| FCU-1                  | BCHC036G | 1,200 CFM | 1 in-wg | 1.85 in-wg | 1.0 hp      | 0.65 hp     | 460 V   | 3     | 2.50 A | 3.13 A | 15 A | 35,150 Btu/h | 25,000 Btu/h | 72 °F | 63 °F | 53.07 °F | 52.95 °F | 45 °F | 57.69 °F | 5.53 GPM  | 7.06 FT |                |       |       |        |        |           |         |           | 175.60 lb    | 165.60 lb   |
| FCU-2                  | BCHC024G | 800 CFM   | 1 in-wg | 1.75 in-wg | 1.0 hp      | 0.40 hp     | 460 V   | 3     | 2.50   | 3.13 A | 15 A | 11,510 Btu/h | 11,510 Btu/h | 72 °F | 63 °F | 58.37 °F | 58.27 °F | 45 °F | 62.74 °F | 1.29 GPM  | 0.41 FT |                |       |       |        |        |           |         |           | 146.10 lb    | 139.30 lb   |
| FCU-3                  | BCHC054G | 1,400 CFM | 1 in-wg | 1.65 in-wg | 1.0 hp      | 0.63 hp     | 460 V   | 3     | 2.50 A | 3.13 A | 15 A | 47,660 Btu/h | 32,000 Btu/h | 72 °F | 63 °F | 51.23 °F | 51.13 °F | 45 °F | 54.03 °F | 10.53 GPM | 4.48 FT |                |       |       |        |        |           |         |           | 241.80 lb    | 219.40 lb   |
| FCU-4                  | BCHC054G | 1,400 CFM | 1 in-wg | 1.74 in-wg | 1.0 hp      | 0.68 hp     | 460 V   | 3     | 2.50 A | 3.13 A | 15 A | 54,040 Btu/h | 32,420 Btu/h | 73 °F | 65 °F | 52 °F    | 51.9 °F  | 45 °F | 54.92 °F | 10.86 GPM | 4.73 FT | 36,440 Btu/h   | 51 °F | 75 °F | 155 °F | 120 °F | 2.11 GPM  | 0.08 FT | 264.20 lb | 237.00 lb    |             |
| FCU-5                  | BCHC072G | 1,900 CFM | 1 in-wg | 1.86 in-wg | 1.0 hp      | 0.97 hp     | 460 V   | 3     | 2.50 A | 3.13 A | 15 A | 79,890 Btu/h | 48,210 Btu/h | 75 °F | 66 °F | 52 °F    | 51.9 °F  | 45 °F | 55.44 °F | 15.25 GPM | 9.96 FT | 49,450 Btu/h   | 51 °F | 75 °F | 155 °F | 116 °F | 2.54 GPM  | 0.12 FT | 298.60 lb | 266.00 lb    |             |

| VAV TERMINAL UNITS |     |               |      |             |             |       |       |                  |        |        |              |       |
|--------------------|-----|---------------|------|-------------|-------------|-------|-------|------------------|--------|--------|--------------|-------|
| EQUIPMENT          | NO. | SERVING       | SIZE | MAX AIRFLOW | MIN AIRFLOW | EAT   | LAT   | HEATING COIL     |        |        | MANUFACTURER | MODEL |
|                    |     |               |      |             |             |       |       | HEATING CAPACITY | EWT    | LWT    |              |       |
| VAV                | 2-1 | CRYO STOR     | 4    | 75 CFM      | 75 CFM      | 52 °F | 52 °F | 0 Btu/h          |        |        | TRANE        | VCCF  |
| VAV                | 2-2 | LN2 STOR      | 4    | 75 CFM      | 75 CFM      | 52 °F | 78 °F | 2,150 Btu/h      | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 2-3 | CLONING LAB   | 12   | 2,000 CFM   | 2,000 CFM   | 52 °F | 78 °F | 35,600 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 2-4 | CELL CULT 1   | 8    | 900 CFM     | 900 CFM     | 52 °F | 78 °F | 16,600 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 2-5 | CELL CULT 2   | 8    | 900 CFM     | 900 CFM     | 52 °F | 78 °F | 16,600 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 2-6 | CELL CULT 3   | 8    | 900 CFM     | 900 CFM     | 52 °F | 78 °F | 16,600 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 2-7 | CORRIDOR 3520 | 10   | 975 CFM     | 975 CFM     | 52 °F | 78 °F | 27,700 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 3-1 | FREEZER ROOM  | 4    | 50 CFM      | 50 CFM      | 52 °F | 52 °F | 0 Btu/h          |        |        | TRANE        | VCCF  |
| VAV                | 3-2 | MAIN LABS     | 16   | 3,600 CFM   | 3,600 CFM   | 52 °F | 78 °F | 80,000 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 3-3 | MILLING LAB   | 8    | 700 CFM     | 700 CFM     | 52 °F | 78 °F | 20,000 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 3-4 | MEDIA PREP    | 10   | 1,050 CFM   | 1,050 CFM   | 52 °F | 78 °F | 22,700 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 3-5 | SHARED ANLNY  | 14   | 2,200 CFM   | 2,200 CFM   | 52 °F | 78 °F | 62,400 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 3-6 | BIO-R LAB     | 12   | 1,800 CFM   | 1,800 CFM   | 52 °F | 78 °F | 44,000 Btu/h     | 155 °F | 135 °F | TRANE        | VCWF  |
| VAV                | 3-7 | CORRIDOR 3535 | 5    | 300 CFM     | 300 CFM     | 52 °F | 78 °F | 8,500 Btu/h      | 155 °F | 135 °F | TRANE        | VCWF  |

| GRILLE REGISTER AND DIFFUSER SCHEDULE |                  |            |                |           |       |
|---------------------------------------|------------------|------------|----------------|-----------|-------|
| TYPE                                  | MANUFACTURER     | MODEL      | NECK SIZE (IN) | FACE SIZE | COUNT |
| E6                                    | Price Industries | PDDRE      | 6 Ø            | 24 x 24   | 4     |
| E8                                    | Price Industries | PDDRE      | 8 Ø            | 24 x 24   | 5     |
| E10                                   | Price Industries | PDDRE      | 10 Ø           | 24 x 24   | 4     |
| E14                                   | Price Industries | PDDRE      | 14 Ø           | 24 x 24   | 2     |
| R14                                   | Price Industries | PDDRE      | 14 Ø           | 24 x 24   | 23    |
| R15                                   | Price Industries | PDDRE      | 15 Ø           | 24 x 24   | 1     |
| RG 22x16                              | Price Industries | 80 Series  | 22 x 16        | 22 x 16   | 1     |
| RG 34x20                              | Price Industries | 80 Series  | 34 x 20        | 34 x 20   | 1     |
| S6                                    | Price Industries | SCD        | 6 Ø            | 24 x 24   | 3     |
| S8                                    | Price Industries | SCD        | 8 Ø            | 24 x 24   | 1     |
| S10                                   | Price Industries | SCD        | 10 Ø           | 24 x 24   | 10    |
| S12                                   | Price Industries | SCD        | 12 Ø           | 24 x 24   | 5     |
| S14                                   | Price Industries | SCD        | 14 Ø           | 24 x 24   | 21    |
| SG 18x14                              | Price Industries | 510 Series | 18 x 14        | 18 x 14   | 1     |
| SG 20x18                              | Price Industries | 510 Series | 20 x 18        | 20 x 18   | 1     |


| GRAVITY VENTILATOR SCHEDULE |           |             |              |               |              |         |
|-----------------------------|-----------|-------------|--------------|---------------|--------------|---------|
| DES.                        | AIRFLOW   | APPLICATION | ROOF OPENING | PRESSURE DROP | MANUFACTURER | MODEL   |
| GV-1                        | 1,050 CFM | Intake      | 18.5"x18.5"  | 0.14 in-wg    | Greenheck    | GRSI-15 |
| GV-2                        | 1,280 CFM | Intake      | 18.5"x18.5"  | 0.12 in-wg    | Greenheck    | GRSI-16 |
| GV-3                        | 2,400 CFM | Intake      | 26.5"x26.5"  | 0.1 in-wg     | Greenheck    | GRSI-24 |
| GV-4                        | 670 CFM   | Intake      | 14.5"x14.5"  | 0.11 in-wg    | Greenheck    | GRSI-12 |

| EXHAUST FAN SCHEDULE |           |            |            |         |         |            |            |            |         |       |              |             |        |
|----------------------|-----------|------------|------------|---------|---------|------------|------------|------------|---------|-------|--------------|-------------|--------|
| DES.                 | AIRFLOW   | ESP        | TOTAL ESP  | FAN RPM | BHP     | MOTOR SIZE | MOTOR TYPE | DRIVE TYPE | VOLTAGE | PHASE | MANUFACTURER | MODEL       | WEIGHT |
| EF-1                 | 1,200 CFM | 0.35 in-wg | 0.35 in-wg | 2729    | 0.76 hp | 1.00 hp    | VARI-GREEN | Belt       | 460 V   | 3     | Greenheck    | VEKTOR-H-10 | 333 lb |
| EF-2                 | 530 CFM   | 0.12 in-wg | 0.12 in-wg | 1300    | 0.03 hp | 0.04 hp    |            | Direct     | 115 V   | 1     | Greenheck    | G-090-G     | 28 lb  |
| EF-3                 | 450 CFM   | 0.41 in-wg | 0.41 in-wg | 1940    | 0.29 hp | 0.75 hp    | VARI-GREEN | Belt       | 460 V   | 3     | Greenheck    | VEKTOR-H-10 | 291 lb |
| EF-4                 | 2,550 CFM | 0.47 in-wg | 0.47 in-wg | 2893    | 2.34 hp | 3.00 hp    | VARI-GREEN | Belt       | 460 V   | 3     | Greenheck    | VEKTOR-H-12 | 380 lb |
| EF-5                 | 520 CFM   | 0.28 in-wg | 0.28 in-wg | 2176    | 0.36 hp | 0.75 hp    | VARI-GREEN | Belt       | 460 V   | 3     | Greenheck    | VEKTOR-H-9  | 291 lb |

| FUME HOOD SCHEDULE |                 |                    |           |         |     |                    |         |                |         |
|--------------------|-----------------|--------------------|-----------|---------|-----|--------------------|---------|----------------|---------|
| DES.               | HOOD TYPE       | REQUIRED UTILITIES | AIRFLOW   | VOLTAGE | AMP | MANUFACTURER       | MODEL   | ASSOCIATED FAN | REMARKS |
| FH-1               | CONSTANT VOLUME | LA, VAC            | 1,200 CFM | 120     | 20A | MOTT MANUFACTURING | 7423040 | EF-1           | (1)     |
| FH-2               | CONSTANT VOLUME | LA, VAC            | 1,200 CFM | 120     | 20A | MOTT MANUFACTURING | 7423040 | EF-4           | (1)     |

1. INCLUDE SERVICE FIXTURES FOR REQUIRED UTILITIES

| HUMIDIFIER SCHEDULE |                  |                                     |   |                                    |  |                            |                                |                      |           |           |        |      |         |       |         |               |  |
|---------------------|------------------|-------------------------------------|---|------------------------------------|--|----------------------------|--------------------------------|----------------------|-----------|-----------|--------|------|---------|-------|---------|---------------|--|
| DES.                | MIXED AIR VOLUME | BEFORE HUMIDIFICATION DRY BULB TEMP | BEFORE HUMIDIFICATION RELATIVE HUMIDITY | AFTER HUMIDIFICATION DRY BULB TEMP | AFTER HUMIDIFICATION RELATIVE HUMIDITY | DESIGN SPACE DRY BULB TEMP | DESIGN SPACE RELATIVE HUMIDITY | TOTAL HUMIDIFICATION | CAPACITY  | FILL RATE | MCA    | MOP  | VOLTAGE | PHASE | MANUF   | MODEL         |  |
| H-1                 | 3,000 CFM        | 55 °F                               | 50%                                     | 55 °F                              | 76%                                    | 70 °F                      | 45%                            | 33 LBS/HR            | 45 LBS/HR | 0.5 GPM   | 18.5 A | 25 A | 480 V   | 3     | CONDAIR | NORTEC RS 045 |  |
| H-2                 | 5,825 CFM        | 55 °F                               | 60%                                     | 55 °F                              | 76%                                    | 70 °F                      | 45%                            | 40 LBS/HR            | 45 LBS/HR | 0.5 GPM   | 18.5 A | 25 A | 480 V   | 3     | CONDAIR | NORTEC RS 045 |  |
| H-3                 | 9,700 CFM        | 55 °F                               | 58%                                     | 55 °F                              | 76%                                    | 70 °F                      | 45%                            | 75 LBS/HR            | 90 LBS/HR | 0.5 GPM   | 38.7 A | 50 A | 480 V   | 3     | CONDAIR | NORTEC RS 090 |  |
| H-4                 | 1,400 CFM        | 55 °F                               | 53%                                     | 55 °F                              | 68%                                    | 70 °F                      | 40%                            | 8 LBS/HR             | 15 LBS/HR | 0.3 GPM   | 6.0 A  | 15 A | 480 V   | 3     | CONDAIR | NORTEC RS 015 |  |
| H-5                 | 1,900 CFM        | 55 °F                               | 55%                                     | 55 °F                              | 68%                                    | 70 °F                      | 40%                            | 10 LBS/HR            | 15 LBS/HR | 0.3 GPM   | 6.0 A  | 15 A | 480 V   | 3     | CONDAIR | NORTEC RS 015 |  |



**HART DESIGN GROUP**

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GENERAL NOTE:  
ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS, FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

|       |     |      |          |                              |      |      |       |
|-------|-----|------|----------|------------------------------|------|------|-------|
| DSGN: | RRM | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
| DR:   | RRM | A    | 03-22-21 | ISSUED FOR 60% CLIENT REVIEW | RRM  | MDC  |       |
| CHK:  | MDC | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| APVD: | MC  | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MC   | MC    |
|       |     |      |          |                              |      |      |       |
|       |     |      |          |                              |      |      |       |

CLD & CCM LABS  
HVAC  
HVAC SCHEDULES

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE:

SCALE:

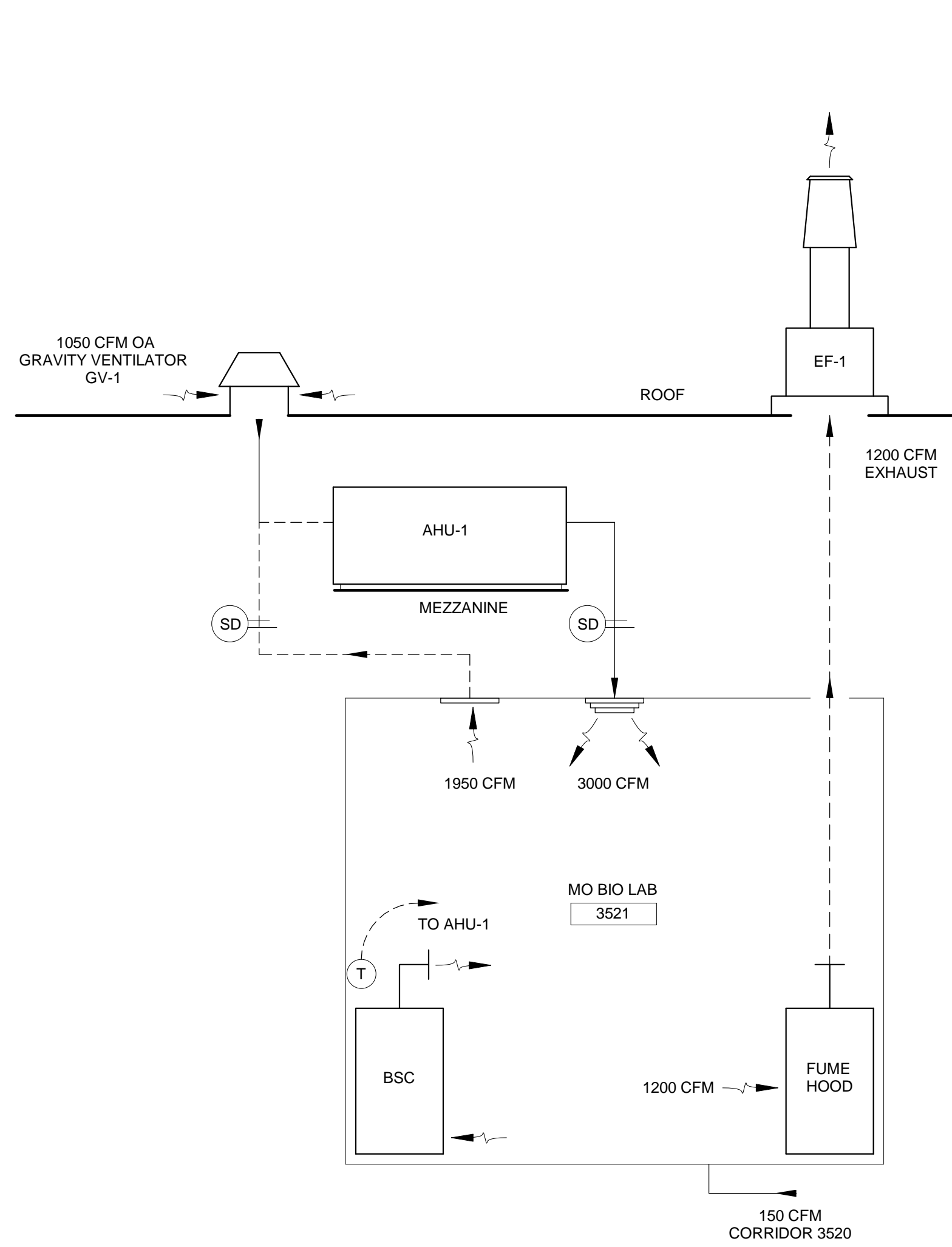
SHEET NUMBER

H-501

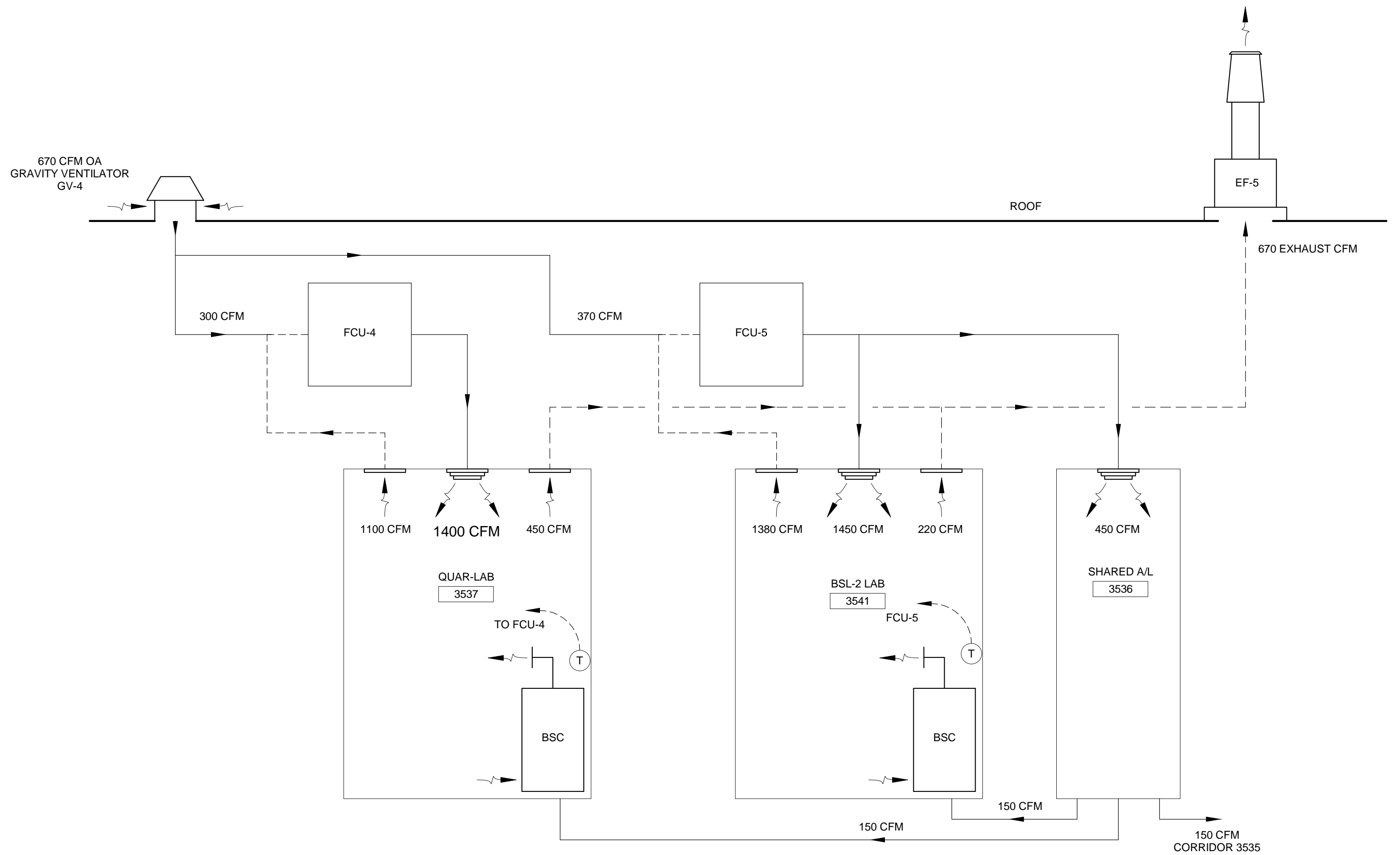


BAR IS ONE INCH ON ORIGINAL DRAWING  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1"



① AHU-1 AIRFLOW DIAGRAM



② QUAR. LABS AIRFLOW DIAGRAM

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| RRM   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MC   | MC    |
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| APVD: | MC   |          |                              |      |      |       |

ISSUE DATE:

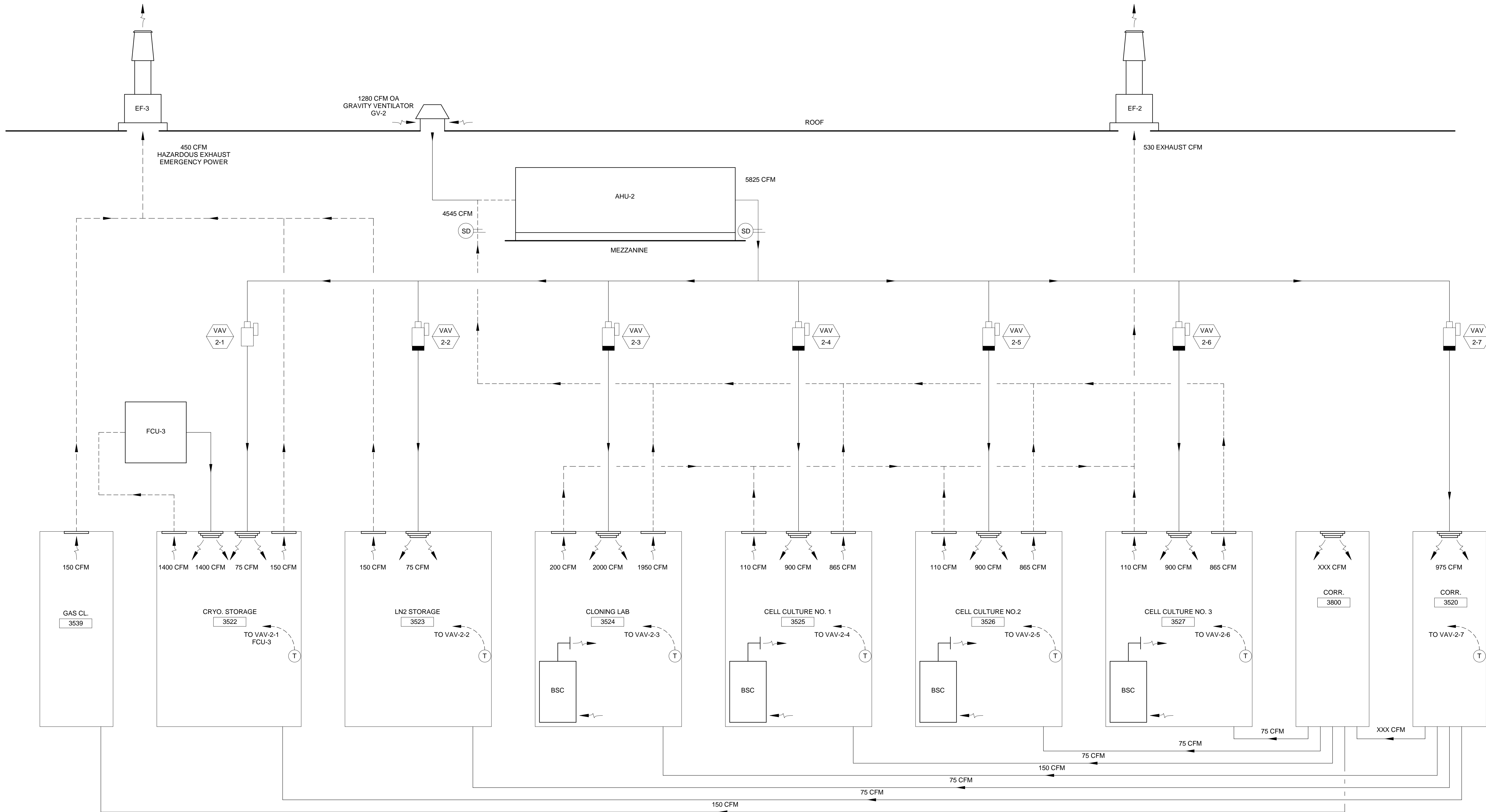
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0' 1"



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|-------|------|----------|------------------------------|------|------|-------|
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| DR:   | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| RRM   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | GHS  | MC   | MC    |
| CHK:  | MDC  |          |                              |      |      |       |
| APVD: | MC   |          |                              |      |      |       |

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AIRFLOW DIAGRAM

PROJ. NO: 20021A CAD FILE:

ISSUE DATE:

SCALE: .

SHEET NUMBER

H-602





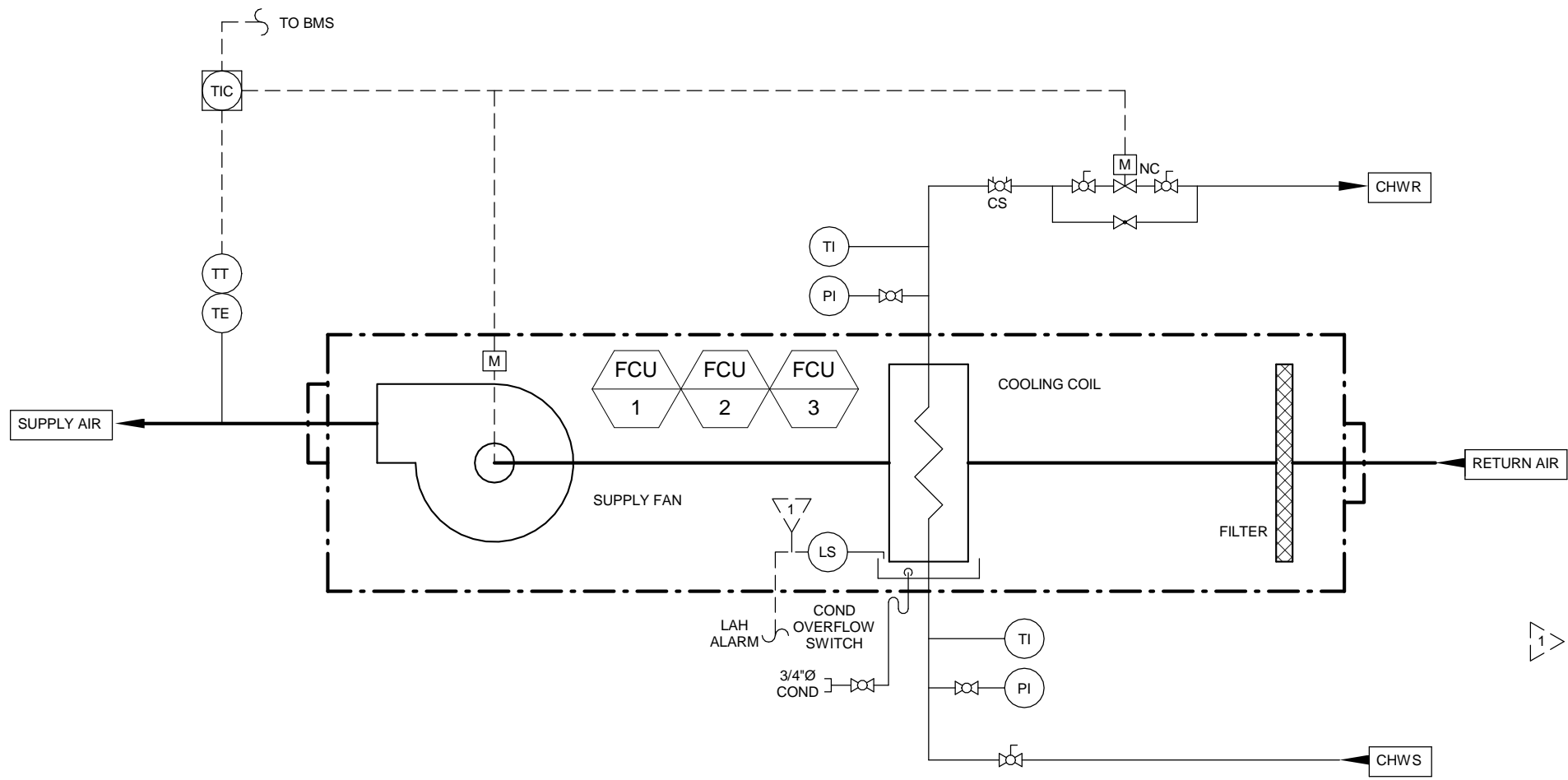




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0' 1" = 1"

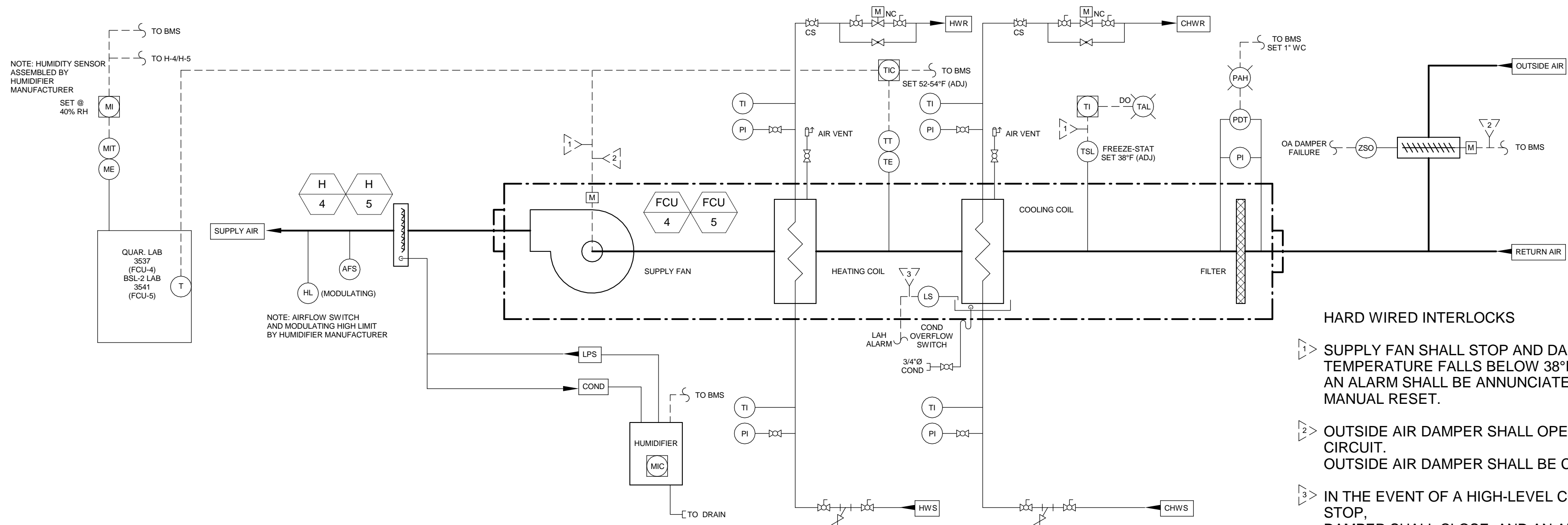
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#### HARD WIRED INTERLOCKS

IN THE EVENT OF A HIGH-LEVEL CONDENSATE FLOAT ACTUATION, COOLING COIL CONTROL VALVE SHALL CLOSE AND AN ALARM SHALL BE ANNUNCIATED TO THE BMS.

2 FCU-1/2/3 CONTROL DIAGRAM



#### HARD WIRED INTERLOCKS

- SUPPLY FAN SHALL STOP AND DAMPERS SHALL CLOSE IN THE EVENT THE SUPPLY AIR TEMPERATURE FALLS BELOW 38°F. AN ALARM SHALL BE ANNUNCIATED TO THE BMS. TEMPERATURE SWITCH SHALL REQUIRE MANUAL RESET.
- OUTSIDE AIR DAMPER SHALL OPEN UPON ENERGIZATION OF SUPPLY FAN STARTER CIRCUIT. OUTSIDE AIR DAMPER SHALL BE CLOSED WHEN SUPPLY FAN IS OFF.
- IN THE EVENT OF A HIGH-LEVEL CONDENSATE FLOAT ACTUATION, SUPPLY FAN SHALL STOP, DAMPER SHALL CLOSE, AND AN ALARM SHALL BE ANNUNCIATED TO THE BMS.

1 FCU-4/5 CONTROL DIAGRAM

#### FCU-1/2/3 SEQUENCE OF OPERATIONS

- UNIT SHALL E ENABLED VIA BMS.
- FAN SHALL START. FAN SHALL RUN CONTINUOUSLY AT A PRESET SPEED.
- COOLING COIL CONTROL VALVE (FAIL CLOSED) SHALL MODULATE TO MAINTAIN TEMPERATURE BASED ON ROOM THERMOSTAT SETPOINT (ADJUSTABLE)

#### FCU-4/5 SEQUENCE OF OPERATIONS

- UNIT SHALL BE ENABLED VIA BMS.
- OA DAMPER SHALL OPEN TO PRESET FIXED POSITION, WITH A LIMIT SWITCH TO PROVE OPERATION. IN THE EVENT THE DAMPER DOES NOT FULLY OPEN, AN ALARM SHALL BE ANNUNCIATED TO THE BMS. FAN MOTOR MAY RUN IF DAMPER LIMIT FAILS TO PROVE.
- FAN SHALL START. FAN SHALL RUN CONTINUOUSLY AT A PRESET SPEED.
- DEHUMIDIFICATION MODE: IF THE ROOM AIR TEMPERATURE RISES ABOVE THE SETPOINT AND THE ROOM RH HAS BEEN 60% (ADJUSTABLE) OR GREATER FOR MORE THAN 15 MINUTES (ADJUSTABLE), THE COOLING COIL SHALL SET TO RUN AT A LEAVING AIR TEMPERATURE OF 52°F (ADJUSTABLE). THE HEATING COIL DOWNSTREAM OF THE COOLING COIL SHALL MODULATE TO MAINTAIN THE ROOM TEMPERATURE SETPOINT (ADJUSTABLE) BASED ON A ROOM-MOUNTED THERMOSTAT.
- IF THE ROOM AIR TEMPERATURE IS ABOVE THE SETPOINT, AND THE RH HAS BEEN LESS THAN 60% (ADJUSTABLE), THE COOLING COIL SHALL MODULATE TO DIRECTLY MAINTAIN THE ROOM TEMPERATURE SETPOINT.
- IF THE RH IS LESS THAN 60%, AND THE ROOM TEMPERATURE FALLS 2°F DEGREES BELOW THE SETPOINT, THE COOLING COIL SHALL BE DISABLED AND THE HEATING COIL SHALL MODULATE TO MAINTAIN THE ROOM TEMPERATURE SET POINT.
- UNIT SHALL BE EQUIPPED WITH BACNET INTERFACE, OR BE DIRECTLY CONTROLLED VIA THE BMS.

#### HUMIDIFIER

- HUMIDIFIER SHALL START AND MODULATE ON ITS OWN INTERNAL CONTROL TO MAINTAIN THE ROOM SUPPLY HUMIDITY SET POINT OF 45% RH (USER ADJUSTABLE).
- HUMIDIFIER SHALL NOT OPERATE IN THE ABSENCE OF AIRFLOW.
- HUMIDIFIER SHALL MAINTAIN A MAXIMUM DUCT HUMIDITY OF 85% RH, BASED ON A MODULATING HIGH LIMIT.

#### GENERAL NOTE:

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|-------|------|----------|-----------------------------|------|------|-------|
| RRM   | A    | 04-19-21 | ISSUE FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| DR:   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION     | GHS  | MC   | MC    |
| CHK:  | MDC  |          |                             |      |      |       |
| APVD: | MC   |          |                             |      |      |       |

#### ISSUE DATE:

SCALE: .

#### SHEET NUMBER

H-605

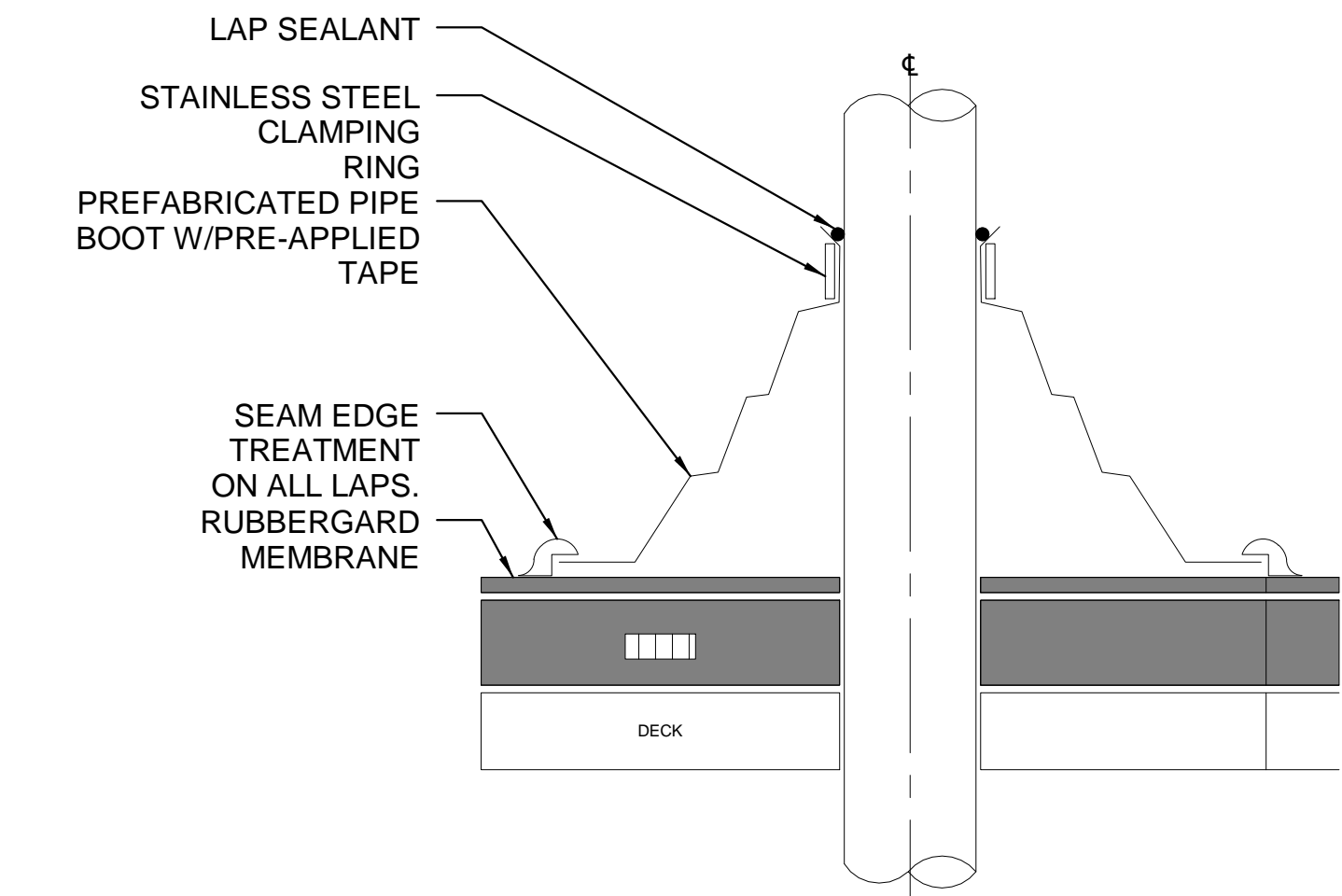
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1" 0'

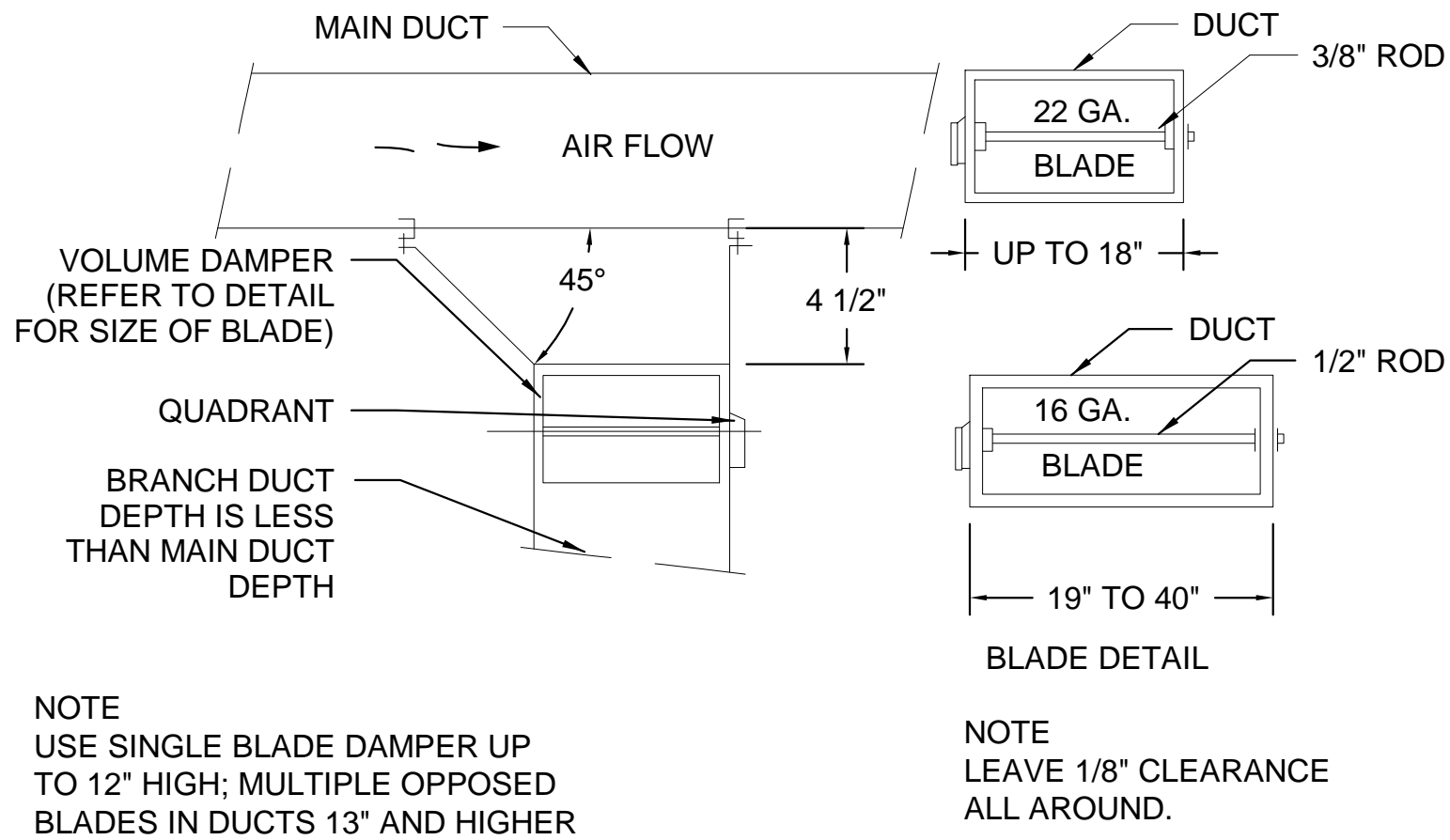
BAR IS ONE INCH ON ORIGINAL DRAWING

| SINGLE LINE DUCTWORK | CORRESPONDING DOUBLE LINE DUCTWORK   |
|----------------------|--|
| 90° ELBOW            | $R = 1\text{--}1/2 \times D$<br>R MP AND LP LP   |
| TEE                  | LP LP MP MP  |
| CROSS                | VD VD MP   |
| SPLIT                | LP VD  |
| TAP TAKE-OFF         | LP AND MP SUPPLY FOR RECTANGULAR DUCT<br>LP AND MP SUPPLY FOR ROUND DUCT<br>MP RETURN  |
| RISE OR DROP         | LP AND MP<br>ELEVATION-OFFSET IN VERTICAL PLANE SHALL BE MADE WITH SMOOTH FITTINGS   |
| HORIZONTAL OFFSET    | LP AND MP<br>OFFSET IN HORIZONTAL PLANE SHALL BE MADE WITH SMOOTH FITTINGS<br>NOTES: MP - FITTING FOR MEDIUM PRESSURE DUCTWORK LP - FITTING FOR LOW PRESSURE DUCTWORK WHERE MORE THAN ONE TYPE IS SHOWN, EITHER MAY BE USED AT CONTRACTOR'S OPTION SUBJECT TO SPACE CONDITION. |

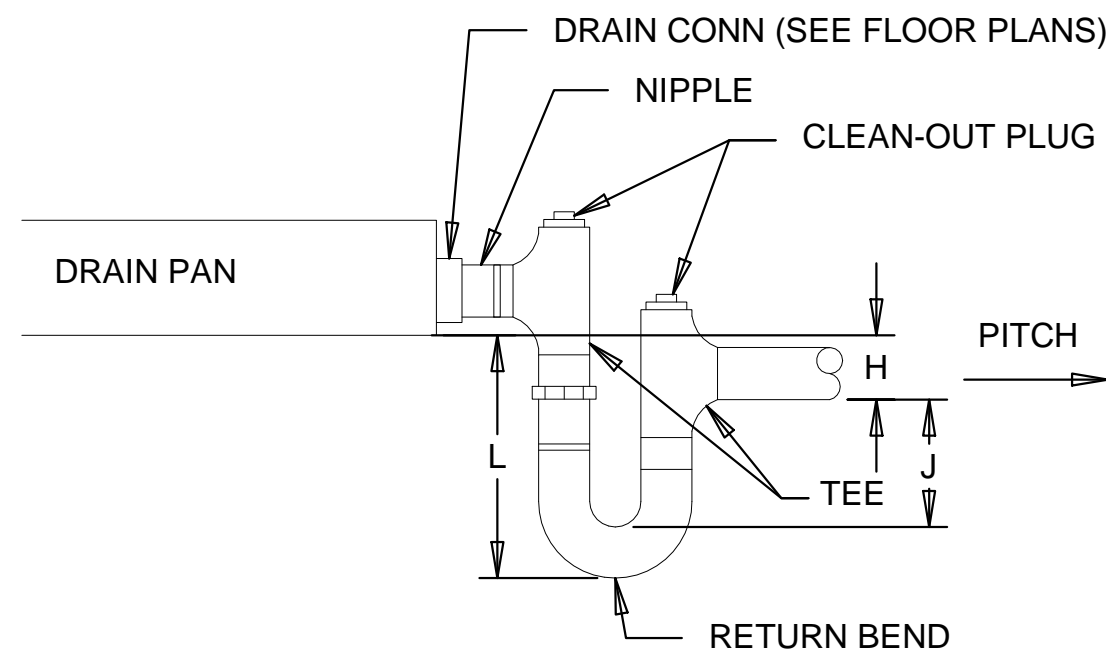
1 DUCT FITTINGS  
SCALE: NONE



6 PIPE THRU ROOF DETAIL  
SCALE: NONE

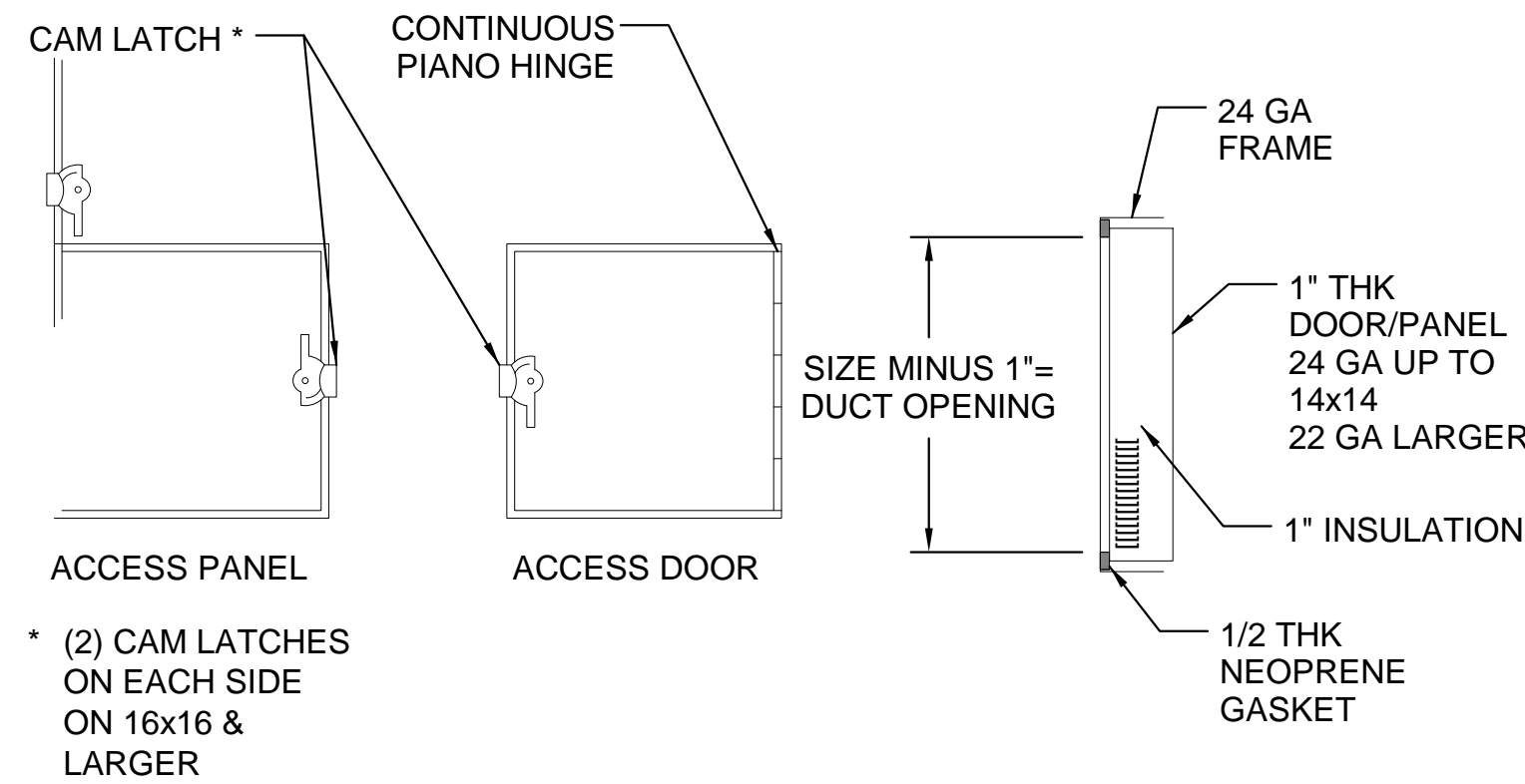


2 DUCT BRANCH-TAKE OFF DETAIL  
SCALE: NONE

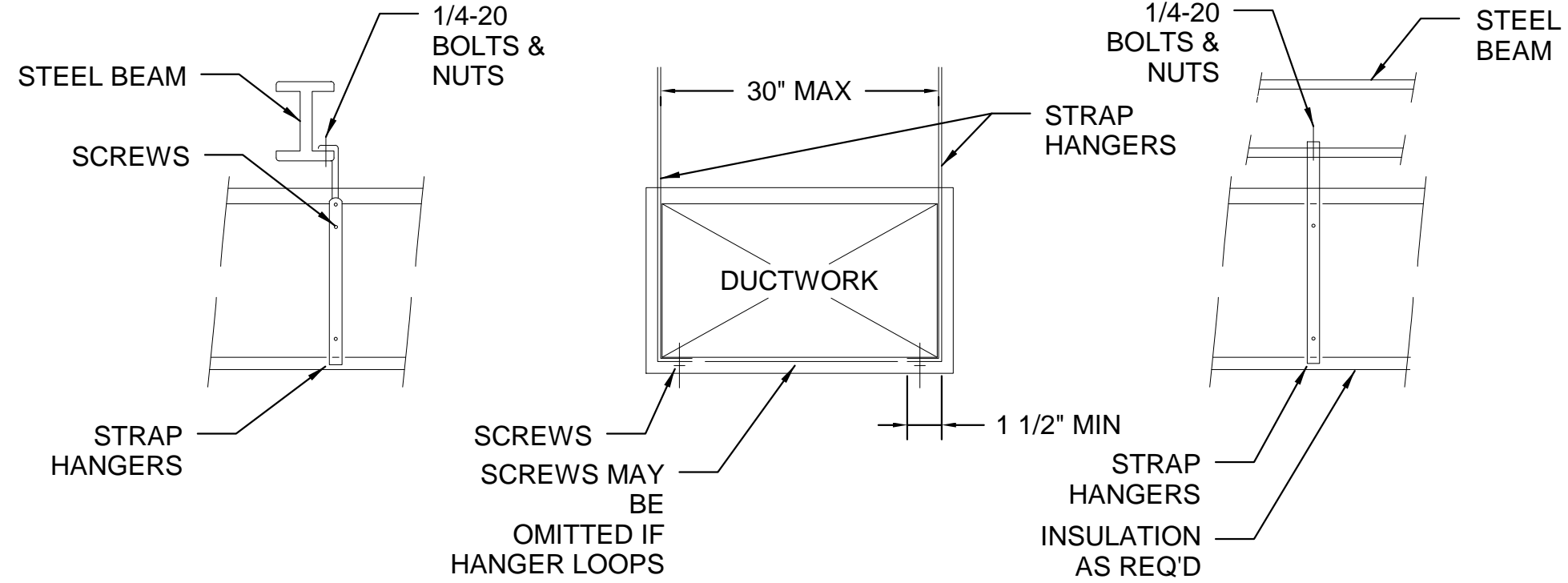


- NOTES:
- FOLLOW AHU MANUFACTURE RECOMMENDATIONS FOR TRAP DIMENSIONS
  - ALLOW SUFFICIENT SPACE BELOW DRAIN PAN FOR TRAP
  - PITCH DRAIN FOR MIN OF 1/8"/FT
  - MANUALLY PRIME FILL TRAP BEFORE START-UP TO FORM INITIAL SEAL
  - WHEN MORE THAN ONE MODULE HAS A DRAIN PAN, TRAP EACH INDIVIDUALLY.

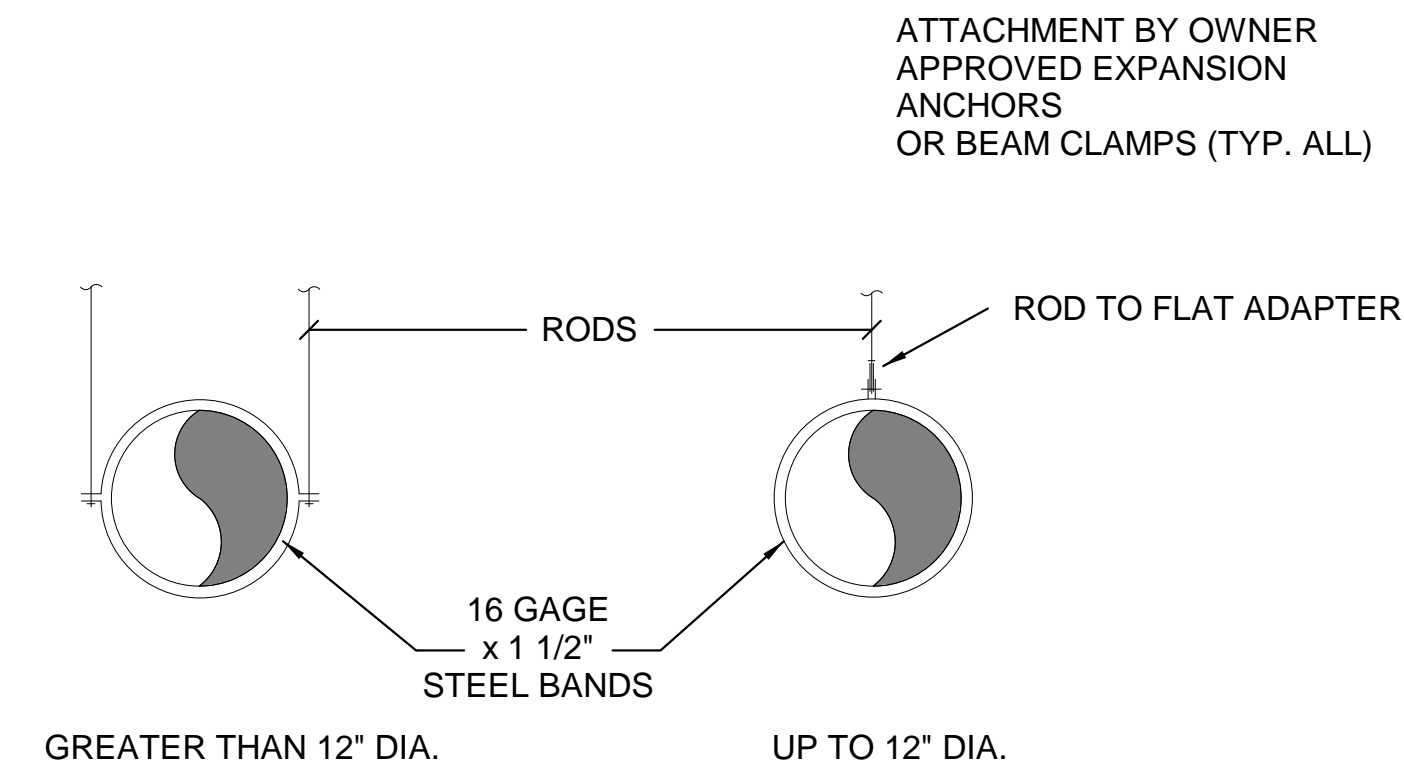
4 DRAW-THRU DRAIN PAN WATER SEAL PIPING  
SCALE: NONE



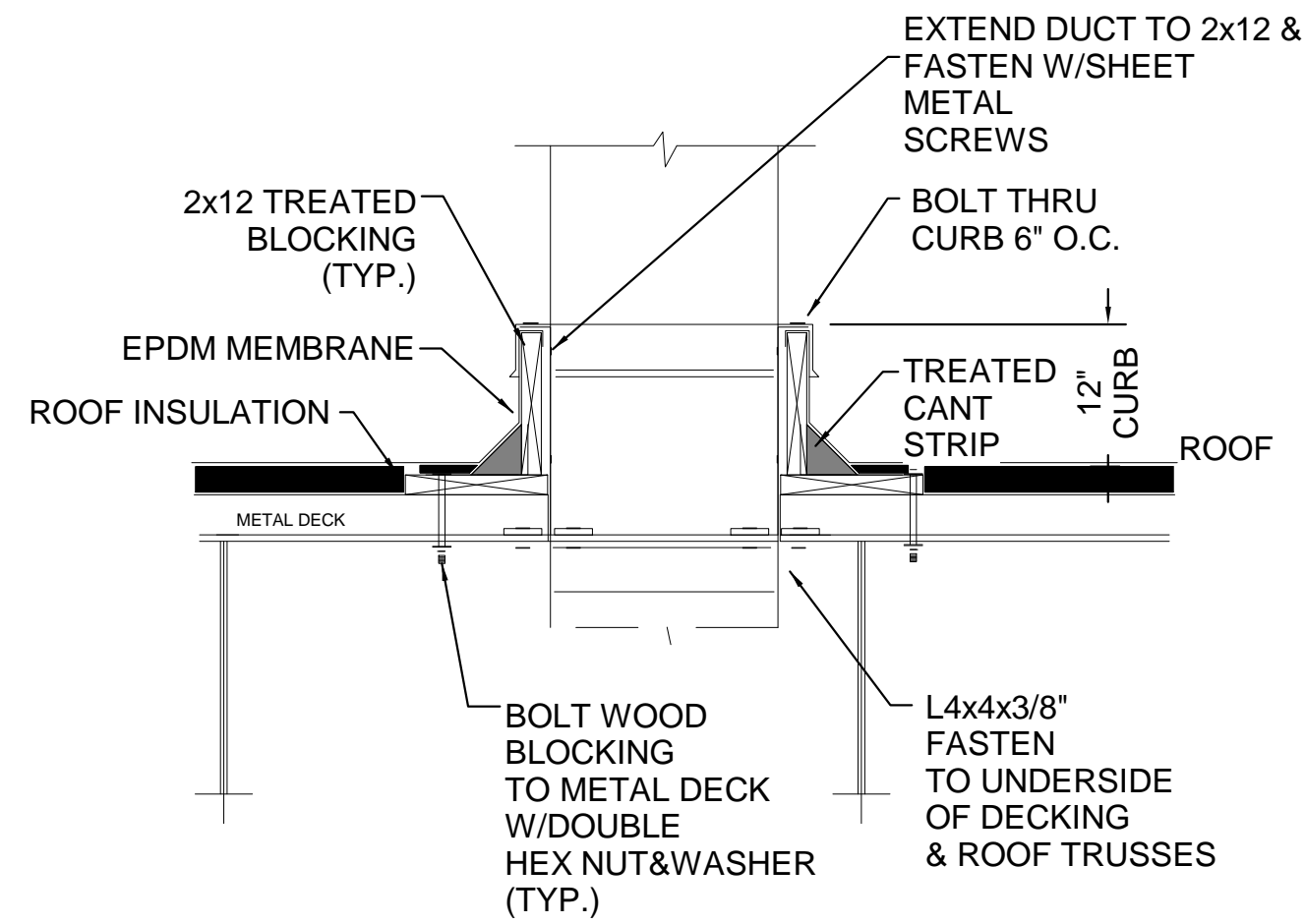
7 DUCT ACCESS DOOR PANEL  
SCALE: NONE



3 DUCT HANGER FOR DUCTS UP TO 30 INCHES  
SCALE: NONE



5 ROUND DUCT HANGER DETAIL  
SCALE: NONE



8 DUCT CURB DETAIL  
SCALE: NONE

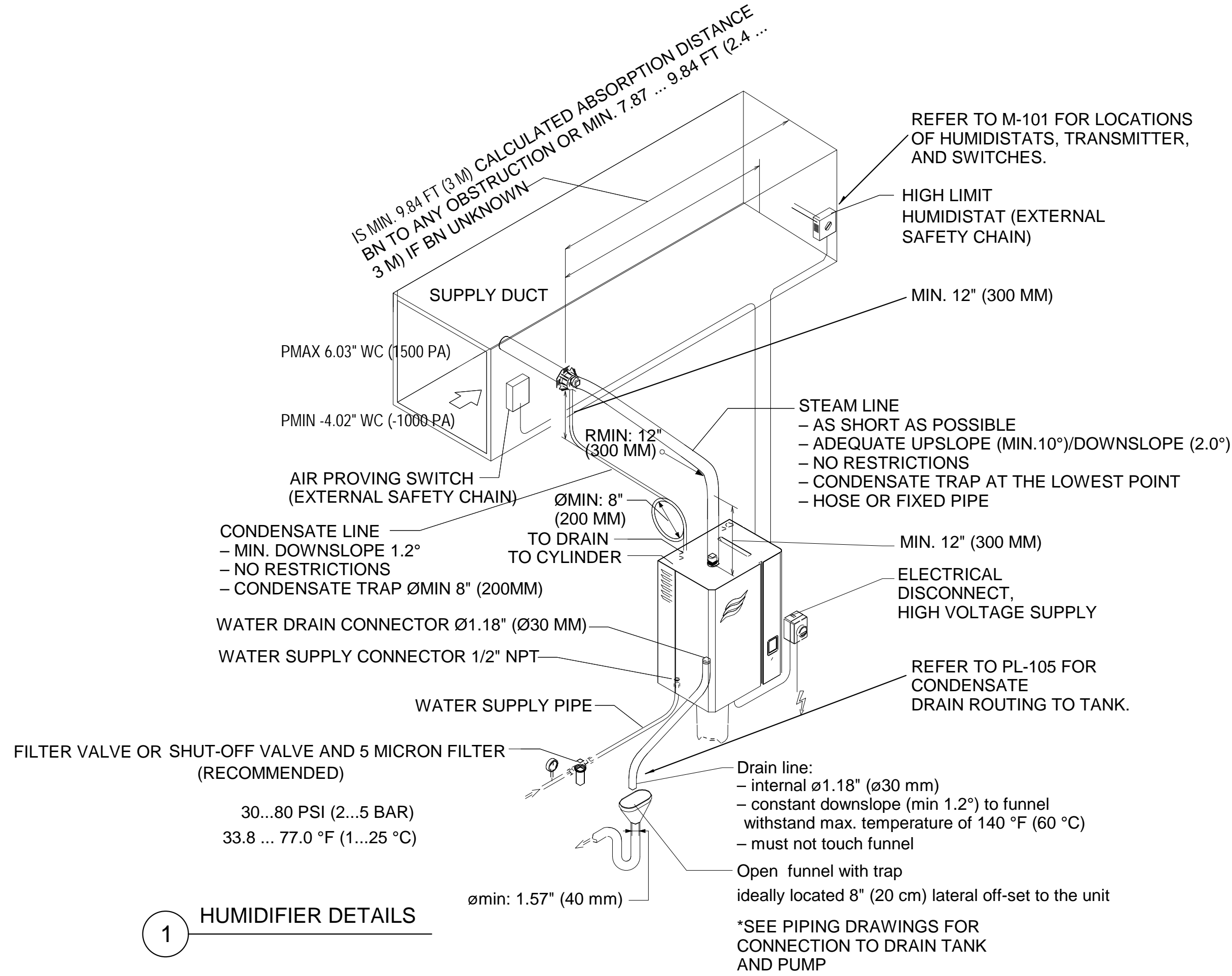
| DSGN: | REV. | DATE     | REVISION DESCRIPTION        | DWG. | CHK. | APVD. |
|-------|------|----------|-----------------------------|------|------|-------|
| RRM   | A    | 04-19-21 | ISSUE FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
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| CHK:  | MDC  |          |                             |      |      |       |
| APVD: | MC   |          |                             |      |      |       |



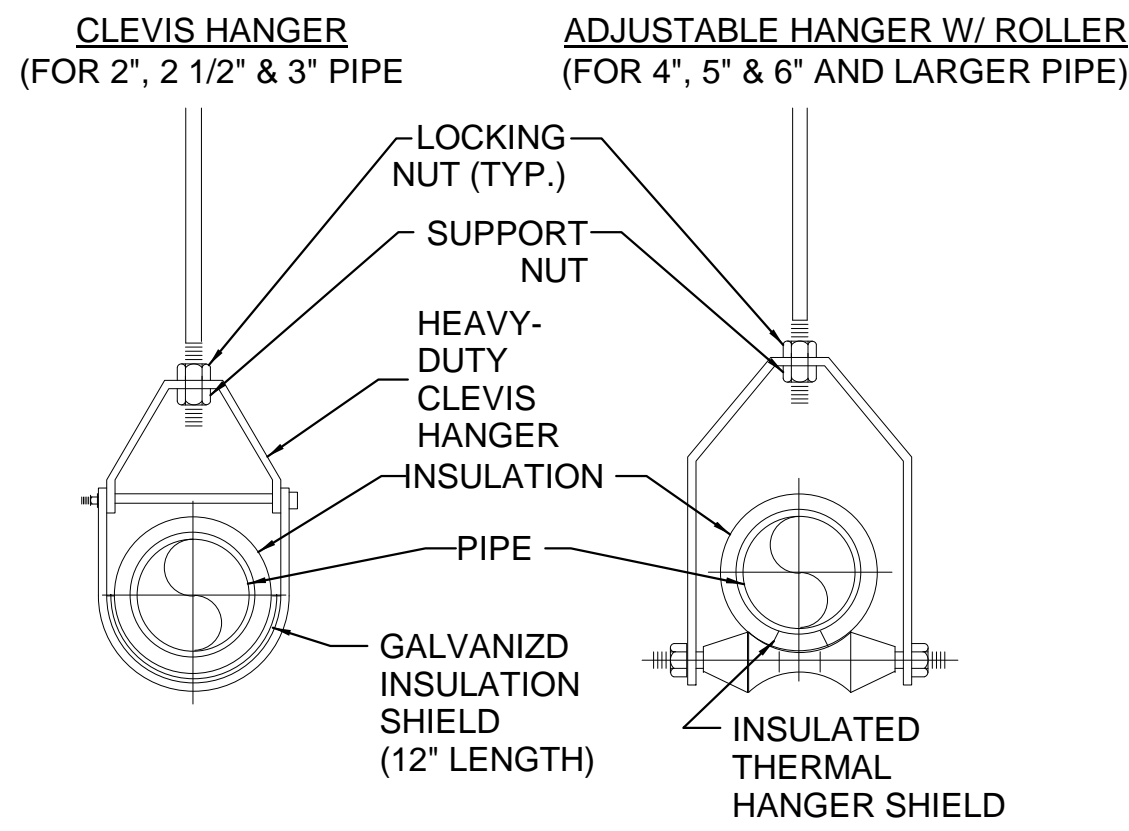
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0' 1" 0'

BAR IS ONE INCH ON ORIGINAL DRAWING

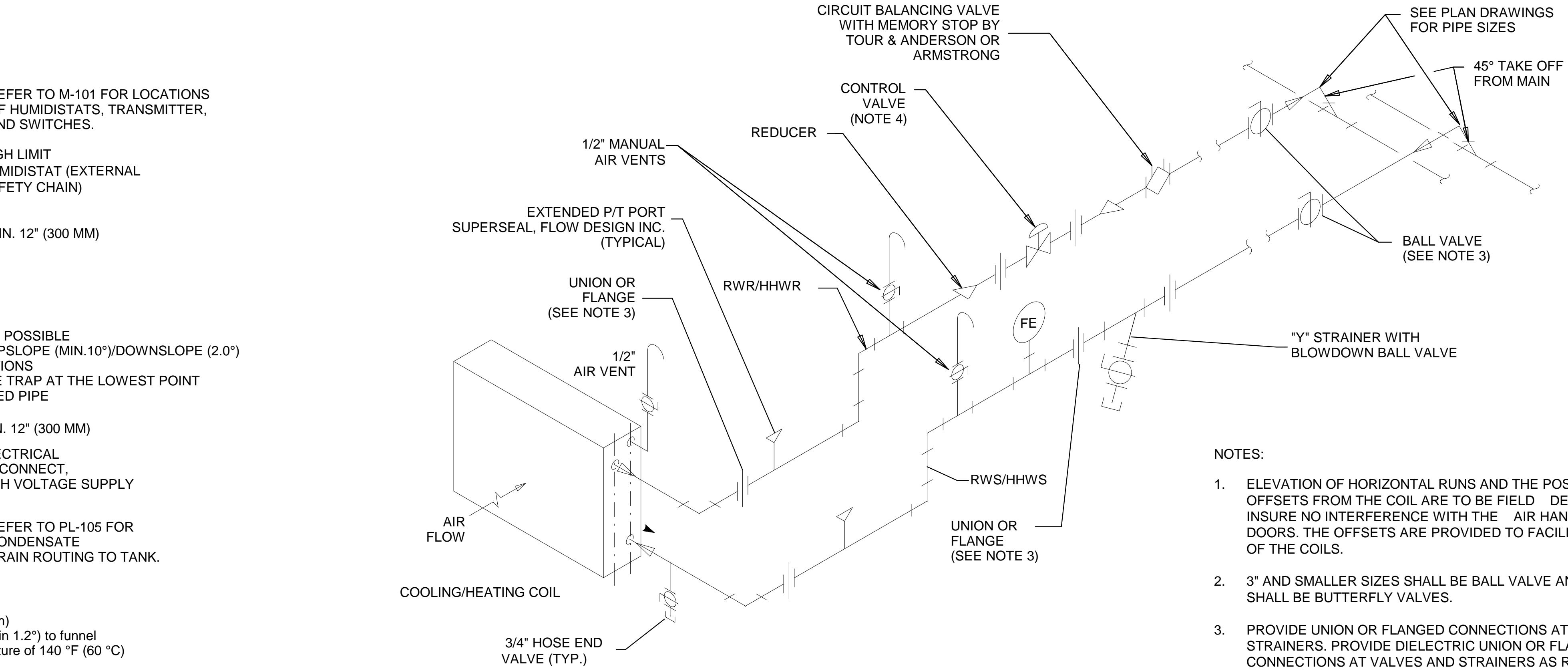


1 HUMIDIFIER DETAILS



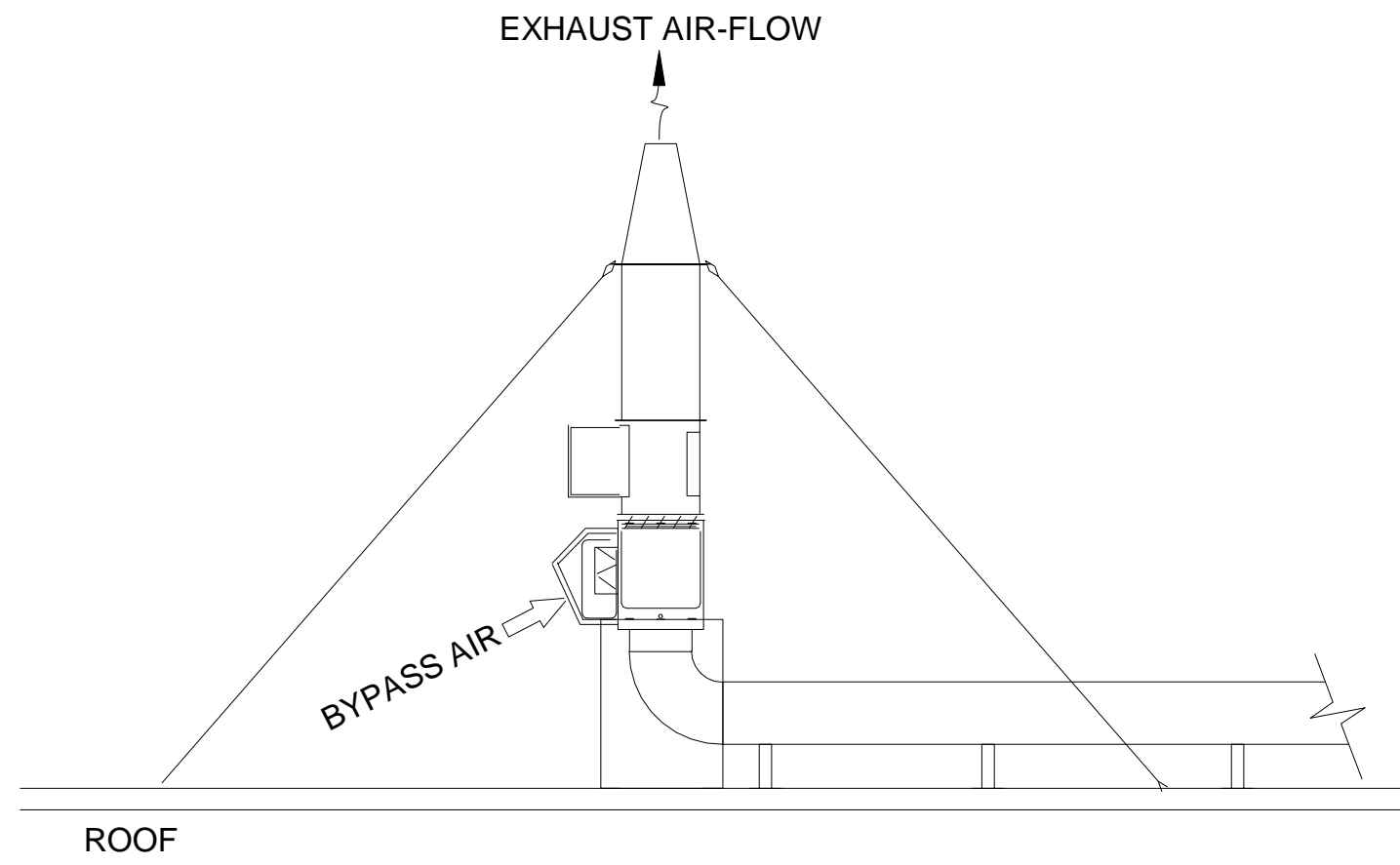
- NOTES:
- SEE SPECIFICATIONS FOR HANGER SIZES.
  - PIPE 8" AND LARGER SHALL HAVE ROLLER SUPPORTED BY DUAL RODS.

3 PIPE HANGER ATTACHMENTS FOR INSULATED PIPES



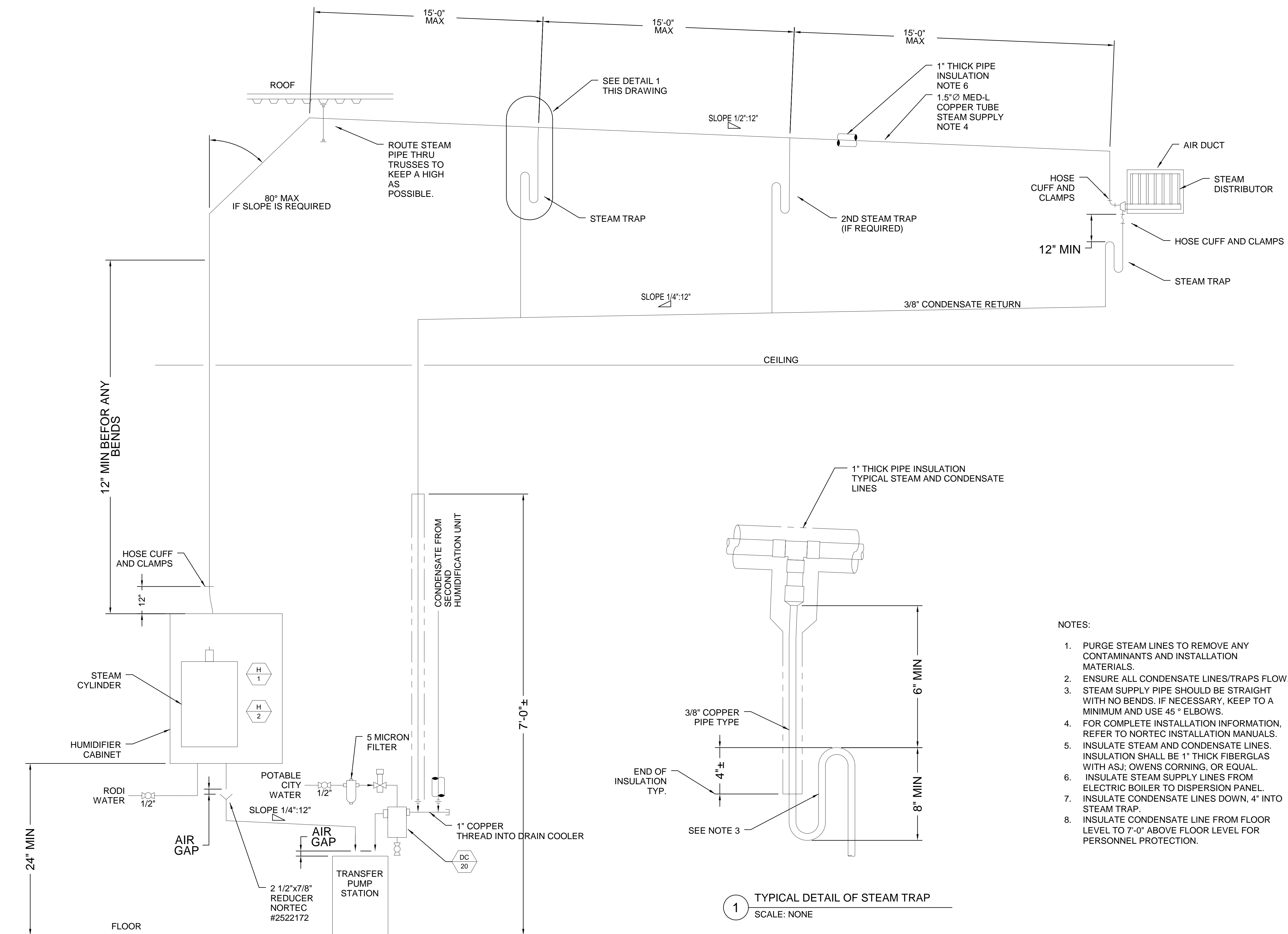
2 SINGLE HEATING/COOLING COIL

- NOTES:
- ELEVATION OF HORIZONTAL RUNS AND THE POSITION OF THE OFFSETS FROM THE COIL ARE TO BE FIELD DETERMINED TO INSURE NO INTERFERENCE WITH THE AIR HANDLING ACCESS DOORS. THE OFFSETS ARE PROVIDED TO FACILITATE THE PULLING OF THE COILS.
  - 3" AND SMALLER SIZES SHALL BE BALL VALVE AND 4" LARGER SHALL BE BUTTERFLY VALVES.
  - PROVIDE UNION OR FLANGED CONNECTIONS AT VALVES AND STRAINERS. PROVIDE DIELECTRIC UNION OR FLANGED CONNECTIONS AT VALVES AND STRAINERS AS REQUIRED TO TRANSITION BETWEEN CARBON STEEL AND COPPER PIPES.
  - TO BE SIZED AND SELECTED BY ATC CONTRACTOR



4 VEKTOR EXHAUST FAN INSTALLATION

| DSGN: | REV. | DATE     | REVISION DESCRIPTION        | DWG. | CHK. | APVD. |
|-------|------|----------|-----------------------------|------|------|-------|
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| CHK:  | MDC  |          |                             |      |      |       |
| APVD: | MC   |          |                             |      |      |       |

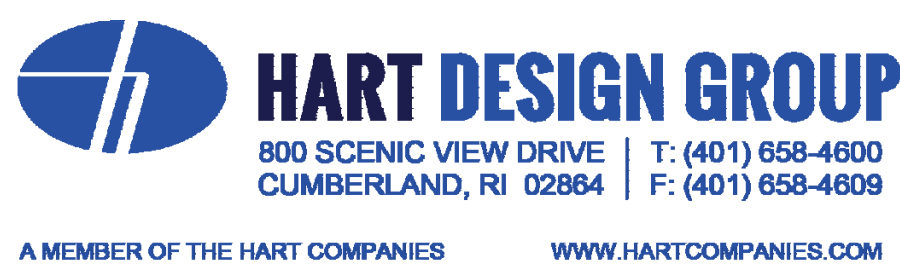


NOTES:

1 TYPICAL DETAIL OF STEAM TRAP  
SCALE: NONE

IF NOT ONE INCH ON THIS SHEET,  
ADJUST SCALES ACCORDINGLY.

0" 1"



|               |
|---------------|
| GENERAL NOTE: |
|---------------|

| DSGN: |     | REV. | DATE     | REVISION DESCRIPTION        | DWG. | CHK. | APVD: |
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| CHK:  | RRM | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION     | GHS  | MC   | MC    |
|       | MDC |      |          |                             |      |      |       |
| APVD: |     |      |          |                             |      |      |       |
|       | MC  |      |          |                             |      |      |       |

| REV. | DATE     | REVISION DESCRIPTION        |
|------|----------|-----------------------------|
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|      |          |                             |
|      |          |                             |
|      |          |                             |

|      |      |       |
|------|------|-------|
| DWG. | CHK. | APVD. |
| RRM  | MDC  |       |
| GHS  | MC   | MC    |
|      |      |       |
|      |      |       |
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CLD & CCM LABS  
HVAC  
HVAC DETAILS

ISSUE DATE:

SHEET NUMBER

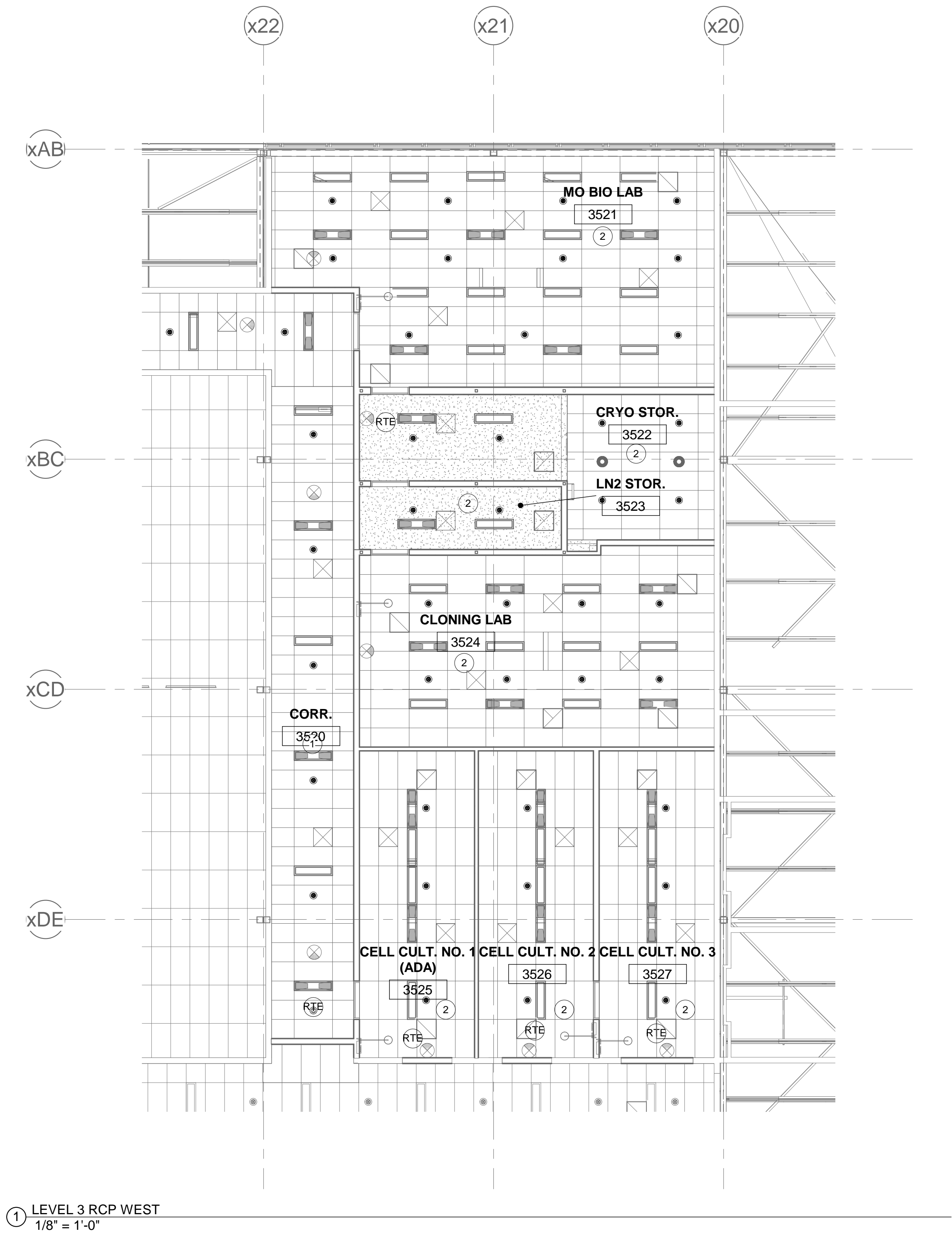
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0' 1" 0' 1" 0'

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FIRE PROTECTION DESIGN BUILD SPECIFICATIONS

NOTE: REFER TO GENERAL CONDITIONS ON ARCHITECTURAL DRAWINGS FOR ADDITIONAL CONTRACT REQUIREMENTS.

- WHERE SHOWN ON THE REFLECTED CEILING PLAN, ALL SPACES ARE TO BE PROVIDED WITH A FIRE SPRINKLER SYSTEM MEETING ALL CODE AND INSURANCE REQUIREMENTS AND CONFORMING TO BUILDING STANDARDS.
- SPRINKLER HEAD LOCATIONS SHOWN ON THE PLAN ARE APPROXIMATE AND THE SPRINKLER CONTRACTOR IS TO FIELD VERIFY THE QUANTITY OF EXISTING HEADS, ADEQUACY, AND PLACEMENT OF HEADS PRIOR TO SUBMISSION OF HIS PROPOSAL.
- COORDINATE SPRINKLER LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLAN. COORDINATE WITH LIGHT FIXTURES, DIFFUSERS, ETC. FINAL COORDINATION OF SPRINKLER LOCATIONS SHALL BE THE RESPONSIBILITY OF THE FIRE PROTECTION CONTRACTOR.
- CENTER SPRINKLERS ON CEILING TILES OR AT QUARTER POINTS IN 2x4 TILES.
- PROVIDE SPRINKLER COVERAGE IN MEZZANINE SPACES PER FM REQUIREMENTS.
- THE CONTRACTOR IS TO PREPARE A PIPING LAYOUT FOR SUBMISSION TO THE BUILDING DEPARTMENT AND INSURANCE UNDERWRITERS; AND THREE COPIES OF THE LAYOUT ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF THE WORK. THE LAYOUT SHALL INDICATE SPRINKLER HEADS, PIPING CONNECTIONS TO THE EXISTING WATER MAIN PIPING AND VALVE AND FLOW SWITCH LOCATIONS WHERE APPLICABLE.
- THIS IS A DESIGN-BUILD SPECIFICATION. WORKING PLANS AND CALCULATIONS SHALL BE SIGNED AND STAMPED BY A PROFESSIONAL FIRE PROTECTION ENGINEER REGISTERED IN THIS STATE. PROVIDE HYDRAULIC CALCULATIONS.
- ALL WORK SHALL CONFORM TO THE COMMONWEALTH OF MASSACHUSETTS BUILDING CODE, AND NFPA 13.
- BEFORE STARTING THE WORK, VISIT AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED. NOTIFY OWNER / OWNER'S REPRESENTATIVE OF ADVERSE CONDITIONS WHICH WILL PREVENT PROPER EXECUTION OF THE WORK. DO NOT COMMENCE WORK UNTIL CONDITIONS WHICH WILL PREVENT PROPER EXECUTION OF THE WORK ARE REMEDIED.
- GIVE ALL NOTICES, FILE ALL PLANS, OBTAIN ALL PERMITS AND PAY ALL FEES IN CONNECTION WITH EXECUTION OF THE WORK. INSURE WORKMEN AS REQUIRED.
- WORKING PLANS ARE SUBJECT TO ENGINEER'S FINAL APPROVAL.
- COOPERATE AND COORDINATE WITH OTHER TRADES IN EXECUTION OF THE WORK.
- ALL MATERIAL AND EQUIPMENT SHALL BE UL AND FM APPROVED.
- NEW SPRINKLER HEADS SHALL MATCH EXISTING SPRINKLER HEADS IN THE BUILDING. SUBMIT SAMPLE OF SPRINKLER HEAD TO OWNERS REPRESENTATIVE FOR APPROVAL.
- GUARANTEE WORK OF THIS SECTION IN WRITING FOR ONE YEAR FROM DATE OF OWNER ACCEPTANCE.
- OBTAIN COMPLETE SHOP DRAWINGS AND PRODUCT DATA FROM MANUFACTURERS, SUPPLIERS, ETC., FOR ALL MATERIAL AND EQUIPMENT SPECIFIED OR SHOWN AND SUBMIT DATA THROUGH OWNER'S REPRESENTATIVE FOR REVIEW. SPRINKLER SHOP DRAWINGS SHALL BEAR APPROVAL STAMP BY THE OWNER'S INSURANCE UNDERWRITERS CONTRACTORS, PROFESSIONAL ENGINEER, AND LOCAL AUTHORITIES BEFORE THE START OF WORK.
- TEST COMPLETED PIPING INSTALLATION AT 200 PSI. ALL DEFECTS OR LEAKS SHALL BE REMEDIED.
- PROVIDE A FINAL "AS-BUILT" SET OF PRINTS AND DRAWING FILES SHOWING ALL ITEMS OF THE WORK IN FULL DETAIL.

SHEET NOTES

- ORDINARY HAZARD GROUP 1  
TYPE: WET SPRINKLER  
DENSITY: 0.14 GPM/SQFT  
DESIGN AREA: 2500 SQFT
- ORDINARY HAZARD GROUP 2  
TYPE: WET SPRINKER  
DENSITY: 0.18 GPM/SQFT  
DESIGN AREA: 2500 SQFT



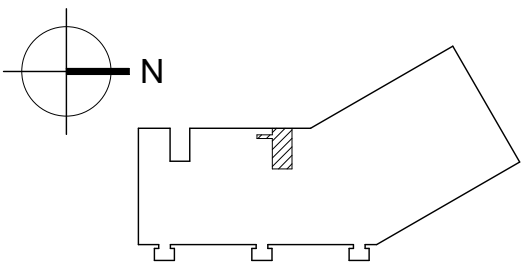
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**cytiva**  
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| DSGN: | REV. | DATE     | REVISION DESCRIPTION        | DWG. | CHK. | APVD. |
|-------|------|----------|-----------------------------|------|------|-------|
| RRM   | A    | 04/19/21 | ISSUE FOR 90% CLIENT REVIEW | RRM  | MDC  |       |
| DR:   | 0    | 06/10/21 | ISSUED FOR CONSTRUCTION     | GHS  | MC   | MC    |
| CHK:  |      |          |                             |      |      |       |
| APVD: |      |          |                             |      |      |       |
| MC    |      |          |                             |      |      |       |



CLD & CCM LABS  
**FIRE PROTECTION**  
FIRE PROTECTION PLAN WEST

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE:  
SCALE: 1/8" = 1'-0"

SHEET NUMBER  
**FP-101**



FIRE PROTECTION DESIGN BUILD SPECIFICATIONS

NOTE: REFER TO GENERAL CONDITIONS ON ARCHITECTURAL DRAWINGS FOR ADDITIONAL CONTRACT REQUIREMENTS.

1. WHERE SHOWN ON THE REFLECTED CEILING PLAN, ALL SPACES ARE TO BE PROVIDED WITH A FIRE SPRINKLER SYSTEM MEETING ALL CODE AND INSURANCE REQUIREMENTS AND CONFORMING TO BUILDING STANDARDS.

2. SPRINKLER HEAD LOCATIONS SHOWN ON THE PLAN ARE APPROXIMATE AND THE SPRINKLER CONTRACTOR IS TO FIELD VERIFY THE QUANTITY OF EXISTING HEADS, ADEQUACY, AND PLACEMENT OF HEADS PRIOR TO SUBMISSION OF HIS PROPOSAL.

3. COORDINATE SPRINKLER LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLAN. COORDINATE WITH LIGHT FIXTURES, DIFFUSERS, ETC. FINAL COORDINATION OF SPRINKLER LOCATIONS SHALL BE THE RESPONSIBILITY OF THE FIRE PROTECTION CONTRACTOR.

4. CENTER SPRINKLERS ON CEILING TILES OR AT QUARTER POINTS IN 2x4 TILES.

4. PROVIDE SPRINKLER COVERAGE IN MEZZANINE SPACES PER FM REQUIREMENTS.

5. THE CONTRACTOR IS TO PREPARE A PIPING LAYOUT FOR SUBMISSION TO THE BUILDING DEPARTMENT AND INSURANCE UNDERWRITERS; AND THREE COPIES OF THE LAYOUT ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF THE WORK. THE LAYOUT SHALL INDICATE SPRINKLER HEADS, PIPING CONNECTIONS TO THE EXISTING WATER MAIN PIPING AND VALVE AND FLOW SWITCH LOCATIONS WHERE APPLICABLE.

6. THIS IS A DESIGN-BUILD SPECIFICATION. WORKING PLANS AND CALCULATIONS SHALL BE SIGNED AND STAMPED BY A PROFESSIONAL FIRE PROTECTION ENGINEER REGISTERED IN THIS STATE. PROVIDE HYDRAULIC CALCULATIONS.

7. ALL WORK SHALL CONFORM TO THE COMMONWEALTH OF MASSACHUSETTS BUILDING CODE, AND NFPA 13.

8. BEFORE STARTING THE WORK, VISIT AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED. NOTIFY OWNER / OWNER'S REPRESENTATIVE OF ADVERSE CONDITIONS WHICH WILL PREVENT PROPER EXECUTION OF THE WORK. DO NOT COMMENCE WORK UNTIL CONDITIONS WHICH WILL PREVENT PROPER EXECUTION OF THE WORK ARE REMEDIED.

9. GIVE ALL NOTICES, FILE ALL PLANS, OBTAIN ALL PERMITS AND PAY ALL FEES IN CONNECTION WITH EXECUTION OF THE WORK. INSURE WORKMEN AS REQUIRED.

10. WORKING PLANS ARE SUBJECT TO ENGINEER'S FINAL APPROVAL.

11. COOPERATE AND COORDINATE WITH OTHER TRADES IN EXECUTION OF THE WORK.

12. ALL MATERIAL AND EQUIPMENT SHALL BE UL AND FM APPROVED.

13. NEW SPRINKLER HEADS SHALL MATCH EXISTING SPRINKLER HEADS IN THE BUILDING. SUBMIT SAMPLE OF SPRINKLER HEAD TO OWNERS REPRESENTATIVE FOR APPROVAL.

14. GUARANTEE WORK OF THIS SECTION IN WRITING FOR ONE YEAR FROM DATE OF OWNER ACCEPTANCE.

15. OBTAIN COMPLETE SHOP DRAWINGS AND PRODUCT DATA FROM MANUFACTURERS, SUPPLIERS, ETC., FOR ALL MATERIAL AND EQUIPMENT SPECIFIED OR SHOWN AND SUBMIT DATA THROUGH OWNER'S REPRESENTATIVE FOR REVIEW. SPRINKLER SHOP DRAWINGS SHALL BEAR APPROVAL STAMP BY THE OWNER'S INSURANCE UNDERWRITERS CONTRACTORS, PROFESSIONAL ENGINEER, AND LOCAL AUTHORITIES BEFORE THE START OF WORK.

16. TEST COMPLETED PIPING INSTALLATION AT 200 PSI. ALL DEFECTS OR LEAKS SHALL BE REMEDIED.

17. PROVIDE A FINAL "AS-BUILT" SET OF PRINTS AND DRAWING FILES SHOWING ALL ITEMS OF THE WORK IN FULL DETAIL.

SHEET NOTES

ORDINARY HAZARD GROUP 1  
TYPE: WET SPRINKLER  
DENSITY: 0.14 GPM/SQFT  
DESIGN AREA: 2500 SQFT

ORDINARY HAZARD GROUP 2  
TYPE: WET SPRINKER  
DENSITY: 0.18 GPM/SQFT  
DESIGN AREA: 2500 SQFT




1 LEVEL 3 RCP EAST  
1/8" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1'

BAR IS ONE INCH ON ORIGINAL DRAWING



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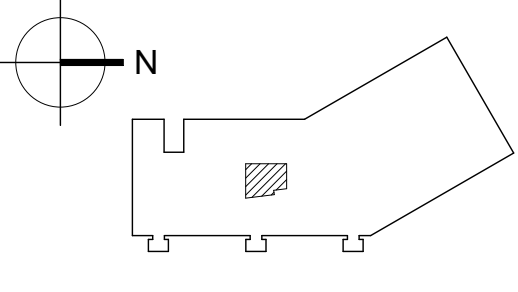


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|  |  |                               |
|--|--|-------------------------------|
| CLD & CCM LABS<br><b>FIRE PROTECTION</b> |  | ISSUE DATE:                   |
| FIRE PROTECTION PLAN EAST                |  | SCALE: 1/8" = 1'-0"           |
| PROJ. NO: 20021A   CAD FILE:             |  | SHEET NUMBER<br><b>FP-102</b> |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

### EQUIPMENT SYMBOLS (PLAN)

|  |   |
|--|---|
|  | 120V DUPLEX RECEPTACLE - "H" DENOTES MOUNTED HORIZONTALLY ABOVE COUNTER; "C" DENOTES MOUNTED 6" ABOVE COUNTER OR 46" AFF TO CENTER LINE. "2" DENOTES CIRCUIT NUMBER |
|  | 120V DUPLEX RECEPTACLE WITH BOTTOM HALF SWITCHED "a" DENOTES SWITCH CONTROL   |
|  | SPECIAL PURPOSE OUTLET - RATING AS INDICATED ("TL" DENOTES TWIST LOCK TYPE)   |
|  | 120V GROUND FAULT CIRCUIT INTERRUPTER TYPE DUPLEX RECEPTACLE  |
|  | 120V DOUBLE DUPLEX RECEPTACLE   |
|  | 120V GROUND FAULT CIRCUIT INTERRUPTER TYPE DUPLEX RECEPTACLE WITH WEATHERPROOF COVER  |
|  | 120V GROUND FAULT INTERRUPTER TYPE DUPLEX RECEPTACLE WITH TAY-MAC WEATHERPROOF COVER MTD  |
|  | 120V DUPLEX RECEPTACLE FOR ELECTRIC WATER COOLER  |
|  | 120V ISOLATED GROUND TYPE DUPLEX RECEPTACLE   |
|  | ISOLATED GROUND TYPE SINGLE RECEPTACLE  |
|  | 480V SINGLE RECEPTACLE  |
|  | 120V DUPLEX RECEPTACLE: FLUSH FLOOR MOUNTED   |
|  | 120V DUPLEX RECEPTACLE FOR SECURITY CAMERA  |
|  | DUPLEX 120VAC WIREMOLD POWER OUTLET   |
|  | PANELBOARD - 120/208V-3Ø, 4W  |
|  | PANELBOARD - 277/480V-3Ø, 4W  |
|  | NORMAL/EMERGENCY PANELBOARD - 277/480V-3Ø, 4W   |
|  | NORMAL/EMERGENCY PANELBOARD - 120/280V-3Ø, 4W   |
|  | ELECTRIC HEATER - XkW HEATER RATING.  |
|  | PHOTO CELL  |
|  | THERMOSTAT  |
|  | JUNCTION BOX - SIZE AS REQUIRED   |
|  | FUSED DISCONNECT SWITCH - "3R" INDICATES NEMA RATING "X" INDICATES FUSE RATING  |
|  | NON-FUSED DISCONNECT SWITCH - "3R" INDICATES NEMA RATING  |
|  | MAGNETIC MOTOR STARTER  |
|  | 480V SINGLE RECEPTACLE WITH NON-FUSED DISCONNECT SWITCH   |
|  | COMBINATION FULL VOLTAGE NON-REVERSING MAGNETIC MOTOR STARTER AND MOTOR CIRCUIT PROTECTOR   |
|  | COMBINATION REVERSING MAGNETIC MOTOR STARTER AND MOTOR CIRCUIT PROTECTOR  |
|  | PULL BOX  |
|  | CONTACTOR   |
|  | DISTRIBUTION DRY TYPE TRANSFORMER RATING AS INDICATED   |
|  | THERMAL SWITCH WITH PILOT LIGHT (FLUSH MOUNTED IN FINISHING AREAS)  |
|  | CONDUIT HOME RUN  |
|  | MOTOR - "X" INDICATES HORSEPOWER  |
|  | GENERATOR   |
|  | UNINTERRUPTED POWER SUPPLY  |
|  | AUTOMATIC DOOR OPERATOR   |

### SOUND SYSTEM (PLAN)

|  |  |
|--|--|
|  | SPEAKER, FLUSH CEILING MOUNTED   |
|  | SPEAKER, FLUSH WALL MOUNTED  |
|  | MICROPHONE OUTLET  |
|  | CEILING MOUNTED PUBLIC ADDRESS SYSTEM SPEAKER  |
|  | WALL MOUNTED PUBLIC ADDRESS SYSTEM SPEAKER. WP INDICATES OUTDOOR WEATHER PROOF UNIT. |

### GROUNDING SYMBOLS (PLAN)

|  |   |
|--|---|
|  | EXISTING PIPE ELECTRODE                                     |
|  | MADE-DRIVEN ROD ELECTRODE                                   |
|  | MADE-PLATE ELECTRODE  |
|  | GROUNDING CONDUCTOR RUN IN EARTH OR CONCRETE                |
|  | WELDED PROCESS-TYPE JOINT                                   |
|  | GROUND BUS BAR  |
|  | EQUIPMENT GROUND  |
|  | GROUND CONNECTION TO STRUCTURAL STEEL                       |
|  | GROUND CONDUCTOR TURNING UP TOWARD OBSERVER READING DRAWING |
|  | GROUND CONDUCTOR TURNING AWAY FROM OBSERVER READING DRAWING |

### INSTRUMENTS AND CONTROLS (PLAN)

|  |  |
|--|--|
|  | FIELD INSTRUMENT (VALVE)   |
|  | FIELD INSTRUMENT (VALVE) WITH INSTRUMENT AIR SUPPLY  |
|  | PNEUMATIC CONTROL SIGNAL   |
|  | INSTRUMENT REQUIRING INTRINSIC SAFE WIRING   |
|  | INSTRUMENT REQUIRING 4-20mA ANALOG OR PULSE SIGNAL WIRING, NON-INTRINSIC.  |
|  | INSTRUMENT REQUIRING 120VAC DIGITAL SIGNAL WIRING OR 120VAC POWER SUPPLY WIRING.                                     |
|  | INSTRUMENT REQUIRING MULTIPLE WIRING TYPES (SEPARATE CIRCUITS) (EXAMPLE SHOWS ANALOG SIGNAL AND 120VAC POWER SUPPLY) |
|  | INSTRUMENT REQUIRING 24VDC SIGNAL WIRING (CONTACT CLOSURE)   |
|  | RTD INSTRUMENT   |

### LIGHT SWITCHING (PLAN)

(ALL SWITCHES MOUNTED 48" AFF UNLESS NOTED OTHERWISE)

|  |   |
|--|---|
|  | SINGLE POLE SWITCH; RATED FOR MOTOR DUTY. "WP" DENOTES WEATHERPROOF ENCLOSURE |
|  | SINGLE POLE SWITCH  |
|  | SINGLE POLE SWITCH. "b" DENOTES SWITCH CONTROL                                |
|  | TWO POLE SWITCH   |
|  | THREE-WAY SWITCH  |
|  | FOUR-WAY SWITCH   |
|  | SINGLE POLE SWITCH WITH PILOT LIGHT   |
|  | SINGLE POLE KEY OPERATED SWITCH   |
|  | 1500 WATT, 120 VOLT DIMMER  |
|  | 2000 WATT, 120 VOLT DIMMER  |
|  | SINGLE POLE SWITCH WITH MOTION (IR) DETECTOR                                  |

### LIGHTING EQUIPMENT (PLAN)

(REFER TO LIGHTING FIXTURE SCHEDULE)

|  |   |
|--|---|
|  | 2'x4' FLUORESCENT LIGHT FIXTURE. "X" INDICATES TYPE OF LIGHT FIXTURE. "a" INDICATES SWITCH CIRCUIT. |
|  | 2'x2' FLUORESCENT LIGHT FIXTURE. "X" INDICATES TYPE OF LIGHT FIXTURE. "a" INDICATES SWITCH CIRCUIT. |
|  | 1'x4' FLUORESCENT LIGHT FIXTURE. "X" INDICATES TYPE OF LIGHT FIXTURE. "a" INDICATES SWITCH CIRCUIT. |
|  | FLUORESCENT VAPORPROOF LIGHTING FIXTURE   |
|  | FLUORESCENT STRIP OR INDUSTRIAL FIXTURE   |
|  | CEILING (PENDANT) MOUNTED FIXTURE, "X" DENOTES FIXTURE TYPE   |
|  | WALL MOUNTED LIGHTING FIXTURE "X" DENOTES FIXTURE TYPE  |
|  | UNDER CANOPY LIGHTING FIXTURE   |
|  | WALLWASH OR DIRECTIONAL LIGHTING FIXTURE  |
|  | ILLUMINATED "EXIT" SIGN, WALL   |
|  | ILLUMINATED "EXIT" SIGN DOUBLE FACE.  |
|  | ILLUMINATED "EXIT" SIGN, WALL, W/DIRECTION  |
|  | EXIT/EMERGENCY LIGHT, WALL MOUNT WITH HEADS AS INDICATED.   |
|  | EMERGENCY LIGHTING, BATTERY UNIT, WITH HEADS AS INDICATED.  |
|  | EXTERIOR WALL MOUNT LIGHT ABOVE DOOR  |
|  | EXTERIOR WALL MOUNT BATTERY BACK UP EGRESS LIGHT ABOVE DOOR   |
|  | 12 VDC EMERGENCY ONLY LIGHTING FIXTURE. SINGLE OR DOUBLE UNIT AS INDICATED                          |
|  | TRACK LIGHTING WITH HEADS AS INDICATED  |
|  | 2'x4' E-LIGHT FLUORESCENT LIGHT FIXTURE.  |
|  | 2'x2' E-LIGHT FLUORESCENT LIGHT FIXTURE.  |
|  | 1'x4' E-LIGHT FLUORESCENT LIGHT FIXTURE.  |

### COMMUNICATION DEVICES (PLAN)

COMMUNICATION OUTLETS SHALL HAVE MINIMUM 3/4" EMPTY CONDUIT STUBBED TO ABOVE HUNG CEILING. 1" CONDUIT FOR DOUBLE OUTLETS. ALL COMMUNICATION OUTLETS MOUNTED 18" AFF UNLESS OTHERWISE NOTED

|  |   |
|--|---|
|  | TELEPHONE OUTLET  |
|  | PUBLIC TELEPHONE. CONFIRM EXACT REQUIREMENTS WITH TELEPHONE CO. |
|  | SECURITY TELEPHONE  |
|  | WALL MOUNTED TELEPHONE OUTLET                                   |
|  | FIRE FIGHTERS PHONE OUTLET                                      |
|  | FLUSH FLOOR TELEPHONE OUTLET                                    |
|  | DEDICATED PHONE OUTLET  |
|  | FLUSH FLOOR DEDICATED TELEPHONE OUTLET                          |
|  | WALL MOUNTED DATA OUTLET  |
|  | FLUSH FLOOR DATA OUTLET   |
|  | COMBINATION TEL/DATA OUTLET                                     |
|  | FLUSH FLOOR TEL/DATA OUTLET                                     |
|  | CABLE OUTLET (COAXIAL)  |

### FIRE ALARM SYSTEM (PLAN)

|  |  |  |   |  |  |
|--|--|--|---|--|--|
|  | ABORT SWITCH                                   |  | MANUAL STATION  |  | HORN WITH LIGHT AS ONE ASSEMBLY  |
|  | HALON ABORT                                    |  | HALON   |  | HORN WITH LIGHT AS SEPARATE ASSEMBLY   |
|  | CARBON DIOXIDE                                 |  | CARBON DIOXIDE  |  | SPEAKER/HORN (ELECTRIC HORN)   |
|  | DRY CHEMICAL                                   |  | DRY CHEMICAL  |  | MINI-HORN  |
|  | FOAM   |  | FOAM  |  | LIGHT (LAMP, SIGNAL LIGHT, INDICATOR LAMP STROBE)  |
|  | WET CHEMICAL                                   |  | WET CHEMICAL  |  | SMOKE DETECTOR   |
|  | CLEAN AGENT                                    |  | PULL STATION  |  | DUCT MTD SMOKE DETECTOR WITH SAMPLING TUBE (FURNISHED & WIRED BY E.C.-INSTALLED BY HVAC) |
|  | WATER MIST                                     |  | CLEAN AGENT   |  | PHOTOELECTRIC PRODUCTS OF COMBUSTION DETECTOR  |
|  | DELUGE SPRINKLER                               |  | WATER MIST  |  | IONIZATION PRODUCTS OF COMBUSTION DETECTOR   |
|  | AUTOMATIC DETECTION AND SUPERVISORY DEVICES    |  | DELUGE SPRINKLER  |  | BEAM TRANSMITTER   |
|  | HEAT DETECTOR (THERMAL)                        |  | FIRE SERVICE OR EMERGENCY TELEPHONE STATION                                   |  | BEAM RECEIVER  |
|  | COMBINATION-RATE OF RISE AND FIXED TEMPERATURE |  | ACCESSIBLE  |  | AIR SAMPLING   |
|  | RATE COMPENSATION                              |  | JACK  |  | GAS DETECTOR   |
|  | FIXED TEMPERATURE                              |  | HANDSET   |  | FLAME DETECTOR   |
|  | RATE OF RISE ONLY                              |  | TAMPER DETECTOR   |  | FLOW DETECTOR/SWITCH   |
|  | LINE TYPE DETECTOR (HEAT SENSITIVE CABLE)      |  | VALVE W/TAMPER DETECTOR   |  | PRESSURE DETECTOR/SWITCH   |
|  | MASTER BOX                                     |  | WATER MOTOR ALARM (WATER MOTOR GONG)  |  | LEVEL DETECTOR/SWITCH  |
|  | GONG   |  | DOOR HOLDER   |  | FIRE ALARM GATE VALVE SUPERVISORY BELL   |
|  | FIRE ALARM CONTROL UNIT                        |  | FIRE DOOR RELEASE   |  | ELEVATOR STATUS/RECALL   |
|  | FIRE ALARM TRANSPONDER OR TRANSMITTER          |  | FIRE SYSTEM ANNUNCIATOR   |  | HALON CONTROL UNIT   |
|  | FIRE ALARM COMMUNICATOR                        |  | CONTROL UNIT FOR HVAC EXHAUST, STAIRWELL PRESSURIZATION, OR SIMILAR EQUIPMENT |  |  |

### SECURITY SYSTEM (PLAN)

|  |                                       |
|--|---------------------------------------|
|  | DOOR SWITCH                           |
|  | CARD READER                           |
|  | PASS KEY                              |
|  | MAGNETIC LOCK                         |
|  | MOTION DETECTOR                       |
|  | SECURITY PANEL                        |
|  | SECURITY CAMERA                       |
|  | PUSH BUTTON FOR ELECTRIC DOOR RELEASE |
|  | LOW VOLTAGE TRANSFORMER               |
|  | SECURITY KEY PAD                      |
|  | DOOR OPENER PUSHBUTTON                |
|  | DOOR OPENER EMERGENCY PUSHBUTTON      |

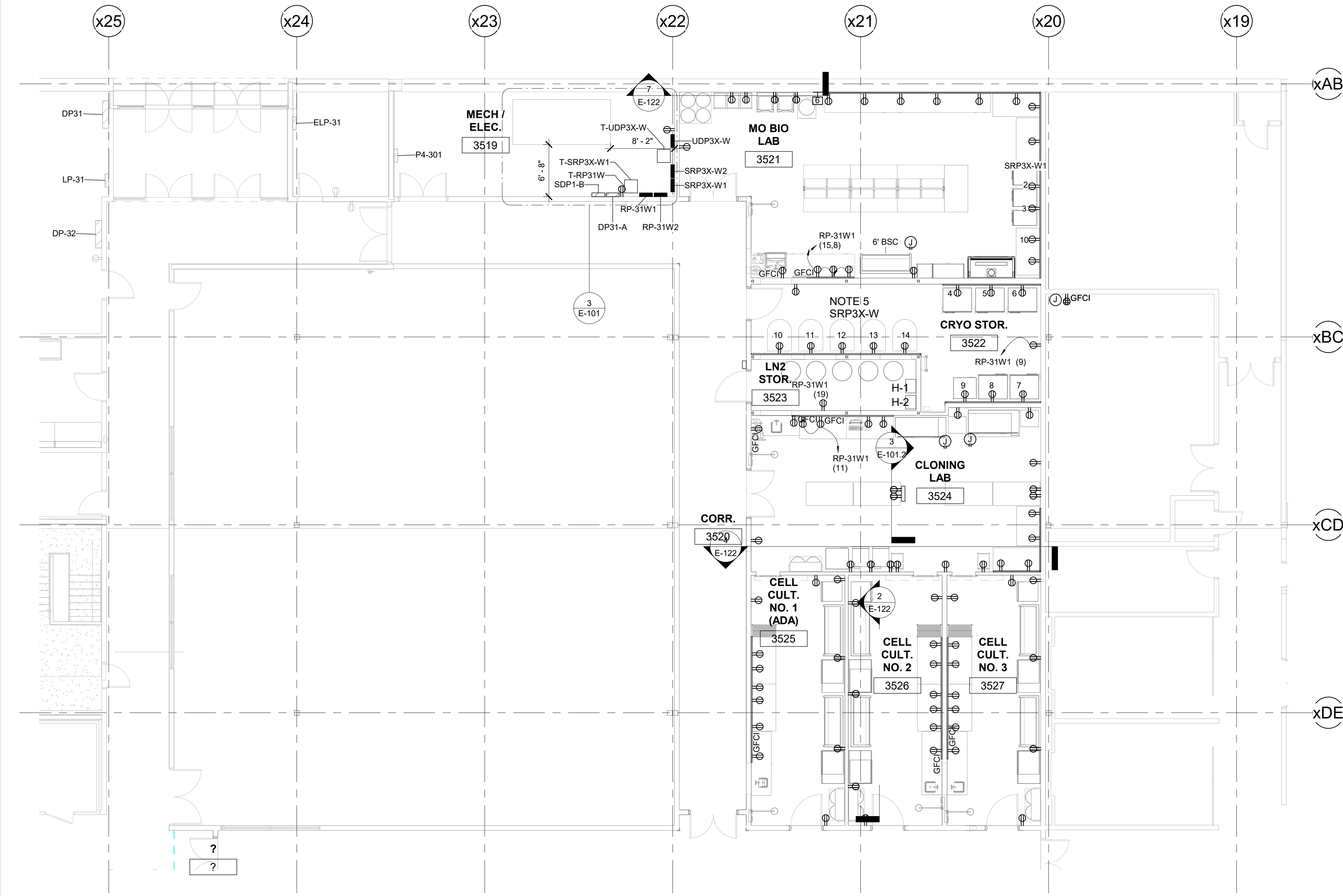
### DRAWING NOTATIONS

|  |  |
|--|--|
|  | REVISION CLOUD (BY DATE/CHANGED/HANGE) |
|  | SCOPE OF WORK LIMITS                   |
|  | THRESHOLD LIMITS                       |

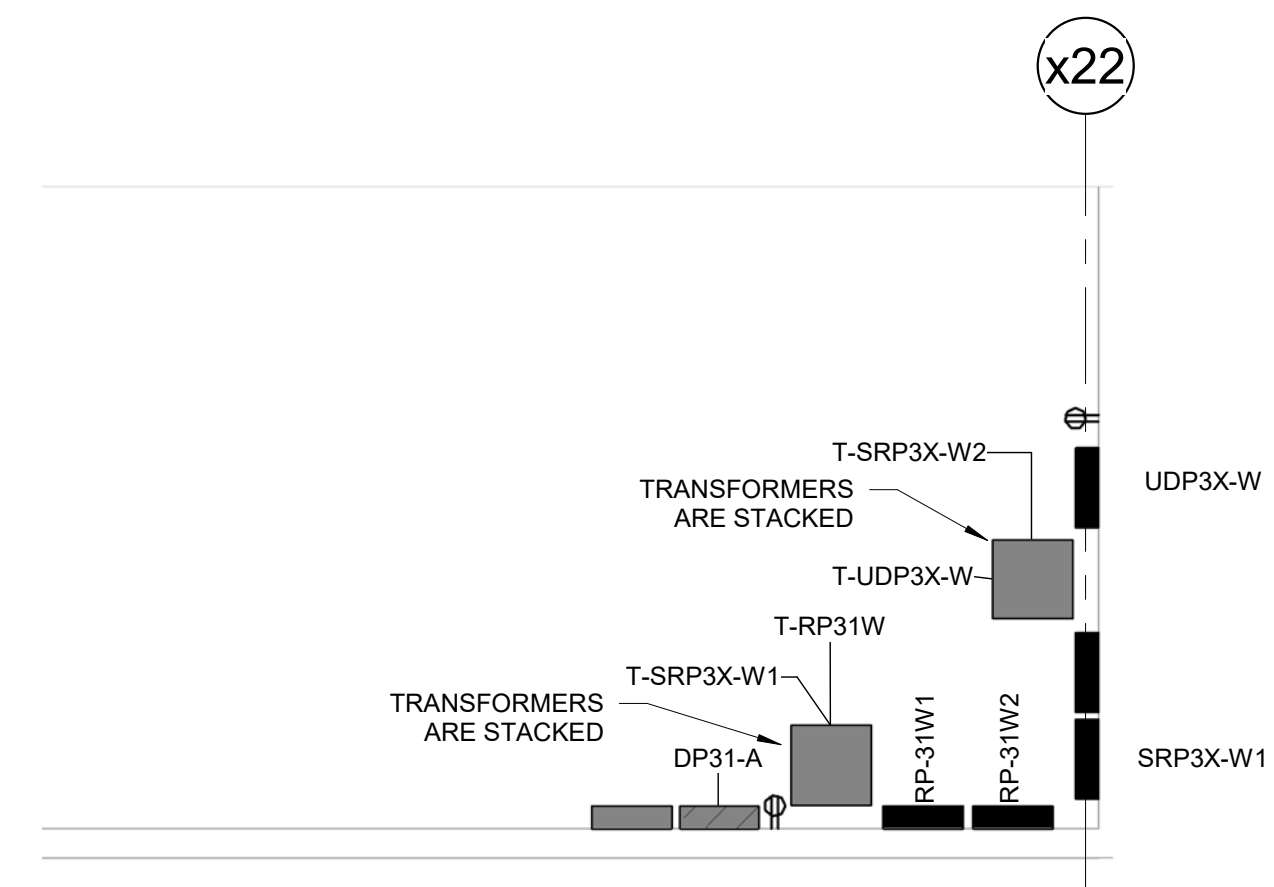
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| S.FITZGERALD | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| CHK:         | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |

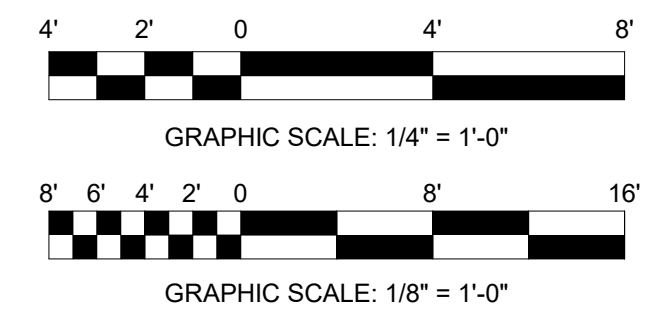


① PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"



③ L.3 FLR POWER PLAN WEST - Callout 1  
1/4" = 1'-0"

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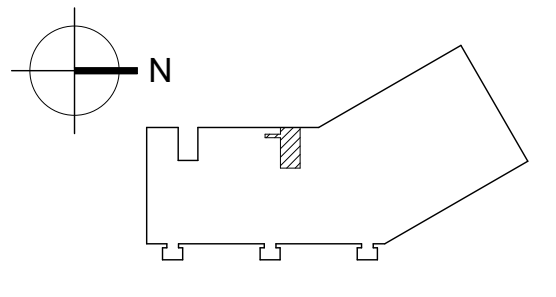


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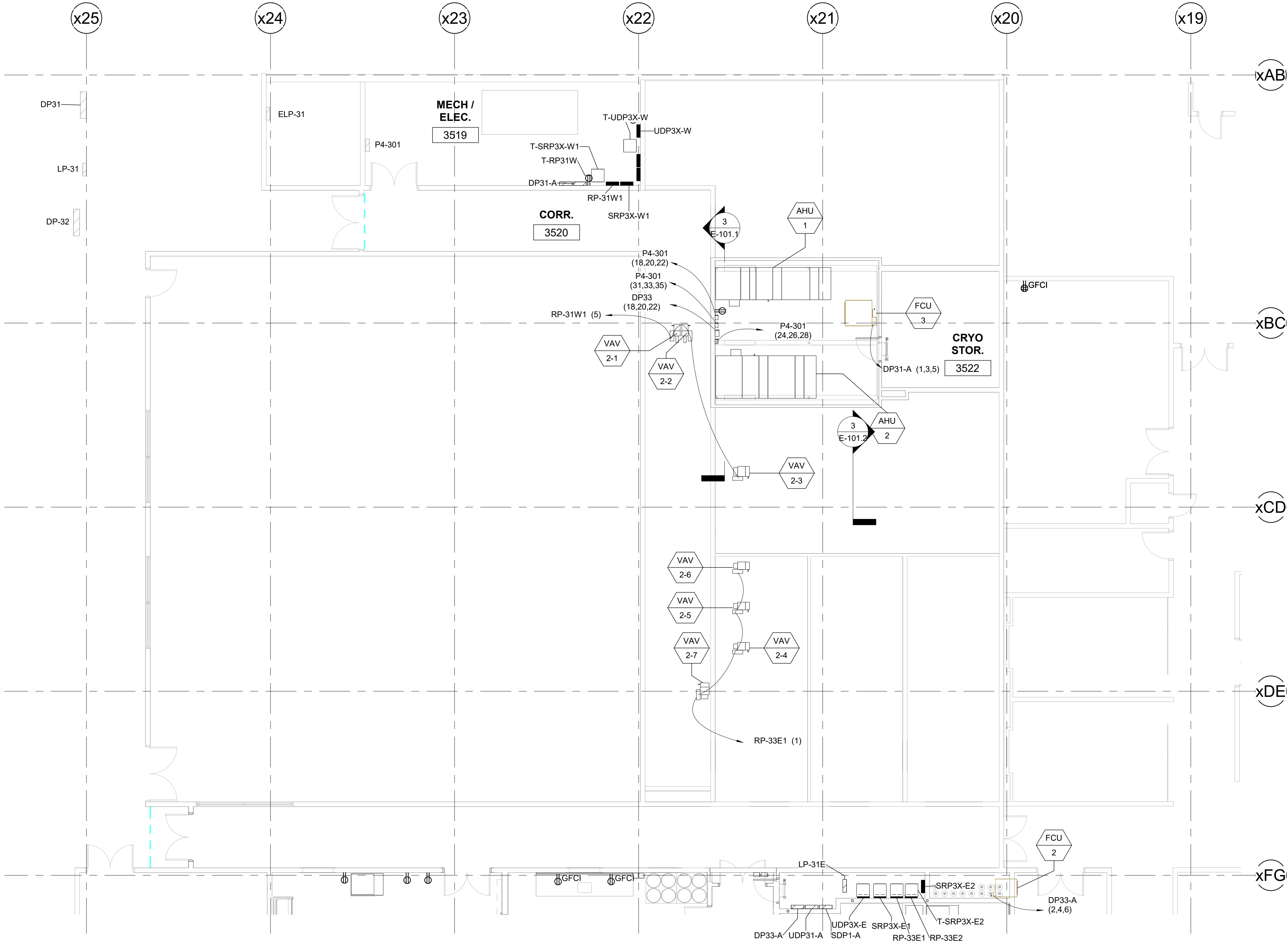
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|--------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD | A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| S.FITZGERALD | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| CHK:         | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
| Approver     |      |          |                              |      |      |       |



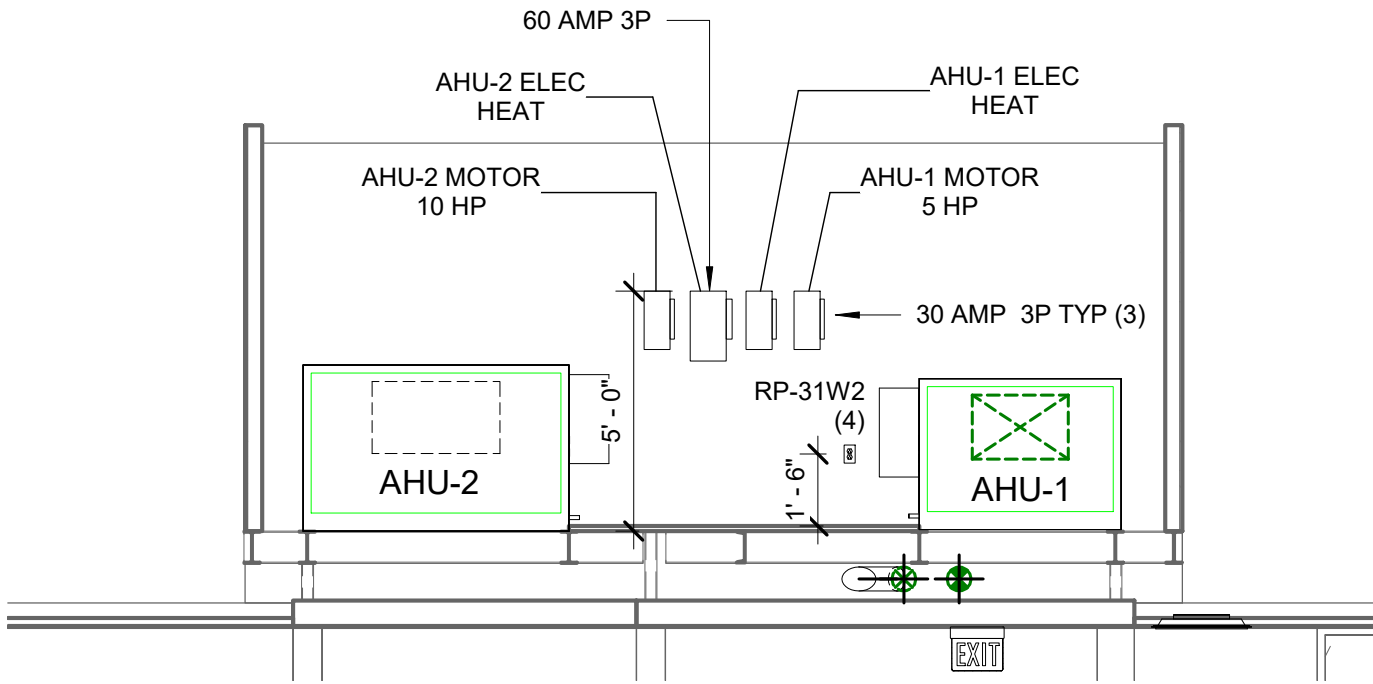
|   |  |   |
|---|--|---|
| CLD & CCM LABS<br><b>ELECTRICAL</b><br>LEVEL 3 WEST PART PLAN<br>120 VAC POWER LAYOUT |  | ISSUE DATE: 02/12/21<br>SCALE: As indicated |
| PROJ. NO: 20021A CAD FILE:  |  | SHEET NUMBER<br><b>E-101</b>                |





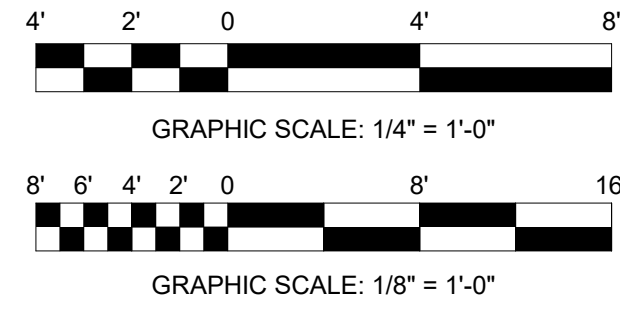
**PROJECT NOTES**

1. ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL 120 VAC CIRCUITS FOR VAV BOXES AS SHOWN.
2. EC TO FURNISH AND INSTALL 480 VAC 3P DISCONNECTS AND CIRCUITS FOR AHU 1 & 2. EACH AHU WILL REQUIRE TWO DISSCONNECTS, ONE FOR THE VFD AND ONE FOR ELECTRICAL HEAT COIL. SEE SECTION THIS DRAWING (#3).
3. EC TO FURNISH AND INSTALL 480 VAC CIRCUITS FOR FCU UNITS AND LOCAL DISCONNECT IF ONE NOT PROVIDED.



1 PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"

3 MEZ AHU 1 & 2  
1/4" = 1'-0"



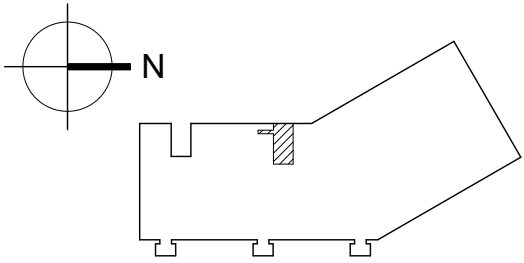
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING

**GENERAL NOTE:**

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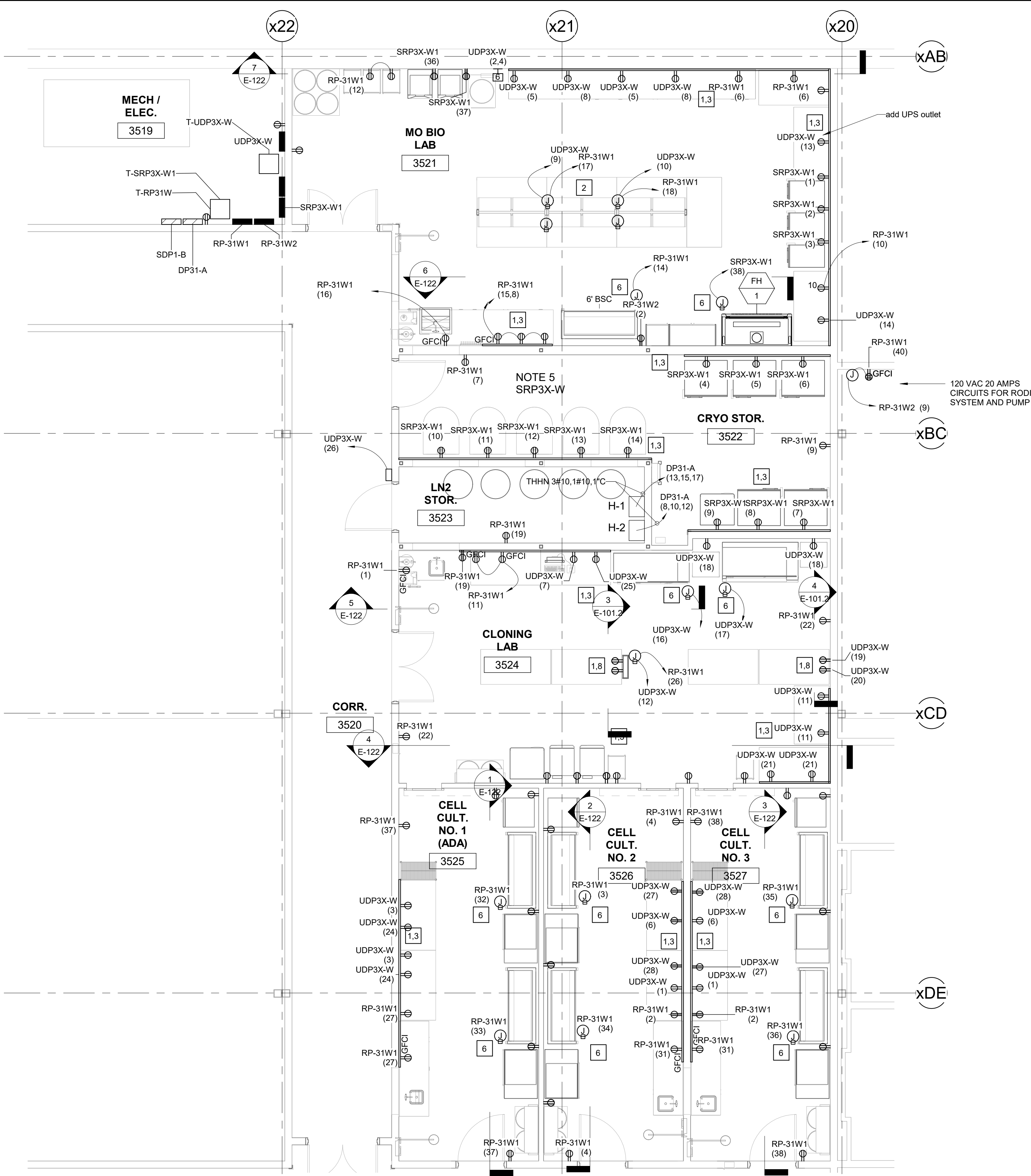
| DSGN:        | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|--------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD | A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| S.FITZGERALD | B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| CHK:         | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 3/16" = 1'-0"

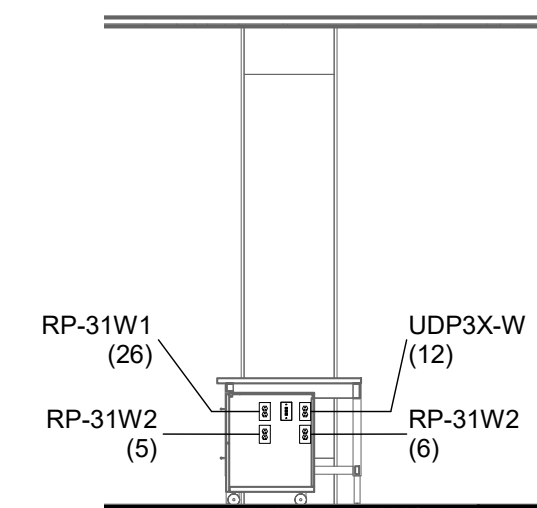
BAR IS ONE INCH ON ORIGINAL DRAWING



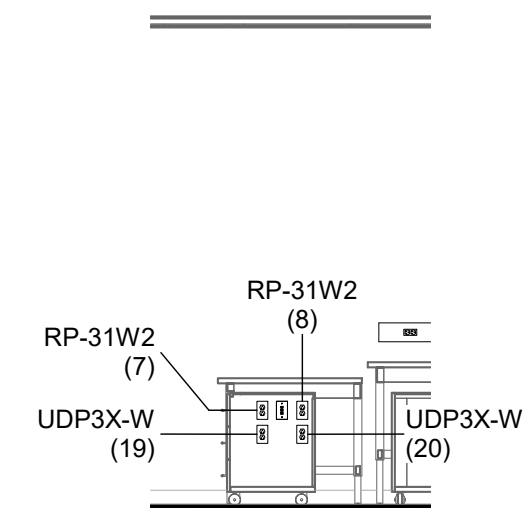
1 PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
3/16" = 1'-0"

#### PROJECT NOTES

- 1 ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL 120 VAC CIRCUITS HAS SHOWN ON PLAN.
- 2 EC TO PROVIDE JUNCTION BOXES ABOVE CASEWORK, EC TO RUN 120 VAC CIRCUITS IN FURNITURE SYSTEM PROVIDED RACEWAYS.
- 3 EC TO FURNISH AND INSTALL 4000 SERIES WIRE MOLD TWO CHANNEL. ONE FOR POWER AND THE OTHER FOR DATA AND BMS CONNECTIONS. FOR 120 VAC CIRCUIT PROVIDE AND INSTALL DUPLEX OUTLETS. SEE DATA PLAN FOR DATA JACK LOCATIONS.
- 4 EC TO PROVIDE HARDWIRED CONNECTION FOR 120 VAC CIRCUITS LAB EQUIPMENT.
- 5 EC TO FURNISH AND INSTALL GROUND BAR FOR STATIC WITH CORD REEL.
- 6 EC TO FURNISH AND INSTALL JUNCTION BOX FOR 120 VAC POWER TO HOODS. JUNCTION SHOWN NOT ABOVE HOOD FOR CLARITY. HARDWIRE 120 VAC TO HOOD USING SINGLE POINT CONNECTION. PROVIDE WIRE AND CONDUIT, AND SUPPORTS TO COMPLETE INSTALLATION.
- 7 ALL CIRCUITS TO BE 20 AMP 120 VAC AND 2#12, 1#12G, 3/4" UNLESS OTHERWISE STATED.
- 8 PROVIDE AND INSTALL 4(X) 120 VAC ONE CIRCUIT 4-5 FT POWER STRIPS MOUNTED UNDER LAB BENCHES. ONE FOR NORMAL POWER AND ANOTHER FOR UPS POWER WITH AT LEAST 4-6 OUTLETS FOR EACH SIDE OF THE LAB BENCH.
- 9 FOR CIRCUIT NOT SHOWN SEE SECTION VIEWS ON E-122 FOR CIRCUITS NUMBERS AND LOCATIONS.



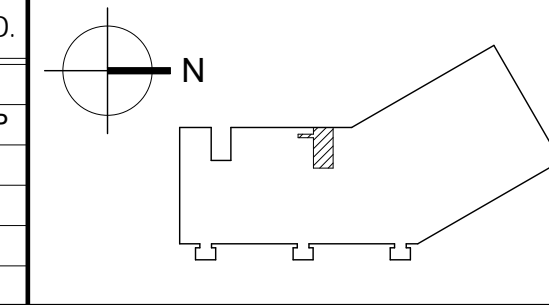
3 WS CLONING TABLE 1  
1/4" = 1'-0"



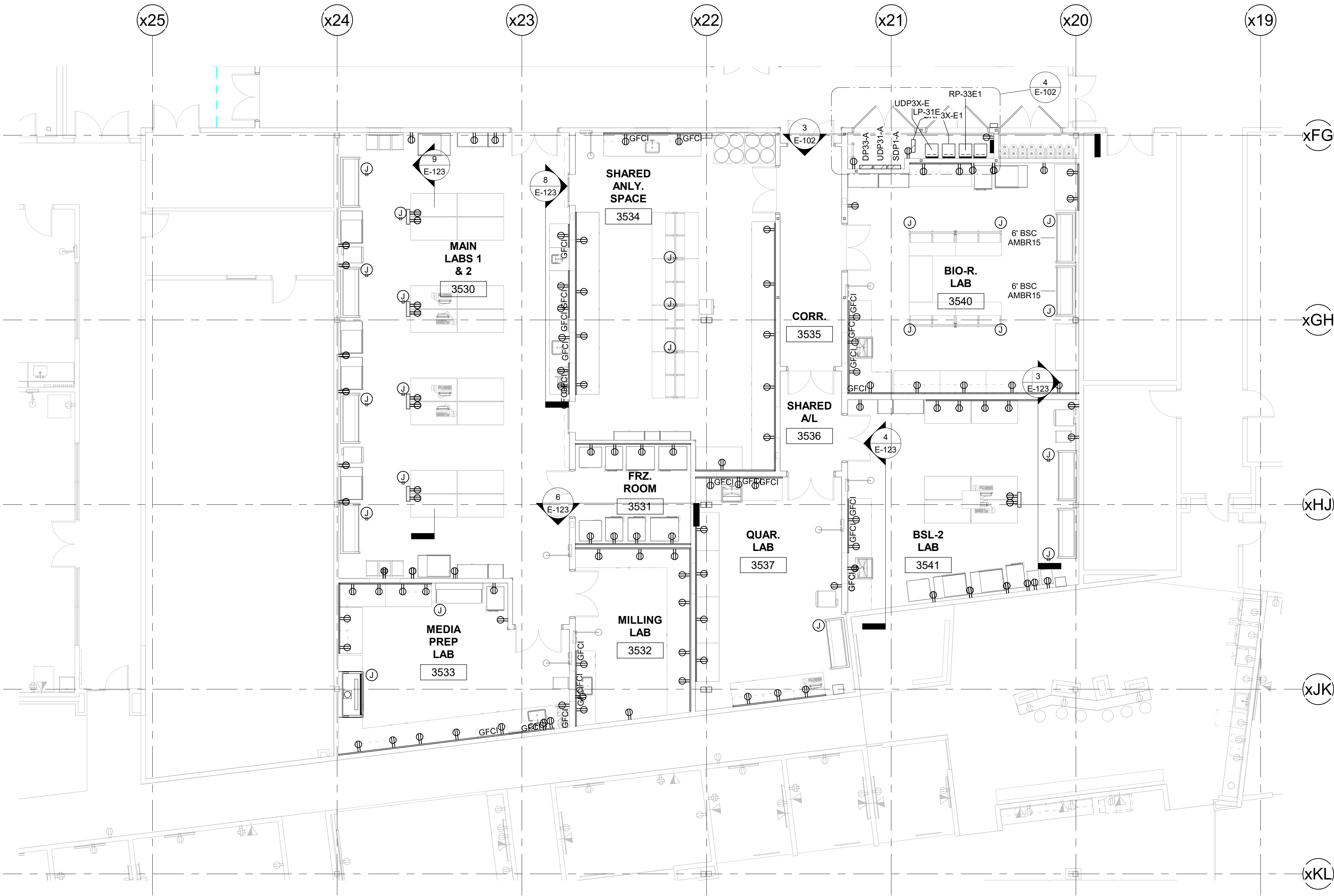
4 WS CLONING TABLE 2  
1/4" = 1'-0"

GRAPHIC SCALE: 1/4" = 1'-0"

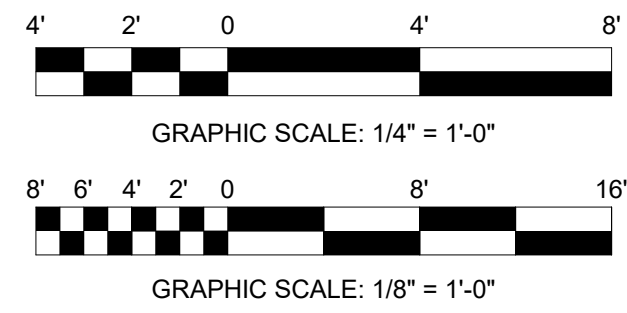
GRAPHIC SCALE: 3/16" = 1'-0"





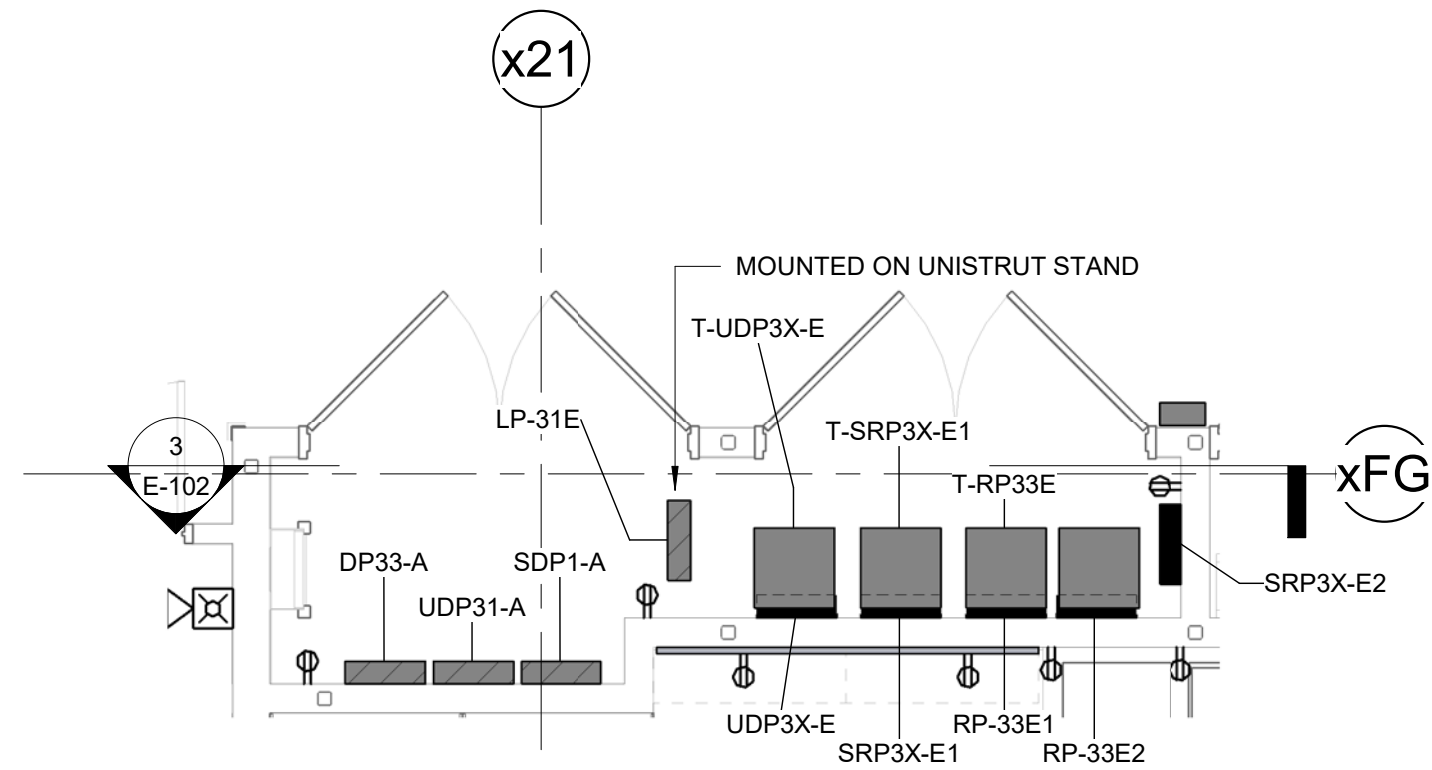


1 PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"

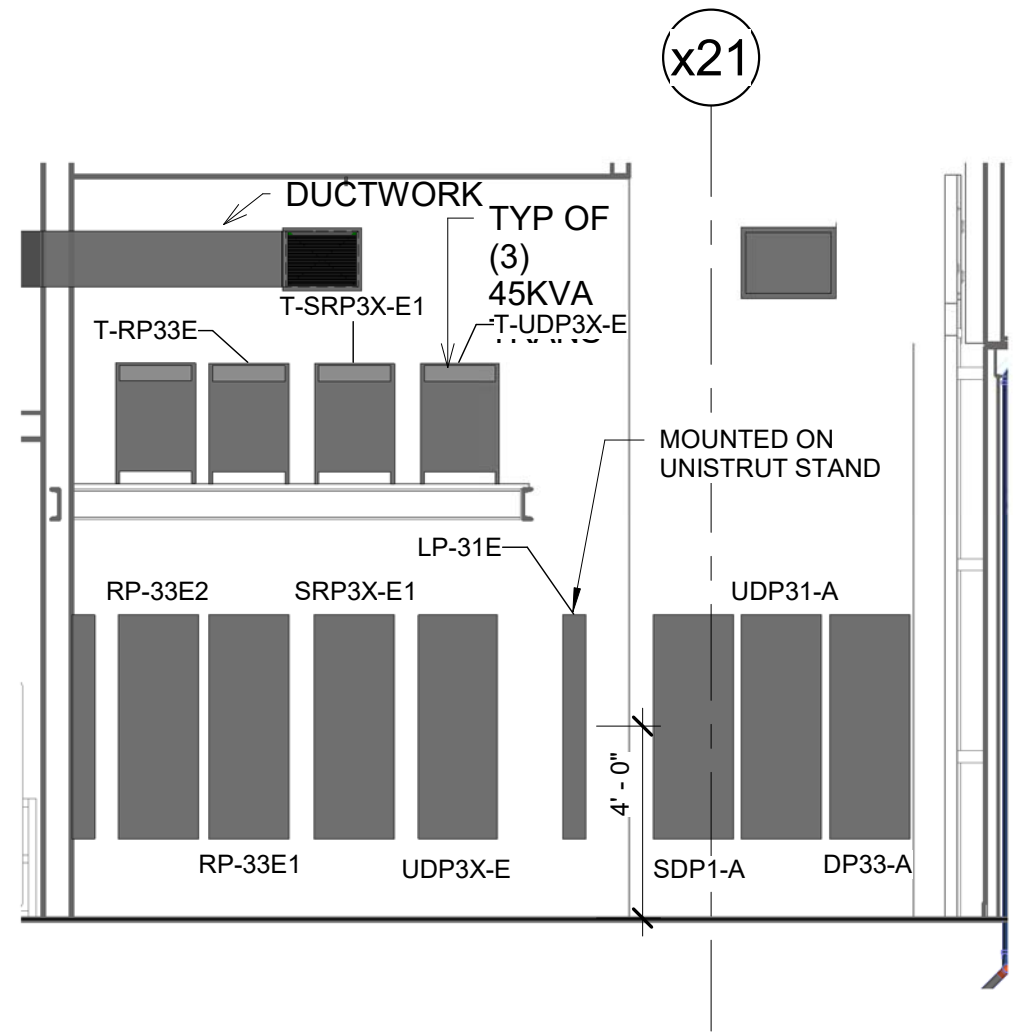


PROJECT NOTES

1. ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL FOUR SQUARE D NF 250 AMP 42 SPACE 3P 4W PANEL BOARDS
2. EC TO FURNISH AND INSTALL FOUR SQUARE D NQ 225 AMP 42 SPACE 3P 4W PANEL BOARDS.
3. EC TO FURNISH AND INSTALL FOUR SQUARE D 480 VAC TO 208/120Y 45KVA TRANSFORMERS. ALL TRANSFORMERS ARE TO BE WALL MOUNTED ON PROVIDED STEEL FRAME.
4. EC TO FURNISH AND INSTALL 120 VAC 20 AMP CIRCUIT TO A JUNCTION BOX ABOVE BSC. PROVIDE CONNECTION FROM JUNCTION TO BSC USING MANUFACTURE SINGLE POINT CONNECTION. SEE MANUFACTURE DOCUMENTATION FOR CONNECTION POINT.
5. EC TO FURNISH AND INSTALL 120 VAC CIRCUITS AS SHOWN TO OPTIMA BENCH SYSTEM. PROVIDE JUNCTION FOR CIRCUITS ABOVE BENCH SYSTEM AND RUN CIRCUITS DOWN INTO SYSTEM USING MANUFACTURE PROVIDED RACEWAYS. PROVIDE OUTLETS AS NEEDED.
6. SEE ONE LINES AND PANEL SCHEDULES FOR MORE INFORMATION.
7. CIRCUITS IN THIS AREA FOR LAB EQUIPMENT ARE SHOWN ON ENLARGED EAST PLAN.



4 L3 FLR POWER PLAN EAST - Callout 1  
1/4" = 1'-0"



3 EAST ELEC. RM SECTION VIEW  
1/4" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

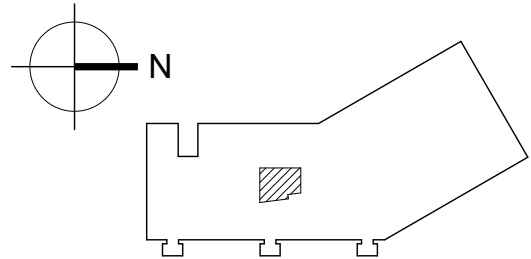
BAR IS ONE INCH ON ORIGINAL DRAWING

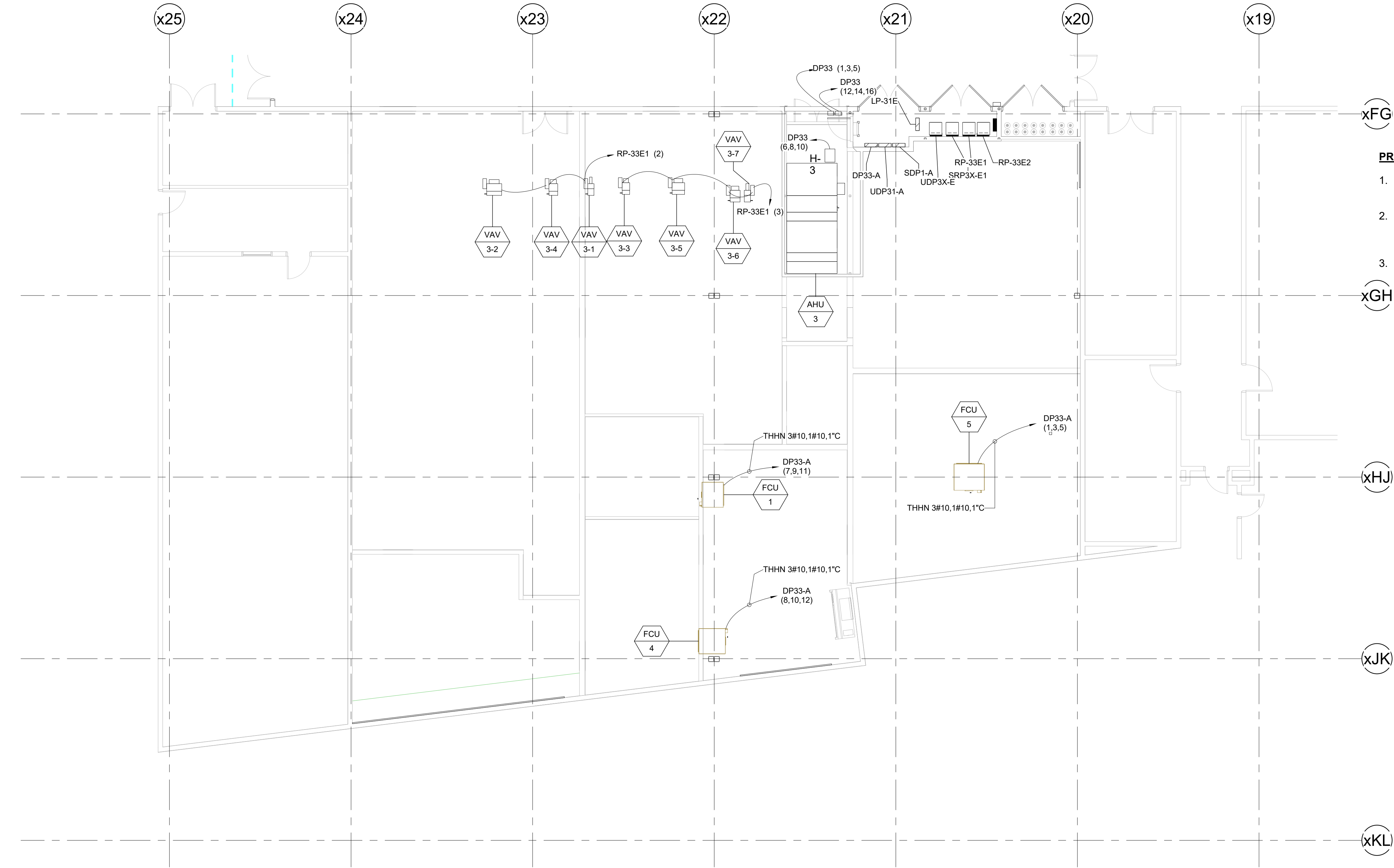
GENERAL NOTE:

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|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |

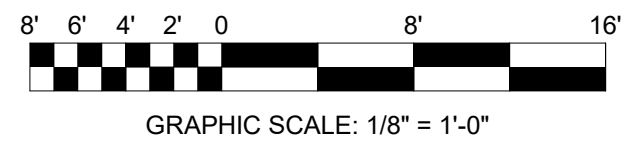




**PROJECT NOTES**

1. ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL 120 VAC CIRCUITS FOR VAV BOXES AS SHOWN.
2. EC TO FURNISH AND INSTALL 480 VAC 3P DISCONNECTS AND CIRCUITS FOR AHU 3. EACH AHU WILL REQUIRE TWO DISSCONNECTS, ONE FOR THE VFD AND ONE FOR ELECTRICAL HEAT COIL.
3. EC TO FURNISH AND INSTALL 480 VAC CIRCUITS FOR FCU UNITS AND LOCAL DISCONNECT IF ONE NOT PROVIDED.

① PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING

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CUMBERLAND, RI 02864 | F: (401) 658-4609  
A MEMBER OF THE HART COMPANIES WWW.HARTCOMPANIES.COM

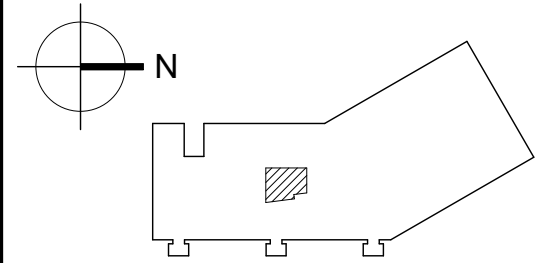
**cytiva**  
100 RESULTS WAY  
MARLBOROUGH, MA 01752

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|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 EAST PART PLAN  
HVAC POWER LAYOUT

PROJ. NO: 20021A CAD FILE:

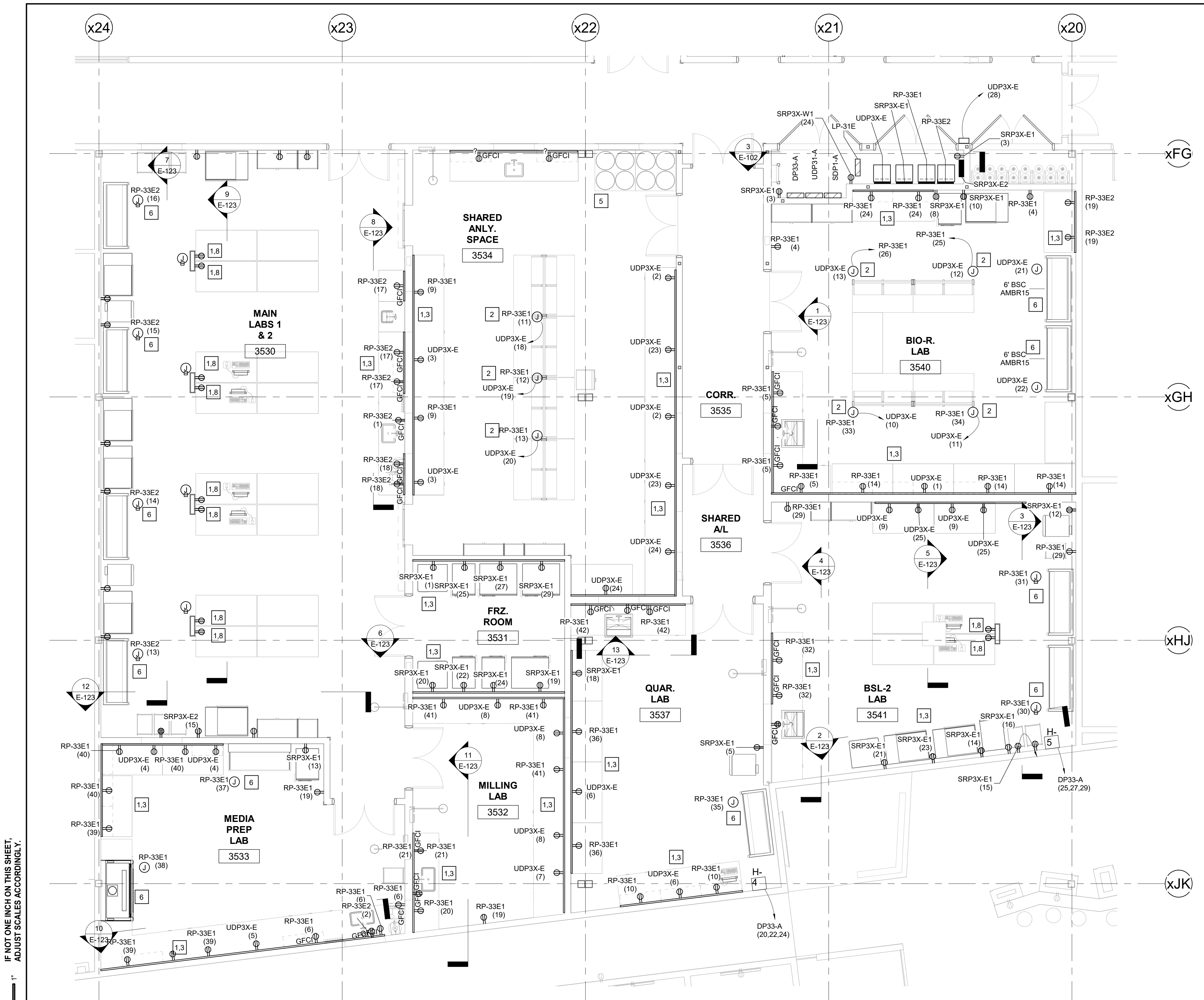
ISSUE DATE: 03/12/21

SCALE: As indicated

SHEET NUMBER

E-102.1

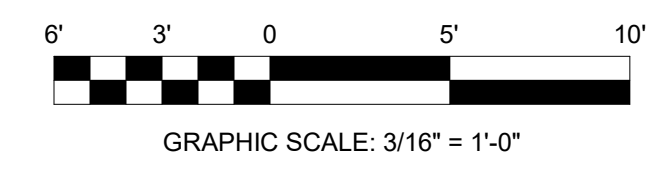




- PROJECT NOTES**
- ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL 120 VAC CIRCUITS HAS SHOWN ON PLAN.
  - EC TO PROVIDE JUNCTION BOXES ABOVE CASEWORK, EC TO RUN 120 VAC CIRCUITS IN FURNITURE SYSTEM PROVIDED RACEWAYS.
  - EC TO FURNISH AND INSTALL 4000 SERIES WIRE MOLD TWO CHANNEL. ONE FOR POWER AND THE OTHER FOR DATA AND BMS CONNECTIONS. FOR 120 VAC CIRCUIT PROVIDE AND INSTALL DUPLEX OUTLETS. SEE DATA PLAN FOR DATA JACK LOCATIONS.
  - EC TO PROVIDE HARDWIRED CONNECTION FOR 120 VAC CIRCUITS LAB EQUIPMENT.
  - EC TO FURNISH AND INSTALL GROUND BAR FOR STATIC WITH CORD REEL.
  - EC TO FURNISH AND INSTALL JUNCTION BOX FOR 120 VAC POWER TO HOODS, JUNCTION SHOWN NOT ABOVE HOOD FOR CLARITY. HARDWIRE 120 VAC TO HOOD USING SINGLE POINT CONNECTION. PROVIDE WIRE AND CONDUIT, AND SUPPORTS TO COMPLETE INSTALLATION.
  - ALL CIRCUITS TO BE 20 AMP 120 VAC AND 2#12, 1#12G, 3/4" UNLESS OTHERWISE STATED.
  - PROVIDE AND INSTALL 4(X) 120 VAC ONE CIRCUIT 4-5 FT POWER STRIPS MOUNTED UNDER LAB BENCHES. ONE FOR NORMAL POWER AND ANOTHER FOR UPS POWER WITH AT LEAST 4-6 OUTLETS FOR EACH SIDE OF THE LAB BENCH.
  - FOR CIRCUIT NOT SHOWN SEE SECTION VIEWS ON E-123 FOR CIRCUITS NUMBERS AND LOCATIONS.

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1 PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
3/16" = 1'-0"

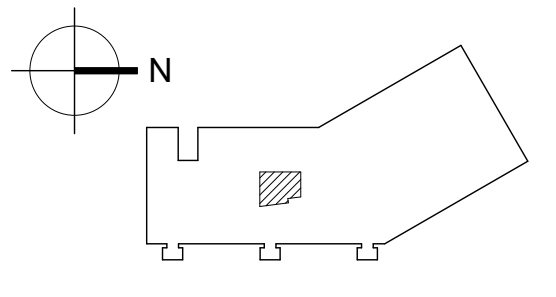


**HART DESIGN GROUP**  
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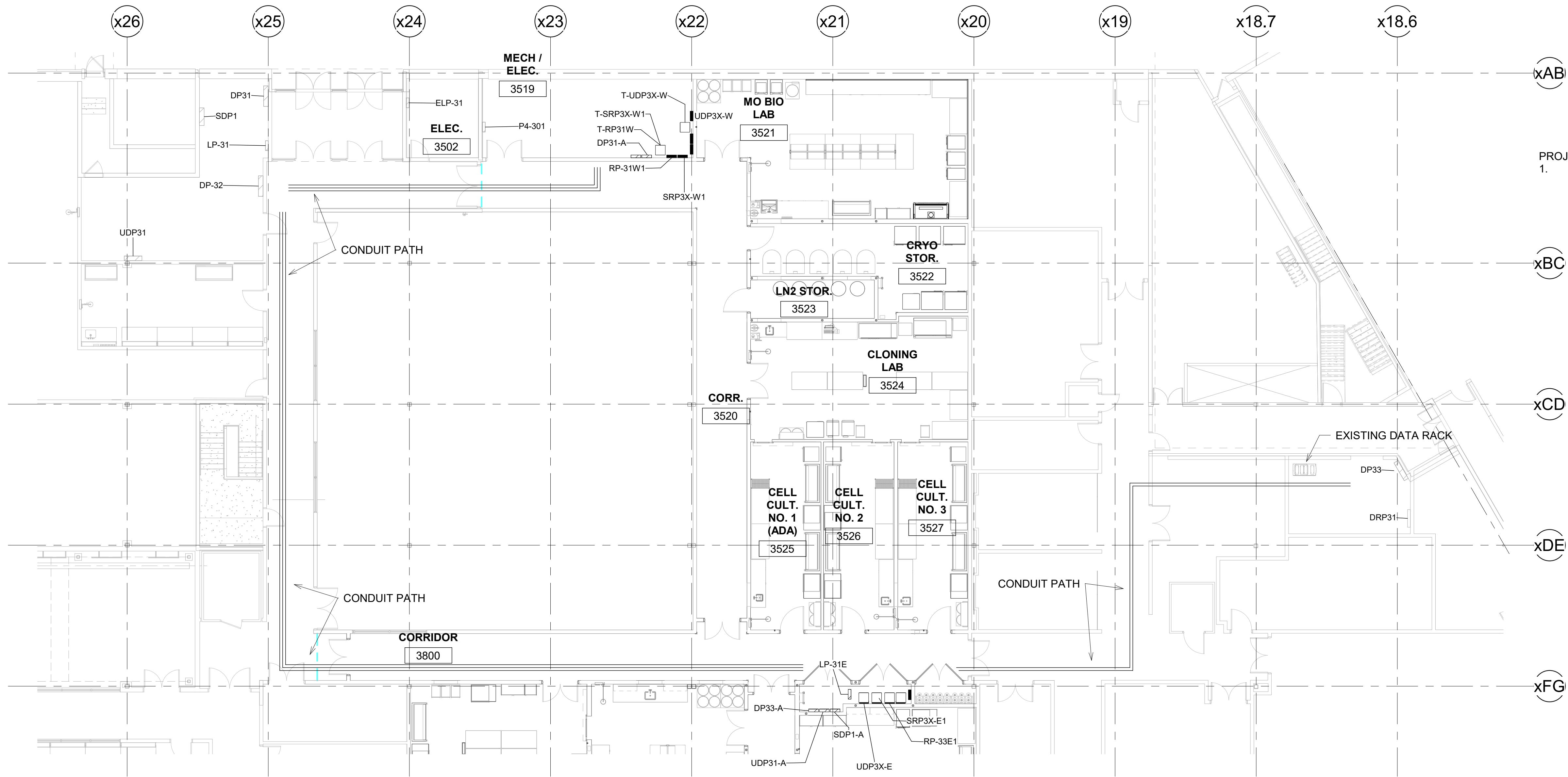
| DSGN:        | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|--------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| S.FITZGERALD | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  |       |
| CHK:         |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
ENLARGED EAST SHELL SPACE  
120 VAC POWER LAYOUT

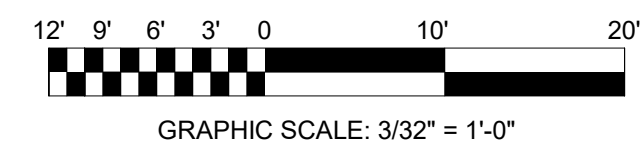
ISSUE DATE: 04/13/21  
SCALE: As indicated  
SHEET NUMBER  
**E-102.2**

PROJ. NO: 20021A CAD FILE:




PROJECT NOTES  
1. THIS PLAN SHOW GENERAL CONDUIT ROUTING AND PROJECT IMPACTED POWER PANELS LOCATIONS, FOR NEW AND EXISTING.

① PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
3/32" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



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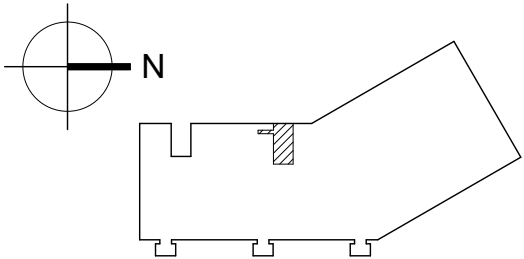


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MARLBOROUGH, MA 01752

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| DSGN:            | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD     | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| DR: S.FITZGERALD | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| CHK: M.POWERS    |      |          |                              |      |      |       |
| APVD: M.POWERS   |      |          |                              |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 PART PLAN  
CONDUIT LAYOUT

PROJ. NO: 20021A CAD FILE:

ISSUE DATE: 02/25/21

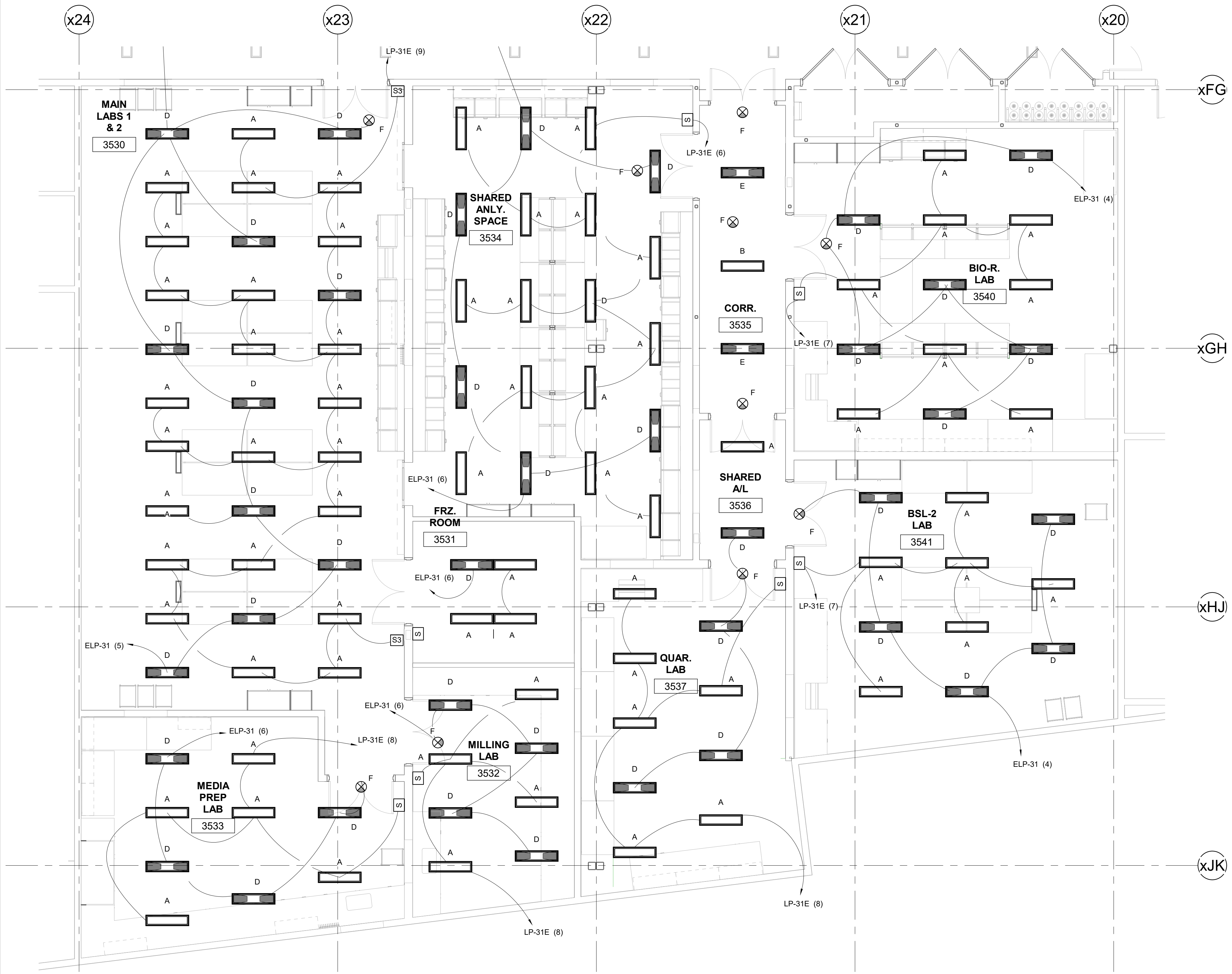
SCALE: 3/32" = 1'-0"

SHEET NUMBER

E-103

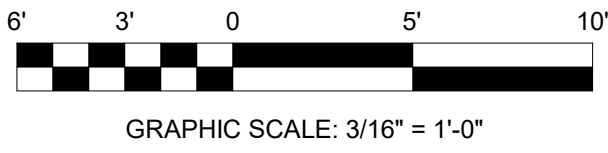






- PROJECT NOTES**
- ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL LED LIGHT FIXTURES AS SHOWN ON PLAN. PROVIDE LIGHTING CIRCUITS AS SHOWN ON PLAN. SEE LIGHTING SCHEDULE FOR LIGHT FIXTURE PART NUMBERS SEE DRAWING SHEET.

1 PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
3/16" = 1'-0"



| LIGHT FIXTURE SCHEDULE COMPLETE EAST |              |                                   |   |      |          |         |            |     |  |
|--------------------------------------|--------------|-----------------------------------|---|------|----------|---------|------------|-----|--|
| TYPE MARK                            | MANUFACTURER | MODEL                             | DESCRIPTION   | LAMP | VOLTAGE  | WATTAGE | MOUNTING   | QTY |  |
| A                                    | LITETRONICS  | PT13520                           | 1x4 LED LIGHT PANEL ADJUSTABLE LIGHT OUTPUT                                     | LED  | 120-277V | 20W     | T-BAR GRID | 69  |  |
| B                                    | LITETRONICS  | PT13520 W/ FPAM221                | 1x4 LED LIGHT PANEL ADJUSTABLE LIGHT OUTPUT, WITH DRYWALL MOUNT KIT             | LED  | 120-277V | 20W     | FLANGE     | 1   |  |
| D                                    | LITETRONICS  | PT13520 W/ EB23UQB                | 1x4 LED LIGHT PANEL ADJUSTABLE LIGHT OUTPUT/ EB BACKUP                          | LED  | 120-277V | 20W     | T-BAR GRID | 41  |  |
| E                                    | LITETRONICS  | PT13520 W/ FPAM221 AND EB23UQB    | 1x4 LED LIGHT PANEL ADJUSTABLE LIGHT OUTPUT, WITH DRYWALL MOUNT KIT & EB BACKUP | LED  | 120-277V | 20W     | FLANGE     | 2   |  |
| F                                    | LITHONIA     | LQM-P-W-3-R-120/277-EL N OR EQUAL | LED EXIT LIGHT W/ BATTERY BACK-UP   | LED  | 120-277V | 1       | SURFACE    | 10  |  |

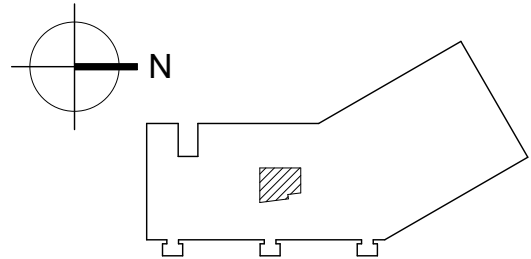
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|       |              |
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| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION         |
|------|----------|------------------------------|
| A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      |

| DWG. | CHK. | APVD. |
|------|------|-------|
| SPF  | MAP  |       |
| SPF  | MAP  |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 EAST PART PLAN  
LIGHTING LAYOUT

ISSUE DATE: 02/25/21

SCALE: As indicated

SHEET NUMBER

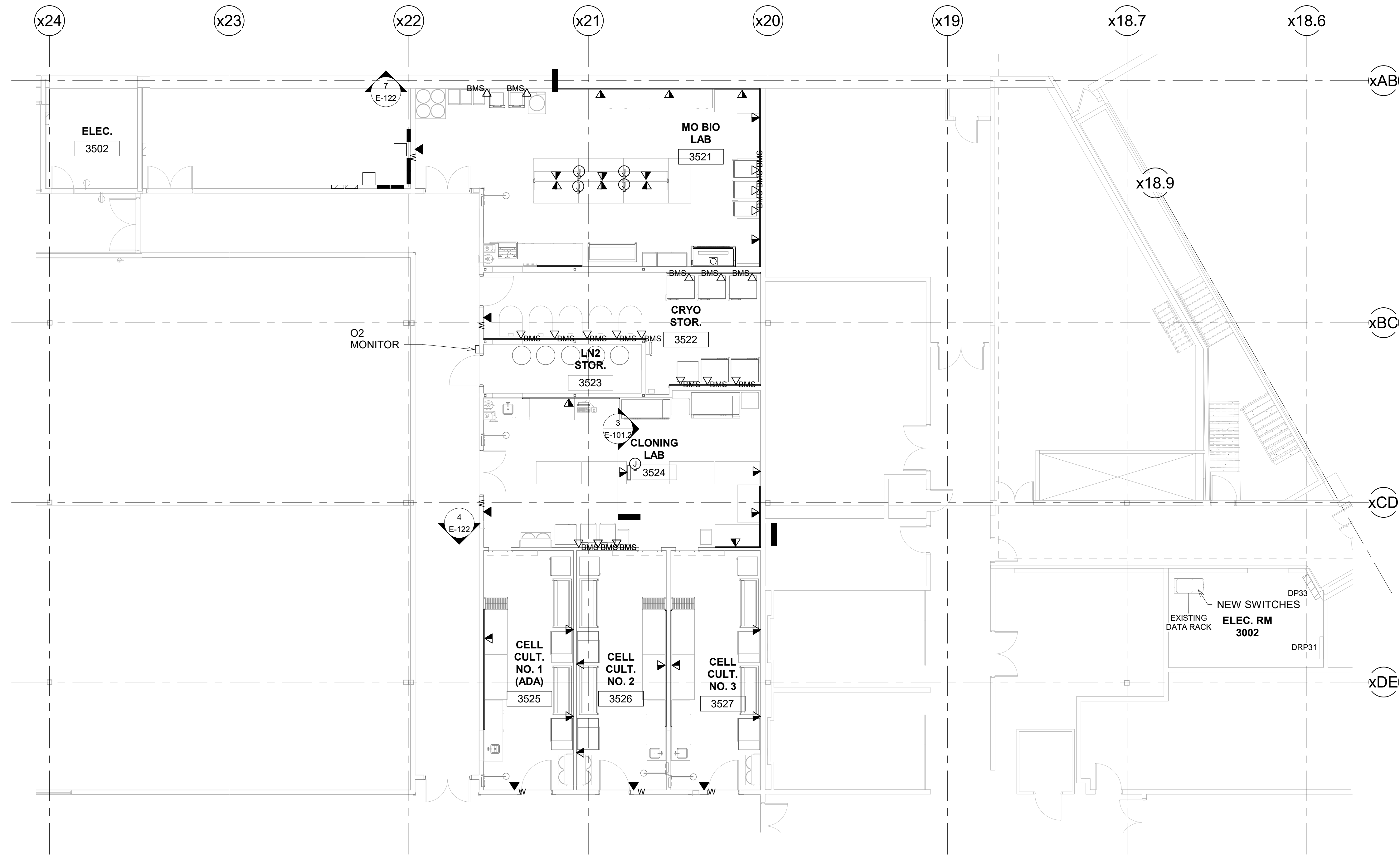
E-105

PROJ. NO: 20021A CAD FILE:

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING





1 PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"

PROJECT NOTES

- ELECTRICAL CONTRACTOR (EC) TO COORDINATE AND SUPPORT JCI CONTRACTOR FOR BMS MONITORING POINTS FOR LAB EQUIPMENT.
- JCI TO SUPPLY BMS PANELS AND LOCATIONS OF BMS PANELS TO EC. EC TO PROVIDE AND INSTALL ANY ADDITIONAL CONDUIT NEED TO COMPLETE INSTALLATION BMS INSTALLATION. JCI TO PROVIDE ALL BMS WIRING AND BMS CONNECTIONS.
- EC TO FURNISH AND INSTALL BMS MONITORING POINTS AS SHOWN IN LAB TO MONITOR LAB EQUIPMENT. RUN WIRING BACK TO NEW BMS PANELS AS NEEDED.
- EC TO FURNISH AND INSTALL TWO 48 PORT ETHERNET SWITCHES IN ELEC ROOM 3002. MOUNT IN EXISTING DATA RACK. WORK WITH SITE IT FOR TYPE AND MODEL. RUN ALL DATA DROPS FROM LABS TO ROOM ELEC RM 3002.
- ALL DATA CABLE TO BE CAT6 AND ALL JACKS TO BE THREE PORTS, WITH TWO PORTS PUNCHED IN.
- EC TO FURNISH AND INSTALL NEW MSA TRIGAURD GAS MONITORING PANEL, SINGLE O2 SENSOR MSA PART # A-TG5000-1-1-16-1-0-0-2-0-0. MOUNT OUTSIDE GAS CLOSET. PROVIDE AND INSTALL ALL CONDUIT AND SUPPORTS NEEDED TO COMPLETE INSTALLATION.
- 

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



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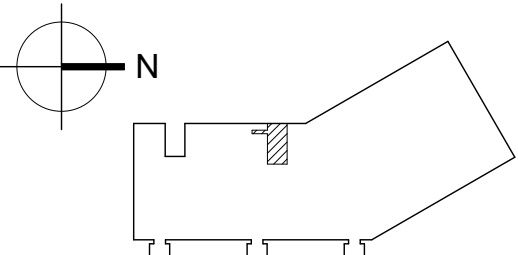
**cytiva**  
100 RESULTS WAY  
MARLBOROUGH, MA 01752

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|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 WEST PART PLAN  
DATA AND SPECIAL SYSTEMS

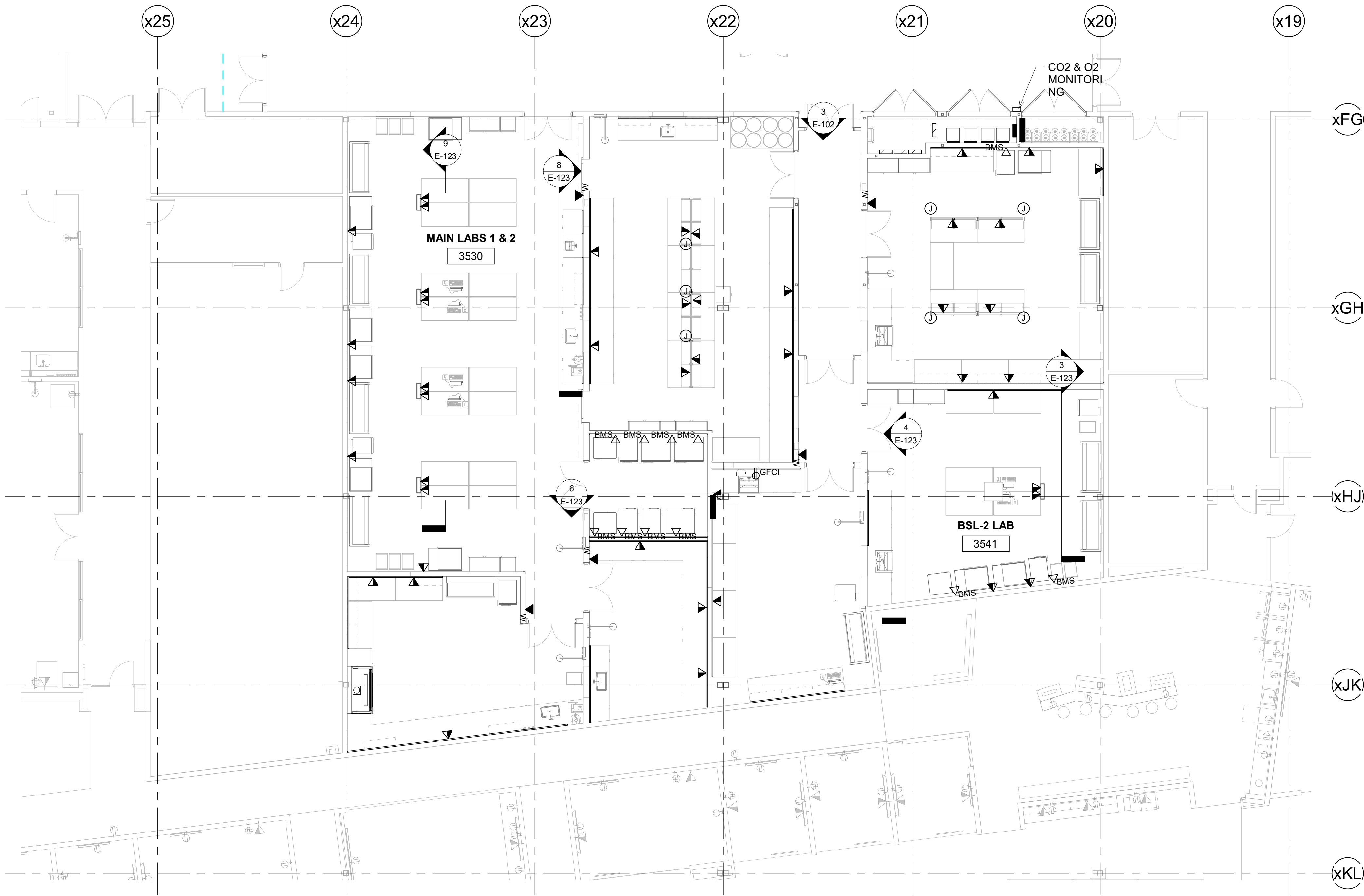
PROJ. NO: 20021A CAD FILE:

ISSUE DATE: 04/08/21

SCALE: As indicated

SHEET NUMBER

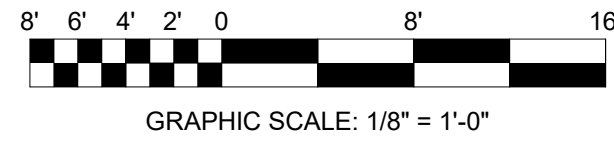
E-106



① PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"

**PROJECT NOTES**

- ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL BMS MONITORING POINTS AS SHOWN IN LAB TO MONITOR LAB EQUIPMENT. RUN WIRING BACK TO NEW BMS PANEL IN 3502 SEE DRAWING E107 FOR PANEL LOCATION.
- EC TO FURNISH AND INSTALL DATA DROPS FROM LABS TO ROOM ELEC RM 3002.
- ALL DATA CABLE TO BE CAT6 AND ALL JACKS TO BE THREE PORTS, WITH TWO PORTS PUNCHED IN.
- EC TO FURNISH AND INSTALL NEW MSA TRIGAURD GAS MONITORING PANEL, TWO SENSOR PANEL, O2 AND CO2, MSA PART # A-TG5000-1-1-16-1-AF-1-2-0-0. MOUNT OUTSIDE GAS CLOSET. PROVIDE AND INSTALL ALL CONDUIT AND SUPPORTS NEEDED TO COMPLETE INSTALLATION.



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



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CUMBERLAND, RI 02864 | F: (401) 658-4609  
A MEMBER OF THE HART COMPANIES [WWW.HARTCOMPANIES.COM](http://WWW.HARTCOMPANIES.COM)

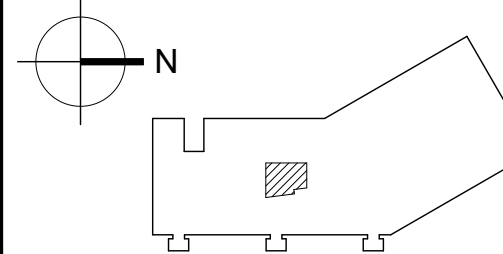


**cytiva**  
100 RESULTS WAY  
MARLBOROUGH, MA 01752

**GENERAL NOTE:**

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| DSGN:        | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|--------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| DR:          | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| CHK:         |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 EAST PART PLAN  
DATA AND SPECIAL SYSTEMS

PROJ. NO: 20021A CAD FILE:

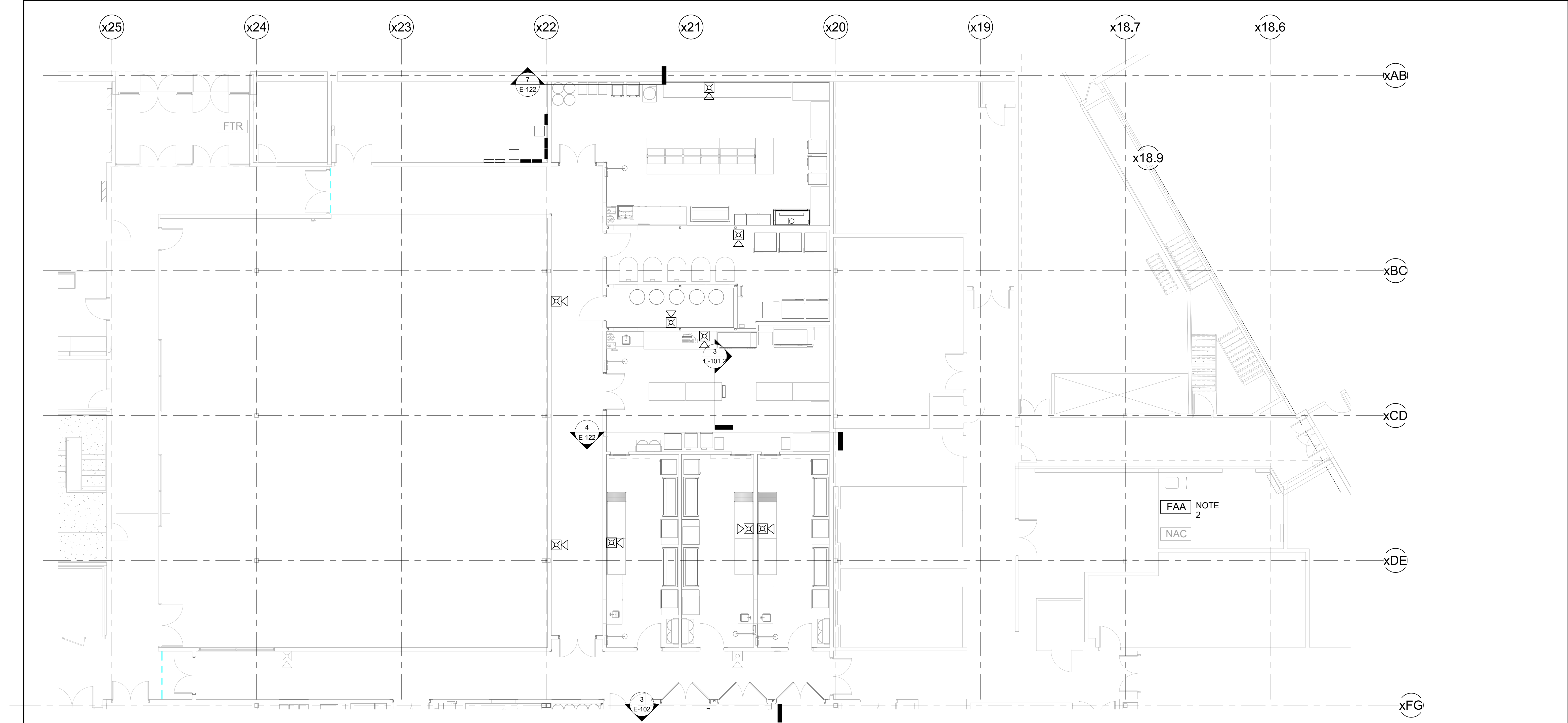
ISSUE DATE: 04/08/21

SCALE: As indicated

SHEET NUMBER

E-107

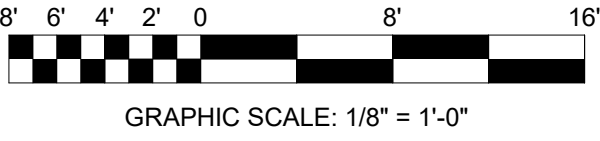




1 PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"


PROJECT NOTES

- ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL FIRE ALARM DEVICES AS SHOWN ON PLAN. FIRE ALARM DEVICES TO MATCH EXISTING USED ON SITE.
- EC TO FURNISH AND INSTALL NEW NOTIFIER FIRE ALARM ANNUNCIATOR PANEL AND CONNECT TO EXISTING FIRE ALARM MAIN PANEL.



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



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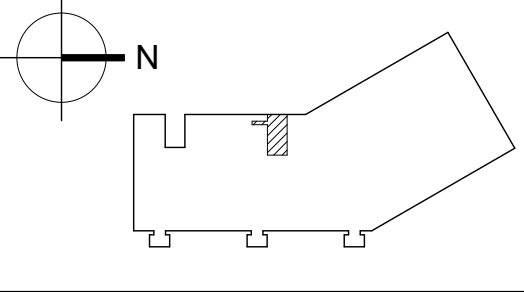


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MARLBOROUGH, MA 01752

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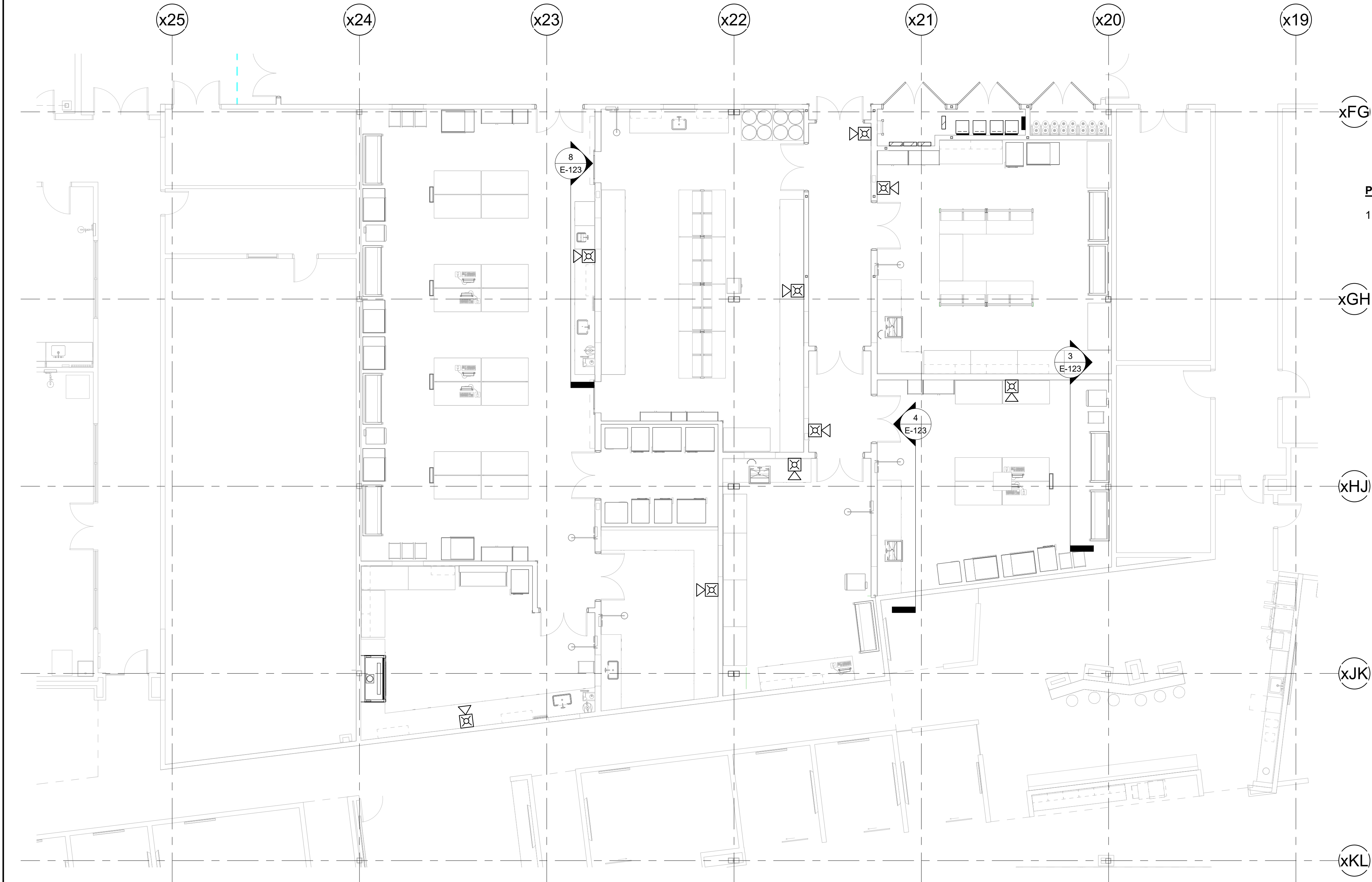
| DSGN:        | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|--------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| DR:          | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| CHK:         |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 WEST PART PLAN  
FIRE ALARM

PROJ. NO: 20021A CAD FILE:

ISSUE DATE: 04/08/21  
SCALE: As indicated  
SHEET NUMBER  
**E-108**



- PROJECT NOTES**
- ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL FIRE ALARM DEVICES AS SHOWN ON PLAN. FIRE ALARM DEVICES TO MATCH EXISTING USED ON SITE.

1 PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"



GRAPHIC SCALE: 1/8" = 1'-0"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

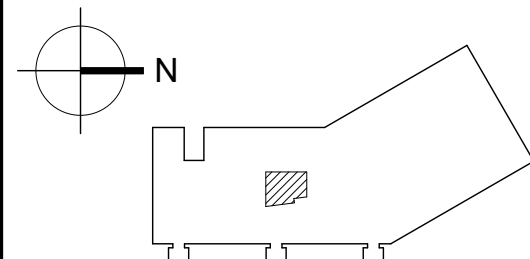
GENERAL NOTE:

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|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION         |
|------|----------|------------------------------|
| A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      |

| DWG. | CHK. | APVD. |
|------|------|-------|
| SPF  | MAP  |       |
| SPF  | MAP  | MAP   |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 EAST PART PLAN  
FIRE ALARM

PROJ. NO: 20021A CAD FILE:

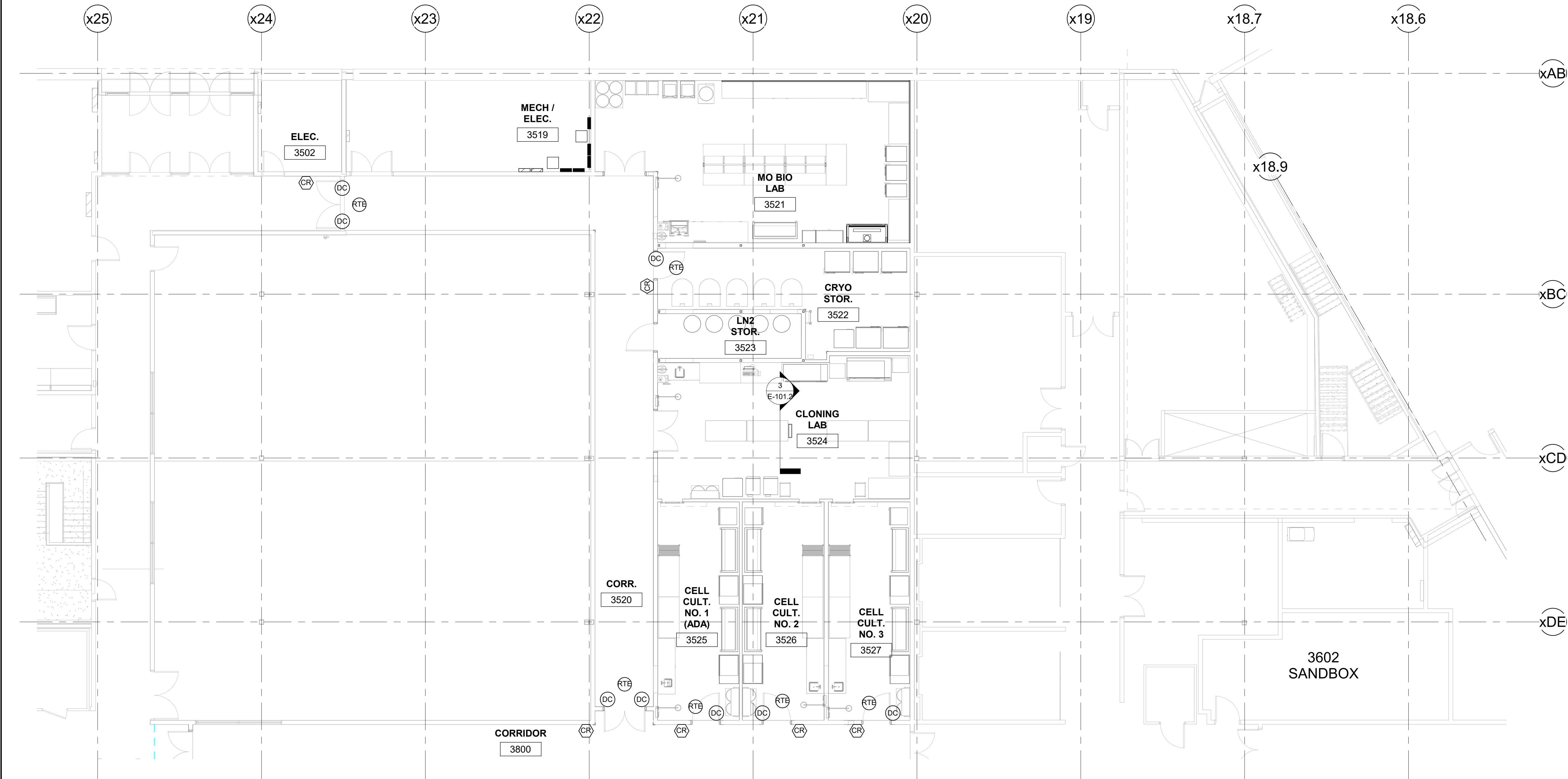
ISSUE DATE: 04/08/21

SCALE: As indicated

SHEET NUMBER

E-109





① PARTIAL THIRD FLOOR PLAN - WEST SHELL SPACE  
1/8" = 1'-0"

ELECTRICAL CONTRACTOR (EC) SECURITY NOTES

- EC TO FURNISH AND INSTALL SECURITY 1 INCH CONDUIT FROM SECURITY DOOR LOCATIONS TO EXISTING SECURITY PANEL IN ROOM 3602. THIS PLAN. INSTALL JUNCTION BOXES FOR 1 INCH CONDUIT WHERE NEEDED. TOTAL OF SIX DOORS ON THIS PLAN.
- PROVIDE AND INSTALL A TWO GANG JUNCTION BOX ABOVE EACH SECURITY DOOR FOR SECURITY WIRING. SECURITY WIRING INSTALLED BY G4 SITE SECURITY CONTRACTOR.
- DOOR INTERLOCKS AND SECURITY DEVICES BY SITE SECURITY CONTRACTOR
- COORDINATE ALL SECURITY WORK WITH G4 SITE SECURITY CONTRACTOR.



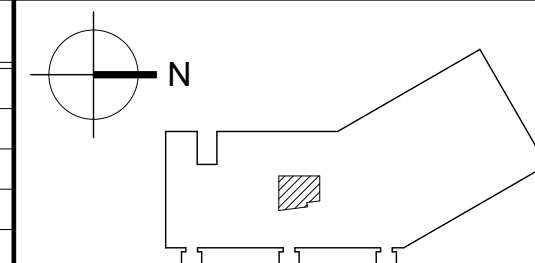
GRAPHIC SCALE: 1/8" = 1'-0"

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

DSGN: S.FITZGERALD  
DR: S.FITZGERALD  
CHK: M.POWERS  
APVD: M.POWERS

| REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|------|----------|-------------------------|------|------|-------|
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | SPF  | MAP  |       |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 WEST PART PLAN  
SECURITY LAYOUT

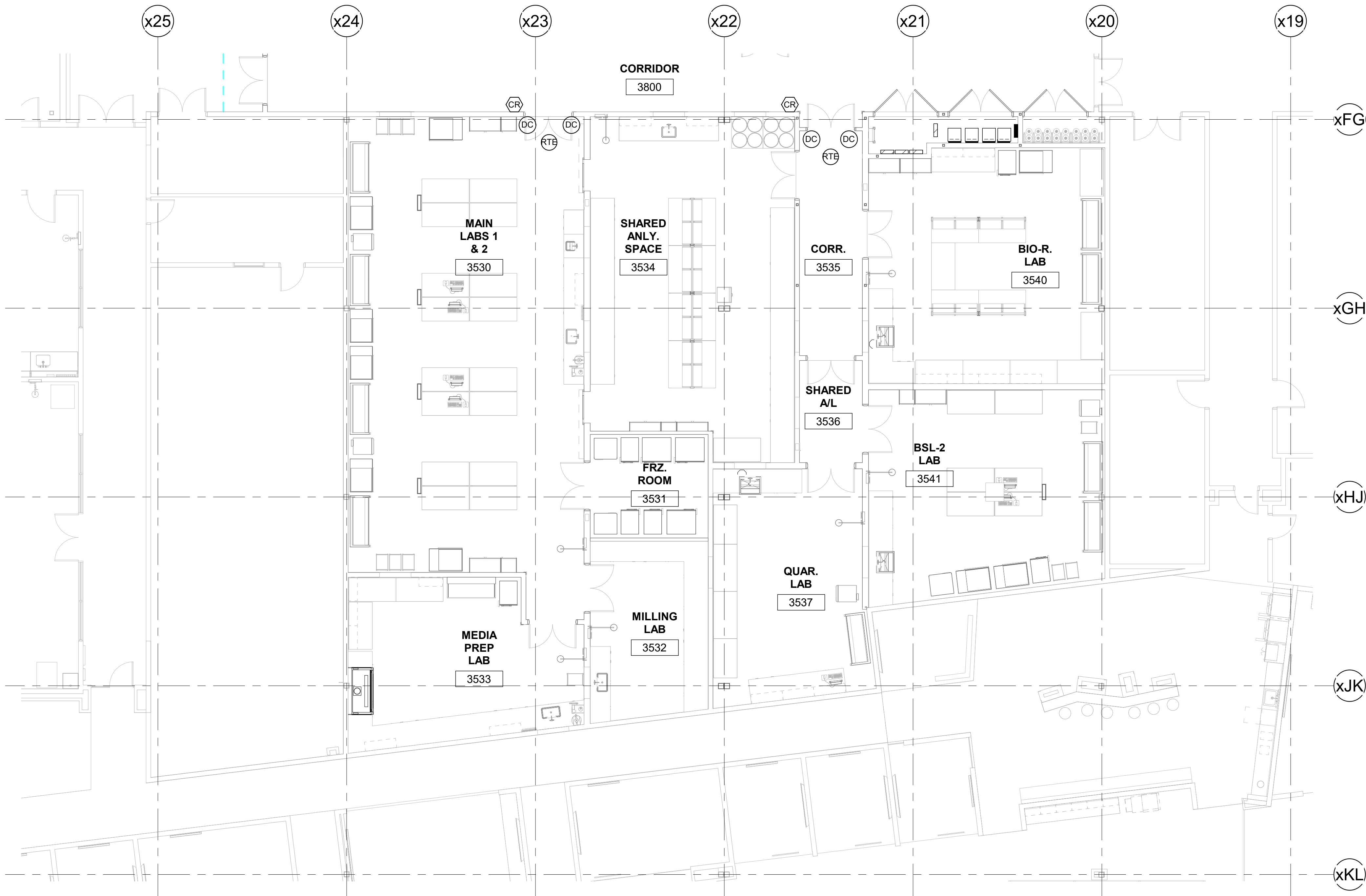
PROJ. NO: 20021A CAD FILE:

ISSUE DATE: 06/07/21

SCALE: As indicated

SHEET NUMBER

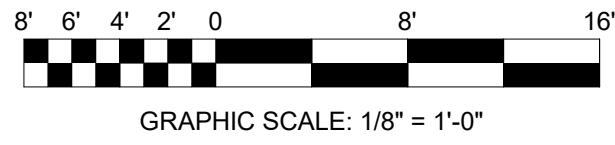
E-110



① PARTIAL THIRD FLOOR PLAN - EAST SHELL SPACE  
1/8" = 1'-0"


ELECTRICAL CONTRACTOR (EC) SECURITY NOTES

1. EC TO FURNISH AND INSTALL SECURITY 1 INCH CONDUIT FROM SECURITY DOOR LOCATIONS TO EXISTING SECURITY PANEL IN ROOM 3602 SHOWN ON E-110. INSTALL JUNCTION BOXES FOR 1 INCH CONDUIT WHERE NEEDED. TOTAL OF TWO DOORS.
2. PROVIDE AND INSTALL A TWO GANG JUNCTION BOX ABOVE EACH SECURITY DOOR FOR SECURITY WIRING. SECURITY WIRING INSTALLED BY G4 SITE SECURITY CONTRACTOR.
3. DOOR INTERLOCKS AND SECURITY DEVICES BY SITE SECURITY CONTRACTOR
4. COORDINATE ALL SECURITY WORK WITH G4 SITE SECURITY CONTRACTOR.



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

BAR IS ONE INCH ON ORIGINAL DRAWING



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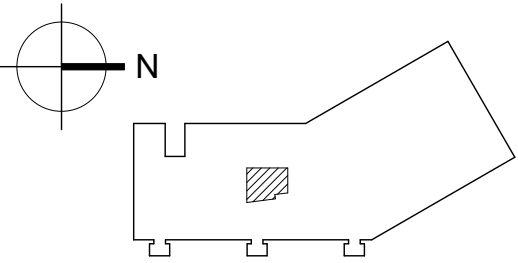
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100 RESULTS WAY  
MARLBOROUGH, MA 01752

GENERAL NOTE:

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|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|------|----------|-------------------------|------|------|-------|
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | SPF  | MAP  | MAP   |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
LEVEL 3 WEST PART PLAN  
SECURITY LAYOUT

PROJ. NO: 20021A | CAD FILE:

ISSUE DATE: 06/07/21

SCALE: As indicated

SHEET NUMBER

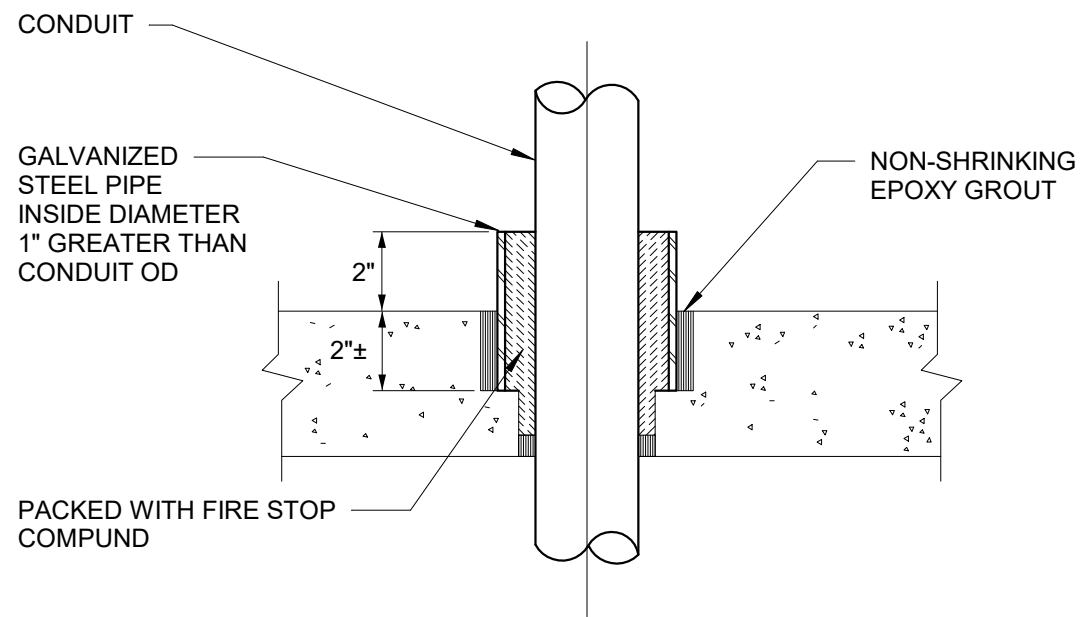
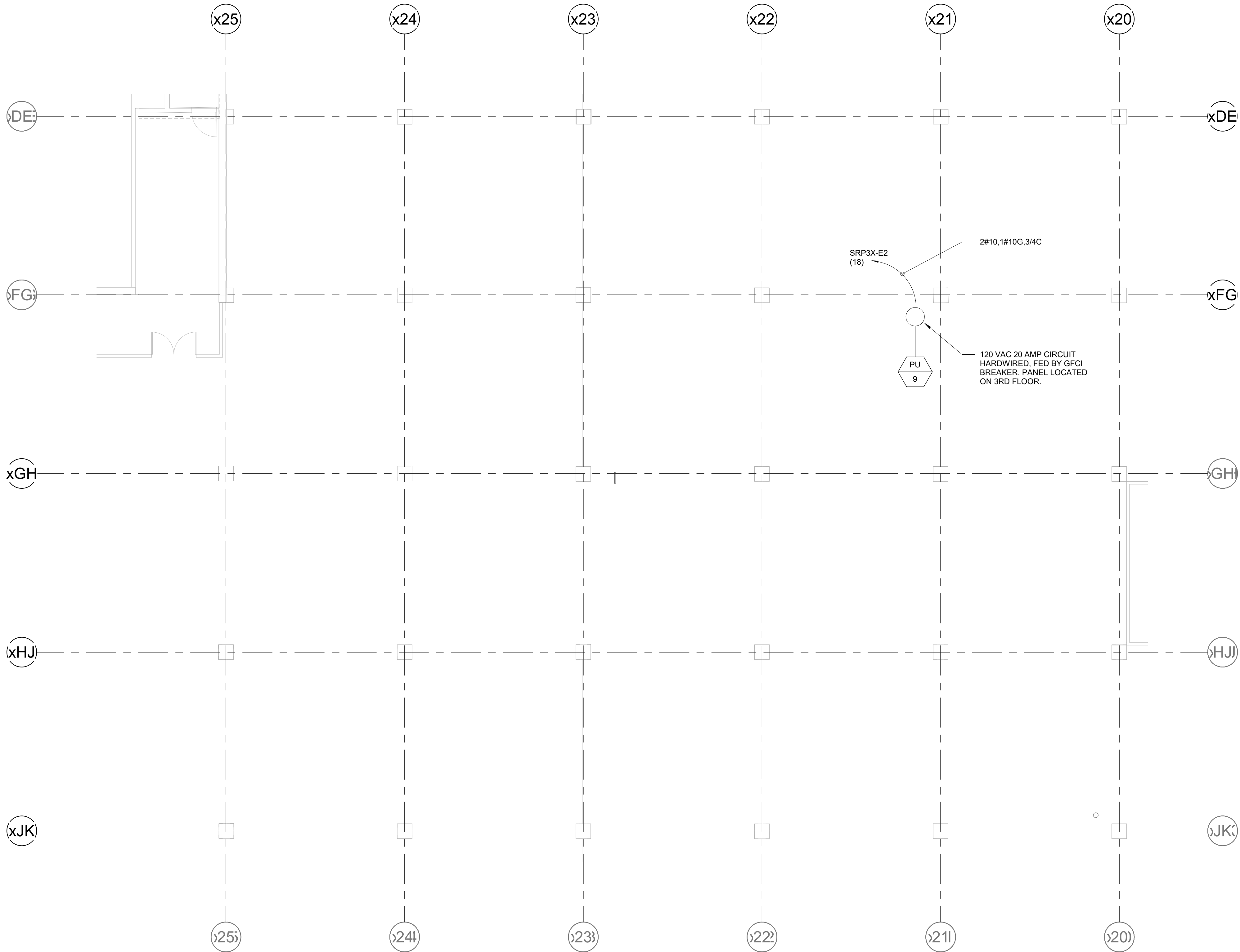
E-111



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

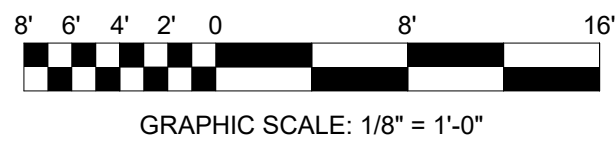
1" = 1'-0"

BAR IS ONE INCH ON ORIGINAL DRAWING



1 PARTIAL PLAN: SECOND FLOOR LAB WASTE & VENT PLUMBING  
1/8" = 1'-0"

2 CONDUIT PENETRATION THRU EXISTING FLOOR

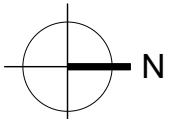


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REQUIRED TO REVIEW ALL  
CONTRACT DOCUMENTS,  
INCLUDING CONTRACT  
DRAWINGS AND/OR PROJECT  
SPECIFICATIONS. FOR ALL  
DISCIPLINES TO ASCERTAIN THE  
COMPLETE SCOPE OF WORK FOR  
THE PROJECT.

| DSGN:        | REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|--------------|------|----------|-------------------------|------|------|-------|
| S.FITZGERALD | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | SPF  | MAP  | MAP   |
| DR:          |      |          |                         |      |      |       |
| S.FITZGERALD |      |          |                         |      |      |       |
| CHK:         |      |          |                         |      |      |       |
| M.POWERS     |      |          |                         |      |      |       |
| APVD:        |      |          |                         |      |      |       |
| M.POWERS     |      |          |                         |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
SECOND FLOOR PART PLAN  
120 VAC POWER LAYOUT  
PROJ. NO: 20021A CAD FILE:

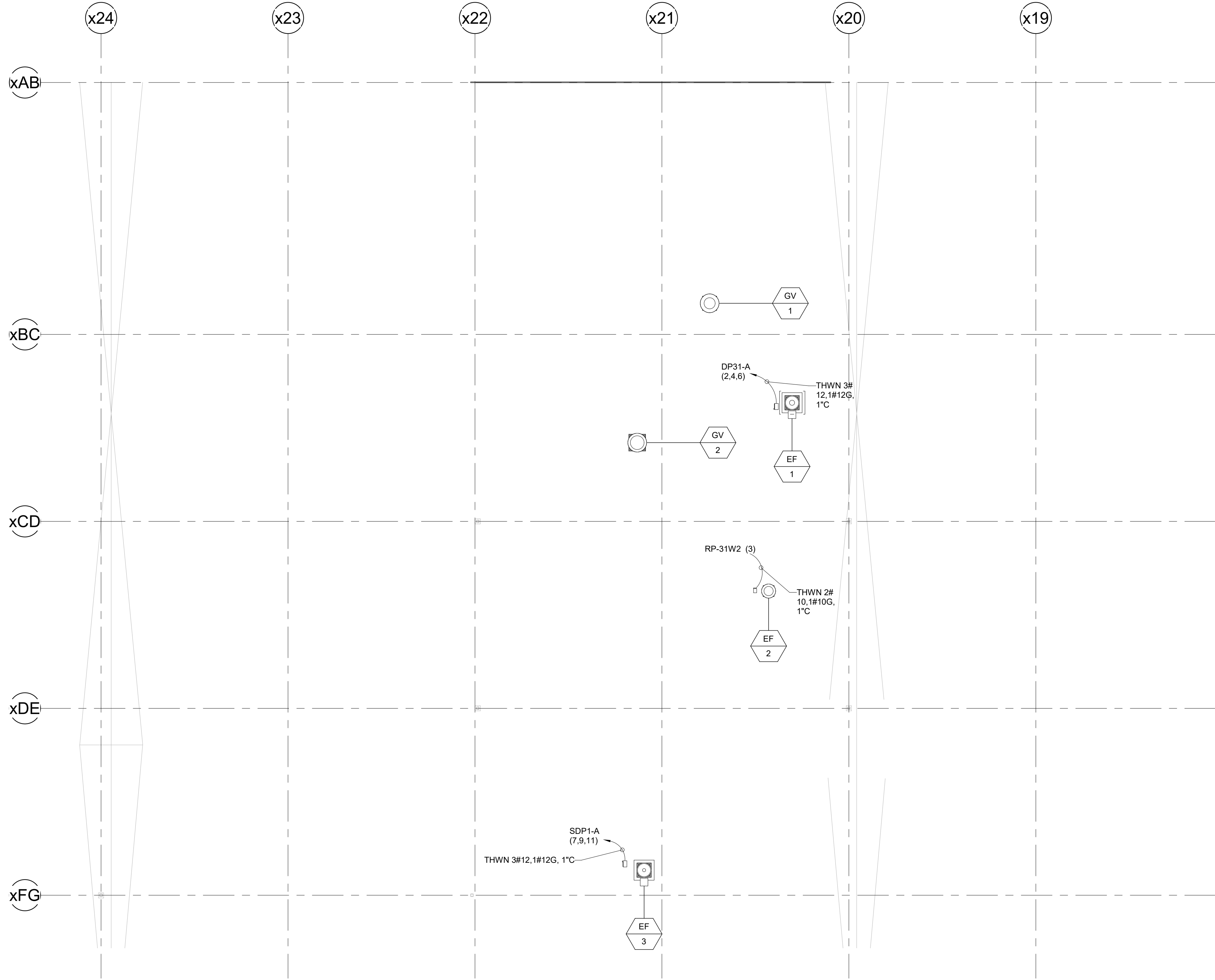
ISSUE DATE: 06/10/21  
SCALE: 1/8" = 1'-0"  
SHEET NUMBER  
**E-112**

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"

0' 8' 6' 4' 2' 0' 8' 16'

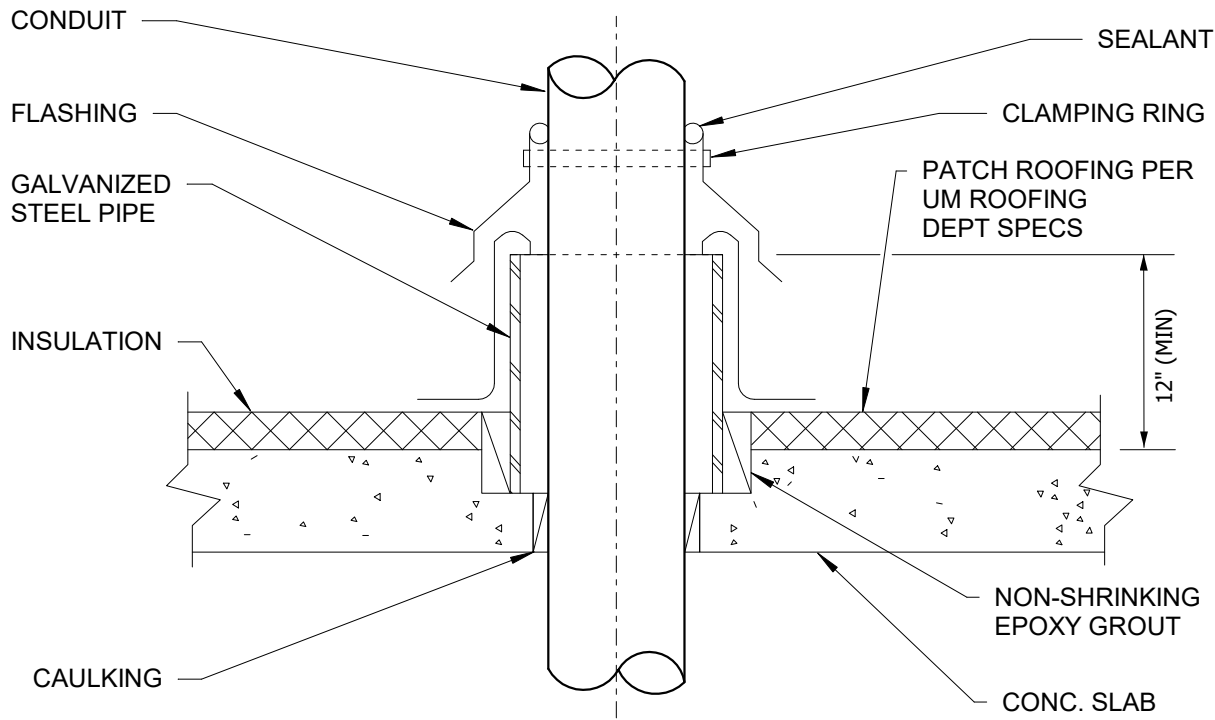
GRAPHIC SCALE: 1/8" = 1'-0"



1 ROOF MECHANICAL PLAN  
1/8" = 1'-0"

PROJECT NOTES

- ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL 480 VAC CIRCUITS TO NEW HVAC EQUIPMENT ROOF. PROVIDE ALL CONDUIT, WIRE, AND SUPPORTS NEEDED TO COMPLETE INSTALL FROM PANELS LISTED. SEE THIRD FLOOR ELECTRICAL PLAN FOR LOCATION OF PANELS. SUPPLY NEMA 3R DISCONNECT IF EQUIPMENT IS NOT SUPPLIED WITH ONE.
- EC TO FURNISH AND INSTALL NEW MS-1P 120 VAC STARTER FOR FOR EF-2 FROM GREENHECK.

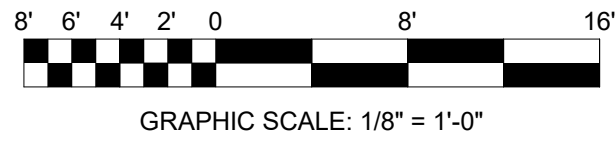


3 CONDUIT PENETRATION THRU EXISTING ROOF



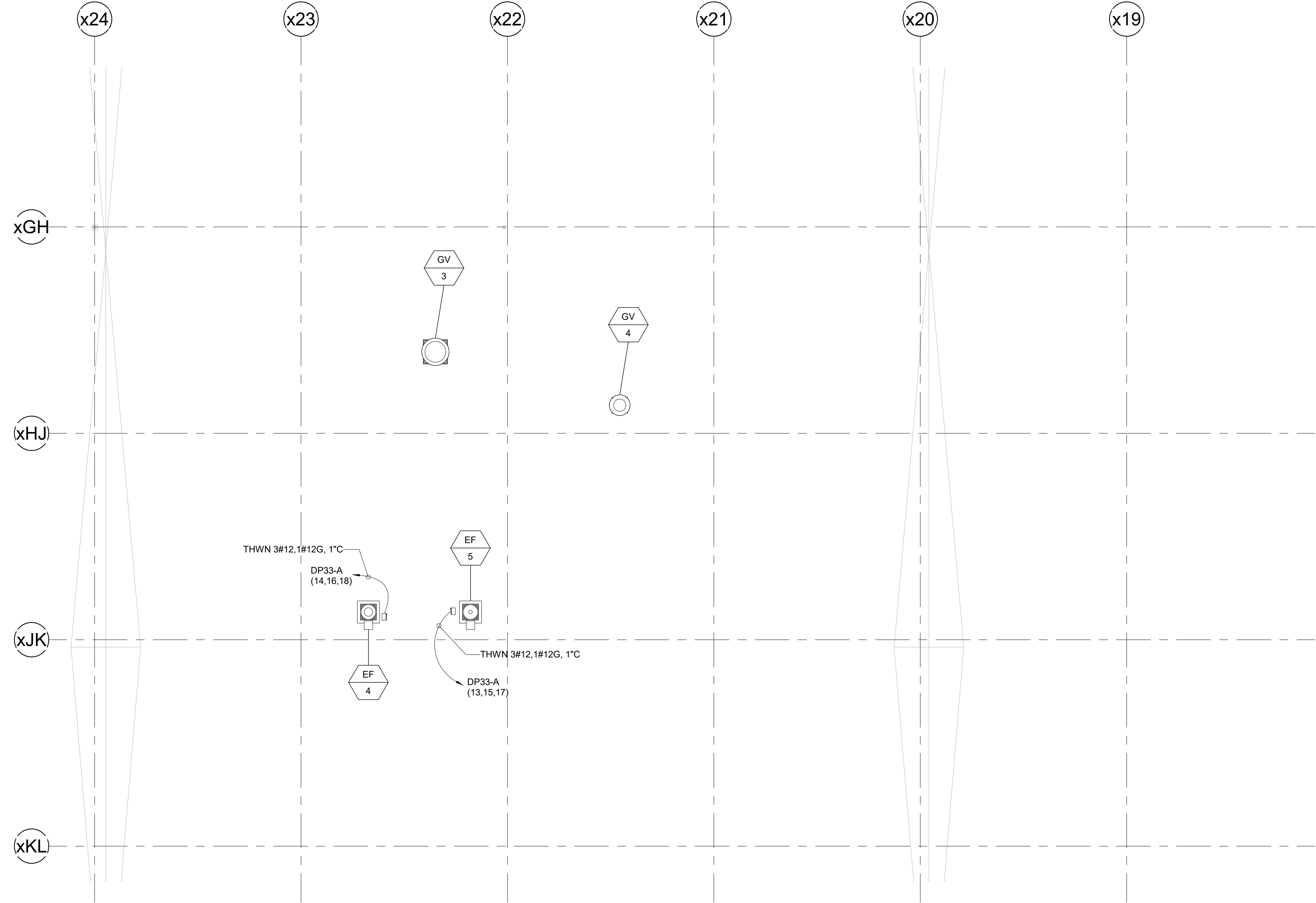
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 1'-0"




GRAPHIC SCALE: 1/8" = 1'-0"

1 ROOF MECHANICAL PLAN  
1/8" = 1'-0"



PROJECT NOTES

1. ELECTRICAL CONTRACTOR (EC) TO FURNISH AND INSTALL 480 VAC CIRCUITS TO NEW HVAC EQUIPMENT ROOF. PROVIDE ALL CONDUIT, WIRE, AND SUPPORTS NEEDED TO COMPLETE INSTALL FROM PANELS LISTED. SEE THIRD FLOOR ELECTRICAL PLAN FOR LOCATION OF PANELS. SUPPLY NEMA 3R DISCONNECT IF EQUIPMENT IS NOT SUPPLIED WITH ONE.



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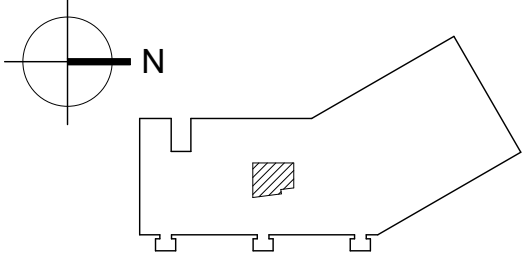


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100 RESULTS WAY  
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| DSGN:            | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD     | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| DR: S.FITZGERALD | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
| CHK: M.POWERS    |      |          |                              |      |      |       |
| APVD: M.POWERS   |      |          |                              |      |      |       |



CLD & CCM LABS  
**ELECTRICAL**  
ROOF EAST PART PLAN  
HVAC POWER LAYOUT

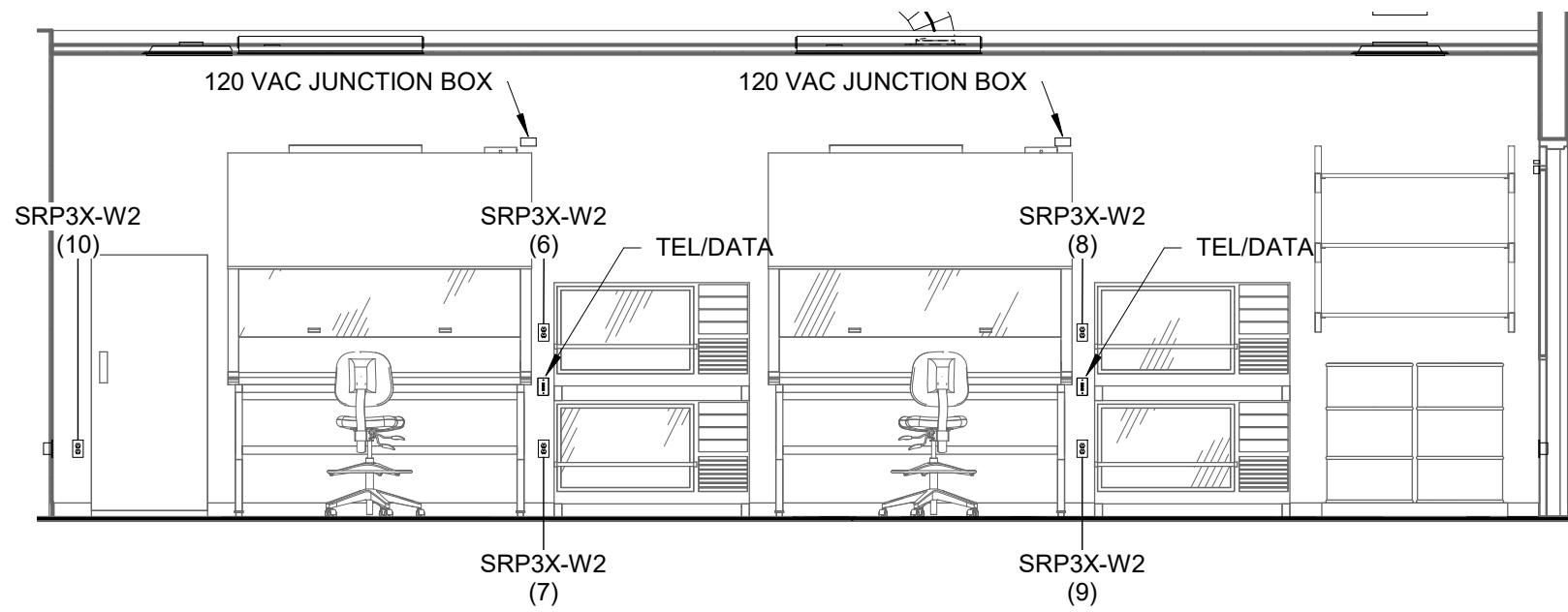
PROJ. NO: 20021A | CAD FILE:

ISSUE DATE: 03/29/21

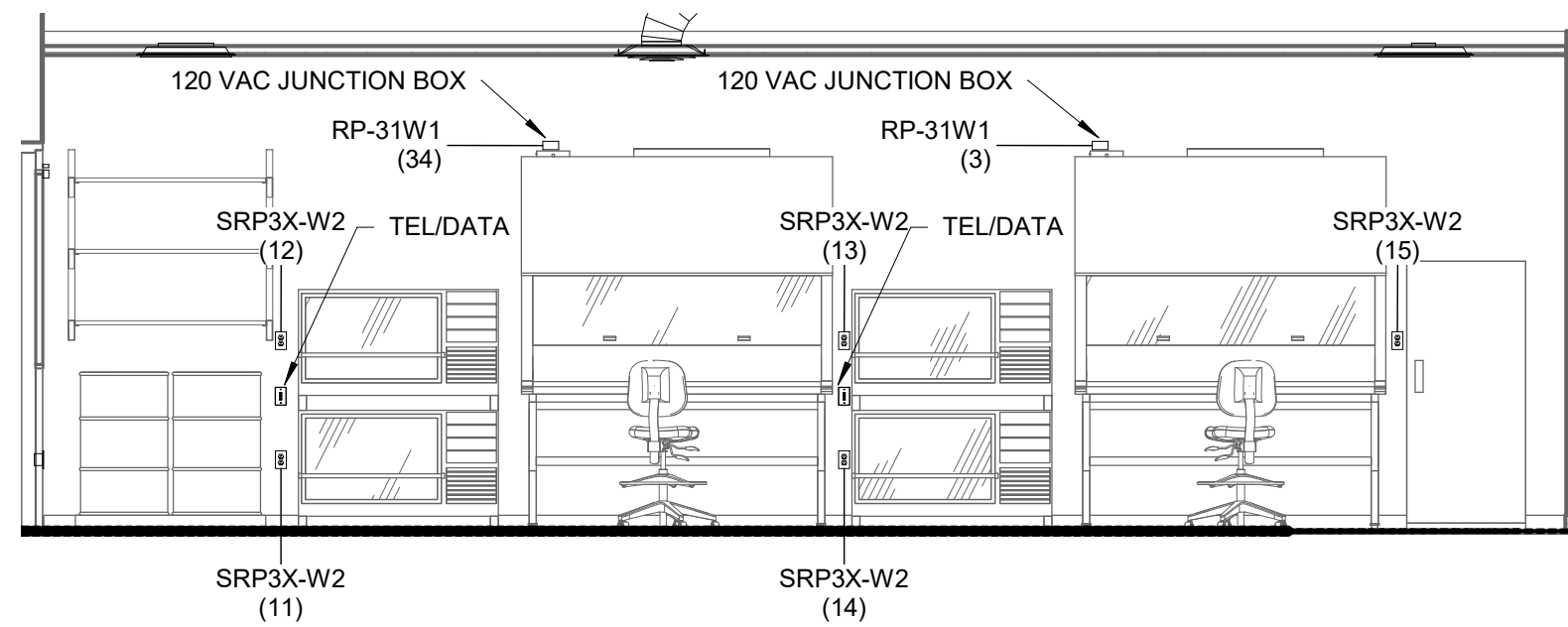
SCALE: As indicated

SHEET NUMBER

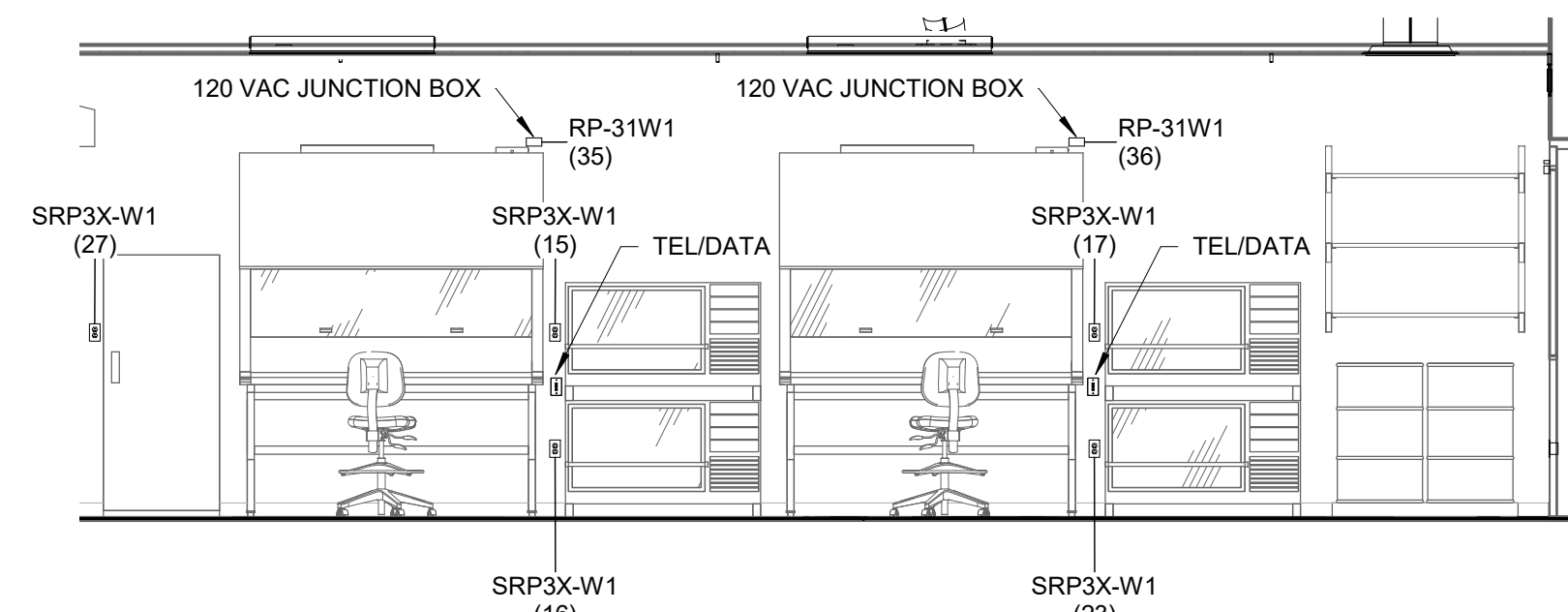
E-121



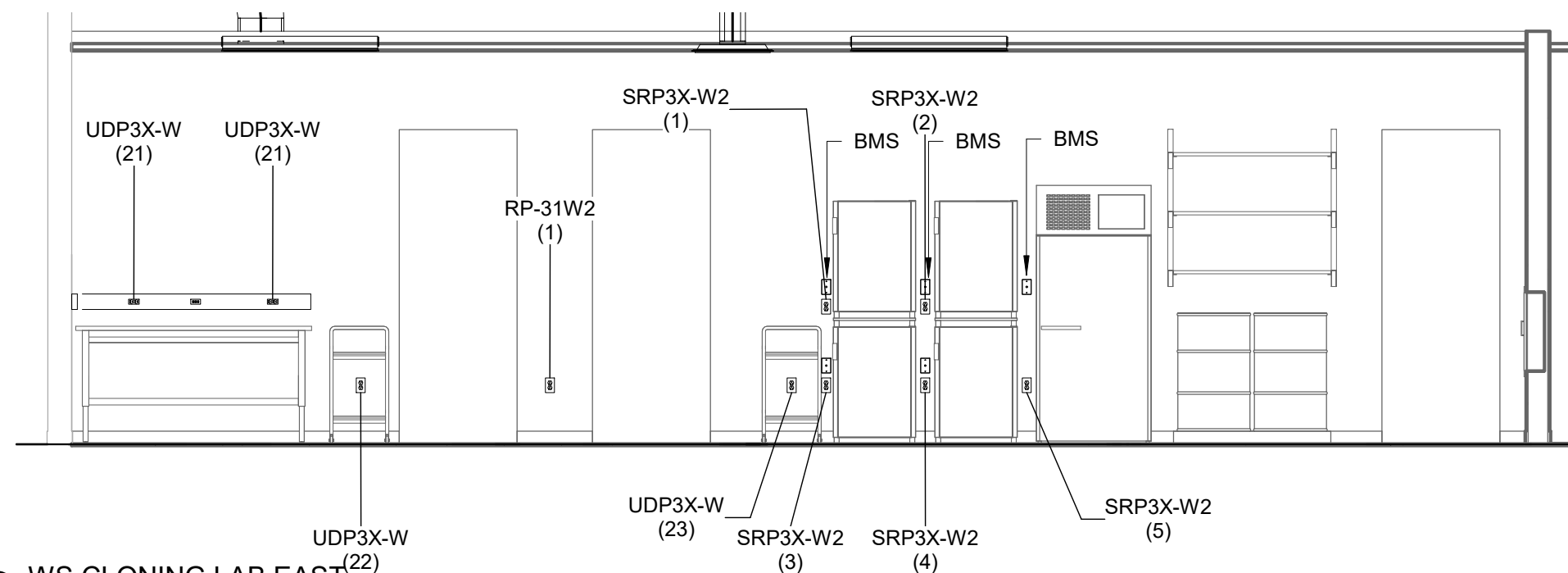
① WS CELL 3525  
1/4" = 1'-0"



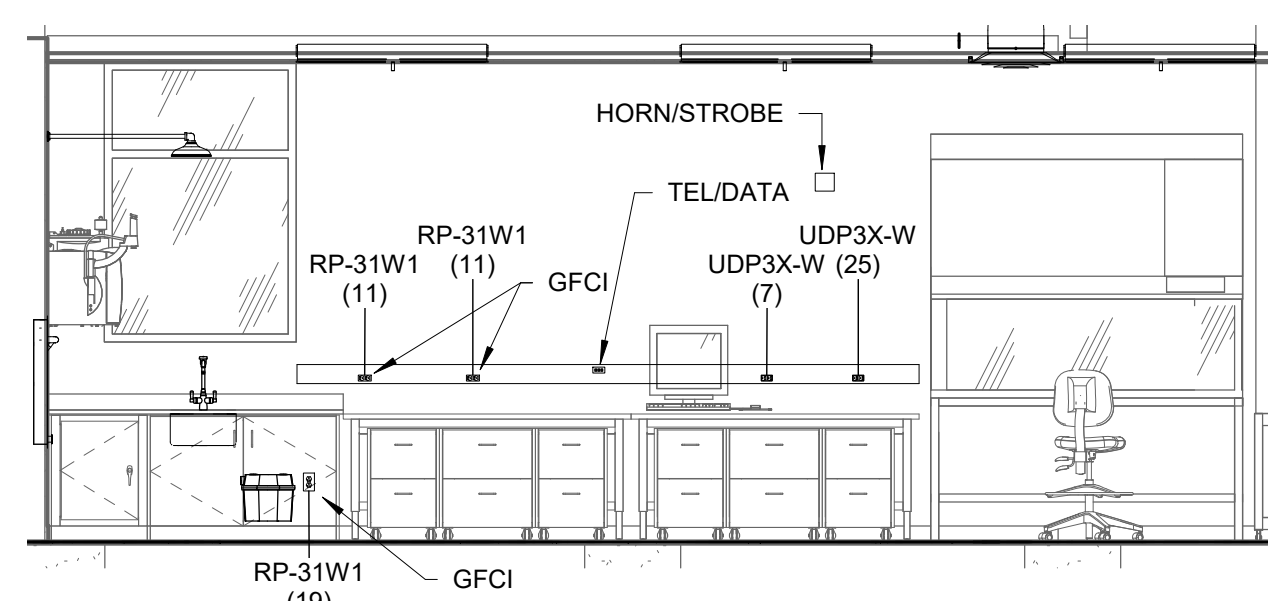
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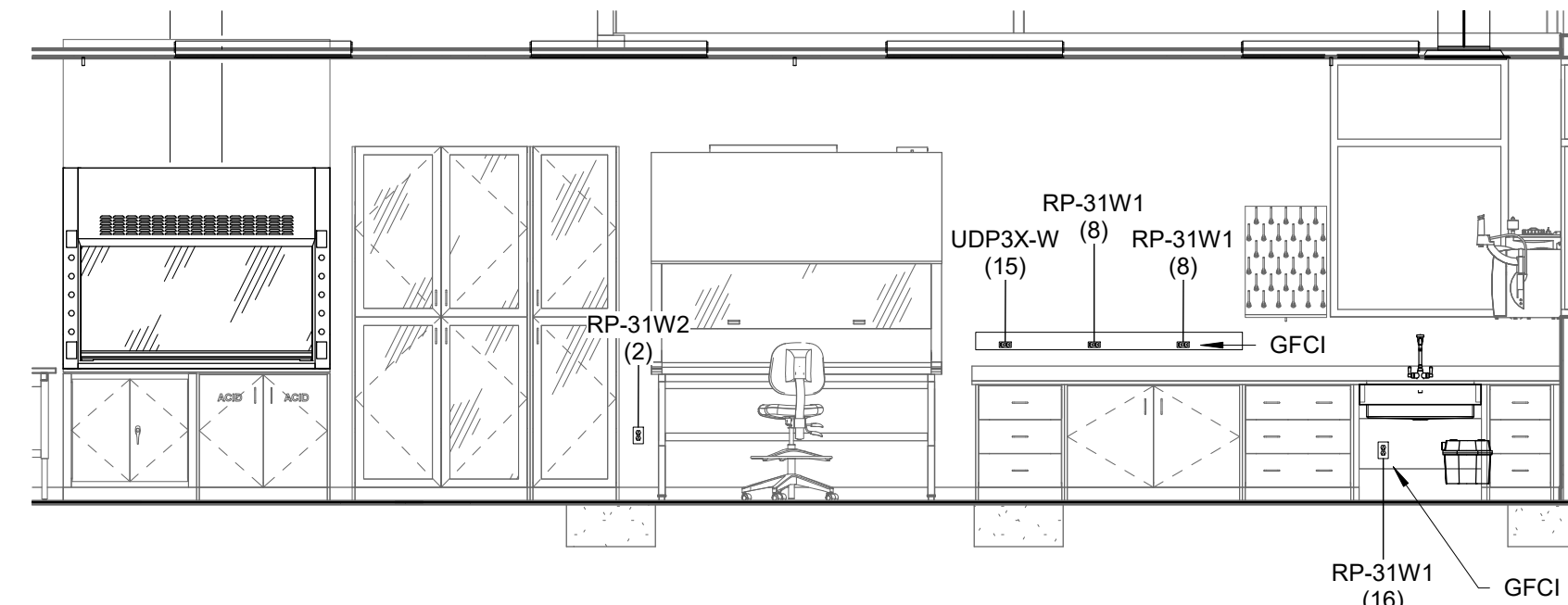
③ WS CELL 3527  
1/4" = 1'-0"



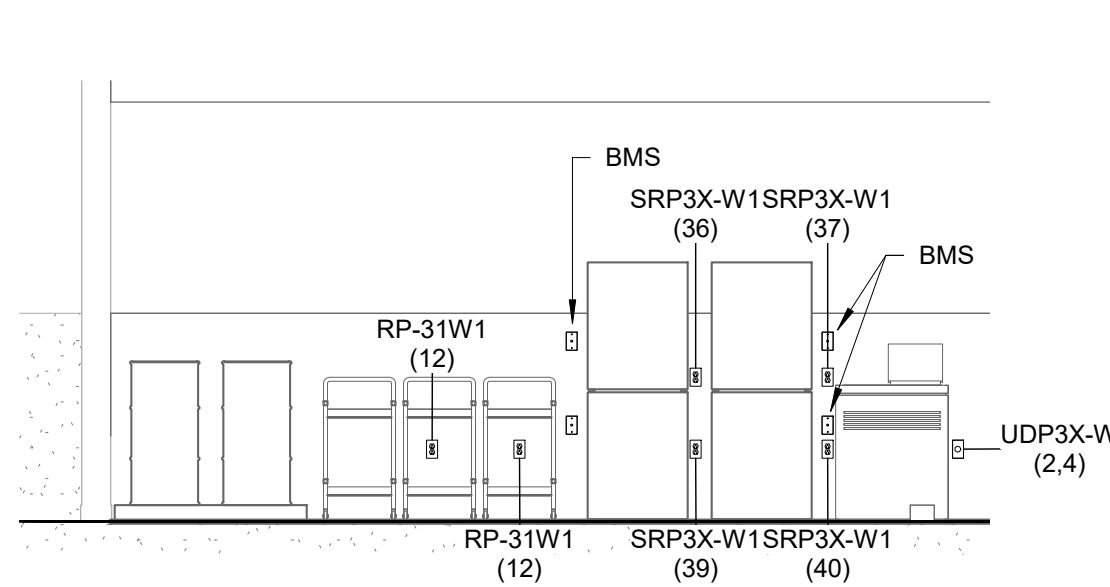
④ WS CLONING LAB EAST<sup>(22)</sup>  
1/4" = 1'-0"



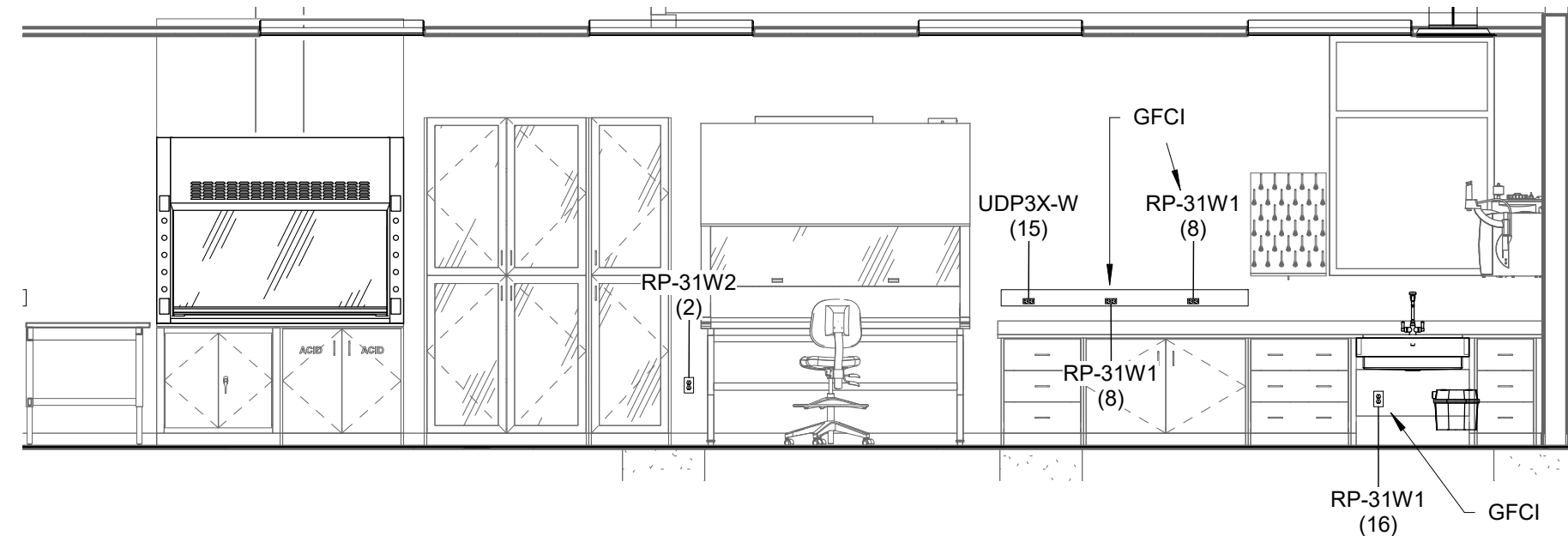
⑤ WS CLONING LAB WEST  
1/4" = 1'-0"



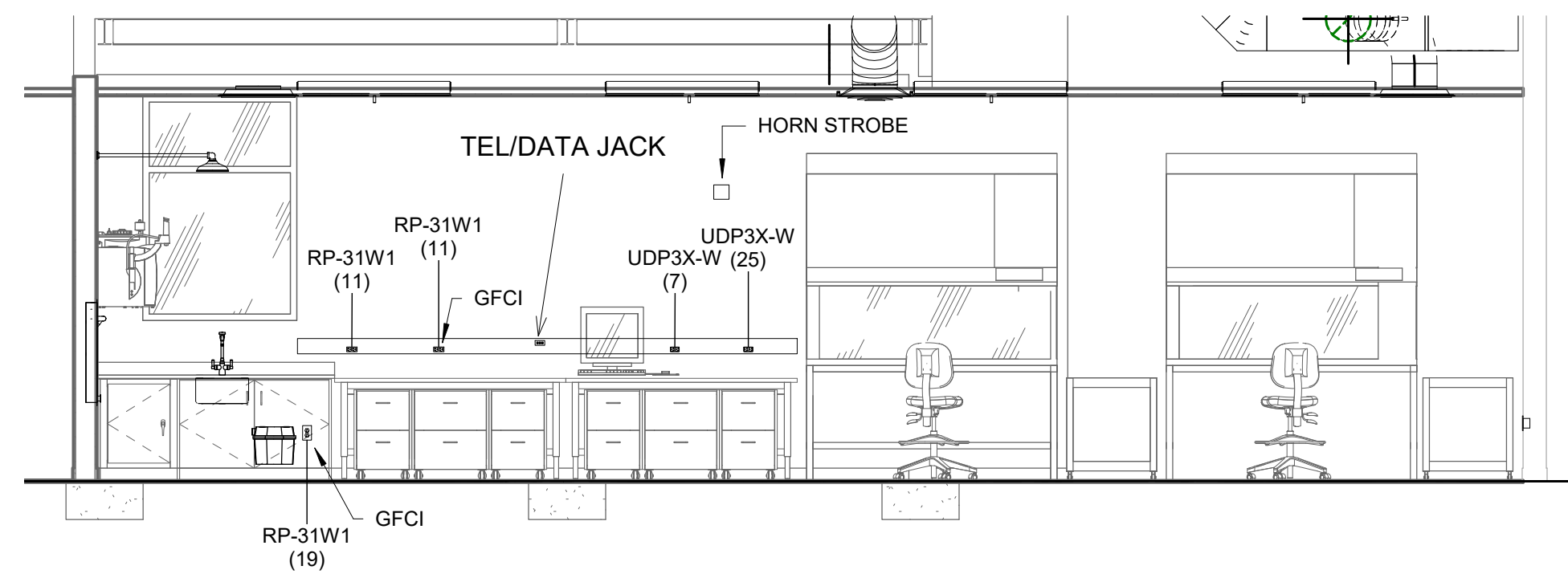
⑥ WS MO BIO LAB UNDER SINK PUMP CIRCUIT  
1/4" = 1'-0"



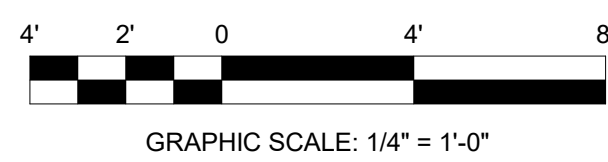
⑦ WS MO BIO LAB WEST  
1/4" = 1'-0"



⑧ WS PUMP UNDER SINK 1  
1/4" = 1'-0"



⑨ WS PUMP UNDER SINK 2  
1/4" = 1'-0"



GRAPHIC SCALE: 1/4" = 1'-0"

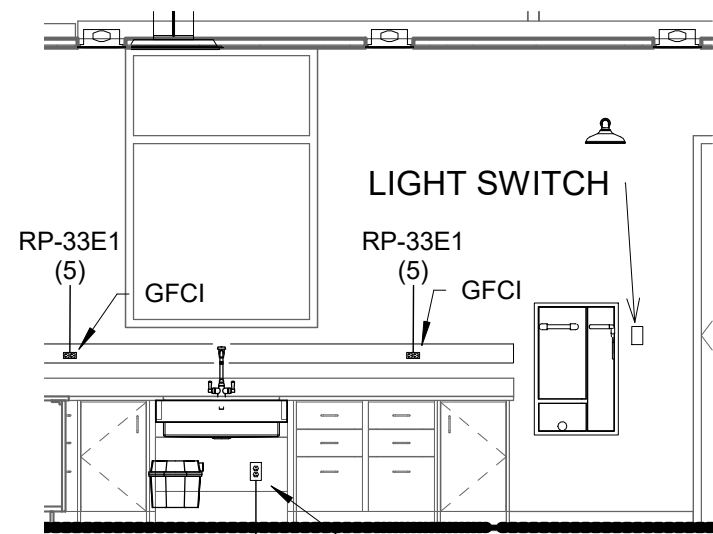
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

GENERAL NOTE:

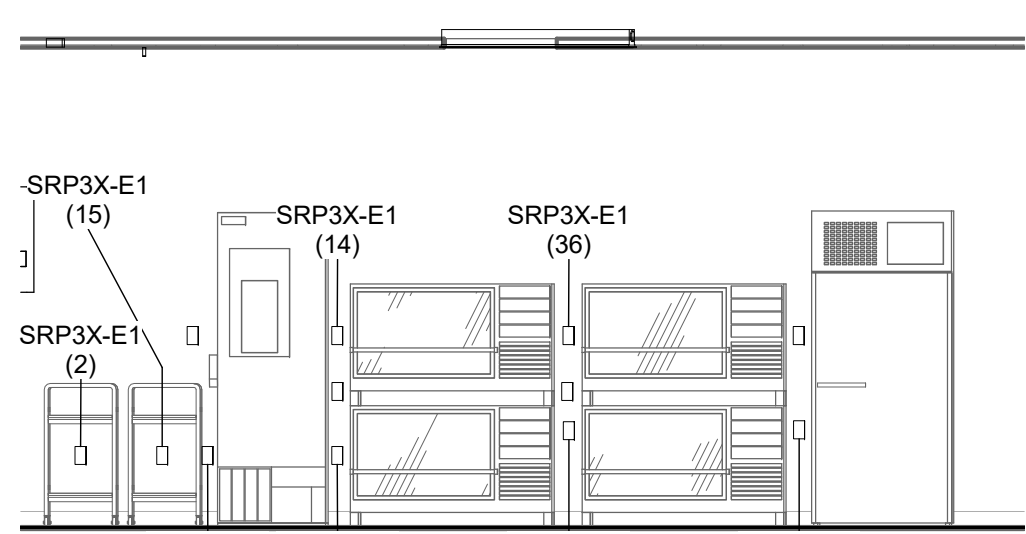
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| DSGN:          | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|----------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD   | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| S.FITZGERALD   | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  |       |
| CHK: M.POWERS  |      |          |                              |      |      |       |
| APVD: M.POWERS |      |          |                              |      |      |       |

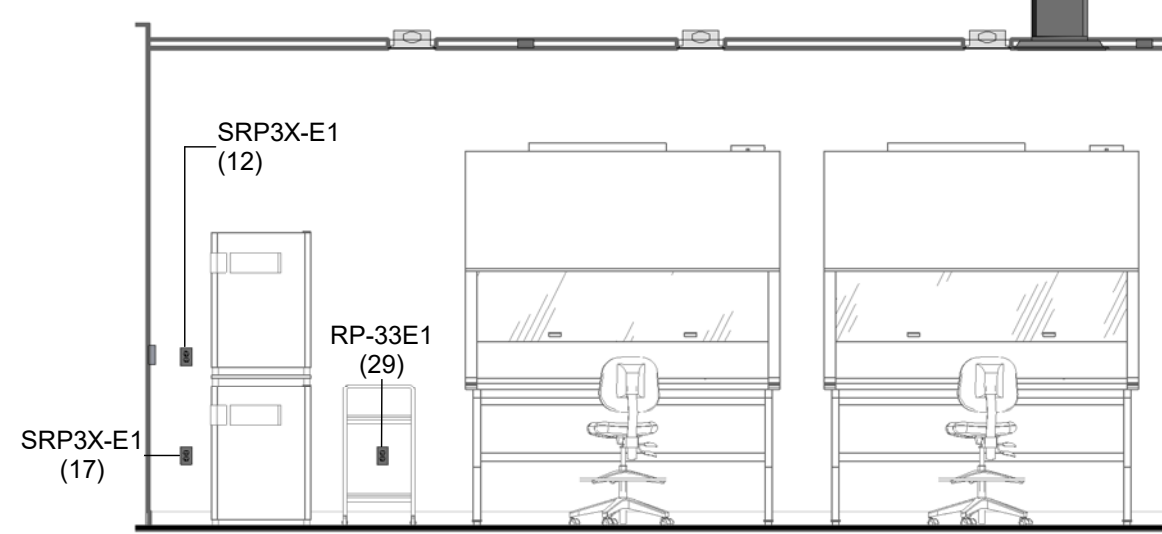




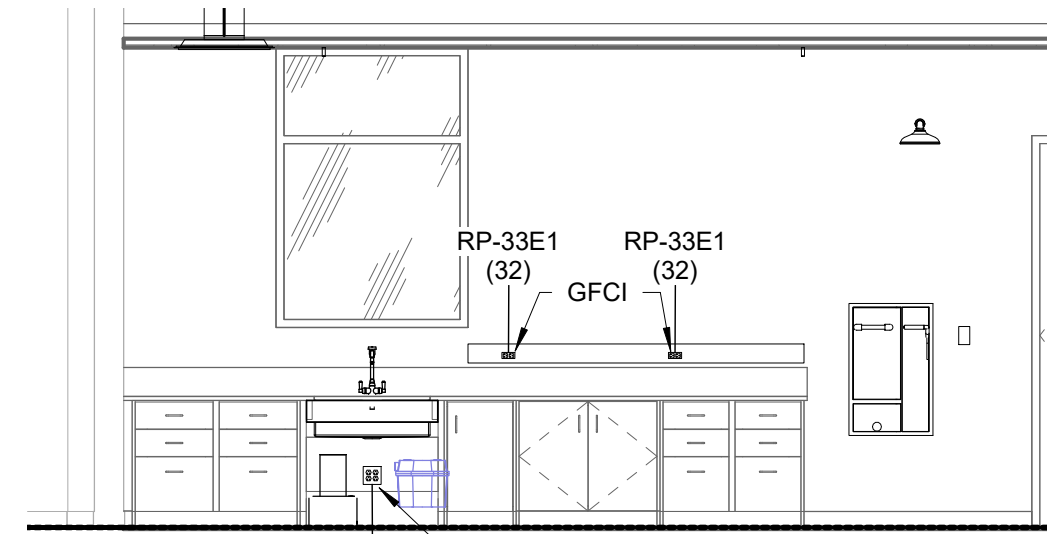
① ES BIO-R SOUTH  
1/4" = 1'-0"



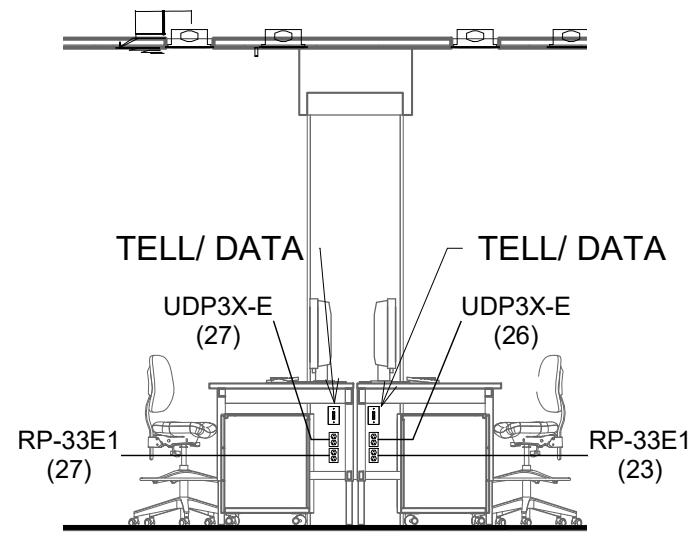
② ES BSL-2 EAST  
1/4" = 1'-0"



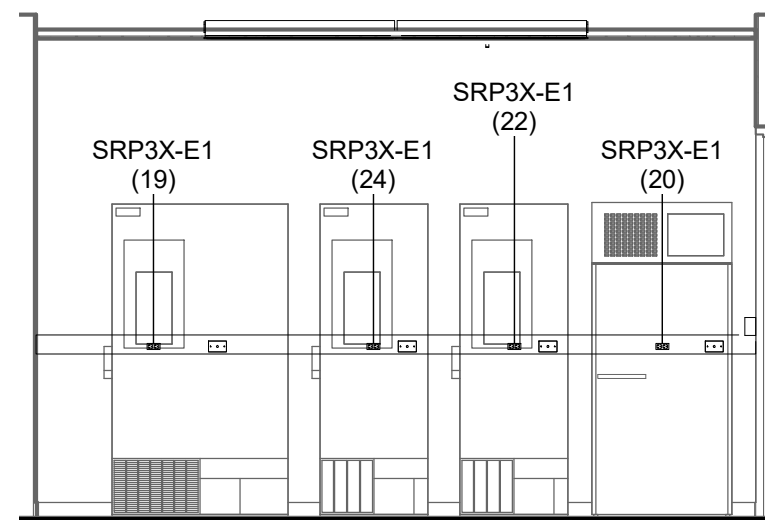
③ ES BSL-2 NORTH  
1/4" = 1'-0"



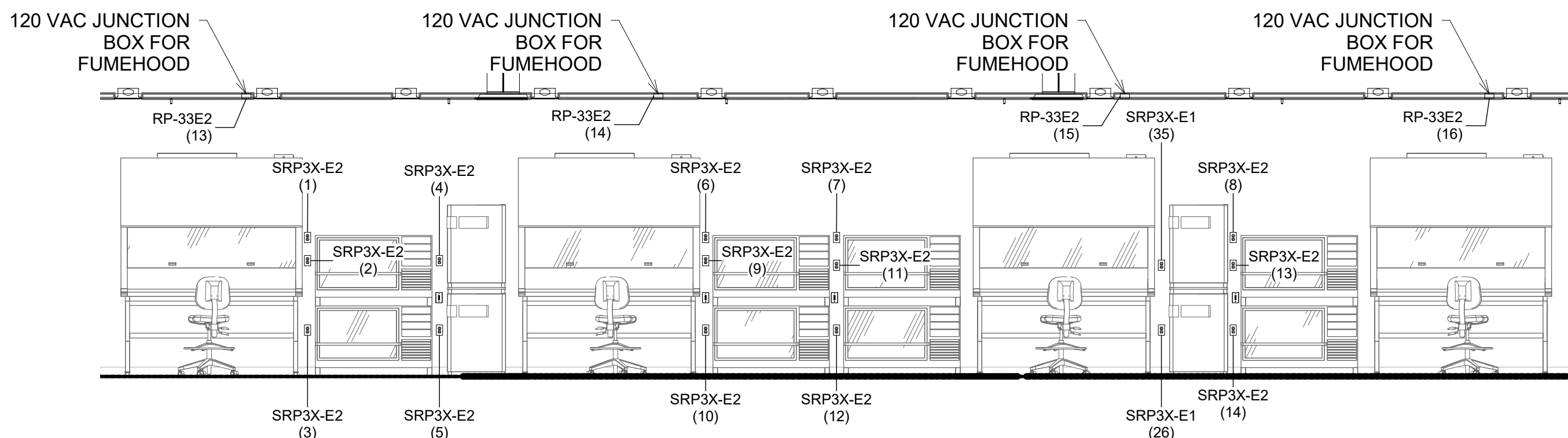
④ ES BSL-2 SOUTH elec cond pump  
1/4" = 1'-0"



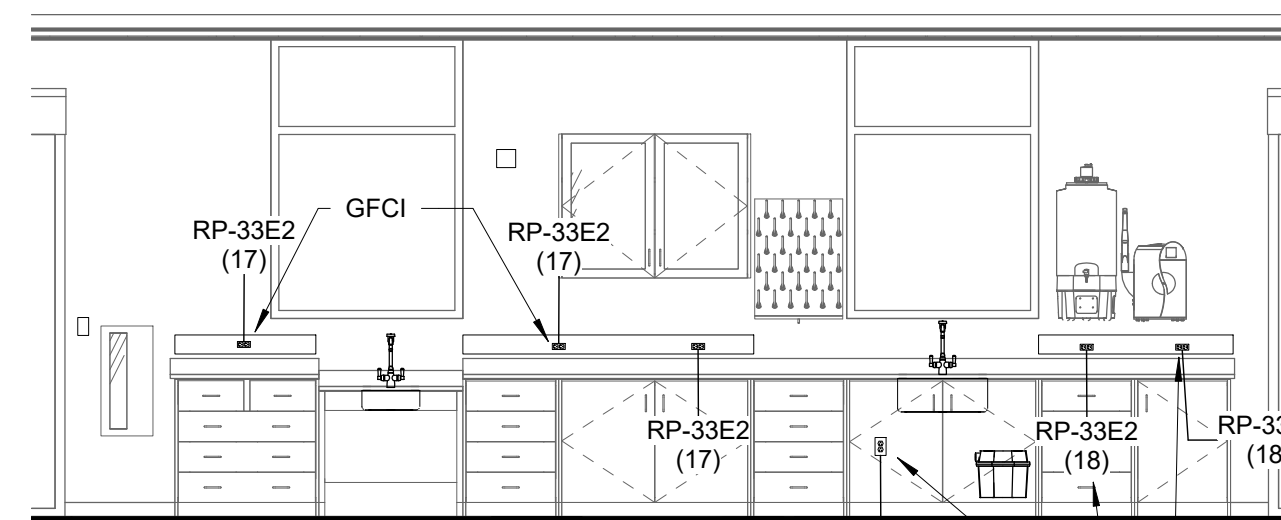
⑤ ES BSL-2 UNDER DESK OUTLETS  
1/4" = 1'-0"



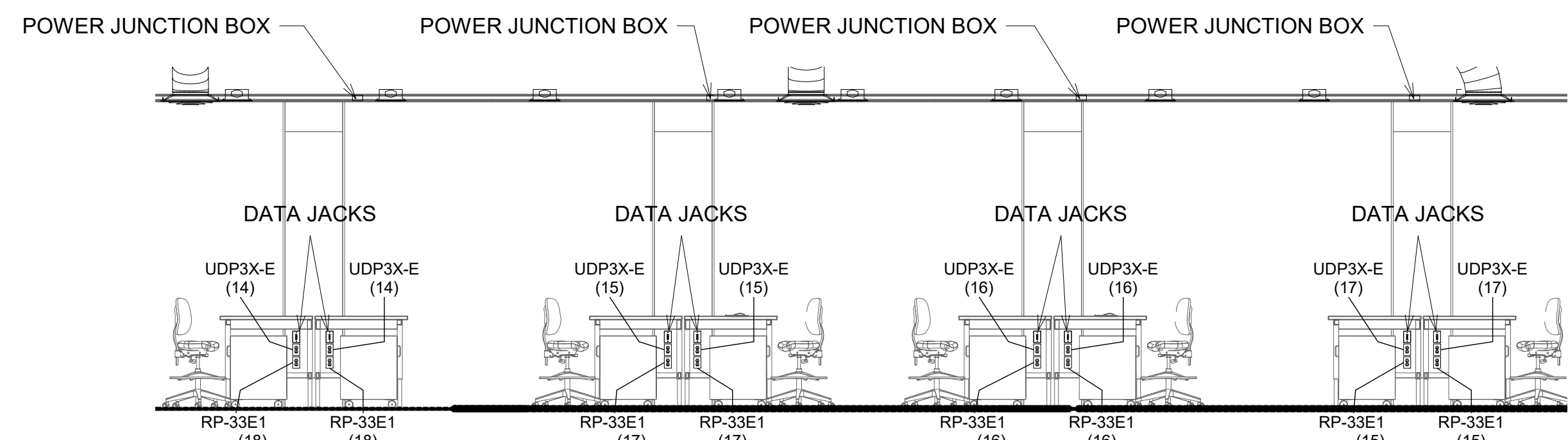
⑥ ES FRZ RM 3531  
1/4" = 1'-0"



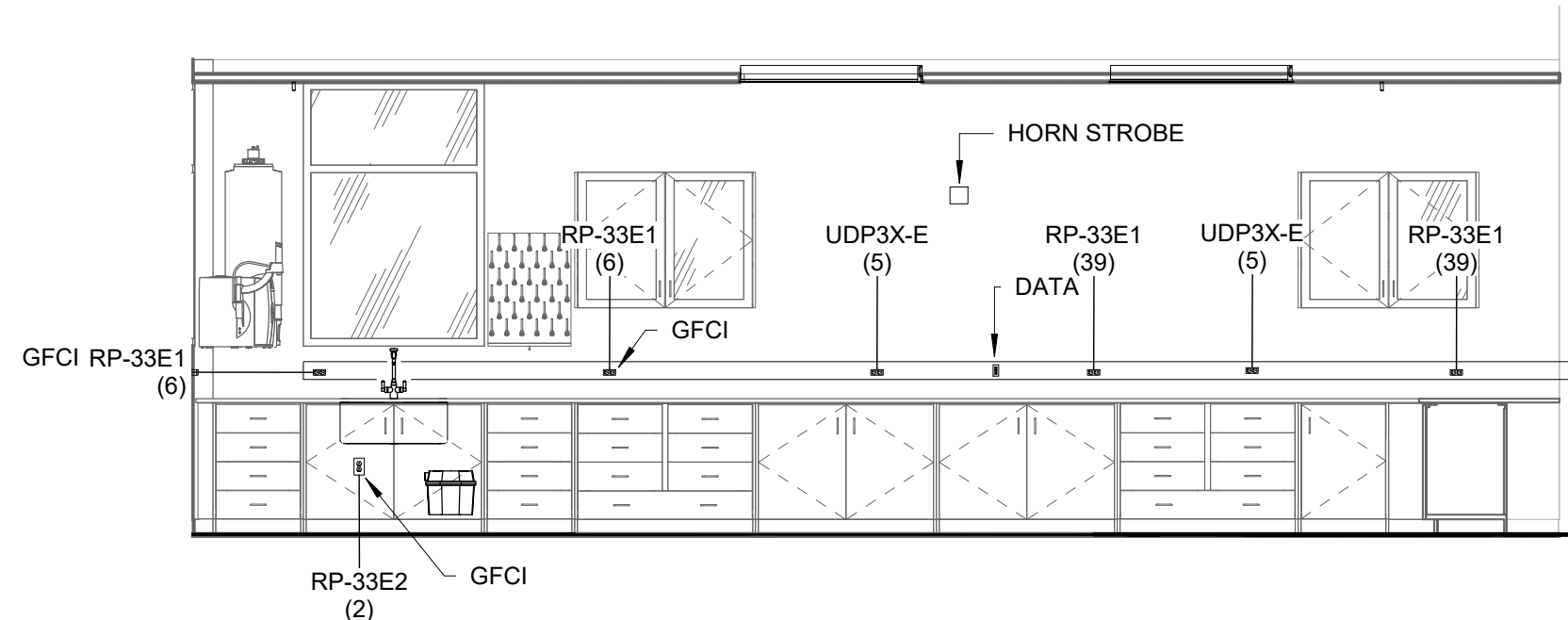
⑦ ES MAIN LAB 1 & 2  
1/4" = 1'-0"



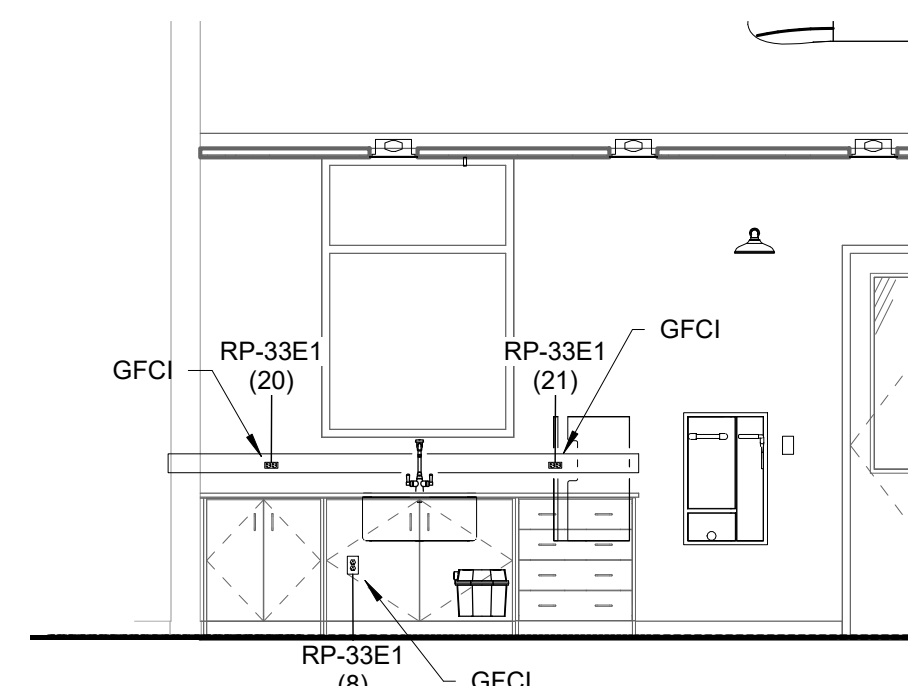
⑧ ES MAIN LAB NORTH  
1/4" = 1'-0"



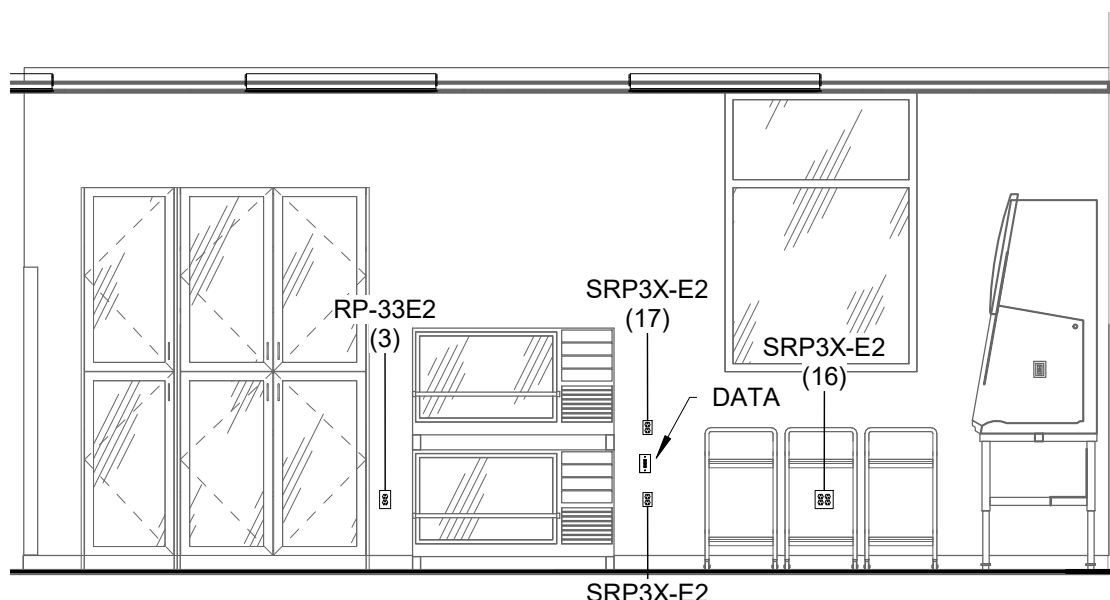
⑨ ES MAIN LAB UNDER DESK DATA AND POWER  
1/4" = 1'-0"



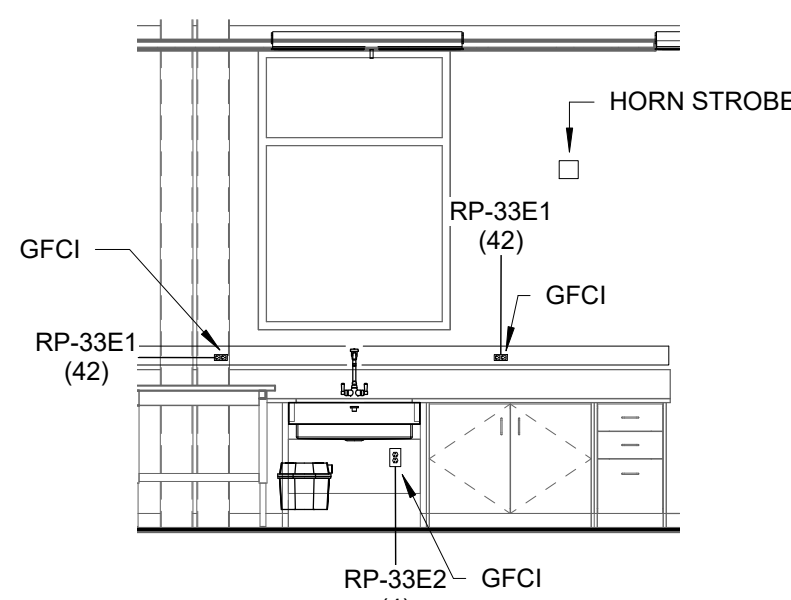
⑩ ES MEDIA PREP LAB EAST  
1/4" = 1'-0"



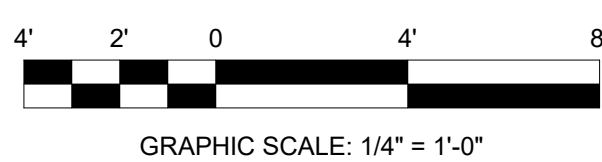
⑪ ES MILLING LAB SOUTH  
1/4" = 1'-0"



⑫ ES MAIN LAB EAST  
1/4" = 1'-0"

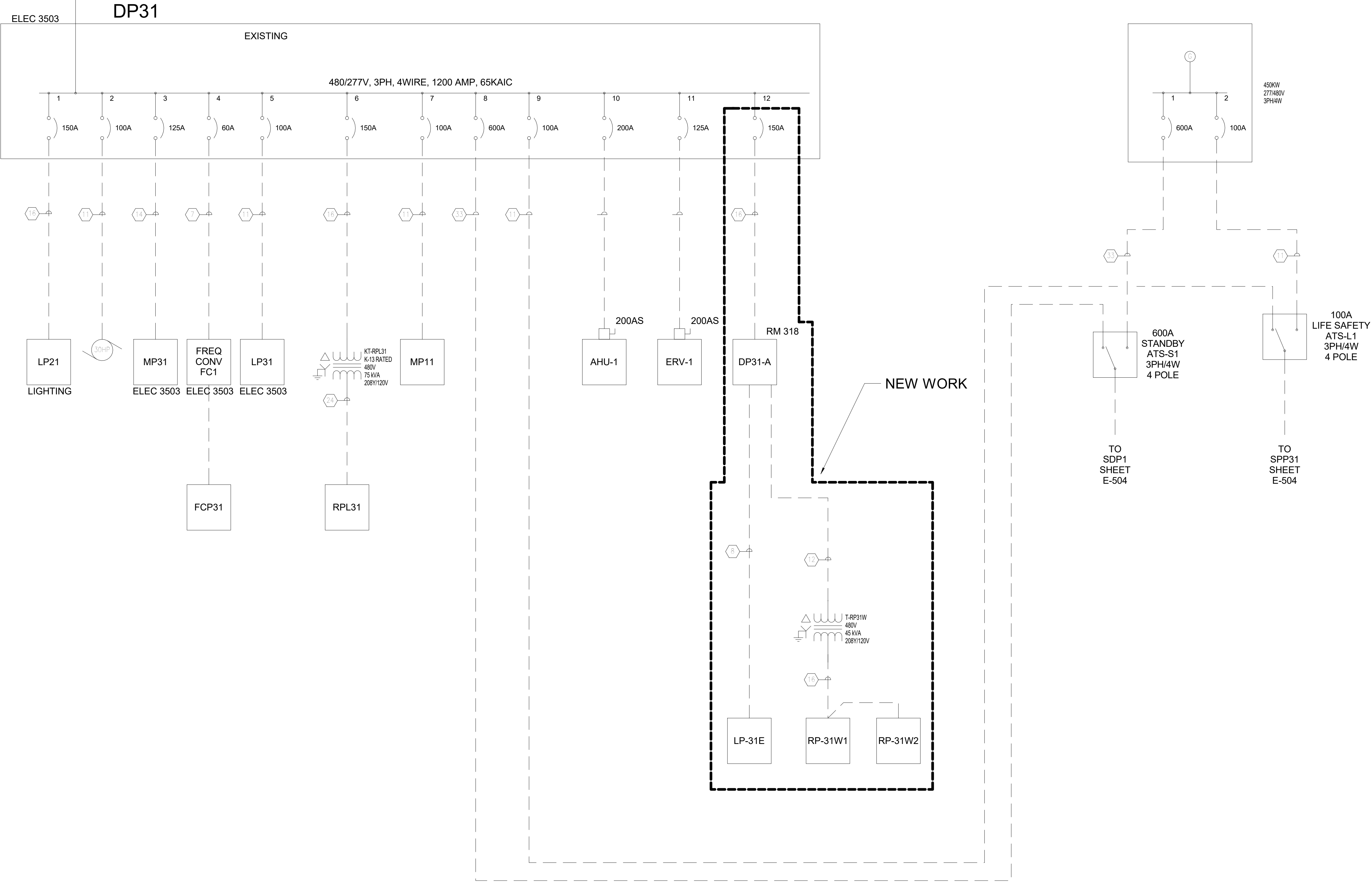


⑬ ES QUAR LAB WEST  
1/4" = 1'-0"



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

TO EXISTING  
SUBSTATION 1D #12



PROJECT NOTES

- SEE DRAWING E-502 FOR FEEDER LEGEND.

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

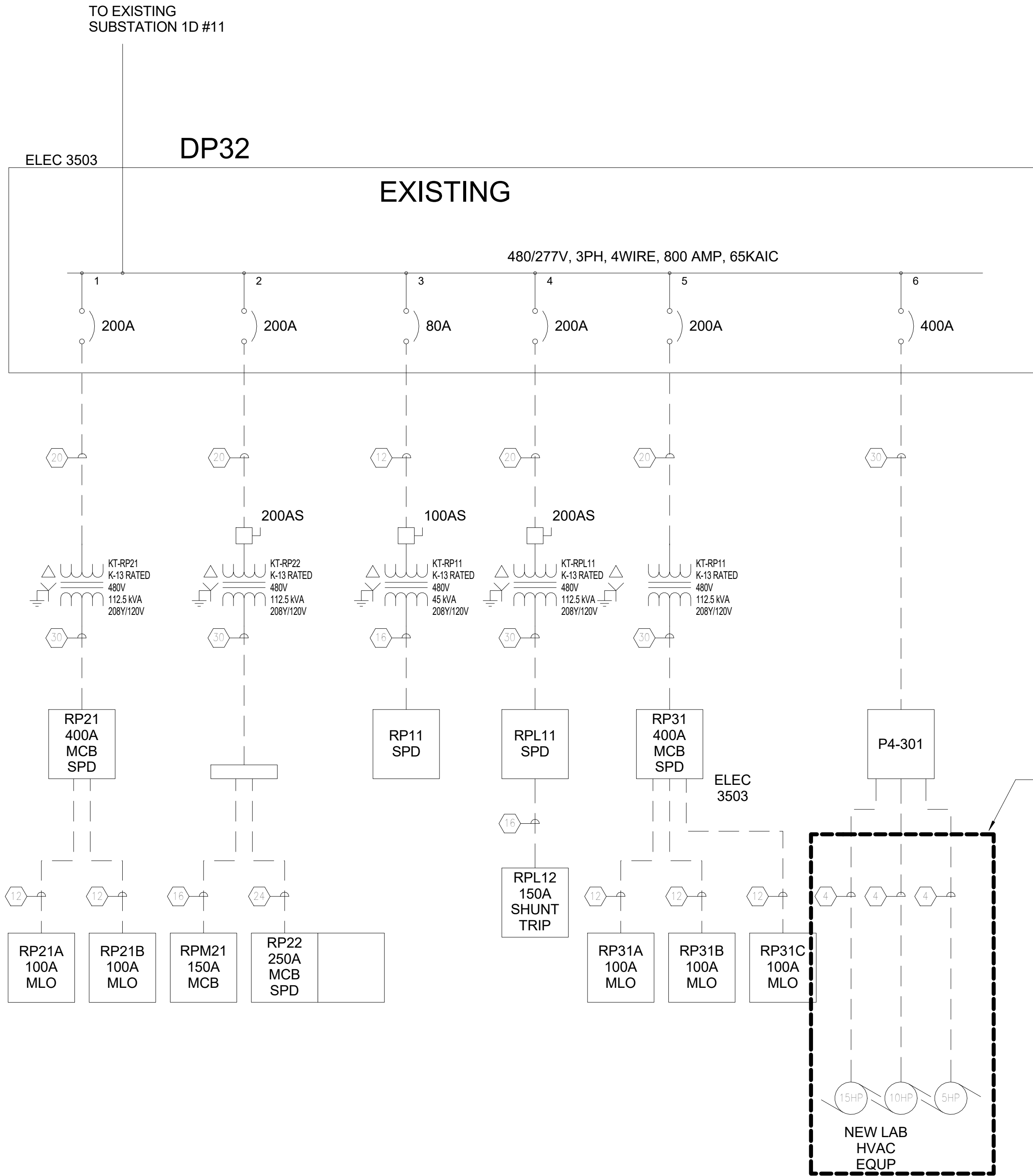
| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  | MAP   |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 0'

BAR IS ONE INCH ON ORIGINAL DRAWING



| LEGEND OF FEEDER SIZES - COPPER CONDUCTORS |  |              |  |              |                       |
|--|--|--------------|--|--------------|-----------------------|
| FEEDER SYMBOL                              | CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND | RACEWAY SIZE | CONDUCTORS (3 PHASE, 4 WIRE) WITH GROUND | RACEWAY SIZE | NOMINAL AMPERE RATING |
| 1  | 3#12 & 1#12 GND.                         | 3/4"         |  |              | 20                    |
| 2  |  |              | 4#12 & 1#12 GND.                         | 3/4"         |                       |
| 3  | 3#10 & 1#10 GND.                         | 3/4"         |  |              | 30                    |
| 4  |  |              | 4#10 & 1#10 GND.                         | 3/4"         |                       |
| 5  | 3#8 & 1#10 GND.                          | 1"           |  |              | 40                    |
| 6  |  |              | 4#8 & 1#10 GND.                          | 1"           |                       |
| 7  | 3#6 & 1#10 GND.                          | 3/4"         |  |              | 60                    |
| 8  |  |              | 4#6 & 1#10 GND.                          | 1"           |                       |
| 9  | 3#4 & 1#8 GND.                           | 1"           |  |              | 70                    |
| 10   |  |              | 4#4 & 1#8 GND.                           | 1-1/4"       |                       |
| 11   | 3#3 & 1#8 GND.                           | 1-1/4"       |  |              | 100                   |
| 12   |  |              | 4#3 & 1#8 GND.                           | 1-1/4"       |                       |
| 13   | 3#1 & 1#6 GND.                           | 1-1/2"       |  |              | 125                   |
| 14   |  |              | 4#1 & 1#6 GND.                           | 1-1/2"       |                       |
| 15   | 3#1/0 & 1#6 GND.                         | 1-1/2"       |  |              | 150                   |
| 16   |  |              | 4#1/0 & 1#6 GND.                         | 2"           |                       |
| 17   | 3#2/0 & 1#6 GND.                         | 2"           |  |              | 175                   |
| 18   |  |              | 4#2/0 & 1#6 GND.                         | 2"           |                       |
| 19   | 3#3/0 & 1#6 GND.                         | 2"           |  |              | 200                   |
| 20   |  |              | 4#3/0 & 1#6 GND.                         | 2"           |                       |
| 21   | 3#4/0 & 1#4 GND.                         | 2"           |  |              | 225                   |
| 22   |  |              | 4#4/0 & 1#4 GND.                         | 2-1/2"       |                       |

| LEGEND OF FEEDER SIZES - COPPER CONDUCTORS |  |              |  |              |                       |
|--|--|--------------|--|--------------|-----------------------|
| FEEDER SYMBOL                              | CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND | RACEWAY SIZE | CONDUCTORS (3 PHASE, 4 WIRE) WITH GROUND | RACEWAY SIZE | NOMINAL AMPERE RATING |
| 23   | (3)250 kcmil & 1#4 GND.                  | 2-1/2"       |  |              | 250                   |
| 24   |  |              | (4)250 kcmil & 1#4 GND.                  | 3"           |                       |
| 25   | (3)350 kcmil & 1#4 GND.                  | 3"           |  |              | 300                   |
| 26   |  |              | (4)350 kcmil & 1#4 GND.                  | 3"           |                       |
| 27   | (3)500 kcmil & 1#3 GND.                  | 3"           |  |              | 350                   |
| 28   |  |              | (4)500 kcmil & 1#4 GND.                  | 3-1/2"       |                       |
| 29   | (3)600 kcmil & 1#3 GND.                  | 3"           |  |              | 400                   |
| 30   |  |              | (4)600 kcmil & 1#3 GND.                  | 3-1/2"       |                       |
| 31   | (6)250 kcmil & 2#2 GND.                  | (2) 2-1/2"   |  |              | 500                   |
| 32   |  |              | (8)250 kcmil & 2#2 GND.                  | (2) 3"       |                       |
| 33   | (6)350 kcmil & 2#1 GND.                  | (2) 3"       |  |              | 600                   |
| 34   |  |              | (8)350 kcmil & 2#1 GND.                  | (2) 3"       |                       |
| 35   | (6)600 kcmil & 2#1/0 GND.                | (2) 4"       |  |              | 800                   |
| 36   |  |              | (8)600 kcmil & 2#1/0 GND.                | (2) 4"       |                       |
| 37   | (9)400 kcmil & 3#2/0 GND.                | (3) 3"       |  |              | 1000                  |
| 38   |  |              | (12)400 kcmil & 3#2/0 GND.               | (3) 3"       |                       |
| 39   | (9)600 kcmil & 3#3/0 GND.                | (3) 3-1/2"   |  |              | 1200                  |
| 40   |  |              | (12)600 kcmil & 3#3/0 GND.               | (3) 4"       |                       |
| 41   | (12)600 kcmil & 4#4/0 GND.               | (4) 3-1/2"   |  |              | 1600                  |
| 42   |  |              | (16)600 kcmil & 4#4/0 GND.               | (4) 4"       |                       |

GENERAL NOTE:

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DSGN:

S.FITZGERALD

DR:

S.FITZGERALD

CHK:

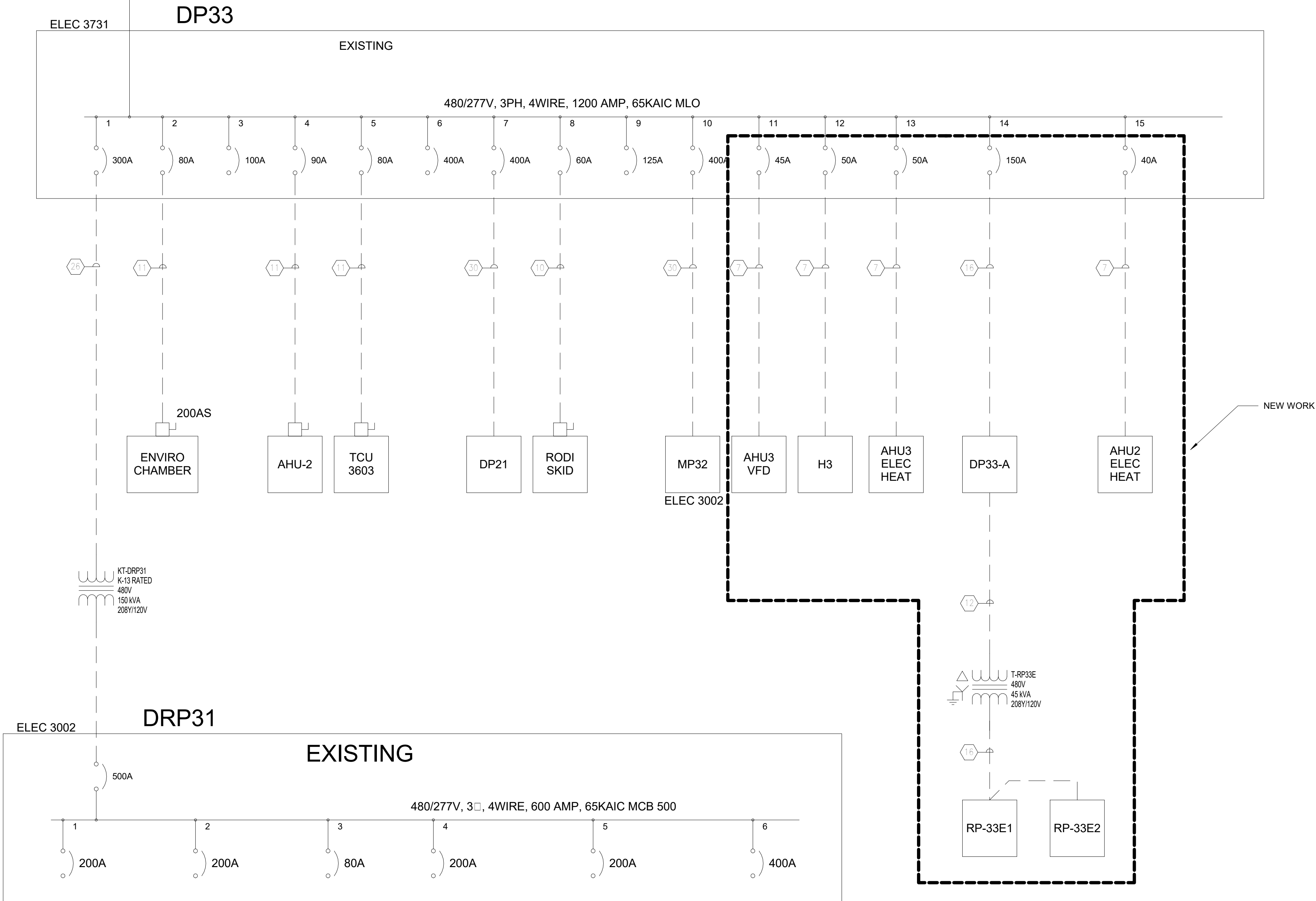
M.POWERS

APVD:

M.POWERS

| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  | MAP   |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |

TO EXISTING  
SUBSTATION 1D #08



PROJECT NOTES

- SEE DRAWING E-502 FOR FEEDER LEGEND.

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 0'

BAR IS ONE INCH ON ORIGINAL DRAWING

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  | MAP   |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |



IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0' 1" 0'

BAR IS ONE INCH ON ORIGINAL DRAWING

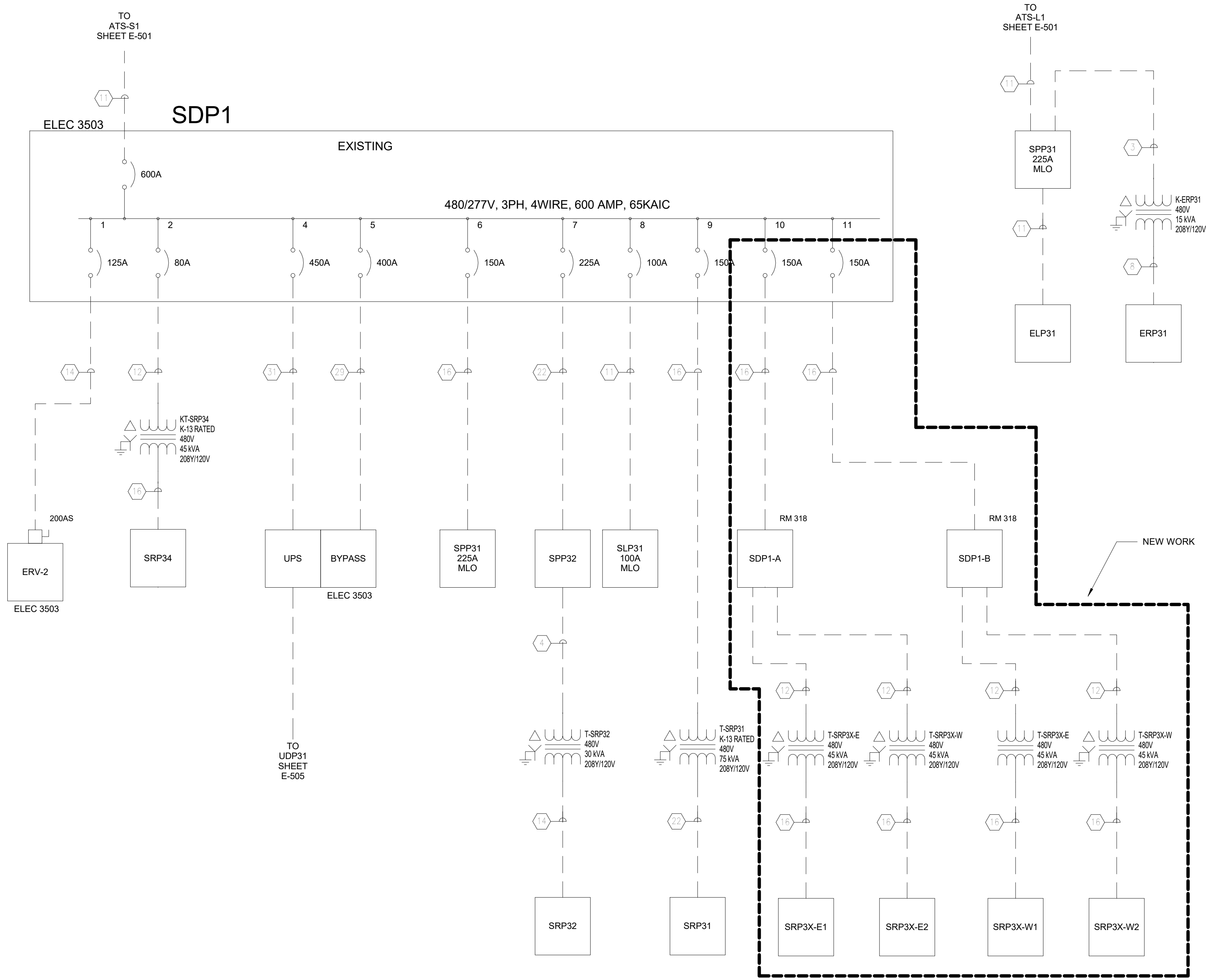
GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

|       |              |
|-------|--------------|
| DSGN: | S.FITZGERALD |
| DR:   | S.FITZGERALD |
| CHK:  | M.POWERS     |
| APVD: | M.POWERS     |

| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 03/22/21 | ISSUED FOR 60% CLIENT REVIEW | SPF  | MAP  |       |
| B    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  | MAP   |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |

- PROJECT NOTES
- SEE DRAWING E-502 FOR FEEDER LEGEND.







BAR IS ONE INCH ON THIS SHEET.  
ORIGINAL DRAWING  
IF NOT ONE INCH ON THIS SHEET,  
ADJUST SCALES ACCORDINGLY.



Panel ID: DP33-A  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From: DP33  
Location: LEVEL 3, ELEC. 3538

MCB Rating: 150A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A    |   | B    |   | C    |   | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------|---------|-------|------|---|------|---|------|---|-------|---------|-------------|-----|
| 1   |             |         |       | 0    | 0 |      |   |      |   |       |         |             | 2   |
| 3   | FCU-5       | 15 A    | 3     |      |   | 0    | 0 |      |   | 3     | 15 A    | FCU-2       | 4   |
| 5   |             |         |       |      |   |      |   | 0    | 0 |       |         |             | 6   |
| 7   |             |         |       | 0    | 0 |      |   |      |   |       |         |             | 8   |
| 9   | FCU-1       | 15 A    | 3     |      |   | 0    | 0 |      |   | 3     | 15 A    | FCU-4       | 10  |
| 11  |             |         |       |      |   |      |   | 0    | 0 |       |         |             | 12  |
| 13  |             |         |       | 0    | 0 |      |   |      |   |       |         |             | 14  |
| 15  | EF-5 (ROOF) | 15 A    | 3     |      |   | 0    | 0 |      |   | 3     | 15 A    | EF-4 (ROOF) | 16  |
| 17  |             |         |       |      |   |      |   | 0    | 0 |       |         |             | 18  |
| 19  |             |         |       | 1800 | 0 |      |   |      |   |       |         |             | 20  |
| 21  | T-RP33E     | 70 A    | 3     |      |   | 3420 | 0 |      |   | 3     | 20 A    | HVAC        | 22  |
| 23  |             |         |       |      |   |      |   | 3960 | 0 |       |         |             | 24  |
| 25  |             |         |       | 0    |   |      |   |      |   |       |         |             | 26  |
| 27  | HVAC        | 20 A    | 3     |      |   | 0    |   |      |   |       |         |             | 28  |
| 29  |             |         |       |      |   |      |   | 0    |   |       |         |             | 30  |
| 31  |             |         |       |      |   |      |   |      |   |       |         |             | 32  |
| 33  |             |         |       |      |   |      |   |      |   |       |         |             | 34  |
| 35  |             |         |       |      |   |      |   |      |   |       |         |             | 36  |
| 37  |             |         |       |      |   |      |   |      |   |       |         |             | 38  |
| 39  |             |         |       |      |   |      |   |      |   |       |         |             | 40  |
| 41  |             |         |       |      |   |      |   |      |   |       |         |             | 42  |

Total Amps: 1800 VA 3420 VA 3960 VA

Total Connected Load: 9180 VA



Panel ID: P4-301  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From:  
Location: LEVEL 3, MECH / ELEC. 3519

MCB Rating: 400 A  
A.I.C. Rating:  
Manufacturer:

EXISTING

| CKT | DESCRIPTION         | CB Size | Poles | A |  | B |  | C |  | Poles | CB Size | DESCRIPTION           | CKT |
|-----|---------------------|---------|-------|---|--|---|--|---|--|-------|---------|-----------------------|-----|
| 1   |                     |         |       |   |  |   |  |   |  |       |         |                       | 2   |
| 3   |                     |         |       |   |  |   |  |   |  |       |         |                       | 4   |
| 5   |                     |         |       |   |  |   |  |   |  |       |         |                       | 6   |
| 7   |                     |         |       |   |  |   |  |   |  |       |         |                       | 8   |
| 9   |                     |         |       |   |  |   |  |   |  |       |         |                       | 10  |
| 11  |                     |         |       |   |  |   |  |   |  |       |         |                       | 12  |
| 13  |                     |         |       |   |  |   |  |   |  |       |         |                       | 14  |
| 15  |                     |         |       |   |  |   |  |   |  |       |         |                       | 16  |
| 17  |                     |         |       |   |  |   |  | 0 |  |       |         |                       | 18  |
| 19  |                     |         |       | 0 |  |   |  |   |  | 3     | 15 A    | AHU-1 VFD 5 HP MOTOR  | 20  |
| 21  |                     |         |       |   |  | 0 |  |   |  |       |         |                       | 22  |
| 23  |                     |         |       |   |  |   |  | 0 |  |       |         |                       | 24  |
| 25  |                     |         |       | 0 |  |   |  |   |  | 3     | 30 A    | AHU-2 VFD 10 HP MOTOR | 26  |
| 27  |                     |         |       |   |  | 0 |  |   |  |       |         |                       | 28  |
| 29  |                     |         |       |   |  |   |  |   |  |       |         |                       | 30  |
| 31  |                     |         |       | 0 |  |   |  |   |  |       |         |                       | 32  |
| 33  | AHU-1 ELECTRIC HEAT | 30 A    | 3     |   |  | 0 |  |   |  |       |         |                       | 34  |
| 35  |                     |         |       |   |  |   |  | 0 |  |       |         |                       | 36  |
| 37  |                     |         |       |   |  |   |  |   |  |       |         |                       | 38  |
| 39  |                     |         |       |   |  |   |  |   |  |       |         |                       | 40  |
| 41  |                     |         |       |   |  |   |  |   |  |       |         |                       | 42  |

Total Amps: 0 VA 0 VA 0 VA

Total Connected Load: 0 VA



Panel ID: DP31-A  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From: DP31  
Location: LEVEL 3, MECH / ELEC. 3519

MCB Rating: 150A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION       | CB Size | Poles | A |      | B |      | C |      | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------------|---------|-------|---|------|---|------|---|------|-------|---------|-------------|-----|
| 1   |                   |         |       | 0 | 0    |   |      |   |      |       |         |             | 2   |
| 3   | FCU-3 RM 3522 MEZ | 15 A    | 3     |   |      | 0 | 0    |   |      | 3     | 15 A    | EF-1 (ROOF) | 4   |
| 5   |                   |         |       |   |      |   |      | 0 | 0    |       |         |             | 6   |
| 7   |                   |         |       | 0 |      |   |      |   |      |       |         |             | 8   |
| 9   |                   |         |       |   |      | 0 |      |   |      | 3     | 25 A    | H-2 RM 3523 | 10  |
| 11  |                   |         |       |   |      |   |      |   | 0    |       |         |             | 12  |
| 13  |                   |         |       | 0 | 2880 |   |      |   |      |       |         |             | 14  |
| 15  | H-1 RM 3523       | 25 A    | 3     |   |      | 0 | 1800 |   |      | 3     | 70 A    | T-RP31W     | 16  |
| 17  |                   |         |       |   |      |   |      | 0 | 1080 |       |         |             | 18  |
| 19  |                   |         |       |   |      |   |      |   |      |       |         |             | 20  |
| 21  |                   |         |       |   |      |   |      |   |      |       |         |             | 22  |
| 23  |                   |         |       |   |      |   |      |   |      |       |         |             | 24  |
| 25  |                   |         |       |   |      |   |      |   |      |       |         |             | 26  |
| 27  |                   |         |       |   |      |   |      |   |      |       |         |             | 28  |
| 29  |                   |         |       |   |      |   |      |   |      |       |         |             | 30  |
| 31  |                   |         |       |   |      |   |      |   |      |       |         |             | 32  |
| 33  |                   |         |       |   |      |   |      |   |      |       |         |             | 34  |
| 35  |                   |         |       |   |      |   |      |   |      |       |         |             | 36  |
| 37  |                   |         |       |   |      |   |      |   |      |       |         |             | 38  |
| 39  |                   |         |       |   |      |   |      |   |      |       |         |             | 40  |
| 41  |                   |         |       |   |      |   |      |   |      |       |         |             | 42  |

Total Amps: 2880 VA 1800 VA 1080 VA

Total Connected Load: 5760 VA

GENERAL NOTE:

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REQUIRED TO REVIEW ALL  
CONTRACT DOCUMENTS,  
INCLUDING CONTRACT  
DRAWINGS AND/OR PROJECT  
SPECIFICATIONS. FOR ALL  
DISCIPLINES TO ASCERTAIN THE  
COMPLETE SCOPE OF WORK FOR  
THE PROJECT.

DSGN:

S.FITZGERALD

DR:

S.FITZGERALD

CHK:

M.POWERS

APVD:

M.POWERS

REV.

A

0

DATE

04-19-21

06-10-21

REVISION DESCRIPTION

ISSUED FOR 90% CLIENT REVIEW

ISSUED FOR 90% CLIENT REVIEW

DWG.

SPF

SPF

CHK.

MAP

MAP

MAP

APVD.

BAR IS ONE INCH ON THIS SHEET.  
ORIGINAL DRAWING

0" 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



Panel ID: SDP1-A  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From: SDP1  
Location: LEVEL 3, ELEC. 3538

MCB Rating: 150A \  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A    | B    | C    | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------|---------|-------|------|------|------|-------|---------|-------------|-----|
| 1   |             |         |       | 5100 |      |      |       |         |             | 2   |
| 3   |             |         |       |      | 6620 |      |       | 3       | 70 A        | 4   |
| 5   |             |         |       |      |      | 7500 |       |         |             | 6   |
| 7   |             |         |       | 0    | 8280 |      |       |         |             | 8   |
| 9   | EF-3        | 15 A    | 3     |      | 0    | 9360 |       | 3       | 70 A        | 10  |
| 11  |             |         |       |      |      | 0    | 7380  |         |             | 12  |
| 13  |             |         |       |      |      |      |       |         |             | 14  |
| 15  |             |         |       |      |      |      |       |         |             | 16  |
| 17  |             |         |       |      |      |      |       |         |             | 18  |
| 19  |             |         |       |      |      |      |       |         |             | 20  |
| 21  |             |         |       |      |      |      |       |         |             | 22  |
| 23  |             |         |       |      |      |      |       |         |             | 24  |
| 25  |             |         |       |      |      |      |       |         |             | 26  |
| 27  |             |         |       |      |      |      |       |         |             | 28  |
| 29  |             |         |       |      |      |      |       |         |             | 30  |
| 31  |             |         |       |      |      |      |       |         |             | 32  |
| 33  |             |         |       |      |      |      |       |         |             | 34  |
| 35  |             |         |       |      |      |      |       |         |             | 36  |
| 37  |             |         |       |      |      |      |       |         |             | 38  |
| 39  |             |         |       |      |      |      |       |         |             | 40  |
| 41  |             |         |       |      |      |      |       |         |             | 42  |

Total Amps: 13380 VA 15980 VA 14880 VA

Total Connected Load: 44240 VA



Panel ID: SDP1-B  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From: SDP1  
Location: LEVEL 3, MECH / ELEC. 3519

MCB Rating: 150A \  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A     | B    | C     | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------|---------|-------|-------|------|-------|-------|---------|-------------|-----|
| 1   |             |         |       | 11760 | 4480 |       |       |         |             | 2   |
| 3   | T-SRP3X-W2  | 70 A    | 3     |       | 6960 | 10520 |       | 3       | 70 A        | 4   |
| 5   |             |         |       |       |      | 8400  | 9100  |         |             | 6   |
| 7   |             |         |       |       |      |       |       |         |             | 8   |
| 9   |             |         |       |       |      |       |       |         |             | 10  |
| 11  |             |         |       |       |      |       |       |         |             | 12  |
| 13  |             |         |       |       |      |       |       |         |             | 14  |
| 15  |             |         |       |       |      |       |       |         |             | 16  |
| 17  |             |         |       |       |      |       |       |         |             | 18  |
| 19  |             |         |       |       |      |       |       |         |             | 20  |
| 21  |             |         |       |       |      |       |       |         |             | 22  |
| 23  |             |         |       |       |      |       |       |         |             | 24  |
| 25  |             |         |       |       |      |       |       |         |             | 26  |
| 27  |             |         |       |       |      |       |       |         |             | 28  |
| 29  |             |         |       |       |      |       |       |         |             | 30  |
| 31  |             |         |       |       |      |       |       |         |             | 32  |
| 33  |             |         |       |       |      |       |       |         |             | 34  |
| 35  |             |         |       |       |      |       |       |         |             | 36  |
| 37  |             |         |       |       |      |       |       |         |             | 38  |
| 39  |             |         |       |       |      |       |       |         |             | 40  |
| 41  |             |         |       |       |      |       |       |         |             | 42  |

Total Amps: 16240 VA 17480 VA 17500 VA

Total Connected Load: 51220 VA



Panel ID: UDP31-A  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From: UDP31  
Location: LEVEL 3, ELEC. 3538

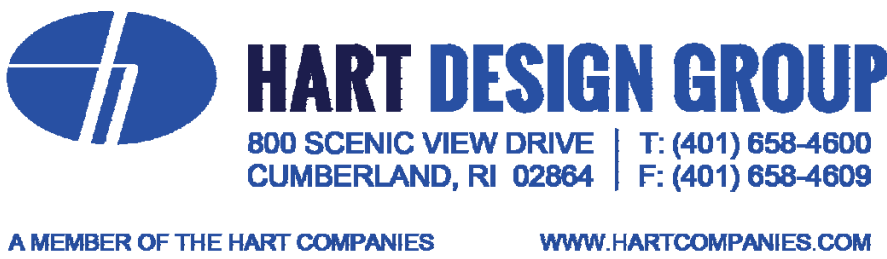
MCB Rating: 150A \  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A    | B    | C    | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------|---------|-------|------|------|------|-------|---------|-------------|-----|
| 1   |             |         |       | 2160 | 4386 |      |       |         |             | 2   |
| 3   | T-UDP3X-E   | 70 A    | 3     |      | 1980 | 4386 |       | 3       | 70 A        | 4   |
| 5   |             |         |       |      |      | 1800 | 2160  |         |             | 6   |
| 7   |             |         |       |      |      |      |       |         |             | 8   |
| 9   |             |         |       |      |      |      |       |         |             | 10  |
| 11  |             |         |       |      |      |      |       |         |             | 12  |
| 13  |             |         |       |      |      |      |       |         |             | 14  |
| 15  |             |         |       |      |      |      |       |         |             | 16  |
| 17  |             |         |       |      |      |      |       |         |             | 18  |
| 19  |             |         |       |      |      |      |       |         |             | 20  |
| 21  |             |         |       |      |      |      |       |         |             | 22  |
| 23  |             |         |       |      |      |      |       |         |             | 24  |
| 25  |             |         |       |      |      |      |       |         |             | 26  |
| 27  |             |         |       |      |      |      |       |         |             | 28  |
| 29  |             |         |       |      |      |      |       |         |             | 30  |
| 31  |             |         |       |      |      |      |       |         |             | 32  |
| 33  |             |         |       |      |      |      |       |         |             | 34  |
| 35  |             |         |       |      |      |      |       |         |             | 36  |
| 37  |             |         |       |      |      |      |       |         |             | 38  |
| 39  |             |         |       |      |      |      |       |         |             | 40  |
| 41  |             |         |       |      |      |      |       |         |             | 42  |

Total Amps: 6546 VA 6366 VA 3960 VA

Total Connected Load: 16872 VA



GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

DSGN: S.FITZGERALD  
DR: S.FITZGERALD  
CHK: M.POWERS  
APVD: M.POWERS

| REV. | DATE     | REVISION DESCRIPTION    | DWG. | CHK. | APVD. |
|------|----------|-------------------------|------|------|-------|
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION | SPF  | MAP  | MAP   |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |
|      |          |                         |      |      |       |

CLD & CCM LABS  
ELECTRICAL  
PANELS SCHEDULES  
480 / 277 VAC CONT.

PROJ. NO: 20021A CAD FILE:


ISSUE DATE: 06/08/21

SCALE:

SHEET NUMBER

E-506.1





Panel ID: SRP3X-E1

Voltage: 120/208 Wye

Phase/Wire: 3/4

Fed From: T-SRP3X-E1

Location: LEVEL 3, ELEC. 3538


MCB Rating: 125A

A.I.C. Rating:

Manufacturer:

NEW PANEL

| CKT                   | DESCRIPTION | CB Size | Poles | A        |      | B       |      | C       |      | Poles | CB Size | DESCRIPTION | CKT |
|-----------------------|-------------|---------|-------|----------|------|---------|------|---------|------|-------|---------|-------------|-----|
| 1                     | Power       | 20 A    | 1     | 180      | 180  |         |      |         |      | 1     | 20 A    | Power       | 2   |
| 3                     | Power       | 20 A    | 1     |          |      | 360     |      |         |      |       |         |             | 4   |
| 5                     | Power       | 20 A    | 1     |          |      |         |      | 180     |      |       |         |             | 6   |
| 7                     |             |         |       |          | 180  |         |      |         |      | 1     | 20 A    | Power       | 8   |
| 9                     |             |         |       |          |      |         | 180  |         |      | 1     | 20 A    | Power       | 10  |
| 11                    |             |         |       |          |      |         |      |         | 180  | 1     | 20 A    | Power       | 12  |
| 13                    | Power       | 20 A    | 1     | 180      | 2580 |         |      |         |      | 1     | 20 A    | Power       | 14  |
| 15                    | Power       | 20 A    | 1     |          |      | 180     | 1580 |         |      | 1     | 20 A    | Power       | 16  |
| 17                    | Power       | 20 A    | 1     |          |      |         |      | 180     | 180  | 1     | 20 A    | Power       | 18  |
| 19                    | Power       | 20 A    | 1     | 180      | 180  |         |      |         |      | 1     | 20 A    | Power       | 20  |
| 21                    | Power       | 20 A    | 1     |          |      | 1380    | 180  |         |      | 1     | 20 A    | Power       | 22  |
| 23                    | Power       | 20 A    | 1     |          |      |         |      | 2580    | 180  | 1     | 20 A    | Power       | 24  |
| 25                    | Power       | 20 A    | 1     | 180      | 1260 |         |      |         |      | 1     | 20 A    | Power       | 26  |
| 27                    | Power       | 20 A    | 1     |          |      | 180     |      |         |      |       |         |             | 28  |
| 29                    | Power       | 20 A    | 1     |          |      |         |      | 180     |      |       |         |             | 30  |
| 31                    |             |         |       |          |      |         |      |         |      |       |         |             | 32  |
| 33                    |             |         |       |          |      |         | 2580 |         |      | 1     | 20 A    | Power       | 34  |
| 35                    | Power       | 20 A    | 1     |          |      |         |      | 1260    | 2580 | 1     | 20 A    | Power       | 36  |
| 37                    |             |         |       |          |      |         |      |         |      |       |         |             | 38  |
| 39                    |             |         |       |          |      |         |      |         |      |       |         |             | 40  |
| 41                    |             |         |       |          |      |         |      |         |      |       |         |             | 42  |
| Total Amps:           |             |         |       | 5100 VA  |      | 6620 VA |      | 7500 VA |      |       |         |             |     |
| Total Connected Load: |             |         |       | 19220 VA |      |         |      |         |      |       |         |             |     |



Panel ID: SRP3X-E2

Voltage: 120/208 Wye

Phase/Wire: 3/4

Fed From: T-SRP3X-E2

Location: LEVEL 3, ELEC. 3538


MCB Rating: 125A

A.I.C. Rating:

Manufacturer:

NEW PANEL

| CKT                   | DESCRIPTION | CB Size | Poles | A        |      | B       |      | C       |      | Poles | CB Size | DESCRIPTION | CKT |
|-----------------------|-------------|---------|-------|----------|------|---------|------|---------|------|-------|---------|-------------|-----|
| 1                     | Power       | 20 A    | 1     | 180      | 2580 |         |      |         |      | 1     | 30 A    | Power       | 2   |
| 3                     | Power       | 30 A    | 1     |          |      | 2580    | 1260 |         |      | 1     | 20 A    | Power       | 4   |
| 5                     | Power       | 20 A    | 1     |          |      |         |      | 1260    | 180  | 1     | 20 A    | Power       | 6   |
| 7                     | Power       | 20 A    | 1     | 180      | 180  |         |      |         |      | 1     | 20 A    | Power       | 8   |
| 9                     | Power       | 30 A    | 1     |          |      | 2580    | 2580 |         |      | 1     | 30 A    | Power       | 10  |
| 11                    | Power       | 30 A    | 1     |          |      |         |      | 2580    | 2580 | 1     | 30 A    | Power       | 12  |
| 13                    | Power       | 30 A    | 1     | 2580     | 2580 |         |      |         |      | 1     | 30 A    | Power       | 14  |
| 15                    | Power       | 20 A    | 1     |          |      | 180     | 180  |         |      | 1     | 20 A    | Power       | 16  |
| 17                    | Power       | 20 A    | 1     |          |      |         |      | 180     | 600  | 1     | 20 A    | Other       | 18  |
| 19                    |             |         |       |          |      |         |      |         |      |       |         |             | 20  |
| 21                    |             |         |       |          |      |         |      |         |      |       |         |             | 22  |
| 23                    |             |         |       |          |      |         |      |         |      |       |         |             | 24  |
| 25                    |             |         |       |          |      |         |      |         |      |       |         |             | 26  |
| 27                    |             |         |       |          |      |         |      |         |      |       |         |             | 28  |
| 29                    |             |         |       |          |      |         |      |         |      |       |         |             | 30  |
| 31                    |             |         |       |          |      |         |      |         |      |       |         |             | 32  |
| 33                    |             |         |       |          |      |         |      |         |      |       |         |             | 34  |
| 35                    |             |         |       |          |      |         |      |         |      |       |         |             | 36  |
| 37                    |             |         |       |          |      |         |      |         |      |       |         |             | 38  |
| 39                    |             |         |       |          |      |         |      |         |      |       |         |             | 40  |
| 41                    |             |         |       |          |      |         |      |         |      |       |         |             | 42  |
| Total Amps:           |             |         |       | 8280 VA  |      | 9360 VA |      | 7380 VA |      |       |         |             |     |
| Total Connected Load: |             |         |       | 25020 VA |      |         |      |         |      |       |         |             |     |



Panel ID: SRP3X-W1

Voltage: 120/208 Wye

Phase/Wire: 3/4

Fed From: T-SRP3X-W1

Location: LEVEL 3, MECH / ELEC. 3519


MCB Rating: 125A

A.I.C. Rating:

Manufacturer:

NEW PANEL

| CKT                   | DESCRIPTION | CB Size | Poles | A        |      | B        |      | C       |      | Poles | CB Size | DESCRIPTION | CKT   |    |
|-----------------------|-------------|---------|-------|----------|------|----------|------|---------|------|-------|---------|-------------|-------|----|
| 1                     | Power       | 20 A    | 1     | 180      | 180  |          |      |         |      | 1     | 20 A    | Power       | 2     |    |
| 3                     | Power       | 20 A    | 1     |          |      | 180      | 1580 |         |      | 1     | 20 A    | Power       | 4     |    |
| 5                     | Power       | 20 A    | 1     |          |      |          |      | 1580    | 1580 | 1     | 20 A    | Power       | 6     |    |
| 7                     | Power       | 20 A    | 1     | 1580     | 1580 |          |      |         |      | 1     | 20 A    | Power       | 8     |    |
| 9                     | Power       | 20 A    | 1     |          |      | 1380     | 180  |         |      | 1     | 20 A    | Power       | 10    |    |
| 11                    | Power       | 20 A    | 1     |          |      |          |      | 180     | 180  | 1     | 20 A    | Power       | 12    |    |
| 13                    | Power       | 20 A    | 1     | 180      | 180  |          |      |         |      | 1     | 20 A    | Power       | 14    |    |
| 15                    | Power       | 30 A    | 1     |          |      | 2400     | 2400 |         |      | 1     | 30 A    | Power       | 16    |    |
| 17                    | Power       | 30 A    | 1     |          |      |          |      | 2400    |      |       |         |             | 18    |    |
| 19                    |             |         |       |          |      |          |      |         |      |       |         |             | 20    |    |
| 21                    |             |         |       |          |      |          |      |         |      |       |         |             | 22    |    |
| 23                    | Power       | 30 A    | 1     |          |      |          |      | 2400    | 180  | 1     | 20 A    | Power       | 24    |    |
| 25                    |             |         |       |          |      |          |      |         |      |       |         |             | 26    |    |
| 27                    | Power       | 20 A    | 1     |          |      | 1200     |      |         |      |       |         |             | 28    |    |
| 29                    |             |         |       |          |      |          |      |         |      |       |         |             | 30    |    |
| 31                    |             |         |       |          |      |          |      |         |      |       |         |             | 32    |    |
| 33                    |             |         |       |          |      |          |      |         |      |       |         |             | 34    |    |
| 35                    |             |         |       |          |      |          |      |         | 600  | 1     | 20 A    | Power       | 36    |    |
| 37                    | Power       | 20 A    | 1     | 600      | 0    |          |      |         |      |       | 1       | 20 A        | Power | 38 |
| 39                    | Power       | 20 A    | 1     |          |      | 600      | 600  |         |      | 1     | 20 A    | Power       | 40    |    |
| 41                    |             |         |       |          |      |          |      |         |      |       |         |             | 42    |    |
| Total Amps:           |             |         |       | 4480 VA  |      | 10520 VA |      | 9100 VA |      |       |         |             |       |    |
| Total Connected Load: |             |         |       | 24100 VA |      |          |      |         |      |       |         |             |       |    |



Panel ID: UDP3X-E

Voltage: 120/208 Wye

Phase/Wire: 3/4

Fed From: T-UDP3X-E

Location: LEVEL 3, ELEC. 3538


MCB Rating: 125A

A.I.C. Rating:

Manufacturer:

NEW PANEL

| CKT                   | DESCRIPTION | CB Size | Poles | A       |     | B       |     | C       |     | Poles | CB Size | DESCRIPTION | CKT |
|-----------------------|-------------|---------|-------|---------|-----|---------|-----|---------|-----|-------|---------|-------------|-----|
| 1                     | Power       | 20 A    | 1     | 180     | 360 |         |     |         |     | 1     | 20 A    | Power       | 2   |
| 3                     | Power       | 20 A    | 1     |         |     | 360     | 360 |         |     | 1     | 20 A    | Power       | 4   |
| 5                     | Power       | 20 A    | 1     |         |     |         |     | 360     | 360 | 1     | 20 A    | Power       | 6   |
| 7                     | Power       | 20 A    | 1     | 180     | 540 |         |     |         |     | 1     | 20 A    | Power       | 8   |
| 9                     | Power       | 20 A    | 1     |         |     | 360     | 0   |         |     | 1     | 20 A    | Other       | 10  |
| 11                    | Other       | 20 A    | 1     |         |     |         |     | 0       | 0   | 1     | 20 A    | Power       | 12  |
| 13                    | Power       | 20 A    | 1     | 0       | 360 |         |     |         |     | 1     | 20 A    | Power       | 14  |
| 15                    | Power       | 20 A    | 1     |         |     | 360     | 360 |         |     | 1     | 20 A    | Power       | 16  |
| 17                    | Other       | 20 A    | 1     |         |     |         |     | 360     | 0   | 1     | 20 A    | Other       | 18  |
| 19                    | Other       | 20 A    | 1     | 0       | 0   |         |     |         |     | 1     | 20 A    | Other       | 20  |
| 21                    | Power       | 20 A    | 1     |         |     | 0       | 0   |         |     | 1     | 20 A    | Power       | 22  |
| 23                    | Power       | 20 A    | 1     |         |     |         |     | 360     | 360 | 1     | 20 A    | Power       | 24  |
| 25                    | Power       | 20 A    | 1     | 360     | 180 |         |     |         |     | 1     | 20 A    | Power       | 26  |
| 27                    | Power       | 20 A    | 1     |         |     | 180     | 0   |         |     | 1     | 20 A    | Other       | 28  |
| 29                    |             |         |       |         |     |         |     |         |     |       |         |             | 30  |
| 31                    |             |         |       |         |     |         |     |         |     |       |         |             | 32  |
| 33                    |             |         |       |         |     |         |     |         |     |       |         |             | 34  |
| 35                    |             |         |       |         |     |         |     |         |     |       |         |             | 36  |
| 37                    |             |         |       |         |     |         |     |         |     |       |         |             | 38  |
| 39                    |             |         |       |         |     |         |     |         |     |       |         |             | 40  |
| 41                    |             |         |       |         |     |         |     |         |     |       |         |             | 42  |
| Total Amps:           |             |         |       | 2160 VA |     | 1980 VA |     | 1800 VA |     |       |         |             |     |
| Total Connected Load: |             |         |       | 5940 VA |     |         |     |         |     |       |         |             |     |



Panel ID: UDP3X-W

Voltage: 120/208 Wye

Phase/Wire: 3/4

Fed From: T-UDP3X-W

Location: LEVEL 3, MECH / ELEC. 3519

MCB Rating: 125A

A.I.C. Rating:

Manufacturer:

NEW PANEL

| CKT                   | DESCRIPTION | CB Size | Poles | A        |      | B       |      | C       |     | Poles | CB Size | DESCRIPTION        | CKT |
|-----------------------|-------------|---------|-------|----------|------|---------|------|---------|-----|-------|---------|--------------------|-----|
| 1                     | Power       | 20 A    | 1     | 360      | 2586 |         |      |         |     | 2     | 30 A    | CENTRIFUGE RM 3521 | 2   |
| 3                     | Power       | 20 A    | 1     |          |      | 360     | 2586 |         |     | 1     | 20 A    |                    | 4   |
| 5                     | Power       | 20 A    | 1     |          |      |         |      | 360     | 360 | 1     | 20 A    | Power              | 6   |
| 7                     | Power       | 20 A    | 1     | 180      | 360  |         |      |         |     | 1     | 20 A    | Power              | 8   |
| 9                     | Other       | 20 A    | 1     |          |      | 0       | 0    |         |     | 1     | 20 A    | Power              | 10  |
| 11                    | Power       | 20 A    | 1     |          |      |         |      | 360     | 180 | 1     | 20 A    | Other              | 12  |
| 13                    | Power       | 20 A    | 1     | 180      | 180  |         |      |         |     | 1     | 20 A    | Power              | 14  |
| 15                    | Power       | 20 A    | 1     |          |      | 180     | 0    |         |     | 1     | 20 A    | Power              | 16  |
| 17                    | Power       | 20 A    | 1     |          |      |         |      | 0       | 360 | 1     | 20 A    | Power              | 18  |
| 19                    | Power       | 20 A    | 1     | 180      | 180  |         |      |         |     | 1     | 20 A    | Power              | 20  |
| 21                    | Power       | 20 A    | 1     |          |      | 360     | 180  |         |     | 1     | 20 A    | Power              | 22  |
| 23                    | Power       | 20 A    | 1     |          |      |         |      | 180     | 360 | 1     | 20 A    | Power              | 24  |
| 25                    | Power       | 20 A    | 1     | 180      | 0    |         |      |         |     | 1     | 20 A    | Other              | 26  |
| 27                    | Power       | 20 A    | 1     |          |      | 360     | 360  |         |     | 1     | 20 A    | Power              | 28  |
| 29                    |             |         |       |          |      |         |      |         |     |       |         |                    | 30  |
| 31                    |             |         |       |          |      |         |      |         |     |       |         |                    | 32  |
| 33                    |             |         |       |          |      |         |      |         |     |       |         |                    | 34  |
| 35                    |             |         |       |          |      |         |      |         |     |       |         |                    | 36  |
| 37                    |             |         |       |          |      |         |      |         |     |       |         |                    | 38  |
| 39                    |             |         |       |          |      |         |      |         |     |       |         |                    | 40  |
| 41                    |             |         |       |          |      |         |      |         |     |       |         |                    | 42  |
| Total Amps:           |             |         |       | 4386 VA  |      | 4386 VA |      | 2160 VA |     |       |         |                    |     |
| Total Connected Load: |             |         |       | 10932 VA |      |         |      |         |     |       |         |                    |     |

|  |
|--|
| <div><div><div></div><div>HART DESIGN GROUP</div></div><div>Panel ID</div></div> |
|--|

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 0'

BAR IS ONE INCH ON ORIGINAL DRAWING



Panel ID: RP-33E1  
Voltage: 120/208 Wye  
Phase/Wire: 3/4  
Fed From: T-RP33E  
Location: LEVEL 3, ELEC. 3538

MCB Rating: 100A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A   | B   | C   | Poles | CB Size | DESCRIPTION | CKT      |
|-----|-------------|---------|-------|-----|-----|-----|-------|---------|-------------|----------|
| 1   | HVAC        | 20 A    | 1     | 0   | 0   |     |       | 1       | 20 A        | HVAC 2   |
| 3   | HVAC        | 20 A    | 1     |     | 0   | 360 |       | 1       | 20 A        | Power 4  |
| 5   | Power       | 20 A    | 1     |     |     | 540 | 540   | 1       | 20 A        | Power 6  |
| 7   | Power       | 20 A    | 1     | 180 | 180 |     |       | 1       | 20 A        | Power 8  |
| 9   | Power       | 20 A    | 1     |     | 360 | 360 |       | 1       | 20 A        | Power 10 |
| 11  | Power       | 20 A    | 1     |     |     | 0   | 0     | 1       | 20 A        | Power 12 |
| 13  | Power       | 20 A    | 1     | 0   | 540 |     |       | 1       | 20 A        | Power 14 |
| 15  | Power       | 20 A    | 1     |     | 360 | 360 |       | 1       | 20 A        | Power 16 |
| 17  | Power       | 20 A    | 1     |     |     | 360 | 360   | 1       | 20 A        | Power 18 |
| 19  | Power       | 20 A    | 1     | 360 | 180 |     |       | 1       | 20 A        | Power 20 |
| 21  | Power       | 20 A    | 1     |     | 180 | 180 |       | 1       | 20 A        | Power 22 |
| 23  | Power       | 20 A    | 1     |     |     | 180 | 360   | 1       | 20 A        | Power 24 |
| 25  | Other       | 20 A    | 1     | 0   | 0   |     |       | 1       | 20 A        | Other 26 |
| 27  | Power       | 20 A    | 1     |     | 180 |     |       |         |             |          |
| 29  | Power       | 20 A    | 1     |     |     | 360 | 0     | 1       | 20 A        | Power 30 |
| 31  | Power       | 20 A    | 1     | 0   | 360 |     |       | 1       | 20 A        | Power 32 |
| 33  | Power       | 20 A    | 1     |     | 0   | 0   |       | 1       | 20 A        | Power 34 |
| 35  | Power       | 20 A    | 1     |     |     | 0   | 360   | 1       | 20 A        | Power 36 |
| 37  | Power       | 20 A    | 1     | 0   | 0   |     |       | 1       | 20 A        | Power 38 |
| 39  | Power       | 20 A    | 1     |     | 540 | 540 |       | 1       | 20 A        | Power 40 |
| 41  | Power       | 20 A    | 1     |     |     | 540 | 360   | 1       | 20 A        | Power 42 |

Total Amps: 1800 VA 3420 VA 3960 VA

Total Connected Load: 9180 VA



Panel ID: RP-31W1  
Voltage: 120/208 Wye  
Phase/Wire: 3/4  
Fed From: T-RP31W  
Location: LEVEL 3, MECH / ELEC. 3519

MCB Rating: 100A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A   | B   | C   | Poles | CB Size | DESCRIPTION | CKT      |
|-----|-------------|---------|-------|-----|-----|-----|-------|---------|-------------|----------|
| 1   | Power       | 20 A    | 1     | 180 | 360 |     |       | 1       | 20 A        | Power 2  |
| 3   | Power       | 20 A    | 1     |     | 0   | 360 |       | 1       | 20 A        | Power 4  |
| 5   | HVAC        | 20 A    | 1     |     |     | 0   | 360   | 1       | 20 A        | Power 6  |
| 7   | Power       | 20 A    | 1     | 180 | 360 |     |       | 1       | 20 A        | Power 8  |
| 9   | Power       | 20 A    | 1     |     | 180 | 180 |       | 1       | 20 A        | Power 10 |
| 11  | Power       | 20 A    | 1     |     |     | 360 | 360   | 1       | 20 A        | Power 12 |
| 13  |             |         |       | 0   |     |     |       | 1       | 20 A        | Power 14 |
| 15  |             |         |       |     | 180 |     |       | 1       | 20 A        | Power 16 |
| 17  | Power       | 20 A    | 1     |     |     | 0   | 0     | 1       | 20 A        | Other 18 |
| 19  | Power       | 20 A    | 1     | 360 |     |     |       |         |             | 20       |
| 21  |             |         |       |     | 360 |     |       | 1       | 20 A        | Power 22 |
| 23  |             |         |       |     |     |     |       |         |             | 24       |
| 25  |             |         |       | 180 |     |     |       | 1       | 20 A        | Power 26 |
| 27  | Power       | 20 A    | 1     |     | 360 |     |       |         |             | 28       |
| 29  |             |         |       |     |     |     |       |         |             | 30       |
| 31  | Power       | 20 A    | 1     | 360 | 0   |     |       | 1       | 20 A        | Power 32 |
| 33  | Power       | 20 A    | 1     |     | 0   | 0   |       | 1       | 20 A        | Power 34 |
| 35  | Power       | 20 A    | 1     |     |     | 0   | 0     | 1       | 20 A        | Power 36 |
| 37  | Power       | 20 A    | 1     | 360 | 540 |     |       | 1       | 20 A        | Power 38 |
| 39  |             |         |       |     | 180 |     |       | 1       | 20 A        | Power 40 |
| 41  |             |         |       |     |     |     |       |         |             | 42       |

Total Amps: 2880 VA 1800 VA 1080 VA

Total Connected Load: 5760 VA



Panel ID: RP-33E2  
Voltage: 120/208 Wye  
Phase/Wire: 3/4  
Fed From:  
Location: ELEC. 3538

MCB Rating: 100A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A   | B   | C   | Poles | CB Size | DESCRIPTION | CKT      |
|-----|-------------|---------|-------|-----|-----|-----|-------|---------|-------------|----------|
| 1   | Power       | 20 A    | 1     | 180 | 180 |     |       | 1       | 20 A        | Power 2  |
| 3   | Power       | 20 A    | 1     |     | 180 | 180 |       | 1       | 20 A        | Power 4  |
| 5   |             |         |       |     |     |     |       |         |             | 6        |
| 7   |             |         |       |     |     |     |       |         |             | 8        |
| 9   |             |         |       |     |     |     |       |         |             | 10       |
| 11  |             |         |       |     |     |     |       |         |             | 12       |
| 13  | Power       | 20 A    | 1     | 0   | 0   |     |       | 1       | 20 A        | Power 14 |
| 15  | Power       | 20 A    | 1     |     | 0   | 0   |       | 1       | 20 A        | Power 16 |
| 17  | Power       | 20 A    | 1     |     |     | 540 | 360   | 1       | 20 A        | Power 18 |
| 19  | Power       | 20 A    | 1     | 360 |     |     |       |         |             | 20       |
| 21  |             |         |       |     |     |     |       |         |             | 22       |
| 23  |             |         |       |     |     |     |       |         |             | 24       |
| 25  |             |         |       |     |     |     |       |         |             | 26       |
| 27  |             |         |       |     |     |     |       |         |             | 28       |
| 29  |             |         |       |     |     |     |       |         |             | 30       |
| 31  |             |         |       |     |     |     |       |         |             | 32       |
| 33  |             |         |       |     |     |     |       |         |             | 34       |
| 35  |             |         |       |     |     |     |       |         |             | 36       |
| 37  |             |         |       |     |     |     |       |         |             | 38       |
| 39  |             |         |       |     |     |     |       |         |             | 40       |
| 41  |             |         |       |     |     |     |       |         |             | 42       |

Total Amps: 720 VA 360 VA 900 VA

Total Connected Load: 1980 VA



Panel ID: RP-31W2  
Voltage: 120/208 Wye  
Phase/Wire: 3/4  
Fed From:  
Location: LEVEL 3, MECH / ELEC. 3519

MCB Rating: 100A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION                             | CB Size | Poles | A   | B   | C   | Poles | CB Size | DESCRIPTION | CKT     |
|-----|---|---------|-------|-----|-----|-----|-------|---------|-------------|---------|
| 1   | Power                                   | 20 A    | 1     | 180 | 180 |     |       | 1       | 20 A        | Power 2 |
| 3   | 120V - NON-Fusible 20A, 277 V/480 V,... | 20 A    | 1     |     | 0   | 180 |       | 1       | 20 A        | Power 4 |
| 5   | Power                                   | 20 A    | 1     |     |     | 180 | 180   | 1       | 20 A        | Power 6 |
| 7   | Power                                   | 20 A    | 1     | 180 | 180 |     |       | 1       | 20 A        | Power 8 |
| 9   | Other                                   | 20 A    | 1     |     | 0   |     |       |         |             | 10      |
| 11  |   |         |       |     |     |     |       |         |             | 12      |
| 13  |   |         |       |     |     |     |       |         |             | 14      |
| 15  |   |         |       |     |     |     |       |         |             | 16      |
| 17  |   |         |       |     |     |     |       |         |             | 18      |
| 19  |   |         |       |     |     |     |       |         |             | 20      |
| 21  |   |         |       |     |     |     |       |         |             | 22      |
| 23  |   |         |       |     |     |     |       |         |             | 24      |
| 25  |   |         |       |     |     |     |       |         |             | 26      |
| 27  |   |         |       |     |     |     |       |         |             | 28      |
| 29  |   |         |       |     |     |     |       |         |             | 30      |
| 31  |   |         |       |     |     |     |       |         |             | 32      |
| 33  |   |         |       |     |     |     |       |         |             | 34      |
| 35  |   |         |       |     |     |     |       |         |             | 36      |
| 37  |   |         |       |     |     |     |       |         |             | 38      |
| 39  |   |         |       |     |     |     |       |         |             | 40      |
| 41  |   |         |       |     |     |     |       |         |             | 42      |

Total Amps: 720 VA 180 VA 360 VA

Total Connected Load: 1260 VA

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

ISSUE DATE: 04/16/21

SCALE:

SHEET NUMBER

E-508



BAR IS ONE INCH ON ORIGINAL DRAWING

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0" 1"



Panel ID: LP-31E  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From:  
Location: LEVEL 3, ELEC. 3538

MCB Rating: 250 A  
A.I.C. Rating:  
Manufacturer:

NEW PANEL

| CKT | DESCRIPTION | CB Size | Poles | A   |     | B   |     | C   |     | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------|---------|-------|-----|-----|-----|-----|-----|-----|-------|---------|-------------|-----|
| 1   | Lighting    | 20 A    | 1     | 286 | 88  |     |     |     |     | 1     | 20 A    |             | 2   |
| 3   |             | 20 A    | 1     |     |     | 44  | 154 |     |     | 1     | 20 A    |             | 4   |
| 5   |             | 20 A    | 1     |     |     |     |     | 198 | 308 | 1     | 20 A    |             | 6   |
| 7   |             | 20 A    | 1     | 352 | 396 |     |     |     |     | 1     | 20 A    |             | 8   |
| 9   |             | 20 A    | 1     |     |     | 506 |     |     |     |       |         |             | 10  |
| 11  |             |         |       |     |     |     |     |     |     |       |         |             | 12  |
| 13  |             |         |       |     |     |     |     |     |     |       |         |             | 14  |
| 15  |             |         |       |     |     |     |     |     |     |       |         |             | 16  |
| 17  |             |         |       |     |     |     |     |     |     |       |         |             | 18  |
| 19  |             |         |       |     |     |     |     |     |     |       |         |             | 20  |
| 21  |             |         |       |     |     |     |     |     |     |       |         |             | 22  |
| 23  |             |         |       |     |     |     |     |     |     |       |         |             | 24  |
| 25  |             |         |       |     |     |     |     |     |     |       |         |             | 26  |
| 27  |             |         |       |     |     |     |     |     |     |       |         |             | 28  |
| 29  |             |         |       |     |     |     |     |     |     |       |         |             | 30  |
| 31  |             |         |       |     |     |     |     |     |     |       |         |             | 32  |
| 33  |             |         |       |     |     |     |     |     |     |       |         |             | 34  |
| 35  |             |         |       |     |     |     |     |     |     |       |         |             | 36  |
| 37  |             |         |       |     |     |     |     |     |     |       |         |             | 38  |
| 39  |             |         |       |     |     |     |     |     |     |       |         |             | 40  |
| 41  |             |         |       |     |     |     |     |     |     |       |         |             | 42  |

Total Amps: 1122 VA 704 VA 506 VA

Total Connected Load: 2332 VA



Panel ID: ELP-31  
Voltage: 480/277 Wye  
Phase/Wire: 3/4  
Fed From:  
Location: LEVEL 3, ELEC. 3502

MCB Rating: 100 A  
A.I.C. Rating:  
Manufacturer:

EXISTING

| CKT | DESCRIPTION | CB Size | Poles | A   |     | B   |     | C   |     | Poles | CB Size | DESCRIPTION | CKT |
|-----|-------------|---------|-------|-----|-----|-----|-----|-----|-----|-------|---------|-------------|-----|
| 1   | Lighting    | 20 A    | 1     | 110 | 220 |     |     |     |     | 1     | 20 A    |             | 2   |
| 3   |             | 20 A    | 1     |     |     | 176 | 374 |     |     | 1     | 20 A    |             | 4   |
| 5   |             | 20 A    | 1     |     |     |     |     | 220 | 330 | 1     | 20 A    |             | 6   |
| 7   |             |         |       |     |     |     |     |     |     |       |         |             | 8   |
| 9   |             |         |       |     |     |     |     |     |     |       |         |             | 10  |
| 11  |             |         |       |     |     |     |     |     |     |       |         |             | 12  |
| 13  |             |         |       |     |     |     |     |     |     |       |         |             | 14  |
| 15  |             |         |       |     |     |     |     |     |     |       |         |             | 16  |
| 17  |             |         |       |     |     |     |     |     |     |       |         |             | 18  |
| 19  |             |         |       |     |     |     |     |     |     |       |         |             | 20  |
| 21  |             |         |       |     |     |     |     |     |     |       |         |             | 22  |
| 23  |             |         |       |     |     |     |     |     |     |       |         |             | 24  |
| 25  |             |         |       |     |     |     |     |     |     |       |         |             | 26  |
| 27  |             |         |       |     |     |     |     |     |     |       |         |             | 28  |
| 29  |             |         |       |     |     |     |     |     |     |       |         |             | 30  |
| 31  |             |         |       |     |     |     |     |     |     |       |         |             | 32  |
| 33  |             |         |       |     |     |     |     |     |     |       |         |             | 34  |
| 35  |             |         |       |     |     |     |     |     |     |       |         |             | 36  |
| 37  |             |         |       |     |     |     |     |     |     |       |         |             | 38  |
| 39  |             |         |       |     |     |     |     |     |     |       |         |             | 40  |
| 41  |             |         |       |     |     |     |     |     |     |       |         |             | 42  |

Total Amps: 330 VA 550 VA 550 VA

Total Connected Load: 1430 VA

GENERAL NOTE:

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS. FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

DSGN:

S.FITZGERALD

DR:

S.FITZGERALD

CHK:

M.POWERS

APVD:

M.POWERS

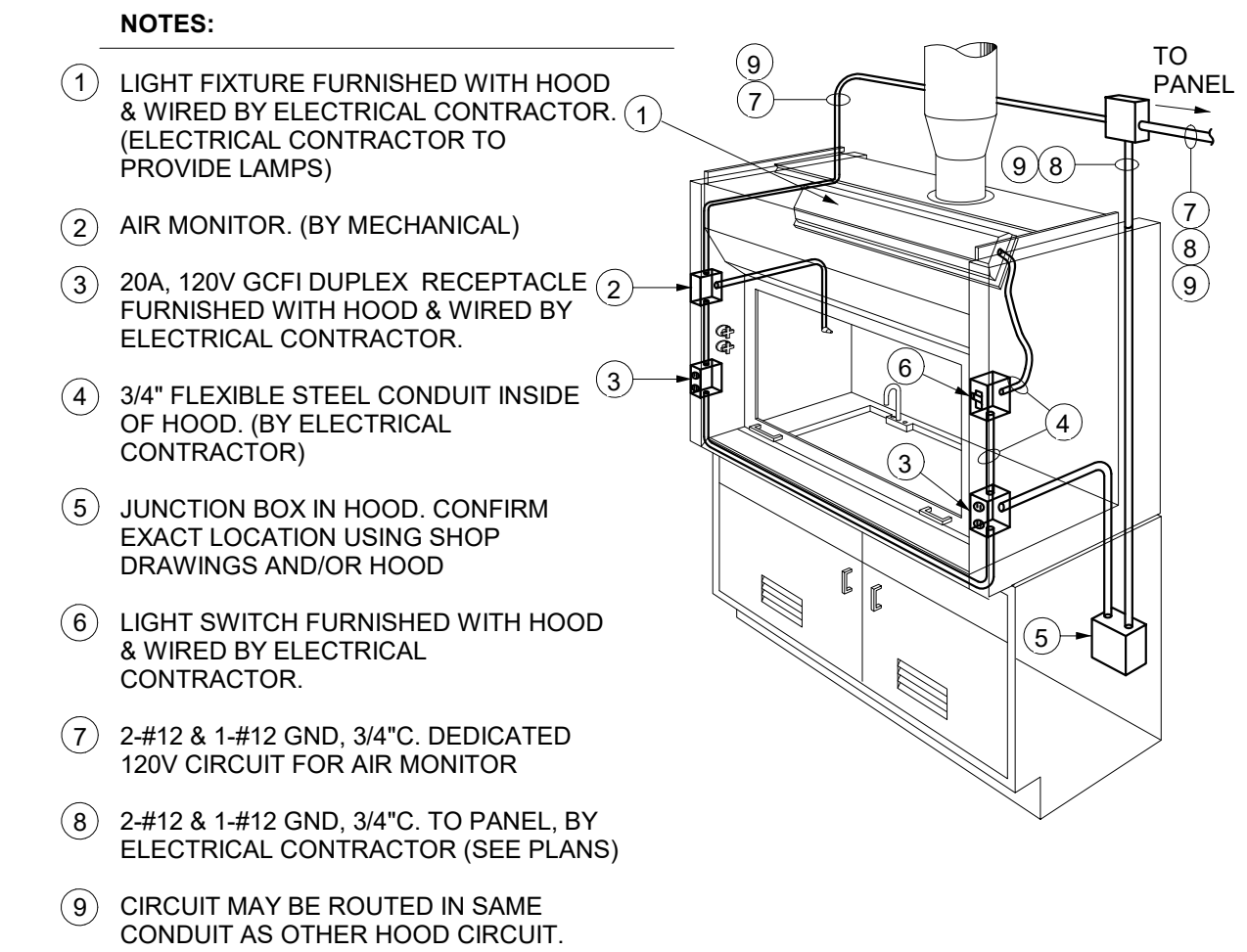
| REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|------|----------|------------------------------|------|------|-------|
| A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  | MAP   |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |
|      |          |                              |      |      |       |

ISSUE DATE: 04/17/21

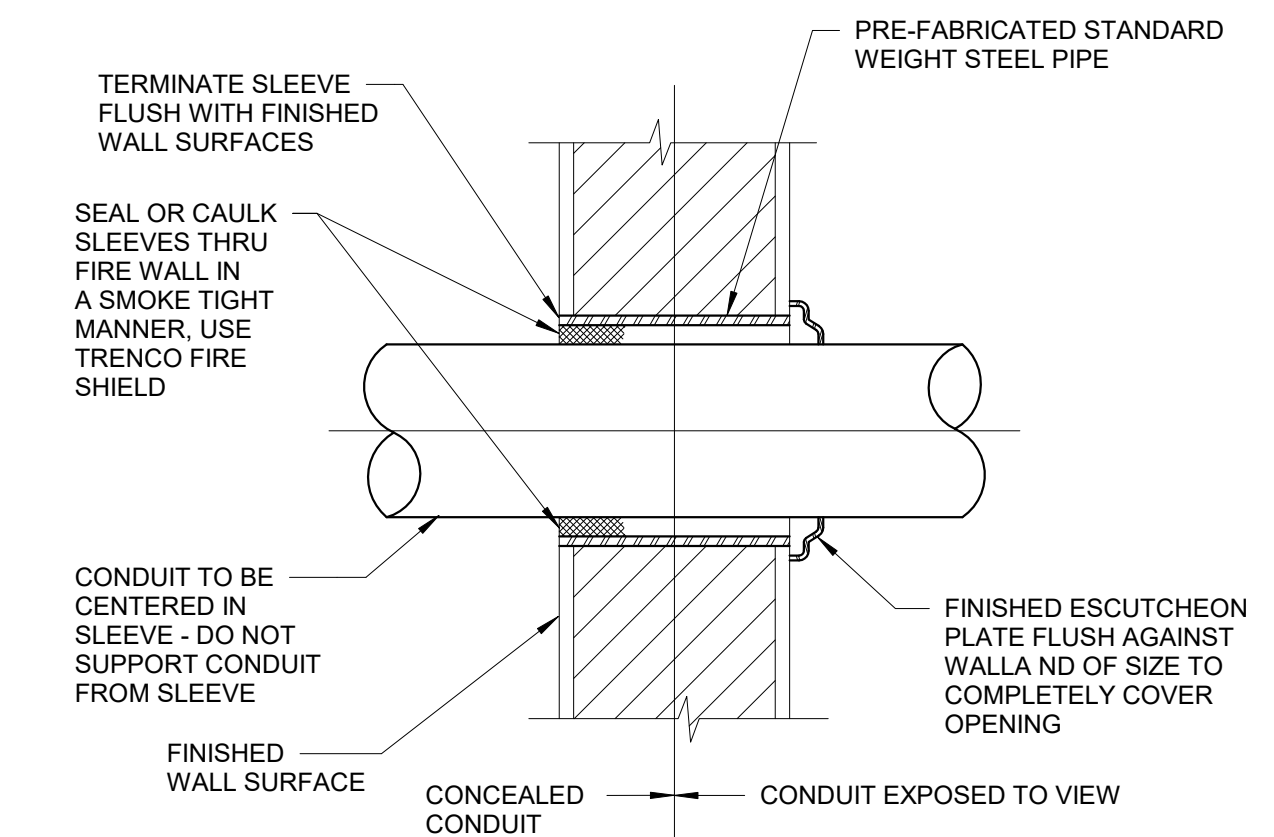
SCALE:

SHEET NUMBER

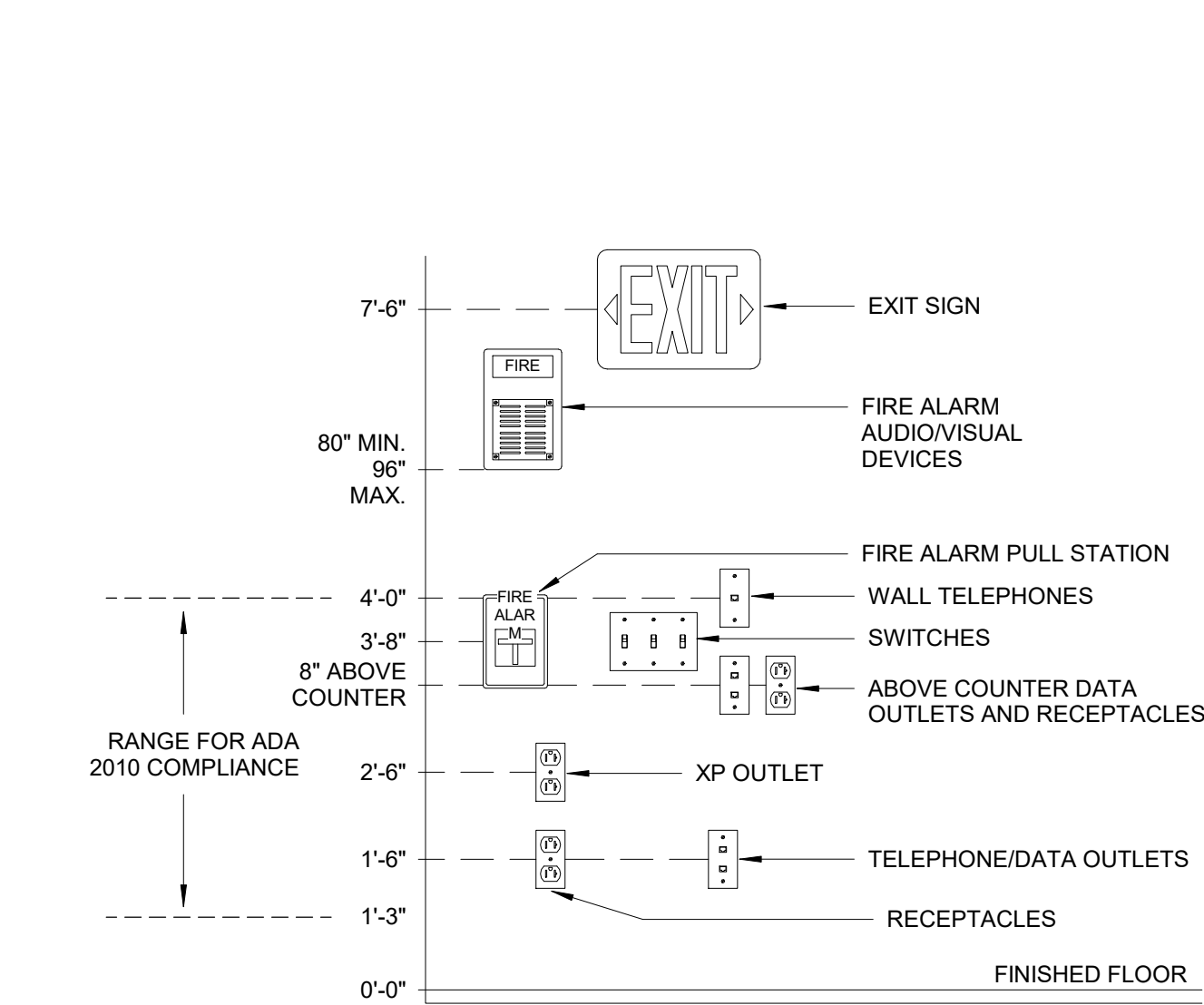
E-509



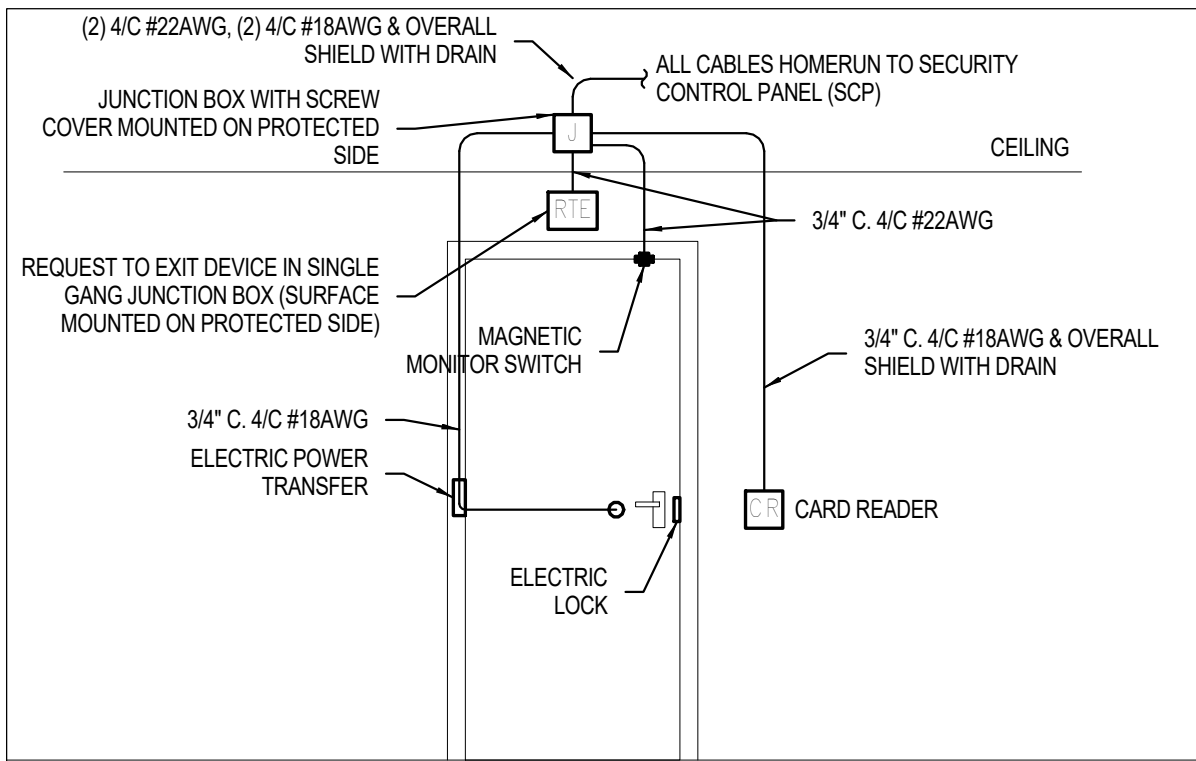
1 FUME HOOD ELECTRICAL SERVICE



2 CONDUIT SLEEVE THRU INTERIOR WALL

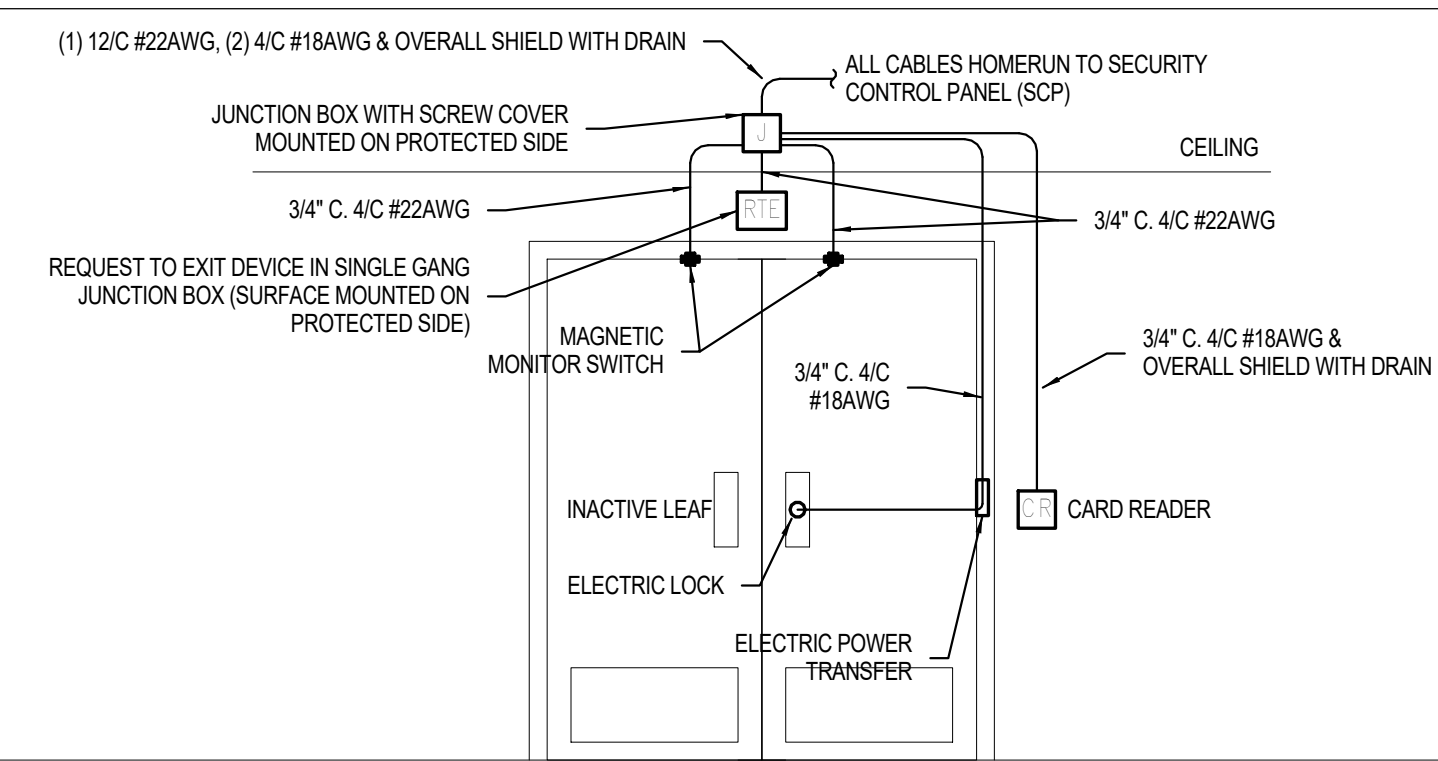


3 Device Mounting Heights new with ADA



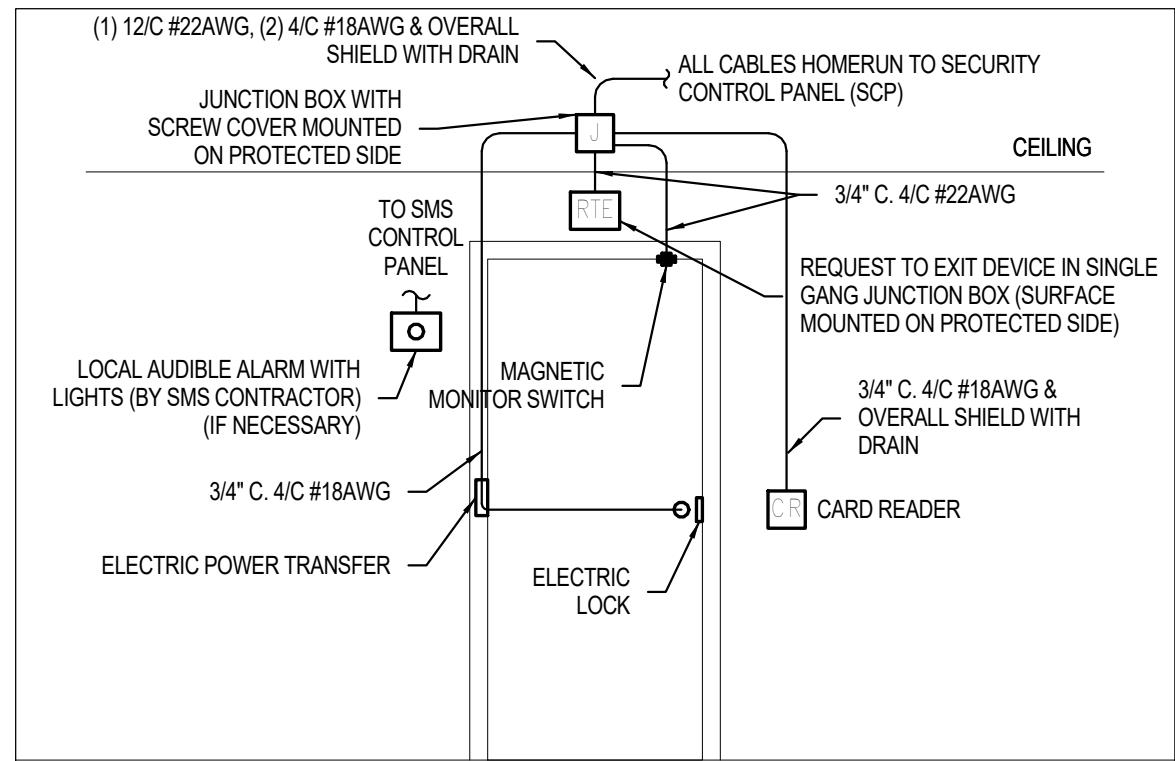
ACCESS CONTROLLED SINGLE DOOR CONFIGURATION

S3 SCALE: NONE



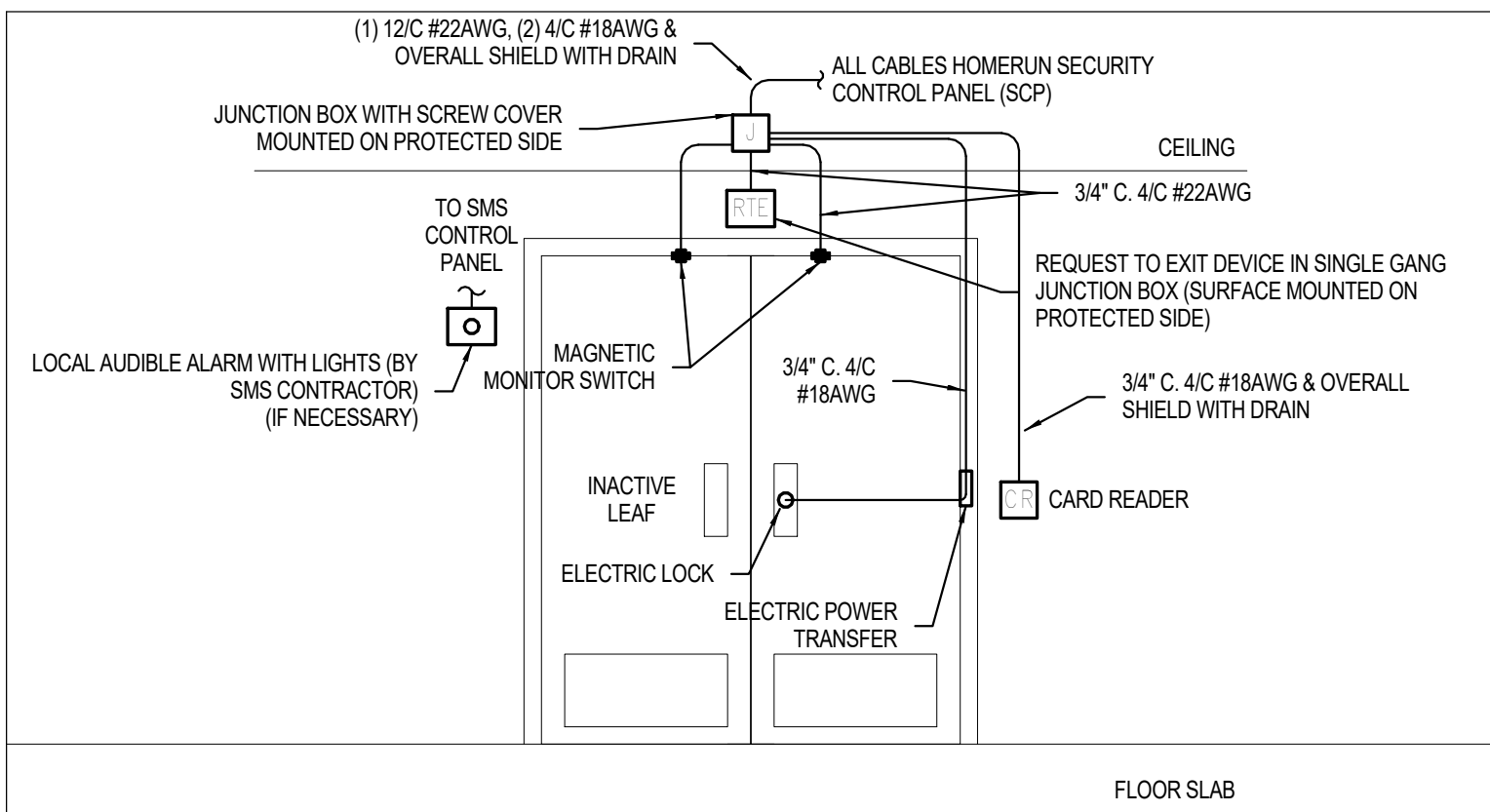
ACCESS CONTROLLED DOUBLE DOOR CONFIGURATION

S4 SCALE: NONE



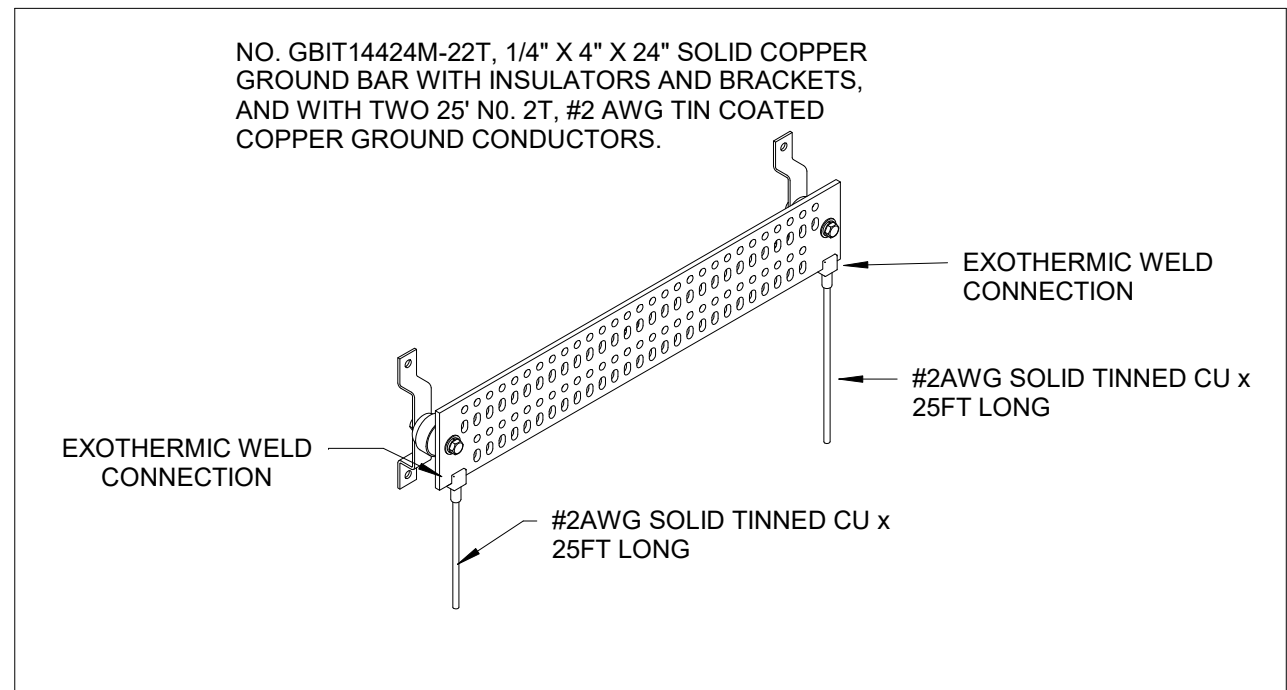
ACCESS CONTROLLED AIRLOCK SINGLE DOOR CONFIGURATION

S5 SCALE: NONE

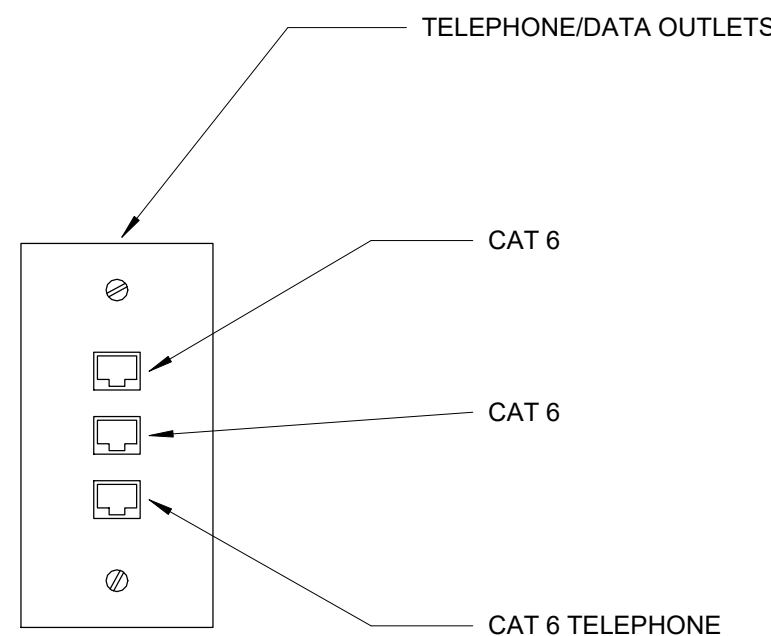


ACCESS CONTROLLED AIRLOCK DOUBLE DOOR CONFIGURATION

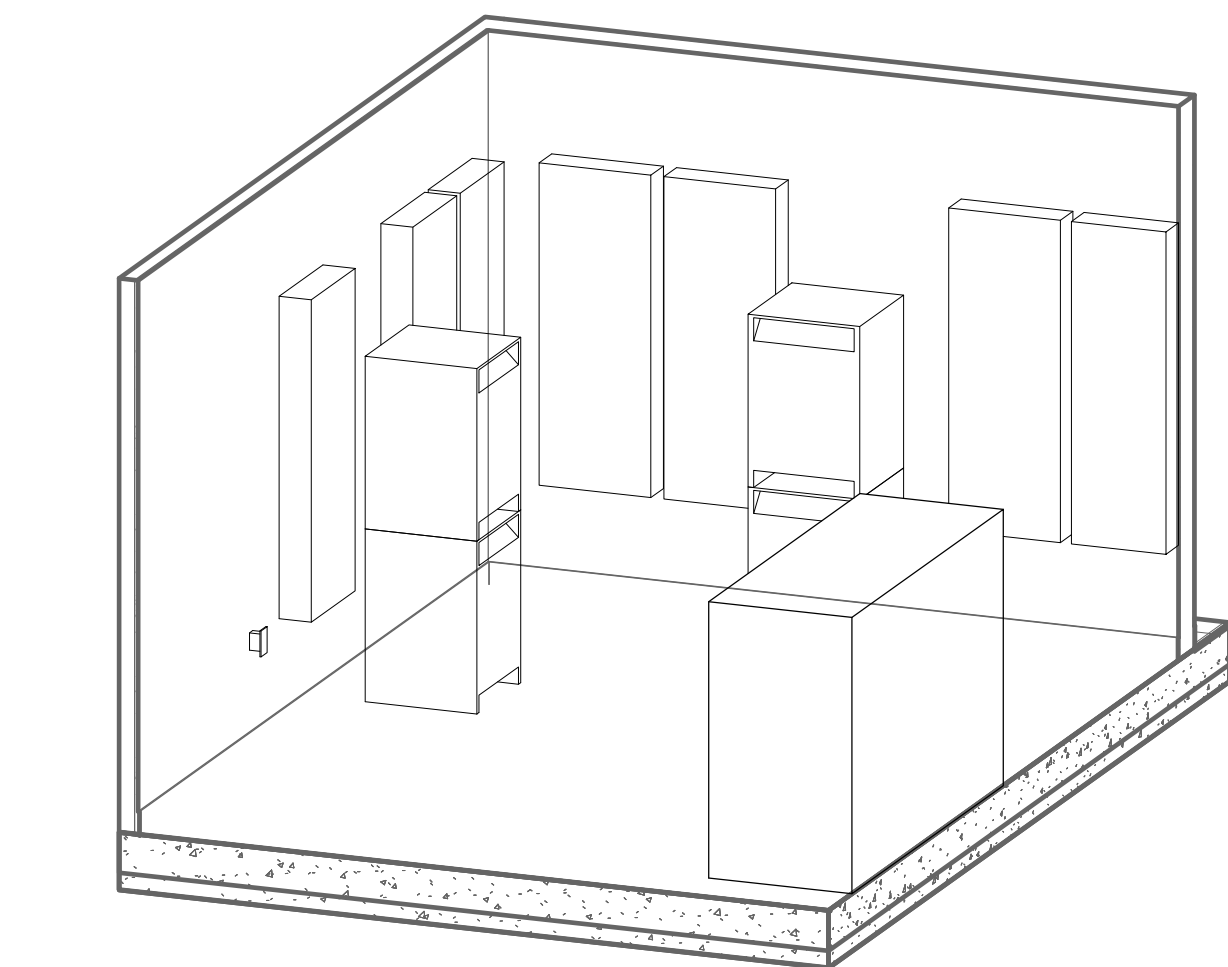
S6 SCALE: NONE



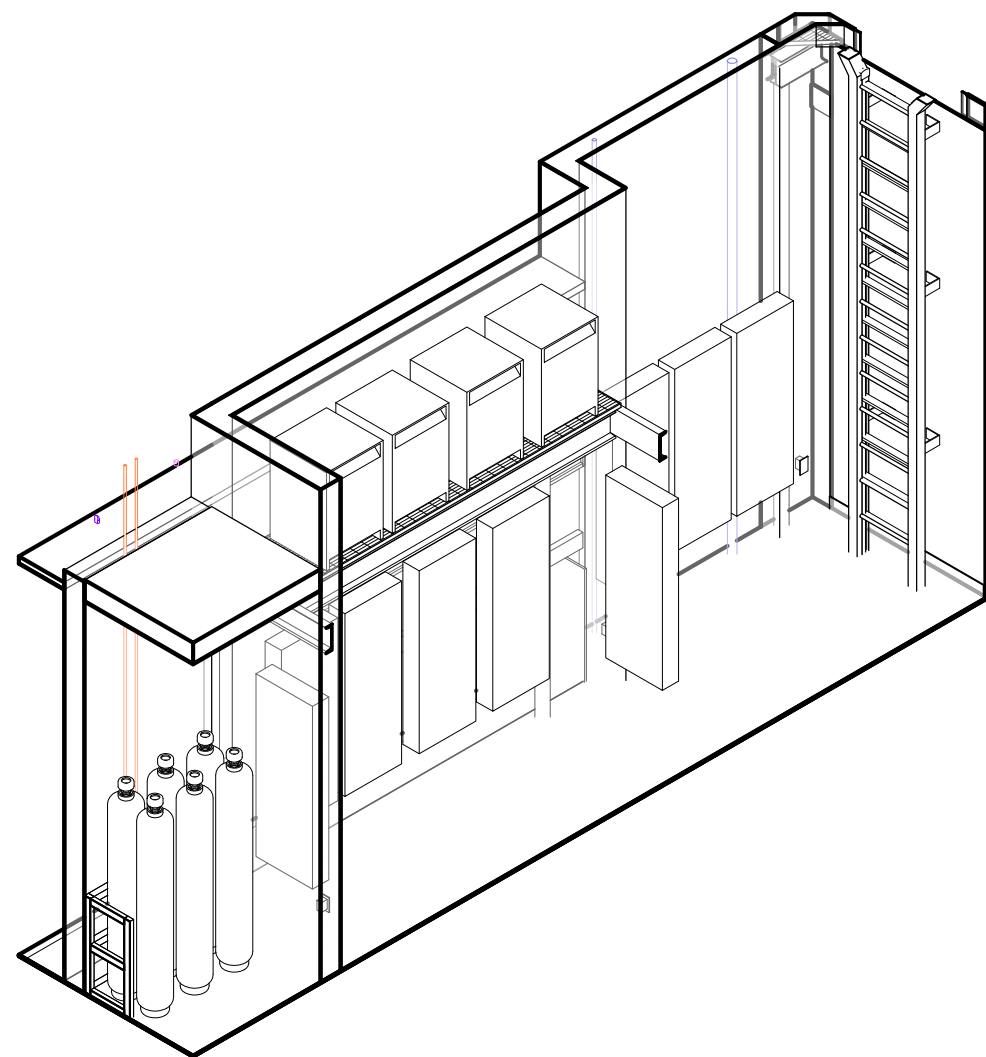
6 GROUND BAR DETAIL 1



8 DATA OUTLET



5 ELEC MECH ROOM



7 ELEC COSET 3D STEEL

| SPECIAL PURPOSE RECEPTACLE SCHEDULE |        |                                |                 |                           |
|-------------------------------------|--------|--------------------------------|-----------------|---------------------------|
| SYMBOL                              | NEMA # | DEVICE RATINGS                 | CIRCUIT BREAKER | BRANCH CIRCUIT            |
|                                     | 5-20R  | 20A., 125V., 2P., 3W.          | 20A-1P          | 2#12 & 1#12 GND - 3/4" C. |
|                                     | 5-30R  | 30A., 125V., 2P., 3W.          | 30A-1P          | 2#10 & 1#10 GND - 3/4" C. |
|                                     | 5-50R  | 50A., 125V., 2P., 3W.          | 50A-1P          | 2#6 & 1#10 GND - 3/4" C.  |
|                                     | 5-60R  | 60A., 125V., 2P., 3W.          | 60A-1P          | 2#6 & 1#10 GND - 3/4" C.  |
|                                     | 6-20R  | 20A., 250V., 2P., 3W.          | 20A-2P          | 2#12 & 1#12 GND - 3/4" C. |
|                                     | 6-30R  | 30A., 250V., 2P., 3W.          | 30A-2P          | 2#10 & 1#10 GND - 3/4" C. |
|                                     | 6-50R  | 50A., 250V., 2P., 3W.          | 50A-2P          | 2#6 & 1#10 GND - 3/4" C.  |
|                                     | 6-60R  | 60A., 250V., 2P., 3W.          | 60A-2P          | 2#6 & 1#10 GND - 3/4" C.  |
|                                     | 7-20R  | 20A., 277V., 2P., 3W.          | 20A-1P          | 2#12 & 1#12 GND - 3/4" C. |
|                                     | 7-30R  | 30A., 277V., 2P., 3W.          | 30A-1P          | 2#10 & 1#10 GND - 3/4" C. |
|                                     | 7-50R  | 50A., 277V., 2P., 3W.          | 50A-1P          | 2#6 & 1#10 GND - 3/4" C.  |
|                                     | 7-60R  | 60A., 277V., 2P., 3W.          | 60A-1P          | 2#6 & 1#10 GND - 3/4" C.  |
|                                     | 14-20R | 20A., 125/250V., 3P., 4W.      | 20A-2P          | 3#12 & 1#12 GND - 3/4" C. |
|                                     | 14-30R | 30A., 125/250V., 3P., 4W.      | 30A-2P          | 3#10 & 1#10 GND - 3/4" C. |
|                                     | 14-50R | 50A., 125/250V., 3P., 4W.      | 50A-2P          | 3#6 & 1#10 GND - 1" C.    |
|                                     | 14-60R | 60A., 125/250V., 3P., 4W.      | 60A-2P          | 3#6 & 1#10 GND - 1" C.    |
|                                     | 15-20R | 20A., 250V., 3 PHASE, 3P., 4W. | 20A-3P          | 3#12 & 1#12 GND - 3/4" C. |
|                                     | 15-30R | 30A., 250V., 3 PHASE, 3P., 4W. | 30A-3P          | 3#10 & 1#10 GND - 3/4" C. |
|                                     | 15-50R | 50A., 250V., 3 PHASE, 3P., 4W. | 50A-3P          | 3#6 & 1#10 GND - 1" C.    |
|                                     | 15-60R | 60A., 250V., 3 PHASE, 3P., 4W. | 60A-3P          | 3#6 & 1#10 GND - 1" C.    |
|                                     | 16-20R | 20A., 480V., 3 PHASE, 3P., 4W. | 20A-3P          | 3#12 & 1#12 GND - 3/4" C. |
|                                     | 16-30R | 30A., 480V., 3 PHASE, 3P., 4W. | 30A-3P          | 3#10 & 1#10 GND - 3/4" C. |
|                                     | 16-50R | 50A., 480V., 3PHASE, 3P., 4W.  | 50A-3P          | 3#6 & 1#10 GND - 1" C.    |
|                                     | 16-60R | 60A., 480V., 3 PHASE, 3P., 4W. | 60A-3P          | 3#6 & 1#10 GND - 1" C.    |

**SCHEDULE NOTES**

1. "L" INDICATES TWIST-LOCK RECEPTACLE. E.G. () L - L15-60R 60A., 250V., 3 PHASE, 3P., 4W TWIST LOCK)
2. COORDINATE EXACT NEMA CONFIGURATION WITH EQUIPMENT MANUFACTURER/PROVIDER.

9 SPEC REC SCH

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

1" = 0'

**GENERAL NOTE:**

ALL CONTRACTED PARTIES ARE REQUIRED TO REVIEW ALL CONTRACT DOCUMENTS, INCLUDING CONTRACT DRAWINGS AND/OR PROJECT SPECIFICATIONS, FOR ALL DISCIPLINES TO ASCERTAIN THE COMPLETE SCOPE OF WORK FOR THE PROJECT.

| DSGN:        | REV. | DATE     | REVISION DESCRIPTION         | DWG. | CHK. | APVD. |
|--------------|------|----------|------------------------------|------|------|-------|
| S.FITZGERALD | A    | 04-19-21 | ISSUED FOR 90% CLIENT REVIEW | SPF  | MAP  |       |
| S.FITZGERALD | 0    | 06-10-21 | ISSUED FOR CONSTRUCTION      | SPF  | MAP  |       |
| CHK:         |      |          |                              |      |      |       |
| M.POWERS     |      |          |                              |      |      |       |
| APVD:        |      |          |                              |      |      |       |
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