



LSR7 Robotics, GiC & Phys Education: Construction Documents

owner:
Lee's Summit R-7 School District
301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4200 Pennsylvania Avenue
Kansas City, MO 64111
816.931.6655
www.multi.studio

civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com

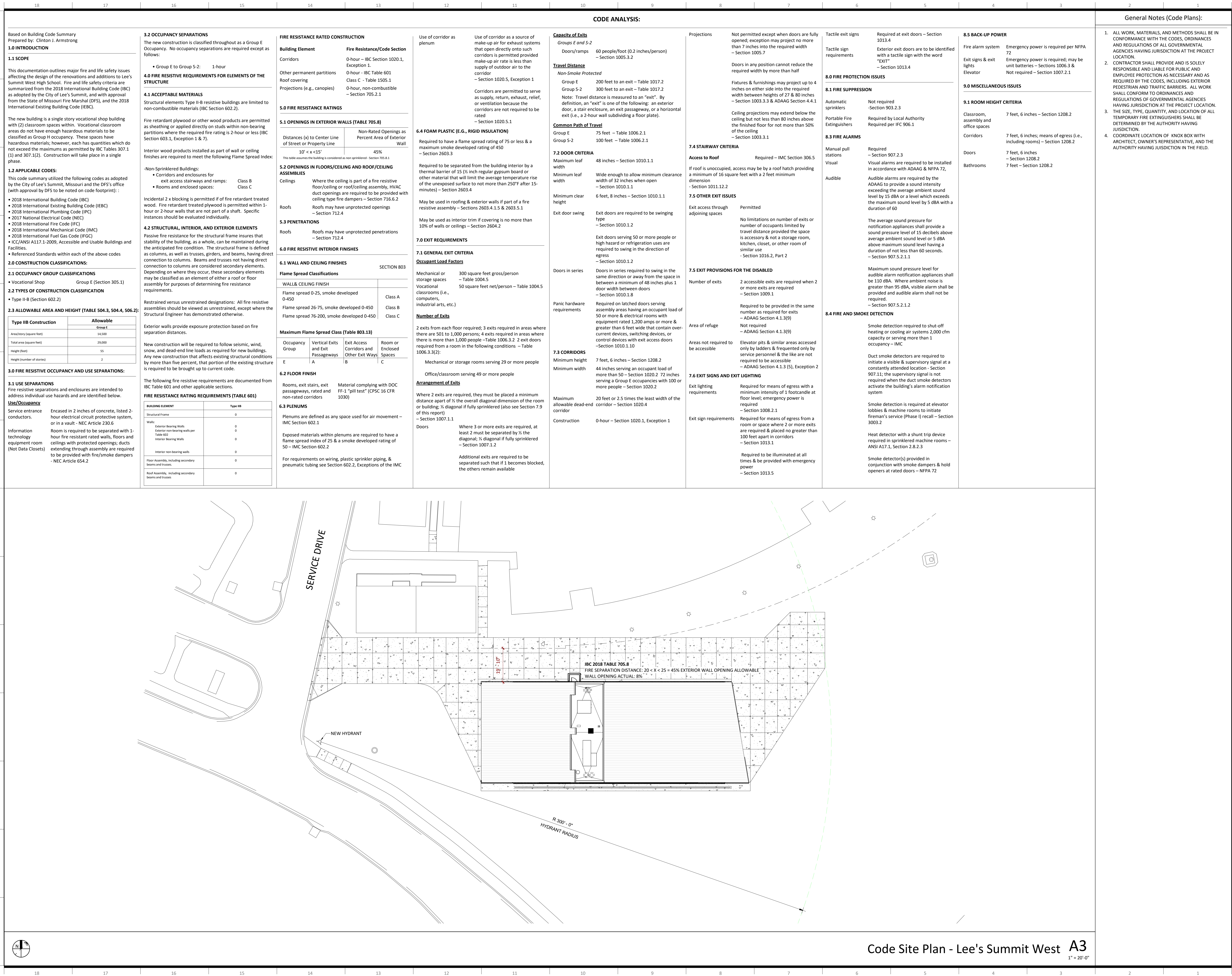
MEPFT/Code::
Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
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structural engineer:
Bob D. Campbell & Company,
4338 Belleview
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

LSN: 901 NE Douglas St.,
Lee's Summit MO 64086
LSW: 2600 SW Ward Rd,
Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy,
Lee's Summit MO 64063
Project Number: 0121-0100
Issue Date: September 9, 2022

multistudio
the evolution of gould evans

[illegible]



1. ALL WORK, MATERIALS, AND METHODS SHALL BE IN CONFORMANCE WITH THE CODES, ORDINANCES AND REGULATIONS OF ALL GOVERNMENTAL AGENCIES HAVING JURISDICTION AT THE PROJECT LOCATION.
2. CONTRACTOR SHALL PROVIDE AND IS SOLELY RESPONSIBLE AND LIABLE FOR PUBLIC AND EMPLOYEE PROTECTION AS NECESSARY AND AS REQUIRED BY THE CODES, INCLUDING EXTERIOR PEDESTRIAN AND TRAFFIC BARRIERS. ALL WORK SHALL CONFORM TO ORDINANCES AND REGULATIONS OF GOVERNMENTAL AGENCIES HAVING JURISDICTION AT THE PROJECT LOCATION.

TEMPORARY FIRE EXTINGUISHERS SHALL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.

4. COORDINATE LOCATION OF KNOX BOX WITH ARCHITECT, OWNER'S REPRESENTATIVE, AND THE AUTHORITY HAVING JURISDICTION IN THE FIELD.


the 1990s, the number of people in the United States who are 65 years of age and older has increased by 50 percent. The number of people aged 75 and older has increased by 100 percent. The number of people aged 85 and older has increased by 200 percent. The number of people aged 95 and older has increased by 400 percent. The number of people aged 100 and older has increased by 800 percent. The number of people aged 105 and older has increased by 1,600 percent. The number of people aged 110 and older has increased by 3,200 percent. The number of people aged 115 and older has increased by 6,400 percent. The number of people aged 120 and older has increased by 12,800 percent. The number of people aged 125 and older has increased by 25,600 percent. The number of people aged 130 and older has increased by 51,200 percent. The number of people aged 135 and older has increased by 102,400 percent. The number of people aged 140 and older has increased by 204,800 percent. The number of people aged 145 and older has increased by 409,600 percent. The number of people aged 150 and older has increased by 819,200 percent. The number of people aged 155 and older has increased by 1,638,400 percent. The number of people aged 160 and older has increased by 3,276,800 percent. The number of people aged 165 and older has increased by 6,553,600 percent. The number of people aged 170 and older has increased by 13,107,200 percent. The number of people aged 175 and older has increased by 26,214,400 percent. The number of people aged 180 and older has increased by 52,428,800 percent. The number of people aged 185 and older has increased by 104,857,600 percent. The number of people aged 190 and older has increased by 209,715,200 percent. The number of people aged 195 and older has increased by 419,430,400 percent. The number of people aged 200 and older has increased by 838,860,800 percent. The number of people aged 205 and older has increased by 1,677,721,600 percent. The number of people aged 210 and older has increased by 3,355,443,200 percent. The number of people aged 215 and older has increased by 6,710,886,400 percent. The number of people aged 220 and older has increased by 13,421,772,800 percent. The number of people aged 225 and older has increased by 26,843,545,600 percent. The number of people aged 230 and older has increased by 53,687,091,200 percent. The number of people aged 235 and older has increased by 107,374,182,400 percent. The number of people aged 240 and older has increased by 214,748,364,800 percent. The number of people aged 245 and older has increased by 429,496,729,600 percent. The number of people aged 250 and older has increased by 858,993,459,200 percent. The number of people aged 255 and older has increased by 1,717,986,918,400 percent. The number of people aged 260 and older has increased by 3,435,973,836,800 percent. The number of people aged 265 and older has increased by 6,871,947,673,600 percent. The number of people aged 270 and older has increased by 13,743,895,347,200 percent. The number of people aged 275 and older has increased by 27,487,790,694,400 percent. The number of people aged 280 and older has increased by 54,975,581,388,800 percent. The number of people aged 285 and older has increased by 109,951,162,777,600 percent. The number of people aged 290 and older has increased by 219,902,325,555,200 percent. The number of people aged 295 and older has increased by 439,804,651,110,400 percent. The number of people aged 300 and older has increased by 879,609,302,220,800 percent. The number of people aged 305 and older has increased by 1,759,218,604,441,600 percent. The number of people aged 310 and older has increased by 3,518,437,208,883,200 percent. The number of people aged 315 and older has increased by 7,036,874,417,766,400 percent. The number of people aged 320 and older has increased by 14,073,748,835,532,800 percent. The number of people aged 325 and older has increased by 28,147,497,671,065,600 percent. The number of people aged 330 and older has increased by 56,294,995,342,131,200 percent. The number of people aged 335 and older has increased by 112,589,990,684,262,400 percent. The number of people aged 340 and older has increased by 225,179,981,368,524,800 percent. The number of people aged 345 and older has increased by 450,359,962,737,049,600 percent. The number of people aged 350 and older has increased by 900,719,925,474,099,200 percent. The number of people aged 355 and older has increased by 1,801,439,850,948,198,400 percent. The number of people aged 360 and older has increased by 3,602,879,701,896,396,800 percent. The number of people aged 365 and older has increased by 7,205,759,403,792,793,600 percent. The number of people aged 370 and older has increased by 14,411,518,807,585,587,200 percent. The number of people aged 375 and older has increased by 28,823,037,615,171,174,400 percent. The number of people aged 380 and older has increased by 57,646,075,230,342,348,800 percent. The number of people aged 385 and older has increased by 115,292,150,460,684,697,600 percent. The number of people aged 390 and older has increased by 230,584,300,921,369,395,200 percent. The number of people aged 395 and older has increased by 461,168,601,842,738,790,400 percent. The number of people aged 400 and older has increased by 922,337,203,685,477,580,800 percent. The number of people aged 405 and older has increased by 1,844,674,407,370,955,161,600 percent. The number of people aged 410 and older has increased by 3,689,348,814,741,910,323,200 percent. The number of people aged 415 and older has increased by 7,378,697,629,483,820,646,400 percent. The number of people aged 420 and older has increased by 14,757,395,258,967,641,292,800 percent. The number of people aged 425 and older has increased by 29,514,790,517,935,282,585,600 percent. The number of people aged 430 and older has increased by 59,029,581,035,870,565,171,200 percent. The number of people aged 435 and older has increased by 118,059,162,071,741,130,342,400 percent. The number of people aged 440 and older has increased by 236,118,324,143,482,260,684,800 percent. The number of people aged 445 and older has increased by 472,236,648,286,964,521,369,600 percent. The number of people aged 450 and older has increased by 944,473,296,573,929,042,739,200 percent. The number of people aged 455 and older has increased by 1,888,946,593,147,858,085,478,400 percent. The number of people aged 460 and older has increased by 3,777,893,186,295,716,170,956,800 percent. The number of people aged 465 and older has increased by 7,555,786,372,591,432,341,913,600 percent. The number of people aged 470 and older has increased by 15,111,572,745,182,864,683,827,200 percent. The number of people aged 475 and older has increased by 30,223,145,490,365,729,367,654,400 percent. The number of people aged 480 and older has increased by 60,446,290,980,731,458,735,308,800 percent. The number of people aged 485 and older has increased by 120,892,581,961,462,917,470,617,600 percent. The number of people aged 490 and older has increased by 241,785,163,922,925,834,941,235,200 percent. The number of people aged 495 and older has increased by 483,570,327,845,851,669,882,470,400 percent. The number of people aged 500 and older has increased by 967,140,655,691,703,339,764,940,800 percent. The number of people aged 505 and older has increased by 1,934,281,311,383,406,679,529,881,600 percent. The number of people aged 510 and older has increased by 3,868,562,622,766,813,359,059,763,200 percent. The number of people aged 515 and older has increased by 7,737,125,245,533,626,718,119,526,400 percent. The number of people aged 520 and older has increased by 15,474,250,491,067,253,436,239,052,800 percent. The number of people aged 525 and older has increased by 30,948,500,982,134,506,872,478,105,600 percent. The number of people aged 530 and older has increased by 61,897,001,964,269,013,744,956,211,200 percent. The number of people aged 535 and older has increased by 123,794,003,928,538,027,489,912,422,400 percent. The number of people aged 540 and older has increased by 247,588,007,857,076,054,979,824,844,800 percent. The number of people aged 545 and older has increased by 495,176,015,714,152,109,959,649,689,600 percent. The number of people aged 550 and older has increased by 990,352,031,428,304,219,919,299,379,200 percent. The number of people aged 555 and older has increased by 1,980,704,062,856,608,439,838,598,758,400 percent. The number of people aged 560 and older has increased by 3,961,408,125,713,216,879,677,197,516,800 percent. The number of people aged 565 and older has increased by 7,922,816,251,426,433,759,354,395,033,600 percent. The number of people aged 570 and older has increased by 15,845,632,502,852,867,518,708,790,067,200 percent. The number of people aged 575 and older has increased by 31,691,265,005,705,735,037,417,580,134,400 percent. The number of people aged 580 and older has increased by 63,382,530,011,411,470,074,835,160,268,800 percent. The number of people aged 585 and older has increased by 126,765,060,022,822,940,149,670,320,537,600 percent. The number of people aged 590 and older has increased by 253,530,120

6.3 PLENUMS

Plenums are defined as any space used for air movement – IMC Section 602.1

Exposed materials within plenums are required to have a flame spread index of 25 & a smoke developed rating of 50 – IMC Section 602.2

For requirements on wiring, plastic sprinkler piping, & pneumatic tubing see Section 602.2, Exceptions of the IMC

Issue Date:		September 9, 2022	
Revisions			
NUMBER	DESCRIPTION	DATE	
<hr/>			
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Code Review.			
G100-B			

LEE'S SUMMIT WEST HIGH SCHOOL - ROBOTICS BUILDING
SITE PLAN
2600 SW WARD RD, LEE'S SUMMIT, MO 64082
SECTION 31 - TOWNSHIP 48 N - RANGE 31 W

COORDINATE TABLE		
NORTHING	EASTING	DESCRIPTION
1000	985053.57	2817526.73 BC
1001	985073.31	2817534.01 EC
1002	985102.35	2817567.56 EC
1003	985091.01	2817577.37 R15
1004	985104.77	2817583.36 EC
1005	985082.95	2817633.45 EC
1006	985079.06	2817636.82 EC
1007	985096.07	2817504.04 BC
1008	985093.72	2817516.34 EC
1009	985256.05	2817703.80 EC
1010	985277.06	2817705.31 EC
1011	985280.38	2817720.70 EC
1012	985265.51	2817742.23 EC
1013	985186.37	2817752.90 EC
1014	985182.48	2817756.27 EC
1016	985070.63	2817514.79 EC
1017	985144.23	2817451.06 EC
1018	985241.24	2817418.81 EC
1019	985244.49	2817428.26 EC
1020	985149.27	2817459.92 EC
1021	985108.69	2817495.06 EC
1022	985036.63	2817549.56 SW
1023	985041.63	2817568.76 SW
1024	985035.89	2817570.24 SW
1025	985030.88	2817550.83 SW
1026	985145.96	2817576.67 SW
1027	985177.71	2817549.17 SW
1028	985145.83	2817723.10 RW
1029	985173.92	2817755.54 RW
1030	985191.71	2817762.27 RW
1031	985288.40	2817749.24 RW
1032	985125.55	2817594.34 EC
1033	985127.53	2817592.63 EC
1034	985162.71	2817633.26 EC
1035	985139.11	2817611.50 B1
1036	985218.76	2817703.47 H1
1037	985176.67	2817739.91 H3
1038	985097.03	2817647.94 B3

PREPARED FOR:
LEE'S SUMMIT R-7 SCHOOL DISTRICT
502 SE TRANSPLANT DRIVE,
LEE'S SUMMIT, MO 64081
PHONE: (816) 986-2420
CONTACT: KYLE CORRELL
EMAIL: kyle.correll@sr7.net

PREPARED BY:
KAW VALLEY ENGINEERING, INC.
14700 W 114TH TERR.
LENEXA, KANSAS 66215
PHONE: (913) 894-5150
CONTACT: CHRIS CROWDER
EMAIL: crowder@kveeng.com

- NOTES:
- 6 DISTURBED AREAS TO BE LANDSCAPED OR SODDED AS NOTED ON L SERIES SHEETS.
 - 13 BOLLARDS (REFER TO ARCHITECTURAL SHEETS)
 - 60 STORM SEWER STRUCTURE (SEE SHEET C690-A)
 - 65 CONTRACTOR TO ADJUST LID TO MATCH ELEVATIONS SHOWN ON C300-A
 - 70 SANITARY SEWER SERVICE STRUCTURE (SEE SHEET C700-A)
 - 80 WATER STRUCTURE (SEE SHEET C800-A)
 - 82 FIRE HYDRANT (SEE SHEET C800-A)

DETAILS - SEE SHEET C190-A FOR THE FOLLOWING DETAILS

- 001 STANDARD CONCRETE CURB & GUTTER
002 ZERO HEIGHT CURB
040 ASPHALT PAVEMENT
042 CONCRETE PAVEMENT
055 CONCRETE SIDEWALK
130 BOLLARD

LEGEND:

- CONTROL POINT
BENCHMARK
PULL BOX (ELECTRIC)
YARD LIGHT
LIGHT POLE
ELECTRIC METER
WALL MOUNTED CAMERA
BREAKER BOX
GAS METER
GAS LINE RISER
WATER METER
WATER LINE GATE VALVE
FIRE HYDRANT
SPRINKLER CONTROL BOX
WATER MANHOLE
WALL MOUNTED SIAMENSE FIRE CONNECTOR
SANITARY SEWER MANHOLE
STORM SEWER MANHOLE
PVC POLYVINYL CHLORIDE PIPE
HDPE HIGH DENSITY POLYETHYLENE
STREET/TRAFFIC SIGN
DOOR ELEVATION
FF FINISH FLOOR ELEVATION
BHE BUILDING HEIGHT/ELEVATION
B/B BACK TO BACK OF CURB MEASUREMENT
E/E EDGE TO EDGE OF ASPHALT
C/C EDGE TO EDGE OF CONCRETE
L/S LANDSCAPING AREA
BOLLARD
GATE POST
FENCE POST

PROPOSED LEGEND

- ASPHALT EDGE TREATMENT. SEE SECTION ON C190
CONCRETE CURB AND GUTTER
CONCRETE CURB AND GUTTER WITH REVERSE FLOW
ASPHALT OVERLAY (040)
AREAS OF FULL DEPTH ASPHALT (040)
TURF
CONCRETE PAVEMENT (042) W/JOINTING
CONCRETE SIDEWALK (055+005) W/JOINTING
JOINT TYPE (TYP)
JOINT TYPE (TYP)
JOINT TYPE (TYP)
LANDING
RAMP
TRANSITION
PROJECT AREA (LIMITS OF DISTURBANCE)

CONSTRUCTION NOTES:

- COORDINATE START-UP AND ALL CONSTRUCTION ACTIVITIES WITH THE LEE'S SUMMIT SCHOOL DISTRICT.
- CONSTRUCTION METHODS AND MATERIALS NOT SPECIFIED IN THESE PLANS ARE TO MEET OR EXCEED THE CURRENT EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF AIAA SPECIFICATIONS AS ADOPTED AND AMENDED BY THE CITY OF LEE'S SUMMIT, MISSOURI AND MODIFIED AS NOTED ON THESE PLANS.
- ALL CONSTRUCTION WORK AND UTILITY WORK OUTSIDE OF PROPERTY BOUNDARIES SHALL BE PERFORMED IN COOPERATION WITH AND IN ACCORDANCE WITH REGULATIONS OF THE AUTHORITIES CONCERNED.
- PUBLIC CONVENIENCE AND SAFETY: THE CONTRACTOR SHALL CONDUCT THE WORK IN A MANNER THAT WILL INSURE, AS FAR AS PRACTICABLE, THE LEAST OBSTRUCTION TO TRAFFIC, AND SHALL PROVIDE FOR THE CONVENIENCE AND SAFETY OF THE GENERAL PUBLIC AND RESIDENTS ALONG AND ADJACENT TO PUBLIC ROADWAYS. CONTRACTOR IS RESPONSIBLE TO OBTAIN RIGHT-OF-WAY PERMIT FOR CONSTRUCTION OF DRIVE APPROACHES AND SIDEWALKS ALONG SE MILLER STREET AND SE MAIN STREET. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE CITY OF LEE'S SUMMIT PUBLIC WORKS DEPARTMENT. REFERENCE MUTCD STANDARD DRAWINGS.
- ALL DIMENSIONS SHOWN ARE TO THE BACK OF CURB UNLESS OTHERWISE NOTED.
- ALL SIDEWALK JOINTS WITHIN PROJECT AREA SHALL BE RECALCULATED WITH JOINT SEALANT. REFER TO TYPE 1 AND TYPE 2 JOINTS ON SHEET C190.

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HEREON ARE FROM FIELD SURVEY INFORMATION OF ONE-CALL LOCATED UTILITIES, FIELD SURVEY INFORMATION OF ABOVE GROUND OBSERVABLE EVIDENCE, AND/OR THE SCALING AND PLOTTING OF EXISTING UTILITY MAPS AND DRAWINGS AVAILABLE TO THE SURVEYOR AT THE TIME OF SURVEY. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHERMORE, THE SURVEYOR DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES BY EXCAVATION UNLESS OTHERWISE NOTED ON THIS SURVEY. MISSOURI ONE CALL TICKET #220632754

WARRANTY / DISCLAIMER

THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER KAW VALLEY ENGINEERING, INC NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE KAW VALLEY ENGINEERING PERSONNEL INSPECT AND CONTROL THE PHYSICAL CONSTRUCTION ON A TEMPORARY BASIS AT THE SITE.

CAUTION - NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS. THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

SAFETY NOTICE TO CONTRACTOR

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.



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Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School District
301 NE Tudor Road
Lee's Summit, MO 64086

architect: multistudio
4201 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi-studio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveeng.com

structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
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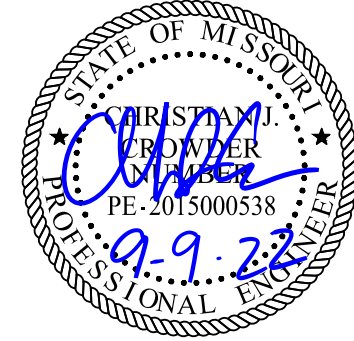
MEP/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions

NUMBER DESCRIPTION DATE

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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW SITE AND
DIMENSION PLAN

C100-A

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE, SLOPED PAVING, EXIT PORCHES, RAMPS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR SHALL VERIFY AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR IS FULLY RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND CONTRACTOR DOCUMENTS.

SITE DATA:

ZONING: PO (PLANNED OFFICE)
SETBACKS: FRONT: ##
REAR: ##
SIDE: ##

EXISTING USE: SCHOOL
PROPOSED USE: SCHOOL
PROJECT AREA (LIMITS OF DISTURBANCE): 39,005 S.F. - 0.895 AC.

IMPERVIOUS COVERAGE WITHIN PROJECT AREA
EXISTING: 2,245 S.F.
PROPOSED: 22,555 S.F.
INCREASE: 20,310 S.F.

HORIZONTAL AND VERTICAL DATUM:

PROJECT COORDINATES ORIGINATE FROM AN ASSUMED COORDINATE SYSTEM.

PROJECT BENCH MARK:

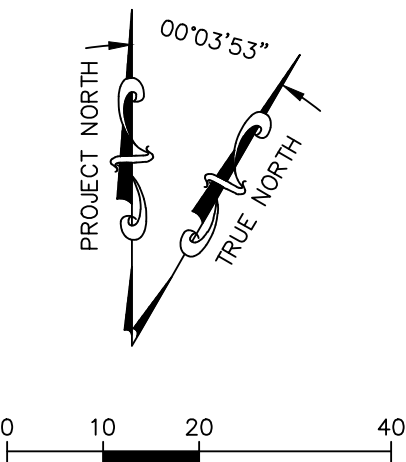
BM-62
FOUND CUT SQUARE AT NORTHWEST CORNER OF CURB INLET AT THE NORTHWEST CORNER OF PARKING AREA "G" & EAST OF TICKET BOOTH.
ELEV = 1018.13
BM-67
CHISELED SQUARE ON CENTER FRONT FACE OF MOST EAST CURB INLET ON SOUTH SIDE OF SOUTH DRIVE LANE.
ELEV = 1037.66

PROJECT CONTROL:

CP #220
1/2"x24" REBAR W/ CONTROL POINT CAP
NORTHING: 948976.954
EASTING: 2817509.181
ELEV = 1035.30

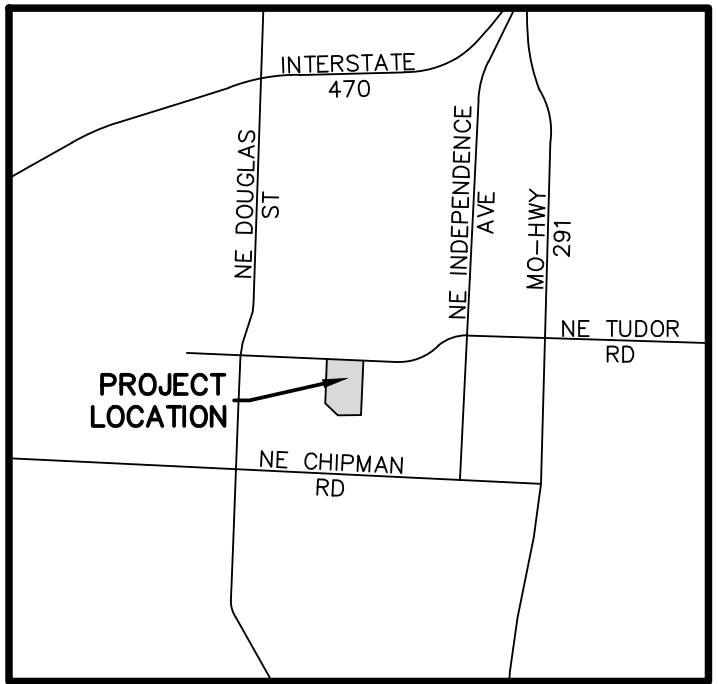
CP #221
1/2"x24" REBAR W/ CONTROL POINT CAP
NORTHING: 984971.175
EASTING: 2817509.181
ELEV = 1035.30

CP #222
1/2"x24" REBAR W/ CONTROL POINT CAP
NORTHING: 985039.868
EASTING: 2817798.415
ELEV = 1052.40



SCALE: 1" = 20'
HALF SCALE: 1" = 40'
CONVERGENCE ANGLE
ESTABLISHED FROM JA-142

LEE'S SUMMIT NORTH HIGH SCHOOL - ROBOTICS BUILDING
SITE PLAN
901 NE DOUGLAS ST, LEE'S SUMMIT, MO 64086
SECTION 31 - TOWNSHIP 48 N - RANGE 31 W



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PREPARED FOR:
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502 SE TRANSPLANT DRIVE,
LEE'S SUMMIT, MO 64081
PHONE: (816) 986-2420
CONTACT: KYLE GORRELL
EMAIL: kyle.gorrell@sr7.net

PREPARED BY:
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LENEXA, KANSAS 66215
PHONE: (913) 894-5150
CONTACT: CHRIS CROWDER
EMAIL: crowder@kveng.com

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE, SLOPED PAVING, EXIT PORCHES, RAMPS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR SHALL VERIFY AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR IS FULLY RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND CONTRACTOR DOCUMENTS.

CONSTRUCTION NOTES:
1. COORDINATE START-UP AND ALL CONSTRUCTION ACTIVITIES WITH THE LEE'S SUMMIT SCHOOL DISTRICT.
2. CONSTRUCTION METHODS AND MATERIALS NOT SPECIFIED IN THESE PLANS ARE TO MEET OR EXCEED THE CURRENT EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SPECIFICATIONS AS ADOPTED AND AMENDED BY THE CITY OF LEE'S SUMMIT, MISSOURI AND MODIFIED AS NOTED ON THESE PLANS.
3. ALL CONSTRUCTION WORK AND UTILITY WORK OUTSIDE OF PROPERTY BOUNDARIES SHALL BE PERFORMED IN COOPERATION WITH AND IN ACCORDANCE WITH REGULATIONS OF THE AUTHORITIES CONCERNED.
4. PUBLIC CONVENIENCE AND SAFETY: THE CONTRACTOR SHALL CONDUCT THE WORK IN A MANNER THAT WILL INSURE, AS FAR AS PRACTICABLE, THE LEAST OBSTRUCTION TO TRAFFIC, AND SHALL PROVIDE FOR THE CONVENIENCE AND SAFETY OF THE GENERAL PUBLIC AND RESIDENTS ALONG AND ADJACENT TO PUBLIC ROADWAYS. CONTRACTOR IS RESPONSIBLE TO OBTAIN RIGHT-OF-WAY PERMIT FOR CONSTRUCTION OF DRIVE APPROACHES AND SIDEWALKS ALONG SE MILLER STREET AND SE MAIN STREET. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE CITY OF LEE'S SUMMIT PUBLIC WORKS DEPARTMENT. REFERENCE MUTCD STANDARD DRAWINGS.
5. ALL DIMENSIONS SHOWN ARE TO THE BACK OF CURB UNLESS OTHERWISE NOTED.
6. ALL SIDEWALK JOINTS WITHIN PROJECT AREA SHALL BE RECALCULATED WITH JOINT SEALANT. REFER TO TYPE 1 AND TYPE 2 JOINTS ON SHEET C190.

DETAILS - SEE SHEET C190-B
FOR THE FOLLOWING DETAILS

- 001 STANDARD CONCRETE CURB & GUTTER
002 ZERO HEIGHT CURB
005 INTEGRAL CURB AND SIDEWALK
040 ASPHALT PAVEMENT
042 CONCRETE PAVEMENT
055 CONCRETE SIDEWALK
060 SIDEWALK RAMP
- NOTES:
6 DISTURBED AREAS TO BE LANDSCAPED OR SODDED AS NOTED ON L SERIES SHEETS.
7 CONCRETE MOW STRIP (REFER TO STRUCTURAL SHEETS)
13 BOLLARD (REFER TO ARCHITECTURAL SHEETS)
60 STORM SEWER STRUCTURE (SEE SHEET C600-B)
70 SANITARY SEWER STRUCTURE (SEE SHEET C700-B)
80 WATER STRUCTURE (SEE SHEET C800-B)
82 FIRE HYDRANT (SEE SHEET C800-B)

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HEREON ARE FROM FIELD SURVEY INFORMATION OF ONE-CALL LOCATED UTILITIES, FIELD SURVEY INFORMATION OF ABOVE GROUND OBSERVABLE EVIDENCE, AND/OR THE SCALING AND PLOTTING OF EXISTING UTILITY MAPS AND DRAWINGS AVAILABLE TO THE SURVEYOR AT THE TIME OF SURVEY. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHERMORE, THE SURVEYOR DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES BY EXCAVATION UNLESS OTHERWISE NOTED ON THIS SURVEY. MISSOURI ONE CALL TICKET #220613016

WARRANTY / DISCLAIMER

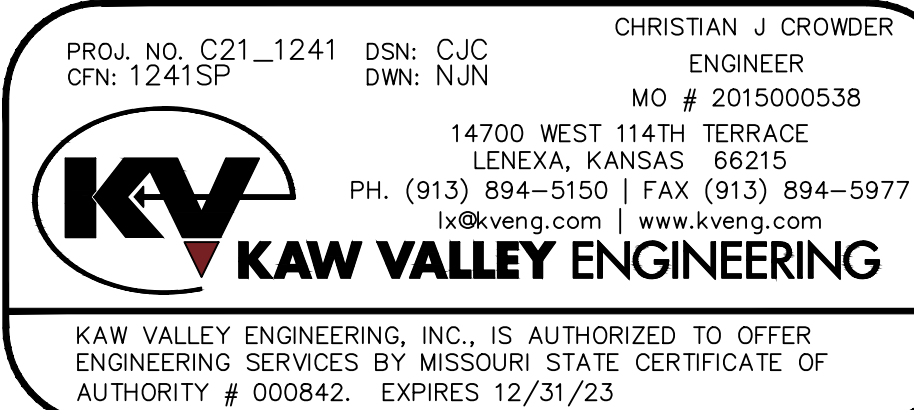
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CAUTION - NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON THE RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

SAFETY NOTICE TO CONTRACTOR

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.



LSN SITE AND
DIMENSION PLAN

C100-B

COORDINATE TABLE		
NORTHING	EASTING	DESCRIPTION
1000	1005562.70	2823983.21 BC
1001	1005562.61	2823986.21 BC
1002	1005579.51	2824004.19 BC
1003	1005609.94	2824002.68 SW
1004	1005615.93	2824002.38 SW
1005	1005645.31	2824000.93 SW
1006	1005650.79	2824006.76 SW
1007	1005639.60	2824017.29 EC
1008	1005598.27	2824058.01 EC
1009	1005568.83	2824026.70 BC
1010	1005561.33	2824026.49 BC
1011	1005561.25	2824029.49 BC
1012	1005614.27	2823968.91 SW
1013	1005607.85	2823960.55 SW
1014	1005616.23	2823962.78 SW
1015	1005623.18	2823960.17 SW
1016	1005654.85	2823991.96 SW
1017	1005681.85	2824030.30 SW
1018	1005666.23	2824045.00 SW
1019	1005670.34	2824049.37 SW
1020	1005686.06	2824034.58 SW
1021	1005749.03	2824101.57 SW
1022	1005733.01	2824116.64 SW
1023	1005730.95	2824114.44 EC
1024	1005738.48	2824122.46 SW
1025	1005754.51	2824107.39 SW
1026	1005754.71	2824098.84 SW
1027	1005796.33	2824143.10 SW
1028	1005790.26	2824145.40 SW
1029	1005794.97	2824187.01 SW
1030	1005788.98	2824186.81 SW
1031	1005712.23	2824147.14 EC
1032	1005753.01	2824190.88 EC
1033	1005703.49	2824155.37 EC
1034	1005688.69	2824154.18 EC
1035	1005696.23	2824162.19 EC
1036	1005725.23	2824178.77 EC
1037	1005738.31	2824197.27 BC
1038	1005734.52	2824199.06 BC
1039	1005727.71	2824197.10 BC
1040	1005763.31	2824186.01 EC
1041	1005770.61	2824186.24 SW
1042	1005770.43	2824192.30 BC
1043	1005764.43	2824192.10 BC
1044	1005643.22	2824022.84 B1
1045	1005602.66	2824060.98 B3
1046	1005726.56	2824111.48 H1
1047	1005686.00	2824149.61 H3

HORIZONTAL AND VERTICAL DATUM:

THE COORDINATES SHOWN HEREON ARE GROUND COORDINATES BASED ON THE MISSOURI STATE PLANE WEST ZONE (NAD 1983) (NAVD 1988) CAF: 0.9999988
1 METER = 3.28083333 U.S. SURVEY FEET
GROUND COORDINATES X COMBINED ADJUSTMENT FACTOR (CAF) = GRID COORDINATES
SCALED AROUND 0.0

JA-142 (PID: 095142)
NORTHING: 302106.953 (METERS) (GRID)
EASTING: 856960.056 (METERS) (GRID)
ELEVATION: 318.0 (METERS)

PROJECT CONTROL:

CP #201
1/2" REBAR FOUND "CAPPED CONTROL POINT"
NORTHING: 1005747.89
EASTING: 2824897.78
ELEV = 1029.48

CP #202
1/2" REBAR FOUND "CAPPED CONTROL POINT"
NORTHING: 1006282.63
EASTING: 2824855.59
ELEV = 1016.25

CP #204
SET 1/2" REBAR WITH CONTROL POINT CAP
NORTHING: 1005472.64
EASTING: 2825043.87
ELEV = 1022.57

SITE BENCHMARKS:

BM-1
CHISELED SQUARE ON EAST SIDE OF CONCRETE LIGHT POLE BASE AT SOUTHEAST CORNER OF PARKING LOT WEST OF STADIUM. (POLE # E-24)
ELEVATION = 1027.98

BM-4
CHISELED SQUARE ON NORTH SIDE OF CONCRETE LIGHT POLE BASE AT SOUTHWEST OF MAINTENANCE BUILDING AT SOUTH END OF TRACK. (POLE # E-28)
ELEVATION = 1023.18

SCALE: 1" = 20'

18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

P | N | M | L | K | J | I | H | G | F | E | D | C | B | A

2' 1' 0.5' 0' 0.5' 1' 2' 3' 4' 5' 6' 7' 8' 9' 10' 11' 12' 13' 14' 15' 16' 17' 18'

PRINT DATE/TIME: 9/8/2022 5:03 PM

Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4209 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com

structural engineer:
Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

MEP/IT/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

LEGEND:	
⊕	CONTROL POINT
⊕	BENCHMARK
⊕	PULL BOX (ELECTRIC)
⊕	YARD LIGHT
⊕	LIGHT POLE
⊕	ELECTRIC METER
⊕	WALL MOUNTED CAMERA
⊕	BREAKER BOX
⊕	GAS METER
⊕	GAS LINE RISER
⊕	WATER METER
⊕	WATER LINE GATE VALVE
⊕	FIRE HYDRANT
⊕	SPRINKLER CONTROL BOX
⊕	WATER MANHOLE
⊕	WALL MOUNTED SIAMASE FIRE CONNECTOR
⊕	SANITARY SEWER MANHOLE
⊕	STORM SEWER MANHOLE
⊕	POLYVINYL CHLORIDE PIPE
⊕	HDPPE HIGH DENSITY POLYETHYLENE
⊕	STREET/TRAFFIC SIGN
⊕	DOOR ELEVATION
⊕	FF FINISH FLOOR ELEVATION
⊕	BHE BUILDING HEIGHT/ELEVATION
⊕	B/B BACK TO BACK OF CURB MEASUREMENT
⊕	E/E EDGE TO EDGE OF ASPHALT
⊕	C/C EDGE TO EDGE OF CONCRETE
⊕	L/S LANDSCAPING AREA
⊕	BOLLARD
⊕	GATE POST
⊕	FENCE POST

PROPOSED LEGEND

⊕	ASPHALT EDGE TREATMENT. SEE SECTION ON C190
⊕	CONCRETE CURB AND GUTTER
⊕	CONCRETE CURB AND GUTTER WITH REVERSE FLOW
⊕	ASPHALT OVERLAY (040)
⊕	AREAS OF FULL DEPTH ASPHALT (040)
⊕	TURF
⊕	CONCRETE PAVEMENT (042) W/Jointing
⊕	CONCRETE SIDEWALK (055+005) W/Jointing
⊕	Joint (Type)
⊕	Joint (Type)
⊕	Joint Type
⊕	L LANDING
⊕	R RAMP
⊕	T TRANSITION
⊕	PROJECT AREA (LIMITS OF DISTURBANCE)

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PROJ. NO. C21_1242 DSN: CJC
CIN: 1242SP DWN: NJN
ENGINEER
MO # 2015000538
14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215
PH. (913) 894-5150 | FAX (913) 894-5977
x@kveng.com | www.kveng.com
KAW VALLEY ENGINEERING
KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER
ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF
AUTHORITY # 000842. EXPIRES 12/31/23

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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UNLESS A PROFESSIONAL SEAL WITH SIGNATURE AND DATE IS
AFFIXED, THIS DOCUMENT IS PRELIMINARY AND IS NOT INTENDED FOR
CONSTRUCTION, RECORDING PURPOSES OR IMPLEMENTATION

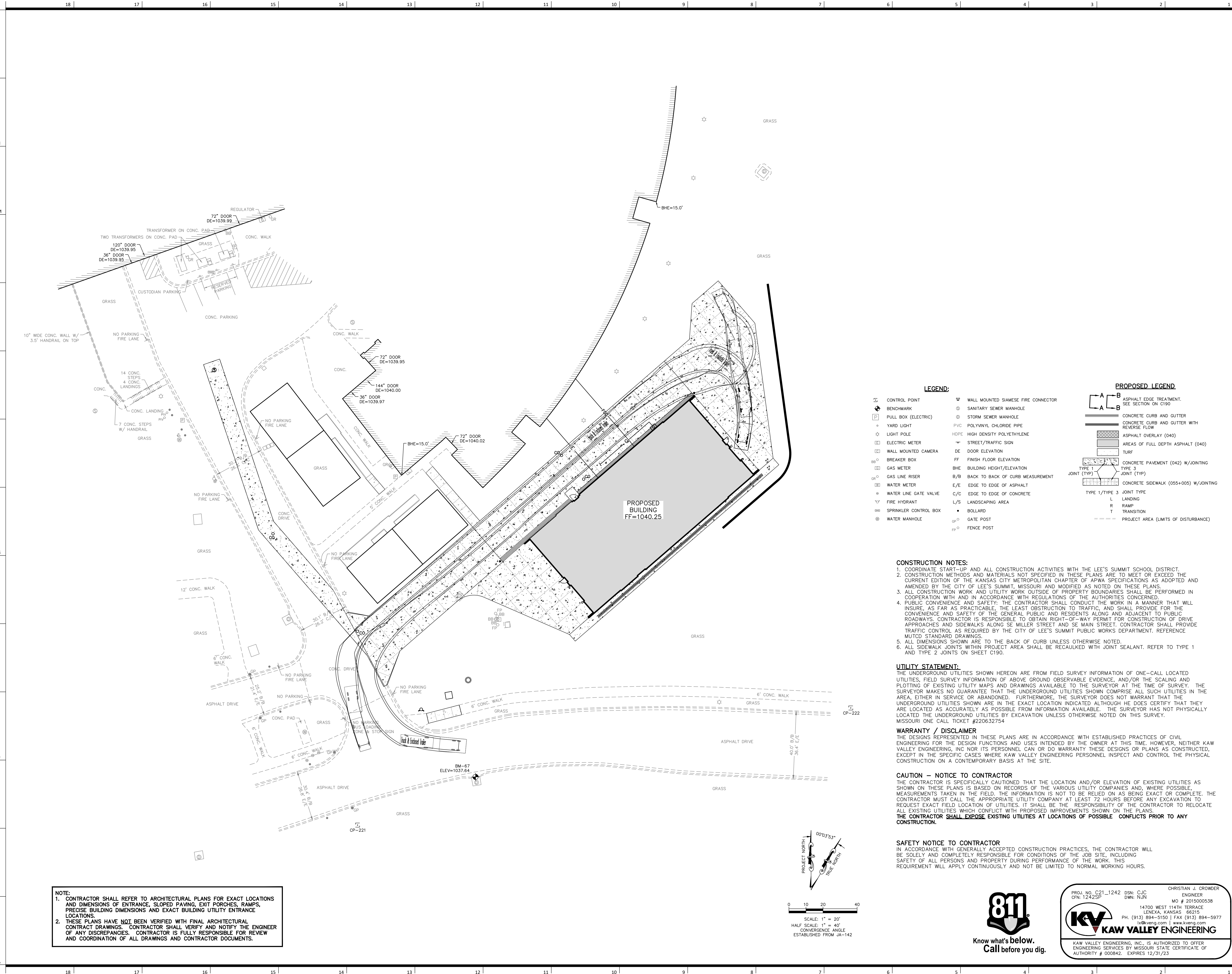


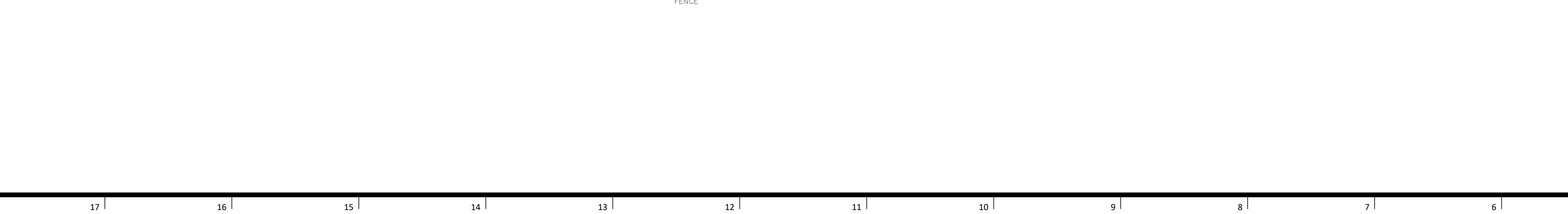
Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW TRUCK TURNING
TEMPLATE

C101-A

- NOTE:
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18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

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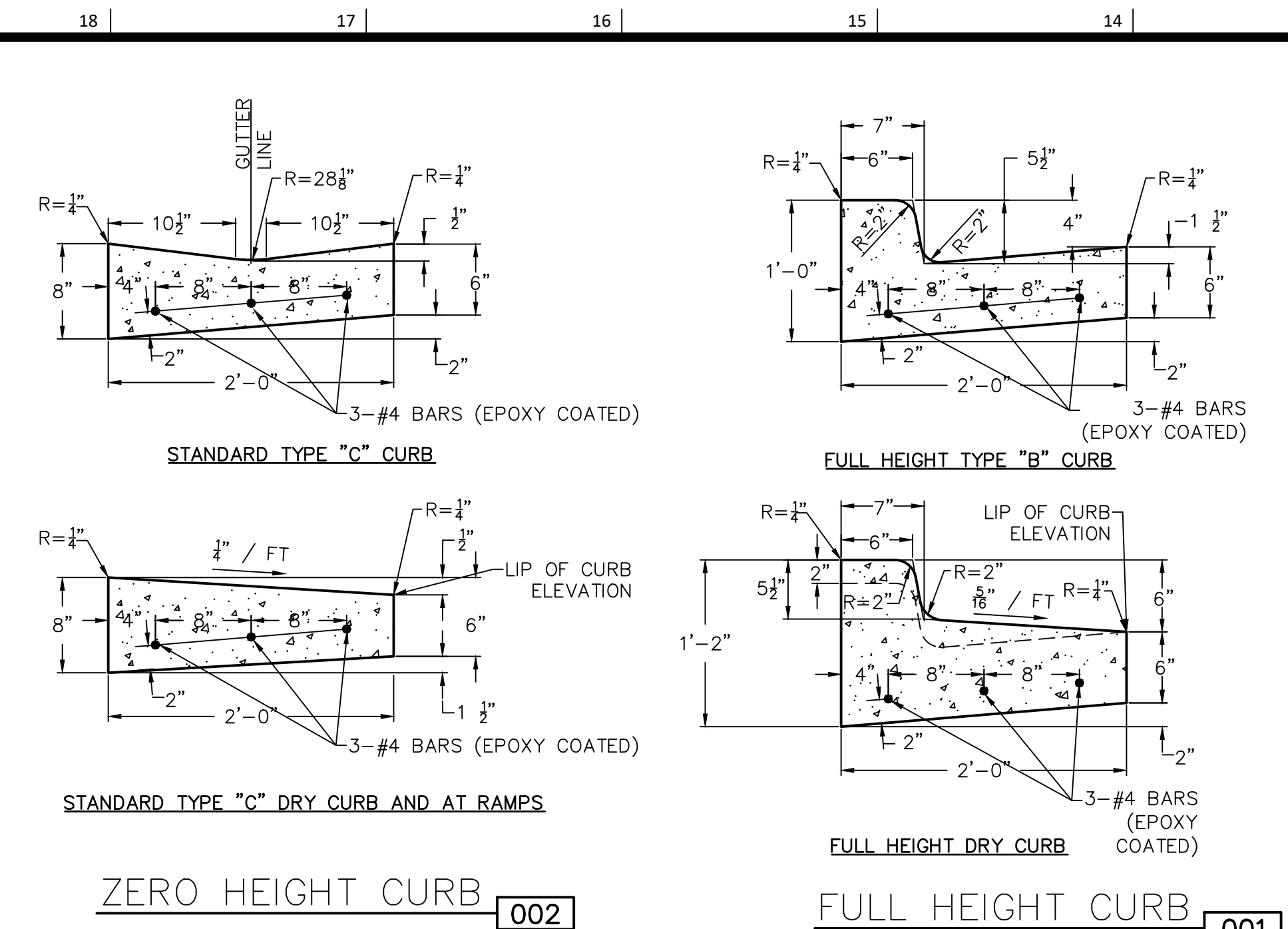
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D

C

B

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CURB & GUTTER NOTES:

1. 2" PREMOLED EXPANSION JOINTS SHALL BE PLACED AT POINTS OF CURVATURE, CURB RETURNS, CURB INLETS AND AT 250' CENTERS. THE EXPANSION JOINTS SHALL BE DOWELED IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTION JOINTS SHALL BE 2" DEEP AND PLACED AT 15' INTERVALS EQUALLY SPACED BETWEEN EXPANSION JOINTS.

2. ALL CONCRETE USED IN THIS WORK SHALL MEET THE LATEST EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION, KOMMB4K CONCRETE SHALL BE USED THROUGHOUT.

3. ALL REINFORCING STEEL SHALL BE SUPPORTED ON FABRICATED STEEL BAR SUPPORTS @ 3'-0" MAXIMUM SPACING.

4. SEE SIDEWALK RAMP DETAILS FOR TYPICAL SIDEWALK RAMP CURB & GUTTER SECTIONS.

5. DETAILS AS SHOWN FOR CONCRETE AND ASPHALT PAVING. WHEN USED WITH CONCRETE PAVING POURED MONOLITHICALLY WITH CURB NO MODIFICATIONS ARE REQUIRED. WHEN CURB AND CONCRETE PAVING ARE TO BE POURED SEPARATELY #4 BARS, 24" LONG ARE TO BE PROVIDED TO TIE CURB TOGETHER WITH CONCRETE PAVING. PLACE AT 8" O.C.

6. ALL REINFORCING SHALL BE 60 GRADE 60 DEFORMED BARS AND COMPLY WITH ASTM A615. EPOXY BARS AS NOTED, SHALL COMPLY WITH ASTM A775.

7. CURBS TO BE CONSTRUCTED ON MINIMUM 6 INCHES OF COMPACTED WELL GRADED BASE ROCK.

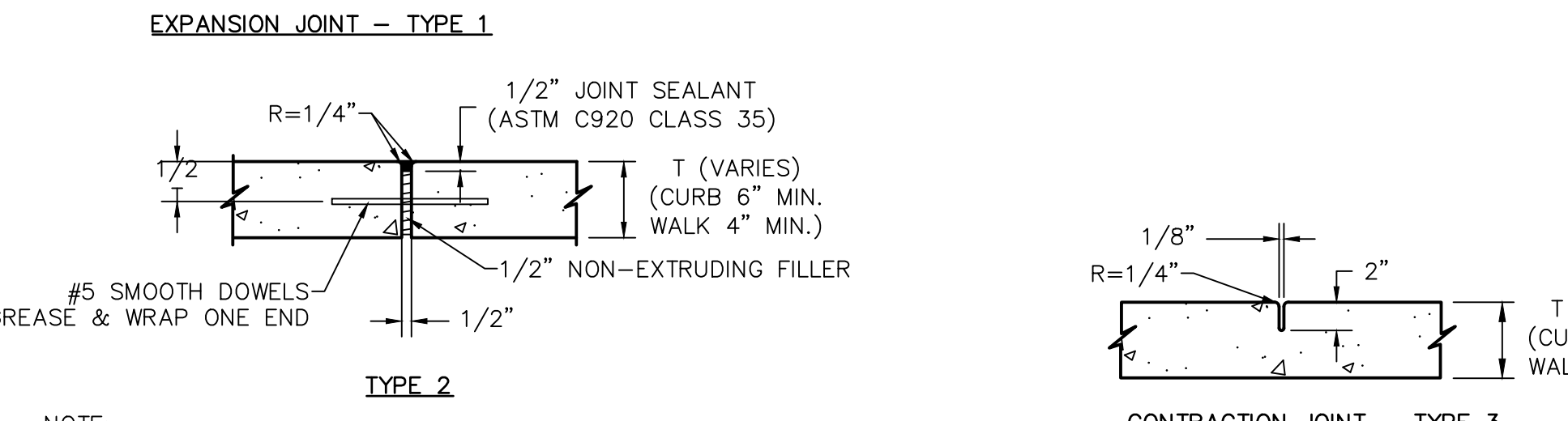
CURB & GUTTER

N.T.S



NOTE:

1. TYPE 1 JOINTS SHALL BE PLACED WHERE NEW CONCRETE ABUTS EXISTING CONCRETE AND IN AREAS WHERE CONCRETE ABUTS BUILDINGS, UNLESS NOTED OTHERWISE.

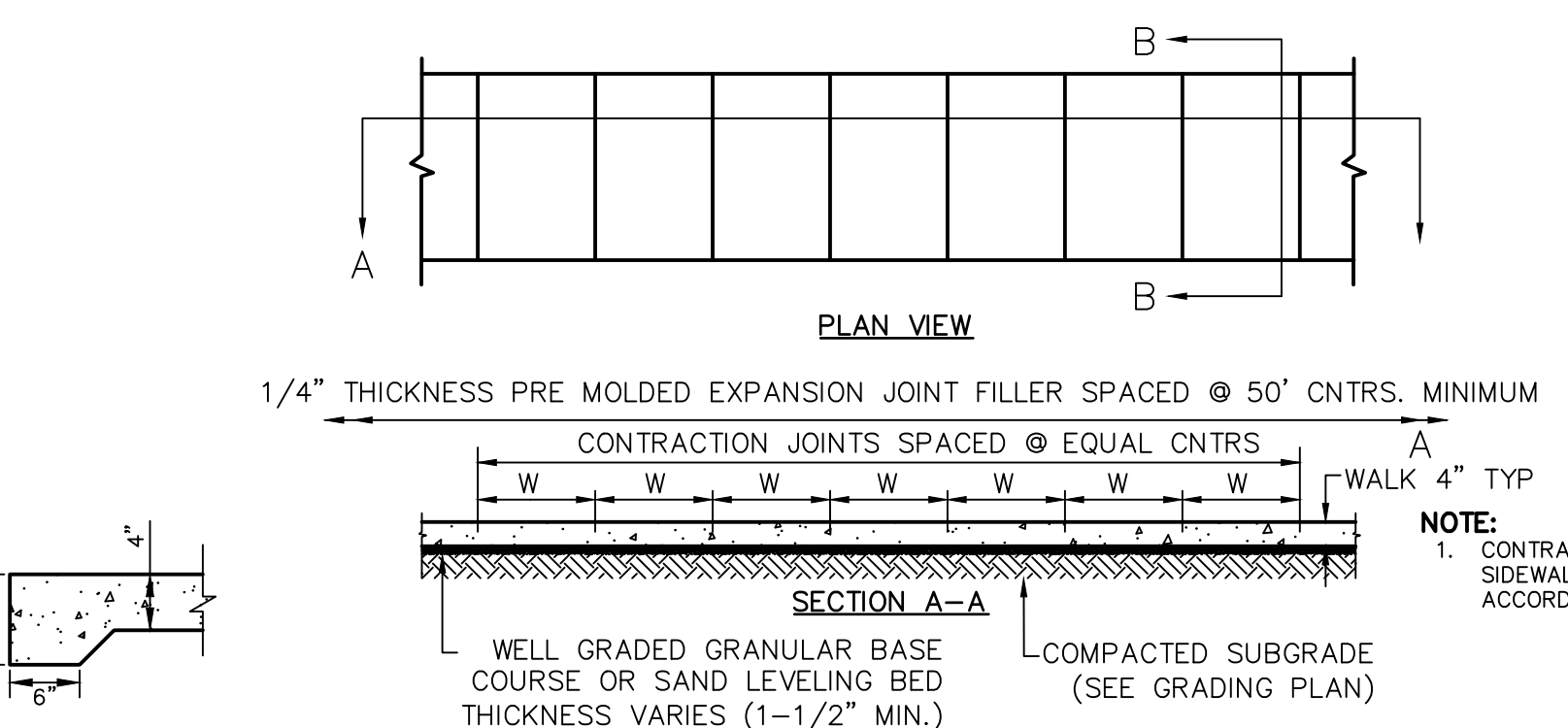


NOTE:

1. TYPE 2 JOINTS SHALL BE PLACED AS NOTED AND AT ALL P.C.'S, P.T.'S AND TRANSITIONS, AND WHERE NEW CURB OR CONCRETE PAVEMENT TIES INTO EXISTING CURB OR CONCRETE PAVEMENT.

2. SMOOTH BARS SHALL BE 24" LONG

CONCRETE JOINTING DETAILS



TURNDOWN

*MATCH ASPHALT THICKNESS

PROVIDE TURN DOWN ALONG PLAYGROUND EDGE CURB PROVIDE 12" BARS AT 24" O.C.

CONCRETE SIDEWALK

055

CONCRETE AND SIDEWALK NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AND COMPLY WITH KOMMB SPECIFICATIONS. ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH APWA SECTION 2200.

2. REINFORCING STEEL SHALL BE GRADE 60 AND COMPLY WITH ASTM A615. EPOXY COATED BARS AS NOTED SHALL COMPLY WITH ASTM A775. ALL CUT ENDS OR DAMAGED AREAS SHALL BE FIELD REPAIRED WITH EPOXY COATING.

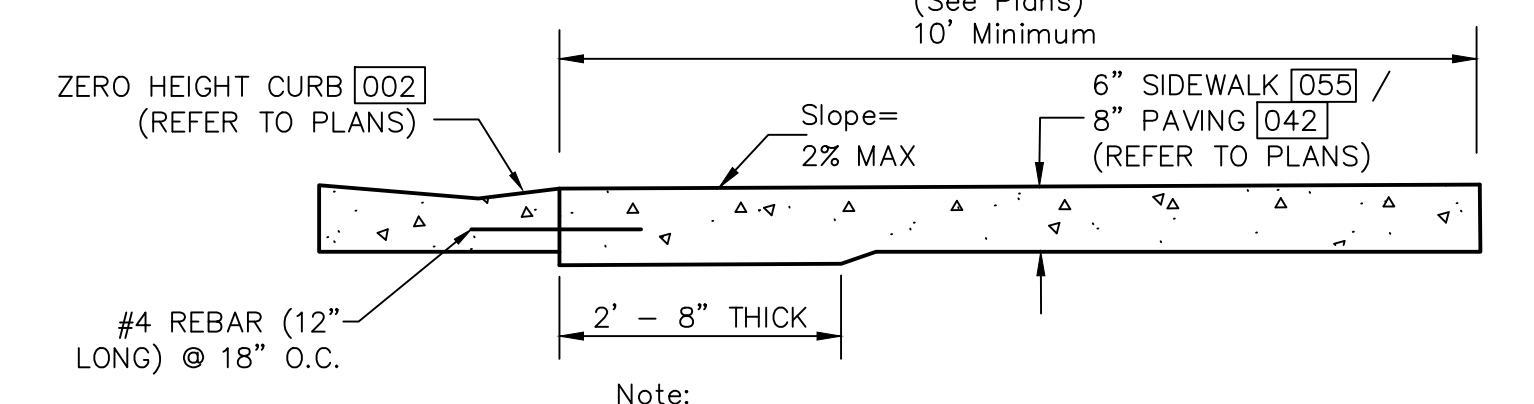
3. SIDEWALKS TO BE BROOM FINISHED.

4. SUBGRADE TO BE COMPACTED TO 90% MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. MOISTURE CONTENT TO BE WITHIN A RANGE OF 2% BELOW TO 2% ABOVE OPTIMUM MOISTURE AS DEFINED BY ASTM D698.

5. SIDEWALK JOINTS MAY BE SAWN UNLESS OTHERWISE NOTED ON ARCHITECTURAL PLANS.

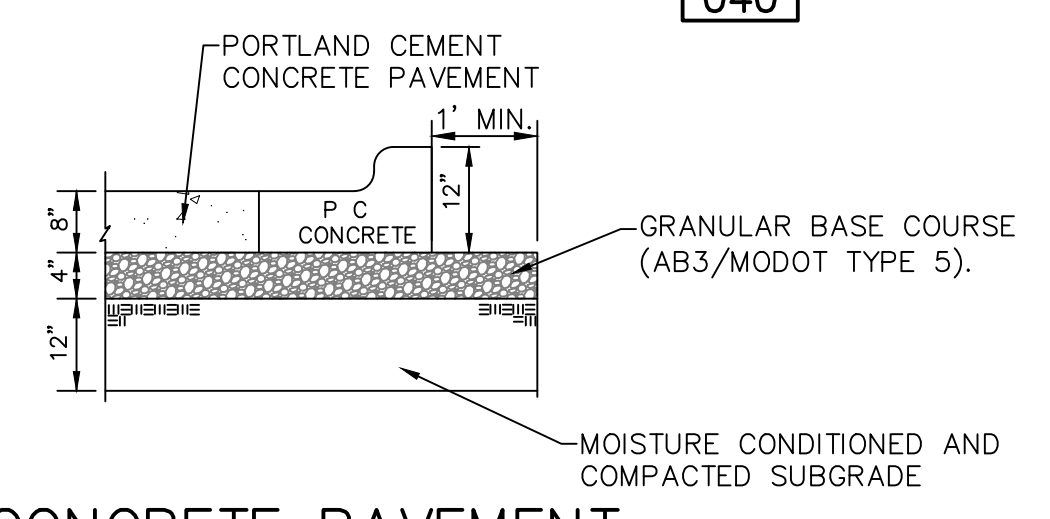
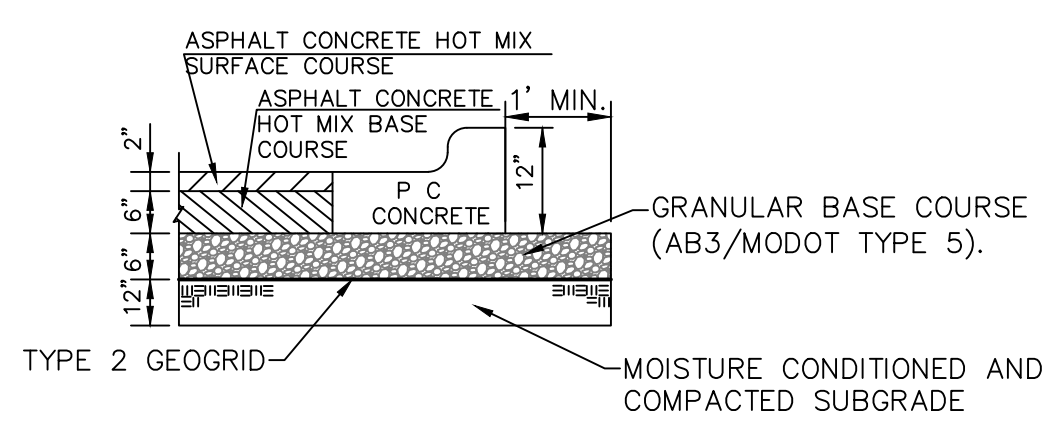
NOTE:

1. CONTRACTOR SHALL BACKFILL SIDEWALKS WITH TOPSOIL AND SEED IN ACCORDANCE WITH NOTES ON PLANS.



INTEGRAL CURB AND SIDEWALK

005

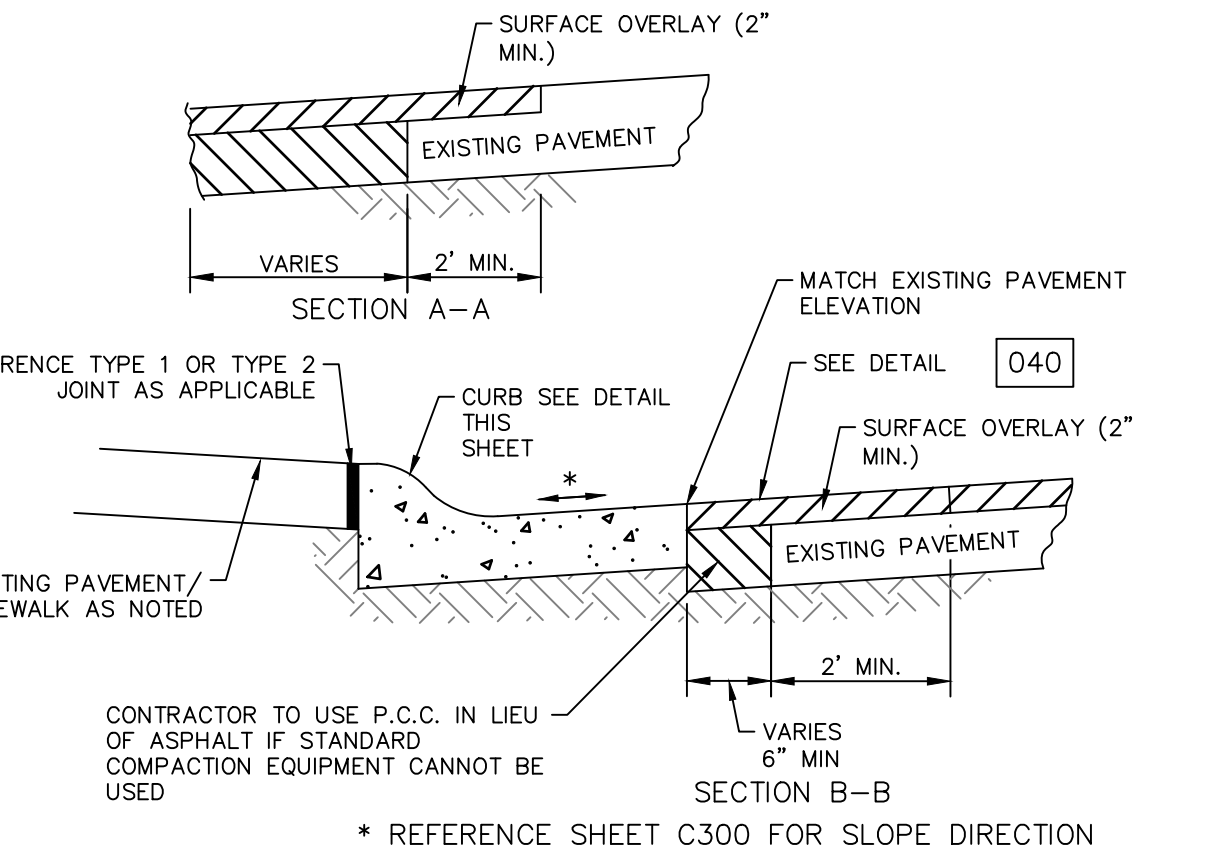


1. FLEXIBLE PAVEMENT SHALL BE IN ACCORDANCE WITH THE LATEST (FEBRUARY 2017) EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200 AS AMENDED BY PROJECT SPECIFICATIONS.

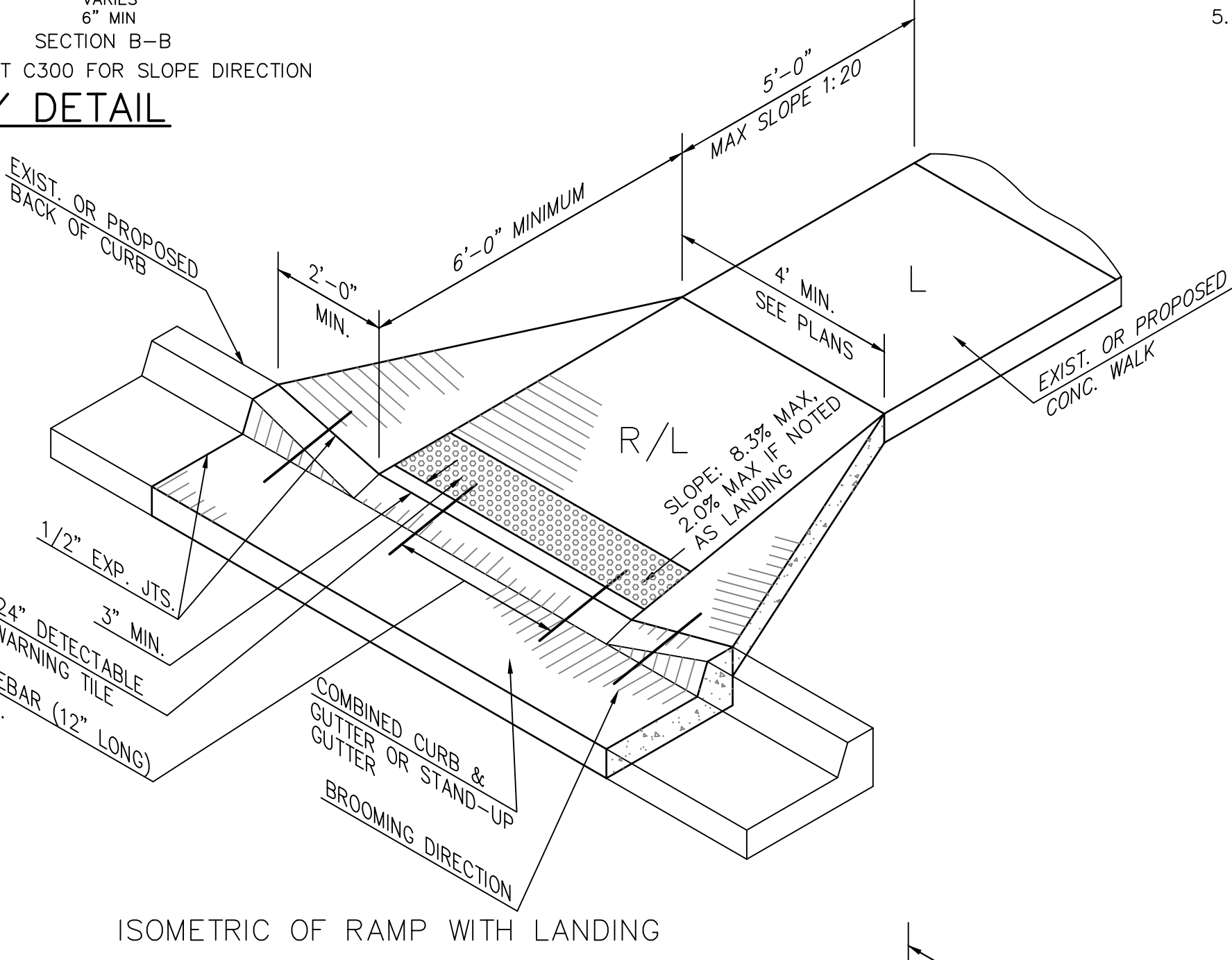
ASPHALT SURFACE COURSE - APWA TYPE 3-01

ASPHALT BASE COURSE - APWA TYPE 2-01

2. PORTLAND CEMENT CONCRETE FOR DRIVEWAYS SHALL BE A KOMMB4K MIX AND SHALL MEET THE LATEST EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200.



MILL AND OVERLAY DETAIL



ASPHALT NOTES:

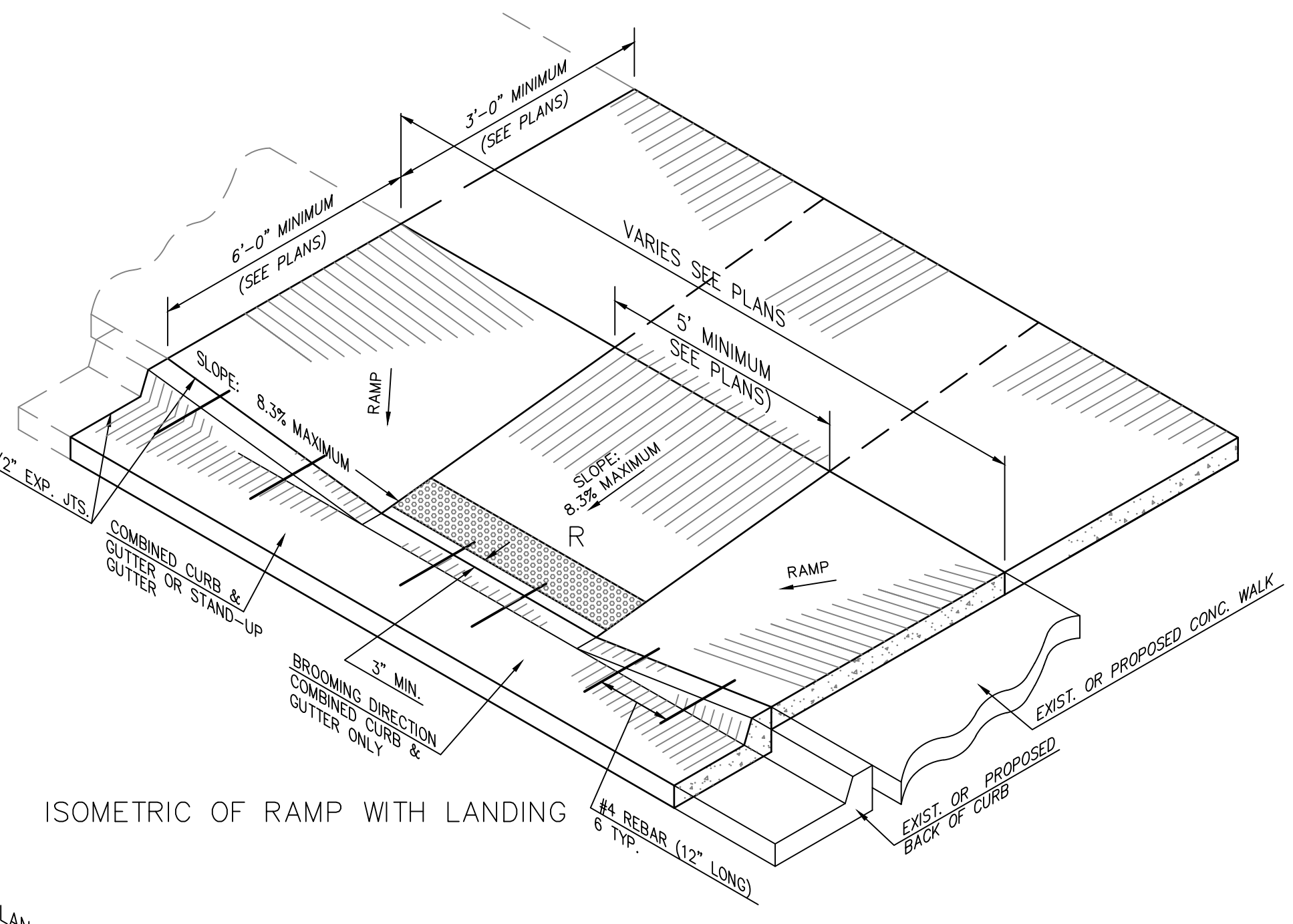
PAVING SHALL BE IN ACCORDANCE WITH THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200 AS AMENDED BELOW.

MILLING FOR THE DRIVES AND PARKING LOTS SHALL BE COLD MILLED AS FOLLOWS:

1. EQUIPMENT: MILLING THE SURFACE OF PAVEMENTS SHALL BE COMPLETED BY USE OF A MILLING MACHINE CONFORMING TO THE FOLLOWING.
- A. MACHINE: THE COLD MILLING MACHINE SHALL BE SELF-PROPELLED AND SHALL HAVE IN COMBINATION THE MEANS OF MILLING AND CUTTING, WITHOUT SOFTENING THE OLD SURFACE AND BLADING THE CUTTING INTO A SINGLE WINDROW, OR DEPOSITING THEM DIRECTLY INTO A TRUCK.
- B. AIR POLLUTION: THE MACHINE SHALL BE EQUIPPED WITH A DUST SUPPRESSION SYSTEM INCLUDING WATER STORAGE TANKS AND HIGH PRESSURE SPRAY BARS.
- C. OPERATING WIDTH: IT IS DESIRABLE THAT THE CUTTING WIDTH BE GREATER THAN 1 FEET (0.3 m). IN THE EVENT THE CUTTING WIDTH IS LESS THAN 1 FEET (0.3 m) CONTRACTOR IS RESPONSIBLE FOR ENSURING GRADE CONTROL AS NOTED ON PLANS.
- D. CUTTING DRUM: THE CUTTING DRUM SHALL BE TOTALLY ENCLOSED TO PREVENT DISCHARGE OF ANY LOOSENED MATERIAL ADJACENT TO WORK AREAS.
2. CONSTRUCTION DETAILS
- A. METHODS OF OPERATIONS FOR MILLING:
1. OPERATOR: THE MILLING MACHINE SHALL BE OPERATED BY AN EXPERIENCED AND CAPABLE OPERATOR.
2. UTILITIES: STREET SURFACES ADJACENT TO MANHOLE, WATER VALVES AND OTHER UTILITY EXTENSIONS, SHALL BE COMPLETELY REMOVED TO THE FULL DEPTH THE CUT SPECIFIED FOR THE STREET UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
3. MATERIAL DISPOSAL: THE MATERIAL WITHDREW BY THE MACHINE SHALL BE REMOVED FROM THE SURFACE OF THE PAVEMENT AND PROPERLY DISPOSED OF BY THE CONTRACTOR.
4. SURFACE CONDITIONS: THE DRUM LACING PATTERNS SHALL PRODUCE A SMOOTH SURFACE AFTER MILLING WITH GROOVE DEPTHS NOT TO EXCEED 1/4 INCH (0.64 cm) AND GROOVE SPACING NOT TO EXCEED 1 INCH (2.54 cm) UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- B. TYPES OF CUTS TO BE MADE BY MILLING:
5. LEVELING: SUFFICIENT PASSES SHALL BE MADE SUCH THAT ALL IRREGULARITIES OR HIGH SPOTS ARE ELIMINATED, AND THAT 100% OF THE SURFACE IS MILLED.
6. AVERAGE DEPTH: SUFFICIENT PASSES, OR CUTS, SHALL BE MADE IN ORDER TO REMOVE A SPECIFIED DEPTH OVER THE ENTIRE STREET SECTION. THESE DEPTHS WILL BE DESIGNATED ON THE PLANS.
7. CURB CUT: SUFFICIENT PASSES, OR CUTS, SHALL BE MADE IN ORDER TO REMOVE A SPECIFIED DEPTH AT THE CURB FOR A SPECIFIED WIDTH. THE DEPTH AT THE WIDTH FURTHEST FROM THE CURB IS 0. THESE DIMENSIONS WILL BE DESIGNATED ON THE PLANS.
- C. CLEANUP: ALL LOOSE ASPHALT AND DEBRIS SHALL BE REMOVED FROM THE STREET SURFACE AND CURB AND GUTTER. ANY MATERIAL AND DEBRIS THAT ADHERES TO THE CURB AND GUTTER SHALL BE REMOVED.

CRACKS: REFER TO CRACK SEALING/FILLING GUIDELINES.

1. AREAS OF THE PAVEMENT REQUIRING PATCHING WILL BE DESIGNATED ON THE PLANS OR MARKED BY THE ENGINEER AFTER COMPLETION OF MILLING OPERATIONS FOR THE SECTION OF PAVEMENT UNDER CONSTRUCTION. THE DETERIORATED PAVEMENT WILL BE REMOVED TO THE LIMITS DESIGNATED BY THE ENGINEER. THE SUBGRADE SHALL BE ADJUSTED TO PERMIT THE THICKNESS OF ASPHALT INDICATED ON THE PLANS. THE SUBGRADE SHALL CONSIST OF MODOT TYPE 5 AGGREGATE AND SHALL BE UNIFORMLY COMPACTED BY HAND TAMPING OR ROLLING. BITUMINOUS MIX FOR PATCHING WILL MEET THE REQUIREMENTS FOR APWA TYPE 1 OR 2 ASPHALT CONCRETE AS SPECIFIED IN THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200. AT THE TIME OF PLACING ASPHALT THE EDGE OF THE AREA TO BE PATCHED WILL BE COATED WITH SS-1H EMULSIFIED ASPHALT OR APPROVED EQUAL. THE ASPHALT IN THE PATCH SHALL BE PLACED IN TWO EQUAL LIFTS WITH EACH LIFT THOROUGHLY COMPACTED PRIOR TO PLACEMENT OF THE SUBSEQUENT LIFT.
2. CONSTRUCTION OF THE 2 INCH OVERLAY WILL BE PERFORMED IN ACCORDANCE WITH THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200 - ASPHALT CONCRETE SURFACE WITH THE FOLLOWING MODIFICATIONS:
3. THE APWA TYPE 3 ASPHALT CONCRETE MIX MAY CONTAIN RECYCLED ASPHALT CONTENT. RECYCLED ASPHALT MIX DESIGN APWA TYPE 3 (FRAP) AND APWA TYPE 1 OR 2 (FRAP) (FOR FULL DEPTH PATCH) MUST BE A 50-BLOW MARSHALL MIX MEETING THE AGGREGATE, GRADATION, AND VOLUMETRIC DESIGN REQUIREMENTS FOR APWA TYPE 3 OR APWA TYPE 3 (FRAP) FOR SURFACE COURSE AND APWA TYPE 1 OR 2 OR APWA TYPE 1 OR 2 (FRAP) FOR BASE COURSES AS DEFINED BY THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200, CURRENT EDITION. ANY SUBMITTED 50-BLOW MARSHALL MIX DESIGN MUST ALSO BE CHECKED FOR RESISTANCE TO STRIPPING DURING DESIGN USING AASHTO T-283 TO DETERMINE IF ANTISTRIPPING IS NEEDED FOR THE SAME ASPHALT. THE CONCRETE CHOSEN FOR THE PROJECT, THE INDEX OF RETAINED STRENGTH SHALL EXCEED 80%. ANY ASPHALT MIX SUPPLIED TO THE PROJECT DURING PLACEMENT WILL BE SUBJECT TO TESTING BY THE OWNERS REPRESENTATIVES USING THE AASHTO T-283 PROCEDURE FOR TENSILE STRENGTH RATIO.)
4. MEASURED DENSITY OF THE COMPLETED OVERLAY SHALL HAVE A COMPACTED DENSITY OF 92% TO 97% OF THE DAILY THEORETICAL MAXIMUM SPECIFIC GRAVITY (GMM) OF THE APWA TYPE 3 MIX SUPPLIED TO THE PROJECT.
5. AREAS OF THE PAVEMENT SURFACE ON THE DRIVES AND PARKING LOTS THAT ARE SHOWN TO HAVE SEGREGATION UPON COMPLETION OF FINAL ROLLING SHALL RECEIVE AN ADDITIONAL SURFACE TREATMENT TO CLOSE THE SURFACE. THE SURFACE TREATMENT SHALL CONSIST OF MANUFACTURED SAND COATED WITH SS-1H EMULSION WORKED INTO THE SURFACE VOIDS TO YIELD A UNIFORM APPEARING SURFACE.



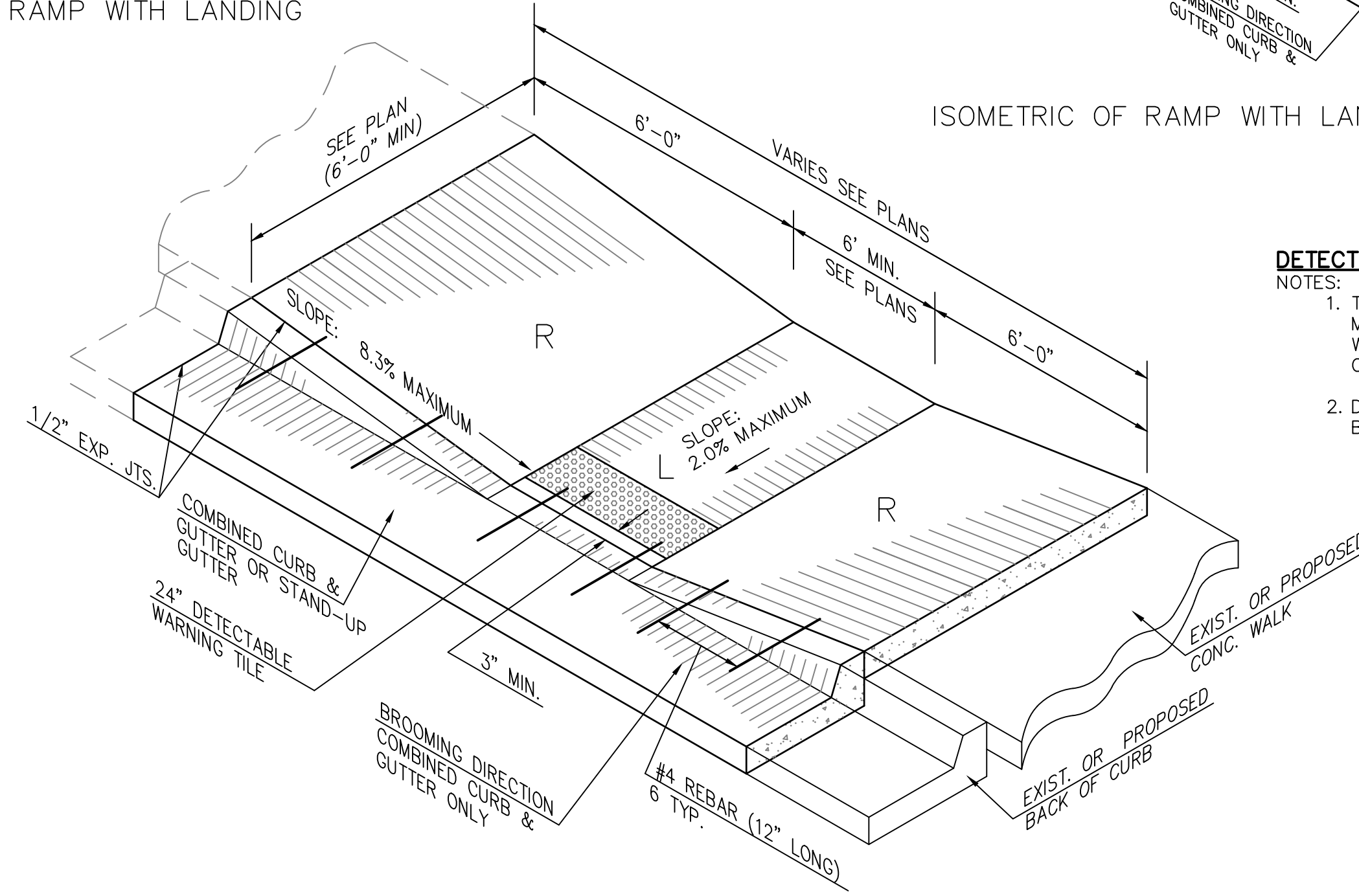
DETECTABLE WARNING SURFACE TILE

101

NOTES:

1. TILE MATERIAL SHALL BE VITRIFIED POLYMER COMPOSITE AS MANUFACTURED BY ARMOR-TILE OR APPROVED EQUAL. DETECTABLE WARNING TILE TO BE PLACED A MINIMUM OF 3 INCHES FROM BACK OF CURB AND ALIGNED IN THE DIRECTION OF PEDESTRIAN TRAVEL.

2. DETECTABLE WARNING TILE TO BE PLACED A MINIMUM OF 3 INCHES FROM BACK OF CURB AND ALIGNED IN THE DIRECTION OF PEDESTRIAN TRAVEL.



SIDEWALK RAMPS

060

PROJ. NO. C21-1242 DSN: CJC
CIN: 12420ET

CHRISTIAN J. CROWDER
ENGINEER

MO # 2015000538

14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215

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KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/23

multistudio
the evolution of gould evans

Lee's Summit Robotics, Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect: Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveeng.com

structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
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MEP/IT/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions	DESCRIPTION	DATE
NUMBER		

UNLESS A PROFESSIONAL SEAL WITH SIGNATURE AND DATE IS AFFIXED, THIS DOCUMENT IS PRELIMINARY AND IS NOT INTENDED FOR CONSTRUCTION, RECORDING PURPOSES OR IMPLEMENTATION



Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW SITE DETAILS

C190-A

Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0321-0100

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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSN SITE DETAILS

18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

ASPHALT NOTES:

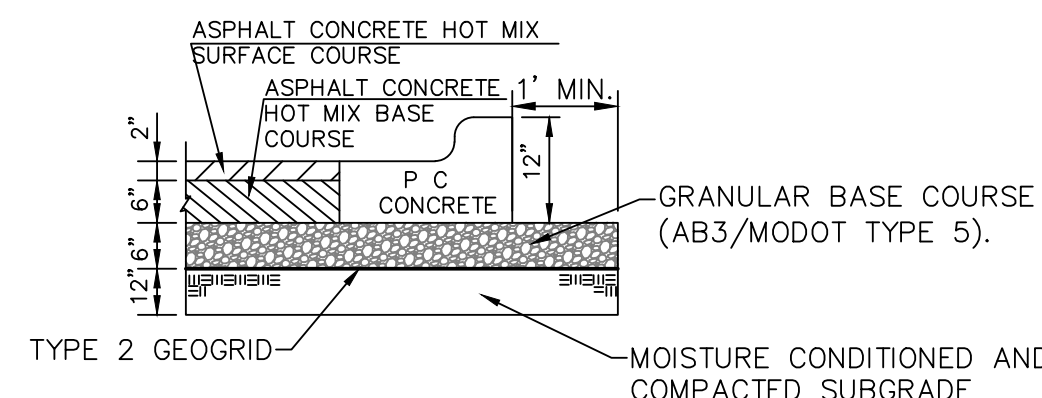
PAVING SHALL BE IN ACCORDANCE WITH THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200 AS AMENDED BELOW.

MILLING FOR THE DRIVES AND PARKING LOTS SHALL BE COLD MILLED AS FOLLOWS:

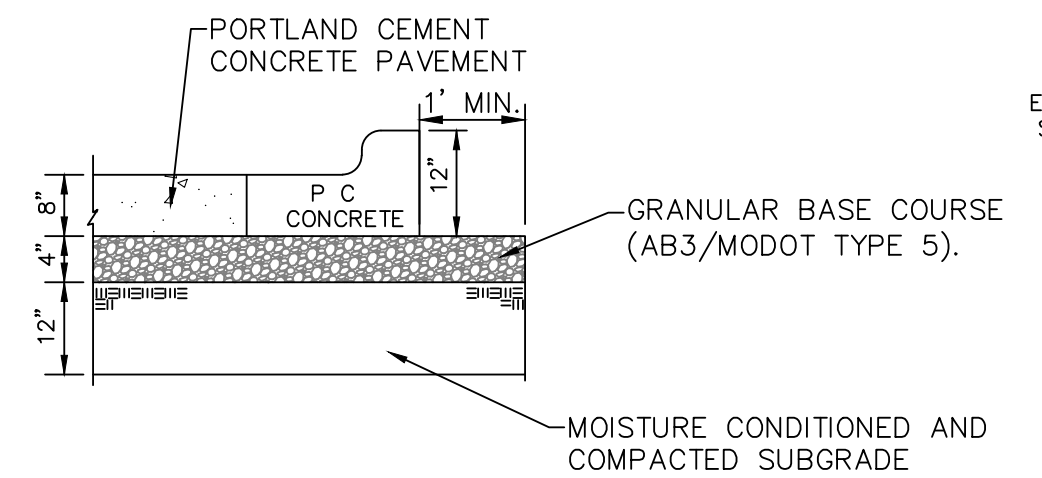
- EQUIPMENT: MILLING THE SURFACE OF PAVEMENTS SHALL BE COMPLETED BY USE OF A MILLING MACHINE CONFORMING TO THE FOLLOWING.
 - MACHINE: THE COLD MILLING MACHINE SHALL BE SELF-PROPELLED AND SHALL HAVE IN COMBINATION THE MEANS OF MILLING AND CUTTING, WITHOUT SOFTENING THE OLD SURFACE AND BLADING THE CUTTING INTO A SINGLE WINDROW, OR DEPOSITING THEM DIRECTLY INTO A TRUCK.
 - AIR POLLUTION: THE MACHINE SHALL BE EQUIPPED WITH A DUST SUPPRESSION SYSTEM INCLUDING WATER STORAGE TANKS AND HIGH PRESSURE SPRAY BARS.
 - OPERATING WIDTH: IT IS DESIRABLE THAT THE CUTTING WIDTH BE GREATER THAN 1 FEET (0.3 m). IN THE EVENT THE CUTTING WIDTH IS LESS THAN 1 FEET (0.3 m) CONTRACTOR IS RESPONSIBLE FOR ENSURING GRADE CONTROL AS NOTED ON PLANS.
 - CUTTING DRUM: THE CUTTING DRUM SHALL BE TOTALLY ENCLOSED TO PREVENT DISCHARGE OF ANY LOOSENED MATERIAL ADJACENT TO WORK AREAS.
- CONSTRUCTION DETAILS
 - METHODS OF OPERATIONS FOR MILLING:
 - OPERATOR: THE MILLING MACHINE SHALL BE OPERATED BY AN EXPERIENCED AND CAPABLE OPERATOR.
 - UTILITIES: STREET SURFACES ADJACENT TO MANHOLE, WATER VALVES AND OTHER UTILITY EXTENSIONS, SHALL BE COMPLETELY REMOVED TO THE FULL DEPTH THE CUT SPECIFIED FOR THE STREET UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
 - MATERIAL DISPOSAL: THE MATERIAL WITHDREW BY THE MACHINE SHALL BE REMOVED FROM THE SURFACE OF THE PAVEMENT AND PROPERLY DISPOSED OF BY THE CONTRACTOR.
 - SURFACE CONDITIONS: THE DRUM LACING PATTERNS SHALL PRODUCE A SMOOTH SURFACE AFTER MILLING WITH GROOVE DEPTHS NOT TO EXCEED 1/4 INCH (0.64 cm) AND GROOVE SPACING NOT TO EXCEED 1 INCH (2.54 cm) UNLESS OTHERWISE APPROVED BY THE ENGINEER.
 - TYPES OF CUTS TO BE MADE BY MILLING:
 - LEVELING: SUFFICIENT PASSES SHALL BE MADE SUCH THAT ALL IRREGULARITIES OR HIGH SPOTS ARE ELIMINATED, AND THAT 100% OF THE SURFACE IS MILLED.
 - AVERAGE DEPTH: SUFFICIENT PASSES, OR CUTS, SHALL BE MADE IN ORDER TO REMOVE A SPECIFIED DEPTH OVER THE ENTIRE STREET SECTION. THESE DEPTHS WILL BE DESIGNATED ON THE PLANS.
 - CURB CUT: SUFFICIENT PASSES, OR CUTS, SHALL BE MADE IN ORDER TO REMOVE A SPECIFIED DEPTH AT THE CURB FOR A SPECIFIED WIDTH. THE DEPTH AT THE WIDTH FURTHEST FROM THE CURB IS 0. THESE DIMENSIONS WILL BE DESIGNATED ON THE PLANS.
 - CLEANUP: ALL LOOSE ASPHALT AND DEBRIS SHALL BE REMOVED FROM THE STREET SURFACE AND CURB AND GUTTER. ANY MATERIAL AND DEBRIS THAT ADHERES TO THE CURB AND GUTTER SHALL BE REMOVED.

CRACKS: REFER TO CRACK SEALING/FILLING GUIDELINES.

- AREAS OF THE PAVEMENT REQUIRING PATCHING WILL BE DESIGNATED ON THE PLANS OR MARKED BY THE ENGINEER AFTER COMPLETION OF MILLING OPERATIONS FOR THE SECTION OF PAVEMENT UNDER CONSTRUCTION. THE DETERIORATED PAVEMENT WILL BE REMOVED TO THE LIMITS DESIGNATED BY THE ENGINEER. THE SUBGRADE SHALL BE ADJUSTED TO PERMIT THE THICKNESS OF ASPHALT INDICATED ON THE PLANS. THE SUBGRADE SHALL CONSIST OF MODOT TYPE 5 AGGREGATE AND SHALL BE UNIFORMLY COMPACTED BY HAND TAMPING OR ROLLING. BITUMINOUS MIX FOR PATCHING WILL MEET THE REQUIREMENTS FOR APWA TYPE 1 OR 2 ASPHALT CONCRETE AS SPECIFIED IN THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200. AT THE TIME OF PLACING ASPHALT THE EDGE OF THE AREA TO BE PATCHED WILL BE COATED WITH SS-1H EMULSION ASPHALT OR APPROVED EQUAL. THE ASPHALT IN THE PATCH SHALL BE PLACED IN TWO EQUAL LIFTS WITH EACH LIFT THOROUGHLY COMPACTED PRIOR TO PLACEMENT OF THE SUBSEQUENT LIFT.
- CONSTRUCTION OF THE 2 INCH OVERLAY WILL BE PERFORMED IN ACCORDANCE WITH THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200 - ASPHALT CONCRETE SURFACE WITH THE FOLLOWING MODIFICATIONS:
- THE APWA TYPE 3 ASPHALT CONCRETE MIX MAY CONTAIN RECYCLED ASPHALT CONTENT. RECYCLED ASPHALT MIX DESIGN APWA TYPE 3 (FRAP) AND APWA TYPE 1 OR 2 (FRAP) (FOR FULL DEPTH PATCH) MUST BE A 50-BLOW MARSHALL MIX MEETING THE AGGREGATE, GRADATION, AND VOLUMETRIC DESIGN REQUIREMENTS FOR APWA TYPE 3 OR APWA TYPE 3 (FRAP) FOR SURFACE COURSE AND APWA TYPE 1 OR 2 OR APWA TYPE 1 OR 2 (FRAP) FOR BASE COURSES AS DEFINED BY THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200. CURRENT EDITION. ANY SUBMITTED 50-BLOW MARSHALL MIX DESIGN MUST ALSO BE CHECKED FOR RESISTANCE TO STRIPPING DURING DESIGN USING AASHTO T-283 TO DETERMINE IF ANTISTRIpping AGENT IS NEEDED FOR THE SAME ASPHALT CONCRETE CHOSEN FOR THE PROJECT. THE INDEX OF RETAINED STRENGTH SHALL EXCEED 80% ANY ASPHALT MIX SUPPLIED TO THE PROJECT DURING PLACEMENT WILL BE SUBJECT TO TESTING BY THE OWNERS REPRESENTATIVES USING THE AASHTO T-283 PROCEDURE FOR TENSILE STRENGTH RATIO.)
- MEASURED DENSITY OF THE COMPLETED OVERLAY SHALL HAVE A COMPACTED DENSITY OF 92% TO 97% OF THE DAILY THEORETICAL MAXIMUM SPECIFIC GRAVITY (GMM) OF THE APWA TYPE 3 MIX SUPPLIED TO THE PROJECT.
- AREAS OF THE PAVEMENT SURFACE ON THE DRIVES AND PARKING LOTS THAT ARE SHOWN TO HAVE SEGREGATION UPON COMPLETION OF FINAL ROLLING SHALL RECEIVE AN ADDITIONAL SURFACE TREATMENT TO CLOSE THE SURFACE VOIDS. THE SURFACE TREATMENT SHALL CONSIST OF MANUFACTURED SAND COATED WITH SS-1H EMULSION WORKED INTO THE SURFACE VOIDS TO YIELD A UNIFORM APPEARING SURFACE.



ASPHALT PAVEMENT [040]

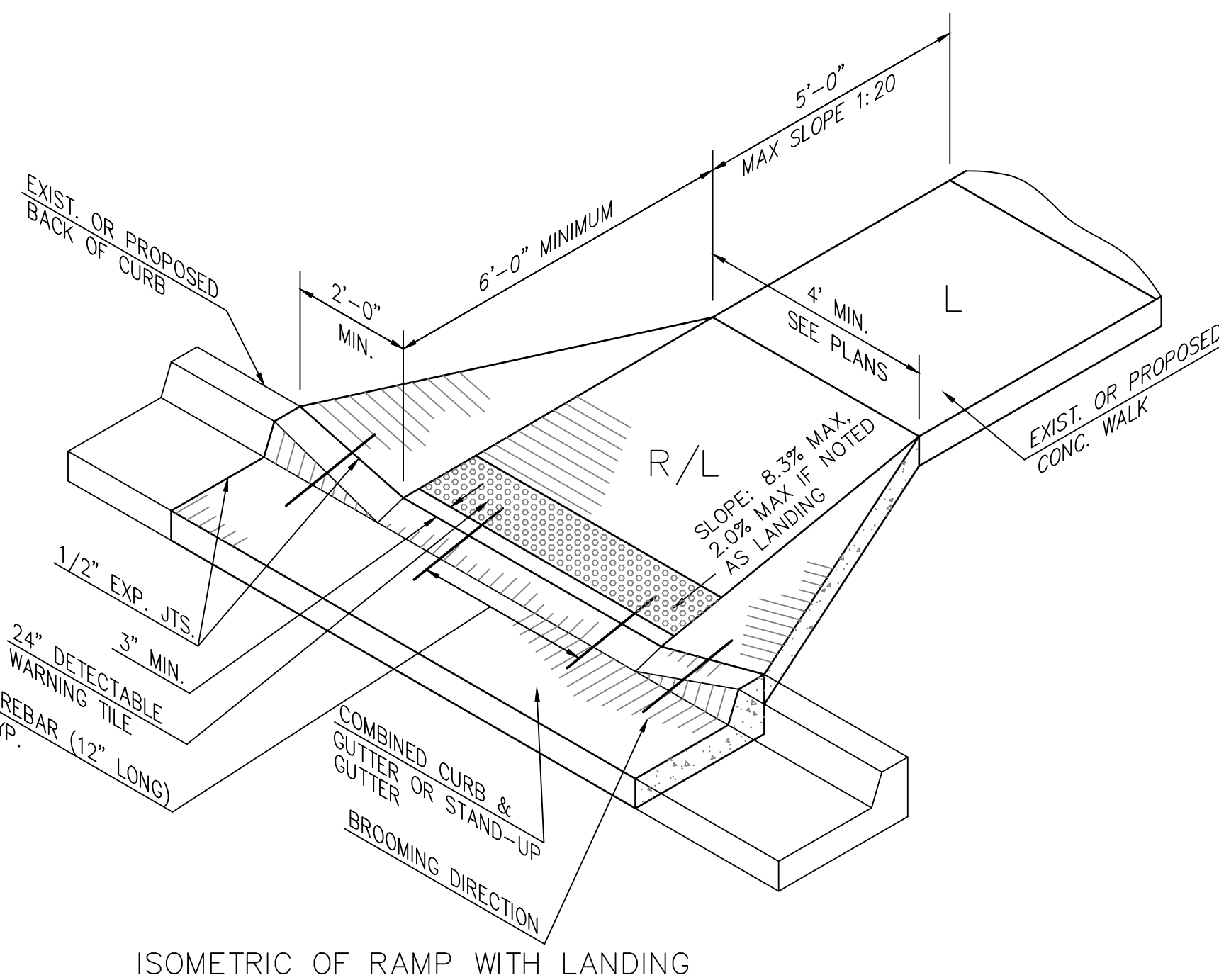


CONCRETE PAVEMENT [042]

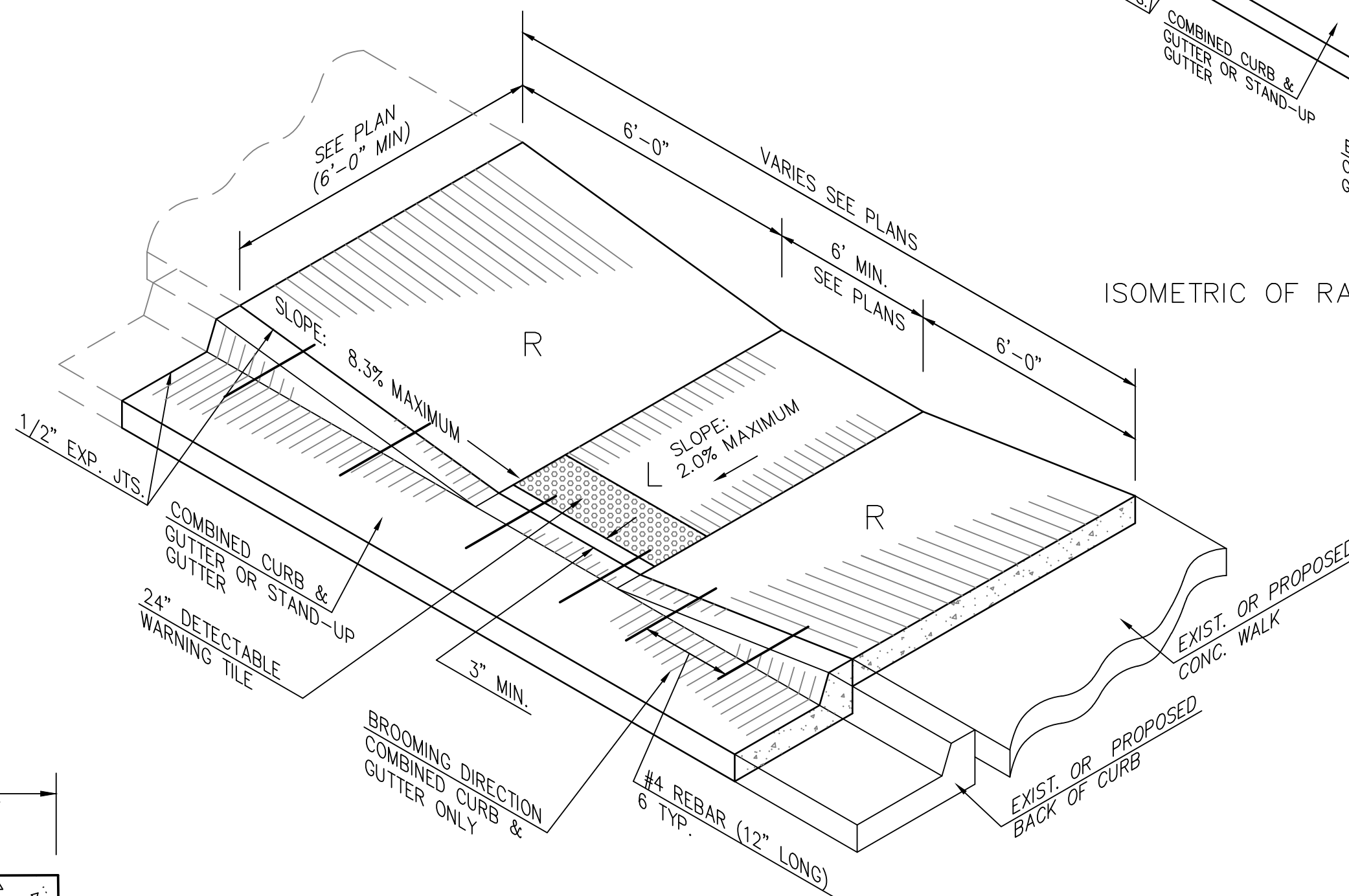
- FLEXIBLE PAVEMENT SHALL BE IN ACCORDANCE WITH THE LATEST (FEBRUARY 2017) EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200 AS AMENDED BY PROJECT SPECIFICATIONS.
- PORTLAND CEMENT CONCRETE FOR DRIVEWAYS SHALL BE A KOMMB4K AE MIX AND SHALL MEET THE LATEST EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SECTION 2200.

ASPHALT SURFACE COURSE - APWA TYPE 3-01

ASPHALT BASE COURSE - APWA TYPE 2-01



ISOMETRIC OF RAMP WITH LANDING



ISOMETRIC OF RAMP WITH LANDING
SIDEWALK RAMPS [060]

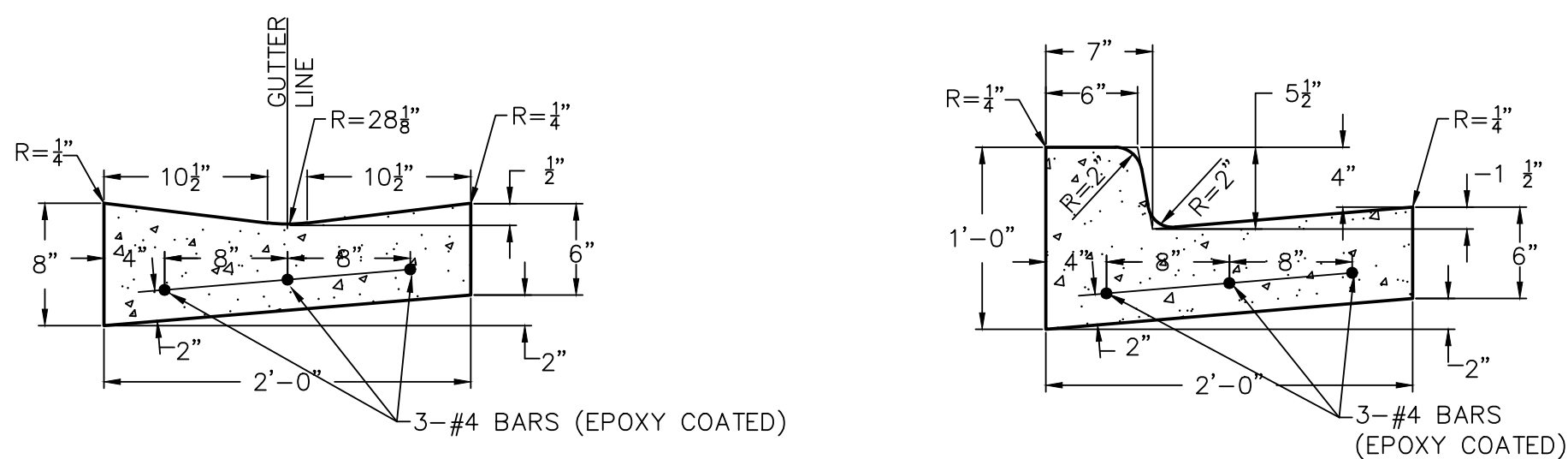
DETECTABLE WARNING SURFACE TILE [101]

- NOTES:
- TILE MATERIAL SHALL BE VITRIFIED POLYMER COMPOSITE AS MANUFACTURED BY ARMOR-TILE OR APPROVED EQUAL. DETECTABLE WARNING TILE TO BE PLACED A MINIMUM OF 3 INCHES FROM BACK OF CURB AND ALIGNED IN THE DIRECTION OF PEDESTRIAN TRAVEL.
 - DETECTABLE WARNING TILE TO BE PLACED A MINIMUM OF 3 INCHES FROM BACK OF CURB AND ALIGNED IN THE DIRECTION OF PEDESTRIAN TRAVEL.

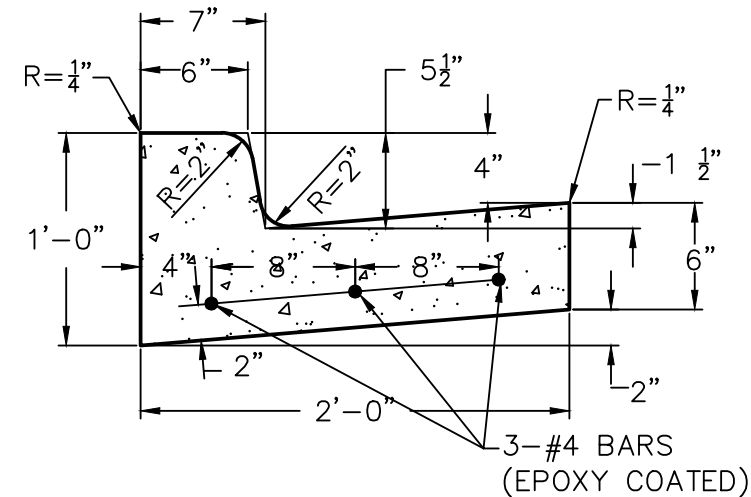
PROJ. NO. C21-1241 DSN: CJC
CPL: 12410ET DWN: NJN
ENGINEER
MO # 2015000538
14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215
PH. (913) 894-5150 | FAX (913) 894-5977
kveg.com | www.kveg.com

KAW VALLEY ENGINEERING

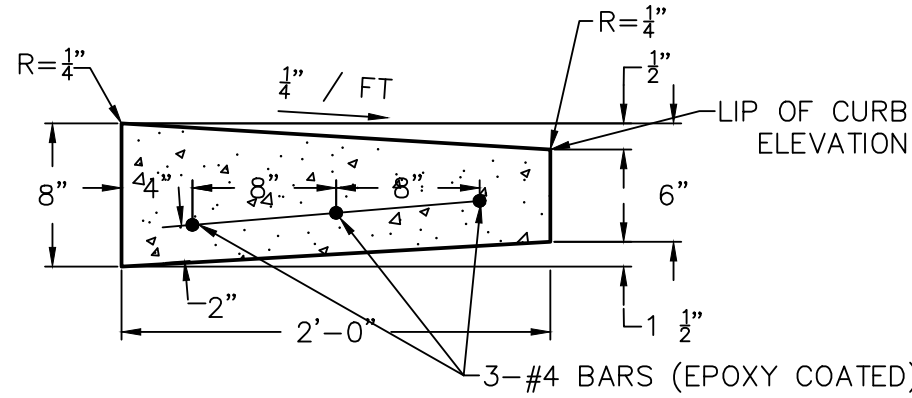
KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/23



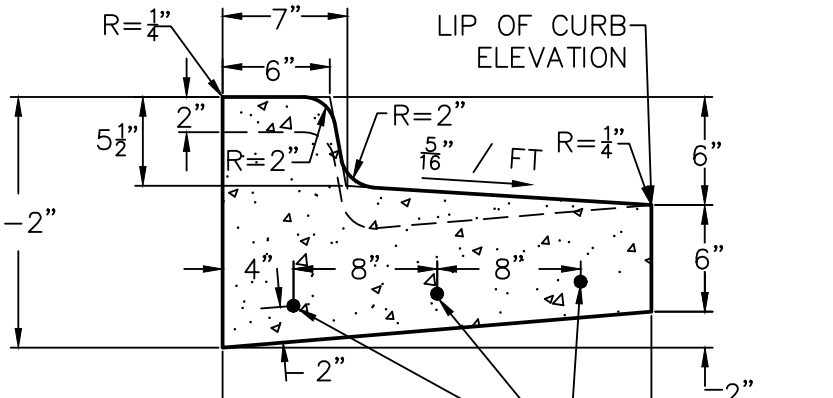
STANDARD TYPE "C" CURB



FULL HEIGHT TYPE "B" CURB



STANDARD TYPE "C" DRY CURB AND AT RAMPS



FULL HEIGHT DRY CURB

ZERO HEIGHT CURB [002]

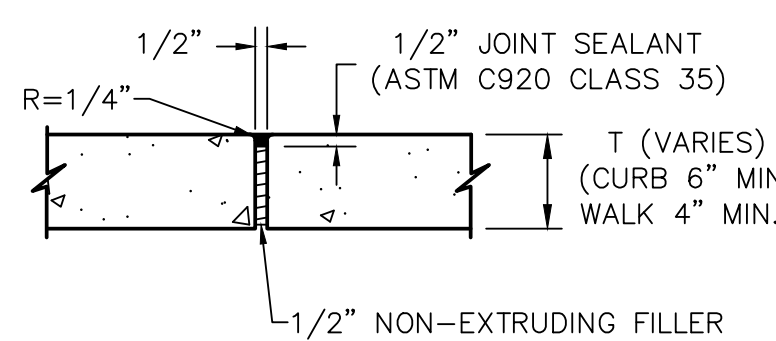
FULL HEIGHT CURB [001]

CURB & GUTTER NOTES:

- 2" PREMOLDED EXPANSION JOINTS SHALL BE PLACED AT POINTS OF CURVATURE, CURB RETURNS, CURB INLETS AND AT 250' CENTERS. THE EXPANSION JOINTS SHALL BE DOWELED IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTION JOINTS SHALL BE 2" DEEP AND PLACED AT 15' INTERVALS EQUALLY SPACED BETWEEN EXPANSION JOINTS.
- ALL CONCRETE USED IN THIS WORK SHALL MEET THE LATEST EDITION OF THE KANSAS CITY METROPOLITAN CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION. KOMMB4K CONCRETE SHALL BE USED THROUGHOUT.
- ALL REINFORCING STEEL SHALL BE SUPPORTED ON FABRICATED STEEL BAR SUPPORTS @ 3'-0" MAXIMUM SPACING.
- SEE SIDEWALK RAMP DETAILS FOR TYPICAL SIDEWALK RAMP CURB & GUTTER SECTIONS.
- DETAILS AS SHOWN FOR CONCRETE AND ASPHALT PAVING. WHEN USED WITH CONCRETE PAVING POURED MONOLITHICALLY WITH CURB NO MODIFICATIONS ARE REQUIRED. WHEN CURB AND CONCRETE PAVING ARE TO BE POURED SEPARATELY #4 BARS, 24" LONG ARE TO BE PROVIDED TO TIE CURB TOGETHER WITH CONCRETE PAVING. PLACE AT 8" O.C.
- ALL REINFORCING SHALL BE 60 GRADE, 60 DEFORMED BARS AND COMPLY WITH ASTM A615. EPOXY BARS AS NOTED, SHALL COMPLY WITH ASTM A775.
- CURBS TO BE CONSTRUCTED ON MINIMUM 6 INCHES OF COMPACTED WELL GRADED BASE ROCK.

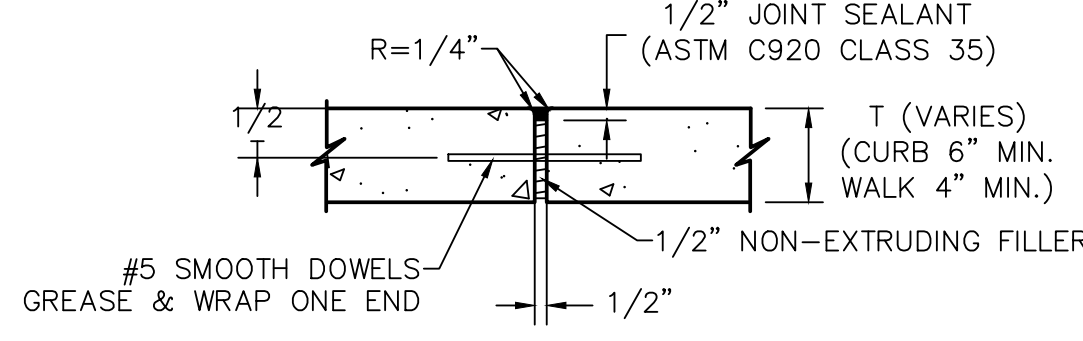
CURB & GUTTER

N.T.S.



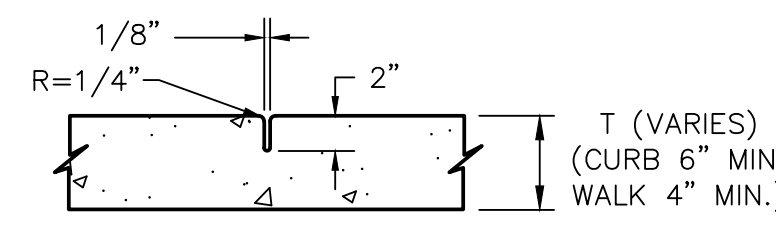
- NOTE:
- TYPE 1 JOINTS SHALL BE PLACED WHERE NEW CONCRETE ABUTS EXISTING CONCRETE AND IN AREAS WHERE CONCRETE ABUTS BUILDINGS. UNLESS NOTED OTHERWISE.

EXPANSION JOINT - TYPE 1



TYPE 2

- NOTE:
- TYPE 2 JOINTS SHALL BE PLACED AS NOTED AND AT ALL P.C.'S, P.T.'S AND TRANSITIONS, AND WHERE NEW CURB OR CONCRETE PAVEMENT TIES INTO EXISTING CURB OR CONCRETE PAVEMENT.
 - SMOOTH BARS SHALL BE 24" LONG

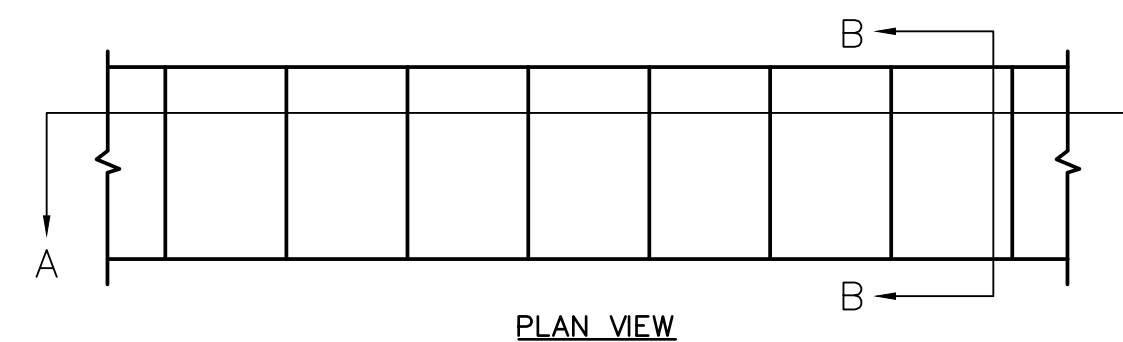


CONTRACTION JOINT - TYPE 3

CONCRETE JOINTING DETAILS

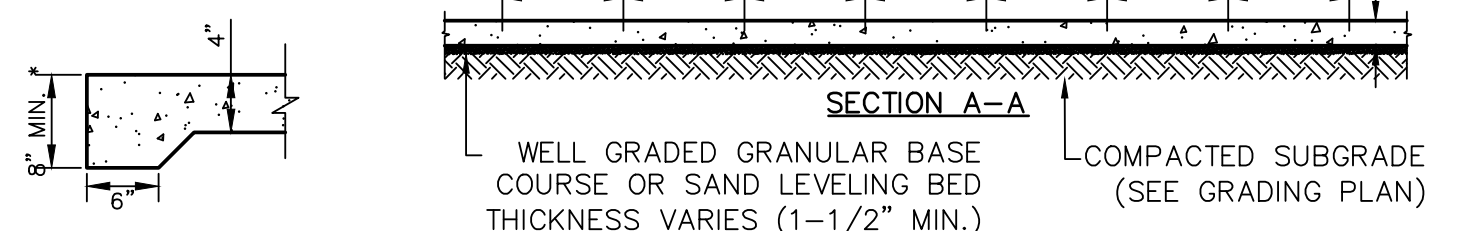
CONCRETE AND SIDEWALK NOTES:

- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AND COMPLY WITH KOMMB SPECIFICATIONS. ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH APWA SECTION 2200. REINFORCING STEEL SHALL BE GRADE 60 AND COMPLY WITH ASTM A615. EPOXY COATED BARS AS NOTED SHALL COMPLY WITH ASTM A775. ALL CUT ENDS OR DAMAGED AREAS SHALL BE FIELD REPAIRED WITH EPOXY COATING.
- SIDEWALKS TO BE BROOM FINISHED.
- SUBGRADE TO BE COMPACTED TO 90% MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. MOISTURE CONTENT TO BE WITHIN A RANGE OF 2% BELOW TO 2% ABOVE OPTIMUM MOISTURE AS DEFINED BY ASTM D698.
- SIDEWALK JOINTS MAY BE SAWN UNLESS OTHERWISE NOTED ON ARCHITECTURAL PLANS.



NOTE:

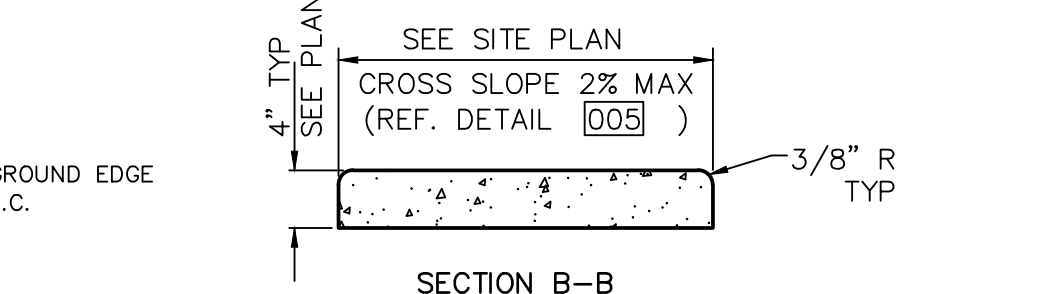
- CONTRACTOR SHALL BACKFILL SIDEWALKS WITH TOPSOIL AND SEED IN ACCORDANCE WITH NOTES ON PLANS.



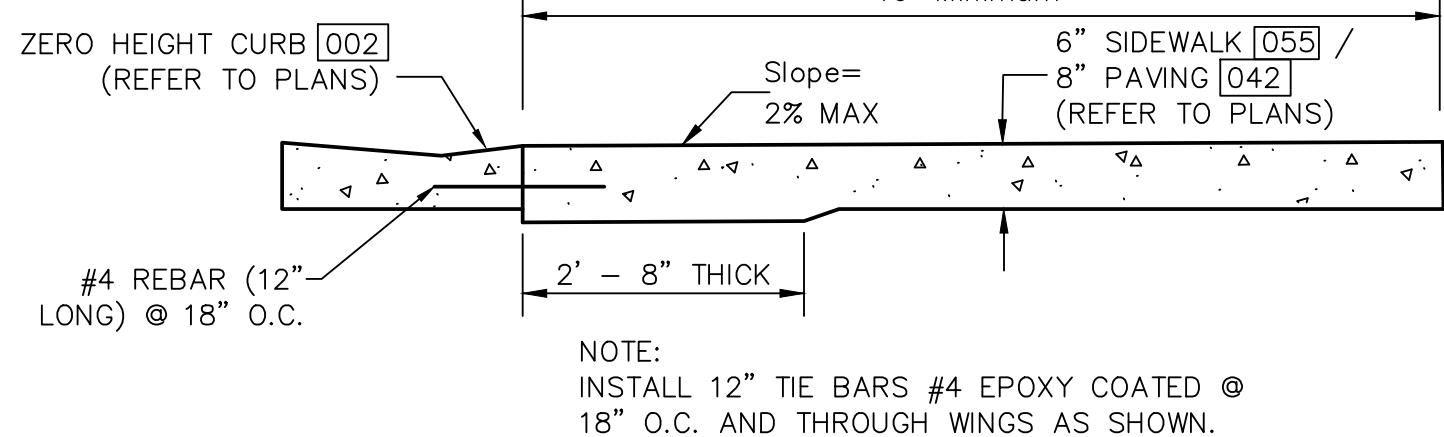
TURNDOWN

*MATCH ASPHALT THICKNESS

PROVIDE TURN DOWN ALONG PLAYGROUND EDGE CURB PROVIDE 12" BARS AT 24" O.C.



CONCRETE SIDEWALK [055]



INTEGRAL CURB AND SIDEWALK [005]

Lee's Summit Robotics,
Gic & Phys Educaiton

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64086
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MEP/IT/Code:
Hendersen Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersenengineers.com

CONSTRUCTION NOTES:

- CONTRACTOR SHALL VERIFY SITE CONDITIONS PRIOR TO BIDDING. CONTRACTOR SHALL REMOVE ALL UTILITIES, PAVEMENT, CURBS AND ALL OTHER STRUCTURES AS NOTED EXCEPTING THOSE DESIGNATED "TO REMAIN" OR "TO BE REMOVED BY OTHERS" IN ACCORDANCE WITH THE SPECIFICATIONS AND THE CITY OF LEE'S SUMMIT AND STATE REGULATIONS. SITE CONDITIONS SHOWN WERE AS OF MARCH 7, 2022.
- ALL UTILITY PIPE LINES TO BE ABANDONED SHALL BE PLUGGED PER CITY AND STATE REGULATIONS.
- ALL PAVING, FLATWORK AND OTHER STRUCTURES DESIGNATED TO BE REMOVED SHALL BE REMOVED FROM PROPERTY AND DISPOSED OF IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
- ALL EXISTING UTILITIES ETC. LOCATED WITHIN THE BOUNDARIES OF THE PROPOSED BUILDING SHALL BE COMPLETELY REMOVED TO 10 FEET OUTSIDE OF BUILDING LINE.
- CONTRACTOR SHALL VERIFY THAT ALL UTILITIES TO EXISTING STRUCTURES HAVE BEEN DISCONNECTED PRIOR TO COMMENCING DEMOLITION.
- COORDINATE START-UP AND ALL CONSTRUCTION ACTIVITIES WITH THE ARCHITECT.
- CONSTRUCTION METHODS AND MATERIALS NOT SPECIFIED IN THESE PLANS ARE TO MEET OR EXCEED THE KANSAS CITY METROPOLITAN CHAPTER OF APWA STANDARD SPECIFICATIONS AS ADOPTED AND AMENDED BY THE CITY OF LEE'S SUMMIT.
- ALL CONSTRUCTION WORK AND UTILITY WORK SHALL BE PERFORMED IN COOPERATION WITH AND IN ACCORDANCE WITH REGULATIONS OF THE AUTHORITIES CONCERNED.

EROSION AND SEDIMENT CONTROL INSPECTION PROCEDURES

THE FOLLOWING PROCEDURES WILL BE USED TO MAINTAIN EROSION AND SEDIMENTATION CONTROLS.

- ALL CONTROL MEASURES WILL BE INSPECTED AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL EVENT PRODUCING RUNOFF AND DAILY DURING PROLONGED RAINFALL PERIODS.
- ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE MADE WITHIN 24 HOURS OF THE INSPECTION.
- SEDIMENT WILL BE REMOVED FROM THE SILT BARRIERS WHEN IT HAS REACHED ONE-THIRD OF THE HEIGHT OF THE BARRIER.
- SILT BARRIERS WILL BE INSPECTED FOR DEPTH OF ACCUMULATED SEDIMENT, TEARS, ATTACHMENT TO POSTS, AND STABILITY ON A WEEKLY BASIS.
- TEMPORARY AND PERMANENT SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
- THE CONSTRUCTION MANAGER WILL SELECT INDIVIDUALS TO BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE, REPAIRS, AND REPORTING. THE DESIGNATED INDIVIDUALS WILL RECEIVE THE NECESSARY TRAINING FROM THE CONSTRUCTION MANAGER TO PROPERLY INSPECT AND MAINTAIN THE CONTROLS IN GOOD WORKING ORDER.

GENERAL NOTES:

- PROJECT AREA IS APPROXIMATE LIMITS OF CONSTRUCTION.
- THE CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE DRAWINGS PRIOR TO BEGINNING EARTHWORK OPERATIONS.
- THE CONTRACTOR SHALL MAINTAIN ALL SILT CONTROL MEASURES DURING CONSTRUCTION.
- ALL SILT SHALL REMAIN WITHIN THE CONSTRUCTION LIMITS. SURROUNDING PARKING LOTS AND PLAYGROUNDS SHALL BE KEPT CLEAR OF ALL MUD AND DEBRIS.
- A SEDIMENTATION BARRIER IS TO BE INSTALLED AS SHOWN.
- ACCUMULATED SEDIMENT SHALL BE REMOVED AND THE SEDIMENTATION BARRIERS MAINTAINED AS NEEDED TO PREVENT SEDIMENTATION BYPASS OF THE BARRIER.
- SLOPES ARE TO BE LEFT IN A ROUGH CONDITION DURING GRADING.
- CURB INLET SEDIMENTATION BARRIERS ARE TO BE INSTALLED AROUND INLETS WHERE SEDIMENTATION IS A CONCERN. INLET BARRIERS SHALL BE FILTER BAGS.
- SEDIMENT IS TO BE REMOVED FROM STORM WATER DRAINAGE SYSTEMS.
- CONTRACTOR IS RESPONSIBLE FOR INSTALLING ANY ADDITIONAL EROSION CONTROL AS HE/SHE DEEMS NECESSARY.
- TEMPORARY SEDIMENT FENCE/STRAW WATTLES TO REMAIN UNTIL ADEQUATE VEGETATION IS ESTABLISHED.
- MUD AND DEBRIS SHALL BE CLEANED UP AT THE CONCLUSION OF EACH WORKING DAY, OR AFTER EACH RAINFALL IF SILT IS PRESENT.
- INSPECTION, MAINTENANCE AND REPAIR OF EROSION CONTROL DEVICES SHALL BE ON GOING THROUGHOUT THE LIFE OF BUILDING CONSTRUCTION TO KEEP THE DEVICES IN OPERABLE CONDITION AT ALL TIMES. ADDITIONAL MEASURES SHALL BE INSTALLED AS REQUIRED BY ACTUAL FIELD CONDITIONS AND/OR GOVERNING INSPECTION AGENCIES.
- INSTALL CONSTRUCTION ENTRANCE AS NOTED.
- AT COMPLETION OF SITE GRADING AND OTHER RELATED CONSTRUCTION ACTIVITIES, ALL DISTURBED AREAS WITHIN THE PROJECT SITE SHALL BE SEEDED, SODED, OR LANDSCAPED AS SHOWN ON THE SITE. IF GRADING ACTIVITIES CEASE ON AN AREA OF THE SITE DISTURBED SLOPES SHALL BE TEMPORARILY SEEDED IN ACCORDANCE WITH PLANS.
- TOPSOIL IS TO BE PLACED IN AREAS UNSUITABLE FOR VEGETATIVE GROWTH.
- STRIP TOPSOIL PRIOR TO EXCAVATION, STOCKPILE AND SPREAD ONTO DISKED SUBGRADE (4" MIN) A THICKNESS OF 4 INCHES.
- THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY FOR RESOLVING COMPLAINTS IN THE EVENT THAT COMPLAINTS OR DAMAGES ARE FILED DUE TO DAMAGES OCCURRING ADJACENT TO OR DOWNSTREAM FROM PROPERTY BY SEDIMENT RESULTING FROM EROSION ON THE PROJECT SITE.
- GOOD HOUSEKEEPING PRACTICES SHALL BE MAINTAINED ON SITE TO KEEP SOLID WASTE FROM ENTRY INTO WATERS.
- ALL FUELING FACILITIES PRESENT ON SITE SHALL ADHERE TO APPLICABLE FEDERAL AND STATE REQUIREMENTS CONCERNING UNDERGROUND STORAGE, ABOVE GROUND STORAGE AND DISPENSERS, INCLUDING SPILL PREVENTION, CONTROL AND COUNTER MEASURES.
- EROSION CONTROL IS TO BE PLACED IN PHASING AS CONSTRUCTION PROGRESSES.
- MINIMAL WASHING OF CONCRETE EQUIPMENT ALLOWED, CHUTE ETC. CONCRETE WASHOUT OF THE DRUM IS NOT ALLOWED. ANY PIT/WASHOUT AREA NEEDS TO BE MAINTAINED IN A NON-DISCHARGING MANNER AND ANY WASTE RESIDUE WILL NEED TO BE CLEANED OUT AND REMOVED AT THE END OF PROJECT.
- EROSION CONTROL SEDIMENT FENCE OR STRAW WATTLE SHALL BE INSTALLED 1'-0" BEHIND CURB & GUTTER OR SIDEWALK UPON COMPLETION OF BACKFILL OF CURB IN ALL AREAS WHERE SLOPES FROM DISTURBED AREAS DRAIN TOWARDS CURB OR SIDEWALK. UPON COMPLETION OF FINAL GRADING THE TOES OF ALL EMBANKMENTS IN EXCESS OF TWO FEET IN HEIGHT WILL HAVE EROSION CONTROL SEDIMENT FENCE INSTALLED

WARRANTY / DISCLAIMER

THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER KAW VALLEY ENGINEERING, INC NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE KAW VALLEY ENGINEERING PERSONNEL INSPECT AND CONTROL THE PHYSICAL CONSTRUCTION ON A TEMPORARY BASIS AT THE SITE.

CAUTION - NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

SAFETY NOTICE TO CONTRACTOR
IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.



Know what's below.
Call before you dig.

PROJ. NO. C21-1241 DSN: CJC CHRISTIAN J. CROWDER
CIN: 1241DEM0 DWN: NJN ENGINEER
MO # 2015000538
14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215
PH. (913) 894-5150 | FAX (913) 894-5977
www.kveg.com | www.kveg.com

KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER
ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF
AUTHORITY # 000842. EXPIRES 12/31/23

LSN DEMOLITION AND
EROSION CONTROL PLAN

C200-B

LEGEND:	
	UNDERGROUND GAS
	GAS METER
	CONTROL POINT
	BENCHMARK
	GATE POST
	CHAIN LINK FENCE
	STREET/TRAFFIC SIGN
	UNDERGROUND FIBER OPTIC CABLE
	UNDERGROUND FIBER OPTIC (FROM RECORDS)
	TELEPHONE PEDESTAL
	SANITARY SEWER MANHOLE
	STORM SEWER MANHOLE
	AREA INLET
	CURB INLET
	SANITARY SEWER CLEAN OUT
	DOWN SPOUT
	FLOOR DRAIN
	FLARED END SECTION
	SANITARY SEWER LINE
	STORM SEWER LINE
	CORRUGATED METAL PIPE
	REINFORCED CONCRETE PIPE
	UNDERGROUND ELECTRIC
	OVERHEAD UTILITY LINE (4 OF LINES)
	PULL BOX
	LIGHT POLE
	UTILITY POLE
	UTILITY POLE W/ LIGHT
	UTILITY POLE W/ TRANSFORMER
	WATER LINE PER RECORD
	UNDERGROUND ELECTRIC PER RECORD
	CONIFEROUS TREE
	HDPPE HIGH DENSITY POLYETHYLENE
	GAS VALVE
	GAS RISER
	GAS LINE SIGN
	DOOR ELEVATION AT THRESHOLD
	FF FINISH FLOOR ELEVATION
	BHE BUILDING HEIGHT/ELEVATION
	B/B BACK TO BACK OF CURB MEASUREMENT
	E/E EDGE TO EDGE OF ASPHALT
	W WATER LINE
	WATER METER
	WATER LINE GATE VALVE
	BUSH
	DECIDUOUS TREE
	TRASH ENCLOSURE
	L/S LANDSCAPING AREA
	CONC CONCRETE
	FLAG POLE
	ELECTRIC METER
	UNDERGROUND ELECTRIC PEDESTAL
	L LANDING
	R RAMP
	UNDERGROUND GAS PER RECORD
	SANITARY SEWER LINE PER RECORD
	STORM SEWER LINE PER RECORD
	ASPHALT PAVING TO BE REMOVED
	CONCRETE PAVING/SIDEWALKS TO BE REMOVED
	LIMITS OF DISTURBANCE

EROSION & PROPOSED IMPROVEMENTS LEGEND:

- EXISTING GROUND CONTOUR (1' INTERVALS)
- PROPOSED FINISHED GROUND CONTOUR (1' INTERVALS)
- GRAVEL FILTER BAGS
- SEDIMENTATION FENCE
- CONSTRUCTION ENTRANCE
- LIMITS OF DISTURBANCE
- CONCRETE WASH AREA

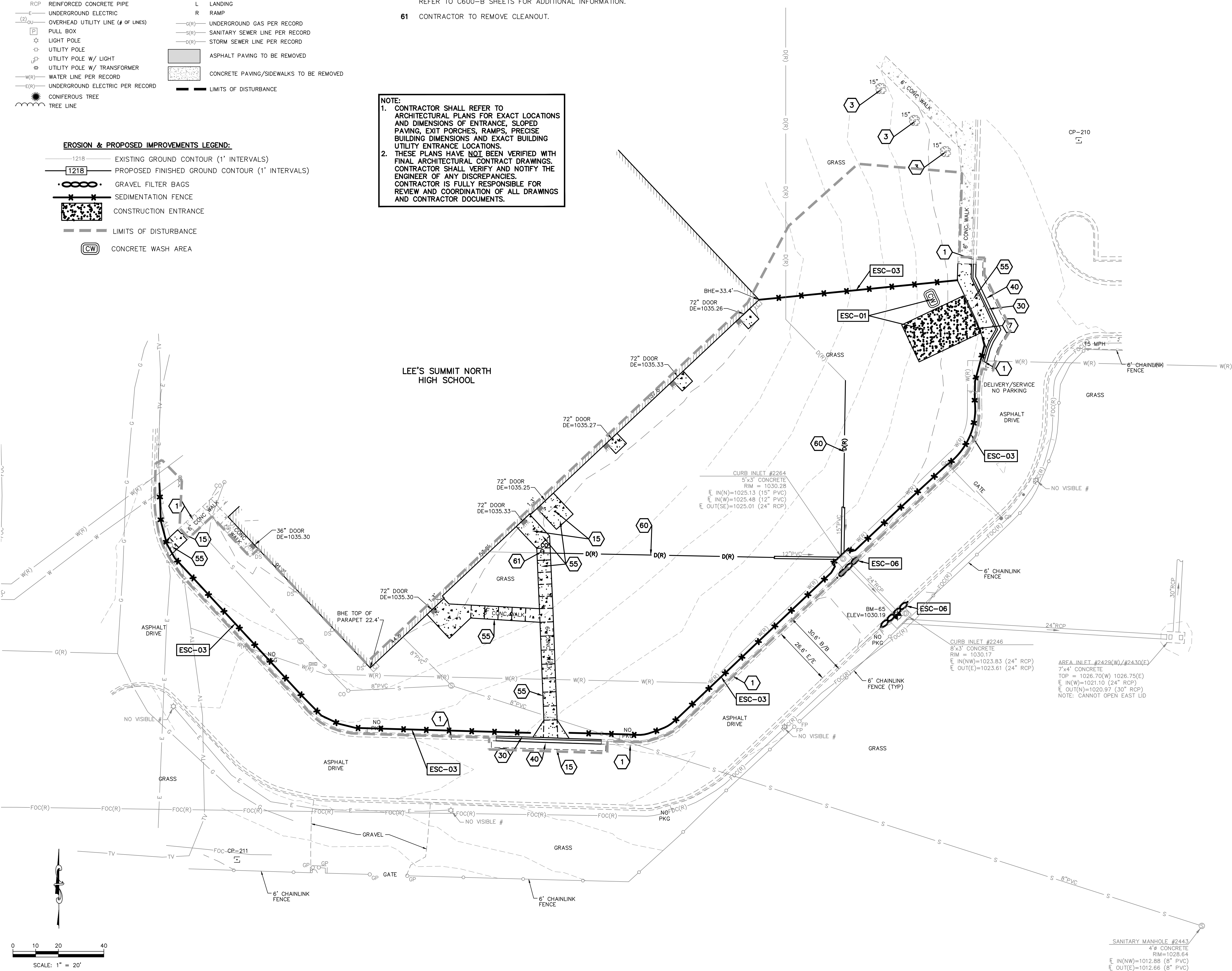
DEMOLITION

- TO REMAIN.
- TREES TO REMAIN. EARTHWORK CONTRACTOR SHALL PROVIDE TREE PROTECTION FENCE AT DRIPLINE PRIOR TO EXCAVATION AND EMBANKMENT. A MINIMUM RADIUS OF 10' FROM TREE SHALL BE PROVIDED ANYWHERE WHERE PORTIONS OF DRIPLINE ARE NOT FENCED OFF. A LAYER OF MULCH (6" MINIMUM) SHALL BE PROVIDED TO PROTECT ROOT SYSTEM FROM DAMAGE. SELECTIVE HARVESTING OF MARKETABLE TREES MAY OCCUR WITH APPROVAL OF PLATTE COUNTY SCHOOL DISTRICT.
- SIGN TO BE RELOCATED
- SAW CUT LINE (FOR CONCRETE SAW CUT AT NEAREST CONTROL JOINT. FOR ASPHALT SAW CUT MINIMUM OF 6" FROM NEW CURB LINE). SEE C100-B AND C200-B SERIES SHEETS FOR LIMITS.
- CONTRACTOR TO REMOVE CONCRETE CURBS TO CONSTRUCT IMPROVEMENTS. SEE SHEET C100-B FOR LIMITS.
- CONTRACTOR TO REMOVE ASPHALT PAVING AS REQUIRED TO CONSTRUCT IMPROVEMENTS.
- CONTRACTOR TO MILL ASPHALT SURFACE, MINIMUM 2' OUTSIDE ASPHALT REMOVAL. REFER TO C100-B SERIES SHEETS SHEETS FOR LIMITS.
- CONTRACTOR TO REMOVE CONCRETE PAVING AND WALKS.
- CONTRACTOR TO MODIFY, REMOVE AND/OR REROUTE STORM SEWER PRIOR TO CONSTRUCTING ADDITIONS. REFER TO C600-B SHEETS FOR ADDITIONAL INFORMATION.
- CONTRACTOR TO REMOVE CLEANOUT.

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE, SLOPED PAVING, EXIT PORCHES, RAMPS, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.
2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR IS FULLY RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND CONTRACTOR DOCUMENTS.

FOR THE FOLLOWING DETAILS REFER TO THE KC METROPOLITAN CHAPTER ADOPTED DIVISION III APWA STANDARD DRAWINGS FOR EROSION AND SEDIMENT CONTROL (2017 VERSION) ON SHEETS C290-B.

- ESC-01 CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT
- ESC-03 SEDIMENTATION FENCE
- ESC-06 CURB INLET PROTECTION
- ESC-07 AREA INLET PROTECTION



Lee's Summit Robotics, GIC & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect: Multistudio
4205 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com

structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

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8345 Lenexa Drive, Suite 300
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Issue Date: September 9, 2022

Revisions
NUMBER DESCRIPTION DATE

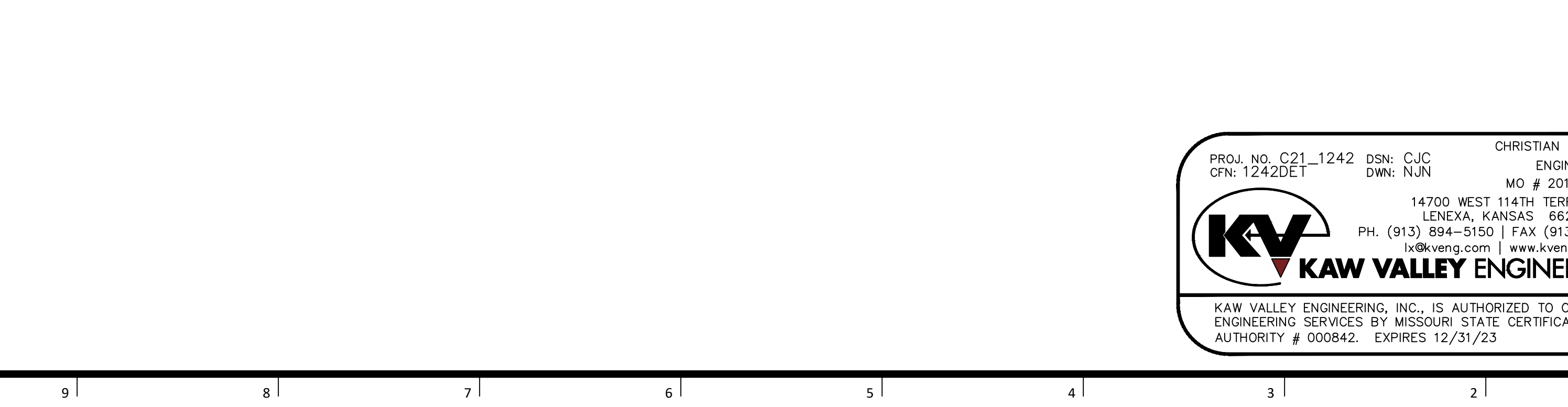
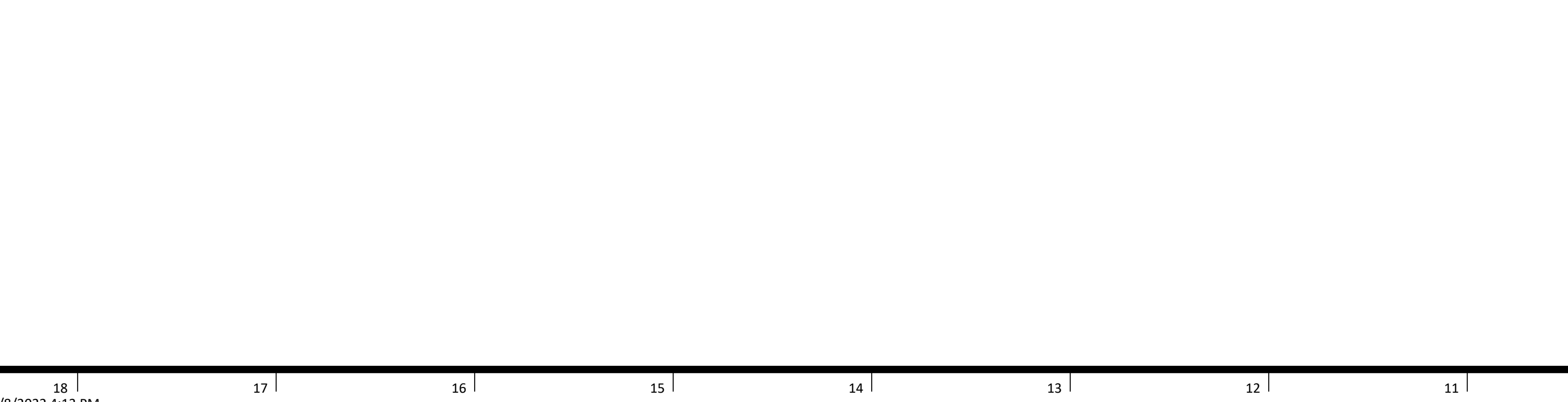
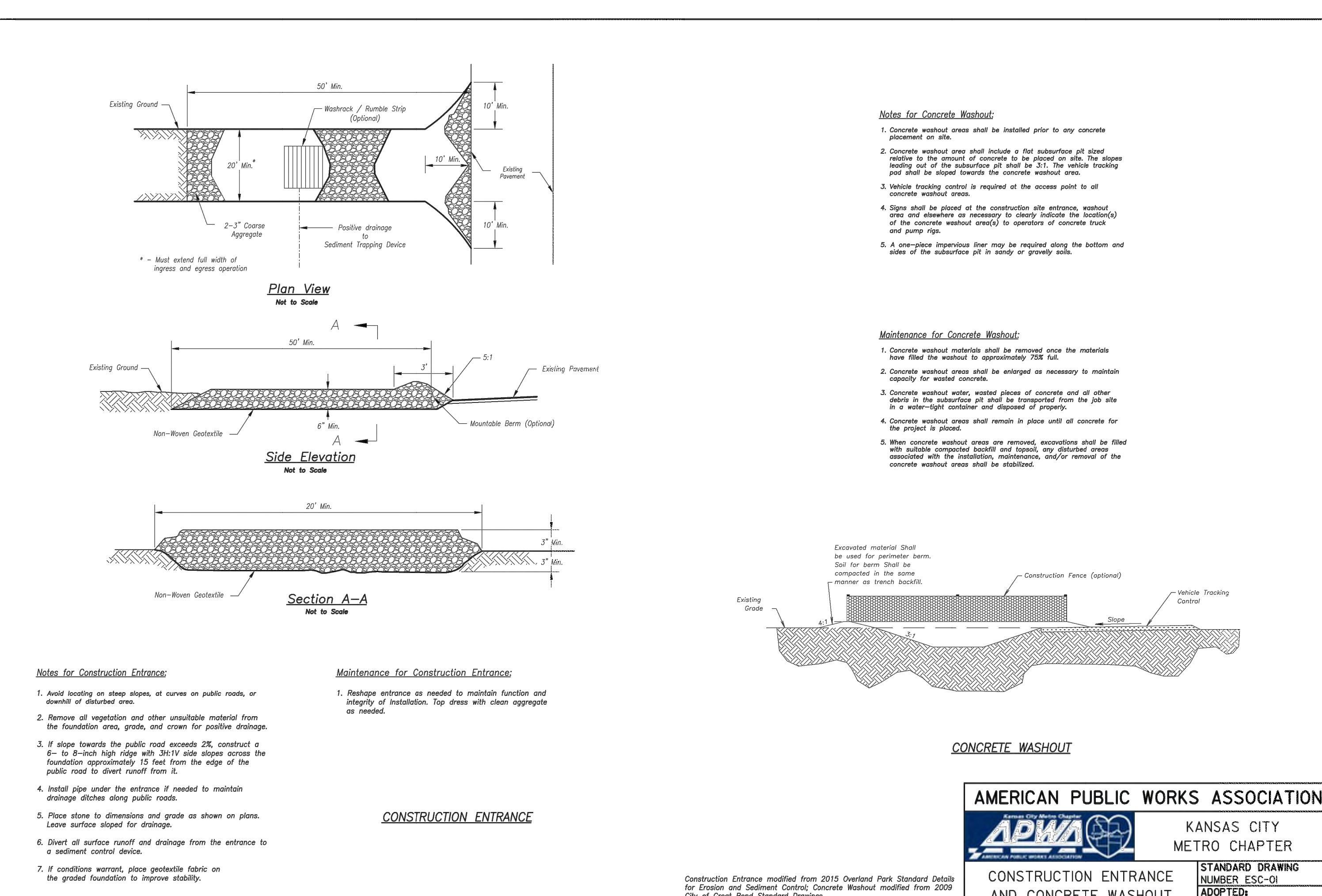
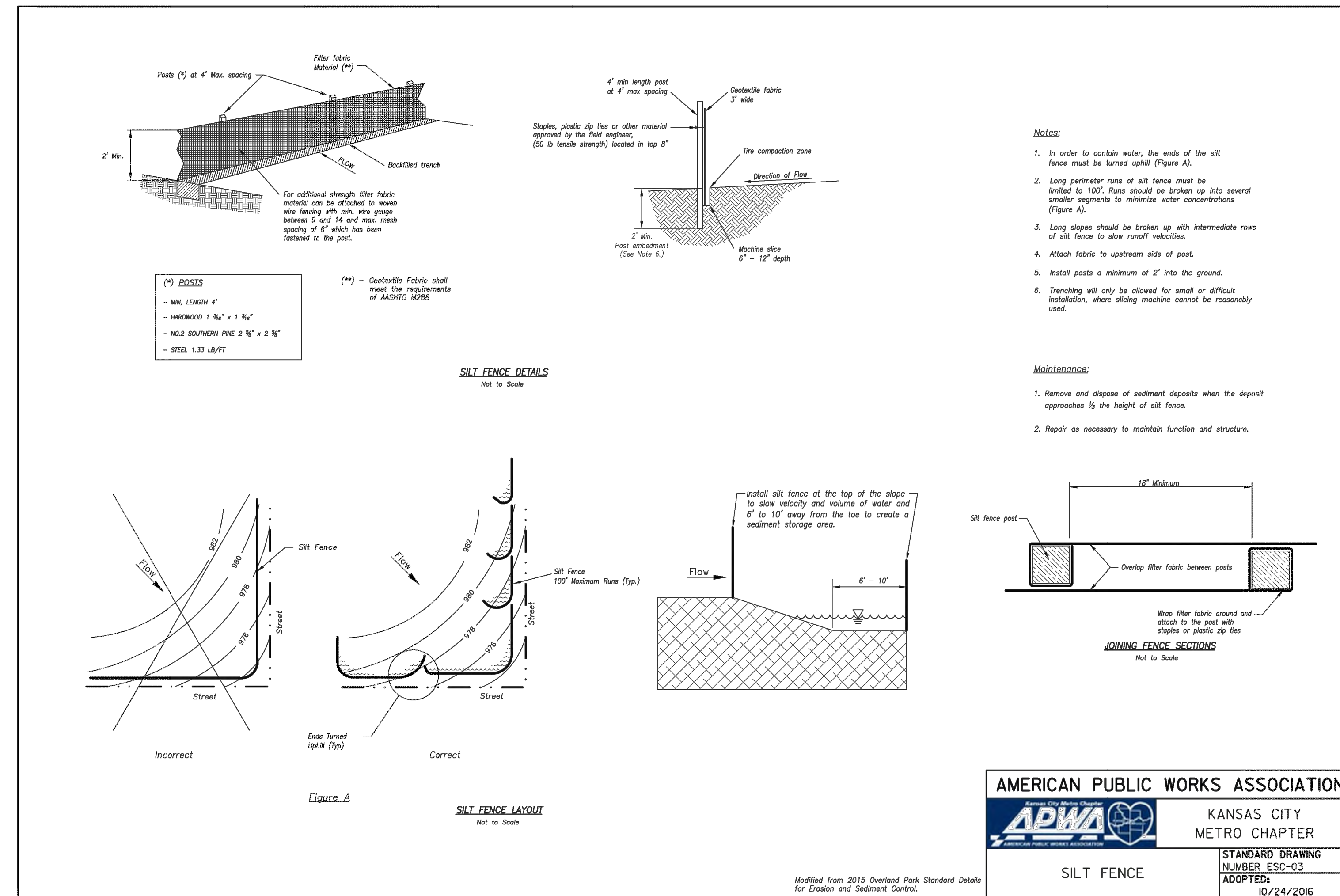
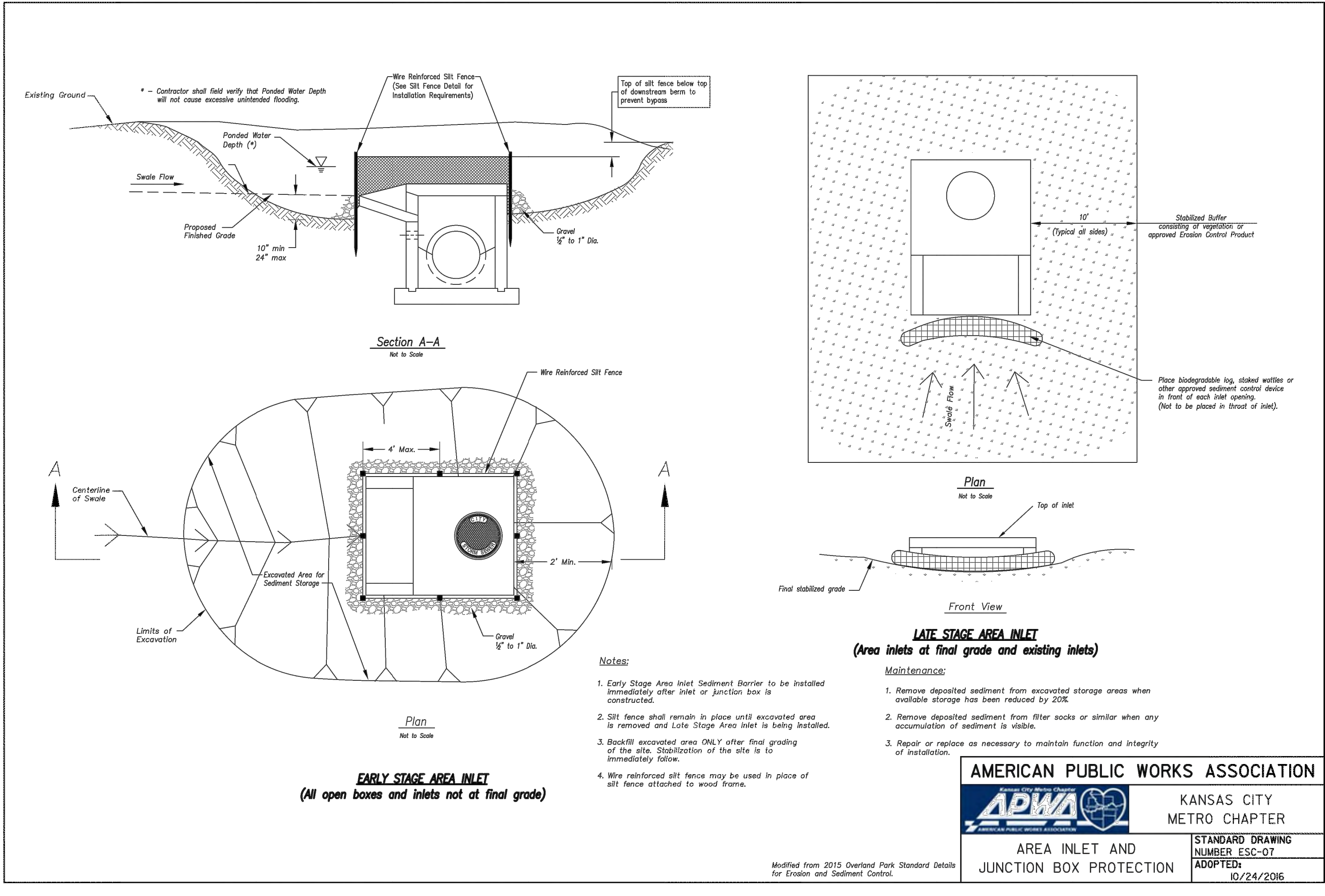
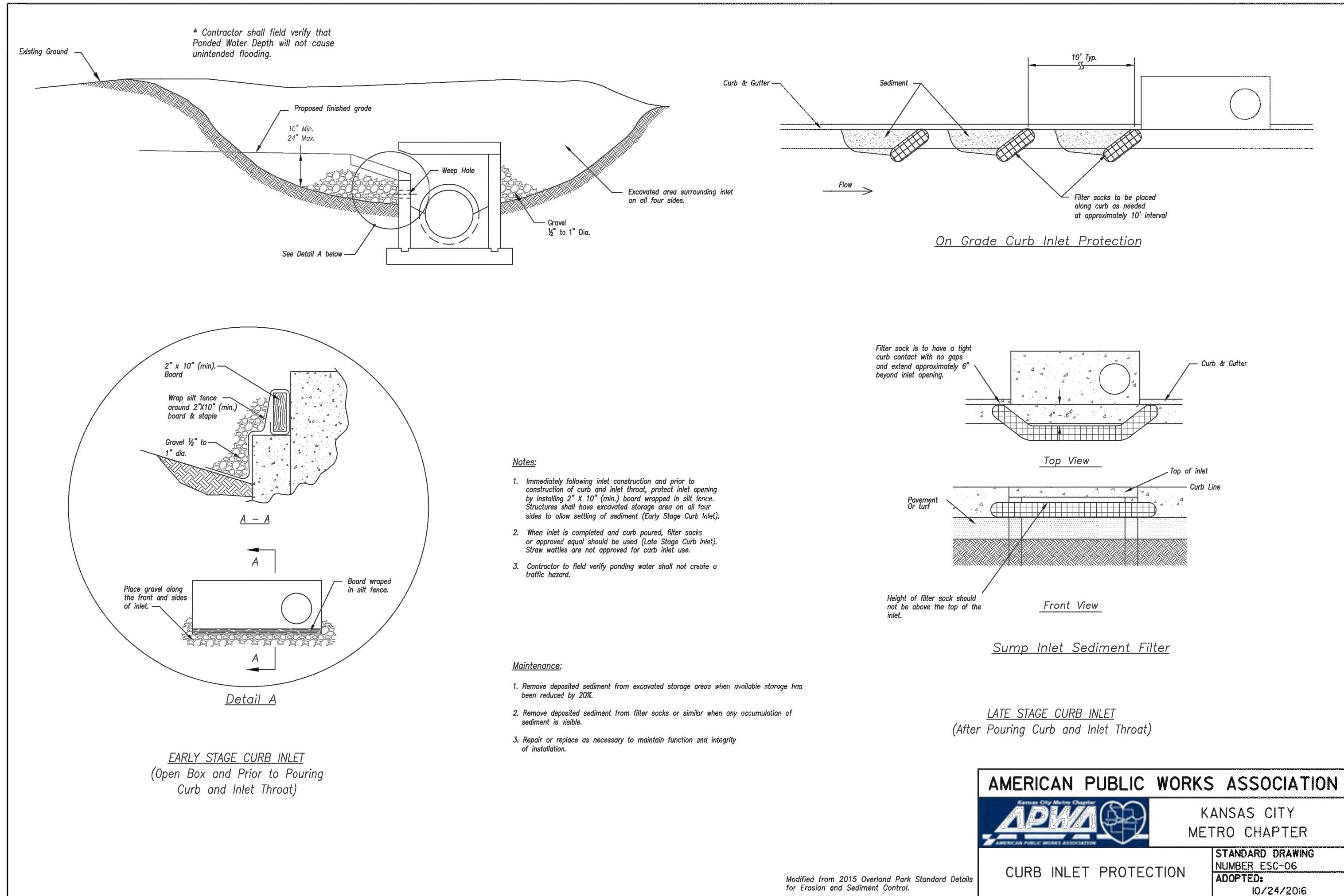
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SEAL OF MISSOURI
CHRISTIAN J. CROWDER
PE-2015000538
9.9.22
EXPIRES 12/31/23

Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW EROSION
CONTROL DETAILS

C290-A



Lee's Summit Robotics, GIC & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

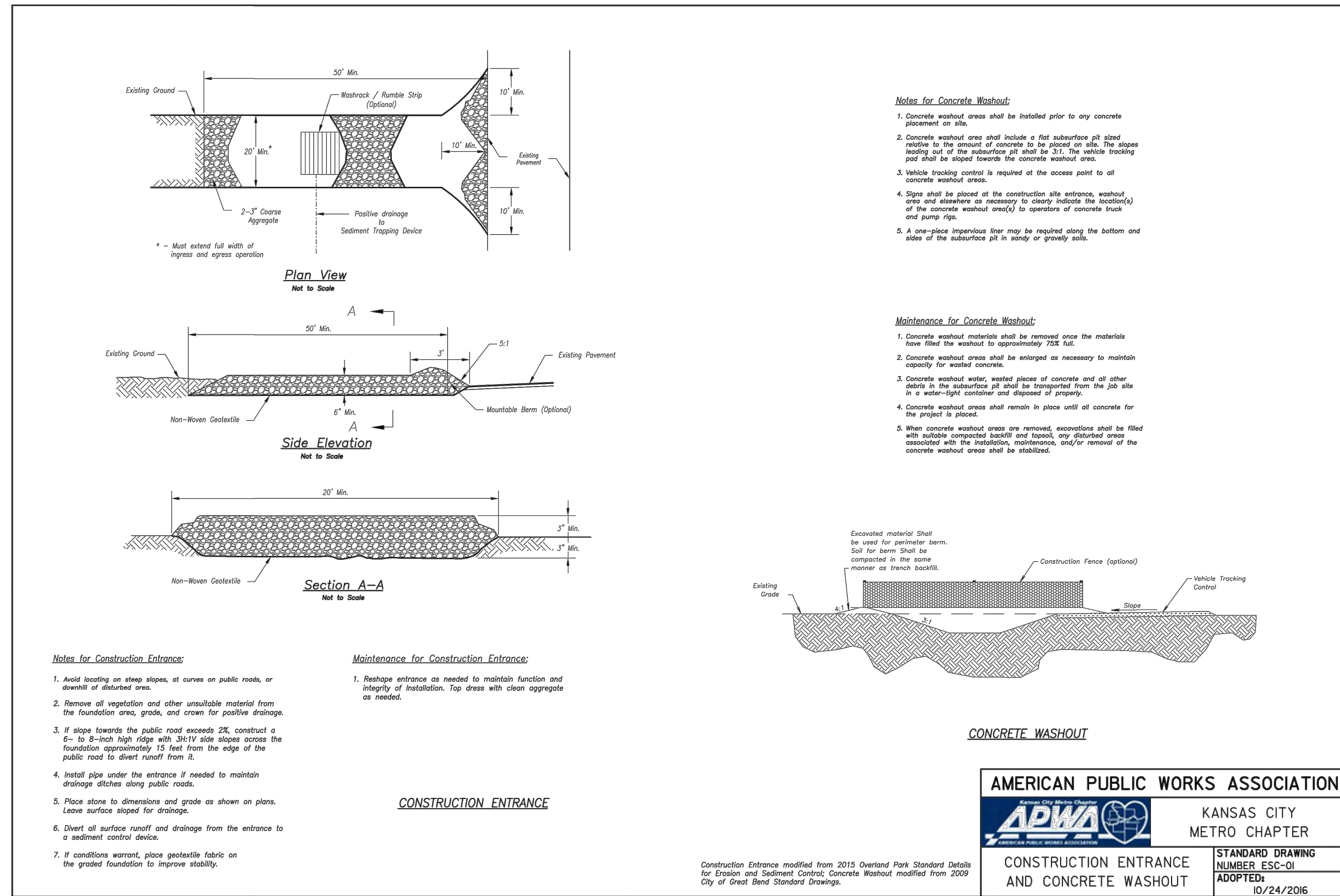
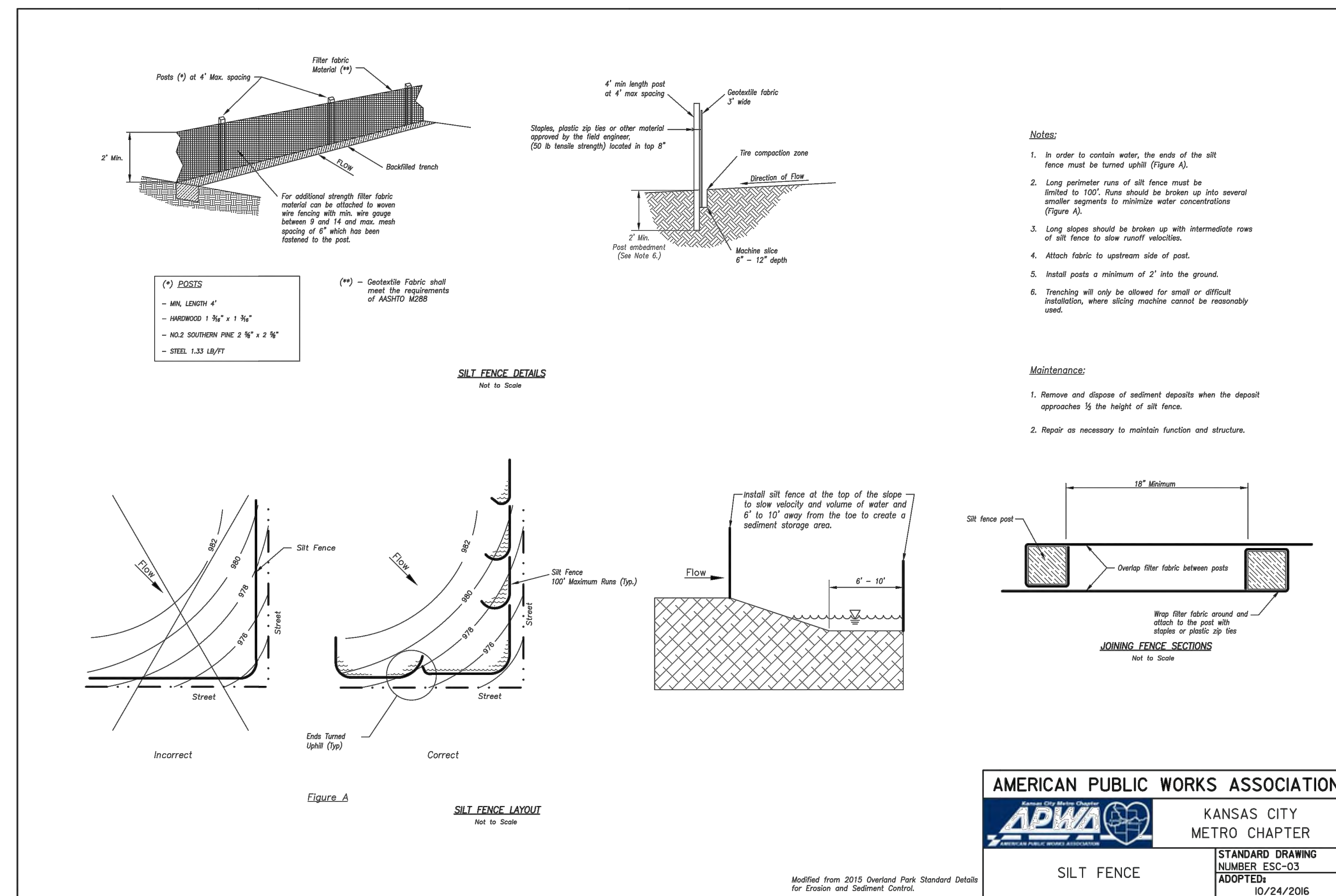
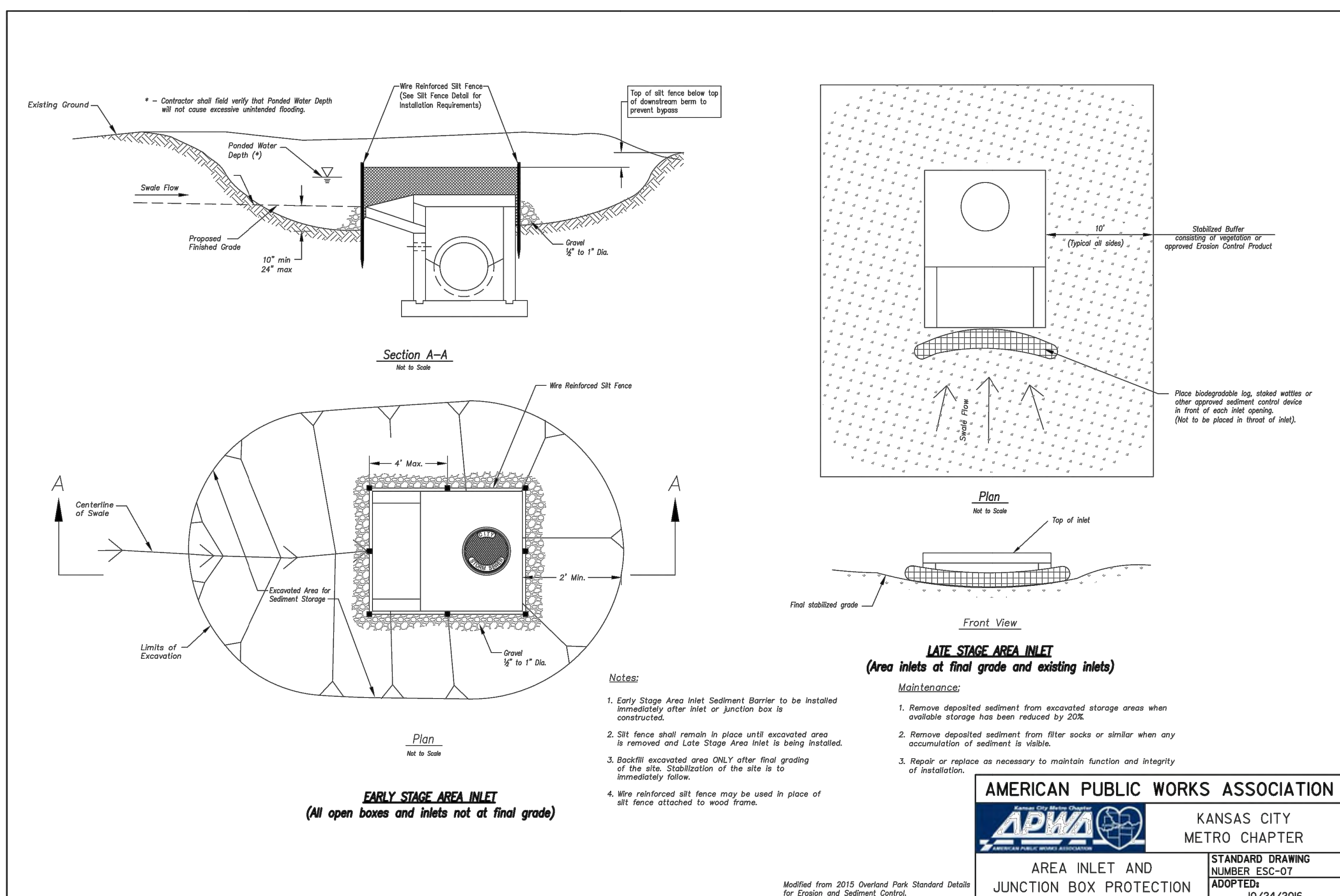
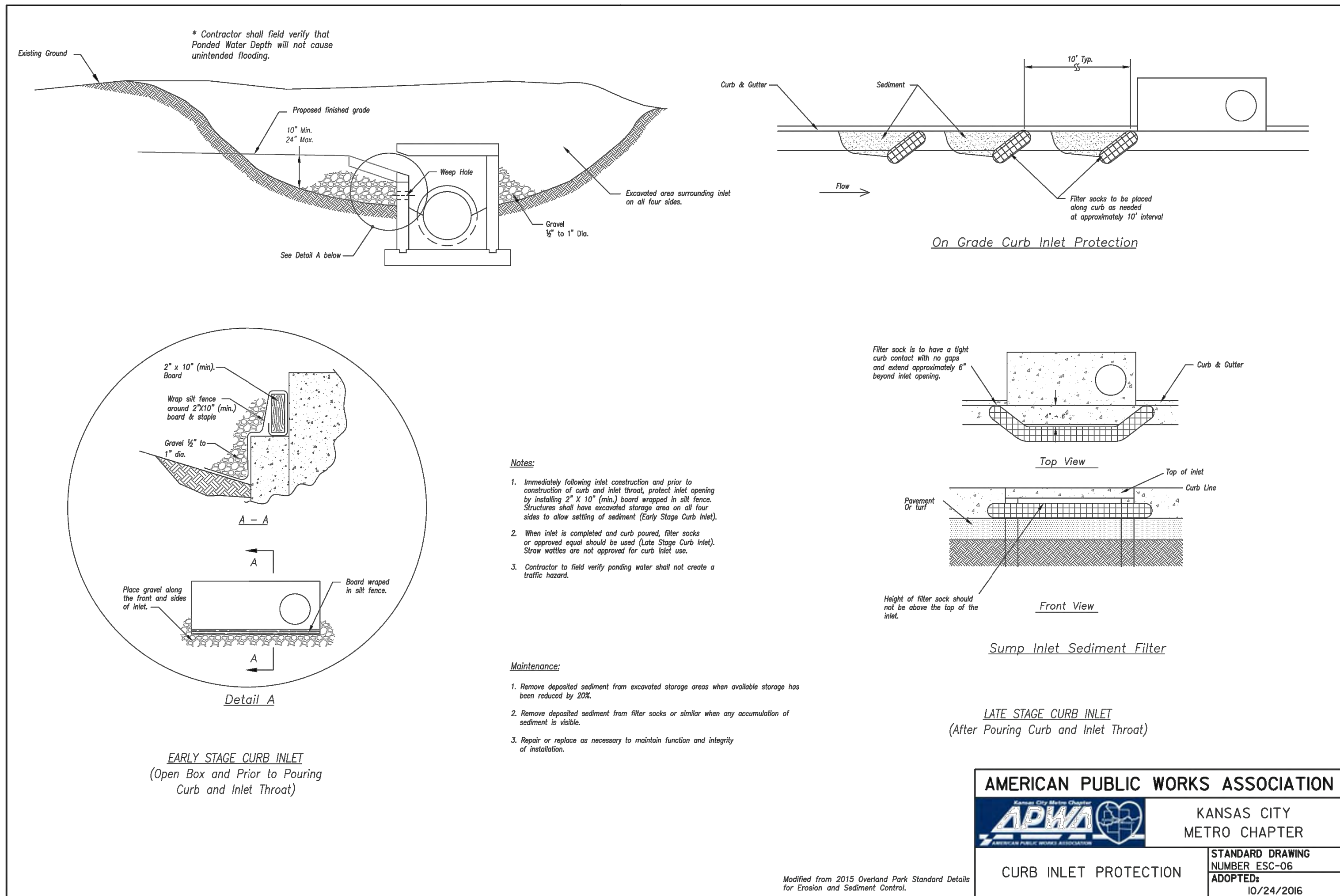
owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect: multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveg.com

structural engineer: Bob D. Campbell &
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MEP/EI/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com



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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSN EROSION CONTROL DETAILS

C290-B

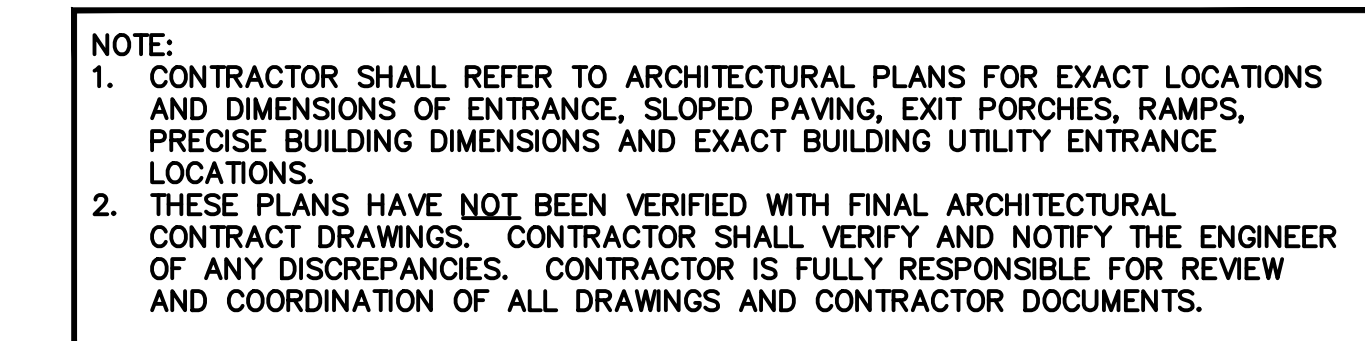
PROJ. NO. C21-1241 DSN: CJC
CPL: 1241DET DWN: NJN
ENGINEER
MO # 2015000538
14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215
PH. (913) 894-5150 | FAX (913) 894-5977
k@kveg.com | www.kveg.com

KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/23

Project Number: 0121-0

MEPFT/Code::
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com



CAUTION – NOTICE TO CONTRACTOR
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SAFETY NOTICE TO CONTRACTOR

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.



**Know what's below.
Call before you dig**

The logo for Kaw Valley Engineering features a stylized 'KEV' in large, bold, black letters. To the right of the logo, the company name 'KAW VALLEY ENGINEERING' is written in a bold, black, sans-serif font. Below the company name, the text 'A KANSAS CORPORATION' is written in a smaller, black, sans-serif font. To the left of the company name, the text 'PROJ. NO. C21-1242' and 'CITY: 1242GP' is written in a black, sans-serif font. To the right of the company name, the text 'DSN: CJC' and 'DWN: NJN' is written in a black, sans-serif font. To the right of the company name, the text 'CHRISTIAN J. CROWDER' and 'ENGINEER' is written in a black, sans-serif font. To the right of the company name, the text 'MO # 2015000538' is written in a black, sans-serif font. To the right of the company name, the text '14700 WEST 114TH TERRACE' and 'LENEXA, KANSAS 66219' is written in a black, sans-serif font. To the right of the company name, the text 'PH. (913) 894-5150' and 'FAX (913) 894-5977' is written in a black, sans-serif font. To the right of the company name, the text 'lx@kvenveng.com' and 'www.kvenveng.com' is written in a black, sans-serif font. Below the company name, the text 'KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER' and 'ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF' and 'AUTHORITY # 000842. EXPIRES 12/31/23' is written in a black, sans-serif font.

UNLESS A PROFESSIONAL SEAL WITH SIGNATURE AND DATE IS
AFFIXED, THIS DOCUMENT IS PRELIMINARY AND IS NOT INTENDED
FOR CONSTRUCTION. RECORDING PURPOSES OR INSTRUMENTATION.



Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000

SW GRADING PLAN

C300-A

Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner:
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301 NE Tudor Road
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architect:
Multistudio
4200 Pennsylvania
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civil engineer:
Kaw Valley Engineering
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Lenexa, KS 66215
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Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSN GRADING PLAN

C300-B

NOTES:

- 22 MATCH EXISTING SIDEWALK ELEVATION.
- 23 MATCH EXISTING PAVEMENT ELEVATION.
- 24 MATCH EXISTING CURB ELEVATION.

LEGEND (PROPOSED)

- 23.4 BACK OF CURB ELEVATION (ADD 1000),
- 22.9 FLOWLINE OF CURB ELEVATION (ADD 1000),
- 22.9 SPOT ELEVATION (ADD 1000),
- FINISHED 1' CONTOUR INTERVALS,
TOP OF PAVEMENT
- EXISTING GROUND CONTOUR (1' INTERVALS)
- SWALE
- LP LOW POINT
- HP HIGH POINT

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS
FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE,
SLOPED PAVING, EXIT PORCHES, RAMPS, PRECISE
BUILDING DIMENSIONS AND EXACT BUILDING UTILITY
ENTRANCE LOCATIONS.
2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL
ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR
SHALL VERIFY AND NOTIFY THE ENGINEER OF ANY
DISCREPANCIES. CONTRACTOR IS FULLY RESPONSIBLE
FOR REVIEW AND COORDINATION OF ALL DRAWINGS
AND CONTRACTOR DOCUMENTS.

GRADING NOTES:

- THE CONSTRUCTION AREA SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL AND ORGANIC MATTER FROM ALL AREAS TO BE OCCUPIED BY BUILDING AND PAVING. TOPSOIL FOR REPLACEMENT ON SLOPES MAY BE STOCKPILED ON SITE. EXCESS TOPSOIL MAY BE WASTED IN FILL SLOPES PROVIDED THAT NO TOPSOIL WILL BE WASTED WITHIN 10 FEET OF THE EDGE OF THE BUILDING OR PARKING AREA. BURNING OF TIMBER WILL NOT BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM GOVERNING OFFICIALS. STRIPPING EXISTING TOPSOIL AND ORGANIC MATTER SHALL BE TO A MINIMUM DEPTH OF 6 INCHES. CONSTRUCTION MANAGER SHALL DESIGNATE LOCATION OF STOCKPILE AREAS DURING CONSTRUCTION. ANY UNAUTHORIZED STOCKPILE SHALL BE REMOVE/RELOCATED AT THE CONTRACTORS EXPENSE.
- AREAS TO RECEIVE FILL SHALL BE SCARIFIED AND THE TOP 12-INCH DEPTH COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698 WITH A MOISTURE CONTENT OF +/-3% OF OPTIMUM FOR SOILS WITH A LIQUID LIMIT OF LESS THAN 40 AND 0 TO +4% FOR SOILS WITH A LIQUID LIMIT GREATER THAN 40. ANY UNSUITABLE AREAS SHALL BE UNDERCUT AND REPLACED WITH SUITABLE MATERIAL BEFORE ANY FILL MATERIAL CAN BE APPLIED.
- OFF-SITE SOIL MATERIAL FOR USE UNDER BUILDING AND PAVED AREAS SHALL HAVE A PLASTICITY INDEX OF 25 OR LESS, A LIQUID LIMIT OF 45 OR LESS AND CONTAIN NO ROCK LARGER THAN THREE INCHES. OFF-SITE FILL MATERIAL SHALL BE APPROVED BY THE OWNER'S TESTING AGENCY PRIOR TO BRINGING ON SITE.
- EARTHWORK UNDER THE BUILDING, PAVING AND LIGHTLY LOADED STRUCTURAL FEATURES SHALL COMPLY WITH THE CONTRACT DOCUMENTS AND PROJECT GEOTECHNICAL REPORT. THE BUILDING PAD SHALL BE EXCAVATED AS REQUIRED TO ALLOW THE PLACEMENT OF LOW VOLUME CHANGE MATERIAL. REFER TO GEOTECHNICAL REPORT FOR PREPARING BUILDING PAD AND LOW VOLUME CHANGE THICKNESS REQUIREMENTS. OTHER FILL MATERIAL SHALL BE MADE IN LIFTS NOT TO EXCEED EIGHT INCHES DEPTH COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698. LVC SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT OF 0 TO +4% OF OPTIMUM FOR SOILS WITH A LIQUID LIMIT GREATER THAN 40 AND +/-3% OF OPTIMUM FOR SOILS WITH A LIQUID LIMIT LESS THAN 40. NO ROCK LARGER THAN THREE INCHES IN ANY DIMENSION NOR ANY SHALE SHALL BE PLACED IN THE TOP 24 INCHES OF EMBANKMENT.
- AREAS THAT ARE TO BE CUT TO SUBGRADE LEVELS SHALL BE PROOF ROLLED WITH A LOADED DUMP TRUCK OR SIMILAR APPROVED CONSTRUCTION EQUIPMENT TO DETECT UNSUITABLE SOIL CONDITIONS.
- IN ALL AREAS OF EXCAVATION, IF UNSUITABLE SOIL CONDITIONS ARE ENCOUNTERED, THE OWNER'S ENGINEER SHALL RECOMMEND TO THE OWNER THE METHODS OF UNDERCUTTING AND REPLACEMENT OF PROPERLY COMPACTED, APPROVED FILL MATERIAL. ALL PROOFROLLING AND UNDERCUTTING SHOULD BE PERFORMED DURING A PERIOD OF DRY WEATHER.
- ALL EXCAVATIONS SHALL BE CONSIDERED AS UNCLASSIFIED. REFER TO PROJECT GEOTECHNICAL REPORT.
- ALL DISTURBED SLOPES ARE TO BE 3:1 OR FLATTER.
- ALL SLOPES DISTURBED EXCEEDING 4:1 SHALL BE HYDROSEEDDED, SODDED OR PROTECTED BY EROSION CONTROL BLANKETS THAT WILL PREVENT EROSION AND PLACED SUCH THAT THE SURFACE IS FLUSH WITH SURROUNDING GROUND AND SHAPED TO CHANNEL WATER IN DIRECTIONS INDICATED. SEE GENERAL NOTES ON THIS SHEETS.
- ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND A MINIMUM OF FOUR INCHES OF TOPSOIL APPLIED, IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON-SITE, THE CONTRACTOR SHALL PROVIDE TOPSOIL, APPROVED BY THE OWNER, AS NEEDED. THE AREA SHALL THEN BE SODDED OR SEEDED. FERTILIZED, MULCHED, WATERED AND MAINTAINED UNTIL HARDY GRASS GROWTH IS ESTABLISHED IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF THE PROJECT. REFER TO THE NOTES ON THIS SHEET FOR TEMPORARY SEEDING SPECIFICATIONS. REFER TO PROJECT SITE PLAN FOR FINAL STABILIZATION TREATMENTS.
- CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.
- IT IS NOT THE DUTY OF THE ENGINEER OR THE OWNER TO REVIEW THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE AT ANY TIME DURING CONSTRUCTION.
- IF ANY OF THESE NOTES CONFLICT WITH THE PROJECT GEOTECHNICAL REPORT AND ALL ADDENDUMS PREPARED BY CFS ENGINEERS DATED AUGUST 3, 2022 (CFS PROJECT NO. 22-5545), RECOMMENDATIONS IN GEOTECHNICAL REPORT SHALL GOVERN.

WARRANTY / DISCLAIMER

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SAFETY NOTICE TO CONTRACTOR

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

CAUTION - NOTICE TO CONTRACTOR

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

PROJ. NO. C21-1241 DSN: CJC
CIN: 1241GP DWN: NJN
ENGINEER
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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER
ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF
AUTHORITY # 000842. EXPIRES 12/31/23

Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

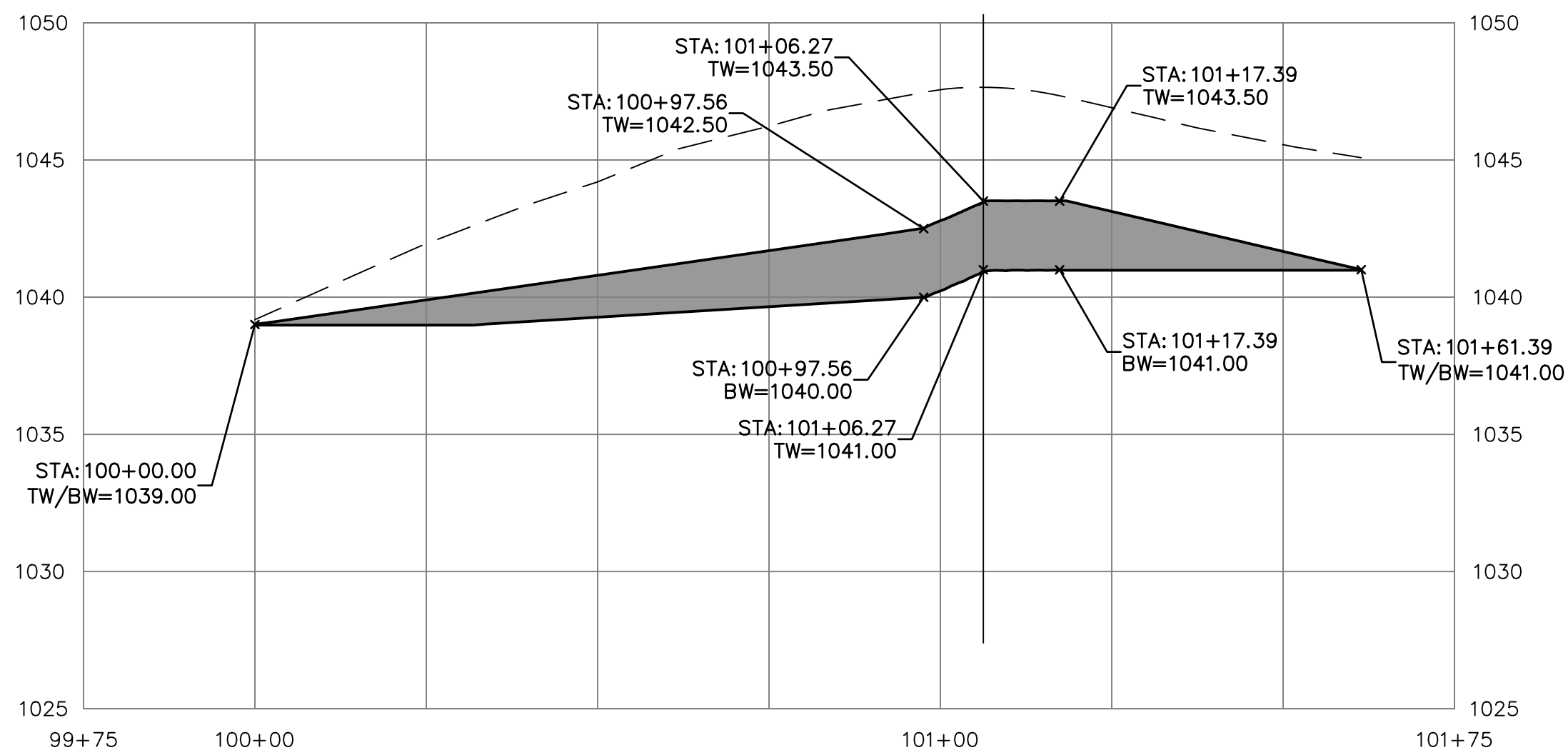
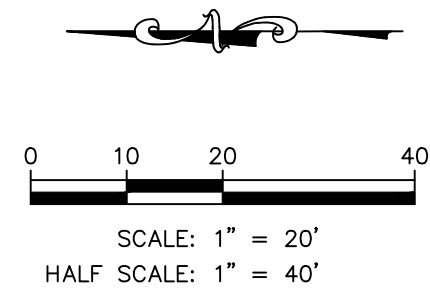
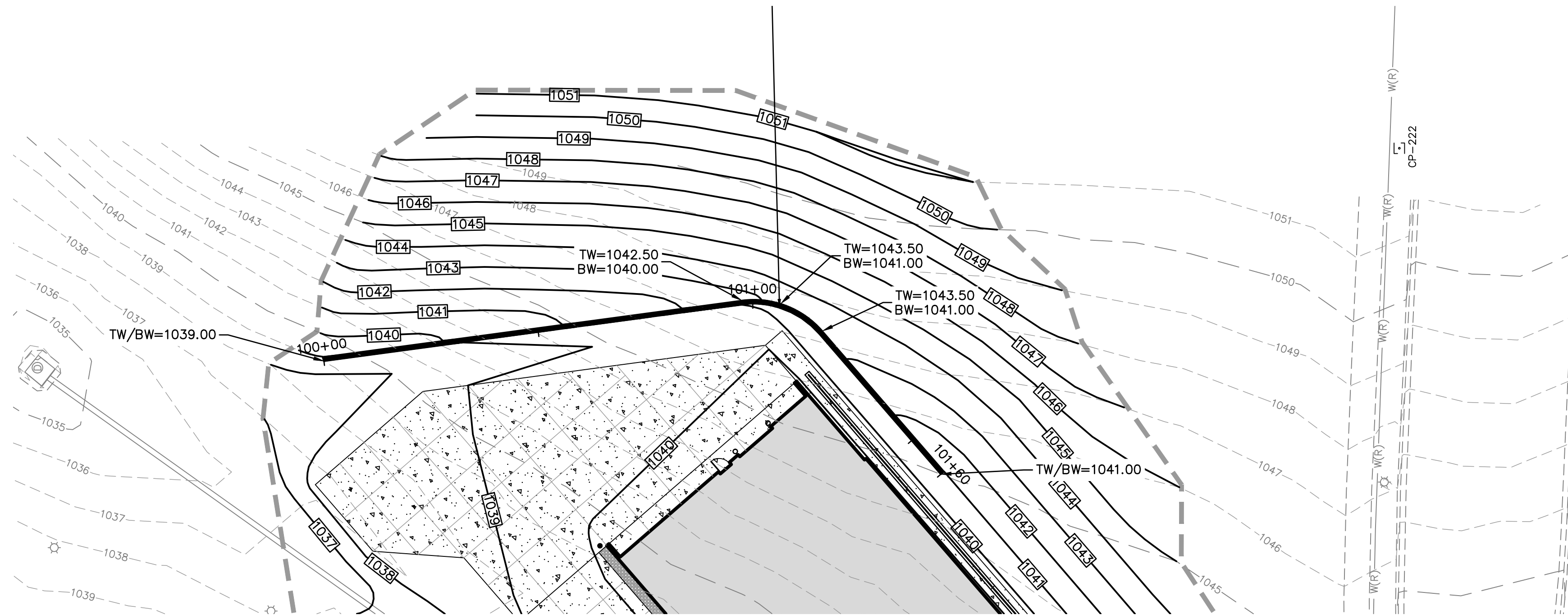
owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect: Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
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structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
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MEP/IT/Code: Henderson Engineers
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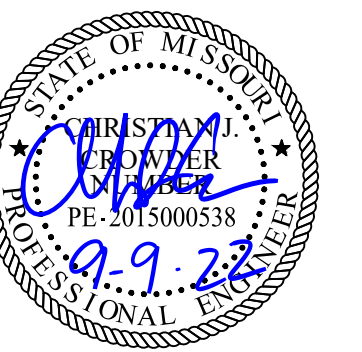


Issue Date: September 9, 2022

Revisions

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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW RETAINING WALL
PLAN AND PROFILE

C310-A

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LENEXA, KANSAS 66215
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x@kveng.com | www.kveng.com

DSN: ENGINEER
DWN: MO # 2015000538

CHRISTIAN J. CROWDER
ENGINEER

KAW VALLEY ENGINEERING

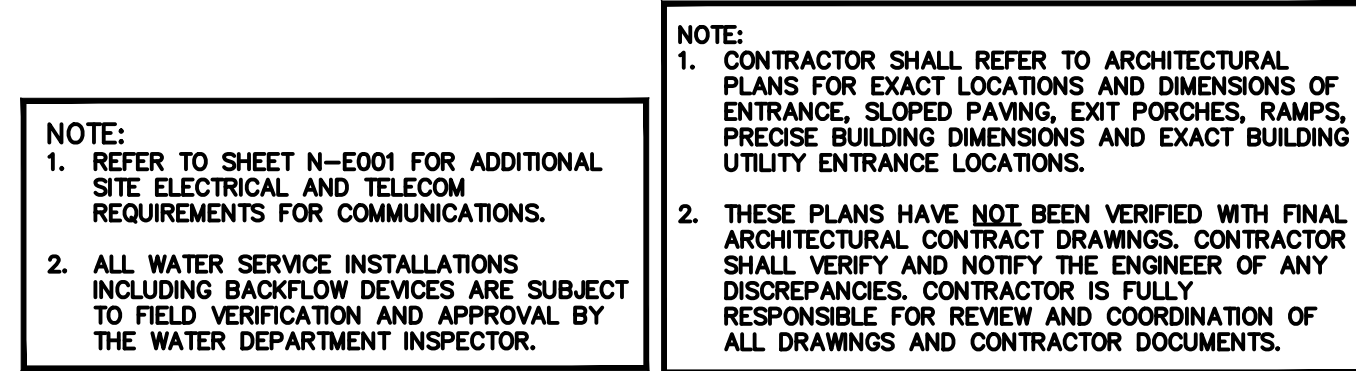
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Project Number: 0121-0100

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kveng.com

structural engineer:
Bob D. Campbell &
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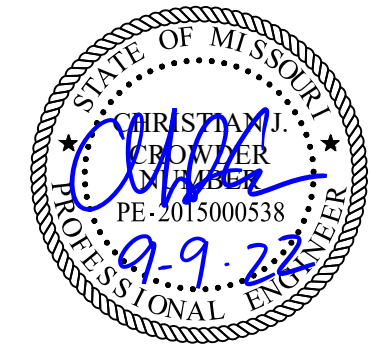
**Know what's below.
Call before you dig.**

The logo for Kaw Valley Engineering is a stylized 'KV' inside a circle. To the right of the logo, the company name 'KAW VALLEY ENGINEERING' is written in a bold, sans-serif font. Below the logo and name, the text 'KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000942. EXPIRES 12/31/23' is displayed in a smaller font. To the right of the logo, contact information is listed: 'CHRISTIAN J. CROWDER ENGINEER MO # 2015000538', '14700 WEST 11TH TERRACE LENEXA, KANSAS 66215', 'PH. (913) 894-5150 | FAX (913) 894-5977', and 'lw@kvenveng.com | www.kvenveng.com'.

Issue Date: September 9, 202

Revisions		
NUMBER	DESCRIPTION	DATE

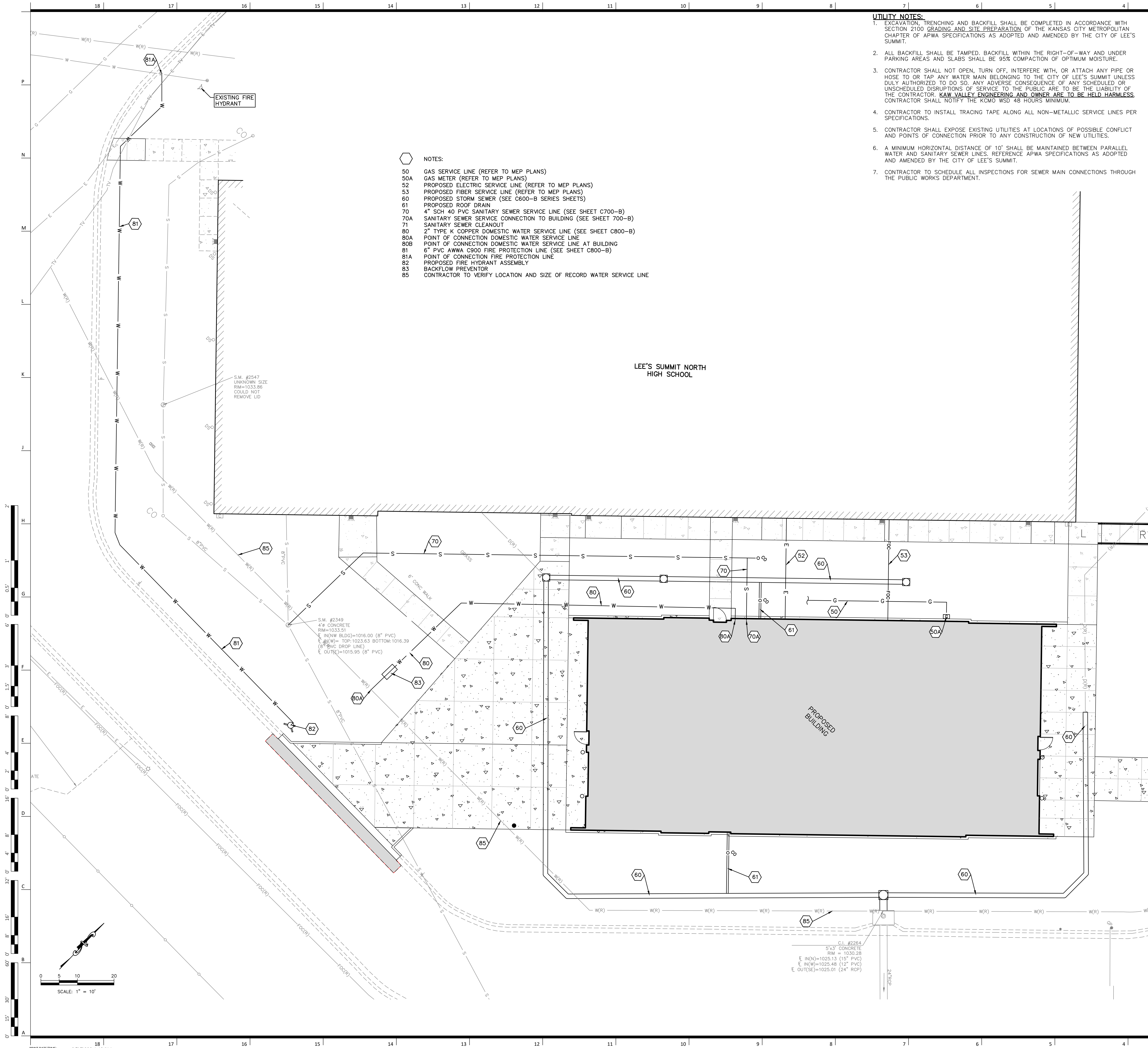
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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-201500053

LSW UTILITY SHEET

C500-A



Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO
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LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

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Lenexa, KS 66214
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www.hendersonengineers.com

Issue Date: September 9, 2022

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Call before you dig.

NOTE:
1. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRANCE, SLOPED PARKING, EXIT PORCHES, RAMP, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS AND EXISTING BUILDING UTILITY ENTRANCE LOCATIONS.

2. THESE PLANS HAVE NOT BEEN VERIFIED WITH FINAL ARCHITECTURAL CONTRACT DRAWINGS. CONTRACTOR SHALL VERIFY AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR IS FULLY RESPONSIBLE FOR REVIEW AND COORDINATION OF ALL DRAWINGS AND CONTRACTOR DOCUMENTS.

NOTE:
1. REFER TO A AND E SERIES SHEETS FOR ADDITIONAL SITE ELECTRICAL AND TELECOM REQUIREMENTS FOR SITE ELECTRICAL, LIGHTING AND SIGNAGE.
2. ALL WATER SERVICE INSTALLATIONS INCLUDING BACKFLOW DEVICES ARE SUBJECT TO FIELD VERIFICATION AND APPROVAL BY THE WATER DEPARTMENT INSPECTOR.

WARRANTY / DISCLAIMER
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PROJ. NO. C21-1241 DSN: CJC CHRISTIAN J. CROWDER
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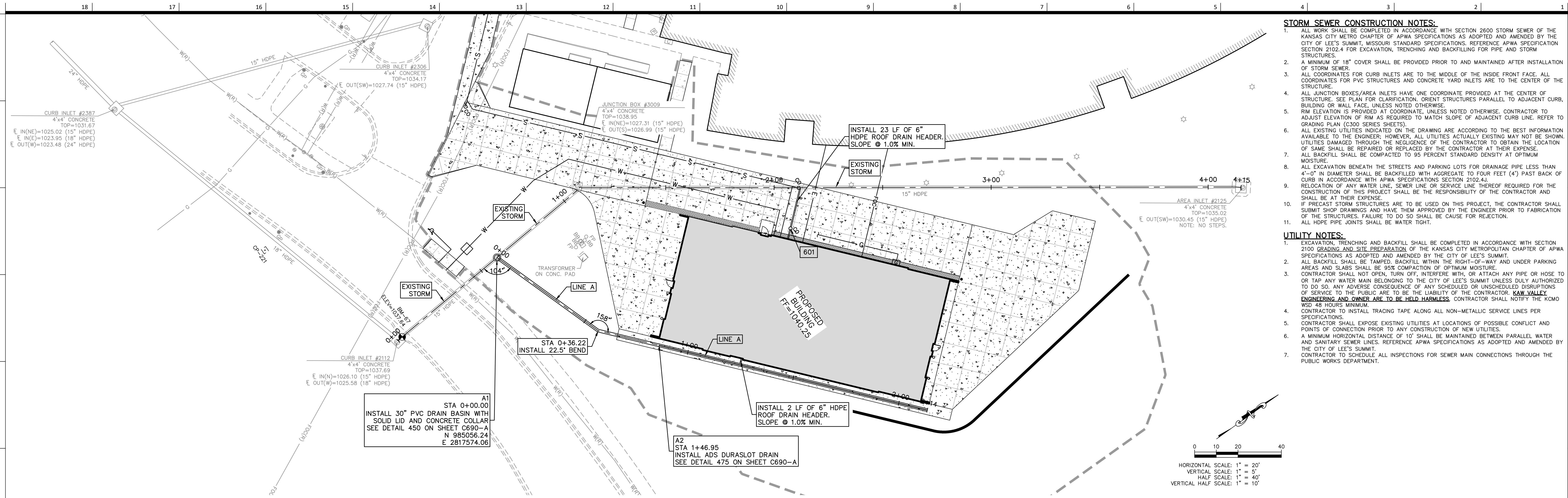
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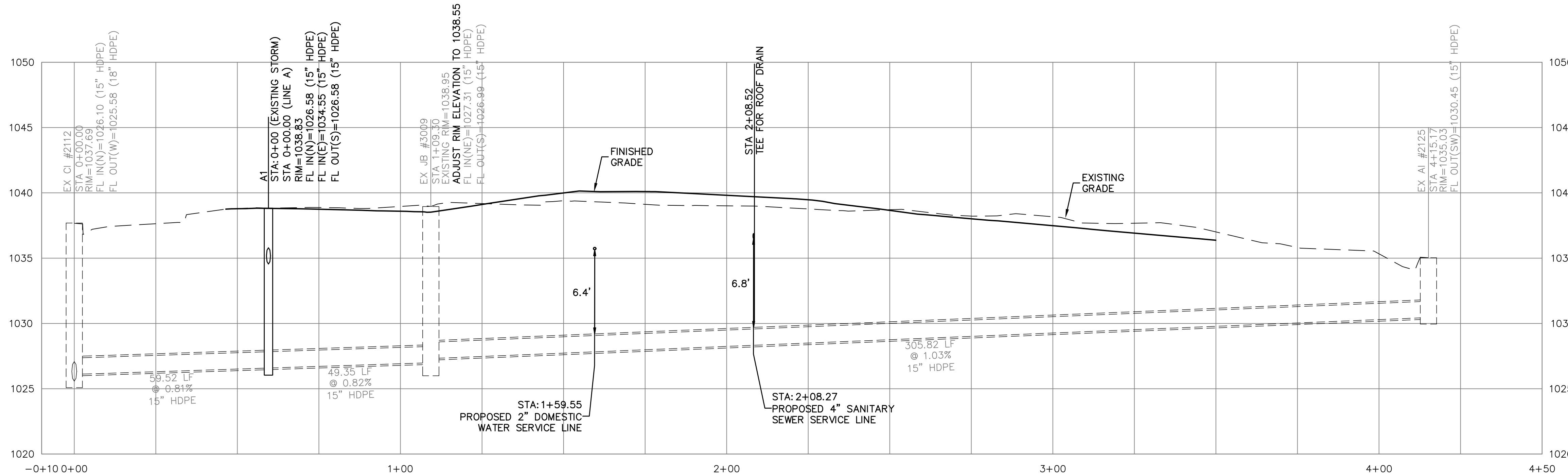
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Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSN UTILITY PLAN

C500-B



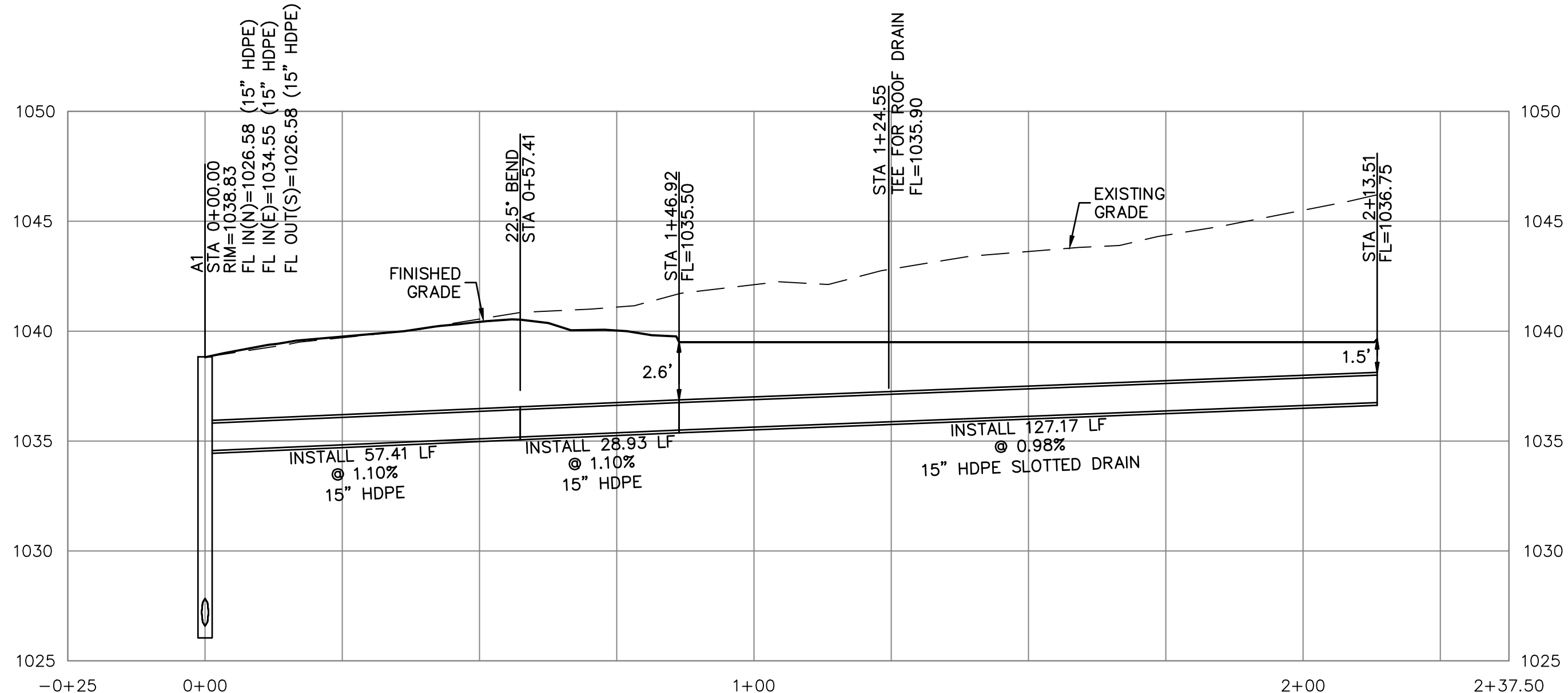
STORM PLAN VIEW



PROPOSED STORM PROFILE VIEW

LEGEND:

- | | | | |
|--|-------------------------------------|--|--------------------------------------|
| | CONTROL POINT | | SANITARY SEWER LINE |
| | BENCHMARK | | PVC POLYVINYL CHLORIDE PIPE |
| | PULL BOX | | HDPE HIGH DENSITY POLYETHYLENE |
| | YARD LIGHT | | STREET/TRAFFIC SIGN |
| | LIGHT POLE | | DE DOOR ELEVATION |
| | ELECTRIC METER | | FF FINISH FLOOR ELEVATION |
| | WALL MOUNTED CAMERA | | BHE BUILDING HEIGHT/ELEVATION |
| | BREAKER BOX | | B/B BACK TO BACK OF CURB MEASUREMENT |
| | UNDERGROUND GAS | | E/E EDGE TO EDGE OF ASPHALT |
| | GAS METER | | C/C EDGE TO EDGE OF CONCRETE |
| | GAS RISER | | L/S LANDSCAPING AREA |
| | WATER LINE (RECORD) | | BOLLARD |
| | WATER METER | | GATE POST |
| | WATER LINE GATE VALVE | | FENCE POST |
| | FIRE HYDRANT | | EXISTING SPOT ELEVATION |
| | SPRINKLER CONTROL BOX | | EXISTING GRADE 1' CONTOUR |
| | WATER MANHOLE | | EXISTING GRADE 5' CONTOUR |
| | WALL MOUNTED SIAMESE FIRE CONNECTOR | | ASPHALT PAVEMENT (040) |
| | SANITARY SEWER MANHOLE | | HEAVY DUTY ASPHALT PAVEMENT (041) |
| | STORM SEWER MANHOLE | | CONCRETE PAVEMENT (042) |



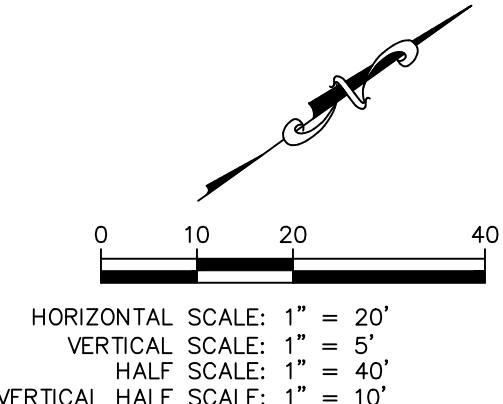
PROPOSED TRENCH DRAIN PROFILE VIEW

STORM SEWER CONSTRUCTION NOTES:

- ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 2600 STORM SEWER OF THE KANSAS CITY METRO CHAPTER OF APWA SPECIFICATIONS AS ADOPTED AND AMENDED BY THE CITY OF LEE'S SUMMIT, MISSOURI STANDARD SPECIFICATIONS, REFERENCE APWA SPECIFICATION SECTION 2102.4 FOR EXCAVATION, TRENCHING AND BACKFILLING FOR PIPE AND STORM STRUCTURES.
- A MINIMUM OF 18" COVER SHALL BE PROVIDED PRIOR TO AND MAINTAINED AFTER INSTALLATION OF STORM SEWER.
- ALL COORDINATES FOR CURB INLETS ARE TO THE MIDDLE OF THE INSIDE FRONT FACE. ALL COORDINATES FOR PVC STRUCTURES AND CONCRETE YARD INLETS ARE TO THE CENTER OF THE STRUCTURE.
- ALL JUNCTION BOXES/AREA INLETS HAVE ONE COORDINATE PROVIDED AT THE CENTER OF STRUCTURE. SEE PLAN FOR CLARIFICATION. ORIENT STRUCTURES PARALLEL TO ADJACENT CURB, BUILDING OR WALL FACE, UNLESS NOTED OTHERWISE.
- RM ELEVATION IS PROVIDED AT COORDINATE. UNLESS NOTED OTHERWISE, CONTRACTOR TO ADJUST ELEVATION OF RM AS REQUIRED TO MATCH SLOPE OF ADJACENT CURB LINE. REFER TO GRADING PLAN (C300 SERIES SHEETS).
- ALL EXISTING UTILITIES INDICATED ON THE DRAWING ARE ACCORDING TO THE BEST INFORMATION AVAILABLE TO THE ENGINEER. HOWEVER, ALL UTILITIES ACTUALLY EXISTING MAY NOT BE SHOWN. UTILITIES DAMAGED THROUGH THE NECESSITY OF THE CONTRACTOR TO OBTAIN THE LOCATION OF SAME SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE.
- ALL BACKFILL SHALL BE COMPACTED TO 95 PERCENT STANDARD DENSITY AT OPTIMUM MOISTURE.
- ALL EXCAVATION BENEATH THE STREETS AND PARKING LOTS FOR DRAINAGE PIPE LESS THAN 4'-0" IN DIAMETER SHALL BE BACKFILLED WITH AGGREGATE TO FOUR FEET (4') PAST BACK OF CURB IN ACCORDANCE WITH APWA SPECIFICATIONS SECTION 2102.4.
- RELOCATION OF ANY WATER LINE, SEWER LINE OR SERVICE LINE THEREOF REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE AT THEIR EXPENSE.
- IF PRECAST STORM STRUCTURES ARE TO BE USED ON THIS PROJECT, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND HAVE THEM APPROVED BY THE ENGINEER PRIOR TO FABRICATION OF THE STRUCTURES. FAILURE TO DO SO SHALL BE CAUSE FOR REJECTION.
- ALL HDPE PIPE JOINTS SHALL BE WATER TIGHT.

UTILITY NOTES:

- EXCAVATION, TRENCHING AND BACKFILL SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 2100 GRADING AND SITE PREPARATION OF THE KANSAS CITY METROPOLITAN CHAPTER OF APWA SPECIFICATIONS AS ADOPTED AND AMENDED BY THE CITY OF LEE'S SUMMIT.
- ALL BACKFILL SHALL BE TAMPED, BACKFILL WITHIN THE RIGHT-OF-WAY AND UNDER PARKING AREAS AND SLABS SHALL BE 95% COMPACTION OF OPTIMUM MOISTURE.
- CONTRACTOR SHALL NOT OPEN, TURN OFF, INTERFERE WITH, OR ATTACH ANY PIPE OR HOSE TO OR TAP ANY WATER MAIN BELONGING TO THE CITY OF LEE'S SUMMIT UNLESS DULY AUTHORIZED TO DO SO. ANY ADVERSE CONSEQUENCE OF ANY UNSCHEDULED DISRUPTIONS OF SERVICE TO THE PUBLIC ARE TO BE THE LIABILITY OF THE CONTRACTOR. KAW VALLEY ENGINEERING AND OWNER ARE TO BE HELD HARMLESS. CONTRACTOR SHALL NOTIFY THE KCMO WEB 48 HOURS MINIMUM.
- CONTRACTOR TO INSTALL TRACING TAPE ALONG ALL NON-METALLIC SERVICE LINES PER SPECIFICATIONS.
- CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICT AND POINTS OF CONNECTION PRIOR TO ANY CONSTRUCTION OF NEW UTILITIES.
- A MINIMUM HORIZONTAL DISTANCE OF 10' SHALL BE MAINTAINED BETWEEN PARALLEL WATER AND SANITARY SEWER LINES. REFERENCE APWA SPECIFICATIONS AS ADOPTED AND AMENDED BY THE CITY OF LEE'S SUMMIT.
- CONTRACTOR TO SCHEDULE ALL INSPECTIONS FOR SEWER MAIN CONNECTIONS THROUGH THE PUBLIC WORKS DEPARTMENT.



- DETAILS SEE SHEET C690-A
- 450 PVC DRAIN BASIN
 - 475 SLOTTED DRAIN (ADS)
 - 601 CLEANOUT

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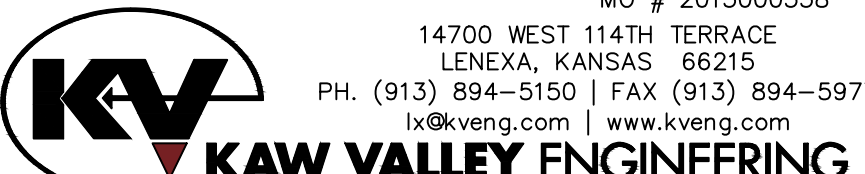
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Know what's below.
Call before you dig.



KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/23.



Lee's Summit Robotics, Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect: Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveg.com

structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

MEP/IT/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW STORM PLAN AND PROFILE

C600-A

Lee's Summit Robotics,
Gic & Phys Educaiton

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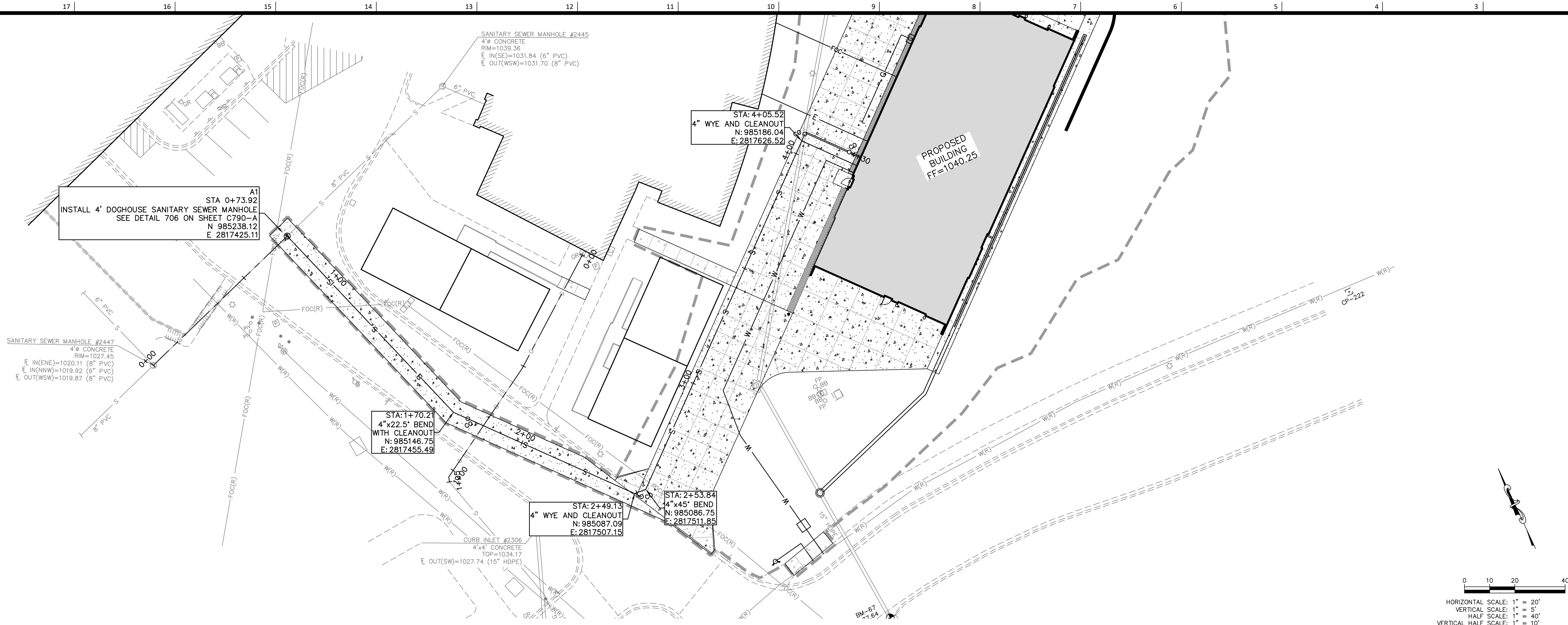
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SEAL OF MISSOURI
Professional Engineer
Christian Crowder
PE-2015000538
9.9.22

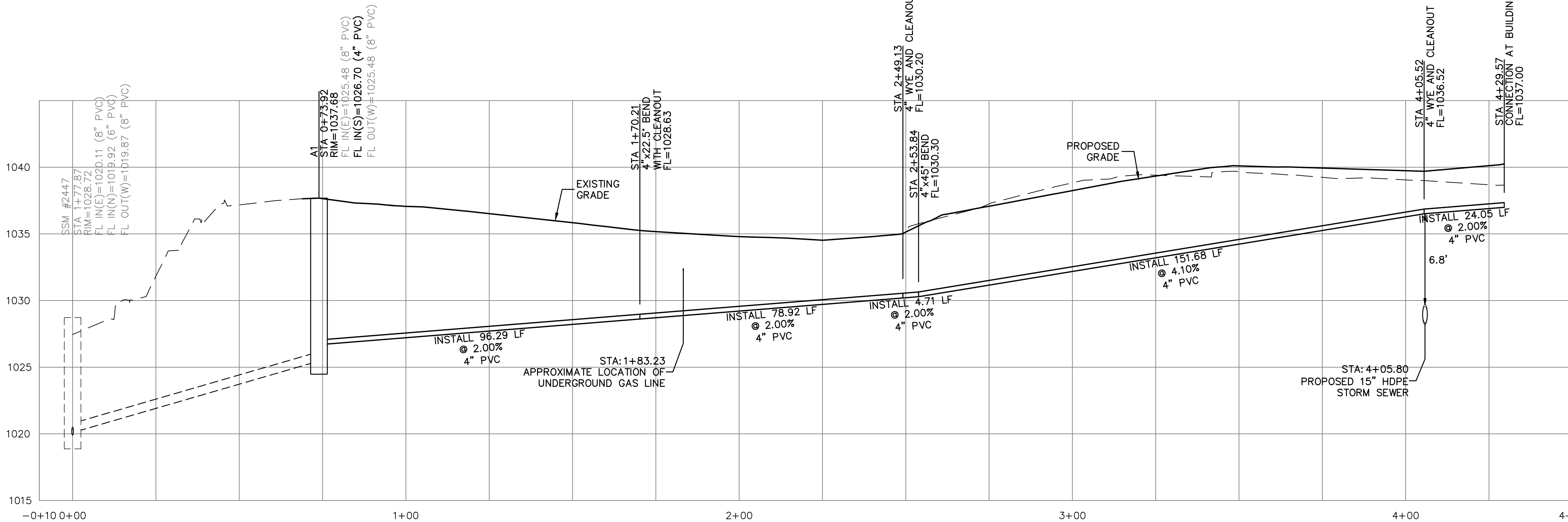
Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSW SANITARY PLAN
AND PROFILE

C700-A



SANITARY PLAN VIEW



PROPOSED SANITARY PROFILE VIEW

LEGEND:

- CONTROL POINT
- BENCHMARK
- PULL BOX
- YARD LIGHT
- LIGHT POLE
- ELECTRIC METER
- WALL MOUNTED CAMERA
- BREAKER BOX
- UNDERGROUND GAS
- GAS METER
- GAS RISER
- WATER LINE (RECORD)
- WATER METER
- WATER LINE GATE VALVE
- FIRE HYDRANT
- SPRINKLER CONTROL BOX
- WATER MANHOLE
- WALL MOUNTED SIAMSE FIRE CONNECTOR
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- SANITARY SEWER LINE
- PVC POLYVINYL CHLORIDE PIPE
- HDPE HIGH DENSITY POLYETHYLENE
- STREET/TRAFFIC SIGN
- DOOR ELEVATION
- FINISH FLOOR ELEVATION
- BUILDING HEIGHT/ELEVATION
- BACK TO BACK OF CURB MEASUREMENT
- EDGE TO EDGE OF ASPHALT
- EDGE TO EDGE OF CONCRETE
- LANDSCAPING AREA
- BOLLARD
- GATE POST
- FENCE POST
- EXISTING SPOT ELEVATION
- EXISTING GRADE 1' CONTOUR
- EXISTING GRADE 5' CONTOUR
- ASPHALT PAVEMENT (040)
- HEAVY DUTY ASPHALT PAVEMENT (041)
- CONCRETE PAVEMENT (042)

SANITARY SEWER MATERIALS AND CONSTRUCTION NOTES:

- ALL WORK RELATED TO SANITARY SEWER SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 3500 SANITARY SEWERS OF THE CITY OF LEE'S SUMMIT, MISSOURI STANDARD SPECIFICATIONS.
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- REFER TO SHEET C580 FOR SANITARY SEWER DETAILS.

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PROJ. NO. C21-1242 DSN: CJC
CIN: 1242SPR DWN: NJN
MO # 2015000538
14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215
PH. (913) 894-5150 | FAX (913) 894-5977
x@kveng.com | www.kveng.com
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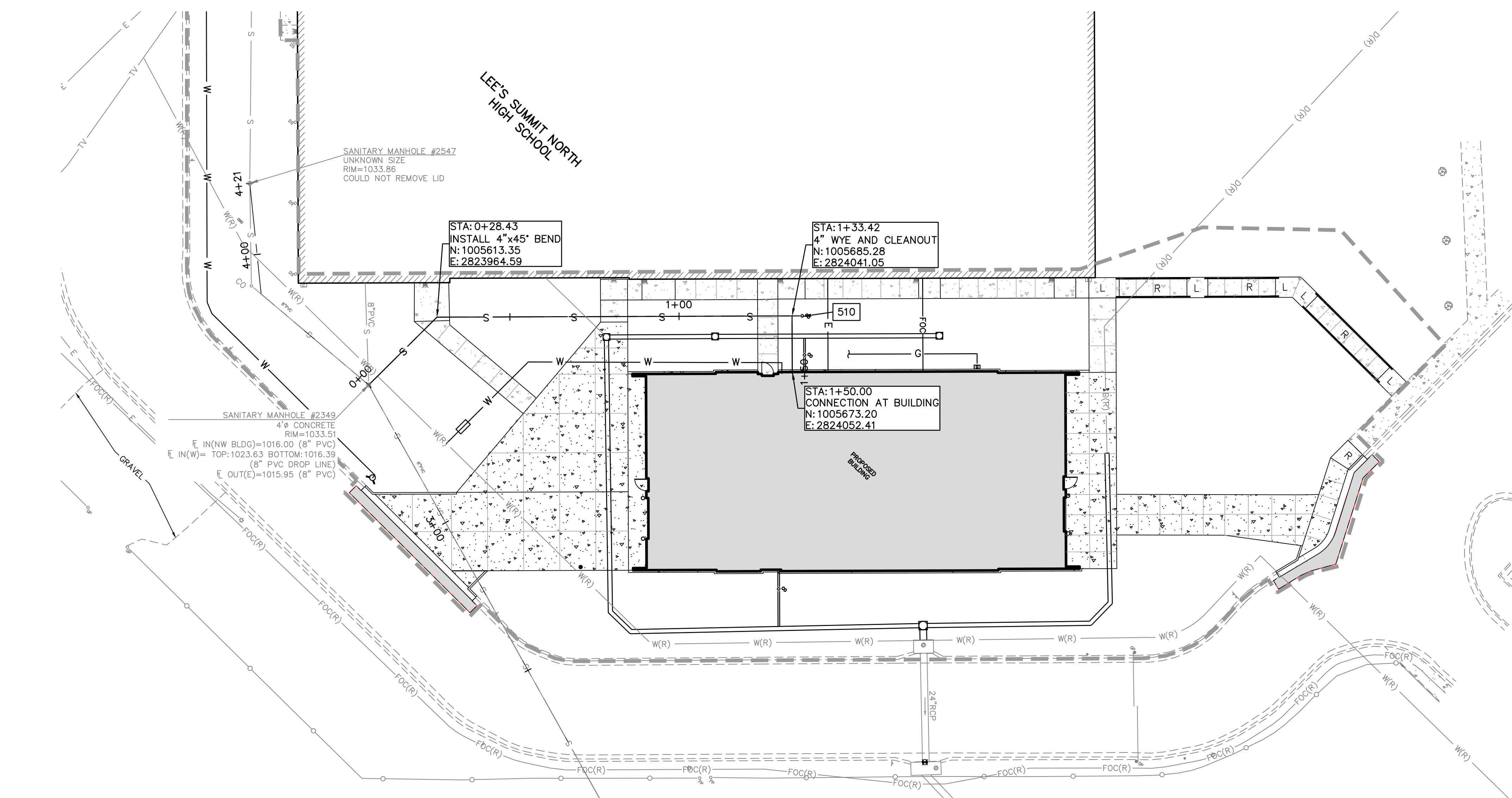
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Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSN SANITARY PLAN
AND PROFILE

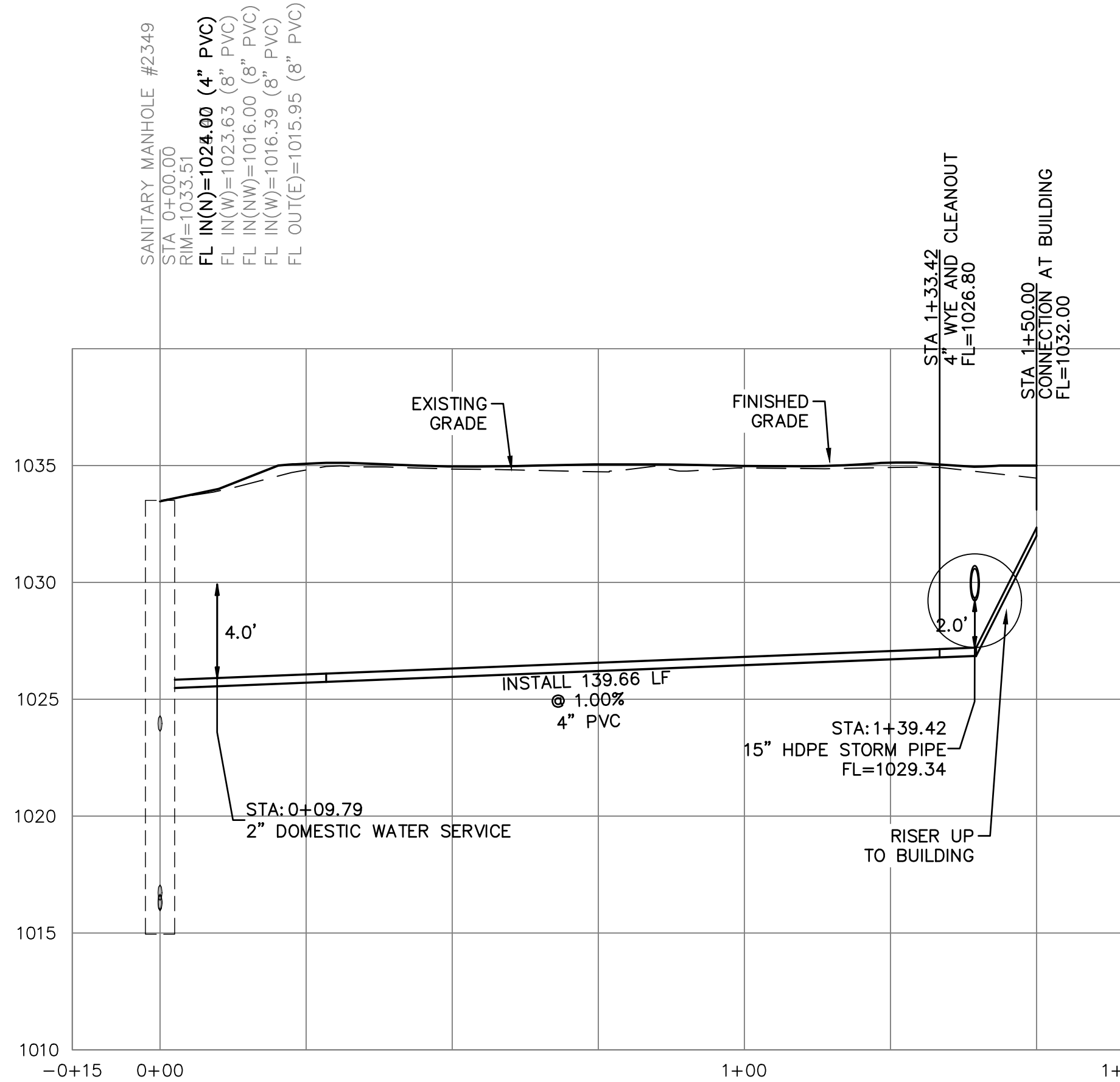
C700-B



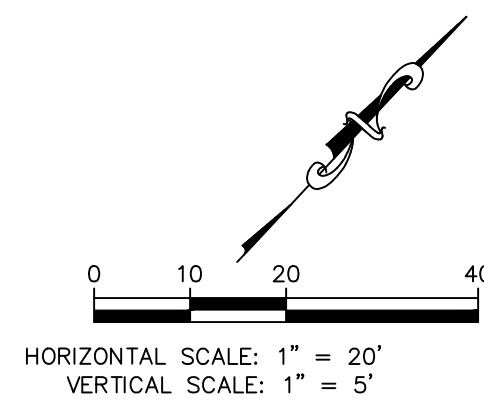
PROPOSED SANITARY SEWER LINE PLAN

DETAILS - SEE SHEET C790-B
FOR THE FOLLOWING DETAILS

510 CLEANOUT
SAN-1 BUILDING SEWER STUB AND RISER



PROPOSED SANITARY SEWER LINE PROFILE



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CPL: 1241SPF DWN: NJN
ENGINEER
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LENEXA, KANSAS 66215
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architect: Multistudio
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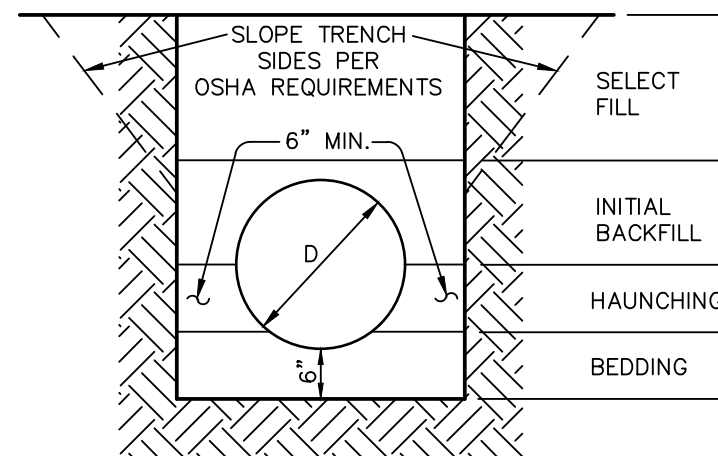
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LSW SANITARY SEWER
DETAILS

C790-A



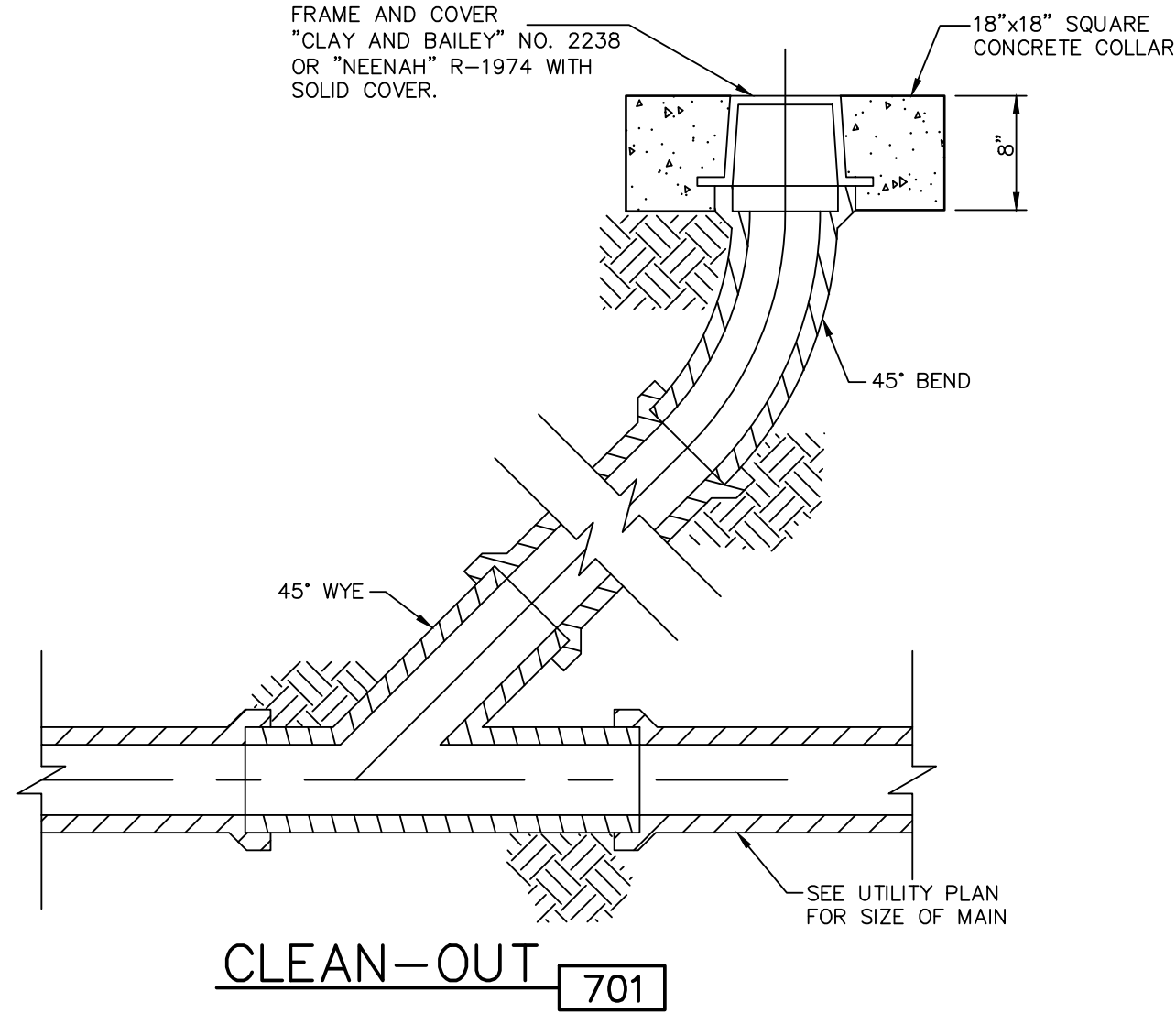
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CHLORIDE PIPE.

RIGID PIPE: INCLUDES REINFORCED
CONCRETE, DUCTILE IRON, & CAST IRON

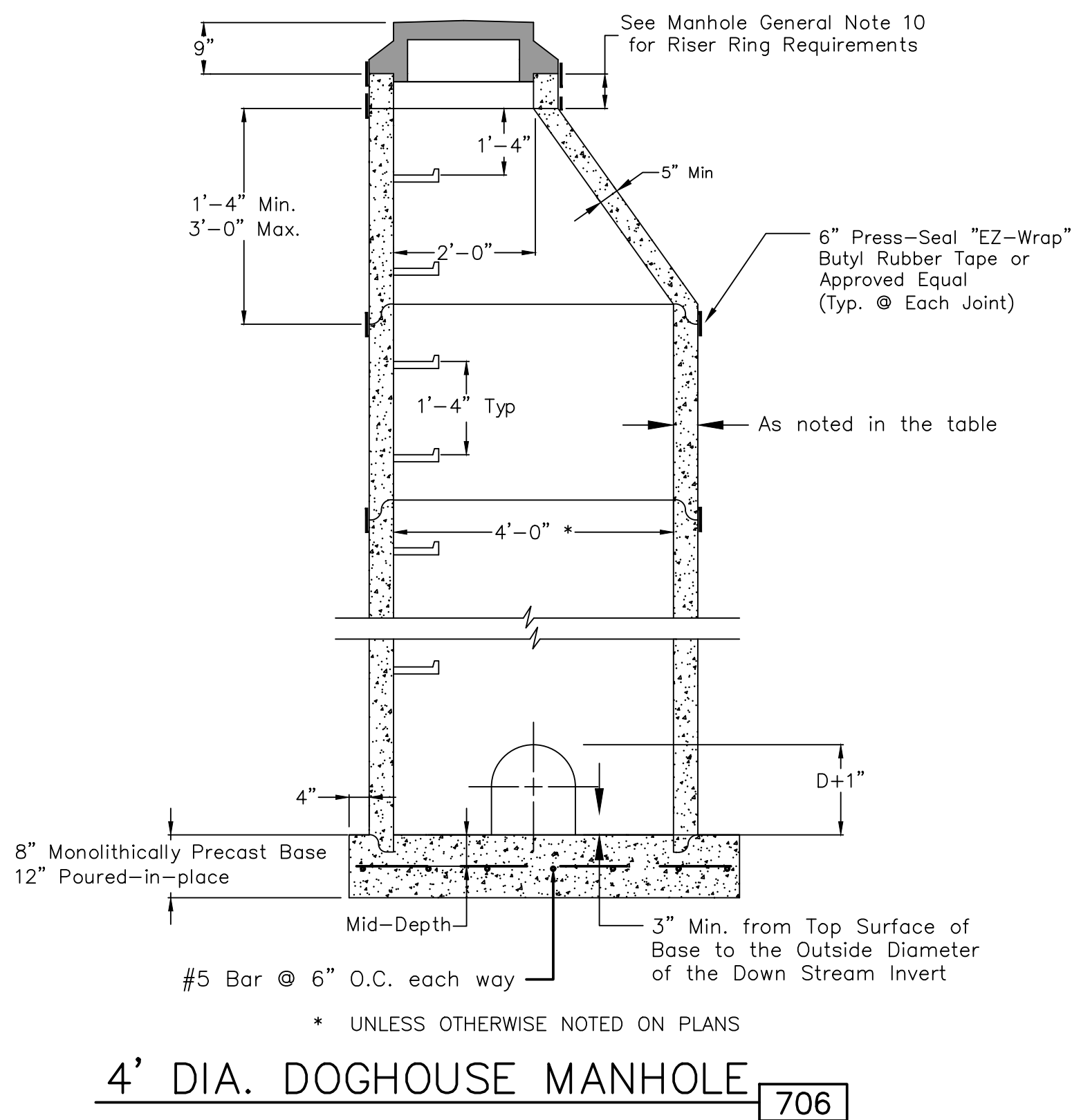
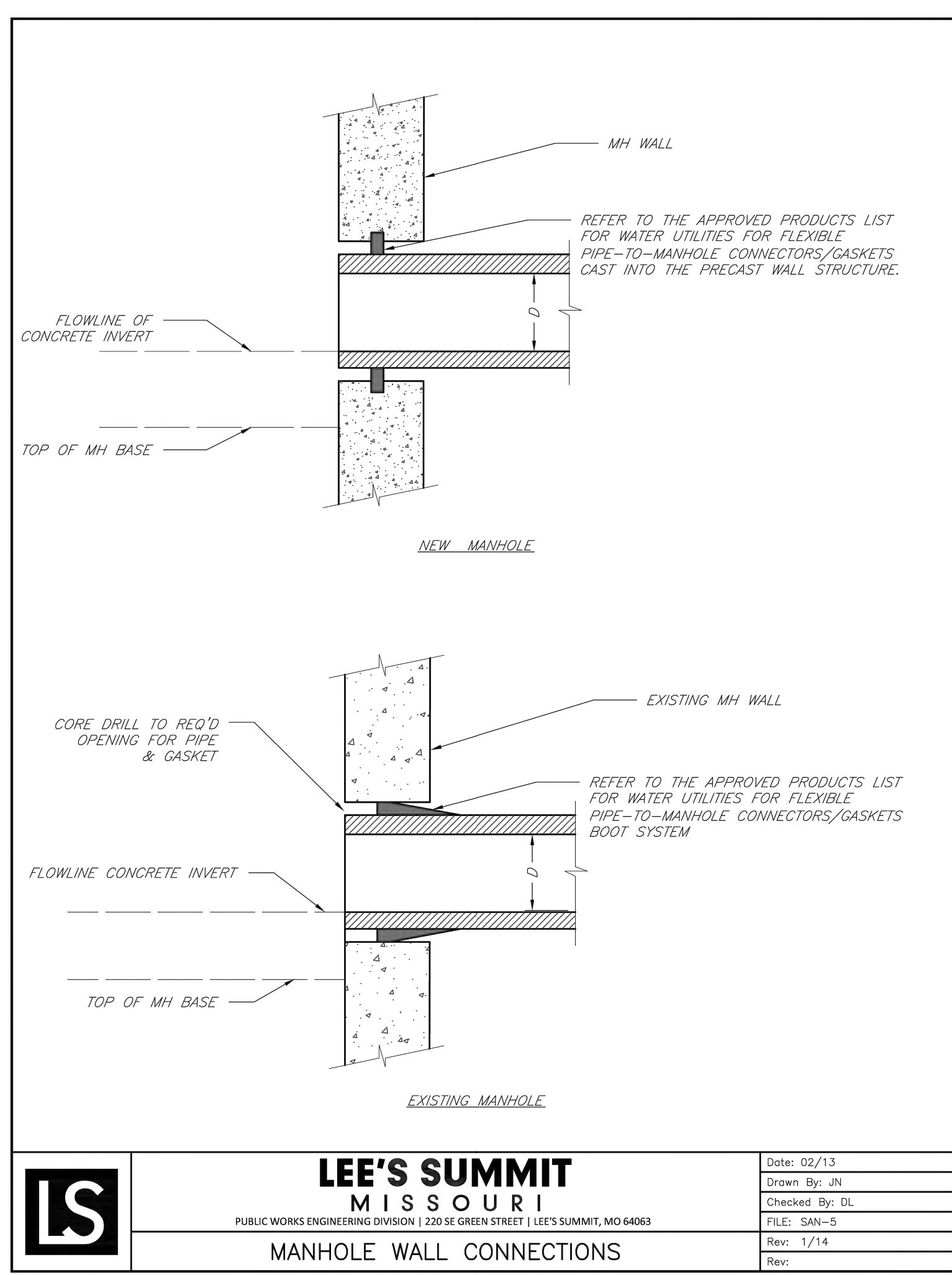
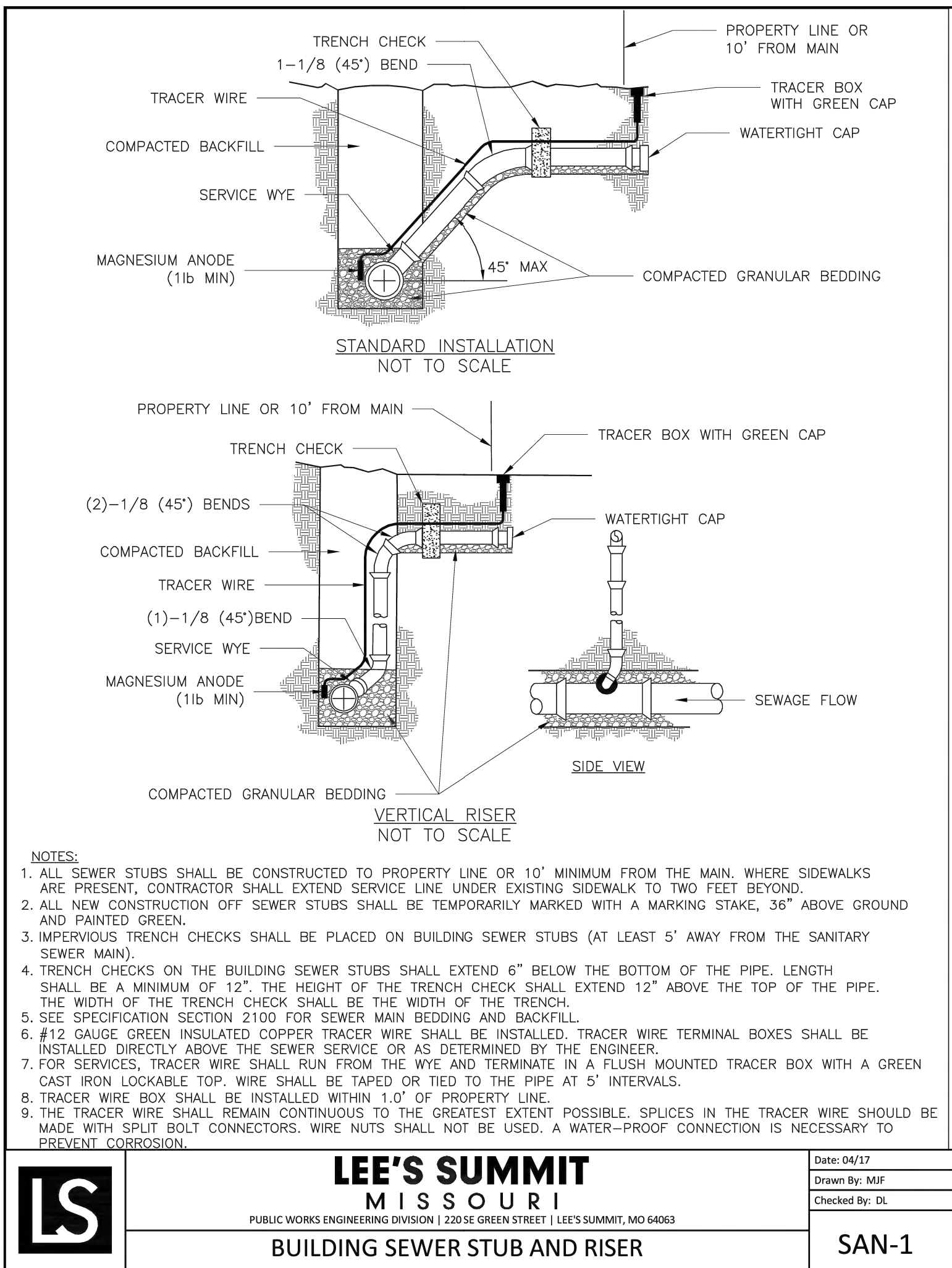
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- HAUNCHING AND INITIAL BACKFILL MATERIAL SHALL BE CLASS I
OR II (REF. ASTM D2321) GRANULAR MATERIAL AND SHALL BE
COMPACTED TO 95% STANDARD PROCTOR.

TRENCH AND BEDDING DETAILS

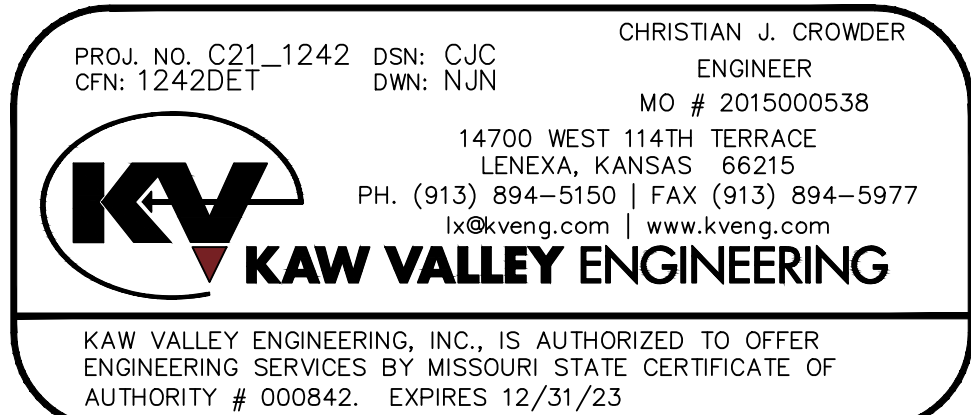
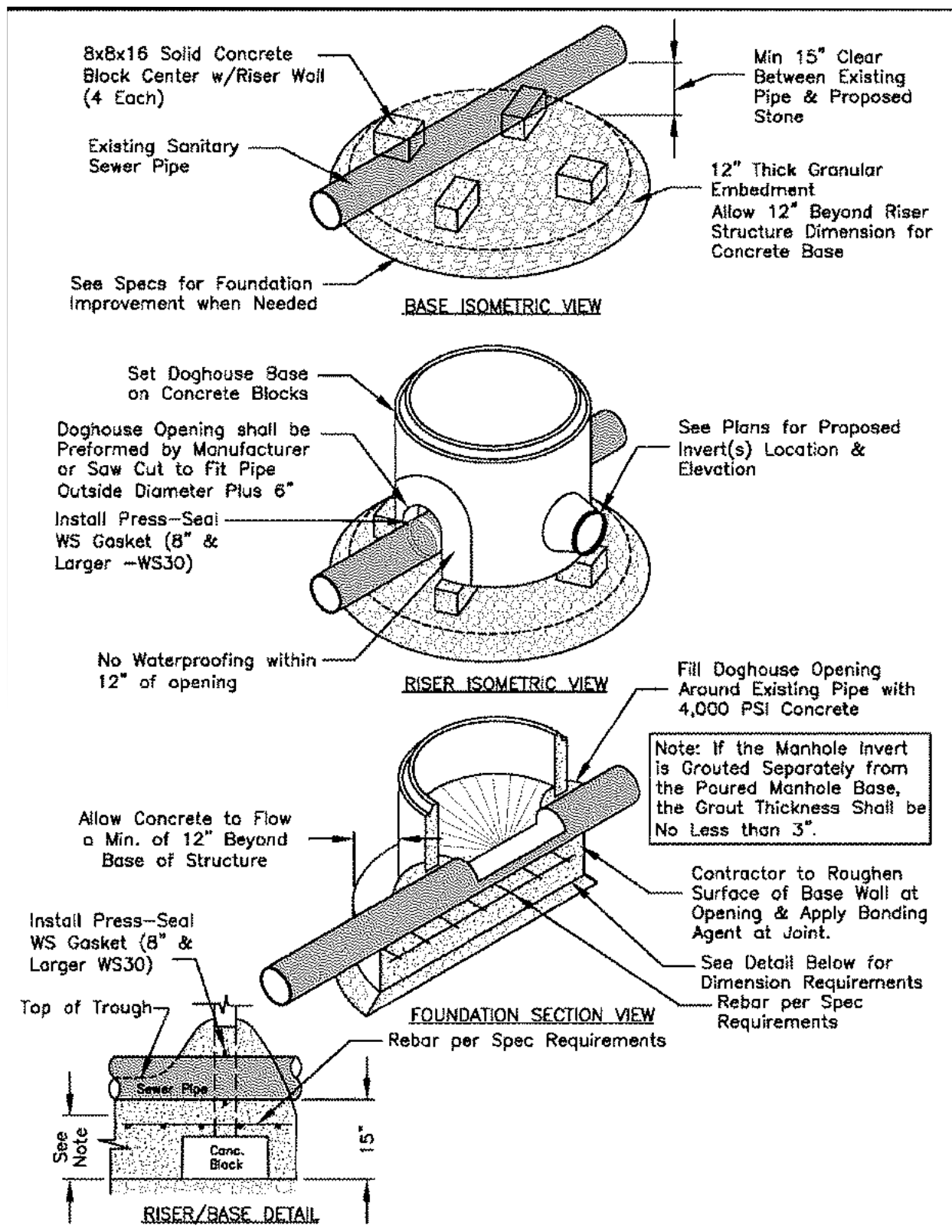
REFER TO KANSAS CITY METROPOLITAN CHAPTER
OF APWA SPECIFICATIONS SECTION 2102.4

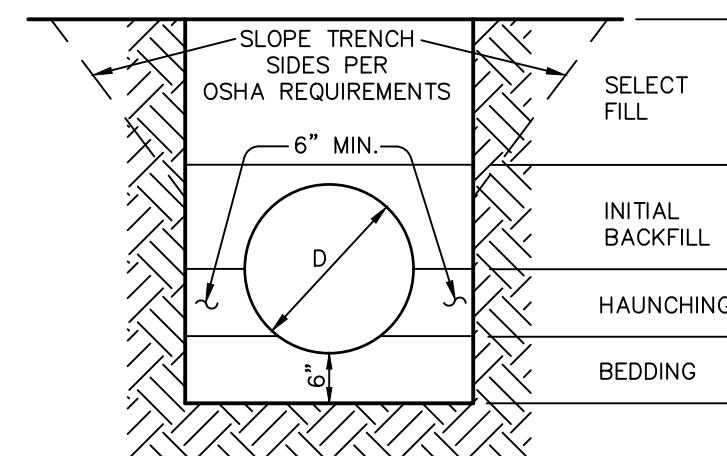
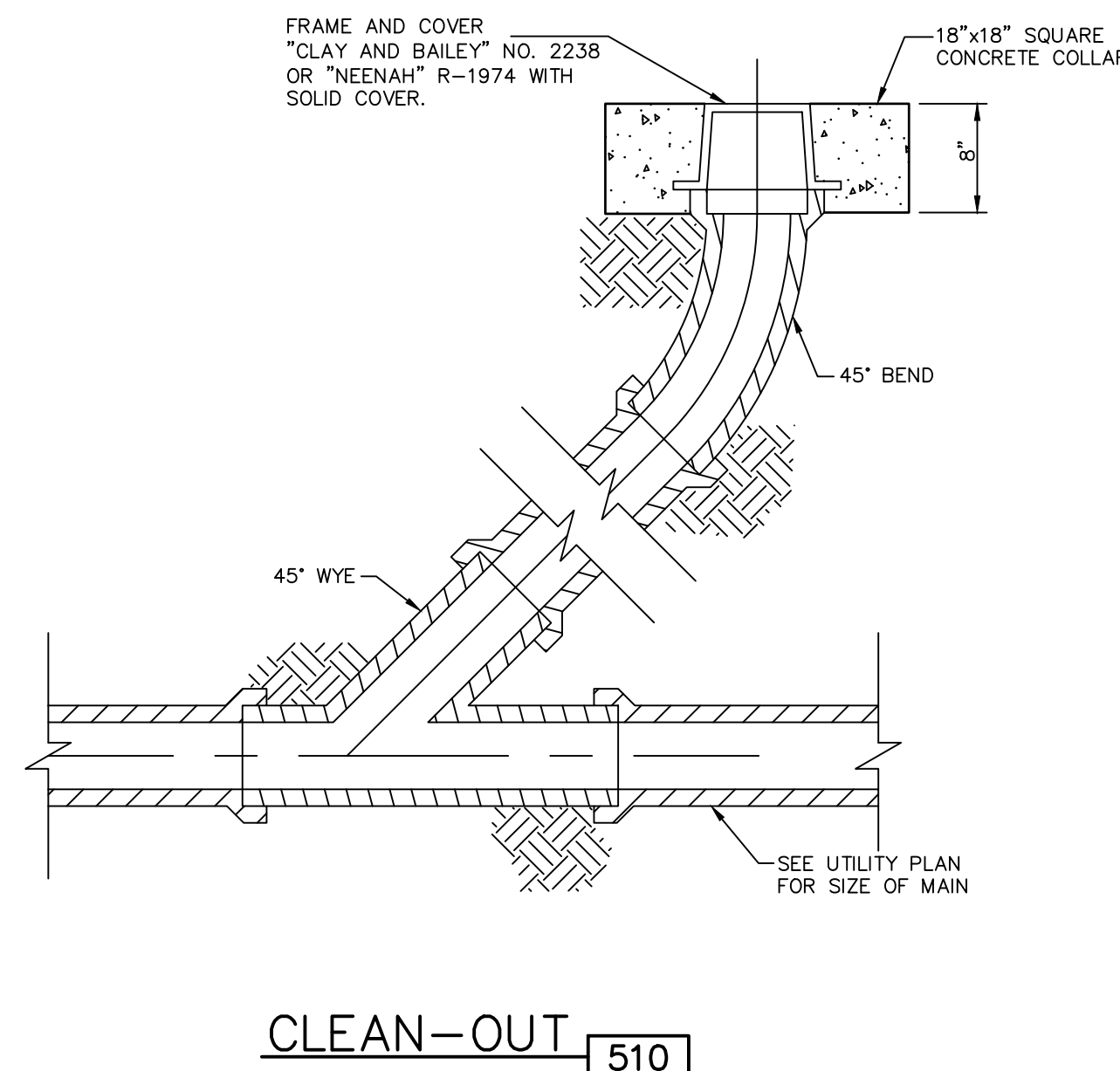
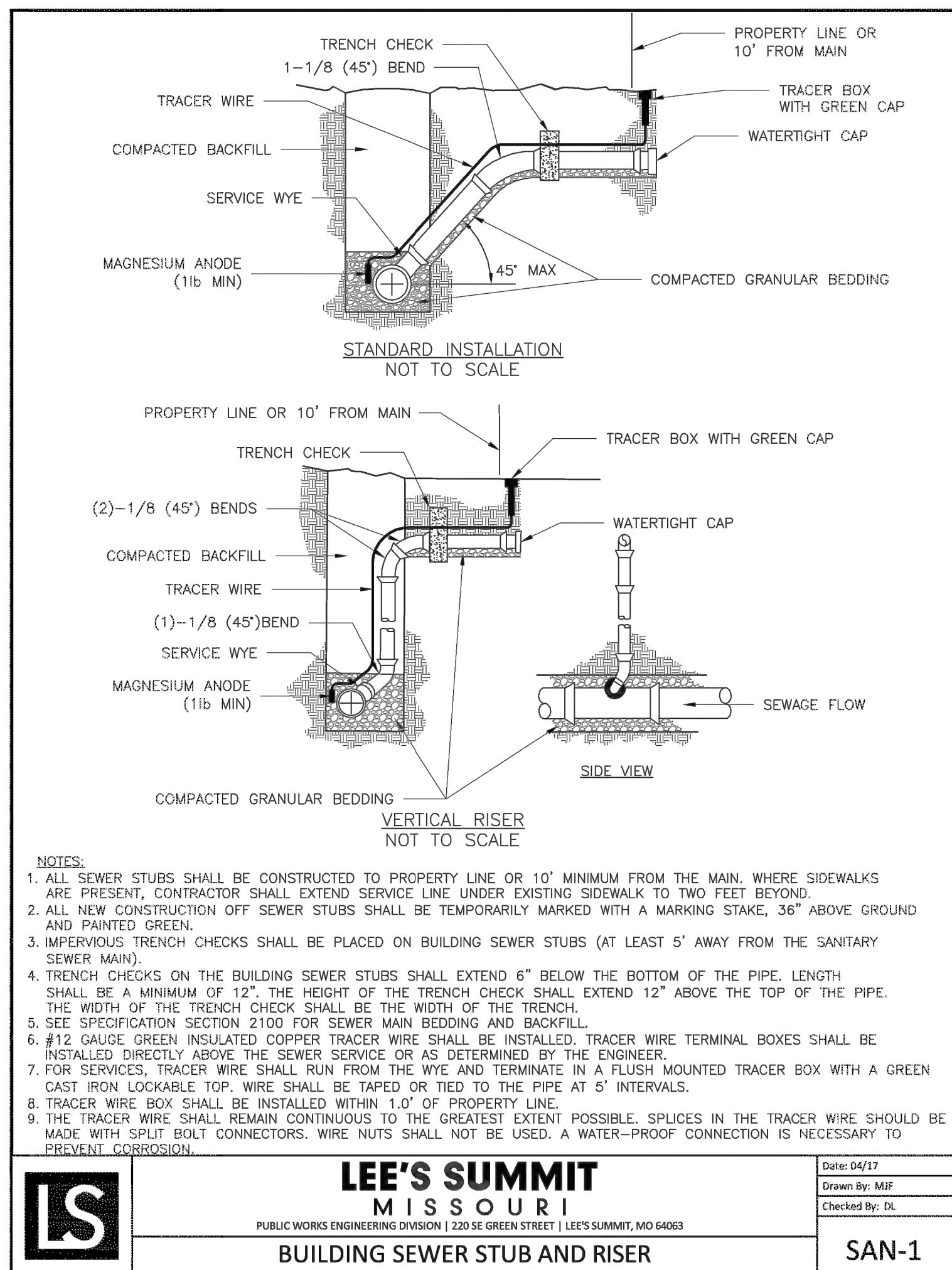


CLEAN-OUT 701



4' DIA. DOGHOUSE MANHOLE 706





FLEXIBLE PIPE: INCLUDES
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REFER TO KANSAS CITY METROPOLITAN CHAPTER
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LS

LEE'S SUMMIT
MISSOURI
ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S
BUILDING SEWER STUB AND

PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64086

BUILDING SEWER STUB AND RISER

Drawn By: MIF
Checked By: DL
SAN-1

LS

LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64065

Date: 02/13
Drawn By: JN
Checked By: DL
FILE: SAN-5
Rev: 1/14

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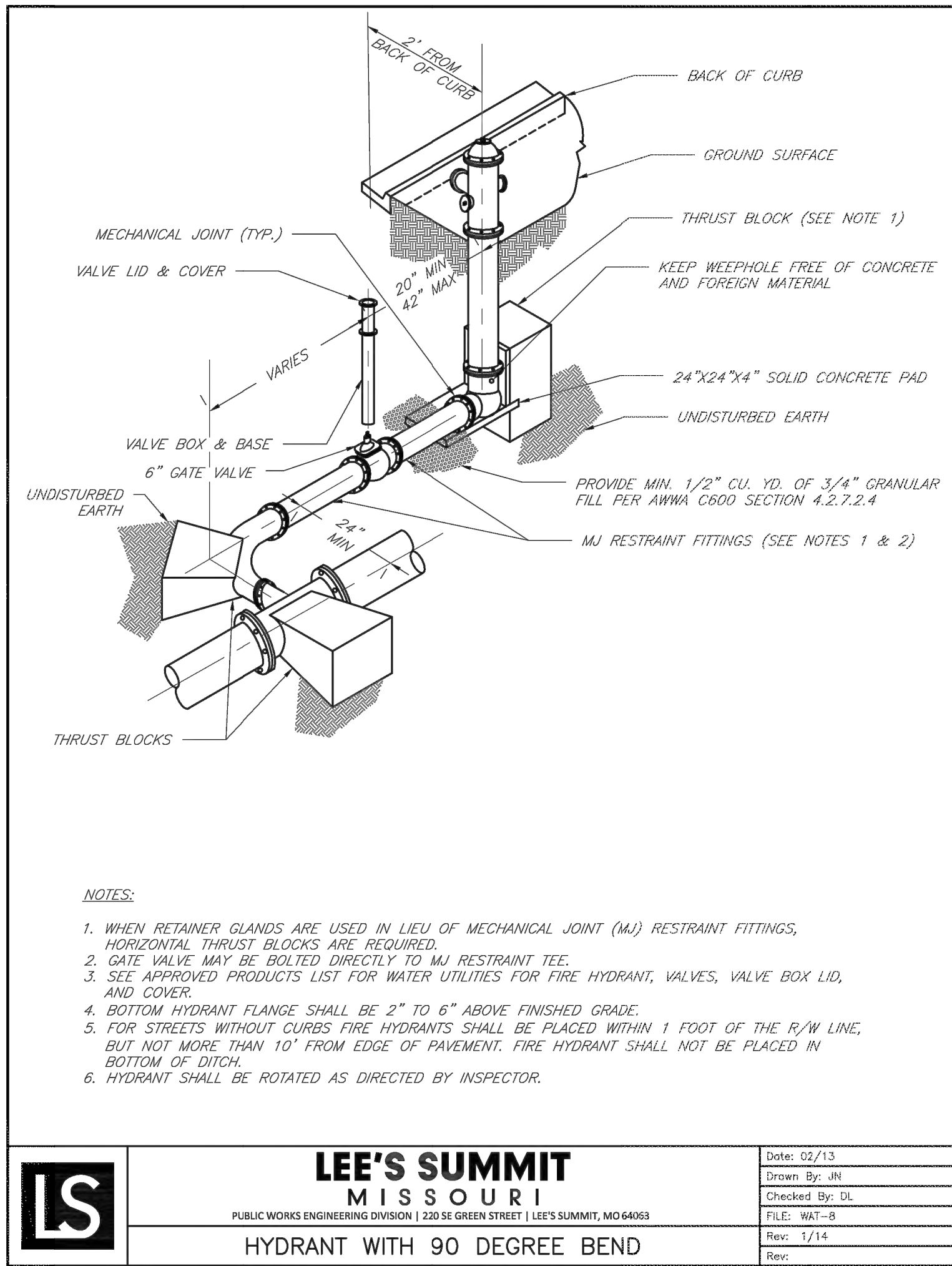
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LSW WATER DETAIL
SHEET

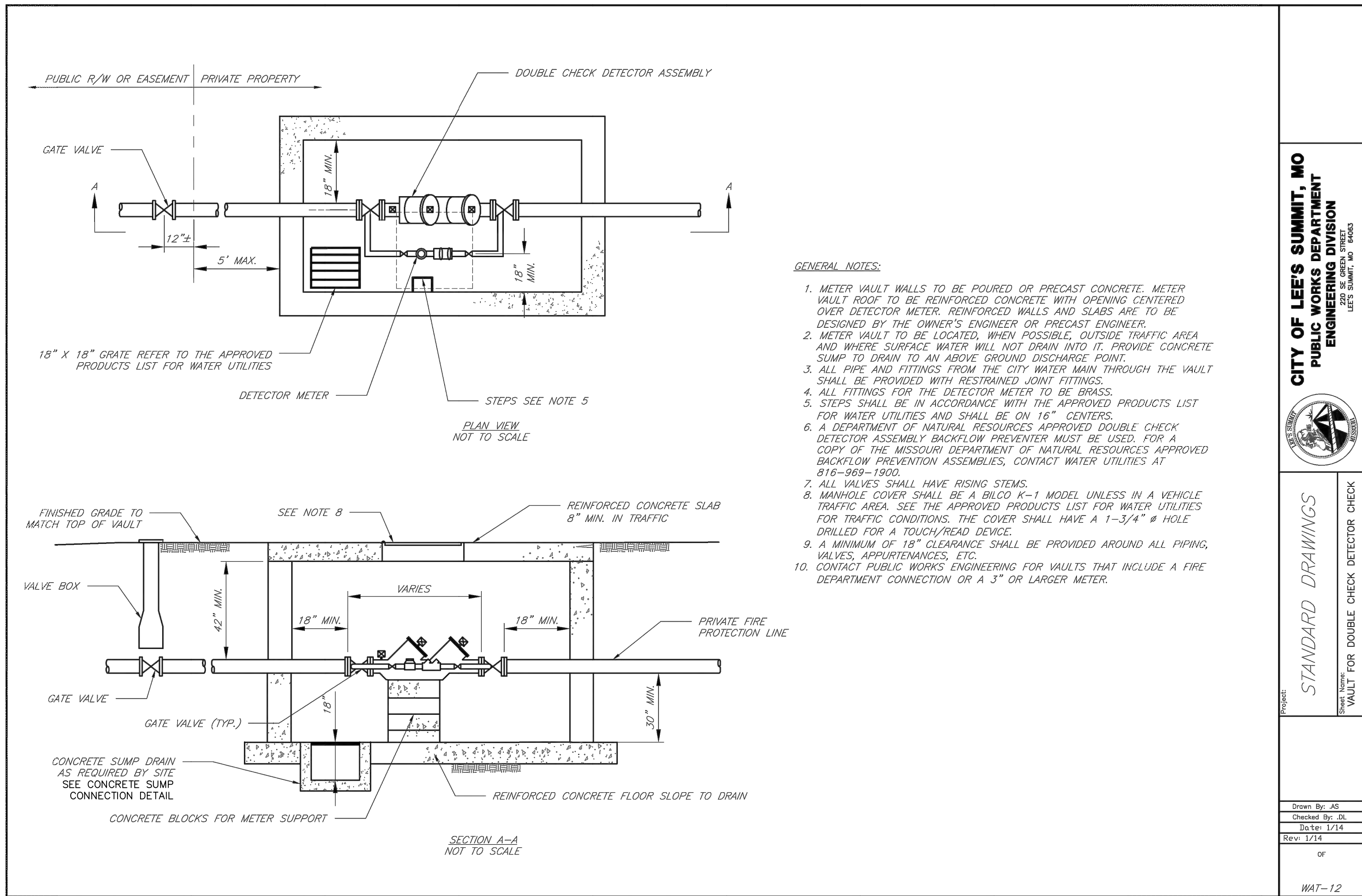
C890-A



- NOTES:
1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
 2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
 3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
 4. BOTTOM HYDRANT FLANGE SHALL BE 2" TO 6" ABOVE FINISHED GRADE.
 5. FOR STREETS WITHOUT CURBS FIRE HYDRANTS SHALL BE PLACED WITHIN 1 FOOT OF THE R/W LINE, BUT NOT MORE THAN 10' FROM EDGE OF PAVEMENT. FIRE HYDRANT SHALL NOT BE PLACED IN BOTTOM OF DITCH.
 6. HYDRANT SHALL BE ROTATED AS DIRECTED BY INSPECTOR.

	LEE'S SUMMIT MISSOURI	Date: 02/15
	PUBLIC WORKS ENGINEERING DIVISION (1315-15 GREEN STREET) LEE'S SUMMIT, MO 64093	Drawn By: JN
		Checked By: DL
		Title: WAT-12
		Rev: 1/14
		Rev:

HYDRANT WITH 90 DEGREE BEND



- GENERAL NOTES:
1. METER VAULT WALLS TO BE POURED OR PRECAST CONCRETE. METER VAULT ROOF TO BE REINFORCED CONCRETE WITH OPENING CENTERED OVER DETECTOR METER. REINFORCED WALLS AND SLABS ARE TO BE DESIGNED BY THE OWNER'S ENGINEER OR PRECAST ENGINEER.
 2. METER VAULT TO BE LOCATED, WHEN POSSIBLE, OUTSIDE TRAFFIC AREA AND WHERE SURFACE WATER WILL NOT DRAIN INTO IT. PROVIDE CONCRETE SUMP TO DRAIN TO AN ABOVE GROUND DISCHARGE POINT.
 3. ALL PIPE AND FITTINGS FROM THE CITY WATER MAIN THROUGH THE VAULT SHALL BE PROVIDED WITH RESTRAINED JOINT FITTINGS.
 4. ALL FITTINGS FOR THE DETECTOR METER TO BE BRASS.
 5. STEPS SHALL BE IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST FOR WATER UTILITIES AND SHALL BE ON 16" CENTERS.
 6. A DEPARTMENT OF NATURAL RESOURCES APPROVED DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER MUST BE USED. FOR A COPY OF THE MISSOURI DEPARTMENT OF NATURAL RESOURCES APPROVED BACKFLOW PREVENTION ASSEMBLIES, CONTACT WATER UTILITIES AT 816-989-1800.
 7. ALL VALVES SHALL HAVE RISING STEMS.
 8. MANHOLE COVER SHALL BE A BILCO K-1 MODEL UNLESS IN A VEHICLE TRAFFIC AREA. SEE THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR TRAFFIC CONDITIONS. THE COVER SHALL HAVE A 1-3/4" Ø HOLE DRILLED FOR A TOUCH-READ DEVICE.
 9. A MINIMUM OF 18" CLEARANCE SHALL BE PROVIDED ABOVE ALL PIPING, VALVES, APPURTENANCES, ETC.
 10. CONTACT PUBLIC WORKS ENGINEERING FOR VAULTS THAT INCLUDE A FIRE DEPARTMENT CONNECTION OR A 3" OR LARGER METER.

CITY OF LEE'S SUMMIT, MO
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
LEE'S SUMMIT, MO 64093



STANDARD DRAWINGS
VAULT FOR DOUBLE CHECK DETECTOR CHECK

Drawn By: JN
Checked By: DL
Date: 1/14
Rev: 1/14
or
WAT-12

	PROJ. NO. C21-1242 DSN: CJC CPL: 1242DET	CHRISTIAN J. CROWDER ENGINEER MO # 2015000538
	14700 WEST 114TH TERRACE LENEXA, KANSAS 66215	
	PH. (913) 894-5150 FAX (913) 894-5977 x@kveng.com www.kveng.com	
	KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/23	

Lee's Summit Robotics,
Gic & Phys Educaiton

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
816.485.0318
kveng.com

structural engineer:
Bob D. Campbell &
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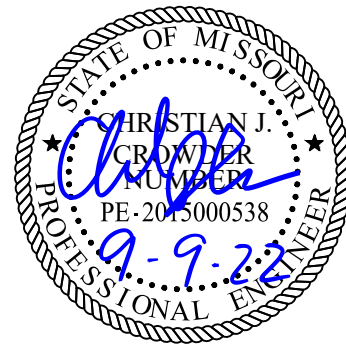
MEP/IT/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions

NUMBER DESCRIPTION DATE

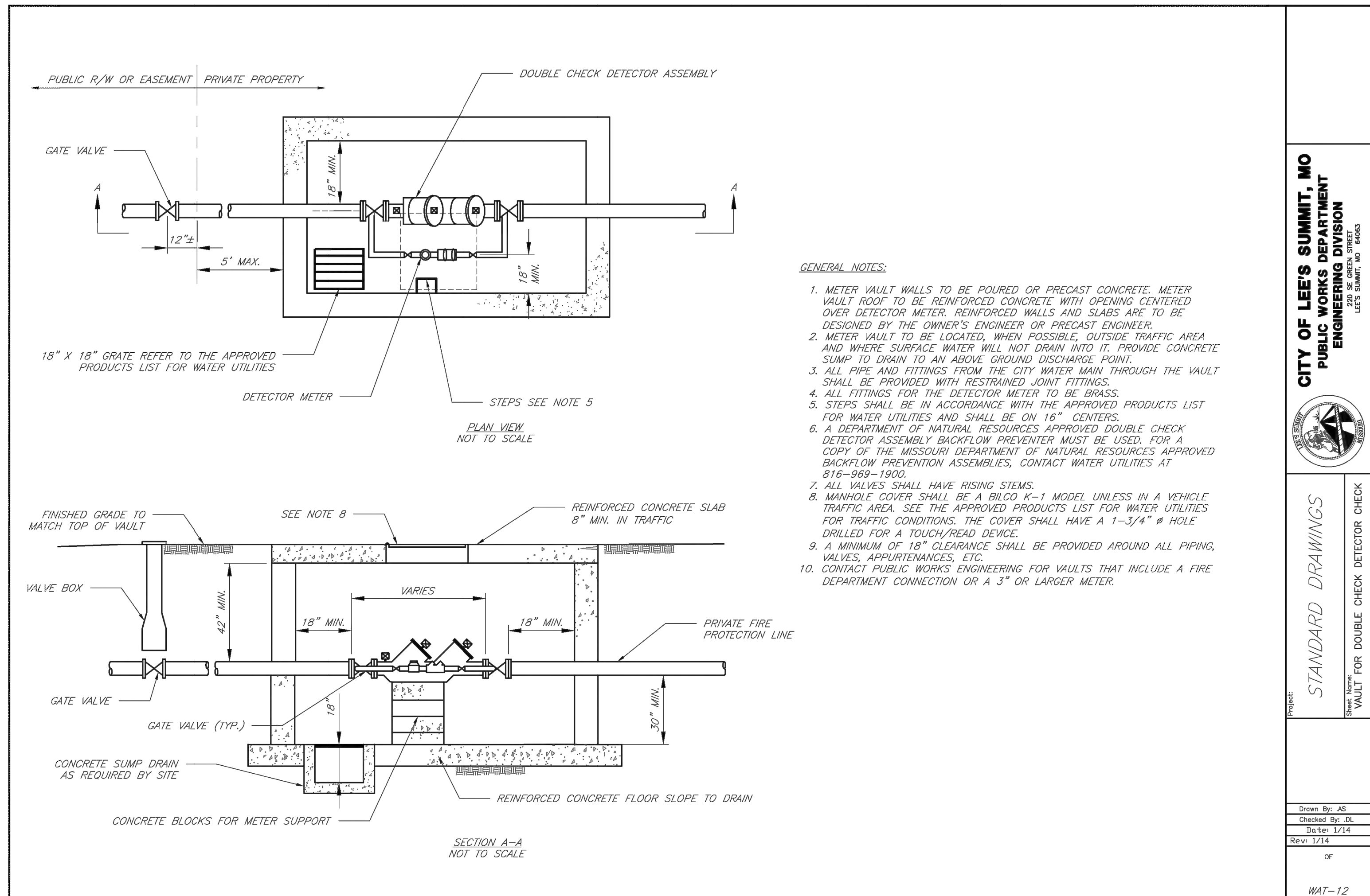
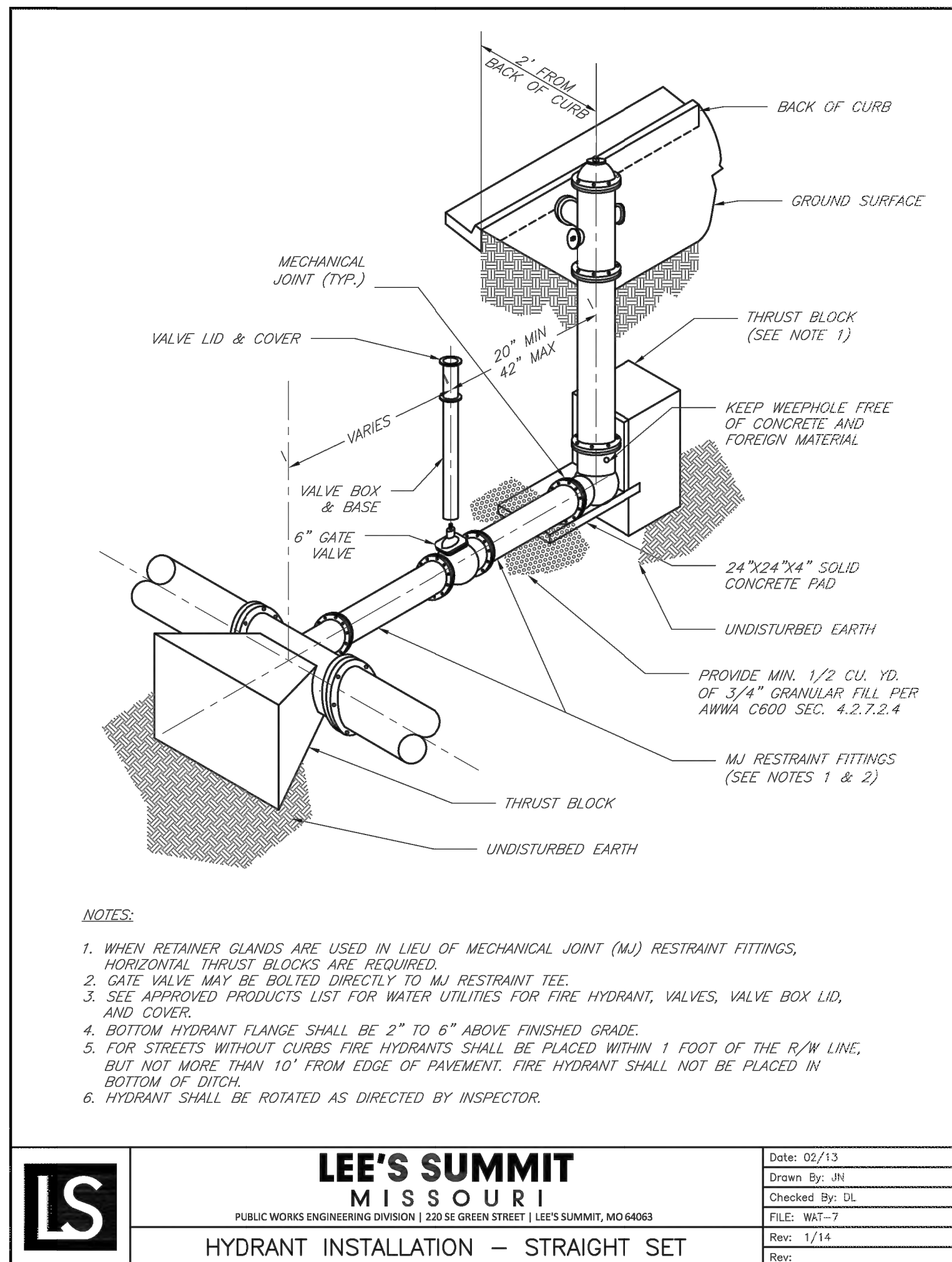
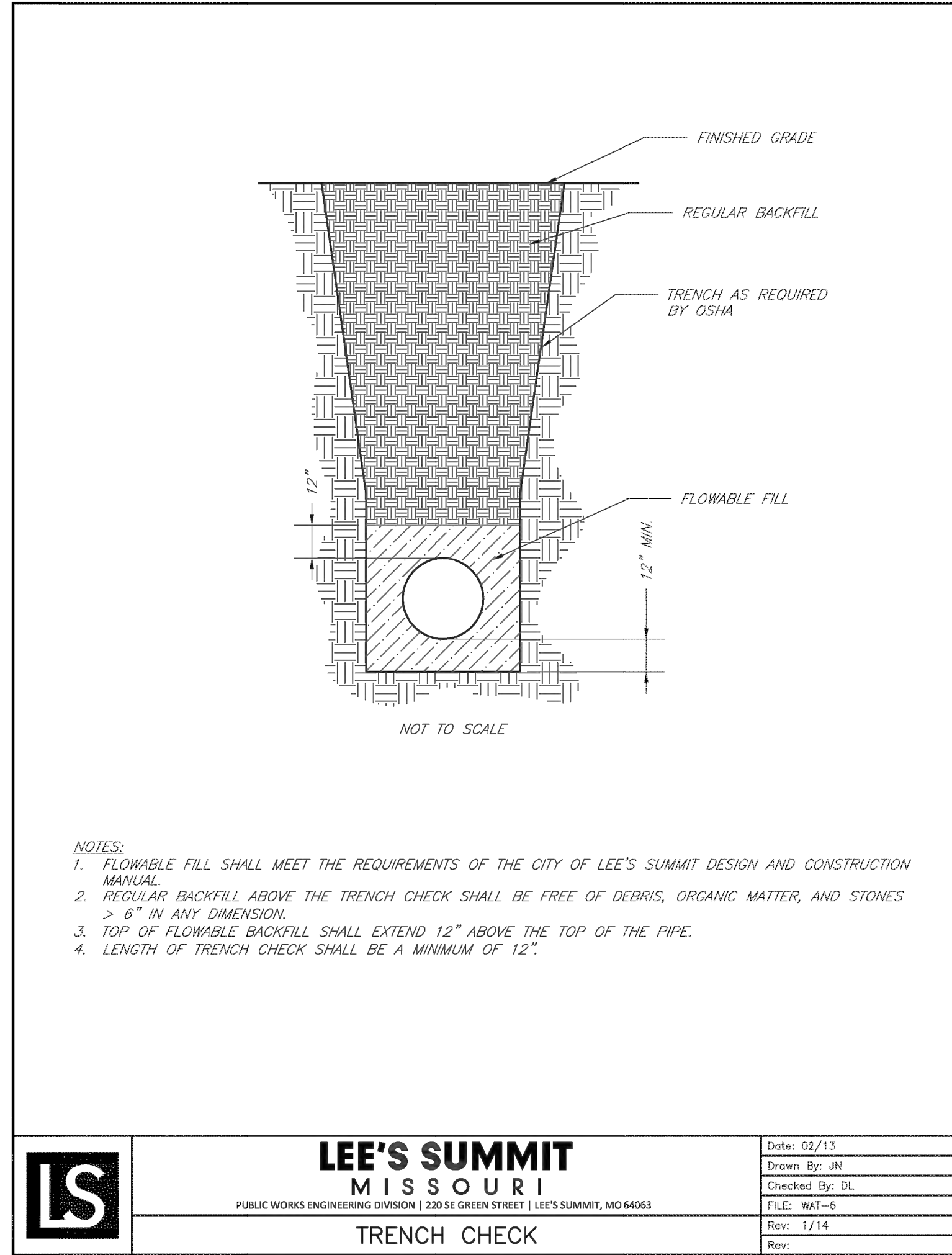
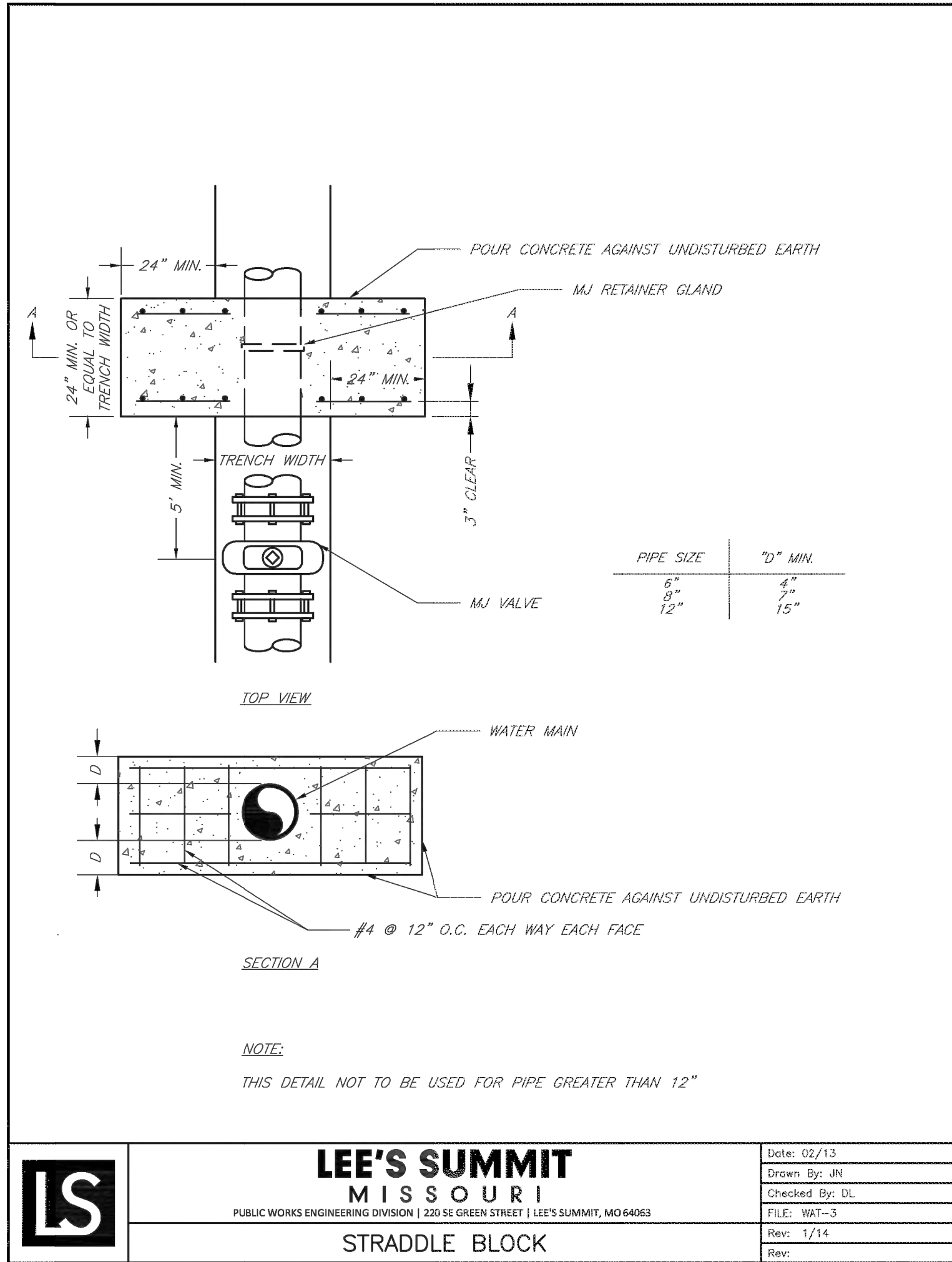
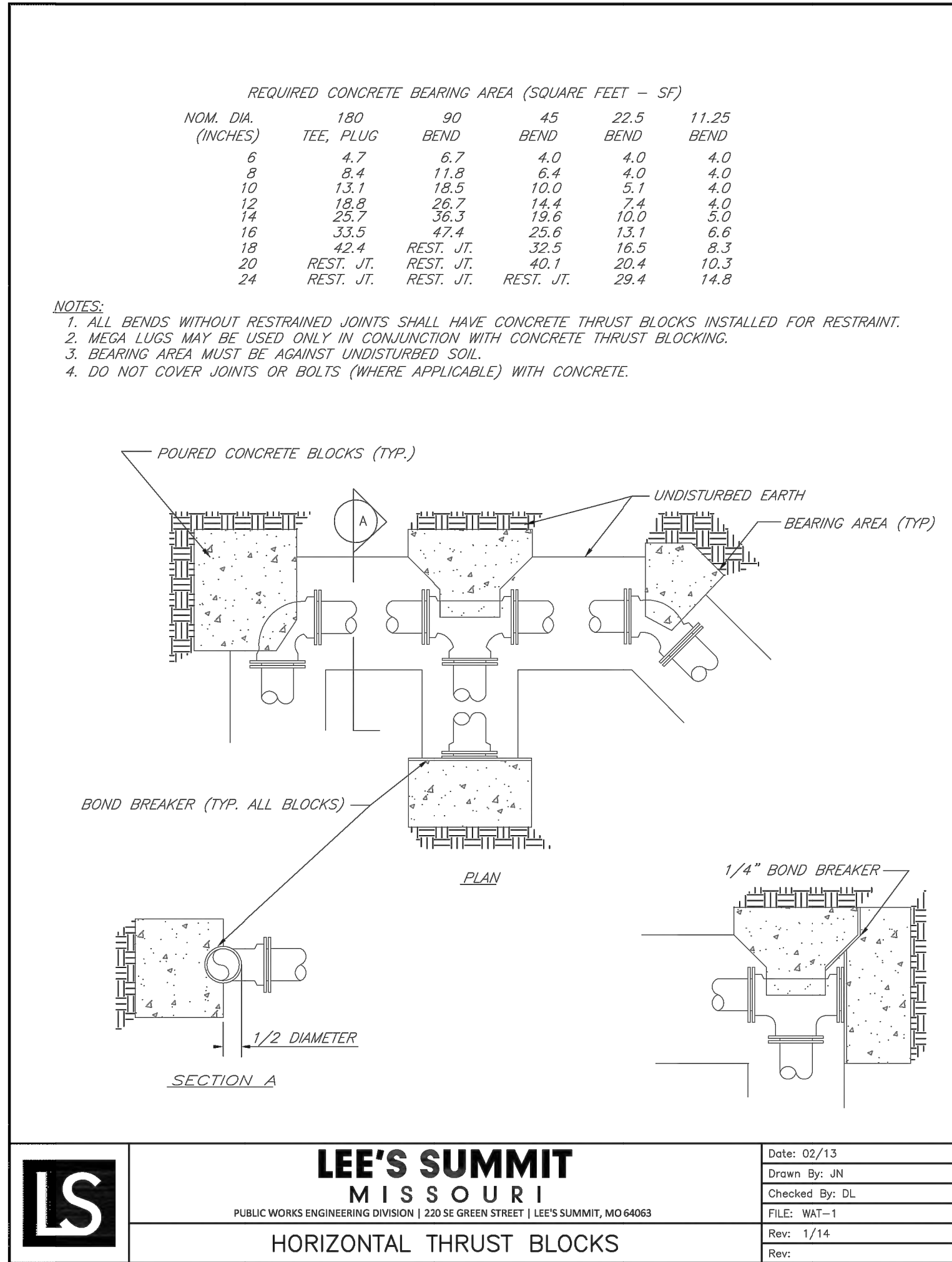
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Kaw Valley Engineering, Inc.
Missouri Certificate of Authority: 000842
Christian Crowder Date: 9/9/2022
Engineer License No. PE-2015000538

LSN WATER LINE
DETAILS

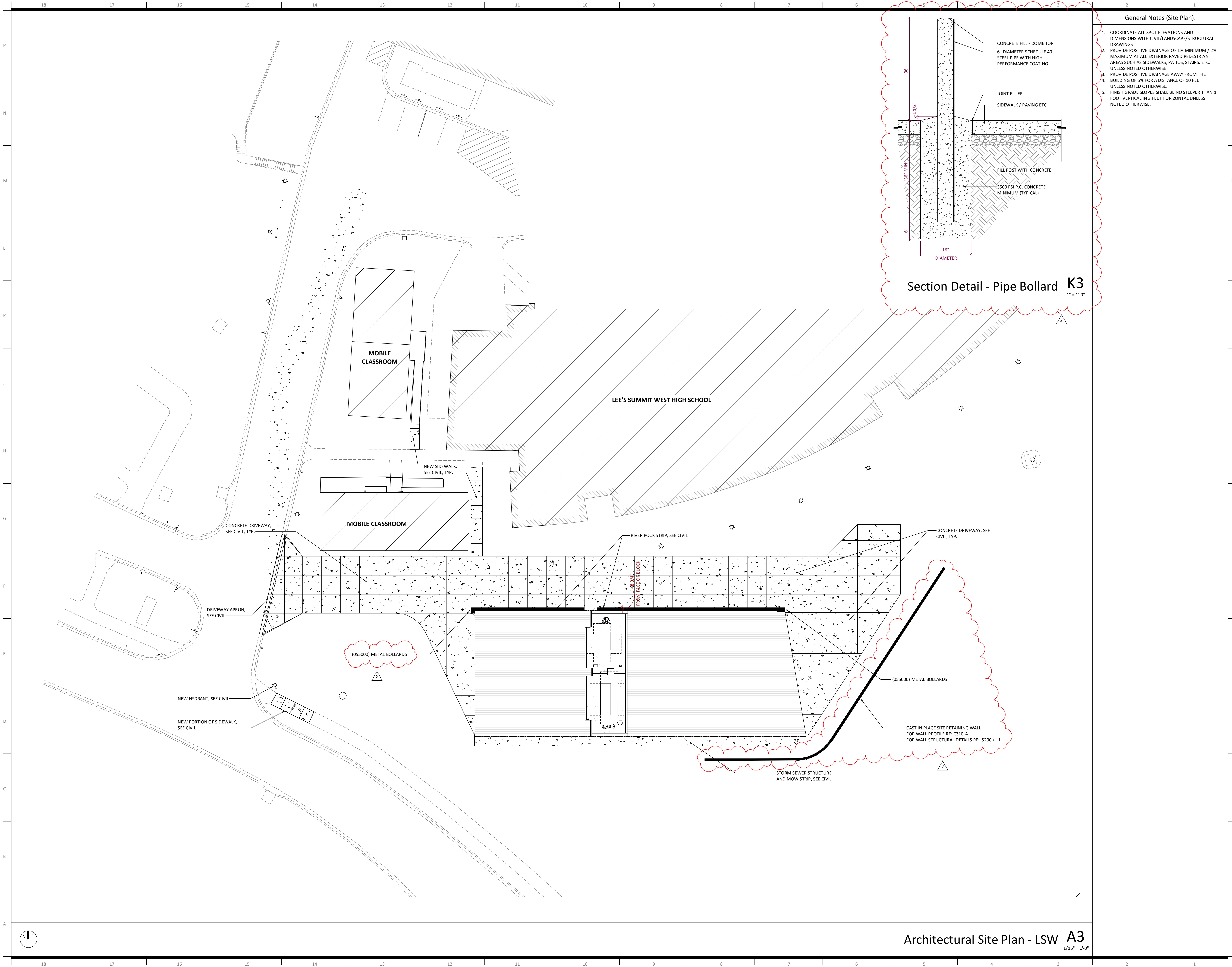
C890-B



PROJ. NO. C21-1241 DSN: CJC ENGINEER
CPL: 1241DET DWN: NJN MO # 2015000538
14700 WEST 114TH TERRACE
LENEXA, KANSAS 66215
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x@kveng.com | www.kveng.com

KV KAW VALLEY ENGINEERING

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multistudio

civil engineer: Kaw Valley Engineering
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913.485.0318
kvang.com

structural engineer: Bob D. Campbell &
4338 Bellevue
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MEP/IT Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
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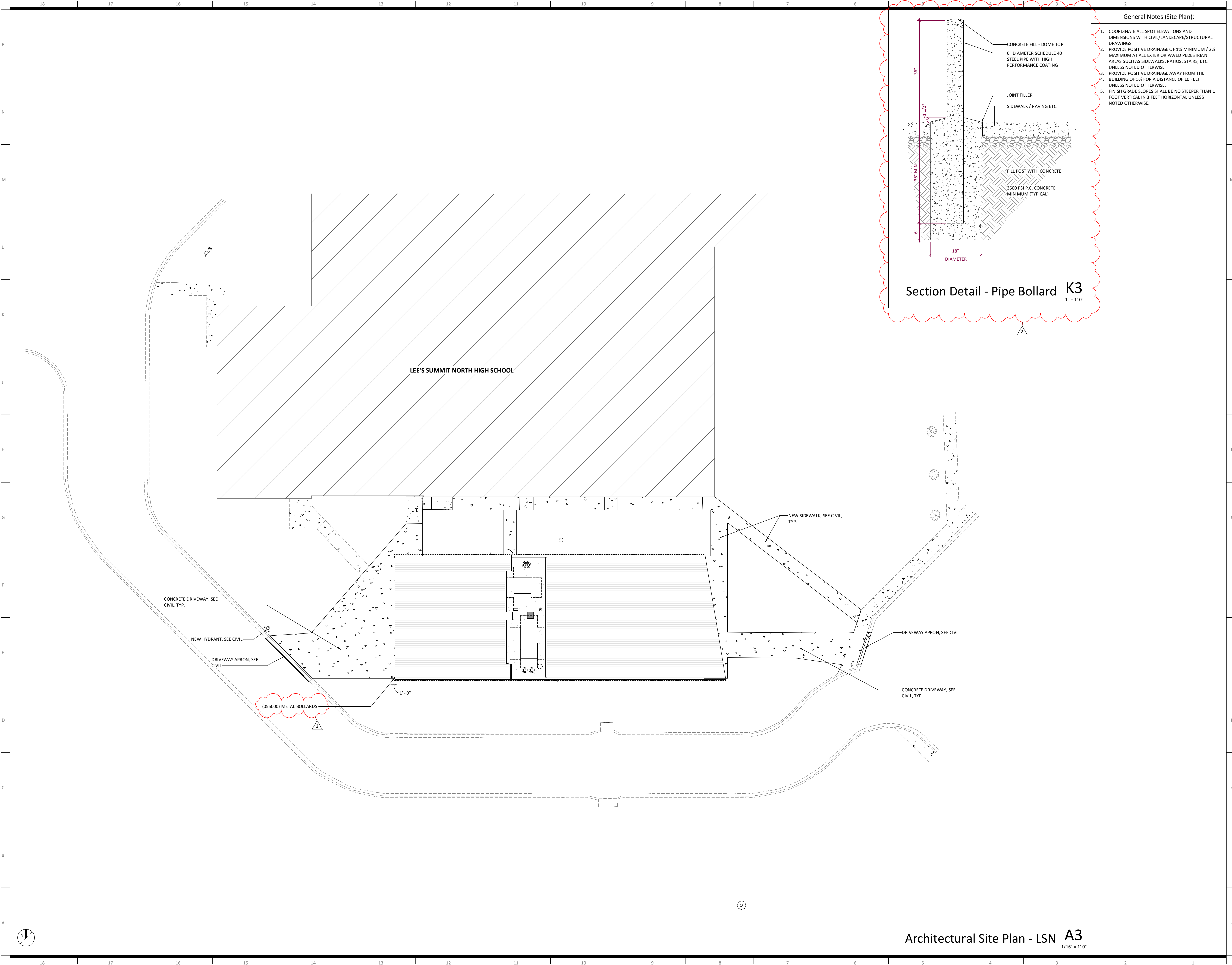
Revisions		
NUMBER	DESCRIPTION	DATE
2	Addendum 02	09/29/2022

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LSW - Architectural Site Plan

AS100-A



multistudio

the evolution of gould evans

LSR7 Robotics, GiC & Phys Education

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301 NE Tudor Road
Lee's Summit, MO 64086

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multistudio

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www.hendersonengineers.com

General Notes (Site Plan):

1. COORDINATE ALL SPOT ELEVATIONS AND DIMENSIONS WITH CIVIL/LANDSCAPE/STRUCTURAL DRAWINGS

2. PROVIDE POSITIVE DRAINAGE OF 1% MINIMUM / 2% MAXIMUM AT ALL EXTERIOR PAVED PEDESTRIAN AREAS SUCH AS SIDEWALKS, PATIOS, STAIRS, ETC. UNLESS NOTED OTHERWISE

3. PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING OF 5% FOR A DISTANCE OF 10 FEET UNLESS NOTED OTHERWISE

4. FINISH GRADE SLOPES SHALL BE NO STEEPER THAN 1 FOOT VERTICAL IN 3 FEET HORIZONTAL UNLESS NOTED OTHERWISE.

Issue Date: September 9, 2022

Revisions

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2	Addendum 02	09/23/2022

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STATE OF MISSOURI

ADAM LEE STERNIS

NUMBER A-7450

REGISTERED PROFESSIONAL

LSN - Architectural Site Plan

AS100-B

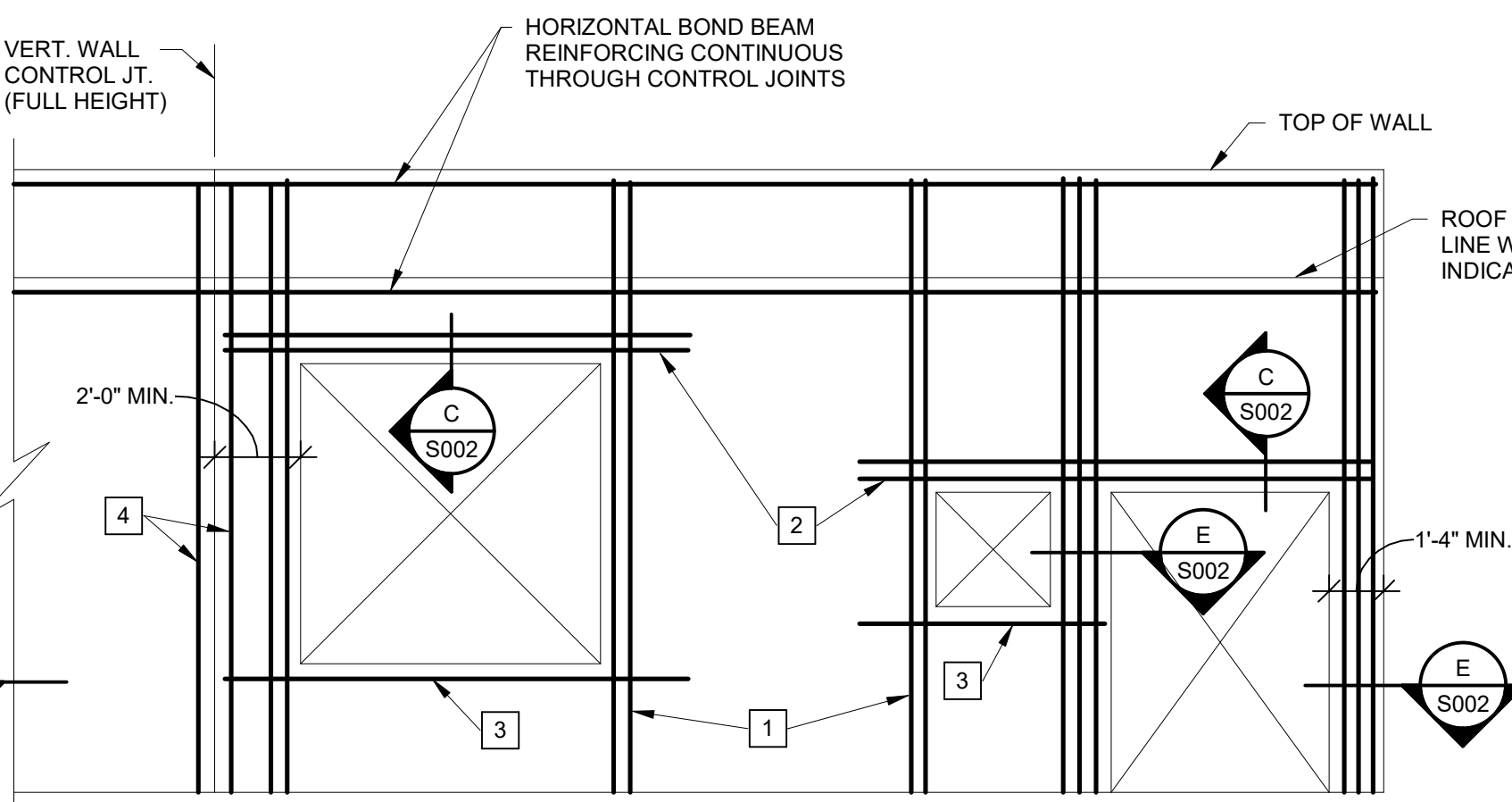
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TYPICAL CMU WALL REINFORCING AT OPENINGS

- LEGEND:**
- 1 FULL HEIGHT VERTICAL BARS AS JAMB REINFORCING IN FIRST 2 CELLS ADJACENT TO OPENING. REINFORCE EACH CELL WITH SIZE & QUANTITY OF BAR TO MATCH WALL REINFORCING (1 BAR TYPICAL IN 8" WALLS AND 2 BARS TYPICAL IN 12" WALLS).
 - 2 LINTEL REINFORCING PER SECTION C. EXTEND 2'-0" PAST EDGE OF OPENING ON EACH SIDE (TYPICAL).
 - 3 2-#5 CONTINUOUS HORIZONTAL BARS AS SILL REINFORCING IN 8" COURSE BELOW OPENING (U.N.O.), EXTEND 2'-0" PAST EDGE OF OPENING ON EACH SIDE (TYPICAL).
 - 4 FULL HEIGHT VERTICAL BARS PER MASONRY VERTICAL REINFORCING SCHEDULE LOCATED IN END CELL AT EACH SIDE OF VERTICAL WALL CONTROL JOINTS.

GENERAL CRITERIA: (SECTION A CONTINUED):

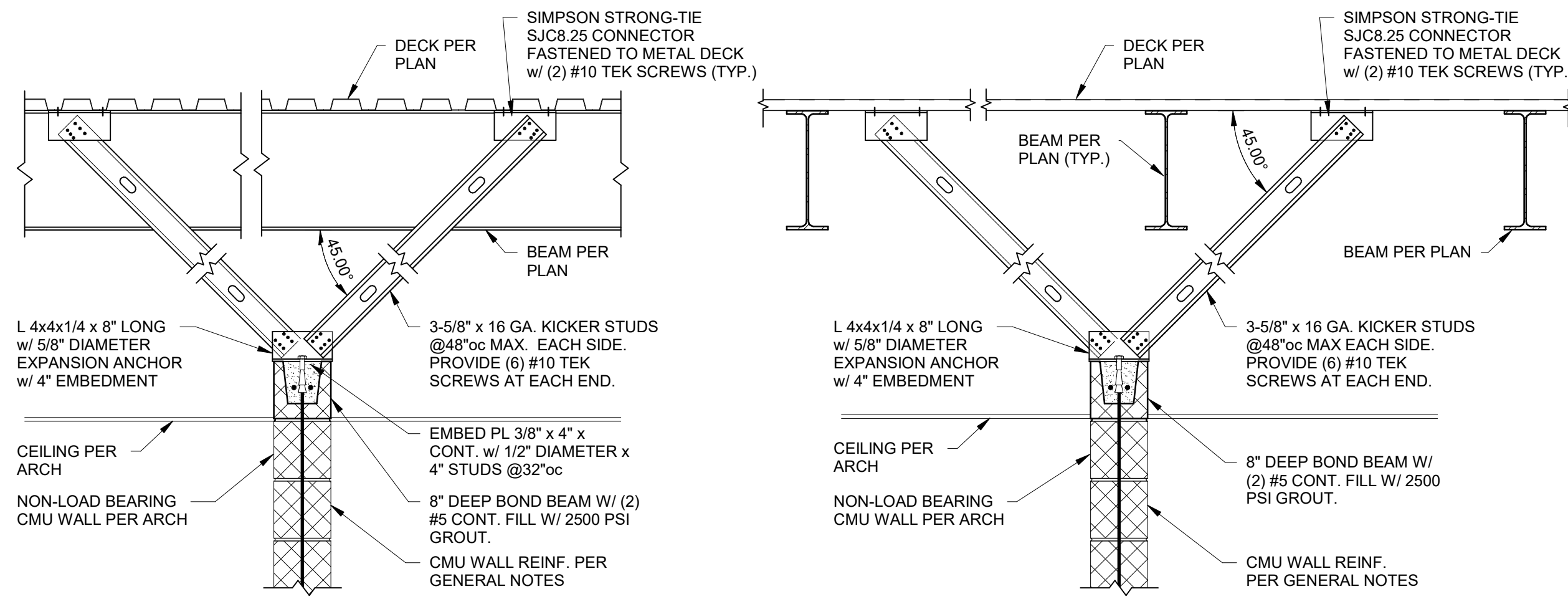
1. VERTICAL REINFORCING BARS SHALL BE DOWELED TO FOUNDATION WITH A DOWEL OF MATCHING SIZE AND SPACING.
2. CONTRACTOR SHALL COORDINATE AND VERIFY OPENINGS IN MASONRY WALLS. OPENINGS SHALL BE DETAILED ON REINFORCING STEEL SHOP DRAWING ELEVATIONS.
3. VERTICAL CONTROL JOINTS IN MASONRY WALLS SHALL BE 38" WIDE, FULL HEIGHT OF WALL. JOINTS SHALL BE SPACED AT A MAXIMUM OF 24'-0" ON CENTER AND NOT LESS THAN 2'-0" FROM THE EDGE OF ANY OPENING. ALL HORIZONTAL JOINT REINFORCING SHALL BE DISCONTINUOUS AT CONTROL JOINTS. ALL BOND BEAM HORIZONTAL REINFORCING SHALL BE CONTINUOUS THROUGH CONTROL JOINTS. CONTRACTOR SHALL COORDINATE AND VERIFY ALL CONTROL JOINT LOCATIONS.

MASONRY VERTICAL REINFORCING SCHEDULE
FOR LOAD BEARING MASONRY (CMU) WALLS

WALL THICKNESS	LOCATION	VERTICAL REINF. (IN GROUDED CELLS)	SPACING
8"	ALL 8" WALLS (U.N.O.)	1-#5	32"oc
12"	ALL 12" WALLS (U.N.O.)	2-#5	16"oc

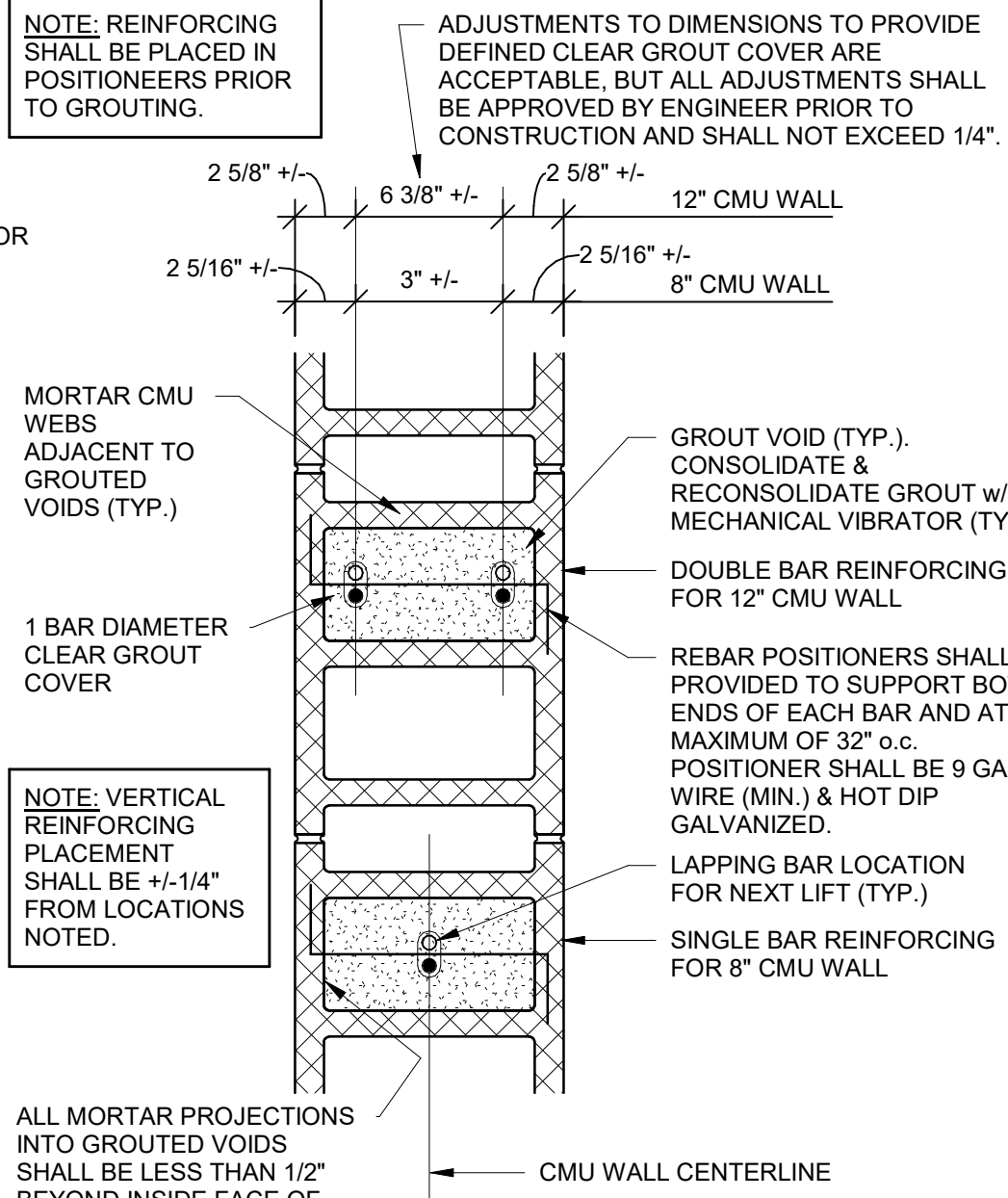
- NOTES:**
1. IN ADDITION TO SPACING SHOWN IN SCHEDULE, VERTICAL REINFORCING SHALL BE PROVIDED IN GROUDED CELLS AT THE FOLLOWING LOCATIONS:
 - A) IN THE FIRST 2 CELLS ADJACENT TO EACH OPENING
 - B) IN THE END CELLS ON EACH SIDE OF VERTICAL CONTROL JOINTS
 - C) IN THE END CELLS OF EACH LENGTH OF WALL
 - D) AT EACH CORNER OF WALLS
 2. ALL MASONRY VOIDS AND BOND BEAMS TO BE GROUDED SHALL BE FREE OF DEBRIS AND MORTAR DROPPINGS PRIOR TO GROUDED. ANY MASONRY w/ DROPPINGS OR DEBRIS OBSERVED IN VOIDS SHALL BE REJECTED.

A CMU WALL ELEVATION
1 1/2" = 1'-0"



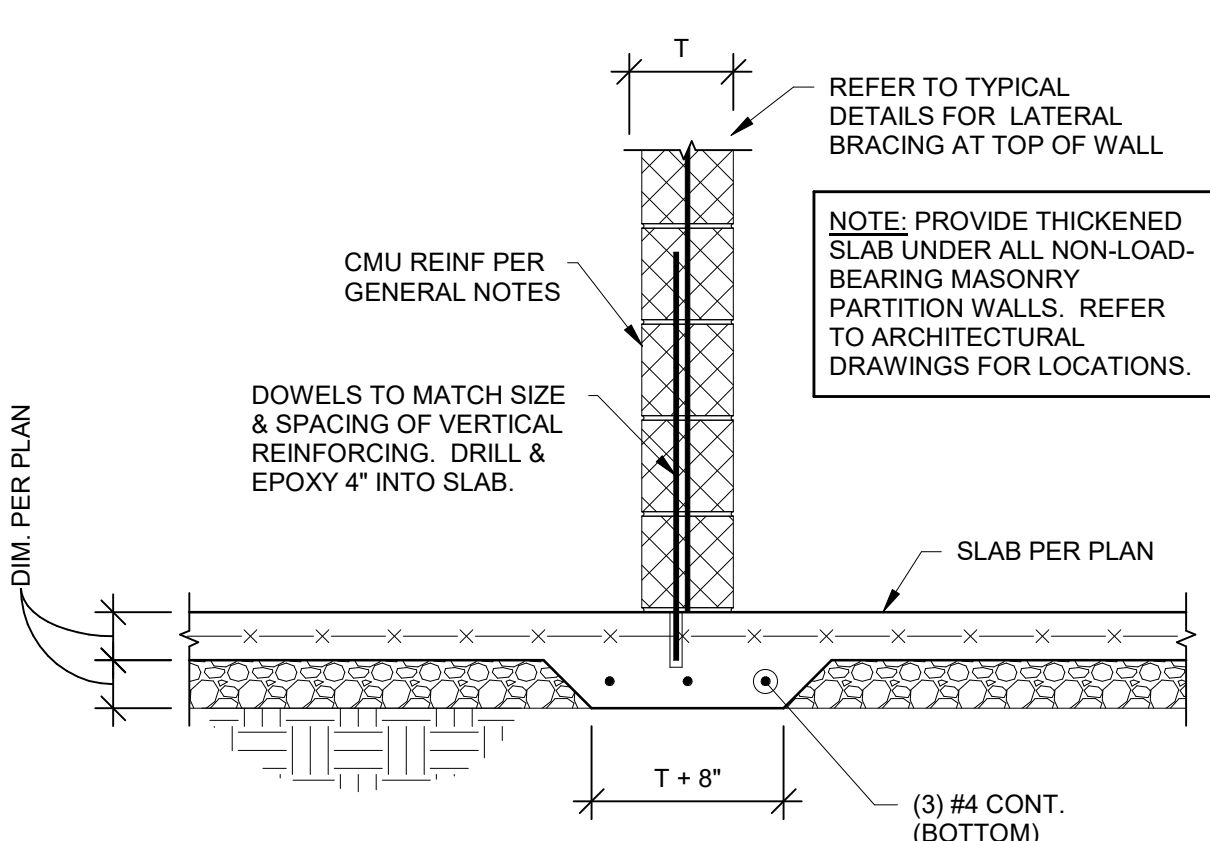
TYPICAL BRACING DETAILS FOR NON-LOAD-BEARING CMU WALLS THAT DO NOT EXTEND TO DECK
(REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION)

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



TYPICAL REBAR POSITIONING DETAIL

B SECTION
1 1/2" = 1'-0"

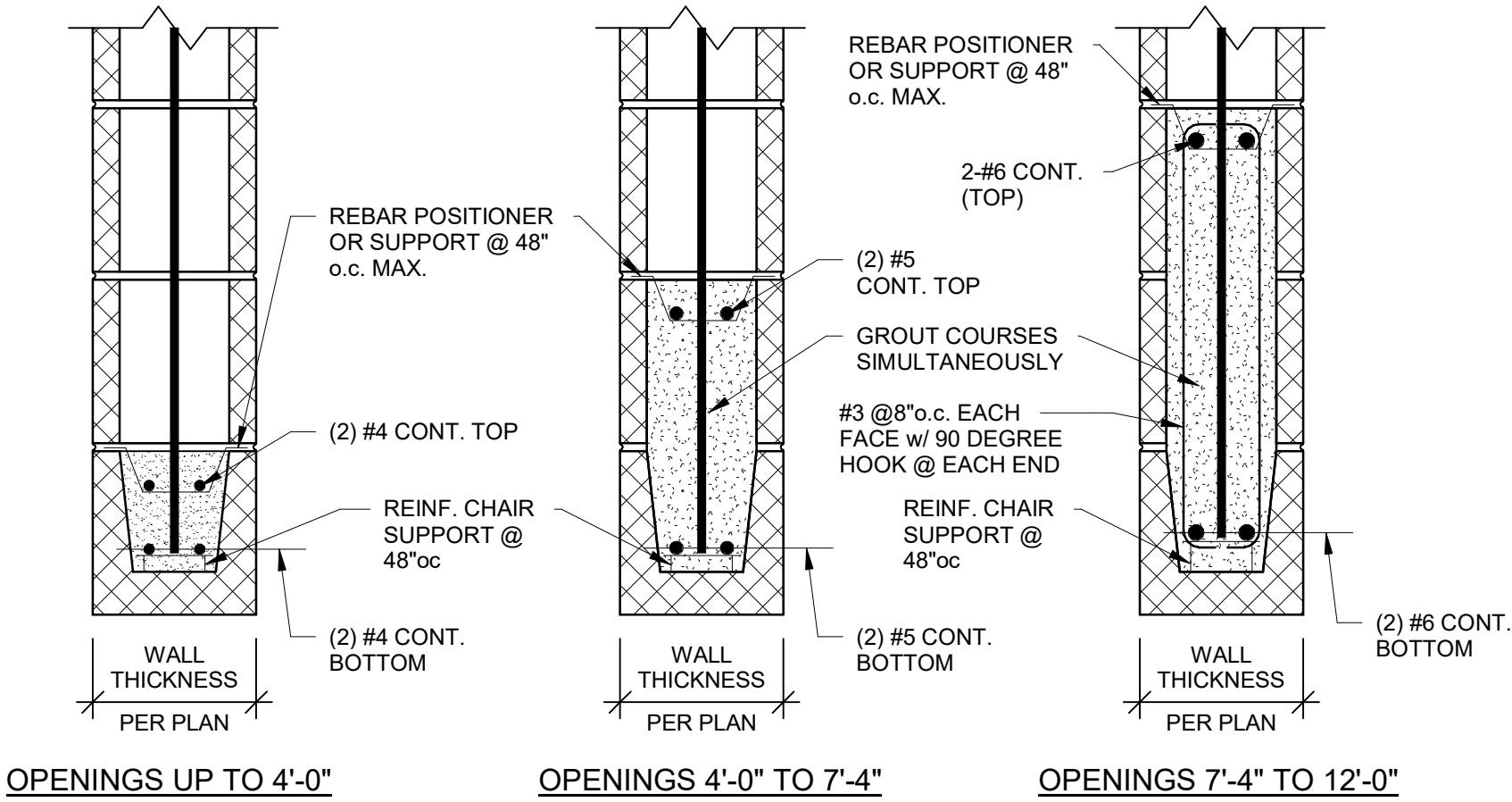


TYPICAL THICKENED SLAB
(UNDER NON-LOAD-BEARING MASONRY)

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

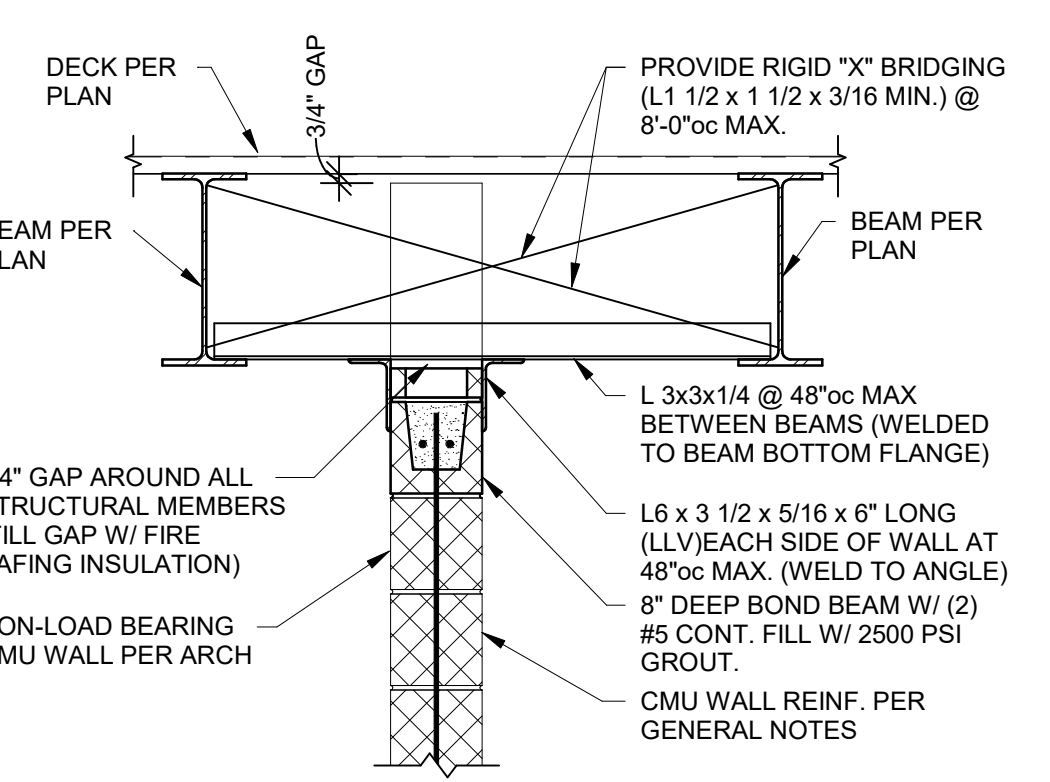
TYPICAL MASONRY REINFORCING NOTE:

ALL INTERIOR & EXTERIOR MASONRY WALLS SHOWN ON ARCHITECTURAL AND STRUCTURAL DRAWINGS ARE TO BE REINFORCED HORIZONTALLY WITH BOND BEAMS (2-#5 BOTTOM) AT BOTTOM COURSE, TOP COURSE, JOIST BEARING ELEVATION AND AT 8'-0" MAXIMUM O.C. AND VERTICALLY AS INDICATED ON DRAWINGS. THESE WALLS ARE TO BE ANCHORED TOP AND BOTTOM TO THE FOUNDATION, FLOOR, OR ROOF PER TYPICAL DETAILS. THE VERTICAL REINFORCING IS CONTINUOUS (IN 6'-0" MAXIMUM LENGTHS, LAPPED 2'-0" MINIMUM). FILL BLOCK CELLS AND BOND BEAMS WITH 2,500psi GROUT. RE: DETAILS "A" THROUGH "E" ON THIS SHEET.



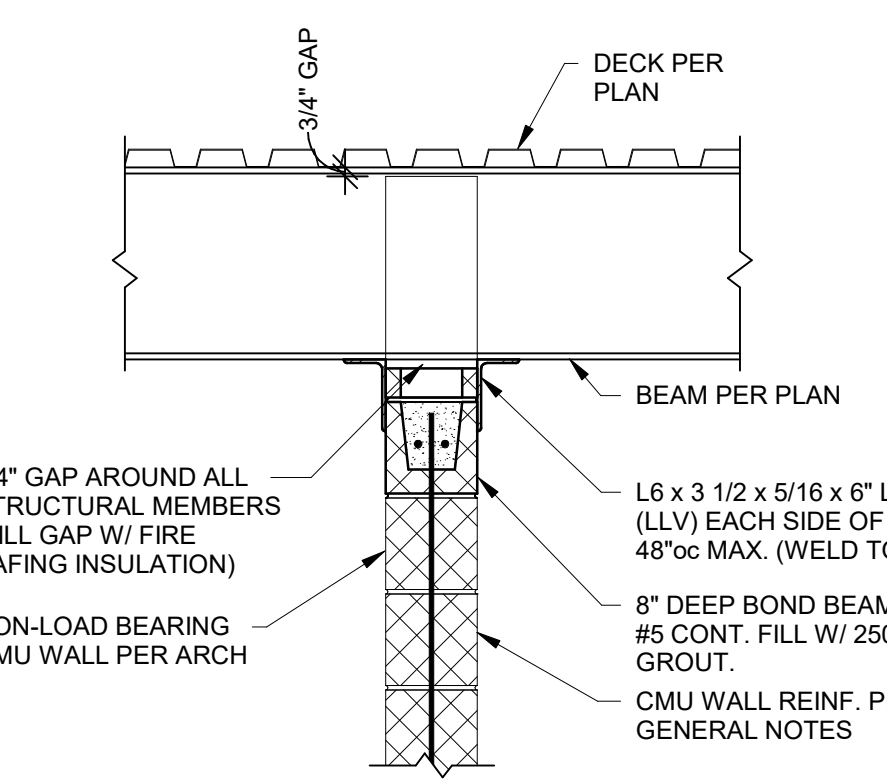
TYPICAL LINTELS AT ALL CMU WALLS (U.N.O.)

C SECTION
1 1/2" = 1'-0"



TYPICAL BRACING DETAILS FOR NON-LOAD-BEARING CMU WALLS THAT EXTEND TO DECK
(REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION)

2 SECTION
3/4" = 1'-0"

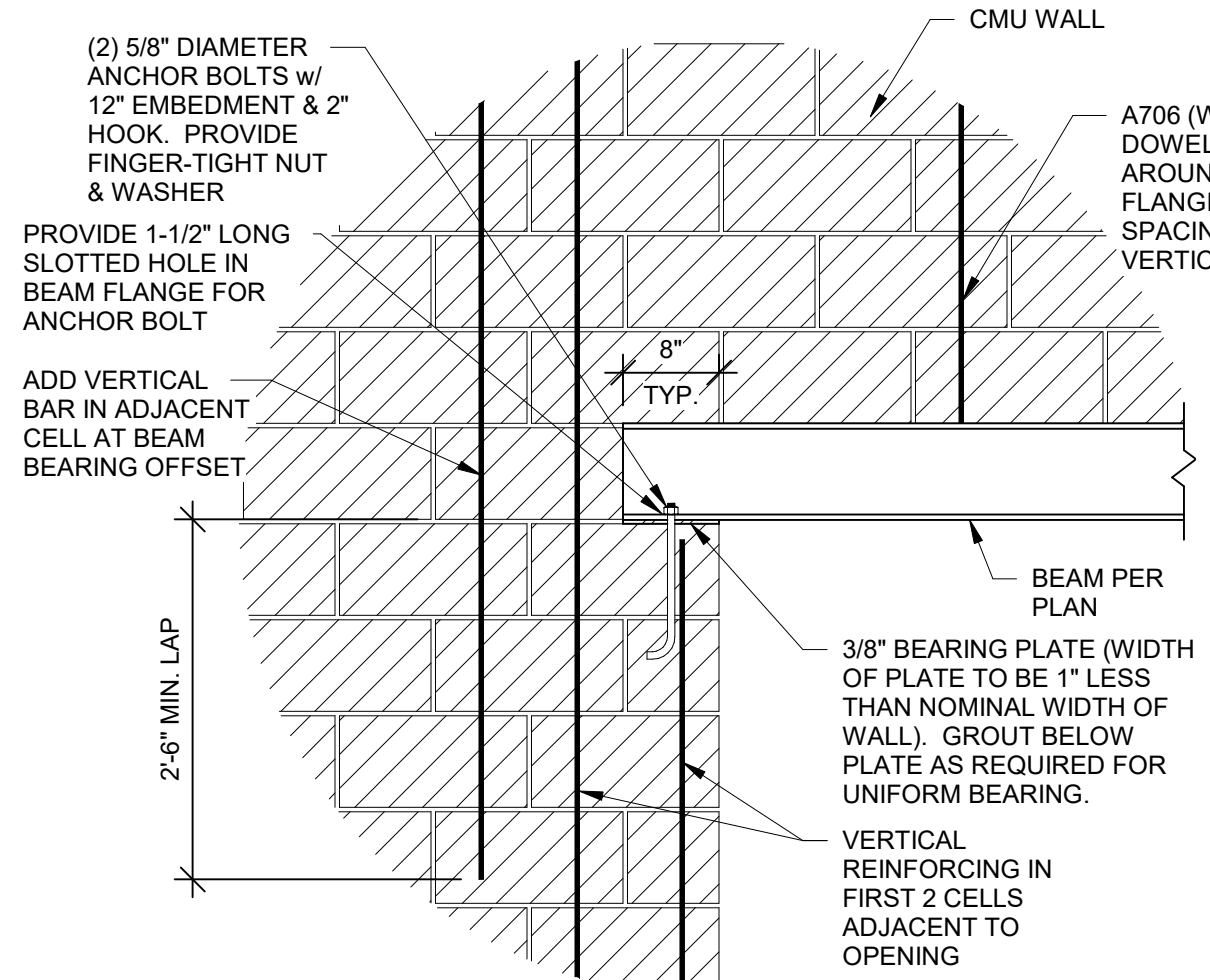


TYPICAL WIDE FLANGE BEAM BEARING ON CMU (U.N.O.)

5 SECTION
3/4" = 1'-0"

TYPICAL STEEL LINTEL DETAIL AT CMU WALL

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



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Revisions

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$$\angle \frac{1}{4}'' = 1'.6$$

NOTES:

1. REFER TO GENERAL NOTES AND LEGEND ON SHEET S001.
2. TOP OF EXTERIOR FOOTING ELEVATION = 99'-4" U.N.O.
3. TOP OF INTERIOR FOOTING ELEVATION = 99'-3" U.N.O.
4. NOTE "A" - POUR STOOP SLAB WITH ADJACENT SIDEWALK.
COORDINATE STOOP WITH SIDEWALK JOINT PATTERN

Structural Foundation Schedule					
NOTE: 1) EXTERIOR FOOTINGS OR FOOTING AT GRADE BEAM SHALL MATCH GRADE BEAM DEPTH AND BE PLACED WITH GRADE BEAM. PROVIDE SPECIFIED REBAR TOP AND BOTTOM WITH 4 STANDEES TO SUPPORT MATS. 2) PROVIDE REINFORCING PER SCHEDULE EACH WAY IN TOP OF FTG. AT ALL MOMENT FRAME AND BRACED BAY COLUMNS. 3) CENTER FOOTINGS ON COLUMNS AND/OR WALL CENTER LINES PER PLAN UNLESS NOTED OTHERWISE (U.N.O.).					
Type Mark	Length	Width	Footing Thickness	Bottom Bars	Quantity (E.W. Top & Bott)
4.5	4'-6"	4'-6"	2'-8"	Rebar : # 4	9
5.5A	5'-6"	5'-6"	2'-8"	Rebar : # 5	7
6.0A	6'-0"	6'-0"	2'-8"	Rebar : # 5	8

TYPE	COLUMN	BASE PLATE (tXBxN)	SHAPE	ANCHOR RODS	EMBEDMENT
1	PER PLAN	3/4"x11"x11"	A	(4) 3/4"Ø	9"
2	PER PLAN	3/4"x12"x12"	A	(4) 3/4"Ø	9"
3	PER PLAN	1"x12"x18"	B	(6) 3/4"Ø	1'-6"
4	PER PLAN	3/4"x9"x10"	C	(4) 3/4"Ø	9"

NOTES:

1. SEE PLAN FOR ORIENTATION OF COLUMNS.
2. PROVIDE PLATE WASHER & EMBEDDED PLATE PER SCHEDULE @ ALL ANCHOR BOLTS
3. U.N.O. ALL THREADED ROD A.B's SHALL BE F1554 (36ksi) MATERIAL.

ANCHOR ROD DIAMETER	MAX. BASE PLATE HOLE DIAMETER	MIN. PLATE WASHER SIZE	MIN. PLATE WASHER THICKNESS	EMBEDDED ANCHOR PLATE SIZE
3/4"	1 5/16"	2"	1/4"	1/2"x2 1/2"x2 1/2"
7/8"	1 9/16"	2 1/2"	5/16"	1/2"x2 1/2"x2 1/2"
1"	1 7/8"	3"	3/8"	5/8"x3"x3"
1 1/4"	2 1/8"	3 1/2"	1/2"	5/8"x3 1/2"x3 1/2"
1 1/2"	2 3/8"	4"	1/2"	5/8"x3 1/2"x3 1/2"
1 3/4"	2 7/8"	4 1/2"	5/8"	3/4"x3 1/2"x3 1/2"
2"	3 1/4"	5"	3/4"	3/4"x3 1/2"x3 1/2"
2 1/2"	3 3/4"	5 1/2"	7/8"	3/4"x3 1/2"x3 1/2"

NOTES:

1. HOLE SIZES PROVIDED ARE BASED ON ANCHOR ROD SIZE AND CORRELATE WITH ACI 117 (ACI, 2010).
2. CIRCULAR OR SQUARE WASHERS MEETING THE WASHER SIZE ARE ACCEPTABLE.
3. HOLE IN PLATE WASHER SHALL BE 1/16" LARGER THAN ANCHOR DIAMETER.

ELEVATION

Issue Date: September 9, 2022

Revisions

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FOUNDATION PLAN

S101-B

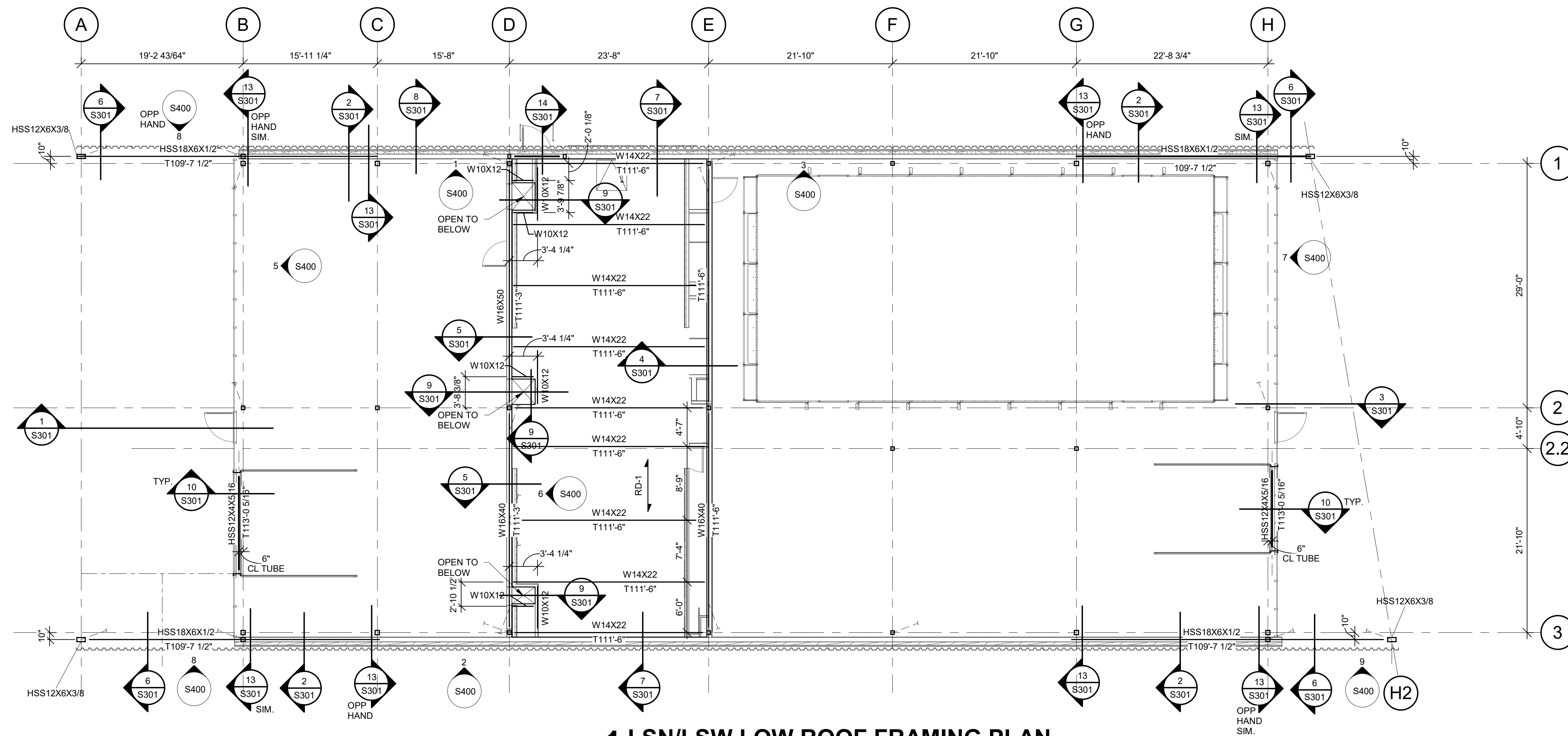
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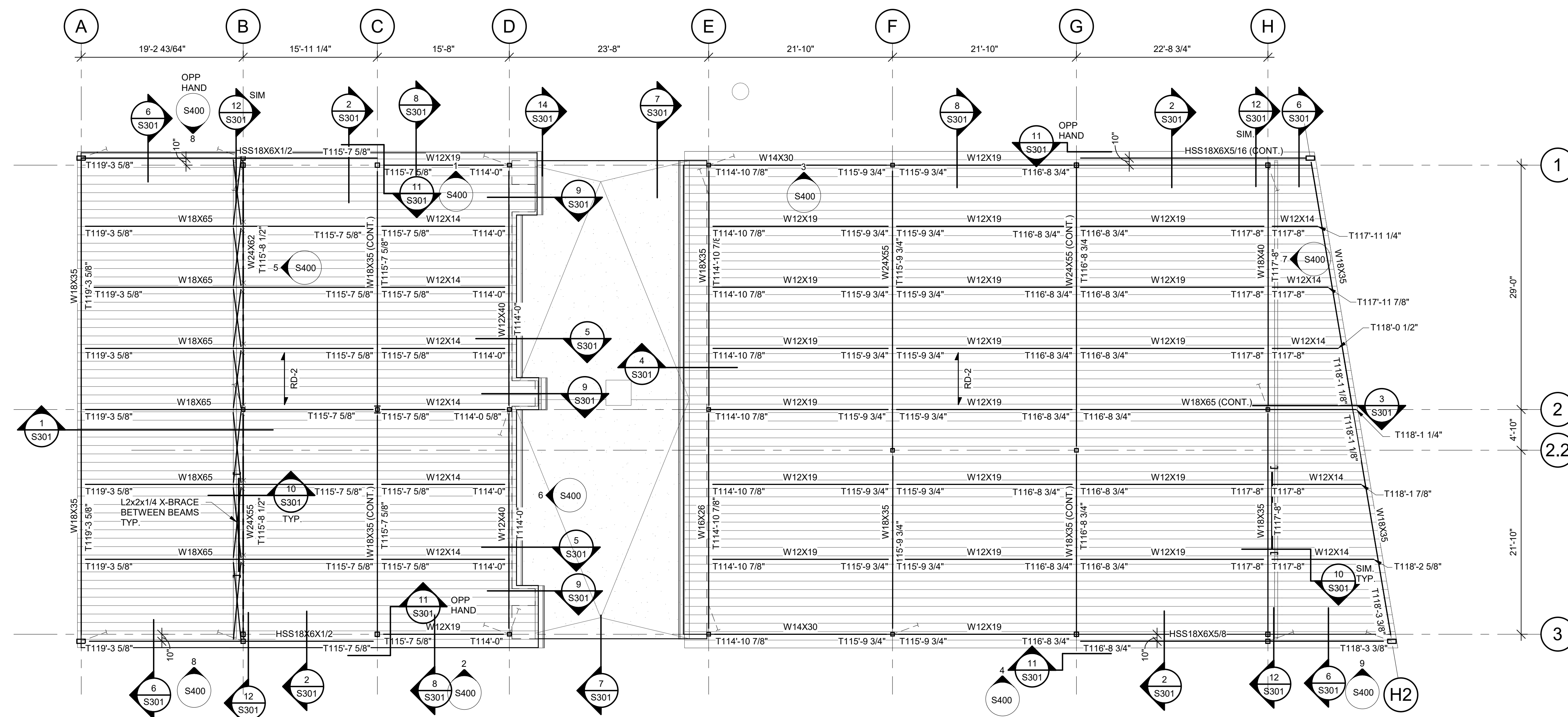
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1 LSN/LSW LOW ROOF FRAMING PLAN
1/8" = 1'-0"



2 LSN/LSW ROOF FRAMING PLAN
1/8" = 1'-0"

NOTES:
1. REFER TO GENERAL NOTES AND LEGEND ON SHEET S001.

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LOW ROOF AND ROOF
FRAMING PLAN

S111-B

LSR7 Robotics, GiC & Phys Education

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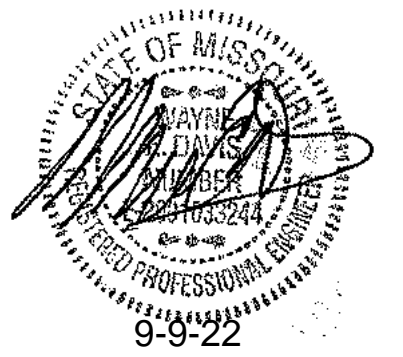
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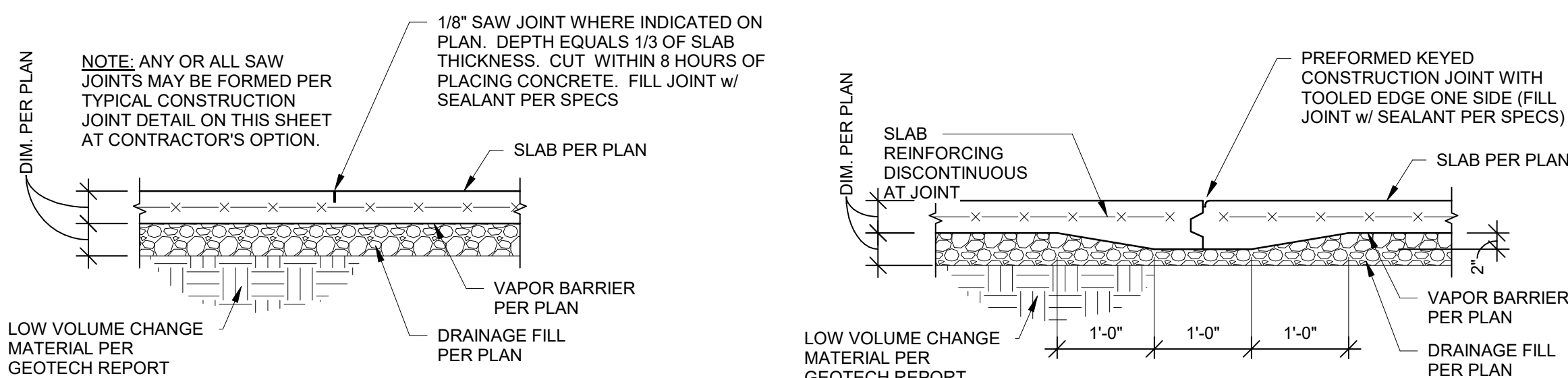
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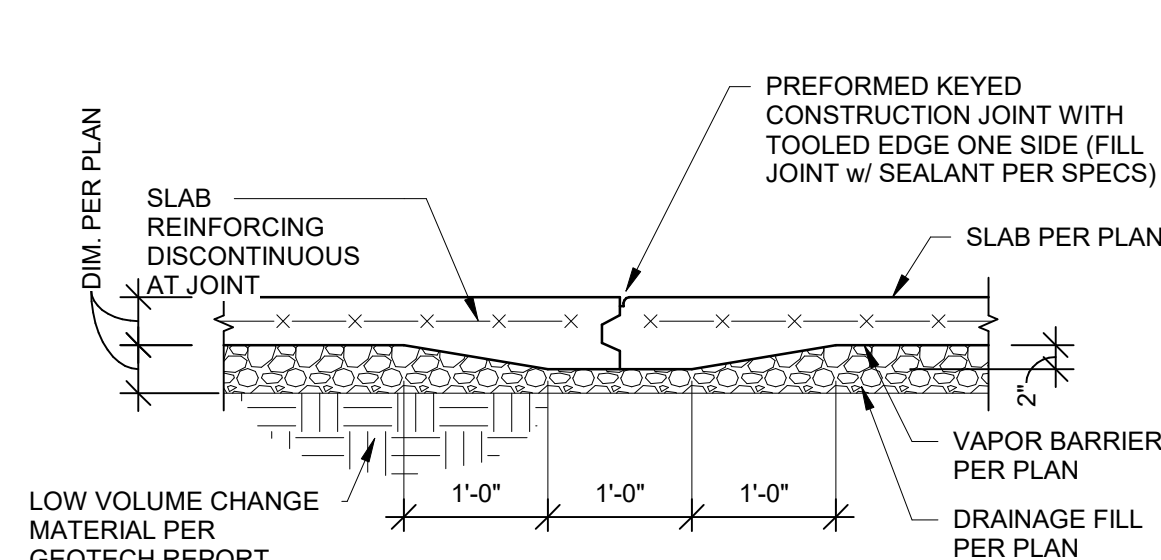


FOUNDATION
SECTIONS
S200



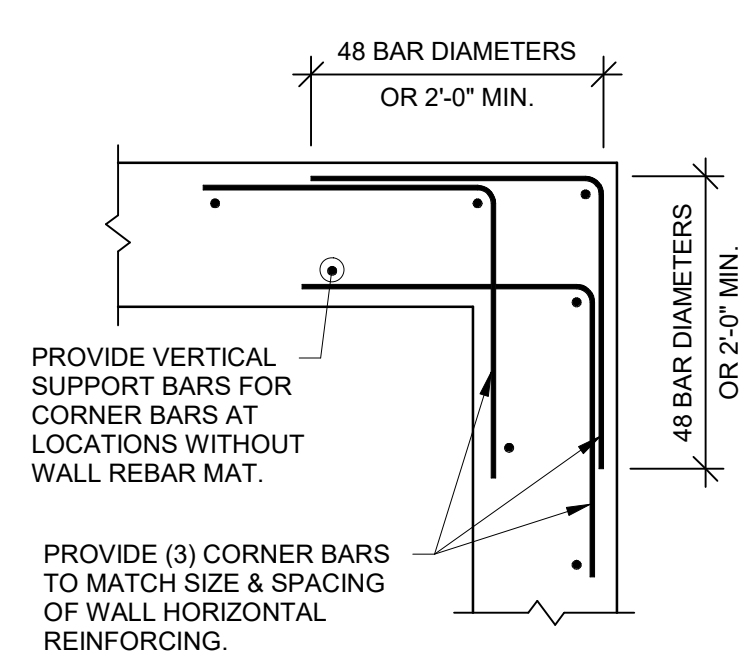
TYPICAL SAW JOINT
NOTED "SJ" ON PLAN

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

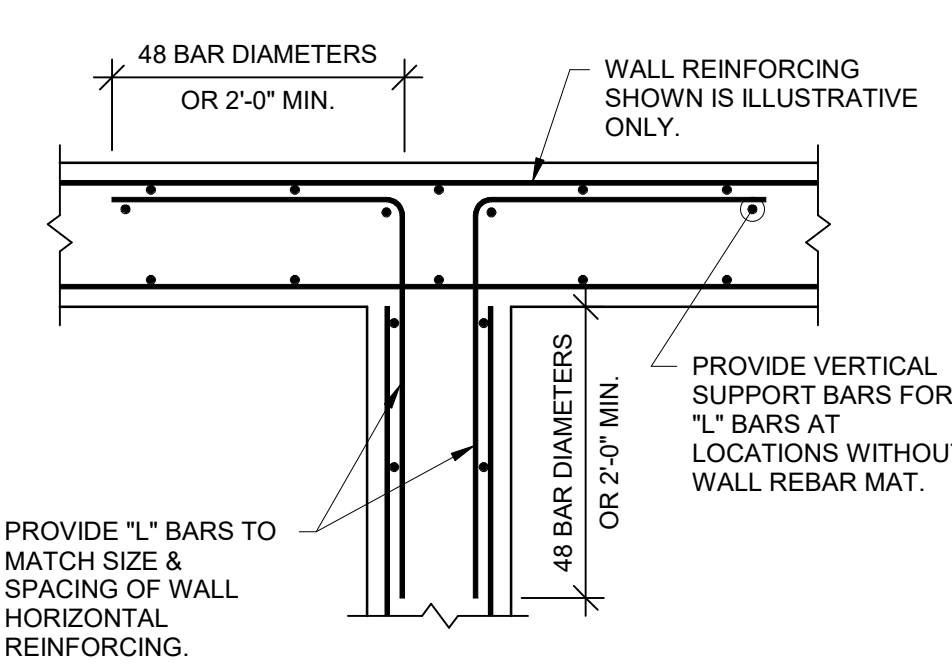


TYPICAL CONSTRUCTION JOINT
NOTED "CJ" ON PLAN

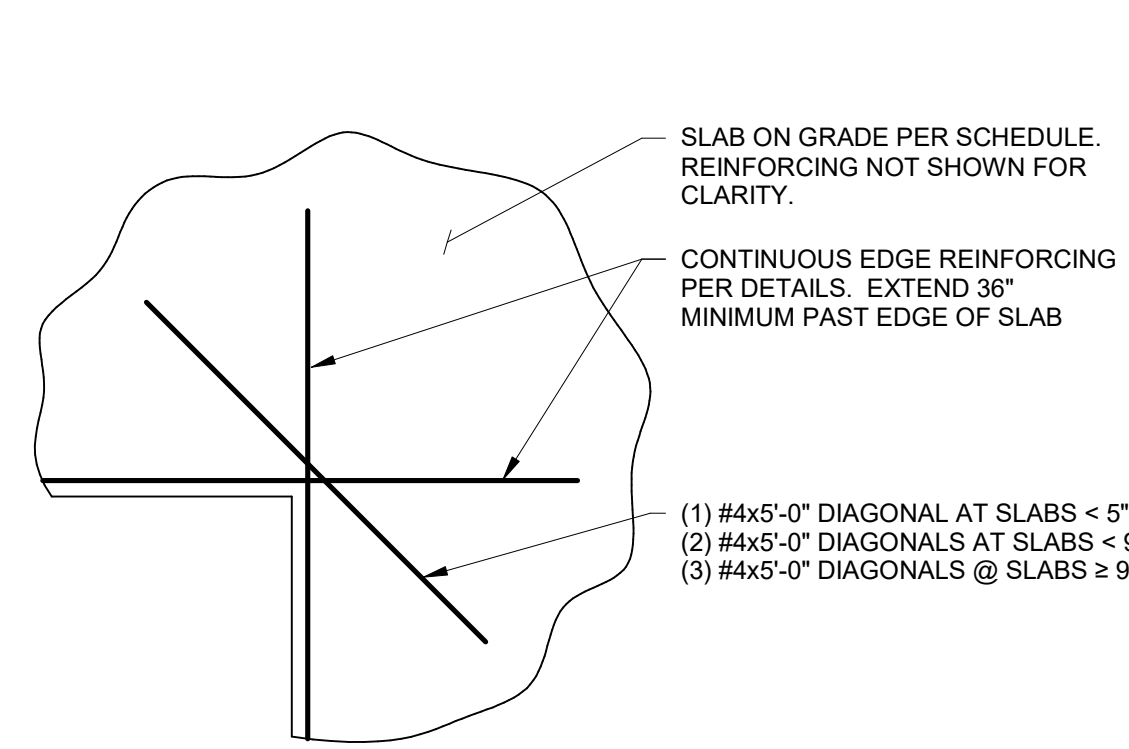
2 SECTION
3/4" = 1'-0"



TYPICAL CORNER BARS AT
CONCRETE WALLS & FOUNDATIONS

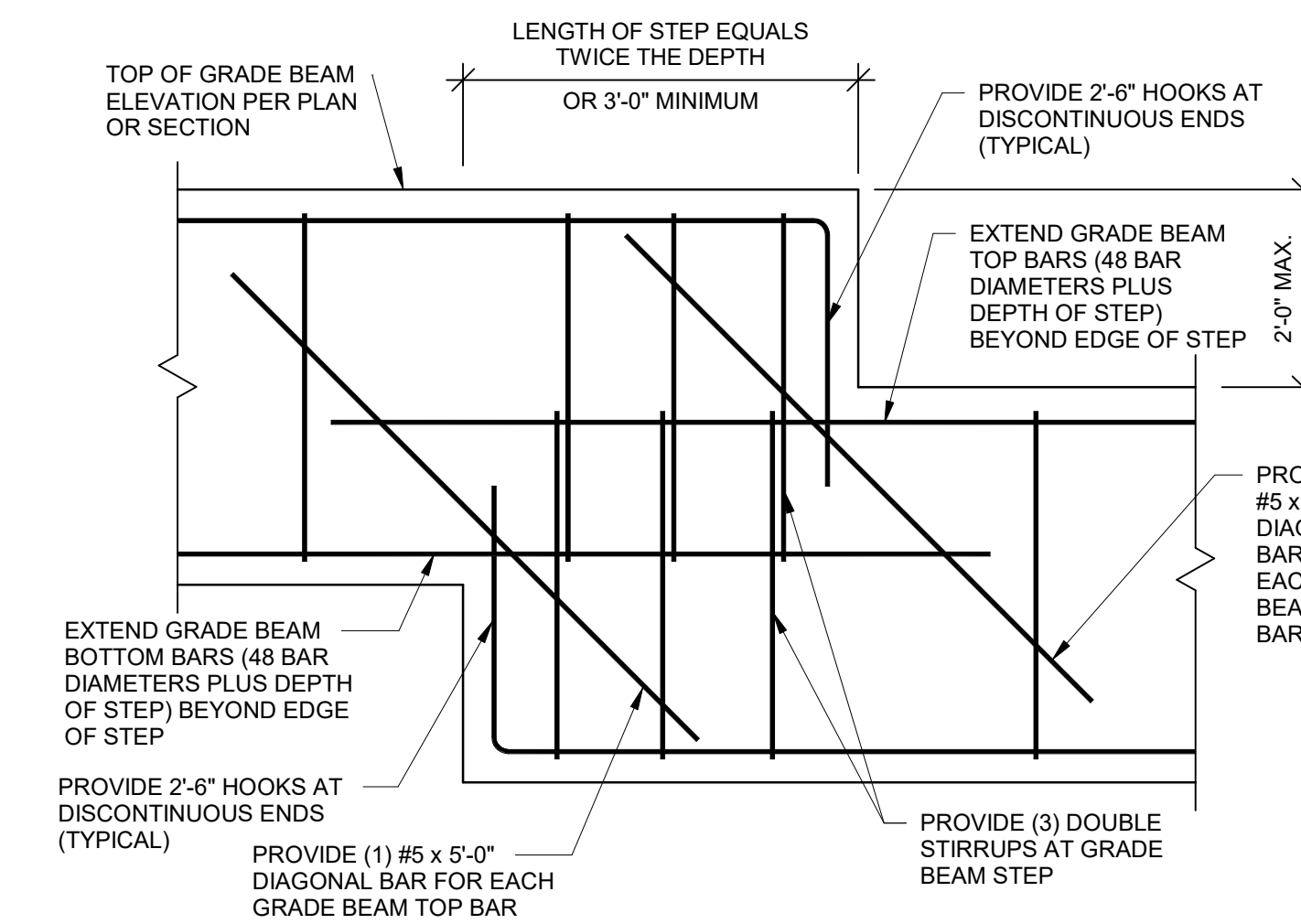


TYPICAL T-INTERSECTION REINFORCING
AT CONCRETE WALLS & FOUNDATIONS

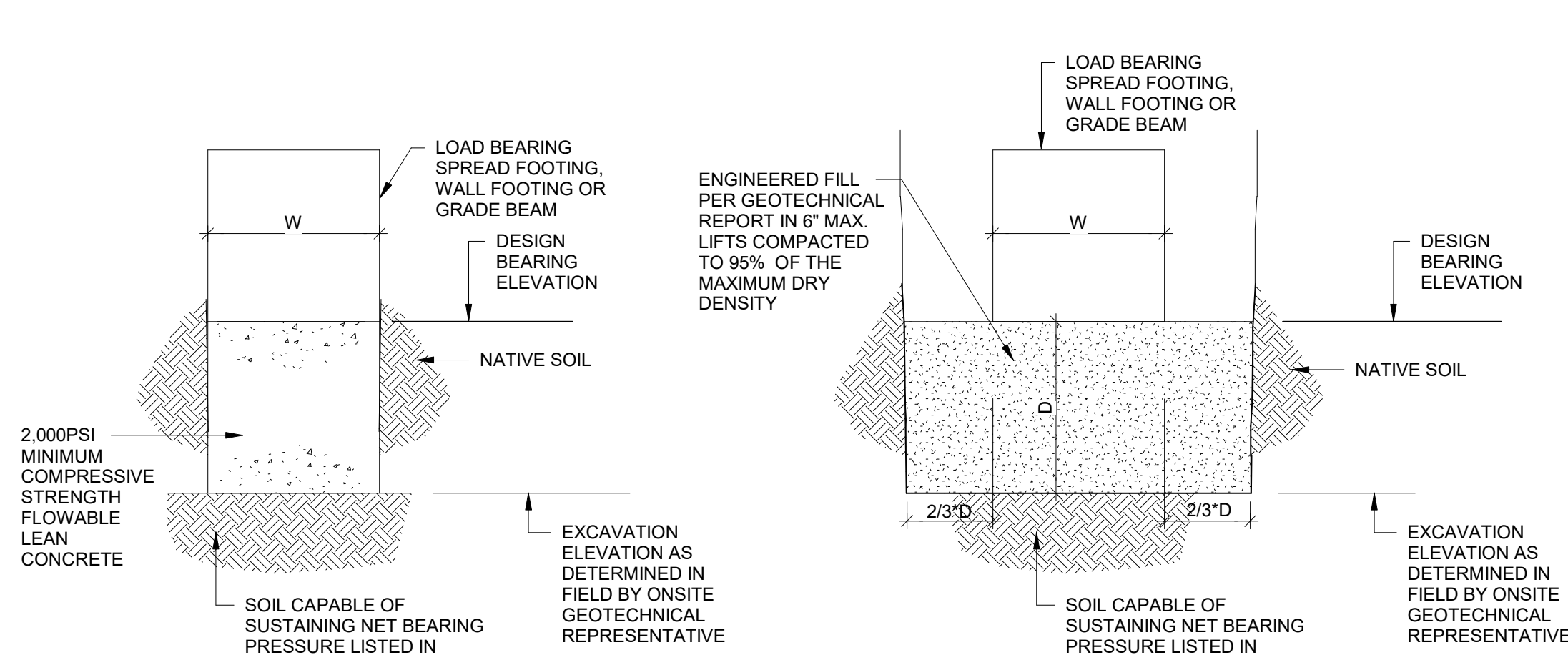


TYPICAL SLAB ON GRADE RE-ENTRANT CORNER BARS

4 DETAIL
1/2" = 1'-0"

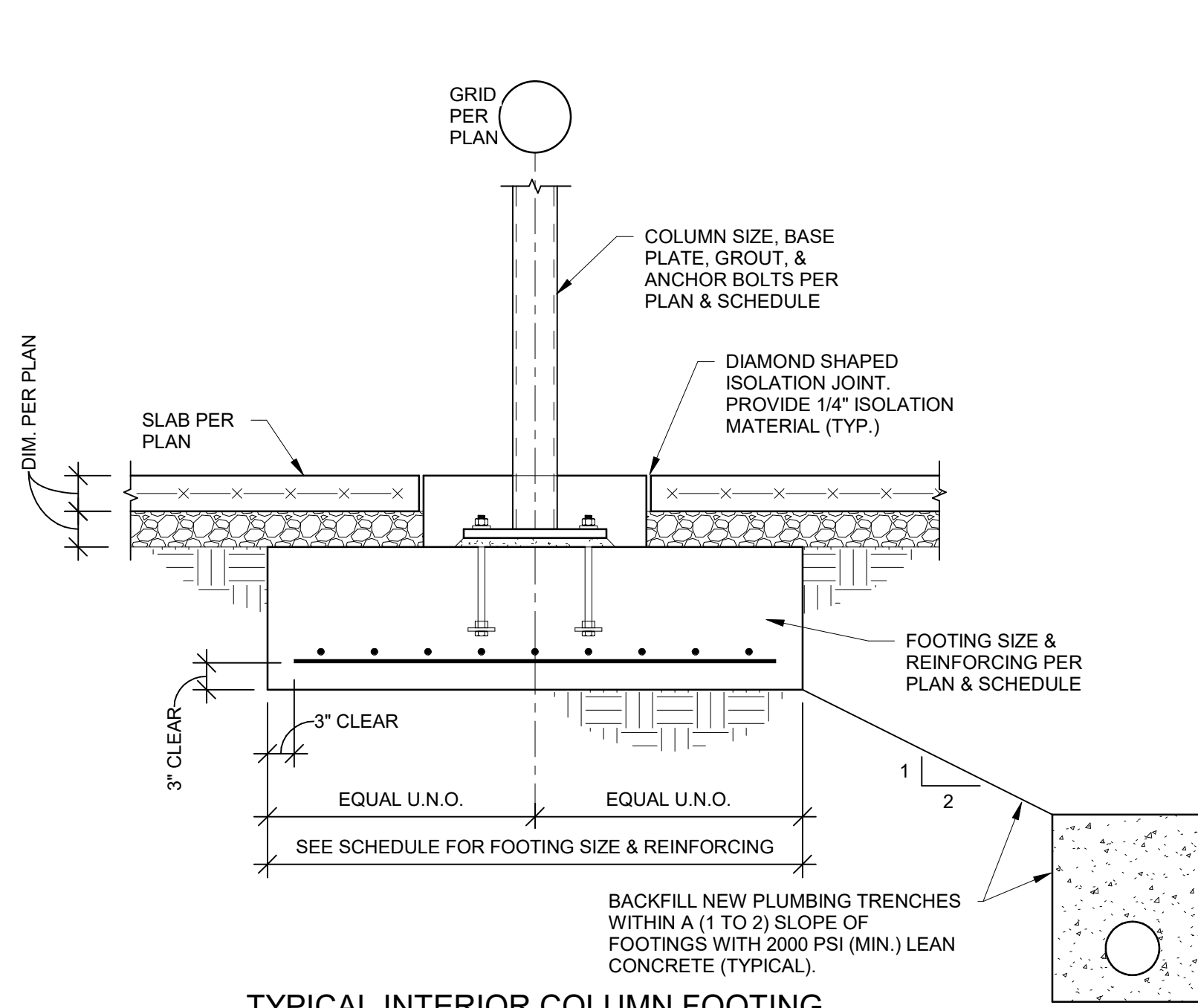


5 TYPICAL GRADE BEAM STEP
3/4" = 1'-0"



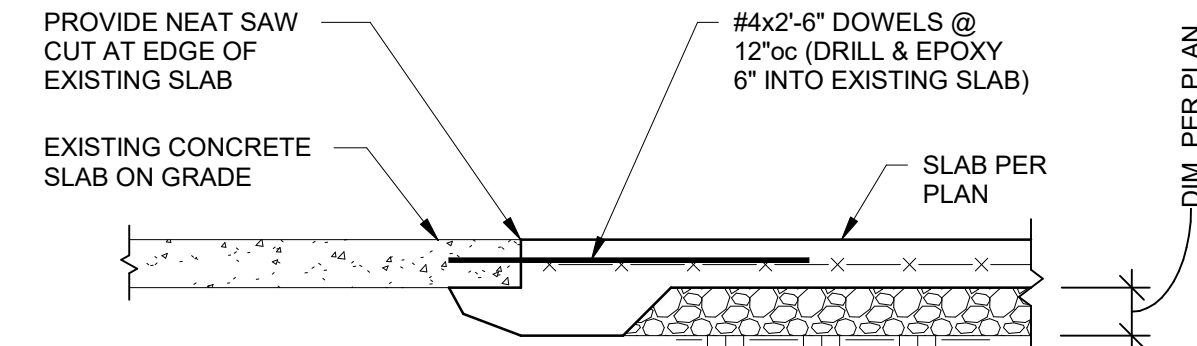
LEAN CONCRETE BACKFILL

6 OVEREXCAVATION DETAIL
3/4" = 1'-0"



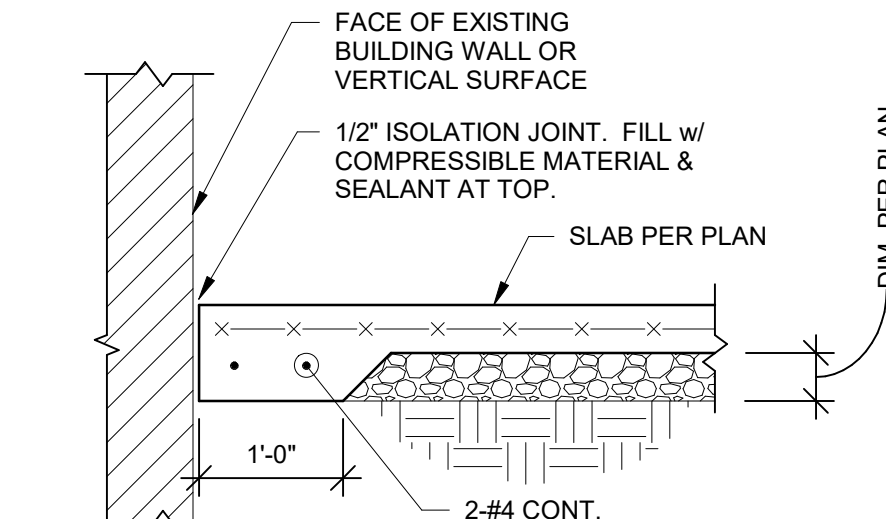
TYPICAL INTERIOR COLUMN FOOTING

7 SECTION
3/4" = 1'-0"



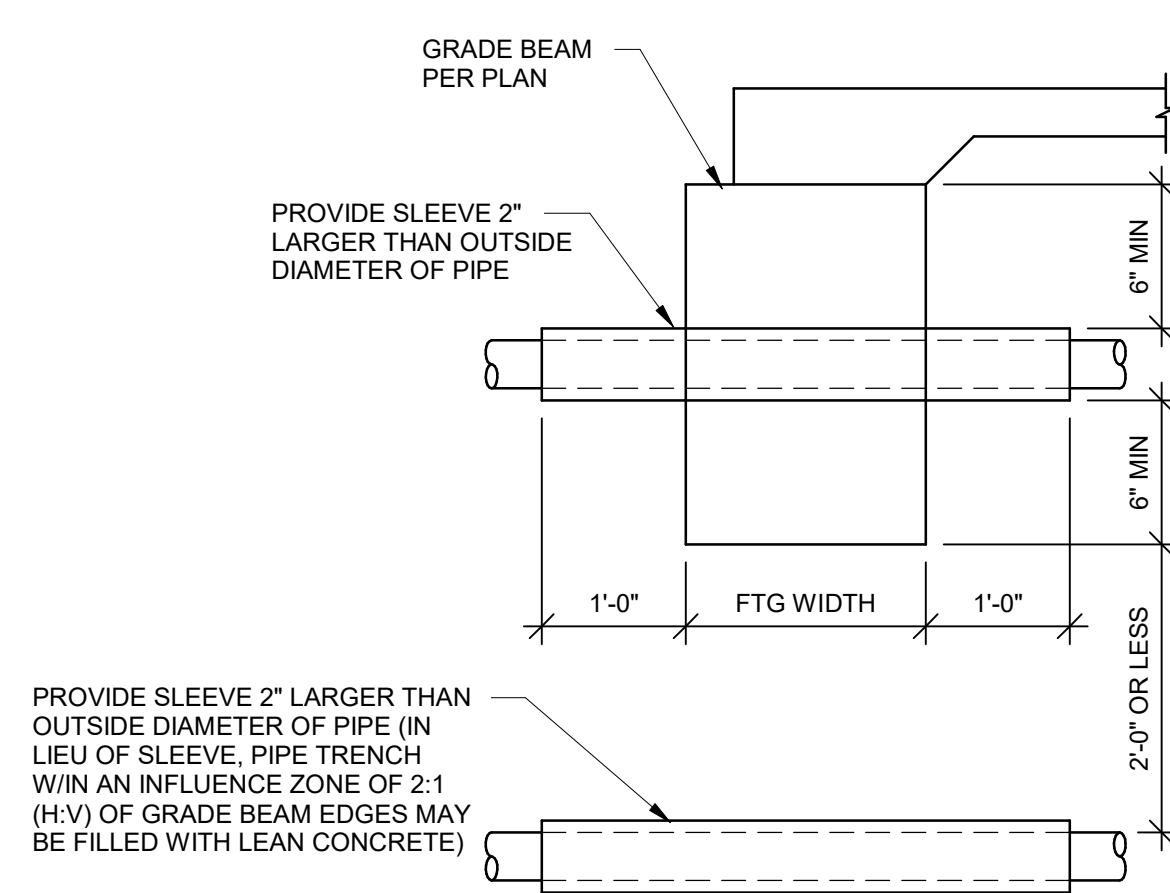
TYPICAL AT NEW-TO-EXISTING SLAB ON GRADE

8 SECTION
3/4" = 1'-0"



TYPICAL SLAB EDGE DETAIL AGAINST EXISTING
BUILDING WALL OR VERTICAL SURFACE

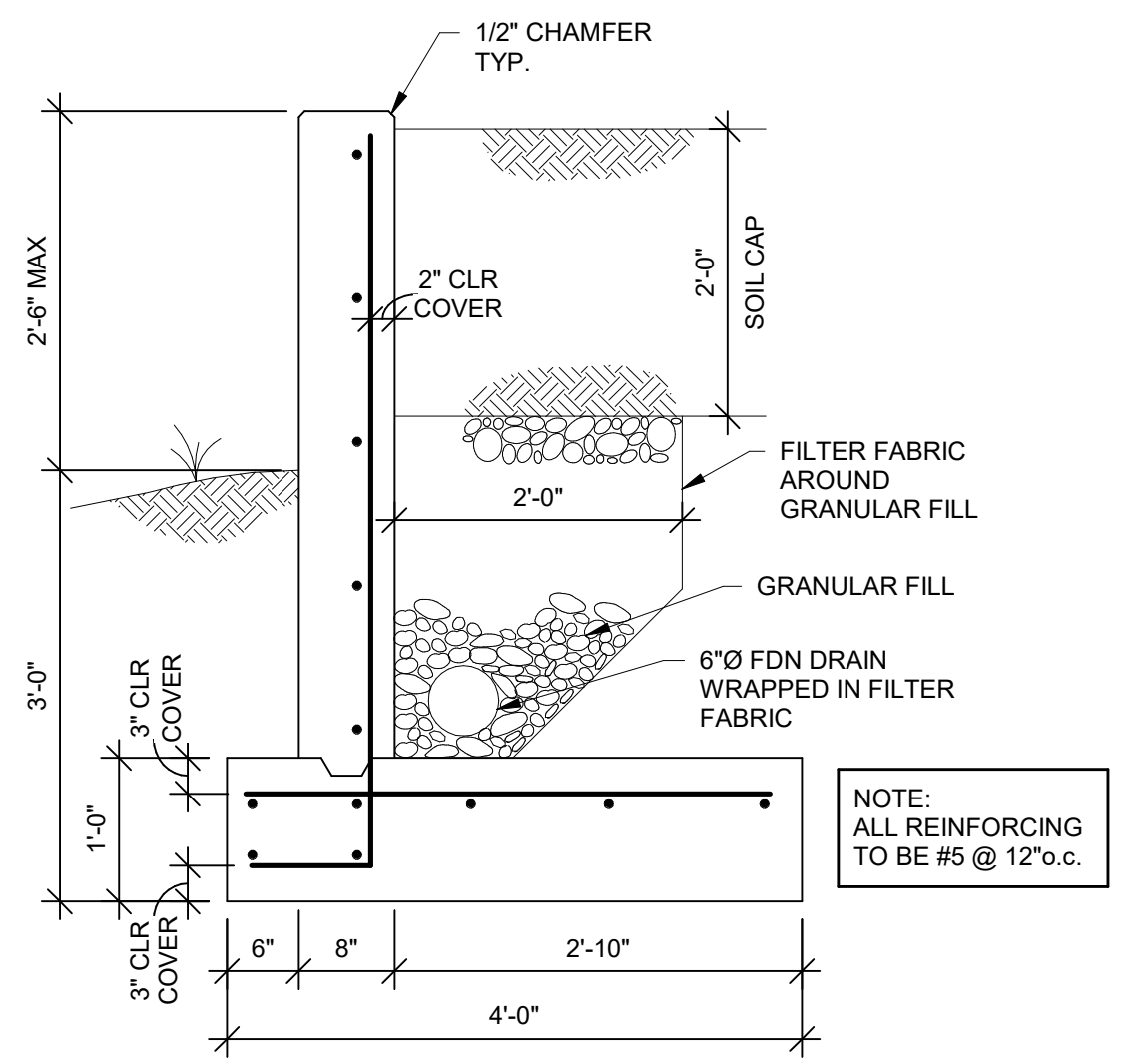
9 SECTION
3/4" = 1'-0"



TYPICAL GRADE BEAM SLEEVE

10 SECTION
3/4" = 1'-0"

IF PIPE FALLS WITHIN
BOTTOM OF GRADE BEAM,
PROVIDE BOTTOM FOOTING
STEP SUCH THAT 6" MIN.
COVERAGE IS PROVIDED



11 LSW-SITE WALL SECTION
3/4" = 1'-0"



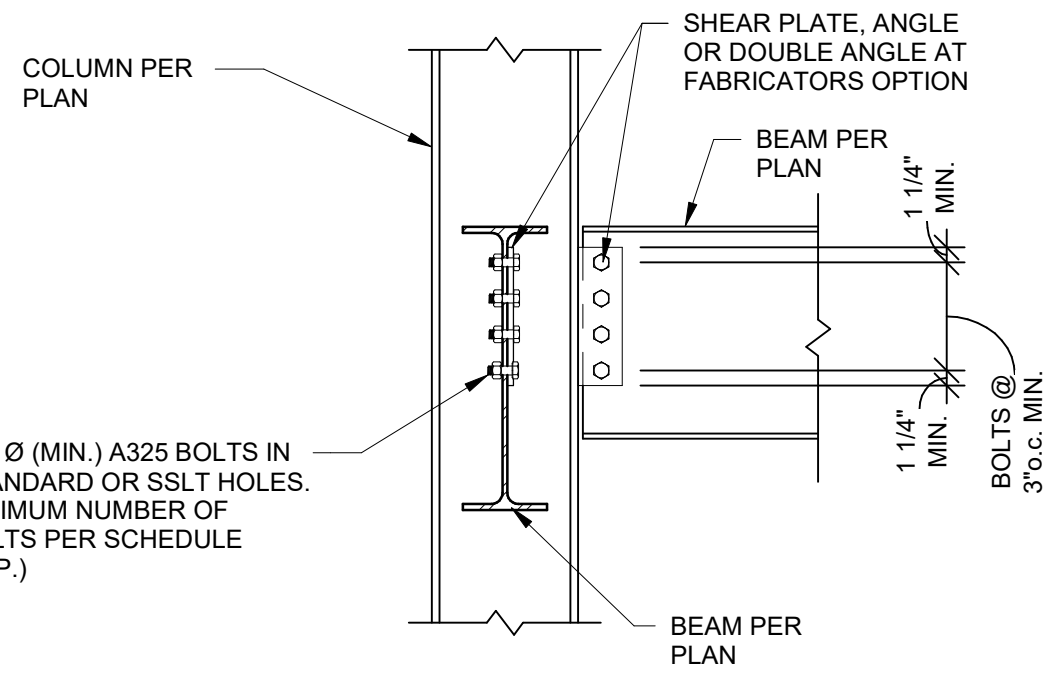
LSR7 Robotics, GiC & Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

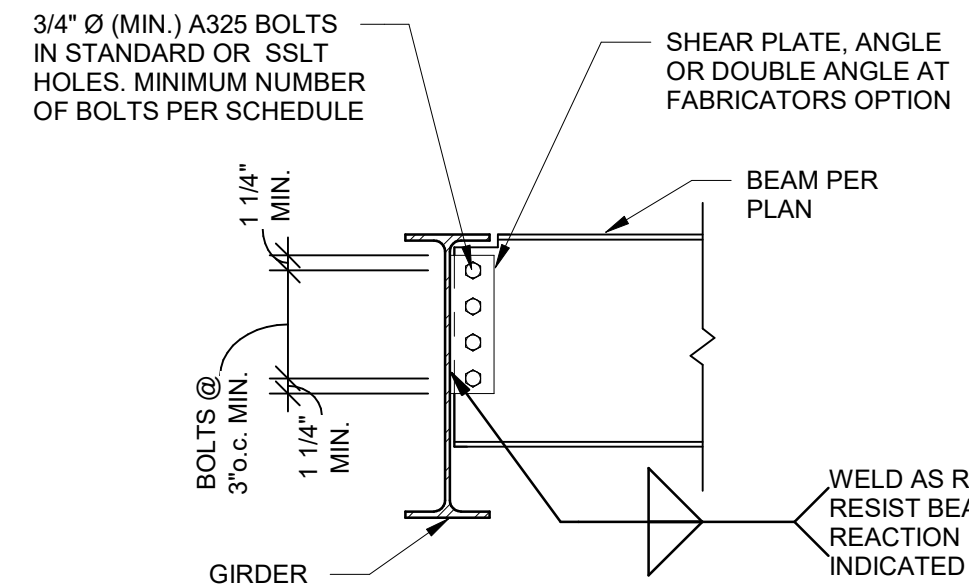
owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086
architect: Multistudio
4205 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi-studio
civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveg.com
structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
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MEP/PT/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com



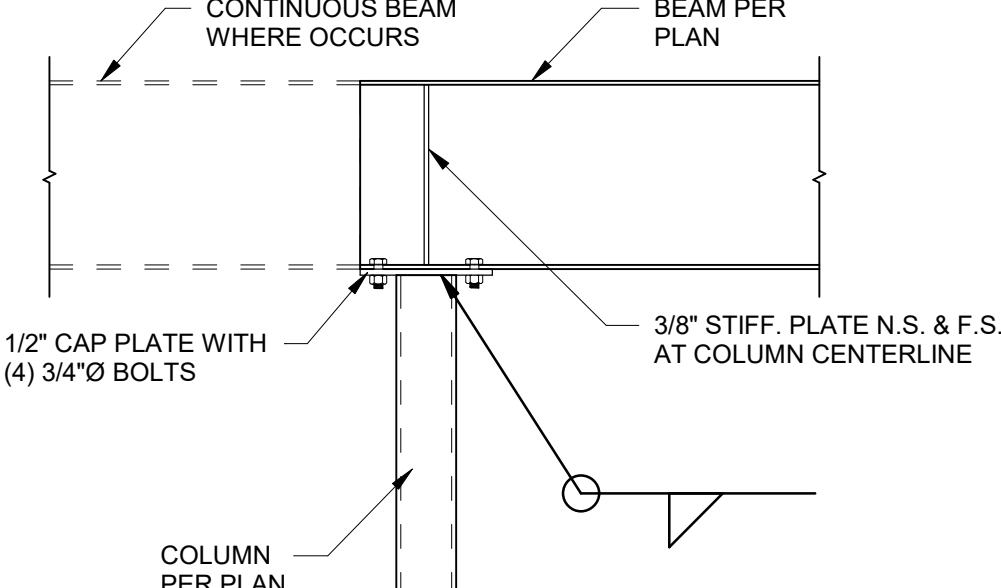
TYPICAL BEAM TO COLUMN SHEAR CONNECTION

1 DETAIL
3/4" = 1'-0"



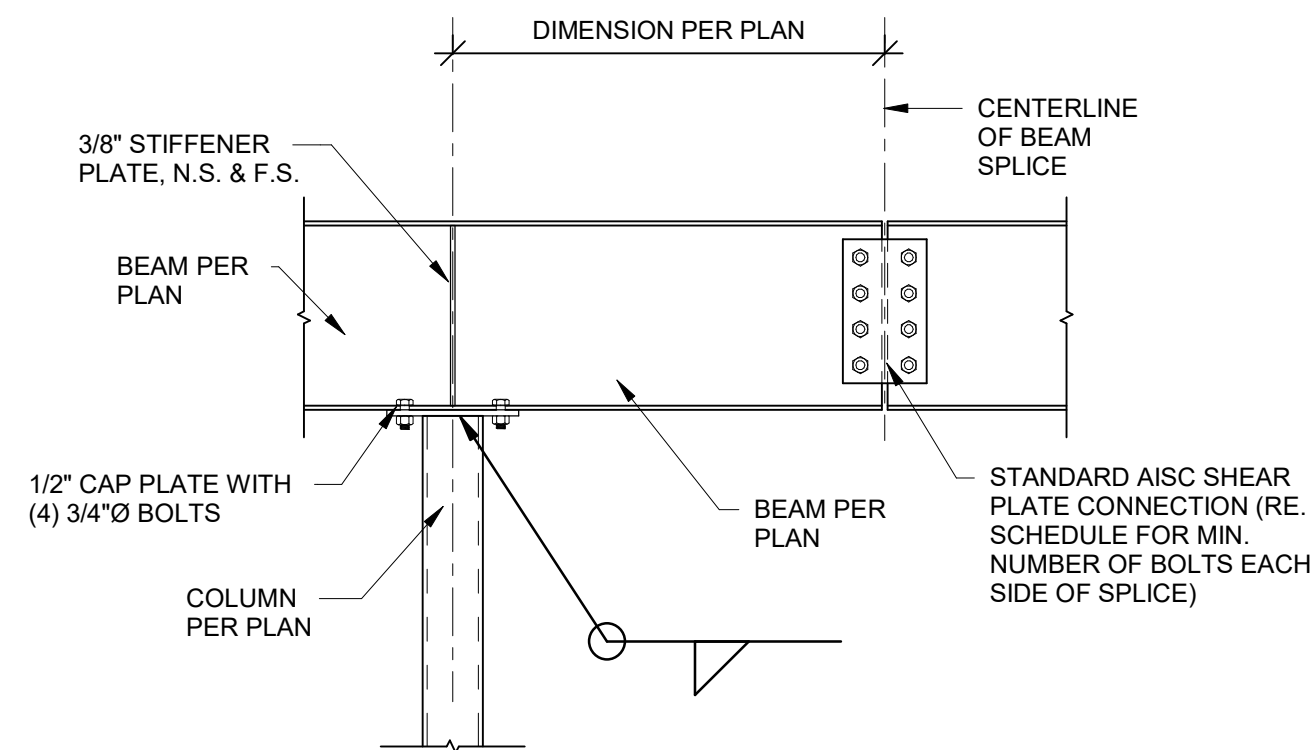
TYPICAL BEAM TO GIRDER CONNECTION

2 DETAIL
3/4" = 1'-0"



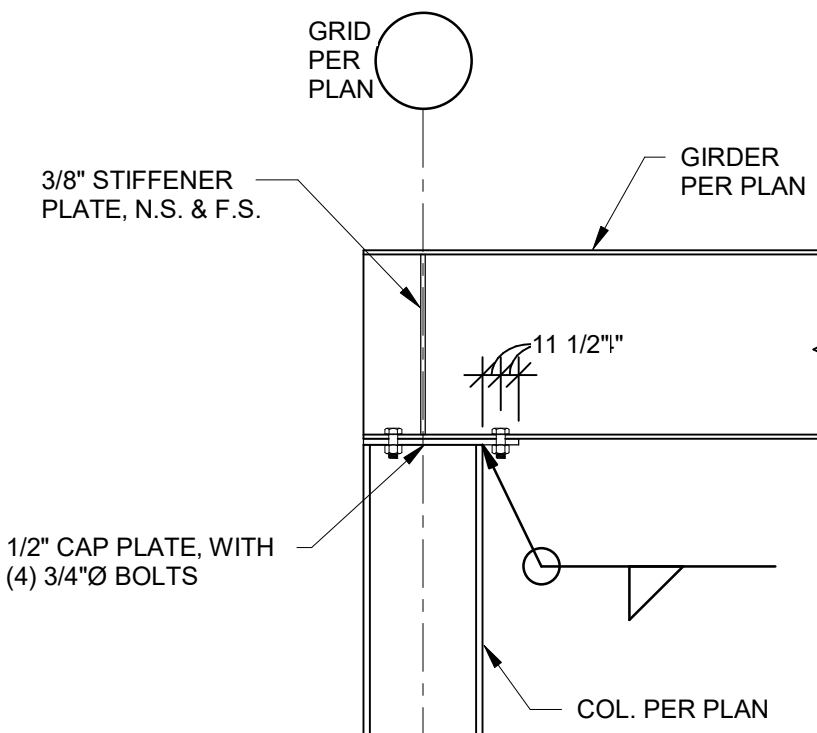
TYPICAL BEAM TO COLUMN CONNECTION

3 DETAIL
3/4" = 1'-0"

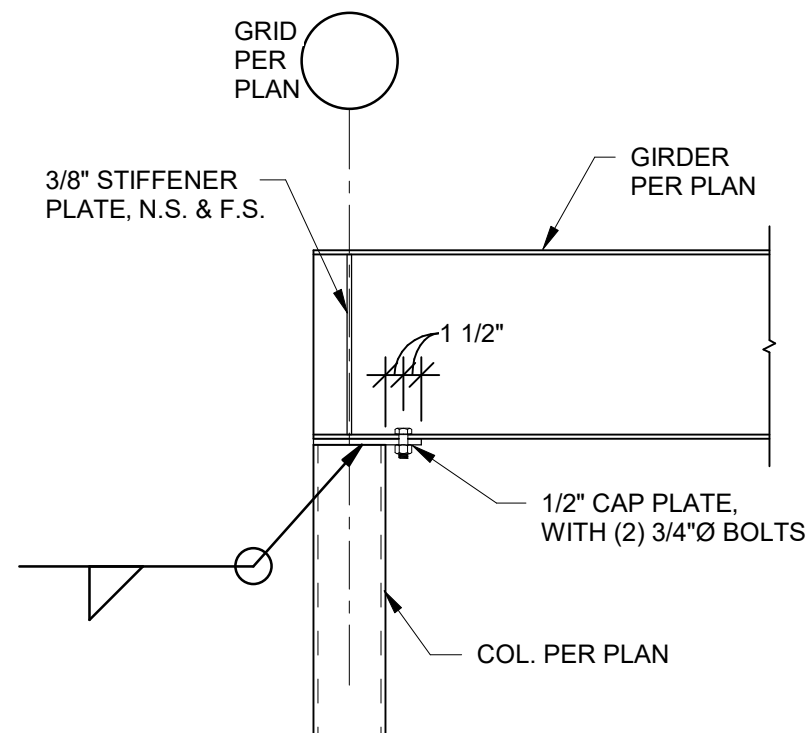


TYPICAL BEAM SPLICE

4 DETAIL
3/4" = 1'-0"



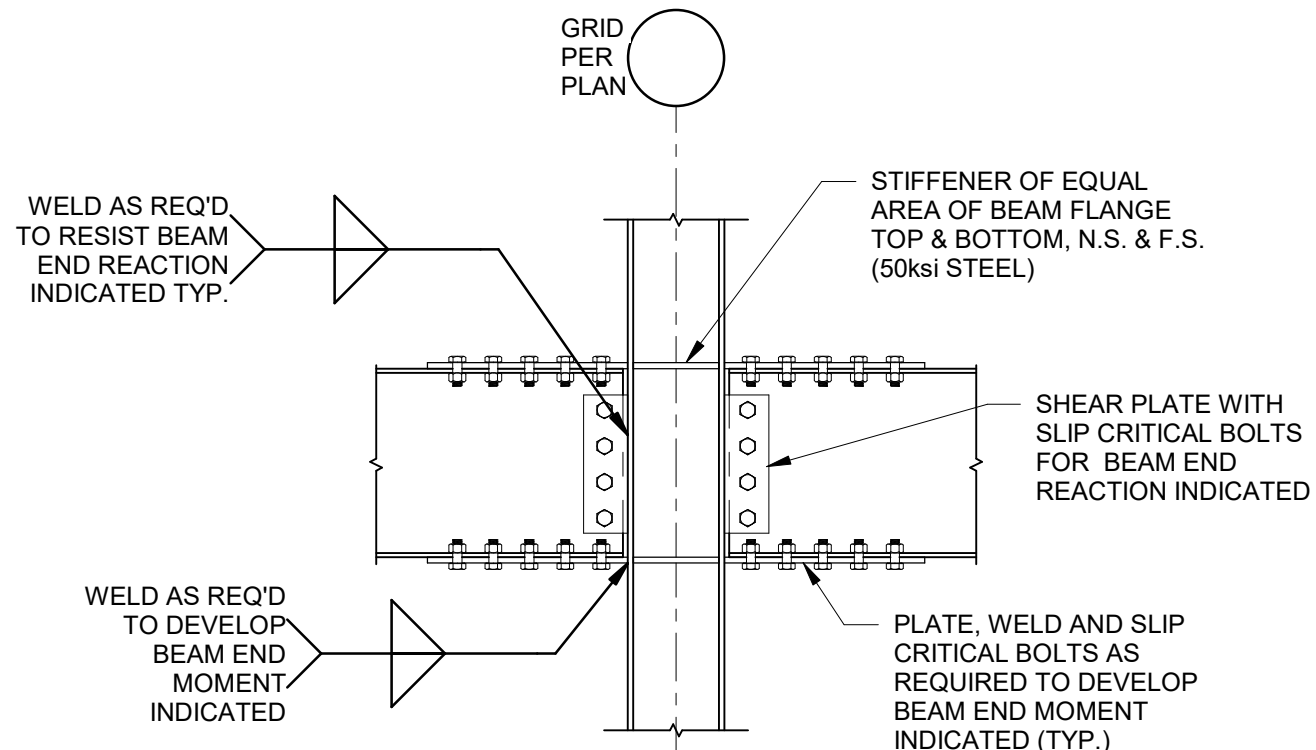
@ WIDE FLANGE COLUMN



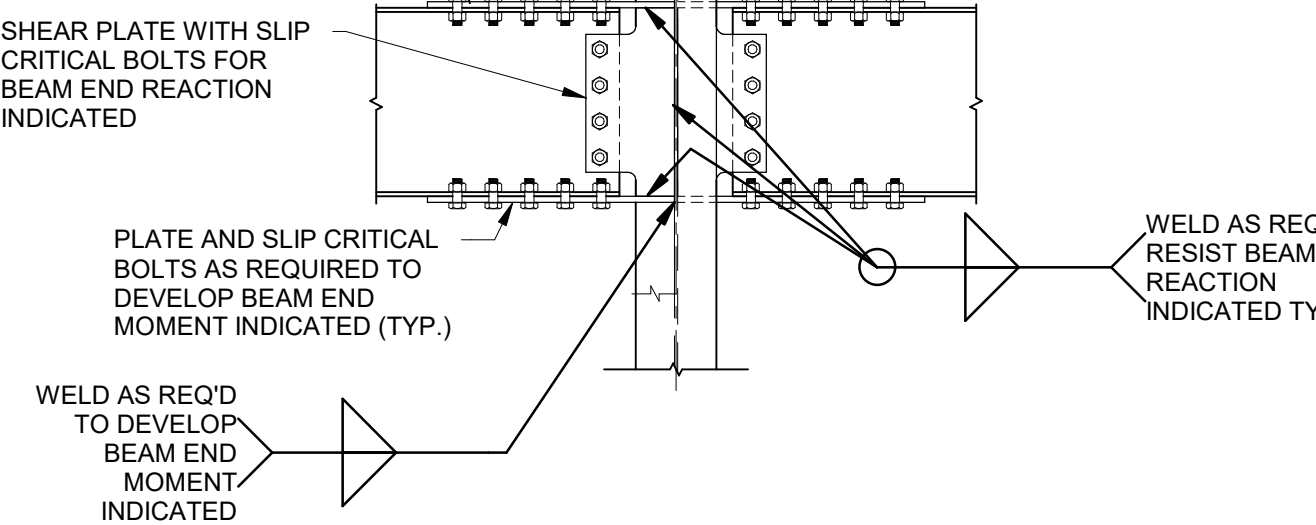
@ HSS COLUMN

5 SECTION
3/4" = 1'-0"

TYPICAL ROOF BEAM TO COLUMN CONNECTION AT EXTERIOR WALL



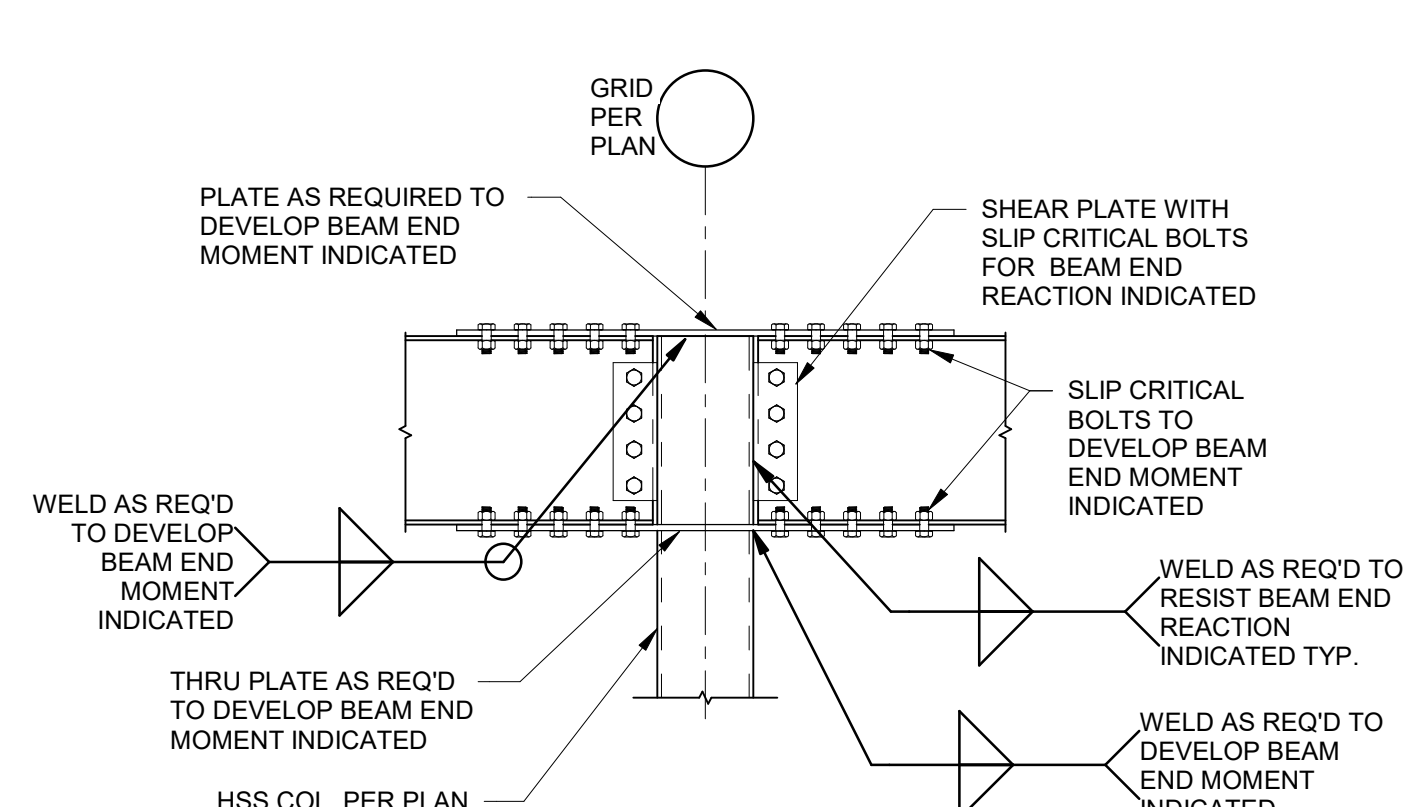
TOP PLATE (50ksi STEEL) OF EQUIVALENT AREA OF BEAM FLANGE



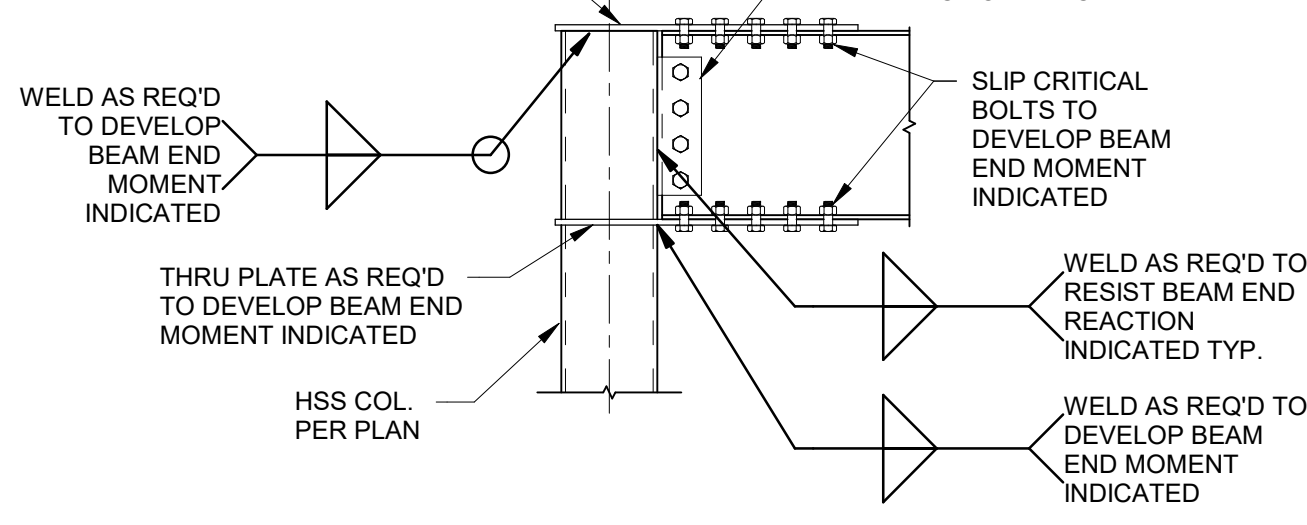
TYP. BEAM TO WIDE FLANGE COL. MOMENT CONNECTIONS

NOTE: FLANGE PLATES MAY BE FULL PENETRATION WELDED TO COLUMN AT CONTRACTORS OPTION

6 SECTION
3/4" = 1'-0"

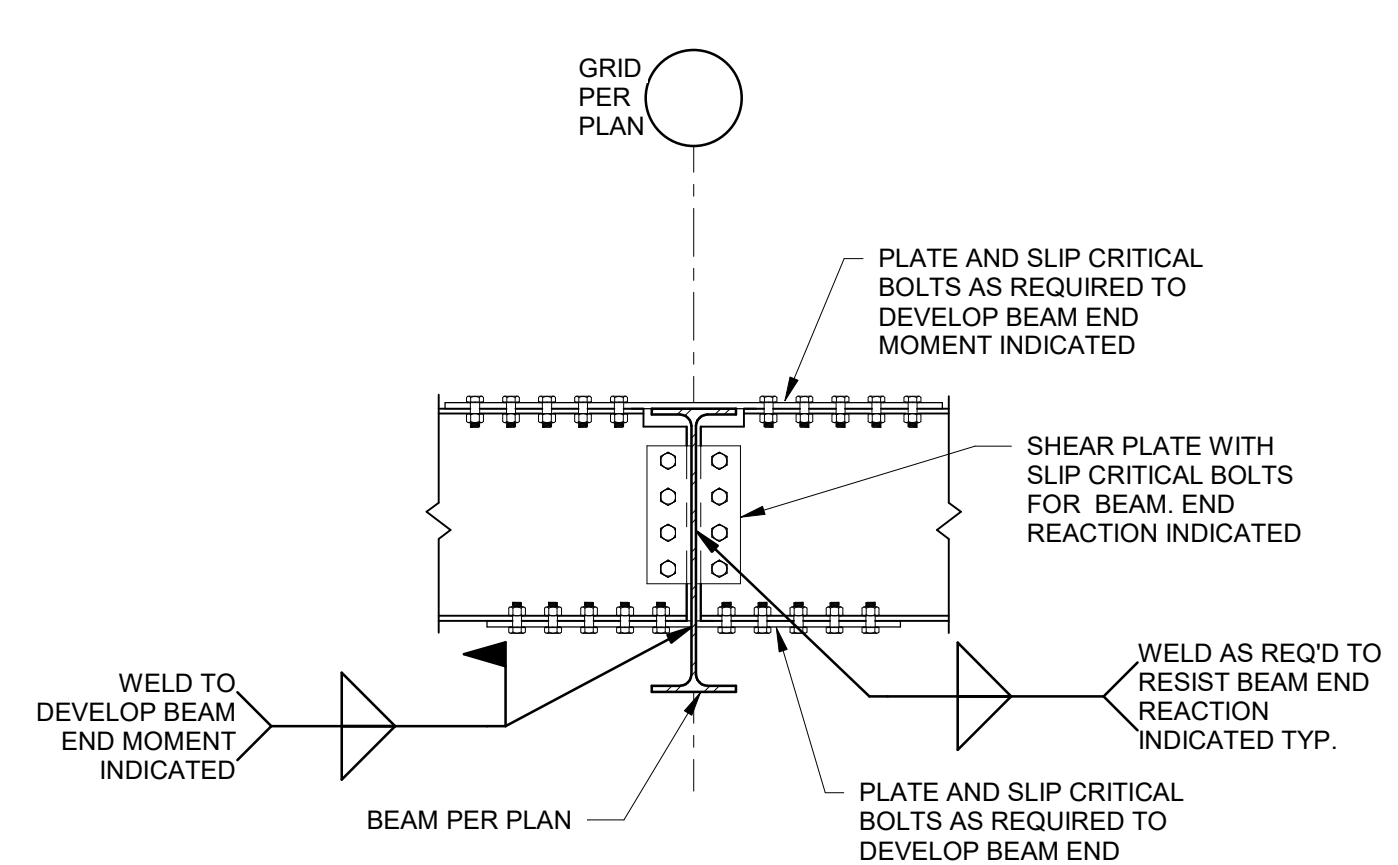


HSS COL. PER PLAN

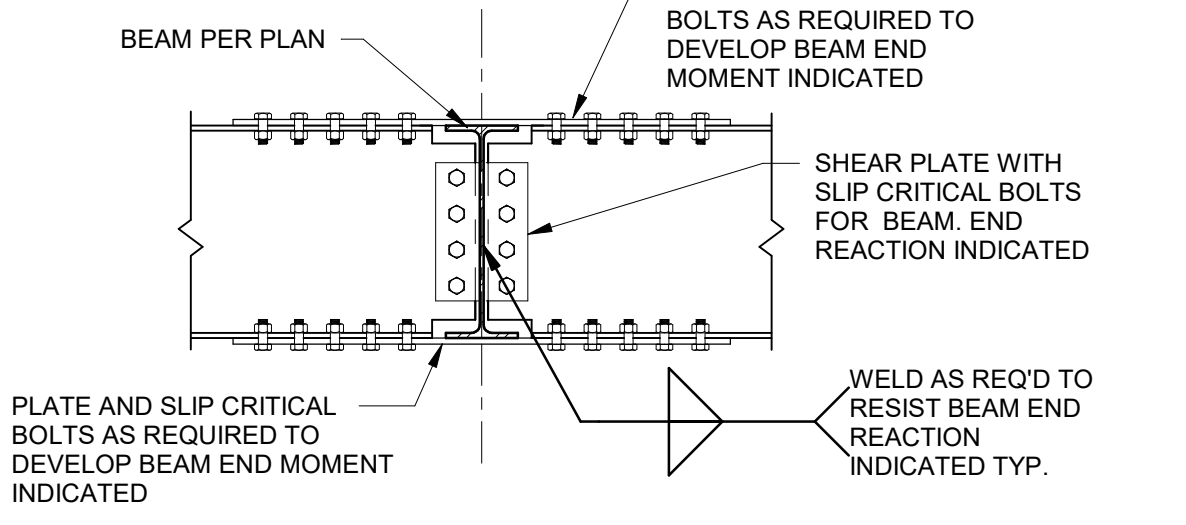


TYPICAL BEAM TO HSS COLUMN MOMENT CONNECTIONS

7 SECTION
3/4" = 1'-0"



BEAM PER PLAN



TYP. BEAM TO BEAM MOMENT CONNECTIONS

8 SECTION
3/4" = 1'-0"

STEEL CONNECTION NOTES:

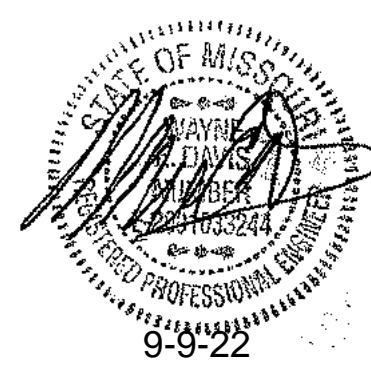
1. REFER TO GENERAL NOTES ON SHEET 5001.
2. CONNECTIONS SHOWN IN THESE DETAILS ARE MINIMUM REQUIREMENTS.
3. FABRICATOR SHALL BE RESPONSIBLE FOR THE ENGINEERING, DESIGNING, AND DETAILING OF EACH CONNECTION FOR LOADS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THE SPECIFICATIONS AND THE STRUCTURAL GENERAL NOTES.
4. SUGGESTED CONNECTION DETAILS ARE SHOWN. FINAL CONNECTION CONFIGURATION AND DESIGN SHALL BE COMPLETED BY THE CONNECTION ENGINEER. CONNECTION DESIGN SHALL INCLUDE COLUMN OR BEAM CONTINUITY PLATES, WEB STIFFENERS, AND/OR DOUBLER PLATES AS REQUIRED FOR THE FORCES INDICATED.
5. FABRICATOR MAY OPT TO USE OTHER AISC APPROVED CONNECTIONS IN LIEU OF THESE SHOWN HEREIN TO MEET END REACTION REQUIREMENTS (i.e. DOUBLE ANGLE CONNECTION).
6. CONNECTION DETAILINGS SHALL COMPLY WITH THE STANDARD DETAILS SHOWN IN THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION.
7. ALL BOLTS SHALL BE 3/4" Ø ASTM A325 MINIMUM.
8. ALL BOLTS SHALL BE SPACED AT 3" c. MINIMUM.
9. ALL BOLTS SHALL HAVE HEAVY HEX NUTS.
10. ALL BOLTS SHALL BE FULLY PRE-TENSIONED.
11. BOLT SPACING AND EDGE DISTANCES SHALL BE ADJUSTED PER AISC MANUAL FOR BOLTS LARGER THAN 3/4" DIAMETER.
12. CLIP ANGLES MAY BE SHOP WELDED TO BEAM WEB PER AISC.
13. FOR BEAMS WITH AXIAL LOADS PER DRAWINGS, BOLTS AND CONNECTIONS SHALL BE SLIP-CRITICAL PER AISC GUIDELINES. INCREASE NUMBER OF BOLTS AND/OR PROVIDE EXTENDED SHEAR PLATE CONNECTION W/ AN ADDITIONAL COLUMN OF BOLTS TO ACCOMMODATE COMBINED FORCES.
14. PROVIDE ASTM A490 BOLTS IF REQUIRED TO MEET END REACTION LOAD REQUIREMENTS.
15. REFER TO ELEVATIONS ON SHEET S FOR BRACE FORCES. REFER TO PLANS FOR ADDITIONAL BEAM AXIAL FORCES, BRACE AND BEAM FORCES INDICATED ARE UNFACTORED (ASD) LOADS AND SHALL BE CONSIDERED CONCURRENT W/ BEAM SHEAR DESIGN FORCES LISTED IN THE BEAM SHEAR CONNECTION SCHEDULE.
16. COORDINATE BRACED FRAME CONNECTION W/ ARCHITECTURAL WALLS AS REQUIRED TO AVOID CONFLICT OR EXPOSURE OUTSIDE OF WALL OR FINISH.
17. ALL END REACTIONS INDICATED ARE UNFACTORED (ASD) LOADS.

BEAM SHEAR CONNECTION SCHEDULE		
BEAM SIZE	MINIMUM ROWS OF BOLTS	END REACTION (kips)(U.N.O.)
W8.C8	2	16
W10.C10	2	16
W12.C12	2	16
W14	3	24
W16.C15	3	24
W18	4	32
W21	5	40
W24	5	40
W27	6	48
W30	7	56
W33	8	64
W36	8	64

Issue Date: September 9, 2022

Revisions		
NUMBER	DESCRIPTION	DATE

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Project Number: 0121-0100

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Lee's Summit, MO 64086

architect:
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civil engineer:
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kveeng.com

structural engineer:
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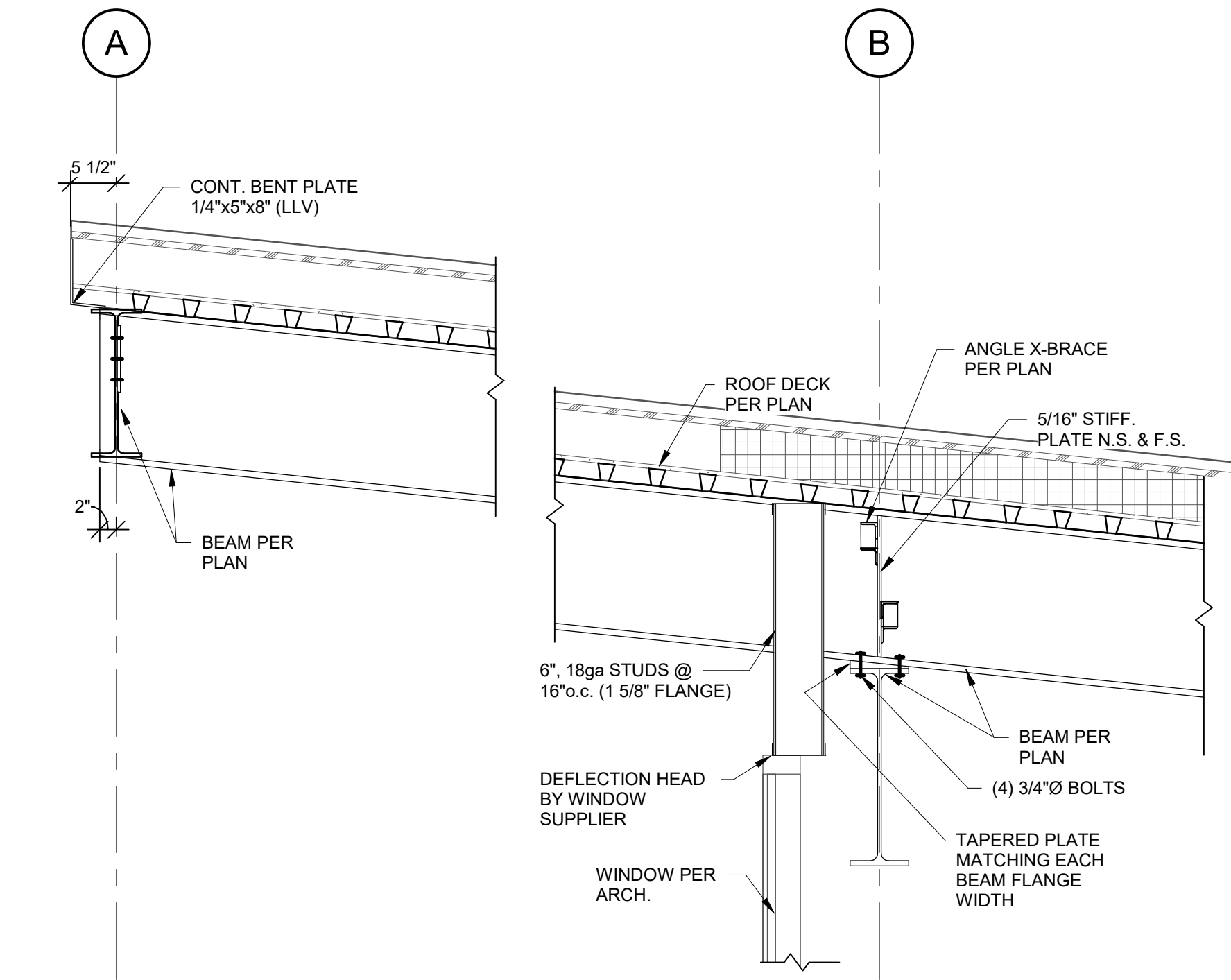
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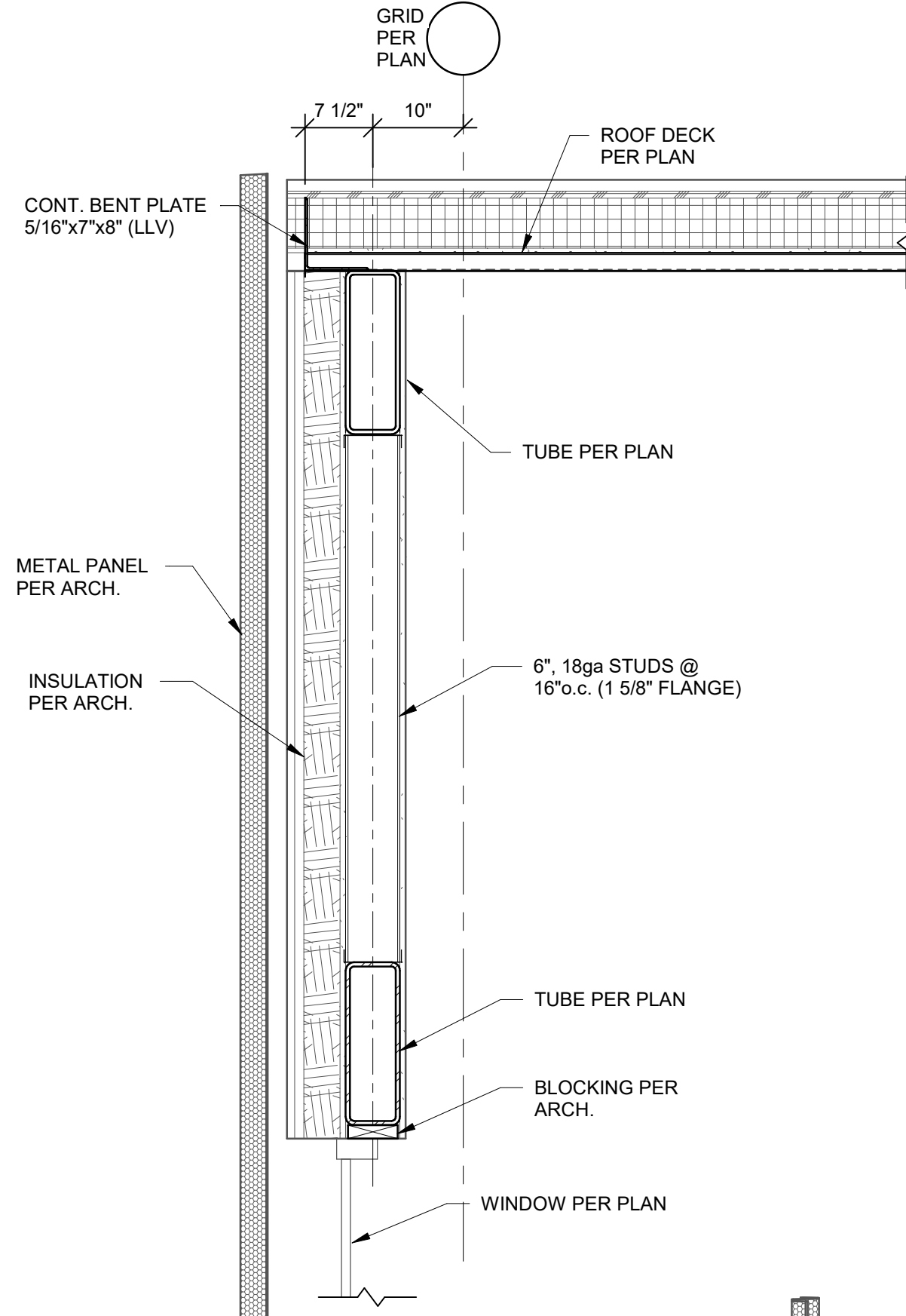


FRAMING SECTIONS

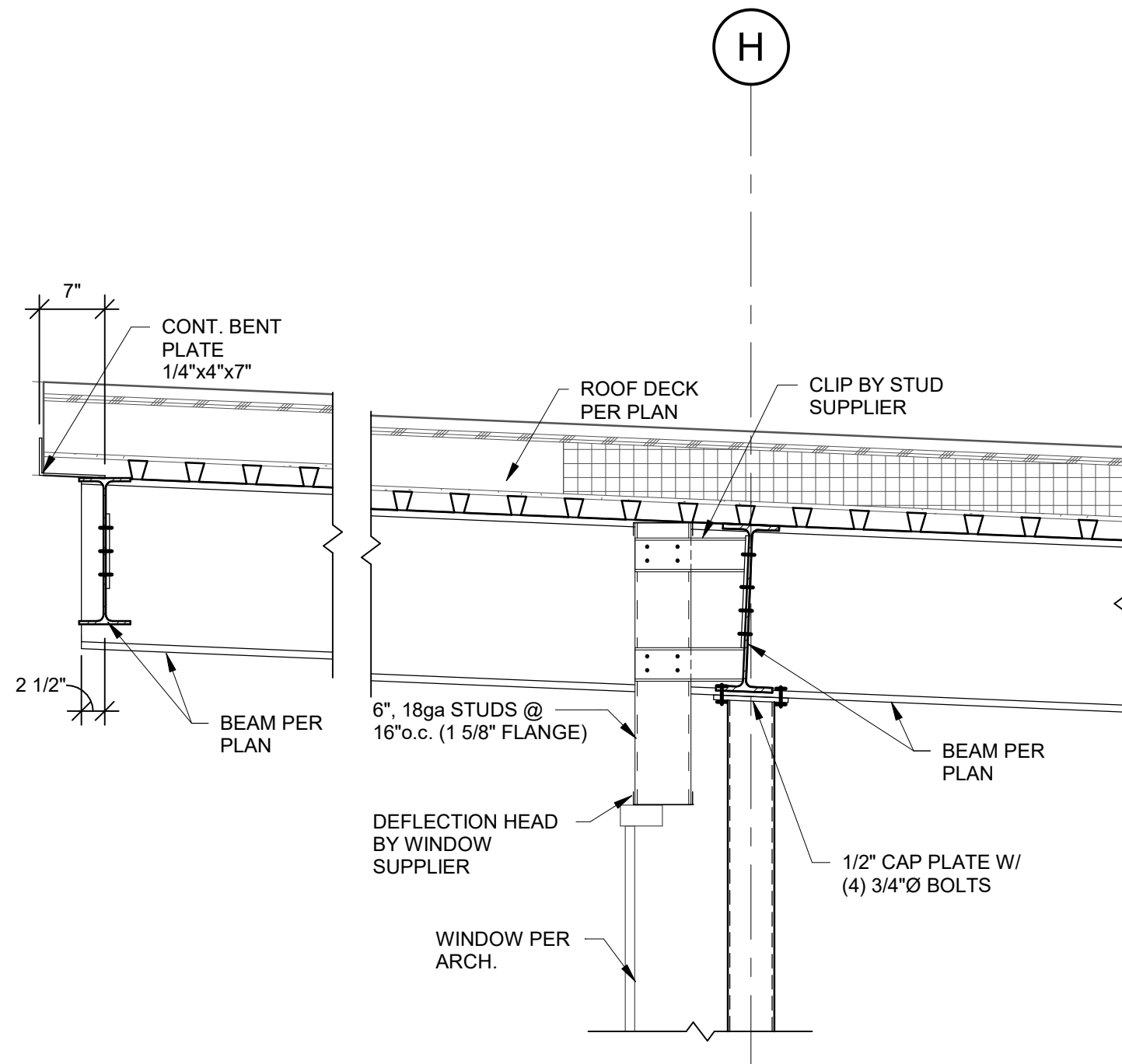
S301



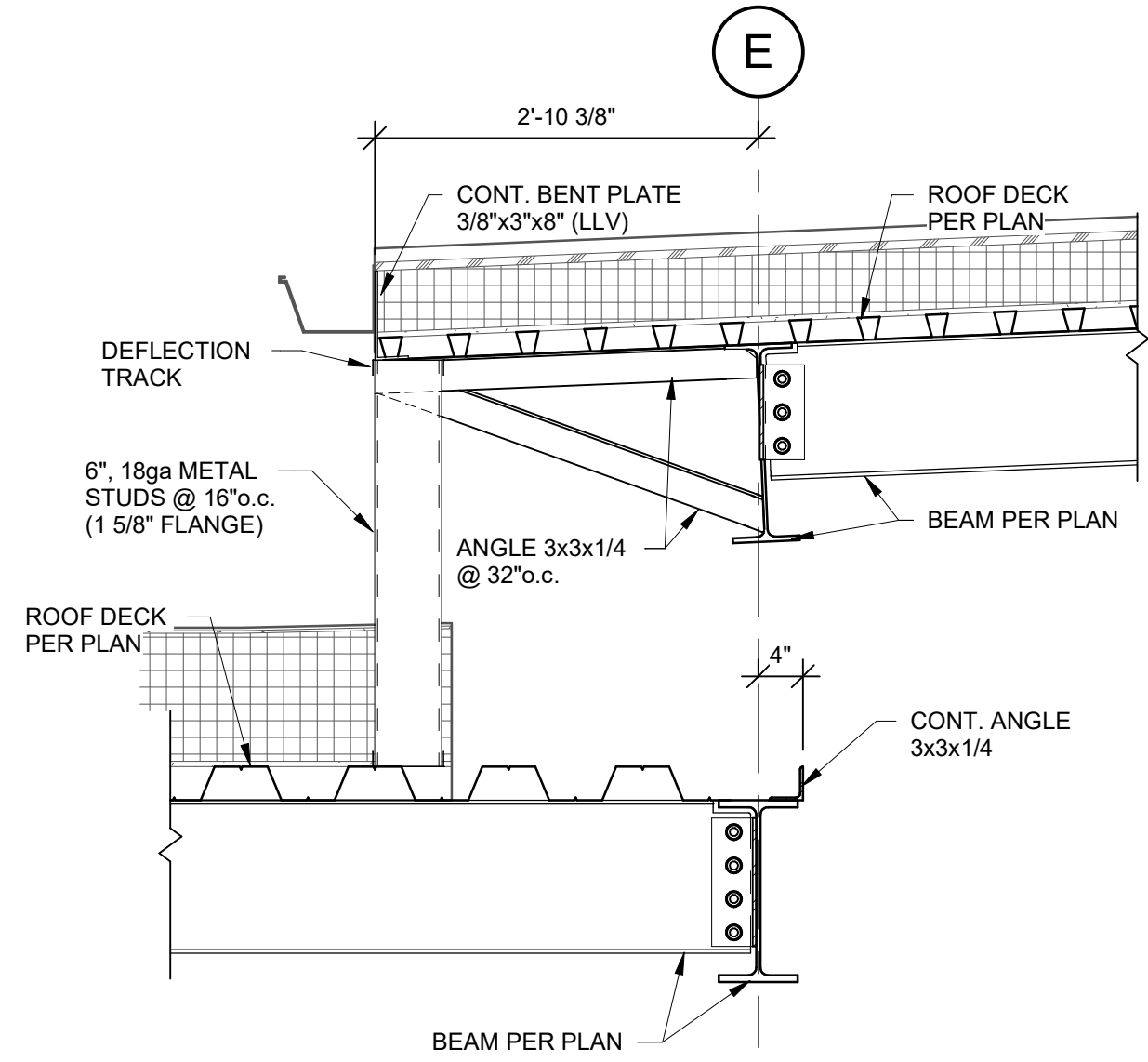
1 SECTION
3/4" = 1'-0"



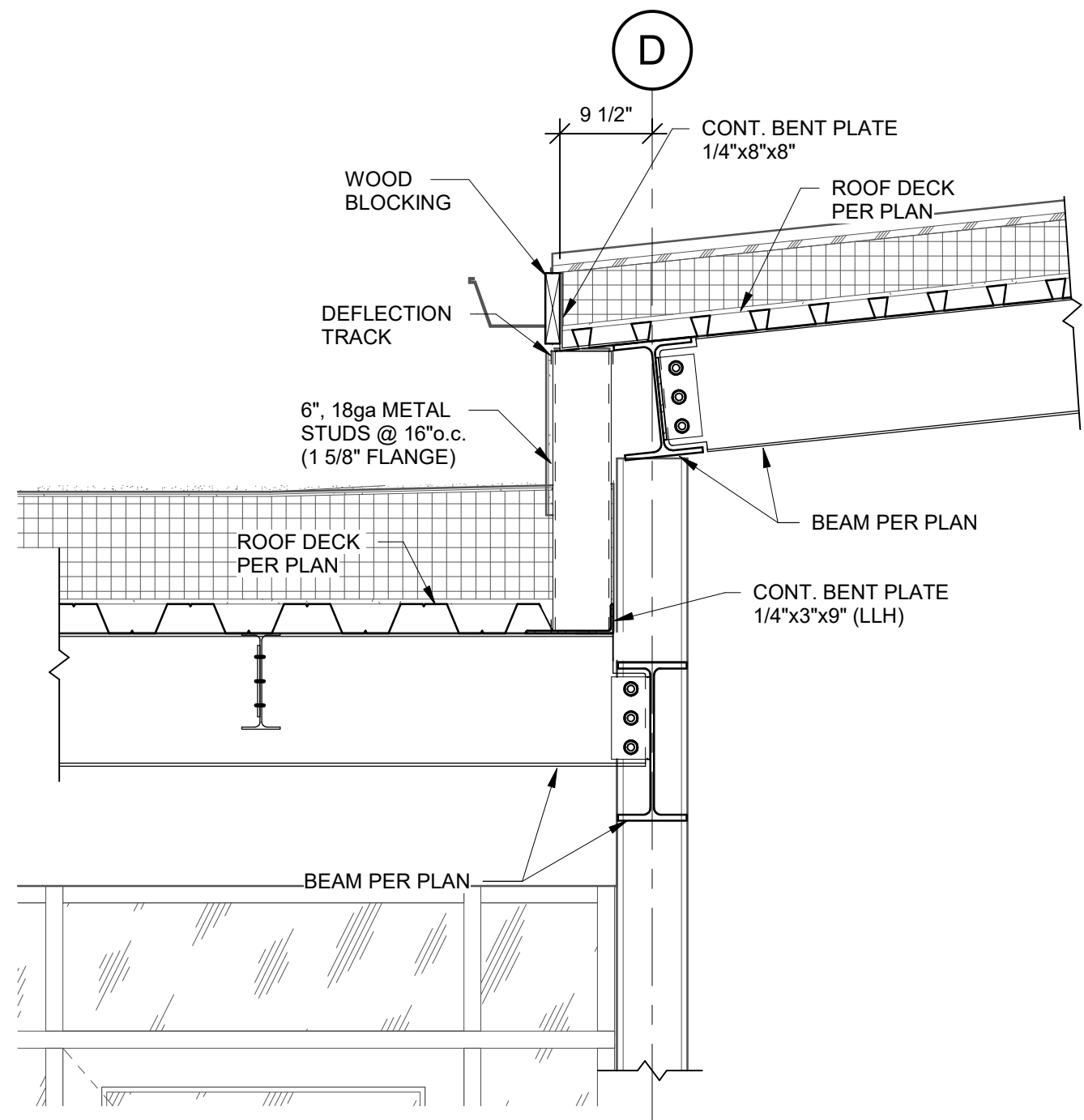
2 SECTION
3/4" = 1'-0"



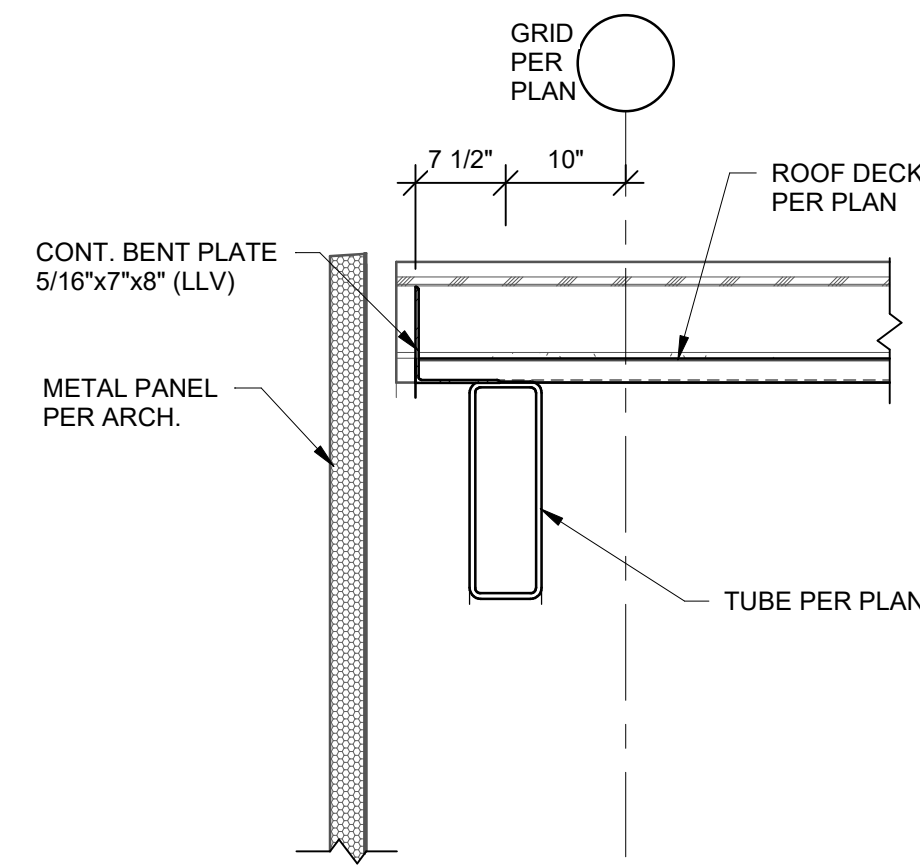
3 SECTION
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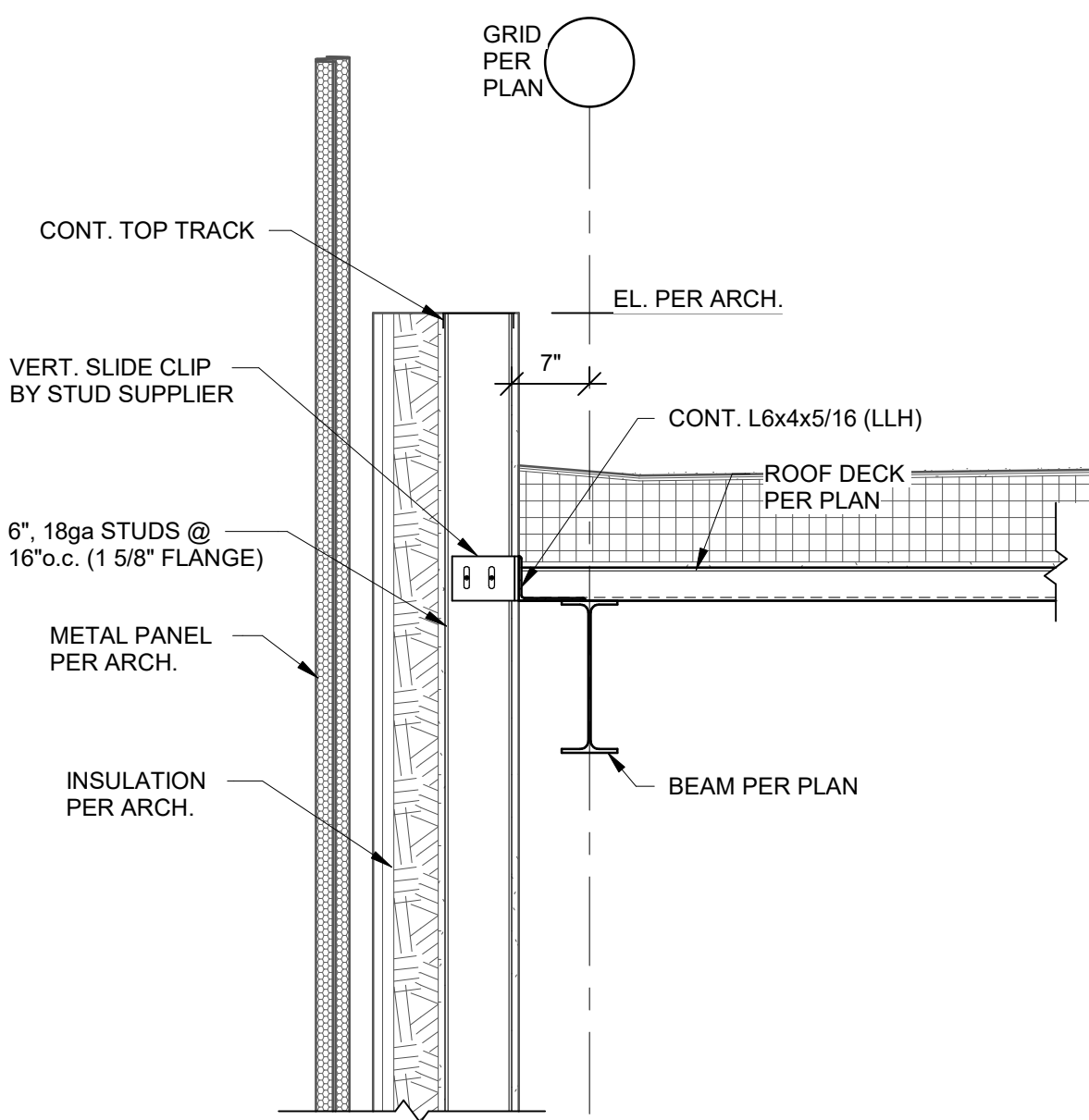
4 SECTION
3/4" = 1'-0"



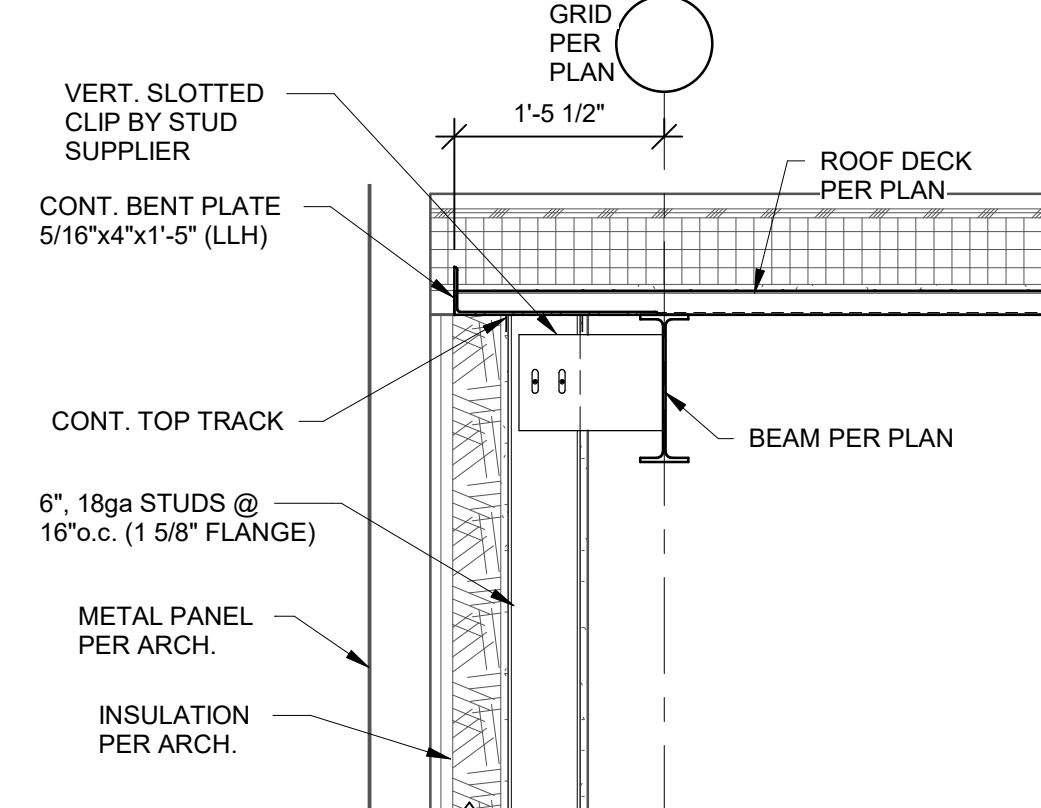
5 SECTION
3/4" = 1'-0"



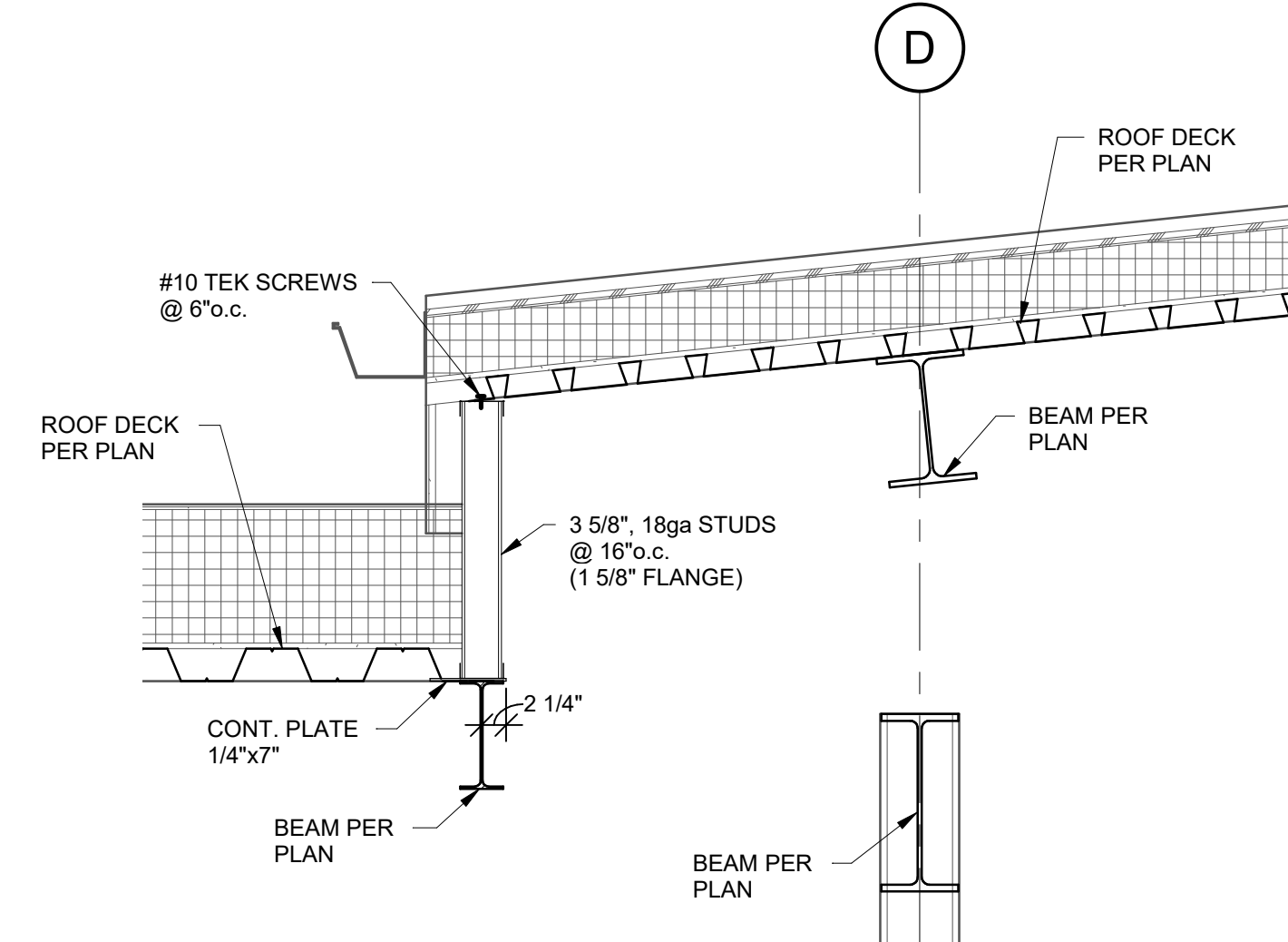
6 SECTION
3/4" = 1'-0"



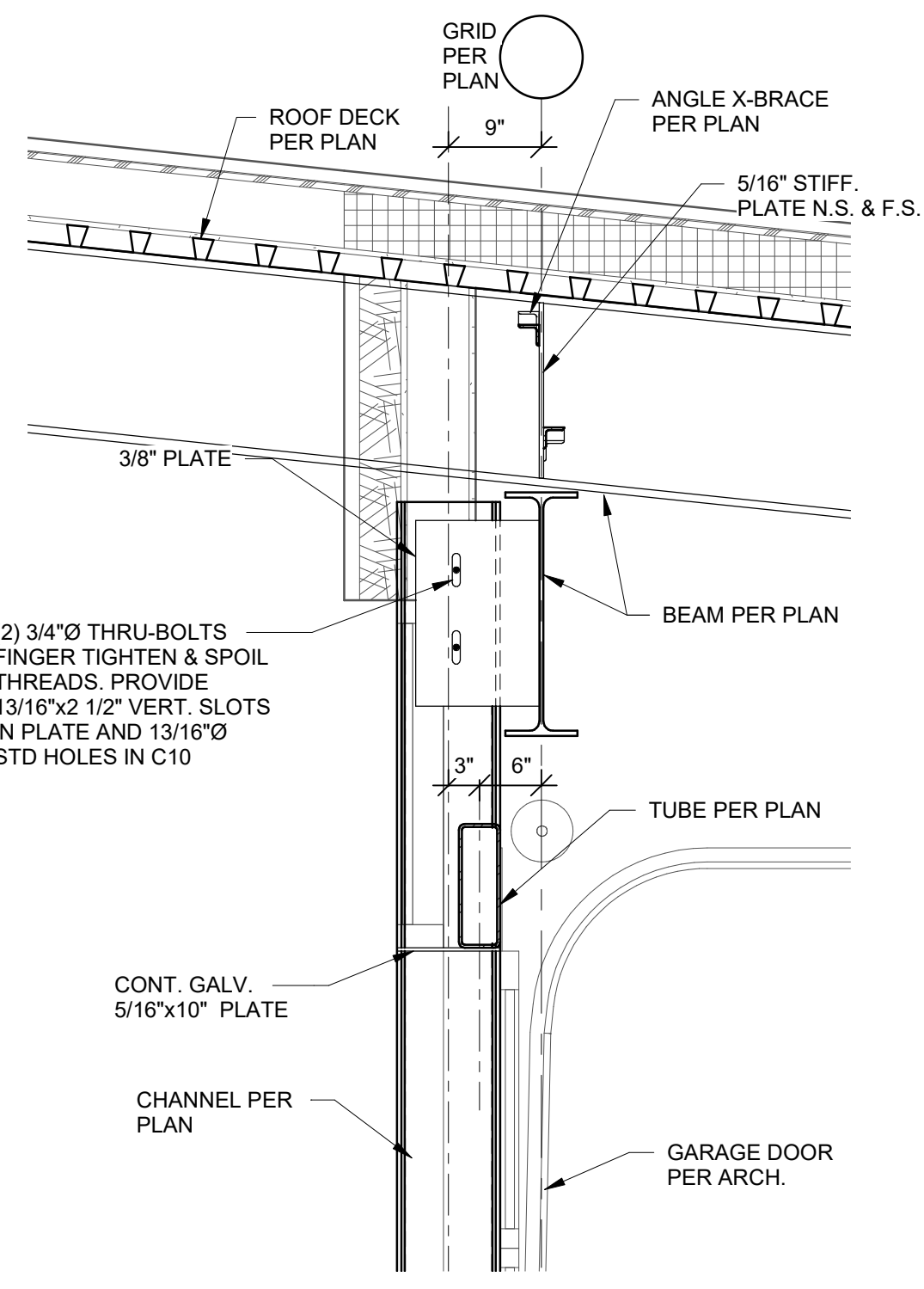
7 SECTION
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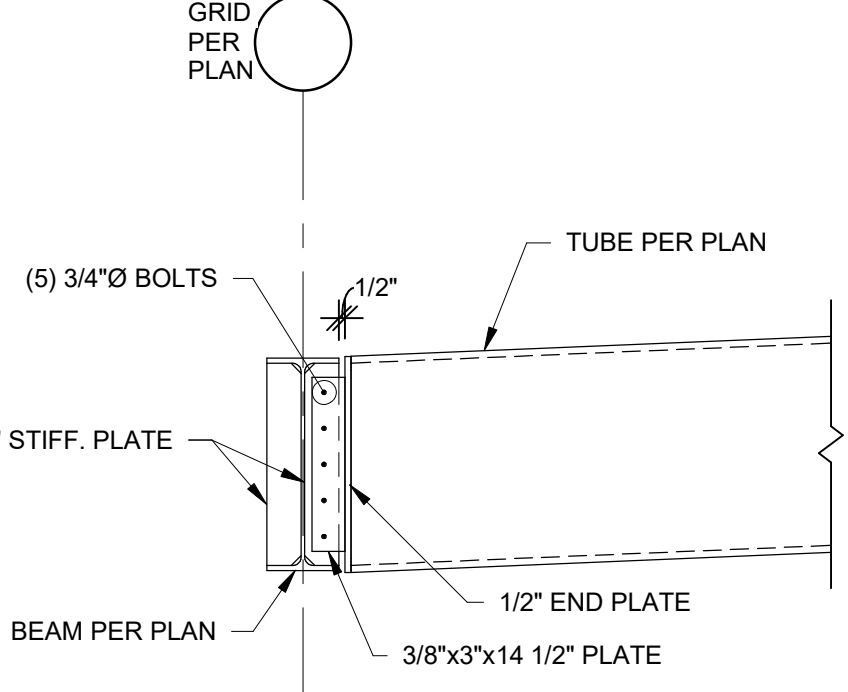
8 SECTION
3/4" = 1'-0"



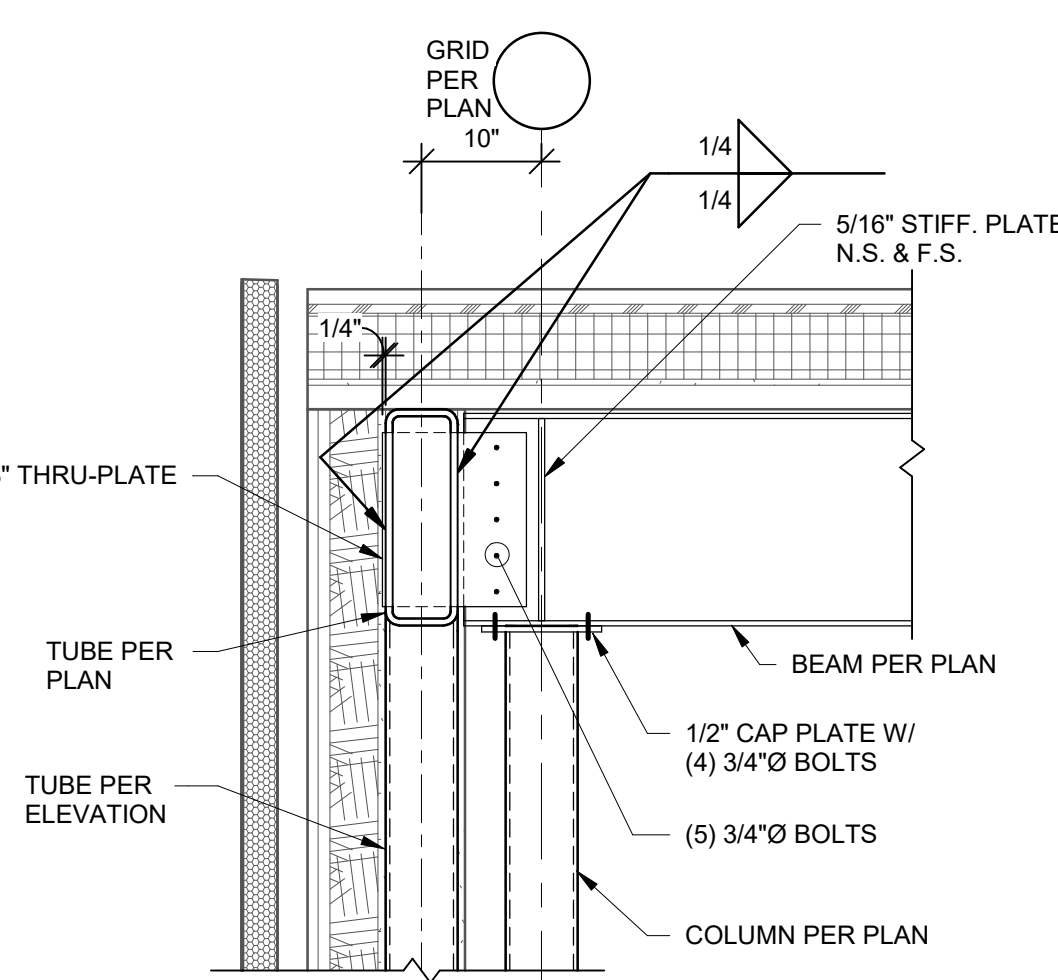
9 SECTION
3/4" = 1'-0"



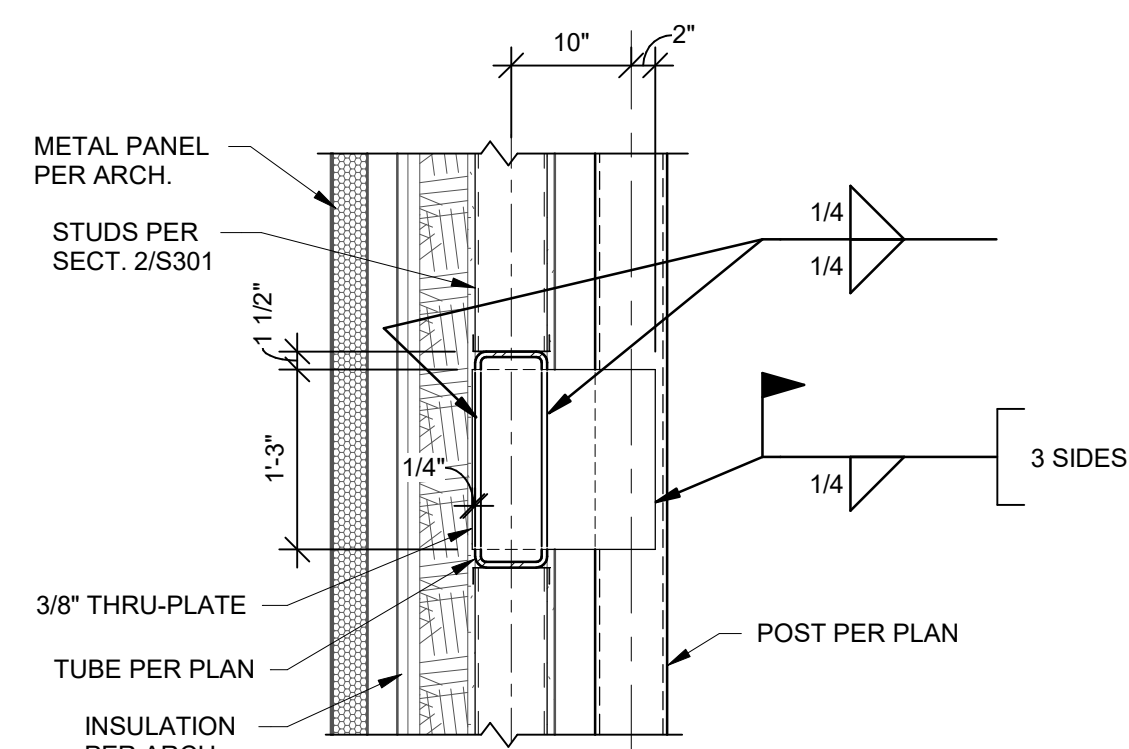
10 SECTION
3/4" = 1'-0"



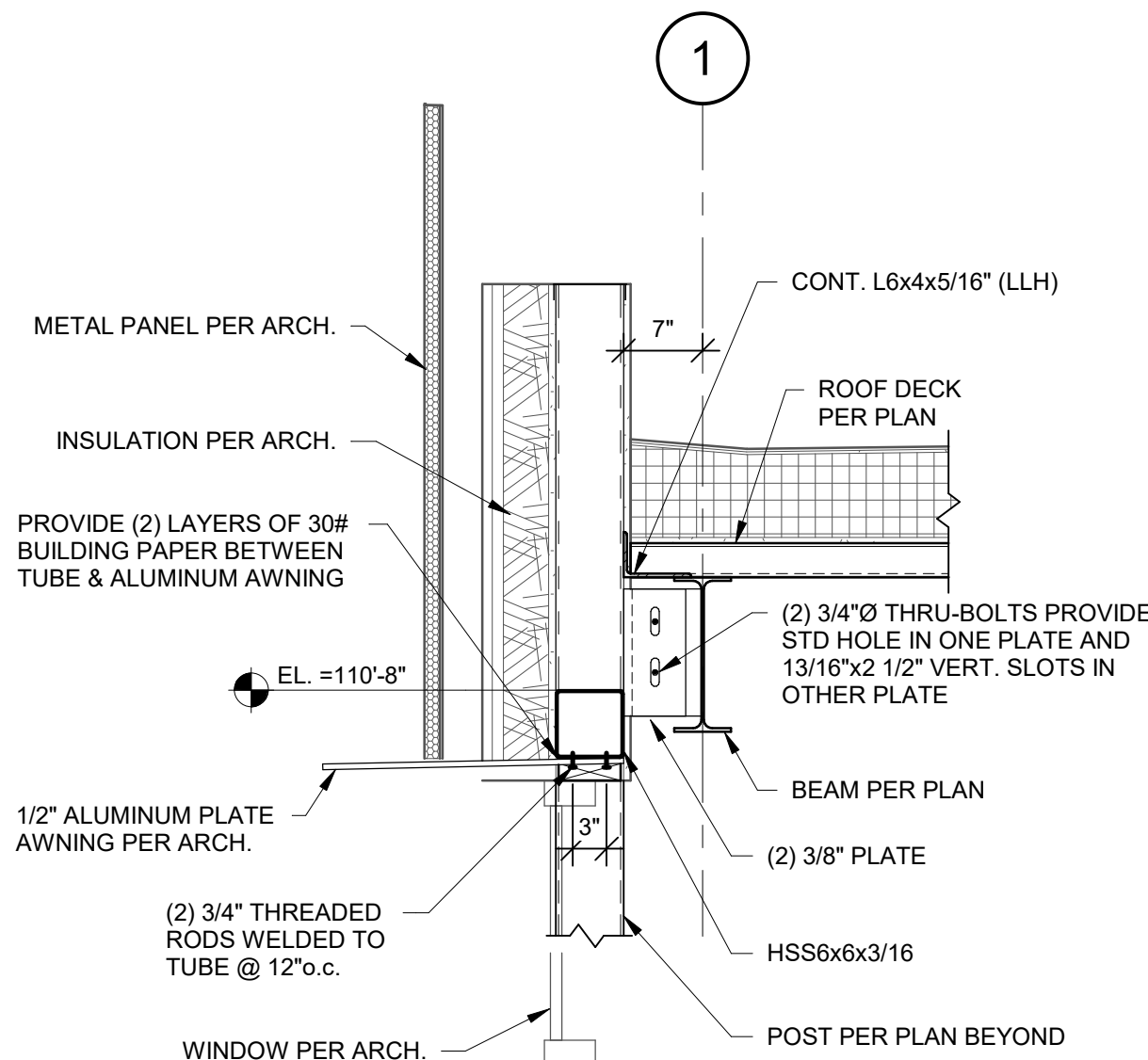
11 SECTION
3/4" = 1'-0"



12 SECTION
3/4" = 1'-0"



13 SECTION
3/4" = 1'-0"



14 SECTION
3/4" = 1'-0"

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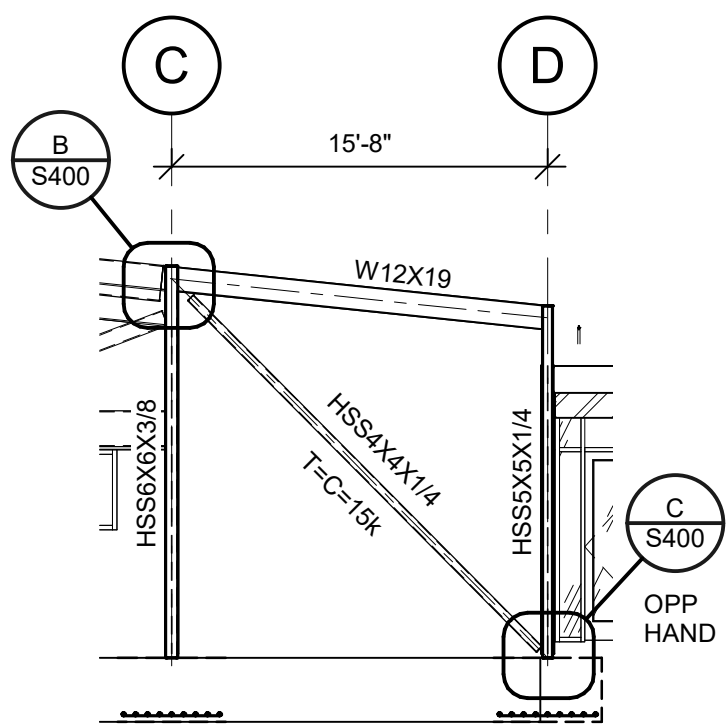
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architect:
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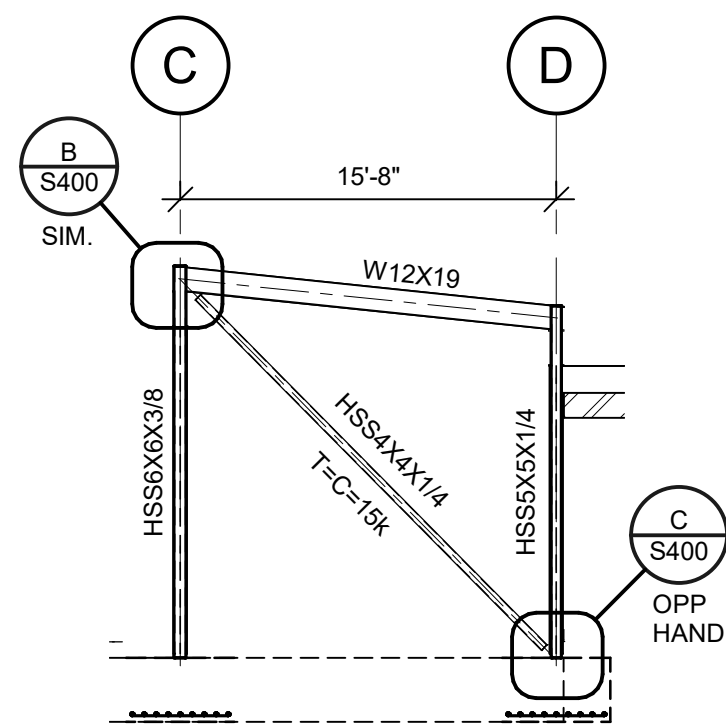
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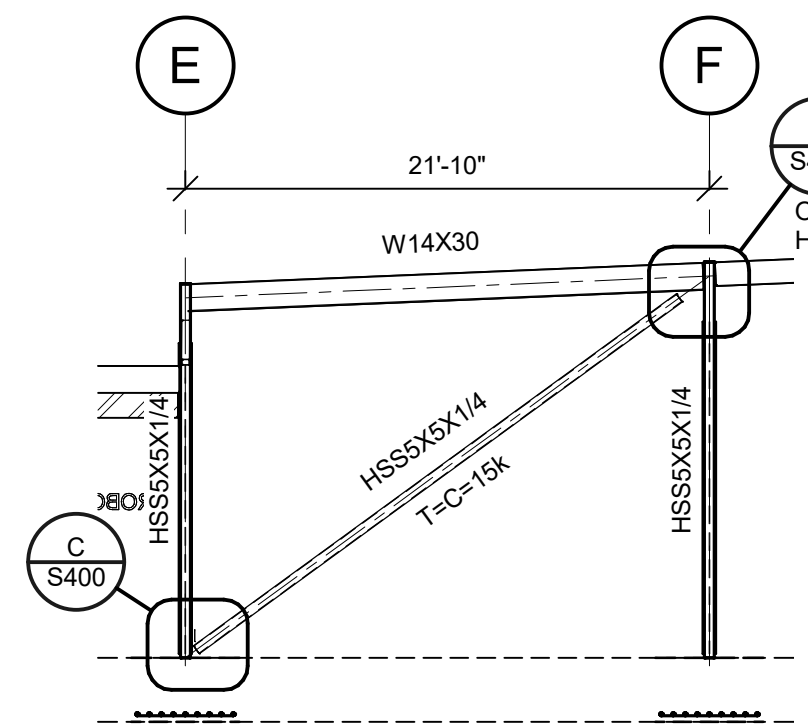
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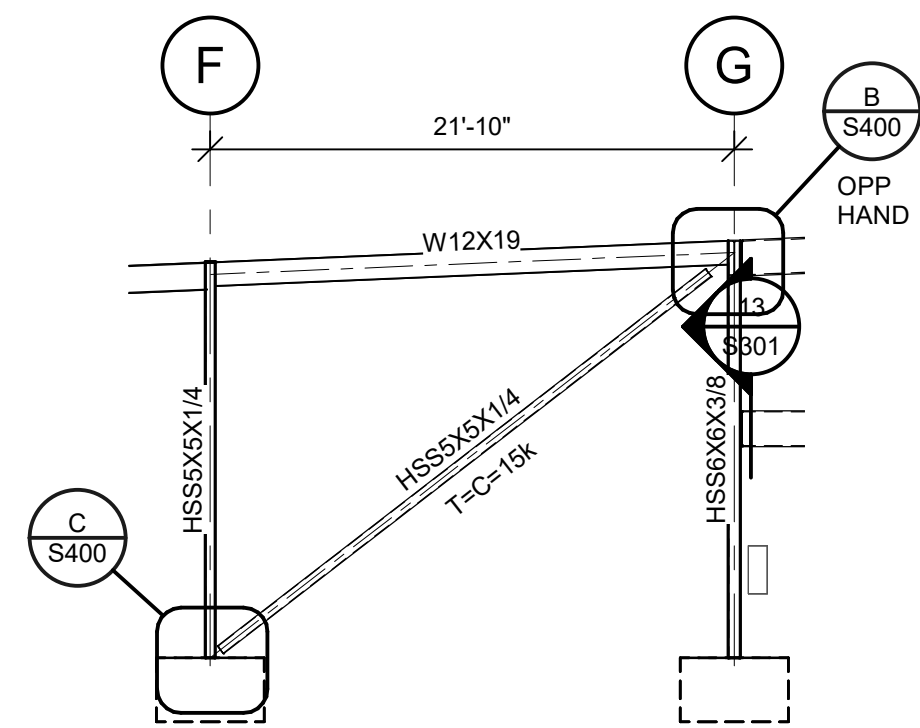
1 ELEVATION
1/8" = 1'-0"



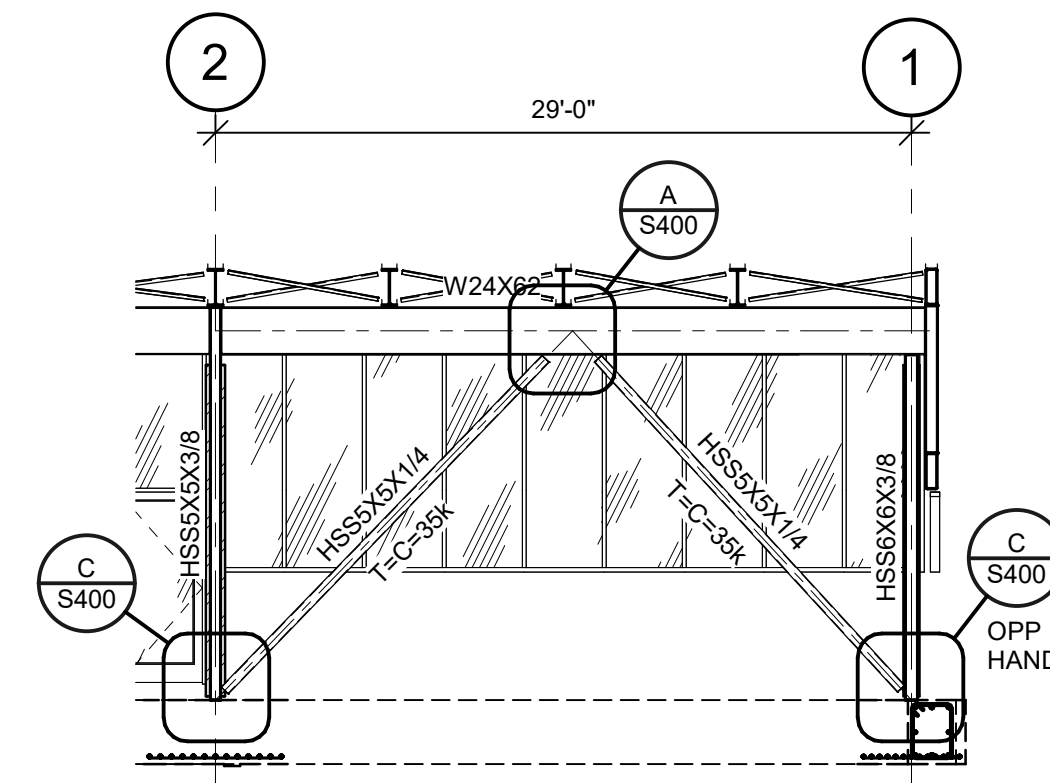
2 ELEVATION
1/8" = 1'-0"



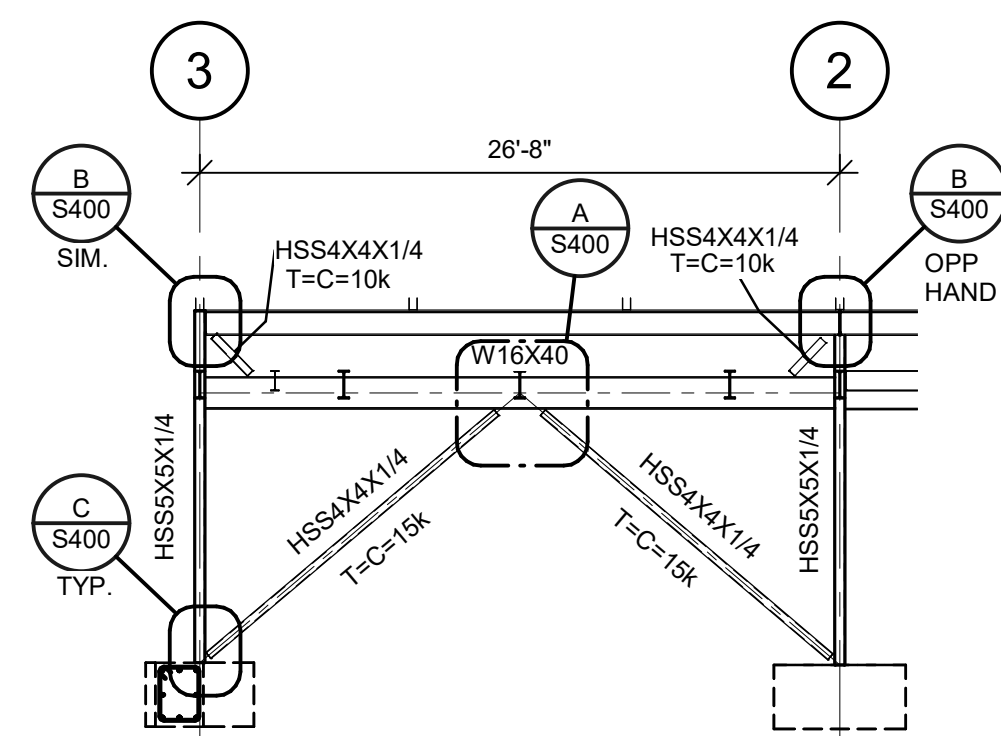
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1/8" = 1'-0"



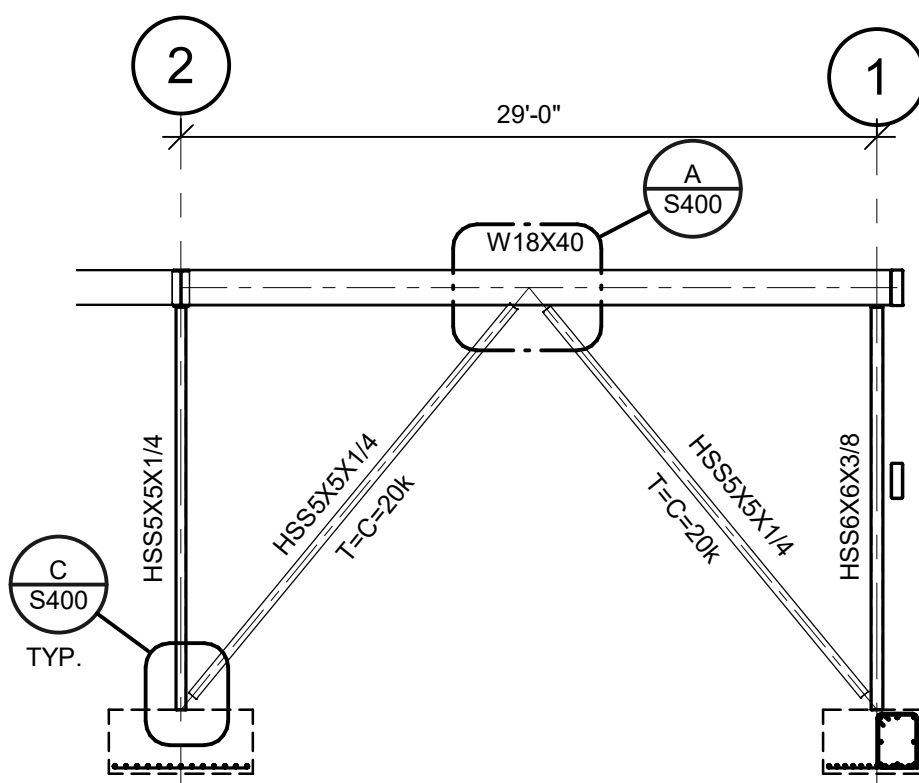
4 ELEVATION
1/8" = 1'-0"



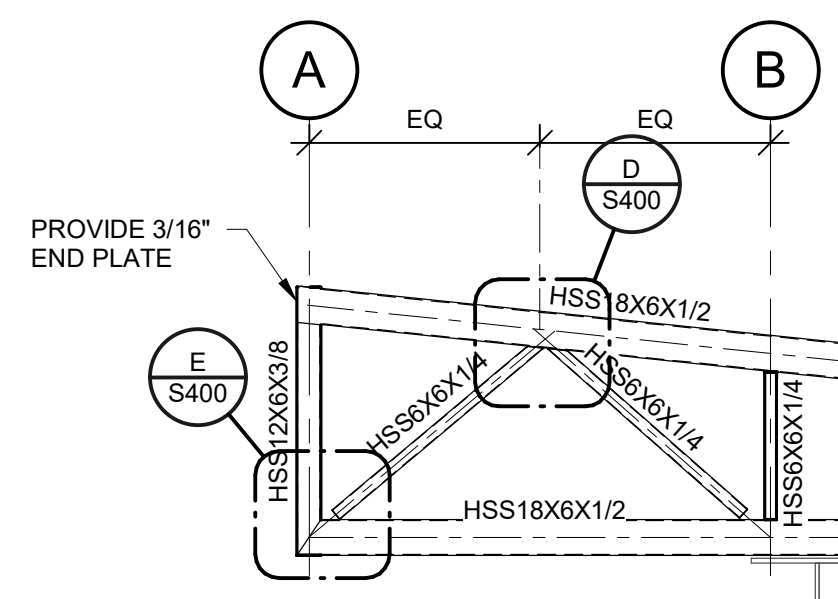
5 ELEVATION
1/8" = 1'-0"



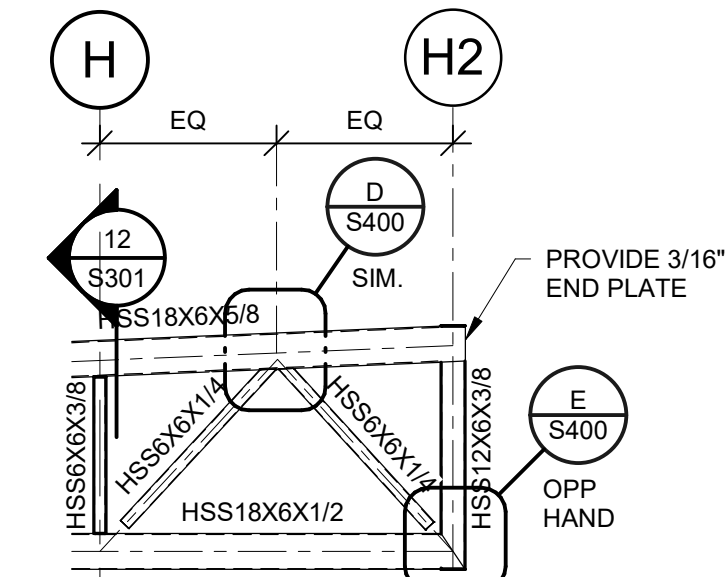
6 ELEVATION
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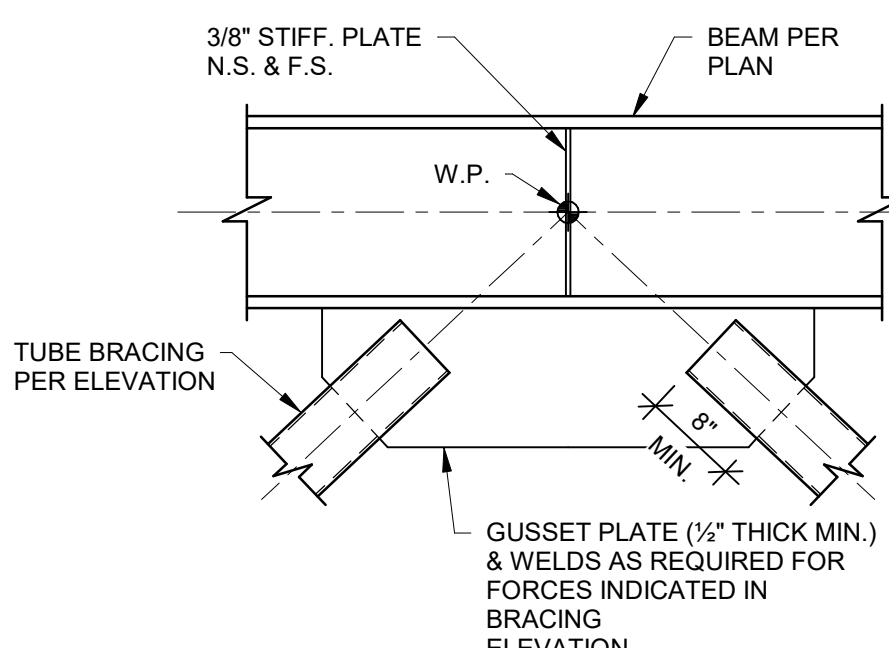
7 ELEVATION
1/8" = 1'-0"



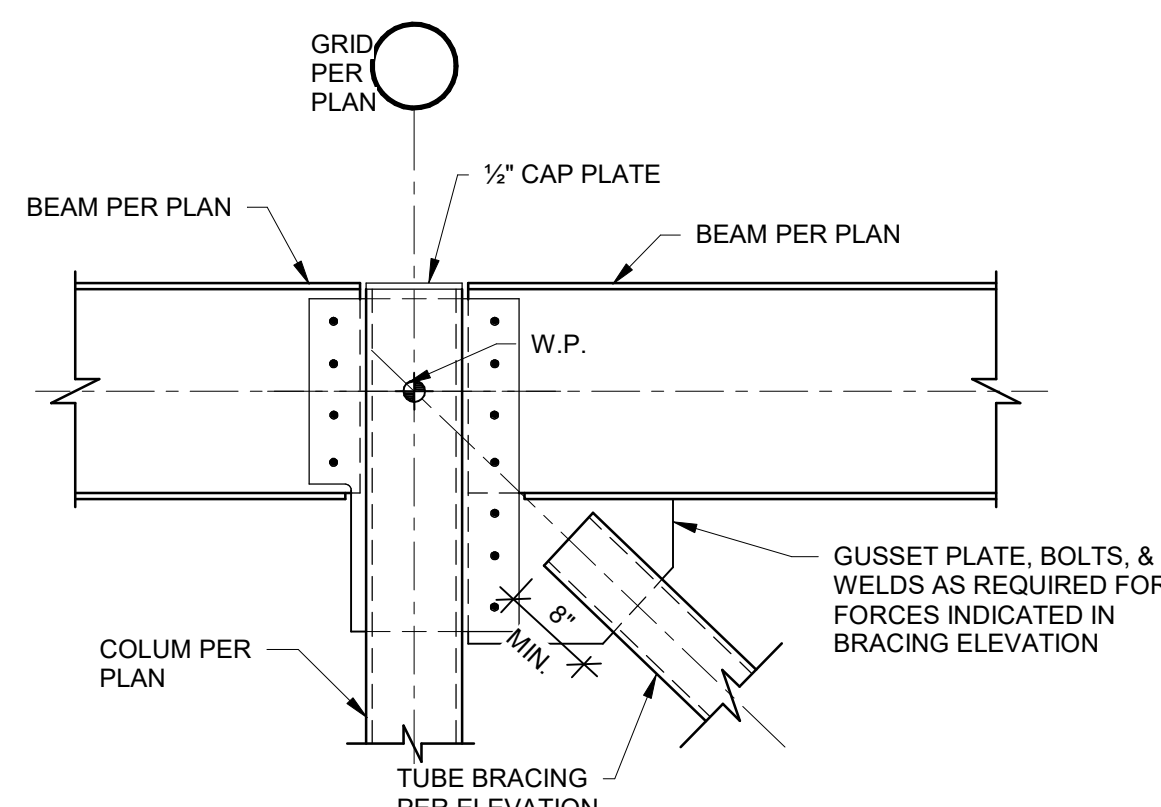
8 ELEVATION
1/8" = 1'-0"



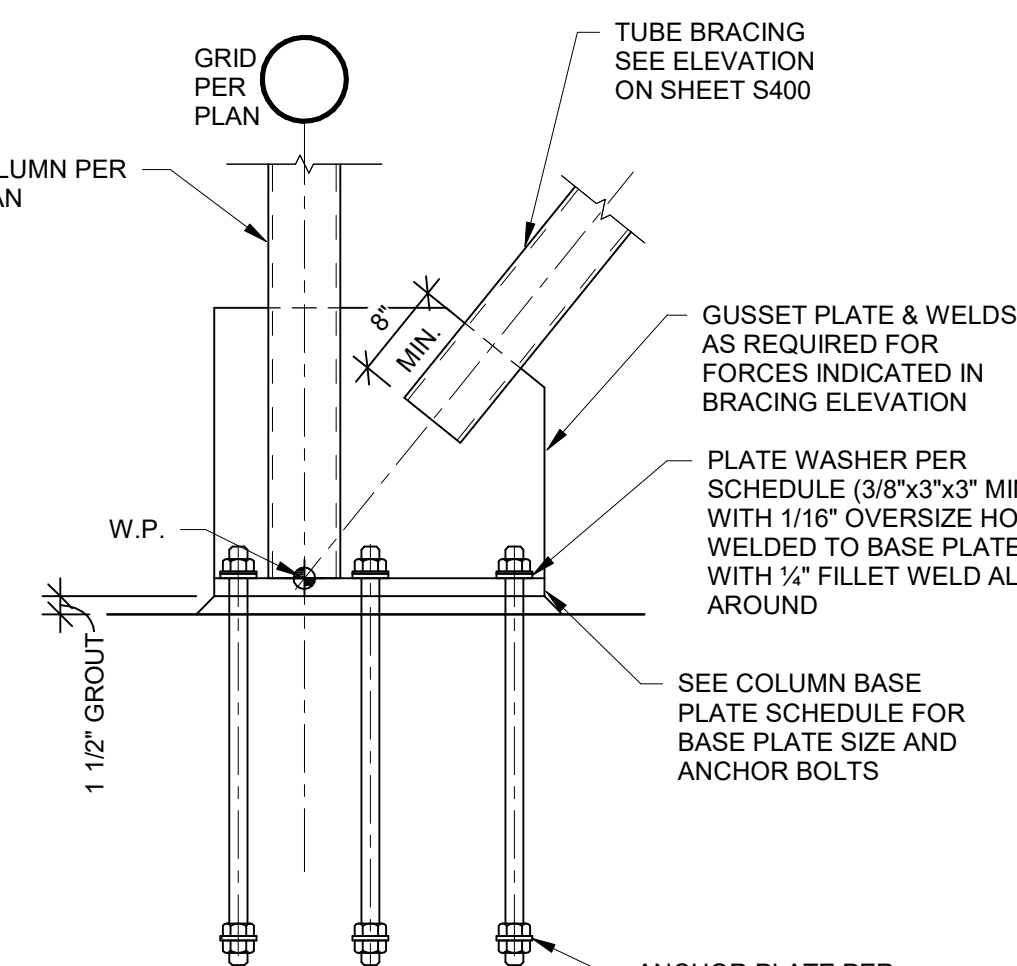
9 ELEVATION
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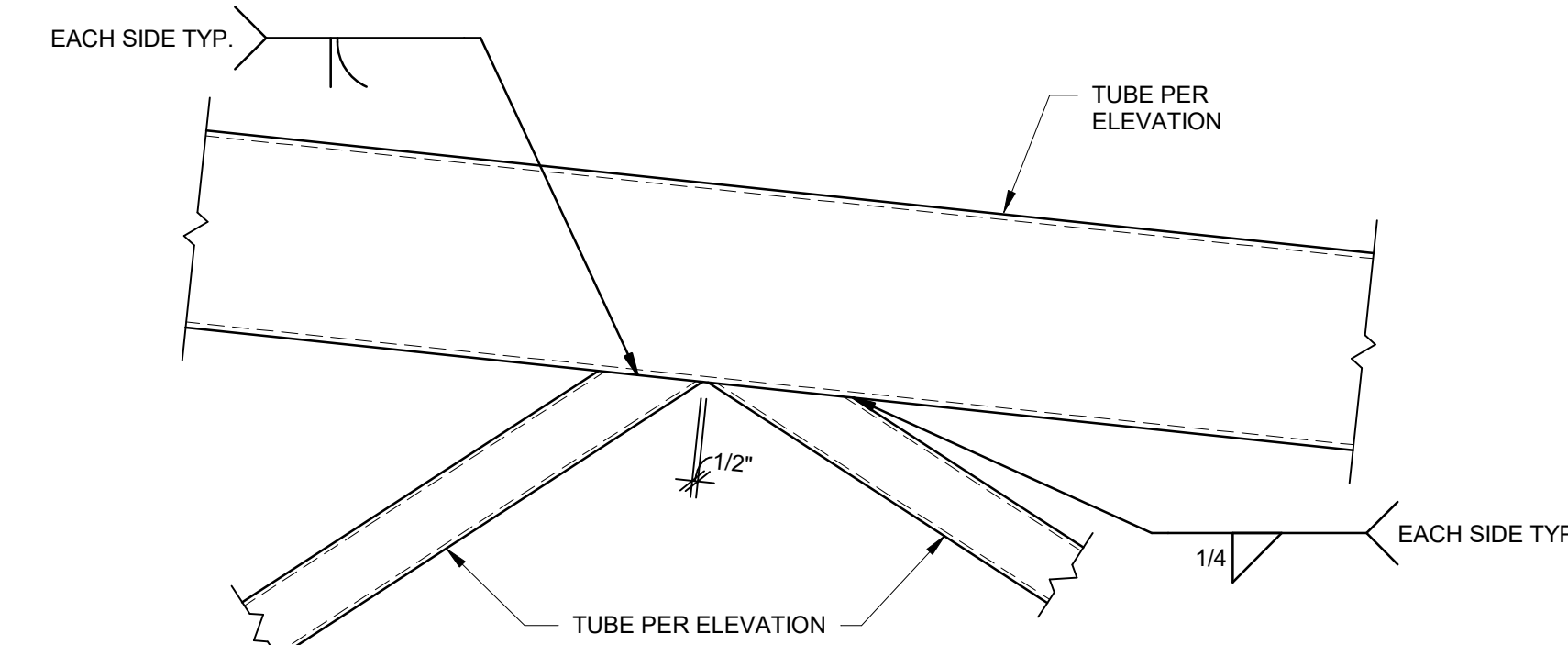
A DETAIL
3/4" = 1'-0"



B DETAIL
3/4" = 1'-0"

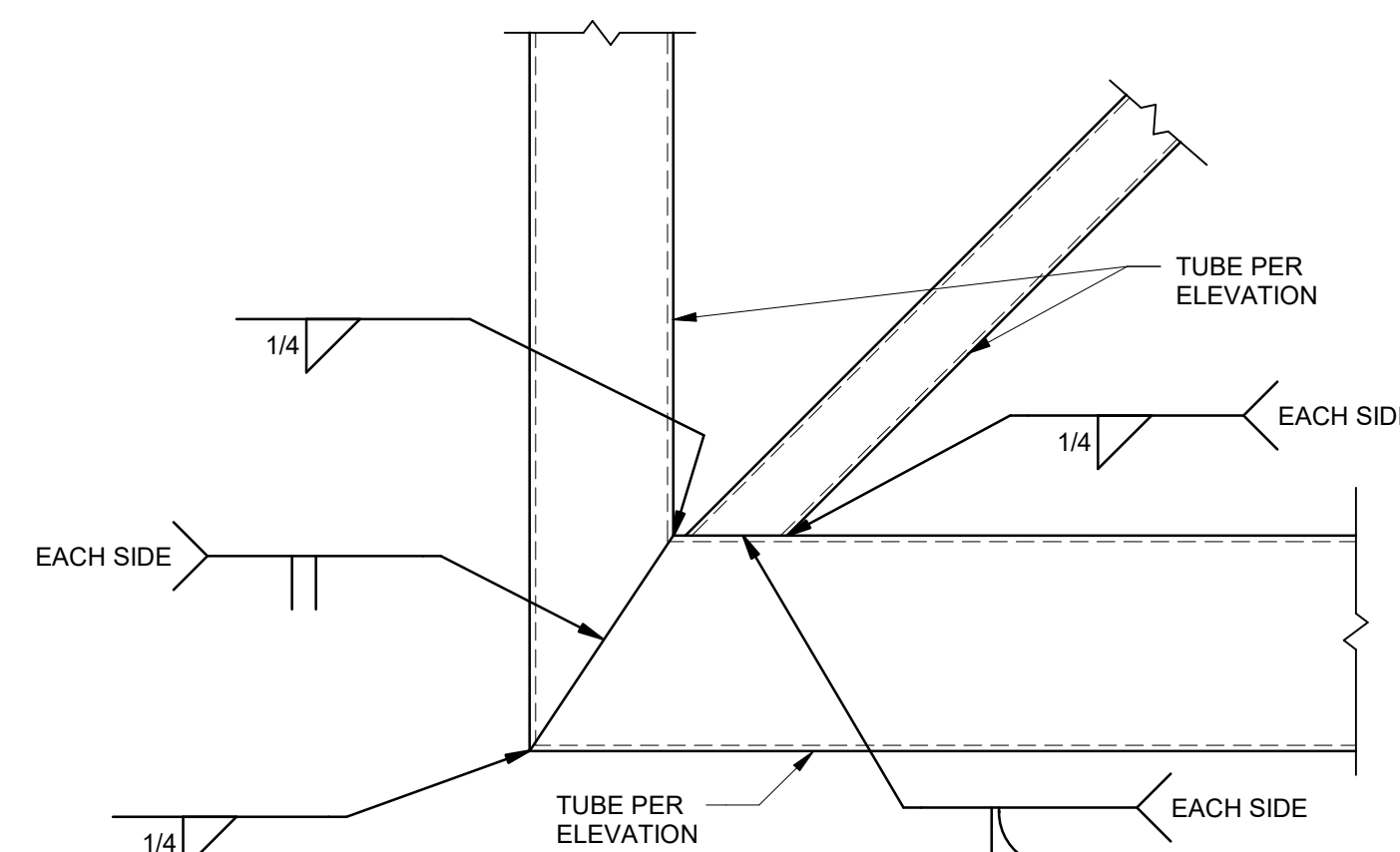


C DETAIL
3/4" = 1'-0"



NOTE: GRIND ALL WELDS SMOOTH

D SECTION
3/4" = 1'-0"



NOTE: GRIND ALL WELDS SMOOTH

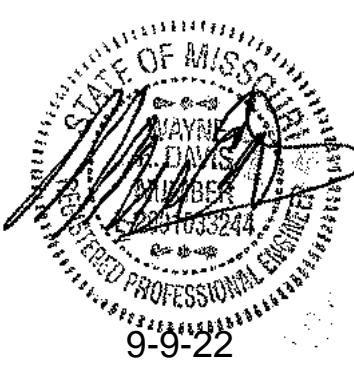
E SECTION
3/4" = 1'-0"

Issue Date: September 9, 2022

Revisions

NUMBER DESCRIPTION DATE

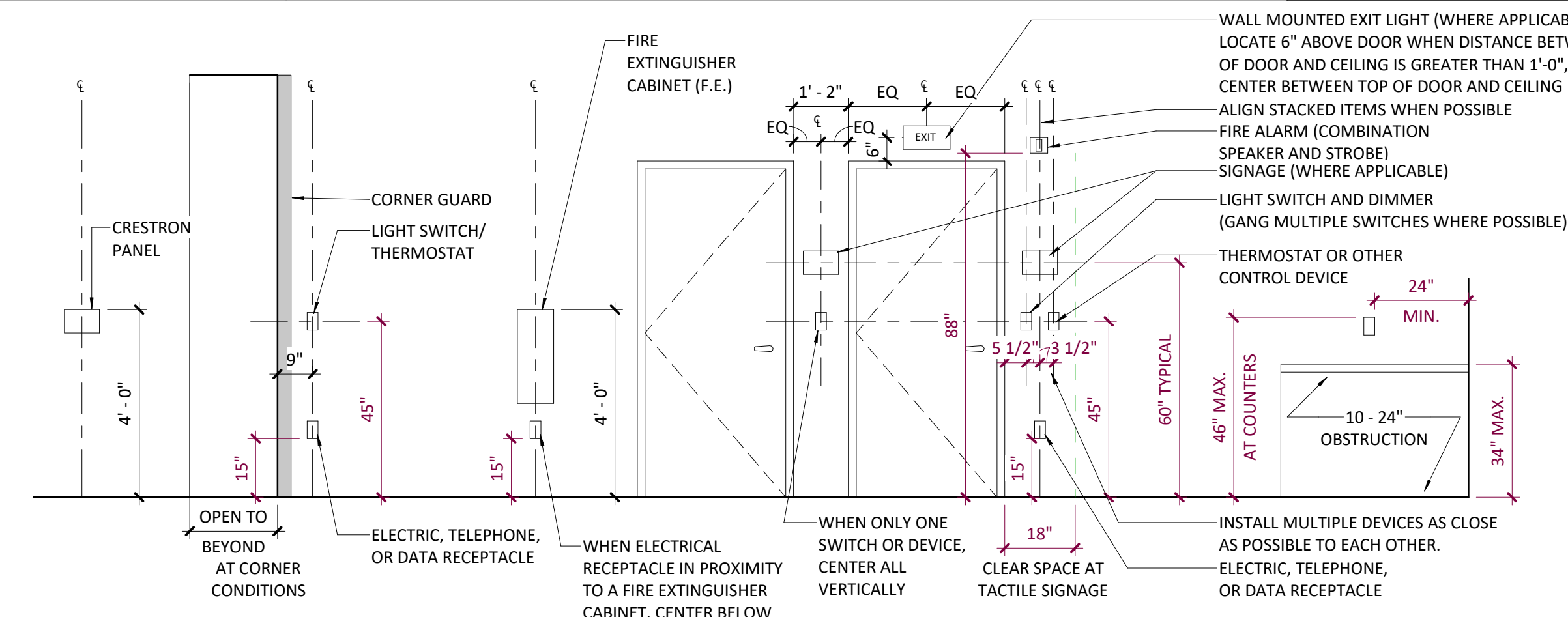
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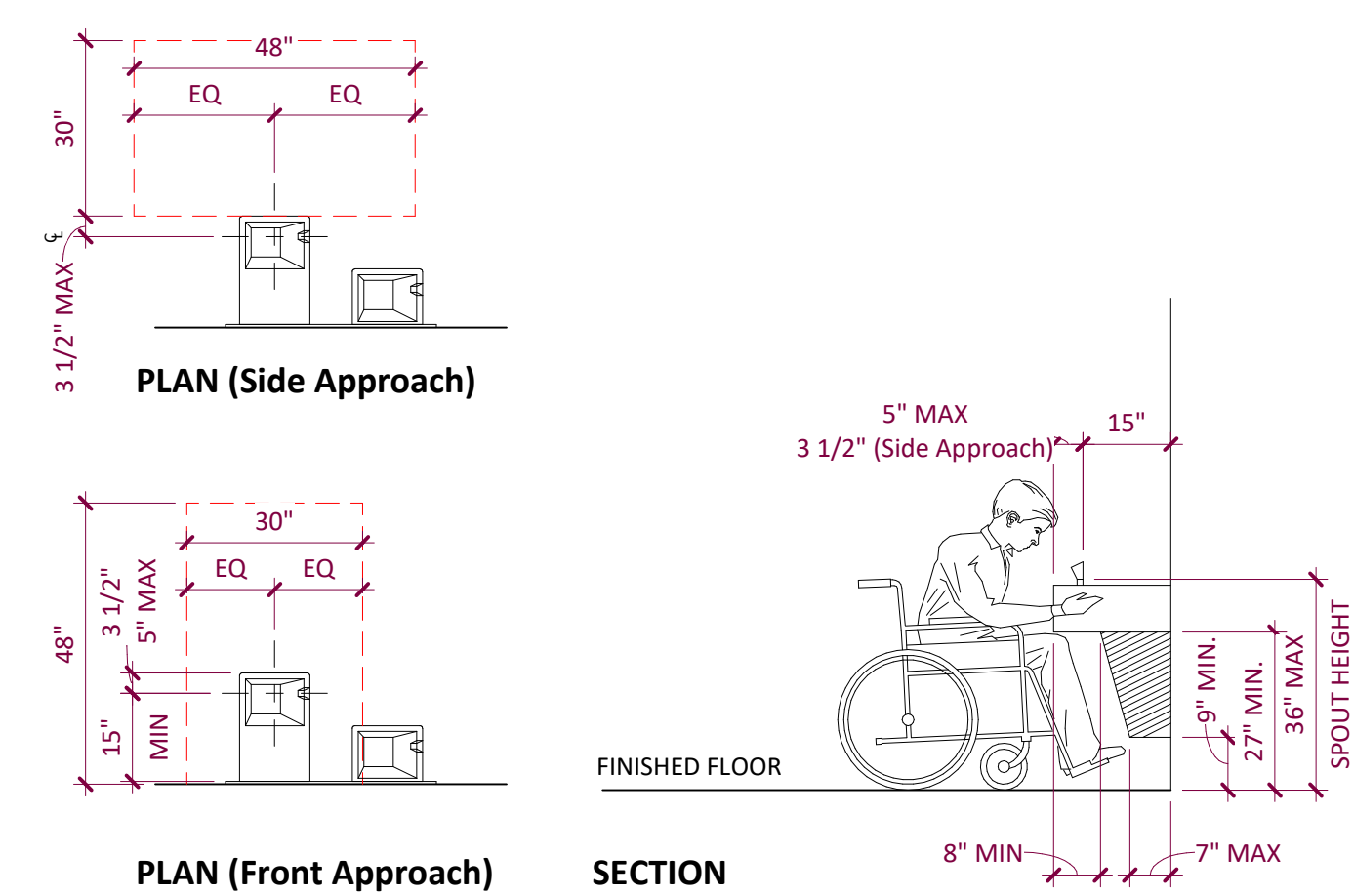
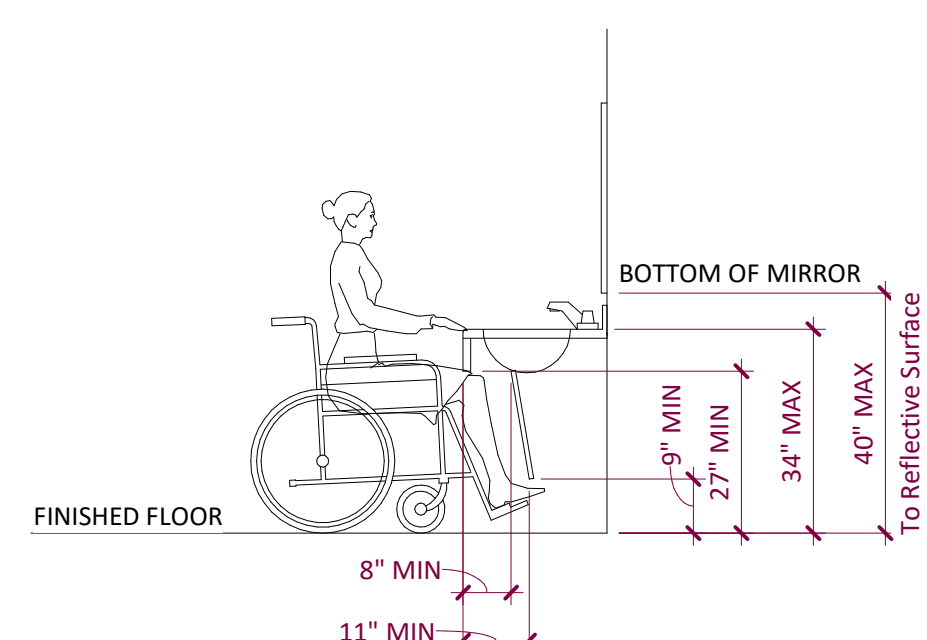
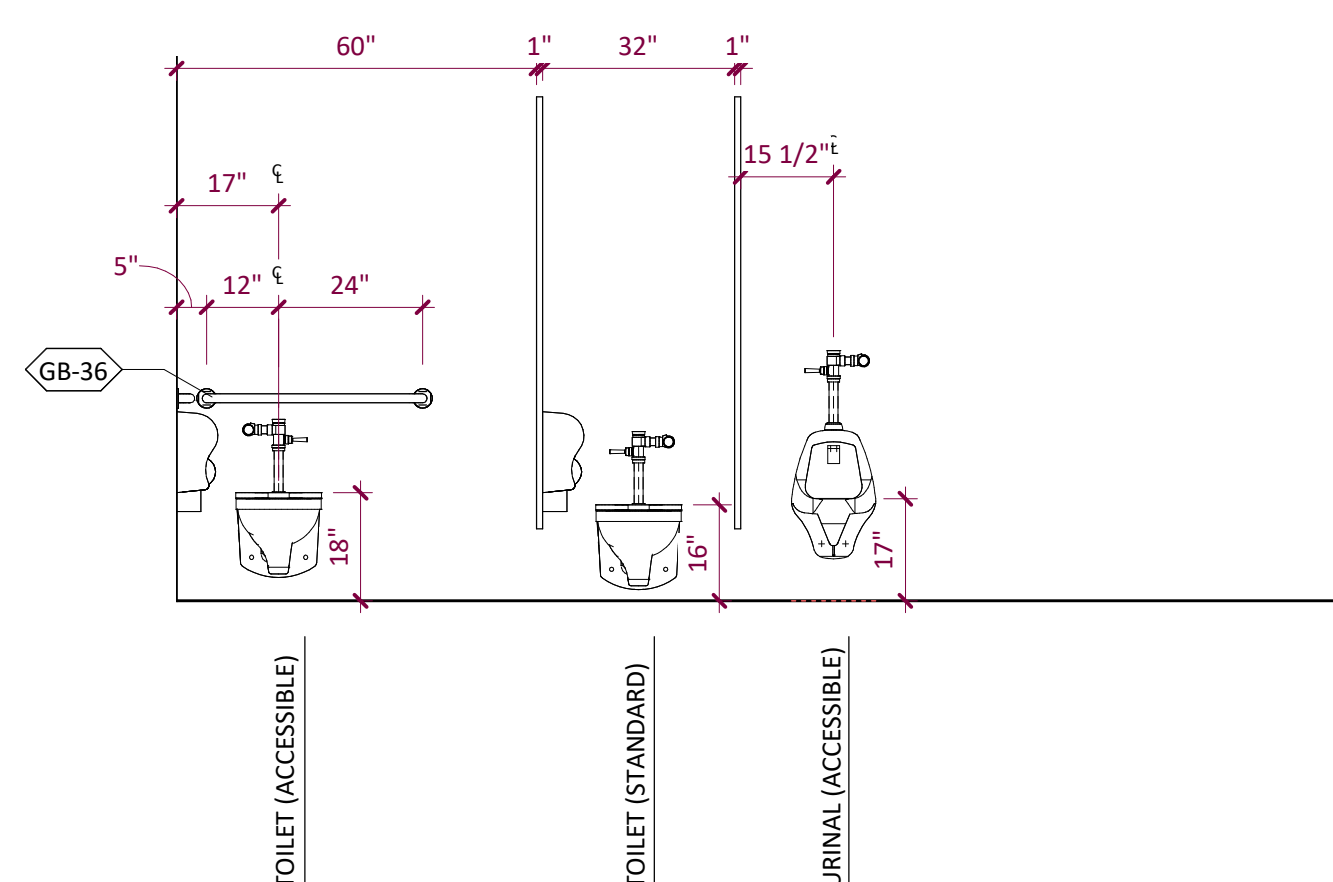
FRAMING ELEVATIONS

S400

1. THIS PROJECT WILL COMPLY WITH ALL AMERICAN WITH DISABILITIES REGULATIONS AND ALL LOCAL ACCESSIBILITY CODE REQUIREMENTS.
2. ALL MOUNTING HEIGHTS ARE TO COMPLY WITH ICC/ANSI-A117.1 REFER TO FIXTURE HEIGHT GUIDELINES FOR TYPICAL MOUNTING HEIGHTS. COORDINATE WITH OWNER/ARCHITECT FOR ANY ITEMS IN CONFLICT OR NOT EXPLICITLY INDICATED.
3. PROVIDE WOOD BLOCKING AT ALL EQUIPMENT FIXTURES, AND ACCESSORIES INCLUDED OWNER PROVIDED ITEMS WHETHER OR NOT SUCH BLOCKING IS NOTED OR SPECIFIED.
4. ACCESSORIES SHOWN ARE GENERIC. REFER TO SCHEDULE SPECIFIED MODEL.
5. FIXTURES ACCESSORIES SHOWN ARE GENERIC. REFER TO PLUMBING DRAWINGS FOR SCHEDULED FIXTURES.



Miscellaneous Heights **G1**
3/8" = 1'-0"

Drinking Fountain Guidelines **D5**
3/8" = 1'-0"

30" TO TOP OF BED WHEN OPEN

30"

34"

40" MAX. TO REFLECTIVE SURFACE

48" MAX.

48" MAX.

48" MAX.

30" MAX.

48" MAX.

48" MAX.

48" MAX.

48" MAX.

48" MAX.

43" MAX.

36" MAX. SPOUT HEIGHT

BABY CHANGING STATION

LAVATORY

MIRROR

AUTOMATIC SOAP DISPENSER

SANITARY NAPKIN VENDING

SANITARY NAPKIN DISPOSAL

SEAT COVER DISPENSER

PAPER TOWEL DISPENSER WITH TOUCH RECEPTACLE

PAPER TOWEL DISPENSER (RECESSED)

PAPER TOWEL DISPENSER (ELECTRONIC)

FIRE EXTINGUISHER CABINET (F.E.)

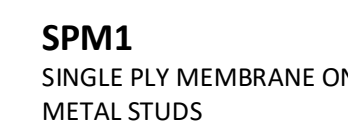
FIRE HOSE REEL CABINET

DRINKING FOUNTAIN (ACCESSIBLE)

Fixture Height Guidelines **A1**

A002

1. ALL OPENINGS, FLASHING, COUNTER FLASHING, AND EXPANSION JOINTS SHALL BE WATERTIGHT.
2. ALL OPEN JOINTS, PENETRATIONS, AND OTHER OPENINGS IN THE ENVELOPE SHALL BE SEALED, GASKETED, OR WEATHER-STRIPPED TO LIMIT AIR LEAKAGE.
3. PROVIDE MOLD RESISTANT GYPSUM BOARD AT ALL EXTERIOR WALLS.



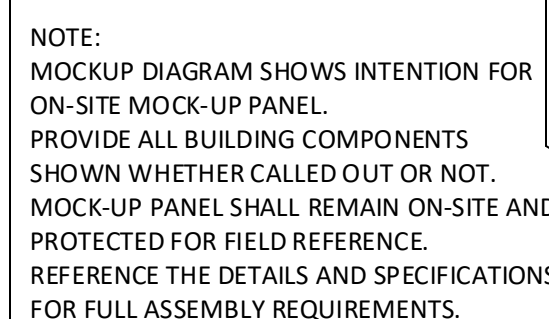
INSULATED CMU WALL



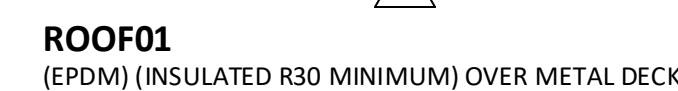
MWP02
CONCEALED FASTENER METAL WALL PANEL
ON METAL STUDS



NOTE: REFER TO SHEET A331 FOR CUSTOM METAL PANEL PROFILE AND PERFORATION PATTERNS.

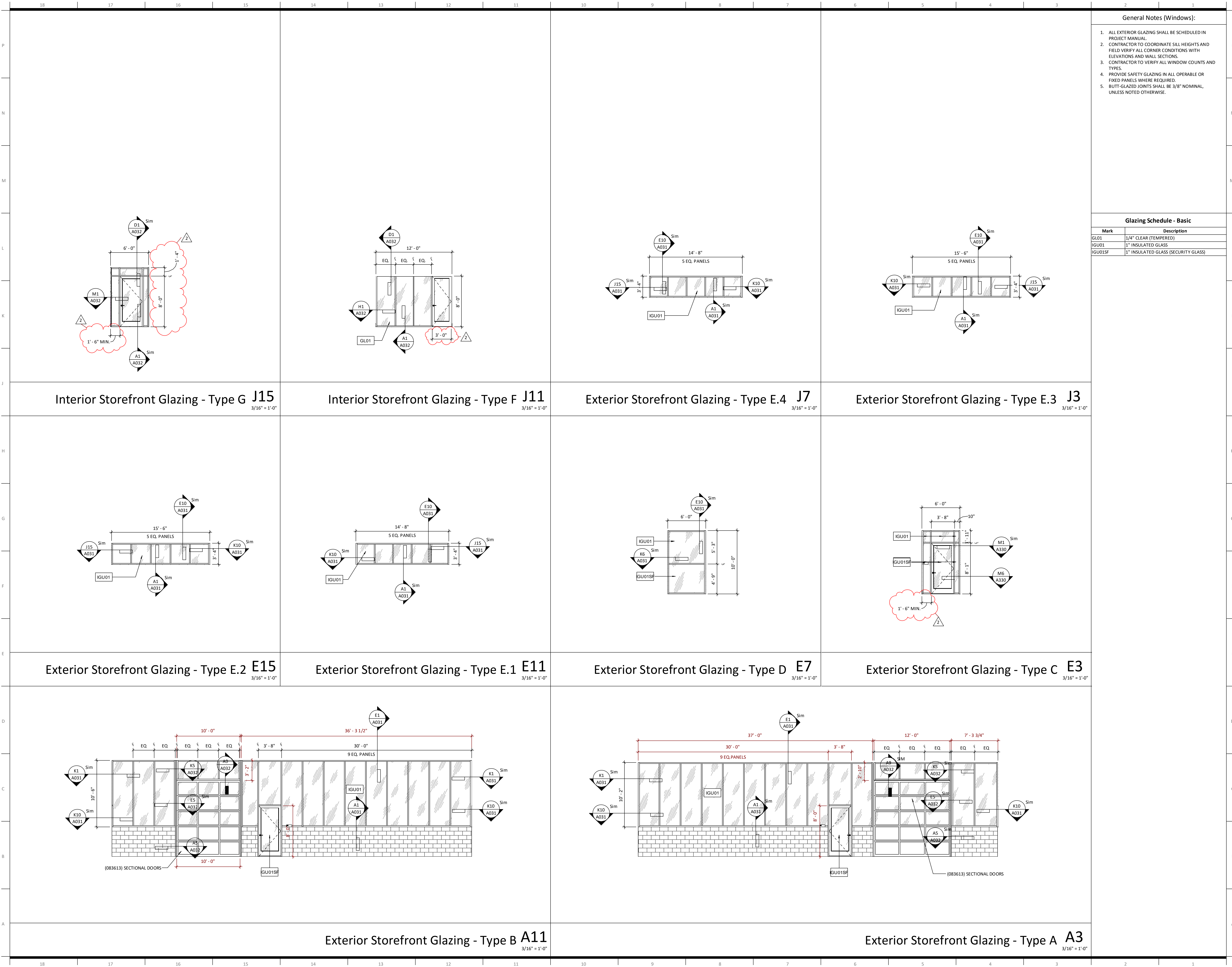


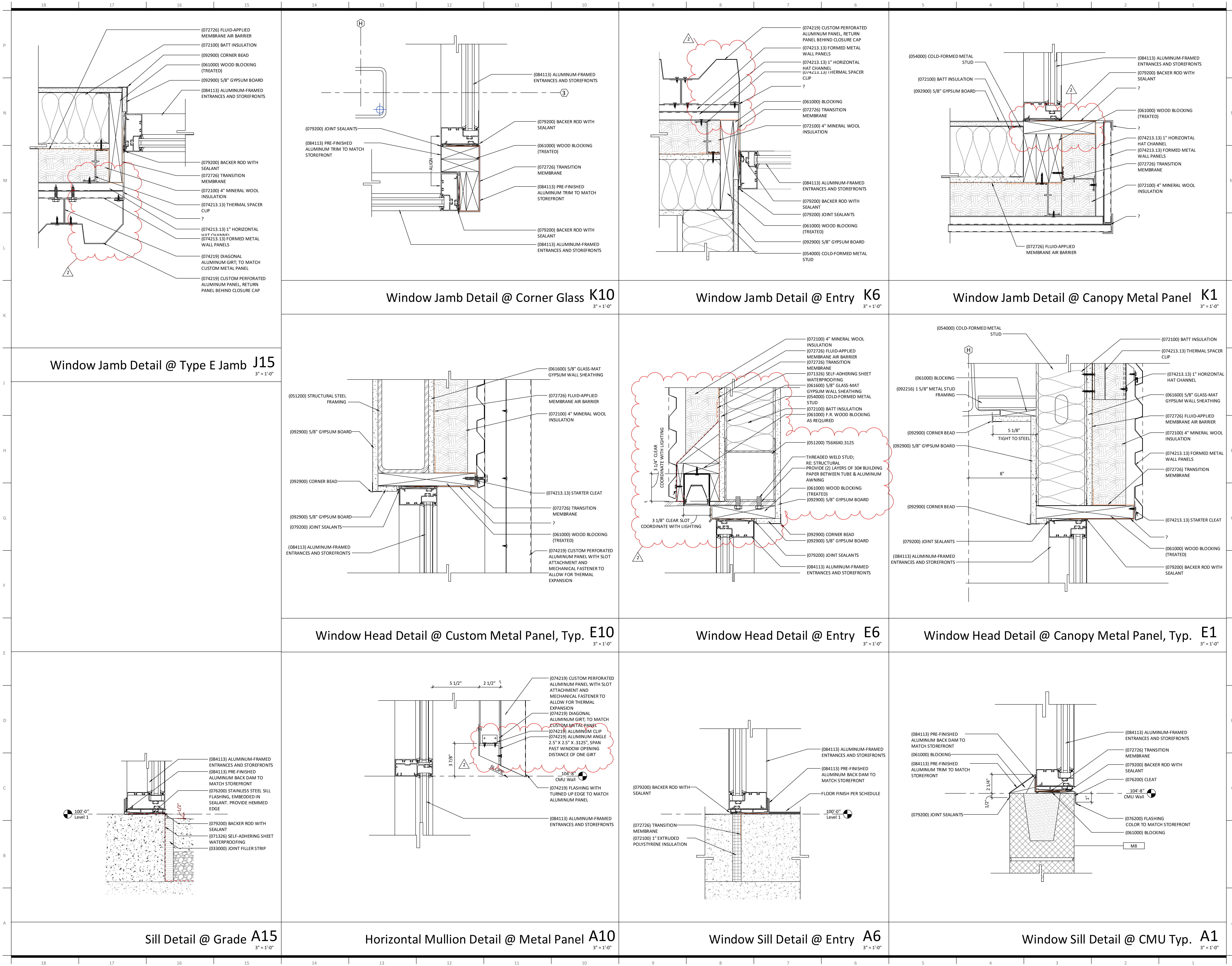
Exterior Envelope Mockup - Front Face A11



Roof Types **A7**

Exterior Wall Types A3





LSR7 Robotics, GIC & Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect: Multistudio
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multistudio

civil engineer: Kaw Valley Engineering
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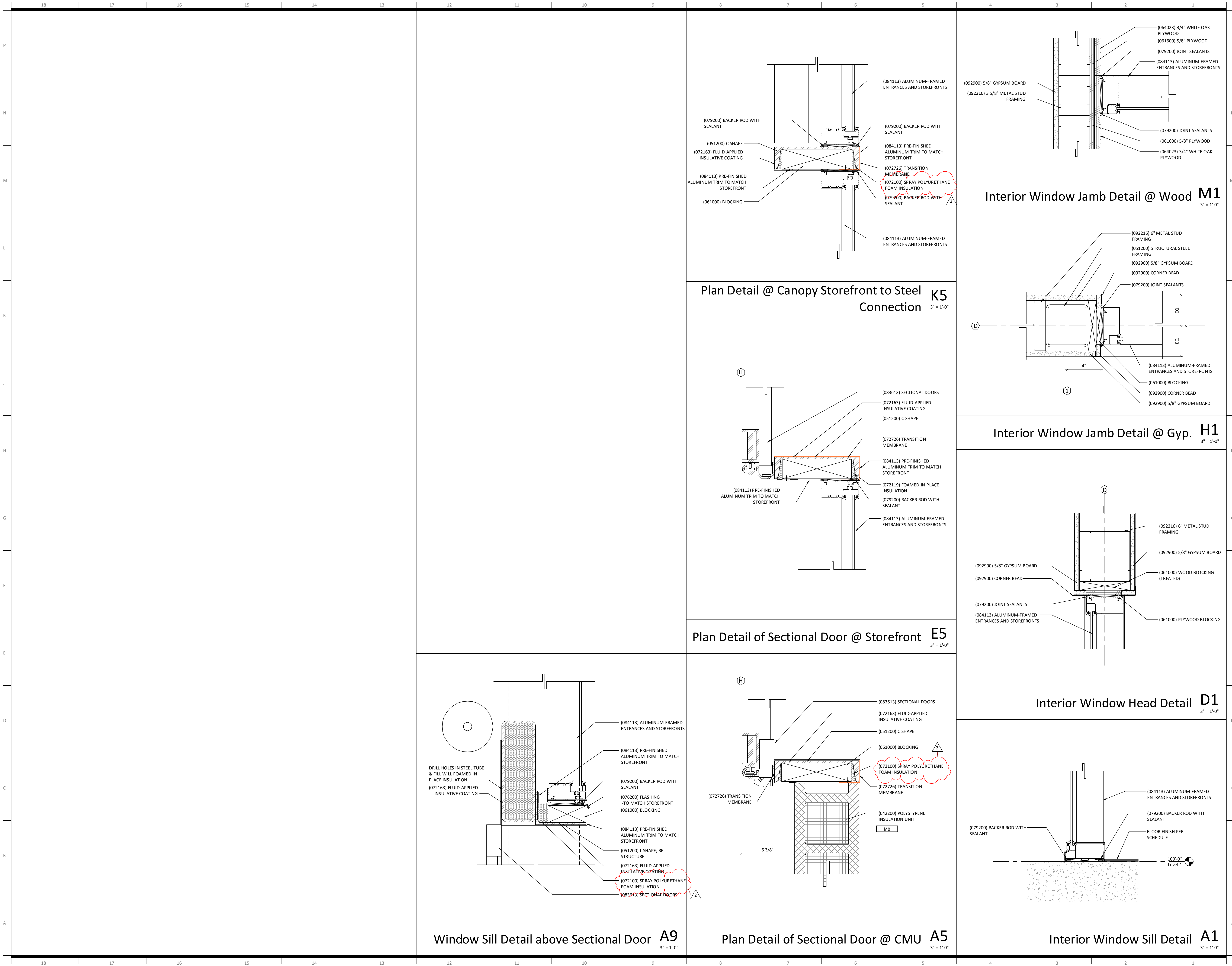
Revisions		
NUMBER	DESCRIPTION	DATE
1	Addendum 01	09/09/2022
2	Addendum 02	09/28/2022

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Interior & Exterior Storefront Details

A031



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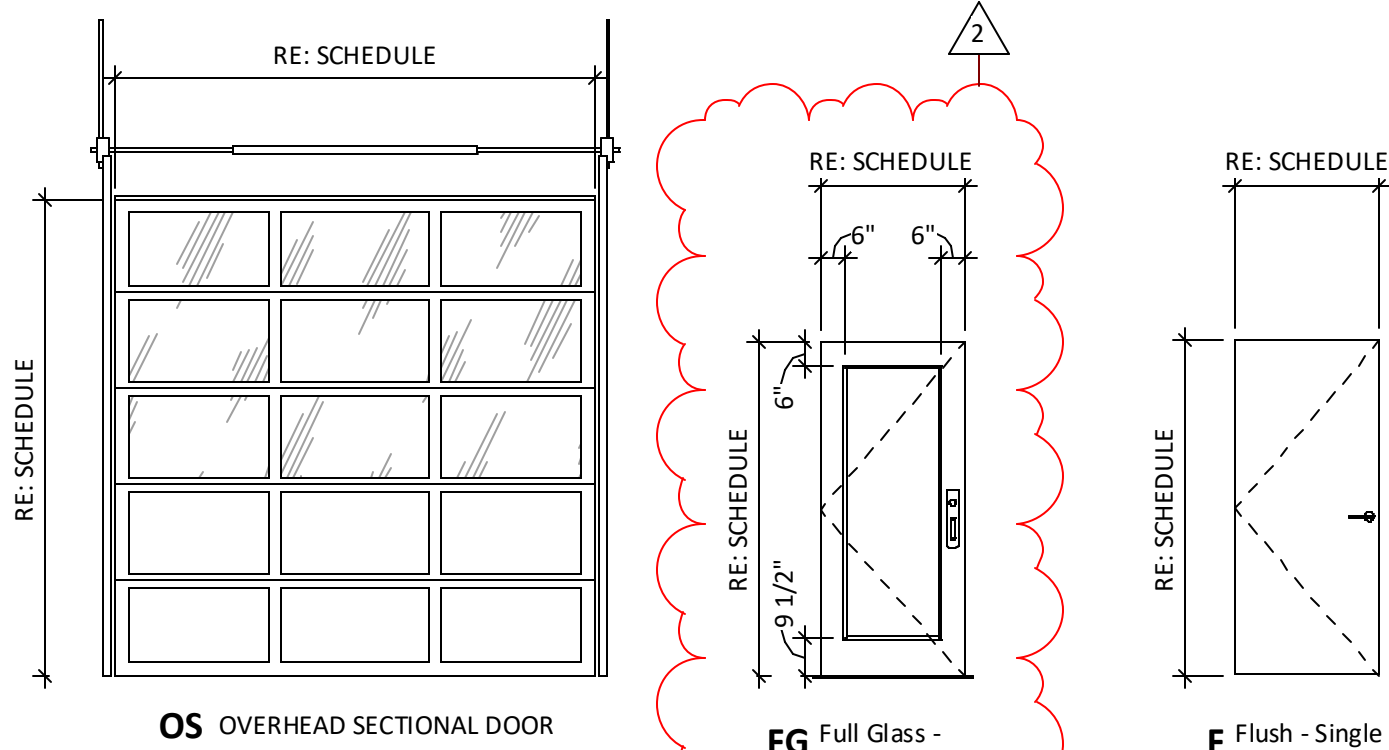
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Interior & Exterior Storefront Details

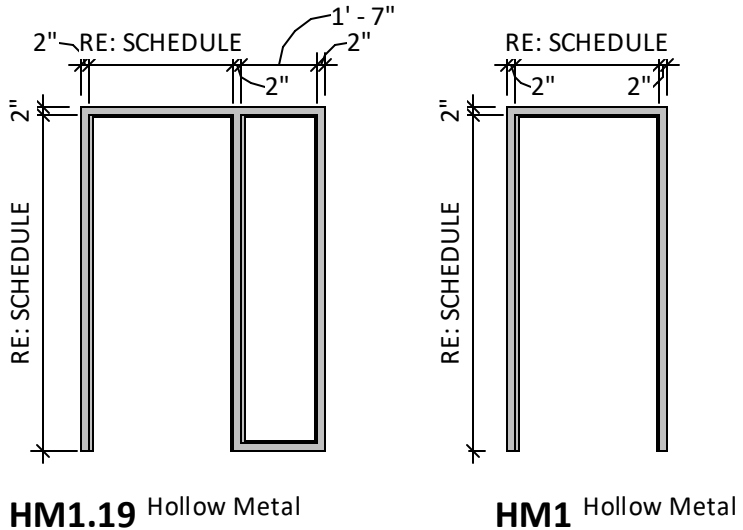
A032

Door Schedule LSN / LSW																	
P	Room		Assembly			Size			Door			Frame			Comments		
	From:	To:	Hardware Set	Fire Rating	Detail Type	Width	Height	Thickness	Type Mark	Material	Finish	Type	Material	Finish			
	R101.1	R101	01	NR	B/C	3'-6"	8'-0"	13/4"	FG	AL/GL	ANNO / IGU-01	AL	AL	ANNO			
	R101.2	R101	R105	07	NR	C	3'-6"	7'-11 19/64"	13/4"	FG	AL/GL	ANNO / IGU-01	AL	AL	ANNO		
	R102	R101	R102	08	NR	A	3'-0"	8'-0"	13/4"	F	WD	WD-02	HM	HM	PT-02		
	R103	R101A	R103	15	NR	A	3'-0"	7'-0"	13/4"	F	WD	WD-02	HM	HM	PT-02		
	R104	R101A	R104	15	NR	A	3'-0"	7'-0"	13/4"	F	WD	WD-02	HM	HM	PT-02		
	R105.1		R105	05	NR	B/C	3'-6"	8'-0"	13/4"	FG	AL/GL	ANNO / IGU-01SF	AL	AL	ANNO		
	R105.2			16	NR	-	10'-2"	12'-0"	13/4"	OS	AL/GL	ANNO / IGU-01 / IGU-01SF	STL	STEEL	PT-02	OVERHEAD SECTIONAL DOOR (083613)	
	R106	R106		09	NR	A	3'-0"	8'-0"	13/4"	F	WD	WD-02	HM	HM	PT-02		
	R107	R107	R105	10	NR	A	3'-0"	8'-0"	13/4"	F	WD	WD-02	HM	HM	PT-02		
	R108	R105	R108	06	NR	A	3'-0"	8'-0"	13/4"	F	WD	WD-02	HM	HM	PT-02		
N	R109.1	R109	R101	13	NR	C	3'-0 1/2"	8'-0"	13/4"	FG	AL/GL	ANNO / IGU-01	AL	AL	ANNO		
	R109.2		R109	02	NR	B/C	3'-6"	8'-0"	13/4"	FG	AL/GL	ANNO / IGU-01SF	AL	AL	ANNO		
	R109.3			16	NR	-	12'-2"	12'-0"	13/4"	OS	AL/GL	ANNO / IGU-01/IGU-01SF	STL	STEEL	PT-02	OVERHEAD SECTIONAL DOOR (083613)	



Door Types - LSN M3

1/4" = 1'-0"



Frame Types

1/4" = 1'-0"

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Note: SHADED CELLS IN THE SCHEDULE ARE ELEMENTS OF THE DOOR THAT ARE EXISTING TO REMAIN AND FOR INFORMATION ONLY.

1. THRESHOLDS SHALL COMPLY WITH ACCESSIBILITY REGULATIONS.

2. ALL DOOR FRAMES ARE TO BE WELDED.

3. EDGE CLEARANCES IN ACCORDANCE WITH AIA QUALITY STANDARDS.

4. DOORS LOCATED IN CORNERS ARE TO HAVE THE INSIDE FACE OF JAMB LOCATED 4 INCHES FROM THE ADJACENT WALL FINISH (8 INCHES IN MASONRY WALLS) UNLESS NOTED OTHERWISE.

5. PROVIDE BLOCKING AT ALL WALL MOUNTED DOOR STOPS.

6. GLAZING STOPS IN WOOD DOORS: SAME SPECIES AS DOOR FACE, MITERED CORNERS, CONCEALED FASTENERS.

7. FACTORY FINISH WOOD DOORS.

8. ALL EXIT DOORS SHALL BE OPERABLE FROM INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT AND SHALL BE LABELED "THIS DOOR TO REMAIN UNLOCKED DURING BUSINESS HOURS." THIS SIGN SHALL BE IN LETTERS NOT LESS THAN ONE INCH HIGH ON A CONTRASTING BACKGROUND. SPECIAL LOCKING DEVICES SHALL BE OF AN APPROVED TYPE, MANUALLY OPERATED. FLUSH BOLTS OR SURFACE BOLTS ARE PROHIBITED.

9. PROVIDE CLOSERS AT ALL FIRE RATED AND EXTERIOR DOORS. COORDINATE WITH HARDWARE SETS.

10. PROVIDE SAFETY GLAZING IN ALL DOORS AND ASSOCIATED ACTIVE/FIXED PANELS.

11. PROVIDE SAFETY GLAZING IN FIXED OR OPERABLE PANELS WHERE WITHIN 24 INCHES OF EITHER EDGE OF AN OPERABLE DOOR.

12. PROVIDE SAFETY GLAZING IN FIXED OR OPERABLE PANELS WHERE WITHIN 18 INCHES FROM AND RAMP/STAIR LANDING OR HAND/GUARDRAIL.

13. ANY DOOR CARRYING A U.L. RATING SHALL BE INSTALLED IN A U.L. RATED FRAME CARRYING THE SAME DESIGNATION.

14. PROVIDE FIRE RATED GLAZING IN PANELS LOCATED WITHIN A RATED WALL.

15. CONTRACTOR TO COORDINATE SILL HEIGHTS WITH ELEVATIONS AND WALL SECTIONS.

16. PAINT METAL DOORS AND FRAMES TO MATCH ADJACENT WALLS UNLESS OTHERWISE NOTED. REFER TO FINISH LEGEND FOR ADDITIONAL INFORMATION.

17. REFER TO "PROJECT MANUAL" FOR HARDWARE SETS AND ADDITIONAL DOOR REQUIREMENTS.

DOOR LEGEND:

AL ALUMINUM

ANNO ANODIZED

CA CARD ACCESS DEVICE

CL CLOSER

FRP FIBERGLASS

GL GLASS

HC HOLLOW CORE

HM HOLLOW METAL

IMP INSULATED METAL PANEL

L LOUVER

PF PRE-FINISHED/FACTORY FINISHED

PH PANIC HARDWARE

PR PAIR

PTD PAINTED

SD SMOKE & DRAFT CONTROL

SS STAINLESS STEEL

STL STEEL

T TEMPERED GLASS

V VISION

WD WOOD

Assembly Detail - Type C A11

1 1/2" = 1'-0"

Assembly Detail - Type B A8

1 1/2" = 1'-0"

Assembly Detail - Type A A3

1 1/2" = 1'-0"

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NUMBER	DESCRIPTION	DATE
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Door Types & Details. A080

LSR7 Robotics, GiC &
Phys Education

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64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

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301 NE Tudor Road
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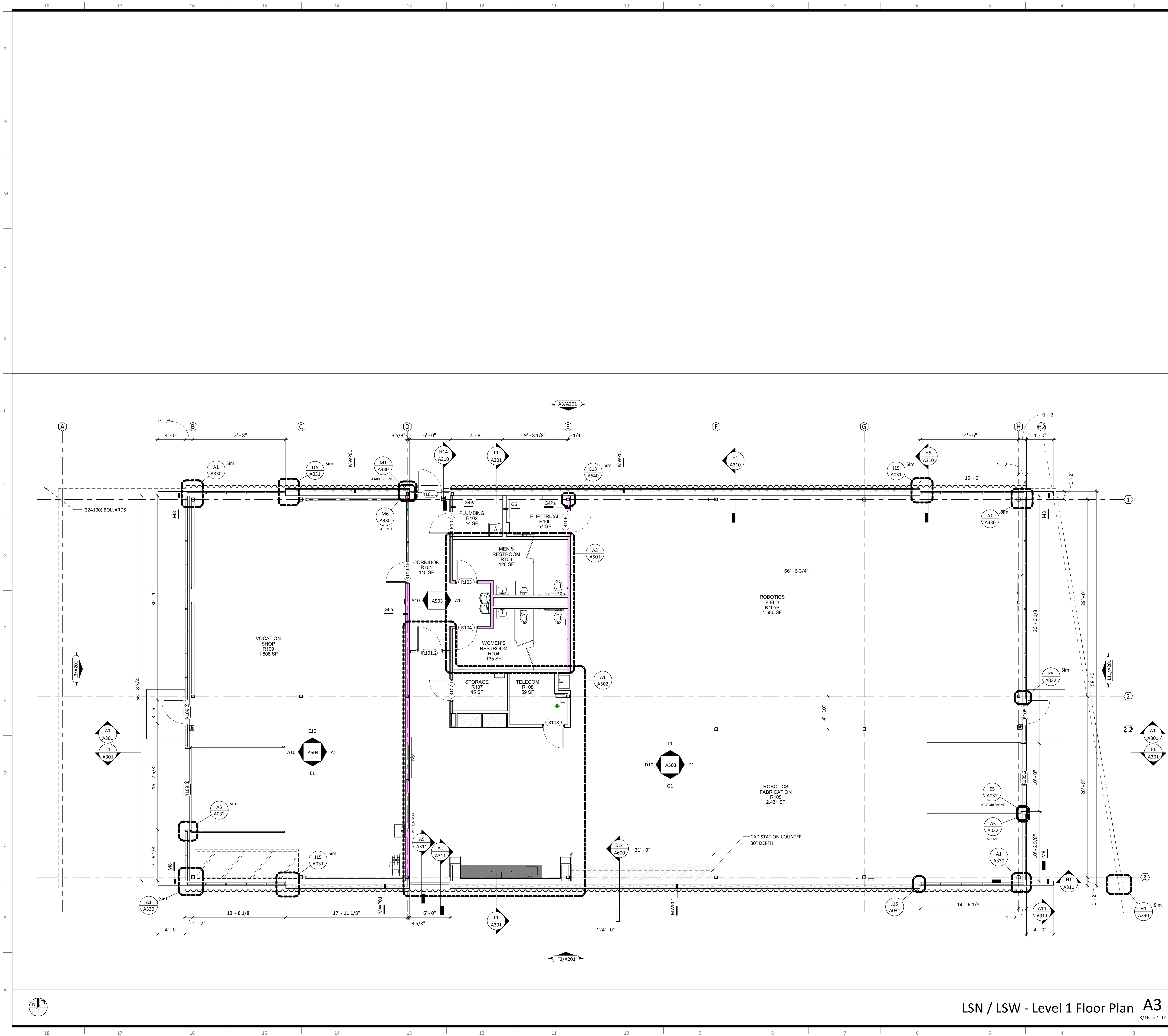
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Slab Plan
A100

LSN / LSW - Level 1 Slab Plan **A1**
3/16" = 1'-0"



- General Notes (Floor Plans):
- ALL WALL TYPES TO BE G4.1 UNLESS OTHERWISE NOTED.
 - ALL WALL DIMENSIONS ARE TO FACE OF WALL UNLESS OTHERWISE NOTED.
 - MASONRY WALLS ARE NOMINALLY CENTERED ON GRID LINES AND MASONRY DIMENSIONS ARE NOMINAL UNLESS OTHERWISE NOTED.
 - DOORS IN STUD WALLS NEAR PERPENDICULAR WALLS ARE LOCATED 4" OFF FACE OF PERPENDICULAR WALL UNLESS OTHERWISE NOTED.
 - DOORS IN MASONRY WALLS ARE LOCATED IN ROUGH OPENINGS DIMENSIONED ON SHEET.
 - SEE GENERAL ACCESSIBILITY SHEET FOR HEIGHTS AND LOCATIONS OF TOILET ACCESSORIES NOT SHOWN ON ELSEWHERE.
 - CONTRACTOR TO FIELD VERIFY ALL MEASUREMENTS AND CONDITIONS NEW AND EXISTING. NOTIFY THE ARCHITECT/OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES.
 - ENLARGED PLANS MAY BE ROTATED OR MIRRORED COORDINATE WITH MAIN FLOOR PLAN.
 - CONTRACTOR TO PROVIDE 4'-0" HIGH PLYWOOD BACKER BOARD IN ALL MECHANICAL AND ELECTRICAL ROOMS MOUNTED 3'-6" A.F.F. FOR PERIMETER OF ROOM.

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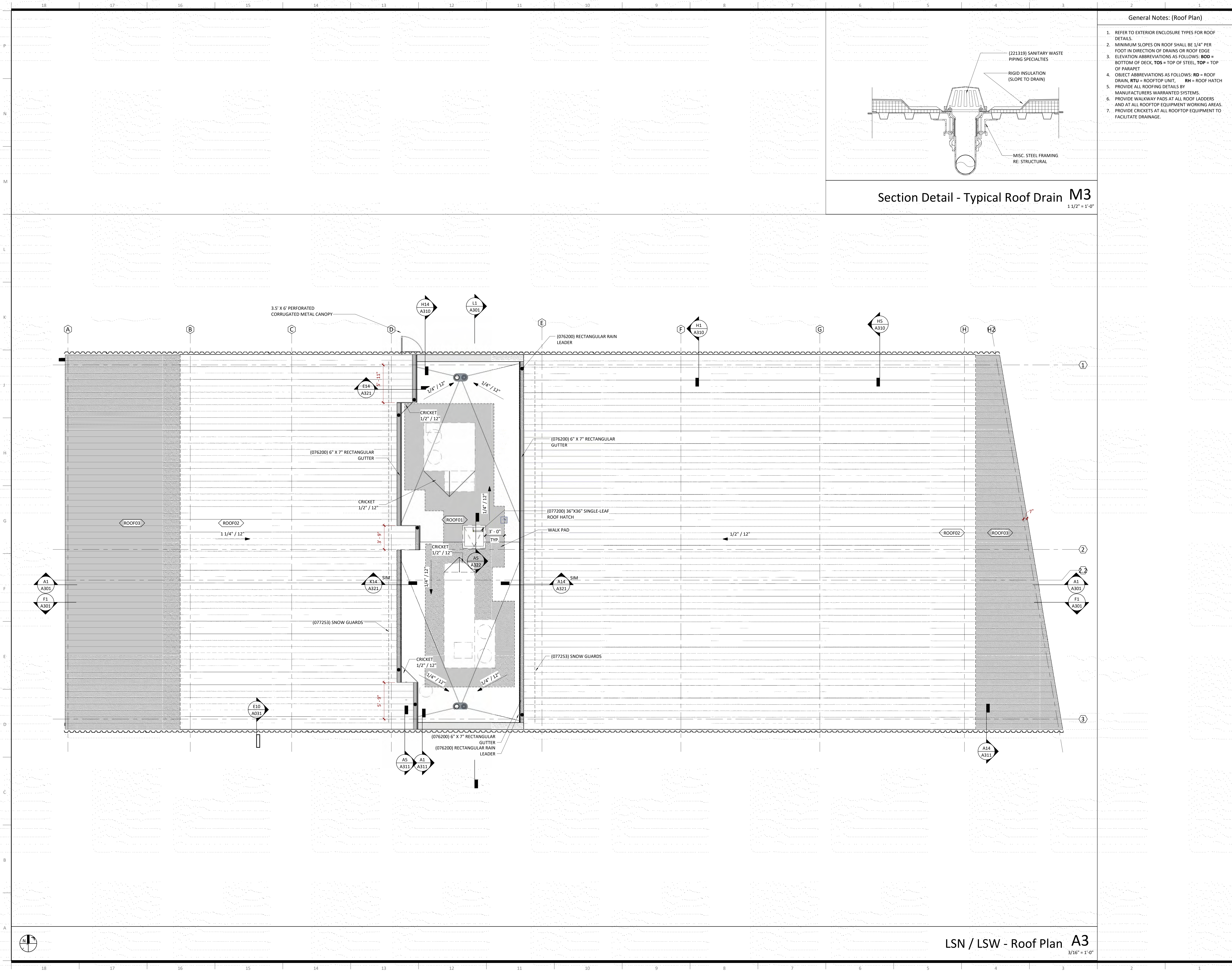
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LSN / LSW - Level 1 Floor Plan A3
3/16" = 1'-0"



LSR7 Robotics, GIC & Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64083

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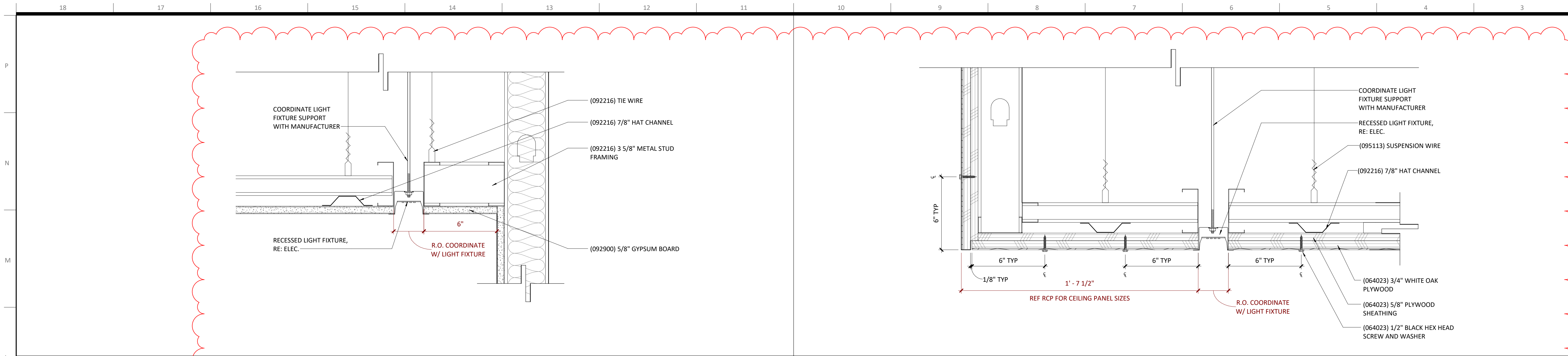
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Restroom Ceiling Detail @ Recessed Light L11
3" = 1'-0"

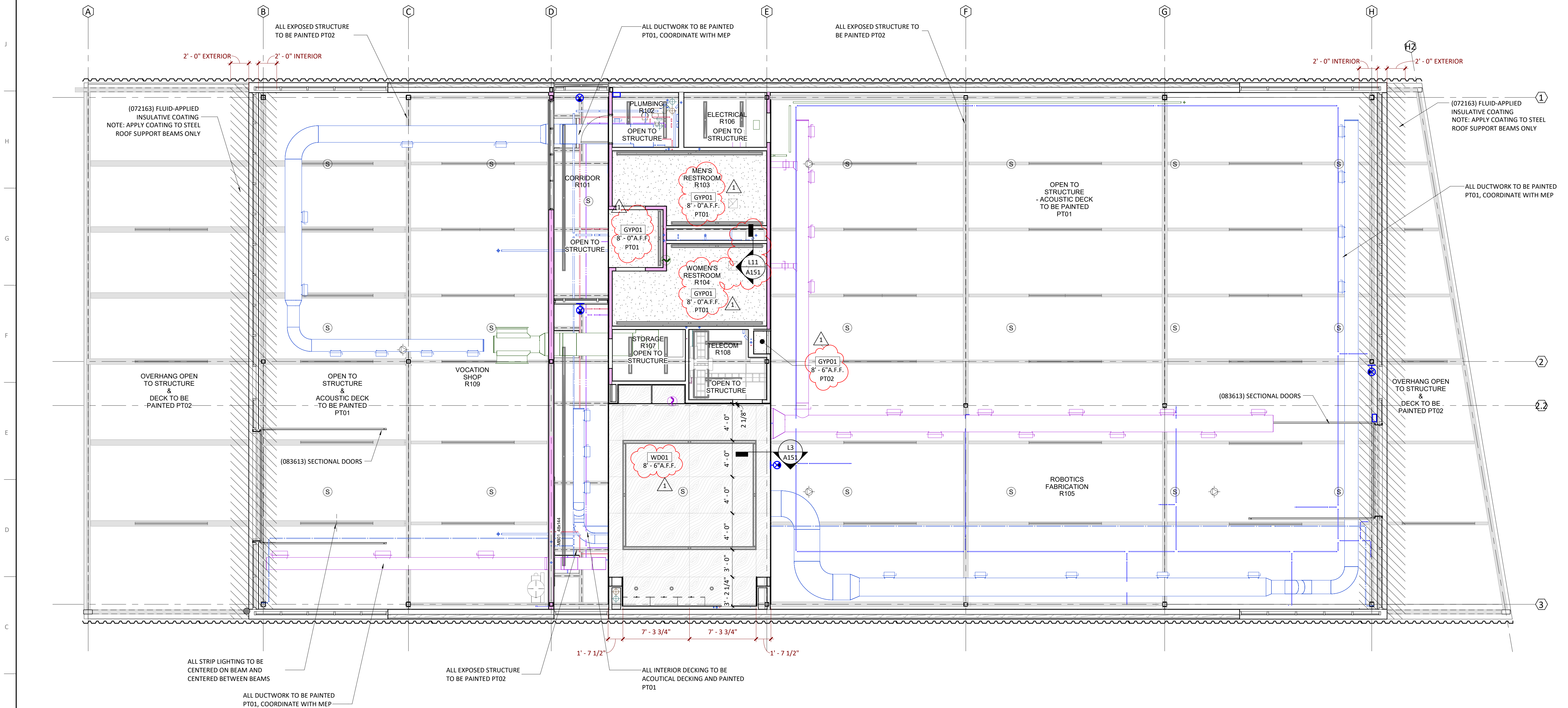
Classroom Ceiling Detail @ Recessed Light L3
3" = 1'-0"

General Notes (Reflected Ceiling Plans):

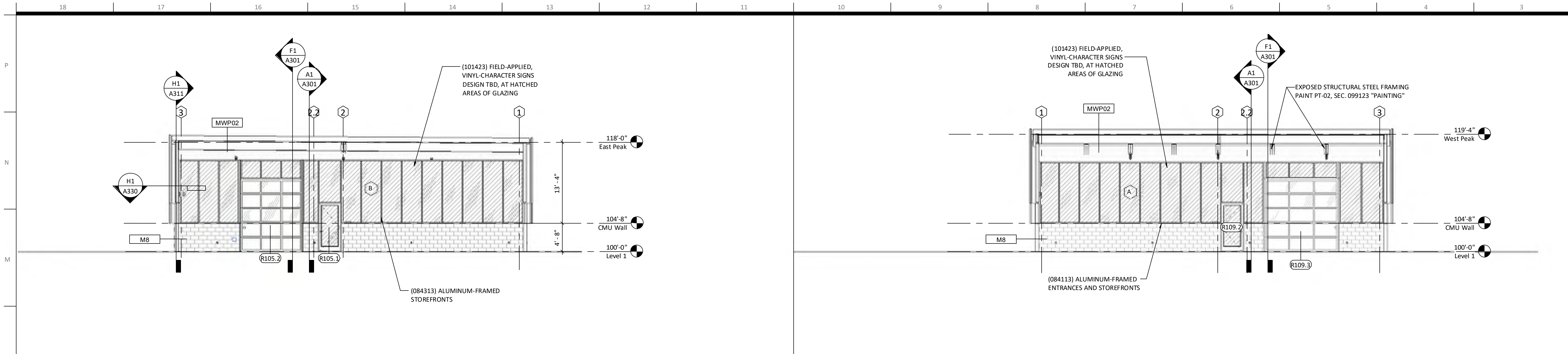
1. ALL CEILING AND SOFFIT HEIGHTS ARE GIVEN ABOVE FINISHED FLOOR ELEVATION - (EL. 0'-0").
2. GENERALLY ONLY CEILING MOUNTED FIXTURES ARE SHOWN ON THIS PLAN. COORDINATE WITH MEP PLANS FOR ADDITIONAL INFORMATION.
3. SOME OR ALL SPRINKLERS MAY NOT BE SHOWN ON THIS PLAN. COORDINATE WITH MEP DRAWINGS FOR ADDITIONAL INFORMATION. SPRINKLER HEADS TO BE CENTERED ON CEILING TILE, TYP.
4. VERIFY LOCATIONS OF ALL CEILING ACCESS PANELS WITH MEP DRAWINGS. COORDINATE LOCATIONS OF PANELS WITH ARCHITECT PRIOR TO INSTALLATION. ACCESS PANEL FIRE RATINGS MUST MATCH CEILING ASSEMBLY FIRE RATINGS.
5. LIGHTING FIXTURES TO BE CENTERED AND SPACED EQUALLY UNLESS NOTED OTHERWISE.
6. LIGHT FIXTURES ARE SHOWN FOR DIMENSIONAL PURPOSES ONLY COORDINATE WITH ELECTRICAL DRAWINGS FOR FIXTURE DESIGNATIONS.
7. IF PROJECT INCLUDES FIRE RATED CEILINGS, LIGHT FIXTURES LOCATED IN RATED CEILING ASSEMBLIES ARE TO BE TENTED OR OTHERWISE RATED TO MATCH THE CEILING.

Lighting Fixture Legend:

- 2X4 FLORESCENT
- 2X2 FLORESCENT
- STRIP FLORESCENT
- RECESSED CAN LIGHT
- CEILING FAN
- EMERGENCY WALL PACK
- TRACK LIGHTING
- STEP LIGHT
- COVE LIGHT

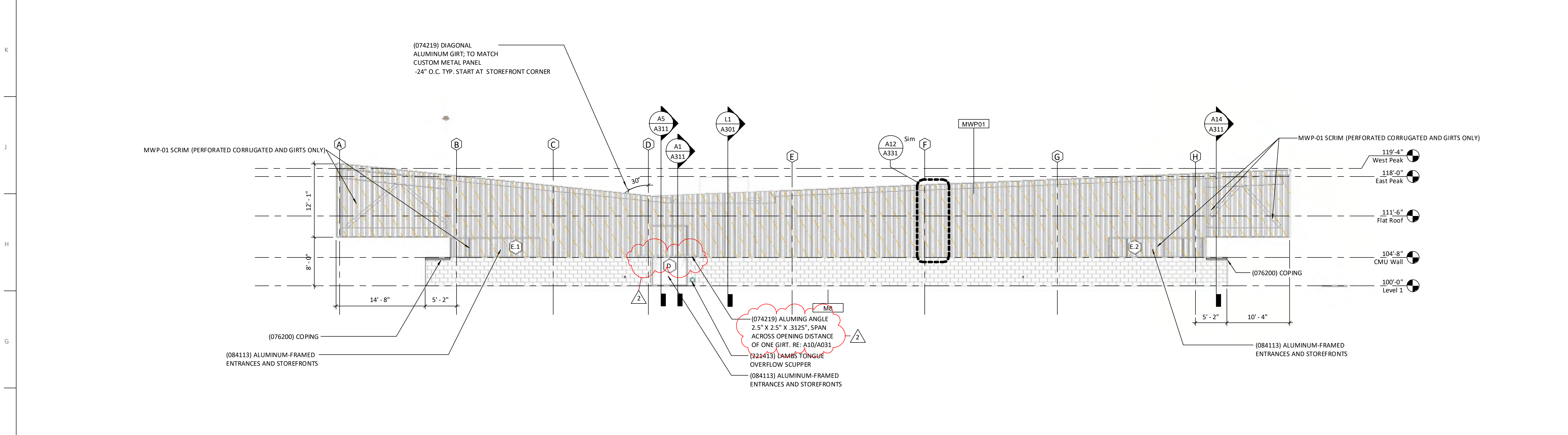


LSN / LSW - Level 1 RCP A3
3/16" = 1'-0"

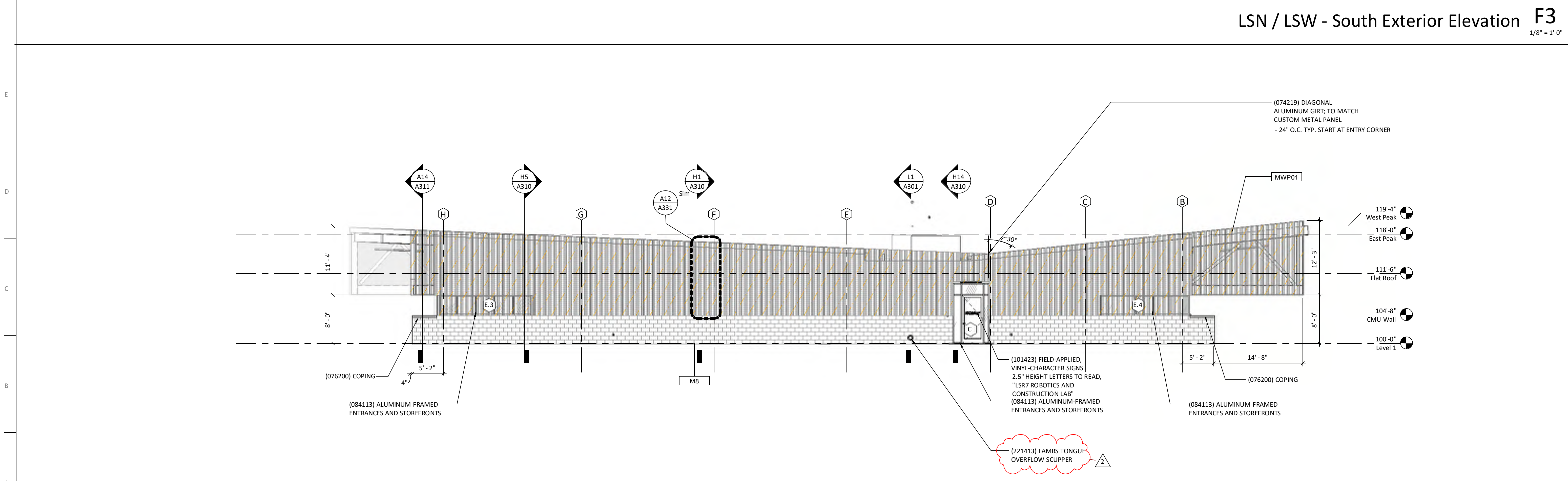


LSN / LSW - East Exterior Elevation **L1**
1/8" = 1'-0"

LSN / LSW - West Exterior Elevation **L3**
1/8" = 1'-0"



LSN / LSW - South Exterior Elevation **F3**
1/8" = 1'-0"



LSN / LSW - North Exterior Elevation **A3**
1/8" = 1'-0"

General Notes (Exterior Elevations):

- MATERIALS AND FINISHES INDICATED APPLY TO ALL SIMILAR ELEMENTS.
- COORDINATE EXTERIOR LIGHTING FIXTURE TYPES AND LOCATIONS WITH ELECTRICAL DRAWINGS.

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Finish Legend - Exterior	
MARK	MODEL
042200	CONCRETE MASONRY UNIT
M8	CONCRETE MASONRY UNIT
074113	STANDING SEAM METAL ROOF PANELS
ROOF02	STANDING SEAM METAL ROOF
074213.13	FORMED METAL WALL PANEL
MWP02	CORRUGATED METAL PANEL
074219	CUSTOM PERFORATED ALUMINUM PANEL
MWP01	METAL RAINSCREEN PANEL - CUSTOM
088000	GLAZING
IGU01	1" INSULATED GLASS
IGU01SF	1" INSULATED GLASS (SECURITY GLASS)

(074219) ALUMINUM RAINSCREEN GIRTS
- 2'-0" O.C. START AT POINT INDICATED ON
ELEVATIONS

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Exterior Elevations
A201

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Phys Education

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LSN / LSW - Building Section 3 L1
3/16" = 1'-0"

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Building Sections
A301

LSN / LSW - Building Section 1 A1
3/16" = 1'-0"

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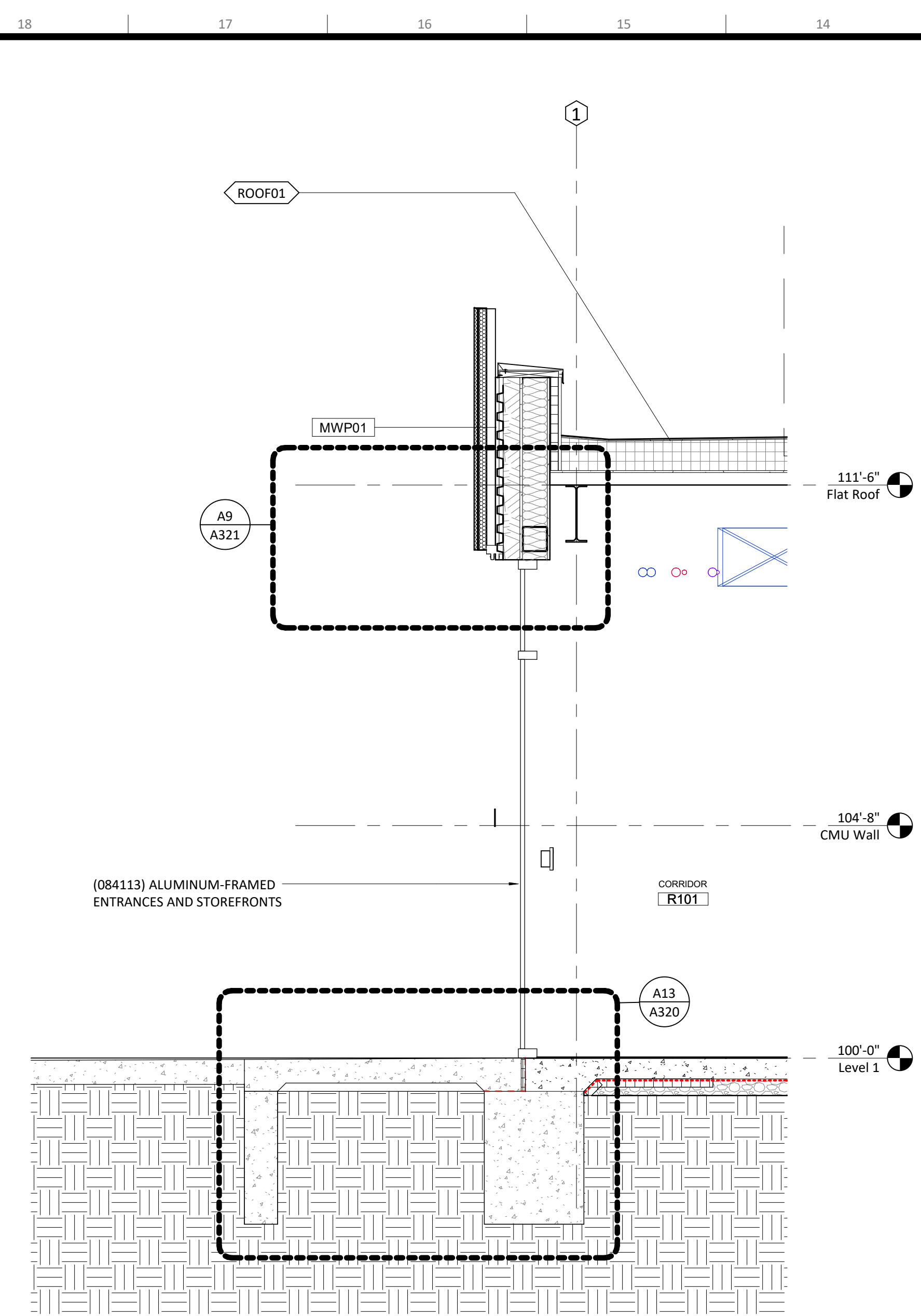
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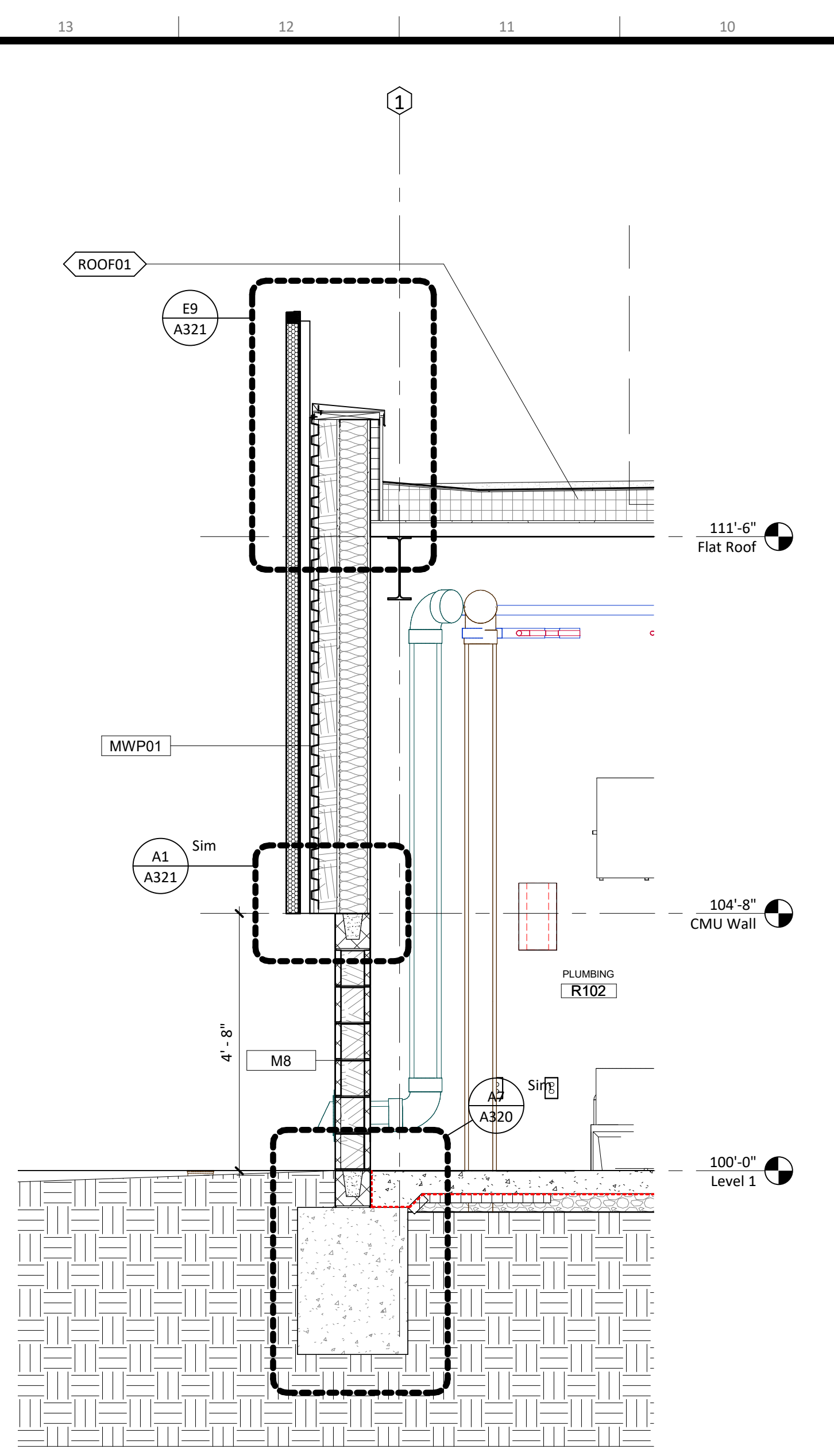
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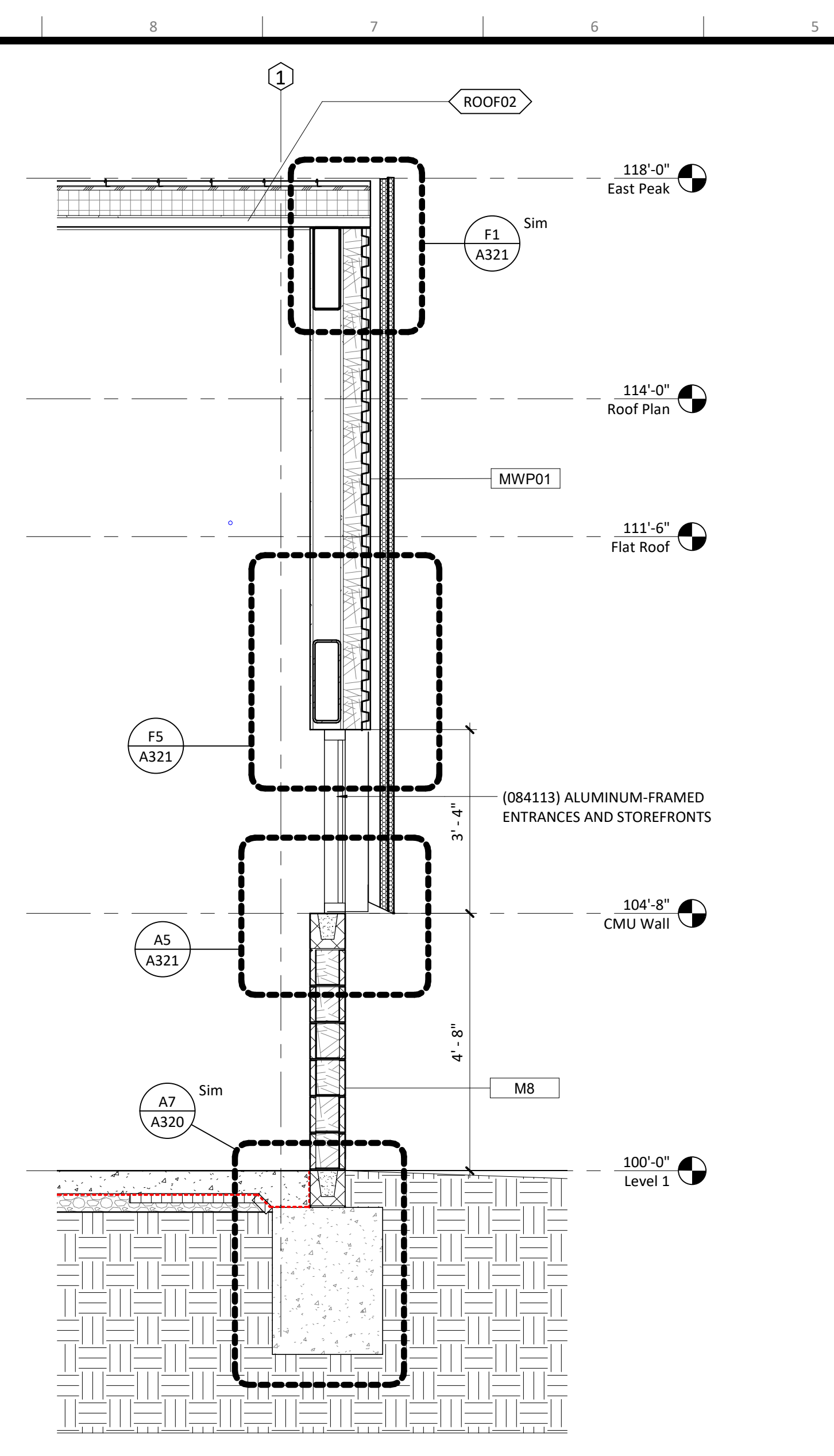
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816.742.5000
www.hendersonengineers.com



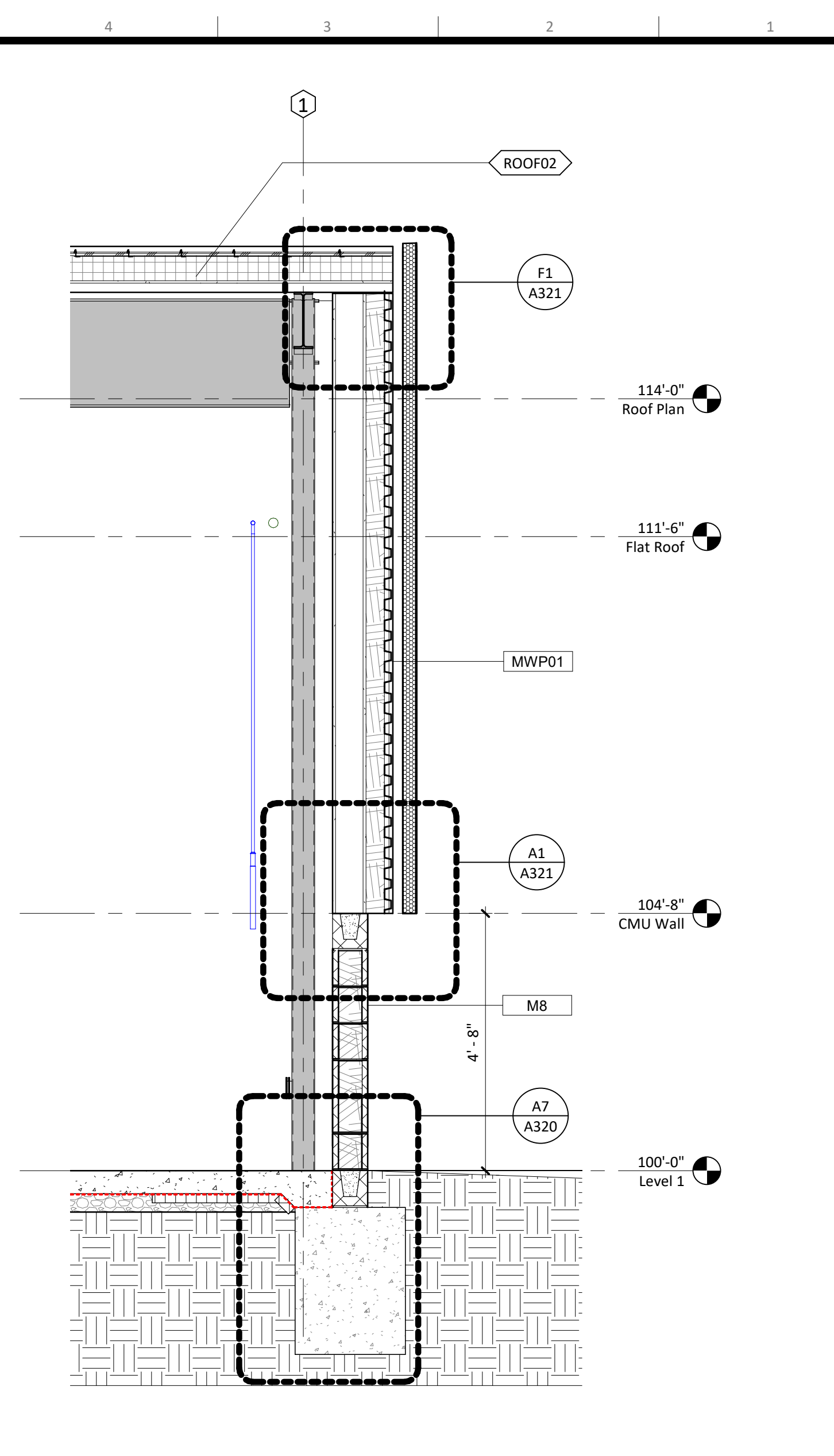
Wall Section @ North Entry H14
1/2" = 1'-0"



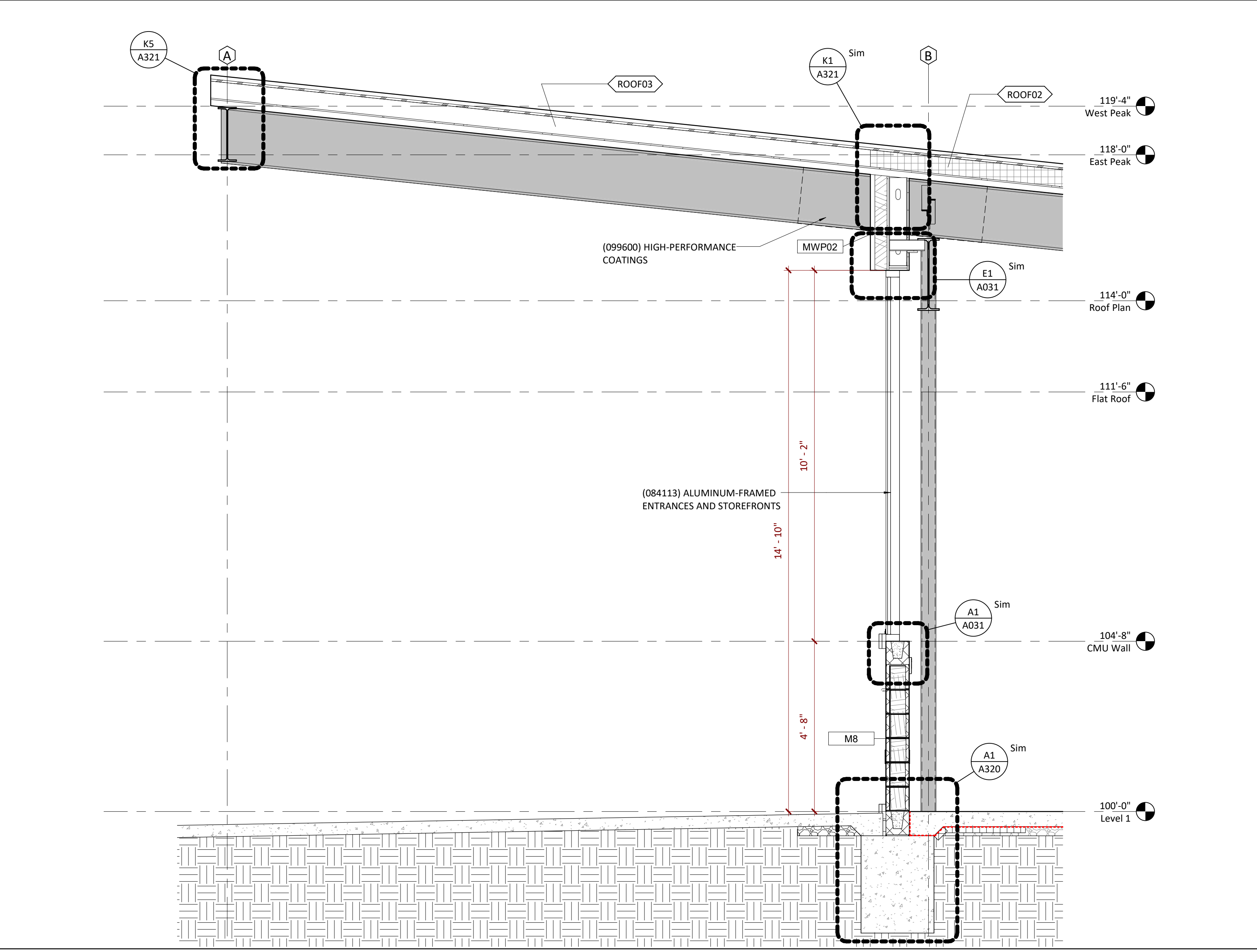
Wall Section @ Mechanical Roof H10
1/2" = 1'-0"



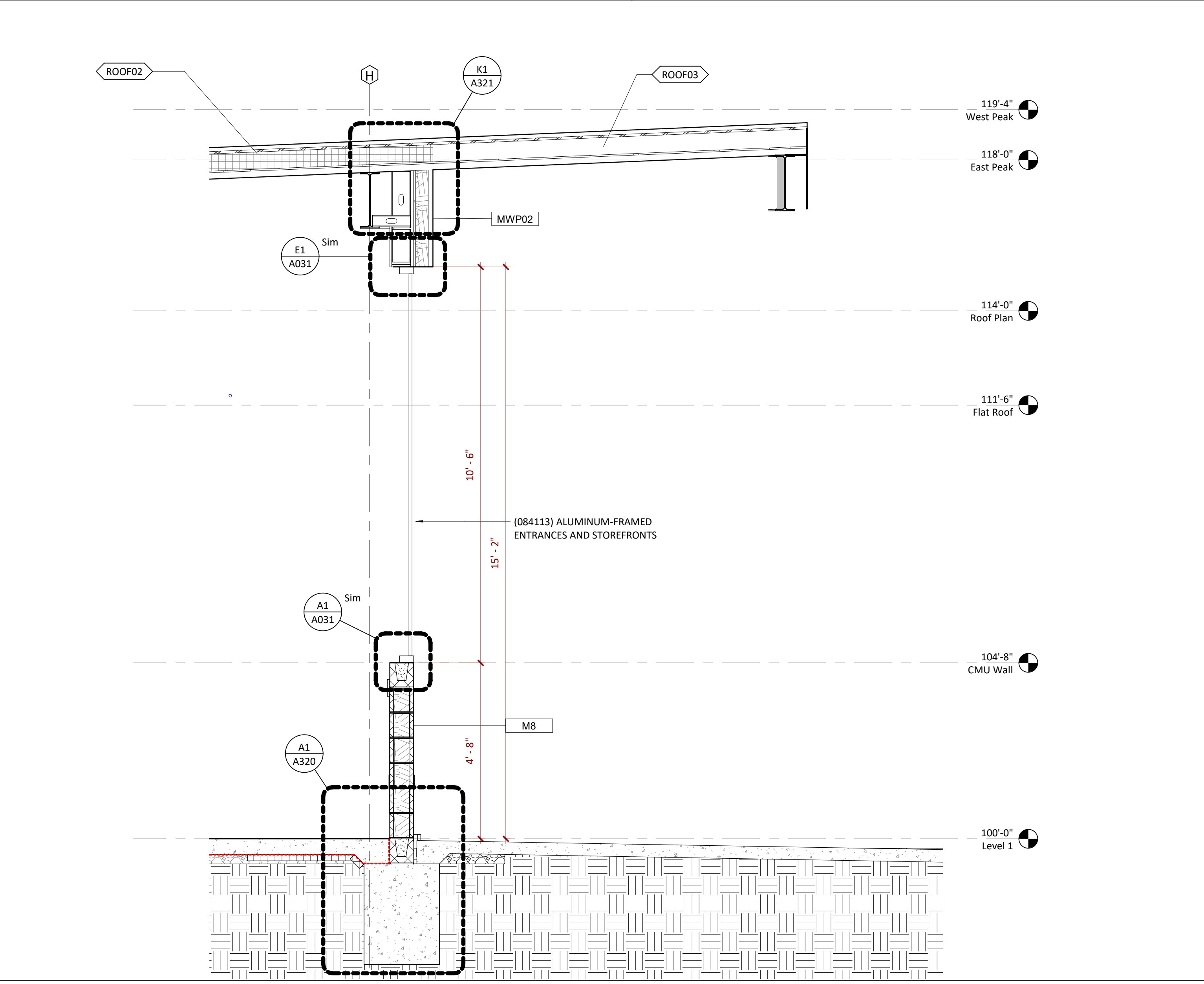
Wall Section @ Metal Panel & Storefront H5
1/2" = 1'-0"



Wall Section @ Metal Panel H1
1/2" = 1'-0"



Wall Section @ GIC Canopy A10
1/2" = 1'-0"



Wall Section @ Robotics Canopy A1
1/2" = 1'-0"

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Wall Sections
A310

LSR7 Robotics, GiC &
Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

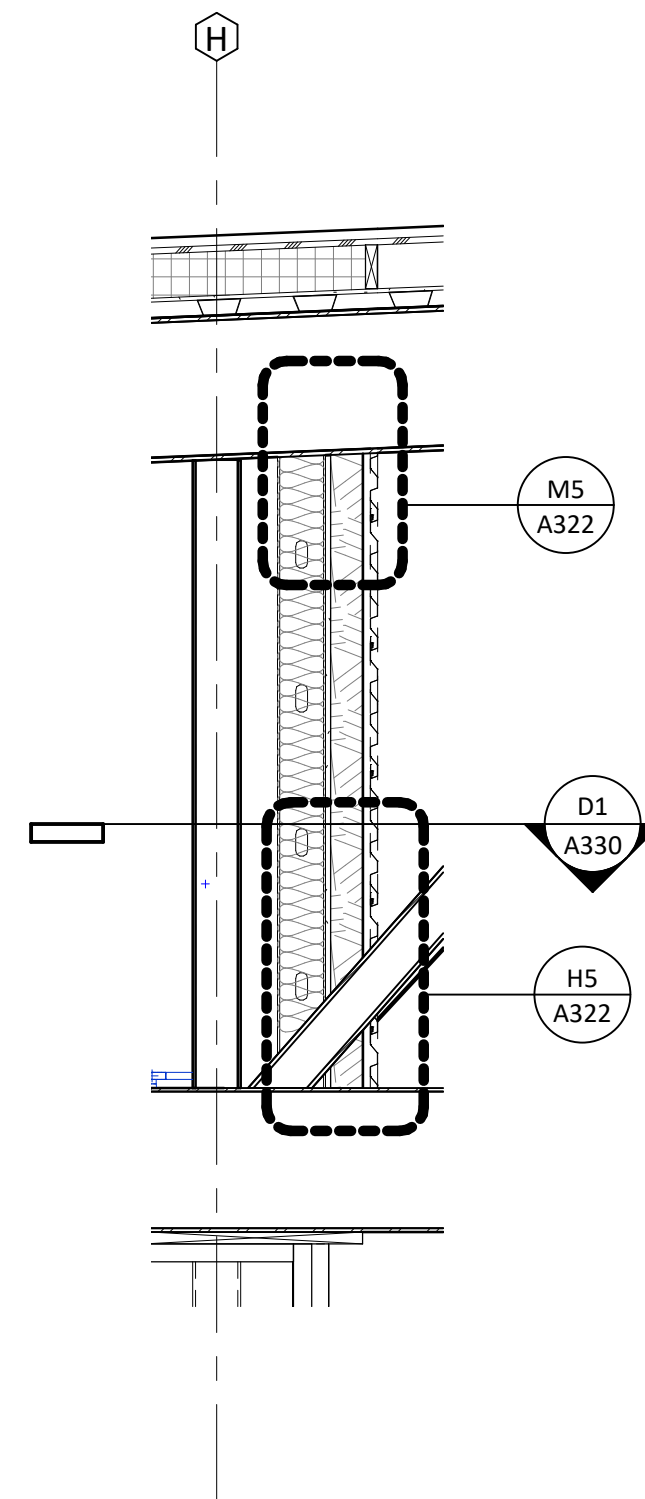
owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086
multi-studio

architect:
Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi-studio

civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com

structural engineer:
Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

MEP/IT/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com



Wall Section - Steel Penetration at Truss H1
1/2" = 1'-0"

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Wall Sections
A311

LSR7 Robotics, GiC &
Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

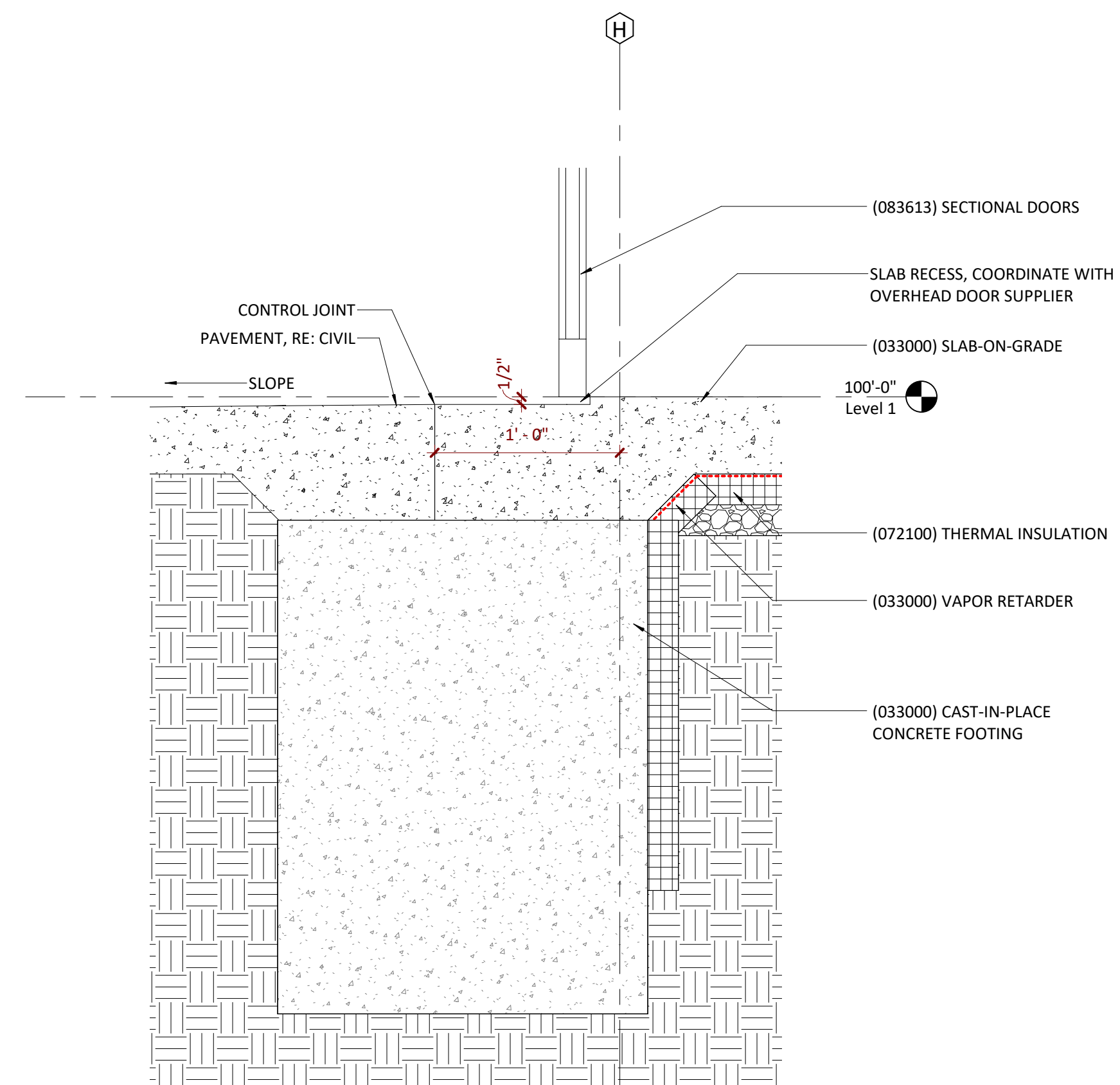
owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086
multi-studio

architect:
Multistudio
4205 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi-studio

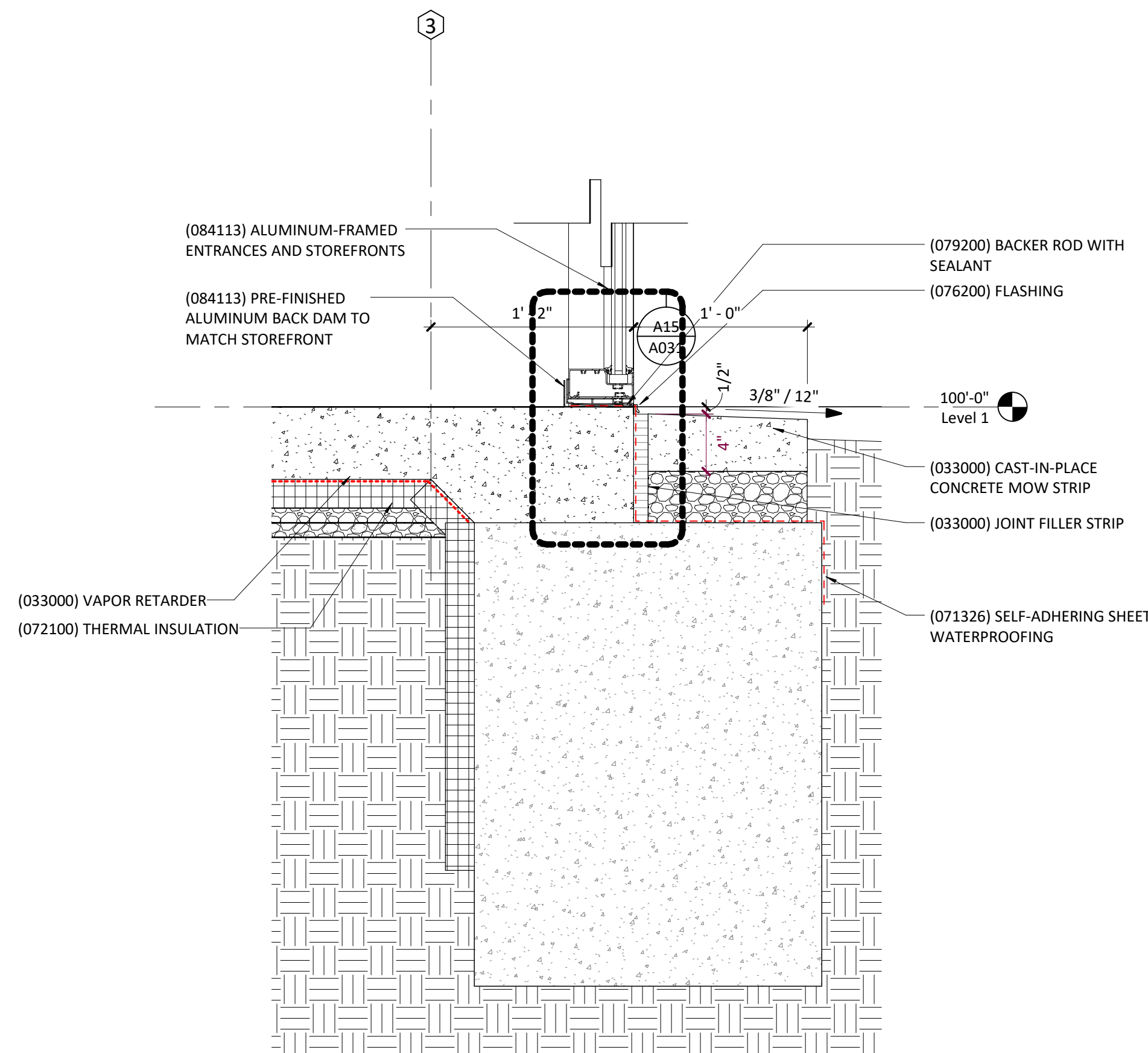
civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kvenr.com

structural engineer:
Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

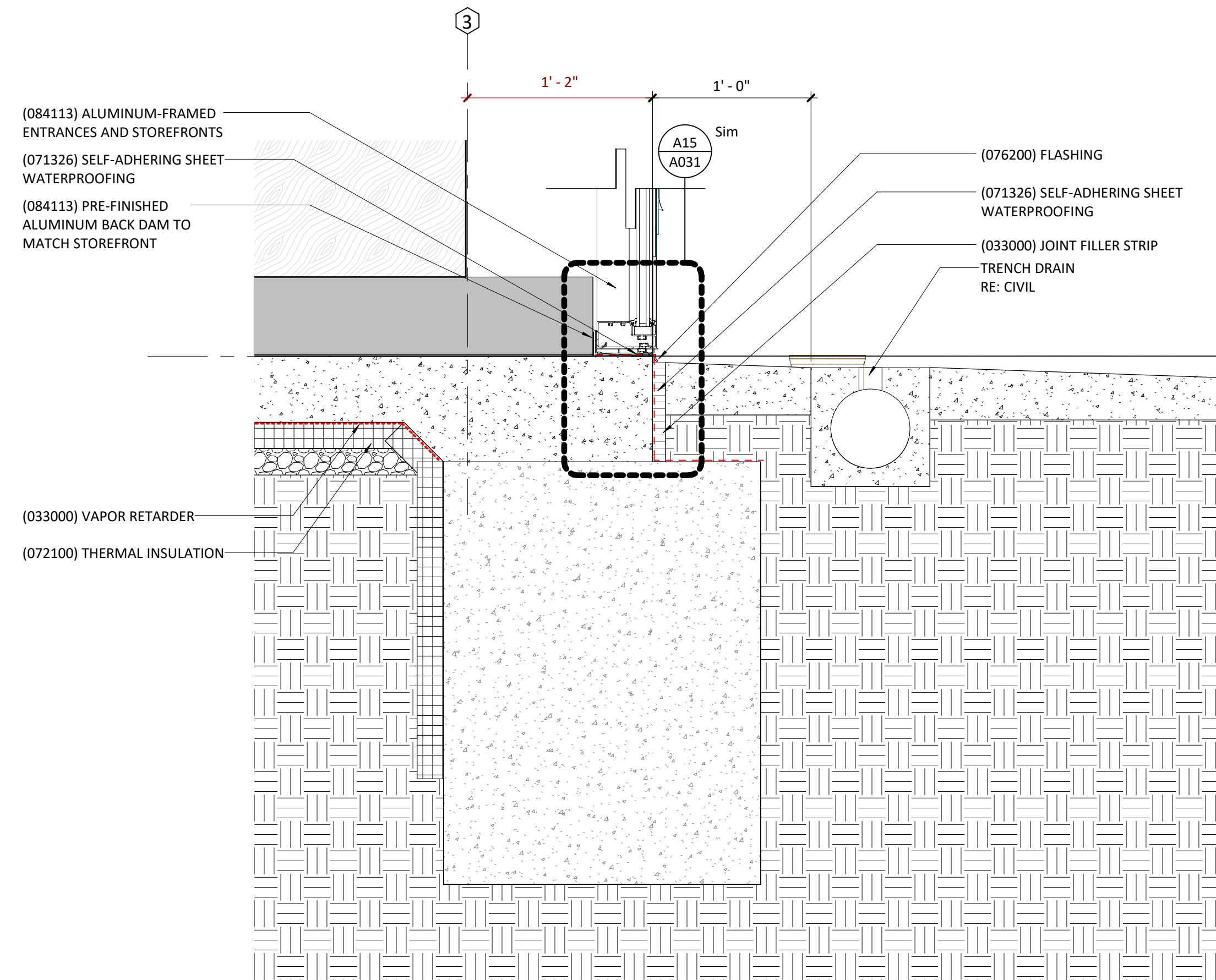
MEP/IT/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com



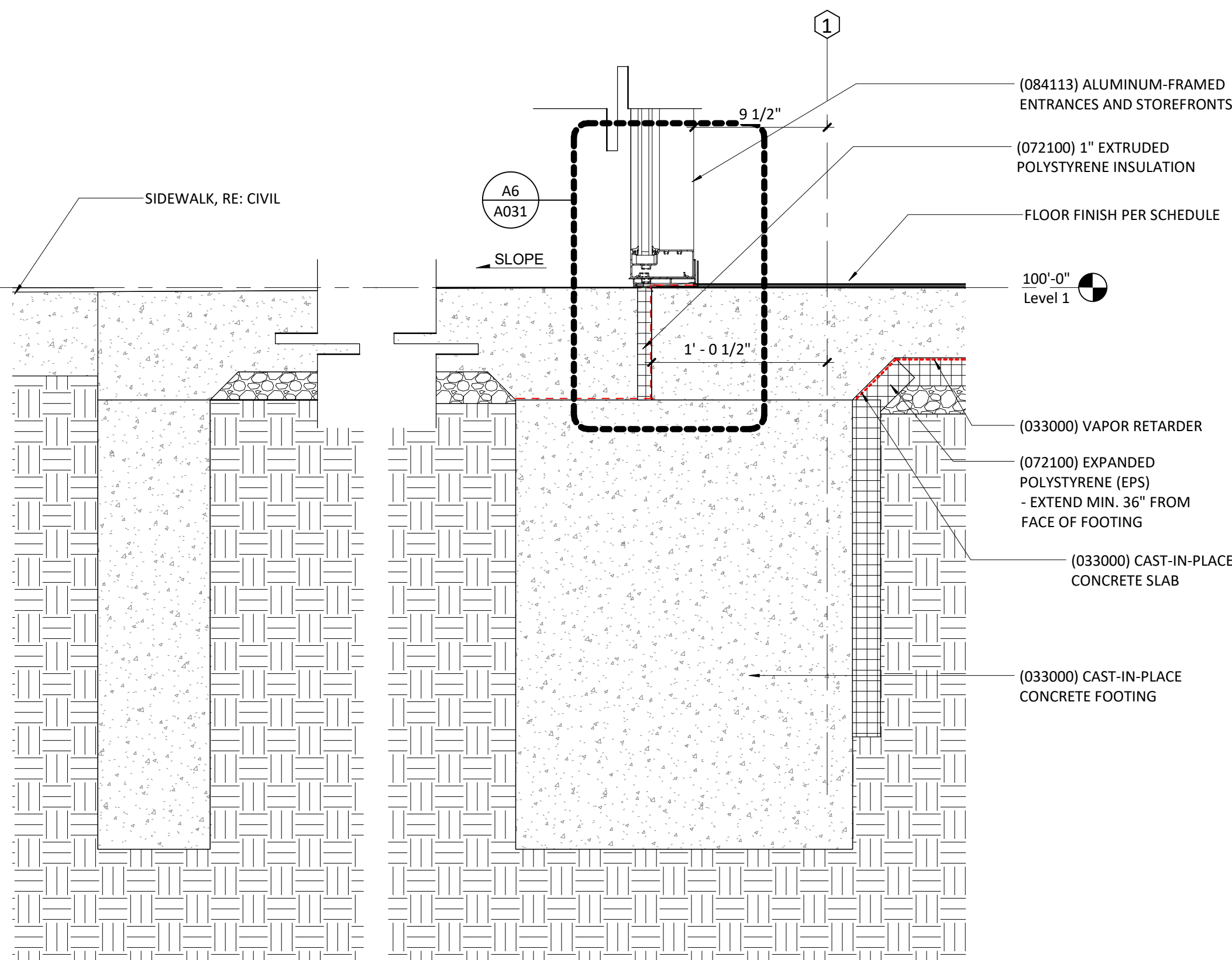
Foundation Detail @ Overhead Door F13
1 1/2" = 1'-0"



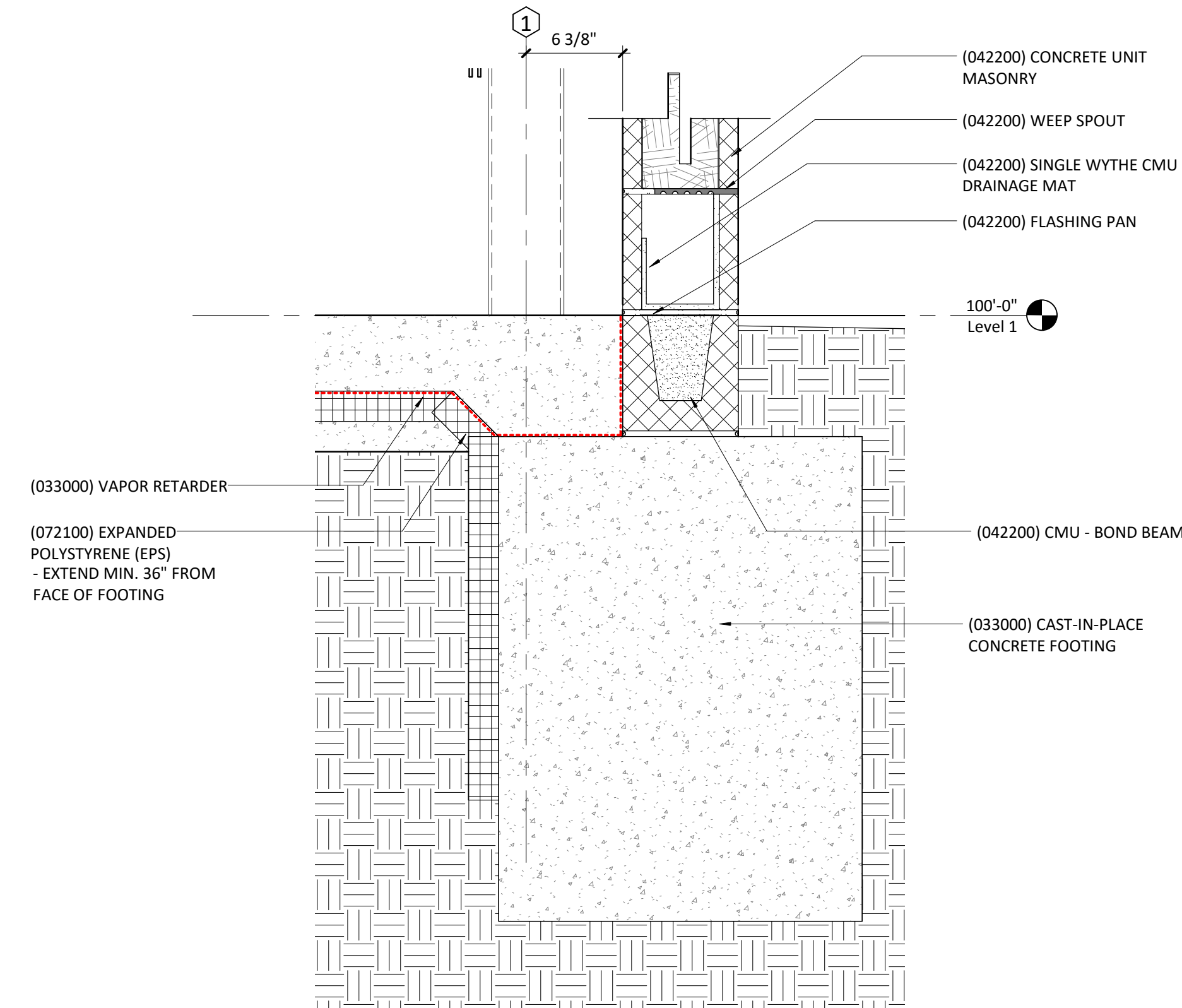
Foundation Detail @ Lee's Summit North F7
1 1/2" = 1'-0"



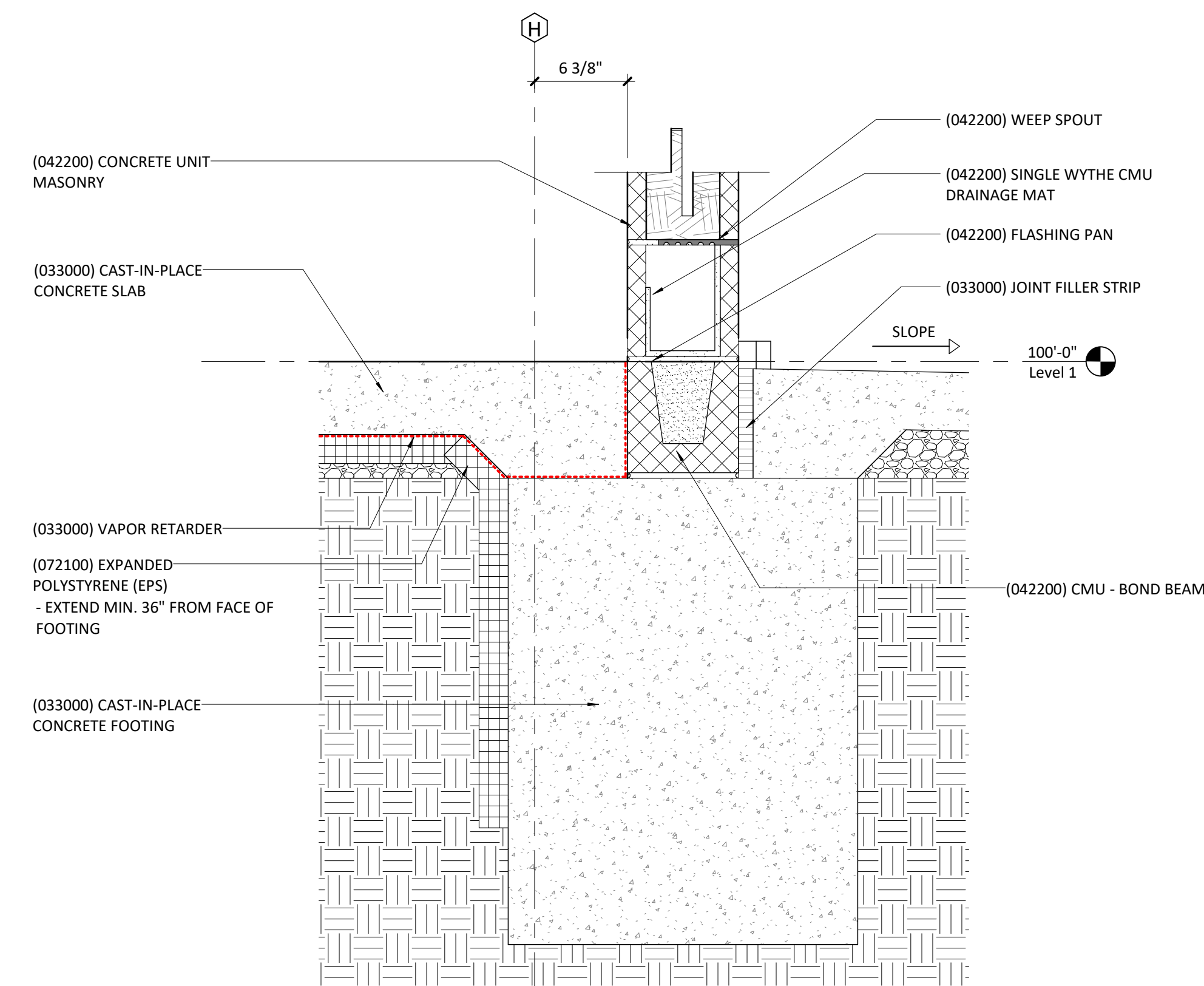
Foundation Detail @ Lee's Summit West F1
1 1/2" = 1'-0"



Foundation Detail @ Storefront Entry A13
1 1/2" = 1'-0"



Typical Foundation Detail @ Grade A7
1 1/2" = 1'-0"



Typical Foundation Detail @ Exterior Concrete A1
1 1/2" = 1'-0"

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Exterior Section Details
- Foundation

A320

LSR7 Robotics, GiC &
Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

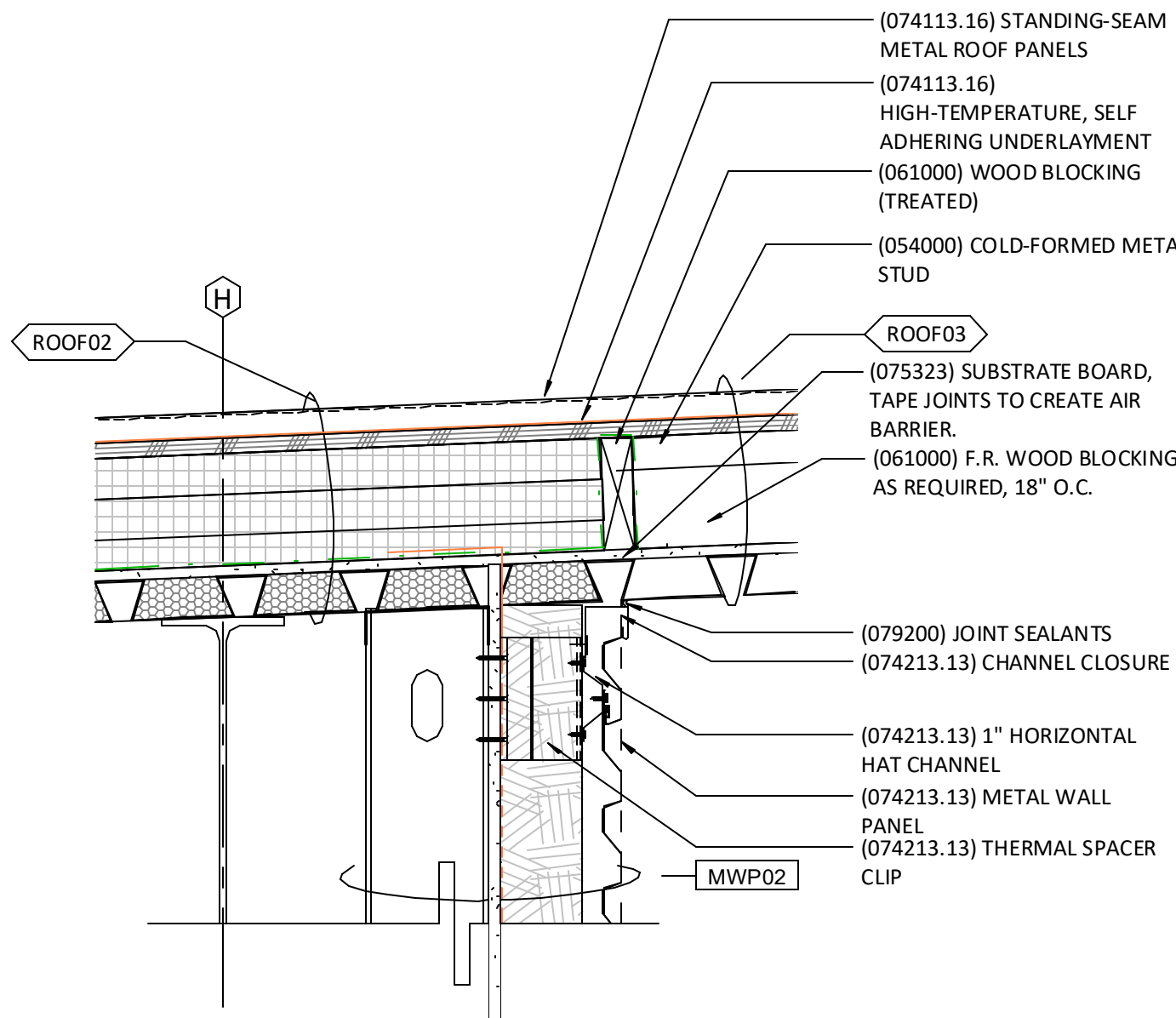
owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4300 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

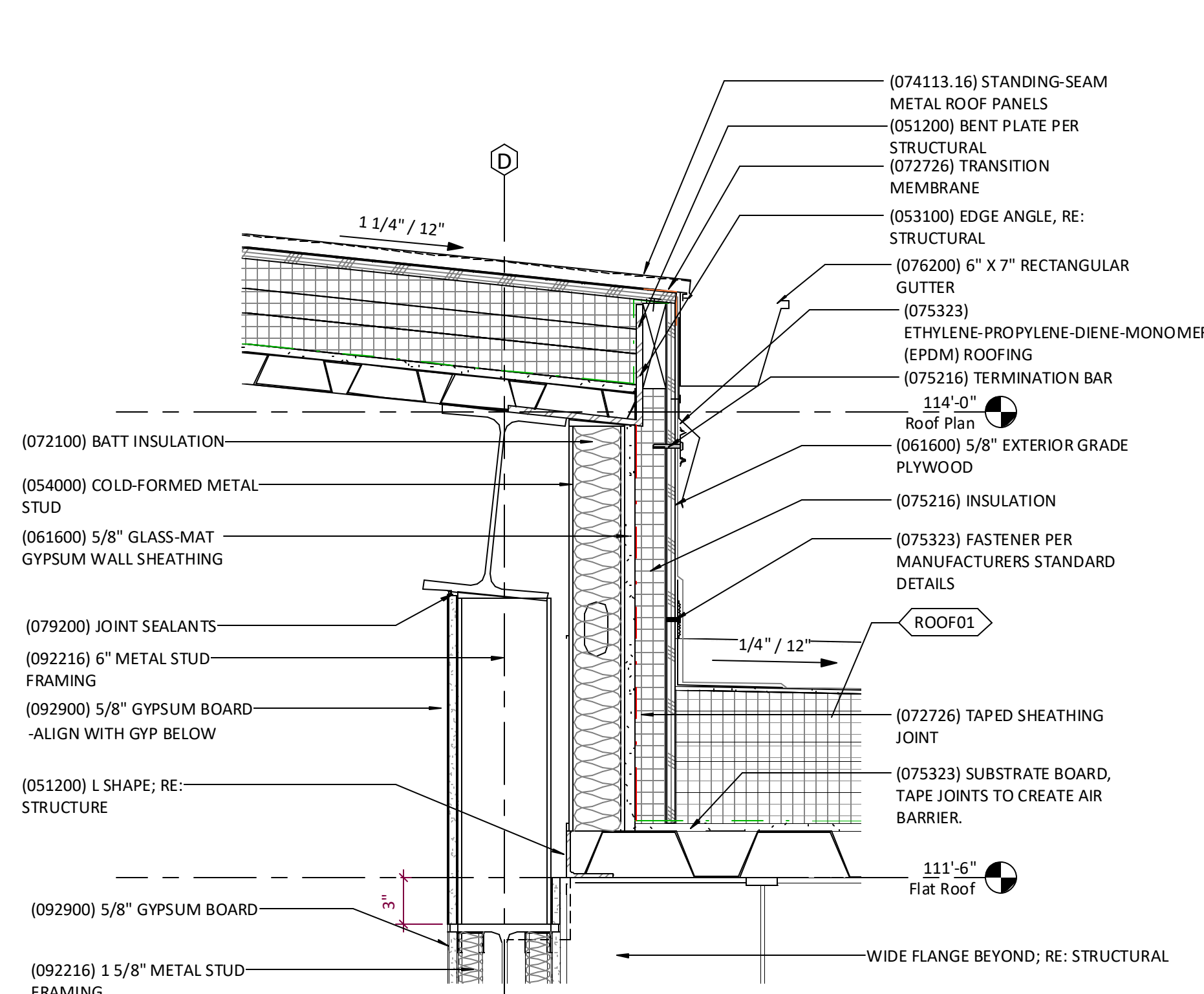
civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveg.com

structural engineer:
Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

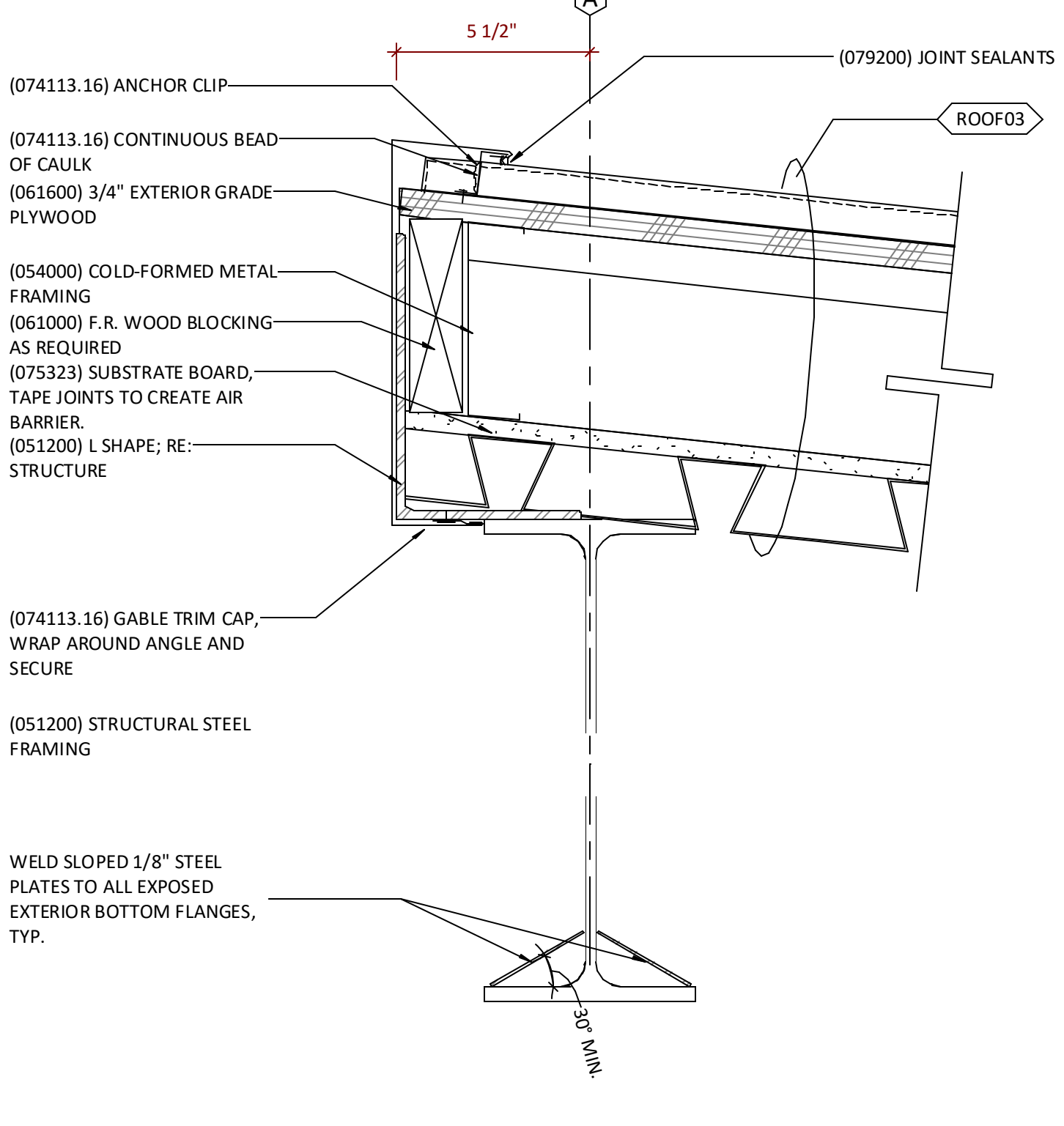
MEP/F/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com



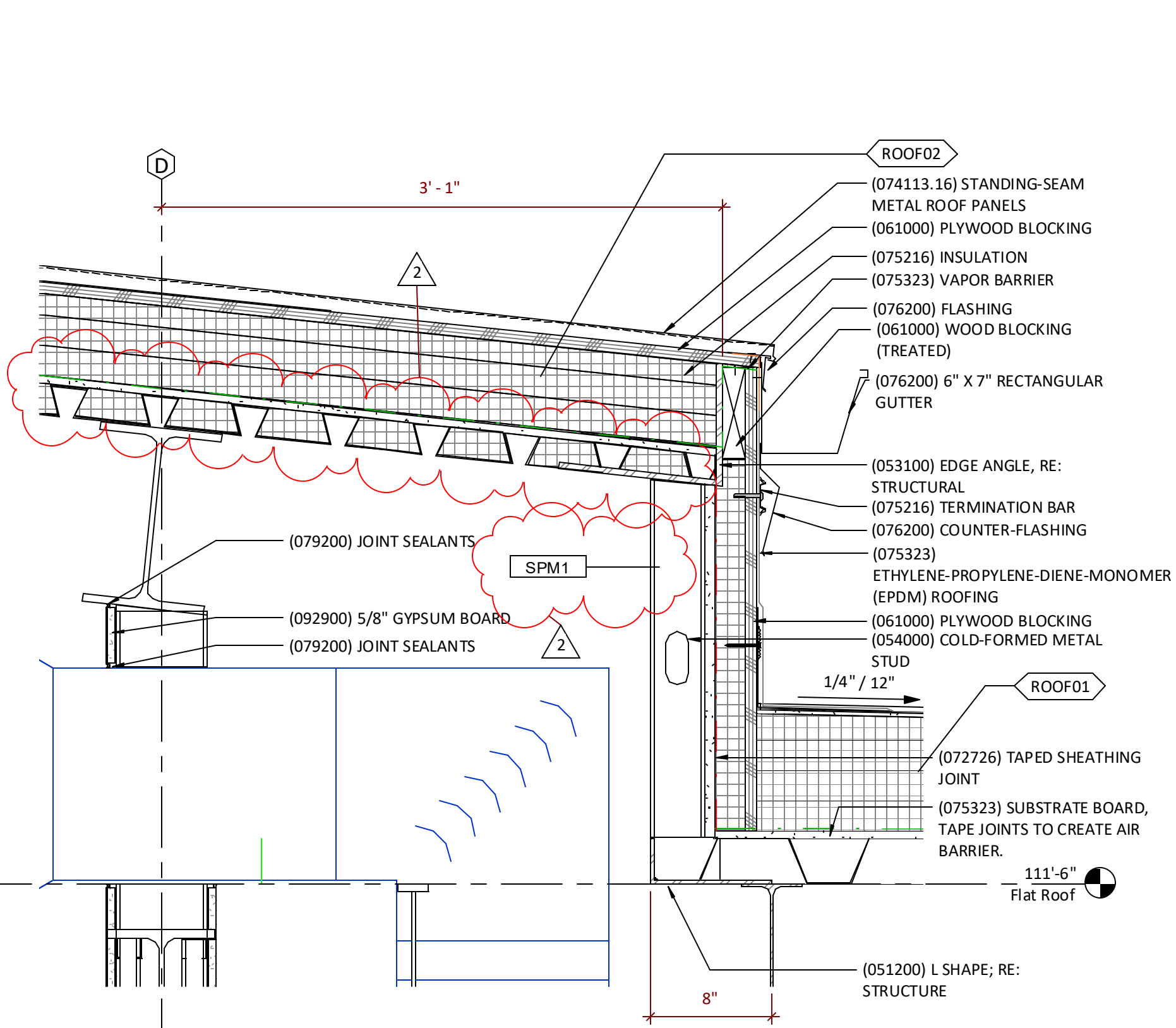
Section Detail @ Canopy Wall K1
1 1/2" = 1'-0"



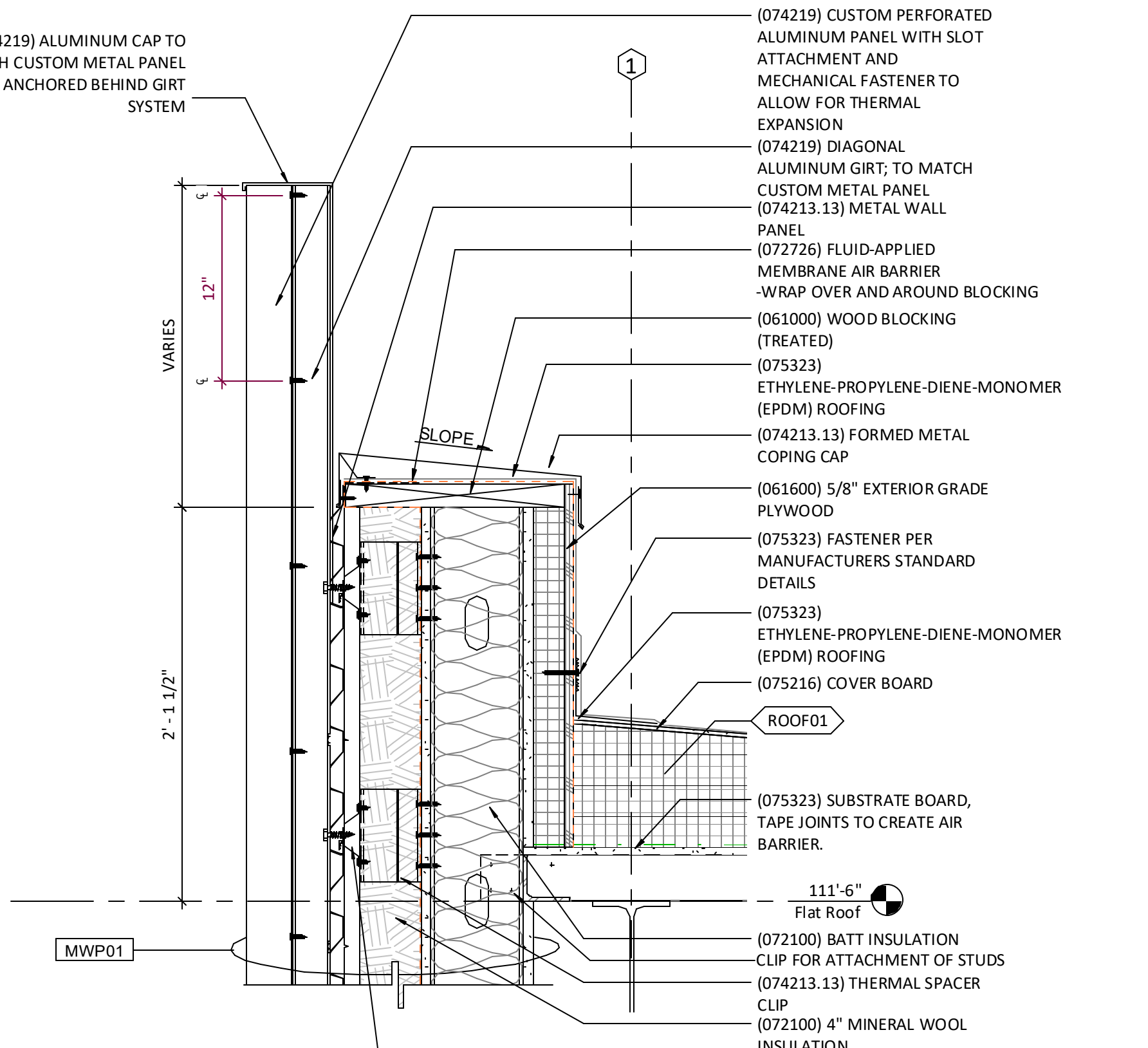
Section Detail @ Lower Roof West Transition K14
1 1/2" = 1'-0"



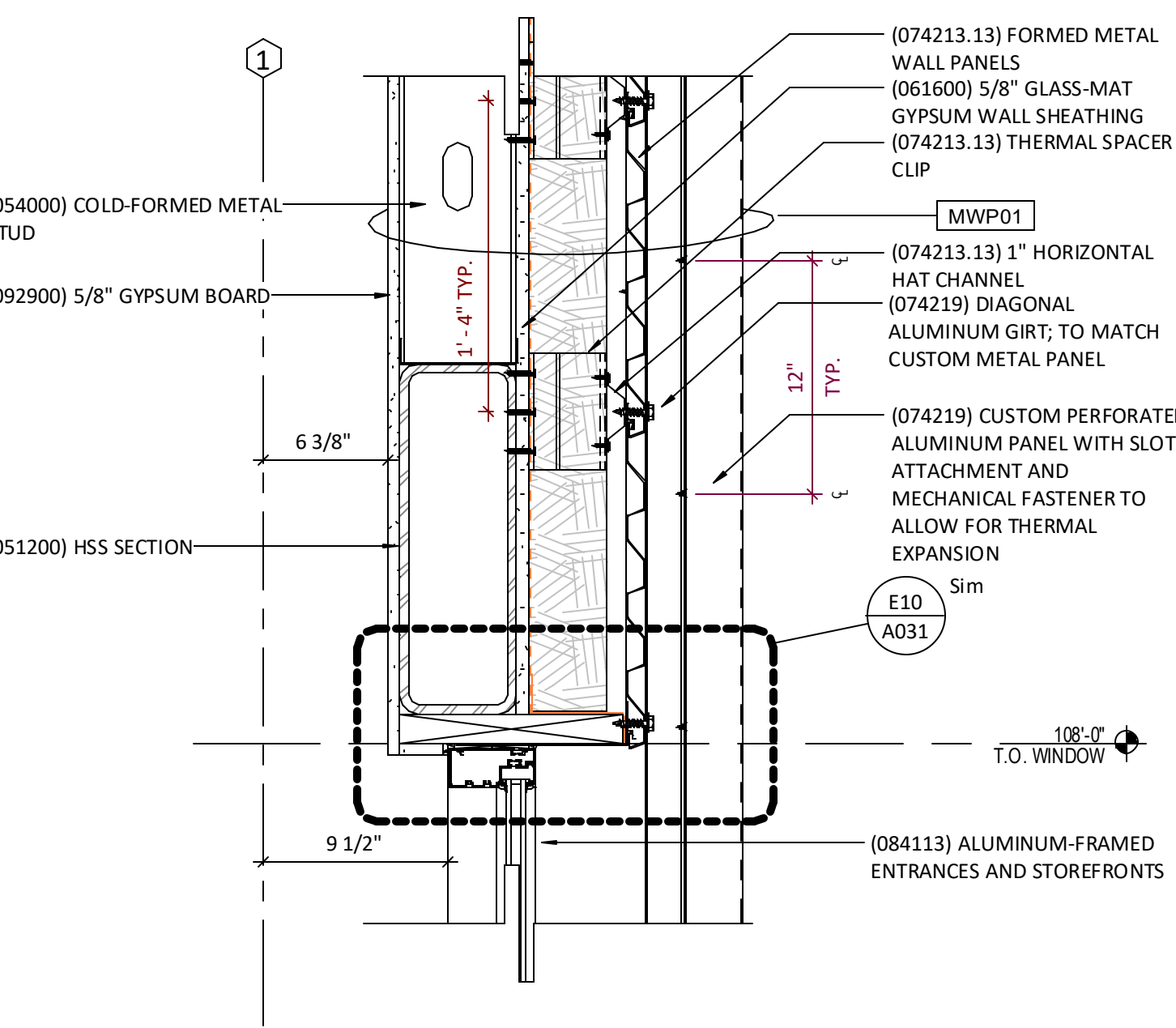
Section Detail @ Rake K5
3" = 1'-0"



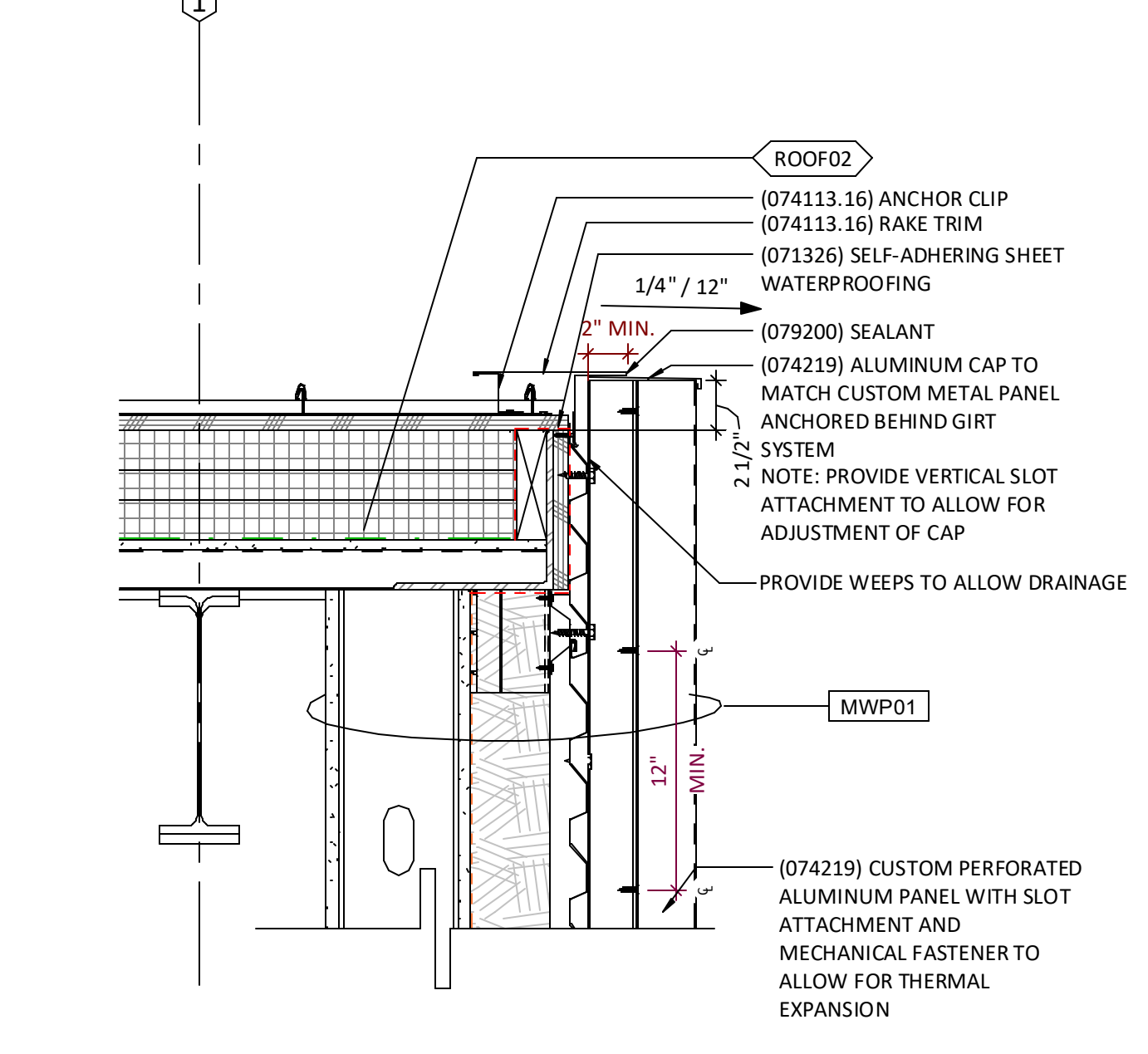
Section Detail @ Lower Roof Duct East Chase E14 Transitions
1 1/2" = 1'-0"



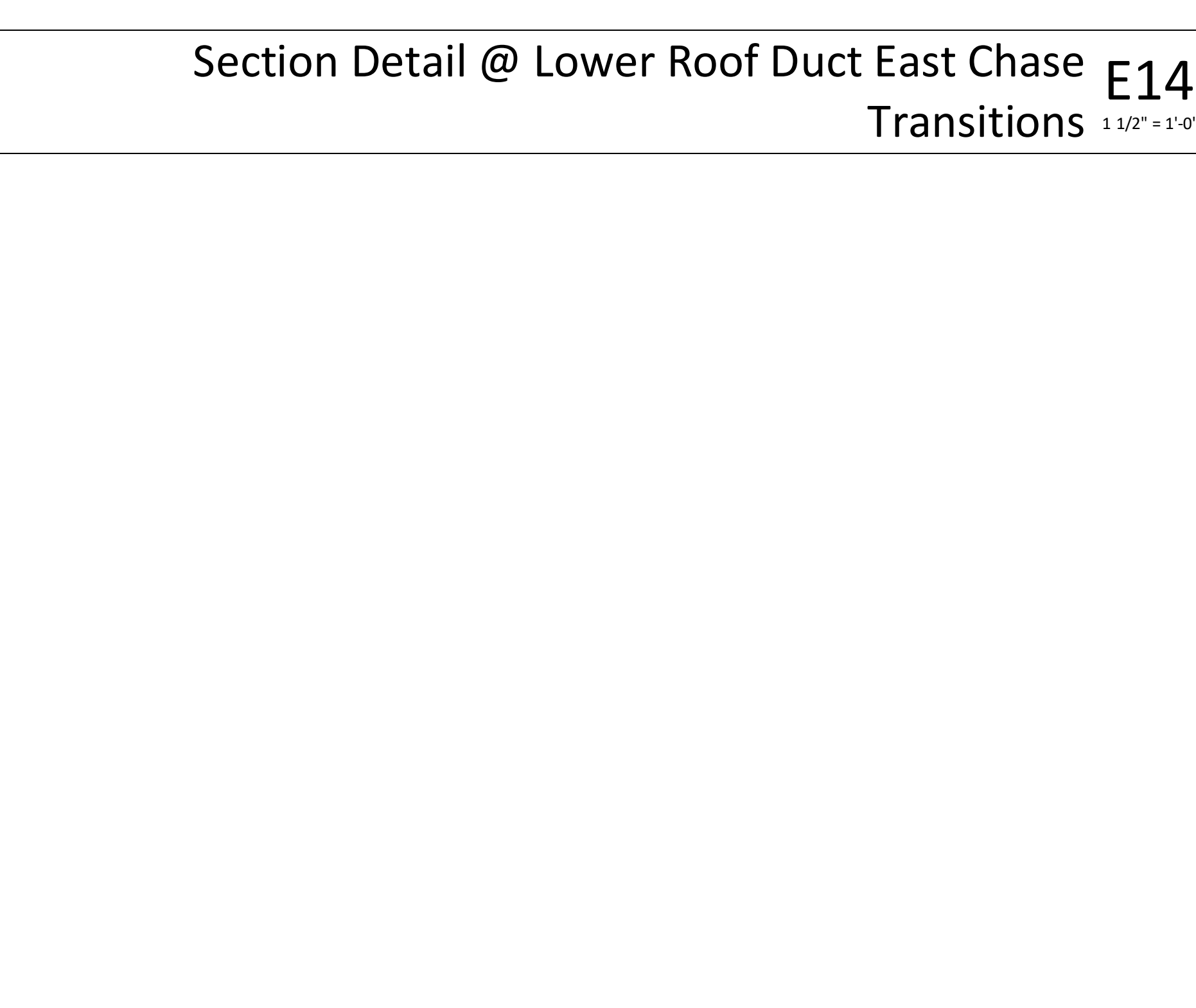
Section Detail @ Lower Roof East Transition A14
1 1/2" = 1'-0"



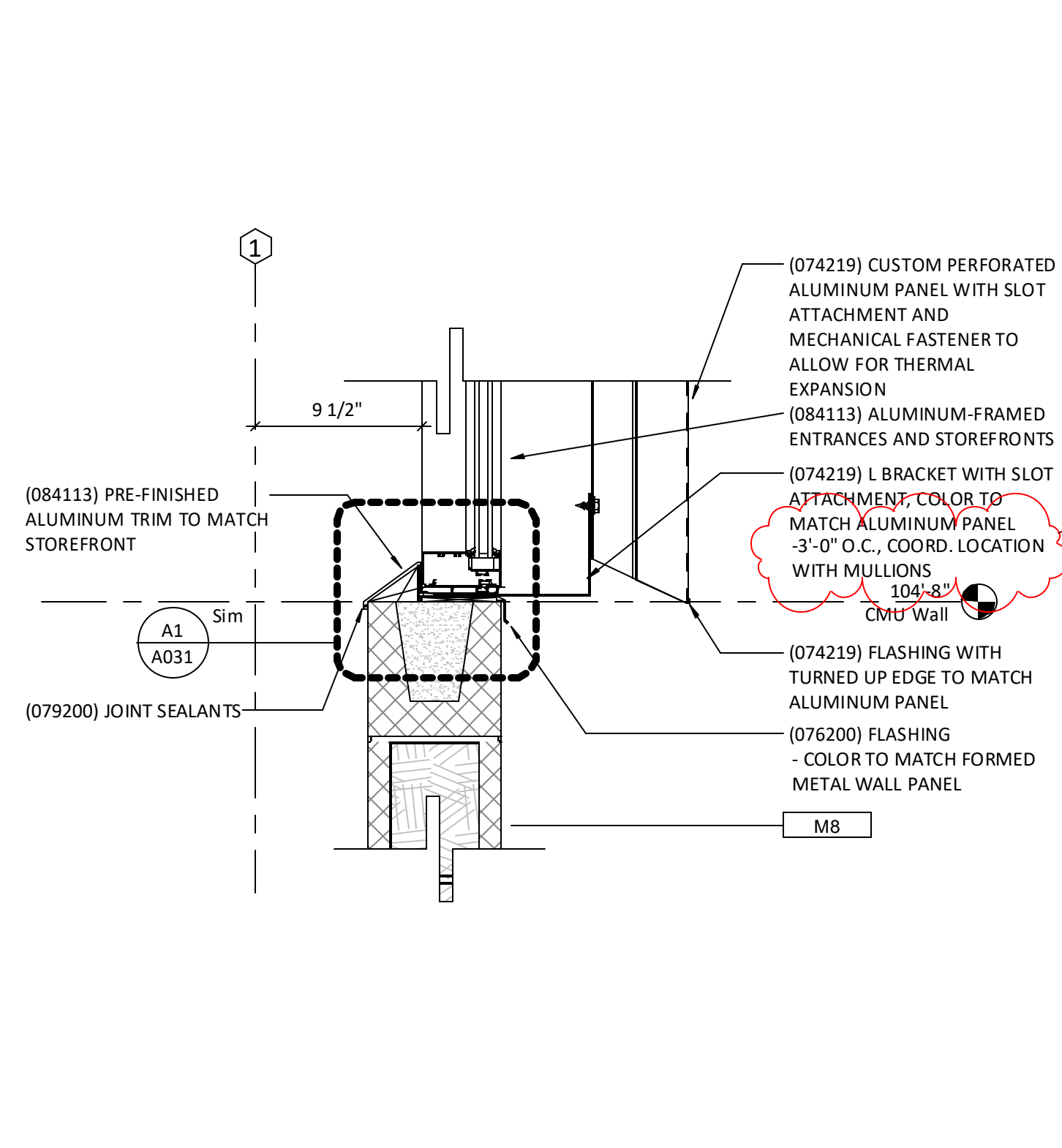
Section Detail @ T.O. Window behind Metal Panel F5
1 1/2" = 1'-0"



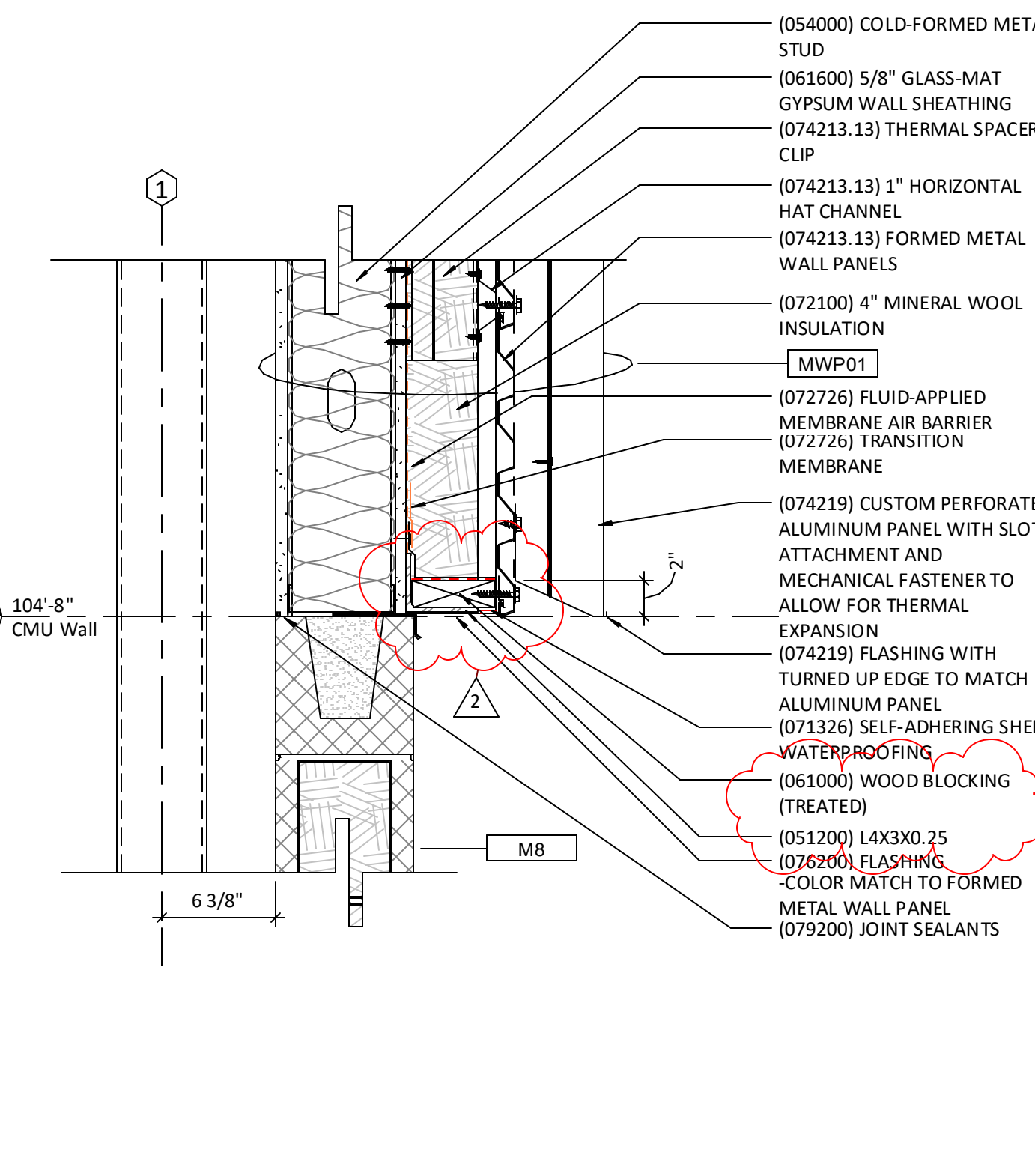
Section Detail @ T.O. Metal Panel F1
1 1/2" = 1'-0"



Section Detail @ Entry Canopy A9
1 1/2" = 1'-0"



Section Detail @ B.O. Metal Panel A5 Window Overlay
1 1/2" = 1'-0"



Section Detail @ B.O. Metal Panel A1
1 1/2" = 1'-0"

Issue Date: September 9, 2022

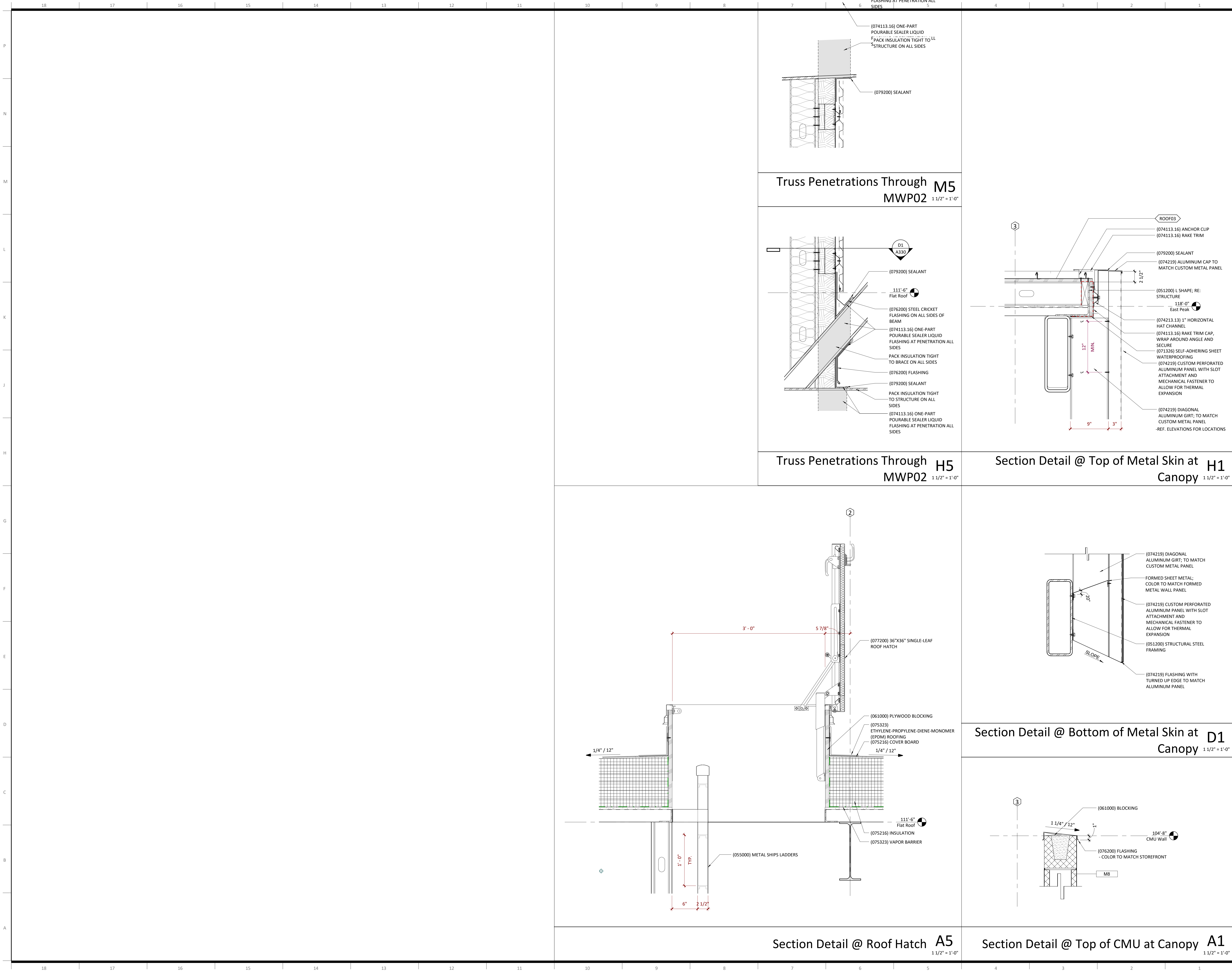
NUMBER	DESCRIPTION	DATE
2	Addendum 02	09/29/2022

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Exterior Section Details

A321



LSR7 Robotics, GiC & Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School 301 NE Tudor Road Lee's Summit, MO 64086 multi-studio	architect: Multistudio 4200 Pennsylvania Kansas City, MO 64111 816.931.6655 multi-studio
civil engineer: Kaw Valley Engineering 14700 West 114th Terrace Lenexa, KS 66215 913.485.0318 kveng.com	structural engineer: Bob D. Campbell & 4338 Bellevue Kansas City, MO 64111 816.531.4144 www.bdc-engrs.com

MEP/T/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions

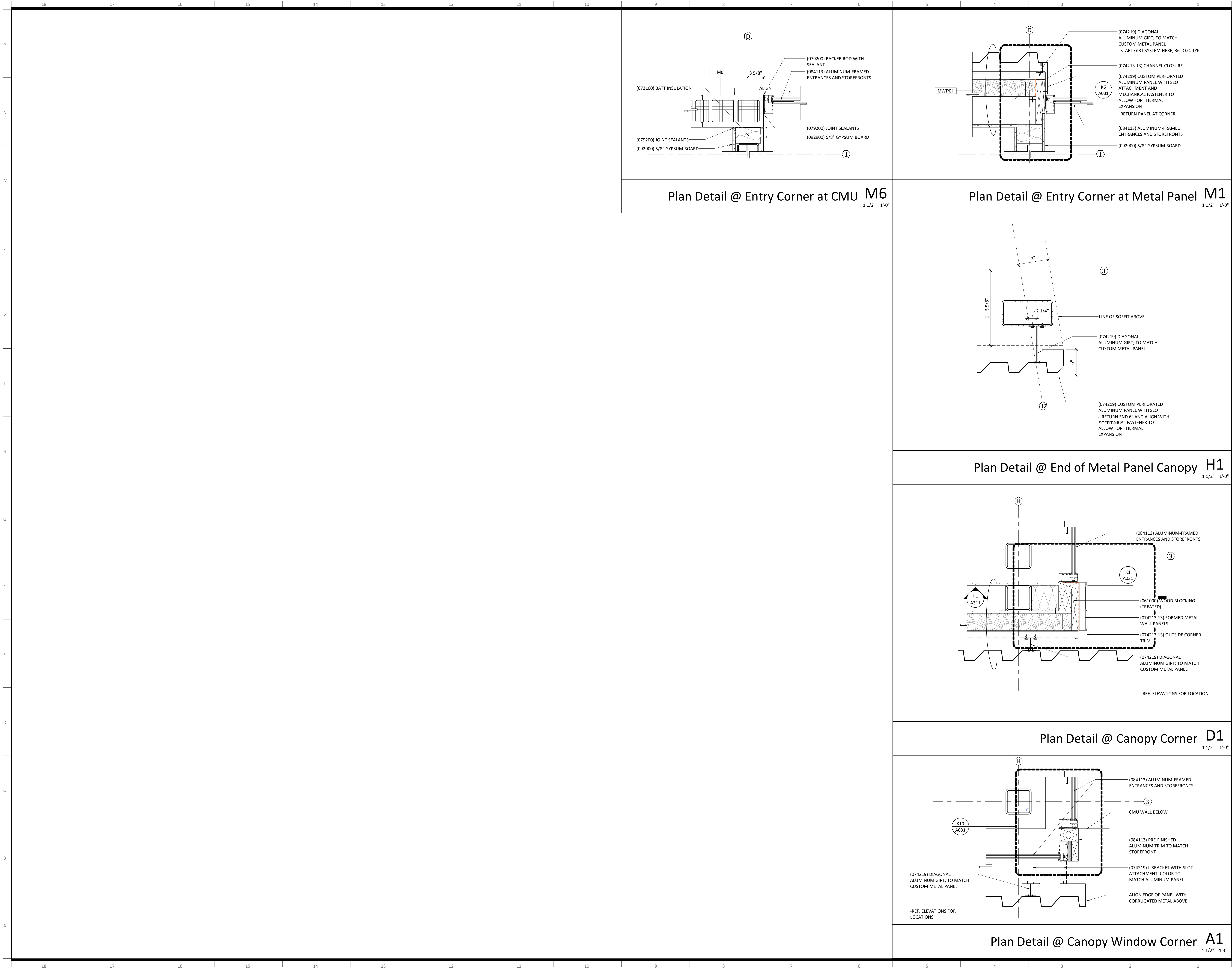
NUMBER	DESCRIPTION	DATE
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Exterior Section Details

A322



LSR7 Robotics, GiC & Phys Education

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LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086
architect: Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi.studio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com
structural engineer: Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

MEP/IT/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions		
NUMBER	DESCRIPTION	DATE

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Exterior Plan & Section Details

A330

LSR7 Robotics, GiC &
Phys Education

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64086
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64082
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owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi.studio

civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kvang.com

structural engineer:
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Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions		
NUMBER	DESCRIPTION	DATE

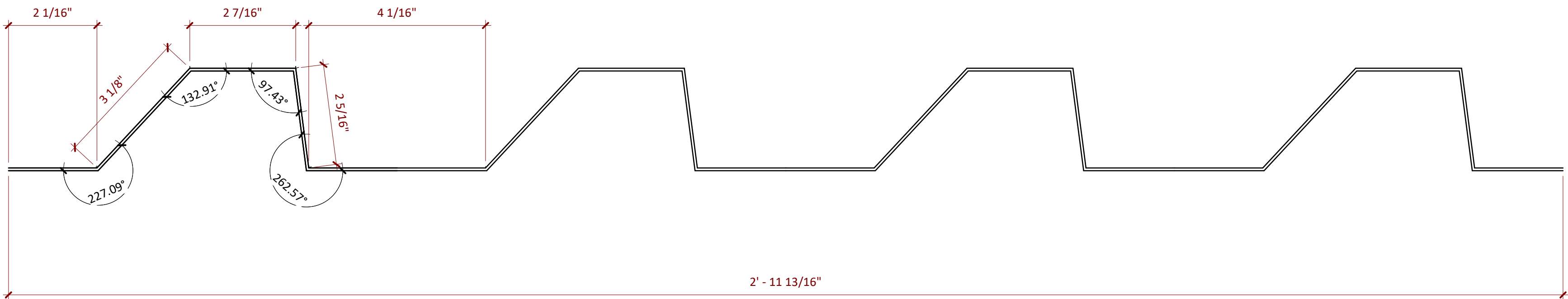
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Exterior Envelope
Section & Details

A331

Axon Detail @ Typical Skin Panel E1
1 1/2" = 1'-0"

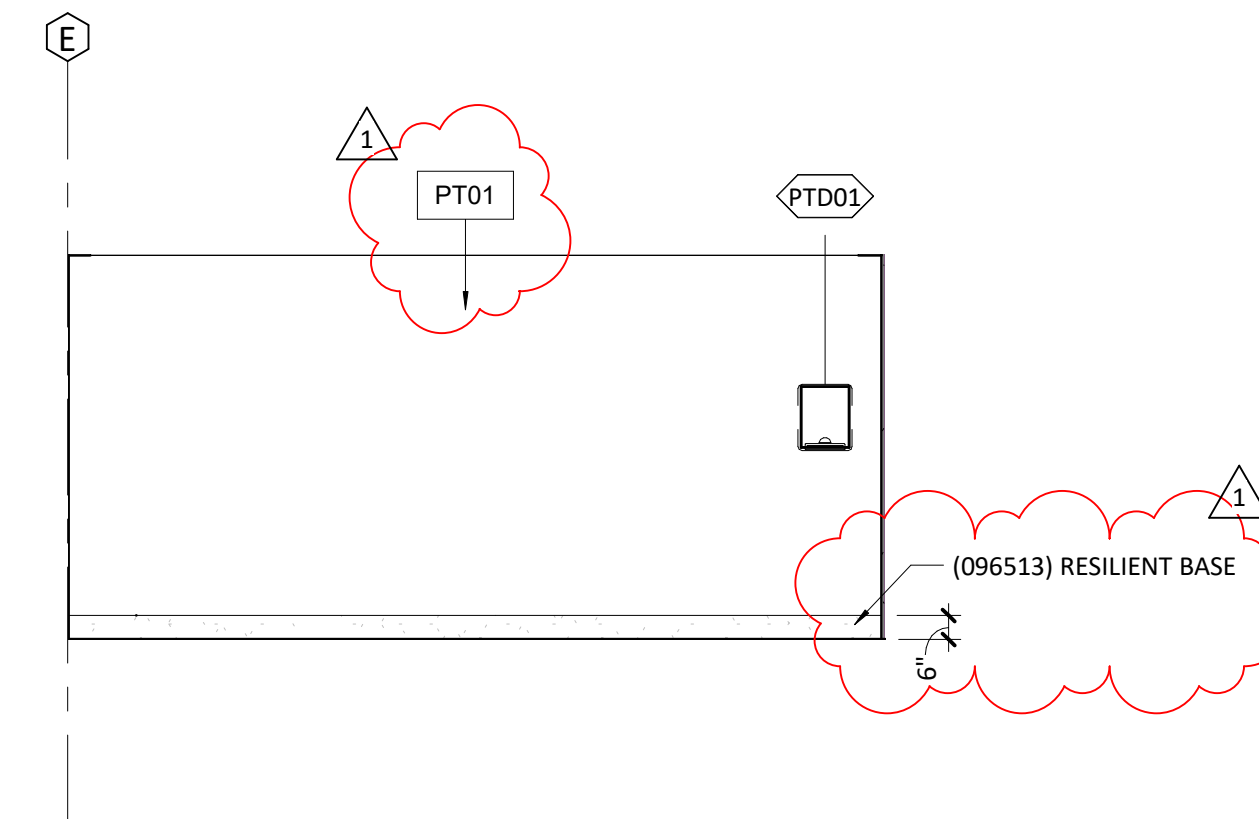


Plan Detail @ Typical Perforation Pattern Prior To Break Forming A12
1 1/2" = 1'-0"

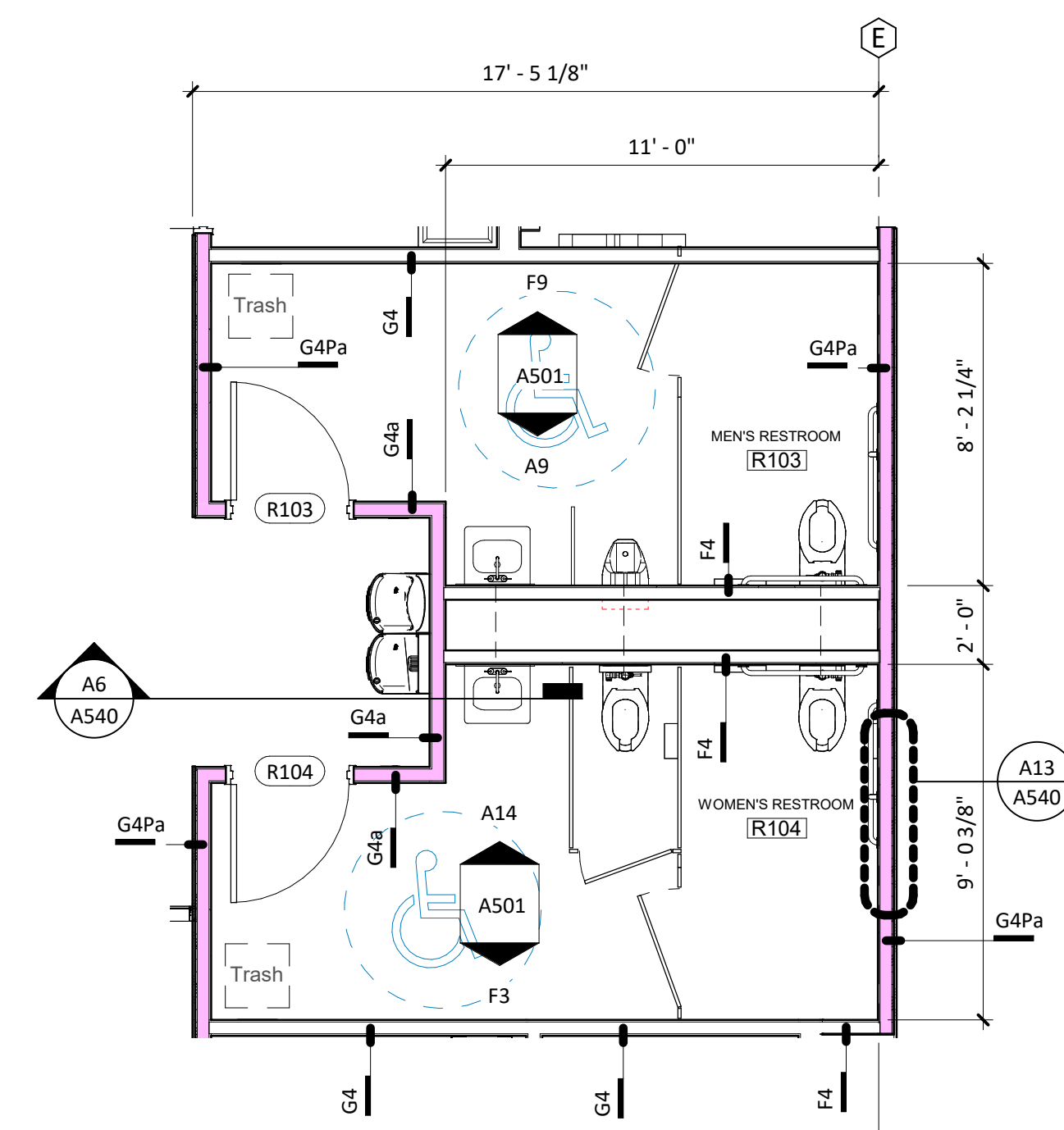
Section Detail @ Typical Skin Panel A1
6" = 1'-0"

1. REFER TO FINISH LEGEND/SCHEDULE FOR COMPLETE LISTING OF FINISHES
2. REFER TO PROJECT STANDARDS FOR INSTALLATION INFORMATION FOR ACCESSORIES, TOILET FIXTURES, ETC.
3. REFER TO PROJECT STANDARDS FOR DEVICES FOR TYPICAL INSTALLATION INFORMATION.
4. AT GYP SOFFIT CONTROL JOINTS, CONTINUE CONTROL JOINT UP BOTH VERTICAL FACES OF SOFFIT.

LSN/LSW Women's Restroom - Interior Elevation 2 **F3**
1/4" = 1'-0"



LSN / LSW - Enlarged Restroom Plan **A3**
1/4" = 1'-0"



Seal of the State of Missouri, Registered Architect, Adam Lee Sterns, Number A-7450.

A501

LSR7 Robotics, GiC &
Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086
multi-studio

architect:
Multistudio
4205 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi-studio

civil engineer:
Kaw Valley Engineering
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Lenexa, KS 66215
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Lenexa, KS 66314
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Issue Date: September 9, 2022

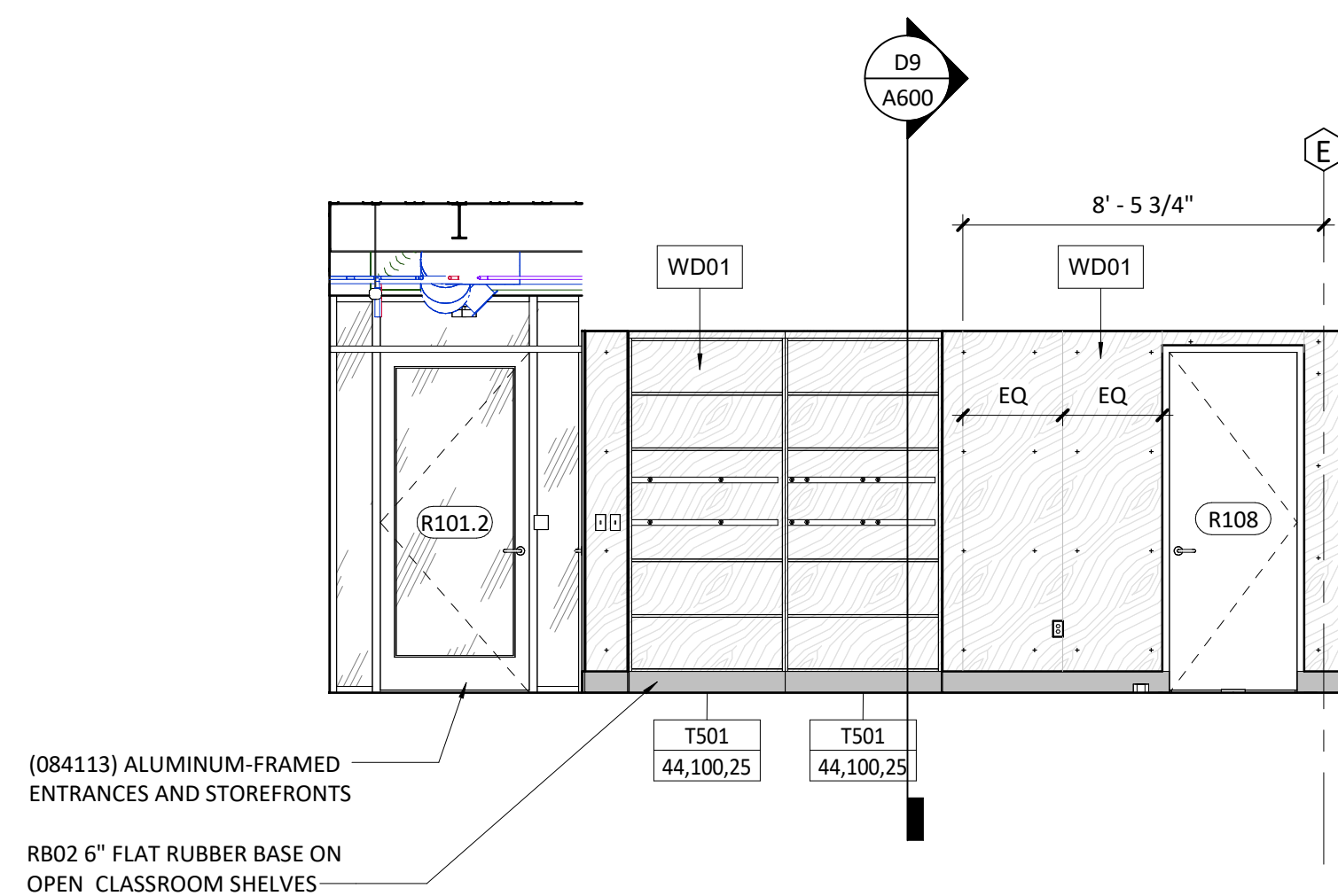
Revisions		
NUMBER	DESCRIPTION	DATE

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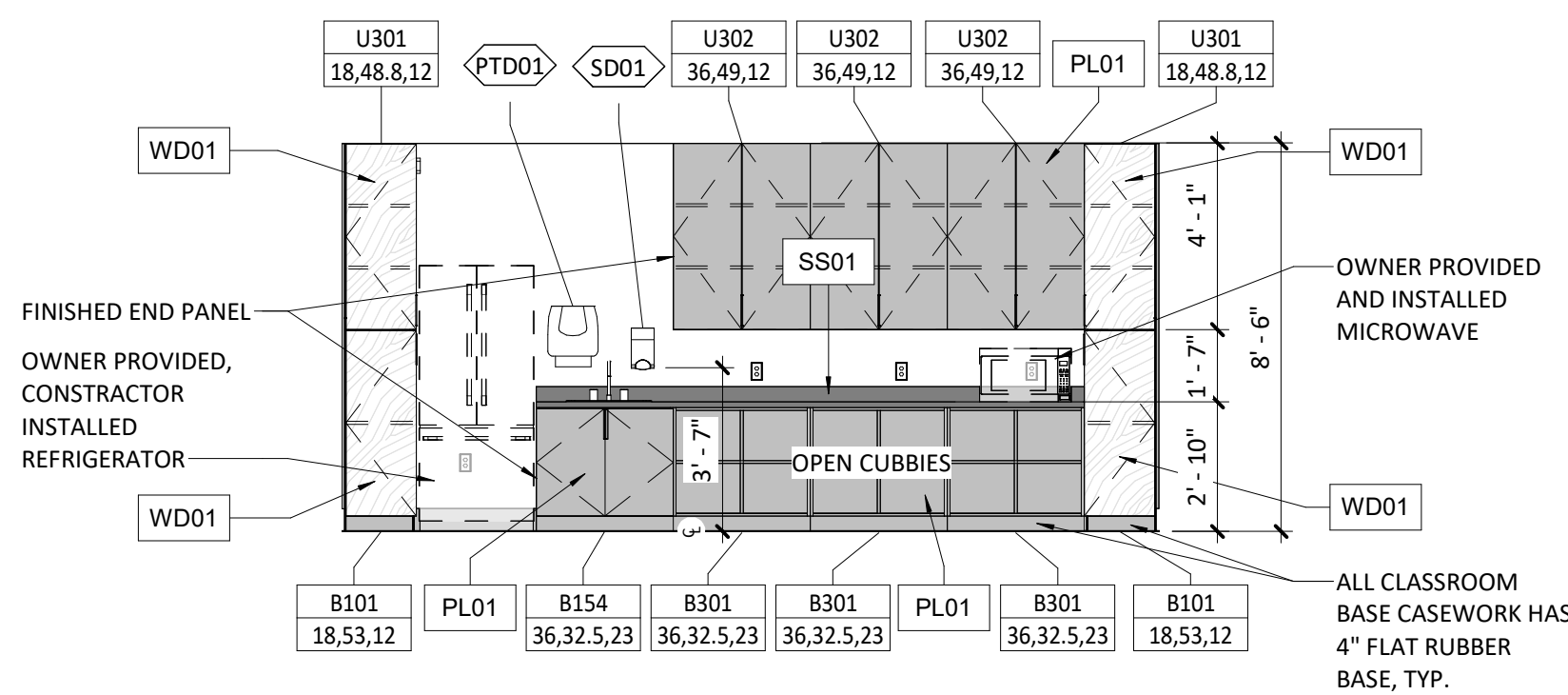


Enlarged Classroom
Plans & Elevations

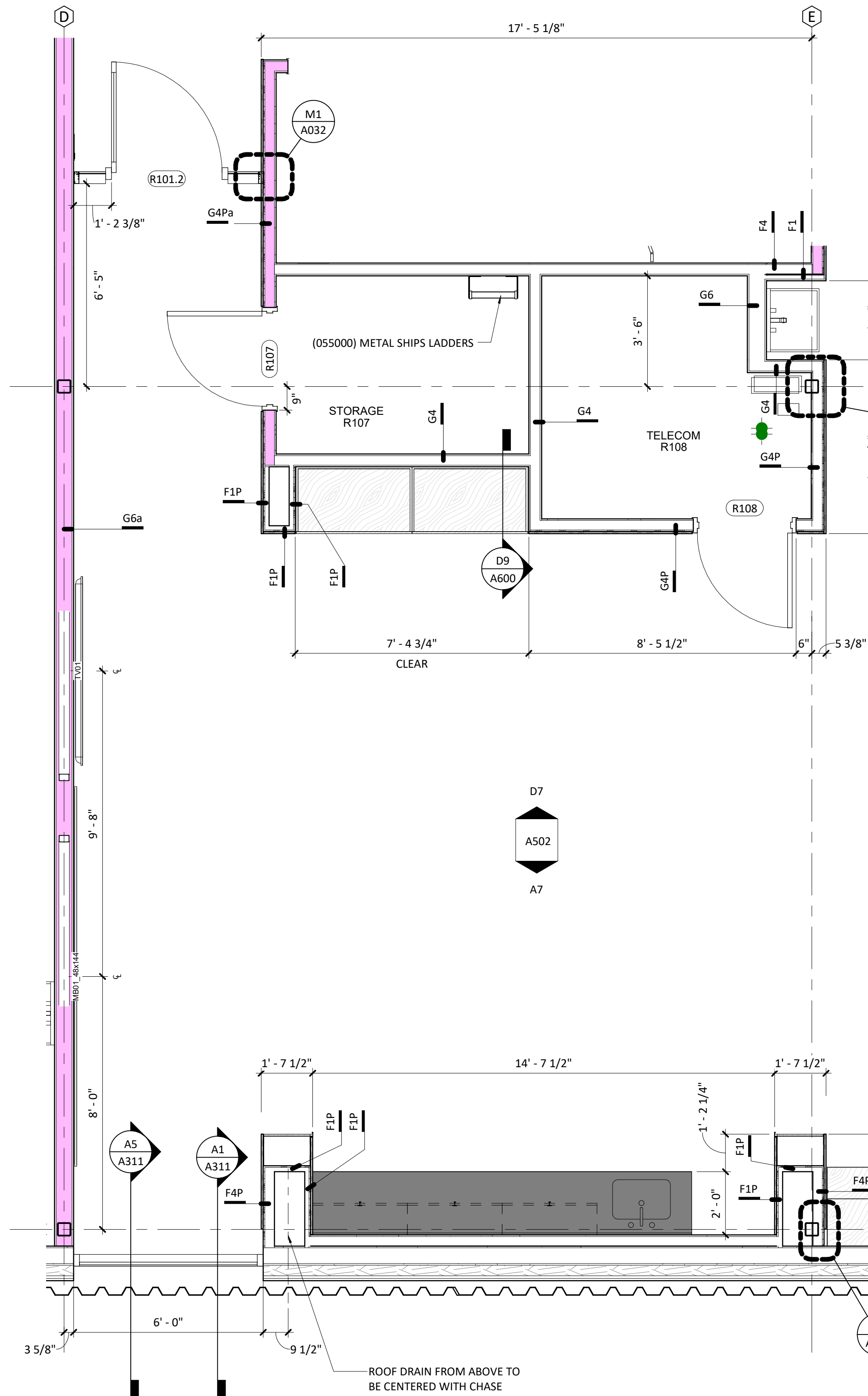
A502

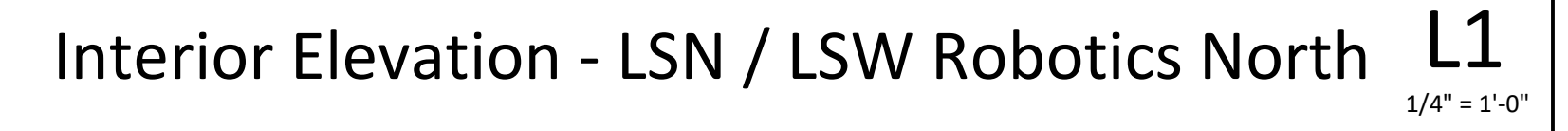


Elevation - Classroom D7
1/4" = 1'-0"



Elevation - Classroom - South A7
1/4" = 1'-0"





LSR7 Robotics, GiC &
Phys Education

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64086
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64082
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Lee's Summit, MO 64086
multi-studio

architect:
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civil engineer:
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Lenexa, KS 66215
913.485.0318
kveng.com

structural engineer:
Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

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300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Issue Date: September 9, 2022

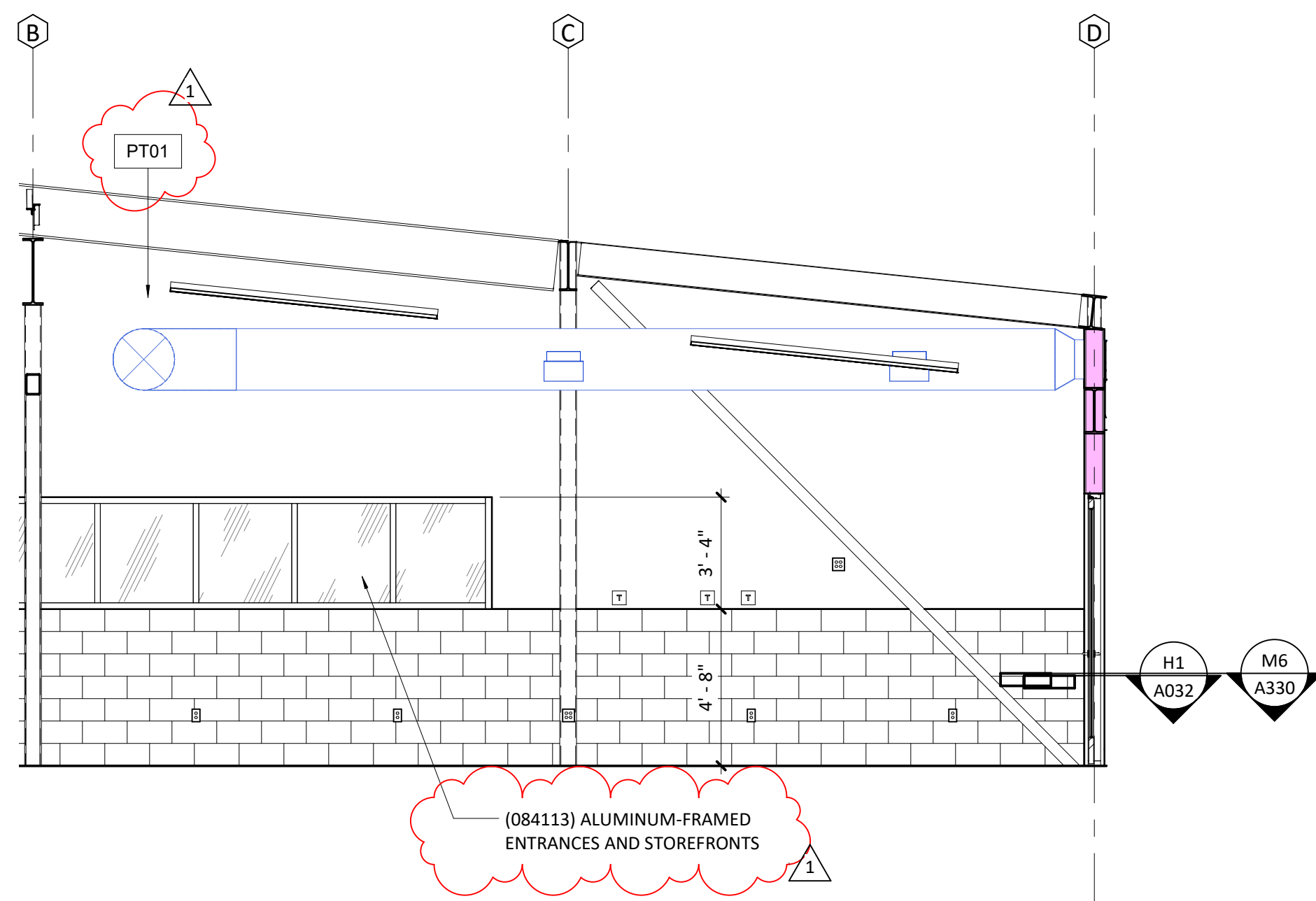
Revisions		
NUMBER	DESCRIPTION	DATE
1	Addendum 01	09/19/2022

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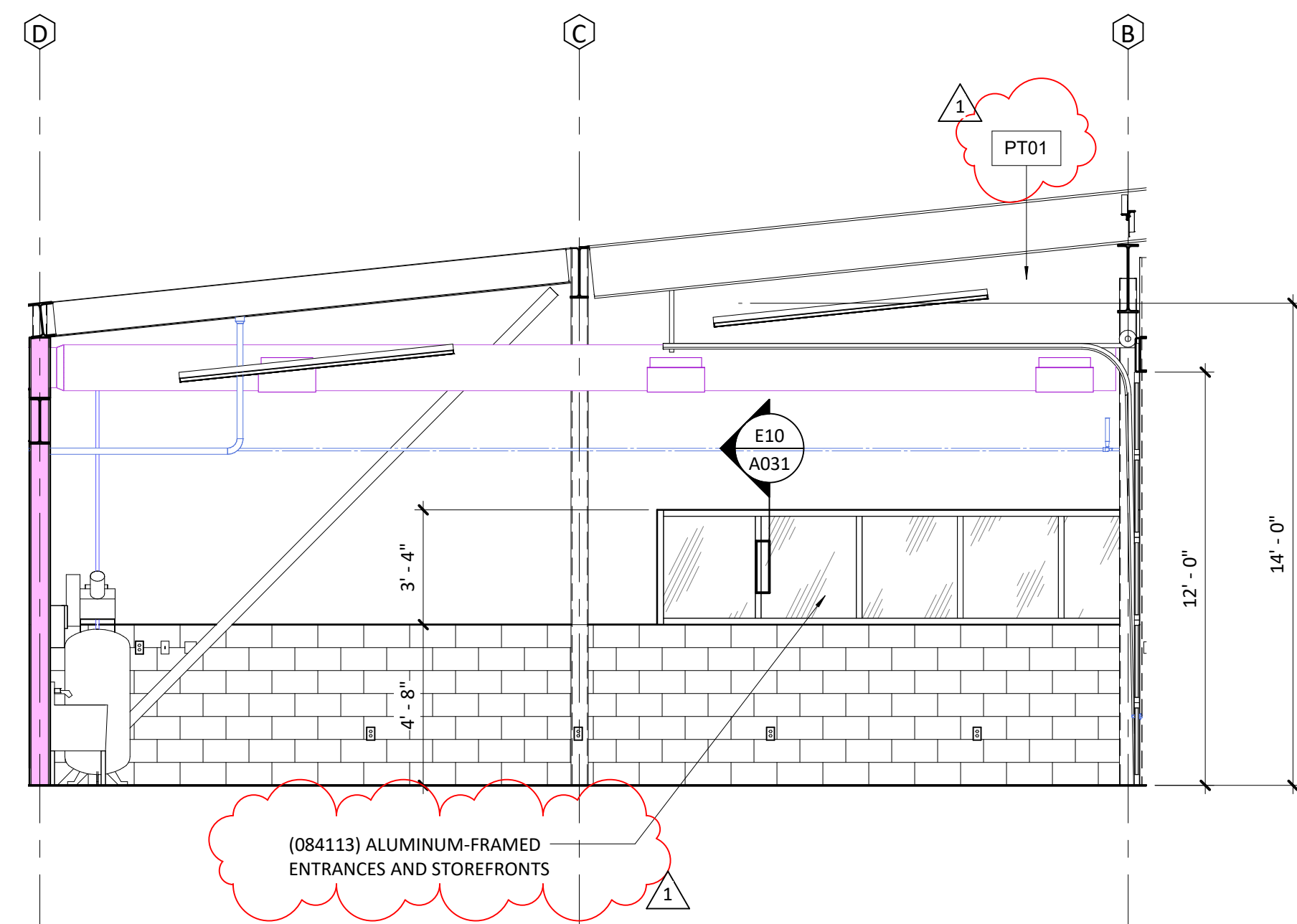


Interior Elevations

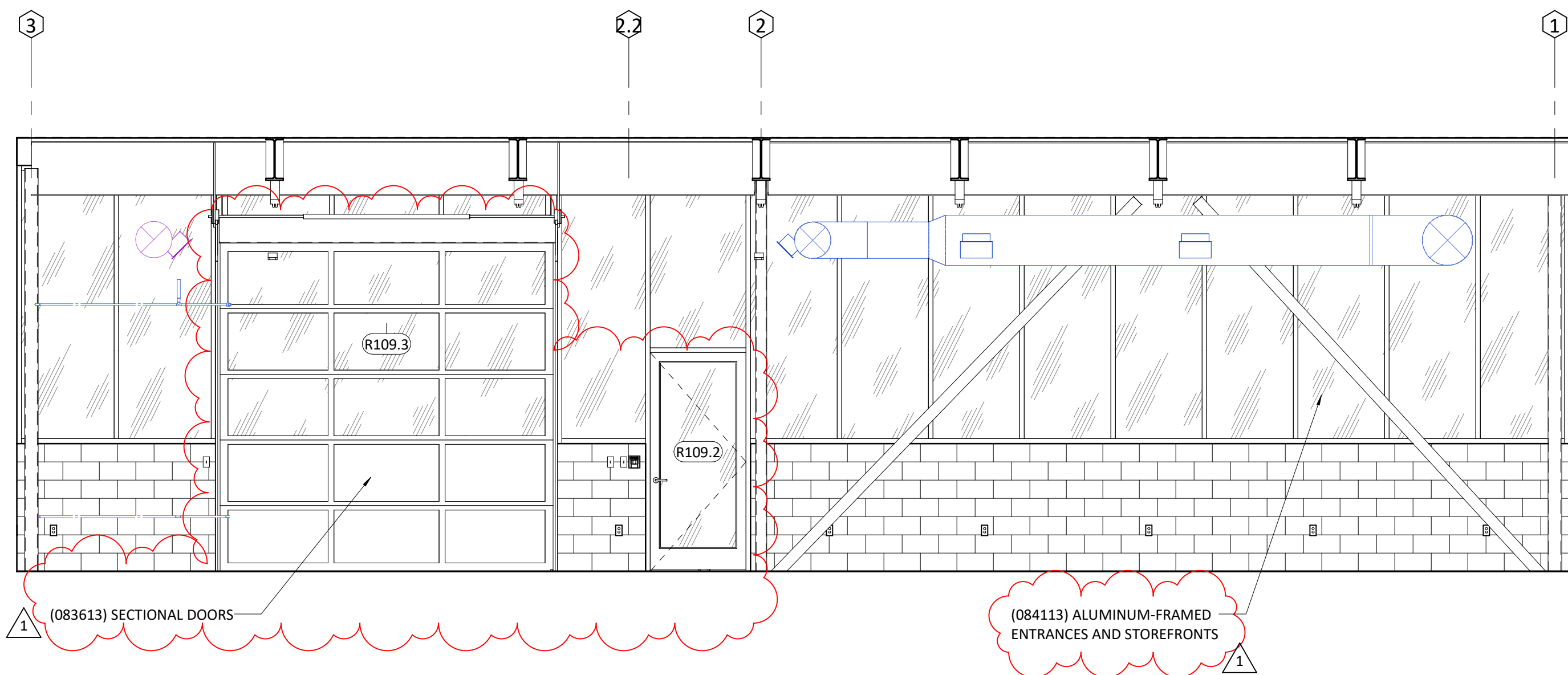
A504



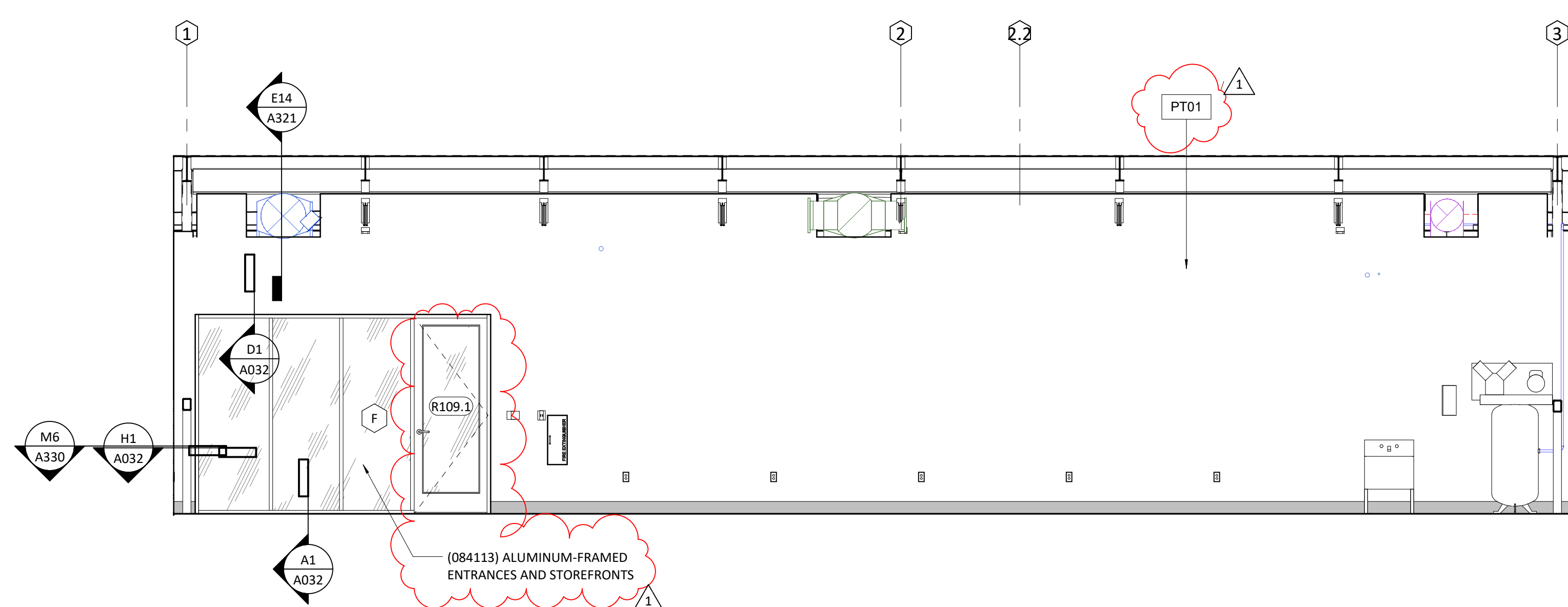
Interior Elevation - LSN / LSW GiC North E10
1/4" = 1'-0"



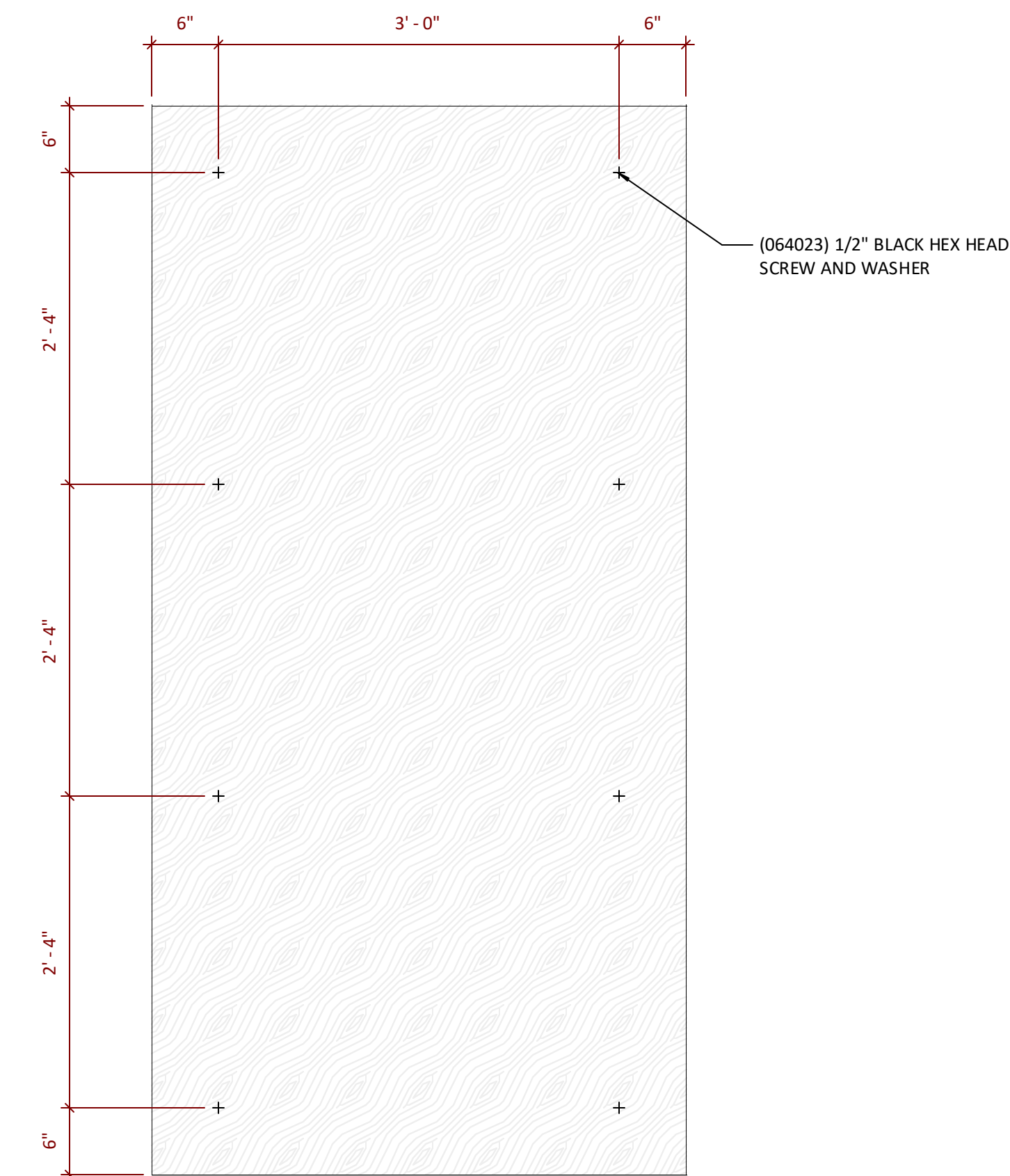
Interior Elevation - LSN / LSW GiC South E1
1/4" = 1'-0"



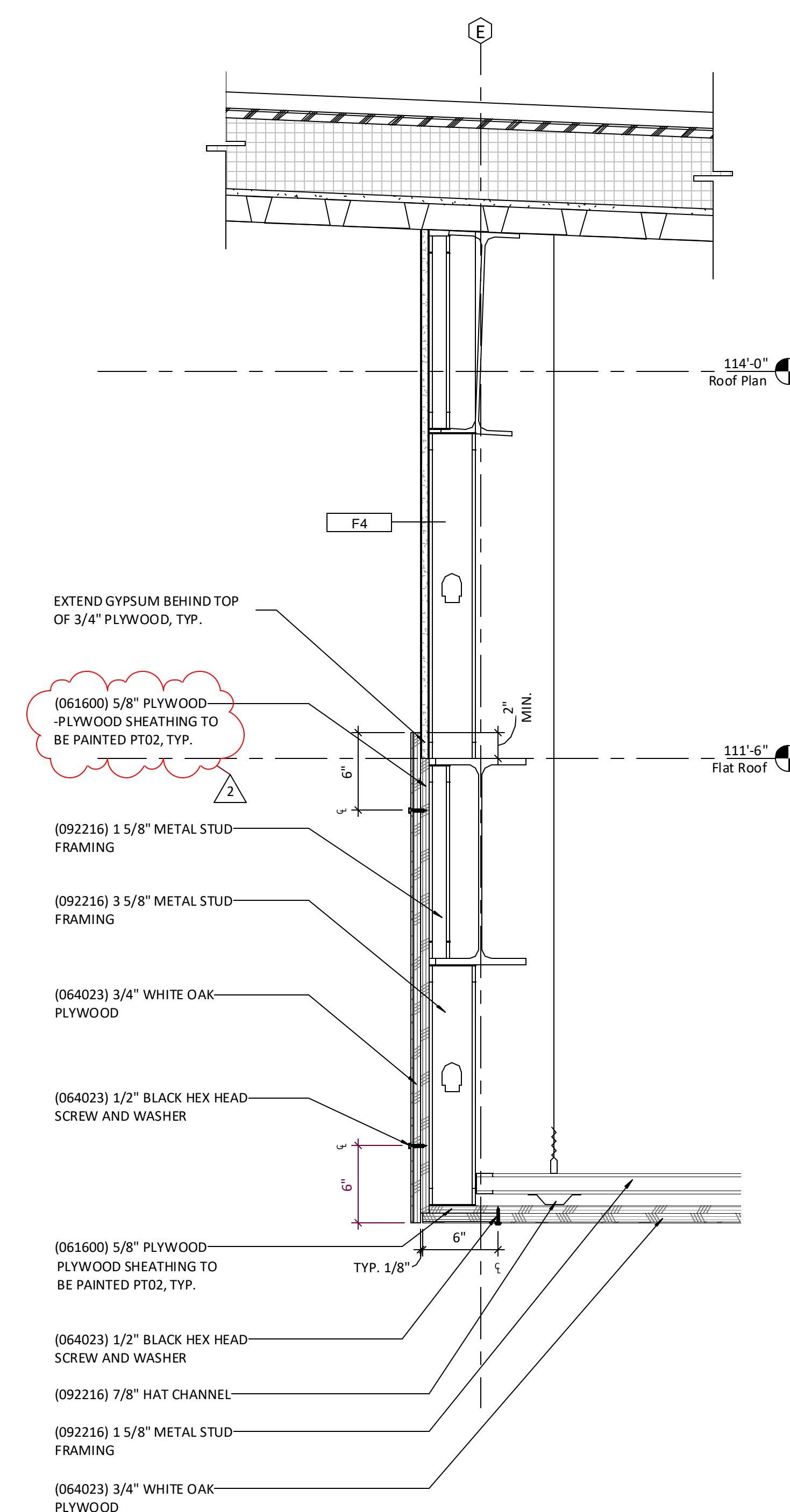
Interior Elevation - LSN / LSW GiC West A10
1/4" = 1'-0"



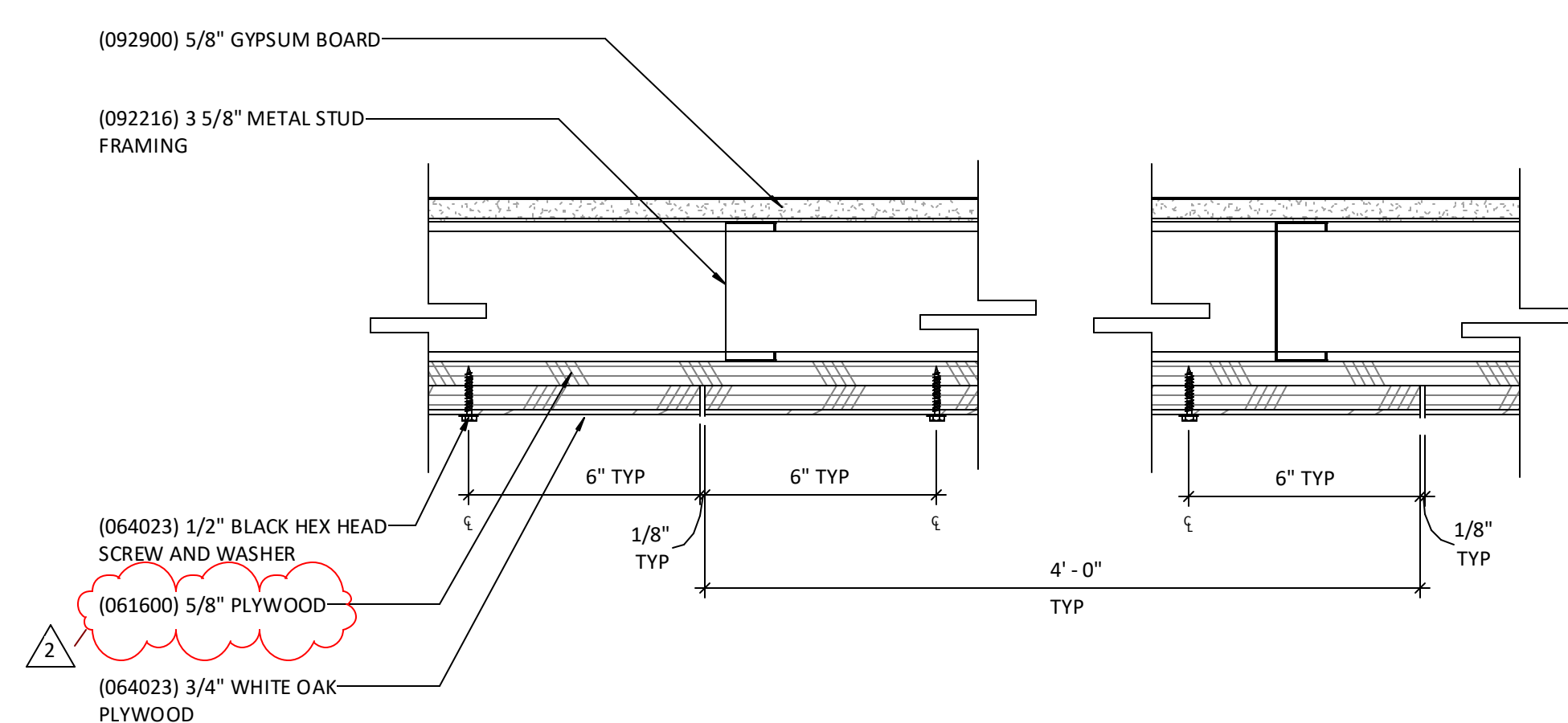
Interior Elevation - LSN / LSW GiC East A1
1/4" = 1'-0"



4' x 8' Finished Plywood Panel (TYP) **J1**
1" = 1'-0"



Plan Detail @ Plywood Panel Vertical Joint **A13**
3" = 1'-0"

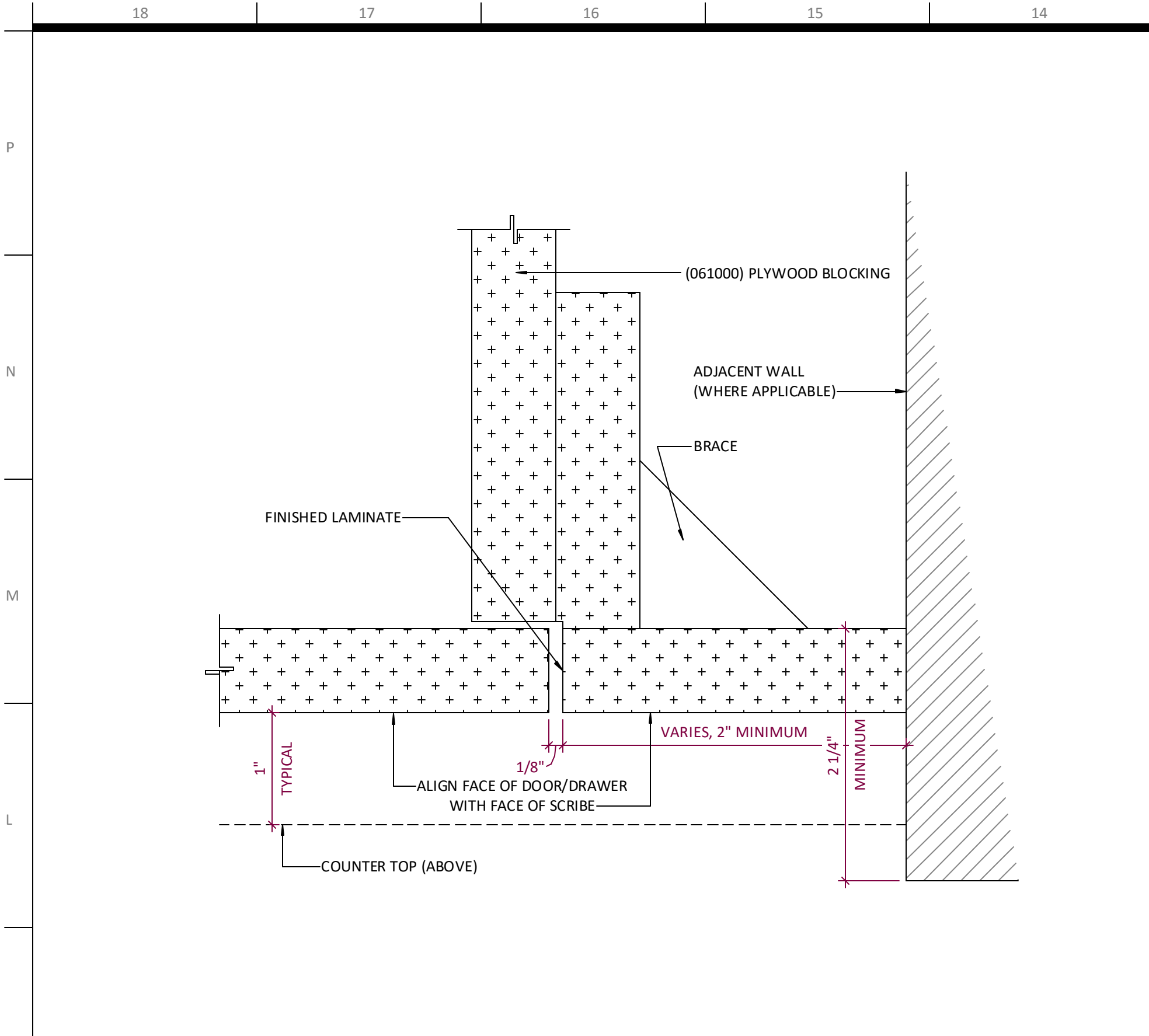
Section Detail @ Restroom Vestibule A6
1 1/2" = 1'-0"Section Detail @ Classroom Ceiling Edge **A1**

NUMBER	DESCRIPTION	DATE
1	Addendum 01	09/19/20
2	Addendum 02	09/21/20

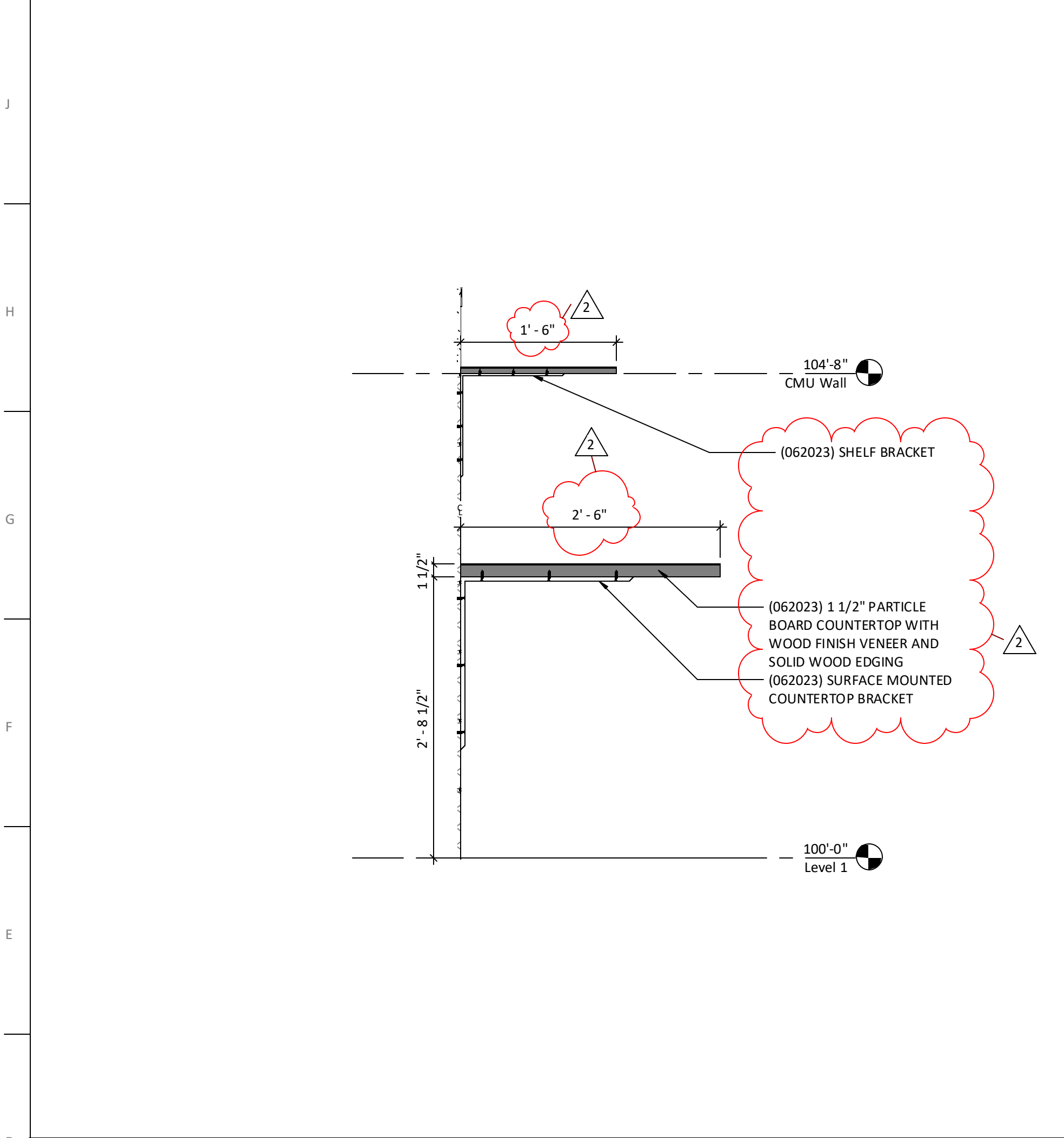
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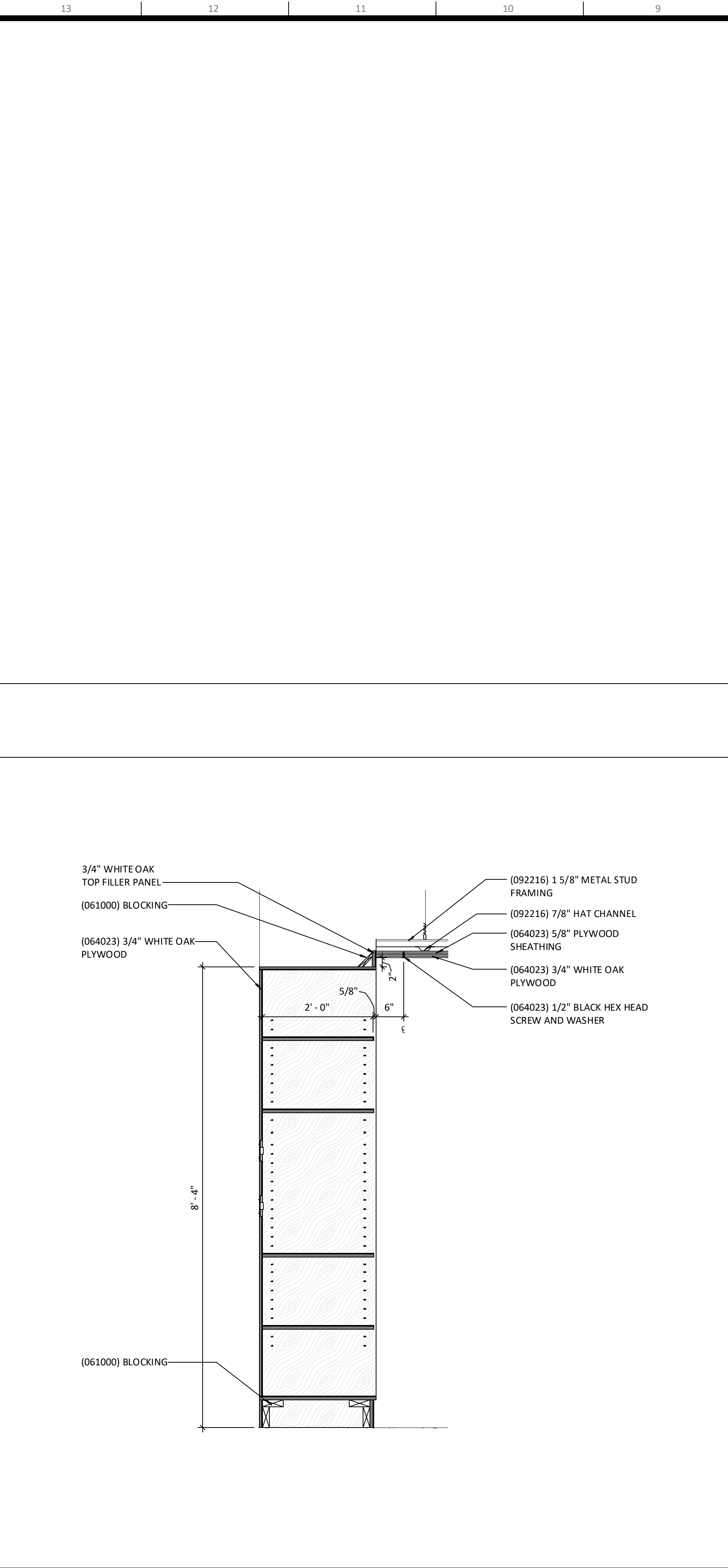
A540



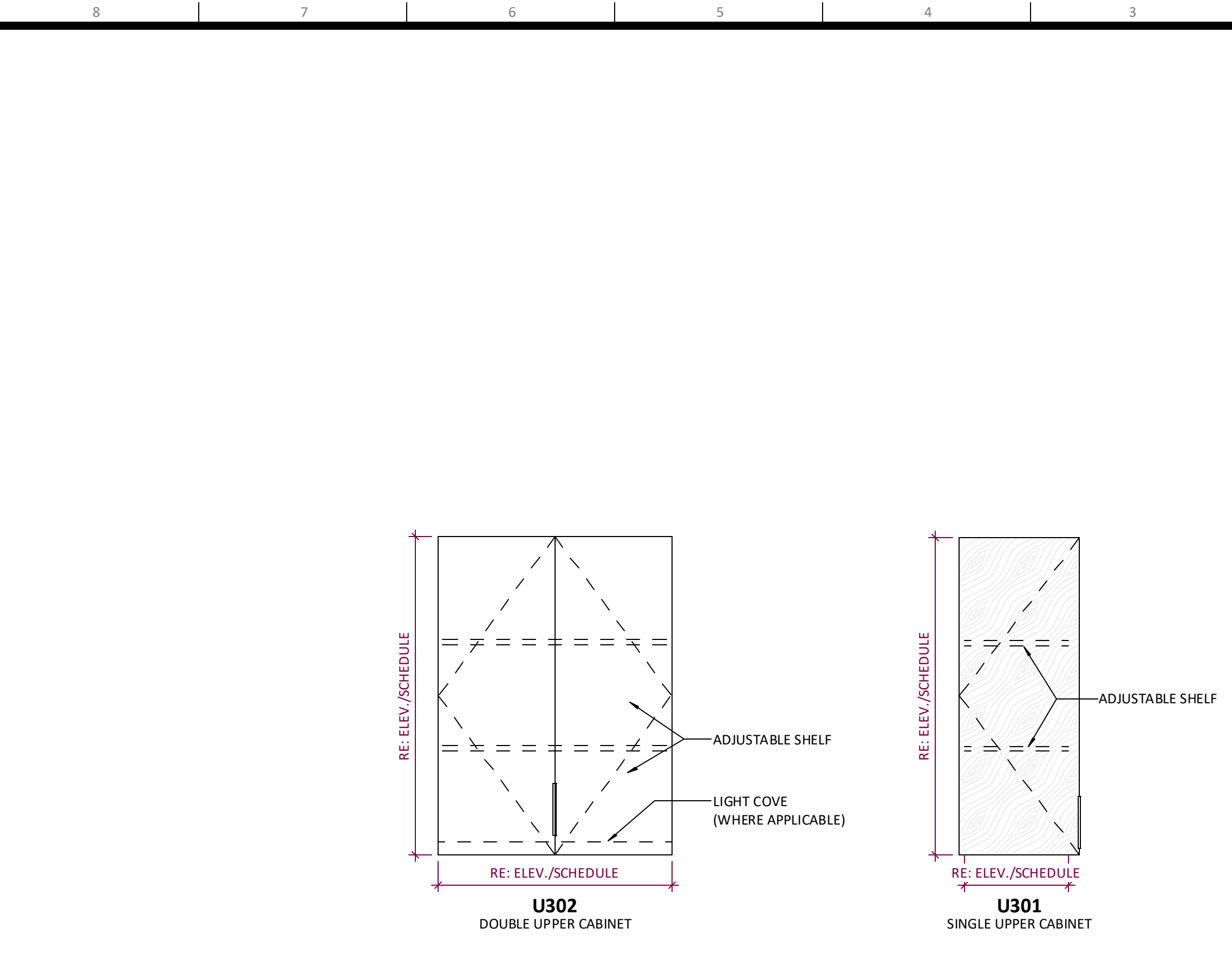
Plan Detail - Typical Scribe **K14**
12" = 1'-0"



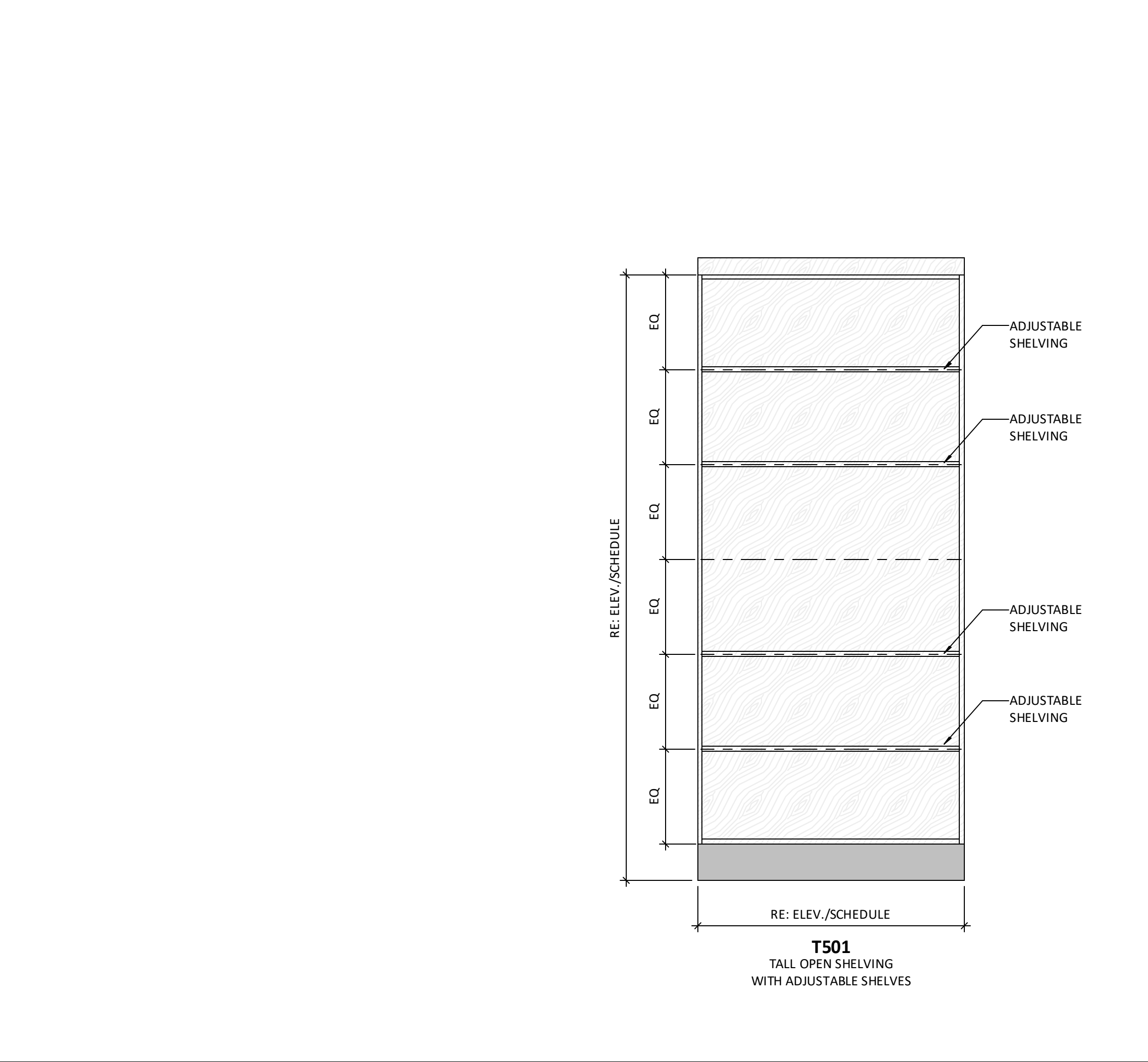
Section Detail @ CAD Station **D14**
1" = 1'-0"



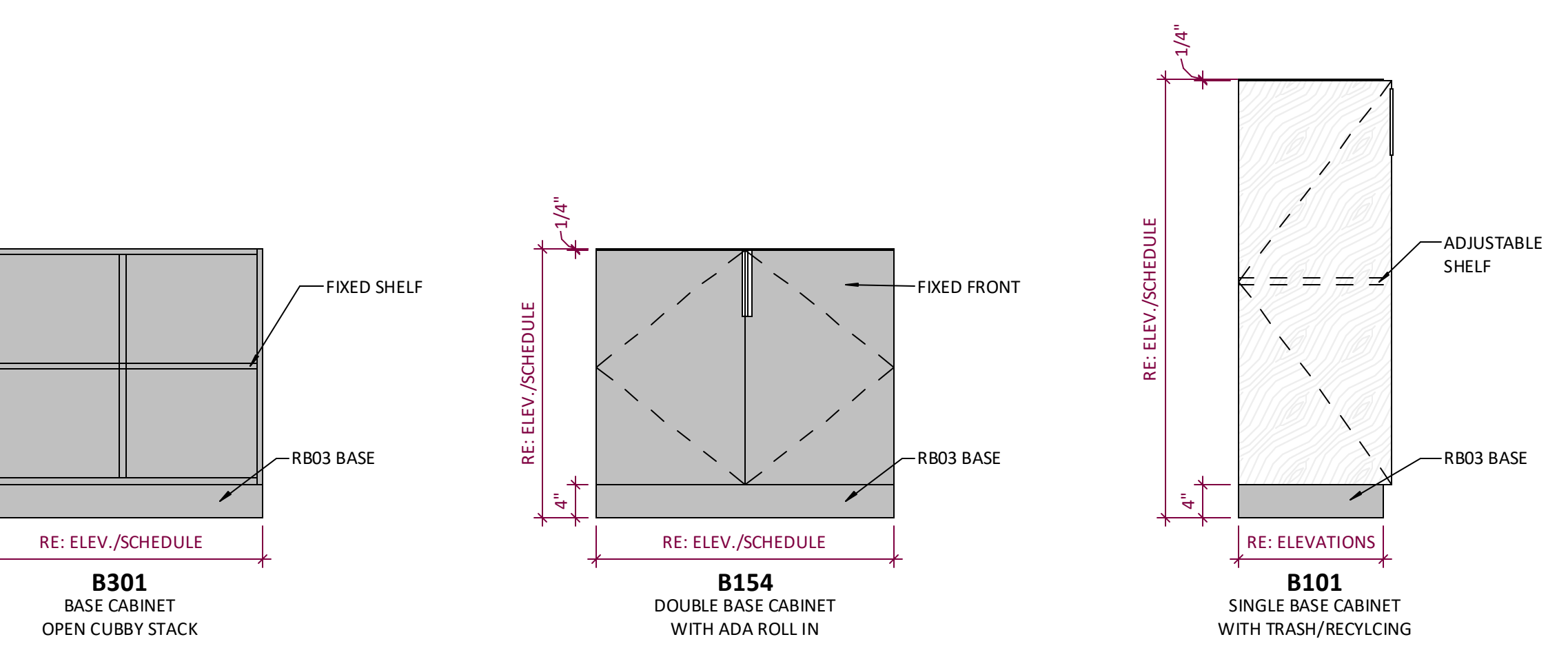
Section Detail @ Classroom Shelving **D9**
3/4" = 1'-0"



Cabinet Types - Upper **K3**
3/4" = 1'-0"



Cabinet Types - Tall **D3**
3/4" = 1'-0"



Cabinet Types - Base **A3**
3/4" = 1'-0"

General Notes (Casework Standards):

1. ALL CASEWORK IS TO BE CONSTRUCTED TO MEET OR EXCEED ARCHITECTURAL WOODWORK INSTITUTE (AWI) STANDARDS.

2. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.

3. PROVIDE RUBBER BASE AT ALL CABINET BASES, UNLESS NOTED OTHERWISE.

4. REFER TO INTERIOR ELEVATIONS AND FINISH SCHEDULE FOR SPECIFIC MATERIAL LOCATIONS.

5. PROVIDE MOISTURE RESISTANT PLYWOOD AT COUNTERTOPS WITH SINKS.

6. SINKS SHOWN ON THESE DRAWINGS INDICATE LOCATIONS ONLY AND MAY NOTE REFLECT ACTUAL SIZES OR TYPES.

7. COORDINATE LOCATIONS OF ALL EQUIPMENT AND CONFIRM PROPER CLEARANCES. NOTIFY ARCHITECT OF ANY DISCREPANCIES.

8. CENTER ALL SINKS IN THE ASSOCIATED CASEWORK, UNLESS NOTED OTHERWISE.

9. PROVIDE SIDE SPLASH WHERE COUNTERTOP ABUTS WALL, OR AT COUNTERTOPS WITH DIFFERENT HEIGHTS ABUT.

10. SEAL ALL JOINTS BETWEEN WORK SURFACES/CABINETS AND ADJOINING SURFACES.

11. PROVIDE IN WALL BLOCKING AS REQUIRED FOR UPPER CABINETS.

12. CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING FINISHED FLOORING SURFACES FROM DAMAGE DURING ALL CONSTRUCTION PHASES.

13. FIELD COORDINATE LOCATIONS OF GROMMETS IN COUNTERTOPS WITH OWNER/ARCHITECT.

14. PROVIDE FINISHED CLOSURE PANELS AT EXPOSED END CONDITIONS.

15. PROVIDE FILLER PANEL/SCRIBE AT ALL LOCATIONS WHERE CASEWORK MEETS A WALL.

16. PROVIDE LOCKS AT ALL CABINET DOORS. FINAL LOCK COORDINATION WILL BE DONE BY OWNER/ARCHITECT DURING SHOP DRAWING PROCESS.

17. ALL PENETRATIONS THROUGH CASEWORK SHALL BE SEALED OR COVERED WITH AN ESCUTCHEON.

CASEWORK CABINET GROUPS:

B BASE CABINET

BS BASE SCRIBE

T TALL CABINET

U UPPER CABINET

US UPPER SCRIBE

owner:
Lee's Summit R-7 School
301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4200 Pennsylvania
Kansas City, MO 64111
816.931.6655
multistudio

civil engineer:
Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com

structural engineer:
Bob D. Campbell &
4338 Bellevue
Kansas City, MO 64111
816.531.4144
www.bdc-engrs.com

MEP/FIT/Code:
Henderson Engineers
8345 Lenexa Drive, Suite
300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

Project Number: 0121-0100

LSN: 901 NE Douglas St., Lee's Summit MO 64086
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LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Casework Legend

SIDESPLASH

BACKSPLASH

COUNTERTOP

CABINET HARDWARE AS SCHEDULED

CABINET DOOR SWING

ADJUSTABLE SHELF

TOE-KICK

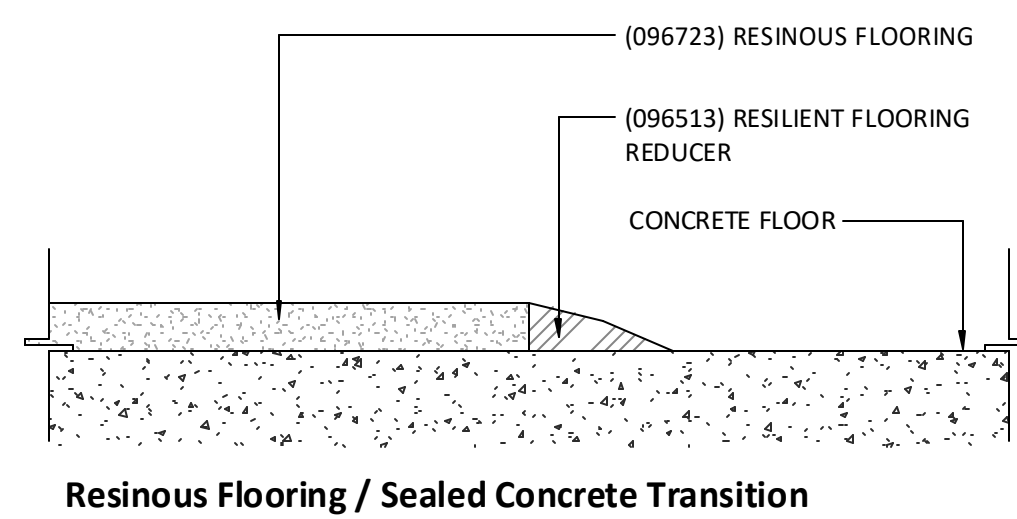
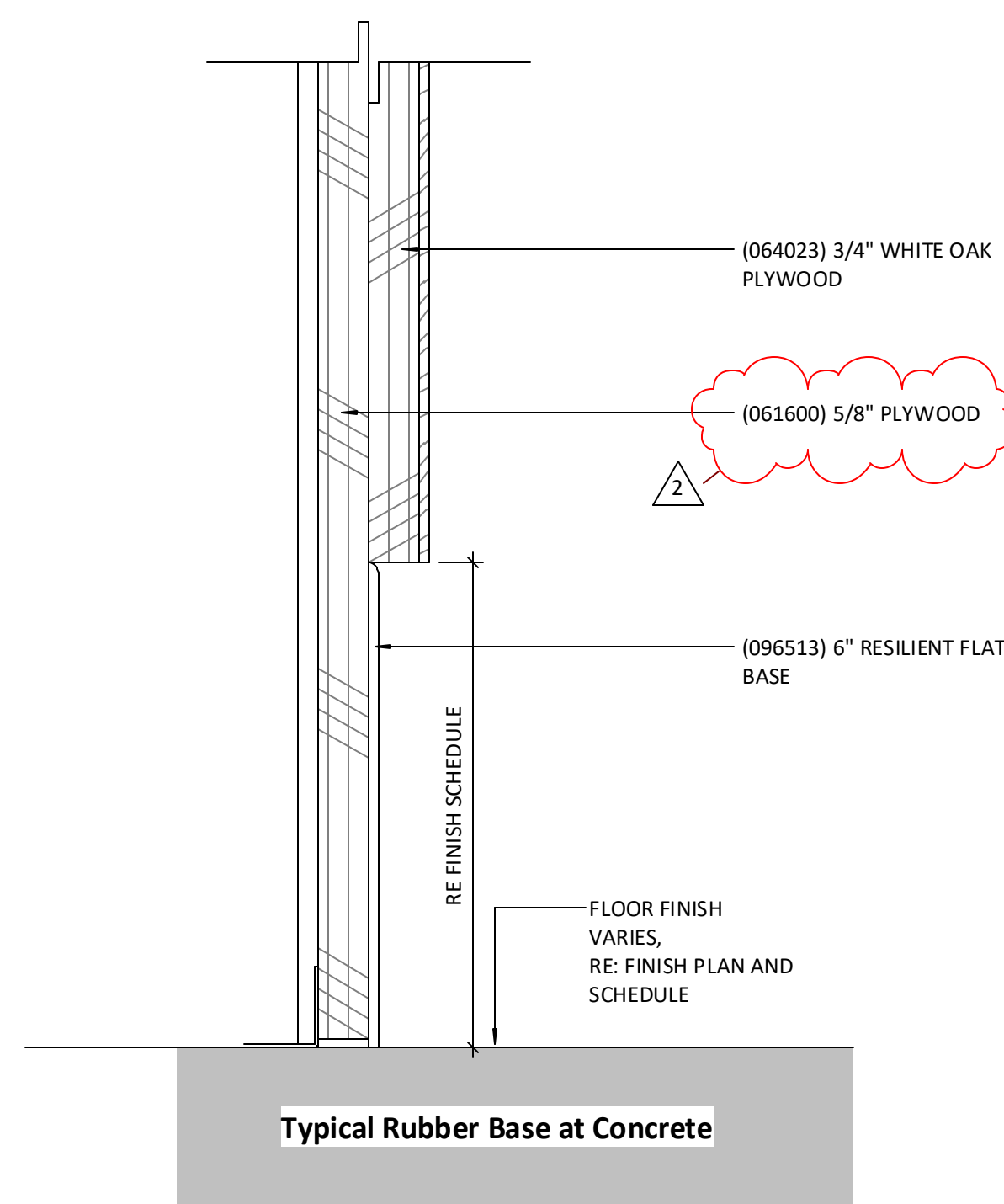
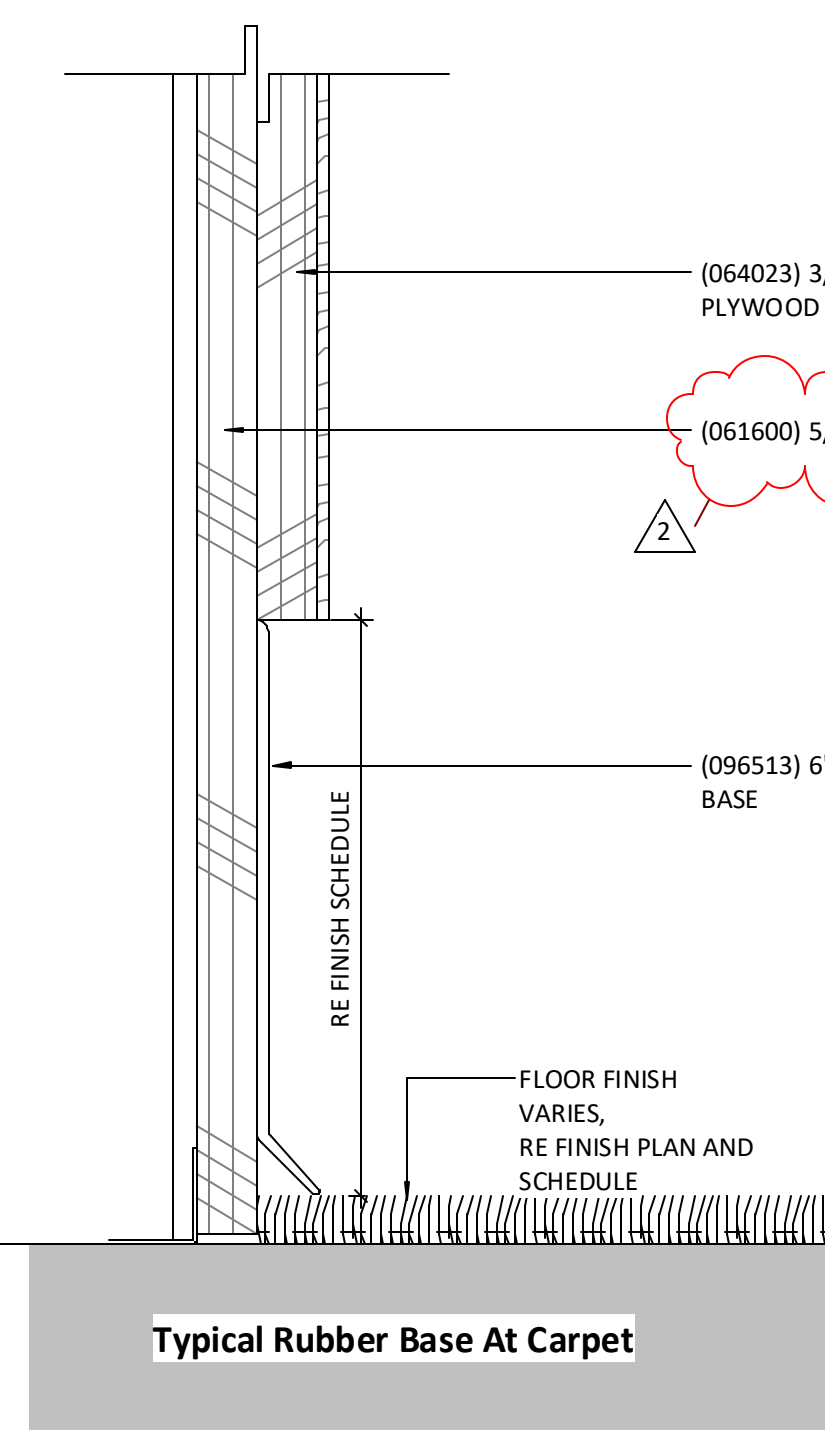
B222 36,32,5,24

CABINET GROUP

CABINET SIZE W,H,D (IN INCHES)

Casework Schedule

Mark	Width	Height	Depth
Base - 301 - Open Cubby Shelving (34 inch)			
B301	36"	32 1/2"	23"
Base-101-Single-Plywood			
B101	17 1/2"	53"	12"
Base-102-Double			
B154	36"	32 1/2"	24"
Base-154-Double for ADA Sink			
B154	36"	32 1/2"	23"
TS25 - Open Shewing Stack (9") 2' Depth			
T501	44"	100"	25 3/8"
Upper-301-Single-Plywood			
U301	17 1/2"	48 3/4"	12"
Upper-302-Double			
U302	36"	49"	12"



Mark	Manufacturer	Model	Material Color	Comments
033000	CAST-IN-PLACE CONCRETE			
SC01	SEALED CONCRETE			CONCRETE WITH SURFACE SEALER
062023	INTERIOR ARCHITECTURAL WOODWORK			
WD01	MURPHY PLYWOOD	3/4" PLYWOOD WALL PANEL WITH TYPE "A" VENEER CORE	WHITE OAK, PLAIN SLICED	REF ELEVATIONS AND RCP FOR LOCATIONS
064136	PLASTIC LAMINATE-CLAD ARCHITECTURAL CABINETS			
PL01	FORMICA	N/A	STORM 912	CLASSROOM CASEWORK, REF ELEVATIONS
081416	FLUSH WOOD DOORS			
WD02	-	N/A	WHITE OAK, PLAIN SLICED	DOOR FINISH
096513	RESILIENT BASE AND ACCESSORIES			
RB01	ROPPE	PINNACLE	123 CHARCOAL	6" COVE WALL BASE
RB02	ROPPE	PINNACLE	123 CHARCOAL	6" FLAT WALL BASE
RB03	ROPPE	PINNACLE	123 CHARCOAL	4" FLAT WALL BASE
096723	EPOXY RESINOUS FLOORING			
EP01	DESCO COATINGS	GRANITE SERIES	GUNMETAL	EPOXY RESINOUS FLOORING IN RESTROOMS, WITH INTEGRAL 6" BASE
096813	TILE CARPET			
CPT01	MATS INC.	SUPER NOP 52	GRIIJS/CHARCOAL	WALK OFF CARPET
099123	INTERIOR PAINTING			
PT01	SHERWIN WILLIAMS	N/A	LAZY GRAY SW6254	EPOXY PAINT REQUIRED FOR ALL WET WALL LOCATIONS IN RESTROOMS.
PT02	SHERWIN WILLIAMS	N/A	PEPPERCORN SW7674	ALL STRUCTURE TO BE PAINTED, TYP. EPOXY PAINT REQUIRED FOR ALL WET WALL LOCATIONS: KITCHEN, WATER FOUNTAINS, SHOP SINK ALCOVE.
101100	VISUAL DISPLAY UNITS			
MB01	CLARIDGE	LCS DELUXE PORCELAIN WHITEBOARD	WHITE	60" ROLL MOUNTED HORIZONTALLY. 3'-0" ALUM TRAY AT BASE. 1 TRIM CONTINUOUS AT TOP. 5'-6" HIGH STARTING 2'-6" AFF
123661	SIMULATED STONE COUNTERTOPS			
SS01	CORIAN SOLID SURFACE	N/A	CARBON AGGREGATE	CLASSROOM COUNTERTOPS

General Finish Notes:

1. ALL FINISH MATERIALS MUST MEET THE FLAME SPREAD RATINGS PER THE BUILDING CODE.
2. REFER TO INTERIORS ELEVATIONS AND PLANS FOR SPECIFIC MATERIAL LOCATIONS.
3. REFERENCED FLOOR/WALL/CILING TYPES FOR TOP FINISH LAYER DETAILS ONLY. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR FLOORING, CEILING ASSEMBLY DETAILS PER LOCATION.
4. PAINT ALL EXPOSED DUCTWORK, CONDUIT, ELECTRICAL EQUIPMENT, ETC. TO MATCH ADJACENT SURFACE.
5. ELECTRICAL NON-FACILITY FINISHED EXPOSED METAL TO MATCH ADJACENT WALL COLOR, UNLESS NOTED OTHERWISE.
6. FLOORING TRANSITIONS AT FLOORING TRANSITION DETAILS FOR ALL FLOORING MATERIALS.
7. FLOORING TRANSITIONS AT DOORS SHOULD BE LOCATED UNDER THE DOOR IN THE CLOSED POSITION. UNLESS NOTED OTHERWISE.
8. CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING FINISHED FLOORING SURFACES FROM DAMAGE DURING ALL CONSTRUCTION PHASES.
9. PROTECT FINISHING TRIM AT TRANSITIONS FROM CERAMIC WALL TILE TO OTHER MATERIAL, UNLESS NOTED OTHERWISE.
10. REFER TO REFLECTED CEILING PLANS FOR CEILING HEIGHT.
11. ALL ELECTRICAL DEVICE COVERS ARE TO BE WHITE UNLESS NOTED OTHERWISE.
12. ALL METAL DOOR AND WINDOW FRAMES AND LIFE SITS ARE TO BE PAINTED TO MATCH ADJACENT WALL COLOR.
13. WALLS AND COLUMNS TO BE PT01 UNO.

Room name

Wall Finish
Base Finish
Floor Finish

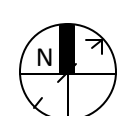
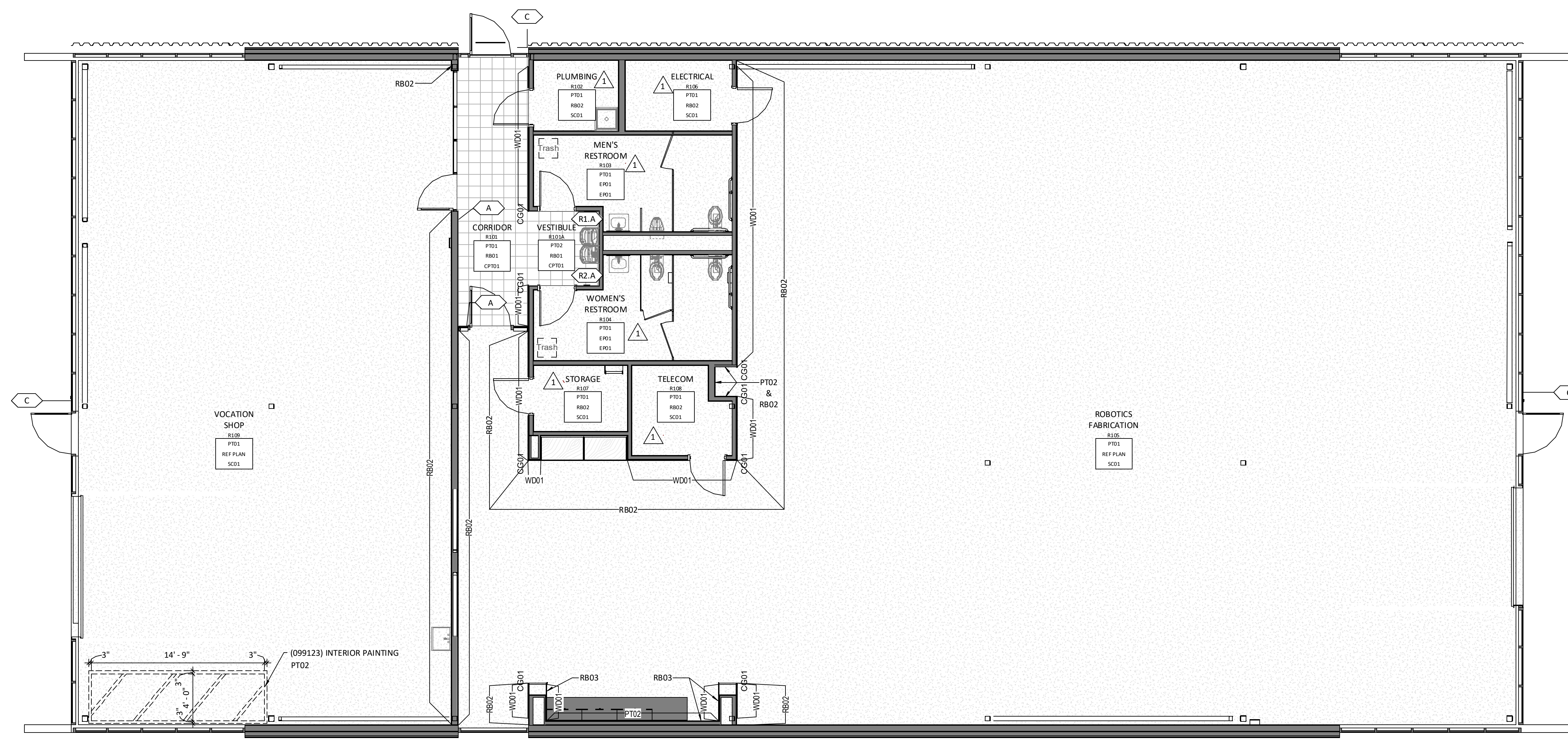
- Signage Schedule -

Type Mark	Type Comments
A	Room ID (Standard)
R1.A	Restroom - Men
R2.A	Restroom - Women
A	Room ID (Standard)
C	Exterior Door Vinyl Sign
C	Exterior Door Vinyl Sign
C	Exterior Door Vinyl Sign

 $\triangle 1$

Wall Base Details J12

Flooring Transitions J9



LSN / LSW - Level 1 Finish Plan **A3**
3/16" = 1'-0"

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LSR7 Robotics, GiC & Phys Education

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LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

Project Number: 0121-0100

owner: Lee's Summit R-7 School 301 NE Tudor Road Lee's Summit, MO 64086	architect: Multistudio 4200 Pennsylvania Kansas City, MO 64111
---	--

civil engineer:
Kaw Valley Engineering
 14700 West 114th Terrace
 Lenexa, KS 66215
 913.485.0318
kveng.com

MEPFT/Code::
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8345 Lenexa Drive, Suite
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www.hendersonengineers.com

Issue Date: September 9, 2022

Revisions

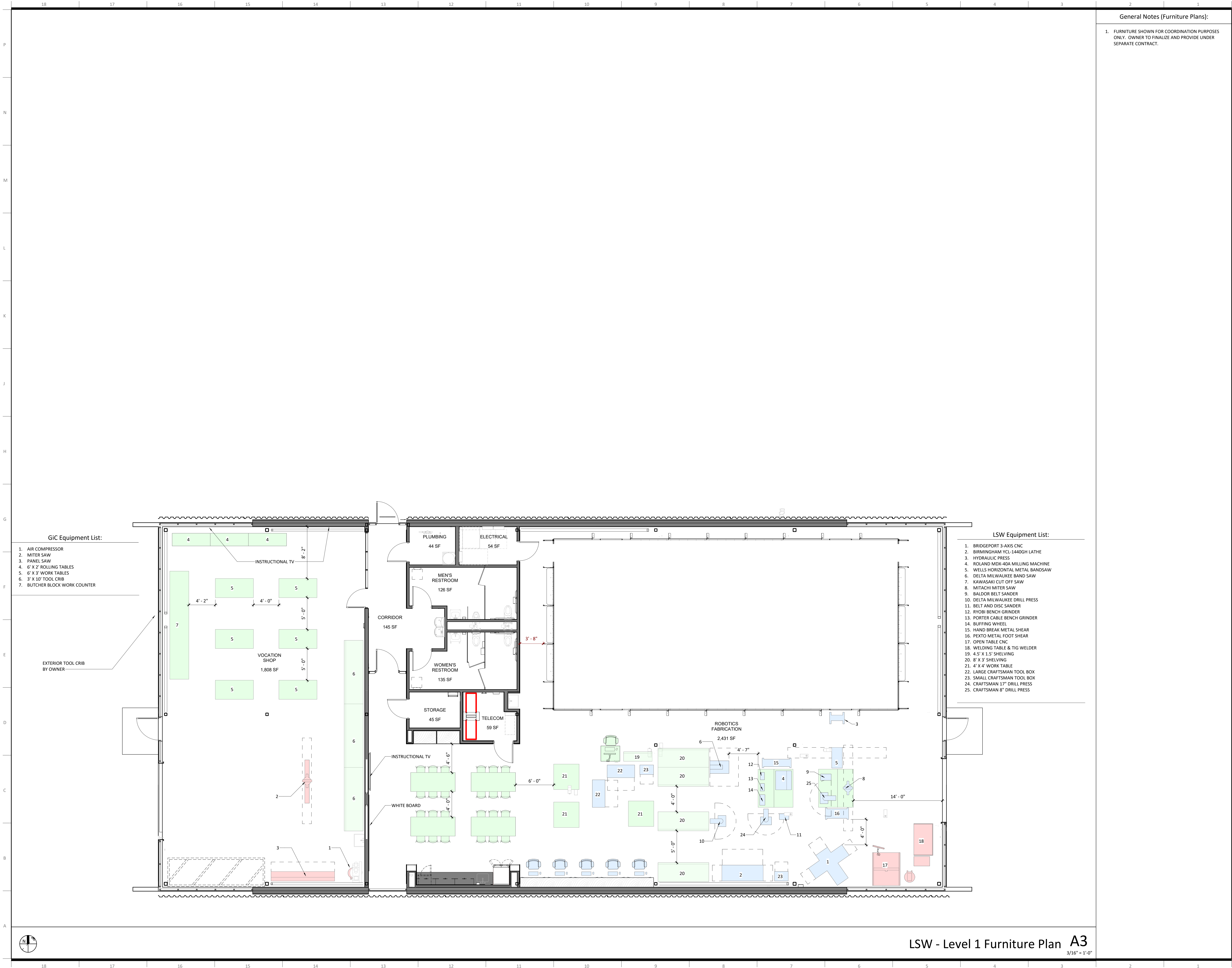
NUMBER	DESCRIPTION	DATE
1	Addendum 01	09/19/2022
2	Addendum 02	09/23/2022

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Finish Plan

AF101



General Notes (Furniture Plans):

1. FURNITURE SHOWN FOR COORDINATION PURPOSES ONLY. OWNER TO FINALIZE AND PROVIDE UNDER SEPARATE CONTRACT.

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structural engineer: Bob D. Campbell &
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GIC Equipment List:

1. AIR COMPRESSOR
2. MITER SAW
3. PANEL SAW
4. 6' X 2' ROLLING TABLES
5. 6' X 3' WORK TABLES
6. 3' X 10' TOOL CRIB
7. BUTCHER BLOCK WORK COUNTER

LSW Equipment List:

1. BRIDGEPORT 3-AXIS CNC
2. BIRMINGHAM YCL-1440GH LATHE
3. HYDRAULIC PRESS
4. ROLAND MDX-40A MILLING MACHINE
5. WELLS HORIZONTAL METAL BANDSAW
6. DELTA MILWAUKEE BAND SAW
7. KAWASAKI CUT OFF SAW
8. MITACHI MITER SAW
9. BALDOR BELT SANDER
10. DELTA MILWAUKEE DRILL PRESS
11. BELT AND DISC SANDER
12. RYOBI BENCH GRINDER
13. PORTER CABLE BENCH GRINDER
14. BUFFING WHEEL
15. HAND BREAK METAL SHEAR
16. PEXTO METAL FOOT SHEAR
17. OPEN TABLE CNC
18. WELDING TABLE & TIG WELDER
19. 4.5' X 1.5' SHELVING
20. 8' X 3' SHELVING
21. 4' X 4' WORK TABLE
22. LARGE CRAFTSMAN TOOL BOX
23. SMALL CRAFTSMAN TOOL BOX
24. CRAFTSMAN 17" DRILL PRESS
25. CRAFTSMAN 8" DRILL PRESS

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Furniture Plan - LSW

AF102-A

LSW - Level 1 Furniture Plan **A3**
3/16" = 1'-0"



General Notes (Furniture Plans):

1. FURNITURE SHOWN FOR COORDINATION PURPOSES ONLY. OWNER TO FINALIZE AND PROVIDE UNDER SEPARATE CONTRACT.

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LSR7 Robotics, GiC & Phys Education

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300
Lenexa, KS 66214
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www.hendersonengineers.com

GiC Equipment List:

1. AIR COMPRESSOR
2. MITER SAW
3. PANEL SAW
4. 6' X 2' ROLLING TABLES
5. 6' X 3' WORK TABLES
6. 3' X 10' TOOL CRIB
7. BUTCHER BLOCK WORK COUNTER

EXTERIOR TOOL CRIB
BY OWNER

LSN Equipment List:

1. BRIDGEPORT 3-AXIS CNC
2. BRIDGEPORT TORQ-CUT 22
3. BIRMINGHAM YCL-1340GH LATHE
4. WEN 3975T HORIZONTAL METAL BANDSAW
5. CRAFTSMAN VERTICAL METAL BANDSAW
6. CENTRAL MACHINERY METAL CUTTING BAND SAW
7. GRIZZLY G7947 DRILL PRESS
8. OPEN TABLE CNC ROUTER
9. BALDOR BUFFER
10. BALDOR DISC SANDER
11. CRAFTSMAN MITER SAW
12. CRAFTSMAN BENCHTOP/DISC SANDER
13. GRIZZLY DUST COLLECTOR
14. AIR COMPRESSOR
15. ARBOR PRESS
16. KARDEX STORAGE SYSTEM
17. RVORBI BENCH GRINDER
18. WELDING TABLE & TIG WELDER
19. 4.5' X 1.5' SHELVING
20. 8' X 3' SHELVING
21. 4' X 4' WORK TABLE
22. LARGE CRAFTSMAN TOOL BOX
23. SMALL CRAFTSMAN TOOL BOX

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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Furniture Plan - LSN

AF102-B

LSN - Level 1 Furniture Plan **A3**
3/16" = 1'-0"

1. THE ENVIRONMENTAL GRAPHICS PACKAGE CONSISTS OF THE FOLLOWING COMPONENTS: DETAIL DRAWINGS, SIGN LOCATION PLANS, SIGNAGE, SCHEDULE, AND/OR CONFLICTS RESOLUTION MANUAL.
2. ALL SIGNS TO BE FABRICATED AND INSTALLED TO COMPLY WITH LOCAL BUILDING CODES, ADAAG, AND ANSI 13.2.1.
3. FABRICATOR TO REVIEW THE STRUCTURAL, MECHANICAL, AND ARCHITECTURAL DRAWINGS AND SITE CONDITIONS TO VERIFY SIZES AND LOCATION OF SIGNAGE RELATED ELEMENTS THAT EXIST. ANY DISCREPANCIES AND/OR CONFLICTS MUST BE IMMEDIATELY REPORTED TO THE OWNER/ARCHITECT/GENERAL CONTRACTOR IN WRITING BEFORE PROCEEDING WITH FABRICATION OR ORDERING MATERIALS.
4. FABRICATOR SHALL SUBMIT FULLY DETAILED WORKSHOP/FABRICATION DRAWINGS TO ARCHITECT/GENERAL CONTRACTOR FOR ALL SIGNS AND GRAPHICS CONTAINED IN THIS PACKAGE. DRAWINGS SHALL BE REVIEWED AND HAVE SIGNED APPROVAL PRIOR TO FABRICATION OR ORDERING OF MATERIALS.
5. ALL SIGNS ARE TO BE FABRICATED FROM MATERIALS SPECIFIED UNLESS OTHERWISE APPROVED IN WRITING BY THE OWNER/ARCHITECT. NO EXCEPTIONS.
6. DRAWINGS CONTAINED IN THIS PACKAGE ARE FOR AESTHETIC AND FUNCTIONAL DESIGN INTENT ONLY. NO INSTRUCTIONS FOR STRUCTURAL APPROPRIATENESS HAVE BEEN PROVIDED. IT IS THE RESPONSIBILITY OF THE SIGNAGE FABRICATOR TO ENSURE THAT ALL ELEMENTS ARE FABRICATED FOR A STABLE AND DURABLE INSTALLATION WHILE MAINTAINING THE AESTHETIC DESIGN INTENT.
7. FABRICATOR IS RESPONSIBLE FOR DETERMINING PROPER MOUNTING METHODS FOR SIGNS UNLESS OTHERWISE SPECIFIED. ALL MOUNTING METHODS AND TECHNIQUES MUST BE APPROVED IN WRITING AND HAVE SIGNED APPROVAL PRIOR TO INSTALLATION.
8. ALL FASTENERS ARE TO BE CONCEALED UNLESS NOTED OTHERWISE.
9. FABRICATOR TO COORDINATE THE INSTALLATION OF SITE SIGNAGE AND ANCHORED FOOTINGS WITH THE GENERAL CONTRACTOR'S INSTALLATION OF THE SUBERRUNDING HARDSCAPE.
10. ALL TEXT DRAWN IN THIS PACKAGE IS FOR REFERENCE ONLY. REFER TO SIGNAGE MESSAGE SCHEDULE FOR EXACT TEXT ON EACH SIGN.
11. ALL ROOM IDENTIFICATIONS SIGNS ARE TO BE MOUNTED ON EACHES FROM THE TOP OF THE SIGN TO THE LATCH SIDE OF DOOR FRAME.

Signage Schedule		
Type Mark	Count	Type Comments
A	1	Room ID (Standard)
R1.A	1	Restroom - Men
R2.A	1	Restroom - Women
A	1	Room ID (Standard)
C	1	Exterior Door Vinyl Sign
C	1	Exterior Door Vinyl Sign
C	1	Exterior Door Vinyl Sign

Signage Notes:

1. Solid Color Insert
2. Clear non-glaze lens over paper insert
3. Printed paper text insert
4. Tactile Lettering
5. 3/32" Grade 2 Braille, match color to background

Issue Date: September 9, 2022

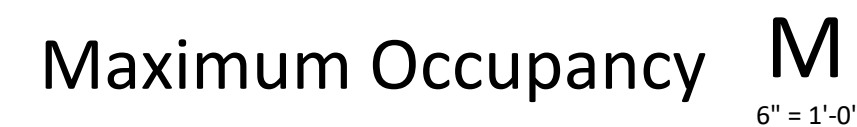
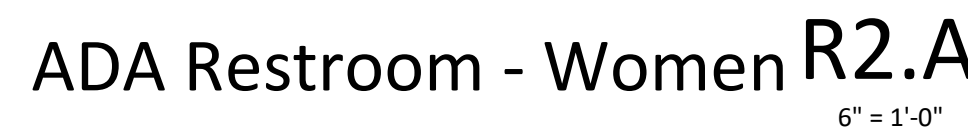
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Signage Types

SG001



GENERAL NOTES:

1. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS. REFER TO SPECIFICATIONS.
2. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY THE ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
3. PROVIDE TO THE ARCHITECT A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS. REFER TO SPECIFICATIONS.
4. INSTALLATION SHALL COMPLY WITH LEGALLY CONSTITUTED CODES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
5. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
6. VERIFY LOCATION AND DEPTH OF UTILITIES AT POINTS OF CONNECTION BEFORE START OF PIPING INSTALLATION.
7. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
8. DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
9. INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE.
10. VALVES SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
11. INSTALL EXPOSED PIPING, WHERE NECESSARY, IN FINISHED AREAS TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. INSTALL PIPING PARALLEL AND / OR PERPENDICULAR TO WALLS.
12. INSTALL VALVES AND APPURTENANCES A MAXIMUM OF 24" ABOVE CEILING IN ACCESSIBLE LOCATION WITHIN 24" OF ACCESS DOORS OR ACCESSIBLE CEILING TILES. PROVIDE PIPE AND FITTINGS TO INSTALL VALVES AND APPURTENANCES AT REQUIRED HEIGHT AND WITHIN 24" OF ACCESS DOORS OR ACCESSIBLE CEILING TILES.
13. INSTALL NO PLASTIC PIPE OF ANY KIND ABOVE SLAB INSIDE THE BUILDING. INSTALL NO PLASTIC PIPE IN THE CEILING RETURN AIR PLENUM.
14. COORDINATE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
15. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTINGS, ETC. WHERE REQUIRED AND AS NOTED ON PLANS. COORDINATE SLEEVE INSTALLATIONS WITH THE ARCHITECT, STRUCTURAL ENGINEER, STRUCTURAL CONTRACTOR AND GENERAL CONTRACTOR BEFORE CONCRETE IS INSTALLED.
16. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.
17. PROVIDE TRAP PRIMERS WHERE REQUIRED BY LOCAL AUTHORITIES.
18. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.
19. PAINT ALL EXPOSED GAS AND WATER PIPING USING RUST INHIBITOR PAINT. PAINT AND COLOR SHALL BE COORDINATED WITH THE ARCHITECT AND / OR OWNER.
20. COORDINATE ALL ROOF PENETRATIONS WITH OTHER TRADES. MAINTAIN 10' MINIMUM CLEARANCE FROM ALL AIR INTAKES. MAINTAIN 2' CLEARANCE FROM ALL OTHER EQUIPMENT.
21. INSULATE PIPING ROUTED IN EXTERIOR BUILDING WALLS WITH MINIMUM 2" BATT INSULATION TO PREVENT FREEZING.
22. PROVIDE "HEAVY-DUTY" NO-HUB COUPLINGS ON SANITARY PIPING 4" AND LARGER. SEE DIVISION 22 SPECIFICATION SECTION "SANITARY DRAINAGE AND VENT AND PIPING SPECIALTIES" FOR MORE INFORMATION.
23. PROVIDE "HEAVY-DUTY" NO-HUB COUPLINGS ON STORM PIPING, INCLUDING CONNECTIONS TO ROOF DRAINS. SEE DIVISION 22 SPECIFICATION SECTION "STORM DRAINAGE PIPING AND SPECIALTIES" FOR MORE INFORMATION.
24. PROVIDE TRANSITION ADAPTER COUPLINGS FOR CONNECTION OF PVC DWV TO CAST IRON AT SLAB ON GRADE. SEE DIVISION 22 SPECIFICATION FOR MORE INFORMATION.
25. PROVIDE TRANSITION ADAPTER COUPLINGS FOR CONNECTION OF PVC DWV TO CAST IRON SANITARY, WASTE AND VENT PIPE AT SLAB ON GRADE. SEE DIVISION 22 SPECIFICATION SECTION "SANITARY DRAINAGE AND VENT PIPING AND SPECIALTIES" FOR MORE INFORMATION.
26. PROVIDE TRANSITION ADAPTER COUPLINGS FOR CONNECTION OF PVC DWV TO CAST IRON STORM PIPE AT SLAB ON GRADE. SEE DIVISION 22 SPECIFICATION SECTION "STORM DRAINAGE PIPING AND SPECIALTIES" FOR MORE INFORMATION.
27. FLOW CONTROL VALVES SHALL BE SIZE 1/2" AND SET AT 0.5 GPM UNLESS NOTED OTHERWISE.
28. WATER HAMMER ARRESTORS SHALL BE SIZE "A" UNLESS NOTED OTHERWISE.
29. PROVIDE VERTICAL LIFT SPRING LOADED CHECK VALVES IN HOT AND COLD WATER SUPPLIES FOR MOP SINK FAUCETS DOWNSTREAM OF SHUTOFF VALVES.
30. PROVIDE WALL PIPES AT PIPING PENETRATIONS OF ELEVATED WATERPROOF FLOOR SLABS, REFER TO SPECIFICATIONS.
31. PROVIDE SIZE AND LENGTH OF HOT WATER FIXTURE SUPPLY PIPE FROM CIRCULATED HOT WATER BRANCH OR MAIN TO TERMINATION OF HOT WATER FIXTURE SUPPLY PIPE AT EACH FIXTURE PER 2015 INTERNATIONAL ENERGY CONSERVATION CODE, TABLE C404.3.1. FOR 1/2" HOT WATER FIXTURE SUPPLY PIPE SIZE TO INDIVIDUAL LAVATORIES, PROVIDE MAXIMUM LENGTH OF TWO FEET. FOR 3/4" HOT WATER FIXTURE SUPPLY PIPE SIZE TO INDIVIDUAL SINKS, PROVIDE MAXIMUM LENGTH OF 45 FEET. FOR 3/4" HOT WATER FIXTURE SUPPLY PIPE SIZE TO INDIVIDUAL SINKS, PROVIDE MAXIMUM LENGTH OF 21 FEET.

PLUMBING SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

V2.02

STANDARD MOUNTING HEIGHTS

HOSE BIBB (CENTERLINE)	36"
ICE MAKER OUTLET BOX (CENTER OF BOX)	24"
JANITOR'S SINK FAUCET FITTINGS (CENTERLINE)	42"
NON FREEZE WALL HYDRANT (AFG TO CENTERLINE)	18"
WASHING MACHINE OUTLET BOX (RIM)	42"

INSTALL PLUMBING FIXTURES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE ARCHITECTURAL DRAWINGS OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS. FINAL APPROVAL OF LOCATIONS BY ARCHITECT. MOUNTING HEIGHTS LISTED ABOVE, OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, ARE AFF. UNO. ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ANNOTATION

	PLUMBING PLAN NOTE CALLOUT
	PLUMBING EQUIPMENT DESIGNATION. (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES
	EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)
	MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
	CONNECTION POINT OF NEW WORK TO EXISTING
	DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
	SECTION CUT DESIGNATION
	DEDICATED EQUIPMENT ACCESS TILE
	ACCESS PANEL

ABBREVIATIONS

ADA	AMERICANS WITH DISABILITIES ACT	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR	N/C	NORMALLY CLOSED
AFG	ABOVE FINISHED GRADE	N/O	NORMALLY OPEN
AHU	AIR HANDLING UNIT	NIC	NOT IN CONTRACT
AP	ACCESS PANEL	ORD	OVERFLOW ROOF DRAIN
BAS	BUILDING AUTOMATION SYSTEM	POI	PLUMBING DRAINAGE INSTITUTE
BFF	BELOW FINISHED FLOOR	PHQ	PHASE
BFG	BELOW FINISHED GRADE	PRV	PRESSURE REDUCING VALVE
BOP	BOTTOM OF PIPE	PVC	POLYVINYL CHLORIDE
BOS	BOTTOM OF STRUCTURE	RCP	REINFORCED CONCRETE
BTU	BRITISH THERMAL UNIT	RD	PIPE
CP	CONDENSATE PUMP	RPM	ROOF DRAIN
CPVC	CHLORINATED POLYVINYL CHLORIDE	RTU	REVOLUTIONS PER MINUTE
CJ	COPPER	SF	ROOFTOP UNIT
DI	DUCTILE IRON	SP	SQUARE FEET
DN	DOWN	SS	SUMP
DFU	DRAINAGE FIXTURE UNIT	SS	STAINLESS STEEL
DS	DOWNSPOUT		SANITARY SEWER, SOIL STACK
(E)	EXISTING	TDH	TOTAL DYNAMIC HEAD
EMS	ENERGY MANAGEMENT SYSTEM	TFA	TO FLOOR ABOVE
ETR	EXISTING TO REMAIN	TFB	TO FLOOR BELOW
EWG	ELECTRIC WATER COOLER	TYP	TYPICAL
FD	FLOOR DRAIN	UL	UNDERWRITERS
FFA	FROM FLOOR ABOVE		LABORATORIES, INC. UNLESS NOTED OTHERWISE
FFB	FROM FLOOR BELOW	UNO	UNLESS NOTED OTHERWISE
FF	FINISHED FLOOR	UPS	UNINTERRUPTIBLE
FL	FLOW LINE		POWER SUPPLY
FLA	FULL LOAD AMPS	VCP	VITRIFIED CLAY PIPE
FLR	FLOOR	VFD	VARIABLE FREQUENCY DRIVE
GPM	GALLONS PER MINUTE		
HD	HEAD, HUB DRAIN	VS	VENT STACK
HZ	HERTZ	VTR	VENT THROUGH ROOF
IE	INVERT ELEVATION	W	WITH
IN WC	INCHES OF WATER COLUMN	W/O	WITHOUT
JB	JUNCTION BOX	WC	WATER COLUMN
J-BOX	JUNCTION BOX	WS	WASTE STACK
KW	KILOWATT	WSFU	WATER SUPPLY FIXTURE UNIT
MAU	MAKE-UP AIR UNIT		
MAX	MAXIMUM	WVS	WASTE VENT STACK
MBH	1000 BTU PER HOUR		
MH	MANHOLE		

PIPING SYMBOLS

	OXYGEN OUTLET
	NITROUS OXIDE OUTLET
	MEDICAL AIR OUTLET
	NITROGEN OUTLET
	MEDICAL VACUUM INLET
	FLOOR SINK (FS), SIZE & TYPE
	FLOOR DRAIN (FD), SIZE & TYPE
	ROOF DRAIN (RD), SIZE & TYPE
	BALL VALVE
	CONTROL VALVE
	SHUTOFF VALVE
	CHECK VALVE
	BALANCING VALVE WITH PRESSURE PORTS
	WATER METER
	STRAINER
	STRAINER WITH BLOWOFF
	RELIEF/SAFETY VALVE
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	GAS PRESSURE REGULATOR
	THERMOSTATIC MIXING VALVE
	PIPE ANCHOR
	EXPANSION JOINT
	BACKFLOW PREVENTER
	PRESSURE GAUGE
	THERMOMETER
	UNION
	FLANGE CONNECTION
	HOSE BIBB (HB)
	NON-FREEZING WALL HYDRANT (NW)
	MANUAL / AUTOMATIC AIR VENT OR VACUUM RELIEF VALVE
	PRESSURE / VACUUM SWITCH
	CLEANOUT
	CAP
	WALL CLEANOUT (WCO)
	FLOOR CLEANOUT (FCO)
	EXTERIOR CLEANOUT (ECO)
	ELBOW UP
	ELBOW DOWN
	TEE UP
	TEE DOWN
	ELBOW UP WITH SHUT-OFF VALVE (SOV)
	ELBOW DOWN WITH SHUT-OFF VALVE (SOV)
	TEE UP WITH SHUT-OFF VALVE (SOV)
	TEE DOWN WITH SHUT OFF VALVE (SOV)
	WATER HAMMER ARRESTER (WHA) WITH PDI SIZES, (A, B, C, D, & E)
	RECIRCULATION PUMP
	P-TRAP
	GAS COCK
	TRAP PRIMER
	TRAP PRIMER WITH DISTRIBUTION UNIT

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING

NEW

DEMOLISH

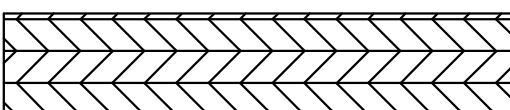
FUTURE

PIPING LINETYPES

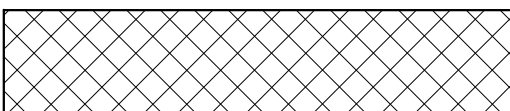
	DOMESTIC COLD WATER (CW)
	SOFTENED COLD WATER (SCW)
	DOMESTIC HOT WATER (HW)
	DOMESTIC HOT WATER RECIRC. (HWR)
	DOMESTIC HOT WATER (140°)
	TRAP PRIMER LINE (T)
	SOIL PIPING - ABOVE FLOOR (S)
	SOIL PIPING - BELOW FLOOR (S)
	WASTE PIPING - ABOVE FLOOR (W)
	WASTE PIPING - BELOW FLOOR (W)
	GREASE WASTE - ABOVE FLOOR (GW)
	GREASE WASTE - BELOW FLOOR (GW)
	COMBINATION GREASE WASTE AND VENT (CGWV)
	COMBINATION WASTE AND VENT (CWV)
	STORM DRAIN - ABOVE FLOOR (ST)
	STORM DRAIN - BELOW FLOOR (ST)
	OVERFLOW STORM DRAIN - ABOVE FLOOR (OST)
	VENT BELOW GRADE (VBG)
	VENT BELOW FLOOR (VBF)
	INDIRECT DRAIN (ID)
	CONDENSATE DRAIN - HIGH EFFICIENCY RTU (CDH)
	CONDENSATE DRAIN (CD)
	AUXILIARY CONDENSATE DRAIN (ACD)
	SUMP OR SEWAGE PUMP DISCHARGE (SPD)
	NATURAL GAS (G)
	NATURAL GAS ON ROOF (G)
	MEDIUM PRESSURE NATURAL GAS (MPG)
	MEDIUM PRESSURE NATURAL GAS ON ROOF (MPG)
	NON-POTABLE WATER (NPW)
	LIQUEFIED PETROLEUM GAS (LPG)
	WATER SERVICE (WS)
	FIRE PROTECTION SPRINKLER DRY (DFP)
	FIRE PROTECTION SPRINKLER WET (FP)
	FIRE PROTECTION STANDPIPE DRY (DSP)
	FIRE PROTECTION STANDPIPE WET (WSP)
	CONDENSATE PUMP DISCHARGE (PD)
	VENT PIPING (V)
	ACID WASTE - ABOVE FLOOR (AW)
	ACID WASTE - BELOW FLOOR (AW)
	ACID VENT (AV)
	GRAY WATER (GWS)
	COMPRESSED AIR (CA)
	MEDICAL AIR (MA)
	MEDICAL VACUUM (VE)
	HELIUM (HE)
	INSTRUMENT AIR (IA)
	INSTRUMENT VACUUM (IV)
	NITROGEN (N2)
	NITROUS OXIDE (N2O)
	OXYGEN (O2)
	EVACWAGAD (EV)
	CARBON DIOXIDE (CO2)
	MEDICAL AIR INTAKE (AI)
	MEDICAL VACUUM EXHAUST (VE)
	DENTAL AIR (DA)
	DENTAL VACUUM (DV)
	FILTERED WATER (FW1)
	FILTERED WATER W/ SCALE INHIBITOR (FW2)
	REVERSE OSMOSIS (RO)
	REVERSE OSMOSIS REMINERALIZATION (ROR)

CALL OUTS

ENLARGED PLAN CALLOUT



NOT IN SCOPE



LSR7 Robotics, GiC & Phys Education

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EXPIRES 12/31/2022

Issue Date: September 5, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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09/09/2022

CARL J. HOLDEN
LICENSE # PE-2020016283

PLUMBING LEGEND
AND GENERAL NOTES
P000



09/22/2022
CARL J. HOLDEN
LICENSE # PE-2020016283

P101-A

0121-0

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P101-B

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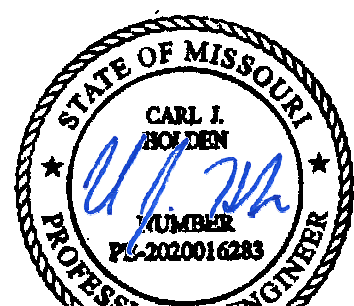
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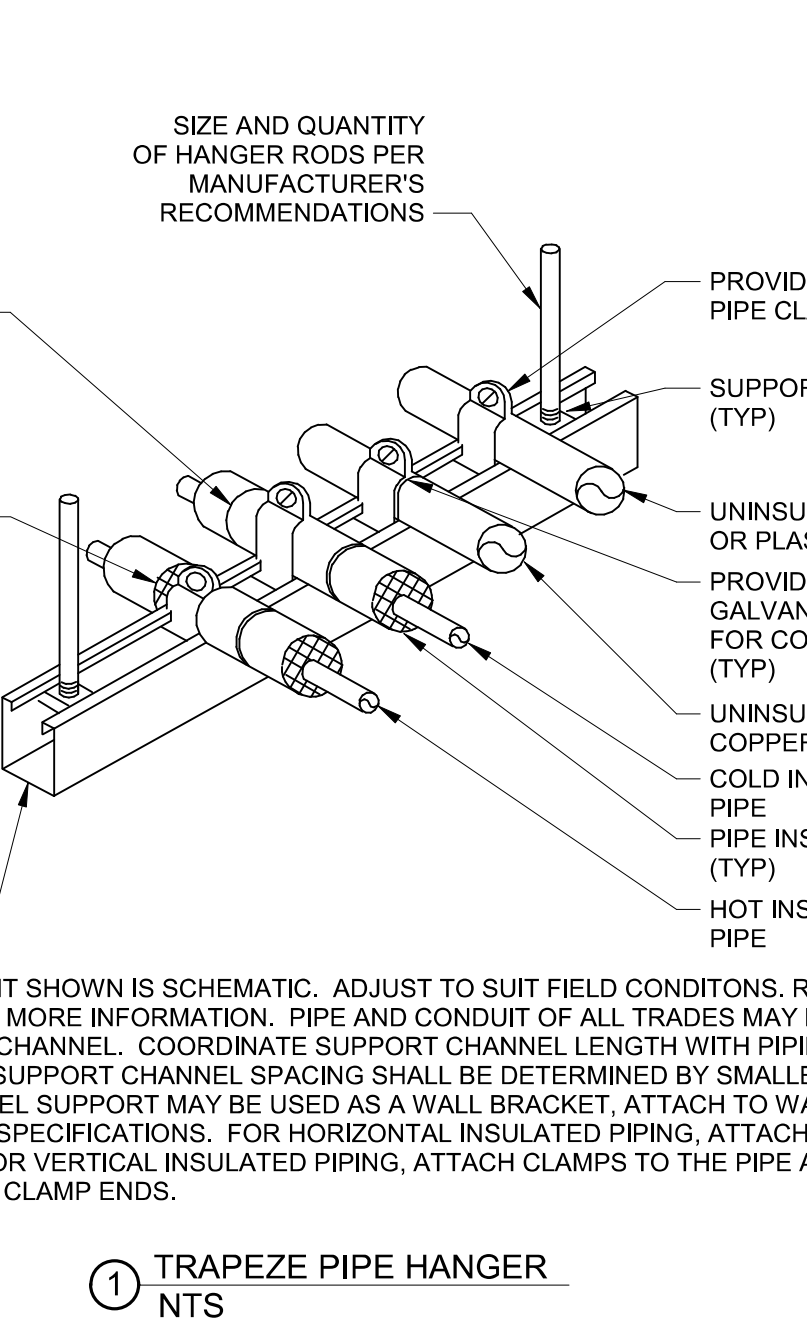
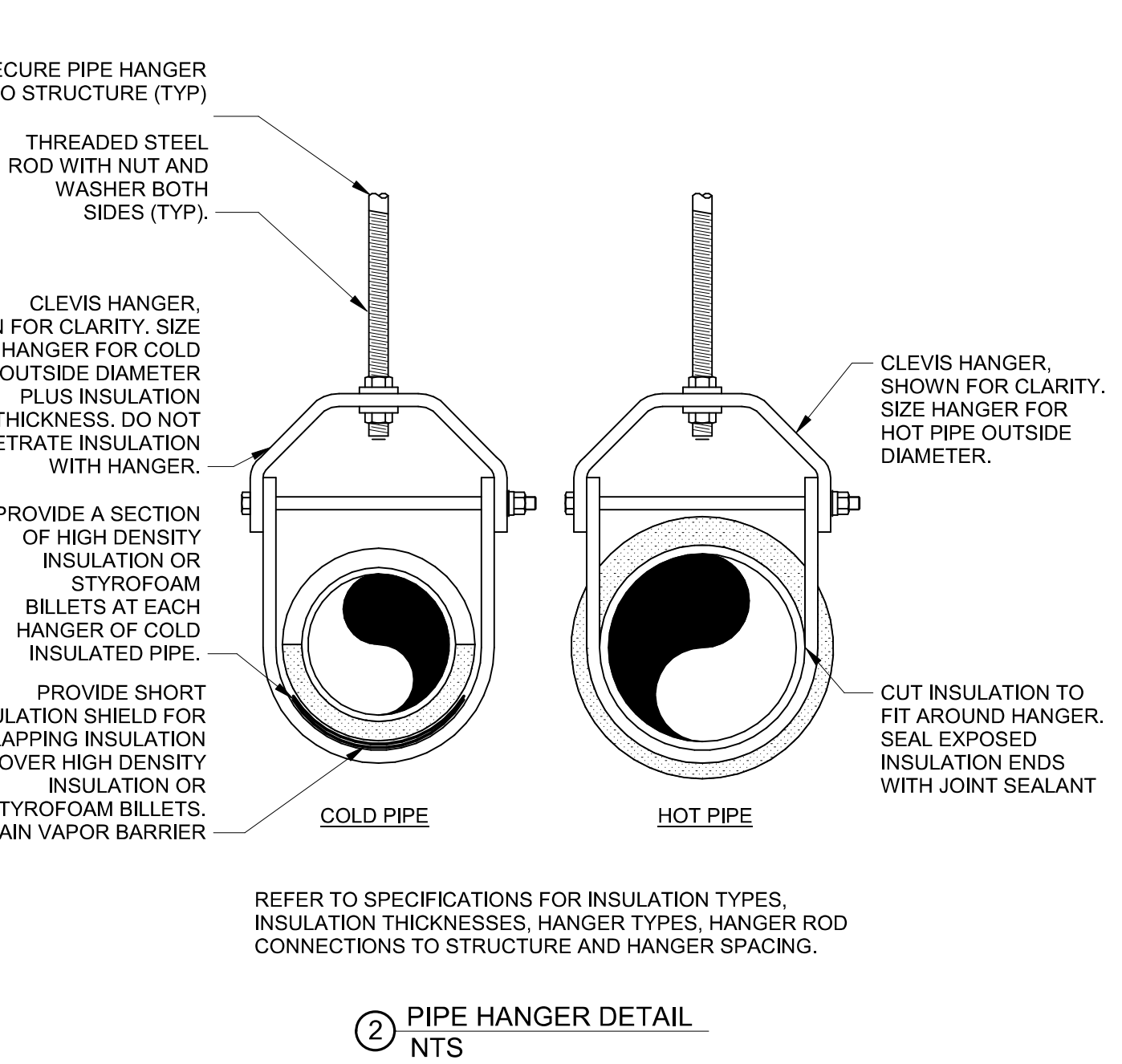
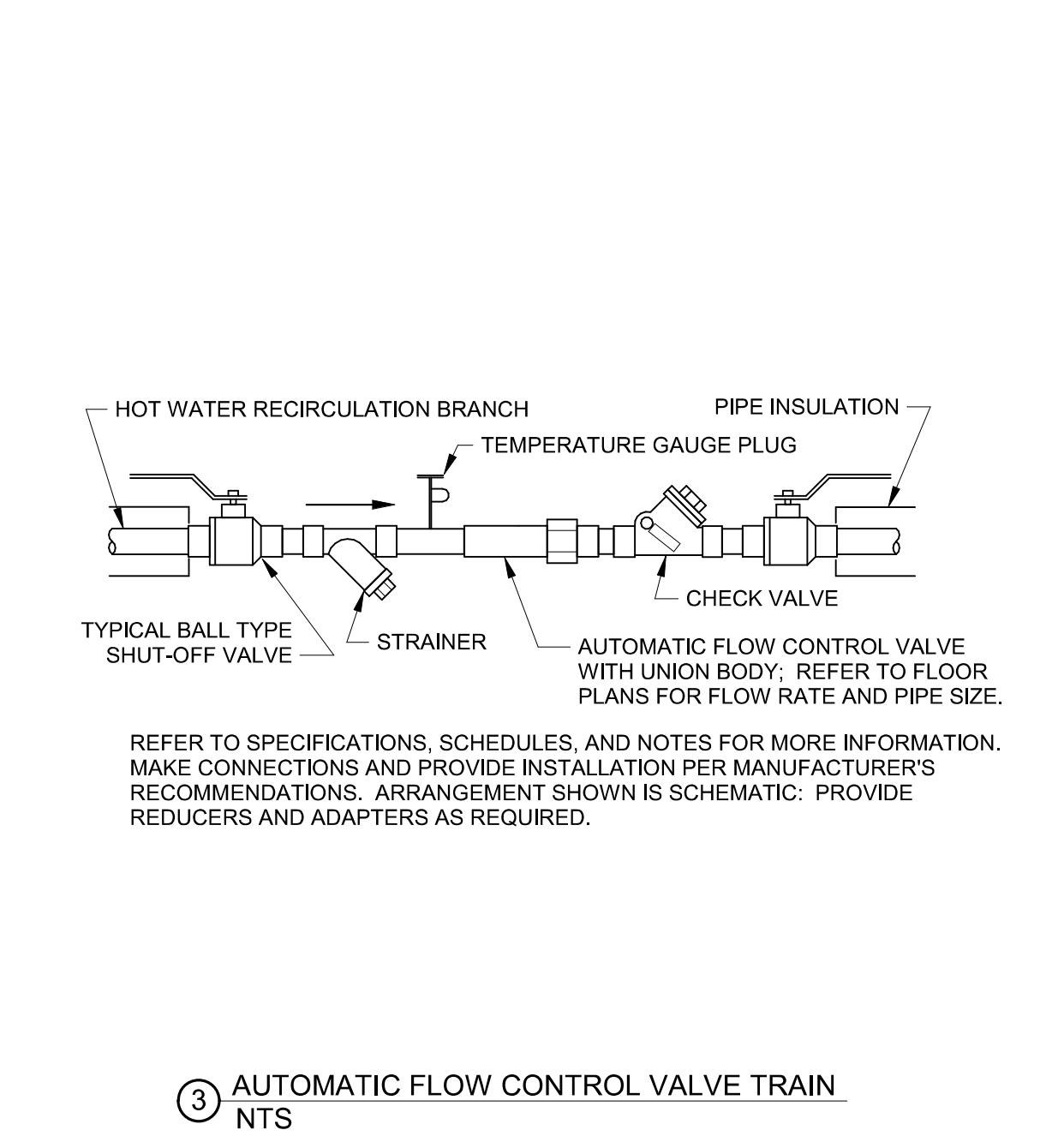
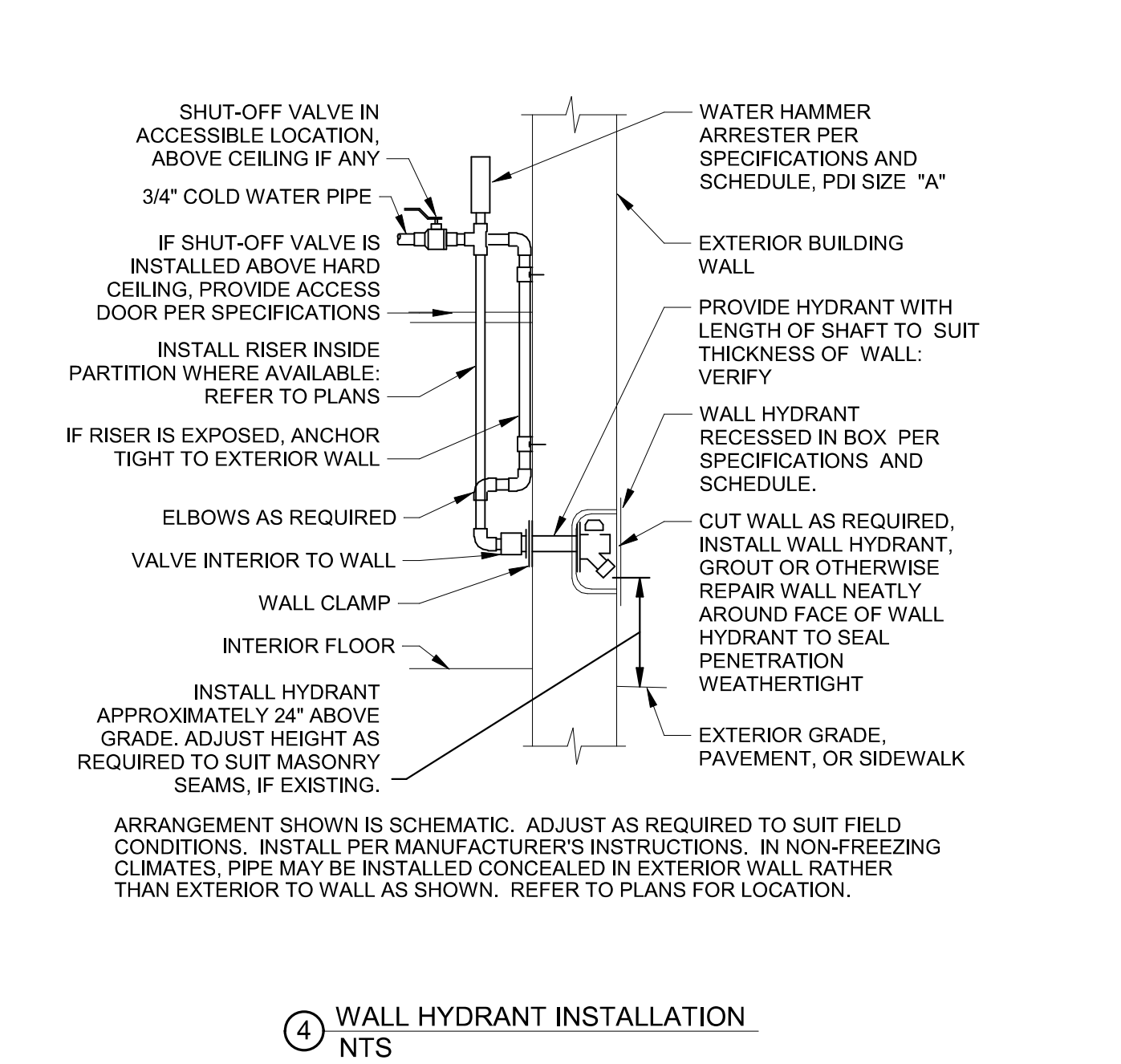
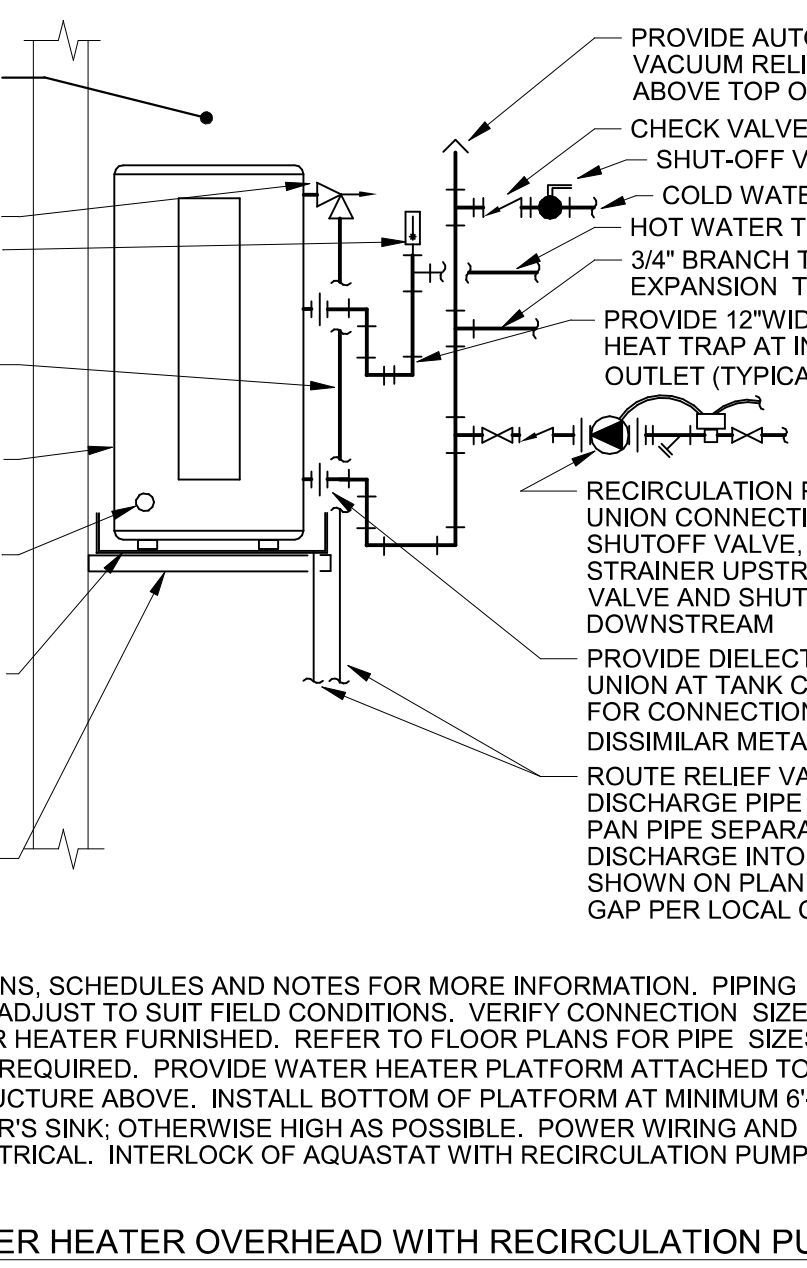
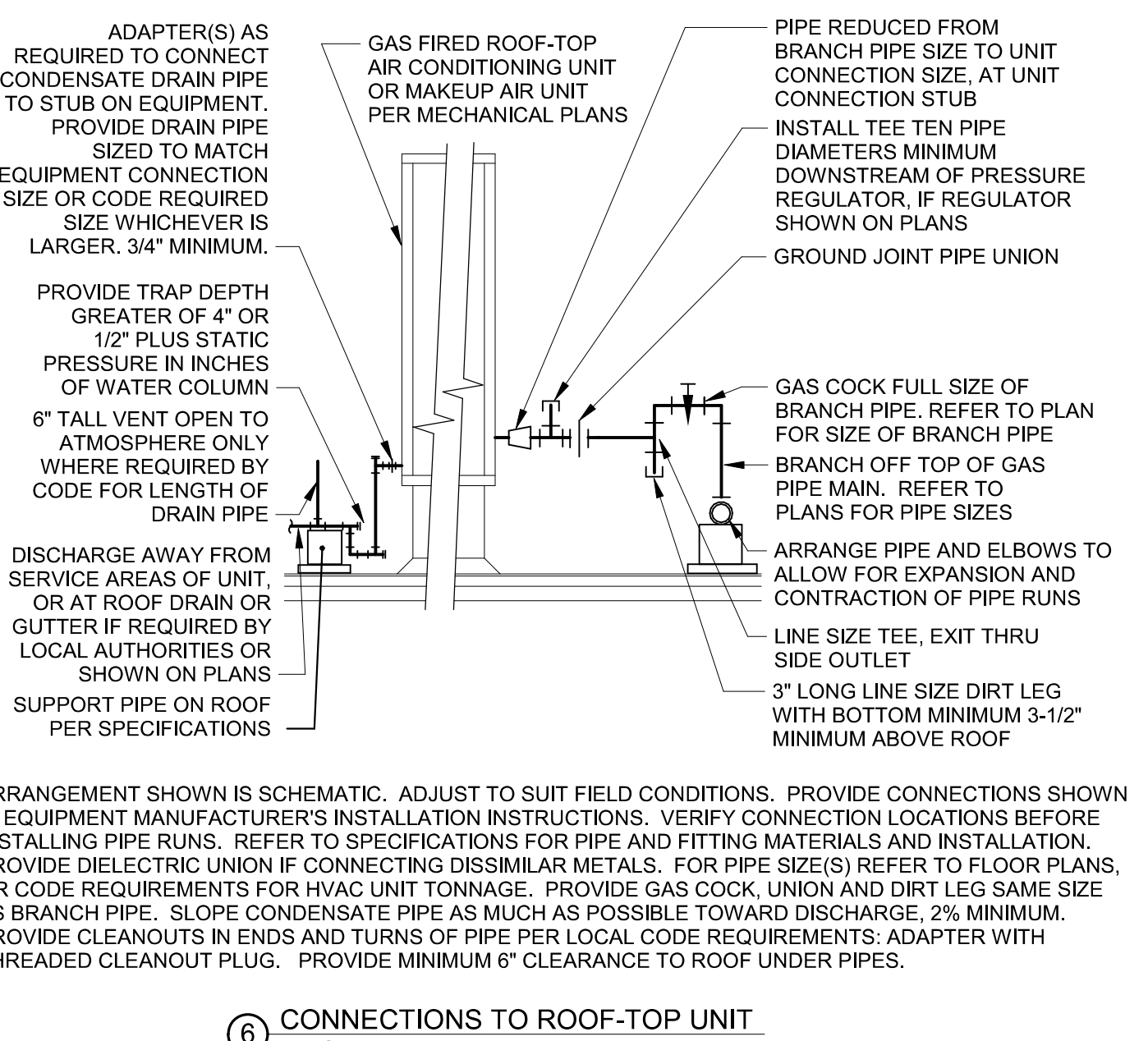
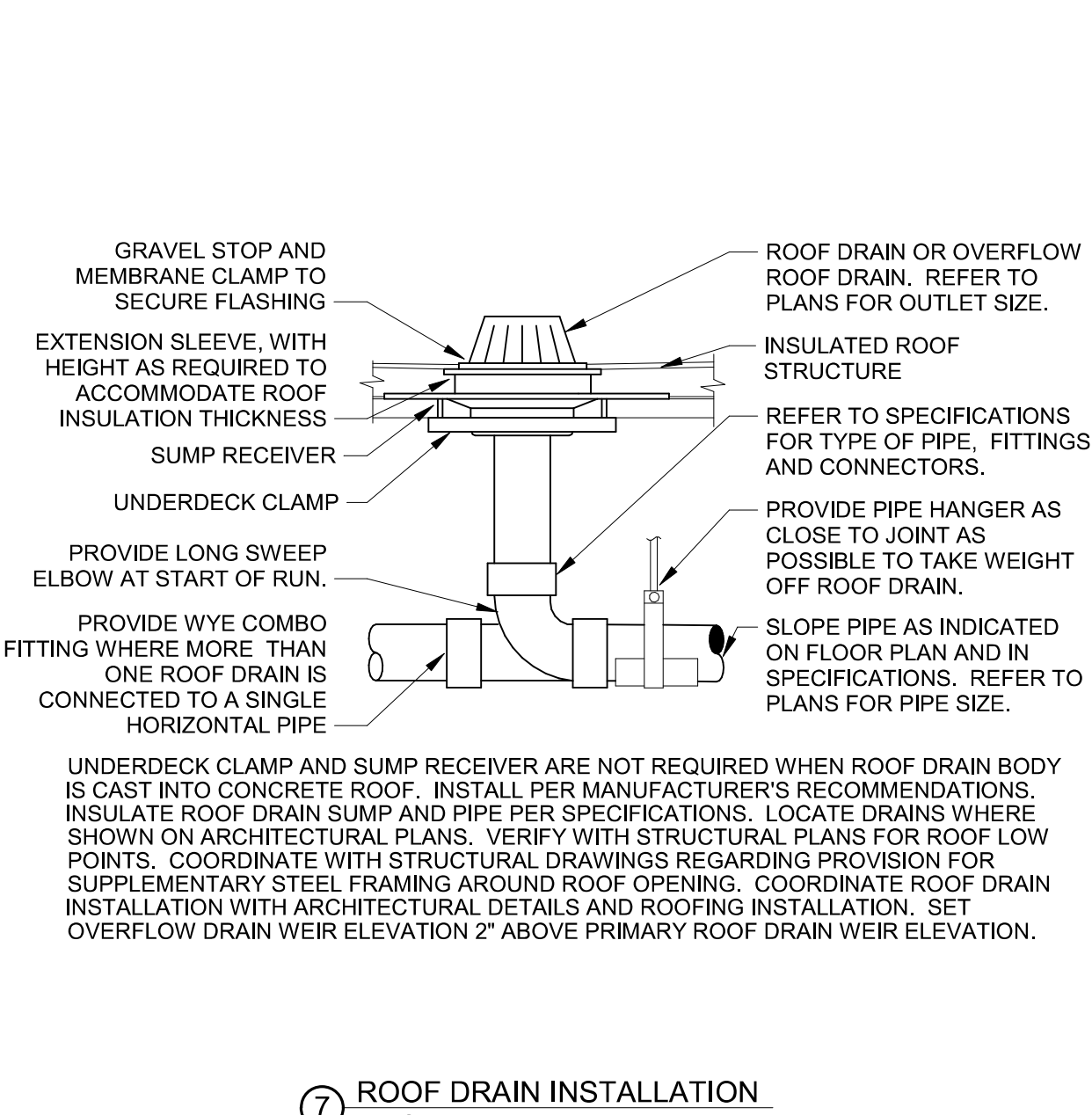
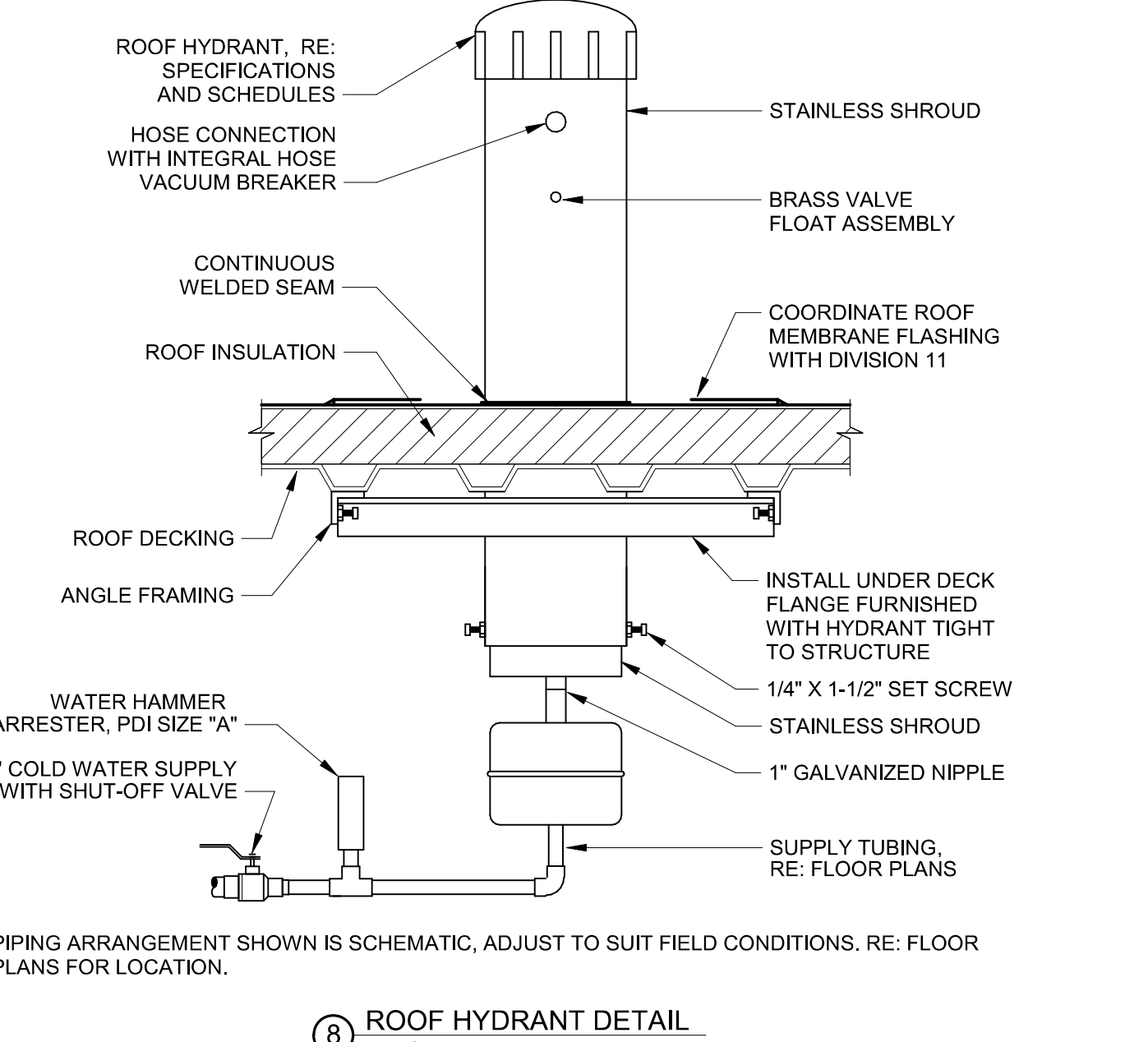
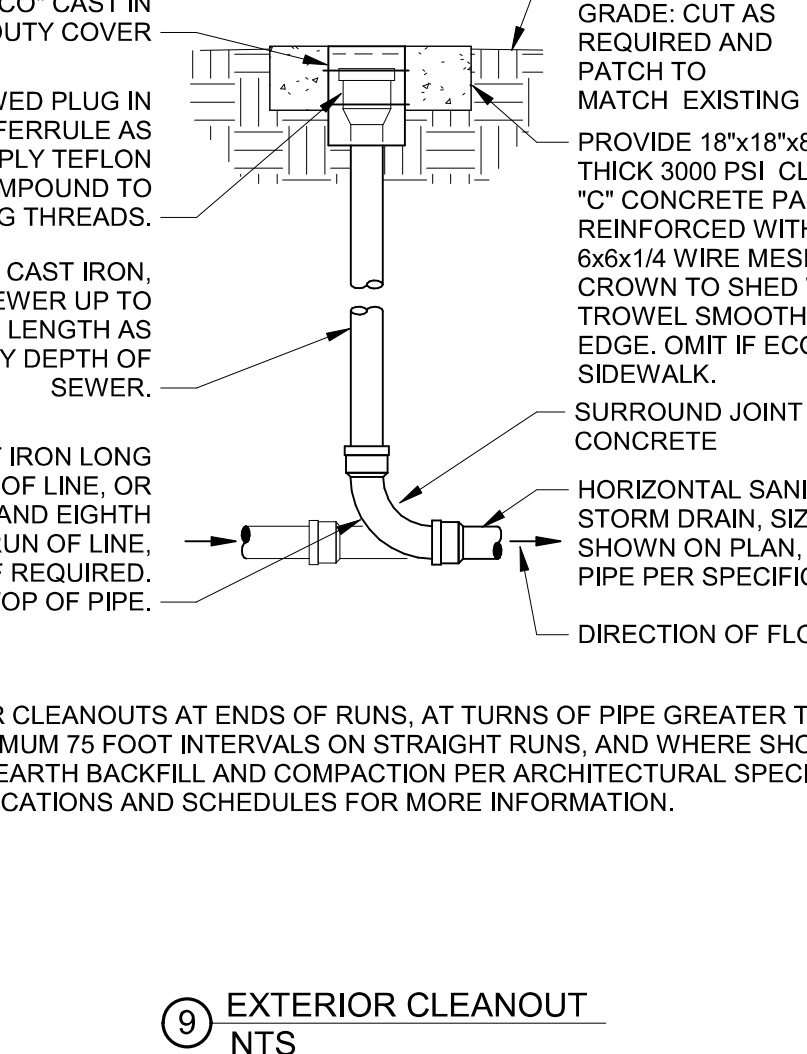
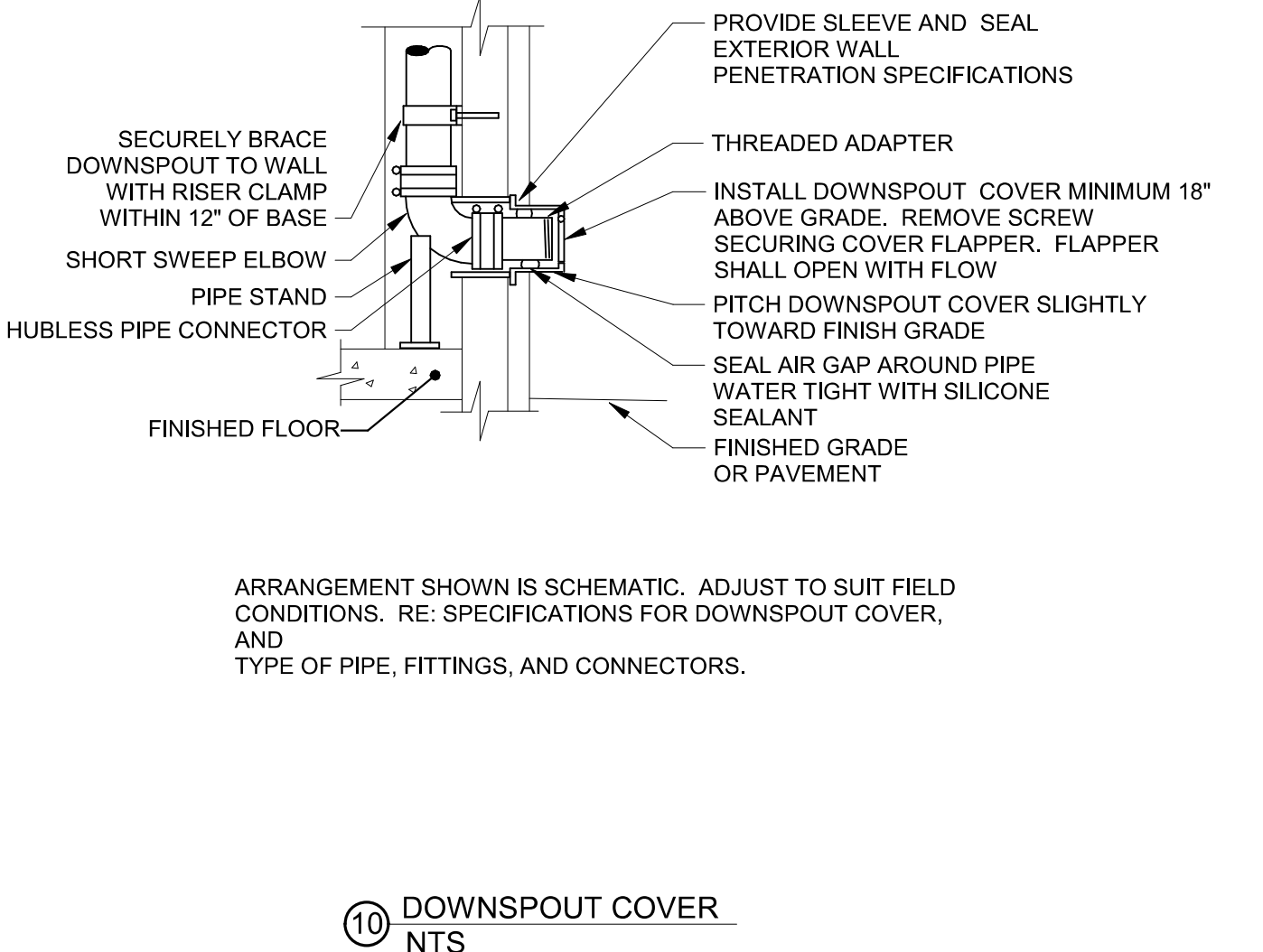
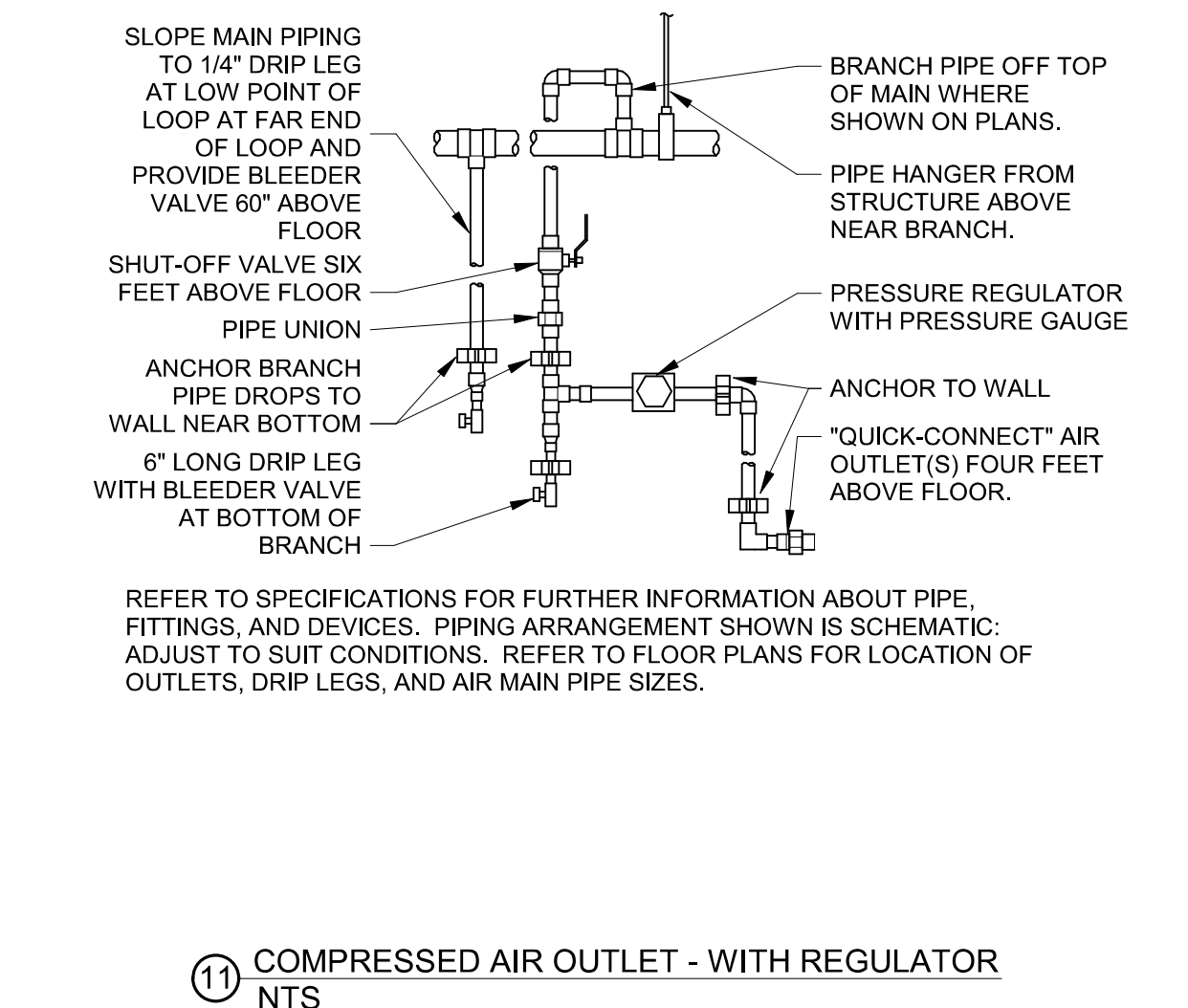
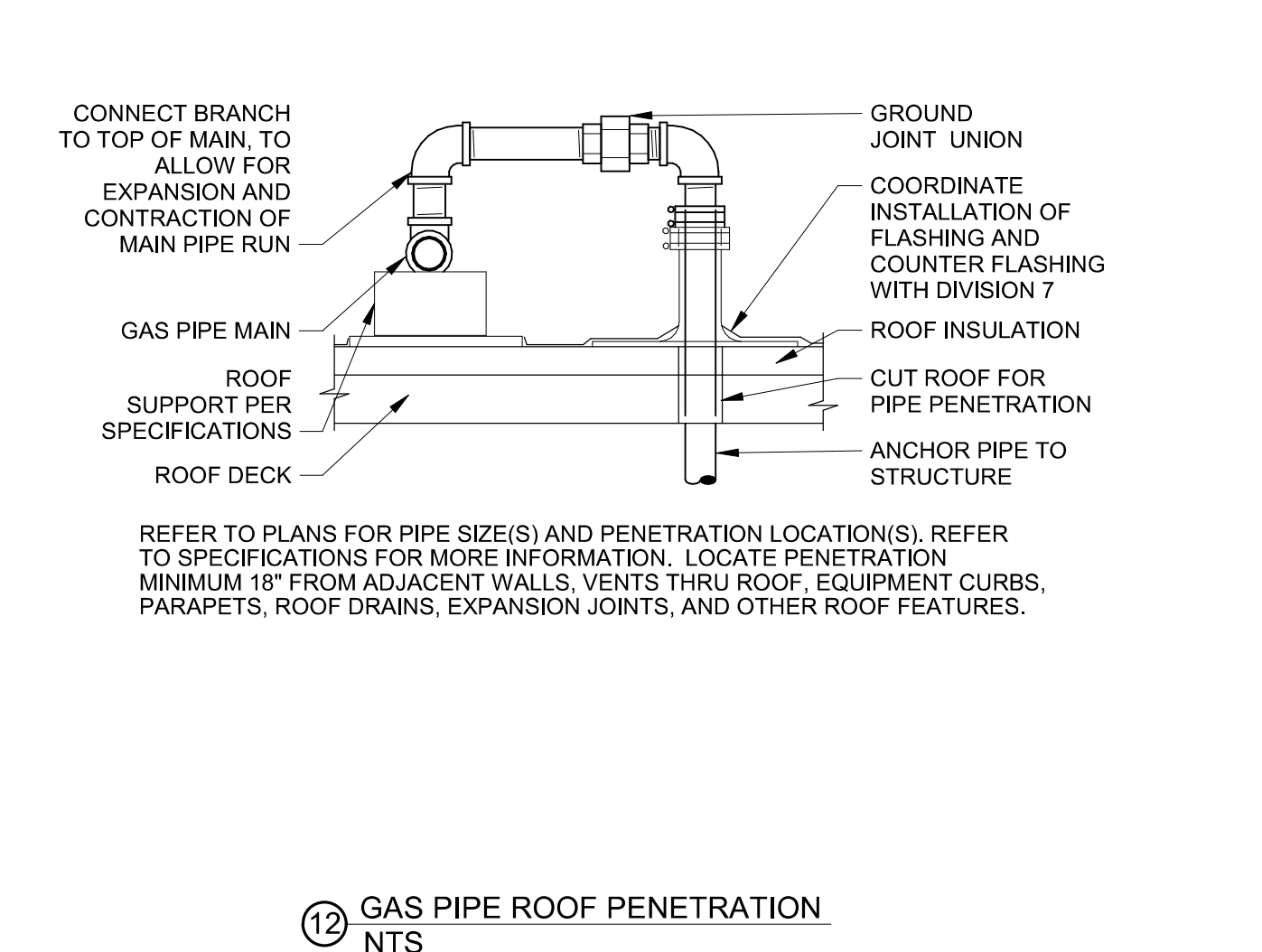
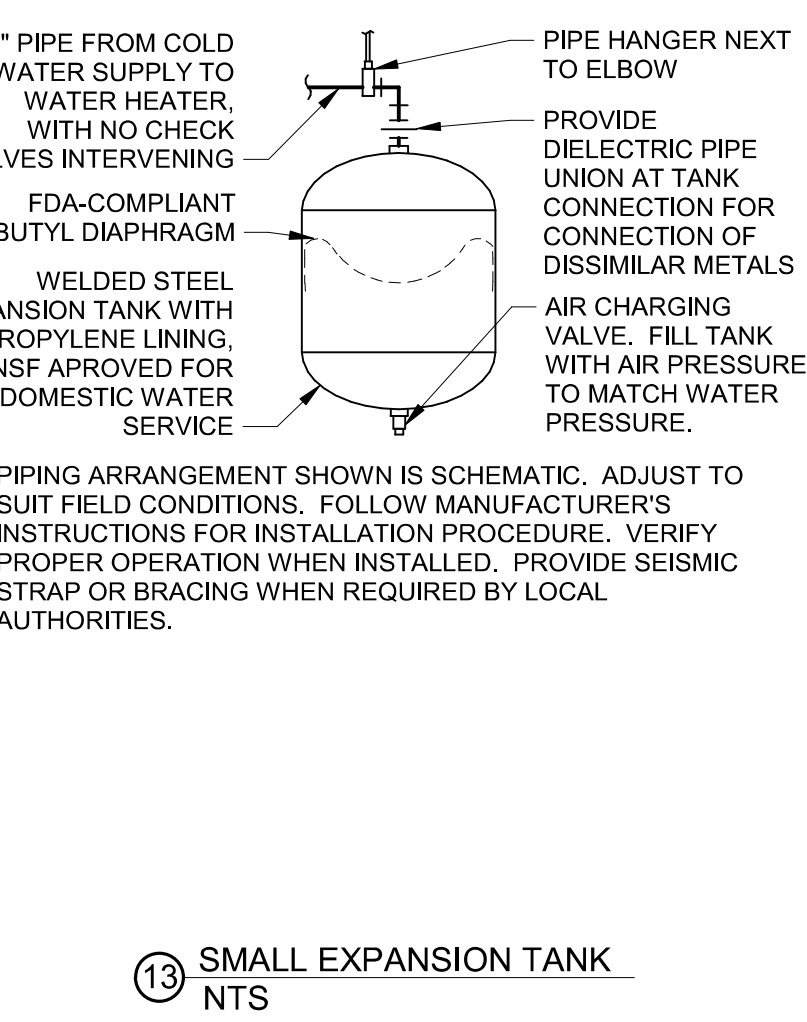
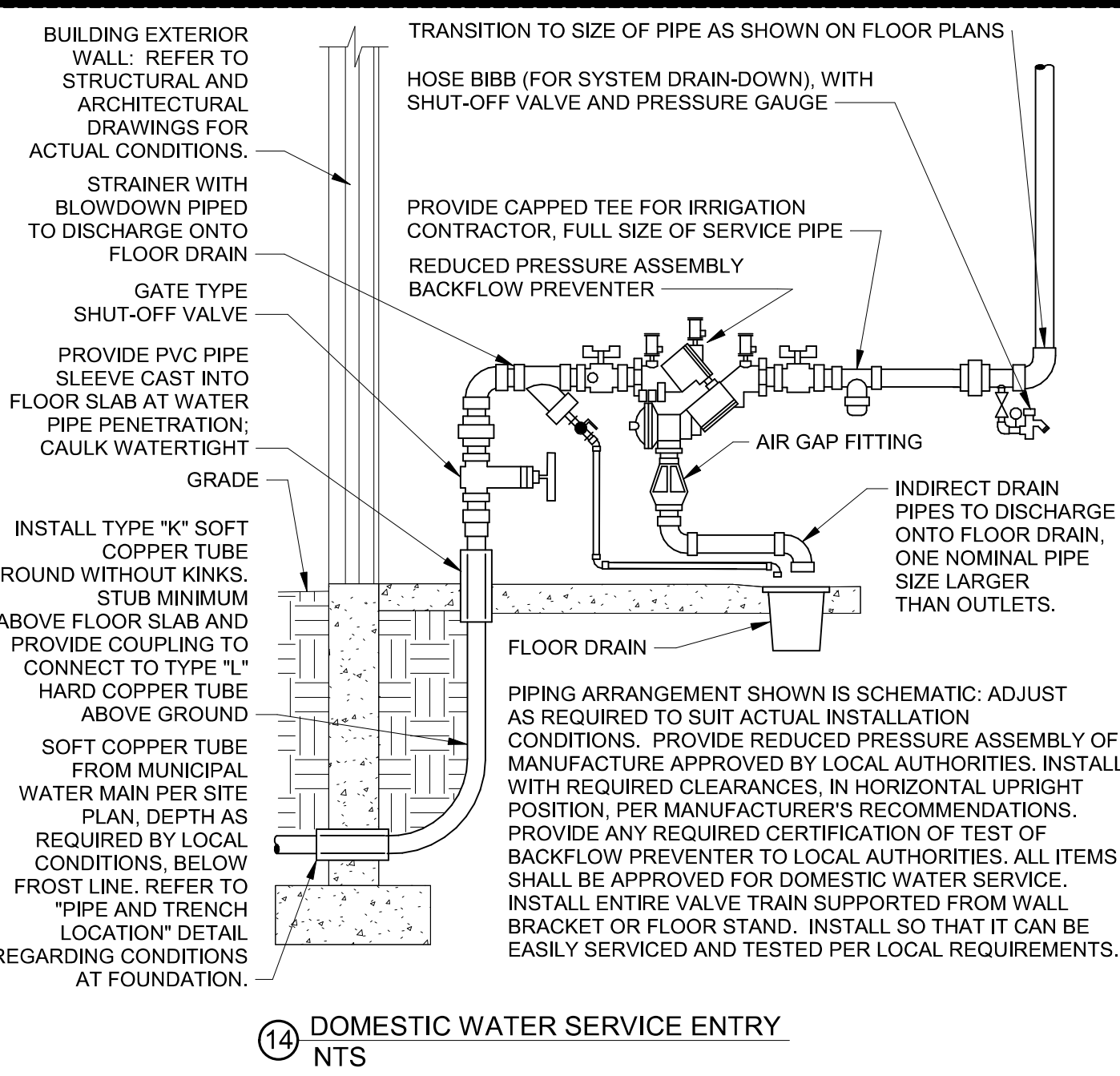
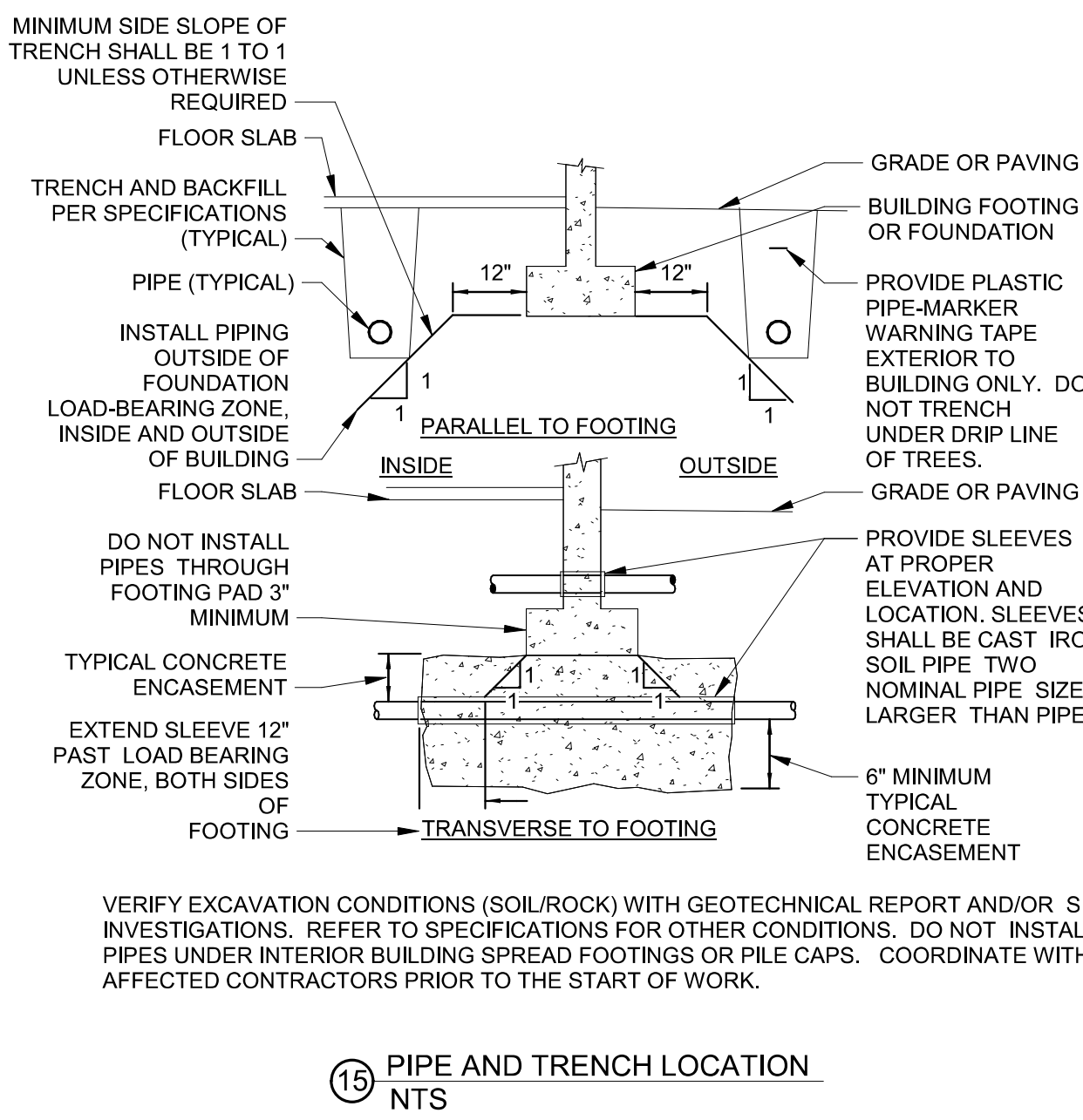
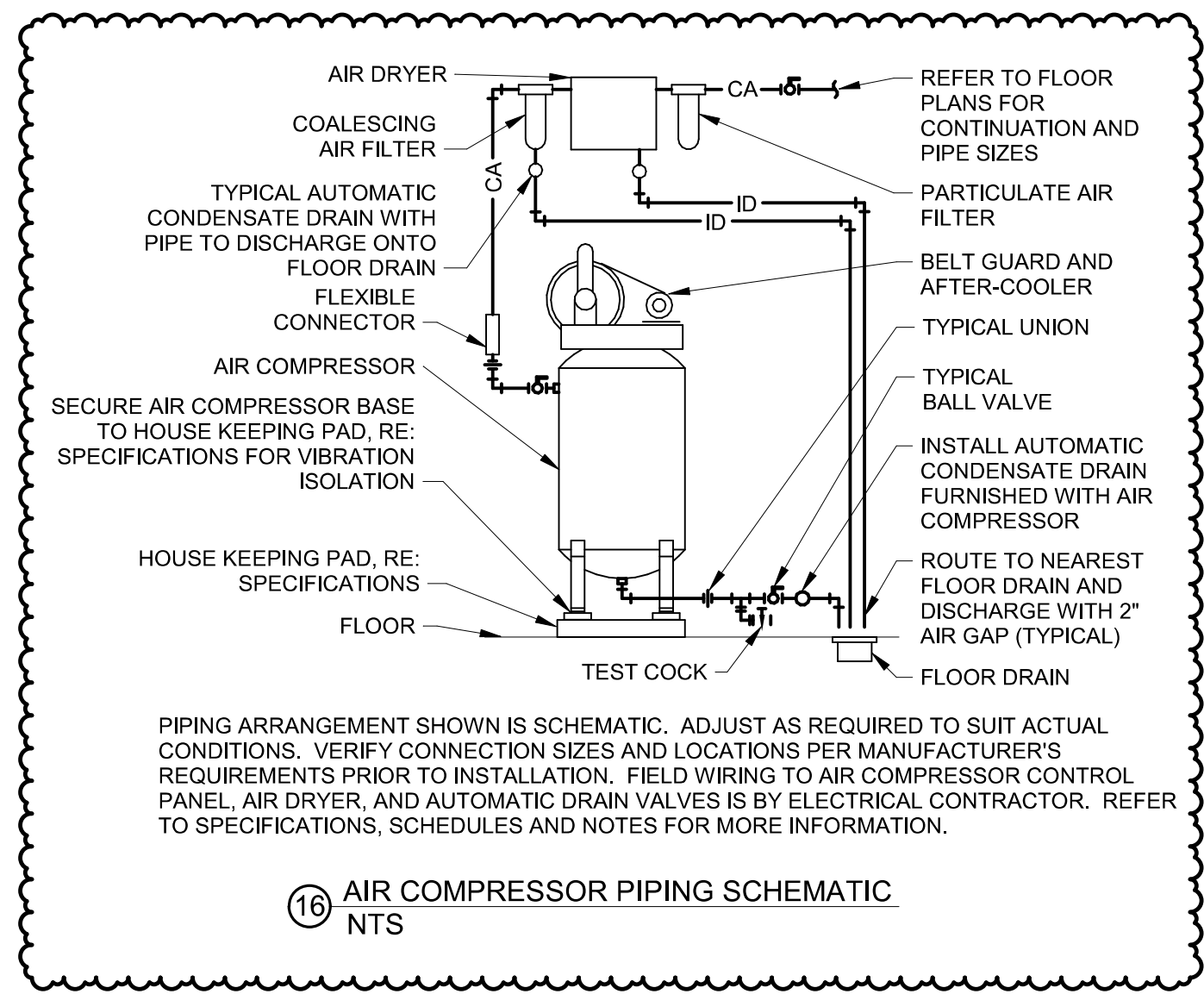
Issue Date: September 9, 2022

NUMBER	DESCRIPTION	DATE
1	Addendum 02	09/13/2022



CARL J. HOLDEN
LICENSE # PE-2020016283

PLUMBING DETAILS
P501



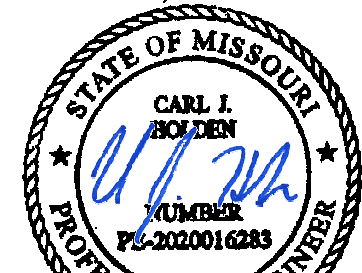
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Issue Date: September 5, 2022

NUMBER	DESCRIPTION	DATE
1	Revisions Addendum 02	09/13/2022



CARL J. HOLDEN
LICENSE # PE-2020016283

PLUMBING SCHEDULES
P601

PLUMBING FIXTURE CONNECTION SCHEDULE

FIXTURE	COLD WATER	HOT WATER	WASTE	VENT
WATER CLOSET (FV)	1-1/4" (NOTE 1)	--	4"	2"
URINAL	3/4" (NOTE 2)	--	2"	2"
LAVATORY	1/2"	1/2"	2"	2"
ELECTRIC WATER COOLER	1/2"	1/2"	2"	2"
JANITOR'S SINK	1/2"	1/2"	2"	2"
FLOOR DRAIN	--	--	2"	2"
SINK	1/2"	1/2"	2"	2"

NOTES:

PIPE SIZES SHOWN ARE MINIMUM, AND ARE FOR INDIVIDUAL SERVICE PIPE SIZES UNLESS NOTED OTHERWISE ON DRAWINGS.

(NOTE 1) PROVIDE 1-1/4" CW TO FLUSH VALVE, REDUCE TO 1" PRIOR TO CONNECTING TO FLUSH VALVE INLET AT INSIDE OF WALL
(NOTE 2) PROVIDE 1" CW TO FLUSH VALVE, REDUCE TO 3/4" PRIOR TO CONNECTING TO FLUSH VALVE INLET AT INSIDE OF WALL

ELECTRIC STORAGE WATER HEATER SCHEDULE

MARK	MANUFACTURER/ MODEL #	AREA SERVED	TANK SIZE (GALLONS)	ELECTRICAL DATA VOLTS PHASE	RECOVERY (GPH)	WEIGHT (LBS)	NOTES
WH1	A.O. SMITH DEL-20	R102	20	277 1 6.0	26	73	A, B, C

NOTES:

- A. 100° TEMPERATURE RISE WITH 140°F OPERATING TEMPERATURE.
- B. SINGLE ELEMENT
- C. "LOW BOY" DESIGN

EXPANSION TANK SCHEDULE

MARK	MANUFACTURER / MODEL #	TANK SIZE (GALLONS)	MIN. ACCEPTANCE VOLUME (GALLONS)	AIR PRESSURE SETTING (PSI)	SERVICE	WEIGHT (LBS)	NOTES
ET1	AMTROL ST-5	2.1	0.882	150	R102	21	A

NOTES:

- A. CHARGE TANK WITH AIR TO IDENTICAL PRESSURE AS STATIC DOMESTIC WATER PRESSURE.

RECIRCULATION PUMP SCHEDULE

MARK	MANUFACTURER / MODEL#	LOCATION	GPM	HEAD (FT.)	CONNECTION SIZE	IMPELLER SIZE (IN.)	VOLTS	PHASE	HP	NOTES
RP1	BELL & GOSSETT # NBF-12ULW	R102	1.5	10.4	3/4"	3.69	115	1	7/85	A, B, C, D, E

NOTES:

- A. ALL LEAD FREE CAST BRONZE BOOSTER.
- B. PROVIDE WITH STRAINER UPSTREAM OF PUMP
- C. PROVIDE ADJUSTABLE, SURFACE MOUNTED AQUASTAT - HONEYWELL 16096C
- D. SET AQUASTAT TO SHUT OFF RECIRCULATION PUMP AT WATER HEATER SET POINT AND ON AT 10° BELOW SET POINT
- E. INTERLOCK PUMP "ON" - "OFF" CONTROL WITH BUILDING AUTOMATION SYSTEM, RE: MECH DRAWINGS

AIR COMPRESSOR SCHEDULE

MARK	MANUFACTURER/ MODEL#	LOCATION	TYPE	ACCUMULATOR CAPACITY (GAL)	COMPRESSOR CAPACITY NOTE B	ELECTRICAL DATA VOLTS PHASE	HP	WEIGHT (LBS)	NOTES
AC	CHAMPION #VR10-8	R109	D	80	34.7 SCFM @ 125 PSIG	208 3	10	723	C & D

NOTES:

- A. S = SIMPLEX, TANK MOUNTED, D = DUPLEX, TANK MOUNTED
- B. FOR ONE COMPRESSOR ONLY
- C. SET OUTLET PRESSURE TO 125 PSIG
- D. SEE SPECIFICATIONS FOR MORE INFORMATION

LOW PRESSURE GAS
PIPE SIZING CHART

PIPE SIZE	LOAD (CFH)
1/2"	37
3/4"	77
1"	145
1-1/4"	299
1-1/2"	448
2"	862
2-1/2"	1,374
3"	2,428
4"	4,953
5"	8,961
6"	14,510
8"	29,912
10"	54,146
12"	85,720

FOR SCHEDULE 40 STEEL PIPE
OPERATING PRESSURE OF 7"WC WITH A
PRESSURE DROP OF 0.5"WC
TOTAL DEVELOPED
LENGTH (FEET) =
175
BASED ON NFPA 54 EQUATION 4-1

TOTAL CONNECTED NATURAL GAS LOAD - LSW

EQUIPMENT DESIGNATION	DESCRIPTION	CFH (EACH)
RTU 1W	ROOFTOP UNIT	300
RTU 2W	ROOFTOP UNIT	200
TOTAL CONNECTED LOAD =		500

NATURAL GAS SYSTEM OPERATING PRESSURE:
NATURAL GAS SYSTEM SIZED WITH TOTAL DEVELOPED LENGTH FROM
GAS METER TO MOST REMOTE PIECE OF EQUIPMENT:
SYSTEM DESIGN PRESSURE DROP:
7" WC
175 FEET
0.5" WC

TOTAL CONNECTED NATURAL GAS LOAD - LSN

EQUIPMENT DESIGNATION	DESCRIPTION	CFH (EACH)
RTU 1N	REMOTE TERMINAL UNIT	300
RTU 2N	REMOTE TERMINAL UNIT	200
TOTAL CONNECTED LOAD =		500

NATURAL GAS SYSTEM OPERATING PRESSURE:
NATURAL GAS SYSTEM SIZED WITH TOTAL DEVELOPED LENGTH FROM
GAS METER TO MOST REMOTE PIECE OF EQUIPMENT:
SYSTEM DESIGN PRESSURE DROP:
7" WC
175 FEET
0.5" WC

WATER PIPE SIZING CHART (IPC) BRANCHES

FIXTURE UNITS VS. PRESSURE LOSS IN PSI / 100 FEET FOR TYPE "L" COPPER TUBE								
COLD WATER @ 2.50 PSI / 100'					HOT WATER @ 2.5 PSI / 100'			
PIPE SIZE	INTERNAL DIAMETER SFU	FLUSH TANK SFU	FLUSH VALVE SFU	VELOCITY FEET / SEC	FLOW GPM	FLUSH TANK SFU	VELOCITY FEET / SEC	FLOW GPM
1/2"	0.545	0.5	N/A	2.3	1.6	*	*	*
3/4"	0.765	1.6	N/A	2.9	4.3	*	*	*
1"	1.025	4.4	N/A	3.4	8.6	*	*	*
1-1/4"	1.265	10.6	5.0	3.9	15.0	*	*	*
1-1/2"	1.505	31.6	8.6	4.3	23.8	*	*	*
2"	1.985	126.0	48.3	5.1	49.3	120.9	5	48.2
2-1/2"	2.465	311.2	187.7	5.9	87.2	246.8	5	74.3
3"	2.945	583.1	476.8	6.6	139.3	406	5	106.1
4"	3.905	1710.4	1710.4	7.8	292.5	859.4	5	186.6
6"	5.845	5269.9	5269.9	8.0	669.0	2859.7	5	418.1
8"	7.725	10143.1	10143.1	8.0	1168.6	5653.3	5	730.3

SIZED WITH HAZEN-WILLIAMS CONSTANT "C" = 140

*UTILIZE COLD WATER SIZING CHART

PLUMBING FIXTURE SCHEDULE - LSW & LSN

PLUMBING PLAN MARK	DESCRIPTION
ACD1	AUTOMATIC CONDENSATE DRAIN: ARROW # 57025 TIMER CONTROLLED SOLENOID DRAIN VALVE WITH MOUNTING KIT, PROVIDE WITH ARROW 5 STRAINER # S202, ELECTRICAL REQUIREMENTS: 120-VOLT SINGLE PHASE.
AF1	AIR FILTER: HANKISON # HF-24-16-4-X-G COALESCING CARTRIDGE TYPE WITH METAL HOUSING AND DIFFERENTIAL PRESSURE INDICATOR AND EXTERNAL DRAIN ADAPTER. FILTER SHALL BE CAPABLE OF REMOVING PARTICLES TO 3 MICRON AND AEROSOLS TO 5 PPM AT 60 SCFM AT 100PSI.
APR	AIR PRESSURE REGULATOR: WILKERSON #WR-8, ALUMINUM BODY, BRASSVALVE STEM, NITRILE DIAPHRAGM AND SEALS, OUTLET PRESSURE GAGE, 3/8" FNPT CONNECTIONS AND MAXIMUM FLOW OF 10 SCFM AT 100PSI.
BFP1	REDUCED PRESSURE ZONE BACKFLOW PREVENTER: WATTS # LF909QT-S, MEETING ASSE 1013, LEAD FREE CAST BRONZE BODY, QUARTER TURN TEST COCKS, QUARTER TURN BALL VALVES, BRONZE STRAINER, AND # 50048 1/4" AIR GAP. PROVIDE 1/2" NPT INLET AND 1/2" NPT OUTLET. HANG WITH SHOCK LOADED "EZ-COIL REWIND SAFETY SYSTEM" WITH LOW RETRACTION SPEED, BRASS BEARING AND 30 FEET OF 1/2" LOW PRESSURE AIR HOSE WITH A MAXIMUM PRESSURE RATING OF 160 PSIG. PROVIDE WITH 4-WAY ROLLER BRACKET #4R8, PROVIDE WITH MOUNTING BRACKET KIT FOR MOUNTING SINGLE HOSE REEL # 15723 EZUP BRACKET, PROVIDE WITH # 5155-1.5 3/4" X 24" INCH LOW PRESSURE HOSE FOR CONNECTION FROM THE COMPRESSED AIR LINE TO THE HOSE REEL INLET. PROVIDE WITH QUICK DISCONNECT (QDC) DESCRIBED ELSE WHERE IN THIS PLUMBING FIXTURE SCHEDULE.
CDB	CONDENSATE DRAIN BOX: SIOUX CHIEF "OXBOX" MODEL # #66-3 OUTLET BOX, MODEL #66-6 CF 2" SCH 40S DRAINAGE PUMP, AND #R-2C 2" SOLID COVER, 2" NPT MOUNTING FLANGE.
DSC	DISCONNECT COUPLER: JAY R. SMITH # 1175, ROUND FABRICATED STAINLESS STEEL ROUND COVER WITH FABRICATED SECURED PERFORATED STAINLESS STEEL HINGED COVER, PROVIDE OUTLET SIZE AS SHOWN ON PLANS.
ECO	EXTERIOR CLEANOUT: EXTERIOR CLEANOUT: JAY R. SMITH # 4261L SERIES DUCO CAST IRON DOUBLE FLANGED HOUSING WITH HEAVY DUTY SECURED SCORATED CAST IRON COVER WITH LIFTING DEVICE AND CLEANOUT BODY WITH ABS PLASTIC PLUG WITH GASKET SEAL AND PUSH-ON JOINT. REFER TO SPECIFICATIONS FOR INSTALLATION. CLEANOUT COVERS SHALL HAVE EITHER "SANITARY" OR "STORM" DESIGNATION AND BE IDENTIFIED BY COLOR CODE.
EWC	ELECTRIC WATER COOLER (ADA ACCESSIBLE): ELKAY # VCGR9NWSK VANDAL-RESISTANT, WALL-MOUNTED, LEAD FREE, WATER COOLER WITH BOTTLE FILLING STATION, MECHANICAL FRONT PUSH BUTTON, STAINLESS STEEL FINISH, VANDAL-RESISTANT BUBBLER, CHILLER WITH 8.0 GALLONS PER HOUR CAPACITY, 50°F DRINKING WATER AT 80°F INLET TEMPERATURES 90°F ROOM TEMPERATURE
FC	BOTTLE FILLING STATION: ELECTRONIC SENSOR FOR TOUCHLESS ACTIVATION WITH AUTO 20-SECOND SHUT-OFF TIMER, UNIT PROVIDES 1.1-1.5 GPM WITH LAMINAR FLOW TO MINIMIZE SPLASHING.
FCV	TRIM: MCGUIRE # LF2165LKS512 LEAD FREE BRASS COMPRESSION ANGLE STOP VALVE WITH STAINLESS STEEL BRAIDED RISER AND ESCUTCHEON, MCGUIRE # B8912CF 1-1/2" 17 GAUGE CAST CHROME PLATED BRASS ADJUSTABLE R-TRAP AND WASTE ARM WITH CLEANOUT PLUG AND ESCUTCHEON, AND SUITABLE CARRIER WITH STANCHIONS TO FLOOR, INSTALL "WCO" UNDERNEATH WASTE CONNECTION.
FCV	ELECTRICAL REQUIREMENTS: 115-VOLT, 4.5 FULL LOAD AMPS.
FCV	FLEXIBLE CONNECTOR: UNITED FLEXIBLE FABRY, 3/4" X 1/2" LONG CORUGATED, 1/2" NPT LONG CORUGATED, STEEL BELLOWS AND 304 STAINLESS STEEL SINGLE BRAID WITH MALE NPT THREADED CONNECTIONS WITH INTEGRAL HEX AND WITH AN INHIBITING OPERATING PRESSURE OF 100PSI.
FCV	FLOOR CLEANOUT: JAY R. SMITH, CAST IRON BODY, FLASHING FLANGE WITH CLAMPING COLLAR, ABS PLUG AND ADJUSTABLE, ROUND, SECURED, NICKEL BRONZE, TOP: # 4031L (F-C), SCORATED TOP FOR EXPOSED, FLUSH WITH FINISHED FLOOR, APPLICATION(S), # 4031L (F-C-Y), STAINLESS STEEL MARKER FOR INSTALLATION IN CARPETED FLOOR AREAS, # 4151 (F-C), 1/8" RECESS FOR INSTALLATION IN TILED FLOOR AREAS(S), # 4191 (F-C), 1/2" RECESS FOR INSTALLATION IN TERRAZZO AND SIMILAR POURED FLOOR AREAS(S). REFER TO SPECIFICATIONS FOR INSTALLATION. CLEANOUT COVERS SHALL HAVE EITHER "SANITARY" OR "STORM" CAST INTO THE COVER TO IDENTIFY SYSTEM SERVICE.
FD1	FLOOR DRAIN: JAY R. SMITH # 209L (A), CAST IRON BODY AND CLAMPING COLLAR, ADJUSTABLE 6" ROUND NICKEL BRONZE STRAINER, PROVIDE TRAP PRIMER PORT IF TRAP PRIMER IS PROVIDED ON THE DRAWINGS. USE PUSH-ON JOINT OF OUTLET SIZE AS SHOWN ON PLANS.
FD2	FLOOR DRAIN: JAY R. SMITH # 209L (A), CAST IRON BODY AND CLAMPING COLLAR, ADJUSTABLE 8" ROUND NICKEL BRONZE STRAINER, PROVIDE TRAP PRIMER PORT IF TRAP PRIMER IS PROVIDED ON THE DRAWINGS. USE PUSH-ON JOINT OF OUTLET SIZE AS SHOWN ON PLANS.
HB	HOSE BIBB: PRIER PRODUCTS # C-258NCP-75, POLISHED NICKEL PLATED BRASS 3/4" MALE INLET, 3/4" THREADED HOSE CONNECTION, LOOSE KEY HANDLE, AND ASSE 1011 INTEGRAL VACUUM BREAKER.
IMB	FIRE RATED ICE MAKER BOX: GUY GRAY MODEL # FRMB12ABDS, ASTM E814 LISTED, WHITE POWDER COAT ON COLD ROLLED STEEL BOX WITH TWO INTUMESCENT PADS ATTACHED, BOTTOM INLET WATER SUPPLY WITH 1/2" X 1/4" LEAD FREE COMPRESSION ANGLE STOP VALVE.
JS	JANITOR'S SINK: STERN-WILLIAMS # MTS-2424, 24" x 24" x 10" HIGH TERRAZZO BASIN WITH INTEGRAL STAINLESS STEEL DRAIN BODY.
JS	FAUCET: CHICAGO FAUCET # B87CP FAUCET WITH WALL BRACE, INTEGRAL VACUUM BREAKER, PAIL HOOK, AND 3/4" MALE HOSE THREADED OUTLET. SECURE FAUCET IN WALL WITH BACKBOARD. TRIM: # BP TYPE 304, 20 GAUGE, STAINLESS STEEL WALL SURROUNDS, # T-35 THREE FOOT LONG REINFORCED HOSE WITH 3/4" CHROME COUPLING AND WALL HOOK, # V-70 EXTRUDED VINYL BUMPER GUARD, AND # T-40 24" STAINLESS STEEL MOP HANGER.
LV	WALL-MOUNTED LAVATORY (ADA ACCESSIBLE): AMERICAN STANDARD # 0356.421 "LUCERNE" 20-1/2" X 18-1/4" RECTANGULAR WALL MOUNTED WHITE VITREOUS CHINA FIXTURE WITH FAUCET LEDGE AND FRONT OVERFLOW.
LV	FAUCET: TOTO # TEL105-D10E #CP DECK-MOUNT, HYDRO-POWERED, LEAD-FREE, SENSOR OPERATED FAUCET, BATTERY BACK-UP, 0.5 GPM (0.09 GALLONS PER CYCLE), AND VANDAL RESISTANT AERATOR.
NW	TRIM: MCGUIRE # LF2165LKS512 LEAD FREE BRASS QUARTER TURN, LOOSE KEY, COMPRESSION ANGLE STOP VALVES WITH STAINLESS STEEL BRAIDED RISERS AND ESCUTCHEONS, MCGUIRE # B8872CF 1-1/4" 17 GAUGE CAST CHROME PLATED BRASS ADJUSTABLE R-TRAP AND WASTE ARM WITH CLEANOUT PLUG AND ESCUTCHEON, PLUMBEX® "PRO-EXTREME" # X-4222 INSULATION KIT FOR WATER AND WASTE PIPES.
NW	THERMOSTATIC MIXING VALVE: POWERS # LFQ480, SOLID LEAD-FREE BRASS OR BRONZE BODY, THERMOSTATIC WAX ELEMENT, CORROSION RESISTANT INTERNAL PARTS, AND INTEGRAL CHECKS, ASSE 1070 COMPLIANT, CAPABLE OF 1.6 GPM WITH A 20 PSI DIFFERENTIAL AND A MINIMUM FLOW RATE OF 0.25 GPM. SET TEMPERATURE TO 109°, PROVIDE WITH MOUNTING BRACKET, MOUNT BELOW THE PLUMBING FIXTURE WHERE INDICATED ON PLANS).
NW	TRIM: MCGUIRE # LF2165LKS512 LEAD FREE BRASS QUARTER TURN, LOOSE KEY, COMPRESSION ANGLE STOP VALVES WITH STAINLESS STEEL BRAIDED RISERS AND ESCUTCHEONS, MCGUIRE # 151 CUP STRAINER WITH 1-1/2" 17 GAUGE TAILPIECE, MCGUIRE # B8912CF 1-1/2" 17 GAUGE CAST CHROME PLATED BRASS ADJUSTABLE R-TRAP WITH BRASS CLEANOUT AND ESCUTCHEON.
NW	NON-FREEZE WALL HYDRANT: PRIER PRODUCTS # C-634NBX1, SATIN NICKEL PLATED BRASS 1" MALE INLET BY 3/4" FEMALE INLET, 3/4" THREADED HOSE CONNECTION, LOOSE KEY HANDLE, HYDRANT LENGTH AS REQUIRED FOR INSTALLED WALL THICKNESS, ADJUSTABLE WALL CLAMP, BRASS BOX WITH SATIN NICKEL PLATED FINISH AND INTEGRAL ASSE 1052 DOUBLE CHECK VACUUM BREAKER.

PLUMBING FIXTURE SCHEDULE - LSW & LSN

PLUMBING PLAN MARK	DESCRIPTION
ORD	OVERFLOW ROOF DRAIN: JAY R. SMITH # 1080Y (E-OK-C-LESS DOME), 15" DIAMETER CAST IRON BODY, FLASHING CLAMP, GRAVEL STOP, UNDERDECK CLAMP, SUMP RECEIVER, HUBLESS OUTLET, FIXED EXTENSION - HEIGHT AS REQUIRED BY INSTALLED INSULATION THICKNESS, CAST IRON DOME BOLTED OR LOCKED DOWN AND 2" HIGH WATER DAM, PROVIDE OUTLET SIZE AS SHOWN ON PLANS.
QCC	CAST IRON ROOF DRAIN DOME: MFB # RG2016DDG ROOF GUARD CAST IRON 19" DIAMETER REPLACEMENT ROOF DOME.
QCC	QUICK CONNECT COUPLER: GRACO # 110198 COUPLER WITH 3/8" FNPT END, GRACO #110198 COUPLER WITH 1/2" FNPT END, VERIFY WITH OWNER THE TYPE OF COUPLER NECESSARY TO MATCH TOOL AND EQUIPMENT CONNECTION NEEDS FOR NEW AND RELOCATED EQUIPMENT.
RAD1	REFRIGERATED AIR DRYER: HANKISON # HPR-35 AIR COOLED NON-CYCLING TYPE WITH 200 PSI MAXIMUM WORKING PRESSURE, AIR DRYING MODULE, ON-OFF SWITCH, POWER ON LIGHT, AUTOMATIC DRAIN VALVE, THERMAL OVERLOAD PROTECTION, CYCLING FAN CONTROL, AND HIGH TEMPERATURE LIGHT. AIR DRYER SHALL BE CAPABLE OF PROVIDING 35 SCFM AT A 35F PRESSURE DEWPOINT AT 100 PSIA.
RD	ROOF DRAIN: JAY R. SMITH # 1101Y (E-OK-C-LESS DOME), 15" DIAMETER CAST IRON BODY, FLASHING CLAMP, GRAVEL STOP, UNDERDECK CLAMP, SUMP RECEIVER, HUBLESS OUTLET, FIXED EXTENSION - HEIGHT AS REQUIRED BY INSTALLED INSULATION THICKNESS, AND CAST IRON DOME BOLTED OR LOCKED DOWN, PROVIDE OUTLET SIZE AS SHOWN ON PLANS. CAST IRON ROOF DRAIN DOME: MFB # RG2016DDG ROOF GUARD CAST IRON 19" DIAMETER REPLACEMENT ROOF DOME.
RH	ROOF NON-FREEZE POST HYDRANT: MAPA PRODUCTS # MPH-24FP FREEZE PROOF POST HYDRANT MEETING ASSE #1057 WITH BLACK POWDER COATED CAST ALUMINUM WEATHER-GUARD DOME HANDLE, STAINLESS STEEL SHROUD WITH WELDED STAINLESS STEEL FLANGE, UNDER DECK CLAMP, BRONZE GLOBE ANGLE VALVE, 3/4" HOSE CONNECTION, QUICK DISCONNECT WITH BUILT-IN VACUUM BREAKER, STAINLESS STEEL, DESCRIBED.
SK1	SINK: ELKAY # WSK-512, ONE 24" X 24" X 14" DEEP COMPARTMENT, 8" HIGH BACKSPLASH, 14 GAUGE TYPE 304 STAINLESS STEEL, AND 16 GAUGE STAINLESS STEEL ADJUSTABLE LEGS.
SK2	FAUCET: CHICAGO FAUCET #445-206578AB 3/8" BACK MOUNT FAUCET WITH 3" - 3/8" ADJUSTABLE "R" ARMS WITH INTEGRAL SHUT OFF, VANDAL RESISTANT # 369 LEVER HANDLES, L9 SWING SPOUT, # E1 FULL FLOW OUTLET, QUARTER TURN CERAMIC CARTRIDGES
SK2	TRIM: ELKAY # LK24RT GRID STRAINER WITH LEVER HANDLE AND 1-1/2" TAILPIECE, AND 1-1/2" HARD VORWER TREE DOWEL, FABRICATED AND FINISHED TO MATCH FLOOR FINISH.
SK2	WATER HAMMER ARRESTER: PRECISION PLUMBING PRODUCTS, HARD DRAWN COPPER BODY WITH WROUGHT COPPER FITTINGS, PISTON TYPE WITH LUBRICATED EPDM "O" RING SEALS, MEETING ASSE 1010 OR PDI WH-201, PROVIDE PDI SIZES "A" THROUGH "F" AS SHOWN ON PLANS. PROVIDE SIZE "A" UNLESS SHOWN OTHERWISE ON THE PLANS.
UR	URINAL (ADA ACCESSIBLE): AMERICAN STANDARD # 6951.017 "TRIMBROOK" WHITE VITREOUS CHINA FIXTURE WITH FLUSHING RIM, 3/4" TOP SPUD, AND SIPHON FLUSH ACTION.
UR	VALVE: TOTO #TEU1UA12#CP, "ECO-POWER" WATER TURBINE AND BATTERY POWERED, 1.0 GALLON PER FLUSH, EXPOSED, CHROME-PLATED, SENSOR OPERATED PISTON TYPE FLUSH VALVE MECHANICAL OVERRIDE PUSH BUTTON, WITH PISTON WITH CHLORAMINE RESISTANT SEAT AND SEALS AND SELF-CLEANING MECHANISM, ESCUTCHEON, INTEGRAL SCREWDRIVER STOP, VACUUM BREAKER, 3/4" FLUSH TUBE AND SWEAT ADAPTER KIT.
WC1	TRIM: SUITABLE CARRIER WITH STANCHIONS TO FLOOR.
WC1	WALL-MOUNTED WATER CLOSET: AMERICAN STANDARD # 2257.001 "AFWALL" WHITE VITREOUS CHINA FIXTURE WITH ELONGATED UNIVERSAL BOWL AND DIRECT-FED SIPHON JET ACTION.
WC1	VALVE: TOTO TE11AR #CP, "ECO-POWER" WATER TURBINE AND BATTERY POWERED, 1.28 GALLON PER FLUSH, EXPOSED, CHROME-PLATED, SENSOR OPERATED PISTON TYPE FLUSH VALVE MECHANICAL OVERRIDE PUSH BUTTON, WITH PISTON WITH CHLORAMINE RESISTANT SEAT AND SEALS AND SELF-CLEANING MECHANISM, ESCUTCHEON, INTEGRAL SCREWDRIVER STOP, VACUUM BREAKER, AND SWEAT ADAPTER KIT.
WC2	TRIM: CHURCH # 9500SSCT WHITE OPEN-FRONT CONTOURED, SOLID PLASTIC, HEAVY DUTY, SEAT LESS COVER WITH SELF-SUSTAINING CHECK HINGES AND STAINLESS-STEEL BOLTS, PROVIDE SUITABLE FIXTURE CARRIER.
WC2	WALL-MOUNTED WATER CLOSET (ADA ACCESSIBLE): AMERICAN STANDARD # 2257.001 "AFWALL" WHITE VITREOUS CHINA FIXTURE WITH ELONGATED UNIVERSAL BOWL AND DIRECT-FED SIPHON JET ACTION.
WC2	VALVE: TOTO TE11AR #CP, "ECO-POWER" WATER TURBINE AND BATTERY POWERED, 1.28 GALLON PER FLUSH, EXPOSED, CHROME-PLATED, SENSOR OPERATED PISTON TYPE FLUSH VALVE MECHANICAL OVERRIDE PUSH BUTTON, WITH PISTON WITH CHLORAMINE RESISTANT SEAT AND SEALS AND SELF-CLEANING MECHANISM, ESCUTCHEON, INTEGRAL SCREWDRIVER STOP, VACUUM BREAKER, AND SWEAT ADAPTER KIT.
WCO	WALL CLEANOUT: JAY R. SMITH # 4530S, CAST IRON CLEANOUT TEE, COUNTER SINK PLUG, STAINLESS STEEL ROUND COVER AND SCREW, AND IRON PLUG WITH GASKET SEAL. REFER TO SPECIFICATIONS FOR INSTALLATION.
WHA	WATER HAMMER ARRESTER: PRECISION PLUMBING PRODUCTS, HARD DRAWN COPPER BODY WITH WROUGHT COPPER FITTINGS, PISTON TYPE WITH LUBRICATED EPDM "O" RING SEALS, MEETING ASSE 1010 OR PDI WH-201, PROVIDE PDI SIZES "A" THROUGH "F" AS SHOWN ON PLANS. PROVIDE SIZE "A" UNLESS SHOWN OTHERWISE ON THE PLANS.

MECHANICAL SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

STANDARD MOUNTING HEIGHT

THERMOSTATS (USER ADJUSTABLE) CONTROLS 46" 46"

INSTALL DEVICES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ABOVE OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS ARE AFF OR AFG TO TOP OF THE DEVICE UNO. ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ANNOTATION

- MECHANICAL PLAN NOTE CALLOUT
- MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- DETAIL REFERENCE. UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- SECTION CUT DESIGNATION
- DEDICATED EQUIPMENT ACCESS TILE
- ACCESS PANEL

ABBREVIATIONS

AIC	AIR CONDITIONING	HWP	HEATING WATER PUMP
ACC	AIR COOLED CHILLER	IN WC	INCHES OF WATER COLUMN
ACCU	AIR COOLED CONDENSING UNIT	L	LOUVER
AFC	ABOVE FINISHED CEILING	LAT	LEAVING AIR TEMPERATURE
AFB	ABOVE FINISHED FLOOR	LDB	LEAVING DRY BULB LOW PRESSURE
AFG	ABOVE FINISHED GRADE	LWB	LEAVING WET BULB LOW PRESSURE
AHJ	AUTHORITY HAVING JURISDICTION	LWT	LEAVING WATER TEMPERATURE
AH	AIR HANDLING UNIT	MAU	MAKE-UP AIR UNIT
AI	ANALOG INPUT	MAX	MAXIMUM
AO	ACCESS PANEL	MBH	1000 BTU PER HOUR
APD	AIR PRESSURE DROP	MD	MOTORIZED DAMPER
AWG	AMERICAN WIRE GAUGE	MFR	MANUFACTURER
B	BOILER	MIN	MINIMUM
BAS	BUILDING AUTOMATION SYSTEM	N/A	NOT APPLICABLE
BB	BACKBONE	NIC	NORMALLY CLOSED
BD	BACKDRAFT DAMPER	NO	NORMALLY OPEN
BD	BLOWDOWN	NOM	NOMINAL
BFC	BELOW FINISHED CEILING	NC	NOISE CRITERIA
BFF	BELOW FINISHED FLOOR	NF	NON-FUSED
BFG	BELOW FINISHED GRADE	NIC	NOT IN CONTRACT
BFP	BOILER FEED PUMP	OA	OUTSIDE AIR
BHP	BRAKE HORSEPOWER	PCV	PRESSURE INDEP. CONTROL VALVE
BI	BINARY INPUT	PROVIDE	FURNISH AND INSTALL
BO	BINARY OUTPUT	QTY	QUANTITY
BOD	BOTTOM OF DUCT	RA	RETURN AIR
BOS	BOTTOM OF STRUCTURE	RC	ROOM CRITERIA
BTU	BRITISH THERMAL UNIT	RD	RETURN DUCT
CFM	CUBIC FEET PER MINUTE	REA	RELIEF AIR
CH	CHILLER	RF	RETURN FAN
CLG	COOLING	RFR	REFRIGERANT
CP	CONDENSATE PUMP	RH	RELATIVE HUMIDITY
CPT	CONTROL POWER	RH	ROOF HOOD
CRAC	COMPUTER ROOM AIR	RPM	REVOLUTIONS PER MINUTE
CRU	CONDITIONING UNIT	SA	SUPPLY AIR
CT	COMPUTER ROOM UNIT	SCP	STEAM CONDENSATE PUMP
CV	COOLING TOWER	SD	SMOKE DUCT DETECTOR
CWP	CONDENSER WATER PUMP	SD	SUPPLY DUCT
CU	CONDENSING UNIT	SF	SUPPLY FAN
CHWP	CHILLED WATER PUMP	SH	SENSIBLE HEAT CAPACITY
DB	DECIBELS	SOW	SCOPE OF WORK
DBA	DECIBEL AVERAGE	SP	STATIC PRESSURE
DDC	DIRECT DIGITAL CONTROL	ST	STEAM TRAP
DI	DIGITAL INPUT	STM	STEAM
DISC	DISCONNECT	TBD	TO BE DETERMINED
DN	DOWN	TC/C	TEMPERATURE CONTROLS CONTRACTOR
DS	DUCT SILENCER	TCP	TEMPERATURE CONTROL PANEL
DX	DIRECT EXPANSION	TF	TRANSFER FAN
(E)	EXISTING	TFA	TO FLOOR ABOVE
EA	EXHAUST AIR	TFB	TO FLOOR BELOW
EAT	ENTERING	TH	TOTAL HEAT CAPACITY
EA	AIR TEMPERATURE	TSP	TOTAL STATIC PRESSURE
EDB	EXHAUST DUCT	TT	TEMPERATURE TRANSMITTAL
EF	EXHAUST FAN	TYP	TYPICAL
EFF	EFFICIENCY	UF	UNDERFLOOR
EMS	ENERGY MANAGEMENT SYSTEM	UG	UNDERGROUND
ESP	EXTERNAL STATIC PRESSURE	US	UNDERSLAB
ETR	EXISTING TO REMAIN	UH	UNIT HEATER
EWB	ENTERING WET BULB TEMPERATURE	UNO	UNLESS NOTED OTHERWISE
EWT	ENTERING WATER TEMPERATURE	VAV	VARIABLE AIR VOLUME
FCU	FAN COIL UNIT	VEL	VELOCITY
FFA	FROM FLOOR ABOVE	VFD	VARIABLE FREQUENCY DRIVE
FFB	FROM FLOOR BELOW	VRF	VARIABLE REFRIGERANT FLOW
FF	FINISHED FLOOR	VRV	VARIABLE REFRIGERANT VOLUME
FPI	FINS PER INCH	W/	WITH
FFM	FEET PER MINUTE	W/O	WITHOUT
GC	GENERAL CONTRACTOR	WB	WET BULB
GPM	GALLONS PER MINUTE	WC	WATER COLUMN
HCA	HAND-OFF-AUTOMATIC	WPD	WATER PRESSURE DROP
HP	HORSEPOWER	XP	EXPLOSION PROOF
HTG	HEATING		

	DUCTWORK/EQUIPMENT TO BE REMOVED OR RELOCATED
	EXISTING DUCTWORK/EQUIPMENT TO REMAIN
	LINEAR SLOT DIFFUSER
	INSULATED FLEXIBLE DUCT (MAX. 5'-0" LONG)
	BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
	ELBOW WITH TURNING VANES
	BRANCH DUCT WITH BELL-MOUTH FITTING & MANUAL VOLUME CONTROL DAMPER
	DUCT UP
	DUCT DOWN
	EXHAUST AIR
	EXHAUST AIR - GREASE
	OUTSIDE AIR
	RELIEF AIR
	RETURN AIR
	SPECIAL EXHAUST
	SUPPLY AIR
	EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
	10" (NECK SIZE) CSD-1 (TYPE) 300 CFM (CFM OF SUPPLY DIFFUSER OR REGISTER)
	24x24 (NECK SIZE) CEG-1 (TYPE) 800 CFM (CFM OF EXHAUST GRILLE)
	EQUIPMENT ACCESS TILE (IN ACT CEILINGS)
	ACCESS PANEL (IN GYPSUM)
	MANUAL VOLUME DAMPER
	SQUARE TO ROUND TRANSITION
	DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)
	ROUND DUCT TAG INDICATING DIAMETER
	RECTANGULAR DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS
	FLAT OVAL DUCT TAG INDICATING INTERNAL DUCT DIMENSIONS
	RISER DESIGNATION
	FIRE DAMPER
	FIRE SMOKE DAMPER
	SMOKE DAMPER
	VOLUME DAMPER
	MOTORIZED DAMPER
	BACKDRAFT DAMPER

ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE DIMENSIONS. REFER TO DUCTWORK SPECIFICATIONS FOR DUCTWORK INSULATION AND LINER INFORMATION.

HVAC CONTROL DEVICES

	HUMIDISTAT
	THERMOSTAT
	CARBON MONOXIDE SENSOR
	CARBON DIOXIDE SENSOR
	DIFFERENTIAL PRESSURE SENSOR
	FLOW SWITCH
	HUMIDITY SENSOR
	PULL STATION
	REMOTE TESTING STATION WITH INDICATING LIGHT
	STATIC PRESSURE
	TEMPERATURE SENSOR

	DIRECTION OF FLOW
	CONTROL VALVE
	THREE-WAY CONTROL VALVE
	SHUTOFF VALVE
	CHECK VALVE
	BALANCING VALVE WITH PRESSURE PORTS
	TRIPLE DUTY VALVE WITH PRESSURE PORTS
	STRAINER
	STRAINER WITH BLOWOFF
	RELIEF / SAFETY VALVE
	SOLENOID VALVE
	PRESSURE REDUCING VALVE
	GAS PRESSURE REGULATOR
	THERMOSTATIC MIXING VALVE
	PIPE ANCHOR
	EXPANSION JOINT
	PIPE GUIDE
	PIPING SUPPORT
	F & T TRAP
	BUCKET TRAP
	THERMOSTATIC TRAP
	BACKFLOW PREVENTER
	PRESSURE GAUGE
	THERMOMETER
	PRESSURE AND TEMPERATURE TEST PLUG
	UNION
	FLANGE CONNECTION
	VACUUM RELIEF VALVE
	AUTOMATIC AIR VENT
	MANUAL AIR VENT
	PRESSURE / VACUUM SWITCH
	CLEANOUT
	CAP
	ELBOW UP
	ELBOW DOWN
	TEE UP
	TEE DOWN
	ELBOW UP WITH SHUT-OFF VALVE (SOV)
	ELBOW DOWN WITH SHUT-OFF VALVE (SOV)
	TEE UP WITH SHUT-OFF VALVE (SOV)
	TEE DOWN WITH SHUT-OFF VALVE (SOV)
	REDUCER
	RECIRCULATION PUMP
	P-TRAP
	GAS COCK
	TOP BEAM CLAMP
	TRAPEZE HANGER
	FLEXIBLE CONNECTION

	EXISTING PIPING TO BE REMOVED OR RELOCATED
	EXISTING PIPING TO REMAIN
	CONDENSATE DRAIN (CD)
	AUXILIARY CONDENSATE DRAIN (ACD)
	NON-POTABLE WATER (NPW)
	NATURAL GAS (G)
	NATURAL GAS ON ROOF (G)
	MEDIUM PRESSURE NATURAL GAS (MPG)
	MEDIUM PRESSURE NATURAL GAS ON ROOF (MPG)
	FUEL OIL SUPPLY (FOS)
	FUEL OIL RETURN (FOR)
	FUEL OIL VENT (FOV)
	LIQUEFIED PETROLEUM GAS (LPG)
	BOILER FEED WATER (BFW)
	HIGH PRESSURE STEAM SUPPLY (HPS)
	HIGH PRESSURE STEAM CONDENSATE (HPC)
	LOW PRESSURE STEAM SUPPLY (LPS)
	LOW PRESSURE STEAM CONDENSATE (LPC)
	CONDENSATE PUMP DISCHARGE (CPD)
	HEATING HOT WATER SUPPLY (HWS)
	HEATING HOT WATER RETURN (HWR)
	CHILLED WATER SUPPLY (CHWS)
	CHILLED WATER RETURN (CHWR)
	HOT / CHILLED WATER SUPPLY (HCS)
	HOT / CHILLED WATER SUPPLY (HCR)
	CONDENSER WATER SUPPLY (CWS)
	CONDENSER WATER RETURN (CWR)
	REFRIGERANT LIQUID (RL)
	REFRIGERANT DISCHARGE (HOT GAS) (RD)
	REFRIGERANT SUCTION (RS)
	REFRIGERANT DISCHARGE BYPASS (RDB)
	REFRIGERANT VENT (RV)

CALL OUTS

ENLARGED PLAN CALLOUT	
NOT IN SCOPE	

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING	NEW
DEMOLISH	FUTURE

GENERAL NEW NOTES:

- PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
- EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
- DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
- PROVIDE TEMPORARY BARRIERS TO CONTAIN DUST AND DEBRIS RESULTING FROM THE PERFORMANCE OF THE WORK TO THE AREA WHERE WORK IS BEING PERFORMED.
- ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY DIVISION 23 UNLESS OTHERWISE NOTED.
- NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
- REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHASES AND PENETRATIONS SHOWN ON ARCHITECTURAL DRAWINGS THAT ARE INTENDED FOR DUCTWORK AND PIPING MEET REQUIREMENTS.
- COORDINATE LOCATION OF ROOF MOUNTED HVAC EQUIPMENT AND ROOF PENETRATIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
- INDOOR AIR QUALITY MEASURES: PROTECT INSIDE OF (INSTALLED AND DELIVERED) DUCTWORK AND HVAC UNITS FROM EXPOSURE TO DUST, DIRT, PAINT AND MOISTURE. REPLACE INSULATION THAT HAS BECOME WET AT ANY TIME DURING CONSTRUCTION. DRYING THE INSULATION IS NOT ACCEPTABLE. SEAL ANY TEARS OR JOINTS OF INTERNAL FIBERGLASS INSULATION. REMOVE DEBRIS FROM CEILING/RETURN AIR PLENUM INCLUDING DUST. VACUUM CLEAN ANY DUCTWORK CONNECTED TO HVAC UNITS THAT WERE OPERATED DURING THE CONSTRUCTION PERIOD AFTER NEW FILTERS ARE INSTALLED AND PRIOR TO TURNING SYSTEM OVER TO THE OWNER. THE INTERNAL SURFACES AND ASSOCIATED COILS OF ANY HVAC UNITS THAT WERE OPERATED SHALL ALSO BE CLEANED.
- INSTALL DUCTWORK AND PIPING PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.
- OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF EXCEPT WHERE CONCRETE INSERTS IN CONCRETE SLABS ARE ALLOWED BY THE SPECIFICATIONS.
- COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT AND/OR FILTER REPLACEMENT.
- SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
- DRAIN, FLUSH, AND REFILL ALL PIPING SYSTEMS NECESSARY TO PERFORM THE WORK. REFERENCE SPECIFICATIONS FOR FLUSHING PERFORMANCE REQUIREMENTS AND SUBMIT FLUSHING PLAN TO ENGINEER FOR REVIEW. PROVIDE CHEMICAL TREATMENT FOR ALL PIPING SYSTEMS AFTER FLUSHING AND REFILLING THE SYSTEM.
- COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
- ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID AND LIGHTING LOCATIONS.
- PAINT PORTIONS OF DUCTWORK AND INSULATION THAT ARE EXPOSED TO VIEW BY THE INSTALLATION OF DIFFUSERS, REGISTERS, AND GRILLES IN CEILINGS OR WALLS FLAT BLACK. PORTIONS INCLUDE BOTH THE INTERIOR OF UNLINED DUCTWORK AND THE EXTERIOR OF DUCTWORK AND INSULATION.
- DUCTWORK CROSSING FIRE RATED WALLS OR OTHER FIRE RATED ASSEMBLIES SHALL BE MINIMUM 26 GAUGE SHEET METAL.
- PROVIDE FIRE OR FIRE/SMOKE DAMPERS, AS APPLICABLE, IN DUCTWORK AT CEILINGS AND WALLS AT LOCATIONS SHOWN ON THE PLANS. FIRE AND FIRE/SMOKE DAMPERS SHALL CONFORM TO NFPA AS APPLICABLE. COORDINATE SLEEVE LENGTH WITH REQUIREMENTS OF INSTALLED LOCATION.
- PROVIDE WALL OR DUCT ACCESS PANELS OR DOORS FOR ACCESS TO FIRE AND FIRE/SMOKE DAMPERS. ACCESS PANEL OR DOOR SHALL BE MINIMUM SIZE OF 10" BY 10" AND SHALL BE INSTALLED WITHIN 12" OF DAMPER. PROVIDE A REMOVABLE DUCT SECTION WHERE DUCT SIZE TOO SMALL FOR A 10" BY 10" ACCESS DOOR.
- LOCATE AND SET THERMOSTATS AND HUMIDISTATS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL DEVICES WITH TOP OF DEVICE AT MAXIMUM 48" APT TO MEET ADA REQUIREMENTS UNLESS NOTED OTHERWISE ON PLANS. PROVIDE INSULATED BACKING FOR THERMOSTATS MOUNTED ON EXTERIOR BUILDING WALLS. INSTALL WIRING IN CONDUIT PROVIDED BY DIVISION 26. AT A MINIMUM, PROVIDE CONDUIT IN THE WALL FROM THE JUNCTION BOX TO 6" ABOVE THE CEILING.
- COORDINATE THE LOCATION AND ELEVATION OF WALL-MOUNTED DEVICES WITH PRESENTATION BOARDS, DISPLAY CABINETS, SHELVES OR OTHER COMPONENTS SHOWN ON THE ARCHITECTURAL DRAWINGS THAT ARE TO BE INSTALLED UNDER OTHER DIVISIONS. CONTRACTOR WILL NOT BE REIMBURSED FOR RELOCATION OF WALL-MOUNTED DEVICES CAUSED BY A LACK OF COORDINATION.
- PROVIDE A MANUAL BALANCING DAMPER IN EACH DUCT TAKEOFF FROM SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS.
- PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES. PROVIDE WITH INTEGRAL MANUAL BALANCING DAMPER AND LOCKING QUADRANT WHERE INDICATED ON PLANS.
- BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.
- REFER TO SPECIFICATIONS FOR DUCTWORK AND PIPING INSULATION REQUIREMENTS. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE AIRFLOW DIMENSIONS. INCREASE SHEET METAL SIZES ACCORDINGLY TO ACCOUNT FOR THICKNESS OF DUCT LINER.
- FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE EQUIPMENT VENTS AND FLUES PER EQUIPMENT MANUFACTURERS RECOMMENDATIONS AND EQUIPMENT SPECIFICATIONS. KEEP PENETRATIONS THROUGH ROOF A MINIMUM OF 10'-0" FROM HVAC EQUIPMENT FRESH AIR INLETS AND 2'-0" FROM ROOF PARAPETS.
- PROVIDE WALL MOUNTED LOUVERS AND DAMPERS WITH SUITABLE MOUNTING FRAME TO MATCH WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL DRAWINGS.
- PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO TESTING, ADJUSTING AND BALANCING AND BEFORE TURNING SYSTEM(S) OVER TO OWNER.

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Revisions

NUMBER	DESCRIPTION	DATE
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09/09/2022

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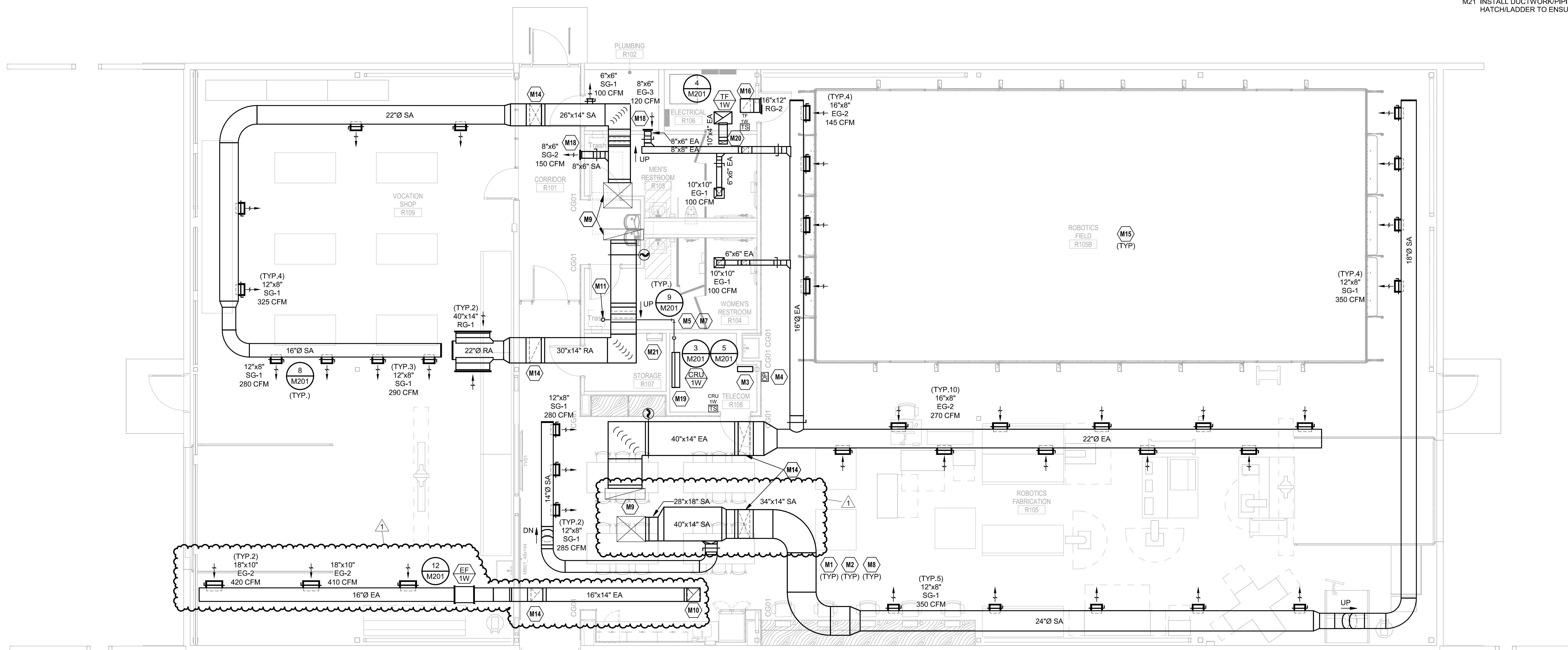
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MECHANICAL PLAN NOTES:

- M1 COORDINATE INSTALLATION OF EQUIPMENT, DUCTWORK, AND PIPING WITH ALL TRADES. DO NOT ROUTE DUCTWORK OR PIPING OVER ELECTRICAL PANELS AND EQUIPMENT.
- M2 ALL FULLY AND PARTIALLY EXPOSED SUPPLY SPIRAL AND RECTANGULAR DUCT SHALL BE INTERNALLY LINED AND FIELD PAINTED, COLOR BY ARCHITECT.
- M3 PROVIDE BUILDING BAS PANEL(S); QUANTITY OF PANELS TO BE DETERMINED BY CONTROL'S CONTRACTOR; COORDINATE LOCATIONS WITH ARCHITECT AND OTHER TRADES.
- M4 INSTALL BUILDING DIFFERENTIAL PRESSURE SENSOR, EXTEND LOW PORT TUBING UP THRU ROOF TO MATCH MANUFACTURER RECOMMENDATIONS/REQUIREMENTS.
- M5 REFRIGERANT PIPING IS SCHEMATIC, ACTUAL ROUTING AND SIZING OF REFRIGERANT LINES SHALL BE DETERMINED PER MANUFACTURER'S RECOMMENDATIONS.
- M7 ALL PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE TO ALLOW MAXIMUM CLEARANCES BELOW.
- M8 COORDINATE PIPING, CONDUIT, AND DUCT ROUTINGS THROUGH EXPOSED AREAS TO CLEANLY ROUTE/GROUP TOGETHER. COORDINATE WITH ALL OTHER TRADES.
- M9 ROUTE SUPPLY/RETURN DUCT UP THROUGH ROOF, TRANSITION TO DUCT/RTU CONNECTION SIZE IN CURB, SEAL ROOF PENETRATION AIR AND WATER TIGHT.
- M10 ROUTE EXHAUST DUCT UP THROUGH ROOF, TRANSITION TO DUCT/RTU CONNECTION SIZE IN CURB, SEAL ROOF PENETRATION AIR AND WATER TIGHT.
- M11 ROUTE REFRIGERANT PIPE UP THROUGH ROOF, SEAL ROOF PENETRATION AIR AND WATER TIGHT.
- M14 ROUTE DUCT UP INTO SOFFIT AND ELBOW OUT INTO SHOP SPACE.
- M15 DO NOT INSTALL ANY DUCTWORK OR PIPING BELOW 12'-6" AFF IN ROBOTICS FIELD.
- M16 INSTALL BOTTOM OF TRANSFER DUCT 12'-0" AFF. DUCT INTO SOFFIT AND INTO ELECTRICAL ROOM FOR TRANSFER AIR CIRCULATION.
- M18 INSTALL BOTTOM OF GRILLE AT 9'-6" AFF.
- M19 MOUNT TOP OF CRU 4" BELOW TOP OF LADDER RACK.
- M20 EXTEND DUCT THROUGH WALL TO DECK AND ELBOW DUCT UP TO PROVIDE TRANSFER AIR PATH FOR FAN.
- M21 INSTALL DUCTWORK/PIPING AWAY FROM ROOF HATCH/LADDER TO ENSURE ROOF ACCESS IS MAINTAINED.



1 HVAC LEVEL 1 PLAN - LSW
3/16" = 1'-0"

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1	Addendum 01	09/16/2022



CARL J. HOLDEN
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09/15/2022

LSW - HVAC PLAN -
LEVEL 1

M101-A

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- M2 ALL FULLY AND PARTIALLY EXPOSED SUPPLY SPIRAL AND RECTANGULAR DUCT SHALL BE INTERNALLY LINED AND FIELD PAINTED. COLOR BY ARCHITECT.
- M3 PROVIDE BUILDING BAS PANEL(S); QUANTITY OF PANELS TO BE DETERMINED BY CONTROLS CONTRACTOR; COORDINATE LOCATIONS WITH ARCHITECT AND OTHER TRADES.
- M4 INSTALL BUILDING DIFFERENTIAL PRESSURE SENSOR. EXTEND LOW PORT TUBING UP THRU ROOF TO MATCH MANUFACTURER RECOMMENDATIONS/REQUIREMENTS.
- M5 REFRIGERANT PIPING IS SCHEMATIC. ACTUAL ROUTING AND SIZING OF REFRIGERANT LINES SHALL BE DETERMINED PER MANUFACTURER'S RECOMMENDATIONS.
- M7 ALL PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE TO ALLOW MAXIMUM CLEARANCES BELOW.
- M8 COORDINATE PIPING, CONDUIT, AND DUCT ROUTING THROUGH EXPOSED AREAS TO CLEANLY ROUTE/GROUP TOGETHER. COORDINATE WITH ALL OTHER TRADES.
- M9 ROUTE SUPPLY/RETURN DUCT UP THROUGH ROOF. TRANSITION TO DUCT/RTU CONNECTION SIZE IN CURB. SEAL ROOF PENETRATION AIR AND WATER TIGHT.
- M10 ROUTE EXHAUST DUCT UP THROUGH ROOF. TRANSITION TO DUCT/RTU CONNECTION SIZE IN CURB. SEAL ROOF PENETRATION AIR AND WATER TIGHT.
- M11 ROUTE REFRIGERANT PIPE UP THROUGH ROOF. SEAL ROOF PENETRATION AIR AND WATER TIGHT.
- M14 ROUTE DUCT UP INTO SOFFIT AND ELBOW OUT INTO SHOP SPACE.
- M15 DO NOT INSTALL ANY DUCTWORK OR PIPING BELOW 12'-6" AFF IN ROBOTICS FIELD.
- M16 INSTALL BOTTOM OF TRANSFER DUCT 12'-6" AFF. DUCT INTO SOFFIT AND INTO ELECTRICAL ROOM FOR TRANSFER AIR CIRCULATION.
- M17 ROUTE DUCT DOWN THROUGH SOFFIT TO CONCEAL IN CEILING ABOVE RESTROOMS.

1 HVAC LEVEL 1 PLAN - LSN
3/16" = 1'-0"

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LSN - HVAC PLAN -
LEVEL 1

M101-B

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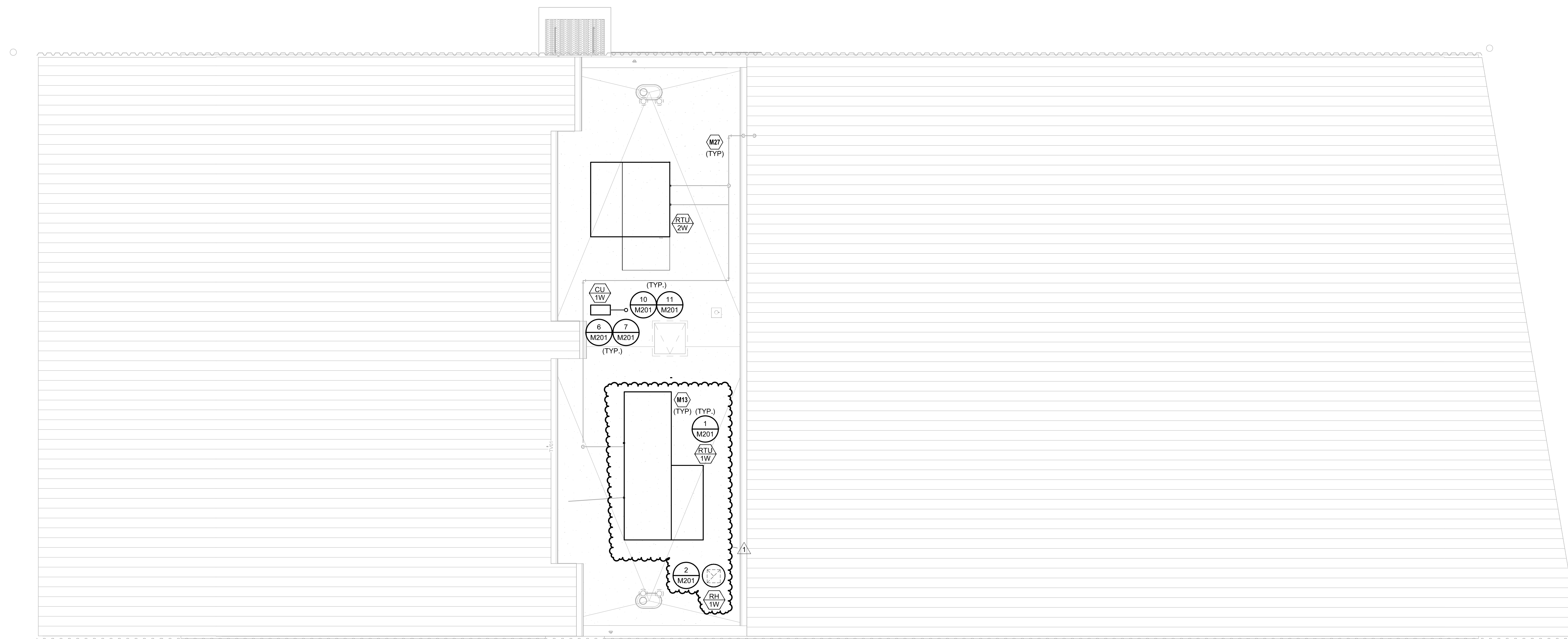
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① MECHANICAL ROOF PLAN - LSW
3/16" = 1'-0"



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LSW - MECHANICAL
PLAN - ROOF
M102-A

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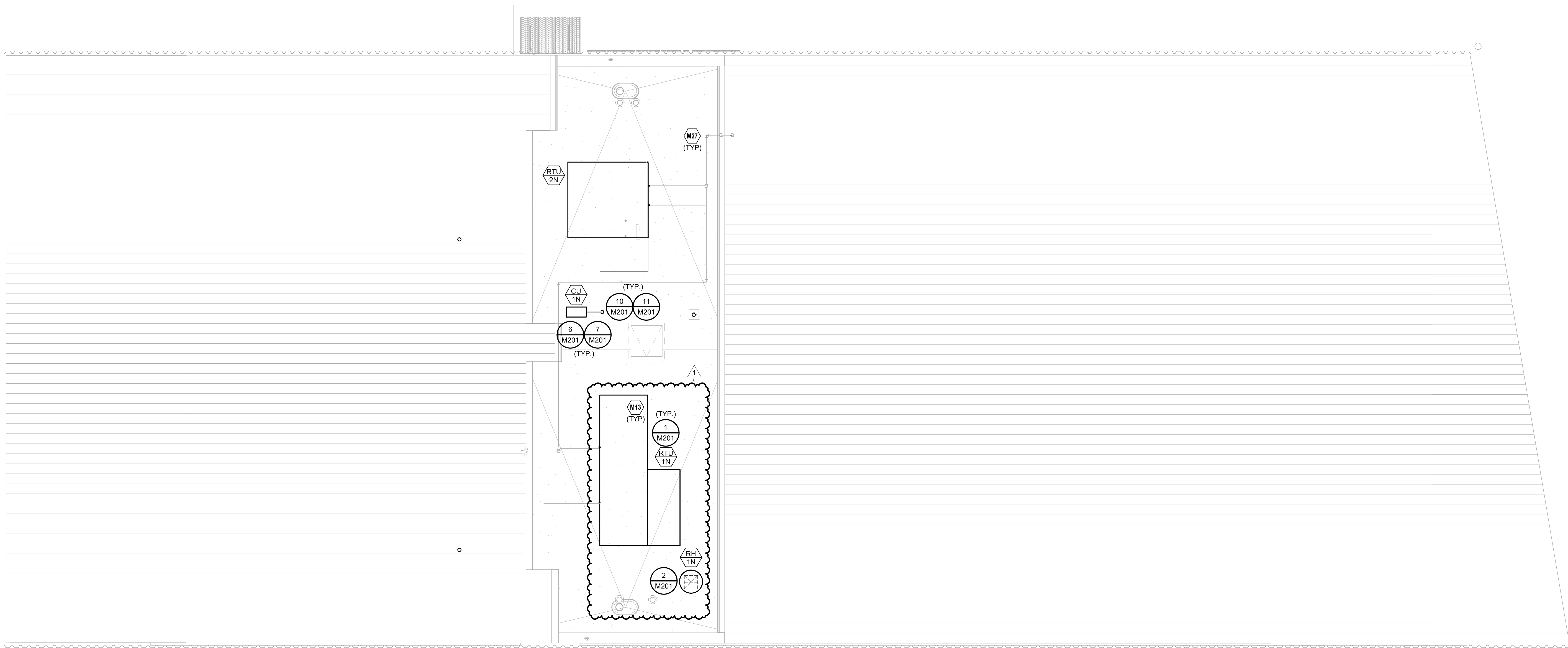
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MECHANICAL PLAN NOTES:
M13 INSTALL ALL SERVICEABLE ROOF MOUNTED EQUIPMENT AT
A MINIMUM 10'-0" AWAY FROM ROOF EDGE UNLESS
SPECIFIED OTHERWISE.
M27 REFER TO PLUMBING PLANS FOR GAS AND CONDENSATE
PIPE SIZES



1 MECHANICAL ROOF PLAN - LSN
3/16" = 1'-0"

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LSN - MECHANICAL
PLAN - ROOF



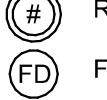
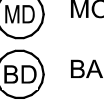
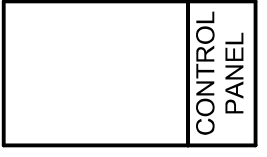
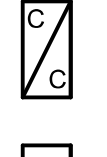
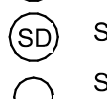
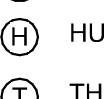
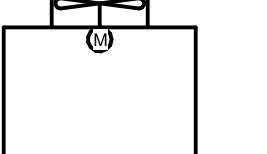
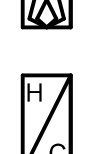
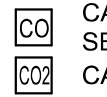
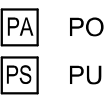
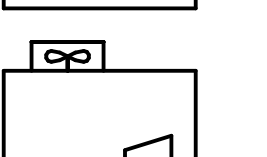

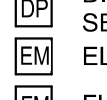
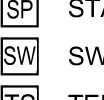
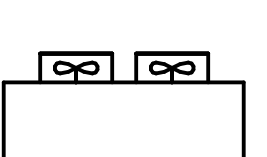
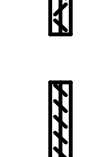
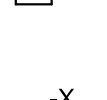

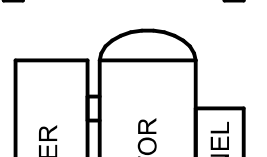
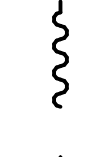
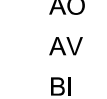
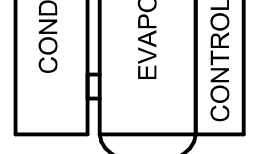

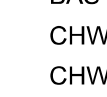
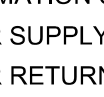

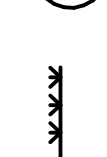
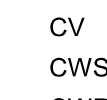
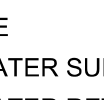
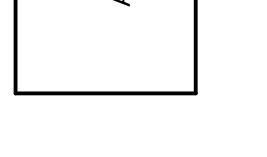
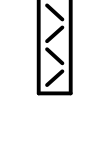
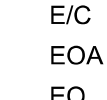
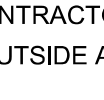
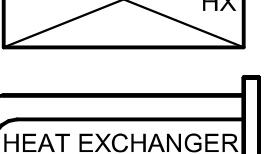

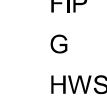

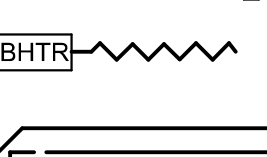

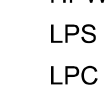
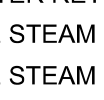

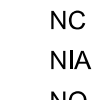
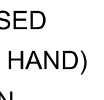


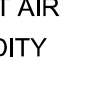

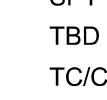

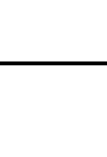
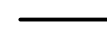





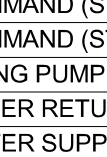

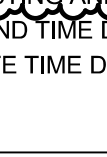



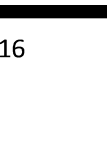
M102-B



MECHANICAL SYMBOLS

CONTROLS SYMBOLS AND NOMENCLATURE

NOTE: THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ABBREVIATIONS, ETC. ARE NECESSARILY USED ON THE DRAWINGS.

	FLUE DAMPER (BOILERS)		HOT GAS REHEAT COIL		RISER DESIGNATION		MOTORIZED DAMPER
	BOILER		COOLING COIL		FIRE DAMPER		BACKDRAFT DAMPER
	COOLING TOWER		FURNACE		FIRE SMOKE DAMPER		VOLUME DAMPER
	CONDENSING UNIT		HEATING COIL		SMOKE DAMPER		HUMIDISTAT
	FLUID COOLER		DAMPER - GENERIC BLADE TYPE		SMOKE DETECTOR		THERMOSTAT
	WATER-COOLED CHILLER		DAMPER - OPPOSED BLADE TYPE		SD (SD=Supply / RD=Return)		
	AIR-COOLED CHILLER		DAMPER - PARALLEL BLADE TYPE		BTU METER		PRESSURE SENSOR
	GENERIC HEAT EXCHANGER		FLEXIBLE SENSING ELEMENT		CARBON MONOXIDE SENSOR		POLLUTANT ALARM
	SHELL AND TUBE HEAT EXCHANGER		AIRFLOW STATION		CARBON DIOXIDE SENSOR		PULL STATION
	BASIN HEATER		PUMP		CONTROL PANEL		REFRIGERANT LEAK SENSOR
	HEAT RECOVERY WHEEL		FAN		CURRENT CIRCUIT RELAY		SENSOR - GENERIC
			HUMIDIFIER		DIFFERENTIAL PRESSURE SENSOR		STATIC PRESSURE PORT
			AIR FILTER		ELECTRIC METER		SWITCH
			3-WAY CONTROL VALVE		FLOW METER / FUEL METER		TEMPERATURE SENSOR
			2-WAY CONTROL VALVE		FLOW SWITCH		WATER METER
			AIR BYPASS DAMPER		HUMIDITY SENSOR		
			AIRFLOW MEASURING STATION				
			DIRECT EXPANSION COOLING UNIT CONTROLLER				
			FURNACE BURNER CONTROLLER				
			SILICON-CONTROLLED RECTIFIER				
			ELECTRIC HEATER CONTROL (MODULATING)				
			ELECTRIC HEATER CONTROLLER (ON/OFF)				
			ELECTRONIC COMMUTATED MOTOR				
			VARIABLE FREQUENCY DRIVE				
			MOTOR STARTER				
			LOW LIMIT TEMPERATURE CONTROLLER (FREEZE/STAT)				
			EMERGENCY PUSH BUTTON				

MISCELLANEOUS CONTROL POINTS - LSW/LSN

POINT ID	DESCRIPTION	POINT TYPE	DEFAULT SETPOINT	FAIL POSITION	STATUS ALARM	ALARM RANGE	NOTES
EXHAUST FANS (EF-XX)							
EF-C	EXHAUST FAN COMMAND (START/STOP)	BO					A
EA-AF	EXHAUST AIR FLOW QUANTITY	AI	CALC.				A,E
EF-BD	EXHAUST FAN BUILDING DIFFERENTIAL OFFSET	AV	100 CFM				A,B,E
SPLIT SYSTEM ROOM AC UNITS (CRU-XX)							
Z-T	ZONE TEMPERATURE	AI			X	Z-T < STPT-15 DEG F	A
Z-FLT	ZONE TEMPERATURE ALARM	AI					A, D
TRANSFER FAN (TF-XX)							
Z-T	ZONE TEMPERATURE	AI	80 F		X	Z-T > 90 DEG F	A
TF-C	TRANSFER FAN COMMAND (START/STOP)	BO					A
TF-ST	TRANSFER FAN COMMAND (START/STOP)	BI			X	TF-C-X=ON, TF-ST-X=OFF	A
DOMESTIC HOT WATER RECIRCULATING PUMP							
DHW-R-T	DOMESTIC HOT WATER RETURN TEMPERATURE	AI					
DHW-T	DOMESTIC HOT WATER SUPPLY TEMPERATURE	AI	110 DEG F		X	DHW-T > 115 DEG F	A, D
HWCP-C	HOT WATER RECIRCULATING PUMP COMMAND (START/STOP)	BO					
HWCP-ST	HOT WATER RECIRCULATING PUMP STATUS (CT)	BI			X	HWCP-C=ON, HWCP-ST=OFF	A, C
WATER HEATER MONITORING							
DHW-T	DOMESTIC HOT WATER SUPPLY TEMPERATURE	AI	110 DEG F		X	DHW-T-X > 115 DEG F	A, D

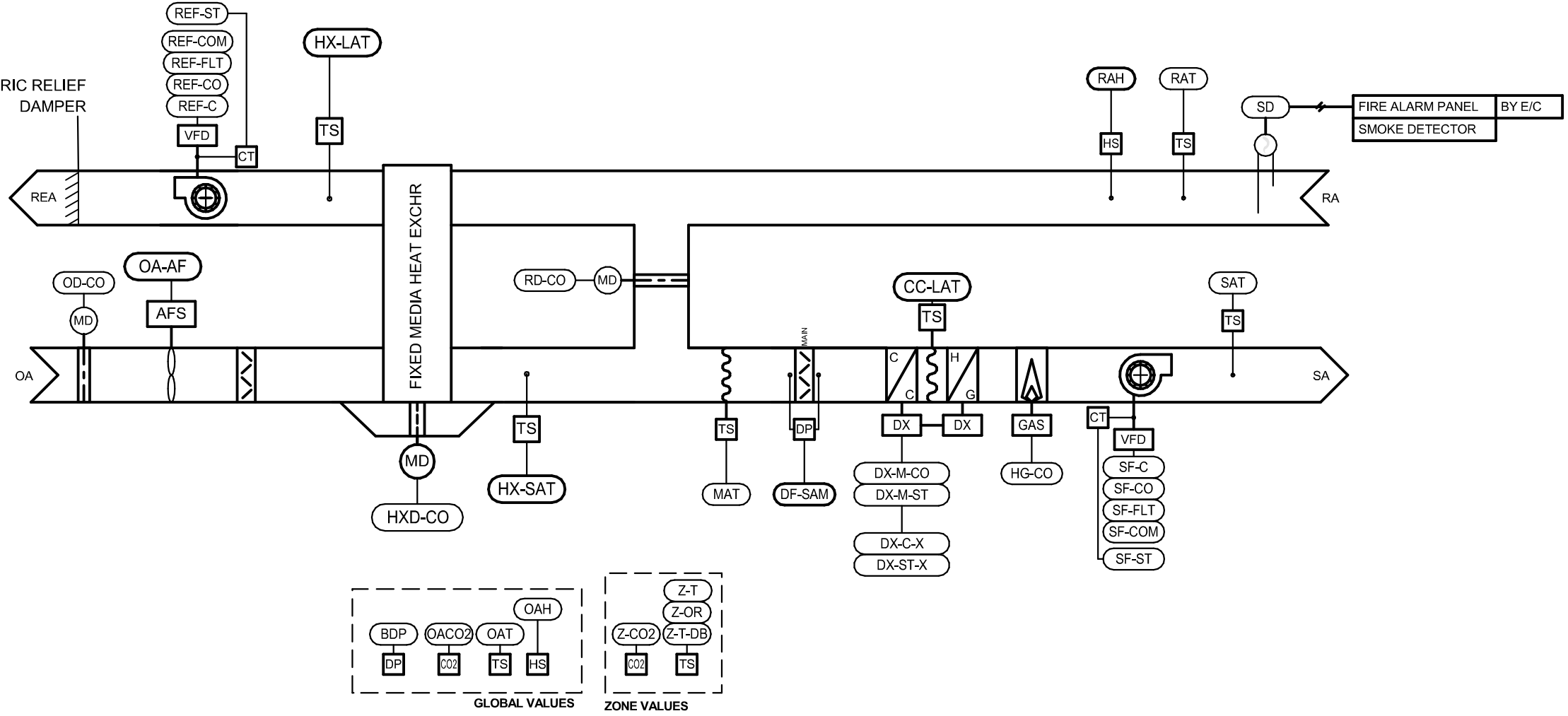
NOTES:
A. POINTS APPLY TO MULTIPLE UNITS. SEE CONTROL DIAGRAMS FOR NUMBER OF UNITS.
B. DETERMINE SETPOINT DURING TESTING AND BALANCING. COORDINATE WITH THE TEST AND BALANCE CONTRACTOR.
C. ALARM TO SIGNAL AFTER 30 SECOND TIME DELAY (ADJ.)
D. ALARM TO SIGNAL AFTER 10 MINUTE TIME DELAY (ADJ.)
E. POINT SHALL BE ADJUSTABLE.

PROJECT DESIGN CONDITIONS - LSW/LSN

CLIMATE CONDITIONS										BUILDING OPERATING HOURS:											
WEATHER STATION:		LEE'S SUMMIT MUNICIPAL, MO								MONDAY - FRIDAY		TBD BY OWNER									
CLIMATE ZONE:		4A								SATURDAY		TBD BY OWNER									
HEATING (DB):		99.6%		4.7		°F						SUNDAY		TBD BY OWNER							
DESIGN HEATING CONDITIONS (DB):		0		°F								HOLIDAY		TBD BY OWNER							
HUMIDIFICATION (DPI/HR/MCDB):		99.6%		°F/				g/ltb				°F									
COOLING (DB/MCWB):		0.4%		96.4		°F/		74.7		°F/											
DESIGN COOLING CONDITIONS (DB/ MCWB):				96.4		°F/		74.7		°F/											
DEHUMIDIFICATION (DPI/HR/MCDB):		0.4%		79.9		°F/		135.8		g/ltb		85.9		°F							

POINTS LIST - ROBOTICS - LSW/LSN							
POINT ID	DESCRIPTION	POINT TYPE	DEFAULT SET POINT	SET POINT RESET RANGE	FAIL POSITION	STATUS ALARM	ALARM RANGE
GLOBAL VALUES							
BDP	BUILDING DIFFERENTIAL PRESSURE	AV					A
OAT	OUTSIDE AIR TEMPERATURE	AV					A
OAH	OUTSIDE AIR HUMIDITY	AV					A
OACO2	OUTSIDE AIR CO2 LEVEL	AV					A
AIR SENSING							
SAT	SUPPLY AIR TEMPERATURE	AI	55 F CLG, 90 F HTG	52 - 65 F CLG		X	50 F > SAT > 100 F
RAT	RETURN AIR TEMPERATURE	AI					
RAH	RETURN AIR HUMIDITY	AI	50 PCT	30-55 PCT	X		15RH > RAH >55RH
MAT	MIXED AIR TEMPERATURE	AI	55 F	52 - 65 F CLG			
CC-LAT	COOLING COIL LEAVING AIR TEMPERATURE	AI	SCHED		X		50 F > CC-LAT > 100 F
OA-AF	OUTSIDE AIR AIRFLOW QUANTITY ABSOL. MIN/ MIN.(CFM)	AI	SCHED		X		MOA-AF < SCHED - 15%
ZONE LEVEL SENSORS							
Z-T	ZONE TEMPERATURE	AI	SCHED				C, D
Z-OR	MANUAL OCCUPANCY OVERRIDE	BI	2 HOURS				
Z-T-DB	ZONE TEMPERATURE	BV	5 F	-2.5 F < Z-T < +2.5 F			
Z-CO2	ZONE CO2	AI	SCHED				Z-CO2 > SPT
SUPPLY FAN							
SF-COM	SUPPLY FAN VFD COMMUNICATION	COM					
SF-C	SUPPLY FAN COMMAND (START/STOP)	BO					
SF-CO	SUPPLY FAN CONTROL OUTPUT - SPEED (PERCENT)	AO		SCHED			
SF-ST	SUPPLY FAN STATUS	BI				X	SF-ST <=> SF-C
SF-FLT	SUPPLY FAN VFD FAULT	BI				X	COMMON ALARM
RELIEF-EXHAUST FAN							
REF-COM	RELIEF-EXHAUST FAN VFD COMMUNICATION	COM					
REF-C	RELIEF-EXHAUST FAN COMMAND (START/STOP)	BO					
REF-CO	RELIEF-EXHAUST FAN CONTROL OUTPUT - SPEED (PERCENT)	AO		SCHED.			
REF-ST	RELIEF-EXHAUST FAN STATUS	BI				X	REF-ST <=> REF-C
REF-FLT	RELIEF-EXHAUST FAN VFD FAULT	BI				X	COMMON ALARM
RETURN AIR DAMPER (MODULATING)							
RD-CO	RETURN AIR DAMPER CONTROL OUTPUT	AO			NO		
OUTSIDE AIR DAMPER (MODULATING)							
OD-CO	OUTSIDE AIR DAMPER CONTROL OUTPUT	AO			NC		
FILTERS							
DF-SAM	DIRTY FILTER INDICATION (SA MAIN FILTER)	BI	SCHED.			X	ON ACTIVATION
COOLING COIL - DX MODULATING AND BINARY STAGES							
DX-M-CO	DX MODULATING COMPRESSOR CONTROL OUTPUT	AO					J
DX-M-ST	DX MODULATING COMPRESSOR STATUS	AI				X	DX-M-ST <=> DX-M-CO
DX-C-X	DX COMPRESSOR STAGE "X" COMMAND	BO					J
DX-ST-X	DX COMPRESSOR STAGE "X" STATUS	BI			X		DX-ST-X <=> DX-C-X
HEATING COIL - GAS FURNACE MODULATING							
HG-CO	GAS FURNACE HEAT MODULATION CONTROL OUTPUT	AO					
HEAT EXCHANGER - TEMPERATURE SENSING							
HX-LAT	LEAVING AIR TEMPERATURE	AI					
HX-SAT	SUPPLY AIR TEMPERATURE	AI				X	HX-SAT < 35 F
HEAT EXCHANGER - FIXED MEDIA							
	(NO ADDITIONAL CONTROL)						
HEAT EXCHANGER - BYPASS DAMPERS							
HXD-CO	BYPASS DAMPER CONTROL OUTPUT	AO			NC		
FIRE ALARM/SMOKE DETECTORS							
SD	SMOKE DETECTOR STATUS	BI				X	ON ACTIVATION
ALL POINTS SHOWN SHALL BE PROVIDED BY BAS CONTRACTOR UNLESS NOTED OTHERWISE.							
NOTES:							
A. DISPLAY VALUE WITH AHU GRAPHIC AT BAS FRONT-END. REFERENCE GLOBAL BUILDING MONITORING SCHEDULE FOR CONTROL POINT.							
C. REFERENCE PROJECT DESIGN CONDITIONS SCHEDULE FOR SETPOINT.							
D. POINT SHALL BE ADJUSTABLE.							
J. COORDINATE NUMBER OF STAGES FOR CONTROL WITH EQUIPMENT FURNISHED.							
K. DEVICE AND RELAY FROM FIRE ALARM SYSTEM PROVIDED BY DIVISION 28. DISPLAY DETECTOR RELAY STATUS (NORMAL/ALARM) AT BAS FRONT END.							

1 ROBOTICS - 100% OA SZ-VAV RTU (RTU-1W/N - LSW/N) NTS



SEQUENCE OF OPERATIONS
SINGLE ZONE VARIABLE AIR VOLUME
ROOFTOP UNIT (RTU-1W/N)

This sequence of operations is organized into the following main categories: operating modes; control setpoint resets; safeties, overrides and interlocks; and component control loops. The operating modes describe the criteria that either enable or disable the various modes of operation. If a mode of operation is not listed within a component control loop section then that mode of operation has no direct influence on the operation of the component. The control setpoint reset section describes the logic and reference variables that will be used to reset control setpoints to a new value within its reset range. The safeties, overrides, and interlocks section outlines the hardwired interlocks that are required to meet life safety requirements. Safeties and interlocks take precedence over all other control strategies outlined in this document. The control responses of each component for the various modes of operation are described in the component control loop sections. Setpoints shall be adjustable (adj.) as noted.

The sequence of operations, the points list and control diagrams shall be used to provide a complete description of the control philosophy for the controlled equipment. Individual setpoint values, reset ranges, and alarm action levels are listed in the points list. Components and control sensor locations are graphically depicted on the control diagram. The controls contractor shall be responsible for coordinating any necessary time delay setpoints to establish stable system operation.

GENERAL DESCRIPTION

The rooftop unit described by this sequence of operations consist of a 100% OA DX/Gas RTU with modulating supply fan, modulating powered exhaust, and static core energy recovery device. The RTU shall be provided with refrigeration only and control to its own internal safeties and time delays. Controls shown in the diagram, points list, and described in the sequence are intended to be provided by controllers, sensors, and programming to achieve the specified sequence of operations indicated.

OPERATING MODES

OCCUPIED MODE:

The unit shall be in occupied mode per the Project Design Conditions Schedule shown on the control drawings.

UNOCCUPIED MODE:

The unit shall be in unoccupied mode for all periods not included in the occupied hours of operation. Overrides of unoccupied schedule are defined at the zone level control.

OCCUPIED STANDBY MODE:

The unit shall be in occupied standby mode when the associated zone is scheduled to be occupied and an occupant sensor indicates zero population within the zone subject to a 5-minute (adj.) delay. The unit shall exit occupied standby mode when occupancy is detected.

COOLING MODE:

The unit shall be in cooling mode when the outside air temperature (OAT) rises above the outside air cooling enable setpoint (OAT-C)

HEATING MODE:

The unit shall be in heating mode when the outside air temperature (OAT) falls below the outside air heating enable setpoint (OAT-H)

VENTILATION ONLY MODE:

The unit shall be in ventilation only mode when the outdoor air temperature is between the outdoor air cooling enable (OAT-C) and outdoor air heating enable (OAT-H) setpoints.

DEHUMIDIFICATION MODE:

The unit shall be in dehumidification mode when the outside air dewpoint (OADP) is greater than the setpoint. The unit shall exit dehumidification mode when the outside air dewpoint (OADP) is less than its setpoint minus the outside air dewpoint deadband (OADP-DB). Dehumidification mode shall take priority over other modes.

ENERGY RECOVERY COOLING MODE- TEMPERATURE ENABLED:

The unit shall be in energy recovery cooling mode when the outside air temperature (OAT) is greater than the return air temperature (RAT).

ENERGY RECOVERY HEATING MODE- TEMPERATURE ENABLED:

The unit shall be in energy recovery heating mode when:
The outside air temperature (OAT) is lower than the return air temperature (RAT) and the outside air temperature (OAT) is colder than the supply air temperature (SAT) setpoint).

ENERGY RECOVERY FROST PREVENTION MODE- TEMPERATURE ENABLED:

The unit shall be in energy recovery frost prevention mode when the heat exchanger exhaust leaving air temperature (HX-LAT) falls below setpoint.
The unit shall be in energy recovery frost prevention mode when the outside air temperature (OAT) is below 30 degrees F (adj).

CONTROL SETPOINT RESETS

SUPPLY AIR TEMPERATURE RESET - DIRECT OUTSIDE AIR RESET:

The supply air temperature (SAT) setpoint shall linearly reset within the range as listed in the "setpoint reset range" column of the points list based on the outside air temperature (OAT) according to the following schedule:

(OAT)	(SAT)
OAT-C setpoint	minimum value of the SAT setpoint range
OAT-H setpoint	maximum value of the SAT setpoint range

VENTILATION RESET (CO2):

The outside airflow CFM (OA-AF) setpoint shall be reset between the minimum and maximum values subject to the associated zone level CO2 value as scheduled in the Project Design Conditions Schedule.

The airflow setpoint shall be at its maximum value when the associated zone CO2 sensor detects levels at or above the maximum CO2 range.
The airflow setpoint shall be at its minimum value when the associated zone CO2 sensor detects levels at or below the minimum CO2 range.

The airflow setpoint shall vary between its minimum and maximum setpoint range linearly as the associated zone CO2 sensor varies between its minimum and maximum value.

SAFETIES, OVERRIDES AND INTERLOCKS

SMOKE DETECTOR INTERLOCK:

The unit shall be disabled via hard wired interlock on activation of a system smoke detector. Display smoke detector relay status (normal or alarm) at the BAS front end.

COMPONENT CONTROL LOOPS

SUPPLY FAN CONTROL - SINGLE ZONE VARIABLE VOLUME:

When the HOA switch is in hand position, the variable speed supply fan shall operate at a speed set manually by the operator at the user interface of the drive.

When the HOA switch is in off position, the fan shall be off.

When the HOA switch is in auto position, the variable speed supply fan shall operate subject to the unit enable signal, and unit operating modes.

When in Occupied Mode:

The fan shall energize and slowly ramp to the initial minimum fan speed determined during system startup. Minimum fan speed shall be established during balancing.
The fan VFD shall modulate to maintain the design outside airflow CFM (OA-AF) as measured by the outside airflow sensor.

When in Occupied Standby Mode:

The fan shall be OFF.

When in Unoccupied Mode:

The fan shall be OFF. On an override signal from the zone level, the fan shall operate as in occupied mode until the override is removed.

When in Pre-Occupancy Purge Mode:

The fan shall operate as in occupied mode.

RELIEF - EXHAUST FAN (REF) - BUILDING PRESSURE SENSOR CONTROL

When in Occupied Mode:

The fan shall be ON. When the building differential pressure (BDP) exceeds setpoint, the fan shall energize and slowly ramp to the initial minimum fan speed determined during system startup. The fan VFD speed shall vary to maintain the building differential pressure (BDP) setpoint.

When in Unoccupied Mode:

The fan shall be OFF.

When in Pre-Occupancy Purge Mode:

The fan shall operate as in occupied mode.

OUTSIDE AIR DAMPER (OA)

When in Occupied Mode:

The damper shall be open.

When in Unoccupied Mode:

The damper shall close after the supply fan is off and a time delay.

When in Pre-Occupancy Purge Mode:

The damper shall be open.

FILTER MONITORING

When in All Modes:

The controller shall monitor the differential pressure across each filter bank and shall provide a signal when the setpoint is exceeded.

ENERGY RECOVERY BYPASS DAMPERS

The supply and exhaust bypass dampers shall be linked together on a common actuator.

When in Occupied Mode:

The dampers shall be open unless unit is in one of the following modes.

When in Ventilation Mode

The dampers shall be open. This takes priority over other energy recovery modes listed below.

When in Energy Recovery Cooling Mode:

The dampers shall be closed.

When in Energy Recovery Heating Mode:

The dampers shall modulate to maintain the heat exchanger leaving air temperature (HX-SAT) setpoint.

When in Energy Recovery Frost Prevention Mode:

Capacity modulation: The energy recovery bypass dampers shall modulate to maintain the heat exchanger exhaust leaving air temperature (HX-LAT) setpoint.

When in Unoccupied Mode:

The dampers shall be open.

On an override signal from the zone level the dampers shall operate as in occupied mode until the override is removed.

HEATING COIL- GAS MODULATED

When in Occupied Mode:

When in Ventilation Only Mode:

The coil shall be OFF.

When in Cooling Mode:

The coil shall be OFF.

When in Heating Mode:

The controller shall modulate the heating to maintain the supply air temperature setpoint (SAT).

When in Dehumidification Mode:

The coil shall be OFF.

When in Unoccupied Mode:

The coil shall be OFF.

On an override signal from the zone level the coil shall operate as in occupied mode until the override is removed.

COOLING COIL DX STAGED + VARIABLE CONTROL (MULTIPLE COMPRESSORS)

When in Occupied Mode:

When in Ventilation Only Mode:

The compressors shall be OFF.

When in Cooling Mode:

The variable compressor shall modulate in coordination with the constant speed compressors (subject to the manufacturer's standard safeties) to maintain the supply air temperature setpoint (SAT).

When in Heating Mode:

The compressors shall be OFF.

When in Dehumidification Mode:

The variable compressor shall modulate in coordination with the constant speed compressors (subject to the manufacturer's standard safeties) to maintain the cooling coil leaving air temperature (CC-LAT).

The variable compressor represents the primary stage of cooling and shall vary continuously between minimum capacity and 100% capacity to maintain the supply air set point temperature. When the supply air temperature setpoint cannot be maintained and the variable compressor is at 100%, then the constant speed compressor shall be energized and the variable compressor shall return to minimum speed and modulate to maintain the supply air setpoint. Units with subsequent stages of cooling shall follow a similar loading and unloading logic.

When in Unoccupied Mode:

The compressors shall be OFF.

On an override signal from the zone level the compressors shall operate as in occupied mode until override is removed.

REHEAT COIL- DX HOT GAS REHEAT

When in Occupied Mode:

When in Ventilation Only Mode:

The coil shall be OFF.

When in Cooling Mode:

The coil shall be OFF.

When in Heating Mode:

The coil shall be OFF.

When in Dehumidification Mode:

The manufacturer onboard controller shall control the hot gas reheat coil valve to maintain the supply air temperature setpoint (SAT).

When in Unoccupied Mode:

The coil shall be OFF.

On an override signal from the zone level the coil shall operate as in occupied mode until the override is removed.

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LSW: 2600 SW Ward Rd, Lee's Summit MO 64082
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SEQUENCE OF OPERATIONS
SINGLE ZONE VARIABLE AIR VOLUME
ROOFTOP UNIT (RTU-2W/N)

This sequence of operations is organized into the following main categories: operating modes; control setpoint resets; safeties, overrides and interlocks; and component control loops. The operating modes describe the criteria that either enable or disable the various modes of operation. If a mode of operation is not listed within a component control loop section then that mode of operation has no direct influence on the operation of the component. The control setpoint reset section describes the logic and reference variables that will be used to reset control setpoints to a new value within its reset range. The safeties, overrides, and interlocks section outlines the hardwired interlocks that are required to meet life safety requirements. Safeties and interlocks take precedence over all other control strategies outlined in this document. The control responses of each component for the various modes of operation are described in the component control loop sections. Setpoints shall be adjustable (adj.) as noted.

The sequence of operations, the points list and control diagrams shall be used to provide a complete description of the control philosophy for the controlled equipment. Individual setpoint values, reset ranges, and alarm action levels are listed in the points list. Components and control sensor locations are graphically depicted on the control diagram. The controls contractor shall be responsible for coordinating any necessary time delay setpoints to establish stable system operation.

GENERAL DESCRIPTION

The rooftop unit described by this sequence of operations consist of a DX/Gas RTU with modulating supply fan and modulating powered exhaust. The RTU shall be provided with refrigeration only and control to its own internal safeties and time delays. Controls shown in the diagram, points list, and described in the sequence are intended to be performed by controllers, sensors, and programming to achieve the specified sequence of operations indicated.

OPERATING MODES

OCCUPIED MODE:

The unit shall be in occupied mode per the Project Design Conditions Schedule shown on the control drawings.

COOLING MODE:

The unit shall be in cooling mode when the zone temperature (Z-T) rises above the dead band (Z-T-DB).

MINIMUM COOLING MODE:

The unit shall be in minimum cooling mode when:
The unit is in cooling mode;
And- The supply fan reaches its minimum speed setting for 2 minutes (adj.).
The unit shall return to cooling mode when:
The cooling coil leaving air temperature (CC-LAT) is at or below its setpoint for 2 minutes (adj.);

HEATING MODE:

The unit shall be in heating mode when the zone temperature (Z-T) falls below the dead band (Z-T-DB).

MINIMUM HEATING MODE:

The unit shall be in minimum heating mode when:
The unit is in heating mode;
And- The supply fan reaches its minimum speed setting for 2 minutes (adj.).
The unit shall return to heating mode when:
The supply air temperature (SAT) is at or above its setpoint for 2 minutes (adj.);

UNOCCUPIED MODE:

The unit shall be in unoccupied mode for all periods not included in the occupied hours of operation. Overrides of unoccupied schedule are defined at the zone level control.

DEHUMIDIFICATION MODE:

The unit shall be in dehumidification mode when the return air humidity sensor (RAH) senses humidity above 60% RH (adj.). The unit shall exit dehumidification mode when the humidity reaches or falls below 50% RH (adj.). The dehumidification mode shall be enabled to operate in occupied and unoccupied mode.

ECONOMIZER MODE – FIXED ENTHALPY WITH FIXED DRY-BULB TEMPERATURE

ENABLED:

The unit shall be in economizer mode when:
The supply fan status is on;
And- the unit is in cooling mode;
And- the AHU is not in freeze protection mode;
And- the outside air enthalpy is less than 28 Btu/lb (adj.);
And- the outside air temperature is less than 75 F (adj.);

MORNING WARM-UP/COOL-DOWN MODE:

The unit shall be in morning warm-up/cool-down mode according to an optimum start sequence to allow the temperature control zones to reach their scheduled occupied setpoints before the scheduled occupancy time.

CONTROL SETPOINT RESETS

SUPPLY AIR TEMPERATURE RESET - TRIM AND RESPOND - COOLING ONLY:

The supply air temperature (SAT) setpoint shall be reset using trim and respond logic within the range as listed in the "Setpoint Reset Range" column of the points list. The control system shall monitor the cooling loop output to determine the direction of reset (i.e., up or down). The control system shall be capable of excluding zones from the analysis.

Trim and respond logic:
When fan is off, reset setpoint to the default value.
While fan is proven on:
If the cooling loop output is less than 90% of cooling loop output (adj.), every 2 minutes (adj.), increase the setpoint by 0.5° F (adj.). Repeat trim and respond logic until the cooling loop output is greater than 90% open (adj.).
If the cooling loop output is greater than 95% open (adj.), every 2 minutes (adj.), decrease setpoint by 0.5° F. Repeat trim and respond logic until cooling loop output is less than 95% open(adj.).
When in economizer mode, reset the mixed air temperature setpoint (MAT) to be equal to the supply air temperature (SAT) setpoint.

COOLING COIL LEAVING AIR TEMPERATURE RESET - TRIM AND RESPOND –

DEHUMIDIFICATION MODE:

While in dehumidification mode, the cooling coil leaving air temperature (CC-LAT) setpoint shall be reset using trim and respond logic within the range as listed in the "Setpoint Reset Range" column of the points list.
Trim and respond logic:
Every 2 minutes (adj.), decrease the setpoint by 1.0° F (adj.). Repeat trim and respond logic until humidity setpoint is satisfied.
After humidity is satisfied, return to supply air temperature reset-cooling only trim and respond sequence.

VENTILATION RESET:

System Level Ventilation Reset - shall modify the minimum outside airflow setpoint value between the absolute minimum and the minimum outside airflow values shown on the air-handling unit schedule subject to the maximum zone level CO2 setpoint as scheduled in the Project Design Conditions Schedule. Upon detection of sensor failure, the system shall provide a signal that resets the ventilation system to supply the design minimum outside air value.

SAFETIES, OVERRIDES AND INTERLOCKS

SMOKE DETECTOR INTERLOCK:

The unit shall be disabled via hard wired interlock on activation of a system smoke detector. Display smoke detector relay status (normal or alarm) at the BAS front end.

COMPONENT CONTROL LOOPS

SUPPLY FAN CONTROL-VFD:

When the HOA switch is in hand position, the variable speed supply fan shall operate at a speed set manually by the operator at the user interface of the drive.
When the HOA switch is in off position, the fan shall be off.
When the HOA switch is in auto position, the variable speed supply fan shall operate subject to the unit enable signal, and unit operating modes.

When in Occupied Mode:

The fan shall energize and slowly ramp to the initial minimum fan speed determined during system startup. Minimum fan speed shall be established during balancing.
When in Cooling Mode:
The fan VFD shall modulate to control zone temperature (Z-T) at setpoint. An increase in zone temperature causes an increase in airflow.
When in Heating Mode:
The fan VFD shall modulate to control zone temperature at setpoint. A decrease in zone temperature causes an increase in airflow.
When in Minimum Cooling, or Minimum Heating Mode:
The fan VFD shall maintain minimum speed.
When in Dehumidification Mode:
The fan VFD shall be locked at its current speed until the minimum supply air temperature setpoint is reached. If the humidity is still not satisfied after 5 minutes (adj.), increase fan speed by 5% (adj.). Repeat fan speed trim and respond sequence until setpoint is satisfied. Return to previous mode of operation upon exiting dehumidification mode.

When in Unoccupied Mode:

The fan shall be OFF. On a call for cooling/heating or override signal from the zone level, the fan shall operate as in occupied mode until the call is cleared or the override is removed.

When in Dehumidification Mode:

The fan shall operate as in occupied mode.

When in Morning Warm-Up/Cool-Down Mode:

The fan shall operate as in occupied mode.

RELIEF - EXHAUST FAN (REF) - BUILDING PRESSURE SENSOR CONTROL

When in Occupied Mode:

The fan shall be OFF. When the building differential pressure (BDP) exceeds setpoint, the fan shall energize and slowly ramp to the initial minimum fan speed determined during system startup.
The fan VFD speed shall vary to maintain the building differential pressure (BDP) setpoint. The fan shall de-energize when the building pressure is satisfied.

When in Unoccupied Mode:

The fan shall be OFF.

When in Morning Warm-Up/Cool-Down Mode:

The fan shall be OFF.

MIXED AIR DAMPER WITH ECONOMIZER

The mixed air damper assembly consists of a outside air (OD) damper and return air (RD) damper.

When in Occupied Mode:

OA Active Control: The OA and RA dampers shall vary together to satisfy the minimum outside airflow setpoint as indicated by the OA airflow measuring station (OA-AF).

When in Unoccupied Mode:

The OA damper shall be fully closed and RA damper shall be fully open. On a call for cooling/heating or override signal, the OA damper shall remain closed unless beneficial for cooling.

When in Economizer Mode:

The OA and RA dampers shall modulate in opposing directions to maintain the supply air temperature (SAT) setpoint.

When in Morning Warm-Up/Cool-Down Mode:

The OA dampers shall be fully closed and the RA damper shall be fully open. The OA dampers shall be allowed to open if beneficial for cooling or heating

FILTER MONITORING

When in All Modes:

The controller shall monitor the differential pressure across each filter bank and shall provide a signal when the setpoint is exceeded.

HEATING COIL- GAS MODULATED

When in Occupied Mode:

The controller shall modulate the heating to maintain the heating coil leaving air temperature setpoint (SAT).
When in Cooling Mode:
The coil shall be OFF.
When in Minimum Heating Mode:
The controller shall modulate the heating to maintain the zone temperature setpoint (Z-T).
When in Heating Mode:
The controller shall modulate the heating to maintain the supply air temperature setpoint (SAT).

When in Unoccupied Mode:

The coil shall be OFF.
On a call for heating or override signal from the zone level the coil shall operate as in occupied mode until the call is cleared or the override is removed.

When in Economizer Mode:

The coil shall be OFF.

When in Morning Warm-Up Mode:

The coil shall operate as in occupied mode.

COOLING COIL DX STAGED + VARIABLE CONTROL (MULTIPLE COMPRESSORS)

When in Occupied Mode:

When in Minimum Cooling Mode:
The variable compressor shall modulate in coordination with the constant speed compressor(s) (subject to the unit manufacturer's standard safeties) to maintain the zone temperature setpoint (Z-T).
When in Cooling Mode:
The variable compressor shall modulate in coordination with the constant speed compressor(s) (subject to the unit manufacturer's standard safeties) to maintain the supply air temperature setpoint (SAT).
When in Heating Mode:
The coil shall be OFF.
When in Dehumidification Mode:
The variable compressor shall modulate in coordination with the constant speed compressors(s) (subject to the unit manufacturer's standard safeties) to maintain the cooling coil leaving air temperature (CC-LAT).
The variable compressor represents the primary stage of cooling and shall vary continuously between minimum capacity and 100% capacity to maintain the supply air set point temperature. When the supply air temperature setpoint cannot be maintained and the variable compressor is at 100%, then the constant speed compressor shall be energized and the variable compressor shall return to minimum speed and modulate to maintain the supply air setpoint. Units with subsequent stages of cooling shall follow a similar loading and unloading logic.

When in Unoccupied Mode:

The compressor(s) shall be OFF.
On a call for cooling or override signal from the zone level the compressor(s) shall operate as in occupied mode until the call is cleared or the override is removed.
On a call for dehumidification the compressor(s) shall operate as in occupied mode until the call is cleared or the override is removed.

When in Morning Cool-Down Mode:

The compressor(s) shall operate as in occupied mode.

REHEAT COIL- DX HOT GAS REHEAT

When in Dehumidification Mode:

The manufacturer onboard controller shall control the hot gas reheat coil valve to maintain the zone temperature setpoint (Z-T).

When in all other modes:

The coil shall be OFF.

Issue Date: September 5, 2022

NUMBER	DESCRIPTION	DATE
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Revisions

09/09/2022

CARL J. HOLDEN
LICENSE # PE-2020016283

MECHANICAL
CONTROLS

M403

09/09/2022

CARL J. HOLDEN
LICENSE # PE-2020016283

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ELECTRICAL SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

STANDARD MOUNTING HEIGHTS			
AUDIBLE APPLIANCE (CENTERLINE)		84"	
ALARM (TOP OF DEVICE)		48"	
ANNUNCIATOR PANEL (DISPLAY)		48"	
CONTROLS (TOP OF DEVICE)	SAME AS ADJACENT DEVICE, UNO	48"	
DATA WALL OUTLET		48"	
EXIT SIGNS (WALL MOUNTED)		60"	
FIRE ALARM ANNUNCIATOR PANEL (TOP OF DISPLAY)		60"	
FIRE ALARM BELL (EXTERIOR) (CENTERLINE)		120"	
FIRE ALARM CONTROL PANEL/UNIT (TOP OF DISPLAY)		60"	
INTERCOM (TOP OF DEVICE)		48"	
PULL STATION (TOP OF DEVICE)		48"	
RECEPTACLE		18"	
RECEPTACLE (ABOVE COUNTER)	48" ABOVE BACKSPASH/COUNTER, 40" MAX		
RECEPTACLE (CLOCK/CENTERLINE)		84"	
RECEPTACLE (EQUIPMENT ROOMS) (TOP OF DEVICE)		84"	
RECEPTACLE (EXTERIOR)		24"	
RECEPTACLE (GARAGES)		24"	
REMOTE INDICATING LIGHT (EQUIPMENT ROOMS) (TOP OF DEVICE)		48"	
REMOTE INDICATING LIGHT (FINISHED AREAS)		CEILING	
SAFETY SWITCH (TOP OF DEVICE)		48"	
STARTER (TOP OF DEVICE)		48"	
SWITCH (TOP OF DEVICE)		48"	
TELEPHONE WALL OUTLET (TOP OF DEVICE)		48"	
TELECOMMUNICATIONS BACKBOARD		48"	
TELEVISION OUTLET		48"	
VISIBLE APPLIANCE (CENTERLINE)	REFER TO ARCH	84"	
INSTALL OUTLET BOXES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ABOVE, OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, ARE AFF OR AFG TO BOTTOM OF OUTLET BOX. UNO, ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.			
ABBREVIATIONS			
AF	AMPERE FUSE SIZE	MCC	MOTOR CONTROL CENTER
AFB	ABOVE FINISHED CEILING	MFR	MANUFACTURER
AFD	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFH	ABOVE FINISHED GRADE	NLO	MAIN LUGS ONLY
AFJ	AUTHORITY HAVING JURISDICTION	NLV	MAGNETIC LOW-VOLTAGE
AHU	AIR HANDLING UNIT	NOC	MAXIMUM OVERCURRENT PROTECTION
AIC	AMPERE INTERRUPTING CAPACITY	MTD	MOUNTED
AS	AMPERE SWITCH SIZE	NA	NOT APPLICABLE
AT	AMPERE TRIP SETTING	NL	NIGHT LIGHT (24HR ON)
ATS	AUTOMATIC TRANSFER SWITCH	NRTL	NATIONALLY RECOGNIZED TESTING LABORATORY
AV	AUDIO VISUAL	NTS	NOT TO SCALE
BAS	BUILDING AUTOMATION SYSTEM	OS	OCCUPANCY SENSOR
BKR	BREAKER	P	POLE
C	CONDUIT	PART	PARTIAL CIRCUIT
CAT	CATEGORY	PH/O	PHASE
CATV	CABLE TELEVISION SYSTEM	PNL	PANEL
CD	CLOSED CIRCUIT TELEVISION	PNLB	PANEL BOARD
CD	CANDELA	PT	POTENTIAL TRANSFORMER
CKT	CIRCUIT	QTY	QUANTITY
CODE	APPLICABLE CODE	R/REL	RELOCATE
CT	CURRENT TRANSFORMER	RCPT	RECEPTACLE
CT	CENTER	RLA	RUNNING LOAD AMPS
CVD	CUMULATIVE VOLTAGE DROP	RTU	ROOFTOP UNIT
DDEMO	DEMOLITION	SCCR	SHORT-CIRCUIT CURRENT RATING
DDPT	DOUBLE-THROW	SD	SMOKE DUCT DETECTOR
DPST	DOUBLE-POLE, SINGLE-THROW	SF	SQUARE FEET
ET/REX	EXISTING TO REMAIN	SPDT	SINGLE-POLE, DOUBLE-THROW
EC	ELECTRICAL CONTRACTOR	SPST	SINGLE-POLE, SINGLE-THROW
EF	EXHAUST FAN	SSBJ	SUPPLY-SIDE BONDING JUNCTION
EM	EMERGENCY	ST	SHUNT TRIP
EMS	ENERGY MANAGEMENT SYSTEM	SWBD	SWITCHBOARD
ELV	ELECTRONIC LOW-VOLTAGE	SWGR	SWITCHGEAR
EW	ELECTRIC WATER COOLER	TBB	TELECOMMUNICATIONS BONDING BACKBONE
FAAP	FIRE ALARM ANNUNCIATOR PANEL	TBD	TO BE DETERMINED
FACP	FIRE ALARM CONTROL PANEL	TGB	TELECOMMUNICATIONS GROUND BUS BAR
FCA	FAULT CURRENT AMPS AVAILABLE	TL	TWISTLOCK
FCU	FAN COIL UNIT	TMGB	TELECOMMUNICATIONS MAIN GROUND BUS BAR
FF	FINISHED FLOOR	TX/FMR	TRANSFORMER
FLA	FULL LOAD AMPS	TY	TYPE
FLR	FLOOR	U/F	UNDERFLOOR
G	GENERAL CONTRACTOR	UG	UNDERGROUND
GEC	GROUNDING ELECTRODE CONDUCTOR	UIS	UNDERINSULATED
GES	GROUNDING ELECTRODE SYSTEM	UH	UNIT HEATER
GFR	GROUND FAULT RELAY	UNO	UNLESS NOTED OTHERWISE
G	GROUND	UPS	UNINTERRUPTIBLE POWER SUPPLY
IG	ISOLATED GROUND	VD	VOLTAGE DROP
ISC	SHORT CIRCUIT CURRENT	VFD	VARIABLE FREQUENCY DRIVE
JUB-BOX	JUNCTION BOX	VS	VACUANCY SENSOR
LF	LINEAR FEET	W	WIRE
LRA	LOCKED ROTOR AMPS	W	WITH
LTGLTS	LIGHTING LIGHTS	WP	WEATHER PROOF
MAU	MAKE-UP AIR UNIT	WR	WEATHER RESISTANT
MAX	MAXIMUM	WT	WATERTIGHT
MCA	MINIMUM CIRCUIT AMPACITY	XP	EXPLOSION PROOF
MCB	MAIN CIRCUIT BREAKER		
LINETYPE LEGEND			
THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK OR TO BE REMOVED FROM THE PROJECT. THE STATUS OF THE ITEMS IN THE FUTURE, THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO DESCRIBE THE PHASING OF THE ELECTRICAL PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASING DESCRIBED IN THE CONSTRUCTION DOCUMENTS IS GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.			
EXISTING	————	ARTICLE 700 OR LIFE SAFETY	
DEMOLISH	----	ARTICLE 701 OR CRITICAL / EQUIPMENT BRANCH	
NEW	----	ARTICLE 702 OR OPTIONAL	
FUTURE	----		

LINE TYPE LEGEND

EXISTING	ARTICLE 700 OR LIFE SAFETY
DEMOLISH	ARTICLE 701 OR CRITICAL / EQUIPMENT BRANCH
NEW	
FUTURE	ARTICLE 702 OR OPTIONAL

NOTE: PROJECT IS DESIGNED IN COMPLIANCE WITH THE FOLLOWING CODES. THIS IS NOT AN EXHAUSTIVE LIST. PROJECT SHALL COMPLY WITH ALL APPLICABLE CODES, STANDARDS AND LOCAL REQUIREMENTS. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE, (NFPA 70)

BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE

ENERGY CODE: N/A

ANNOTATION

1

MECHANICAL OR FIRE PROTECTION PLAN NOTE CALLOUT

1

PLUMBING PLAN NOTE CALLOUT

1

ELECTRICAL OR FIRE ALARM PLAN NOTE CALLOUT

1

TECHNOLOGY PLAN CALLOUT

1

PLUMBING EQUIPMENT DESIGNATION, (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES

1

EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)

CUL

1

MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)

1

CONNECTION POINT OF NEW WORK TO EXISTING

1

E1

DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER

1

E1

SECTION CUT DESIGNATION

1

E1

DEDICATED EQUIPMENT ACCESS TILE

1

E1

ACCESS PANEL

CIRCUITING & WIRING

7 5 3

OR

1-3,5,7

1

R1

P1

HOMERUN TO PANELBOARD, INFORMATION AT ARROWS ARE CIRCUIT NUMBERS AND PANELBOARD FOR TERMINATION. REFER TO PANELBOARD SCHEDULES FOR BRANCH CIRCUIT CONDUCTOR SIZES.

1

R1

INDICATES RELAY NUMBER

1

R1

CIRCUIT CONTINUATION OR PARTIAL CIRCUIT

1

R1

CONDUIT CONCEALED

1

R1

CONDUIT CONCEALED (EMERGENCY)

1

R1

CONDUIT IN UNDER FLOOR/GROUND CONSTRUCTION

1

R1

EXPOSED CONDUIT

1

R1

EXPOSED CONDUIT (EMERGENCY)

1

R1

FLEXIBLE CONDUIT

1

R1

LOW VOLTAGE CABLE (NOT ROUTED IN CONDUIT)

1

R1

CONDUIT TURNING DOWN

1

R1

CONDUIT TURNING UP

1

R1

CONNECTION POINT OR EQUIPMENT TERMINATION

1

R1

EQUIPMENT TERMINATION

CONDUCTOR TICK MARK LEGEND

WHERE TICK MARKS ARE SHOWN, THE FOLLOWING SHALL GOVERN:

1

SWITCHED HOT (PHASE) CONDUCTORS (SHOWN TRAILING NEUTRAL)

1

NEUTRAL (GROUNDED) CONDUCTOR

1

UNSWITCHED HOT (PHASE) CONDUCTORS (SHOWN LEADING NEUTRAL)

1

NOTE: HASH MARKS INDICATE QUANTITY OF CONDUCTORS

1

EQUIPMENT GROUNDING CONDUCTOR IN CONDUIT (GREEN INSULATION OR BARE)

1

ISOLATED GROUNDING CONDUCTOR IN CONDUIT (GREEN INSULATION WITH YELLOW TRACER)

BRANCH CIRCUIT CONDUCTOR TABLE

WHERE TICK MARKS ARE NOT SHOWN, THE FOLLOWING SHALL GOVERN:

OF POLES

HOT (PHASE)*

NEUTRAL

GROUNDING**

1P

(1)

(1) UNO

(1)

2P

(2)

(1) UNO

(1)

3P

(3)

(1) UNO

(1)

* PROVIDE ADDITIONAL CONDUCTORS THROUGH ENTIRE CIRCUIT (SWITCHED, UNSWITCHED, ETC.) AS INDICATED THROUGHOUT CONSTRUCTION DOCUMENTS AND AS REQUIRED FOR A COMPLETE AND WORKING SYSTEM.

** REFER TO SPECIFICATIONS FOR LIMITATIONS ON SHARING NEUTRAL (GROUNDED) CONDUCTORS. DO NOT CIRCUIT AS A MULTI-WIRE BRANCH CIRCUIT, UNO.

*** PROVIDE ADDITIONAL ISOLATED GROUNDING CONDUCTORS WHERE INDICATED.

REFER TO SPECIFICATIONS, PLANS, NOTES, WIRING AND CONTROL DIAGRAMS FOR ADDITIONAL CIRCUITING REQUIREMENTS.

LIGHTING	
①	LIGHT FIXTURE
①	a = LOWER CASE LETTER IS SWITCH IDENTIFIER
①	A = UPPER CASE LETTER INDICATES LIGHT FIXTURE TYPE
①	= WALL MOUNT
①	= ARROW INDICATED AIMING DIRECTION
①	LIGHT FIXTURE CIRCUITED AS A NIGHT LIGHT (NL)
①	EMERGENCY LIGHT FIXTURE WITH EMERGENCY LIGHTING BATTERY PACK OR CONNECTED TO EMERGENCY SOURCE
①	NIGHT LIGHT/EMERGENCY LIGHT FIXTURE WITH EMERGENCY BATTERY PACK OR CONNECTED TO EMERGENCY SOURCE
①	LIGHT FIXTURE WITH DUAL BALLASTS CIRCUITED SEPARATELY (SHADING IMPLIES EMERGENCY LIGHT FIXTURE)
①	LIGHTING TRACK (# INDICATES RELAY NUMBER)
①	MIRROR LIGHTS
①	EXTERIOR PARKING LOT LIGHT FIXTURE
①	EXTERIOR PEDESTRIAN POST TOP LIGHT FIXTURE
①	EXTERIOR LOT BOLLARD LIGHT
①	EXIT SIGN - CEILING / WALL MOUNTED, ARROWS AS INDICATED, FACE HATCHED
①	EMERGENCY LIGHTING UNIT EQUIPMENT WITH BATTERY PACK - CEILING/WALL MOUNTED
①	AFEA (AREA FOR EVACUATION ASSISTANCE) SIGN - CEILING/WALL MOUNTED, ARROWS AS INDICATED
REFER TO LIGHT FIXTURE SCHEDULE FOR MORE INFORMATION	
POWER EQUIPMENT & DEVICES	
①	ELECTRICAL PANELBOARD (SURFACE OR FLUSH MOUNT)
①	ELECTRICAL CABINET (SURFACE OR FLUSH MOUNT), TYPE AS NOTED
①	PLYWOOD TERMINAL BOARD FOR TELEPHONE SYSTEM, UNO, SIZE AS NOTED
①	SWITCHBOARD OR MOTOR CONTROL CENTER ON HOUSEKEEPING PAD
①	ELECTRICAL DISTRIBUTION PANELBOARD
①	TRANSFORMER
①	DISCONNECT SWITCH - "2003/150/3R" DENOTES AMPERES/POLE/FUSE/NEMA ENCLOSURE RATING, NF= NON-FUSED, CB= CIRCUIT BREAKER (2003/CB), NO VALUE (2003/150) FOR NEMA ENCLOSURE MEANS STANDARD NEMA 1 RATING
①	COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER "303/15/13R" DENOTES AMPERES/POLE/FUSE/NEMA STARTER SIZE/NEMA ENCLOSURE RATING, NF= NON-FUSED, CB= CIRCUIT BREAKER (303/CB/1), NO VALUE (2003/150/13) FOR NEMA ENCLOSURE MEANS STANDARD NEMA 1 ENCLOSURE RATING
①	MAGNETIC MOTOR STARTER, NEMA SIZE AS NOTED, 3-POLE, UNO
①	VARIABLE FREQUENCY DRIVE
①	INDICATING LIGHT
①	EMERGENCY POWER OFF BUTTON
①	STOP-START PUSH BUTTON CONTROL STATION
①	HAND-OFF-AUTO PUSH BUTTON CONTROL STATION
①	MUSHROOM-TYPE PUSH BUTTON
①	OVERHEAD PADDLE FAN

BOXES, LIGHTING CONTROL & WIRING DEVICES	
SWITCH LETTER DESIGNATIONS AS FOLLOWS:	
BLANK = SINGLE	
2 = TWO POLE	
3 = THREE-WAY	
4 = FOUR-WAY	
D = DIMMER	
F = FAN SPEED CONTROL	
FH = FRACTIONAL HORSEPOWER MANUAL CONTROLLER	
IH = INTEGRAL HORSEPOWER MANUAL CONTROLLER	
K = KEVED	
LVH = LOW VOLTAGE / DIGITAL	
M = MANUAL MOTOR STARTER DISCONNECT	
OSH = OCCUPANCY SENSOR	
P = SPST PILOT LIGHT	
WP = WEATHER PROOF	
# = REFER TO LIGHTING CONTROL DEVICE SCHEDULE	
①	AUTOMATIC LOAD CONTROL RELAY
①	BRANCH CIRCUIT TRANSFER SWITCH
①	CEILING / WALL MOUNTED OCCUPANCY SENSOR (# INDICATES TYPE PER SCHEDULE)
①	CORNER 90 DEGREE SENSING
①	ONE-DIRECTION SENSING, CEILING/WALL MOUNT
①	CEILING MOUNT, TWO DIRECTION SENSING
①	CEILING MOUNT, FOUR DIRECTION SENSING
①	CONTACTOR (SIZE, COIL VOLTAGE AND NUMBER OF POLES AS INDICATED)
①	TRACK-MOUNTED CURRENT LIMITER (## INDICATES AMPERAGE)
①	DAYLIGHT SENSOR (# INDICATES TYPE PER SCHEDULE)
①	LIGHTING CONTROLS PROCESSOR AND/OR EQUIPMENT
①	POWER PACK (# INDICATES TYPE PER SCHEDULE)
①	PHOTOELECTRIC SWITCH
①	ROOM CONTROLLER (# INDICATES TYPE PER SCHEDULE)
①	TIME SWITCH
①	SIMPLEX RECEPTACLE - NEMA 5-20R, UNO
①	DUPLEX RECEPTACLE - NEMA 5-20R, UNO
①	DOUBLE DUPLEX RECEPTACLE - NEMA 5-20R, UNO
①	SPECIAL RECEPTACLE - NEMA TYPE AS NOTED
①	TWIST-LOCK TYPE RECEPTACLE
①	BLANK FACE GFCI FEED THROUGH DEVICE
①	GFCI TYPE RECEPTACLE*
①	ISOLATED GROUND TYPE RECEPTACLE*
①	EMERGENCY RECEPTACLE*
①	RECEPTACLE INSTALLED ABOVE COUNTER OR BACKSPASH*
①	RECEPTACLE INSTALLED IN CEILING*
①	RECEPTACLE INSTALLED IN FLOOR*
①	RECEPTACLE INSTALLED VIA DROP CORD*
RECEPTACLE LETTER DESIGNATIONS AS FOLLOWS:	
C = AUTOMATICALLY CONTROLLED	
CH = CLOCK HANGER TYPE	
G-ROPT PROTECTED BY GFCI CIRCUIT BREAKER OR UPSTREAM GFCI DEVICE	
H = HORIZONTALLY MOUNTED	
S = MANUALLY CONTROLLED	
SP TVSS = SURGE PROTECTION TRIP - TAMPER RESISTANT	
TV = TELEVISION	
USB = USB/DUPLEX	
WR = WEATHER PROOF COVER	
WR = WEATHER RESISTANT	
①	MULTI-OUTLET ASSEMBLY
①	TELEPHONE OUTLET
①	DATA OUTLET
①	MULTI-SERVICE OUTLET; TELEPHONE AND DATA
①	ABOVE COUNTER, TYP
①	WALL, TYP
①	FLOOR, TYP
①	MULTI-SERVICE POWER POLE WITH TELEPHONE, DATA AND POWER OUTLETS A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
①	MULTI-SERVICE FLOOR BOX WITH TELEPHONE, DATA AND POWER OUTLETS A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
①	POKE THROUGH, A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
①	THERMOSTAT
①	CEILING/FLOOR MOUNT JUNCTION/OUTLET BOX
①	WALL MOUNT JUNCTION/OUTLET BOX
* SYMBOL DEMONSTRATED WITH DUPLEX RECEPTACLE. WHEN USED IN COMBINATION WITH OTHER DEVICES MEANING IS SIMILAR FOR THOSE DEVICE TYPES.	
REFER TO LIGHTING CONTROL DEVICE SCHEDULE FOR MORE INFORMATION.	

ELECTRICAL ONE-LINE & RISER DIAGRAM	
①	SWITCH (RATING AS INDICATED)
①	DRAWOUT CIRCUIT BREAKER (RATINGS AS INDICATED)
①	FUSED SWITCH (RATING, POLES AND FUSE TYPE AS INDICATED)
①	COMBINATION FUSED SWITCH/STARTER AND STARTER SIZE
①	CIRCUIT BREAKER (RATINGS AS INDICATED)
①	COMBINATION CIRCUIT BREAKER/STARTER AND STARTER SIZE
①	PANELBOARD, SINGLE OR MULTI-SECTION (REFER TO SCHEDULES)
①	ISOLATED POWER PANELBOARD W/ INTEGRAL TRANSFORMER (REFER TO SCHEDULES)
①	TRANSFORMER (TYPE AND RATINGS AS INDICATED)
①	SHIELDED TRANSFORMER (TYPE AND RATINGS AS INDICATED)
①	AUTOMATIC TRANSFER SWITCH (RATINGS AS INDICATED)
①	AUTOMATIC TRANSFER SWITCH WITH BYPASS (RATINGS AS INDICATED)
①	GENERATOR (RATINGS AS INDICATED)
①	SWITCHGEAR, SWITCHBOARD AND/OR DISTRIBUTION PANELBOARD (TYPE, RATING, DEVICES AND ACCESSORIES AS INDICATED)
①	COMBINATION DIGITAL VOLT METER/AMMETER
①	CIRCUIT IDENTIFICATION (REFER TO CIRCUIT SCHEDULE)
①	GROUND FAULT RELAY
①	PHASE FAILURE RELAY
①	KIRK-KEY INTERLOCK (# INDICATES KEY PAIR)
①	SHUNT TRIP
①	AMMETER (RANGE AS SPECIFIED OR REQUIRED)
①	VOLTMETER (RANGE AS SPECIFIED OR REQUIRED)
①	UTILITY METER (AS REQUIRED BY UTILITY)
①	AMMETER SWITCH
①	VOLTMETER SWITCH
①	WATT-HOUR METER, "D" DENOTES DEMAND REGISTER, "15" DENOTES MINUTES OF DEMAND INTERVAL
①	CURRENT TRANSFORMER RATING AS SPECIFIED OR REQUIRED
①	POTENTIAL TRANSFORMER RATING AS SPECIFIED OR REQUIRED
①	SURGE-PROTECTIVE DEVICE
①	GROUND CONNECTION
①	GROUND CONNECTION WITH TEST WELL
①	GROUND ROD
①	LIGHTNING ARRESTER
①	CAPACITOR
①	CONTACT (OPEN OR CLOSED)
①	HEATER
①	MOTOR
①	BLOCK LOAD KW OR KVA
①	FAULT POINT REFERENCED IN SHORT CIRCUIT CURRENT AND VOLTAGE DROP SPREADSHEET
①	× FB × FPP
CALL OUTS	
①	ENLARGED PLAN CALLOUT
①	NOT IN SCOPE

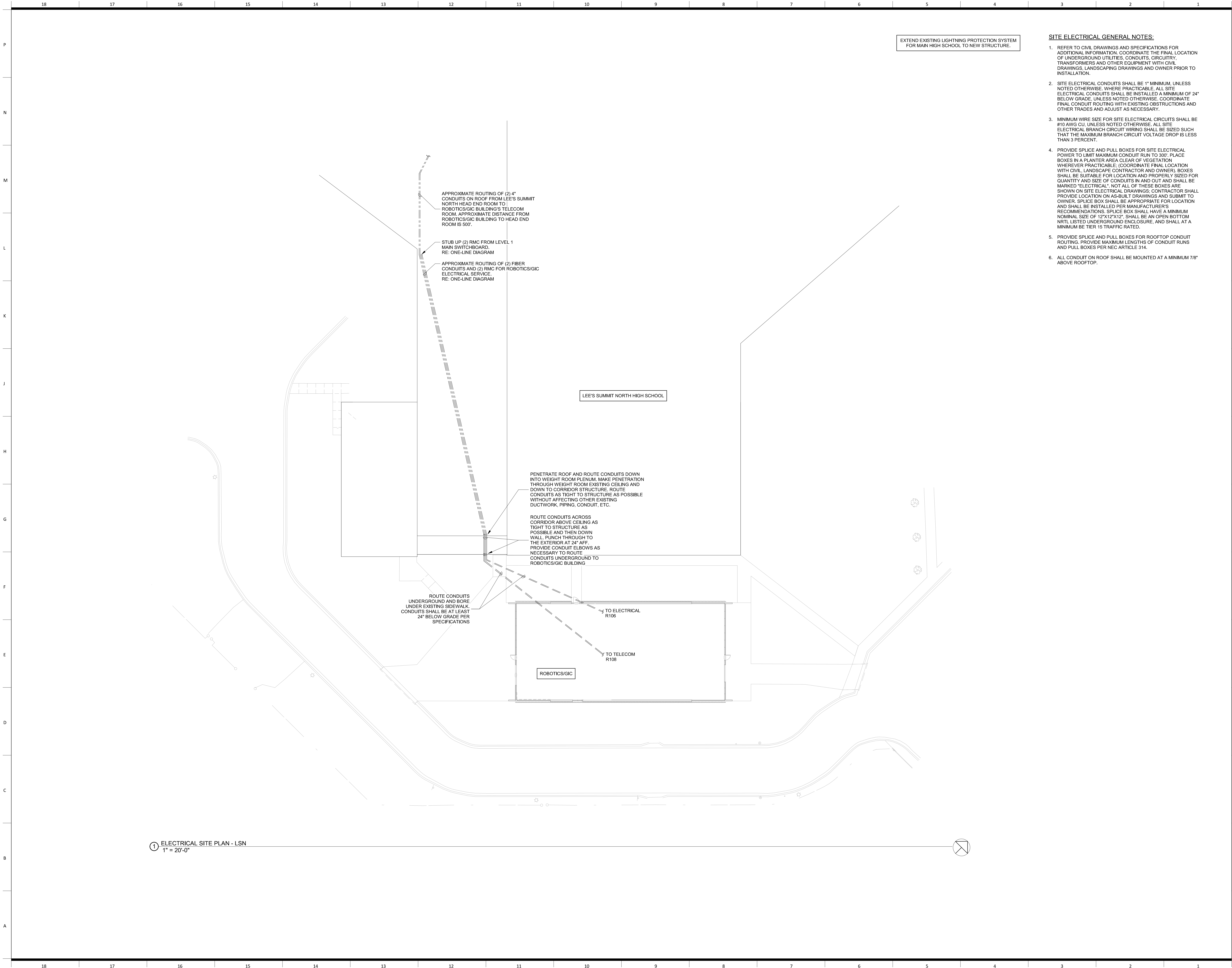
SPECIAL SYSTEMS SUPPLEMENTAL SPECIFICATIONS:

- PROVIDE NECESSARY BOXES, CONDUIT AND MAKE FINAL CONNECTIONS TO TEMPERATURE CONTROL DEVICES PER MANUFACTURER'S RECOMMENDATIONS. THIS INCLUDES BUT IS NOT LIMITED TO: MAIN CONTROL PANELS, THERMOSTATS, HUMIDISTATS, AC SOLENOIDS, HEAT RECLAIM WIRING, AHU CONTROL WIRING, DUCT FURNACE CONTROL WIRING, TIMERS, AND SIMILAR CONTROLS. PROVIDE CONDUIT FOR ALL WIRING WITHIN WALLS. PROVIDE CONTROL AND INTERLOCK WIRING WHEN NOT PROVIDED BY OTHER TRADES. COORDINATE REQUIREMENTS WITH EQUIPMENT SUPPLIERS AND OTHER TRADES PRIOR TO ROUGH-IN.
- PROVIDE LINE VOLTAGE WIRING AND MAKE FINAL CONNECTIONS TO ALL DUCT-MOUNTED SMOKE DETECTORS, FIRE/SMOKE AND SMOKE DAMPERS WHERE APPLICABLE. COORDINATE REQUIREMENTS WITH OTHER TRADES PRIOR TO INSTALLATION.
- DEVICES MOUNTED ON ACOUSTICAL TILE CEILINGS SHALL BE CENTERED ON THE TILE, UNO.
- PROVIDE BOX AND 3/4" CONDUIT FROM EACH THERMOSTAT LOCATION TO MECHANICAL EQUIPMENT. (FLUSH MOUNT BOX WHEREVER PRACTICABLE). COORDINATE LOCATION OF ALL THERMOSTAT BOXES WITH MECHANICAL/CONTROLS CONTRACTOR AND OWNER PRIOR TO ROUGH-IN.
- PROVIDE BOXES AND CONDUITS FOR THE FIRE PROTECTION SYSTEM LOW VOLTAGE WIRING AS REQUIRED. THIS INCLUDES EXPOSED WIRING LESS THAN 96" AFF. AT A MINIMUM, PROVIDE 3/4" CONDUIT, UNLESS NOTED OTHERWISE. COORDINATE REQUIREMENTS AND LOCATIONS WITH SYSTEM INSTALLER AND FIRE ALARM SPECIFICATIONS.
- AT A MINIMUM, PROVIDE EXTRA DEEP, DOUBLE GANG COMMUNICATION OUTLET BOXES, (FLUSH MOUNTED WHEREVER PRACTICABLE), WITH SINGLE-GANG PLASTER RING AND 1" CONDUIT STUBBED-UP CONCEALED TO ACCESSIBLE CEILING SPACE, UNLESS NOTED OTHERWISE. PROVIDE SURFACE MOUNTED DATA BOXES WITHIN CABINETS, AND SELECT OTHER LOCATIONS AS INDICATED ON THE DRAWINGS. COORDINATE TELEPHONE/DATA BOX AND CONDUIT LOCATIONS AND SIZES WITH OWNER AND OTHER TRADES PRIOR TO ROUGH-IN.

- PROVIDE NYLON BUSHINGS FOR ALL COMMUNICATIONS AND LOW VOLTAGE WIRING CONDUITS AND SLEEVES, UNLESS NOTED OTHERWISE.
- ALL COMMUNICATIONS AND LOW VOLTAGE WIRING CONDUIT SHALL BE INSTALLED WITH AN ACCESSIBLE PULLBOX BETWEEN EVERY 180 DEGREE CHANGE IN DIRECTION AND AT 100' INTERVALS OF CONTINUOUS RUNS.
- MINIMUM BEND RADIUS FOR COMMUNICATIONS CONDUIT IS 6 TIMES THE INSIDE DIAMETER FOR CONDUITS 2" IN DIAMETER AND SMALLER AND 10 TIMES THE INSIDE DIAMETER FOR CONDUITS GREATER THAN 2" IN DIAMETER, UNLESS NOTED OTHERWISE.
- ALL LOW VOLTAGE CLASS 2 OR 3 WIRING NOT IN CONDUIT SHALL BE PLENUM RATED WHERE APPLICABLE.
- LOW VOLTAGE CABLE SHEATH LABELS AND RELATED MANUFACTURER INFO SHALL REMAIN APPARENT IN ALL EXPOSED APPLICATIONS. PROTECT ALL EXPOSED CABLES FROM PAINTING AND OVERSPRAY (INCLUDES CABLE NOT ROUTED IN CONDUIT AND THAT IS IN CABLE TRAY).

ELECTRICAL SUPPLEMENTAL SPECIFICATIONS:

- PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS, AS APPLICABLE. REVIEW THE OWNER CRITERIA, GENERAL NOTES, OTHER TRADE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT AND ENGINEER OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMITTING BID.
- ALL WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES AS WELL AS APPLICABLE INDUSTRY STANDARDS. ALL EQUIPMENT SHALL BEAR LABELS FOR THE USE INTENDED BY THE AHJ ACCEPTED NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL), SUCH AS UL OR ETL. THE FINAL ELECTRICAL INSTALLATION OF THE FACILITY OCCUPIED BY OWNER SHALL BE FREE FROM ELECTRICAL DEFECTS TO THE SATISFACTION OF THE AHJ, OWNER, ARCHITECT AND ENGINEER.
- COORDINATE FINAL LOCATION AND INSTALLATION REQUIREMENTS OF ALL LIGHT FIXTURES, ELECTRICAL EQUIPMENT AND ELECTRICAL DEVICES WITH ARCHITECTURAL DRAWINGS, EXISTING CONDITIONS AND OTHER TRADES PRIOR TO ROUGH-IN. PROVIDE ALL NECESSARY DEVICES, CORDS, PLUGS, DISCONNECTS AND FINAL CONNECTIONS TO ELECTRICAL EQUIPMENT FOR PROPER OPERATION IN ACCORDANCE WITH CODE, OWNER AND MANUFACTURER REQUIREMENTS.
- ELECTRICAL DRAWINGS ARE DIAGRAMMATIC/SCHEMATIC IN NATURE AND REPRESENT THE GENERAL SCOPE OF WORK. IT IS NOT WITHIN THE SCOPE OF THE ELECTRICAL DRAWINGS TO SHOW ALL NECESSARY RACEWAY ROUTING, BENDS, OFFSETS, PULL BOXES AND OBSTRUCTIONS. CONTRACTOR SHALL COORDINATE THE FINAL LOCATION OF EQUIPMENT AND WIRING DEVICES WITH OTHER TRADES PRIOR TO INSTALLATION AND INSTALL ALL WORK TO CONFORM TO THE OWNER REQUIREMENTS.
- ALL CONDUCTOR AND CONDUIT LENGTHS SHOWN IN THESE DESIGN DOCUMENTS ARE INTENDED SOLELY FOR USE IN THE DESIGN CALCULATIONS BY THE DESIGN PROFESSIONAL, UNLESS NOTED OTHERWISE. LENGTHS SHOWN SHALL NOT BE USED TO ASSIST IN THE BIDDING TAKEOFF PROCESS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MATERIAL QUANTITIES REQUIRED TO BID AND CONSTRUCT THE COMPLETE PROJECT.
- PROVIDE PROPER FIRE PROOFING AND SEALANT FOR PENETRATIONS THROUGH FIRE RATED ASSEMBLIES. THE FIRE STOPPING METHOD, MATERIAL AND ITS APPLICATION SHALL BE NRTL LISTED, CODE COMPLIANT AND APPROVED BY AHJ.
- WHEN CONCRETE TRENCHING/CORING IS REQUIRED, THE METHODS, DEPTHS, AND LOCATIONS SHALL BE PRE-APPROVED BY LANDLORD, ARCHITECT, AND STRUCTURAL ENGINEER PRIOR TO THE START OF WORK. X-RAY SLAB AS NECESSARY TO AVOID DAMAGING ANY UNDER-SLAB UTILITY OR STRUCTURE. SLAB REPLACEMENT SHALL BE INSTALLED WITH DOWELLING AND REINFORCED CONCRETE AS DIRECTED BY THE STRUCTURAL ENGINEER. WHERE SLAB ON GRADE IS SAW-CUT AND REMOVED FOR TRENCHING THE CONTRACTOR SHALL INSTALL MOISTURE BARRIER PER LANDLORD'S REQUIREMENTS. PROVIDE 3/4" MINIMUM CONDUITS ROUTED THROUGH SLAB AND STUBBED UP INTO DEVICES. FOR SLAB ON DECK, THE FLOOR SHALL BE SLEEVED AND EQUIPPED WITH THE APPROPRIATE LISTED ASSEMBLY. PROVIDE 3/4" MINIMUM CONDUITS ROUTED BELOW SLAB, TIGHT TO STRUCTURE, AND STUBBED UP INTO DEVICES.
- ALL APPLICABLE SWITCHES, RECEPTACLES, OUTLETS, AND CONTROLS SHALL BE PLACED AT HEIGHTS THAT ARE IN ACCORDANCE WITH ADA ACCESSIBILITY GUIDELINES.
- COORDINATE FLOOR MOUNTED BOX, RECEPTACLE, AND COVER PLATE TYPES WITH ARCHITECT AND OWNER PRIOR TO ORDER.
- WIRING DEVICES ADJACENT TO EACH OTHER SHALL BE INSTALLED UNDER A SINGLE COVER PLATE, UNO. HORIZONTALLY TO REDUCE SOUND TRANSMISSION BETWEEN ROOMS, UNO.
- WIRING DEVICES SHOWN BACK-TO-BACK ON A COMMON WALL SHALL BE OFFSET A MINIMUM OF 12" HORIZONTALLY TO REDUCE SOUND TRANSMISSION BETWEEN ROOMS, UNO.
- ALL 120V RECEPTACLES 50A OR LESS, 208V AND 240V RECEPTACLES 100A OR LESS, SHALL BE GFCI PROTECTED IN LOCATIONS REQUIRED BY CODE. THIS INCLUDES BATHROOMS, KITCHENS/FOOD PREP AREAS, EXTERIOR LOCATIONS AND RECEPTACLES WITHIN 6' OF A SINK. GFCI RECEPTACLES SHALL BE READILY ACCESSIBLE AND SHALL NOT BE LOCATED BEHIND STATIONARY EQUIPMENT. GFCI PROTECTION MAY BE VIA A GFCI CIRCUIT BREAKER OR GFCI RECEPTACLE, UNLESS NOTED OTHERWISE. WHERE NECESSARY, GFCI PROTECTION MAY BE ACHIEVED VIA A BLANK FACE GFCI DEVICE LOCATED IN A READILY ACCESSIBLE LOCATION NEAR RECEPTACLE BEING PROTECTED. FOR DOWNSTREAM WIRING DEVICES LOCATED ON THE SAME BRANCH CIRCUIT, THE GFCI PROTECTION MAY BE PROVIDED FOR BY A SINGLE UPSTREAM DEVICE IF ALL PROTECTED DEVICES ARE LABELED PER CODE.
- PROVIDE TAMPER-RESISTANT (TR) TYPE RECEPTACLES AT ALL CODE REQUIRED LOCATIONS AND AT LOCATIONS WHERE RECEPTACLES ARE MOUNTED LESS THAN 5'-6" AFF AND ARE EASILY ACCESSIBLE BY CHILDREN, UNLESS NOTED OTHERWISE.
- FLEXIBLE CONDUIT IS ONLY PERMITTED WHERE SPECIFICALLY ALLOWED IN THE CONSTRUCTION DOCUMENTS, WHERE CONCEALED FROM VIEW OR EXPOSED FINAL CONNECTIONS TO LIGHT FIXTURES AND EQUIPMENT IN LENGTHS OF 6'-0" OR LESS.
- ALL EMPTY CONDUIT/RACEWAY SHALL BE INSTALLED WITH PULL STRINGS. TERMINATE CONDUIT STUB-UP WITH A NYLON BUSHING.
- EXPOSED CONDUIT/RACEWAY SHALL BE PAINTED TO MATCH ADJACENT SURFACE, UNLESS NOTED OTHERWISE. COORDINATE REQUIREMENTS WITH ARCHITECT AND OWNER PRIOR TO INSTALLATION.
- CONDUITS/RACEWAYS SHALL BE CONCEALED FROM VIEW WHEREVER PRACTICABLE. UNLESS NOTED OTHERWISE, ROUTE CONDUITS SERVING ROOFTOP EQUIPMENT CONCEALED INSIDE EQUIPMENT CURB AND MINIMIZE ROOF PENETRATIONS AND EXTERIOR CONDUIT RUNS WHERE PRACTICABLE. SUPPORT RACEWAY FROM STRUCTURE, NOT ROOF DECK. MAINTAIN 2" MIN SPACING FROM BOTTOM OF ROOF DECK TO PREVENT ROOFING SCREWS FROM PENETRATING RACEWAY. DO NOT ROUTE CONDUITS ACROSS SKYLIGHTS, ACCESS PANELS, HATCHES/TILES, HVAC DIFFUSERS, OR EQUIPMENT WORKING CLEARANCE SPACE. ROUTE ALL EXPOSED NON-FLEXIBLE CONDUITS TIGHT TO STRUCTURE, PARALLEL TO BUILDING LINES AND IN STRUT OR CABLE/PIPE TRAY WHERE PRACTICABLE. INSTALL CONDUITS PLUMB/LEVEL WHERE EXPOSED TO VIEW. COORDINATE RACEWAY ROUTING AND INSTALLATION WITH OTHER TRADES PRIOR TO ROUGH-IN.
- WHERE PRACTICABLE, ALL UNDER-FLOOR/UNDER-GROUND CONDUIT/RACEWAY SHALL BE INSTALLED A MINIMUM OF 24" BELOW BOTTOM OF SLAB/PAVING/GRADE, UNLESS NOTED OTHERWISE. NOTE: THE DESIGN INTENT FOR INSTALLING ELECTRICAL CIRCUITRY AT THIS DEPTH IS TO PROTECT THE ELECTRICAL CIRCUITRY FROM DAMAGE DUE TO FUTURE WORK.
- PROVIDE LABEL



LSR7 Robotics, GiC & Phys Education

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Revisions		
NUMBER	DESCRIPTION	DATE

STATE OF MISSOURI
DOUGLAS M. EVERHART
NUMBER
PE-2019007648
PROFESSIONAL ENGINEER
09/09/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSN - ELECTRICAL SITE
PLAN
E100-B

LSR7 Robotics, GiC &
Phys Education

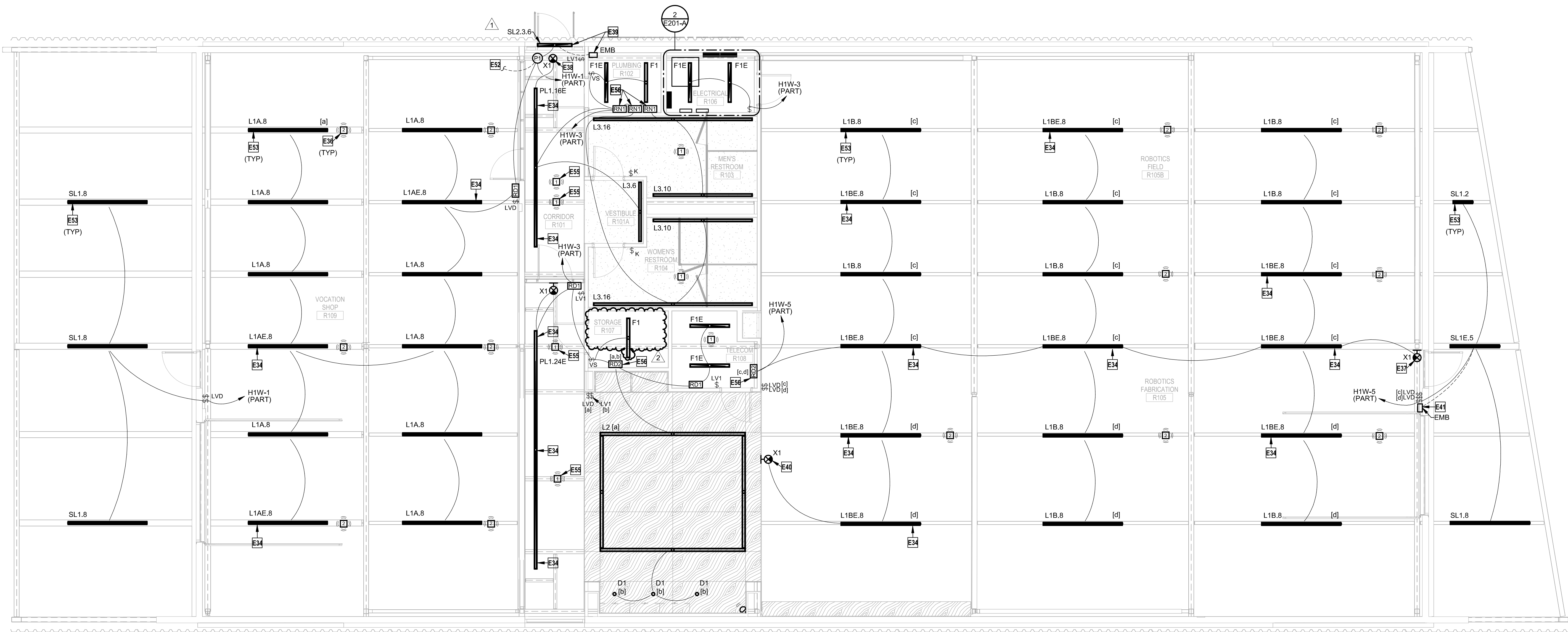
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NO EXPOSED CONDUITS SHALL PENETRATE FINISHED
PLYWOOD ON WALLS. ALL CONDUITS SHALL ROUTE ABOVE
PLYWOOD WHEN PENETRATING WALLS. REFER TO
ARCHITECTURAL SHEETS FOR EXACT HEIGHTS OF FINISHED
PLYWOOD.

ELECTRICAL PLAN NOTES:

- E34 PROVIDE EMERGENCY BATTERY PACK CAPABLE OF
OPERATING 4' SECTION OF FIXTURE AT THIS LOCATION
WITHIN CONTINUOUS FIXTURE RUN. REFER TO LIGHT
FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.
E36 SURFACE MOUNT OCCUPANCY SENSOR TO UNDERSIDE OF
STRUCTURE.
E37 SURFACE MOUNT EXIT SIGN TO SIDE OF COLUMN 10' AFF.
E38 SURFACE MOUNT EXIT SIGN TO UNDERSIDE OF STRUCTURE.
E39 MOUNT FIXTURE TO UNDERSIDE OF BLOCKING BETWEEN
EXTERIOR METAL SKIN AND BUILDING EXTERIOR. CIRCUIT
WITH REMOTE BATTERY IOTA ILB CP10 HE SD (OR
APPROVED EQUIVALENT) FOR EMERGENCY OPERATION.
MOUNT BATTERY IN ENCLOSURE TIGHT TO STRUCTURE IN
PLUMBING R102. REFER TO ARCHITECTURAL DETAILS FOR
ADDITIONAL MOUNTING REQUIREMENTS AND INFORMATION.
E40 MOUNT EXIT SIGN 12' AFF.
E41 CIRCUIT WITH REMOTE BATTERY IOTA ILB CP10 HE SD (OR
APPROVED EQUIVALENT) FOR EMERGENCY OPERATION.
MOUNT BATTERY IN ENCLOSURE TIGHT TO STRUCTURE.
E52 REFER TO ROOF PLAN FOR LOCATION OF PHOTOELECTRIC
SWITCH FOR CONTROL CANOPY FIXTURE.
E53 SURFACE MOUNT FIXTURE TO UNDERSIDE OF STRUCTURE.
E55 PENDANT MOUNT OCCUPANCY SENSOR NO HIGHER THAN
12' AFF.
E56 PROVIDE LABEL FOR ROOM CONTROLLERS NOTING THE
ROOMS THEY SERVE. MOUNT ON WALL NO HIGHER THAN 10'
AFF.



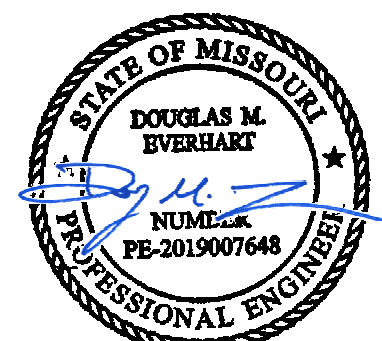
1 LIGHTING LEVEL 1 RCP - LSW
3/16" = 1'-0"



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1	Addendum 01	09/16/2022
2	Addendum 02	09/19/2022



09/23/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSW - LIGHTING RCP
E101-A

LSR7 Robotics, GiC & Phys Education

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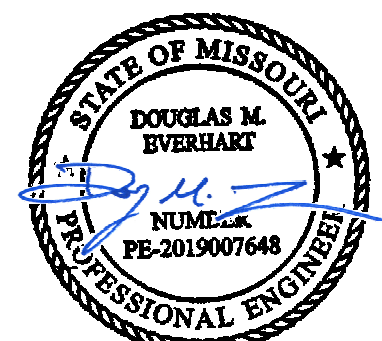
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1	Addendum 01	09/16/2022
2	Addendum 02	09/13/2022



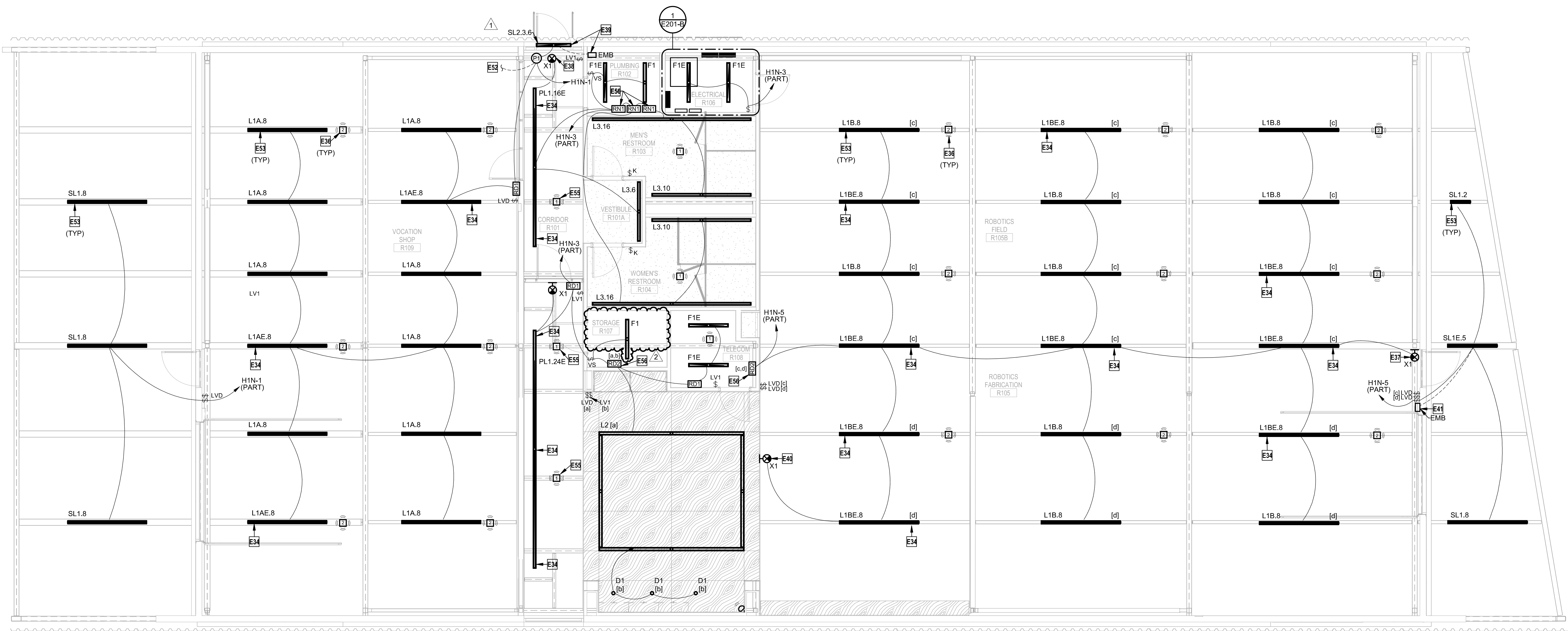
09/23/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSN - LIGHTING RCP
E101-B

NO EXPOSED CONDUITS SHALL PENETRATE FINISHED PLYWOOD ON WALLS. ALL CONDUITS SHALL ROUTE ABOVE PLYWOOD WHEN PENETRATING WALLS. REFER TO ARCHITECTURAL SHEETS FOR EXACT HEIGHTS OF FINISHED PLYWOOD.

ELECTRICAL PLAN NOTES:

- E34 PROVIDE EMERGENCY BATTERY PACK CAPABLE OF OPERATING 4" SECTION OF FIXTURE AT THIS LOCATION WITHIN CONTINUOUS FIXTURE RUN. REFER TO LIGHT FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.
- E36 SURFACE MOUNT OCCUPANCY SENSOR TO UNDERSIDE OF STRUCTURE.
- E37 SURFACE MOUNT EXIT SIGN TO SIDE OF COLUMN 10' AFF.
- E38 SURFACE MOUNT EXIT SIGN TO UNDERSIDE OF STRUCTURE.
- E39 MOUNT FIXTURE TO UNDERSIDE OF BLOCKING BETWEEN EXTERIOR METAL SKIN AND BUILDING EXTERIOR. CIRCUIT WITH REMOTE BATTERY IOTA ILB CP10 HE SD (OR APPROVED EQUIVALENT) FOR EMERGENCY OPERATION. MOUNT BATTERY IN ENCLOSURE TIGHT TO STRUCTURE IN PLUMBING R102. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL MOUNTING REQUIREMENTS AND INFORMATION.
- E40 MOUNT EXIT SIGN 12' AFF.
- E41 CIRCUIT WITH REMOTE BATTERY IOTA ILB CP10 HE SD (OR APPROVED EQUIVALENT) FOR EMERGENCY OPERATION. MOUNT BATTERY IN ENCLOSURE TIGHT TO STRUCTURE.
- E52 REFER TO ROOF PLAN FOR LOCATION OF PHOTOELECTRIC SWITCH FOR CONTROL CANOPY FIXTURE.
- E53 SURFACE MOUNT FIXTURE TO UNDERSIDE OF STRUCTURE.
- E55 PENDANT MOUNT OCCUPANCY SENSOR NO HIGHER THAN 12' AFF.
- E56 PROVIDE LABEL FOR ROOM CONTROLLERS NOTING THE ROOMS THEY SERVE. MOUNT ON WALL NO HIGHER THAN 10' AFF.



1 LIGHTING LEVEL 1 RCP - LSN
3/16" = 1'-0"

LSR7 Robotics, GiC & Phys Education

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LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

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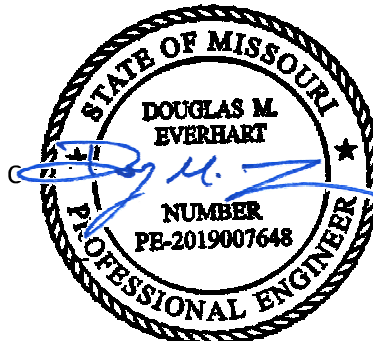
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EXPIRES 12/31/2022

Issue Date: September 9, 2022

NUMBER	DESCRIPTION	DATE
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09/09/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSW - POWER PLAN

E201-A

GIC EQUIPMENT SCHEDULE

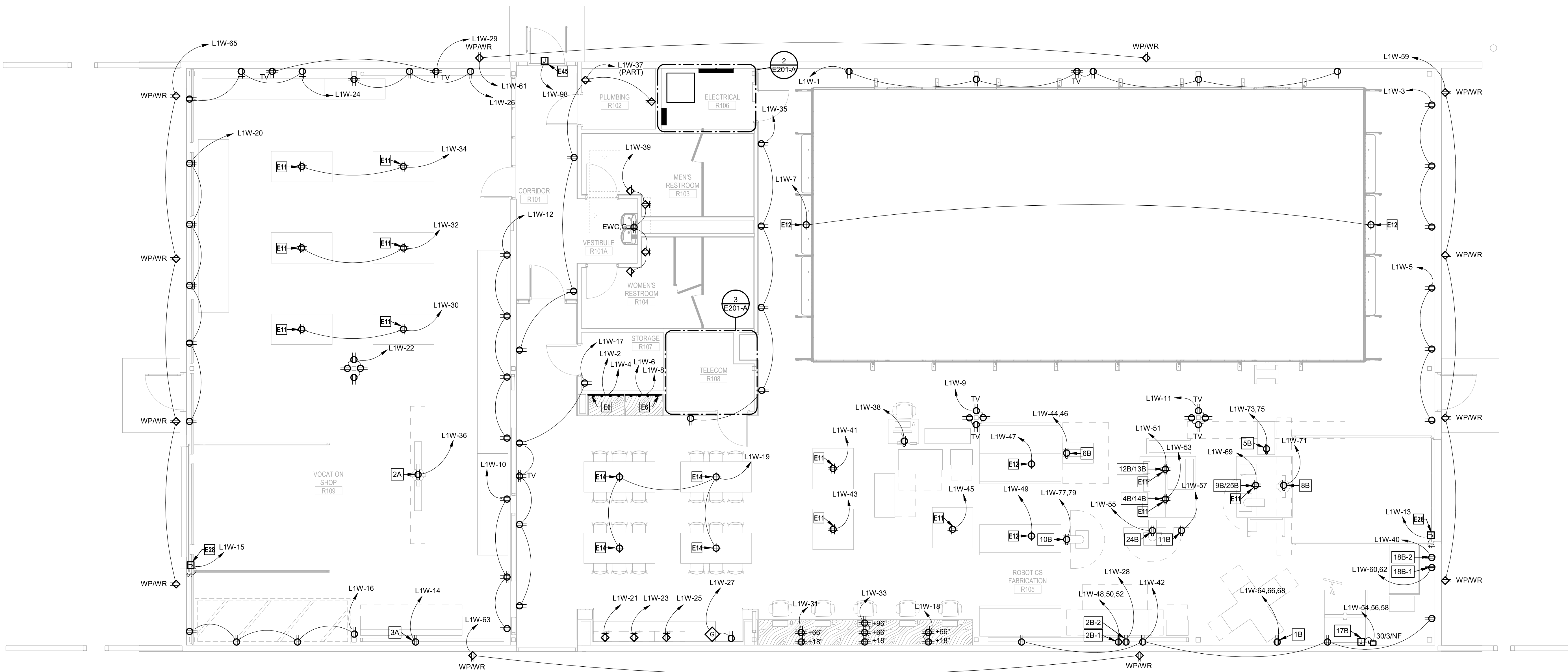
TAG	EQUIPMENT DESCRIPTION	VOLTAGE	PHASE	RECEPTACLE TYPE
2A	MITER SAW	120 V	1	5-20R
3A	PANEL SAW	120 V	1	5-20R

ROBOTICS EQUIPMENT SCHEDULE

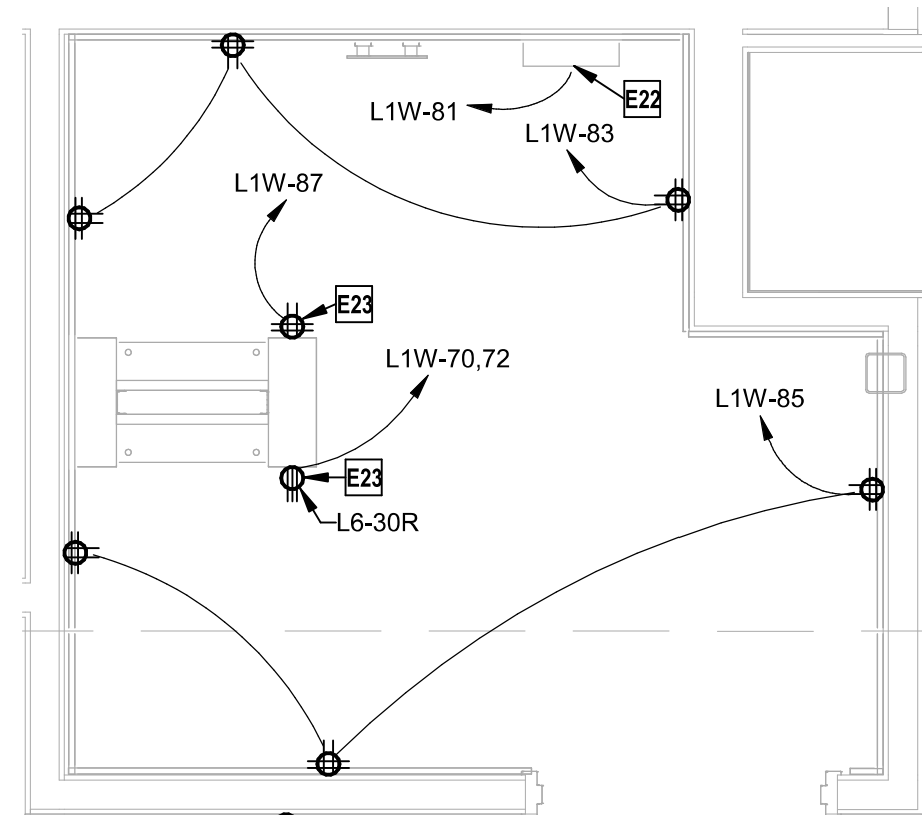
TAG	EQUIPMENT DESCRIPTION	VOLTAGE	PHASE	RECEPTACLE TYPE
1B	BRIDGEPORT 3-AXIS CNC	208 V	1	15-20R
2B-1	BIRMINGHAM YCL-1440GH LATHE (MAIN)	208 V	3	15-30R
2B-2	BIRMINGHAM YCL-1440GH LATHE (CONTROLS)	120 V	1	5-20R
4B/14B	ROLAND MDX-40A MILLING MACHINE BUFFING WHEEL	120 V	1	RE PLAN NOTE
5B	WELLS HORIZONTAL BANDSAW	208 V	1	6-20R
6B	DELTA MILWAUKEE BAND SAW	208 V	1	6-20R
9B	MITACHI MITER SAW	120 V	1	5-20R
9B/25B	BALDOR BELT SANDER CRAFTSMAN 8" DRILL PRESS BUFFING WHEEL	120 V	1	5-20R
10B	DELTA MILWAUKEE DRILL PRESS	208 V	1	6-20R
11B	BELT AND DISC SANDER	120 V	1	5-20R
12B/13B	RYOBI BENCH GRINDER PORTER CABLE BENCH GRINDER	120 V	1	RE PLAN NOTE
17B	OPEN TABLE CNC	208 V	3	HARDWIRED
18B-1	TIG WELDER (MAIN)	208 V	1	6-30R
18B-2	TIG WELDER (MISC)	120 V	1	5-20R
24B	CRAFTSMAN 17" DRILL PRESS	120 V	1	5-20R

ELECTRICAL PLAN NOTES:

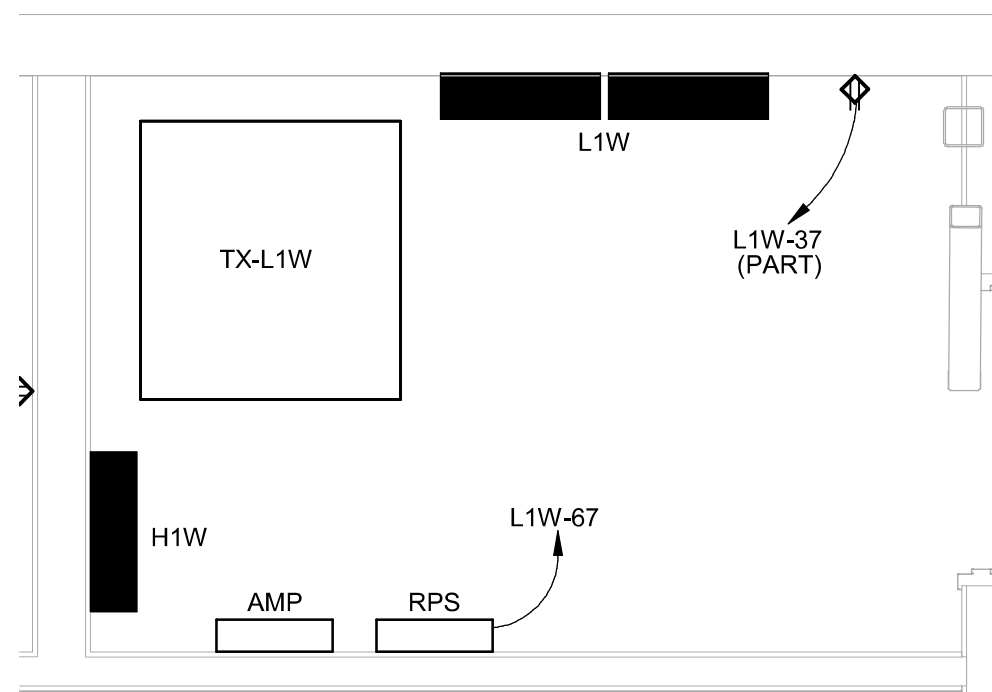
- E6 PROVIDE (2) DUAL CHANNEL ALUMINUM RACEWAYS, LEGRAND ALA4800 SERIES WITH RECEPTACLES AND DATA OUTLETS SPACED AT 1' INTERVALS. PROVIDE AT 4' AFF AND 5' AFF. REFER TO ARCHITECTURAL ELEVATIONS FOR ADDITIONAL INFORMATION.
- E11 PROVIDE KH INDUSTRIES RTBB3L-WDD520-J12F RETRACTABLE CORD REEL OR APPROVED EQUIVALENT. 25' CORD LENGTH WITH #12/3 WIRES RATED FOR 20A AT 120V. (2) DUPLEX RECEPTACLES, NEMA 2 ENCLOSURE. 5JOW BLACK CORD. 12 POSITION ADJUSTABLE GUIDE ARM WITH ADJUSTABLE RATCHED AND BALL STOP. 6' FEEDER CORD.
- E12 PROVIDE KH INDUSTRIES RTAN3LW-WCL520-J12F RETRACTABLE CORD REEL OR APPROVED EQUIVALENT. 25' CORD LENGTH WITH #12/3 WIRES RATED FOR 20A AT 120V. (1) TWISTLOCK L5-20R RECEPTACLE, NEMA 2 ENCLOSURE. 5JOW BLACK CORD. 4 POSITION ADJUSTABLE ARM WITH (4) ROLLER GUIDES AND ADJUSTABLE BALL STOP. 6' FEEDER CORD. WHITE FINISH.
- E14 RECESS L5-20R TWISTLOCK RECEPTACLE IN WOOD CEILING.
- E22 PROVIDE POWER CONNECTION TO ACCESS CONTROL PANEL.
- E23 MOUNTED RECEPTACLE TO LADDER RACK AT 7'-0" AFF. COORDINATE FINAL LOCATION AND ROUTINGS WITH OWNER PRIOR TO ROUGH-IN.
- E28 PROVIDE JUNCTION BOX AND HARDWIRE CONNECTION TO MOTORIZED OVERHEAD GARAGE DOOR. COORDINATE ROUGH-IN AND CONTROL LOCATIONS WITH APPROVED MANUFACTURER PRIOR TO INSTALL.
- E45 PROVIDE LINE VOLTAGE CONNECTION TO ADA DOOR OPERATOR WITH LOW VOLTAGE WIRING TO PUSH BUTTON(S). COORDINATE WIRING CONFIGURATION WITH APPROVED MANUFACTURER PRIOR TO ROUGH-IN.



1 POWER LEVEL 1 PLAN - LSW
3/16" = 1'-0"



3 POWER LEVEL 1 PLAN - LSW - TELECOM ROOM
1/2" = 1'-0"



2 POWER LEVEL 1 PLAN - LSW - ELEC ROOM
1/2" = 1'-0"

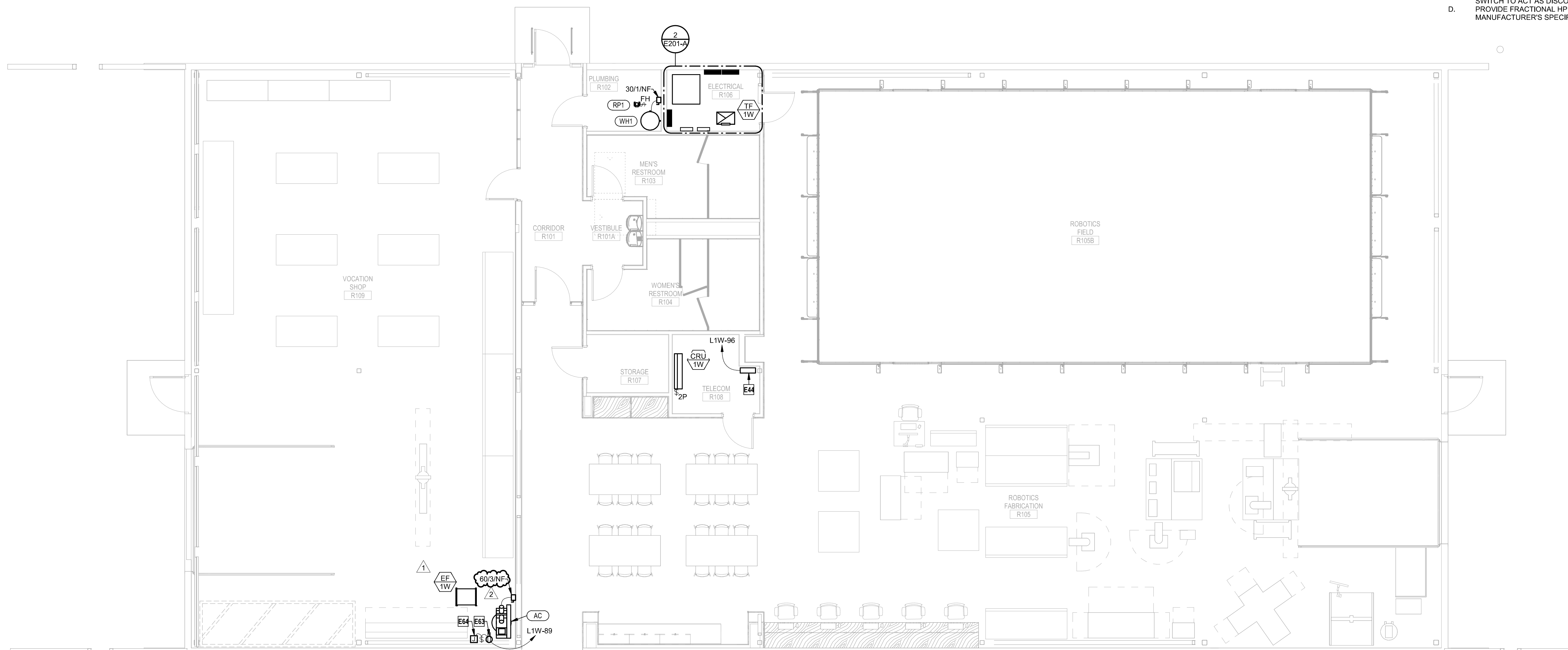
EQUIPMENT CONNECTION SCHEDULE NOTES:

- DISCONNECT MEANS (FRACTIONAL HP SWITCH, FUSED DISCONNECT SWITCH, ETC.) AND/OR CONTROLLER (STARTER, VFD, ETC.) IS FACTORY MOUNTED OR PROVIDED BY DIVISION 23.
- PROVIDE FUSED AND/OR FUSED DISCONNECT SWITCH SIZED PER EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND THE NEC. REFER TO ELECTRICAL SYMBOLS LEGEND FOR NAMING DESIGNATIONS.
- PROVIDE POWER AND CONTROL WIRING FROM ASSOCIATED CONDENSING UNIT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE FRACTIONAL HP SWITCH TO ACT AS DISCONNECTING MEANS.
- PROVIDE FRACTIONAL HP SWITCH SIZED PER EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND THE NEC.

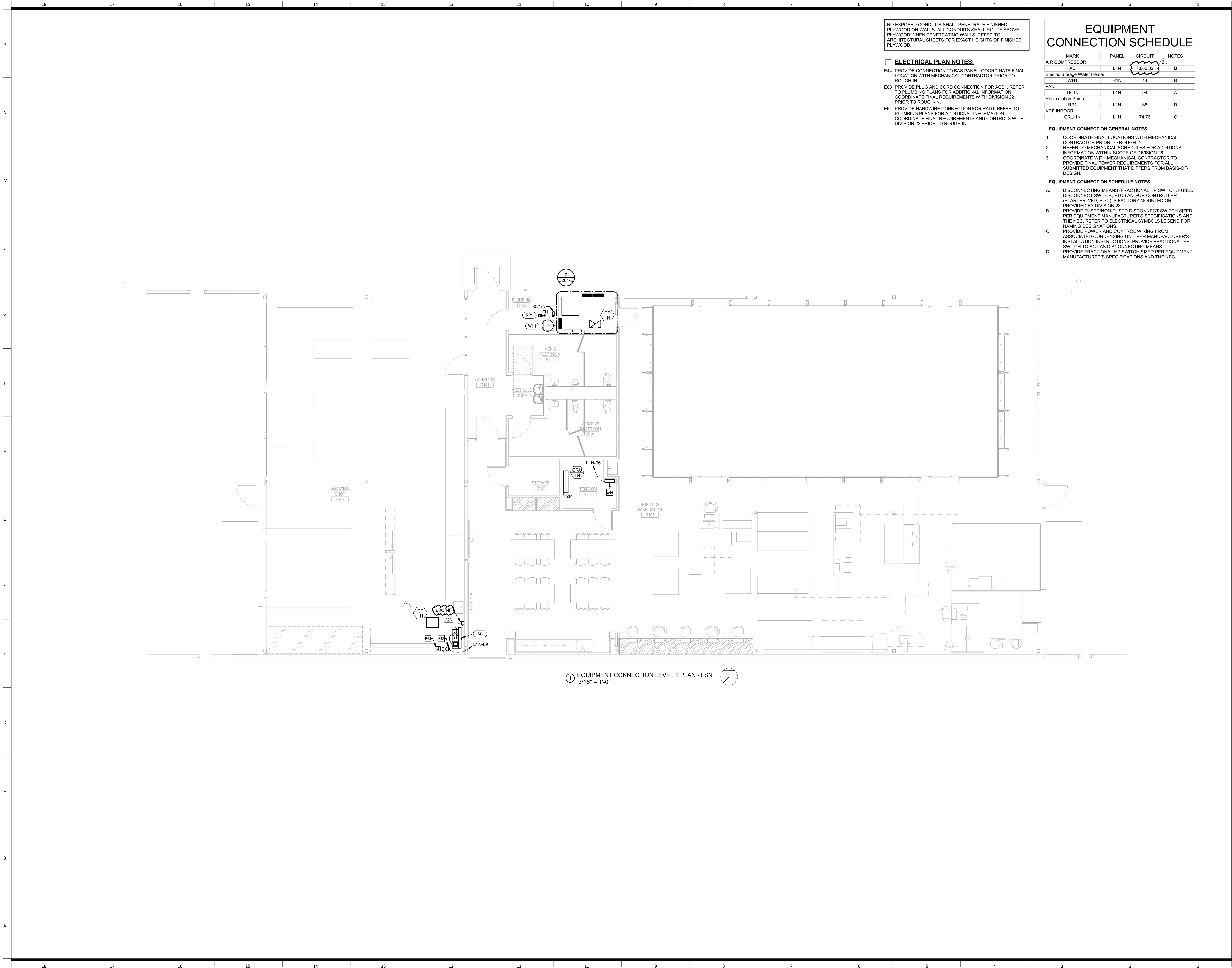
E44 PROVIDE CONNECTION TO BAS PANEL. COORDINATE FINAL LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

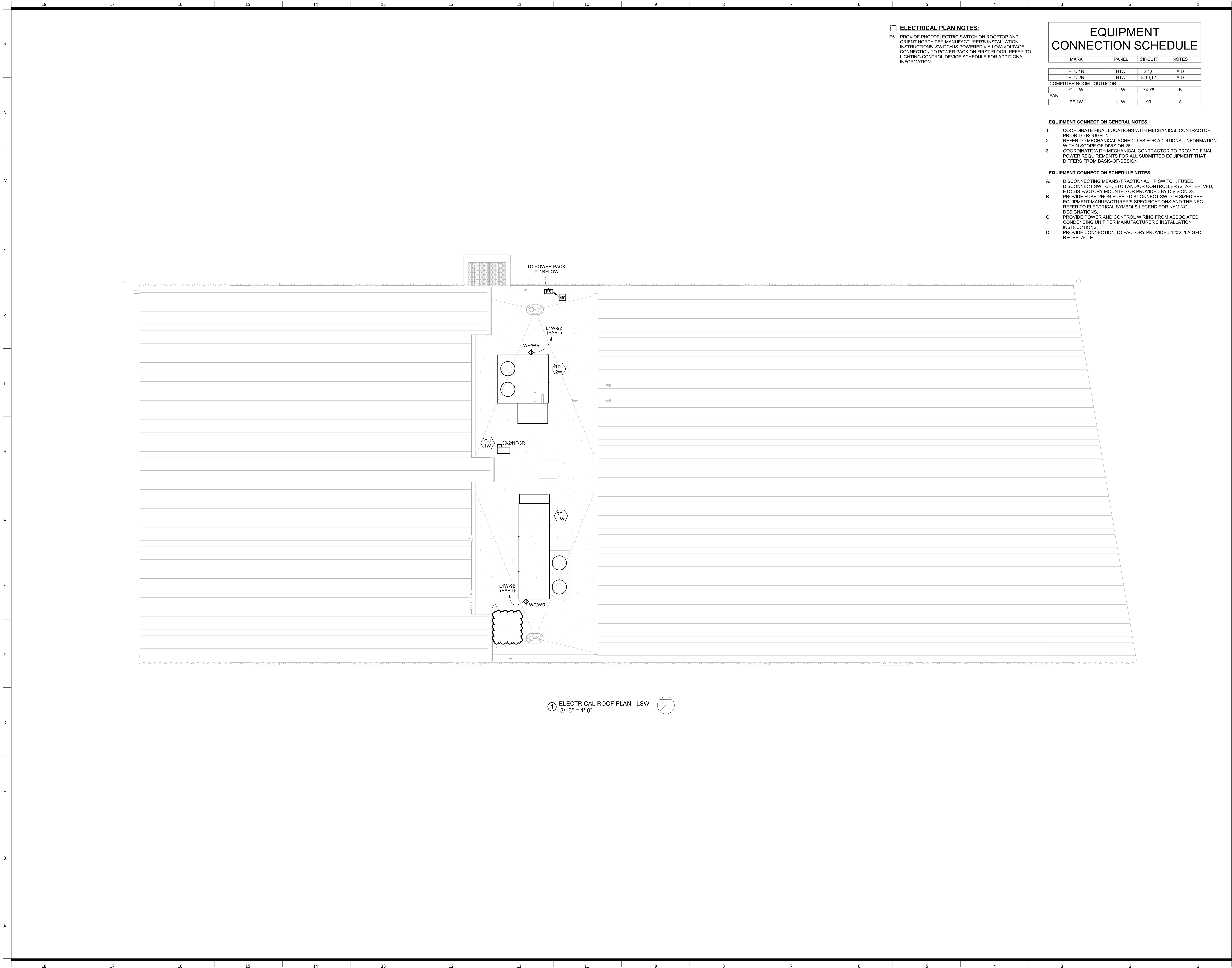
E63 PROVIDE PLUG AND CORD CONNECTION FOR ACD1. REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION. COORDINATE FINAL REQUIREMENTS WITH DIVISION 22 PRIOR TO ROUGH-IN.

E64 PROVIDE HARDWIRE CONNECTION FOR RAD1. REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION. COORDINATE FINAL REQUIREMENTS AND CONTROLS WITH DIVISION 22 PRIOR TO ROUGH-IN.



① EQUIPMENT CONNECTION LEVEL 1 PLAN - LSW
3/16" = 1'-0"





multistudio
the evolution of gould evans

LSR7 Robotics, GiC & Phys Education
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EXPIRES 12/31/2022

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
1	Addendum 01	09/16/2022

09/15/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSW - ELECTRICAL ROOF PLAN
E302-A

0121-0

MEPFT/Code::
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EQUIPMENT CONNECTION GENERAL NOTES:

1. COORDINATE FINAL LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
2. REFER TO MECHANICAL SCHEDULES FOR ADDITIONAL INFORMATION WITHIN SCOPE OF DIVISION 26.
3. COORDINATE WITH MECHANICAL CONTRACTOR TO PROVIDE FINAL POWER REQUIREMENTS FOR ALL SUBMITTED EQUIPMENT THAT DIFFERS FROM BASIS-OF-DESIGN.

EQUIPMENT CONNECTION SCHEDULE NOTES:

- A. DISCONNECT MEANS (FRACTIONAL HP SWITCH, FUSED DISCONNECT SWITCH, ETC.) AND/OR CONTROLLER (STARTER, VFD, ETC.) IS FACTORY MOUNTED OR PROVIDED BY DIVISION 23.
- B. PROVIDE FUSED-NON-FUSED DISCONNECT SWITCH SIZED PER EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND THE NEC. REFER TO ELECTRICAL SYMBOLS LEGEND FOR NAMING DESIGNATIONS.
- C. PROVIDE POWER AND CONTROL WIRING FROM ASSOCIATED CONDENSING UNIT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- D. PROVIDE CONNECTION TO FACTORY PROVIDED 120V 20A GFCI RECEPTACLE.

EQUIPMENT CONNECTION SCHEDULE NOTES

- A. DISCONNECTING MEANS (FRACTIONAL HP SWITCH, FUSED DISCONNECT SWITCH, ETC.) AND/OR CONTROLLER (STARTER, VFD, ETC.) IS FACTORY MOUNTED OR PROVIDED BY DIVISION 23.
- B. PROVIDE FUSED/UNFUSED DISCONNECT SWITCH SIZED PER EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND THE NEC. REFER TO ELECTRICAL SYMBOLS LEGEND FOR NAMING DESIGNATIONS.
- C. PROVIDE POWER AND CONTROL WIRING FROM ASSOCIATED CONDENSING UNIT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- D. PROVIDE CONNECTION TO FACTORY PROVIDED 120V 20A GFCI RECEPTACLE.

 ELECTRICAL PLAN NOTES:

E51 PROVIDE PHOTOELECTRIC SWITCH ON ROOFTOP AND ORIENT NORTH PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. SWITCH IS POWERED VIA LOW-VOLTAGE CONNECTION TO POWER PACK ON FIRST FLOOR. REFER TO LIGHTING CONTROL DEVICE SCHEDULE FOR ADDITIONAL INFORMATION.

① ELECTRICAL ROOF PLAN - LSN
3/16" = 1'-0"

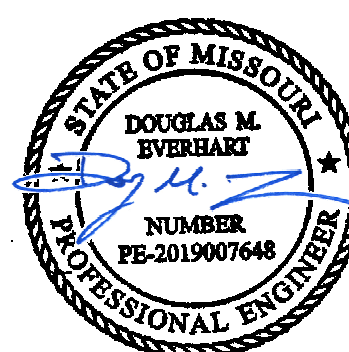


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EXPIRES 12/31/2022

Issue Date: September 9, 2015

Revisions

NUMBER	DESCRIPTION
1	Addendum 01

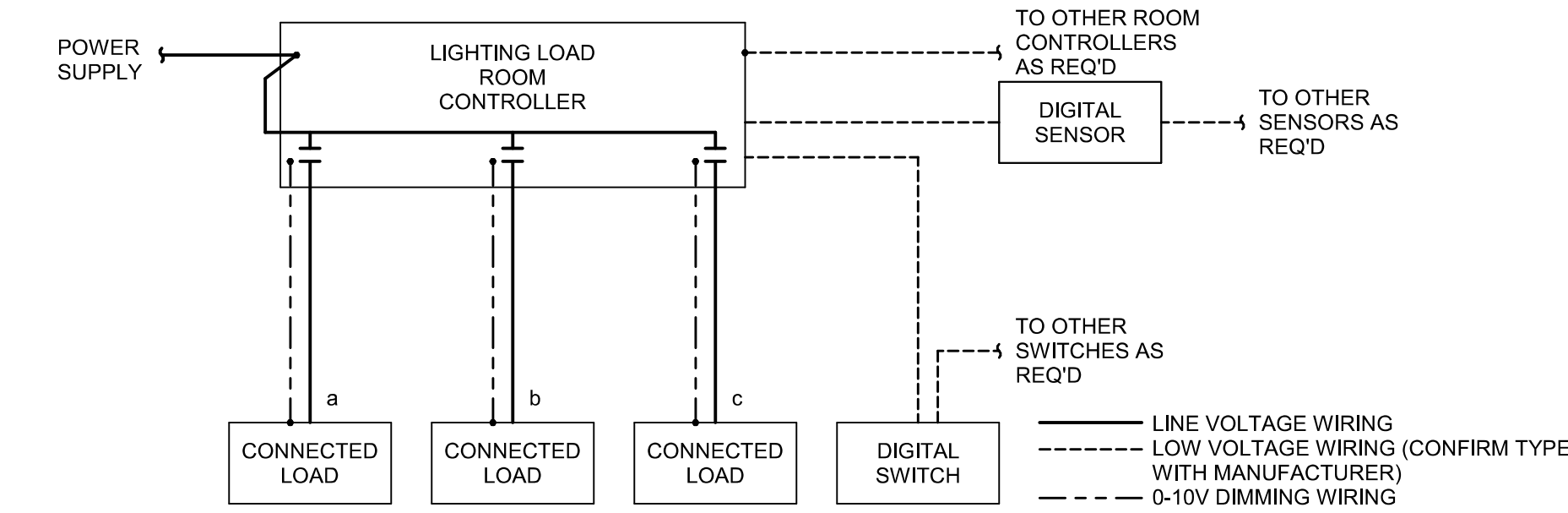


09/15/2022
DOUGLAS M. EVERHART
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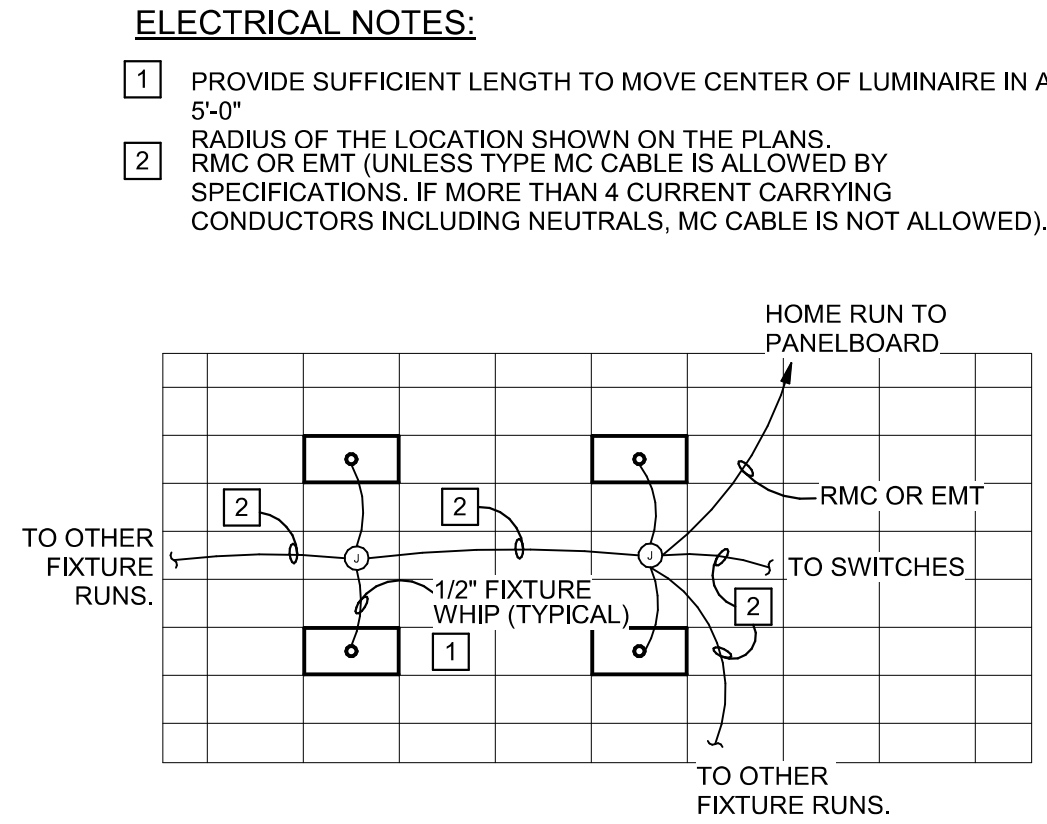
**LSN - ELECTRICAL ROOM
PLAN**

E302-B

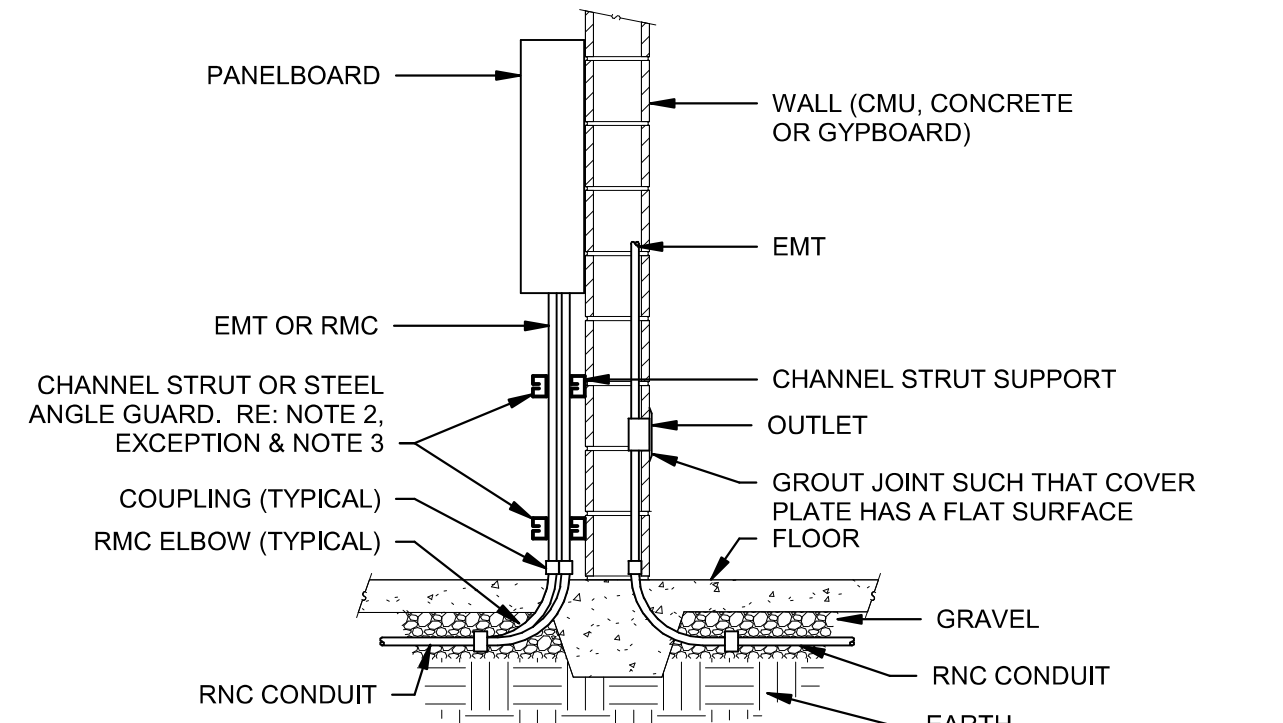
DOUGLAS M. EVERHART



- NOTES:**
1. REFER TO LIGHTING CONTROL DEVICE SCHEDULE FOR DEVICE AND EQUIPMENT SPECIFICATIONS.
 2. QUANTITY OF RELAYS SHOWN IS GENERIC. REFER TO PLANS, LIGHTING CONTROL DEVICE SCHEDULE, AND SHOP DRAWINGS FOR FINAL QUANTITY PER ROOM CONTROLLER.
 3. DETAIL IS DIAGRAMMATIC AND IS BASED ON LEGRAND. THIS REPRESENTS THE GENERAL SCOPE OF WORK AND LOCATION OF DEVICES IN RELATION TO EACH OTHER ALONG THE POWER CIRCUIT. DIAGRAMS MAY BE DIFFERENT FOR ALLOWED EQUIVALENT MANUFACTURERS. ELECTRICAL CONTRACTOR SHALL COORDINATE FULL SYSTEM REQUIREMENTS WITH SELECTED MANUFACTURER. PROVIDE ALL PARTS AND PIECES REQUIRED FOR A FULLY FUNCTIONAL SYSTEM. REFER TO FINAL APPROVED MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WIRING DIAGRAMS FOR INSTALLATION.
 4. CIRCUITING SHOWN ON THE PLAN CORRESPONDS TO THE LIGHTING CONTROL INTENT. IF CIRCUITING IS CHANGED IN THE FIELD, ENSURE THAT SYSTEM PROGRAMMING WITH REVISED CIRCUITING MEETS THE ORIGINAL LIGHTING CONTROL INTENT. UPDATE LIGHTING CONTROL PANEL SCHEDULES IN RECORD DRAWINGS.
- ⑥ ROOM CONTROLLER DETAIL - ON/OFF OR ON/OFF/0-10V DIMMING CONTROL**
NTS



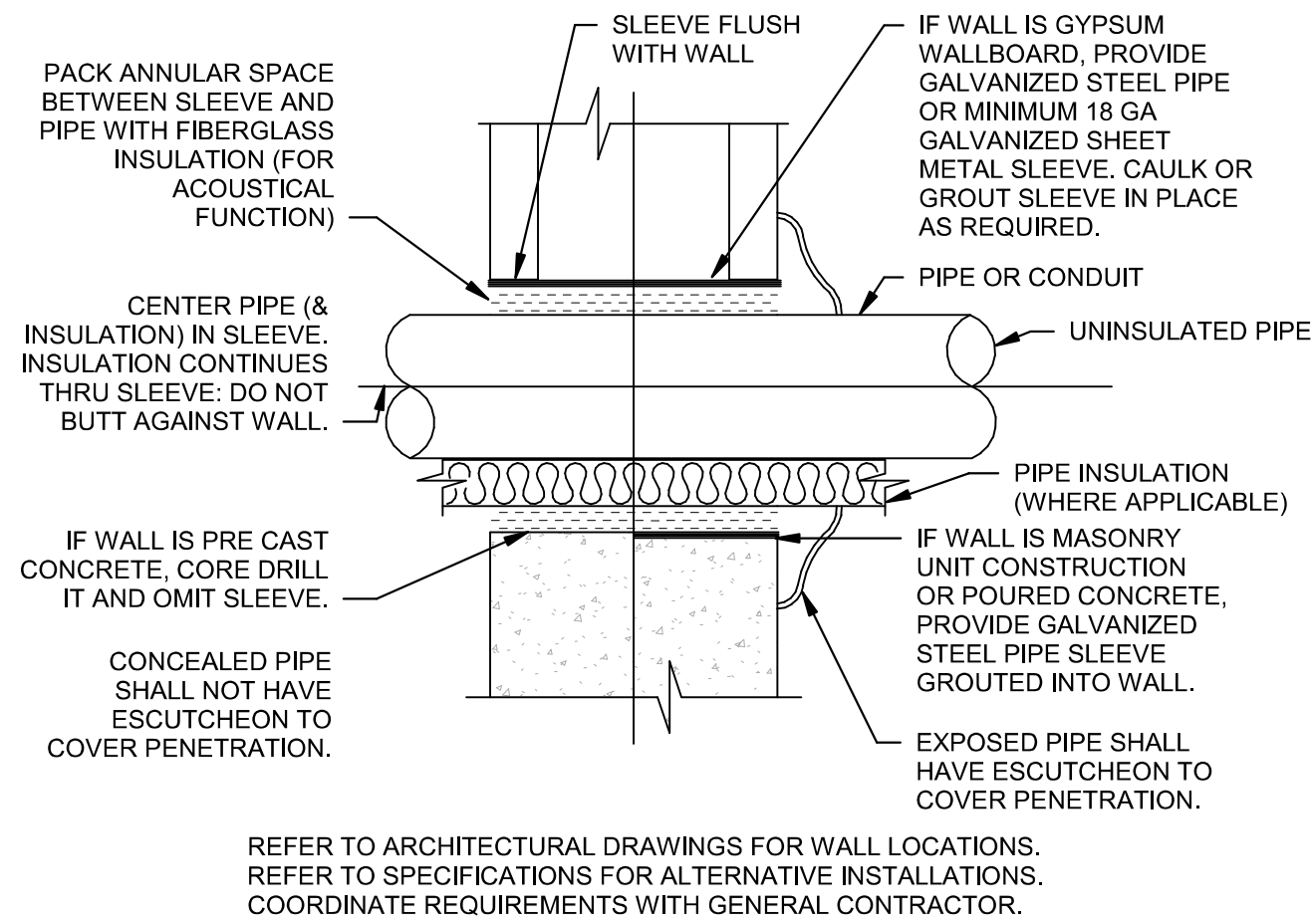
⑤ LIGHTING STANDARD LUMINAIRE WIRING
NTS



- NOTES:**
1. CONDUITS TURNED UP INSIDE WALLS MAY BE RNC FROM ABOVE THE SLAB TO RECESSED PANELBOARDS OR OUTLETS. FROM THE OUTLET UP IT SHALL BE EMT.
 2. CONDUITS TURNED UP EXPOSED SHALL HAVE AN RMC ELBOW THROUGH THE SLAB. PROTECT THE ENTIRE ELBOW WITH RNC COATING OR MASTIC UP THROUGH THE TOP OF THE SLAB.

EXCEPTION: IN LIEU OF RMC ELBOW, CONTRACTOR MAY USE RNC ELBOWS IF A CHANNEL STRUT OR STEEL ANGLE GUARD IS PROVIDED. GUARD SHALL STAND OFF THE WALL INDEPENDENT OF THE CONDUIT.
 3. IN AREAS WITH VEHICULAR ACCESS, USE GALVANIZED RMC ELBOWS AND A STEEL GUARD.
 4. APPLIES TO ALL STUB-UP LOCATIONS UNLESS NOTED OTHERWISE ON PLANS.

② CONDUIT STUB-UP AT WALLS
NTS



① CONDUIT PENETRATION THRU NON-FIREWALL
NTS

LSR7 Robotics, GiC & Phys Education

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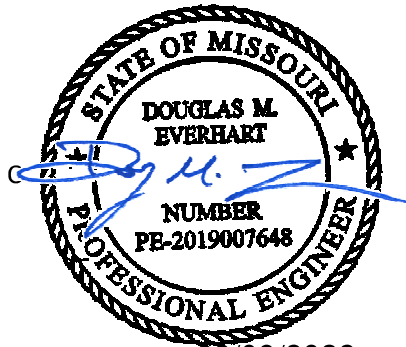
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MO. CORPORATE NO. E-858D
EXPIRES 12/31/2022

Issue Date: September 9, 2022

Revisions		
NUMBER	DESCRIPTION	DATE



09/09/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

DOUGLAS M. EVERHART

PANELBOARD: H1N (NEW)										PANELBOARD: L1N (NEW)										EQUIPMENT GROUND BUS	
BUS AMPS: 400A MAIN SIZE/TYPE: 400A MCB VOLTS/PHASE: 480Y/277 V 3P/4W SUPPLIED BY: MSB				SCHOOL BUILDING SQUARE FOOTAGE: 7000				FAULT CURRENT: REFER TO ONE-LINE AIC RATED: FULLY RATED SERVES: FCA +10% MINIMUM MOUNTING: ROBOTICS / GIC LOCATION: SURFACE ELECTRICAL R106				EQUIPMENT GROUND BUS SERVICE ENTRANCE RATED									
LINE-SIDE LUGS: MECHANICAL																LINE-SIDE LUGS: MECHANICAL					
CKT NO.	DESCRIPTION	LOAD TYPE	NOTES	WIRE SIZE	BKR AMP	P	PHASE A	PHASE B	PHASE C	P	BKR AMP	WIRE SIZE	NOTES	LOAD TYPE	DESCRIPTION	CKT NO.					
1	LTG - GIC CANOPY, N	LZ		12	20	1	1808	10641								2					
3	LTG - CENTRAL CORE	LZ		12	20	1		1255	10641							4					
5	LTG - ROBOTICS, E CANOPY	LZ		12	20	1			1889	10641	3	50	8			6					
7	SPARE			20	1		0	7593								8					
9	SPARE			20	1			0	7593		3	35	8			10					
11	SPARE			20	1				0	7593	1	30	10			12					
13	SPARE			20	1		0	6000			1	20		U	WH-1	14					
15	SPARE			20	1			0	0		1	20			SPARE	16					
17	SPARE			20	1				0	0	1	20			SPARE	18					
19	SPARE			20	1		0	0			1	20			SPARE	20					
21	SPARE			20	1			0	0		1	20			SPARE	22					
23	SPARE			20	1				0	0	1	20			SPARE	24					
25	SPARE			20	1		0	0			1	20			SPARE	26					
27	SPARE			20	1			0	0		1	20			SPARE	28					
29	SPARE			20	1				0	0	1	20			SPARE	30					
31	SPARE			20	1		0	0			1	20			SPARE	32					
33	SPARE			20	1			0	0		1	20			SPARE	34					
35	SPARE			20	1				0	0	1	20			SPARE	36					
37	EQUIPPED SPACE			1	0		33934				3	175	OL		R Z M	TX-1.1N	38				
39	EQUIPPED SPACE			1				0	32582								40				
41	EQUIPPED SPACE			1					0	35339							42				
TOTAL LOAD (VA):							59977 VA	52071 VA	55463 VA												
TOTAL AMPS:							218 A	188 A	202 A												
LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	NEC DEMAND	PANELBOARD NOTES										PANELBOARD TOTALS						
EXISTING LOAD (E)		0 VA	100%	0 VA											TOTAL CONNECTED LOAD		185775 VA				
COOLING (C)		31510 VA	100%	31510 VA											TOTAL NEC LOAD		1869924 VA				
HEATING (H)		0 VA	0%	0 VA																	
LIGHTING (L) (PER NEC-220)		21000 VA	125%	26250 VA																	
RECEPTACLES (R)		25560 VA	70%	17780 VA																	
MOTORS (M)		60906 VA	100%	60906 VA																	
SUPPLEMENTAL HEAT (U)		6000 VA	100%	6000 VA																	
MISC EQUIP (Z)		26084 VA	100%	26084 VA																	
REFRIGERATION (F)		0 VA	100%	0 VA																	
SIGNAGE (S)		0 VA	125%	0 VA																	
KITCHEN (K)		0 VA	100%	0 VA																	
LARGEST MOTOR		14715 VA	125%	18394 VA																	
SHOW WINDOW (W)		0 VA	125%	0 VA																	
TRACK LIGHTING		0 VA	100%	0 VA																	

PANELBOARD: L1N (NEW)										PANELBOARD: L1N (NEW)										EQUIPMENT GROUND BUS									
BUS AMPS: 400A MAIN SIZE/TYPE: 400A MCB VOLTS/PHASE: 208Y/120 V 3P/4W SUPPLIED BY: H1N VIA TX-L1N										FAULT CURRENT: REFER TO ONE-LINE AIC RATED: FULLY RATED SERVES: FCA +10% MINIMUM MOUNTING: ROBOTICS / GIC LOCATION: SURFACE ELECTRICAL R106																			
										LINE-SIDE LUGS: MECHANICAL										LINE-SIDE LUGS: MECHANICAL									
CKT NO.	DESCRIPTION	LOAD TYPE	NOTES	WIRE SIZE	BKR AMP	P	PHASE A	PHASE B	PHASE C	P	BKR AMP	WIRE SIZE	NOTES	LOAD TYPE	DESCRIPTION	CKT NO.													
1	RCPT - N ROBOTICS FIELD	R		12	20	1	1260	360				1	20	12	R	PLGMLD 1 - 3D PRINTERS	2												
3	RCPT - E ROB FIELD CKT 1	R		12	20	1			540	360			1	20	12	R	PLGMLD 2 - 3D PRINTERS	4											
5	RCPT - E ROB FIELD CKT 2	R		12	20	1				540	360		1	20	12	R	PLGMLD 3 - 3D PRINTERS	6											
7	RCPT - TWSTLCK ROB FIELD	R		12	20	1	360	360				1	20	12	R	PLGMLD 4 - 3D PRINTERS	8												
9	RCPT - ROB FIELD COL 1	R		12	20	1			720	720			1	20	12	R	RCPT - GIC SE WALL	10											
11	RCPT - ROB FIELD COL 2	R		12	20	1				720	720		1	20	12	R	RCPT - GIC E WALL	12											
13	EAST GARAGE DOOR	M		12	20	1	500	1800				1	20	10	VD	M	RCPT - GIC PANEL SAW	14											
15	WEST GARAGE DOOR	M		12	20	1		500	720			1	20	12	R	RCPT - GIC S WALL	16												
17	RCPT - ROB CLSRM W WALL	R Z		12	20	1			1080	720		1	20	12	R	RCPT - CAD STATION CKT 3	18												
19	RCPT - ROB CLSRM TWSTLCKS	R		12	20	1	720	900				1	20	12	R	RCPT - GIC W WALL	20												
21	RCPT - MICROWAVE	Z		12	20	1		1200	720			1	20	12	R	RCPT - GIC CTR COLUMN	22												
23	RCPT - ABV CTR 1	Z		12	20	1			1200	540		1	20	12	R	RCPT - GIC NW WALL	24												
25	RCPT - ABV CTR 2	Z		12	20	1	1200	720				1	20	12	R	RCPT - GIC NE WALL	26												
27	RCPT - FRIDGE	Z		12	20	1		800	540			1	20	12	M	DROP RCPT - HORIZ BANDSAW	28												
29	RCPT - GIC TVS	Z		12	20	1			720	720		1	20	12	R	CRD REEL - GIC TABLES 1	30												
31	RCPT - CAD STATION CKT 1	R		12	20	1	720	720				1	20	12	R	CRD REEL - GIC TABLES 2	32												
33	RCPT - CAD STATION CKT 2	R		12	20	1		1080	720			1	20	12	R	CRD REEL - GIC TABLES 3	34												
35	RCPT - W ROB FIELD	R		12	20	1			900	1800		1	20	10	VD	Z	DROP RCPT - GIC MITER SAW	36											
37	RCPT - CORR PLUMB ELEC	R		12	20	1	1080	500				1	20	12	Z	DROP RCPT - GEN ASSEMB COMP	38												
39	RCPT - RESTROOMS, EWC	R Z		12	20	1		1200	500			1	20	12	Z	DROP RCPT - CNC COMP	40												
41	CRD REEL - GEN ASSEMB 1	Z		12	20	1			1200	540		1	20	12	R	RCPT - ROB S WALL	42												
43	CRD REEL - GEN ASSEMB 2	Z		12	20	1	1200	841				3	20	12	M	DROP RCPT - 3 AXIS CNC	44												
45	CRD REEL - GEN ASSEMB 3	Z		12	20	1		1200	841								46												
47	CRD REEL - GEN ASSEMB TL 1	Z		12	20	1			1200	841							48												
49	CRD REEL - GEN ASSEMB TL 2	Z		12	20	1	1200	3038									50												
51	CRD REEL - SHOP AREA 1	M		12	20	1		300	3038			3	50	6	M	DROP RCPT - TORQ CUT 22	52												
53	CRD REEL - SHOP AREA 3	Z		12	20	1			1452	3038							54												
55	CRD REEL - SHOP AREA 4	Z		12	20	1	1200	1383				2	30	10	M	RCPT - BIRMINGHAM LATHE	56												
57	CRD REEL - SHOP AREA 5	Z		12	20	1		1200	1383								58												
59	RCPT - E EXTERIOR	R		12	20	1			720	1608		1	20	12	Z	CRD REEL - SHOP AREA 2	60												
61	RCPT - N EXTERIOR	R		12	20	1	360	1920				1	30	10	M	DROP RCPT - METAL BANDSAW	62												
63	RCPT - S EXTERIOR	R		12	20	1		360	1920			1	20	10	VD	M	RCPT - GRIZZLY DRILL PRESS	64											
65	RCPT - W EXTERIOR	R		12	20	1			720	1082		2	20	12	M	RCPT - GRIZZLY DUST COLLECTOR	66												
67	FIRE RPS	Z		12	20	1	360	1082									68												
69	RCPT - TIG WELDER MAIN	M	VD	8	30	2		2496	1500			2	30	10	Z	RCPT - TELECOM RACK (208V)	70												
71									2496	1500							72												
73	DROP RCPT - CRFTS MITER SAW	M	VD	10	20	1	1800	31				2	20	12	M	CJ -N1CRU-1N	74												
75	RCPT - KARDEX STOR SYST	R		12	20	1		180	31								76												
77	RCPT - BIRMINGHAM LATHE CTRLS	R		12	20	1			180	3699							78												
79	RCPT - TIG WELDER MISC	R		12	20	1	180	3699				3	60	6	M	GIC AIR COMPRESSOR	80												
81	SECURITY PANEL	Z		12	20	1		500	3699								82												
83	RCPT - TELECOM N WALL	R		12	20	1			1080	0		1	20			SPARE	84												
85	RCPT - TELECOM S, E WALL	R		12	20	1	1080	0				1	20			SPARE	86												
87	RCPT - TELECOM RACK	R		12	20	1		360	58								88												
89									964	0		1	20	12	M	EF-IN	90												
91							2500	360				1	20	12	R	EXT RCPT - ROOFTOP	92												
93	OPEN TABLE CNC	M		10	30	3		2500	696			1	20	12	M	TF-IN	94												
95									2500	500		1	20	12	Z	BAS PANEL	96												
97	SPARE				0	500						1	20	12	Z	N DOOR ACTUATOR	98												
99	EQUIPPED SPACE							0	0			1				EQUIPPED SPACE	100												
101	EQUIPPED SPACE								0	0		1				EQUIPPED SPACE	102												
103	EQUIPPED SPACE						0	0				1				EQUIPPED SPACE	104												
105	EQUIPPED SPACE							0	0			1				EQUIPPED SPACE	106												
107	EQUIPPED SPACE								0	0		1				EQUIPPED SPACE	108												
TOTAL LOAD (VA):							33934 VA	32582 VA	35339 VA																				
TOTAL AMPS:							285 A	272 A	296 A																				
PANELBOARD NOTES										PANELBOARD TOTALS																			
LOAD TYPE	CONNECTED LOAD	DEMAND FACTOR	NEC DEMAND																										
EXISTING LOAD (E)	0 VA	100%	0 VA							TOTAL CONNECTED LOAD 104031 VA																			
COOLING (C)	2080 VA	100%	2080 VA							TOTAL NEC LOAD 99025 VA																			
HEATING (H)	0 VA	0%	0 VA																										
LIGHTING (L)	0 VA	125%	0 VA																										
RECEPTACLES (R)	28560 VA	70%	17780 VA							TOTAL CONNECTED CURRENT 289 A																			
MOTORS (M)	39251 VA	100%	39251 VA							TOTAL NEC DEMAND CURRENT 275 A																			
SUPPLEMENTAL HEAT (U)	0 VA	100%	0 VA																										
MISC EQUIP (Z)	26044 VA	100%	26044 VA																										
REFRIGERATION (F)	0 VA	100%	0 VA																										
STORAGE (S)	0 VA	125%	0 VA																										
KITCHEN (K)	0 VA	100%	0 VA																										
LARGEST MOTOR	11096 VA	125%	13870 VA																										
SHOW WINDOW (W)	0 VA	125%	0 VA																										
TRACK LIGHTING	0 VA	100%	0 VA																										

P

N

M

L

K

J

H

G

F

E

D

C

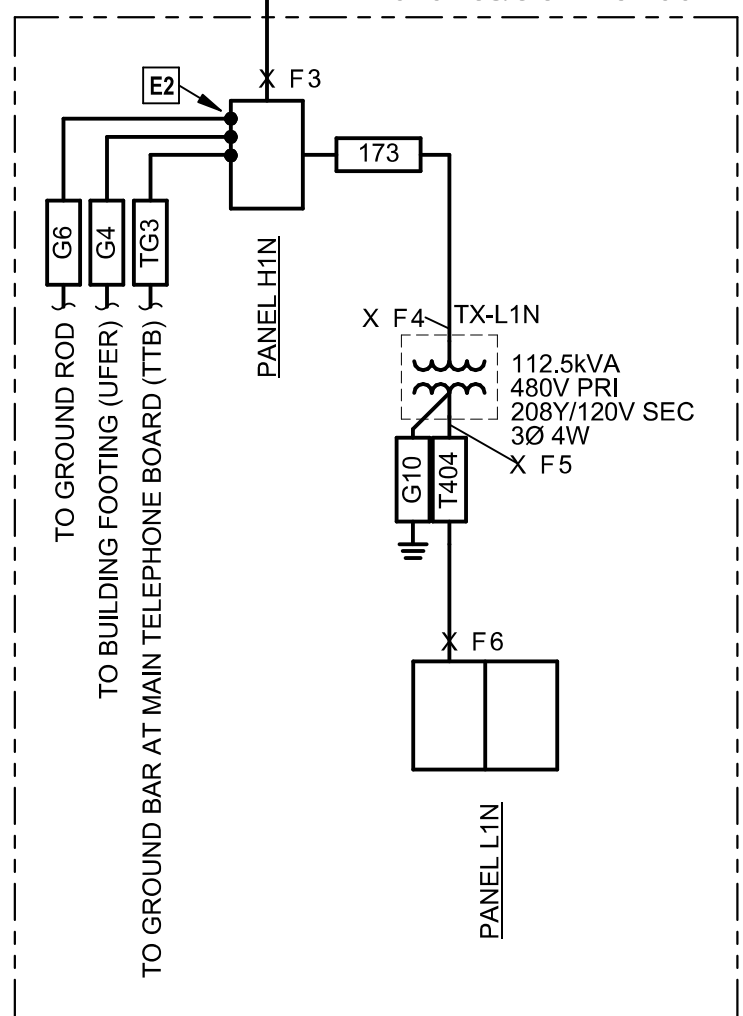
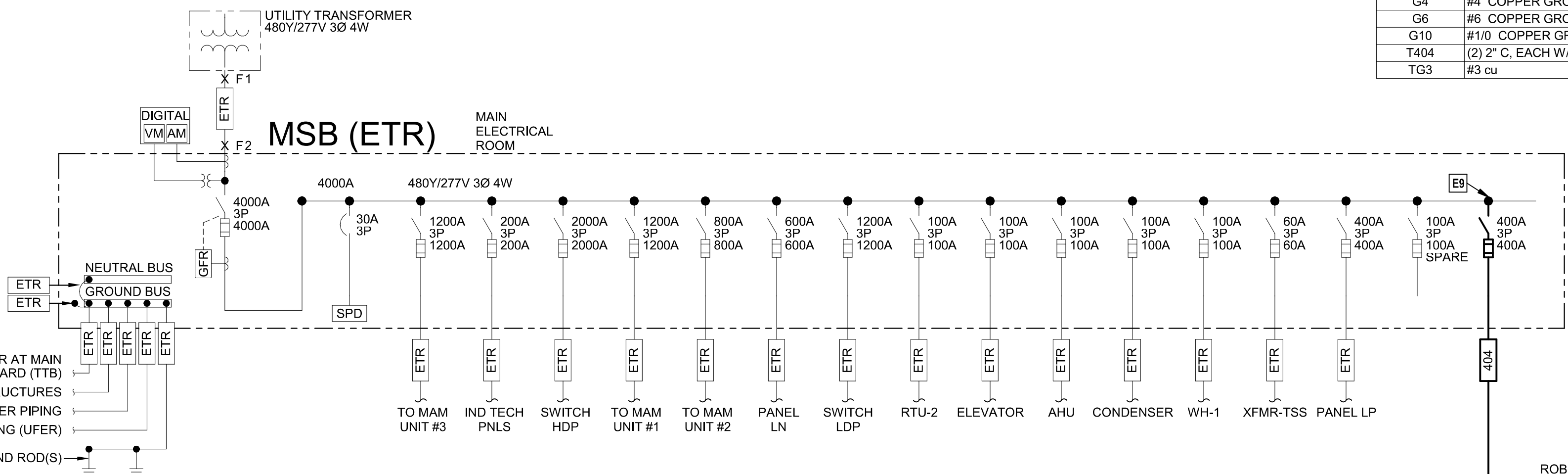
B

A

FEEDER SCHEDULE:

SIZES ARE BASED ON COPPER (CU) THHN/THWN-2 INSULATION, UNO. ALL CONDUCTOR SIZES ARE BASED ON 75 DEG C RATED TERMINATIONS, UNO. CONDUIT SIZES SHOWN ARE APPROPRIATE FOR SCHEDULE 40 PVC, EMT, GRS, IMC AND RMC. ADJUST SIZE AS NEEDED FOR OTHER RACEWAY TYPES. FOR ANY OTHER CONDITIONS MODIFY SIZES PER CODE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

FEEDER TAG	FEEDER DESCRIPTION
173	(3) #20, (1) #6 S, 1-1/2" C
404	(2) 2" C, EACH W/ (4) #30, (1) #3 G
G4	#4 COPPER GROUND, 3/4" C
G6	#6 COPPER GROUND, 3/4" C
G10	#10 COPPER GROUND, 3/4" C
T404	(2) 2" C, EACH W/ (4) #30, (1) #4 SSBJ
TG3	#3 CU



3 ELECTRICAL PARTIAL ONE-LINE DIAGRAM - LSN NTS

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:

ISC (2) = ISC(1) x M(1)

ISC (1) = short circuit current at fault point 1

ISC (2) = short circuit current at fault point 2

M= 1/(1+I)

Feeder: f (3Ø) = 1.73 x I x L x Isc

C x E

Feeder: f (1Ø)= 2 x I x L x Isc

C x E

XFMR: f (3Ø) = I² x L x Vp x 1.73 x %Z

100,000 x KVA

XFMR: f (1Ø)= I² x L x Vp x %Z

100,000 x KVA

IS(sec)= Vp x M x I(P) x Isc

Vs

VOLTAGE DROP (3Ø): %VD = ((R x cos(arccos(pf)) + X x sin(arccos(pf))) x L x I x 1.73) / E

VOLTAGE DROP (1Ø): %VD = ((R x cos(arccos(pf)) + X x sin(arccos(pf))) x 2 x L x I x 1) / E

%VD CUM = Cumulative Voltage Drop from Fault Point 1 to Fault Point #

R = resistance in ohms per LF

X = reactances in ohms per LF

System Voltage: 480Y/277V - 3 phase															Date of Calculations: 08/29/2022															
Fault Point (F#)	Bus/Feeder Description	Source (Fault Point)	Phase	Source Isc (amps)	Conduit Type TX	Material	Feeder Quantity of Parallel Sets and Bus/ Phase & Neutral Size	Conductor 'C' Value	Busway 'C' Value	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Resistance (R)	Conductor Reactance (X)	Arccos (pf) (Radians)	Type	Degree Rise	kVA	New Xfmr Z	Existing Xfmr Z	Secondary Voltage	Tap Setting	I	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (F#)	
1	Utility Service Point			51,742	at the secondary of the utility transformer										Source Isc = 6x Motor Contribution = 61,342															
Motor Contribution																														
2	MSB (LSN)	1	3	61,342	NM	CU	12 Set(s) of 400 kcmil	24297	--	480	50	0.9	2,631	0.000033	0.000040	0.451027									0.038	0.96	59,099	-0.19%	-0.19%	2
3	H1N	2	3	59,099	M	CU	2 Set(s) of 3/0 AWG	12844	--	480	305	0.9	230	0.000079	0.000052	0.451027									2.532	0.28	16,732	-1.19%	-1.37%	3
4	TO TX-L1N	3	3	16,732	M	CU	1 Set(s) of 2/0 AWG	10755	--	480	10	0.9	230	0.000100	0.000054	0.451027									0.056	0.95	15,843	-0.09%	-1.47%	4
5	TX-L1N	4	3	15,843	TX					480															5.116	0.16	5,978	-1.47%		5
6	L1N	5	3	5,978	M	CU	2 Set(s) of 3/0 AWG	12844	--	208	10	0.9	300	0.000079	0.000052	0.451027	DOE	150	112.5	4.37		208		0.019	0.98	5,964	-0.12%	-1.58%	6	
7	RTU-1N	3	3	16,732	M	CU	1 Set(s) of 8 AWG	1567	--	480	75	0.85	38	0.000780	0.000065	0.554811									2.908	0.26	4,281	-0.72%	-2.09%	7
8	RTU-2N	3	3	16,732	M	CU	1 Set(s) of 8 AWG	1567	--	480	50	0.85	28	0.000780	0.000065	0.554811									1.939	0.34	5,693	-0.35%	-1.73%	8

ELECTRICAL PLAN NOTES:

- E2 PROVIDE GROUNDING ELECTRODE CONDUCTOR(S) AS REQUIRED BY NEC 250.32, DO NOT BOND GROUND AND NEUTRAL BAR TOGETHER.
- E9 MAIN SERVICE ENTRANCE LOCATION IS ON MEZZANINE LEVEL ABOVE. EQUIPMENT IS ETR.

LOAD SUMMARY: MSB

PANEL DESCRIPTION: 480Y/277 V			
LOAD TYPE	CONNECTED LOAD KVA	DEMAND FACTOR	NEC DEMAND KVA
EXISTING PEAK UTILITY (@ 0.9 pf)	1666.67	125%	2083.33
COOLING (C)	31.51	100%	31.51
HEATING (H)	0.00	0%	0.00
LIGHTING (L)	4.88	125%	6.10
RECEPTACLES (R)	25.74	69%	17.87
MOTORS (M)	56.80	100%	56.80
SUPPLEMENTAL HEAT (U)	6.00	100%	6.00
MISC EQUIP (Z)	25.60	100%	25.60
REFRIGERATION (F)	0.00	100%	0.00
SIGNAGE (S)	0.00	125%	0.00
KITCHEN (K)	0.00	100%	0.00
LARGEST MOTOR	14.72	125%	18.39
SHOW WINDOW (W)	0.00	125%	0.00
TRACK LIGHTING	0.00	100%	0.00
EXISTING LOAD TO BE DELETED	0.00	100%	0.00
ELEVATOR (V)	0.00	100%	0.00
TOTAL LOAD	1831.92	KVA	2245.61
TOTAL AMPACITY	2203.47	AMPS	2701.07
PANEL AMPACITY		AMPS	4000.00
SPARE CAPACITY		AMPS	1298.93
*PER UTILITY COMPANY BILLING PEAK DEMAND OF: 1500.00 KW 01/2021			

ONE-LINE DIAGRAM GENERAL NOTES:

1. THE INFORMATION SHOWN IN THE SHORT-CIRCUIT AND VOLTAGE DROP CALCULATIONS SCHEDULE IS SHOWN FOR CALCULATION PURPOSES ONLY. CONTRACTOR SHALL NOT USE THE CONDUIT TYPES, CONDUCTOR TYPES, SIZES, QUANTITIES OR LENGTHS FOR TAKEOFFS OR BIDDING PURPOSES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN THIS SCHEDULE AND OTHER PORTIONS OF THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL NOTIFY ENGINEER OF AS-BUILT CONDITIONS THAT CONSTITUTE A CHANGE FROM WHAT IS SHOWN BELOW. THIS INCLUDES CONDUCTOR LENGTHS DIFFERING BY MORE THAN 10%.
2. REFER TO THE SHORT-CIRCUIT AND VOLTAGE DROP CALCULATIONS TABLE ON THIS SHEET. AVAILABLE FAULT CURRENT INFORMATION IS LISTED UNDER THE "FAULT CURRENT" COLUMN. VOLTAGE DROP VALUES ARE LISTED UNDER THE "CUMULATIVE VOLTAGE DROP" COLUMN. THE AIC/SCOR RATING OF THE EQUIPMENT SHALL NOT BE LESS THAN THE AVAILABLE 3-PHASE SYMMETRICAL FAULT CURRENT. ALL SERIES RATED EQUIPMENT SHALL BE PROPERLY LISTED AND LABELED PER CODE.
3. FEEDER SIZES ARE BASED ON COPPER (CU) THHN/THWN-2 INSULATION, UNLESS NOTED OTHERWISE. CONDUIT SIZES SHOWN ARE APPROPRIATE FOR SCHEDULE 40 PVC, EMT, GRS, IMC AND RMC. ADJUST SIZE AS NEEDED FOR OTHER RACEWAY TYPES. ALL CONDUCTOR SIZES ARE BASED ON 75 DEG C RATED TERMINATIONS, UNLESS NOTED OTHERWISE. FOR ANY OTHER CONDITIONS MODIFY SIZES PER CODE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4. INSTALL FEEDERS OVERHEAD AS HIGH AS PRACTICABLE AND ORTHOGONALLY ALONG BUILDING STRUCTURE, UNLESS NOTED OTHERWISE. COORDINATE FINAL ROUTING WITH OTHER TRADES.
5. PROVIDE A PERMANENT LABEL ON FRONT OF EQUIPMENT ENCLOSURE: REFER TO SPECIFICATIONS FOR LABEL REQUIREMENTS. LABEL SHALL READ AS FOLLOWS (INCLUDE RESPECTIVE NAMES IN BLANKS):

SERVICE EQUIPMENT LABEL:

EXAMPLE:
208Y/120V, 60HZ
800A
SCCR = 65,000A
MAX AVAILABLE FAULT CURRENT = 58,815A
CALCULATED: 01/01/2018

PANELBOARD/SWITCHBOARD LABEL:
LINE 1: PANELBOARD " " SUPPLIED BY UPSTREAM
LINE 2: PANELBOARD/SWITCHBOARD " "
LINE 3: LOCATED IN " "
LINE 4: PANELBOARD " " SUPPLIES DOWNSTREAM
LINE 5: PANELBOARD(S) " "

TRANSFORMERS LABEL:
LINE 1: TRANSFORMER " " SUPPLIED BY UPSTREAM
LINE 2: PANELBOARD/SWITCHBOARD " "
LINE 3: LOCATED IN " "
LINE 4: TRANSFORMER " " SUPPLIES DOWNSTREAM
LINE 5: PANELBOARD(S) " "

ELECTRICAL UTILITY CONTACT NOTE:

UTILITY COMPANY: EVERGY
UTILITY CONTACT: PHILLIP INGRAM
PHONE: 816-347-4339
EMAIL: PHILLIP.INGRAM@EVERGY.COM

FAULT CURRENT GENERAL NOTE (ESTIMATED VALUE):

THE MAXIMUM AVAILABLE 3-PHASE SYMMETRICAL FAULT CURRENT VALUE AT THE UTILITY TRANSFORMER SECONDARY/POINT OF SERVICE COULD NOT BE DETERMINED AT THE TIME OF THIS SUBMITTAL. THE ESTIMATED WORST CASE VALUE OF 51,742A IS BASED ON AN INFINITE BUS CALCULATION AT THE UTILITY TRANSFORMER. CONTRACTOR SHALL VERIFY ACTUAL AVAILABLE FAULT CURRENT VALUE WITH UTILITY PRIOR TO BEGINNING CONSTRUCTION. NOTIFY ENGINEER IF ACTUAL VALUE EXCEEDS ESTIMATED CALCULATED VALUE. ESTIMATED DESIGN VALUE IS BASED ON THE FOLLOWING:

UTILITY TRANSFORMER SECONDARY VOLTAGE: 480V
UTILITY TRANSFORMER SIZE: 2000 KVA, 3PH 4W

OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY GENERAL NOTE:

CONTRACTOR SHALL PROVIDE AN OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY TO DETERMINE THE CORRECT SETTINGS FOR THE ADJUSTABLE TRIP CIRCUIT BREAKERS TO DOCUMENT ARC-FLASH HAZARDS, PROVIDE ALL NECESSARY AS-BUILT INFORMATION REQUIRED FOR COMPLETION OF THE STUDY TO THE ENGINEER DOING THE STUDY. PROVIDE SUBMITTALS INDICATED WITHIN THE SPECIFICATIONS TO OWNER AND ARCHITECT/ENGINEER TO CONFIRM STUDY HAS BEEN COMPLETED. CONTRACTOR SHALL INCLUDE THE COST FOR THIS WORK IN THEIR BID. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

ONE-LINE DIAGRAM GENERAL NOTES:

1. COORDINATE WORK WITH ARCHITECTURAL PHASING DRAWINGS TO PROPERLY STAGE TRANSITION TO PROVIDE POWER TO EXISTING, NEW AND TEMPORARY LOADS. MONITOR LOADS ON DISTRIBUTION SYSTEM TO MAKE SURE SHIFTING OF LOADS DOES NOT OVERLOAD ELECTRICAL EQUIPMENT.
2. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE EXISTING AIC/SCOR RATING OF EACH PANELBOARD/SWITCHBOARD. ALL NEW AND EXISTING OVER-CURRENT PROTECTION DEVICES (CIRCUIT BREAKERS AND FUSES) MUST HAVE AN AIC/SCOR RATING EXCEEDING THE AVAILABLE FAULT CURRENT AT THAT POINT IN THE SYSTEM. NOTIFY THE OWNER AND THE ENGINEER IF THE EXISTING EQUIPMENT DOES NOT COMPLY WITH THIS REQUIREMENT.
3. VERIFY THE INTEGRITY OF THE EXISTING GROUNDING ELECTRODE SYSTEM AND THAT THE NEUTRAL AND GROUND ARE PROPERLY BONDED TOGETHER AT THE POINT OF SERVICE ENTRANCE. NOTIFY THE LANDLORD, OWNER AND THE ENGINEER OF ANY EXISTING DEFICIENCIES.

ONE-LINE DIAGRAM SUPPLEMENTAL SPECIFICATIONS:

1. GROUNDING ELECTRODE SYSTEM SHALL BE PER LOCAL REQUIREMENTS AND SHALL NOT BE LESS STRINGENT THAN THAT SPECIFIED IN THE CONSTRUCTION DOCUMENTS.
2. PROVIDE PROPERLY SIZED LUGS FOR ALL EQUIPMENT, CIRCUIT BREAKERS, AND OTHER ELECTRICAL DEVICES TO ACCOMMODATE INSTALLED CONDUCTORS, A LARGER FRAME, OVERSIZED LUGS OR NON-STANDARD PRODUCT MAY BE REQUIRED IN SOME INSTANCES. UTILIZE PIN ADAPTERS ONLY IF NECESSARY AND ONLY AS ALLOWED BY MANUFACTURER AND AHJ.
3. PROVIDE ANY AVAILABLE SPACE IN SWITCHBOARDS/PANELBOARDS WITH BUSSING.
4. PROVIDE TYPED FINAL CIRCUIT DIRECTORY FOR ALL PANELBOARDS TO REFLECT ACTUAL AS-BUILT CONDITIONS. COORDINATE FINAL ROOM NAMES, NUMBERS AND DESCRIPTIONS WITH OWNER PRIOR TO COMPLETION. CIRCUIT DESCRIPTIONS SHALL BE PER CODE AND SHALL BE DISTINGUISHABLE FROM ALL OTHERS.

LSR7 Robotics, GiC & Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO 64086
LSW: 2600 SW Ward Rd., Lee's Summit MO 64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

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301 NE Tudor Road
Lee's Summit, MO 64086

architect: Multistudio
4209 Pennsylvania
Kansas City, MO 64111
816.931.6655
multi.studio

civil engineer: Kaw Valley Engineering
14700 West 114th Terrace
Lenexa, KS 66215
913.485.0318
kveng.com

structural engineer: Bob D. Campbell & Company, Inc.
4338 Bellevue
Kansas City, MO 64111
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MEP/ET/Code: Henderson Engineers
8345 Lenexa Drive, Suite 300
Lenexa, KS 66214
816.742.5000
www.hendersonengineers.com

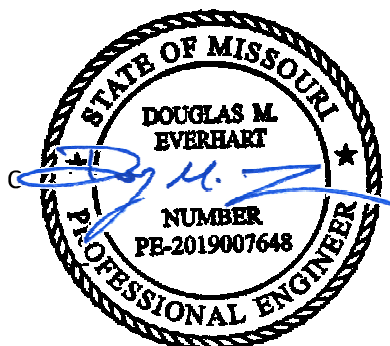
8345 LENEXA DRIVE, SUITE 300
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WWW.HENDERSONENGINEERS.COM

2150005255
MO. CORPORATE NO. E-8580
EXP/RES 12/31/2022

Issue Date: September 5, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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08/09/2022

DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSN - ELECTRICAL
ONE-LINE DIAGRAM
AND CALCULATIONS
E800-B

FIRE ALARM SCOPE NOTES:

1. FIRE ALARM SCOPE AT LSN AND LSW BOTH INCLUDES THE MODIFICATION OF THE EXISTING FIRE ALARM SYSTEM. PROVIDE NEW EMERGENCY VOICE ALARM NOTIFICATION IN THE NEW LSSD ROBOTICS FACILITY IN ACCORDANCE WITH NFPA 72 AND ANY LOCAL LAWS.

FIRE ALARM GENERAL NOTES:

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. SYSTEM DESIGN, INSTALLATION AND MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS. SYSTEM SHALL ALSO MEET ALL APPLICABLE BUILDING CODES, FIRE CODES AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER. VERIFY REQUIREMENTS PRIOR TO BID SUBMITTAL.
3. INFORMATION ON CONTRACT DOCUMENTS IS GENERAL. INFORMATION AND FOR BID PURPOSES ONLY. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE FINAL SYSTEM DESIGN AND LAYOUT OF ALL COMPONENTS, COORDINATION WITH ALL OTHER TRADES, AND SYSTEM CALCULATIONS REQUIRED FOR APPROVAL BY THE AUTHORITY HAVING JURISDICTION, ENGINEER, AND OWNER'S INSURER.
4. THE CONTRACTOR SHALL FOLLOW THE ENGINEER OF RECORD'S SYSTEM DESIGN AND LAYOUT OF ALL COMPONENTS EXCEPT WHERE MODIFICATION TO THE DESIGN IS NECESSARY. MODIFICATIONS SHALL BE REFLECTED IN THE CONTRACTOR'S SHOP DRAWINGS AND CALCULATIONS.
5. DEVIATIONS FROM ENGINEER'S DESIGN WILL NOT BE CONSIDERED UNLESS A FORMALLY SUBMITTED RFIS RECEIVED AND APPROVED.
6. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM AS INDICATED IN THE DRAWINGS AND SPECIFICATIONS.
7. WHERE EXISTING SYSTEMS ARE PRESENT, CONTRACTOR SHALL MODIFY, RELOCATE AND/OR PROVIDE ADDITIONAL EQUIPMENT AS REQUIRED FOR SCOPE OF WORK AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. COORDINATE WITH WALLS, CEILINGS, LIGHTS, DIFFUSERS, STRUCTURE, OBSTRUCTIONS, ETC. IN AREAS AFFECTED BY SCOPE OF WORK, NEW EQUIPMENT SHALL BE COMPATIBLE WITH EXISTING SYSTEMS. CONTRACTOR SHALL REMOVE ALL ABANDONED EQUIPMENT. COORDINATE SYSTEM MODIFICATIONS TO MINIMIZE SYSTEM IMPAIRMENT, AND PROVIDE FIRE WATCH AND/OR INTERIM FIRE PROTECTION MEASURES WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION, INSURANCE CARRIER OR OWNER.
8. PROVIDE ADDITIONAL MATERIALS AND LABOR REQUIRED DUE TO LACK OF COORDINATION OR TO MEET AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.
9. FORWARD COMPLETED CERTIFICATE OF COMPLETION AND CONTRACTOR MATERIAL TEST CERTIFICATES TO THE OWNER.
10. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

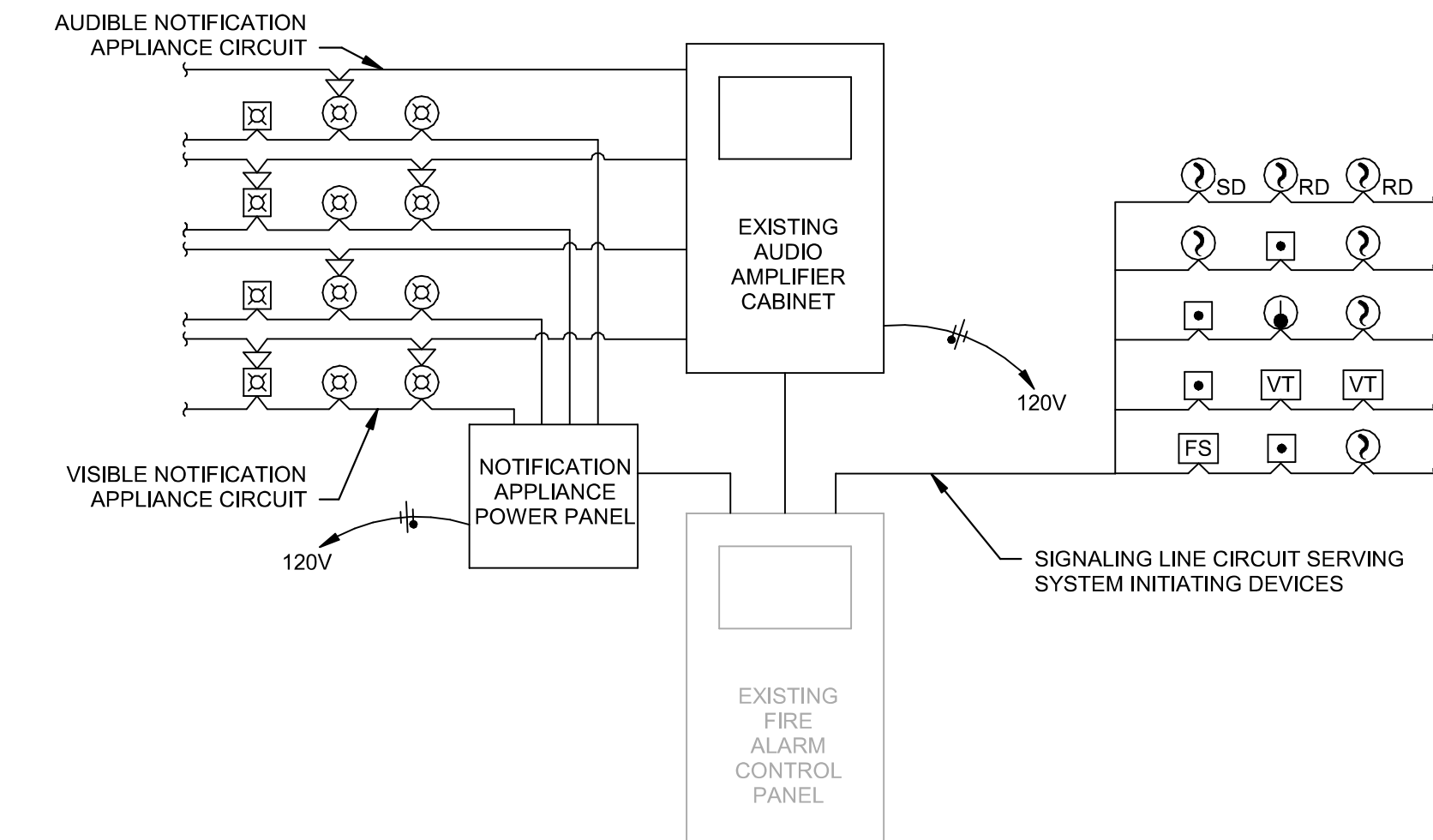
FIRE ALARM GENERAL DEMOLITION NOTES:

1. COORDINATE ALL DEMOLITION WITH WHAT IS SHOWN ON DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
2. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
3. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR OWNER, AS DEFINED IN BID DOCUMENTS, OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID. ADDITIONAL COMPENSATION WILL NOT BE PAID FOR LACK OF SUCH DETERMINATION, FAMILIARIZATION, AND/OR ALLOWANCE.
4. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
5. OWNER RETAINS RIGHTS OF SALVAGE FOR EQUIPMENT AND FIXTURES TO BE REMOVED. COORDINATE WITH THE OWNER THE EQUIPMENT AND FIXTURES TO BE SALVAGED AND THE LOCATION FOR STORAGE. AVOID DAMAGE TO EQUIPMENT DURING DEMOLITION WORK AND DURING TRANSPORT TO OWNER'S DESIGNATED STORAGE LOCATION. PROPERLY DISPOSE OF MATERIALS THAT ARE REMOVED AND ARE NOT REQUESTED TO BE SALVAGED BY THE OWNER.
6. EQUIPMENT TO BE REMOVED SHALL BE KEPT FOR REINSTALLATION DURING THE CONSTRUCTION PHASE WHEN POSSIBLE AND/OR INDICATED ON THE DRAWINGS. AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN FOR NEW INSTALLATION. REPAIR ANY DAMAGE CAUSED DURING WORK AT NO EXTRA COST TO THE OWNER.
7. SEAL PENETRATIONS THROUGH FLOORS, WALLS, CEILINGS AND ROOFS WHERE COMPONENTS ARE REMOVED AND WHERE THE EXISTING PENETRATION IS NOT USED FOR THE NEW INSTALLATION. REPAIR DAMAGED SURFACES TO MATCH ADJACENT AREAS OR AS INDICATED ON THE ARCHITECTURAL DRAWINGS.
8. PERFORM ALL WORK ACCORDING TO THE PHASING SCHEDULE FOR THIS PROJECT. PROVIDE ALL TEMPORARY DESIGN AND/OR CONFIGURATIONS THAT MEET APPLICABLE CODE REQUIREMENTS AS NECESSARY TO CONFORM TO THE REQUIRED CONSTRUCTION PHASING OF THE PROJECT.
9. ONLY THE PORTIONS OF THE BUILDING AFFECTED BY THE SCOPE OF THE PROJECT HAVE BEEN SHOWN. INFORMATION SHOWN AS EXISTING TO REMAIN IS NOT BEING MODIFIED AS A PART OF THIS PROJECT.
10. ALL WORK SHALL BE PERFORMED SO AS TO NOT INTERRUPT SERVICE. THE CONTRACTOR SHALL PROPERLY NOTIFY THE BUILDING OWNER, LANDLORD, THE LEASER AND ADJACENT TENANTS AS APPLICABLE A MINIMUM OF 48 HOURS IN ADVANCE BEFORE PROCEEDING WITH THIS WORK.
11. REMOVE ALL UNUSED AND DEMOLISHED EQUIPMENT AND ASSOCIATED MATERIALS FROM SITE. ABANDONING UNUSED PORTIONS WILL NOT BE ACCEPTABLE.
12. SYSTEM(S) NOT ASSOCIATED WITH THE DEMOLITION SHALL BE LEFT IN SERVICE AS APPLICABLE.
13. INSPECT EXISTING EQUIPMENT TO REMAIN TO VERIFY THAT EQUIPMENT IS OPERATING PROPERLY. NOTIFY OWNER OF DAMAGED AND/OR MALFUNCTIONING COMPONENTS.
14. ALL SYSTEMS TO BE LEFT IN SERVICE PRIOR TO THE END OF EACH WORKDAY.

FIRE PROTECTION SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED. V2.02

ABBREVIATIONS		FIRE ALARM
AFB AFG CD DI ESFR ETR FHC FP GC GPM JB/J-BOX MAX MIN N/A	ABOVE FINISHED FLOOR OC CANDELA DUCTILE IRON EARLY SUPPRESSION FAST RESPONSE EXISTING TO REMAIN FIRE HOSE CABINET FIRE PROTECTION CONTRACTOR GALLONS PER MINUTE TYP JUNCTION BOX MAXIMUM MINIMUM NOT APPLICABLE	NIC ON CENTER PIV PROVIDE PRESSURE REDUCING VALVE RD RETURN DUCT REV REVISION SD SUPPLY DUCT SF SQUARE FEET TYP UNLESS NOTES OTHERWISE V VOL(T)S W WATTS WP WEATHERPROOF
ANNOTATION		
1		FIRE PROTECTION PLAN NOTE CALLOUT
CONNECTION POINT OF NEW WORK TO EXISTING		
1 F1		DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
SECTION CUT DESIGNATION		
DEDICATED EQUIPMENT ACCESS TILE		
ACCESS PANEL		
STANDARD MOUNTING HEIGHTS		
AUDIBLE APPLIANCE (TOP OF APPLIANCE)		90"
FIRE ALARM ANNUNCIATOR PANEL (TOP OF DISPLAY)		60"
FIRE ALARM BELL (EXTERIOR) (CENTERLINE)		120"
FIRE ALARM CONTROL PANEL/UNIT (TOP OF DISPLAY)		60"
PULL STATION (TOP OF DEVICE)		48"
VISIBLE APPLIANCE (CENTERLINE)		84"
INSTALL DEVICES AT THE MOUNTING HEIGHTS SHOWN ABOVE UNO IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ABOVE, OR ELSEWHERE IN THE CONSTRUCTION DOCUMENTS, ARE AFF OR AFG. UNO, ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.		
CALL OUTS		
ENLARGED PLAN CALLOUT		
NOT IN SCOPE		
LINETYPE LEGEND		
THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.		
EXISTING		NEW
DEMOLISH		FUTURE



RISER DIAGRAM IS SCHEMATIC IN NATURE. NOT ALL DEVICES ARE SHOWN. REFER TO PLANS FOR EQUIPMENT QUANTITIES AND LOCATIONS.

DUCT DETECTORS MAY HAVE INTEGRAL RELAYS FOR AIR HANDLING UNIT SHUT-DOWN AND FIRE/SMOKE DAMPER CONTROL. WIRING FOR THIS FUNCTION HAS NOT BEEN SHOWN. COORDINATE WITH MECHANICAL SYSTEM INSTALLER.

REFER TO PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

3 FIRE ALARM RISER DIAGRAM - ADDRESSABLE SYSTEM (VOICE)
NTS

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2150005255
MO. CORPORATE NO. E-858D
EXPIRES 12/31/2022

Issue Date: September 9, 2022

NUMBER	DESCRIPTION	DATE
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STATE OF MISSOURI
Professional Engineer
NUMBER
PE-2012037646
CHRISTOPHER J. CULP
LICENSE # PE-2012037646
09/08/2022

FIRE ALARM GENERAL
NOTES AND LEGEND
FA000

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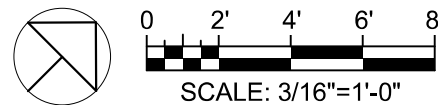
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FIRE ALARM PLAN NOTES:

- F1 PROVIDE REMOTE POWER SUPPLY TO POWER VISIBLE NOTIFICATION APPLIANCES.
F3 PROVIDE DUCT MOUNTED SMOKE DETECTOR FOR FAN POWERED MECHANICAL AIR HANDLING EQUIPMENT SHUTDOWN. INSTALL DETECTOR PER MANUFACTURER'S RECOMMENDATIONS. REFER TO MECHANICAL SHEETS FOR EQUIPMENT AND DUCTWORK LAYOUT AND DETAILS.
F5 PROVIDE LOW VOLTAGE WIRING FROM DUCT DETECTOR TO REMOTE TEST STATION. MOUNT REMOTE TEST STATION IN CEILING.
F6 PROVIDE A CARBON MONOXIDE DETECTOR IN ROOMS CONTAINING FIRST DIFFUSER FROM GAS POWERED AIR HANDLING UNITS. CARBON MONOXIDE DETECTOR SHALL EMIT A LOCAL ALARM TONE UPON DETECTION OF CARBON MONOXIDE.
F7 PROVIDE NEW FIRE ALARM VOICE AMPLIFIER PANEL.

FIRE ALARM PLAN - LSN
3/16" = 1'-0"



FIRE ALARM PLAN - LSW
3/16" = 1'-0"



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Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
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CHRISTOPHER J. CULP
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09/08/2022

FIRE ALARM PLAN
FA101

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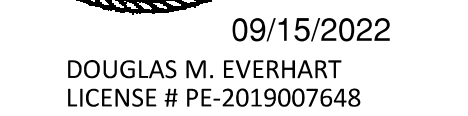
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Issue Date: September 9, 2021

Revisions

NUMBER	DESCRIPTION	
1	Addendum 01	09/1



TN101-A

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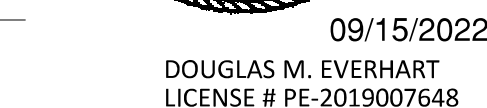
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Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
1	Addendum 01	09/16/2022



TN101-B

A INIOI D

 TECHNOLOGY PLAN NOTES:

T16 PROVIDE DATA FOR ACCESS CONTROL PANEL

T18 DATA SHOWN FOR SECURITY CAMERA. REFER TO TY DRAWINGS FOR EXACT LOCATION PRIOR TO INSTALLATION

① TECHNOLOGY LEVEL 1 PLAN - LSN
3/16" = 1'-0"

DOUGLAS M. EVERHART

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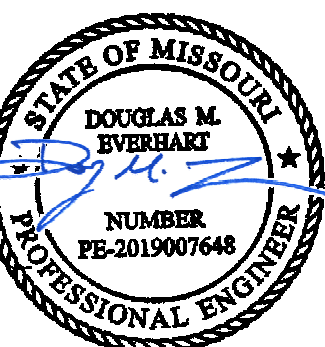
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Issue Date: September 9, 2022

NUMBER	DESCRIPTION	DATE
2	Addendum 02	09/23/2022



09/23/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

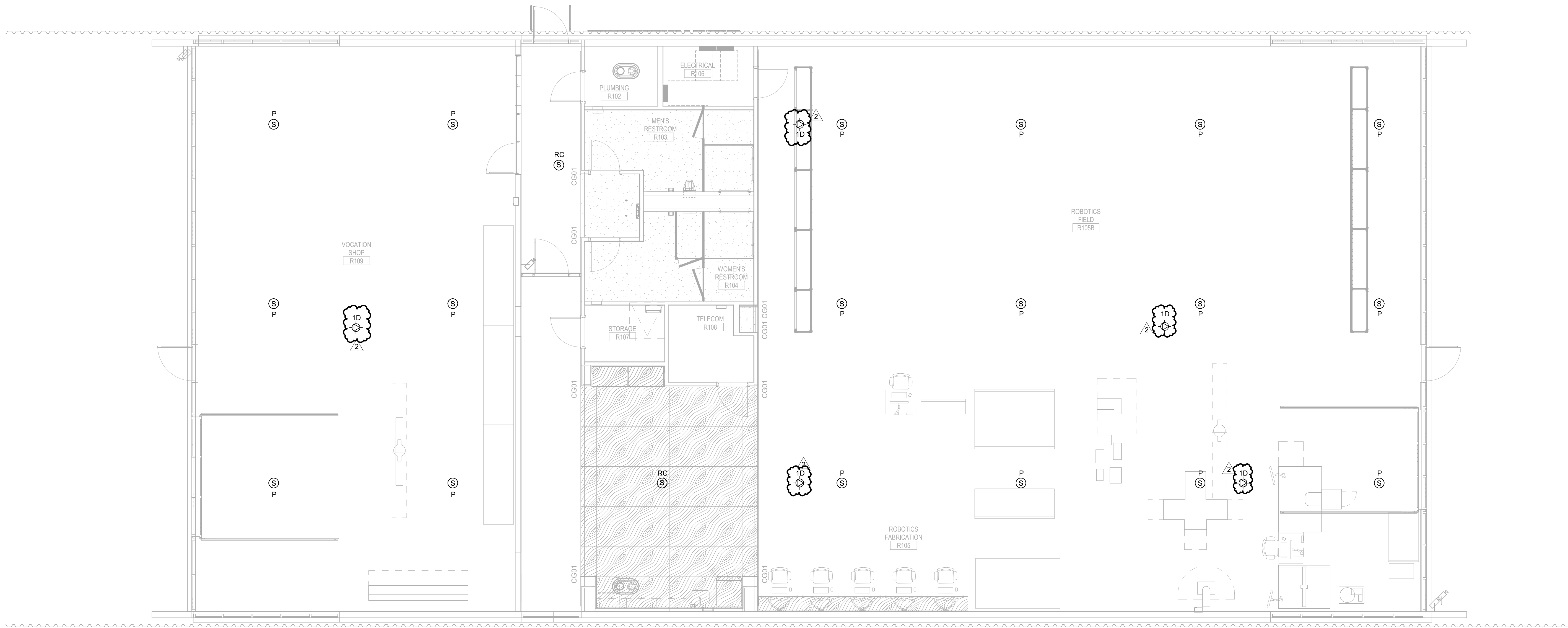
LSW - TECHNOLOGY
RCP - LEVEL 1

TN201-A

① TECHNOLOGY LEVEL 1 RCP - LSW
3/16" = 1'-0"



① TECHNOLOGY LEVEL 1 RCP - LSN
3/16" = 1'-0"



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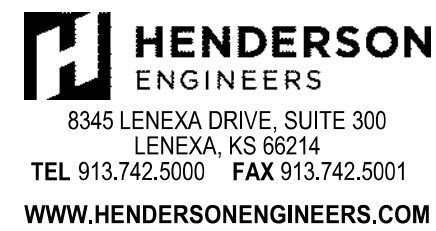
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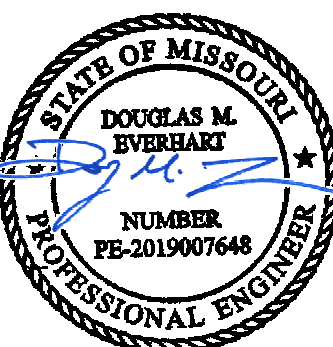
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Issue Date: September 9, 2022

Revisions		
NUMBER	DESCRIPTION	DATE
2	Addendum 02	09/23/2022



09/23/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSN - TECHNOLOGY RCP
- LEVEL 1

TN201-B

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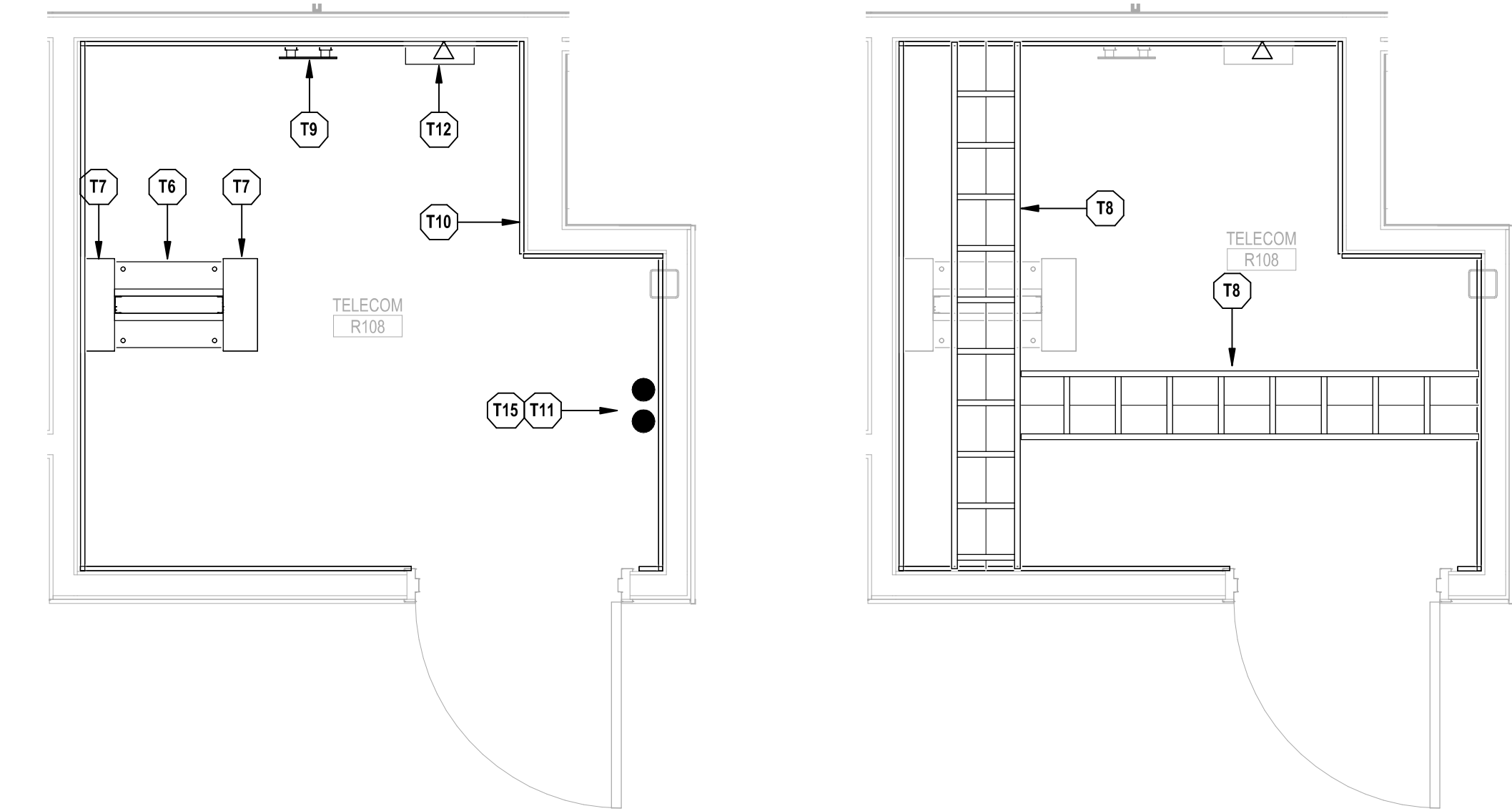
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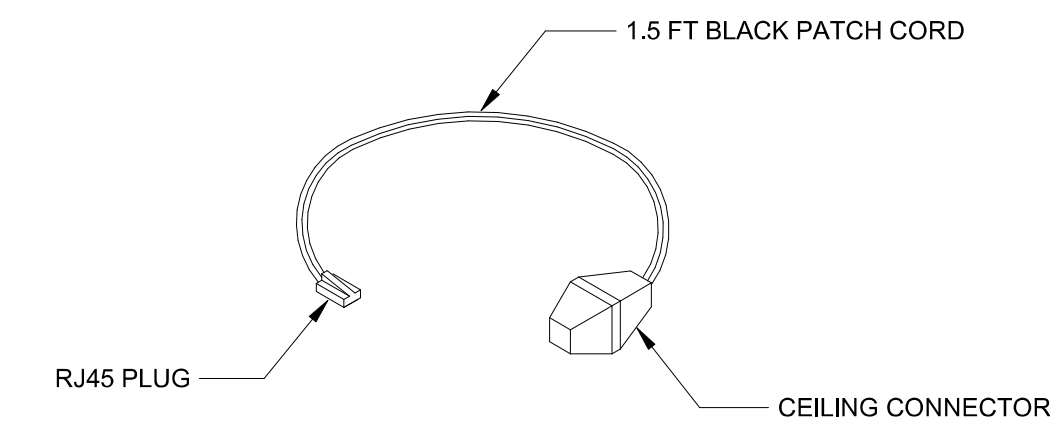
TECHNOLOGY PLAN NOTES:

- T6 PROVIDE 19" WIDE TWO-POST EQUIPMENT RACK. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.
T7 PROVIDE 6" VERTICAL WIRE MANAGER. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.
T8 PROVIDE 12" WIDE LADDER RACK. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.
T9 PROVIDE TELECOMMUNICATIONS GROUNDING BUS BAR. SEE DETAILS SHEET AND SECTIONS 270500 FOR FURTHER REQUIREMENTS.
T10 PROVIDE 3/4" FIRE-RATED TELECOMMUNICATIONS PLYWOOD BACKBOARD DOUBLE COATED IN UL 723 CLASSIFIED FIRE RETARDANT LOW GLOSS WHITE PAINT. PLYWOOD SHALL BE PAINTED PRIOR TO INSTALLATION.
T11 (2) 4" CONDUIT INCOMING SERVICE CONDUITS. REFER TO ELECTRICAL SITE PLANS FOR EXACT ROUTING AND FURTHER INFORMATION.
T12 ACCESS CONTROL PANEL. REFER TO SECURITY DRAWINGS FOR FURTHER REQUIREMENTS.
T15 PROVIDE 12" WIDE VERTICAL LADDER RACK. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.

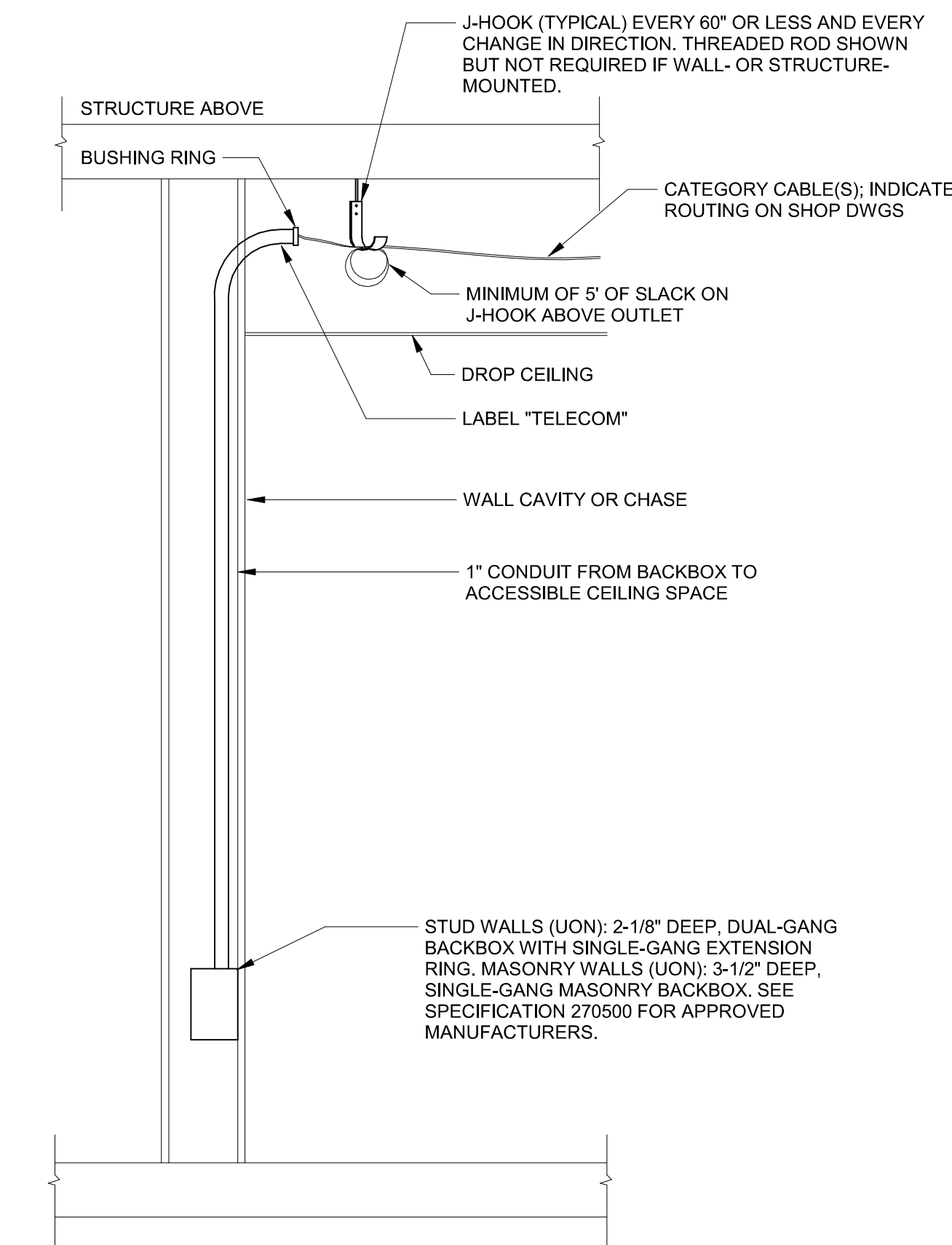


1 LSW TELECOM ROOM #R108 - ENLARGED PLAN
1/2" = 1'-0"

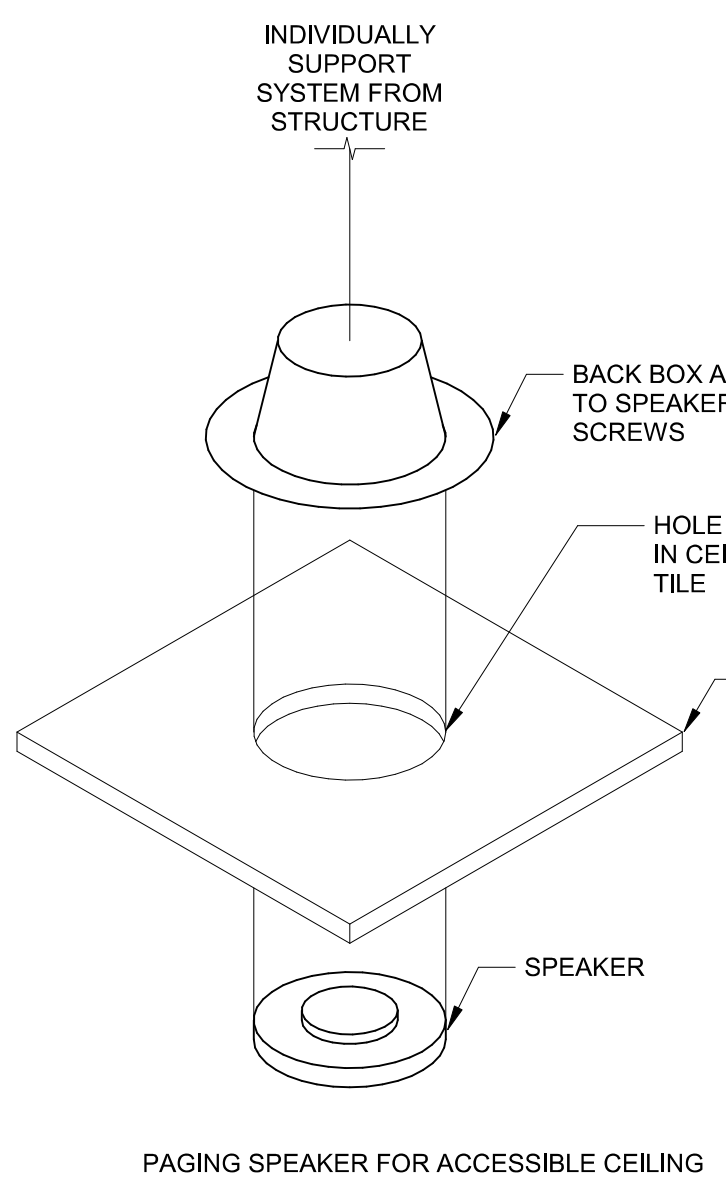
2 LSW TELECOM ROOM #R108 - ENLARGED PATHWAY
1/2" = 1'-0"



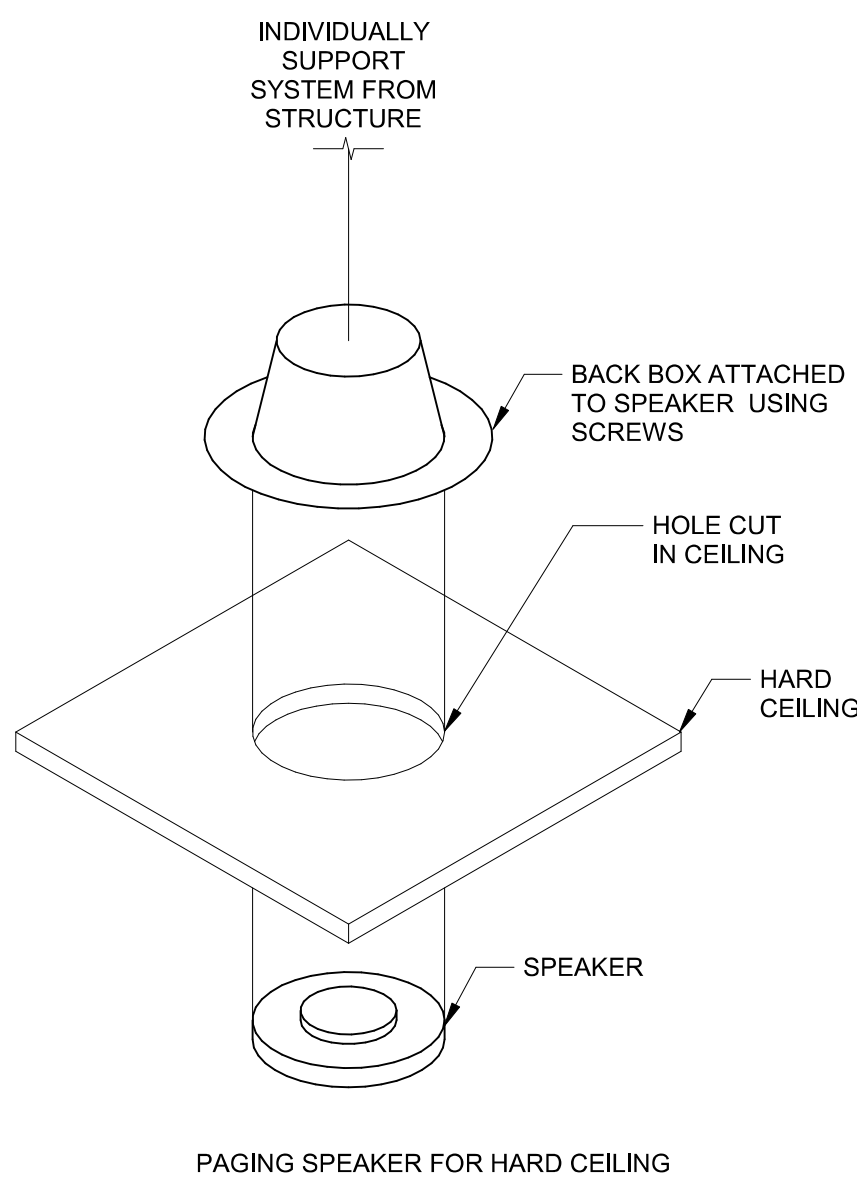
3 ACCESS POINT CONNECTOR ASSEMBLY
NTS



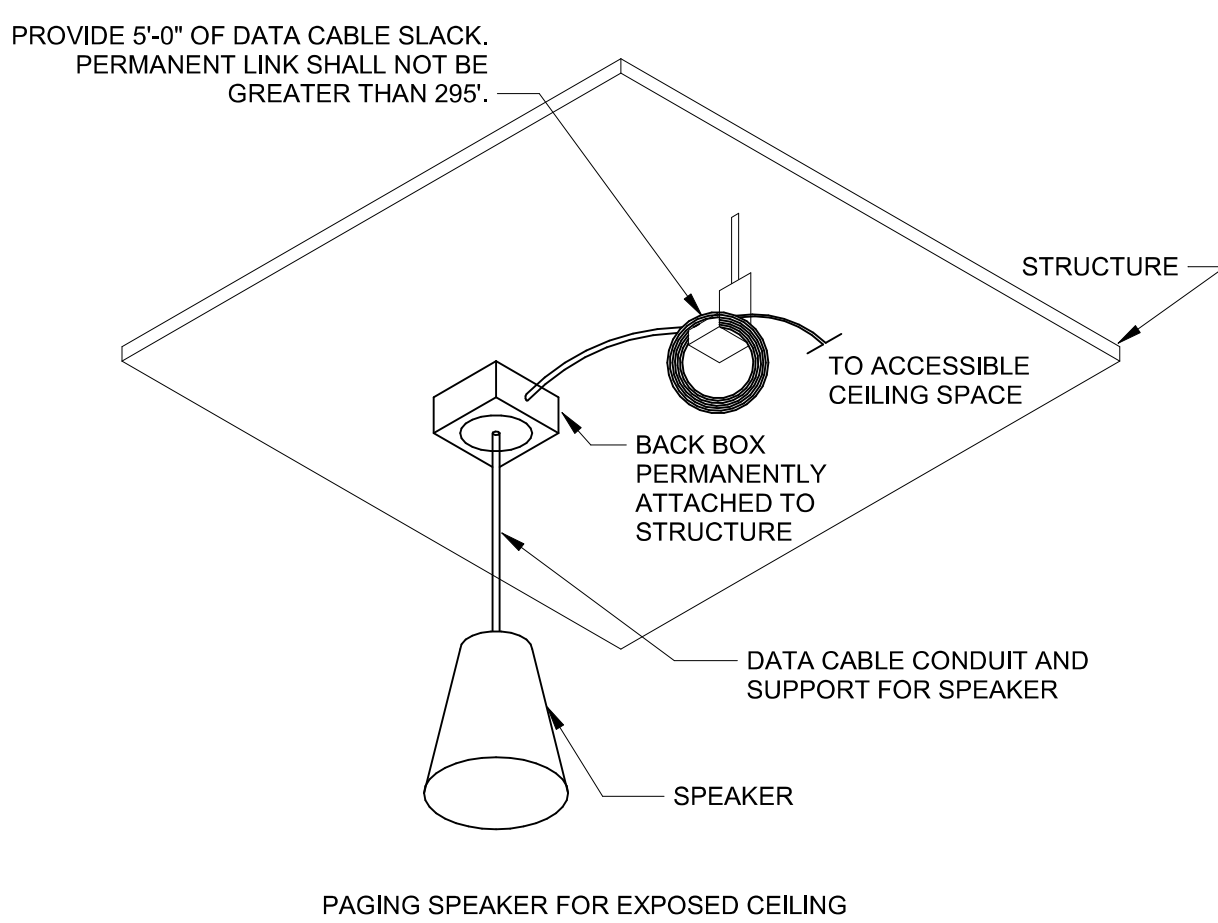
4 COMMUNICATIONS OUTLET MOUNTING
NTS



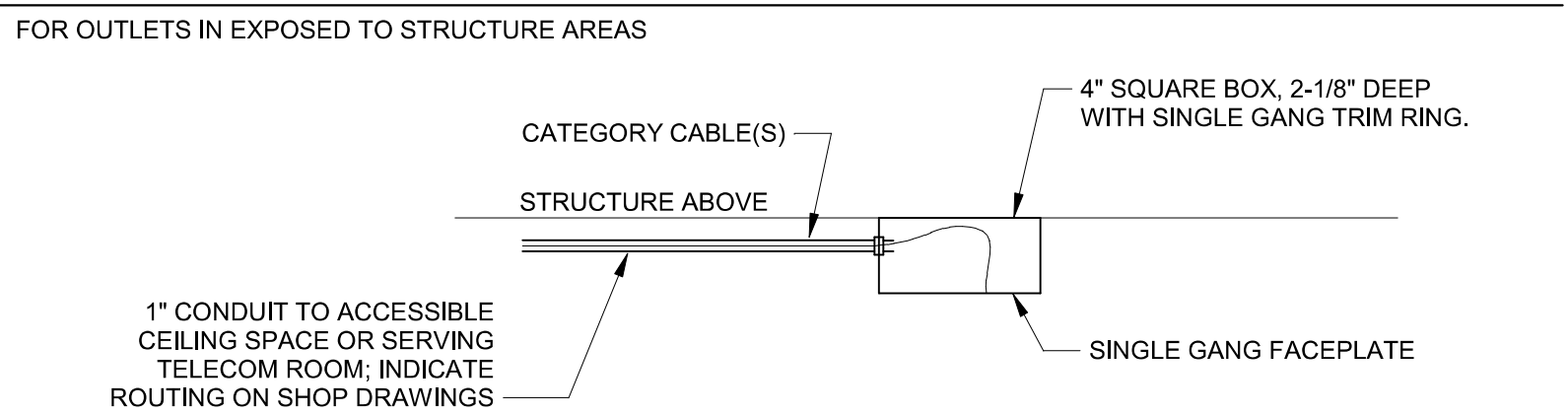
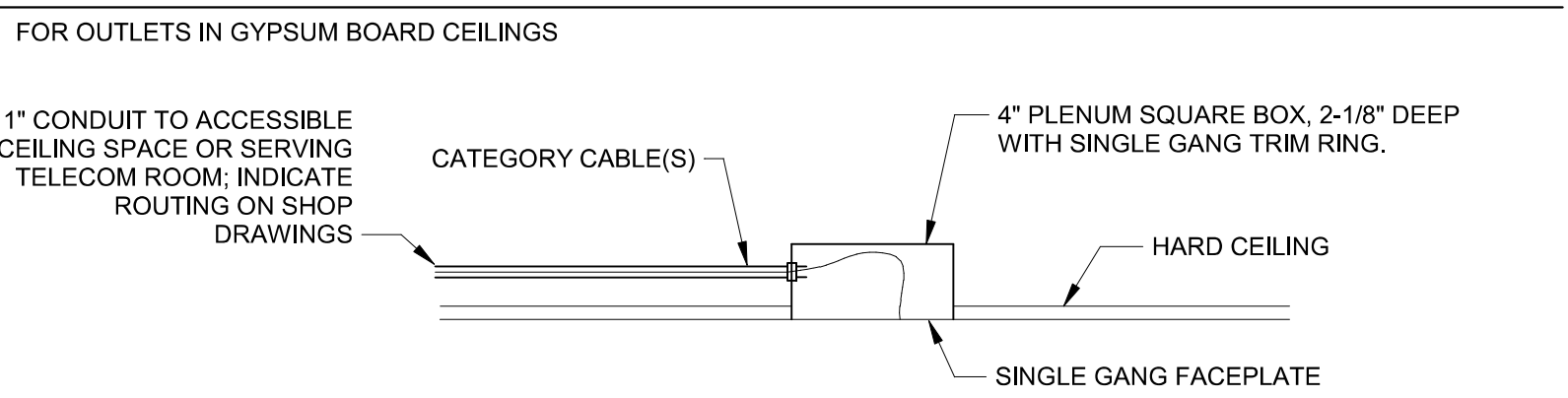
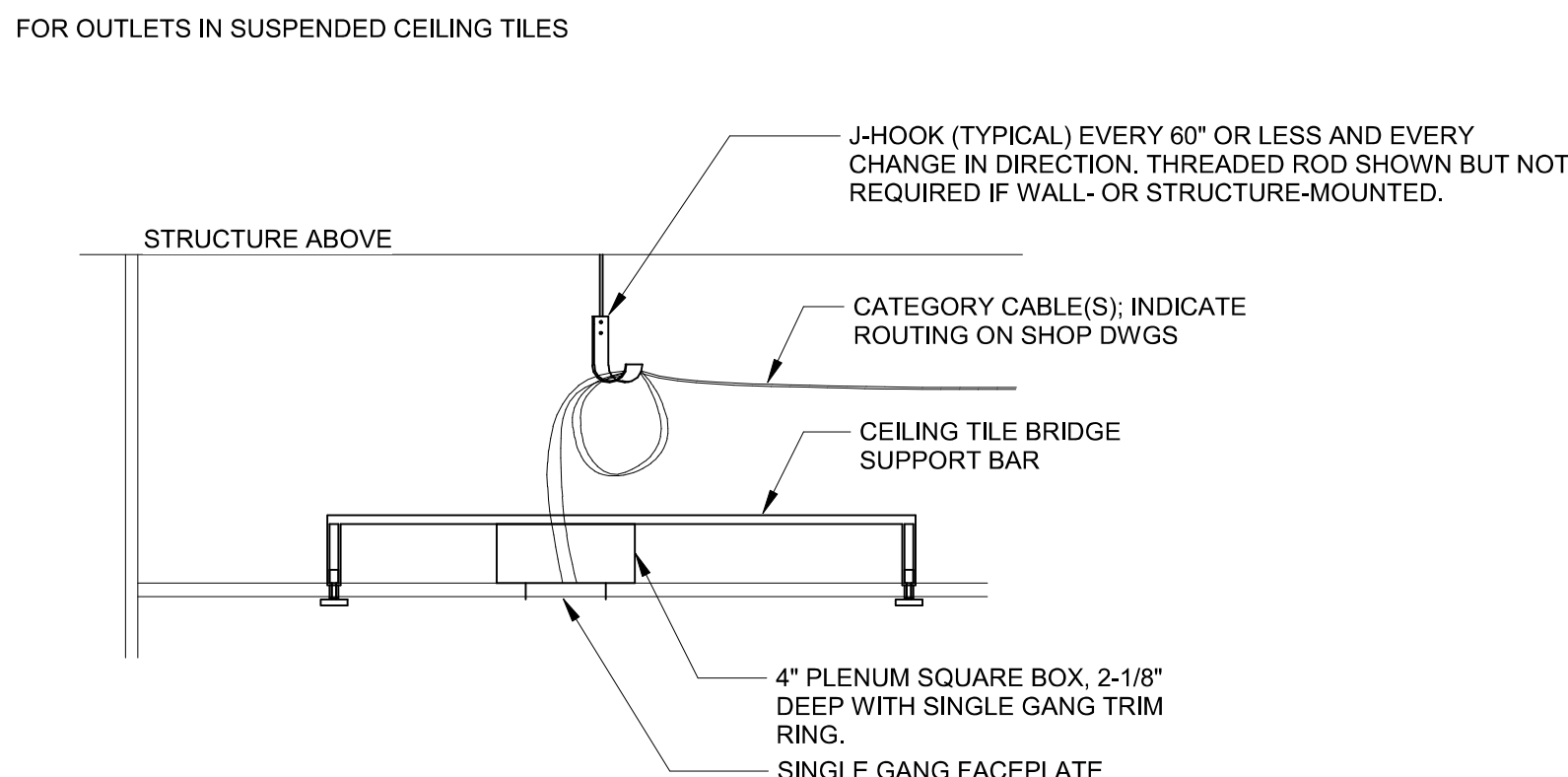
5 SPEAKER INSTALLATION
NTS



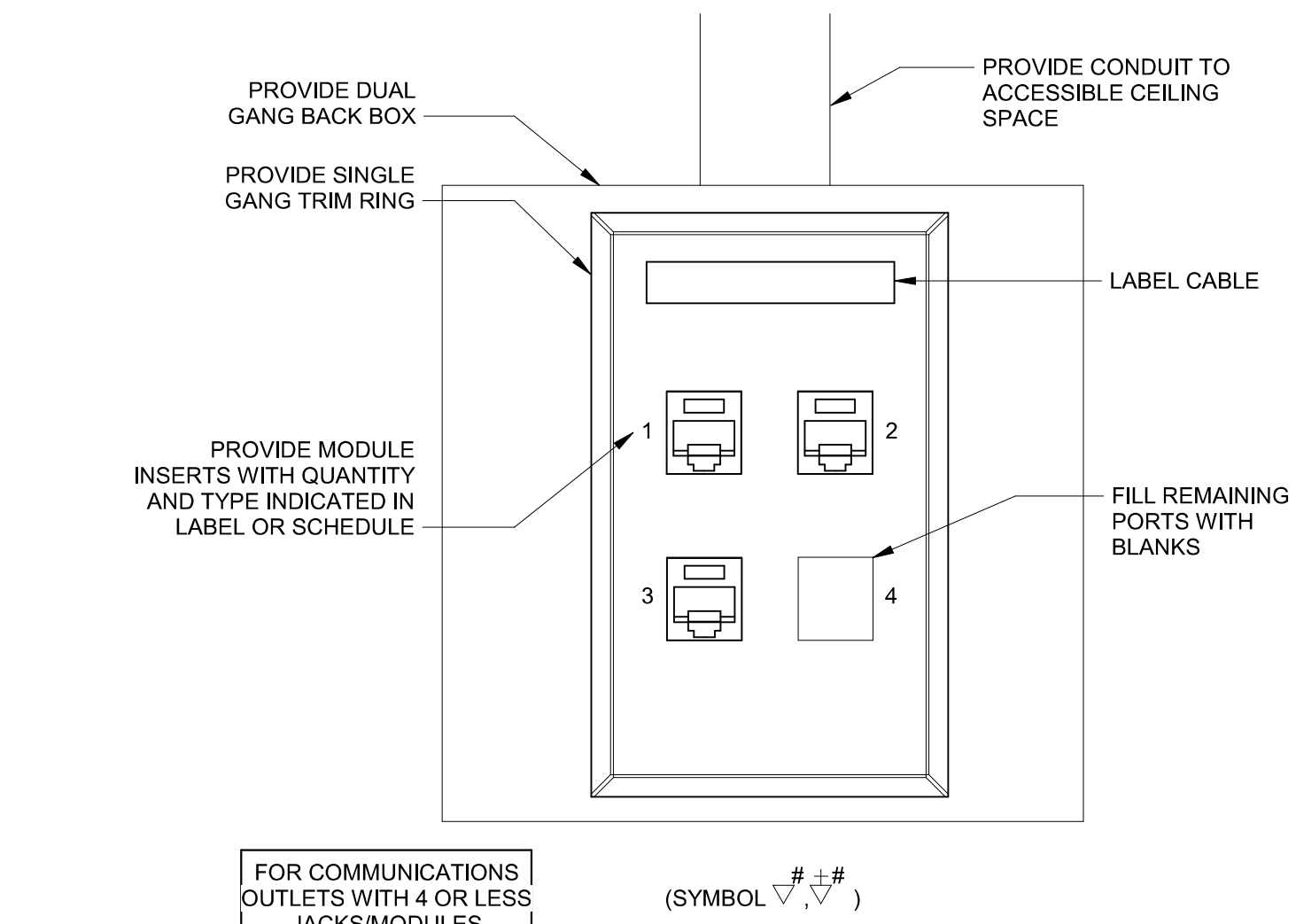
PAGING SPEAKER FOR HARD CEILING



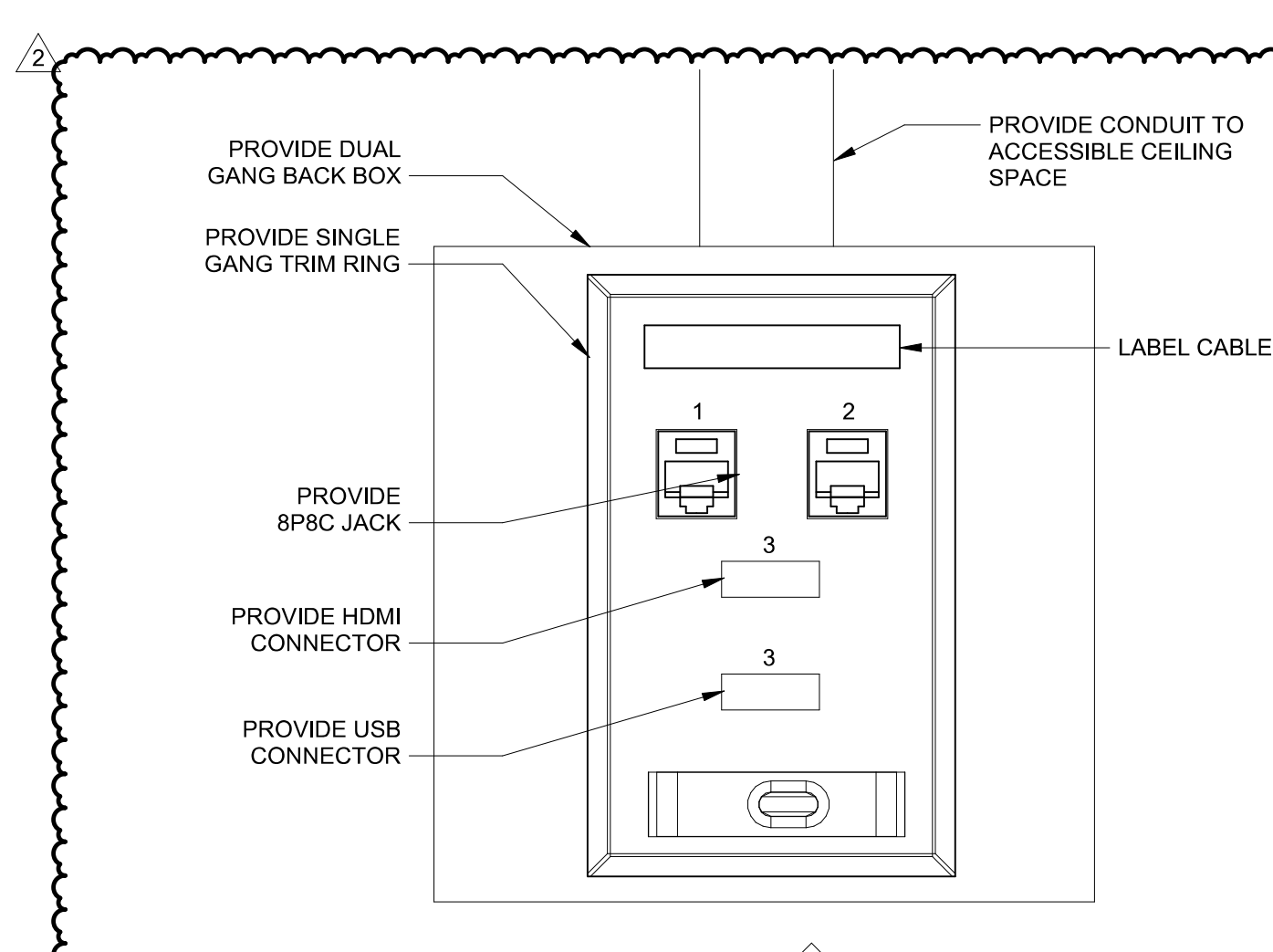
PAGING SPEAKER FOR EXPOSED CEILING



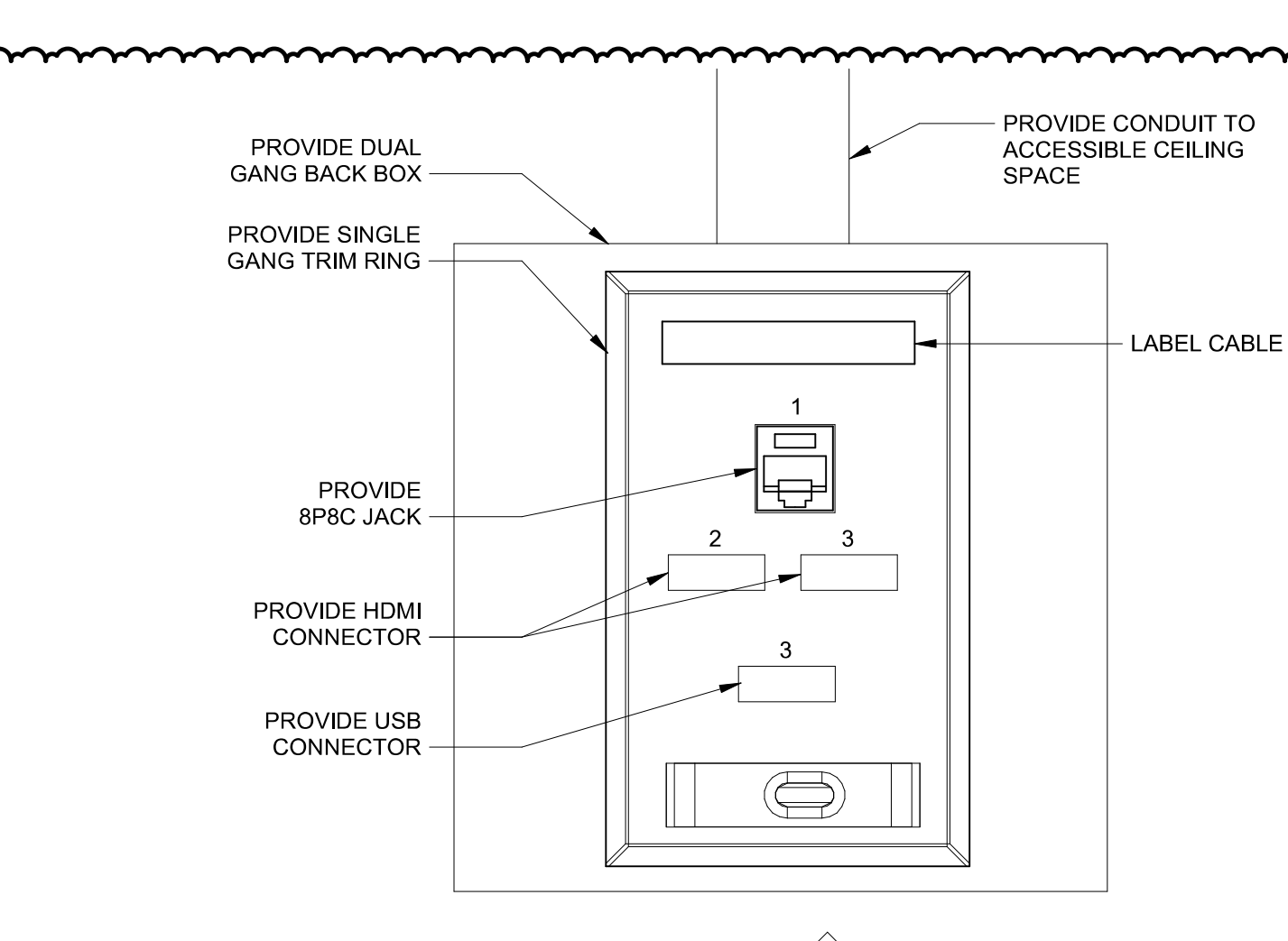
6 CEILING COMM OUTLET 2D
NTS



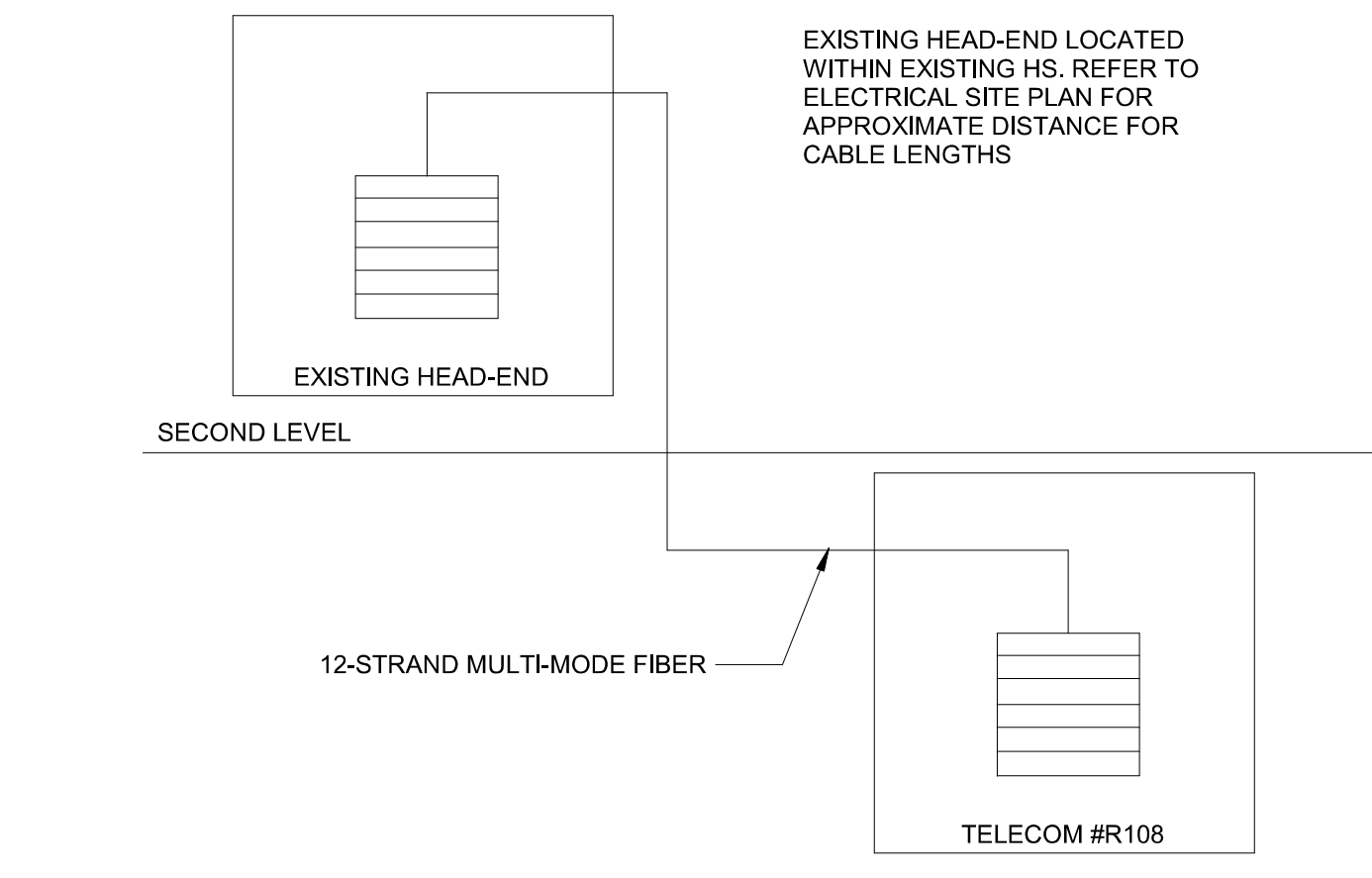
7 SINGLE GANG COMM OUTLET (2D)
NTS



8 SINGLE GANG COMM OUTLET FOR DISPLAY (2D)
NTS



9 SINGLE GANG COMM OUTLET FOR DISPLAY (2D)
NTS



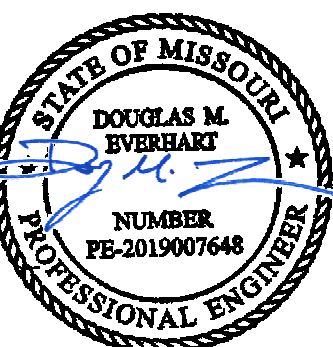
10 RISER DIAGRAM - BACKBONE CABLES
NTS

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EXPIRES 12/31/2022

Issue Date: September 9, 2022

Revisions

NUMBER	DESCRIPTION	DATE
2	Addendum 02	09/23/2022



09/23/2022
DOUGLAS M. EVERHART
LICENSE # PE-2019007648

LSW - TECHNOLOGY
ENLARGED PLANS AND
DETAILS

TN400-A

LSR7 Robotics, GiC &
Phys Education

LSN: 901 NE Douglas St., Lee's Summit MO
64086
LSW: 2600 SW Ward Rd, Lee's Summit MO
64082
LSHS: 400 SE Blue Pkwy, Lee's Summit MO 64063

0121-0100

owner:
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301 NE Tudor Road
Lee's Summit, MO 64086

architect:
Multistudio
4205 Pennsylvania
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816.931.6655
multi.studio

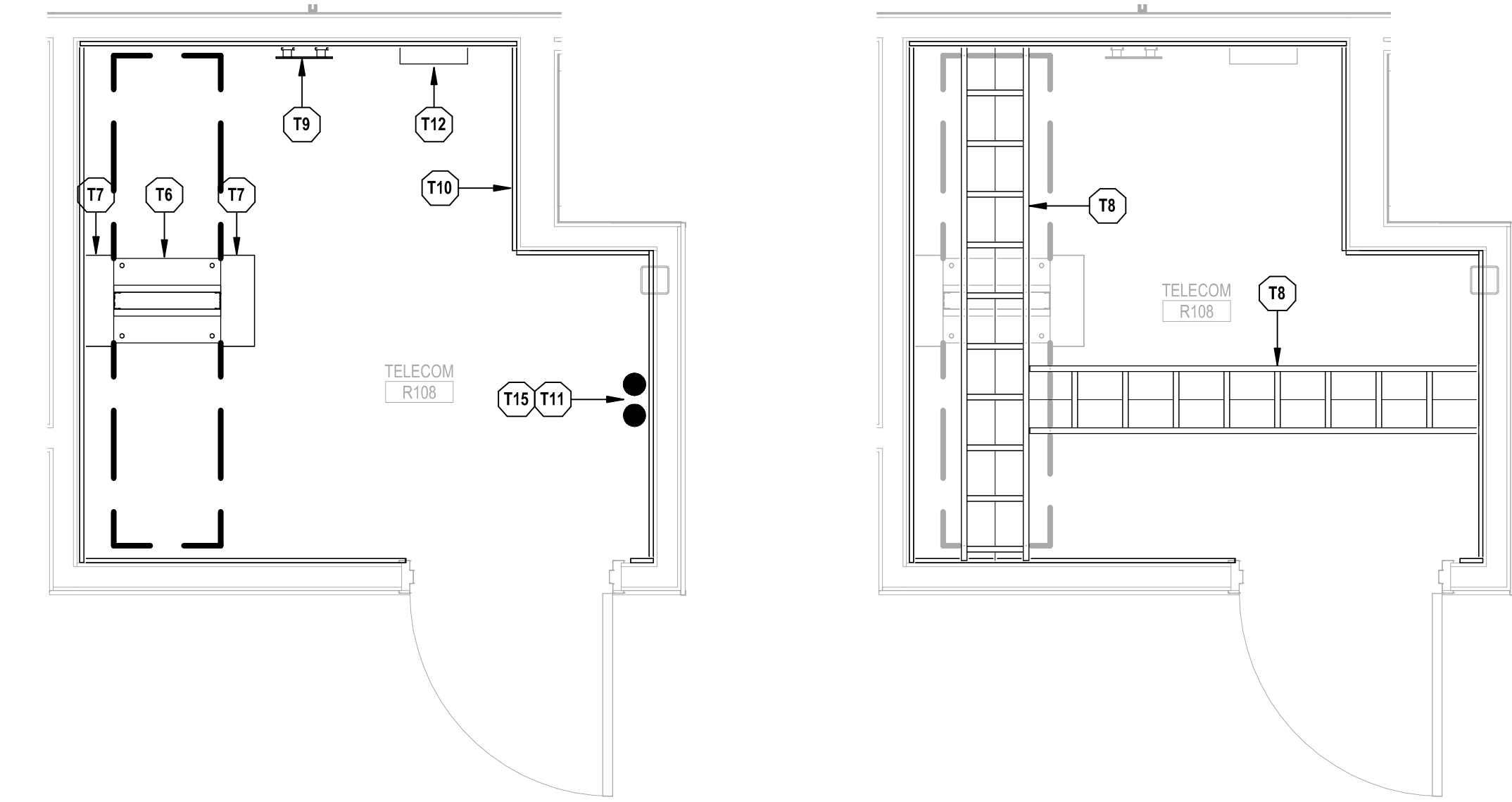
civil engineer:
Kaw Valley Engineering
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Lenexa, KS 66215
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structural engineer:
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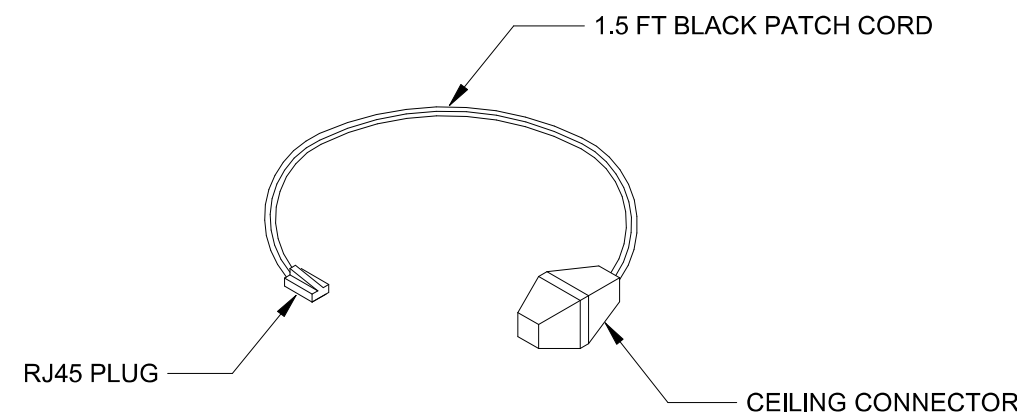
TECHNOLOGY PLAN NOTES:

- T6 PROVIDE 19" WIDE TWO-POST EQUIPMENT RACK. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.
T7 PROVIDE 6" VERTICAL WIRE MANAGER. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.
T8 PROVIDE 12" WIDE LADDER RACK. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.
T9 PROVIDE TELECOMMUNICATIONS GROUNDING BUS BAR. SEE DETAILS SHEET AND SECTIONS 270500 FOR FURTHER REQUIREMENTS.
T10 PROVIDE 3/4" FIRE-RATED TELECOMMUNICATIONS PLYWOOD BACKBOARD DOUBLE COATED IN UL 723 CLASSIFIED FIRE RETARDANT LOW GLOSS WHITE PAINT. PLYWOOD SHALL BE PAINTED PRIOR TO INSTALLATION.
T11 (2) 4" CONDUIT INCOMING SERVICE CONDUITS. REFER TO ELECTRICAL SITE PLANS FOR EXACT ROUTING AND FURTHER INFORMATION.
T12 ACCESS CONTROL PANEL. REFER TO SECURITY DRAWINGS FOR FURTHER REQUIREMENTS.
T15 PROVIDE 12" WIDE VERTICAL LADDER RACK. REFER TO SECTION 271100 FOR FURTHER REQUIREMENTS.

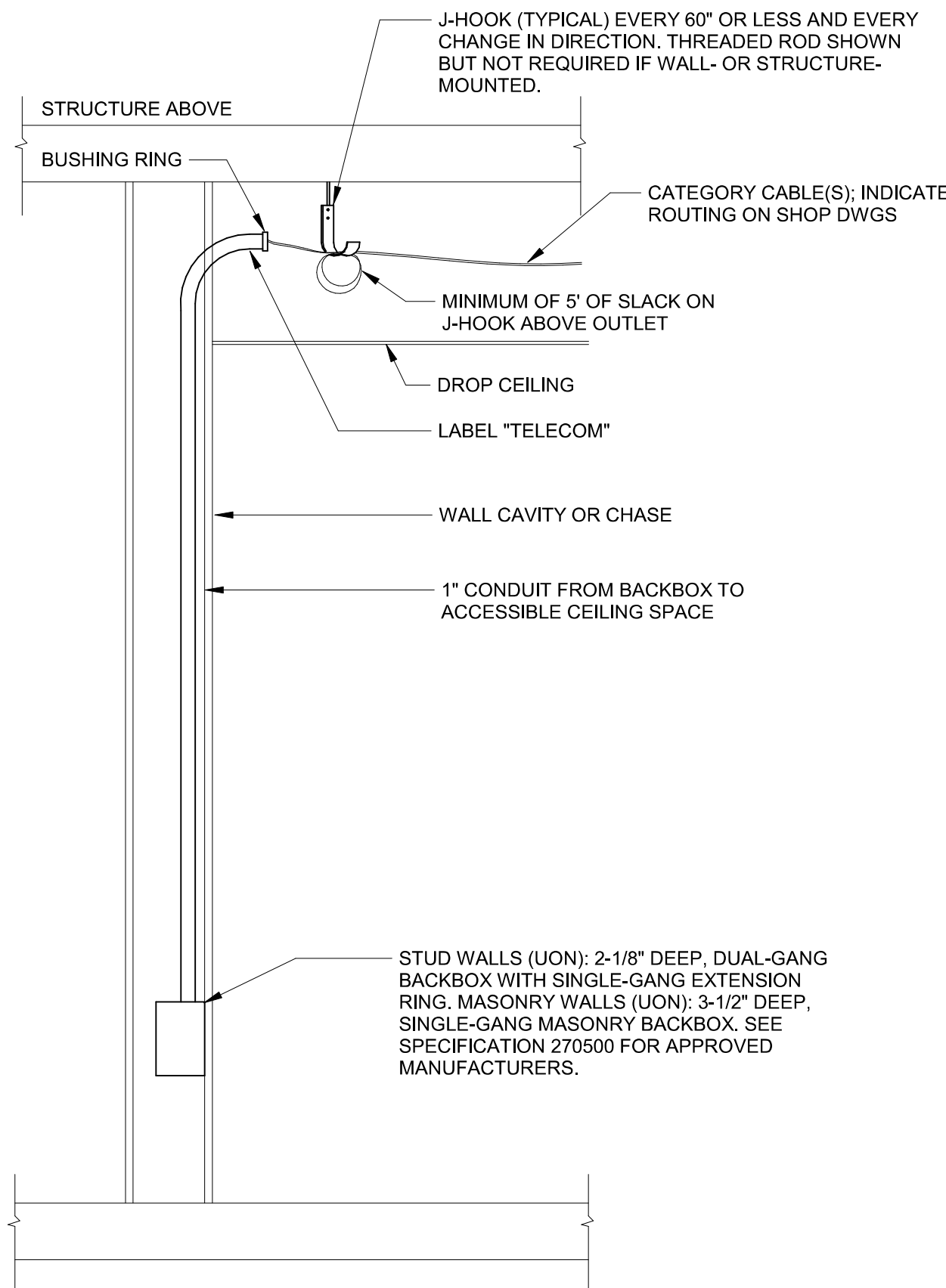


1 LSN TELECOM ROOM #R108 - ENLARGED PLAN
1/2" = 1'-0"

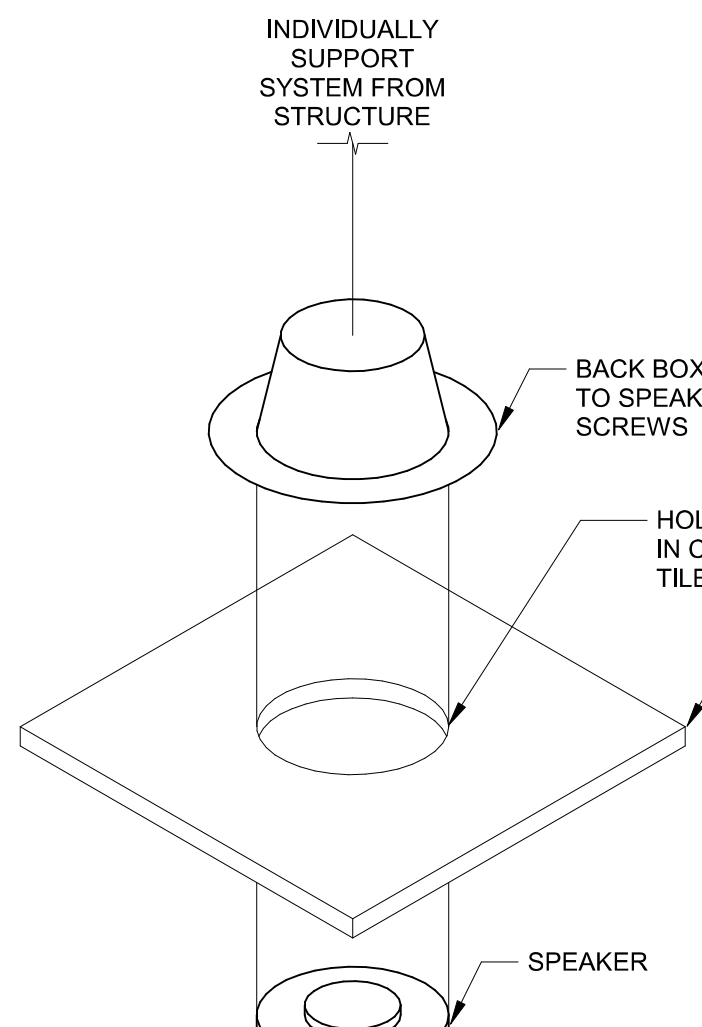
2 LSN TELECOM ROOM #R108 - ENLARGED PATHWAY
1/2" = 1'-0"



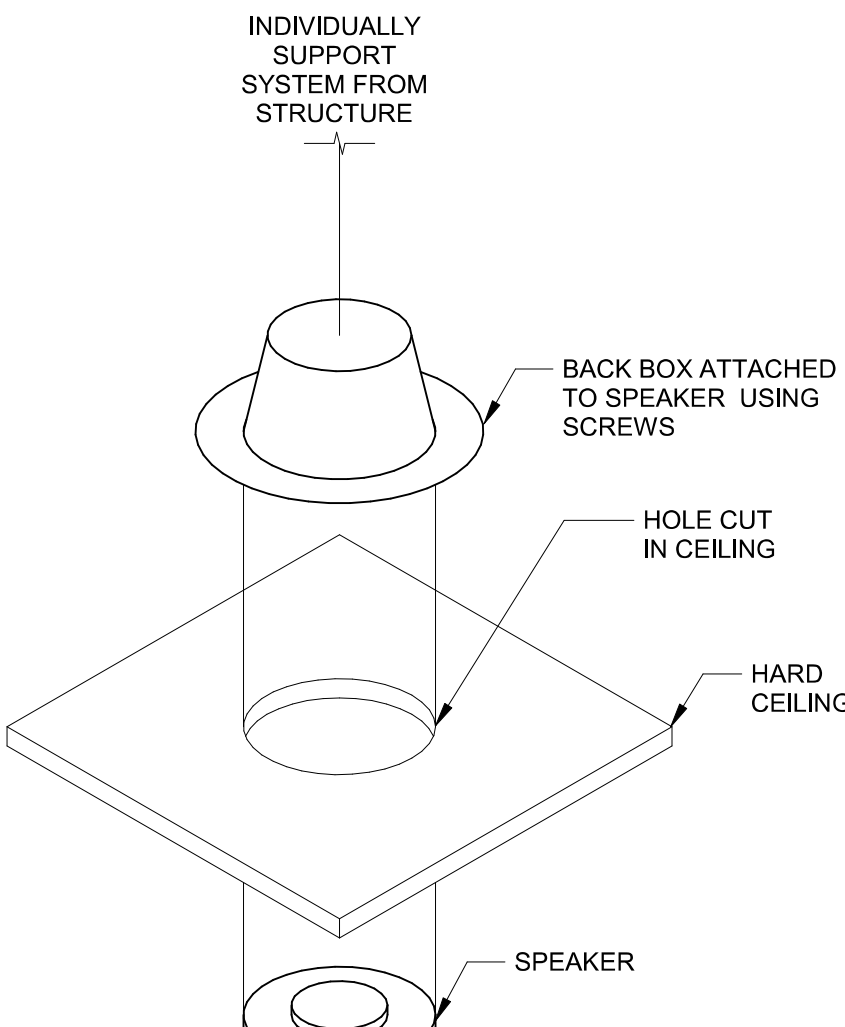
3 ACCESS POINT CONNECTOR ASSEMBLY
NTS



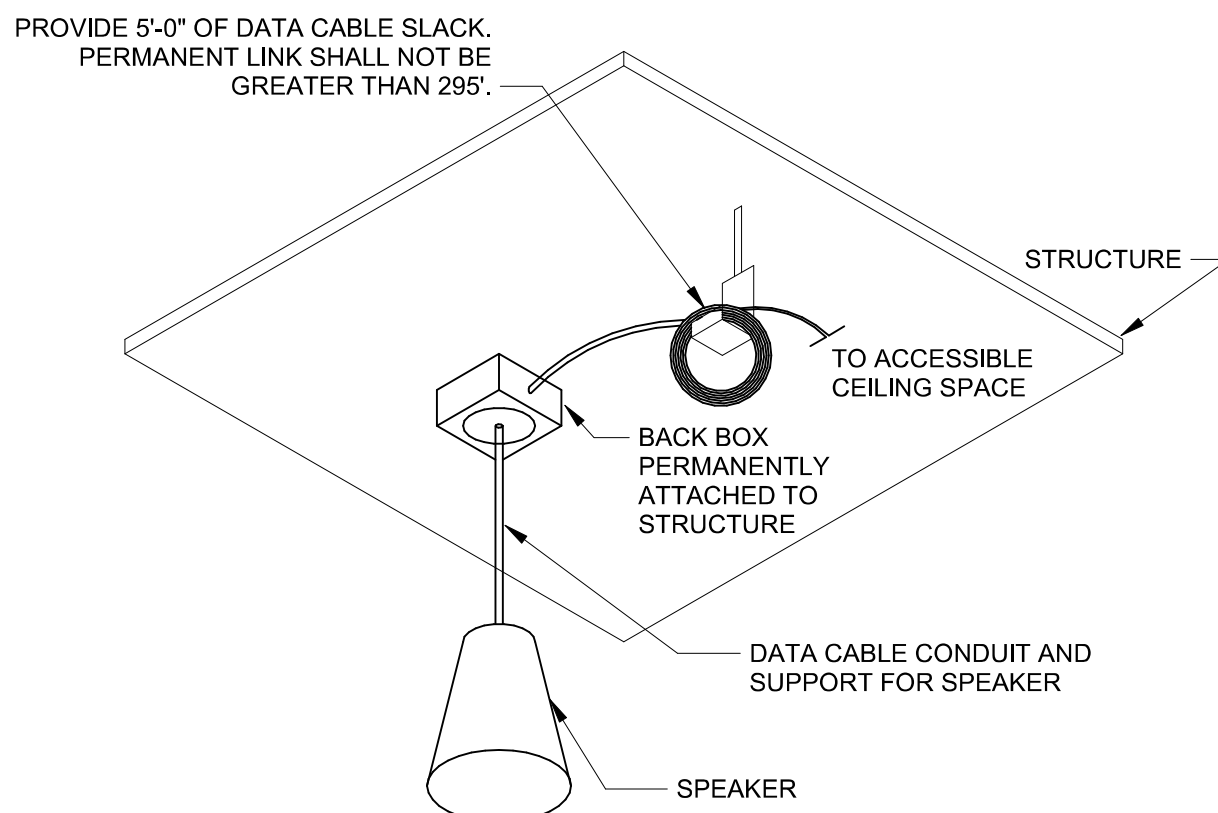
4 COMMUNICATIONS OUTLET MOUNTING
NTS



PAGING SPEAKER FOR ACCESSIBLE CEILING

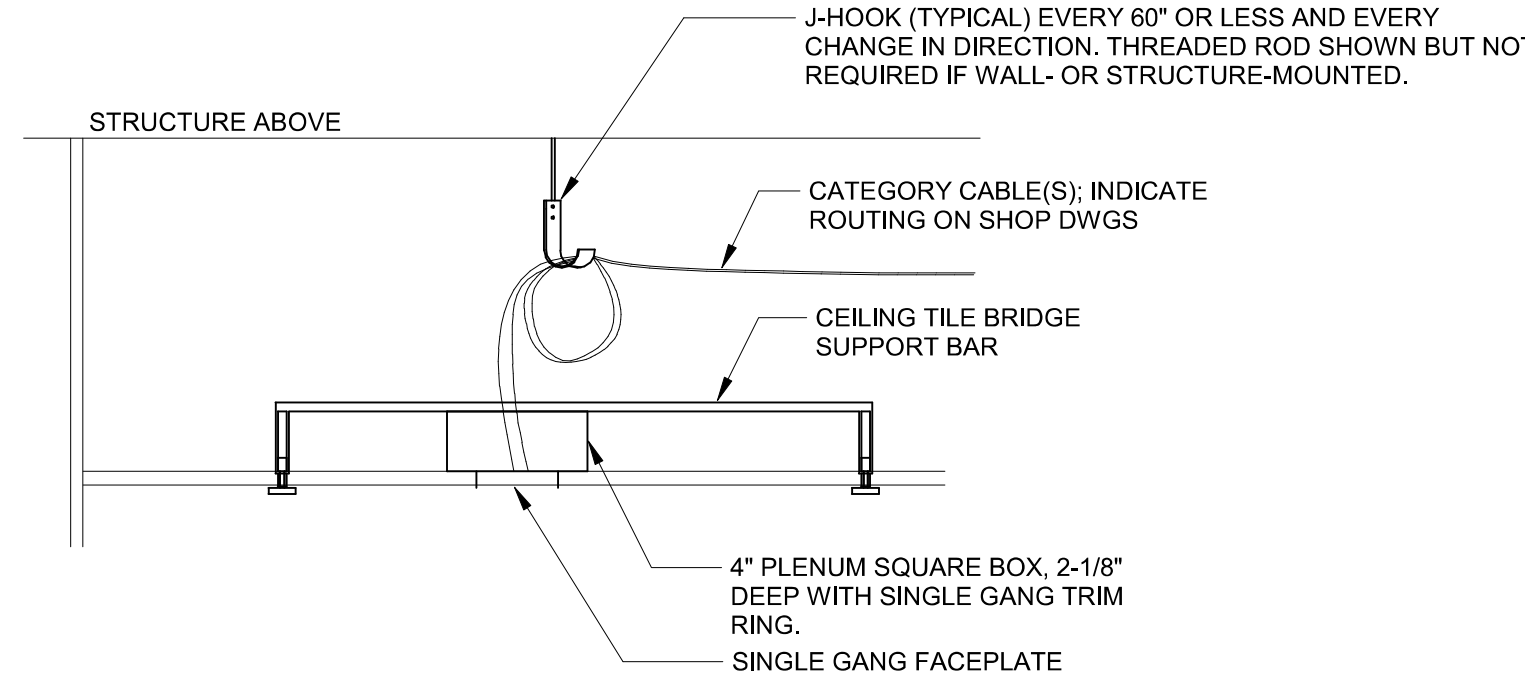


PAGING SPEAKER FOR HARD CEILING

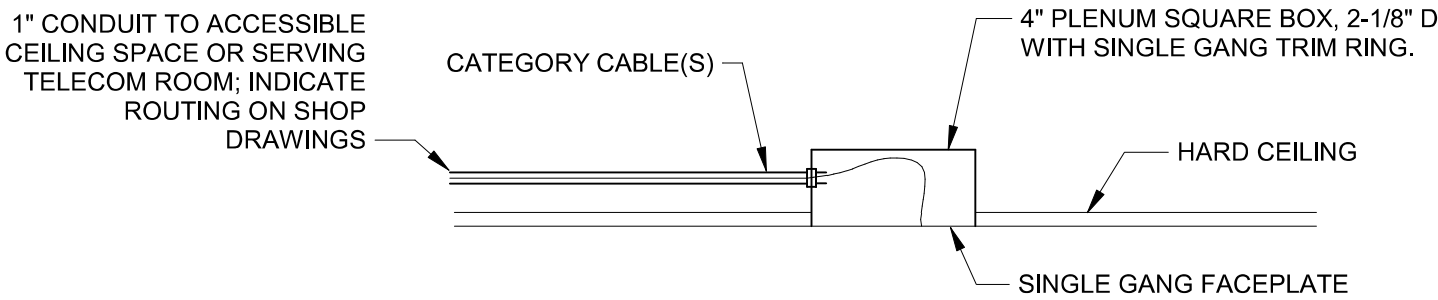


PAGING SPEAKER FOR EXPOSED CEILING

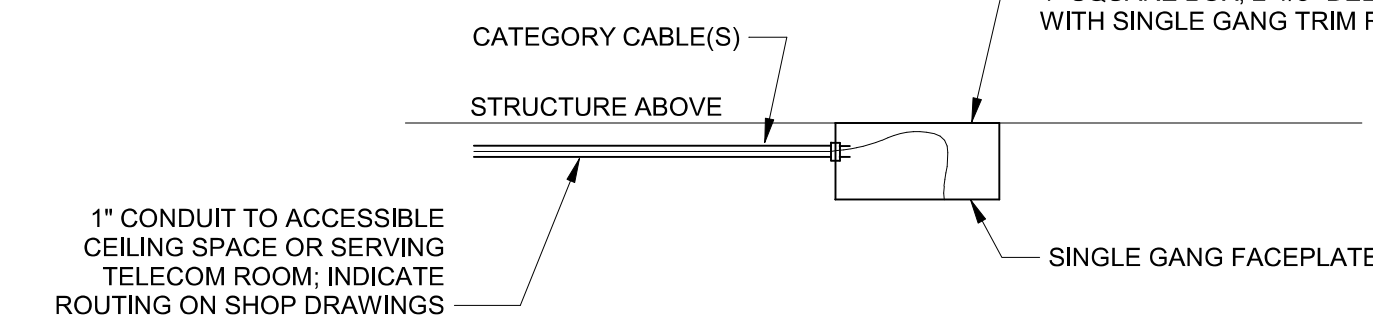
FOR OUTLETS IN SUSPENDED CEILING TILES



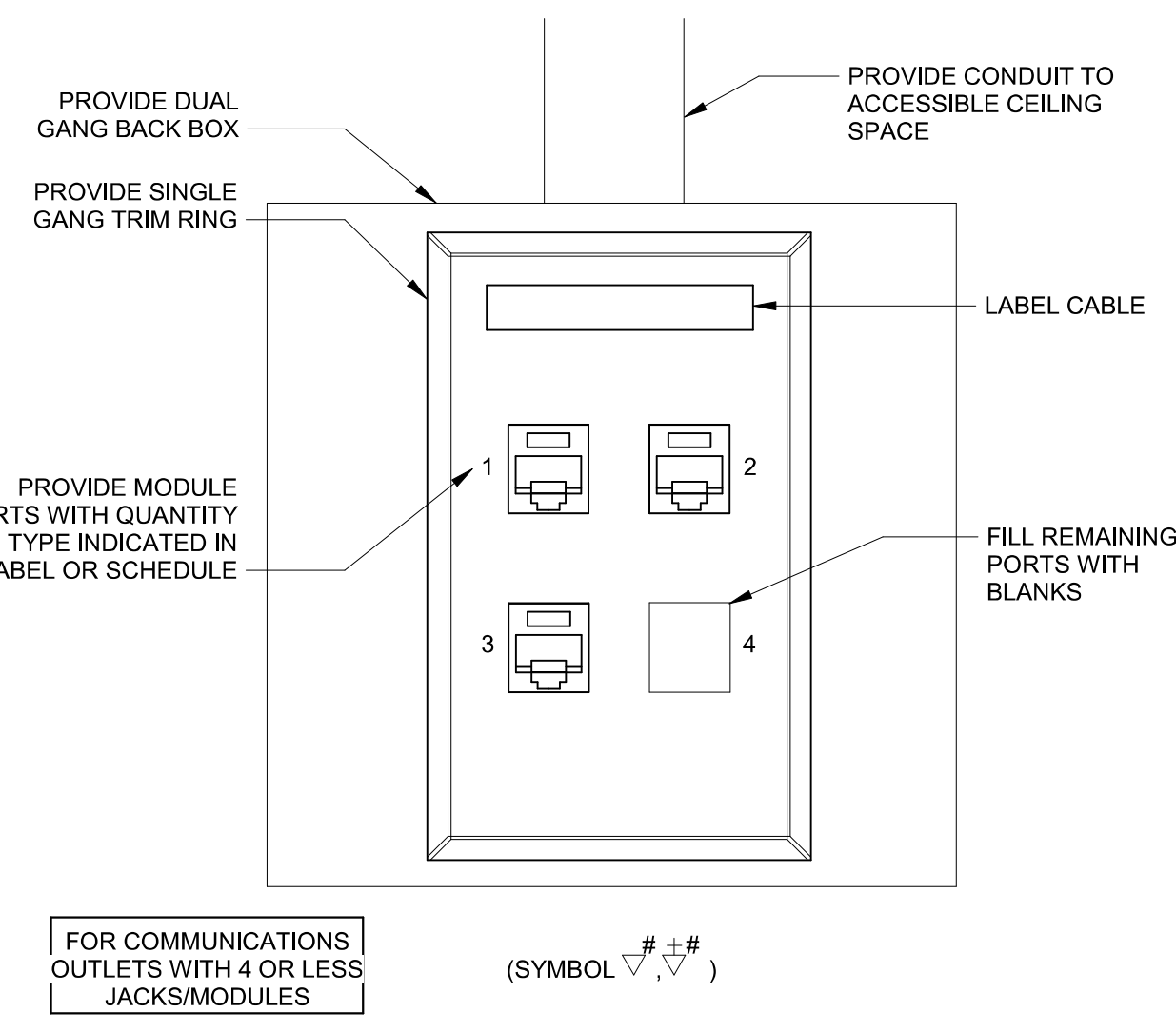
FOR OUTLETS IN GYPSUM BOARD CEILINGS



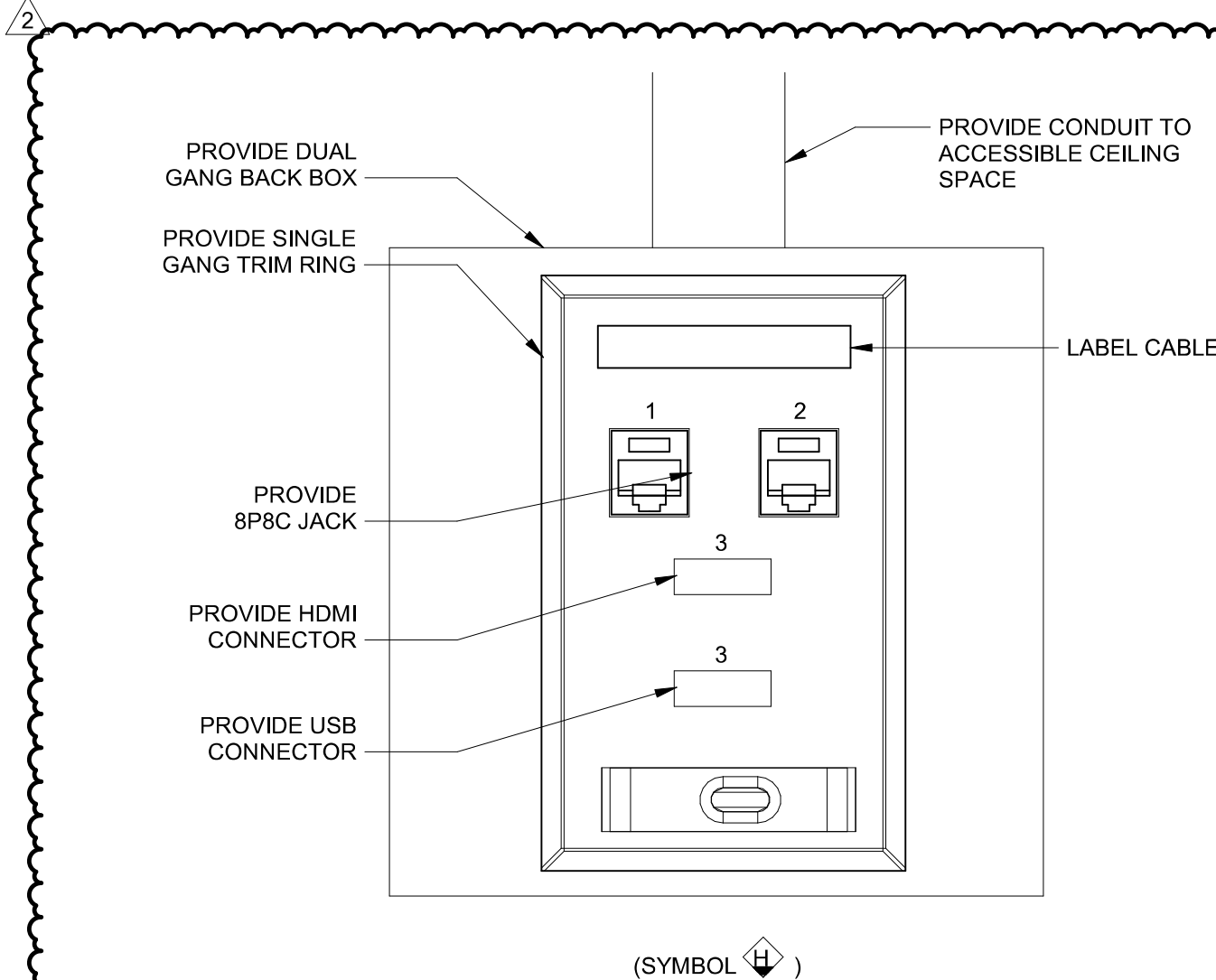
FOR OUTLETS IN EXPOSED TO STRUCTURE AREAS



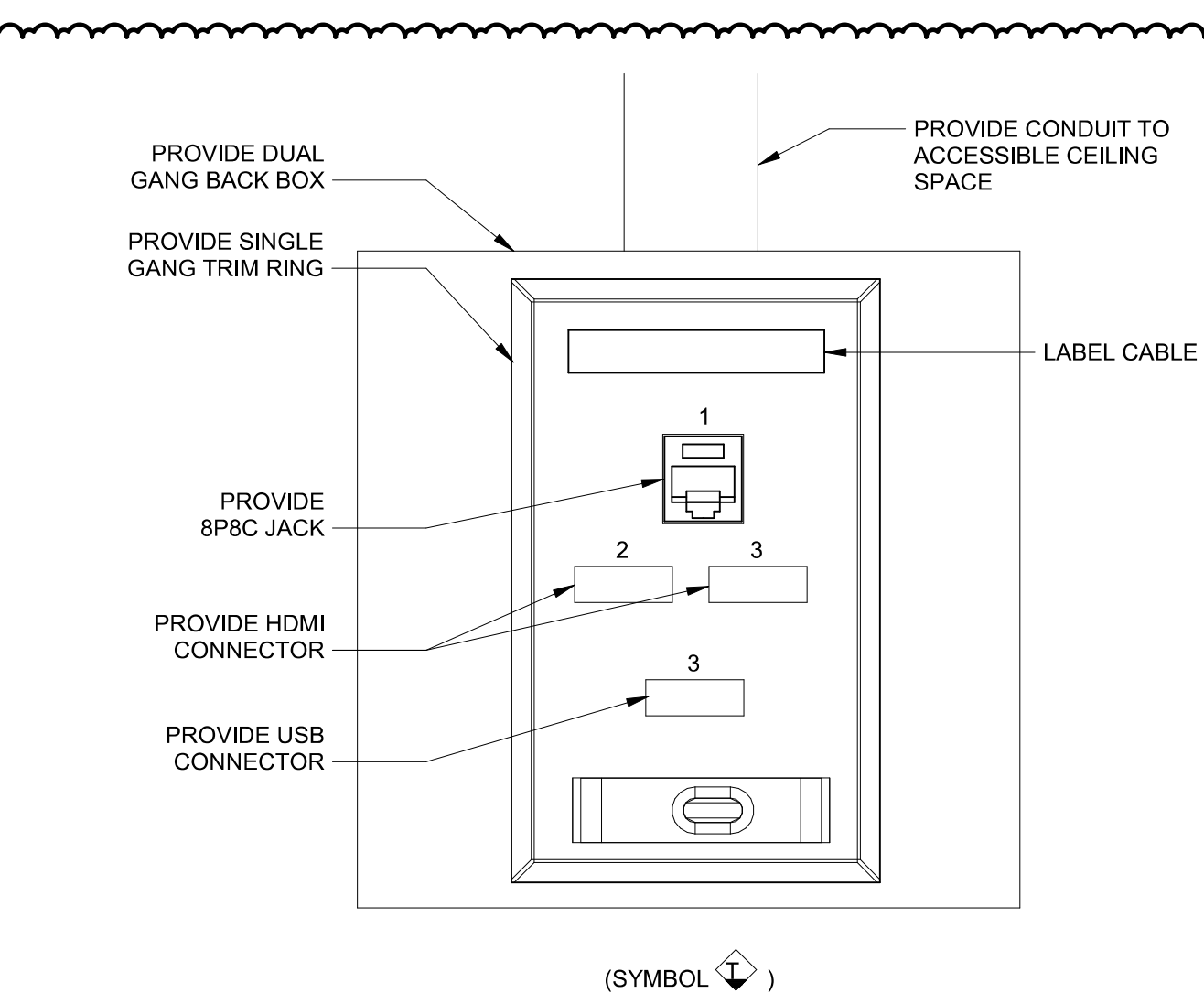
6 CEILING COMM OUTLET 2D
NTS



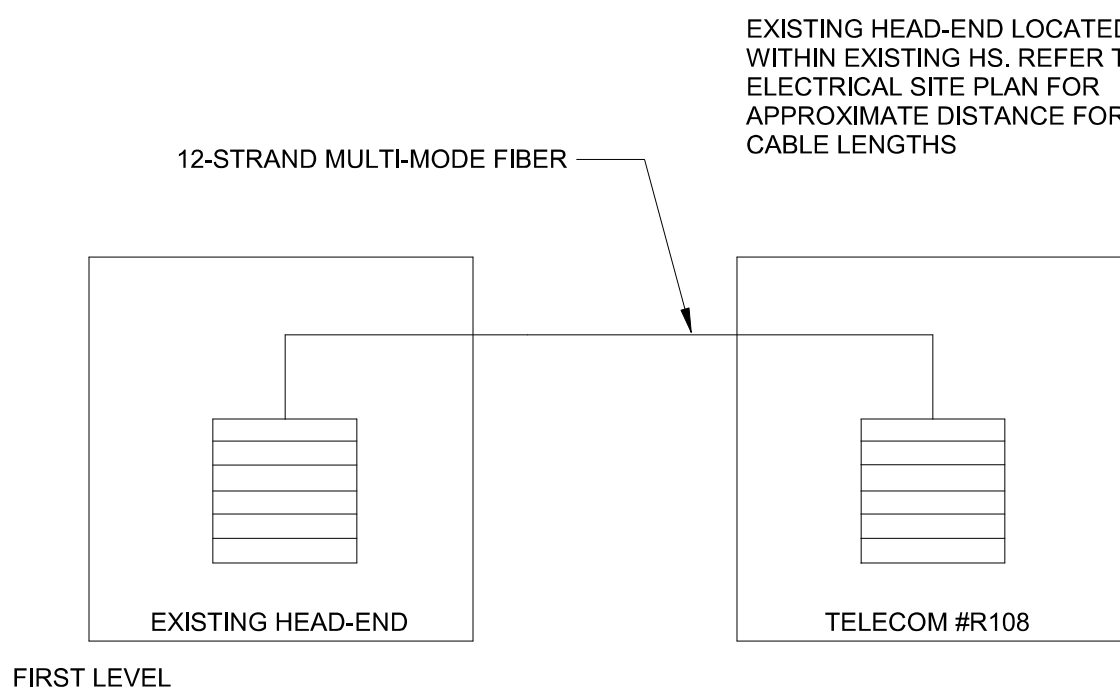
7 SINGLE GANG COMM OUTLET (2D)
NTS



8 SINGLE GANG COMM OUTLET FOR DISPLAY (2D)
NTS



9 SINGLE GANG COMM OUTLET FOR DISPLAY (2D)
NTS



10 RISER DIAGRAM - BACKBONE CABLES
NTS

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09/23/2022
DOUGLAS M. EVERHART
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TN400-B

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SECURITY SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

STANDARD MOUNTING HEIGHTS

INTERCOM (OPERABLE PART)	48"
CARD READER (CENTER OR TOP WHERE OPERABLE PARTS EXIST)	44"
EMERGENCY LOCK RELEASE	48"
EMERGENCY PHONE (OPERABLE PARTS)	48"

DEFAULT MOUNTING HEIGHTS SHOWN ABOVE WHERE NO CALL-OUT IS PROVIDED. MOUNTING HEIGHTS LISTED ARE ABOVE FINISHED FLOOR (AFF) OR ABOVE FINISHED GRADE (AFG). ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ABBREVIATIONS

A AMPERS	KVM KEYBOARD VIDEO MOUSE
ACP ACCESS CONTROL PANEL	SWITCH
ADA AMERICANS WITH DISABILITIES ACT	LAN LOCAL AREA NETWORK
AFB ABOVE FINISHED CEILING	LED LIGHT-EMITTING DIODE
AFF ABOVE FINISHED FLOOR	LF LINEAR FEET
AFG ABOVE FINISHED GRADE	MBS MAINTENANCE BYPASS
AHJ AUTHORITY HAVING JURISDICTION	MDF MAIN DISTRIBUTION FRAME
ANSI AMERICAN NATIONAL STANDARDS INSTITUTE	MFR MANUFACTURER
AV AUDIO-VIDEO	MH MAINTENANCE HOLE
AWG AMERICAN WIRE GAUGE	MM MULTIMODE
BAS BUILDING AUTOMATION SYSTEM	MPOE MAIN POINT OF ENTRANCE
BD BUILDING DISTRIBUTOR	MPOP MAIN POINT OF PRESENCE
BDF BUILDING DISTRIBUTION FRAME	MTD MOUNTED
BFC BELOW FINISHED CEILING	N/A NOT APPLICABLE
BR BIOMETRIC READER	NEC NATIONAL ELECTRICAL CODE
C CONDUIT	NFPA NATIONAL FIRE PROTECTION ASSOCIATION
CAT CATEGORY	NIC NOT IN CONTRACT
CC CENTRAL CONTROL	nm NANOMETER
CCVT CLOSED CIRCUIT TELEVISION	NRTL NATIONALLY RECOGNIZED TESTING LAB
CD CAMPUS DISTRIBUTOR	NVR NETWORK VIDEO RECORDER
CMP COMMUNICATIONS PLENUM JACKET	OC OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
CMR COMMUNICATIONS RISER JACKET	OSP OUTSIDE PLANT
CMR COMMUNICATIONS RISER JACKET	POE POWER OVER ETHERNET
DAS REMOTE DEVICE	PON PASSIVE OPTICAL NETWORK
DAS DISTRIBUTED ANTENNA SYSTEM	QTY QUANTITY
dB DECIBELS	(R) RELOCATED EXISTING DEVICE
DCS DOOR CONTROL SYSTEM	(RE) REMOVE EXISTING DEVICE AND INSTALL AT ANOTHER LOCATION, SEE (R)
DEMO DEMOLITION	RMC RIGID METAL CONDUIT
DSP DIGITAL SIGNAL PROCESSOR	RMS REMOTE MONITORING STATION
DVR DIGITAL VIDEO RECORDER	RU RACK UNIT
(E) EXISTING DEVICE	SCS STRUCTURED CABLING SYSTEM
EC ELECTRICAL CONTRACTOR	SF SQUARE FEET
ECIA ELECTRONIC COMPONENTS INDUSTRY ASSOCIATION	SM SINGLEMODE
EMI ELECTROMAGNETIC INTERFERENCE	SP SCRAMBLE PAD
EMS ENERGY MANAGEMENT SYSTEM	TBD TO BE DETERMINED
EMT ELECTRICAL METALLIC TUBING	TIA TELECOMMUNICATIONS INDUSTRY ASSOCIATION
ER EQUIPMENT ROOM	TGB TELECOMMUNICATIONS GROUND BUS BAR
(ETR) EXISTING TO REMAIN	TMGB TELECOMMUNICATIONS MAIN GROUND BUS BAR
(F) DOOR FRAME MOUNTED DEVICE	TR TELECOMMUNICATIONS ROOM
FAAP FIRE ALARM ANNUNCIATOR PANEL	TYP TYPICAL
FACP FIRE ALARM CONTROL PANEL	UNO UNLESS NOTED OTHERWISE
FD FLOOR DISTRIBUTOR	UL UNDERWRITER LABORATORIES, INC.
FMC FLEXIBLE METAL CONDUIT	UPS UNINTERRUPTIBLE POWER SUPPLY
FOR FIRE STOP SYSTEM	UPS DP UNINTERRUPTIBLE POWER SUPPLY DISTRIBUTION
FLR FLOOR	PANEL
GC GENERAL CONTRACTOR	V VOL(T)S
(GT) GUARD TOUR	VCM VERTICAL CABLE MANAGER
GYP GYPSUM BOARD	VMS VIDEO MANAGEMENT SYSTEM
HH HAND HOLE	WAO WORK AREA OUTLET
HZ HERTZ	WP WEATHER PROOF
IMC INTERMEDIATE METAL CONDUIT	WR WEATHER RESISTANT
ICS INTERCOM CONTROL SYSTEM	WT WATERTIGHT
IP INTERNET PROTOCOL	XP EXPLOSION-PROOF
ISP INSIDE PLANT CABLE	
J-BOX JUNCTION BOX	
(K) ELECTRICALLY OPERATED BY KEY	
KP KEY PAD	

() - INDICATES MODIFIER FOR SPECIAL OPERATION IN LABELING SCHEME

ANNOTATION

	SECURITY PLAN CALLOUT
	CONNECTION POINT OF NEW WORK TO EXISTING
	DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER, LOWER NUMBER INDICATES SHEET NUMBER
	SECTION CUT DESIGNATION

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINE-TYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF THE NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING	NEW
DEMOLISH	FUTURE

SECURITY SYMBOLS

	AREA OF REFUGE CALL BOX
	CARD READER
	CLIENT WORKSTATION WHERE X = NUMBER OF MONITORS
	(AC) ACCESS CONTROL
	(SM) SECURITY MANAGEMENT
	(TS) TOUCHSCREEN CONTROL
	(VS) VIDEO SURVEILLANCE
	DOOR OPERATOR
	DOOR BELL
	(PB) PUSH BUTTON
	(CH) CHIME
	DOOR POSITION SWITCH
	SEE ARCHITECTURAL DOOR HARDWARE SCHEDULE
	DOOR POSITION SWITCH AND LATCHBOLT MONITOR
	SEE ARCHITECTURAL DOOR HARDWARE SCHEDULE
	ELECTRIFIED LOCKING DEVICE
	SEE ARCHITECTURAL DOOR HARDWARE SCHEDULE
	ELECTRIFIED LOCKING DEVICE
	SEE ARCHITECTURAL DOOR HARDWARE SCHEDULE
	EMERGENCY PHONE
	GLASS BREAK DETECTOR
	INTERCOM
	(CR) WITH CARD READER
	(DS) DOOR STATION
	(RS) RECEIVING (MASTER) STATION
	(VS) VIDEO STATION
	INMATE PHONE
	KEYPAD
	(ID) INTRUSION DETECTION SYSTEM
	(AC) ACCESS CONTROL
	LIGHTING CONTROL RELAYS
	MOTION DETECTOR
	PANIC ALARM THREE-COLOR INDICATOR LIGHT
	REQUEST-TO-EXIT PUSH PAD
	REMOTE UNLOCK/OPEN BUTTON
	MICROPHONE STATUS LIGHT, WALL MOUNT
	MICROPHONE
	MICROPHONE MUTE ILLUMINATED SWITCH
	SPEAKER (DOOR BELL)
	PAGING SPEAKER
	VAULT MONITOR
	WATER CONTROL VALVE
	VALVE BY DIVISION 22, CONTROL BY DIVISION 28
	WATCH TOUR

SECURITY CAMERAS

	FIXED CAMERA		TWO IMAGER CAMERA
	PTZ CAMERA		FOUR IMAGER CAMERA
	360 CAMERA		
	180 CAMERA		

MOUNTING TYPE SYMBOLS (APPLIES TO ANY SECURITY DEVICE SYMBOL)

	CEILING MOUNT
	WALL MOUNT
	POLE / BOLLARD MOUNT
	CORNER MOUNT
	PENDANT MOUNT
	WALL MOUNT PENDANT ARM

LABELING SCHEME

SECURITY DEVICES (TYPICAL)

	A: DEVICE SYMBOL
	XX: MODIFIER FOR SPECIAL OPERATION IF APPLICABLE
	YY: DEVICE TYPE

SEE MATCHING SCHEDULES ON THIS SHEET (IF APPLICABLE)

SECURITY CAMERAS (TYPICAL)

	XX: CAMERA NUMBER
	AA: CAMERA TYPE (SEE CAMERA SCHEDULE ON THIS PAGE)
	## AFF: FOR WALL MOUNTED CAMERAS, HEIGHT ABOVE FINISHED FLOOR

SEE MATCHING SCHEDULES ON THIS SHEET (IF APPLICABLE)

GENERAL NOTES

- CONTRACTOR SHALL SUPPORT ALL CABLE WITH APPROVED PATHWAY.
- ALL CABLES SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO THE BUILDING STRUCTURE, UNLESS OTHERWISE NOTED.
- DOOR HARDWARE AND OPENING CONDITIONS SHOULD BE EVALUATED PRIOR TO CONDUIT AND CABLING INSTALLATION AND COORDINATED WITH DIVISION 08.
- PROVIDE CONDUIT SLEEVE WITH NYLON BUSHINGS FOR NON-RATED WALL PENETRATIONS FOR COMMUNICATIONS CABLES. PATHWAYS SHALL BE SIZED FOR NO MORE THAN FOURTY (40) PERCENT FILL.
- PROVIDE CONDUIT SLEEVE WITH NYLON BUSHINGS FOR OVERHEAD CEILINGS THAT BLOCK ACCESS FOR MOVE/ADD/CHANGES TO CABLE PATHWAY, LIKE HARD GYPSUM CEILING. PATHWAYS SHALL BE SIZED FOR NO MORE THAN FOURTY (40) PERCENT FILL.
- PROVIDE UL LISTED FIRESTOP ASSEMBLY AT FIRE WALL PENETRATIONS FOR COMMUNICATIONS CABLES. MATERIAL AND INSTALLATION SHALL MAINTAIN THE RATED CAPACITY OF WALL AND MEET ALL APPLICABLE CODES.
- CONTRACTOR SHALL COORDINATE ALL COMMUNICATIONS AND CABLING PATHWAYS WITH OTHER DIVISIONS (08, 21, 22, 23, 26, AND 27) PRIOR TO INSTALL OF DUCTWORK, PIPING, CONDUITS, AND ETC.
- FULLY COORDINATE ALL CONDUIT ROUTING WITH STRUCTURAL ELEMENTS. COORDINATE CONDUIT INSTALLATIONS WITH ARCHITECT, STRUCTURAL ENGINEER, STRUCTURAL CONTRACTOR, AND GENERAL CONTRACTOR PRIOR TO INSTALLATION. ROUTING IN OR UNDER THE SLAB FLOOR REQUIRES THE USE OF CABLE RATED FOR A WET ENVIRONMENT.
- VERIFY ALL CAMERA LOCATIONS PRIOR TO ROUGH-IN. FIELD OF VIEW SHALL NOT BE OBSTRUCTED BY OTHER ELEMENTS INCLUDING, BUT NOT LIMITED TO, EXIT SIGNS, LIGHT FIXTURES, MILLWORK, SPRINKLERS, CURTAINS, AND SIGNAGE.
- ALL WIRING SHALL BE INSTALLED COMPLETE AND UNSPLICED FROM THE SERVING EQUIPMENT PANEL TO DEVICE.
- REFER TO TNO.1 FOR TECHNOLOGY GENERAL NOTES THAT ALSO DESCRIBES SECURITY COMPONENTS.

SECURITY ROUGH-IN

ROUGH-IN ONLY SCHEDULE					
SYMBOL	DESCRIPTION	BACK BOX	CONDUIT	CABLE(S)	MOUNTING HEIGHT
	SECURITY ELECTRIFIED LOCK	N/A	(1) 1/2" EMT TO C DOOR FRAME	N/A	
	SECURITY CARD READER, WALL	2-GANG BACKBOX WITH 1-GANG MUD RING	(1) 3/4" EMT	B	44"
	SECURITY CARD READER, M/MuLLION	N/A	(1) 3/4" EMT	B	44"
	SECURITY REQUEST-TO-EXIT	1-GANG BACKBOX WITH 1-GANG MUD RING	(1) 1/2" EMT	E	REFER TO DOOR HARDWARE SCHEDULE
	SECURITY CAMERA, CEILING - RECESSED	PROVIDER'S BACKBOX	(1) 3/4" EMT	A	N/A
	SECURITY CAMERA, CEILING - SURFACE	2-GANG BACKBOX WITH 1-GANG MUD RING	(1) 3/4" EMT	A	N/A
	SECURITY CAMERA, WALL - INTERIOR	2-GANG BACKBOX WITH 1-GANG MUD RING	(1) 3/4" EMT	A	9' - 0"
	SECURITY CAMERA, WALL - EXTERIOR	2-GANG BACKBOX WITH 1-GANG MUD RING	(1) 3/4" EMT	A	10' - 0"
	SECURITY VIDEO INTERCOM, WALL	PROVIDER'S BACKBOX	(1) 3/4" EMT	A,E	48" TO PUSH BUTTON
	SECURITY PANIC BUTTON, DESK/WALL	1-GANG BACKBOX WITH 1-GANG MUD RING	(1) 1/2" EMT	D	N/A
	DOOR POSITION SWITCH	N/A	(1) 1/2" EMT TO D DOOR FRAME	N/A	

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CABLE TYPES

A	CATEGORY 6 CABLE
B	22 AWG, 6C SHIELDED
C	18 AWG, 4C UNSHIELDED
D	22 AWG, 2C UNSHIELDED
E	22 AWG, 4C UNSHIELDED

CABLE TYPES SHOWN ABOVE ARE TYPICAL FOR CABLE DISTANCES LESS THAN 500 FEET. REFER TO DEVICE MANUFACTURER'S INSTALLATION REQUIREMENTS FOR LONGER DISTANCES. COORDINATE WITH DOOR HARDWARE PROVIDER TO CONFIRM CABLING REQUIREMENTS FOR LOCK POWER.



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EXPIRES 12/31/2022

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SECURITY GENERAL NOTES AND LEGEND

TY000

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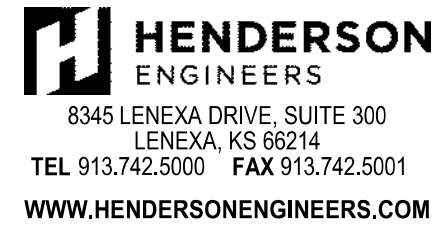
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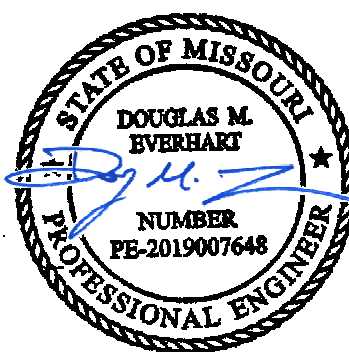
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1	Addendum 01	09/16/2022



09/15/2022
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LSW - SECURITY PLAN -
LEVEL 1

TY101-A

SECURITY PLAN NOTES:

TY1 PROPOSED ACCESS CONTROL LOCATION. OWNER'S VENDOR SHALL COORDINATE FINAL LOCATION.

TY3 ADA ACTUATOR. REFER TO DIVISION 06 DOOR HARDWARE. ENSURE ADA ACTUATOR WILL ONLY OPERATE WHEN THE DOOR IS UNLOCKED OR WITHIN 10 SECONDS OF A VALID CARD READ.

TY4 CENTER BOX AT ~9'-6" VERTICALLY ON THE STRUCTURAL BEAM AND ROUTE HARD CONDUIT INTO NEAREST ACCESSIBLE CEILING. ENSURE ALL PATHWAY IS WEATHERTIGHT.

1 SECURITY LEVEL 1 PLAN - LSW
3/16" = 1'-0"



